FITOK

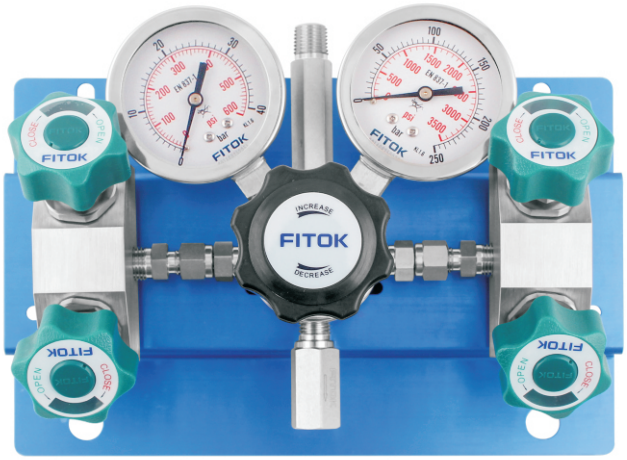
Full Technical Catalog
For Specialty Gas Application

Cylinder Pressure Regulators

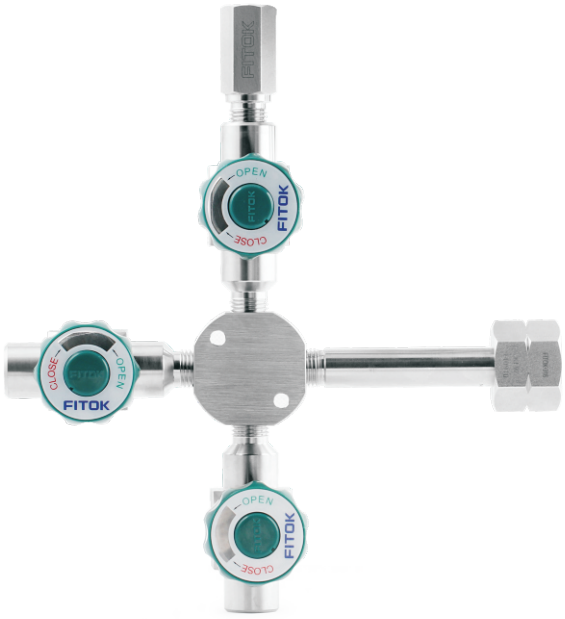
Line Pressure Regulators

Point-of-use Panels

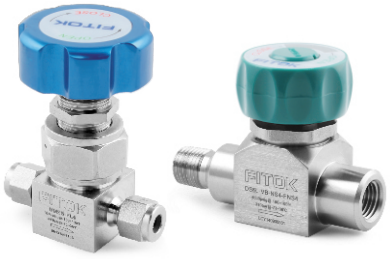
Pressure Control Panels



Purge Assemblies



Diaphragm Valves



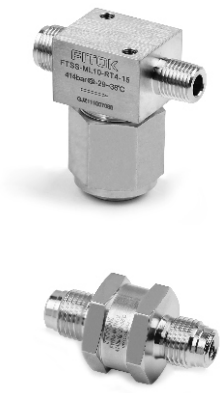
Ball Valves

Needle Valves

Check Valves

Relief Valves

Filters



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Gas Control Equipment

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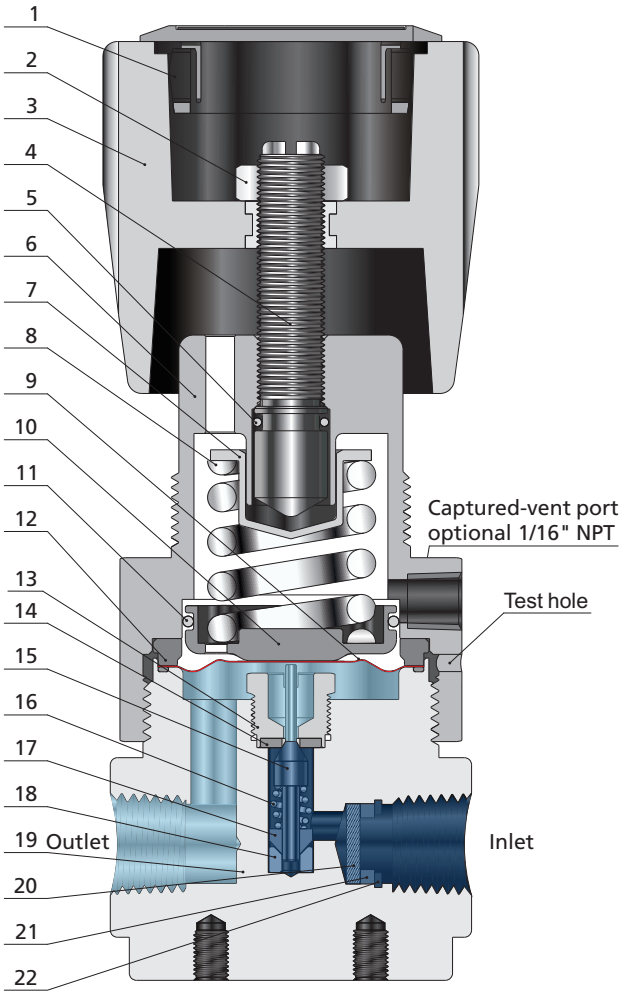
General Introduction

