SINCE 1937

GEC

GAS EQUIPMENT CO, INC

Cryogenic & Industrial Gas Equipment Catalog

02-03-2021

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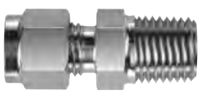
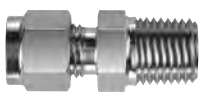
Series D Dual Ferrule Instrument Tube Fittings

GENERANT Fluid Connectors

BI-LOK to MALE NPT



DCT
Male NPT Connector



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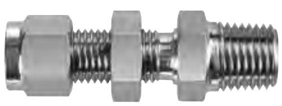
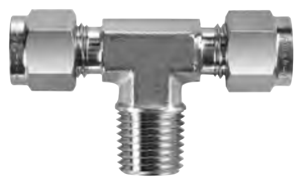
Thermocouple Connector



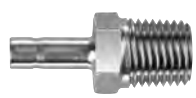
DSC
Bulkhead Male
NPT Connector

DLN
Male NPT Elbow

DTK
Male NPT Run Tee

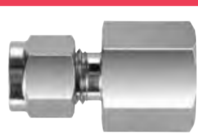


DTN
Male NPT Branch Tee

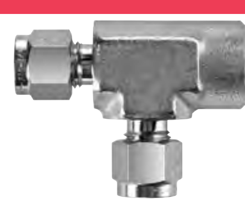


DHA
Tube Stub to
Male NPT Adapter

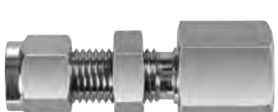
BI-LOK to FEMALE NPT



DSA
Female NPT
Connector

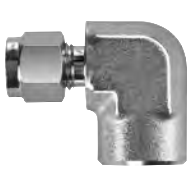


DTF
Female NPT Run Tee



DSS
Bulkhead Female
NPT Connector

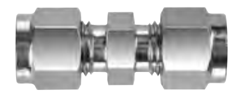
DTH
Female NPT Branch Tee



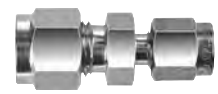
DLF
Female NPT Elbow

DHC
Tube Stub to
Female NPT Adapter

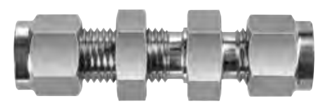
BI-LOK UNION



DUA
Union

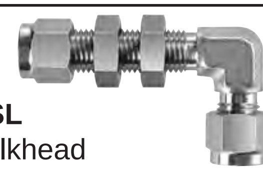


DUR
Reducing Union

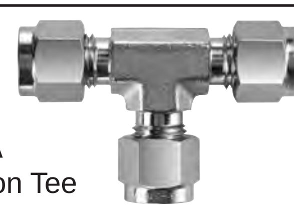


DSU
Bulkhead Union

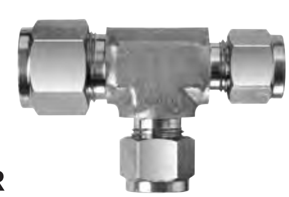
DLA
Union Elbow



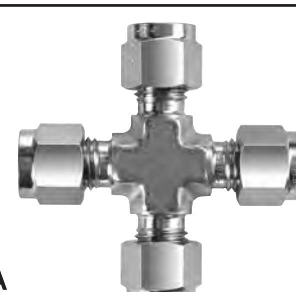
DSL
Bulkhead
Union Elbow



DTA
Union Tee

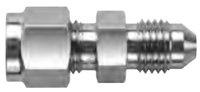


DTR
Reducing Union Tee

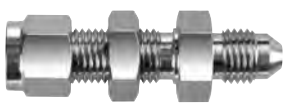


DXA
Union Cross

BI-LOK to AN 37° FLARE



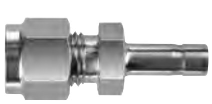
DUC
AN 37° Flare Union



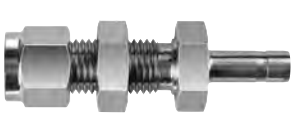
DUE
Bulkhead AN
37° Flare Union

DAN
AN 37°
Flare Adapter

TUBE STUB



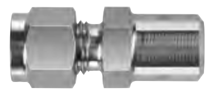
DRE
Reducer



DSE
Bulkhead Adapter

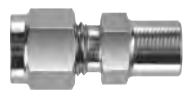
DPC
Port Connector

BI-LOK to WELD

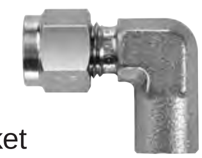


DCB
Male Pipe
Weld Connector

DLB
Male Pipe
Weld Elbow



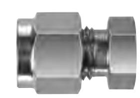
DCW
Tube Socket
Weld Union



DLW
Tube Socket
Weld Elbow

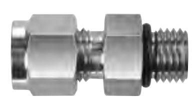
PLUG AND CAP

DBA
Plug



DCA
Cap

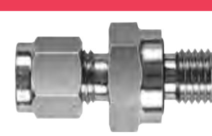
BI-LOK to SAE/MS STRAIGHT THREAD



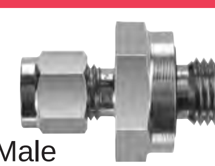
DCU
SAE/MS Male
Straight Thread
Connector

DLO
Positionable
SAE/MS Male
Straight Thread Elbow

BI-LOK to O-SEAL



DCO
O-Seal Male Straight
Thread Connector



DCM
O-Seal Male
NPT Connector

COMPONENTS

DOF
Front Ferrule

DOB
Back Ferrule

DNA
Nut

DOS
Ferrule Set

DTI
Tube Insert

CONSTRUCTION AND OPERATION

BI-Lok Series D Dual Ferrule Tube Fittings are composed of four precision machined component parts: 1) fitting body, 2) front ferrule, 3) back ferrule, 4) nut. BI-Lok Tube Fittings are shipped fully assembled and individually bagged. Once the tubing has been fully inserted into the fitting, a leak tight seal is achieved through the simple action of tightening the nut against the fitting body. The tightening of the nut provides the axial thrust required to engage the captively held ferrules against the outside diameter of the tubing. The staged swaging action of the ferrules, with minimal torque transfer to the tubing during make-up, provides the key to BI-Lok's high integrity sealing capability and exceptional service life.

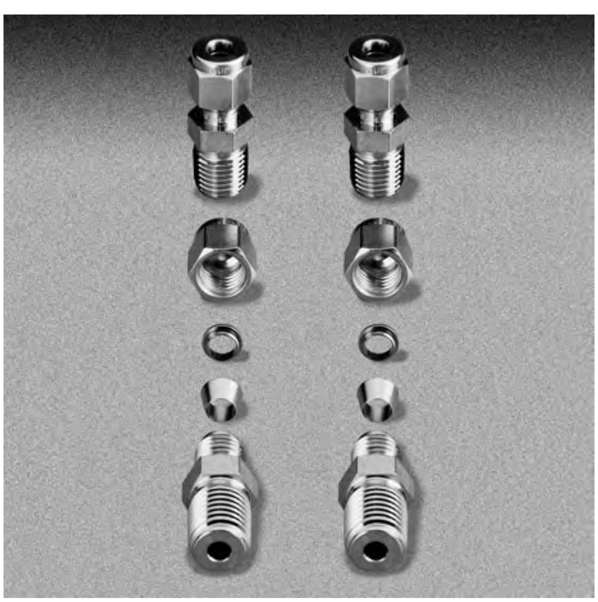
MATERIALS OF CONSTRUCTION

<table>
<tr><th colspan="2" rowspan="2">Component</th><th colspan="2">Fitting Material</th></tr>
<tr><th>Brass</th><th>316 Stainless Steel</th></tr>
<tr><td rowspan="2">Fitting Body</td><td>Forged</td><td>ASTM B124, CDA 377</td><td>ASTM A182</td></tr>
<tr><td>Bar Stock</td><td rowspan="2">ASTM B16, CDA 360</td><td rowspan="2">ASTM A479</td></tr>
<tr><td colspan="2">Front Ferrule
Back Ferrule
Nut</td></tr>
</table>

Stainless Steel Fitting Bodies and Nuts are Heat /Lot code traceable. Stainless steel nuts are silver plated to prevent gauling and reduce make-up torque.

QUALITY CONTROL

BI-Lok Tube Fittings are designed, manufactured and inspected to the rigid quality requirements of our ISO certified production facility. All Stainless Steel Fittings are Heat/Lot code traceable. BI-Lok Tube Fittings have been tested and certified to a variety of Global International Industry standards and regulatory agencies.



*Swagelok® is a registered trade mark of the Swagelok Company

INTERCHANGEABILITY AND GAGEABILITY

BI-Lok Series D Dual Ferrule Tube Fittings are manufactured to be completely component intermixable with the Swagelok® brand of tube fittings. Independent third party testing concluded that piece by piece intermixing of each manufacturer's component parts, in various combinations, yielded no performance degradation of the fitting connection. BI-Lok Dual Ferrule Tube Fittings are fully compatible for use with the Swagelok® brand Gap Inspection Gauges.

TUBING SELECTION AND PREPARATION

The selection of the proper tubing is essential to both the performance and safety of a tubing system. Careful consideration should be applied to the following variables; system pressure, media, flow, operating temperature and environmental conditions. Tube fittings should always be used with similar tube materials. i.e.; Stainless Steel fittings with Stainless Steel tubing and Brass fittings with copper tubing. In order to achieve proper fitting make-up, the tubing must be softer that the fitting material. For stainless steel tubing, we recommend fully annealed seamless or welded and drawn tubing of ASTM A269, A213 and A249. Tubing hardness should not exceed Rockwell B-90. For copper tubing, seamless or soft annealed ASTM B-75, or seamless soft annealed Type K or Type L water tubing ASTM B-88 is recommended. Care should be taken in tube handling to ensure that tubing is reasonably straight and is cut in a manner to create smooth square ends, free of burrs. Handling practices should consider that surface scratches on the tube OD may be a potential source of leaks.

PRESSURE RATINGS

The BI-Lok Dual Series D Ferrule Tube Fitting consists of four elements – nut, front ferrule, back ferrule and fitting body. However, the actual sealing function is accomplished with the addition of a fifth element, the tubing itself. Therefore, the pressure rating of the fitting assembly is a direct function of the tubing selected. Proper tube selection is critical and the ultimate responsibility of the system designer/user. The tables listed on page 2 provide the allowable pressure ratings of a variety of commonly used tube sizes and materials.

STAINLESS STEEL TUBING

Tube OD	Tube Wall Thickness (Inches)											
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049	0.065	0.083	0.095	0.109
1/16"	5600	6800	8100	9400	12000							
1/8"						8500	10900					
3/16"						5400	7000	10200				
1/4"						4000	5100	7500	10200		Working Pressure, PSIG	
5/16"							4000	5800	8000			
3/8"							3300	4800	6500			
1/2"							2600	3700	5100	6700		
5/8"								2900	4000	5200		
3/4"								2400	3300	4200	4900	5800
7/8"								2000	2800	3600	4200	4800
1"									2400	3100	3600	4200

304 and 316 annealed seamless tubing per ASTM A-269 or equivalent working pressure are based on allowable stress of 20,000 psi between -20° F and 100° F (Reference: ANSI B31.3)

COPPER TUBING

Tube OD	Tube Wall Thickness (Inches)							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120
1/8"	2700	3600	5100					
3/16"	1800	2300	3400					
1/4"	1300	1600	2500	3500				
5/16"		1300	1900	2700		Working Pressure, PSIG		
3/8"		1000	1600	2200				
1/2"		800	1100	1600	2100			
5/8"			900	1200	1600	1900		
3/4"			700	1000	1300	1500	1800	
7/8"			600	800	1100	1300	1500	
1"			500	700	900	1100	1300	1500

Copper tubing per ASTM B-75 or equivalent. Working pressures are based on allowable stress of 6,000 psi between -70°F and 100° F (Reference: ANSI B31.3)

STRESS FACTORS

Stress Factor used to calculate maximum allowable working pressures at elevated temperatures.

NOTE: *To find the maximum allowable working pressures for various tube materials at elevated temperatures, simply multiply the maximum allowable working pressure for the the tube size and wall thickness found in these charts by the correct Stress Factor found in the table below:*

Temperature Stress Factor

TEMP (°F)	304 Stainless Steel	316 Stainless Steel	Carbon Steel	Copper
200	1.00	1.00	.95	.80
400	.93	.96	.87	.50
600	.82	.85		
800	.76	.79		
1000	.69	.76		

CARBON STEEL TUBING

Tube OD	Tube Wall Thickness, (Inches)							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120
1/8"	8000	10200						
3/16"	5100	6600	9600					
1/4"	3700	4800	7000	9600				
5/16"		3700	5500	7500		Working Pressure, PSIG		
3/8"		3100	4500	6200				
1/2"		2300	3200	4500	5900			
5/8"		1800	2600	3500	4600	5300		
3/4"			2100	2900	3700	4300	5100	
7/8"			1800	2400	3200	3700	4300	
1"			1500	2100	2700	3200	3700	4100

Carbon steel hydraulic tubing per ASTM A-179 or equivalent. Working pressures are based on allowable stress of 15,700 psi between -70°F and 100° F (Reference: ANSI B31.3)

PIPE END PRESSURE RATINGS

NPT Pipe Size	316 Stainless and Carbon Steel		Brass	
	Male	Female	Male	Female
1/8"	10000	6500	5000	3200
1/4"	8000	6600	4000	3300
3/8"	7800	5300	3900	2600
1/2"	7700	4900	3800	2400
3/4"	7300	4600	3600	2300
1"	5300	4400	2600	2200

Fittings with both Tube and NPT threaded pipe end connections have different pressure ratings. When specifying these type fittings, please refer to this chart for maximum allowable pressure ratings. A thread sealant is recommended when using NPT connections.

ASSEMBLY INSTRUCTIONS

Assembly Instructions

The following procedures refer to the proper assembly of the BI-Lok Series D Dual Ferrule Tube Fittings.

1. BI-Lok Tube Fittings are supplied fully assembled and individually bagged, allowing for clean efficient make-up. Should component assembly be required, please note that the order of assembly is the front ferrule into the cone of fitting body, back ferrule and fitting nut as noted in Fig. 1.
2. Insert the tubing into the fitting body until it bottoms out against the tube stop shoulder of the fitting. Please note that tubing should be cut squarely and free of burrs.
3. Hand tighten the nut as much as possible, bringing the fitting to what is called the “finger tight” position.
4. Secure the fitting body with a wrench and tighten the nut with another wrench an additional 3/4 of a turn for tube sizes 1/16” thru 3/16” or for sizes 1/4” and above 1-1/4 turns. (refer to Fig. 2a, 2b, and 2c).

Fig.1

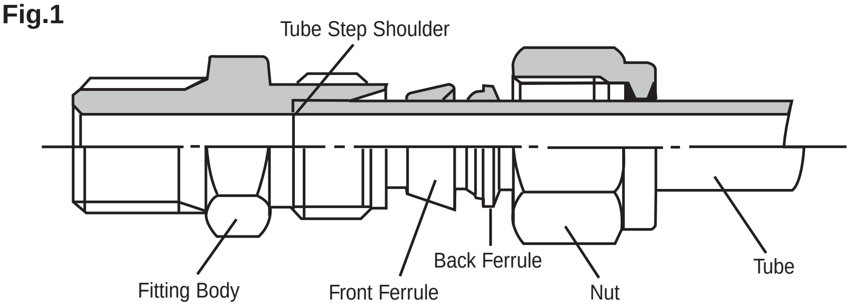


Fig.2a

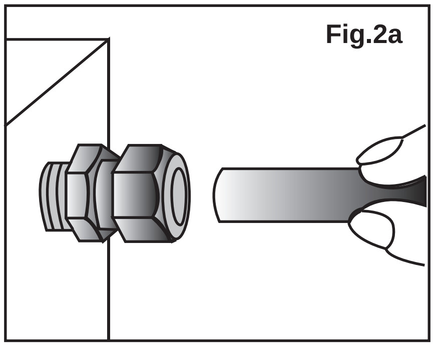
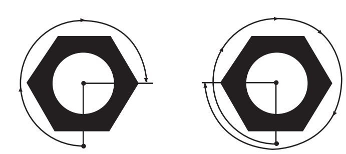


Fig.2c



Reassembly Instructions

To reassemble a BI-Lok Series D Dual Ferrule Tube Fitting, simply insert the tube assembly (nut, front and back ferrule preswaged on the tube) into the fitting body and hand tighten the nut. Next, using a wrench, rotate the nut approximately 1/4 of a turn (back to the original make-up position) and then tighten the nut slightly.

Fig.2b

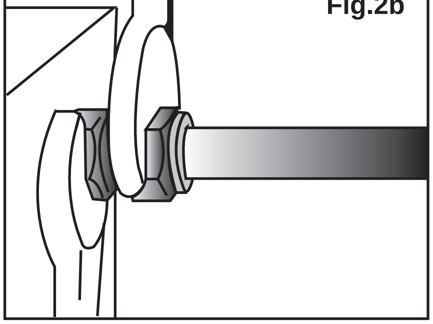
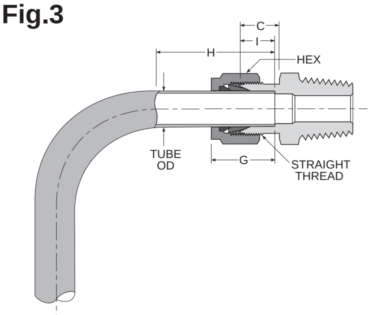


Fig.3



Tube Measuring and Fitting

When measuring and bending tubing it is important to be aware of two critical measurements. The first being the tube insertion depth (reference dimension G) into the fitting assembly which must be considered in the determining the over all length of tube required. The other being the minimum length of straight tubing required for a proper tube bend (reference dimension H). Both measurements are dependant on tube OD; please use Fig. 3 for reference purposes.

Tube Size	A Tube OD	Straight Thread	Hex Tube Nut	C	G	H	I
1	1/16”	10-32	5/16”	0.27	0.34	1/2”	0.19
2	1/8”	5/16”-20	7/16”	0.34	0.50	23/32”	0.25
3	3/16”	3/8”-20	1/2”	0.37	0.54	3/4”	0.28
4	1/4”	7/16”-20	9/16”	0.40	0.60	13/16”	0.31
5	5/16”	1/2”-20	5/8”	0.44	0.64	7/8”	0.34
6	3/8”	9/16”-20	11/16”	0.47	0.66	15/16”	0.37
8	1/2”	3/4”-20	7/8”	0.47	0.90	1 3/16”	0.50
10	5/8”	7/8”-20	1”	0.47	0.96	1 1/4”	0.56
12	3/4”	1”-20	1 1/8”	0.47	0.96	1 1/4”	0.56
14	7/8”	1 1/8”-20	1 1/4”	0.47	1.02	1 5/16”	0.63
16	1”	1 5/16”-20	1 1/2”	0.56	1.23	1 1/2”	0.75

ORDERING INFORMATION

How To Order

BI-Lok tube fittings are ordered by part number as listed in this catalog. The part numbering system is designed so that you can easily identify the type, configuration, size and material of the fitting. Using the example below, specify the Fitting Type, Size Designator, Material and any additional Options desired.

DCT - 4-4 - SS - *

Fitting Type — Size Designator — Material — Option

Type	Description	Page	End Connection 1		End Connection 2
DAN	AN 37° Flare Union	5	Tube OD		AN Flare
DBA	Plug	5		Tube OD	
DCA	Cap	6		Tube OD	
DCB	Male Pipe Weld Connector	6	Tube OD		Male Weld Pipe
DCM	O-Seal Male NPT Connector	7	Tube OD		Male NPT
DCO	O-Seal Male Straight Thread Connector	7	Tube OD		Straight Thread
DCT	Male NPT Connector	8	Tube OD		Male NPT
DCU	SAE/MS Male Straight Thread Connector	9	Tube OD		Straight Thread
DCW	Tube Socket Weld Union	9		Tube OD	
DCTZ	Male NPT Connector	10	Tube OD		Male NPT
DHA	Tube Stub to Male NPT Adapter	11	Tube Stub		Male NPT
DHC	Tube Stub to Female NPT Adapter	12	Tube Stub		Female NPT
DLA	Union Elbow	12		Tube OD	
DLB	Male Pipe Weld Elbow	13	Tube OD		Male Weld Pipe
DLF	Female NPT Elbow	13	Tube OD		Female NPT
DLN	Male NPT Elbow	14	Tube OD		Male NPT
DLO	Positionalbe SAE/MS Male Straight Thread Elbow	15	Tube OD		Straight Thread
DLW	Tube Socket Weld Elbow	15		Tube OD	
DNA	Nut	15		Tube OD	
DOB	Back Ferrule	16		Tube OD	
DOF	Front Ferrule	16		Tube OD	
DOS	Ferrule Set	16		Tube OD	
DPC	Port Connector	17	Tube OD		Tube Stub
DRE	Reducer	17-18	Tube OD		Tube Stub
DSA	Female NPT Connector	18-19	Tube OD		Female NPT
DSC	Bulkhead Male NPT Connector	19	Tube OD		Male NPT
DSE	Bulkhead Reducer	20	Tube OD		Tube Stub
DSL	Bulkhead Union Elbow	20		Tube OD	
DSS	Bulkhead Female NPT Connector	21	Tube OD		Female NPT
DSU	Bulkhead Union	21		Tube OD	
DTA	Union Tee	22		Tube OD	
DTF	Female NPT Run Tee	22	Tube OD		Female NPT
DTH	Female NPT Branch Tee	23	Tube OD		Female NPT
DTI	Tube Insert	23	Tube OD		Tube ID
DTK	Male NPT Run Tee	24	Tube OD		Male NPT
DTN	Male NPT Branch Tee	24	Tube OD		Male NPT
DTR	Reducing Union Tee	25	Tube OD	Tube OD	Tube OD*
DUA	Union	26		Tube OD	
DUC	AN 37° Flare Union	26	Tube OD		AN Flare
DUE	Bulkhead AN 37° Flare Union	27	Tube OD		AN Flare
DUR	Reducing Union	27	Tube OD		Tube OD
DXA	Union Cross	28		Tube OD	

*For DTR specify end connection, 1, 2 and 3

Size Indicator	Tube OD or Threaded Connection
1	1/16"
2	1/8"
3	3/16"
4	1/4"
5	5/16"
6	3/8"
8	1/2"
10	5/8"
12	3/4"
14	7/8"
16	1"

SS - 316 stainless steel, ASTM A479
B - Brass, ASTM B16

N - Nylon Ferrules
T - T eflon Ferrules
X - Cleaned and packaged for oxygen service

GENERANT Valves & BI-Lok Fittings

FORGED NEEDLE VALVE
1/8" - 3/8" NPT
1/8" and 1/4" Dual Ferrule Tube
Vacuum - 5000 Psig (345 Bar)

SERIES FNV

Description

Series FNV Needle Valves feature a forged body, integral bonnet design with PTFE and metallic wafer stem packing. This provides leak-tite service from vacuum to the maximum operating pressure. Series FNV are available in Straight and Angle configurations, with NPT and Dual Ferrule Tube connections. The industry standard panel mounting allows the FNV to be a cost effective solution to many applications. Standard metal to metal stem and optional Soft Tip stem provide accurate metering over a wide range of pressures. The Series FNV can be ordered Cleaned for Oxygen Service.

Features

- Metallic and PTFE Wafer Stem Packing provides low operating torque
- Panel Mounting Standard
- Metal to Metal Standard, Optional Soft Stem Tip (PCTFE)
- Straight or Angle Body Configurations
- Male and Female NPT or Dual Ferrule Tube Connections
- Suitable For Cryogenic Service
- 100% Factory Tested

Technical Data

Maximum Operating Pressure @ 100° F
Brass: 3000 Psig (207 Bar)
Stainless: 5000 Psig (345 Bar)

Temperature/Pressure Ratings

Temperature, °F (°C)	Max. Working Pressure, Psig (Bar)	
	Brass	316 SS
- 320 (-195) to 100 (38)	3000 (207)	5000 (345)
100 (38) to 250 (121)	2200 (151)	4085 (282)
250 (121) to 350 (177)	1470 (101)	3715 (256)
350 (177) to 450 (232)	-	3435 (237)

Temperature Range:

Metal to Metal Stem: -320° to 450° F (-195°C to 232°C)
PCTFE Soft Stem Tip: -65° to 200°F (-54° to 93°C)
NOTE: Stem Packing may begin to bind up, making valve adjustment difficult or impossible, at temperatures below -65°F.

Orifice: 0.17" (4.32 mm)

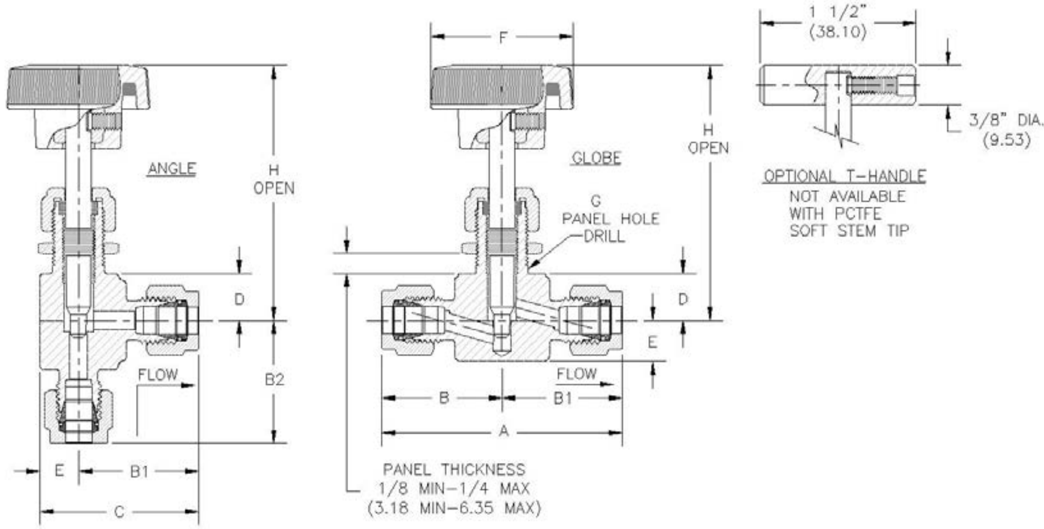
Flow Coefficient (Cv): 0.37

Internal and External Leakage:
0.1 cc/min max at 1000 PSI (69 bar).

Materials of Construction

Component	Brass	Stainless
Valve Body	Brass, ASTM 377	316 SS, ASTM A182
Packing Nut	Brass, ASTM B16	316 SS, ASTM A479
Regulating Stem	316 SS, ASTM A479	
Packing Washers	Brass, ASTM B36	316 SS, ASTM A479
Packing	PTFE, ASTM D1710	
Soft Stem Tip	PCTFE (Neoflon® M400), ASTM D1430	
Panel Nut	Brass, ASTM B16	303 SS, ASTM A582
Round Handle	Nylon 6/6 (Zytel®) with Brass Insert	
"T" Handle	303 SS, ASTM A582	
Handle Set Screw	304 SS, ASTM A182	
Lubricant	Oxygen Compatible Perfluoropolyether (PFPE) Grease	

FORGED NEEDLE VALVE

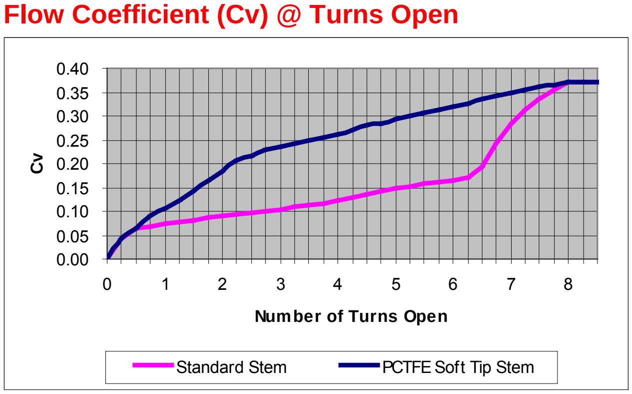


Dimensional Data

MODEL CODE	PORT CONFIGURATION		Dimension in inches (mm)										
	INLET	OULET	A	B	B1	B2	C	D	E	F	G	H (open)	Orifice
FNV-2T	1/8" Tube		2.07 (52.58)	1.04 (26.42)	1.04 (26.42)	1.04 (26.42)	1.42 (36.07)	0.44 (11.18)	0.38 (9.65)	1.34 (34.04)	0.53 (13.46)	2.34 (59.44)	.08 (2.03)
FNV-2F	1/8" Female NPT		1.62 (41.15)	.81 (20.57)	.81 (20.57)	.81 (20.57)	1.19 (30.23)						0.17 (4.32)
FNV-2M	1/8" Male NPT		1.70 (43.18)	.85 (21.59)	.85 (21.59)	.85 (21.59)	1.24 (31.50)						
FNV-2MF	1/8" Male NPT	1/8" Female NPT	1.67 (42.42)		.81 (20.57)		1.19 (30.23)						
FNV-2MT	1/8" Male NPT	1/8" Tube	1.89 (48.01)		1.02 (25.91)		1.41 (35.81)						
FNV-2M4T	1/8" Male NPT	1/4" Tube	2.01 (51.05)		1.15 (29.21)	1.15 (29.21)	1.54 (39.12)						
FNV-4T	1/4" Tube		2.31 (58.67)	1.15 (29.21)									
FNV-4F	1/4" Female NPT		2.12 (53.85)	1.06 (26.92)	1.06 (26.92)	1.11 (28.19)	1.45 (36.83)						
FNV-4M	1/4" Male NPT		2.04 (51.82)	1.02 (25.91)	1.02 (25.91)	1.02 (25.91)	1.40 (35.56)						
FNV-4MF	1/4" Male NPT	1/4" Female NPT	2.08 (52.83)		1.06 (26.92)		1.45 (36.83)						
FNV-4MT	1/4" Male NPT	1/4" Tube	2.17 (55.12)		1.15 (29.21)		1.54 (39.12)						
FNV-6M	3/8" Male NPT		2.25 (57.15)	1.12 (28.45)	1.12 (28.45)	1.12 (28.45)	1.51 (38.35)						

Note: Dimensions are shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. All valve bodies are 3/4" (19 mm) wide. NPT Threads per ASME B1.20.1

Flow Coefficient (Cv) @ Turns Open



How To Order

F N V - 4 T A S S - K - X

- Model Code
  FNV - Forged Needle Valve
  See Dimensional Data Above
- Body Configuration
  For Angle Configuration,
  Add "A" to Model Code
- Material Code
  B - Brass
  SS - 316 Stainless Steel
- Options
  K - PCTFE Soft Tip Stem
  SH - Stainless Steel Handle
- Cleaning Option
  X- Cleaned and Packaged
  for Oxygen Service

Neoflon® is a registered trademark of Daikin Industries of Japan.
Zytel® is a registered trademark of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT Valves & Bi-Lok Fittings

FORGED NEEDLE VALVE, ML STAINLESS
1/4" to 1/2" NPT
3/8" to 3/4" Dual Ferrule Tube Connection
Vacuum - 6000 Psig (414 Bar)

SERIES FNV ML STAINLESS

Description

Series FNV ML Stainless Forged Needle Valves feature a forged body, integral bonnet design with spring loaded PTFE and stainless steel wafer stem packing. Valves provide long life, leak-tight service from vacuum to the maximum operating pressure. Series FNV ML Stainless Forged Needle Valves are available in Straight and Angle configurations and with NPT and Dual Ferrule Tube connections. Valves come ready to panel mount and with stainless steel stem tip standard for a metal to metal internal seal but user can specify Soft Tip (PCTFE) stem. Both provide accurate metering over a wide range of pressures. All valves can be ordered Cleaned for Oxygen Service.

Features

- Spring Loaded Stainless Steel / PTFE Wafer Stem Packing provides low operating torque and long lasting stem seal.
- Panel Mounting Standard
- Metal to Metal Standard, Optional Soft Stem Tip (PCTFE)
- Straight or Angle Body Configurations
- Male NPT, Female NPT, or Dual Ferrule Tube Connections
- Suitable For Cryogenic Service
- 100% Factory Tested

Technical Data

Max Working Pressure (Temperature Dependent):

Temperature	Max. Working Pressure, Psig (Bar)
- 320°F to 300°F (-196°C to 149°C)	6000 (413.7)
300°F to 400°F (149°C to 204°C)	5640 (388.9)
400°F to 450°F (204°C to 232°C)	5480 (377.9)

Usable Temperature per Stem Type:
Metal Stem Tip: -320° to 450° F (-195°C to 232°C)
PCTFE Soft Stem Tip: -65° to 200°F (-54° to 93°C)
NOTE: Stem Packing may begin to bind up, making valve adjustment difficult or impossible, at temperatures below -65°F.

Maximum Flow Coefficient:
Dependent on Orifice Size, see Dimensional Data.

Orifice Size	Cv
0.250"	0.65
0.375"	1.60

Additional Flow Information provided in chart on next page.

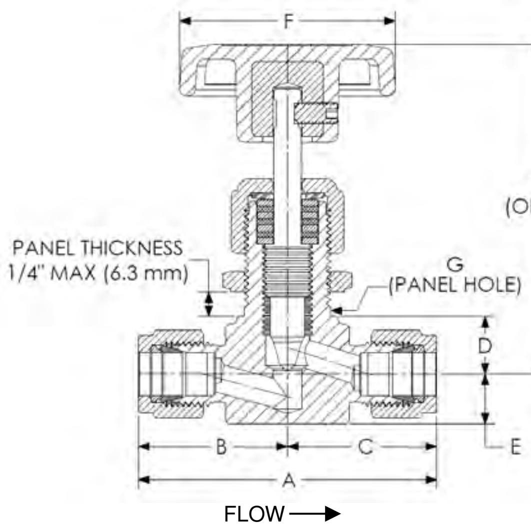
Internal and External Leakage:
0.1 cc/min max at 1000 PSI (69 Bar).

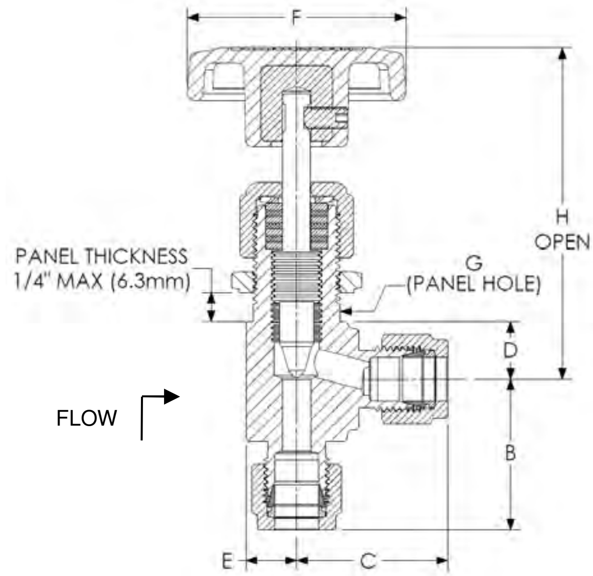
Materials of Construction

Component	Material
Valve Body	316 SS, ASTM A182
Packing Nut	316 SS, ASTM A479
Regulating Stem	316 SS, ASTM A479
Packing Washers	316 SS, ASTM A479
Packing	PTFE, ASTM D1710
Spring Washer	302 Stainless Steel
Soft Stem Tip	PCTFE, ASTM D1430
Panel Nut	303 SS, ASTM A582
Round Handle*	Anodized Aluminum
T-Handle*	303 SS, ASTM A582
Handle Set Screw	304 SS, ASTM A182
Lubricant	Oxygen Compatible Perfluoropolyether (PFPE) Grease

*0.250" orifice valves supplied with round handle standard, T-Handle option is available. 0.375" orifice valves supplied with T-Handle standard.

FORGED NEEDLE VALVE

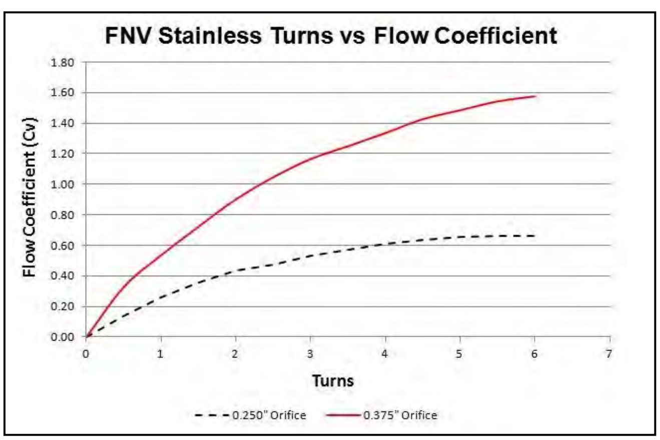




Dimensional Data

<table>
<tr><th rowspan="2">MODEL CODE</th><th colspan="2">PORT CONFIGURATION</th><th colspan="9">Dimension in inches (mm)</th><th rowspan="2">Handle</th></tr>
<tr><th>INLET</th><th>OULET</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th><th>Orifice</th></tr>
<tr><td>FNV-6TSSM</td><td colspan="2">3/8” Dual Ferrule Tube</td><td>2.58 (65.5)</td><td colspan="2">1.29 (32.8)</td><td rowspan="8">0.50
(12.7)</td><td rowspan="8">0.44
(11.2)</td><td rowspan="8">1.87
(47.5)
OR
2.20
(55.9)
(SH Option)</td><td rowspan="8">0.78
(19.8)</td><td rowspan="8">2.86
(72.6)</td><td rowspan="8">0.25
(6.4)</td><td rowspan="8">Round Knob
OR
Optional
T-Handle
(SH Option)</td></tr>
<tr><td>FNV-8TSSM</td><td colspan="2">1/2” Dual Ferrule Tube</td><td>2.76 (70.1)</td><td colspan="2">1.38 (35.1)</td></tr>
<tr><td>FNV-4FSSM</td><td colspan="2">1/4” NPT Female</td><td>2.12 (53.8)</td><td colspan="2">1.06 (26.9)</td></tr>
<tr><td>FNV-6MSSM</td><td colspan="2">3/8” NPT Male</td><td>2.26 (57.4)</td><td colspan="2">1.13 (28.7)</td></tr>
<tr><td>FNV-4M6TSSM</td><td>1/4” NPT Male</td><td>3/8” Tube</td><td>2.42 (61.5)</td><td>1.13
(28.7)</td><td>1.29
(32.8)</td></tr>
<tr><td>FNV-6MTSSM</td><td>3/8” NPT Male</td><td>3/8” Tube</td><td>2.19 (55.6)</td><td>1.13
(28.7)</td><td>1.06
(26.9)</td></tr>
<tr><td>FNV-6M8TSSM</td><td>3/8” NPT Male</td><td>1/2” Tube</td><td>2.51 (63.8)</td><td>1.13
(28.7)</td><td>1.38
(35.1)</td></tr>
<tr><td>FNV-4MFSSM</td><td>1/4” NPT Male</td><td>1/4” NPT
Female</td><td>2.19 (55.6)</td><td>1.13
(28.7)</td><td>1.06
(26.9)</td></tr>
<tr><td>FNV-8TSSL</td><td colspan="2">1/2” Dual Ferrule Tube</td><td rowspan="2">3.80
(96.5)</td><td colspan="2" rowspan="2">1.90
(48.3)</td><td rowspan="6">0.75
(19.0)</td><td rowspan="6">0.60
(15.2)</td><td rowspan="6">3.00
(76.2)</td><td rowspan="6">1.03
(26.2)</td><td rowspan="6">3.82
(97.0)</td><td rowspan="6">0.38
(9.5)</td><td rowspan="6">T-Handle</td></tr>
<tr><td>FNV-12TSSL</td><td colspan="2">3/4” Dual Ferrule Tube</td></tr>
<tr><td>FNV-6FSSL</td><td colspan="2">3/8” NPT Female</td><td rowspan="4">3.00
(76.2)</td><td colspan="2" rowspan="4">1.50
(38.1)</td></tr>
<tr><td>FNV-8FSSL</td><td colspan="2">1/2” NPT Female</td></tr>
<tr><td>FNV-8MSSL</td><td colspan="2">1/2” NPT Male</td></tr>
<tr><td>FNV-8MFSSL</td><td>1/2” NPT Male</td><td>1/2” NPT
Female</td></tr>
</table>

Note: Dimensions are shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. NPT Threads per ASME B1.20.1



How To Order

FNV-6TSSM - K - X

MODEL CODE

FNV-____ - Forged Needle Valve
See Dimensional Data Above.
For Angle Configuration, Insert "A" before "SS" material code.
E.G. "FNV-6TASSM"

OXYGEN CLEAN

X - Cleaned and Packaged for Oxygen Service

OPTIONS

K - PCTFE Soft Tip Stem
SH - T-Handle

PROPER COMPONENT SELECTION: When specifying a component, total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT Valves & BI-Lok Fittings

SCREWED BONNET NEEDLE VALVE
1/8" - 1/2" NPT
Globe and Block Configuration
Brass, 303 and 316 Stainless Steel

3000 SERIES

Description

Series 3000 bar stock, screwed bonnet type needle valves are available in brass, 303 and 316 stainless steel with working pressures to 5000 Psig in 1/8" to 1/2" sizes. The unique, externally adjustable, wear compensating, virgin PTFE stem packing offers long trouble free service life in most liquid or gas applications. A wide variety of options including panel mounting, metal to metal seat, soft stem tip and taper proof cap, the Series 3000 provides economical, quality solutions for the most demanding applications. Valves can be ordered cleaned and packaged for oxygen service.

Globe

(Panel Mount Option Shown)

Features

- Adjustable PTFE Stem Packing
- Excellent Gauge Isolation Valve
- Wide variety of options to suit many diverse applications
- Available in 303 SS as an economical alternative to 316 SS (where applicable)
- 100% factory tested

Technical Data

Maximum Operating Pressure @ 100° F (38 ° C)
Brass: 3000 Psig (207 Bar)
Stainless: 5000 Psig (345 Bar)
Flow Coefficient
Globe (.187" Orifice): 0.40 Cv
Block (.312" Orifice): 0.90 Cv

Temperature Ratings

Metal to Metal Stem: -320° F to 400°F (-195° C to 204°C)
Kel-F Tip Stem: -65° F to 200°F (-54° C to 93°C)

Leakage

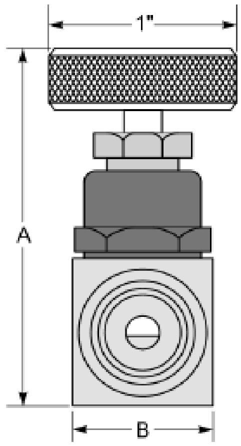
External leakage – zero.
Maximum allowable seat leakage – 0.1 cc/min @ 3000 psig (207 Bar) Nitrogen

Block

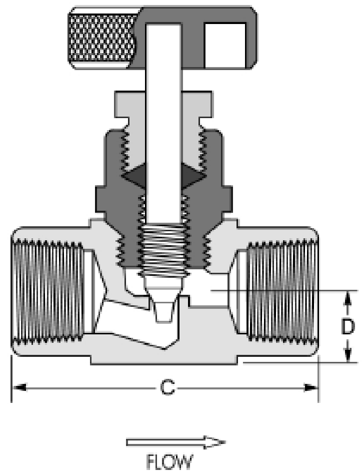
Materials of Construction

<table>
<tr><th rowspan="2">Component</th><th colspan="3">Valve Body Material</th></tr>
<tr><th>Brass</th><th>303 Stainless</th><th>316 Stainless</th></tr>
<tr><td>Valve Body, Bonnet Packing Nut</td><td rowspan="3">Brass, ASTM B16</td><td>303 SS, ASTM A582</td><td>316 SS, ASTM A479</td></tr>
<tr><td>Stem[1]</td><td>303 SS, ASTM A582/Kel-F (CTFE)</td><td>316 SS, ASTM A479/Kel-F (CTFE)</td></tr>
<tr><td>Handle[2]</td><td colspan="2">Brass, ASTM B16, (Nickel Plated, ASTM 689)</td></tr>
<tr><td>Set Screw</td><td colspan="3">ANSI B18.3 (Alloy Steel)</td></tr>
<tr><td>Packing</td><td colspan="3">Virgin TFE</td></tr>
<tr><td>Panel Nut</td><td rowspan="2">Brass, ASTM B16</td><td colspan="2">Brass, ASTM B16, (Nickel Plated, ASTM 689)</td></tr>
<tr><td>Tamper Proof Cap</td><td colspan="2">N/A</td></tr>
</table>

1. Stainless valves supplied with Kel-F stem, optional metal to metal stem, option code "Q", see ordering information. Block valves not available with soft stem tip option.
2. Optional black phenolic knob, option code "M"



Square



Dimensional Data

Valve Number	Pipe Size (NPT)	PORT CONFIGURATION INLET	OULET	Orifice	Cv	A (Open)	B (Square)	C	D
1	1/8"	Female		.187"	0.40	2-1/4"	3/4"	1-5/8"	3/8"
2		Male							
3		Male	Female						
4	1/4"	Female						1-13/16"	
5		Male							
6		Male	Female						
7	3/8"	Male							1/2"
8		Female		.312"	0.90	2-7/16"	1"	2-3/16"	
9		Male	Female						
10	1/2"	Female							
11		Male							
12		Male	Female						

Ordering Information

3000 - 4SS - X

Part Number

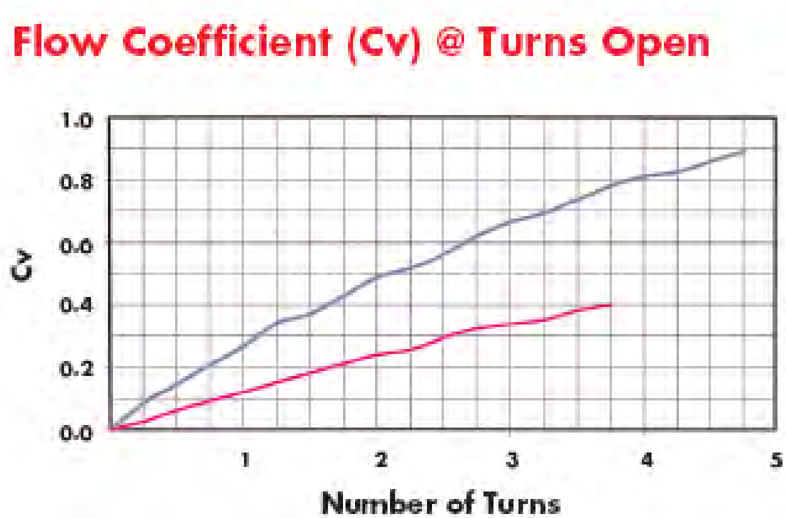
Valve Number	Port Configuration	Part Number
1	1/8" Female x 1/8" Female	3000-1
2	1/8" Male x 1/8" Male	3000-2
3	1/8" Male x 1/8" Female	3000-3
4	1/4" Female x 1/4" Female	3000-4
5	1/4" Male x 1/4" Male	3000-5
6	1/4" Male x 1/4" Female	3000-6
7	3/8" Male x 3/8" Male	3000-7
8	3/8" Female x 3/8" Female	3000-8
9	3/8" Male x 3/8" Female	3000-9
10	1/2" Female x 1/2" Female	3000-10
11	1/2" Male x 1/2" Male	3000-11
12	1/2" Male x 1/2" Female	3000-12

NPT threads per ANSO/ASME B1.20.1. For other thread configurations, consult factory.

Material Code
B - Brass
SS - 303 Stainless Steel
SSS - 316 Stainless Steel

Options
P - Panel Mount (9/16" Hole, 3/16" Max. Panel Thickness)
M - Plastic Knob (1-3/8" Diameter)
N - Kel-F Soft Stem Tip (Standard with SS valves)
T - PTFE Soft Stem Tip
Q - Stainless Steel Stem
QN - Stainless Steel Stem with Kel-F Soft Stem Tip
C - Screw Driver Slotted Stem
QC - Stainless Steel Screw Driver Slotted Stem
X - Cleaned and Packaged for Oxygen Service

Shaded Options are available for Globe Valves Only (1-7)



3/16" Orifice, Valves 1-7 5/16" Orifice, Valves 8-12

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

PRECISION METERING VALVE
1/8" and 1/4" NPT
1/8" and 1/4" Dual Ferrule Tube
Vacuum - 1000 Psig (68.9 Bar)

PMV SERIES

Description

Series PMV Precision Metering Valves are designed for accurate and repeatable flow control of fluids and gases. Valves feature a one-piece forged body and a screwed bonnet design. Stainless steel 3 degree tapered stem seals bubble tight into an Acetal soft seat. With panel mounting and lockable adjustment standard, these valves offer cost effective solutions for precise metering.

Features

- Straight or Angle Flow Patterns
- Forged Body Brass or Stainless Steel Construction
- NPT or Dual Ferrule Tube Connections
- Unique Soft Seat Provides Positive Shut Off
- Wear Compensating Knob Adjustment
- Locking Screw Prevents Inadvertent Flow Changes
- Stem Threads are isolated from System Fluid
- 100% Factory Tested for Leakage

Technical Data

Maximum Operating Pressure @ 100º F
Brass and Stainless: 1000 Psig (68.9 Bar)
Stem Taper: 3 Degree (included angle)
Stem Pitch: 40 Threads per inch
Orifice: 0.055” (1.4 mm)
Flow Coefficient (Cv): 0.04
Panel Mounting
Panel Mount Hole: 9/16” (14.3 mm)
Max Panel Mount Thickness: 1/8" (3.3 mm)
Factory Preset for zero flow at positive stop with 150 Psig (10.34 Bar)

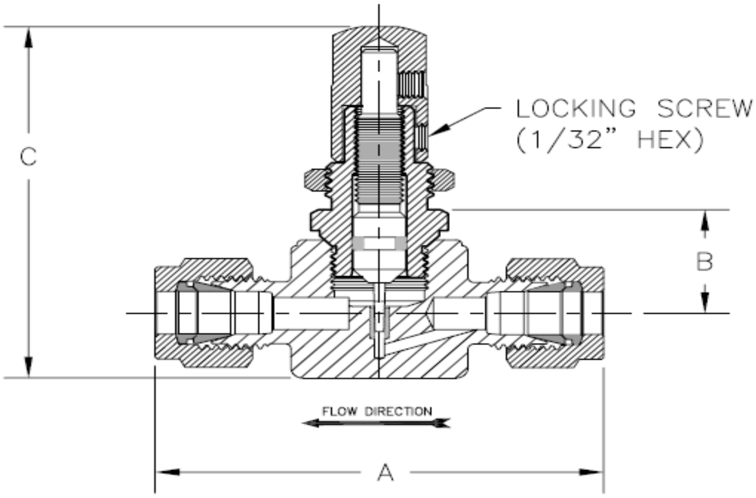
Temperature Range:
Seal Dependent (See How To Order)

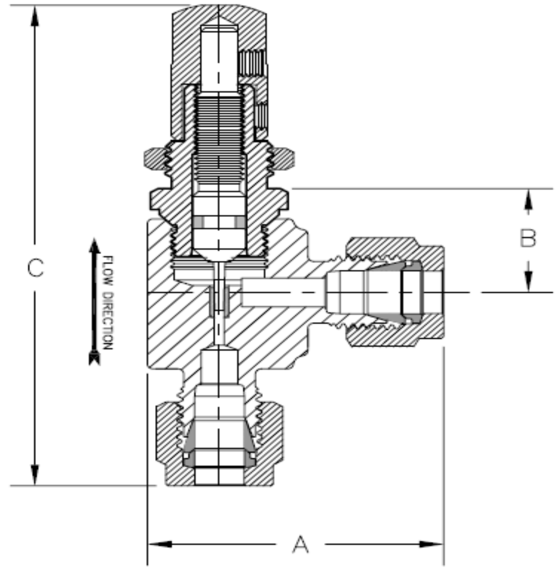
Materials of Construction

Component	Valve Body Material	
	Brass	**Stainless Steel**
Body	Forged Brass, ASTM 377	Forged 316 SS, ASTM A182
Bonnet	Brass, ASTM B16, Nickel Plated	316 SS, ASTM A479
Stem	316 SS, ASTM A479	
Knob and Panel Nut	Brass, ASTM B16, Nickel Plated	
Seat Insert	Acetal CoPolymer, ASTM D4181	
O-Ring	Buna-N, Neoprene, Ethylene Propylene or Viton®	
Set Screw (2)	18-8 SS, ASTM A182	

Nickel Plating per ASTM B689
Stem Threads and O-Rings are lubricated with Krytox®

PRECISION METERING VALVE



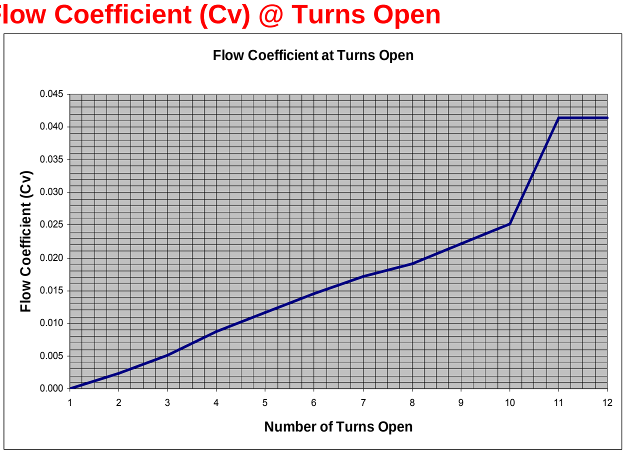


Dimensional Data

Model Code	Port Configuration			Dimensions in inches (mm)				
	Inlet	Outlet	Configuration	Orifice	OAL "A"	Panel To C/L "B"	Height "C"	Knob Diameter
PMV-2T	1/8" Tube		Straight		2.07 (52.58)		2.10 (53.34)	
PMV-4T	1/4" Tube				2.31 (58.70)		2.10 (53.34)	
PMV-2TA	1/8" Tube		Angle		1.43 (36.20)		2.75 (69.72)	
PMV-4TA	1/4" Tube				1.53 (38.74)		2.89 (73.30)	
PMV-2F	1/8" Female NPT		Straight		1.63 (41.28)		2.10 (53.34)	
PMV-2FA			Angle	0.055 (1.4)	1.19 (30.15)	.62 (15.75)	2.50 (63.50)	0.50 (12.7)
PMV-2PTA	1/8" Male NPT	1/8" Tube	Angle		1.43 (36.20)		2.53 (64.14)	
PMV-2P	1/8" Male NPT		Straight		1.63 (41.28)		2.10 (53.34)	
PMV-2PA			Angle		1.19 (30.15)		2.53 (64.14)	
PMV-4P	1/4" Male NPT		Straight		1.96 (49.78)		2.10 (53.34)	
PMV-4PA			Angle		1.35 (34.37)		2.71 (68.83)	

Note: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. All valve bodies are 3/4" (19 mm) wide. NPT Threads per ASME B1.20.1

Flow Coefficient (Cv) @ Turns Open



Note: Valves may require up to one full turn before flow is evident.

How To Order

PMV - 4T SS - V - X

Model Code
PMV - Percision Metering Valve
See Dimensional Data Above

Material Code
B - Brass
SS - 316 Stainless Steel

Seal Material
B - Buna-N, -40° F to 180° F (-40° C to 82° C)
V - Viton, -10° F to 180° F (-23° C to 82° C)
N - Neoprene, -40° F to 180° F (-40° C to 82° C)
EP - Ethylene Propylene, -50° F to 180° F (-46° C to 82° C)

Cleaning Option
X- Cleaned and Packaged for Oxygen Service

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT Valves & BI-Lok Fittings

ADJUSTABLE CHECK VALVE
1/4” & 1/2" NPT
3 – 600 Psig

SERIES ACV

Description

Compact one piece body, adjustable check/relief valves are available in Brass or 316 Stainless Steel. Available in 1/4" and 1/2" NPT with a wide selection of seal materials. Series ACV valves can be ordered factory “preset and locked” in crack pressures up to 600 Psig. All valves are 100% factory tested and available cleaned & packaged for Oxygen service.

Features

- Compact One Piece Body Construction
- Working Pressures to 3000 Psig (206 bar)
- Adjustable Cracking Pressures from 3 to 600 Psig (0.2 bar to 41.3 bar)
- Fully retained O-Ring Seal
- Full Back Pressure Rating
- Factory Presetting Available
- 100% Factory Tested for Leakage, Crack and Reseal Performance

Technical Data

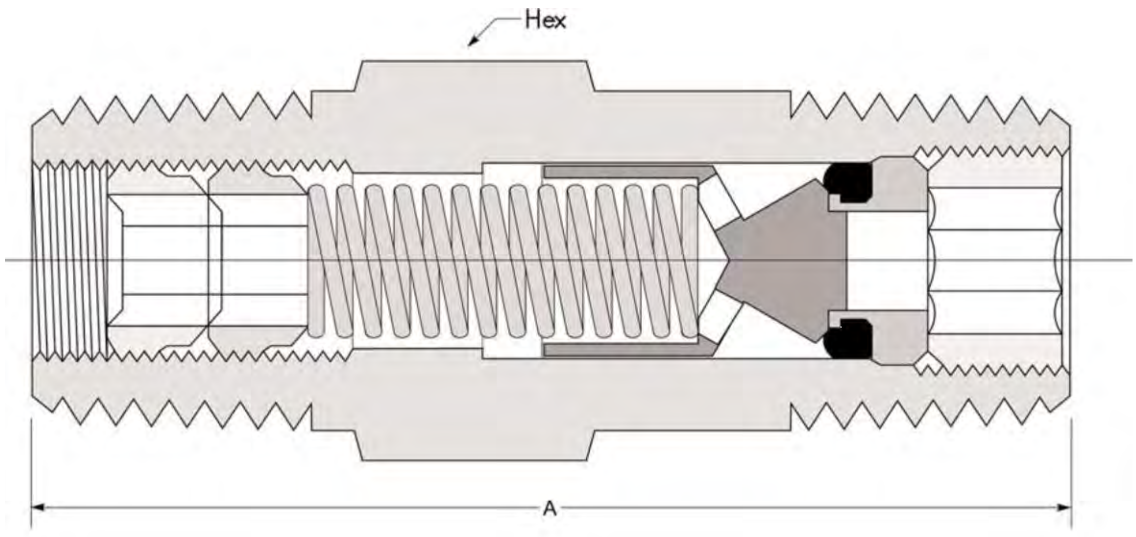
Cracking Pressure Ranges:
- 3 to 20 Psig (0.2 to 1.4 bar)
- 20 to 65 Psig (1.4 to 4.5 bar)
- 65 to 175 Psig (4.5 to 12.1 bar)
- 175 to 350 Psig (12.1 to 24.1 bar)
- 350 to 600 Psig (24.1 to 41.3 bar)

Maximum Pressure: 3000 Psig @ 100°F (206 bar @ 40°C)
Temperature Rating: -80°F to 450°F (-65°C to 232°C)
(based on seal selection, see ordering information)

Materials of Construction

Component	Valve Body Material	
	Brass	Stainless Steel
Body, Poppet, Seat Locking Screw, Adjustment Screw, Pressure Locking Screw	Brass, ASTM B16	316 SS, ASTM A479
Spring	302 SS, ASTM A313	
O-Ring Seal[1]	Buna-N	Viton™

1 Lubricated with Krytox™



Dimensions

Model Code	Connection Inlet & Outlet	Dimensions		
		A	Hex	Cv
ACV-4P	1/4" Male NPT	1.62”	9/16”	0.35
ACV-4FF	1/4" Female NPT	2.98”	3/4"	
ACV-8P	1/2” Male NPT	2.56”	7/8”	1.20

Flow tested in accordance with ISA S75.21 with air. Restrictions in the inlet or outlet piping may reduce flow. NPT Threads per ASME B1.20.1.

Ordering Information

ACV - 4P B V - 125

SERIES
ACV - Adjustable Check Valve

PORT CONFIGURATION
4P - 1/4" Male NPT x 1/4" Male NPT
4FF - 1/4" Female NPT x 1/4" Female NPT
8P - 1/2" Male NPT x 1/2" Male NPT

MATERIAL CODE
B - Brass
SS - 316 SS

CRACK PRESSURE
(standard pressure ranges)
3 to 20 Psig (0.2 bar to 1.4 bar)
20 to 65 Psig (1.4 bar to 4.5 bar)
65 to 175 Psig (4.5 bar to 12.1 bar)
175 to 350 Psig (12.1 bar to 24.1 bar)
350 to 600 Psig (24.1 bar to 41.3 bar)
May be ordered factory preset to your specifications
Specify Cracking Pressure, Example ACV-4PB-V-125

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
* - EP has a max set pressure of 400 Psig (27.6 bar)

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

ONE PIECE CHECK VALVE
1/4" & 1/2" NPT
0 – 3000 Psig

OPC SERIES

Description
Compact one piece body, fully retained O-ring seal, poppet type check valve. Available in 1/4" and 1/2" NPT in brass or 316 stainless steel. Suitable for working pressures to 3000 Psig. A wide selection of seal materials and crack pressures make the Series OPC a quality and cost effective solution. All valves are 100% factory tested and available cleaned and packaged for oxygen service.

Features and Benefits
- Compact One Piece Body Construction
- Working Pressures to 3000 Psig (206 bar)
- Full Back Pressure Rating
- Fully Retained O-Ring Seal
- Cracking Pressures from .3 to 25 Psig (0.02 – 1.7 bar)
- 100% Factory Tested for Leakage

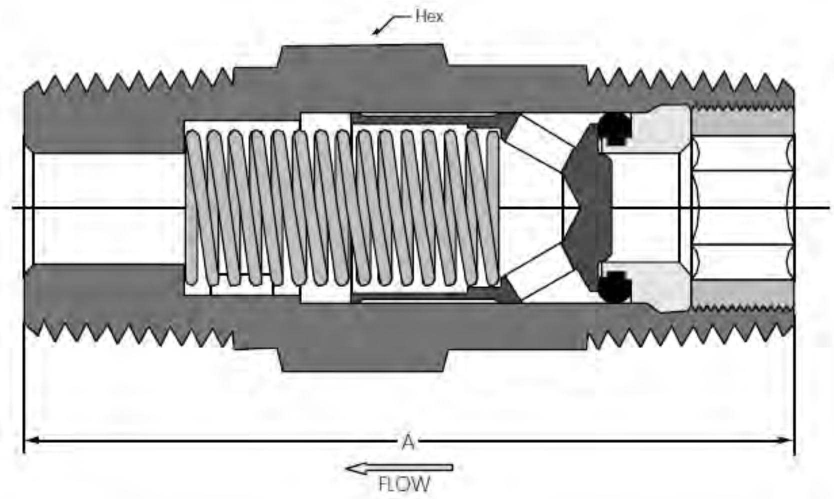
Technical Data
- Nominal Crack Pressures: .3, 1, 10, & 25 Psig (0.02, 0,07, 0.7, & 1.7 bar)
- Maximum Pressure: 3000 Psig @ 70°F (206 bar @ 21° C)
- Temperature Rating: -80°F to 450°F (-62°C to 232°C) (based on seal selection, see ordering information)

Materials of Construction

Component	Valve Body Material	
	Brass	Stainless Steel
Body, Poppet, Seat Insert, Locking Screw[1]	Brass, ASTM B16	316 SS, ASTM A479
Spring	302 SS, ASTM A313	
O-Ring Seal[2]	Buna-N	Viton™

1 1/4" Brass valves have 316 SS locking screw
2 Lubricated with Krytox™

SERIES OPC
ONE PIECE CHECK VALVE



Dimensional/Flow Data

Model Code	Port Configuration		A (inches)	Hex	Cv
	Inlet	Outlet			
OPC-4P	1/4" Male NPT	1/4" Male NPT	1.62	9/16"	0.35
OPC-4MF	1/4" Male NPT	1/4" Female NPT	1.75	3/4"	
OPC-4FF	1/4" Female NPT	1/4" Female NPT	2.41		
OPC-8P	1/2" Male NPT	1/2" Male NPT	2.28	7/8"	1.20
OPC-8MF	1/2" Male NPT	1/2" Female NPT	2.83	1 – 1/16"	

Flow tested in accordance with ISA S75.21 with air. Restrictions in the inlet or outlet piping may reduce flow.

Ordering Information

OPC - 4P SS - V - 1

SERIES
OPC - One Piece Check Valve

PORT CONFIGURATION
4P - 1/4" Male x 1/4" Male
4MF - 1/4" Male x 1/4" Female
4FF - 1/4" Female x 1/4" Female
8P - 1/2" Male x 1/2" Male
8MF - 1/2" Male x 1/2" Female
NPT Threads per ANSI/ASME B1.20.1

MATERIAL CODE
B - Brass
SS - 316 SS

CRACK PRESSURE
.3 - (.1 - .4 Psig) (0.02 bar)
1 - (.5 - 1 Psig) (0.07 bar)
10 - (8 - 12 Psig) (0.7 bar)
25 - (22 - 27 Psig) (1.7 bar)

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
T - PTFE, -50°F to 350°F (-46°C to 176°C)
PTFE Seal may require back pressure to seal leak tight

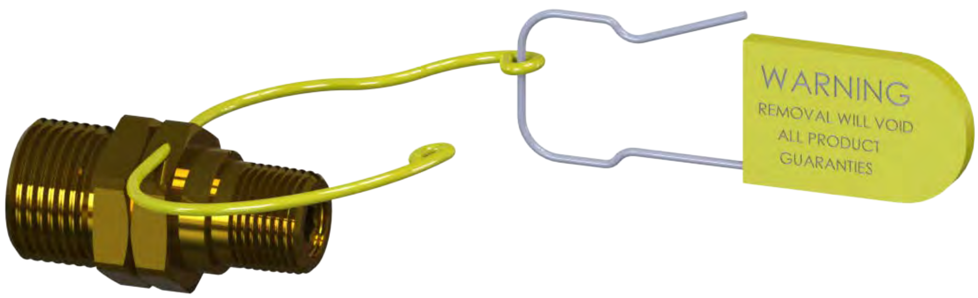
OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-LOK Fittings

CYLINDER CHECK VALVE
3/8" - 1/2" NPT x CGA 540 or 580
0-3000 PSIG



Description

The Cylinder Check Valve is used on the gas use outlet of industrial cryogenic liquid cylinders to prevent back flow into the cylinder. The optional “Tamper Evident Restraint” provides a visual indication if removal of the connection has been attempted. Available in CGA 540 & 580 configurations.

Features

- Compact and rugged one piece body construction
- Optional “Tamper Evident Restraint” - lock wire and lockout tag
- Provides visual evidence of compliance
- High flow design exceeds maximum cylinder output
- Supplied cleaned and bagged for Oxygen Service
- 100% Factory Tested for leakage
- GLT Low Temperature Viton™ Seal

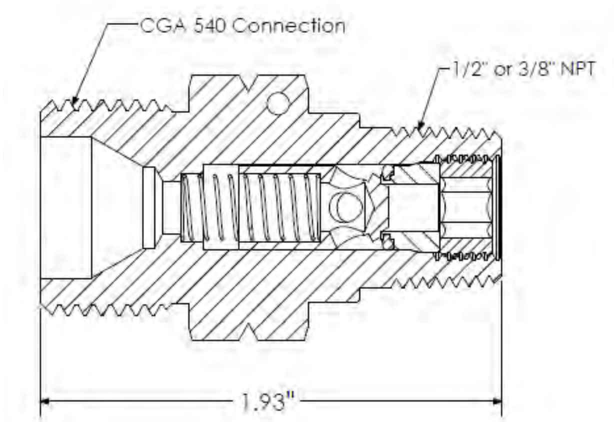
Technical Data

- Nominal Crack Pressure: 1 Psig (0.07 Bar)
- External Leakage: Zero leak
- Internal Leakage: Zero leak at 0.5 PSIG (0.03 bar) Back Pressure
- Cv (flow coefficient): 0.65
- Maximum Pressure: 3000 PSIG @ 150° F (206 bar @ 66° C)
- Proof Pressure: 5,000 PSIG (345 bar)

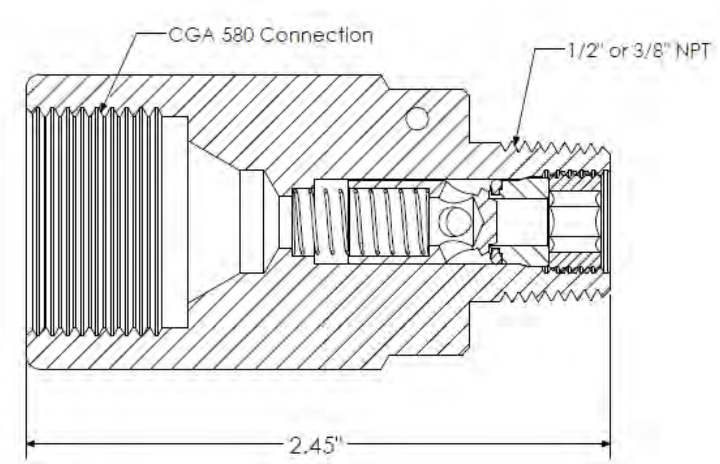
Materials of Construction

Component	Material
Body, Poppet, Seat Insert, Seat Locking Screw	Brass, ASTM B16
Spring	Phosphor Bronze, ASTM B159
O’Ring Seal*	GLT Viton™

*Lubricated with Krytox™ GPL-205



Flow



Flow

Ordering Information

OPC – 3 540 – V - 1 – T

SERIES
OPC – One Piece Check

INLET PORT
3 – 3/8" Male NPT
4 – 1/2" Male NPT
Note: Port Threads into Outlet of Gas Use Shut-Off Valve

OUTLET PORT
540 – CGA 540 Connection
580 – CGA 580 Connection

TAMPER EVIDENT
T – Tamper Evident
Note: Omit if not required

CRACK PRESSURE
1 – 1 PSI Nominal
Note: Only available in 1 PSI Crack Pressure

SEAL
V – GLT Viton™

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

POPPET CHECK VALVE
1/8" - 1/2" Dual Ferrule Tube, Female & Male NPT, 1/4" Face Seal
0-3000 PSIG

PCV SERIES

Description

Poppet type, zero leak, inline check valve for liquid and gas applications to 3000 Psig. Fully retained O-ring seal design permits full rated pressure in the checked direction. Offered with fully interchangeable dual ferrule tube or metal to metal face seal connections. A variety of crack pressures and seal materials, combined with a metal to metal positive stop provides long trouble free service life in the most demanding applications.

Features

- Working Pressures to 3000 Psig (206 bar)
- Full Pressure Rating in Check Direction
- Fully Retained O-ring Seal
- Dual Ferrule Tube, Female NPT, Male NPT and Face Seal Connections Available
- Cracking Pressures from 0.3 to 25 Psig (0.02-1.7 bar)
- 100% Factory tested for crack, leakage and reseal performance

Technical Data

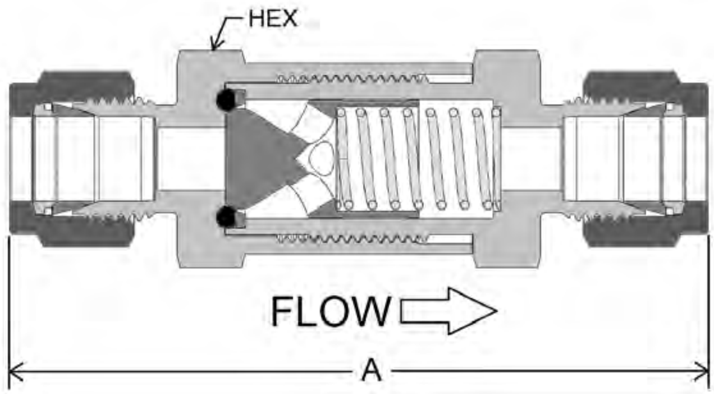
- Nominal Crack Pressures: 0.3, 1, 10, & 25 Psig (0.02, 0,07, 0.7, & 1.7 bar)
- Maximum Pressure: 3000 Psig @ 70°F (206 bar @ 21° C)
- Temperature Rating:
  -80°F to 375°F (-62°C to 190°C)
  (based on seal selection, see ordering information)

Materials of Construction

Component	Valve Body Material	
	Brass	Stainless Steel
Inlet Cap, Outlet Body, Poppet	Brass, ASTM B16	316 SS, ASTM A479
O-ring Retainer	316 SS, ASTM A479	
Spring	302 SS, ASTM A313	
O'Ring Seal	Buna-N	Viton™

- Lubricated with Krytox™

SERIES PCV POPPET CHECK VALVE



Dimensional/Flow Data

Model Code	Port Configuration		Dimensions/Flow		
	Inlet	Outlet	A[1] (inches)	Hex	Cv
PCV-2T	1/8” Tube	1/8” Tube	2.19	5/8”	0.10
PCV-2P	1/8” Male NPT	1/8” Male NPT	1.71		
PCV-2F	1/8” Female NPT	1/8” Female NPT	1.89		
PCV-4VS[2]	1/4" Face Seal	1/4" Face Seal	2.21		0.47
PCV-4T	1/4" Tube	1/4" Tube	2.35		
PCV-4P	1/4" Male NPT	1/4" Male NPT	2.09		
PCV-4PT	1/4" Male NPT	1/4" Tube	2.22		
PCV-4F	1/4" Female NPT	1/4" Female NPT	2.15	3/4"	
PCV-6T	3/8” Tube	3/8” Tube	3.17	7/8”	1.47
PCV-6P	3/8” Male NPT	3/8” Male NPT	2.78		
PCV-6F	3/8” Female NPT	3/8” Female NPT	2.98		
PCV-8T	1/2" Tube	1/2" Tube	3.42		1.68
PCV-8P	1/2" Male NPT	1/2" Male NPT	3.16		
PCV-8F	1/2" Female NPT	1/2" Female NPT	3.58	1-1/16”	

1 Dimensions are shown with nuts finger-tight.
2 316 SS only
Flow tested in accordance with ISA S75.21 with air. Restrictions in the inlet or outlet piping may reduce flow.
Other Inlet and Outlet combinations available. Consult Factory.

Ordering Information

PCV - 4T SS - V - 1

SERIES
PCV - Poppet Check Valve

PORT CONFIGURATION
2T - 1/8” Tube x 1/8” Tube
2P - 1/8” Male NPT x 1/8” Male NPT
2F - 1/8” Female NPT x 1/8” Female NPT
4VS - 1/4" Face Seal x 1/4" Face Seal
4T - 1/4" Tube x 1/4" Tube
4P - 1/4" Male NPT x 1/4" Male NPT
4PT - 1/4" Male NPT x 1/4" Tube
4F - 1/4" Female NPT x 1/4" Female NPT
6T - 3/8” Tube x 3/8” Tube
6P - 3/8” Male NPT x 3/8” Male NPT
6F - 3/8” Female NPT x 3/8” Female NPT
8T - 1/2" Tube x 1/2" Tube
8P - 1/2" Male NPT x 1/2" Male NPT
8F - 1/2" Female NPT x 1/2" Female NPT

MATERIAL CODE
B - Brass
SS - 316 SS

CRACK PRESSURE
.3 - (.1 - .4 Psig) (0.02 bar)
1 - (.5 - 1 Psig) (0.07 bar)
10 - (8 - 12 Psig) (0.7 bar)
25 - (22 - 27 Psig) (1.7 bar)

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
T - PTFE, -50°F to 350°F (-46°C to 176°C)
PTFE Seal may require back pressure to seal leak tight.

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

INLINE CHECK VALVE
1/8” – 3/4" NPT
Vacuum – 800 Psig

ICV SERIES

Description

A compact, inline, direct acting poppet check valve suitable for pressure and vacuum applications. Bubble tight sealing is achieved by a line of contact between a precision machined seat and a standard elastomer O-ring with minimum differential pressure, regardless of mounting attitude. Floating poppet and fluted retainer design provides laminar flow. Metal to metal positive stop ensures long service life.

Technical Data

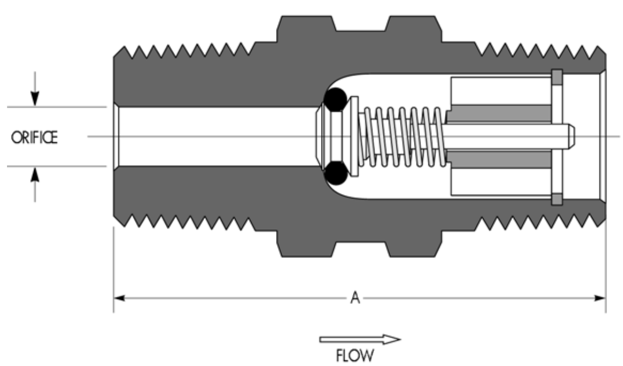
- Nominal Crack Pressures: .15, 1 & 3 Psig (0.01, 0.07 & 0.21 bar)
- Proof Pressure: 1200 Psig (83 bar)
- Operating Pressure Range: Vacuum - 800 Psig (55 bar)
- Leakage: Zero @ > 0.5 Psig Back Pressure (0.03 bar)
- Temperature Rating: -80°F to 375°F (-62°C to 190°C) based on seal material

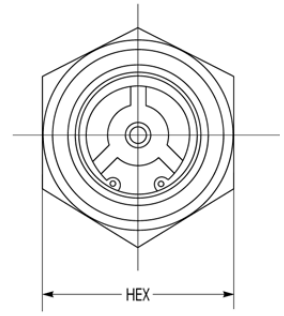
Materials of Construction

Component	Valve Body Material	
	Brass	Stainless Steel[1]
Body, Poppet	Brass, ASTM B16	316 SS, ASTM A479
Spring Retainer	Brass, ASTM B16[2]	316 SS, ASTM A479
Spring	302 SS, ASTM A313	
O’Ring[3]	Buna-N	Viton™
Retaining Ring	Zinc Plated Carbon Steel	Stainless Steel

1 Stainless Steel available in 1/8”, 1/4", 3/8” & 1/2" Male x Male only
2 1/8” & 1/4" Brass valves have 316SS retainer
3 Lubricated with Krytox™

SERIES ICV
INLINE CHECK VALVE





Dimensional/Flow Data

Pipe Size (NPT)	Port Configuration		A (inches)	HEX	Orifice (inches)	Cv	Flow at Max Psid[1] (SCFM)
	Inlet	Outlet					
1/8”	Male	Male	1.312	1/2"	.140	0.4	7.2
	Female	Female	1.687				
	Female	Male	1.437				
1/4"	Male	Male	1.592	5/8”	.193	0.8	14.3
	Female	Female	1.937	3/4"			
	Female	Male	1.500				
3/8”	Male	Male	1.610	3/4"	.270	1.2	21.5
1/2"	Male	Male	2.140	7/8”	.327	2.0	35.5
3/4"	Male	Male	2.160	1 – 1/8”	.467	5.0	90.0

1. Maximum allowable pressure drop 15 Psid.
Flow tested in accordance with ISA S75.02 with air. Restrictions in the inlet or outlet piping may reduce flow.

Ordering Information

ICV - FF - 250 B - V - 1

SERIES
ICV - Inline Check Valve

PORT CONFIGURATION
MM - Male x Male (Standard/Omit)
FF - Female x Female (1/8" & 1/4” brass only)
FM - Female x Male (1/8" & 1/4” brass only)

PIPE SIZE (NPT)
125 - 1/8”
250 - 1/4"
375 - 3/8”
500 - 1/2"
750 - 3/4" (brass only)
NPT threads per ANSI/ASME B1.20.1

CRACK PRESSURE
.15 - (.1-.4 Psig) (0.01 bar)
1 - (.5 - 1 Psig) (0.07 bar)
3 - (2-4 Psig) (0.21 bar)

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40° F to 250° F (-40° C to 121° C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)
S - Silicone, -65° F to 400° F (-54° C to 205° C)

MATERIAL CODE
B - Brass
SS - 316 SS

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

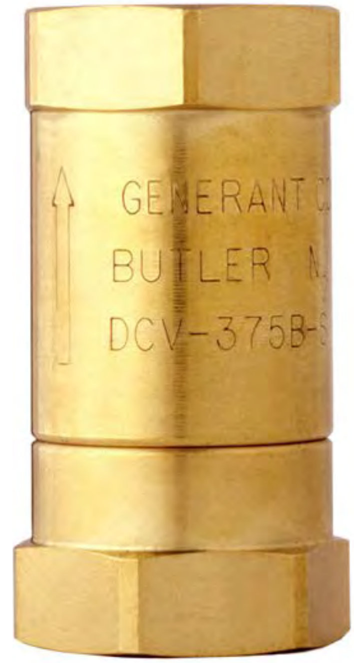
Valves & BI-Lok Fittings

DISC CHECK VALVE
1/8", 1/4" & 3/8” Female NPT
0 – 500 Psig

DCV SERIES

Description

The DCV Series’ unique Floating Acetal Copolymer Disc design allows for a positive bubble tight seal with as low as one inch of water crack pressure. Rated for service up to 500 Psig, the DCV Series is available with many standard elastomer seal options, making it a versatile choice for many low pressure applications. DCV Series valves can be ordered cleaned for Oxygen service.



Features

- Ideal for High Cycling Applications
- Quick Acting: less than 10 milliseconds to seal from reversing flow
- No Spring: valve is operated solely by the flow of the media
- Bubble tight closure from zero to 500 Psig

Technical Data

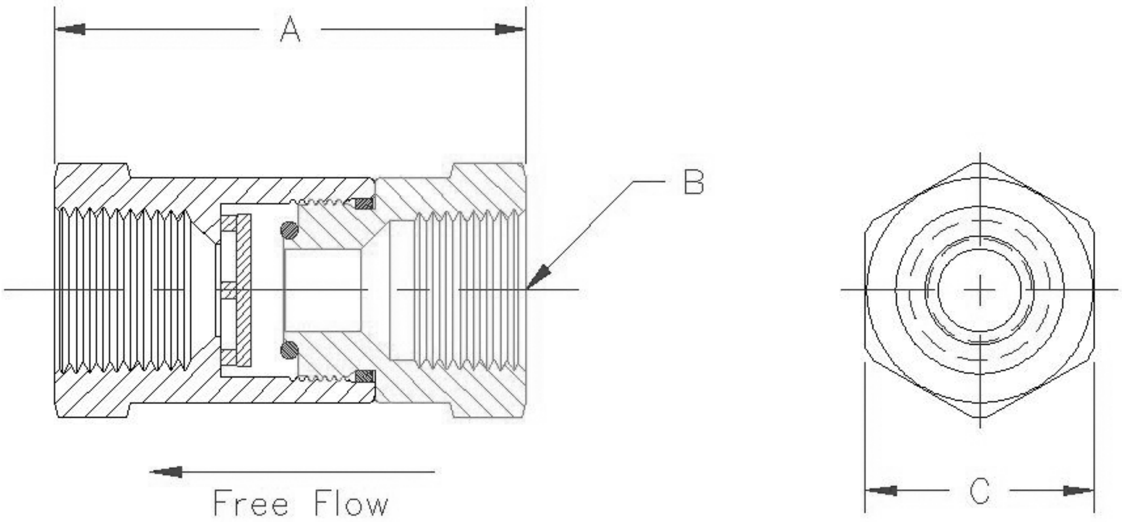
Maximum Pressure: 500 Psig
Cracking Pressure: <1” H_20
Flow Coefficient (Cv):
1/8” & 1/4" – 0.80
3/8” – 1.35
Temperature Rating: -40°F to 210°F (-40° to 100°C)
(based on seal selection, see ordering information)

Materials of Construction

Component	Valve Body Material
Body, End Cap	Brass, ASTM B16
Poppet Disc	Acetal Copolymer
O-Ring[1]	Viton™(standard)

1 Lubricated with Krytox™

SERIES DCV
DISC CHECK VALVE



Dimensions

Model Code	A	B	C
DCV-125B	1 – 5/8”	1/8" NPT	11/16"
DCV-250B	1 – 15/16”	1/4" NPT	3/4"
DCV-375B	1 – 15/16”	3/8” NPT	15/16”

Ordering Information

DCV - 250 B - V

SERIES
DCV - Disc Check Valve

PIPE SIZE (NPT)
125 - 1/8" Female x Female
250 - 1/4" Female x Female
375 - 3/8” Female x Female

MATERIAL CODE
B - Brass
SS - 316 SS

SEAL MATERIAL
V - Viton™, -10°F to 210°F (-23°C to 100°C)
B - Buna-N, -40°F to 210°F (-40°C to 100°C)
EP - Ethylene Propylene, -40°F to 210°F (-40°C to 100°C)
S - Silicone, -40°F to 210°F (-40°C to 100°C)

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

GENERANT Valves & BI-Lok Fittings

CHECK VALVE
1/8” – 2” NPT
0 – 4500 Psig

CV SERIES

Description

High flow, zero leak, low pressure drop check valve suitable for most fluid and gas applications. Fully guided poppet with free floating O-ring design is extremely tolerant of particulate contamination. A metal to metal positive stop in both the open and checked position protects O-ring and spring from over-stress fatigue. Zero external leakage is achieved by the utilization of a static O-ring seal with PTFE backup ring. When specified with the proper seal material, these valves are ideally suited to cryogenic system applications.

Technical Data

- Nominal Crack Pressures: .15, 1, 3 & 8 Psig (0.01, 0.07, 0.21 & 0.55 bar)
- Leakage: Zero to maximum operating pressure. PTFE seals may require back pressure to seal leak-tight
- Temperature Rating: -320°F to 450°F (-195°C to 232°C) based on seal material
- Maximum Operating Pressures to 300°F (149°C)

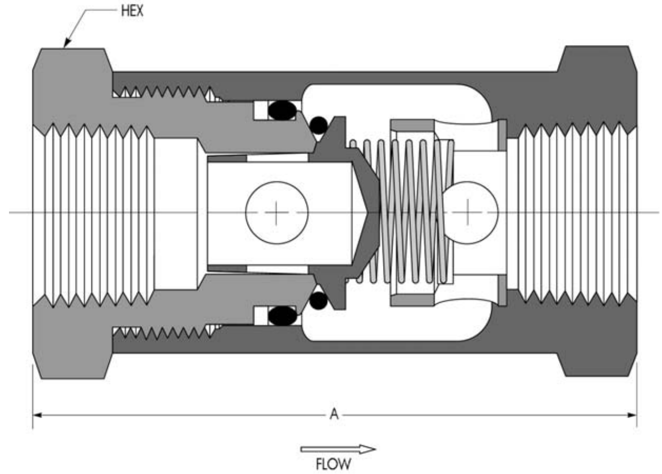
Pipe Size	Brass Psig (bar)	Carbon Steel Psig (bar)	303 Stainless Steel Psig (bar)	316 Stainless Steel Psig (bar)
1/8” – 1”	3000 (206)	3000 (206)	4500 (310)	
1-1/4” & 1-1/2”		Non standard, consult factory		
2”	1500 (103)			

Materials of Construction

Component	Valve Body Material			
	Brass	Carbon	303 SS	316 SS
Inlet Cap, Outlet Body, Poppet, Spring Retainer	Brass ASTM B16	Carbon Steel ASTM A108 Zinc & Black Plated per ASTM B633	303 SS ASTM A582	316 SS ASTM A479
Dynamic O-Ring[1]	Buna-N		Viton™	
Static O-Ring				
Backup Ring	Virgin PTFE			
Spring	302 SS, ASTM A313			

1 Lubricated with Krytox™

SERIES CV
CHECK VALVE



Dimensional/Flow Data

Pipe Size (NPT)	A (inches)	Hex	Cv	Flow at 5.0 Psid (SCFM)
1/8"	1.70	13/16"	1.7	35
1/4"	2.25	1"	3.0	60
3/8"	2.43	1 – 1/8"	3.9	80
1/2"	2.93	1 – 1/2"	7.4	150
3/4"	3.37	1 – 3/4"	11.4	280
1"	3.99	2"	14.2	380
1 – 1/4"	4.50	2 – 3/4"	26.8	700
1 – 1/2"	5.35			
2"	6.10	3 – 1/2" Round[1]	51.0	1200

1. Machined from 3-1/2" round stock with 2-3/4" wrench flats.
Flow tested in accordance with ISA S75.02 with air. Restrictions in the inlet or outlet piping may reduce flow

Ordering Information

CV - 500 B - V - 3

SERIES
CV - Check Valve

PIPE SIZE (NPT)
125 - 1/8"
250 - 1/4"
375 - 3/8"
500 - 1/2"
750 - 3/4"
1000 - 1"
1250 - 1-1/4" (brass only)
1500 - 1-1/2" (brass only)
2000 - 2" (brass only)
NPT threads per ANSI/ASME B1.20.1

MATERIAL CODE
B - Brass (1/8" - 2")
S - 303 SS (1/4" - 1")
SS - 316 SS (1/8" - 1)
C - Carbon Steel (1/4" - 1")

CRACK PRESSURE
.15 - (.1-.4 Psig) (0.01 bar)
1 - (.5 - 1 Psig) (0.07 bar)
3 - (2-4 Psig) (0.21 bar)
8 - (6-10 Psig) (0.55 bar)

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
T - PTFE, -320°F to 350°F (-195°C to 176°C)
PTFE Seal may require back pressure to seal leak tight

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory

Note: Viton™ and Krytox™ are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

GENERANT

HIGH PRESSURE CHECK VALVE
1/4" and 1/2" NPT
10,000 Psig (690 Bar)

HPCV SERIES

Description

Series HPCV is a High Pressure, One-Piece Body, Zero Leak, Check Valve for High Pressure and Severe Service applications. The unique design features a fully retained encapsulated O-ring seal with metal to metal backup for long service life. Available in Brass, 316 and 17-4 PH Stainless Steel to 10,000 psig.

Features

- One-Piece Body Design
- Encapsulated Seal with Metal Backup
- Self Purging Design prevents leakage
- Increasing Pressure Increases Sealing Efficiency

Technical Data

Maximum Operating Pressure @ 100° F

Body Material	Operating Pressure Psig (Bar)	Proof Pressure Psig (Bar)
Brass	5000 (345)	7500 (517)
316 Stainless	6000 (413)	10000 (690)
17-4 PH Stainless	10000 (690)	15000 (1034)

Minimum Burst Pressure: Greater than 3 times Operating Pressure

Leakage:
Elastomeric Seals: Zero @ 1.0 Psig (0.07 Bar) to Proof
Teflon Seals: Zero @ 75 Psig (5.2 Bar) to Proof

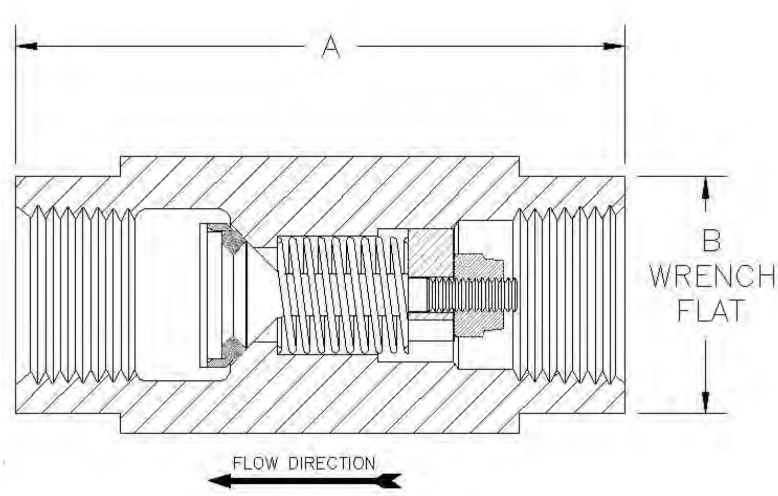
Nominal Crack Pressure: 2 - 5 Psig (0.14 - 0.34 Bar)

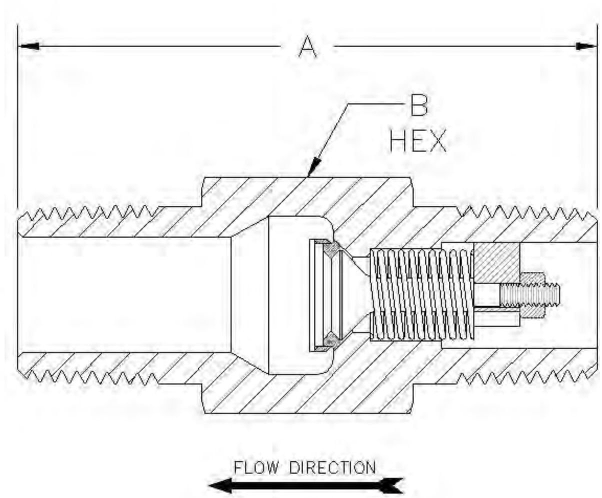
Temperature Range:
Seal Dependent (see How to Order)

Materials of Construction

<table>
<tr><th rowspan="2">Component</th><th colspan="3">Valve Body Materials</th></tr>
<tr><th>Brass</th><th>316 Stainless Steel</th><th>17-4 PH Stainless Steel</th></tr>
<tr><td>Valve Body</td><td rowspan="3">Brass, ASTM B16</td><td rowspan="3">316SS, ASTM A479</td><td>17-4 PH SS, ASTM A564, Heat Treated to H1150D</td></tr>
<tr><td>Stem</td><td>17-4 PH SS, ASTM A564</td></tr>
<tr><td>Spring Retainer</td><td>303 SS, ASTM A582</td></tr>
<tr><td>O-Ring Shroud</td><td colspan="3">303 SS, ASTM A582</td></tr>
<tr><td>Spring</td><td colspan="3">302 SS, ASTM A313</td></tr>
<tr><td>Locknut</td><td colspan="3">Corrosion Resistant Austenitic Steel (CRES)</td></tr>
<tr><td>O-Ring</td><td colspan="3">Buna-N, Teflon® or Viton®</td></tr>
</table>

O-rings are lubricated with Krytox®





Dimensional Data

Model Code	Port Configuration		Flow Coefficient, Cv	Dimensions in inches (mm)	
	Inlet	Outlet		OAL	Hex Size[1]
HPCV-4F	1/4" Female NPT		0.69	2.00 (50.8)	3/4 (19.05)
HPCV-8F	1/2" Female NPT		2.63	2.89 (73.4)	1-1/8 (28.58)
HPCV-4P	1/4" Male NPT		0.32	1.82 (46.23)	5/8 (15.88)
HPCV-8P	1/2" Male NPT		1.83	2.75 (69.85)	1 (25.4)

Note: Dimensions are in inches (millimeters), for reference only and subject to change.
Flow Coefficient stated with Nitrogen and 2 - 5 Psig Nominal Spring.
[1] Female x Female Configuration made from Round Stock with Wrench Flats.
NPT Threads per ASME B1.20.1

How To Order

HPCV-8F PH - T - X

Model Code
HPCV - High Pressure Check Valve

Material Code
B - Brass
SS - 316 Stainless Steel
PH - 17-4 PH Stainless Steel
(PH is available for 4F and 8F only)

Cleaning Option
X- Cleaned and Packaged for Oxygen Service

Seal Material
T - Teflon® -100°F to 400°F (-73°C to 204°C)
V - Viton®-10°F to 375°F (-23°C to 190°C)
B - Buna-N -40°F to 250°F (-40°C to 171°C)

For additional configurations consult factory.

Krytox®, Teflon®and Viton® are registered trade marks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT

Valves & BI-Lok Fittings

HIGH PRESSURE RELIEF VALVE
1/8" - 3/4" NPT
10-2400 Psig

HPRV SERIES

Description

The HPRV Series High Pressure Relief Valve provides accurate crack pressure with zero leakage up to 98% of set pressure. When properly specified, this factory preset, tamper proof design is ideally suited for most liquid and gas applications. Encapsulating the o-ring seal within the poppet prevents seal extrusion and cold flow. A precise line of contact seal is maintained by guiding the poppet in the body. At high crack pressure settings, the o-ring is protected by a metal-to-metal stop between the poppet and the body. The valve's high flow design, combined with narrow band interchangeable springs, minimizes system pressure rise as flow demand increases. Series HPRV valves are available in brass or stainless steel and inline or discharge to atmosphere configurations. They can also be supplied with a manual pull ring override and cleaned for oxygen service.

Features

- 100% Factory Preset and Tested
- Zero Leakage to 95-98% of Set Pressure
- Tamper Proof Adjustment
- Excellent Reseat Performance

Technical Data

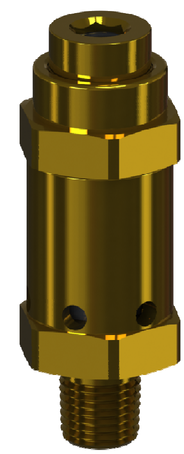
- Set Pressure Range: 10 to 2400 Psig (0.7 to 166 Bar)
- Set Pressure Tolerance: Factory Preset +/-5% on increasing pressure
- Reseat: Elastomer Seals 90%-95% of Actual Crack Pressure. PTFE may be slightly lower
- Inline Valves (Series HPRV):
  Proof Pressure: 3700 Psig (225 Bar)
  Burst Pressure: >5000 Psig (345 Bar)
- Temperature Range: -320º F to 400º F (-220º C to 205º C)
  Based on seal selection, see ordering information

Materials of Construction

Component	Valve Body Material		
	Brass	303 Stainless Steel	316 Stainless Steel
Inlet Body, Outlet Cap, Spring Chamber, Spring Retainer,O'Ring Spreader	Brass, ASTM B16	303 SS, ASTM A582*	316 SS, ASTM A479*
Poppet	303 SS, ASTM A582		
Spring	302 SS / 17-7 PH ASTM A313		
Locking Screw	18-8 SS		
Seals*	As Specified, See Ordering Information		
Pull Stud	Brass, ASTM B16	303 SS, ASTM A582	316 SS, ASTM A479
Pull Ring	Plated Steel		

*Lubricated with Krytox ™

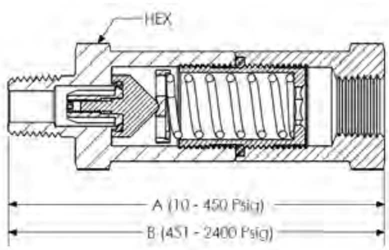
HPRV
Inline



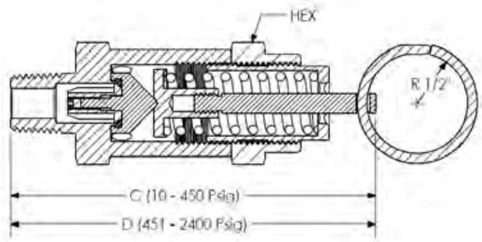
HPRVA
Vent to Atmosphere

HPRVM
Vent to Atmosphere
(Manual Override)

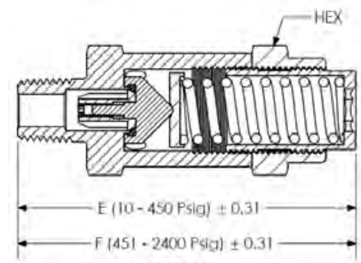
HIGH PRESSURE RELIEF VALVE



HPRV
Inline



HPRVM
Discharge to Atmosphere
(Manual Override)



HPRVA
Discharge to Atmosphere

Dimensional Data

Inlet (NPT)	HPRV		HPRM		HPRVA		Hex
	A	B	C	D	E	F	
1/8"	3.34	4.24	3.30	4.20	2.87	3.77	1"
1/4"							
3/8"							
1/2"	4.16	5.06	4.27	5.18	3.56	4.46	1-1/4"
3/4"	5.90	7.14	5.44	6.70	4.82	6.13	1-3/4"

Dimensional data is stated in inches.

Flow Data

Set Pressure Range	HPRV				HPRVA and HPRVM			
	10-1250		1251-2400		10-1250		1251-2400	
Inlet (NPT)	Orifice	Kd	Orifice	Kd	Orifice	Kd	Orifice	Kd
1/8"	.215	0.14	.215	0.16	.215	0.57	.215	0.65
1/4"	.275	0.27			.275	0.65		
3/8"								
1/2"	.515	0.20	.275	0.27	.515	0.35	.275	0.65
3/4"	See "HPRV-750 Flow Datasheet"							

Kd is stated at 110% of Nominal Set Pressure.
Orifice sizes are stated in inches.
Consult factory for proper sizing or flow requirements, flow curves available on request.

Ordering Information

HPRV - 250 SS - V - 450

SERIES
HPRV - Male x Female, Inline
HPRVA - Male Inlet, Discharge to Atmosphere
HPRVM - Male Inlet, Vent to Atmosphere with Manual Override

STANDARD PORTING CONNECTION

125 – 1/8" NPT	ANSI/ASME B1.20.1 (Inlet & Outlet)
250 – 1/4" NPT	
375 – 3/8" NPT	
500 – 1/2" NPT	
750 – 3/4" NPT	

OPTIONAL PORTING CONNECTION
Consult factory

-6SAE	Inlet - MS33656 with Cone Point Removed (adapts to SAE J1926)
-8SAE	
-10SAE	
-12SAE	Outlet - SAE J1926
-16SAE	
-6JIC	Inlet - SAE J514, 37 Degree Flare
-8JIC	
-10JIC	
-12JIC	Outlet - Corresponding SAE J1926 Size Female
-16JIC	

NOMINAL SET PRESSURE
Specify 10 - 2400 Psig

SEAL MATERIAL
V - Viton^{TM}, -20°F to 400°F (-29°C to 204°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
T - Teflon^{TM}, -320°F to 400°F (-220°C to 204°C)

MATERIAL CODE
B - Brass
S - 303 Stainless Steel
SS - 316 Stainless Steel

OPTIONS
Oxygen cleaning, tamper proof lock wire, alternative seals and Other thread configurations, consult factory

Viton, Krytox, and Teflon are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT

VENT RELIEF VALVE
1/8" - 1" NPT
.5 - 150 Psig (0.03 – 10.3 bar)

VRV SERIES

Description

A compact, highly accurate, direct acting pressure relief valve. Factory preset to desired crack pressure and/or flow specifications. Internal adjustment provides tamper proof safety against inadvertent pressure changes. Available vent to atmosphere or inline configurations in brass, aluminum and 316 stainless steel. Valves feature a Quad ring seal which provides for extreme accuracy and repeatability with a narrow reseal band. Optional deflector cap increases flow capacity and provides for deflection of discharge.

VRV
Vent to Atmosphere

Features

- Accurate and Repeatable Cracking Pressure
- 100% Factory Preset and Tested
- Zero Leakage to 95-98% of Set Pressure
- Tamper Proof Adjustment
- Excellent Reseal Performance
- Compact Size

Technical Data

- Set Pressure Range: 0.5 to 150 Psig (0.03 to 10.34 bar)

- Inline Valves (Series VRVI):
  Proof Pressure: 400 Psig (28 bar)
  Burst Pressure: >500 Psig (34 bar)

- Set Pressure Tolerance: Factory preset
  < 2 Psig (0.14 bar): +/-10%
  2 to 150 Psig (0.14 to 10.3 bar): +/- 5%
  (on increasing pressure)

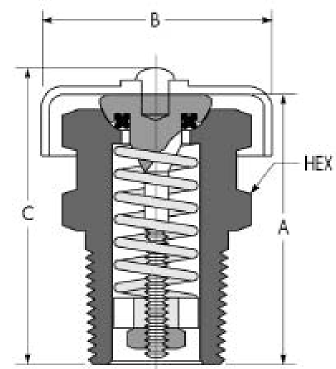
- Reseal:
  80% of Set Pressure for valves specified 2-10 Psig (0.14 to 0.7 bar)
  92% of Set Pressure for valves specified 10-150 Psig (0.7 to 10.3 bar)

Temperature Range: -320° to 400° F (-195° C to 205° C)

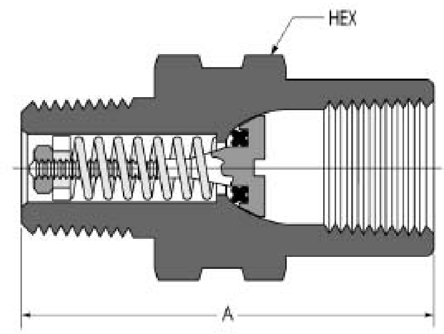
(based on sealing selection, see ordering information)

VRVI
Inline

SERIES VRV
VENT RELIEF VALVE



VRV & VRVD
Vent to Atmosphere



VRVI
Inline

Dimensional Data

Pipe Size NPT[1]	VRV & VRVD				VRVI	
	A	B	C	Hex	A	Hex
1/8"	.97	.69	1.10	1/2"	Not Available	
1/4"	1.20	.92	1.32	5/8"	1.62	3/4"
3/8"	1.24	1.17	1.38	3/4"	2.12	7/8"
1/2"	1.75	1.40	1.92	1"	2.20	1"
3/4"	2.25	1.73	2.44	1-1/8"	2.72	1-1/4"
1"	3.12	1.94	3.29	1-1/2"	Not Available	

1 Available with male straight thread connections. (SAE J1926, MS33656 with cone point removed) Consult factory

Materials of Construction

Component	Valve Body Material		
	Brass	Aluminum[1]	Stainless Steel
Valve Body	Brass, ASTM B16 (Nickel Plated, ASTM B689)	2024 Aluminum ASTM B211 (Clear Anodized, ASTM B580)	316 SS, ASTM A479
Stem	Brass, ASTM B16		
Spring Retainer[2]			
Seal[3]	As specified, see ordering information		
Spring	302 SS/17-7 PH, ASTM A313		
Locknut	18-8 SS		
Deflector Cap and Rivet	2024 Aluminum ASTM B211 (Clear Anodized, ASTM B580)		

1 Available in 1/8" and 1/4" valves only
2 All 1/8" and 1/4" valves have 316 stainless steel (ASTM A479) retainers
3 Lubricated with Krytox™

GENERANT

SERIES VRV
VENT RELIEF VALVE

Flow Data, Series VRV (Vent to Atmosphere)

Nominal Spring		1		5		10		20		50		100		150	
Set Pressure Range		0.5 - 2.5		2.6 - 7.5		7.6 - 15		16 - 35		36-75		76 - 125		126 - 150	
Valve Size	Orifice	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd
1/8" NPT (VRV-125)	0.187	7.7	0.03	34	0.06	55	0.07	90	0.08	260	0.12	500	0.13	610	0.11
1/4" NPT (VRV-250)	0.275	8	0.01	37	0.03	69	0.04	123	0.05	515	0.11	2011	0.24	2290	0.19
3/8" NPT (VRV-375)	0.345	12	0.01	58	0.03	108	0.04	150	0.04	550	0.07	1300	0.1	1140	0.06
1/2" NPT (VRV-500)	0.410	50	0.04	110	0.04	150	0.04	220	0.04	1458	0.14	3725	0.2	4000	0.15
3/4" NPT (VRV-750)	0.570	74	0.03	82	0.01	95	0.01	225	0.02	1050	0.05	2080	0.06	3450	0.07
1" NPT (VRV-1000)	0.785	Consult Factory		175	0.02	114	0.01	310	0.02	550	0.01	4600	0.07	5500	0.06

Flow Data, Series VRVD (Vent to Atmosphere, with Deflector Cap)

Nominal Spring		1		5		10		20		50		100		150	
Set Pressure Range		0.5 - 2.5		2.6 - 7.5		7.6 - 15		16 - 35		36-75		76 - 125		126 - 150	
Valve Size	Orifice	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd
1/8" NPT (VRVD-125)	0.187	10.3	0.04	39	0.07	95	0.12	100	0.09	280	0.13	580	0.15	780	0.14
1/4" NPT (VRVD-250)	0.275	11	0.02	40	0.03	100	0.05	172	0.07	2340	0.5	4272	0.5	6650	0.55
3/8" NPT (VRVD-375)	0.345	13	0.01	77	0.04	130	0.05	195	0.05	738	0.1	4353	0.33	6275	0.33
1/2" NPT (VRVD-500)	0.410	60	0.05	246	0.09	420	0.11	658	0.12	2605	0.25	6800	0.37	7600	0.29
3/4" NPT (VRVD-750)	0.570	50	0.02	76	0.01	116	0.02	2500	0.23	6000	0.30	11000	0.30	20000+	0.34+
1" NPT (VRVD-1000)	0.785	Consult Factory		560	0.06	500	0.04	600	0.03	660	0.02	12000	0.18	20000+	0.20+

Flow Data, Series VRVI (Inline)

Nominal Spring		1		5		10		20		50		100		150	
Set Pressure Range		0.5 - 2.5		2.6 - 7.5		7.6 - 15		16 - 35		36-75		76 - 125		126 - 150	
Valve Size	Orifice	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd	Flow (SCFH)	Kd
1/4" NPT (VRVI-250)	0.187	7.7	0.03	34	0.06	55	0.07	90	0.08	260	0.12	500	0.13	610	0.11
3/8" NPT (VRVI-375)	0.275	8	0.01	37	0.03	69	0.04	123	0.05	515	0.11	2011	0.24	2290	0.19
1/2" NPT (VRVI-500)	0.345	12	0.01	58	0.03	108	0.04	150	0.04	550	0.07	1300	0.1	1140	0.06
3/4" NPT (VRVI-750)	0.410	50	0.04	110	0.04	150	0.04	220	0.04	1458	0.14	3725	0.2	4000	0.15

Notes to Flow Data

- Flow and Kd (discharge coefficient) are stated at 110% accumulation above set point with Nitrogen and Zero Downstream Pressure
- Interpolate charts for set pressures between points given
- Restrictions in the inlet or outlet piping may reduce flow
- Exceeding 115% accumulation may result in valve failure
- Generant offers complete design assistance. Consult factory for correct relief valve sizing
- Individual flow curves available on request
- Orifice sizes are stated in inches

SERIES VRV
VENT RELIEF VALVE

Ordering Information

VRV - 125 B - V - 15

SERIES
VRV - Vent to Atmosphere
VRVD - Vent to Atmosphere with Deflector Cap
VRVI - Inline Relief (Male x Female)

NOMINAL SET PRESSURE
Specify .5 - 150 Psig
(Teflon™ Seals not available below 20 Psig)
Valves that are not actuated for a period of time may exhibit higher initial crack pressure (first bubble) than subsequent cycles

PORT SIZE

125 -1/8"
250 - 1/4"
375 - 3/8"
500 - 1/2"
750 - 3/4"
1000 - 1" (Note: VRVI Not Available)
NPT threads per ANSI/ASME B1.20.1

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40° F to 250° F (-40° C to 121° C)
N - Neoprene, -40° F to 250° F (-40° C to 121° C)
EP - Ethylene Propylene, -65° F to 300° F (-54° C to 148° C)
FS - Fluorsilicone, -80° F to 350° F (-62° C to 176° C)
S - Silicone, -65° F to 400° F (-54° C to 205° C)
T - Teflon™, -320° F to 400° F (-220° C to 205° C)

Material Code

B - Brass
A - Aluminum
SS - 316 SS
For other materials, consult factory

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult the factory

Viton, Krytox & Teflon are trademarks of DuPont.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

VENT RELIEF VALVE
1/8” – 1/4” NPT
150 – 600 Psig

SERIES VRVH

Description

A compact, highly accurate, direct acting pressure relief valve. Factory preset to desired crack pressure and/or flow specifications. Internal adjustment provides tamper proof safety against inadvertent pressure changes. Available in vent to atmosphere or inline configurations. Valves feature an encapsulated O-ring seal to prevent extrusion at higher differential pressures.

VRVH
Vent to Atmosphere

Features and Benefits

- Accurate and Repeatable Cracking Pressure
- 100% Factory Preset and Tested
- Zero Leakage to 95 – 98% of Set Pressure
- Tamper Proof Adjustment
- Excellent Reseal Performance
- Compact Size

Technical Data

- Set Pressure Range: 150 to 600 Psig (10.3 to 42 bar)
- Inline Valves *(Series VRVHI):*
  Proof Pressure: 750 Psig (52 bar)
  Burst Pressure: >1000 Psig (69 bar)
- Set Pressure Tolerance: Factory preset +/- 5% on increasing pressure:
- Reseal: 90% of Set Pressure for Elastomers Seals
  80% of Set Pressure for PTFE Seals
- Temperature Range:
  -320°F to 350°F (-195°C to 177°C)
  based on seal selection, see ordering information

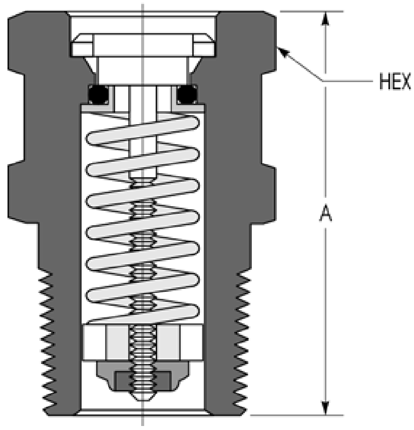
VRVHI
Inline

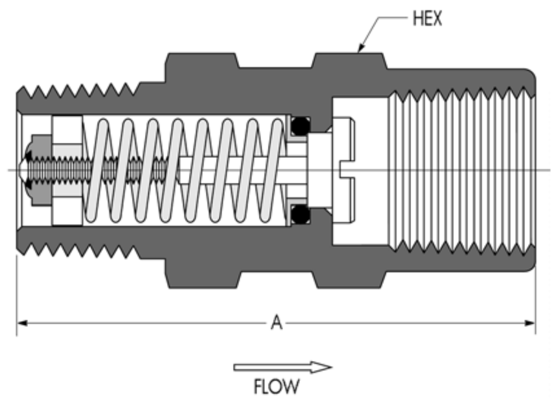
Materials of Construction

Component	Material
Valve Body, Stem, O-Ring Cup	Brass, ASTM B16
Spring Retainer	316 SS, ASTM A479
Seal[1]	As specified, see ordering information
Spring	302 SS/17-7 PH, ASTM A313
Locknut	18-8 SS

1 Lubricated with Krytox™

SERIES VRVH
VENT RELIEF VALVE





Dimensional Data

Pipe Size NPT	VRVH		VRVHI	
	A	Hex	A	Hex
1/8"	.94	1/2"	1.44	1/2"
1/4"	1.29	5/8"	1.75	3/4"

Dimensional data is stated in inches

Flow Data, Series VRVH (Vent to Atmosphere)

Nominal Spring		150		250		500	
Set Pressure Range (Psig)		125-175		175-350		350-600	
Valve Size	Orifice	Flow (SCFM)	Kd	Flow (SCFM)	Kd	Flow (SCFM)	Kd
1/8" NPT (VRVH-125)	0.156	7.5	0.12	12.5	0.12	33	0.16
1/4" NPT (VRVH-250)	0.293	50	0.22	90	0.24	150	0.21

Flow Data, Series VRVHI (Inline)

Nominal Spring		150		250		500	
Set Pressure Range (Psig)		125-175		175-350		350-600	
Valve Size	Orifice	Flow (SCFM)	Kd	Flow (SCFM)	Kd	Flow (SCFM)	Kd
1/8" NPT (VRVHI-125)	0.156	12	0.18	13.5	0.13	35	0.17
1/4" NPT (VRVHi-250)	0.250	45	0.27	80	0.30	175	0.33

Ordering Information

VRVHI - 250 B - V - 450

SERIES
VRVH - Vent to Atmosphere
VRVHI - Inline Relief (Male x Female)

PIPE SIZE (NPT)
125 - 1/8" Male
250 - 1/4" Male
NPT threads per ANSI/ASME B1.20.1

MATERIAL CODE
B - Brass
For other materials, consult factory

NOMINAL SET PRESSURE
Specify 150-600 Psig
Valves that are not actuated for a period of time may exhibit higher initial crack pressure (first bubble) than subsequent cycles.

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
S - Silicone, -70°F to 450°F (-56°C to 232°C)
T - PTFE, -320°F to 350°F (-195°C to 176°C)
PTFE Seals may not reseal bubble tight.

Note: Viton™ and Krytox™ are trademarks of DuPont.

OPTIONS
Oxygen cleaning, alternative seals and other thread configurations, consult factory.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

Valves & BI-Lok Fittings

INDUSTRIAL RELIEF VALVE (BRASS)
1/4" - 1/2" NPT
10 - 750 Psig (0.69 - 51.7 Bar)

SERIES IRV BRASS

Description

The Generant Series Brass IRV, Industrial Relief Valve is a spring reference over pressure protection device. The valve can be ordered with set pressures ranging from 10 to 750 Psig (0.69 to 51.7 Bar) and comes factory preset and permanently locked. Relief pressure cannot be altered or adjusted in the field. Seat and poppet geometry combined with optimized spring ranges provide high flow rates with minimum pressure accumulation. Relief pressure can be discharged to atmosphere or to a downstream connection. For severe service applications and set pressures above 50 Psig (3.45 Bar), specify optional PTFE seals.

Series IRV

Features

- Supplied Factory Preset Set and Permanently Locked for Tamper Proof Service
- 100% Factory Tested for Leakage, Crack and Reseal Performance
- High Flow Capacity and Excellent Reseal Performance
- Discharge to Atmosphere or Inline Piping Configurations
- Optional Deflector Cap available for Diverting Exhausted Gas to Atmosphere
- Available Cleaned and Packaged for Oxygen Service

Technical Data

Set Pressure Range:
FKM and Fluorosilicone: 10 - 750 Psig (0.69 to 51.7 Bar)
PTFE and PCTFE: 50 - 750 Psig (3.45 to 51.7 Bar)
Factory Set Tolerance: +/- 5% of Specified Pressure
Zero Leakage to 95% of Set Pressure
Full Rated Flow @ 110% of Set Pressure, unaffected by up to 10% Back Pressure
Reseal: 90% of Set Pressure
PTFE seals 80% of Set Pressure
Temperature Rating: -320º F to 375º F (-196º C to 190° C)
based on seal material (see how to order)
Lubricant: Krytox®

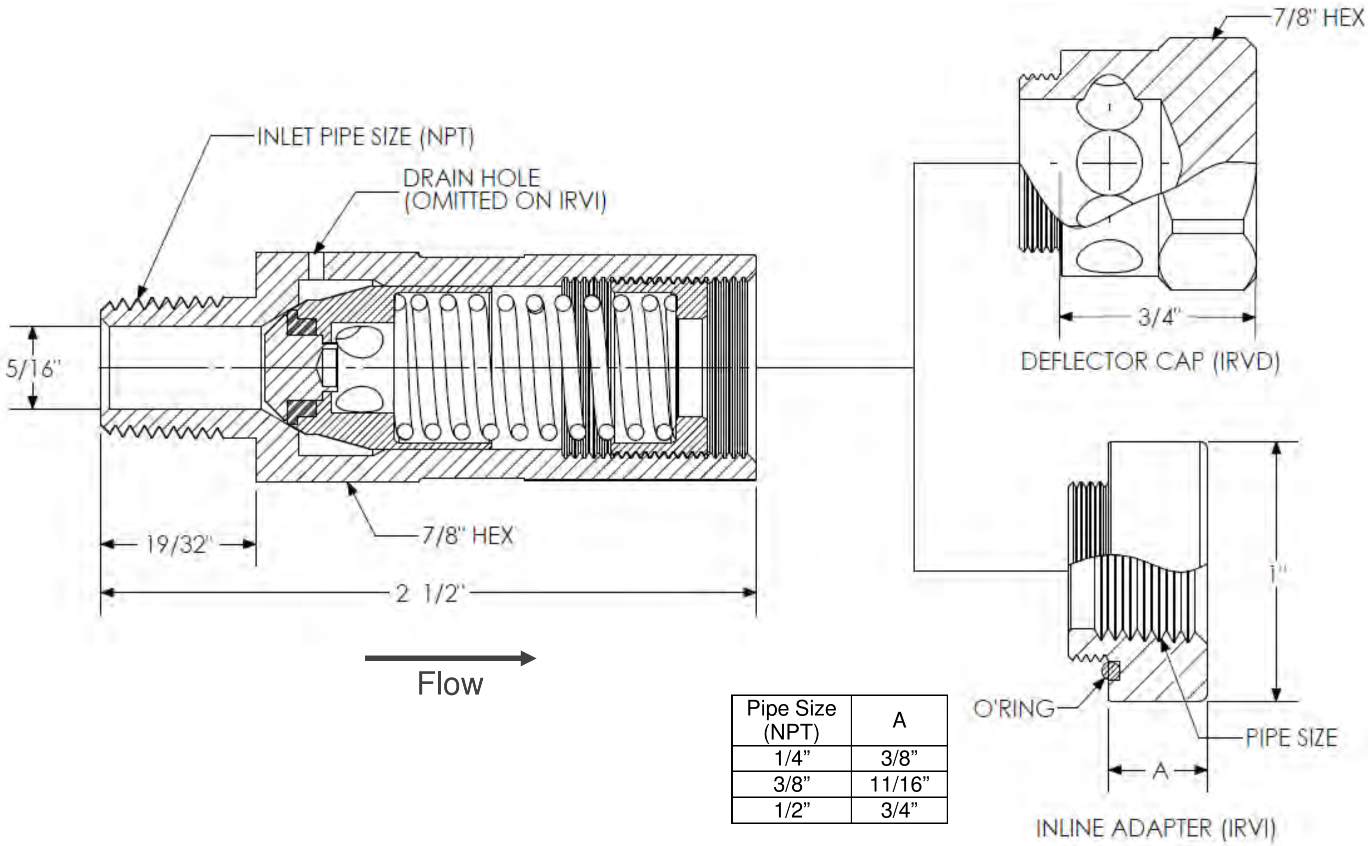
Series IRVI

Materials of Construction

Component	Material
Body, Poppet, Seat Rivet, Spring Retainer, In-Line Adapter*	CDA 360 Brass, ASTM B16
Adjustment Spring	302 or 17-7 PH Stainless Steel, ASTM A313
Seals	FKM, PTFE, PCTFE, Fluorosilicone

*In-line Adapters Utilize FKM O'Ring Seals

INDUSTRIAL RELIEF VALVE (BRASS)



Pipe Size (NPT)	A
1/4"	3/8"
3/8"	11/16"
1/2"	3/4"

Flow Data*

Set Pressure Range (Psig)		Discharge Coefficient
From	To	Kd
10	28	0.59
29	45	0.59
46	62	0.59
63	89	0.54
90	130	0.42
131	180	0.35
181	275	0.25
275	400	0.12
401	615	0.18
616	750	0.14

*Orifice Diameter 0.312

How To Order

IRV - 250B - V - 300 - X

SERIES
IRV Vent to Atmosphere
IRVI2 1/4" Female NPT In-Line Adapter
IRVI3 3/8" Female NPT In-Line Adapter
IRVI4 1/2" Female NPT In-Line Adapter
IRVD Deflector Cap

INLET PIPE SIZE (NPT)
250B - 1/4" Male
375B - 3/8" Male
500B - 1/2" Male

SEAL MATERIAL
V - FKM, -20° F to 375° F (-29° C to 190° C)
T - PTFE, -60° F to 375° F (-51° C to 190° C)
K - PCTFE, -320° F to 200° F (-220° C to 93° C)
FS - Fluorosilicone, -80° F to 350° F (-62° C to 176° C)

Specify Set Pressure
10-750 Psig (0.69 to 51.7 Bar) for Seal Material V or FS
50-750 Psig (3.45 to 51.7 Bar) for Seal Material T or K

Cleaning Option
X - Clean and Packaged for Oxygen Service

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

INDUSTRIAL RELIEF VALVE (STAINLESS)
1/4" and 1/2" NPT
-4 and -8 Metal To Metal Face Seal
1/4" and 1/2" Bi-Lok Dual Ferrule Tube
10 - 750 Psig (0.69 - 51.7 Bar)

SERIES IRV STAINLESS

Description

The Generant Series Stainless Steel IRV, Industrial Relief Valve is a spring reference over pressure protection device. The valve can be ordered with set pressures ranging from 10 to 750 Psig (0.69 to 51.7 Bar) and come factory preset and permanently locked. Relief pressure can not be altered or adjusted in the field. Seat and poppet geometry combined with optimized spring ranges provide high flow rates with minimum pressure accumulation. Compact design and availability of a variety of inlet and outlet configurations reduces size and piping requirements. Relief pressure can be discharged to atmosphere or to a downstream connection. The IRV is supplied with FKM seals. For severe service applications and set pressures above 50 Psig (3.45 Bar), specify optional PTFE seals.

Features

- Supplied Factory Preset Set and Permanently Locked for Tamper Proof Service
- 100% Factory Tested for Leakage, Crack and Reseal Performance
- High Flow Capacity and Excellent Reseal Performance
- Available in NPT, Metal to Metal Face Seal and Bi-Lok Dual Ferrule Tube Connections
- Discharge to Atmosphere or a Wide Varity of Inline Piping Configurations
- Optional Deflector Cap available for Diverting Exhausted Gas to Atmosphere
- Available Cleaned and Packaged for Oxygen Service

Technical Data

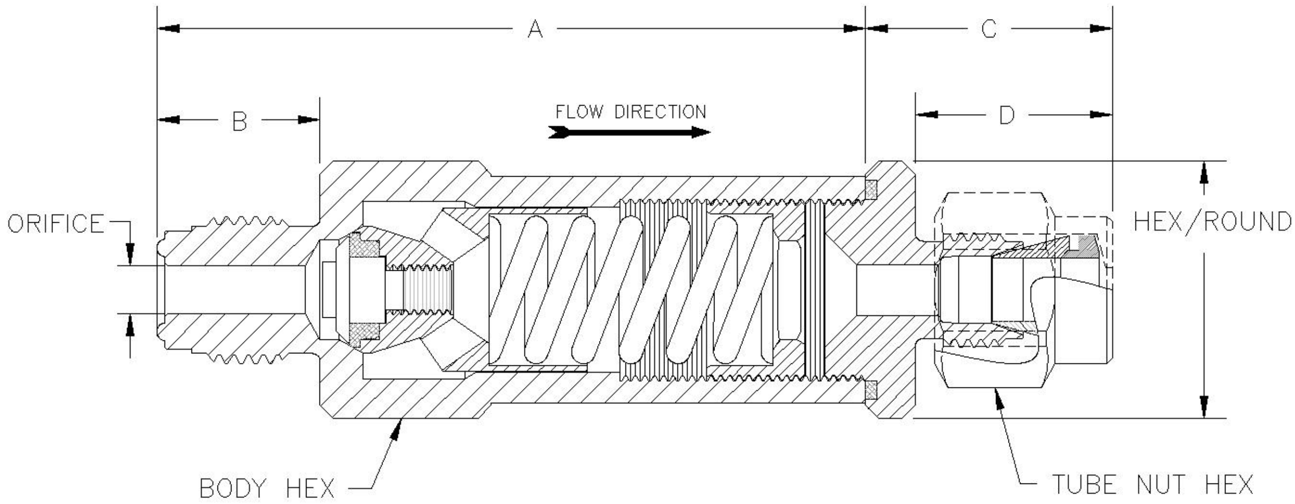
Set Pressure Range:
FKM: 10 - 750 Psig (0.69 to 51.7 Bar)
PTFE: 50 - 750 Psig (3.45 to 51.7 Bar)
Factory Set Tolerance: +/- 5% of Specified Pressure
Zero Leakage to 95% of Set Pressure
Full Rated Flow @ 110% of Set Pressure, unaffected by up to 10% Back Pressure
Reseal: FKM seals 90% of Set Pressure
PTFE seals 80% of Set Pressure
Temperature Rating: -60° F to 375° F (-51° C to 190° C) based on seal material (see how to order)
Lubricant: Krytox®

Materials of Construction

Component	Material
Body, Poppet, Seat Screw, Spring Retainer, In-Line Adapter[1], Nuts and Ferrules	316 Stainless Steel, ASTM A479[2]
Adjustment Spring	302 or 17-7 PH Stainless Steel, ASTM A313
Seals	FKM or PTFE

[1] Inline Adapters utilize FKM o'ring seals. Metal to Metal Face Seal Inline Adapters are Electro Polished to 10 Ra Max.
[2] Valves supplied with Metal to Metal Face Seal connections have Electro Polished Inlet, Poppet and Seat Screw to 10 Ra Max.

INDUSTRIAL RELIEF VALVE (STAINLESS)



Configuration Shown IRV4T-4V

Dimensional Data

Inlet Size	Designation	Orifice	A	B	Body Hex	Tube Nut Hex
1/4" NPT	4	.312 (7.93)	2.65 (65.02)	0.59 (14.99)	7/8"	N/A
1/2" NPT	8	.400 (10.16)				
-4 Face Seal	4V	.180 (4.57)	2.68 (68.07)	0.62 (15.75)		
1/4" Bi-Lok	4T	.180 (4.57)	3.35 (85.09)	0.70 (17.78)		9/16"
1/2" Bi-Lok	8T	.400 (10.16)	3.51 (89.15)	0.86 (21.84)		7/8"
-8 Face Seal	8V	.400 (10.16)	2.82 (71.63)	0.75 (19.05)	1"	N/A

Configuration	Outlet	C	D	Hex/Round	Tube Nut Hex
IRV	Vent to Atmosphere	N/A			
IRVD	Deflector Cap	0.75 (19.05)	N/A	7/8" Hex	N/A
IRV4	1/4" FNPT	0.37 (9.40)		1" Rd	
IRV6	3/8" FNPT	0.67 (17.02)			
IRV8	1/2" FNPT	0.74 (18.80)			
IRV4V	-4 Face Seal	0.80 (20.32)	0.62 (15.75)	7/8" Hex	
IRV4T	1/4" Bi-Lok	0.89 (22.61)	0.70 (17.78)		9/16"
IRV8T	1/2" Bi-Lok	1.05 (26.67)	0.86 (21.84)		7/8"
IRV8V	-8 Face Seal	0.94 (23.88)	0.75 (19.05)	1" Hex	N/A

Note: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change.
NPT Threads per ASME B1.20.1

Flow Data

Set Pressure Range (Psig)		Discharge Coefficient, Kd		
From	To	.180 Orifice (4.57mm)	.312 Orifice (7.92mm)	.400 Orifice (10.16mm)
8	19	0.05	0.44	0.25
20	28	0.30	0.57	0.30
29	45	0.30	0.57	0.34
46	62	0.34	0.57	0.34
63	89	0.60	0.57	0.34
90	130	0.60	0.57	0.34
131	180	0.60	0.55	0.28
181	275	0.57	0.55	0.28
275	400	0.37	0.43	0.28
401	615	0.37	0.28	0.25
616	750	0.37	0.17	0.12

Krytox® is a registered trademark of DuPont.

How To Order

IRV4 - 4V - V - 300 - X

Series
IRV Vent to Atmosphere
IRVD Deflector Cap
IRV4 1/4" Female NPT In-Line Adapter
IRV6 3/8" Female NPT In-Line Adapter
IRV8 1/2" Female NPT In-Line Adapter
IRV4V -4 Face Seal In-Line Adapter
IRV4T 1/4" Bi-Lok In-Line Adapter
IRV8T 1/2" Bi-Lok In-Line Adapter
IRV8V -8 Face Seal In-Line Adapter

Inlet Size Designation
4 1/4" NPT Male Inlet
8 1/2" NPT Male Inlet
4V -4 Metal to Metal Face Seal
4T 1/4" Bi-Lok Dual Ferrule Tube
8T 1/2" Bi-Lok Dual Ferrule Tube
8V -8 Metal to Metal Face Seal

Seals
V - FKM, -10° to 375° F (-23° to 190° C)
T - PTFE, -60° to 375° F (-51° to 190° C)

Specify Set Pressure
10-750 Psig (0.69 to 51.7 Bar) for Seal Material V
50-750 Psig (3.45 to 51.7 Bar) for Seal Material T

Cleaning Option
X - Clean and Packaged for Oxygen Service

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT Valves & BI-Lok Fittings

CRYOGENIC RELIEF VALVE (BRASS)
1/4", 3/8" and 1/2" NPT
10 - 750 Psig (0.7 - 51.7 Bar)

SERIES BRASS CRV

Description

The Generant Series Brass CRV, Cryogenic Relief Valve is a spring reference over pressure protection device. The CRV incorporates Generant's exclusive "Dirt Guard" feature which increases the valves ability to tolerate particulate contamination. This device is ideally suited for use as a "Blocked Line Safety" in cryogenic systems. The CRV is supplied cleaned and packaged for oxygen service. The valve can be ordered with set pressures ranging from 10 to 750 Psig (0.7 to 51.7 Bar) and come factory preset and permanently locked. Relief pressure can not be altered or adjusted in the field. Seat and poppet geometry combined with optimized spring ranges provide high flow rates with minimum pressure accumulation. Compact design and availability of a variety of inlet and outlet configurations reduces size and piping requirements. Relief pressure can be discharged to atmosphere or to a downstream connection. The CRV is supplied with Flourosilicone seals for set pressures from 10 – 49 Psig (0.7 – 3.4 Bar) and PCTFE seals for set pressures 50 – 750 Psig (3.5 – 51.7 Bar).

Features

- Available **CE** marked in accordance to the requirements of the PED
- Exclusive "Dirt Guard" poppet incorporates screen to extend valve life and ensure reliability
- High Flow Capacity and Excellent Reseal Performance
- Supplied Factory Preset and Permanently Locked for Tamper Proof Service
- Discharge to Atmosphere or a Wide Variety of Inline Piping Configurations
- Optional Deflector Cap available for diverting exhausted gas
- 100% Factory Tested for Leakage, Crack and Reseal
- Cleaned and Packaged for Oxygen Service

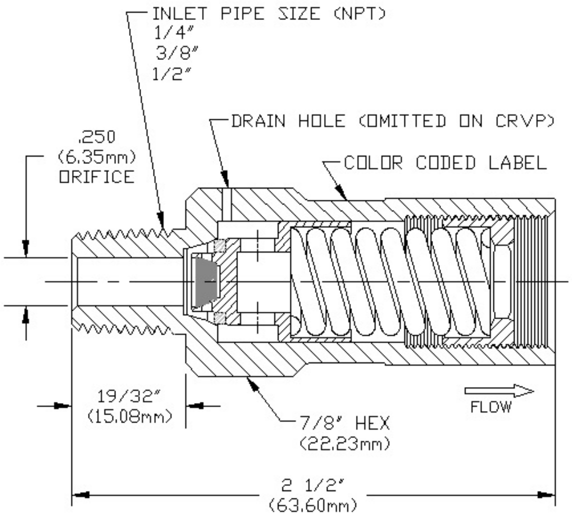
Technical Data

Nominal Set Pressure Range: 10 – 750 Psig (0.7 to 51.7 Bar)
Factory Set Tolerance*: Set Pressure ≤ 28.90 PSI, ± 5%
Set Pressure 29.00 – 48.30 PSI, ± 1.45 PSI
Set Pressure ≥ 48.40 PSI, ± 3%
*tolerance specifications per *EN ISO 4126-1*.
Zero Leakage to 95% of Set Pressure
Full Rated Flow @ 110% of Set Pressure
Unaffected by up to 10% Back Pressure
Reseat: 90% of set pressure
85% for PCTFE seals set below 100 Psig (6.9 Bar)
Temperature Rating: -320° to 350° F (-196° C to 176° C)
based on seal material (see How To Order)
Lubricant: Krytox®

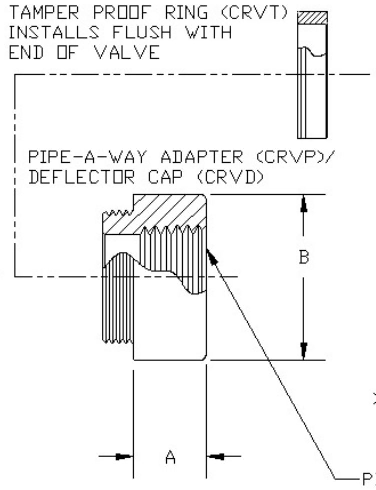
Materials of Construction

Component	Material
Body, Poppet, Adjusting Spring Retainer, Pipe-Away Adapters, Deflector Cap, Tamper Proof Ring	Brass, ASTM B16
Spring	302 (ASTM A313) or 17-4PH (ASTM A564)
Seal	PCTFE (ASTM D1430), or Fluorosilicone
Color Coded Identification Label	Mylar

CRYOGENIC RELIEF VALVE (BRASS)



CRV SHOWN WITH "DIRT GUARD" POPPET



PIPE SIZE	A	B
1/4" NPT	11/32" (8.73mm)	7/8" (22.23mm)
3/8" NPT	11/16" (17.46mm)	7/8" (22.23mm)
1/2" NPT	3/4" (19.05mm)	1" (25.40mm)
1/2" BSPT	3/4" (19.05mm)	1" (25.40mm)
DEFLECTOR CAP *	3/4" (19.05mm)	7/8" HEX (22.23mm)

* DEFLECTOR CAP DIVERTS FLOW TO SIDES THROUGH SIX (6) 1/4"(6.35mm) HOLES. (NOT SHOWN)

OPTIONAL CONFIGURATIONS (SEE HOW TO ORDER)

Flow Data

Set Pressure Range (Psig)		Discharge Coefficient Kd*	
From	To		
10.0	17.0	0.62	Valve Orifice .250" (6.35mm) Diameter (same for 1/4", 3/8" and 1/2" NPT) *Flow Coefficient Kd is stated at 110% accumulation Relief Valve Flow Capacity can be calculated using **Generant's Online Flow Calculator** at www.generant.com or contact Customer Service at 973-838-6500.
17.1	29.0	0.62	
29.1	40.0	0.53	
40.1	60.0	0.53	
60.1	90.0	0.61	
90.1	125.0	0.76	
125.1	190.0	0.76	
190.1	275.0	0.67	
275.1	375.0	0.61	
375.1	600.0	0.48	
600.1	750.0	0.40	

How To Order

CRV - 250B - K - 350

SERIES
- CRV -Cryogenic Relief Valve
- CRVP2 -Cryogenic Relief Valve with 1/4" Female Pipe-A-Way Adapter Installed
- CRVP3 -Cryogenic Relief Valve with 3/8" Female Pipe-A-Way Adapter Installed
- CRVP4 -Cryogenic Relief Valve with 1/2" Female Pipe-A-Way Adapter Installed
- CRVT -Cryogenic Relief Valve with Tamper Proof Ring Installed
- CRVD -Cryogenic Relief Valve with Deflector Adapter Installed
- CRVB4 -Cryogenic Relief Valve with 1/2" BSPT Female Pipe-A-Way Adapter Installed

NOMINAL SET PRESSURE
10-750 Psig (0.7 - 51.7 Bar)

SEAL MATERIAL
FS - Fluorosilicone for 10-49 Psig (-85° to 350° F (-65° to 176°C))
K - PCTFE for Above 50 Psig (-320° to 165° F (-196° to 74° C))

INLET PIPE SIZE (NPT)
250B - 1/4" Male
375B - 3/8" Male
500B - 1/2" Male

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

CRYOGENIC RELIEF VALVE WITH INTEGRAL BLEED VALVE
1/4", 3/8" and 1/2" NPT
10 - 750 Psig (0.7 - 51.7 Bar)

SERIES CRB

Description

The Generant Series CRB, Cryogenic Relief Valve with Integral Bleed Valve, is a spring reference over pressure protection device with a built-in bleed valve function for venting system pressure during line maintenance operations. This device is ideally suited for use as a "Blocked Line Safety" in cryogenic systems. The bleed adjustment screw is fully retained to prevent removal and can be opened and closed using a 5/64" allen wrench. The bleed valve's unique porting configuration vents system pressure away from the operator. The CRB offers all the same functions and features as Generant's Series CRV, including the exclusive "Dirt Guard" feature for minimizing valve contamination. The CRB is supplied cleaned and packaged for oxygen service.

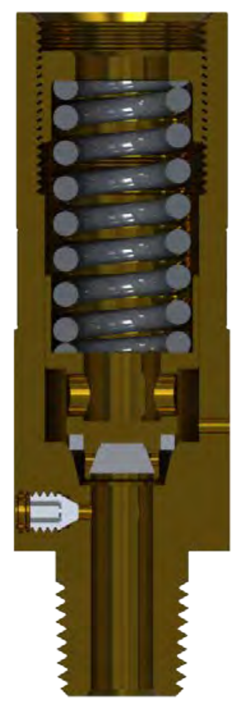
The valve can be ordered with set pressures ranging from 10 to 750 Psig (0.7 to 51.7 Bar) and comes factory preset and permanently locked. Relief pressure cannot be altered or adjusted in the field. The CRB is supplied with Flourosilicone (FS) seals for set pressures 10 – 49 Psig (0.7 – 3.4 Bar) and PCTFE (K) seals for set pressures 50 – 750 Psig (3.5 – 51.7 Bar).

Features

- Integral Bleed Valve for Quick and Easy System Depressurization during Maintenance Operations.
- Fully Retained Bleed Valve Adjustment Screw to Prevent Removal
- Exclusive "Dirt Guard" Poppet incorporates Screen to Extend Valve Life and Ensure Reliability
- High Flow Capacity and Excellent Reseal Performance
- Supplied Factory Preset and Permanently Locked for Tamper Proof Service
- Discharge to Atmosphere or a Wide Variety of Inline Piping Configurations
- Optional Deflector Cap available for Diverting Exhaust Gas
- 100% Factory Tested for Leakage, Crack and Reseal
- Cleaned and Packaged for Oxygen Service

Technical Data

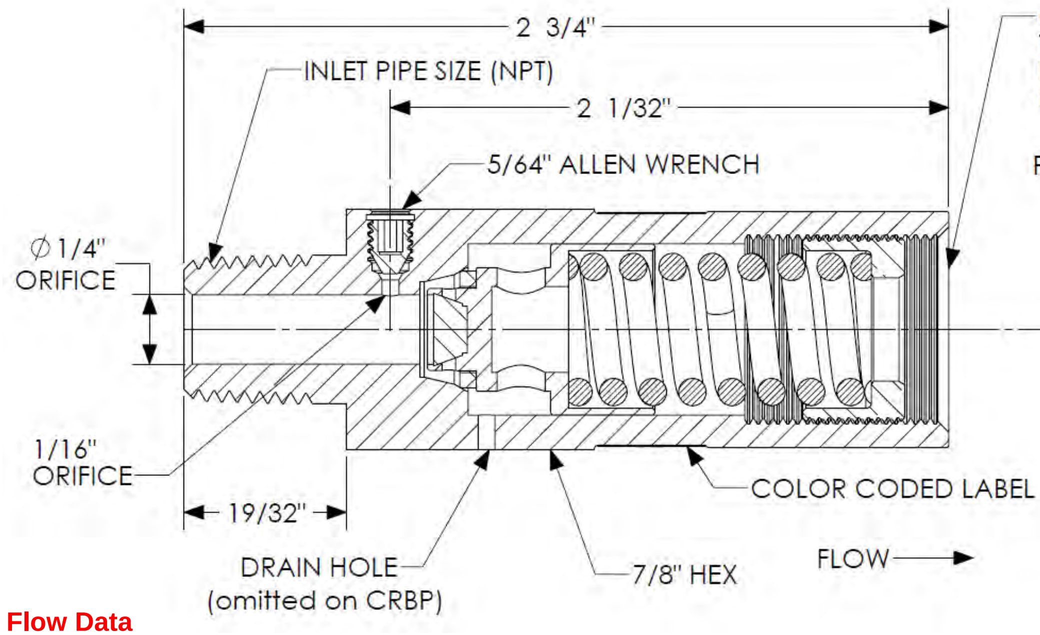
Nominal Set Pressure Range: 10 – 750 Psig (0.7 to 51.7 Bar)
Factory Set Tolerance*: Set Pressure ≥ 72.5 PSI, ± 3%
Set Pressure < 72.5 PSI, ± 2.175 PSI
*tolerance specifications per *EN ISO 4126-1*.
Zero Leakage to 95% of Set Pressure
Full Rated Flow @ 110% of Set Pressure
Unaffected by up to 10% Back Pressure
Reseat: 90% of set pressure
85% for PCTFE seals set below 100 Psig (6.9 Bar)
Temperature Rating: -320º to 350º F (-196º C to 176º C)
based on seal material (see How To Order)
Lubricant: Krytox®

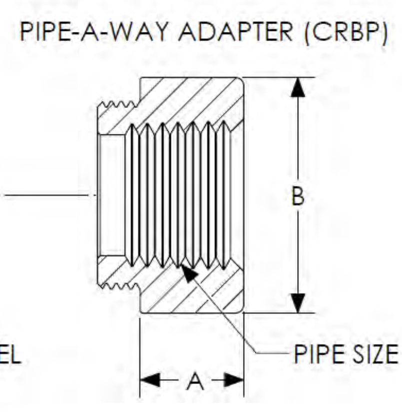


Materials of Construction

Component	Material
Body, Poppet, Adjusting Spring Retainer, Pipe-Away Adapters, Deflector Cap, Tamper Proof Ring	Brass, ASTM B16
Bleed Valve Set Screw	316 SS (ASTM A313)
Spring	302 SS (ASTM A313) or 17-4PH SS (ASTM A564)
Seal	PCTFE (ASTM D1430), or Fluorosilicone
Color Coded Identification Label	Mylar

CRYOGENIC RELIEF VALVE (BRASS)





Pipe Size	A	B
1/4" NPT	11/32"	7/8"
3/8" NPT	11/16"	1"
1/2" NPT	3/4"	1"

* Deflector Cap (CRBD) diverts flow radially through six 1/4" holes.

Flow Data

Set Pressure Range (Psig)		Discharge Coefficient (Kd*)
From	**To**	
10.0	17.0	0.62
17.1	29.0	0.62
29.1	40.0	0.53
40.1	60.0	0.53
60.1	90.0	0.61
90.1	125.0	0.76
125.1	190.0	0.76
190.1	275.0	0.67
275.1	375.0	0.61
375.1	600.0	0.48
600.1	750.0	0.40

Valve Orifice .250" (6.35mm) Diameter (same for 1/4", 3/8" and 1/2" NPT)

*Flow Coefficient Kd is stated at 110% accumulation

Relief Valve Flow Capacity can be calculated using **Generant's Online Flow Calculator** at www.generant.com or contact Customer Service at 973-838-6500.

How To Order

CRB - 250B - K - 350

SERIES
- CRB -Cryogenic Relief Valve with Bleed
- CRBP2 -Cryogenic Relief Valve with Bleed - 1/4" Female Pipe-A-Way Adapter Installed
- CRBP3 -Cryogenic Relief Valve with Bleed - 3/8" Female Pipe-A-Way Adapter Installed
- CRBP4 -Cryogenic Relief Valve with Bleed - 1/2" Female Pipe-A-Way Adapter Installed
- CRBT -Cryogenic Relief Valve with Bleed - Tamper Proof Ring Installed
- CRBD -Cryogenic Relief Valve with Bleed - Deflector Adapter Installed
- CRBB4 -Cryogenic Relief Valve with Bleed - 1/2" BSPT Female Pipe-A-Way Adapter Installed

NOMINAL SET PRESSURE
10-750 Psig (0.7 - 51.7 Bar)

SEAL MATERIAL
FS - Fluorosilicone for 10-49 Psig (-85° to 350° F (-65° to 176°C))
K - PCTFE for Above 50 Psig (-320° to 165° F (-196° to 74° C))

INLET PIPE SIZE (NPT)
250B - 1/4" Male
500B - 1/2" Male

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

CRYOGENIC RELIEF VALVE (STAINLESS)
1/4" and 1/2" NPT
-4 and -8 Metal To Metal Face Seal
1/4", 3/8”, and 1/2" Bi-Lok Dual Ferrule Tube
10 - 750 Psig (0.69 - 51.7 Bar)

SERIES STAINLESS CRV

Description

The Generant Series Stainless Steel CRV, Cryogenic Relief Valve is a spring reference over pressure protection device. The Stainless CRV is supplied cleaned and packaged for oxygen service making it an ideal choice for most cryogenic relief valve applications. The valve can be ordered with set pressures ranging from 10 to 750 PSIG (0.69 to 51.7 Bar) and come factory preset and permanently locked. Relief pressure cannot be altered or adjusted in the field. Seat and poppet geometry combined with optimized spring ranges provide high flow rates with minimum pressure accumulation. Compact design and availability of a variety of inlet and outlet configurations reduces size and piping requirements. Relief pressure can be discharged to atmosphere or to a downstream connection. The CRV can be specified with PCTFE or PTFE for set pressures above 50 PSIG (3.45 Bar), Fluorosilicone for set pressures below 50 PSIG, and FKM (Viton™) throughout the available set pressure range.

Features

- Available in NPT, Metal to Metal Face Seal and Bi-Lok Dual Ferrule Tube Connections
- High Flow Capacity and Excellent Reseal Performance
- Discharge to Atmosphere or a Wide Varity of Inline Piping Configurations
- Supplied Factory Preset Set and Permanently Locked for Tamper Proof Service
- 100% Factory Tested for Leakage, Crack and Reseal Performance
- Optional Deflector Cap available for diverting exhausted gas
- Cleaned and Packaged for Oxygen Service

Technical Data

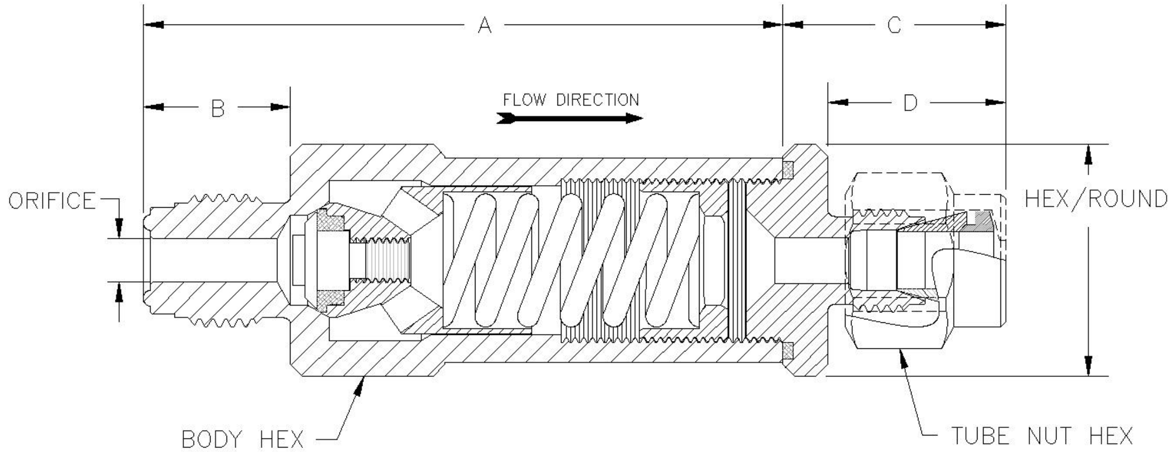
Nominal Set Pressure Range: 10 – 750 PSIG (0.69 to 51.7 Bar)
Factory Set Tolerance: +/- 5% of Specified Pressure
Zero Leakage to 95% of Set Pressure
Full Rated Flow @ 110% of Set Pressure
Reseat: 90% of set pressure OR
80% for PCTFE seals set below 100 PSIG (6.9 Bar)
80% for PTFE seals, any set pressure
Unaffected by up to 10% Back Pressure
Temperature Rating: -320º to 392º F (-196º C to 200º C)
based on seal material (see How To Order)
Lubricant: Krytox®

Materials of Construction

Component	Material
Body, Poppet, Seat Screw, Spring Retainer, In-Line Adapter[1], Nuts and Ferrules	316 Stainless Steel (ASTM A479)[2]
Spring	302 or 17-7 PH Stainless Steel (ASTM A313)
Seals	PCTFE (ASTM D1430), PTFE, Viton® or Fluorosilicone

[1] Inline Adapters utilize Viton® o-ring seals. Metal to Metal Face Seal Inline Adapters are Electro Polished to 10 Ra Max.
[2] Valves supplied with Metal to Metal Face Seal connections have Electro Polished Inlet, Poppet and Seat Screw to 10 Ra Max.

CRYOGENIC RELIEF VALVE (STAINLESS)



Configuration Shown CRV4T-4V

Dimensional Data

Inlet Size	Designation	Orifice	A	B	Body Hex	Tube Nut Hex
1/4" NPT	4	.312 (7.9)	2.65 (65.0)	0.59 (15.0)	7/8”	N/A
1/2" NPT	8	.400 (10.2)				
-4 Face Seal	4V	.180 (4.6)	2.68 (68.1)	0.62 (15.8)		
1/4" Bi-Lok	4T	.180 (4.6)	2.94 (74.7)	0.70 (17.8)		9/16”
3/8” Bi-Lok	6T	.281 (7.1)	2.94 (74.7)	0.76 (19.3)		11/16”
1/2" Bi-Lok	8T	.400 (10.2)	3.51 (89.2)	0.86 (21.8)		7/8”
-8 Face Seal	8V	.400 (10.2)	2.82 (71.6)	0.75 (19.1)	1”	N/A

Outlet Configuration	Configuration	C	D	Hex/Round	Tube Nut Hex
Vent to Atmosphere	CRV	N/A			
Deflector Cap	CRVD	0.75 (19.1)	N/A	7/8” Hex	N/A
1/4" FNPT	CRV4	0.37 (9.4)		1” Rd	
3/8” FNPT	CRV6	0.67 (17.0)			
1/2" FNPT	CRV8	0.74 (18.8)			
-4 Face Seal	CRV4V	0.80 (20.3)	0.62 (15.8)	7/8” Hex	
1/4" Bi-Lok	CRV4T	0.89 (22.6)	0.70 (17.8)		9/16”
3/8” Bi-Lok	CRV6T	0.65 (16.6)	0.76 (19.3)		11/16”
1/2" Bi-Lok	CRV8T	1.05 (26.7)	0.86 (21.8)		7/8”
-8 Face Seal	CRV8V	0.94 (23.9)	0.75 (19.1)	1” Hex	N/A

Note: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. NPT Threads per ASME B1.20.1

Flow Data

Set Pressure Range (PSIG)		Discharge Coefficient, Kd		
From	To	.180 Orifice (4.6mm)	.312 Orifice (7.9mm)	.400 Orifice (10.2mm)
8	19	0.05	0.44	0.25
20	28	0.30	0.57	0.30
29	45	0.30	0.57	0.34
46	62	0.34	0.57	0.34
63	89	0.60	0.57	0.34
90	130	0.60	0.57	0.34
131	180	0.60	0.55	0.28
181	275	0.57	0.55	0.28
275	400	0.37	0.43	0.28
401	615	0.37	0.28	0.25
616	750	0.37	0.17	0.12

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How To Order

CRV4 - 4 - K - 350

CONFIGURATION
CRV Vent To Atmosphere
CRVD Deflector Cap
CRV4 1/4" NPT Female Inline Adapter
CRV6 3/8" NPT Female Inline Adapter
CRV8 1/2" NPT Female Inline Adapter
CRV4V -4 Face Seal Inline Adapter
CRV4T 1/4" Bi-Lok Inline Adapter
CRV6T 3/8" Bi-Lok Inline Adapter
CRV8T 1/2" Bi-Lok Inline Adapter
CRV8V -8 Face Seal Inline Adapter

Inlet Size Designation
4 1/4" Male NPT
8 1/2" Male NPT
4V -4 Metal to Metal Face Seal
4T 1/4" Bi-Lok Dual Ferrule Tube
6T 3/8" Bi-Lok Dual Ferrule Tube
8T 1/2" Bi-Lok Dual Ferrule Tube
8V -8 Metal to Metal Face Seal

Seal Material
K PCTFE, above 50 PSIG Only (-320° to 165°F (-196° to 74°C))
V FKM (Viton TM) (-20° to 375°F (-29° to 190°C))
FS Fluorosilicone (-85° to 392°F (-65° to 200°C))
T PTFE (-60° to 375°F (-51° to 190°C)

Specify Set Pressure
10 - 750 PSIG

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

SERIES LCV

LIQUID CYLINDER VALVE
1/4" NPT
22 - 500 Psig (1.5 – 34.5 Bar)

Description

The Series LCV Liquid Cylinder Pressure Control/Relief Valve is designed exclusively for use on DOT 4L Cryogenic Liquid Cylinders. The LCV dramatically reduces the noise associated with traditional cylinder relief device discharge. Under normal operating conditions, the LCV optimizes cylinder performance by venting only what is required to maintain cylinder pressure in a tight band. In the event that circumstances demand, the LCV has adequate flow capacity to ensure safety, meeting all industry and regulatory requirements.

Features

- Designed exclusively for use on DOT 4L Liquid Cylinders
- Eliminates disruptive “pop” historically associated with traditional cylinder relief devices
- Incorporates the customer proven “Dirt Guard” poppet
- Accurately maintains and controls cylinder pressure minimizing product loss
- Exceeds industry and regulatory flow capacity requirements
- Complies with OSHA sound level regulations
- Extensively field qualified
- OEM approved and endorsed
- Cleaned and Packaged for Oxygen Service

Technical Data

Nominal Set Pressure Range: 22 - 500 Psig (1.5 to 34.5 Bar)
Factory Set Tolerance*: Set Pressure ≥ 72.5 PSI, ± 3%
Set Pressure < 72.5 PSI, ± 2.175 PSI
*tolerance specifications per *EN ISO 4126-1*.
Zero Leakage to 95% of Set Pressure
Reseat: 90% of set pressure
Temperature Rating: -320° to 350° F (-196° C to 176° C)
based on seal material (see How To Order)
Lubricant: Krytox®

Materials of Construction

<table>
<tr><th>Component</th><th colspan="2">Material</th></tr>
<tr><td>Valve, Body, Poppet, Spring Retainer, and Screen</td><td colspan="2">Brass, ASTM B16</td></tr>
<tr><td>Spring</td><td colspan="2">302 (ASTM A313) or
17-4PH (ASTM A564)</td></tr>
<tr><td>Seal</td><td>Flourosilicone
22 to 49 Psig
(1.5 to 3.4 Bar)</td><td>PCTFE
50 to 500 Psig
(3.5 to 34.5 Bar)</td></tr>
<tr><td>Label</td><td colspan="2">.004 Thick Mylar</td></tr>
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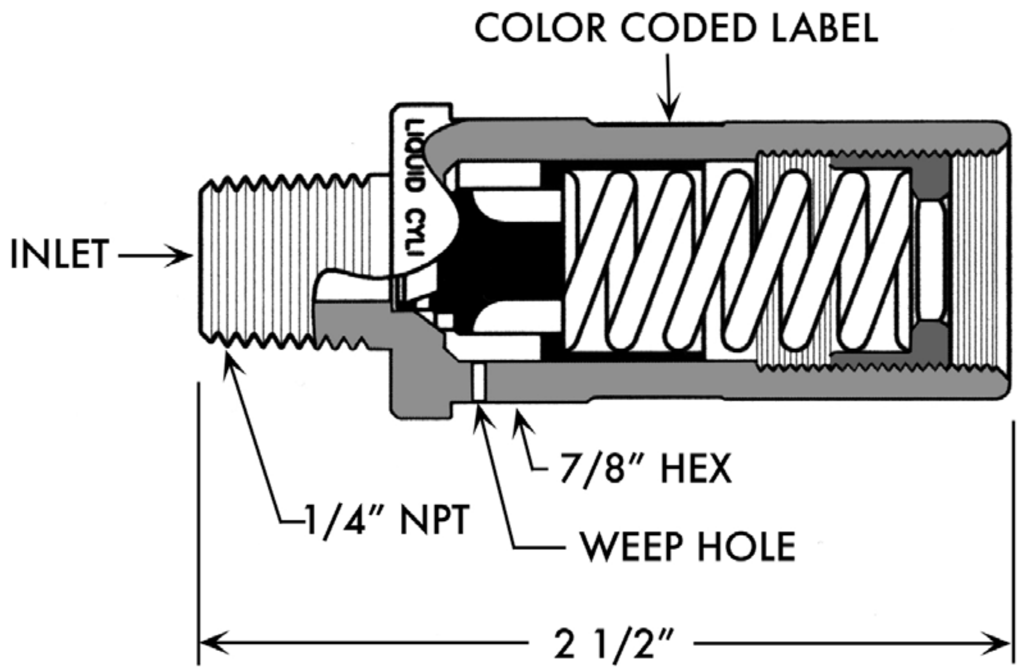
LIQUID CYLINDER VALVE



Flow Data

	Flow Rate (SCFM N2)	
Set Pressure (PSIG)	110% Set Pressure	120% Set Pressure
22	11.8	12.4
100	21.8	31.0
230	43.9	64.7
350	61.2	85.3
500	77.1	111.4

How To Order

LCV - 250B - K - 230

SERIES
LCV - Vent to Atmosphere

PIPE SIZE
250B - 1/4" Male NPT (Brass)

NOMINAL SET PRESSURE
22-500 Psig (1.5 - 34.5 Bar)

SEAL MATERIAL
FS - Fluorosilicone for 22-49 Psig (-85° to 350° F (-65° to 176°C))
K - PCTFE for Above 50 Psig (-320° to 165° F (-196° to 74° C))

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT
Valves & BI-Lok Fittings

ABSOLUTE PRESSURE RELIEF VALVE
1/4" NPT, Dual Ferrule Tube
15.0 – 24.0 PSIA (1.02-1.65 Bar)

SERIES APRV

Description

The Generant Series APRV, Absolute Pressure Relief Valve, is a spring reference over pressure protection device for applications requiring constant set pressure independent of changes in ambient pressure (altitude). The valve was developed primarily for use with liquid helium dewars and the valve has been extensively tested to verify that the valve can withstand the extreme cold environment (FS Seals). Valves are constructed primarily of brass, with the seal and stainless steel spring being the only non-brass components. Valves come factory preset with set pressures ranging from 15.0 to 24.0 PSIA (1.02 to 1.65 Bar). Relief pressure can be discharged to atmosphere or to a downstream connection.

Features

- Supplied Factory Preset
- 100% Factory Tested for Leakage, Crack and Reseat Performance
- Minimal Set Pressure Drift due to change in ambient pressure
- Qualified for Extreme Low Temperature applications
- High Flow Capacity and Excellent Reseat Performance
- Discharge to Atmosphere or Inline Piping Configurations

Technical Data

Set Pressure Range: 15.0 to 24.0 PSIA (1.02 to 1.65 Bar)
Factory Set Tolerance: ± 0.5 PSI
Reseat: 92% of Set Pressure in PSIA
Temperature Rating: -80º F to 350º F (-62º C to 176º C)

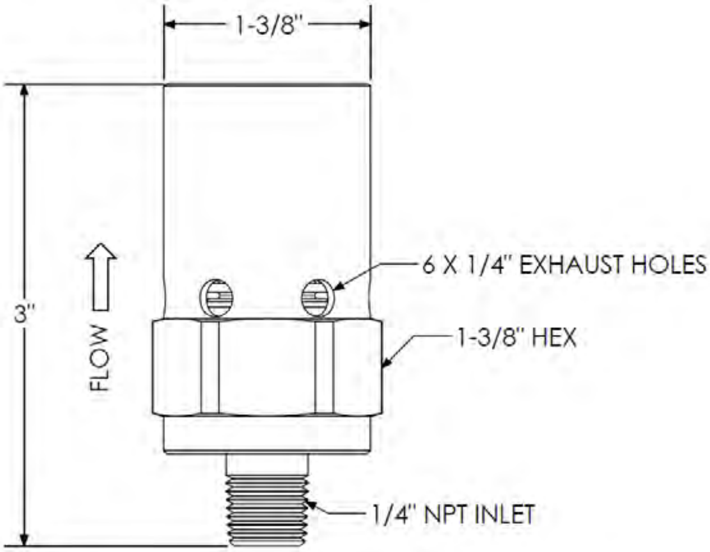
Materials of Construction

Component	Material
Body, End Cap*	Nickel Plated CDA 360 Brass, ASTM B16
Poppet, Adjustment Screw, Nuts, Ferrules	CDA 360 Brass, ASTM B16
Bellows	Brass and 300 Series Stainless Steel
Seals	Fluorosilicone

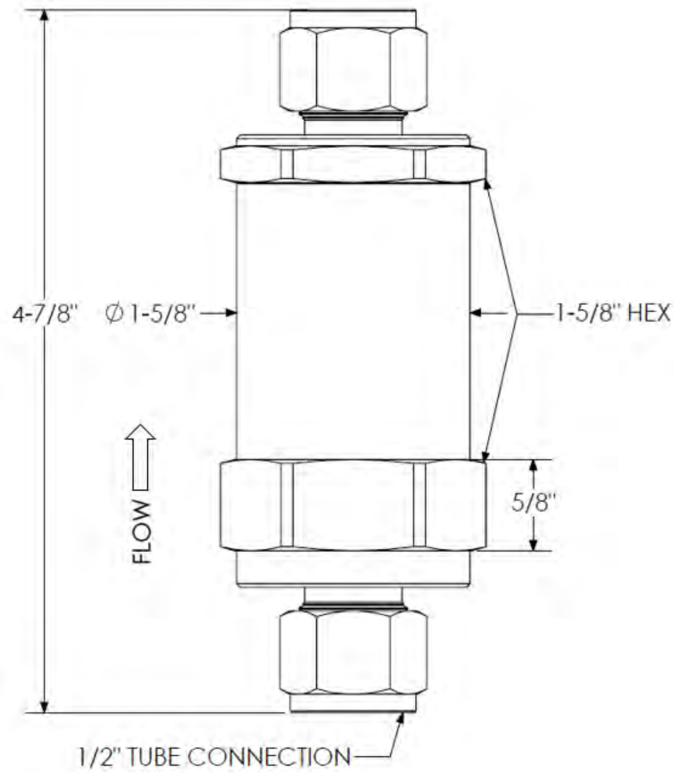
NOTE: Seals lubricated with Krytox ®
*applicable only for inline versions (APRV)

ABSOLUTE PRESSURE RELIEF VALVE

APRVA-250



APRV-8T



Flow Data

Set Pressure (PSIA)	Flow at 110% of Set Pressure in PSIA (SCFM N2)
16.0	1.52
18.0	1.90

For other set pressures, consult factory.

NOTE: to convert flow from SCFM N2 to SCFM He, multiply by 2.64

How To Order

APRVA-250 - FS - 15.2

SERIES AND CONFIGURATION

APRVA-250 - Absolute Pressure Relief Valve, Vent to Atmosphere, 1/4" NPT Inlet Port

APRV-8T - Absolute Pressure Relief Valve, Inline, 1/2" Bi-Lok Dual Ferrule Tube Inlet and Outlet Ports

SET PRESSURE

Specify set pressure in PSIA (15.0 - 24.0 PSIA)

SEAL MATERIAL

FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)

NOTE: For other port configurations and seal materials, consult factory.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

HIGH PRESSURE GAS CONTROL VALVE
NPT Female x Female, NPSM Male RH & LH, O-Ring Seal Union
Vacuum (29 inHg) – 5500 Psig (380 Bar)

Description

The Series MV High Pressure Gas Control Valve is optimized for the demanding requirements of Gas Cylinder Fill Plants, Manifold, and Piping System applications. The High Pressure Oxygen Service Valve Configuration (Material Code "C") was third party tested per ISO 7291 (O2 Surge) and ASTM G175 (Promoted Ignition). The valve is also available with a PCTFE seal (Material Code "K") for positive sealing in non-oxygen applications. The Series MV is available in a variety of porting and mounting configurations. The panel mount configuration is supplied with two panel nuts for easy retro-fitting to existing panel mount installations.

Model MV

Features

- **OXYGEN SAFE**: Copper Valve (Material Code "C") Configuration Third Party Tested per ISO 7291 (O2 Surge) and ASTM G175 (Promoted Ignition)
- **LOW TORQUE**: Needle Thrust Bearing Maintains Low Operating Torque (< 10 in-lbs) Throughout Full Pressure Range
- **FLOW CONTROL**: Unique Valve Geometry Allows User to Meter Flow on Initial Opening and Minimizes Initial Pressure Surges
- **LONG SERVICE LIFE**: Optimized Material and Component Selection for Long Service Life; Non-Rotating Poppet and Non-Rising Stem Maintain Seat and Seal Integrity, Needle Thrust Bearing Efficiently Minimizes Wear Effects of Mechanical Load
- **FAST OPENING**: 2.5 turns from Closed to Full-Open
- **HIGH FLOW**: Large Orifices and Internal Flow Paths for Maximum Flow Efficiency
- **FIELD RE-BUILDABLE**: All Valves are Fully Field Re-Buildable
- **ADAPTABLE TO EXISTING INSTALLATIONS**: Panel mount version supplied with two panel nuts for easy retro-fitting to existing installations

Series MV Copper Seal Valves now feature 45% more poppet thread engagement to resist wear and provide a longer service life.

Technical Data

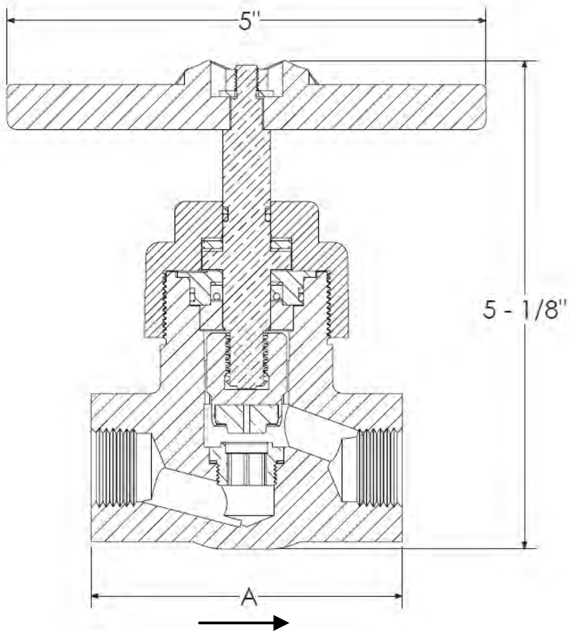
- Operating Pressure Range: Vacuum to 5500 Psig (380 Bar) @ 70°F (MAWP Rating per ASME BPVC Section VIII Division 1)
  Note: Valves with NPSM Connections (1" - 11.5 NPSM) are de-rated to 3500 Psig (242 bar) due to the connection's maximum pressure rating.
- Operating Temperature Range: -40° to 165°F (-40° to 74°C)
- Flow Coefficient: C_v is 2.5 for all valve configurations
- Valves are 100% Factory Tested for Internal and External Leakage
  No bubbles visible for 10 seconds with N2 gas at 2500 PSI.

Model MVP

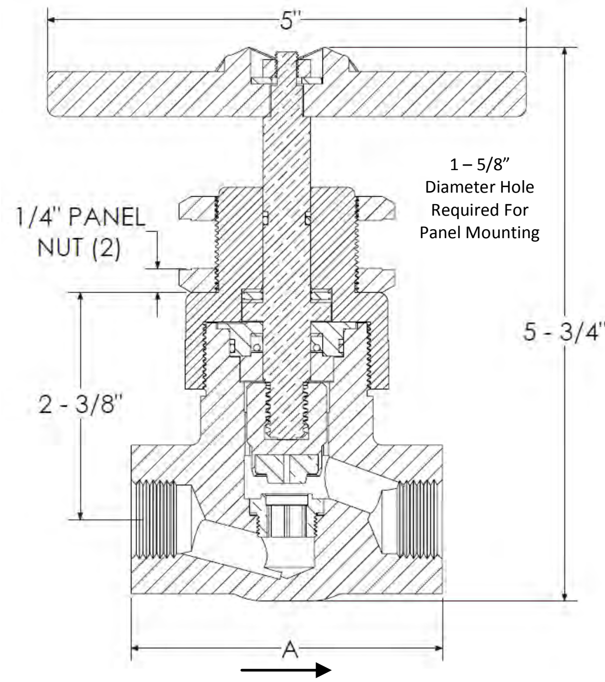
Materials of Construction

Component	Material Code	
	"C" (Copper)	"K" (PCTFE)
Body	CW617N Forged Brass, EN 12420	
Handle, Bonnet, Poppet, Panel Nut, Inner Bonnet, Washer	Brass, ASTM B16	
Needle Bearing, Bearing Washer (Both Non-Wetted)	ANSI 52100 Bearing Steel 58-62 HRc	
Stem Seal	FKM	Molythane
Poppet Insert (Seal)	Copper, ASTM B152	PCTFE, ASTM D1430
Replaceable Seat and Stem	Monel® 400	303 SS
O-Rings (2)	FKM	
Replaceable Seat Crush Washer	Copper, ASTM B152	
Seal Washer, Backup Rings (2)	PTFE, ASTM D1710	
Handle Nut and Washer	Zinc Plated Steel	

Valve is lubricated with Dupont Krytox®.
Monel® is a registered trademark of Special Metals Corporation.



Model MV



Model MVP*

*Model MVP Valves are supplied with two panel nuts to allow for variable depth panel mounting (back of panel to port centerline: 2-3/8" to 3").

Dimensional Data

PORT SIZE	PORT CONFIGURATION	Dimensions: inches (millimeters)	
		Valve Orifice	Dimension A
4F	1/2" NPT Female	0.406 (10.3)	3.25 (82.5)
6F	3/4" NPT Female		
8NR	1" 11.5 NPSM Right Hand		3.80 (96.5)
8NL	1" 11.5 NPSM Left Hand		
2FS	1-3/8"-12 O-Ring Seal Union		

Notes: Dimensions are in inches (millimeters), for reference only and subject to change.
Restrictions in inlet or outlet piping may reduce flow. NPT Threads per ASME B1.20.1.

How To Order

MV - 8NR - C

SERIES
MV - High Pressure Gas Control Valve
MVP - Panel Mount High Pressure Gas Control Valve

PORT SIZE AND CONFIGURATION
4F - ½" NPT Female Ports
6F - ¾" NPT Female Ports
8NR - 1" - 11.5 NPSM Right Hand Ports
8NL - 1" - 11.5 NPSM Left Hand Ports
2FS - 1-3/8"-12 O-Ring Seal Union*
*-Compatible with Soft-Seal™, O-Seal™, Tech-O-Seal™

MATERIAL CODE
C - Copper (Cleaned for O_2 Service, Standard)
K - PCTFE

Generant does not recommend the use of PCTFE Material Code in Oxygen Service.

Repair Kits

Kits can be ordered as assembled cartridges that simply plug into the valve body or as loose replacement parts. Repair Kit MV2-C may require a replacement stem. Our "Series MV Repair Kit Selection Guide" provides detailed information on how to specify and order repair kits.

Part Number	Description
MV2-C	Copper Seal Repair Kit
MV-K	PCTFE Seal Repair Kit
MVP2-CART-C	Copper Panel Mount Repair Cartridge
MV2-CART-C	Copper Non-Panel Mount Repair Cartridge
MVP-CART-K	PCTFE Panel Mount Repair Cartridge
MV-CART-K	PCTFE Non-Panel Mount Repair Cartridge

Repair Kits come with Replacement Seat, Poppet, and all seals.
Repair Cartridges come already assembled with all repair parts.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT Valves & BI-Lok Fittings

INSTRUMENT BALL VALVE
1/4” - 3/4" NPT
1/4” - 3/4" Dual Ferrule Tube
0 – 6000 Psig (413 Bar)

IBV SERIES

Description

Series IBV Instrument Ball Valves offer reliable 1/4-turn ON/OFF flow control for pressures up to 6,000 Psig (413 bar). These valves feature a Micro-Finished Floating Ball design to provide a positive seal in both directions. Series IBV Instrument Ball Valves also feature a “straight-through” flow path to ensure high flows with minimum pressure drop. The valves are designed to operate with a low operation torque while providing a long service life. All valve configurations can be panel mounted.

IBV-8T

Features

- Bi-Directional
- Straight-Through Flow Path
- Micro-Finished Floating Ball
- Large Orifices for High Flow Efficiency
- Handle Orientation Indicates Flow
- NPT, O’ring Face Seal, or Dual Ferrule Tube Connections
- Adjustable Stem Packing for in-line maintenance
- 100% Factory Tested

- **3D CAD MODELS AVAILABLE ONLINE**

Technical Data

Pressure Rating: 6,000 PSI (413 Bar) at 100°F (3:1 SF)[1]
Per NFPA 52 (2013): 4,750 PSI (328 Bar)
Per ASME B31.3 (2012): 4,400 PSI (303 Bar)
Temperature Rating: -65° to 200°F (-54° to 93°C)
Leakage: < 0.1 SCCM @ 2,100 PSIG (145 Bar)
- 100% Factory Tested for Leakage

Note: For a leak-free stem seal at pressures higher than 2,100 PSI or after prolonged use, additional tightening of the stem packing may be required.

Flow Coefficients: per size, see Dimensional Data Table

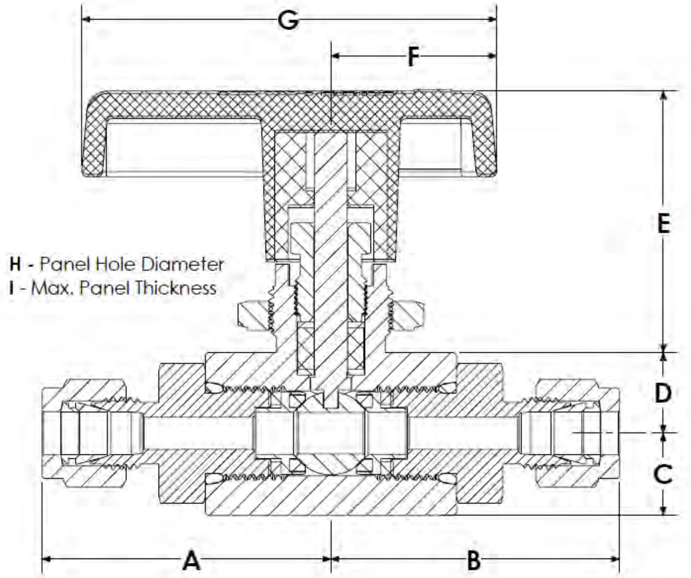
IBV-4T

Materials of Construction

Component	Material
Body	316 Stainless Steel, ASTM A182
Valve Stem, Valve Ball, Tube Ends, Nuts, Washers, Ferrules	316 Stainless Steel, ASTM A479
Ball Seat Assembly	316 Stainless Steel, ASTM A479 and PCTFE ASTM D1430
Seat Spacer, Stem Packing, O’Rings	PTFE, ASTM D1710
Handle with Insert	ABS with Stainless Steel Insert
Set Screw	18-8 Stainless Steel
Face Seal O’Rings[2]	Standard – FKM
	Option “H” - HNBR

[1] for sustained use at temperatures higher than 100°F, pressure rating may be affected, consult factory.
[2] other O’Ring materials available, consult factory.

Note: All valves lubricated with perfluorinated polyether (PFPE)



Dimensional Data

MODEL CODE	PORT CONFIGURATION (INLET AND OULET)	FLOW COEFF. (Cv)	VALVE ORIFICE (in)	Dimensions in inches (mm)							
				A, B	C	D	E	F	G	H	I
IBV-4T	1/4" Bi-Lok	1.05	0.187	1.50 (38.1)	0.49 (12.4)	0.48 (12.2)	1.56 (39.6)	1.00 (25.4)	2.50 (63.5)	0.77 (19.6)	0.20 (5.1)
IBV-4F	1/4" NPT Female	2.35	0.250	1.50 (38.1)							
IBV-6T	3/8" Bi-Lok	2.35	0.250	1.80 (45.7)							
IBV-6FS	3/8" Face Seal	2.35	0.250	1.50 (38.1)							
IBV-6F	3/8" NPT Female	6.40	0.406	2.25 (57.1)	0.72 (18.3)	0.71 (18.0)	1.73 (43.9)	1.25 (31.8)	3.50 (88.9)	0.90 (22.9)	0.35 (8.9)
IBV-8T	1/2" Bi-Lok	6.40	0.406	2.65 (67.3)							
IBV-8F	1/2" NPT Female	6.40	0.406	2.45 (62.2)							
IBV-8FS	1/2" Face Seal	5.60	0.375	2.25 (57.1)							
IBV-12T	3/4" Bi-Lok	6.40	0.406	2.65 (67.3)							
IBV-12F	3/4" NPT Female	6.40	0.406	2.65 (67.3)							

Notes: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. Restrictions in inlet or outlet piping may reduce flow. NPT Threads per ASME B1.20.1. Face Seal Connections per SAE J1453.

How to Order

IBV - 8T

SERIES
IBV - Instrument Ball Valve

PORT CONFIGURATION
4T - 1/4" Bi-Lok
4F - 1/4" NPT Female
6T - 3/8" Bi-Lok
6FS - 3/8" Face Seal*
6F - 3/8" NPT Female
8T - 1/2" Bi-Lok
8F - 1/2" NPT Female
8FS - 1/2" Face Seal*
12T - 3/4" Bi-Lok
12F - 3/4" NPT Female
* - Face Seal Connections come standard with FKM O-Rings.

Natural Gas Service
HNBR O-Rings are recommended for Face Seal Connections in Natural Gas Service. Specify "-H" suffix to indicate HNBR Face Seal O-Rings.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

SHUT OFF VALVE
1/8” - 1/2" NPT
1/8” - 1/2" Dual Ferrule Tube
0 – 3000 Psig (207 Bar)

SOV SERIES

Description

Series SOV Shut Off Valves offers low torque, quarter turn, positive shut off of forward flow up to 3000 Psig (207 Bar). These valves feature a one piece body construction with a machined metallic replaceable plug Stem. Sealing is accomplished with a standard elastomeric O-Ring seal. Larger size valves utilize Teflon Backup Rings to reduce operating torque and provide long service life. The Series SOV can be ordered Cleaned for Oxygen Service.

Features

- Straight-Through Flow Path
- Large Orifices Provide Higher Flows
- Handle Orientation Indicates Flow
- Optional Downstream Vent
- Unique Soft Open Plug Stem
- NPT or Dual Ferrule Tube Connections
- 100% Factory Tested for Leakage

Technical Data

Maximum Operating Pressure @ 100º F
Brass and Stainless: 3000 Psig (207 Bar)

Notes: 1-1/8" (28.6 mm) Square Brass Body Valves downgraded to 2000 Psig (137 Bar) Max. If reverse flow occurs, differential pressure is limited to 150 Psid (10.3 Bar) Max. Attempting to meter flow in the reverse flow direction may damage O-Ring.

Leakage: Zero both Internal and External
100% Factory tested for leakage at 150 Psig (10.3 Bar)

Downstream Vent Option - Downstream pressure is relieved to atmosphere when valve is in the closed position. Maximum operating pressure is downgraded to 150 Psig (10.3 Bar).

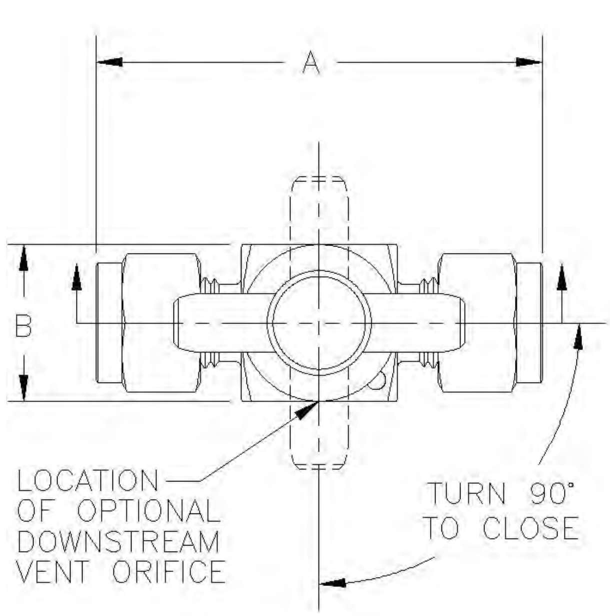
Downstream Vent Orifice:
5/8" (15.9 mm) and 3/4" (19.1 mm) Square Body Valves: 0.04" (1.0 mm)
1-1/8" (28.6 mm) Square Body Valves: 0.09" (2.3 mm)

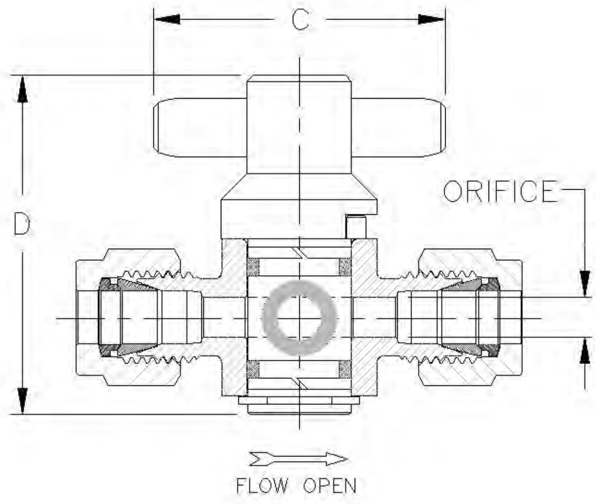
Temperature Range:
Seal Dependent (See How To Order)

Materials of Construction

Component	Brass	Stainless Steel
Body, Plug Stem, Nuts and Ferrules	Brass, ASTM B16	316SS, ASTM A479
Handle	6061 Aluminum, ASTM B211, Anodized per Mil-A-8625	
Orifice/Body Seals	Buna-N, Neoprene, Ethylene Propylene, or Viton®	
Backup Ring[1]	PTFE	
Retaining Ring	PH 15-7 Mo SS, AISI 632	
Stop Pin	18-8 SS	

[1] 5/8" Square Body Valves are not supplied with PTFE Backup Rings
Plug Stem and O-Rings are lubricated with Krytox®.





Dimensional Data

MODEL CODE	PORT CONFIGURATION		FLOW COEFFICIENT Cv	Dimensions in inches (mm)				
	INLET	OUTLET		VALVE ORIFICE	A OVERALL LENGTH	B BODY (SQ)	C HANDLE	D HEIGHT
SOV-2T	1/8" Tube		0.05	0.093 (2.4)	1.89 (48.0)	0.625 (15.9)	1.19 (30.2)	1.41 (35.8)
SOV-4T	1/4" Tube		0.72	0.187 (4.7)	2.15 (54.6)	0.75 (19.1)	1.40 (35.6)	1.63 (41.3)
SOV-6T	3/8" Tube		1.45	0.281 (7.2)	2.68 (68.1)	1.125 * (28.6)	2.50 (63.5)	2.14 (54.4)
SOV-8T	1/2" Tube		2.34	0.343 (8.71)	2.88 (73.2)	1.125 * (28.6)	2.50 (63.5)	2.14 (54.4)
SOV-2F	1/8" Female NPT		0.30	0.125 (3.2)	1.69 (42.9)	0.625 (15.9)	1.19 (30.2)	1.41 (35.8)
SOV-4F	1/4" Female NPT		0.72	0.187 (4.7)	1.87 (47.5)	0.75 (19.1)	1.40 (35.6)	1.63 (41.3)
SOV-6F	3/8" Female NPT		2.34	0.343 (8.71)	2.75 (69.9)	1.125 * (28.6)	2.50 (63.5)	2.14 (54.4)
SOV-8F	1/2" Female NPT		2.34	0.343 (8.71)	2.88 (73.2)	1.125 (28.6)	2.50 (63.5)	2.14 (54.4)
SOV-2P	1/8" Male NPT		0.30	0.125 (3.2)	1.5 (38.1)	0.625 (15.9)	1.19 (30.2)	1.41 (35.8)
SOV-4P	1/4" Male NPT		0.30	0.125 (3.2)	1.69 (42.9)	0.625 (15.9)	1.19 (30.2)	1.41 (35.8)
SOV-8P	1/2" Male NPT		2.34	0.343 (8.71)	2.64 (67.1)	1.125 * (28.6)	2.50 (63.5)	2.14 (54.4)
SOV-4PT	1/4" Male NPT	1/4" Tube	0.72	0.187 (4.7)	2.00 (50.8)	0.75 (19.1)	1.40 (35.6)	1.63 (41.3)
SOV-4PF	1/4" Male NPT	1/4" Female NPT	0.72	0.187 (4.7)	1.84 (46.7)	0.75 (19.1)	1.40 (35.6)	1.63 (41.3)
SOV-4FP	1/4" Female NPT	1/4" Male NPT	0.72	0.187 (4.7)	1.84 (46.7)	0.75 (19.1)	1.40 (35.6)	1.63 (41.3)

Notes: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. Restrictions in inlet or outlet piping may reduce flow.
NPT Threads per ASME B1.20.1
* 1–1/8" Brass body valves have a maximum operating pressure of 2000 psig (137 Bar).

How to Order

SOV-4T SS - V - X

Model Code
SOV - Shut Off Valve

Material Code
B - Brass
SS - 316 Stainless Steel

Options
X- Cleaned and Packaged for Oxygen Service
E - Downstream Vent - Downstream pressure is relieved to atmosphere when valve is in the closed position

Seal Material
B - Buna-N, -40° F to 250° F (-40° C to 121° C)
V - Viton®, -10° F to 375° F (-23° C to 190° C)
N - Neoprene, -40° F to 300° F (-40° C to 148° C)
EP - Ethylene Propylene, -65° F to 300° F (-54° C to 148° C)

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

QUICK OPENING VALVE
1/8” & 1/4” NPT
125 Psig (8.6 Bar)

SERIES 4000

Description

The Series 4000 Quick Opening Valve functions as in-line on-off switch particularly suited to applications in Instrumentation and Control Panels to open and close circuits or isolate gauges. The unique design of these valves permits full-closed to full-open operation quickly with a 60° turn of the knob. Standard units will detent in the selected position or, if desired, can be spring loaded (Option R) to return to the off position when released. The Series 4000 is offered in 2-way and 3-way designs. The 2-way design is a snap action on-off control, while the 3-way design offers the same snap on-off action while venting the downstream pressure to atmosphere when in the off position. These valves are compact in size and can be utilized for in-line and panel mount applications. Valves can be ordered Cleaned and Packaged for Oxygen service.

Model Q-44

Technical Data

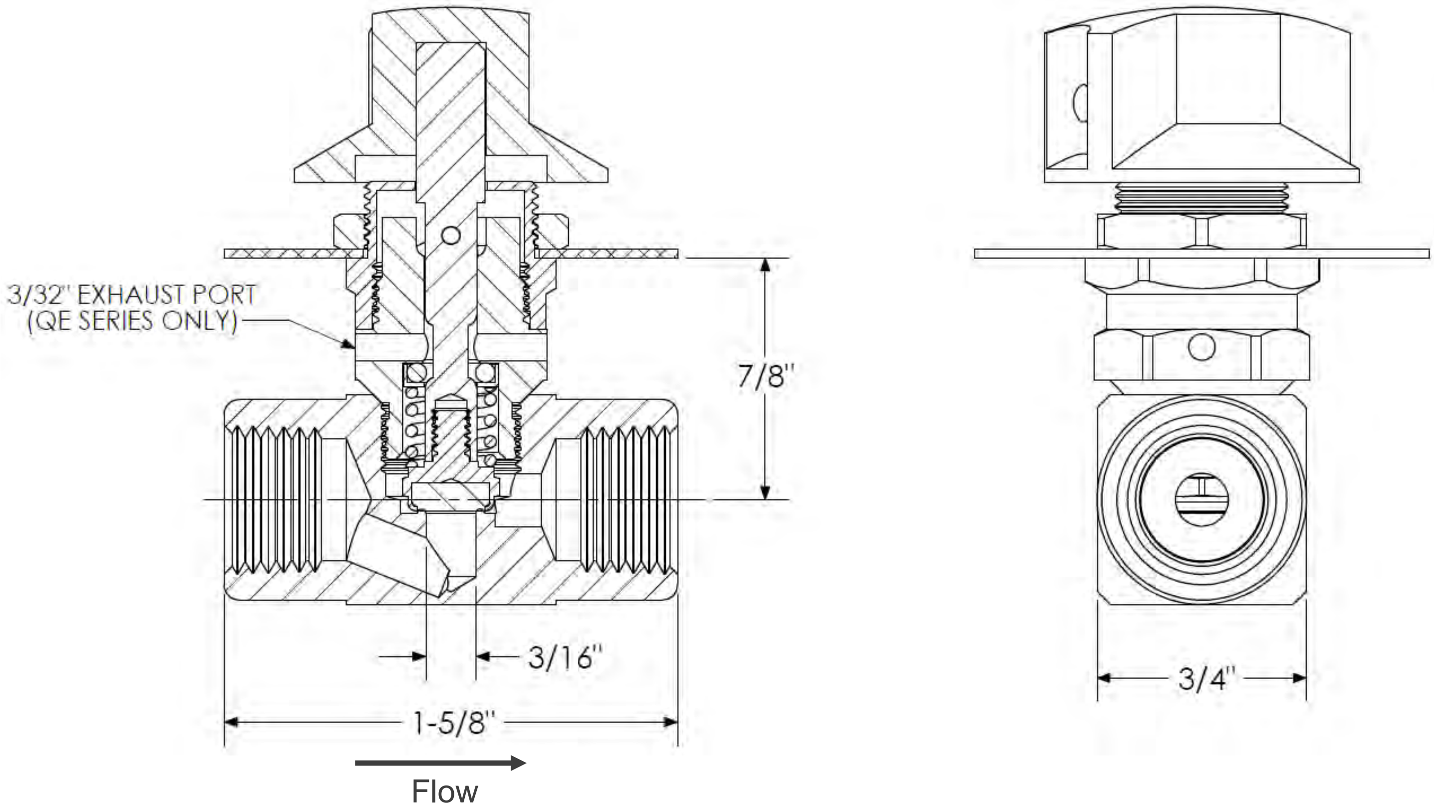
- Max Operating Pressure: 125 Psig (8.6 Bar)
- Temperature Range: -20°F to 300°F (-29°C to 149°C)
- Flow Coefficient (C_v): 0.5
- 2-Way or 3-Way (vents downstream to atmosphere thru 3/32” orifice) Configurations
- 100% Factory Tested for Bubble Tight Shut Off
- Optional Spring Return to Close
- Standard Panel Mount:
  - Supplied with “Off – On” Aluminum Indicator Plate (1/16” thick, 1-5/8” diameter) and Panel Nut
  - 5/8” Panel Hole
  - 5/32” Maximum Panel Thickness

Model Q-45

Materials of Construction

Component	Material
Body, Stem, Housing, Bonnet, Valve Seat, Valve Cup, Rollers, Locknut	Brass, ASTM B16
Knob	Thermosetting Phenolic
Indicator Plate	Aluminum
Spring	17-7 SS, ASTM A313
Roller Pin	Hardened Steel
Set Screw	Steel (Black Oxide)
Valve Seal, O-Ring	FKM

Model QE-44



How To Order

QE - 41 - R

SERIES

Q - 2 Way Quick Opening Valve
QE - 3 Way Quick Opening Valve
(Exhausts downstream pressure to atmosphere)

PIPE SIZE (NPT)

41 - 1/8" Female x Female
42 - 1/8" Male x Male
43 - 1/8" Male x Female
44 - 1/4" Female x Female
45 - 1/4" Male x Male
46 - 1/4" Male x Female

OPTIONS

R - Snap Return to Off
X - Cleaned and Packaged for Oxygen Service

GENERANT

GAS DELIVERY REGULATOR
1/4" - 1" NPT, BSPT
Spring Reference & Pilot Operated

GDR SERIES

Description

The GDR Series Regulator provides reliable and precise pressure control in the most demanding applications. Optimized spring design with unique venturi design assures high flow with extremely low droop characteristics. Solid, non-tied diaphragm and all brass construction will provide leak-free and long-lasting performance. Regulator is fully balanced to virtually eliminate outlet pressure fluctuations due to inlet pressure variations. All GDR Series regulators are 100% factory tested.

STANDARD

Features

- **FULLY BALANCED DESIGN**: Maintains a constant delivery pressure regardless of inlet pressure fluctuations.
- **OPTIMIZED FOR HIGH FLOW**: Unique Venturi Tube and Optimized Spring Design allows for high flow rates.
- **WIDE PRESSURE RANGE**: Inlet Pressures up to 550 PSI, Outlet Pressures up to 450 PSI.
- **SOLID, NON-TIED, DIAPHRAGM**: Solid diaphragm eliminates potential leak path and increases sensitivity.
- **CONFIGURABLE**: Order Regulators with Various Porting Options, Panel-Mounted, with Chamber Pipe-A-Way, or Pilot Operated.
- **OXYGEN SERVICE COMPATIBLE**: Designed for use in Oxygen Service and Cleaned for use in O2 Service standard.

PILOT OPERATED

Technical Data

GDR-500

Max Inlet Pressure: 550 PSIG (37.9 bar)

Outlet Pressure Ranges:

Spring	Outlet Pressure Range
A	0-55 PSIG (0-3.8 bar)
B	50-135 PSIG (3.5-9.3 bar)
C	125-225 PSIG (8.6-15.5 bar)
D	225-450* PSIG (15.5-31 bar)

*rated at 450 PSIG @ 100°F
A, B, and C Range Springs are interchangeable.
D Range Spring requires dedicated Chamber.

Fail Open Flow Coefficients:

Port Configuration	Fail Open Cv
1/4" NPT and BSPT	1.6
3/8" NPT	2.4
1/2" NPT and BSPT	2.9

GDR-1000

Max Inlet Pressure: 400 PSIG (27.6 bar)

Outlet Pressure Ranges:

Spring	Outlet Pressure Range
A	0-55 PSIG (0-3.8 bar)
B	50-135 PSIG (3.5-9.3 bar)
C	125-225 PSIG (8.6-15.5 bar)

A, B, and C Range Springs are interchangeable.

Fail Open Flow Coefficients:

Port Configuration	Fail Open Cv
3/4" and 1" NPT	5.8
3/4" and 1" BSPT	5.8

PANEL MOUNT

GDR-500 Pilot Operated

Max. Pilot: 450 PSIG (31.0 bar) @ 100°F
Max. Usable Cv: 1.5
Pilot Pressure to Outlet Pressure: 1/.95
(100 PSI Pilot = 95 PSI Outlet)

GDR-1000 Pilot Operated

Max. Pilot: 250 PSIG (17.2 bar) @ 140°F
Max. Usable Cv: 2.7
Pilot Pressure to Outlet Pressure: 1/.90
(100 PSI Pilot = 90 PSI Outlet)

Effect of Inlet Pressure Variation on Set (Regulator Balance): < 0.25 PSI per 100 PSI

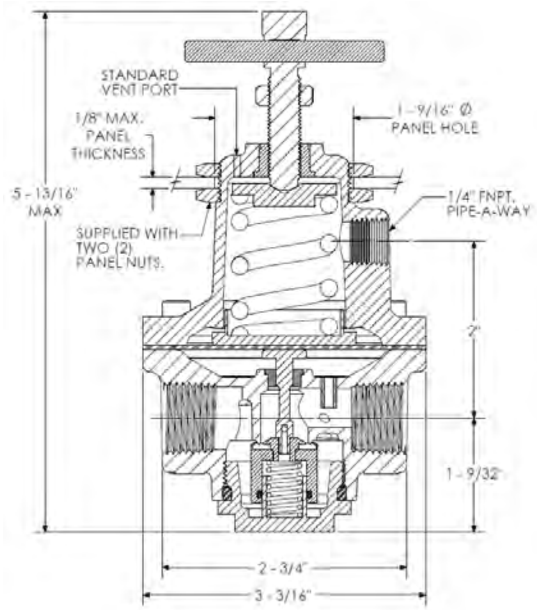
Materials of Construction

Component	Material
Body	CW617N Forged Brass, EN 12420
Adjustment Screw, Valve, Valve Stem, Spring Button, Spring Retainer, Venturi Tube	CDA 360 Brass, ASTM B16
Chamber Insert	303 SS, ASTM A276
Adjustment Springs	GDR-500: Music Wire, ASTM A228 GDR-1000: Chrome Silicon, ASTM A401
Valve Spring	302 SS, ASTM A313
Diaphragm	FKM, EPDM, or Nitrile on Nylon Backing
Soft Seals (Valve and O'Rings)	FKM, EPDM, or Nitrile
Trim (Flange Screws and Locknut)	18-8 Stainless Steel

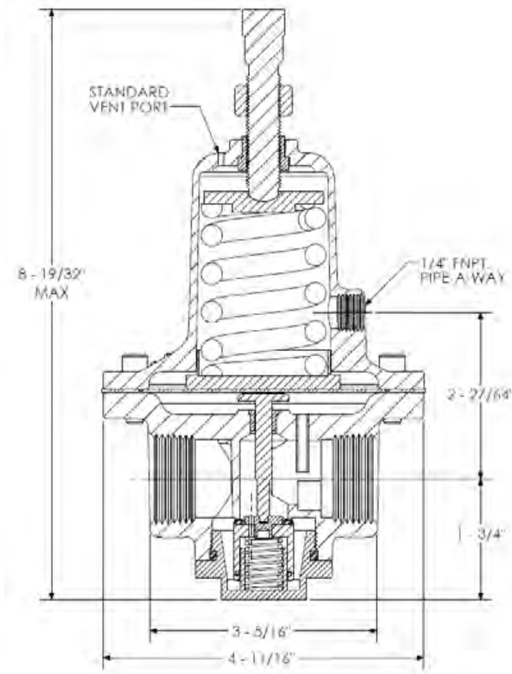
NOTES: Regulators are assembled with Dupont Krytox® lubricant.

PIPE-A-WAY OPTION

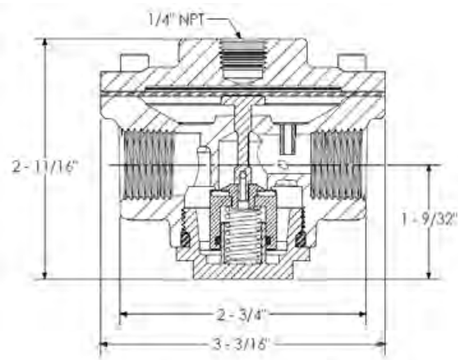
Dimensional Data



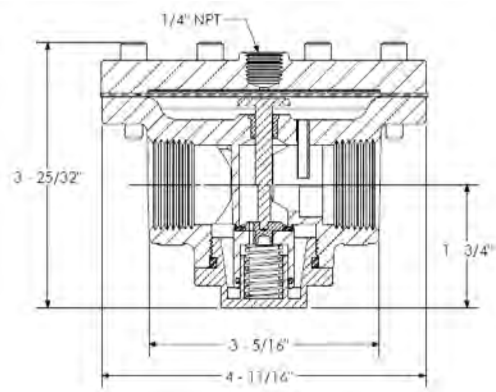
GDR-500
(shown with Panel Mount and Pipe-A-Way Options)



GDR-1000
(shown with Pipe-A-Way Option)



GDR-500 Pilot Operated

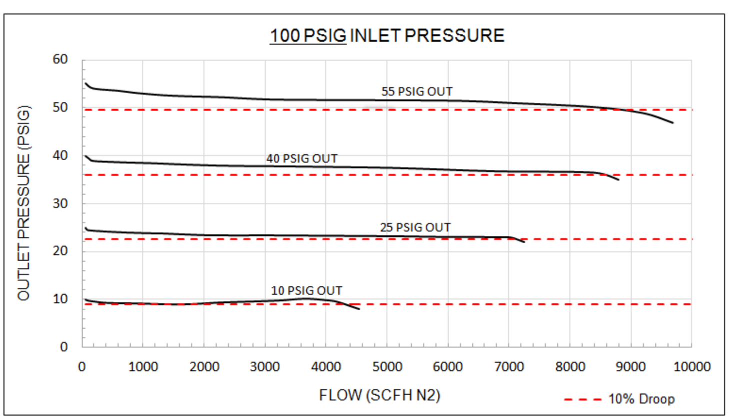


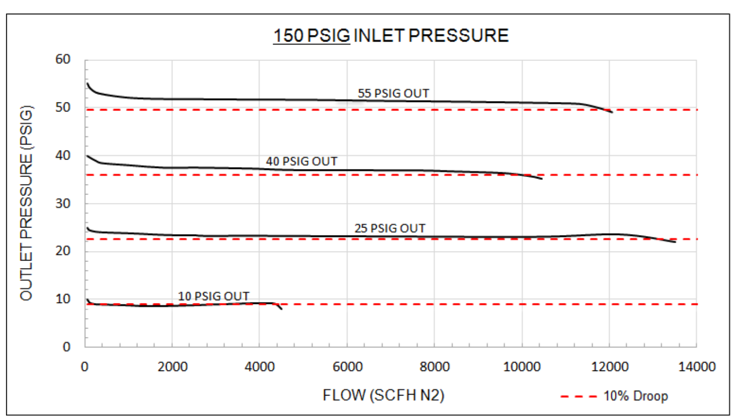
GDR-1000 Pilot Operated

Flow Performance

Each chart provides a variety of regulator setpoints and its respective flow performance with a constant inlet pressure condition. Flow Testing was performed using Nitrogen gas at ambient conditions. Use gas conversion factors listed on the next page to convert flow rates to a different gas service. Regulators were set in a dynamic condition at 60 SCFH N2 flow.

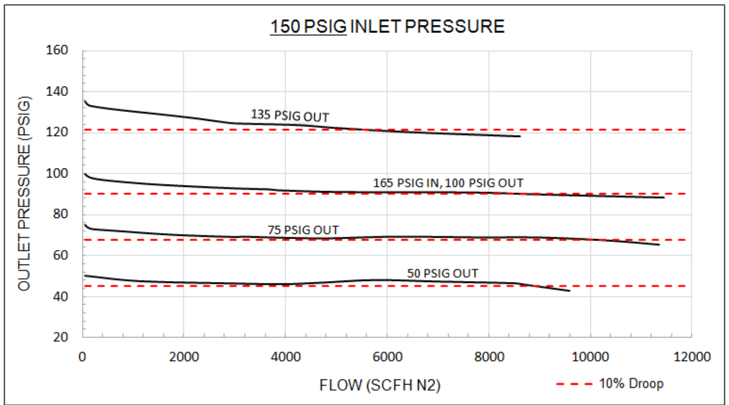
GDR-500: A Spring

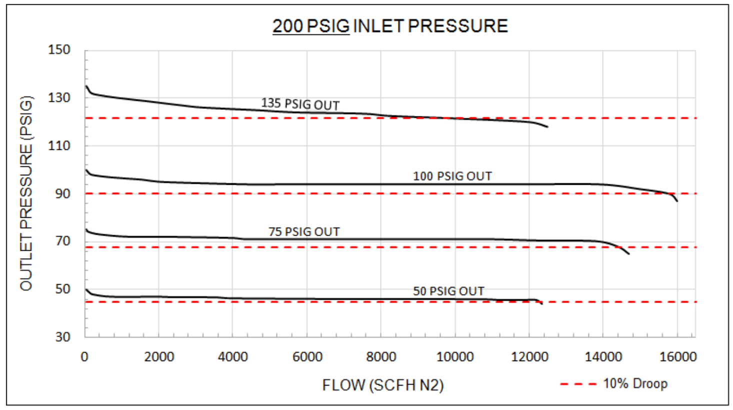




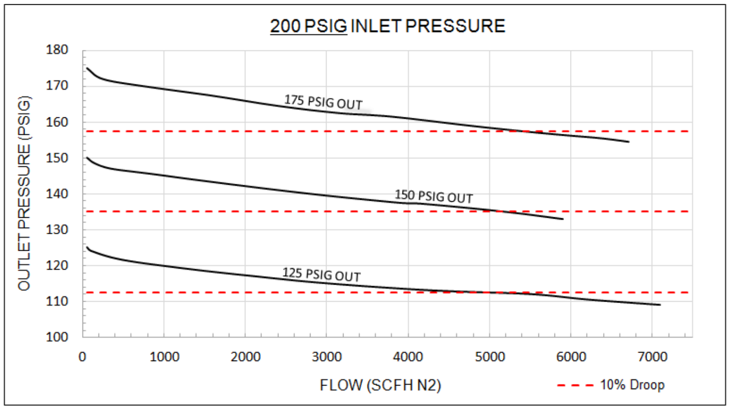
Flow Performance (continued)

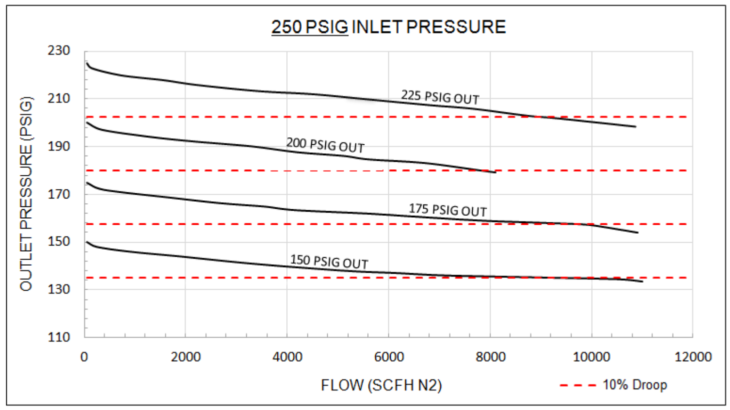
GDR-500: B Spring



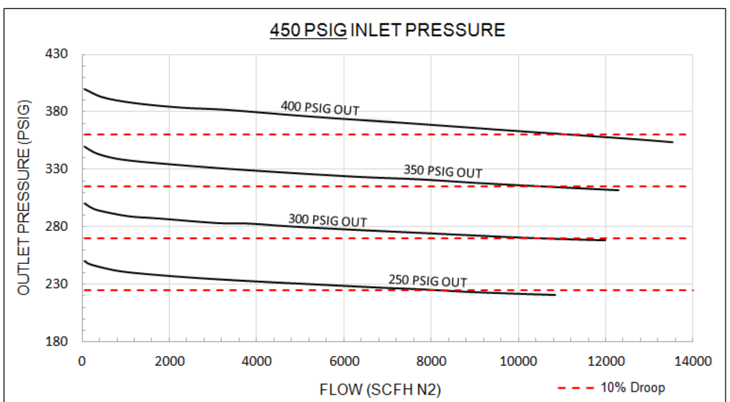


GDR-500: C Spring





GDR-500: D Spring

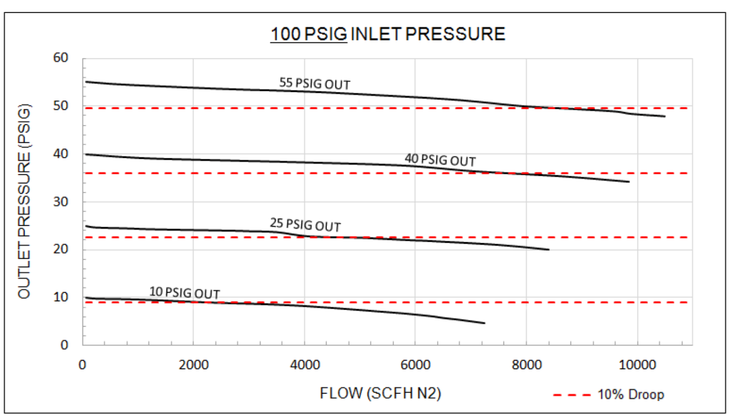


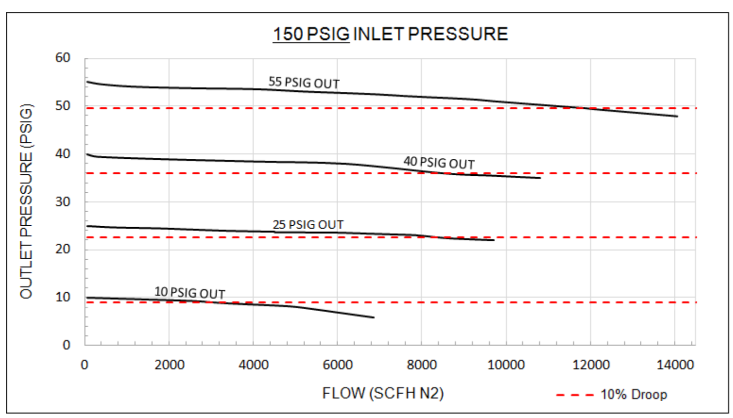
GAS CONVERSION FACTORS

Multiply Nitrogen Flow Rate by Conversion Factor to find equivalent gas flow rate.

Gas	Conversion Factor
Air	0.985
Argon	0.837
Carbon Dioxide	0.795
Helium	2.645
Hydrogen	3.603
Nitrogen	1.0
Nitrous Oxide	0.799
Natural Gas	1.285
Oxygen	0.935
Methane	1.320

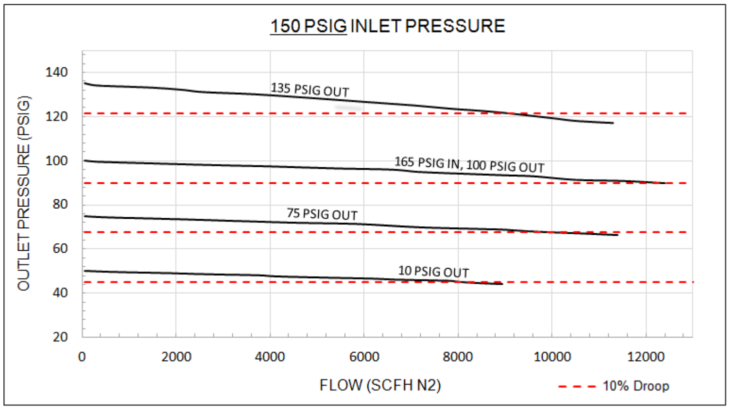
GDR-1000: A Spring

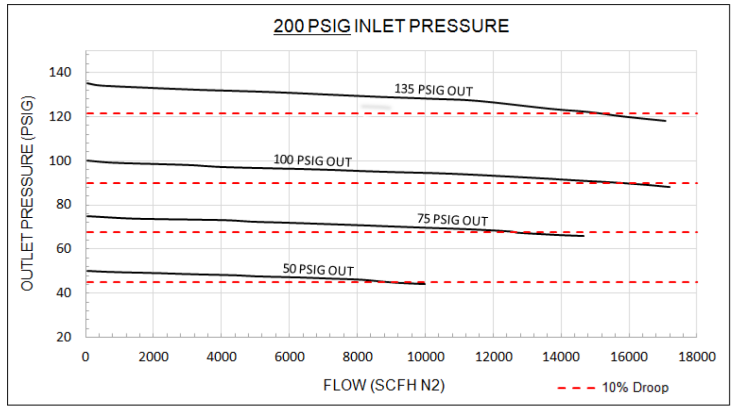




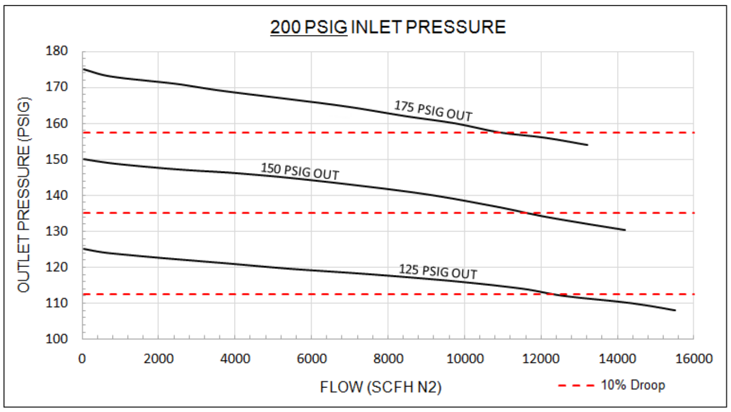
Flow Performance (continued)

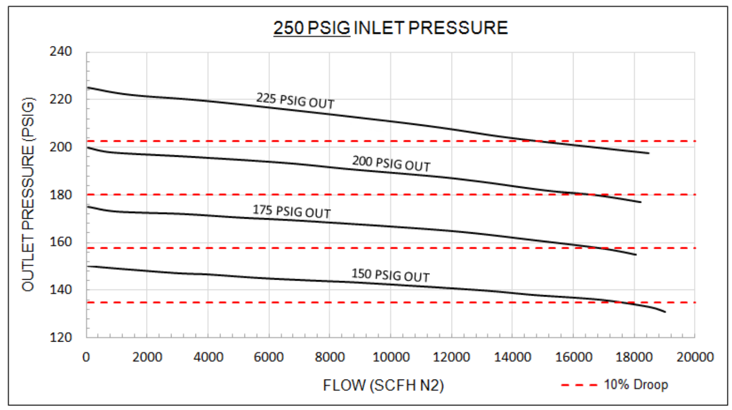
GDR-1000: B Spring





GDR-1000: C Spring





How To Order

4GDR - 750B - V - A - S

SERIES
4GDR - 4 Port Gas Delivery Regulator
5GDR - 4 Port Gas Delivery Regulator with Pipe-A-Way Chamber (1/4" NPT)

PORT SIZE
250B - 1/4" NPT
375B - 3/8" NPT
500B - 1/2" NPT
2BSPT - 1/4" BSPT
4BSPT - 1/2" BSPT
750B - 3/4" NPT
1000B - 1" NPT
6BSPT - 3/4" BSPT
8BSPT - 1" BSPT

GDR-500 ONLY

OPTION
S - Side Vent
W - Hex Adjustment Screw
P - Panel Mount

OUTLET PRESSURE RANGE
A - 0 to 55 PSIG
B - 50 to 135 PSIG
C - 125-225 PSIG
D - 225 to 450 PSIG
PO - Pilot Operated

SEALS / DIAPHRAGM MATERIAL
V - GLT Fluoroelastomer (-20°F to 225°F)
EP - EPDM - CO2 Service (-60°F to 225°F)
B - Nitrile - NG Service (-40°F to 225°F)

Seals/Diaphragm Material Compatibility Notes:
EP – EPDM: Recommended for CO2 Service
B – Nitrile: Recommended for NG Service, NOT recommended for O2 Service

Repair Kits

Includes: Valve Stem, Diaphragm, Valve Assembly, Valve Spring and Bottom Plug O-Ring

Model Size	Seal Material	Specify
1/4", 3/8" & 1/2"	FKM	GDR-RK-1V
	EPDM	GDR-RK-1EP
	Nitrile	GDR-RK-1B
3/4" & 1"	FKM	GDR-RK-2V
	EPDM	GDR-RK-2EP
	Nitrile	GDR-RK-2B

NOTE: FKM and EDPM Kits are cleaned for Oxygen Service.

Replacement Spring Kits

Includes: Spring (3/4" & 1" kit includes corresponding spring retainer)

Model Size	Specify
1/4", 3/8" & 1/2"	GDR-SK-1-*
3/4" & 1"	GDR-SK-2-*

***Specify Spring Model Code: A, B, C, or D**

Note: All Regulators are supplied with 2 (two) ¼" NPT Pipe Plugs. Pipe plugs are supplied finger tight. Final installation is the responsibility of the end user.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT

PILOT PRESSURE REGULATOR
1/4" NPT
Inlet 400 Psig (27.6 Bar)

SERIES PR

Description

Generant Series PR, Pilot Pressure Regulators are balanced, relieving regulators ideally suited for providing a reliable, constant pilot pressure to a Pilot Operated / Dome Loaded regulator. The balanced design allows for a consistent, regulated downstream pressure regardless of fluctuations in inlet pressure. The relieving function allows the regulator to vent when adjustments are made without the need for bleeding pressure from the pilot circuit. Materials of construction allow for compatibility with most gases. The Series PR can be ordered Cleaned & Packaged for Oxygen Service.

Features

- Balanced Design to Minimize Outlet Pressure Fluctuations upon Changing Inlet Pressure
- Relieving Design Suitable for Pilot Pressure Applications
- Optimized spring performance and patented Venturi tube provides high flow rates with low droop
- Easily cleanable by removing bottom plug
- Optional Plastic knob and Panel Mounting Configurations

Technical Data

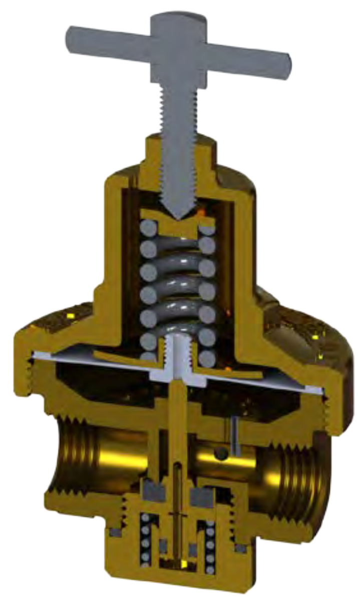
Maximum Inlet Pressure: 400 Psig (27.6 Bar)
Effect of Inlet Pressure Variation: < 1.0 PSI / 100 PSI
Temperature Range: -20 to 200 °F (-30 to 95 °C)

Pressure Ranges

Spring Code	Outlet Pressure Range PSI (bar)
A	0 - 50 (0-3.4)
B	5 - 125 (0.3-8.5)
C	10 - 200 (0.7-13.6)

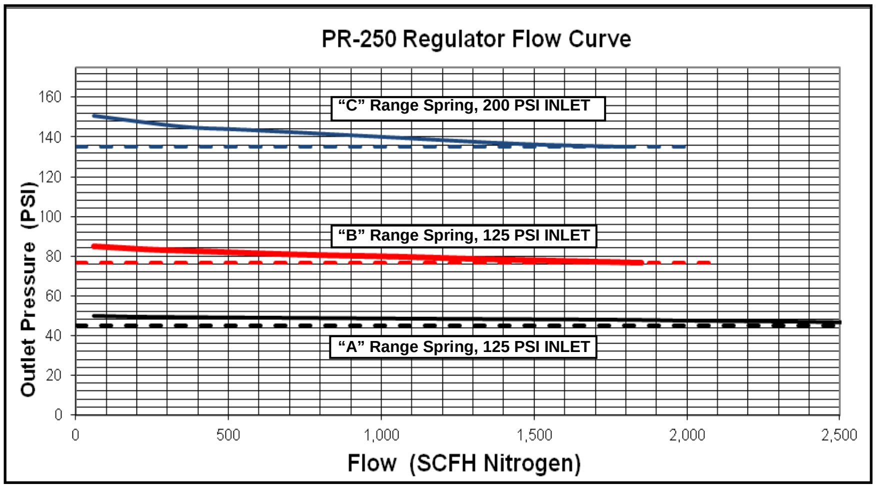
Flow Coefficient Cv

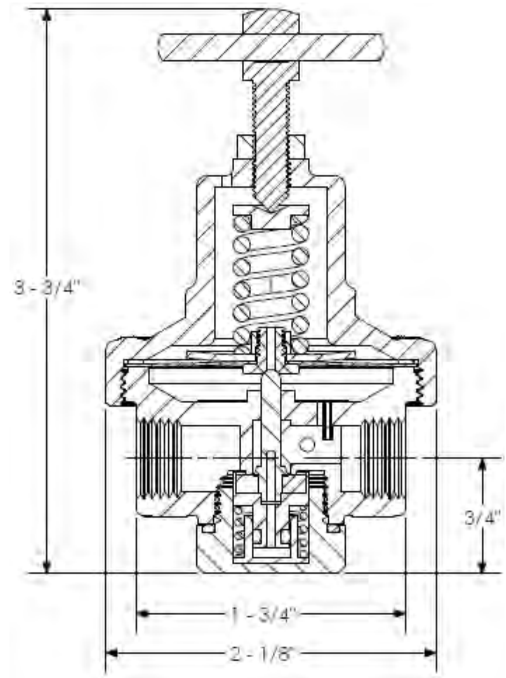
Size	Fail-Open
1/4" NPT	1.6



Materials of Construction

Component	Material
Body, Spring Chamber	Forged Brass, ASTM 377
Spring Button, Adjustment Screw Lock Nut, Bottom Plug, Panel Nut, Diaphragm Nut, Turbulence Pin	Brass, ASTM B16
Diaphragm Plate	Brass, ASTM A36
Adjustment Screw	303 Stainless Steel, ASTM A582
Valve and Stem Assembly	Brass, ASTM B16 and EPDM / FKM
Valve O-ring	EPDM / FKM
Adjustment Spring	Plated Music Wire, ASTM A228
Valve Spring	Phosphorous Bronze, ASTM B103
Bottom Plug O-ring	EPDM / FKM
Diaphragm Gasket	Red Fiber
Diaphragm	EPDM / FKM on Nylon
Diaphragm Screw	Nylon 101 (Type 66)

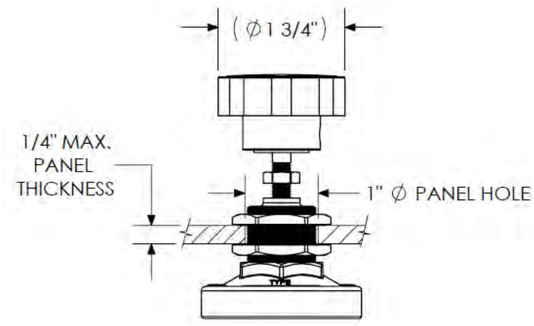




*Initial Set Pressure at 1 SCFM Flow: A - 50 PSIG, B – 85 PSIG, C – 150 PSIG

** Dotted line represents 10% decrease in outlet pressure from set point (droop)

Panel Mount Dimensions:



How To Order

4PR - 250 - V - A - X

SERIES
4PR - 4 Port, Pilot Pressure Regulator
4PRP - 4 Port, Pilot Pressure Regulator, Panel Mount*
Note: Regulators have 1/4" NPT Female Outlet Pressure Gauge Ports.

PORT SIZE
250 - 1/4" NPT Ports
Note: For other porting configurations, consult factory.

OPTIONS*
M - Plastic Knob
X - Oxygen Clean
* - May specify more than one option

SPRING RANGE
A - 0-50 Psig (0-3.5 bar)
B - 5-125 Psig (0.4-8.6 bar)
C - 10-200 Psig (0.7-13.8 bar)

SEAL MATERIAL
E - EPDM
V - FKM

Repair Kits

Seal Material	Specify	Kit Includes
FKM	PR-100V-*	FKM Valve Assembly, Diaphragm Assembly, Fiber Diaphragm Gasket, Adjusting Spring (Specify Range), Adjusting Spring Button, Valve Spring, Bottom Plug O-Ring
EPDM	PR-100EP-*	EPDM Valve Assembly, Diaphragm Assembly, Fiber Diaphragm Gasket, Adjusting Spring (Specify Range), Adjusting Spring Button, Valve Spring, Bottom Plug O-Ring

*Specify Spring Range: A, B, or C

GENERANT
www.generant.com
1865 Route 23 South PO Box 768 Butler, New Jersey 07405 973.838.6500 Fax 973.838.4888

CRYOGENIC/PRESSURE BUILD REGULATOR
3/8” and 1/2" NPT, BSPT
Inlet 600 PSIG (42 Bar)

SERIES CR

Description

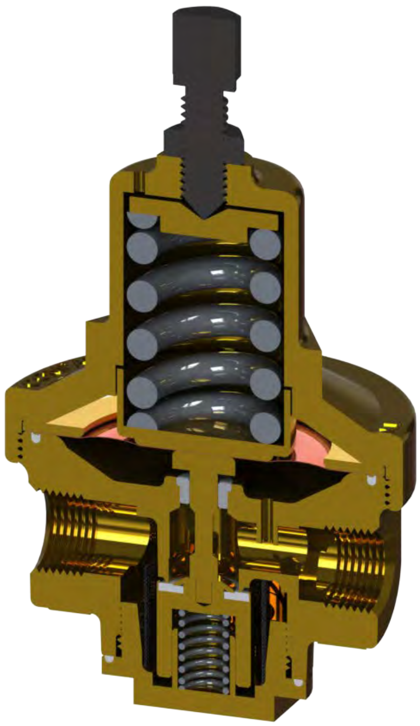
The Generant Series CR Cryogenic Regulator provides high flow during Cryogenic Vessel Pressure Build function and increased sensitivity to downstream pressure changes as a function of our pre-formed all metallic diaphragm and optimized spring design. The unique diaphragm is unlike anything on the market today and results in less decrease in Cryogenic vessel pressure and faster recovery during periods of higher demand, thus decreasing the potential for flooding the pressure build coil. The unit features a 304 SS Inlet Strainer/Filter to aid in reducing contaminant related failures. Optional Cleaned and Packaged for Oxygen Service Series CR Regulators utilize Monel Inlet Strainer/Filters. All Series CR Cryogenic Regulators are 100% Factory Tested and are supplied factory pre-set.

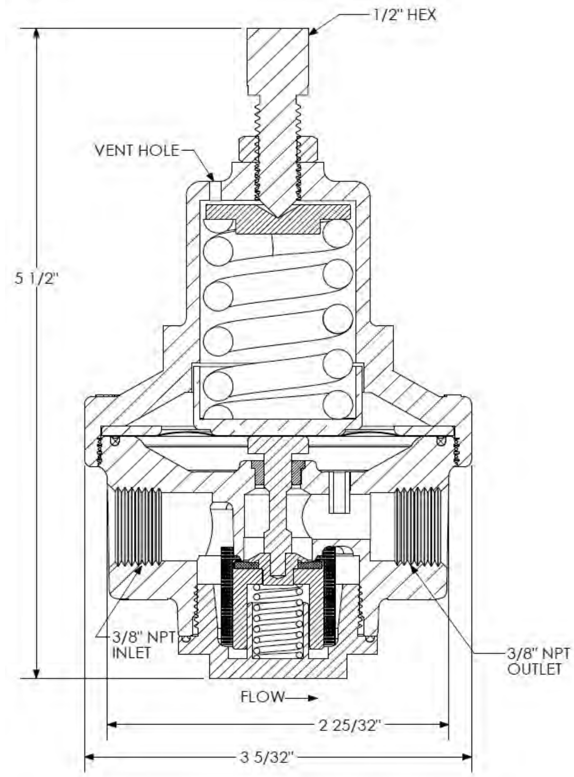
Features

- Designed for High Flow Liquid Service
- Can be installed Upstream or Downstream of the Vaporizer
- Unique Pre-Formed Multiple Stacked Phosphorous Bronze Diaphragms
- Can be Supplied Factory Preset
- Hex Head Adjustment Screw with Locknut
- 304 SS Inlet Strainer/Filter
- Optional Cleaned and Packaged for Oxygen Service **(includes Monel Inlet Strainer/Filter**)

Materials of Construction

- Forged Brass Body and Chamber, ASTM 377
- Brass Bar Stock Components, ASTM B16
- Phosphorous Bronze Diaphragms, ASTM B103
- PTFE Valve, Diaphragm and Bottom Plug Seal, ASTM D1710
- PCTFE Valve Stem Bearing, ASTM D1430
- 17-7PH Stainless Steel Adjustment and Valve Spring, ASTM A313
- Stainless Steel Adjustment Screw and Locknut, ASTM A276
- 304 SS Inlet Strainer/Filter **(Monel Inlet Strainer/Filter when specified for Oxygen Service)**





Technical Data

Maximum Inlet Pressure: 600 PSIG (42 Bar)
Outlet Pressure Range: 0 to 235 PSIG (0 to 16 Bar)
Temperature Range: -320° to 225° F (78° to 380° K)
Fail Open C_V: 3/8" NPT Ports – 2.4
1/2" NPT and BSPT Ports – 2.9

Flow Capacity

Flow Capacity is system dependent. For accurate flow capacity data, consult Generant with your specific system characteristics for more information.

How To Order

2CR - 375 - C - X

SERIES
2CR - 2 Port Cryogenic/ Pressure Build Regulator

PORT SIZE
375 - 3/8" FNPT
500 - 1/2" FNPT
4BSPT - 1/2" BSPT

CLEANING OPTION
X- Cleaned and Packaged for Oxygen Service (includes Monel Inlet Strainer/Filter)

OUTLET PRESSURE CODE

CODE	RANGE (PSIG)	FACTORY SETTING (PSIG)	PSIG/TURN (APPROX)
A	0 - 35	20	8
B	25 - 135	75	25
C	100 - 235	150	55

Note: Regulators are supplied pre-set to factory setting shown above. When adjusting regulator set pressure up (CW) or down (CCW), approximate PSIG/TURN can be used as a reference.

For additional configurations consult factory.

Repair Kits

Includes: Valve Assembly, Bottom Plug O-Ring, Valve Spring, 304 SS Inlet Strainer/Filter (Monel Inlet Strainer/Filter for Oxygen Service Kits), Valve Stem, Preformed Phosphorous Bronze Diaphragms (2) and Diaphragm O-Ring.

Specify: CR-RK-500 (304 SS Inlet Strainer/Filter for Standard Service)
CR-RK-500-X (Monel Inlet Strainer/Filter for Oxygen Service)

Note: Repair Kits fit all port sizes.

Replacement Spring Kits

Includes: Adjustment Screw and Spring

Specify: CR-SK-500-A, 0-35 PSIG Range
CR-SK-500-B, 25-135 PSIG Range
CR-SK-500-C, 100-235 PSIG Range

Note: Adjustment Screws are sized according to Springs. Spring Code is engraved on the Adjustment Screw (A, B, C).

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

GENERANT Valves & BI-Lok Fittings

CRYOGENIC REGULATOR, MINI
1/4" NPT
Inlet 600 PSI (41.4 bar)

SERIES CRM

Description

CRM Series pressure regulators provide high flow and quick, positive shut off at the desired set pressure. The regulator design is a non-balanced, spring reference, pressure reducing type regulator. They were designed especially for use as pressure build regulators for cryogenic liquid cylinders but can be used in many other applications. Solid, non-tied diaphragm provides leak-free and long-lasting performance. Optimized diaphragm and adjustment spring designs provide high flow performance. All CRM Series regulators are supplied factory pre-set and cleaned for oxygen service.

Features

- **OPTIMIZED FOR HIGH FLOW**: Optimized Spring and Diaphragm Design allows for high flow rates and low pressure drop.
- **QUICK SHUT-OFF**: Regulators transition from the flowing condition to shut in a tight pressure band.
- **SOLID, NON-TIED, DIAPHRAGM**: Solid diaphragm eliminates potential leak path and increases sensitivity.
- **DESIGNED FOR CRYOGENICS**: All materials were selected specifically for use in cryogenic environments.
- **CLEANED FOR OXYGEN SERVICE**: Regulators are cleaned for use in Oxygen service standard.

Technical Data

Max Inlet Pressure: 600 PSIG (41.4 bar)

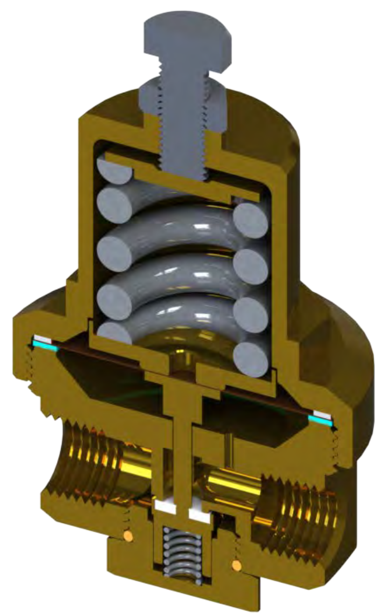
Outlet Pressure Ranges:

Spring	Outlet Pressure Range
A	15 to 65 PSIG (1.0 to 4.5 bar)
B	50 to 175 PSIG (3.4 to 12.1 bar)
C	150 to 350 PSIG (10.3 to 24.1 bar)
D	300 to 525 PSIG (20.7 to 36.2 bar)

A, B, and C Range Springs are interchangeable.
D Range Spring requires Chamber Ring.

Temperature Range: -320° to 200°F (-196° to 93°C)

Full Open Flow Coefficient: 0.51



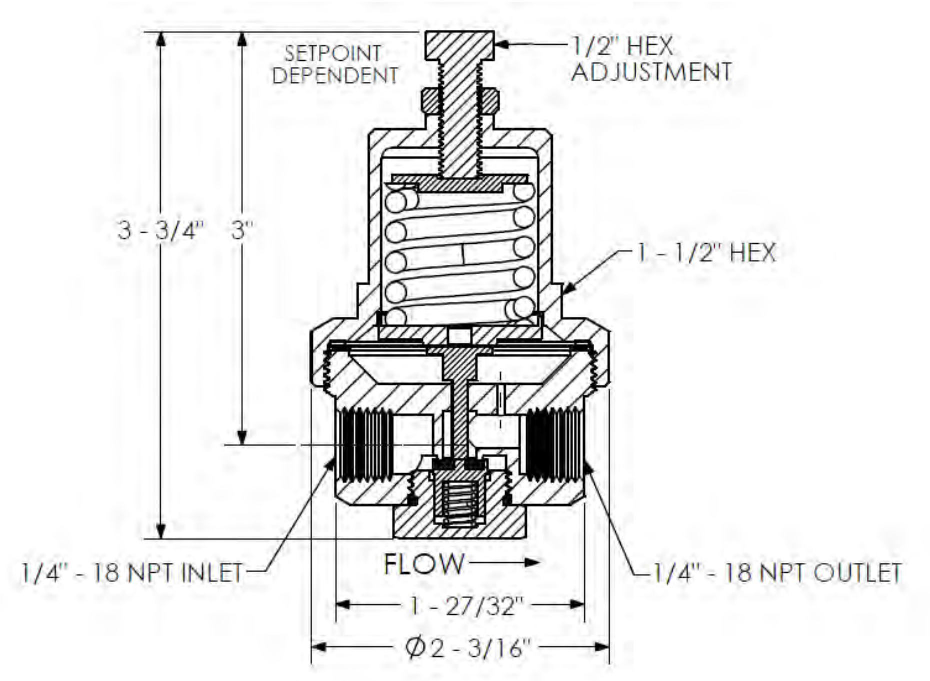
Materials of Construction

Component	Material
Body, Chamber, Valve Body, Stem, Spring Button, Spring Retainer, Bottom Plug	CDA 360 Brass, ASTM B16
Adjustment Springs	Chrome Silicon, ASTM A401
Adjustment Screw and Locknut	18-8 Stainless Steel
Valve Spring	302 SS, ASTM A313
Diaphragms	Phosphor Bronze
Diaphragm Gasket	Vulcanex ®
Valve Seal	PTFE
Chamber Seal	Gylon ®
Bottom Plug Seal	Silicone

NOTE: Regulators are assembled with Dupont Krytox® lubricant.

CRYOGENIC REGULATOR, MINI

Dimensional Data



How To Order

CRM-250 - B - 125

SERIES

CRM-250 - Cryogenic Regulator Mini, 1/4" NPT, Side IN, Side OUT

SPRING RANGE

A - 15 to 65 PSI (1.0 to 4.5 bar)
B - 50 to 175 PSI (3.4 to 12.1 bar)
C - 150 to 350 PSI (10.3 to 24.1 bar)
D - 300 to 525 PSI (20.7 to 36.2 bar)

SET PRESSURE

Specify set pressure in PSI

Replacement Spring Kits / Repair Kit

Part Number	Spring
CRM-SK-A	A (15 to 65 PSI)
CRM-SK-B	B (50 to 175 PSI)
CRM-SK-C	C (150 to 350 PSI)
CRM-SK-D	D (300 to 525 PSI)

All Replacement Spring Kits come with a Replacement Spring, Adjustment Screw, Chamber Seal, and either Diaphragm Gasket (A, B, and C springs) or Chamber Ring (D Spring).

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

BACK PRESSURE REGULATOR
1/4" NPT
15 - 525 PSI

BPR SERIES

Description

BPR Series back pressure regulators are designed for use as both economizers or diaphragm type pressure limiting devices on cryogenic liquid cylinders and systems. Optimized diaphragm and adjustment spring designs provide high flow above the desired setpoint. Robust metal-metal seal and seat design ensures low leakage rates below setpoint. The BPR Series is constructed of primarily brass and stainless steel for long-lasting performance. All BPR Series regulators are supplied factory pre-set and cleaned for oxygen service.

BPR-250

Features

- **OPTIMIZED FOR HIGH FLOW**: Optimized Diaphragm and Spring Design allows for high flow rates at pressures beyond setpoint.
- **QUICK SHUT-OFF**: Regulators transition from the flowing condition to shut in a tight pressure band.
- **INLET FILTER SCREEN:** Protects against system debris and particulate.
- **DESIGNED FOR CRYOGENICS**: All materials were selected specifically for use in cryogenic environments.
- **FIELD ADJUSTABLE**: Regulators can be adjusted to any desired setpoint within the spring's pressure range.
- **CLEANED FOR OXYGEN SERVICE**: Regulators are cleaned for use in Oxygen service standard.

Technical Data

Max Inlet Pressure: 600 PSIG (41.4 bar)

Pressure Ranges:

Spring	Pressure Range
A	15 to 65 PSIG (1.0 to 4.5 bar)
B	50 to 175 PSIG (3.4 to 12.1 bar)
C	150 to 350 PSIG (10.3 to 24.1 bar)
D	300 to 525 PSIG (20.7 to 36.2 bar)

A, B, and C Range Springs are interchangeable.
D Range Spring requires Chamber Ring.

Temperature Range: -320° to 200°F (-196° to 93°C)

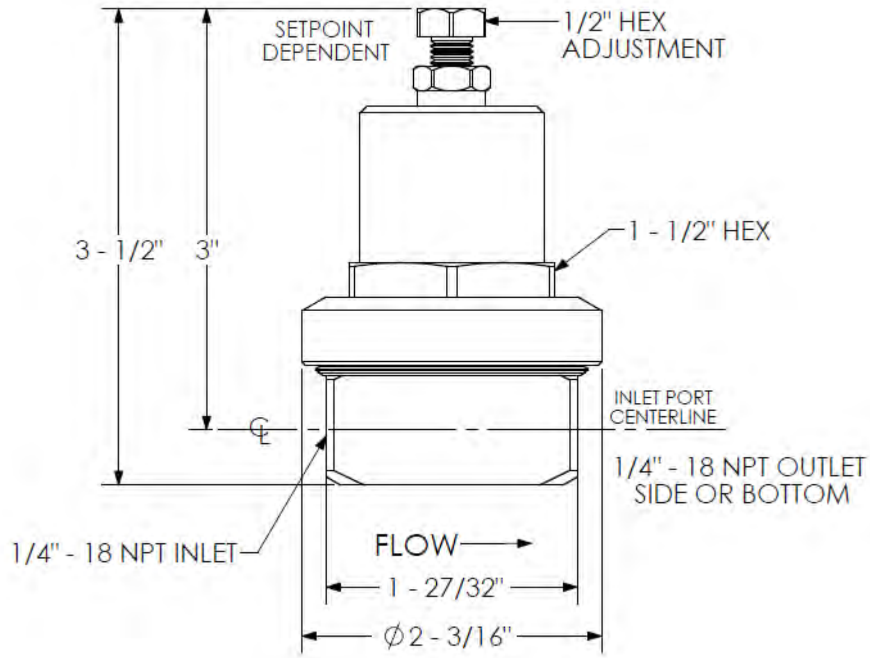
BPR-250I

Materials of Construction

Component	Material
Body, Chamber, Spring Button, Spring Retainer, Chamber Ring	CDA 360 Brass, ASTM B16
Adjustment Springs	Chrome Silicon, ASTM A401
Adjustment Screw, Locknut, Diaphragm Assembly Screw, Lock Washer	18-8 Stainless Steel
Poppet, Seat	303 SS, ASTM A313
Diaphragms	Phosphor Bronze
Inlet Filter Screen	Brass Wire Mesh, ASTM E437
Diaphragm Gasket	Vulcanex ®
Chamber and Diaphragm Assembly Seal	Gylon ®

NOTE: Regulators are assembled with Dupont Krytox® lubricant.

Dimensional Data



How To Order

BPR - 250 - B - 140

SERIES
BPR - Back Pressure Regulator

PORT CONFIGURATION
250 - 1/4" NPT, Side IN - Bottom OUT
250I - 1/4" NPT, Side IN - Side OUT

SPRING RANGE
A - 15 to 65 PSI (1.0 to 4.5 bar)
B - 50 to 175 PSI (3.4 to 12.1 bar)
C - 150 to 350 PSI (10.3 to 24.1 bar)
D - 300 to 525 PSI (20.7 to 36.2 bar)

SET PRESSURE
Specify set pressure in PSI

Replacement Spring Kits / Repair Kit

Part Number	Spring
CRM-SK-A	A (15 to 65 PSI)
CRM-SK-B	B (50 to 175 PSI)
CRM-SK-C	C (150 to 350 PSI)
CRM-SK-D	D (300 to 525 PSI)

All Replacement Spring Kits come with a Replacement Spring, Adjustment Screw, Chamber Seal, and either Diaphragm Gasket (A, B, and C springs) or Chamber Ring (D Spring).

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

GENERANT

HIGH CAPACITY PRESSURE REGULATOR
1/4", 3/8" and 1/2" NPT
Inlet 400 Psig (27.6 Bar)

SERIES HC

Description

The Generant Series HC, High Capacity Regulators are ideally suited for industrial applications requiring a rugged high flow pressure regulator. The Series HC features Heavy Duty all metallic body and spring chambers and are easily rebuilt in the field. The Series HC is available in Relieving and Non-Relieving configurations ideally suited for both liquid and gas service.

Features

- 3/8" and 1/2" Regulators are fully balanced to maintain constant delivery pressure regardless of inlet pressure fluctuations. 1/4" Regulators are currently available non-balanced only.
- Available Relieving or Non-Relieving
- Optimized spring performance and patented Venturi tube provides high flow rates with low droop
- Easily cleanable by removing bottom plug
- Optional Plastic knob
- Panel Mounting Configurations available on HC-250 Series Only

Technical Data

Maximum Inlet Pressure: 400 Psig (27.6 Bar)
Temperature Range: -20 to 200 °F (-30 to 95 °C)

Pressure Ranges

Spring Code	Outlet Pressure Range PSI (bar)
A	0 - 50 (0-3.4)
B	5 - 125 (0.3-8.5)
C	10 - 200 (0.7-13.6)

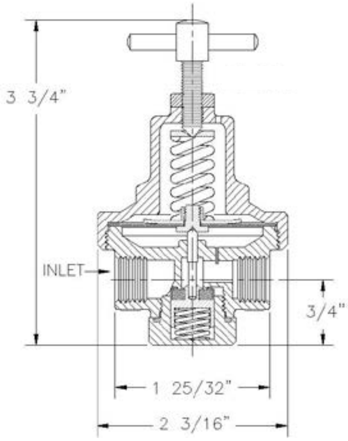
Flow Coefficient Cv

Size	Fail Open
1/4" NPT	1.6
3/8" NPT	2.4
1/2" NPT	2.9

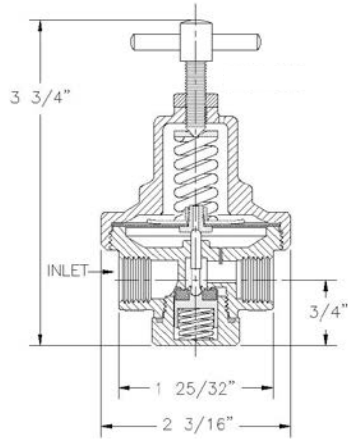
Materials of Construction

Component	HC-250	HCR-250	HC-375/500	HCR-375/500
Body	Forged Brass, ASTM 377			
Spring Chamber	Forged Brass, ASTM 377		Die Cast Zinc (Zamak)	
Spring Retainer	N/A		Die Cast Zinc (Zamak)	
Spring Button	Brass, ASTM B16			
Diaphragm Screw	Brass, ASTM B16	Nylon 6-6, ASTM AD589	Brass, ASTM B16	Nylon 6-6, ASTM AD589
Diaphragm Plate / Nut	Brass, ASTM A36		N/A	
Adjustment Screw	303 Stainless Steel, ASTM A582			
Adjustment Screw Lock Nut	Brass, ASTM B16		Plated Steel	
Chamber Insert	N/A		Brass, ASTM B16	
Valve Stem	Brass, ASTM B16			
Valve Assembly	Brass, ASTM B16 and FKM, ASTM D1418			
Valve O-ring	N/A		Buna-N	
Adjustment Spring	Plated Music Wire, ASTM A228			
Valve Spring	302 Stainless Steel, ASTM A313		17-7 Stainless Steel, ASTM A564	
Turbulence Pin	18-8 SS, ASTM A276		Brass, ASTM B16	
Bottom Plug	Brass, ASTM B16			
Bottom Plug O-ring	Buna-N			
Sieve	N/A		304 SS, ASTM A276	
Diaphragm Gasket	Red Fiber		N/A	
Diaphragm	Buna-N and Nylon			
Panel Nut	Brass, ASTM B16 (HC-250 Only)			

HC-250 (1/4" NPT Ports)

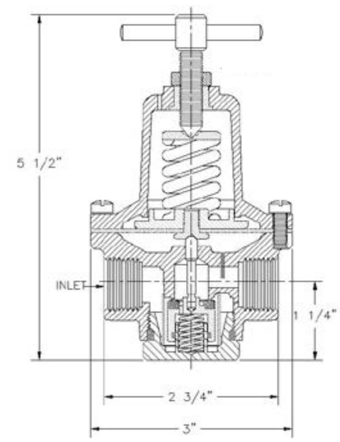


HC, Non-Relieving

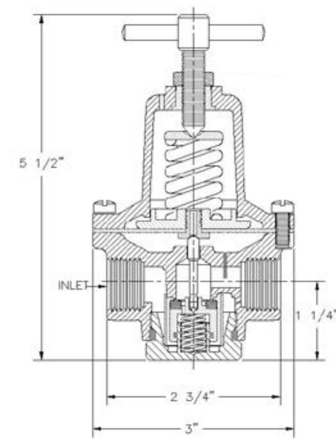


HCR, Relieving

HC-375 / HC-500 (3/8" and 1/2" NPT Ports)

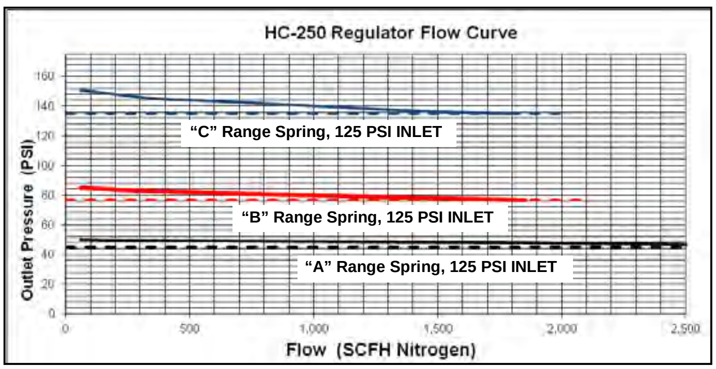


HC, Non-Relieving



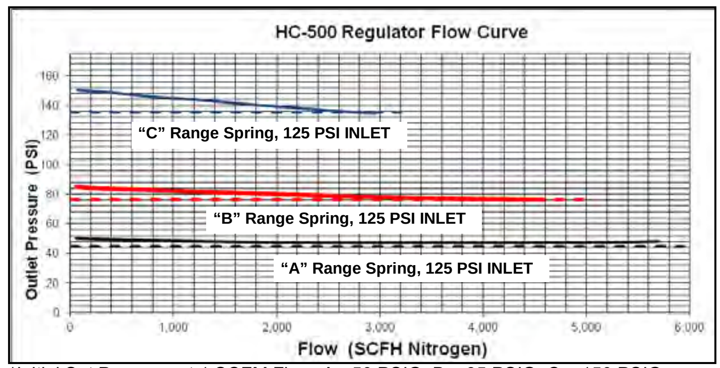
HCR, Relieving

Flow Curve



*Initial Set Pressure at 1 SCFM Flow: A - 50 PSIG, B – 85 PSIG, C – 150 PSIG
** Dotted line represents 10% decrease in outlet pressure from setpoint (droop)

Flow Curve



*Initial Set Pressure at 1 SCFM Flow: A - 50 PSIG, B – 85 PSIG, C – 150 PSIG
** Dotted line represents 10% decrease in outlet pressure from setpoint (droop)

How To Order

4HCR P - 375 - A - M

SERIES
4HC - 4 Port, High Capacity, Non-Relieving Pressure Regulator
4HCR - 4 Port, High Capacity, Relieving Pressure Regulator
Note: Regulators have 1/4" NPTF Outlet Pressure Gauge Ports

PANEL MOUNT OPTION (HC-250 Only)
Add "P" to Series Code for Panel Mount Option
e.g. 4HCP - 4 Port, Non-Relieving Panel Mount
Note: All Panel Mount Options come with Plastic Knob

PORT SIZE (NPT)
250 - 1/4"
375 - 3/8"
500 - 1/2"

SPRING RANGE
A - (0-50) Psig
B - (5-125) Psig (standard/Omit)
C - (10-200) Psig

OPTIONS
M - Plastic Knob

*Panel Mount Option available on HC-250 Series Only. 1/4" Regulator fits in 1" diameter panel hole for panel up to 7/16" thick.

Repair Kits

Model Size	Specify	Kit Includes
4HC, 1/4"	HC-100-*	Valve Assembly, Valve Stem, Diaphragm Assembly, Fibre Diaphragm Gasket, Adjusting Spring (Specify Range), Adjusting Spring Button, Valve Spring, Bottom Plug O-Ring
4HCR, 1/4"	HCR-100-*	Relieving Valve & Stem Assembly, Relieving Diaphragm Assembly, Fibre Gasket, Adjusting Spring (Specify Range), Adjusting Spring Button, Bottom Plug O-Ring
4HC, 3/8" & 1/2"	HC-200-*	Valve Assembly with O-Ring, Valve Stem, Sieve, Diaphragm Assembly, Adjusting Spring (Specify Range), Adjusting Spring Button, Valve Spring, Bottom Plug O-Ring
4HCR, 3/8" & 1/2"	HCR-200-*	Relieving Valve & Stem Assembly with O-Ring, Sieve, Relieving Diaphragm Assembly, Adjusting Spring (Specify Range), Adjusting Spring Button, Valve Springs, Bottom Plug O-Ring

*Specify Spring Range A, B, or C

Note: All Regulators are supplied with 2 (two) ¼" NPT Pipe Plugs. Pipe plugs are supplied finger tight. Final installation is the responsibility of the end user.

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT

GENERANT Valves & BI-Lok Fittings

SERIES SDC
Self-Locking Liquid Cylinder Connectors

SERIES SDC

Description

The Series SDC connection system is supplied for installation into the outlet ports of most gas use, vent and fill valves on a cryogenic liquid cylinder. The system is a one-piece assembly consisting of a CGA fitting/clutch mechanism permanently mounted in a stainless steel locking bracket. Once installed, this system cannot be removed without rendering the CGA outlet connection unusable.

Features and Benefits

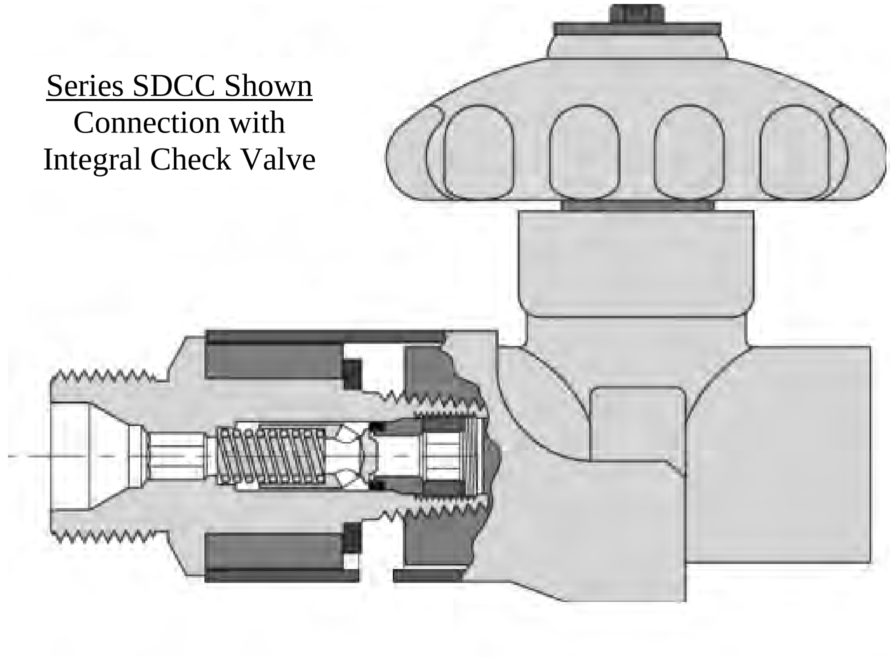
- Easily installs on most existing threaded cylinder valves using standard hex wrench.
- NPT Male connection supplied with factory applied PTFE thread sealant tape
- Suitable for both Industrial and Medical Applications
- CGA connections manufactured to industry standards
- Zero external leakage
- Cleaned and Packaged for Oxygen Service
- Optional Integral Anti-Back-Flow Check Valve
- OEM Endorsed

Materials of Construction

Component	Material
Fitting Body, Clutch Housing	Brass, ASTM B16
Spherical Locking Pawls	440 SS, ANSI 440C
Springs, Stop Washer	302 SS, ASTM A313
Locking Sleeve, Retaining Pins	304 SS, ASTM A240
Warning Label	4 Mil Laminated Vinyl

SERIES SDC
Self-Locking Liquid Cylinder Connectors

Series SDCC Shown
Connection with
Integral Check Valve



Ordering Information

SDCC - 3 540 - V

SERIES
SDC - Self Locking CGA Connection
SDCC - Self Locking CGA Connection with
Integral Check Valve (3320, 3326, 3540, & 3580 only)
Nominal 1 psi crack pressure.

INLET
3 - 3/8" NPT Male
375 - 3/8" NPT Male Plug (3000 psi) omit outlet designation
(specify SDC-375)

OUTLET (MAWP*)
540 - CGA-540 (3000 psi)
320 - CGA-320 (3000 psi)
326 - CGA-326 (3000 psi)
580 - CGA-580 (3000 psi)
440 - CGA-440 (500 psi)
295 - CGA-295 (500 psi)
622 - CGA-622 (500 psi)
624 - CGA-624 (500 psi)

SEAL MATERIAL
V - Viton™, -10°F to 375°F (-23°C to 190°C)
B - Buna-N, -40°F to 250°F (-40°C to 121°C)
N - Neoprene, -40°F to 300°F (-40°C to 148°C)
EP - Ethylene Propylene, -65°F to 300°F (-54°C to 148°C)
FS - Fluorosilicone, -80°F to 350°F (-62°C to 176°C)

Note: Viton™ is a trademark of DuPont.

* as defined in CGA V-1 Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections

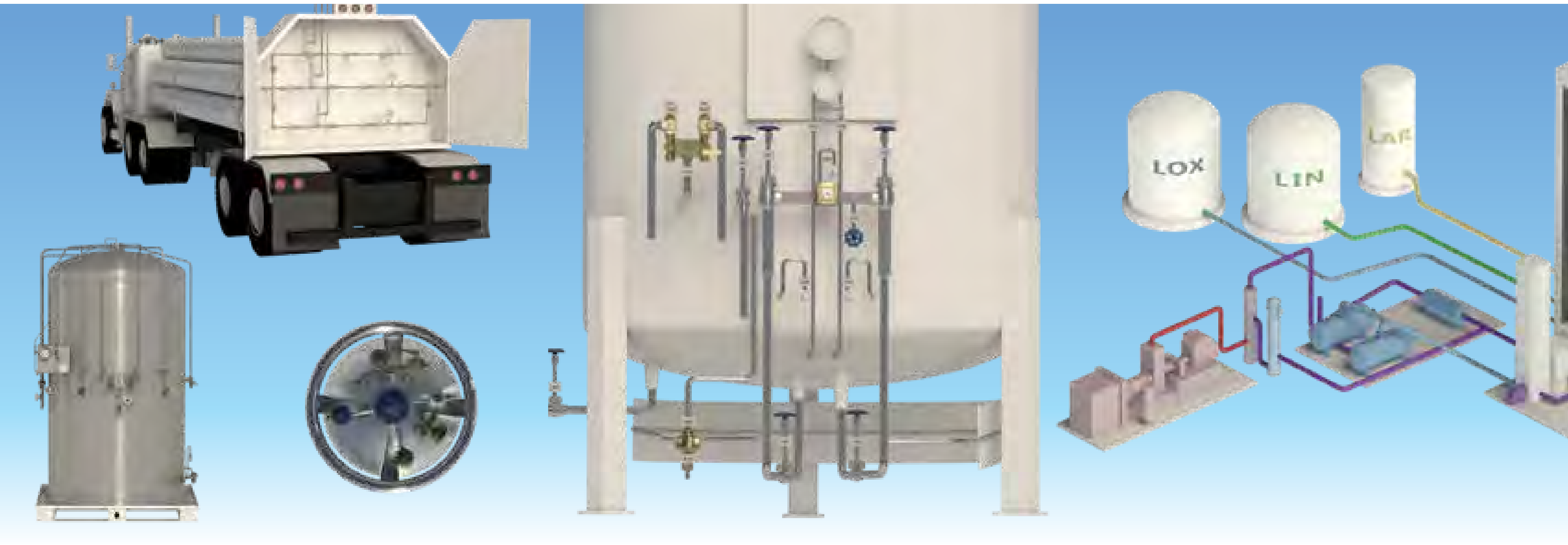
PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

GENERANT
Valves & BI-Lok Fittings

SINCE 1937

GEC

GAS EQUIPMENT CO, INC



Cryogenic & Industrial Gas Equipment

Air separation unit (ASU) products

24/7 production schedules demand 24/7 toughness

RegO valves, regulators and safety devices are engineered to stand up to the toughest environments and provide years of reduced maintenance and worry-free operation. When you have been designing and manufacturing your own products for more than 100 years, you pay attention to the details—like anti-corrosive, ergonomic hand wheels and leak-proof valves that deliver superior flow rates.

www.regoproducts.com/cryo/

GLOBE VALVES

210 SERIES   SK SERIES   232 SERIES

GATE VALVES

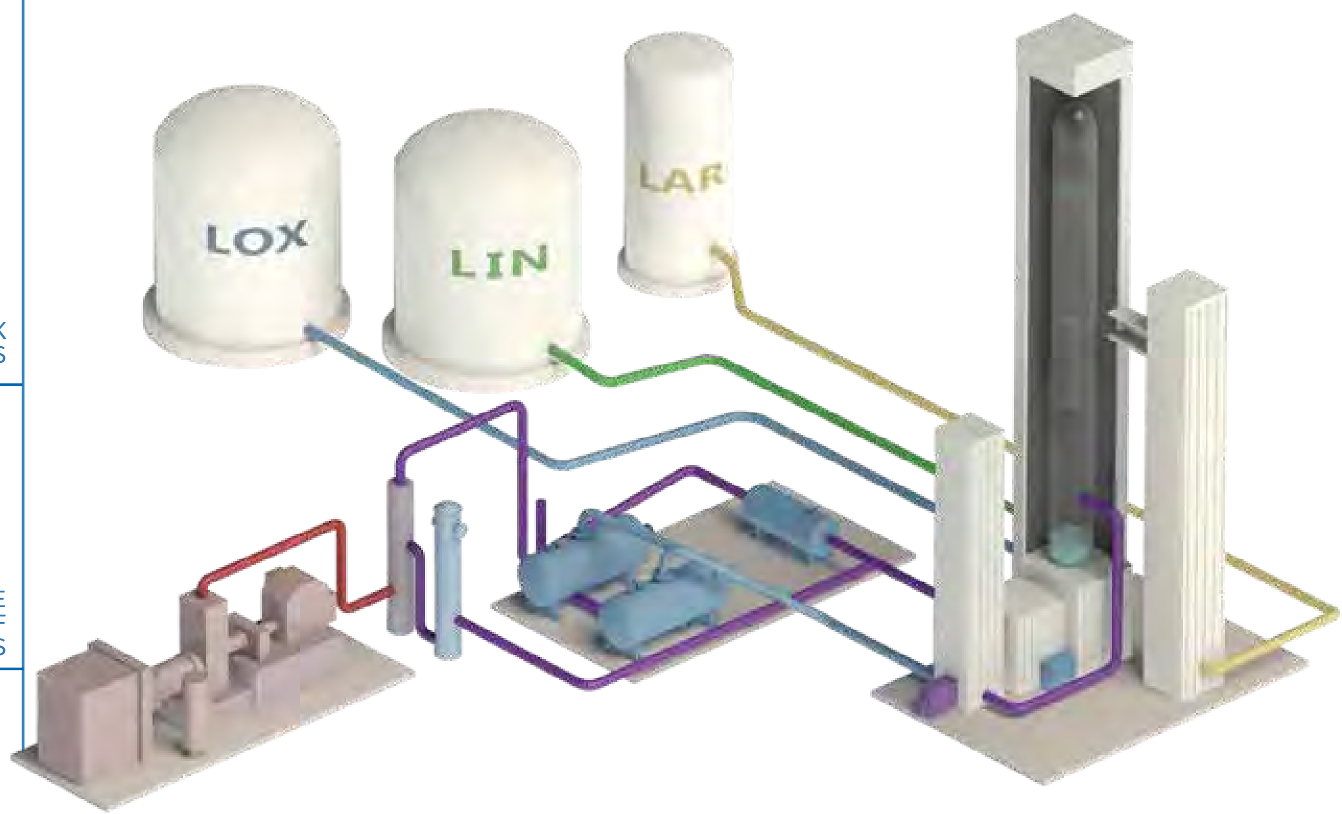
110 SERIES

CHECK VALVES

886 SERIES   CG SERIES

PRESSURE RELIEF VALVES

AR SERIES   9400 SERIES



The illustrations in this application guide are intended to inform a professional installer/system designer where our products are generally installed on certain containers or applications. These illustrations are not intended for and must not be used for system design.

Bulk tank storage

Breadth of line meets depth of knowledge

Combine RegO's industry experience, design assistance and broad product line to build a flow control system that enables maximum efficiency and excellent value for bulk storage applications.

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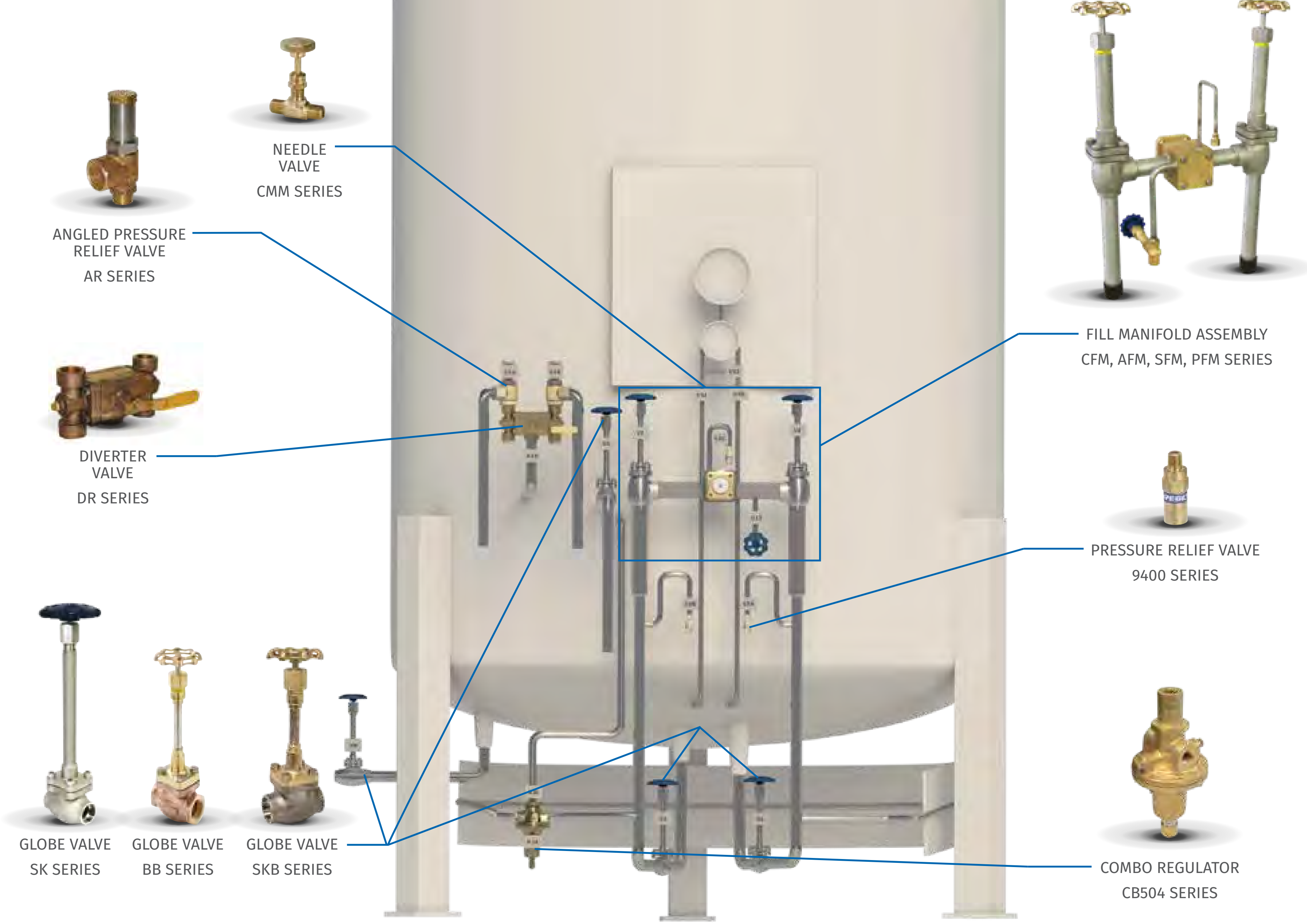
REGO BULK TANK PRODUCTS



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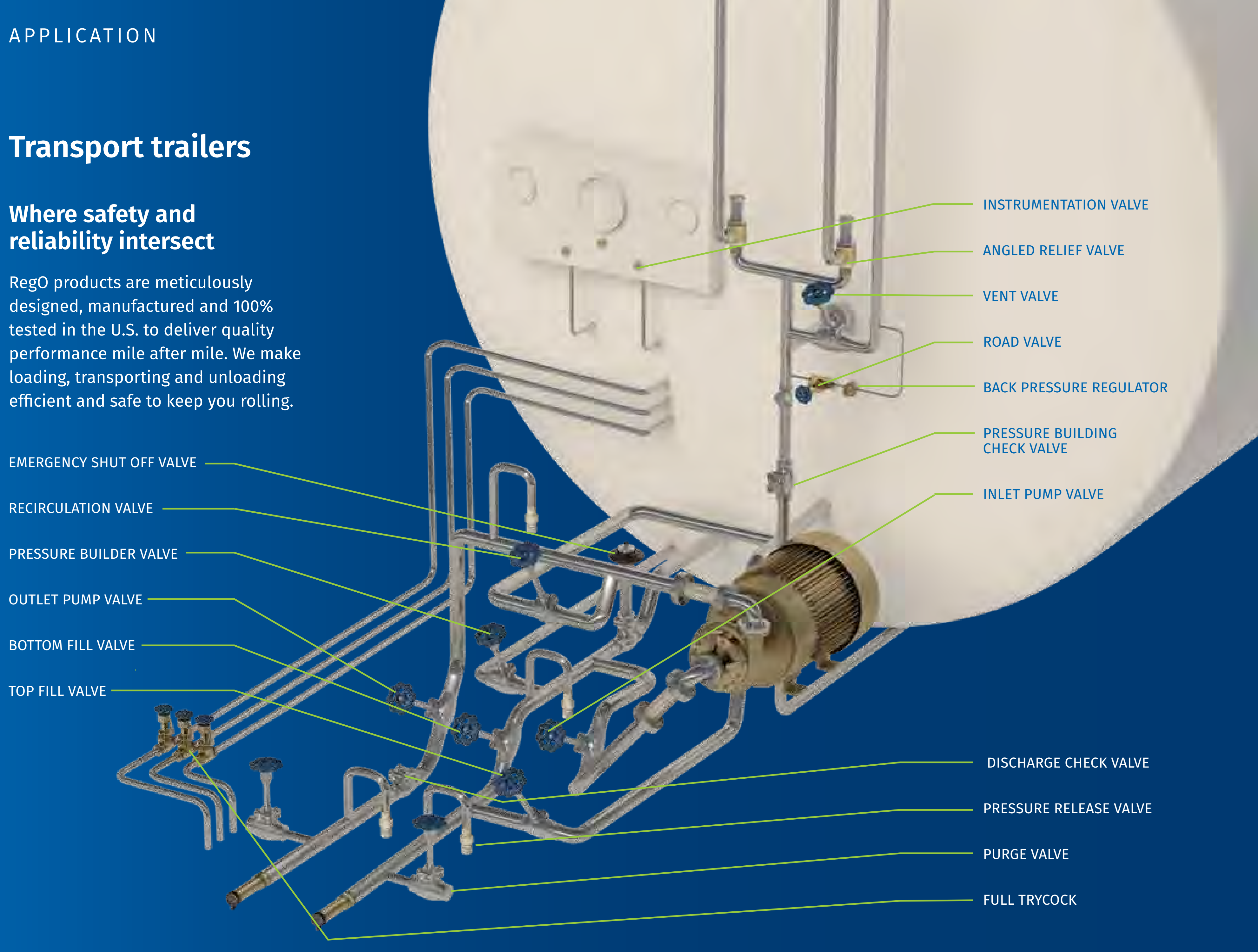
Transport trailers

Where safety and reliability intersect

RegO products are meticulously designed, manufactured and 100% tested in the U.S. to deliver quality performance mile after mile. We make loading, transporting and unloading efficient and safe to keep you rolling.



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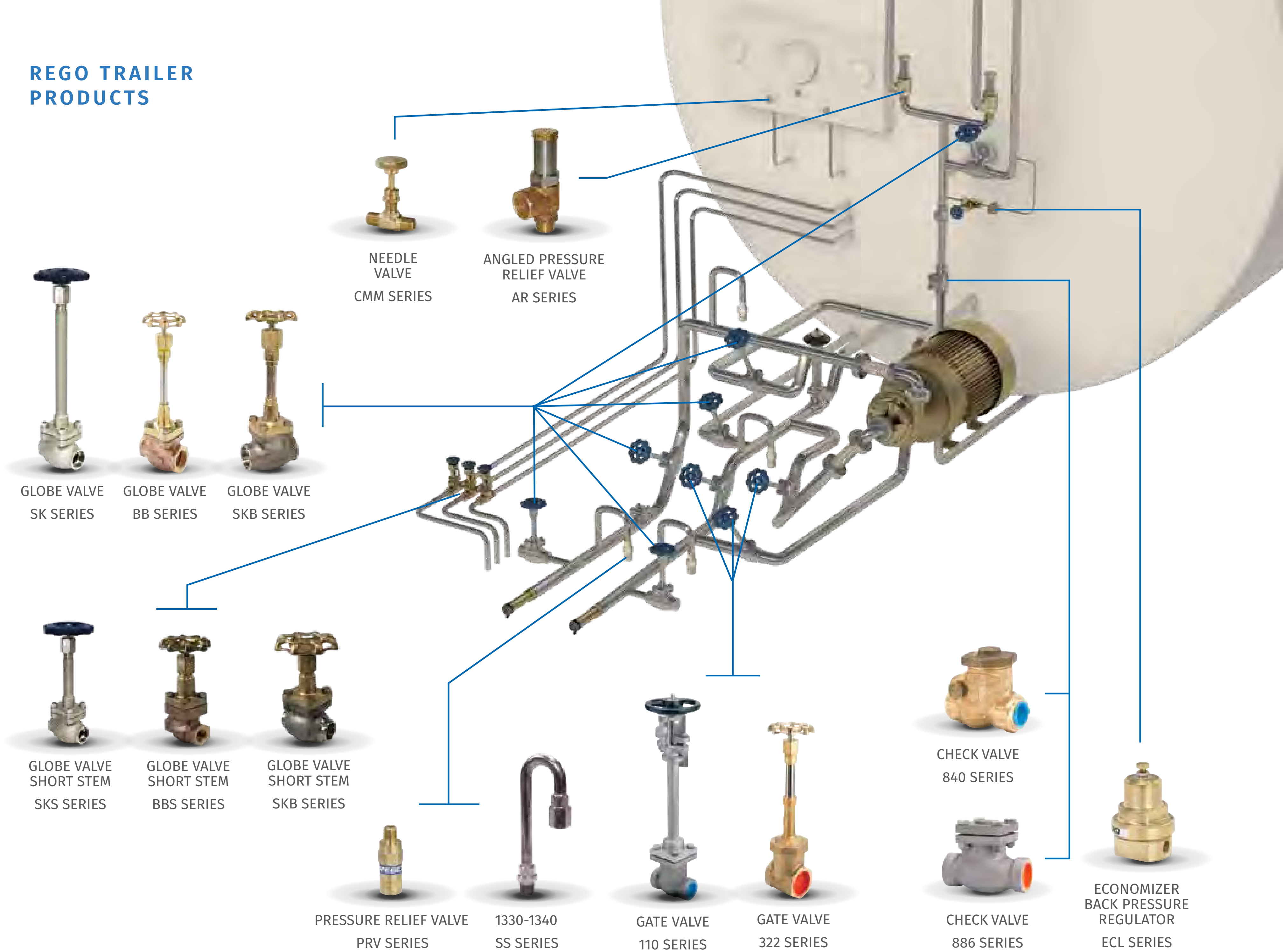
REGO TRAILER PRODUCTS



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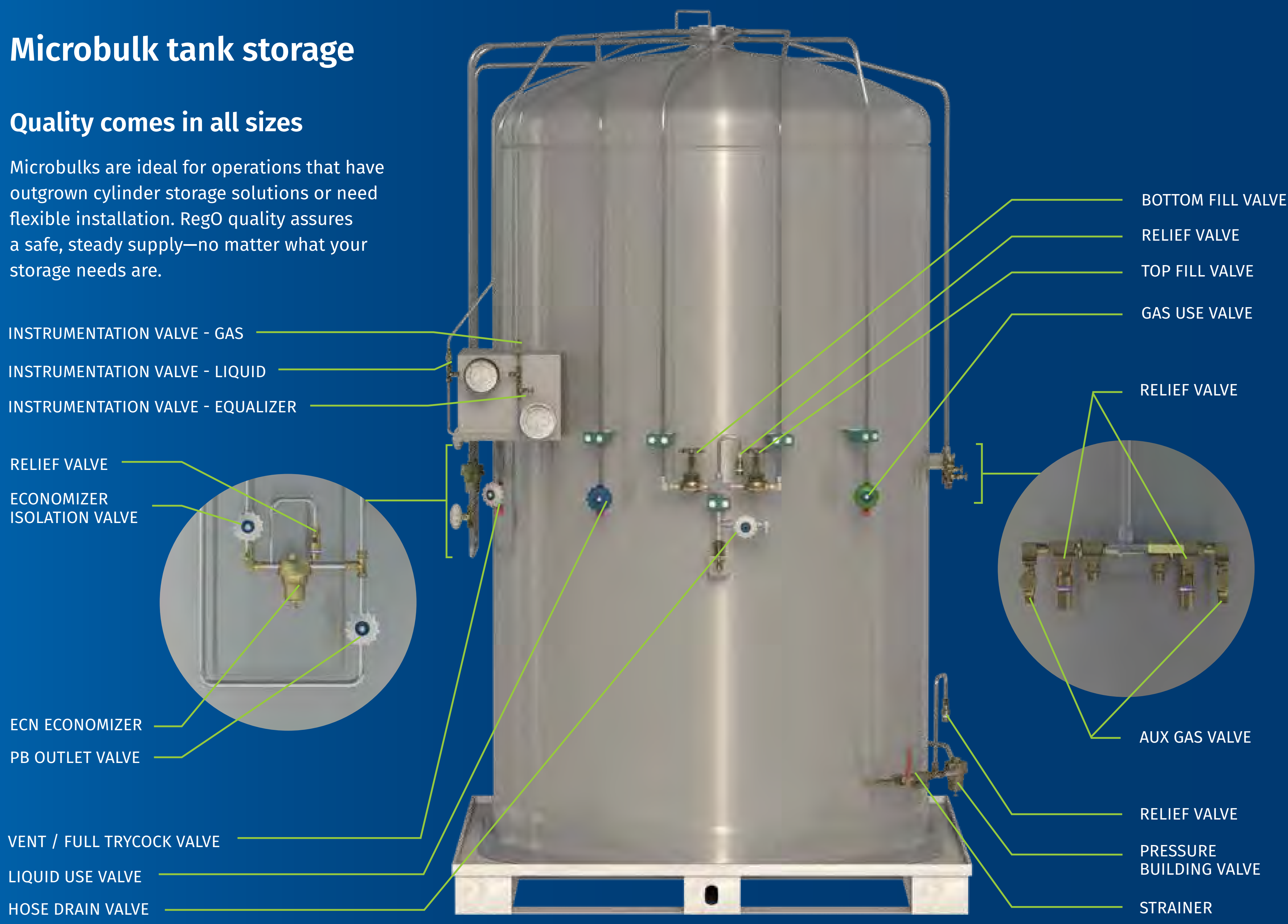
Microbulk tank storage

Quality comes in all sizes

Microbulks are ideal for operations that have outgrown cylinder storage solutions or need flexible installation. RegO quality assures a safe, steady supply—no matter what your storage needs are.



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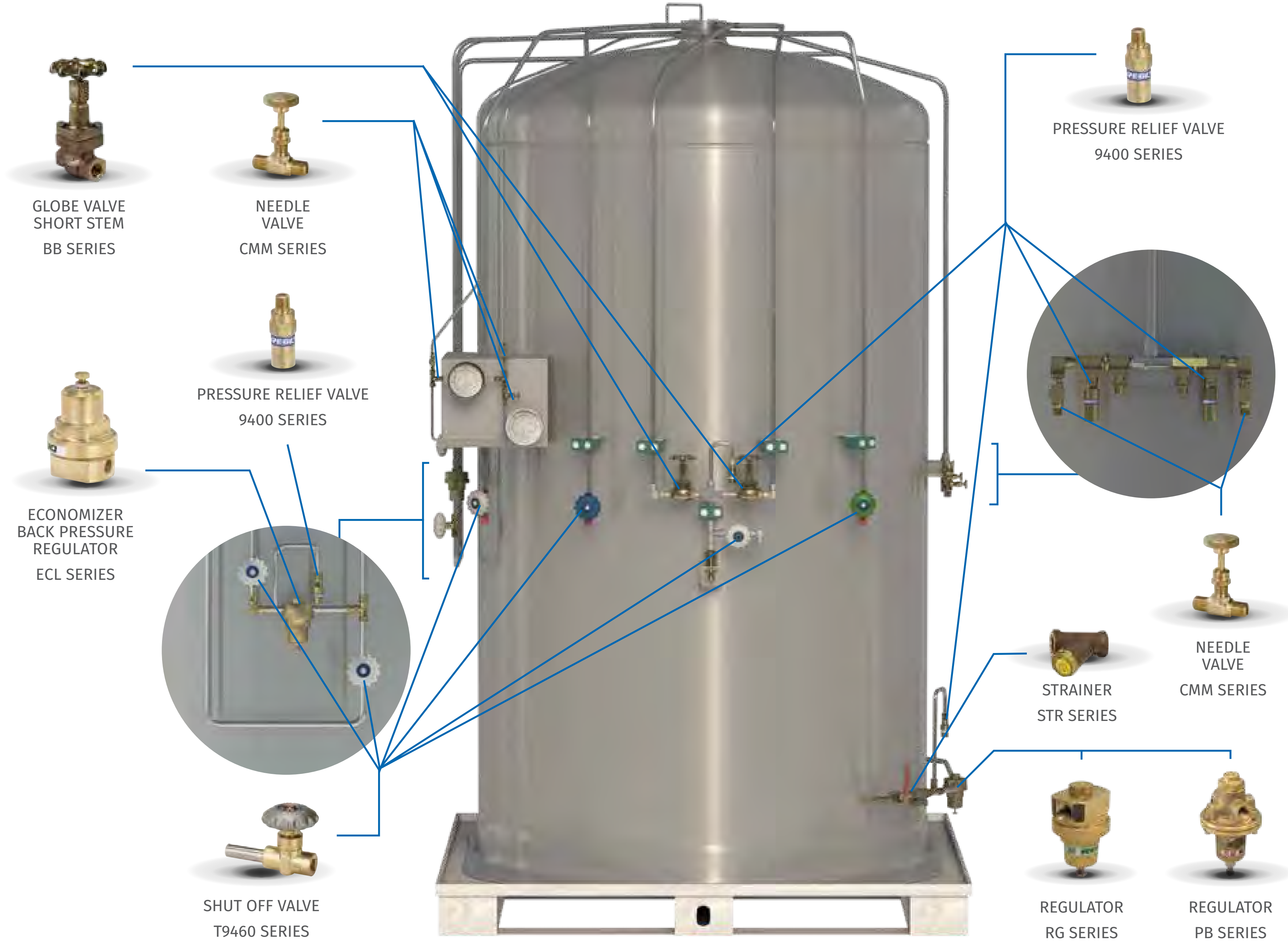
REGO MICROBULK TANK PRODUCTS



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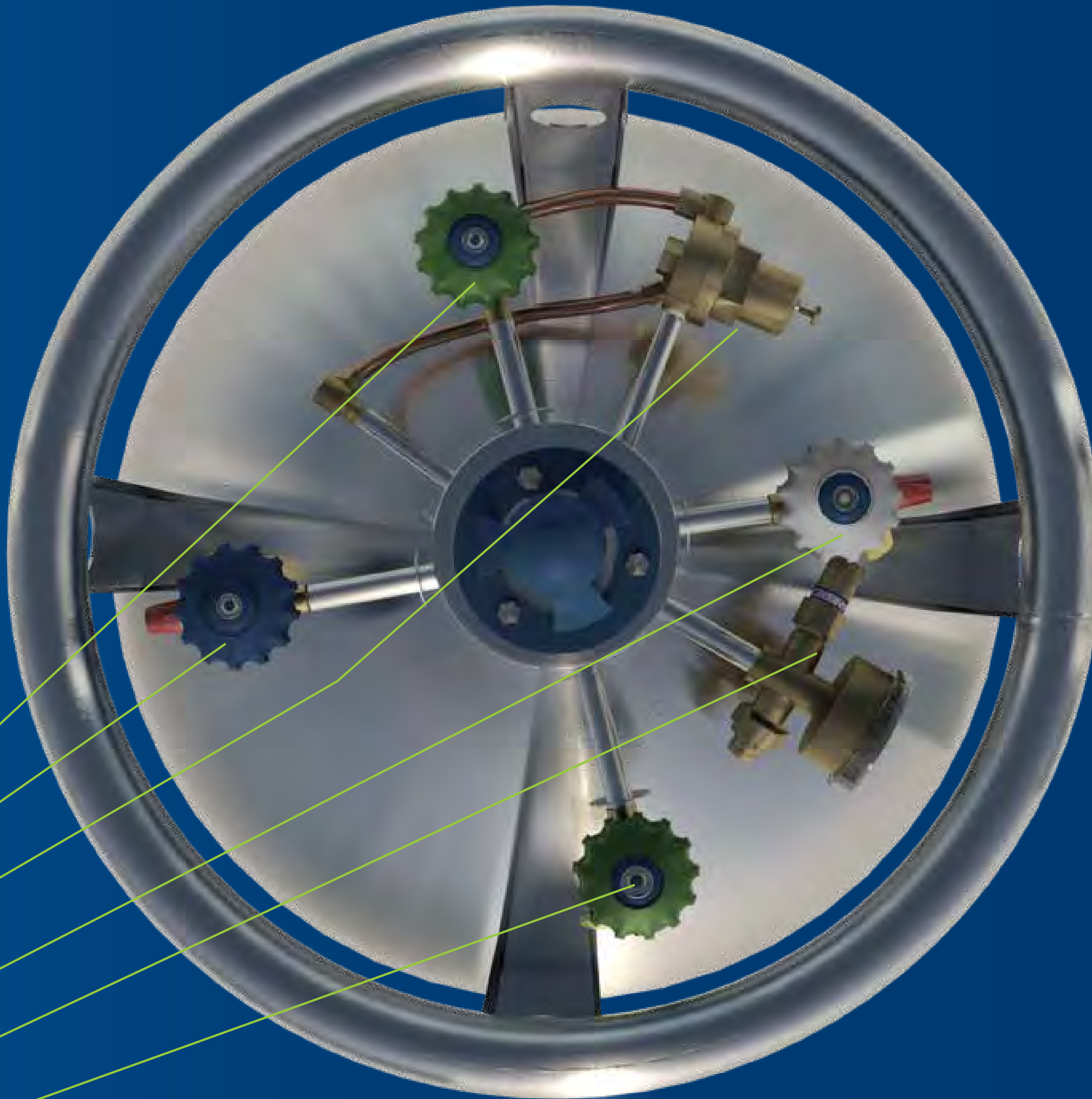
Liquid cylinders

We do not freeze under pressure

Cylinders can take a beating in transport and everyday use. RegO valves are the most widely used in the industry, and deliver a pressure-sealed barrier to avoid freeze-up and maintain constant flow. The robust design prevents maintenance requirements and avoids downtime, while safeguarding against over-torquing for long-lasting operation, with lower operational costs.

Rated for liquid oxygen service per CGA G-4.1.



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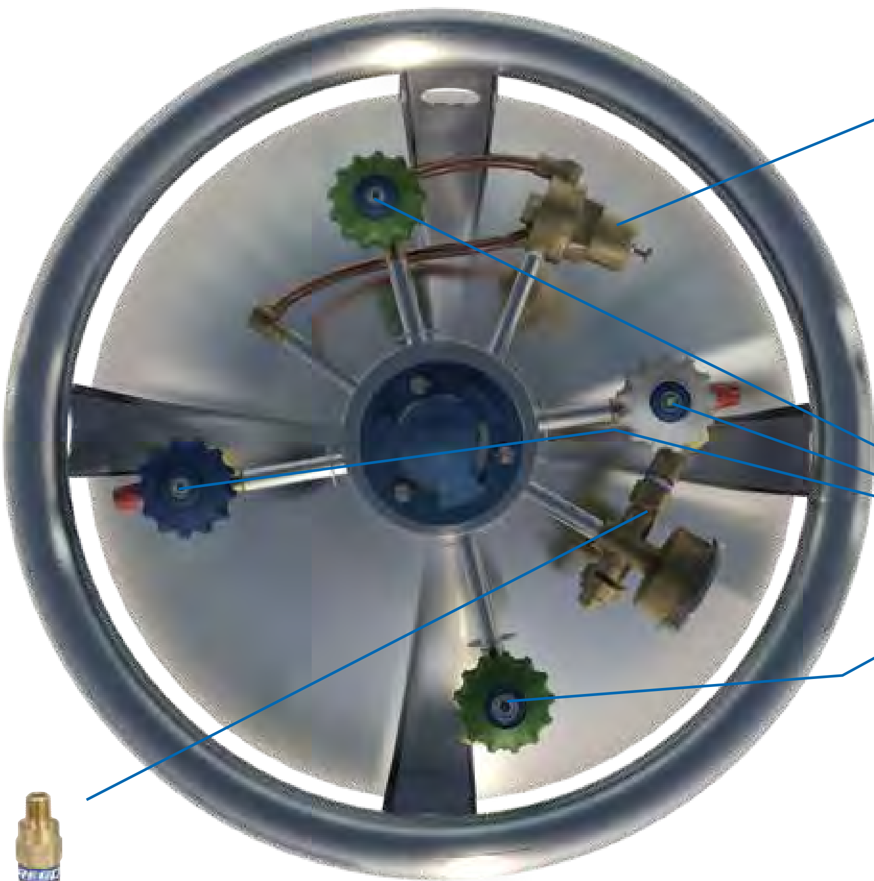
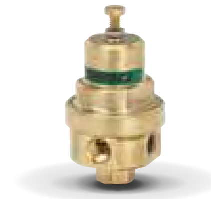
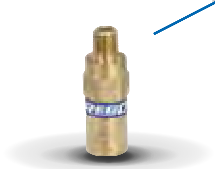
REGO LIQUID CYLINDER PRODUCTS





COMBO REGULATOR
CBC/CBH SERIES

SHUT OFF VALVES
T9460 SERIES



PRESSURE RELIEF VALVE
PRV SERIES

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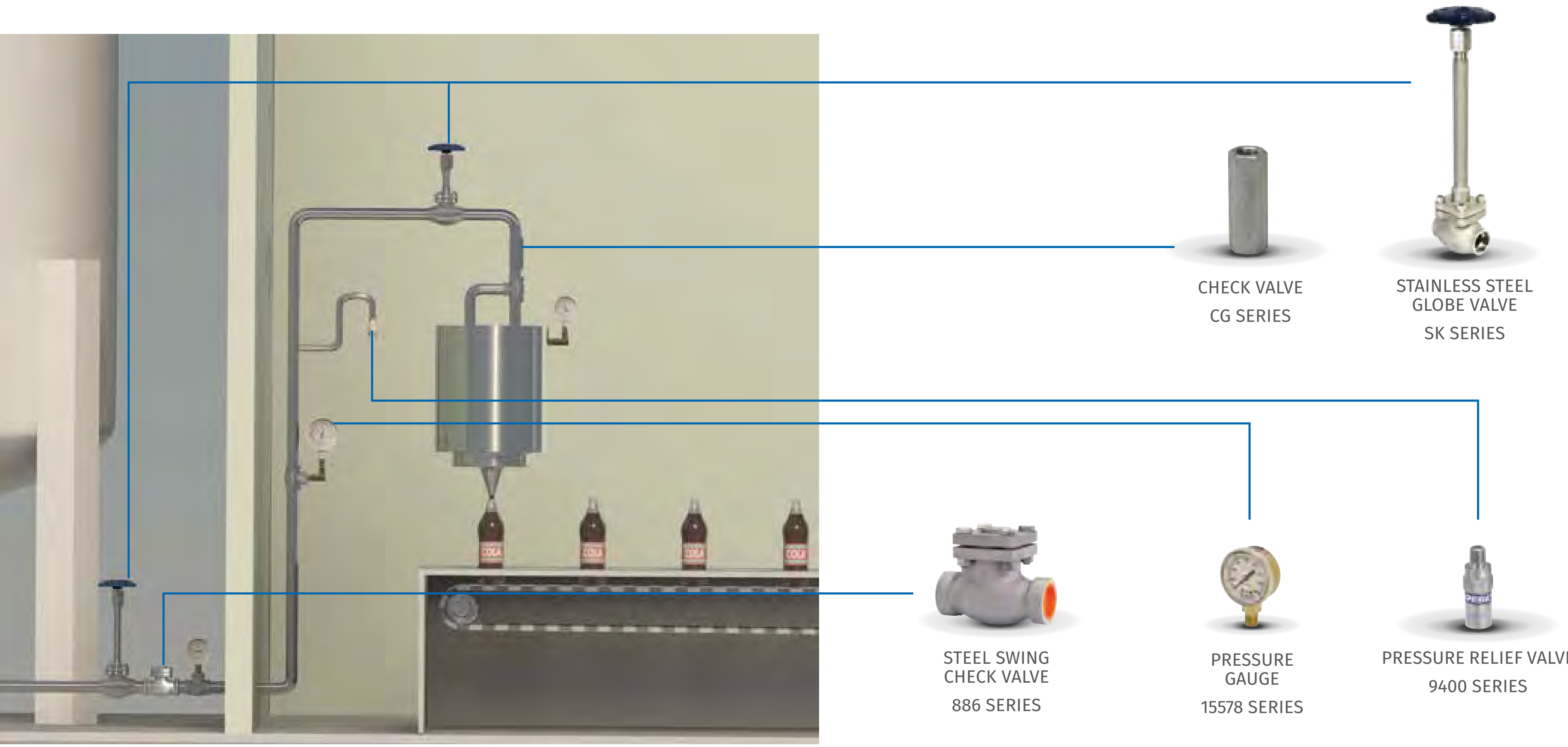
Liquid cryogenic delivery systems

The key to fast freezing and fresher foods

Chilling, freezing, preservation and carbonation are just some of the ways cryogenic gases help preserve and transport foods and beverages. RegO flow control products are constructed for superior performance in demanding manufacturing environments.

NITROGEN INJECTION SYSTEMS FOR FOOD PRESERVATION AND FAST FREEZING



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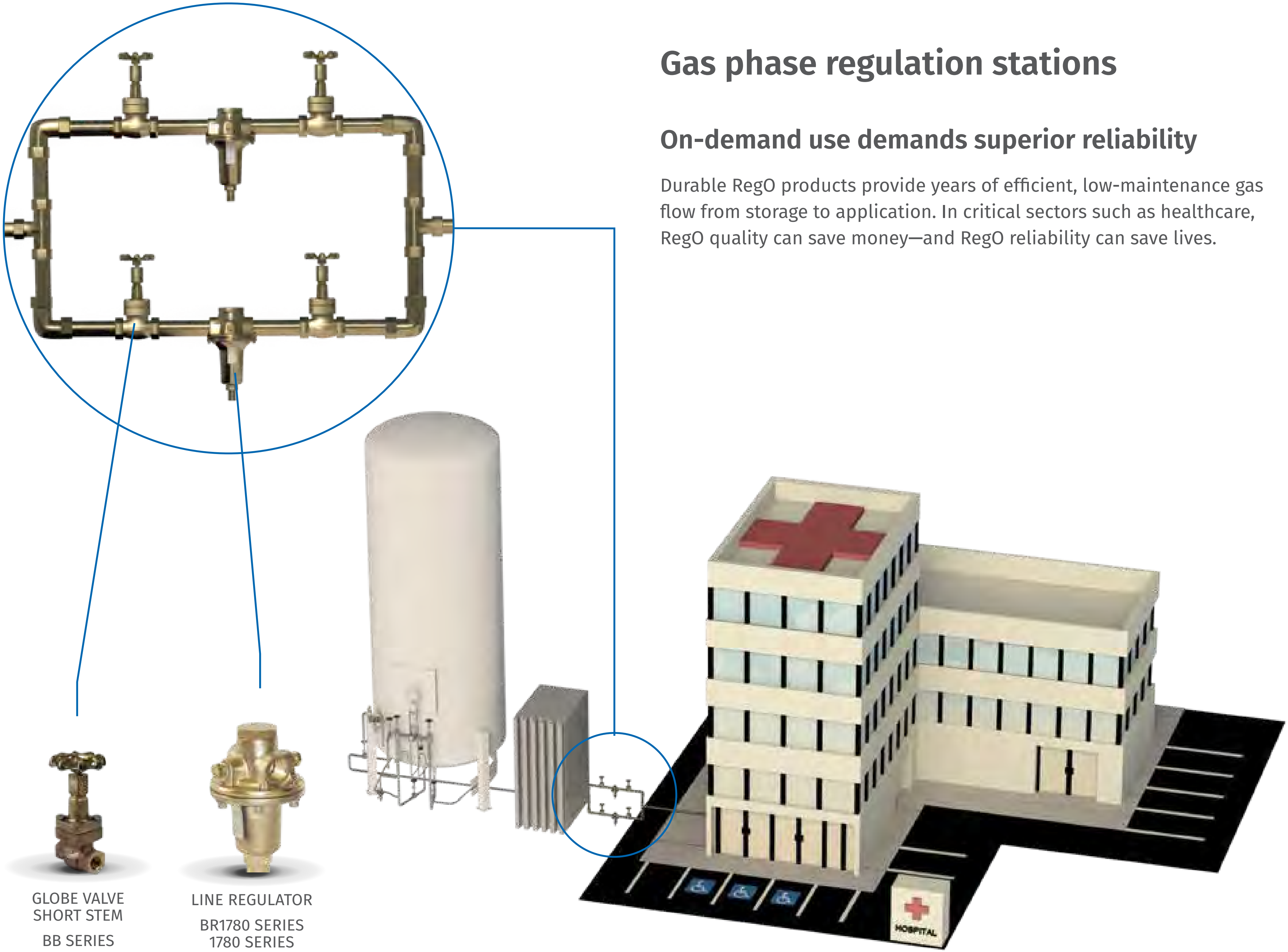
Gas phase regulation stations

On-demand use demands superior reliability

Durable RegO products provide years of efficient, low-maintenance gas flow from storage to application. In critical sectors such as healthcare, RegO quality can save money—and RegO reliability can save lives.



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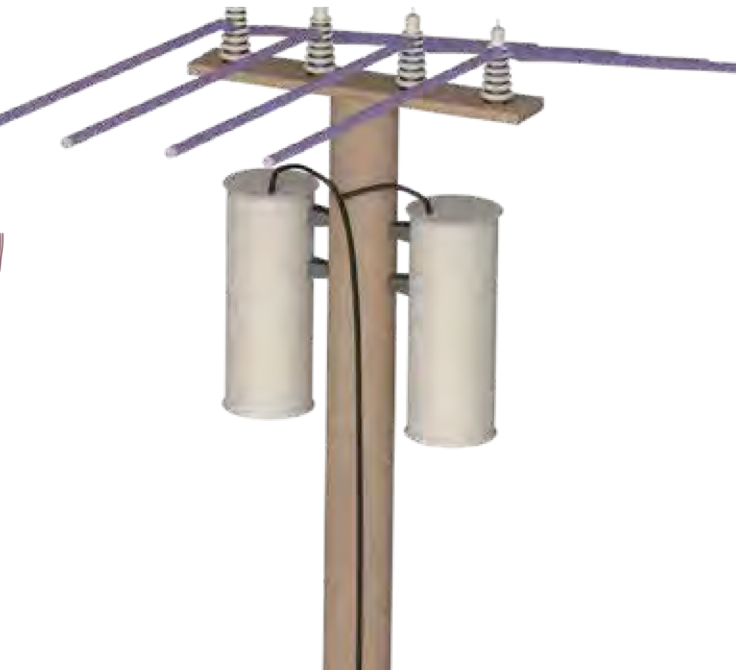
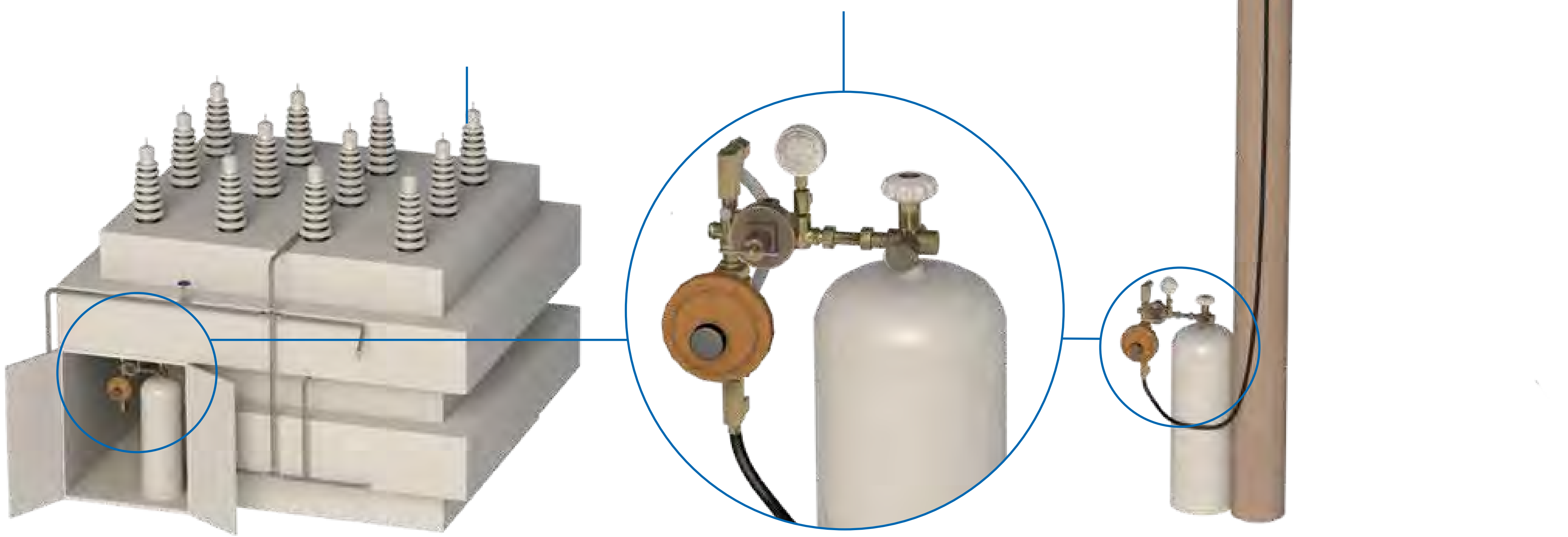
Electric transformer nitrogen delivery systems

Keep the power flowing with RegO

RegO Inertrol™ systems deliver the constant supply of nitrogen needed to provide an inert gas seal in transformer applications, and prevent oxidation and humidity in the transformer oil—extending the lifetime of the unit. Built to withstand the elements and to safely adjust for changes in temperature, RegO systems can be integrated to trigger alerts for unexpected changes in pressure.

INERTROL OUTFITS
4286, 4289, 4291 SERIES





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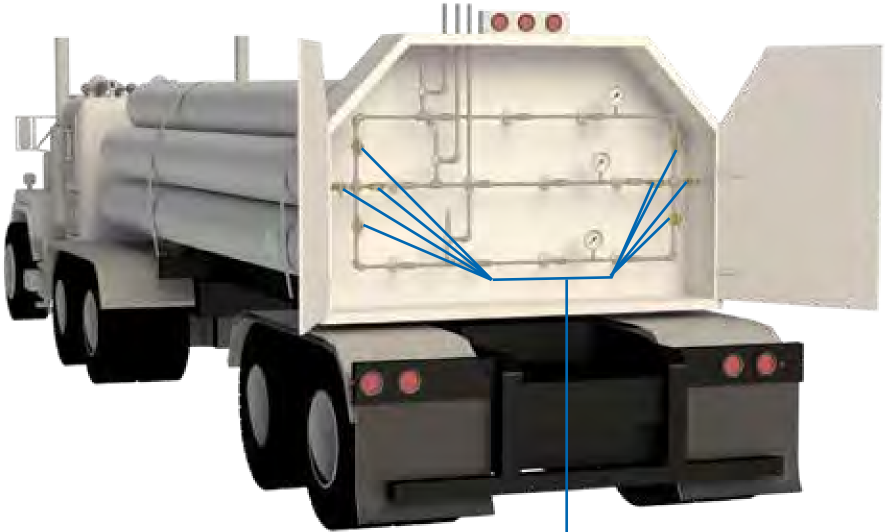
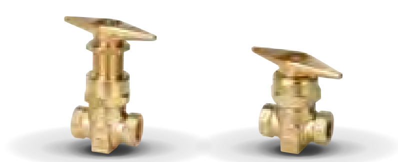
High pressure gas tube storage and transport

High pressure applications meet low maintenance solutions

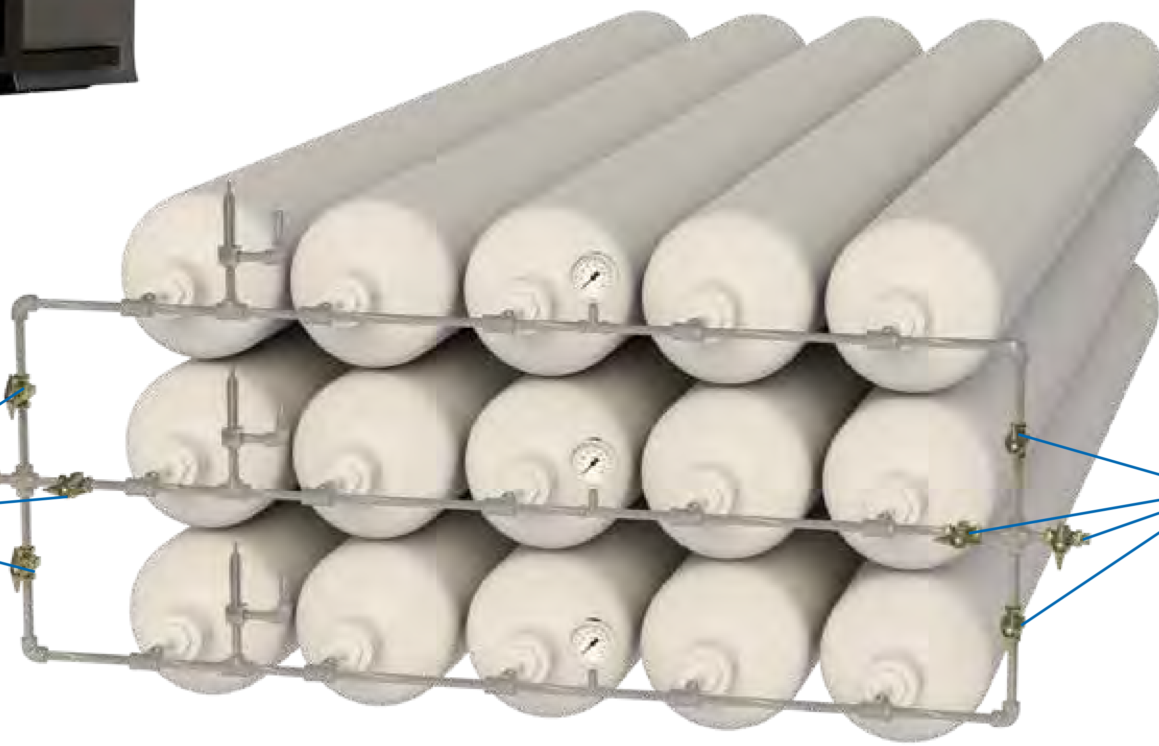
Tube storage brings volume capabilities. A RegO valve brings years of safe, leak-free flow control to gas tube applications, as well as other high pressure manifold and piping systems. The HP9560 Series exhibits a very low operating torque under pressure for ease of manual operation.





HIGH PRESSURE GAS MASTER VALVE

HP9560 SERIES



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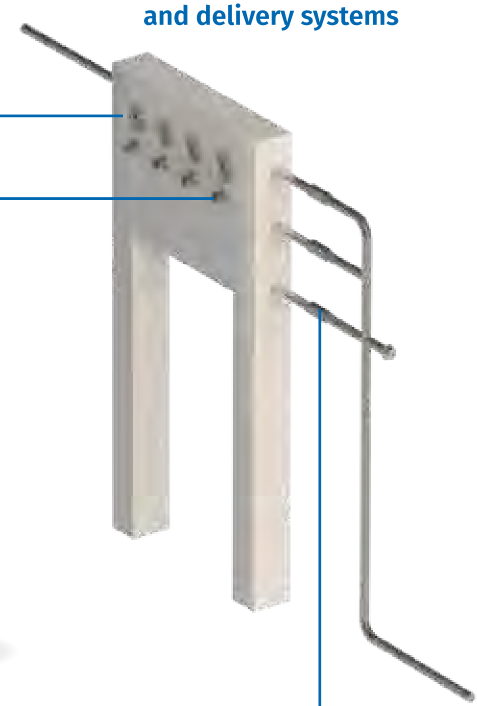
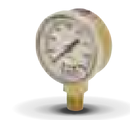
High and medium pressure manifold and delivery systems

We can handle all kinds of pressure

RegO has all the components you need to create your own system. Or you can tap our technical team's deep product and application knowledge and we will build to your specifications. Either way, you will get the benefit of RegO quality and innovation throughout to maintain steady pressure and excellent performance.

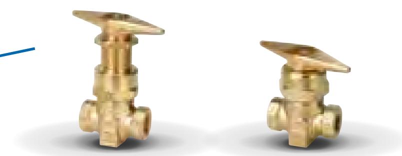
High pressure manifold and delivery systems





PRESSURE GAUGE

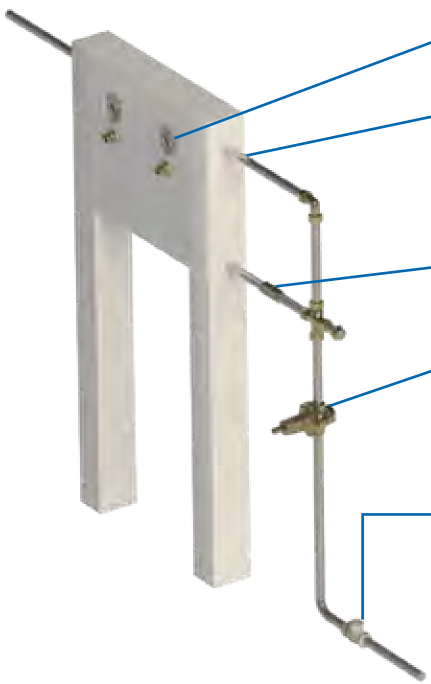
15578 SERIES



HIGH PRESSURE GAS MASTER VALVE

HP9560 SERIES

Medium and low pressure manifold and delivery systems

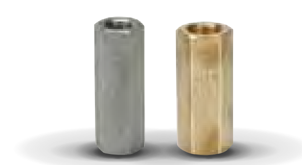


HORIZONTAL CHECK VALVE

8500 SERIES

LINE REGULATOR

BR 1780 SERIES
1780 SERIES



CHECK VALVE

CG SERIES

REGO ALSO OFFERS A COMPLETE SELECTION OF BRASS PIPE, ELBOWS TEES, CROSSES, CAPS AND PLUGS.

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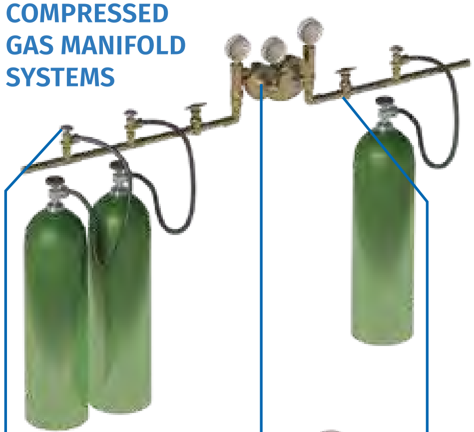
Gas delivery systems

Reliable, on-demand industrial gas

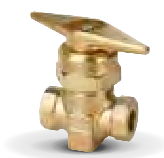
RegO products manage gas for industrial applications, such as welding, cutting, heating and power generation. Through innovative design our products provide maximum reliability and precision to help fuel manufacturing processes and business profits.

COMPRESSED GAS MANIFOLD SYSTEMS



AUTOMATIC CHANGEOVER REGULATOR

M2523HP SERIES

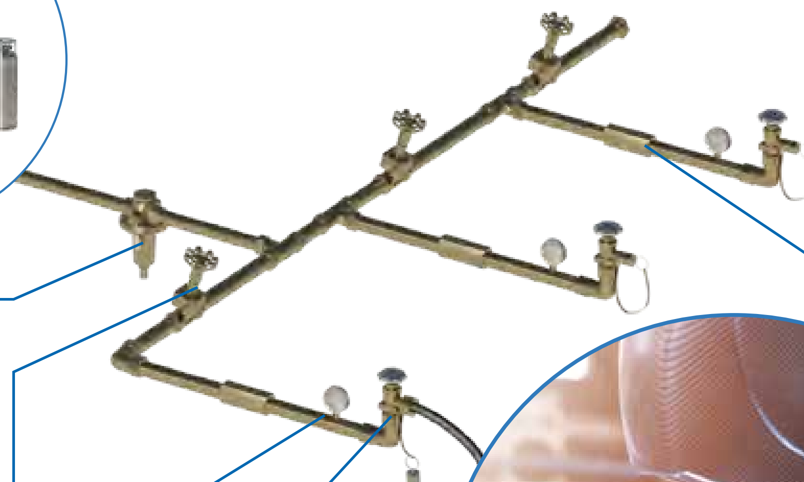


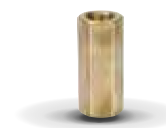
SOFT SEAT CHECK VALVE

CG SERIES

LINE STATION VALVE

7160 SERIES





CHECK VALVE

CG SERIES

REGULATOR

BR1780 SERIES
1780 SERIES

BBS GLOBE VALVE

9400 SERIES

PRESSURE GAUGE

15578 SERIES

LINE STATION VALVE

7160 SERIES

REGO ALSO OFFERS A COMPLETE SELECTION OF BRASS PIPE, ELBOWS TEES, CROSSES, CAPS AND PLUGS.

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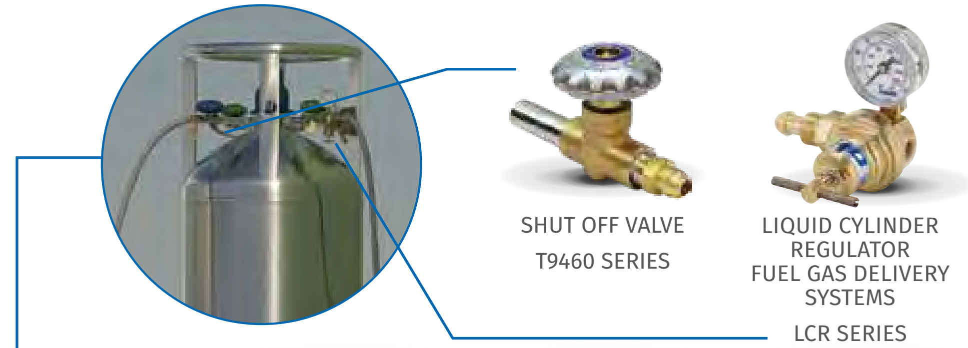
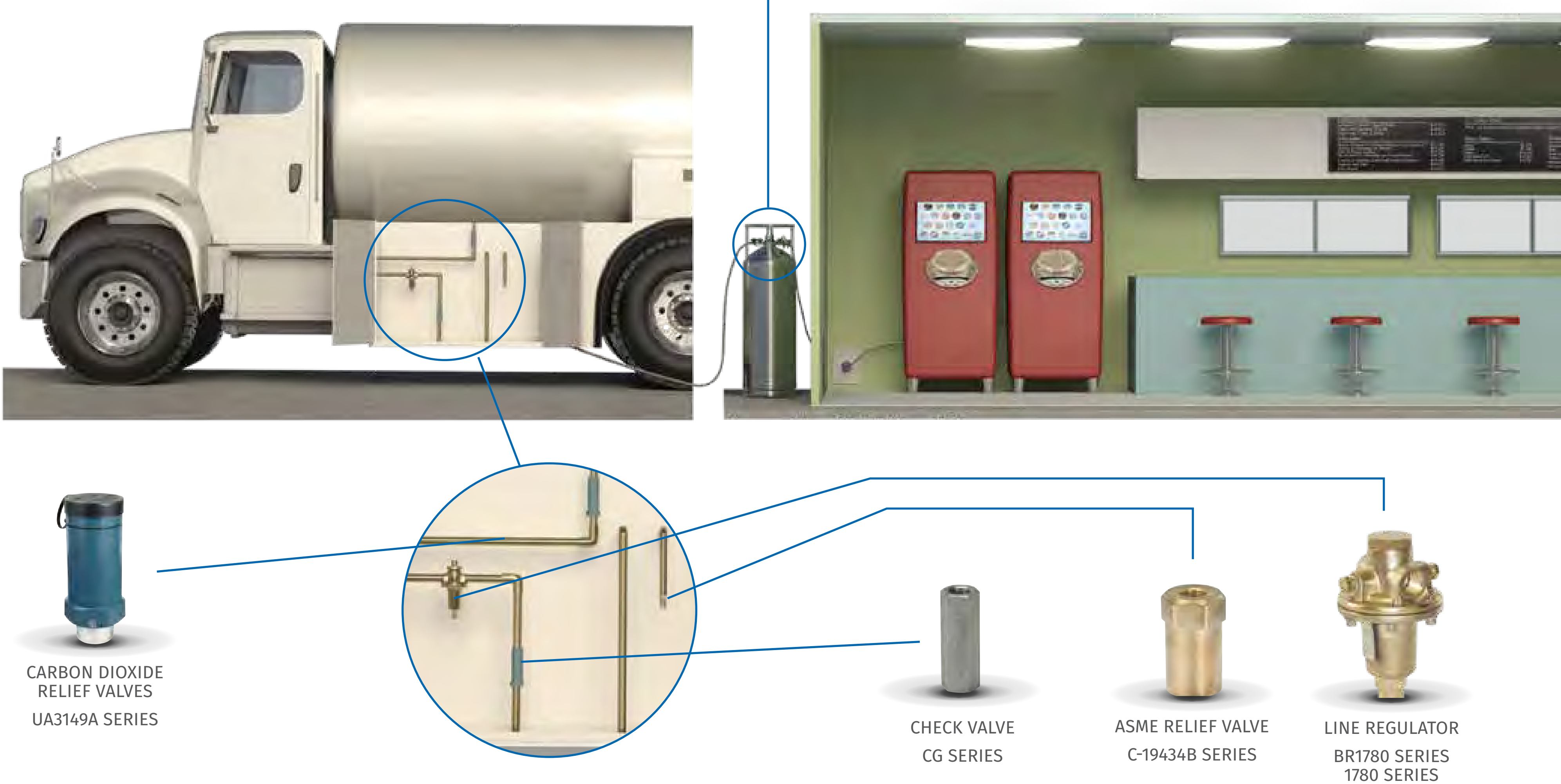
Carbon dioxide delivery systems

We bring the “fizz” without the fuss

From the tank truck to the soda fountain, RegO products bring reliable, cost-effective carbon dioxide delivery—refill after refill.





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Foreword

This catalog briefly describes the Rego® Industrial Gas and Cryogenic Equipment. As a result of condensing information in this catalog, some highly technical and special application material has been omitted. Proper application, installation and maintenance of the product is essential. Buyers should obtain further information if there are any doubts or questions. All information contained in this catalog is subject to change by RegO without notice. Additional product information is available from RegO or authorized product distributors. Illustrations and drawings of individual products are representative of "product groups" and all products within a product group are similar in construction.

Warning

Never use any product on oxygen service if another gas has been previously used on the product. All RegO® Products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured for storage, transport, transfer and use of toxic flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

Materials

RegO may make suggestions for a material to use with a specific media. These suggestions will be based on technical compatibility resources through associations and manufacturers. RegO does not guarantee the material to be compatible with the specific media – this is the responsibility of the user. Users must test under their own operating conditions to determine the suitability of any material in a particular application.

Oxygen Service

RegO provides specified product cleaned in accordance with the intermediate level of ASTMG93 and CGA G-4.1 which assures removal of visible particles and combustible residues. System designers must verify the compatibility of the materials used in this product before installation and operation. Specifications of materials for oxygen service is the USER'S RESPONSIBILITY. If there is any doubt consult an expert.

Notice

Installation, usage and maintenance of all RegO® products must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA 51, CGA, ASME, DOT, ANSI and all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential and should be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and service.

For Sales in California:

WARNING: This product can expose you to chemicals including lead which is known to the state of California to cause cancer, birth defects or reproductive harm. For more information go to **www.P65Warnings.ca.gov**

LIMITED 10 YEAR WARRANTY AND LIMITATION OF LIABILITY

REGO 10 YEAR WARRANTY

NOTICE

Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for the performance of the product.

WARNING

All RegO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, plastic, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage. Many RegO® products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

LIMITED 10 YEAR WARRANTY

RegO® warrants products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within 30 days after buyer's discovery of what buyer believes is a defect, buyer must notify RegO® thereof in writing and ship (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, NC 27244. RegO®, at it's option, and within 45 days, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by it to be defective. Failure of buyer to give such written notice and return the product within 30 days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This limited warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This limited warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain or neglect, nor does it extend to any product or part which has been modified, altered, disassembled or repaired in the field. This limited warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN A COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such a cause arises, whether such cause be based on theories of contract, negligence, strict liability, tort or otherwise. RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or material. From time to time buyers might call to ask RegO® for technical advice based upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not at buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice provided to buyer by any third party and buyer assumes all risk of such advise and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of this limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

The benefits given by the Limited Warranty above are in addition to any other rights and remedies to which you may be entitled by law.

NOTE TO AUSTRALIAN PURCHASERS: The following applies if you purchased this product as a "consumer" as defined in the Australian Consumer Law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Information regarding how to return a product and make a claim under this Limited Warranty is set forth below.

Nothing in this document purports to modify or exclude your rights if any under the Australian Consumer Law, or other laws which cannot be lawfully be modified or excluded.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO® products. Since most users have purchased these products from RegO® distributors, to make a claim under this Limited Warranty the user must, within 30 days after the user's discovery of what the user believes is a defect, notify in writing and return the product (at the user's expense) to the distributor from whom he purchased the product or parts. The distributor may or may not at the distributor's option, choose to submit the product or parts to RegO®, pursuant to its Limited Warranty. Failure by buyer to give such written notice and return the product within 30 days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product or parts by RegO® distributor for replacement or repairs under terms of RegO® Limited Warranty in no way obligates RegO® to the terms of the above warranty. Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

EUROPEAN PED/TPED CERTIFICATION				
The following product categories have received PED/TPED certification by the notified body Tüv, #0036				
Valve number	Maximum Connection Size		DN	PED Category
	Inches	mm		
9560 series	1”	25	25	SEP
9500 series	1”	25	25	SEP
BK8400 series	2”	51	50	II
BK9400 series	2”	51	50	II
T9450 series	½”	13	15	TPED
T9460 series	½”	13	15	TPED
1682 series	¼”	6	8	SEP
BR-&1780 series	1”	25	25	SEP
RG series	¼”	6	8	SEP
ECL series	¼”	6	8	SEP
PRV9430 & PRV19430 series	½”	13	15	IV & TPED
SS9430 & PRV29430 series	½”	13	15	IV & TPED
BK008400 Series	2”	51	50	II
BK009400 Series	2”	51	50	II
BB9400 Series	2”	51	50	II
SKA9400 Series	2”	51	50	II & TPED
SKS9400 Series	2”	51	50	II & TPED
SKM9400 Series	2”	51	50	II & TPED
SKL9400 Series	2”	51	50	II & TPED
Goddard 110/210 Series	4”	102	100	Cat II (6” Class 300 is Cat III)
Goddard 886 / 886M Series	1 ½”	38	40	II
Goddard 840 / 846M Series	2”	51	50	II
Goddard 302 / 306 / 312 / 322 / 326 Series	3”	76	80	II
Goddard 202X / 206 / 222 / 222X / 226 / 226X / 231 / 232 Series	3”	76	80	II
AR4100/5100 Series	1½”	38	40	IV & TPED
DR6108	1”	25	25	SEP
DR6112	1 ½”	38	40	II
DR6113	1 ½”	38	40	II

PED	Pressure Equipment Directive
SEP	Sound Engineering Practice
II	Module A1 Internal Production Control with Monitoring of Final Assessment
	Module D1 QA for Production, Final Inspection and Testing
	Module E1 QA for Final Inspection and Testing
TPED	Transportable Pressure Equipment Directive
IV	Module B EC Type-Examination
	Module D Quality Assurance (QA) for Production, Final Inspection and Testing
	Module F Product Verification
	Module G Unit Verification
	Module H1 Full QA with Design Examination and Monitoring of Final Assessment

You don't thrive for more than 100 years because you're lucky.

It takes quality products, constant innovation, and above all a dedication to the customer.

From a pioneer in the development of oxygen regulators to a global leader delivering a comprehensive line of flow control products, RegO has always kept our customers' interests first.

Quality matters. Industrial gas applications have no room for leaks. That's why we design and manufacture to rigid industry standards and, test 100% of our products, and can offer a 10-year warranty. RegO products work better and last longer.

Innovative products, processes and people. We invest in technology and training to deliver flow control products designed to reduce maintenance and replacement costs, and ensure an efficient, safe work flow.

When our customers thrive, we do too. Our experienced team can provide technical support and design assistance. We're here to help in any way, every day.

Quality materials, innovative, long-lasting design are built into every product we manufacture. That's how we can offer a 10-year product warranty—double that of other companies.

Designed, manufactured and tested in the USA. Our four state-of-the-art facilities build the products that are most critical to your application.

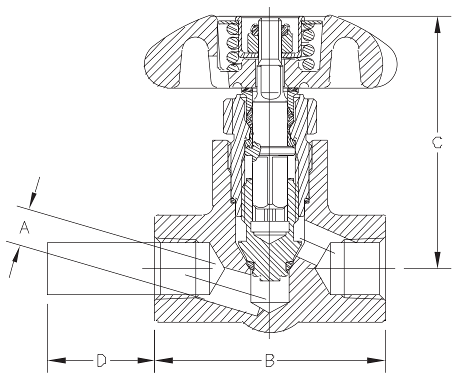
Short Stem Cryogenic Valves
T9450 Series & T9460 Series

Application
The T9450 and T9460 series valves are designed for use on portable cryogenic cylinders and other in-line shut-off valve applications.

Features
- Spring loaded stem seal automatically adjusts for any gasket wear, eliminating the need to constantly retighten the packing nut
- Non-rising stem and low profile allow the valve to fit into tight areas and still provide easy access
- Unique pressure-sealed moisture barrier helps prevent freeze up at cryogenic temperatures
- Conical swivel seal design helps prevent seat galling from over torquing
- Cleaned for oxygen service per CGA G-4.1
- Maximum working pressure is 600 psig (42 barg)
- Working temperature range is -320°F to +165°F (-196ºC to +74ºC)
- Approved for TPED in accordance with EN1626
- 100% Factory Tested

T9450 Series

T9460 Series



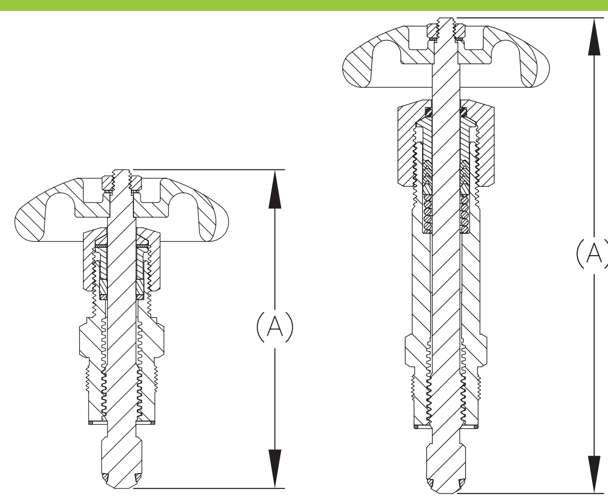
Materials
Body .... Brass
Bonnet .... Brass
Seat Disc .... PCTFE
Stem Seal Gasket.......... PTFE
Handwheel.......... Aluminum
Spring .... Stainless Steel
Stem .... Brass
Poppet ....Brass

Ordering Information

Part Number	Inlet	Outlet	Orifice A	Length B		Height (Approx.) C		Tube D	C_V (Kv)
				inches	mm	inches	mm		
T9452	¼" F.NPT	¼" F.NPT	.250	2½"	63.50	2¾"	69.85	None	.99 (0.85)
T9453	⅜"F.NPT	⅜"F.NPT	.406						1.76 (1.52)
T9454	½" F.NPT	½" F.NPT							1.79 (1.54)
T9464CA	.675" O.D. Tube	⅜"F.NPT	.406					1⅛"	1.76 (1.52)
T9464DA								2⅛"	
T9464ADA								3⅜"	

Extended Stem Retrofit Kits

Application
Retrofit kits may be used to convert the 9450 and 9460 series short stem shut off valves into extended stem style. The conversion can be done without removing the valve from your system. Available in two stem lengths. All kits are oxygen cleaned and packaged per CGA G-4.1.



Materials
Body .... Brass
Seat Disc .... PCTFE
Handwheel.......... Aluminum
Packing.......... PTFE
Stem .... Stainless Steel
Stem Seal Gasket.......... PTFE

Ordering Information

Part Number	Stem Length A	Style
BK9450R	6.5" (165.1mm)	Extended Bonnet and Stem, Spring Loaded Packing

ES8450 & TES8450 Series Extended Stem Valves
BK9450 & BK9470 Series Extended Bonnet Valves

REGO 10 YEAR WARRANTY

Application

For use as a trycock valve or hose drain valve on cryogenic tanks, or as a use, liquid fill, or vent valve on mini-bulk cryogenic tanks. These valves can be used also for other cold gas applications requiring extended stem valves as LNG fueling.

Features

- Union bonnet
- One piece stainless steel stem
- Conical seat design
- Maximum working pressure is 600 psig (42 barg)
- Working temperature is –320°F to +165°F (-196ºC to 74ºC)
- Cleaned for oxygen service per CGA G-4.1
- 100% Factory Tested

TES8450 Series specific feature:

- Grafoil® packing
- Approved by PED and TPED

ES8450 Series specific feature:

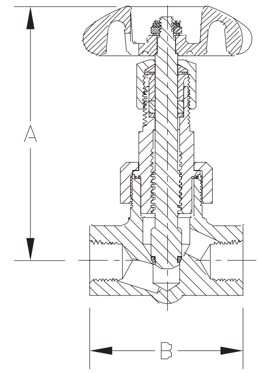
- Manual torque compression packing

BK9450 and BK9470 Series specific feature:

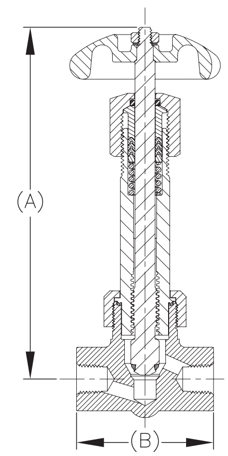
- Extended bonnet and spring loaded packing

BK9470 Series specific feature:

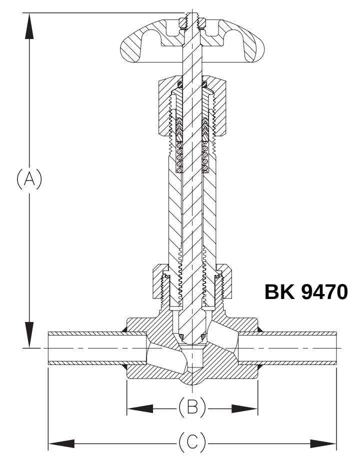
- 304 St. Stl Tube brazed into both ends

ES 8450 Series

BK 9450 Series



BK 9470 Series

Materials

Body and Bonnet..Brass
Stem .... Stainless Steel
Seat Disc .... PCTFE
Handwheel.. Aluminum
Bonnet Gasket... PTFE

Conversion Kit

BK 9450-KIT is a bonnet and stem assembly kit to convert ES 8450 series and previous ES 9450 Series to the BK 9450 style.

Ordering Information

Part Number	Inlet/Outlet Connections	Packing	Height "A" Inches	Height "A" mm	Body Width "B" Inches	Body Width "B" mm	Width with Tube "C" Inches	Width with Tube "C" mm	Cv (Kv)
ES8452	¼" FNPT	PTFE	4.2"	107	2.5"	63	N/A		0.70 (0.60)
TES8452		Grafoil							
ES8453	⅜" FNPT	PTFE							1.10 (0.95)
TES8453		Grafoil							
ES8454	½"FNPT	PTFE							
TES8454		Grafoil							
BK9452	¼" FNPT	PTFE	6.5"	165					0.70 (0.60)
BK9453	3/8" FNPT								1.10 (0.95)
BK9454	½"FNPT								
BK9453FA	5/8" OD tubing x ⅜"FNPT						4.0"	102	
BK9475A	5/8" OD tubing both ends						5.5"	140	

REGO-LOK™
for Securing CGA Fittings on Liquid Cylinders

Application

The REGO-LOK™ is designed for installation on the RegO T9450 and T9460 Series liquid cylinder valves to deter and prevent the removal of the CGA fitting from the valve. The REGO-LOK™ retains standard CGA outlet connection so unauthorized persons do not remove the fitting. By use of a special one-way bolt, the REGO-LOK™ is secured to the valve. The REGO-LOK™ installs in a few minutes with the use of screwdrivers, without valve disassembly, brazing, welding, or drilling. The REGO-LOK™ deters and prevents fitting removal by gas customers, however allows the replacement of fittings by authorized gas supplier plant personnel.

Use The REGO-LOK™ for compliance with CGA SB-26 for medical and industrial liquid cylinders.

REGO 10 YEAR WARRANTY

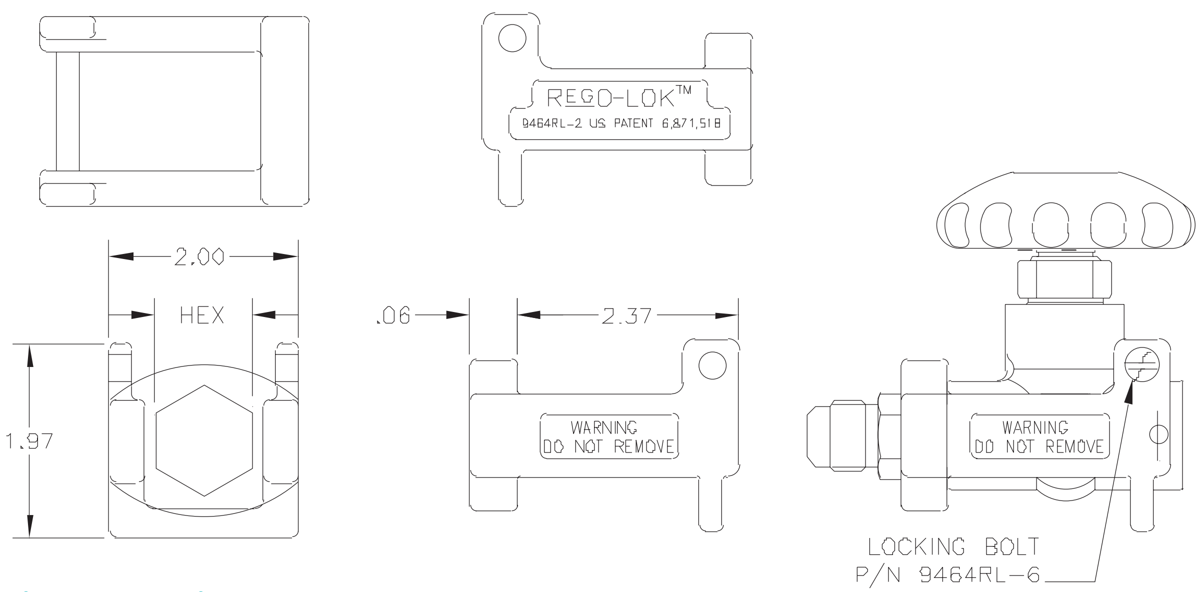
RegO-Lok™

Features

- Stainless Steel REGO-LOK™ with one-way bolt
- Retrofit all common liquid cylinder valves
- Can be supplied on new RegO liquid cylinder valves
- REGO-LOK™ indicates “WARNING: DO NOT REMOVE”
- Worn CGA fittings can be simply replaced by authorized personnel. Requires new 9464RL-6 Bolt
- Can fit over existing fittings for CGA 540, CGA 440, CGA 295, CGA 320, and CGA 326. Check fitting hex size

  NOTE: RegO supplied fitting P/N CGA580RL is required for REGO-LOK™ use with CGA 580 connection
- Prevents loosening of CGA fittings on valves

Satisfies CGA SB-26 and FDA requirements for medical and industrial liquid cylinders.



Ordering Information

Part Number	Item Description	Typical Service Connection
9464RL-0	REGO-LOK™ for ¾” hex fittings	N/A
9464RL-1	REGO-LOK™ for ⅞” fittings	CGA 320, CGA 326 & CGA 295
9464RL-2	REGO-LOK™ for 1” fittings	CGA 440, CGA 540
9464RL-3	REGO-LOK™ for 1⅛” hex CGA 580RL fitting by RegO	CGA 580
CGA580RL	⅜” MNPTxCGA for use with 9464RL-3	CGA 580

Cryogenic Pressure Builder
RG Series

Application

RG series cryogenic regulators are primarily designed to maintain pressure on cryogenic liquid within cryogenic containers. They may also be used in cryogenic lines, vaporizer and converter applications. They are especially useful in installations where space and cost limitations are important.

REGO 10 YEAR WARRANTY

RG Series

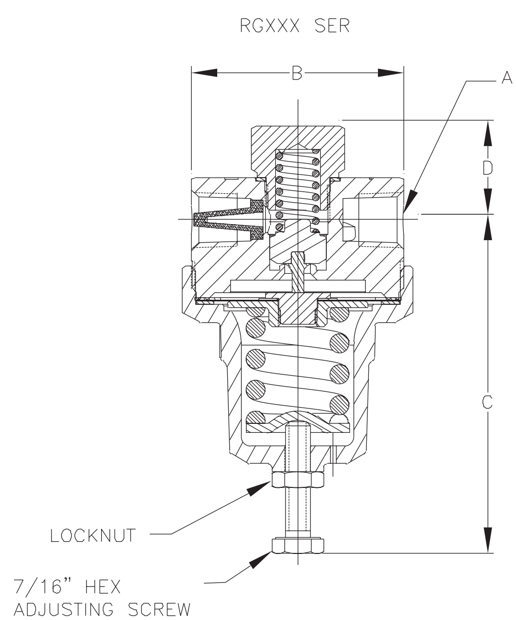
RGXXXAG with gauge port & T handle

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F (-196º C)
- PTFE seat helps assure a positive shut-off at cryogenic temperatures down to -320°F (-196º C)
- High and low pressure regulators are the same compact size—designed to fit in close quarters
- Interchangeable with existing cryogenic regulator units
- Inlet filter helps prevent foreign material from entering the regulator
- Locknut is provided to maintain adjusting screw setting
- RG090AG is available with T handle adjustment screw and gauge ports
- Maximum inlet pressure of 550 psig (37.9 barg)
- Cleaned for oxygen service per CGA G-4.1
- 100% Factory Tested

Materials

Body .... Brass
Bonnet .... Brass
Seat .... PTFE
Springs .... Stainless Steel
Diaphragm Gasket........ PTFE
Backcap Gasket .... Copper
Diaphragm........Bronze



Ordering Information

Part Number	Inlet / Outlet Connections (F.NPT) A Inches (mm)	Width B Inches (mm)	C Inches (mm)	D Inches (mm)	Operating Range (psig)
RG022A	¼" (6.35)	2¹/₁₆" (52.32)	3" (76.20)	1" (25.40)	0-30 psig (0-2.1 barg)
RG125A					25-250 psig (1.7-17.2 barg)
RG125C3	⅜" (9.52)	2⅛" (53.97)	3.33" (84.58)	0.80" (20.32)	
RG175C3					
RG300A	¼" (6.35)	2¹/₁₆" ((52.32)	3" (76.20)	1" (25.40)	125-350 psig (17.2-24.2 barg)
RG90AG					25-250 psig (1.7-17.2 barg)

*Contact sales representative for additional settings.

REGO

Cryogenic ½" Pressure Builder
PB Series

Application

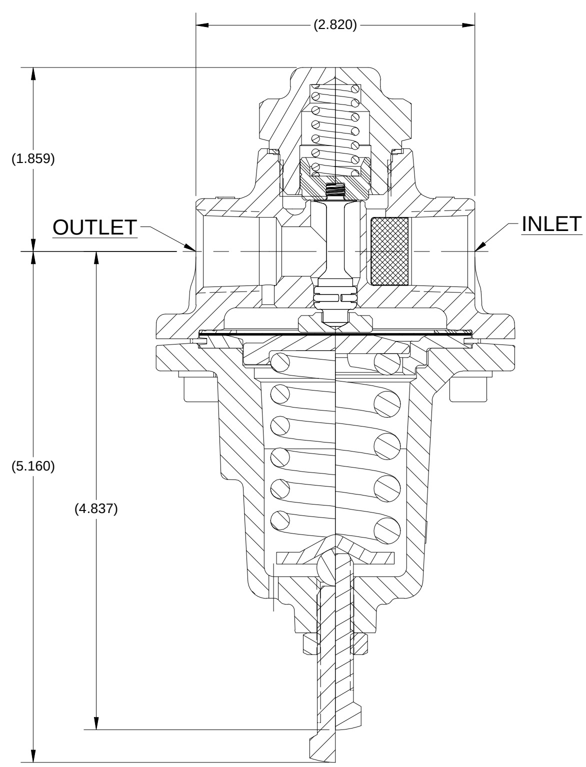
PB series cryogenic regulators are primarily designed to maintain the pressure in cryogenic containers; they may also be used as a line regulator for cryogenic lines and cold gas lines. They are specifically useful in installations where the precision in pressure control and flow capability are important. For use with oxygen, nitrogen, argon, LNG and CO_2.

REGO 10 YEAR WARRANTY

PB504

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F. (-196º C)
- One-piece PTFE Poppet seat design eliminates possible leak paths at cryogenic temperatures and provides better guidance for improved seating, ensuring a positive shutoff.
- High and low pressure regulators are the same compact size—designed to fit in close quarters
- Customizable pressure settings between 20 - 550 psig (1.4 - 37.9 barg)
- Interchangeable with existing cryogenic regulator units
- Inlet filter (150 Mesh) helps prevent foreign material from entering the regulator
- Easier to service, use an allen wrench versus large crescent wrench
- Less field repair because diaphragm is squeezed versus twisted
- Locknut is provided to maintain adjusting screw setting
- Maximum inlet pressure of 600 psig (41.4 barg)
- Cleaned for oxygen service per CGA G-4.1
- 100% Factory Tested
- Copper Backcap Gasket reduces the possibility of external leakage at cryogenic temperatures, as the contraction coefficient is similar to that of brass



Materials

Body .... Brass
Bonnet .... Brass
Poppet .... PTFE
Springs .... Stainless Steel
Diaphragm Gasket .... PTFE
Backcap Gasket .... Copper
Diaphragm .... Bronze

PB504 Series part number configuration

PB504 - 205

PB504 → Series

205 → Set Pressure psig

Ordering Information

Part Number	Inlet / Outlet Connections (F.NPT) A Inches (mm)	Delivery Pressure Setting Range psig (barg)
PB504-020 to 070	½" (12.70)	20 - 75 psig (1.4 - 5.2 barg)
PB504-071 to 175		50 - 180 psig (3.4 - 12.4 barg)
PB504-176 to 300		150 - 300 psig (10.3 - 20.7 barg)
PB504-301 to 465		250 - 465 psig (17.2 - 32.1 barg)
PB504-466 to 550		400 - 550 psig (27.6 - 37.9 barg)

Delivery pressure setting psig specified by suffix in PB regulator number. Example: An order for PB504-125 has a maximum inlet pressure rating of 600 psig (41.3 barg) and is set at an outlet pressure of 125 psig (8.6 barg).

REGO

Cryogenic Economizers
ECL502 Series

Application

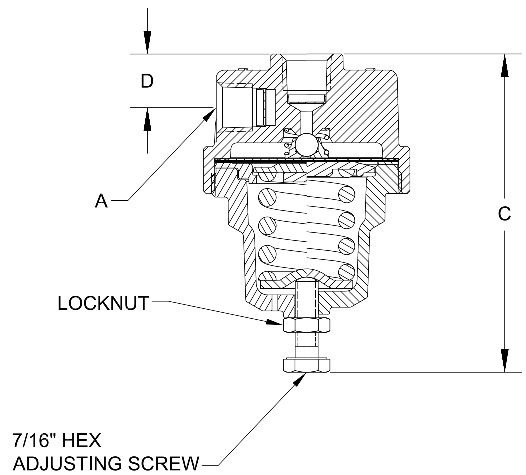
ECL502 series cryogenic economizers are designed to be used as pressure reducing valves to automatically maintain a constant inlet or back pressure, normally closed at pressures below its set point and open at pressures above its set point. The ECL502 is primarily designed to assist in maintaining a desired system pressure ideal for Nitrogen, Oxygen, Argon and other cryogenic cylinder applications with a 100% performance improvement over RegO's ECLXXX series. ECL502 series offers outstanding performance for maintaining LNG fuel line pressure.

REGO 10 YEAR WARRANTY

ECL Series

Features

- ECL502 series design provides premium flow characteristics allowing for fast pressure reduction while maintaining sensitive flow control at lower pressure settings
- All materials of construction- copper alloy, PTFE and stainless steel were selected for compatibility with cryogenic service
- 150 count mesh Monel screens installed into the inlet and outlet ports prevent debris from entering or damaging any downstream components
- Interchangeable with existing cryogenic economizer units.
- Bi-directional flow for LNG fuel systems
- Temperature range: -320°F to +165°F (-196°C to +74°C)
  Low Pressure Models ≤175: 375 psig (≤ 12,1: 25.3 barg)
  High Pressure Models >175: 550 psig (> 12,1: 37.9 barg)
- Pressure setting range: 10-350 psig (0.7-24.1 barg)
- Clean for oxygen service per CGA G-4.1
- Designed in accordance with UNECE.R110 19 - 340 psig (1.3 -23.4 barg)



Materials

Body	Brass
Diaphragm Liner	PTFE
Poppet Seat	Stainless Steel
Adjusting Screw	Stainless Steel
Bonnet	Brass
Screen	Monel
Diaphragm	Bronze
Springs	Stainless Steel

Ordering Information

<table>
<tr><th>Part Number</th><th>Inlet / Outlet Connections (F.NPT) A</th><th>Max inlet pressure</th><th>Width B</th><th>C</th><th>D</th><th>Operating Range</th></tr>
<tr><td>ECL502-22</td><td rowspan="6">¼" NPT</td><td rowspan="5">235 psig (16 barg)</td><td rowspan="6">2.25"
57 mm</td><td rowspan="6">3.5"
89 mm</td><td rowspan="6">.58"
15 mm</td><td>10-60 psig
(0.7 - 4.1 barg)</td></tr>
<tr><td>ECL502-100</td><td rowspan="4">50 - 175 psig
(3.4 - 12.1 barg)</td></tr>
<tr><td>ECL502-123</td></tr>
<tr><td>ECL502-140</td></tr>
<tr><td>ECL502-175</td></tr>
<tr><td>ECL502-325</td><td>550 psig (38 barg)</td><td>150 - 350 psig
(10.3 - 24.1 barg)</td></tr>
</table>

*Contact sales representative for additional settings.

Cryogenic ½" Combination Pressure Builder/Economizer for Bulk Vessels CB504

Application

CB504 series regulators maintain the pressure of cryogenic liquid within bulk vessels combining the pressure building and economizer function in one unit, with ½" NPT inlet and outlet.

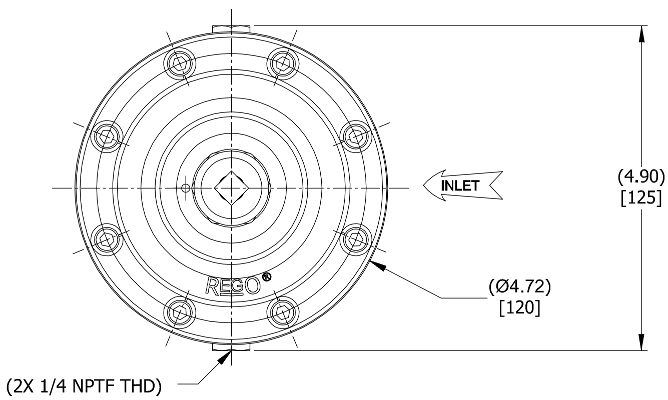
Features

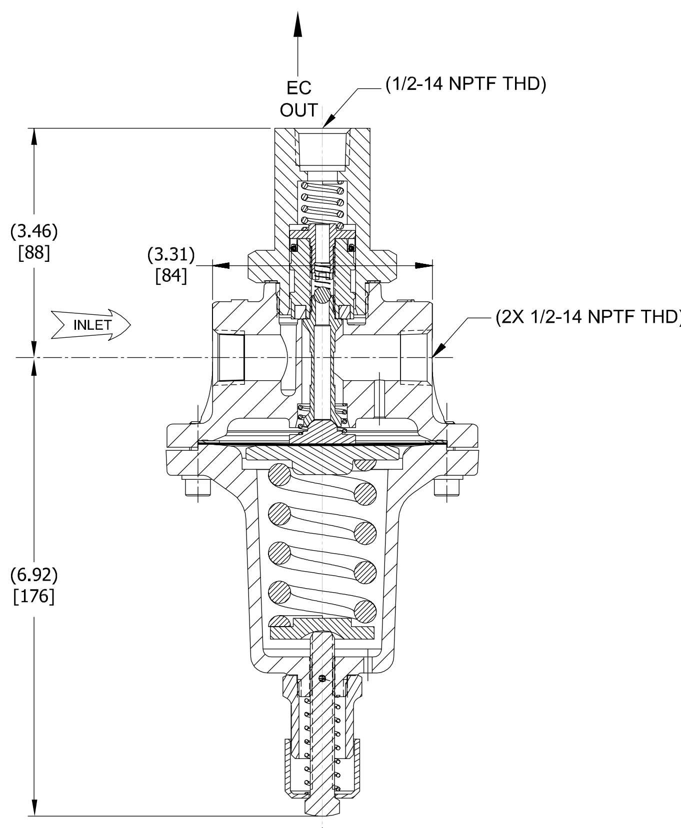
- All parts are copper alloy (brass), PTFE, and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to –320ºF. (–196ºC)
- Pressure setting scale on bonnet cap aids in pressure adjustment
- Maximum inlet pressure of 400 psig (27.6 barg)
- PTFE seat provides positive shut off at cryogenic temperatures
- Compact design fits well in tight plumbing geometries
- 100% factory tested
- Cleaned per CGA G-4.1 for oxygen service
- Suitable for argon, CO2, nitrogen, oxygen and LNG

CB504

Materials

Body	Brass
Bonnet	Brass
Spring	Stainless Steel
Diaphragm Gasket	PTFE
Diaphragm	Phosphor Bronze
Seat	PTFE
Backcap Gasket	Copper





Ordering Information

Part Number	Inlet/Outlet Connections (F.NPT) Inches (mm)	Operating Range (psig)
CB504B	½" (12.70)	100-200 psig (6.9-13.8 barg)

Cryogenic ¼" Combination Pressure Builder/Economizer
CBH502 & CBC502 Series

Application

The regulator combines the function of Pressure Building and Economizer functions in one compact unit. Available in Chart and Taylor-Wharton piping geometries and a variety of pressure ratings.

Features

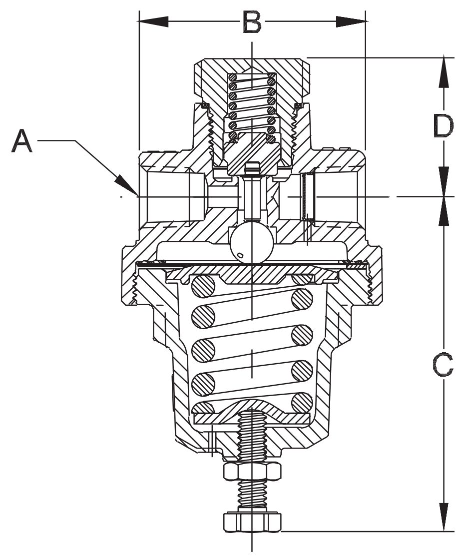
- All parts are copper alloy (brass), PTFE and stainless steel materials selected specifically for compatibility with cryogenic temperatures down to -320° F. (–196ºC)
- PTFE seat helps assure a positive shut-off at cryogenic temperatures down to -320° F. (–196ºC)
- High and low pressure builder/economizers are the same compact size designed to fit in close quarters.
- Interchangeable with existing cryogenic regulator units.
- Inlet screen helps prevent foreign material from entering the regulator.
- Locknut is provided to maintain adjusting screw setting.
- Maximum inlet pressure of 550 psig (37.9 barg)
- Cleaned for oxygen service per CGA G-4.1
- 100% Factory Tested.
- Suitable for argon, CO2, nitrogen, oxygen and LNG.

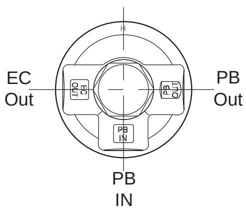
REGO 10 YEAR WARRANTY

CBH502 Series

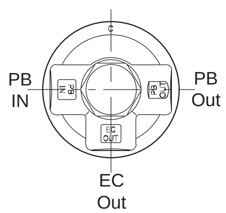
Materials

Body .... Brass
Bonnet .... Brass
Seat Disk .... PTFE
Springs .... Stainless Steel
Gaskets .... PTFE & Copper
Diaphragm .... Bronze





CBH Series



CBC Series

Ordering Information

Part Number	Inlet/Outlet Connections (F.NPT)	"A"	"B"	"C"	"D"	Factory Pressure Setting (psig)	Operating Range (psig)
CBH502-015						15 psig (1.03 barg)	10-60 psig (0.69-4.1 barg)
CBH502-125						125 psig (8.6 barg)	50-175 psig (3.45-12.1 barg)
CBH502-300						300 psig (20.7 barg)	
CBH502-315						315 psig (21.7 barg)	150-350 psig (10.3-24.1 barg)
CBH502-325						325 psig (22.4 barg)	
CBH502-350	¼"	¼"	1.97"	2.89"	1.19"	350 psig (24.1 barg)	
CBC502-015						15 psig (1.03 barg)	10-60 psig (0.69-4.1 barg)
CBC502-125						125 psig (8.6 barg)	50-175 psig (3.45-12.1 barg)
CBC502-300						300 psig (20.7 barg)	
CBC502-325						325 psig (22.4 barg)	150-350 psig (10.3-24.1 barg)
CBC502-350						350 psig (24.1 barg)	

Cryogenic Liquid Cylinder Regulator
LCR Series

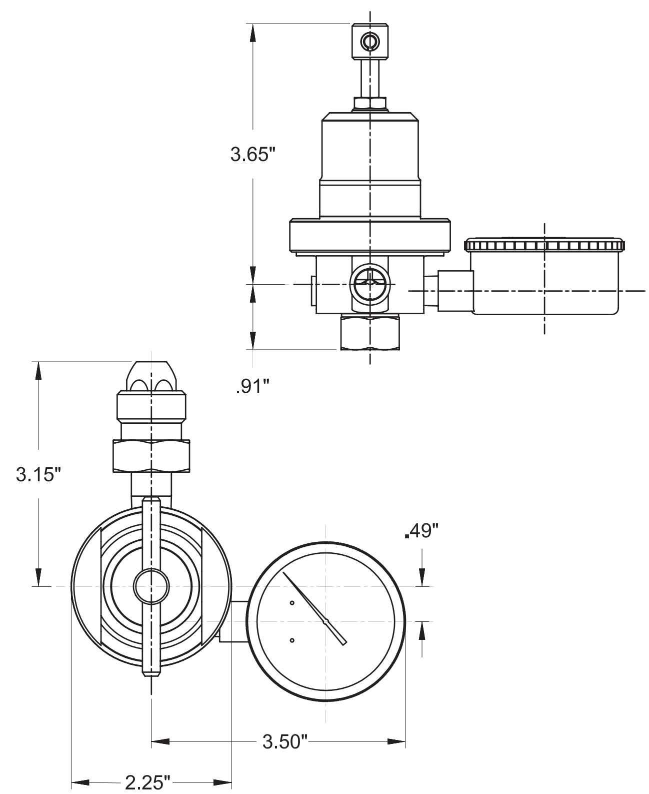
Application

The RegO LCR Series pressure reducing regulator assembly controls the pressure from the gas use line or the discharge of any liquid cylinder with a flow capacity at least double the capacity of the cylinder vaporization coil. For use with oxygen, nitrogen, argon, or carbon dioxide liquid cylinders.

LCR Series

Features

- Easy adjusting screw to maintain pressure setting
- 100% Factory tested
- CGA fitting inlet connection for ready hook-up and ¼" F. NPT outlet.
- Gauges with applicable pressure ranges.
- Two delivery pressure ranges available.
- Clean for use in Oxygen per CGA G-4.1
- Temperature range -320°F (-196°C) to + 165°F (74°C)
- Maximum inlet pressure 550 psig (37.9 barg)
- Inlet filter helps prevent foreign material from entering the regulator.



Materials

Body & Bonnet.. Brass
Seat.. PTFE
Spring & Nut.. Stainless Steel
Diaphragm Gasket... PTFE
Diaphragm.. Bronze
Backcap Gasket... Copper

Ordering Information

Part Number	Gas	Liquid Cylinder Connection	Delivery Pressure Range
LCR200A580	Nitrogen/Argon	CGA 580	25 to 200 psig (1.7-13.8 barg)
LCR200A540	Oxygen	CGA 540	
LCR200A320	Carbon Dioxide	CGA 320	25 to 200 psig (1.7-13.8 barg)
LCR350A580	Nitrogen/Argon	CGA 580	100 to 350 psig (6.9-24.1 barg)
LCR350A540	Oxygen	CGA 540	
LCR350A320	Carbon Dioxide	CGA 320	

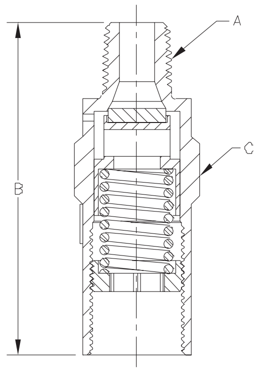
Cryogenic Gas Relief Valves, Non-ASME
9400 Series

Application

9400 series relief valves are specifically designed for vapor line safety relief applications and cryogenic liquid containers.

Features

- Cleaned and packaged for oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Color coded labels clearly identify pressure setting range
- Tamper resistant
- Adapters provide standard pipe thread connections for venting gas to the outdoors
- Repeatable performance
- 100% factory tested
- Temperature Range (Teflon Seat) -320° to +165° F (-196ºC to +74ºC)
  (Flurosilicone Seat) -60° to +165° F (-51ºC to +74ºC)
- Rated for gas service only
- In liquid service be sure to use with a candy cane riser (Sold Separately)
- Setpoint tolerance ± 3%



9400 Series

Materials **SS Style**

Body .... Stainless Steel
Spring .... Stainless Steel
Seat Retainer .... Stainless Steel
Pipe-Away Adapter .... Stainless Steel

Materials **PRV and B-Style**

Body .... Brass
Spring .... Stainless Steel
Seat Retainer .... Brass
Pipe-Away Adapter .... Brass

Flow Performance

- For set pressures 90 - 600 psig capacity is 0.783 SCFM of air per psig of flow pressure. For set pressures 15 - 89 psig capacity is 0.750 SCFM of air per psig of flow pressure.
- B-9425N flow of 6.7 SCFM Air/psig at 120% of set pressure.
- B-9426N flow of 11.0 SCFM Air/psig at 120% of set pressure

Ordering Information

Fill in the blanks with options below.

Example: PRV9432T350

PRV	9432	T	Blank or "P"	350	Blank or "P"
Style	**Size**	**Seat Material**	**Drain Hole**	**Set Pressure**	**Pipe Away Option**

This example part number indicates a ¼" M.NPT PRV style brass relief valve with PTFE seat, set at 350 psig with drain hole and no pipe away adapter.

Seat Material Option

F for Fluorosilicone for PRV and SS styles for 16-139 psig (1.10 - 9.58 barg)
T for PTFE for PRV and SS styles for 140-600 psig (9.65 - 41.36 barg)
N for B-9425 and B-9426, Fluorosilicone seat, all set pressures.

Drain Hole Option

Relief valves without pipeaway typically provided with drain holes, leave blank. **P** - for relief valves without drain hole, for example PRV9432TP350
Drain hole can not be used with pipeaway.

Pipe Away Option

P Pipeaway included and attached, No drain hole in relief valve.
For example PRV9432TP350**P**
Leave blank for relief valve without pipe-away attached.
For example PRV9432TP350.

Set Pressure

Specify set pressure within range specified for style and size. The B-9425 & B-9426N are available in select settings only. Special order.

For easy identification, the following standard settings have color coded labels for all PRV and SS Style sizes and settings marked in psig and barg:

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Style	Size	Inlet M.NPT A Inches (mm)	Body and Valve Material	Pressure Setting Range psig (barg)	Height B Inches (mm)	Wrenching Hex C (mm)	Orifice Size Sq. Inch (mm)	Pipe-Away Adapter P/N	Pipe-Away Outlet F.N.P.T. Inches (mm)
PRV	9432	¼" (6.35)	Brass	10-600 (0.68-41.36)	2.6" (66.04)	⅞" (22.35)	.062 (1.57)	B-9412-2	⅜" (9.65)
SS	9432	¼" (6.35)	Stainless Steel	10-600 (0.68-41.36)	2.6" (66.04)	⅞" (22.35)	.062 (1.57)	SS9412-4	½" (6.35)
PRV	9433	⅜" (9.65)	Brass	10-600 (0.68-41.36)	2.6" (66.04)	⅞" (22.35)	.062 (1.57)	B-9412-2	⅜" (9.65)
SS	9433	⅜" (9.65)	Stainless Steel	10-600 (0.68-41.36)	2.6" (66.04)	⅞" (22.35)	.062 (1.57)	SS9412-4	½" (6.35)
PRV	9434	½" (12.70)	Brass	10-600 (0.68-41.36)	2.8" (71.12)	⅞" (22.35)	.062 (1.57)	B-9412-4	½" (6.35)
SS	9434	½" (12.70)	Stainless Steel	10-600 (0.68-41.36)	2.8" (71.12)	⅞" (22.35)	.062 (1.57)	SS9412-4	½" (6.35)
B-	9425	¾" (19.05)	Brass	20-300 (1.37-20.68)	3.4" (86.36)	1¾" (44.45)	.44 (11.17)	B-3131-10	1" (25.4)
B-	9426	1" (25.4)	Brass	60-300 (4.13-20.68)	5.3" (134.62)	2⅜" (60.45)	.62 (15.74)	B-3132-10	1¼" (31.75)

Pressure Setting and Flow Data
PRV9400

Pressure Setting and Flow Data PRV9400 Series								
Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	barg	Air Flow Capacity SCFM
15	1.0	25	215	14.8	197	450	31.0	399
20	1.4	28	220	15.2	201	460	31.7	408
22	1.5	30	225	15.5	205	470	32.4	416
25	1.7	32	230	15.9	210	480	33.1	425
30	2.1	36	235	16.2	214	490	33.8	434
35	2.4	40	240	16.5	218	500	34.5	442
40	2.8	44	250	17.2	227	510	35.2	451
45	3.1	48	260	17.9	235	520	35.9	459
50	3.4	52	270	18.6	244	530	36.5	468
55	3.8	56	275	19.0	248	540	37.2	477
60	4.1	61	280	19.3	253	550	37.9	485
65	4.5	65	285	19.7	257	560	38.6	494
70	4.8	69	290	20.0	261	570	39.3	502
75	5.2	73	300	20.7	270	580	40.0	511
80	5.5	77	310	21.4	279	590	40.7	520
85	5.9	81	320	22.1	287	600	41.4	528
90	6.2	89	325	22.4	291			
100	6.9	98	330	22.8	296			
110	7.6	106	340	23.4	304			
120	8.3	115	350	24.1	313			
125	8.6	119	360	24.8	322			
130	9.0	123	370	25.5	330			
140	9.7	132	375	25.9	334			
150	10.3	141	380	26.2	339			
160	11.0	149	390	26.9	347			
170	11.7	158	400	27.6	356			
175	12.1	162	410	28.3	365			
180	12.4	167	420	29.0	373			
190	13.1	175	425	29.3	378			
200	13.8	184	430	29.6	382			
210	14.5	192	440	30.3	390			

Color Identification

22 psig	230 psig
35 psig	350 psig
50 psig	450 psig
100 psig	500 psig
150 psig	

Color Identification

1.51 barg	15.85 barg
2.41 barg	24.13 barg
3.44 barg	31.02 barg
6.89 barg	34.47 barg
10.34 barg	

Non-ASME Ordering Information

PRV	94	32	T	P	350	P

- P → Pipe-Away Adapter (Blank designates no adapter)
- 350 → Pressure Setting (psig)
- P → Without Drain Hole (Blank designates no drain hole)
- T → Seal Material Teflon (Available F for Fluorosilicone)
- 32 → Size ¼" (Available 33 for 3/8" and 34 for ½")
- 94 → Series Identification
- PRV → Style and Material Brass. (Available SS for Stainless Steel)

Cryogenic Gas Relief Valves, ASME
PRV19430 & PRV29430 Series

Application

The 19430 and 29430 relief valves are designed for oxygen and other industrial gases and for cryogenic service in the vapor space. Apply on piping systems, liquid cylinders or mini-bulk cryogenic containers where an ASME relief valve is required.

19430 Series

Features

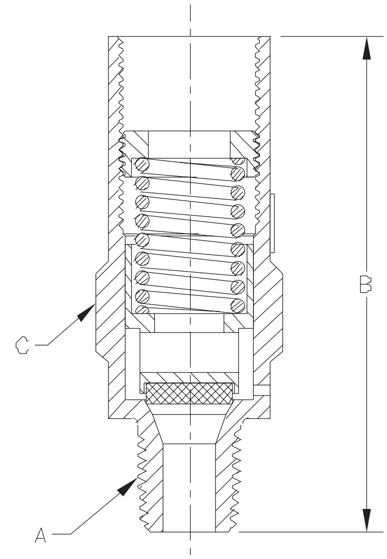
- A.S.M.E. rated, National Board Certified
- Bubble tight at 95% of set pressure
- Full flow at 110% at set pressure
- Repeatable performance
- 100% factory tested
- Temperatures Range (Teflon Seat) -320° to +165° F (-196ºC to +74ºC)
  (Flurosilicone Seat) -60° to +165° F (-51ºC to +74ºC)
- Cleaned and packaged for oxygen service per CGA G-4.1
- Rated for gas service only
- Color coded labels clearly identify pressure setting range
- Tamper resistant
- In liquid service be sure to use with a candy cane riser (Sold Separately)

Materials SS Style

Body .... Stainless Steel
Spring .... Stainless Steel
Seat Retainer........ Stainless Steel
Pipe-Away Adapter .... Stainless Steel

Materials PRV and B-Style

Body .... Brass
Spring .... Stainless Steel
Seat Retainer........ Brass
Pipe-Away Adapter .... Brass



Flow Performance

For set pressures 90 - 600 capacity is 0.692 SCFM of air per psig of flow pressure. For set pressures 15 - 89 capacity is 0.750 SCFM of air per PSIA of flow pressure. Flow pressure per ASME is 10% above set pressure or +3 psig (0.2 barg), whichever is greater.

Ordering Information

Fill in the blanks with options below.

Example: PRV019432T350

PRV	1	9432	T	Blank or "P"	350
Style	**Body Material**	**Size**	**Seat Material**	**Drain Hole**	**Set Pressure**

Body Material Option

1 ASME approved valve made of brass
2 ASME approved valve made of stainless steel

Seat Material Option

F for Fluorosilicone for 15 to 139 psig (6.2 - 9.5 barg) set points.
T for PTFE for 140-600 psig (9.6 - 41.4 barg) set points.

Drain Hole Option

Leave blank for relief with drain hole. Insert **P** if no drain hole.

Set Pressure

Enter number for set pressure in psig (6.2 - 41.4 barg) from 15 to 600.

Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Material	Inlet A Inches (mm)	Height B Inches (mm)	Wrenching Hex C Inches (mm)	Orifice Size
PRV19432	Brass	¼" (6.35)	2.6" (66.04)	⅞" (22.35)	.062 sq. inch 1.57 sq. mm
PRV29432	Stainless Steel				
PRV19433	Brass	⅜" (9.65)			
PRV29433	Stainless Steel				
PRV19434	Brass	½" (12.70)	2.8" (71.12)		
PRV29434	Stainless Steel				

Pipe-away adapter options available (sold separately)
Drain hole can not be used with pipe-away

Pressure Setting and Flow Data
PRV19430 and PRV29430 Series

Pressure Setting and Flow Data PRV19430 and PRV29430 Series								
Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	Barg	Air Flow Capacity SCFM
15	1	25	215	14.8	174	450	31	353
20	1.4	28	220	15.2	178	460	31.7	360
22	1.5	30	225	15.5	181	470	32.4	368
25	1.7	32	230	15.9	185	480	33.1	376
30	2.1	36	235	16.2	189	490	33.8	383
35	2.4	40	240	16.5	193	500	34.5	391
40	2.8	44	250	17.2	200	510	35.2	398
45	3.1	48	260	17.9	208	520	35.9	406
50	3.4	52	270	18.6	216	530	36.5	414
55	3.8	56	275	19	220	540	37.2	421
60	4.1	61	280	19.3	223	550	37.9	429
65	4.5	65	285	19.7	227	560	38.6	436
70	4.8	69	290	20	231	570	39.3	444
75	5.2	73	300	20.7	239	580	40	452
80	5.5	77	310	21.4	246	590	40.7	459
85	5.9	81	320	22.1	254	600	41.4	467
90	6.2	79	325	22.4	258			
100	6.9	86	330	22.8	261			
110	7.6	94	340	23.4	269			
120	8.3	102	350	24.1	277			
125	8.6	105	360	24.8	284			
130	9	109	370	25.5	292			
140	9.7	117	375	25.9	296			
150	10.3	124	380	26.2	299			
160	11	132	390	26.9	307			
170	11.7	140	400	27.6	315			
175	12.1	143	410	28.3	322			
180	12.4	147	420	29	330			
190	13.1	155	425	29.3	334			
200	13.8	162	430	29.6	337			
210	14.5	170	440	30.3	345			

Color Identification

22 psig	230 psig
35 psig	350 psig
50 psig	450 psig
100 psig	500 psig
150 psig	

Color Identification

1.51 barg	15.85 barg
2.41 barg	24.13 barg
3.44 barg	31.02 barg
6.89 barg	34.47 barg
10.34 barg	

ASME Ordering Information

PRV	194	32	T	P	350

- 350 → Pressure Setting (psig)
- P → Without Drain Hole
- T → Seal Material Teflon (Available F for Fluorosilicone)
- 32 → Size ¼" (Available 33 for 3/8" and 34 for ½")
- 194 → Series Identification and Material, 194 for Brass and 294 for SS
- PRV → Style

Brass High Pressure ASME Relief Valves
PRV19534K Series

Application

The RegO PRV19534 Series relief valves are designed for CO2 and other industrial gases and for cryogenic service in the vapor space. Apply on piping systems, liquid cylinders or mini-bulk cryogenic containers where an ASME relief valve is required. Compatible with all oxygen, nitrogen, argon, helium, LNG and CO2.

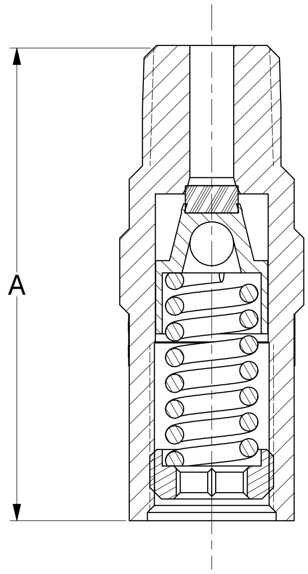
PRV19534K Series

Features

- All valves are cleaned and packaged for oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Full flow at 110% of set pressure
- Temperature range -320°F to +165°F (-196ºC to +74ºC)
- Rated for gas service only, not liquid
- Setpoint tolerance +/- 3%
- Available in brass with settings from 800 to 1,000 psig
- Builds off proven experience of and further extends PRV9400 series offerings
- ASME rated National Board Certified
- Easy to read color coded psig / bar labels
- Tamper resistant
- Adapters provide standard pipe thread connections for venting gas to the outdoors (B-9412-4, sold separately)
- Repeatable performance
- 100% factory tested
- In liquid service be sure to use with a candy cane riser (sold separately)
- In liquid service be sure to use with a candy cane riser (Sold Separately)

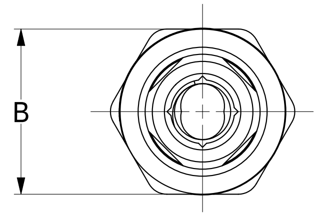
Flow Performance

For set pressures 800-1000 psig, capacity is 0.805 SCFM of air per PSIA of flow pressure. Flow pressure per ASME is 10% above set pressure or +3 PSIG, whichever is greater.



Materials

Body .... Brass ASTM B16 UNS C36000
Spring .... Stainless Steel ASTM A313
Seat Retainer.................................... Brass ASTM B16 UNS C36000
Seat .... PCTFE (Kel –F)
Pipe-Away Adapter .... Brass ASTM B16 UNS C36000



Ordering Information

Part Number	Material	Pressure Setting Range psig (barg)	Inlet M.NPT	"A" Inches (mm)	"B" Inches (mm)	Orifice Size Inch² (mm²)	Kd Value	Pipe-Away Adapter P/N
PRV19534K	Brass	800- 1000 (55.1 - 68.9)	½"	2.9 (73.1)	1.0 (25.4)	0.266 (171.6)	0.79	B-9412-4

Pressure Setting and Flow Data
PRV19534K Series

Pressure Setting PSIG	Pressure Setting BARG	Air Flow Capacity SCFM	Pressure Setting PSIG	Pressure Setting BARG	Air Flow Capacity SCFM
800	551.6	720	900	620.5	809
805	555	725	905	624	813
810	558.5	729	910	627.4	818
815	561.9	734	915	630.9	822
820	565.4	738	920	634.3	826
825	568.8	742	925	637.8	831
830	572.3	747	930	641.2	835
835	575.7	751	935	644.7	840
840	579.2	756	940	648.1	844
845	582.6	760	945	651.6	849
850	586.1	765	950	655	853
855	589.5	769	955	658.5	857
860	593	773	960	661.9	862
865	596.4	778	965	665.3	866
870	599.8	782	970	668.8	871
875	603.3	787	975	672.2	875
880	606.7	791	980	675.7	880
885	610.2	796	985	679.1	884
890	613.6	800	990	682.6	888
895	617.1	804	995	686	893
			1000	689.5	897

Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

ASME Ordering Information

PRV	195	34	K	P	809

- 809 → Pressure Setting (psig)
- P → Without Drain hole
- K → Seal Material Kel-F
- 34 → Size ½”
- 195 → Series Identification
- PRV → Style

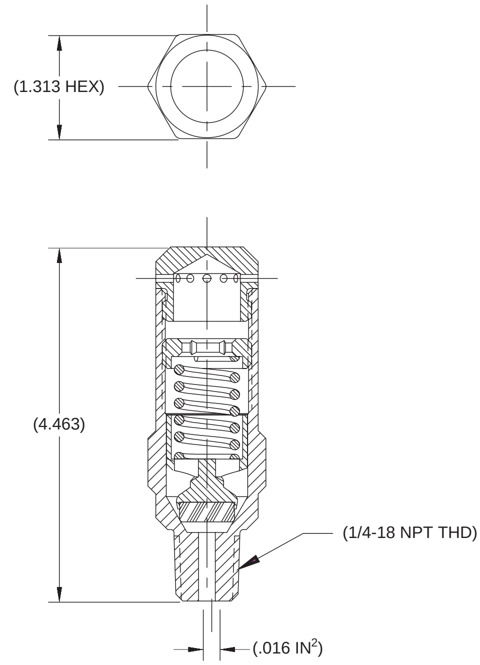
Noise Reduction Relief Valve
NRF9430 Series

Application
For use with cryogenic liquid cylinders to provide substantial reduction of discharge noise in sensitive environments. Our patent pending design allows for an efficient and environmentally friendly flow path.

Features
- Packaged and cleaned for oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Temperature range –320ºF to +165ºF (-196º to +74 Cº)
- 100% factory tested
- Tamper Resistant
- Repeatable Performance
- Below 90db@ 350 Set Pressure @ 2 meters away
- In liquid service be sure to use with a candy cane riser (Sold Separately)

NRF Series

Pipe Away Option
P Pipeaway included and attached, No drain hole in relief valve.
For example NRF9432T140P
Leave blank for relief valve without pipe-away attached.
Pipeaway adapter part number NRF250-4.



Materials
Body ....Brass
Spring .... Stainless Steel
Seat Retainer...Brass

Ordering Information

Part Number	Inlet Inches (mm)	Set Pressure psig	Set Pressure barg
NRF9432T230	¼" (6.35)	230	15.9
NRF9432T350		350	24.1
NRF9432T500		500	34.5

Noise Reduction Relief Valve
NR Series

Application

Designed especially for indoor applications such as laboratories where relief valve discharge noise is an issue. RegO's NR series PRV provides excellent flow characteristics with a 50% reduction in outlet noise related to relief valve.

Features

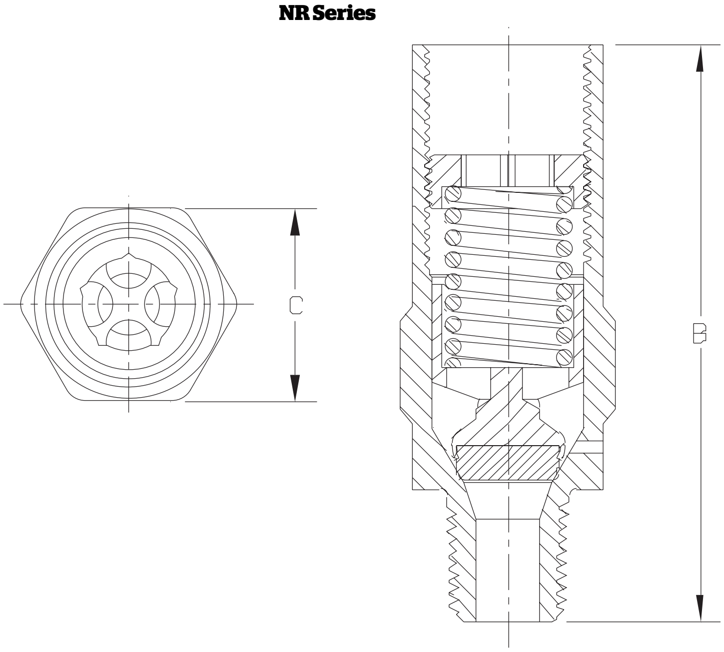
- Packaged and cleaned for oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Temperature range –320ºF to +165ºF (-196º to +74 Cº)
- 100% factory tested
- Repeatable Performance
- Below 90db@ 350 Set Pressure @ 2 meters away
- In liquid service be sure to use with a candy cane riser (Sold Separately)

Materials

Body .... Brass
Spring .... Stainless Steel
Gasket .... PTFE

NR Series

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.



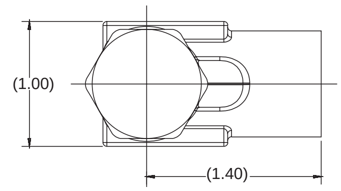
Ordering Information

Part Number	Seat Material	Inlet Connections (M.NPT) Inches (mm)	"B" Inches (mm)	"C" Inches (mm)	Orifice Size Inches (mm)	Factory Pressure Setting		Pipe-Away Adapter
						psig	barg	
NR9432F022	Fluorosilicone	¼" (6.35)	2.60" (66.04)	⅞" (22.35)	.062 (1.57)	22	1.51	B-9412-2
NR9432F050						50	3.44	
NR9432F100						100	6.89	
NR9432T230	PTFE					230	15.85	
NR9432T250						250	17.23	
NR9432T300						300	20.68	
NR9432T350						350	24.13	
NR9432T360						360	24.82	

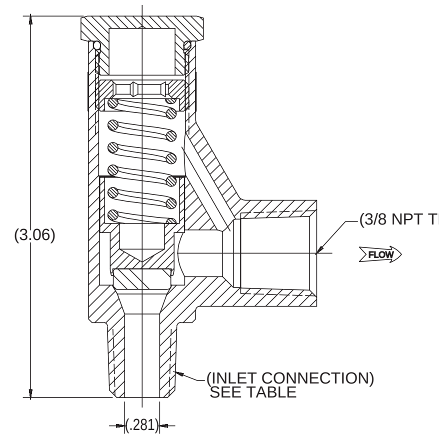
Right Angle Relief Valves
NG900 Series

Application

The NG900 series is designed specifically to avoid over-pressurization in LNG fuel tank applications and LNG installations. The NG900 Series is also compatible with oxygen, nitrogen, argon, helium, and hydrogen.
These valves open and close at preset pressures to ensure reliable performance at cryogenic temperatures.



NG9002T

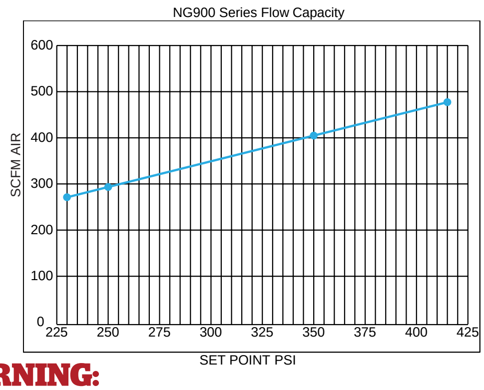


Features

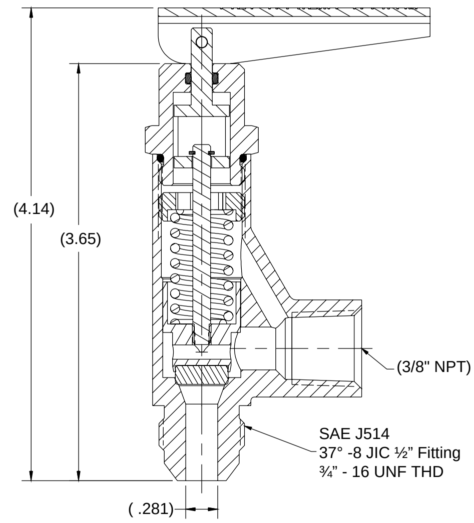
- Optional pull lever for manual override
- 100% Factory tested
- Temperature range -320ºF to +196ºF (-196ºC to +74ºC)
- Designed in accordance with & approved by ECE R110
- Approved by PED and TPED

Materials

Spring Pin .... Stainless Steel
Handle .... Stainless Steel
O-rings .... Fluorosilicone
Connector .... Brass
Stem .... Stainless Steel
Bonnet .... Brass
Seat Disc .... PTFE
Spring .... Stainless Steel
Adjusting Screw .... Stainless Steel
Body .... Brass
Poppet .... Brass



NG9008M



WARNING:

Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Manual Override	Pressure setting	
				psig	barg
NG9002T022	¼" MNPT (6.35 mm)	⅜" FNPT (9.65 mm)	No	22	1.52
NG9002T058				58	4.0
NG9002T230				230	15.85
NG9002T250				250	17.23
NG9002T275				275	18.96
NG9002T350				350	24.13
NG9002T415				415	28.61
NG9003T230	⅜" MNPT (9.65 mm)			230	15.85
NG9003T250				250	17.23
NG9003T350				350	24.13
NG9003T415				415	28.61
NG9008M230	SAE J514 (37˚-8JIC ½" fitting) (¾"-16 UNF thread male)		Yes	230	15.85
NG9008M250				250	17.23
NG9008M280				280	19.30
NG9008M350				350	24.13
NG9008M415				415	28.61

*Contact your sales representative for additional settings.

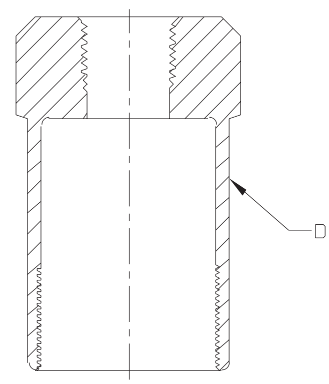
Cryogenic Gas Relief Valves, ASME
B-19434B Series

Application

The B-19434B Series relief valves are suitable for use with oxygen and non corrosive industrial gases, such as nitrogen, argon and helium.

Features

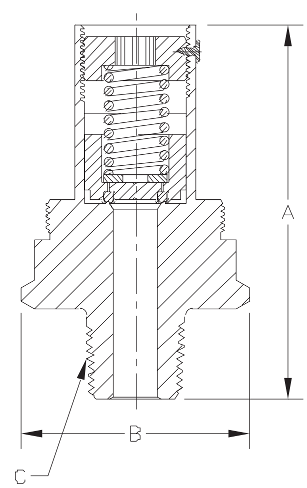
- The B-19434B design permits the valve to open slightly to relieve moderately excessive pressure
- When the pressure increases beyond a predetermined point, the valve opens to its full discharge capacity in order to quickly reduce excess pressure
- Pipe-away adapter for venting gas to the outdoors is available (Sold Separately)
- ASME rated, certified
- Cleaned for use in oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Full flow at 110% of set pressure
- Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater
- Rated for gas service only
- 100% factory tested
- Temperature range: -60º to 165º F (-51º - 74º C)



Materials

Body .... Brass
Spring .... Stainless Steel
Seat Retainer... Brass
Seat Disc (B-19434B Series).. .Silicone
Pipe-Away Adapter .... Brass

B-19434B Series



WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Pressure Setting	ASME Relief Capacity (CFM/Air)	Height A Inches (mm)	Width B Inches (mm)	Inlet Connection (M.NPT) C Inches (mm)	Pipe-Away Adapter Part Number D
B-19434B235	235 psig (16.2 barg)	476	2¹⁵⁄₁₆" (74.67)	1¾" (44.45)	½" (12.7)	*B-19434-5 ½" F.NPT Outlet (12.70 mm)
B-19434B250	250 psig (17.2 barg)	505				
B-19434B300	300 psig (20.7 barg)	601				
B-19434B350	350 psig (24.1 barg)	711				
B-19434B375	375 psig (25.9 barg)	760				

* Pipe Away Adapter is sold separately.
** Contact factory for additional settings.

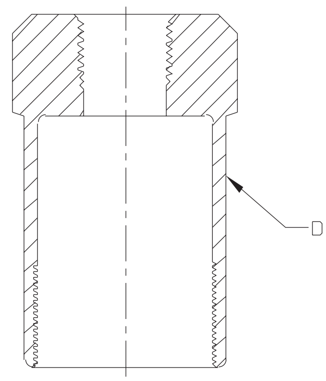
Cryogenic Gas Relief Valves, ASME
C-19434B Series

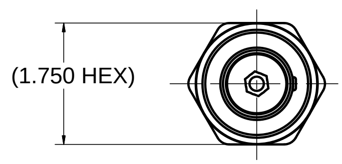
Application

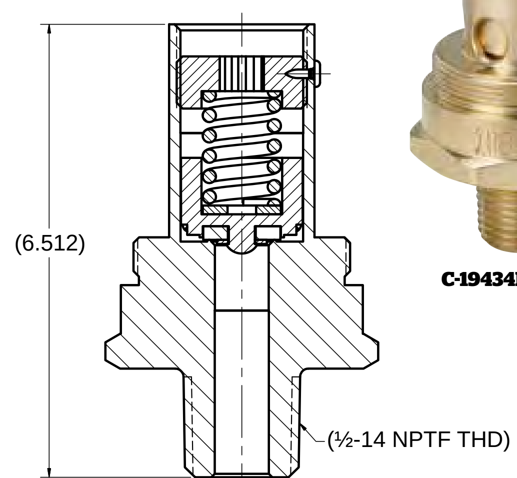
The C-19434B series relief valves are designed for use in carbon dioxide service.

Features

- The C-19434B design permits the valve to open slightly to relieve moderately excessive pressure
- When the pressure increases beyond a predetermined point, the valve opens to its full discharge capacity in order to quickly reduce excess pressure
- Pipe-away adapter for venting gas to the outdoors is available
- ASME rated, certified
- Cleaned for use in oxygen service per CGA G-4.1
- Bubble tight at 95% of set pressure
- Full flow at 110% of set pressure
- Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater
- Repeatable performance guaranteed by well-proven seat design used in many other RegO relief valves for many years.
- Rated for gas service only
- 100% factory tested
- Temperature range: -40º to 165º F (-40º - 74º C)







C-19434B Series

Materials

Body .... Brass
Spring .... Stainless Steel
Seat Retainer.. Brass
Seat Disc C-19434B Series....................... EPDM Synthetic Rubber
Pipe-Away Adapter .... Brass

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Pressure Setting (psig)	ASME Relief Capacity (CFM/Air)	Height A Inches (mm)	Width B Inches (mm)	Inlet Connection (M.NPT) C Inches (mm)	Pipe-Away Adapter Part Number D
C-19434B235	235 psig (16.2 barg)	476	2$\frac{15}{16}$” (74.67)	1¾” (44.45)	½” (12.7)	*B-19484-6 1” F.NPT Outlet (25.40 mm)
C-19434B250	250 psig (17.2 barg)	505				
C-19434B280	280 psig (19.3 barg)	555				
C-19434B285	285 psig (19.6 barg)	579				
C-19434B300	300 psig (20.7 barg)	601				
C-19434B325	325 psig (22.4 barg)	649				
C-19434B335	335 psig (23.1 barg)	668				
C-19434B350	350 psig (24.1 barg)	711				
C-19434B375	375 psig (25.9 barg)	760				

* Pipe Away Adapter is sold separately.
** Contact factory for additional settings.

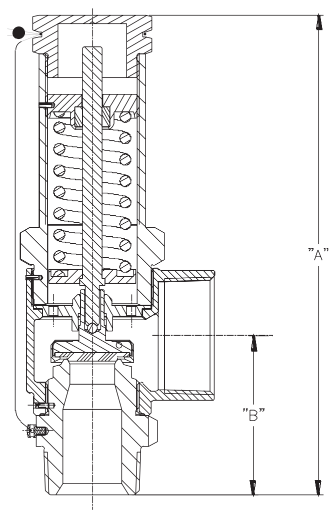
Angle Relief Valve, ASME
AR4100 Series

Application

The ASME approved 90° relief valves AR Series, provide precise relief set points which protect cryogenic vessels and piping systems for over-pressurization.

Features

- High flow rates are approved by rigorous testing to ASME BVPC Code Section VIII
- The ninety degree configuration provides relief of gases eliminating direct flow through the spring
- The ninety degree configuration allows easy incorporation to plumbing for output containment
- Bubble tight seat provides 100% shut off when reseating or static mode
- A variety of inlets and pressure settings assure adherence to application requirements
- Temperature Range: -320°F (-196°C) to +165°F (+74°C)
- Cleaned for Oxygen Service per CGA G-4.1
- 100% Factory Tested
- PED, TPED, ASME & CRN Certified



AR4100 Series

REGO 10 YEAR WARRANTY

Materials

Body .... Bronze ASTM B61
Upper Body.................................... Stainless Steel ASTM A582
Seat & Stem .... Brass ASTM B16
Poppet Guide... Brass ASTM B16
Spring Retainer... Brass ASTM B16
Adjusting Screw... Brass ASTM B16
Cap .... Brass ASTM B16
Ball... Stainless Steel
Gasket .... Copper ASTM B152-17
Spring .... Stainless Steel ASTM A313
Seal ....PCTFE for < 75 psig, Fluorosilicone for ≥ 75 psig

Ordering Information

Fill in the blanks with options below.

Example: AR4106A300

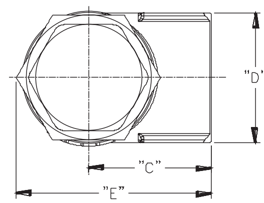
AR	4106	A	300
Angle Relief	Size	Cert Requirements and Pressure Unit	Set Pressure

Certifications
A - ASME, TPED, PED
B - ASME, TPED, PED
N - TPED, PED
: - B Version Assembled in Europe

Set Pressure	Size
A,N - psig	04=½"
B - barg	06=¾"
	08=1"
	12=1½"

Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

Note: For psig pressure settings, the part numbers end in A
For barg pressure settings, the part numbers end in B



Air Capacity= m x P
Where:
m = Slope Value
P= Pressure, Absolute @10% overpressure.

Example: Pressure relief valve, ½" inlet x 1" outlet, at 80 psig. Part number AR4104A080.
m = 1.4
P= 80 psig
Air Capacity= 1.4 x [(80psi x 1.10) +14.7]
Air Capacity= 143.8 SCFM (air)

Flow Performance

AR4104A set pressures 75 - 500 capacity is 1.4 SCFM of air per psig of flow pressure.
AR4106A set pressures 75 - 400 capacity is 1.56 SCFM of air per psig of flow pressure.
AR4108A set pressures 75 - 425 capacity is 3.463 SCFM of air per psig of flow pressure.
AR4112A set pressures 80 - 425 capacity is 7.86 SCFM of air per psig of flow pressure.
Flow pressure per ASME is 10% above set pressure or +3 psig (0.2 barg), whichever is greater.

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Ends	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Set Pressure	ASME Flow Capacity (Air) at 110% Set Pressure	Weight Lbs (Kg)
AR4104A	½" (15)	1" (25)	Thread NPT	6.03" (153.16)	1.97" (50.04)	1.63" (41.40)	1.63" (41.40)	2.49" (63.25)	250 psig	406 SCFM *	2.75 (1.25)
AR4104B									17.23 barg*	690 m³/hr	
AR4106A	¾" (20)		Thread NPT						250 psig*	451 SCFM	
AR4106B									17.23 barg*	766 m³/hr	
AR4108A	1" (25)	1¼" (32)	Thread NPT	6.88" (174.75)	2.37" (60.20)	2.00" (50.80)	1.90" (48.26	3.01" (76.45)	250 psig*	1,003 SCFM	3.75 (1.70)
AR4108B									17.23 barg*	1704 m³/hr	
AR4112A	1½" (40)	2" (50)	Thread NPT	9.64" (244.86)	3.20" (81.28)	2.45" (62.23)	2.60" (66.04)	3.89" (98.81)	250 psig*	2,277 SCFM	8.00 (3.63)
AR4112B									17.23 barg*	3869 m³/hr	

*Various pressure settings are available within listed ranges
Note: For Non-ASME stamp, the part numbers are: AR4104N, AR4106N, AR4108N, AR4112N.

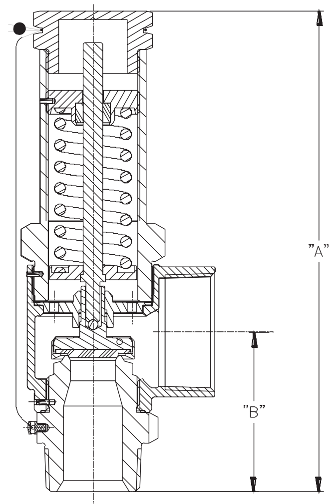
Angle Relief Valve, ASME
AR5100 Series

Application

The ASME approved 90° relief valves AR Series, provide precise relief set points which protect cryogenic vessels and piping systems for over-pressurization.

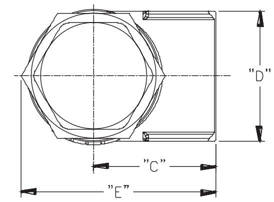
REGO 10 YEAR WARRANTY

AR5100 Series



Features

- High flow rates are approved by rigorous testing to ASME BVPC Code Section VIII
- The ninety degree configuration provides relief of gases eliminating direct flow through the spring
- The ninety degree configuration allows easy incorporation to plumbing for output containment
- Bubble tight seat provides 100% shut off when reseating or static mode
- A variety of inlets and pressure settings assure adherence to application requirements
- Temperature Range: -320°F (-196°C) to +165°F (+74°C)
- Cleaned for Oxygen Service per CGA G-4.1
- 100% Factory Tested
- PED, TPED & ASME Certified



Materials

Body .... Bronze ASTM B61
Upper Body.................................. Stainless Steel ASTM A582
Seat & Stem .... Brass ASTM B16
Poppet Guide.. Brass ASTM B16
Spring Retainer... Brass ASTM B16
Adjusting Screw.. Brass ASTM B16
Cap... Brass ASTM B16
Ball.. Stainless Steel
Gasket .... Copper ASTM B152-17
Spring .... Stainless Steel ASTM A313
Seal ....PCTFE for < 75 psig, Fluorosilicone for ≥ 75 psig

Ordering Information

Fill in the blanks with options below.

Example: AR5106A300

AR	5106	A	300
Angle Relief	Size	Cert Requirements and Pressure Unit	Set Pressure

Certifications
A - ASME, TPED, PED
B - ASME, TPED, PED
N - TPED, PED
: - B Version Assembled in Europe

Set Pressure
A,N - psig
B - barg

Size
04=½”
06=¾”
08=1”
12=1½”

Setpoint tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

Note: For psig pressure settings, the part numbers end in A
For barg pressure settings, the part numbers end in B

Air Capacity= m x P
Where:
m = Slope Value
P= Pressure, Absolute @10% overpressure.

Example: Pressure relief valve, ½” inlet x 1” outlet, at 80 psig. Part number AR5104A080.
m = 1.4
P= 80 psig
Air Capacity= 1.4 x [(80psi x 1.10) +14.7]
Air Capacity= 143.8 SCFM (air)

Flow Performance

AR5104A set pressures 75 - 500 capacity is 1.4 SCFM of air per psig of flow pressure.
AR5106A set pressures 75 - 400 capacity is 1.56 SCFM of air per psig of flow pressure.
AR5108A set pressures 75 - 425 capacity is 3.463 SCFM of air per psig of flow pressure.
AR5112A set pressures 80 - 425 capacity is 7.86 SCFM of air per psig of flow pressure.
Flow pressure per ASME is 10% above set pressure or +3 psig (0.2 barg), whichever is greater.

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Ends	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Set Pressure	ASME Flow Capacity (Air) at 110% Set Pressure	Weight Lbs (Kg)
AR5104A	½” (15)	1” (25)	Thread BSP	6.03” (153.16)	1.97” (50.04)	1.63” (41.40)	1.63” (41.40)	2.49” (63.25)	250 psig*	406 SCFM	2.75 (1.25)
AR5104B									17.23 barg*	690 m^3/hr	
AR5106A	¾” (20)		Thread BSP						250 psig*	451 SCFM	
AR5106B									17.23 barg*	766 m^3/hr	
AR5108A	1” (25)	1¼” (32)	Thread BSP	6.88” (174.75)	2.37” (60.20)	2.00” (50.80)	1.90” (48.26	3.01” (76.45)	250 psig*	1,003 SCFM	3.75 (1.70)
AR5108B									17.23 barg*	1704 m^3/hr	
AR5112A	1½” (40)	2” (50)	Thread BSP	9.64” (244.86)	3.20” (81.28)	2.45” (62.23)	2.60” (66.04)	3.89” (98.81)	250 psig*	2,277 SCFM	8.00 (3.63)
AR5112B									17.23 barg*	3869 m^3/hr	

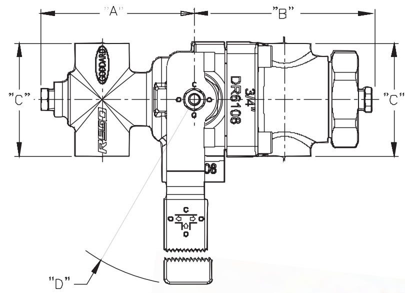
*Various pressure settings are available within listed ranges
Note: For Non-ASME stamp, the part numbers are: AR5104N, AR5106N, AR5108N, AR5112N.

Pressure Setting and Flow Data
AR Series

Pressure Setting and Flow Data AR Series SCFM (air)						
Pressure Setting psig	barg	MPAG	AR4104A AR5104A	AR4106A AR5106A	AR4108A AR5108A	AR4112A AR5112A
22	1.5	.15	54	61	135	306
25	1.7	.17	59	66	146	332
30	2.1	.21	67	74	165	375
35	2.4	.24	74	83	184	418
40	2.8	.28	82	91	203	461
45	3.1	.31	90	100	222	505
50	3.4	.34	98	108	241	548
55	3.8	.38	105	117	260	591
60	4.1	.41	113	126	279	634
65	4.5	.45	121	134	299	678
70	4.8	.48	128	143	318	721
75	5.2	.52	136	151	337	764
80	5.5	.55	144	160	356	807
90	6.2	.62	159	177	394	894
100	6.9	.69	175	194	432	980
110	7.6	.76	190	211	470	1067
120	8.3	.83	205	228	508	1153
130	9.0	.90	221	245	546	1240
140	9.7	.97	236	262	584	1326
145	10.0	1.0	244	271	603	1369
150	10.3	1.03	252	280	622	1413
175	12.1	1.21	290	322	718	1629
200	13.8	1.38	329	365	813	1845
225	15.5	1.55	367	408	908	2061
230	15.9	1.59	375	417	927	2104
235	16.2	1.62	382	425	946	2148
240	16.6	1.66	390	434	965	2191
250	17.2	1.72	406	451	1003	2277
260	17.9	1.79	421	468	1041	2364
265	18.3	1.83	429	476	1060	2407
275	19.0	1.90	444	494	1098	2494
280	19.3	1.93	452	502	1118	2537
285	19.7	1.97	459	511	1137	2580
290	20.0	2.0	467	519	1156	2623
295	20.3	2.03	475	528	1175	2666
300	20.7	2.07	483	536	1194	2710
325	22.4	2.24	521	579	1289	2926
350	24.1	2.41	560	622	1384	3142
375	25.9	2.59	598	665	1479	3358
400	27.6	2.76	637	708	1575	3574
425	29.3	2.93	675	750	1670	3791
450	31.0	3.1	714	793	1765	4007
475	32.8	3.28	752	836	1860	4223
500	34.5	3.45	791	879	1956	4439
525	36.2	3.62	829	921	2051	4655
550	37.9	3.79	868	964	2146	4871

RegO® - Relief Device Diverter (3-Way) Valve
DR6100 Series

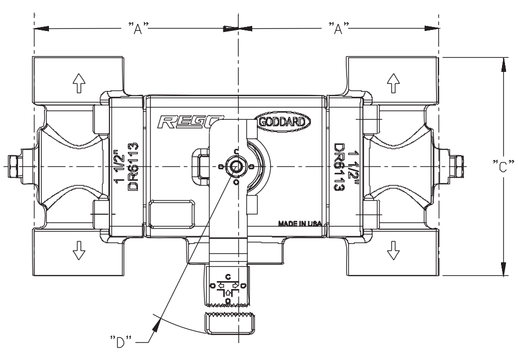
Application
The DR Diverter Valve Series provides a simple solution for the isolation of pressure relief devices during routine change out of a relief valve and burst discs without evacuating the vessel. Excellent for protecting bulk liquid vessels, transport trailers, industrial pipelines, and LNG systems.



Features
- High flow rates complement our AR series pressure relief valves.
- Valve side selection is accomplished with a heavy duty control arm clearly labeled for positive isolation
- RegO® needle valves accessorize for easy bleed of gas before removing pressure relief devices
- Fitted with threaded top Relief Valve ports and bottom Burst Disk connections
- Pressure Rating: 600 psig (41.37 barg) MAWP
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C).
- 100% Factory tested
- Oxygen cleaned per CGA G-4.1
- PED Certified
- **Stainless Steel inlet stub available, add the letter P in the end of the part number to request this option.**

DR6108

Materials
Bodies... Bronze ASTM B61 UNS C92200
Bushing, End Cap... Brass B16 C36000
Seat Rings... PCTFE ASTM D1430
Gasket... PTFE
Ball... 316 Stainless Steel
Lever.. Cadmium Plated Steel
Packing.. PTFE
Stem .... Stainless Steel ASTM A582 UNS S30300



DR6112P

DR6112 & DR6113

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Connection Type	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	Height Inches (mm)	Weight Lbs (Kg)	Open Port	C_V (Kv)
DR6108	1" (25.4)	¾" (19.05)	Thread NPT	4" (101.7)	4.65" (118.3)	2.94" (74.90)	R 7.36" (187.1)	5.18" (63.25)	10 (4.50)	Right	13.3 (11.50)
										Left	
										Both	20.1 (17.38)
DR6112	1½" (38.1)	1" (25.4)		4.12" (104.6)	-	5.70 (145.0)	R 7.36" (187.1)	5.770" (146.6)	28 (12.70)	Right	18.8 (16.26)
										Left	
										Both	37 (32.00)
DR6113	1½" (38.1)	1½" (38.1)			-	5.70 (145.0)	R 7.36" (187.1)	5.770" (146.6)	30 (13.60)	Right	22.6 (19.54)
										Left	
										Both	40.2 (34.77)

REGO

RegO® - Bulk Vessel Safety Assembly – Relief Valve & Diverter
DA6200 Series

REGO 10 YEAR WARRANTY

Application

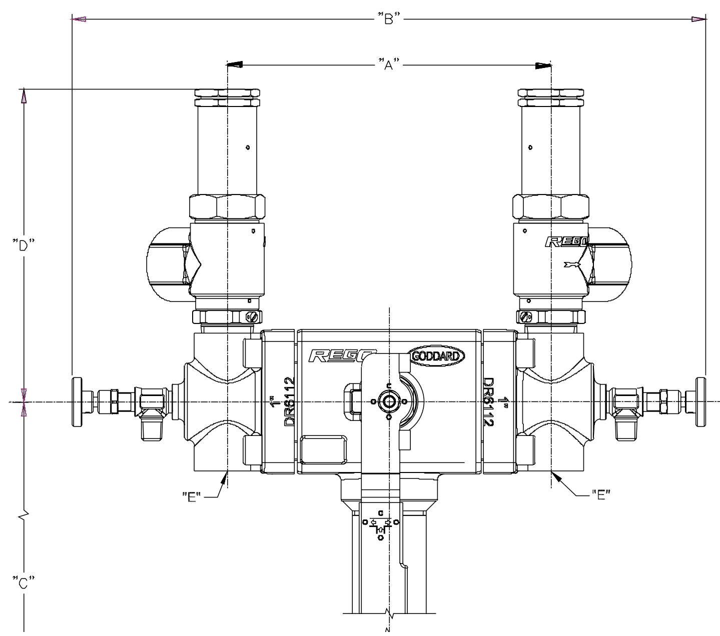
RegO® provides a complete unitized solution for pressure relief devices assembled in a factory setting ready for attachment to cryogenic bulk tanks. Ideal for OEM applications where pre-fabricated assemblies are favored to streamline construction. Excellent for protecting bulk liquid vessels, transport trailers, industrial pipelines and LNG systems.