Typical Construction

Diaphragm Regulators

A pressure reducing regulator is positioned where the high pressure of a medium needs to be reduced and maintained to a lower and stable level. By turning the adjustment handle, the tension of range spring would be changed so as to control the outlet pressure of the regulator.



Component		Material/Specification
1	Hole Plug	ABS
2	Stem Nut	C36000/ASTM B16
3	Knob Handle	ABS
4	Stem	C36000/ASTM B16
5	O-ring	Buna-N
6	Bonnet	304 SS/ASTM A479 or Brass
7	Spring Button	304 SS/ASTM A276
8	Range Spring	Alloy
9	Diaphragm	Hastelloy
10	Spring Plate	Aluminium alloy
11	O-ring	Buna-N
12	Seal Ring	304 SS/ASTM A479
13	Seat Retainer	316L SS/ASTM A276
14	Seat	PCTFE/ASTM D1430
15	Lift Poppet	316L SS/ASTM A276
16	Poppet Spring	Alloy X-750
17	Poppet Damper	PTFE/ASTM D1710
18	Friction Sleeve	316L SS/ASTM A276
19	Body	316L SS/ASTM A479 or Brass
20	Filter	316L SS
21	Filter Ring	PTFE/ASTM D1710
22	Retaining Ring	316L SS

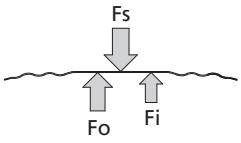
Features

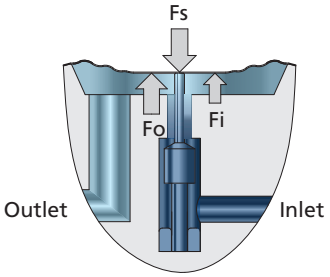
- ◎ Convoluted diaphragm to provide accurate pressure adjustment
- ◎ Spring loaded
- ◎ 316L SS filter installed at inlet
- ◎ Some regulators are fitted with captured-vent, such as FCR-1S, FLR-3 and FLR-5 series and self-venting FCR-2 and FLR-2 series
- ◎ Users can connect the captured vent port so that the media can be contained or redirected if self-vented or the diaphragm accidentally breaks
- ◎ Optional sealing material for different gases and purity class
- ◎ Hastelloy diaphragm to provide higher burst pressure and corrosion resistance
- ◎ Low leak rates
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium

When the regulator is in operation, the inlet pressure (Fi) plus the out pressure (Fo) should be equal to the downward force on the diaphragm by the compressed spring (Fs), namely Fi+Fo=Fs to reach an equilibrium.

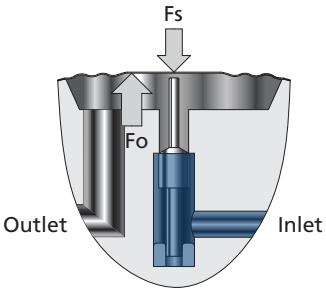
When the outlet pressure (Fo) is lower than the set pressure, the poppet would be pushed away from the seat by the excess downward force , allowing more high pressure gas to enter the chamber so as to increase the outlet pressure.

As soon as the outlet pressure (Fo) exceeds the set pressure, the excess upstream force shall lift the poppet back to the seat to limit high pressure gas entering, so as to reduce the outlet pressure.