Features

- High flow rates complement our AR series pressure relief valves and burst disks
- Valve side selection is accomplished with a heavy duty control arm clearly labeled for positive isolation
- RegO® needle valves accessorize for easy bleed of gas before removing pressure relief devices
- Inlet pipe factory installed for easy assembly
- Pressure Rating: 600 psig (41.37 barg) MAWP
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- Oxygen cleaned per CGA G-4.1
- Packaged ready for installation
- PED Certified CE
- **Copper inlet stubs available for DA6206CA.**

Diverter Materials

Bodies... Bronze ASTM B61 UNS C92200
Bushing, End Cap... Brass B16 C36000
Seat Rings.. PCTFE ASTM D1430
Gasket... PTFE
Ball... 316 Stainless Steel
Lever.. Cadmium Plated Steel
Packing... PTFE
Stem .... Stainless Steel ASTM A582 UNS S30300



Relief Valve Materials

Body .... Bronze ASTM B61
Upper Body... Stainless Steel ASTM A582
Seat & Stem .... Brass ASTM B16
Poppet Guide... Brass ASTM B16
Spring Retainer.. Brass ASTM B16
Adjusting Screw... Brass ASTM B16
Cap.. Brass ASTM B16
Ball.. Stainless Steel
Gasket... Copper ASTM B152-17
Spring .... Stainless Steel ASTM A313
Seal .... PCTFE for < 75 psig, Fluorosilicone for ≥ 75 psig

Ordering Information

Part Number*	Inlet Inches (mm)	Outlet Inches (mm)	Connection Type	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)
DA6206AXXX	1" (25.4)	¾" (19.05)	Thread NPT	4.76" (120.9)	13.25" (336.55)	9.75" (247.7)	7.00" (177.8)	¾" NPT (19.0)
DA6208AXXX	1½" (38.1)	1" (25.4)		8.33" (211.6)	16.30" (414)	16.47" (418.34)	8.06" (204.7)	1" NPT (25.0)

* Include pressure setting in part number.

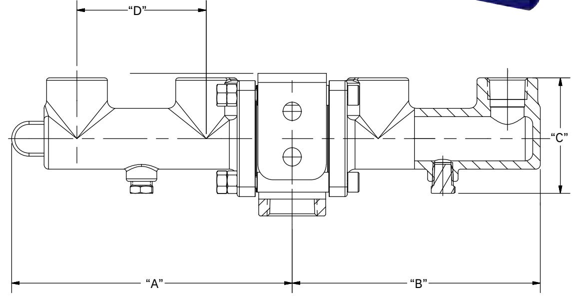
RegO® Stainless Steel Relief Device Diverter (3-Way) Valve
DV4108 Series

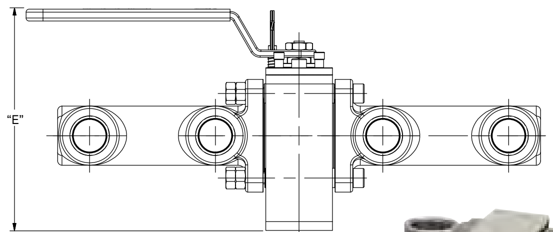
Application

The DV4108 Diverter Valve Series provides a lightweight, simplified solution for the isolation of pressure relief valves during testing and change out of relief valves and burst discs without requiring evacuation of the vessel and guaranteeing that one port will be available to work during the operation. This all stainless steel diverter valve is ideal for use with oxygen, nitrogen, krypton, carbon dioxide, nitrous oxide, dinitrogen monoxide, carbon oxide, methane, ethane, ethylene, argon, and LNG.

REGO 10 YEAR WARRANTY

DV4108SU Series



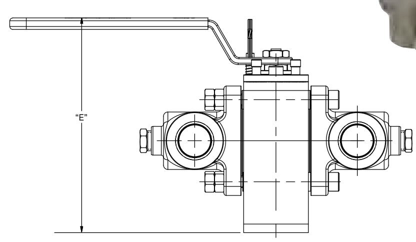


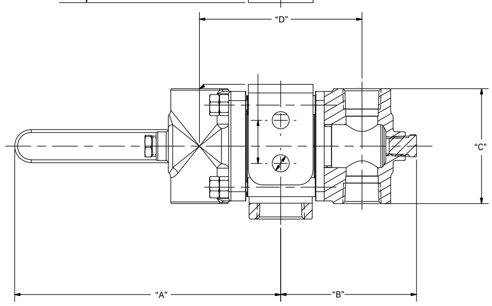
Features

- High flow rates complement the RegO AR and PRV series pressure relief valves
- Outlet ports sufficiently spaced to allow AR and PRV series relief valves as well as burst discs to be easily installed and removed
- Compact, lightweight design
- Unique resilient seat design with Dyneon™ TFM 1600 material provides smooth operation and bubble tight seal in cryogenic conditions
- Special seal design using proven Kold-Seal technology, live loaded PTFE in conjunction with wave springs and added sealing protection prevent internal and external leakage (EN 1626:2008 compliant)
- Clearly labeled, heavy duty lever arm and locking pin provide positive isolation verification
- Various connection and configuration options available
- Bracket included for easy installation
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature rating: -320°F to +150°F (-196°C to +65°C)
- Pressure rating: Cold, non-shock, 720 PSIG (50 BAR) Class 300 (PN 50)
- 100% factory tested; each valve is individually bagged and boxed to arrive in factory new condition until installation
- Cleaned and packaged for oxygen service per CGA G-4.1

PED Certified CE

DV4108MU Series





Materials

Body .... 316 Stainless Steel ASTM A351-CF-8M (DIN 1.4408)
Ball..........................316L Stainless Steel ASTM A276 (DIN 1.4006)
Seat .... Dyneon TFM 1600
End caps....................304 Stainless Steel ASTM A743 (DIN 1.4027)
Wave springs....................Stainless Steel ASTM A313 (DIN 1.4544)
Wave spring washers 304 Stainless Steel ASTM A182 (DIN 1.5415)
Packing... Live Loaded PTFE
Stem ....316L Stainless Steel ASTM A276 (DIN 1.4006)
Lever..........................304 Stainless Steel ASTM A182 (DIN 1.5415)
Bracket ....304 Stainless Steel ASTM A182 (DIN 1.5415)

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Outlet Connection Type	Outlet Port Orientation	Bleeder Connection	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Open Port	Cv (Kv)
DV4108SU04	1 (DN25)	½ (DN15)	Thread NPTF	4 ports, all opposite of Inlet	1/4" NPTF, same side as inlet	7.29 (185)	6.42 (163)	2.98 (76)	3.34 (85)	5.90 (150)	One Side	12.0 (10.4)
											Both Sides	21.7 (18.8)
DV4108SU06		¾ (DN20)									One Side	13.3 (11.5)
											Both Sides	22.5 (19.5)
DV4108SU08		1 (DN25)									One Side	16.0 (13.8)
											Both Sides	25.3 (21.9)
DV4108SM04		½ (DN15)		1 port up, 1 port down on each side	1/4" NPTF, 90° from inlet		3.72 (95)"	3.2 (80)	4.45 (113)		One Side	11.0 (9.5)
											Both Sides	20.0 (17.3)
DV4108SM06		¾ (DN20)									One Side	12.7 (11.0)
											Both Sides	21.6 (18.7)
DV4108SM08		1 (DN25)									One Side	14.1 (12.2)
											Both Sides	23.2 (20.1)

Other outlet port orientation options available; please contact your Sales representative with inquiries.

RegO® Stainless Steel Relief Device Diverter (3-Way) Valve DV4108SD Series for PRVs

Application

The DV4108SD04 Diverter Valve Series provides a lightweight, simplified solution for the isolation of pressure relief valves during testing and change out of pressure relief valves and burst discs without requiring evacuation of the vessel and guaranteeing that one port will be available to work during the operation. This all stainless steel diverter valve is ideal for use with oxygen, nitrogen, krypton, carbon dioxide, nitrous oxide, dinitrogen monoxide, carbon oxide, methane, ethane, ethylene, argon, and LNG.

The DV4108SD04 has the inlet port in the upper position for the easy installation of the Micro-Bulk's relief pressure line, and the four-outlet port oriented at down position to avoid the humidity going into the PRVs and guarantee proper operation.

PED Certified CE

REGO 100% TESTED ★

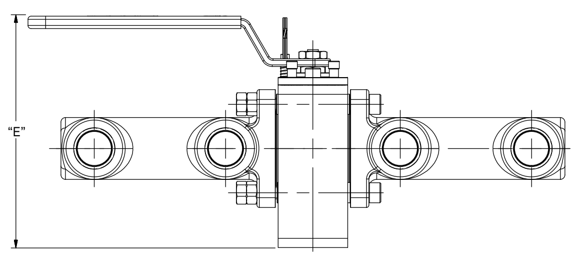
CLEANED FOR OXYGEN SERVICE O_2 CGA G-4.1

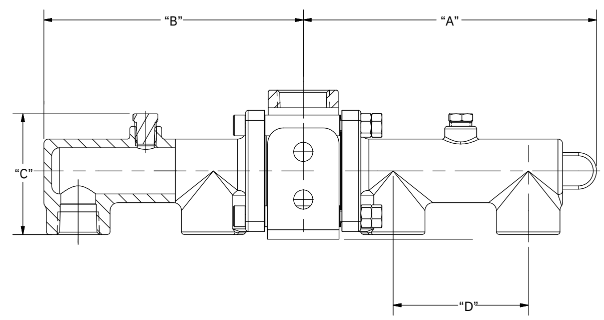
REGO 10 YEAR WARRANTY

DV4108SD04

Materials

Body .... 316 Stainless Steel ASTM A351-CF-8M (DIN 1.4408)
Ball...........................316L Stainless Steel ASTM A276 (DIN 1.4006)
Seat .... Dyneon TFM 1600
End caps.....................304 Stainless Steel ASTM A743 (DIN 1.4027)
Wave springs.....................Stainless Steel ASTM A313 (DIN 1.4544)
Wave spring washers 304 Stainless Steel ASTM A182 (DIN 1.5415)
Packing.. Live Loaded PTFE
Stem ....316L Stainless Steel ASTM A276 (DIN 1.4006)
Lever...........................304 Stainless Steel ASTM A182 (DIN 1.5415)
Bracket ....304 Stainless Steel ASTM A182 (DIN 1.5415)





Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	End Connection Type	Outlet Port Orientation	Bleeder Port Orientation	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Open Port	Cv (Kv)
DV4108SD04	1" (DN25)	½ (DN15)	Thread NPTF	4 ports, all opposite of inlet	¼" NFPT, same side as inlet	7.29 (185)	6.42 (163)	2.98 (76)	3.34 (85)	5.90 (150)	One Side	12.0 (10.4)
											Both Side	21.7 (18.8)
DV4108SD06		¾" (DN20)									One Side	13.3 (11.5)
											Both Side	22.5 (19.5)
DV4108SD08		1" (DN25)									One Side	16.0 (13.8)
											Both Side	25.3 (21.9)

Other outlet port orientation options available; please contact your Sales representative with inquiries.

Carbon Dioxide Relief Valves, ASME
UA3149A Series

Application

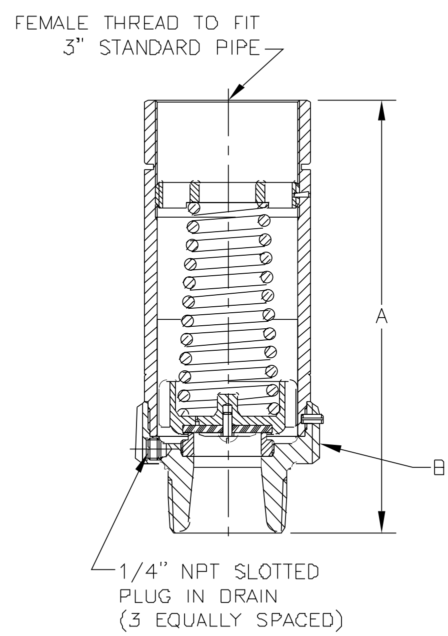
The UA3149A series "pop-type" relief valves are especially designed for use as a secondary relief valve in carbon dioxide transports and stationary storage tanks. The relief valve is designed to protect the tank from excessive over pressure in the event of fire or other emergencies. A small throttling-type primary relief valve must also be provided to control boil-off and maintain tank pressure. Provisions must be made to prevent the accumulation and build-up of water and foreign material in the valve by use of protective cap included.

REGO 10 YEAR WARRANTY

UA3149A Series

Features

- "Pop-type" design permits the relief valve to open slightly to relieve moderately excessive pressures
- Relief valve "pops" open to full discharge capacity when pressure exceeds a predetermined point
- UA3149A relief valves incorporate integral pipeaway adapter with break off groove that protects the valve from piping stress damage.
- Optional pipeaway adapters have grooves that will break off to protect the relief valve from damage should excess stress be applied to the piping.
- UA3149A relief valves include weep hole deflectors, installed to guard against flame impingement on adjacent containers.
- 100% Factory Tested
- Temperature Rating: -40°F (-37°C) to 85°F (29°C)
- Tamper Resistant
- Repeatable Performance
- ASME Rated
- Rated for Gas Service
- Resilient seat disc provides "bubble-tight" seal.



Materials

Body .... Steel and Ductile Iron
Liner.. Stainless Steel
Seat Insert .... Stainless Steel
Spring Guide.. Brass
Adjusting Screw... Ductile Iron
Seat Disc .... Urethane Compound
Spring .... Corrosion Resistant Steel

Ordering Information

Part Number	Pressure Setting psig (barg)**	Flow Capacity (SCFM/Air)	Inlet Connection (M.NPT) Inches (mm)	Height A Inches (mm)	Wrenching Hex B Inches (mm)
UA3149A303	303 psig (20.9 barg)	9,883*	2½" (63.50)	10½" (266.70)	4⅛" (104.90)
UA3149A330	330 psig (22.7 barg)	10,726*			
UA3149A350	350 psig (24.1 barg)	11,351*			
UA3149A358	358 psig (24.7 barg)	11,601*			

*Capacity certified by National Board of Boiler and Pressure Vessel Inspectors at 10% above set pressure.
**Other Settings not ASME/NB Certified

REGO

Multiport® Pressure Relief Valve Manifold Assemblies For Large CO2 Containers, ASME UA8560, UA8570 Series

Application

Designed especially for use as a primary relief device on large stationary pressurized storage containers with flanged openings. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The handwheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.

Features

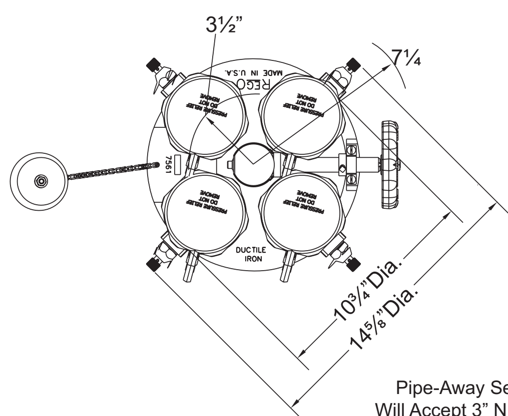
- Allows for relief valve removal and replacement on a periodic basis without shutting down and evacuating the container
- "Pop-action" design of relief valves insures maximum protection with only minimal product loss at moderately excessive pressures
- A rubber plug with chain is provided to protect manifold outlet threads where the relief valve has been removed
- May be mounted directly to a welding neck flange or manway cover plate. Requires no inlet piping
- Relief valves designed to automatically reseat firmly after discharge
- Resilient relief valve seat disc provides "bubble-tight" seal
- Relief valves are ASME rated, UA3149 Series
- Certified CE

Materials

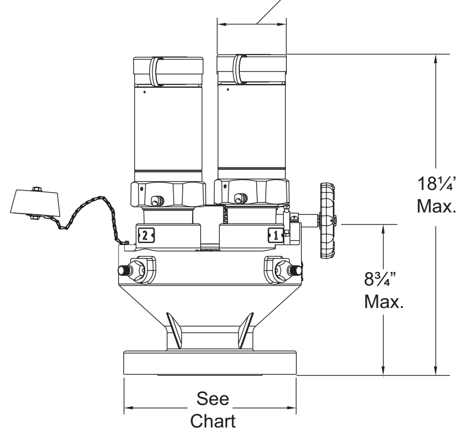
Body .... Ductile Iron
Resilient Parts .... Teflon
Clapper Disc .... Stainless Steel
Bleeder Valve .... Stainless Steel

REGO 10 YEAR WARRANTY

A8560 A8570



Pipe-Away Section
Will Accept 3" NPT Pipe



Bolt Stud and Nut Assemblies

Part Number	Consists of	For Use With:	For Connection To:	Number Required
7560-55	1-Bolt Stud and Nut	All RegO Multiports™	Modified 3" - 300# and 4"-ASA 300# Welding Neck Flange	8
7560-56			Manway Cover Plate	

Ordering Information

Part Number	Start To Discharge Setting	Container Flange Connection	Relief Valve		
			Max Quantity	Part Number	Inlet Connection M. NPT Inches (mm)
UA8564A330	330 psig (22.7 barg)	3"-300#*	4	UA3149A330	2½" (63.5)
UA8574A290	290 psig (20.0 barg)	4"-300#		UA3149A290	

* For use with modified 300# ANSI flange with 4" port.

** Outlet 3½-8N (F) thread, will accept 3" M. NPT pipe thread.

Bronze Globe Valve for Cryogenic Service
BB Series

Application

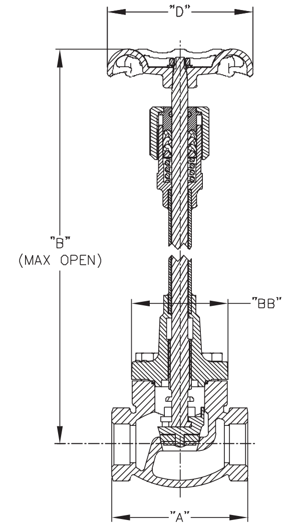
The BB Series globe valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Internal components are identical with the SKB Series. The BB Series globe valves are offered with brazed-in schedule 10 and 40 stainless steel pipe stubs. Also available in short stem version.

Features

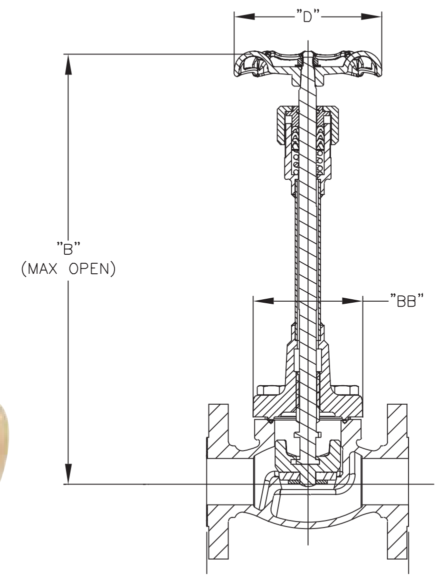
- Superior Flow: Provides high Cv for rapid and reliable loading and unloading
- V-Ring spring loaded packing: provides extended service life without constant packing adjustment
- Conical PCTFE Seat: provides exceptional flow; bubble tight seal; less chance of debris trapped in the seat and longer service life
- Ideal for loading & unloading cryogenic bulk tanks and trucks. The 1½" & 2" valves are designed to be operator friendly, opening and closing completely with only four 360° rotations
- Connections: NPT, SBT & Flange
- Sizes: ¼" to 2"
- Bonnet Type: Bolted
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -325°F (-198°C) to +150°F (+65°C)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations.
- Cleaned for Oxygen Service per CGA G-4.1

REGO 10 YEAR WARRANTY

BB9412T



BB9412F



Materials

Body .... Bronze ASTM B61
Upper Bonnet ....Brass ASTM B16
Lower Bonnet .... Brass ASTM B283
Stem .... .Stainless Steel ASTM A582
Spring .... Stainless Steel ASTM A313
Packing...PTFE
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws .... Stainless Steel ASTM A320
Handwheel................... Chromated Coated Ductile Iron ASTM A395

Ordering Information

Part Number	Size Inches	Size mm	Connection	A Inches	A mm	B Inches	B mm	D Inches	D mm	BB Inches	BB mm	Cv	Kv	Weight lbs.	Weight kg.
BB9402S	¼"	8	Silver Brazed Tube	2.68	68	14.40	366	3.00	76	2.00	51	1.7	1.47	8.30	3.7
BB9404S	½"	15		2.88	73							5.0	4.30		
BB9406S	¾"	20		3.55	90			4.00	102	2.66	67	9.4	8.1		
BB9408S	1"	25		3.75	95							14.0	12.10		
BB9412S	1½"	40		4.78	121	14.60	371	4.75	121	3.44	87	28.3	21.60	12.90	5.8
BB9416S	2"	50		5.88	149	16.21	412	5.25	133	4.06	103	53.0	47.41	21.60	9.8
BB9402T	¼"	8	Threaded NPT	2.68	68	14.40	366	3.00	76	2.00	51	1.7	1.47	8.30	3.7
BB9404T	½"	15		2.88	73							5.0	4.30		
BB9406T	¾"	20		3.55	90			4.00	102	2.66	67	9.4	8.1		
BB9408T	1"	25		3.75	95							14.0	12.10		
BB9412T	1½"	40		4.78	121	14.60	371	4.75	121	3.44	87	28.3	21.60	12.90	5.8
BB9416T	2"	50		5.88	149	16.21	412	5.25	133	4.06	103	53.0	47.41	21.60	9.8
BB9412F	1½"	40	Flanged RF	6.50	165	14.60	371	4.75	121	3.44	87	28.3	21.60	18.56	8.4
BB9416F	2"	50		8.00	203	16.21	412	5.25	133	4.06	103	53.0	47.41	30.00	13.6

Bronze Globe Valve for Cryogenic Service with Pipe Ends
BB Series

REGO 10 YEAR WARRANTY

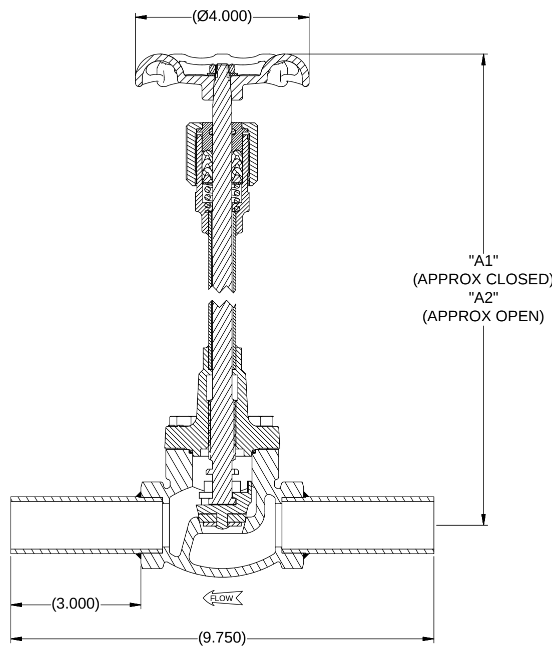
Application

The BB Series globe valves with pipe ends are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO containers and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Internal components are identical with the SKB Series.

Features

- Superior Flow: Provides high Cv for rapid and reliable loading and unloading
- V-Ring spring loaded packing: provides extended service life without constant packing adjustment
- Conical PCTFE Seat: provides exceptional flow; bubble tight seal; less chance of debris trapped in the seat and longer service life
- Connections: SS pipe extension SCH 10 and SCH 40
- Sizes: ½" to 2"
- Bonnet Type: Bolted
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -320°F (-196°C) to +150°F (+65°C)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations
- Cleaned for Oxygen Service per CGA G-4.1

BB9404AA



Materials

Body .... Bronze ASTM B61
Upper Bonnet ....Brass ASTM B16
Lower Bonnet .... Brass ASTM B283
Stem .... .Stainless Steel ASTM A582
Spring .... Stainless Steel ASTM A313
Packing..PTFE
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws.................................... Stainless Steel ASTM A320
Handwheel.................... Chromated Coated Ductile Iron ASTM A395

Ordering Information

Part Number	Size Inches	Size mm	Connection	A1 Inches	A1 mm	A2 Inches	A2 mm	B Inches	B mm	C Inches	C mm	D Inches	D mm	Cv (Kv)	Weight lbs.	Weight Kg.
BB9404AA	½"	15	SCH 10 Pipe	13.9	353.06	14.4	365.76	3.00	76.2	8.88	225.55	2.00	50.8	5.0 (4.30)	9.13	4.14
BB9406AA	¾"	20						4.00	101.6	9.55	242.57	2.60	66.04	9.4 (8.10)		
BB9408AA	1"	25								9.75	247.65	2.68	68.07	14.0 (12.10)		
BB9412AA	½"	40						4.75	120.65	10.79	274.06	3.47	88.13	28.3 (21.60)	14.19	6.43
BB9416AA	2"	50		15.27	387.85	16.21	411.73	5.25	133.35	11.88	301.75	3.26	82.80	53.0 (45.80)	23.76	10.77
BB9404BB	1½"	15	SCH 40 Pipe	13.9	353.06	14.4	365.76	3.00	76.2	8.88	225.55	2.00	50.8	5.0 (4.30)	9.22	4.18
BB9406BB	¾"	20						4.00	101.6	9.55	242.57	2.60	66.04	9.4 (8.10)		
BB9408BB	1"	25								9.75	247.65	2.68	68.07	14.0 (12.10)		
BB9412BB	1½"	40						4.75	120.65	10.79	274.06	3.47	88.13	28.3 (21.60)	14.48	6.56
BB9416BB	2"	50		15.27	387.85	16.21	411.73	5.25	133.35	11.88	301.75	3.26	82.80	53.0 (45.80)	24.19	10.97

Bronze Globe Valve Short Stem for Cryogenic Service
BBS Series

REGO 10 YEAR WARRANTY

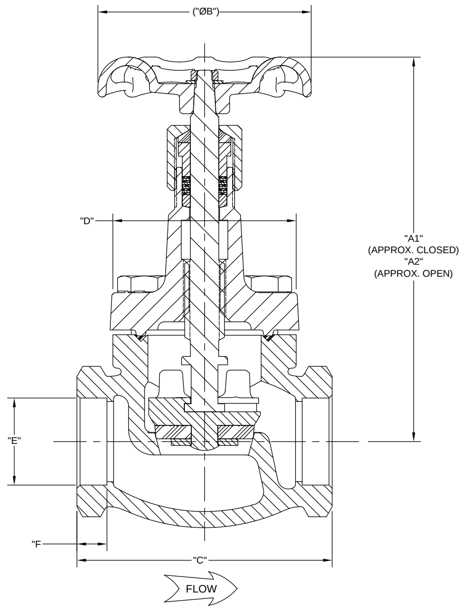
Application

The BB Series globe valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Internal components are identical with the SKB Series.

Features

- Superior Flow: Provides high Cv for rapid and reliable loading and unloading
- Designed with the unique Kold-Seal
- Conical PCTFE Seat: provides exceptional flow; bubble tight seal; less chance of debris trapped in the seat and longer service life
- Ideal for loading & unloading cryogenic bulk tanks and trucks. The 1½" & 2" valves are designed to be operator friendly, opening and closing completely with only four 360° rotations
- Connections: NPT & SBT
- Sizes: ¼" to 2"
- Bonnet Type: Bolted
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -320°F (-196°C) to +150°F (+65°C)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations
- Cleaned for Oxygen Service per CGA G-4.1
- Recommended for vapor phase and non-permanent cryogenic liquid use

BBS9404S



Materials

Body .... Bronze ASTM B61
Upper Bonnet ....Brass ASTM B16
Lower Bonnet .... Brass ASTM B283
Stem .... .Stainless Steel ASTM A582
Spring .... Stainless Steel ASTM A313
Packing...PTFE
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws .... Stainless Steel ASTM A320
Handwheel.................. Chromated Coated Ductile Iron ASTM A395

Ordering Information

Part Number	Size Inches	Size mm	Connection	A1		A2		B		C		D		E		F		Cv (Kv)	Weight lbs.	Weight Kg
				Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm			
BBS9402S	¼"	15	Silver Brazed Tube	5.75	146	6.24	158	3.00	76	8	203	2.00	51	0.38	9	0.30	8	1.7 (1.47)	5.2	2.3
BBS9404S	½"									2.88	73			0.63	16	0.40	10	5.0 (4.30)		
BBS9406S	¾"	20		6.07	154	6.6	168	4.00	101	3.55	90	2.60	66	0.88	22			9.4 (8.10)		
BBS9408S	1"	25								3.75	95			1.13	29	0.50	13	14 (12.10)		
BBS9412S	1½"	40		7.20	183	7.93	201	4.75	121	4.79	121	3.47	88	1.63	41	0.56	14	28.3 (21.60)	7.25	3.2
BBS9416S	2"	50		8.85	225	9.84	250			5.87	149	3.96	100	0.38	9	0.30	8	53 (45.80)	11.96	5.4
BBS9402T	¼"	8	Threaded NPT	5.75	146	6.24	158	3.00	76	8	203	2.00	51					1.7 (1.47)	5.2	2.3
BBS9404T	½"	15								2.88	73			0.63	16	0.40	10	5.0 (4.30)		
BBS9406T	¾"	20		6.07	154	6.6	167	4.00	101	3.55	90	2.60	66	0.88	22			9.4 (8.10)		
BBS9408T	1"	25								3.75	95			1.13	29	0.50	13	14 (12.10)		
BBS9412T	1½"	40		7.20	183	7.93	201	4.75	121	4.79	121	3.47	88	1.63	41	0.56	14	28.3 (21.60)	7.25	3.2
BBS9416T	2"	50		8.85	225	9.84	250			5.87	149	3.96	100	2.13	54	0.63	16	53 (45.80)	11.96	5.4

Application

The BK and BKA Series valves are designed exclusively for the handling of cryogenic liquids on bulk storage tanks, transports, and pipelines. These globe valves provide positive shutoff and offer a long, low-maintenance service life. The valves are available with a variety of inlet and outlet connections and stem lengths. Certain BK valves are offered with brazed-in schedule 5 and schedule 10 Stainless Steel Pipe Stubs.

Features

- PCTFE seat disc and swivel seat design offer positive shutoff, minimal seat wear, and a long service life
- Unique spring-loaded upper packing provides extended service life without constant packing adjustment
- One piece slip-on seat assembly for easy replacement
- Each valve is cleaned and packaged for oxygen service per CGA G-4.1
- Maximum working pressure is 600 psig (41.37 barg) MAWP (-196ºC)
- Working temperature range is -320°F to +165°F (196ºC to +79ºC)
- 100% Factory Tested

Materials

Body .... ASTM B61
Upper Bonnet .... ASTM B16
Lower Bonnet .... Brass ASTM B16 for up to 1" Valve Size
.... BRASS ASTM B283 For Larger Sizes
Seat Disc .... PCTFE
Seat Retainer Assembly .... Brass ASTM B16
Stem and Bonnet Extension Tube .... Stainless Steel ASTM A582
Spring .... Stainless Steel ASTM AB13
Jam Ring and Pressure Seal Rings .... PTFE
Handwheel .... Aluminum for up to 1" valve size,
.... Coated Malleable Iron for larger size

Bonnet Design

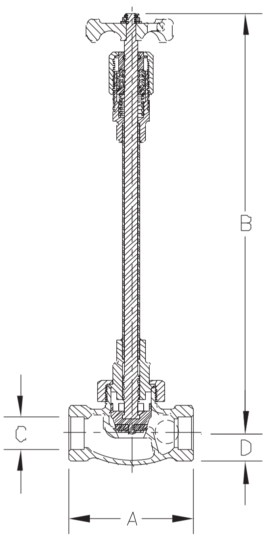
Union Bonnet for ½", ¾", 1" valve sizes and on both the 1" model BKA8408S and 1½" model BKA8412S angle valves. Bolted Bonnet design is used on the BK9416 (2") models.

BK8408T

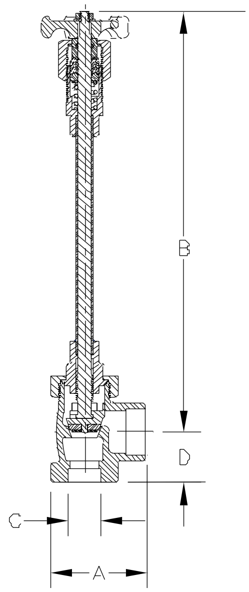
BK9412S

BK9408AA

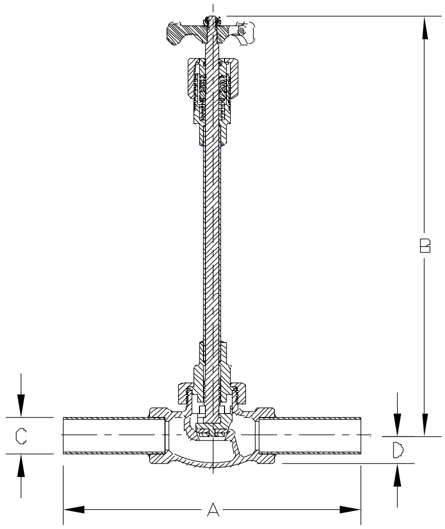
BKA8412S



Straight Globe Valve



Angle Globe Valve



Straight Globe Valve with Pipe Stubs

Ordering Information

Part Number	Body Style	A Length Inches (mm)	B Max Open (Approx) Inches (mm)	C Inlet / Outlet Connections INCHES (MM)	D Inches (mm)	C_V (Kv)
BK8404S	Straight	3 11/16” (94)	9 5/32” (233)	.631”-.634” (16.02-16.10)	1” (25)	4.7 (4.06)
BK8404T				½” F.NPT (12.7)		
BK8404ST				.631”-.634”x ½” F.NPT (16.02-16.10x12.7)		
BK9404S			15” (381)	.631”-.634” (16.02-16.10)		
BK9404T				½” F.NPT (12.7)		
BK9404AA		9 11/16” (246)		½” SCH10 Pipe (12.7)		
BK9404PT-F30		6 11/16” (170)		½” Sch5 Pipe x ½” F.NPT (12.7)		
BK9404ST		3 11/16” (94)		.631”-.634”x½” F.NPT (16.02-16.10x12.7)		
BK8406S			9 5/32” (233)	.881”-.884” (22.37-22.45)		
BK8406T				¾” F.NPT (19)		
BK9406S			15” (381)	.881”-884” (22.37-22.45)		
BK9406T				¾” F.NPT (19)		
BK9406AA		9 11/16” (246)	14.9 (378)	¾” SCH10 Pipe (19)		
BK8408S		4 5/16” (109)	9 1/8” (232)	1.131”-1.134” (28.72-28.80)	1 1/8” (28)	11.2 (9.68)
BK8408T				1” F.NPT (25)		
BK9408S			15” (381)	1.131”-1.134” (28.72-28.80)		
BK9408T				1” F.NPT (25)		
BK9408AA		10 5/16” (262)		1” Sch10 Pipe (25)		
BK9408PT-F30		7 5/16” (185)		1” Sch5 Pipe x 1” F.NPT (25)		
BK9412AA		11 3/16” (284)	16 9/16” (420)	1½” Sch10 Pipe (38)	1½” (38)	25.1 (21.71)
BK9412PT-F30		8 3/16” (208)		1½” Sch5 Pipe x 1½” F.NPT (38)		
BK9416S*		6” (152)	16” (406)	2.131” - 2.134” (54.12-54.20)	1 5/8” (41)	41 (35.46)
BK9416AA		11.88” (302)		2” SCH10 Pipe (51)		
BK9416T*		6” (152)		2” F.NPT (51)		
BK9416PT-F30		9” (229)		2” Sch5 Pipe x 2” F.NPT (51)		
BKA8408S	Angle	3 1/4” (82)	9 5/11” (240)	1.131”-1.134” x1.631”-1.634” (28.72-28.80 x 41.42-41.50)	1 3/4” (44)	14.5 (12.54)
BKA9408S			14 5/8” (371)			
BKA8412S		4 1/4” (108)	13” (330)	1.631”-1.634” (41.42-41.50)		30.0 (25.95)

* Valves with bolted bonnet design.
BB Available for 1½”.

Brass Angle Globe Valves
B-226BLA

Application

RegO/Goddard brass angle globe valves are designed for handling cryogenic liquids. Designed for fill manifolds applications of bulk tanks. RegO Kold-Seal™ stem seal technology assures a tight seal preventing gas loss. Maintenance on the packing and seat is quick and easy. Ideal service medium includes oxygen, nitrogen, argon, carbon dioxide, nitrous oxide, methane, ethane, ethylene, krypton, and carbon oxide.

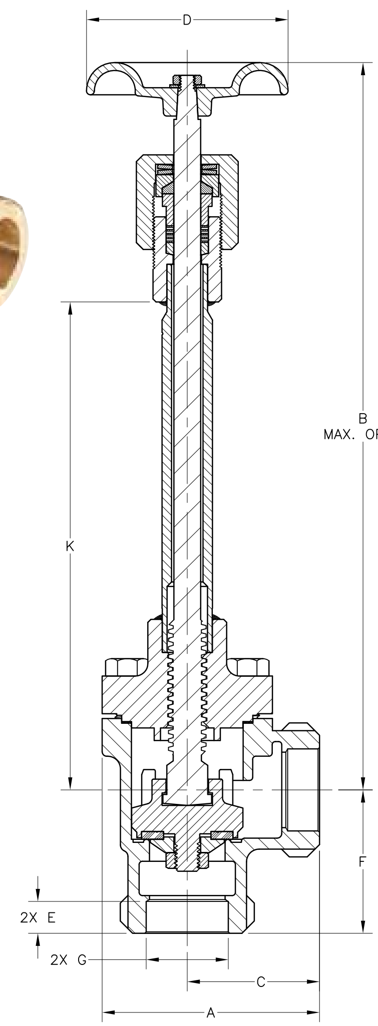
Features

- Sizes: 1½"
- Connection: Silver Brazed Tube
- Service: Liquefied and vaporized atmospheric gases
- Temperature rating: -325°F to +150°F (-198°C to +65°C)
- Pressure rating: Cold, Non-Shock, 600 psig (41.4 barg)
- Cleaned and packaged for oxygen service per CGA G-4.1
- Soft Seat: PCTFE material which is the most widely specified cryogenic seat material in the industry
- Stem Packing: Proven Kold-Seal technology, live loaded PTFE
- Flat seat
- 100% factory tested. Each valve is individually bagged and boxed to arrive in factory new condition until installation

Materials

Body .... Brass ASTM B61
Bonnet and Tube .... Stainless Steel ASTM A269
Seat Disk .... PCTFE
Seat Retainer.. Brass ASTM B61
Packing.. Live Loaded PTFE Packing
Handwheel...ASTM A395
Bonnet Gasket.............................PTFE 25% Glass Fill Virgin Grade

B-226BLA-12S6



Part Number	Size Inches	Nominal Size DN	Connection	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	E inches (mm)	F inches (mm)	G inches (mm)	K inches (mm)	Cv (Kv)	Weight lbs (kg)
B-226BLA-12S6	1- ½"	40	Silver Brazed Tube	14.63 (371)	1.63 (41.4)	2.63 (67)	4.00 (102)	63 (67)	2.85 (72)	1.63 (41)	9.7 (246)	30 (25.95)	10.50 (4.76)

REGO

Bronze Globe Valve for Cryogenic Service 222 Series Including 226LL, 226GF, 226ULL, 226BLL, 222X, 226LL, 226BLL

Application

The 222 Series valves are designed exclusively for the handling of cryogenic liquids on bulk storage tanks, transports, and pipelines. These globe valves provide positive shutoff and offer a long, low-maintenance service life. The valves are available with a variety of inlet and outlet connections and stem lengths.

B-226ULL

Features

- **Top Entry:** This union bonnet valve can be permanently installed in the line and serviced from the top. The stainless steel tube prevents stem distortion. Also available in bolted bonnet configuration.
- **Construction:** Bronze cast body and bonnet
  Rugged construction for long life
- **Designed with the unique Kold-Seal™** and high Cv. standard PTFE seat design assures bubble tight seating and high cycle life
- Oxygen cleaned per CGA G-4.1
- **Sizes:** ¼" through 3" (8mm through 80mm)
- **Ends:** Threaded (FNPT), Sil Braze Tube (SBT), Silver Braze Pipe and back brazed threaded pipe nipples
- **Service:** Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating:** -320°F to 150°F (-196°C to +65°C)
- **Pressure Rating:** (Cold, Non-shock)
  400 and 600 psig (28 and 42 barg)
  Sizes 1½" to 3" PED approved
- **Kold-Seal™ Technology assures tight seal preventing cryogen gas loss**
- **Extended stem suitable for cold box, transport vehicles, pipelines, and customer service applications**
- **Live (LL) loaded option improves life of asset and minimizes service costs**
- **Replaceable top works equates to low maintenance costs**

B-226BLL

Ordering Information

222X

Bronze Globe Valves, Extended Stem - Conical Seat, 400 psig (28 barg) Cold Working Pressure

Threaded End

Part Number	NPT size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-222X-2T4	¼"	8 mm	Threaded	1.50	0.70	1.30 (1.12)
B-222X-4T4	½"	15 mm		1.50	0.70	3.25 (2.81)
B-222X-6T4	¾"	20 mm		3.00	1.40	6.25 (5.40)
B-222X-8T4	1"	25 mm		4.00	1.80	10.00 (8.65)
B-222X-12T4	1½"	40 mm		7.75	3.50	26.00 (22.49)
B-222X-16T4	2"	50 mm		12.50	5.70	45.00 (38.92)
B-222X-20T4	2½"	63.5 mm		61.00	27.70	50.00 (43.25)
B-222X-24T4	3"	80 mm		61.00	27.70	100.00 (86.5)

Sil Brazed End

Part Number	SBT size Inches	SBT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-222X-4S4	½"	15 mm	Silver Braze	2.00	0.90	3.25 (2.81)
B-222X-6S4	¾"	20 mm		2.75	1.30	6.25 (5.40)
B-222X-8S4	1"	25 mm		3.75	1.70	10.00 (8.65)
B-222X-12S4	1½"	40 mm		7.25	3.30	26.00 (22.49)
B-222X-16S4	2"	50 mm		11.50	5.20	45.00 (38.92)
B-222X-24S4	3"	80 mm		58.00	26.40	100.00 (86.5)

Bronze Globe Valve for Cryogenic Service 222 Series Including 226LL, 226GF, 226ULL, 226BLL, 222X, 226LL, 226BLL

Ordering Information

SB-222X

Stainless Steel Body, Bronze Topworks, Conical Seat, 450 psig Cold Working Pressure

Part Number	NPT size Inches	NPT Size mm	Ends
SB00222X-12SW	1½"	40 mm	Socket Weld

226LL

Bronze Globe Valves, Live Load Packing, Extended Stem, 600 psig (42 barg) Cold Working Pressure

Threaded End

Part Number	NPT size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-0226LL-2T6	¼"	8 mm	Threaded	1.50	0.70	1.30 (1.12)
B-0226LL-3T6	⅜"	10 mm		1.50	0.70	2.40 (2.07)
B-0226LL-4T6	½"	15 mm		1.50	0.70	3.25 (2.81)
B-0226LL-6T6	¾"	20 mm		3.00	1.40	6.25 (5.40)
B-0226LL-8T6	1"	25 mm		4.00	1.80	10.00 (8.65)

Sil Brazed Ends

Part Number	SBT size Inches	SBT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-0226LL-4S6	½"	15 mm	Silver Braze	2.00	0.90	3.25 (2.81)
B-0226LL-6S6	¾"	20 mm		2.75	1.30	6.25 (5.40)
B-0226LL-8S6	1"	25 mm		5.8	1.70	10.00 (8.65)

226ULL

Bronze Globe Valves, Live Loaded Packing - Union Bonnet, Extended Stem, 600 psig (42 barg) Cold Working Pressure

Threaded End

Part Number	NPT size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-226ULL-12T6	1½"	40 mm	Threaded	7.75	3.50	26.00 (22.49)
B-226ULL-16T6	2"	50 mm		12.50	5.70	45.00 (38.92)

Sil Brazed Ends

Part Number	SBT size Inches*	SBT Size mm*	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-226ULL-12S6	1½"	40 mm	Silver Braze	7.25	3.30	26.00 (22.49)
B-226ULL-16S6	2"	50 mm		11.50	5.20	45.00 (38.92)

*Nominal Size

226XGF

Bronze Globe Valves, Extended Stem - Conical Seat Grafoil® Packing, Gasket and PFA Seat
600 psig (42 barg) Cold Working Pressure Temperature Range -325°F to +300°F (-198°C to +149°C)

Threaded End

Part Number	NPT size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
VB-226XGF-4T6	½"	15 mm	Threaded	1.50	0.70	3.25 (2.81)
VB-226XGF-6T6	¾"	20 mm		3.00	1.40	6.25 (5.40)
VB-226XGF-8T6	1"	25 mm		4.00	1.80	10.00 (8.65)
VB-226XGF-12T6	1½"	40 mm		7.75	3.5	26.00 (22.49)

226BLL

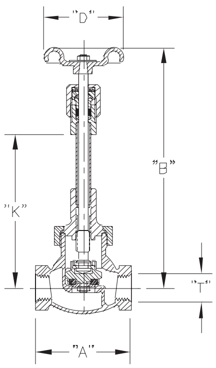
Bronze Globe Valves, Live Loaded Packing - Bolted Bonnet, Extended Stem, 600 psig (42 barg) Cold Working Pressure

Threaded End

Part Number	NPT size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-226BLL-12T6	1½"	40 mm	Threaded	7.75	3.50	26.00 (22.49)
B-226BLL-16T6	2"	50 mm		12.50	5.70	45.00 (38.92)

Bronze valves standard connection are for tube, not pipe.

Bronze Globe Valve for Cryogenic Service 222 Series Including 226LL, 226GF, 226ULL, 226BLL, 222X, 226LL

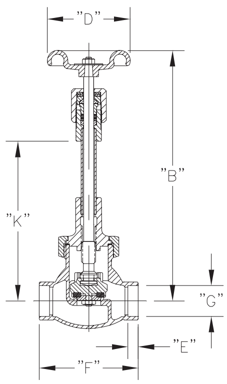


226ULL
Pressure Rating 600 psig (42 barg)
Temperature Rating -325°F to +150°F (-198°C to +56°C)

Dimensional data

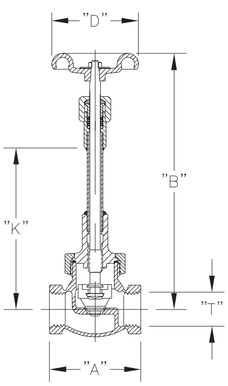
Threaded Ends

Size		"A"		"B"		"D"		"T" NPT		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	4¾"	121	14⅝"	372	4"	102	1½"	38	9 11/16"	246
2"	51	5¾"	146	15⅛"	384	4¾"	121	2"	51		



Sil Brazed End

Size		"B"		"D"		"E"		"F"		"G"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	14⅝"	372	4"	102	⅝"	16	5¼"	133	1.63"	41	9 11/16"	246
2"	51	15⅛"	384	4¾"	121	21/23"	16	6½"	165	2.13"	54		

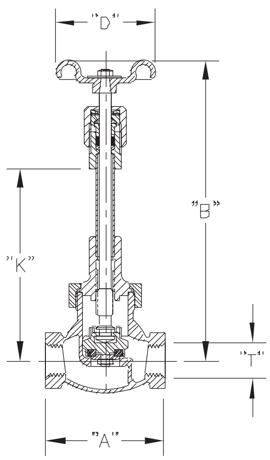


226XGF
Pressure Rating 600 psig (42 barg)
Temperature Rating -325°F to +300°F (-198°C to +149°C)

Dimensional data

Threaded Ends

Size		"A"		"B"		"D"		"T" NPT		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	2⅝"	67	8¼"	209	2⅜"	60	½"	13	4⅞"	124
¾"	19	3 3/16"	81	8⅝"	219	2¾"	70	¾"	19	4 13/16"	122
1"	25	3¾"	95	10½"	267	3"	76	1"	25	6½"	165



226LL
Pressure Rating 600 psig (42 barg)
Temperature Rating +150°F to -325°F (+65°C to -198°C)

Dimensional Data

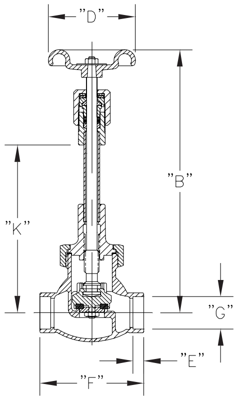
Threaded Ends

Size		"A"		"B"		"D"		"T" NPT		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¼"	6	2 5/16"	59	7 9/16"	192	2"	51	¼"	6	4 19/32"	117
⅜"	10							⅜"	10		
½"	13	2⅝"	67	8¼"	209	2⅜	61	½"	13	4⅞"	124
¾"	19	3 3/16"	81	8⅝"	219	2¾"	70	¾"	19	4 13/16"	122
1"	25	3¾"	95	10½"	267	3"	76	1"	25	6½"	165

*Bolted Bonnet

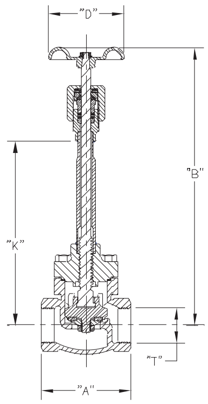
REGO

Bronze Globe Valve for Cryogenic Service 222 Series Including 226LL, 226GF, 226ULL, 222X, 226LL



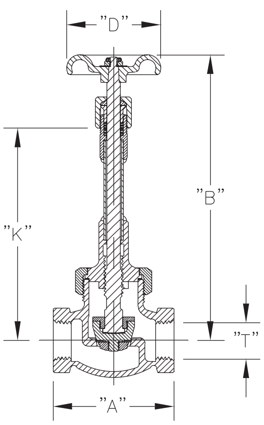
Sil Brazed Ends

Size		"B"		"D"		"E"		"F"		"G"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	8¼"	209	2⅜"	60	⅜"	9	3¼"	82	.63	16	4⅞"	124
¾"	19	8⅝"	219	2¾"	70	13/32"	10	3¾"	83	.88	22	4 13/16"	122
1"	25	10½"	267	3"	76	7/16"	11	4¼"	108	1.13	29	6½"	165



226BLL Threaded Ends - Bolted Bonnet

Size		"A"		"B"		"D"		"T" NPT		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	4¾"	121	14⅝"	371	4"	101	1½"	38	9 11/16"	246
2"	51	5¾"	146	14 15/16"	379	4¾"	121	2"	51		

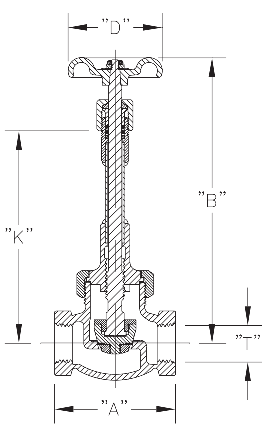


222X

Pressure Rating 400 psig (28 barg)

Temperature Rating -325°F to +150°F (-198°C to +65°C)

Part Number	Size		"A"		"B"		"D"		"T" NPT		"K"	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
B-222X-2T4	¼"	6	2.63"	67	8.38"	213	2.38"	60	¼"	6	4.8"	122
B-222X-4T4	½"	13							½"	13		
B-222X-4T4A					15.54"	395					12.2"	310
B-222X-6T4	¾"	19	3.19"	81	8.63"	219	2.75"	70	¾"	19	4.9"	124
B-222X-6T4A					15.79"	401					12"	305
B-222X-8T4	1"	25	3.75"	95	10.50"	267	3"	76	1"	25	6.5"	165
B-222X-8T4A					16.01"	407					12"	05
B-222X-12T4	1½"	38	4.75"	121	14.63"	372	4"	102	1½"	38	9.7"	246
B-222X-12T4A					18.44"	468					13.5"	343
B-222X-16T4	2"	51	5.75"	146	15.13"	384	4.75"	121	2"	51	9.7"	246
B-222X-16T4A					22.43"	570					14.2"	361
B-222X-20T4	2½"	64	8.5"	216	22.75"	578	8"	203	2½"	64	16"	406
B-222X-24T4	3"	76							3"	76		



SB-222X

Pressure Rating 400 psig (28 barg)

Temperature Rating -325°F to +150°F (-198°C to +65°C)

Size		"A"		"B"		"D"		"BB		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	4¾"	121	14⅝"	372	4"	102	3"	76	9.7"	246

Bronze Globe Valve for Cryogenic Service
202X Series Including 206LL, 206GF, 206ULL, 206BLL

REGO 10 YEAR WARRANTY

Features

- Top Entry: This union bonnet valve can be permanently installed in the line and serviced from the top
- Construction: Rugged construction for long life, bronze cast body and bonnet
- Designed with the unique Kold-Seal™ and high CV. Standard PCTFE seat design assures bubble tight seating and high cycle life
- Sizes: ¼” through 2” (8mm through 50mm)
- Ends: Threaded (FNPT), Sil Braze Tube (SBT), or with stainless steel pipe nipples brazed in
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature Rating: -320°F to 150°F (-196°C to +65°C)
- Pressure Rating: (Cold, Non-shock)
  202 Series Rated for 400 psig (28 barg)
  206 Series Rated for 600 psig (42 barg)
  Sizes 1.5” to 2.0” PED approved per EN10204, 3.1
- Kold-Seal™ Technology assures tight seal preventing cryogen gas loss. Non-extended stem for selective cold gas service.
- Cleaned for Oxygen Service per CGA G-4.1

206ULL

206BLL

Ordering Information

202X
Bronze Globe Valves
Non-Extended Stem - Conical Seat
400 psig (28 barg) Cold Working Pressure
For selective Cold Gas Applications

Threaded End

Part Number	NPT Valve size Inches	NPT Valve Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-202X-12T4	1½”	40 mm	Threaded	6.50	3.00	29.00 (25.08)
B-202X-16T4	2”	50 mm		10.50	4.80	50.00 (43.25)

Sil Braze Ends

Part Number	SBT Valve size Inches *	SBT Valve Size mm *	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-202X-4S4	½”	15 mm	Silver Braze	1.50	0.7	3.90 (3.37)
B-202X-8S4	1”	25 mm		3.25	1.50	11.50 (9.94)
B-202X-12S4	1½”	40 mm		6.50	3.00	29.00 (25.08)
B-202X-16S4	2”	50 mm		10.50	4.80	50.00 (43.25)

* Nominal Size

Bronze Globe Valve for Cryogenic Service
202X Series Including 206LL, 206GF, 206ULL, 206BLL

206GF
Bronze Globe Valves
Non-Extended Stem - PFA seat with high temperature, low permeability GRAFOIL® packing and gasket.
600 psig (42 barg) Cold Working Pressure, For Selective Cold Gas Applications, High Temperature Service Rating +350°F (+176°C)

Threaded Ends

Part Number	NPT Valve size Inches	NPT Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (KV)
VB-206GF-2T6	¼”	8 mm	Threaded	1.25	0.6	1.30 (1.12)
VB-206GF-4T6	½”	15 mm		1.50	0.7	3.90 (3.37)
VB-206GF-6T6	¾”	20 mm		2.50	1.1	7.10 (6.14)
VB-206GF-8T6	1”	25 mm		3.50	1.6	11.50 (9.94)
VB-206GF-12T6	1½”	40 mm		7.00	3.2	29.00 (25.08)
VB-206GF-16T6	2”	50 mm		11.75	5.3	50.00 (43.25)

206LL
Bronze Globe Valves, Non-Extended Stem, Live Loaded Packing, 600 psig (42 barg) Cold Working Pressure
For Selective Cold Gas Applications

Threaded Ends

Part Number	NPT Valve size Inches	NPT Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-206LL-2T6	¼”	8 mm	¼” NPT	1.25	0.6	1.30 (1.12)
B-206LL-3T6	⅜”	10 mm	⅜” NPT			2.40 (2.07)
B-206LL-4T6	½”	15 mm	½” NPT	1.75	0.8	3.90 (3.37)
B-206LL-6T6	¾”	20 mm	¾” NPT	2.5	1.1	7.10 (6.14)
B-206LL-8T6	1”	25 mm	1” NPT	3.5	1.6	11.50 (9.94)

Sil Brazed Ends

Part Number	SBT Valve size Inches *	SBT Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-206LL-4S6	½”	10 mm	Silver Braze	1.25	0.6	3.90 (3.37)
B-206LL-6S6	¾”	15 mm		1.75	0.8	7.10 (6.14)
B-206LL-8S6	1”	20 mm		2.5	1.1	11.50 (9.94)

* Nominal Size

206ULL
Bronze Globe Valves, Non-Extended Stem, Live Loaded Packing - Union Bonnet,
600 psig (42 barg) Cold Working Pressure For Selective Cold Gas Applications

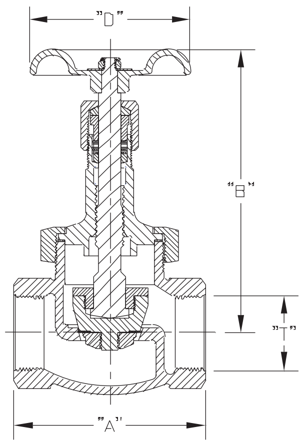
Sil Brazed Ends

Part Number	SBT Valve size Inches	SBT Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-206ULL-12S6	1½”	40 mm	Silver Braze	7	3.2	29.00 (25.08)
B-206ULL-16S6	2”	50 mm		11.75	5.3	50.00 (43.25)
B-206ULL-12T6	1½”	40 mm	1½” NPT	7	3.2	29.00 (25.08)
B-206ULL-16T6	2”	50 mm	2” NPT	11.75	5.3	50.00 (43.25)

206BLL
Bronze Globe Valves, Non-Extended Stem, Live Loaded Packing - Bolted Bonnet,
600 psig (42 barg) Cold Working Pressure For Selective Cold Gas Applications

Sil Brazed Ends

Part Number	SBT Valve size Inches	SBT Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated Cv (Kv)
B-206BLL-12S6	1½”	40 mm	Silver Braze	7	3.2	29.00 (25.08)
B-206BLL-12T6			1½” NPT			

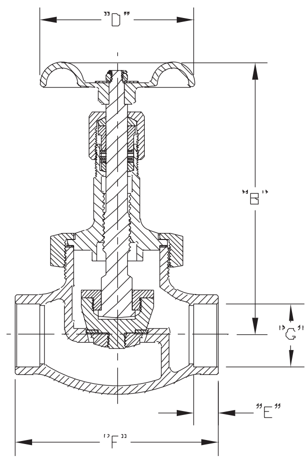


202 Series
202X
Pressure Rating 400 psig (28 barg)
Temperature Rating -325°F to +150°F (-198°C to +65°C)
Non-Extended Valve for Cold Gas Applications
Conical Seat

Dimensional data
All Dimensional Data are in inches.

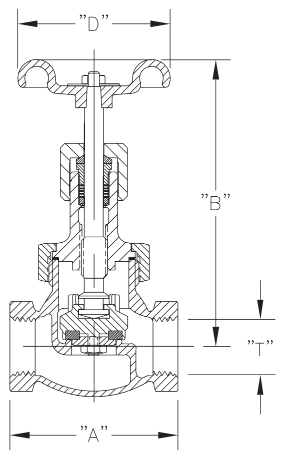
Threaded Ends

Size		"A"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	4¾"	121	8⅝"	219	4"	102	1½"	38
2"	51	5¾"	146	9½"	241	4¾"	121	2"	51



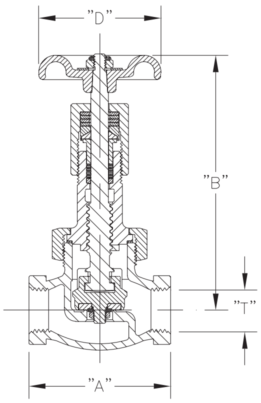
Silver Brazed Ends

Size		"B"		"D"		"E"		"F"		"G"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	4⅝"	117	2"	51	.38	10	3¼"	82	.63/.63	16/16
1"	25					.44	11	4¼"	108	1.13/1.13	29/29
1½"	38	5"	127	2⅜"	60	.62	16	5¼"	133	1.63/1.63	41/41
2"	51	5¾"	146	2¾"	70	.66	17	6½"	159	2.13/2.13	54/54



206GF
Pressure Rating 600 psig (42 barg)
Temperature Rating -325°F to +350°F (-198°C to +22°C)
Non-Extended Stem - GRAFOIL® Packing, Gasket and PFA Seat
Dimensional data
All Dimensional Data are in inches.
Threaded Ends

Size		"A"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¼"	6	2⅝"	67	4⅝"	117	2"	51	¼"	6
½"	13			5"	127	2⅜"	60	½"	13
¾"	19	3 3/16"	81	5¾"	146	2¾"	70	¾"	19
1"	25	3¾"	95	6¾"	171	3"	76	1"	25
1½	38	4¾"	121	8⅝"	219	4"	102	1½"	38
2"	51	5¾"	146	9½"	241	4¾"	121	2"	51



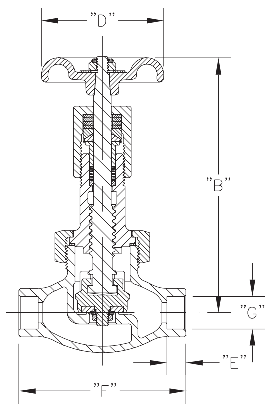
206LL

Pressure Rating 600 psig (42 barg)
Temperature Rating +150° F to -325° F (+65°C to -198°C)
Live Load Packing
Union Bonnet

Dimensional Data

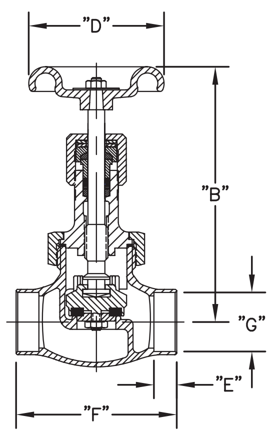
Threaded Ends

Size		"A"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¼"	6	2⅝"	67	5"	127	2⅜"	60	¼"	6
⅜"	9							⅜"	9
½"	13							½"	13
¾"	19	3 3/16"	81	5¾"	146	2¾"	70	¾"	19
1"	25	3¾"	95			3"	76	1"	25



Sil Brazed Ends

Size		"B"		"D"		"G"		"E"		"F"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¼"	6	5"	127	2⅜"	60	.38/.38	10/10	.26	7	2⅜"	60
½"	13					.63/.63	16/16	.38	10	3¼"	82
1"	25	6¾"	171	3"	76	1.13/1.13	29/29	.44	11	4¼"	108



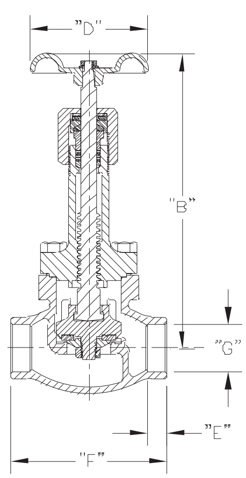
206ULL

Pressure Rating 600 psig (42 barg)
Temperature Rating +150° F to -325° F (+65°C to -198°C)
Live Load Packing - Union Bonnet

Dimensional Data

Sil Brazed Ends

Size		"F"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	4¾"	121	8⅝"	219	4"	102	1½"	38
2"	51	5¾"	146	11¾"	298	4¾"	121	2"	51



206BLL

Pressure Rating 600 psig (42 barg)
Temperature Rating +150°F to -325°F (+65°C to -198°C)
Live Load Packing - Bolted Bonnet

Dimensional Data

Sil Brazed Ends

Size		"B"		"D"		"G"		"E"		"F"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1½"	38	8⅝"	219	4"	102	1.62/1.64	41/42	.63	16	5¼"	133

Bronze/Stainless Steel Body Globe Valve for Cryogenic Service
SKB Series

REGO 10 YEAR WARRANTY

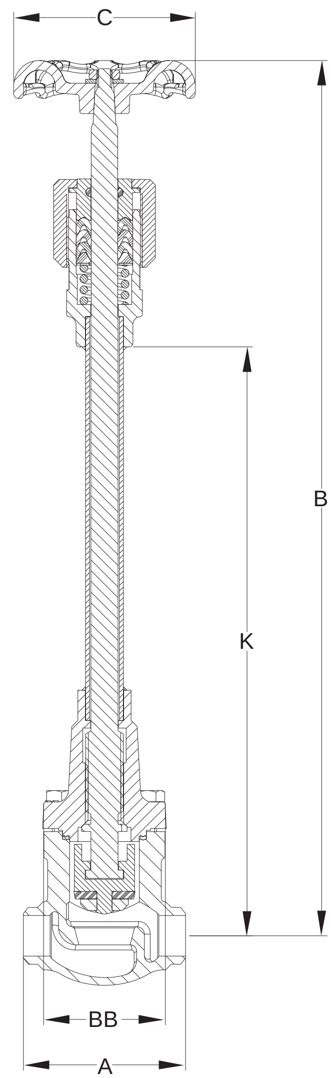
Application

The SKB Series globe valves are designed for the handling of cryogenic liquids through trailer, bulk tanks and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Internal components are the same for BB Series. Also available in short stem version.

Features

- **Superior Flow**: Provides high Cv for rapid and reliable trailer and tank loading and unloading
- **Top Entry**: This valve can be permanently installed in the line and serviced from the top. Bolted bonnet style provides secure integrity
- **Soft Seated**: Conical PCTFE seat provides a bubble tight seal. Less chance of debris trapped in the seat and longer service life
- **Stem Packing**: V-Ring spring loaded packing provides extended service life without constant packing adjustment
- **Sizes**: 1/4"though 2" - (20mm through 50mm)
- **Ends**: Buttweld and Socket Weld
- **Service**: Liquefied and vaporized atmospheric gases, LNG for trailers, bulk tanks ISO containers and piping configurations
- **Temperature Rating**: -325ºF to +150ºF (-198ºC to +65ºC)
- **Pressure Rating**: (Cold, Non-Shock) 720 psig (50 barg)
- Cleaned for oxygen service per CGA G-4.1

SKB Series



Materials

Body	Stainless Steel ASTM A351
Upper Bonnet	Brass ASTM B16
Lower Bonnet	Bronze ASTM B283
Seat Disk	PCTFE ASTM D1430
Seat Retainer	Brass ASTM B16
Stem	Stainless Steel ASTM A582
Spring	Stainless Steel ASTM A313
Packing	PTFE
Handwheel	Chromate Coated Ductile Iron ASTM A395
Bonnet Gasket	PTFE, 25% Glass Filled
Fasteners	Stainless Steel ASTM A320

Ordering Information

Part Number	Size Inches	Size mm	Connection	A		B		C		BB		K		Cv (Kv)
				Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
SKB9402BW	¼"	DN 6	Butt Weld	2.68	68	14.4	366	3	76	2	51	9.7	246	1.7 (1.47)
SKB9402SW			Socket Weld											
SKB9404BW	½"	DN 15	Butt Weld											5.0 (4.30)
SKB9404SW			Socket Weld											
SKB9406BW	¾"	DN 20	Butt Weld	3.62	92			4	102	2.66	67	9.5	241	9.4 (8.10)
SKB9406SW			Socket Weld											
SKB9408BW	1"	DN 25	Butt Weld											14.0 (12.10)
SKB9408SW			Socket Weld											
SKB9412BW	1½"	DN 40	Butt Weld	4.75	121	14.6	371	4.75	121	3.44	87	9.3	236	28.3 (21.60)
SKB9412SW			Socket Weld											
SKB9416BW	2"	DN 50	Butt Weld	5.75	146	16.21	412	5.25	133	4.06	103	9.9	251	53 (45.80)
SKB9416SW			Socket Weld											

RegO - Goddard Bronze/Stainless Steel Body Globe Valve for Cryogenic Service. Short Stem SKB Series

REGO 10 YEAR WARRANTY

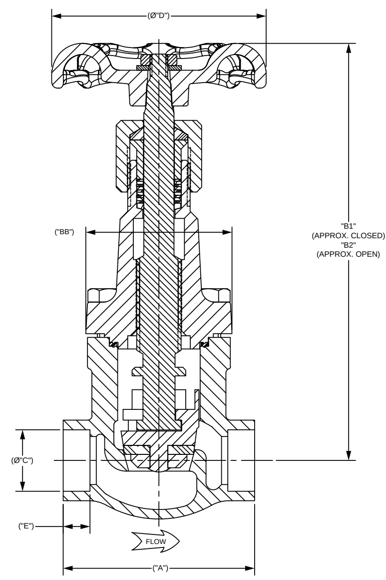
Application

The SKB Series globe valves short stem are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Internal components are the identical with the BBS Series and SKB short Stem Series.

SKB9406BWS

Features

- Superior Flow: Provides high Cv for rapid and reliable loading and unloading
- Designed with the unique Kold-Seal™
- Conical PCTFE Seat: provides exceptional flow; bubble tight seal; less chance of debris trapped in the seat and longer service life.
- Connections: NPT & SBT
- Sizes: ¼" to 2"
- Bonnet Type: Bolted
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -325°F (-198°C) to +150°F (+65°C)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations
- Cleaned for Oxygen Service per CGA G-4.1
- Recommended for vapor phase and non-permanent cryogenic liquid use



Materials

Body .... Stainless Steel ASTM A351
Upper Bonnet ....Brass ASTM B16
Lower Bonnet ....Brass ASTM B283
Stem .... Stainless Steel ASTM A582
Spring .... Stainless Steel ASTM A313
Packing...PTFE
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws .... Stainless Steel ASTM A320
Handwheel.................. Chromated Coated Ductile Iron ASTM A395

Ordering Information

Part Number	Size		Connection	A		B1		B2		C		D		E		BB		Cv (Kv)	Weight lbs. (Kg)
	Inches	mm		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm		
SKB9402BWS	¼"	8	Butt Weld	2.68	68	5.79	147	6.24	158	0.56	14	3.00	76	0.37	9	2.05	52	1.7 (1.47)	5.72 (2.59)
SKB9404BWS	½"	15								0.86	22							5 (4.30)	
SKB9406BWS	¾"	20		3.62	92	6.15	156	6.68	170	1.07	27	4.00	102	0.50	13	2.65	67	9.4 (8.10)	
SKB9408BWS	1"	25								1.33	34							14 (12.10)	
SKB9412BWS	1½"	40		4.75	121	7.2	183	7.93	201	1.92	49	4.75	121			3.54	90	28.3 (21.60)	7.97 (3.61)
SKB9416BWS	2"	50		5.75	146	8.85	225	9.84	250	2.41	61	5.25	133	0.62	16	4.04	103	53 (45.80)	13.15 (5.96)
SKB9402SWS	¼"	8	Socket Weld	2.68	68	5.79	147	6.24	158	0.56	14	3.00	76	0.37	9	2.05	52	1.7 (1.47)	5.72 (2.59)
SKB9404SWS	½"	15								0.86	22							5 (4.30)	
SKB9406SWS	¾"	20		3.62	92	6.15	156	6.68	170	1.07	27	4.00	102	0.50	13	2.65	67	9.4 (8.10)	
SKB9408SWS	1"	25								1.33	34							14 (12.10)	
SKB9412SWS	1½"	40		4.75	121	7.2	183	7.93	201	1.92	49	4.75	121			3.54	90	28.3 (21.60)	7.97 (3.61)
SKB9416SWS	2"	50		5.75	146	8.85	225	9.84	250	2.41	61	5.25	133	0.62	16	4.04	103	53 (45.80)	13.15 (5.96)

Stainless Steel Globe Valves for Cryogenic Service
SK Advantage Series Long Stem

Application

The SK Advantage Series of Stainless Steel Globe Valves are designed for handling cryogenic liquids through trailer, bulk vessels and piping configurations. Ideal service medium includes oxygen, nitrogen, krypton, carbon dioxide, dinitrogen monoxide, carbon dioxide, methane, ethane, ethylene, argon and LNG . Our Kold-Seal stem seal technology assures a tight seal preventing cryogen gas loss. The conical seat design allows exceptional flow, positive shutoff and less chance of debris accumulation in the flow path, all resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy.

REGO 10 YEAR WARRANTY

Features

- **Soft Seat:** PCTFE material which is the most widely specified cryogenic seat material in the industry
- **Construction:** Bolted bonnet allows easy access to the valve internals for servicing
- **Stem Packing:** Proven Kold-Seal technology, Live Loaded PTFE
- **Sizes:** ¼" through 2"
- **Connection:** Socket weld and butt weld
- **Service:** Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating:** -320°F to +150°F (-198°C to +65°C)
- **Pressure Rating:** Cold, Non-Shock, 725 psig (50 barg) Class 300 (PN 50)
- Cleaned and packaged for oxygen service per CGA G-4.1
- **Application:** Multiple stem lengths available for selected service
- **Packaging:** Each valve is individually bagged and boxed to arrive in factory new condition until installation

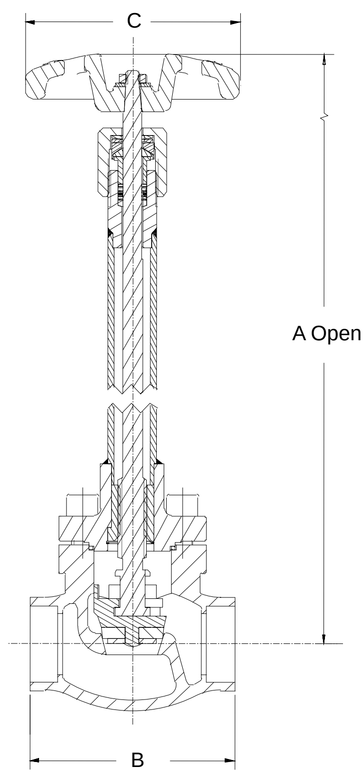
Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube .. Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring..Stainless Steel ASTM A313 S30200
Packing.. Live Loaded PTFE Packing
Gasket..PTFE 25% Glass Fill
Seat Disc...PCTFE ASTM D1430
Seat Retainer..Brass ASTM B16
Bonnet Screws..ASTM B16 C36000
Handwheel.. Painted Aluminum

Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

SK Advantage



TPED & PED Certified

Ordering Information

Part Number	Size Inches	Size dn	Connection	A Inches	A mm	B Inches	B mm	C Inches	C mm	Cv	Kv	Weight lbs	Weight kg
SKL9402SW	¼"	8	Socket Weld	14.6	370	2.7	68	4	102	1.7	1.47	3.76	1.70
SKL9404SW	½"	15								5	4.30	3.47	1.68
SKL9406SW	¾"	20				3.6	92			9.4	8.10	5.17	2.34
SKL9408SW	1"	25								14	1.16	5.34	2.42
SKL9412SW	1½"	40				4.7	121	5	127	28.3	21.9	9.48	4.30
SKL9416SW	2"	50		14.5	368	5.7	146			53	45.8	16.3	7.39
SKL9402BW	¼"	8	Butt Weld	14.6	370	2.7	68	4	102	1.7	1.47	3.76	1.70
SKL9404BW	½"	15								5	4.30	3.47	1.68
SKL9406BW	¾"	20				3.6	92			9.4	8.10	5.17	2.34
SKL9408BW	1"	25								14	12.10	5.34	2.42
SKL9412BW	1½"	40				4.7	121	5	127	28.3	21.60	9.48	4.30
SKL9416BW	2"	50		14.5	368	5.7	146			53	45.80	16.3	7.39

SW = Socket Weld; BW = Butt Weld

Stainless Steel Globe Valves for Cryogenic Service
SK Advantage Series Medium Stem

Application

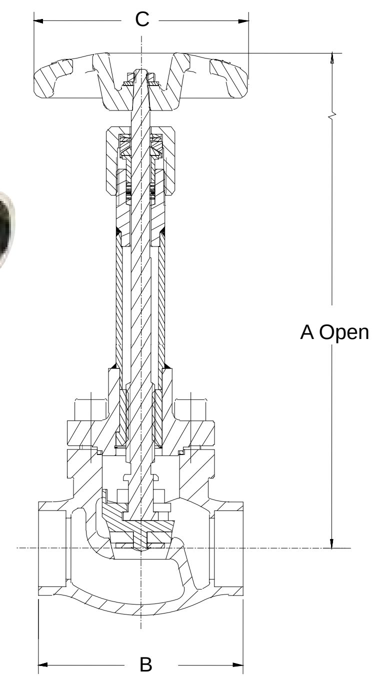
The SK Advantage Series of Stainless Steel Globe Valves are designed for handling cryogenic liquids through trailer, bulk vessels and piping configurations. Ideal service medium includes oxygen, nitrogen, krypton, carbon dioxide, dinitrogen monoxide, carbon oxide, methane, ethane, ethylene, argon and LNG . Our Kold-Seal stem seal technology assures a tight seal preventing cryogen gas loss. The conical seat design allows exceptional flow, positive shutoff and less chance of debris accumulation in the flow path, all resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy.

REGO 10 YEAR WARRANTY

Features

- **Soft Seat:** PCTFE material which is the most widely specified cryogenic seat material in the industry
- **Construction:** Bolted bonnet allows easy access to the valve internals for servicing
- **Stem Packing:** Proven Kold-Seal technology, Live Loaded PTFE
- **Sizes:** ¼" through 2"
- **Connection:** Socket weld and butt weld
- **Service:** Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating:** -325°F to +150°F (-198°C to +65°C)
- **Pressure Rating:** Cold, Non-Shock, 725 psig (50 barg) Class 300 (PN 50)
- Cleaned and packaged for oxygen service per CGA G-4.1
- **Application:** Multiple stem lengths available for selected service
- **Packaging:** Each valve is individually bagged and boxed to arrive in factory new condition until installation

SKM9406BW



Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube .. Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing... Live Loaded PTFE Packing
Gasket..PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel.. Painted Aluminum

Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

TPED & PED Certified

Ordering Information

Part Number	Size Inches	Size dn	Connection	A Inches	A mm	B Inches	B mm	C Inches	C mm	Cv	Kv	Weight lbs	Weight kg
SKM9402SW	¼"	8	Socket Weld	10.6	270	2.7	68	4	102	1.7	1.47	3.31	1.50
SKM9404SW	½"	15								5	4.30	3.29	1.48
SKM9406SW	¾"	20				3.6	92			9.4	8.10	4.86	2.20
SKM9408SW	1"	25								14	12.10	5.02	2.27
SKM9412SW	1½"	40				4.7	121	5	127	28.3	21.60	8.92	4.04
SKM9416SW	2"	50				5.7	146			53	45.80	15.30	6.94
SKM9402BW	¼"	8	Butt Weld			2.7	68	4	102	1.7	1.47	3.31	1.50
SKM9404BW	½"	15								5	4.30	3.29	1.48
SKM9406BW	¾"	20				3.6	92			9.4	8.10	4.86	2.20
SKM9408BW	1"	25								14	12.10	5.02	2.27
SKM9412BW	1½"	40				4.7	121	5	127	28.3	21.60	8.92	4.04
SKM9416BW	2"	50				5.7	146			53	45.80	15.30	6.94

SW = Socket Weld; BW = Butt Weld

Stainless Steel Globe Valves for Cryogenic Service
SK Advantage Series Short Stem

REGO 10 YEAR WARRANTY

Application

The SKS Series globe valves short stem are designed for handling of vapor phase and cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Our time tested spring loaded stem packing and superior seat design provide for long life and easy maintenance. Recommended for vapor phase and intermittent cryogenic liquid use.

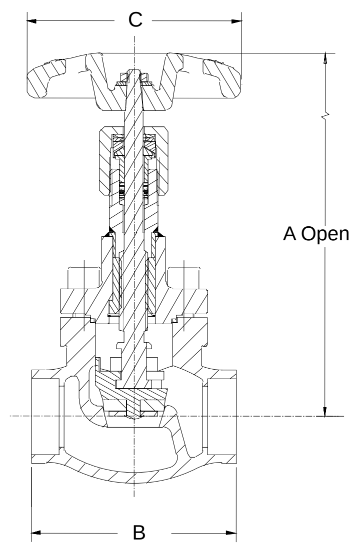
Features

- Superior Flow: Provides high Cv for rapid and reliable loading and unloading
- Designed with the unique Kold-Seal™
- Conical PCTFE Seat: provides exceptional flow; bubble tight seal; less chance of debris trapped in the seat and longer service life
- Connections: Socket Weld & Butt Weld
- Sizes: ¼" to 1½"
- Bonnet Type: Bolted
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -320°F (-196°C) to +150°F (+65°C)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations
- Cleaned for Oxygen Service per CGA G-4.1

SKS9406BW

Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube .. Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing.. Live Loaded PTFE Packing
Gasket...PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer...Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel.. Painted Aluminum



Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

PED Certified

Ordering Information

<table>
<tr><th>Part Number</th><th>Size Inches</th><th>Size mm</th><th>Connection</th><th>A Inches</th><th>A mm</th><th>B Inches</th><th>B mm</th><th>C Inches</th><th>C mm</th><th>Cv</th><th>Kv</th><th>Weight lbs</th><th>Weight kg</th></tr>
<tr><td>SKS9402SW</td><td>¼"</td><td>8</td><td rowspan="5">Socket Weld</td><td rowspan="4">6.7</td><td rowspan="4">170</td><td rowspan="2">2.7</td><td rowspan="2">68</td><td rowspan="4">4</td><td rowspan="4">102</td><td>1.7</td><td>1.47</td><td>2.64</td><td>1.20</td></tr>
<tr><td>SKS9404SW</td><td>½"</td><td>15</td><td>5</td><td>4.30</td><td>2.62</td><td>1.19</td></tr>
<tr><td>SKS9406SW</td><td>¾"</td><td>20</td><td rowspan="2">3.6</td><td rowspan="2">92</td><td>9.4</td><td>8.10</td><td>4.21</td><td>1.91</td></tr>
<tr><td>SKS9408SW</td><td>1"</td><td>25</td><td>14</td><td>12.10</td><td>4.10</td><td>1.86</td></tr>
<tr><td>SKS9412SW</td><td>1½"</td><td>40</td><td>7.0</td><td>178</td><td>4.7</td><td>120</td><td>5</td><td>127</td><td>28.3</td><td>21.60</td><td>7.16</td><td>3.25</td></tr>
<tr><td>SKS9402BW</td><td>¼"</td><td>8</td><td rowspan="5">Butt Weld</td><td rowspan="4">6.7</td><td rowspan="4">170</td><td rowspan="2">2.7</td><td rowspan="2">68</td><td rowspan="4">4</td><td rowspan="4">102</td><td>1.7</td><td>1.47</td><td>2.64</td><td>1.20</td></tr>
<tr><td>SKS9404BW</td><td>½"</td><td>15</td><td>5</td><td>4.30</td><td>2.62</td><td>1.19</td></tr>
<tr><td>SKS9406BW</td><td>¾"</td><td>20</td><td rowspan="2">3.6</td><td rowspan="2">92</td><td>9.4</td><td>8.10</td><td>4.21</td><td>1.91</td></tr>
<tr><td>SKS9408BW</td><td>1"</td><td>25</td><td>14</td><td>12.10</td><td>4.10</td><td>1.86</td></tr>
<tr><td>SKS9412BW</td><td>1½"</td><td>40</td><td>7.0</td><td>178</td><td>4.7</td><td>120</td><td>5</td><td>127</td><td>28.3</td><td>21.60</td><td>7.16</td><td>3.25</td></tr>
</table>

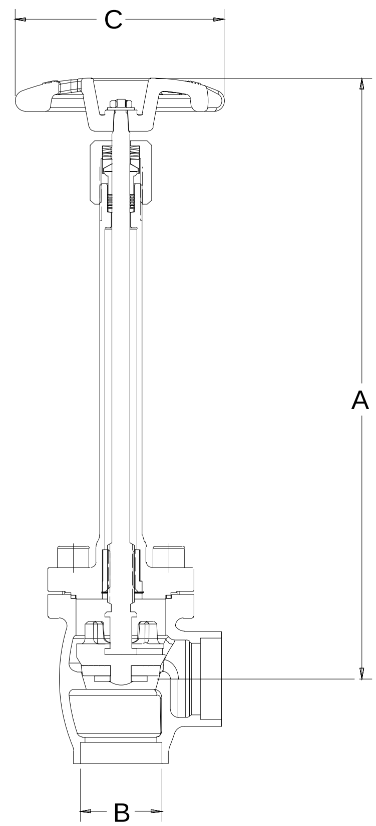
Stainless Steel Angle Globe Valves for Cryogenic Service
SKA Advantage Series

Application

RegO/Goddard stainless steel angle globe valves are designed for handling cryogenic liquids. Designed for fill manifolds applications of bulk tanks. RegO Kold-Seal™ stem seal technology assures a tight seal preventing gas loss. The conical seat design allows exceptional flow, positive shut off and less chance of debris accumulation in the flow path—resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy. Ideal service medium includes oxygen, nitrogen, argon, carbon dioxide, nitrous oxide, methane, ethane, ethylene, krypton, and LNG.

Features

- Sizes: 1" through 1½"
- Connection: Socket Weld
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature rating: -320°F to +150°F (-196°C to +65°C)
- Pressure rating: Cold, Non-Shock, 720 psig (50 barg) Class 300 (PN 50)
- Cleaned and packaged for oxygen service per CGA G-4.1
- Soft Seat: PCTFE material which is the most widely specified cryogenic seat material in the industry
- Stem Packing: Proven Kold-Seal technology, live loaded PTFE.
- Conical seat, provides more Cv
- Seat assembly without nut and washer. No loose materials from vibration. Less chance of failure
- Pressure relief system of the bonnet increases life of packing system
- Ergonomics handwheels for ease of use
- 100% factory tested. Each valve is individually bagged and boxed to arrive in factory new condition until installation



Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube .... Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing... Live Loaded PTFE Packing
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer..Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel.. Painted Aluminum

PED Certified

Ordering Information

Part Number	Size Inches	Size dn	Connection	A Inches	A mm	B Inches	B mm	C Inches	C mm	Weight lbs	Weight kg
SKA9408LSW	1"	25	Socket Weld	14.6	370	1.33	33.78	4	102	5.41	2.45
SKA9412LSW	1½"	40				1.92	48.77	5	127	8.85	4.01
SKA9408MSW	1"	25			270	1.33	33.78	4	102	5.0	2.2
SKA9412MSW	1½"	40				1.92	48.77	5	127	8.0	3.6

Stainless Steel Globe Valve for Cryogenic Service
210 Series

REGO 10 YEAR WARRANTY

Features

- **Top Entry**: This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: Body and Bonnet ASTM A351 J92600 Stainless steel
- **Sizes**: ½" - 4" (15mm - 100mm)
- **Ends**: RF Flange, Butt weld, Socket weld, Threaded (FNPT)
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- **100% Factory Tested**
- **Clean for use in oxygen** per CGA G-4.1
- **Temperature Rating**: -320°F - 150°F (-196°C +65°C)
- **Pressure Rating**: (Cold, Non-shock)
  Class 150 valve - 275 psig (19 barg)
  Class 300 valve - 720 psig (50 barg)

  ½" - 4" Class 150
  PED Approved
  ½" - 4" Class 300
  PED Approved

Our investment cast stainless steel is specified by leading industrial gas companies for storage tank and yard operations. Special order bonnet extensions are available for cold box applications. Valves for hydrogen use can be supplied

210 Series

Ordering Information

Stainless Body • RF Flange Ends

150# Part Number	300# Part Number	Valve Size		Ends	150# Weight		300# Weight		Estimated C_V (Kv)
		Inches	MM		Lbs.	Kg.	Lbs.	Kg.	
GS-00210W-8F	GS-00210W-8F3	1"	25 mm	Flange	15	6.80	20	9.07	11.50 (9.94)
GS-00210W-16F	GS-00210W-16F3	2"	50 mm		35	15.88	40	18.14	40.00 (34.60)
GS-00210W-24F	GS-00210W-24F3	3"	80 mm		65	29.48	70	31.75	60.00 (51.90)
GS-00210W-32F	GS-00210W-32F3	4"	100 mm		95	43.09	100	45.35	175 (151.37)

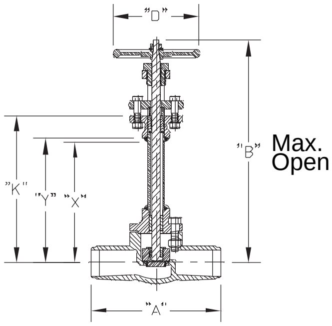
150# ANSI Class (275 psig (19 barg) Cold Working Pressure)
300# ANSI Class (720 psig (50 barg) Cold Working Pressure)

Stainless Body • Butt Weld, Socket Weld, Threaded Ends

300# Part Number	Valve Size		Ends	Weight		Estimated C_V (Kv)
	Inches	MM		Lbs.	Kg	
GS-00210W-4S3	½"	15 mm	Socket Weld	15	6.80	3.90 (3.37)
GS-00210W-4T3	½"	15 mm	Threaded			
GS-00210W-6S3	¾"	20 mm	Socket Weld			7.10 (6.14)
GS-00210W-6T3	¾"	20 mm	Threaded			
GS-00210W-8S3	1"	25 mm	Socket Weld			11.50 (9.94)
GS-00210W-8T3	1"	25 mm	Threaded			
GS-00210W-12S3	1½"	40 mm	Socket Weld	25	11.34	29.00 (25.08)
GS-00210W-16W3A	2"	50 mm	Butt Weld SCH10	35	15.88	40.00 (34.60)
GS-00210W-16W3J	2"	50 mm	Butt Weld SCH40			
GS-00210W-24W3A	3"	80 mm	Butt Weld SCH10	55	24.95	60.00 (51.90)
GS-00210W-24W3J	3"	80 mm	Butt Weld SCH40			
GS-00210W-32W3A	4"	100 mm	Butt Weld SCH10	80	36.29	175.00 (151.37)
GS-00210W-32W3J	4"	100 mm	Butt Weld SCH40			
LOX00210W-24W3A**	3"	80 mm	Butt Weld SCH10	55	24.95	60.00 (51.90)
LOX00210W-32W3A**	4"	100 mm	Butt Weld SCH10	80	36.29	175.00 (151.37)

* Second number indicates part number for 300# valve.
** LOX valves specifically for Liquid Oxygen Service, for more information on LOX valves see page 62
150# ANSI Class (275 psig (19 barg) Cold Working Pressure)
300# ANSI Class (720 psig (50 barg) Cold Working Pressure)

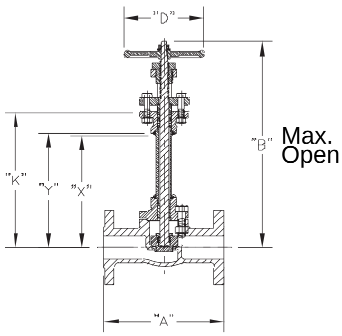
Stainless Steel Globe Valve for Cryogenic Service
210 Series



Butt Weld Ends

Size		"A"		"B"		"D"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
2"	51	10½"	267	22¼"	565	7"	178	15"	381	12¾"	324	13 1/16"	332
3"	76	12"	305	30½"	768	10"	254	21½"	546	19 1/16"	484	19⅜"	492
4"	102	13½"	343	36¾"	933	12"	305	24¼"	616	21 11/16"	551	22"	559

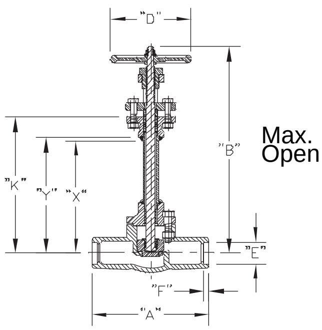
∆ For SCH. 40 A=12½"
ϴ For SCH. 40 A=14"
* Unless otherwise specified, SCH 10 weld ends are supplied
- Special B,K,X & Y dimensions available.



Raised Face Flange Ends*

Size		"A" 150#		"A" 300#		"B"		"D"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1"	25	6½"	165	8"	203	18⅛"	460	5"	127	12¾"	324	11 1/16"	484	11⅜"	289
2"	51	8"	203	10½"	267	22¼"	565	7"	178	15"	381	12¾"	324	13 1/16"	332
3"	76	9½"	241	12½"	317	30½"	775	10"	254	21½"	546	19 1/16"	484	19⅜"	492
4"	102	11½"	292	14"	356	36¾"	933	12"	305	24¼"	616	21 11/16"	551	22"	559

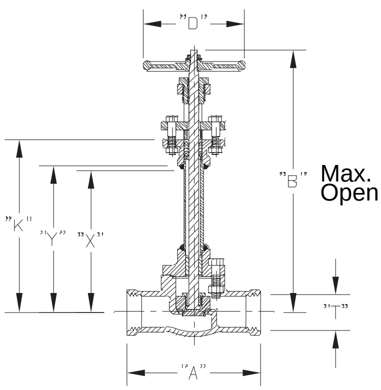
- Special B,K,X & Y dimensions available.



Socket Weld Ends

Size		"A"		"B"		"D"		"E"		"F"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	5"	127	18⅛"	460	5"	127	.855	22	⅜"	9	12¾"	324	11 1/16"	281	11⅜"	289
¾"	19							1.06	27	½"	13						
1"	25							1.33	34								
1½"	38	10¼"	260	22¼"	565	7"	178	1.91	48			15"	381	12¾"	324	13 1/16"	332

- Special B,K,X & Y dimensions available.



Threaded Ends

Size		"T" - NPT		"A"		"B"		"D"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	½"-14	13-356	5"	127	18⅛"	460	5"	127	12¾"	324	11 1/16"	281	11⅜"	289
¾"	19	¾"-14	19-356												
1"	25	1"-11½	25-292	5¾"	146										

- Special B,K,X & Y dimensions available.

Stainless Steel Globe Valve for Hydrogen Cryogenic Service
231 Series

REGO 10 YEAR WARRANTY

Application

The RegO Goddard 231 Series Stainless Steel globe valves are designed for handling of cryogenic liquids through bulk tanks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, hydrogen, helium and argon.

Features

- **Top Entry**: Rugged stainless steel ASTM A351-CF3M (316L) soft seated cryogenic globe valve. This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: One piece investment cast bonnet eliminates welded joint in topworks
- **Stem Packing**: Proprietary Goddard system utilizing GRAFOIL® flexible graphite
- **Sizes**: ¼" through 1½" (6mm through 40mm)
- **Ends**: Socket weld, Butt weld
- **Service**: Liquefied and Gaseous hydrogen service only (see series 232 for non-hydrogen service)
- **Temperature Rating**: -425°F to 150°F (-254°C to +65°C)
- **Pressure Rating**: (Cold, Non-shock)
  300 psig (20 barg)
  400 psig (27 barg)

PED Approved
Designed to ASME B16.34

A rugged construction and easy access are design features which provide minimum installation and maintenance cost while maintaining superior performance and operator safety. This valve replaces higher cost bellows-seated valves in many applications. The proprietary Goddard GRAFOIL® stem packing system provides excellent performance when the valve operates in liquid hydrogen service.

231 Series

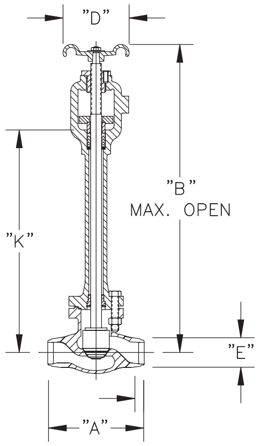
Ordering Information

Stainless Body • 400 psig (28 barg) Socket Weld Ends

Part Number	Valve size Inches	Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
S-231-2S4	¼"	6	Socket Weld	6	2.72	1.30 (1.12)
S-231-4S4	½"	15				3.90 (3.37)
S-231-6S4	¾"	20		10	4.54	7.10 (6.14)
S-231-8S4	1"	25				10.50 (9.08)
S-231-12S4	1½"	40		15	6.80	25.00 (21.62)

Stainless Body • 300 psig (20 barg) Butt Weld Ends

Part Number	Valve size Inches	Valve Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
S-231-4WA	½"	15	Butt Weld	6	2.72	3.90 (3.37)
S-231-8WA	1"	25		10	4.54	10.50 (9.08)
S-231-12WA	1½"	40		15	6.80	25.00 (21.62)

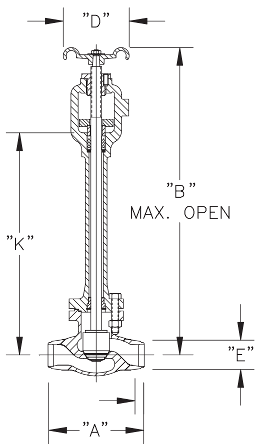


Pressure Rating 400 psig (28 barg)
Temperature Rating - 425° F to+150° F (-25°C to 65°C)
This valve is not approved for gaseous and/or liquid oxygen service
For oxygen service use Goddard series 232H cryogenic globe valve

Dimensional data

Socket Weld Ends

Size		"A"		"B"		"D"		"E"		"F"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¼"	6	4¼"	108	14 9/16"	370	2⅜"	60	0.560	14	0.375	9	10 3/16"	259
½"	13							0.860	22				
¾"	19	5⅜"	137	17"	432	3"	76	1.070	27	0.500	13	11½"	292
1"	25							1.335	34				
1½"	38	6½"	165	18 14/16"	479	4"	102	1.920	49			12 15/16"	329



Pressure Rating 300 psig (20 barg)
Temperature Rating - 425° F to +150° F (-253°C to 65°C)
This valve is not approved for gaseous and/or liquid oxygen service
For oxygen service use Goddard series 232H cryogenic globe valve

Dimensional data

Butt Weld Ends

Size		"A"		"B"		"D"		"K"		"E"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	4¼"	108	14 9/16"	370	2⅜"	60	10 3/16"	259	½"	13
1"	25	5"	127	17"	432	3"	76	11½"	292	1"	25
1½"	38	6½"	165	18⅞"	479	4"	102	12 5/16"	313	1½"	38

Stainless Steel Globe Valve for Cryogenic Service
232 Series

Application

The RegO Goddard 232 Series Stainless Steel globe valves are designed for handling of cryogenic liquids through bulk tanks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, helium and argon.

REGO 10 YEAR WARRANTY

Features

- **Top Entry**: Rugged stainless steel ASTM A351-CF3M (316L) soft seated cryogenic globe valve. This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: One piece investment cast bonnet eliminates welded joint in topworks.
- **Sizes**: ½” through 1½” (15mm through 40mm)
- **Ends**: Socket weld and Butt weld
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating**: -325°F to 150°F (-198°C to +65°C)
- **Pressure Rating**: (Cold, Non-shock)
  300 psig (20 barg)
  400 psig (27 barg)

  PED Approved,

A rugged construction and easy access are design features which provide minimum installation and maintenance cost while maintaining superior performance and operator safety.

232 Series

Ordering Information

Stainless Body Socket Weld Ends 400 psig (28 barg)

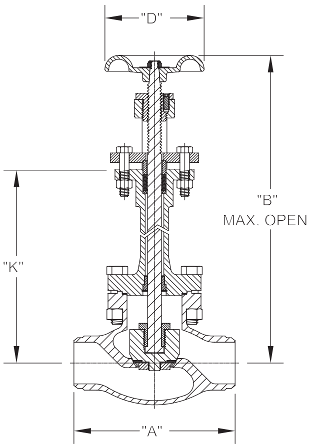
Part Number	Valve size Inches	Valve Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
S-232-4S4	½”	15	Socket Weld	6	2.72	3.90 (3.37)
S-232-8S4	1”	25		10	4.54	10.50 (9.08)

High Purity Cryogenic Bonnet Nickel Plated Naval Brass Yoke Bushing Stainless Steel Body Butt Weld Ends 300 psig (20 barg)

Part Number	Valve size Inches	Valve Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
S-232HCB-4WA	½”	15	Butt Weld	6	2.72	3.90 (3.37)
S-232HCB-8WA	1”	25		10	4.54	10.50 (9.08)
S-232HCB-12WA	1½”	40		15	6.80	25.00 (21.62)

High Purity Cryogenic Bonnet Nickel Plated Naval Brass Yoke Bushing, Stainless Steel Body Socket Weld Ends 400 psig (28 barg)

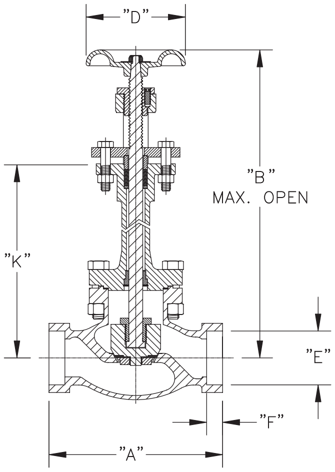
Part Number	Valve size Inches	Valve Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
S-232HCB-4S4	½”	15	Socket Weld	6	2.72	3.90 (3.37)
S-232HCB-8S4	1”	25		10	4.54	10.50 (9.08)
S-232HCB-12S4	1½”	40		15	6.80	25.00 (21.62)



Pressure rating 300 psig (20 barg) non-shock cold
Temperature rating +150° F to -325° F (+65°C to -198°C)
Dimensional Data

Butt Weld Ends

Size		"A"		"B"		"D"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	4¼"	108	14 9/16"	370	2⅜"	60	10 3/16"	259
1"	25	5"	127	17"	432	3"	76	11½"	292
1½"	38	6"	152	18⅞"	479	4"	102	12 5/16"	313



Pressure rating 400 psig (28 barg) non-shock cold
Temperature rating +150° F to -325° F (+65°C to -198°C)
Dimensional Data

Socket Weld Ends

<table>
<tr><th colspan="2">Size</th><th colspan="2">"A"</th><th colspan="2">"B"</th><th colspan="2">"D"</th><th colspan="2">"E"</th><th colspan="2">"F"</th><th colspan="2">"K"</th></tr>
<tr><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th><th>Inches</th><th>mm</th></tr>
<tr><td>½"</td><td>13</td><td>4¼"</td><td>108</td><td>14 9/16"</td><td>370</td><td>2⅜"</td><td>60</td><td>0.86</td><td>22</td><td>0.37</td><td>9</td><td>10 3/16"</td><td>259</td></tr>
<tr><td>1"</td><td>25</td><td>5⅜"</td><td>136</td><td>17"</td><td>432</td><td>3"</td><td>76</td><td>1.33</td><td>34</td><td rowspan="2">0.50</td><td rowspan="2">13</td><td>11 ½"</td><td>292</td></tr>
<tr><td>1½"</td><td>38</td><td>6½"</td><td>165</td><td>18⅞"</td><td>479</td><td>4"</td><td>102</td><td>1.92</td><td>49</td><td>12 5/16"</td><td>313</td></tr>
</table>

Cryogenic Fill Manifold
CSB & CSM Series

REGO
10
YEAR
WARRANTY

Application

RegO® Goddard high quality welded and welded assemblies are ideal for the manufacturer of original equipment for bulk cryogenic vessels. Using the same technology of our globe valves with SK Series bolt cap, stainless steel bodies and superior works and stainless steel construction pipes are available as a production unit with stainless steel control block and control block brass. Ideal for all cryogenic liquids including Liquefied Nitrogen, Oxygen Argon, and CO2. Safe and reliably used in LNG Systems. In addition, RegO® can custom design configurations that are welded and brazed in a factory setting.

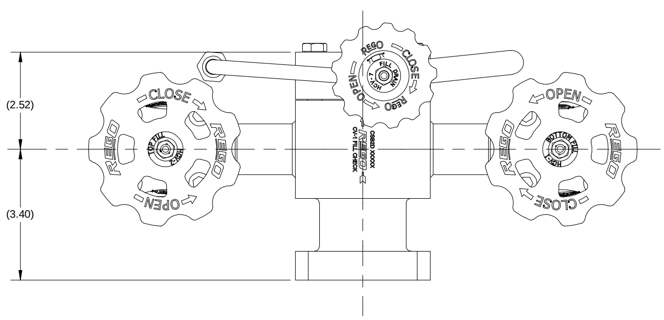
CSM2D

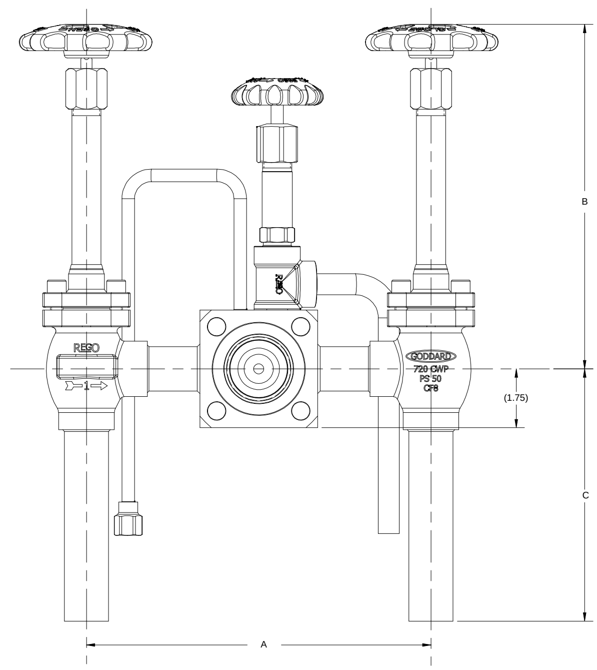
Features

- Unitized construction eliminates leaks and provides easy fit-up to tank piping
- Modules commonly include top and bottom fill valves, fill check with strainer and hose bleed and relief valve
- Many options are available which can include specific end user dimensions and specifications
- Our valve products stand up to high cycle environments, without the need for field adjustment of valve packing
- Available alone or as a unitized welded assembly for bulk tank filling
- Repeatable performance and geometry
- Precision silver brazed assembly
- Cleaned for Oxygen Service per CGA G-4.1
- Pressure Rating: 600 psig (41 barg)
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- 100% Factory tested

Materials

Globe Valve .... Stainless Steel ASTM A351
Check Valve... Stainless Steel ASTM A351
Bleed Valve ....Brass ASTM B16
Check Valve ....Brass ASTM B16
Bleed Valve .... Stainless Steel ASTM A351
Tube .... 304L Stainless Steel ASTM A312





Ordering Information

Part Number	Size Inches	Size mm	Check Valve And Bleed Valve Material	Dimensions					
				A Inches	A mm	B Inches	B mm	C Inches	C mm
CSB2D	1"	25	Brass	10.3	260	10.6	269	7.5	190.5
CSB4D	1½"	40						15	381
CSM2D	1"	25	Stainless Steel					7.5	190.5
CSM4D	1½"	40						15	381

Cryogenic Fill Manifold
CFM, AFM & PFM Series

Application

RegO® Goddard high quality brazed and welded assemblies are ideally suited for the original equipment manufacturer of bulk cryogenic vessels. A wide variety of valve types including union or bolted bonnet, bronze bodies & top works and piping of stainless steel or copper construction are available as production unit.

Ideal for all cryogenic liquids including Liquefied Nitrogen, Oxygen, Argon, and CO2. In addition RegO® can custom design configurations that are welded and brazed in a factory setting.

CFM4E

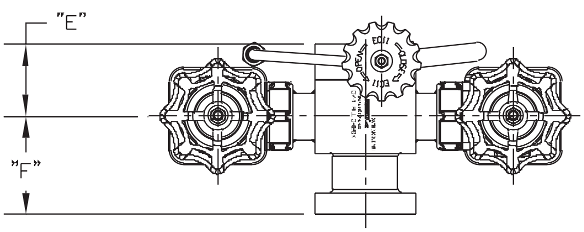
REGO 10 YEAR WARRANTY

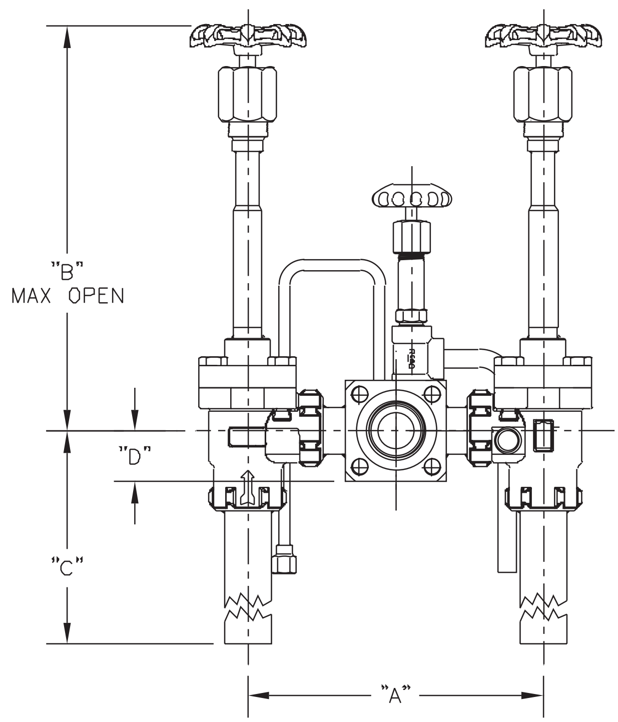
Features

- Unitized construction eliminates leaks and provides easy fit-up to tank piping
- Modules commonly include top and bottom fill valves, fill check with strainer and hose bleed and relief valve
- Many options are available which can include specific end user dimensions and specifications
- Our valve products stand up to high cycle environments, without the need for field adjustment of valve packing
- Available alone or as a unitized welded assembly for bulk tank filling
- Repeatable performance and geometry
- Precision silver brazed and welded assembly
- Cleaned for Oxygen Service per CGA G-4.1
- Pressure Rating: CFM, AFM & PFM Series 600 psig (41 barg)
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- 100% Factory tested

Materials

Globe Valve ....Brass ASTM B16
Check Valve .... Brass ASTM B16 "F Bleed
Valve ....Brass ASTM B16
Tube .... 304L Stainless Steel or Copper





Ordering Information

Part Number	Size Inches	Size mm	Pipe Material	Bonnet Type	Dimensions						Cv (Kv)	
					A Inches	A mm	B Inches	B mm	C Inches	C mm	One side open	Both sides open
CFM2D	1"	25	Stainless Steel	Union	10.25	260.35	14.64	371.85	7.5	190.5	10.8 (9.34)	20.8 (17.99)
CFM4D	1½"	40					15	381	9.5	241.3		
CFM4E				Bolted			13	330.2				
AFM4D					15	381	14.64	371.85	20	508		
PFM4D			Copper									

Diaphragm Type Globe Valves
2500 Series

Application

The 2500 series valves are designed for use in hospital and industrial piping systems where gases are supplied from a central source to branch outlets throughout the system.

Features

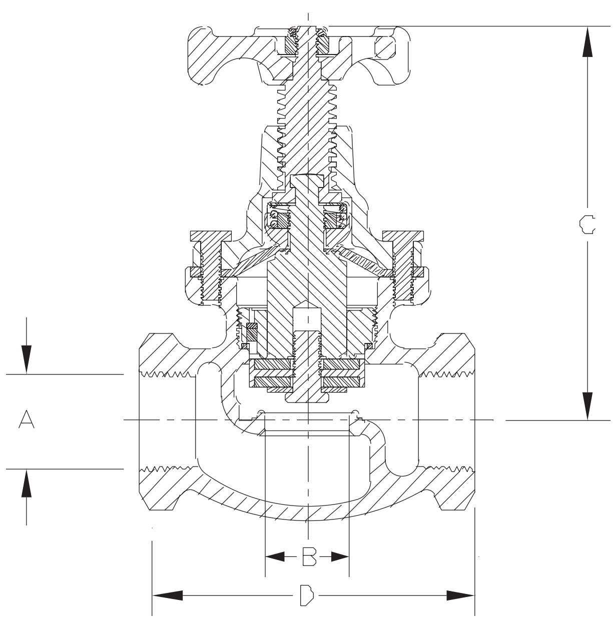
- UL listed for use with air, argon, acetylene, helium, hydrogen, LP-Gas, nitrogen, inert gases and oxygen service
- Leakage is prevented by a dependable diaphragm stem seal
- A resilient seat disc provides positive shut-off
- Heavy duty ACME stem threads assure easy operation and long working life
- Unique back seat design enabling the diaphragm assembly to be repaired while the valve remains in service
- Maximum working pressure is 400 psig (27.5 barg)
- Working temperature range is -40°F to +165°F (-40ºC to +74ºC)
- 100% Factory Tested
- All valves clean for use in oxygen per CGA G-4.1
- 2505AC and 2507AC are UL Listed.

REGO 10 YEAR WARRANTY

Materials

Body 2507AC, 2511AC & 2513AC .... Cast Bronze, Tin Plated
Body 2505AC ....Cast Red Brass, Tin Plated
Bonnet .... Brass
Stem .... Manganese Bronze
Seat Disc .... Neoprene
Diaphragm .... Neoprene

2505AC



Ordering Information

Part Number	Inlet/Outlet Thread (Female NPT) A		Port Diameter B		Height C		Length D		Cv (Kv)
	inches	mm	inch	mm	inch	mm	inch	mm	
2505AC	¾"	19.05	15/16"	23.87	5¼"	133.35	4"	101.60	9.0 (7.78)
2507AC	1"	25.40	1 1/8"	28.57	5 3/8"	136.65	4 3/8"	111.25	15.0 (12.97)
2511AC	1½"	38.10	1 11/16"	42.92	6¾"	171.45	5 3/8	136.65	33.4 (28.89)
2513AC	2"	50.80	2 5/16"	58.67	7⅛"	180.97	6¼"	158.75	51.7 (44.72)

REGO

Diaphragm Type Globe Valves
2550 Series

Application

The 2550 series valves are designed for use in hospital and industrial piping systems where gases are supplied from a central source to branch outlets throughout the system.

UL LISTED

REGO 10 YEAR WARRANTY

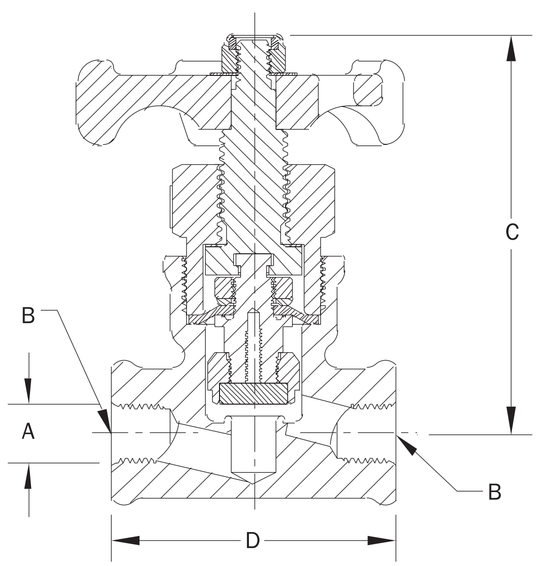
Features

- UL listed for use with acetylene, hydrogen, nitrogen, oxygen service and compressed air
- Leakage is prevented by a dependable diaphragm stem seal
- A resilient seat disc provides positive shut-off
- Heavy duty ACME stem threads assure easy operation and long working life
- Maximum working pressure is 250 psig (17.2 barg)
- Working temperature range is -40°F to +165°F (-40ºC to +74ºC)
- 100% Factory Tested
- All valves clean for use in oxygen per CGA G-4.1

2554AC

Materials

Body (2554 series) .... Cast Red Brass, Tin Plated
Seat Disc .... Filled Teflon
Diaphragm .... Neoprene
Bonnet .... Brass
Stem .... Manganese Bronze
Handwheel... Aluminum



Ordering Information

Part Number	Inlet/Outlet Thread (Female NPT) A		Port Diameter B		Height C		Length D		Cv (Kv)
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
2554AC	½"	13	21/32"	17	3⅜"	86	3 1/8"	79	4.3 (3.71)
2554AAC	¾"	19							

REGO

Extended Bonnet Bronze Gate Valve for Cryogenic Service
322 and 326 Series

Application

The RegO Goddard 322 and 326 Series gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, and argon.

Features

- **Top Entry:** This union bonnet valve can be permanently installed in the line and serviced from the top
- **Construction:**
  Bronze cast body and Internals
  Rugged construction for long life
  Straight through construction for high CV
  Designed with unique KOLD-SEAL™ packing
  Standard split wedge design provides better sealing and cycle life
- **Sizes:** ½" - 3" (15mm - 80mm)
- **Ends:** Threaded (FNPT), Sil Braze Tube (SBT), Silver Brazed Pipe (SBP) or with stainless steel pipe nipples brazed in
- **Service:** Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating:** -320°F to +150°F (-196°C + 65°C)
- **Pressure Rating:** (Cold, Non-shock)
  322 Series 400 psig (28 barg)
  326 Series 600 psig (42 barg)
- Cleaned for Oxygen Service per CGA G-4.1

  Designed to MSS SP-80 and ASME B31.3
  Series 1.5" to 3" PED Approved per EN 10204, 3.1

  Ideal for cryogenic supply and storage handling applications.
  Straight-through flow for highest CV rating in the industry.

  Also available with GRAFOIL® packing

322 Series

Extended Bonnet Bronze Gate Valve for Cryogenic Service 322 and 326 Series

Ordering Information

322 Series

Bronze Gate Valves
400 psig (28 barg) COLD WORKING PRESSURE

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-322-20T4	2½"	65 mm	Threaded	19.00	8.64	372.00 (321.78)
B-322-24T4	3"	80 mm		28.00	121.73	588.00 (508.62)

Part Number	SBT Size Inches*	SBT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-322-4S4	½"	15 mm	Silver Braze	1.75	0.80	19.80 (17.12)
B-322-6S4	¾"	20 mm		2.25	1.02	36.00 (31.14)
B-322-8S4	1"	25 mm		3.50	1.59	60.80 (52.59)
B-322-12S4	1½"	40 mm		7.50	3.41	152.00 (131.48)
B-322-16S4	2"	50 mm		11.25	5.11	245.00 (211.92)
B-322-20S4	2½"	65 mm		17.00	7.73	372.00 (321.78)
B-322-24S4	3"	80 mm		24.00	10.91	588.00 (508.62)

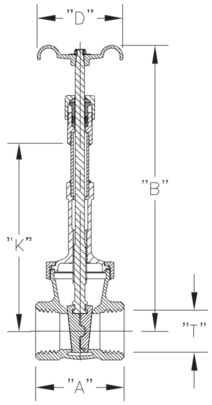
*Nominal Size

326 Series

Bronze Gate Valves
600 psig (42 barg) COLD WORKING PRESSURE

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated Cv (Kv)
B-326-4T6	½"	15 mm	Threaded	1.75	0.80	19.80 (17.12)
B-326-6T6	¾"	20 mm		2.25	1.02	36.00 (31.14)
B-326-8T6	1"	25 mm		4.00	1.82	60.80 (52.59)
B-326-12T6	1½"	40 mm		8.25	3.75	152.00 (131.48)
B-326-16T6	2"	50 mm		12.50	5.68	245.00 (211.92)

Extended Bonnet Bronze Gate Valve for Cryogenic Service
322 and 326 Series

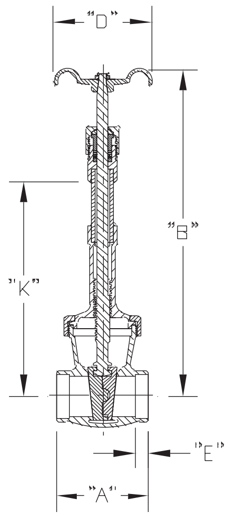


322 Series

MAWP: 400 psig (28 barg) Non-Shock Cold
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Dimensional Data

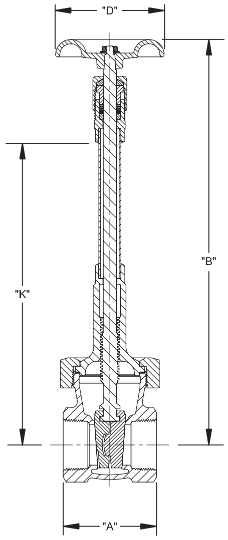
Threaded End (NPT)

Size		"A"		"B"		"D"		"K"		"T"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
2½"	63	4.68"	119	22.5"	571	5.25"	133	14.5"	368	2½"	63
3"	76	5.12"	130	24.87"	632	6.12"	155	16.31"	414	3"	76



Sil Braze End

Size		"A"		"B"		"D"		"K"		"E"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	2.5"	63	9.38"	238	2.37"	60	5.5"	140	.38"	10
¾"	19	3"	76	10.56"	268	2.75"	70	6.12"	155	.40"	10
1"	25	3.25"	83	12.38"	314	3"	76	7.68"	195	.43"	11
1½"	38	4"	102	17"	432	4"	102	10.87"	276	.62"	16
2"	51	4.5"	114	19.62"	498	4.75"	121	12.38"	314	.65"	16
2½"	63	5.25"	133	22.5"	571	5.25"	133	14.5"	368	.78"	20
3"	76	6"	152	24.87"	632	6.12"	155	16.31"	414	.82"	21



326 Series

MAWP: 600 psig (42 barg) Non-Shock Cold
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Dimensional Data

Threaded End (NPT)

Size		"A"		"B"		"D"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	2.34"	59	9.37"	238	2¼"	57	5.5"	140
¾"	19	2.5"	63	10.56"	268	2¾"	70	6.12"	155
1"	25	2.34"	59	12.37"	314	3"	76	7.6"	193
1½"	38	3.43"	87	17"	432	4"	102	10.87"	276
2"	51	3.81"	97	19.62"	498	4¾"	121	12.37"	314

Bronze Gate Valves for Cryogenic Service
302, 306, 310 & 310X Series

REGO
10
YEAR
WARRANTY

Application

The RegO Goddard 302, 306, 310, & 310X Series gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, and argon.

Features

- **Top Entry**: This union bonnet valve can be permanently installed in the line and serviced from the top
- **Construction**:
  Bronze cast body and bonnet
  Rugged construction for long life
  Straight through design for high C_V
  Designed with unique KOLD-SEAL™
- **Sizes**: ½” - 3” (15mm - 80mm)
- **Ends**: Threaded (FNPT), Sil Braze Tube (SBT), or with stainless steel pipe nipples brazed in
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- **Temperature Rating**: -320°F - +150°F (-196°C +65°C)
- Cleaned for Oxygen Service per CGA G-4.1
- **Pressure Rating**: (Cold, Non-shock)
  310, 310x Series 300 psig
  302 Series 400 psig (28 barg)
  306 Series 600 psig (42 barg)

  Designed to MSS SP-80 and ASME B31.3
  Sizes 1.5” - 3.0” PED approved
- **Soft Seated** Series 310 & 310X: Solid wedge with PCTFE (Neoflon®) provides a bubble tight seal and is replaceable
- **Metal Seated** Series 302 & 306: Split wedge made of Bronze and also replaceable

Gate design for high flow applications.
Straight-through flow for highest C_V rating in the industry.

302, 306 Non-Extended stem for selective cold gas applications

310, 310X Extended stem ideal for cryogenic supply applications

302 Series

Bronze Gate Valves for Cryogenic Service
302, 306, 310 & 310X Series

Ordering Information

302 Series

Bronze Gate Valves
Bronze Body Non-Extended Bonnet, Split Wedge
For selected cold gas operations
400 psig (28 barg) COLD WORKING PRESSURE
Temperature Rating -325°F to +150° F (-198°C TO +65°C)

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
B-302-4T4	½"	15	Threaded	1.50	0.70	19.80 (17.12)
B-302-20T4	2½"	65		17.50	8.00	372.00 (321.78)
B-302-24T4	3"	80		26.00	11.80	588.00 (508.62)

Part Number	SBT Size Inches*	SBT Size mm*	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
B-302-4S4	½"	15	Silver Braze	1.25	0.60	19.80 (17.12)
B-302-6S4	¾"	20		2.25	1.00	36.00 (31.14)
B-302-8S4	1"	25		3.00	1.40	60.80 (52.59)
B-302-12S4	1½"	40		6.00	2.70	152.00 (131.48)
B-302-16S4	2"	50		9.50	4.30	245.00 (211.92)
B-302-20S4	2½"	65		14.50	6.60	372.00 (321.78)
B-302-24S4	3"	80		22.00	10.00	588.00 (508.62)

*Nominal Size

306 Series

600 psig (42 barg) Bronze Body, Non-Extended Bonnet, Split Wedge
Temperature Rating -325°F to +150° F (-198°C TO +65°C)

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
B-306-6T6	¾"	20	Threaded	2.25	1.00	36.00 (31.14)
B-306-8T6	1"	25		3.00	1.40	60.80 (52.59)
B-306-12T6	1½"	40		6.00	2.70	152.00 (131.48)
B-306-16T6	2"	50		9.50	4.30	245.00 (211.92)

310 Series

300 psig (20 barg)Bronze Body, Extended Bonnet, Solid Wedge, Soft Seat
Temperature Rating -325°F to +150° F (-198°C TO +65°C)

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
B-310-20T	2½"	65	Threaded	14.50	6.60	372.00 (321.78)
B-310-24T	3"	80		22.00	10.00	588.00 (508.62)

Part Number	SBT Size Inches *	SBT Size mm *	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
B-310-24S	3"	80	Silver Braze	22.00	10.00	588.00 (508.62)

*Nominal Size

310X Series

Short Top Works for Trailer Service
300 psig (20 barg)Bronze Body, Extended Bonnet, Solid Wedge, Soft Seat
Temperature Rating -325°F to +150° F (-198°C TO +65°C)

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
B-310X-20T	2½"	65	Threaded	14.50	6.60	372.00 (321.78)
B-310X-24T	3"	80		22.00	10.00	588.00 (508.62)

Part Number	SBT Size Inches *	SBT Size mm *	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
B-310X-24S	3"	80	Silver Braze	22.00	10.00	588.00 (508.62)

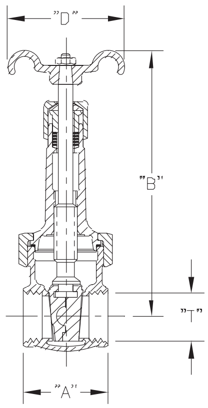
*Nominal Size

SB-00310X

Stainless Steel Body - Bronze Topworks
Temperature Rating -325°F to +150° F (-198°C TO +65°C)

Part Number	SBT Size Inches *	SBT Size mm *	Ends	Weight Lbs.	Weight Kgs.	Estimated C_V (Kv)
SB-310X-24SW	3"	80	Socketweld	22.00	10.00	588.00 (508.62)

Bronze Gate Valves for Cryogenic Service
302, 306 Series

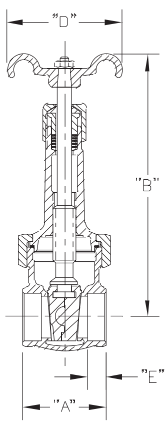


302 Series

MAWP: 400 psig (28 barg) Non-Shock Cold
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Non-Extended Valve for selective cold gas applications
Dimensional Data

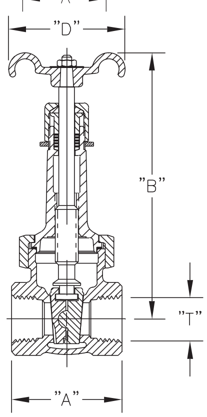
Threaded End (NPT)

Size		"A"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	2.34"	59	5.81"	147	2.37"	60	½"	13
2½"	63	4.68"	119	15.81"	401	5.25"	133	2½"	63
3"	76	5.12"	130	18.25"	463	6.12"	155	3"	76



Sil Braze End

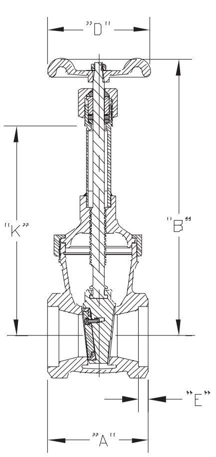
Size		"A"		"B"		"D"		"E"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	2.50"	63	5.81"	147	2.37"	60	.38"	10
¾"	19	3"	76	6.94"	176	2.75"	70	.40"	10
1"	25	3.25"	82	8.43"	214	3"	76	.43"	11
1½"	38	4"	102	11.19"	284	4"	102	.62"	16
2"	51	4.5"	114	13.19"	335	4.75"	121	.65"	17
2½"	63	5.25"	133	15.81"	401	5.25"	133	.78"	20
3"	76	6"	152	18.25"	463	6.12"	155	.82"	21



306 Series

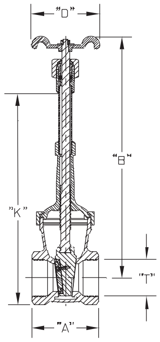
MAWP: 600 psig (42 barg) Non-Shock Cold-
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Non-Extended Valve for selective cold gas applications
Dimensional Data

Size		"A"		"B"		"D"		"T" NPT	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
¾"	19	2.5"	63	6.93"	176	2¾"	70	¾"	19
1"	25	2.84"	72	8.43"	214	3"	76	1"	25
1½"	38	3.43"	87	11.18"	284	4"	102	1½"	38
2"	51	3.81"	97	13.81"	351	4¾"	121	2"	51



SB-00310X-24SW Sil Braze End (Stainless Steel Body)

Size		"A"		"B"		"D"		"E"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
3"	76	6"	152	20.38"	518	6.12	155	0.63	16	12.5	317

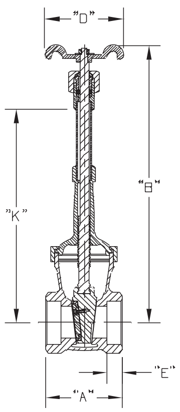


310 Series

MAWP: 300 psig (20 barg) Non-Shock Cold-
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Extended Valve for selective cold gas applications
Dimensional Data

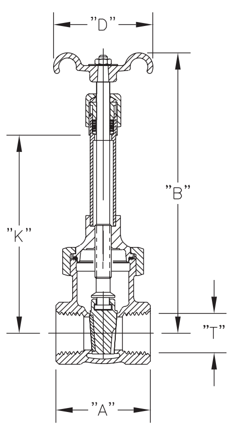
Threaded End (NPT)

Size		"A"		"B"		"D"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
3"	76	6"	152	25.38"	645	6.12"	155	16.30"	414



Sil Braze End

Size		"A"		"B"		"D"		"E"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
2½"	64	6"	152	25.38"	645	6.12"	155	.03"	1	16.30"	414
3"	76										

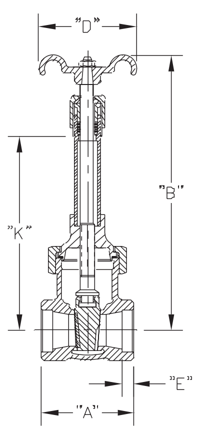


310X Series

MAWP: 300 psig (20 barg) Non-Shock Cold-
Temperature Rating +150° F to -325°F (+65°C to -198°C)
Extended Valve for selective cold gas applications, Ideal for Trailer Service
Dimensional Data

Threaded End (NPT)

Size		"A"		"B"		"D"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
2½"	64	6"	152	20.38"	518	6.12"	155	11.5"	292
3"	76								



Sil Braze End

Size		"A"		"B"		"D"		"E"		"K"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
3"	76	6"	152	20.38"	518	6.12"	155	0.83"	21	16.3"	414

Stainless Steel Gate Valve for Cryogenic Service
110 Series

Application

RegO Goddard gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, argon and LNG.

Features

- **Top Entry**: This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: Body and Bonnet ASTM A351-CF8 J92600 Stainless steel
- **Sizes**: ½" - 6" (15mm - 150mm)
- **Ends**: RF Flange, Butt weld, Socket weld, Threaded (FNPT)
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- WHZ valves with Grafoil® stem packing available
- **Temperature Rating**: -320°F - 150°F (-196°C +65°C)
- 100% Factory Tested
- Clean for use in oxygen per CGA G-4.1
- PED Approved
- **Pressure Rating**: (Cold, Non-shock)
  Class 150 valve - 275 psig (19 barg)
  Class 300 valve - 720 psig (50 barg)

110 Series

REGO 10 YEAR WARRANTY

Ordering Information

Stainless Body • RF Flange Ends

150# Part Number	300# Part Number	Valve Size		Ends	Weight 150#		Weight 300#		Estimated C_V (Kv)
		Inches	mm		Lbs.	Kg	Lbs.	Kg.	
GS-110W-8F	-	1"	25 mm		15	6.80	-	-	30.00 (25.95)
GS-110W-12F	GS-110W-12F3	1½"	40 mm		35	15.88	45	20.41	85.00 (73.52)
GS-110W-16F	GS-110W-16F3	2"	50 mm	Flange	35	15.88	50	22.68	100.00 (86.50)
GS-110W-24F	GS-110W-24F3	3"	80 mm		65	29.48	85	35.56	310.00 (268.15)
GS-110W-32F	GS-110W-32F3	4"	100 mm		90	40.82	120	54.43	700.00 (605.50)
GS-110W-48F	GS-110W-48F3	6"	150 mm		150	68.04	200	90.72	850.00 (735.25)

150# ANSI Class (275 psig (19 barg) Cold Working Pressure) 300# ANSI Class (720 psig (50 barg) Cold Working Pressure)

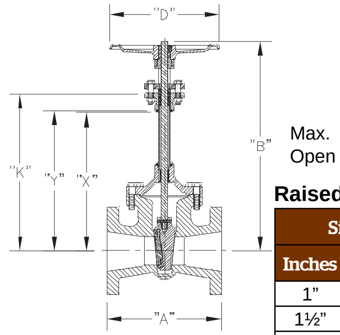
Ordering Information

Stainless Body • Butt Weld, Socket Weld, Threaded Ends

150# Part Number	300# Part Number	Valve Size		Ends	Weight		Estimated Cv (Kv)
		Inches	mm		Lbs.	Kg.	
GS-110W-4WA	-	½"	15 mm	Butt Weld SCH10	10	4.54	7.00 (6.05)
-	GS-110W-4S3			Socket Weld	15	6.80	
GS-110W-4T	-			Threaded	10	4.54	
GS-110W-6WA	-	¾"	20 mm	Butt Weld SCH10			23.00 (19.89)
-	GS-110W-6S3			Socket Weld	15	6.80	
GS-110W-8WA	-	1"	25 mm	Butt Weld SCH10	10	4.54	30.00 (25.95)
-	GS-110W-8S3			Socket Weld	15	6.80	
GS-110W-8T	-			Threaded	10	4.54	
GS-110W-12WA	-	1½"	40 mm	Butt Weld SCH10	30	13.61	85.00 (73.52)
-	GS-110W-12S3			Socket Weld	35	15.88	
-	GS-110W-16W3A	2"	50 mm	Butt Weld SCH10			100.00 (86.50)
-	GS-110W-16W3J			Butt Weld SCH40			
GS-110W-16S	-			Socket Weld	30	13.61	
-	GS-110W-24W3A	3"	80 mm	Butt Weld SCH10	65	29.48	310.00 (268.15)
-	GS-110W-24W3J			Butt Weld SCH40			
-	GS-110W-32W3A	4"	100 mm	Butt Weld SCH10	80	40.82	700.00 (605.50)
-	GS-110W-32W3J			Butt Weld SCH40			
-	GS-110W-48W3A	6"	150 mm	Butt Weld SCH10	120/150*	54.43/68.04*	850.00 (735.25)
-	GS-110W-48W3J			Butt Weld SCH40			

150# ANSI Class (275 psig (19 barg) Cold Working Pressure) 300# ANSI Class (720 psig (50 barg) Cold Working Pressure)* Second number indicates valve for 300# part number. Service: 300#-720 psig (50 barg) Non-shock Cold • Service: 150#-275 psig (19 barg) Non-shock Cold
• Temperature Rating +150°F - 325°F (+65°C to -198°C) • Mounting plate option available

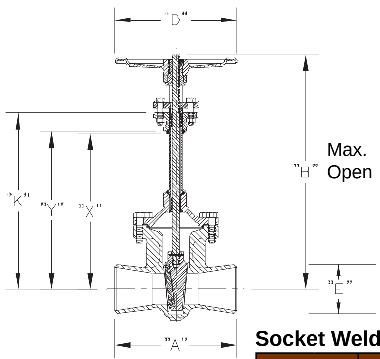
Stainless Steel Gate Valve for Cryogenic Service
110 Series



Raised Face Flange Ends*

Size		"A" 150#		"A" 300#		"B"		"D"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
1"	25	4⅛"	105	N/A	-	17¾"	451	4½"	114	12¾"	324	11 1/16"	281	11⅜"	289
1½"	38	4⅝"	118	6⅛"*	156	21⅞"	556	7"	178	14"	356	12 5/16"	313	12⅝"	321
2"	51	7"	178	7¼"*	184										
3"	76	8"	203	8¾"*	222	31½"	800	12"	305	20"	508	17¾"	451	18 1/16"	459
4"	102	9"	229	12"	305	33¾"	857			21½"	546	19¼"	489	19 9/16"	497
6"	152	10½"	267	15⅞"	403	41½"	1054	16"	406	26"	660	23 9/16"	598	23⅞"	606

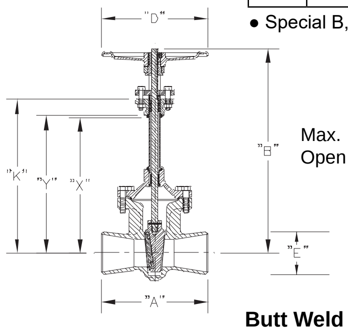
*Face-to-face dimensions (A) are Goddard standard not to ANSI standard.
- Special B,K,X & Y Dimensions Available



Socket Weld Ends

Size		"A" 150#		"A" 300#		"B"		"D"		"E"		"F"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	3¾"	95	3¾"	95	17¾"	451	4½"	114	.855	21	⅜"	10	12¾"	324	11 1/16"	281	11⅜"	284
¾"	19									1.065	27	½"	13						
1"	25	3½"	89	4"	102					1.330	34								
1½"	38	4⅝"	118	5"	127	21⅞"	556	7"	178	1.915	49			14"	356	12 5/16"	313	12⅝"	321
2"	51	8½"	216	N/A	-					2.406	61	⅝"	16						

- Special B,K,X & Y Dimensions Available



Butt Weld Ends

Size		"A" 150#		"A" 300#		"B"		"D"		"K"		"X"		"Y"	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½"	13	4¼"	108	N/A	-	17¾"	451	4½"	114	12¾"	324	11 1/16"	281	11⅜"	289
¾"	19	4⅝"	117												
1"	25	5"	127												
1½"	38	6"	152	6"	152	21⅞"	556	7"	178	14"	356	12 5/16"	313	12⅝"	321
2"	51	8½"	216	8½"	216										
3"	76	11⅛"	282	11⅛"	282	31½"	800	12"	305	20"	508	17¾"	451	18 1/16"	459
4"	102	12"	305	12"	305	33¾"	857			21½"	546	19¼"	489	19 9/16"	497
6"	152	15⅞"	403	15⅞"	403	41½"	1054	16"	406	26"	660	23 9/16"	598	23⅞"	606

- Special B,K,X & Y Dimensions Available
- Unless otherwise specified, Schedule 10 weld ends are supplied

Stainless Steel Gate Valve for Cryogenic Service
110WHZ Series

REGO
10
YEAR
WARRANTY

Application

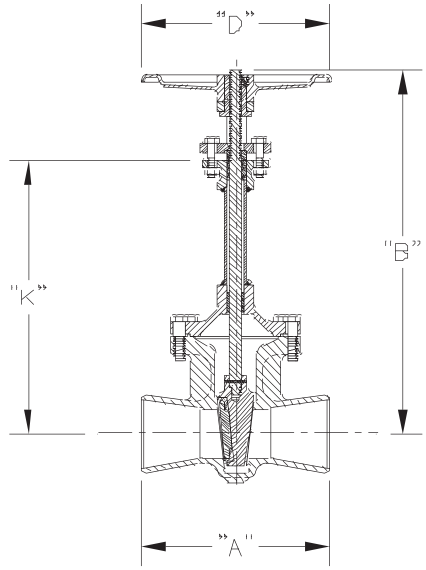
RegO Goddard gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, argon and LNG.

Features

- **Top Entry**: This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: Stainless steel body and bonnet
- **Sizes**: ½" - 6" (15mm - 150mm)
- **Ends**: RF Flange, Butt weld, Socket weld, Threaded (FNPT)
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- Grafoil® stem packing.
- **Temperature Rating**: -320°F - 150°F (-196°C +65°C)
- 100% Factory Tested
- Clean for use in oxygen per CGA G-4.1
- Grafoil® Stem Packing
- **Pressure Rating**: (Cold, Non-shock)
  Class 300 valve - 720 psig (50 barg)

½" - 6" Class 300
PED Approved

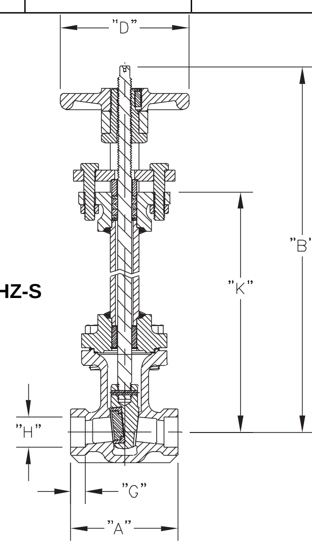
S-110WHZ-W



Ordering Information

Part Number	Ends	Size		"A"		"B"		"D"		"K"		Estimated Cv (Kv)	Weight Lbs. (Kg)
		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm		
GS-110WHZ-16W3A	S10	2"	51	8.50	216	21.88	556	7	178	14	356	100 (86.5)	35 (16)
GS-110WHZ-16W3J	S40												
GS-110WHZ-24W3A	S10	3"	76	11.12	282	31.5	800	12	305	20	508	310 (268.15)	65 (29)
GS-110WHZ-32W3A	S10	4"	102	12	305	33.75	857			21.5	546	700 (605.50)	80 (36)
GS-110WHZ-48W3A	S10	6"	152	15.88	403	41.5	1054	16	406	26	660	850 (735.25)	150 (68)
GS-110WHZ-48W3J	S40												

S-110WHZ-S



Ordering Information

Part Number	Size		"A"		"B"		"D"		"G"		"H"		"K"		Estimated Cv (Kv)	Lbs. (Kg.)
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm		
GS-110WHZ-4S3	½"	13	3.75	95	17.75	451	4.5	114	.38	10	.86	22	12.8	325	7 (6.05)	15 (6.80)
GS-110WHZ-6S3	¾"	19							.5	13	1.07	27			23 (19.89)	
GS-110WHZ-8S3	1"	25	4	102							1.33	34			30 (25.95)	
GS-110WHZ-12S3	1½"	38	5	127	21.88	556	7	178			1.92	49	14	356	85 (73.52)	35 (15.87)

REGO

Stainless Steel Gate Valve for Cryogenic Service
LOX Series

Application

RegO LOX Series gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with oxygen, nitrogen, CO2, argon and LNG. Specifically designed for liquid oxygen (LOX) service.

Features

- **Top Entry**: This valve can be permanently installed in the line and serviced from the top
- **Soft Seated**: PCTFE Seat provides a bubble tight seal and is replaceable
- **Construction**: Body and Bonnet ASTM A351-CF8 J92600 Stainless steel
- **Sizes**: ½" - 6" (15mm - 150mm)
- **Ends**: RF Flange, Butt weld, Socket weld, Threaded (FNPT)
- **Service**: Liquefied and vaporized atmospheric gases, LNG
- WHZ valves with Grafoil® stem packing available
- **Temperature Rating**: -320°F - 150°F (-196°C +65°C)
- 100% Factory Tested
- Clean for use in oxygen per CGA G-4.1
- **Pressure Rating**: (Cold, Non-shock)
  Class 300 valve - 720 psig (50 barg)

LOX Series

Ordering Information

Stainless Body ● Butt Weld, Socket Weld, Threaded Ends

300# Part Number	Valve Size		Ends	Weight		Estimated Cv (Kv)
	Inches	MM		Lbs.	Kg.	
LOX110W-4S3	½"	15 mm	Socket Weld	15	6.80	7.00 (6.05)
LOX110W-6S3	¾"	20 mm	Socket Weld	15	6.80	23.00 (19.89)
LOX110W-8S3	1"	25 mm	Socket Weld	15	6.80	30.00 (25.95)
LOX110W-12S3	1½"	40 mm	Socket Weld	35	15.88	85.00 (73.52)
LOX110W-16W3A	2"	50 mm	Butt Weld SCH10			100.00 (86.50)
LOX110W-24W3A	3"	80 mm	Butt Weld SCH10	65	29.48	310.00 (268.15)
LOX110W-24W3J			Butt Weld SCH40			
LOX110W-32W3A	4"	100 mm	Butt Weld SCH10	80	40.82	700.00 (605.50)
LOX110W-32W3J			Butt Weld SCH40			
LOX110W-48W3A	6"	150 mm	Butt Weld SCH10	120/150*	54.43/68.04*	850.00 (735.25)
LOX110W-48W3J			Butt Weld SCH40			

300# ANSI Class (720 psig (50 barg) Cold Working Pressure)* Second number indicates valve for 300# part number.
Service: 300#-720 psig (50 barg) Non-shock Cold ● Service: 150#-275 psig (19 barg) Non-shock Cold
● Temperature Rating +150°F - 325°F (+65°C -198°F) ● Mounting plate option available
● Custom sizes and connections available.

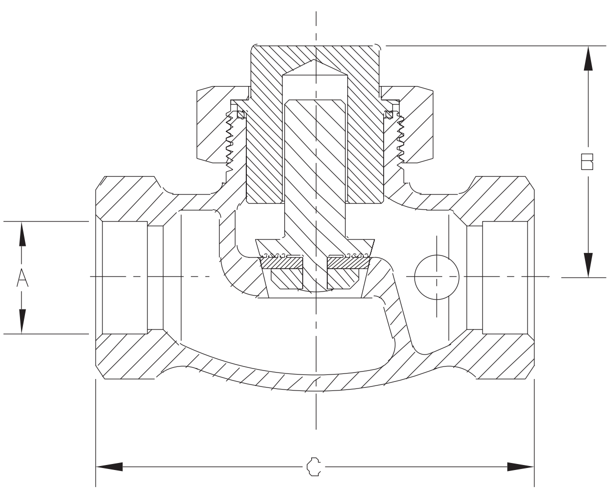
Horizontal Lift Check Valves
8500 Series

Application
8500 series valves are designed for use as a check valve on cryogenic bulk stations and pipelines.

Features
- Replaceable Kel-F seat discs
- Self-centering cap holds plunger in position
- Each valve is cleaned and packaged for liquid oxygen service per CGA G-4.1
- 100% Factory Tested
- Working temperature range is -320°F to +165°F (-196ºC to +74ºC)
- Maximum working pressure is 600 psig MAWP (41.3 barg)
- 2 psig opening pressure

Materials
Body .... Bronze
Cap .... Brass
Plunger .... Brass
Seat .... PCTFE

BK8508S



BK8512S

Ordering Information

Part Number	Inlet / Outlet Connection A	B		Length C		C_V (Kv)
		inches	mm	inches	mm	
BK8508S	1.128"-1.130"	2¼"	57.15	4^{15}/16"	125.47	10 (8.65)
BK8508T	1" F.NPT					
BK8512S	1.629"-1.631"	3¼"	82.55	5^{3}/16"	131.82	27 (23.35)
BK8512T	1½" F.NPT					

Bronze Swing Check Valve for Cryogenic Service Including 846M Goddard 840 Series

Application

The RegO Goddard 846M and 840 series check valve is designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Compatible with oxygen, nitrogen, CO_2, argon and LNG.

Features

- **Top Entry:** This swing check valve can be permanently installed in the line and serviced from the top
- **Construction:** Designed to prevent back flow in cryogenic systems. Higher fluid capacity (Cv) than poppet or lift check valves. Bronze body and internals. Rugged construction for long life and minimal down time
- **Sizes:** ½" through 2" (15mm through 50mm)
- **Ends:** Threaded (FNPT), or with Sil Brazed Tube (SBT)
  SCH-10, Threaded back brazed pipe nipples in 1" increments up to 6"
  SCH-40, Threaded back brazed pipe nipples in 1" increments up to 6"
  SCH-80, Threaded back brazed pipe nipples in 1" increments up to 6"
- **Temperature Rating:** -320°F to +150°F (-196°C to +65°C)
- Cleaned for Oxygen Service per CGA G-4.1.
- **Pressure Rating:** (Cold, Non-shock)
  840 Series 400 psig (27.6 barg)
  846M Series 600 psig (41.4 barg)
  Sizes 1½" to 2" PED Approved

  Note: Do not use for reciprocating gas service.

- **Cracking Pressure:** 0.5 psig (.03 barg)

840 Series

Ordering Information

840

Bronze Swing Check Valves - Soft Seated, Threaded, Sil Brazed Ends, Threaded and Back Brazed Pipe Nipples
400 psig (28 barg) Cold Working Pressure

Threaded Ends

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
B-840-4T	½"	15	Threaded	2.00	0.91	4.50 (3.89)
B-840-6T	¾"	20		4.00	1.81	7.00 (6.05)
B-840-8T	1"	25		4.50	2.04	10.00 (8.65)
B-840-12T	1½"	40		8.50	3.86	40.00 (34.6)
B-840-16T	2"	50		14.50	6.58	100.00 (86.5)

Silver Brazed - Pipe Nipple

Part Number	SBT Size Inches*	SBT Size mm*	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
B-840-4S	½"	15	Silver Braze	2.50	1.13	4.50 (3.89)
B-840-6S	¾"	20		4.5	2.05	7.00 (6.05)
B-840-8S	1"	25		5.25	2.38	10.00 (8.65)
B-840-12S	1½"	40		10.75	4.88	40.00 (34.6)
B-840-16S	2"	50		17.50	7.94	100.00 (86.5)

* Nominal Size

846M

Bronze Swing Check Valves - Metal Seated, Threaded, Sil Brazed Ends, Threaded and Back Brazed Pipe Nipples
600 psig (42 barg) Cold Working Pressure

Threaded Ends

Part Number	NPT Size Inches	NPT Size mm	Ends	Weight Lbs.	Weight Kg	Estimated C_V (Kv)
B-846M-4T6	½"	15	Threaded	2.00	0.91	4.50 (3.89)
B-846M-8T6	1"	25		4.50	2.04	10.00 (8.65)
B-846M-12T6	1½"	40		8.50	3.86	40.00 (34.6)
B-846M-16T6	2"	50		14.50	6.58	100.00 (86.5)

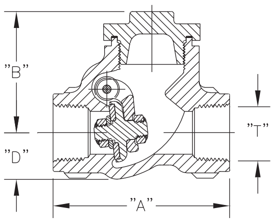
Bronze Swing Check Valve for Cryogenic Service Including 846M 840 Series

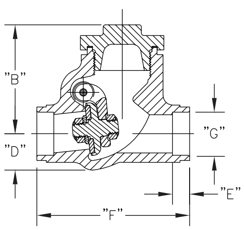
Silver Brazed - Pipe Nipple

Part Number	SBT Size Inches*	SBT Size mm*	Ends	Weight Lbs.	Weight Kg	Estimated CV
B-846M-4S6	½”	15	Silver Braze	2.50	1.13	4.50
B-846M-6S6	¾”	20		4.50	2.04	7.00
B-846M-8S6	1”	25		5.25	2.38	10.00
B-846M-12S6	1½”	40		10.75	4.88	40.00
B-846M-16S6	2”	50		17.50	7.94	100.00

* Nominal Size

● Contact company for threaded, back brazed pipe nipple information



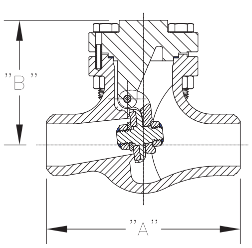


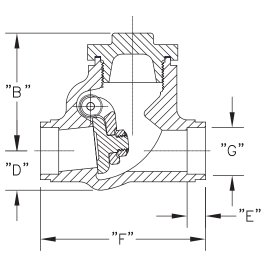
840 Series

Pressure Rating MSS SP-80 Class 200
MAWP 400 psig (28 barg) Non-Shock Cold
Temperature Rating +150°F to -325°F (+65°C to -198°C)

Dimensional data

Size		“A”		“B”		“D”		“T” NPT		“E”		“F”		“G”	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½”	13	3.00”	76	2.13”	54	¾”	19	½”	13	.38”	10	2.94”	75	.63”	16
¾”	19	3.69”	94	2.81”	71	1.12”	28	¾”	19	.41”	11	3.60”	91	.88”	22
1”	25	4.00”	102			1.13”	29	1”	25	.45”	11	4.00”	102	1.13”	29
1½”	38	5.03”	128	3.63”	92	1.44”	36	1½”	38	.63”	16	5.03”	128	1.63”	41
2”	51	6.35”	161	4.34”	110	1.84”	47	2”	51	.66”	17	6.35”	161	2.13”	54





846M Series

Pressure Rating MSS SP-80 Class 300
MAWP 600 psig (42 barg) Non-Shock Cold
Temperature Rating +150°F to -325°F (+65°C to -198°C)

Dimensional data

Size		“A”		“B”		“D”		“T” NPT		“E”		“F”		“G”	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
½”	13	3.00”	76	2.13”	54	¾”	19	½”	13	.38”	10	2.94”	75	.63”	16
¾”	19	3.69”	94	2.81”	71	1⅛”	28	¾”	19	.41”	11	3.60”	91	.88”	22
1”	25	4.00”	102					1”	25	.45”	11	4.00”	102	1.13”	29
1½”	38	5.03”	128	3.63”	92	$1\frac{7}{16}$”	36	1½”	38	.63”	16	5.03”	128	1.63”	41
2”	51	6.35”	161	4.34”	110	$1\frac{27}{32}$”	47	2”	51	.66”	17	6.35”	161	2.13”	54

Stainless Steel Spring-Loaded Piston Lift Check Valves
CV9400 Series

Application

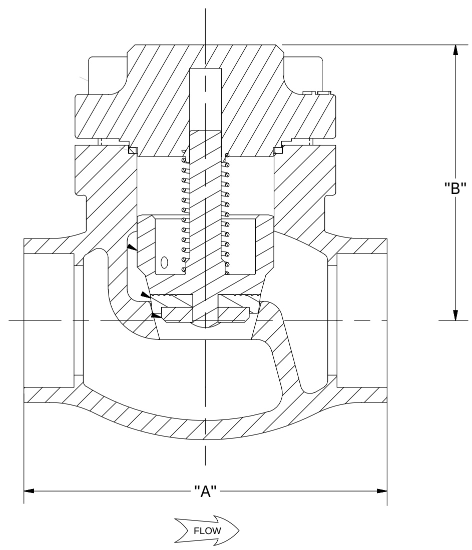
The CV9400 Series of Stainless Steel Lift Check Valves are designed with a spring-loaded piston for installation in various piping configurations in liquid cryogenic applications, including bulk tanks, trailers and ISO tanks. Ideal service medium includes oxygen, nitrogen, krypton, carbon dioxide, nitrous oxide, dinitrogen monoxide, carbon oxide, methane, ethane, ethylene, argon, and LNG.

REGO 100% TESTED ★ | CLEANED FOR OXYGEN SERVICE O_2 CGA G-4.1 | REGO 10 YEAR WARRANTY

Features

- Soft Seat: Dyneon™ TFM1600 material enables bubble tight sealing performance under cryogenic conditions
- Seat Disc: Conical seat design provides higher Cv and a bubble tight seal
- Seat Assembly: One-piece assembly with no small pieces prevent possible dislodge of material during vibration that could damage downstream equipment or potentially cause an explosion
- Seat Holder: Lower position guiding ensures repeatability of tight reseal
- Spring: 316Ti material provides repeatable, lasting performance when exposed to cryogenic liquid
- Opening Pressure: 1.5 PSIG (0.1 BARG)
- Sizes: ½" through 2"
- Connection: SCH 10 Socket Weld & Butt Weld per ASTM A312 & ASME B16.25 standards
- Temperature rating: -320°F to +185°F (-196°C to +85°C)
- Pressure rating: Cold, non-shock, 720 PSIG (50 BARG) Class 300 (PN 50)
- 100% Factory Tested
- Each valve is individually bagged and boxed to arrive in factory new condition until ready for installation
- Cleaned and packaged for oxygen service per CGA G-4.1

CV9416SW



CV9416SW

Materials

Body .... 316 Stainless Steel ASTM A351-CF-8M (DIN 1.4408)
Bonnet ....304 Stainless Steel ASTM A182 (DIN 1.5415)
Spring ....316Ti Stainless Steel ASTM A313 (DIN 1.4544)
Gasket ....PTFE 25% Glass Fill
Seat Disc .... Dyneon TFM 1600
Seat Retainer....................................Brass ASTM B16 (DIN 2.0375)
Bonnet Screws ....Stainless Steel ASTM 240 (DIN 1.4006)

PED Certified CE

Ordering Information

Part Number	Size Inches	Size DN	Connection Type	A Inches	A mm	B Inches	B mm	Cv	Kv	Weight lbs	Weight kg
CV9404SW	½"	15	Socket Weld	2.7	67	2.7	68	5.0	4.3	1.9	0.9
CV9406SW	¾"	20		2.8	70	3.6	92	9.4	8.1	3.4	1.5
CV9408SW	1"	25		2.8	70	3.6	92	14.0	12.1	3.6	1.6
CV9412SW	1½"	40		3.1	79	4.8	121	28.3	21.6	7.0	3.2
CV9416SW	2"	50		4.2	106	5.8	146	53.0	45.8	12.2	5.6
CV9404BW	½"	15	Butt Weld	2.7	67	2.7	68	5.0	4.3	1.9	0.9
CV9406BW	¾"	20		2.8	70	3.6	92	9.4	8.1	3.4	1.5
CV9408BW	1"	25		2.8	70	3.6	92	14.0	12.1	3.6	1.6
CV9412BW	1½"	40		3.1	79	4.8	121	28.3	21.6	7.0	3.2
CV9416BW	2"	50		4.2	106	5.8	146	53.0	45.8	12.2	5.6

Stainless Steel Swing Check Valve for Cryogenic Service
886 Series

Application

The RegO Goddard 886 Series check valve is designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Compatible with oxygen, nitrogen, CO2 argon and LNG.

REGO 10 YEAR WARRANTY

Features

- **Top Entry:** This bolted bonnet valve can be permanently installed in the line and services from the top
- **Construction:** Designed to prevent back flow in cryogenic systems. Higher fluid capacity (C_V) than poppet or lift check valves. 316L stainless steel investment cast body, cap and arm, according to ASME B16.34
- **Sizes:** ½" through 4" (15mm through 100mm)
- **Ends:** Socket weld and butt weld schedule 10 and 40
- **Temperature Rating:** -320°F to 150°F (-196°C to +66°C)
- Cleaned for Oxygen Service per CGA G-4.1.
- **Pressure Rating:** (Cold, Non-shock)
  400 psig (27 barg) ½" - 2"
  275 psig (19 barg) 150# ANSI Class 3" and 4"
  720 psig (50 barg) 300# ANSI Class 3" and 4"
  PED Approved
- **Note: Do not use for reciprocating gas service**
- **Our investment cast stainless steel is specified by leading industrial gas companies for storage tank and yard operations**
- **Ideal for liquid atmospheric gases and LNG storage and handling**
- **High cycle life and superior sealing**
- **Valves for hydrogen service can be supplied (-425°F to +350°F) (-254° C to 176° C.)**
- **Cracking Pressure:** 0.5 psig (0.03) barg

886 Series

Ordering Information

886

Stainless Steel Swing Check Valves
Soft Seat

GRAFOIL® Gasket - Hydrogen Service - Socket Weld

Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V (Kv)	Weight	
	Inches	mm					Lbs.	Kg
S-886GF-4S	½"	15 mm	Socket Weld	Soft	400 (27.5 barg)	18.00 (15.57)	3	1.36
S-886GF-8S	1"	25 mm				61.00 (52.76)	11	4.98
S-886GF-12S	1½"	40 mm					17	7.71

PTFE Gasket - Socket Weld

Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V (Kv)	Weight	
	Inches	mm					Lbs.	Kg
S-886-4S	½"	15 mm	Socket Weld	Soft	400 (27.5 barg)	18.00 (15.57)	3	1.36
S-886-8S	1"	25 mm				61.00 (52.76)	11	4.98
S-886-12S	1½"	40 mm					17	7.71

Stainless Steel Swing Check Valve for Cryogenic Service
886 Series

PTFE Gasket - Buttweld

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V (Kv)	Weight	
	Inches	mm						Lbs.	Kg
S-886-4WA	½”	15 mm	Butt Weld	Soft	10	400 (27.5 barg)	4.50 (3.89)	3	1.36
S-886-8WA	1”	25 mm					18.00 (15.57)	11	4.98
S-886-12WA	1½”	40 mm					61.00 (52.76)	17	7.71
S-886-16W3A	2”	50 mm				720 (50 barg)	99.00 (85.63)		
S-886-24WA	3”	80 mm				275 (19 barg)	225.00 (194.62)	47	21.31
S-886-24WJ	3”	80 mm			40			46	20.86
S-886-32W3J	4”	100 mm				720 (50 barg)	475.00 (410.87)	95	43.09
S-886-32WA	4”	100 mm			10	275 (19 barg)			

886M

Stainless Steel Swing Check Valves - Metal Seat

PTFE Gasket - Socket Weld

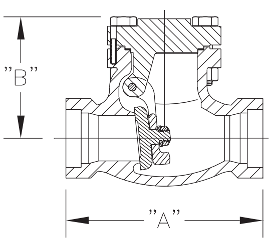
Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V (Kv)	Weight	
	Inches	mm					Lbs.	Kg
S-886M-4S3	½”	15 mm	Socket Weld	Metal	720 (50 barg)	4.50 (3.89)	3	1.36
S-886M-8S3	1”	25 mm				18.00 (15.57)	11	4.98
S-886M-12S3	1½”	40 mm				61.00 (52.76)	17	7.71

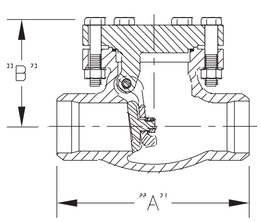
Butt Weld Ends

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V (Kv)	Weight	
	Inches	mm						Lbs.	Kg
S-886M-16W3A	2”	50 mm	Butt Weld	Metal	10	720 (50 barg)	99.00 (85.63)	17	7.71
S-886M-24W3J	3”	80 mm			40		225.00 (194.62)	46	20.86
S-886M-24W3A	3”				10				
S-886M-32WA	4”	100 mm				275 (19 barg)	475.00 (410.87)	95	43.09
S-886M-32W3J	4”				40	720 (50 barg)			

Butt Weld Ends with GRAFOIL® Gasket for Hydrogen Service

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V (Kv)	Weight Lbs.	
	Inches	mm						Lbs.	Kg
S-886MGF-16W3A	2”	50 mm	Butt Weld	Metal	10	720 (50 barg)	99.00 (85.63)	17	7.71
S-886MGF-24W3A	3”	80 mm					225.00 (194.62)	46	20.86

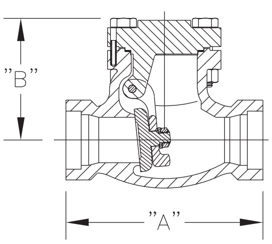




886

Pressure Rating 300 psig (20 barg) Non-Shock Cold,
Temperature Rating +150° F to - 325° F (+65°C to -198°C)

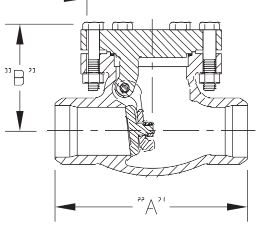
Size		“A”		“B”	
inches	mm	inches	mm	inches	mm
½”	12.7	4¼”	107.95	2½”	63.5
¾”	19.05	5”	127	3¼”	82.55
1”	25.4				
1½”	38.1	6½”	165.1	4”	101.6
2”	50.8	8”	203.2	4½”	107.95



886M

Service 300 Class 720 psig (50 barg) Non-Shock Cold,
Temperature Rating +150° F to - 325° F (+65°C to -198°C)

Size		“A”		“B”		Butt Weld End Schedule
inches	mm	inches	mm	inches	mm	
1½”	38.1	6½”	165.1	4”	101.6	10
2”	50.8	8”	203.2	4½”	107.95	
3”	76.2	9½”	241.3	5¾”	146.05	10 & 40
4”	101.6	11½”	292.1	8⅜”	212.85	10
		14”	355.6			40



Size		“A”		“B”		End	End Dimension
inches	mm	inches	mm	inches	mm		
½”	12.7	2⁷/₁₆”	61.97	4¼”	107.69	Socket Weld	SCH 10
							½” Pipe Socket

REGO

Inline Check Valves
CG Series Gas and Cryogenic Check Valves

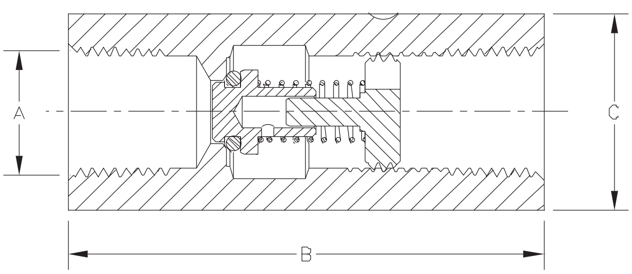
Application
Inline check valves with metal seat option for cryogenic service or with soft seat option for leak free operation in gas service.

Features
- One directional flow indicated by arrow on body
- Large Cv for high flow capability and low pressure drop
- Working temperature range:
  -320° F to +165° F (-195°C to +74°C) for metal seats
  -20° F to +165° F (-20°C to +74°C) for soft seats
- 1 psig opening pressure
- Cleaned for use in oxygen service per CGA G-4.1

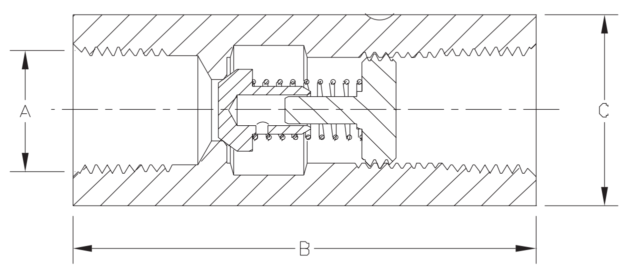
Materials
Body (B and BL suffix) .... ASTM B16 Brass
Body (SS and SSL suffix) .... 203 Stainless Steel
Spring .... Stainless Steel
Piston... Stainless Steel
O-Ring (soft seat option units only) .... Viton
Metal Seat .... 303 Stainless Steel

REGO 10 YEAR WARRANTY

CG Series



Soft Seat Option



Metal Seat Option

Ordering Information

Part Number	Seating Option	Inlet/Outlet Connections FNPT A	Length B		Wrenching Hex Size C		Cv (Kv)	Maximum Operating Pressure
			inches	mm	inches	mm		
Stainless Steel Check Valves								
CG250SS	Metal	¼”	2⅜”	60.45	13/16”	20.57	.87 (0.75)	5000 psig (345 barg)
CG375SS		⅜”	2½”	63.50	1”	25.4	2.3 (1.98)	
CG500SS		½”	3”	76.20	1⅛”	28.575	3.5 (3.02)	
CG750SS		¾”	3⅝”	92.20	1½”	38.1	5.2 (4.49)	
CG250SSL	Soft	¼”	2⅜”	60.45	13/16”	20.57	.87 (0.75)	250 psig (17.2 barg)
CG375SSL		⅜”	2½”	63.50	1”	25.4	2.3 (1.98)	
CG500SSL		½”	3”	76.20	1⅛”	28.575	3.5 (3.02)	2000 psig (138 barg)
CG750SSL		¾”	3⅝”	92.20	1½”	38.1	5.2 (4.49)	
Brass Body Check Valves								
CG250B	Metal	¼”	2⅜”	60.45	13/16”	20.57	.87 (0.75)	3000 psig (207 barg)
CG375B		⅜”	2½”	63.50	1”	25.4	2.3 (1.98)	
CG500B		½”	3”	76.20	1⅛”	28.575	3.5 (3.02)	
CG750B		¾”	3⅝”	92.20	1½”	38.1	5.2 (4.49)	
CG250BL	Soft	¼”	2⅜”	60.45	13/16”	20.57	.87 (0.75)	250 psig (17.2 barg)
CG375BL		⅜”	2½”	63.50	1”	25.4	2.3 (1.98)	
CG500BL		½”	3”	76.20	1⅛”	28.575	3.5 (3.02)	2000 psig (138 barg)
CG750BL		¾”	3⅝”	92.20	1½”	38.1	5.2 (4.49)	

RegO® Check Valves
NG304 Series

Application

The NG304 series is specifically designed to prevent backflow (reverse flow) in applications of LNG fuel tanks and LNG facilities. These valves permit the safe refill operation of the LNG tanks and the maintenance process of the fill receptacle, ensure reliable performance at cryogenic temperatures.

NG304 **NG304SSA**

Features

NG304

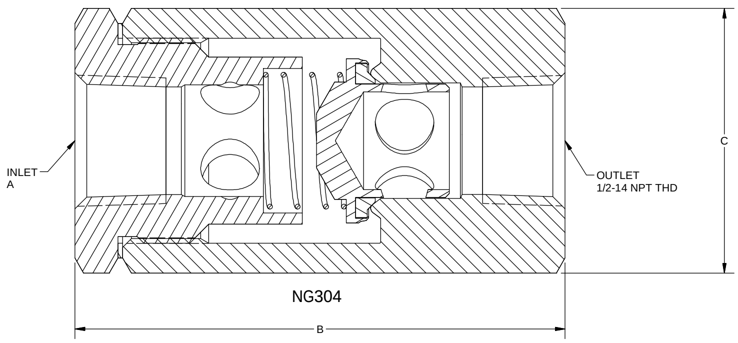
- Maximum inlet pressure 1000 psig (69 barg)
- 100% factory tested
- Temperature Range: -320º F to 165ºF (-196ºC to 74ºC)
- Designed in accordance with & approved by ECE R110

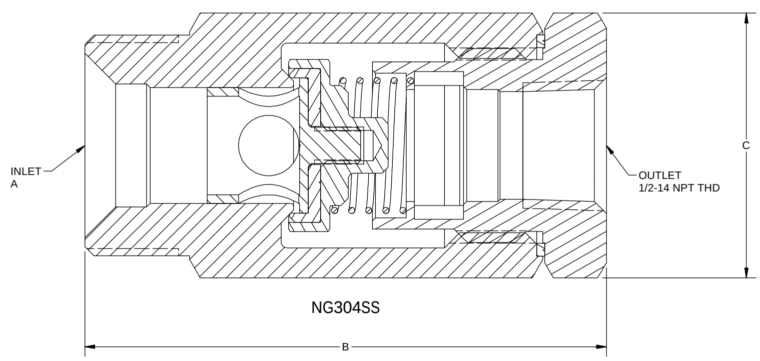
Materials for NG304

Body .... Brass ASTM B16 C36000
Spring .... Stainless Steel 302 ASTM A313
Gasket .... Copper ASTM B152 UNS C11000
Poppet .... Brass ASTM B16 UNS C36000
Seat Disc .... PTFE Virgin Teflon

Materials NG304SS

Body .... Stainless Steel 304 ASTM276
Spring .... Stainless Steel 302 ASTM A313
Gasket .... Copper ASTM B152 UNS C11000
Poppet .... Brass 360 FC (UNS C36000 PER ASTM B16)
Seat Disc .... UHMWPE (ASTM D4020)





Ordering Information

Part Number	Body Material	Connection (A)	B Inches	B mm	C Inches	C mm	Weight Lbs: Lbs	Weight Lbs: Kg	Silver Plated End Piece
NG304	Brass	Threaded FNPT F ½	3.135	80	1.5 (Hex)	38	1.25	0.6	N/A
NG304SSA	Stainless Steel	M36x2 Male	3.346	85			1.10	0.5	
NG304SSB		M30x1.5 Male	2.953	75					
NG304SSC		½"-14 NPT Female							
NG304SSAP		M36x2 Male	3.346	85					Yes
NG304SSBP		M30x1.5 Male							
NG304SSCP		½"-14 NPT Female	2.953	75					

3" Flanged Internal Valves for Bobtail Delivery Trucks, Transports and Large Stationary Storage Containers TA3217

Application

Designed primarily for CO_2 filling and/or withdrawal on bobtail delivery trucks, transports and stationary storage tanks with flanged pumps or piping. Installation is quick and easy, and the valve may be operated manually by cable or pneumatically. Lever available on right or left side to allow for installation without the use of an extra pulley.

Features

Provides More Efficient Operation

- Flow passages designed to allow substantially higher without cavitation or loss of efficiency--saving time and money
- Simple operating lever facilitates easy adaptation of all cable controls
- Lever available on right or left side to allow for installation without the use of an extra pulley
- Nylon bearing supported operating shaft provides smooth, easy operation

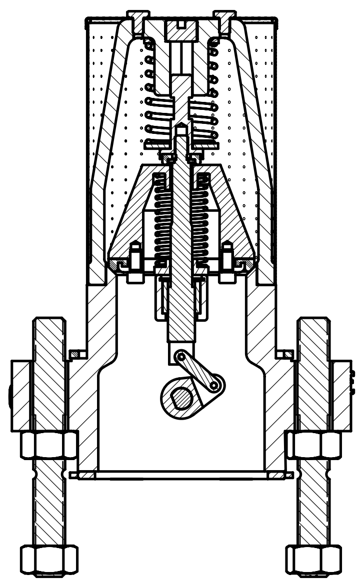
Less Frequent-Easier Maintenance

- Stainless steel screws resist rusting and are easily removed during valve disassembly
- Heavy duty rod wiper helps minimize dirt and foreign material from entering operating shaft and hampering operation

Durable Construction

- Cadmium plating helps resist corrosion during storage and use
- All ferrous materials with a temperature range of -40° F. to +165° F. (-40°C to +74°C) and a pressure rating of 400 psig (28 barg)
- Sturdy retaining ring secures operating cam to provide for more durable, slack-free operation
- Built-in excess flow valve
- Specify RegO Internal Valves on your next new tank or when your truck is rebuilt

TA3217



Ordering Information

Part Number		Operating Lever Position	Inlet Connection	Outlet Connection	Closing Flow GPM	Accessories	
						Pneumatic Actuator	
					CO_2	Right Operation	Left Operation
TA3217AR410	TA3217AL410	Right or Left	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	410	A3217RA	A3217LA

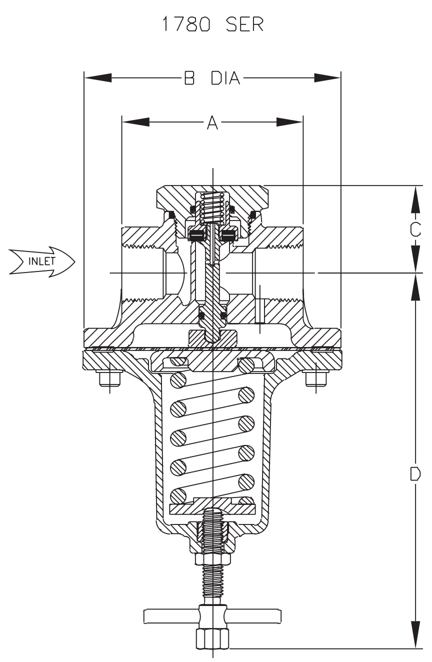
* Valve supplied with 16 nuts and 8 studs for mounting.

Heavy Duty Gas Line Regulator
1780 Series

Application
The 1780 Series Regulators are designed for final line pressure regulation on gas distribution systems. They are suitable for a variety of gases in medical or industrial applications. The 1780 Series Regulators have a balanced seat, are constructed with oxygen compatible materials, and have the same valve design, brass body, and internal parts as the premium BR-1780 Series. Flow performance is equal to the BR-1780 Series. Compatible with oxygen, nitrogen, argon, hydrogen, helium, CO_2, and LNG.

1780 Series

Features
- Maintains a steady downstream pressure across a range of inlet pressures commonly provided by a cryogenic bulk tank
- Large seat and diaphragm areas provide high capacity with sensitive control of delivery pressure with low falloff
- Two ¼" FNPT delivery pressure gauge ports are located (plugged) on each side of the valve
- Two bonnet drain/vent holes to allow for different mounting orientation
- T-handle adjusting screw
- Maximum inlet pressure is 500 psig (34.5 barg)
- Available in four delivery pressure ranges (A-D)
- Temperature range: -40° F to +165º F. (-40ºC to +74ºC)
- Cleaned per CGA G-4.1 for oxygen service
- 100% Factory Tested



Materials
Body .... Forged Brass
Bonnet .... Nickel Plated Aluminum
Diaphragm .... Nitrile with PTFE liner
Springs and Fasteners .... Stainless Steel
Other valve parts .... Brass
Seat Disc & O-Rings.......... Viton is standard

For Carbon Dioxide or Nitrous Oxide service: Specify EPDM material for seat disc and O-rings, add "E" to end of part number.

Ordering Information

Part Number	Delivery Pressure Range	Pressure Gauge*		Inlet & Outlet (F.N.P.T.)		Dimensions								Cv (Kv)
		Range (psig)	P/N			"A"		"B"		"C"		"D"		
				Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
1784A	5-55 psig (0.3-3.8 barg)	1-100	1286	½"	22	2.82"	1.28	3.62"	1.64	1.38"	.62	5.47"	2.5	3.1 (2.68)
1784B	40-110 psig (2.8-7.6 barg)	1-200	S1679											
1784C	100-200 psig (6.9-13.8 barg)	1-400	15578											
1784D	175-300 psig (12.1-20.7 barg)													
1786A	5-55 psig (0.3-3.8 barg)	1-100	1286	¾"	34	3.31"	1.50	4.69"	2.12	1.60"	.72	6.84"	3.1	4.8 (4.15)
1786B	40-110 psig (2.8-7.6 barg)	1-200	S1679											
1786C	100-200 psig (6.9-13.8 barg)	1-400	15578											
1786D	175-275 psig (12.1-19.0 barg)													
1788A	5-55 psig (0.3-3.8 barg)	1-100	1286	1"	45									5.5 (4.75)
1788B	40-110 psig (2.8-7.6 barg)	1-200	S1679											
1788C	100-200 psig (6.9-13.8 barg)	1-400	15578											
1788D	175-275 psig (12.1-19.0 barg)													

*Regulator sold without gauge. Order gauge separately.

Heavy Duty Brass Final Line Pressure Regulator
BR-1780 Series

Application

BR-1780 Series Regulators are designed for final line pressure regulation on medical oxygen systems. They are equally suitable for a variety of gases in medical or industrial applications. The BR-1780 Series Regulators have a balanced seat, are constructed with oxygen compatible materials, and offer a tamper resistant adjustment screw cap. Flow performance is impressive as well offering up to 30,000 SCFH for the ¾" and 1" model and up to 20,000 SCFH for the ½" model. Compatible with oxygen, nitrogen, argon, hydrogen, helium, CO_2, and LNG.

REGO 10 YEAR WARRANTY

BR-1784

Features

- Maintains a steady downstream pressure across a range of inlet pressures commonly provided by a cryogenic bulk tank
- Large seat and diaphragm areas provide high capacity with sensitive control of delivery pressure with low falloff
- Two ¼" FNPT plugged delivery pressure gauge ports are located on each side of the valve
- Two bonnet drain/vent holes to allow for various mounting orientations
- Bonnet cap covering adjusting screw for tamper protection
- Maximum inlet pressure is 500 psig (34.5 barg)
- Available in four delivery pressure ranges. (A-D)
- Temperature range: -40° F to +165° F. (-40ºC to +74ºC)
- Cleaned per CGA G-4.1 for oxygen service
- 100% Factory Tested

Materials

Body .... Forged Brass
Bonnet .... Forged brass
Diaphragm .... Nitrile with PTFE liner
Springs, fasteners, and adjusting screw .... Stainless Steel
Other valve parts .... Brass
Seat Disc & O-Rings .... Viton is standard

For Carbon Dioxide and Nitrous Oxide Service: Specify EPDM material for seat disc and 0-Rings, add "E" to end of part number.

BR1786 and BR1788

Ordering Information

<table>
<tr><th rowspan="3">Part Number</th><th rowspan="3">Delivery Pressure Range</th><th colspan="2">Pressure Gauge*</th><th colspan="2">Inlet & Outlet (F.N.P.T.)</th><th colspan="8">Dimensions</th><th rowspan="3">Cv (Kv)</th></tr>
<tr><th rowspan="2">Range (psig)</th><th rowspan="2">P/N</th><th rowspan="2">inches</th><th rowspan="2">mm</th><th colspan="2">"A"</th><th colspan="2">"B"</th><th colspan="2">"C"</th><th colspan="2">"D"</th></tr>
<tr><th>inches</th><th>mm</th><th>inches</th><th>mm</th><th>inches</th><th>mm</th><th>inches</th><th>mm</th></tr>
<tr><td>BR-1784A</td><td>5-55 psig (0.3-3.8 barg)</td><td>1-100</td><td>1286</td><td rowspan="4">½"</td><td rowspan="4">12.7</td><td rowspan="4">2.82"</td><td rowspan="4">71.62</td><td rowspan="4">3.62"</td><td rowspan="4">91.94</td><td rowspan="4">1.38"</td><td rowspan="4">35.05</td><td rowspan="4">5.21"</td><td rowspan="4">132.33</td><td rowspan="4">3.1 (2.68)</td></tr>
<tr><td>BR-1784B</td><td>40-110 psig (2.8-7.6 barg)</td><td>1-200</td><td>S1679</td></tr>
<tr><td>BR-1784C</td><td>100-200 psig (6.9-13.8 barg)</td><td rowspan="2">1-400</td><td rowspan="2">15578</td></tr>
<tr><td>BR-1784D</td><td>175-300 psig (12.1-20.7 barg)</td></tr>
<tr><td>BR-1786A</td><td>5-55 psig (0.3-3.8 barg)</td><td>1-100</td><td>1286</td><td rowspan="4">¾"</td><td rowspan="4">19.05</td><td rowspan="8">3.31"</td><td rowspan="8">84.07</td><td rowspan="8">4.69"</td><td rowspan="8">119.12</td><td rowspan="8">1.60"</td><td rowspan="8">40.64</td><td rowspan="8">6.46"</td><td rowspan="8">164.08</td><td rowspan="4">4.8 (4.15)</td></tr>
<tr><td>BR-1786B</td><td>40-110 psig (2.8-7.6 barg)</td><td>1-200</td><td>S1679</td></tr>
<tr><td>BR-1786C</td><td>100-200 psig (6.9-13.8 barg)</td><td rowspan="2">1-400</td><td rowspan="2">15578</td></tr>
<tr><td>BR-1786D</td><td>175-275 psig (12.1-19.0 barg)</td></tr>
<tr><td>BR-1788A</td><td>5-55 psig (0.3-3.8 barg)</td><td>1-100</td><td>1286</td><td rowspan="4">1"</td><td rowspan="4">25.4</td><td rowspan="4">5.5 (4.75)</td></tr>
<tr><td>BR-1788B</td><td>40-110 psig (2.8-7.6 barg)</td><td>1-200</td><td>S1679</td></tr>
<tr><td>BR-1788C</td><td>100-200 psig (6.9-13.8 barg)</td><td rowspan="2">1-400</td><td rowspan="2">15578</td></tr>
<tr><td>BR-1788D</td><td>175-275 psig (12.1-19.0 barg)</td></tr>
</table>

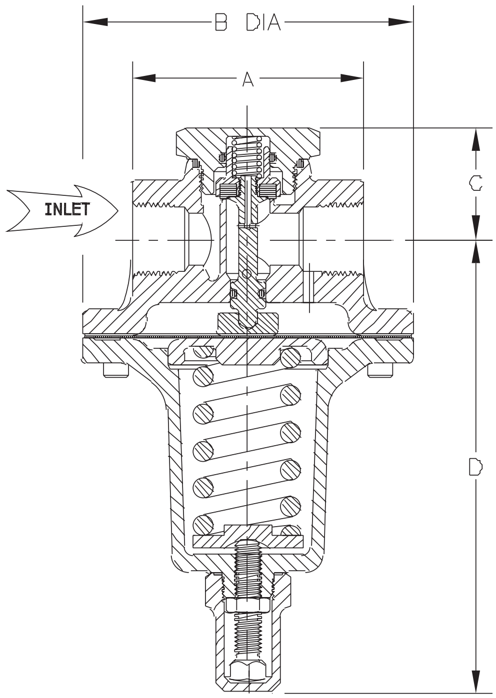
*Regulator sold without gauge. Order gauge separately.

Heavy Duty Brass Final Line Pressure Regulator
BR-1780 Series

Flow Performance

See the RegO Flow Performance Curves section of the catalog for more detailed flow curves.

For Carbon Dioxide or Nitrous Oxide Service, add “E” to end of part number.



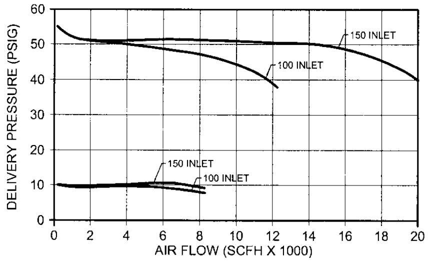
Maintenance and Options Kits

Regulator Models	BR1784	BR1786	BR1788
Repair Kit Part Number	BR-1784-80	BR-1786-80	BR-1786-80
Spring Kit Part Numbers:			
“A” spring 5 –55 psig (.34-3.79 barg)	BR-1784-7SKA	BR-1786-7SKA	BR-1788-7SKA
”B” spring 40-110 psig (2.75-7.58 barg)	BR-1784-7SKB	BR-1786-7SKB	BR-1788-7SKB
”C” spring 100-200 psig (6.89-13.78 (barg)	BR-1784-7SKC	BR-1786-7SKC	BR-1788-7SKC
”D” spring 175-275 psig (12-19 barg) 300 psig (20 barg) for 1784	BR1784-7SKD	BR-1786-7SKD	BR-1788-7SKD
T-Handle Screw Option Kit	BR-1784ST	BR-1786ST	BR-1786ST

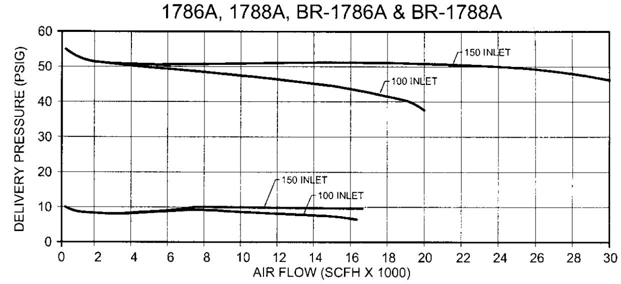
Heavy Duty Line Regulators Performance Curves
1780 Series & BR-1780 Series

"A" spring range 5 - 55 psig

1784A & BR-1784A

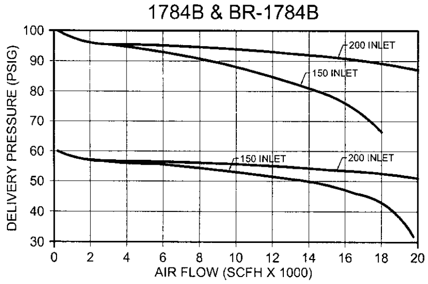


1786A, 1788A, BR-1786A & BR-1788A

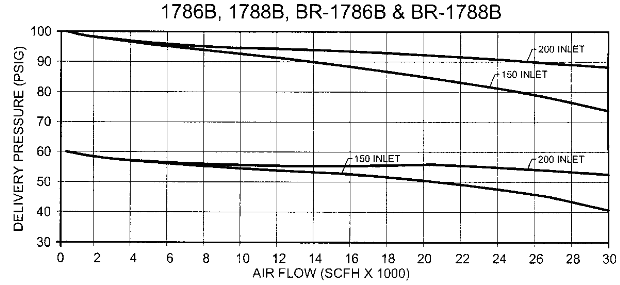


"B" spring range 40 - 110 psig

1784B & BR-1784B

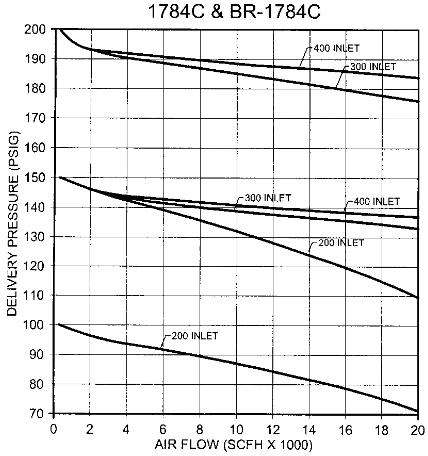


1786B, 1788B, BR-1786B & BR-1788B

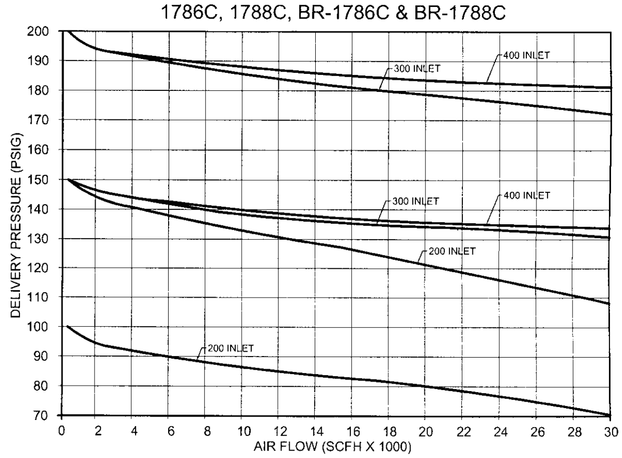


"C" spring range 100 - 200 psig

1784C & BR-1784C



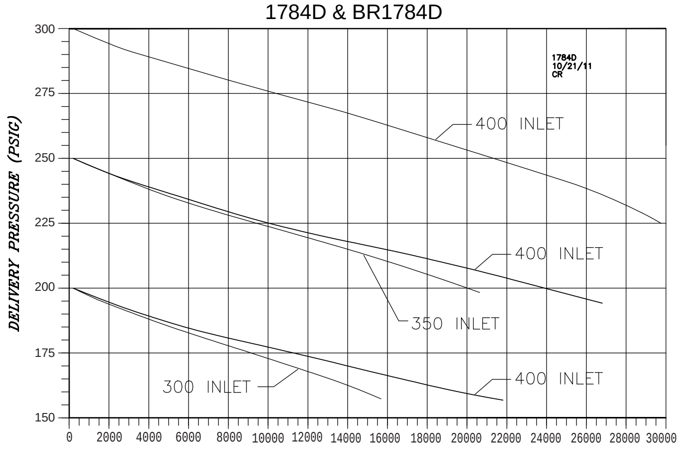
1786C, 1788C, BR-1786C & BR-1788C



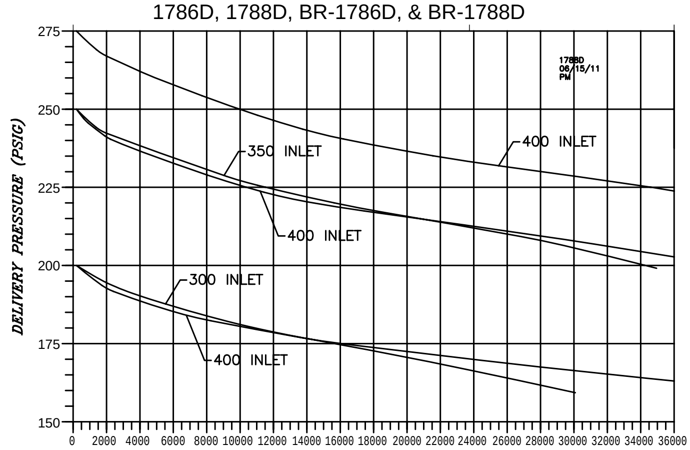
Gas Conversion Table

Service	Multiply Air Capacity By:
Fuel Gases	0.86
Helium	2.69
Hydrogen	3.79
Nitrogen	1.02
Natural Gas	1.25
Acetylene (15 psi max.)	1.06
Argon	0.85
Carbon Dioxide	0.81
Nitrous Oxide	0.81
Oxygen	0.95

1784D & BR1784D



1786D, 1788D, BR-1786D, & BR-1788D



Aluminum Pressure Regulators
1682M Series & C-1682M Series

Application

The 1682M Series Regulators are designed primarily for second stage regulation of a variety of gases in industrial and hospital piping systems and manifolds. The C-1682M Series is specifically designed for use with Carbon Dioxide.

Features

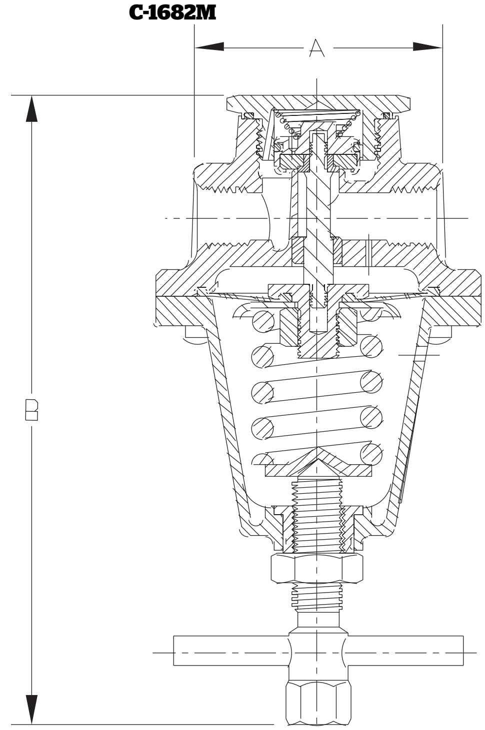
- Maximum inlet pressure is 400 psig (28 barg)
- Two ¼" F.NPT gauge ports are located 180° apart to allow for gauge mounting in convenient positions
- Each 1680M Series regulator is cleaned and packaged for oxygen per CGA G-4.1
- 100% Factory Tested
- T-handle adjusting screw
- Available in three delivery pressure ranges
- Temperature Range: -40° F to +165°F (-40ºC to +74ºC)

Materials

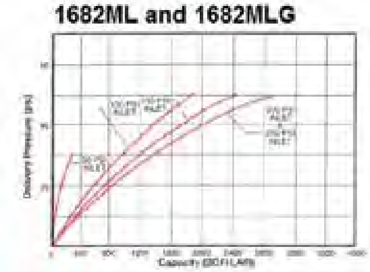
Body .... Forged Aluminum
Bonnet .... Aluminum
Seat Disc (1682M) .... Neoprene
Seat Disc (C-1682M) .... EPDM
Diaphragm (1682M) .... Neoprene
Diaphragm (C-1682M) .... EPDM

REGO 10 YEAR WARRANTY

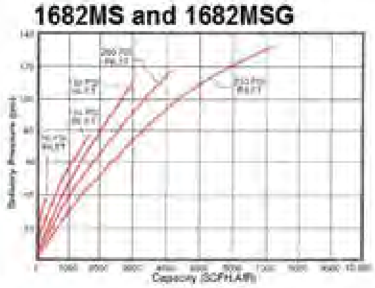
C-1682M



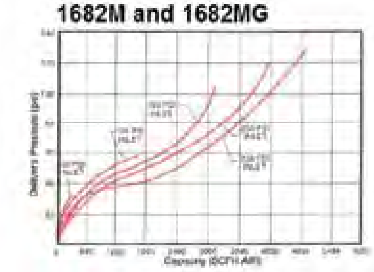
1682ML and 1682MLG



1682MS and 1682MSG



1682M and 1682MG



Ordering Information

Part Number		Delivery Pressure Range (psig)	Pressure Gauge		Inlet & Outlet Connection (F.NPT)		Width A		Maximum Height B	
			Range psig (barg)	Part Number	Inches	mm	Inches	mm	Inches	mm
1682ML	C-1682ML	5-50 psig (0.3-3.4 barg)	*	*	¼"	6	2³/₁₆"	56	4 ⅛"	105
1682MLG	C-1682MLG		1-100 (6.89)	1286						
1682M	C-1682M	50-125 psig (3.4-8.6 barg)	*	*						
1682MG	C-1682MG		1-200 (13.78)	S1679						
1682MS	C-1682MS	100-250 psig (6.9-17.2 barg)	*	*						
1682MSG	C-1682MSG		1-400 (27.57)	15578						

* Pressure gauge not included.

REGO

Automatic Changeover Regulators
M2523HP Series

Application

M2523HP series automatic changeover regulators are designed especially for use in systems where a reserve cylinder is used to provide a continuous, uninterrupted supply of gas. These regulators are suitable for use with carbon dioxide, hydrogen, oxygen, industrial air, nitrous oxide, nitrogen, helium and argon.

REGO 10 YEAR WARRANTY

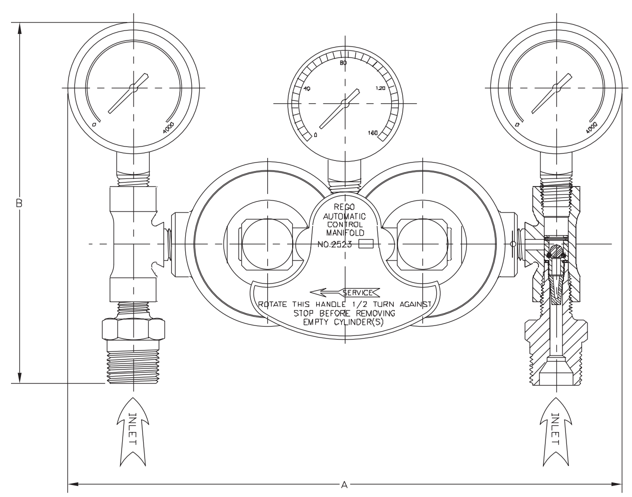
Features

- Automatically withdraws from the reserve cylinder after exhausting the "service" cylinder
- Cylinder pressure gauges let you know at a glance the contents of each cylinder is in use. There is no need to shutdown the system to replace empty cylinders
- Nickel plated
- 100% Factory Tested
- Cleaned per CGA G-4.1 for oxygen service
- Porous bronze filters are installed in each inlet to minimize the entry of foreign particles
- Back pressure check valves are installed in each inlet to help assure positive shut-off in case of reverse flow
- Each unit comes complete with mounting bracket and a special delivery pressure adjustment wrench
- Factory set at 50 psig (3.44 barg) on service side. CO_2 and N_2O regulators are factory set at 100 psig (6.89 barg) on service side

Conversion Table

Source	Multiply
Carbon Dioxide	.81
Nitrogen	1.02
Nitrous Oxide	.81
Argon	.85
Oxygen	.95
Helium	2.69
Hydrogen	3.79

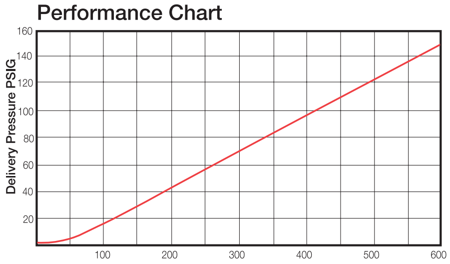
M2523HP Series



Materials

Body	Brass
Bonnet	Brass
Seat Disc (all gases except CO_2)	Viton
Seat Disc (CO_2 Only)	Butyl Rubber
Diaphragm (all gases except CO_2)	Neoprene
Diaphragm (CO_2 Only)	Buna N
Handle	Aluminum
Bonnet Spring	Steel
Backcap Spring	Stainless Steel

Performance Chart



Ordering Information

Part Number	Gas Service	CGA Inlet Connection	Outlet Connection Inches	Outlet Connection mm	Width A Inches	Width A mm	Height B Inches	Height B mm	Maximum Inlet Pressure	Delivery Pressure Range	Accessory Regulators
M2523HP320	Carbon Dioxide	320	¼" F.NPT	6	7¾"	196	5⅛"	130	1800 psig (124.2 barg)	30-130 psig (2.1-8.9 barg)	BR-1784E, 1784E C-1682 M Series
M2523HP326	Nitrous Oxide	326									
M2523HP350	Hydrogen	350							3000 psig (202 barg)		1784 Series 1682 M Series BR 1784 Series
M2523HP540	Oxygen	540									
M2523HP580	Nitrogen, Argon, Helium	580									
M2523HP590	Industrial Air	590									

Low Pressure Line Regulators
4403 Series

Application

The 4403 series regulators provide very sensitive control of a variety of gases at low pressures. The large molded diaphragm assures responsive regulation with inlet pressures up to 250 psig.

Features

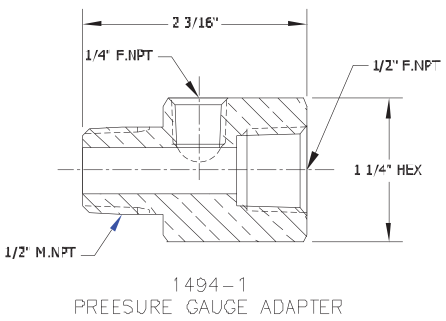
- Large molded diaphragm provides highly sensitive and accurate low pressure control
- Zinc body and bonnet resist corrosion and provide longer life
- Teflon seat disc, teflon faced diaphragms, and stainless steel nozzles make the T4403J regulators compatible with a variety of gases
- LV4403C2H42 features integral relief valve set at 3 psig (0.2 barg)
- Adjusting screw is concealed by a plastic cap which helps prevent pressure adjustments by unauthorized personnel
- Pressure gauge adapter available part # 1494-1
- Working temperature range is -40°F to +165°F. (-40ºC to +74ºC)
- Not suitable for oxygen applications

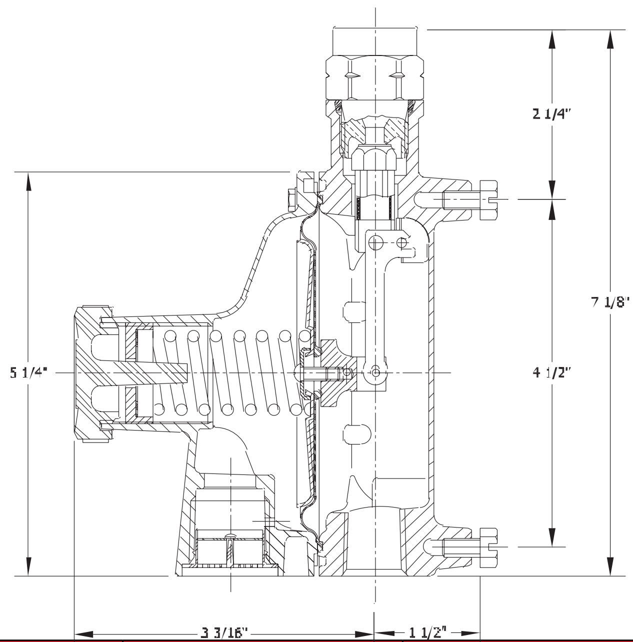
REGO 10 YEAR WARRANTY

LV4403C2H42

Materials

Body .... Zinc
Bonnet .... Zinc
Diaphragm .... T4403J, 4403W, S4, T4, U4 Teflon Faced Buna N
    4403WP4, R4 .... Buna N
    (LV4403C) .... Integrated Fabric and Synthetic Rubber
Spring .... Steel
Seat (T4403J) .... PTFE
    (4403W) (LV4403C) .... Buna N
Nozzle (T4403J) .... Stainless Steel
    (4403W, LV4403C) .... Brass





Ordering Information

Part Number	Inlet Connection		Outlet Connection		Factory Delivery Pressure*	Delivery Adjustment Range	Relief Setting
	Inches	mm	Inches	mm			
4403W-P4	½" F.NPT	13	½" F.NPT	13	5" w.c.	3.5 - 6" w.c.	None
4403W-R4					25" w.c.	15 - 28" w.c.	
4403W-S4					5 psig (0.34 barg)	1-5 psig (0.07-0.34 barg)	
4403W-T4					10 psig (0.69 barg)	5-10 psig (0.34-0.69 barg)	
4403W-U4					15 psig (1.03 barg)	10-15 psig (0.69-1.03 barg)	
LV4403C2H42	¼" F.NPT	6			1.5 psig (0.1 barg)	1.5 psig (0.1 barg)	3 psig (0.21 barg) ± 20%
T4403JS2					5 psig (0.34 barg)	1-5 psig (0.07-0.34 barg)	None
T4403JT2					10 psig (0.69 barg)	5-10 psig (0.34-0.69 barg)	

* Based on 50 psig inlet pressure. LV4403C2H42 based on 100 psig inlet pressure.

Application

The 4286, 4289, and 4291 series Inertrol outfits are three stage nitrogen regulators especially designed to maintain oil filled transformer atmospheres at 0.5 psig (.03 barg). Each Inertrol outfit consists of a two-stage regulator connected in series to a highly sensitive single-stage regulator which maintains the 0.5 psig (.03 barg) pressure. A built-in pressure relief valve in the third stage regulator helps protect against over-pressurization of the system.
Inertrol units are designed for oil-filled transformers manufactured by ABB, Inc., General Electric, and Cooper Power. Some outfits are equipped with an alarm switch that activates a customer equipped warning device should the cylinder pressure drop below 300 psig (20 barg) .

REGO 10 YEAR WARRANTY

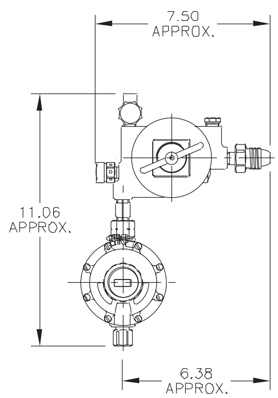
Inertrol Outfit

Features

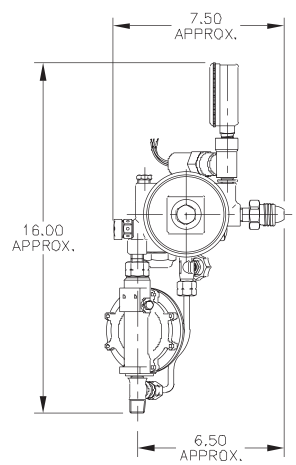
- Heavy duty brass and aluminum construction resists corrosion and provides for longer life
- The 4289 series incorporates a special by-pass valve to allow for quick filling of the transformer
- Hidden pressure adjusting screw helps protect against tampering by unauthorized personnel
- Large diameter diaphragm in the third-stage regulator provides for sensitive and precise control of the gas flow
- Maximum inlet pressure - 3000 psig (206 barg)

Materials

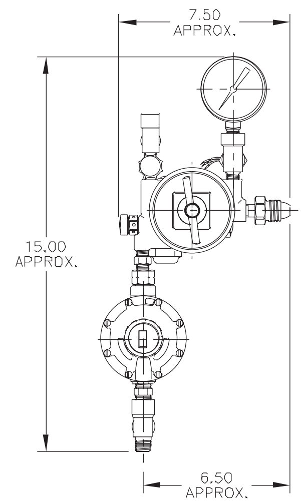
Two-Stage Regulator:
Body .... Brass
Bonnet .... Brass
Diaphragms .... Synthetic Rubber
1st Stage Seat Disc .... Nylon
2nd Stage Seat Disc .... Neoprene
Third-Stage Regulator:
Body .... Zinc
Bonnet .... Zinc
Diaphragm .... Buna N
Seat Disc .... Buna N



4286A580



4289 Series



4291A

Ordering Information

Part Number	Gas Service	Inlet	Outlet Inches	Outlet mm	Two Stage Regulator Part number	Third Stage Regulator Part Number	Alarm Gauge	Transformer Manufacturer
4286A580	Nitrogen	CGA580	1⁄8" NPT	3	4286A-2NW	LV4286-10-8	None	ABB, Inc.
4289AG			9⁄16" -18 L.H.	14	4289A-2G	LV4289-10	4285-9B	General Electric
4289G							None	
4291A			3⁄8" NPT	.9	4291B-2P	LV4286-10-8	4285-9B	Cooper Power

REGO

High Pressure Gas Regulator
4200 Series

Application

4200 Series high-pressure regulators are designed especially for use in high-pressure cylinders and are used to provide the supply of gas. These regulators are suitable for use with industrial air, nitrogen, helium, and argon.

Features

- Cylinder pressure gauges let you know at a glance whether the contents of the cylinder is in use and the supply pressure
- Temperature rating: -40° F to +165°F (-40ºC to +74ºC)
- MAWP: 3000 psig (206 barg)
- Cleaned and packaged for oxygen service per CGA G-4.1
- Pressure relief valve incorporate or protection of the low pressure system
- 100% factory tested. Each valve is individually bagged and boxed to arrive in factory new condition until installation

Materials

Body .... Brass
Bonnet .... Brass
Seat Disc .... Neoprene
Diaphragm .... Nitrile
Bonnet Spring .... Stainless Steel
Blackcap Spring .... Stainless Steel

REGO 10 YEAR WARRANTY

4291B-2P with 5563 & 15578

Ordering Information

New Part Numbers	Adjustment Screw Cap	Inlet Pressure	Inlet Connection	Outlet Connection	Inlet Pressure Gauge	Outlet Pressure Gauge	Gas Use
4291B-2P	No	3000 psig (206 barg)	CGA 580	¼" FNPT	5563	15578	Nitrogen, Argon, Helium, CO2/Argon mixture.
4289A-2GP	Yes						

* Pressure gauges sold separately.

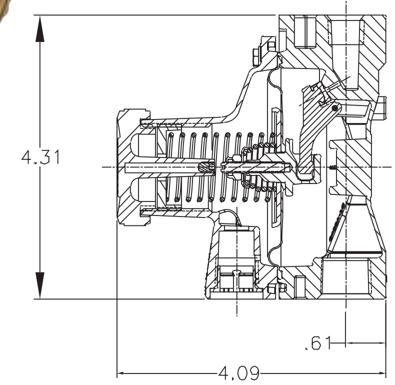
Low Pressure Regulators LV4286-10 Series & LV4289-10 Series

Application

The LV4286 and LV4289 series Inertrol third-stage low pressure regulators are designed especially for secondary regulation of gaseous nitrogen on electrical transformer systems.

Factory preset at 14" to 15" water column delivery pressure with an inlet pressure of 5 to 10 psig.

LV4286-10-8



Features

- Large diaphragm allows for highly sensitive and accurate low pressure control
- Incorporates integral relief valves (except on LV4289-10)
- Zinc body and bonnet resist corrosion and provide longer life
- Adjusting screw is concealed by a cap to help prevent against tampering by unauthorized personnel
- Operating temperature range is -40°F to +160°F (-40°C to +71°C)

Materials

Body .... Zinc
Bonnet .... Zinc
Diaphragm .... Buna N
Seat Disc .... Buna N
Spring .... Steel

Ordering Information

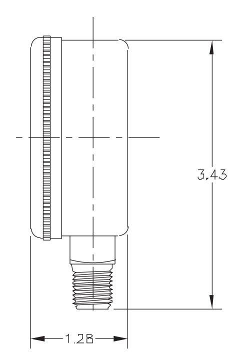
Part Number	Inlet (NPT)	Outlet (NPT)	Delivery Pressure Setting	Relief Valve Setting
LV4286-10-5	¼"	½"	14"-15" w. c.	5 psig (.34 barg)
LV4286-10-8				8 psig (.55 barg)
LV4289-10				None

Alarm Gauges 4285-9B

Application

The 4285-9B inertrol alarm gauges are designed to alert the user when pressure has fluctuated ±90 psig (6.2 barg) from the 300 psig (20 barg) factory setting. Under these conditions, electrical contacts in the switch will close and set off a user-furnished alarm system.

4285-9B



Features

- Solid brass gauge casing resists corrosion and provides for longer life
- Equipped with a heavy-duty, 36" long, 3-wire electrical cable
- Each gauge is factory pre-set at 300 psig (20 barg), then sealed to help prevent against tampering once in service
- Electrical circuit is rated for a maximum of 3 AMPS at 460 volts AC

Materials

Gauge Case .... Brass

Ordering Information

Part Number	Inlet M.NPT	Diameter		Pressure Range psig	Adjustable	Alarm Furnished
		Inches	mm			
4285-9B	¼"	2½"	63.5	0 - 4000 (0 - 275 barg)	No	None

Application

The HP9560 Series high pressure brass valves are used on cylinder filling panels, tube trailers, and high pressure manifolds and piping systems. The HP9560 Series exhibits a very low operating torque under pressure for ease of manual operation.

Features

- 5600 psig (386 barg) maximum working pressure
- Non-rising stem design with O-Ring Seal for durable service
- Large brass handwheel for easy low torque operation under pressure
- All valves cleaned for use in oxygen per CGA G-4.1
- Temperature range -40°F to +165°F(-40°C to +74°C)
- 100% Factory Tested

STANDARD BONNET VALVE

PANEL MOUNT VALVE

Materials

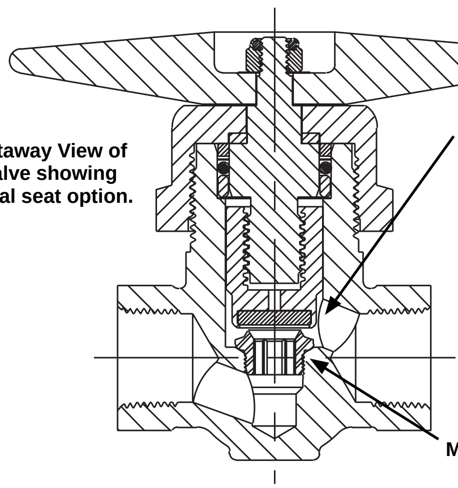
Body, bonnet, stem, and seat retainer, stem seal retaining rings and washer .... Brass
Stem O-ring .... Viton
Thrust bearing .... PCTFE

Soft Seat Option
The soft seat valves use a PCTFE seat disc in the seat retainer to create a "bubble-tight" seal against a machined seat surface on the brass body. Valve Cv is 2.6. The soft seat option is especially useful for small molecule gases like hydrogen and helium, but can be used for a variety of non-corrosive industrial gases including argon, nitrogen, carbon dioxide, nitrous oxide, and acetylene.

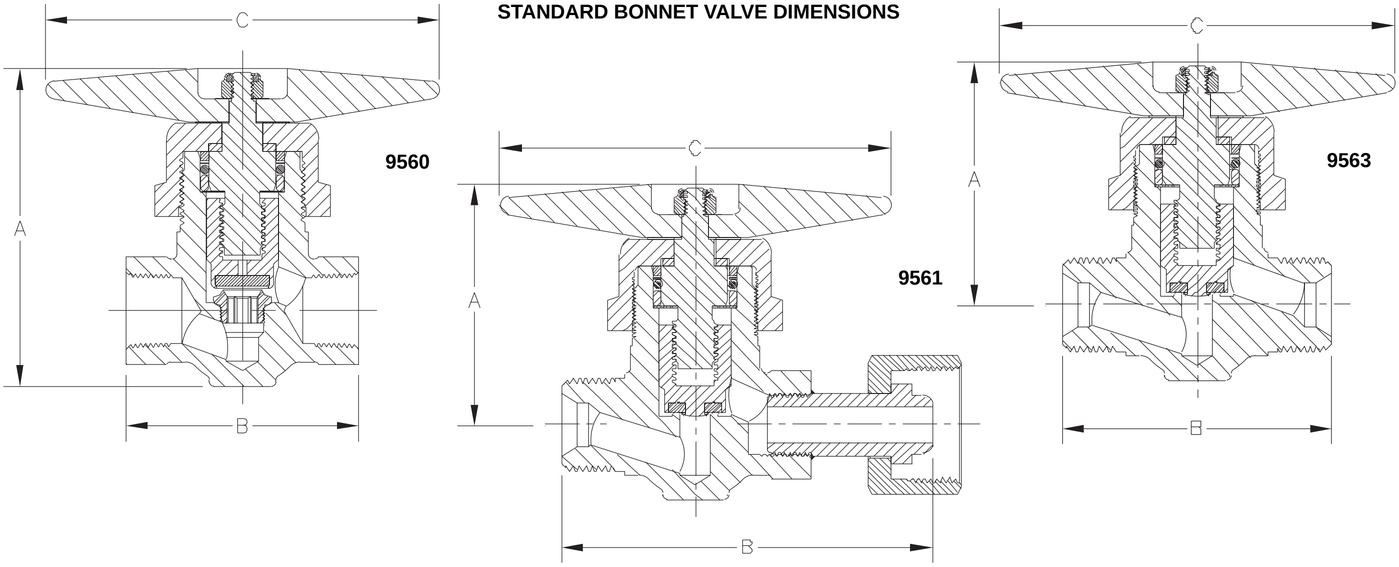
Metal Seat Option:
A copper seat disc is used in the seat retainer to create a seal against a Monel body seat, which is installed into the body and can be replaced. Valve Cv is 2.3. The metal seat option minimizes the possibility of seat decomposition or ignition in oxygen service under adiabatic compression. The metal seat option is recommended for oxygen, and can also be used for other non-corrosive industrial gases. The metal seat option is not to be used for acetylene due to the copper seat. Not to be applied in hydrogen or helium service or where a "bubble-tight" seal is essential. (Note: C in part number)

Nylon seat option: available also (ex. HP9560NB).

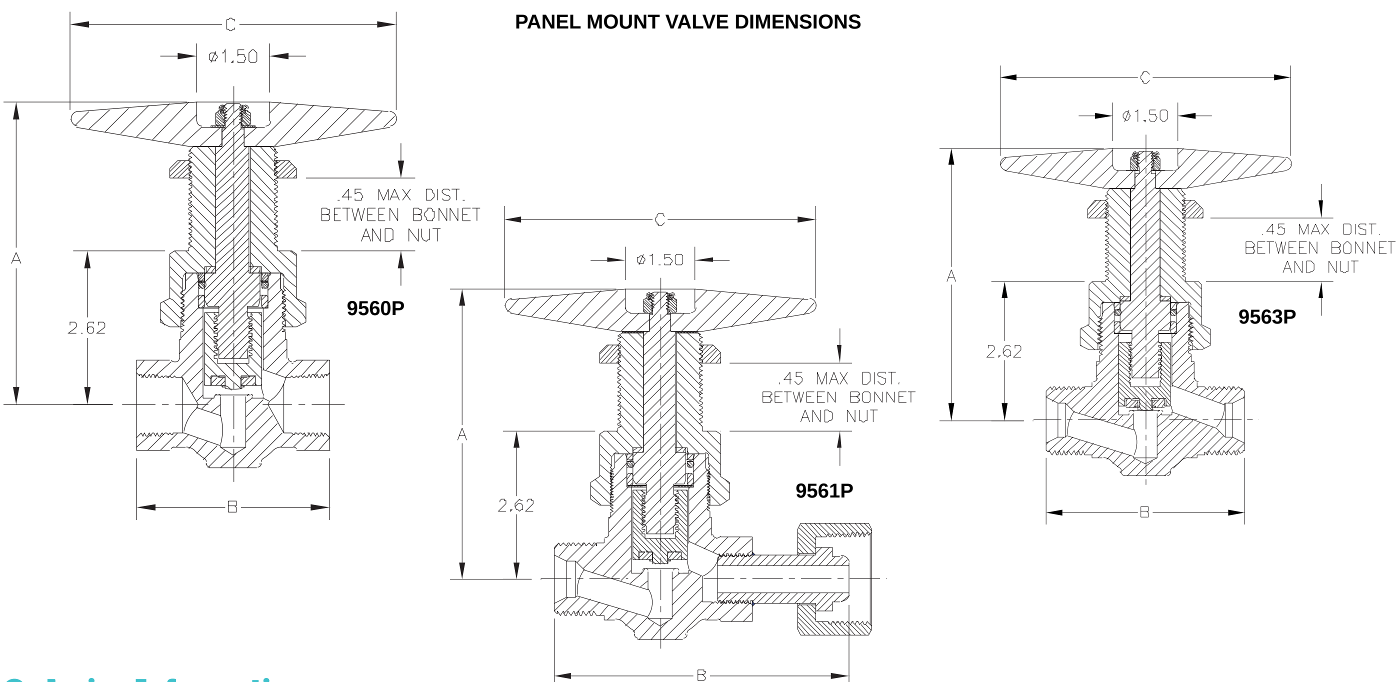
Bonnet Versions
- Standard Bonnet for low profile.
- Panel Mount Bonnet for ease of panel installation. Includes threaded bonnet and nickel plated brass mounting nut. Metal Seat Option 1.625" diameter panel hole required for mounting. (Note: P in part number)



STANDARD BONNET VALVE DIMENSIONS



PANEL MOUNT VALVE DIMENSIONS



Ordering Information

Part Number				Height A		Length B		Handwheel Length C	
Soft Seat	Metal Seat	Inlet Connection	Outlet Connection	Inches	mm	Inches	mm	Inches	mm
HP9560A	HP9560CA	½" F. NPT	½" F. NPT	4.36" *[6.19" for panel mount version]	111 *[157 mm for panel mount version]	3.25"	82	5.5"	140
HP9560B	HP9560CB	¾" F. NPT	¾" F. NPT						
HP9561R	HP9561CR	1"-11½" NPSM R.H.	1"-11½" R.H. Female Swivel			5.27"	134		
HP9561RL	HP9561CRL	1"-11½" NPSM R.H.	1"-11½" NPS L.H. Female Swivel						
HP9561L	HP9561CL	1"-11½" NPSM L.H.	1"-11½" L.H. Female Swivel						
HP9563R	HP9563CR	1"-11½" NPSM R.H.	1"-11½" NPSM R.H.			3.79"	96		
HP9563L	HP9563CL	1"-11½" NPSM L.H.	1"-11½" NPSM L.H.						
HP9560ASE	HP9560CASE	.843 - .847	.843 - .847			3.25"	82		
HP9560BSE	HP9560CBSE	1.053 - 1.057	1.053 - 1.057						
HP9560BSE-B	HP9560CBSE-B	1.053 - 1.057	¾" F.NPT						

Note: Place "P" at end of part number for panel mount version.
Nylon seat option is also available (ex: HP9560NBP)
For different handwheel size consult factory.

Application

7160 series valves are designed for use with oxygen and all fuel gases at station outlets of line distribution systems such as welder's benches, cutting stations, hospital rooms, etc.

Features

- UL Listed Approved for oxygen and all fuel gas services at 400 psig (28 barg) maximum working pressure
- All valves cleaned for use in oxygen per CGA G-4.1
- O-ring stem seal works with the pressure causing a tighter seal as pressure increases
- A reverse flow check valve installed in the valve outlet connection helps prevent reverse flow
- Available with brass cap and chain protection
- Meets the requirements of National Fire Protection Association (NFPA) Pamphlet No. 51
- Temperature range -40° F to +165° F (-40°C to +74°C)

UL LISTED

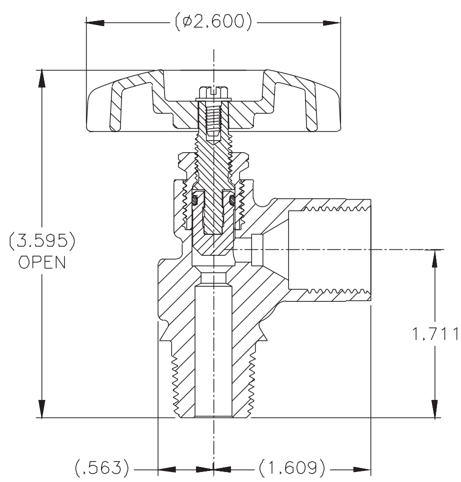
REGO 10 YEAR WARRANTY

7160 Series

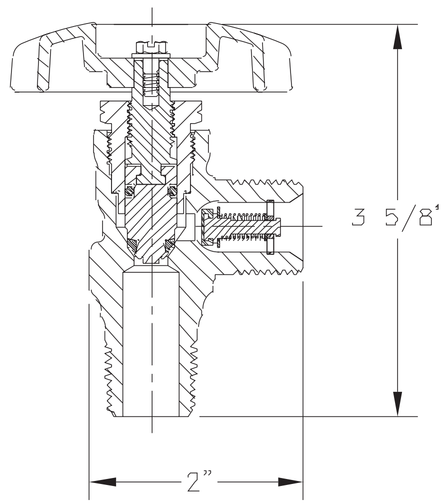
Materials

Body .... Brass
Stem and Seat Retainer .... Brass
O-ring .... Neoprene
Seat Disc .... Nylon
Reverse Flow Check Seat .... Neoprene

7164



7160 and 7161 Series



Ordering Information

Part Number	Gas Service	Inlet Thread	Outlet Thread	CGA Connection	C_V (Kv)	Outlet Protection*
7160V	Oxygen and Inert Gases	½" NGT	$^7/_8$" - 14 M. R.H.	024	.76 (0.65)	10663 Brass Cap & Chain
7160VL						None
7161V	Fuel Gases		$^7/_8$" - 14 M. L.H.	025		10664 Brass Cap & Chain
7161VL						None
7164	Inert Gases	½" NPT	$^7/_8$" - 14 F. R.H.	034		None

*Outlet Protection is recommended.

REGO

Application

Gauges are available in a variety of popular pressure ranges for gas plant applications.

Gauges should be selected so that the maximum working pressure of the particular system represents 66% to 75% of the maximum gauge reading. Greater safety and accuracy may be realized by following these guidelines.

15578

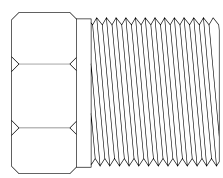
REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Maximum Calibration (psig)	Size	M. NPT	Increment Division (psig)	Case Material
1286	100 psig (6.89 barg)	2"	¼"	2 psig (0.14 barg)	Steel
2523HP-7	160 psig (11.03 barg)		⅛"	5 psig (0.34 barg)	
S1679	200 psig (13.79 barg)		¼"		
15578	400 psig (27.58 barg)			10 psig (0.69 barg)	Brass
5562C	4000 psig (275.8 barg)			50 psig (3.45 barg)	Steel

Brass Plugs

(for pressures to 3000 psig)
Safety factor = 5:1



Typical Plug

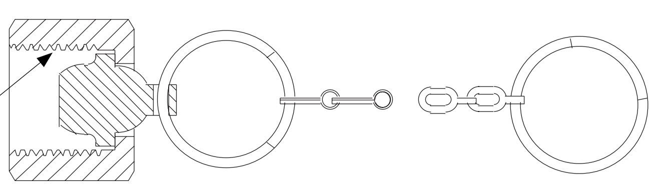
REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Thread Connection	Hex Flats
985B	¼" NPT	9/16"
985D	½" NPT	7/8"
985E	¾" NPT	1 1/8"
985F	1" NPT	1 3/8"

Brass Outlet Cap and Chain Assemblies

Internal Threads



Cap with Plug

REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Thread Connection	End Ring Fits Pipe
10663	7/8"-14NF-RH	½"
10664	7/8"-14NF-LH	½"

Needle Valves
CMM250 Series and CFF250 Series

Application

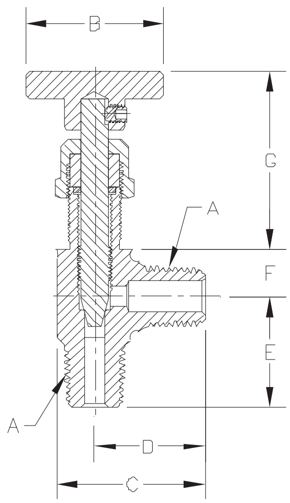
Ideal for use as a gauge isolation valve or applications requiring accurate throttling of pressure or in bulk vessel gauging lines .

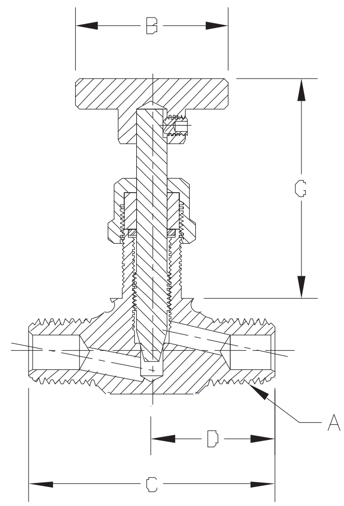
Features

- Compact design provides easy installation
- Fine stem threading and long taper allow precise metering and leak-free shut-off
- Internal stop prevents the stem from being accidentally unscrewed from the body
- Rugged forged brass bodies withstand higher pressures
- Unbreakable brass handwheel
- Valves come equipped for panel mounting
- Working temperature range is -40°F to +165°F (-40ºC to +74ºC)
- Maximum operating pressure: 2000 psig air (137.9 barg)
- Cleaned for oxygen service per CGA G-4.1
- Female ports available - consult factory

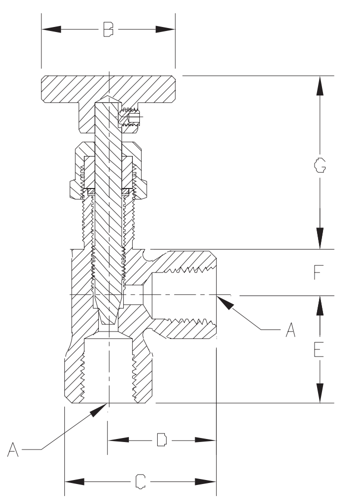
REGO
10
YEAR
WARRANTY

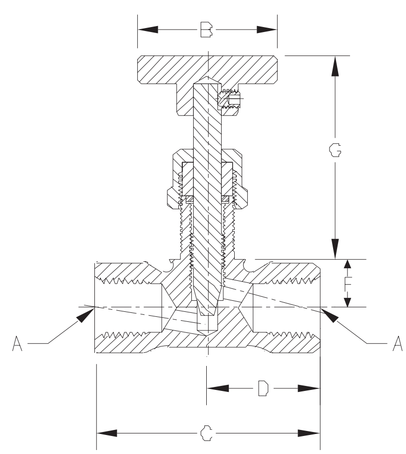

CMM250A CMM250G





CFF250A CFF250G





Materials

Body .... ASTM B283 Brass
Stem .... Brass
Knob .... Brass
Bonnet Nut........ Brass
Panel Mount Nut (Optional)........ Brass
Set Screw .... Steel
Stem Packing .... PTFE with Brass Gland

Ordering Information

	A (NPT)		B		C		D		E		F		G Open		G Closed		
Part Number	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	C_V (Kv)
CMM250A	¼	6	1¼	32	$1\frac{11}{32}$	35	1	25	1	25	$\frac{7}{16}$	11	$2\frac{5}{32}$	29	$1\frac{19}{32}$	40	.7 (0.60)
CMM250G					2	51			-	-			$2\frac{3}{8}$	60	$1\frac{13}{16}$	46	.5 (0.43)
CFF250A					$1\frac{13}{32}$	36			1	25			$2\frac{5}{32}$	55	$1\frac{19}{32}$	40	.7 (0.60)
CFF250G					2	51			-	-			$2\frac{3}{8}$	60	$1\frac{13}{16}$	46	.5 (0.43)

Strainer
STR002P

Application

The STR002P strainers have been designed to retain debris and any other pollution that could be in the lines, and could affect the performance of regulators and other devices. The STR002P use a Monel filter material. Designed for the handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations.

REGO 10 YEAR WARRANTY

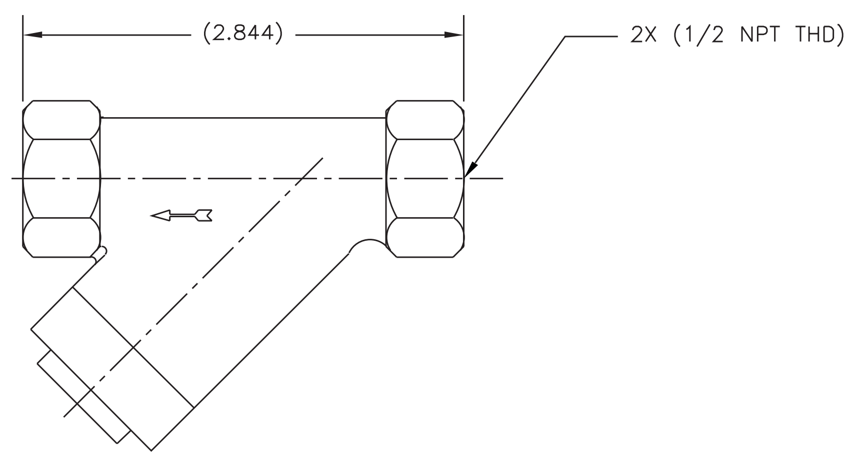
Features

- Temperature range: -320°F to 165°F. (-196°C to 74°C)
- Maximum working pressure: 600 psig (41,37 barg)
- Connections: FNPT
- Sizes: ½" (13 mm)
- Service: Liquefied & Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, Iso-Containers and Piping Configurations
- Cleaned for Liquid Oxygen Service per CGA G-4.1
- 100% Factory tested

STR000002P

Materials

Body ....Brass
Cap..Brass
Filter Material... 100 Mesh Monel



Ordering Information

Part Number	Inlet		Outlet		A	
	Inches	mm	Inches	mm	Inches	mm
STR2P	½"	13	½	13	2⁴/₅"	71

REGO

Brass Pipe & Pipe Nipples

Heavy-duty, yellow brass pipe and pipe nipples are designed with a high quality, seamless thick wall construction. They are suitable for use in most industrial piping applications.

ASTM B135 Alloy 330
½" I.D. pipe, O.D. is 0.840".
¾" I.D. pipe, O.D. is 1.050".

Fig. 1
PIPE

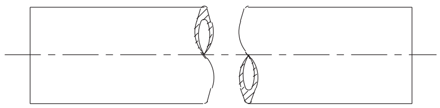
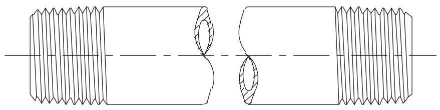


Fig. 2
NIPPLE



Ordering Information

Part Number	Figure	Inside Diameter		Inlet / Outlet Connections (M.NPT)		Length		Maximum Operating Pressure*
		Inches	mm	Inches	mm	Inches	mm	
TNE1050-14400	1	½"	13	Not Available	-	12 Feet	3657	3600 psig (248.2 barg)
TNE1075-14400		¾"	19					
1025-15	2	¼"	6	¼"	6	1.44"	37	
1050-10		½"	13	½"	13	1.13"	29	
1050-15						1.5"	38	
1050-20						2"	51	
1050-25						2.5"	63	
1050-40						4"	102	
1050-60						6"	152	
1050-80						8"	203	
1075-20		¾"	19	¾"	19	2"	51	
1075-30						3"	76	
1075-40						4"	102	
1075-50						5"	127	
1075-60						6"	152	

Brass Elbows

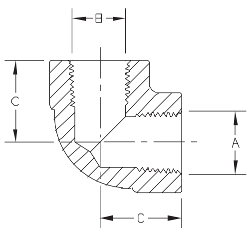


Fig. 1

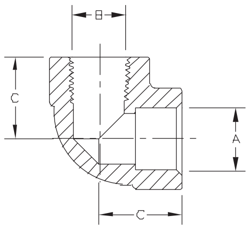


Fig. 2

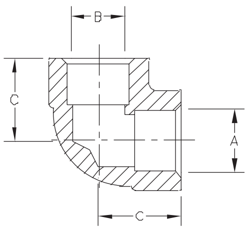


Fig. 3

Ordering Information

Part Number	Figure	A (Female)		B (Female)		C (Ref.)		Working Pressure
		Inches	mm	Inches	mm	Inches	mm	
1228-1	1	½" NPT	13	½" NPT	13	1⅛"	28	3750 psig (258.7 barg)
HP1228-1						1½"	38	4500 psig (310.5 barg)
1043		¾" NPT	19	¾" NPT	19			
1228-2	2	½" NPT	13	.843-.847	21-22	1⅛"	28	3750 psig (258.7 barg)
HP1228-2						1½"	38	4500 psig (310.5 barg)
2223-2		¾" NPT	19	1.053-1.057	27			
1228-4	3	.843-.847	21-22	.843-.847	21-22	1⅛"	28	3750 psig (258.7 barg)
HP1228-4						1½"	38	6000 psig (414 barg)
2233-6		1.053-1.057	27	1.053-1.057	27			4500 psig (310.5 barg)

*Safety factor = 4:1

Brass Tees

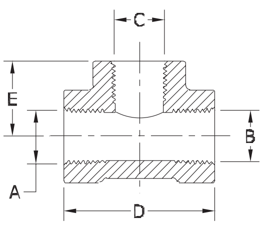


Fig. 1

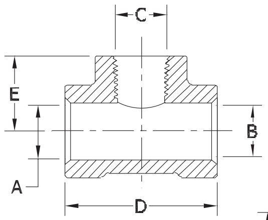


Fig. 4

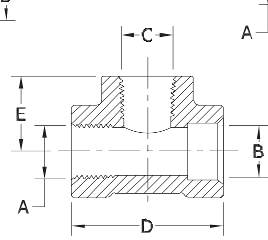


Fig. 2

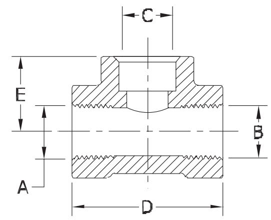


Fig. 5

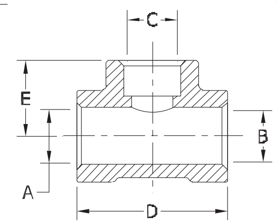


Fig. 3

Ordering Information

Part Number	Figure	A (Female)		B (Female)		C (Female)		D (Ref.)		E (Ref)		Working Pressure psig*
		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
1227-1	1	½" NPT	13	½" NPT	13	½" NPT	13	2¼"	57	1⅛"	29	3750 psig (258.7 barg)
HP1227-1								3"	76	1½"	38	4500 psig (310.5 barg)
1042-20		¾" NPT	19	¾" NPT	19							
1042						¾" NPT	19					
1227-3	2	½" NPT	13	.843-.847	21-22	½" NPT	13	2¼"	57	1⅛"	29	3750 psig (258.7 barg)
HP1227-3								3"	76	1½"	38	4500 psig (310.5 barg)
4608-5		¾" NPT	19	1.053-1.057	27	¾" NPT	19					
1227-28	3	.843-.847	21-22	.843-.847	21-22	.843-.847	21-22	2¼"	57	1⅛"	29	3750 psig (258.7 barg)
HP1227-28								3"	76	1½"	38	4500 psig (310.5 barg)
2118-2		1.053-1.057	27	1.053-1.057	27	1.053-1.057	27					
1227-9	4	.843-.847	21-22	.843-.847	21-22	½" NPT	13	2¼"	57	1⅛"	29	3750 psig (258.7 barg)
HP1227-9								3"	76	1½"	38	4500 psig (310.5 barg)
2223-3		1.053-1.057	27	1.053-1.057	27	¾" NPT	19					
HP1227-5	5	½" NPT	13	½" NPT	13	.843-.847						

*Safety factor = 4:1

Brass Crosses

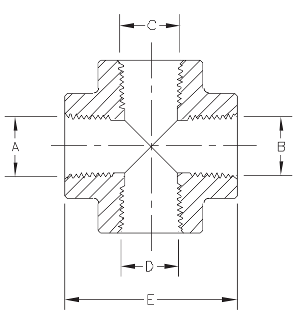


Fig. 1

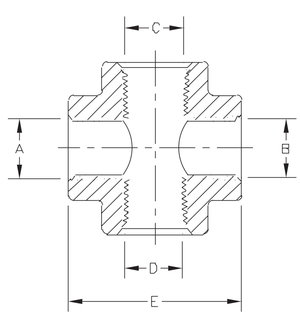
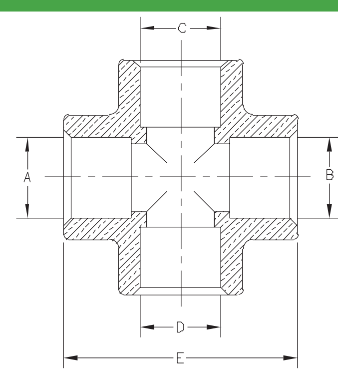


Fig. 2



Ordering Information

Fig. 3

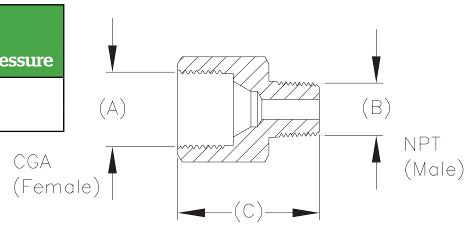
Part Number	Figure	A (Female)		B (Female)		C (Female)		D (Female)		E (Ref.)		Working Pressure*
		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
1225-1	1	½ "NPT	13	½ "NPT	13	½ "NPT	13	½ "NPT	13	2¼"	57	3750 psig (258.7 barg)
HP1225-1										3"	76	4500 psig (310.5 barg)
1045		¾ "NPT	19	¾ "NPT	19	¾ "NPT	19	¾ "NPT	19			
1225-3	2	.843-.847	21-22	.843-.847	21-22	½ "NPT	13	½ "NPT	13	2¼"	57	3750 psig (258.7 barg)
HP1225-3										3"	76	4500 psig (310.5 barg)
2222-2		1.053-1.057	27	1.053-1.057	27	¾ "NPT	19	¾ "NPT	19			
HP1225-4	3	.843-.847	21-22	.843-.847	21-22	.843-.847	21-22	.843-.847	21-22			
2222-4		1.053-1.057	27	1.053-1.057	27	1.053-1.057		1.053-1.057	27			

*Safety factor = 4:1

Brass Adapters CGA x Misc.

Ordering Information

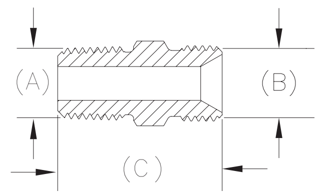
Part Number	A		B		C (Ref.)		Maximum Operating Pressure
	Inches	mm	Inches	mm	Inches	mm	
1877C	.580	15	½"	13	1¾"	44	3000 psig (206 barg)
1877D			¾"	19			



Brass Adapters Male x Male

Ordering Information

Part Number	A (Male)		B (Male)		C (Ref.)		Maximum Operating Pressure
	Inches	mm	Inches	mm	Inches	mm	
1300	¼ NPT	6	9/16" - 18NF-LH	14-457	1 1/4"	32	3000 psig (206 barg)
1200							
2233-4HAL	½ NPT	13	1" - 11½NPS-LH	25-292	2 3/8"	60	
2233-4HA							
2233-4HL	¾ NPT	19			2 9/16"	65	
2233-4H							



Brass Adapters Female x Female

Ordering Information

Part Number	Figure	A Female)		B Female)		C (Ref.)		Maximum Operating Pressure
		Inches	mm	Inches	mm	Inches	mm	
1125-15	1	½" NPT	13	½" NPT	13	1 5/8"	46	3000 psig (206 barg)
1044		¾" NPT	19	¾" NPT	19	2"	51	

Part Number	Figure	A (Female)		B (Female)		C (Ref.)		Maximum Operating Pressure
		Inches	mm	Inches	mm	Inches	mm	
1125-16	2	.843-.847	21-22	.843-.847	21-22	1 5/8"	46	3000 psig (206 barg)
1044-1		1.053-1.057	27	1.053-1.057	27	2"	51	

Figure 1

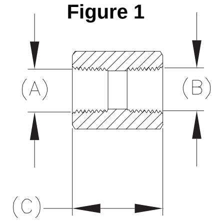
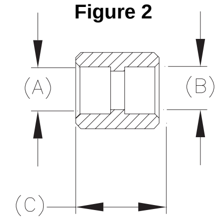


Figure 2



Brass Adapters Male x Female

Ordering Information

Part Number	Figure	A (Male)		B (Female)		C (Ref.)		Maximum Operating Pressure
		Inches	mm	Inches	mm	Inches	mm	
489-10	1	½" NPT	13	¼" NPT	6	1¼"	38	3000 psig (206 barg)
1252		¾" NPT	19			1 19/64"	33	
1252A				½" NPT	13			
2165-3		1"-11½NPS-RH	25-292	¾" NPT	19	1 27/32"	47	
2165-3B	2			.843-.847	21-22	1 3/16"	30	
2165-3A				1.053-1.057	27	1 27/32"	47	

Figure 1

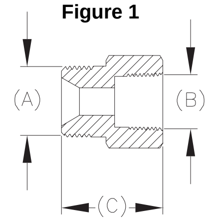
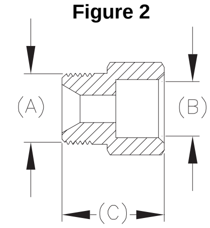


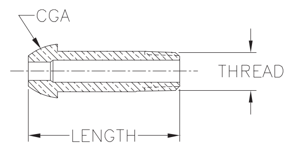
Figure 2



CGA Brass Tailpieces

Ordering Information

Part Number	CGA Connection	Thread of Bore for Tubing	Length (Approx.)	Maximum Operating Pressure
2603-2U	510, 580, 590	¼" NPT	1 3/32"	3000 psig (206 barg)



Miscellaneous Brass Tailpiece

Ordering Information

Part Number	For Use with Nut (RH or LH)		Figure	Thread of Bore for Tubing		Length (Approx.)		Maximum Operating Pressure
	Inches	mm		Inches	mm	Inches	mm	
2233-3A	1" - 11½ NPS	25-292	1	½" NPT	13	3 7/16"	87	3000 psig (206 barg)
2670-35			2	.312 I.D.	8	2 7/16"	62	

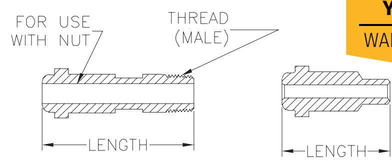


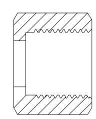
Fig 1 THREADED   Fig 2 SWEAT END

Brass Union Connection Nuts

Ordering Information

Part Number	Figure	Thread Connection		Wrench Flats		Maximum Operating Pressure
		Inches	mm	Inches	mm	
1302-1	2	9/16" - 18-LH	17-457	11/16"	17	3000 psig (206 barg)
1271-1		⅞" - 14-RH	22-356	1⅛"	29	
1371-1		⅞" - 14-LH	22-356			
2223-6		1" - 11½ NPS-RH	25-292	1¾"	44	
2223-6A		1" - 11½ NPS-LH	25-292			

Internal Threads



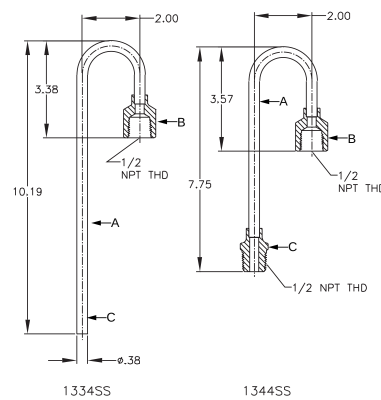
Candy Cane Riser Tubes and Assemblies For Piping-Away PRV9400, SS9400, PRV19400 & PRV29400 Series Relief Valves from Cryogenic Piping.

Materials

Tubing..Stainless Steel
Fitting: ....Brass

Ordering Information

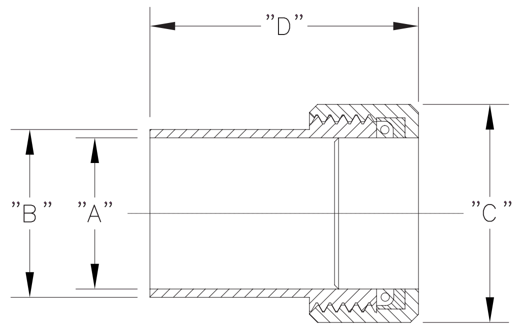
Part Number	Tubing Material	Fitting Material	"A" PRV Connection		"B" Tubing OD		"C" Inlet Connection		Maximum Operating Pressure
			Inches	mm	Inches	mm	Inches	mm	
1332SS	Stainless Steel	Brass	¼" FNPT	6	.375"	9	Tubing 0.375"	9	600 psig (41.37 barg)
1334SS			½" FNPT	13					
1344SS							½" MNPT	13	
1344SSA					.625"	16			



Quikonnect Vacuum Couplings

Features

- An extensive range of tube sizes available. Most sizes nest, and can be used as reducers in combination with one another.
- May be used for vacuum down to 1x10^{-8} Microns
- Viton O-rings are standard
- "Quikonnect" vacuum couplings have four basic components:
  * Knurled Nut
  * Retainer Ring
  * O-ring
  * Sleeve



Ordering Information

Quikonnect Vacuum Couplings

Brass Machine Finish	"A"		"B"		"C"		"D"		Tube OD Size	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
B-006-M	0.072"	2	0.375"	10	⅝"	16	1 1/32"	26	1/16"	2
B-012-M	0.135"	3							⅛"	3
B-018-M	0.197"	5							3/16"	5
B-025-M	0.260"	7							¼"	6
B-031-M	0.322"	8	0.500"	13	13/16"	16	1¼"	32	5/16"	8
B-038-M	0.385"	10							⅜"	9
B-050-M	0.510"	13	0.625"	16	⅞"	22			½"	13
B-062-M	0.635"	16	0.750"	19	1⅛"	28	1⅜"	35	⅝"	16
B-075-M	0.760"	19	0.875"	22	1¼"	32	1½"	38	¾"	19
B-087-M	0.885"	22	1.000"	25	1 7/16"	36	1 23/32"	44	⅞"	22
B-100-M	1.010"	26	1.125"	28	1½"	38	1 13/16"	46	1"	25
B-112-M	1.135"	29	1.250"	32	1⅝"	41	1 15/16"	49	1⅛"	28
B-125-M	1.260"	32	1.500"	38	2"	51	1 3/16"	30	1¼"	32
B-138-M	1.385"	35	1.625"	41					1⅜"	35
B-150-M	1.150"	29	1.750"	44	2¼"	57			1½"	38
B-162-M	1.635"	41	1.875"	48	2⅜"	60	2¼"	57	1⅝"	41
B-200-M	2.010"	51	2.250"	57	2¾"	70	2.70"	69	2"	51

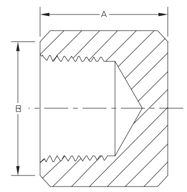
Brass Pipe Caps

Application

For capping cryogenic tank piping or gas pipelines.

Features

- Machined from brass
- For 600 psig (41.37 barg) maximum working pressure service.
- Part number stamped on cap
- Cleaned for oxygen per CGA G-4.1



Ordering Information

Part Number	Thread Connections		Dim. A		Dim. B		Dim. C	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
CAP750	¾" Female NPT	19	1.250"	32	1.313"	33	1.313"	33
CAP1000	1" Female NPT	25	1,500"	38	1.750"	44	1.750"	44
CAP1500	1 ½" Female NPT	38	1.750"	44	2.375"	60	2.375"	60
CAP2000	2" Female NPT	51	2.000	51	3.250"	82	3.250"	82

Repair Kits

T9450 Series, T9460 Series, ES8450 Series, TES8450 Series, BK9450 Series and BK9470 Series

Kit Number	Part Number	Kit Contents
ES8450R	T9450 Series and T9460 Series	(1) Stem assembly (4"), (1) packing, (1) bonnet, (1) handwheel.
BK9450-80	9450 Series, 9460 Series	(1) Stem assembly ,(1) Spring, (1) Jam Ring,(1)Packing V-ring,(1) Packing Gland,(1) O-ring, Washer,(1) Locknut, (1) Gasket.
BK9450R *	9450 Series, 9460 Series	(1) Extended Bonnet Assembly Kit, (1) Spring load packing for conversion of extended stem valves and topworks replacement
BKA8400R	BKA8412SE	(1) Stem assembly,(1) handwheel, (1) seat assembly Converts SE Series to New Style S Series
T9464-80	T9450 Series, T9460 Series,9450 Series, 9460 Series	(1) Complete valve trim assembly including Silver handwheel
T9464-80B		(1) Complete valve trim assembly including Blue handwheel
T9464-80G		(1) Complete valve trim assembly including Green handwheel
T9464-80R		(1) Complete valve trim assembly including Red handwheel
BK-9450-KIT**	ES8450 Series,ES9450 Series,BK9450 Series	(1) Extended Bonnet Assembly Kit,(1) Spring load packing for conversion of extended stem valves and topworks replacement

* Changes to a 6.5" (165mm) stem.
**Retrofits ES8450 and ES9450 to a 6.5" (165mm) stem and a repair kit for the BK9450 Series.

RG Series, CBH & CBC Series and LCR Series

Kit Number	Part Number	Kit Contents
RG-80*	RG22, RG75, RG125,CBC125, CBH125,LCR.	(1) Backcap gasket, (1) diaphragm assembly, (1) diaphragm gasket,(1) seat assembly.
RG-80A*	RG300	
RG-81**	RG75A, RG125A, CBC125A & CBH125A,LCR.	
RG-81A**	RG300A, CBC300A & CBH300A,LCR.	
RG-82	RG Series,LCR Series	(1) Diaphragm assembly,(1) gasket.
1784NG-80	1784NG Series	(1) Diaphragm assembly,(1) seat assembly,(1) gasket.

*Good for valves manufactured before Fall 2010
**Good for valves manufactured after Fall 2010

PB Series

Kit Number	Part Number	Kit Contents
PB504-80R	PB504 Series	(1) Poppet O-ring, (1) Seat Retainer, (1) Seat Disc,(1) Stem Seat,(1) Back O-ring, (1) Backcap Seal.
PB504-81R	PB504 Series	(1) Diaphragm, (1) gasket

ECL502 Series

Kit Number	Part Number	Kit Contents
ECL502-80	ECL502-22 to ECL502-175.	Diaphragms, Diaphragm liner, Spring guide, ball seat.
ECL502-80A	ECL502-180 to ECL502-350.	
ECL-80	ECL22, ECL70, ECL100, ECL140	Diaphragm assembly, diaphragm gasket, poppet, retaining ring, spring, washer.
ECL-80A	ECL325	

CB504 Series

Kit Number	Part Number	Kit Contents
CB504	CB504-B	Seat Retainer,Seat Disc, Stem, Ball, Cylindrical Spring, Check Retainer, Spring Seal, Thrusr Button, Diaphragm gasket, Diaphragm, Gasket.

CBH502 & CBC502 Series

Kit Number	Part Number	Kit Contents
CB502-80	CBC502-22 to CBC502-175, CBH502-22 to CBH502-175	Diaphragm assembly, diaphragm gasket, Backcap gasket,poppet seat, seat pin.
CB502-80A	CBC502-180 to CBC502-350, CBH502-180 to CBH502-350	

Repair Kits

BB Series, BBS Series, SKB Series and Old SK Series

Kit Number	Part Number	Kit Contents
SK9404-81*	BB9402, BB9404,SKB9402, SKB9404,SK9402,SK9404	(1) Gasket, (1) Spring, (1) Washer, (1) Ring V Male. (3) Ring V female,(1) O'ring.
SK9408-81*	BB9406, BB9408,SKB9406, SKB9408,SK9406,SK9408	
SK9412-81*	BB9412,SKB9412,SK9412	
SK9416-81*	BB9416,SKB9416,SK9416	
SK9404-82*	BB9402, BB9404,SKB9402, SKB9404,SK9402,SK9404,BBS9402, BBS9404.	(1) Gasket and (1) Seat Disc Assembly.
SK9408-82*	BB9406, BB9408,SKB9406, SKB9408,SK9406,SK9408, BBS9406, BBS9408.	
SK9412-82*	BB9412,SKB9412,SK9412,BBS9412.	
BB9412-82A***	BB9412,SKB9412,BBS9412.	
SK9416-82*	BB9416,SKB9416,SK9416,BBS9416.	
SK9404-83*	BB9402, BB9404,SKB9402, SKB9404,SK9402,SK9404,BBS9402, BBS9404.	(1) Gasket.
SK9408-83*	BB9406, BB9408,SKB9406, SKB9408,SK9406,SK9408, BBS9406, BBS9408.	
SK9412-83*	BB9412,SKB9412,SK9412,BBS9412.	
BB9412-83A***	BB9412,SKB9412,BBS9412.	
SK9416-83*	BB9416,SKB9416,SK9416,BBS9416.	
BB9404-85	BB9402, BB9404,SKB9402, SKB9404.	(1) Gasket, (1)Stem,(1) Bonnet & tube Assy, (1) Spring, (1) Washer, (1)Ring V Male. (3) Ring V female,(1) O-ring, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
BB9408-85	BB9406, BB9408,SKB9406, SKB9408.	
BB9412-85**	BB9412,SKB9412.	
BB9412-85A***	BB9412,SKB9412.	
BB9416-85	BB9416,SKB9416.	
BB9412-81A***	BB9412,SKB9412.	(1)Gland Follower, (1)Bonnet Bearing, (1)Packing Adapter,(1) Bonnet Packing, (1)Packing Separator, (1) Gasket.
BBS9404-81	BBS9402,BBS9404, SKB9402BWS, SKB9402SWS, SKB9404BWS, SKB9404SWS.	
BBS9408-81	BBS9406,BBS9408, SKB9406BWS, SKB9406SWS, SKB9408BWS, SKB9408SWS.	
BBS9412-81**	BBS9412, SKB9412BWS, SKB9412SWS.	
BBS9412-81A***	BBS9412, SKB9412BWS, SKB9412SWS.	
BBS9404-81	BBS9416,SKB9416BWS, SKB9416SWS	
BBS9404-85	BBS9402,BBS9404, SKB9402BWS, SKB9402SWS, SKB9404BWS, SKB9404SWS.	(4) Screw, (1) Kit Upper Assembly, (10 Handwheel, (1) Nut lock, (1) Washer, (1)Gland Follower, (1)Bonnet Bearing, (1)Packing Adapter,(1) Bonnet Packing, (1) Packing Separator, (1) Gasket.
BBS9408-85	BBS9406,BBS9408, SKB9406BWS, SKB9406SWS, SKB9408BWS, SKB9408SWS.	
BBS9412-85**	BBS9412, SKB9412BWS, SKB9412SWS.	
BBS9412-85A***	BBS9412, SKB9412BWS, SKB9412SWS.	
BBS9404-85	BBS9416,SKB9416BWS, SKB9416SWS	

*Good for SK Series valves manufactured before 2017.
** Good for Valves produced on or before 05C19.
*** Good for Valves produced on or after 05D19.

BK Series

Kit Number	Part Number	Kit Contents
BK8400-80J	BK8404,BK8406,BK8408,BKY8408,BK9404,BK9406,BK9408	(1)Jam ring,(1) O-ring, (3)Pressure seal rings , (1)Spring, (1) Tape, (1) Washer, (1) Gasket.
BKA8412-80J	BK8408,BK9408,BKA8408,BKA9408.	
BK9400-80J*	BK9410, BK9412.	
BK9416-80JS	BK9416.	
BK8400-80AJ	BK8404,BK8406,BK9404,BK9406.	(1) Seat Disc Assembly,(1) Gasket.
BK9400-80AJ	BK9410, BK9412.	
BKY8408-80AJ	BKY8408.	
BK8400-80BJ	BK8408,BK9408,BKA8408,BKA9408.	
BKA8412-80JA*	BKA8412, BKA8408, BKA9408.	
BK9416-80AJ	BK9416.	
BK8404-Kit	BK8404.	(1)Stem, (1) Bonnet & tube Assembly, (1) Seal housing, (1) Spring, (1) Packing Gland, (1) Washer, (1) Jam Ring, (3)Pressure seal rings, (1) O-ring, (1) Seat Assembly, (1) Locknut, (1) Washer, (1) Handwheel, (1) Gasket.

*Only for valves produced after 1991.

222 Series and 202 Series

Kit Number	Part Number	Kit Contents
B-222X-4-81	B-222X-2, B-222X-4, B-00202X-4.	(1) Handwheel nut, Bonnet bearing, (1) Gland Follower, (5) Bonnet Packing, (4) Packing Separator, (1) Bonnet packing adapter.
B-222X-6-81	B-222X-6	
B-222X-8-81	B-222X-8	
B-222X-12-81	B-222X-12, B-222XBS-12, SB-222X-12SW	
B-222X-16-81	B-222X-16	
B-222X-24-81	B-222X-24, GB-0222WE-24PC.	
B-222X-4-82	B-222X-2, B-222X-4, B-00202X-4.	(1) Seat Disc Assembly,(1) Gasket.
B-222X-6-82	B-222X-6	
B-222X-8-82	B-222X-8	
B-222X-12-82	B-222X-12, B-222XBS-12, SB-222X-12SW	
B-222X-16-82	B-222X-16	
B-222X-24-82	B-222X-24, GB-0222WE-24PC.	
B-222X-4-83	B-222X-2, B-222X-4, B-00202X-4.	(1) Gasket.
B-222X-6-83	B-222X-6	
B-222X-8-83	B-222X-8	
B-222X-12-83	B-222X-12, B-222XBS-12, SB-222X-12SW	
B-222X-16-83	B-222X-16	
B-222X-24-83	B-222X-24, GB-0222WE-24PC.	
B-222X-4KIT	B-222X-2, B-222X-4.	(1)Stem, (1) Bonnet & tube Assembly, (1) Handwheel nut, Bonnet bearing, (1) Gland Follower, (5) Bonnet Packing, (4) Packing Separator, (1) Bonnet packing adapter, (1) Seat Assembly, (1) Locknut, (1) Washer, (1) Handwheel, (1) Gasket.
B-222X-6KIT	B-222X-6	
B-222X-8KIT	B-222X-8	
B-222X-12KIT	B-222X-12, B-222XBS-12, SB-222X-12SW	
B-222X-16KIT	B-222X-16	
B-222X-24KIT	B-222X-24, GB-0222WE-24PC.	

226LL Series

Kit Number	Part Number	Kit Contents
B-226LL-4-81	B-226LL-2, B-226LL-3, B-226LL-4.	(1) Handwheel nut, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter.
B-226LL-8-81	B-226LL-6, B-226LL-8, PB-226LL-8T6Y1.	
B-226LL-4-82	B-226LL-2, B-226LL-3, B-226LL-4.	(1) Seat Disc Assembly,(1) Gasket.
B-226LL-8-82	B-226LL-6, B-226LL-8, PB-226LL-8T6Y1.	
B-226LL-4-83	B-226LL-2, B-226LL-3, B-226LL-4.	(1) Gasket.
B-226LL-8-83	B-226LL-6, B-226LL-8, PB-226LL-8T6Y1.	
B-226LL-4KIT	B-226LL-2, B-226LL-3, B-226LL-4.	(1) Handwheel nut, (1) Handwheel, (1)Stem, (1) Bonnet nut, (1)Bonnet & tube ASM, (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket.
B-226LL-8KIT	B-226LL-6, B-226LL-8, PB-226LL-8T6Y1.	

226ULL Series

Kit Number	Part Number	Kit Contents
B-226ULL-12-81	B-206ULL-12, B-226ULL-12.	(1) Handwheel nut, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter.
B-226ULL-16-81	B-206ULL-16, B-226ULL-16.	
B-226ULL-12-82	B-206ULL-12, B-226ULL-12.	(1) Seat Disc Assembly,(1) Gasket.
B-226ULL-16-82	B-206ULL-16, B-226ULL-16.	
B-226ULL-12-83	B-206ULL-12, B-226ULL-12.	(1) Gasket.
B-226ULL-16-83	B-206ULL-16, B-226ULL-16.	
B-226ULL-12KIT	B-226ULL-12.	(1) Handwheel nut, (1) Handwheel, (1)Stem, (1) Bonnet nut, (1)Bonnet & tube ASM, (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket.
B-226ULL-16KIT	B-226ULL-16.	

Repair Kits

226XGF Series

Kit Number	Part Number	Kit Contents
VB-226XGF-4-81	VB-226XGF-4	(1) Handwheel nut, (1)Bonnet bearing, (1) Packing Follower, (1) Grafoil Packing, (1) Packing adapter.
VB-226XGF-6-81	VB-226XGF-6	
VB-226XGF-8-81	VB-226XGF-8	
VB-226XGF-12-81	VB-226XGF-12	
VB-226XGF-4-82	VB-226XGF-4	(1) Seat Disc Assembly,(1) Grafoil Gasket.
VB-226XGF-6-82	VB-226XGF-6	
VB-226XGF-8-82	VB-226XGF-8	
VB-226XGF-12-82	VB-226XGF-12	
VB-226XGF-4-83	VB-226XGF-4	(1) Grafoil Gasket.
VB-226XGF-6-83	VB-226XGF-6	
VB-226XGF-8-83	VB-226XGF-8	
VB-226XGF-12-83	VB-226XGF-12	
VB-226XGF-4KIT	VB-226XGF-4	(1) Handwheel nut, (1) Handwheel, (1)Stem, (1) Bonnet nut, (1)Bonnet & tube ASM, (1) Bonnet ring, (1)Seat Assembly, Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket,(1)Bonnet bearing, (1) Packing Follower, (1) Grafoil Packing, (1) Packing adapter.
VB-226XGF-6KIT	VB-226XGF-6	
VB-226XGF-8KIT	VB-226XGF-8	
VB-226XGF-12KIT	VB-226XGF-12	

226BLL Series

Kit Number	Part Number	Kit Contents
B-226BLL-12-81	B-206BLL-12, B-226BLA-12, B-226BLL-12.	(1) Handwheel nut, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Packing separator.
B-226BLL-16-81	B-226BLL-16.	
B-226BLL-12-82	B-206BLL-12, B-226BLA-12, B-226BLL-12.	(1) Seat Disc Assembly,(1) Gasket.
B-226BLL-16-82	B-226BLL-16.	
B-226BLL-12-83	B-206BLL-12, B-226BLA-12, B-226BLL-12.	(1) Gasket.
B-226BLL-16-83	B-226BLL-16.	
B-226BLL-12KIT	B-206BLL-12, B-226BLA-12, B-226BLL-12.	(1) Handwheel nut, (1) Handwheel, (1)Stem, (1) Bonnet nut, (1)Bonnet & tube ASM, (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (1) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket.
B-226BLL-16KIT	B-226BLL-16.	

202 Series

Kit Number	Part Number	Kit Contents
B-202X-8-81	B-202X-8	(1) Handwheel nut, (1) Bonnet Bearing, (1) Gland Follower, (5) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Packing separator.
B-202X-12-81	B-202X-12	
B-202X-16-81	B-202X-16	
B-202X-8-82	B-202X-8	(1) Seat Disc Assembly,(1) Gasket.
B-202X-12-82	B-202X-12	
B-202X-16-82	B-202X-16	
B-202X-8-83	B-202X-8	(1) Gasket.
B-202X-12-83	B-202X-12	
B-202X-16-83	B-202X-16	
B-202X-4KIT	B-202X-4	(1) Handwheel nut, (1) Handwheel, (1)Stem & Seat ASM, (1) Bonnet nut, (1)Bonnet , (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (5) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket, (1) Packing separator.
B-202X-8KIT	B-202X-8	
B-202X-12KIT	B-202X-12	
B-202X-16KIT	B-202X-16	

Repair Kits

206GF Series

Kit Number	Part Number	Kit Contents
VB-206GF-2-81	VB-206GF-2	(1) Handwheel nut, (1)Bonnet bearing, (1) Gland Follower, (1) Grafoil Packing, (1) Bonnet packing adapter.
VB-206GF-4-81	VB-206GF-4	
VB-206GF-6-81	VB-206GF-6	
VB-206GF-8-81	VB-206GF-8	
VB-206GF-12-81	VB-206GF-12	
VB-206GF-16-81	VB-206GF-16	
VB-206GF-2-82	VB-206GF-2	(1) Seat Disc Assembly,(1) Grafoil Gasket.
VB-206GF-4-82	VB-206GF-4	
VB-206GF-6-82	VB-206GF-6	
VB-206GF-8-82	VB-206GF-8	
VB-206GF-12-82	VB-206GF-12	
VB-206GF-16-82	VB-206GF-16	
VB-206GF-2-83	VB-206GF-2	(1) Grafoil Gasket.
VB-206GF-4-83	VB-202GF-3, VB-206GF-4	
VB-206GF-6-83	VB-206GF-6	
VB-206GF-8-83	VB-206GF-8	
VB-206GF-12-83	VB-206GF-12	
VB-206GF-16-83	VB-206GF-16	
B-206GF-02-85	VB-206GF-2	(1) Handwheel nut, (1) Handwheel, (1)Stem, (1) Bonnet nut, (1)Bonnet & tube ASM, (1) Bonnet ring, (1)Seat Assembly, Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket,(1)Bonnet bearing, (1) Packing Follower, (1) Grafoil Packing, (1) Packing adapter.
B-206GF-04-85	VB-206GF-4	
B-206GF-06-85	VB-206GF-6	
B-206GF-08-85	VB-206GF-8	
B-206GF-12-85	VB-206GF-12	
B-206GF-16-85	VB-206GF-16	

206LL Series

Kit Number	Part Number	Kit Contents
B-206LL-4KIT	B-206LL-3, B-206LL-4.	(1) Handwheel nut, (1) Handwheel, (1)Stem , (1) Bonnet nut, (1)Bonnet , (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Live-Load Washer, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (5) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket, (4) Packing separator.
B-206LL-8KIT	B-206LL-6, B-206LL-8.	

206ULL Series

Kit Number	Part Number	Kit Contents
B-206ULL-12KIT	B-206ULL-12	(1) Handwheel nut, (1) Handwheel, (1)Stem , (1) Bonnet nut, (1)Bonnet , (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Live-Load Washer, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (5) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket, (4) Packing separator.
B-206ULL-16KIT	B-206ULL-16	

206BLL Series

Kit Number	Part Number	Kit Contents
B-206BLL-12KIT	B-206BLL-12	(1) Handwheel nut, (1) Handwheel, (1)Stem , (1) Bonnet nut, (1)Bonnet , (1) Bonnet ring, (1)Seat Assembly, (1) Live-Load Spring, (1) Live-Load Washer, (1) Spring Washer, (1) Bonnet Bearing, (1) Gland Follower, (5) Bonnet Packing, (1) Bonnet Packing Adapter, (1) Bonnet gasket, (4) Packing separator.

SK Advantage Series

Kit Number	Part Number	Kit Contents
SKM9404-83	SKL9402,SKM9402, SKS9402,SKL9404,SKM9404 and SKS9404	(1) Gasket.
SKM9408-83	SKL9406,SKM9406, SKS9406,SKL9408,SKM9408, SKS9408 and SKA9408	
SKM9412-83	SKL9412, SKM9412, SKS9412 and SKA9412	
SKM9416-83	SKL9416 and SKM9416	
SKM9404-80AJ	SKL9402,SKM9402, SKS9402,SKL9404,SKM9404 and SKS9404	(1) Gasket and (1) Seat Disc Assembly.
SKM9408-80AJ	SKL9406,SKM9406, SKS9406,SKL9408,SKM9408, SKS9408 and SKA9408	
SKM9412-80AJ	SKL9412, SKM9412, SKS9412 and SKA9412	
SKM9416-80AJ	SKL9416 and SKM9416	
SKM9408-80J	SKL9402, SKM9402,SKS9402, SKL9404, SKM9404, SKS9404, SKL9406,SKM9406,SKS9406 SKL9408,SKM9408, SKS9408 and SKA9408	(2) Spring, Belleville, (1) Washer, Live-loading, (5) Packing, Bonnet, (4) Packing,separator, (1) Bearing, Bonnet, (1)Follower, Gland, (1) Packing, Adapter.
SKM9412-80J	SKL9412, SKM9412, SKS9412 and SKA9412	
SKM9416-80J	SKL9416 and SKM9416	
SKS9404-KIT	SKS9402 and SKS9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1)Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKS9408-KIT	SKS9406 and SKS9408	
SKS9412-KIT	SKS9412	
SKM9404-KIT	SKM9402 and SKM9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1)Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKM9408-KIT	SKM9406 and SKM9408	
SKM9412-KIT	SKM9412	
SKM9416-KIT	SKM9416	
SKL9404-KIT	SKL9402 and SKL9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1)Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKL9408-KIT	SKL9406, SKL9408 and SKA9408	
SKL9412-KIT	SKL9412 and SKA9412	
SKL9416-KIT	SKL9416	

210 Series

Kit Number	Part Number	Kit Contents
S-210-8-81	GS-210W-4, GS-210W-6 and GS-210W-8	(1) Packing adapter, (1) Chevron adapter, (1) Chevron set, (1) Gasket.
S-210-16-81	GS-210W-12 and GS-210W-16	
S-210-24-81	GS-210W-24	
S-210-32-81	GS-210W-32	
S-210WHZ-8-81	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	(1) Packing adapter, (1) Chevron adapter, (1) Grafoil Packing, (1) Gasket.
S-210WHZ-16-81	GS-210WHZ-12 and GS-210WHZ-16	
S-210-8-82	GS-210W-4, GS-210W-6 and GS-210W-8	(1) Seat/Seat Assembly, (1) Gasket.
S-210-16-82	GS-210W-12 and GS-210W-16	
S-210-24-82	GS-210W-24	
S-210-32-82	GS-210W-32	
S-210WHZ-8-82	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	(1) Seat/Seat Assembly, (1) Grafoil Gasket.
S-210WHZ-16-82	GS-210WHZ-12 and GS-210WHZ-16	
S-210-8-83	GS-210W-4, GS-210W-6 and GS-210W-8	(1) Bonnet Gasket.
S-210-16-83	GS-210W-12 and GS-210W-16	
S-210-24-83	GS-210W-24	
S-210-32-83	GS-210W-32	
S-210WHZ-8-83	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	(1) Bonnet Grafoil Gasket.
S-210WHZ-9-84	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	
S-210WHZ08-853	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	(1) Handwheel, (2) Packing Bolt, (2) Nut, (1) Stem & Seat Assembly, (4) Bonnet Bolt, (1)Bonnet & Yoke ASM, (1) Retaining ring, (1) Stem bearing, (1) Gland Flange, (1) Grafoil Packing Set, (1) Chevron adapter, (1) Packing adapter, (1) Gasket, (1) Jam nut, (1) Washer, (1) Grafoil Gasket.
S-210WHZ16-853	GS-210WHZ-12 and GS-210WHZ-16	

Repair Kits

231 Series

Kit Number	Part Number	Kit Contents
S-231-4-81	S-231-4	(1) Packing adapter, (1) Chevron adapter, (1) Grafoil packing, (1) Grafoil Gasket.
S-231-8-81	S-231-8	
S-231-12-81	S-231-12	
S-231-4-82	S-231-4	(1) Seat/Seat Assembly, (1) Grafoil Gasket.
S-231-8-82	S-231-8	
S-231-12-82	S-231-12	
S-231-4-83	S-231-4	(1) Grafoil Gasket.
S-231-8-83	S-231-8	
S-231-12-83	S-231-12	
S-231-4-85	S-231-4	(1) Handwheel, (2) Packing Bolt, (2) Nut, (1) Stem & Seat Assembly, (4) Bonnet Bolt, (4) Bonnet nut, (1) Bonnet & Yoke ASM, (1) Retaining ring, (1) Stem bearing, (1) Gland Flange, (1) Grafoil Packing Set, (1) Chevron adapter, (1) Packing adapter, (1) Gasket, (1) Jam nut, (1) Washer, (1) Grafoil Gasket.
S-231-8-85	S-231-8	
S-231-12-85	S-231-12	

232 Series

Kit Number	Part Number	Kit Contents
S-232-4-81	S-232-4	(1) Packing adapter, (1) Chevron adapter, (1)Chevron set, (1) Gasket.
S-232-8-81	S-232-8	
S-232-12-81	S-232-12	
S-232-4-82	S-232-4	(1) Seat/Seat Assembly, (1) Gasket.
S-232-8-82	S-232-8	
S-232-12-82	S-232-12	
S-232-4-83	S-232-4	(1) Gasket.
S-232-8-83	S-232-8	
S-232-12-83	S-232-12	
S-232-4-85	S-232-4	(1) Handwheel, (2) Packing Bolt, (2) Nut, (1) Stem & Seat Assembly, (4) Bonnet Bolt, (4) Bonnet nut, (1) Bonnet & Yoke ASM, (1) Retaining ring, (1) Stem bearing, (1) Gland Flange, (1)Chevron Set, (1) Chevron adapter, (1) Packing adapter, (1) Gasket, (1) Jam nut, (1) Washer, (1) Gasket.
S-232-8-85	S-232-8	
S-232-12-85	S-232-12	

CFM, AFM, PFM, SFM, CSB, & CSM Series

Kit Number	Part Number	Kit Contents
CFM2D-82	SFM, CFM, AFM, PFM, CSB, CSM Fill Manifolds Series	(1) Piston Assy, (1) Spring,(1) Strainer, (1) Gasket.
CFM2D-86	CFM-2D & CFM-4D, CSB2D, CSB4D	(1) Copper gasket, (1) Retrofit Kit, (01) Gasket, (04) Cap screw, (01) Rear Flange Assy.
CSM2D-86	CSM2D, CSM4D	
SKM9408-83	CSB2D, CSM2D	(1) Gasket.
SKM9412-83	CSB4D, CSM4D	
SKM9408-80AJ	CSB2D, CSM2D	(1) Gasket and (1) Seat Disc Assembly.
SKM9412-80AJ	CSB4D, CSM4D	
SKM9408-80J	CSB2D, CSM2D	(2) Spring, Belleville, (1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing,separator, (1) Bearing, Bonnet, (1)Follower, Gland, (1) Packing, Adapter.
SKM9412-80J	CSB4D, CSM4D	
SKM9408-KIT	CSB2D, CSM2D	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1)Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKM9412-KIT	CSB4D, CSM4D	

2500 and 2550 Series

Kit Number	Part Number	Kit Contents
2505AC-80	2505AC	(2) Seat disc,(1) Diaphragm,(1) Washer, (1) Gaskets.
2507AC-80	2507AC	
2511AC-80	2511AC	
2513AC-80	2513AC	
2553AC-80	2553AC, 2553AAC.	(1) Diaphragm Assembly, (1) Washer.
2554AC-80	2554AC, 2554AAC.	

Repair Kits

302 and 322 Series

Kit Number	Part Number	Kit Contents
B-322-8-81	B-302-8, B-312-8, B-322-8, WCB-8, WCBN-8, GB-322WE-8.	(1) Handwheel nut, (1) Bonnet Bearing, (1) Grand follower, (5) Bonnet packing, (4) packing separator, (1) Bonnet packing adapter.
B-322-12-81	B-302-12, B-312-12, B-322-12, WCB-12, WCBN-12.	
B-322-16-81	B-322-16	
B-322-20-81	B-302-20, B-312-20, B-322-20, WCB-20, WCBN-20.	
B-322-24-81	B-302-24, B-312-24, B-322-24, WCB-24, WCBN-24.	
B-322-8-82	B-302-8, B-312-8, B-322-8, WCB-8, WCBN-8, GB-322WE-8.	(1) Split Wedge Assembly, (1) Bonnet Gasket.
B-322-12-82	B-302-12, B-312-12, B-322-12, WCB-12, WCBN-12.	
B-322-16-82	B-322-16	
B-322-20-82	B-302-20, B-312-20, B-322-20, WCB-20, WCBN-20.	
B-322-24-82	B-302-24, B-312-24, B-322-24, WCB-24, WCBN-24.	
B-322-8-83	B-302-8, B-312-8, B-322-8, WCB-8, WCBN-8, GB-322WE-8.	(1) Bonnet Gasket.
B-322-12-83	B-302-12, B-312-12, B-322-12, WCB-12, WCBN-12.	
B-322-16-83	B-322-16	
B-322-20-83	B-302-20, B-312-20, B-322-20, WCB-20, WCBN-20.	
B-322-24-83	B-302-24, B-312-24, B-322-24, WCB-24, WCBN-24.	
B-322-4KIT	B-322-4	(1)Handwheel, (1) Handwheel nut, (1) Stem, (1) Bonnet Nut, (1) Bonnet & Tube ASM, (1) Bonnet ring, (1) Split wedge ASM, (1) Bonnet bearing, (1) Gland follower, (5) Bonnet packing, (4) Packing separator, (1) Bonnet packing adapter, (1) Bonnet gasket.
B-322-8KIT	B-322-8	
B-322-12KIT	B-322-12	
B-322-16KIT	B-322-16	
B-322-20KIT	B-322-20	
B-322-24KIT	B-322-24	

302, 306, 322, and 326 Series

Kit Number	Part Number	Kit Contents
B-326-4-81	B-312-4, B-322-4, B-326-4, GB-326WE-4, WCB-4, WCBN-4.	(1) Handwheel nut, (1) Bonnet bearing, (1) Gland follower, (5) Packing, (4) Packing Separator, (1) Packing adapter.
B-326-6-81	B-302-6, B-306-6, B-312-6, B-326-6, WCB-6, WCBN-6.	
B-326-8-81	B-306-8, B-326-8, GB-0326EP-8, GB-0326WE-8.	
B-326-12-81	B-306-12, B-326-12, GB-0326EP-12, GB-0326WE-12.	
B-326-16-81	B-302-16, B-306-16, B-312-16, B-322-16, B-326-16, GB-322WE-16, GB-326EP-16, WCB-16, WCBN-16.	
B-326-4-82	B-312-4, B-322-4, B-326-4, GB-326WE-4, WCB-4, WCBN-4	(1) Split Wedge Assembly, (1) Bonnet gasket.
B-326-6-82	B-302-6, B-306-6, B-312-6, B-326-6, WCB-6, WCBN-6.	
B-326-8-82	B-306-8, B-326-8, GB-0326EP-8, GB-0326WE-8.	
B-326-12-82	B-306-12, B-326-12, GB-0326EP-12, GB-0326WE-12.	
B-326-16-82	B-302-16, B-306-16, B-312-16, B-322-16, B-326-16, GB-322WE-16, GB-326EP-16, WCB-16, WCBN-16.	
B-326-4-83	B-312-4, B-322-4, B-326-4, GB-326WE-4, WCB-4, WCBN-4	(1) Bonnet gasket.
B-326-6-83	B-302-6, B-306-6, B-312-6, B-326-6, WCB-6, WCBN-6.	
B-326-8-83	B-306-8, B-326-8, GB-0326EP-8, GB-0326WE-8.	
B-326-12-83	B-306-12, B-326-12, GB-0326EP-12, GB-0326WE-12.	
B-326-16-83	B-302-16, B-306-16, B-312-16, B-322-16, B-326-16, GB-322WE-16, GB-326EP-16, WCB-16, WCBN-16.	
B-326-4KIT	B-326-4	(1)Handwheel, (1) Handwheel nut, (1) Stem, (1) Bonnet Nut, (1) Bonnet & Tube ASM, (1) Bonnet ring, (1) Split wedge ASM, (1) Bonnet bearing, (1) Gland follower, (5) Bonnet packing, (4) Packing separator, (1) Bonnet packing adapter, (1) Bonnet gasket.
B-326-6KIT	B-326-6	
B-326-8KIT	B-326-8	
B-326-12KIT	B-326-12	
B-326-16KIT	B-326-16	

302 Series

Kit Number	Part Number	Kit Contents
B-302-4KIT	B-302-4	(1)Handwheel, (1) Handwheel nut, (1) Stem, (1) Bonnet Nut, (1) Bonnet & Tube ASM, (1) Bonnet ring, (1) Split wedge ASM, (1) Bonnet bearing, (1) Gland follower, (5) Bonnet packing, (4) Packing separator, (1) Bonnet packing adapter, (1) Bonnet gasket.
B-302-8KIT	B-302-8	
B-302-12KIT	B-302-12	
B-302-16KIT	B-302-16	
B-302-20KIT	B-302-20	
B-302-24KIT	B-302-24	

Repair Kits

306 Series

Kit Number	Part Number	Kit Contents
B-000306-6KIT	B-000306-6	(1)Handwheel, (1) Handwheel nut, (1) Stem, (1) Bonnet Nut, (1) Bonnet & Tube ASM, (1) Bonnet ring, (1) Split wedge ASM, (1) Bonnet bearing, (1) Gland follower, (5) Bonnet packing, (4) Packing separator, (1) Bonnet packing adapter, (1) Bonnet gasket.
B-000306-8KIT	B-000306-8	
B-000306-12KIT	B-000306-12	
B-000306-16KIT	B-000306-16	

310 Series

Kit Number	Part Number	Kit Contents
B-310X-24-81	B-310-20, B-310-24, B-310C-24, B-310X-20, B-310X-24, SB-310S-24SW.	(1) Handwheel nut, (1) Bonnet bearing, (1) Gland follower, (5) Packing, (4) Packing separator, (1) Packing adapter.
B-310X-24-82		(1) Wedge, (1) Seat,(1) Seat clamp, (3) Cap screw, (1) Gasket.
B-310X-24-83		(1) Gasket.
B-310X-24-84		(1) Seat,(1) Seat clamp, (3) Cap screw, (1) Gasket.
B-310X-24KIT	B-310X-20, B-310X-24.	(1)Handwheel, (1) Handwheel nut, (1) Stem, (1) Bonnet Nut, (1) Bonnet & Tube ASM, (1) Bonnet ring, (1) Split wedge ASM, (1) Bonnet bearing, (1) Gland follower, (5) Bonnet packing, (4) Packing separator, (1) Bonnet packing adapter, (1) Bonnet gasket.
B-310-24KIT	B-310-20, B-310-24.	

110 Series

Kit Number	Part Number	Kit Contents
S-110-08-81	GS-110W-4, GS-110W-6 and GS-110W-8.	(1) Packing Adapter, (1) Chevron adapter, (01) Chevron set, (1) Gasket.
S-110-16-81	GS-110W-12 and GS-110W-16.	
S-110-24-81	GS-110W-24.	
S-110-32-81	GS-110W-32.	
S-110-48-81	GS-110W-48.	
S-110WHZ-08-81	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8.	(1) Packing Adapter, (1) Chevron adapter, (01) Grafoil set, (1) Gasket.
S-110WHZ-16-81	GS-110WHZ-12 and GS-110WHZ-16.	
S-110WHZ-24-81	GS-110WHZ-24.	
S-110WHZ-32-81	GS-110WHZ-32.	
S-110WHZ-48-81	GS-110WHZ-48.	
S-110-08-82	GS-110W-4, GS-110W-6 and GS-110W-8.	(1) Wedge/Stem Assembly, (1) Seat, (1) Seat Clamp, (1) Cap Screw, (1) Gasket.
S-110-16-82	GS-110W-12 and GS-110W-16.	
S-110-24-82	GS-110W-24.	
S-110-32-82	GS-110W-32.	
S-110-48-82	GS-110W-48.	
S-110WHZ-8-82	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8.	
S-110WHZ-16-82	GS-110WHZ-12 and GS-110WHZ-16.	
S-110WHZ-24-82	GS-110WHZ-24.	
S-110WHZ-32-82	GS-110WHZ-32.	
S-110WHZ-48-82	GS-110WHZ-48.	
S-110-08-83	GS-110W-4, GS-110W-6 and GS-110W-8.	(1) Gasket.
S-110-16-83	GS-110W-12 and GS-110W-16.	
S-110-24-83	GS-110W-24.	
S-110-32-83	GS-110W-32.	
S-110-48-83	GS-110W-48.	
S-110WHZ-08-83	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8.	
S-110WHZ-16-83	GS-110WHZ-12 and GS-110WHZ-16.	
S-110WHZ-24-83	GS-110WHZ-24.	
S-110WHZ-32-83	GS-110WHZ-32.	
S-110WHZ-48-83	GS-110WHZ-48.	
S-110-08-84	GS-110W-4, GS-110W-6 and GS-110W-8.	(1) Gasket, (1) Seat, (1) Seat Clamp, (1) Cap Screw.
S-110-16-84	GS-110W-12 and GS-110W-16.	
S-110-24-84	GS-110W-24.	
S-110-32-84	GS-110W-32.	
S-110-48-84	GS-110W-48.	
S-110WHZ-08-84	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8.	
S-110WHZ-16-84	GS-110WHZ-12 and GS-110WHZ-16.	
S-110WHZ-24-84	GS-110WHZ-24.	
S-110WHZ-32-84	GS-110WHZ-32.	
S-110WHZ-48-84	GS-110WHZ-48.	
S-110WHZ08-853	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8.	(1) Handwheel Assembly, (2) Bolt, (2) Nut, (1) Stem & Wedge Assembly, (4) Bolt, (1) Bonnet & Yoke Assembly, (1) Retaining Ring, (1) Stem Bearing, (1) Gland Flange, (1) Packing Set, (1) Chevron Adapter, (1) Packing Adapter, (2) Gasket- Grafoil, (1) Seat, (1) Seat Clamp, (2) Socket Head Cap Screw, (1) Set Screw.
S-110WHZ16-853	GS-110WHZ-12 and GS-110WHZ-16.	
S-110WHZ24-853	GS-110WHZ-24.	
S-110WHZ32-853	GS-110WHZ-32.	
S-110WHZ48-853	GS-110WHZ-48.	

Repair Kits

LOX110 Series

Kit Number	Part Number	Kit Contents
LOX110W-08-85	LOX110W-04, LOX110W-06,and LOX110W-08.	(1) Handwheel Assembly, (2) Bolt, (2) Nut, (1) Stem & Wedge Assembly, (4) Bolt, (1) Bonnet & Yoke Assembly, (1) Retaining Ring, (1) Stem Bearing, (1) Gland Flange, (1) Packing Set, (1) Chevron Set, (1) Chevron Adapter, (1) Packing Adapter, (2) Gasket, (1) Seat, (1) Seat Clamp, (2) Socket Head Cap Screw, (1) Set Screw.
LOX110W-16-85	LOX110W-12,and LOX110W-16.	
LOX110W-24-85	LOX110W-24.	
LOX110W-32-85	LOX110W-32.	
LOX110W-48-85	LOX110W-48.	
LOX110WEP-16-85	LOX110WEP-12,and LOX110WEP-16.	
LOX110WEP-32-85	LOX110WEP-32.	
LOX110WEP-48-85	LOX110WEP-48.	

840 and 846M Series

Kit Number	Part Number	Kit Contents
B-840-4-82	B-840-4.	(1) Disc/Arm Assembly, (1) Gasket, (1) Pivot Pin, (2) Side Plug, (2) Plug Gasket.
B-840-6-82	B-840-6.	
B-840-8-82	B-840-8.	
B-840-12-82	B-840-12.	
B-840-16-82	B-840-16.	
B-846M-4-82	B-846M-4.	
B-846M-6-82	B-846M-6.	
B-846M-8-82	B-846M-8.	
B-846M-12-82	B-846M-12.	
B-846M-16-82	B-846M-16.	

886 Series

Kit Number	Part Number	Kit Contents
S-886-04-82	S-886-4	(1) Disc/Arm Assembly, (1) Pin, (1) Gasket.
S-886-08-82	S-886-8	
S-886-12-82	S-886-12	
S-886-16-82	S-886-16	
S-886-24-82	S-886-24	
S-886-32-82	S-886-32	
S-886M-04-82	S-886M-4	
S-886M-08-82	S-886M-8	
S-886M-12-82	S-886M-12	
S-886M-16-82	S-886M-16	
S-886M-24-82	S-886M-24	
S-886M-32-82	S-886M-32	
S-886GF-04-82	S-886GF-4	(1) Disc/Arm Assembly, (1) Pin, (1) Grafoil Gasket.
S-886GF-08-82	S-886GF-8	
S-886GF-12-82	S-886GF-12	
S-886-04-83	S-886-4	(01) Gasket.
S-886M-8-83	S-886M-8	
S-886M-12-83	S-886M-12	
S-886M-16-83	S-886M-16	
S-886M-24-83	S-886M-24	
S-886M-32-83	S-886M-32	
S-886GF-04-83	S-886GF-4	(1) Grafoil Gasket.
S-886GF-08-83	S-886GF-8	
S-886GF-12-83	S-886GF-12	

TA3217AR410 Series

Kit Number	Part Number	Kit Contents
TA3217AR-80	TA3217AR410	(1) Gasket , (1) Gasket, (1) Seat, (1) Stem Bearing, (1) Seat Retainer, (1) Bearing Seal Grand, (1) Retainer Ring, (1) "V" Packing Male Ring, (3) "V" Packing Female Ring, (1) Body Bearing, (1) O-ring, (1) Dust Seal, (1) Coiling Spring Ring, (1) Seal Housing, (1) Seal Spring, (1) Groove Pin, (1) Upper Stem Bearing, (1) Retaining Ring.

Repair Kits

1780 and BR-1780 Series.

Kit Number	Part Number	Kit Contents
BR-1784-80	1784 Series	Diaphragm assembly, stem and seat assembly, seal, Viton seat
BR-1786-80	1786 Series and 1788 Series	Diaphragm assembly, stem and seat assembly, seal, viton seat for oxygen service
BR-1784-7SKA BR-1784-7SKB BR-1784-7SKC BR-1784-7SKD	1784 Series	Spring kit for 1784, “A” spring range, 5 to 55 psig (.34 o 3.79 barg) delivery pressure 1784 “B” spring range, 40 to 110 psig (2.75 to 7.58 barg) delivery pressure Spring kit for 1784, “C” spring range, 100 to 200 psig (6.89 to 13.78 barg) delivery pressure, Spring kit for 1784, “D” spring range 175 to 300 psig (12 o 20.7 barg) delivery pressure
BR-1786-7SKA BR-1786-7SKB BR-1786-7SKC BR-1786-7SKD	1786 Series	Spring kit for 1786, “A” spring range, 5 to 55 psig (.34 o 3.79 barg) delivery pressure 1786 “B” spring range, 40 to 110 psig (2.75 to 7.58 barg) delivery pressure Spring kit for 1786, “C” spring range, 100 to 200 psig (6.89 to 13.78 barg) delivery pressure, Spring kit for 1786, “D” spring range 175 to 300 psig (12 o 20.7 barg) delivery pressure
BR-1788-7SKA BR-1788-7SKB BR-1788-7SKC BR-1788-7SKD	1788 Series	Spring kit for 1788, “A” spring range, 5 to 55 psig (.34 o 3.79 barg) delivery pressure 1788 “B” spring range, 40 to 110 psig (2.75 to 7.58 barg) delivery pressure Spring kit for 1788, “C” spring range, 100 to 200 psig (6.89 to 13.78 barg) delivery pressure, Spring kit for 1788, “D” spring range 175 to 300 psig (12 o 20.7 barg) delivery pressure

1682M and C-1682M Series.

Kit Number	Part Number	Kit Contents
1682Y-80	1682Y Series	Diaphragm assembly, stem and seat assembly seal.
C-1682M-80	C-1682M Series	
1686Y-80	1686Y, 1688Y Series	
1684MHP-80	1684MHP	
1684M-80	BR-1684M Series	
1686M-80	1686M, 1688M Series	
1682M-80	1682M Series	Molded diaphragm assembly, stem and seat assembly seal.
1684M-80	1684M Series	
1684Y-80	1684Y Series	Diaphragm assembly, stem and seat assembly seal, guide.

M2523HP Series.

Kit Number	Part Number	Kit Contents
2523HP-80A	M2523HP350, M2523HP540, M2523HP580,M2523HP590, M2523HP1320	Seat and centerpiece assembly, diaphragm assembly, nozzle, spring, washer, gaskets.
2523HP-80B	M2523HP320	

HP9560 Series.

Kit Number	Part Number	Kit Contents
9500-80K*	UL9500 Series,NUL9500 Series	(1) Packing ring set, (1) Washer, 1) Seal washer, (1) Seat Disc & Retainer Assembly.
9550-80	9550 Series	(1) Seat Assembly, (1) O-ring, (2) Back up Ring, (3) Washer, (1) O-ring.
9550-3-80	9550 Series	(1) Sleeve.
9560-81	9560 Series	(1) O-ring, (1) Back up ring, (1) Thrust Bearing, (1) Friction washer.
9560C-80	HP9560C Series, 9560C Series	(1) Seat Assembly, (1) O-ring, (1) Back up Ring, (2) Washer, (1) Thrust bearing, (1)Retainer lower, (1) Nut, (1) friction washer, (1) Retainer, (1) Seat insert.
9560-80	HP9560 Series, 9560 Series	(1) Seat Assembly, (1) O-ring, (1) Back up Ring, (2) Washer, (1) Thrust bearing, (1)Retainer lower, (1) Nut, (1) friction washer, (1) Retainer.
9560N-80 Repair Kit	HP9560N Series, 9560N Series	(1) Seat Assembly Nylon, (1) O-ring, (1) Back up Ring, (2) Washer, (1) Thrust bearing, (1)Retainer lower, (1) Nut, (1) friction washer, (1) Retainer.
9560-4-80	HP9560 Series, HP9560N Series	(1) Stem.
9560-7-80	HP9560P Series, 9560P Series	(1) Stem, (1) Nut, (1) Bonnet cap.
9560-8-80	HP9560P Series, 9560P Series	(1) Stem.

* Post 1978

7160 Series.

Kit Number	Part Number	Kit Contents
7160-80B	7160 Series	(1) Bonnet, (1) Stem, (1)Lower Stem Assembly,(1) Screw, (1) Handwheel.

LNG and Natural Gas Equipment

Cylinder Equipment

LNG Dispenser Equipment

Globe Valves

Gate Valves

Regulators

Pressure Relief Valves

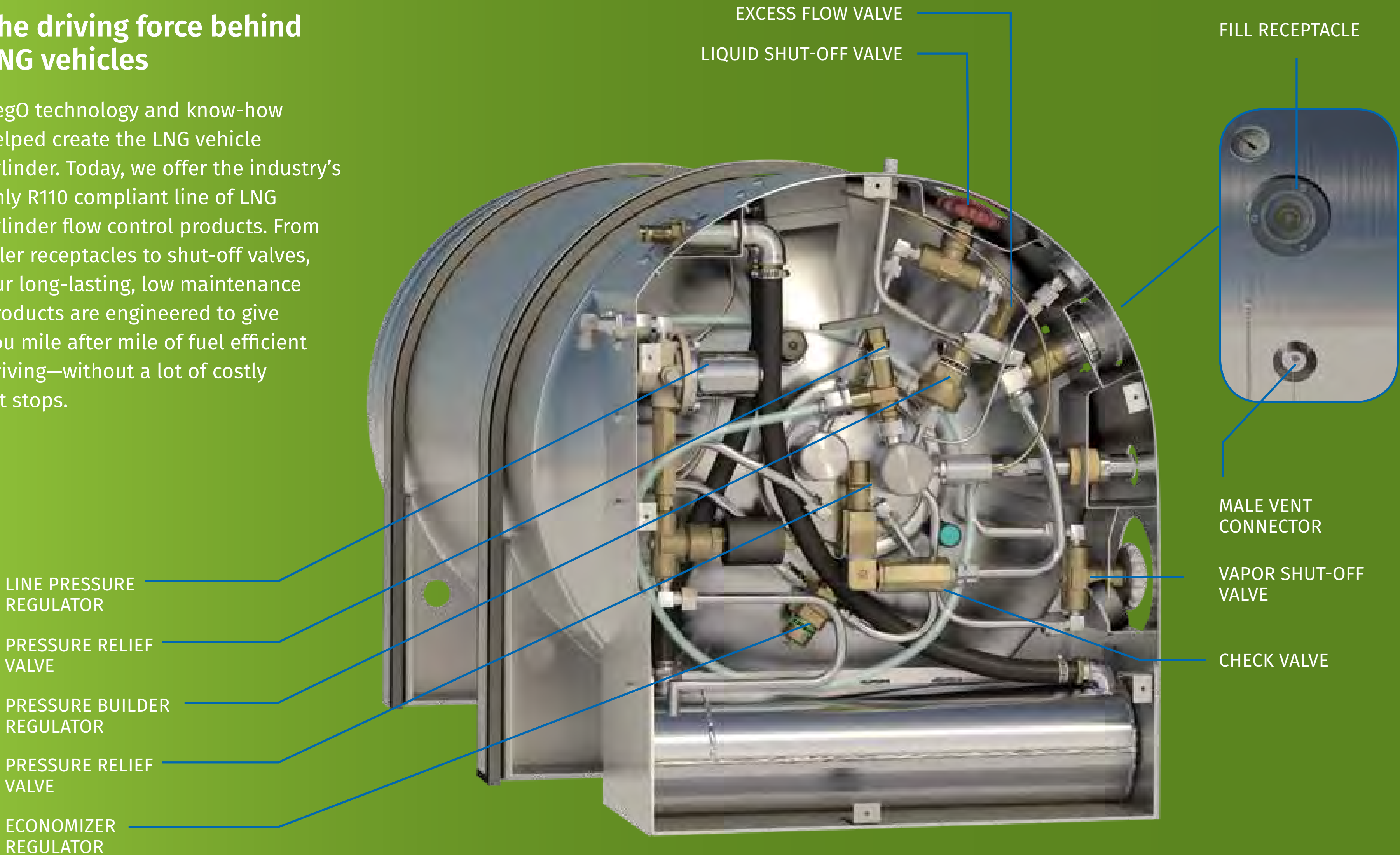
Miscellaneous Equipment

Repair Kits

LNG cylinders

The driving force behind LNG vehicles

RegO technology and know-how helped create the LNG vehicle cylinder. Today, we offer the industry's only R110 compliant line of LNG cylinder flow control products. From filler receptacles to shut-off valves, our long-lasting, low maintenance products are engineered to give you mile after mile of fuel efficient driving—without a lot of costly pit stops.

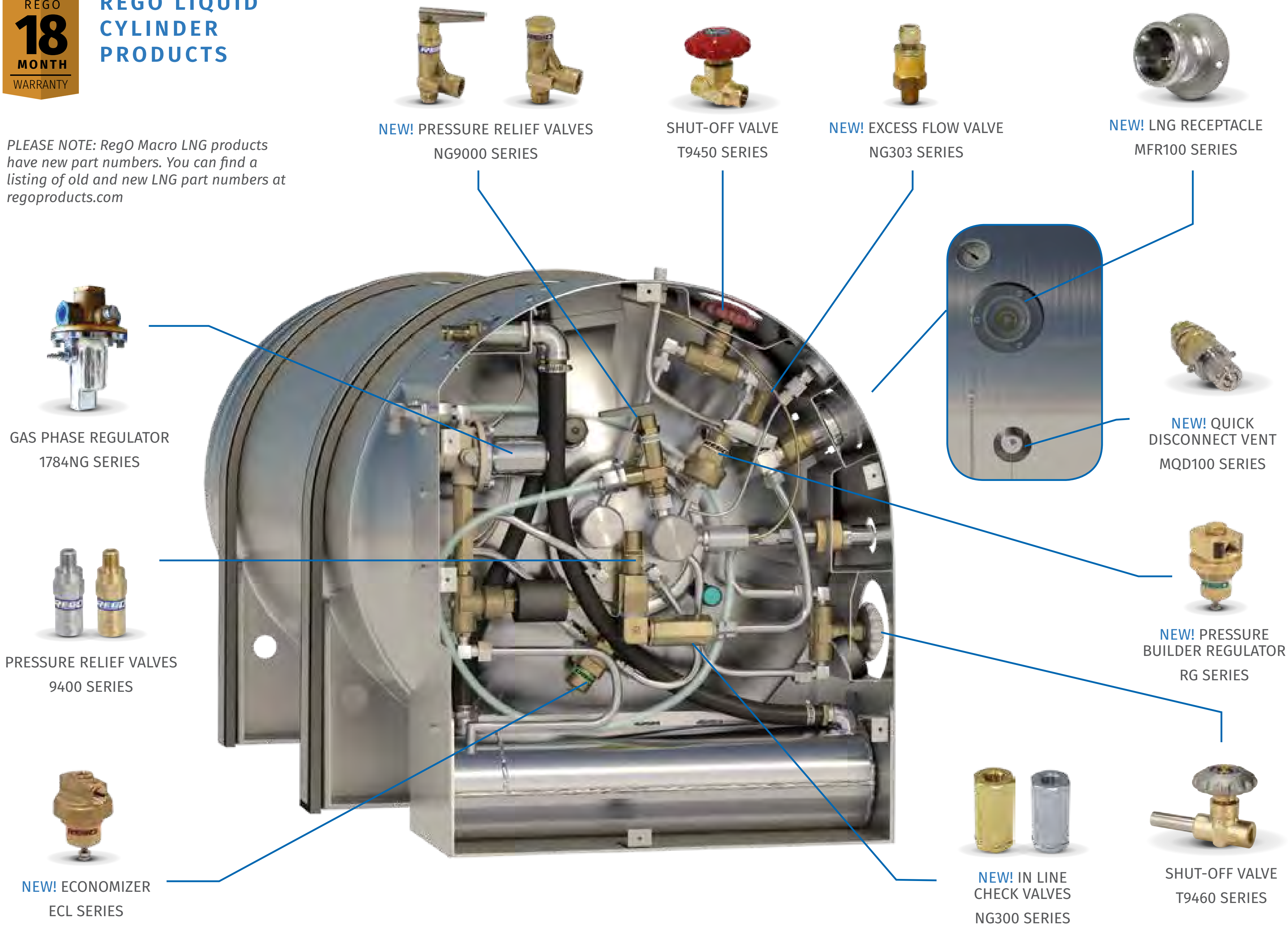


The illustrations in this application guide are intended to inform a professional installer/system designer where our products are generally installed on certain containers or applications. These illustrations are not intended for and must not be used for system design.

REGO 18 MONTH WARRANTY

REGO LIQUID CYLINDER PRODUCTS

PLEASE NOTE: RegO Macro LNG products have new part numbers. You can find a listing of old and new LNG part numbers at regoproducts.com



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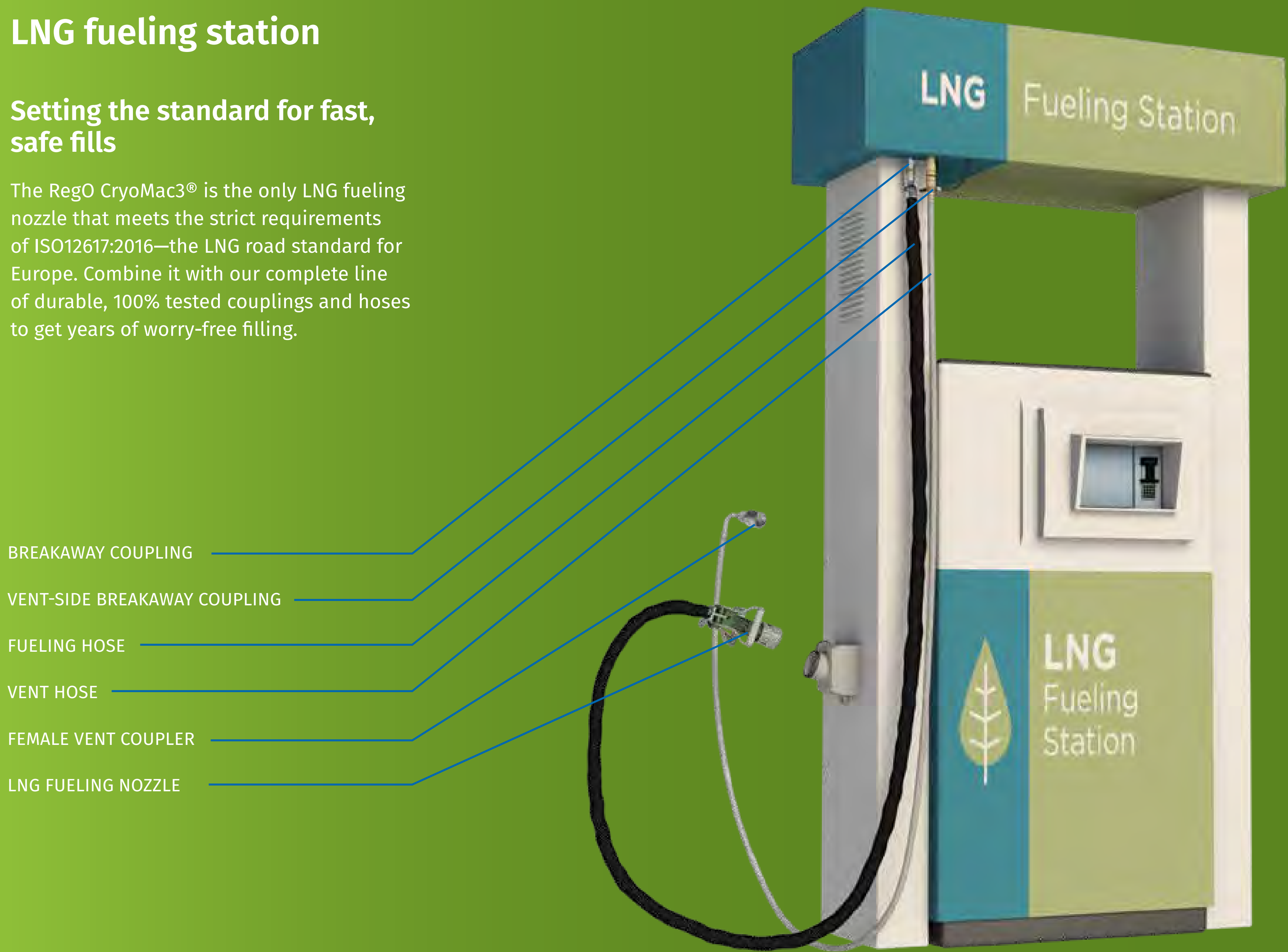
LNG fueling station

Setting the standard for fast, safe fills

The RegO CryoMac3® is the only LNG fueling nozzle that meets the strict requirements of ISO12617:2016—the LNG road standard for Europe. Combine it with our complete line of durable, 100% tested couplings and hoses to get years of worry-free filling.



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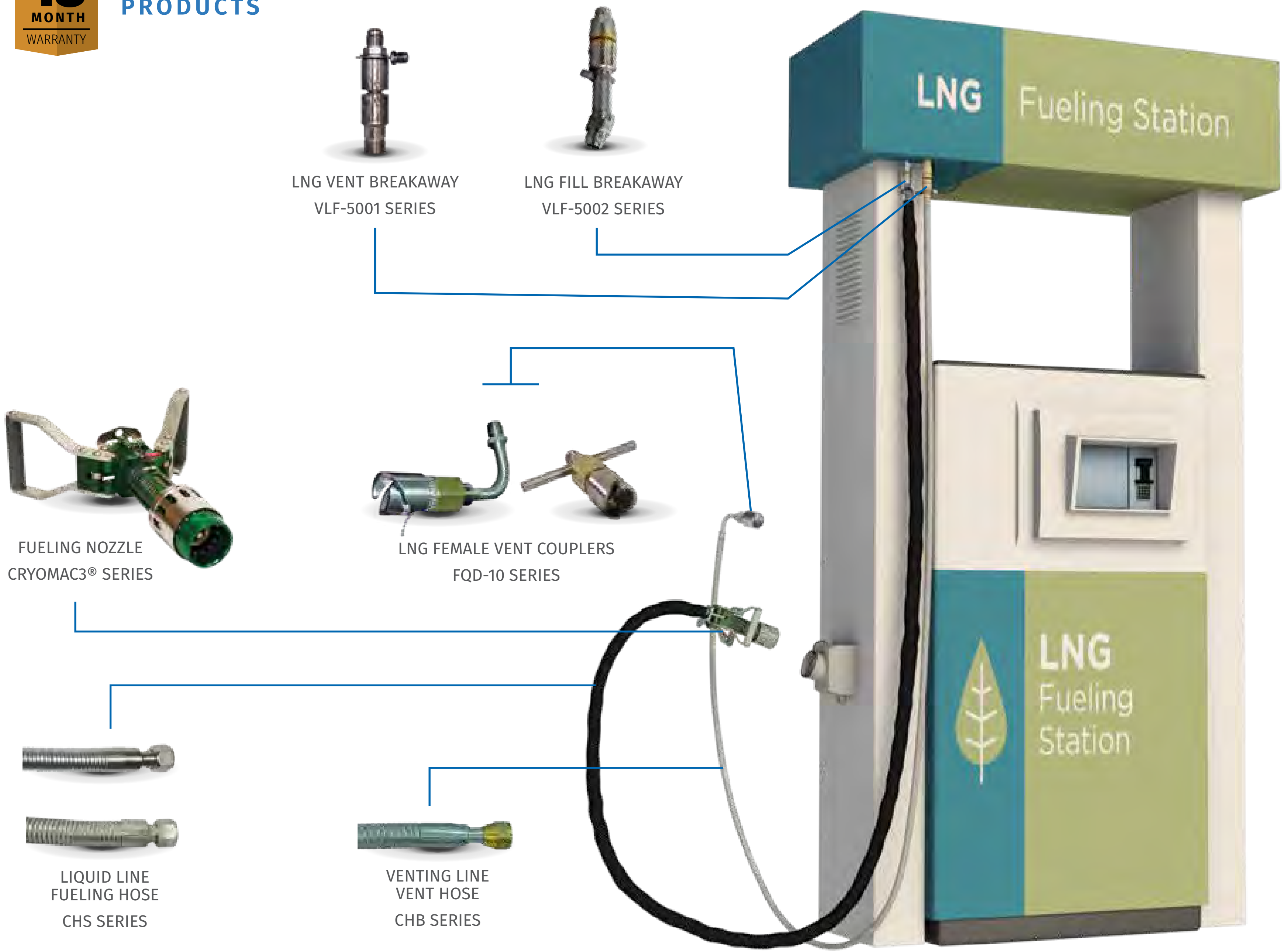
REGO 18 MONTH WARRANTY

REGO LNG FUELING STATION PRODUCTS



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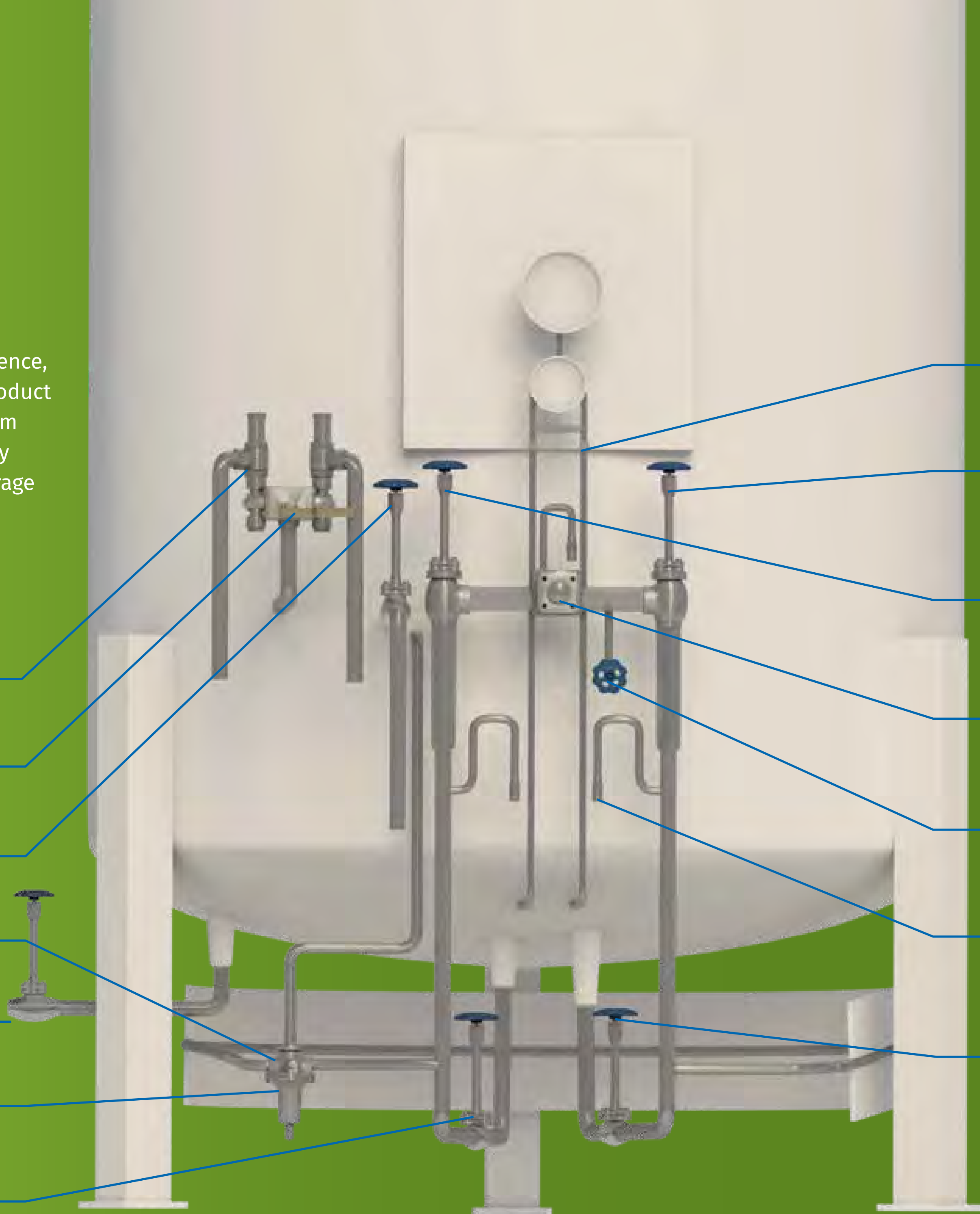
Bulk tank storage

Breadth of line meets depth of knowledge

Combine RegO's industry experience, design assistance, and broad product line to build a flow control system that enables maximum efficiency and excellent value for bulk storage applications.



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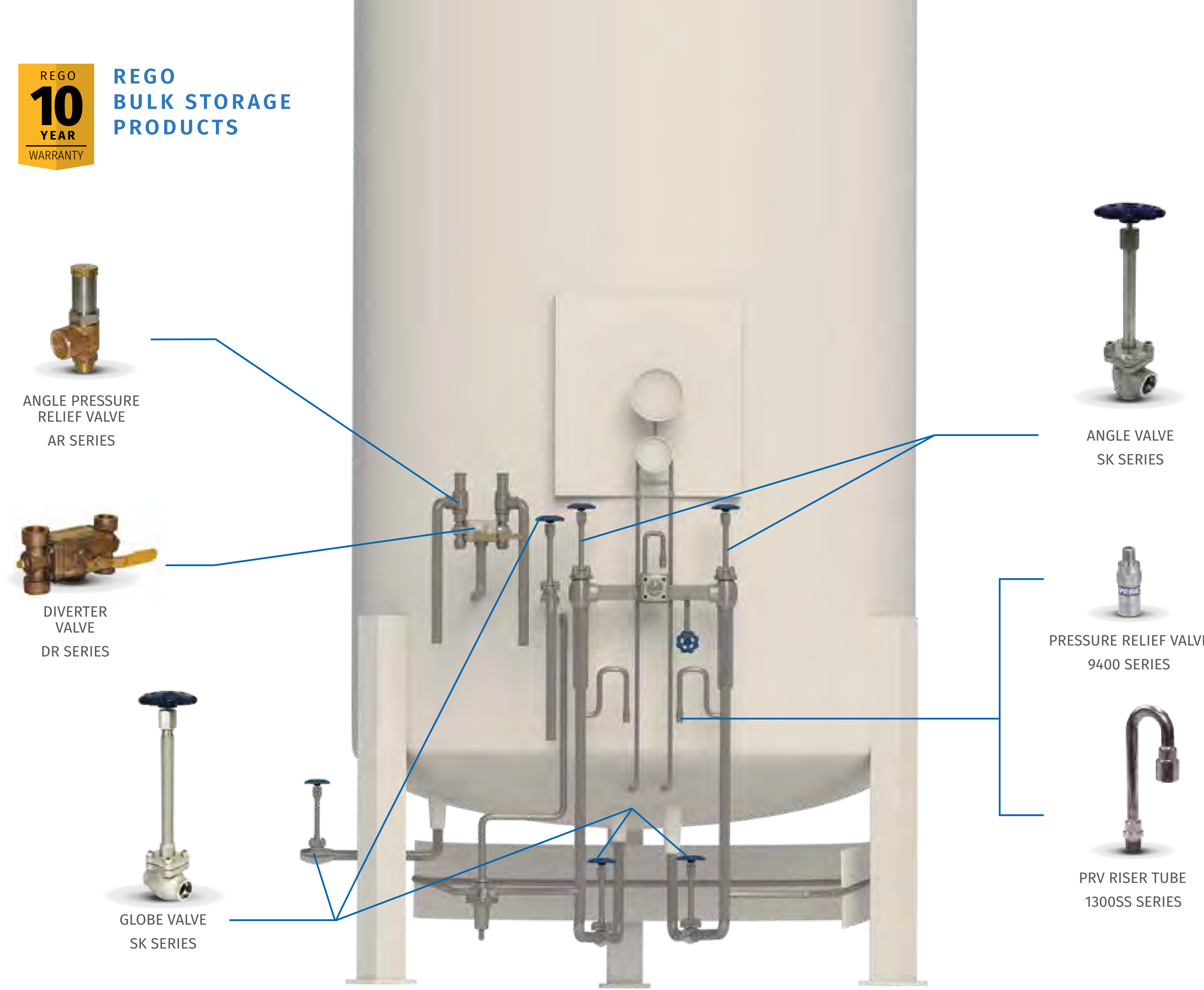
REGO 10 YEAR WARRANTY

REGO BULK STORAGE PRODUCTS

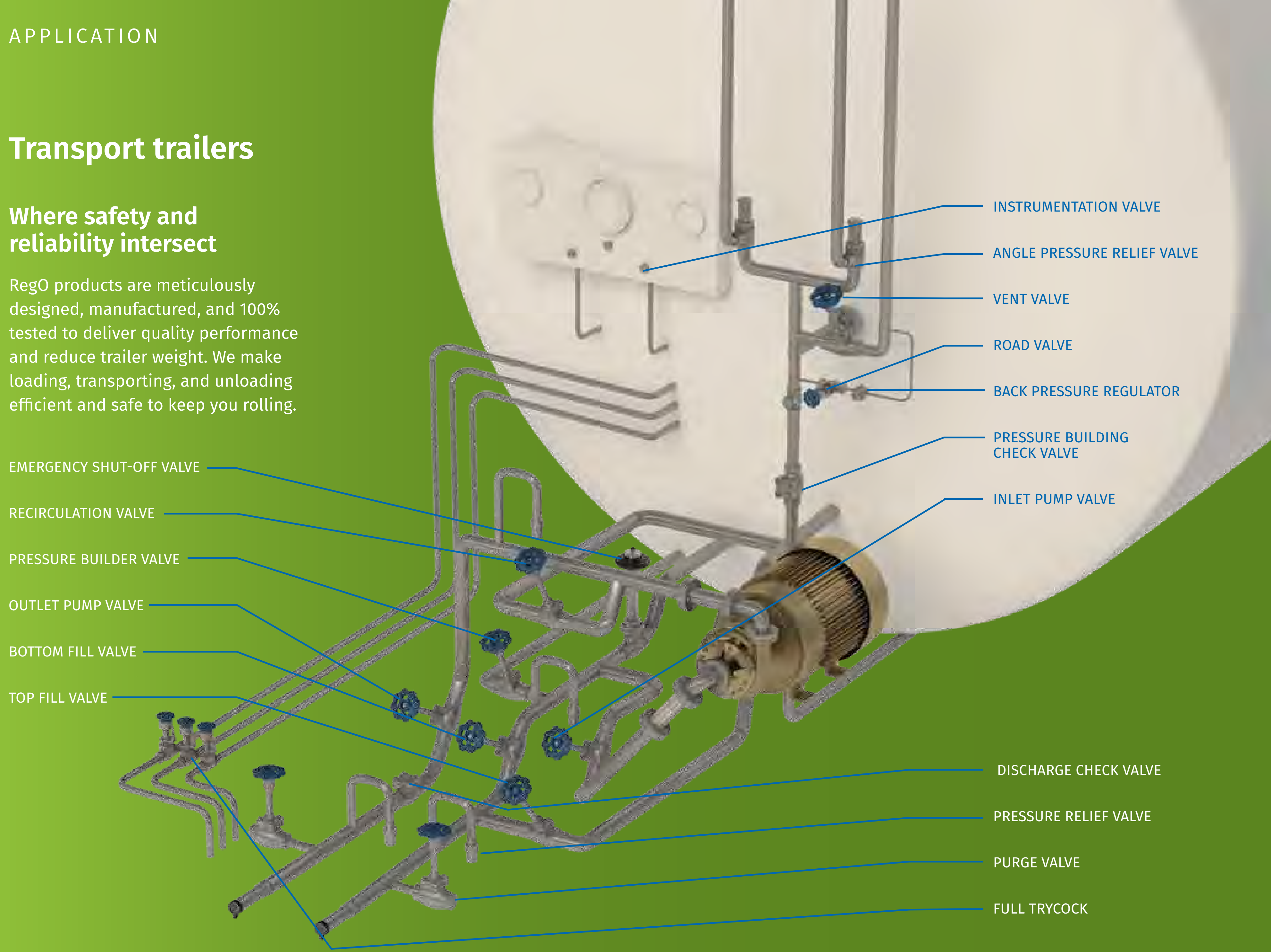


The illustrations in this application guide are intended to inform a professional installer/system designer where our products are generally installed on certain containers or applications. These illustrations are not intended for and must not be used for system design.

Transport trailers

Where safety and reliability intersect

RegO products are meticulously designed, manufactured, and 100% tested to deliver quality performance and reduce trailer weight. We make loading, transporting, and unloading efficient and safe to keep you rolling.



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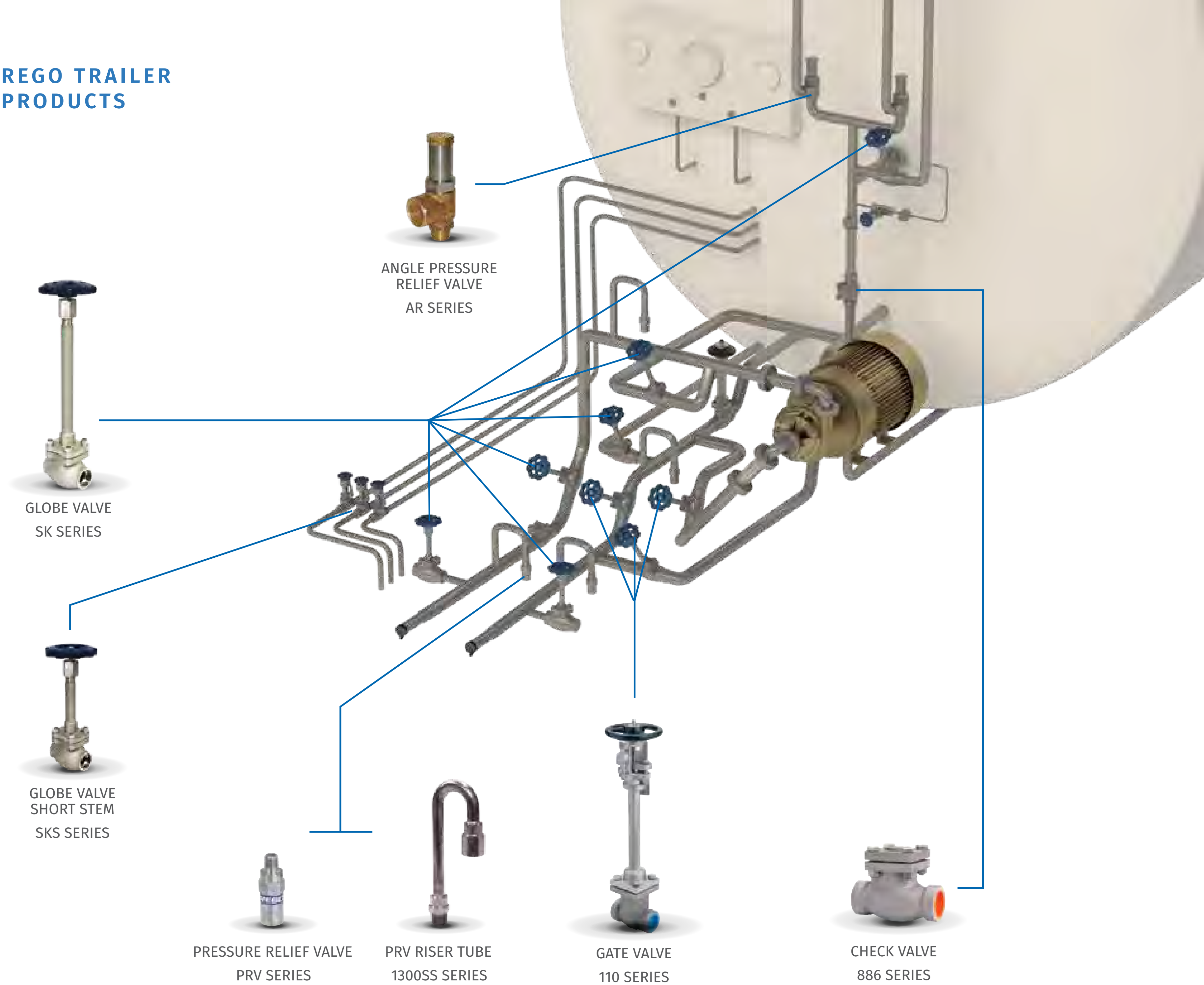
REGO TRAILER PRODUCTS



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This catalog briefly describes the Rego® LNG Equipment. As a result of condensing information in this catalog, some highly technical and special application material has been omitted. Proper application, installation and maintenance of the product is essential. Buyers should obtain further information if there are any doubts or questions. All information contained in this catalog is subject to change by RegO without notice. Additional product information is available from RegO or authorized product distributors. Illustrations and drawings of individual products are representative of "product groups" and all products within a product group are similar in construction.

Warning

Never use any product on Oxygen service if another gas has been previously used on the product. All RegO® Products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured for storage, transport, transfer and use of toxic flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

Materials

RegO may make suggestions for a material to use with a specific media. These suggestions will be based on technical compatibility resources through associations and manufacturers. RegO does not guarantee the material to be compatible with the specific media – this is the responsibility of the user. Users must test under their own operating conditions to determine the suitability of any material in a particular application.

Notice

Installation, usage and maintenance of all RegO® products must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA 57, NFPA 30A, NFPA 59A, CGA, ASME, DOT, ANSI, R110 and all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential and should be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and service.

For Sales in California:

WARNING: This product can expose you to chemicals including lead which is known to the state of California to cause cancer, birth defects or reproductive harm. For more information go to **www.P65Warnings.ca.gov**

Cryogenic Economizers
ECL502 Series

Application

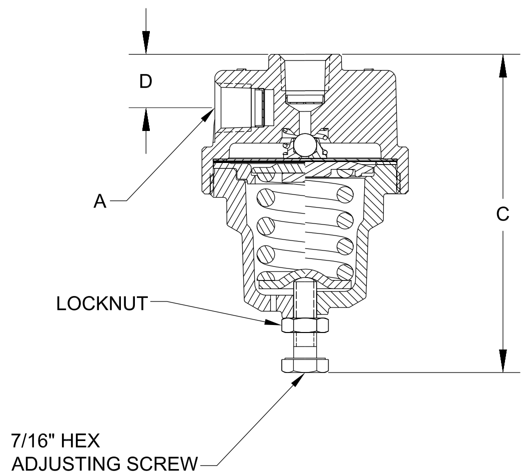
ECL502 series cryogenic economizers are designed to be used as pressure reducing valves to automatically maintain a constant inlet or back pressure, normally closed at pressures below its set-points and open at pressures above its set-point. The ECL502 is primarily designed to assist in maintaining a desired system pressure ideal for Nitrogen, Oxygen, Argon and other cryogenic cylinder applications with a performance improvement over RegO's ECLXXX series. ECL502 series offers outstanding performance for maintaining LNG fuel line pressure.

Features

- ECL502 series design provides premium flow characteristics allowing for fast pressure reduction while maintaining sensitive flow control at lower pressure settings
- All materials of construction- copper alloy, PTFE and stainless steel were selected for compatibility with cryogenic service
- 150 count mesh Monel screens installed into the inlet and outlet ports prevent debris from entering or damaging any downstream components
- Interchangeable with existing cryogenic economizer units.
- Bi-directional flow for LNG fuel systems
- Temperature range: -320°F to +165°F (-196°C to +74°C)
- Max inlet pressure:
- Low Pressure Models ≤175: 375 psig (≤ 12,1: 25.3 barg)
- High Pressure Models >175: 550 psig (> 12,1: 37.9 barg)
- Pressure setting range: 10-350 psig (0.7-24.1 barg)
- Clean for Oxygen service per CGA G-4.1
- Designed in accordance with & approved by ECE R110

REGO 10 YEAR WARRANTY

ECL Series



Materials

Body	Brass
Diaphragm Liner	PTFE
Poppet Seat	Stainless Steel
Adjusting Screw	Stainless Steel
Bonnet	Brass
Screen	Monel
Diaphragm	Bronze
Springs	Stainless Steel

Ordering Information

<table>
<tr><th>Part Number</th><th>Inlet / Outlet Connections (FNPT) A</th><th>Width B</th><th>C</th><th>D</th><th>E</th><th>Operating Range (psig)</th></tr>
<tr><td>ECL502-22</td><td rowspan="6">¼" NPT</td><td rowspan="6">2.25"
57 mm</td><td rowspan="6">3.5"
89 mm</td><td rowspan="6">.58"
15 mm</td><td rowspan="6">1"
25 mm</td><td>10-60 psig
0.7 - 4.1 barg</td></tr>
<tr><td>ECL502-100</td><td rowspan="4">50 - 175 psig
3.4 - 12.1 barg</td></tr>
<tr><td>ECL502-123</td></tr>
<tr><td>ECL502-140</td></tr>
<tr><td>ECL502-175</td></tr>
<tr><td>ECL502-325</td><td>150 - 350 psig
10.3 - 24.1 barg</td></tr>
</table>

*Contact sales representative for additional settings.

Cryogenic Pressure Builder
RG Series

Application

RG series cryogenic regulators are primarily designed to maintain pressure on cryogenic liquid within cryogenic containers. They may also be used in cryogenic lines, vaporizer and converter applications. They are especially useful in installations where space and cost limitations are important.

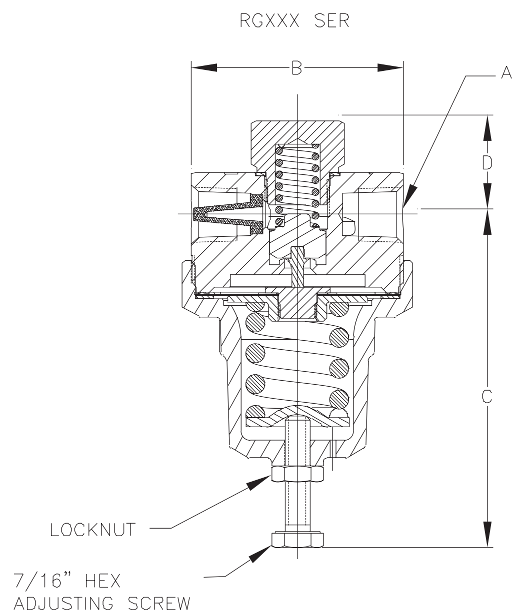
REGO 10 YEAR WARRANTY

RG Series

RGXXXAG with gauge port and T-handle

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F (-196º C)
- PTFE seat helps assure a positive shut-off at cryogenic temperatures down to -320°F (-196º C)
- High and low pressure regulators are the same compact size—designed to fit in close quarters
- Interchangeable with existing cryogenic regulator units
- Inlet filter helps prevent foreign material from entering the regulator
- Locknut is provided to maintain adjusting screw setting
- RG125C and RG175C Series available with flat inlet screen
- RG90AG is available with T-handle adjustment screw and gauge ports
- Maximum inlet pressure of 550 psig (37.9 barg)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested



Materials

Body ..... Brass
Bonnet ..... Brass
Seat ..... PTFE
Springs ..... Stainless Steel
Diaphragm Gasket..... PTFE
Backcap Gasket ..... Copper
Diaphragm..... Bronze

Ordering Information

Part Number	Inlet / Outlet Connections (FNPT) A	Width B	C	D	Operating Range (psig)
RG022A	¼"	2 1/16"	3"	1"	0-30 psig (0-2.1 barg)
RG125A					25-250 psig (1.7-17.2 barg)
RG125C3	⅜"	2 ⅛"	3.33"	0.80"	
RG175C3					
RG300A	¼"	2 1/16"	3"	1"	125-350 psig (17.2-24.2 barg)
RG000090AG					25-250 psig (1.7-17.2 barg)

*Contact sales representative for additional settings.

Gas Phase Regulator
1784NG

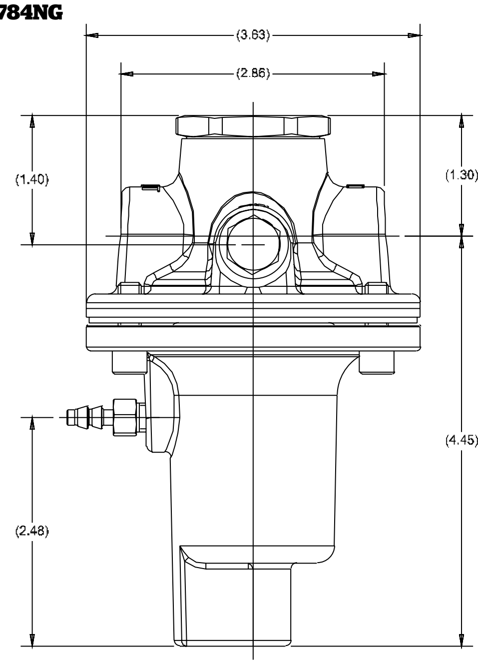
Application

The 1784NG Series Regulators are designed for the Natural Gas vehicle market. The 1784NG Series Regulators are engineered with unique design features ideal for optimal natural gas engine performance.

Features

- Highly responsive to changes in flow, pressure remains steady if flow increases
- New bonnet construction features hose barb and choice of ports for dome loading
- Adjusting screw is pre-set and protected against tampering by a pressure tight sealed plug
- Pre-set adjusting screw allows for internal adjustment
- Design utilizes abrasion resistant bushing for smooth performance
- Tied diaphragm minimizes risk of damage to downstream components in case outlet pressure increases above set-point
- Design optimized to provide stable performance with natural gas
- Maintains a steady downstream pressure across a range of inlet pressure commonly provided by a LNG bulk tank or cylinder
- Large seat and diaphragm areas provide high capacity with sensitive control of delivery pressure with low falloff
- Two ¼" FNPT delivery pressure gauge ports are located (plugged) on each side of the valve
- Two bonnet drain/vent holes to allow for different mounting orientation
- Maximum inlet pressure is 435 psig (30 barg)
- Temperature range: -40° F to +165 F (-40ºC to +74ºC)
- Designed in accordance with & approved by ECE R110
- 100% Factory Tested

1784NG



Materials

Body .... Forged Brass
Bonnet .... Nickel Plated Aluminum
Diaphragm .... Viton
Springs and Fasteners .... Stainless Steel
Other valve parts .... S/S and Brass
Seat Disc and O-Rings .... Viton

Ordering Information

Part Number	Inlet Pressure psig (barg)	Delivery Pressure psig (barg)	Hose Barb,Drain and Plug Option	Inlet and Outlet	Cv
1784NG45	137.5 (9.5)	63.5 (4.5)	No hose barb, plug in the side.	½" FNPT	3.1
1784NG86	188.5 (13.0)	124.7 (8.6)			
1784NG145	188.5 (13.0)	144.0-145.5 (10.0)			
1784NGB	137.5 (9.5)	36.0 - 101.0 (2.5 -7.0)	Hose barb over outlet, plug in the top.		
1784NGC	220.0 (15.2)	87.0 - 189.0 (6.0 - 13.0)			
1784NGB93	137.5 (9.5)	93.0 (6.4)			

*Contact sales representative for additional settings and/or configuration options.

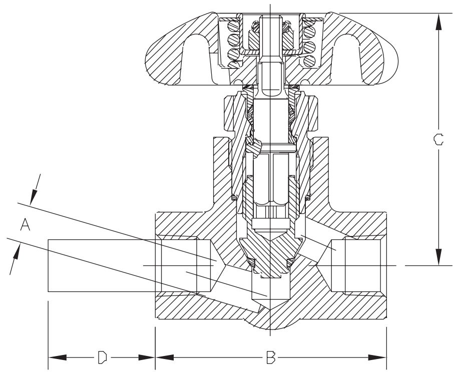
Short Stem Cryogenic Valves
T9450 Series and T9460 Series

Application
The T9450 and T9460 series valves are designed for use on portable cryogenic cylinders, LNG fueling systems and other in-line shut-off valve applications. T9460 Series Approved for TPED in accordance with EN1626.


T9450 Series


T9460 Series

Features
- Spring-loaded stem seal automatically adjusts for any gasket wear, eliminating the need to constantly retighten the packing nut
- Non-rising stem and low profile allow the valve to fit into tight areas and still provide easy access
- Unique pressure-sealed moisture barrier helps prevent freeze-up at cryogenic temperatures
- Conical swivel seal design helps prevent seat galling from over-torquing
- Cleaned for Oxygen service per CGA G-4.1.
- Maximum working pressure is 600 psig (42 barg)
- Working temperature range is -320°F to +165°F. (-196ºC to +74ºC)
- Designed in accordance with & approved by ECE R110
- 100% Factory Tested



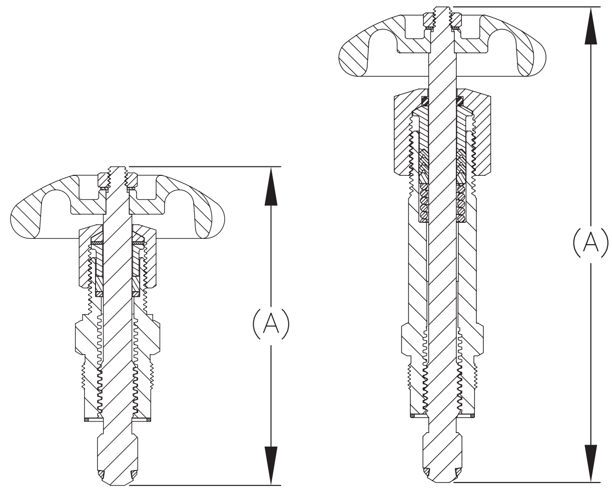
Materials
Body .... Brass
Bonnet .... Brass
Seat Disc .... PCTFE
Stem Seal Gasket........ PTFE
Handwheel........ Aluminum
Spring .... Stainless Steel
Stem .... Brass
Poppet ....Brass

Ordering Information

Part Number	Inlet	Outlet	Orifice A	Length B	Height (Approx.) C	Tube D	C_V Factor
T9452	¼" FNPT	¼" FNPT	.250	2½"	2¾"	None	.99
T9453	⅜"FNPT	⅜"FNPT	.406				1.76
T9454	½" FNPT	½" FNPT					1.79
T9464CA	.675" O.D. Tube	⅜"FNPT	.406	2½"	2¾"	1⅛"	1.76
T9464DA						2⅛"	
T9464ADA						3⅜"	

Extended Stem Retrofit Kits

Application
Retrofit kits are used to convert the 9450 and 9460 series short stem shut-off valves into extended stem style. The conversion can be done without removing the valve from your system. Available in two stem lengths. All kits are Oxygen cleaned and packaged per CGA G-4.1.



Materials
Body .... Brass
Seat Disc .... PCTFE
Handwheel........ Aluminum
Packing........ PTFE
Stem .... Stainless Steel
Stem Seal Gasket........ PTFE

Ordering Information

Part Number	Stem Length A	Style
ES8450R	4"	Extended Stem, Std. Bonnet, Manual Packing
BK9450R	6.5"	Extended Bonnet and Stem, Spring-loaded Packing

Shut-off Valve with Tubing Connections T9464CCAG

Application

Short stem valves are designed for use on LNG fueling systems to provide reliable performance at cryogenic temperatures.

Features

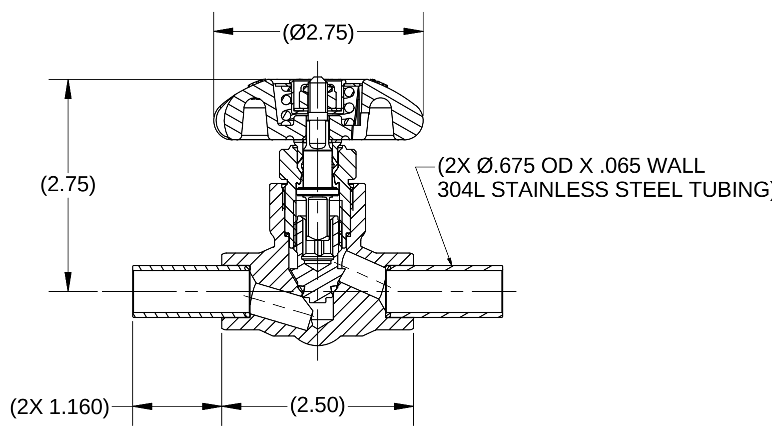
- Spring-loaded stem seal automatically adjusts for any gasket wear, eliminating the need to constantly retighten the packing nut
- Non-rising stem and low profile allow the valve to fit into tight areas of LNG fueling systems and still provide easy access
- Unique pressure-sealed moisture barrier helps prevent freeze-up at cryogenic temperatures
- Conical swivel seal design helps prevent seat galling from over-torquing
- Maximum working pressure is 600 psig (41.4 barg)
- Working temperature range is -320°F to +165°F (-196°C to +74°C)
- Designed in accordance with & approved by ECE R110
- 100% factory tested

REGO 10 YEAR WARRANTY

T9464CCAG

Materials

Tube .... Stainless Steel
Body .... Brass
Bonnet .... Brass
Seat .... CTFE
Gasket .... PTFE
Handwheel .... Aluminum
Spring .... Stainless Steel
Stem .... Brass



Ordering Information

Part Number	Inlet/Outlet Connections	Handwheel	C_V Factor for Gaseous Flow	C_V Factor for Liquid Flow
T9464CCAG	0.675" Tubing	Green	1.08	1.79

Shut-off valve w/90°bent tubes T9464LAS and T9464LCB

Application

Designed to conform to space constraints in LNG fueling systems. Maintains the same flow and outstanding service life of all RegO cryogenic in-line shut-off valves.

Features

- Spring-loaded stem seal automatically adjusts for any gasket wear, eliminating the need to constantly retighten the packing nut
- Non-rising stem and low profile allow the valve to fit into tight areas of LNG fueling systems and still provide easy access
- Unique pressure sealed moisture barrier helps prevent freeze-up at cryogenic temperatures
- Conical swivel seal design helps prevent seat galling from over-torquing
- Maximum working pressure is 600 psig (41.4 barg)
- Working temperature range is -320°F to +165°F. (-196°C to +74°C)
- Designed in accordance with & approved by ECE R110
- 100% factory tested

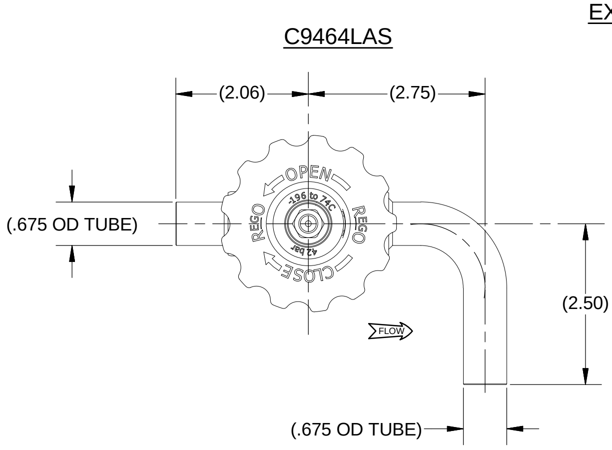
REGO 10 YEAR WARRANTY

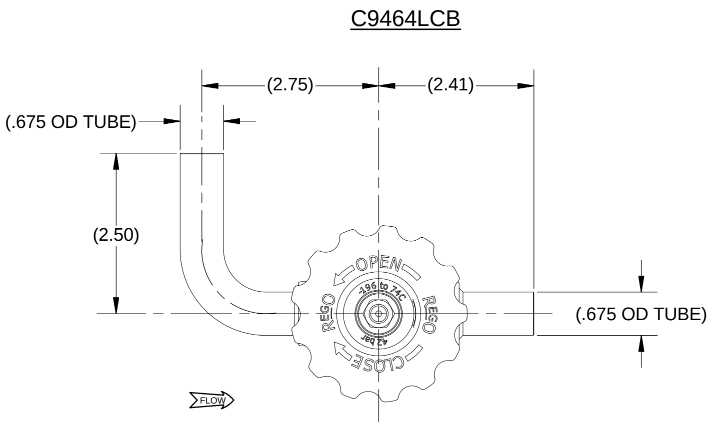
T9464LAS

Materials

Tube .... Stainless Steel
Body .... Brass
Bonnet .... Brass
Seat .... CTFE
Gasket .... PTFE
Handwheel .... Aluminum
Spring .... Stainless Steel
Stem .... Brass

EXTERIOR VIEWS





Ordering Information

Part Number	Tube Diameter	Bent Tube Location	Handwheel	C_V Factor for Gaseous Flow	C_V Factor for Liquid Flow
T9464LAS	.675	Outlet	Silver	1.08	1.79
T9464LCB		Inlet	Blue		

Shut-off valves
T9464LDR and T9464LES

Application
Designed to conform to space constraints in LNG fueling systems. Maintains the same flow and outstanding service life of all RegO cryogenic in-line shut-off valves.

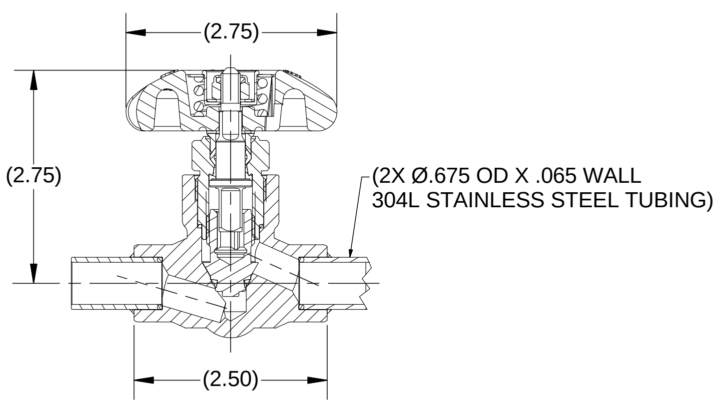
Features
- Spring-loaded stem seal automatically adjusts for any gasket wear, eliminating the need to constantly retighten the packing nut
- Non-rising stem and low profile allow the valve to fit into tight areas of LNG fueling systems and still provide easy access
- Unique pressure-sealed moisture barrier helps prevent freeze-up at cryogenic temperatures
- Conical swivel seal design helps prevent seat galling from over-torquing
- Maximum working pressure is 600 psig (41.3 barg)
- Working temperature range is -320°F to +165°F (-196°C to +74°C)
- Designed in accordance with & approved by ECE R110
- 100% factory tested

REGO 10 YEAR WARRANTY

T9464LDR

T9464LES

Materials
Tube .... Stainless Steel
Body .... Brass
Bonnet .... Brass
Seat .... CTFE
Gasket .... PTFE
Handwheel........ Aluminum
Spring .... Stainless Steel
Upper Stem .... Brass
Lower Stem .... Magnesium Bronze
Fitting........ Brass



T9464LJS

Ordering Information

Part Number	Outlet	Inlet	C_V Factor for Gaseous Flow	C_V Factor for Liquid Flow
T9464LDR	½" Flared tube fitting 45° elbow.	.675 Tube		
T9464LES	⅜" NTPF	.813 Tube	1.08"	1.79"
T9464LJS				

REGO

ES8450 and TES8450 Series Extended Stem Valves
BK9450 and BK9470 Series Extended Bonnet Valves

Application

For use as a trycock valve or hose drain valve on cryogenic tanks, or use as a liquid fill or vent valve on mini-bulk cryogenic tanks. These valves can be used also for other cold gas applications requiring extended stem valves as LNG fueling.

Features

- Union bonnet
- One piece stainless steel stem
- Conical seat design
- Maximum working pressure is 600 psig (42 barg)
- Working temperature is –320°F to +165°F. (-196ºC to 74ºC)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested

TES8450 Series specific feature:

- Grafoil® packing
- Approved by PED and TPED

ES8450 Series specific feature:

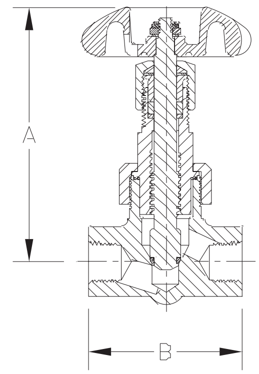
- Manual torque compression packing

BK9450 and BK9470 Series specific feature:

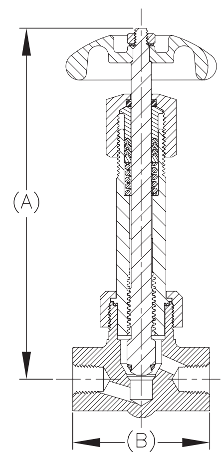
- Extended bonnet and spring-loaded packing

BK9470 Series specific feature:

- 304 St. Stl Tube brazed into both ends

ES 8450 Series

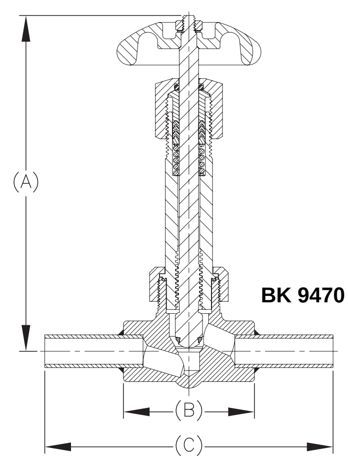



BK 9450 Series

REGO 10 YEAR WARRANTY

Materials

Body and Bonnet..Brass
Stem .... Stainless Steel
Seat Disc .... PCTFE
Handwheel... Aluminum
Bonnet Gasket.. PTFE
Packing... PTFE
Packing (TES.. Grafoil



BK 9470 Series

Conversion Kit

BK 9450-KIT is a bonnet and stem assembly kit to convert ES 8450 series and previous ES 9450 Series to the BK 9450 style.

Ordering Information

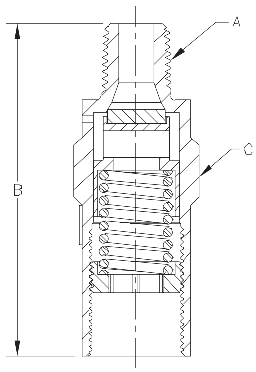
Part Number	Inlet/Outlet Connections	Height "A"	Body Width "B"	Width with Tube "C"	Cv
ES8452	¼" FNPT	4.2"	2.5"	NA	0.70
TES8452					
ES8453	⅜" FNPT				1.10
TES8453					
ES8454	½"FNPT				
TES8454					
BK9452	¼" FNPT	6.5"			0.70
BK9453	⅜" FNPT				1.10
BK9454	½"FNPT				
BK9453FA	⅝" OD tubing x ⅜"FNPT			4.0"	
BK9475A	⅝" OD tubing both ends			5.5"	

REGO

Cryogenic Gas Relief Valves, Non-ASME
9400 Series

Application
9400 series relief valves are specifically designed for vapor line safety relief applications and cryogenic liquid containers.

Features
- Cleaned for Oxygen service per CGA G-4.1
- Bubble-tight at 95% of set pressure
- Easy to read color coded barg/mpa labels
- Tamper resistant
- Adapters provide standard pipe thread connections for venting gas to the outdoors
- Repeatable performance
- 100% factory tested
- Temperatures Range (Teflon Seat) -320° to +165° F. (-196ºC to +74ºC)
- Temperatures Range (Flurosilicone Seat) -60° to +165° F. (-51ºC to +74ºC)
- Rated for gas service only
- Designed in accordance with & approved by ECE R110



REGO 10 YEAR WARRANTY

9400 Series

Materials SS Style
Body .... Stainless Steel
Spring .... Stainless Steel
Seat Retainer........ Stainless Steel
Pipe-Away Adapter .... Stainless Steel

Materials PRV and B-Style
Body .... Brass
Spring .... Stainless Steel
Seat Retainer........ Brass
Pipe-Away Adapter .... Brass

Flow Performance

- For set pressures 90 - 600 capacity is 0.783 SCFM of air per psig of flow pressure. For set pressures 15 - 89 capacity is 0.750 SCFM of air per psig of flow pressure. Flow pressure per ASME is 10% above set pressure or +3 psig, whichever is greater.
- B-9425N flow of 6.7 SCFM Air/psig at 120% of set pressure
- B-9426N flow of 11.0 SCFM Air/psig at 120% of set pressure

Seat Material Option
F for Fluorosilicone for PRV and SS styles for 15-139 psig
T for PTFE for PRV and SS styles for 140-600 psig
N for B-9425 and B-9426, Fluorosilicone seat, all set pressures

Drain Hole Option
Relief valves without pipeaway typically provided with drain holes, leave blank. **P** - for relief valves without drain hole, for example PRV9432TP350

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information
Fill in the blanks with options below.

Example: PRV9432T350

PRV	9432	T	Blank or "P"	350	Blank or "P"
Style	Size	Seat Material	Drain Hole	Set Pressure	Pipe-away Option

This example part number indicates a ¼" MNPT PRV style brass relief valve with PTFE seat, set at 350 psig with drain hole and no pipe-away adapter.

Pipe-away Option
P Pipeaway included and attached, No drain hole in relief valve
For example PRV9432TP350**P**
Leave blank for relief valve without pipe-away attached
For example PRV9432TP350

Set Pressure
Specify set pressure within range specified for style and size. The B-9425 and B-9426N are available in select settings only. Special order.

For easy identification, the following standard settings have color coded labels for all PRV and SS Style sizes and settings marked in psig and barg:

Color Identification

22 psig	230 psig
35 psig	350 psig
50 psig	450 psig
100 psig	500 psig
150 psig	

Ordering Information

Style	Size	Inlet MNPT A	Body and Valve Material	Pressure Setting Range psig	Height B	Wrenching Hex C	Orifice Size Sq. Inch	Pipe-Away Adapter P/N	Pipe-Away Outlet FNPT
PRV	9432	¼"	Brass	15-600	2.6"	⅞"	.062	B-9412-2	⅜"
SS			Stainless Steel					SS-9412-4	½"
PRV	9433	⅜"	Brass					B-9412-2	⅜"
SS			Stainless Steel					SS-9412-4	½"
PRV	9434	½"	Brass		2.8"			B-9412-4	
SS			Stainless Steel					SS-9412-4	
B-	9425	¾"	Brass	20-300	3.4"	1¾"	.44	B-3131-10	1"
	9426	1"		60-300	5.3"	2⅜"	.62	B-3132-10	1¼"

Cryogenic Gas Relief Valves, ASME
PRV19430 and PRV29430 Series

Application

The 19430 and 29430 relief valves are designed for Oxygen and other industrial gases and for cryogenic service in the vapor space. Apply on piping systems, liquid cylinders or mini-bulk cryogenic containers where an ASME relief valve is required.

REGO 10 YEAR WARRANTY

Features

- A.S.M.E. rated, National Board Certified
- Bubble-tight at 95% of set pressure
- Full flow at 110% at set pressure
- Repeatable performance
- 100% factory tested
- Temperatures Range (Teflon Seat) -320° to +165° F. (-196ºC to +74ºC)
- Temperatures Range (Flurosilicone Seat) -60° to +165° F. (-51ºC to +74ºC)
- Cleaned for Oxygen service per CGA G-4.1
- Rated for gas service only
- Easy to read color coded barg/mpa labels
- Tamper resistant
- Designed in accordance with & approved by ECE R110

19430 Series

Materials **SS Style**

Body .... Stainless Steel
Spring .... Stainless Steel
Seat Retainer.................... Stainless Steel
Pipe-Away Adapter .... Stainless Steel

Materials **PRV and B-Style**

Body .... Brass
Spring .... Stainless Steel
Seat Retainer.................... Brass
Pipe-Away Adapter .... Brass

Flow Performance

For set pressures 90 - 600 capacity is 0.783 SCFM of air per PSIA of flow pressure. For set pressures 15 - 89 capacity is 0.750 SCFM of air per PSIA of flow pressure. Flow pressure per ASME is 10% above set pressure or +3 psig, whichever is greater.

Ordering Information

Fill in the blanks with options below.

Example: PRV019432T350

PRV	1	9432	T	Blank or "P"	350
Style	Body Material	Size	Seat Material	Drain Hole	Set Pressure

Body Material

1 ASME approved valve made of brass
2 ASME approved valve made of stainless steel

Seat Material

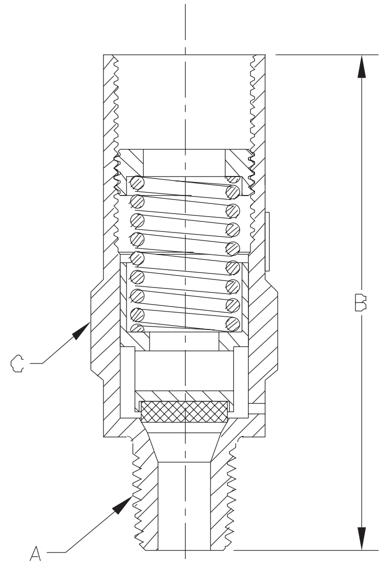
F for Fluorosilicone for 15 to 139 psig (6.2 - 9.5 barg) set-points.
T for PTFE for 140-600 psig (9.6 - 41.4 barg) set-points.

Drain Hole

Leave blank for relief with drain hole. Insert **P** if no drain hole.

Set Pressure

Enter number for set pressure in psig (6.2 - 41.4 barg) from 15 to 600.



Set-point tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Material	Inlet A	Height B	Wrenching Hex C	Orifice Size
PRV19432	Brass	¼"	2.6	⅞"	.062 sq. inch
PRV29432	Stainless Steel				
PRV19433	Brass	⅜"			
PRV29433	Stainless Steel				
PRV19434	Brass	½"	2.8		
PRV29434	Stainless Steel				

Pressure Setting and Flow Data
PRV9400, PRV19430 and PRV29430

Pressure Setting and Flow Data PRV9430 Series								
Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	barg	Air Flow Capacity SCFM	Pressure Setting psig	barg	Air Flow Capacity SCFM
15	1.0	25	215	14.8	197	450	31.0	399
20	1.4	28	220	15.2	201	460	31.7	408
22	1.5	30	225	15.5	205	470	32.4	416
25	1.7	32	230	15.9	210	480	33.1	425
30	2.1	36	235	16.2	214	490	33.8	434
35	2.4	40	240	16.5	218	500	34.5	442
40	2.8	44	250	17.2	227	510	35.2	451
45	3.1	48	260	17.9	235	520	35.9	459
50	3.4	52	270	18.6	244	530	36.5	468
55	3.8	56	275	19.0	248	540	37.2	477
60	4.1	61	280	19.3	253	550	37.9	485
65	4.5	65	285	19.7	257	560	38.6	494
70	4.8	69	290	20.0	261	570	39.3	502
75	5.2	73	300	20.7	270	580	40.0	511
80	5.5	77	310	21.4	279	590	40.7	520
85	5.9	81	320	22.1	287	600	41.4	528
90	6.2	89	325	22.4	291			
100	6.9	98	330	22.8	296			
110	7.6	106	340	23.4	304			
120	8.3	115	350	24.1	313			
125	8.6	119	360	24.8	322			
130	9.0	123	370	25.5	330			
140	9.7	132	375	25.9	334			
150	10.3	141	380	26.2	339			
160	11.0	149	390	26.9	347			
170	11.7	158	400	27.6	356			
175	12.1	162	410	28.3	365			
180	12.4	167	420	29.0	373			
190	13.1	175	425	29.3	378			
200	13.8	184	430	29.6	382			
210	14.5	192	440	30.3	390			

Non-ASME Ordering Information

PRV	94	32	T	P	350	P

- P → Pipe-Away Adapter
- 350 → Pressure Setting (psig)
- P → Without Drain Hole
- T → Seal Material Teflon (Available F for Fluorosilicone)
- 32 → Size ¼" (Available 33 for 3/8" and 34 for ½")
- 94 → Series Identification
- PRV → Style and Material Brass. (Available SS for Stainless Steel)

ASME Ordering Information

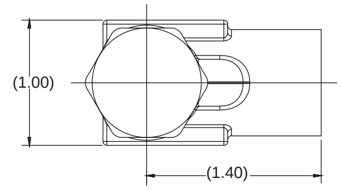
PRV	194	32	T	P	350

- 350 → Pressure Setting (psig)
- P → Without Drain Hole
- T → Seal Material Teflon (Available F for Fluorosilicone)
- 32 → Size ¼" (Available 33 for 3/8" and 34 for ½")
- 194 → Series Identification and Material, 194 for Brass and 294 for SS
- PRV → Style

Right Angle Relief Valves
NG-900 Series

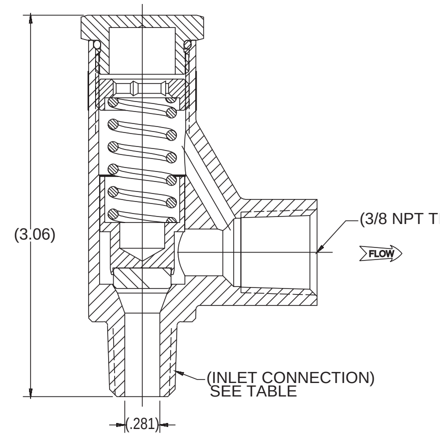
Application

The NG-900 series is designed specifically to avoid over pressurization in LNG fuel tank applications and LNG installations. These valves open and close at preset pressures to ensure reliable performance at cryogenic temperatures.



Features

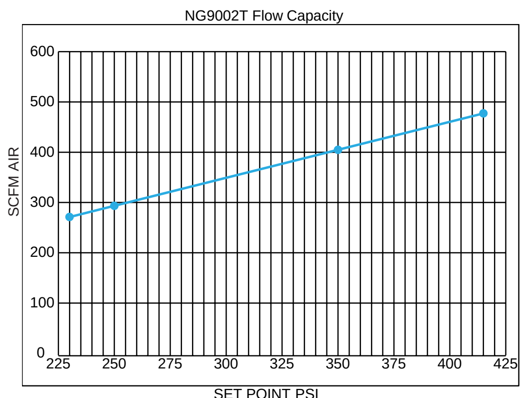
- Optional pull lever for manual override
- Materials selected specifically for compatibility with Natural Gas
- 100% Factory tested
- Temperature range -320ºF to +196ºF (-196ºC to +74ºC)
- Designed in accordance with & approved by ECE R110

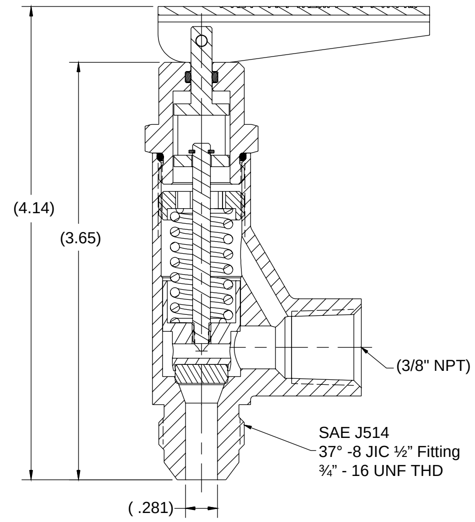


NG-9002T

Materials

Spring Pin....................Stainless Steel
Handle....................Stainless Steel
O-rings....................Fluorosilicone
Connector....................Brass
Stem....................Stainless Steel
Bonnet....................Brass
Seat Disc....................PTFE
Spring....................Stainless Steel
Adjusting Screw....................Stainless Steel
Body....................Brass
Poppet....................Brass





NG-9008M

WARNING:

Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information

Part Number	Inlet Connection	Outlet Connection	Manual Override	Pressure setting	
				psig	barg
NG9002T022	¼" MNPT	⅜" FNPT	No	22	1.52
NG9002T058				58	4.0
NG9002T230				230	15.85
NG9002T250				250	17.23
NG9002T275				275	18.96
NG9002T350				350	24.13
NG9002T415				415	28.61
NG9003T230	⅜" MNPT			230	15.85
NG9003T250				250	17.23
NG9003T350				350	24.13
NG9003T415				415	28.61
NG9008M230	SAE J514 (37˚-8JIC ½" fitting) (¾"-16 UNF thread male)		Yes	230	15.85
NG9008M250				250	17.23
NG9008M280				280	19.30
NG9008M350				350	24.13
NG9008M415				415	28.61

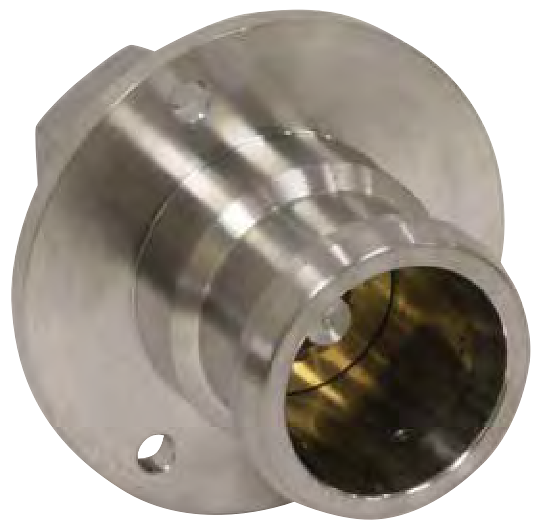
*Contact your sales representative for additional settings.

REGO

LNG Male Fueling Receptacle
MFR50 Series

Application

When mounted on the tank of a Liquid Natural Gas fueled vehicle, the LNG Tank Receptacle offers a safe and secure connection with the CryoMac3 50M LNG Nozzle. In addition to providing a perfect fit with the CryoMac3 50M LNG Nozzle, the LNG Tank Receptacle is engineered to offer the same safe and secure connection with many other LNG Nozzles.



MFR5008

Features

- Max internal pressure 300 psig /20.7 barg (while fueling)
- Max system pressure 550 psig /38 barg (static)
- Flow capacity 50 GPM
- Available in the more standard inlet connections
- Temperature range -350°F to 150°F (-212°C to 65°C)
- 100% pressure tested
- Global certifications
- 66% lower LNG emissions during disconnect
- Easy service
- Different outlet available upon request
- Robust poppet design and protection of seat for longer life
- Patent pending

Materials

Body ....316L Cres Per ASTM A312
Poppet ....303 ASTM A 582
Spring .... 302 Cres ASTM A313
Seal ASSY (C version) .... UHMWL Brass
Seal ASSY (Non-C Version) .... Duronl Stainless Steel
Retainer ....Brass
Retainer ring..Stainless Steel

Ordering Information

Part Number	Certification	Outlet Connection	GPM
MFR5008	ECE Mark, R110	¾" FNPT	50
MFR5010		37° SAE flare fitting	
MFR5011		M30x1.5 thread metric tube fitting	
MFR5013		M36x2.0 thread metric tube fitting	

MQD100 Series

Application

For venting excess pressure in LNG vehicle tanks.

Engineered for easy connection / disconnection with quick disconnect vent couplers.

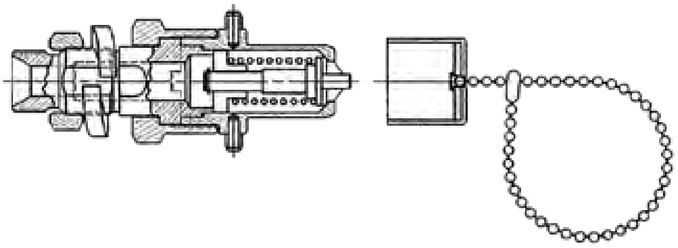
Features

- Designed for durability and long lasting performance
- Materials selected specifically for compatibility with LNG
- PTFE seat provides positive shut off at cryogenic temperatures
- Temperature range: -325°F(-198°C) to +150°F(+65°C)
- 100% factory tested
- Max fueling pressure: 300 psig (20.7 barg)
- Max system pressure: 550 psig (38 barg)
- Designed in accordance with & approved by ECE R110

MQD100

Materials

Inlet body.. Stainless Steel
Body .... Stainless Steel
Seat ....PTFE
Spring .... Stainless Steel
Cap (optional)... Vinyl



Ordering Information

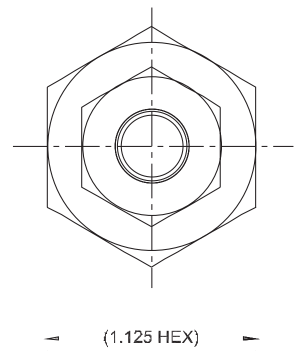
Old Part Number	New Part Number	Inlet Connection	Subjection to Base
11170	MQD100401N	⅜” SW	n
14075	MQD100701P	⅜” MNPT	Panel mount with nut
14000	MQD100101P	M20 X 1.5	Bulkhead. Panel Mount
12895	MQD100201P	⅜” -18 MNPT	
12680	MQD100201N	⅜” -18 MNPT	Without
14190	MQD100201F		Bulkhead, Flanged
	MQD100701P		Bulkhead
14080	MQD100701N		Without, Extended
14410-1	MQD100501F	37° SAE Flare Fitting	Bulkhead, Flanged

RegO® Excess Flow Valve
NG303

Application
For use with LNG liquid lines as an effective shut-off when an excess flow condition occurs downstream to prevent uncontrolled release of system media.

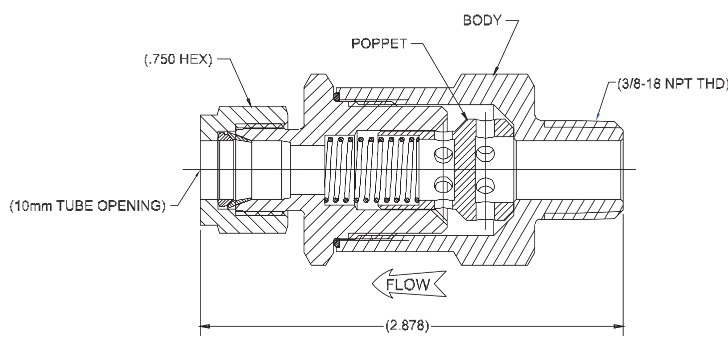
Features
- Materials selected specifically for compatibility with LNG
- Poppet design provides high-flow capacity
- Design allows spring to reset poppet automatically when system pressure equalizes
- Maximum inlet pressure: 4MPa
- Temperature range: -320º F to 165º F
- Designed in accordance with & approved by ECE R110
- 100% factory tested

NG303



Materials
Body .... Brass
Spring .... Stainless Steel
Poppet .... Brass
Bonnet .... Stainless Steel

Configuration Options
- NG303XYZ
- X is a Material option
- Y is a Connection option
- Z is a Poppet orifice size option
- Currently have 24 configuration options:
  - 2 materials
  - 4 connections
  - 3 poppet sizes



Ordering Information

Part Number	Inlet	Outlet	Poppet Orifice mm (inch)	Ferrule Nut Hex inches	Closing Flow
NG303B	⅜"	10mm Tube	2.0 (.079)	.750	3.5 - 5.5 GPM
NG303B3		⅜" Tube		.688	
NG303S		10mm Tube		.750	
NG303S3		⅜" Tube		.688	

RegO® LNG Check Valves
NG Series

Application

NG301

For use with LNG liquid lines as an effective shut-off utilizing ball and spring mechanism. ⅛" design fits compact piping systems.
Heavy-duty spring and precision ball provide dependable service in LNG fuel applications.

NG304

For use with LNG fuel lines as an effective one-way shut-off utilizing. soft seated design for quick acting response to flow.
Poppet design is ideal for LNG and resistant to particulates.

NG304 **NG304SSA**

Features

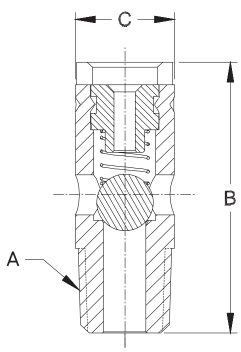
NG301

- Materials selected specifically for compatibility with LNG
- Quick acting ball and spring mechanism.
- Metal to metal seating provides durable service life.
- Maximum inlet pressure 1000 psig (69 barg).
- 100% factory tested.
- Temperature Range: -320º F to 165ºF (-196ºC to 74ºC).
- Designed in accordance with & approved by ECE R110.

Features

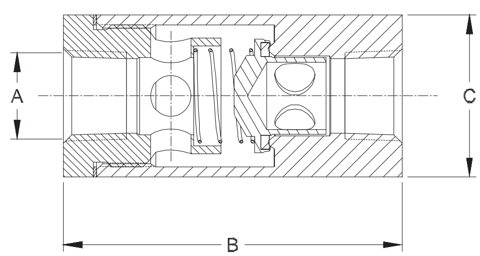
NG304

- Materials selected specifically for compatibility with LNG.
- Maximum inlet pressure 1000 psig (69 barg).
- 100% factory tested.
- Temperature Range: -320º F to 165ºF (-196ºC to 74ºC).
- Designed in accordance with & approved by ECE R110.



NG301

NG301



NG304

Materials for NG301

Body .... Brass ASTM B16 C36000
Spring .... Stainless Steel 302 ASTM A313
Plug .... Brass ASTM B16 C36000
Ball........................ Stainless Steel 316

Materials for NG304

Body .... Brass ASTM B16 C36000
Spring .... Stainless Steel 302 ASTM A313
Gasket .... Copper ASTM B152 UNS C11000
Poppet .... Brass ASTM B16 UNS C36000
Seat Disc .... PTFE Virgin Teflon

Materials NG304SS

Body .... Stainless Steel 304 ASTM276
Spring .... Stainless Steel 302 ASTM A313
Gasket .... Copper ASTM B152 UNS C11000
Poppet .... Brass 360 FC (UNS C36000 PER ASTM B16)
Seat Disc .... UHMWPE (ASTM D4020)

Ordering Information

Part Number	Body Material	Connection (A)	B	C	Weight Lbs	Silver Plated End Piece
NG301	Brass	Threaded MNPT F ⅛	1.200	.438	0.01	N/A
NG304		Threaded FNPT F ½	3.135	1.5 (Hex)	1.25	
NG304SSA	Stainless Steel	M36x2 Male	3.346		1.10	
NG304SSB		M30x1.5 Male	3.346			
NG304SSC		½"-14 NPT Female	2.953			
NG304SSAP		M36x2 Male	3.346			Yes
NG304SSBP		M30x1.5 Male	3.346			
NG304SSCP		½"-14 NPT Female	2.953			

50 GPM LNG Fueling Nozzle
CryoMac® 3

Application

The CryoMac 3 is a high technology LNG fueling nozzle, unique with safety stop to guarantee a safe operation and prevents safety stop from resetting prematurely during nozzle removal.

Features

- Fluid Compatibility: LNG, Methane and LN2
- Maximum Pressure: 500 psig/34.5 barg
- Burst Pressure: greater than 1,500 psig/103.5 barg
- Rated Flow: 50 GPM @ 250 psig (LNG)
- Nozzle Weight: 10 lbs
- Port Size: 1” Male SAE 37 degree flare (SAE J514) (1 5/16 -12 thd.)
- Operating Temperature: -320°F to +140°F / -195°C to 60°C
- 3rd Party KIWA Testing in accordance with ISO 12617
- 100% pressure tested
- Improved positive “safety stop” does not release until triggered after venting trapped gas and before disconnecting the nozzle for added safety and operator protection
- Improved longer service life of the receptacle end seal
- Reconfigured to be more compatible with Macro and other receptacle designs
- Ball bearing design “guides and locks” the nozzle in place during fueling for easier connections
- Designed to prevent freezing onto the receptacle utilizing non-metallic bearings, air gaps and insulation
- Easy access for maintenance on the receptacle end seal, poppet assembly and seat

CryoMac 3

CERTIFIED

according to ISO 12617 approved product as specified by ISO 16924 Natural gas fueling stations – LNG stations for fueling vehicles

CE Ex II 2G c IIA T3 X

ATEX

Designed, tested and marks in accordance with ATEX directive 2014/34/EU

Materials

Seat .... UHMW
Poppet Body .... Brass
Spring .... Stainless Steel or Spring Wire
Probe .... Stainless Steel
Tube .... Stainless Steel
Fitting .... Stainless Steel
Housing .... Aluminum

Ordering Information

Old Part Number	New Part Number	Inlet Connection	Handle
CryoMac3-50M	CryoMac3-50M	SAE J514 (37° Flare JIC)	Standard
CryoMac3-50M-S	CryoMac3-50M-S	SAE J514 (37° Flare JIC)	Short

LNG Female Vent Coupler
FQD10 Series

Application
The most popular Female Vent Coupler for dispensers of LNG. Safe and easy operation.

Features
- Over 100,000 in service worldwide
- LNG vent/fill connection (male). Handles both LNG Vent Gas and LNG Liquid
- Max internal pressure 300 psig /20.7 barg (while fueling)
- Max system pressure 550 psig /38 barg (static)
- Temperature range -350°F to 150°F (-212°C to 65°C).
- 100% pressure tested

FQD100602N

Materials
Female Housing .... Stainless Steel 316L
Seal Retainer... Stainless Steel 303
Seal ASSY .... TFE/Viton
Seal .... TFE
Poppet .... Stainless Steel 303
Seal Poppet .... PCTFE
Spring .... Stainless Steel 301/302

Ordering Information

Old Part Number	New Part Number	Inlet Connection
11175	FQD100604N	90° Tubing. ⅝" 45° SAE Fitting (CGA 440)
13775	FQD100602N	⅝" 45° SAE Fitting (CGA 440) Short Straight Handle
13785	FQD100603N	⅝" 45° SAE Fitting (CGA 440) Long Straight Handle

LNG Hoses Brass Connections
CHB Series

Application

The CHB Series are cryogenic transfer hoses with brass nuts used in the venting line of the LNG dispensers. The flexibility and resistance of this cryogenic hoses guarantee a safe operation and easy handling during the refilling of liquid cylinders.

Features

- Stainless steel corrugated inner core, a 304 stainless steel single braid.
- Armor cover protection.
- Max Working Pressure: 1100 psi (76 bar) for ½" hoses.
- Minimum Operating Temperature -454°F (-270°C)
- Serial number included
- 100% pressure tested

Materials

Core tube...321/316 Stainless Steel
Exterior Braid...304 Stainless Steel
Armor..304 Stainless Steel
Ferrule,Flare, Tube.................................304L/316 Stainless Steel
Nut... Brass ISO 10806

Ordering Information

Old Part Number	New Part Number	Size	Length Inches (mts)	Double Armor Cover	Spiral Supporting Spring	End Connections
CHB-440-440-48	CHB-4-440-440-048	½"	48 (120)	Yes	No	CGA 440 (⅝ 45° SAE)
CHB-440-440-60	CHB-4-440-440-060		60 (150)			
CHB-440-440-72	CHB-4-440-440-72		72 (180)			
CHB-440-440-96	CHB-4-440-440-96		96 (2.40)			
CHB-440-440-120	CHB-4-440-440-120		120 (3.0)			
CHB-440-440-144	CHB-4-440-440-144		144 (3.60)			
CHB-440-440-156	CHB-4-440-440-156		156 (3.90)			
CHB-440-440-180	CHB-4-440-440-180		180 (4.50)			
CHB-440-440-196	CHB-4-440-440-196		196 (5.0)			

LNG Hoses Stainless Steel Connections
CHS Series

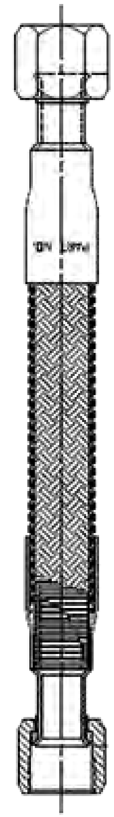
Application

The CHS Series are cryogenic transfer hoses with stainless steel nuts used in the LNG dispensers. The flexibility and resistance of this cryogenic hoses guarantee a safe operation and easy handling during the refilling of liquid cylinders. The spiral support spring protects the hoses giving a longer term life.

Features

- Stainless steel corrugated inner core, a 304 stainless steel single braid.
- Armor cover protection.
- Max Working Pressure: 1100 psi (76 bar) for ½" hoses.
- Max Working Pressure: 450 psi (31.0 bar) for 1" hoses.
- Minimum Operating Temperature -454°F (-270°C)
- Serial number included
- 100% pressure tested

CHS-440-440-072



Materials

Core tube..321/316 Stainless Steel
Exterior Braid..304 Stainless Steel
Armor...304 Stainless Steel
Ferrule,Flare, Tube.................................304L/316 Stainless Steel
Nut...304/316 Stainless Steel

Ordering Information

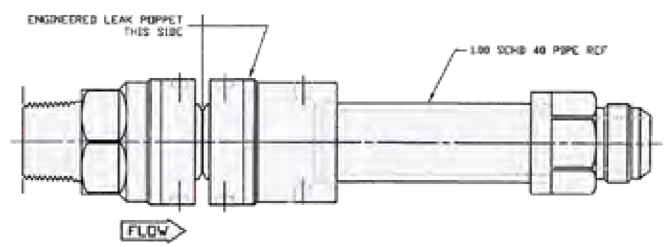
Old Part Number	New Part Number	Size	Length Inches (mts)	Double Armor Cover	Spiral Supporting Spring	End Connections
CHS-440-440-24	CHS-4-440-440-024	½"	24 (0.60)	Yes	No	CGA 440 (⅝ 45° SAE)
CHS-440-440-36	CHS-4-440-440-036		36 (0.90)			
CHS-440-440-48	CHS-4-440-440-048		48 (120)			
CHS-440-440-60	CHS-4-440-440-060		60 (150)			
CHS-440-440-72	CHS-4-440-440-072		72 (180)			
CHS-440-440-96	CHS-4-440-440-096		96 (2.40)			
CHS-440-440-120	CHS-4-440-440-120		120 (3.0)			
CHS-440-440-144	CHS-4-440-440-144		144 (3.60)			
CHS-440-440-197	CHS-4-440-440-197		197 (5.0)			
CHS-440-440-240	CHS-4-440-440-240		240 (6.0)			
11910-072	CHS-8-514-514-072	1"	72 (180)			SAE J514 (37° Flare JIC)
11910-120	CHS-8-514-514-120		120 (3.0)			
11910-144	CHS-8-514-514-144		144 (3.60)			
11910-156	CHS-8-514-514-156		156 (3.90)			
11910-180	CHS-8-514-514-180		180 (4.50)			
11910-197	CHS-8-514-514-197		197 (5.0)			
11910-240	CHS-8-514-514-240X		240 (6.0)			
14340-120	CHS-8-514-514-072X		120 (3.0)			
14340-144	CHS-8-514-514-120X		144 (3.60)			
14340-156	CHS-8-514-514-144X		156 (3.90)			
14340-180	CHS-8-514-514-180X		180 (4.50)			
14340-197	CHS-8-514-514-197X		197 (5.0)			
14340-240	CHS-8-514-514-240X		240 (6.0)			
14340-120 Special	CHS-8-514-514-072XS		120 (3.0)		Yes	
14340-144 Special	CHS-8-514-514-120XS		144 (3.60)			

LNG Vent/Fill Breakaway
VFL Series

Application
The VFL Series are LNG vent/fill breakaway are designed to prevent pull away accidents, protect fill station/dispenser and eliminate unwanted product release.

Features
- Max internal pressure 300 psig/20.7 barg (while fueling)
- Max system pressure 550 psig/38 barg (static)
- Temperature range -340°F to 140°F (-206°C to 60°C).
- Fill Breakaway Flow Capacity 50 GPM
- Vent Breakaway Flow Capacity 10 GPM
- 100% pressure tested

VFL-500202NA-10



Materials
Housing .... 304 Stainless Steel ASME SA479
Housing .... Brass ASTM B16
Poppet .... Brass ASTM B16
Spring .... 302 Stainless Steel
Guide .... Brass ASTM B16
Hose Adapter............................ 304 Stainless Steel ASME SA479

Ordering Information

Old Part Number	New Part Number	Inlet Connection	Outlet Connection	Sensor Plug	Length	Angled
14370	VFL-500101NA-6	CGA 440 (⅝" 45° SAE)	¾" -14 NPTF	Yes	6"	No
14390-4	VFL-500202AN-7	1.00-11.5 MNTP	SAE J514 (37° Flare JIC)	No	7.25"	Yes
14390-8	VFL-500203AN-7		M36x2.0	No		
13740-4	VFL-500202AA-7		SAE J514 (37° Flare JIC)	Yes		
	VFL-500203AA-7		M36x2.0	Yes		
14390-2	VFL-500202AN-10		SAE J514 (37° Flare JIC)	No	10.50"	
	VFL-500203AN-10		M36x2.0	No		
13740-2	VFL-500202AA-10		SAE J514 (37° Flare JIC)	Yes		
13740-6	VFL-500203AA-10S		M36x2.0	Yes		
14585	VFL-500202AN-10		SAE J514 (37° Flare JIC)	No		
14390-5	VFL-500202NN-10			No		No
13740-5	VFL-500202NA-10			Yes		

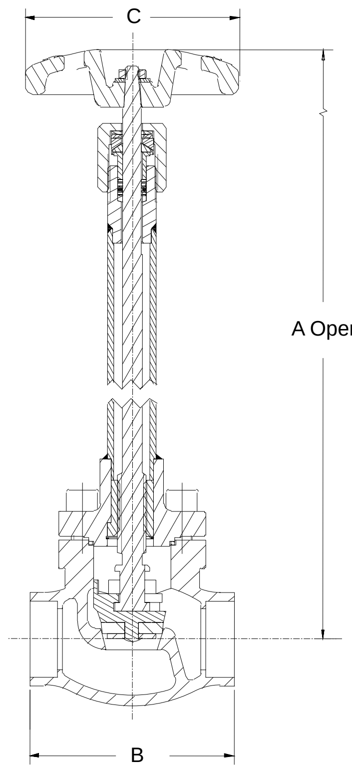
Stainless Steel Globe Valves for Cryogenic Service
SKL Advantage Series Long Stem

Application

The SK Advantage Series of Stainless Steel Globe Valves are designed for handling cryogenic liquids through trailer, bulk vessels and piping configurations. Ideal service medium includes Oxygen, Nitrogen, Krypton, Carbon Dioxide, Dinitrogen Monoxide, Carbon Dioxide, Methane, Ethane, Ethylene, Argon and LNG . Our Kold-Seal stem seal technology assures a tight seal preventing cryogen gas loss. The conical seat design allows exceptional flow, positive shut-off and less chance of debris accumulation in the flow path, all resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy.

REGO 10 YEAR WARRANTY

SK Advantage



Features

- Soft Seat: PCTFE material which is the most widely specified cryogenic seat material in the industry
- Construction: Bolted bonnet allows easy access to the valve internals for servicing
- Stem Packing: Proven Kold-Seal technology, Live-loaded PTFE
- Sizes: ¼” through 2”
- Connection: Socket Weld and Butt Weld
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature Rating: -320°F to +150°F (-198°C to +65°C)
- Pressure Rating: Cold, Non-Shock, 725 psig (50 barg) Class 300 (PN 50)
- Cleaned for Oxygen service per CGA G-4.1
- Application: Multiple stem lengths available for selected service
- Packaging: Each valve is individually bagged and boxed to arrive in factory new condition until installation

Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring..Stainless Steel ASTM A313 S30200
Packing.. Live-loaded PTFE Packing
Gasket..PTFE 25% Glass Fill
Seat Disc...PCTFE ASTM D1430
Seat Retainer..Brass ASTM B16
Bonnet Screws..ASTM B16 C36000
Handwheel... Painted Aluminum

Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

TPED and PED Certified Π CE

Ordering Information

Part Number	Size (Inches)	Size dn	Connection	A (Inches)	A (mm)	B (Inches)	B (mm)	C (Inches)	C (mm)	Cv	Kv	Weight lbs	Weight kg
SKL9402SW	¼”	8	Socket Weld	14.6	370	2.7	68	4	102	1.7	1.47	3.76	1.70
SKL9404SW	½”	15								5	4.30	3.47	1.68
SKL9406SW	¾"	20				3.6	92			9.4	8.10	5.17	2.34
SKL9408SW	1"	25								14	12.10	5.34	2.42
SKL9412SW	1½"	40				4.7	121	5	127	28.3	24.5	9.48	4.30
SKL9416SW	2”	50		13.6	345	5.7	146			53	45.8	16.3	7.39
SKL9402BW	¼”	8	Butt Weld	14.6	370	2.7	68	4	102	1.7	1.47	3.76	1.70
SKL9404BW	½”	15								5	4.30	3.47	1.68
SKL9406BW	¾"	20				3.6	92			9.4	8.10	5.17	2.34
SKL9408BW	1"	25								14	12.10	5.34	2.42
SKL9412BW	1½"	40				4.7	121	5	127	28.3	24.5	9.48	4.30
SKL9416BW	2”	50		13.6	345	5.7	146			53	45.80	16.3	7.39

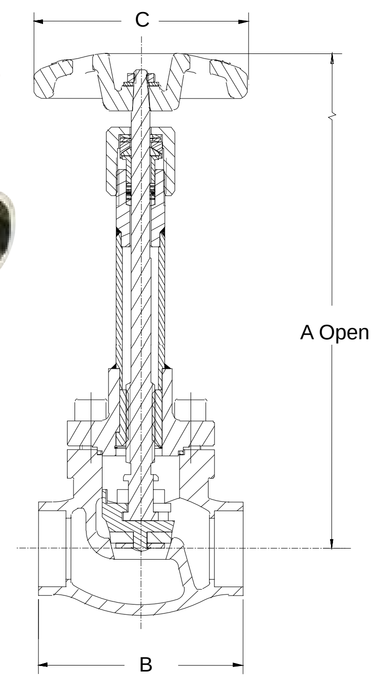
SW = Socket Weld; BW = Butt Weld

Stainless Steel Globe Valves for Cryogenic Service
SKM Advantage Series Medium Stem

Application

The SK Advantage Series of Stainless Steel Globe Valves are designed for handling cryogenic liquids through trailer, bulk vessels and piping configurations. Ideal service medium includes Oxygen, Nitrogen, Krypton, Carbon Dioxide, Dinitrogen Monoxide, Carbon Oxide, Methane, Ethane, Ethylene, Argon and LNG . Our Kold-Seal stem seal technology assures a tight seal preventing cryogen gas loss. The conical seat design allows exceptional flow, positive shut-off and less chance of debris accumulation in the flow path, all resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy.

SKM9406BW



Features

- Soft Seat: PCTFE material which is the most widely specified cryogenic seat material in the industry
- Construction: Bolted bonnet allows easy access to the valve internals for servicing
- Stem Packing: Proven Kold-Seal technology, Live-loaded PTFE
- Sizes: ¼" through 2"
- Connection: Socket Weld and Butt Weld
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature Rating: -325°F to +150°F (-198°C to +65°C)
- Pressure Rating: Cold, Non-Shock, 725 psig (50 barg) Class 300 (PN 50)
- Cleaned for Oxygen service per CGA G-4.1
- Application: Multiple stem lengths available for selected service
- Packaging: Each valve is individually bagged and boxed to arrive in factory new condition until installation

Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing... Live-loaded PTFE Packing
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer... Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel... Painted Aluminum

Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

TPED and PED Certified

Ordering Information

<table>
<tr><th>Part Number</th><th>Size (Inches)</th><th>Size dn</th><th>Connection</th><th>A (Inches)</th><th>A (mm)</th><th>B Inches)</th><th>B (mm)</th><th>C (Inches)</th><th>C (mm)</th><th>Cv</th><th>Kv</th><th>Weight lbs</th><th>Weight kg</th></tr>
<tr><td>SKM9402SW</td><td>¼"</td><td>8</td><td rowspan="6">Socket Weld</td><td rowspan="12">10.6</td><td rowspan="12">270</td><td rowspan="2">2.7</td><td rowspan="2">68</td><td rowspan="4">4</td><td rowspan="4">102</td><td>1.7</td><td>1.47</td><td>3.31</td><td>1.50</td></tr>
<tr><td>SKM9404SW</td><td>½"</td><td>15</td><td>5.0</td><td>4.30</td><td>3.29</td><td>1.48</td></tr>
<tr><td>SKM9406SW</td><td>¾"</td><td>20</td><td rowspan="2">3.6</td><td rowspan="2">92</td><td>9.4</td><td>8.10</td><td>4.86</td><td>2.20</td></tr>
<tr><td>SKM9408SW</td><td>1"</td><td>25</td><td>14.0</td><td>12.10</td><td>5.02</td><td>2.27</td></tr>
<tr><td>SKM9412SW</td><td>1½"</td><td>40</td><td>4.7</td><td>121</td><td rowspan="2">5</td><td rowspan="2">127</td><td>28.3</td><td>24.50</td><td>8.92</td><td>4.04</td></tr>
<tr><td>SKM9416SW</td><td>2"</td><td>50</td><td>5.7</td><td>146</td><td>53.0</td><td>45.80</td><td>15.30</td><td>6.94</td></tr>
<tr><td>SKM9402BW</td><td>¼"</td><td>8</td><td rowspan="6">Butt Weld</td><td rowspan="2">2.7</td><td rowspan="2">68</td><td rowspan="4">4</td><td rowspan="4">102</td><td>1.7</td><td>1.47</td><td>3.31</td><td>1.50</td></tr>
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</table>

SW = Socket Weld; BW = Butt Weld

Stainless Steel Globe Valves for Cryogenic Service
SKS Advantage Series Short Stem

Application

The SKS Series globe valves short stem are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Our time tested spring-loaded stem packing and superior seat design provide for long life and easy maintenance.

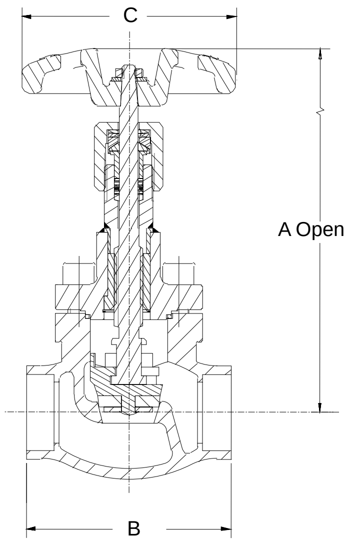
SKS9406BW

Features

- Superior Flow: Provides high Cv for rapid and reliable loading and unloading.
- Designed with the unique Kold-Seal™.
- Conical PCTFE Seat: provides exceptional flow; bubble-tight seal; less chance of debris trapped in the seat and longer service life.
- Connections: Socket Weld and Butt Weld.
- Sizes: ¼" to 1½".
- Bonnet Type: Bolted.
- Pressure Rating: 720 psig (50 barg)
- Temperature Rating: -320°F (-196°C) to +150°F (+65°C).
- Service: Liquefied and Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, ISO-Containers and Piping Configurations.
- Cleaned for Oxygen service per CGA G-4.1.

Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing.. Live-loaded PTFE Packing
Gasket..PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer... Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel... Painted Aluminum



Quality / Facility Features

- Material traceability in accordance with BS EN 10204 3.1
- CE Marking per European Pressure Equipment Directive

PED Certified π CE

Ordering Information

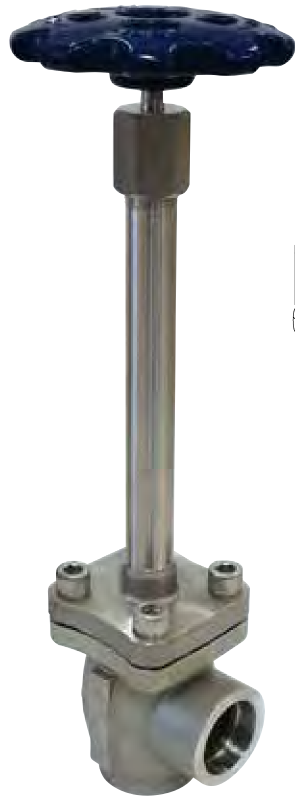
Part Number	Size Inches	Size dn	Connection	A (Inches)	A (mm)	B (Inches)	B (mm)	C (Inches)	C (mm)	Cv	Kv	Weight lbs	Weight kg
SKS9402SW	¼"	8	Socket Weld	6.7	170	2.7	68	4	102	1.7	1.47	2.64	1.20
SKS9404SW	½"	15								5	4.30	2.62	1.19
SKS9406SW	¾"	20				3.6	92			9.4	8.10	4.21	1.91
SKS9408SW	1"	25								14	12.10	4.10	1.86
SKS9412SW	1½"	40		7.0	178	4.7	120	5	127	28.3	24.50	7.16	3.25
SKS9402BW	¼"	8	Butt Weld	6.7	170	2.7	68	4	102	1.7	1.47	2.64	1.20
SKS9404BW	½"	15								5	4.30	2.62	1.19
SKS9406BW	¾"	20				3.6	92			9.4	8.10	4.21	1.91
SKS9408BW	1"	25								14	12.10	4.10	1.86
SKS9412BW	1½"	40		7.0	178	4.7	120	5	127	28.3	24.50	7.16	3.25

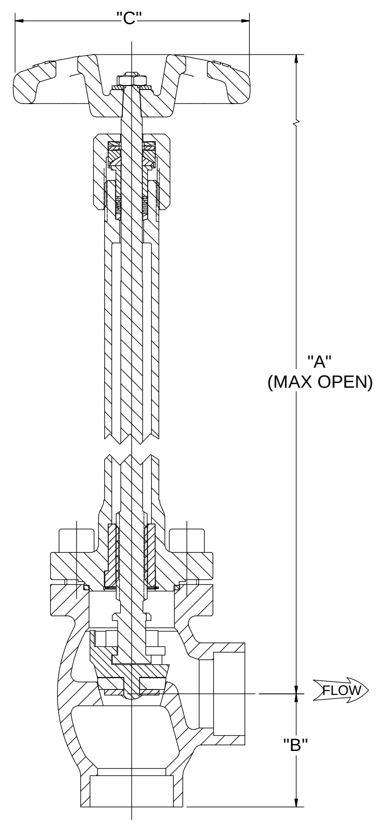
Stainless Steel Angle Globe Valves for Cryogenic Service
SKA Advantage Series

REGO 10 YEAR WARRANTY

Application

RegO/Goddard stainless steel angle globe valves are designed for handling cryogenic liquids. Designed for fill manifolds applications of bulk tanks. RegO Kold-Seal™ stem seal technology assures a tight seal preventing gas loss. The conical seat design allows exceptional flow, positive shut off and less chance of debris accumulation in the flow path—resulting in an overall longer service life. Maintenance on the packing and seat is quick and easy. Ideal service medium includes Oxygen, Nitrogen, Argon, Carbon Dioxide, Nitrous Oxide, Methane, Ethane, Ethylene, Krypton, and LNG.





Features

- Sizes: 1” through 1½”
- Connection: Socket Weld
- Service: Liquefied and vaporized atmospheric gases, LNG
- Temperature rating: -320°F to +150°F (-196°C to +65°C)
- Pressure rating: Cold, Non-Shock, 720 psig (50 barg) Class 300 (PN 50)
- Cleaned for Oxygen service per CGA G-4.1
- Soft Seat: PCTFE material which is the most widely specified cryogenic seat material in the industry
- Stem Packing: Proven Kold-Seal technology, live-loaded PTFE
- Conical seat, provides more Cv
- Seat assembly without nut and washer. No loose materials from vibration. Less chance of failure
- Pressure relief system of the bonnet increases life of packing system
- Ergonomic handwheels for ease of use
- 100% factory tested. Each valve is individually bagged and boxed to arrive in factory new condition until installation

Materials

Body .... Stainless Steel ASTM A351 CF8
Bonnet and Tube .Stainless Steel ASTM A351 CF8/ASTM A479 type 304
Stem ....Stainless Steel ASTM A582 S30300
Spring ....Stainless Steel ASTM A313 S30200
Packing... Live-loaded PTFE Packing
Gasket ....PTFE 25% Glass Fill
Seat Disc ....PCTFE ASTM D1430
Seat Retainer... Brass ASTM B16
Bonnet Screws ....ASTM B16 C36000
Handwheel.. Painted Aluminum

PED Certified

Ordering Information

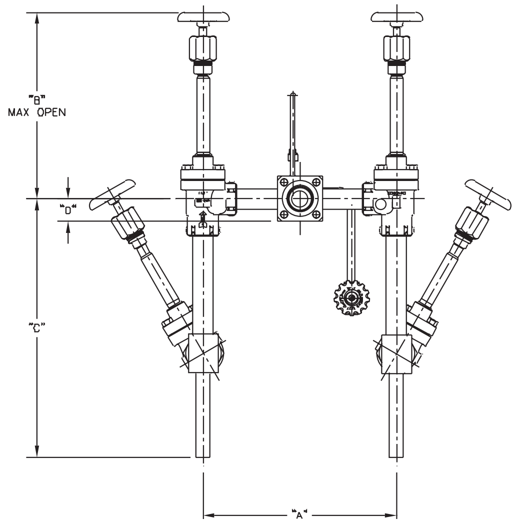
Part Number	Size Inches	Size DN	Connection	A (Inches)	A mm)	B (Inches)	B (mm)	C (Inches)	C (mm)	Weight Lbs	Weight Kg
SKA9408LSW	1"	25	Socket Weld	14.6	370	1.81	46	4	102	5.41	2.45
SKA9412LSW	1½"	40				2	51	5	127	8.85	4.01
SKA9408MSW	1"	25		10.6	270	1.81	46	4	102	4.8	2.17
SKA9412MSW	1½"	40				2	51	5	127	8.2	3.72

Cryogenic Fill Manifold
CFM, AFM, PFM and SFM Series

Application

RegO® Goddard high quality brazed and welded assemblies are ideally suited for the original equipment manufacturer of bulk cryogenic vessels. A wide variety of valve types including union or bolted bonnet, bronze or stainless steel bodies and top works and piping of stainless steel or copper construction are available as production unit.