Fs > Fo+Fi

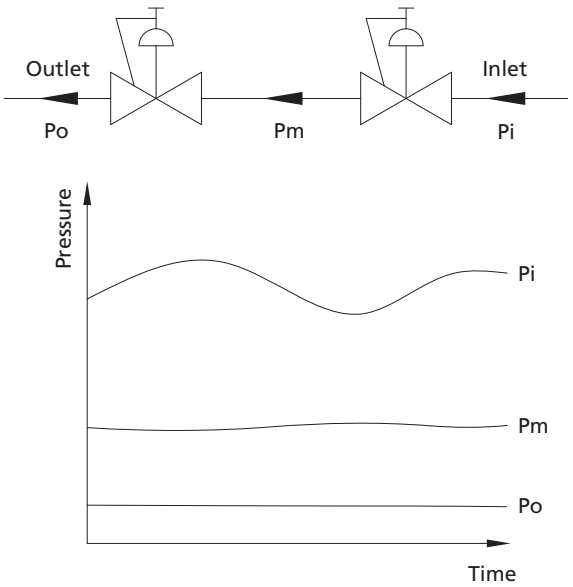


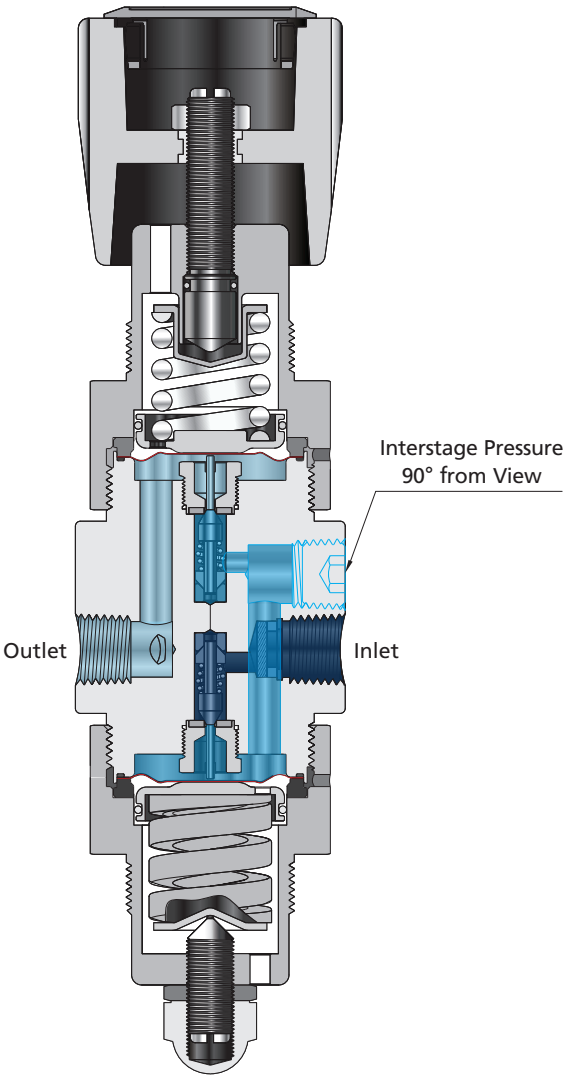
Fs < Fo+Fi
(in this figure, inlet pressure doesn't act on diaphragm)

Dual-stage Diaphragm Regulators

When the inlet pressure (Pi) decreases, the outlet pressure (Po) shall increase. Even though the increase may not be significant, the dual-stage regulator would be a better option when more stable pressure required, and the upstream pressure fluctuates violently.

The function of a dual-stage regulator is similar to that of two single-stage regulators in series. The 1st-stage regulator reduces the inlet pressure to an intermediate level for the 2nd-stage regulator to adjust to a constant output, which at the most extent ensures the stability of the outlet pressure.

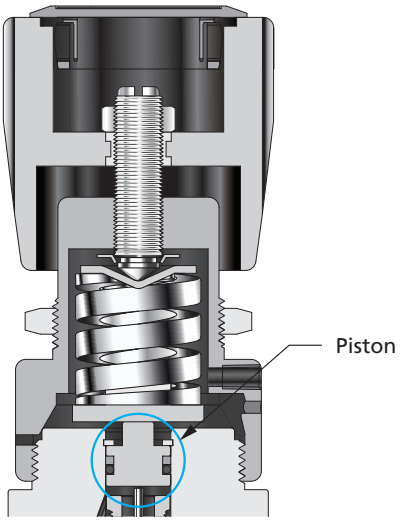




Piston Regulators

Although diaphragm regulators have many advantages such as precision, sealing effect, cleanliness and etc., in order to ensure sensitivity, the structural strength of the diaphragm regulators is low so as not being able to withstand high pressure. Therefore, it is recommended to utilize the piston regulators for high pressure applications.