Ideal for all cryogenic liquids including Liquefied Nitrogen, Oxygen and Argon. Safe and reliably used in LNG Systems. In addition RegO® can custom design configurations that are welded and brazed in a factory setting.



REGO 10 YEAR WARRANTY

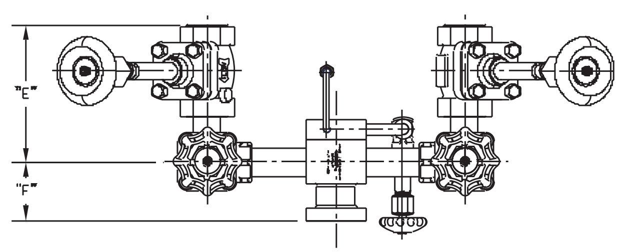
Features

- Unitized construction eliminates leaks and provides easy fit-up to tank piping
- Modules commonly include top and bottom fill valves, fill check with strainer and hose bleed and relief valve
- Many options are available which can include specific end user dimensions and specifications
- Our valve products stand up to high cycle environments, without the need for field adjustment of valve packing
- Available alone or as a unitized welded assembly for bulk tank filling
- Repeatable performance and geometry
- Precision silver brazed and welded assembly
- Cleaned for Oxygen service per CGA G-4.1
- Pressure Rating: 600 psig (41 barg)
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- 100% Factory tested

SFM-4D

Materials

Globe Valve .... Stainless Steel
Check Valve .... Brass
Bleed Valve .... Brass
Tube .... 304L Stainless Steel or Copper



Ordering Information

<table>
<tr><th>Part Number</th><th>Size Inches</th><th>Size mm</th><th>Bonnet Type</th><th>Pipe Material</th><th>Valve Material</th><th>A Inches</th><th>B Inches</th><th>C Inches</th><th>D Inches</th><th>E Inches</th><th>F Inches</th></tr>
<tr><td>SFM00004D</td><td rowspan="2">1½”</td><td rowspan="2">40</td><td rowspan="2">Bolted</td><td rowspan="2">Stainless Steel</td><td rowspan="2">Stainless Steel</td><td rowspan="2">15.00</td><td rowspan="2">14.63</td><td>20</td><td rowspan="2">1.75</td><td>2.54</td><td rowspan="2">3.4</td></tr>
<tr><td>SFM00004E</td><td>9.5</td><td>2.5</td></tr>
</table>

Stainless Steel Globe Valve for Cryogenic Service
210 Series

Features

- Top Entry: This valve can be permanently installed in the line and serviced from the top
- Soft Seated: PCTFE Seat provides a bubble-tight seal and is replaceable
- Construction: Body and Bonnet ASTM A351 J92600 Stainless steel
- Sizes: ½" - 4" (15mm - 100mm)
- Ends: RF Flange, Butt Weld, Socket Weld, Threaded (FNPT)
- Service: Liquefied and vaporized atmospheric gases, LNG
- 100% Factory Tested
- Clean for use in Oxygen per CGA G-4.1
- Temperature Rating: -320°F - 150°F (-196°C +65°C)
- Pressure Rating: (Cold, Non-shock)
  Class 150 valve - 275 psig (19 barg)
  Class 300 valve - 720 psig (50 barg)

  ½" - 4" Class 150
  PED Approved
  ½" - 4" Class 300
  PED Approved

210 Series

Our investment cast stainless steel is specified by leading industrial gas companies for storage tank and yard operations. Special order bonnet extensions are available for cold box applications. Valves for hydrogen use can be supplied.

Ordering Information

Stainless Body • RF Flange Ends

150# Part Number	300# Part Number	Valve Size Inches	Valve Size MM	Ends	150# Weight Lbs.	150# Weight Kg.	300# Weight Lbs.	300# Weight Kg.	Estimated C_V
GS-00210W-8F	GS-00210W-8F3	1"	25 mm	Flange	15	6.80	20	9.07	11.50
GS-00210W-16F	GS-00210W-16F3	2"	50 mm		35	15.88	40	18.14	40.00
GS-00210W-24F	GS-00210W-24F3	3"	80 mm		65	29.48	70	31.75	60.00
GS-00210W-32F	GS-00210W-32F3	4"	100 mm		95	43.09	100	45.35	175

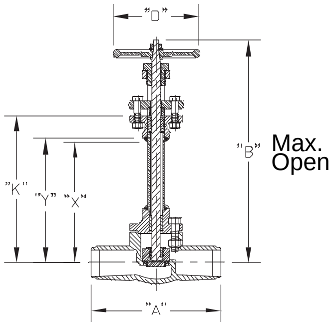
150# ANSI Class (275 psig Cold Working Pressure)
300# ANSI Class (720 psig Cold Working Pressure)

Stainless Body • Butt Weld, Socket Weld, Threaded Ends

150# Part Number	300# Part Number	Valve Size Inches	Valve Size MM	Ends	Weight Lbs.	Weight Kg	Estimated C_V
GS-00210W-4S3	GS-00210W-4S3	½"	15 mm	Socket Weld	15	6.80	3.90
GS-00210W-4T3	GS-00210W-4T3	½"	15 mm	Threaded	15	6.80	3.90
GS-00210W-6S3	GS-00210W-6S3	¾"	20 mm	Socket Weld	15	6.80	7.10
GS-00210W-6T3	GS-00210W-6T3	¾"	20 mm	Threaded	15	6.80	7.10
GS-00210W-8S3	GS-00210W-8S3	1"	25 mm	Socket Weld	15	6.80	11.50
GS-00210W-8T3	GS-00210W-8T3	1"	25 mm	Threaded	15	6.80	11.50
GS-00210W-12S3	GS-00210W-12S3	1½"	40 mm	Socket Weld	25	11.34	29.00
GS-00210W-16W3A	GS-00210W-16W3A	2"	50 mm	Butt Weld SCH10	35	15.88	40.00
GS-00210W-16W3J	GS-00210W-16W3J	2"	50 mm	Butt Weld SCH40	35	15.88	40.00
GS-00210W-24W3A	GS-00210W-24W3A	3"	80 mm	Butt Weld SCH10	55	24.95	60.00
GS-00210W-24W3J	GS-00210W-24W3J	3"	80 mm	Butt Weld SCH40	55	24.95	60.00
GS-00210W-32W3A	GS-00210W-32W3A	4"	100 mm	Butt Weld SCH10	80	36.29	175.00
GS-00210W-32W3J	GS-00210W-32W3J	4"	100 mm	Butt Weld SCH40	80	36.29	175.00

* Second number indicates valve for 300# part number.
150# ANSI Class (275 psig Cold Working Pressure)
300# ANSI Class (720 psig Cold Working Pressure)

Stainless Steel Globe Valve for Cryogenic Service
210 Series

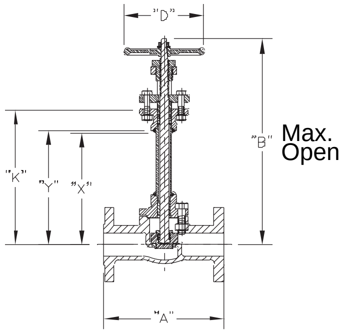


Butt Weld Ends

Size	"A"	"B"	"D"	"K"	"X"	"Y"
2"	10½"	22¼"	7"	15"	12¾"	13 1/16"
3"	12"	30½"	10"	21½"	19 1/16"	19⅜"
4"	13½"	36¾"	12"	24¼"	21 11/16"	22"

∆ For SCH. 40 A=12½"
ϴ For SCH. 40 A=14"

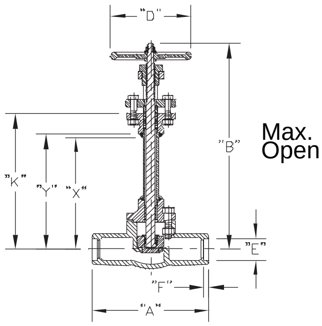
* Unless otherwise specified, SCH 10 weld ends are supplied
● Special B,K,X and Y dimensions available.



Raised Face Flange Ends*

Size	"A" 150#	"A" 300#	"B"	"D"	"K"	"X"	"Y"
1"	6½"	8"	18⅛"	5"	12¾"	11 1/16"	11⅜"
2"	8"	10½"	22¼"	7"	15"	12¾"	13 1/16"
3"	9½"	12½"	30½"	10"	21½"	19 1/16"	19⅜"
4"	11½"	14"	36¾"	12"	24¼"	21 11/16"	22"

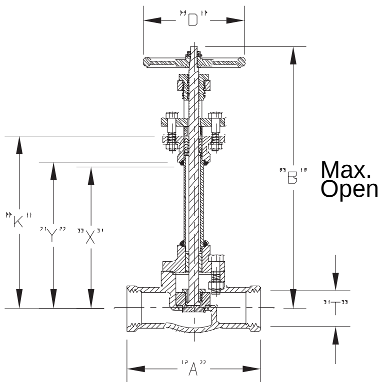
● Special B,K,X and Y dimensions available.



Socket Weld Ends

Size	"A"	"B"	"D"	"E"	"F"	"K"	"X"	"Y"
½"	5"	18⅛"	5"	.855	⅜"	12¾"	11 1/16"	11⅜"
¾"				1.065	½"			
1"				1.330	½"			
1½"	10¼"	22¼"	7"	1.915	½"	15"	12¾"	13 1/16"

● Special B,K,X and Y dimensions available.



Threaded Ends

Size	"T" - NPT	"A"	"B"	"D"	"K"	"X"	"Y"
½"	½"-14	5"	18⅛"	5"	12¾"	11 1/16"	11⅜"
¾"	¾"-14						
1"	1"-11½	5¾"					

● Special B,K,X and Y dimensions available.

Stainless Steel Gate Valve for Cryogenic Service
110 Series

Application

RegO Goddard gate valves are designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ASU plants and piping configurations. Compatible with Oxygen, Nitrogen, CO2, Argon and LNG.

Features

- Top Entry: This valve can be permanently installed in the line and serviced from the top
- Soft Seated: PCTFE Seat provides a bubble-tight seal and is replaceable
- Construction: Body and Bonnet ASTM A351-CF8 J92600 Stainless steel
- Sizes: ½" - 6" (15mm - 150mm)
- Ends: RF Flange, Butt Weld, Socket Weld, Threaded (FNPT)
- Service: Liquefied and vaporized atmospheric gases, LNG
- WHZ valves with Grafoil® stem packing available
- Temperature Rating: -320°F - 150°F (-196°C +65°C)
- 100% Factory Tested
- Clean for use in Oxygen per CGA G-4.1
- PED Approved
- Pressure Rating: (Cold, Non-shock)
  Class 150 valve - 275 psig (19 barg)
  Class 300 valve - 720 psig (50 barg)

REGO 10 YEAR WARRANTY

110 Series

Ordering Information

Stainless Body • RF Flange Ends

150# Part Number	300# Part Number	Valve Size Inches	Valve Size MM	Ends	Weight 150# Lbs.	Weight 150# Kg	Weight 300# Lbs.	Weight 300# Kg.	Estimated C_V
GS-00110W-8F	-	1"	25 mm		15	6.80	-	-	30.00
GS-00110W-12F	GS-00110W-12F3	1½"	40 mm		35	15.88	45	20.41	85.00
GS-00110W-16F	GS-00110W-16F3	2"	50 mm	Flange	35	15.88	50	22.68	100.00
GS-00110W-24F	GS-00110W-24F3	3"	80 mm		65	29.48	85	35.56	310.00
GS-00110W-32F	GS-00110W-32F3	4"	100 mm		90	40.82	120	54.43	700.00
GS-00110W-48F	GS-00110W-48F3	6"	150 mm		150	68.04	200	90.72	850.00

150# ANSI Class (275 psig Cold Working Pressure) 300# ANSI Class (720 psig Cold Working Pressure)

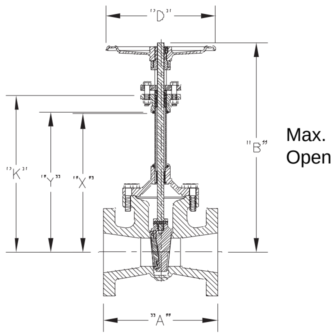
Ordering Information

Stainless Body • Butt Weld, Socket Weld, Threaded Ends

150# Part Number	300# Part Number	Valve Size Inches	Valve Size MM	Ends	Weight Lbs.	Weight Kg.	Estimated Cv
GS-00110W-4WA	-			Butt Weld SCH10	10	4.54	
GS-00110W-4S3	GS-00110W-4S3	½"	15 mm	Socket Weld	15	6.80	7.00
GS-00110W-4T	-			Threaded	10	4.54	
GS-00110W-6WA	-	¾"	20 mm	Butt Weld SCH10			23.00
GS-00110W-6S3	GS-00110W-6S3			Socket Weld	15	6.80	23.00
GS-00110W-8WA	-			Butt Weld SCH10	10	4.54	
GS-00110W-8S3	GS-00110W-8S3	1"	25 mm	Socket Weld	15	6.80	30.00
GS-110W-8T	-			Threaded	10	4.54	
GS-00110W-12WA	-	1½"	40 mm	Butt Weld SCH10	30	13.61	85.00
GS-00110W-12S3	GS-00110W-12S3			Socket Weld			
GS-00110W-16W3A	GS-00110W-16W3A			Butt Weld SCH10	35	15.88	
GS-00110W-16W3J	GS-00110W-16W3J	2"	50 mm	Butt Weld SCH40			100.00
GS-00110W-16S	-			Socket Weld	30	13.61	
GS-00110W-24W3A	GS-00110W-24W3A	3"	80 mm	Butt Weld SCH10	65	29.48	310.00
GS-00110W-24W3J	GS-00110W-24W3J			Butt Weld SCH40			
GS-00110W-32W3A	GS-00110W-32W3A	4"	100 mm	Butt Weld SCH10	80	40.82	700.00
GS-00110W-32W3J	GS-00110W-32W3J			Butt Weld SCH40			
GS-00110W-48WA	GS-00110W-48W3A	6"	150 mm	Butt Weld SCH10	120/150*	54.43/68.04*	850.00
GS-00110W-48W3J	GS-00110W-48W3J			Butt Weld SCH40			

150# ANSI Class (275 psig Cold Working Pressure) 300# ANSI Class (720 psig Cold Working Pressure)* Second number indicates valve for 300# part number.
Service: 300#-720 psig Non-shock Cold • Service: 150#-275 psig Non-shock Cold • Temperature Rating +150°F - 325°F • Mounting plate option available

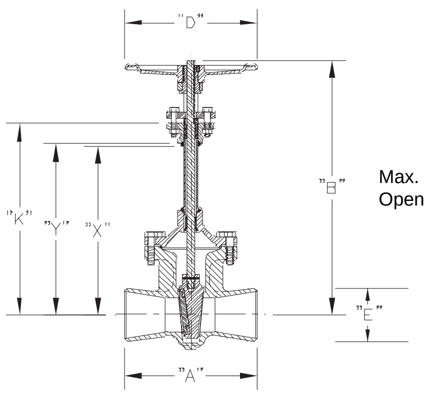
Stainless Steel Gate Valve for Cryogenic Service
110 Series



Raised Face Flange Ends*

Size	"A" 150#	"A" 300#	"B"	"D"	"K"	"X"	"Y"
1"	4⅛"	N/A	17¾"	4½"	12¾"	11 1/16"	11⅜"
1½"	4⅝"	6⅛"*	21⅞"	7"	14"	12 5/16"	12⅝"
2"	7"	7¼"*	21⅞"	7"	14"	12 5/16"	12⅝"
3"	8"	8¾"*	31½"	12"	20"	17¾"	18 1/16"
4"	9"	12"	33¾"	12"	21½"	19¼"	19 9/16"
6"	10½"	15⅞"	41½"	16"	26"	23 9/16"	23⅞"

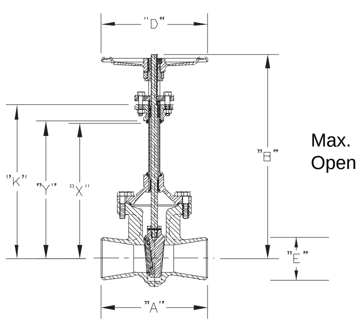
*Face-to-face dimensions (A) are Goddard standard not to ANSI standard.
- Special B,K,X and Y Dimensions Available



Socket Weld Ends

<table>
<tr><th>Size</th><th>"A" 150#</th><th>"A" 300#</th><th>"B"</th><th>"D"</th><th>"E"</th><th>"F"</th><th>"K"</th><th>"X"</th><th>"Y"</th></tr>
<tr><td>½"</td><td rowspan="2">3¾"</td><td rowspan="2">3¾"</td><td rowspan="3">17¾"</td><td rowspan="3">4½"</td><td>.855</td><td>⅜"</td><td rowspan="3">12¾"</td><td rowspan="3">11 1/16"</td><td rowspan="3">11⅜"</td></tr>
<tr><td>¾"</td><td>1.065</td><td rowspan="3">½"</td></tr>
<tr><td>1"</td><td>3½"</td><td>4"</td><td>1.330</td></tr>
<tr><td>1½"</td><td>4⅝"</td><td>5"</td><td rowspan="2">21⅞"</td><td rowspan="2">7"</td><td>1.915</td><td rowspan="2">14"</td><td rowspan="2">12 5/16"</td><td rowspan="2">12⅝"</td></tr>
<tr><td>2"</td><td>8½"</td><td>N/A</td><td>2.406</td><td>⅝"</td></tr>
</table>

- Special B,K,X and Y Dimensions Available



Butt Weld Ends

Size	"A" 150#	"A" 300#	"B"	"D"	"K"	"X"	"Y"
½"	4¼"	N/A	17¾"	4½"	12¾"	11 1/16"	11⅜"
¾"	4⅝"	N/A	17¾"	4½"	12¾"	11 1/16"	11⅜"
1"	5"	N/A	17¾"	4½"	12¾"	11 1/16"	11⅜"
1½"	6"	6"	21⅞"	7"	14"	12 5/16"	12⅝"
2"	8½"	8½"	21⅞"	7"	14"	12 5/16"	12⅝"
3"	11⅛"	11⅛"	31½"	12"	20"	17¾"	18 1/16"
4"	12"	12"	33¾"	12"	21½"	19¼"	19 9/16"
6"	15⅞"	15⅞"	41½"	16"	26"	23 9/16"	23⅞"

- Special B,K,X and Y Dimensions Available
- Unless otherwise specified, Schedule 10 weld ends are supplied

Cryogenic ½" Pressure Builder
PB Series

Application

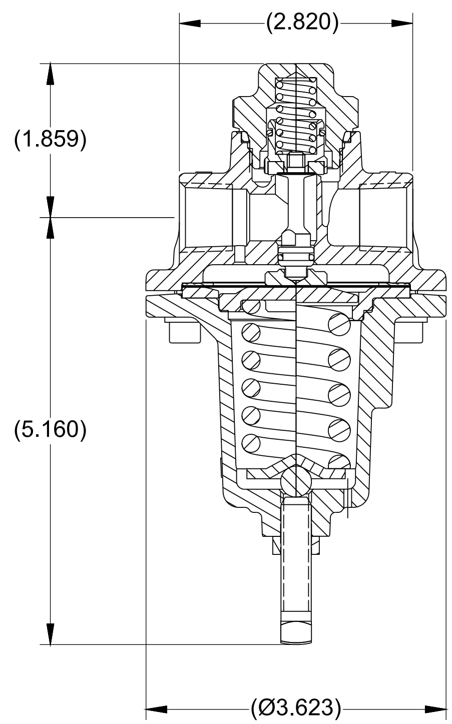
PB series cryogenic regulators are primarily designed to maintain the pressure in cryogenic containers; they may also be used as a line regulator for cryogenic lines and cold gas lines. They are specifically useful in installations where the precision in pressure control and flow capability are important. For use with Oxygen, Nitrogen, Argon, LNG and CO2.

Features

- All parts are copper alloy (brass), PTFE and stainless steel—materials selected specifically for compatibility with cryogenic temperatures down to -320°F (-196º C)
- PTFE seat helps assure a positive shut-off at cryogenic temperatures down to -320°F (-196º C)
- High and low pressure regulators are the same compact size—designed to fit in close quarters
- Customizable pressure settings between 20 - 550 psig (1.4 - 37.9 barg)
- Interchangeable with existing cryogenic regulator units
- Inlet filter (150 Mesh) helps prevent foreign material from entering the regulator.
- Easier to service, use an Allen wrench versus large crescent wrench
- Less field repair because diaphragm is squeezed versus twisted
- Locknut is provided to maintain adjusting screw setting
- Maximum inlet pressure of 600 psig (41.4 barg)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested

REGO 10 YEAR WARRANTY

PB504



Materials

Body .... Brass
Bonnet .... Brass
Seat .... PTFE
Springs .... Stainless Steel
Diaphragm Gasket............ PTFE
Backcap Seal............ PTFE
Diaphragm .... Bronze
Inlet Filter............ Monel)

PB504 Series part number configuration

PB504 - 205

Series

Set Pressure psig

Ordering Information

Part Number	Inlet / Outlet Connections (FNPT) A	Delivery Pressure Setting Range psig (barg)
PB504-020 to 070	½"	20 - 75 psig (1.4 - 5.2 barg)
PB504-071 to 175		50 - 180 psig (3.4 - 12.4 barg)
PB504-176 to 300		150 - 300 psig (10.3 - 20.7 barg)
PB504-301 to 550		250 - 550 psig (17.2 - 37.9 barg)

Delivery pressure setting psig specified by suffix in PB regulator number. Example: An order for PB504-125 has a maximum inlet pressure rating of 600 psig (41.3 barg) and is set at an outlet pressure of 125 psig (8.6 barg).

Heavy-duty Gas Line Regulator
1780 Series

Application

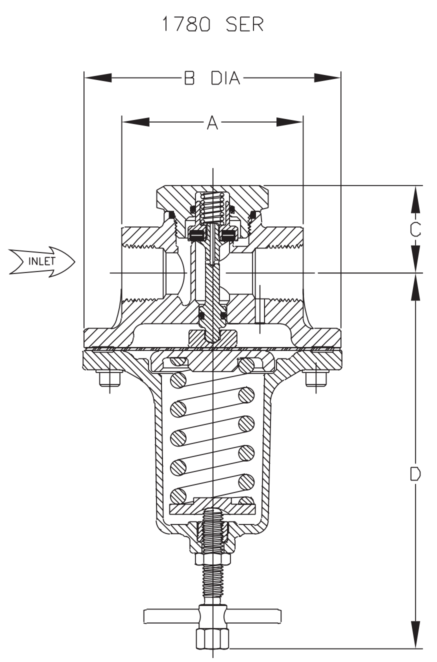
The 1780 Series Regulators are designed for final line pressure regulation on gas distribution systems. They are suitable for a variety of gases in medical or industrial applications. The 1780 Series Regulators have a balanced seat, are constructed with Oxygen compatible materials, and have the same valve design, brass body, and internal parts as the premium BR-1780 Series. Flow performance is equal to the BR-1780 Series.

REGO 10 YEAR WARRANTY

1780 Series

Features

- Maintains a steady downstream pressure across a range of inlet pressures commonly provided by a cryogenic bulk tank
- Large seat and diaphragm areas provide high capacity with sensitive control of delivery pressure with low falloff
- Two ¼" FNPT delivery pressure gauge ports are located (plugged) on each side of the valve
- Two bonnet drain/vent holes to allow for different mounting orientation
- T-handle adjusting screw
- Maximum inlet pressure is 500 psig (34.5 barg)
- Available in four delivery pressure ranges (A-D)
- Temperature range: -40° F to +165º F. (-40ºC to +74ºC)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested



Materials

Body .... Forged Brass
Bonnet .... Nickel Plated Aluminum
Diaphragm .... Nitrile with PTFE liner
Springs and Fasteners .... Stainless Steel
Other valve parts .... Brass
Seat Disc and O-Rings .... Viton is standard

For Carbon Dioxide or Nitrous Oxide service: Specify EPDM material for seat disc and O-rings, add "E" to end of part number.

Ordering Information

Part Number	Delivery Pressure Range	Pressure Gauge*		Inlet and Outlet (FNPT.)	Dimensions				Cv
		Range (psig)	P/N		"A"	"B"	"C"	"D"	
1784A	5-55 psig (0.3-3.8 barg)	1-100	1286	½"	2.82"	3.62"	1.38"	5.47"	3.1
1784B	40-110 psig (2.8-7.6 barg)	1-200	S1679						
1784C	100-200 psig (6.9-13.8 barg)	1-400	15578						
1784D	175-300 psig (12.1-20.7 barg)								
1786A	5-55 psig (0.3-3.8 barg)	1-100	1286	¾"	3.31"	4.69"	1.60"	6.84"	4.8
1786B	40-110 psig (2.8-7.6 barg)	1-200	S1679						
1786C	100-200 psig (6.9-13.8 barg)	1-400	15578						
1786D	175-275 psig (12.1-19.0 barg)								
1788A	5-55 psig (0.3-3.8 barg)	1-100	1286	1"					5.5
1788B	40-110 psig (2.8-7.6 barg)	1-200	S1679						
1788C	100-200 psig (6.9-13.8 barg)	1-400	15578						
1788D	175-275 psig (12.1-19.0 barg)								

*Regulator sold without gauge. Order gauge separately.

Angle Relief Valve, ASME
AR4100 Series

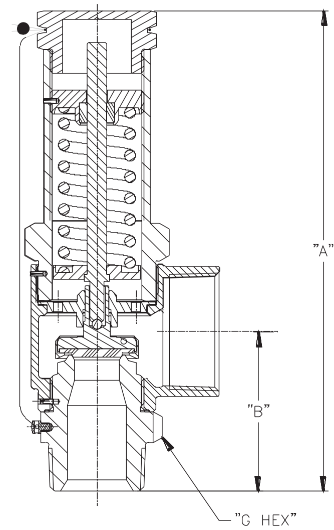
Application

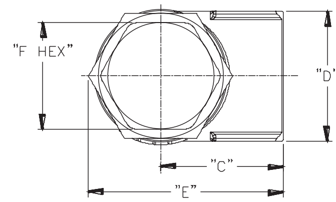
The ASME approved 90° relief valves AR Series, provide precise relief set-points which protect cryogenic vessels and piping systems for over-pressurization.

Features

- High flow rates are approved by rigorous testing to ASME BVPC Code Section VIII
- The 90° configuration provides relief of gases eliminating direct flow through the spring
- The 90° configuration allows easy incorporation to plumbing for output containment
- Bubble-tight seat provides 100% shut off when reseating or static mode
- A variety of inlets and pressure settings assure adherence to application requirements
- Temperature Range: -320°F (-196°C) to +165°F (+74°C)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested
- PED, TPED, ASME and CRN Certified

AR4100 Series





REGO 10 YEAR WARRANTY

Materials

Body .... Bronze ASTM B61
Upper Body .... Stainless Steel ASTM A582
Seat and Stem .... Brass ASTM B16
Poppet Guide .... Brass ASTM B16
Spring Retainer .... Brass ASTM B16
Adjusting Screw .... Brass ASTM B16
Cap .... Brass ASTM B16
Ball .... Stainless Steel
Gasket .... Copper ASTM B152-17
Spring .... Stainless Steel ASTM A313
Seal .... Modified PTFE

Ordering Information

Fill in the blanks with options below.

Example: AR4106A300

AR	4106	A	300
Angle Relief	Size	Cert Requirements and Pressure Unit	Set Pressure

Certifications
A - ASME, TPED, PED
B - ASME, TPED, PED
N - TPED, PED
: - B Version Assembled in Europe

Set Pressure
A,N - psig
B - barg

Size
04=½"
06=¾"
08=1"
12=1½"

Set-point tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

Note: For psig pressure settings, the part numbers end in A
For barg pressure settings, the part numbers end in B

Air Capacity= m x P
Where:
m = Slope Value
P= Pressure, Absolute @10% overpressure.

Example: Pressure relief valve, ½" inlet x 1" outlet, at 80 psig. Part number AR4108A080.
m = 1.4
P= 80 psig
Air Capacity= 1.4 x [(80psig x 1.10) +14.7]
Air Capacity= 143.8 SCFM (air)

Flow Performance

AR4104A set pressures 75 - 500 capacity is 1.4 SCFM of air per psig of flow pressure.
AR4106A set pressures 75 - 400 capacity is 1.56 SCFM of air per psig of flow pressure.
AR4108A set pressures 75 - 425 capacity is 3.463 SCFM of air per psig of flow pressure.
AR4112A set pressures 80 - 425 capacity is 7.86 SCFM of air per psig of flow pressure.
Flow pressure per ASME is 10% above set pressure or +3 psig, whichever is greater.

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Ends	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Set Pressure	ASME Flow Capacity (Air) at 110% Set Pressure	Weight Lbs (Kg)
AR4104A	½" (15)	1" (25)	Thread NPT	6.03" (153.16)	1.97" (50.04)	1.63" (41.40)	1.63" (41.40)	2.49" (63.25)	250 psig	406 SCFM *	2.75 (1.25)
AR4104B									17.23 barg*	690 m³/hr	
AR4106A	¾" (20)		Thread NPT						250 psig*	451 SCFM	
AR4106B									17.23 barg*	766 m³/hr	
AR4108A	1" (25)	1¼" (32)	Thread NPT	6.88" (174.75)	2.37" (60.20)	2.00" (50.80)	1.90" (48.26	3.01" (76.45)	250 psig*	1,003 SCFM	3.75 (1.70)
AR4108B									17.23 barg*	1704 m³/hr	
AR4112A	1½" (40)	2" (50)	Thread NPT	9.64" (244.86)	3.20" (81.28)	2.45" (62.23)	2.60" (66.04)	3.89" (98.81)	250 psig*	2,277 SCFM	8.00 (3.63)
AR4112B									17.23 barg*	3869 m³/hr	

*Custom psig and barg settings are available
Note: For Non-ASME stamp, the part numbers are: AR4104N, AR4106N, AR4108N, AR4112N.

REGO

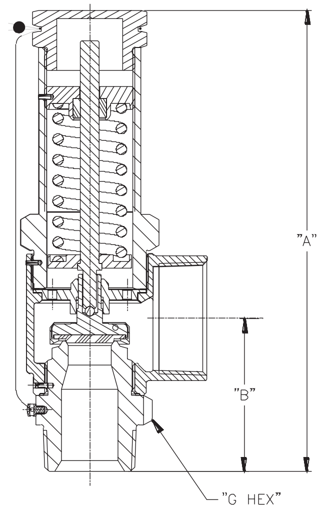
Application

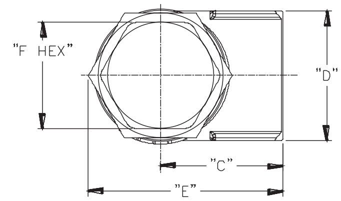
The ASME approved 90° relief valves AR Series, provide precise relief set-points which protect cryogenic vessels and piping systems for over-pressurization.

Features

- High flow rates are approved by rigorous testing to ASME BVPC Code Section VIII
- The 90° configuration provides relief of gases eliminating direct flow through the spring
- The 90° configuration allows easy incorporation to plumbing for output containment
- Bubble-tight seat provides 100% shut off when reseating or static mode
- A variety of inlets and pressure settings assure adherence to application requirements
- Temperature Range: -320°F (-196°C) to +165°F (+74°C)
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory Tested
- PED, TPED and ASME Certified

AR5100 Series





Materials

Body	Bronze ASTM B61
Upper Body	Stainless Steel ASTM A582
Seat and Stem	Brass ASTM B16
Poppet Guide	Brass ASTM B16
Spring Retainer	Brass ASTM B16
Adjusting Screw	Brass ASTM B16
Cap	Brass ASTM B16
Ball	Stainless Steel
Gasket	Copper ASTM B152-17
Spring	Stainless Steel ASTM A313
Seal	Modified PTFE

Ordering Information

Fill in the blanks with options below.

Example: AR5106A300

AR — 5106 — A — 300

Angle Relief | **Size** | **Cert Requirements and Pressure Unit** | **Set Pressure**

Certifications
A - ASME, TPED, PED
B - ASME, TPED, PED
N - TPED, PED
: - B Version Assembled in Europe

Set Pressure
A,N - psig
B - barg

Size
04=½"
06=¾"
08=1"
12=1½"

Set-point tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

Note: For psig pressure settings, the part numbers end in A
For barg pressure settings, the part numbers end in B

Air Capacity= m x P
Where:
m = Slope Value
P= Pressure, Absolute @10% overpressure.

Example: Pressure relief valve, ½" inlet x 1" outlet, at 80 psig. Part number AR5108A080.
m = 1.4
P= 80 psig
Air Capacity= 1.4 x [(80psig x 1.10) +14.7]
Air Capacity= 143.8 SCFM (air)

Flow Performance

AR5104A set pressures 75 - 500 capacity is 1.4 SCFM of air per psig of flow pressure.
AR5106A set pressures 75 - 400 capacity is 1.56 SCFM of air per psig of flow pressure.
AR5108A set pressures 75 - 425 capacity is 3.463 SCFM of air per psig of flow pressure.
AR5112A set pressures 80 - 425 capacity is 7.86 SCFM of air per psig of flow pressure.
Flow pressure per ASME is 10% above set pressure or +3 psig, whichever is greater.

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Ends	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	Set Pressure	ASME Flow Capacity (Air) at 110% Set Pressure	Weight Lbs (Kg)
AR5104A	½" (15)	1" (25)	Thread BSPP	6.03" (153.16)	1.97" (50.04)	1.63" (41.40)	1.63" (41.40)	2.49" (63.25)	250 psig*	406 SCFM	2.75 (1.25)
AR5104B									17.23 barg*	690 m³/hr	
AR5106A	¾" (20)								250 psig*	451 SCFM	
AR5106B									17.23 barg*	766 m³/hr	
AR5108A	1" (25)	1¼" (32)		6.88" (174.75)	2.37" (60.20)	2.00" (50.80)	1.90" (48.26	3.01" (76.45)	250 psig*	1,003 SCFM	3.75 (1.70)
AR5108B									17.23 barg*	1704 m³/hr	
AR5112A	1½" (40)	2" (50)		9.64" (244.86)	3.20" (81.28)	2.45" (62.23)	2.60" (66.04)	3.89" (98.81)	250 psig*	2,277 SCFM	8.00 (3.63)
AR5112B									17.23 barg*	3869 m³/hr	

*Custom psig and barg settings are available
Note: For Non-ASME stamp, the part numbers are: AR5104N, AR5106N, AR5108N, AR5112N.

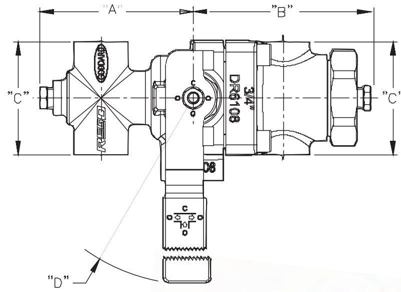
Pressure Setting and Flow Data
AR Series

Pressure Setting and Flow Data AR Series SCFM (air)						
Pressure Setting psig	barg	MPA	AR4104A AR5104A	AR4106A AR5106A	AR4108A AR5108A	AR4112A AR5112A
22	1.5	.15	54	61	135	306
25	1.7	.17	59	66	146	332
30	2.1	.21	67	74	165	375
35	2.4	.24	74	83	184	418
40	2.8	.28	82	91	203	461
45	3.1	.31	90	100	222	505
50	3.4	.34	98	108	241	548
55	3.8	.38	105	117	260	591
60	4.1	.41	113	126	279	634
65	4.5	.45	121	134	299	678
70	4.8	.48	128	143	318	721
75	5.2	.52	136	151	337	764
80	5.5	.55	144	160	356	807
90	6.2	.62	159	177	394	894
100	6.9	.69	175	194	432	980
110	7.6	.76	190	211	470	1067
120	8.3	.83	205	228	508	1153
130	9.0	.90	221	245	546	1240
140	9.7	.97	236	262	584	1326
145	10.0	1.0	244	271	603	1369
150	10.3	1.03	252	280	622	1413
175	12.1	1.21	290	322	718	1629
200	13.8	1.38	329	365	813	1845
225	15.5	1.55	367	408	908	2061
230	15.9	1.59	375	417	927	2104
235	16.2	1.62	382	425	946	2148
240	16.6	1.66	390	434	965	2191
250	17.2	1.72	406	451	1003	2277
260	17.9	1.79	421	468	1041	2364
265	18.3	1.83	429	476	1060	2407
275	19.0	1.90	444	494	1098	2494
280	19.3	1.93	452	502	1118	2537
285	19.7	1.97	459	511	1137	2580
290	20.0	2.0	467	519	1156	2623
295	20.3	2.03	475	528	1175	2666
300	20.7	2.07	483	536	1194	2710
325	22.4	2.24	521	579	1289	2926
350	24.1	2.41	560	622	1384	3142
375	25.9	2.59	598	665	1479	3358
400	27.6	2.76	637	708	1575	3574
425	29.3	2.93	675	750	1670	3791
450	31.0	3.1	714	793	1765	4007
475	32.8	3.28	752	836	1860	4223
500	34.5	3.45	791	879	1956	4439
525	36.2	3.62	829	921	2051	4655
550	37.9	3.79	868	964	2146	4871

RegO® - Relief Device Diverter (3-Way) Valve
DR6100 Series

Application

The DR Diverter Valve Series provides a simple solution for the isolation of pressure relief devices during routine change out of a relief valve and burst discs without evacuating the vessel. Excellent for protecting bulk liquid vessels, transport trailers, industrial pipelines, and LNG systems.



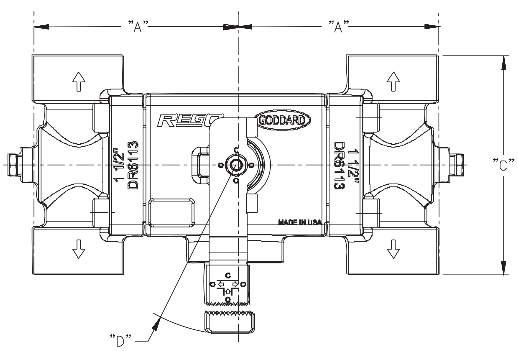
Features

- High flow rates complement our AR series pressure relief valves
- Valve side selection is accomplished with a heavy-duty control arm clearly labeled for positive isolation
- RegO® needle valves accessorize for easy bleed of gas before removing pressure relief devices
- Fitted with threaded top Relief Valve ports and bottom Burst Disk connections
- Pressure Rating: 600 psig (41.37 barg) CWP
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- 100% Factory tested
- Cleaned for Oxygen service per CGA G-4.1

DR6108

Materials

Bodies....................................... Bronze ASTM B61 UNS C92200
Bushing, End Cap... Brass B16 C36000
Seat Rings... PCTFE ASTM D1430
Gasket .... PTFE
Ball.. 316 Stainless Steel
Lever.. Cadmium Plated Steel
Packing... PTFE
Stem .... Stainless Steel ASTM A582 UNS S30300



DR6112 and DR6113

Ordering Information

Part Number	Inlet Inches (mm)	Outlet Inches (mm)	Connection Type	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	Height Inches (mm)	Weight Lbs (Kg)	Open Port	Cv
DR6108	1" (25.4)	¾" (19.05)	Thread NPT	4" (101.7)	4.65" (118.3)	2.94" (74.90)	R 7.36" (187.1)	5.18" (63.25)	10# (4.50)	Right	13.3
										Left	
										Both	20.1
DR6112	1½" (38.1)	1" (25.4)		4.12" (104.6)	-	5.70 (145.0)	R 7.36" (187.1)	5.770" (146.6)	28# (12.70)	Right	18.8
										Left	
										Both	37
DR6113	1½" (38.1)	1½" (38.1)			-	5.70 (145.0)	R 7.36" (187.1)	5.770" (146.6)	30# (13.60)	Right	22.6
										Left	
										Both	40.2

RegO® - Bulk Vessel Safety Assembly – Relief Valve and Diverter DA6200 Series

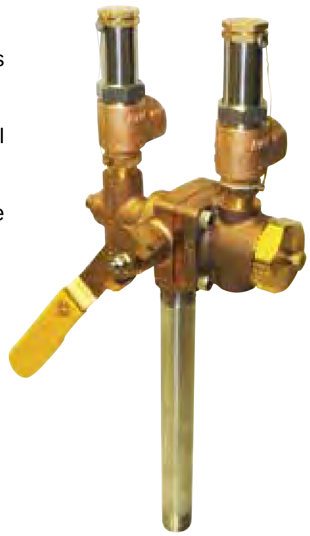
Application

RegO® provides a complete unitized solution for pressure relief devices assembled in a factory setting ready for attachment to cryogenic bulk tanks. Ideal for OEM applications where pre-fabricated assemblies are favored to streamline construction. Excellent for protecting bulk liquid vessels, transport trailers, industrial pipelines and LNG systems.

REGO 10 YEAR WARRANTY

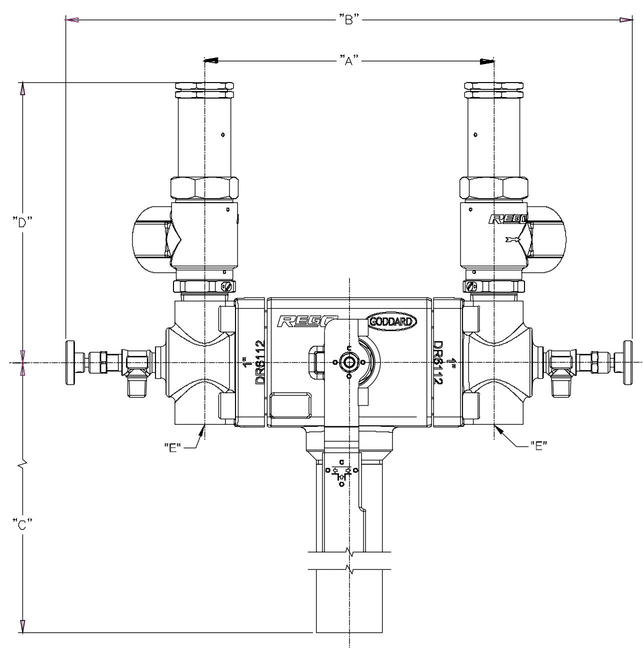
Features

- High flow rates complement our AR series pressure relief valves and burst disks
- Valve side selection is accomplished with a heavy-duty control arm clearly labeled for positive isolation
- RegO® needle valves accessorize for easy bleed of gas before removing pressure relief devices
- Pressure Rating: 600 psig (41.37 barg) CWP
- Temperature Rating: -320°F (-196°C) to +165°F (+74°C)
- Cleaned for Oxygen service per CGA G-4.1
- Packaged ready for installation



DA6206

DA6208



Ordering Information

Fill in the blanks with options below.

Example: DA6206A300

DA	6206	A	300
Diverter Assembly	Size	Cert Requirements and Pressure Unit	Set Pressure

Certifications
A - ASME, TPED, PED
B - ASME, TPED, PED
N - TPED, PED
: - B Version Assembled in Europe

Set Pressure	Size
A,N - psig	04=½"
B - barg	06=¾"
	08=1"
	12=1½"

Set-point tolerance is ± 3% of the set pressure or ± 2 psig whichever is greater.

Ordering Information

Part Number	Inlet Inches (mm)	Connection Type	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)
DA6206	¾"	Thread NPT	4.76" (120.9)	13.25" (336.55)	9.75" (247.7)	7.00" (177.8)	¾" NPT (19.0)
DA6208	1"		8.33" (211.6)	16.30" (414)	16.47" (418.34)	8.06" (204.7)	1" NPT (25.0)

Stainless Steel Swing Check Valve for Cryogenic Service
886 Series

REGO 10 YEAR WARRANTY

Application

The RegO Goddard 886 Series check valve is designed for handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations. Compatible with Oxygen, Nitrogen, CO2 Argon and LNG.

Features

- Top Entry: This bolted bonnet valve can be permanently installed in the line and service from the top
- Construction: Designed to prevent back flow in cryogenic systems. Higher fluid capacity (C_V) than poppet or lift check valves. 316L stainless steel investment cast body, cap and arm
- Sizes: ½” through 4” (15mm through 100mm)
- Ends: Socket Weld and Butt Weld schedule 10 and 40
- Temperature Rating: -320°F to 150°F (-196°C to +66°C)
- Cleaned for Oxygen service per CGA G-4.1.
- Pressure Rating: (Cold, Non-shock)
  400 psig (27 barg) ½” - 2”
  275 psig (19 barg) 150# ANSI Class 3” and 4”
  720 psig (50 barg) 300# ANSI Class 3” and 4”
  PED Approved

- Note: Do not use for reciprocating gas service.

- Our investment cast stainless steel is specified by leading industrial gas companies for storage tank and yard operations.

- Ideal for liquid atmospheric gases and LNG storage and handling.

- High cycle life and superior sealing.

- Valves for hydrogen service can be supplied. (-425°F to +350°F)

- Cracking Pressure: 0.5 psig (0.03) barg

886 Series

Ordering Information

886

Stainless Steel Swing Check Valves
Soft Seat

GRAFOIL® Gasket - Hydrogen Service - Socket Weld

Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm					
S-0886GF-4S	½”	15 mm	Socket Weld	Soft	400 (27.5 barg)	4.50	3 Lbs.
S-0886GF-8S	1”	25 mm				61.00	11 Lbs.
S-0886GF-12S	1½”	40 mm				99.00	17 Lbs.

PTFE Gasket - Socket Weld

Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm					
S-000886-4S	½”	15 mm	Socket Weld	Soft	400 (27.5 barg)	4.50	3 Lbs.
S-000886-8S	1”	25 mm				61.00	11 Lbs.
S-000886-12S	1½”	40 mm				99.00	17 Lbs.

Stainless Steel Swing Check Valve for Cryogenic Service
886 Series

PTFE Gasket - Buttweld

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm						
S-000886-4WA	½"	15 mm	Butt Weld	Soft	10	400 (27.5 barg)	4.50	3 Lbs.
S-000886-8WA	1"	25 mm					18.00	11 Lbs.
S-000886-12WA	1½"	40 mm					61.00	17 Lbs.
S-000886-16W3A	2"	50 mm				720 (50 barg)	99.00	17 Lbs.
S-000886-24WA	3"	80 mm				275 (19 barg)	255.00	47 Lbs.
S-000886-24WJ	3"	80 mm			40		225.00	46 Lbs.
S-000886-32W3J	4"	100 mm				720 (50 barg)	475.00	95 Lbs.
S-000886-32WA	4"	100 mm			10	275 (19 barg)	475.00	95 Lbs.

886M

Stainless Steel Swing Check Valves - Metal Seat

PTFE Gasket - Socket Weld

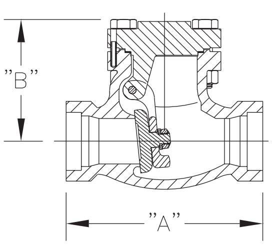
Part Number	Valve Size		End Connection	Seat	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm					
S-00886M-4S3	½"	15 mm	Socket Weld	Metal	720 (50 barg)	4.50	3 Lbs.
S-00886M-8S3	1"	25 mm				18.00	11 Lbs.
S-00886M-12S3	1½"	40 mm				61.00	17 Lbs.

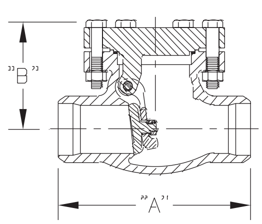
Butt Weld Ends

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm						
S-0886M-16W3A	2"	50 mm	Butt Weld	Metal	10	720 (50 barg)	99.00	17 Lbs.
S-00886M-24W3J	3"	80 mm			40		225.00	46 Lbs.
S-00886M-24W3A	3"				10		225.00	
S-00886M-32WA	4"	100 mm				275 (19 barg)	475.00	95 Lbs.
S-00886M-32W3J	4"				40	720 (50 barg)	475.00	

Butt Weld Ends with GRAFOIL® Gasket for Hydrogen Service

Part Number	Valve Size		End Connection	Seat	Butt Weld Schedule	Pressure Rating	Estimated C_V	Weight Lbs.
	Inches	mm						
S-886MGF-16W3A	2"	50 mm	Butt Weld	Metal	10	720 (50 barg)	99.00	17 Lbs.
S-886MGF-24W3A	3"	80 mm					225.00	46 Lbs.

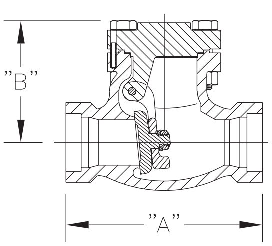


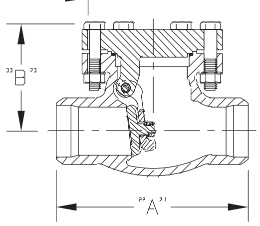


886

Pressure Rating 300 psig Non-Shock Cold, Temperature Rating +150° F to - 325° F
All Dimensional Data are in inches.

Size	"A"	"B"
½"	4¼"	2½"
¾"	5"	3¼"
1"		
1½"	6½"	4"
2"	8"	4½"





886M

Service 300 Class 720 psig Non-Shock Cold, Temperature Rating +150° F to - 325° F
All Dimensional Data are in inches.

Size	"A"	"B"	Butt Weld End Schedule
1½"	6½"	4"	10
2"	8"	4½"	
3"	9½"	5¾"	10 and 40
4"	11½"	8⅜"	10
4"	14"	8⅜"	40

Size	"A"	"B"	End	End Dimension
½"	2 7/16"	4¼"	Socket Weld	SCH 10
				½" Pipe Socket

REGO

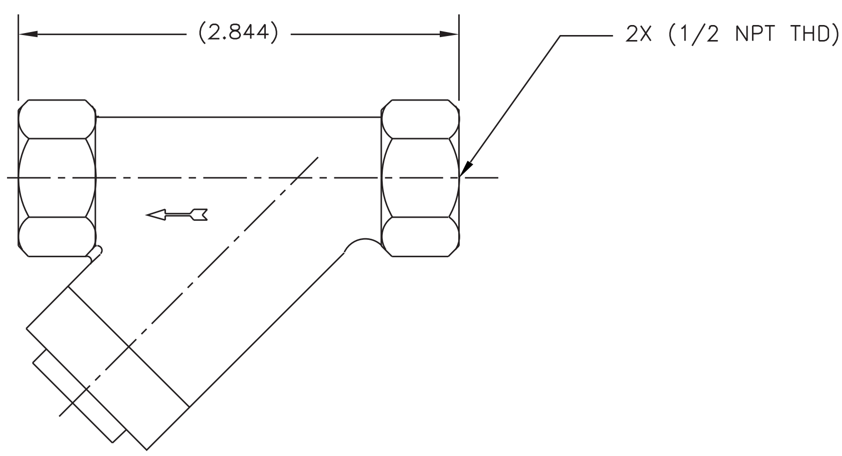
Strainer
STR000002

Application
The STR000002 strainers have been designed to retain debris and any other pollution that could be in the lines, and could affect the performance of regulators and other devices. The STR000002 use a Monel filter material. Designed for the handling of cryogenic liquids through bulk tanks, trucks, trailers, ISO-containers and piping configurations.

Features
- Temperature range: -320°F to 165°F. (-196°C to 74°C)
- Maximum working pressure: 600 psig (41,37 barg)
- Connections: FNPT
- Sizes: ½”
- Service: Liquefied and Vaporized Atmospheric Gases and LNG for Trailers, Bulk Tanks, ISO-Containers and Piping Configurations.
- Cleaned for Oxygen service per CGA G-4.1
- 100% Factory tested.

STR000002

Materials
Body ....Brass
Cap ....Brass
Filter Material.. 100 Mesh Monel



Ordering Information

Part Number	Inlet Inches	Outlet Inches	A Inches
STR000002	½”	½	2 4/5”

Repair Kits

Ordering Information

Kit Number	Part Number	Kit Contents
ECL502-80R	ECL502-22 to ECL502-175.	Diaphragms, Diaphragm liner, Spring guide, ball seat.
ECL502-80A	ECL502-180 to ECL502-350.	
CB502-80	CBC502-22 to CBC502-175, CBH502-22 to CBH502-175	Diaphragm assembly, diaphragm gasket, Backcap gasket,poppet seat, seat pin.
CB502-80A	CBC502-180 to CBC502-350, CBH502-180 to CBH502-350	
ECL-80	ECL22, ECL70, ECL100, ECL140	Diaphragm assembly, diaphragm gasket, poppet, retaining ring, spring, washer.
ECL-80A	ECL325	
RG-80*	RG22, RG75, RG125, BC125, CBH125	Backcap gasket, diaphragm assembly, diaphragm gasket, seat assembly.
RG-80A*	RG300	
RG-81**	RG75A, RG125A, CBC125A & CBH125A	
RG-81A**	RG300A, CBC300A & CBH300A	
RG-82	RG Series	Diaphragm assembly, gasket.
1784NG-80	1784NG Series	Diaphragm assembly,seat assembly,gasket.

*Good for valves manufactured before Fall 2010
**Good for valves manufactured after Fall 2010

Ordering Information

Kit Number	Part Number	Kit Contents
ES8450R	T9450 Series and T9460 Series	Stem assembly (4”), packing, bonnet, handwheel
BK9450-80	9450 Series, 9460 Series	Stem assembly , Spring, Jam Ring,Packing V-ring,Packing Gland, O-ring, Washer, Locknut, Gasket.
BK9450R **	9450 Series, 9460 Series	Extended Bonnet Assembly Kit, Spring load packing for conversion of extended stem valves and topworks replacement
BKA8400R	BKA8412SE	Stem assembly, handwheel, seat assembly Converts SE Series to New Style S Series
T9464-80	T9450 Series, T9460 Series,9450 Series, 9460 Series	Complete valve trim assembly including Silver handwheel
T9464-80B		Complete valve trim assembly including Blue handwheel
T9464-80G		Complete valve trim assembly including Green handwheel
T9464-80R		Complete valve trim assembly including Red handwheel
BK-9450-KIT***	ES8450 Series,ES9450 Series,BK9450 Series	Extended Bonnet Assembly Kit, Spring load packing for conversion of extended stem valves and topworks replacement

** Changes to a 6.5” stem.
***Retrofits ES8450 and ES9450 to a 6.5” stem and a repair kit for the BK9450 Series

Ordering Information

Old kit Part Number	New kit Part Number	Part Number	Description
13665	13665	MFR50 Series	Aluminum Cap for 50 GPM Male Fueling Receptacle
13685	13685		Dock, fueling Nozzle Receptacle
14237	14237		Dock, fueling Nozzle Receptacle closed-end
T-3003	MFR50-Tool		Repair Kit Tool for Male Fueling Receptacle, for 14405, 13990,14050 and 14005.
14596	14596		Seal for Male Fueling Receptacle, for 14405, 13990,14050 and 14005.

Ordering Information

Old kit Part Number	New kit Part Number	Part Number	Description
11170-1	MQD10-84	MDV100 Series	Repair Kit for 11170, 12680, 12895
12524-1	MQD10-81		Black plastic Cap cover and chain assembly for Male QDV vent
13675	MQD10-82		Aluminum anodized blue Cap cover and lanyard assembly for Male QDV vent
13937	MQD10-83		Male Quick Disconnect Vent Poppets-leakdown

Repair Kits

Ordering Information

Old kit Part Number	New kit Part Number	Part Number	Description
14103	CryoMac3-80	CRYOMAC3	Sleeve Assembly for CryoMac (sleeve, nose piece, 16 balls, 6 guide pins, and a rubber band)
14255	CryoMac3-81		Seat & Seal Assembly for CryoMac
14591	CryoMac3-82		Cryomac Interface Seal replacement (to ensure a correct seal replacement use tool kit p/n 14590)
14576	CRYOMAC3-90		Macro Retaining Ring for CRYOMAC
14566	CRYOMAC3-91		Macro Hinge Pin for CRYOMAC 3
13999	CRYOMAC3-92		Macro Washer Brass for CRYOMAC 3
14574	CRYOMAC3-93		Spring for CRYOMAC 3
14424	CryoMac3-82B		Cryomac Interface Seal replacement – OBSOLETE VERSION (please use latest release p/n 14591)
14590	CryoMac3-TOOL1		Cryomac Seal Repair Tool Kit
13960	CryoMac3-84		Poppet Assembly for CryoMac3
T-2961	CryoMac3-TOOL2		Tool for poppet removal for CryoMac
11157	CryoMac2-84	CRYOMAC2	Poppet Assembly for CryoMac2

Ordering Information

Old kit Part Number	New kit Part Number	Part Number	Description
11175-2	FQD10-80	FDQ10 Series	Repair Kit for Quick Disconnect Vent Female containing #14535 Poppet Assembly, #11173 Seal and 11093 Seal Assembly.
11093	FQD10-81		Seal Kit for Quick Disconnect Vent Female
14535	FQD10-82		Poppet Assembly for Quick Disconnect Vent Female
11173	FQD10-81-A		Body Seal for Quick Disconnect Vent Male/Female
T-1948	FQD10-TOOL		Vent Thread Ring Tool for Quick Disconnect Vent Female

Ordering Information

Kit Number	Part Number	Kit Contents
SKM009404-80AJ	SKL9402,SKM9402, SKS9402,SKL9404,SKM9404 and SKS9404	(1) Gasket and (1) Seat Disc Assembly.
SKM009408-80AJ	SKL9406,SKM9406, SKS9406,SKL9408,SKM9408, SKS9408 and SKA9408	
SKM009412-80AJ	SKL9412, SKM9412, SKS9412 and SKA9412	
SKM009416-80AJ	SKL9416 and SKM9416	
SKM009408-80J	SKL9402, SKM9402,SKS9402, SKL9404, SKM9404, SKS9404, SKL9406,SKM9406,SKS9406 SKL9408,SKM9408, SKS9408 and SKA9408	(2) Spring, Belleville, (1) Washer, Live-loading, (5) Packing, Bonnet, (4) Packing,separator, (1) Bearing, Bonnet, (1)Follower, Gland, (1) Packing, Adapter.
SKM009412-80J	SKL9412, SKM9412, SKS9412 and SKA9412	
SKM009416-80J	SKL9416 and SKM9416	
SKS009404-KIT	SKS9402 and SKS9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1) Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKS009408-KIT	SKS9406 and SKS9408	
SKS009412-KIT	SKS9412	
SKM009404-KIT	SKM9402 and SKM9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1) Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKM009408-KIT	SKM9406 and SKM9408	
SKM009412-KIT	SKM9412	
SKM009416-KIT	SKM9416	
SKL009404-KIT	SKL9402 and SKL9404	(1) Gasket, (1) Stem, (1) Bonnet & tube Assy, (2) Spring, Belleville,(1) Washer, Live-loading, (5) Packing, Bonnet, (4)Packing, Separator, (1) Bearing, Bonnet, (1) Follower, Gland, (1) Nut, Stem, (1) Ring, Retaining, (1) Packing, Adapter, (1) Nut, Bonnet, (4) Screw, (1) Handwheel, (1) Nut, Hex, and (1) Washer.
SKL009408-KIT	SKL9406, SKL9408 and SKA9408	
SKL009412-KIT	SKL9412 and SKA9412	
SKL009416-KIT	SKL9416	

Repair Kits

Ordering Information

Kit Number	Part Number	Kit Contents
CFM-2D-82	SFM Fill Manifold Series	Piston Assy, Spring, Strainer, Gasket

Ordering Information

Kit Number	Part Number	Kit Contents
S-000210-8-81	GS-210W-4, GS-210W-6 and GS-210W-8	Upper Packing ½”, ¾” & 1”
S-000210-8-82		Seat/Stem Assy ½”, ¾” & 1”
S-000210-8-83		Bonnet Gasket ½”, ¾” & 1”
S-000210-16-81	GS-210W-12 and GS-210W-16	Upper Packing 1½” & 2”
S-000210-16-82		Seat/Stem Assy 1½” & 2”
S-000210-16-83		Bonnet Gasket 1½” & 2”
S-000210-24-81	GS-210W-24	Upper Packing 3”
S-000210-24-82		Seat/Stem Assy 3”
S-000210-24-83		Bonnet Gasket 3”
S-000210-32-81	GS-210W-32	Upper Packing 4”
S-000210-32-82		Seat/Stem Assy 4”
S-000210-32-83		Bonnet Gasket 4”
S-210WHZ-8-81	GS-210WHZ-4, GS-210WHZ-6 and GS-210WHZ-8	Upper Packing ½”, ¾” & 1”
S-210WHZ-8-82		Seat/Stem Assy ½”, ¾” & 1”
S-210WHZ-8-83		Bonnet Gasket ½”, ¾” & 1”
S-210WHZ08-853		Upper Assembly Repair Kit ½”, ¾” & 1”
S-210WHZ-16-81	GS-210WHZ-12 and GS-210WHZ-16	Upper Packing 1½” & 2”
S-210WHZ-16-82		Seat/Stem Assy 1½” & 2”
S-210WHZ-16-83		Bonnet Gasket 1½” & 2”
S-210WHZ16-853		Upper Assembly Repair

Repair Kits

Ordering Information

Kit Number	Part Number	Kit Contents
S-000110-8-81	GS-110W-4, GS-110W-6 and GS-110W-8	Upper Packing ½", ¾" & 1"
S-000110-8-82		Seat/Stem Assy ½", ¾" & 1"
S-000110-8-83		Bonnet Gasket ½", ¾" & 1"
S-000110-8-84		Seat Replacement ½", ¾" & 1"
S-000110-16-81	GS-110W-12 and GS-110W-16	Upper Packing 1½" & 2"
S-000110-16-82		Seat/Stem Assy 1½" & 2"
S-000110-16-83		Bonnet Gasket 1½" & 2"
S-000110-16-84		Seat Replacement 1½" & 2"
S-000110-24-81	GS-110W-24	Upper Packing 3"
S-000110-24-82		Seat/Stem Assy 3"
S-000110-24-83		Bonnet Gasket 3"
S-000110-24-84		Seat Replacement 3"
S-000110-32-81	GS-110W-32	Upper Packing 4"
S-000110-32-82		Seat/Stem Assy 4"
S-000110-32-83		Bonnet Gasket 4"
S-000110-32-84		Seat Replacement 4"
S-000110-48-81	GS-110W-48	Upper Packing 6"
S-000110-48-82		Seat/Stem Assy 6"
S-000110-48-83		Bonnet Gasket 6"
S-000110-48-84		Seat Replacement 6"
S-110WHZ-8-81	GS-110WHZ-4, GS-110WHZ-6 and GS-110WHZ-8	Upper Packing ½", ¾" & 1"
S-110WHZ-8-82		Seat/Stem Assy ½", ¾" & 1"
S-110WHZ-8-83		Bonnet Gasket ½", ¾" & 1"
S-110WHZ-8-84		Seat Replacement ½", ¾" & 1"
S-110WHZ08-853		Upper Assembly Repair Kit ½", ¾" & 1"
S-110WHZ-16-81	GS-110WHZ-12 and GS-110WHZ-16	Upper Packing 1½" & 2"
S-110WHZ-16-82		Seat/Stem Assy 1½" & 2"
S-110WHZ-16-83		Bonnet Gasket 1½" & 2"
S-110WHZ-16-84		Seat Replacement 1½" & 2"
S-110WHZ16-853		Upper Assembly Repair Kit 1½" & 2"
S-110WHZ-24-81	GS-110WHZ-24	Upper Packing 3"
S-110WHZ-24-82		Seat/Stem Assy 3"
S-110WHZ-24-83		Bonnet Gasket 3"
S-110WHZ-24-84		Seat Replacement 3"
S-110WHZ24-853		Upper Assembly Repair Kit 3"
S-110WHZ-32-81	GS-110WHZ-32	Upper Packing 4"
S-110WHZ-32-82		Seat/Stem Assy 4"
S-110WHZ-32-83		Bonnet Gasket 4"
S-110WHZ-32-84		Seat Replacement 4"
S-110WHZ32-853		Upper Assembly Repair Kit 4"
S-110WHZ-48-81	GS-110WHZ-48	Upper Packing 6"
S-110WHZ-48-82		Seat/Stem Assy 6"
S-110WHZ-48-83		Bonnet Gasket 6"
S-110WHZ-48-84		Seat Replacement 6"
S-110WHZ48-853		Upper Assembly Repair Kit 6"

Ordering Information

Kit Number	Part Number	Kit Contents
PB504-80R	PB504 Series	Poppet (0-ring, Seat Reatiner, Seat Disc, Stem Seat, Back O-ring, Backcap Seal.
PB504-81R	PB504 Series	Diaphragm, gasket

Ordering Information

Kit Number	Part Number	Kit Contents
BR-1784-80	1784 Series	Diaphragm assembly, stem and seat assembly, seal, Viton seat
BR-1786-80	1786 Series and 1788 Series	Diaphragm assembly, stem and seat assembly, seal, viton seat for oxygen service
BR-1784-7SKA	1784 Series	Spring kit for 1784, “A” spring range, 5 to 55 psig delivery pressure 1784 “B” spring range, 40 to 110 psig delivery pressure Spring kit for 1784, “C” spring range, 100 to 200 psig delivery pressure, Spring kit for 1784, “D” spring range 175 to 300 psig delivery pressure
BR-1784-7SKB		
BR-1784-7SKC		
BR-1784-7SKD		
BR-1786-7SKA	1786 Series	Spring kit for 1786, “A” spring range, 5 to 55 psig delivery pressure 1786 “B” spring range, 40 to 110 psig delivery pressure Spring kit for 1786, “C” spring range, 100 to 200 psig delivery pressure, Spring kit for 1786, “D” spring range 175 to 300 psig delivery pressure
BR-1786-7SKB		
BR-1786-7SKC		
BR-1786-7SKD		
BR-1788-7SKA	1788 Series	Spring kit for 1788, “A” spring range, 5 to 55 psig delivery pressure 1788 “B” spring range, 40 to 110 psig delivery pressure Spring kit for 1788, “C” spring range, 100 to 200 psig delivery pressure, Spring kit for 1788, “D” spring range 175 to 300 psig delivery pressure
BR-1788-7SKB		
BR-1788-7SKC		
BR-1788-7SKD		

Ordering Information

Kit Number	Part Number	Kit Contents
S-000886-4-82	S-886-4	Seat Assembly ½”
S-000886-4-83	S-886-4	Bonnet Gasket ½”
S-000886-8-82	S-886-8	Seat Assembly 1”
S-000886-12-82	S-886-12	Seat Assembly 1½”
S-000886-16-82	S-886-16	Seat Assembly 2”
S-000886-24-82	S-886-24	Seat Assembly 3”
S-000886-32-82	S-886-32	Seat Assembly 4”
S-0886GF-4-82	S-886GF-4	Seat Assembly ½”
S-0886GF-4-83	S-886GF-4	Bonnet Gasket ½”
S-0886GF-8-82	S-886GF-8	Seat Assembly 1”
S-0886GF-8-83	S-886GF-8	Bonnet Gasket 1”
S-0886GF-12-82	S-886GF-12	Seat Assembly 1½”
S-0886GF-12-83	S-886GF-12	Bonnet Gasket 1½”
S-0886M-4-82	S-886M-4	Seat Assembly ½”
S-0886M-8-82	S-886M-8	Seat Assembly 1”
S-0886M-8-83	S-886M-8	Bonnet Gasket 1”
S-0886M-12-82	S-886M-12	Seat Assembly 1½”
S-0886M-12-83	S-886M-12	Bonnet Gasket 1½”
S-0886M-16-82	S-886M-16	Seat Assembly 2”
S-0886M-16-83	S-886M-16	Bonnet Gasket 2”
S-0886M-24-82	S-886M-24	Seat Assembly 3”
S-0886M-24-83	S-886M-24	Bonnet Gasket 3”
S-0886M-32-82	S-886M-32	Seat Assembly 4”
S-0886M-32-83	S-886M-32	Bonnet Gasket 4”

REGO®

Flow Controls

Stainless Steel Flow Controls
TMF Series with Color Bands

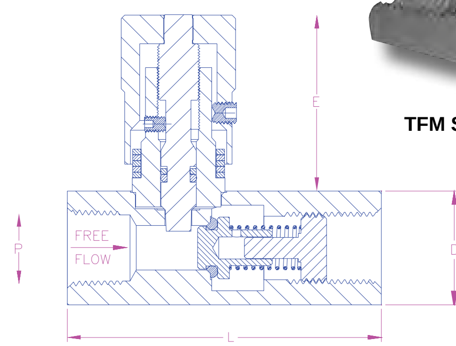
Application

Designed for extremely precise control of hydraulic and pneumatic actuators. Provides metered flow in one direction and free-flow in the reverse direction. Specifically designed for use in food processing industries and other highly corrosive environments.

TFM Series

Features

- Easy-to-read color bands and micrometer knob for exact flow settings.
- Re-set repeatability within 1%.
- Precision-machined Double-Step stem with fine threading provides accurate control, even at extremely low flows.
- Rugged, all-metal construction — no plastic parts.
- Bleed holes in piston provide a cushion to soften closing impact and extend valve life.
- Brazed construction to withstand high pressure.
- 303 stainless steel body construction for maximum corrosion protection.



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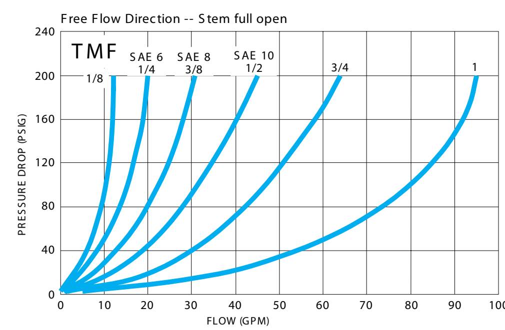
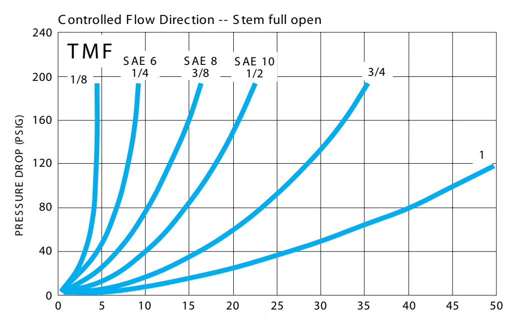




Specifications

Maximum Operating Pressure.. 5000 PSIG
Temperature Range.. -20ºF to +400ºF
Cracking Pressure (Check Valve).. 2 PSIG
Stem Taper .... 2º x 45º DOUBLE-STEP
Stem Pitch .... 40 Threads/Inch
CV Factor .... See Ordering Information

Materials

Body .... 303 Stainless Steel
Piston.. Stainless Steel
Piston Seal .... Metal to Metal
Spring .... Stainless Steel
Stem .... Stainless Steel
Knob .... Nickel-Chrome Plated Brass
Color Bands... Anodized Aluminum
Piston Retainer.. Stainless Steel
Set Screw .... Stainless Steel
Stem Packing .... Viton O-ring with "Teflon" Backup

Ordering Information

Part Number	Body Material	Piston Seal	P Female	D (In.) Square	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV (Free-Flow Direction)	CV (Controlled Flow Direction)
TMF250SS	Stainless Steel	Metal	¼" NPT	13/16"	2⅝"	1⅜"	5/32"	1.47	.47
TMF375SS			⅜" NPT	1"	2¾"	1 23/32"	7/32"	2.95	.72
TMF500SS			½" NPT	1⅛"	3 7/16"	2¼"	5/16"	4.50	1.07
TMF750SS			¾" NPT	1½"	3⅞"	⅝"	⅜"	5.41	1.71
TMF1000SS			1" NPT	2"	5"	3⅞"	7/32"	5.90	2.45
TMF620SS			9/16"-18 SAE 6	13/16"	3⅛"	1⅜"	5/32"	1.47	.47
TMF820SS			¾"- 16 SAE 8	1"	3½"	1 23/32"	7/32"	2.95	.72
TMF1020SS			7/14" - 14 SAE 10	1⅛"	4"	2¼"	5/16"	4.50	1.07

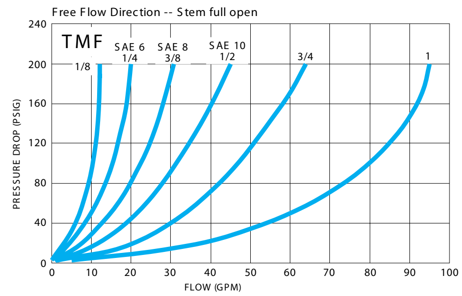
Flow Controls
TRU Micro TMF Series with Color Bands

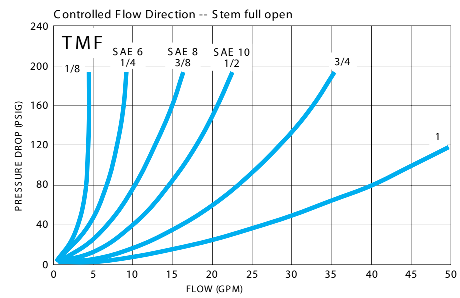
Application

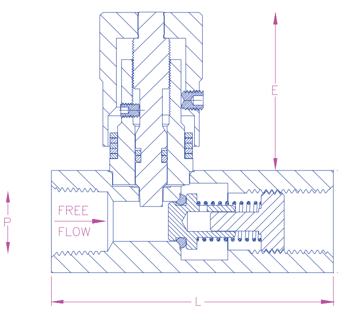
Designed for extremely precise control of hydraulic and pneumatic actuators. Provides metered flow in one direction and free-flow in the reverse direction.

Features

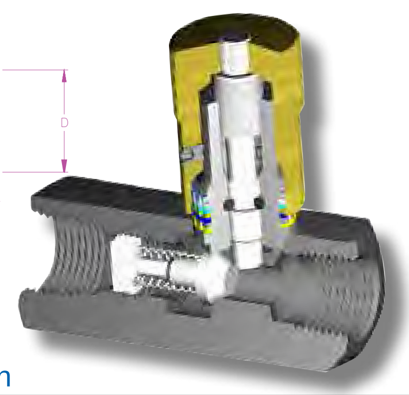
- Easy-to-read color bands and micrometer knob for exact flow settings.
- Re-set repeatability within 1%.
- Precision-machined Double-Step stem with fine threading provides accurate control, even at extremely low flows.
- Rugged, all-metal construction — no plastic parts.
- Bleed holes in piston provide a cushion to soften closing impact and extend valve life.
- Brazed construction to withstand high pressure.
- Soft-seat piston check, available on ¼” and ⅛” brass sizes, assures leak-free air service. All others have metal to metal seat.
- Steel valves are zinc-plated AND sealed with colorless chromate for double corrosion protection. Also available with stainless steel body







TMF Series



Specifications

Maximum Operating Pressure Steel................................ 5000 PSIG
Maximum Operating Pressure Brass............................. 2000 PSIG
Temperature Range..-20ºF to +400ºF
Cracking Pressure (Check Valve).. 2 PSIG
Stem Taper .... 2º x 45º DOUBLE-STEP
Stem Pitch .... 40 Threads/Inch
CV Factor .... See Ordering Information

Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Piston... Stainless Steel
Piston Seal ...Viton on ¼” and ⅜” Brass Models with soft seat option (Metal to Metal seal on all others)
Spring .... Stainless Steel
Stem .... Stainless Steel
Knob .... Brass
Color Bands.. Anodized Aluminum
Piston Retainer... Stainless Steel
Set Screw .... Steel (Black Oxide)
Stem Packing .... Viton O-ring with “Teflon” Backup

Ordering Information

Part Number	Body Material	Piston Seal	P Female	D (In.) Square	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV (Free-Flow Direction)	CV (Controlled Flow Direction)
TMF250B	Brass	Metal	⅛ NPT / ¼ NPT	13/16”	2⅝”	1⅜”	5/32”	1.47	.47
TMF250BL	Brass	Viton	¼ NPT	13/16”	2⅝”	1⅜”	5/32”	1.47	.47
TMF375B	Brass	Metal	⅜ NPT	1”	2¾”	1 23/32”	7/32”	2.95	.72
TMF375BL	Brass	Viton	⅜ NPT	1”	2¾”	1 23/32”	7/32”	2.95	.72
TMF500B	Brass	Metal	½ NPT	1⅛”	3 7/16”	2¼”	5/16”	4.50	1.07
TMF750B	Brass	Metal	¾ NPT	1½”	3⅞”	2 15/32”	⅜”	5.41	1.71
TMF250S	Steel	Metal	¼ NPT	13/16”	2⅝”	1⅜”	5/32”	1.47	.47
TMF375S	Steel	Metal	⅜ NPT	1”	2¾”	1 23/32”	7/32”	2.95	.72
TMF500S	Steel	Metal	½ NPT	1⅛”	3 7/16”	2¼”	5/16”	4.50	1.07
TMF620S	Steel	Metal	9/16 - 18 SAE 6	13/16”	3⅞”	1⅜”	5/32”	1.47	.47
TMF750S	Steel	Metal	¾ NPT	1½”	3⅞”	2 15/32”	⅜”	5.41	1.71
TMF820S	Steel	Metal	¾ - 18 SAE 6	1”	3½”	1 23/32”	7/32”	2.95	.72
TMF1000S	Steel	Metal	1 NPT	2”	5”	3⅞”	⅝”	5.90	2.45
TMF1020S	Steel	Metal	⅞ - 14 SAE 10	1⅛”	4”	2¼”	5/16”	4.50	1.07

Needle Valves
TRU Micro TMN Series with Color Bands

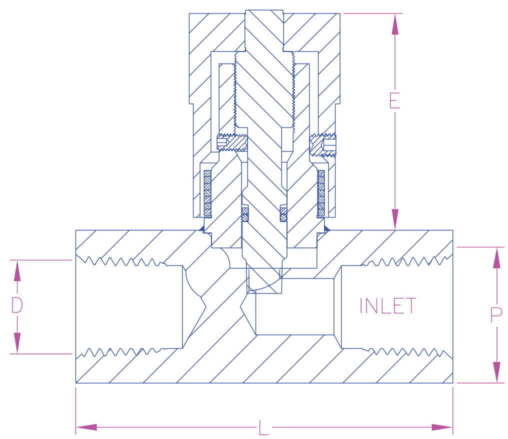
Application

Designed for extremely precise control of air and hydraulic fluids. Metered flow in both directions.

Features

- Easy-to-read color bands and micrometer knob provide exact flow settings.
- Re-Set Repeatability within 1%.
- Precision machined DOUBLE-STEP stem with fine threading provides accurate control, even at extremely low flows.
- Rugged, all-metal construction – no plastic parts.
- Brazed construction to withstand high pressure.
- Steel valves are zinc-plated AND sealed with colorless chromate for double corrosion protection.

TMN Series



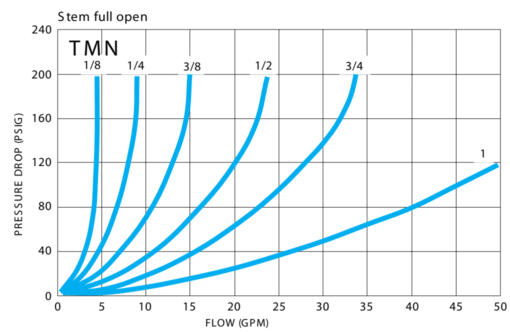
Specifications

Maximum Operating Pressure (Steel) .... 5000 PSIG
Maximum Operating Pressure (Brass) .... 2000 PSIG
Temperature Range .... -20ºF to +400ºF
Stem Taper .... 2º x 45º DOUBLE-STEP
Stem Pitch .... 40 Threads/Inch
CV Factor .... See Ordering Information

Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Stem .... Stainless Steel
Knob .... Brass
Color Bands .... Anodized Aluminum
Set Screw .... Steel
Stem Packing .... Viton O-ring with “Teflon” Backup

Performance



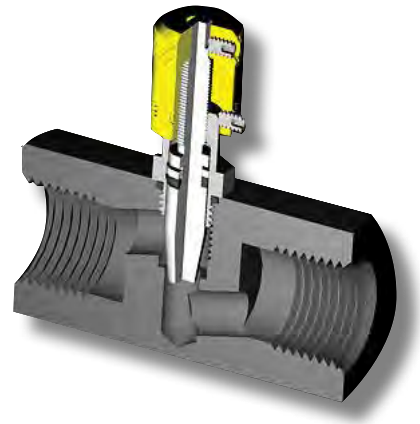
Ordering Information

Part Number	Body Material	P (NPT) Female	D (In.) Square	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV
TMN125B	Brass	⅛”	⅝”	1½”	1 7/32”	⅛”	.25
TMN250B		¼”	13/16”	2”	1⅜”	5/32”	.47
TMN375B		⅜”	1”	2½”	1 23/32”	7/32”	.72
TMN500B		½”	1⅛”	2⅝”	2½”	5/16”	1.07
TMN250S	Steel	¼”	13/16”	2”	1⅜”	5/32”	.47
TMN375S		⅜”	1”	2½”	1 23/32”	7/32”	.72
TMN500S		½”	1⅛”	2⅝”	2¼”	5/16”	1.07
TMN750S		¾”	1½”	3¼”	2 15/32”	⅜”	1.71
TMN1000S		1”	2”	4¼”	3⅞”	⅝”	2.45

Needle Valves
MN Series

Application

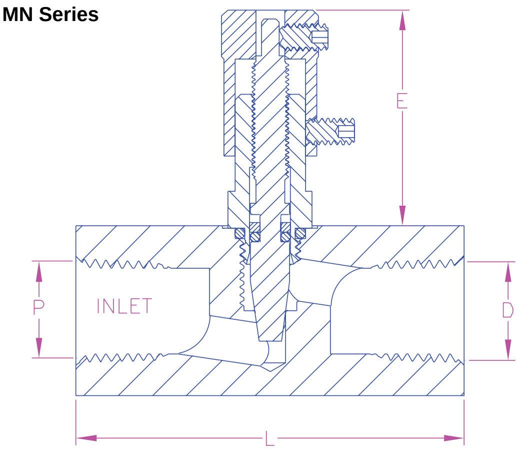
The best value for precise control of air and hydraulic fluids where a calibrated knob is required.



Features

- Precision-machined long tapered stem with fine threading provides exact control.
- Calibrated knob provides setting reference and does not drift from setting.
- Durability provided by rugged, all metal construction with no plastic parts.
- Steel valves are zinc-plated and sealed with "golden" chromate for double corrosion protection.

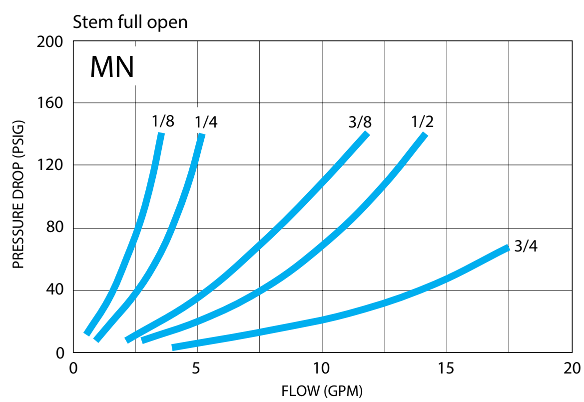
MN Series



Specifications

Maximum Operating Pressure. 5000 PSIG Steel 2000 PSIG Brass
Temperature Range .... -20ºF to +212ºF
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch
Cv Factor .... See Ordering Information

Performance



Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Stem .... Stainless Steel or Brass
Knob .... Brass
Chamber .... Steel
Set Screw .... Steel
Stem Packing .... Viton with "Teflon" Backup

Ordering Information

Part Number	Body Material	P (NPT) Female	D (In.) Hex	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV
MN125B	Brass	⅛"	1¹⁄₁₆"	1½"	1¼"	.156	.25
MN250B		¼"	⅞"	2"			.39
MN375B		⅜"	1¹⁄₁₆"	2¼"	1⅜"	.265	.93
MN500B		½"	1⁵⁄₁₆"	2²¹⁄₃₂"		.281	1.12
MN250S	Steel	¼"	⅞"	2"	1¼"	.156	.39
MN375S		⅜"	1¹⁄₁₆"	2¼"	1⅜"	.265	.93
MN500S		½"	1⁵⁄₁₆"	2²¹⁄₃₂"		.281	1.12
MN750S		¾"	1⅝"	3"	1¼"	.343	2.00
MN1000S		1"	1⅞"	3"	2⅛"	.343	2.00

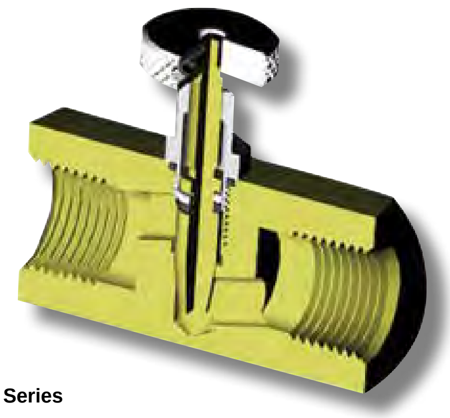
Needle Valves
KLN Series

Application

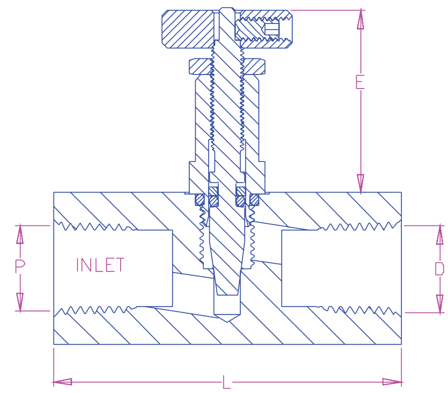
Designed for the precise control of air and hydraulic fluids.

Features

- Precision-machined long tapered stem with fine threading provides exact control.
- Lock nut provided to secure flow settings.
- Durability provided by rugged, all metal construction with no plastic parts.
- Steel valves are zinc plated and sealed with "golden" chromate for double corrosion protection.



KLN Series



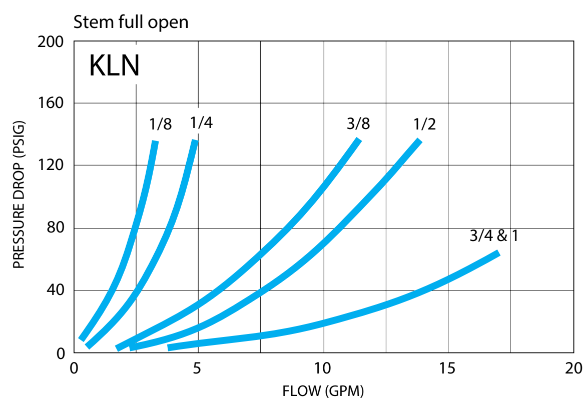
Specifications

Maximum Operating Pressure... 5000 PSIG Steel, 2000 PSIG Brass
Temperature Range...-20ºF to +212ºF
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch (⅛", ¼", ⅜", ½" Sizes)
.... 24 Threads/Inch (¾", 1" Sizes)
CV Factor ....See Ordering Information

Materials

Body .... 12L14 Steel, ASTM B 16 Brass, or 303 Stainless Steel
Stem ....Stainless Steel or Brass
Knob .... Aluminum (⅛", ¼", ⅜", ½" Sizes), Brass (¾", 1" Sizes)
Chamber... Steel (zinc plated)
Lock Nut ....Brass
Stem Packing .... Viton O-ring with "Teflon" Backup

Performance



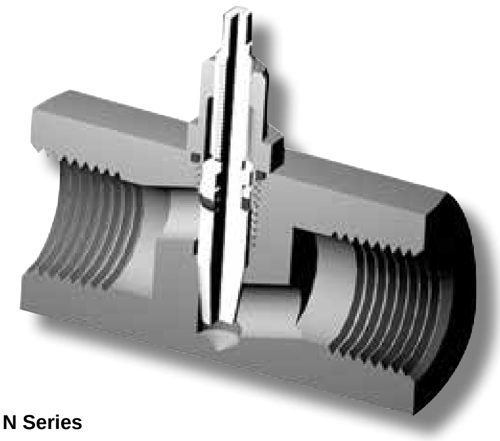
Ordering Information

Part Number	Body Material	P (NPT) Female	D (In.) Hex	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV
KLN125B	Brass	⅛"	11/16"	1½"	1¼"	.156	.25
KLN250B		¼"	⅞"	2"			.39
KLN375B		⅜"	1/16"	2¼"	1⅜"	.256	.93
KLN500B		½"	1 5/16"	2 21/32"		.281	1.12
KLN750B		¾"	1⅝"	3"	1⅞"	.343	2.00
KLN1000B		1"	1⅞"				
KLN125S	Steel	⅛"	11/16"	1½"	1¼"	.156	.25
KLN250S		¼"	⅞"	2"			.39
KLN375S		⅜"	1/16"	2¼"	1 3/5"	.256	.93
KLN500S		½"	1 5/16"	2 21/32"		.281	1.12
KLN750S		¾"	1⅝"	3"	1⅞"	.343	2.00

Needle Valves
N Series

Application

Economically designed for effective control of air and hydraulic fluids where frequent adjustment is not required.



N Series

Features

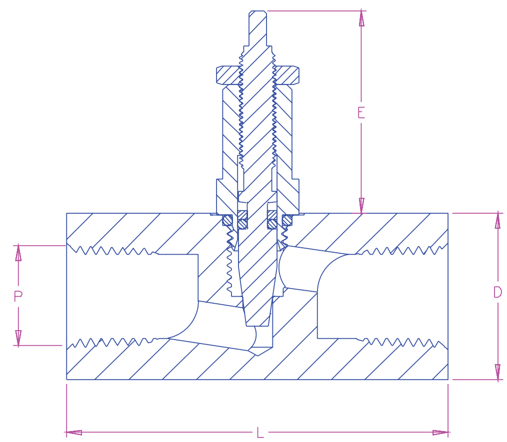
- Wrench flats provided to adjust setting, while resisting unwanted tampering.
- Steel valves are zinc plated and sealed with "golden" chromate for double corrosion protection.
- Durable, rugged, all metal construction — no plastic parts.

Specifications

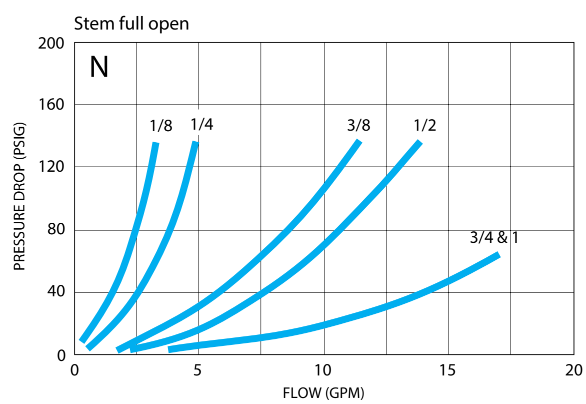
Maximum Operating Pressure............................... 5000 PSIG Steel
Maximum Operating Pressure.............................. 2000 PSIG Brass
Temperature Range.. -20ºF to +212ºF
CV Factor .... See Ordering Information
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch

Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Stem .... Stainless Steel or Brass
Chamber... Steel (Zinc Plated)
Lock Nut .... Brass
Stem Packing .... Viton O-Ring



Performance



Ordering Information

Part Number	Body Material	P (NPT) Female	D (In.) Hex	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV
N125B	Brass	⅛"	11/16"	1½"	1¼"	.156	.25
N250B		¼"	⅞"	2"			.39
N375B		⅜"	1 11/16"	2¼"	1⅜"	.265	.93
N500B		½"	1 5/16"	2 21/32"		.281	1.12
N250S	Steel	¼"	⅞"	2"	1¼"	.156	.39
N375S		⅜"	1 1/16"	2¼"	1⅜"	.265	.93
N500S		½"	1 5/16"	2 21/32"		.281	1.12

Needle Valves
Mini-Line Series

Application

Ideal for test bench and control panel applications. Designed for use with air, oil, water, vacuum service, and most chemicals.

Features

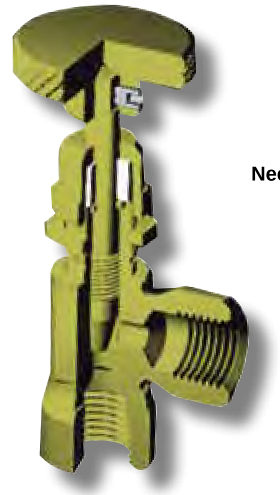
- Compact design provides easy installation.
- Fine stem threading and long taper allow precise metering and leak-free shut-off.
- Internal stop prevents the stem from being accidentally unscrewed from the body.
- Rugged forged brass bodies withstand higher pressures.
- Available in globe and angle configurations.
- Valves come equipped for panel mounting.
- Some models available with stainless steel stem (ss suffix denotion).

Specifications

Maximum Operating Pressure........................ 5000 PSIG Hydraulic
Maximum Operating Pressure.................................. 2000 PSIG Air
Minimum Burst Pressure .... 8000 PSIG
Temperature Range.. -40ºF to +500ºF
Orifice Diameter... .182”
Stem Taper 15º
Stem Pitch .... 28 Threads/Inch
CV Factor .... See Ordering Information

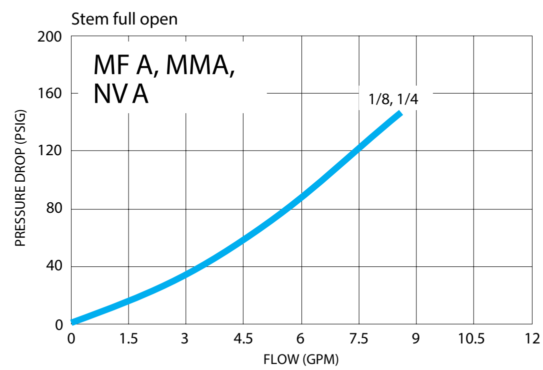
Materials

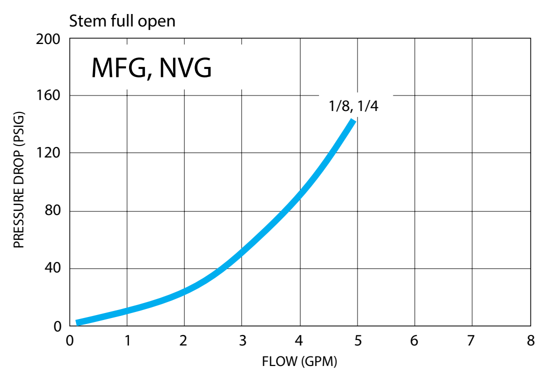
Body .... ASTM B283 Brass
Stem .... Brass
Knob .... Brass
Bonnet Nut.. Brass
Panel Mount Nut... Brass
Set Screw .... Steel
Stem Packing .... Teflon with Brass Gland



Needle Valve

Performance



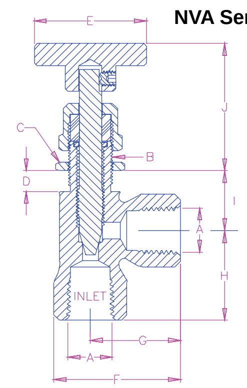


Ordering Information

NVA Series

Part Number	A (NPT)	B (UNS-2B) Thd. Size	C (In.) Hex Size	D (In.) Max.	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.) Open	J (In.) Closed	CV
NVA125B	⅛”	½” - 27”	11/16”	3/32”	1¼”	1 5/32”	¾”	¾”	7/16”	1 31/32”	1 11/16”	.7
NVA250B	¼”			7/32”		1 13/32”	1”	1”		2 5/32”	1 19/32”	

NVA Series



Needle Valves
Mini-Line Series

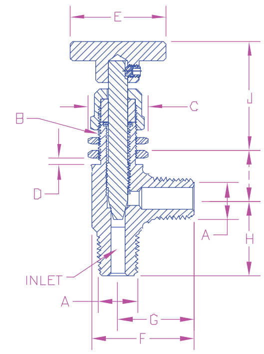
Ordering Information

MMA Series

Part Number	A (NPT)	B (UNS-2B) Thd. Size	C (In.) Hex Size	D (In.) Max.	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.) Open	J (In.) Closed	CV
MMA250B	¼”	½” - 27”	11/16”	7/32”	1¼”	1 11/32”	1”	1”	7/16”	2 5/32”	1 19/32”	.7
HHA250B	¼”											

* ¼” Hose Barbs

MMA Series

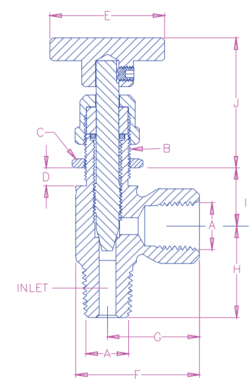


Ordering Information

MFA Series

Part Number	A (NPT)	B (UNS-2B) Thd. Size	C (In.) Hex Size	D (In.) Max.	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.) Open	J (In.) Closed	CV
MFA125B	⅛”	½” - 27	11/16”	7/32”	1¼”	1 7/32”	⅞”	⅞”	7/16”	2 5/32”	1 19/32”	.7
MFA250B	¼”					1 11/32”	1”	1”				
MFA250BSS												

MFA Series



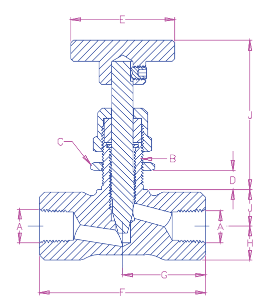
MFA SER

Ordering Information

NVG

Part Number	A (NPT)	B (UNS-2B) Thd. Size	C (In.) Hex Size	D (In.) Max.	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.) Open	J (In.) Closed	CV
NVG125B	⅛”	½” - 27	11/16”	7/32”	1¼”	1 7/8”	15/16”	13/32”	7/16”	2 5/32”	1 25/32”	.5
NVG250B	¼”					2”	1”					
NVG250BSS												

NVG Series



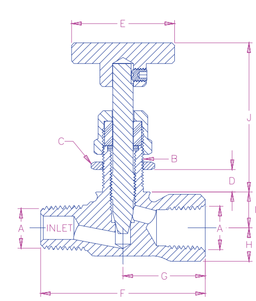
NVG SER

Ordering Information

MFG

Part Number	A (NPT)	B (UNS-2B) Thd. Size	C (In.) Hex Size	D (In.) Max.	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.) Open	J (In.) Closed	CV
MFG125BF	⅛”	½” - 27	11/16”	7/32”	1¼”	1 7/8”	15/16”	13/32”	7/16”	2 5/32”	1 25/32”	.5
MFG250BF	¼”					2”	1”					

MFG Series



MFG SER

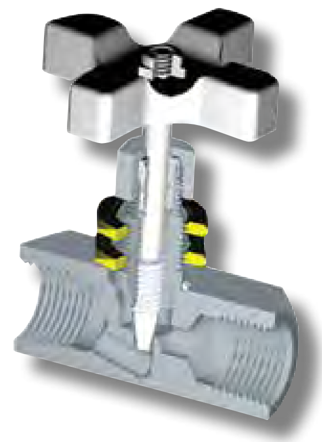
Needle Valves
2000 Series

Application

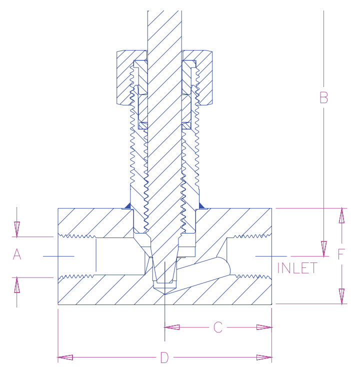
Ideal for applications which require fine metering and shut-off. Designed for use with air, oil, water, steam, liquid fuels and most chemicals.

Features

- Heavy duty brazed construction for added strength and safety up to 10,000 psi.
- Precision-machined stems and valve bodies provide perfect seat alignment for leak-free shut-off.
- Carbon steel valves are zinc plated and sealed with colorless chromate for double corrosion protection.
- Available in globe and angle configuration; in-line or panel mounted.
- Machined from carbon steel, or 303 stainless steel.



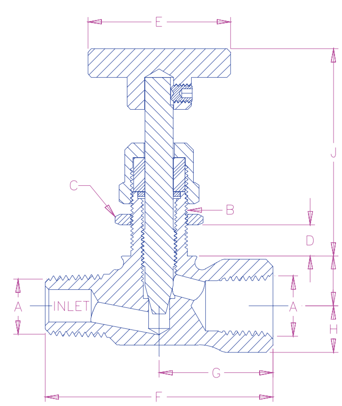
FFG Series



Ordering Information

Part Number	Body Material	A (NPT) Female	B (In.) Max.	C (In.)	D (In.)	E (In.)	F (In.) Square	G (In.)	H (In.) Diam.	Orifice Diam. (In.)	CV
FFG2001T	Carbon Steel	⅛	3½"	31/32"	1 15/16"	2½"	⅞"	⅜"	⅝"	7/22"	.66
FFG2002T		¼		1 31/32"	2 1/16"						
FFG2003T		⅜	3⅝"	1 7/16"	2¾"		1⅛"		¾"		.70
FFG2004T		½									
FFG2006TA		¾	5 3/16"	1 13/16"	3⅝"	4¼"	1½"	⅞"	1½"	9/16"	3.90
FFG2008TA		1	5 5/16"	2 1/32"	4 1/16"		2"				5.22
FFG2002SST	303 Stainless Steel	¼	3½"	1 1/32"	2 1/16"	2½"	⅞"	¾"	⅝"	7/32"	.66
FFG2003SST		⅜	3⅝"	1 7/16"	2¾"		1⅛"		¾"		.70
FFG2004SST		½									

MFG Series



Ordering Information

Part Number	Body Material	A (NPT) Female	B (In.) Max.	C (In.)	D (In.)	E (In.)	F (In.) Square	G (In.)	H (In.) Diam.	Orifice Diam. (In.)	CV
MFG2002T	Carbon Steel	¼	3½"	1 1/32"	2 11/32"	2½"	⅞"	⅜"	⅝"	.218	.92
MFG2003T		⅜	3⅝"	1⅜"	2¾"		1⅛"		¾"		1.10
MFG2004T		½			2⅝"						

Specifications

Maximum Operating Pressure...................... 10,000 PSIG Hydraulic
Maximum Operating Pressure.................................. 2000 PSIG Air
Minimum Burst Pressure .... 20,000 PSIG
Temperature Range.. -40ºF to +500ºF
Stem Taper .... 10½º (⅛, ¼, ⅜, ½" Sizes)
Stem Taper .... 15º (¾, 1" Sizes)
Stem Pitch .... 16 Threads/Inch (1/8, 1/4, 3/8, 1/2" Sizes)
Stem Pitch .... 14 Threads/Inch (3/4, 1" Sizes)
CV Factor ....See Ordering Information

Panel Mounting Kits:

⅛ to ¼...KIT2002S
⅜ to ½...KIT2004S
¾ to 1...KIT2005S

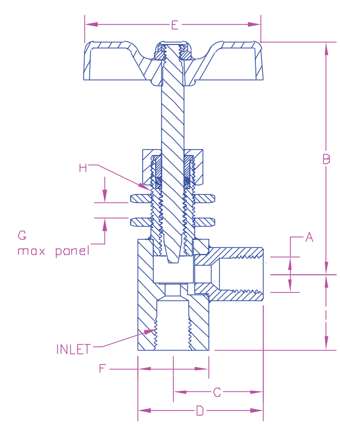
Materials

	T and TA Models	SST and STA Models
Body	12L14 Carbon Steel	303 Stainless
Stem	303 Stainless	303 Stainless
Bonnet Nut	Carbon Steel	303 Stainless
Handle	Aluminum	Aluminum
Stem Packing	Teflon	Teflon

Needle Valves
2000 Series

Ordering Information

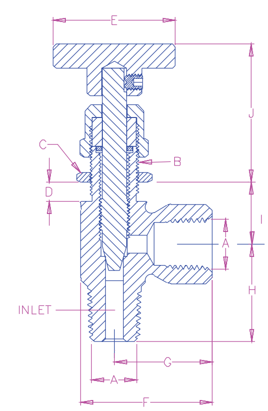
FFA Series



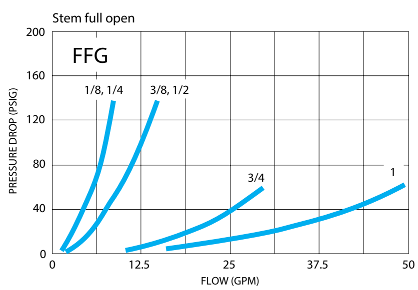
Part Number	Body Material	A (NPT) Female	B (In.) Max.	C (In.)	D (In.)	E (In.)	F (In.) sq.	G (In.)	H (In.) Diam.	I (In.)	Orifice Diam. (In.)	CV
FFA2001T	Carbon Steel	⅛	3½”	1”	1½”	2½”	1”	⅜”	⅝”	1 1/16”	7/32”	.92
FFA2002T		¼		1 9/32”	2 25/32”							
FFA2003T		⅜	3⅝”	1 17/32”	2 5/32”		1¼”		¾”	1 19/32”		1.10
FFA2004T		½										
FFA2006TA	303 Stainless Steel	¾	5 3/16”	1 27/32”	2 23/32”	4¼”	1¾”	⅞”	1½”	1 15/16”	9/16”	4.43
FFA2002SST		¼	3½”	2 9/32”	1 25/32”	2½”	1”	⅜”	⅝”	1 1/16”	7/32”	.92

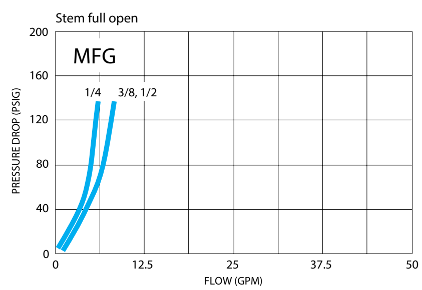
Ordering Information

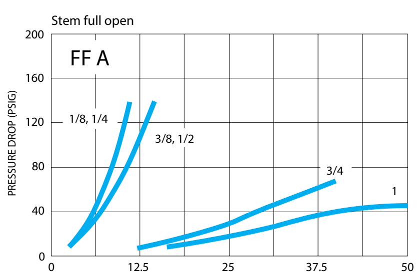
MFA Series

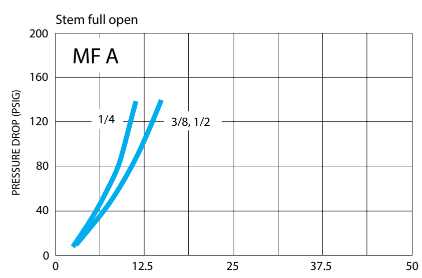


Part Number	Body Material	A (NPT) Female	B (In.) Max.	C (In.)	D (In.)	E (In.)	F (In.) Square	G (In.)	H (In.) Diam.	I (In.)	Orifice Diam. (In.)	CV
MFA2002T	Carbon Steel	¼	3½”	1 9/32”	1 25/32”	2½”	1”	⅜”	⅝”	1 1/16”	7/32”	.92
MFA2003T		⅜	3⅝”	1 17/32”	2⅝”		1¼”		¾”	1¾”		1.10
MFA2004T		½										



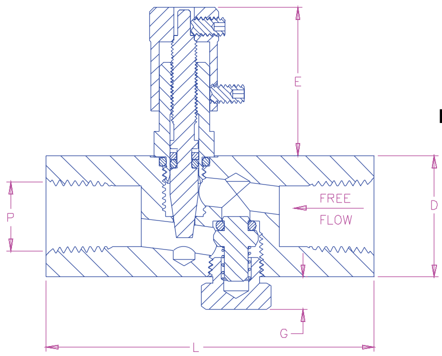




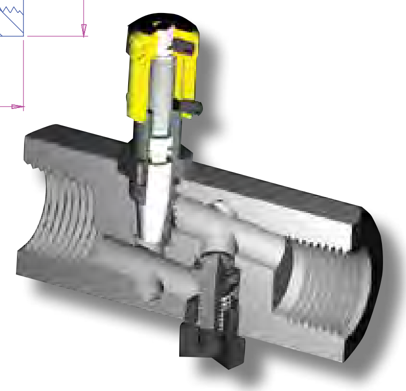


Application

The best valve for precise control of hydraulic and pneumatic actuators where a calibrated knob is required. Provides metered flow in one direction and free-flow in the reverse direction.



MF Series

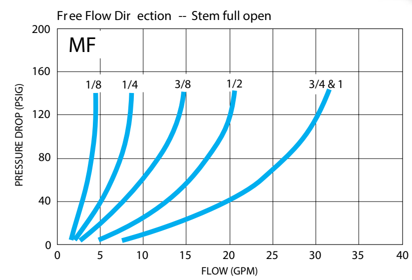


Features

- Precision-machined long tapered stem with fine threading provides exact control.
- Calibrated knob provides setting reference.
- Soft-seat piston check for leak-free service.
- No “draft” setting.
- Optional ball check for high cycle applications.
- Rugged, all-metal construction — no plastic parts.
- Steel valves are zinc-plated and sealed with “golden” chromate for double corrosion protection.

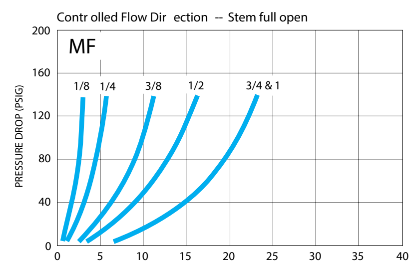
Specifications

Max Operating Pressure Ball Check Models........... 5000 PSIG Steel
Max Operating Pressure Ball Check Models........ 2000 PSIG Brass
Max Operating Pressure Piston Check Models...... 2000 PSIG Brass
Temperature .... -20ºF to +212ºF
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch (⅛, ¼, ⅜, ½” Sizes)
Stem Pitch .... 24 Threads/Inch (¾”, 1” Size)
CV Factor .... See Ordering Information



Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Piston Assembly .... Stainless Steel with Viton O-ring
Spring .... Stainless Steel
Stem .... Stainless Steel or Brass
Knob ....Brass
Check Plug .... Steel or Brass
Chamber.. Steel
Set Screw ....Steel
Stem Packing .... Viton O-ring with “Teflon” Backup



Ordering Information

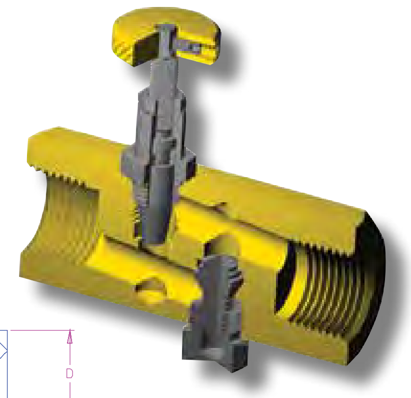
Part Number	Body Material	Check Style	P (NPT) Female	D (In.) Hex	G (In.)	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV Free-Flow Direction)	CV (Controlled Flow Direction)	Cracking Pressure (PSIG
MF125B	Brass	Piston	⅛”	11/16”	9/32”	1¾”	1¼”	.156”	.32	.23	10
MF250B			¼”	⅞”	5/16”	2⅜”			.70	.44	7
MF375B			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.256”	1.14	.90	8
MF500B			½”	1 5/16”	⅜”	3 3/16”		.281”	1.74	1.32	5
MF750B			¾”	1⅝”	15/32”	3 9/16”	1⅞”	.343”	2.91	2.02	2
MF125BBC		Ball	⅛”	11/16”	9/32”	1¾”	1¼”	.156”	.32	.23	11
MF250BBC			¼”	⅞”	5/16”	2⅜”			.70	.44	7
MF375BBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.256”	1.14	.90	3
MF500BBC			½”	1 5/16”	⅜”	3 3/16”		.281”	1.74	1.32	1
MF250SBC	Steel	Brass	¼”	⅞”	5/16”	2⅜”	1¼”	.156”	.70	.44	7
MF375SBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265”	1.14	.90	3
MF500SBC			½”	1 5/16”	⅜”	3 3/16”		.281”	1.74	1.32	1
MF750SBC			¾”	1⅝”	15/32”	3 9/16”	1⅞”	.343	2.91	2.02	3
MF1000SBC			1”	⅞”							

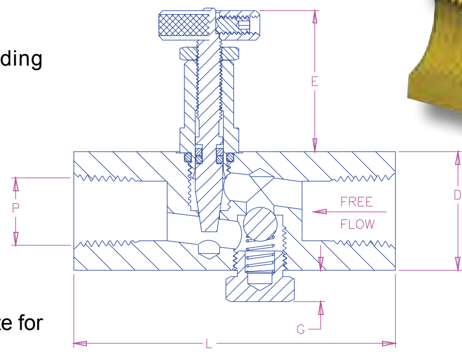
Flow Controls
KLF Series

Application

Designed for the precise control of hydraulic and pneumatic actuators. Provides metered flow in one direction and free-flow in the reverse direction.

KLF Series



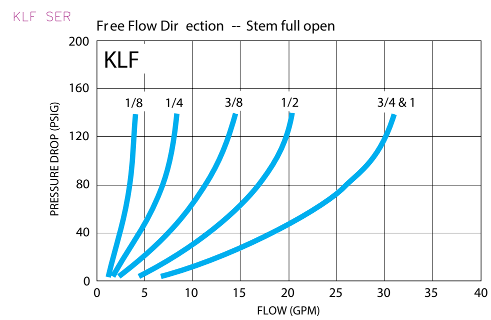


Features

- Precision-machined long tapered stem with fine threading provides exact control.
- Lock nut included to secure flow setting.
- Soft-seat piston check for leak-free service.
- Ball check option available for high cycle applications.
- Rugged, all-metal construction — no plastic parts.
- Steel valves are zinc-plated and sealed with “golden” chromate for double corrosion protection.

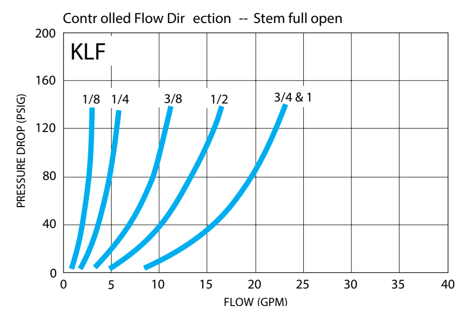
Specifications

Max Operating Pressure Ball Check Models........... 5000 PSIG Steel
Max Operating Pressure Ball Check Models........ 2000 PSIG Brass
Max Operating Pressure Piston Check Models...... 2000 PSIG Brass
Temperature Range.. -20ºF to +212ºF
CV Factor ....See Ordering Information
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch (⅛, ¼, ⅜, ½” Sizes)
Stem Pitch .... 24 Threads/Inch (¾”, 1” Size)



Materials

Body .... 12L14 Steel, ASTM B 16 Brass, or 303 Stainless Steel
Piston Assembly .... Stainless Steel with Viton O-ring
Ball.. Stainless Steel
Spring .... Stainless Steel
Stem ....Stainless Steel or Brass
Knob .... Aluminum (⅛, ¼, ⅜, ½” Sizes) Brass (¾, 1” Sizes)
Check Plug .... Steel or Brass
Chamber.. Steel
Set Screw .... Steel (Black Oxide)
Stem Packing .... Viton O-ring with “Teflon” Backup
Lock Nut .... Brass



Ordering Information

Part Number	Body Material	Check Style	P (NPT) Female	D (In.) Hex	G (In.)	L (In.)	E (In.) Max.	Orifice Diameter (In.)	CV Free-Flow Direction)	CV (Controlled Flow Direction)	Cracking Pressure (PSIG)
KLF125B	Brass	Piston	⅛”	11/16”	9/32”	1¾”	1¼”	.156	.32	.23	10
KLF250B			¼”	⅞”	5/16”	2⅜”			.70	.44	7
KLF375B			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	8
KLF500B			½”	1 5/16”	⅜”	3 3/16”		.281	1.74	1.32	5
KLF750B			¾”	1⅝”	15/32”	3 9/16”	1⅞”	.343	2.91	2.02	2
KLF1000B			1”	1⅞”							
KLF125BBC		Steel Ball Check	⅛”	11/16”	9/32”	1¾”	1¼”	.156	.32	.23	11
KLF250BBC			¼”	⅞”	5/16”	2⅜”			.70	.44	7
KLF375BBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	3
KLF500BBC			½”	1 5/16”	⅜”	3 3/16”		.381	1.74	1.32	1
KLF750BBC			¾”	1⅝”	15/32”	3 9/16”	1⅞”	.343	2.91	2.02	3
KLF125SBC	Steel		⅛”	11/16”	9/32”	1¾”	1¼”	.156	.32	.23	11
KLF250SBC			¼”	⅞”	5/16”	2⅜”			.70	.44	7
KLF375SBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	3
KLF500SBC			½”	1 5/16”	⅜”	3 3/16”		.281	1.74	1.32	1
KLF750SBC			¾”	1⅝”	15/32”	3 9/16”	1⅞”	.343	2.91	2.02	3

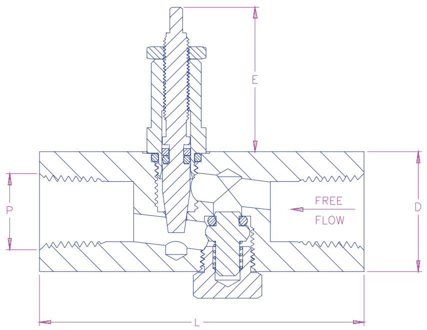
Flow Controls
F Series

Application

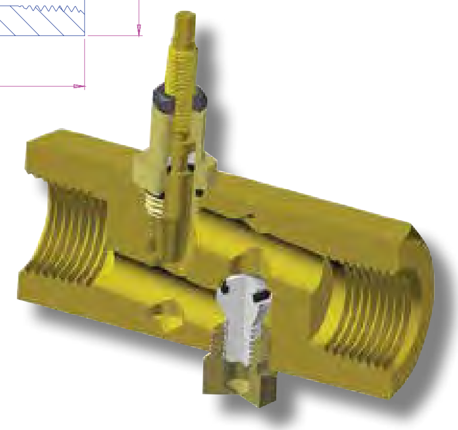
Economically designed for effective control of hydraulic and pneumatic actuators where frequent adjustment is not required.

Features

- Soft-seat piston check for leak-free service.
- Optional ball check for high cycle applications.
- Wrench flats provided to adjust setting, while resisting unwanted tampering.
- Steel valves are zinc plated and sealed with “golden” chromate for double corrosion protection.



F Series

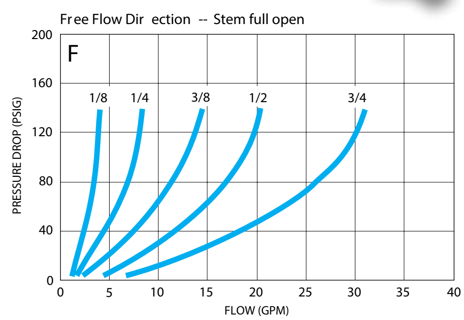


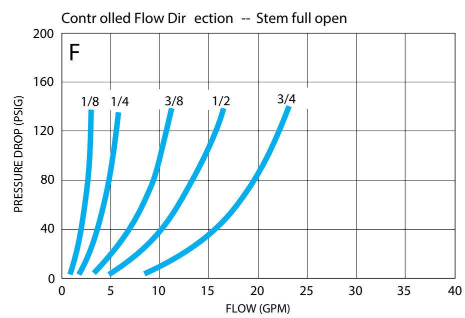
Specifications

Max Operating Pressure Ball Check Models........... 5000 PSIG Steel
Max Operating Pressure Ball Check Models........ 2000 PSIG Brass
Max Operating Pressure Piston Check Models...... 2000 PSIG Brass
Temperature Range.. -20ºF to +212ºF
CV Factor ....See Ordering Information
Stem Taper 8º
Stem Pitch .... 40 Threads/Inch (⅛, ¼, ⅜, ½” Sizes)
Stem Pitch .... 24 Threads/Inch (¾”, Size)

Materials

Body .... 12L14 Steel or ASTM B 16 Brass
Piston Assembly .... Stainless Steel with Viton O-Ring
Ball.. Stainless Steel
Spring .... Stainless Steel
Stem ....Stainless Steel or Brass
Knob .... Aluminum (⅛, ¼, ⅜, ½” Sizes) Brass (¾, 1” Sizes)
Check Plug .... Steel or Brass
Lock Nut .... Brass
Stem Packing ....Viton O-ring with “Teflon” Backup Gland
Chamber.. Steel





Ordering Information

Part Number	Body Material	Check Style	P (NPT) Female	D (In.) Hex	G (In.)	L (In.)	E (In.) Max.	Orifice Diam. (In.)	CV (Free-Flow Direction)	CV (Controlled Flow Direction)	Cracking Pressure (PSIG)
F125B	Brass	Piston	⅛”	11/16”	9/32”	1¾”	1¼”	.156	.32	.23	10
F250B			¼”	⅞”	5/16”	2⅜”			.70	.44	7
F375B			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	8
F500B			½”	1 5/16”	⅜”	3 3/16”		.281	1.74	1.32	5
F250BBC		Ball Check	¼”	⅞”	5/16”	2⅜”	1¼”	.156	.70	.44	7
F375BBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	3
F500BBC	Steel		½”	1 5/16”	⅜”	3 3/16”		.281	1.74	1.32	1
F250SBC			¼”	⅞”	5/16”	2⅜”	1¼”	.156	.70	.44	7
F375SBC			⅜”	1 1/16”	11/32”	2¾”	1⅜”	.265	1.14	.90	3
F500SBC			½”	1 5/16”	⅜”	3 3/16”		.281	1.74	1.32	1
F750SBC							1⅞”	.343	2.91	2.02	3

Check Valves
C-Series

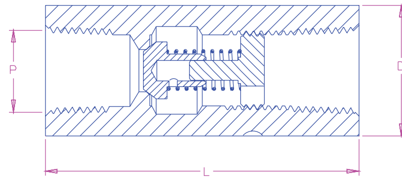
Application

Especially designed for the control of hydraulic and pneumatic systems. Allows full-flow in one direction only.

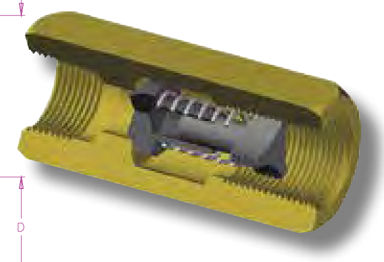
Features

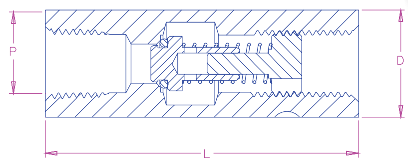
- Efficient in line design provides high flow capability with low pressure drop.
- Soft seat poppet assures leak free service. Durable all metal poppets standard on all other models.
- Steel valves are zinc plated with “golden” chromate for double corrosion protection.
- Versatile design can be mounted in any position.

C Series



Metal to Metal Seat

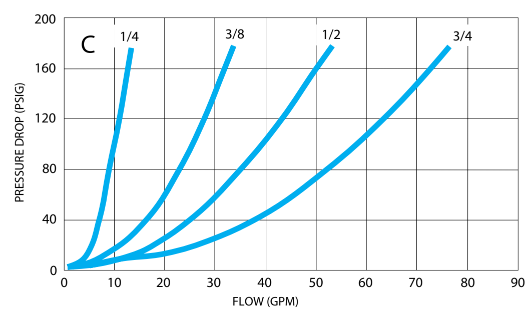




Soft Seat

Specifications

Maximum Operating Pressure....................See Ordering Information
Temperature Range.. -20ºF to +212ºF
CV Factor ....See Ordering Information
Cracking Pressure............. 5 PSIG Standard, call for other settings



Materials

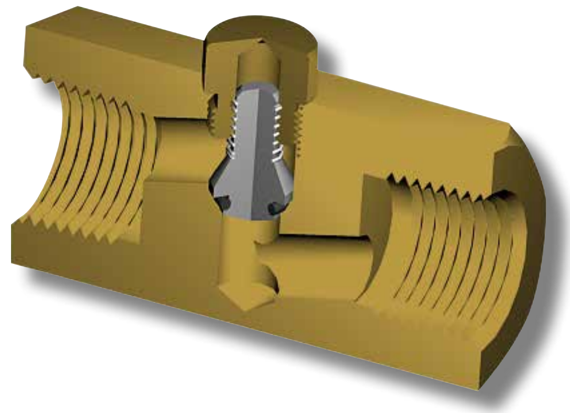
Body .... ASTM B 16 Brass, 12L14 Steel, or 303 Stainless Steel
Spring .... Stainless Steel
Piston... Stainless Steel
Piston Seat - soft-.. Viton

Ordering Information

Part Number	Seating Option	Inlet/Outlet Connections FNPT P	Length L	Wrenching Hex Size D	CV	Maximum Operating Pressure
Stainless Steel Check Valves						
C250SS	Metal	¼”	2⅜”	13/16”	.87	5000 PSIG
C375SS		⅜”	2½”	1”	2.3	
C250SSL	Soft	¼”	2⅜”	13/16”	.87	250 PSIG
C375SSL		⅜”	2½”	1”	2.3	
C500SSL		½”	3”	1⅛”	3.5	3000 PSIG
C750SSL		¾”	3⅝”	1½”	5.2	
Brass Body Check Valves						
C250B	Metal	¼”	2⅜”	13/16”	.87	3000 PSIG
C375B		⅜”	2½”	1”	2.3	
C500B		½”	3”	1⅛”	3.5	
C750B		¾”	3⅝”	1½”	5.2	
C250BL	Soft	¼”	2⅜”	13/16”	.87	250 PSIG
C375BL		⅜”	2½”	1”	2.3	
C500BL		½”	3”	1⅛”	3.5	3000 PSIG
C750BL		¾”	3⅝”	1½”	5.2	
Steel Check Valves						
C250S	Metal	¼”	2⅜”	13/16”	.87	5000 PSIG
C375S		⅜”	2½”	1”	2.3	
C500S		½”	3”	1⅛”	3.5	
C750S		¾”	3⅝”	1½”	5.2	
C250SL	Soft	¼”	2⅜”	13/16”	.87	250 PSIG
C375SL		⅜”	2½”	1”	2.3	
C500SL		½”	3”	1⅛”	3.5	3000 PSIG
C750SL		¾”	3⅝”	1½”	5.2	

Application

Compact, versatile design for the control of air and liquids. Allows full-flow in one direction.

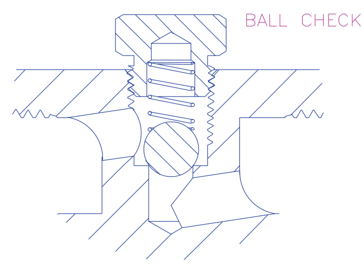


Features

- Piston check design for leak-free air service.
- Ball check design for heavy duty liquid service.
- Low cracking pressures and smooth operation provide efficient service.
- Steel valves are zinc-plated and sealed with “golden” chromate for double corrosion protection.

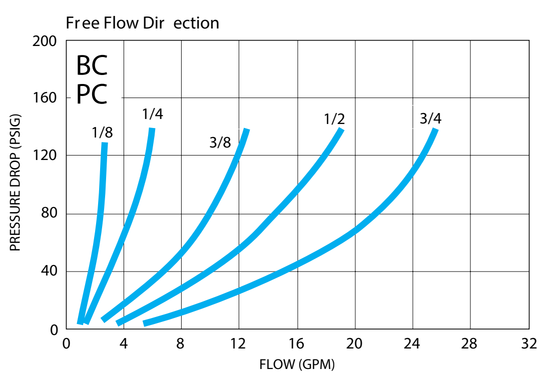
Specifications

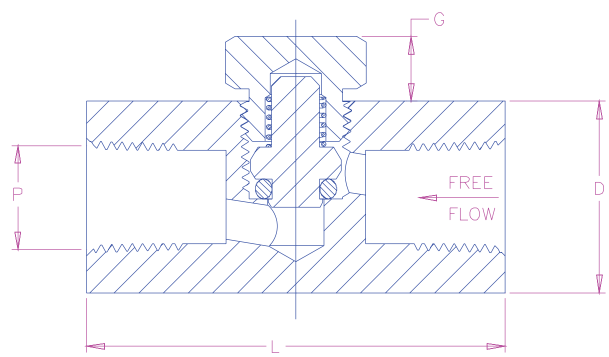
Maximum Operating Pressure “BC” Models............ 5000 PSIG Steel
Maximum Operating Pressure “BC” Models......... 2000 PSIG Brass
Maximum Operating Pressure “PC” Models............ 2500 PSIG Steel
Maximum Operating Pressure “PC” Models......... 2000 PSIG Brass
Temperature Range..-20ºF to +212ºF
CV Factor .... See Ordering Information



Materials

Body .... 12L14 Steel or ASTM B16 Brass
Piston Assembly “PC” Models ..... Stainless Steel with Viton O-Ring
Ball, “BC” Models... Stainless Steel
Spring .... Stainless Steel
Plug .... Steel or Brass





Ordering Information

Part Number	Body Material	Check Style	P (NPT) Female	D (In.) Hex	L (In.)	G (In.)	Orifice Diameter (In.)	CV	Cracking Pressure (PSIG)
PCI25B	Brass	Piston	⅛”	11/16”	1½”	9/32”	.203	.21	10
PC250B			¼”	⅞”	2”	5/16”		.45	7
PC375B			⅜”	1 1/16”	2¼”	11/32”	.272	1.00	8
PC500B			½”	1 5/16”	2 21/32”	⅜”	.328	1.60	½
BC125B	Brass	Ball	⅛”	11/16”	1½”	9/32”	.203	.21	11
BC250B			¼”	⅞”	2”	5/16”		.45	7
BC375B			⅜”	1 1/16”	2¼”	11/32”	.272	1.00	3
BC500B			½”	1 5/16”	2 21/32”	⅜”	.328	1.60	1
BC250S	Steel	Ball	¼”	⅞”	2”	5/16”	.203	.45	7
BC375S			⅜”	1 1/16”	2¼”	11/32”	.272	1.00	3
BC500S			½”	1 5/16”	2 21/32”	⅜”	.328	1.60	1
BC750S			¾”	1⅝”	3”	15/32”	.453	2.21	3

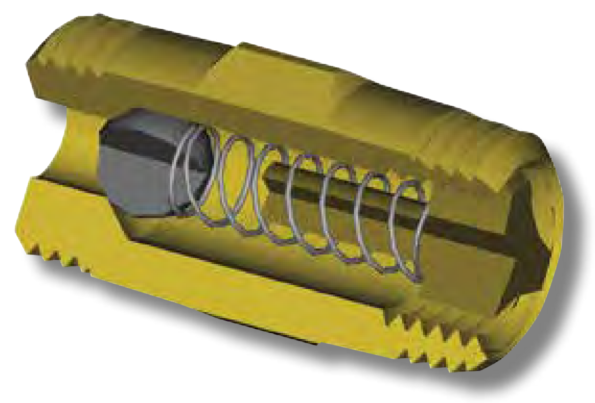
Check Valves
CMM Series

Application

Space saving, in-line design for the control of air and liquids.

Features

- Metal to Metal seal for leak-free liquid service.
- O-ring design for leak-free air service.
- Steel valves are zinc-plated and sealed with clear chromate for double corrosion protection.



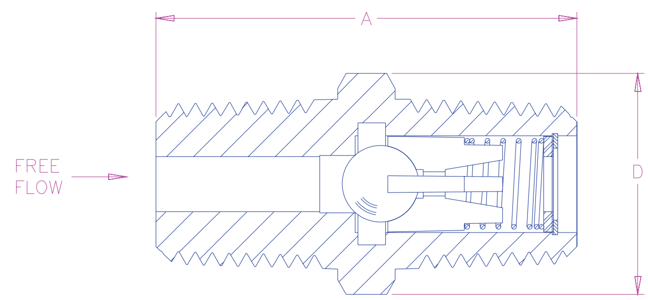
CMM Series

Specifications

Maximum Operating Pressure....................See Ordering Information
Temperature Range.. -20ºF to +400ºF
Cracking Pressure.....................................See Ordering Information
CV Factor .... See Ordering Information

Materials

Body .... ASTM B 16 Brass
Body .... 12L14 Steel
Ball...Stainless Steel
Retainer .... Brass or Steel
Spring ....Stainless Steel



Ordering Information

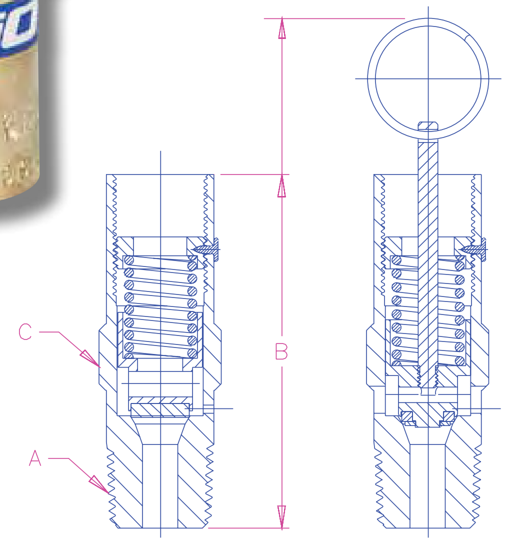
Part Number	Body Material	Seal	Port Size (NPT) Male	A (In.)	B (In.) Hex	Orifice Diameter (In.)	CV	Cracking Pressure (PSIG)	Maximum Pressure (PSIG)
CMM250B	Brass	Metal	¼"	1 5/32"	9/16"	3/16"	.5	7	1000
CMM250B-L		Viton							
CMM375B		Metal	⅜"	1⅜"	11/16"	¼"	.8	3	
CMM250S	Steel	Viton			9/16"	3/16"	.5	7	3000
CMM375S		Viton	⅜"	1⅜"	11/16"	¼"	.8	3	

Relief Valves
PRV - Series

Application

The PRV series of relief valves are ideal for air service. The valve will weep slightly at set pressure and achieve full lift and high flow by 110 percent of their rated set pressure.

PRV Series



Features

- Bubble tight at 97% of set pressure.
- Easy to read color coded psig / bar labels.
- Unique tamper resistant and staked adjusting screw.
- Repeatable performance.
- 100% factory tested.
- Temperatures Range -320 to +212 F.
- Set pressures range from 17-600psi.

Materials

Body	Brass
Spring	Stainless Steel
Seat Retainer	Brass
Adjusting Screw	Brass
Seat Disc (Below 140psi)	Fluorosilicone
Seat Disc (Above 140psi)	Teflon

PRV Series also available with all stainless steel components

Flow Data for Rego ¼", ⅜" & ½" Relief Valves:

Set Pressure PSIG	Flow Pressure PSIG	Flow Rate SCFM Air
22	24	29
50	55	52
100	110	93
150	165	134
230	253	200
350	385	298
400	440	339
450	495	380
500	550	421

WARNING: Inspection and maintenance of pressure relief valves is very important. Failure to properly inspect and maintain pressure relief valves could result in personal injuries or property damage. The useful safe service life of a pressure relief valve may be significantly affected by the service environment.

Ordering Information
The PRV - series valves are ordered by specifying the basic relief valve part number and specifying with or without pull ring.

Example:

PRV	250B	R	350
Series	**Size**	**Ring or no ring**	**Pressure Setting**

Ordering Information

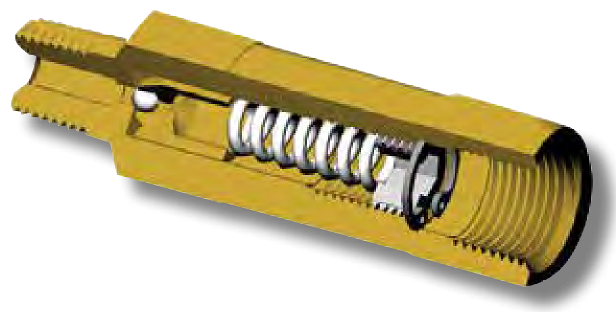
Part Number Specify Relief Setting "XXX"	Ring Pull	Body	A (NPT) Male	B Ht.	C (IN.) Hex	Relief Setting
*PRV250BRXXX	Yes	Brass	¼	3.0	⅞	Available in settings from 17-600 psi.
PRV250BXXX	No			2.6		
*PRV500BRXXX	Yes		½	3.2		
PRV500BXXX	No			2.8		

* (R) indicates a relief valve comes with a pull ring.

Relief Valves
ARV SERIES

Application

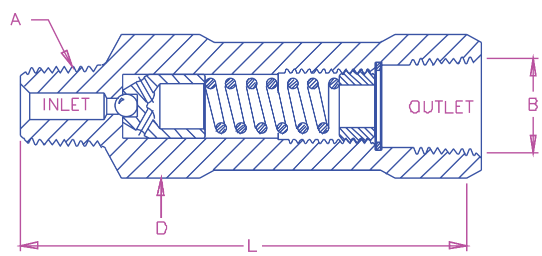
Adjustable design to relieve liquid pressure above a predetermined setting. For use anywhere excessive pressure may harm system components.



Features

- Space saving in line design.
- Retaining ring prevents adjusting screw from being backed out too far.
- Pop-off action does not “chatter” or “scream”.
- Metal-to-metal seal assures long life.
- Suitable for oil, water and steam.

ARV Series



Specifications

Operating Range .... 400 to 5000 PSIG
Temperature Range .... -60ºF to +450ºF
CV Factor .... .21
Orifice Diameter... 3⁄32”

Materials

Body .... ASTM B16 Brass
Spring .... 303 Stainless Steel
Piston..Brass
Ball... Stainless Steel
Adjusting Screw..................... 302 Stainless Steel (¼” Allen Wrench)
Retaining Ring .... Stainless Steel

Ordering Information

Part Number	A (NPT) Inlet Port	B (NPT) Outlet Port	C (In.) Length	D (In.) Hex
ARV250B	¼” Male	⅜” Female	3⅛”	⅞”

Flow Data

Flow and pressure drop characteristics for valves manufactured by Engineered Controls International. Inc. are based on laboratory testing of random production samples and by an independent testing agency. The graphs are based on 150 SSU oil at the controlled temperature of 140ºF. Flow coefficient (CV) have been provided for valves in this catalog. Calculating flo or pressure drop at other conditions is achieved with the following equation:

$$\text{Flow in GPM} \quad C_V \frac{\sqrt{P1 - P2}}{\sqrt{Gf}}$$

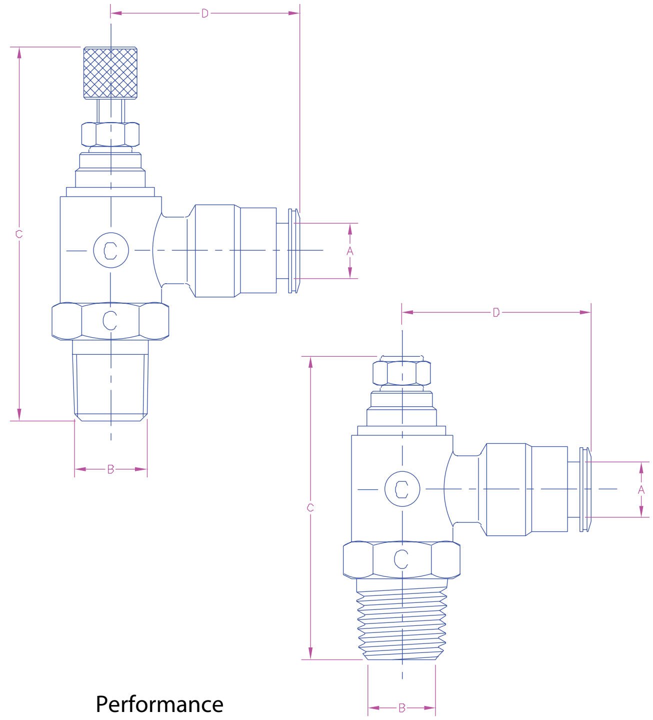
Where...

CV = Flow coefficien
P1 = Inlet pressure (PSIG)
P2 = Outlet pressure (PSIG)
Gf = Specifi gravity of medium at operating temperature

Compact Pneumatic Flow Controls With Push-In-Tube Connection

Features

- Compact design permits mounting directly on pneumatic cylinder.
- Push-In-Tube connections allow convenient tube assembly without the need for tools or other components.
- Tubing easily installed by pushing into outlet and released by pressing collet and pulling.
- Available with convenient knurled knob or tamper resistant recessed screwdriver slot.
- Valves are nickel plated for corrosion protection.
- Unique cup seal provides positive seal during metered flow.
- Precision long-tapered stem provides accurate control.
- Tube Port rotates fully after mounting.



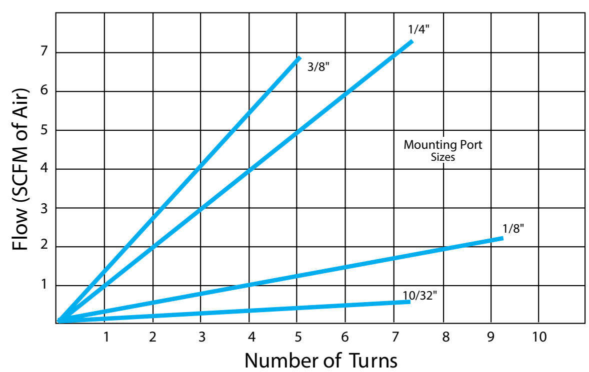
Specifications

Operating Pressure .... 15 to 150 PSIG
Temperature Range...+32º F to +176º F
Body Material.......................... OT58 Brass Body with Nickel Plating
Seal Material..Buna-N

Ordering Information

Part Number	Actuation	A Tube Port O.D.	B Mounting Port	C Height (Valve Open)	D
RAM 53-02	Knurled Knob	5/32"	⅛" NPT	1⅛"	⅞"
RAM 4-02		¼"			1 5/16"
RAM 4-04			¼" NPT	2¼"	1 1/16"
RAM 6-04		⅜"			1⅛"
RAM 6-06			⅜" NPT	2⅝"	1 5/16"
RAS 53-02	Recessed Screwdriver Slot	5/32"	⅛" NPT	1½"	⅞"
RAS 4-02		¼"			1 5/16"
RAS 4-04			¼" NPT	1⅝"	1 1/16"
RAS 6-04		⅜"			1⅛"
RAS 6-06			⅛" NPT	1 13/16"	1 5/16"

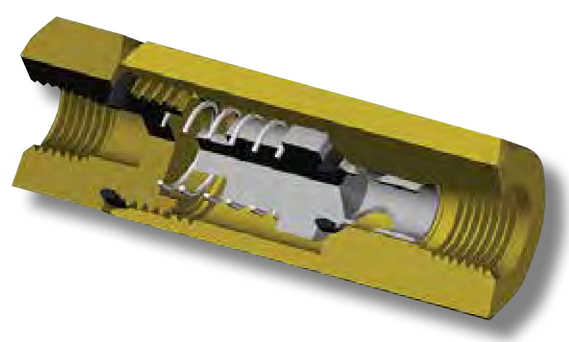
Performance



CW-series check valves

Features

- A check valve specifically designed and manufactured for the car wash/pressure washing industry.
- Unique two piece construction allows the user to dis-assemble the valve, clean and replace seals as necessary.
- Both valves which are available in 1/4" and 3/8"NPTF contain O-rings of Viton7 and Buna-N for long-lasting durability.
- Maximum operating pressure on each valve is 2000 psi.
- Cracking pressure is 5 psig.



Ordering Information

Valve Number	Material	Thread (Both Ends)	A Length (in)	B Width (in)
CW250BL	ASTM B 16 Brass	¼ NPTF	3.03	1.00
CW375BL		⅜ NPTF		
CW250SSL	303 Stainless Steel	¼ NPTF		
CW375SSL		⅜ NPTF		

Limited Warranty and Limitation of Liability

LIMITED WARRANTY

RegO warrants products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 12 months from the date of installation or operation or 18 months from the date of shipment from the factory, whichever is earlier. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifie RegO thereof in writing, RegO, at its option, and within forty-fiv days, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by it to be defective. Failure of buyer to give such written notice within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used in accordance with RegO's printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT, CGA, and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse or neglect, nor does it extend to any product or part which has been modified altered, or repaired in the field

Except as expressly set forth above, and subject to the limitation of liability below, RegO makes NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, with respect to its products and parts, whether used alone or in combination with others. RegO disclaims all warranties not stated herein.

LIMITATION OF LIABILITY

RegO's total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such cause be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO shall not be liable for incidental, consequential or punitive damages or other losses. RegO shall not be liable for, and buyer assumes liability for, all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or material.

If RegO furnishes technical advice to buyer, whether or not at buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO shall not be liable for technical advice and buyer assumes all risks of such advise and the results thereof.

NOTE: Some states do not allow the limitation or exclusion of incidental or consequential damages, so the above limitations or exclusions, wholly or partially, may not apply. The portions of this limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

WARNING

All RegO products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammabl and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the firs purchasers of RegO products. Since most users have purchased these products from RegO distributors, the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing the distributor from whom he purchased the product/parts. The distributor may or may not at the distributor's option, choose to submit the product/parts to RegO pursuant to its Limited Warranty. Failure by buyer to give such written notice within thirty (30) days shall be deemed an absolute and unconditional waiver or buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO's distributor for replacement or repairs under the terms of RegO's Limited Warranty in no way obligates RegO to the terms of the above warranty.

Because of a policy of continuous product improvement, <u>RegO reserves the right to change designs, materials or specification without notice.</u>

Canadian Registration Numbers

The majority of products in this catalog are registered with the Canadian Department of Labor under the following reference Number: 0* 8040.5**

* Represents Fitting Categories: A, C, G, H

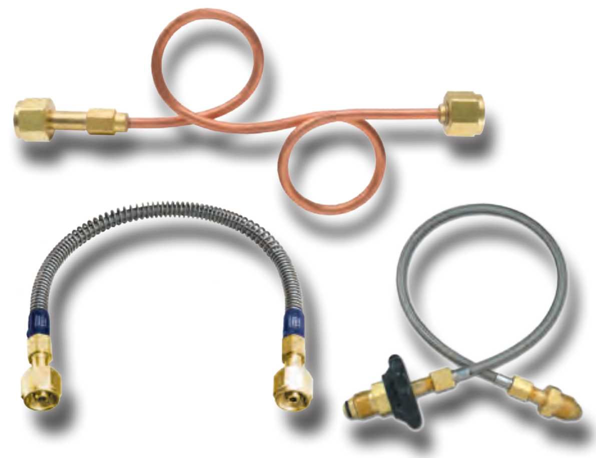
Province	CRN
1 British Columbia	0 * 8040.51
2 Alberta	0 * 8040.52
3 Saskatchewan	0 * 8040.53
4 Manitoba	0 * 8040.54
5 Ontario	0 * 8040.5
6 Quebec	0 * 8040.56
7 New Brunswick	0 * 8040.57
8 Nova Scotia	0 * 8040.58
9 Prince Edward Island	0 * 8040.59
0 Newfoundland	0 * 8040.50
N Nunavut	0 * 8040.5N
T Northwest Territories	0 * 8040.5T
Y Yukon Territory	0 * 8040.5Y

* Represents Fitting Categories A, C, F, G, H

Superior Products

Redefining Gas Management Systems

Brass & Stainless Steel
Gas Fittings & Assemblies



Flexible & Rigid Pigtails

Manifolds & Gas Management Systems

Industrial Hospital Specialty

Superior Products, LLC. has made every effort to publish the most helpful and comprehensive catalog of compressed gas products available. With safety and accurate product specification as top priorities, our product descriptions include information on sizes, operating pressures, application, construction materials, CGA numbers, and all other relevant information.

CGA numbers identify products intended for specific gas services. All Superior Products fittings are manufactured to Compressed Gas Association standards.

In addition to CGA numbers, many popular fittings are commonly referred to as **"A", "B", "C", and "D"** sized fittings . For your convenience, these letter identifications are also included in our product descriptions as **"A"**, **"B"**, **"C"**, and **"D"**. **Pressure ratings** on A, B, C, and D sized fittings included on these pages are limited by the CGA to 200 PSI (1400 kPa) maximum working pressure. Kilopascals (kPa) are the metric equivalent of Pounds Per Square Inch (PSI).

gas acronyms used

(not all standard)

CGA	Compressed Gas Association	**RH**	Right Handed
NGO	National Gas Outlet	**LH**	Left Handed
NPT	National Pipe Thread	**WT**	Wrench Tight
UNS	Unified Numbering System	**HT**	Hand Tight
PSI	Pounds per Square Inch	**QC**	Quick Connect
EXT	External (**M** - Male Thread)	**CP**	Chrome Plated
INT	Internal (**F** - Female Thread)	**ID**	Inside Diameter
CS	Countersunk	**OD**	Outside Diameter

metric conversion — PSI to kPa to Bar

The following conversions are used throughout this catalog, rounded off for ease of use. Kilopascals & Bar conversions are provided whenever possible.**(1 PSI = 6.89 kPa = .07 Bar**

200 PSI = 1379 kPa = 14 Bar	3000 PSI = 20685 kPa = 207 Bar
400 PSI = 2758 kPa = 28 Bar	4500 PSI = 27580 kPa = 310 Bar
500 PSI = 3400 kPa = 35 Bar	5500 PSI = 37920 kPa = 380 Bar
1000 PSI = 6895 kPa = 70 Bar	6000 PSI = 41370 kPa = 414 Bar

maximum gas withdrawal rates for liquified gases

CRYOGENIC CYLINDERS

CO_2 - 110 SCFH

NITROUS OXIDE - 80 SCFH

ARGON, NITROGEN, OXYGEN - 75 SCFH

HIGH PRESSURE W/LIMITED WITHDRAWAL RATE

CO_2 50 - SCFH

NITROUS OXIDE - 50 SCFH

Acetylene - 1/10 CYL CAPACITY/HOUR

part type	letter prefix
Adaptors - Outlet	A
Bushings - Pipe	B
Brass Tubing	BT
Cable Connectors	CN
Check Valves	CV
Couplers - Tees	C
Copper Tubing	CT
Crimping Tools	KT
Dust Caps & Chain	CC
Elbow	EL
Cryogenic Elbow	CEL
Cryogenic Flexible Hose	CHF
Cryo Hand Tight with Elbow	CHTE
Cryogenic Phase Separator	CPS
Check Valves	CV
Filters	F
Flare Adaptors	FA
Flash Back Arrestor	FA
Gas Manifold Assemblies	GMA
Gas Manifold Fittings	GMF
Hand Tight Cyrogenic	HTC
Hand Tight Nuts	HTN
Hose Repair Kits	RK
Manifold Blocks	MB
Chrome Nuts	MN
Chrome Nipples	MNP
Leak Detector	LD
Nipples	NP
Nuts	N
NPT Male	MNPT
NPT Female	FNPT
'O' Rings	OR
Pigtails Rigid	PT
Pigtails Flexible	PTF
Plastic Tips	T
Plugs & Chains	PC
Power Cable Holders	PCH
Reverse Flow Check Valve	RCV
Splicers	S
Stainless Steel	SS
Snap Rings	XSR
Valves	V
Washers	W
"Y" Connectors	Y
"Y"' Connectors with Valves	YV

Hose Nuts

200 PSI

Oxygen

N-20

Thread Size	CGA	Part No.
“A” 3/8”-24-RH	020	**N-10**
“B” 9/16”-18-RH	022	**N-20**
Railroad 41/64”-18-RH	028	**N-30**
“C” 7/8”-14-RH	024	**N-34**
“D” 1-1/4”-12-RH	026	**N-42**

Hose Nuts

200 PSI

Fuel Gas

N-21

Thread Size	CGA	Part No.
“A” 3/8”-24-LH	021	**N-11**
“B” 9/16”-18-LH	023	**N-21**
Railroad 41/64”-18-LH	029	**N-31**
“C” 7/8”-14-LH	025	**N-35**
“D” 1-1/4”-12-LH	027	**N-43**

Barb Hose Nipples

200 PSI

NP-10

Size/Length	For Hose Size	Part No.
“A”, 1-7/32”	3/16” I.D.	**NP-4**
“B”, 3-1/32”	1/8”-5/32” I.D.	**NP-5**
“B”, 1-7/16”	3/16” I.D.	**NP-6**
“B”, 1-7/16”(with ‘O’Ring)	3/16” I.D.	**NP-6W**
“B”, 1-7/16”	1/4” I.D.	**NP-10**
“B”, 1-7/16”(with ‘O’Ring)	1/4” I.D.	**NP-10W**
“B”, 1-1/8”	1/4”-9/32” I.D.	**NP-65**
“B”, 1-7/16”	5/16” I.D.	**NP-14**
“B”, 1-7/16”	3/8” I.D.	**NP-18**
“B”, 1-3/4”	3/8” I.D.	**NP-20**
“C”, 1-35/64”	1/4” I.D.	**NP-12**
“C”, 2”	3/8” I.D.	**NP-24**
“C”, 2-1/4”	1/2” I.D.	**NP-28**
“C”, 4-9/16”	1/2” I.D.	**NP-30**
“D”, 2-1/2”	1/2” I.D.	**NP-34**
“D”, 3-1/2”	3/4” I.D.	**NP-36**
‘O’Ring for NP-6W & NP-10W		**XOR-002**

Spiral Hose Nipples

200 PSI

NP-46

Size/Length	For Hose Size	Part No.
“A”, 1-1/4”	3/16” I.D.	**NP-40**
“B”, 1-5/16”	3/16” I.D.	**NP-42**
“B”, 1-19/32”	1/4” I.D.	**NP-46**
“B”, 1-5/8”	3/8” I.D.	**NP-54**

Nipples With Threads- ”B”, ”C” & ”D” Size

NP-605

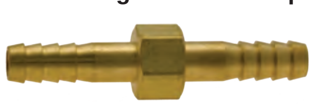
Size/Length	Thread size	Part No.
“B”, 1”	1/8” MNPT	**NP-595**
“B”, 1-1/2”	1/8” MNPT	**NP-596**
“C”, 2”	1/4” MNPT	**NP-605***
“C”, 2-1/2”	1/4” MNPT	**NP-606***
“D”, 2-1/2”	1/2” MNPT	**NP-640**

*To order with filter, add suffix “RF”

Hose Splicers

200 PSI

Barb Hexagon Center Stop



S-244

For Hose Size	Part No.
3/16” I.D.	**S-233**
1/4” I.D.	**S-244**
5/16” I.D.	**S-255**
3/8” I.D.	**S-266**

Barb Round Center Stop

S-344

For Hose Size	Part No.
3/16” I.D.	**S-333**
1/4” I.D.	**S-344**
5/16”I.D.	**S-355**
3/8” I.D.	**S-366**
1/2” I.D.	**S-388**

200 PSI

Spiral Hexagon Center Stop

S-544

For Hose Size	Part No.
1/4” I.D.	**S-544**

Barb No Center Stop

S-444

For Hose Size	Part No.
3/16” I.D.	**S-433**
1/4” I.D.	**S-444**
3/8” I.D.	**S-466**

brass hose fittings

Brass Thread To Hose Barb Adaptor

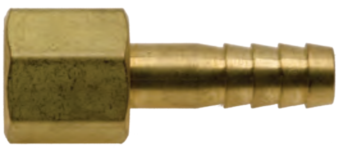
200 PSI

Male NPT Thread

A-113

Thread Size	For Hose Size	Part No.
1/8" MNPT	1/8" I.D.	**A-101**
1/8" MNPT	3/16" I.D.	**A-102**
1/8" MNPT	1/4" I.D.	**A-103**
1/8" MNPT	3/8" I.D.	**A-105**
1/4" MNPT	1/8" I.D.	**A-111**
1/4" MNPT	3/16" I.D.	**A-112**
1/4" MNPT	1/4" I.D.	**A-113**
1/4" MNPT	5/16" I.D.	**A-114**
1/4" MNPT	3/8" I.D.	**A-115**
3/8" MNPT	1/4" I.D.	**A-122**
3/8" MNPT	5/16" I.D.	**A-123**
3/8" MNPT	3/8" I.D.	**A-124**

Female NPT Thread Thread



A-151

Thread Size	For Hose Size	Part No.
1/8" FNPT	1/8" I.D.	**A-151**
1/8" FNPT	3/16" I.D.	**A-152**
1/8" FNPT	1/4" I.D.	**A-153**
1/4" FNPT	1/8" I.D.	**A-161**
1/4" FNPT	3/16" I.D.	**A-162**
1/4" FNPT	1/4" I.D.	**A-163**
1/4" FNPT	5/16" I.D.	**A-164**
1/4" FNPT	3/8" I.D.	**A-165**

Hose Barb Adaptors

200 PSI

(Standard B Thread)

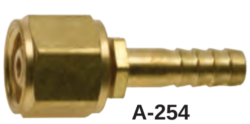
A-51

Thread Size	For Hose Size	Part No.
Oxygen"B" 9/16"-18-RH-EXT	3/16" I.D.	**A-50**
Fuel Gas"B" 9/16"-18-LH-EXT	3/16" I.D.	**A-51**
Oxygen"B" 9/16"-18-RH-EXT	1/4" I.D.	**A-60**
Fuel Gas "B" 9/16"-18-LH-EXT	1/4" I.D.	**A-61**

Hose Adaptors

200 PSI

Swivel Nut to Hose Barb Adaptors



A-254

Thread Size	For Hose Size	Part No.
Oxygen "A" 3/8"-24-RH-INT	1/4" I.D. Hose	**A-250**
Fuel Gas "A" 3/8"-24 LH-INT	1/4" I.D. Hose	**A-251**
Oxygen "B" 9/16"-18 -RH-INT	1/4" I.D. Hose	**A-254**
Fuel Gas "B" 9/16"-18 -LH-INT	1/4" I.D. Hose	**A-255**

Swivel Nut Adaptors

200 PSI

A-193

A-192

Thread Size	Hose Connection	Part No.
1/4" MNPT	"B" 9/16"-18-RH-INT	**A-192**
1/4" MNPT	"B" 9/16"-18-LH-INT	**A-193**

External Hose Nut to Swivel Nut and Nipple

200 PSI

A-300

A-307

Oxygen

Thread Size	Thread Size	Part No.
“A” 3/8”-24-RH-EXT	“B” 9/16”-18-RH-INT	**A-300**
“B” 9/16”-18-RH-EXT	“A” 3/8”-24-RH-INT	**A-306**
“B” 9/16”-18-RH-EXT	“C” 7/8”-14-RH-INT	**A-308**

Fuel Gas

Thread Size	Thread Size	Part No.
“A” 3/8”-24-LH-EXT	“B” 9/16”-18-LH-INT	**A-301**
“B” 9/16”-18-LH-EXT	“A” 3/8”-24-LH-INT	**A-307**

Pipe Thread to Swivel Nut and Nipple 2-1/2”

200 PSI

A-188

Oxygen

Thread Size	Thread Size	Part No.
1/4” MNPT	“B” 9/16”-18-RH-INT	**A-188**

Fuel Gas

Thread Size	Thread Size	Part No.
1/4” MNPT	“B” 9/16”-18-LH-INT	**A-189**

Female Pipe Thread to “B” Connections

200 PSI

FNPT

EXT Hose
“B” Coupler

A-238

Oxygen

Thread Size	Thread Size	Part No.
1/8” FNPT	“B” 9/16”-18-RH-EXT	**A-238**
1/4” FNPT	“B” 9/16”-18-RH-EXT	**A-242**

Fuel Gas

Thread Size	Thread Size	Part No.
1/4” FNPT	“B” 9/16”-18-LH-EXT	**A-243**

Female NPT to Internal Swivel Nut

200 PSI

FNPT

INT Hose “B”
Swivel Nut

A-228

Oxygen

Thread Size	Thread Size	Part No.
1/4” FNPT	“B” 9/16”-18-RH-INT	**A-228**

Fuel Gas

Thread Size	Thread Size	Part No.
1/4” FNPT	“B” 9/16”-18-LH-INT	**A-229**

brass/stainless steel hose fittings, regulator outlets

90° External Hose Coupler to Internal Swivel Nut

200 PSI

Standard B Oxygen Nut

Standard B Oxygen Hose Coupler

A-322

Oxygen

Thread Size	Thread Size	Part No.
"B" 9/16"-18-RH-EXT	"B" 9/16"-18-RH-INT	**A-322**
1/4" MNPT	"B" 9/16"-18-RH-INT	**A-194**

Fuel Gas

Thread Size	Thread Size	Part No.
"B" 9/16"-18-LH-EXT	"B" 9/16"-18-LH-INT	**A-323**

90° External Pipe to External "B" coupler

200 PSI

Standard B Oxygen Hose Coupler

MNPT

A-334

Oxygen

Thread Size	Thread Size	Part No.
1/4" MNPT	"B" 9/16"-18-RH-EXT	**A-334**

Fuel Gas

Thread Size	Thread Size	Part No.
1/4" MNPT	"B" 9/16"-18-LH-EXT	**A-335**

Hose Couplers (Brass)

200 PSI

C-50

Oxygen

Thread Size	Thread Size	Part No.
"A" 3/8"-24-RH-EXT	"A" 3/8"-24-RH-EXT	**C-10**
"B" 9/16"-18-RH-EXT	"A" 3/8"-24-RH-EXT	**C-20**
"B" 9/16"-18-RH-EXT	"B" 9/16"-18-RH-EXT	**C-50**
"C" 7/8"-14-RH-EXT	"C" 7/8"-14-RH-EXT	**C-80**
"D" 1-1/4" - 12-RH-EXT	"D" 1-1/4" - 12-RH-EXT	**C-90**

Fuel Gas

Thread Size	Thread Size	Part No.
"A" 3/8"-24LH-EXT	"A" 3/8"-24-LH-EXT	**C-11**
"B" 9/16"-18LH-EXT	"A" 3/8"-24-LH-EXT	**C-21**
"B" 9/16"-18LH-EXT	"B" 9/16"-18-LH-EXT	**C-51**
"C" 7/8"-14-LH-EXT	"C" 7/8"-14-LH-EXT	**C-81**
"D" 1-1/4" - 12-LH-EXT	"D" 1-1/4" - 12-LH-EXT	**C-91**

Regulator Outlet Adaptors

200 PSI

B-28

B-28SS

Oxygen

Thread Size	Thread Size	Part No.
1/8" MNPT	"A" 3/8"-24-RH-EXT	**B-6**
1/8" MNPT	"B" 9/16"-18-RH-EXT	**B-8**
1/4" MNPT	"A" 3/8"-24-RH-EXT	**B-26**
1/4" MNPT	"B" 9/16"-18-RH-EXT	**B-28**
1/4" MNPT	"B" 9/16"-18-RH-EXT	**B-28**SS
3/8" MNPT	"B" 9/16"-18-RH-EXT	**B-50**
1/2" MNPT	"C" 7/8"-14-RH-EXT	**B-66**
1/2" MNPT	"D" 1-1/4" - 12-RH-EXT	**B-72**
3/4" MNPT	"D" 1-1/4" - 12-RH-EXT	**B-74**

Fuel Gas

Thread Size	Thread Size	Part No.
1/8" MNPT	"A" 3/8"-24-LH-EXT	**B-7**
1/8" MNPT	"B" 9/16"-18-LH-EXT	**B-9**
1/4" MNPT	"A" 3/8"-24-LH-EXT	**B-27**
1/4" MNPT	"B" 9/16"-18-LH-EXT	**B-29**
3/8" MNPT	"B" 9/16"-18-LH-EXT	**B-51**
1/2" MNPT	"C" 7/8"-14-LH-EXT	**B-67**

Check Valves

Torch Type Check Valve

CV-10R

Inlet	Flow	Outlet	Part No.
			200 PSI
Oxygen “A” 3/8”-24-RH-EXT	—>	“A” 3/8”-24-RH-INT	**CV-10R**
Fuel Gas “A” 3/8”-24-LH-EXT	—>	“A” 3/8”-24-LH-INT	**CV-11L**

B-Size One Piece Torch Type

CV-20R

Inlet	Flow	Outlet	Part No.
			200 PSI
Oxygen “B” 9/16”-18-RH-EXT	—>	“B” 9/16”-18-RH-INT	**CV-20R**
Fuel “B” 9/16”-18-LH-EXT	—>	“B” 9/16”-18-LH-INT	**CV-21L**

Regulator Bushing Adaptor Type

CV-128R

Inlet	Flow	Outlet	Part No.
			200 PSI
Oxygen “B” 9/16”-RH-INT	—>	“B” 9/16”-18-RH-EXT	**CV-128R**
Fuel Gas“B” 9/16”-LH-INT	—>	“B” 9/16”-18-LH-EXT	**CV-129L**
1/4” MNPT	—>	“B” 9/16”-18-RH-EXT	**CV-28R**
1/4” MNPT	—>	“B” 9/16”-18-LH-INT	**CV-29L**

Low Pressure Inline Check Valves

CV-25

Inlet	Flow	Outlet	Part No.
			200 PSI
1/4” MNPT	—>	1/4” MNPT	**CV-24**
1/4” MNPT	—>	1/4” FNPT	**CV-25**
1/4” FNPT	—>	1/4” FNPT	**CV-26**

High Pressure Inline Check Valves

CV-230

Inlet	Flow	Outlet	Part No.
			3000 PSI
1/4” MNPT	—>	1/4” MNPT	**CV-215**
1/4” MNPT	—>	1/4” FNPT	**CV-219**
1/4” FNPT	—>	1/4” FNPT	**CV-229**
1/4” FNPT	—>	1/4” MNPT	**CV-230**

Stainless Steel Inline Check Valves

CV-219SS

Inlet	Flow	Outlet	Part No.
			6000 PSI
1/4” MNPT	—>	1/4” MNPT	**CV-215SS**
1/4” MNPT	—>	1/4” FNPT	**CV-219SS**
1/4” FNPT	—>	1/4” FNPT	**CV-229SS**
1/4” FNPT	—>	1/4” MNPT	**CV-230SS**

flash arrestors

- Designed for "B" size torch, regulator and hose connections
- Built-in check valve prevents reverse flow of gas
- Stainless steel sintered element stops multiple flashes (no resetting required)
- U/L Listed
- Purchase as POP display pack or as individual units
- High Flow Capacity
- 2 PSI is minimum pressure for gas to flow
- 1750 SCFH @ 125 psi

*Always leak test system before pressurizing
*Always bleed the system before disconnecting

200 PSI

Description	Part No.
Oxygen/Fuel Gas Set, Regulator Style, POP Display	**FBK-100**
Oxygen/Fuel Gas Set, Torch Style, POP Display	**FBK-200**
Individual Oxygen Arrestor, Regulator Style	**FB-122**
Individual Fuel Gas Arrestor, Regulator Style	**FB-123**
Individual Oxygen Arrestor, Torch Style	**FB-222**
Individual Fuel Gas Arrestor, Torch Style	**FB-223**

quick connectors

- Durable brass coupling pin
- Designed for "B" torch and hose fittings
- Design guided by ISO 7289 safety standards
- Gas specific oxygen and fuel connectors prevent cross connection
- Built-in automatic gas cut-offs shut down upstream gases when disconnected

*Always leak test system before pressurizing

*Always bleed the system before disconnecting

Oxygen: 200 PSI Max   Fuel Gas: 50 PSI Max

Description	Part No.
Oxygen & Fuel Gas Set, Torch Style, POP Display	**QCT-100**
Oxygen Set, Torch Style	**QCT-112**
Fuel Gas Set, Torch Style	**QCT-113**
Oxygen & Fuel Gas Set, Regulator Style, POP Display	**QCR-200**
Oxygen Set, Regulator Style	**QCR-222**
Fuel Gas Set, Regulator Style	**QCR-223**
Oxygen & Fuel Gas Set, Hose Style, POP Display	**QCH-300**
Oxygen Set, Hose Style	**QCH-332**
Fuel Gas Set, Hose Style	**QCH-333**
Replacement Pins for Above Parts:	**Part No.**
Male Pin, Oxygen, Torch Style, 9/16-18 RH-INT	**QCT-112-PIN**
Male Pin, Fuel Gas, Torch Style, 9/16-18 LH-INT	**QCT-113-PIN**
Male Pin, Oxygen, Regulator Style, 9/16-18 RH-INT	**QCT-222-PIN**
Male Pin, Fuel Gas, Regulator Style, 9/16-18 LH-INT	**QCT-223-PIN**
Male Pin, Oxygen, Hose Style, 9/16-18 RH-EXT	**QCH-332-PIN**
Male Pin, Fuel Gas, Hose Style, 9/16-18 LH-EXT	**QCH-333-PIN**

Brass: Maximum Pressure 3,000 PSI
Stainless Steel (SS): Maximum Pressure 6,000 PSI

Brass/Stainless Steel Pipe Thread Fittings

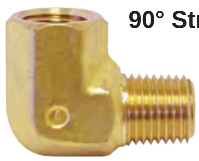
90° Elbow

PEL-4HP

PEL-4SS

Thread Size	Material	Part No.
1/8” FNPT x 1/8” FNPT	Brass	**PEL-2HP**
1/4” FNPT x 1/4” FNPT	Brass	**PEL-4HP**
1/2” FNPT x 1/2” FNPT	Brass	**PEL-8HP**
1/4” FNPT x 1/4” FNPT	SS	**PEL-4SS**

90° Street Elbow



PL-4HP

PL-4SS

Thread Size	Material	Part No.
1/8” FNPT x 1/8” MNPT	Brass	**PL-2HP**
1/4” FNPT x 1/4” MNPT	Brass	**PL-4HP**
3/8” FNPT x 3/8” MNPT	Brass	**PL-6HP**
1/2” FNPT x 1/2” MNPT	Brass	**PL-8HP**
1/4” FNPT x 1/4” MNPT	SS	**PL-4SS**

45° Street Elbow

PSL-4-4HP

PSL-4SS

Thread Size	Material	Part No.
1/8” FNPT x 1/8” MNPT	Brass	**PSL-2-2HP**
1/4” FNPT x 1/4” MNPT	Brass	**PSL-4-4HP**
1/4” FNPT x 1/4” MNPT	SS	**PSL-4SS**

Cap

P-54

Thread Size	Material	Part No.
1/8” FNPT	Brass	**P-52**
1/4” FNPT	Brass	**P-54**
3/8” FNPT	Brass	**P-56**
1/2” FNPT	Brass	**P-58**

Tee

PFT-4HP

PFT-4SS

Thread Size	Material	Part No.
1/8” FNPT (3)	Brass	**PFT-2HP**
1/4” FNPT (3)	Brass	**PFT-4HP**
1/2” FNPT (3)	Brass	**PFT-8HP**
1/4” FNPT (3)	SS	**PFT-4SS**

Street Tee

PST-4HP

Thread Size	Material	Part No.
1/8” FNPT (2) x 1/8” MNPT	Brass	**PST-2HP**
1/4” FNPT (2) x 1/4” MNPT	Brass	**PST-4HP**

Cross

PCR-4HP

PCR-4SS

Thread Size	Material	Part No.
1/8” FNPT (4)	Brass	**PCR-2HP**
1/4” FNPT (4)	Brass	**PCR-4HP**
1/4” FNPT (4)	SS	**PCR-4SS**

brass / stainless steel pipe thread fittings

Brass/Stainless Steel Pipe Thread Fittings

Brass: Maximum Pressure 3,000 PSI
Stainless Steel (SS): Maximum Pressure 6,000 PSI

Hex Brass Nipples

B-241

B-215SS

Thread Size	Material	Part No.
1/8” MNPT x 1/8” MNPT	Brass	**B-200**
1/4” MNPT x 1/8” MNPT	Brass	**B-206**
1/4” MNPT x 1/4” MNPT	Brass	**B-215**
1/4” MNPT x 1/4” MNPT	SS	**B-215SS**
3/8” MNPT x 3/8” MNPT	Brass	**B-222**
3/8” MNPT x 1/4” MNPT	Brass	**B-239**
1/2” MNPT x 1/4” MNPT	Brass	**B-241**
1/2” MNPT x 3/8” MNPT	Brass	**B-242**
1/2” MNPT x 1/2” MNPT	Brass	**B-243**
3/4” MNPT x 3/4” MNPT	Brass	**B-247**

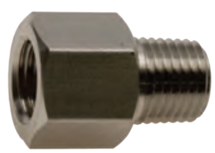
Hex Head Plug

P-4

1/8” MNPT	Brass	**P-2**
1/4” MNPT	Brass	**P-4**
1/2” MNPT	Brass	**P-8**

Adaptors

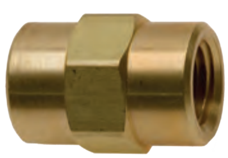
B-219



B-219SS

1/4” FNPT x 1/4” MNPT	Brass	**B-219**
1/4” FNPT x 1/4” MNPT	SS	**B-219SS**
1/8” FNPT x 1/8” MNPT	Brass	**B-293**
1/4” FNPT x 1/8” MNPT	Brass	**B-294**
3/8” FNPT x 1/4” MNPT	Brass	**B-296**
1/2” FNPT x 1/4” MNPT	Brass	**B-299**
1/4” FNPT x 3/4” MNPT	Brass	**B-286**
3/4” FNPT x 1/2” MNPT	Brass	**B-303**

Connectors



B-218

B-218SS

1/8” FNPT x 1/8” FNPT	Brass	**B-201**
1/4” FNPT x 1/8” FNPT	Brass	**B-207**
1/4” FNPT x 1/4” FNPT	Brass	**B-218**
1/4” FNPT x 1/4” FNPT	SS	**B-218SS**
1/2” FNPT x 1/4” FNPT	Brass	**B-231**
1/2” FNPT x 1/2” FNPT	Brass	**B-233**
3/4” FNPT x 1/2” FNPT	Brass	**B-234**
3/4” FNPT X 3/4” FNPT	Brass	**B-236**

Reducer Bushing

B-284

1/4” MNPT x 1/8” FNPT	Brass	**B-280**
3/8” MNPT x 1/4” FNPT	Brass	**B-282**
1/2” MNPT x 1/4” FNPT	Brass	**B-284**
1/2” MNPT x 3/8” FNPT	Brass	**B-285**
3/4” MNPT x 1/4” FNPT	Brass	**B-286**
3/4” MNPT x 1/2” FNPT	Brass	**B-288**

Round Brass Nipples

PNP-4-25

1/8” MNPT, 1.5” Long	Brass	**PNP-2-15**
1/4” MNPT, 1.5” Long	Brass	**PNP-4-15**
1/4” MNPT, 2.0” Long	Brass	**PNP-4-20**
1/4” MNPT, 2.5” Long	Brass	**PNP-4-25**
1/4” MNPT, 3.0” Long	Brass	**PNP-4-30**
1/4” MNPT, 3.5” Long	Brass	**PNP-4-35**

Pipe Extension

B-430

1/8” FNPT x1/8” MNPT, 2.5” Long	Brass	**B-395**
1/4” FNPT x 1/4”MNPT, 3.0” Long	Brass	**B-430-3**
1/4” FNPT x 1/4”MNPT, 4.0” Long	Brass	**B-430-4**
1/4” FNPT x 1/4”MNPT, 6.0” Long	Brass	**B-430-6**
1/4” FNPT x 1/4”MNPT, 3.0” Long	SS	**B-430-3SS**

Round Brass Hose Ferrules

Standard Package: **25**

Diameter(INT)	Length	Part No.
.330"	1/2"	**6231**
.358"	1/2"	**833**
.380"	1/2"	**622**
.410"	1/2"	**620**
.450"	9/16"	**769**
.478"	11/16"	**4750**
.500"	1/2"	**624**
.500"	1"	**7322**
.525"	1"	**7323**
.525"	1/2"	**625**
.531"	1"	**7324**
.548"	31/64"	**626**
.562"	1"	**7325**
.564"	3/4"	**3588**
.575"	31/64"	**KK**
.593"	1"	**7326**
.600"	1/2"	**JJ**
.625"	1/2"	**II**
.625"	1"	**7327**
.650"	1/2"	**HH**
.656"	1"	**7328**
.675"	33/64"	**GG**
.687"	1"	**7329**
.700"	33/64"	**FF**
.718"	1"	**7330**
.725"	17/32"	**EE**
.750"	17/32"	**DD**
.750"	1"	**7331**
.781"	1"	**7332**
.812"	1"	**7333**
.850"	9/16"	**Z**
.875"	27/32"	**7244A**
.900"	27/32"	**5029A**
.937"	27/32"	**7242A**
.975"	27/32"	**5028A**

NOTE: Hose diameters may vary, match the O.D. of hose with the I.D. of ferrule. Include any hose barb expansion.

Oval Brass Dual Hose Braces

Dimension(INT)	Length	Metal Gauge	Part No.
.448 x .890	15/32"	.019"	**9116**
.474 x .943	15/32"	.019"	**9979**
.535 x 1.071	3/4"	.024"	**9940P**
.593 x 1.109	3/4"	.024"	**9593**
.593 x 1.238	3/4"	.025"	**453**
.700 x 1.325	3/4"	.025"	**454**

Gas Leak Detector, Oxygen Safe

Description	Part No.
8 oz. Reusable Plastic Applicators	**LD-008**
1 Gallon Container for Refilling Applicators	**LD-128**

REPAIR KITS:
Hose Connections, Crimping Tools & Pipe Fittings


RK-26


RK-27

Description	Part No.
Superior hose repair kits include: fittings (nuts & nipples, splicers, couplers and ferrules) for the stated hose I.D. and thread size. Also, included with the kits are a 2 hole vise grip crimping tool for fast, easy and reliable crimping of the hose fittings. All kits come in a sectioned plastic case with instructions and fitting description charts. NEW All kits are available without the crimping tool and just the fittings that you need if you already have a crimper. To order the kit you want without a crimping tool, add LT to the back of the kit part number. For example, the RK-27LT will get you just the replacement fittings in the same sectioned box.	
"B" hose fittings with KT-28 Crimping Tool. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" and 3/16" I.D. hose.	RK-24
"B" hose fittings, fittings only, nipples, couplers, splicers and ferrules for 1/4" and 3/16" I.D. hose.	RK-24LT
"B" hose fittings with KT-28 Crimping Tool. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" I.D. hose.	RK-26
"B" hose fittings only nuts, nipples, couplers, splicers and ferrules for 1/4" I.D. hose.	RK-26LT
"A" & "B" hose fittings with KT-28 Crimping Tool. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" and 3/16" I.D. hose.	RK-27
"A" & "B" hose fittings only. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" and 3/16" I.D. hose.	RK-27LT
"B" hose fittings only. Contains nuts, nipples, couplers, splicers and ferrules for 5/16" & 3/8" I.D. hose.	RK-28LT
"B" hose fittings only. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" and 3/16" I.D. hose.	RK-35LT
Inert hose fittings with KT-28 crimping tool. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" I.D. hose	RK-50
Inert hose fittings only. Contains nuts, nipples, couplers, splicers and ferrules for 1/4" I.D. hose	RK-50LT

Ferrule Crimping Tools, Vice Grip Type


KT-28


KT-30

Description	Part No.
2-Hole Jaws to Crimp 1/2" wide to crimp 3/16" - 1/4" Hose	**KT-28**
3-Hole Jaws to Crimp 1/2" wide to crimp 5/16", 11/32", 27/64" Hole Size Diameters 7/16" and 9/16" on Twin or Single Hose	**KT-30**

*No hammer, vise, or other tool needed. Insert hose with ferrule and splicer or nut and nipple in proper hole. Offset tool approximately 1/8" from end of ferrule and squeeze. Make 1/4 turn and squeeze again.


SCR-100

Description	Part No.
Bench top, 5-die, crimper Die sizes for 5/8", 37/64", 17/32", 31/64", and 11/16" diameters.	**SCR-100**

Brass Nipple & Copper Tube Assembly

Maximum Pressure 200 PSI

CN-16

Description	Part No.
"B" Brass Nipple x .225" O.D. Copper Tube, Max.140" Dia. Cable Hole	CN-16*
"B" Brass Nipple x .322" O.D. Copper Tube, Max.246" Dia. Cable Hole	CN-20*

* use with nuts N-2400 or N-2500

CN-36

Description	Part No.
"C" Brass Nipple x .263" O.D. Copper Tube & Max.166" Dia. Cable Hole	CN-32*
"C" Brass Nipple x .322" O.D. Copper Tube & Max.246" Dia. Cable Hole	CN-36*

* use with nuts N-3600 or N-3700

CN-28

Description	Part No.
"C" Brass Nipple x .225" O.D. Copper Tube & Max.140" Dia. Cable Hole	CN-28*

* use with nuts N-34 or N-35

Power Cable Connector w/ Brass Swivel Nut & Nipple Soldered to Copper Tube for Crimping

CN-48

CN-54

CN-60

CN-68

CN-72

Description	Part No.
"A" Brass Nipple with 3/8"-24 RH-EXT Brass Nut x .322" O.D Copper Tube and Max .246" Cable Hole	CN-48
"A" Brass Nipple with 3/8"-24 LH EXT Brass Nut x .322" O.D. Copper Tube and Max .246" Cable Hole	CN-49
"A" Brass Nipple with 3/8"-24 RH EXT Brass Nut x .322" O.D Copper Tube and Max .246" Cable Hole	CN-54
.21" Dia. Brass Nipple with 1/4"-28 INT Brass Nut x .225 O.D. Copper Tube and Max .140" Cable Hole	CN-60
.37" Dia. Brass Nipple with 7/16"-20 INT Brass Nut x .375 O.D. Copper Tube and Max .245" Cable Hole	CN-68
"B" Brass Nipple with 5/8"-18 EXT Brass Nut x .468 O.D. Copper Tube and Max .328" Cable Hole	CN-72

Brass Power Cable Nipples (One Piece)

CN-10

Description	Part No.
"A" Nipple x .250" O.D. Tube and Max .203" Diameter Cable Hole * use with nuts N-14 or N-15	CN-6*
"B" Nipple x .375" O.D. Tube (.420"O.D. Barbs) Hole and Max .312" Diameter Cable * use with nuts N-2400 or N-2500	CN-10*

Brass Nipple & Tellurium Copper Tube Assembly

image not available

Description	Part No.
"B" Brass Nipple x .225" O.D. Tellurium Copper Tube, Max.140" Dia. Cable Hole * use with nuts N-2400 or N-2500	CN-16-T*
.21" Dia. Brass Nipple with 1/4"-28 INT Brass Nut x .225 O.D. Tellurium Copper Tube and Max .140" Cable Hole	CN-60-T
.37" Dia. Brass Nipple with 7/16"-20 INT Brass Nut x .375 O.D. Tellurium Copper Tube and Max .245" Cable Hole	CN-68-T

Air-Water Coupler

Maximum Pressure 200 PSI

C-134

Thread Size	Part No.
5/8”-18-RH-EXT x 5/8”-18-RH-EXT	**C-130**
5/8”-18-RH-EXT x 9/16”-18-RH-EXT	**C-134**
5/8”-18-LH-EXT x 9/16”-18-LH-EXT	**C-135**

Air-Water Adaptor

A-404

Thread Size	Part No.
1/8” MNPT x 5/8”-18-RH-INT	**A-402**
1/4” MNPT x 5/8”-18-RH-INT	**A-404**
1/4” MNPT x 5/8”-18-LH-INT	**A-405**
1/4” MNPT x 5/8”-18-RH-EXT	**A-450**

Air-Water Hose Adaptors with Swivel Nuts

A-478

A-462

A-424

Thread Size	Part No.
1/4” MNPT 5/8”-18-RH- EXT “B”	**A-414**
1/4” MNPT 5/8”-18-LH- EXT “B”	**A-415**
“B” 5/8”-18-RH-EXT-90 5/8”-18-RH- INT “B”	**A-424**
“B“ 5/8”-18-RH-EXT x “B” 9/16”-18-RH-EXT	**A-462**
“B” 5/8”-18-RH-INT x “B” 9/16”-18-RH-INT	**A-478**
“B” 5/8”-18-RH-INT x “B” 9/16”-18-RH-INT (one piece)	**A-479**

Inert Arc Hose Nuts

N-2400

Thread Size	Use with:	Part No.
“A” 3/8”-24-RH-EXT	NP-66, 67, “A” Cable Connectors	**N-14**
“A” 3/8”-24-LH-EXT	NP-66, 67, “A” Cable Connectors	**N-15**
“B” 5/8”-18-RH-EXT	NP-69, 70, 72, 73, 74, 76, “B” Cable Connectors	**N-2400**
“B” 5/8”-18-LH-EXT	NP-69, 70, 72, 73, 74, 76, “B” Cable Connectors	**N-2500**
“C” 7/8”-14-RH-EXT	NP-606, “C” Cable Connectors	**N-3600**
“C” 7/8”-14-LH-EXT	NP-606, “C” Cable Connectors	**N-3700**

Air-Water Nut

Maximum Pressure 200 PSI

N-26

Thread Size	Use with:	Part No.
5/8"-18-RH-INT	NP-595, NP-596	**N-26**

Inert Arc Barb Hose Nipples

NP-73

Description	For Hose Size	Use With Nuts	Part No.
"A"-size	1/8" I.D.	N-14, N-15	**NP-66**
"B"-size	1/8" I.D. undersize	N-2400, N-2500	**NP-68**
"B"-size	1/8" I.D.	N-2400, N-2500	**NP-69**
"B"-size	3/16" I.D.	N-2400, N-2500	**NP-70**
"B"-size	1/4" I.D.	N-2400, N-2500	**NP-72**
"B" Special 1/4" barb	1/4" I.D.	N-2400, N-2500	**NP-73**
"B"-size	5/16" I.D.	N-2400, N-2500	**NP-74**
"B"-size	3/8" I.D.	N-2400, N-2500	**NP-76**

Inert Arc Hose Couplers

Maximum Pressure 200 PSI

C-124

Thread Size	Thread Size	Part No.
3/8"-24-RH-INT "A"	3/8"-24-RH-INT "A"	**C-118**
3/8"-24-LH-INT "A"	3/8"-24-LH-INT "A"	**C-119**
1/4" FNPT	5/8"-18-RH-INT "B"	**C-124**
1/4" FNPT	5/8"-18-LH-INT "B"	**C-125**
5/8"-18-RH INT "B"	5/8"-18-RH INT "B"	**C-126**
5/8"-18-LH INT "B"	5/8"-18-LH INT "B"	**C-127**
7/8"-14-RH-INT "C"	7/8"-14-RH-INT "C"	**C-144**
7/8"-14-LH-INT "C"	7/8"-14-LH-INT "C"	**C-145**

British style fittings

H.P. Cylinder Connectors

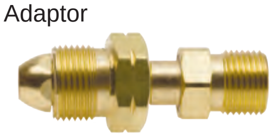
BS 341 #3 Oxygen, Inert Gases

Maximum Pressure (300 bar) 4350 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	5/8"A-RH-EXT	Brass	**BN-341-3**
Handtight Nuts 	Nut-HT	5/8"A-RH-EXT	Brass, Plastic Grip	**BNH-341-3**
Nipple-Threaded Inlets 	Nipple	1/4" NPT-M, 2.5"Long	Brass	**BNP-341-3-2.5**
Nipple-Handtight 	Nipple-HT	1/4" NPT-M, 3.5"Long	Brass	**BNP-341-3W-3.5**
Replacement Items 	"O"Ring	For BNP-341-3W-3.5	Nitrile	**OR-580**
Adaptor 	Cylinder Adaptor	To CGA 540 Regulator	Brass	**BA-540**
	Cylinder Adaptor	To CGA 580 Regulator	Brass	**BA-580**

BS 341 #2 Flammables

Maximum Pressure (300 bar) 4350 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	G 5/8 A-LH-EXT	Brass	**BN-341-2**
Nipple-Threaded Inlets 	Nipple	1/4" NPT-M, 2.5"Long	Brass	**BNP-341-3-2.5**
Nipple-Handtight 	Nipple-HT	1/4" NPT-M, 3.5"Long	Brass	**BNP-341-3W-3.5**
Replacement Items 	"O"Ring	For BNP-341-3W-3.5	Nitrile	**OR-580**
Adaptor 	Cylinder Adaptor	To CGA 510 Regulator	Brass	**BA-510**

L.P. Hose Connectors

Maximum Pressure 200 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	3/8” R.H. Oxygen, Inerts	Brass	**BN-375RH**
Nut	3/8” L.H. Fuel Gas, Combustibles	Brass	**BN-375LH**

Nipple- Hose Barb

Part	Description	Material	Part No.
Nipple	1/4” ID Hose, used for 3/8” Nut	Brass	**BNP-375-4**
Nipple	5/16” ID Hose, used for 3/8” Nut	Brass	**BNP-375-5**

German Style Fittings

DIN-477 Connectors

#6 Inert Gases

Maximum Pressure (300 bar) 4350 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	W 21.80 x 1/14-RH-INT	Brass	**DN-477-06**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT-M, 3.5”Long	Brass	**DNP-477-6-3.5**

Replacement Items

Part	Description	Material	Part No.
Washer	For Nipple	Nylon	**DW-477-6N**

#9 Oxygen

Maximum Pressure (300 bar) 4350 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	R 3/4-RH-INT	Brass	**DN-477-09**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT-M, 3.5”Long	Brass	**DNP-477-6-3.5**

Replacement Items

Part	Description	Material	Part No.
Washer	For Nipple	Nylon	**DW-477-6N**

German standard fittings

#10 Nitrogen Maximum Pressure (300 bar) 4350 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	W 24.32 x 1/14-RH-INT	Brass	**DN-477-10**
Nipple-Threaded Inlets 	Nipple	1/4” NPT-M, 3.5”Long	Brass	**DNP-477-6-3.5**
Replacement Items 	Washer	For Nipple	Nylon	**DW-477-6N**

#12 Nitrous Oxide Maximum Pressure (300 bar) 4350 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	R 3/4-RH-EXT	Brass	**DN-477-12**
Nipple-Threaded Inlets 	Nipple	1/4” NPT-M, 3.5”Long	Brass	**DNP-477-6-3.5**
Replacement Items 	Washer	For Nipple	Nylon	**DW-477-6N**

Product specification guide and ordering information for regulator inlet nuts and nipples

Superior Products offers nuts and nipples in a variety of materials and styles to fit a full range of gas service requirements. Seven different types of nut/nipple combinations are available:

- Brass nut and nipple
- Stainless steel nut and nipple
- Brass, chrome plated nut and nipple
- Nut and nipple with check valve
- Nut and nipple recessed for tubing
- Hand tight nut and nipple
- Quick connect nut and nipple

Please note that all types may not be available for every CGA.

Nipples with check valves

Nipples with integral check valves are designed to provide additional safety in gas management systems and other equipment.

- Check valve nipples can be built into pigtails, tee connections and manifold blocks to resist back flow of gases from lines, equipment and cylinders.
- Check valves are factory installed and are 100% tested.
- Available in brass and stainless steel
- Check valves are for reverse flows only - they are not to be used as flashback arrestors.
- When using high-pressure cylinder valve connections you should always refer to the Compressed Gas Association V-7 and/or V-7.1 for the correct method of determining cylinder valve outlet connection.

Hand tight nuts and nipples

Superior Products hand tight nuts are available in brass or with plastic grips.

- All nuts are machined to CGA specifications and designed with wrench flats.
- Soft tip or o-ring type nipples always should be used with hand tight nuts.
- CGA fittings rated over 3000 PSI do not have soft tips and final gas tight seating requires a wrench to tighten.

ORDERING INFORMATION
INLET NIPPLES FILETERS

Most brass and chrome plated nipples may be ordered in any of the following two configurations:

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

Example: NP-210 with filter becomes NP-210RF

BRASS AND CHROME PLATED BRASS NIPPLES WITHOUT FILTERS

- Simply order the part numbers as listed under the CGA numbers
- Please note that all Superior Products nipples come standard with filter recess, so a filter can be added.

BRASS AND CHROME PLATED BRASS NIPPLES WITH INSTALLED FILTERS

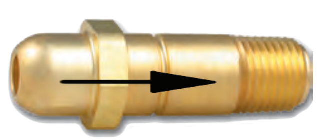
- Add “RF” to end of nipple part numbers listed under the CGA numbers
- Some nipples require filters to be in NPT end of nipples

		Part No.	
FILTERS FOR REGULATOR		F-7	Porous metal filter sintered bronze (nickel plated), rated at 35 microns 6000psi
		F-8	Porous metal filter sintered bronze (nickel plated), rated at 35 microns 6000psi
NIPPLE RETAINING RING		XSR-020	C-clip available to hold nut in position and protect nipple seating area.

CGA check valve nipples are factory tested and installed in CGA nipples for additional safety in gas systems, etc. to prevent dangerous reverse flow of gases in lines and other compressed gas equipment.

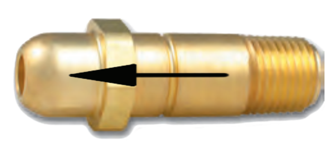
NOTE: These check valves protect against reverse flow only and are not flashback arrestors.

- Available in brass and stainless steel



Flow
Part No. NP-210CV

Also available with the check valve reversed. Specify “RCV”.