A piston regulator has the same working principle as a diaphragm regulator. The key distinction is that the diaphragm is changed to a piston to satisfy the needs for high pressure applications. The inlet pressure of a piston regulator can reach 6000 psig. Its construction is simple and reliable with multiple options of O-rings to fulfill the various requirements of different media.



Series of Products

Cylinder Pressure Regulators (FCR)

Cylinder pressure regulators are designed to reduce the pressure of the cylinders to a lower level. The regulator is connected to the cylinder normally through a cylinder connection.

Line Pressure Regulators (FLR)

Line pressure regulators are used to further control the pressure in line.

Pressure Control Panels (FSR)

Pressure control panels are installed in the gas storage area (cylinder stock room or gas cabinet). They reduce cylinder or tank pressure to the desired line pressure for in-house use. Via the subsequent piping system, the gas will be guided to the point-of-use.

Changeover Systems (FDR)

There are manual changeover system and automatic changeover system.

Manual changeover system can connect with several independent gas sources at a time. When one gas source is depleted, it could be switched to another source quickly through a shutoff valve.

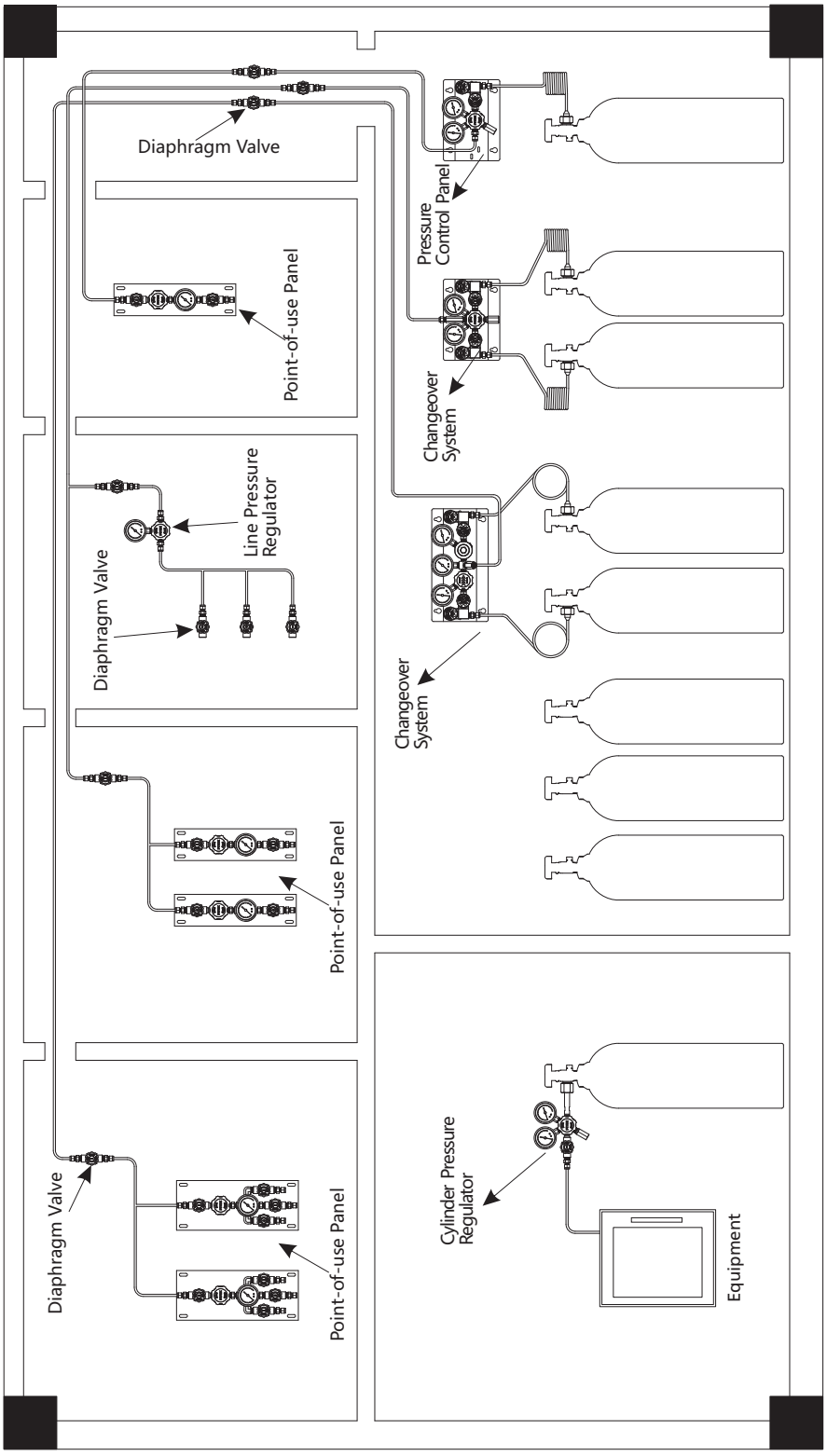
Automatic changeover system is installed onto gas pipelines which need continuous gas supply. It can connect with two independent gas sources at a time. When the gas source from one side is depleted, it can automatically switch to the gas source from the other side. Subsequently, replacing the exhausted gas source.

Point-of-use Panels (FPR)

Its function is to most precisely regulate the pressure and shut off at the point-of-use.

Products Practical Application

Gas Supply System



Selection Guide

		Series																
		FCR-1	FCR-1S	FCR-2	FCR-1D	FLR-1	FLR-2	FLR-3	FSR-1	FSR-2	FDR-1	FDR-2	FDR-1L	FDR-1T	FPR-1	FPR-1S	BPR-1	BPR-2
Material	Brass	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	SS	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Hastelloy	√			√	√									√			
Pressure Reduction Design	Diaphragm	√	√		√	√		√	√		√		√	√	√	√	√	
	Piston			√			√			√		√						√
	Preset												√				√	√
	Adjustable	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Single-Stage	√	√	√		√	√	√	√	√	√	√	√		√	√		
	Dual-Stage				√									√				
Regulator Type	Cylinder	√	√	√	√													
	In-Line					√	√	√										
	Control Panel								√	√	√	√	√	√				
	Point-of-use														√	√		
	Back Pressure																√	√
Maximum Inlet Pressure	6000 psig			√														
	4500 psig	√	√	√	√		√		√	√	√	√	√	√				
	3000 psig	√	√		√		√	√	√	√	√	√	√	√				
	1500 psig					√									√	√		
	500 psig					√		√										
Control Pressure Range	0~25 psig	√	√		√	√		√	√		√		See page A-50	√	√	√	√	
	0~50 psig	√	√		√	√		√	√		√			√	√	√	√	
	0~100 psig	√	√		√	√		√	√		√			√	√	√	√	
	0~150 psig		√		√			√						√		√		
	0~200 psig		√					√								√		
	0~250 psig	√			√	√	√		√		√				√		√	
	0~300 psig																	√
	0~500 psig	√					√		√		√				√			√
	0~750 psig			√			√			√		√						
	0~1000 psig						√											√
	0~1500 psig			√						√		√						
	0~2500 psig			√						√		√						
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Cylinder Pressure Regulators