Flow
Part No. NP-210RCV

CGA-170 Non-Corrosive Gases In Small Cylinders

3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.5625”-18UNF-2B-RH-INT	Brass	**N-49**
	Nut	.5625”-18UNF-2B-RH-INT	SS	**N-49SS**
Nipple-Threaded Inlets 	Nipple	1/8” NPT, 1.25” Long	Brass	**NP-101**
	Nipple	1/8” NPT, 1.25” Long	SS	**NP-101SS**
Replacement Items 	Washer	For Nipple	PTFE	**W-60**

CGA-180 All Gases In Small Cylinders

3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.625 -18UNF-2B-RH-INT	Brass	**N-50**
	Nut	.625 -18UNF-2B-RH-INT	CP Brass	**MN-050**
Nipple-Threaded Inlets 	Nipple	1/8” NPT, 1.75”Long	Brass	**NP-109**
	Nipple	1/8” NPT, 1.75”Long	CP Brass	**MNP-109**
Replacement Items 	Washer	For Nipple	PTFE	**W-65**

CGA-200 “MC” Acetylene In Small Cylinders

500 PSI

	Part	Description	Material	Part No.
Hex Nut 	Nut	.628”-20NGO-RH-INT	Brass	**N-57**
Handtight Nut 	Nut-HT	.628”-20NGO-RH-INT	Brass, Plastic Grip	**HTN-57P**
Nipple-Threaded Inlets 	Nipple	1/8” NPT, 1.25”Long	Brass	**NP-414**
Nipple-Handtight 	Nipple-HT	1/8” NPT, 2.5”Long	Brass, PTFE	**NP-418T3**
Replacement Item 	Replacement Tip	For HT Nipple	PTFE	**T418-3**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-280 Medical Breathing Mixtures

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.750” -14NGO-RH-INT	Brass	**N-59**
Nut	.750” -14NGO-RH-INT	CP Brass	**MN-059**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5”Long	Brass	**NP-118**
Nipple	1/4” NPT, 2.5”Long	CP Brass	**MNP-118**

CGA-296 Industrial Oxygen Mixtures

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.803” -14UNS-2A-RH-EXT	Brass	**N-60**
Nut	.803” -14UNS-2A-RH-EXT	CP Brass	**MN-060**

Handtight Nut

Part	Description	Material	Part No.
Nut-HT	.803” -14UNS-RH-EXT	Brass	**HTN-60**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 3”Long	Brass	**NP-123**
Nipple	1/4” NPT, 3”Long	CP Brass	**MNP-123**

Nipple-Handtight

Part	Description	Material	Part No.
Nipple-HT	1/4” NPT, 3”Long w/O-ring	Brass, Nitrile	**NP-123W**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple-CS	For 5/16” Tube	Brass	**NP-122C3**

Nipple-Check Valve

Part	Description	Material	Part No.
Nipple-CV	1/4” NPT, 3”Long	Brass	**NP-123CV**

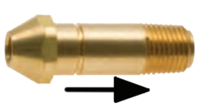
Replacement Item

Part	Description	Material	Part No.
O-Ring	For HT-Nipple	Nitrile	**OR-296**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-300 Ethyl Chlorides (R160) Formerly Commercial Acetylene

500 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.830"-14NGO-RH-INT	Brass	**N-56**
	Nut	.830"-14NGO-RH-INT	CP Brass	**MN-056**
Handtight Nuts  	Nut-HT	.830"-14NGO-RH-INT	Brass	**HTN-56**
	Nut-HT	.830"-14NGO-RH-INT	Brass, Plastic Grip	**HTN-56P**
Nipple-Threaded Inlets 	Nipple	1/4" NPT, 2"Long	Brass	**NP-126**
	Nipple	1/4" NPT, 2.5"Long	Brass	**NP-128**
	Nipple	1/4" NPT, 3.5"Long	Brass	**NP-130**
	Nipple	1/4" NPT, 3.5"Long	CP Brass	**MNP-130**
Nipple-Handtight 	Nipple-HT	1/4" NPT-2.5"Long	Brass, PTFE	**NP-128T3**
Nipple-Countersunk 	Nipple-CS	For 1/4" Tube	Brass	**NP-126C2**
	Nipple-CS	For 5/16" Tube	Brass	**NP-126C3**
	Nipple-CS	For 3/8" Tube	Brass	**NP-126C4**
Nipple-Check Valve 	Nipple-CV	1/4" NPT, 2.5"Long	Brass	**NP-128CV**
Replacement Items  	Soft Tip	For HT-Nipple	PTFE	**T128-3**
	O-Ring	For O-Ring Nipple	Nitrile	**MR-116**

Add "RF" to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-320 Carbon Dioxide

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.830”-14NGO-RH-INT	Brass	**N-61**
Nut	.830”-14NGO-RH-INT	SS	**N-61SS**
Nut	.830”-14NGO-RH-INT	CP Brass	**MN-061**

Handtight Nuts

Part	Description	Material	Part No.
Nut-HT	.830”-14NGO-RH-INT	Brass	**HTN-61**
Nut-HT	.830”-14NGO-RH-INT	Brass, Plastic Grip	**HTN-61P**
Nut-HT	.830”-14NGO-RH-INT	CP Brass, Plastic Grip	**MHN-061P**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple*	1/4” NPT, 2”Long	Brass	**NP-147**
Nipple*	1/4” NPT, 2”Long	Brass	**NP-147SS**
Nipple*	1/4” NPT, 2”Long	CP Brass	**MNP-147**
Nipple*	1/4” NPT, 2.5”Long	Brass	**NP-150**
Nipple*	1/4” NPT, 2.5”Long	SS	**NP-150SS**
Nipple*	1/4” NPT, 2.5” Long	CP Brass	**MNP-150**
Nipple*	1/4” NPT, 3” Long	Brass	**NP-151**
Nipple*	1/4”-NPT, 3” Long	CP Brass	**MNP-151**
Nipple*	1/4” NPT, 3.5” Long	SS	**NP-154SS**
Nipple*	1/2” 27UNS, 2.5” Long	Brass	**NP-152**

Nipple-Handtight

Part	Description	Material	Part No.
Nipple-HT**	1/4” NPT, 2.5” Long	Brass	**NP-150T3**
Nipple-HT**	For 1/4” Tube	Brass	**NP-147T3C2**
Nipple-HT**	For 5/16” Tube	Brass	**NP-147T3C3**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple-CS*	For 1/4” Tube	Brass	**NP-147C2**
Nipple-CS*	For 5/16” Tube	Brass	**NP-147C3**
Nipple-CS*	For 1/4” Tube	SS	**NP-147C2SS**

Nipple-Check Valve

Part	Description	Material	Part No.
Nipple-CV*	1/4”NPT, 2.5” Long	Brass	**NP-150CV**
Nipple-CV*	1/4”NPT, 2.5” Long	CP Brass	**MNP-150CV**
Nipple-CV*	1/4”NPT, 2.5” Long	SS	**NP-150SSCV**

Nipples for use with Residual Pressure Valves

Part	Description	Material	Part No.
Nipple-RPV*	1/4”NPT, 3” long	Brass	**NP-151-PIN-SS**
Nipple-RPV-washer*	1/4”NPT, 3.5” long with Retractable Pin & Washer	Brass	**NP-154W-RPV**

Replacement Items

Part	Description	Material	Part No.
Washer	For Nipple	Fiber	**W-6**
Washer	For Nipple	PTFE	**W-8**
Washer	For HT-Nipples	PTFE	**W-10**
Washer	For Nipple	Nylon	**MYP-011**
Pin	For RPV Nipple	SS	**PIN-NP-SS**

*Includes Washer

**Replace washer with W-10 only

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-326 Nitrous Oxide

3,000 PSI

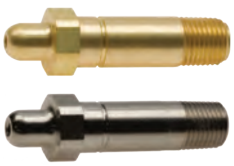
Hex Nuts

Part	Description	Material	Part No.
Nut	.830"-14NGO-RH-INT	Brass	**N-82**
Nut	.830"-14NGO-RH-INT	SS	**N-82SS**
Nut	.830"-14NGO-RH-INT	CP Brass	**MN-082**

Handtight Nuts

Part	Description	Material	Part No.
Nut-HT	.830"-14NGO-RH-INT	Brass	**HTN-82**
Nut-HT	.830"-14NGO-RH-INT	Brass, Plastic Grip	**HTN-82P**
Nut-HT	.830"-14NGO-RH-INT	CP Brass, Plastic Grip	**MHN-082P**

Nipple-Threaded Inlets

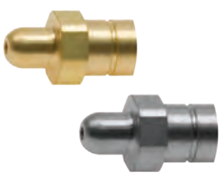


Part	Description	Material	Part No.
Nipple	1/4" NPT, 2.125" Long	Brass	**NP-732**
Nipple	1/4" NPT, 2.5" Long	Brass	**NP-733**
Nipple	1/4" NPT, 2.5" Long	SS	**NP-733SS**
Nipple	1/4" NPT, 2.5" Long	CP Brass	**MNP-733**
Nipple	1/4" NPT, 3" Long	Brass	**NP-734**

Nipple-Handtight

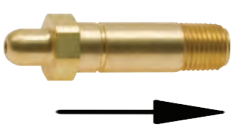
Part	Description	Material	Part No.
Nipple-HT	1/4" NPT, 2.5" Long	Brass, PCTFE	**NP-733T1**
Nipple-HT-CS	For 1/4" Tube	Brass, PCTFE	**NP-732T1C3**

Nipple-Countersunk



Part	Description	Material	Part No.
Nipple-CS	For 1/4" Tube	SS	**NP-732C2SS**
Nipple-CS	For 5/16" Tube	Brass	**NP-732C3**
Nipple-CS	For 3/8" Tube	Brass	**NP-732C4**

Nipple-Check Valve



Part	Description	Material	Part No.
Nipple-CV	1/4" NPT, 2.5"Long	Brass	**NP-733CV**
Nipple-CV	1/4" NPT, 2.5"Long	SS	**NP-733SSCV**
Nipple-CV	1/4" NPT, 2.5"Long	CP Brass	**MNP-733CV**

Nipples for use with Residual Pressure Valves

Part	Description	Material	Part No.
Nipple-RPV-O-Ring	1/4" NPT, 3.5"Long with Retractable Pin & O-Ring	Brass, EPDM	**NP-735W-RPV**

Replacement Items

Part	Description	Material	Part No.
Soft Tip	For HT-Nipple	PCTFE	**T733-1**
O-ring	For NP-735W-RPV	EPDM	**OR-326**

Add "RF" to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-330 Non-Corrosive Gases

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.830”-14NGO-LH-INT	Brass	**N-62**
Nut	.830”-14NGO-LH-INT	SS	**N-62SS**
Nut	.830”-14NGO-LH-INT	CP Brass	**MN-062**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple*	1/4” NPT, 2” Long	Brass	**NP-161**
Nipple*	1/4” NPT, 2” Long	SS	**NP-161SS**
Nipple*	1/4” NPT, 2.5” Long	Brass	**NP-162**
Nipple*	1/4” NPT, 2.5” Long	SS	**NP-162SS**
Nipple*	1/4” NPT, 2.5” Long	CP Brass	**MNP-162**
Nipple*	1/4” NPT, 3.5” Long	SS	**NP-165SS**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple*	For 1/4” Tube	SS	**NP-161C2SS**

Replacement Items

Part	Description	Material	Part No.
Washer	For Nipple	Fiber	**W-6**
Washer	For Nipple	PTFE	**W-8**
Washer	For Nipple	ETFE	**MYP-010**
Washer	For Nipple	Nylon	**MYP-011**

*Includes Washer

CGA-346 Air

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.830”-14NGO-RH-INT	Brass	**N-84**
Nut	.830”-14NGO-RH-INT	CP Brass	**MN-084**
Nut	.830”-14NGO-RH-INT	SS	**N-84SS**

Handtight Nuts

Part	Description	Material	Part No.
Nut-HT	.830”-14NGO-RH INT	Brass	**HTN-84**
Nut-HT	.830”-14NGO-RH INT	Brass, Plastic Grip	**HTN-84P**
Nut-HT	.830”-14NGO-RH INT	CP Brass, Plastic Grip	**MHN-084P**

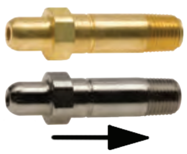
Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-753**
Nipple	1/4” NPT, 2.5” Long	SS	**NP-753SS**
Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-753**
Nipple	1/4” NPT, 3.5” Long	Brass	**NP-755**
Nipple	1/4” NPT, 3.5” Long	SS	**NP-755SS**
Nipple	1/4” NPT, 3.5” Long	CP Brass	**MNP-755**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

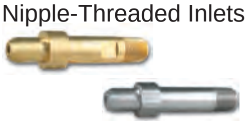
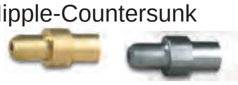
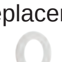
CGA-346 Air Continued

3,000 PSI

	Part	Description	Material	Part No.
Nipple-Handtight 	Nipple-HT	1/4” NPT, 2.5” Long	Brass, PCTFE	**NP-753T1**
	Nipple-HT-CS	For 1/4” Tube	Brass, PCTFE	**NP-753T1C2**
	Nipple-HT-CS	For 5/16” Tube	Brass, PCTFE	**NP-753T1C3**
Nipple-Countersunk 	Nipple-CS	For 1/4” Tube	Brass	**NP-752C2**
	Nipple-CS	For 1/4” Tube	SS	**NP-752C2SS**
	Nipple-CS	For 5/16” Tube	Brass	**NP-752C3**
	Nipple-CS	For 3/8” Tube	Brass	**NP-752C4**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 2.5” Long	Brass	**NP-753CV**
	Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-753SSCV**
	Nipple-CV	1/4” NPT, 2.5” Long	CP Brass	**MNP-753CV**
Replacement Items 	Soft Tip	For HT-Nipple	PCTFE	**T753-1**
	O-Ring	For Quicknut Nipple	Polyurethane	**OR-346**

CGA-347 Air

3,001 - 4,700 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.830”-14NGO-RH-INT	Brass	**N-85**
	Nut	.830”-14NGO-RH-INT	SS	**N-85SS**
	Nut	.830”-14NGO-RH-INT	CP Brass	**MN-085**
Handtight Nuts 	Nut-HT	.830”-14NGO-RH-INT	Brass	**HTN-85**
	Nut-HT	.830”-14NGO-RH-INT	Brass, Plastic Grip	**HTN-85P**
	Nut-HT	.830”-14NGO-RH-INT	SS, Alum. Grip	**HTN-85SS**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 3” Long	Brass	**NP-765**
	Nipple	1/4” NPT, 3” Long	SS	**NP-765SS**
	Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-765**
Nipple-Handtight 	Nipple-HT	1/4” NPT, 3” Long w/ O-Ring	SS, Polyurethane	**NP-765SSW**
	Nipple-HT	1/4” NPT, 3” Long w/ O-Ring	Brass, Polyurethane	**NP-765W**
Nipple-Countersunk 	Nipple-CS	For 1/4” Tube	Brass	**NP-765C2**
	Nipple-CS	For 1/4” Tube	SS	**NP-765C2SS**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 3” Long	SS	**NP-765SSCV**
Replacement Items 	O-Ring	For HT- Nipple	Polyurethane	**OR-347**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-350 Hydrogen/Methane/Natural Gas

3,000 PSI

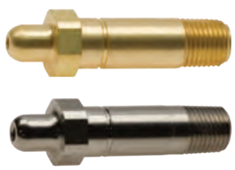
Hex Nuts

Part	Description	Material	Part No.
Nut	.830"-14NGO-LH-INT	Brass	**N-64**
Nut	.830"-14NGO-LH-INT	SS	**N-64SS**
Nut	.830"-14NGO-LH-INT	CP Brass	**MN-064**

Handtight Nuts

Part	Description	Material	Part No.
Nut-HT	.830"-14NGO-LH-INT	Brass	**HTN-64**
Nut-HT	.830"-14NGO-LH-INT	Brass, Plastic Grip	**HTN-64P**

Nipple-Threaded Inlets



Part	Description	Material	Part No.
Nipple	1/4" NPT, 2.125" Long	Brass	**NP-167**
Nipple	1/4" NPT, 2.5" Long	Brass	**NP-168**
Nipple	1/4" NPT, 2.5" Long	SS	**NP-168SS**
Nipple	1/4" NPT, 2.5" Long	CP Brass	**MNP-168**
Nipple	1/4" NPT, 3" Long	Brass	**NP-169**
Nipple	1/4" NPT, 3" Long	CP Brass	**MNP-169**
Nipple	1/4" NPT, 3.5" Long	Brass	**NP-170**
Nipple	1/4" NPT, 3.5" Long	SS	**NP-170SS**
Nipple	1/4" NPT, 3.5" Long	CP Brass	**MNP-170**

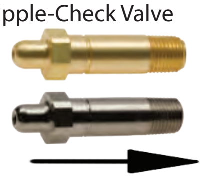
Nipple-Handtight

Part	Description	Material	Part No.
Nipple-HT	1/4" NPT, 2.5" Long	Brass, PTFE	**NP-168T3**
Nipple-HT-CS	For 1/4" Tube	Brass, PTFE	**NP-168T3C2**
Nipple-HT-CS	For 5/16" Tube	Brass, PTFE	**NP-168T3C3**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple-CS	For 1/4" Tube	Brass	**NP-168C2**
Nipple-CS	For 1/4" Tube	SS	**NP-168C2SS**
Nipple-CS	For 5/16" Tube	Brass	**NP-168C3**
Nipple-CS	For 3/8" Tube	Brass	**NP-168C4**

Nipple-Check Valve



Part	Description	Material	Part No.
Nipple-CV	1/4" NPT, 2.5" Long	Brass	**NP-168CV**
Nipple-CV	1/4" NPT, 2.5" Long	SS	**NP-168SSCV**
Nipple-CV	1/4" NPT, 2.5" Long	CP Brass	**MNP-168CV**

Nipples for use with Residual Pressure Valves

Part	Description	Material	Part No.
Nipple-RPV	1/4" NPT, 2.5" Long	Brass, SS Pin	**NP-168-PIN-SS**
Nipple-RPV	1/4" NPT, 2.5" Long	Brass, Monel Pin	**NP-168-PIN-M**
Nipple-RPV	1/4" NPT, 3.5" Long	Brass, Retractable SS Pin	**NP-170-RPV**

Replacement Items

Part	Description	Material	Part No.
Soft Tip	For HT-Nipple	PTFE	**T168-3**
Pin	SS Pin for NP-168-PIN-SS	SS	**PIN-NP-SS**
Pin	Monel Pin for NP-168-PIN-M	Monel	**PIN-NP-M**

Add "RF" to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-410 Canadian Acetylene

500 PSI

Hex Nut

Part	Description	Material	Part No.
Nut	.855”-14NGO-LH-INT	Brass	**N-66**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-168**
Nipple	1/4” NPT, 3” Long	Brass	**NP-169**
Nipple	1/4” NPT, 3.5” Long	Brass	**NP-170**

CGA-415 Canadian Acetylene

500 PSI

Hex Nut

Part	Description	Material	Part No.
Nut	.855”-14NGO-LH-INT	Brass	**N-66**

Nipple-Threaded Inlet

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-181**

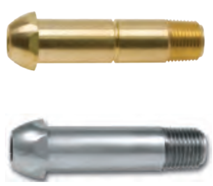
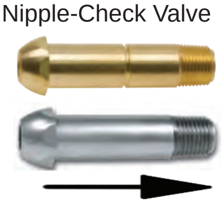
Replacement Part

Part	Description	Material	Part No.
Washer	For Nipple	Fiber	**W-50**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-500 Medical Mixtures

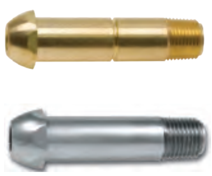
3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.880"-14NGO-RH-EXT	Brass	**N-67**
	Nut	.880"-14NGO-RH-EXT	CP Brass	**MN-067**
Handtight Nuts 	Nut-HT	.880"-14NGO-RH-EXT	Brass, Plastic Grip	**HTN-67P**
	Nut-HT	.880"-14NGO-RH-EXT	CP Brass, Plastic Grip	**MHN-067P**
Nipple-Threaded Inlets 	Nipple	1/4" NPT, 2.5" Long	Brass	**NP-188**
	Nipple	1/4" NPT, 2.5" Long	CP Brass	**MNP-188**
	Nipple	1/4" NPT, 3" Long	Brass	**NP-189**
	Nipple	1/4" NPT, 3" Long	CP Brass	**MNP-189**
	Nipple	1/4" NPT, 3.5" Long	Brass	**NP-190**
	Nipple	1/4" NPT, 3.5" Long	CP Brass	**MNP-190**
	Nipple	1/4" NPT, 4.5" Long	Brass	**NP-191**
Nipple-Handtight 	Nipple-HT	1/4" NPT, 3.5" Long	Brass, PTFE	**NP-190T3**
	Nipple-HT	1/4" NPT, 3.5" Long w/ O-Ring	Brass, Nitrile	**NP-190W**
	Nipple-HT	1/4" NPT, 3.5" Long w/ O-Ring	CP Brass, Nitrile	**MNP-190W**
	Nipple-HT-CS	For 1/4" Tube	Brass, PTFE	**NP-188T3C2**
	Nipple-HT-CS	For 5/16"Tube	Brass, PTFE	**NP-188T3C3**
Nipple-Countersunk 	Nipple-CS	For 1/4" Tube	Brass	**NP-188C2**
	Nipple-CS	For 5/16" Tube	Brass	**NP-188C3**
	Nipple-CS	For 3/8" Tube	Brass	**NP-188C4**
Nipple-Check Valve 	Nipple-CV	1/4" NPT, 2.5" Long	Brass	**NP-188CV**
	Nipple-CV	1/4" NPT, 2.5" Long	CP Brass	**MNP-188CV**
	Nipple-CV	1/4" NPT, 3" Long	Brass	**NP-189CV**
Replacement Parts 	O-Ring	For O-Ring Nipple	Nitrile	**OR-580**
	Soft Tip	For HT-Nipple	PTFE	**T189-3**

Add "RF" to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-510 Acetylene/Propane/Natural Gas

500 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.880”-14NGO-LH-EXT(7/8”Hex)	Brass	**N-68**
	Nut	.880”-14NGO-LH-EXT	Brass	**N-69**
	Nut	.880”-14NGO-LH-EXT	SS	**N-69SS**
	Nut	.880”-14NGO-LH-EXT	CP Brass	**MN-069**
Handtight Nuts 	Nut-HT	.880”-14NGO-LH-EXT	Brass	**HTN-69**
	Nut-HT	.880”-14NGO-LH-EXT	Brass, Plastic Grip	**HTN-69P**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 2.5” Long	Brass	**NP-188**
	Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-188**
	Nipple	1/4” NPT, 2.5” Long	SS	**NP-188SS**
	Nipple	1/4” NPT, 3” Long	Brass	**NP-189**
	Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-189**
	Nipple	1/4” NPT, 3” Long	SS	**NP-189SS**
	Nipple	1/4” NPT, 3.5” Long	Brass	**NP-190**
	Nipple	1/4” NPT, 3.5” Long	SS	**NP-190SS**
	Nipple	1/4” NPT, 3.5” Long	CP Brass	**MNP-190**
	Nipple	1/4” NPT, 4.5” Long	Brass	**NP-191**
Nipple-Handtight 	Nipple-HT	1/4” NPT, 3” Long (only with HTN-69)	Brass, PTFE	**NP-189T3**
	Nipple-HT	1/4” NPT, 3.5” Long, w/ soft tip	Brass, PTFE	**NP-190T3**
	Nipple-HT	1/4” NPT, 3.5” Long w/ O-Ring	Brass, Nitrile	**NP-190W**
	Nipple-HT-CS	For 1/4” Tube	Brass, PTFE	**NP-188T3C2**
	Nipple-HT-CS	For 5/16” Tube	Brass, PTFE	**NP-188T3C3**
Nipple-Countersunk 	Nipple-CS	For 1/4” Tube	Brass	**NP-188C2**
	Nipple-CS	For 1/4” Tube	SS	**NP-188C2SS**
	Nipple-CS	For 5/16” Tube	Brass	**NP-188C3**
	Nipple-CS	For 5/16” Tube	SS	**NP-188C3SS**
	Nipple-CS	For 3/8” Tube	Brass	**NP-188C4**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 2.5” Long	Brass	**NP-188CV**
	Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-188SSCV**
	Nipple-CV	1/4” NPT, 2.5” Long	CP Brass	**MNP-188CV**
	Nipple-CV	1/4” NPT, 3” Long	Brass	**NP-189CV**
	Nipple-CV	1/4” NPT, 3” Long	SS	**NP-189SSCV**
Replacement Items 	Soft Tip	For HT-Nipple	PTFE	**T189-3**
	O-Ring	For NP-190W	Nitrile	**OR-580**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-520 “B Size” Acetylene In Small Cylinders

500 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.899”-18NGO-RH-INT	Brass	**N-70**
Handtight Nuts 	Nut-HT	.899”-18NGO-RH-INT	Brass, Plastic Grip	**HTN-70P**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 1.75” Long	Brass	**NP-435**
Nipple-Handtight 	Nipple-HT	1/4” NPT, 1.75” Long w/ O-Ring	Brass, EPDM	**NP-435W**
Nipple-Countersunk 	Nipple-CS	For 1/4”Tube	Brass	**NP-435C2**
Replacement Parts 	O-Ring	For HT	EPDM	**OR-520Z**

Notes:

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-540 Oxygen

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.908”-14NGO-RH-INT.	Brass	**N-71**
Nut	.908”-14NGO-RH-INT.	SS	**N-71SS**
Nut	.908”-14NGO-RH-INT	CP Brass	**MN-071**

Handtight Nuts

Part	Description	Material	Part No.
Nut-HT	.908”-14NGO-RH-INT	Brass	**HTN-71**
Nut-HT	.908”-14NGO-RH-INT	Brass, Plastic Grip	**HTN-71P**
Nut-HT	.908”-14NGO-RH-INT	CP Brass, Plastic Grip	**MHN-071P**

Nipples - Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.06” Long	Brass	**NP-210**
Nipple	1/4” NPT, 2.06” Long	CP Brass	**MNP-210**
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-211**
Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-211**
Nipple	1/4” NPT, 2.5” Long	SS	**NP-211SS**
Nipple	1/4” NPT, 3” Long	Brass	**NP-212**
Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-212**
Nipple	1/4” NPT, 3.5” Long	Brass	**NP-213**

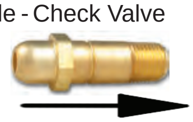
Nipples - Handtight

Part	Description	Material	Part No.
Nipple-HT	1/4” NPT, 2.5” Long w/ O-Ring	Brass/Viton	**NP-211W**
Nipple-HT	1/4” NPT, 2.5” Long w/ O-Ring	CP Brass/Viton	**MNP-211W**
Nipple-HT	1/4” NPT, 2.5” Long	Brass/PCTFE	**NP-211T1**
Nipple-HT	For 1/4” Tube	Brass/PCTFE	**NP-210T1C2**
Nipple-HT	For 5/16” Tube	Brass/PCTFE	**NP-210T1C3**

Nipples - Countersunk

Part	Description	Material	Part No.
Nipple-CS	For 1/4” Tube	Brass	**NP-210C2**
Nipple-CS	For 1/4” Tube	SS	**NP-210C2SS**
Nipple-CS	For 5/16” Tube	Brass	**NP-210C3**
Nipple-CS	For 3/8” Tube	Brass	**NP-210C4**

Nipple - Check Valve



Part	Description	Material	Part No.
Nipple-CV	1/4” NPT, 2.125” Long	Brass	**NP-210CV**
Nipple-CV	1/4” NPT, 2.125” Long	CP Brass	**MNP-210CV**
Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-211SSCV**

Nipples - Residual Pressure Valve

Part	Description	Material	Part No.
Nipple-RPV	1/4” NPT, 2.5” Long	Brass (Monel Pin)	**NP-211-PIN-M**
Nipple-RPV	1/4” NPT, 2.5” Long	Brass (SS Pin)	**NP-211-PIN-SS**
Nipple-RPV	1/4” NPT, 2.5” Long w/ O-Ring	Brass (Monel Pin)	**NP-211W-PIN-M**
Nipple-RPV	1/4” NPT, 3.5” Long w/ O-Ring	Brass (Retractable SS Pin)	**NP-213W-RPV**

Replacement Items

Part	Description	Material	Part No.
Soft Tip	For HT-Nipple	PCTFE	**T211-1**
O-Ring	For O-Ring Nipple	Viton	**OR-011V7**
Pin	For RPV Nipple	SS	**PIN-NP-SS**
Pin	For RPV Nipple	Monel	**PIN-NP-M**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-555 Propane, Butane For Liquid Withdrawal

3,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.908”-14NGO-LH-INT	Brass	**N-86**
Nut	.908”-14NGO-LH-INT	CP Brass	**MN-086**

Handtight Nuts

Nut-HT	.908”-14NGO-LH-INT	Brass	**HTN-86**

Nipple-Threaded Inlets

Nipple	1/4” NPT, 2.06” Long	Brass	**NP-210**
Nipple	1/4” NPT, 2.06” Long	CP Brass	**MNP-210**
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-211**
Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-211**
Nipple	1/4” NPT, 3” Long	Brass	**NP-212**
Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-212**
Nipple	1/4” NPT, 3.5” Long	Brass	**NP-213**

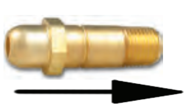
Nipple-Handtight

Nipple-HT	1/4” NPT, 2.5” Long w/ o-ring	Brass, Viton	**NP-211W**
Nipple-HT	1/4” NPT, 2.5” Long w/ o-ring	CP Brass, Viton	**MNP-211W**
Nipple-HT	1/4” NPT, 2.5” Long	Brass, PCTFE	**NP-211T1**
Nipple-HT-CS	For 1/4” Tube	Brass, PCTFE	**NP-210T1C2**
Nipple-HT-CS	For 5/16” Tube	Brass, PCTFE	**NP-210T1C3**

Nipple-Countersunk

Nipple-CS	For 1/4” Tube	Brass	**NP-210C2**
Nipple-CS	For 5/16”Tube	Brass	**NP-210C3**
Nipple-CS	For 3/8” Tube	Brass	**NP-210C4**

Nipple-Check Valve



Nipple-CV	1/4” NPT, 2.125” Long	Brass	**NP-210CV**
Nipple-CV	1/4” NPT, 2.125” Long	CP Brass	**MNP-210CV**

Replacement Parts

Soft Tip	For Soft Tip-Nipple	PCTFE	**T211-1**
O-Ring	For O-Ring-Nipple	Viton	**OR-011V7**

CGA-577 Oxygen

3,001 - 4,000 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	.965”-14NGO-RH-INT	Brass	**N-577**

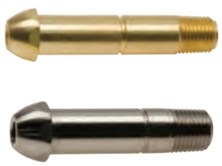
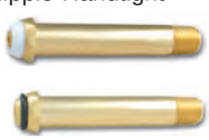
Nipple-Threaded Inlets

Nipple	1/4” NPT, 3” Long	Brass	**NP-823**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-580 Argon, Helium, Nitrogen

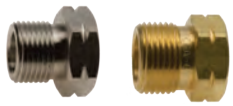
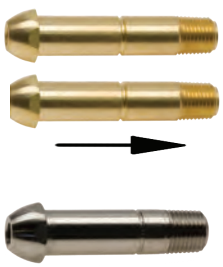
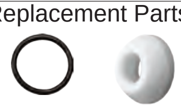
3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.960”-14NGO-RH-EXT	Brass	**N-73**
	Nut	.960”-14NGO-RH-EXT	SS	**N-73SS**
	Nut	.960”-14NGO-RH-EXT	CP Brass	**MN-073**
Handtight Nuts 	Nut, HT	.960”-14NGO-RH-EXT	Brass	**HTN-73**
	Nut, HT	.960”-14NGO-RH-EXT	CP Brass, Plastic Grip	**MHN-073P**
	Nut, HT	.960”-14NGO-RH-EXT	Brass, Plastic Grip	**HTN-73P**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 2.5” Long	Brass	**NP-188**
	Nipple	1/4” NPT, 2.5” Long	SS	**NP-188SS**
	Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-188**
	Nipple	1/4” NPT, 3” Long	Brass	**NP-189**
	Nipple	1/4” NPT, 3” Long	SS	**NP-189SS**
	Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-189**
	Nipple	1/4” NPT, 3.5” Long	Brass	**NP-190**
	Nipple	1/4” NPT, 3.5” Long	SS	**NP-190SS**
	Nipple	1/4” NPT, 3.5” Long	CP Brass	**MNP-190**
	Nipple	1/4” NPT, 4.5” Long	Brass	**NP-191**
Nipple-Handtight 	Nipple-HT	1/4” NPT, 3” Long	Brass, PTFE	**NP-189T3**
	Nipple-HT	1/4” NPT, 3.5” Long	Brass, PTFE	**NP-190T3**
	Nipple-HT	1/4” NPT, 3.5” Long, w/ o’ ring	Brass, Nitrile	**NP-190W**
	Nipple-HT-CS	For 1/4” Tube	Brass, PTFE	**NP-188T3C2**
	Nipple-HT-CS	For 5/16” Tube	Brass, PTFE	**NP-188T3C3**
Nipple-Countersunk 	Nipple-CS	For 1/4” Tube	Brass	**NP-188C2**
	Nipple-CS	For 1/4”Tube	SS	**NP-188C2SS**
	Nipple-CS	For 5/16” Tube	Brass	**NP-188C3**
	Nipple-CS	For 5/16” Tube	SS	**NP-188C3SS**
	Nipple-CS	For 3/8” Tube	Brass	**NP-188C4**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 2.5” Long	Brass	**NP-188CV**
	Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-188SSCV**
	Nipple-CV	1/4” NPT, 2.5” Long	CP Brass	**MNP-188CV**
	Nipple-CV	1/4” NPT, 3” Long	Brass	**NP-189CV**
	Nipple-CV	1/4” NPT, 3” Long	SS	**NP-189SSCV**
Nipples - Residual Pressure Valve 	Nipple-RPV	1/4” NPT, 3.5” Long	Brass, SS PIN	**NP-190-PIN-SS**
	Nipple-RPV	1/4” NPT, 3.5” Long	Brass, Monel PIN	**NP-190-PIN-M**
	Nipple-RPV-O-Ring	1/4” NPT, 3.5” Long	Brass, Retractable Pin	**NP-190W-RPV**
Replacement Parts 	Soft Tip	For Soft Tip-Nipple	PTFE	**T189-3**
	O-Ring	For O-Ring-Nipple	Nitrile	**OR-580**
	Pin	For RPV Nipple	SS	**PIN-NP-SS**
	Pin	For RPV Nipple	Monel	**PIN-NP-M**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-590 Sulfur Hexafluoride Formerly Industrial Air

3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	.960”-14NGO-LH-EXT	Brass	**N-74**
	Nut	.960”-14NGO-LH-EXT	SS	**N-74SS**
	Nut	.960”-14NGO-LH-EXT	CP Brass	**MN-074**
Nipple - Handtight 	Nut-HT	.960”-14NGO-LH-EXT	Brass	**HTN-74**
	Nut-HT	.960”-14NGO-LH-EXT	Brass, Plastic	**HTN-74P**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 2.5” Long	Brass	**NP-188**
	Nipple	1/4” NPT, 2.5” Long	SS	**NP-188SS**
	Nipple	1/4” NPT, 2.5” Long	CP Brass	**MNP-188**
	Nipple	1/4” NPT, 3” Long	Brass	**NP-189**
	Nipple	1/4” NPT, 3” Long	SS	**NP-189SS**
	Nipple	1/4” NPT, 3” Long	CP Brass	**MNP-189**
	Nipple	1/4” NPT, 3.5” Long	Brass	**NP-190**
	Nipple	1/4” NPT, 3.5” Long	CP Brass	**MNP-190**
	Nipple	1/4” NPT, 3.5” Long	SS	**NP-190SS**
	Nipple	1/4” NPT, 4.5” Long	Brass	**NP-191**
Nipple-Handtight 	Nipple-HT	1/4” NPT, 3” Long	Brass, PTFE	**NP-189T3**
	Nipple-HT	1/4” NPT, 3.5” Long	Brass, PTFE	**NP-190T3**
	Nipple-HT	1/4” NPT, 3.5” Long, w/ o’ ring	Brass, Nitrile	**NP-190W**
	Nipple-HT-CS	For 1/4” Tube	Brass, PTFE	**NP-188T3C2**
	Nipple-HT-CS	For 5/16” Tube	Brass, PTFE	**NP-188T3C3**
Nipple-Countersunk 	Nipple-CS	For 1/4” Tube	Brass	**NP-188C2**
	Nipple-CS	For 1/4”Tube	SS	**NP-188C2SS**
	Nipple-CS	For 5/16” Tube	Brass	**NP-188C3**
	Nipple-CS	For 5/16” Tube	SS	**NP-188C3SS**
	Nipple-CS	For 3/8” Tube	Brass	**NP-188C4**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 2.5” Long	Brass	**NP-188CV**
	Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-188SSCV**
	Nipple-CV	1/4” NPT, 2.5” Long	CP Brass	**MNP-188CV**
	Nipple-CV	1/4” NPT, 3” Long	Brass	**NP-189CV**
	Nipple-CV	1/4” NPT, 3” Long	SS	**NP-189SSCV**
Replacement Parts 	Soft Tip	For Soft Tip-Nipple	PTFE	**T189-3**
	O-Ring	For O-Ring-Nipple	Nitrile	**OR-580**

CGA-621 Oil Tolerant Nitrogen

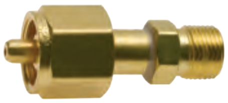
3,001-4,700 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	1.035”-14NGO-LH-INT	Brass	**N-621**
Nipple-Threaded Inlets 	Nipple	1/4” NPT, 3” Long	Brass	**NP-621**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-622 Carbon Dioxide For Liquid Withdrawal

500 PSI

	Part	Description	Material	Part No.
Hex Nut 	Nut	1.035”-14NGO-RH-INT	Brass	**N-622**
Nipple-Threaded Inlet 	Nipple	1/4” NPT, 3” Long	Brass	**NP-621**
Liquid Cylinder to Hose Adaptor 	Nipple	1.035”-14NGO-RH-INT to CGA 320	Brass	**A-622**

CGA-624 Nitrous Oxide For Liquid Withdrawal

500 PSI

	Part	Description	Material	Part No.
Hex Nut 	Nut	1.035”-14NGO-RH-INT	Brass	**N-624**
Nipple-Threaded Inlet 	Nipple	1/4” NPT, 3” Long	Brass	**NP-624**

CGA-660 Refrigerant Gases

3,000 PSI

	Part	Description	Material	Part No.
Hex Nuts 	Nut	1.035”-14NGO-RH-INT	Brass	**N-77**
	Nut	1.035”-14NGO-RH-INT	SS	**N-77SS**
	Nut	1.035”-14NGO-RH-INT	CP Brass	**MN-077**
Nipple-Threaded Inlets 	Nipple*	1/4” NPT, 1.75” Long	Brass	**NP-236**
	Nipple*	1/4” NPT, 2.5” Long	Brass	**NP-238**
	Nipple*	1/4” NPT, 2.5” Long	SS	**NP-238SS**
	Nipple*	1/4” NPT, 2.5” Long	CP Brass	**MNP-238**
	Nipple*	1/4” NPT, 3” Long	SS	**NP-239SS**
	Nipple*	1/4” NPT, 3.5” Long	SS	**NP-240SS**
Nipple-Countersunk 	Nipple-CS*	For 1/4” Tube	SS	**NP-236C2SS**
Nipple-Check Valve 	Nipple-CV	1/4” NPT, 2.5” Long	SS	**NP-238SSCV**
Replacement Item 	Washer	For Nipple	PTFE	**W-18**

**Includes Washer*

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

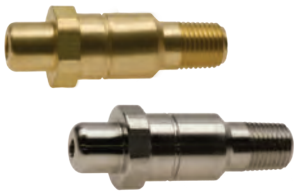
CGA-677 Argon/Nitrogen/Helium

4,701-6,400 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	1.035”-14NGO-LH-INT	Brass	**N-80**
Nut	1.035”-14NGO-LH-INT	SS	**N-80SS**

Nipple-Threaded Inlets



Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5” Long	Brass	**NP-246**
Nipple	1/4” NPT, 2.5” Long	SS	**NP-246SS**
Nipple	1/4” NPT, 3” Long	Brass	**NP-247**
Nipple	1/4” NPT, 3” Long	SS	**NP-247SS**
Nipple	1/4” NPT, 3.5” Long	SS	**NP-248SS**
Nipple	3/8” NPT, 3” Long	Brass	**NP-250**
Nipple	3/8” NPT, 3” Long	SS	**NP-250SS**

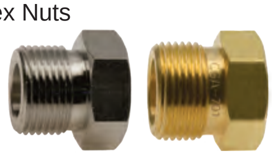
Nipple-Tube Sockets

Part	Description	Material	Part No.
Nipple-CS	For 1/4” Tube	SS	**NP-246C2SS**

CGA-680 Argon/Nitrogen/Helium

3,001-4,700 PSI

Hex Nuts



Part	Description	Material	Part No.
Nut	1.040”-14NGO-RH-EXT	Brass	**N-680**
Nut	1.040”-14NGO-RH-EXT	SS	**N-680SS**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5”	Brass	**NP-842**
Nipple	1/4” NPT, 2.5”	SS	**NP-842SS**
Nipple	1/4” NPT, 3”	Brass	**NP-843**
Nipple	1/4” NPT, 3”	SS	**NP-843SS**
Nipple	1/4” NPT, 3.5”	Brass	**NP-844**

Nipple-Tube Sockets

Part	Description	Material	Part No.
Nipple-CS	For 1/4” Tube	Brass	**NP-842C2**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters

CGA-695 Hydrogen/Methane

3,001-4,700 PSI

Hex Nut

Part	Description	Material	Part No.
Nut	1.040”-14NGO-LH-EXT	Brass	**N-695**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5”	Brass	**NP-842**
Nipple	1/4” NPT, 3”	Brass	**NP-843**
Nipple	1/4” NPT, 3.5”	Brass	**NP-844**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple-CS	For 1/4” Tube	Brass	**NP-842C2**

CGA-701 Oxygen

3,501-4,700 PSI

Hex Nut

Part	Description	Material	Part No.
Nut	1.108”-18NGO-RH-INT	Brass	**N-701**
Nut	1.108”-18NGO-RH-INT	SS	**N-701SS**

Nipple-Threaded Inlet

Part	Description	Material	Part No.
Nipple	1/4” NPT, 3”	Brass	**NP-863**
Nipple	1/4” NPT, 3”	SS	**NP-863SS**

CGA-702 Air

4,701-6,400 PSI

Hex Nuts

Part	Description	Material	Part No.
Nut	1.120”-14NGO-RH-EXT	Brass	**N-702**
Nut	1.120”-14NGO-RH-EXT	CP Brass	**MN-702**

Nipple-Threaded Inlets

Part	Description	Material	Part No.
Nipple	1/4” NPT, 2.5”	Brass	**NP-842**
Nipple	1/4” NPT, 3”	Brass	**NP-843**
Nipple	1/4” NPT, 3”	CP Brass	**MNP-843**
Nipple	1/4” NPT, 3.5”	Brass	**NP-844**

Nipple-Countersunk

Part	Description	Material	Part No.
Nipple-CS	For 1/4” Tube	Brass	**NP-842C2**

Add “RF” to end of nipple part numbers listed under the CGA numbers for Installed Filters





CGA-870 Oxygen

Inlet	Part No.
Yoke w/HT grip x CGA 540 male	**MFY-870-1H**
Yoke w/T-handle x CGA 540 male	**MFY-870-1**
Yoke w/HT grip x 1/4" NPT male	**MFY-870-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-870-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-870-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-870-8**
Yoke w/S.S. HT grip x 1/4" NPT male	**MFY-870-4H-M**
Yoke w/S.S. HT grip x 1/2" NPT male	**MFY-870-8H-M**

CGA-940 CO2/Oxygen Mixture w/ CO2 Over 7%

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-940-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-940-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-940-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-940-8**

CGA-880 CO2/Oxygen Mixture w/ CO2 Not Over 7%

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-880-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-880-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-880-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-880-8**

CGA-950 Medical Air

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-950-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-950-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-950-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-950-8**

CGA-890 Helium/Oxygen Mixture w/ He Not Over 80%

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-890-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-890-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-890-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-890-8**

CGA-960 Nitrogen

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-960-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-960-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-960-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-960-8**

CGA-910 Nitrous Oxide

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-910-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-910-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-910-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-910-8**

CGA-973 Medical Gas Mixtures

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-973-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-973-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-973-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-973-8**

CGA-930 Helium/Oxygen Mixture w/ He Over 80%

Inlet	Part No.
Yoke w/HT grip x 1/4" NPT male	**MFY-930-4H**
Yoke w/T-handle x 1/4" NPT male	**MFY-930-4**
Yoke w/HT grip x 1/2" NPT male	**MFY-930-8H**
Yoke w/T-handle x 1/2" NPT male	**MFY-930-8**

Replacement Parts for all Yokes	Part No.
T-handle	**MYP-001**
Handtight handle	**MYP-002**
Inlet bushing 1/4" NPT male	**MYP-004**
Inlet bushing 1/2" NPT male	**MYP-008**
ETFE washer	**MYP-010**
Nylon washer	**MYP-011**
FKM washer	**MYP-012**
Sintered inlet filter	**MYP-015**
Stainless steel pin	**MYP-020**
Bushing CGA 540 outlet male w/filter	**MYP-540**
S.S. Replacement Hand tight handle	**MYP-002Z**

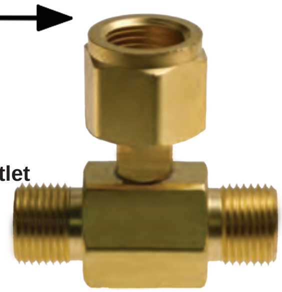
CGA manifold coupler tees

MC-540

C-2580

Oxygen
CGA-540
Nut

CGA-540 Outlet



CGA-540

CGA-540
C-2540CV

C-2580SS

Brass

CGA No.	Swivel Connection	End Connection	PSI	Part No.
296 Industrial Oxygen Mixtures	.803"-14NGO-RH-EXT	.803"-14NGO-RH-INT (2)	3000	**C-2296***
300 (Ethyl Chloride)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	500	**C-2300***
320 (Carbon Dioxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**C-2320***
326 (Nitrous Oxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**C-2326***
346 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**C-2346***
347 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	5500	**C-2347**
350 (Hydrogen/Methane/Natural Gas)	.830"-14NGO-LH-INT	.830"-14NGO-LH-EXT (2)	3000	**C-2350***
510 (Acetylene/Methane/Propane)	.880"-14NGO-LH-EXT	.880"-14NGO-LH-INT (2)	500	**C-2510***
540 (Oxygen)	.908"-14NGO-RH-INT	.908"-14NGO-RH-EXT (2)	3000	**C-2540***
555 (Butane/Propane-Liquid Withdrawal)	.908"-14NGO-LH-INT	.908"-14NGO-LH-EXT (2)	3000	**C-2555**
577 (Oxygen)	.965"-14NGO-RH-INT	.965"-14NGO-RH-EXT (2)	4000	**C-2577**
580 (Inert Gases)	.960"-14NGO-RH-EXT	.960"-14NGO-RH-INT (2)	3000	**C-2580***
590 (Sulfur Hexafluoride)	.960"-14NGO-LH-EXT	.960"-14NGO-LH-INT (2)	3000	**C-2590***
660 (Refrigerant Gases)	1.035"-14NGO-RH-INT	1.035"-14NGO-RH-EXT (2)	3000	**C-2660**
677 (Inert Gases)	1.035"-14NGO-LH-INT	1.035"-14NGO-LH-EXT (2)	7500	**C-2677**
680 (Inert Gases)	1.040"-14NGO-RH-EXT	1.040"-14NGO-RH-INT (2)	5500	**C-2680**
695 (Flammables)	1.040"-14NGO-LH-EXT	1.040"-14NGO-LH-INT (2)	5500	**C-2695**
701 (Oxygen)	1.108"-14NGO-RH-EXT	1.108"-14NGO-RH-INT (2)	5500	**C-2701**
702 (Air)	1.120"-14NGO-RH-EXT	1.120"-14NGO-RH-INT (2)	7500	**C-2702**

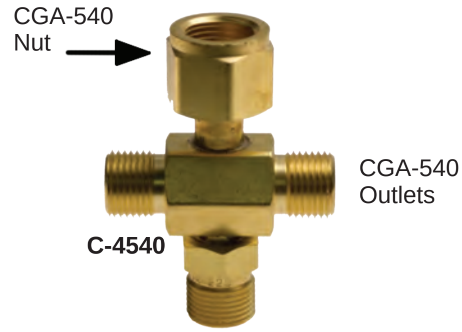
Chrome Plated Brass

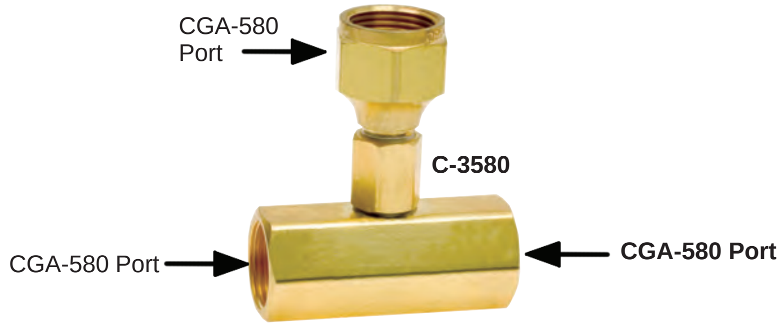
CGA No.	Swivel Connection	End Connection	PSI	Part No.
320 (Carbon Dioxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**MC-320**
326 (Nitrous Oxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**MC-326**
346 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**MC-346**
500 (Medical Mixture)	.880"-14NGO-RH-EXT	.880"-14NGO-RH-INT (2)	3000	**MC-500**
540 (Oxygen)	.908"-14NGO-RH-INT	.908"-14NGO-RH-EXT (2)	3000	**MC-540**
580 (Nitrogen/Helium)	.960"-14NGO-RH-EXT	.960"-14NGO-RH-INT (2)	3000	**MC-580**

Stainless Steel

CGA No.	Swivel Connection	End Connection	PSI	Part No.
320 (Carbon Dioxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**C-2320SS**
346 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	3000	**C-2346SS**
347 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (2)	5500	**C-2347SS**
350 (Hydrogen)	.830"-14NGO-LH-INT	.830"-14NGO-LH-EXT (2)	3000	**C-2350SS**
540 (Oxygen)	.908"-14NGO-RH-INT	.908"-14NGO-RH-EXT (2)	3000	**C-2540SS**
580 (Inert Gases)	.960"-14NGO-RH-EXT	.960"-14NGO-RH-INT (2)	3000	**C-2580SS**
677 (Inert Gases)	1.035"-14NGO-LH-INT	1.035"-14NGO-LH-EXT (2)	7500	**C-2677SS**

***Available with check valve nipple: Add CV to the end of part number.**





Brass Manifold Coupler Tees - 4 way CGA Valve Outlets, Nut & Nipple Inlet

CGA No.	Swivel Connection	End Connections	PSI	Part No.
320 (Carbon Dioxide)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (3)	3000	**C-4320***
346 (Air)	.830"-14NGO-RH-INT	.830"-14NGO-RH-EXT (3)	3000	**C-4346***
510 (Acetylene/Propane)	.880"-14NGO-LH-EXT	.880"-14NGO-LH-INT (3)	500	**C-4510***
540 (Oxygen)	.908"-14NGO-RH-INT	.908"-14NGO-RH-EXT (3)	3000	**C-4540***
580 (Argon/Helium/Nitrogen)	.960"-14NGO-RH-EXT	.960"-14NGO-RH-INT (3)	3000	**C-4580***
590 (Sulfur Hexafluoride)	.960"-14NGO-LH-EXT	.960"-14NGO-LH-INT (3)	3000	**C-4590***

Brass Manifold Coupler Tees - 3 way CGA Valve Outlets

CGA No.	End Connections	PSI	Part No.
540 (Oxygen)	.830"-14NGO-RH-EXT (3)	3000	**C-3540**
580 (Argon/Helium/Nitrogen)	.960"-14NGO-RH-INT (3)	3000	**C-3580**

*Available w/ Check Valve:
Add "CV" to end of part number

2" Hex Brass Body (with 6 valve outlets)

Brass/Stainless Steel Manifold Blocks & Assemblies

CGA No.	Swivel Connection	End Connection	Part No.
540 (Oxygen)	.908"-14NGO-RH-INT	.908"-14NGO-RH-EXT (6)	**MB-540-7***
580 (Argon/Helium/Nitrogen)	.960"-14NGO-RH-EXT	.960"-14NGO-RH-INT (6)	**MB-580-7***

2" Hex Manifold Blocks (with Female Ports)

Connection	Material	PSI	Part No.
1/4" FNPT (6)	Brass	3000	**MB-6**
1/4" FNPT (6)	SS	6000	**MB-6SS**
1/4" FNPT (7)	Brass	3000	**MB-7**
1/4" FNPT (7)	SS	6000	**MB-7SS**
1/4" FNPT(6) x 1/2"FNPT(2)	Brass	4500	**GMA-SCMB**

MB-7

MB-6SS

GMA-SCMB

ERGONOMIC DESIGN

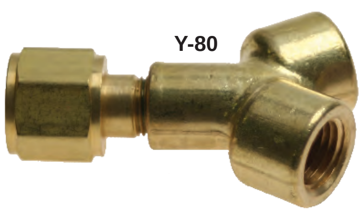

YV-50


YV-420

“Y” Connectors With Shut-Off Valves

200 PSI

Service	Inlets	Outlets	Part No.
Oxygen	“B” 9/16”-18-RH-INT Swivel Nut	“B” 9/16”-18-RH-EXT	**YV-50**
Fuel Gas	“B” 9/16”-18-LH-INT Swivel Nut	“B” 9/16”-18-LH-EXT	**YV-51**
Argon	“B” 5/8”-18-RH-EXT Swivel Nut	“B” 5/8”-18-RH-INT	**YV-420**
Air-Water	“B” 5/8”-18-LH-EXT Swivel Nut	“B” 5/8”-18-LH-INT	**YV-421**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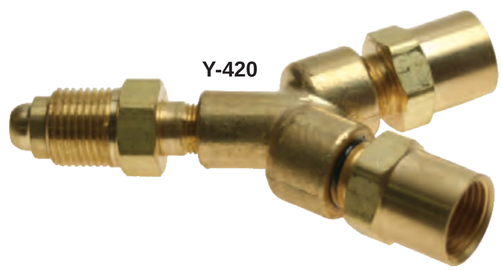

Y-420

“Y” Connectors Without Shut-Off Valves

200 PSI

Service	Inlets	Outlets	Part No.
Oxygen	“B” 9/16”-18-RH-INT Swivel Nut	“B” 9/16”-18-RH-EXT	**Y-50**
Oxygen	“B” 9/16”-18-RH-INT Swivel Nut	1/4” FNPT	**Y-80**
Fuel Gas	“B” 9/16”-18-LH-INT Swivel Nut	“B” 9/16”-18-LH-EXT	**Y-51**
Fuel Gas	“B” 9/16”-18-LH-INT Swivel Nut	1/4” FNPT	**Y-81**
Argon	5/8”-18-RH-EXT Swivel Nut	“B” 5/8”-18-RH-INT	**Y-420**
Air-Water	5/8”-18-LH-EXT Swivel Nut	“B” 5/8”-18-LH-INT	**Y-421**


Y-224

“Y” Connectors With Pipe Threads

3,000 PSI

Service	Inlets	Outlets	Part No.
Non-Corrosive Gases	1/8” FNPT	1/4” FNPT	**Y-184**
Non-Corrosive Gases	1/4” MNPT	1/4” FNPT	**Y-224**

Brass Seat Shut-Off Valves

200 PSI

V-88

Service	Inlet	Outlet	Part No.
Oxygen	"B" 9/16"-18-RH-EXT	"B" 9/16"-18-RH-EXT	**V-50**
Oxygen	"B"" 9/16"-18-RH-INT Swivel Nut	"B" 9/16"-18-RH-EXT	**V-52**
Oxygen	"B" 9/16"-18-RH-EXT	1/4" MNPT	**V-76**
Oxygen	1/4" MNPT	"B" 9/16"-18-RH-EXT	**V-88**
Fuel Gas	1/4" NPT-M	"B" 9/16"-18LH-EXT	**V-89**
Fuel Gas	"A" 3/8"-24-LH-EXT	1/8" NPT-Male	**V-25**
Fuel Gas	"B" 9/16"-18-LH-EXT	"B" 9/16"-18-LH-EXT	**V-51**
Fuel Gas	"B" 9/16"-18-LH-INT Swivel Nut	"B" 9/16"-18-LH-EXT	**V-53**
Fuel Gas	"B" 9/16"-18-LH-EXT	1/8" MNPT	**V-69**
Fuel Gas	"B" 9/16"-18-LH-EXT	1/4" MNPT	**V-77**
Fuel Gas	"B" 9/16"-18-LH-EXT	1/4" FNPT	**V-81**
Argon	5/8" -18-RH-EXT Swivel Nut "B"	5/8" -18-RH-INT "B"	**V-420**
Argon	1/4" NPT-M	5/8" -18-RH-INT"B"	**V-454**

3000 PSI

V-335

Service	Inlet	Outlet	Part No.
All Gases	1/8" MNPT	1/8" MNPT	**V-301**
All Gases	1/4" FNPT	1/4" FNPT	**V-332**
All Gases	1/4" MNPT	1/4" MNPT	**V-333**
All Gases	1/4" FNPT	1/4" MNPT	**V-334**
All Gases	1/4" MNPT	1/4" FNPT	**V-335**

Dust Cap & Chain Assemblies (Non-Gas Tight)

Dust caps are one-piece blind nuts used to protect threads and keep some contamination from cylinder valves. CGA thread specifications are used, but they do not make a gas tight seal.

CC-8540
Oxygen

CGA No.	Gases	Connection	Part No.
022	Oxygen Std.	"B"9/16" -18-RH-INT	**CC-8020**
023	Fuel Gas Std.	"B"9/16" -18-LH-INT	**CC-8021**
024	Oxygen	"C"7/8"-14-RH-INT	**CC-8034**
025	Fuel Gas	"C"7/8"-14-LH-INT	**CC-8035**
300	Ethyl Chloride Acetylene	.830"-14NGO-RH-INT	**CC-8300**
320	Carbon Dioxide	.830"-14NGO-RH-INT	**CC-8320**
346	Air	.830"-14NGO-RH-INT	**CC-8346**
350	Hydrogen/Methane	.830"-14NGO-LH-INT	**CC-8350**
500	Medical Mixture	.880"-14NGO-RH-EXT	**CC-8500**
510	Acetylene/Propane	.880"-14NGO-LH-EXT	**CC-8510**
540	Oxygen	.908"-14NGO-RH-INT	**CC-8540**
555	Propane Liquid Withdrawal	.908"-14NGO-LH-INT	**CC-8555**
580	Argon, Helium, Nitrogen	.960"-14NGO-RH-EXT	**CC-8580**
660	Refrigeration Gases	1.035"-14NGO-RH-INT	**CC-8660**

Two-Piece Assemblies

These two-piece nut and blind nipple assemblies are made to CGA standards and make a gas tight seal.

PC-4540

PC-4510

CGA No.	Gases	Connection	Gas Seal (PSI)	Part No.
022	Oxygen	"B"9/16 -18-RH-INT	200	**PC-4020**
023	Fuel Gas	"B"9/16 -18-LH-INT	200	**PC-4021**
024	Oxygen	"C"7/8"-14-RH-INT	200	**PC-4034**
025	Fuel Gas	"C"7/8"-14-LH-INT	200	**PC-4035**
026	Oxygen	"D"1-1/4"-12-RH-INT	200	**PC-4042**
027	Fuel Gas	"D"1-1/4"-12-LH-INT	200	**PC-4043**
032	Inert Gas	"B"5/8"-18-RH-EXT	200	**PC-4024**
033	Air-Water	"B"5/8"-18-LH-EXT	200	**PC-4025**
032	Inert Gas	"B"5/8"-18-RH-INT	200	**PC-4026**
034	Inert Gas	"C"7/8"-14-RH-EXT	200	**PC-4036**
320	Carbon Dioxide	.830"-14NGO-RH-INT	3000	**PC-4320**
326	Nitrous Oxide	.830"-14NGO-RH-INT	3000	**PC-4326**
347	Air	.830"-14NGO-RH-INT	5500	**PC-4347**
350	Hydrogen/Methane	.830"-14NGO-LH-INT	3000	**PC-4350**
510	Acetylene/Propane	.880"-14NGO-LH-EXT	500	**PC-4510**
520	Acetylene	.899"-18NGO-RH-INT	500	**PC-4520**
540	Oxygen	.908"-14NGO-RH-INT	3000	**PC-4540**
555	Propane	.908"-14NGO-LH-INT	3000	**PC-4555**
580	Argon/Helium/Nitrogen	.960"-14NGO-RH-EXT	3000	**PC-4580**
680	Argon/Helium/Nitrogen	1.040"-14NGO-RH-EXT	5500	**PC-4680**

One-Piece Assemblies - With Chain

These shorter one-piece plug and chains can be used, where space is limited, to seal off cylinder valves and still be able to install the cylinder valve cap. The part makes a gas tight seal. Nipples have replaceable soft tips or o-rings.

PC-580
Argon, Helium, Nitrogen

CGA No.	Gases	Connection	Gas Seal (PSI)	Part No.
320	Carbon Dioxide	.830"-14NGO-RH-INT	3000	**PC-320**
326	Nitrous Oxide	.830"-14NGO-RH-INT	3000	**PC-326**
330	Non-Corrosive Gas	.830"-14NGO-LH-INT	3000	**PC-330**
346	Air	.830"-14NGO-RH-INT	3000	**PC-346**
350	Hydrogen/Methane	.830"-14NGO-RH-INT	3000	**PC-350**
510	Acetylene/Propane	.880"-14NGO-LH-EXT	500	**PC-510**
540	Oxygen	.908"-14NGO-LH-INT	3000	**PC-540**
555	Propane	.908"-14NGO-LH-INT	3000	**PC-555**
580	Argon/Helium/Nitrogen	.960"-14NGO-RH-EXT	3000	**PC-580**
590	Sulfur Hexafluoride/Ind. Air	.960"-14NGO-LH-EXT	3000	**PC-590**
680	Argon/Helium/Nitrogen	.960"-14NGO-RH-EXT	4700	**PC-680**

PC-540
Oxygen

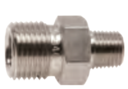
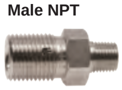
One-Piece Assemblies - Without Chain

These shorter one-piece plugs (sold without chains) can be used, where space is limited, to seal off cylinder valves and still be able to install the cylinder valve cap. The part makes a gas tight seal. Nipples have replaceable soft tips or o-rings.

P-580
Argon, Helium, Nitrogen

P-540
Oxygen

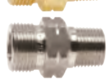
CGA No.	Gases	Connection	Gas Seal (PSI)	Part No.
022	Oxygen	9/16"-18RH-INT	200	**P-022**
023	Fuel Gas	9/16"-18LH-INT	200	**P-023**
024	Oxygen	7/8"-14RH-INT	200	**P-024**
025	Fuel Gas	7/8"-14LH-INT	200	**P-025**
026	Oxygen	1.25"-12RH-INT	200	**P-026**
027	Fuel Gas	1.25"-12LH-INT	200	**P-027**
032	Inert	5/8"-18RH-EXT	200	**P-032**
032	Inert	5/8"-18RH-INT	200	**P-032INT**
033	Industrial Air	5/8"-18LH-EXT	200	**P-033**
034	Inert	7/8"-14RH-EXT	200	**P-034**
200	Acetylene "MC"	.625"-20RH-INT	500	**P-200**
300	Acetylene	.830"-14NGO-RH-INT	500	**P-300**
320	Carbon Dioxide	.830"-14NGO-RH-INT	3000	**P-320**
326	Nitrous Oxide	.830"-14NGO-RH-INT	3000	**P-326**
330	Non-Corrosive Gas	.830"-14NGO-LH-INT	3000	**P-330**
346	Air	.830"-14NGO-RH-INT	3000	**P-346**
350	Hydrogen/Methane	.830"-14NGO-RH-INT	3000	**P-350**
510	Acetylene/Propane	.880"-14NGO-LH-EXT	500	**P-510**
540	Oxygen	.908"-14NGO-LH-INT	3000	**P-540**
555	Propane	.908"-14NGO-LH-INT	3000	**P-555**
580	Argon/Helium/Nitrogen	.960"-14NGO-RH-EXT	3000	**P-580**
590	Sulfur Hexafluoride/Ind. Air	.960"-14NGO-LH-EXT	3000	**P-590**

	CGA No.	Valve Outlet Adaptors Gas	Male & Female Pipe Threads Connection x NPT	Material	PSI	Part No.
Male NPT 	180	Non-Corrosive	.620”-18UNF-2B-RH-EXT x 1/4 MNPT	Brass	3,000	**A-518**
	180	Non-Corrosive	.620”-18UNF-2B-RH-EXT x 1/4 MNPT	SS	3,000	**A-518SS**
Female NPT 	296	Industrial Oxygen Mixtures	.803” UNS-2B-RH-INT x 1/4 FNPT	Brass	3,000	**N-853A**
Male NPT 	300	Ethyl Chloride (formerly Acetylene)	.825” 14NGO-RH-EXT x 1/4 MNPT	Brass	500	**A-531**
	300	Ethyl Chloride (formerly Acetylene)	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	500	**A-533**
Male NPT 	320	Carbon Dioxide	.825” 14NGO-RH-EXT x 1/4 MNPT	Brass	3,000	**A-541**
	320	Carbon Dioxide	.825” 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-542**
	320	Carbon Dioxide	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-543**
	320	Carbon Dioxide w/ Check Valve	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-543CV**
Female NPT 	320	Carbon Dioxide	.825” 14NGO-RH-EXT x 1/4 FNPT	Brass	3,000	**N-854A**
	330	Carbon Sulfide	.825” 14NGO-LH-EXT x 1/4 FNPT	Brass	3,000	**N-330A**
Male NPT 	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 1/4 MNPT	Brass	3,000	**A-631**
	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 1/4 MNPT	CP Brass	3,000	**MA-631**
	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-632**
	326	Nitrous Oxide w/ Check Valve	.825” 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-632CV**
	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-633**
	326	Nitrous Oxide w/ Check Valve	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-633CV**
Female NPT 	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 1/4 FNPT	Brass	3,000	**N-811A**
	326	Nitrous Oxide	.825” 14NGO-RH-EXT x 1/4 FNPT	CP Brass	3,000	**MN-326A**
Male NPT  	346	Air	.825” 14NGO-RH-EXT x 1/4 MNPT	Brass	3,000	**A-641**
	346	Air	.825” 14NGO-RH-EXT x 1/4 MNPT	CP Brass	3,000	**MA-641**
	346	Air	.825” 14NGO-RH-EXT x 1/4 MNPT	SS	3,000	**A-641SS**
	346	Air w/ Check Valve	.825” 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-642CV**
	346	Air	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-643**
	346	Air w/ Check Valve	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-643CV**
Female NPT 	346	Air	.825” 14NGO-RH-EXT x 1/4 FNPT	Brass	3,000	**N-866A**
	346	Air	.825” 14NGO-RH-EXT x 1/4 FNPT	SS	3,000	**N-866A-SS**
	346	Air	.825” 14NGO-RH-EXT x 1/4 FNPT	CP Brass	3,000	**MN-346A**
Male NPT  	347	Air	.825” 14NGO-RH-EXT x 1/4 MNPT	Brass	4,700	**A-661**
	347	Air	.825” 14NGO-RH-EXT x 1/4 MNPT	SS	4,700	**A-661SS**
	347	Air	.825” 14NGO-RH-EXT x 1/2 MNPT	Brass	4,700	**A-663**

(347 continue next page)

valve outlet adaptors

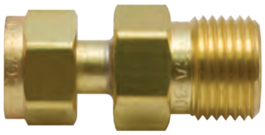
	CGA No.	Valve Outlet Adaptors Gas	Male & Female Pipe Threads Connection x NPT	Material	PSI	Part No.
Female NPT 	347	Air	.825" 14NGO-RH-EXT x 1/4 FNPT	Brass	4,700	**N-347A**
	347	Air	.825" 14NGO-RH-EXT x 1/4 FNPT	SS	4,700	**N-347A-SS**
Male NPT 	350	Hydrogen/Methane/Natural Gas	.825" 14NGO-LH-EXT x 1/4 MNPT	Brass	3,000	**A-551**
	350	Hydrogen/Methane/Natural Gas	.825" 14NGO-LH-EXT x 1/2 MNPT	Brass	3,000	**A-553**
Female NPT 	350	Hydrogen/Methane/Natural Gas	.825" 14NGO-LH-EXT x 1/4 FNPT	Brass	3,000	**N-874A**
	350	Hydrogen/Methane/Natural Gas	.825" 14NGO-LH-EXT x 1/4 FNPT	SS	3,000	**N-874A-SS**
	350	Hydrogen/Methane/Natural Gas	.825" 14NGO-LH-EXT x 1/4 FNPT	CP Brass	3,000	**MN-350A**
Female NPT 	410	Canadian Acetylene	.850" 14NGO-LH-EXT x 1/4 FNPT	Brass	500	**N-836A**
Male NPT 	500	Medical Mixtures	.885" 14NGO-RH-INT x 1/4 MNPT	Brass	3,000	**A-571**
	500	Medical Mixtures w/ Check Valve	.885" 14NGO-RH-INT x 3/8 MNPT	Brass	3,000	**A-572CV**
	500	Medical Mixtures w/ Check Valve	.885" 14NGO-RH-INT x 1/2 MNPT	Brass	3,000	**A-573CV**
Female NPT 	500	Medical Mixtures	.885" 14NGO-RH-INT x 1/4 FNPT	Brass	3,000	**N-807A**
	500	Medical Mixtures	.885" 14NGO-RH-INT x 1/4 FNPT	CP Brass	3,000	**MN-500A**
Male NPT 	510	Acetylene/Propane/Natural Gas	.885" 14NGO-LH-INT x 1/4 MNPT	Brass	500	**A-581**
	510	Acetylene/Propane/Natural Gas	.885" 14NGO-LH-INT x 1/2 MNPT	Brass	500	**A-583**
Female NPT   N-802A	510	Acetylene/Propane/Natural Gas	.885" 14NGO-LH-INT x 1/4 FNPT	Brass	500	**N-800A**
	510	Acetylene/Propane/Natural Gas	.885" 14NGO-LH-INT x 1/4 FNPT	CP Brass	500	**MN-510A**
	510(90°)	Acetylene/Propane/Natural Gas	.885" 14NGO-LH-INT x 1/4 FNPT	Brass	500	**N-802A**
Male NPT  	540	Oxygen	.903" 14NGO-RH-EXT x 1/4 MNPT	Brass	3,000	**A-591**
	540	Oxygen	.903" 14NGO-RH-EXT x 1/4 MNPT	SS	3,000	**A-591SS**
	540	Oxygen	.903" 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-592**
	540	Oxygen w/ Check Valve	.903" 14NGO-RH-EXT x 3/8 MNPT	Brass	3,000	**A-592CV**
	540	Oxygen	.903" 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-593**
	540	Oxygen w/ Check Valve	.903" 14NGO-RH-EXT x 1/2 MNPT	Brass	3,000	**A-593CV**
Female NPT 	540	Oxygen	.903" 14NGO-RH-EXT x 1/4 FNPT	Brass	3,000	**N-876A**
	540	Oxygen	.903" 14NGO-RH-EXT x 1/4 FNPT	SS	3,000	**N-876A-SS**
	540	Oxygen	.903" 14NGO-RH-EXT x 1/4 FNPT	CP Brass	3,000	**MN-540A**
Male NPT 	555	Propane/Butane for Liquid Withdrawal	.903" 14NGO-LH-EXT x 1/4 MNPT	Brass	3,000	**A-651**
	555	Propane/Butane for Liquid Withdrawal	.903" 14NGO-LH-EXT x 1/2 MNPT	Brass	3,000	**A-653**
Female NPT 	555	Propane/Butane for Liquid Withdrawal	.903" 14NGO-LH-EXT x 1/4 FNPT	Brass	3,000	**N-885A**
Male NPT 	577	Oxygen	.960" 14NGO-RH-EXT x 1/2 MNPT	Brass	3,500	**A-563**
Female NPT 	577	Oxygen	.960" 14NGO-RH-EXT x 1/4 FNPT	Brass	3,500	**N-577A**

	CGA No. Gas	Valve Outlet Adaptors	Male & Female Pipe Threads Connection x NPT	Material	PSI	Part No.
Male NPT 	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 1/4 MNPT	Brass	3,000	**A-601**
	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 3/8 MNPT	Brass	3,000	**A-602**
	580	Argon/Helium/Nitrogen w/ Check Valve	.965" 14NGO-RH-INT x 3/8 MNPT	Brass	3,000	**A-602CV**
	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 1/2 MNPT	Brass	3,000	**A-603**
	580	Argon/Helium/Nitrogen w/ Check Valve	.965" 14NGO-RH-INT x 1/2 MNPT	Brass	3,000	**A-603CV**
	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 3/4 MNPT	Brass	3,000	**A-605**
Female NPT 	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 1/4 FNPT	Brass	3,000	**N-862A**
	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 1/4 FNPT	SS	3,000	**N-862ASS**
	580	Argon/Helium/Nitrogen	.965" 14NGO-RH-INT x 1/4 FNPT	CP Brass	3,000	**MN-580A**
Male NPT 	590	Sulfur Hexafluoride/Industrial Air	.965" 14NGO-LH-INT x 1/4 MNPT	Brass	3,000	**A-611**
	590	Sulfur Hexafluoride/Industrial Air	.965" 14NGO-LH-INT x 1/2 MNPT	Brass	3,000	**A-613**
Female NPT 	590	Sulfur Hexafluoride/Industrial Air	.965" 14NGO-LH-INT x 1/4 FNPT	Brass	3,000	**N-954A**
	590	Sulfur Hexafluoride/Industrial Air	.965" 14NGO-LH-INT x 1/4 FNPT	CP Brass	3,000	**MN-590A**
Male NPT 	622	Carbon Dioxide Liquid Withdrawal	1.030" 14NGO-RH-EXT x 3/8 MNPT	Brass	500	**A-722**
Male NPT 	624	Nitrous Oxide Liquid Withdrawal	1.030" 14NGO-RH-EXT x 3/8 MNPT	Brass	500	**A-732**
Female NPT 	660	Refrigerant Gases	1.030" 14NGO-RH-EXT x 1/4 FNPT	Brass	3,000	**N-880A**
	660	Refrigerant Gases	1.030" 14NGO-RH-EXT x 1/4 FNPT	CP Brass	3,000	**MN-660A**
Male NPT 	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/4 MNPT	Brass	6,400	**A-671**
	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/4 MNPT	SS	6,400	**A-671SS**
	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/2 MNPT	Brass	6,400	**A-673**
	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/2 MNPT	SS	6,400	**A-673SS**
Female NPT 	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/4 FNPT	Brass	6,400	**N-677A**
	677	Argon/Helium/Nitrogen	1.030" 14NGO-LH-EXT x 1/4 FNPT	SS	6,400	**N-677A-SS**
Male NPT 	680	Argon/Helium/Nitrogen	1.045" 14NGO-RH-INT x 1/4 MNPT	Brass	4,700	**A-681**
	680	Argon/Helium/Nitrogen	1.045" 14NGO-RH-INT x 1/2 MNPT	Brass	4,700	**A-683**
Female NPT 	680	Argon/Helium/Nitrogen	1.045" 14NGO-RH-INT x 1/4 FNPT	Brass	4,700	**N-680A**
	680	Argon/Helium/Nitrogen	1.045" 14NGO-RH-INT x 1/4 FNPT	SS	4,700	**N-680A-SS**
Male NPT 	701	Oxygen	1.103" 18NGO-RH-EXT x 1/2 MNPT	Brass	4,700	**A-753**
Female NPT 	701	Oxygen	1.103" 18NGO-RH-EXT x 1/4 FNPT	Brass	4,700	**N-701A**
Male NPT 	702	Air	1.125" 14NGO-RH-INT x 1/2 MNPT	Brass	6,400	**A-763**
Female NPT 	702	Air	1.125" 14NGO-RH-INT x 1/4 FNPT	Brass	6,400	**N-702A**

brass cga cylinder to regulator adaptors

CGA 200-300 — Part No. A-775
500 PSI

Acetylene Cylinder (CGA-200)



Commercial Acetylene Regulator (CGA-300)

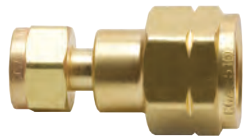
CGA 200-510 — Part No. A-780
500 PSI

Acetylene Cylinder (CGA-200)

Acetylene P.O.L. Regulator (CGA-510)

CGA 200-510 — Part No. A-781
500 PSI

Acetylene “MC” Cylinder (CGA-200)



Acetylene P.O.L. Regulator (CGA-510)

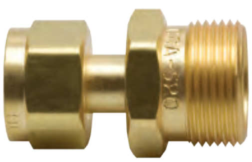
CGA 200-520 — Part No. A-783
500 PSI

Acetylene “MC” Cylinder (CGA- 200)

Acetylene B Regulator (CGA-520)

CGA 200-520 — Part No. A-784
500 PSI

Acetylene “MC” Cylinder (CGA-200)



Acetylene B Regulator (CGA-520)

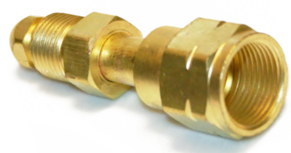
CGA 280-540 — Part No. A-789
3000 PSI

Medical Breathing Mixtures CGA-280 Cylinder

Oxygen Regulator (CGA-540)

CGA 296-590 — Part No. A-968
3000 PSI

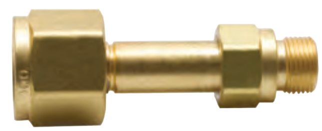
Industrial Oxygen Mixtures CGA-296 Cylinder



Industrial Air Regulator (CGA-590)

CGA 300-200 — Part No. A-792
500 PSI

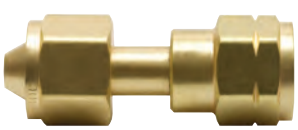
Commercial Acetylene Cylinder (CGA-300)



Acetylene “MC” Regulator (CGA-200)

CGA 300-510 — Part No. A-800
500 PSI

Commercial Acetylene Cylinder (CGA-300)



Acetylene P.O.L. Regulator (CGA-510)

CGA 300-510 — Part No. A-801
500 PSI

Commercial Acetylene Cylinder (CGA-300)
1 pc. Adaptor

Acetylene P.O.L. Regulator (CGA-510)

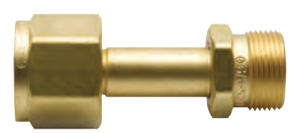
CGA 300-510 — Part No. A-802
500 PSI

Commercial Acetylene Cylinder (CGA-300)

510 Acetylene P.O.L. Regulator (CGA-510)

CGA 300-520 — Part No. A-804
500 PSI

Commercial Acetylene Cylinder (CGA-300)



Acetylene B Regulator (CGA-520)

CGA 320-580 — Part No. A-809
3000 PSI

Carbon Dioxide Cylinder (CGA-320)

Argon, Helium, or Nitrogen Regulator (CGA-580)

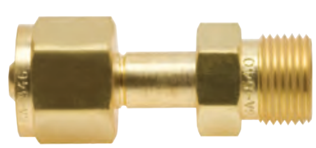
CGA 320-580 — Part No. A-810
3000 PSI

Carbon Dioxide Cylinder (CGA-320)
1 pc. Adaptor

Argon, Helium, or Nitrogen Regulator (CGA-580)

CGA 346-540 — Part No. A-930
3000 PSI

Air Cylinder (CGA-346)



Oxygen Regulator (CGA-540)

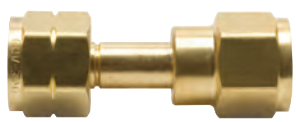
CGA 346-580 — Part No. A-935
3000 PSI

Air Cylinder (CGA-346)

Argon, Helium, or Nitrogen Regulator (CGA-580)

CGA 350-580 — Part No. A-820
3000 PSI

Hydrogen, Methane Cylinder (CGA-350)



Argon, Helium, or Nitrogen Regulator (CGA-580)

CGA 415-510 — Part No. A-827
500 PSI

Canadian L.A. Acetylene Cylinder (CGA-415)

Acetylene P.O.L. Regulator (CGA-510)

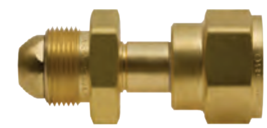
CGA 500-540 — Part No. A-909
3000 PSI

Medical Mixtures Cylinder (CGA-500)

Oxygen Regulator (CGA-540)

CGA 500-580 — Part No. A-912
3,000 PSI

Medical Mixtures Cylinder (CGA-500)



Argon, Helium, or Nitrogen Regulator (CGA-580)

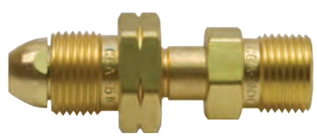
CGA 510-200 — Part No. A-828
500 PSI

Acetylene P.O.L. Cylinder (CGA-510)

Acetylene "MC" Regulator (CGA-200)

CGA 510-300 — Part No. A-830
500 PSI

Acetylene P.O.L. Cylinder (CGA-510)



Commercial Acetylene Regulator (CGA-300)

CGA 510-300 — Part No. A-831
500 PSI

Acetylene P.O.L. Cylinder (CGA-510)

1 pc Adaptor

Commercial Acetylene Regulator (CGA-300)

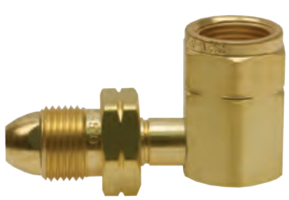
CGA 510-410 — Part No. A-836
500 PSI

Acetylene P.O.L. Cylinder (CGA-510)

Canadian Acetylene Regulator (CGA-410)

CGA 510-510 — Part No. A-838
500 PSI

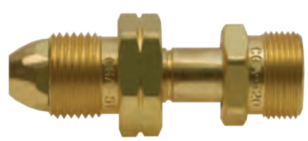
Acetylene P.O.L. Cylinder (CGA-510)



Acetylene P.O.L. Regulator (CGA-510)

CGA 510-520 — Part No. A-840
500 PSI

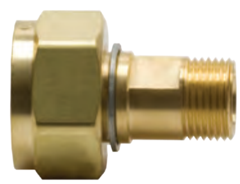
Acetylene P.O.L. Cylinder (CGA-510)



Acetylene B Regulator (CGA-520)

CGA 520-200 — Part No. A-842
500 PSI

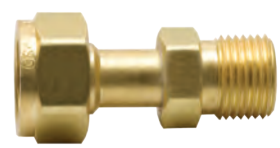
Acetylene B Cylinder (CGA-520)



Acetylene "MC" Regulator (CGA-200)

CGA 520-300 — Part No. A-844
500 PSI

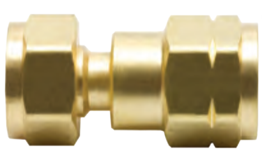
Acetylene B Cylinder (CGA-520)



Commercial Acetylene Regulator (CGA-300)

CGA 520-510 — Part No. A-848
500 PSI

Acetylene B Cylinder (CGA-520)



Acetylene P.O.L. Regulator (CGA-510)

CGA 520-510 — Part No. A-850
500 PSI

Acetylene B Cylinder (CGA-520)

Acetylene P.O.L. Regulator (CGA-510)

CGA 540-346 — Part No. A-866
3000 PSI

Oxygen Cylinder (CGA-540)

Air Regulator (CGA-346)

CGA 540-580 — Part No. A-862
3000 PSI

Oxygen Cylinder (CGA-540)

Argon, Helium, or Nitrogen Regulator (CGA-580)

brass cga cylinder to regulator adaptors

CGA 555-510	Part No.
500 PSI	A-948

Propane (L.W.)
Cylinder (CGA-555)

Acetylene P.O.L.
Regulator (CGA-510)

CGA 555-580	Part No.
3000 PSI	A-952

Propane (L.W.)
Cylinder (CGA-555)

Argon, Helium, or Nitrogen
Regulator (CGA-580)

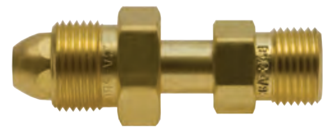
CGA 580-320	Part No.
3000 PSI	A-870

Argon, Helium, or Nitrogen
Cylinder (CGA-580)

Carbon Dioxide
Regulator (CGA-320)

CGA 580-346	Part No.
3000 PSI	A-882

Argon, Helium, or Nitrogen
Cylinder (CGA-580)



Air Regulator
(CGA-346)

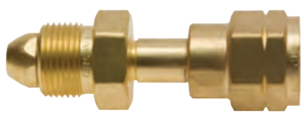
CGA 580-540	Part No.
3000 PSI	A-876

Argon, Helium, or Nitrogen
Cylinder (CGA-580)

Oxygen Regulator
(CGA-540)

CGA 580-590	Part No.
3000 PSI	A-879

Argon, Helium, or Nitrogen
Cylinder (CGA-580)



Industrial Air
Regulator (CGA-590)

CGA 590-346	Part No.
3000 PSI	A-894

Industrial Air Cylinder
(CGA-590)

Air Regulator
(CGA-346)

CGA 590-580	Part No.
3000 PSI	A-892

Industrial Air Cylinder
(CGA-590)

Argon, Helium, or Nitrogen
Regulator (CGA-580)

CGA 410-510	Part No.
500 PSI	A-837

Canadian Acetylene
Cylinder (CGA-410)

image not available

Acetylene P.O.L.
Regulator (CGA-510)

CGA 500-590	Part No.
3000 PSI	A-910

Medical Mixtures
Cylinder (CGA-500)

image not available

Industrial Air
Regulator (CGA-590)

CGA 510-555	Part No.
500 PSI	A-841

Acetylene P.O.L.
Cylinder (CGA-510)

Propane (L.W.)
Regulator (CGA-555)

FLARE TUBING ADAPTORS

500 PSI

FA-4404

CGA	Connection	Gas	Part No.
CGA 165 male	1/4" flare x 1/8" MNPT	Refrigerants	**FA-1651**
CGA 165 male	1/4" flare x 1/4" MNPT	Refrigerants	**FA-1652**
CGA 182 male	3/8" flare x 1/4" MNPT	Refrigerants	**FA-1822**
CGA 295 male	1/2" flare x 1/4" MNPT	Cryogenic Inert	**FA-2952**
CGA 295 male	1/2" flare x 3/8" MNPT	Cryogenic Inert	**FA-2953**
CGA 295 male	1/2" flare x 1/2" MNPT	Cryogenic Inert	**FA-2954**
CGA 440 male	5/8" flare x 1/4" MNPT	Cryogenic Oxygen	**FA-4402**
CGA 440 male	5/8" flare x 3/8" MNPT	Cryogenic Oxygen	**FA-4403**
CGA 440 male	5/8" flare x 1/2" MNPT	Cryogenic Oxygen	**FA-4404**
CGA 440 male	5/8" flare x 3/4" MNPT	Cryogenic Oxygen	**FA-4405**
CGA 450 LH male	5/8" flare x 1/4" MNPT	Methane, Natural Gas	**FA-4502**

CGA 440 Oxygen Cryogenic Transfer Hose

(B)=Brass Ends (S)=Stainless Steel Ends – Insert type of material.

500 PSI

STAINLESS STEEL
CHS-440-440-72

CGA 440 female both ends 48" long	CH( )-440-440-48
CGA 440 female both ends 60" long	CH( )-440-440-60
CGA 440 female both ends 72" long	CH( )-440-440-72
CGA 440 female both ends 120" long	CH( )-440-440-120
CGA 440 female both ends 144" long	CH( )-440-440-144

**Other lengths available. Call for part number.*

CGA 295 Nitrogen Cryogenic Transfer Hose

(B)=Brass Ends (S)=Stainless Steel Ends

500 PSI

STAINLESS STEEL
CHS-295-295-72

CGA 295 female both ends 48" long	CH( )-295-295-48
CGA 295 female both ends 60" long	CH( )-295-295-60
CGA 295 female both ends 72" long	CH( )-295-295-72
CGA 295 female both ends 120" long	CH( )-295-295-120
CGA 295 female both ends 144" long	CH( )-295-295-144

Example - CHS-295-295-72 = CGA Stainless Steel ends 72" long

Quick Connect Handwheel

500 PSI

STAINLESS STEEL

Oxygen CGA 440 Handwheel	**HTC-440**
Nitrogen/Inert CGA 295 Handwheel	**HTC-295**

Quick Connect Tee Handle

500 PSI

STAINLESS STEEL

Oxygen CGA 440 Tee Handle	**CHTE-440**
Nitrogen/Inert CGA 295 Tee Handle	**CHTE-295**

Cryogenic Phase Separator

500 PSI

STAINLESS STEEL

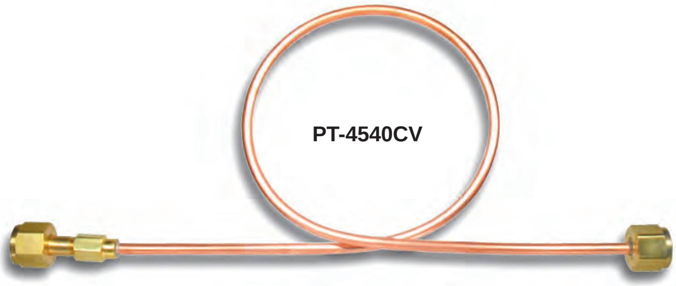
3/8" female NPT	**CPS-001**

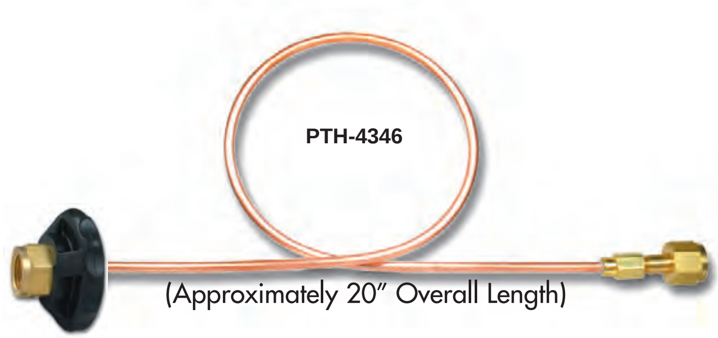
Fill Elbow

500 PSI

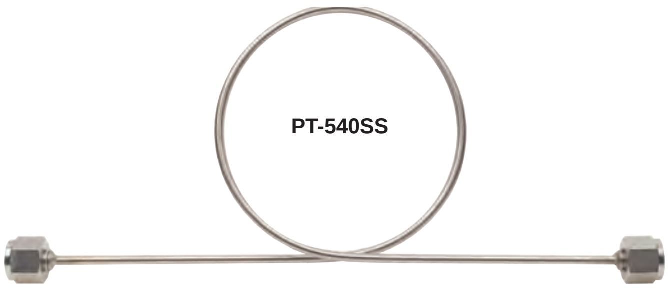
STAINLESS STEEL

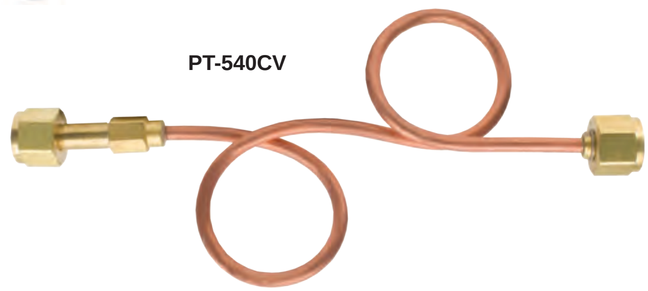
Oxygen CGA 440	**CEL-440**
Nitrogen/Inert CGA 295	**CEL-295**





(Approximately 20" Overall Length)





Rigid Pigtail Assemblies with Single & Double Loop

CGA No.	Operating Pressure (PSI)	Standard Pigtail	Plastic H.T. Nut-One End	Brass Wrench One End	S.S. Tube & S.S Ends	Copper pigtail 2 loops,brass ends
300	250	*PT-3300	*PTH-3300	*PTW-3300	N/A	*PT-300
320	3000	PT-4320	PTH-4320	PTW-4320	PT-320SS	PT-320
326	3000	PT-4326	PTH-4326	PTW-4326	PT-326SS	PT-326
346	3000	PT-4346	PTH-4346	PTW-4346	PT-346SS	PT-346
350	3000	PT-4350	PTH-4350	PTW-4350	PT-350SS	PT-350
510	500	PT-4510	PTH-4510	PTW-4510	PT-510SS	PT-510
510-90°	250	*PT-3510	*PTH-3510	*PTW-3510	N/A	N/A
540	3000	PT-4540	PTH-4540	PTW-4540	PT-540SS	PT-540
580	3000	PT-4580	PTH-4580	PTW-4580	PT-580SS	PT-580
590	3000	PT-4590	PTH-4590	PTW-4590	PT-590SS	PT-590

To add check valve to inlet, add "CV". For reverse check valve on outlet, add "RCV" (see pg. 23 for explanation).

* All pigtails designated for Acetylene service are built with brass tubing.

Annealed Copper Coiled Tubing 3000 psi	Part No.
Seamless copper tubing 1/4"O.D. x .065 wall	**CT-44**
Seamless copper tubing 5/16"O.D. x .065 wall	**CT-45**
50 ft. Rolls, Not Cleaned for 02 service	

NPT ends for copper & brass tubing 3000 psi	Part No.
Male 1/4" NPT x 5/16" O.D. Tubing	**XPTE-004C3**
Female 1/4" NPT x 1/4" O.D. Tubing	**XPTE-005C2**
Female 1/4" NPT x 1/4" O.D. Tubing, Stainless Steel	**XPTE-005C2SS**
Female 1/4" NPT x 5/16" O.D. Tubing	**XPTE-005C3**

XPTE-005C3

XPTE-004C3

Snap rings for pigtail nut & nipples	
Snap Ring - Secures Nut to Nipple	**XSR-020**
Standard package of 25	

XSR-020

min. length=6”
max length=600”

EXAMPLE:
PTF-580H-580-24

PTFE/STAINLESS BRAIDED HOSE

3000 PSI WORKING PRESSURE

EXAMPLE	PTF	-	580H	-	580	-	24
	Hose Type		Inlet		Outlet		Length

Superior PTF Series PTFE Lined Stainless Braided Pigtails are designed for 3000 PSI working pressure for a broad range of applications. Comes standard with stainless steel ferrules for longer service life. Available with Armor Guard or spring guard.

Not recommended for lighter than air gases based on effusion

Specifications:
- 1/4” Nominal I.D.
- Braid is Type 304 stainless steel
- Temperature rating -65°F to 450°F
- Burst pressure is 12,000 PSI at room temperature
- Minimum bend radius of 3 inches for maximum safety & life

EXAMPLE:
PTFT-34I-34I-24

ETFE/STAINLESS BRAIDED HOSE

3000 PSI WORKING PRESSURE

EXAMPLE	PTFT	-	34I	-	34I	-	24
	Hose Type		Inlet		Outlet		Length

For use in Helium and Hydrogen gas service to reduce effusion of lighter than air gases. ETFE Hose is also good for high purity applications where off gassing of hydrocarbons and low diffusion rate is a concern. Please note ETFE has a lower diffusion rate than PTFE, although it does not provide zero effusion. For zero effusion, use rigid copper, brass or stainless steel. Available with Armor Guard or spring guard.

Specifications:
- 1/4” Nominal I.D.
- Braid is Type 304 stainless steel, lining is ETFE
- Temperature rating -65°F to 450°F
- Burst pressure is 12,000 PSI at room temperature
- Minimum bend radius of 3 inches for maximum safety & life

EXAMPLE:
PTFN-N34I-N34I-24

NYLON SYNTHETIC BRAIDED HOSE

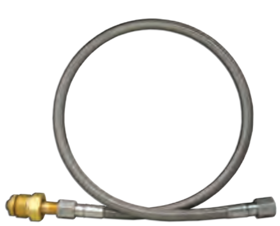
3000 PSI WORKING PRESSURE

EXAMPLE	PTFN	-	N 34I	-	N34I	-	24
	Hose Type		Inlet		Outlet		Length

For use in Helium and Hydrogen gas service to reduce effusion of lighter than air gases. Please note synthetic nylon tube has a lower diffusion rate than PTFE, although it does not provide zero effusion. For zero effusion, use rigid copper, brass or stainless steel. Available with Armor Guard or spring guard.

Not for oxygen service

Specifications:
- 1/4” Nominal I.D.
- Braid is synthetic fiber, lining is extruded nylon, polyurethane cover
- Temperature rating -40°F to 212°F
- Burst pressure is 12,000 PSI at room temperature
- Minimum bend radius of 3 inches for maximum safety & life



EXAMPLE:
PTF6-680-64ISS-24

PTFE/STAINLESS DOUBLE BRAIDED HOSE

6000 PSI WORKING PRESSURE

EXAMPLE	PTF6	-	680	-	641SS	-	24
	Hose Type		Inlet		Outlet		Length

For newer high pressure CGA’s. PTFE lined, stainless braided hose for 6000 PSI working pressure. (NOT available with Armor Guard.)

Specifications:
- 1/4” Nominal I.D.
- Braid is Type 304 stainless steel
- Temperature rating -65°F to 450°F
- Burst pressure is 24,000 PSI at room temperature
- Minimum bend radius of 3 inches for maximum safety & life

EXAMPLE:
PTF36-34I-34I-24

POST SINTERED, DOUBLE BRAIDED, PTFE HOSE

3600 PSI WORKING PRESSURE

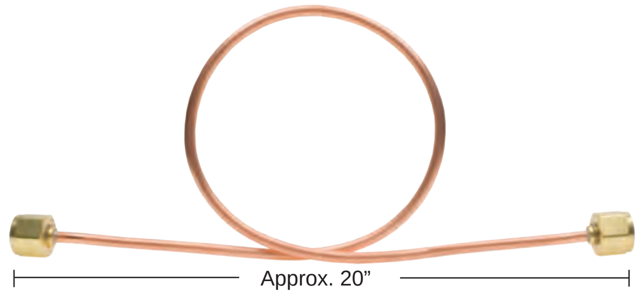
EXAMPLE	PTF36	-	34I	-	34I	-	24
	Hose Type		Inlet		Outlet		Length

For newer high pressure CGA’s. PTFE lined, stainless braided hose is available with or without Armor Guard for 3,600 PSI working pressure.

Specifications:
- 1/4” Nominal I.D.
- Braid is Type 304 stainless steel
- Temperature rating -65°F to 450°F
- Burst pressure is 14,400 PSI at room temperature
- Minimum bend radius of 3 inches for maximum safety & life

NFPA Replacement Pigtails for Hospital Medgas Systems

- 304 Stainless Steel Braid
- PTFE Core
- 3,000 PSI Working Pressure
- 100% Leak Tested & Bagged
- Permanent non removable CGA fitting ends per NFPA code
- Stainless Steel Braid not for use with Oxygen



- **Annealed Copper Tubing**
- **5/16” OD x .065 wall**
- **Silver Brazed End Fittings**
- **3,000 PSI Working Pressure**
- **Permanent non removable CGA fitting ends per NFPA code**

Gas Service	Inlet/Outlet Threads	Hose Materials	Part No.
Carbon Dioxide	CGA 320 Female Nut	Stainless Steel/Teflon	**PTFP-320-24 or 36**
Nitrous Oxide	CGA 326 Female Nut	Stainless Steel/Teflon	**PTFP-326-24 or 36**
Medical Air	CGA 346 Female Nut	Stainless Steel/Teflon	**PTFP-346-24 or 36**
Medical Mixture	CGA 500 Male Nut	Stainless Steel/Teflon	**PTFP-500-24 or 36**
Nitrogen, Helium	CGA 580 Male Nut	Stainless Steel/Teflon	**PTFP-580-24 or 36**
Oxygen	CGA 540 Female Nut	Copper/Brass ends	**PT-4540**
Nitrous Oxide	CGA 326 Female Nut	Copper/Brass ends	**PT-4326**

72” Liquid Cylinder Gas Use Pigtails
for use with Dewar manifold systems

- Black polyester blend perforated cover
- 3/8” ID Nylon Core
- 2,250 PSI Working Pressure
- Temperature rating -70F to +212F
- Permanent non removable CGA fitting ends per NFPA code

Gas Service	Inlet/Outlet Threads	Hose Material	Part No.
Carbon Dioxide	CGA 320 Female Nut	3/8” I.D. Nylon Tube	**PFSL-320-72**
Nitrous Oxide	CGA 326 Female Nut	3/8” I.D. Nylon Tube	**PFSL-326-72**
Medical Air	CGA 346 Female Nut	3/8” I.D. Nylon Tube	**PFSL-346-72**
Medical Mixture	CGA 500 Male Nut	3/8” I.D. Nylon Tube	**PFSL-500-72**
Oxygen	CGA 540 Female Nut	3/8” I.D. Nylon Tube	**PFSL-540-72**
Nitrogen, Helium	CGA 580 Male Nut	3/8” I.D. Nylon Tube	**PFSL-580-72**

The pigtails on this page are specially designed to meet the requirements of NFPA for Hospital medgas manifold systems. The major feature being NFPA’s requirement for permanent affixed ends to avoid cross connection through modification or switching of the nut and nipple to hook up a different gas than a system was designed for. The other requirement is a mandatory copper pigtail for use in high pressure oxygen service. Some states also require that because Nitrous Oxide is an oxidizer, copper is also required.

STANDARD 1/4 Inch Flexible PIGTAILS

- 304 Stainless Steel Braid
- PTFE or ETFE Core
- 3000 or 6000 PSI Working Pressure
- 100% Pressure Tested
- Cleaned & bagged for oxygen service
- Stainless Steel Collar

Stainless Steel Braided PTFE or ETFE with 1/4" NPT Female Brass Ends

Materials	Inlet Threads		Outlet Threads	Length	Part No.
PTFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	18"	**PTF-34I-34I-18**
PTFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	24"	**PTF-34I-34I-24**
PTFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	36"	**PTF-34I-34I-36**
PTFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	48"	**PTF-34I-34I-48**
ETFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	18"	**PTFT-34I-34I-18**
ETFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	24"	**PTFT-34I-34I-24**
ETFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	36"	**PTFT-34I-34I-36**
ETFE core/SS braid, brass ends	1/4"NPT female	X	1/4"NPT female	48"	**PTFT-34I-34I-48**

Stainless Steel Double Braided PTFE with 1/4" NPT Female Stainless Steel Ends

Materials	Inlet Threads		Outlet Threads	Length	Part No.
PTFE core/SS braid, SS ends	1/4"NPT female	X	1/4"NPT female	18"	**PTF6-64ISS-64ISS-18**
PTFE core/SS braid, SS ends	1/4"NPT female	X	1/4"NPT female	24"	**PTF6-64ISS-64ISS-24**
PTFE core/SS braid, SS ends	1/4"NPT female	X	1/4"NPT female	36"	**PTF6-64ISS-64ISS-36**
PTFE core/SS braid, SS ends	1/4"NPT female	X	1/4"NPT female	48"	**PTF6-64ISS-64ISS-48**

SPECIAL CONFIGURED PIGTAILS

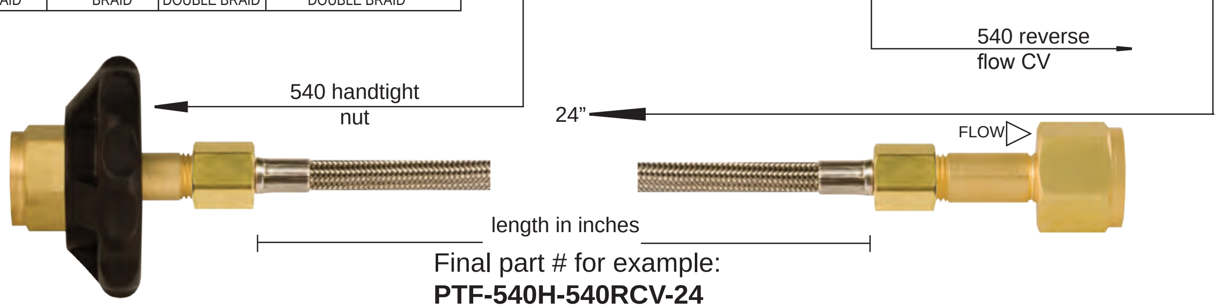
Ordering Information

Superior's flexible hose assemblies are made to order, tested and individually bagged. Each configured part number consists of four elements: (see below) The **1st** place holder specifies the type of hose, PTF etc. The **2nd** place holder specifies the inlet fitting and or accessories such as 540H = oxygen with a hand tight nut & nipple on the inlet. The **3rd** place holder specifies outlet connection and/or accessories. The **4th** place holder designates the length of hose in inches.

TYPE OF HOSE

PTF	PTFT	PTFN	PTF6	PTF36
3,000 PSI	3,000 PSI	3,000 PSI	6,000 PSI	3,600 PSI
PTFE TUBE TUBE	ETFE TUBE	NYLON TUBE	PTFE TUBE	Post Sintered PTFE
Stainless Steel BRAID	Stainless Steel BRAID	Synthetic BRAID	Stainless Steel DOUBLE BRAID	Stainless Steel DOUBLE BRAID

— END CONNECTION & ACCESSORIES STATED AS **CGA &** OPTIONS PG. 65 — END CONNECTION & ACCESSORIES STATED AS **CGA &** OPTIONS PG. 65 — LENGTH OF HOSE STATED IN INCHES



Final part # for example:
PTF-540H-540RCV-24

available hose options and features

Spring Guard is available for Superior's PTF, PTFT, PTF36 and PTFN Series hoses. Spring Guard provides protection from kinking and abrasion of your flexible hose. The crimped ends offer whip protection if the hose is severed.

Specification: Dependent on the type of hose being used (see available hoses on the previous page)

Minimum Length is 24"

Spring Guard Braided — PTFSG

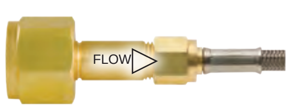
Female NPT — xxx 34I

Male NPT — xxx 34E

Female CGA's — xxx 540

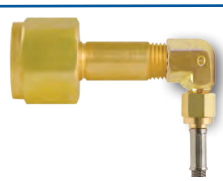
Male CGA's — xxx 580

Check Valve Nipple — CV



Reverse Flow Check Valve Nipple — RCV

Elbow — L

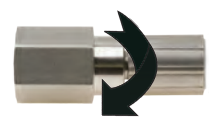


Armor guard Is available for Superior's PTF, PTFT, PTF36 and PTFN Series Stainless hoses. Armor Guard provides protection from cutting, kinking, abrasion, or crushing your flexible hose. The crimped ends offer whip protection if the hose is severed. Specifications: Dependent on the type of hose being used (see available hoses on the previous page)

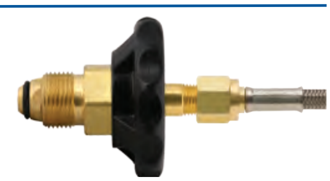
Minimum Length is 24"

Armor Guard Protection — PTFG

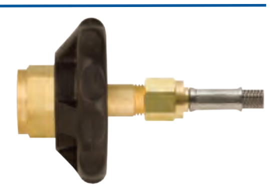
1/4" FNPT Swivel — SW



Male CGA Handtight — H



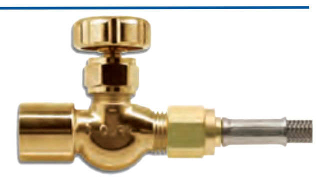
Female CGA Handtight — H



Flash Arrestor — FA

O2 Adibiatic Heat Sink End — HS

Valves — V



Outlet Adaptor — O

Female NPT

Brass 1/8" Female NPT	=	32I
Brass 1/4" Female NPT	=	34I
Stainless Steel 1/4" Female NPT	=	34ISS
Brass 3/8" Female NPT	=	36I
Brass 1/2" Female NPT	=	38I

Male NPT

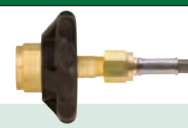
Brass 1/8" Male NPT	=	32E
Brass 1/4" Male NPT	=	34E
Stainless Steel 1/4" Male NPT	=	34ESS
Brass 3/8" Male NPT	=	36E
Brass 1/2" Male NPT	=	38E

Female CGA

CGA 280	=	280
CGA 300	=	300
CGA 320	=	320
CGA 326	=	326
CGA 330	=	330
CGA 346	=	346
CGA 350	=	350**
CGA 577	=	577*
CGA 701	=	701*

* Only on 6,000 PSI Hose (PTF6)
** Only with ETFE or Nylon Hose (PTFT/PTFN)

Handtight



CGA 300	=	300H
CGA 326	=	326H
CGA 346	=	346H
CGA 347	=	347H*
CGA 350	=	350H**
CGA 520	=	520H
CGA 540	=	540H
CGA 555	=	555H

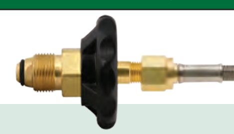
* Only on 6,000 PSI Hose (PTF6)
** Only with ETFE or Nylon Hose (PTFT/PTFN)

Male CGA

CGA 296	=	296
CGA 500	=	500
CGA 510	=	510
CGA 580	=	580**

** For Helium Use, ETFE or Nylon hose is recommended (PTFT/PTFN)

Handtight



CGA 296	=	296H
CGA 500	=	500H
CGA 510	=	510H
CGA 580	=	580H**
CGA 590	=	590H

* Only with 6,000 PSI (PTF6)
** For Helium Use, ETFE or Nylon hose is recommended (PTFT/PTFN)

Male CGA Valve Outlets

CGA 540

CGA 300	=	300M
CGA 320	=	320M
CGA 326	=	326M
CGA 346	=	346M
CGA 347	=	347M*
CGA 350	=	350M**
CGA 540	=	540M
CGA 555	=	555M
CGA 577	=	577M*
CGA 701	=	701M*

* Only on 6,000 PSI Hose (PTF6)
** Only with ETFE or Nylon Hose (PTFT/PTFN)

Female CGA Valve Outlets

CGA 580

CGA 500	=	500F
CGA 510	=	510F
CGA 580	=	580F**
CGA 590	=	590F
CGA 680	=	680F*

* Only on 6,000 PSI Hose (PTF6)
** For Helium Use, ETFE or Nylon hose is recommended (PTFT/PTFN)

All Handtight Nuts are plastic handles with brass insert. All brass Handtight Nuts available on special request.

pigtail ordering matrix

1. Pick Your Hose Type

PTF, PTFE,
PTFT, ETFE,
PTFN, SYNTHETIC TUBE
PTF6, 6000 PSI,
PTF36 POST SINTERED 3600 PTFE DOUBLE BRAID

EXAMPLE:
PTF-580H-580-36

EXAMPLE:
PTFT-34I-34I-36

EXAMPLE:
PTFN-N341-N341-24

EXAMPLE:
PTF6-680-64ISS-36

EXAMPLE:
PTF36-34I-34I-24

2. Guard Option

G = Armor Guard
SG=Spring Guard

EXAMPLE:
PTFSG-G341-G341-24

Armor guard minimum length 24"

EXAMPLE:
PTFG-G341-G341-24

3. CGA or NPT Thread at Inlet

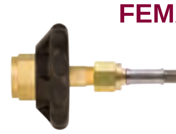
END CONNECTION STATED AS THE CGA OF THE GAS YOU WISH TO USE IN THE HOSE OR THE TYPE OF TANK

Brass 1/4 Male NPT	**34E**
Stainless Steel 1/4 Male NPT	**34ESS**
Brass 1/4 Female NPT	**34I**
Stainless Steel 1/4 Female NPT	**34ISS**
Brass 3/8 Female NPT	**36I**
Brass 1/2 Female NPT	**38I**
Brass 1/4 Female NPT, 3600 psi	**44I**

FEMALE CGA

280
300
320
326
330
346
347
350**
410
415
520
540
555
577*
660
701*

FEMALE CGA HT

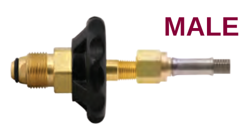


300H
320H
326H
346H
347H*
350H**
520H
540H
555H

MALE CGA

296
500
510
580**
590
680*

MALE CGA HT



296H
500H
510H
580H**
590H

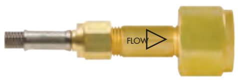
* Only on 6,000 PSI Hose (PTF6)
** Only with ETFE or Nylon Hose (PTFT/PTFN) CGA

4. Options for either end

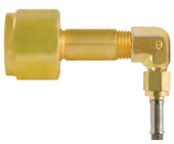
ADDITIONAL OPTIONS OR ENHANCEMENTS SUCH AS CHECK VALVES, VALVES, ELBOWS, SWIVEL, BRASS WRENCH, HEAT SINK

CV

RCV

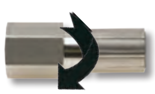


L



V

SW



PW

FA

(Acetylene only, 500 PSI)

HS

5. CGA or NPT thread at outlet

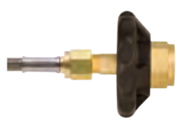
END CONNECTION STATED AS THE CGA OF THE GAS YOU WISH TO USE IN THE HOSE OR THE TYPE OF TANK

Brass 1/4 Male NPT	**34E**
Stainless Steel 1/4 Male NPTE	**34ESS**
Brass 1/4 Female NPT	**34I**
Stainless Steel 1/4 Female NPT	**34ISS**
Brass 3/8 Female NPT	**36I**
Brass 1/2 Female NPT	**38I**
Brass 1/4 Female NPT, 3600 psi	**44I**

FEMALE CGA 280

00
320
326
330
346
347
350**
410
415
520
540
555
577*
660
701*

FEMALE CGA HT 300H



320H
326H
346H
347H*
350H**
520H
540H
555H

MALE CGA 296

500
510
580**
590
680*

MALE CGA HT 296H

500H
510H
580H**
590H

6. Length of hose (in inches)

STANDARD LENGTHS SHOWN
CUSTOM LENGTHS AVAILABLE TOO

Max - 48 ft (576”)
Min - 6 in

Not cleaned for oxygen service past 20 ft.

Superior Product’s Online Pigtail Configurator

www.superiorprod.com

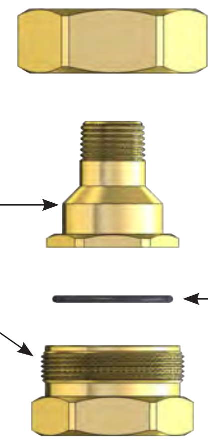
Configure your custom pigtails by selecting:

-Hose type
-Hose length
-Inlet connection
-Inlet fittings
-Inlet thread material
-End options inlet
-Outlet connection
-Size of outlet fittings
-Outlet thread material
-End options outlet

ZERO CLEARANCE FITTINGS **1,000 PSI**

- Zero clearance for easy removal of piped components
- All thread sizes can be mixed and matched.
- Largest possible through holes for maximum flow

Flange Part No.	Thread
FL-ZC-04	1/4"-18NPT-M
FL-ZC-06	3/8"-18NPT-M
FL-ZC-08	1/2"-14NPT-M
FL-ZC-12	3/4"-14NPT-M



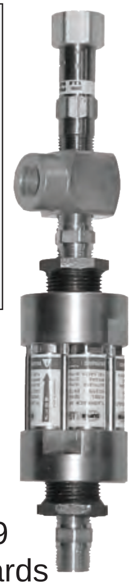
Nut Part No.	
N-ZC-001	Nut for all zero clearance sets

O-Ring Part No.	*Boss includes O-Ring
OR-024B7	O-ring for all zero clearance sets

Boss Part No.	Thread
N-ZC-04A	1/4"-18NPT-F
N-ZC-06A	3/8"-18NPT-F
N-ZC-08A	1/2"-14NPT-F
N-ZC-12A	3/4"-14NPT-F

DRY TYPE FLASH BACK ARRESTORS **GMA-FK series**

Superior's flash arrestor kit provides flash back, reverse flow and pressure relief protection in one compact device. This unit is included with a Superior Products acetylene manifold for more than 2 cylinders. It is also available as an option for use with hydrogen or propane manifolds.



- No water or fluid to check or replenish
- Approved safety device under ANSI Z49
- Help meet OSHA & NFPA safety standards
- Built in relief valve meets NFPA 51 requirements

Part No.	Type	Capacity	Inlet/Outlet	Relief Valve
GMA-FKA	Acetylene	300	1/2" NPT	15 PSIG
GMA-FKP-40	Propane	300	1/2" NPT	40 PSIG
GMA-FKP-60	Propane	300	1/2" NPT	60 PSIG
GMA-FKH	Hydrogen	300	1/2" NPT	40 PSIG

FUEL GAS SEMI-AUTOMATIC CHANGEOVER

GMA-SA High Pressure Series

Designed to regulate flow from high-pressure cylinders (up to 3,000 PSI), the GMA-SA series or GMA-SAHP series provides an uninterrrupted gas supply when changing from the "In Use" side to the "Reserve" side, Line delivery pressure remains constant to the pipeline during the changeover cycle. The SA series is perfect for fuel gas as it comes with a NEMA 4 explosion proof cabinet. The SA series is easy to operate. All that is required after cylinder change out is to move the lever to selected primary gas supply bank for the manifold. The SA series is a mechanical pressure differential system that does not require power to operate. Visual and audible alarms are available if power at the site is available.

How to Order

Control Type + Gas/CGA Service + Total # of Cylinders

Ex. GMA-SA or SAHP-580-4

Semi-Automatic changeover, inert service, 4 tanks

PRO-MIX GAS MIXERS

GMA-MX series — Proportional Gas Mixer

Superior Product's PMX mixers are suited for all applications where precise gas mixtures are required. These non-adjustable, high mix accuracy (+/- 2% full scale of cylinder pressure) offer a price advantage over less accurate adjustable models. The MX2000 series requires **NO SURGE TANK** to maintain mixture accuracy. The panel is a small wall mounted unit that is easy to install and requires no electricity, on-going maintenance or adjustment.

Features
- Tamper proof
- Highly accurate
- Low start up cost
- Compact
- No surge tank required (MX2000)

Mixer Specifications	GMA-MX series
Inlet pressure range	110-150 PSIG
Outlet pressure	0-100 PSIG adjustable
Flow rate	300 SCFH or 900 SCFH
Mixture accuracy	± 2% (3 to 900 SCFH)
Inlet filters	50 Micron
Dimensions	8"W x 10"H x 4.5"D
Weight	8 lbs.

Mixers available for the following **Gases**:

Argon	580A
Nitrogen	580N
Helium	580H
CO_2	320
Oxygen	540
Hydrogen	350

How to Order		
Gas Mixer Assembly	-	CGA - % - CGA - %
GMA-MX	**-**	**XXX - % - XXX - %**
GMA-MX900	**-**	**XXX - % - XXX - %**
GMA-MX2000	**-**	**XXX - % - XXX - %**

Example: GMA-MX2000-580A-75-320-25 Mixer for Argon-75% & CO2-25%

* Higher flow rates available upon request increase in 300 SCFH increments up to 2000 SCFH

* Three gas mixers available upon request

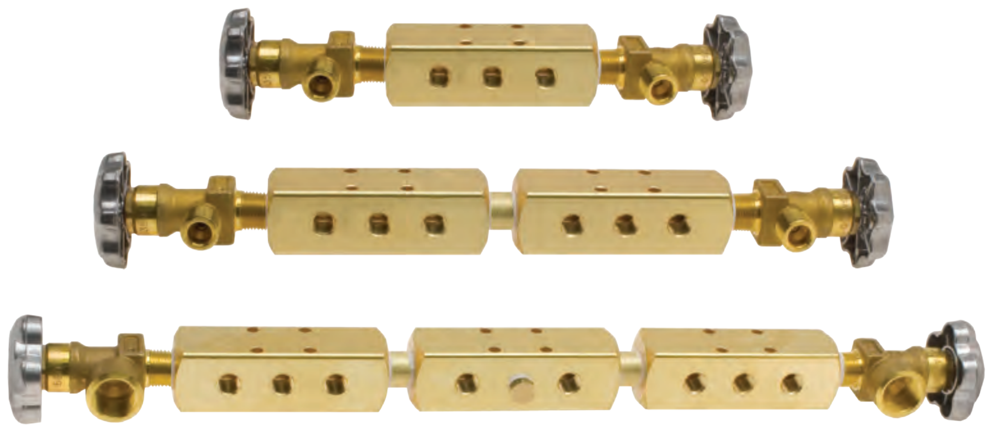
GMA-MX2000 series — Proportional Gas Mixer /High Capacity

Features
- Tamper proof
- Highly accurate
- Low start up cost
- Compact
- No surge tank required

Mixer Specifications	GMA-MX series
Inlet pressure range	120 PSIG
Outlet pressure	0-100 PSIG adjustable
Flow rate	2000 SCFH
Mixture accuracy	± 2% (2 to 2000 SCFH)
Inlet filters	50 Micron
Dimensions	20"W x 22"H x 6"D
Inlet & Outlet fittings	1/4" NPFT

SCMB Series

Superior's SCMB series is the ideal, low cost replacement header to fit most commercially available cylinder cradles. The body is machined from 1 1/2" yellow brass bar stock. Includes proper CGA valves or RPV valves* and 24" flexible, stainless steel pigtails PTFE lined for standard gas service or ETFE lined for high purity and lighter than air gases (hydrogen and helium) or 3,600 PSI Post Sintered PTFE. Also available with armor guarded flex pigtails for heavy duty service. The modular design and removable flexible pigtails allow for quick, easy repairs.



Available to order	
6 pack, stainless steel PTFE lined pigtails	**GMA-SCMB-XXX-06**
6 pack, stainless steel ETFE lined pigtails	**GMA-SCMB-XXXTZ-06**
6 pack, single loop copper pigtails	**GMA-SCMB-XXX-06-RGD**
6 pack, stainless steel 3,600 PSIG PTFE Lined Pigtail	**GMA-SCMB-XXX-36-06**
12 pack, stainless steel PTFE lined pigtails	**GMA-SCMB-XXX-12**
12 pack, stainless steel ETFE lined pigtails	**GMA-SCMB-XXXTZ-12**
12 pack, single loop copper pigtails	**GMA-SCMB-XXX-12-RGD**
12 pack, stainless steel 3,600 PSIG PTFE Lined Pigtail	**GMA-SCMB-XXX-36-12**
16 pack, stainless steel PTFE lined pigtails	**GMA-SCMB-XXX-16**
16 pack, stainless steel ETFE lined pigtails	**GMA-SCMB-XXXTZ-16**
16 pack, single loop copper pigtails	**GMA-SCMB-XXX-16-RGD**
16 pack, stainless steel 3,600 PSIG PTFE Lined Pigtail	**GMA-SCMB-XXX-36-16**

* For **ArmorGuard** Option add "**AG**" to part number
Example: GMA-SCMB-XXXAG-06-PTFE
GMA-SCMB-XXXTZAG-06-ETFE
GMA-SCMB-XXX36AG-06-PTFE 3,600 PSI

* For **Residual Pressure Valve** add "**RPV**" to part number
Example: GMA-SCMB-XXXRPV-06
Please Note 3,600 PSIG PTFE is Post Sintered

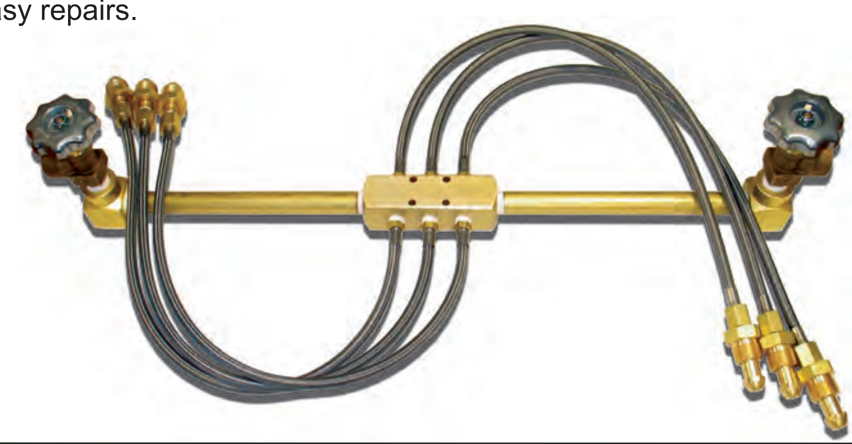
• Other CGA's available upon request
• Optional Tee with gauge available between valve and block

Available for the following gases, replace **XXX** in part number with **CGA#**

Carbon Dioxide	**CGA 320**
Nitrous Oxide	**CGA 326**
Air	**CGA 346**
Hydrogen	**CGA 350**
Propane/Acetylene	**CGA 510**
Oxygen	**CGA 540**
Inert Gases	**CGA 580**

CPR Series

Superior's CPR series is a cradle pack replacement header to fit most common size cylinder cradles. The body is machined from 1 1/2" yellow brass bar stock. Includes proper CGA valves or RPV valves, 24" flexible, stainless steel pigtails PTFE lined for standard gas service, ETFE lined for high purity and lighter than air gases (hydrogen and helium) or 3,600 PSIG Post Sintered PTFE. Also available with armor guarded flexible pigtails for heavy duty service. The modular design and removable flexible pigtails allow for quick, easy repairs.



Available to order		
6	pack, stainless steel PTFE lined pigtails	**GMA-CPR-XXX-06**
6	pack, stainless steel ETFE lined pigtails	**GMA-CPR-XXXTZ-06**
6	pack, stainless steel 3,600 PSIG PTFE lined pigtails	**GMA-CPR-XXX-36-06**
6	pack, single loop copper pigtails	**GMA-CPR-XXX-06-RGD**
12	pack, stainless steel PTFE lined pigtails	**GMA-CPR-XXX-12**
12	pack, stainless steel ETFE lined pigtails	**GMA-CPR-XXXTZ-12**
12	pack, stainless steel 3,600 PSIG PTFE lined pigtails	**GMA-CPR-XXX-36-12**
12	pack, single loop copper pigtails	**GMA-CPR-XXX-12-RGD**
16	pack, stainless steel PTFE lined pigtails	**GMA-CPR-XXX-16**
16	pack, stainless steel ETFE lined pigtails	**GMA-CPR-XXXTZ-16**
16	pack, stainless steel 3,600 PSIG PTFE lined pigtails	**GMA-CPR-XXX-36-16**
16	pack, single loop copper pigtails	**GMA-CPR-XXX-16-RGD**

* For **ArmorGuard** Option add "**AG**" to part number
Example: GMA-CPR-XXXAG-06-PTFE
GMA-CPR-XXXTZAG-06-ETFE
GMA-CPR-XXX36AG-06-PTFE 3,600 PSI

* For **Residual Pressure Valve** add "**RPV**" to part number
Example: GMA-CPR-XXXRPV-06

*Please Note 3,600 PSIG PTFE is Post Sintered

• Other CGA's available upon request

Available for the following gases, replace **XXX** in part number with **CGA**

Carbon Dioxide	**CGA 320**
Nitrous Oxide	**CGA 326**
Air	**CGA 346**
Hydrogen	**CGA 350**
Propane/Acetylene	**CGA 510**
Oxygen	**CGA 540**
Inert Gases	**CGA 580**

MODULAR NON-BRAZED SIMPLEX HEADERS
FOR INDUSTRIAL, SPECIALTY GAS & HOSPITAL MANIFOLD SYSTEMS

Modular simplex manifold headers are a single unit design manufactured from free cutting brass bar stock. This design eliminates all brazed joints. Each unit is tested to full operating pressure and cleaned for oxygen service per CGA-G4.1. Manifold headers can be shipped complete with master valve, individual check valve inlets, flexible stainless steel or rigid copper pigtails, mounting hardware, and CGA inlet connections. Systems available include simplex, MHV series with flexible stainless pigtails, CMHV with rigid copper pigtails, MHE and CMHE series header extensions. Headers are ordered in 2 or 3 cylinder configurations to arrive at the desired number of cylinders. Custom configurations are also available for U-shaped and L-shaped to meet your space requirements.

Configuration: Systems are available in three different basic configurations, for 2 or 3 cylinder sections. Five inch center to center spacing is standard. To order 90 degree elbow sections separately, specify GMF-3710. See page 70.

HOW TO ORDER

1 Start with Blank Header

- Machine, not brazed, joints
- 5 inches between ports, even when expanded

1 - 11 1/2 NPS Thread for expansion

GMA2
(2 port)

GMA4
(4 port - Crossover)

GMA3
(3 port)

GMA6
(6 port - Crossover, Inlets on opposite sides)

2 Choose Outlet

MHV = **Modular Header Valve**

MHE = **Modular Header Extension**

3 Choose Gas

Male Inlets

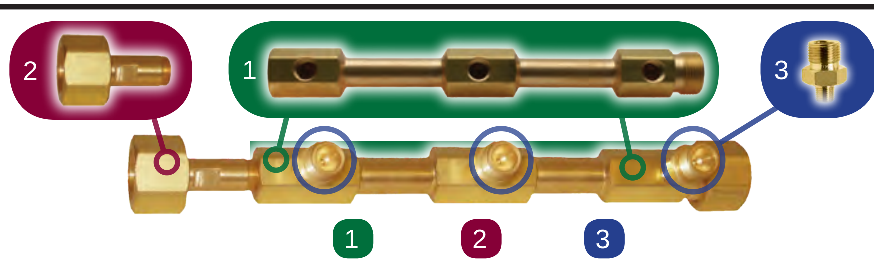
CGA 300 - Ethyl Chlorides (formerly **Acetylene**)
CGA 320 - Carbon Dioxide
CGA 326 - Nitrous Oxide
CGA 346 - Air
CGA 350 - Hydrogen
CGA 540 - Oxygen
CGA 555 - Propane
CGA 577 - Oxygen

Female Inlets

CGA 500 - Medical Mixtures
CGA 510 - Acetylene
CGA 580 - Inert Gases
CGA 590 - Sulfur HexaFlouride (formerly **Industrial Air**)

*** Pigtails sold separately**
For check valve inlets add "CV" after CGA number

CONFIGURED MANIFOLD EXAMPLE



GMA3 - MHE - 540CV
3 Cylinder CGA 540 Header Extension with check valve inlets

GAS MANIFOLD ASSEMBLIES

ORDERING INFORMATION:

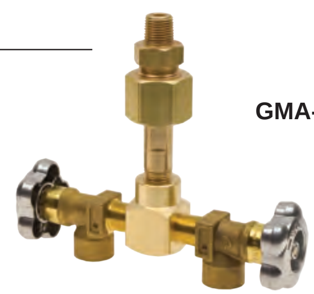
Each manifold part number consists of four sections. The first section denotes a Gas Manifold Assembly (GMA). The second section denotes the type of manifold and its configuration (only for duplex manifolds) otherwise do not use configuration number. The third section denotes the CGA number or type of gas, and the last section denotes the number of inlets or cylinders. The example below is for a twelve cylinder Oxygen duplex manifold in a standard configuration with outlet adaptor with check valves instead of header valves.

GMA	-	**DM**	-	**540CV**	-	**12**
Gas Manifold Assembly		Type of Manifold & Configuration		CGA Number		Number of Cylinder Inlets

Type of Manifold	Type of Configuration	Type of Gases	
SD-Simple Duplex(Manual) SM-Simplex(Manual) DM-Duplex(Manual) HEL-Header Extension, left side HER-Header Extension, right side	Standard Configuration 2-Crossover Configuration 3-"L" Shaped Configuration 4-"U" Shaped Configuration 5-Staggered Configuration	300-Commercial Acetylene 320-Carbon Dioxide 326-Nitrous Oxide 346-Air 350-Hydrogen	510-Acetylene & Propane 540-Oxygen 580-Nitrogen, Helium & Argon 590-Industrial Air

SIMPLE DUPLEX MANIFOLDS

The simple duplex manifold is an economical system with a two cylinder capacity, one per side. The unit is furnished with two header valves and two pigtails with check valves, 1/2" NPT tee, a union and a mounting bracket. Manifolds for Acetylene gas will include pigtails with dry type flashback arrestors.



GMA-SD-320-02

SIMPLEX MANIFOLDS WITH MANUAL CONTROLS

The simplex manifold has a master shut off valve with a single row of cylinder modules. Each module consists of 1/2" piping, 1/2" tees, header valves and pigtails with check valves or outlet adaptors with check valve and regular pigtails, a union, a CGA end plug and mounting brackets. The last module will have a plug and chain connected to an adaptor that allows for future expansion. Proper CGA fittings will be furnished for the specified gas. Manifolds for Acetylene gas will include a Hydraulic Flash Arrestor and pigtails with dry type arrestors.

GMA-SM-346-02

10 inches

MANIFOLD HEADER EXTENSION ASSEMBLIES

Header extensions are shipped ready for addition to existing manifolds. Unit includes CGA inlet, CGA end plug, 1/2" piping, 1/2" tees, header valves and pigtails with check valves or outlet adaptors with check valves and flexible pigtails and a mounting bracket. The last module will have a plug and chain connected to an adaptor that allows for future expansion. Specify right side extension (HER) or left side extension (HEL).

GMA-HER-540-02

DUPLEX MANIFOLDS WITH MANUAL CONTROLS

The duplex manifold has two master shut off valves allowing replacement of the exhausted bank of cylinders while the full bank of cylinders is in operation. The center section accommodates a single regulator. The manifold is shipped with 1/2" piping, 1/2" tees, header valves and pigtails with check valves or adaptor outlets with check valve and regular pigtails, a union, a CGA end plug and mounting brackets are included with each module. Modules are furnished with a plug and chain on the last module that allows for future expansion. Proper CGA fittings will be furnished for specified gas. Manifolds for Acetylene gas will include a Hydraulic Flash Arrestor and pigtails with dry type arrestors.

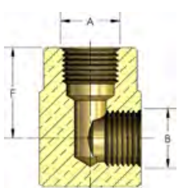
GMA-DM-580-04

BRASS MANIFOLD PIPE AND PIPE FITTINGS

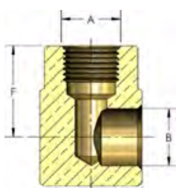
Fittings Are Machined From CDA-360 Brass, Stress Relieved and Cleaned For Oxygen Service

PIPE ELBOWS

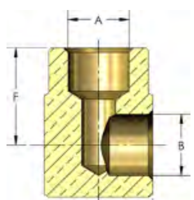
3,000 PSI



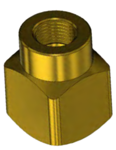
GMF-3011



GMF-3012



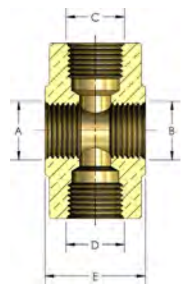
GMF-3013



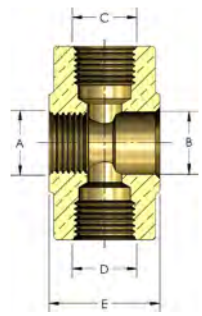
Part No.	Ref. A	Ref. B	Ref. F	Ref.G
GMF-3011	1/2"-14 NPT	1/2"-14 NPT	1-5/16"	3/4"
GMF-3012	1/2"-14 NPT	.843"-.847"	1-5/16"	3/4"
GMF-3013	.843"-.847"	.843"-.847"	1-5/16"	3/4"

PIPE CROSSES

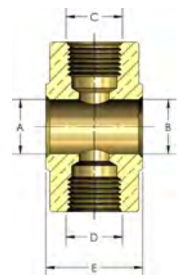
3,000 PSI



GMF-3041



GMF-3042

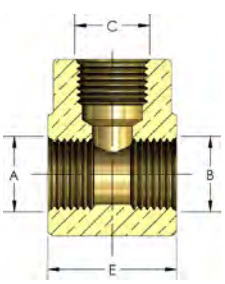


GMF-3043

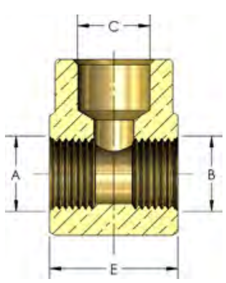
Part No.	Ref. A	Ref. B	Ref.C & D	Ref.E
GMF-3041	1/2"-14 NPT	1/2"-14 NPT	1/2"-14 NPT	1-1/2"
GMF-3042	.843"-.847"	1/2"-14 NPT	1/2"-14 NPT	1-1/2"
GMF-3043	.843"-.847"	Slip Thru	1/2"-14 NPT	1-1/2"

PIPE TEES

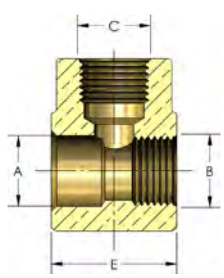
3,000 PSI



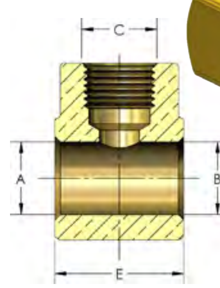
GMF-3021



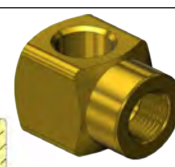
GMF-3022

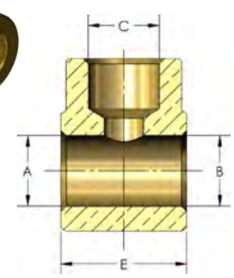


GMF-3023



GMF-3033





GMF-3034

Part No.	Ref. A	Ref. B	Ref. C	Ref.E
GMF-3021	1/2"-14 NPT	1/2"-14 NPT	1/2"-14 NPT	1-1/2"
GMF-3022	1/2"-14 NPT	1/2"-14 NPT	.843"-.847"	1-1/2"
GMF-3023	.843"-.847"	1/2"-14 NPT	1/2"-14 NPT	1-1/2"

Part No.	Ref. A	Ref. B	Ref. C	Ref. E
GMF-3033	.843"-.847"	Slip Thru	1/2"-14 NPT	1-1/2"
GMF-3034	.843"-.847"	Slip Thru	.843"-.847"	1-1/2"

3,000 PSI

PIPE NIPPLES, THREADED ENDS

-Cleaned For Oxygen Service
-Suitable For Acetylene
-Machined From CDA 360 Brass

GMF-3214

Part No.	Thread Size	Length
GMF-3211	1/2"-14 NPT	1-1/2"
GMF-3212	1/2"-14 NPT	2"
GMF-3213	1/2"-14 NPT	4"
GMF-3214	1/2"-14 NPT	6"
GMF-3215	1/2"-14 NPT	9-3/4"
GMF-3216	1/2"-14 NPT	12-3/4"

PIPE LENGTHS, PLAIN ENDS

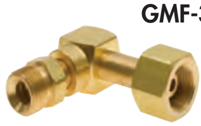
-Cleaned For Oxygen Service
-Suitable For Acetylene
-Made From CDA 360 Brass
-Special Lengths Available
Upon Request

GMF-3224

Part No.	Pipe Size	Length
GMF-3222	1/2" Nom.	2"
GMF-3223	1/2" Nom.	4"
GMF-3224	1/2" Nom.	6"
GMF-3225	1/2" Nom.	9-3/4"
GMF-3226	1/2" Nom.	12-3/4"

UNION 90^0

GMF-3710



Wall Bracket

GMF-3611

image not to scale

UNION PLUG

Part No.	Thread
GMA-RH-PLUG	1"-11-1/2 NPS RH-INT.
GMA-LH-PLUG	1"-11-1/2 NPS LH-INT.

PIPE LENGTHS, PLAIN ENDS

-***NOT CLEANED*** For Oxygen Service
-Suitable For Acetylene
-Made From CDA 360 Brass

Part No.	Pipe Size	Length
GMF-3236	1/2" Nom.	6 FT.
GMF-3237	1/2" Nom.	12 FT.
GMF-6236	3/4" Nom.	6 FT.
GMF-6237	3/4" Nom.	12 FT.

NOTE: GMF-3237 and GMF-6237 must ship via common carrier

UNION NUTS

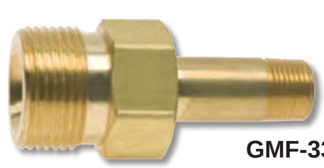
Part No.	Thread
GMF-3311	1"-11-1/2 NPS RH-INT.
GMF-3312	1"-11-1/2 NPS LH-INT.

GMF-3311

UNION NIPPLES

GMF-3326

Part No.	Thread	Length
GMF-3321	3/8"-18 NPT	2.40"
GMF-3326	1/2"-14 NPT	2.94"



GMF-3333

UNION BUSHINGS

GMF-3332

UNION BUSHINGS WITH FILTER 3,000 PSI

Part No.	Thread	Pipe Thread	Length
GMF-3333	1"-11-1/2 NPS RH	3/8"-18 NPT	3.125"
GMF-3334	1"-11-1/2 NPS RH	1/2"-14 NPT	2.187"
GMF-3337	1"-11-1/2 NPS LH	3/8"-18 NPT	3.125"
GMF-3338	1"-11-1/2 NPS LH	1/2"-14 NPT	2.187"

GMF-3341	Replacement Filter
GMF-3342	Replacement Snap-Ring

UNION BUSHINGS WITHOUT FILTER 3,000 PSI

Part No.	Thread	Pipe Thread	Length
GMF-3331	1"-11-1/2 NPS RH	3/8"-18 NPT	3.125"
GMF-3332	1"-11-1/2 NPS RH	1/2"-14 NPT	2.187"
GMF-3335	1"-11-1/2 NPS LH	3/8"-18 NPT	3.125"
GMF-3336	1"-11-1/2 NPS LH	1/2"-14 NPT	2.187"

LINE STATION DROPS & LINE STATION VALVES

200 PSI

Part No.	Gas Service	No. Of Outlets	Outlet Size
GMA-SSD-022V-01	Oxygen	Single	9/16"-18 RH "B" size valve
GMA-SSD-022V-02	Oxygen	Double	9/16"-18 RH "B" size valve
GMA-SSD-023V-01	Fuel Gas	Single	9/16"-18 LH "B" size valve
GMA-SSD-023V-02	Fuel Gas	Double	9/16"-18 LH "B" size valve
GMA-SSD-024V-01	Oxygen	Single	7/8"-14 RH "C" size valve
GMA-SSD-024V-02	Oxygen	Double	7/8"-14 RH "C" size valve
GMA-SSD-025V-01	Fuel Gas	Single	7/8"-14 LH "C" size valve
GMA-SSD-025V-02	Fuel Gas	Double	7/8"-14 LH "C" size valve

GMV-1024

Part No.	Operating Pressure	CGA Outlet	Valve Inlet
GMV-1024	200 psi	CGA-024	1/2"-14 NGT
GMV-1025	200 psi	CGA-025	1/2"-14 NGT

GMV-1025

BALL VALVES

Inlet & Outlet size	Part No.
1/4" female NPT	**GMV-334**
1/2" female NPT	**GMV-338**
3/4" female NPT	**GMV-3312**

Brass body, hot forged brass ball valve, 600 psi rated
Safe for use with acetylene

MANIFOLD VALVES

GMV-1580

GMV-1540

** = Residual Pressure Valve*

No Safety Relief Devices

Part No.	Operating Pressure	CGA Outlet	Valve Inlet
GMV-1300	250 psi	CGA-300	1/2"-14 NGT
GMV-1320	3,000 psi	CGA-320	1/2"-14 NGT
GMV-1326	3,000 psi	CGA-326	1/2"-14 NGT
GMV-1346	3,000 psi	CGA-346	1/2"-14 NGT
GMV-1350	3,000 psi	CGA-350	1/2"-14 NGT
GMV-1510	250/500 psi	CGA-510	1/2"-14 NGT
GMV-1540	3,000 psi	CGA-540	1/2"-14 NGT
GMV-1580	3,000 psi	CGA-580	1/2"-14 NGT
GMV-1590	3,000 psi	CGA-590	1/2"-14 NGT
GMV-3346	3,000 psi	CGA-346	3/4"-14 NGT
GMV-3350	3,000 psi	CGA-350	3/4"-14 NGT
GMV-3540	3,000 psi	CGA-540	3/4"-14 NGT
GMV-3540RPV*	3,000 psi	CGA-540	3/4"-14 NGT
GMV-3580	3,000 psi	CGA-580	3/4"-14 NGT
GMV-3580RPV*	3,000 psi	CGA-580	3/4"-14 NGT
GMV-3660SS	3,000 psi	CGA-660	3/4"-14 NGT
GMV-3680	4,700 psi	CGA-680	3/4"-14 NGT
GMV-3702	6,400 psi	CGA-702	3/4"-14 NGT

* Residual Pressure Valve

SS = Stainless Steel

MASTER SHUT-OFF VALVES

3,000 PSI

-Forged Brass Body
-PTFE Packing
-Kel-F Seat

GMV-1001

GMV-1341

Part No.	Inlet	Outlet
GMV-1001	1/2"-14 NPT	1/2"-14 NPT
GMV-1341	1"-11-1/2 NPS RH-EXT	1"-11-1/2 NPS RH-INT.

LIMITED WARRANTY

WARRANTY:
The manufacturer warrants the products sold hereunder to be free from defects in material and workmanship at the date of shipment. Please note the distinction between "defects" and "damage" as used in this warranty: defects are covered because we, the manufacturer, are responsible: however, we have no control over damage caused by such things as misuse or improper installation. Therefore, damage for any reason is not covered under this warranty.

WHAT THE MANUFACTURER WILL DO:
If you, the Buyer, meet the eligibility requirements and obligations listed below, then we shall, within thirty (30) days of receipt of a timely claim and the parts claimed to be defective, inspect the parts and repair or replace, at our option, any parts which we determine were defective at the time of shipment from us. However, if we determine that the parts were defective and also that circumstances are such as to prevent us from remedying the warranted defects by repair or replacement, then we may at our option, refund you the purchase price of the parts.

ELIGIBILITY REQUIREMENTS & OBLIGATIONS OF BUYER:
You are eligible to obtain service under this warranty if you are the original consumer purchaser, either from us directly or from a seller who stocks our product for resale. However, in order for you to obtain service under this warranty, you must do the following:
1. Send a claim in writing along with samples of the parts claimed to be defective to us freight prepaid.
2. Have your claim and sample parts delivered within ninety (90) days from the date of shipment of the parts from our factory. However, if you bought the parts for resale, or if you bought the parts from someone who bought them for resale, then you must deliver the claim and the parts to us within ninety (90) days from the date of re sale–except under no circumstances shall we honor any claim which fails to be delivered to us with the parts within one hundred and eighty (180) day from the date of shipment of the parts from our factory.

Your claim should be in typed or printed form and include the following information:
1. Your name and address; and
2. The name and address of the seller of the parts; and
3. The date of purchase of the parts; and
4. A short description of the alleged defect; and
5. Proof of the purchase of the parts, for example, a receipt or canceled check.

WHAT IS NOT COVERED UNDER THIS WARRANTY (LIMITATION OF LIABILITY):
As stated above, damage for any reason is not covered under this warranty. Furthermore NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF OUR PRODUCTS. However, some states do not allow limitations on how an implied warranty lasts, so this limitation may not apply to you. Also, since this is a limited warranty, WE SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE FOR ANY OTHER CHARGES, LABOR COSTS, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES OF ANY KIND OR DESCRIPTION WHATSOEVER ARISING OUT OF, OR IN ANYWAY RELATING TO, ANY BREACH OF THIS WARRANTY OR CLAIMED DEFECT IN, OR NON-PERFORMANCE OF, OUR PRODUCTS. However, some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty also excludes commercial and other non-consumer purchasers other than the original consumer purchaser.

WE HAVE NO AGENTS:
We do not authorize any person to create for us any obligation of liability in connection with our products.

LEGAL RIGHTS:
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state (province to province in Canada).

Your claim, along with the sample part or parts, should be sent to:

Superior Products, LLC.
3786 Ridge Road
Cleveland, Ohio 44144-1175
ATTN: QCA DEPT.

Superior Products

Redefining Gas Management Systems

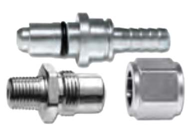
Industrial Hospital Specialty

Superior Products

VISIT WWW.SUPERIORPROD.COM
TO LEARN MORE ABOUT OUR OTHER PRODUCT LINES

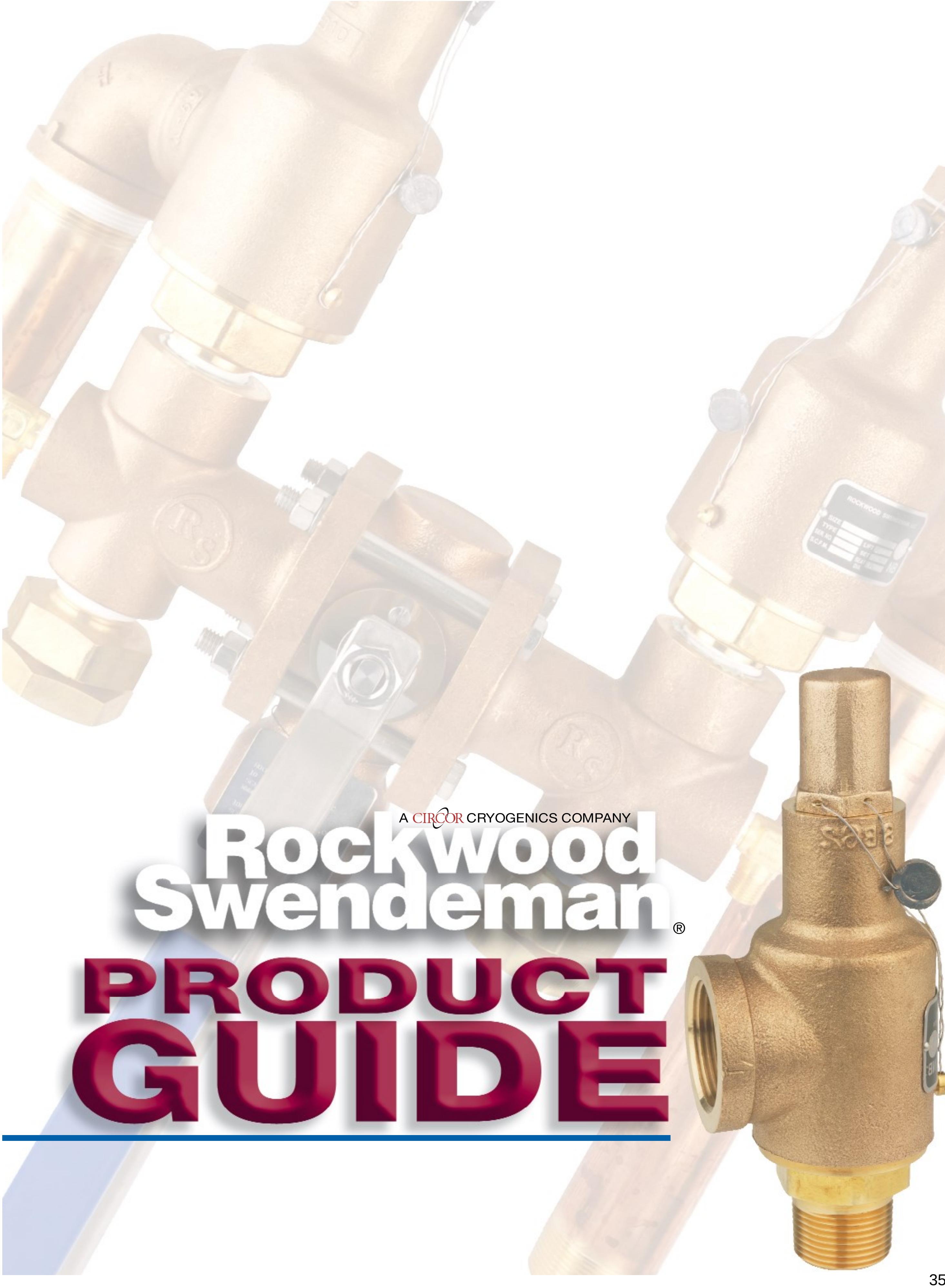
Medical Gas Fittings and Accessories

- Cylinder Fittings (Regulator)
- Demand Valves
- DISS Fittings
- Quick Connectors
  (DISS, Ohmeda, Chemetron, Puritan, Oxequip)
  - Duplex or Couplers
  - Flowmeters
  - Gauges
  - Hoses
  - Hose Fittings and Accessories



- Pigtails
- NPT Pipe Fittings
- Valves
- Y-Connectors
- Yokes

SP Industrial   SP Hospital   SP Specialty



A CIRCOR CRYOGENICS COMPANY

Rockwood Swendeman®

PRODUCT GUIDE

A CIRCOR CRYOGENICS COMPANY

Rockwood Swendeman®

Designed and manufactured with a commitment to quality and service with over 50 years of experience in the cryogenic and gas industry.

Rockwood Swendeman valves are guaranteed against defects in material or workmanship for a period of one year. Any valve claimed to be defective may be returned to us, on receipt of our written consent, for examination. If in our opinion the valve is defective it will be repaired or replaced F.O.B. our plant. Under no circumstances does Rockwood Swendeman assume responsibility for consequential damages, labor, repair or other expenses.

Any adjustments or repairs should be done by Rockwood Swendeman at our facility. We have 50 plus years experience as a world leader in the manufacture and assembly of reliable safety relief valves for the industrial gas industry. Today many multi-national firms in the industry rely on quality Rockwood Swendeman valves. We manufacture bronze and stainless steel valves for air, gas and liquid service.

UV TÜV ANLAGEN UND UMWELT AAR

Rockwood Swendeman Pressure Relief valves are safety devices designed to protect pressurized vessels, lines or systems during an overpressure event. The recommendations below are general and it is the responsibility of the user to assure that installation and maintenance are in accordance with the applicable ASME Codes and local requirements. Neither Rockwood Swendeman nor its agents assume any liability for valves improperly installed or maintained. **Alternates European languages per Directive 97/23/ECs (PED) are available through our website s www.rockwoodswendeman.com.**

GENERAL RECOMMENDATIONSs It is solely th e responsibility of the system designer and th e user to select products and materials suitable for their specific application requirements (including but not limited to set pressure/temperature and fluid service) and to ensure proper installation, operation, and maintenance of these products. See Product Guide for applicable pressure/temperature limits. Assistance shall be afforded with the selection of the materials based on the tech nical information supplied to Spence Engineering Co. Applicable codes, material compatibility, product ratings and application details should be considered in the selection and application. Improper selection, application or use of the pressure relief valve can cause personal injury or property damage. If the product is intended for an application or use other than originally specified, the system designer and or user must reconfirm that the selection is suitable for the new operating conditions.

INSTALLATION

1. Qualified service personnel must perform installation only.
2. Valves must be installed in an upright vertical position with the spindle vertical.
3. The connection to the vessel should be provided with a radius to permit smooth flow to the valve.
4. Do not place any block valves or check valves between pressure vessel and safety relief valve.
5. Make sure the system is clean and free of any dirt, sediment or scale that might become lodged on the valve seat.
6. Use a minimum amount of thread sealant or tape on inlet thread. Tighten valve using the proper wrench on the hex flats of the valve base. Do not use excessive force during tightening.
7. The opening through all pipe and fittings between the pressure vessel and the valve must be at least the same area as the relief valve inlet.
8. Discharge piping shall be at least the same size as the pressure relief valve outlet. The discharge piping should be anchored to prevent any swaying or vibration while the valve is discharging.
9. CAUTION: The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure equipment.

MAINTENANCE

1. Valves are set and sealed to prevent tampering. If wire seal is broken, the valve is unsafe and should not be used. Guarantee is void if any seal is broken.
2. The valves should be checked periodically to see that they are not clogged or seized due to dirt or other foreign matter and that they will operate satisfactorily.
3. WARNING: Operation of valve involves the discharge of high-pressure cryogenic fluids. Suitable hearing protection should be worn and hands must be kept away from discharge.
4. The setting adjustment or repair should be done only by an authorized repair facility.
5. WARNING: Injury or death can occur due to failure to completely isolate valve from all sources of pressure before beginning disassembly. Do not proceed until valve has been completely isolated from process stream and vented to atmosphere.
6. Only original, unmodified Rockwood Swendeman parts should be used to assure safe and proper operation.

TYPE RXSO

0 - 400 psig

A CIRCOR CRYOGENICS COMPANY

Rockwood Swendeman®

BRONZE SAFETY RELIEF VALVES

Technical Data

Operating Ranges

Temperature ....-423°F to +400°F

Set Pressures ....to 400 psig

Materials of Construction

Shell ....Cast Bronze, A.S.M.E SB-62

Base ....Forged Brass, Alloy C37700

Trim ....Copper Alloy

Spring ....Stainless Steel 17-7 PH A.S.T.M., A-313, Type 631

Tests

Each valve is set, tested, retested and sealed at the factory to the customer's specifications.

Sizes

Inlet - 1/2 inch to 2 inch

Outlet - 3/4 inch to 2-1/2 inch

Applicable Codes

Designed and manufactured to meet:

- CGA S-1.2 and S-1.3.
- V-4301 (Cryogenic Non-Oxygen)
- V-4401 (Oxygen)
- ASME sec.VIII
- API 527
- AD-Merkblatt A2
- CRN 0G0591.9

Features

- **Special Teflon® seat, making bubble-tight seals possible to over 90% of set pressures per spec API 527; not applicable to steam.**
- **Adjustable blowdown ring**
- **Meets AD-Merkblatt A2 certified by TÜV**
- **Cleaned and packaged for use in O_2 service in compliance with the CGA specification G-4.1**

  Additional cleaning specifications:
  - **4WPI-SW70003**
  - **ES.660.503**
  - **GS-38**
  - **GS-40**

Application

- **Especially recommended where noxious or expensive liquids or gases place a premium on seal quality.**
- **Stationary Cryogenic storage tanks**
- **Dual Safety relief systems**
- **Overpressure relief of tanks, pipelines, vessels, pumps**
- **Air and gas compressors**
- **Corrosive industrial applications**

Options

- **Large and Extra Large Capacity**

  Consult factory for flow rates
- **BSP threads are available on most sizes**
- **Lever operation**

Dimensions & Characteristics

AIR CAPACITY TABLE

Discharge capacities in cubic feet per minute of air at 10% or 3 PSI, whichever is greater, overpressure.

Inlet Sizes Inches	1/2 3/4	1/2 3/4 1	3/4 1 1-1/4	1 1-1/4 1-1/2	1-1/4 1-1/2 2
Outlet Sizes	3/4 1	1 1-1/4	1-1/4 1-1/2	1-1/2 2	2 2-1/2
Seat Diameter	A 0.750	B 1.000	C 1.250	D 1.500	E 2.000
Flow Area	0.118	0.204	0.326	0.424	0.628
Set Pressure					
10	36	63	100	130	193
15	43	74	118	154	227
20	48	85	136	177	262
25	55	96	154	200	297
30	62	108	172	224	332
35	70	120	192	250	370
40	77	133	212	276	408
45	84	145	232	301	446
50	91	157	252	327	485
55	98	170	271	353	523
60	105	182	291	379	561
65	113	195	311	405	599
70	120	207	331	430	638
75	127	220	351	456	676
80	134	232	371	482	714
85	141	244	391	508	752
90	149	257	410	534	791
95	156	269	430	560	829
100	163	282	450	585	867
105	170	294	470	611	905
110	177	307	490	637	944
115	184	319	510	663	982
120	192	331	530	689	1020
125	199	344	549	715	1058
130	206	356	569	740	1097
135	213	369	589	766	1135
140	220	381	609	792	1173
145	228	393	629	818	1211
150	235	406	649	844	1249
155	242	418	668	869	1288
160	249	431	688	895	1326
165	256	443	708	921	1364
170	264	456	728	947	1402
175	271	468	748	973	1441
180	278	480	768	999	1479
185	285	493	788	1024	1517
190	292	505	807	1050	1555
195	299	518	827	1076	1594
200	307	530	847	1102	1632
205	314	543	867	1128	1670

Inlet Sizes Inches	1/2 3/4	1/2 3/4 1	3/4 1 1-1/4	1 1-1/4 1-1/2	1-1/4 1-1/2 2
Outlet Sizes	3/4 1	1 1-1/4	1-1/4 1-1/2	1-1/2 2	2 2-1/2
Seat Diameter	A 0.750	B 1.000	C 1.250	D 1.500	E 2.000
Flow Area	0.118	0.204	0.326	0.424	0.628
Set Pressure					
210	321	555	887	1153	1708
215	328	567	907	1179	1747
220	335	580	927	1205	1785
225	343	592	946	1231	1823
230	350	605	966	1257	1861
235	357	617	986	1283	1900
240	364	629	1006	1308	1938
245	371	642	1026	1334	1976
250	378	654	1046	1360	2014
255	386	667	1066	1386	2053
260	393	679	1085	1412	2091
265	400	692	1105	1437	2129
270	407	704	1125	1463	2167
275	414	716	1145	1489	2206
280	422	729	1165	1515	2244
285	429	741	1185	1541	2282
290	436	754	1204	1567	2320
295	443	766	1224	1592	2359
300	450	779	1244	1618	2397
305	458	791	1264	1644	2435
310	465	803	1284	1670	2473
315	472	816	1304	1696	2511
320	479	828	1324	1721	2550
325	486	841	1343	1747	2588
330	493	853	1363	1773	2626
335	501	866	1383	1799	2664
340	508	878	1403	1825	2703
345	515	890	1423	1851	2741
350	522	903	1443	1876	2779
355	529	915	1463	1902	2817
360	537	928	1482	1928	2856
365	544	940	1502	1954	2894
370	551	952	1522	1980	2932
375	558	965	1542	2005	2970
380	565	977	1562	2031	3009
385	990	989	1582	2057	3047
390	580	1002	1602	2083	3085
395	587	1015	1621	2109	3123
400	594	1027	1641	2135	3162

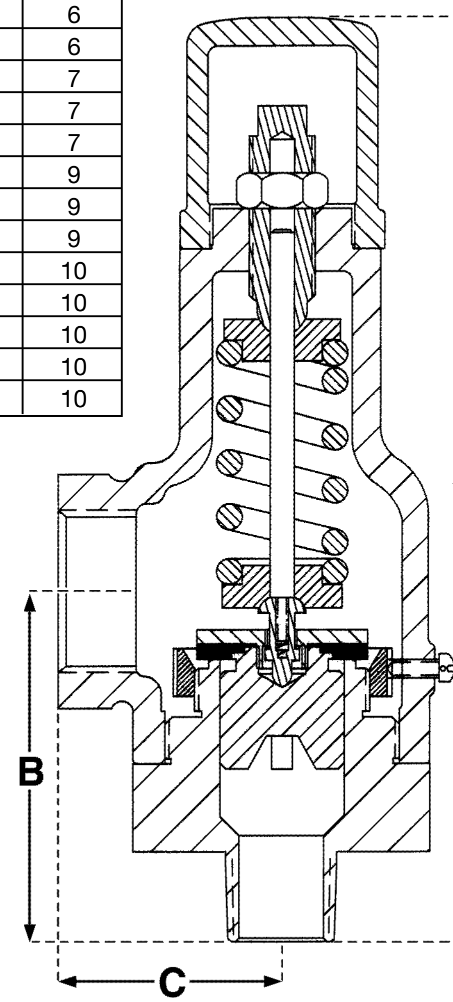
Note: Pressure Settings below 15psig (1.034 barg) are non code.

Type RXSO

DIMENSIONS & WEIGHTS

RXSO	Inlet (in)	Orifice	Outlet (in)	Max P (psi)	A Overall Height	B Outlet Height	C Outlet Width	Weight (lb)
71**ACD	0.5	A	0.75	400	5.78	2.44	1.34	2
71**ACE	0.5	A	1	400	6.41	2.69	1.69	3
71**ADD	0.75	A	0.75	400	5.905	2.565	1.34	2
71**ADE	0.75	A	1	400	6.535	2.815	1.69	3
71**BCE	0.5	B	1	400	7.402	2.902	1.66	3
71**BCF	0.5	B	1.25	400	7.492	2.992	1.88	3
71**BDE	0.75	B	1	400	7.402	2.902	1.66	3
71**BDF	0.75	B	1.25	400	7.492	2.992	1.88	4
71**BEE	1	B	1	400	7.402	2.902	1.66	4
71**BEF	1	B	1.25	400	7.492	2.992	1.88	5
71**CDF	0.75	C	1.25	300	8.68	3.53	2.25	4
71**CDG	0.75	C	1.5	400	9.87	3.59	2.59	4
71**CEF	1	C	1.25	300	8.65	3.5	2.25	5
71**CEG	1	C	1.5	400	9.87	3.59	2.59	6
71**CFF	1.25	C	1.25	300	8.65	3.5	2.25	6
71**CFG	1.25	C	1.5	400	9.87	3.59	2.59	6
71**DEG	1	D	1.5	350	9.84	3.56	2.59	7
71**DEH	1	D	2	400	9.69	3.69	2.75	7
71**DFG	1.25	D	1.5	350	9.84	3.56	2.59	7
71**DFH	1.25	D	2	400	9.69	3.69	2.75	9
71**DGG	1.5	D	1.5	350	9.84	3.56	2.59	9
71**DGH	1.5	D	2	400	9.69	3.69	2.75	9
71**EFH	1.25	E	2	400	9.625	3.625	2.75	10
71**EGH	1.5	E	2	400	9.705	3.705	2.75	10
71**EGJ	1.5	E	2.5	400	9.705	4.015	2.94	10
71**EHH	2	E	2	400	9.685	3.685	2.75	10
71**EHJ	2	E	2.5	400	9.685	3.995	2.94	10

NOTE: Codes used for 710 and 715 series



HOW TO ORDER USING CODE

SAFETY RELIEF VALVES with O_2 Cleaning

Example: *1/2" x 3/4" RXSO Bronze body ASME coded, with open lever, air/gas Sec VII set @ 25 psi =* **710EACD-A025**

	Model			Cap	Orifice	Inlet Size	Outlet Size	Dash	Valve Service	Set Pressure		
	7	**1**	**0**	**E**	**A**	**C**	**D**	**-**	**A**	**0**	**2**	**5**
Position	1	2	3	4	5	6	7	8	9	10	11	12

Model #	**Cap**	**Orifice**	**Inlet Size**	**Outlet Size**	**Dash**	**Valve Service (For Set Valves)**	**Set Pressure**
POSITION 1, 2 & 3	**4**	**5**	**6**	**7**	**8**	**9**	**10, 11 & 12**
710 = RXSO Bronze ASME coded	N = Plain Cap	A = 0.750	C = 1/2	C = 1/2	-	A = Air/Gas Sec. VIII	Set
715 = RXSO Bronze PED coded	E = Open Lever	B = 1.000	D = 3/4	D = 3/4		N = Air/Gas/Liquid Non Code	Pressure
760 = RXSO-S Stainless Steel RXSO		C = 1.250	E = 1	E = 1		B = BSPT Connection	
765 = RXSO-S Stainless Steel PED coded		D = 1.500	F = 1¼	F = 1¼		Z = Other	
770 = RSL Bronze Non ASME coded		E = 2.000	G = 1½	G = 1½			
775 = RSL SS Non ASME coded			H = 2	H = 2			
				J = 2½			

TYPE RXSO-S

0 to 400 psig

A CIRCOR CRYOGENICS COMPANY

Rockwood Swendeman®

STAINLESS STEEL SAFETY RELIEF VALVE

Technical Data

Operating Ranges

Temperature ....-423˚F to +400˚F

Set Pressures ....to 400 psig

Materials of Construction

Shell ....Investment Cast 316SS, A.S.M.E SA-351

Base ....Investment Cast 316SS, A.S.M.E SA-351

Trim ....316SS, A.S.M.E. SA-479

Spring ....Stainless Steel 17-7 PH A.S.T.M., A-313, Type 631

Tests

Each valve is set, tested, retested and sealed at the factory to the customer's specifications.

Sizes

Inlet - 1/2 inch to 1 inch

Outlet - 3/4 inch to 1-1/4 inch

Applicable Codes

Designed and manufactured to meet:

- CGA S-1.2 and S-1.3.
- V-4301 (Cryogenic Non-Oxygen)
- V-4401 (Oxygen)
- ASME sec.VIII
- API 527
- AD-Merkblatt A2
- CRN 0G0591.9

Features

- **Special Teflon® seat, making bubble-tight seals possible to over 90% of set pressures per spec API 527; not applicable to steam.**
- **Adjustable blowdown ring**
- **Cleaned and packaged for use in O_2 service in compliance with the CGA specification G-4.1**
  Additional cleaning specifications:
  - **4WPI-SW70003**
  - **ES.660.503**
  - **GS-38**
  - **GS-40**
- **Electropolishing of base and proper assembly for high purity and electronic applications**

Application

- **Especially recommended where corrosive or expensive gases benefit from stainless steel construction.**
- **Stationary Cryogenic storage tanks**
- **Dual Safety relief systems**
- **Overpressure relief of tanks, pipelines, vessels, pumps**
- **Air and gas compressors**

Options

- **Large and Extra Large Capacity**
  Consult factory for flow rates
- **BSP threads are available on most sizes.**
- **Lever operation**

Dimensions & Characteristics

AIR CAPACITY TABLE

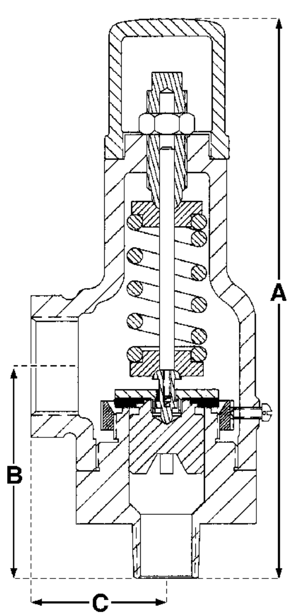
Discharge capacities in cubic feet per minute of air at 10% or 3 PSI, whichever is greater, overpressure.

Inlet Sizes Inches	1/2 3/4	1/2 3/4 1
Outlet Sizes Inches	3/4 1	1-1/4
Seat Diameter Inches	A 0.750	B 1.000
Flow Area	0.118	0.204
Set Pressure		
10	36	63
15	43	74
20	48	85
25	55	96
30	62	108
35	70	120
40	77	133
45	84	145
50	91	157
55	98	170
60	105	182
65	113	195
70	120	207
75	127	220
80	134	232
85	141	244
90	149	257
95	156	269
100	163	282
105	170	294
110	177	307
115	184	319
120	192	331
125	199	344
130	206	356
135	213	369

Inlet Sizes Inches	1/2 3/4	1/2 3/4 1
Outlet Sizes Inches	3/4 1	1-1/4
Seat Diameter Inches	A 0.750	B 1.000
Flow Area	0.118	0.204
Set Pressure		
140	220	381
145	228	393
150	235	406
155	242	418
160	249	431
165	256	443
170	264	456
175	271	468
180	278	480
185	285	493
190	292	505
195	299	518
200	307	530
205	314	543
210	321	555
215	328	567
220	335	580
225	343	592
230	350	605
235	357	617
240	364	629
245	371	642
250	378	654
255	386	667
260	393	679
265	400	692

Inlet Sizes Inches	1/2 3/4	1/2 3/4 1
Outlet Sizes Inches	3/4 1	1-1/4
Seat Diameter Inches	A 0.750	B 1.000
Flow Area	0.118	0.204
Set Pressure		
270	407	704
275	414	716
280	422	729
285	429	741
290	436	754
295	443	766
300	450	779
305	458	791
310	465	803
315	472	816
320	479	828
325	486	841
330	493	853
335	501	866
340	508	878
345	515	890
350	522	903
355	529	915
360	537	928
365	544	940
370	551	952
375	558	965
380	565	977
385	990	989
390	580	1002
395	587	1015
400	594	1027

Note: Pressure Settings below 15psig (1.034 barg) are non code.



DIMENSIONS & WEIGHTS

RXSO-S	Inlet (in)	Orifice	Outlet (in)	Max P (psi)	A Overall Height	B Outlet Height	C Outlet Width	Weight (lb)
76**ACD	0.5	A	0.75	400	5.78	2.44	1.34	2
76**ACE	0.5	A	1	400	6.41	2.69	1.69	3
76**ADD	0.75	A	0.75	400	5.905	2.565	1.34	2
76**ADE	0.75	A	1	400	6.535	2.815	1.69	3
76**BCF	0.5	B	1.25	400	7.492	2.992	1.88	3
76**BDF	0.75	B	1.25	400	7.492	2.992	1.88	4
76**BEF	1	B	1.25	400	7.492	2.992	1.88	5

NOTE: Codes used for 760 and 765 series

TYPE RSL

0 - 300 psig

A CIRCOR CRYOGENICS COMPANY
Rockwood Swendeman®

BRONZE & STAINLESS STEEL SAFETY RELIEF VALVES

Technical Data

Operating Ranges

Temperature ....0 to +300°F
Set Pressures ....to 300 psig
For use with back pressure services, please consult factory.

Materials of Construction

BRONZE
Shell .....Cast Bronze, A.S.M.E. SB-62
Base .....Forged Brass, Alloy C37700
Trim ......Copper Alloy
Spring ....Stainless Steel
17-7 PH A.S.T.M., A-313, Type 631

STAINLESS STEEL
Shell .....Investment Cast 316SS, A.S.M.E SA-351
Base .....Investment Cast 316SS, A.S.M.E SA-351
Trim ......316SS, A.S.M.E. SA-479
Spring ....Stainless Steel
17-7 PH, A.S.T.M., A-313, Type 631

Tests

Each valve is set, tested and retested at the factory to the customer's specifications.

Sizes

Bronze Inlet - 1/2 inch to 2 inches
Outlet - 3/4 inch to 2-1/2 inch
Stainless Steel Inlet - 1/2 inch to 1 inch
Outlet - 3/4 inch to 1-1/4 inch

Features

- **Teflon® seat for improved seat tightness**
- **Cleaned and packaged for use in O_2 service in compliance with the CGA specification G-4.1**
  Additional cleaning specifications:
  - **4WPI-SW 7003**
  - **GS-38**

Applications

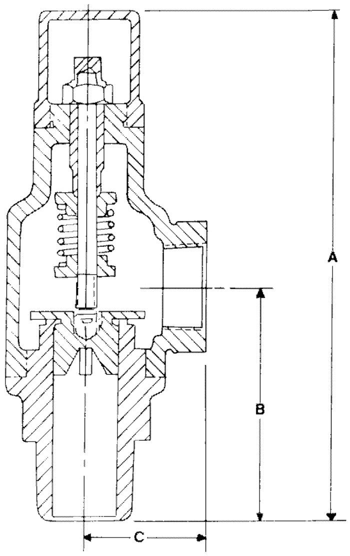
- **Tanks, pumps, pipe lines and other vessels containing non-corrosive liquid, and where large relieving capacities are not required.**

Options

- **BSP threads available on most sizes**
- **Lever operation**

Type RSL

Dimensions & Characteristics



DIMENSIONS & WEIGHTS

RSL	Inlet (in)	Orifice	Outlet (in)	Max P (psi)	A Overall Height	B Outlet Height	C Outlet Width	Wgt. (lb)
770*ACC	0.5	A	0.5	300				
770*ACD	0.5	A	0.75	300	5.78	2.44	1.34	2
770*ACE	0.5	A	1	300	6.41	2.69	1.69	3
770*ADD	0.75	A	0.75	300	5.905	2.565	1.34	2
770*ADE	0.75	A	1	300	6.535	2.815	1.69	3
770*BDE	0.75	B	1	300	7.402	2.902	1.66	3
770*BEE	1	B	1	300	7.402	2.902	1.66	4
770*CFF	1.25	C	1.25	300	8.65	3.5	2.25	6
770*DGG	1.5	D	1.5	300	9.84	3.56	2.59	9
770*DGH	1.5	D	2	300	9.69	3.69	2.75	9
770*EGH	1.5	E	2	300	9.705	3.705	2.75	10
770*EHH	2	E	2	300	9.685	3.685	2.75	10
770*EHJ	2	E	2.5	300	9.685	3.995	2.94	10

DIMENSIONS & WEIGHTS

RSL-S	Inlet (in)	Orifice	Outlet (in)	Max P (psi)	A Overall Height	B Outlet Height	C Outlet Width	Wgt. (lb)
775*ACD	0.5	A	0.75	300	5.78	2.44	1.34	2
775*ADD	0.75	A	0.75	300	5.905	2.565	1.34	2
775*BEF	1	B	1.25	300	7.492	2.992	1.88	5

WATER CAPACITY TABLE

Rate of discharge in gallons of water per minute at set pressure plus 25% accumulation or overpressure.

Inlet Sizes Inches	1/2 3/4	3/4 1	1/2 1 1-1/4	3/4 1-1/4 1-1/2	1 1-1/2 2
Outlet Sizes	3/4 1	1 1-1/4	1-1/4 1-1/2	1-1/2 2	2 2-1/2
Seat Diameter Inches	A .75	B 1.00	C 1.25	D 1.50	E 2.00
Flow Area	.118	0.204	0.326	0.424	0.628
Set Pressure					
5	10.5	17.6	28.1	36.5	54.1
10	12.0	20.0	32.0	41.6	61.6
15	13.3	22.2	35.5	46.1	68.3
20	14.5	24.2	38.6	50.3	74.4
25	15.6	26.0	41.6	54.1	80.1
30	16.6	27.7	44.3	57.6	85.3
35	17.6	29.3	46.9	61.0	90.3
40	18.5	30.9	49.3	64.1	95.0
45	19.4	32.3	51.6	67.2	99.5
50	20.2	33.7	53.9	70.1	103.8
55	21.0	35.1	56.0	72.9	107.9
60	21.8	36.3	58.1	75.5	111.9
65	22.5	37.6	60.1	78.1	115.7
70	23.3	38.8	62.0	80.6	119.4
75	24.0	40.0	63.9	83.1	123.0
80	24.6	41.1	65.7	85.4	126.5
85	25.3	42.2	67.4	87.7	129.9
90	25.9	43.3	69.2	89.9	133.2
95	26.6	44.3	70.8	92.1	136.5
100	27.2	45.4	72.5	94.3	139.6
105	27.8	46.4	74.1	96.3	142.7
110	28.4	47.3	75.6	98.4	145.7
115	29.0	48.3	77.2	100.4	148.7
120	29.5	49.2	78.7	102.4	151.6
125	30.1	50.2	80.2	104.3	154.4
130	30.6	51.1	81.6	106.2	157.2
135	31.2	52.0	83.1	108.0	160.0
140	31.7	52.8	874.5	109.8	162.7
145	32.2	53.7	85.8	111.6	165.4
150	32.7	54.6	87.2	113.4	168.0
155	33.2	55.4	88.5	115.1	170.5
160	33.7	56.2	89.8	116.9	173.1
165	34.2	57.0	91.1	118.5	175.6
170	34.7	57.8	92.4	120.2	178.0
175	35.1	58.6	93.7	121.9	180.5
180	35.6	59.4	94.9	123.5	182.9
185	36.1	60.2	96.2	125.1	185.3
190	36.5	60.9	97.4	126.7	187.6
195	37.0	61.7	98.6	128.2	189.9
200	37.4	62.4	99.8	129.8	192.2
205	37.9	63.2	100.9	131.3	194.4
210	38.3	63.9	102.1	132.8	196.7
215	38.7	64.6	103.2	134.3	196.9
220	39.2	65.3	104.4	135.7	201.1
225	39.6	66.0	105.5	137.2	203.2
230	40.0	66.7	106.6	138.6	205.3
235	40.4	67.4	107.7	140.1	207.5
240	40.8	68.1	108.8	141.5	209.5
245	41.2	68.7	109.9	142.9	211.6
250	41.6	69.4	110.9	144.3	213.7
255	42.0	70.1	112.0	145.6	215.7
260	42.4	70.7	113.0	147.0	217.7
265	42.8	71.4	114.1	148.3	219.7
270	43.2	72.0	115.1	149.7	221.7
275	43.5	72.6	116.1	151.0	223.6
280	43.9	73.3	117.7	152.3	225.6
285	44.3	73.9	118.1	153.6	227.5
290	44.7	74.5	119.1	154.9	229.4
295	45.0	75.1	120.1	156.2	231.3
300	45.4	75.7	121.0	157.4	233.2

DIVERTER VALVE

0 - 600 psig

A CIRCOR CRYOGENICS COMPANY
Rockwood Swendeman®

FULL FLOW DIVERTER VALVE

Features

- Engineered for maximum safety and reliability
- Full flow manifold ends
- Medical level O_2 cleaning in conformance with CGA G-4.1
- 180 degree operation
- Handle indicates flow direction
- Low maintenance
- Blow out proof stem
- V-ring stem packing
- All stainless externals

Applications

- Dual safety relief systems
- Stationary cryogenic tanks
- Manifolding
- Distribution systems
- Process systems
- Liquid and Gaseous Cryogenic Applications

Technical Data

Operating Ranges

Temperatures ....-423°F to 400°F
Set Pressures ....to 600 psig

Materials of Construction

Body..........................Bronze B61
End Plate ....Bronze B61
Ball ....Bronze
Stem...........................316SS
Seats ....MTFE
Body Seals ....TFE
Stem Seals ....CTFE
Stem Bearing ....TFE
Bellville Wsh ....17-7 SS
External Hdwe ....300 Series SS

Sizes

Available in 3/4 inch F to 1 inch F

Applicable Codes

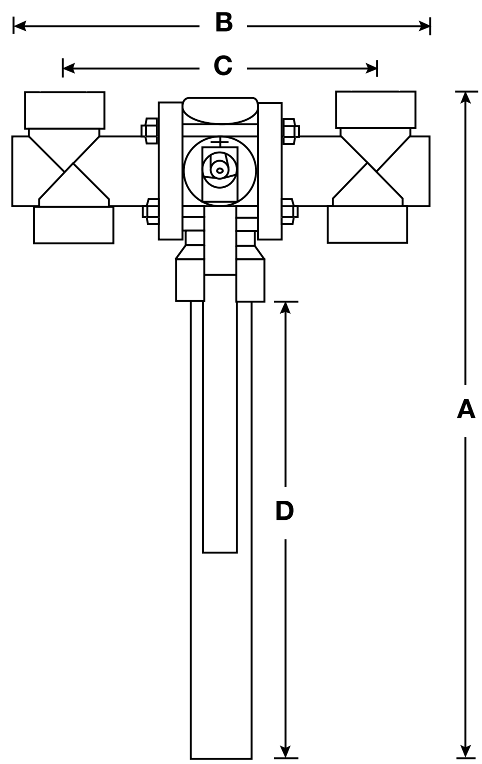
Designed and manufactured to meet:

- ANSI B31.3, B16.34

HIGH FLOW DIVERTER VALVE CV VALUES*

Sizes (inches)	Safety Relief Valve Outlet		Rupture Disc Outlet		Torque
	CV@ mid position (90°)	CV@ full open (180°)	CV@ mid position (90°)	CV@ full open (180°)	Max. Value
¾F	9.2	8.2	10.7	8.1	200 in. lbs.
1F	25.3	18.3	16.4	14.0	300 in. lbs.

** Flows may vary slightly due to outlet connection sizes.*

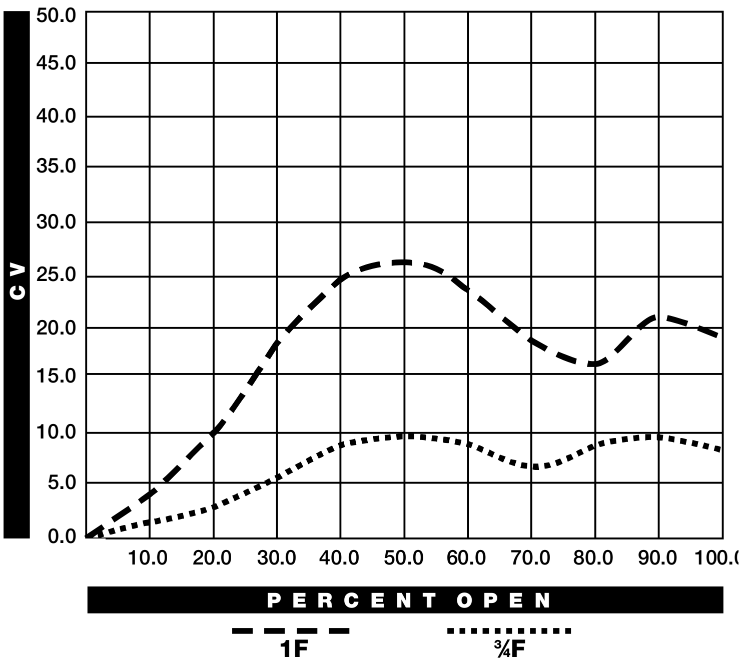


DIMENSIONS (inches)

Size	A	B	C	D
¾F	13.00	9.38	7.25	7.75
1F	17.66	11.61	8.73	12.00

Dimensions for reference only

HIGH FLOW DIVERTER VALVE Cv GRAPH



CRYOTREE™

0 - 400 psig

A CIRCOR CRYOGENICS COMPANY
Rockwood Swendeman®

SAFETY RELIEF VALVE SUB-ASSEMBLY

Technical Data

Temperatures ....-423°F to 400°F
Set Pressures ....to 400 psig

Materials

Body...........................Bronze B61
End Plate ....Bronze B61
Ball ....Bronze
Stem...........................316SS

Tests

Hydrostatically tested as a complete unit to assure leak tightness

Sizes

Available in 3/4 inch F to 1 inch F

Applicable Codes

Designed and manufactured to meet:

- CGA S-1.2 and S-1.3.
- ASME Sec.VIII
- API 527
- AD -Merkblatt A2
- ANSI B31.3, B16.34

Features

- **Dual safety relief systems engineered for maximum safety and reliability**
- **Easy system installation**
- **Includes high capacity safety relief valves, full flow diverting valve, rupture discs, bleed valves, and related piping assembled**
- **Standardized components**
- **Low maintenance**
- **Eliminates the need to shut down and evacuate the tank for service**
- **Minimizes pressure drop in system**
- **Medical level O_2 cleaning in conformance with CGA G-4.1**
- **Sealed in 6 mil poly bags to eliminate contamination prior to installation**
- **Handle indicates flow direction**

Applications

- **On stationary cryogenic storage tanks to isolate safety relief valves and rupture discs in the event they need to be serviced**

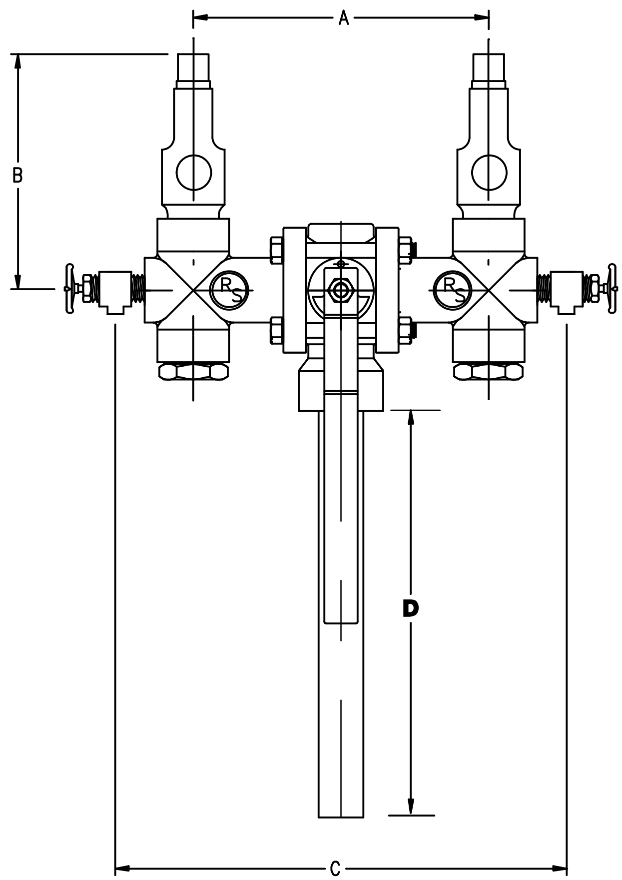
Rockwood Swendeman's CryoTree™ assemblies are manufactured for use on stationary cryogenic storage tanks to isolate safety relief valves and rupture discs in the event they need to be serviced. Utilizing this system eliminates the need to shut down and evacuate the tank for service. This modular assembly provides for just a single connection to the internal tank piping.

CRYOTREE™

HIGH FLOW DIVERTER VALVE CV VALUES*

Size (inches)	Safety Relief Valve Outlet		Rupture Disc Outlet	
	CV@ mid position (90°)	CV@ full open (180°)	CV@ mid position (90°)	CV@ full open (180°)
¾F	9.2	8.2	10.7	8.1
1F	25.3	18.3	16.4	14.0

Flows may vary slightly due to outlet connection sizes.

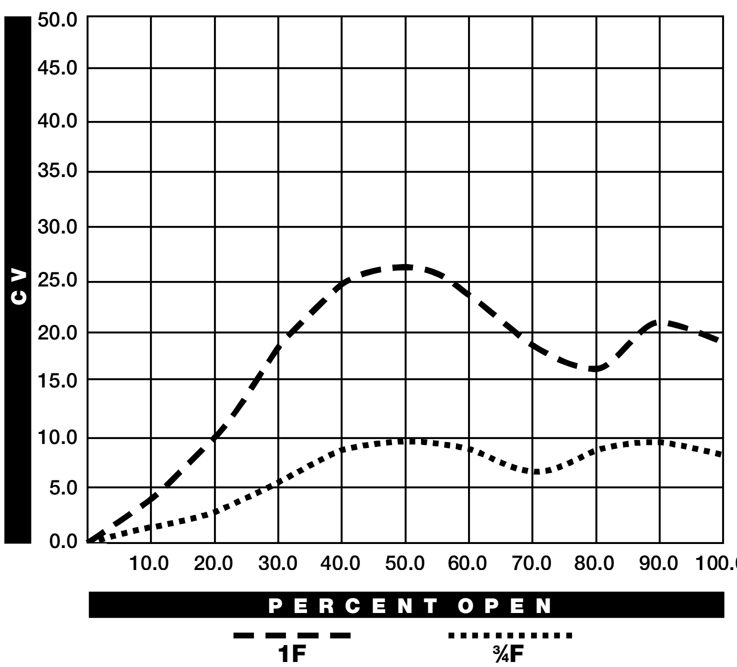


DIMENSIONS - INCHES

SIZE	A	B	C
¾F	5.9	22.5	14.8
1F	8.7	25.7	16.5

Dimensions for reference only.

HIGH FLOW DIVERTER VALVE Cv GRAPH



HOW TO ORDER USING CODE

DIVERTER

Example: *3/4" Full with 3/4" Top, 1/2" Bottom and 1/4" Side Ports* = **780DFDCAB**

	Model			Inlet Size	Orifice	Top Port	Bottom Port	Side Port	Material
	7	**8**	**0**	**D**	**F**	**D**	**C**	**A**	**B**
Position	1	2	3	4	5	6	7	8	9

Model	Inlet Size	Orifice	Top Port	Bottom Port	Side Port	Material
POSITION 1, 2 & 3	**4**	**5**	**6**	**7**	**8**	**9**
780	D = 3/4"	F = Full	D = 3/4"		A = 1/4"	B = Bronze
	E = 1"	T = Tag for Customer	E = 1"			
			F = 1¼"	C = 1/2"		
				D = 3/4"		
				E = 1"		

Diverter Size	Max NPT		
	Top	Side	Bottom
3/4"	3/4"	3/4"	1/2"
1"	1¼"	1"	1"

CRYOTREE™

Example: *3/4" Full with 3/4" B 1-1/4" SRV @ 150psi & 1/2" Rupture Disc @ 225psi* = **790DFDCAB-FB150**

	Model			Size	Options	SRV Inlet Size	Rupture Disc Size	Purge Valve Location	Rupture Disc Setting	Dash	SRV Outlet & Orifice		SRV Settings		
	7	**9**	**0**	**D**	**F**	**D**	**C**	**A**	**B**	**-**	**F**	**B**	**1**	**5**	**0**
Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Model	Inlet Size	Options	SRV[1] Inlet Size	Rupture Disc Size	Purge Valve Location	Rupture[3, 4] Disc Setting	Dash	SRV Outlet & Orifice	SRV Setting
POSITIONS 1, 2 & 3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11 & 12**	**13, 14 & 15**
790	D = 3/4"	F = Standard	D = 3/4"	A = 1/4"	A[2] = Side	3 = 130%	-	DA = 3/4" Outlet, A Orif	nnn
	E = 1"	T = Tag for Customer	E = 1"	B = 3/8"	B = Bottom	4 = 140%		EA = 1" Outlet, A Orif	
			F = 1¼"	C = 1/2"		B = 150%		EB = 1"Outlet, B Orif	
				D = 3/4"		6 = 160%		FB = 1¼" Outlet, B Orif	
				E = 1"		7 = 170%		FC = 1¼" Outlet, C Orif	
						8 = 180%		GC = 1½" Outlet, C Orif	
						9 = 190%		GD = 1½" Outlet, D Orif	
						0 = 200%		HD = 2" Outlet, D Orif	
								HE = 2" Outlet, E Orif	

1. Diverter Top Port
2. A is the standard
   Cryotree only available with 1/4" side or bottom port
3. Rupture Disc setting over SRV set pressure
   (example: 150psi X 150% = 225psi)
   Actual settings to be in 5 psi increments (prefered)
4. B is the standard

Diverter Size	Max NPT		
	Top	Side	Bottom
3/4"	3/4"	3/4"	1/2"
1"	1¼"	1"	1"

A broad range of pressure build regulators, pressure reducing valves, final line gas valves and combination pressure build economizer valves for cryogenic service

FEATURES

- Six models for pressure reducing or pressure build-up service.
- Five models for back-pressure service on economizer circuit.
- Three models for combined pressure building and economizer functions.
- Low temperature cut-off valves.
- Two models for final line gas service.
- High purity regulating valves for pressure reducing, back pressure and differential services.
- All parts commercially cleaned for cryogenic/oxygen service or high purity gas compatibility.
- Complementary 'Y' pattern strainers reduce maintenance costs.
- Cryogenic safety and shut-off valves also available.

GENERAL APPLICATION

A variety of controls for cryogenic systems including liquid and gas line-pressure build-up regulators, economizer (heat leak) back pressure valves, temperature safety valves, combination valves, shut-off valves and final-line/service-line regulators.

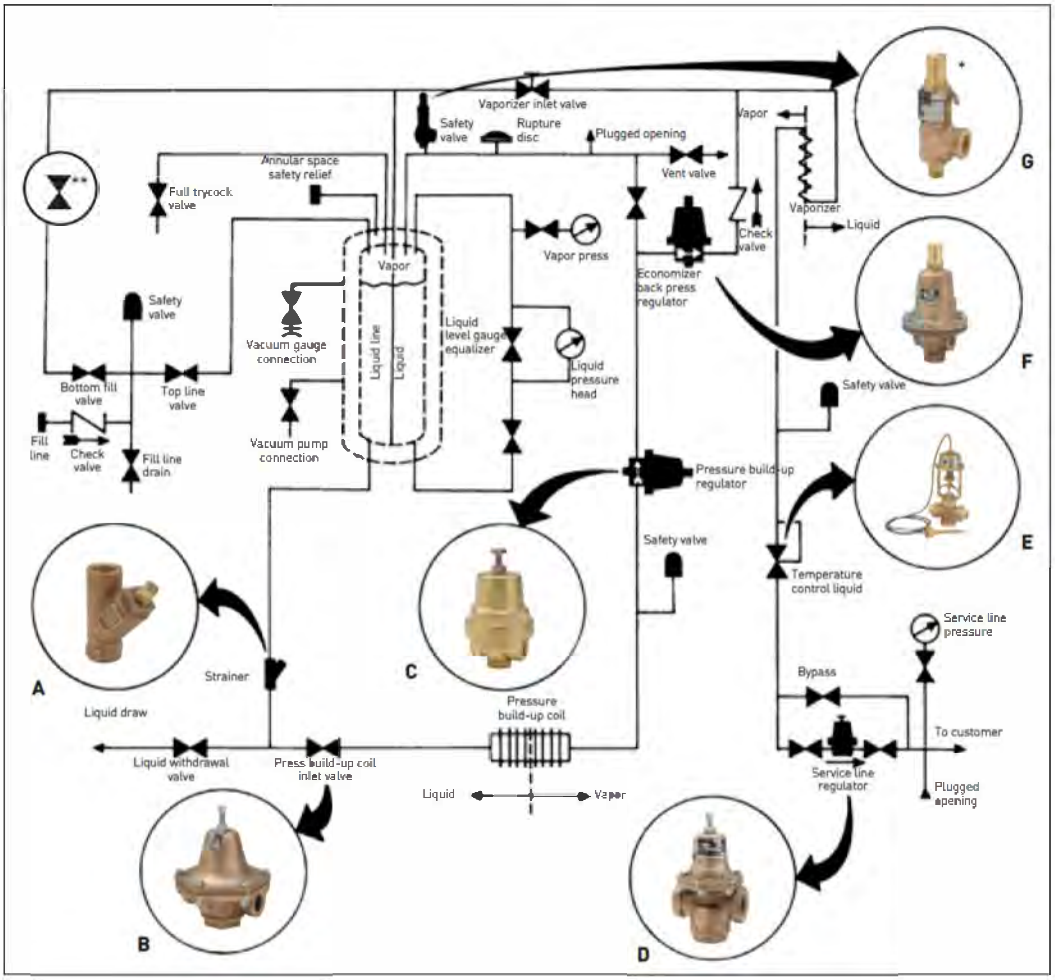
TECHNICAL DATA

Materials:	Bronze, brass and stainless steel
Sizes:	¼" to 2" (7 to 50 mm)
Connections:	Threaded NPTF (BSP optional on some models)
Max initial pressure:	650 psi (45.7 kg/cm²)

Temperature ranges

Standard range:	+150° to -320°F (339 to 78K)
High purity valves:	+ 400° to -425°F (478 to 19K)

LIQUID-GAS DISTRIBUTION SYSTEM SCHEMATIC DIAGRAM



A. Type SY-70C
B. Type B
C. Type A-32
D. Type E-55
E. Type LTC
F. Type FR
G. Type C-776

* C-776 cryogenic safety relief valve - for additional information, write or call for data sheet VCTDS-00515.

** Shut-off valve - for additional information, see page 17.

OVERVIEW

Cryogenics - the science of materials at extremely low temperatures - has become increasingly important to industry. One important aspect of this field is the liquification of normally gaseous elements which are used widely throughout the industry, including:

Oxygen	- used extensively in BOF furnaces in the steel industry, for metal cutting, as a rocket fuel and in medicine.
Acetylene	- widely used in welding.
Nitrogen	- used in refrigeration systems, for metal degassing, in aerosol packaging and in cryogenic surgery.
Hydrogen	- used as a rocket propellant and in the production of several metals.
Argon	- widely used in incandescent lamps and fluorescent tubes.
Helium	- used for arc welding, in the manufacture of electron tubes and in cryogenic research.
Carbon Dioxide	- used in refrigeration, to make aerosol tanks and in fire fighting.

Other cryogenic fluids include liquefied natural gas, fluorine, krypton, neon, methane and ethane.

The extensive range of Cash valves and controls is suitable for use in all the major areas of cryogenic converters, or 'dewars', which are either stationary or installed in over-the-road transport vehicles.

THE PRESSURE BUILD-UP CIRCUIT

The build-up circuit in the converter maintains a pressure of approximately 25 psi [1.76 kg/cm^2] above that required to drive the liquid to the final vaporizer and a pressure differential of approximately 25 psi [1.76 kg/cm^2] or higher across the service line regulator. To do this, liquid is drawn into the pressure build-up coil, where it is warmed by ambient air and vaporized. The gas then passes through the pressure build-up regulator and into the top of the tank, where it begins to build up pressure because expansion is limited by the fixed volume.
When this pressure reaches the pressure build-up regulator's set point, the regulator shuts off, stopping vaporization and pressure build-up. As liquid is forced from the tank to the final vaporizer, pressure in the tank begins to drop and the pressure build-up regulator returns to operation.

The pressure build-up regulator may be located in the liquid line before the pressure build-up coil. As it is now used for liquid rather than gas service, it may have a smaller orifice or be a smaller-sized valve. Its operation is the same as that of a gas regulator with the exception that it regulates the liquid flow before the pressure build-up coil rather than the gas flow after the coil. When pressure in the tank drops, the liquid pressure build-up regulator opens, allowing liquid to flow through the pressure build-up coil and vaporize.

Pressure build-up regulators are available for most cryogenic system applications. The Type A-32 is a small ¼" [8 mm] pressure build-up valve; the larger Type B, Type G-60 and Type E-55 can be used for either liquid or gas.

The Type B is available in sizes from ¼" to 2" [8 mm to 50 mm], the G-60 from ¼" to 1½" [8 mm to 40 mm] and the Type E-55 from 1¼" to 2" [32 mm to 50 mm].

A-32 PRESSURE REDUCING OR PRESSURE BUILD-UP SERVICE

Construction
Brass forged body and spring chamber; bronze trim and diaphragms; PTFE seat disc and diaphragm gasket; stainless steel pressure spring. All parts are commercially cleaned for cryogenic service.

Note: also available in stainless steel and special construction for hi-purity service. Contact your sales representative.

Temperature rating: +150°F to -320°F [339K to 78K]

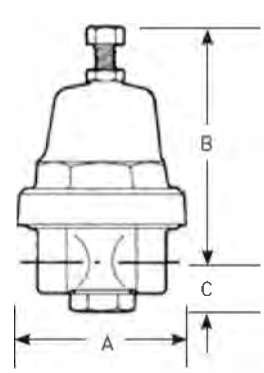
Maximum initial pressure: 600 psi [42.18 kg/cm^2]

REDUCED PRESSURE RANGES

Maximum working pressure	
psi	**[kg/sq cm]**
2-25	[0.14-1.76]
15-65	[1.05-4.57]
40-100	[2.81-7.03]
50-150	[3.52-10.55]
75-175	[5.27-12.30]
100-250	[7.03-17.58]
200-400	[14.06-28.12]
300-600	[21.09-42.18]

DIMENSIONS

Size		Dimensions A		Dimensions B		Dimensions C		Shipping weight	
inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	lbs	[kgs]
¼	[8]	2¼	[57.15]	3 3/16	[80.96]	⅝	[15.88]	1⅛	[0.51]
⅜	[10]	2¼	[57.15]	3 3/16	[80.96]	⅝	[15.88]	1⅛	[0.51]



A-36 PRESSURE REDUCING OR PRESSURE BUILD-UP SERVICE

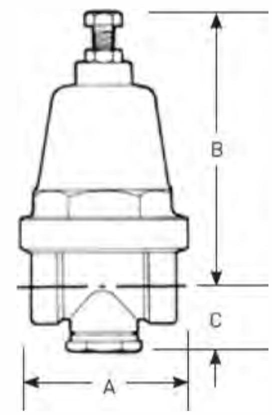
Construction
Brass forged body and bronze spring chamber; bronze trim and diaphragms; PTFE seat disc and gaskets; stainless steel pressure spring. All parts are commercially cleaned for cryogenic service.

Note: also available in stainless steel and special construction for hi-purity service. Contact your sales representative.

Temperature rating: +150°F to -320°F [339K to 78K]
Maximum initial pressure: 600 psi [42.18 kg/cm²]

REDUCED PRESSURE RANGES

Maximum working ranges	
psi	[kg/sq cm]
10-30	[0.70-2.11]
20-50	[1.41-3.52]
40-80	[2.81-5.62]
75-150	[5.27-10.55]
100-250	[7.03-17.58]
High pressure construction only	
200-400	14.06-28.12



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	lbs	[kgs]
3/8	[10]	2 7/16	[61.91]	4½	[114.30]	1	[25.40]	2½	[1.13]
3/8	[10]	2 7/16	[61.91]	4½	[114.30]	1	[25.40]	2½	[1.13]

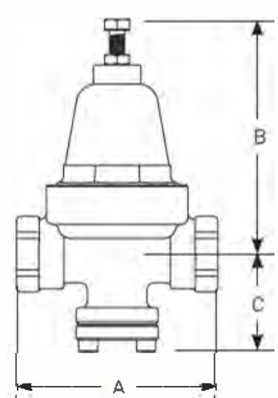
A-401 PRESSURE REDUCING OR PRESSURE BUILD-UP SERVICE

Construction
Bonze cast body and bronze spring chamber; bronze trim and neoprene/nylon diaphragms; FKM seat disc and gaskets; stainless steel pressure spring. All parts are commercially cleaned for cryogenic service.

Temperature rating: +150°F to -320°F [339K to 78K]
Maximum initial pressure: 600 psi [42.18 kg/cm²]

REDUCED PRESSURE RANGES

Maximum working ranges	
psi	[kg/sq cm]
20 to 60	[1.41 to 4.22]
40 to 80	[2.81 to 5.62]
75 to 125	[5.27 to 8.79]
100 to 250	[7.03 to 17.58]
200 to 400	[14.06 to 28.12]
High pressure construction only	
300 to 600	[21.09 to 42.18]



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	lbs	[kgs]
½	[15]	4	[101.6]	4.64	[117.80]	1.95	[49.6]	4½	[1.68]

MODELS A36, A401 SELECTION GUIDE

Example:	A36Z	B	C	S	Z	S	Z	T	H	01	-	E	0015

Model	
A36Z	A36 (Bronze body)
A36G	A36 (SST body)
A401	A401
Size	
B	⅜" (A36)
C	½" (A401)
Service	
C	Cyrogenic
F	Final line gas (A401)
Body/connection style	
S	Side inlet/side outlet - straight thru NPT
B	Side inlet/side outlet - straight thru BSPT
Spring chamber material	
Z	Bronze spring chamber
Spring chamber style	
S	Standard
V	Vented
Diaphragm material	
G	316 SST (A36)
T	Neoprene w/PTFE liner (A401 final line only)
Z	Bronze
Seat material	
T	PTFE
V	FKM (A401 final line only)
Pressure screw style	
H	Hex
Variations	
01	Standard
Design revision	
(-)	Original design
Spring material	
E	Stainless steel
Set pressure	
0005	5 psi
0015	15 psi
0100	100 psi

Standard spring ranges - must specify during order process							
A 36 (**)	10-30	20-50	40-80	75-150	100-250	200-400	300-600
A401 (**)	20-60	40-80	75-125	100-250	200-400	300-600	

Note: (**) Stainless steel

B PRESSURE REDUCING OR PRESSURE BUILD-UP SERVICE

Construction

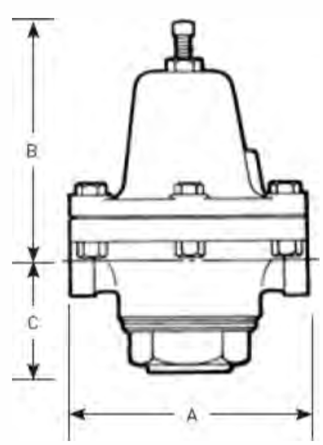
Bronze body, spring chamber, trim and diaphragms; PTFE seat and diaphragm gasket; stainless steel pressure spring; stainless steel bolts and nuts; PTFE bottom-plug gasket; Monel® strainer screen. All parts are commercially cleaned for cryogenic service. Also available with BSP threads.

Temperature rating:	+150°F to -320°F (339K to 78K)
Maximum initial pressure:	400 psi (28.12 kg/cm²)

Note: Type B95 available in stainless steel construction ½" thru 1" (15 to 25 mm) size.

REDUCED PRESSURE RANGES

Valve size		Maximum working ranges	
Inches	(mm)	psi	(kg/sq cm)
¼	(8)	10-30	(0.70-2.11)
		25-100	(1.76-7.03)
		50-200	(3.52-14.06)
		100-250	(7.03-17.58)
⅜	(10)	10-50	(0.70-3.52)
		40-150	(2.81-10.55)
		100-250	(7.03-17.58)
½	(15)	10-30	(0.70-2.11)
		20-75	(1.41-5.27)
		25-125	(1.76-8.79)
		100-200	(7.03-14.06)
		150-250	(10.55-17.58)
¾	(20)	10-30	(0.70-2.11)
		20-70	(1.41-4.92)
		30-100	(2.11-7.03)
		50-150	(3.52-10.55)
		100-225	(7.03-15.82)
		150-250	(10.55-17.58)
1	(25)	10-35	(0.70-2.46)
		20-60	(1.41-4.22)
		50-100	(3.52-7.03)
		100-250	(7.03-17.58)
1¼	(32)	10-30	(0.70-2.11)
		20-40	(1.41-2.81)
		35-80	(2.46-5.62)
		75-150	(5.27-10.55)
1½	(40)	10-30	(0.70-2.11)
		20-40	(1.41-2.81)
		35-80	(2.46-5.62)
		75-150	(5.27-10.55)
2	(50)	5-20	(0.35-1.41)
		10-50	(0.70-3.52)
		20-100	(1.41-7.03)



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kgs)
¼	(8)	3	(76.2)	2⅞	(73.03)	1¾	(44.45)	3	(1.35)
⅜	(10)	3⅞	(98.43)	4⅛	(104.78)	1¾	(44.45)	5½	(2.47)
½	(15)	4½	(114.3)	4½	(114.3)	2⅛	(53.98)	8	(3.6)
¾	(20)	5⅛	(130.18)	4⅝	(117.48)	2⅛	(53.98)	10	(4.5)
1	(25)	5⅞	(149.23)	5⅜	(136.53)	2⅝	(66.68)	16	(7.2)
1¼	(32)	6¾	(171.45)	6⅛	(155.58)	2⅝	(66.68)	20	(9.0)
1½	(40)	6¾	(171.45)	6⅛	(155.58)	3¼	(82.55)	20	(9.0)
2	(50)	9¼	(234.95)	8½	(215.9)	3½	(88.90)	37	(16.65)

TYPE B SELECTION GUIDE

Example	B	Z	A	C	S	S	Z	T	S	01	-	E	0025

Model
B B valve

Material of construction
Z Bronze

Valve size
A ¼"
B ⅜"
C ½"
D ¾"
E 1"
F 1¼"
G 1½"
H 2"

Service
C Cryogenic
F Final line gas (O_2 clean adder required)

Body style/connection style
S Side inlet/side outlet - straight thru w/NPT connections
B Side inlet/side outlet - straight thru w/BSPT connections
C Side inlet/side outlet - straight thru w/copper tube connections (⅜" only)

Spring chamber style
S Standard
D w/pressure screw cap and differential connection

Diaphragm material
B NBR (final line)
Z Bronze (cryo)

Seat material
B NBR (final line)
T PTFE (cryo)

Pressure screw style
S Standard

Variation
01 Standard

Design revision
(-) Indicates original design

Spring material
D Steel (final line gas)
E SST (cryo)

Set pressure
0005 5 psig
0025 25 psig
0150 150 psig

Standard spring ranges - must specify during order process						
B ¼" (**)	10-30	25-100	50-200	100-250		
B ⅜" (**)	10-50	40-150	100-250			
B ½" (**)	10-30	20-75	25-125	100-200	150-250	
B ¾" (**)	10-30	20-70	30-100	50-150	100-225	150-250
B 1" (**)	10-35	20-60	50-100	50-150	100-250	
B 1¼" & 1½" (**)	10-30	20-40	35-80	75-150		
B 2" (**)	5-20	10-50	20-100			
Final line only						
B ¼" (*)	2-25	20-60	30-100	50-150		
B ⅜" (*)	2-30	20-70	40-110	90-150		
B ½" (*)	2-30	10-50	30-125	50-150		
B ¾" (*)	2-20	10-35	30-75	50-110	105-150	
B 1" (*)	2-20	10-45	20-60	55-100	90-150	
B 1¼" & 1½" (*)	2-15	10-30	20-50	45-100	90-150	
B 2" (*)	2-20	10-60	20-100	90-150		

Note: (**) Stainless steel (*) Steel

TYPE B95 SELECTION GUIDE

Example:	B95	G	C	C	S	S	G	T	S	01	-	E	0025

Model

B95	B95 valve

Material of construction

G	316 SST body and chamber

Valve size

C	½"
D	¾"
E	1"

Service

C	Cryogenic

Body style/connection style

S	Side inlet/side outlet - straight thru w/NPT connections

Spring chamber style

S	Standard
K	w/pressure screw cap and differential connection

Diaphragm material

G	316 SST [cryo]

Seat material

T	PTFE [cryo]

Pressure screw style

S	Standard

Variation

01	Standard

Design revision

(-)	Indicates original design

Spring material

E	Stainless steel

Set pressure

0005	5 psig
0025	25 psig
0150	150 psig

Standard spring ranges - must specify during order process							
B95 ½" [**]	10-30	20-75	25-125	100-200	150-250	250-400	200-600
B95 ¾" [**]	10-30	20-70	30-100	50-150	100-225	150-250	
B95 1" [**]	10-35	20-60	50-100	50-150	100-250	200-400	

Note: [**] Stainless steel

G-60 PRESSURE REDUCING OR PRESSURE BUILD-UP SERVICE

Construction

Threaded ends; bronze body, spring chamber, diaphragms and trim; stainless steel pressure spring and body seat; PTFE seat and gaskets; stainless steel bolts. Closing cap over screw provided.
Also available with all system exposed internal parts in stainless steel. All parts are commercially cleaned for cryogenic service. Also available with BSP threads.

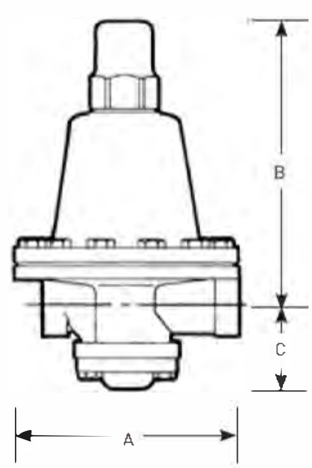
Note: also available in stainless steel and special construction for hi-purity service.
Contact your sales representative.

Temperature rating:	+150°F to -320°F (339K to 78K)
Maximum initial pressure:	600 psi (42.18 kg/cm²)

REDUCED PRESSURE RANGES

Valve size		Maximum working ranges	
Inches	(mm)	psi	(kg/sq cm)
¼ & ⅜	(8 & 10)	5-30	(0.35-2.11)
		15-65	(1.05-4.57)
		30-110	(2.11-7.73)
		75-200	(5.27-14.06)
		100-400*	(7.03-28.12*)
		100-600*	(7.03-42.18*)
½	(15)	0-7	(0-0.49)
		5-70	(0.35-4.92)
		50-150	(3.52-10.55)
		50-250	(3.52-17.58)
		200-500	(14.06-35.16)
¾	(20)	0-10	(0-0.70)
		5-75	(0.35-5.27)
		50-200	(3.52-14.06)
		100-600*	(7.03-42.18)
1	(25)	10-50	(0.70-3.52)
		50-200	(3.52-14.06)
		100-600*	(7.03-42.18)
1¼ & 1½	(32 & 40)	5-15	(0.35-1.05)
		10-50	(0.70-3.52)
		30-75	(2.11-5.27)
		50-120	(3.52-8.44)
		75-150	(5.27-10.55)
		100-400*	(7.03-28.12)

* **Note:** higher ranges are attained by modifying standard valve and/or using a different pressure spring.
Contact your sales representative.



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kgs)
¼	(8)	4	(101.60)	6⅝	(168.28)	2³⁄₁₆	(55.55)	9	(4.05)
⅜	(10)	4	(101.60)	6⅝	(168.28)	2³⁄₁₆	(55.55)	9	(4.05)
½	(15)	4¾	(120.65)	7⅝	(193.68)	2⁵⁄₁₆	(58.72)	16	(7.20)
¾	(20)	5⅝	(142.88)	10	(254.00)	2⅝	(66.68)	24	(10.80)
1	(25)	6½	(165.10)	10¾	(273.05)	2⅞	(73.03)	35	(15.75)
1¼	(32)	8	(203.20)	12⁵⁄₁₆	(312.74)	3⁹⁄₁₆	(90.49)	63	(28.35)
1½	(40)	8	(203.20)	12⁵⁄₁₆	(312.74)	3⁹⁄₁₆	(90.49)	63	(28.35)

TYPE G60 SELECTION GUIDE

Example:	G60Z	A	W	S	S	Z	Z	B	S	01	-	E	0015

Model
- **G60Z** G60 w/bronze body
- **G60G** G60 w/316 stainless steel body

Valve size

A	¼"	**E**	1"
B	⅜"	**F**	1¼"
C	½"	**G**	1½"
D	¾"		

Service
- **C** Cryogenic service
- **F** Final line gas (O_2 clean but not used in cryo service)

Body/connection style
- **S** Side inlet/side outlet - straight thru w/NPT connections

Spring chamber style
- **S** Standard
- **C** w/pressure screw cap
- **D** w/pressure screw cap and differential connection
- **V** Vented
- **W** Vented w/pressure screw cap

Spring chamber material
- **Z** Bronze
- **G** 316 stainless steel

Diaphragm material
- **B** NBR (final line gas)
- **Z** Bronze (cryo)
- **G** 316 stainless steel (cryo)
- **L** NBR w/PTFE liner (final line gas)

Seat material
- **B** NBR (final line gas)
- **T** PTFE (cryo)
- **V** FKM (final line gas)

Pressure screw style
- **S** Standard

Variation
- **01** Standard (303 stainless steel trim)
  (303 SST seat ring, 303 SST pusher post button, 303 SST pusher post, 303 SST guide bushing, 303 SST piston and 316 SST bottom cap)
- **31** Brass trim
  (303 SST seat ring, brass pusher post button, brass pusher post, 303 SST guide bushing, brass piston and bronze bottom cap)

Design revision
- **(-)** Indicates original design

Spring material
- **E** Stainless steel

Set pressure
- **0005** 5 psig
- **0025** 25 psig
- **0300** 300 psig

Standard spring ranges - must specify during order process						
¼" & ⅜" (**)	5-30	15-65	30-110	75-200	100-400	100-600
½" (**)	0-7	5-70	50-150	50-250	100-400	200-500
¾" (**)	0-10	5-75	50-200	100-400	100-600	
1" (**)	10-50	50-200	100-400	100-600		
1¼" & 1½" (**)	5-15	10-50	30-75	50-120	75-150	100-400

Note: (**) Stainless steel

E-55 PRESSURE REDUCING, PRESSURE BUILD-UP OR FINAL-LINE GAS SERVICE

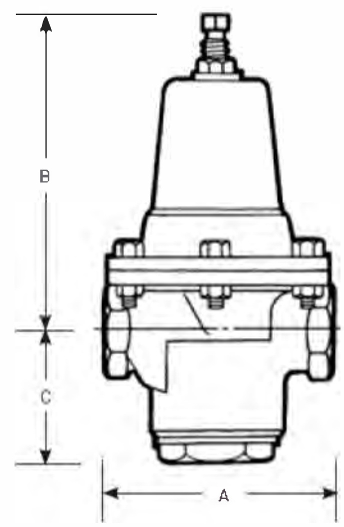
Construction - for pressure reducing or pressure build-up service
Bronze body, spring chamber, trim; stainless steel body seat and pressure spring; PTFE seat, O-rings and bottom plug gasket; Monel® diaphragms and strainer screen; stainless steel bolts. All parts are commercially cleaned for cryogenic service. Also available with BSP threads.

Size range:	1¼", 1½", 2" [32, 40, 50 mm]
Temperature rating:	+150°F to -320°F [339K to 78K]
Maximum initial pressure:	400 psi [28.12 kg/cm²]

Construction - for final-line gas service
Bronze body, spring chamber and trim; stainless steel body seat and pressure spring; FKM seat disc and PTFE bottom plug gasket; FKM O-ring and neoprene diaphragm with FKM liner; Monel® strainer screen. All parts are commercially cleaned for oxygen service. Also available with BSP threads.

Size range:	½", ¾", 1", 1¼", 1½", 2" [15, 20, 25, 32, 40, 50 mm]
Temperature rating:	+150°F to 0°F [339K to 255K]
Maximum initial pressure:	400 psi [28.12 kg/cm²]

Note: Specification for final-line gas service is not for use on cold gas or liquid [less than 0°F].



REDUCED PRESSURE RANGES

Valve size		Maximum working ranges	
Inches	[mm]	psi	[kg/sq cm]
½", ¾", 1"	[15, 20, 25]	10-35	[0.70-2.46]
		20-75	[1.41-5.27]
		75-125	[5.27-8.79]
		125-175	[8.79-12.30]
		75-250	[5.27-17.58]
1¼", 1½", 2"	[32, 40, 50]	20-70	[1.41-4.92]
		50-150	[3.52-10.55]
		75-300	[5.27-21.09]

DIMENSIONS

Size		Dimensions A		Dimensions B		Dimensions C		Shipping weight	
inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	lbs	[kgs]
½	[15]	4	[101.6]	7¼	[184.15]	2¼	[57.15]	6	[2.7]
¾	[20]	4	[101.6]	7¼	[184.15]	2¼	[57.15]	6	[2.7]
1	[25]	4	[101.6]	7¼	[184.15]	2¼	[57.15]	6	[2.7]
1¼	[32]	5⅝	[142.88]	11⅛	[282.58]	3¼	[82.55]	17	[7.7]
1½	[40]	5⅝	[142.88]	11⅛	[282.58]	3¼	[82.55]	17	[7.7]
2	[50]	5¾	[146.05]	11⅜	[288.93]	2⅞	[73.03]	17	[7.7]

TYPE E-55 SELECTION GUIDE

Example:	E55	C	C	S	G	T	01	-	E	0025

Model

E55	E-55 valve w/bronze body and spring chamber

Valve size

C	½"	**F**	1¼"
D	¾"	**G**	1½"
E	1"	**H**	2"

Service

C	Cryo [1¼" - 2"]
F	Final line gas (all sizes)

Body style/connection style

S	Side inlet/side outlet - straight thru w/NPT connections
B	Side inlet/side outlet - straight thru w/BSPT connections
C	Side inlet/side outlet - straight thru w/NPT connections (enlarged port) 1" E-55 only
D	Side inlet/side outlet - straight thru w/BSPT connections (enlarged port) 1" E-55 only

Diaphragm material

G	316 SST (cryo) [1¼" - 2"]
N	Neoprene w/FKM diaphragm liner (final gas line)

Seat material

T	PTFE (cryo)
V	FKM (final line gas)

Variation

01	Standard

Design revision

(-)	Indicates original design

Spring material

E	SST

Set pressure

0005	5 psig
0025	25 psig
0150	150 psig

Standard spring ranges - must specify during order process					
Sizes C, D, E (**)	10-35	20-75	75-125	125-175	75-250
Sizes F, G, H (**)	20-70	50-150	75-175	75-200	150-300

Note: (**) Stainless steel

THE ECONOMIZER CIRCUIT

The economizer back pressure regulator is set from 10 to 25 psi (.70 to 1.76 kg/sq cm) above the set pressure of the pressure build-up regulator. When no gas is being used and heat leakage in the tank causes a gas pressure build-up, the excess pressure is by-passed into the final vaporizer line to conserve gas rather than allow the safety valve in the pressure build-up circuit to relieve the excess gas into the atmosphere.

Five types of back pressure valves are available for this circuit: the Type FRM, low flows, max. 600 psi (42.18 kg/cm^2); FRM-2, medium flows, max. 250 psi (17.58 kg/cm^2); FRM-2 (HP) high pressure, medium flows, max. 400 psi (28.12 kg/cm^2); FR, large flows, max. 400 psi (28.12 kg/ cm^2) and the FR-6, max. 600 psi (42.18 kg/cm^2).

FRM BACK PRESSURE OR ECONOMIZER SERVICE

Construction
Threaded ends; 2-way, side inlet-side outlet; 2-way, side inlet-bottom outlet; 3-way, 2 side inlets-bottom outlet; forged bronze body; bronze diaphragms; stainless steel seat disc, seat ring and pressure spring; PTFE diaphragm gasket. All parts commercially cleaned for cryogenic service.

Note: Also available in stainless steel and special construction for hi-purity service.
Contact your sales representative.

Temperature rating: +150°F to -320°F (339K to 78K)
Maximum set pressure: 600 psi (42.18 kg/cm^2)

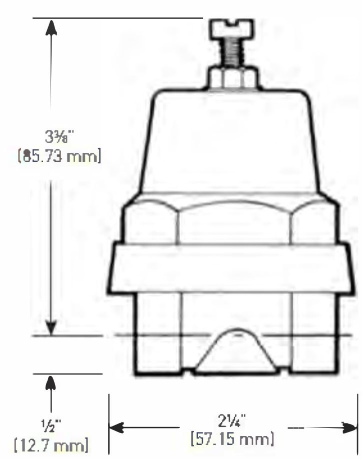
PRESSURE RANGES

Maximum working ranges	
psi	(kg/sq cm)
2-25	(0.14-1.76)
15-65	(1.05-4.57)
40-100	(2.81-7.03)
75-175	(5.27-12.30)
100-250	(7.03-17.58)
200-400	(14.06-28.12)
300-600	(21.09-42.18)

DIMENSIONS

	Size		Shipping weight	
Description	**inches**	**(mm)**	**lbs**	**(kgs)**
Side inlet, side outlet	¼	(8)	1⅛	(0.51)
Side inlet, side outlet	⅜	(10)	1⅛	(0.51)
Side inlet, bottom outlet	¼	(8)	1⅛	(0.51)
Side inlet, bottom outlet	⅜	(10)	1⅛	(0.51)
2 Side inlets, bottom outlet	¼	(8)	1⅛	(0.51)

* Use valve numbers for pressures to 175 psi only. Consult factory for other numbers.



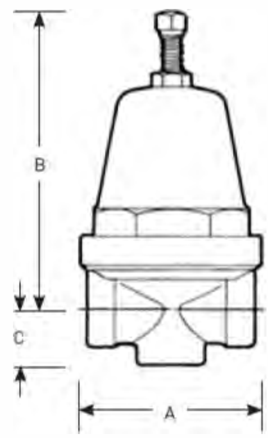
FRM-2, FRM-2 (HP) BACK PRESSURE OR ECONOMIZER SERVICE

Construction

Threaded ends; 2-way, side inlet-side outlet; 2-way, side inlet-bottom outlet; 3-way, 2 side inlets-bottom outlet; forged bronze body; cast bronze spring chamber; stainless steel seat disc, seat ring and pressure spring; bronze diaphragms; PTFE diaphragm gasket. All parts commercially cleaned for cryogenic service.

Note: FRM-2 available in stainless steel and special construction for hi-purity service. Contact your sales representative.

Temperature rating:	+150°F to -320°F [339K to 78K]
Maximum set pressure	
FRM-2:	250 psi [17.58 kg/cm²]
FRM-2HP:	400 psi [28.12 kg/cm²]



PRESSURE RANGES

Size	Maximum working ranges psi	(kg/sq cm)
FRM-2		
All sizes	0-30	[0-2.11]
All sizes	20-50	[1.41-3.52]
All sizes	40-80	[2.81-5.62]
All sizes	75-150	[5.27-10.55]
All sizes	100-275	[7.03-19.34]
FRM-2HP		
All sizes	200-400	[14.06-28.12]

DIMENSIONS

Description	Size inches	Size (mm)	Dimensions A inches	A (mm)	B inches	B (mm)	C inches	C (mm)	Shipping weight lbs	(kgs)
FRM-2										
Side inlet, side outlet	¼	[8]	2 11/16	[68.26]	4½	[114.3]	¾	[19.05]	2½	[1.13]
Side inlet, side outlet	⅜	[10]	2 11/16	[68.26]	4½	[114.3]	¾	[19.05]	2½	[1.13]
Side inlet, side outlet	½	[15]	2⅞	[73.03]	4½	[114.3]	1⅛	[28.58]	3½	[1.58]
Side inlet, bottom outlet	¼	[8]	2 11/16	[68.26]	4½	[114.3]	¾	[19.05	2½	[1.13]
Side inlet, bottom outlet	⅜	[10]	2 11/16	[68.26]	4½	[114.3]	¾	[19.05]	2½	[1.13]
Side inlet, bottom outlet	½	[15]	2⅞	[73.03]	4½	[114.3]	1⅛	[28.58]	3½	[1.58]
2 Side inlets, bottom outlet	¼	[8]	2 11/16	[68.26]	4½	[114.3]	¾	19.05]	2½	[1.13]
2 Side inlets, bottom outlet	⅜	[10]	2 11/16	[68.26]	4½	[114.3]	¾	[19.05]	2½	[1.13]
2 Side inlets, bottom outlet	½	[15]	2⅞	[73.03]	4½	[114.3]	1⅛	[28.58]	3½	[1.58]
FRM-2HP										
Side inlet, side outlet	¼	[8]	2 11/16	[68.26]	4½	[114.3]	25/32	[19.84]	2½	[1.13]
Side inlet, bottom outlet	¼	[8]	2 11/16	[68.26]	4½	[114.3]	25/32	[19.84]	2½	[1.13]
Side inlet, side outlet	⅜	[10]	2 11/16	[68.26]	4½	[114.3]	25/32	[19.84]	2½	[1.13]
Side inlet, bottom outlet	⅜	[10]	2 11/16	[68.26]	4½	[114.3]	25/32	[19.84]	2½	[1.13]
Side inlet, side outlet	½	[15]	2 11/16	[68.26]	4½	[114.3]	1⅛	[28.585]	3½	[1.58]
Side inlet, bottom outlet	½	[15]	2 11/16	[68.26]	4½	[114.3]	25/32	[19.84]	3½	[1.58]

FRM, FRM-2 SELECTION GUIDE

Example:	FRM-	A	W	Z	S	A	S	B	F	02	-	D	0005

Model	
FRM-	FRM
FRM2	FRM-2
Size	
A	¼" (all)
B	⅜" (all)
C	½" (FRM-2)
Service	
C	Cryogenic (FRM & FRM-2)
Material of construction	
Z	Brass
G	316 SST (FRM & FRM-2)
E	303 SST (FRM)
Body/connection style	
S	Side inlet/side outlet (all) NPT
R	2 side inlets/bottom outlet (FRM & FRM-2) NPT
E	Side inlet/bottom outlet (FRM & FRM-2) NPT
B	Side inlet/side outlet (BSPT)
P	Side inlet/side outlet ¼" NPS - .082 wall pipe (FRM-2)
T	Side inlet/side outlet ⅜" NPS - .035 wall pipe (FRM-2)
V	Side inlet/side outlet ⅜" NPS - .049 wall pipe (FRM-2)
Spring chamber material	
Z	Brass spring chamber
G	SST spring chamber (FRM-2)
C	Chrome plated
Spring chamber style	
S	Standard
W	Without vent hole
Diaphragm material	
G	316 SST
Z	Bronze
Pressure screw style	
F	Fillister (FRM only)
H	Hex
T	T-handle (FRM)
Variations	
03	303 Stainless steel trim w/PTFE diaphragm gasket (metal diaphragms only)
04	303 Stainless steel trim w/6 x 0.005 thick bronze diaphragms
05	303 Stainless steel trim w/nylon inserted locknut
13	316 Stainless steel trim w/PTFE diaphragm gasket (metal diaphragms only)
23	Monel trim w/PTFE diaphragm gasket (metal diaphragms only)
32	Remote sensing
Design revision	
(-)	Original design
Spring material	
E	Stainless steel (FRM-2)
Set pressure	
0005	5 psig
0015	15 psig
0100	100 psig

Standard spring ranges - must specify during order process									
FRM (**)	2-25	15-65	40-100	50-150	75-175	100-250	200-400	200-600	300-600
FRM-2 (**)	0-30	20-50	40-80	75-150	100-275	200-400	300-600		

Note: (**) Stainless steel only

FR, FR-6 BACK PRESSURE OR ECONOMIZER SERVICE

Construction

Threaded ends; 3-way, 2 side inlets-bottom outlet; bronze body, spring chamber and diaphragms; brass body seat; stainless steel seat disc, seat ring and pressure spring; PTFE O-ring and diaphragm gasket; stainless steel bolts; pressure-tight closing cap. All parts are commercially cleaned for cryogenic service. Also available with BSP threads.

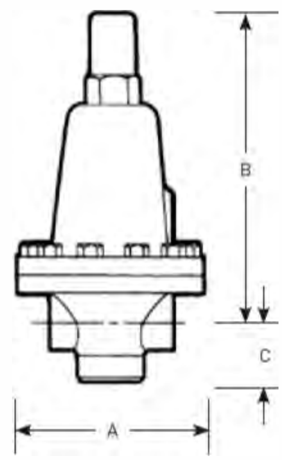
Note: also available in stainless steel and special construction for hi-purity systems. Contact your sales representative.

Temperature rating: +150°F to -320°F [339K to 78K]

MAXIMUM INITIAL PRESSURE

Type	psi	kg/cm²
FR	250	17.58
FR-½"	400	28.12
FR-¾"	265	18.64
FR-1"-2"	250	17.58
FR-6	400	28.12
	600	42.18 on ½"

Maximum set pressure: see below. For higher pressures, contact your sales representative.



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
in.	[mm]	in.	[mm]	in.	[mm]	in.	[mm]	lbs	[kgs]
½	[15]	4¾	[120.65]	6¾	[171.45]	1⅝	[41.28]	9½	[4.27]
¾	[20]	5⅝	[142.88]	8	[203.20]	2	[50.80]	14¾	[6.64]
1	[25]	6½	[165.1]	10⁵⁄₁₆	[261.94]	2¼	[57.15]	23½	[10.58]
1¼	[32]	6½	[165.1]	10⅞	[276.23]	2⅜	[60.33]	24½	[11.03]
1½	[40]	7½	[190.5]	10¾	[273.05]	2⅝	[66.68]	33	[14.85]
2	[50]	7½	[190.5]	11	[279.40]	2⅝	[66.68]	35½	[15.98]

PRESSURE RANGES

Valve size		Maximum working ranges	
inches	(mm)	psi	(kg/sq cm)
½	(15)	0-20	(0-1.41)
		10-50	(0.70-3.52)
		40-90	(2.81-6.33)
		75-200	(5.27-14.06)
		100-400	(7.03-28.12)
		300-600	(21.09-42.18)
¾	(20)	0-10	(0-.70)
		10-70	(0.70-4.92)
		50-175	(3.52-12.30)
		100-265	(7.03-18.63)
		200-400*	(14.06-28.12*)
1	(25)	0-15	(0-1.06)
		20-75	(1.41-5.27)
		40-200	(2.81-14.06)
		50-250	(3.51-17.58)
		200-400*	(14.06-28.12*)

Valve size		Maximum working ranges	
inches	(mm)	psi	(kg/sq cm)
1¼	(15)	0-15	(0-1.06)
		20-85	(1.41-5.98)
		40-125	(2.81-8.79)
		50-250	(3.52-17.58)
		200-400*	(14.06-28.12)*
1½	(40)	0-15	(0-1.06)
		10-55	(0.70-3.87)
		30-100	(2.11-7.03)
		40-160	(2.81-11.25)
		100-250	(7.03-17.58)
		200-400*	(14.06-28.12)*
2	(50)	0-15	(0-1.06)
		10-55	(0.70-3.87)
		30-100	(2.11-7.03)
		40-160	(2.81-11.25)
		100-250	(7.03-17.58)
		200-400*	(14.06-28.12)*

* **Note:** requires special diaphragm ring and pressure plate.

FR SERIES SELECTION GUIDE

Example													
	FR-	Z	A	W	S	S	Z	Z	B	H	01	-	E	0015

Model
FR- FR
FR6 FR-6

Material of construction
Z Bronze (FR, FR-6)
G 316 SST (FR, FR-6)

Valve size
C ½"
D ¾"
E 1"
F 1¼"
G 1½"
H 2"

Service
C Cryogenic service

Body/connection style
S 2 side inlets/bottom outlet - w/NPT connections

Spring chamber style
S Standard
C w/pressure screw cap
D w/differential connection
V Vented
W Vented w/pressure screw cap

Spring chamber material
Z Bronze
G 316 Stainless steel

Diaphragm material
Z Bronze (cryo)
G 316 Stainless steel (cryo)

Body seat material
E 303 Stainless steel
G 316 Stainless steel
Z Brass

Pressure screw style
S Standard

Variation (Trim consists of ball seat and seat ring)
04 303 Stainless steel trim w/PTFE O-ring and PTFE diaphragm gasket
14 316 Stainless steel trim w/PTFE O-ring and PTFE diaphragm gasket

Design revision
(-) Indicates original design

Spring material
E Stainless steel

Set pressure
0005 5 psig
0025 25 psig
0300 300 psig

Standard spring ranges - must specify during order process						
FR ½" (**)	0-20	10-50	40-90	75-200	100-300	100-400
FR ¾" (**)	0-10	0-15	10-70	50-175	100-265	
FR 1" (**)	0-15	10-35	20-75	40-200	50-250	
FR 1¼" (**)	0-15	10-30	20-85	40-125	50-250	
FR 1½" & 2" (**)	0-15	5-20	10-55	30-100	40-160	100-250

Note: (**) Stainless steel

COMBINATION PRESSURE BUILDER-ECONOMIZER

PBE Series regulators combine the pressure building and economizer functions into one unit. The economizer phase starts at the point at which the pressure build level is reached, assuring a smooth transition between the two functions. For sizing information, please request engineering data sheets 1074 (PBE-1A) and 1077 (PBE-2).

PBE-1A COMBINATION PRESSURE BUILDER-ECONOMIZER

Construction

Forged brass body and spring chamber; brass and stainless steel trim; PTFE/Armalon or bronze diaphragm; stainless steel pressure spring. All parts are commercially cleaned for oxygen service.

Temperature rating: +150°F to -320°F (339K to 78K)

Maximum initial pressure: 600 psi (42.18 kg/cm²)

PRESSURE RANGES

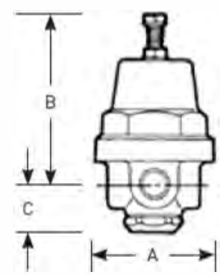
Max. working pressure	
psi	(kg/sq cm)
50-175	(3.52-12.32)
150-350	(10.55-24.61)

DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kg)
¼	(8)	2¼	(57.15)	3⅛	(79.38)	⅞	(22.29)	1.4	(0.65)

Low pressure - ranges to 175 psig

High pressure - ranges 150-350 psig



PBE-2 COMBINATION PRESSURE BUILDER-ECONOMIZER

Construction

Bronze body, spring chamber, trim and diaphragms; PTFE seat and diaphragm gasket; stainless steel economizer seat; stainless steel spring, nuts and bolts. All parts are commercially cleaned for oxygen service.

Temperature rating: +150°F to -320°F (339K to 78K)

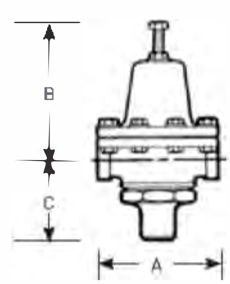
Maximum initial pressure: 400 psi (28.12 kg/cm²)

PRESSURE RANGES

Max. working pressure	
psi	(kg/sq cm)
10-30	(0.70-2.11)
20-75	(1.41-5.27)
25-125	(1.76-8.79)
100-200	(7.03-14.06)
150-250	(10.55-17.58)

DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kgs)
½	(15)	4½	(114.30)	5¼	(133.35)	3	(76.20)	9	(4.08)



PBE-5 COMBINATION PRESSURE BUILDER-ECONOMIZER

Construction

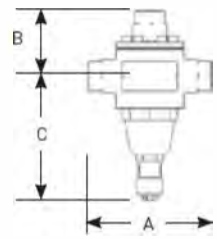
Forged brass body, bronze spring chamber; brass and stainless steel trim; bronze diaphragms; stainless steel pressure spring; graduated adjustment screw. All parts are commercially cleaned for oxygen service.

Temperature rating:	+150°F to -320°F [339K to 78K]
Maximum initial pressure:	650 psi [45.7 kg/cm²]

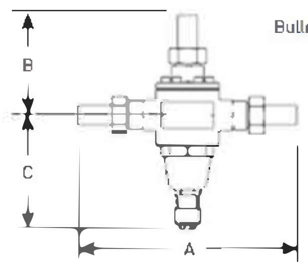
PRESSURE RANGES

Max. working pressure	
psi	**(kg/sq cm)**
0 - 30	(0.00 - 2.11)
20 - 50	(1.41 - 3.52)
40 - 80	(2.81 - 5.62)
75 - 150	(5.27 - 10.55)
100 - 275	(7.03 - 19.33)
200 - 350	(14.06 - 24.61)
300 - 600	(21.09 - 42.18)

NPTF



Bullnose



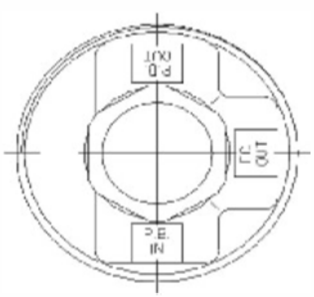
DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kg)
NPTF									
½	(15)	5.19	(131.8)	5.23	(132.9)	2.76	(70.2)	7	(3.2)
½	(15)	5.19	(131.8)	5.23	(132.9)	2.76	(70.2)	7	(3.2)
Note: 300 to 600 psi range, high pressure; Ranges to 350 psi, low pressure									
Bullnose									
0.839	(21.3)	9.81	(149.2)	5.13	(130.3)	4.48	(113.8)	8	(3.6)
0.839	(21.3)	9.81	(149.2)	5.13	(130.3)	4.48	(113.8)	8	(3.6)
Note: 300-600 psi range, high pressure; Ranges to 350 psi, low pressure									

TYPES PBE-1, PBE-2, PBE-5 SELECTION GUIDE

Example:	**PBE1**	**A**	**Z**	**3**	**S**	**01**	**-**	**E**	**0015**

Code	Description
Model	
PBE1	PBE-1A valve
PBE2	PBE-2 valve
PBE5	PBE-5 valve
Valve size	
A	¼" (PBE-1A)
C	½" (PBE-2; PBE-5)
Body and spring chamber	
Z	Brass/bronze (all)
G	316 SST (PBE-2)
Economizer outlet side (see diagram below)	
2	Left hand (PBE-1A)
3	Right hand; PB out l/h (PBE-1A)
B	Bottom (PBE-2; PBE-5)
Option	
S	Standard
C	with check (PBE-2; PBE-5)
Variation	
01	Standard
02	With tube end connections (PBE-2; PBE-5)
Design revision	
(-)	Indicates original design (PBE-2; PBE-5)
B	With active economizer (PBE-1A)
Spring material	
E	Stainless steel
Set pressure	
0005	5 psig
0025	25 psig
0300	300 psig



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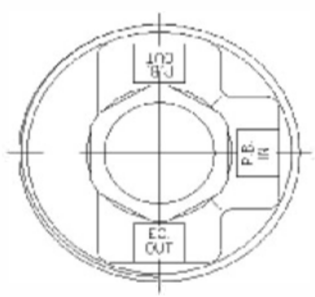


3

Standard spring ranges - must specify during order process							
PBE-1	15-65	50-175	150-350	300-600			
PBE-2	10-30	20-75	25-125	100-200	150-250	200-400	
PBE-5	0-30	20-50	40-80	75-150	100-275	200-350	300-600

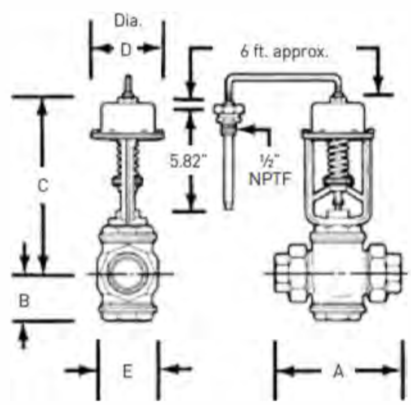
LOW TEMPERATURE CUT-OFF VALVES

The temperature control valve between the vaporizer and service line regulator is designed to shut off the gas flow if the gas temperature drops below a pre-determined point, usually -20°F (144.4K), often caused by a rapid or quick gas draw. If the temperature drops below the temperature control valve's setting, the valve closes to prevent excessively cold gas from reaching the service end of the system. In particular, the cold gas is prevented from contacting the final-line regulator, which is not constructed or intended for such low-temperature conditions. The valve opens automatically when gas temperature rises above the set point.

The Type LTC temperature control valve is a double-port valve with a range of 0°F to -40°F (255K to 233K) for low temperature cut-off. As it is subject to ambient temperature under normal conditions, it will normally be in a wide-open position. A copper well is recommended for each installation, which allows the removal of the capillary bulb without depressurizing the system.

Note: valve seat closure may take several seconds under normal operating conditions. In addition, Type LTC fails in the closed position.

LTC REVERSE-ACTING TEMPERATURE REGULATOR FOR CRYOGENIC SERVICE



Construction
Brass union ends; bronze body and trim; copper capillary armor and bellows; PTFE gasket and packing; stainless steel spring; copper bulb and capillary.
Copper bulb is ½" x 5.82" (15 mm x 147.83 mm). All parts are commercially cleaned for oxygen service. A copper well is available as an option and is recommended for each cryogenic application.

Maximum operating limits
Operating temperature range is 0°F to -40°F (255K to 233K); standard setting is -20°F (244K).
Maximum temperature limit is 300°F (408K); minimum temperature limit is -320°F (78K).
Maximum body pressure on all sizes is 400 psi (28.12 kg/cm²); however, for proper operation, maximum pressure differentials as shown on page 21 must be observed.

DIMENSIONS

Size		Dimensions									
		A		B		C		D		E	
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
½	(15)	6.04	(153.42)	2.08	(52.84)	9.80	(248.92)	4.31	(109.48)	2.50	(63.50)
¾	(20)	6.04	(153.42)	2.08	(52.84)	9.80	(248.92)	4.31	(109.48)	2.50	(63.50)
1	(25)	6.04	(153.42)	2.08	(52.84)	9.80	(248.92)	4.31	(109.48)	2.50	(63.50)
1¼	(32)	7.61	(193.30)	2.75	(69.85)	10.47	(265.94)	4.31	(109.48)	3.56	(90.43)
1½	(40)	7.61	(193.30)	2.75	(69.85)	10.47	(265.94)	4.31	(109.48)	3.56	(90.43)
2	(50)	8.58	(217.43)	3.12	(79.25)	10.84	(275.34)	4.31	(109.48)	4.31	(109.48)

Note: also available: Separable well - ask for part number 17960.
Thermal system repair kit - ask for part number 18052.

TYPE LTC MAXIMUM PRESSURE DIFFERENTIALS

Valve size		Temperature setting					
		0°F	(255°K)	-20°F	(244.4°K)	-40°F	(233°K)
inches	(mm)	psi	(kg/sq cm)	psi	(kg/sq cm)	psi	(kg/sq cm)
½ - ¾	(15-20)	400	(28.12)	400	(28.12)	400	(28.12)
1	(25)	275	(19.33)	400	(28.12)	400	(28.12)
1¼ - 1½	(32-40)	275	(19.33)	350	(24.61)	350	(24.61)
2	(50)	275	(19.33)	275	(19.33)	300	(21.09)

Note: it requires approximately 15°F change in temperature to fully close valve.

TYPE LTC CAPACITY INFORMATION (SCFH) OXYGEN SERVICE - 50 PSI AND 100 PSI LEVELS

		50 psi level				100 psi level			
Size	C_v	1 psid	2 psid	5 psid	10 psid	1 psid	2 psid	5 psid	10 psid
½"	9.0	4109	5788	9044	12530	5480	7734	12147	16986
¾"	9.0	4109	5788	9044	12530	5480	7734	12147	16986
1"	13.0	5935	8361	13064	18100	7916	11171	17546	24535
1¼"	37.5	17122	24119	37684	52211	22835	32223	50612	70775
1½"	37.5	17122	24119	37684	52211	22835	32223	50612	70775
2"	52.5	23970	33767	52757	73095	31969	45113	70857	99085

TYPE LTC CAPACITY INFORMATION (SCFH) OXYGEN SERVICE - 150 PSI AND 200 PSI LEVELS

		150 psi level				200 psi level			
Size	C_v	1 psid	2 psid	5 psid	10 psid	1 psid	2 psid	5 psid	10 psid
½"	9.0	6572	9280	14605	20495	7506	10602	16705	23485
¾"	9.0	6572	9280	14605	20495	7506	10602	16705	23485
1"	13.0	9492	13404	21096	29603	10842	15315	24129	33922
1¼"	37.5	27382	38665	60853	85394	31274	44177	69604	97853
1½"	37.5	27382	38665	60853	85394	31274	44177	69604	97853
2"	52.5	38334	54130	85195	119552	43784	61847	97445	136994

Note: psid values are pressure drops across valve.

TO DETERMINE CAPACITY

Determine operating pressure level at the valve and the maximum allowable pressure drop across the valve. Then refer to table above reading down the appropriate column to the selected pipe size. As an example: you are operating at a 150 psi pressure level and the maximum allowable pressure drop across the valve is 2 psi. Look at the second table under the 150 psi level and 2 psid column. For a 1¼" pipe size, the capacity would be 38,665 SCFH. Note: the values shown in the table are for oxygen gas; all capacity figures are standard cubic feet per hour. To determine capacity figures for other gases, consult the conversion chart below and multiply the chart capacities by the factor given.

GAS CONVERSION FACTORS

Gas	Oxygen	Nitrogen	Hydrogen	Helium	Argon
Factor	1.000	1.075	4.000	2.860	0.893

TYPE LTC SELECTION GUIDE

Example:	LTC	C	S	-	01	A
Model						
LTC LTC valve						
Valve size						
C ½"						
D ¾"						
E 1"						
F 1¼"						
G 1½"						
H 2"						
Connection type						
S NPT threaded union ends						
B BSPT threaded union ends						
Design revision						
(-) Indicates original design						
Variation						
01 Catalog standard						
02 With Thermowell						
Temperature range						
A -40°F to 0°F						

FINAL LINE CIRCUIT (HOUSE LINE)

Liquid is forced into the vaporizer through the liquid line by the action of the vapor pressure in the tank. The liquid in the vaporizer is warmed by ambient air (or sometimes by steam) and changed into gas, which is then distributed through the final-line regulator. As the gas is at or near ambient temperature, the diaphragm and seat in the regulator can be furnished in standard rubber materials.

A-31 PRESSURE REDUCING VALVE FOR FINAL-LINE GAS SERVICE

Construction

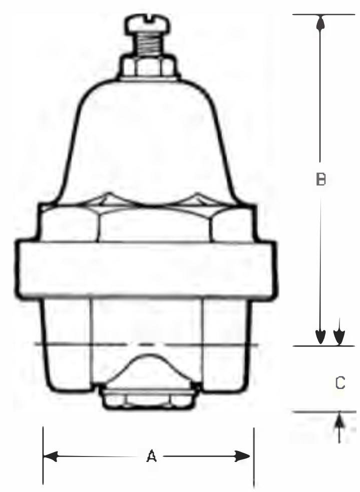
Brass forged body, brass piston; NBR seat disc and diaphragm; aluminum spring chamber; stainless steel spring. All parts are commercially cleaned for oxygen service. Standard valve has side inlet-side outlet connections. Also available with side gauge connections.

Temperature rating: +150°F to 0°F (339K to 255K)

Maximum initial pressure: 400 psi (28.12 kg/cm²)

REDUCED PRESSURE RANGES

Maximum working ranges	
psi	**(kg/sq cm)**
2-25	(0.14-1.76)
15-65	(1.05-4.57)
40-100	(2.81-7.03)
50-150	(3.52-10.55)
75-175	(5.27-12.30)



DIMENSIONS

Size		Dimensions						Shipping weight	
		A		B		C			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kgs)
1/4	(8)	2¼	(57.15)	3 3/16	(80.96)	5/8	(15.88)	1⅛	(0.51)

A16, A31, A31S, A31VR, A32, A32S SELECTION GUIDE

Example:	A16-	A	W	S	A	S	B	B	F	02	-	D	0005

Model

A16-	A16	**A32Z**	A32 w/bronze body
A31-	A31	**A32E**	A32 w/stainless steel body
A31S	A31S	**A32S**	A32S
A31V	A31VR		

Size

- **Y ⅛"** (A31, A31S)
- **A ¼"** (A16, A31, A31S, A31VR, A32, A32S)
- **B ⅜"** (A16, A31, A31S, A32)

Service

- **W** Water/air
- **C** Cryogenic (A32Z, A32E)
- **F** Final line gas (A31)
- **V** Vacuum service (A32VR)

Body/connection style

- **S** Side inlet/side outlet - straight thru (A16, A31, A32)
- **R** Side inlet/side outlet - straight thru w/right side gauge port (A31S)
- **L** Side inlet/side outlet - straight thru w/left side gauge port (A16, A31S)
- **B** Side inlet/bottom outlet w/straight thru gauge connection (A31VR)

Spring chamber material

- **A** Aluminum spring chamber (A16, A31, A31S, A32, A32S)
- **Z** Brass spring chamber (A31, A32, A31VR only)
- **C** Brass chrome plate spring chamber (A32 only)

Spring chamber style

- **S** Standard
- **N** Non-vented
- **P** Panel mount

Diaphragm material

B	NBR (A16, A31, A31S, A32S)	**T**	Neoprene w/PTFE liner (A31, A31S)
L	NBR w/ PTFE liner (A31, A31S)	**Z**	Bronze (A32 only)
G	316 SST (A32)	**R**	EPR (A31VR, A32S)
N	Neoprene (A31, A31S)	**F**	EPR w/ PTFE liner (A31VR)

Seat material

B	NBR (A16, A31, A31S, A32S)	**S**	Silicone (A31VR)
T	PTFE (A31, A32, A32S)	**K**	Kalrez (A31VR)
V	FKM (A31, A31S)		

Pressure screw style

F	Fillister (A16, A31, A31S, A32, A32S)	**K**	Knurled (A31VR)
T	T-handle (A31, A31S)	**W**	Handwheel plastic (A21)
H	Hex (A31,A31S, A32)		

Variations

01	Standard	**11**	Standard variation w/inlet screen (A31, A32)
02	Balanced piston (A31, A31S)	**12**	Balanced piston w/inlet screen (A31)

Design revision

- **(-)** Original design

Spring material

- **D** Carbon steel (Industrial or final line gas service only)
- **E** Stainless steel

Set pressure

- **0005** 5 psig
- **0015** 15 psig
- **0100** 100 psig

Standard spring ranges - must specify during order process									
A16 (*)	2-30	10-50	25-90	80-120	100-180				
A31, A31S & A32 (*)	2-30	10-50	30-90	80-120	100-180				
A31 & A32 (**)	2-15	2-25	15-65	40-100	50-150	75-175	100-250	200-400 (A32)	300-600 (A32)
A31S (**)	2-15								
A31VR (*) in/hg	0-15	10-30							

Note: (*) Steel (**) Stainless steel

HIGH PURITY REGULATING VALVES

A line of high purity regulating valves for electronic grade and other high purity gases is also available. This includes pressure reducing valves, back pressure valves and valves suitable for differential service.
Valve bodies are investment cast 316L stainless steel, with internal trim 316L bar stock. Interior (wetted) surface finish is 15 micro inch or better. The finish is electropolished. Also, all maintenance may be carried out without removing the valve from the line.

Sizes are ½" to 1½", butt weld ends, 0.065 wall (½" size, 0.049 wall). Spring ranges are typically up to 400 psig (28.12 kg/cm²) control.

Temperature limits are 400°F (478K) to -425°F (19K). All valves are cleaned for high purity gas compatibility.

Contact your sales representative for additional information and pricing.

Reference:
G60HP-pressure build service
FRHP-economizer service

C-776 SAFETY VALVE

Type C-776 cryogenic safety valves are available in sizes from ½" thru 2" (15 to 50 mm).

Request data sheet VCTDS-00515 for details.

2300 SHUT-OFF VALVE

Type 2300 is a brass shut-off globe style valve with ¼", ⅜", and ½" (7, 10.5 and 15 mm) NPTF connections. It offers the option of a stainless steel stub end inlet connection with a ⅜" (10.5 mm) NPTF outlet connection.

Temperature rating:	+150°F to -320°F (339K to 78K)
Maximum inlet pressure:	700 psig (49.2 kg/cm²)

TYPE 2300 SELECTION GUIDE

Example:		**2300**	**A**	**S**	**P**	**-**	**01**
Model							
2300	2300 shut-off valve						
Valve size							
A	¼"						
B	⅜"						
C	½"						
Body connection							
S	Side in/side out w/NPT connections						
B	Side in/side out w/BSPP connections						
1	Inlet ⅜" sch.10 x 1.125 long pipe/outlet ⅜" NPT						
2	Inlet ⅜" sch.10 x 2.125 long pipe/outlet ⅜" NPT						
3	Inlet ⅜" sch.10 x 3.375 long pipe/outlet ⅜" NPT						
4	Inlet and outlet ⅜" sch.10 x 1.125 long pipe						
5	Inlet ½" sch.5S x 2.125 long pipe/outlet ½" NPT						
Handwheel colors							
P	Plain						
B	Blue						
G	Green						
R	Red						
Design revision							
(-)	Indicates original design						
Variation							
01	Standard						
02	With 4" extended stem						

CASH VALVE TYPE C-776 SAFETY VALVES

A full lift ASME Section VIII air/gas and cryogenic, UV National Board certified safety valve suitable for cryogenic service

FEATURES

- Ideal for cryogenic service to -320°F (-195°C).
- Kel-F® soft seat disc ensures positive reseating and leak tight seal.
- Full lift maximum discharge capacity.
- Unobstructed flow through top guided design.
- Pressure tight dome.
- Stainless steel springs as standard. Inconel® springs supplied for higher pressures.
- All parts are commercially cleaned for oxygen service.
- Built to ASME Code Section VIII for cryogenic service.
- Rated capacity: 110% of set pressure.

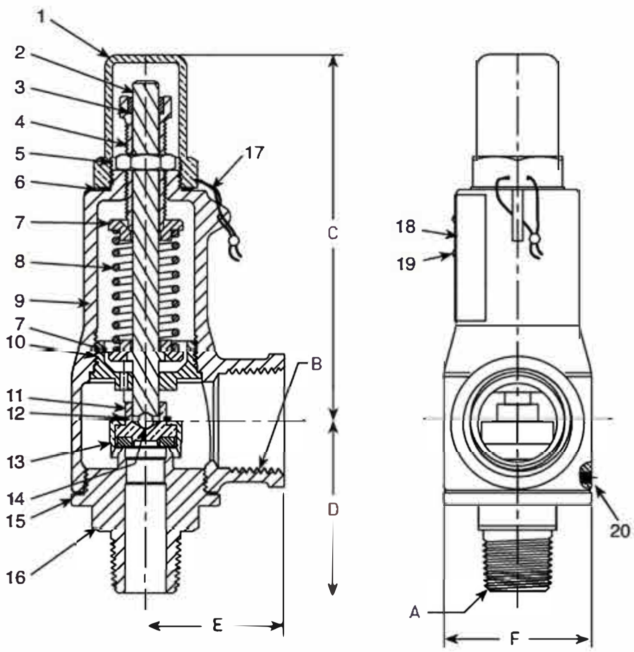
GENERAL APPLICATION

Protects piping, storage tanks and process equipment used in the distribution of industrial gases against damage caused by liquefied gas expansion. Ideal for oxygen, nitrogen, argon, carbon dioxide, helium, hydrogen and other industrial gases.

TECHNICAL DATA

Materials:	Bronze
Sizes:	½" x ¾" to 2" x 2½"
Connections:	Threaded NPTF
Pressure ranges	
½" to ¾" size:	15 to 600 psig* (1 to 41.3 barg)
1" to 2" size:	15 to 500 psig (1 to 34.5 barg)
Temperature range:	-320° to +150°F (-195° to 65.6°C)

* ¾" x 1¼" maximum pressure 500 psig (34.5 barg)



LIST OF MATERIALS

Item	Qty.	Description	Material
1	1	Adj. screw cap	Brass ASTM B16
2	1	Pull rod	Brass ASTM B16
3	1	Bushing	Virgin PTFE
4	1	Adjusting screw	Brass ASTM B16
5	1	Nut	Brass ASTM B16
6	1	Gasket	Gylon PTFE
7	2	Pressure plate	Brass ASTM B16
8	1	Spring	302 SST A313/Inconel® B637
9	1	Body	Bronze
10	1	Guide bushing	Brass ASTM B16
11	1	Seat assembly	Brass/Kel-F®
12	1	Retaining ring	SST
13	1	Seat shell	Brass ASTM B16
14	1	Ball	Monel®
15	1	Gasket	Gylon PTFE
16	1	Body seat	Brass ASTM B16
17	1	Wire seal	SST/Lead
18	1	Name plate	Aluminum
19	2	Drive screw	SST
20	1	Set screw	SST

DIMENSIONS

Valve size	Inlet size A	Outlet size B	C In. (mm)	D In. (mm)	E In. (mm)	F In. (mm)
½"	½"	¾"	4.46 (113.3)	2.11 (53.5)	1.69 (42.9)	1.81 (46.0)
½"	½"	1"	4.46 (113.3)	2.11 (53.5)	1.69 (42.9)	1.81 (46.0)
¾"	¾"	1"	4.46 (113.3)	2.11 (53.5)	1.69 (42.9)	1.81 (46.0)
¾"	¾"	1¼"	6.55 (166.3)	2.88 (73.1)	2.15 (54.6)	2.63 (66.7)
1"	1"	1¼"	6.55 (166.3)	2.88 (73.1)	2.15 (54.6)	2.63 (66.7)
1¼"	1¼"	1½"	7.32 (185.9)	3.06 (77.7)	2.37 (60.1)	3.00 (76.2)
1½"	1½"	2"	9.36 (237.6)	3.28 (83.3)	2.75 (69.9)	3.74 (95.0)
2"	2"	2½"	10.99 (279.1)	3.74 (94.9)	3.19 (81.0)	4.65 (118.0)

NOTE

NPTF, also referred to as 'Dryseal' thread, is designed to provide a more leak-free seal without the use of PTFE tape or other sealant compound. NPTF threads are interchangeable with NPT threads and are standard on all Cash Valve products.

SPECIFICATIONS - Capacity (Air capacity in SCFM by size - ambient temperature)

Set pressure psig	½" x ¾" ½" x 1" ¾" x 1"	1" x 1¼" Special for air products	¾" x 1¼" 1" x 1¼"	1¼" x 1½"	1½" x 2"	2" x 2½"
15	80	161	230	305	485	789
20	92	186	265	352	559	910
30	117	235	336	446	707	1152
40	144	289	413	548	870	1417
50	171	343	491	651	1034	1683
60	198	397	568	754	1197	1948
70	224	452	645	857	1360	2214
80	251	506	723	959	1523	2479
90	278	560	800	1062	1686	2745
100	305	614	878	1165	1849	3010
110	332	668	955	1268	2012	3276
120	359	722	1032	1370	2175	3541
130	386	776	1110	1473	2339	3807
140	413	831	1187	1576	2502	4073
150	440	885	1265	1679	2665	4338
160	467	939	1342	1781	2828	4604
170	494	993	1420	1884	2991	4869
180	521	1047	1497	1987	3154	5135
190	547	1101	1574	2090	3317	5400
200	574	1156	1652	2192	3480	5666
210	601	1210	1729	2295	3644	5931
220	628	1264	1807	2398	3807	6197
230	655	1318	1884	2500	3970	6463
240	682	1372	1962	2603	4133	6728
250	709	1426	2039	2706	4296	6994
260	736	1481	2116	2809	4459	7259
270	763	1535	2194	2911	4622	7525
280	790	1589	2271	3014	4785	7790
290	817	1643	2349	3117	4949	8056
300	844	1697	2426	3220	5112	8321
310	871	1751	2503	3322	5275	8587
320	897	1806	2581	3425	5438	8852
330	924	1860	2658	3528	5601	9118
340	951	1914	2736	3631	5764	9384
350	978	1968	2813	3733	5927	9649
400	1113	2239	3200	4247	6743	10977
450	1247	2510	3587	4761	7558	12305
500	1382	-	3974	5275	8374	13632
550	1517	-	-	-	-	-
600	1651	-	-	-	-	-

Discharge capacities in standard cubic feet per minute of air at 110% of set pressure or set pressure +3 psi, whichever is greater.

Gas	Oxygen	Nitrogen	Hydrogen	Helium	CO_2	Argon	Methane
Factor	1.05	0.98	0.26	0.37	1.24	1.18	0.74

1. For gases other than air, multiply the required gas flow for your gas by the appropriate factor above to obtain the equivalent air flow. Then use the capacity chart above for determining valve size.
2. To find the gas flow equivalent to the air flow given in the above chart, divide the chart flow by the appropriate factor above.

Capacity data based on a maximum back pressure of 10%.

SELECTION GUIDE

Example:				C776	B	D	CD	K	01	-	K	M	0015
Model													
C776	C776 valve												
Connection/body and nozzle material													
B	Male x female NPTF bronze												
Orifice area													
D	(0.169 in²)	**G**	(0.645 in²)										
E	(0.340 in²)	**H**	(1.024 in²)										
F	(0.486 in²)	**J**	(1.667 in²)										
Valve (inlet/outlet) size													
CD	½ x ¾	**EF**	1 x 1¼										
CE	½ x 1	**FG**	1¼ x 1½										
DE	¾ x 1	**GH**	1½ x 2										
AP	1 x 1¼	**HJ**	2 x 2½										
DF	¾ x 1¼												
Seat material													
K	Kel-F®												
Variation													
01	Threaded cap												
Design revision													
(-)	Indicates original design												
Service													
K	Air/gas ASME Section VIII												
N	Non-code air/gas												
Spring material													
M	302 SST or Inconel® X750												
Set pressure													
15 psig (0015) through 600[1] psig (0600) (1.0 barg through 41.3 barg)													

NOTES

1. Sizes DF, EF, FG, GH and HJ only available up to 500 psig (34.5 barg)
   Size AP only available up to 400 psig (27.5 barg)

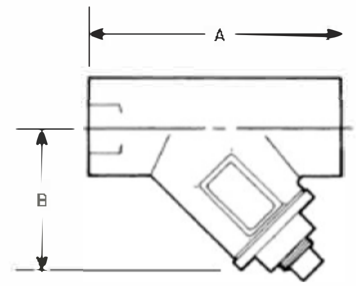
SY-70C 'Y' PATTERN STRAINERS

These strainers are suited for most cryogenic applications. Installed in the line ahead of automatic regulators, they protect valve seats, gauges, meters, regulators and other equipment from most foreign material to reduce maintenance costs and replacement expense.

Construction

ASTM B62 high-tensile cast bronze body, 100 mesh Monel® strainer screen; a brass blowoff plug is shipped with each strainer. All parts are commercially cleaned for cryogenic service.

Temperature rating: +150°F to -320°F [339K to 78K]
Maximum set pressure: 400 psi [28.12 kg/cm²]



DIMENSIONS

Strainer size		Blow off plug size		Dimensions				Shipping weight	
				A		B			
inches	(mm)	inches	(mm)	inches	(mm)	inches	(mm)	lbs	(kgs)
½	[15]	¼	[8]	2 15/16	[74.68]	1 27/32	[46.99]	0.6	[0.27]
¾	[20]	¼	[8]	3 5/8	[91.95]	1 15/16	[49.53]	1.3	[0.59]
1	[25]	⅜	[10]	4½	[114.30]	2¾	[69.85]	2	[0.91]
1¼	[32]	⅜	[10]	5⅛	[130.30]	3 11/32	[85.09]	3.1	[1.41]
1½	[40]	½	[15]	5 13/16	[147.58]	3¾	[95.25]	4.1	[1.86]
2*	[50]	¾	[20]	6 13/16	[172.58]	4 13/16	[122.68]	9	[4.08]

Capacity information

Capacity information is available on request. Write to the factory supplying full valve and application specifications.

NOTE

NPTF, also referred to as 'Dryseal' thread, is designed to provide a more leak-free seal without the use of PTFE tape or other sealant compound. NPTF threads are interchangeable with NPT threads and are standard on all Cash Valve products.

CASH VALVE MODEL C600 CRYOGENIC RELIEF VALVE

A pressure relief valve for industrial gas service at temperatures down to -320°F (-196°C)

FEATURES

- All valves are cleaned and packaged for oxygen service.
- Bubble tight to 95% of set pressure.
- Color coded labels for ease of set pressure identification.
- PTFE and fluorosilicone seat materials provide leak free performance and longer cycle life.
- Reseat pressure greater than 75% of set pressure.
- Pipe away adapter available.
- Tamper resistant adjustment screw.
- Repeatable performance.
- 100% factory tested.

GENERAL APPLICATION

The C600 protects piping, storage tanks and process equipment used in the distribution of industrial gases against damage caused by liquefied gas expansion.

TECHNICAL DATA

Material:	
Body	Brass
Seat	PTFE or Fluorosilicone
Spring	Stainless steel
Sizes:	¼", ⅜", ½"
Connections:	Threaded NPT and SAE-6
Pressure range:	15 to 600 psig (1 1 to 41.3 barg)
Temperature range:	-320° to +200°F (-196° to +93 3°C)

Code:

UV

CASH VALVE MODEL C600 CRYOGENIC RELIEF VALVE

SPECIFICATIONS

PARTS AND MATERIALS

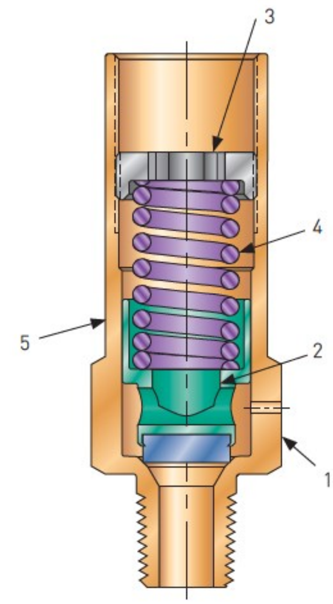
Item	Description	Material
1	Body	BRS ASMT B16
2	Piston sub	BRS ASMT B16 / PTFE
3	Adjusting screw	BRS ASMT B16
4	Spring	SST ASTM A313-302 / 17-7
5	Label	Polyester

SIZES (in)

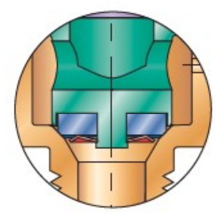
Valve size	Height	Wrenching hex	Orifice size
¼	2.83	⅞	0.29
⅜	2.83	⅞	0.29
½	3.00	⅞	0.29

LABEL CODES

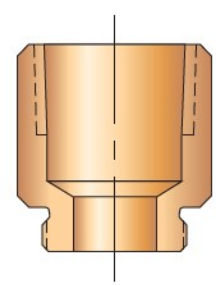
Psi	Bar	Color
22	1.5	Yellow
35	2.4	Purple
50	3.4	White
100	6.9	Gray
125	8.6	Green
150	10.3	Red
230	15.9	Blue
250	17.2	Light blue
350	24.1	Orange
400	27.6	Black
450	31.0	Pink
500	34.5	Light green



PTFE SEAT



OPTIONAL FLUOROSILICONE SEAT



OUTLET PIPE ADAPTER
Variation 02: ⅜ NPT connection
Variation 03: ½ NPT connection

SERVICE: ASME SECTION VIII AIR, ENGLISH, (SCFM) SLOPE = 0.792 SCFM/PSIA

Set press. (psig)	Capacity (SCFM)	Set press. (psig)	Capacity (SCFM)	Set press. (psig)	Capacity (SCFM)	Set press. (psig)	Capacity (SCFM)
15	26	100	99	270	247	440	395
20	30	110	107	280	256	450	404
25	34	120	116	290	264	460	412
30	38	130	125	300	273	470	421
35	42	140	134	310	282	480	430
40	46	150	142	320	290	490	439
45	51	160	151	330	299	500	447
50	55	170	160	340	308	510	456
55	60	180	168	350	317	520	465
60	64	190	177	360	325	530	473
65	68	200	186	370	334	540	482
70	73	210	195	380	343	550	491
75	77	220	203	390	351	560	500
80	81	230	212	400	360	570	508
85	86	240	221	410	369	580	517
90	90	250	229	420	378	590	526
95	94	260	238	430	386	600	534

SERVICE: ASME SECTION VIII AIR, METRIC, (Nm^3/hr) SLOPE = 17.05 (Nm^3/hr)/BARA

Set press. (barg)	Capacity (Nm^3/hr)	Set press. (barg)	Capacity (Nm^3/hr)	Set press. (barg)	Capacity (Nm^3/hr)	Set press. (barg)	Capacity (Nm^3/hr)
1.1	40	7.5	158	18	355	31	599
1.5	46	8	167	19	374	32	617
2	55	8.5	177	20	392	33	636
2.5	64	9	186	21	411	34	655
3	74	9.5	195	22	430	35	674
3.5	83	10	205	23	449	36	692
4	92	11	224	24	467	37	711
4.5	102	12	242	25	486	38	730
5	111	13	261	26	505	39	749
5.5	120	14	280	27	524	40	767
6	130	15	299	28	542	41	786
6.5	139	16	317	29	561	41.3	792
7	149	17	336	30	580		

SELECTION GUIDE

Example:	C600	M	A	B	T	-	01	K	0100

Model
C600 Safety valve

Connection
M Male NPT
S Male SAE

Connection size
A ¼"
B ⅜"
C ½"
D ⁹⁄₁₆" (SAE only)

Orifice size
B (0.066 in²)

Seat material
T PTFE (90 - 600 psig only)
F Fluroscilicone (FVMQ) (15 - 140 psig only)

Design variation
(-) Indicates original design

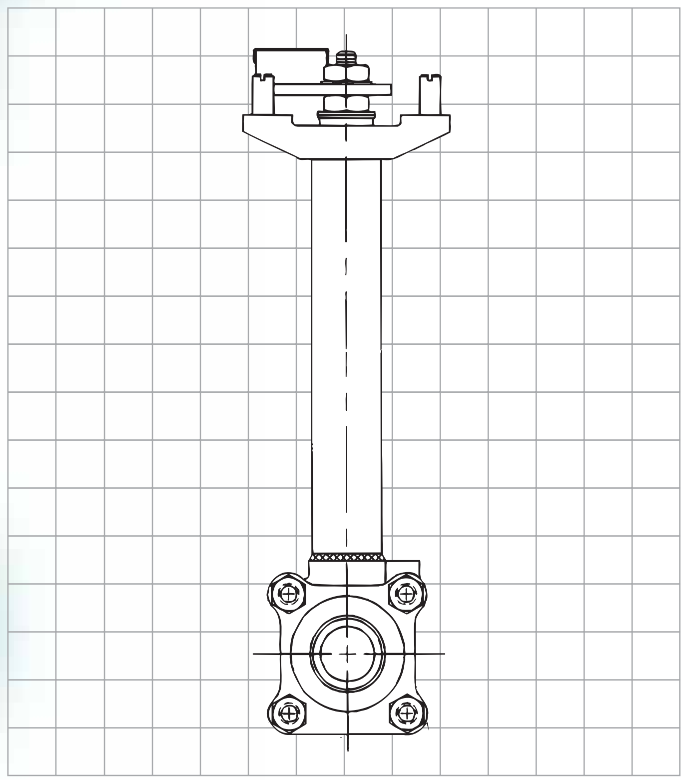
Variation
01 Standard version
02 With pipe adapter ⅜" NPT
03 With pipe adapter ½" NPT

Service
K Air/gas ASME Section VIII (PTFE seat only)
N Non-code air/gas

Set pressure
0015 15 psig (1.0 barg)
0600 600 psig (41.3 barg)

FLOWSERVE
Worcester Controls

AN ISO 9001 REGISTERED COMPANY

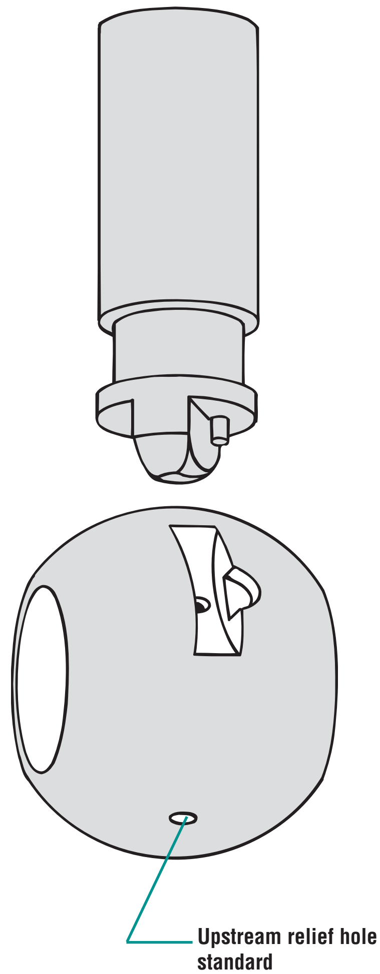


C4, C44, and C51 Ball Valves for Cryogenic Service

High-performance, shutoff valves for intermittent and continuous flow applications with temperatures to -425°F

Flowserve Worcester Controls presents the quality solution to problems of manual and automatic control of cryogens.

Flowserve Worcester Controls has the quality solution for tough applications involving all types of cryogens; oxygen, hydrogen, methane, ammonia, nitrogen, fluorine, LNG and deuterium. Our complete line of cryogenic valves, backed by years of successful field experience, incorporates superior technology and design. This means automatic or manual control of cryogenic fluids with no contamination, no fluid degradation and no waste while assuring safety for workers, property and the environment. The wrong specifications here can turn an inferior valve into a time bomb. Tough applications demand Worcester Controls' special service cryogenic valves.



Here's Why:

Positive Ball Cavity Relief – An upstream relief hole in the ball prevents dangerous overpressure due to thermal expansion. On extended stem valves through 2", a one-piece stem with alignment pin assures proper orientation of the ball.

Pressure Safe Stem – Both one-piece and two-piece, assembled-inside-the-body stems are safe from blowout and are supported with Polyfill® thrustwashers.

Zero Leak Packing – Belleville live-loaded TFE packing rings and stem centering followers assure zero leakage through the toughest, high-cycle applications.

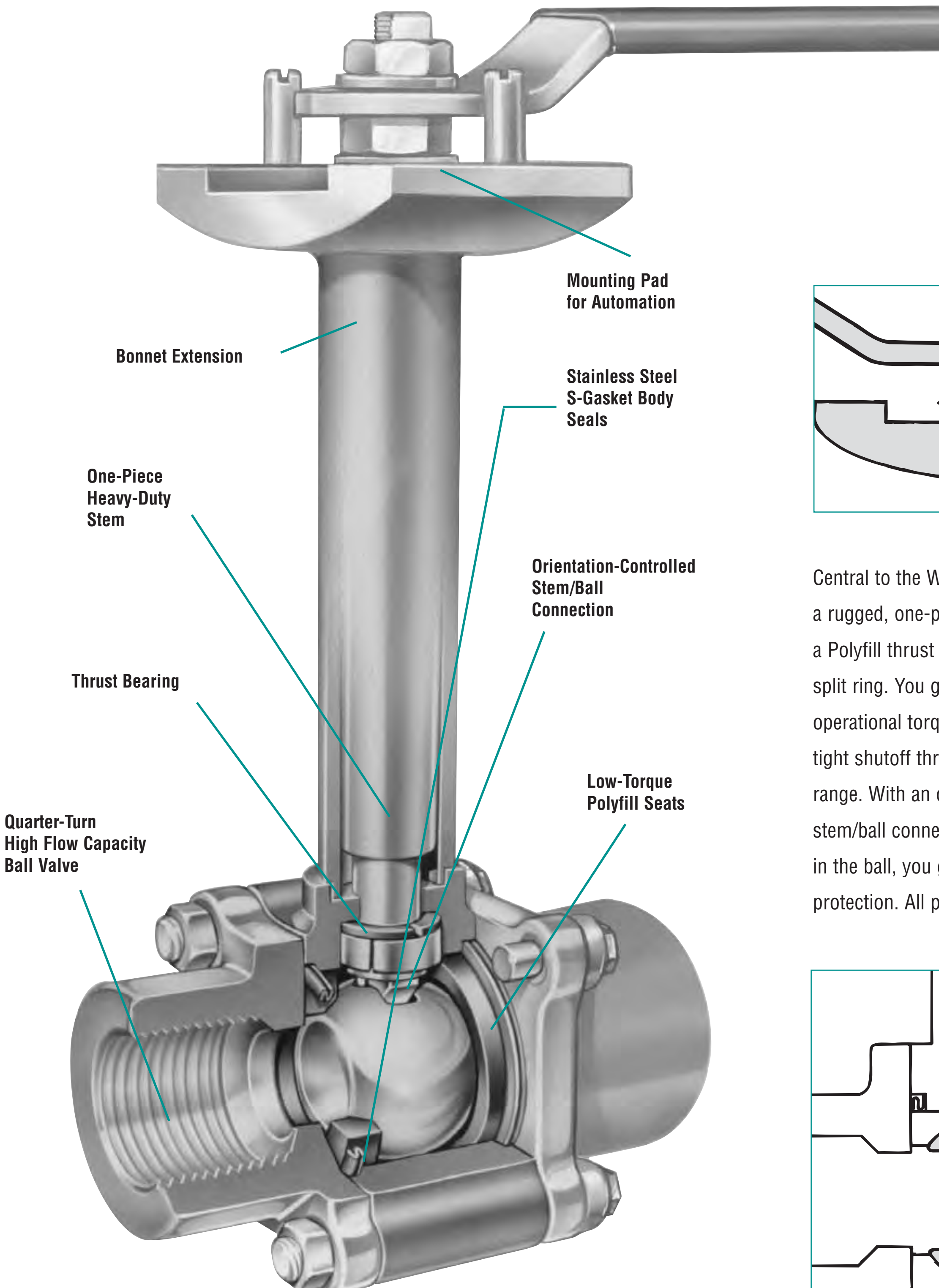
Effective Bonnet Extensions – The stem extensions of Worcester Controls' cryogenic valves conform to standard industrial practices. That means wall thickness and lengths that keep heat transfer down, the packing frost-free, operational torques low, and actuators solidly supported.

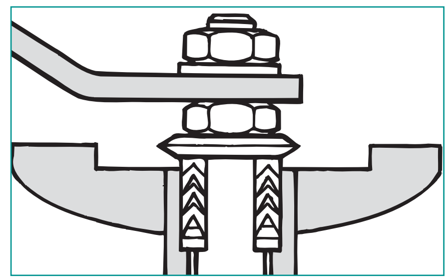
High-Performance/Low-Thermal Stress – The special "part compatibility" design of valve parts, Polyfill seats and body seals assure tight shutoff, zero body leakage and low torque through large thermal excursions from ambient to -425°F.

Valves Designed for Automation – Approximately 40% of cryogenic installations require fail-safe operation or automatic on/off control. Worcester Controls has the pneumatic and electronic, computer-compatible controls for your installation.

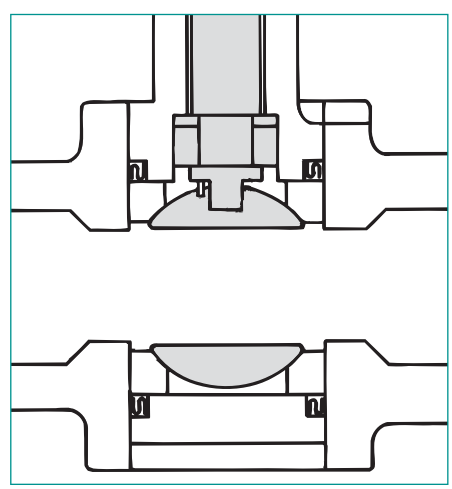
Valves Designed for Fire Safety – A Series 94 double-graphite, stem-sealed fire-tight version of our cryogenic valve is available through the Custom Products Department. These valves are especially effective in hydrogen and liquefied natural gas systems.

No Leak Seats and Seals





Central to the Worcester cryogenic design is a rugged, one-piece, pressure safe stem with a Polyfill thrust bearing and stainless steel split ring. You get design safety and low operational torque. Polyfill seats give you tight shutoff throughout the temperature range. With an orientation-controlled stem/ball connection and an upstream hole in the ball, you get positive overpressure protection. All parts are oxygen compatible.



C44 Brass or Stainless Steel

C44 Diverter

C4 Wafer

C4 Flanged

Cryogenic Valve Configurations

Flowserve Worcester Controls cryogenic valves are available in four basic body configurations; C44 (1/4"-2"), C44 Diverter (1/2"-2"), C4 Wafer (3"-6"), and C51 Flanged (3"-6"). All four valve styles offer the same features: exclusive Polyfill seats, all stainless steel construction, pressure-safe stem, extension bonnet lengths, positive ball cavity relief and low operational torques.

C44 – The Worcester cryogenic valve incorporates many of the features of the Series 44 line of valves. Three-piece construction makes it easy to install, versatile in application and simple to maintain. By removing three of the body bolts and loosening the fourth, the valve may be swung out of line. In welded or soldered piping systems, all four body bolts may be removed and the center section lifted out for maintenance or replacement. A variety of connections are available; screwed end, socket weld, butt weld and solder/sweat ends.

C44 Diverter – The cryogenic diverter valve accepts media through the bottom inlet port and directs it to one of two side ports. There are two ball porting configurations; Porting No. 1 directs flow from one outlet port to the other through a 90° rotation. Porting No. 2 diverts media from one outlet port to the other through a 180° rotation. With Porting No. 2, the flow can be turned off by positioning the valve at 90° rotation. A Porting No.1 diverter valve can be automated pneumatically or electrically. A Porting No. 2 valve may be operated by a Series 75 electric actuator. Bottom connection options are the same as standard valve (except butt weld).

C4 Wafer – The Worcester wafer is a flangeless cryogenic valve that mounts between ANSI Class 150 or 300 flanges. The extension construction is slightly different than the smaller C4 valves and includes a two-piece pinned stem extension and solid ring 15% glass-filled TFE stem seals and a virgin TFE body seal.

C51 Flanged – The C51 is identical in internal construction to the wafer cryogenic valve. The body is cast with ANSI Class 150 flanges.

Valves Without Stem Extension – Valves in all four configurations are available without stem extensions for intermittent cryogenic service.

Codes and Standards: Praxair® Specification GS-38 and GS-40. Valves may comply with ANSI B16.34 if ordered with V58 suffix. Brass and wafer valve bodies are not covered by ANSI B16.34.

Valves Without Stem Extensions

Applications

- Over-the-Road LNG-LPG Trailers
- Terminal Unloading Stations
- High-Purity Cryogenic/Gas Systems
- LNG Storage and Distribution
- CO_2 and Nitrogen Injection for Enhanced Oil Recovery
- Over-the-Road CO_2, LNG, Food Carriers
- Petroleum Refining Unleaded Gasoline (Gas Treatment Skids)
- Lyophilization Systems
- Air Separation Plants
- Liquid and Gaseous Oxygen for Steel Production
- Inerting and Heat Treatment
- Liquid Ammonia Systems (consult factory)

Clean Room Assembly

Environmental Control

Before final assembly, valve components are cleaned and degreased. Cleaning and tagging procedures for Flowserve Worcester cryogenic valves are based on Praxair Specification GS-38 and GS-40.

Assembly occurs in a Class 100 environment, per Federal Standard 209B for assembly and test.

Stainless Steel Passivation – Worcester engineering specifications strictly define procedures for cleaning, descaling and passivating stainless steel parts. Inspection is performed with a copper sulfate test per ASTM A380.

Wipe Test – All wetted components are wipe tested using Whatman® #44 paper.

Helium Leak Test – Valves are dry tested, internally pressurized with 80 psi helium and checked with a helium leak detector (Helium Mass Spectrometer sensitive to 1 x 10^{-5} cc/sec.).

Vacuum Sealed – After all testing has been completed, cryogenic valves are capped with protective plastic end caps, stamped, tagged and heat sealed in 4 mil polyethylene bags. This ensures valve integrity up to the point of installation.

Custom Testing – On request, special material, valve integrity, tightness and operational testing can be performed with valves submerged in liquid nitrogen.

Throttling Control of Cryogenics

Worcester's characterized metal-seated control valves for modulating service offer many advantages over traditional globe valves for demanding cryogenic applications.

Rotary Concept

Eliminates expensive high-maintenance stuffing box design of rising stem globe valves.

Eliminates the unbalanced, heavy actuators of extended bonnet globe valves.

Reduces the size of the control valve package by one third.

Characterized Seats

- High accuracy
- High rangeability
- Class VI shutoff or better
- Modified characteristics for better control
- Smaller valve sizes than conventional globe valves

Lower Material Cost

For applications such as oxygen, the added cost is significantly lower than globe valves.

Choice of Pneumatic or Electric Actuation

Pneumatic Series 39 actuators available with Pulsair® loop-powered, intrinsically safe positioner or all-pneumatic positioners for precise throttling control.

Economical, Series 75 electric actuators with Series DFP17 DataFlo™ positioner or Series DFC17 DataFlo controller allow for dependable throttling control in colder environments where moisture in the airlines can freeze or in systems where compressed air is not available.

Easier direct electronic interface.

Characterized seat control valves for cryogenic service are available through Worcester's Custom Products Department.

Pneumatic and Electric Automation

Easy automation for on/off service is assured by our Series 39 pneumatic or Series 75 electric actuators. Both are backed by our exclusive two-year warranty. The Series 39 actuator is the toughest and most versatile rotary actuator available. Fail-safe capability, and mechanical and proximity limit switches provide system safety and valve position feedback. Refer to Brochure WCABR1003.

Mount a Series 75 electric actuator and you have a high-performance control valve package specifically designed for computer or PLC control. A variety of options allow you to select the performance criteria and feedback information you desire. The Series 75 is available with TYPE 1, 4, 7 or 9 enclosures. Refer to Brochure WCABR1014.

Series 75
Electric Actuator

Series 39
Pneumatic Actuator

Series 39 Pneumatic Actuator
with Pulsair Positioner

Specifications

C44 and C44 Diverter Valves Without Extensions

Valve Sizes:	1/4", 3/8", 1/2", 3/4", 1", 1½" and 2" (diverter not available in 1/4" and 3/8").
Styles:	Unidirectional flow, three-piece design Bottom entry, one-piece, blowout-proof stem diverter-V1, V2 porting
Body:	ASTM A351 CF8M, 316 or CF3M, 316L stainless steel ASTM B283 C37700, brass
Pipe Ends:	ASTM A351 CF3M (316L) stainless steel ASTM A351 CF8M (316) stainless steel ASTM B283 C37700, brass
Ball:	ASTM A479 316 Condition A stainless steel or ASTM A351 CF8M stainless steel ASTM B16 HO2 Upstream relief hole (V3) in ball to relieve cavity pressure.
Stem:	ASTM A479 316 stainless steel, Condition A ASTM B16 HO2
Seats:	Polyfill
Body Seals:	TFE coated 316 stainless steel gaskets
Externals:	300 series stainless steel
End Connections:	SE – Screwed pipe ends (NPT) (dimensions to ANSI B1.20.1) SW – Socket weld ends (dimensions to ANSI B16.34) SW0 – Socket weld ends for O.D. tubing to ASTM A269 (stainless steel only) BW1 – Butt weld ends for schedule 10 pipe (dimensions to ANSI B16.25) (stainless steel only) TE – Tube ends (sweat ends for type K, L and M copper tubing to ASTM B88) (brass only)
Follower:	AISI 316L stainless steel
Packing:	Polyfill

C4 Wafer Valves and C51 Flanged Valves with and without Extensions

Valve Sizes:	3", 4" and 6"
Style:	Unidirectional flow, wafer/flangeless and flanged design Blowout-proof stem
Valve Ratings:	Wafer – fits between ANSI Class 150 and 300 flanges Flanged – ANSI Class 150
Body and End Plug:	ASTM A351 CF8M stainless steel ASTM B584 C83600 brass (wafer only)
Ball:	ASTM A351 CF8M ASTM B584 C83600 brass (wafer only)
Stem:	ASTM A479 316 stainless steel Condition A
Seats:	Polyfill
Body Seal:	TFE Virgin
Stem Seals:	TFE – 15% glass filled
Centering Washers:	AISI 316 stainless steel ASTM B121 C34200 brass (wafer only)
Thrust bearing:	TFE – 25% glass filled
Follower:	3", 4" ASTM A479 316 stainless steel 6" ASTM A269 300 stainless steel
Externals:	300 series stainless steel

C44 and C44 Diverter Valves With Stem Extensions

Valve Sizes:	1/4", 3/8", 1/2", 3/4", 1", 1½" and 2" (diverter not available in 1/4" and 3/8")
Styles:	Unidirectional flow, three-piece design Extended, one-piece, blowout-proof stem diverter-V1, V2 porting
Body:	ASTM A351 CF3M, 316L stainless steel ASTM B283 C37700, Brass
Pipe Ends:	ASTM A351 CF3M (316L) stainless steel ASTM A351 CF8M (316) stainless steel ASTM B283 C37700, brass
Ball:	ASTM A479 316 Condition A stainless steel or ASTM A351 CF8M stainless steel ASTM B16 HO2
Stem:	ASTM A479 316L, 316L Condition A solution annealed. One-piece stem with alignment pin in bottom and arrow on top for proper orientation of ball in valve. Gives positive external indication of ball position.
Seats:	Polyfill
Body Seals:	TFE coated 316 stainless steel gaskets
Stem Packing:	V-ring packing (TFE style C-VH rings) Optional “G7” graphite chevron packing available for valve horizontal applications
Thrust bearing Upper:	(2) Polyfill
Followers:	ASTM A479 316L
Split Ring:	ASTM A479 316L
Split Thrust bearing Lower:	Polyfill (1"-2"), PBI (1/2", 3/4")
Externals:	300 series stainless steel
End Connections:	SE – Screwed pipe ends (NPT) (dimensions to ANSI B1.20.1) SW – Socket weld ends (dimensions to ANSI B16.34) SW0 – Socket weld ends for O.D. tubing to ASTM A269 (stainless steel only) BW1 – Butt weld ends for schedule 10 pipe (dimensions to ANSI B16.25) (stainless steel only) TE – Tube ends (sweat ends for type K, L and M copper tubing to ASTM B88) (brass only)

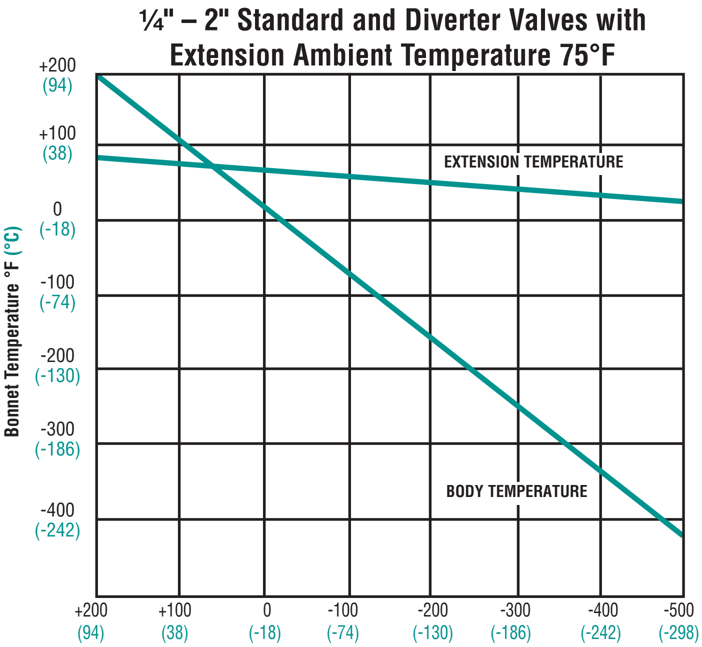
General Specifications

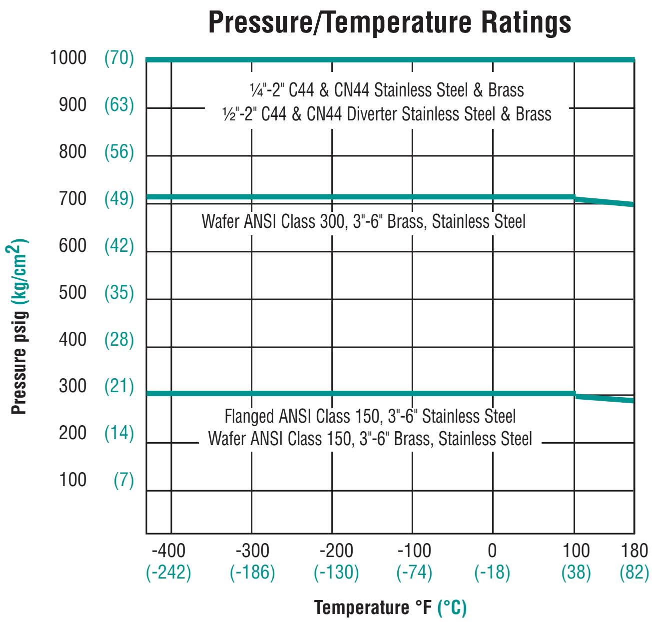
Worcester’s stainless steel cryogenic valves are designed to meet B16.34 specifications. For compliance to the code, special hydro testing is required. Full CMTRs (Certified Material Tests Reports) on pressure vessels are available. Please order V-58 for complete B16.34 compliance and CMTRs.

Shutoff:	The valve exceeds the tightness requirements of recognized industry standards (.10 SCFH per inch of valve @ 100 psi helium and -320°F maximum leakage).
Packaging:	End connections are capped or plugged, and valves are placed in 4 mil thick (minimum) polyethylene bags and heat sealed.
Operation:	Lever handle, pneumatic or electric actuators. Valve must be installed with extension bonnet within 30° of true vertical.
Cleaning:	Cleaning for all valves is based on the oxygen cleaning procedures of Praxair (formally Linde Division) Spec. GS38 and GS40. Body, ball, stem and pipe ends degreased.
Lubrication:	Molykote® 321
Assembly:	Assembly and test in a Class 100 environment per Federal Standard 299B is available upon request.
Testing:	Valves are dry tested, internally pressurized with 80 psi helium, check with helium leak detector (Helium Mass Spectrometer) sensitive to 1 x 10^{-5} cc/sec.
	Upstream relief hole (V3) in ball to relieve cavity pressure. Slot in top of ball for insertion of stem alignment pin to ensure proper orientation in valve. Gives external positive indication of ball position (¼" - 2" valves).
Temperature Range:	-425°F to +180°F

Specifications

Body Temperature vs Bonnet Temperature





Flow Coefficient

Cv Values and Equivalent Lengths of Pipe

Valve Size	C_V				Equivalent Length of Schedule 40 Pipe (ft.)			
	C44	C44 Diverter	Wafer	Flanged	C44	C44 Diverter	Wafer	Flanged
¼"-½"	8	3			3.1	19.6		
¾"	12	5			6.3	30.4		
1"	32	10			3.1	27.8		
1½"	82	24			4.3	43.5		
2"	120	36			7.5	22.7		
3"			350	350			7.1	7.1
4"			720	720			6.9	6.9
6"			1020	1020			20.4	20.4

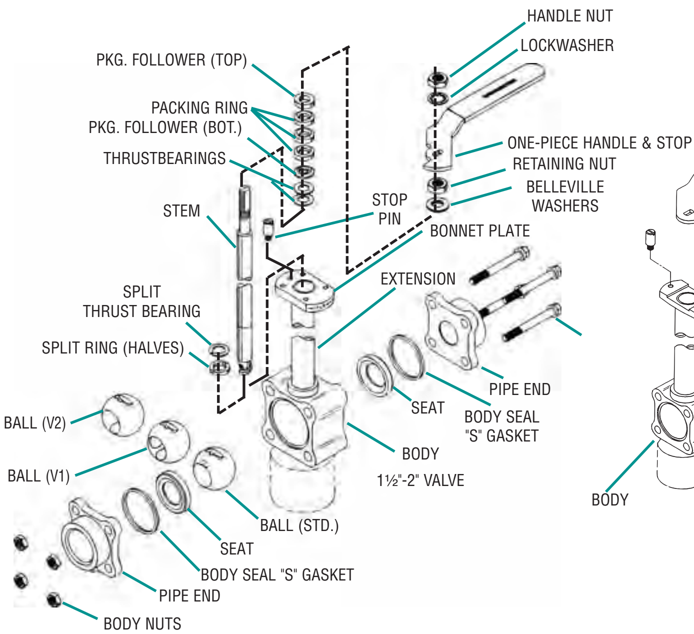
Pressure and Torque for Automated Valves

Before the actuator can be sized for any given valve application, the amount of torque required by the valve must be determined. The operating torque of the ball valve is influenced by a number of factors. Some are design and materials related, others are application (service conditions) related. Design related factors include the type of materials of the valve seats while application factors include system pressure, media, and frequency of operation.

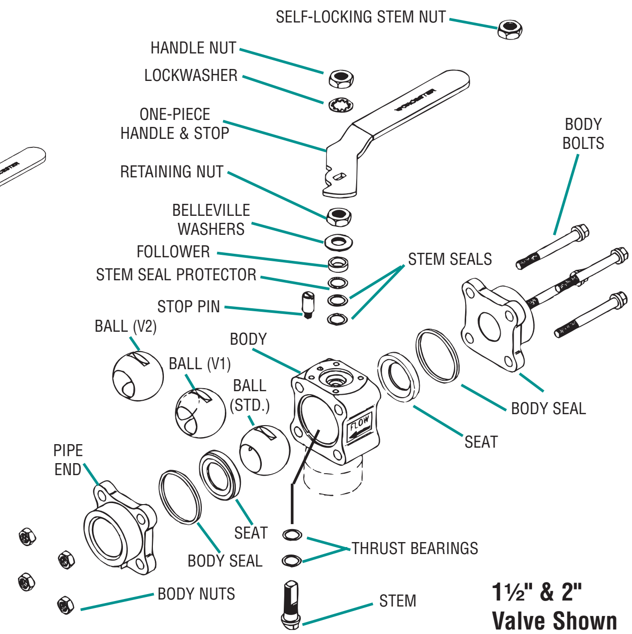
For complete valve operating torque data, refer to Worcester's Actuator Sizing Manual (WCASS0001). This 16-page publication explains the concept of valve torque, presents torque curves for each seat material, and provides correction factors for media and the type of service such as on/off operation, cycle frequency, etc.

Output torque charts for all Flowserve Worcester Controls actuators are provided in the Acutator Sizing Manual.

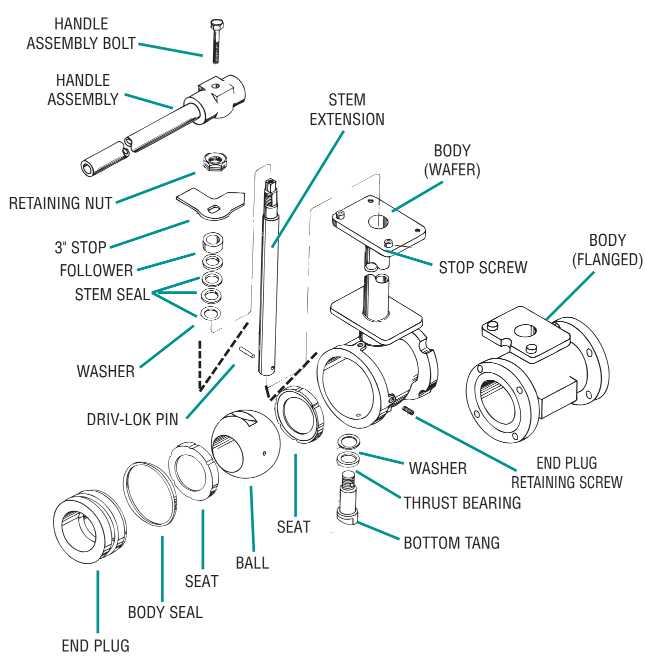
Parts Identification



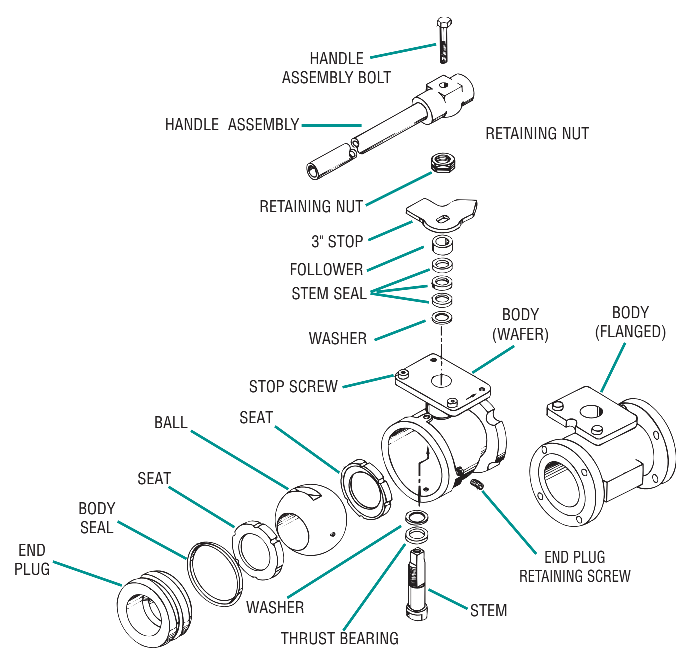
¼" - 2" Cryogenic C44 and C44 Diverter Valves with Extension



¼" - 2" Cryogenic C44 and C44 Diverter Valves without Extension

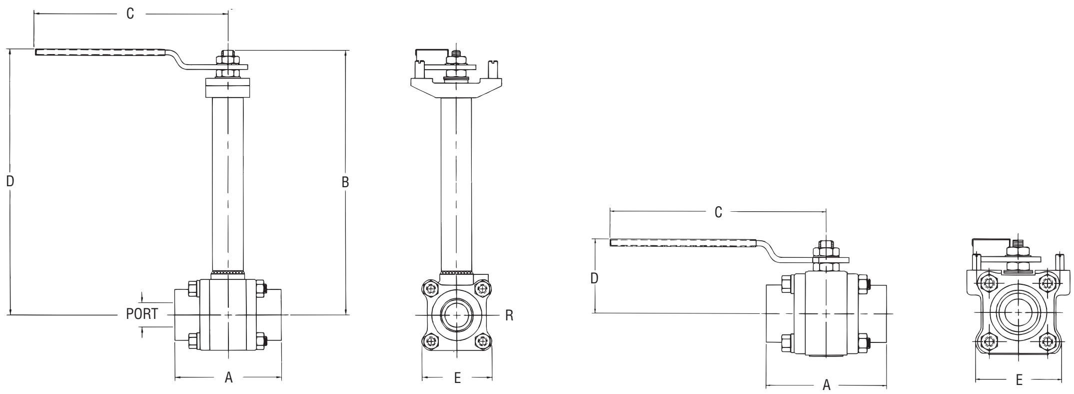


3" - 6" Cryogenic C4 and C51 Valves with Extension



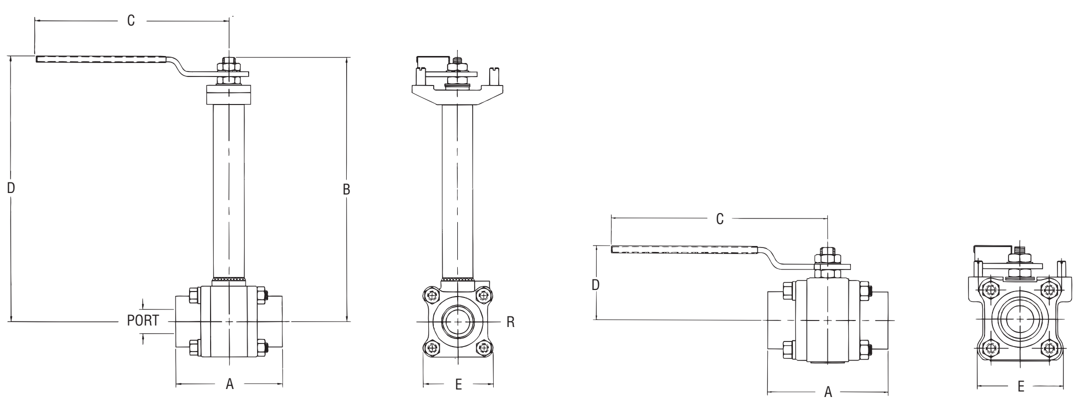
3" - 6" Cryogenic C4 and C51 Valves without Extension

Dimensions



¼" - 2" Cryogenic C44 Ball Valves Extended and Non-extended Bonnets

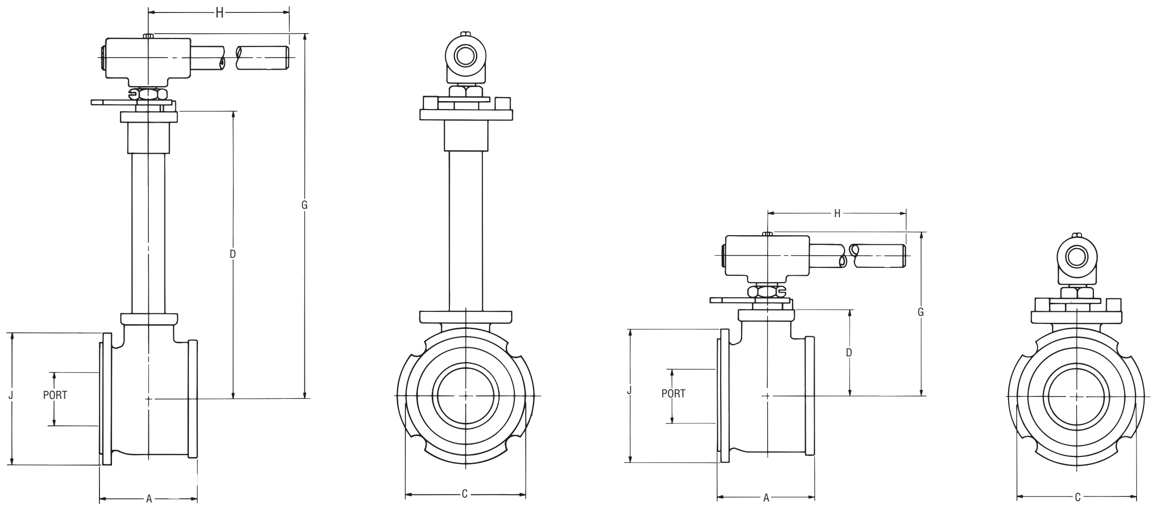
Valve Size	A	B	C		D		E	Port	Approx. Weight lbs. (kg.)	
			With Ext.	Without Ext.	With Ext.	Without Ext.			With Ext.	Without Ext.
¼", ⅜", ½"	2.54 (64.52)	7.86 (199.6)	6.53 (166)	5.53 (140)	7.87 (200)	1.76 (44.7)	1.75 (44.4)	.44 (11.8)	3.0 (1.4)	1.1 (0.5)
¾"	2.76 (70.10)	7.96 (202.2)	6.53 (166)	5.53 (140)	7.97 (202)	1.86 (47.2)	2.00 (50.8)	.56 (14.22)	3.5 (1.6)	1.8 (0.8)
1"	3.66 (92.96)	8.91 (226.3)	6.53 (166)	6.53 (1.66)	8.94 (227)	2.28 (57.8)	2.38 (60.4)	.81 (20.57)	5.0 (2.3)	3.1 (1.4)
1½"	4.50 (114.30)	10.23 (259.8)	8.03 (204)	8.03 (204)	10.25 (260)	2.83 (71.9)	3.16 (80.3)	1.25 (31.75)	11.1 (5.0)	6.2 (2.8)
2"	4.94 (125.48)	10.41 (264.4)	8.03 (204)	8.03 (204)	10.44 (261)	3.02 (76.7)	3.56 (90.4)	1.50 (38.10)	14.4 (6.5)	9.5 (4.3)



½" - 2" Cryogenic C44 Diverter Ball Valves Extended and Non-extended Bonnets

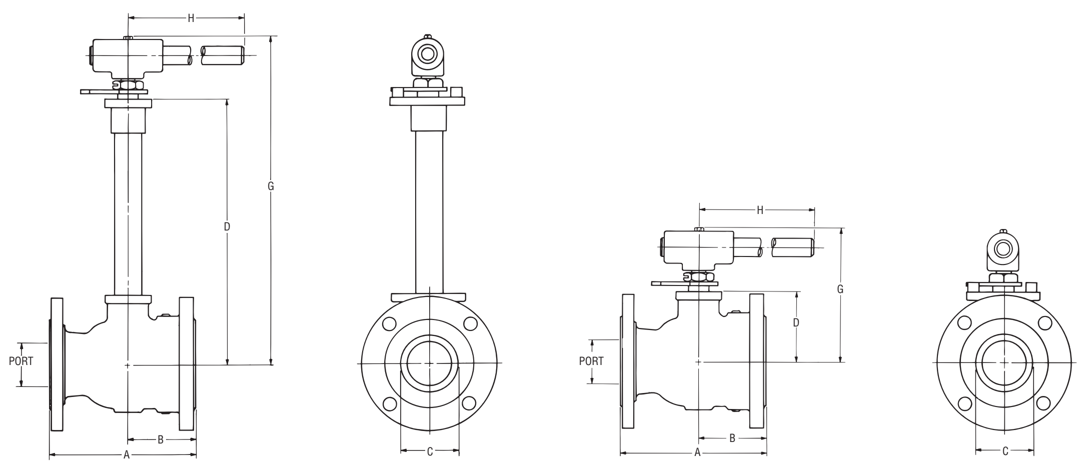
Valve Size	A	B	C		D		E	R	End Port Dia.	Bottom Port Dia.	Approx. Weight - lbs. (kg.)	
			With Ext.	Without Ext.	With Ext.	Without Ext.					With Ext.	Without Ext.
½"	2.54 (64.52)	7.86 (199.6)	6.53 (166)	5.53 (140)	7.87 (200)	1.76 (44.7)	1.75 (44.4)	2.25 (51.0)	.38 (9.70)	.34 (8.64)	3.2 (1.5)	1.6 (0.7)
¾"	2.76 (70.10)	7.96 (202.2)	6.53 (166)	5.53 (140)	7.97 (202)	1.86 (47.2)	2.00 (50.8)	2.50 (63.5)	.52 (13.20)	.50 (12.70)	3.8 (1.7)	2.0 (0.9)
1"	3.66 (92.96)	8.91 (226.3)	6.53 (166)	6.53 (166)	8.94 (227)	2.28 (57.8)	2.38 (60.4)	3.06 (77.7)	.75 (19.10)	.72 (18.29)	5.3 (2.4)	3.6 (1.6)
1½"	4.50 (114.30)	10.23 (259.8)	8.03 (204)	8.03 (204)	10.25 (260)	2.83 (71.9)	3.16 (80.3)	3.56 (90.4)	1.25 (31.75)	1.12 (28.45)	12.5 (5.7)	7.2 (3.3)
2"	4.94 (125.48)	10.41 (264.4)	8.03 (204)	8.03 (204)	10.44 (261)	3.02 (76.7)	3.56 (90.4)	3.94 (100.1)	1.50 (38.10)	1.38 (35.05)	14.7 (6.7)	9.6 (4.4)

Dimensions



3" - 6" Cryogenic C4 Wafer Ball Valves Extended and Non-extended Bonnets

Valve Size	A	C Diam.	D		G		H	J Diam.	Port Dia.	Approx. Weight - lbs. (kg.)	
			With Ext.	Without Ext.	With Ext.	Without Ext.				With Ext.	Without Ext.
3"	4.50 (114.3)	5.31 (135)	15.38 (391)	3.88 (98.6)	18.73 (476)	7.22 (183.4)	22.0 (559)	5.88 (149)	2.50 (63.5)	27 (12.3)	21 (9.5)
4"	5.81 (147.6)	6.81 (173)	15.94 (405)	4.48 (114)	19.30 (490)	7.84 (199.1)	22.0 (559)	7.50 (190)	3.25 (82.5)	41 (18.6)	34 (15.4)
6"	7.38 (187.5)	8.69 (221)	17.98 (457)	6.19 (157)	23.00 (584)	11.21 (284.7)	26.0 (660)	9.88 (251)	4.38 (111.2)	94 (42.7)	64 (29)



3" - 6" Cryogenic C51 Flanged Ball Valves Extended and Non-extended Bonnets

Valve Size	A	B	C Diam.	D		G		H	Port Dia.	Approx. Weight - lbs. (kg.)	
				With Ext.	Without Ext.	With Ext.	Without Ext.			With Ext.	Without Ext.
3"	8.00 (203.2)	3.62 (91.9)	3.06 (77.7)	15.38 (391)	3.88 (98.6)	18.73 (476.0)	7.22 (183.4)	22.0 (549)	2.50 (63.5)	46 (20.9)	39.5 (17.9)
4"	9.00 (228.6)	4.00 (101.6)	4.03 (102)	15.94 (405)	4.48 (114.0)	19.30 (490.0)	7.84 (199.1)	22.0 (559)	3.25 (82.5)	69 (31.3)	62 (28.1)
6"	10.50 (266.7)	4.25 (108.0)	6.06 (154)	17.98 (457)	6.19 (157.0)	23.00 (584.0)	11.21 (284.7)	26.0 (660)	4.38 (111.2)	139 (63.1)	125 (56.7)

WORCESTER 3-PIECE VALVES

IDENTIFICATION CHART

BLOCK A			
NOMINAL PIPE SIZE			
INCHES	MM	Code	
1/4"	8	0	2
3/8"	10	0	3
1/2"	15	0	5
3/4"	20	0	7
1"	25	1	0
1 1/4"	32	1	2
1 1/2"	40	1	5
2"	50	2	0
2 1/2"	65	2	5
3"	80	3	0
4"	100	4	0
6"	150	6	0

BLOCK C	
Code	DESCRIPTION
44	STD. PORT
H44	HIGH PRESSURE 44
45	STD. PORT >2"
59	FULL PORT
70	FORGED TUBE BORE CLEAN VALVE
74	TUBE BORE CLEAN VALVE
H71	HIGH PRESSURE FULL PORT
94	STD. PORT FUGUTIVE EMISSIONS
95	FULL PORT FUGITIVE EMISSIONS

BLOCK E	
Code	MATERIAL
B	BUNA N
N	NEOPRENE
T	TFE
R	REINFORCED TFE
Y	DELRIN (LUBETAL)
P	POLYFILL
U	UHMWPE
A	METAL A (TFE)
G	METAL G (GRAPHITE)
X	PEEK (HIGH-PER FILL)
TFM	TFM (WK SERIES ONLY)

BLOCK F	
Code	MATERIAL
B	BUNA N
N	NEOPRENE
T	TFE
E	EPR
V	VITON
M	TFE COATED 316SS
Z	GRAFOIL
U	UHMWPE
G	GRAPHITE COATED 316SS

BLOCK H	
FOLLOWS BLOCK G	
MATERIAL	CUT
A STAINLESS STEEL WITH PTFE	02
	03
	06
	12
G STAINLESS STEEL WITH GRAPHITE	15
	30
	60
	90
	120

05444466TTSEV77							
05		44	44	66	TT	SE	V77
1/2" PIPE DIAMETER	NO STANDARD VARIATIONS	44 SERIES, STANDARD PORT	CARBON STEEL BODY & ENDS	STAINLESS STEEL BALL & STEM	TFE SEATS & SEALS	FEMALE NPT THREADED ENDS	SUPPLIED WITH MTRS
ORDER EXAMPLE							

A	B	C	D				E	F	G		H	I	J	K
SIZE	STANDARD VARIANT (BLANK IF NONE)	SERIES	BODY MAT.	END MAT.	BALL MAT.	STEM MAT.	SEAT MAT.	SEAL MAT.	END 1	END 2 (ONLY SPECIFY IF OUTLET END IS DIFFERENT THAN INLET)	CHARACTERIZED CONTROL SEAT MATERIAL & CUT (CPT ONLY)	STANDARD VARIATION V-CODE(S) IF ANY	4-DIGIT C/N/P/T-NUMBER (CUSTOM APPLICATION ONLY)	REVISION LEVEL (NOT SPECIFIED WHEN ORDERING VALVES)

BLOCK B	
Code	VARIANT DESCRIPTION
E	BARE STEM, AUTOMATION STEM BUILD
A	BARE STEM W/ MOUNTING KIT FOR 34, 36 SERIES ACTUATORS
B	BARE STEM W/ MOUNTING KIT FOR 75 SERIES ACTUATORS
G	STEM GROUNDING SPRING
K	LOCKING LEVER HANDLE
V	VACUUM SERVICE PREPARATION
X	CLEANED FOR OXYGEN SERVICE
C	CRYOGENIC VALVE WITH EXTENSION
CN	CRYOGENIC VALVE WITHOUT EXTENSION
W	STEAM SERVICE VALVE
WK	CLEAN VALVE
AF/FZ	API-607 COMPLIANT
D	DIVERTER, SPECIFY V1 OR V2 PORTING
PT	HIGH PRESSURE/TEMP SERVICE VALVE SERIES
P	WK SERIES ELECTROPOLISHED
MP	MOLDING PRESS 44 SERIES
TB	TANK BOTTOM VALVE
CPT	CHARACTERIZED SEAT CONTROL VALVE

BLOCK D	
Code	MATERIAL
1	BRASS
4	CARBON STEEL
6	STAINLESS STEEL
7	MONEL
C	HASTELLOY C
A	ALLOY 20
I	INCONEL

BLOCK G	
Code	CONNECTION TYPE
SE	FEMALE NPT THREADED
BW5	SCH 5 BUTT WELD
BW1	SCH 10 BUTT WELD
BW4	SCH 40 BUTT WELD
BW8	SCH 80 BUTT WELD
BW6	SCH 160 BUTT WELD
XBO	EXTENDED TUBE ENDS
TE	SOLDER SWEAT ENDS (BRASS ONLY)
SW	SOCKET WELD
SWO	SOCKET WELD OD TUBE
TC	QUICK DISCONNECT
MS	MS (SPEC REQUIRED)
SAE	FEMALE SAE THREADED
NP	NO PIPE ENDS

BLOCK K
VALVE REVISION LEVEL INDICATES THE SPECIFIC BILL OF MATERIALS USED IN MANUFACTURE AND IS TO BE SPECIFIED WHEN ORDERING REPAIR PARTS ONLY

WORCESTER FLANGED VALVES

IDENTIFICATION CHART

BLOCK A			
NOMINAL PIPE SIZE			
INCHES	MM	Code	
1/2"	15	0	5
3/4"	20	0	7
1"	25	1	0
1 1/2"	40	1	5
2"	50	2	0
2 1/2"	65	2	5
3"	80	3	0
4"	100	4	0
6"	150	6	0
8"	200	8	0
10"	250	A	0

BLOCK C	
Code	DESCRIPTION
51, 52	STD. PORT 150, 300 CLASS
818, 828	FULL PORT 150, 300 CLASS
94	STD. PORT FUGUTIVE EMISSIONS
4	STD. PORT WAFER VALVE

BLOCK E	
Code	MATERIAL
T	TFE
R	REINFORCED TFE
P	POLYFILL
U	UHMWPE
A	METAL A (TFE)
G	METAL G (GRAPHITE)
X	PEEK (HIGH-PER FILL)

BLOCK F	
Code	MATERIAL
B	BUNA N
T	TFE
V	VITON
M	TFE COATED 316SS
Z	GRAFOIL
U	UHMWPE
G	GRAPHITE COATED 316SS*
	*varies by valve size

10514466TT150V77							
10		51	44	66	TT	150	V77
1" PIPE DIAMETER	NO STANDARD VARIATIONS	51 SERIES, STANDARD PORT	CARBON STEEL BODY	STAINLESS STEEL BALL & STEM	TFE SEATS & SEALS	150 CLASS RAISED-FACE FLANGES	SUPPLIED WITH MTRS
ORDER EXAMPLE							

A	B	C	D				E	F	G	H	I	J	K
SIZE	STANDARD VARIANT (BLANK IF NONE)	SERIES	BODY MAT.	END PIECE MAT.	BALL MAT.	STEM MAT.	SEAT MAT.	SEAL MAT.	FLANGE CLASS	CHARACTERIZED CONTROL SEAT MATERIAL & CUT (CPT ONLY)	STANDARD VARIATION V-CODE(S) IF ANY	4-DIGIT C/N/P/T-NUMBER (CUSTOM APPLICATION ONLY)	REVISION LEVEL (NOT SPECIFIED WHEN ORDERING VALVES)

BLOCK B	
Code	VARIANT DESCRIPTION
E	BARE STEM, AUTOMATION STEM BUILD (EXCEPT 818/828)
G	STEM GROUNDING SPRING
K	LOCKING LEVER HANDLE
V	VACUUM SERVICE PREPARATION
X	CLEANED FOR OXYGEN SERVICE
C	CRYOGENIC VALVE WITH EXTENSION
CN	CRYOGENIC VALVE WITHOUT EXTENSION
W	STEAM SERVICE VALVE
AF/FZ	API-607 COMPLIANT
D	DIVERTER, SPECIFY V1 OR V2 PORTING
PT	HIGH PRESSURE/TEMP SERVICE VALVE SERIES
CPT	CHARACTERIZED SEAT CONTROL VALVE
	818/828 SERIES ONLY:
E	FUGITIVE EMISSIONS BONNET W/PURGE PORT
J	BARE STEM, AUTOMATION STEM BUILD

BLOCK D	
Code	MATERIAL
4	CARBON STEEL
6	STAINLESS STEEL
7	MONEL
C	HASTELLOY C
A	ALLOY 20
I	INCONEL

BLOCK G	
Code	CONNECTION TYPE
150	ANSI 150, B16.5
300	ANSI 300, B16.5
600	ANSI 600, B16.5 (94 SERIES ONLY)
	4 SERIES WAFER ONLY:
151	FITS BETWEEN ANSI 150 RFF
301	FITS BETWEEN ANSI 300 RFF

BLOCK H	
FOLLOWS BLOCK G	
MATERIAL	CUT
A	02
STAINLESS	03
STEEL WITH	06
PTFE	12
G	15
STAINLESS	30
STEEL WITH	60
GRAPHITE	90
	120

BLOCK K
VALVE REVISION LEVEL INDICATES THE SPECIFIC BILL OF MATERIALS USED IN MANUFACTURE AND IS TO BE SPECIFIED WHEN ORDERING REPAIR PARTS ONLY

FLOWSERVE

Worcester Controls Series F39 Pneumatic Actuator

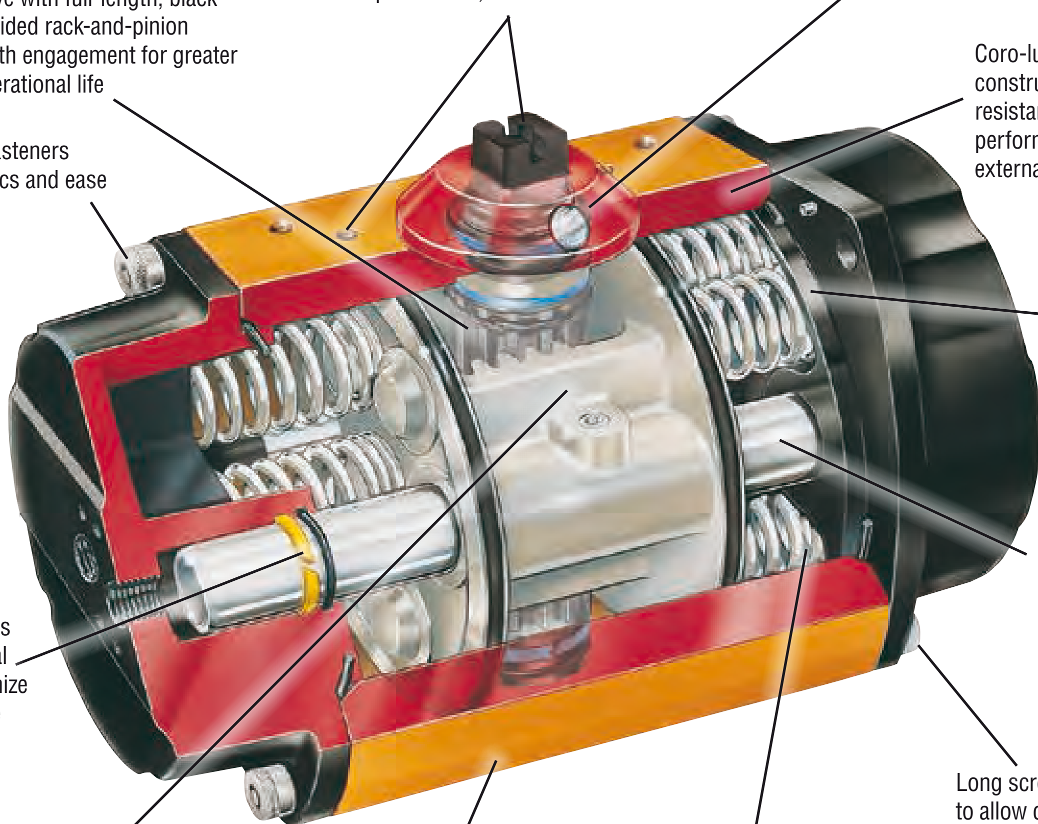
Twin-piston, double rack-and-pinion

Experience In Motion

FLOWSERVE

Series F39 Pneumatic Actuators

High cycle pneumatic power for on/off or throttling control of rotary valves and dampers



* Size 05F39 does not utilize piston guide rods.

Features and Benefits

- Available as spring-return or double-acting
- Large range of sizes for efficient torque matching
- Internal parts are factory lubricated for maximum service life
- Safe disassembly, no special tools required
- Can be mounted for fail-open or fail-closed operation
- Limit stop for accurate rotational positioning
- Standard NAMUR ancillary attachment
- International ISO5211 actuator mounting pattern

Operating Principle

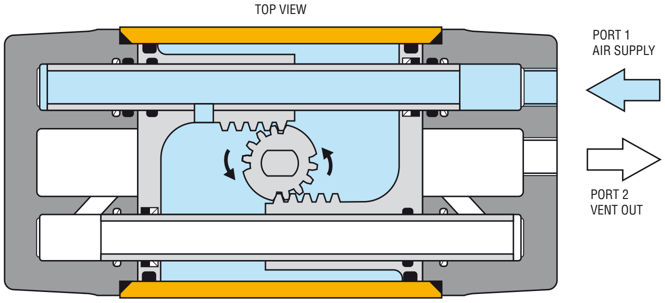
The Series F39 Pneumatic Actuator design is based on the opposed rack-and-pinion principle utilizing piston guide rods to guarantee part alignment. The fully supported guide rods minimize friction and wear between the pistons and the body bore.

In the double-acting actuator, compressed air is applied to Port 1. The air flows through the rear guide rod and enters the center chamber to push the pistons apart, turning the shaft counterclockwise (as seen from above) to open the valve. During this action, air in the end caps is vented through Port 2 via the front guide rod. Action is reversed, i.e., the valve is closed by applying air to Port 2 and venting air through Port 1.

In a fail-safe spring-return actuator, springs are located in the end caps. The number of springs in each cap depends on the available supply air pressure and required torque output. Air is supplied through Port 1 to the center chamber to push the pistons apart, which compresses the springs. During this action, air in the end caps is vented through Port 2 via the front guide rod. When air is vented out through Port 1 (via a three-way solenoid valve) the springs push the pistons back together thus closing the valve. Port 2 is continuously vented. The springs provide a dependable, safe closure in the event of electrical or air supply failure.

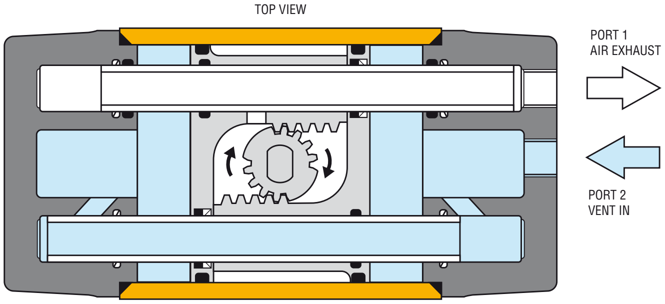
DOUBLE-ACTING ACTUATOR F39

TOP VIEW



STROKE OPENING

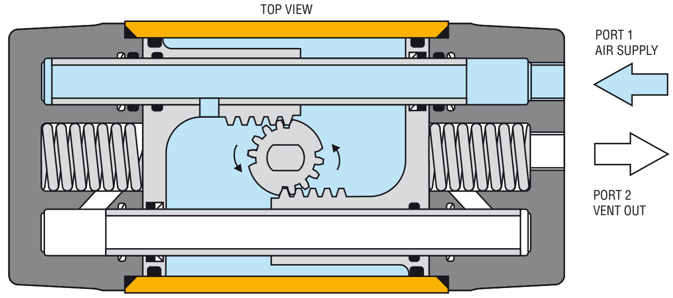
TOP VIEW



STROKE CLOSING

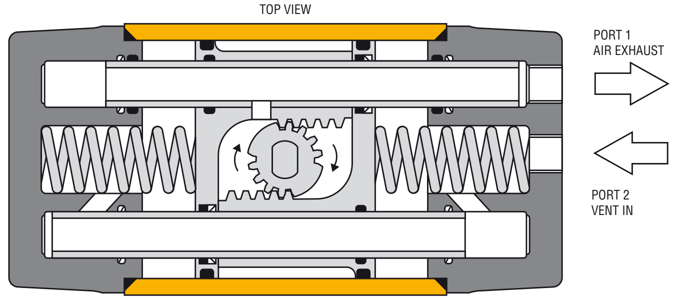
SPRING-RETURN ACTUATOR F39S

TOP VIEW



STROKE OPENING

TOP VIEW



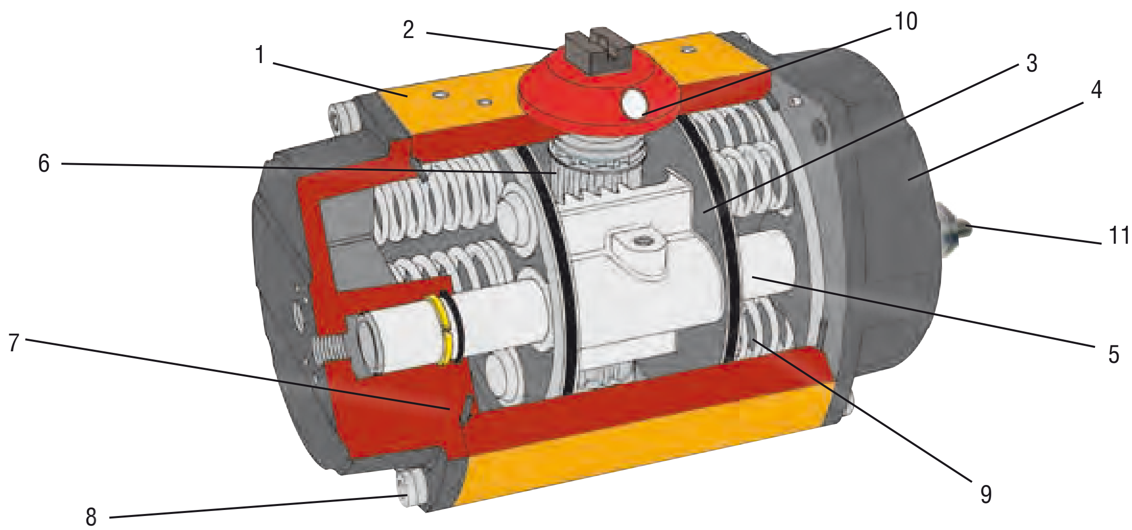
STROKE CLOSING

FLOWSERVE

Product Specifications

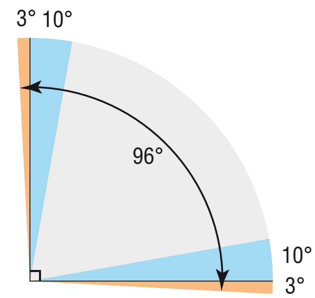
- Pneumatic Actuators are of a dual-piston design for compactness, highest torque output, minimal air consumption and even weight distribution (balanced) on the valve stem.
- Actuators are equipped with two piston guide rods to bear the lateral rack-and-pinion thrust forces, increasing piston seal life and eliminating the possibility of cylinder scratching by the pistons. Elastomeric seals are not loaded as bearings.
- The torque is generated through a double rack-and-pinion gearing mechanism with full-length, uninterrupted engagement of the rack-and-pinion teeth.
- The rack is machined as part of the piston in order to extend the actuator life and eliminate hysteresis.
- Actuator housings are protected both internally and externally from corrosion using an anodizing process.
- Single-acting actuators use multi-springs at each end to eliminate uneven forces on the pistons and are field adaptable to balance reduced pressure air supplies.
- Actuators are supplied with end mounted limit stops for accurate position control
- Actuators can have optional integral end-mounted limit switches, reducing overall height and allowing the use of the actuator pinion for manual override (cannot be combined with limit stops).
- Actuators can be supplied with integral solenoid valving without the use of transfer tubes. Valving incorporates fail-safe action upon interruption of electrical signal.

Parts List/Material Specifications



Item No.	Description	Material/Finish
1	Body	Aluminum (Extrusion) Anodized
2	Pinion	Carbon Steel (Corrosion-Resistant Nitride Treatment)
3	Pistons	Aluminum
4	End Caps	Aluminum Anodized
5	Guide Rods	Stainless Steel
6	Bearings	Acetal
7	“O” Rings	Nitrile Rubber
8	End Cap Screws	Stainless Steel
9	Springs	Chrome Silicon (Corrosion-Resistant Coated)
10	Position Indicator	Polyethylene
11	Limit Stops	Stainless Steel

End Mounted Limit Stops



Recognizing the increasing need for accurate rotation adjustment on many applications within the process industry, Worcester Controls has developed a unique method of providing this feature which is now standard on the actuator. The design takes advantage of the moving guide rods within the actuator and uses two stops in the end cap to limit their travel and therefore adjust the rotation of the actuator in both directions.

The design allows for a nominal rotation of 90° providing 3° of adjustable over travel at each end of the actuator stroke. The limit stop screws can also be used to adjust the under travel of the actuator by 10° at each end of the actuator stroke.

End Mounted Solenoid Block

The solenoid end cap of each actuator is pre-drilled to VDE/VDI NAMUR 3845 to allow rapid attachment of either a double-acting or spring-return solenoid control block.

The double-acting solenoid control block provides extremely fine and independent adjustments for speed control on the opening and closing strokes of a double-acting actuator (20:1 ratio). The double-acting solenoid control block can be overridden by manual operation of the control block spool.

The spring-return solenoid control block provides an optional adjustment for speed control on the spring stroke of a spring-return actuator. The advanced design prohibits environmental ingress to spring chamber during piston stroke extending actuator life.

Both double-acting and spring-return styles return to the actuator "closed" position (pistons together) upon electrical failure.

An extensive range of Weatherproof and Explosionproof coil options is available, along with a wide voltage selection including low-power and intrinsically safe.

Watertight Class F Coil (Type 4, 4x)

Voltage	Inrush amps	Holding Amps
24/60. 22/50 VAC	0.36	0.24
120/60. 110/50 VAC	0.08	0.05
240/60. 220/50 VAC	0.04	0.03
12 VDC	0.38	0.38
24 VDC	0.20	0.20
120 VDC	0.04	0.04

Hazardous Class H Coil (Type 4, 4x, 7, 9)

Voltage	Inrush amps	Holding Amps
24/60. 22/50 VAC	Consult Factory	
120/60. 110/50 VAC	0.10	0.05
240/60. 220/50 VAC	0.05	0.03
12 VDC	0.38	0.38
24 VDC	0.19	0.19
120 VDC	Consult Factory	

Type 7 (UL & CSA listed for Class I, Division I, groups A, B, C & D) and Type 9 (UL & CSA listed for class II E, F & G) The type 7 solenoid is also rated 4, 4x

W25NFA 2-position, 3-Way, Single Operator and W25NAA 2-position, 4-way, Single Operator

- NAMUR mounting
- Weatherproof and Hazardous Area
- Speed control – Standard
- Momentary override – Standard
- Interchangeable coils – Standard
- -40F to 180F - Standard
- Rebreather design - Standard

W25NFA Three-Way Spring-Return Solenoid

W25NAA Four-Way Double-Acting Solenoid

FLOWSERVE

Torque Output

Sizing

Determine appropriate valve torque requirements from valve literature. For double-acting actuators, select the actuator whose torque output at available air supply exceeds breakaway torque requirements of the valve. For detailed instructions, consult Worcester Controls Ball Valve Actuator Selection Manual.

For fail-closed, spring-return actuators, select the appropriate size actuator whose torque output at the end of the spring stroke (at available air supply) is sufficient to close the valve.

For fail-open spring-return actuators, select appropriate actuator whose torque output at the end of the air stroke is sufficient to close the valve For fail-open actuators, it is also necessary to determine that the torque output at the start of the spring stroke exceeds breakaway requirements of the valve.

Spring-Return Actuator Torque Output Series 05F39 (in-lb/Nm)

Model No.	Stroke	Operating Pressure psi (Bar) 50 (3.4) 2 Springs		60 (4.1) 2 Springs		70 (4.8) 2 Springs		80 (5.5) 4 Springs	
		Start	End	Start	End	Start	End	Start	End
05F39	Air	27	16	35	24	49	38	53	37
		3.1	1.8	4.0	2.7	5.5	4.3	6.0	4.2
	Spring	42	32	42	32	42	32	53	41
		4.7	3.6	4.7	3.6	4.7	3.6	6.0	4.6

Spring-Return Actuator Torque Output (in-lb/Nm)

Model No.	Stroke	Operating Pressure psi (Bar) 30 (2.0) 4 Springs		40 (2.7) 4 Springs		50 (3.4) 6 Springs		60 (4.1) 8 Springs		70 (4.8) 8 Springs		80 (5.5) 10 Springs		90 (6.2) 10 Springs	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
10F39	Air	57	27	89	60	105	60	118	60	152	91	168	89	201	114
		6.4	3.0	10.0	6.8	11.9	6.8	13.3	6.8	17.2	10.3	19.0	10.0	22.7	12.9
	Spring	70	42	70	42	105	63	140	84	140	84	175	104	175	104
		7.9	4.7	7.9	4.7	11.9	7.1	15.8	9.5	15.8	9.5	19.8	11.8	19.8	11.8
15F39	Air	115	70	181	133	193	140	239	145	284	193	335	219	399	282
		13.0	7.9	20.5	15.0	21.8	15.8	27.0	16.4	32.1	21.8	37.8	24.8	45.1	31.9
	Spring	115	74	115	74	173	112	231	149	231	149	289	186	289	186
		13.0	8.4	13.0	8.4	19.5	12.6	26.1	16.8	26.1	16.8	32.6	21.0	32.6	21.0
20F39	Air	210	128	332	243	389	257	443	274	558	389	612	404	735	513
		23.7	14.5	37.5	27.5	44.0	29.0	50.0	31.0	63.0	44.0	69.2	45.6	83.0	58.0
	Spring	210	135	210	135	315	212	419	272	419	272	525	339	525	339
		23.7	15.3	23.7	15.3	35.6	23.9	47.4	30.7	47.4	30.7	59.3	38.3	59.3	38.3
25F39	Air	345	188	549	381	637	398	730	398	925	549	1009	611	1212	797
		39.0	21.2	62.0	43.0	72.0	45.0	82.5	45.0	104.5	62.0	114.0	69.0	137.0	90.0
	Spring	379	232	379	232	568	348	758	465	758	465	947	581	947	581
		42.8	26.2	42.8	26.2	64.2	39.3	85.6	52.5	85.6	52.5	107.0	65.6	107.0	65.6
30F39	Air	577	320	912	628	1044	646	1204	690	1531	991	1682	1027	2009	1345
		65.2	36.2	103.0	71.0	118.0	73.0	136.0	78.0	173.0	112.0	190.0	116.0	227.0	152.0
	Spring	609	372	609	372	912	558	1221	744	1221	744	1522	929	1522	929
		68.8	42.0	68.8	42.0	103.0	63.1	138.0	84.1	138.0	84.1	172.0	105.0	172.0	105.0
33F39	Air	1053	564	1682	1177	1947	1221	2213	1221	2832	1859	3098	1850	3735	2460
		119	64	190	133	220	138	250	138	320	210	350	209	422	278
	Spring	1257	804	1257	804	1885	1204	2513	1611	2513	1611	3151	2009	3151	2009
		142	91	142	91	213	136	284	182	284	182	356	227	356	227
35F39	Air	1345	780	2133	1522	2478	1593	2814	1682	3717	2434	3938	2487	4752	3230
		152	88	241	172	280	180	318	190	420	275	445	281	537	365
	Spring	1451	929	1451	929	2177	1398	2903	1859	2903	1859	3629	2328	3629	2328
		164	105	164	105	246	158	328	210	328	210	410	263	410	263
40F39	Air	2142	1080	3407	2301	3983	2354	4469	2390	5620	3452	6257	3567	7523	4779
		242	122	385	260	450	266	505	270	635	390	707	403	850	540
	Spring	2487	1496	2487	1496	3726	2239	4974	2982	4974	29798	6213	3735	6213	3735
		281	169	281	169	421	253	562	337	562	337	702	422	702	422
42F39	Air	3717	1797	5974	3983	6859	3938	7744	3894	9912	6018	10859	6000	13054	8142
		420	203	675	450	775	445	875	440	1120	680	1227	678	1475	920
	Spring	4390	2593	4390	2593	6584	3885	8779	5177	8779	5177	10974	6469	10974	6469
		496	293	496	293	744	439	992	585	992	585	1240	731	1240	731
		8 springs		12 springs		16 springs		20 springs		20 springs		24 springs		24 springs	
45F39	Air	6275	3142	7965	3452	9735	3717	11505	3894	14868	6992	16470	7204	19736	10399
		709	355	900	390	1100	420	1300	440	1680	790	1861	814	2230	1175
	Spring	6107	3159	9160	4735	12213	6319	15266	7894	15266	7894	18320	9478	18320	9478
		690	357	1035	535	1380	714	1725	892	1725	892	2070	1071	2070	1071
50F39	Air	9717	4876	12169	5310	15045	5664	17700	5753	20355	10399	24877	10585	30533	15488
		1098	551	1375	600	1700	640	2000	650	2300	1175	2811	1196	3450	1750
	Spring	9647	4885	14470	7319	19293	9762	24116	12204	24116	12204	28940	14638	28940	14638
		1090	552	1635	827	2180	1103	2725	1379	2725	1379	3270	1654	3270	1654

Double-Acting Actuator Torque Output (in-lb/Nm)

Model No.	Operating Pressure psi (Bar) 30 (2.0)	40 (2.7)	50 (3.4)	60 (4.1)	70 (4.8)	80 (5.5)	90 (6.2)	100 (6.9)	110 (7.6)	120 (8.3)
05F39	34	49	60	73	87	97	106	126	137	148
	3.8	5.5	6.8	8.3	9.8	11.0	12.0	14.2	15.5	16.7
10F39	89	130	173	202	239	274	310	350	385	425
	10.0	14.7	19.5	22.8	27.0	31.0	35.0	39.6	43.5	48.0
15F39	177	248	319	389	460	531	602	673	743	814
	20.0	28.0	36.0	44.0	52.0	60.0	68.0	76.0	84.0	92.0
20F39	327	451	584	708	841	965	1097	1221	1354	1478
	37.0	51.0	66.0	80.0	95.0	109	124	138	153	167
25F39	540	752	965	1177	1389	1620	1841	2062	2283	2505
	61.0	85.0	109	133	157	183	208	233	258	283
30F39	885	1239	1593	1947	2301	2655	3009	3363	3717	4071
	100	140	180	220	260	300	340	380	420	460
33F39	1735	2390	3053	3717	4514	5195	5885	6638	7346	8054
	196	270	345	420	510	587	665	750	830	910
35F39	2124	2974	3806	4691	5531	6372	7213	8098	8983	9824
	240	336	430	530	625	720	815	915	1015	1110
40F39	3390	4717	6062	7390	8717	10169	11505	12921	14337	15753
	383	533	685	835	985	1149	1300	1460	1620	1780
42F39	5885	8319	10620	12833	15222	17638	20134	22568	25001	27435
	665	940	1200	1450	1720	1993	2275	2550	2825	3100
45F39	8806	12213	15753	19293	22833	26408	29913	33630	37170	40710
	995	1380	1780	2180	2580	2984	3380	3800	4200	4600
50F39	13620	19028	24338	29913	35400	40860	46374	51861	57348	62835
	1539	2150	2750	3380	4000	4617	5240	5860	6480	7100

Engineering Data

Stroke Time (seconds)*

Model No.	Double Acting	Spring Return	With Max.* Speed Control
05F39	Less than 1	Less than 1	10
10F39	Less than 1	Less than 1	10
15F39	Less than 1	1	15
20F39	1	1-2	15
25F39	2-3	2-3	18
30F39	3-4	3-4	20
33F39	4-5	7-8	25
35F39	4-5	8-9	25
40F39	5-6	9-10	30
42F39	10-11	11-12	36
45F39	10-12	11-13	40
50F39	12-14	13-15	60

Actuator Free Internal Volume

Open Cubic Inches (in³)	Open Litres	Close DA Only Cubic Inches (in³)	Close DA Only Litres
3	0.05	3	0.05
10	0.17	13	0.22
21	0.35	24	0.39
42	0.69	45	0.74
74	1.22	80	1.31
114	1.86	125	2.05
207	3.39	292	4.79
240	3.93	338	5.54
411	6.73	500	8.19
732	12.00	848	13.89
824	13.51	1220	20.00
1457	23.87	1861	30.50

Tubing Requirements

Under 4 ft. Run	Over 4 ft. Run
1/8"	1/4"
1/8"	1/4"
1/8"	1/4"
1/8"	1/4"
1/8"	1/4"
1/4"	1/2"
1/4"	1/2"
1/4"	1/2"
1/4"	1/2"
1/4"	1/2"
1/4"	1/2"
1/4"	1/2"

Weights lb. (kg)

Double Acting	Spring Return
1.6 (0.7)	1.8 (0.8)
3 (1.3)	3.5(1.6)
6 (2.7)	7 (3.1)
10 (4.5)	12 (5.5)
16 (7.4)	18.5 (8.4)
24 (11)	27 (12)
50 (22.5)	57 (26)
57 (26)	66 (30)
96 (43.6)	107 (48.6)
158 (71.8)	177 (80.6)
213 (97)	253 (115)
304 (138)	354 (161)

*** NOTE:** These figures are meant as an indication of obtainable speeds only. For more precise figures for any particular application, contact your Flowserve rep. Faster speeds are obtainable, if required, by using additional control equipment. Speed control with spring-return actuators only available on exhaust air (spring stroke).

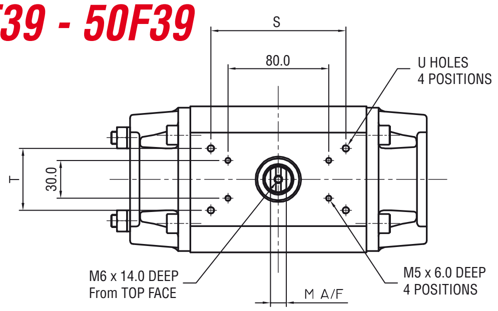
Operating Conditions

Pressure Range	30–120 psi Double-Acting, 40–120 psi All Spring-Return Versions (Standard spring-return units require 80 psi minimum. Reduced-pressure versions are available).
Media	Air or non-corrosive gas.
Temperature Range	**Standard temperature option:** Actuator only 0° to 212°F (-18° to 100°C) Actuator with Watertight Type 4, 4x or Hazardous Locations Type 4, 4x, 7 & 9 solenoid to 180°F (82°C) continuous **High temperature option** to 250°F continuous, to 300°F intermittent (without solenoid) **Low temperature option** to -40°F (without Solenoid)
Rotation	Actuators rotate in counterclockwise direction when the outer air connection is pressurized.
Movement	90° with 3° over travel and 10° under travel controllable
Supply Air	The Series F39 Actuator is factory lubricated. For optimum performance, standard filtered and lubricated air is recommended.

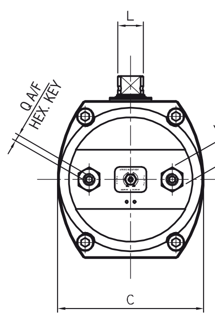
FLOWSERVE

Dimensions Sizes 10F39 - 50F39

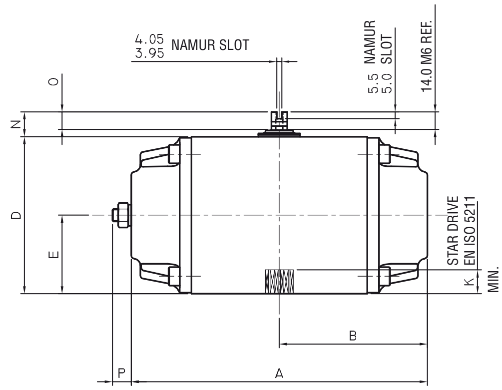
Inches (mm)

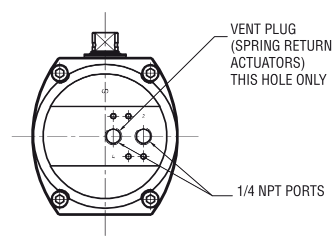


EN 15714-3 NAMUR TOP ACCESSORY MOUNTING

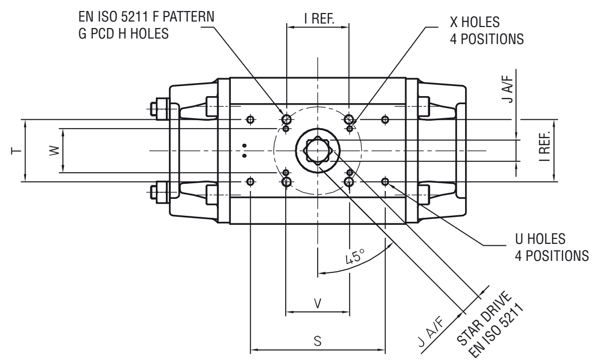


LIMIT STOP ENDCAP





EN 15714-3 NAMUR
INLET ENDCAP



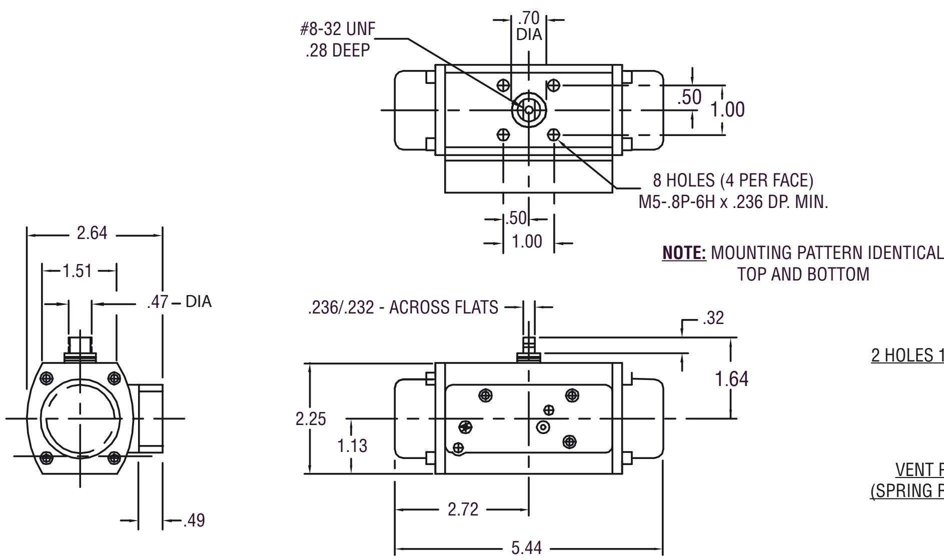
ACTUATOR MOUNTING
ATTACHMENT EN ISO 5211

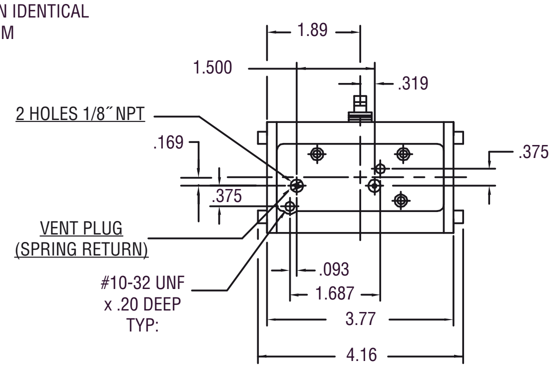
Model	Legacy Mount Dimensions		
	V	W	X
10F39	2.00 50.8	1.37 34.9	10-32 UNF x 0.3 (7.7) DP
15F39	2.00 50.8	1.37 34.9	10-32 UNF x 0.31 (8.0) DP
20F39	2.00 50.8	1.37 34.9	10-32 UNF x 0.31 (8.0) DP

Model	Basic Dimensions					Bottom ISO Mounting Dimensions						Top Pinion Dimensions				Limit Stop Dimensions			Ancillary Hole Dimensions (Note 2)		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
10F39	6.11 155.3	3.06 77.7	3.02 76.8	3.37 85.5	1.69 42.8	F04	1.65 42.0	M5 x 0.25 6.25 DP	1.17 29.7	0.43 11.0	0.47 12.0	0.59 15.0	0.35 9.0	0.79 20.0	0.63 16.0	0.39 10.0	0.16 4.0	0.51 13.0	2.87 73.0	1.25 31.8	M5 x 0.25 6.3 DP
15F39	7.69 195.3	3.84 97.7	3.70 94.0	4.09 104.0	2.05 52.0	F05	1.97 50.0	M6 x 0.30 7.5 DP	1.39 35.4	0.55 14.0	0.63 16.0	0.63 16.0	0.50 12.6	0.79 20.0	0.55 13.9	0.43 11.0	0.16 4.0	0.51 13.0	2.87 73.0	1.25 31.8	M5 x 0.24 6.0 DP
20F39	9.27 235.4	4.63 117.7	4.57 116.0	4.92 125.0	2.46 62.5	F07	2.76 70.0	M8 x 0.40 10.0 DP	1.95 49.5	0.67 17.0	0.75 19.0	0.80 20.3	0.50 12.6	0.79 20.0	0.54 13.8	0.59 15.0	0.20 5.0	0.67 17.0	4.22 107.2	1.94 49.2	M6 x 0.27 7.0 DP
25F39	10.67 271.0	5.33 135.5	5.33 135.5	5.77 146.6	2.89 73.5	F07	2.76 70.0	M8 x 0.40 10.0 DP	1.95 49.5	0.67 17.0	0.75 19.0	0.75 19.0	0.75 19.0	1.18 30.0	0.87 22.2	0.83 21.0	0.24 6.0	0.75 19.0	4.22 107.2	1.94 49.2	M6 x 0.4 10.0 DP
30F39	12.80 325.1	6.40 162.6	6.10 155.0	6.59 167.5	3.30 83.8	F10	4.02 102.0	M10 x 0.50 12.5 DP	2.84 72.1	0.87 22.0	0.94 24.0	0.87 22.1	0.87 22.1	1.18 30.0	0.86 21.9	0.91 23.0	0.24 6.0	0.75 19.0	6.34 161.1	2.87 73.0	M6 x 0.4 10.0 DP
33F39	15.70 398.7	7.85 199.4	8.11 206.0	8.43 214.0	4.21 107.0	F12	4.92 125.0	M12 x 0.70 18.0 DP	3.48 88.4	1.06 27.0	1.14 29.0	1.12 28.5	1.12 28.5	1.18 30.0	0.83 21.2	0.91 23.0	0.31 8.0	0.94 24.0	6.34 161.1	3.39 86.0	M8 x 0.5 13.0 DP
35F39	16.69 423.9	8.34 212.0	8.39 213.0	8.54 217.0	4.27 108.5	F12	4.92 125.0	M12 x 0.63 16.0 DP	3.48 88.4	1.06 27.0	1.14 29.0	1.12 28.5	1.12 28.5	1.18 30.0	0.82 20.9	1.18 30.0	0.31 8.0	0.94 24.0	8.37 212.7	4.00 101.6	M8 x 0.6 14.0 DP
40F39	20.15 511.8	10.07 255.9	9.64 244.9	10.87 276.0	5.87 149.0	F14	5.51 140.0	M16 x 0.95 24.0 DP	3.90 99.0	1.42 36.0	1.57 40.0	1.37 34.9	1.37 34.9	1.97 50.0	1.46 37.0	1.06 27.0	0.39 10.0	1.18 30.0	9.59 243.6	4.63 117.5	M10 x 0.6 15.0 DP
42F39	24.40 619.7	12.20 309.9	11.14 283.0	12.44 316.0	6.69 170.0	F16	6.50 165.0	M20 x 1.20 30.0 DP	4.59 116.7	1.81 46.0	1.97 50.0	2.00 50.8	2.00 50.8	1.97 50.0	1.36 34.5	1.18 30.0	0.39 10.0	1.18 30.0	5.25 133.4	4.00 101.6	M8 x 0.5 13.0 DP
45F39	22.67 575.9	11.34 288.0	13.19 334.9	14.70 373.5	7.99 203.0	F16	6.50 165.0	M20 x 1.20 30.0 DP	4.59 116.7	1.81 46.0	1.89 48.0	2.00 50.8	2.00 50.8	1.97 50.0	1.36 34.5	1.10 28.0	0.39 10.0	1.18 30.0	13.00 330.2	6.25 158.7	M16 x 0.95 24.0 DP
50F39	24.65 626.0	12.32 313.0	15.26 387.5	16.70 424.2	8.95 227.4	F25	10.00 254.0	M16 x 0.95 24.0 DP	Note 1	2.17 55.0	2.24 57.0	2.24 57.0	2.24 57.0	1.97 50.0	1.29 32.8	1.38 35.0	0.39 10.0	1.18 30.0	9.59 243.7	4.63 117.5	M10 x 0.6 15.0 DP

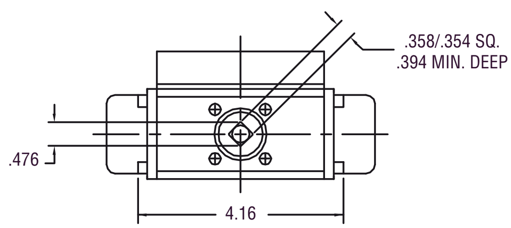
1. The model 50F39 uses 8 mounting holes on a 10.0 inch (254mm) PCD distributed evenly about the center lines of the actuator.
2. On models 42F39, 45F39 and 50F39 ancillary mounting holes are only on the top of the actuator, on 40F39, only on the base. These sizes also have a location spigot on the base of the actuator in accordance with ISO 5211

Dimensions Size 05F39
Inches





Double-Acting Actuator End Cap Detail



Spring Return Actuator End Cap Detail

How to Order

10	E	F39	S	W	Z	120A	-----	----
Actuator Sizes	**Special Services**	**Series**	**Operating Mode**	**Solenoid**	**End Mount Limit Switches**	**Solenoid Voltage**	**Spring Return Supply Pressure**	**Options †**
05 10 15 20 25 30 33 35 40 42 45 50	Blank - None 9 - Fail-Open Mount H - High Temperature** (N & SN Models Only) E - End mounted Limit Switch Module* L - Low Temperature** (N, SN, W models only)	F39	Blank - Double Acting S - Spring Return	W - Watertight Solenoid (Type 4, 4x) X - Hazardous Locations Solenoid (Type 4, 4x, 7 & 9) N - No Solenoid	(must specify "E" in Special Service Column)† Z - Watertight/Hazardous Locations, SPDT Switches ZD - Watertight/Hazardous Locations, DPDT Switches Z1 - Watertight/Hazardous Locations, 2-Wire AC/DC Proximity Sensors	12D - 12 DC 24D - 24 DC 24A - 24/60 AC 120A - 120/60 AC 240A - 240/60 AC	Blank - 80 psig 7 - 70 psig 6 - 60 psig 5 - 50 psig 4 - 40 psig	V54 - SST Springs (Sizes 10-30 only) V90 - Reverse Rotation (FCCW) V95 - NorGuard Severe Service Actuator*** V96 - CE Marking***

† Not available on Series 05F39.

* NOTE: Not available with end mounted travel stops. Top-mounted travel stops available on 10-30 Sizes only - consult factory. End-mounted travel stops standard on all size 10-42 actuators, excluding end mount switches.

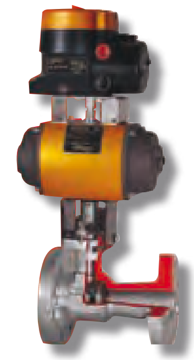
** NOTE: Consult Factory for high and low temperature solenoid variations.

*** NOTE: Applies to actuator only.

Positioners and limit switches

Pulsair® Zero Air Bleed Positioner

For pneumatically actuated control valves such as the characterized seat control valve shown here, Flowserve offers the Pulsair® loop-powered positioner with auto-calibration and zero air bleed. Operated by a 4-20 mA analog signal, Pulsair's® microprocessor and three-button keypad provide on-site automatic calibration, split-range, speed adjustment, fault delay etc. Available with HART Protocol®, FOUNDATION Fieldbus and Profibus.



Position Indication Switches

The UltraSwitch series of position indicators provides a compact and economical package for both visual and remote electrical indication of valve position. Hazardous location approvals and corrosion resistant materials make the Worcester Controls rotary position indicators ideal for even the most hostile environments.

End-mounted Limit Switches (CSA and FM approved)

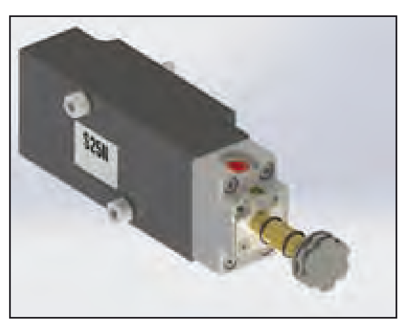
Where compact installation is required, an end-mounted limit switch module is available. This module comes as a combined Watertight TYPE 4 and Hazardous Location (Class I, Division 1,2, Group C, D; and Class II, Division 1, 2, Group E, F, G) and comes with two SPDT or two DPDT mechanical switches. It is also available with SPST AC or DC proximity switches.

Solenoid Accessories

S25N NAMUR / In-Line solenoid

- Standard NAMUR or In-Line options
- 3-way or 4-way convertible
- Interchangeable coils

NAMUR accessories include speed control, actuator ingress protection and lockout and vent module



Accessories and Options

NorGuard surface treatment can be supplied for severe service protection.

NorGuard coating complies with:

- MIL-A-63576A-Type 1-Aluminium Oxide Coating - Lubrication
- MIL-A-8625 (Anodic Coatings)
- ASTM B 117 (Salt Spray Testing)

Declutchable Gear Override

Also Available:

- Top-Mounted, Stainless Steel Rotary Switches
- Stainless Steel Springs
- Fast Acting

ACCESS™

Limit switches, solenoid and diagnostics integrated with the actuator

There's never been this much performance in such a small package - until now. ACCESS is an industry innovation which integrates the pneumatic actuator, limit switches, solenoid and diagnostics into a single package!

The ACCESS is available for either conventional wiring applications or for simple communications with the most common digital protocols.

The ACCESS is significantly more compact than conventional actuators with accessories and eliminates unnecessary brackets, couplings and additional enclosures. Advanced digital technology provides instant valve/actuator status. A simple cable connection - for both power supply and communications - reduces engineering time, wiring and installation costs.

Member of ASI Trade Organization and the Open DeviceNet Vendor Association

FLOWSERVE

Worcester Controls
CPT Characterized Seat Control Valve
Customized Control for Severe Throttling Services

Experience In Motion

Flowserve Worcester CPT Characterized Seat Control Valves

After years of research and performance evaluation under severe throttling services, where precise computer control was required, Flowserve Worcester Controls has developed the CPT characterized seat control valve series. These valves exceed the performance features of traditional linear valves, as well as that of segmented ball and eccentric plug designs.

The CPT characterized seat control valve is a ball valve, but that's where the similarity ends. The control capacity is defined by a revolutionary seat technology. These seats consist of a sintered stainless steel material that has been fully impregnated with TFE or Graphite, then laser-cut to a customized shape to best suit the individual application.

Combine these capabilities with Flowserve's high-cycle pneumatic, electric, or electro-pneumatic actuators, positioners, and accessories, and you have a control valve package that will meet the performance capabilities available with computers and PLC controllers.

- Precision control
- Zero external leakage
- High cycle capability
- Interchangeable characterized seats
- High rangeability (turn down)
- Efficient shearing action for solids and fibers
- Tight shutoff–bubbletight
- Low maintenance, few parts
- Compact design, light weight
- High flow capacity
- Energy efficient

Advanced Control Technology

Look beyond traditional globe control valves to a valve technology that gives you high pressure drop capability with straight-through flow, precision control, shearing action, erosion control and bubbletight shutoff. This technology is the CPT's self-lubricated, full contact seat of sintered stainless steel impregnated with TFE or graphite. The flow characteristic is laser cut to a "V" shape, slots, or customized shapes to meet any control requirement. The V-shaped port is available in seven standard angles for equal-percent characteristic with capacity closely matched to system needs. The lubricating action of the special coating on the ball and TFE or graphite impregnation throughout the thickness of the characterized seat results in amazingly smooth, stable throttling control.

The characterized seat design allows use of exotic materials such as Inconel 600®, Hastelloy C22®, Stellite 6 or Monel®.

FM Oil and Gas Safety Shutoff

The ¼"–2" CPT 44 series valves and ½"–4" CPT 51/52 valves with Pulsair III are approved by Factory Mutual for oil and gas safety shutoff service and flow control. For further information, contact the Custom Products Department.

Standard ΔP Capabilities

Liquids to 500 psi

Steam to 300 psi

316 sintered metal seats are impregnated with TFE or graphite to provide positive shutoff and lubrication when contacting the hard coated ball.

Characterized Seats with Metal A (TFE impregnation) or Metal G (graphite impregnation) are available in sizes ¼"–4".

A High Pressure Drop Control Valve with Custom Characteristics and Bubbletight Shutoff

The characterized seat control valve gives you extremely accurate control through the entire valve stroke with seat openings designed specifically for your process. This design means efficient, straight-through flow, rotary shaft sealing and bubbletight shutoff.

The seat design makes a throttling control valve that is both forgiving and accommodating. If a valve is sized incorrectly or if process conditions change, you can change the Cv and/or the control characteristic by merely changing out the seat.

At last! A control valve that shuts off bubbletight. The floating ball concept and Worcester Controls proprietary metal CPT seat design allows the valve to be bi-directional and still exceed ASME Class VI shutoff. The unique design of the Worcester CPT utilizes both a 316 stainless steel metal seat and a resilient seat, allowing for less operating torque than traditional ball control valves.

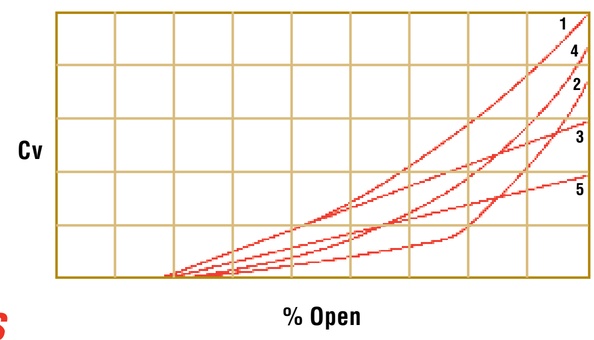
- Characterized seat
- Resilient or round metal seat

The characterized seat control valve is a bi-directional valve.

Flowserve recommends that the CPT seat be located in the downstream position in applications where the potential for erosion exists so any potential damage will occur away from the valve body. This is a major improvement in applications where damage by erosion in the valve body has been an expensive and time consuming problem.

Control Valve Sizing Software

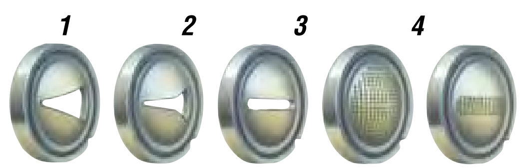
Flowserve Performance! Software is now available to support your applications and project activities. Order your copy of Performance! today! For more information, or to download a trial version, go to http://performance.flowserve.com.



Virtually Limitless Seat Designs

The V-shape of the standard seat (1) in CPT characterized seat control valves is precision laser cut and offers inherent modified equal percentage flow characteristic. Slotted seat valves (3) have inherent linear flow characteristics. If your requirements are different, we change the seat cut. Seats with multiple ports and custom openings (2, 4, and 5) are available to meet your unique control needs.

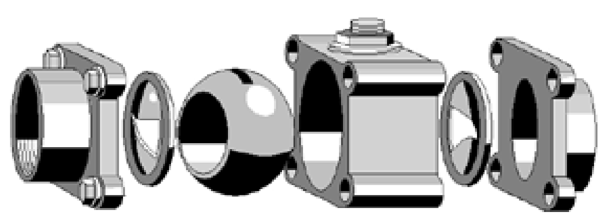
Simple changeout of the seat permits change of valve characteristic to match your process requirements.



Vee-Twin Valves for the Most Severe Applications

Flowserve offers the CPT Vee-Twin for more severe applications. The Vee-Twin design combines two CPT seats into one body for staged pressure reduction. This results in better resistance to cavitation and reduced noise.

In addition to providing excellent resistance to cavitation, the dual Characterized V-port seats are not subject to fouling like conventional anticavitation trims that utilize many small holes. The Vee-Twin allows relatively large particles to pass through the valve, and the shearing action of the ball against the seat slices off fibrous contaminants and cleans the seating surface in every cycle.



Seat leakage is less than allowed by ANSI Class IV. The Vee-Twin option is available on all versions of the CPT, but special actuator sizing applies. Refer to page 22 for actuator sizing data and for flow coefficients, refer to page 20.

Complete Piping Versatility

One Control Valve, Six Valve Configurations, Hundreds of Characteristics

The CPT control valve is not locked into one body style. Now you can choose a characterized seat control valve for the compactness of skid-mounted systems, the ruggedness of flanged piping, the high pressure integrity of welded systems, and the leakproof containment of sterile fluids*, cryogenics*, and chemicals in the EPA's Toxic Release Inventory.

Valve Configuration
Cryogenic design,
Three-piece (shown) or flanged

Model
C44, C51/C52

Sizes
¼", ½", ¾", 1", ½", 2", 3", 4"

Pressure Rating
1000 psi max.

End Connections
Screw end, socket weld, butt weld,
ASME Class 150 or 300 flanges

Valve Configuration
Wafer

Model
CPT 151, CPT 301

Sizes
3", 4"

Pressure Rating
ASME Class 150, ASME Class 300

End Connections
Wafer – for use between ASME
Class 150 or Class 300 flanges

Valve Configuration
Flanged

Model
CPT 51, CPT 52

Sizes
½", ¾", 1", 1½", 2", 3", 4"

Pressure Rating
ASME Class 150, ASME Class 300

End Connections
ASME Class 150 or Class 300
raised face flanges

Valve Configuration
Three-piece

Model
CPT 44

Sizes
¼", ½", ¾", 1", ½", 2"

Pressure Rating
1000 psi max.

End Connections
Screw end, socket weld, butt weld

Valve Configuration
Anti-fugitive emission three-piece

Model
CPT 94

Sizes
¼", ½", ¾", 1", 1½", 2"

Pressure Rating
1000 psi max.

End Connections
Screw end, socket weld, butt weld

Valve Configuration
Anti-fugitive emission flanged

Model
CPT 94

Sizes
½", ¾", 1", 1½", 2", 3", 4"

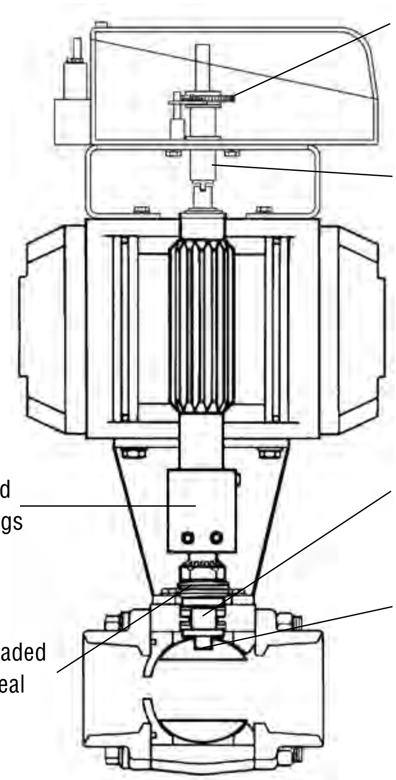
Pressure Rating
ASME Class 150, 300, 600

End Connections
Raised face flanges

** Characterized seat clean valves and cryogenic valves are available through Flowserve's Custom Products Department.*

Advanced Stem Design for Low Hysteresis, High Repeatability and Leak-Free, Stick-Free, High-Cycle Operation

Flowserve Worcester Controls CPT characterized seat control valves represent a profound improvement over traditional globe and rotary valves that use heavy linear actuators, crank arms, and associated linkage. Worcester Controls has eliminated significant hysteresis and assured repeatability by powering through a solidly clamped, in-line stem. All shafts operate together: actuator, positioner, valve stem. The design also eliminates side load on the valve stem because components (valve, actuator, positioner) are mounted symmetrically and forces are balanced. This extends valve seal life far beyond conventional valves.

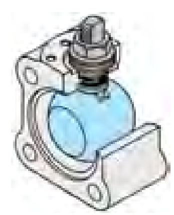


High-Performance Stem Seals

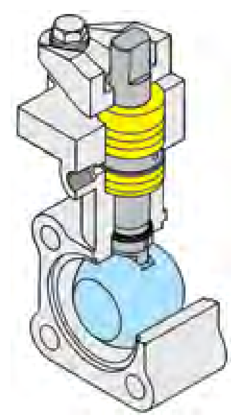
A new stem seal design, consisting of PEEK and Polyfill® thrust bearings and seals, significantly increases valve cycle life over conventional control valves and extends time between adjustments. The stem seal is live loaded to compensate for wear or thermal effects. Valve action is rotary. This means that toxic fluids, flammable fluids, and fluids that tend to crystallize or oxidize upon contact with atmosphere are fully contained and do not inhibit the freedom of motion of the valve.

Stem Seals for EPA Requirements

For an extended leak-free process environment, extended temperature application, and to meet EPA requirements, Worcester Controls offers the CPT 94 Control Valve. The Series CPT 94 valve is a NACE compatible, rugged, throttling ball control valve for fluids such as chlorine, phosgene, and many toxic liquids and gases. All Worcester Controls standard and characterized seats are available in this valve configuration. The heart of the Series 94 valve is a large diameter stem with double, live-loaded seal, and a Lantern-Ring connection. The connection may be used to detect and channel unlikely leakage from the primary seal, or may be used to create a liquid/gas seal for the stem, or for a steam purge to provide a sterile packing. A second connection is optional. Seal loading is kept constant with a series of Belleville washers. The standard seal consists of a TFE box ring with TFE V-ring packing. Graphite packing is optional.



Standard high-cycle, live-loaded, high-performance stem seal



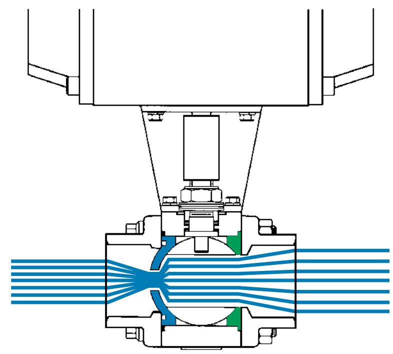
Series CPT 94 high-cycle, anti-fugitive emission stem seal

Applications

Steam Control

Controlling steam pressure is not easy. Typical problems associated with globe control valves in steam service have been stem leakage, sticking, poor shutoff, and high maintenance. Linear stem valves require frequent packing adjustment and over-tight packing may create added stem friction that could cause controller instability. Furthermore, Class V, IV, or III shutoff is usually too much leakage for many applications requiring tight shutoff.

Worcester Controls characterized seat valves solve these problems with tight shutoff exceeding Class VI. Self-compensating rotary stem seals and tailored seat characteristics provide a ramp-up condition quickly while maintaining precision low-flow control. Thousands of CPT valves are successfully operating in steam systems where globe valves were originally used. A typical user reaction: "We are removing our globe valves and replacing them with Worcester Controls characterized seat control valves because they work better and control better."



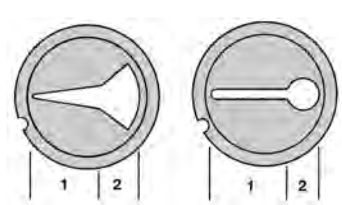
Toxic Fluids

Traditional rising stem globe valves cannot stand up to the demanding specifications implemented by the EPA, OSHA and other regulating agencies. The very nature of the design, even with double packing and/or bellows seals have relatively short cycle lives compared to rotary seals. The Series CPT 94 control valve shown on page 6 has been certified by third party testing, allowing less than 25 ppm leakage, whereas EPA requirements are 500 ppm. Self-adjusting stem seals with multiple Belleville washers make this valve ideal for throttling toxic chemicals.

pH Control

Low flow rates associated with pH process control loops require valves with very small openings. This creates a major problem in traditional rising stem control valves if any solids larger than the valve opening are in the system. Unfortunately, in most pH systems, it is impossible to eliminate solids in the liquid stream. They often clog control valves. This results in having to shut the line down and disassemble the valve for cleaning.

The CPT is the ideal control valve for pH control when using a low flow opening and solid removal hole. The special opening of the pH control seats, shown, provide the most ideal throttling characteristics and turndown while allowing solids to move out of the larger opening. Also, erosion problems are minimized and the valve body is protected since the vena contracta is located outside the valve body.



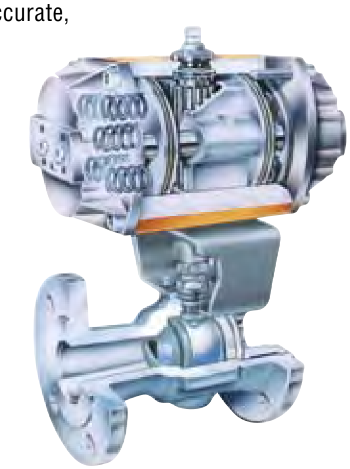
Applications

Cryogenics

Compactness, balanced weight, precision control, tight shutoff, and long service life are features considered unique and unmatched by conventional control valve designs and styles. The cryogenic characterized seat valve is also designed to handle large temperature swings with its special seats and self-compensating rotary stem seal design. All this has made CPT an ideal control valve for low temperature and cryogenic applications such as freezing systems, lyophilization systems, high-purity gas systems, terminal loading stations, over-the-road CO_2, LNG food carriers, and air separation systems. The characterized valve provides tailored flow characteristics for each process—in the body and trim materials you require. CPT valves can be easily and economically controlled by Worcester Controls Series 39 pneumatic or Series 75 electric actuators.

Series 39 Actuator

The heart of our pneumatic automation package is the Series 39 actuator. A Worcester Controls innovation, the Series 39 is an accurate, compact, powerful, double-piston, rack-and-pinion actuator with an impressive track record for reliability. That's why we back it with an exclusive two-year warranty. One plant reported 14 million complete cycles without appreciable original seal wear.



Piston tilting is prevented due to unique guide rods that always keep the pistons parallel with each other and perpendicular to the cylinder. This feature enables the Series 39 actuator to match the performance of diaphragm actuators in terms of high resolution. Internal friction is reduced with a nickel acetate-coated cylinder, low coefficient-of-friction acetal resin bearings and a special permanent lubricant with corrosion inhibitors.

Worcester's control valve packages are designed to function with virtually no inherent hysteresis, an important feature in throttling control. Precision parts within the Series 39 actuator permit very high torque performance with minimum backlash.

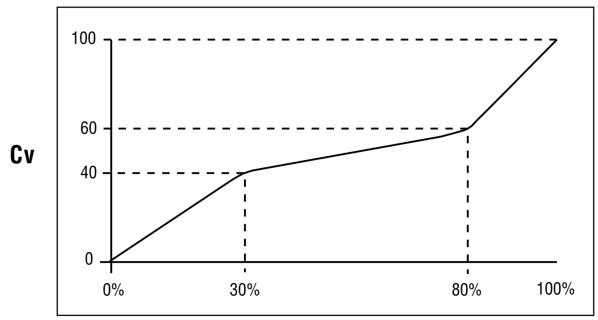
Series 75 Actuator

Presenting the ultimate actuator package for electronic process control: the Series 75. Ideal for analog or digital controlled systems where pneumatic control is neither possible nor desirable.

The Series 75 actuator adds a new dimension of operational dependability and flexibility to modern processes controlled by computers and programmable logic controllers. It is compact and powerful. Its brushless, split phase capacitor, start/run reversing AC motor or rugged and powerful DC motor, drives the valve through a permanently lubricated gear train which offers virtually lifetime maintenance-free, dependable operation. Precision throttling control is achieved by a choice of electronic positioners and controllers that can work with digital or analog control loops. A variety of options allow you to select the performance criteria, diagnostic data and feedback information you desire.

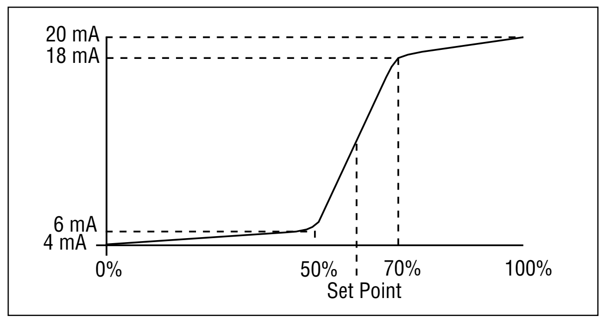
New Technology – Positioners and Accessories

Now is your opportunity to stop oscillation or hunting in your process. Most process control loops are unstable due to an improper valve characteristic, positioner characteristic or both. The Worcester Controls CPT characterized seat control valve with either the Pulsair III or DataFlo positioner puts a permanent stop to these problems. It is done by tailoring the characterized seat opening and free characteristic curve of the positioner for each process loop. Install our control valve package in any of your flow, temperature, pressure, vacuum or other demanding or critical control applications and find out how our new technology can give you the precise control you have always looked for but couldn't achieve with traditional control valves and positioners.



20% Cv change for 50% valve rotation is a tailored CPT valve characteristic. Result is 0.1°F control of temperature or 0.1 psi pressure control.

Valve Rotation



Above free tailored characteristic programmed in Pulsair III or DataFlo uses 75% of the available signal to move the valve around the set point position by only 20%.

Flowserve offers all the accessories you need for precise control valve positioning and position feedback.

For pneumatically actuated control valves

The Pulsair III loop-powered valve positioner with auto calibration and zero air bleed is a totally new concept in pneumatic control valve positioning. Operated and controlled by a 4–20 mA analog signal, Pulsair III is microprocessor-based with piezoelectric valves. Air is pulsed to the actuator pistons, eliminating constant air bleed and providing very accurate positioning without overshoot. With a 100-plus-function menu and a five-button keypad, you can automatically calibrate the positioner, change valve action, split range, modify the control characteristic and select many other control parameters. Intrinsically safe option available. Ask for brochure FCD WCABR1019.

Through-cover display
XP enclosure

For electrically actuated control valves

The DataFlo P™ Positioner, controlled by a 4–20 mA analog signal from a PLC or digitally from a computer, gives you calibration, monitoring and diagnostics both on-site or from a control room computer. This dramatically increases system dependability and lowers valve calibration, monitoring, and maintenance costs.

DataFlo P®

SMART POSITIONER

An electronic positioner with a built-in microcontroller for precise process control

DataFlo P controls your process better and turns your final control element into an efficient digital communications platform. Standard PM15 positioners are offered for 3–15 psi pneumatic control and AF17 positioners for analog control of electrically actuated control valves. Refer to brochures FCD WCABR1032 and FCD WCABR1000.

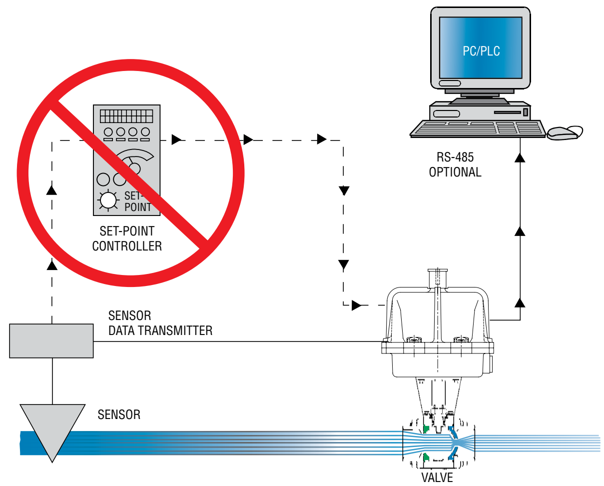
Three-button keypad for on-site calibration and functional setup

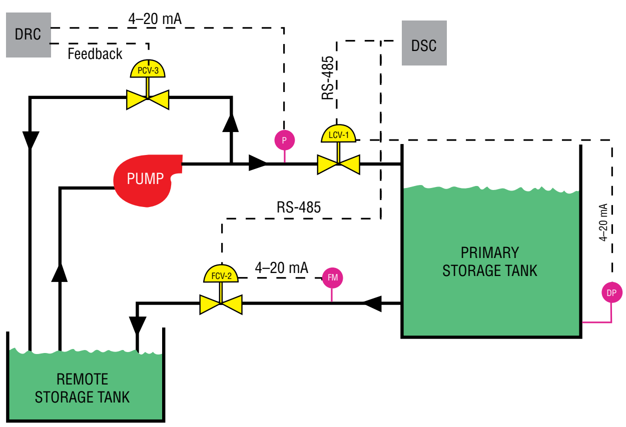
New Technology – Direct Process Control

The DataFlo C™ controller is a fresh approach to PID control. This combination microcontroller-based PID single-loop controller and final control element brings control to the point of use. The rugged compact package simplifies wiring requirements by directly accepting RTD, analog or thermocouple inputs.The signal does not have to be conditioned, improving reliability. All the parameters are easily programmable through the local keypad or via a simple RS-485 computer interface. The control valve/PID controller is easily tuned to the loop with the built-in auto tune program (excluding level control). Refer to brochure FCD WCABR1021.

PC/PLC/Computer Interface and Manual Valve Control

Remote interface capability allows the user to monitor their process and change the controller settings. An additional feature allows the user to take the controller off-line and operate in a manual positioning mode. The user can switch between PID control and a linear positioning mode by a discrete 24 VDC output from the PLC. An operator can also change set point input via an analog input to the controller.





Process Control Solutions

LCV-1: Level control – differential pressure
DataFlo supervisory controller (process interface)

FCV-2: Flow control (tank discharge) – flow meter
DataFlo supervisory controller (process interface)

PCV-3: Pressure control (pump bypass) – pressure transducer
DataFlo remote controller (process interface)

DRC/DSC

Flowserve introduces two new products that allow the customer the capability to control and monitor their process control valves from a remote location.

The DataFlo Remote Controller (DRC) is specifically designed to interface with electrically actuated control valves. This combined positioner-controller accommodates multiple I/O options for both set point and process inputs. Performance monitoring and maintenance diagnostic data is available locally for “real time” user interface and remotely for predictive maintenance programs. The DRC is packaged in a NEMA 4X enclosure and features a splash-proof keypad and bright alphanumeric LED display for user-friendly interface.

The DataFlo Supervisory Controller (DSC) is designed to interface with multiple process control valves via a two-wire fieldbus network. The DSC provides interface process control and performance monitoring for a maximum of 31 process control loops. (Performance monitoring and maintenance diagnostic data is available locally for “real time” user interface and remotely for predictive maintenance programs.) The DSC is packaged in a NEMA 4X enclosure and features a 16-key splash-proof keypad and four-line “avionics” grade LED display for user-friendly interface. The DSC is a cost effective solution that eliminates expensive traditional “PLC” type systems with central control and point-to-point wiring.

Specifications

Characterized Seat Control Valves

CPT 51/52 Flanged Control Valves

Valve Size: ½", ¾", 1", 1½", 2", 3", 4"

Valve Pressure Class:
CPT 51 – ASME Class 150 flanges
CPT 52 – ASME Class 300 flanges

Body and End Plug Materials:
Carbon steel, 316 stainless steel
Other materials available upon request.

Stem Seal Assembly:
PEEK and Polyfill (½"–2")
Refer to Series 51/52 brochure.

Maximum Valve Temperature: 650°F
For higher temperatures consult Flowserve.

C44, C51/C52 Cryogenic Control Valves

Valve Size: ¼", ½", ¾", 1", 1½", 2" (three-piece valves) 1"–4" flanged valves

Valve Pressure Class:
ASME Class 600 (This is the body pressure rating.)
Seat selection may derate the valve.

Body and Pipe End Materials:
Carbon steel, 316 stainless steel
Other materials available upon request.

End Connections:
Screw end, socket weld, butt weld

Stem Seal Assembly:
PEEK and Polyfill — Refer to Series 44 brochure.

Maximum Valve Temperature: 600°F
For higher temperatures consult Flowserve.

CPT 44 Three-Piece Control Valves

Valve Size: ¼", ½", ¾", 1", 1½", 2"

Valve Pressure Class:
ASME Class 600 (This is the body pressure rating.)
Seat selection may derate the valve.

Body and Pipe End Materials:
Carbon steel, 316 stainless steel
Other materials available upon request.

End Connections:
Screw end, socket weld, butt weld

Stem Seal Assembly:
PEEK and Polyfill — Refer to Series 44 brochure.

Maximum Valve Temperature: 650°F
For higher temperatures consult Flowserve.

CPT 151/301 Wafer Control Valves

Valve Size: 3" and 4"

Valve Pressure Ratings: To ASME Class 150 and 300

Body and End Plug Materials:
Carbon steel, 316 stainless steel

Stem Assembly:
PEEK and Polyfill — Refer to Wafer Ball Valve brochure.

Maximum Valve Temperature: 650°F
For higher temperatures consult Flowserve.

CPT 94 Three-Piece and Flanged Control Valves

Valve Size: ¼", ½", ¾", 1", 1½", 2" – three-piece valves
½", ¾", 1", 1½", 2", 3", 4" – flanged valves

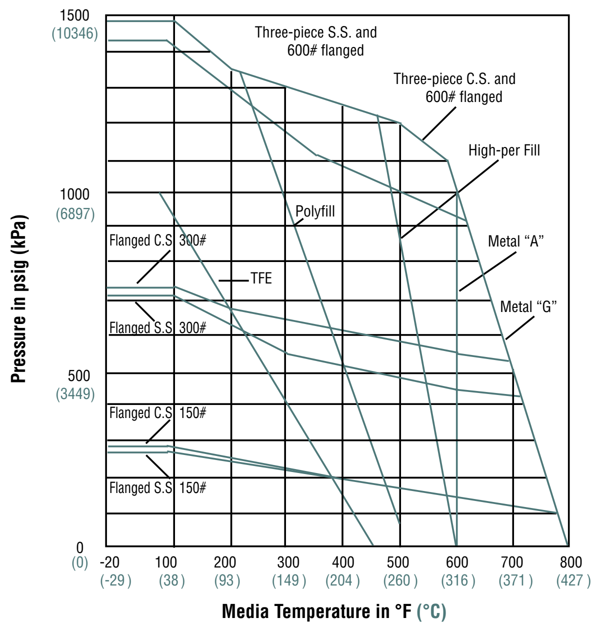
Valve Pressure Class:
ASME Class 600 – three-piece valves
ASME Class 150 and 300 – flanged valves

Body and Pipe End or End Plug Materials:
Carbon steel, 316 stainless steel

Stem Assembly:
Dual stem seal of TFE and/or Grafoil, 35% carbon-filled
TFE or Grafoil — Refer to Series 94 brochure.

Maximum Valve Temperature:
600°F with Metal “A” characterized seat
800°F with Metal “G” characterized seat

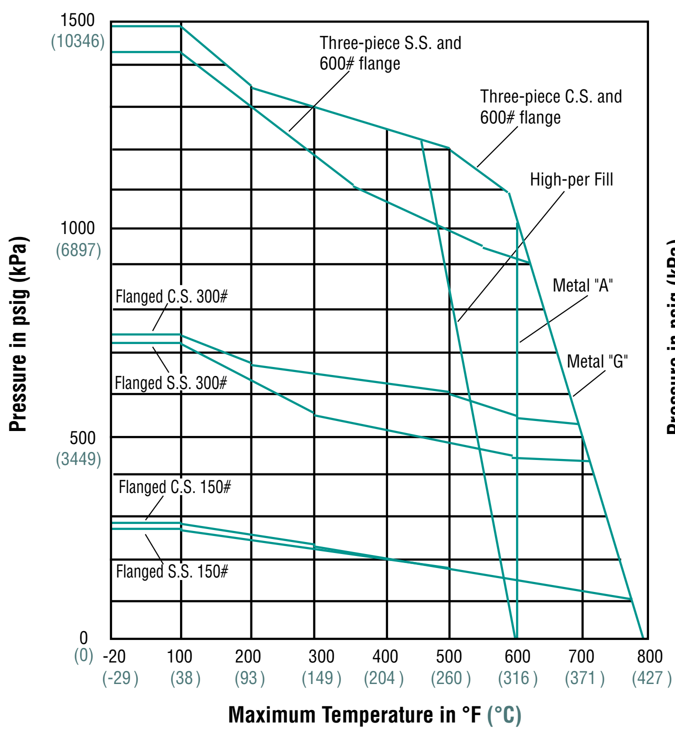
*Series 44, 4, 51/52, 151/301 Pressure/Temperature Ratings**

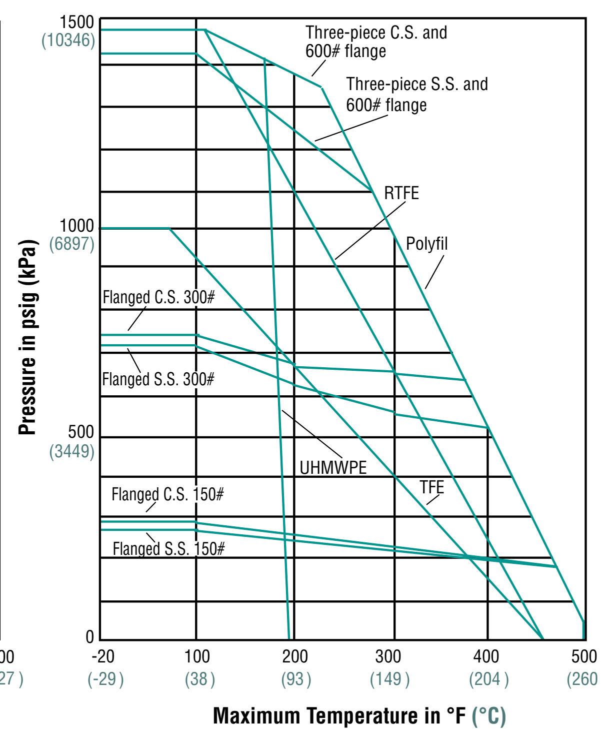


* *For applications above 650°F, use Series CPT 94 valve.*

Series CPT 94 Pressure / Temperature Rating

NOTES: Body seals have pressure/temperature ratings that equal or exceed the rating of the seat. TFE body seals will not withstand thermal cycles in excess of 200°F.





General Specifications

CPT Control Valves

Valve Size: ¼" ½", ¾", 1", 1½", 2" three-piece valves

Characterized Seat:

Metal "A", TFE-impregnated sintered stainless steel Metal "G", graphite-impregnated sintered stainless steel Optional materials available, consult Flowserve.

Characterized Seat Back Seal:

Graphite; optional Polyfill, silicone
Encapsulated TFE O-ring or Viton

Second Seat (Round):

TFE, Polyfill, High-per Fill, Metal "A", Metal "G"

Ball: 316 stainless steel, hard nickel-coated; optional materials available.

Valve Orientation and Shutoff:

Characterized seat upstream standard.

Shutoff is bubbletight.

Characterized seat downstream recommended for applications involving cavitation and flashing.

Shutoff exceeds requirements of ASME and ISA Class VI.

Standard Pressure Drop Limits:

300 psi – Steam
500 psi – Liquid service
Note: Consult Flowserve for applications about this pressure.

Recommended Product Specification for Characterized Seat Control Valves

Available with special stem design to meet fugitive emission requirements.

Impregnated Metal Seats – Graphite or TFE-impregnated in 316 stainless steel or other metals.

Metal seats to be full size (same as the resilient seats) in order to provide for ability to handle 800°F, pressures up to 1440 psig and pressure drops to 500 psi for liquids and 300 psi for steam.

Seats to be available in various openings for specific Cv and specific characteristics.

Seats to be available with a slotted opening for linear control characteristics.

Valves to offer rangeability in excess of two hundred to one if needed.

Valves to be bi-directional.

Valves to be available with a resilient upstream or down-stream seat to reduce torque and provide tight shutoff.

Ball to be round and be coated with a hard nickel coating to provide for smooth control and long life.

Ball and stem engagement to be free of play to eliminate hysteresis.

The characterized seat to provide for shearing action in handling slurries and to be abrasion resistant.

Valve to be equipped with compact rotary pneumatic or electric actuator.

The valve should be available with inherent characteristics, linear and equal percentage or other characteristics as needed.

The valve to be rotary design, compact and low weight.

The valve to be available in one-piece flanged, flangeless wafer design, or three-piece body with various end connections.

The valve should be constructed with minimum parts and be easy to repair if necessary.

Valve Torque:

Before the actuator can be sized for any given application, determine the amount of torque required by the valve.

For complete valve operating torque data, refer to the Worcester Controls Actuator Sizing Manual. This publication explains the concept of valve torque, presents torque curves for each material, and provides output torque figures for the Series 39 pneumatic and Series 75 electric actuators.

Pneumatic Control:

Series 39 Actuator — Refer to brochure FCD WCABR1003.

Pneumatic Control Options:

PM-15 Pneumatic and Electro-Pneumatic Positioners — Refer to brochure FCD WCABR1032.

MAStermind dribble feed control

Pulsair Analog/Digital Positioner — Refer to brochures FCD WCABR1018 and FCD WCABR1019.

Electronic/Computer Control:

Series 75 Actuator — Refer to brochure FCD WCABR1014.

Electronic Control Options:

Step Control: I-75 Circuit Board — Refer to brochure FCD WCABR1046.

Analog control: AF 17 Positioner — Refer to brochure FCD WCABR1000.

Digital/Analog Control: DFP-17 Positioner — Refer to brochure FCD WCABR1021.

P.I.D. Control: DFC-17 Controller — Refer to brochure FCD WCABR1021.

How to Order Characterized Seat Control Valves

1"	CPT 44	4	6	P	M	SE	A30
Valve Size	**Valve Series**	**Body/Pipe Ends**	**Ball /Stem**	**Round Port Seal**	**Body Seals**	**End Connections**	**Specify Characterized Seat**
¼" **½"** **¾"** **1"** **1 ½"** **2"**	**CPT 44** **CPT94** 3-piece **C44** Cryogenic*	**4:** Carbon Steel **6:** 316 Stainless Steel **7:** Monel*** **A:** Alloy 20*** **C:**Hastelloy-C*** **1:** Brass	**6:** 316 Ni Plt Ball, 17-4 stem **S:** Stellite Ball, 17-4 stem **C:** Hastelloy C Ball, Hast-C stem***	**T:** Virgin PTFE **P:** Polyfill **H:** High-Per-Fill **A:** Metal A **C:** Hastelloy-C **G:** Metal G **S:** Stellite 6 **U:** UHMWPE **V:** Vee-Twin****	**M:** 316/TFE "S" gasket **G:** Grapite/316 "S" gasket **T:** PTFE **B:** Buna **N:** Neoprene **E:** EPDM **U:** UHMWPE **V:** Viton	**SE:** Female NPT **BW1:** Buttweld Sch 10 (SS only) **BW4:** Buttweld Sch 40 **BW5:** Buttweld Sch 5 (SS only) **BW8:** Buttweld Sch 80 **XBO:** Extended Buttweld (OD Tube) **XB(n):** Extended Buttweld (n=Sch) **SW:** Socketweld (pipe sizes) **SWO:** Socketweld (Tube OD sizes)	Specify Metallic seat material code and configuration **15:** 15° **30:** 30° **60:** 60° **90:** 90° **120:**120° **02:** 1/64 SLOT **03:** 1/32 SLOT **06:** 1/16 SLOT **12:** 1/8 SLOT
3" **4"**	**CPT151** Wafer 150 **CPT301** Wafer 300 **C151/301** Cryo**					**150:** ASME Class 150 Flanges **300:** ASME Class 300 Flanges	
½" **1"** **1 ½"** **2"** **3"** **4"**	**CPT51** Flgd 150 **CPT52** Flgd 300 **CPT94** Flgd 150 **CPT94** Flgd 300 **C51, C52** Cryo**						

94 rated to -20°F

*Cryo: Brass and stainless only
**Cryo in stainless only
***3-piece only
****All 3-piece valves. Flanged bodies 3" & 4" only

CAUTION: Ball valves can retain pressurized media in the body cavity when closed. Use care when disassembling. Always open valve to relieve pressure prior to disassembly.

Blackmer®

Positive Displacement Pumps and Oil-Free Gas Compressors

for Liquid CO_2 Applications

- Recirculation
- Processing
- Bulk Transfer
- Truck & Transport
- Railcar Unloading
- Vapor Recovery

Blackmer Liquid CO_2 Pumps & Compressors

Guide to Blackmer Liquid CO_2 Equipment

Product	Description / Application
CRLR 1.25 CRL 1.25 CRL 1.5	Motor-speed pumps for cylinder filling, low volume motor fueling and small vaporizers. Capacities to 22 U.S. gpm (83 L/min.).
CRL 2 CRL 3 CRL 4	Foot-mounted pumps for bulk transfer, recirculation and truck systems. Capacities to 300 U.S. gpm (1,135 L/min.).
HD162 HD362 HD602 HDL322 HDL342 HDL642	Oil-free gas compressors for liquid transfer and vapor recovery. Capacities to 63 cfm (107 m^3/hr).
BV0.75 BV1 BV1.25 BV1.5 BV2	Bypass valves for in-line system protection. Capacities to 250 U.S. gpm (946 L/min.).

Liquefied gas pumps specially designed for liquid CO_2 service

In response to specific requests from major CO_2 marketers for a more durable pump, capable of handling higher working pressures on liquid CO_2 service, Blackmer accepted the challenge of designing a pump that would meet or exceed the marketers' specifications. Design criteria included the ability to easily handle dry, non-lubricating CO_2, at sub-zero temperatures, with differential pressures up to 100 psig (6.89 bar).* After four years of intensive research and development, and 30,000 hours at combined laboratory and field testing, Blackmer introduced a line of pumps that far exceeded the original expectations. Utilizing Blackmer's unique sliding-vane design, these rotary positive displacement pumps offer the best combined characteristics of sustained high level performance, energy efficiency, trouble-free operation and low maintenance cost.

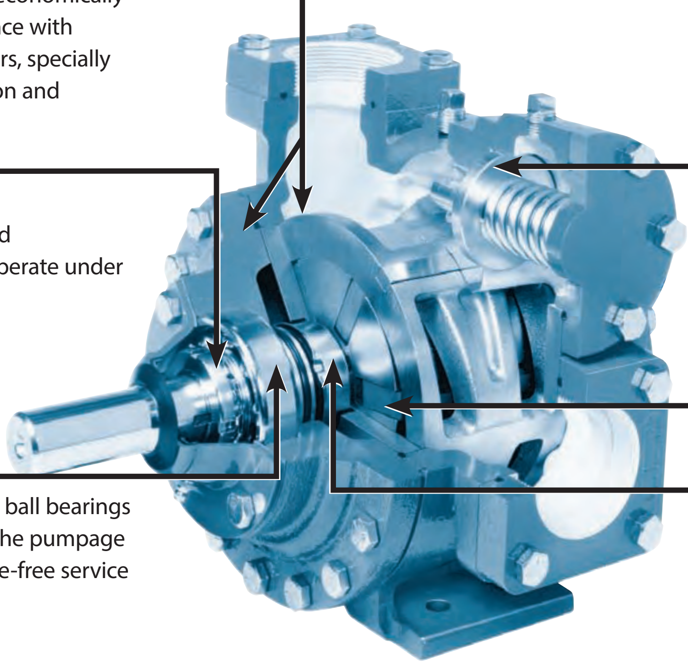
A full line of transfer and recirculation pump models are available in 1.25, 1.5, 2, 3 and 4-inch port sizes for industrial and food processing systems, refrigeration, process plants and transport loading and unloading. Capacities range from 5 to 300 gpm (19-1,134 L/min). with working pressures up to 525 psi (36.2 bar) and operating temperatures down to -30°F (-34°C).

* To improve pump life on continuous duty applications, slower pump speeds and less than 100 psig (6.89 bar) differential pressure are required.

Replaceable casing liner and end discs
Blackmer CRL models can be economically rebuilt for like-new performance with replaceable end discs and liners, specially designed to suppress cavitation and reduce wear.

Two-piece threaded lock collars
Precisely position the rotor and shaft, allowing the pump to operate under high inlet pressures.
In addition, this positive lock thrust control helps prevent premature wear to internal components.

External ball bearings
Low friction grease-lubricated ball bearings are completely isolated from the pumpage by mechanical seals for trouble-free service and long life.



Ductile iron construction
All pressure parts are of ductile iron for greater resistance to both thermal and mechanical shock.

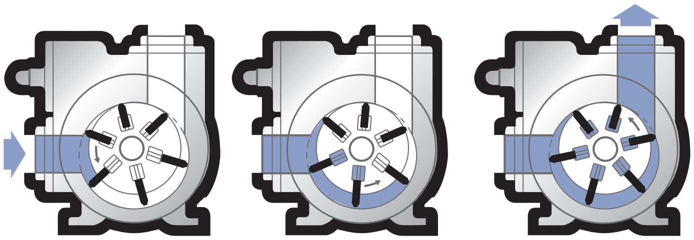
Internal relief valve
Protects the pump from excessive pressure buildup in the event of an obstructed or closed return line.

Self-adjusting vanes
Designed to resist wear under non-lubricating conditions.
These chemically inert vanes are formulated of a tough laminate material for long life and quiet operation.

Blackmer mechanical seals
Specially developed for non-lubricating liquid CO_2 applications, Blackmer's exclusive component-type design is field proven to provide long life and reliable service.

High Performance Design Features

FIGURE 1. How Blackmer's sliding vane action works



How Blackmer sliding vane pumps achieve high efficiency

As shown in Figure 1, Blackmer pumps use a rotor with sliding vanes that draw the liquid in behind each vane, through the inlet port and into the pumping chamber. As the rotor turns, the liquid is transferred between the vanes to the outlet where it is discharged as the pumping chamber is squeezed down. Each vane provides a positive mechanical push to the liquid before it.

Vane contact with the chamber wall is maintained by three forces: (1) centrifugal force from the rotor's rotation, (2) push rods moving between opposing pairs of vanes, and (3) liquid pressure entering through the vane grooves and acting on the rear of the vanes. Each revolution of a Blackmer pump displaces a constant volume of fluid. Variance in pressure has minimal effect. Energy-wasting turbulence and slippage are minimized and high volumetric efficiency is maintained.

Efficiency means energy savings

The high efficiency of Blackmer pumps means they require less horsepower than other positive displacement pumps. So you spend less on motors initially and less on electricity to operate the pumps after they are installed.

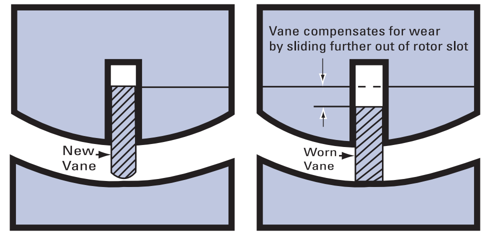
High capacity at lower speeds means reduced wear

The volumetric efficiency of Blackmer pumps saves more than energy. Their inherently low slippage allows them to operate at substantially lower rpms than other positive displacement pump types, while still delivering equivalent output. These lower operating speeds mean quieter operation, longer service life, and reduced maintenance requirements.

Self-adjusting vanes keep performance high

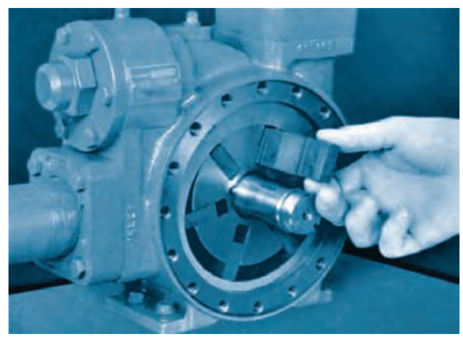
The performance of gear pumps will constantly diminish as wear increases clearances. To compensate for the reduced performance, you must increase the pump speed (which further accelerates pump wear) or put up with reduced capacity until performance drops to a totally unacceptable level. The vanes on a Blackmer pump automatically slide out of their rotor slots to continuously adjust for wear. No more speeding up to compensate and no more putting up with poor performance. Blackmer pumps maintain near-original efficiency and capacity throughout the life of the vanes.

FIGURE 2. How Blackmer's sliding vanes maintain efficiency



Vane replacement in minutes, easy inspection

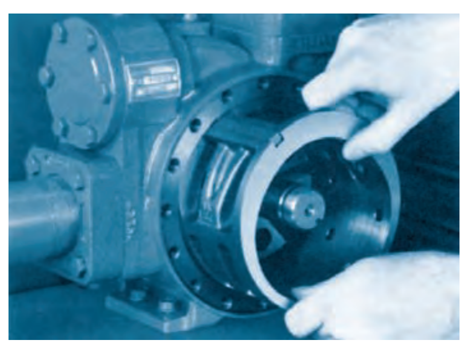
Vane replacement is easy. Simply remove the outboard head assembly, slide out the old vanes, insert the new ones, and reinstall the head. In a matter of minutes, your pump is back in operation. Routine inspection is equally easy. In fact, most maintenance can be done without disconnecting the pump from its piping or drive shaft.



Simple vane replacement requires no special tools.

Replaceable liners economically restore efficiency

Blackmer CO_2 pumps are equipped with replaceable liners that protect the pump casing and provide the economy of simple replacement, restoring the pump to like-new efficiency. No special tools are required to remove a worn liner and install a new one, and the simple operation can be completed in a few minutes without taking the pump off line.

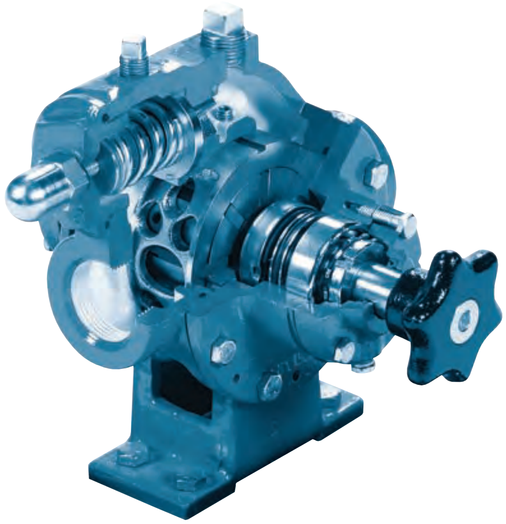


Easily replaceable liner restores efficiency.

All Products in this bulletin are manufactured to ISO 9001 quality standards.

CRLR1.25, CRL1.25 & CRL1.5 Pumps

Motor-Speed Recirculation Pumps



CRL(R) 1.25" / CRL 1.5" cutaway

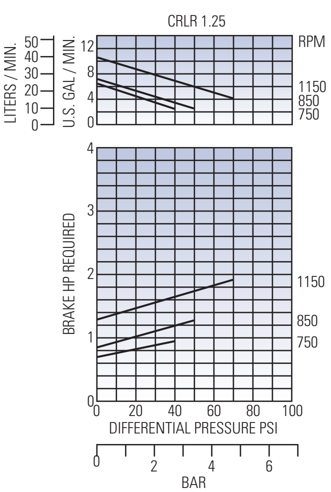
These durable motor-speed pumps offer capacities from 5 to 22 U.S. gpm (19-83 L/min.), and are ideal for loop systems and low-volume transfer applications. The CRL models are designed for foot-mounting to a common baseplate.

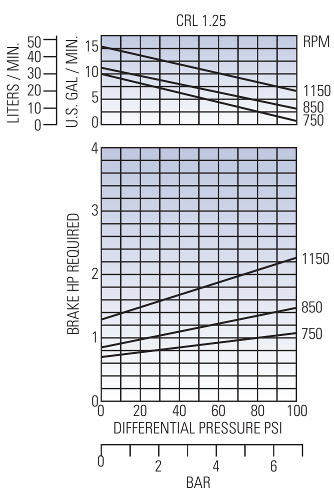
Available with 1.25 or 1.5-inch NPT tapped ports, all models are equipped with an internal relief valve, and a replaceable casing liner and end discs for easy rebuilding of the pumping chamber if ever necessary. The CRLR 1.25-inch model features a special liner which offers lower flow rates than the CRL 1.25-inch pump.

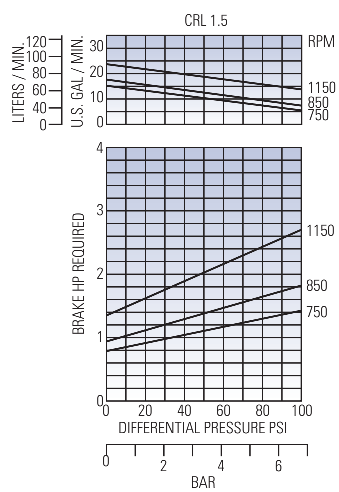
Standard construction materials for these pumps include silicon carbide mechanical seals and laminate vanes. Maximum differential pressure for the CRLR 1.25 is 70 psi (4.83 bar), and 100 psi (6.89 bar) for the CRL 1.25 and CRL 1.5-inch models.

Assembled pump units are available from the factory, with or without motors. For dimensions of assembled pump units, refer to catalog dimension sheets.

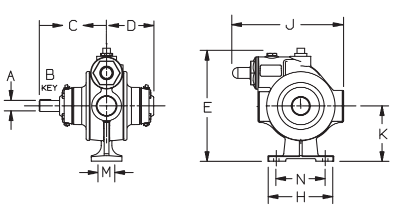
Performance Curves







Base Pump Dimensions

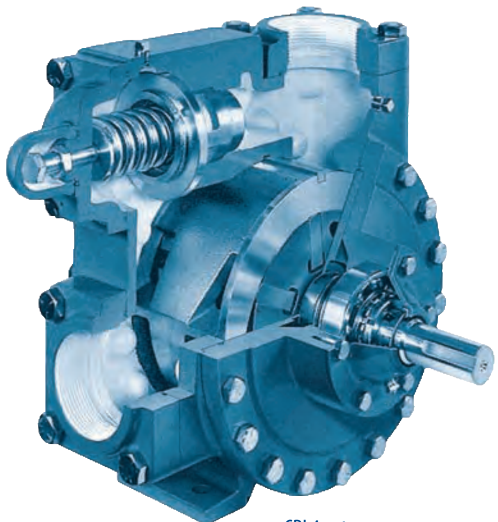


Pump Model		A	B	C	D	E	G	H	J	K	M	N	Approx. Weight Less Motor
CRLR 1.25 CRL 1.25 CRL 1.5	in	7/8	3/16	5 1/2	3 7/8	9 1/8	–	5 1/2	9 1/8	4 1/2	1 3/8	4	30 lbs.
	mm	–	–	140	98	232	–	140	232	114	35	102	14 kg

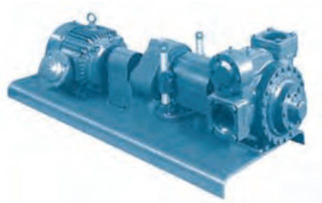
Foot Mounting - Direct Motor Drive

CRL2, CRL3 & CRL4 Pumps

Bulk-Transfer Recirculation Pumps



CRL4 cutaway



Helical Gear Reduction Drive

V-Belt Drive

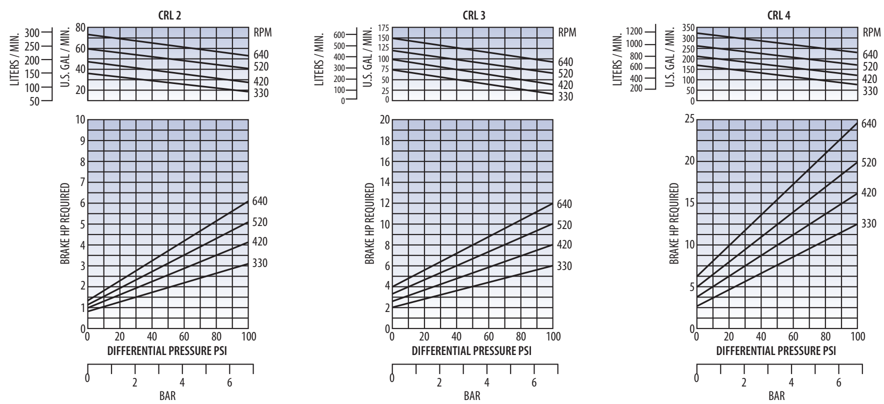
These rugged pumps are widely used for bulk-transfer and recirculation applications which include industrial and food-processing systems, refrigeration, process plants and transport loading and unloading.

Models are available in 2, 3 and 4-inch port sizes with capacities ranging from 25 to 300 U.S. gpm (95-1,134 L/min.). All models have a double-ended drive shaft arrangement, which allows the pump to be easily positioned for clockwise or counterclockwise shaft rotation. These pumps are equipped with an internal relief valve, and a replaceable casing liner and end discs for easy rebuilding of the pumping chamber if ever necessary.

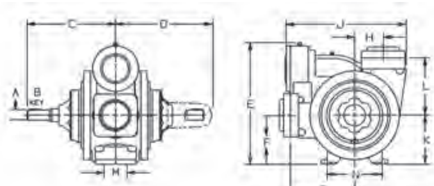
Standard construction materials for these models include silicon carbide mechanical seals and laminate vanes. Ports are offered with NPT tapped companion flanges or weld flanges (see companion flange chart below). Maximum differential pressure is 100 psi (6.89 bar) for all models.

Standard base-mounted unit assemblies are available from the factory with helical gear reduction or V-belt drives. All assembled units are available with or without motors. For dimensions of assembled pump units, refer to catalog dimension sheets. Alternate drive arrangements include P.T.O., hydraulic motor or engine drivers.

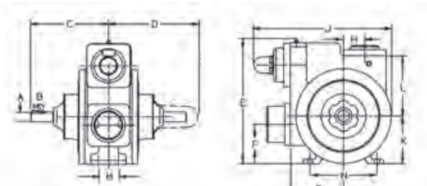
Performance Curves



Base Pump Dimensions



CRL2/CRL3



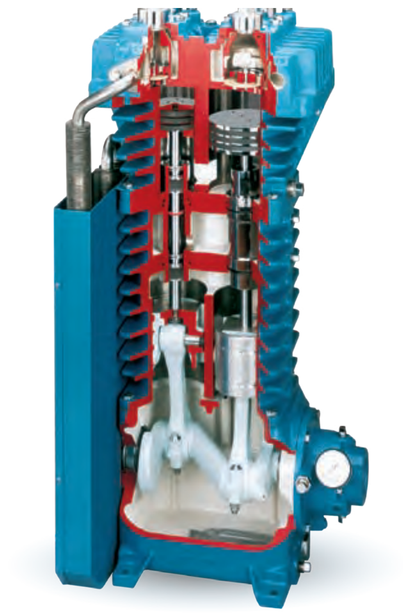
CRL4

Product	Standard or Optional	Intake	Discharge
CRL2	Standard	2" NPT Flange	2" NPT Flange
	Optional	2" Weld Flange	2" Weld Flange
CRL3	Standard	3" NPT Flange	3" NPT Flange
	Optional	3" Weld Flange	3" Weld Flange
CRL4	Standard	4" Weld Flange	3" Weld Flange
	Optional	3" NPT Flange	3" NPT Flange
	Optional	3" Weld Flange	3" Weld Flange
	Optional	4" Weld Flange	4" Weld Flange

Pump Model		A	B	C	D	E	F	G	H	J	K	L	M	N	Approx. Weight Less Motor lbs.	Approx. Weight Less Motor kg
CRL2	in	1 1/8	1/4	8	8 15/16	10	3 3/4	4 13/16	2 3/8	9 11/16	4	4 7/8	1 5/8	5	85	39
	mm	-	-	203	227	254	95	122	60	246	102	124	41	127		
CRL3	in	1 1/8	1/4	9 5/8	11 1/8	13 3/8	5 3/8	7	3 1/8	13 1/4	5 3/8	6 5/16	2 1/2	6	160	73
	mm	-	-	245	283	340	137	178	79	337	137	160	64	152		
CRL4	in	1 1/4	5/16	9 5/8	11 1/16	15 7/16	4 7/8	6 9/16	2 5/8	16 15/16	5 15/16	7 1/2	2 1/2	8 1/4	250	93
	mm	-	-	245	281	392	124	167	67	430	151	191	64	210		

HD162, HD362, HD602, HDL322, HDL342 & HDL642

Oil-Free Gas Compressors



Blackmer oil-free gas compressors are ideal for railcar unloading and vapor- recovery applications. These single-stage compressors are designed to give maximum performance and reliability under the most severe conditions.

The double-seal compressor models incorporate a vented or pressurized distance piece chamber which prevents piston rod over-travel, eliminating any contamination of compressed CO_2. Crankcase oil contamination and cylinder blow-by is further prevented in all compressor models with live-loaded, self-adjusting, filled PTFE seals which maintain a constant sealing pressure around the piston rods.

Models are available with capacities from 4 to 63 cfm (6.8-107 m3/hr), with working pressure up to 1,000 psia (69 bar). Blackmer offers a variety of mounting arrangements to fit most application requirements. Complete factory-assembled base-mounted units are available with liquid trap, four-way valve, strainer, relief valve, pressure gauges, interconnecting piping, and V-belt drive assembly including motor sheave and hub with adjustable motor slide base.

Compressors are available with or without motors or accessories. All models can be transport mounted, and can be adapted for either direct drive or V-belt drive. For more information and specifications for all Blackmer industrial compressors, request Bulletin 901-001.

Engineering Specifications

Double-Seal Models	HD162	HDL322	HDL342	HD362	HDL642	HD602
Number of Cylinders	2	2	2	2	2	2
Bore - in. (mm)	3.0 (76)	2.0 (51)	2.69 (68)	4.0 (102)	3.25 (83)	4.625 (117)
Stroke in. (mm)	2.5 (64)	3.0 (76)	3.0 (76)	3.0 (76)	4.0 (102)	4.0 (102)
Maximum Allowable Working Pressure - psia (bar)	350 (24.1)	1,000 (69)	750 (51.7)	350 (24.1)	750 (51.7)	350 (24.1)
Minimum/Maximum rpm	350 / 825	350 / 825	350 / 825	350 / 825	350 / 825	350 / 825
Piston Displacement @100 rpm - cfm (m^3/hr) @Min rpm - cfm (m^3/hr) @Max rpm - cfm (m^3/hr)	 2.05 (3.48) 7.16 (12.2) 16.9 (28.7)	 1.09 (2.80) 3.81 (9.8) 9.00 (23.1)	 1.97 (3.34) 6.89 (11.71) 16.25 (27.61)	 4.36 (7.41) 15.3 (26.0) 36.0 (61.2)	 3.84 (6.5) 13.4 (22.8) 31.7 (53.8)	 7.78 (13.2) 27.2 (46.3) 64.2 (109.0)
Max. BHP (kW)	10 (7.5)	15 (11)	15 (11)	15 (11)	40 (30)	40 (30)
Wt. w/Flywheel - lb. (kg)	~225 (102)	~385 (175)	~375 (170)	~365 (166)	~705 (320)	~705 (320)
Inlet / Outlet Connections	0.75" NPT	1.5" 600# ANSI	1.5" 600# ANSI	1.5" 300# ANSI	2" 600# ANSI	2" 300# ANSI

Compression Ratios are normally limited by discharge temperature. High compression ratios and certain gases can cause excessive heat, i.e. over 350°F (177°C). The duty cycle must provide for adequate cooling time between periods of operation to prevent excessive operating temperature.

Compressor Selection Data: Carbon Dioxide (CO_2)

Model	Approximate Liquid Transfer Delivery[1]		Pipe Diameter[2]			
			Vapor		Liquid	
	U.S. gpm	L/min.	in.	mm	in.	mm
HD162	50-100	190-375	1.25	32	2	50
HD362	125-200	475-750	2	50	3	80
HD602	250-340	945-1,285	2.5	65	4	100

1 Delivery will depend on proper system design, pipe sizing and valve capacity.

2 Use next larger pipe size if piping exceeds 100 feet (30 meters).

Bypass Valves

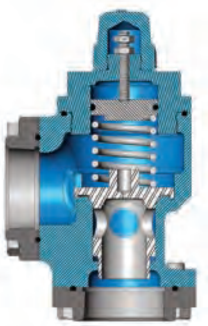
Precise, On-Line Pressure Protection

BV0.75/BV1 BV2

Blackmer differential bypass valves are designed to protect pumps and system components from excessive pressure damage, and no CO_2 pump installation is complete without one. Blackmer offers five different models that provide full-flow pressure control to 250 U.S. gpm (946 L/min.) at 120 psid (8.27 bar). Installation is easy with NPT tapped ports in sizes from 3/4 in. to 2 in.

In operation, Blackmer valves provide exceptionally close pressure control, even under widely varying bypass flow conditions. The performance curve in Figure 3 below shows how a Blackmer valve maintains a virtually constant pressure of 100 psi (6.89 bar) even as the volume being bypassed rises from 10 gpm to 100 gpm (38-378 L/min.). Although the curve is that of a BV1.5 in. valve, the precision it demonstrates is typical of any Blackmer valve.

Blackmer bypass valves have no small, easily plugged sensing passages; and with only two moving parts, their operation is simple and reliable. They open precisely at the preset spring pressure, and they close smoothly and quietly, thanks to a patented dash-pot design. As shown in Figure 4, a small chamber in the valve stem fills with liquid when the valve opens. This liquid then provides a hydraulic cushion preventing the valve from slamming shut if pressure is suddenly released. It also minimizes chatter and valve-seat wear when pressures hover around the critical limit.



BV2 cutaway

FIGURE 3.

Bypass volume/pressure curve BV1.5 in.

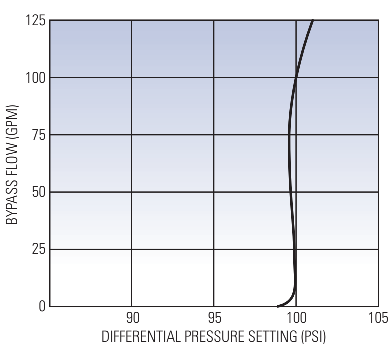
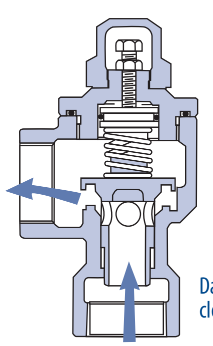


FIGURE 4.

Bypass valve operation



Dash-pot chamber cushions closing of valve

Selection Guide

Model BV0.75 (ports are 3/4-inch NPT tapped)
Model BV1 (ports are 1-inch NPT tapped)

These models are commonly used for cylinder-filling system. Either valve can be used with 1.25 or 1.5-inch Blackmer pump models.

Model BV1.25 (ports are 1.25-inch NPT tapped)
Model BV1.5 (ports are 1.5-inch NPT tapped)

These models are normally used for bobtail trucks and smaller bulk plant systems. Either valve can be used with 2 or 3-inch Blackmer pump models.

Model BV2 (ports have 2-inch NPT companion flanges, 1.25-inch and 1.5-inch NPT and WELD bolt-on flanges are available)

The BV2 model is widely used for transports or larger bulk plant systems. It is recommended for use with 3 and 4-inch Blackmer pump models.

Maximum flow-through valve

Model	Maximum Rated Flow* - gpm (L/min.) @			
	20 psi (1.38 bar)	50 psi (3.45 bar)	80 psi (5.52 bar)	120 psi (8.27 bar)
BV0.75 BV1	25 (95)	40 (151)	50 (189)	60 (227)
BV1.25 BV1.5	60 (227)	80 (303)	100 (379)	125 (473)
BV2	150 (568)	180 (681)	220 (833)	250 (946)

* Normal maximum bypass flow rates without significantly exceeding the set pressure limit.

CRL8 Pump
Liquid CO_2 Transfer, Ductile Iron

Design Features

Blackmer CRL pumps are specifically designed for harsh CO_2 transfer pump duty — handling a dry, non-lubricating liquid at sub-zero temperatures and high differential pressures. The CRL8 is constructed of ASTM 536 ductile iron that will withstand sudden thermal shock and stress well beyond the capabilities of cast iron. Replaceable casing liners and end discs allow easy rebuilding of the pump, without removing the pump from the piping.

Standard features include Buna O-rings, external ball bearings, mechanical seals, 8-inch ANSI flanged port sizes and a maximum rated capacity of 1,020 gpm (231 m^3/h). An optional bolt-on relief valve is available to protect the pump from excessive pressure.

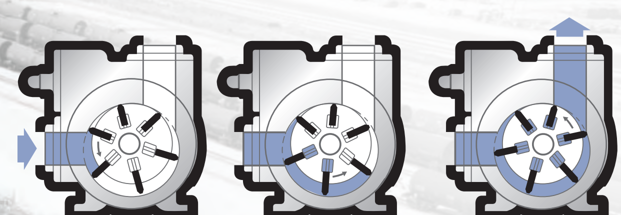
Base-mounted unit assemblies with commercial gear reduction drives are available. Consult factory for details.

Applications

The Blackmer CRL8 is for high capacity CO_2 applications such as a charge pump in CO_2 injection well fracing, terminal operations, barge and ship loading, and off-loading applications.

Benefits

Utilizing Blackmer's unique sliding vane design, these positive displacement rotary pumps offer the best combined characteristics of sustained high level performance, energy efficiency, trouble-free operation and low maintenance cost.

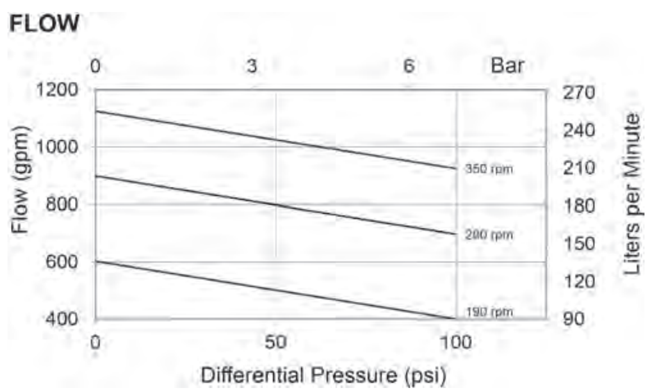


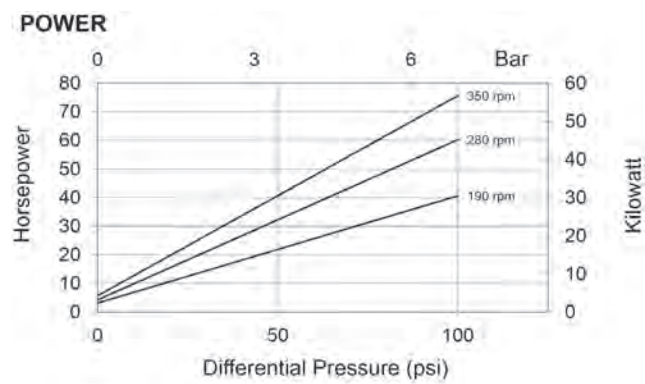
How Blackmer's sliding vane action works

CRL8 Pump
Liquid CO_2 Transfer, Ductile Iron

Maximum Operating Limits

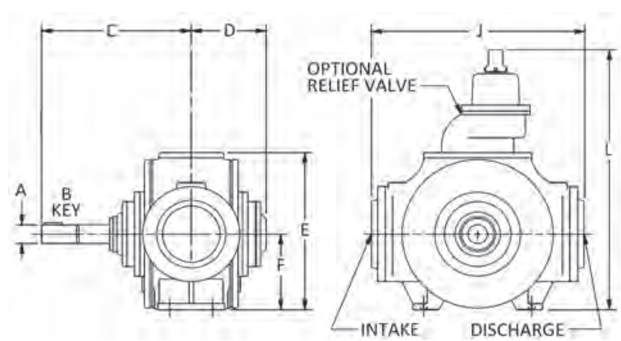
Pump Model	Differential Pressure		Nominal Flowrate		Minimum Temperature		Working Pressure		Pump Speed
	psi	bar	gpm	L/min	°F	°C	psi	bar	rpm
CRL8	100	6.8	1,020	3,860	-30	-34	400	27.58	350



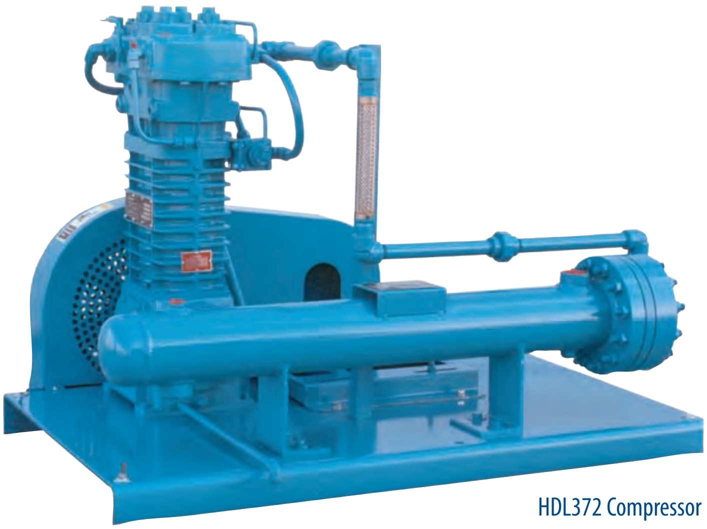


Dimensions

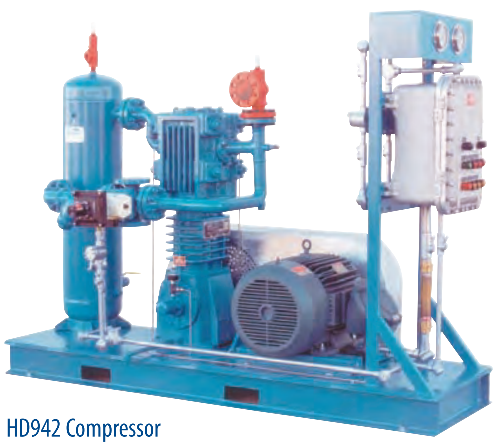
Pump Model		A	B	C	D	E	F	J	L	Approx. Wt.
CRL8	in.	2 5/8	5/8	22 1/4	10 3/8	22 3/4	10 3/4	29 1/2	36 7/8	1,010 lbs.
	mm	–	–	565	264	578	273	749	937	458 kg



HD Compressors
Experts in Mission Critical Industrial Gas Process Compressor Solutions



HDL372 Compressor



HD942 Compressor

Applications for:

- Gas Transfer
- Liquefied Gas Transfer
- Vapor Recovery
- Gas Gathering
- Gas Evacuation
- Gas Blanketing
- Pressure Boosting
- Flare Elimination
- Leak Test Recovery
- Enhanced Recovery

Blackmer® Oil-free HD Compressors for Industrial Gas Applications

Heavy-duty, high efficiency, low maintenance and quiet operation

Blackmer process compressors provide efficient and quiet delivery of oil-free gas or air. These heavy-duty single and two-stage stationary compressors combine advanced design technology and state of the art materials to give maximum performance with minimum maintenance.

Single-Stage & Two-Stage Models

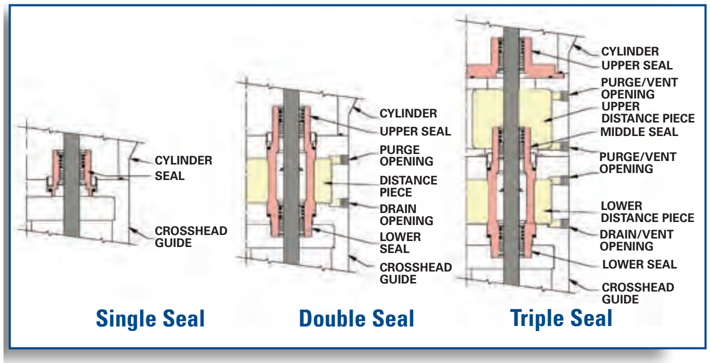
Single-stage models are available in 7 sizes with piston displacements to 125 cfm (212 m^3/hr) and working pressures to 1,000 psia (69 bara) for use on low to moderate compression ratio applications. Three sizes of two-stage models are available for higher compression ratio requirements.

Air-Cooled & Liquid-Cooled Models

The HD air-cooled models are suitable for most applications, especially for operation at lower compression ratios and for liquefied gas transfer applications. HDL models have a liquid-cooled head and cylinder for more demanding applications.

Single, Double & Triple Seal Models

The standard double-seal models are constructed with a single distance piece between two sets of piston rod seals. The distance piece provides leakage control and prevents oil contamination of the compressed gas stream. Triple seal models use two distance pieces for maximum leakage control and are well suited for handling toxic, hazardous or corrosive gases. Ports are provided in each distance piece chamber for purging, pressurizing or venting. Single-seal models are also available.



Blackmer HD Compressors are designed for the transfer, boosting and recovery of a wide range of industrial gases:

Air, Ammonia, Argon, Butadiene, Butane, Carbon Dioxide, Carbon Monoxide, CFC's, Chlorine, Cyclohexane, Cyclopropane, Dimethylamine, Dimethyl Ether, Ethane, Ethyl Alcohol, Ethyl Chloride, Ethylene, Ethylene Oxide, HCFC's, Helium, n-Heptane, n-Hexane, Hydrogen, Hydrogen Chloride, Hydrogen Sulfide, Isobutane, Isobutene, Isobutylene, Isopentane, Methane, Methanol, Methyl Chloride, Methyl Mercaptan, Monoethylamine, Natural Gas, Nitrogen, Nitrogen Dioxide, Nitrous Oxide, Oxygen, Ozone, n-Octane, n-Pentane, Propane, Propylene, Refrigerants, Sulfur Dioxide, Sulfur Hexafluoride, Trichlororet hane, Tetrafluorethylene, Trimethylamine, Vinyl Chloride, Xenon and other gases.

Blackmer® HD Compressors - Custom Made Units

Complete custom packages are available. Engineering, fabrication and drawings are all provided per specifications to meet the application requirements.

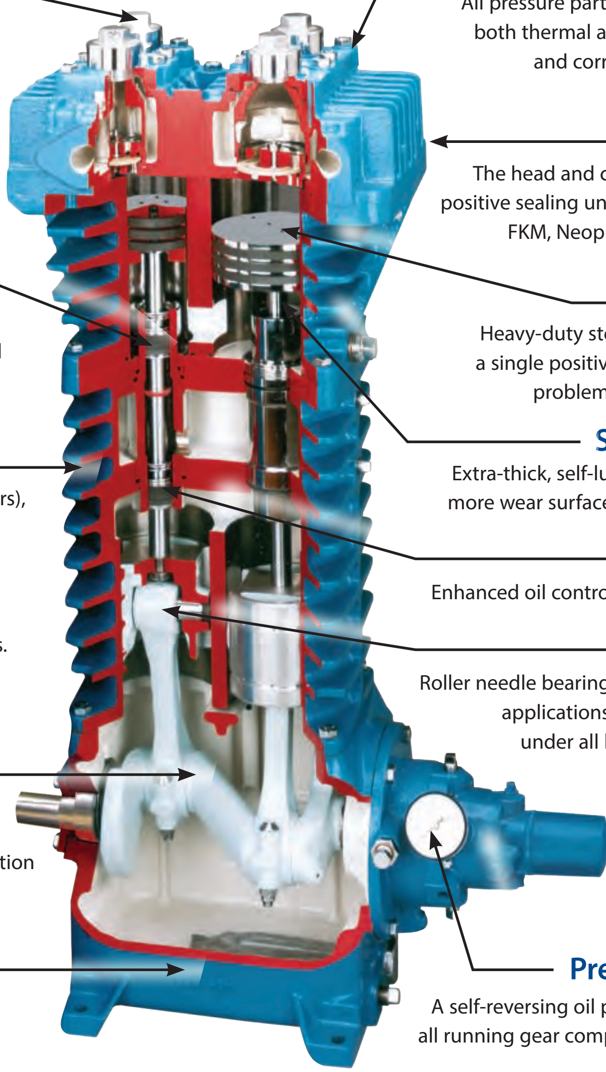
HD942 compressor with explosion-proof control panel and electrically actuated 4-way flow control valve for LPG transfer.

Duplex HD613 two-stage triple-seal compressors with control panel for natural gas pressure boosting operation.

HDL372 two-stage water-cooled compressor with water-cooled aftercooler for Helium recovery service.

Single and Multi-Stage Compressors

The inside view on why Blackmer compressors are superior in handling industrial gases



High efficiency, PEEK valves

Blackmer valves are specifically designed for oil-free gas applications. Standard valve plates are constructed of self-lubricating PEEK (Poly Ether Ketone) material that provides superior sealing characteristics, high efficiency and durability. Optional stainless steel valves are also available. **Note:** *Series HD160 and HD170 have TNT-12 impregnated steel valves.*

Live loaded piston rod seals

Filled PTFE seals are wear compensating and maintain a constant sealing pressure around the piston rods with minimum friction. This special seal design prevents crankcase oil contamination and cylinder blow-by.

Single or double-distance piece

Single or double distance pieces (isolation chambers), control contamination of the compressed gas from crankcase lubricant, even at high vacuum inlet conditions. Each isolation chamber may be independently purged, pressurized or vented for maximum containment of toxic or hazardous gases.

Heavy-duty precision ground crankshaft

The ductile iron crankshaft features roller bearings and integral counterweights for smooth, quiet operation. Rifle drilling ensures positive oil distribution to the wrist pin andconnecting rod bearings.

Two-part epoxy paint

Ductile iron construction

All pressure parts are ductile iron for greater resistance to both thermal and mechanical shock. For extended wear and corrosion resistance, specify the TNT-12 PTFE and Nickel impregnation option.

O-Ring seals

The head and cylinder are sealed with O-rings to ensure positive sealing under severe operating conditions. Buna-N, FKM, Neoprene, PTFE or Ethylene-Propylene O-rings are available.

One piece piston

Heavy-duty steel pistons are connected to the rod with a single positive locking nut, which eliminates potential problems associated with multiple piece designs.

Self-lubricating piston rings

Extra-thick, self-lubricating filled PTFE piston rings provide more wear surface for maximum sealing and extended life.

S3R Seal (600/900 Series)

Enhanced oil control providing even greater leakage control.

Wrist pin needle bearings

Roller needle bearings provide longer life under high rod load applications. Superior wrist pin lubrication is assured under all load conditions. All HD/HDL compressors are free of yellow metals

ANSI flanges

Many models are available with ANSI flanges for compatibility with CPI and refinery industry standards.

Pressure lubricated crankcase

A self-reversing oil pump provides positive oil distribution to all running gear components for long life and minimal wear. A full-flow spin-on oil filter is standard.

Options

- **Wear and Corrosion-Resistant Components** TNT-12 impregnated parts
- **Switches:** Automatic pressure, temperature shut-down, alarm switches
- **Suction Valve Unloader:** Loadless starting and constant speed unloading packages
- **Poly-Filled PTFE Piston Rings** for dry-gas service
- **Alternate O-Ring Materials** available
- **Extended Crankshaft** for direct drive mounting
- **Vapor Strainer Assembly** features 30-mesh stainless steel screen
- **Liquid Traps available** with mechanical valve or electric float switch (or both). ASME code construction also available
- **Piping:** Threaded or welded steel piping systems
- **Heat Exchangers:** pre-coolers, inter-coolers and after-coolers available
- **Four-Way Valve** with handle and easy-to-read flow direction indictor
- **Base Plates** of formed steel or fabricated skid
- **Motors** can be customized for any application
- **Control Panels** can be explosion-proof or weather-proof
- **Tests** certificates available for each compressor

Oil-Free Compressors

HD Models are air-cooled and HDL Models have liquid-cooled head and cylinders

Single-Stage Models

Single-Seal Double-Seal Triple-Seal	HD161 HD162 HD163	HDL322	HDL342 HDL343	HD361 HD362/HDL362 HD363/HDL363	HDL642 HDL643	HD602/HDL602 HD603/HDL603	HD942/HDL942 HD943/HDL943
Number of Cylinders	2	2	2	2	2	2	2 (Double Acting)
Bore - in. (mm)	3.0 (76)	2.0 (51)	2.69 (68)	4.0 (102)	3.25 (83)	4.625 (117)	4.625 (117)
Stroke in. (mm)	2.5 (64)	3.0 (76)	3.0 (76)	3.0 (76)	4.0 (102)	4.0 (102)	4.0 (102)
Maximum Allowable Working Pressure - psia (bara)	350 (24.1)	1,000 (69)	750 (51.7)	350 (24.1)	750 (51.7)	350 (24.1)	350 (24.1)
Minimum/Maximum rpm	350 / 825	350 / 825	350 / 825	350 / 825	350 / 825	350 / 825	350 / 825
Piston Displacement @100 rpm - CFM (m^3/hr) @Min rpm - CFM (m^3/hr) @Max rpm - CFM (m^3/hr)	 2.05 (3.48) 7.16 (12.2) 16.9 (28.7)	 1.09 (1.85) 3.81 (6.49) 9.00 (15.3)	 1.97 (3.34) 6.89 (11.71) 16.25 (27.61)	 4.36 (7.41) 15.3 (26.0) 36.0 (61.2)	 3.84 (6.5) 13.4 (22.8) 31.7 (53.8)	 7.78 (13.2) 27.2 (46.3) 64.2 (109.0)	 14.99 (25.47) 52.46 (89.1) 125.2 (212)
Max. bph (kW)	10 (7.5)	15 (11)	15 (11)	15 (11)	40 (30)	40 (30)	50 (37)
Wt. w/Flywheel - lb. (kg)	~225 (102)	~385 (175)	~375 (170)	~365 (166)	~705 (320)	~705 (320)	~905 (410)
Inlet / Outlet Connections	0.75" NPT	1.5" 600# ANSI	1.5" 600# ANSI	1.5" 300# ANSI	2" 600# ANSI	2" 300# ANSI	2" 300# ANSI

Two-Stage Models

Double-Seal Triple-Seal	HD172 / HDL172 HD173 / HDL173		HD372 / HDL372 HD373 / HDL373		HD612 / HDL612 HD613 / HDL613	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
# Cyl. per Stage	1	1	1	1	1	1
Bore - in. (mm)	3.0 (76.2)	1.75 (44.5)	4.625 (117)	2.687 (68)	6 (152)	3.25 (.83)
Stroke in. (mm)	2.5 (63.5)		3.0 (76)		4.0 (102)	
Maximum Allowable Working Pressure - psia (bara)		615 (42.4)		615 (42.4)		415 (28.6)
Minimum/Maximum rpm	350 / 825		350 / 825		350 / 825	
Piston Displacement **@100 rpm - CFM (m^3/hr)** **@Min rpm - CFM (m^3/hr)** **@Max rpm - CFM (m^3/hr)**	 1.02 (1.73) 3.57 (6.07) 8.42 (14.3)		 2.92 (4.96) 10.2 (17.3) 26.1 (40.8)		 6.54 (11.1) 22.9 (38.9) 53.7 (91.2)	
Max. bph (kW)	10 (7.5)		15 (11)		40 (30)	
Wt. w/Flywheel - lb. (kg)	~290 (132)		~405 (184)		~775 (352)	
Inlet / Outlet NPT - in.	0.75/0.75		1.25/1.00		2.00*/1.50* *Weld type flanges available	

Compression Ratios are normally limited by discharge temperature. High compression ratios and certain gases can cause excessive heat, i.e. over 350°F (177° C). The duty cycle must provide for adequate cooling time between periods of operation to prevent excessive operating temperature.

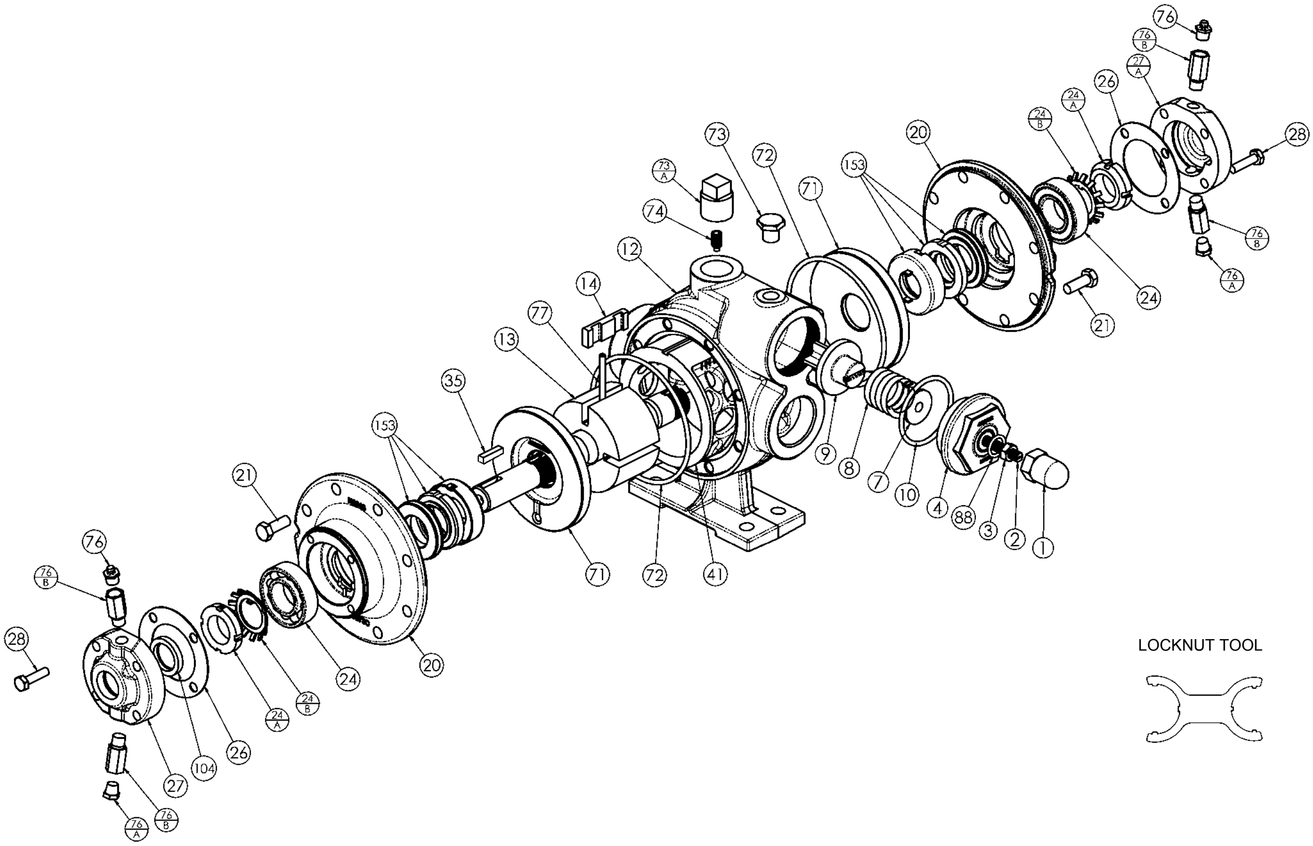
PARTS LIST
701-A01

Section	701
Effective	Mar 2010
Replaces	July 2002

BLACKMER PARTS LIST

PUMP MODELS: CRLR1.25, CRL1.25, CRL1.5

Keep with Instructions 701-A00 for Installation, Operation and Maintenance



LOCKNUT TOOL

Ref. No.	Description	Parts per Pump	Part No.	Ref. No.	Description	Parts per Pump	Part No.
1	Cap – Relief Valve (R/V)	1	413200	41	Liner – CRLR1.25	1	[2] 183003
2	Adjusting Screw – R/V	1	433909		Liner – CRL1.25		[2] 183004
3	Locknut – Adjusting Screw	1	922923		Liner – CRL1.5		[2] 183301
4	Cover – R/V	1	413076	71	Disc	2	[2] 063075
7	Spring Guide – R/V	1	423955	72	O-Ring – Head	2	[1] 701918
8	Spring – R/V (81 – 125 psi)	1	471428	73	Gage Plug (1/4")	1	908198
9	Valve – R/V	1	453077	73A	Gage Plug (3/4") (see note)	1	908225
10	O-Ring – R/V Cover	1	[1] 711924	74	Setscrew – Liner	1	922088
12	Casing (1.25)	1	013075	76	Grease Fitting	2	317815
	Casing (1.5)		013376	76A	Grease Relief Fitting	2	701992
13	Rotor & Shaft Assembly (Includes Ref. Nos. 24A & 24B)	1	[2] 263076	76B	Extension Coupling	4	701905
				77	Push Rod – CRLR1.25	2	[1] 123004
14	Vane – Laminate	4	[1] 093089		Push Rod – CRL1.25		[1] 123076
20	Head	2	033076		Push Rod – CRL1.5		[1] 123401
21	Capscrews – Head	16	920276	88	O-Ring – R/V Cap	1	[1] 701949
24	Ball Bearing	2	[1] 903114	104	Grease Seal	1	[1] 331927
24A	Locknut – Bearing	2	[2] 903534		Tool – Locknut		903090
24B	Lockwasher – Bearing	2	[1] 903533		Kit - Maintenance , CRLR1.25		898902
26	Gasket – Bearing Cover	2	[1] 383075		Kit - Maintenance , CRL1.25		898903
27	Bearing Cover – Inboard	1	043070		Kit - Maintenance , CRL1.5		898904
27A	Bearing Cover – Outboard	1	043071		Kit – Rebuild ,CRLR1.25		899002
28	Capscrews – Bearing Cover	8	920080		Kit – Rebuild ,CRL1.25		899003
35	Key – Shaft [3]	1	[2] 909152		Kit – Rebuild ,CRL1.5		899004

[1] Included in Maintenance Kits and Rebuild Kits [2] Included in Rebuild Kits [3] Previous versions used Woodruff Key 901925

Ref. No. 73A: Earlier versions of these pumps may use a 1/4" plug (pn 908198) or 1/2" plug (pn 908215).

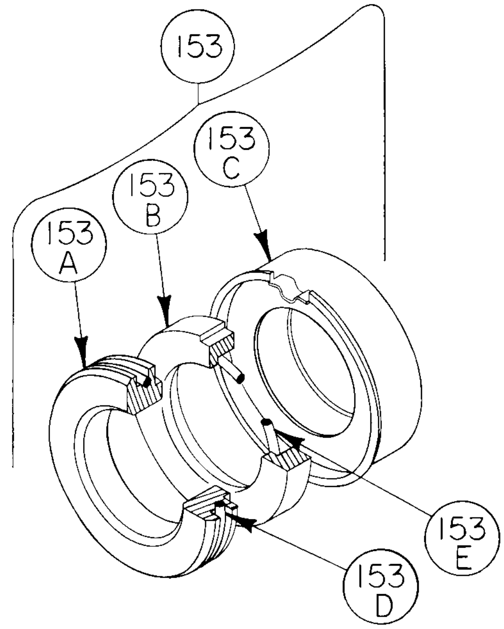
Note: earlier versions of these pumps used taper pins, which are no longer required.

MECHANICAL SEAL

Ref. No.	Part Name	Parts Per Pump	Part No.
153	Mechanical Seal Assembly (CELE)	2	[1] 333025
153A**	Stationary Seat (Carbon)	2	333023
153B**	Seal Face (Silicon Carbide)	2	333024
153C**	Jacket Assembly	2	333001
153D	O-Ring – Stationary (Special-EPDM)	2	702351
153E	O-Ring – Rotating (Special-EPDM)	2	702350

[1] Included in Maintenance Kits and Rebuild Kits

** Ref. Nos. 153A, 153B, 153C are not available as separate replacement parts.



Blackmer®

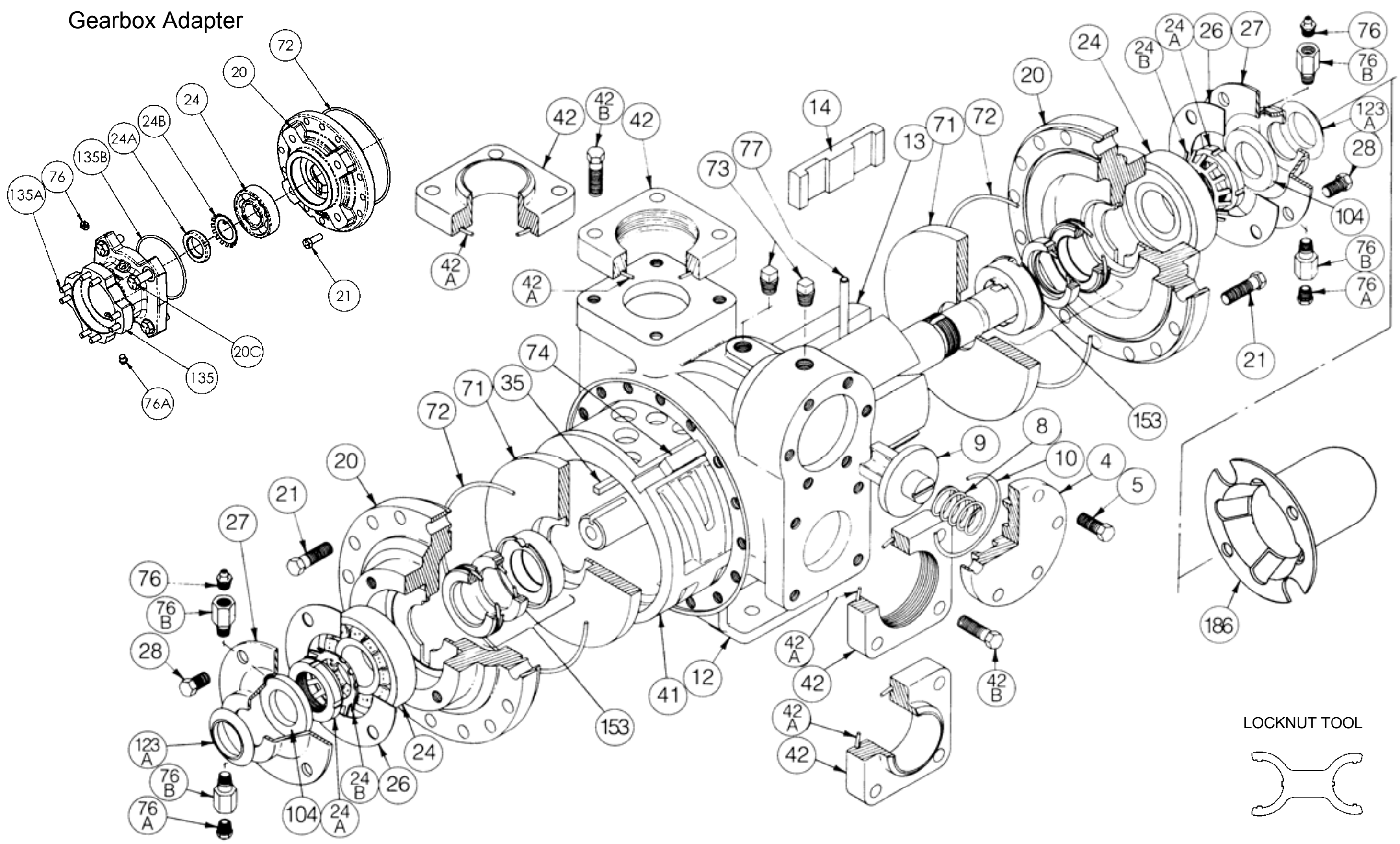
BLACKMER PARTS LIST

PUMP MODELS: CRL2, CRL3

OBSOLETE MODELS: TCRL2, TCRL3

Keep with Instructions 701-B00 for Installation, Operation and Maintenance

Section	701
Effective	Jul 2018
Replaces	May 2009



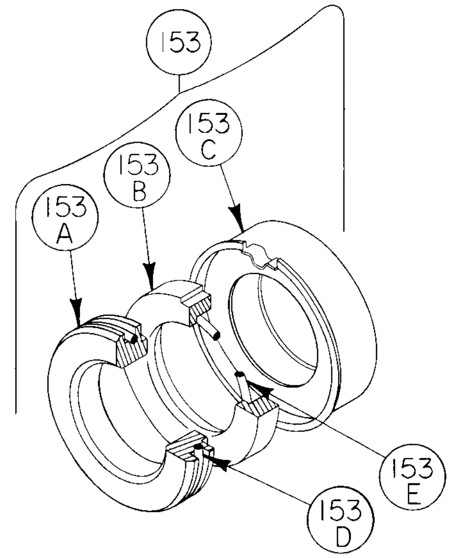
Ref. No.	Description	Parts per Pump	Size 2 Part No.	Size 3 Part No.	Ref. No.	Description	Parts per Pump	Size 2 Part No.	Size 3 Part No.
4	Relief Valve (R/V) Cover	1	414401	415113	42	Flange – NPT	2	654401	655112
5	R/V Cover Capscrews	6	920331	920331		Flange – Weld		654405	655102
8	R/V Spring (150 psi)	1	471423	475135	42A	O-Ring – Flange	2	[1] 702004	[1] 702002
9	R/V Valve	1	454405	455129	42B	Capscrew – NPT Flange	8	920384	920547
10	O-Ring – R/V Cover	1	[1] 701919	[1] 701925		Capscrew – Weld Flange		920351	920510
12	Casing	1	014405	015127	71	Disc	2	[2] 064412	[2] 065112
13	Rotor & Shaft Asy. [3] (Includes Ref. 24A & 24B)	0-1	[2] 264445	[2] 265148	72	O-Ring – Head	2	[1] 702022	[1] 702041
					73	Gage Plug	2	908198	908198
	Rotor & Shaft Asy.	0-1	264443	N/A	74	Liner Key	1	[2,4] 183991	[2] 185191
14	Vane – Laminate	6	[1] 091427	[1] 095109	76	Grease Fitting	2	317815	317815
20	Head	1-2	034416	035128	76A	Grease Relief Fitting	2	701992	701992
	Head (Integrated Gearbox)	0-1	034427	N/A	76B	Extension Coupling	4	701905	701905
20C	Capscrews	0-4	920510	N/A	77	Push Rod	3	[1] 123905	[1] 125105
21	Head Capscrews	32-40	920351	920369	104	Grease Seal	2	[1] 331918	[1] 331908
24	Bearing	2	[1] 903156	[1] 903172	135	Adapter – Gearbox	0-1	833992	N/A
24A	Bearing Locknut	2	[2] 903521	[2] 903523	135A	Capscrew (Metric)	0-8	920028	N/A
24B	Bearing Lockwasher	2	[1] 903522	[1] 903524	135B	O-Ring – Gearbox Adapter	0-1	701991	N/A
26	Bearing Cover Gasket	2	[1] 383940	[1] 385125	123A	Dirt Shield	2	[1] 701480	N/A
27	Bearing Cover	2	041431	041815	186	Shaft Protector	1	341601	341801
28	Bearing Cover Capscrews	8-12	920285	920285		Tool - Locknut		903091	903091
35	Shaft Key	1	[1,7] 909209	[1,7] 909209		Kit - Maintenance		898905	898906
41	Liner	1	[2] 184405	[2] 185111		Kit - Rebuild		899005	899006

[1] Included in Maintenance & Rebuild Kit [2] Included in Rebuild Kit [3] Double Ended Rotor & Shaft [4] Pump models before January 1995 require key PN 184407 [7] Pumps prior to April 2008 used Woodruff key 909130, included in Maintenance kits

MECHANICAL SEAL

Ref. No.	Part Name	Parts Per Pump	Size 2 Part No.	Size 3 Part No.
153	Mechanical Seal Assembly (CELE)	2	[1] 334414	[1] 335132
153A	Stationary Seat (Carbon)	2	**	**
153B	Seal Face (Silicon Carbide)	2	**	**
153C	Seal Jacket Assembly	2	**	**
153D	O-Ring – Stationary (Special-EPDM)	2	702354	702355
153E	O-Ring – Rotating (Special-EPDM)	2	702352	702353

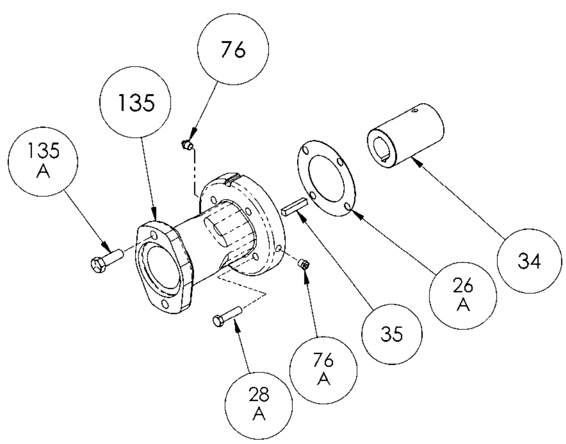
[1] Included in Maintenance Kits and Rebuild Kits
** Mechanical Seal Asy. (Ref. No. 153) is only sold as a complete assembly. Ref. Nos. 153A/153B/153C are not available as separate replacement parts.



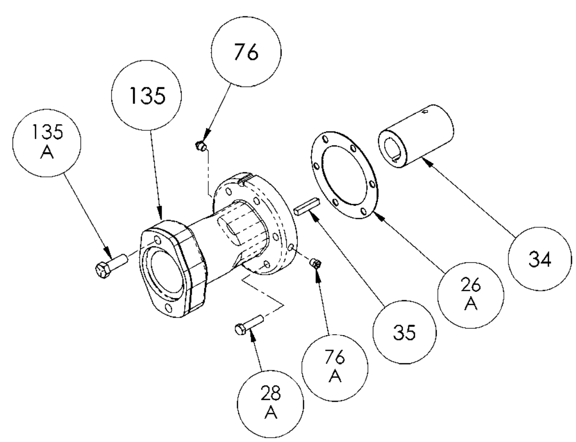
OPTIONAL HYDRAULIC MOTOR ADAPTER PARTS

Ref. No.	Part Name	Parts Per Pump	Size 2 Part No. 1-¼" Hyd Motor Shaft	Size 3 Part No. 1-¼" Hyd Motor Shaft	Size 3 Part No. 1" Hyd Motor Shaft
See Below	**Hydraulic Motor Adapter Kit** *	See Below	894425	895140	895143
26A	Gasket- Hydraulic Motor Adapter	1	383940	381817	381817
28A	Capscrew – Hydraulic Motor Adapter / Head	4 / 6	920369	920369	920369
34	Coupling w/ Setscrew – straight key hydraulic motor shaft	1	906967	906967	906990
35	Key – Coupling	1	909184	909184	909184
76	Grease Fitting	1	317815	317815	317815
76A	Grease Relief Fitting	1	701992	701992	701992
135	Hydraulic Motor Adapter – SAE A Flange	1	041827	041831	041831
135A	Capscrew – Adapter / Motor	2	920510	920510	920510

* Hydraulic Motor Adapter Kits prior to Spring 2002 were of a two piece design – refer to page 206-D00



CRL2



CRL3

Blackmer
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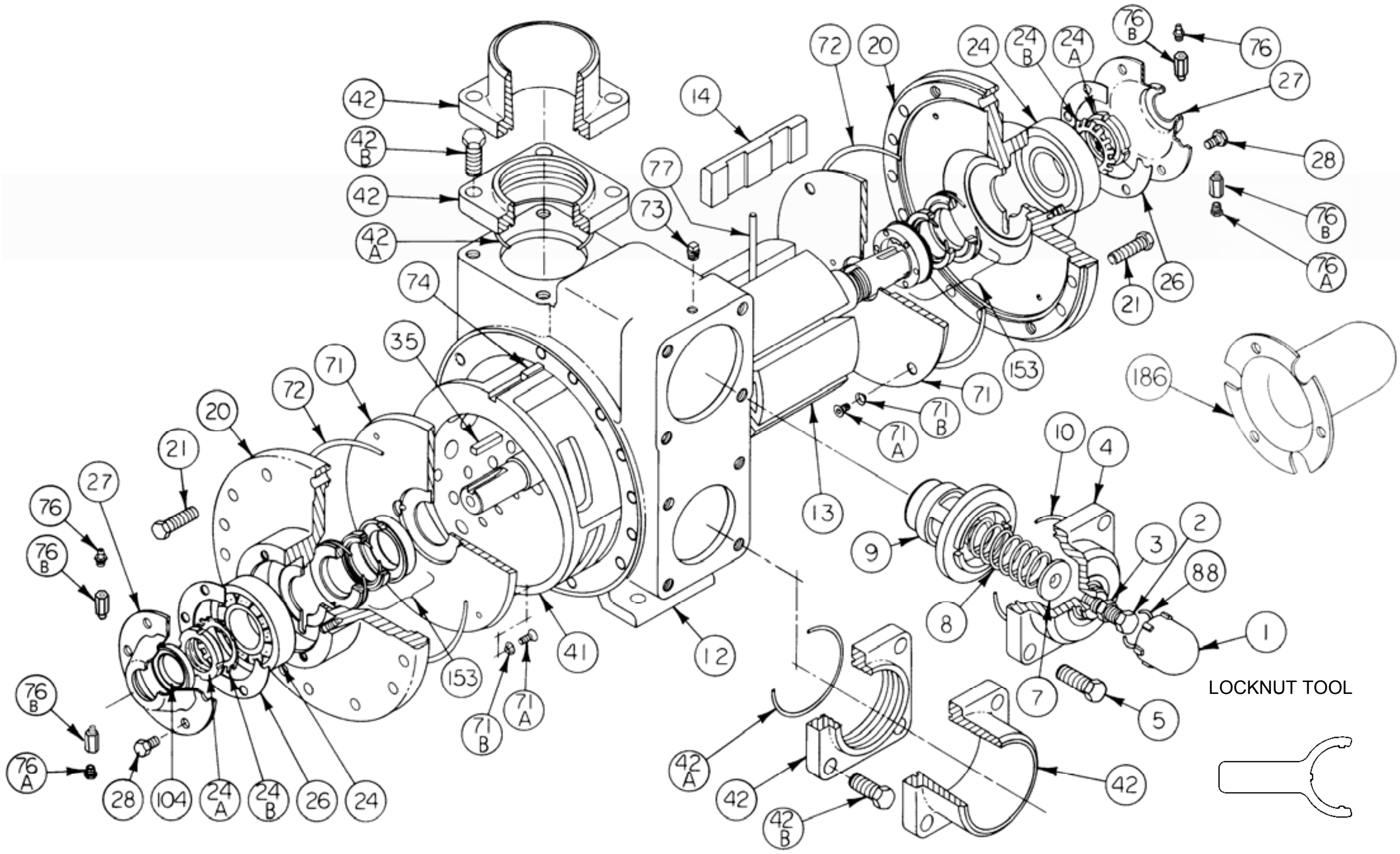
E-Mail: blackmer@blackmer.com / Internet: www.blackmer.com

BLACKMER PARTS LIST
PUMP MODEL: CRL4B

Keep with Instructions 701-C00 for Installation, Operation and Maintenance

Section	701
Effective	Jan 2010
Replaces	Sept 2009



Ref. No.	Description	Parts per Pump	Part No.	Ref. No.	Description	Parts per Pump	Part No.
1	Cap – R/V	1	413957	41	Liner – Casing	1	[2] 182000
2	Screw – R/V Adjusting	1	436310	42	Flange – 3″ NPT	1-2	652012
3	Locknut – Adjusting Screw	1	432039		Flange – 3″ Weld		652007
4	Cover – R/V	1	412001		Flange – 4″ Weld		652005
5	Capscrew – R/V Cover	4	920663	42A	O-Ring – Flange	2	[1] 701937
7	Guide – R/V Spring	1	426355	42B	Capscrew – NPT Flange	8	920663
8	Spring – Valve	1	472039		Capscrew – Weld Flange		920640
9	Valve – R/V	1	452001	71	Disc	2	[2] 062039
10	O-Ring – R/V Cover	1	[1] 701946	71A	Screw – Disc Machine	8	[2] 920015
12	Casing – Pump	1	012019	71B	Lockwasher – Disc	8	[2] 909622
13	Rotor & Shaft Asy. w/Locknut & Lockwasher (Ref. No. 24A & 24B)	1	[2] 262041	72	O-Ring – Head (Buna-N)	2	[1] 702039
				73	Plug – Gage	2	908198
14	Vane – Laminate	6	[1] 092026	74	Key – Liner	1	[2] 182040
20	Head	2	032041	76	Fitting – Grease	2	317815
21	Capscrews – Head	28	920532	76A	Fitting – Grease Relief	2	701992
24	Ball Bearing	2	[1] 903172	77	Push Rod – Composite	3	[1,] 122009
24A	Locknut – Bearing	2	[2] 903541	88	O-Ring – R/V Cap	1	[1] 701926
24B	Lockwasher – Bearing	2	[1] 903542	104	Seal – Grease	2	[1] 331908
26	Gasket – Bearing Cover	2	[1] 385125	186	Protector – Shaft End	1	341801
27	Cover – Inboard Bearing	2	041815		Tool - Locknut		903092
28	Capscrews – Bearing Cover	12	920285		Kit - Maintenance		898907
35	Key – Shaft	1	[1] 909183		Kit - Rebuild		899007

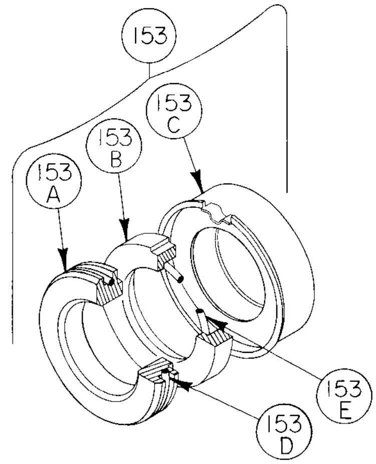
[1] Included in Maintenance and Rebuild Kits [2] Included in Rebuild Kits

MECHANICAL SEAL

Ref. No.	Part Name	Parts Per Pump	Part No.
153	Mechanical Seal Assembly (CELE)	2	[1] 332059
153A	Seat – Stationary (Carbon)	2	*
153B	Face – Seal (Silicon Carbide)	2	*
153C	Jacket Assembly – Seal	2	*
153D	O-Ring – Stationary (Special-EPDM)	2	702356
153E	O-Ring – Rotating (Special-EPDM)	2	702353

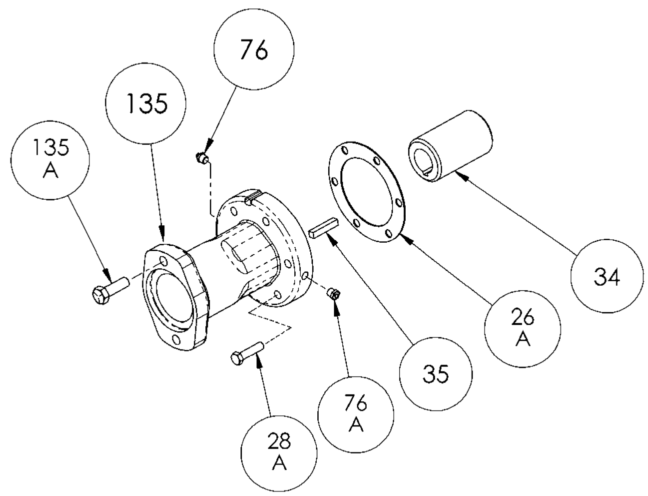
[1] Included in Maintenance and Rebuild Kits

* Mechanical Seal Ref. No. 153 is only sold as a complete assembly.
Ref Nos. 153A, 153B & 153C are not available as separate replacement parts.



HYDRAULIC MOTOR ADAPTER PARTS

REF. NO.	PART NAME	PARTS PER PUMP	PART NO.
See Below	**Hydraulic Motor Adapter Kit** *	See Below	892037
26A	Gasket – Hydraulic Motor Adapter	1	381817
28A	Capscrew – Hydraulic Motor Adapter / Head	6	920369
34	Coupling w/ Setscrew – for 1.25” straight key hyd. motor shaft	1	906970
35	Key – Coupling	1	909184
76	Grease Fitting	1	317815
76A	Grease Relief Fitting	1	701992
135	Hydraulic Motor Adapter – SAE A Flange	1	041829
135A	Capscrew – Adapter / Motor	2	920510



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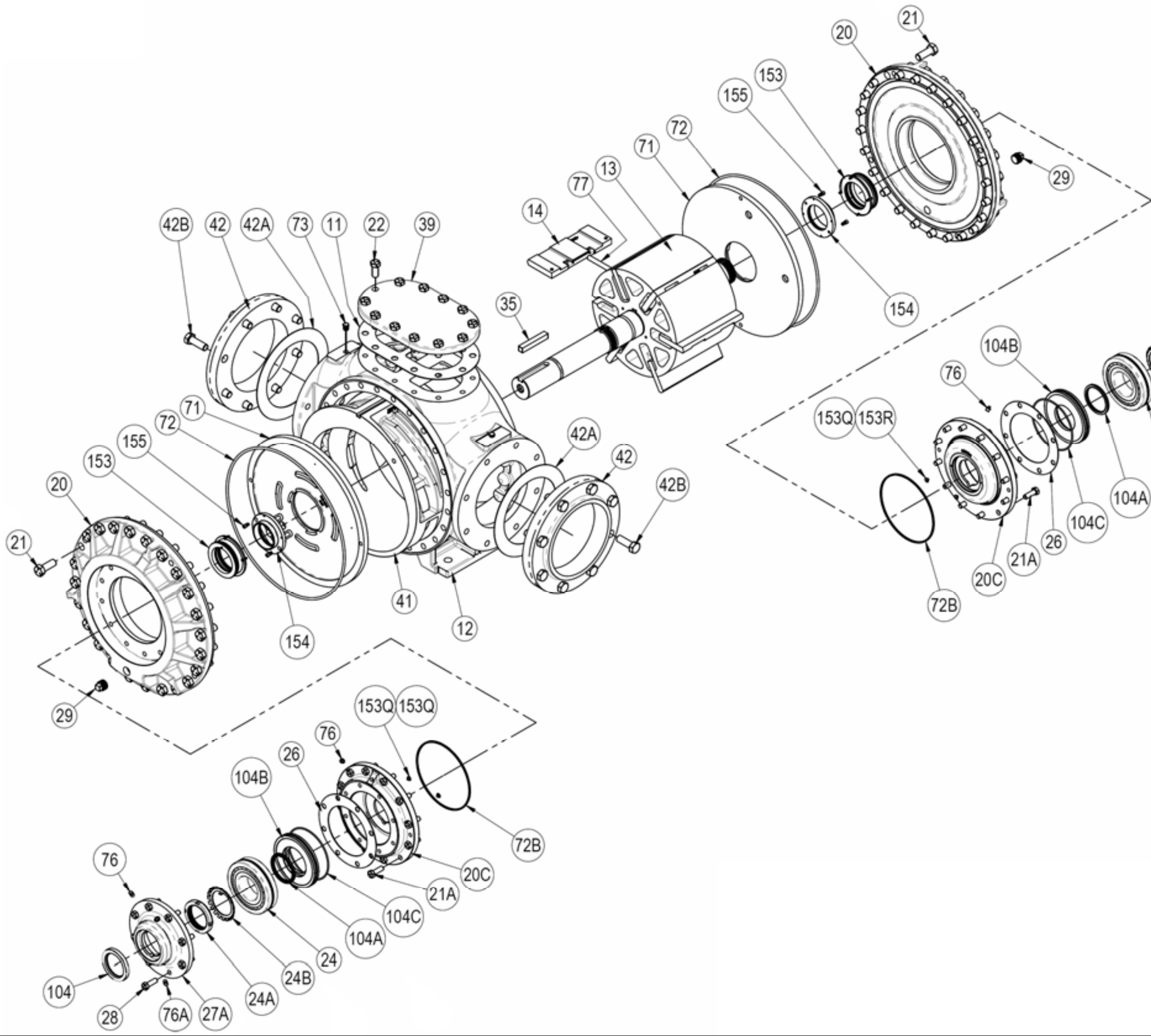
BLACKMER PARTS LIST
PUMP MODEL: CRL8A

Section	701
Effective	Mar 2016
Replaces	July 2013

Keep with Instructions **701-D00** for Installation, Operation and Maintenance)



Ref. No.	Description	Parts per Pump	Part No.	Ref. No.	Description	Parts per Pump	Part No.
11	Gasket - Blanking Plate	1	537752	42	Flanges, Weld	2	657708
12	Casing	1	[2] 017718	42A	Gaskets - Flange	2	387711
13	Rotor & Shaft (Full Size)	1	[1] 287730	42B	Capscrews - Flange	16	920801
14	Vane – Extra Clearance Laminate	6	097707	71	Discs	2	067716
20	Heads (High Pressure - Ductile)	2	037710	72	O-Rings - Head (Buna-N)	2	711967
20C	Hubs	2	037748	72B	O-Rings - Hub (Buna-N)	2	701944
21	Capscrews - Head	48	920781	73	Gage Plug	2	908198
21A	Capscrews - Hub	24	920510	76	Grease Fitting	2	317815
22	Capscrews - Blanking Plate	12	920639	76A	Grease Relief Fitting	2	701992
24	Bearings	2	903274	77	Push Rods	3	127705
24A	Locknuts - Bearing	2	903527	104	External Grease Seal	1	904180
24B	Lockwashers - Bearing	2	903528	104A	Bearing Grease Seal	2	904187
26	Gasket - Bearing Cover	2	387221	104B	Carrier, Bearing Grease Seal	2	904186
27	Bearing Cover - Outboard	1	047205	104C	O-Ring - Grease Seal Carrier	2	702054
27A	Bearing Cover – Inboard	1	047707	153	Mechanical Seal Assembly	See Back	
28	Capscrews - Bearing Cover	16	920510	153Q	Retaining Screw - Seal	4	922763
29	Drain Plug	2	908225	153R	Washer – Retaining Screw	4	909668
35	Key - Shaft	1	909107	154	Shaft Sleeve Assembly	2	337772
39	Blanking Plate	1	[3] 497708	155	Capscrew – Shaft Sleeve	4	920008
41	Liner	1	187705				

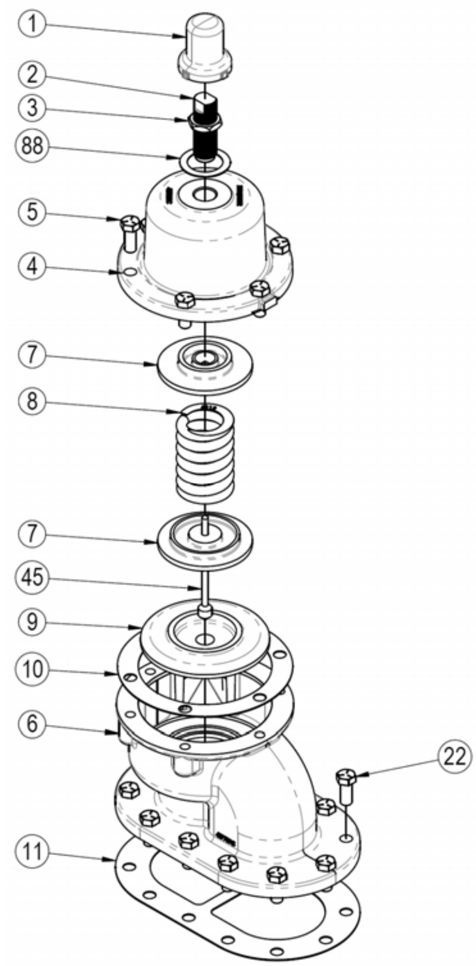
[1] Includes Locknuts and Lockwashers, ref. 24A & 24B.

[2] Includes liner locating pin 930549 at 12 o'clock position.

[3] Blanking Plates are no longer offered.

RELIEF VALVE - OPTIONAL

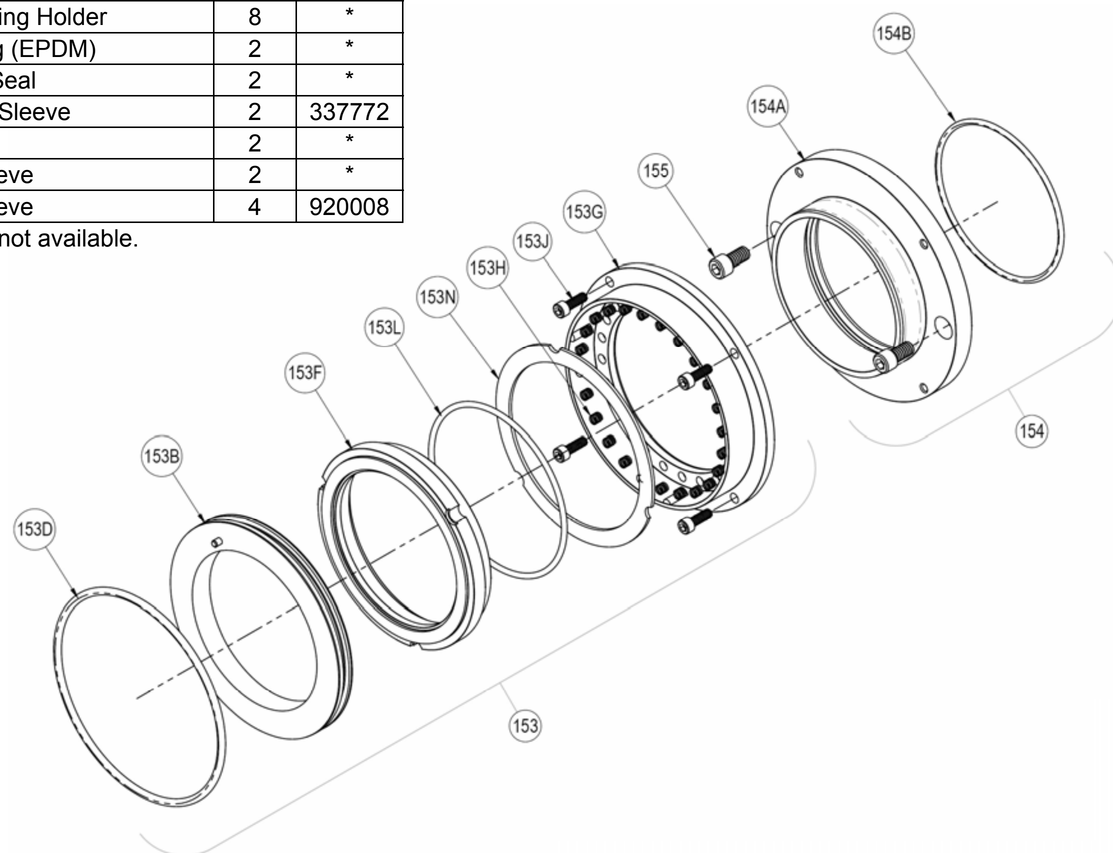
Ref. No.	Part Name	Parts Per Pump	Part No.
1	Cap - Relief Valve (R/V)	1	417710
2	Adjusting Screw - R/V	1	437205
3	Locknut - Adjusting Screw	1	436655
4	Cover - R/V	1	417200
5	Capscrews - R/V Cover	6	920639
6	Body - R/V	1	407709
7	Spring Guide - R/V	2	427200
8	Spring - R/V (STE 81-100 psi)	1	476912
	Spring - R/V (STS 101-120 psi)		477204
9	Valve - R/V	1	457215
10	Gasket - R/V Cover	1	536606
22	Capscrews - R/V Body	12	920639
45	Guide Rod - R/V	1	427205
88	Gasket - R/V Cap	1	536652



MECHANICAL SEAL

Ref. No.	Part Name	Parts Per Pump	Part No.
153	Mechanical Seal Asy. (UECE)	2	337771
153B	Stationary Seat (Tungsten Carbide)	2	*
153D	O-Ring - Stationary (EPDM)	2	*
153F	Rotating Seal Face (Carbon)	2	*
153G	Holder, Seal Spring	2	*
153H	Spring, Seal	48	*
153J	Screw - Seal Spring Holder	8	*
153L	O-Ring - Rotating (EPDM)	2	*
153N	Retaining Ring, Seal	2	*
154	Assembly, Shaft Sleeve	2	337772
154A	Shaft Sleeve	2	*
154B	O-ring, Shaft Sleeve	2	*
155	Screw, Shaft Sleeve	4	920008

* Individual seal parts are not available.



Blackmer
Part of Pump Solutions Group®
A DOVER COMPANY

Z3500 Pump

For Truck and Stationary Applications

Reversible sideplates add twice the life. Sideplates are easily reversed/replaced by removing just twelve head bolts.

Unique elongated flange configuration enables you to retrofit other three-inch pumps with little or no change in piping.

Patented needle roller thrust bearings rated for 4,000 lbs minimizes sideplate wear. Typically, no field adjustment is required.

Computer designed porting and profiling of the cam reduces cavitation and improves the pumping efficiency.

New Z-Series pump with higher flow rates for faster loading and unloading!

The Z3500 is a three-inch foot mount pump designed for stationary and truck applications such as loading and unloading single and dual bobtails. It offers the same locked rotor design used in the Corken Z-Series truck pumps to ensure a longer pump life and excellent performance. The Z3500 also delivers higher flow rates than other three-inch competitive pumps, so your loading times are shortened.

Lastly, installation is easy because the Z3500 retrofits the Corken model 1021 pump and other competitive three-inch pumps with little or no change in piping.

Advantages:

- Large diameter non-metallic pins are not speed sensitive so you can operate the pump at a higher RPM and not damage the pump.
- High tech materials used on cam and blades extend the life of the pump.
- Up to 7% or more capacity at 640 RPM.
- Unlike other three-inch stationary pumps rated at 640 RPM, the Z3500 is rated up to 800 RPM providing higher capacity without damage.
- Maintenance is made simple. When it becomes necessary to service the pump, all you need to do is remove twelve head bolts to inspect the bearings, seals, sideplates, rotor, vanes and vane drivers.
- Retrofits the Corken model 1021 pump and other three-inch competitive pumps with little or no change in piping.

CAPACITY COMPARISON*

	RPM			
	420	520	640	780
Corken gpm (L/min)	86 (326)	116 (439)	143 (541)	177 (670)
Competitor gpm (L/min)	80 (303)	108 (409)	133 (503)	—

All capacities are rated at 50 psid and system and condition dependent.

Solutions beyond products...

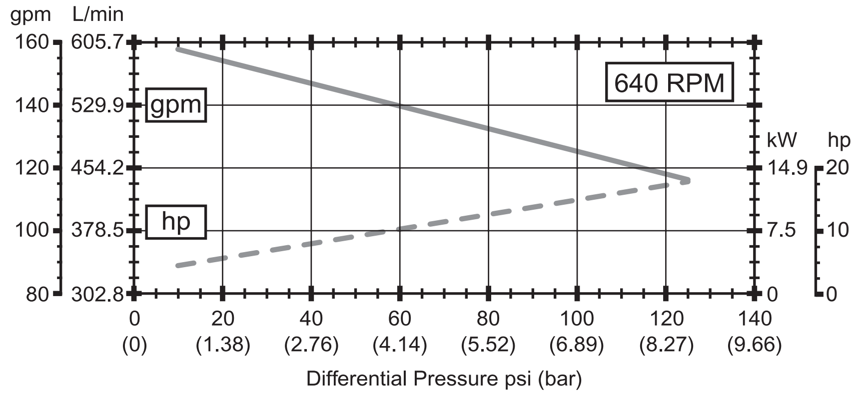
CORKEN®

IDEX

Operating Specifications

RPM range:	420–800 RPM
Max working pressure:	400 psig (28.6 bar)
Temperature range:	-25°F–225°F (-32°C–107°C)
Internal relief valve:	Yes
Max differential pressure:	150 psid (10.3 bar d)
Flow range:	52–197 gpm (197–746 L/min)

Performance Curves

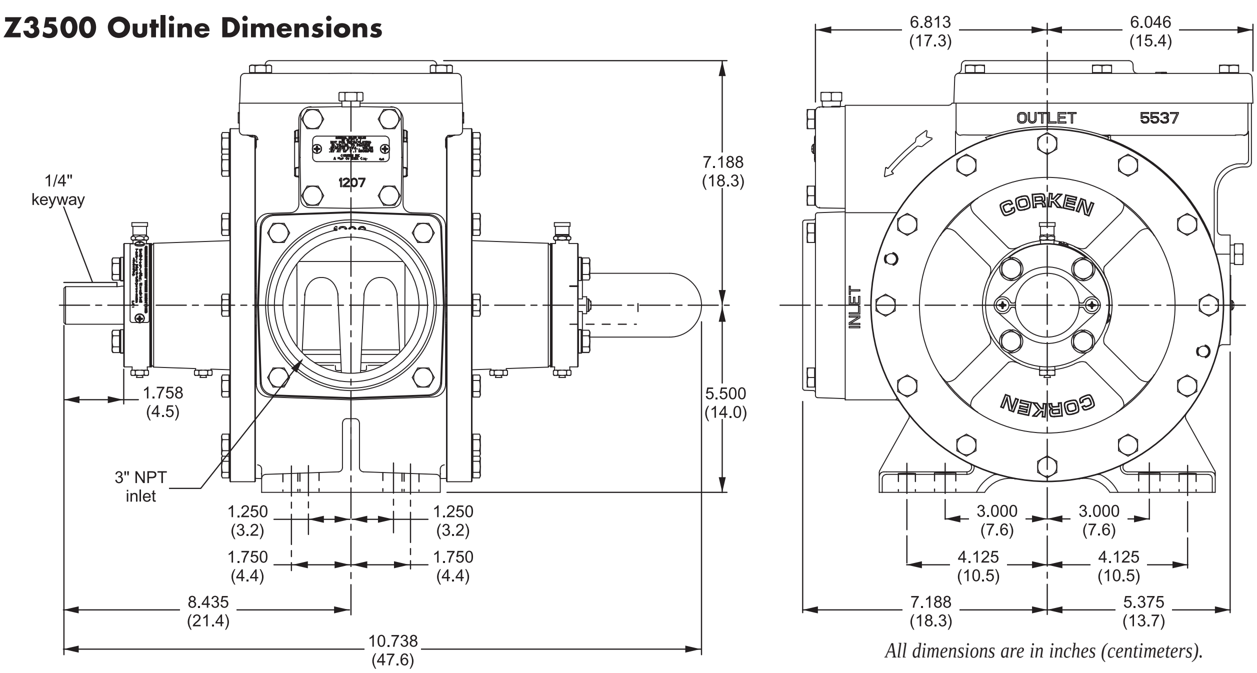


Material Specifications

Part	Standard Material	Optional Material
Case, head, rotor, relief-valve cap, bearing cap	Ductile iron ASTM A536	
Cam	Gray iron ASTM A48, Class 50	
Sideplate	Gray iron ASTM A48, Class 30	
Welding flange	Steel	
Seal seat	Gray iron	Stainless steel & Ni-Resist
Seal metal parts	Steel	
Shaft	8620 steel	
Vanes and vane drivers	Advanced polymers	
Relief valve spring	Stainless steel	
Relief valve	Steel	
Bearing	Steel	
Thrust bearing	Steel	
O-rings	Buna-N	PTFE, Viton®, Neoprene®[1]
Retainer rings	Steel	

[1]*Viton® and Neoprene® are a registered trademarks of the DuPont company.*

Z3500 Outline Dimensions



All dimensions are in inches (centimeters).

Solutions beyond products...

QUALITY ISO 9001 SYSTEM

CORKEN® IDEX

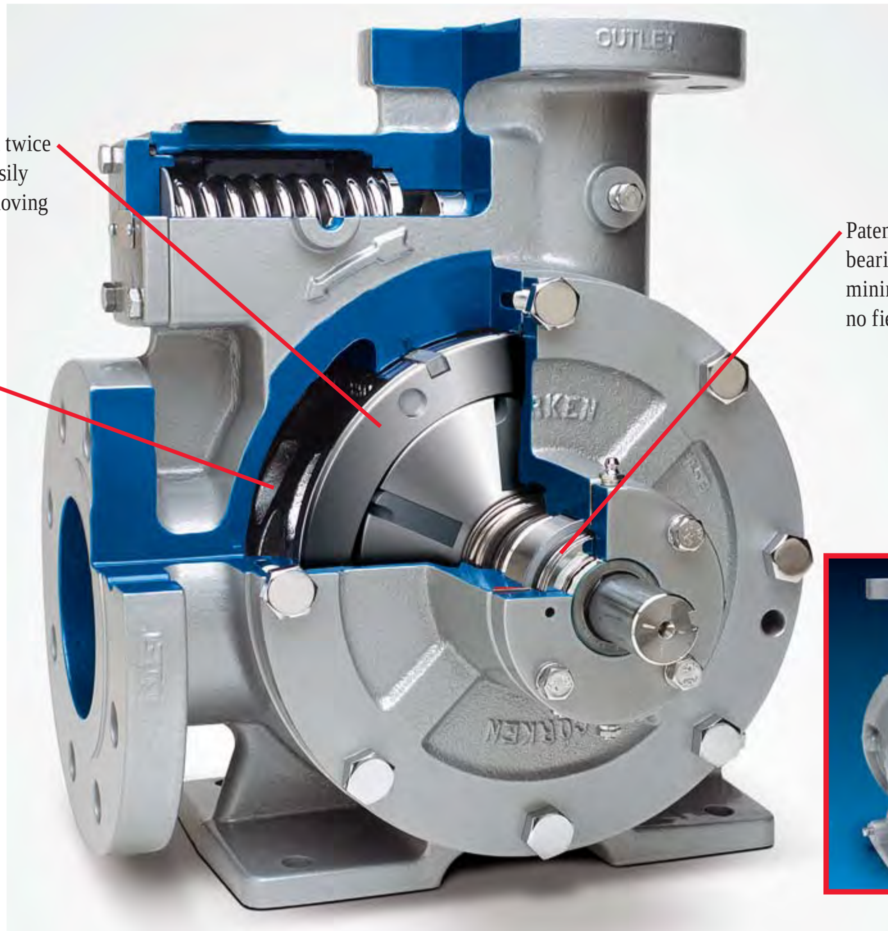
ENVIRONMENTAL ISO 14001 MANAGEMENT SYSTEM

Z4500 Stationary Pump

Reduces Fill Times to Save Time and Money

Reversible sideplates add twice the life. Sideplates are easily reversed/replaced by removing just eight head bolts.

Computer designed porting and profiling of the cam reduces cavitation and improves the pumping efficiency.



Patented needle roller thrust bearings rated for 4,000 lbs minimizes sideplate wear. Typically, no field adjustment is required.

Higher capacities shorten fill times for transports and multiple bobtail loading.

The Z4500 is a four-inch stationary pump designed for transport loading and multiple bobtail loading applications. If you have two or more bulkheads to load bobtails and transports and would like to shorten your fill times, then the Z4500 is the stationary pump for you. The Z4500 can fill two 3,000 gallon bobtails in 20 minutes or less at typical operating RPMs.

- Large diameter non-metallic pins are not speed sensitive so you can operate the pump at a higher RPM and not damage the pump.
- High tech materials used on cam and blades help extend the life of the pump.
- Unlike other four-inch stationary pumps rated at 640 RPM, the Z4500 is rated up to 800 RPM providing higher capacity without damage.
- Maintenance made simple. When it becomes necessary to service the Z4500 stationary pump, all you need to do is remove eight head bolts to inspect the bearings, seals, sideplates, rotor, vanes and vane drivers.
- Higher capacities than other four-inch stationary pumps—up to 15% more at typical operating conditions.

CAPACITY COMPARISON*

	RPM			
	420	520	640	780
Corken gpm (L/min)	197 (746)	248 (939)	309 (1,170)	382 (1,446)
Competitor gpm (L/min)	170 (643)	220 (833)	270 (1,022)	——

All capacities are rated at 50 psid and system and condition dependent.

Solutions beyond products...

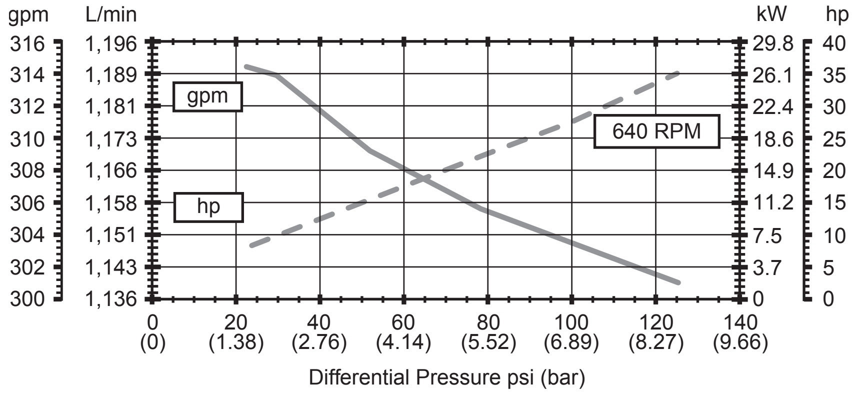
CORKEN®

IDEX

Operating Specifications

RPM range:	420–800 RPM
Max working pressure:	400 psig (28.6 bar)
Temperature range:	-25°F–225°F (-32°C–107°C)
Internal relief valve:	Yes
Max differential pressure:	125 psid (8.6 bar d)
Flow range:	190–382 gpm (719–1,457 L/min)

Performance Curves

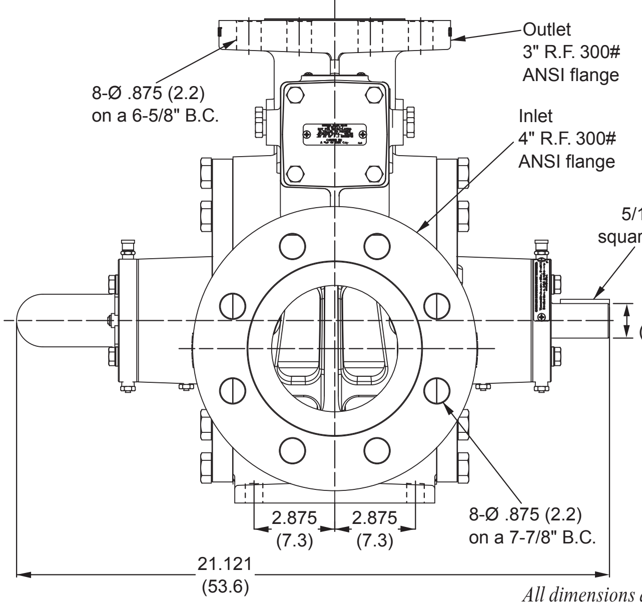


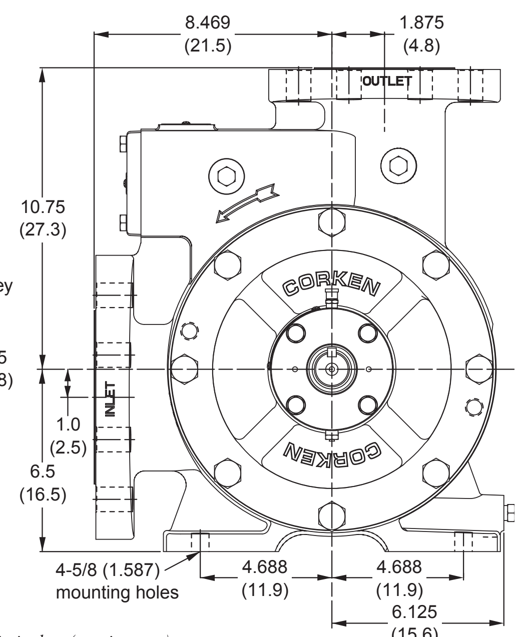
Material Specifications

Part	Standard Material	Optional Material
Case, head, rotor, relief-valve cap, bearing cap	Ductile iron ASTM A536	
Cam	Gray iron ASTM A48, Class 50	
Sideplate	Gray iron ASTM A48, Class 30	
Welding flange	Steel	
Seal seat	Gray iron	Stainless steel & Ni-Resist
Seal metal parts	Steel	
Shaft	8620 steel	
Vanes and vane drivers	Advanced polymers	
Relief valve spring	Stainless steel	
Relief valve	Stainless steel	
Bearing	Steel	
Thrust bearing	Steel	
O-rings	Buna-N	PTFE, Viton®, Neoprene®[1]
Retainer rings	Steel	

[1] *Registered trademark of the DuPont company.*

Z4500 Outline Dimensions





All dimensions are in inches (centimeters).

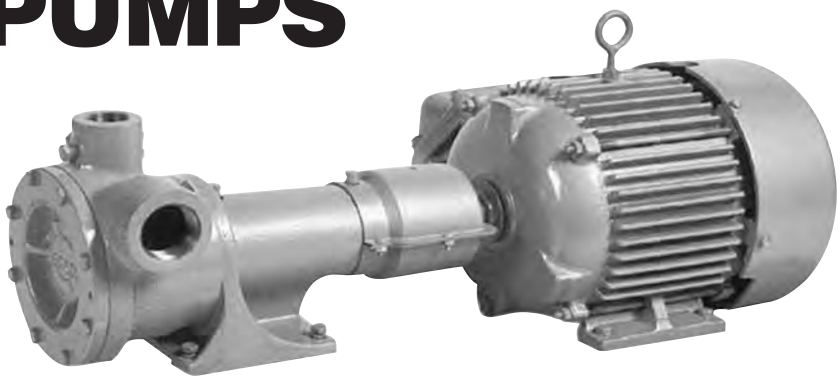
Solutions beyond products...

QUALITY
ISO 9001
SYSTEM

CORKEN®
IDEX

ENVIRONMENTAL
ISO 14001
MANAGEMENT
SYSTEM

INDUSTRIAL CORO-FLO® PUMPS



MODEL F14-101

F-MODEL WITH ANSI FLANGES

DS/DL MODEL

Solutions beyond products...

CORKEN®
IDEX

TYPICAL APPLICATIONS

Reflux pump for gas liquids
LP-Gas vaporizer feed pump
Aerosol propellant pump
Anhydrous ammonia cylinder filling
Propane motor fuel pumping

Pumps 2 to 36 gpm (7.6 to 136 lit/min)
Heads to 700 ft (213 m)

FOR THIN LIQUIDS & LIQUEFIED GASES

Propane
Butane
Ammonia
Refrigerants
Sulfur Dioxide
Carbon Dioxide
Gasoline
Light Oils
Solvents
Propylene
Pentane
Foam Blowing Agents

Listed by Underwriters' Laboratories, Inc. for use in LP-Gas and Anhydrous Ammonia.

THE CORKEN CORO-FLO PUMP - ‘F’ SERIES

IDEAL FOR RESEARCH LABORATORY WORK AND FOR HANDLING MANY LIQUIDS OF THE PETROCHEMICAL, LPG, NH3 AND AEROSOL INDUSTRIES.

For low-capacity, high-head pumping, the Corken Coro-Flo pump is designed and built for the tough jobs. Without the noise, vibration and pulsations of the positive displacement gear and sliding vane pumps, the Coro-Flo pump handles volatile and other hard-to-handle thin liquids smoothly and quietly. The one moving part, the impeller, floats on the shaft with no rubbing, grinding or metal-to-metal contact.

The Corken Coro-Flo was originally developed to fill propane cylinders, but it has found its way into many other fields, especially where volatile liquid transfer is involved. It is commonly used to feed aerosol filling lines, and to transfer liquefied gases like NH_3 CO_2, SO_2 and the refrigerant gases.

The Coro-Flo pump has been designed for simplicity of inspection and service. The cover can be removed and the impeller and seal serviced without disturbing the piping. The balanced mechanical seal is furnished with its own sleeve for the longest and most reliable service.

Every Corken Coro-Flo pump is carefully inspected and run to assure its quality and performance. The Coro-Flo is listed by Underwriters' Laboratories, Inc. for use in LP-Gas and anhydrous ammonia service.

MATERIAL SPECIFICATIONS

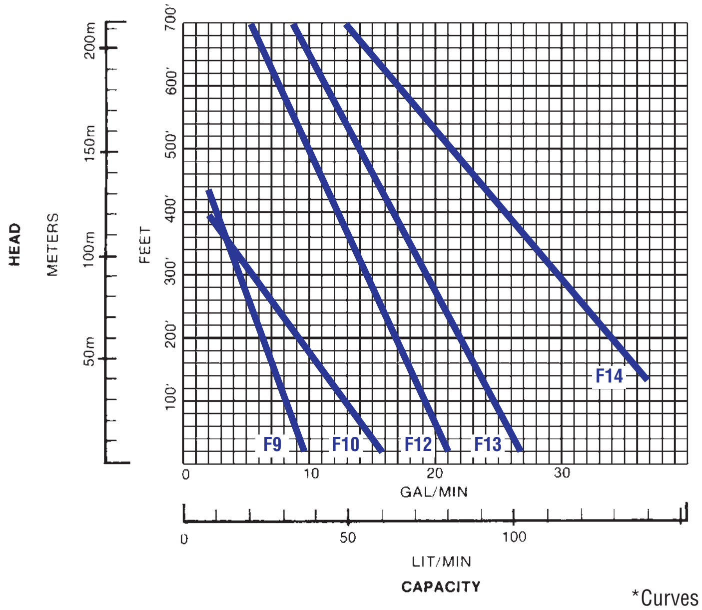
Part	Standard	Optional
CASE/COVER	Ductile Iron ASTM A-536	None
IMPELLER	Bronze	303 Stainless Steel Ductile Iron
SHAFT	Stressproof Steel	416 Stainless Steel
O-RINGS	Buna N	Teflon* Viton* Neoprene* Etylene-Propylene
SEAL SLEEVE	Aluminum	416 Stainless Steel
SEAL SEAT	Cast Iron	304 Stainless Steel Ni-Resist Ceramic Tungsten Carbide
SEAL HOUSING	Steel, Cadmium Plated	416 Stainless Steel

*Registered Trademarks of Du-Pont.

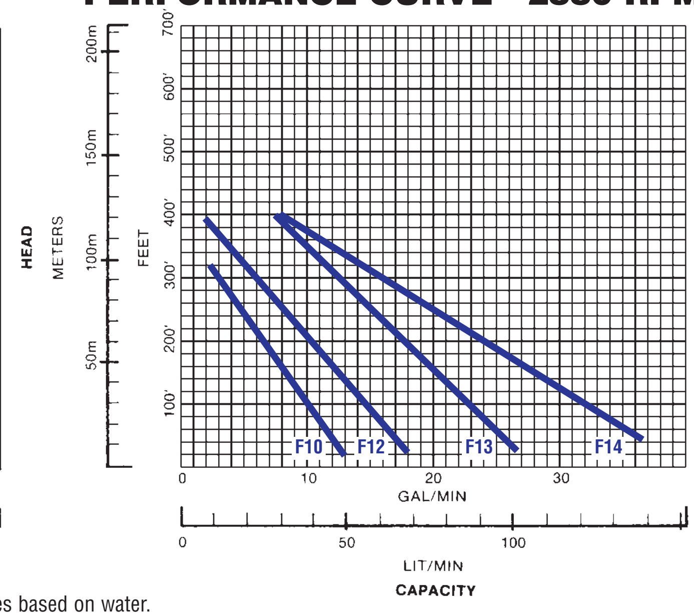
MECHANICAL SPECIFICATIONS

INLET	1-1/4” NPT (Models F9, F10) 1-1/2” NPT (Models F12, F13, F14, F15) 1-1/2” ANSI 300 LB. (Models FF9-FF15)
OUTLET	1” NPT 1” ANSI 300 LB. (FF9-FF15)
ROTATION	Clockwise only (From driven end)
MAX. RPM	3600
MAX. CASE TEST PRESSURE	2500 psig (172 Bar)
MAX WORKING PRESSURE	400 psig (27.6 Bar)
MAX DIFFERENTIAL PRESSURE	125 psig (10.3 Bar)
HORSEPOWER RANGE	1/2 to 10
TEMPERATURE RANGE	-25° to +225° F (-32° to +107°C)
MAX. VISCOSITY	400 SSU

PERFORMANCE CURVE - 3450 RPM*



PERFORMANCE CURVE - 2880 RPM*



*Curves based on water.

EXCLUSIVE FEATURES OF THE CORO-FLO PUMP

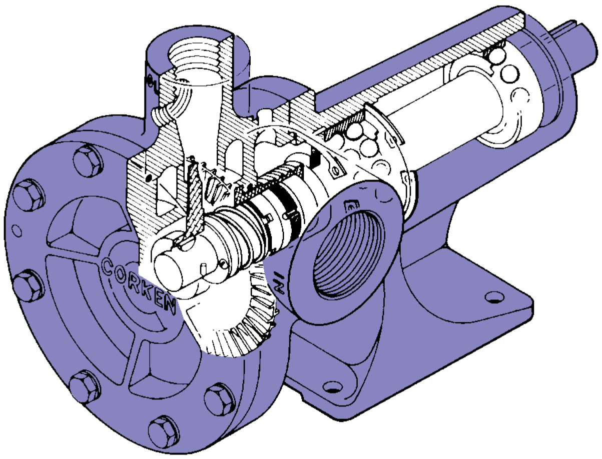
EXCLUSIVE DIVIDED SUCTION DESIGN provides smooth continuous flow through the pump.

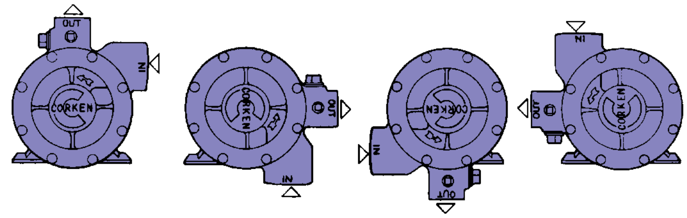
A BY-PASS CONNECTION, 3/4" pipe thread, has been located on the outlet nozzle to simplify piping of the pump.

A PRESSURE GAUGE CONNECTION, 1/4" pipe thread, has been located on the outlet nozzle.

UNDERWRITERS' LABORATORIES, INC has tested and inspected CORO-FLO PUMPS and has listed them for use in the handling of L.P. Gas and Anhydrous Ammonia Liquid.

THE BALANCED MECHANICAL SEAL ASSEMBLY with its own shaft sleeve may be replaced easily by removing the Cover and the Impeller without disturbing the piping or driver. No special tools are needed.





THE IMPELLER "floats" on the shaft and may be replaced easily when worn or damaged by simply removing the Cover without disturbing the piping.

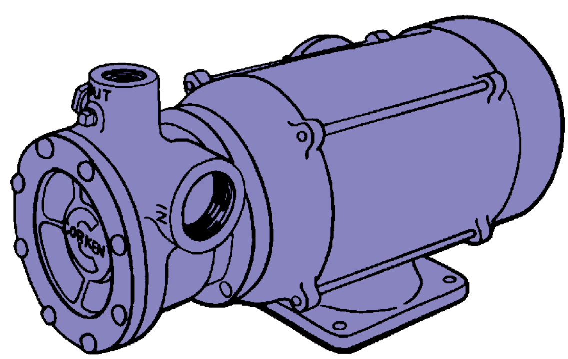
HEAVY-DUTY BALL BEARINGS are used for precision operation and long service life.

RUGGED DUCTILE IRON has been used in the manufacture of this pump for parts under pressure of the liquid.

THE PUMP NOZZLES MAY BE ROTATED into four different positions, 90 degrees apart, if desired.

300 LB. ANSI FLANGES are also available for those applications requiring stringent leakage control.

FOR LP-GAS APPLICATIONS ONLY



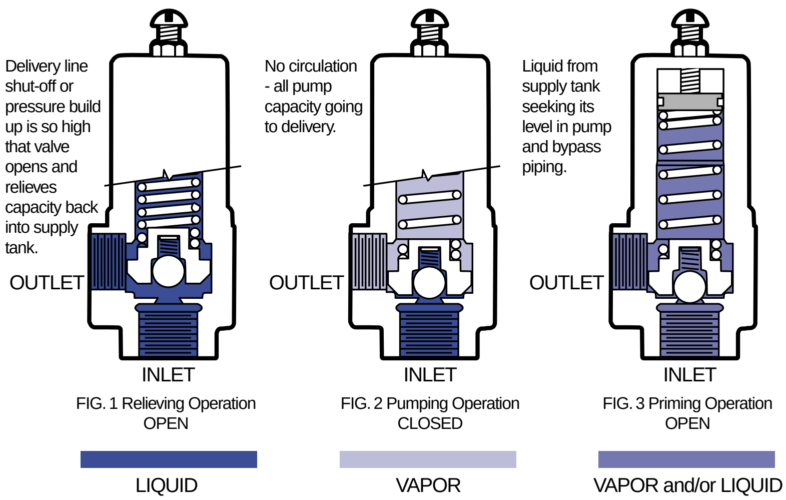
Close-Coupled Pump Motor units are available.
See Corken Bulletin LPG100.

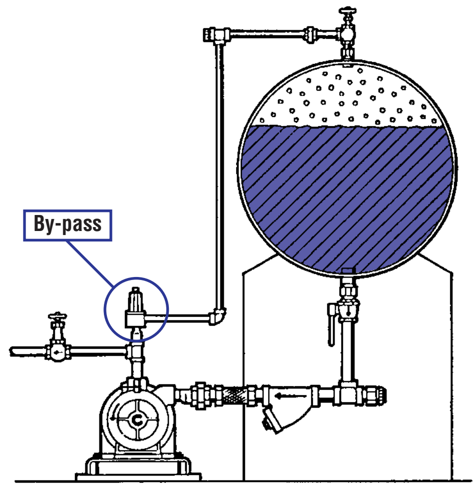
AN IMPORTANT ACCESSORY TO THE CORO-FLO PUMP
CORKEN B166 BY-PASS VALVE

Automatic, Dual Purpose By-pass Valve

This is a combination by-pass and priming valve specifically designed for small bottle filling pumps, such as the Corken Coro-Flo pump series. The patented vapor elimination systems keep liquefied gas pumps primed to increase system reliability and decrease pump and seal wear. The B166 is a smooth operating by-pass with moderate pressure build up.

Corken B166 Bypass Valve Functions.





Typical Application: On all Corken Coro-Flo pumps as well as bottle pumps of other manufacturers. On propellant feed pumps at aerosol filling plants.

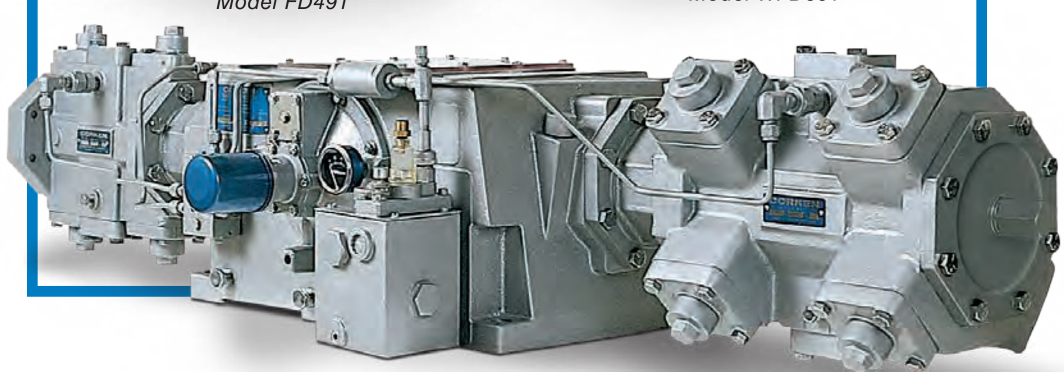
Solutions beyond products...

I-Series

Industrial Series Compressors

Model FD491

Model WFD591



Model HG602

Solutions beyond products...

CORKEN®

IDEX

Why Select Corken Compressors?

Oil-free compression for a wide range of process gases...

Corken's line of oil-free industrial series (I-Series) compressors has been designed to transfer a wide range of process gases including, but not limited to, **butadiene, hydrogen, helium, methyl chloride, sulfur dioxide, chlorine** and **HCFCs**. The industrial series compressors are highly reliable reciprocating machines and are used in applications as varied as compressing exotic gases for research, compressing process gases for the chemical industry, compressing corrosive biogases in landfills and boosting gases in the oil and gas industry.

Greater control of fugitive emissions...

For toxic, hazardous and explosive gases, Corken's D-style (single-distance piece with two sets of packing) and T-style (double-distance-piece with three sets of packing) designs provide precise leakage control. When properly equipped, Corken's T-style compressors comply with the EPA's requirements for fugitive emissions control of volatile organic compounds (VOCs).*

Multiple options to match your application requirements...

Corrosion resistant coatings: Corken offers a special coating which acts to prevent corrosion and premature wear of critical parts within the compressor. The coating is a nickel alloy plating which is impregnated with fluorocarbons. See page 11 for details.

Material options: To meet the demands of volatile and toxic gases, Corken offers a wide range of materials for compressor parts, gaskets and O-rings.

ANSI flange option: The industrial series (I-Series) vertical compressors are available with ANSI flanges. ANSI is a raised faced flange that dramatically improves leakage containment and structural integrity. Most of the industrial series (I-Series) horizontal compressors are not available with ANSI flanges; however, they do come with a slip-on weld flange option. The only exception is the 2.75" horizontal cylinder which comes standard with ANSI flanges.

DIN iron option: For maximum thermal shock endurance, Corken offers DIN spec iron for pressure containing parts (cylinder and head) on several of its compressors. These parts meet German DIN ductile iron specifications. Consult factory for details regarding a specific compressor model.

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*

Model WD391

Compatibility Chart

Air	Carbon tetrachloride	Ethane	Isobutene	Neon	CFC-113	HFC-152A
Ammonia	Carbonyl sulfide	Ethyl chloride	Isobutylene	Nitric oxide	CFC-114	Sulfur dioxide
Argon	Chlorine	Ethylene	Krypton	Nitrous oxide	CFC-115	Sulfur hexafluoride
Benzene	Chlorodifluoro-	Ethylene oxide	Methane	N-octaine	CFC500	Tetrafluoroethylene
Biogas	methane	Helium	Methyl acetylene	Ozone	CFC502	Trichloroethane
Butadiene	Cyanogen	Hexafluoroethane	Methyl bromide	N-pentane	CFC503	Trimethylamine
N-butane	Cyclohexane	N-heptane	Methyl chloride	Propane	HCFC-22	Vinyl bromide
1-butene	Cyclopropane	N-hexane	Methyl fluoride	Propylene	HCFC-141B	Vinyl fluoride
Bromotrifluoro-	Deuterium	Hydrocarbon gas	Methyl mercaptan	Refrigerants:	HCFC-142B	Vinyl chloride
methane	Dimethylamine	Hydrogen	Monoethylamine	CFC-11	HFC-14	Xenon
Carbon dioxide	Dimethyl ether	Hydrogen chloride	Monomethylamine	CFC-12	HFC-23	And many more
Carbon monoxide	2,2-dimethylpropane	Isobutane	Natural gas	CFC-13	HFC-134A	

Features & Benefits

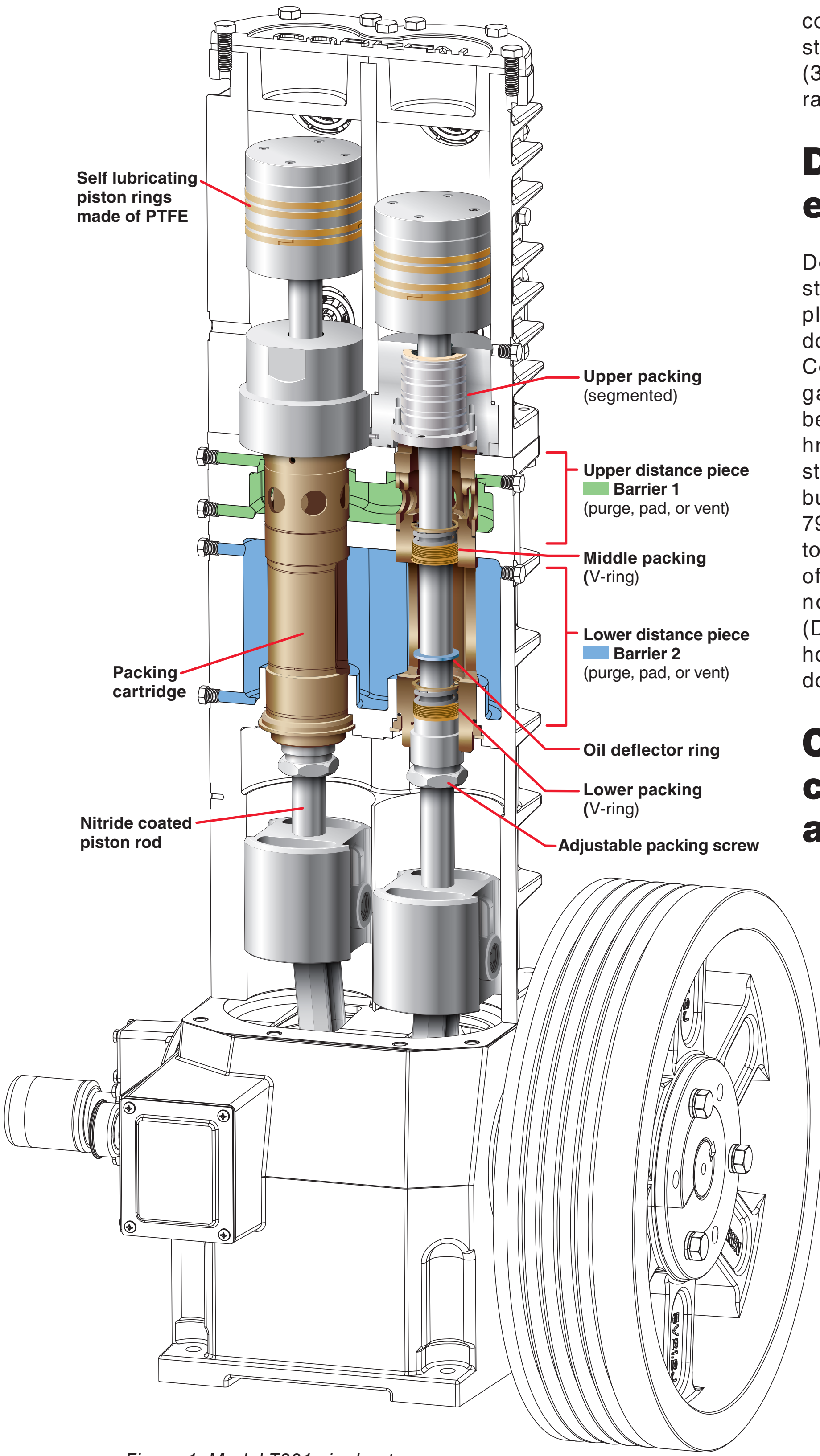


Figure 1: Model T891 single-stage compressor.

compressors come in a variety of single- and two-stage models. Cylinder sizes range from 1.25" to 6" (31.8 to 152.4 mm) while piston displacement ranges from 2.8 to 60.8 CFM (4.76–103.3 m^3/hr).

Double-acting designs for even greater capacity...

Double-acting compressors have two compression strokes per revolution so the compression takes place on both sides of the piston. As a result, double-acting compressors offer greater capacities. Corken's model 891 is a double-acting single-stage gas compressor that is capable of supplying between 56.7 and 117.0 CFM (96.3 and 198.8 m^3/hr), while the model 791 is a double-acting two-stage compressor with roughly the same capacities but a much higher working pressure. The model 791 has an adjustable clearance head that is used to balance the pressure load between stages. Both of these units are offered in either lubricated or non-lubricated versions. The D791 and D891 (D-style) compressors are not oil-free designs; however, the T791 and T891 (T-style) compressors do offer oil-free gas compression.

Custom engineered compressor packages available...

Corken offers standard mountings designed specifically for liquefied gas transfer, vapor recovery and gas booster applications. If the standard mountings and compressor packages do not meet your application requirements, Corken can supply a custom engineered package that meets the most demanding customer specifications. Skid mounted units can be supplied with control panels, safety controls, pulsation dampeners, receiver tanks, valves and other special accessories as required. For more details see the standard mounting and compressor packages and custom engineered packages at the back of this sales brochure.

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*

Horizontal Industrial Gas Compressors

Obtain higher pressures and capacities with a horizontal compressor...

When the pressures or capacities of your application are beyond the capabilities of a vertical compressor, the horizontal compressor is your next option. Corken's horizontal industrial compressor is a two-throw design that can build up to 1,650 psig (113 bar g). The available piston displacement ranges from 7.6 CFM (12.9 m^3/hr) to 414 CFM (704 m^3/hr). This balanced opposed compressor offers smooth, quiet operation and the flexibility of changing cylinder sizes as needed to optimize the compressor for the desired operating conditions. Cylinder sizes are 8" (203.2 mm), 6" (152.4 mm), 5" (127.0 mm), 4" (101.4 mm), 3.25" (82.6 mm), and 2.75" (69.9 mm). These cylinders can be arranged in various single-stage and two-stage configurations. Lubricated, non-lubricated, and oil-free versions are available.

Available in two styles...

Corken offers two styles of horizontal industrial compressors: plain style and T-style. The plain style (HG600 series) only has one set of packing per piston rod while the T-style (THG600 series) has three sets of packing per piston rod.

Use a single-packed, plain style for standard leakage containment...

The plain style (HG600 series) horizontal industrial compressor is not oil free and only has one set of packing. This packing configuration is typically used in non-corrosive, non-toxic services where oil-free gas is not required and leakage containment is not critical. Some examples are LPG, oilfield applications (natural gas) and air boosting applications.

Use a triple-packed, T-style for maximum leakage containment...

The T-style (THG600 series) is a non-lubricated, oil-free design with three sets of packing that form two distance pieces or barriers to external leakage (see figure 2 for details). For a wide range of application flexibility, each distance piece has its own line connections that can be pressurized, purged or vented separately. This allows you to choose the best method of containment for your application. When properly equipped with a purge kit, Corken's double-distance piece (T-style) provides precise leakage control and complies with the EPA's requirements for fugitive emissions control of volatile organic compounds (VOC).* For added convenience, purge kits with all of the accessories needed to control the purging or pressurization of each chamber are available. T-styles are typically used in corrosive or toxic applications where leakage containment and non-contamination of the gas stream are critical.

Piston rod packing design...

Unlike Corken's vertical industrial compressor that uses a V-ring packing design, the horizontal industrial compressor uses a segmented purge packing design. Segmented purge packing consists of purge packing cups, spacers, O-rings, segmented packing, backup rings and springs.

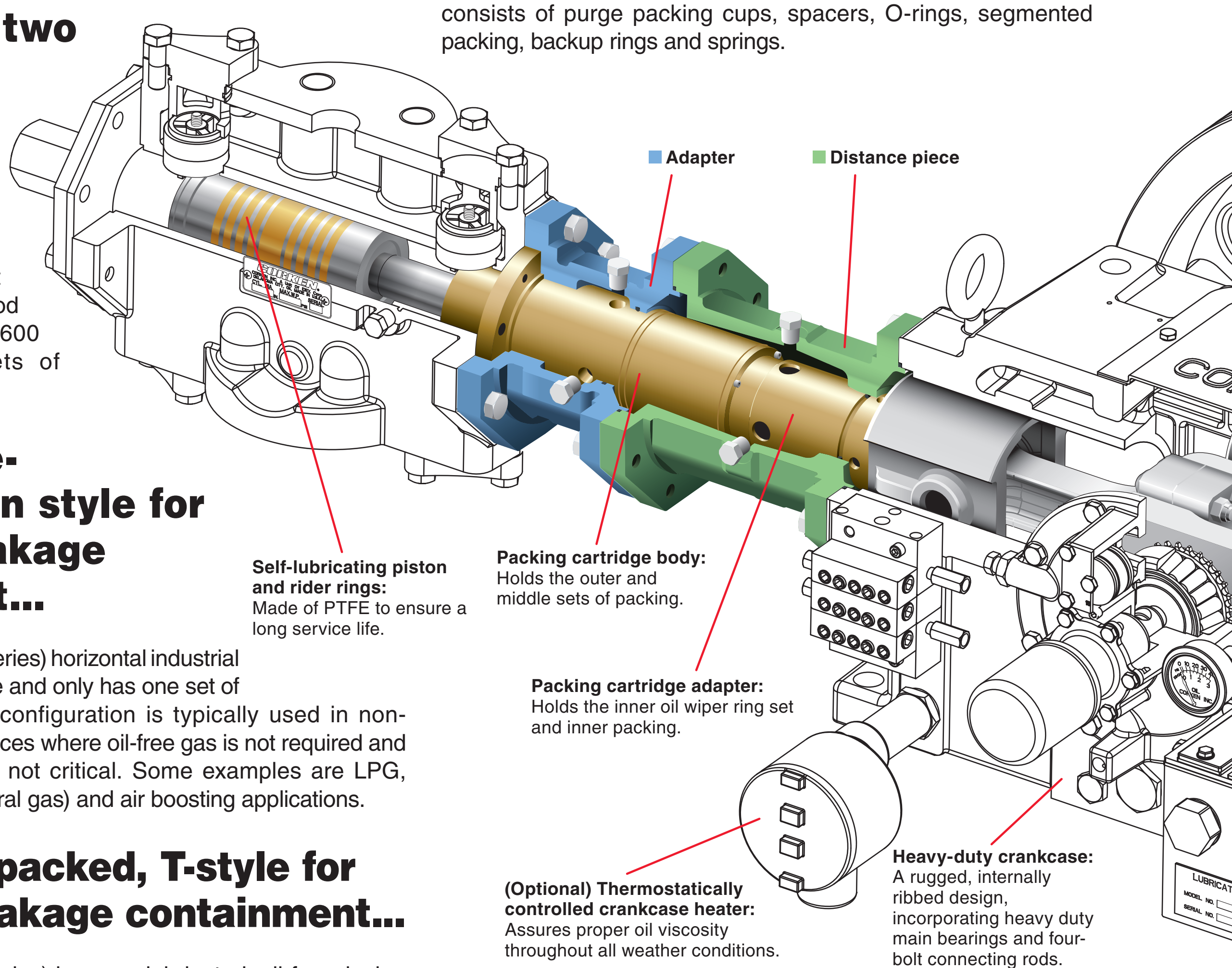


Figure 2: THG602BF (T-style) compressor.

Features & Benefits

Oil-free gas compression...

To meet the stringent requirements of today's markets, Corken's T-style (double-distance piece) horizontal compressors are oil free so there's no contamination of the process gas stream. The T-style has three sets of segmented packing. Since the distance between each set of packing is greater than the stroke of the compressor, there's no rod over travel or oil carryover. In other words, the portion of the piston rod that comes into contact with the first set of packing will never reach the second set of packing while the portion of the piston rod that comes into contact with the second set of packing will never reach the third set of packing. In the event oil gets past the inner packing set, the oil deflector ring keeps the oil from reaching the outer distance piece (see figure 2 for details).

Available in single- or double-acting configurations...

The plain and T-style horizontal industrial compressors are available in single- or double-acting configurations. Single-acting configurations are ideal for applications that require low flow and high pressure while double-acting configurations offer maximum capacity. Single-acting configurations require a blank valve option.

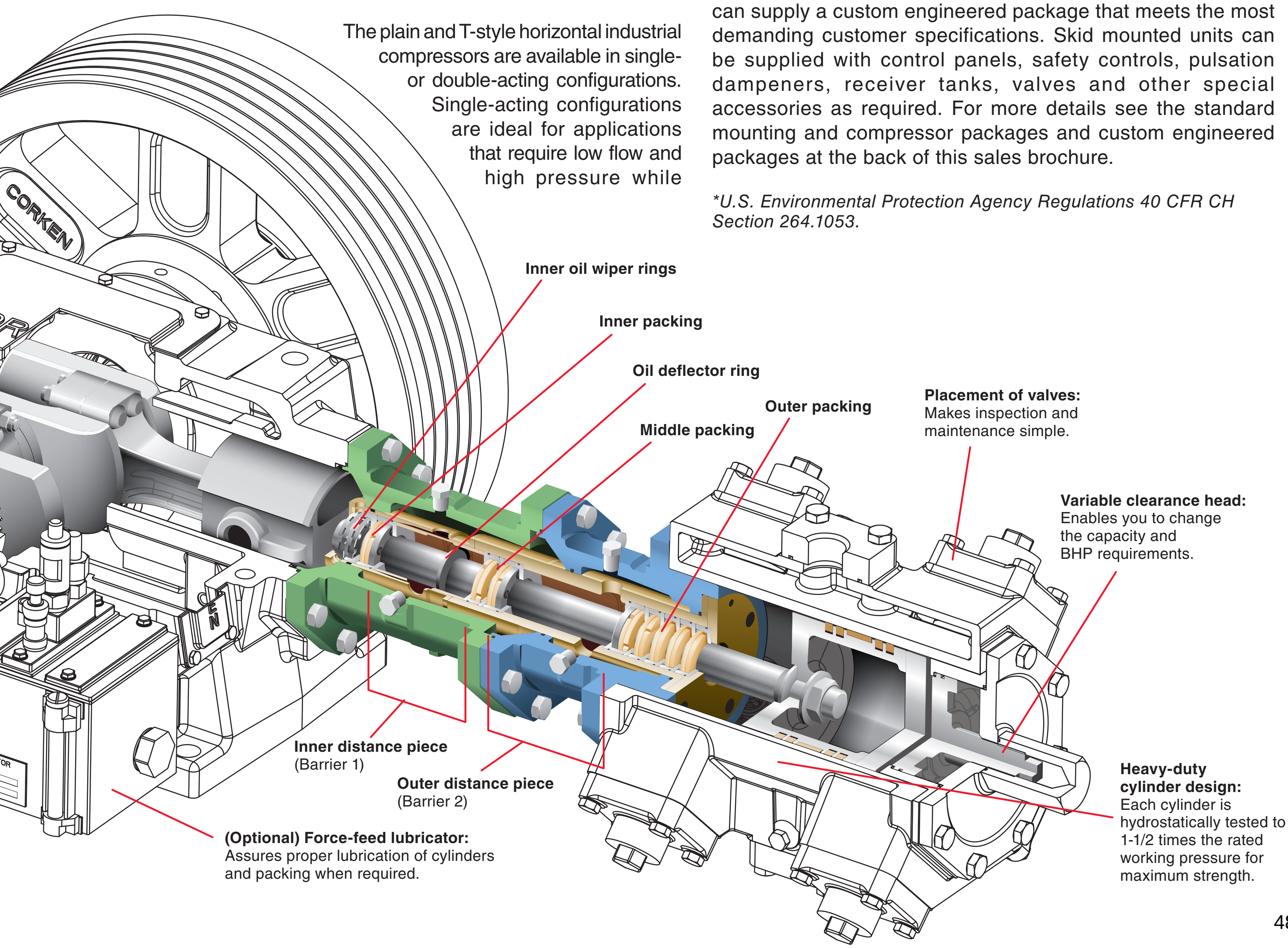
External crankcase oil cooler...

Corken's horizontal industrial compressors are equipped with a force-feed-lubrication system and external oil filter. For applications that require a high horsepower, Corken recommends an optional external oil cooler. This will ensure a consistent oil temperature and an optimal service life for the compressor.

Custom engineered compressor packages available...

Corken offers standard mountings designed specifically for liquefied gas transfer, vapor recovery and gas booster applications. If the standard mountings and compressor packages do not meet your application requirements, Corken can supply a custom engineered package that meets the most demanding customer specifications. Skid mounted units can be supplied with control panels, safety controls, pulsation dampeners, receiver tanks, valves and other special accessories as required. For more details see the standard mounting and compressor packages and custom engineered packages at the back of this sales brochure.

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*



Vertical Industrial Gas Compressors

Compressors matched to your needs...

Corken offers many types of vertical industrial compressors to meet the stringent requirements of today's markets. Depending on your application, Corken can provide single- or two-stage, air- or water-cooled, and single- and double-acting vertical compressors. Lubricated and non-lubricated versions are available as well.

Water-cooled heads, cylinders and packing...

To increase the versatility of the vertical industrial compressors used in the process gas market, Corken offers water-cooled heads, cylinders and packing on several models. The water-cooled features greatly reduces the operating temperature and allows the compressor to be used in applications with gases that have a high K value such as argon, air, helium, hydrogen, and nitrogen.

Oil-free gas compression...

Corken's vertical industrial compressors deliver oil-free gas compression and are equipped with a single-distance piece (D-style) or a double-distance piece (T-style). The D-style has two sets of packing per piston rod while the T-style has three sets of packing per piston rod. Since the distance between each set of packing is greater than the stroke of the compressor, there's no rod over travel or oil carryover. In the event oil gets past the lower packing set, the oil deflector ring keeps the oil from rising up the piston rod (see figure 1 for details). Additionally, the lower packing set has an adjustable packing screw that is used to maintain maximum sealing performance. These features allow the compressor to supply oil-free gas whether it's being used as a simple gas booster or for vacuum service. Both single- and two-stage compressors are capable of developing up to 23 in Hg (157 mm Hg) vacuum.

Piston rod packing design...

With the exception of models 791 and 891, all of Corken's vertical industrial compressors use a V-ring packing design. Models 791 and 891 use a combination of V-ring and segmented packing. V-ring packing consists of several V-rings, male and female packing rings, washers and a spring. In high temperature applications, K-ring spacers (optional) can be used in conjunction with the V-ring packing to improve leakage control and help extend the service life of the packing. Segmented packing consists of packing cups, spacers, O-rings, segmented packing, backup rings and a spring.

Greater leakage control and containment...

The D-style (single-distance piece) forms one isolation chamber while the T-style (double-distance piece) forms two isolation chambers/barriers (see figure 1 for details). Each distance piece has its own line connections and can be separately pressurized, purged or vented depending on the requirements of your application. Purge kits with all of the accessories needed to purge each distance piece are available. With the purge kit option, the T-style compressor is virtually leak proof and complies with the EPA requirements for fugitive emissions control of volatile organic compounds (VOC).*

Single-stage oil-free compressors...

Corken's single-stage compressors are typically used in applications where the gas compression ratio is less than 5:1. Generally, applications with relatively low differential pressures are well suited for a single-stage compressor. Transport, rail car and marine unloading by vapor differential are examples of this type of application.

Two-stage oil-free compressors...

Corken's two-stage compressors are typically used in applications where the gas compression ratio is greater than 5:1. The two-stage compressors divide the compression process into two separate steps and allow the gas to be cooled after the first stage of compression so the final discharge temperature is lower. These compressors are commonly used in booster and vapor recovery applications. Due to the need for higher differential pressures which result in higher operating temperatures, Corken also offers a water-cooled, two-stage compressor where both the cylinder and the head are cooled.

Single-acting designs with a wide range of capacities...

Single-acting vertical compressors only have one compression stroke per revolution so the compression takes place on one side (top) of the piston. The single-acting

Vertical Industrial Gas Compressors

Operating Specifications

Specifications	Single-Stage Compressors							Two-Stage Compressors						
D-style (single-distance piece)	D91	D291	D491	D491-3	D691	D691-4	D891[a]	FD151	D191	FD351	D391	WFD551	FD591	D791[a]
T-style (double-distance piece)	T91	T291	T491	T491-3	T691	T691-4	T891[a]	FT151	T191	FT351	T391	WFT551	FT591	T791[a]
Bore of cylinder inches (mm)														
First stage	3.0 (76.2)	3.0 (76.2)	4.0 (101.6)	3.0 (76.2)	4.5 (114.3)	4.0 (101.6)	4.5 (114.3)	2.5 (63.5)	3.0 (76.2)	2.75 (69.9)	4.5 (114.3)	4.0 (101.6)	6.0 (152.4)	6.0 (152.4)
Second stage							3.0 (76.2)	1.25 (31.8)	1.75 (44.5)	1.75 (44.5)	2.5 (63.5)	2.5 (63.5)	3.25 (82.5)	3.25 (82.5)
Stroke inches (mm)	2.5 (63.5)	2.5 (63.5)	3.0 (76.2)	3.0 (76.2)	4.0 (101.6)	4.0 (101.6)	4.0 (101.6)	2.5 (63.5)	2.5 (63.5)	3.0 (76.2)	3.0 (76.2)	4 (101.6)	4.0 (101.6)	4.0 (101.6)
Piston displacement CFM (m^3/hr) @ 400 rpm	4.1 (7.0)	8.2 (13.9)	17.5 (29.7)	9.8 (16.7)	29.5 (50.1)	23.3 (39.6)	56.7 (96.3)	2.8 (4.76)	4.1 (7.0)	4.1 (7.0)	11.1 (18.9)	11.6 (19.7)	26.2 (44.5)	52.4 (89.0)
Piston displacement CFM (m^3/hr) @ 825 rpm	8.4 (14.3)	16.9 (28.7)	36.0 (61.2)	20.3 (34.5)	60.8 (103.3)	48.0 (81.6)	117.0 (198.8)	5.9 (10.0)	8.9 (15.2)	8.5 (14.4)	22.8 (38.7)	24.8 (42.1)	54.0 (91.7)	105.8 (179.8)
Maximum working pressure psig (bar g)	335 (23.1)	335 (23.1)	335 (23.1)	600 (41.4)	335 (23.1)	600 (41.4)	450 (31.0)	1,200 (82.8)	600 (41.4)	1,200 (82.8)	600 (41.4)	1,000 (69.0)	600 (41.4)	600 (41.4)
Maximum brake horsepower (kW)	7.5 (5.6)	15 (11)	15 (11)	15 (11)	35 (26.1)	35 (26.1)	45 (34)	15 (11)	15 (11)	15 (11)	15 (11)	35 (26.1)	35 (26.1)	45 (34)
Maximum rod load lbs (kg)	3,600 (1,633)	3,600 (1,633)	4,000 (1,814)	4,000 (1,814)	7,000 (3,175)	7,000 (3,175)	7,000 (3,175)	3,600 (1,633)	3,600 (1,633)	4,000 (1,814)	4,000 (1,814)	7,000 (3,175)	7,000 (3,175)	7,000 (3,175)
Maximum discharge temperature °F (°C)[b]	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)
Bare unit weight with flywheel lbs (kg)	150 (68.0)	210 (95.2)	390 (176.9)	390 (176.9)	745 (337.9)	745 (337.9)	900 (408.2)	215 (97.5)	215 (97.5)	340 (154)	350 (158.8)	815 (369.7)	790 (358.8)	930 (421.9)
ANSI/DIN flange option	Yes	Yes	Yes	Yes	Yes	Yes	–	Standard	Yes	Standard	Yes	Standard	Standard	–
Water-cooled option	–	–	–	–	Yes	Yes	–	–	–	Yes	Yes	Standard	Yes	–

[a] *Double-acting compressor*

[b] *350°F discharge temperature requires use of high temperature O-rings, such as PTFE or Viton. Maximum recommended discharge temperature for use with Buna N or Neoprene O-rings is 250°F.*

Note: *Specific application conditions may limit a compressor's operating performance to less than the values shown on this page. Contact a Corken distributor or the factory for verification. Specifications may be changed without liability or advance notice.*

Selection Criteria for Vertical and Horizontal Compressors

Corken's vertical industrial gas compressors offer piston displacement ranging from 2.8 to 117 CFM (4.76 to 198.8 m^3/hr) while horizontal gas compressors offer piston displacement ranging from 7.6 to 414 CFM (12.9 to 704 m^3/hr). Sizing and selection of a gas compressor requires many pieces of information. Corken applications engineers and sales staff have the skills to properly size and select the best machine to meet your needs.

When applying Corken gas compressors, please provide the engineer the following information:

- Gas name (give % composition if a mixture)
- Gas characteristics if not common (material compatibility, toxicity, EPA regulated, etc.)
- Gas data if not common (critical temperature, critical pressure, specific gravity, molecular weight)
- Ambient temperatures
- Ambient pressure if above or below sea level
- Gas suction pressure (specify psia or psig, bar a or bar g and if the compressor will pull a vacuum)
- Gas suction temperature
- Gas discharge pressure and any temperature limitations
- Desired flow rate in ACFM, lbs/hr, SCFM, Actual m^3/hr, kg/hr, or Standard m^3/hr
- Description of the application

With this information, our engineers will size the compressor and select materials and options that suit the gas and your particular application. A computer printout of your performance data is also provided with the quotation.

Horizontal Industrial Gas Compressors

Operating Specifications

Single-Stage Horizontal Compressors

Single Cylinder Models	HG601AX THG601AX	HG601BX THG601BX	HG601CX THG601CX	HG601DX THG601DX	HG601EX THG601EX	HG601FX THG601FX
Size	**8"**	**6"**	**5"**	**4"**	**3.25"**	**2.75"**
Displacement cfm (m^3/hr)						
400 rpm	68.8 (116.9)	38.4 (65.2)	26.4 (44.9)	16.8 (28.5)	10.8 (18.3)	7.6 (12.9)
1200 rpm	207.0 (351.7)	115.0 (195.4)	79.2 (134.4)	49.8 (84.6)	32.2 (54.5)	22.8 (56.0)
Approximate shipping weight lb. (kg.)						
HG model	730 (331.1)	650 (295.0)	640 (290.3)	630 (285.8)	620 (281.2)	620 (281.2)
THG model	780 (353.8)	700 (317.5)	690 (313.0)	680 (308.4)	670 (303.9)	670 (303.9)
Two Cylinder Models	**HG601AA THG601AA**	**HG601BB THG601BB**	**HG601CC THG601CC**	**HG601DD THG601DD**	**HG601EE THG601EE**	**HG601FF THG601FF**
Size	**8" x 8"**	**6" x 6"**	**5" x 5"**	**4" x 4"**	**3.25" x 3.25"**	**2.75" x 2.75"**
Displacement cfm (m^3/hr)						
400 rpm	138 (234.5)	76.8 (130.5)	52.8 (89.7)	33.2 (56.4)	21.2 (36.0)	14.8 (25.1)
1200 rpm	414 (704)	231 (393)	158.4 (268.8)	99.6 (169.2)	64 (108.7)	44.4 (75.6)
Approximate shipping weight lb. (kg.)						
HG model	1,070 (485.4)	910 (412.8)	890 (403.7)	870 (394.6)	845 (383.3)	845 (383.3)
THG model	1,170 (530.7)	1,010 (458.1)	990 (449.1)	970 (440.0)	945 (428.7)	945 (428.7)

Two-Stage Horizontal Compressors

Two Cylinder Models	HG602AB THG602AB	HG602AC THG602AC	HG602AD THG602AD	HG602BC THG602BC	HG602BD THG602BD	HG602BF THG602BF
Size	**8" x 6"**	**8" x 5"**	**8" x 4"**	**6" x 5"**	**6" x 4"**	**6" x 2.75"**
Displacement cfm (m^3/hr)						
400 rpm	68.8 (116.9)	68.8 (116.9)	68.8 (116.9)	38.4 (65.2)	38.4 (65.2)	38.4 (65.2)
1200 rpm	207.0 (351.7)	207.0 (351.7)	207.0 (351.7)	115.0 (195.4)	115.0 (195.4)	115.0 (195.4)
Approximate shipping weight lb. (kg.)						
HG model	990 (449.1)	980 (444.5)	970 (440.0)	930 (421.9)	895 (406.0)	880 (399.2)
THG model	1,090 (494.4)	1,080 (489.9)	1,070 (485.4)	1,030 (467.2)	995 (451.3)	980 (444.5)

Two Cylinder Models (continued)	HG602BE THG602BE	HG602CD THG602CD	HG602CF THG602CF	HG602DE THG602DE	HG602DF THG602DF	HG602EF THG602EF
Size	**6" x 3.25"**	**5" x 4"**	**5" x 2.75"**	**4" x 3.25"**	**4" x 2.75"**	**3.25" x 2.75"**
Displacement cfm (m^3/hr)						
400 rpm	38.4 (65.2)	26.4 (44.9)	26.4 (44.9)	16.8 (28.5)	16.8 (28.5)	10.8 (18.3)
1200 rpm	79.2 (134.4)	79.2 (134.4)	79.2 (134.4)	49.8 (84.6)	49.8 (84.6)	32.2 (54.5)
Approximate shipping weight lb. (kg.)						
HG model	880 (399.2)	880 (399.2)	867 (393.3)	860 (390.1)	860 (390.1)	845 (383.3)
THG model	980 (444.5)	980 (444.5)	967 (438.6)	960 (435.5)	960 (435.5)	945 (428.7)

Cylinder Data

Description	Cylinder Code					
	A	B	C	D	E	F
Cylinder bore in. (mm)	8 (203.2)	6 (152.4)	5 (127)	4 (101.6)	3.25 (82.6)	2.75 (69.9)
Maximum working pressure psig (bar g)	300.0 (20.7)	350 (24.1)	750 (51.7)	1,000.0 (69.0)	1,200.0 (82.8)	1,650.0 (113.8)

Frame Data

Stroke inches (mm)	3.0 (76.2)
Maximum gas rod load lb (kg)	7,000 (3,175.2)
Maximum motor size hp (kW)	75 (55.9)
Maximum discharge temp °F (°C)[a]	350.0 (176.7)
Minimum temp °F (°C)	-25 (-31.6)
RPM range	400 - 1,200

[a]350°F discharge temperature requires use of high temperature O-rings, such as PTFE or Viton. Maximum recommended discharge temperature for use with Buna N or Neoprene O-rings is 250°F.

Vertical & Horizontal Compressor Options

Corken offers many options and accessories...

Purge Kit Accessories: Due to new regulations and the growing number of gases that pose possible safety and environmental hazards, leakage containment and control has become a high priority. For maximum leakage control, Corken offers purge kits for D- and T-style industrial compressors. The purge kits have all of the accessories needed to purge or pressurize each distance piece. For a wide range of application flexibility, each distance piece has its own line connections and can be separately pressurized, purged or vented. This flexibility allows you to choose the best method of containment for your application. Figure 3 illustrates how a typical purge kit operates on a T-style (triple packing with double-distance piece) vertical industrial compressor.

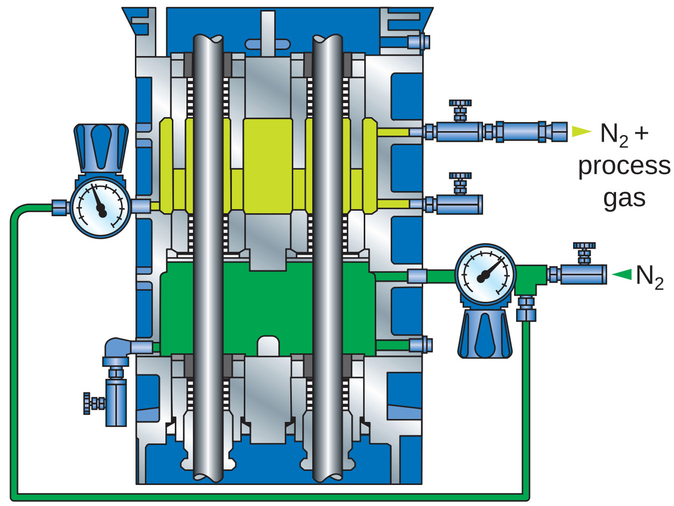


Figure 3: A vertical T-Style (double-distance piece) compressor is shown above with the purge kit option. Purge kits are used to pressurize or purge the distance piece.

Crosshead guide, piston rod, packing barrel, K-ring spacers and packing set.

Piston Rod Coating Options: To minimize piston rod wear and increase corrosion resistance, Corken recommends the Nitrotec®[1] coating for most applications. Nitrotec®[1] piston rods are made from specially heat treated steel having a dark gray finish and is a standard option on all industrial compressors. If the Nitrotec®[1] coating does not meet your needs, an optional coating is available.

K-ring Spacers: These spacers, when used in conjunction with our V-ring packing, offer improved leakage control and extend service life in applications where operating temperatures exceed 250°F (121°C).

Liquid Traps: Corken offers automatic electric and mechanical traps. The automatic electric design incorporates one or two liquid level switches depending on specific requirements. Custom traps are available on package units. Traps constructed per ASME code are optional. See figure 4 for details.

Safety and Control Switches: Corken can supply safety shutdown switches for pressure, temperature, liquid level and vibration to meet international and U.S. specifications. These switches, in conjunction with a control panel, can effectively automate the operation of the compressor.

Intercoolers/Aftercoolers: Corken offers water-cooled and air-cooled intercoolers/aftercoolers in a variety of materials. Custom designed heat exchangers are available for applications which require extra cooling or special material considerations.

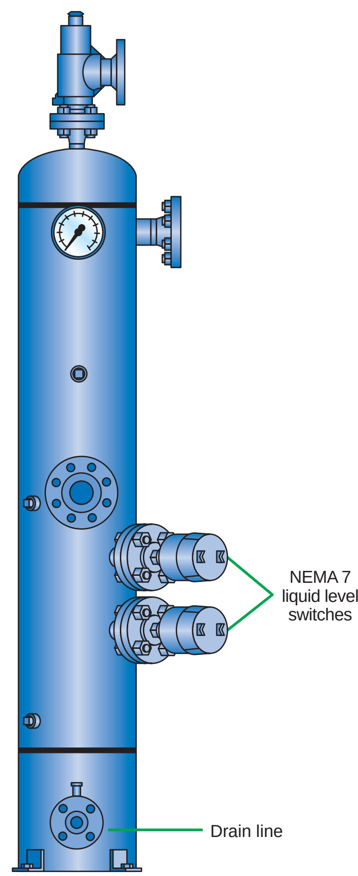


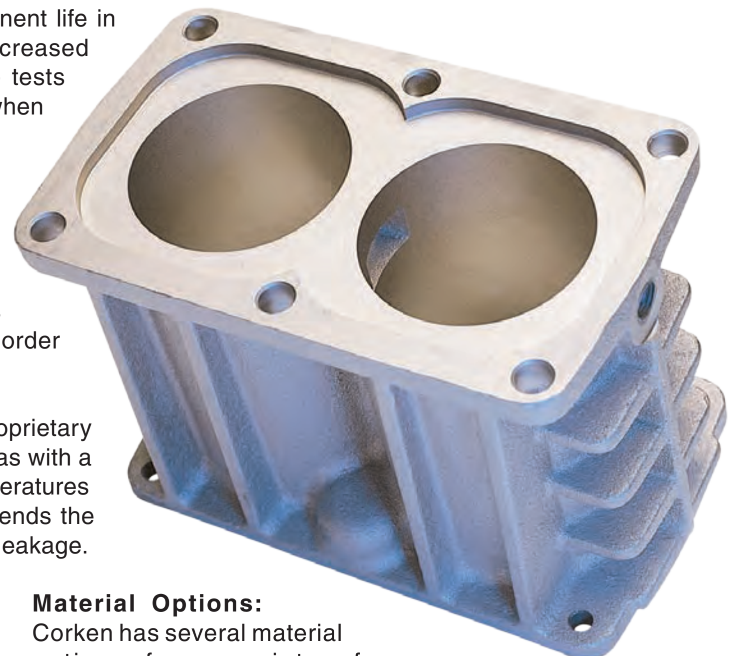
Figure 4: Flanged, ASME code liquid trap with liquid-level switches, manual drain and stainless steel demister pad.

Vertical & Horizontal Compressor Options

MC1002 Coating: This coating significantly increases component life in corrosive gas service. It will not peel or chip and offers increased corrosion, moisture, abrasion and chemical resistance. Lab tests indicate that piston rings can last up to three times longer when used with an MC1002-coated cylinder.

Suction Valve Unloaders: Unloaders may be used to provide loadless starting and/or constant speed unloading. Loadless starting is required in applications which have a high initial differential pressure. Constant speed unloading allows for loading and unloading the compressor while it is running rather than stopping and starting the compressor in order to control capacity.

ALLOY 50 piston rings and rod packing: ALLOY 50 (a proprietary composition) is recommended when compressing a very dry gas with a high K value. These gases tend to have high operating temperatures and offer minimal lubricating qualities. ALLOY 50 material extends the service life of the piston rings and rod packing and minimizes leakage.



MC1002 coated cylinder.

ALLOY 50 piston rings and V-ring piston rod packing.

Material Options:
Corken has several material options for a variety of compressor parts. Piston rings are available in ALLOY 50, PEEK and other filled PTFE, blends. Valve plates are available in stainless steel and PEEK materials. Optional materials for piston rods are also available. O-rings are offered in PTFE, Viton®[2], Buna-N or Neoprene®[2]. Consult the factory for optional materials that can be specified on special applications.

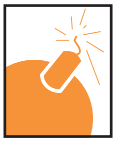
Options to match your process gases...

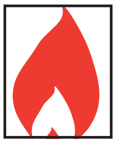
Corken offers numerous options that adapt to your compression needs. The table on the following page lists some of the more common gases and some of the hazards associated with these gases. As noted, certain gases or gas mixtures are corrosive, flammable, explosive or toxic. Many of these factors will affect the selection of the compressor and accompanying options. Some of the more common options are matched up with the assorted gases listed on the following page; however, this not a comprehensive list of required options. Based on years of experience, Corken's sales engineers will recommend the most suitable materials of construction and select the appropriate options based on your application and product. These engineers carefully review your specifications and recommend the components necessary for the optimal performance of the selected compressor. As part of Corken's continuous improvement program, new state-of-the-art materials are continually being evaluated to enhance the compressor life in gas applications.

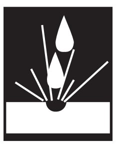
1 Registered trademark of TTI Group, Ltd.
2 Registered trademark of the DuPont Company.

Solutions beyond products...
CORKEN®

Matching Options with Process Gases


Explosive


Flammable


Corrosive


Toxic

T-style
Double-Distance Piece

MC1002 Coating
Corrosion Resistant Coating

Alloy 50
Piston Rings & Rod Packing Materials

Optional Materials
Optional Materials

Type of Gas	Formula					T Style	MC 1002 Coating	Alloy 50	Optional Materials	Comments
Amines									●	Copper, aluminum and zinc prohibited. PTFE O-rings and iron/lead trim recommended.
Ammonia	NH_3			●	●				●	Copper and copper alloys prohibited.
Argon	AR					●		●		Leak tightness important. Compression ratios are limited due to high specific heat ratio.
Biogas		●	●	●	●		●		●	Highly corrosive when wet. Recommendations will vary depending on nature of mixture.
Butadiene	C_4H_6	●	●		●	●			●	Copper and copper alloys prohibited. Leak tightness is important.
Butane, butene	C_4H_{10} / C_4H_8	●	●							Easily liquefied.
CFC, HFC, HCFC						●		●	●	Leak tightness important.
Carbon dioxide	CO_2			●			●			Acidic when wet, compression ratios are limited due to high specific heat ratios.
Carbon monoxide	CO	●			●					No high nickel alloys or pure nickel. Compression ratios are limited due to high specific heat ratio.
Chlorine	Cl_2			●	●	●	●		●	Highly corrosive when wet, chrome oxide piston rod coating and PTFE O-rings required.
Dimethylamine	$(CH_3)_2NH$	●	●		●	●			●	Copper, tin, zinc prohibited. PTFE O-rings required.
Dimethyl ether	$(CH_3)_2O$	●	●						●	Optional O-ring material available.
Ethane	C_2H_6	●	●							
Ethylene	C_2H_4	●	●							Iron/lead trim and PTFE O-rings recommended.
Ethylene oxide	C_2H_4O	●	●		●	●	●		●	Copper, silver, magnesium prohibited. PTFE O-rings required.
Helium	He					●		●	●	Leak tightness important. Compression ratios are limited due to high specific heat ratio.
Hydrocarbon gases	HC	●	●							Unusual compressibility factors, chance of liquefaction.
Hydrogen	H_2	●	●			●		●	●	Leak tightness very important. Compression ratios are limited due to high specific heat ratio.
Hydrogen chloride	HCl			●	●	●	●		●	Chrome oxide piston rod coating recommended. Iron/lead trim and PTFE O-rings required. Compression ratios are limited due to high specific heat ratio.
Isobutane	$CH(CH_3)_3$	●	●							
Isobutylene	$(CH_3)_2C{:}CH_2$	●	●						●	Iron/lead trim and PTFE O-rings required.
Methane	CH_4	●	●							
Methyl chloride	CH_3Cl	●	●	●	●	●	●		●	Zinc, aluminum, magnesium, and their alloys prohibited. Chrome oxide piston rod coating recommended. PTFE O-rings recommended.
Methyl mercaptan	CH_3SH	●	●		●	●	●		●	Copper, lead, zinc prohibited. PTFE O-rings required.
Natural gas		●	●							Review composition of mixture.
Nitrogen	N_2							●		Usually very dry with no lubricating qualities. Compression ratios are limited due to high specific heat ratio.
Nitrous oxide	N_2O			●			●		●	Avoid any hydrocarbons.
Propylene	C_3H_6	●	●			●			●	Leak tightness important. Iron/lead trim and PTFE O-rings recommended.
Sulfur Dioxide	SO_2			●	●	●	●		●	Corrosive when wet. Leak tightness important.
Vinyl chloride	CH_2CHCl	●	●			●	●		●	Chrome oxide piston rod coating recommended. Iron/lead trim and PTFE recommended.

Note: *Consult factory for selection of appropriate options.*

Standard Compressor Packages

I-Series compressors are used in many applications...

- Air boosting
- Gas blanketing
- Instrumentation
- Landfill gas recovery
- Liquid transfer
- Pressure boosting
- PSA gas generation
- Refrigerant reclaiming
- Selective catalytic reduction
- Tank car unloading
- Vapor recovery

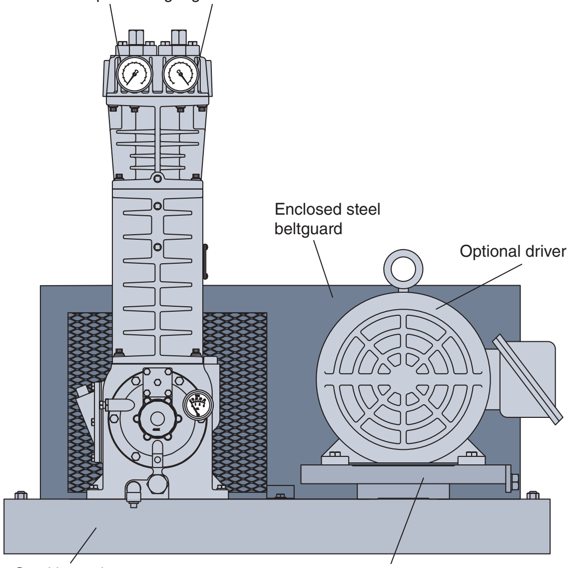
Industries served...

Process
- Chemical / petrochemical processing

Energy
- Oil & natural gas production
- Alternative fuel
- Liquefied gases
- Electric power generation

Transportation
- Truck & transport
- Liquid & liquefied gas terminals
- Marine

Corken offers three standard mountings for our industrial compressors. The 103 mounting is a basic mounting and allows for maximum flexibility for on-site installation. The 107 is designed with a 4-way valve and liquid trap to be used in LTVR (liquid transfer vapor recovery) operations. The 109 mounting has a liquid trap for use in liquefied gas service but no 4-way valve, and is best suited when vapor recovery is not needed.



–103 mounting shown above.

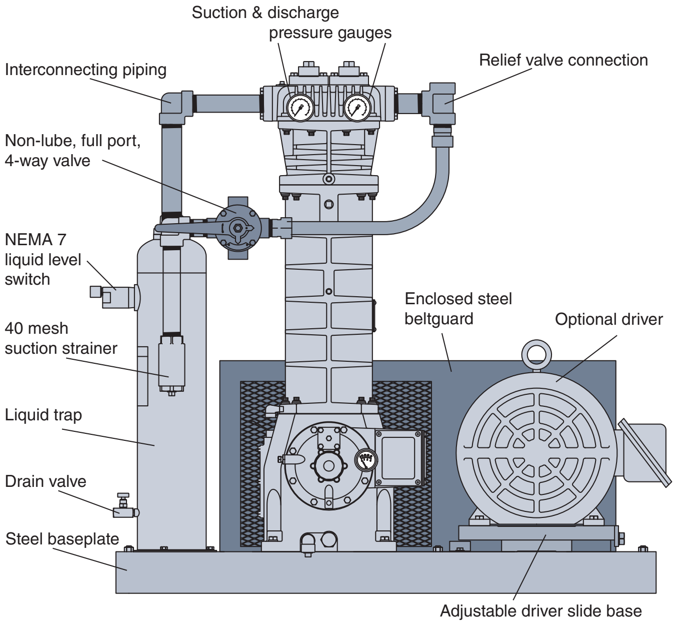
The various 107 and 109 mountings are available with three different liquid trap configurations. The first liquid trap, used on the 107 and 109, is a mechanical liquid trap that uses a floating ball to block the suction and cut off flow before liquid can enter and damage the compressor. The 107A and 109A have an automatic liquid trap that uses a single NEMA 7 liquid level switch for shut down control. The 107B and 109B use a larger ASME code liquid trap with two NEMA 7 liquid level switches that are used for alarm and shut down, or can be configured to operate a dump system.

All have the option of the heavy-duty mounting which is often employed for slow running operations to balance out the rotational forces. Add an HD (heavy duty) to the end of any standard mounting number to make it heavy duty and be sure to add the heavy-duty flywheel as well.

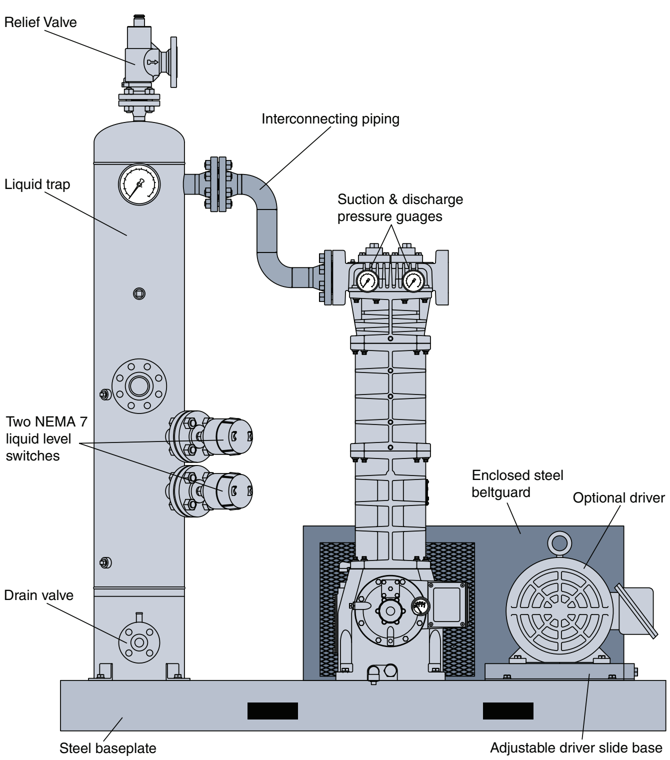
103 Mounting

- Steel baseplate
- V-belt drive
- Adjustable driver slide base
- Enclosed steel beltguard
- Suction and discharge pressure gauges

Standard Compressor Packages (continued)



–107A mounting shown above.



–109F mounting shown above.

Standard 107 Items

- All 103 items plus
- 40 Micron strainer
- Non-lube 4-way valve
- Interconnecting piping
- Liquid trap as specified below

107 Mounting

- Mechanical liquid trap with ball float

107A Mounting

- Automatic liquid trap with one NEMA 7 liquid level switch

107B Mounting

- Automatic liquid trap with two NEMA 7 liquid level switches

107F Mounting

- 107A or 107B with 300# ANSI flanged components and connections

Standard 109 Items

- All 103 items plus
- Interconnecting piping
- Liquid trap as specified below

109 Mounting

- Mechanical liquid trap with ball float

109A Mounting

- Automatic liquid trap with one NEMA 7 liquid level switch

109B Mounting

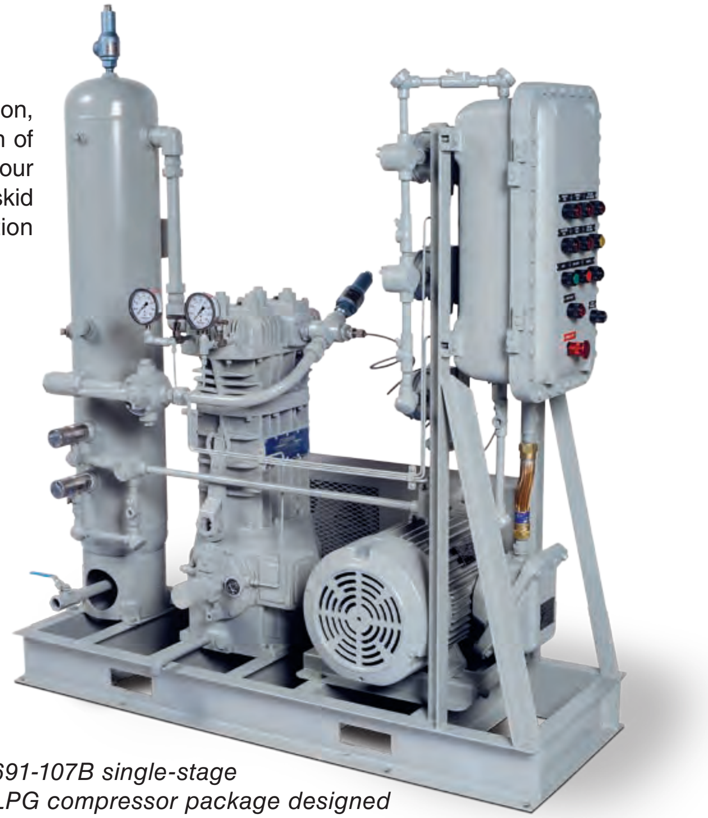
- Automatic liquid trap with two NEMA 7 liquid level switches

109F Mounting

- 109A or 109B with 300# ANSI flanged components and connections

Custom Engineered Compressor Packages

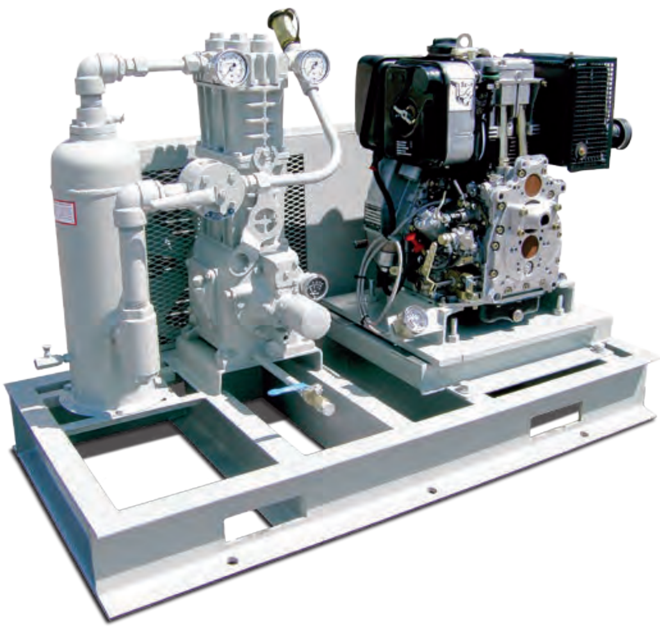
When you cannot fit one of Corken's standard mountings into your application, we will customize one for you. Most custom packages are a modification of our standard mountings; however, if your needs do not fit within one of our custom packages, we can start from scratch and build you a mounting or skid from the floor up. Send in your specifications and one of our application engineers will design a custom engineered package to meet your needs.



691-107B single-stage LPG compressor package designed for liquefied gas transfer and vapor recovery applications.

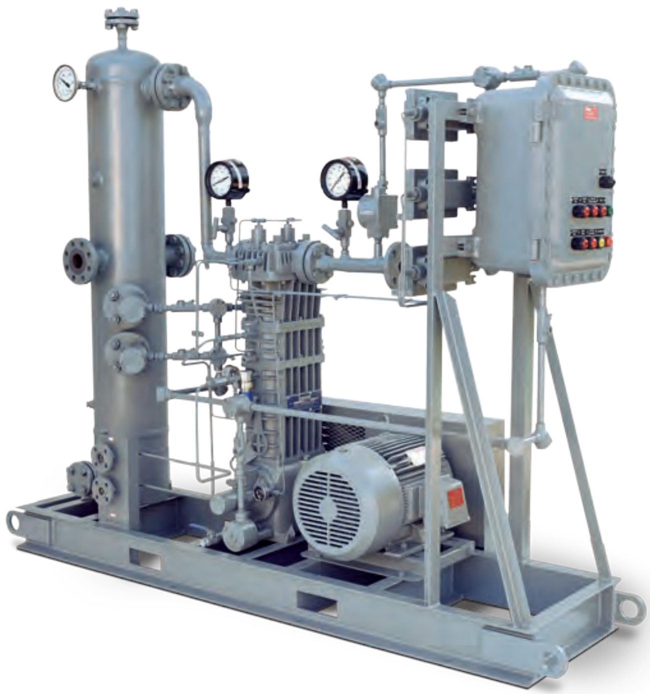
Above: D891-109F single-stage compressor package designed for a liquefied gas transfer application using vinyl chloride.

Right: HG602CE-109C two-stage compressor package designed for LPG sphere evacuation. This package can operate in single-stage and two-stage mode for deep evacuation. This package can also be used for propylene and other products.



291-107 single-stage compressor package designed for tank maintenance evacuation and emergency evacuation situations like an over turned tank car or transport truck.

FT691-107B single-stage compressor package designed for liquefied gas transfer and vapor recovery applications.



FT491-109F single-stage, flanged compressor package designed for liquefied gas transfer applications using vinyl chloride, butadiene and methyl chloride.

D891-109F single-stage compressor package designed for a liquefied gas transfer application using propylene.

Solutions beyond products...

CORKEN®

IDEX

ROCHESTER GAUGES, LLC

ISO 9001:2015 CERTIFIED

Magnetel® Gauge for Liquid CO_2 Storage & Transport Applications

Application

This product is used to extend the dial chamber on any Magnetel® gauge away from the gauge head far enough to pass through the insulating jacket on tanks containing CO_2, thus reducing refrigeration effects on the dial.

General Information & Features*

Gauge available in Trim 11, steel and stainless steel; and Trim 12, all stainless steel with enclosed magnet.

Dial in percent of total tank volume.

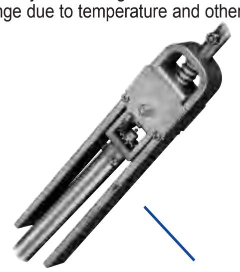
Length of epoxy glass laminated tube is available to specifications.

Stainless steel spiral wound teflon filled gasket.

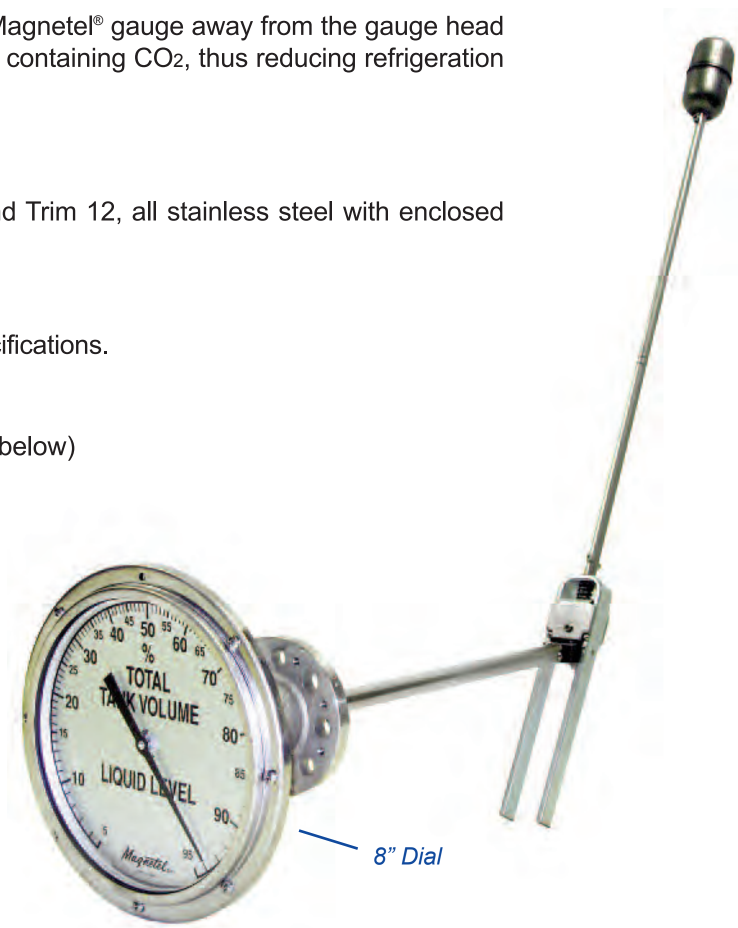
For mobile applications specify model DM 6342.(Shown below)

See DS-681 for special installation instructions.
See 6300 Series sheet for standard gauge features.

* Materials and specifications are subject to change without notice. Pressure ratings subject to change due to temperature and other environmental considerations.



An exclusive spring steel shock absorber controls shock and vibration on mobile model DM 6342.



8” Dial

Instruction Sheet For Magnetel® Gauge with CO_2 Extension

The purpose of the head extension is to extend the dial chamber from the gauge mounting flange. This insulates the dial chamber from the tank and allows for the insulating space between the inner tank and the outer shell.

Installation

The head extension is equipped with a plugged 1/8” N.P.T. hole in the bottom of the extension tube. Before installation of the gauge in the tank, this plug should be replaced with a tubing fitting. The tubing (1/4” minimum) should be routed to a convenient access point and then capped.

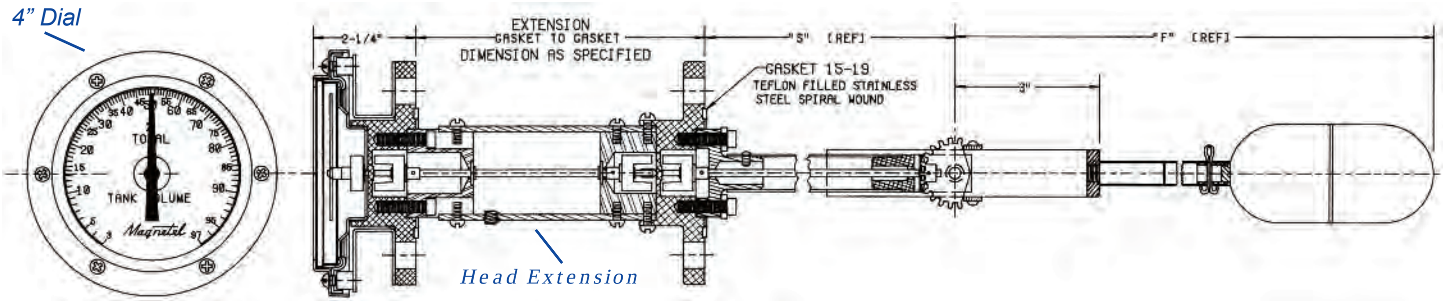
Trouble Shooting

If the gauge reading seems to be “stuck”, there are several possibilities: There may be a problem with the float mechanism inside the tank, a problem with the head extension or a problem with the dial chamber. Check the dial chamber first.

Dial Chamber Removal

Remove 8” dial chamber by removing the three screws located nearest the 9 o’clock, 3 o’clock and then the 12 o’clock positions. Remove 4” dial chamber by removing the two screws located nearest the 9 o’clock and 3 o’clock positions. After the dial chamber has been removed, DON’T disassemble.

See reverse side for dimensional data, materials of construction, performance, and advice on how to order.



Dial Chamber Test

Test dial chamber from the back side. You should be able to rotate the pointer easily by rotating the bar test magnet against the center back of the dial chamber. The Small Test Magnet has the appropriate magnetic properties for this test. If the pointer cannot be rotated freely, the dial chamber should be replaced.

PLEASE NOTE: Bent dial brackets can cause the pointer to bind when the dial chamber is re-installed. Be sure brackets are not bent.

If the dial chamber is functional, the next test is for the head extension.

Head Extension Test

With the dial chamber removed, place the large test magnet in the center of the dial chamber recess on the exposed portion of the head extension. This recess is about two inches in diameter and about 3/8” deep. The Large Test Magnet has the appropriate magnetic properties for this test. Rotate the large test magnet slowly one complete revolution. The large test magnet should overpower the drive magnet in the tank and rotate the magnet and shaft assembly in the head extension. If the magnet and shaft assembly in the head extension is frozen, the large test magnet will be repelled by the non-rotating magnet in the head extension. This repelling force will try to push the large test magnet out of the recess as it is rotated. If the CO_2 extension is frozen, the corrective action is drying. If the extension is functional, proceed to "float mechanism".

Drying

Drying the inside of the head extension is usually done by injecting a dry gas such as nitrogen. The gas is injected by inserting a 1/8" or 5/32" diameter plastic supply tube inside the 1/4" access tube that is attached to the head extension. Be sure that the small tube goes completely inside the extension and that the exhaust gas can pass through the annular space between the outside of the supply tubing and the inside of the access tubing.

This process works best if the temperature of the head extension can be raised above the freezing point of water. One way to do this is to warm the flowing gas before it reaches the CO_2 extension. Another way is to wrap the extension with a water pipe heating strip. After the head extension has thawed and dried, retest using the large magnet. If the function seems satisfactory, allow the temperature of the head extension to return to the normal below freezing condition. Retest the head extension again using the large test magnet.

Float Mechanism

If the head extension seems to be functioning properly, the next test is for the gauge and float mechanism inside the tank. For this test you will need to replace the dial chamber. Before bolting the dial chamber to the mounting brackets, be sure that all brackets touch the dial chamber without the dial chamber rocking. If the dial chamber does not fit properly, one or more of the dial brackets may be bent and should be replaced. Once the dial chamber has been replaced, take steps necessary to produce a significant change in the level of the product inside the tank. If the pointer does not move, then the problem may be in the gauge mechanism inside the tank. If this seems to be the case, then follow the trouble shooting guide for the gauge. This guide is located in bulletin 115-820.

If the gauge function is still not satisfactory after following the trouble shooting guide, then the entire gauge including head extension and dial chamber should be returned to the factory for overhaul, adjustment and re-lubrication of the head extension.

SPECIAL REQUIREMENTS FOR TESTS:

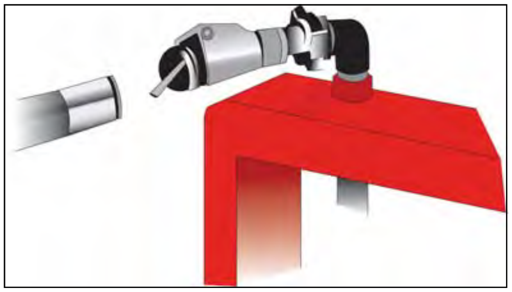
1. Small Test Magnet - 1/16” DIA x 1/2” Neodymium Rod Magnet.
2. Large Test Magnet - 1/2” DIA x 3/4” Neodymium Rod Magnet.
3. Bulletin 115-820

Test magnets may be obtained from: http://www.kjmagnetics.com

06/23/2016

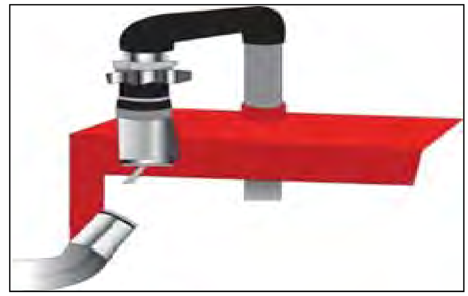
Engineering Services

Smart Engineering for your new facility. Let us help you engineer a custom safety solution for your critical transfer applications.



Horizontal Pull Angle / Hose Port:
8900 LBS.

45 Degree Pull Angle / Hose Port:
1300 LBS.



90 Degree Pull Angle / Hose Port:
900 LBS.

Smart-Hose Technologies is an engineering company that designs safety systems in and around hazardous chemical transfer hose assemblies. Our management and engineering team has over 35 years of experience designing safety systems to protect your facility from the devastating consequences associated with a catastrophic hose failure and a pull-away incident.

If you are designing a new facility we can design a custom safety system to protect your facility from an uncontrolled release of hazardous chemicals associated from catastrophic hose failures. Smart-Hose Technologies engineering services can lower your engineering costs while adding a layer of protection in and around the weak-link, "the hose assembly." The Smart-Hose Safety System is a truly passive device and therefore, needs no human intervention or expensive sensors or controls to activate.

Smart-Hose Engineered Solutions:

Chemical Transfer

Petroleum Transfer

Railroad Car Loading / Unloading

Tank Truck Loading / Unloading

Loading Arm Applications

Chlorine Transfer

Agricultural Applications

Ship to Shore Transfer

Military Applications

Oil Rig Applications

Compressed Gas Transfer

Industrial Gas Transfer

Cylinder Filling

Cryogenic Applications

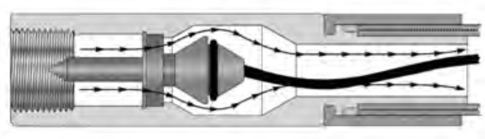
Pharmaceutical Applications

Smart-Hose™ FLUID SYSTEMS

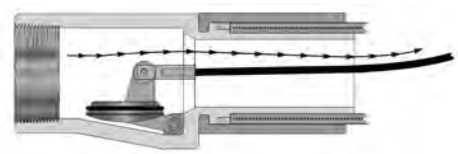
ENGINEERING DATA

Metal Hose – 316

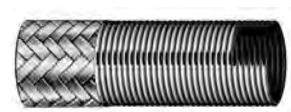
STAINLESS STEEL



Lifeline 1



Lifeline 3



Single Braid

Double Braid

The Smart-Hose Safety System is built into a stainless steel metal hose to prevent or eliminate the catastrophic consequences of a hose separation resulting from a pull away or major hose rupture. In the event of such an occurrence, the Smart-Hose Safety System will shut off the flow of product in both directions instantly upon hose separation.

This type hose is an excellent choice for liquid and gaseous chemicals, along with compressed air, petroleum and other products requiring the chemical resistance of 312 stainless steel.

Each hose is welded by the manufacturer in accordance with their specifications and 100% pressure tested with dried air under water to insure assembly safety. Each serial numbered assembly has a test certification and instruction booklet attached. Mass-spectrometer testing is supplied on request for all hazardous material transfer service hoses. (2" ID and larger hose can have a Flex Guard installed to guard against over bending at the coupling.)

- Each hose is tested with dry air or nitrogen to test pressure
- Each hose is serial numbered and has test certificate and Operating Booklet
- Hose can be made to meet DOT - E 12325 (special rail car unloading exemption eliminates the requirement for continuous human monitoring during load and unloading).
- Hose can be made to meet DOT HM225/49CFR173.315

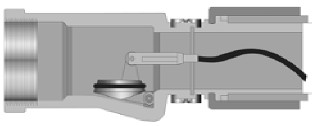
Hose Data

Tube 316 Stainless Steel
Braid 321 & 304 Stainless Steel (1 or 2 braids)
Welds Performed by the manufacturer with ANSI code 9 welders
Testing Proof testing by manufacturer, second pressure test by Smart-Hose to a minimum of 1.5 working pressure based on specification
Temperature Cryogenic to +450˚F (Cryogenic to +230˚C)

ID	1 Braid WP psi	2 Braid WP psi	1 Braid Hose Wt./Ft.	2 Braid Hose Wt./Ft.	1 Braid Static Bend Radius	2 Braid Static Bend Radius	1 Braid Intermittent Bend Radius	2 Braid Intermittent Bend Radius	Cplg. Lgth.	Cplg. Type	Cplg. Wt. Ea.
1/2"	1050	1575	0.41	0.54	1.5"	1.5"	6.5"	6.5"	3"	LL1	12.7 oz
3/4"	880	1410	0.67	0.85	2"	2"	8"	8"	3.5"	LL1	1.62 lb
1"	605	970	0.97	1.19	2.75"	2.75"	8"	8"	4"	LL1	2.50 lb
1 1/2"	525	790	1.96	2.36	3.75"	3.75"	10"	10"	4.25"	LL3	3.4 lb
2"	455	730	2.21	2.82	5"	5"	14"	14"	5"	LL3	4.7 lb
3"	290	405	2.63	3.46	7"	7"	18"	18"	6.9"	LL3	7.1 lb
4"	285	350	3.3	4.5	11"	11"	22"	33"	6.9"	LL3	12.1 lb
6"	240	299	6.2	8.0	16.5"	16.5"	33"	41"	6.9"	LL3	44.5 lb

Smart-Hose® Cryogenic Metal Break-away Assembly

FLOW



OPEN

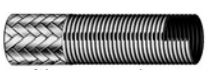
NO FLOW

CLOSED

The Smart-Hose® Cryogenic Break-Away Assembly has been designed to protect your plant, bulkhead, tank truck piping and loading arms from the potential negative effects associated with a pull-away incident. It is engineered with a predetermined break point and works in conjunction with integrated valves that stop flow in both directions. The Smart-Hose® Cryogenic Break-Away Assembly adds an additional layer of protection inside your hose assembly while protecting your plant from the devastating consequences of a pull-away accident. Offered at a price point significantly less than conventional break-away technology. Patent pending.

Features and Benefits:

- Full Flow Break-away Design.
- 360 Degree Engineered Break-away point.
- Designed with a welded metal seal.
- 316 SS Schedule 80 construction.
- Integrated to work with the Smart-Hose Safety System
- Custom Engineered break-points for specific applications.
- Currently available for 2ò & 3ò applications.
- Priced significantly less than a conventional break-away technology



Single Braid

Double Braid

Hose Data

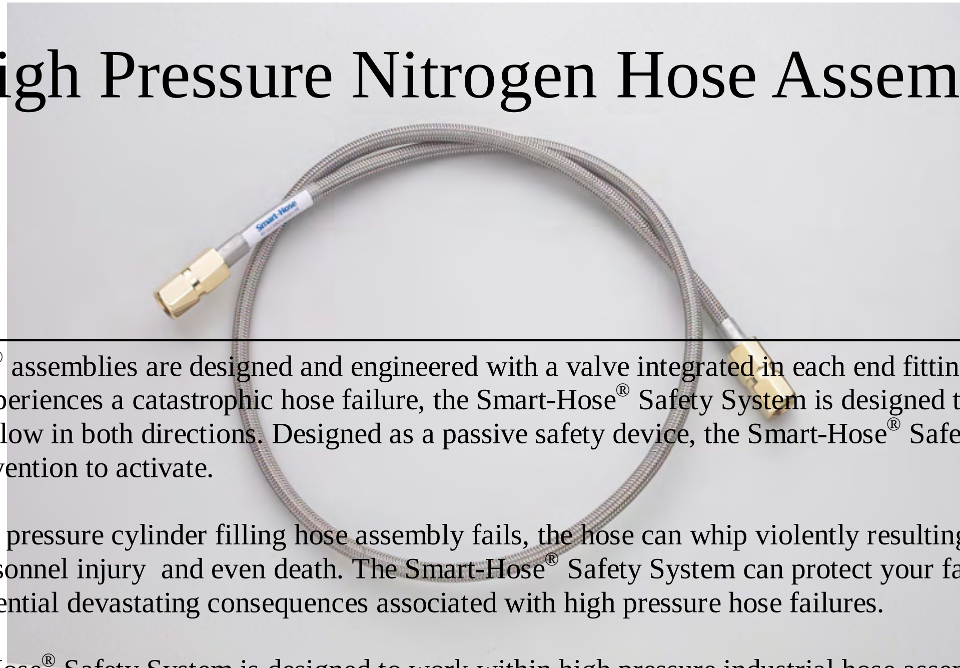
Braids	304 Stainless Steel - Single / Double
Construction	P4 Series, Annular hose with a standard pitch
Tube	316L Stainless Steel
Cover	SS Armor
Maintenance	See Smart-Hose Proper Use, Care, and Maintenance Booklet

Hose ID	Braid Layers	Working Pressure PSI	Burt Pressure PSI	Bend Radius (in.) Dyn.	Bend Radius (in.) Static	Hose Weight Per Ft (lb.)	Smart-Hose End Fittings LL3-B x LL3	End Fitting Weight (lb.)	Part Number
3ò	1	335	1,340	22.00	9.00	2.00	MNPT x MNPT	7.44	M20024872XXXX*
	2	536	2,145			2.80	MNPT x MNPT		M21024872XXXX*

* XXXX Represents the overall length of the hose assembly in inches

Smart-Hose® TECHNOLOGIES

High Pressure Nitrogen Hose Assemblies



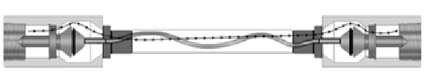
Smart-Hose® assemblies are designed and engineered with a valve integrated in each end fitting. If the hose assembly experiences a catastrophic hose failure, the Smart-Hose® Safety System is designed to instantaneously shut off the flow in both directions. Designed as a passive safety device, the Smart-Hose® Safety System needs no human intervention to activate.

When a high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury and even death. The Smart-Hose® Safety System can protect your facility and personnel from the potential devastating consequences associated with high pressure hose failures.

The Smart-Hose® Safety System is designed to work within high pressure industrial hose assemblies with a PTFE tube typically used for high pressure nitrogen, oxygen, argon and all inert gas applications.

Each hose is tested under water with dry air or nitrogen to working and test pressure
Each hose is serial numbered
Each hose is shipped with a Test Certificate and Operating Booklet
All high pressure hose assemblies are Oxygen cleaned to industry standards

Normal Flow—LL1 Valves Open



Coupling Ejection - LL1 Valves Closed

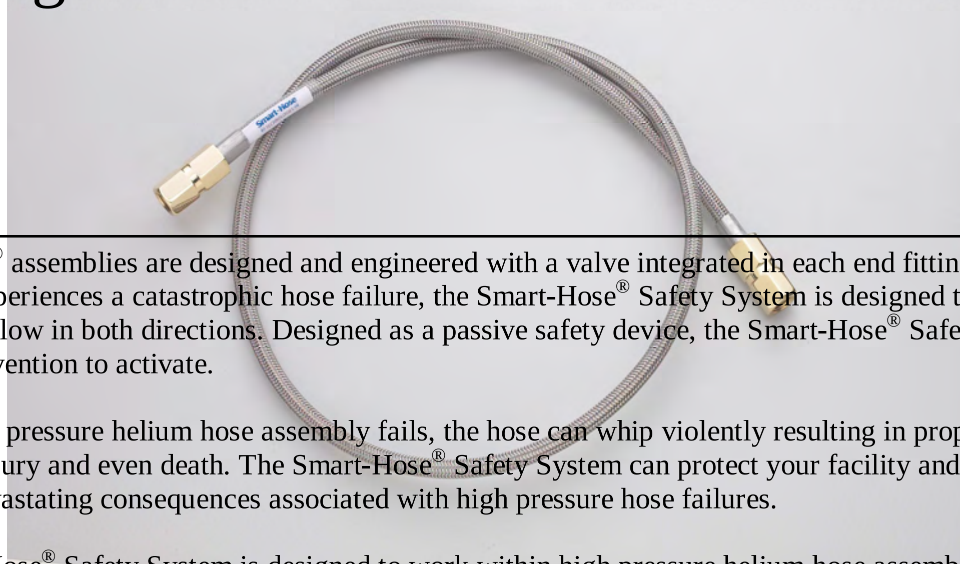
Hose Data

Cover	SS Armor available on request
Reinforcement	Double Braid 304 SS
Tube	PTFE Tube, True ID and Post Sintered PTFE Tube
Maintenance	See Smart-Hose® Proper Use, Care, and Maintenance Booklet
Accessories	Safety Loops, External Cable, Bend Restrictors, CGA, various ends available

Hose ID (in.)	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.) each	Part Number
1/4ò	3500	14000	Brass FNPT 316-SS FNPT	0.40	P02-002-17-XXXX* P02-002-11-XXXX*
1/4ò	4500	18000	Bronze FNPT 316-SS FNPT	0.40	P04-002-12-XXXX* P04-002-11-XXXX*
3/8ò	4000	16000	Brass FNPT	0.60	P03-003-17-XXXX*
1/2ò	4000	16000	Brass FNPT 316-SS FNPT	0.80	P03-004-17-XXXX* P03-004-11-XXXX*

* XXXX Represents the overall length of the hose assembly in inches

High Pressure Helium Hose Assemblies



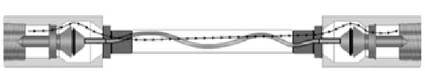
Smart-Hose® assemblies are designed and engineered with a valve integrated in each end fitting. If the hose assembly experiences a catastrophic hose failure, the Smart-Hose® Safety System is designed to instantaneously shut off the flow in both directions. Designed as a passive safety device, the Smart-Hose® Safety System needs no human intervention to activate.

When a high pressure helium hose assembly fails, the hose can whip violently resulting in property damage, personnel injury and even death. The Smart-Hose® Safety System can protect your facility and personnel from the potential devastating consequences associated with high pressure hose failures.

The Smart-Hose® Safety System is designed to work within high pressure helium hose assemblies with a ETFE post sintered tube for applications requiring lower effusion, typically used for high pressure hydrogen and helium applications.

Each hose is tested under water with dry air or nitrogen to working and test pressure
Each hose is serial numbered
Each hose is shipped with a Test Certificate and Operating Booklet

Normal Flow—LL1 Valves Open



Coupling Ejection - LL1 Valves Closed

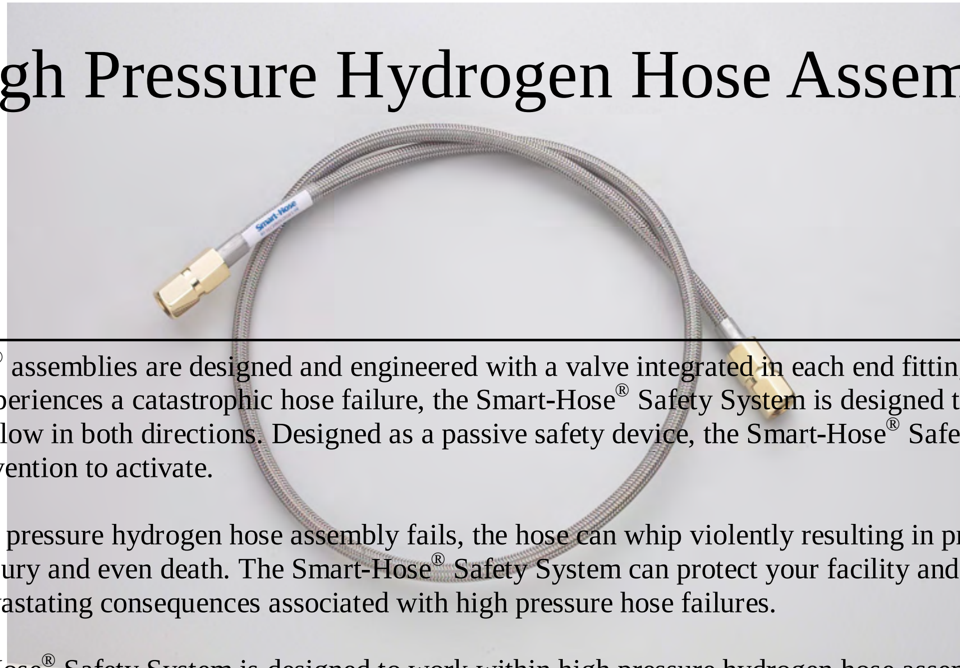
Hose Data

Cover	SS Armor available on request
Reinforcement	Double Braid 304 SS
Tube	ETFE Post Sintered tube (applications requiring low effusion)
Maintenance	See Smart-Hose® Proper Use, Care, and Maintenance Booklet
Accessories	Safety Loops, External Cable, Bend Restrictors, CGA, various ends available

Hose ID (in.)	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.) each	Part Number
1/4ò	3500	14000	Brass FNPT 316-SS FNPT	0.40	P51-002-17-XXXX* P51-002-11-XXXX*
1/2ò	4000	16000	Brass FNPT 316-SS FNPT	0.80	P52-004-17-XXXX* P52-004-11-XXXX*

* XXXX Represents the overall length of the hose assembly in inches

High Pressure Hydrogen Hose Assemblies



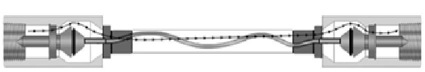
Smart-Hose® assemblies are designed and engineered with a valve integrated in each end fitting. If the hose assembly experiences a catastrophic hose failure, the Smart-Hose® Safety System is designed to instantaneously shut off the flow in both directions. Designed as a passive safety device, the Smart-Hose® Safety System needs no human intervention to activate.

When a high pressure hydrogen hose assembly fails, the hose can whip violently resulting in property damage, personnel injury and even death. The Smart-Hose® Safety System can protect your facility and personnel from the potential devastating consequences associated with high pressure hose failures.

The Smart-Hose® Safety System is designed to work within high pressure hydrogen hose assemblies with a ETFE post sintered tube for applications requiring lower effusion, typically used for high pressure hydrogen and helium applications.

Each hose is tested under water with dry air or nitrogen to working and test pressure
Each hose is serial numbered
Each hose is shipped with a Test Certificate and Operating Booklet

Normal Flow—LL1 Valves Open



Coupling Ejection - LL1 Valves Closed

Hose Data

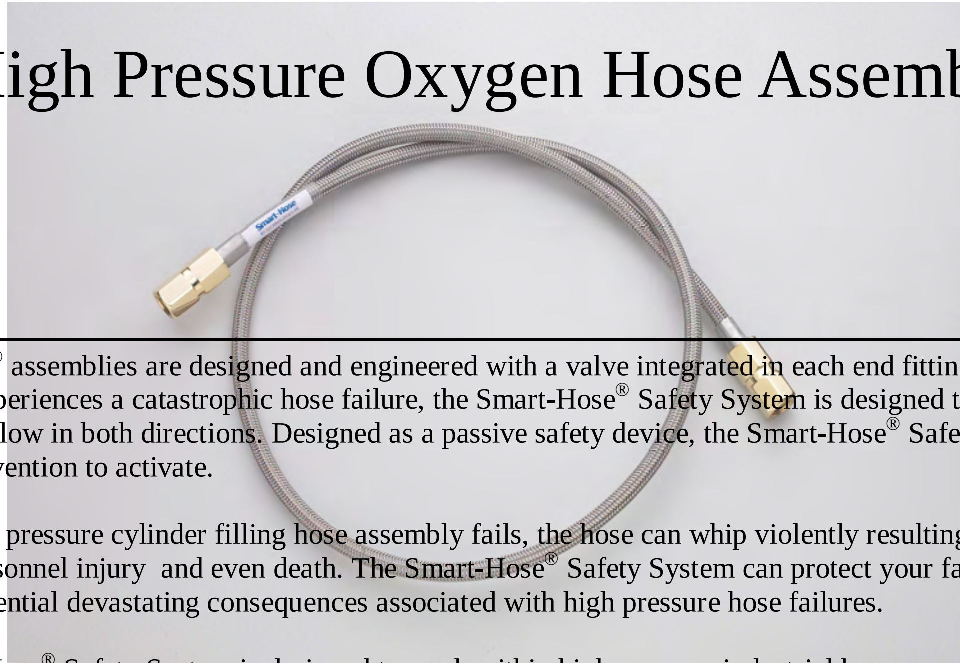
Cover	SS Armor available on request
Reinforcement	Double Braid 304 SS
Tube	ETFE Post Sintered tube (applications requiring low effusion)
Maintenance	See Smart-Hose® Proper Use, Care, and Maintenance Booklet
Accessories	Safety Loops, External Cable, Bend Restrictors, CGA, various ends available

Hose ID (in.)	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.) each	Part Number
1/4ò	3500	14000	Brass FNPT 316-SS FNPT	0.40	P51-002-17-XXXX* P51-002-11-XXXX*
1/2ò	4000	16000	Brass FNPT 316-SS FNPT	0.80	P52-004-17-XXXX* P52-004-11-XXXX*

* XXXX Represents the overall length of the hose assembly in inches

Smart-Hose® TECHNOLOGIES

High Pressure Oxygen Hose Assemblies



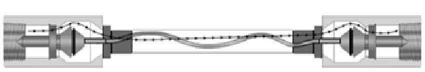
Smart-Hose® assemblies are designed and engineered with a valve integrated in each end fitting. If the hose assembly experiences a catastrophic hose failure, the Smart-Hose® Safety System is designed to instantaneously shut off the flow in both directions. Designed as a passive safety device, the Smart-Hose® Safety System needs no human intervention to activate.

When a high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury and even death. The Smart-Hose® Safety System can protect your facility and personnel from the potential devastating consequences associated with high pressure hose failures.

The Smart-Hose® Safety System is designed to work within high pressure industrial hose assemblies with a PTFE tube typically used for high pressure oxygen and inert gas applications.

Each hose is tested under water with dry air or nitrogen to working and test pressure
Each hose is serial numbered
Each hose is shipped with a Test Certificate and Operating Booklet
All high pressure hose assemblies are Oxygen cleaned to industry standards

Normal Flow—LL1 Valves Open



Coupling Ejection - LL1 Valves Closed

Hose Data

Cover	SS Armor available on request
Reinforcement	Double Braid 304 SS
Tube	PTFE Tube, True ID and Post Sintered PTFE Tube
Maintenance	See Smart-Hose® Proper Use, Care, and Maintenance Booklet
Accessories	Safety Loops, External Cable, Bend Restrictors, CGA, various ends available

Hose ID (in.)	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.) each	Part Number
1/4ò	3500	14000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.40	P02-002-17-XXXX* P02-002-11-XXXX* P02-002-19-XXXX*
1/4ò	4500	18000	Bronze FNPT 316-SS FNPT	0.40	P04-002-12-XXXX* P04-002-11-XXXX*
3/8ò	4000	16000	Brass FNPT	0.60	P03-003-17-XXXX*
1/2ò	4000	16000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.80	P03-004-17-XXXX* P03-004-11-XXXX* P03-004-19-XXXX*

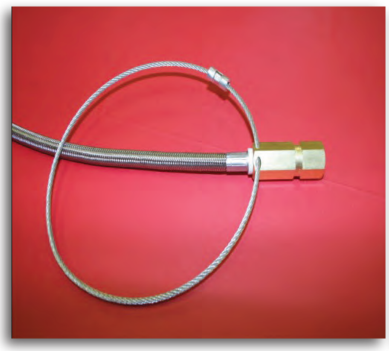
* XXXX Represents the overall length of the hose assembly in inches

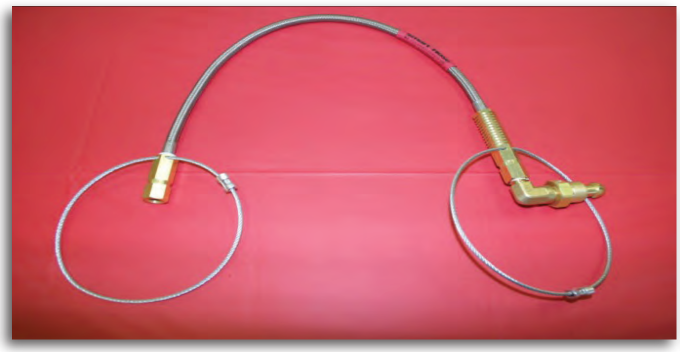
Smart-Hose™ TECHNOLOGIES

High Pressure Pigtail Accessories

Smart-Hose Technologies produces the safest high pressure hose assemblies in the world. Designed with internal valves integrated with-in each end fitting, the Smart-Hose Safety System will instantaneously shut down the flow of material in both directions in the event of a catastrophic hose failure. The Smart-Safety System is a passive safety system and therefore, needs no human intervention to activate.

Smart-Hose High Pressure hose assemblies can be ordered with a wide range of accessories and configurations. Ask your Smart-Hose sales representative for additional details.





Smart-Hose: High Pressure Pigtail Accessories

Spring Guard
Scuff Guard
Safety Loops
Heat Dissipater Fittings
Live Swivel Fitting (Built into the end fitting)*
Live Swivel Adapter (Screwed into Std. fitting)*
Bend Restrictors*
External Anti-Whip Cable (with safety loops)
CGA Fittings
Brass BSPP Fittings
SS BSPP Fittings
Male NPT
(*) Indicates New Products

Smart-Hose Technologies: Any Hose, Any Fitting, Any Application. We can make your transfer operation Safer!

TWIN CITY HOSE, INC.

CRYOGENIC

LIQUID CYLINDER HOSE

We work closely with the cryogenic industry to develop flexible transfer assemblies for cryogenic applications and industrial gases. Our assemblies are available in a wide range of sizes and materials.

ADVANTAGES

- In-house oxygen cleaning
- Individually cleaned, capped and bagged
- Full or partial armor guard
- End fitting customization

APPLICATIONS

- CNG/LNG
- Air Separation
- Manifold Lines
- Fueling and Fuel Systems
- Nitrogen and Oxygen Liquefiers
- Other Industrial Gas Applications

CLEANED, CAPPED, AND BAGGED

Oxygen cleaning services are performed in-house in our clean room.

Assembly that has been cleaned and bagged for oxygen service.

END FITTINGS

- CGA 295 and 440
- Female Flared JIC Swivel Fittings
- Schedule 40 Straight Male NPT Fittings
- Hex Male NPT Fittings
- Plain Tube Fittings

*** Custom fittings available**

CRYOGENIC

TWIN CITY HOSE, INC.

PTFE PIGTAILS

All PTFE and stainless steel pigtails are fabricated at the factory in Rogers, MN.

PTFE pigtails consist of PTFE smooth bore hose with stainless steel braid and choice of end fittings. Recommended for frequent cylinder replacement situations.

Sizes Available :	**End Fittings:**
¼", ⅜", ½"	Male or female brass
Open Overall Length	or stainless steel

Stainless steel pigtails consist of corrugated stainless steel hose with stainless steel braid. Recommended for high-usage or corrosive gas.

Sizes Available :	**End Fittings:**
¼", ⅜" and ½"	Male or female NPT
Open Overall Length	stainless steel

Custom PTFE or stainless steel assemblies are available with a variety of end fittings.

FILLER ADAPTERS

"90" Elbow

"S" Straight

"T" Adapter

Easy On and Off:
This unique design requires no tools. The filler adapter freely spins to allow for quick connect and disconnect, this saves time when filling one or more cylinders.

Styles and Sizes:
The filler adapter is available in either a straight, T or 90 degree elbow configuration to fit your specific system, design and set-up.

Advantages:
90 degree elbow prevents the hose from over-bending, thus extending the life of the hose. Stainless steel construction eliminates oxidizing, distortion, cracking and leaking.

UNISOURCE MFG.

your single source supplier

Series 4770

LCO_2 Transfer Hose

Let Unisoure's 4770 LCO_2 compatible hose help you meet your FOOD SAFETY MODERNIZATION ACT (FSMA) requirements.

Series 4770 thermoplastic hose is specially designed for the transfer of liquid and gaseas carbon dioxide (CO_2) for beverage applications. It is commonly used on small bulk delivery trucks as well as flexible lines from the restaurant wall-box to the liquid cylinders. **Series 4770** hose is specially formulated to perform well in temperatures as low as -40ºF, and the proprietary core tube is plasticizer free and FDA compliant. Our unique bonding process guarantees excellent kink resistance, and the proprietary "Tuff-Skin" cover provides for superior handling and abrasion resistance.

Test Results

- **CGA 6.5 Compliant**
- **CGA 6.6 Cold Bend Test Compliant**
- **NFPA 55 Compliant**
- **NSF 51 Compliant**
- **Leachate Resistant to Liquid CO2**
- **Contains no Bisphenol A (BPA)**

Features

- Plasticizer Free core tube
- Core tube is FDA compliant
- 100% Bonded Construction
- Excellent kink resistance
- Non-stick, low co-efficient of friction cover (75% better)
- Superior abrasion resistant cover (67% better)

Construction

- Tube - Proprietary Polymer
- Reinforcement - Polyester Braid
- Cover - Proprietary Polyurethane ("Tuffskin")
- Cover Color - Blue, Perforated

Temperature

- -40ºF to + 150ºF (-109ºF Intermittent)
- -40ºC to + 66ºC (-78ºC Intermittent)
- (Delta) Working length @ rated WPSI: ±2% max.

Part Number	Nominal I.D.		Maximum O.D.		Minimum Bend Radius		Maximum Working Pressure		Minimum Burst Pressure		Weight		Couplings
											lbs/ 100 ft	kg/ 100 m	
	in	mm	in	mm	in	mm	psi	bar	psi	bar			
4770-04	1/4	6	0.510	13	1.25	32	2,750	190	11,000	759	6.5	9.7	SB
4770-06	3/8	10	0.660	17	2.0	.51	2,250	155	9,000	621	9.7	14.4	SB
4770-08	1/2	13	0.810	21	3.0	76	2,000	138	8,000	552	13.4	19.9	SB

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IBDEA — Connect. Network. Succeed.

CGA — Compressed Gas Association — *The Standard For Safety Since 1913*

Cryogenic Society of America, Inc.