FCR-1 Series General Diaphragm Regulators

Features

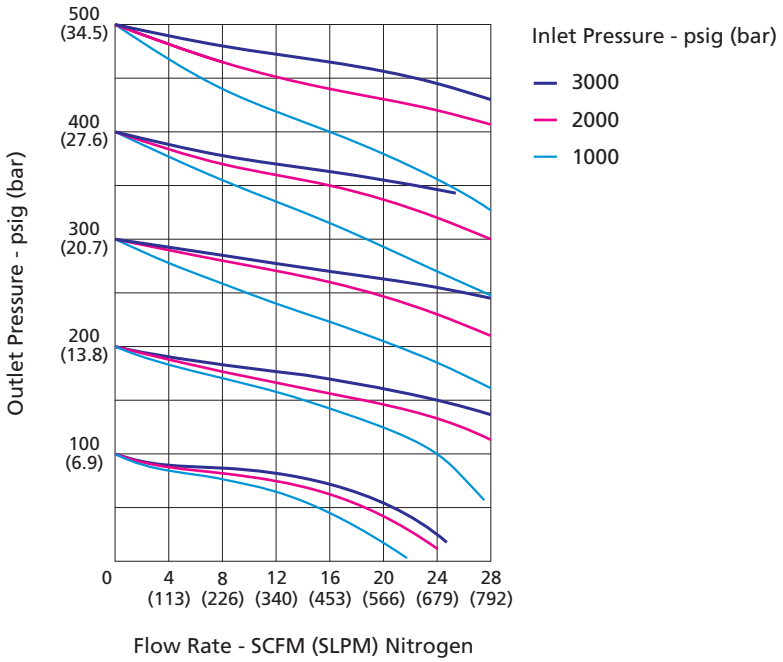
◎ Metal-to-metal seal to minimize external leak
◎ Convoluted diaphragm design to improve regulation precision and cycle life
◎ Applicable to corrosive or toxic gases
◎ With special cleaning and packaging, applicable to oxygen-enriched environments
◎ Adjustable relief pressure
◎ 20 μm filter installed at inlet

Model: FCR-16L-30-100-C330-B-B-00-R-P

Technical Data

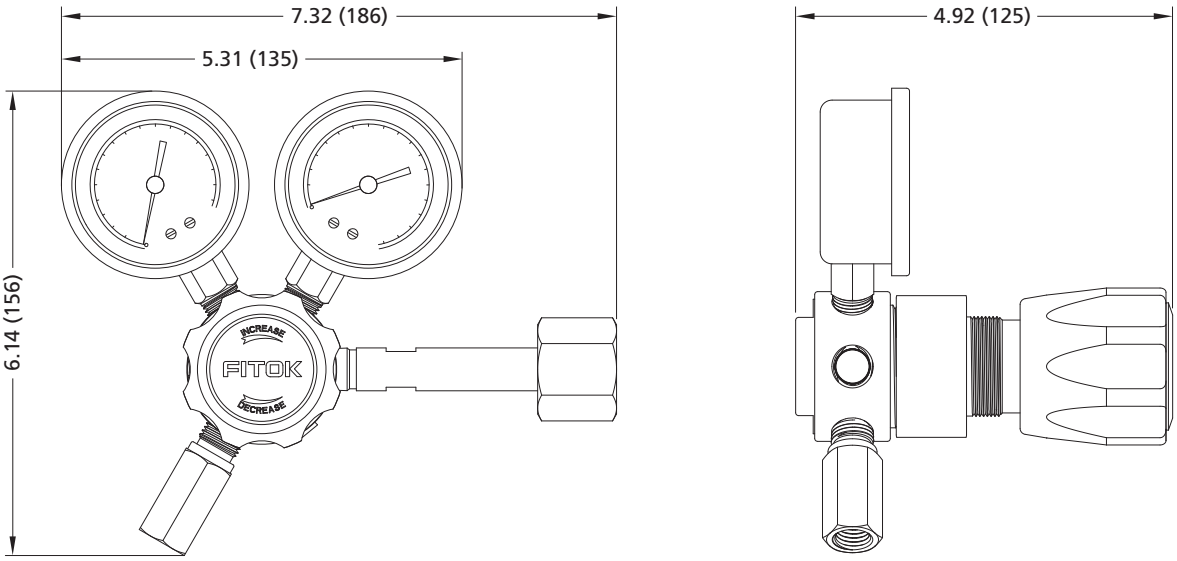
◎ Single-stage regulator
◎ Maximum inlet pressure: 3000 or 4500 psig
◎ Outlet pressure range: 0~25, 0~50, 0~100, 0~250 or 0~500 psig
◎ Material of the internal components:
Seat: PCTFE
Diaphragm: Hastelloy
Filter: 316L
◎ Temperature: -40°F~+165°F (-40°C~+74°C)
◎ Leak rates:
Internal: ⩽1x10^{-7} mbar·l/s helium
External: ⩽1x10^{-9} mbar·l/s helium
◎ Flow coefficient (Cv): 0.06
◎ Weight (regulator only): ≈1.98 lbs (0.9 kg)
◎ Body ports: 1/4" female NPT for inlet, outlet, gauge and relief valve

Typical Flow Chart

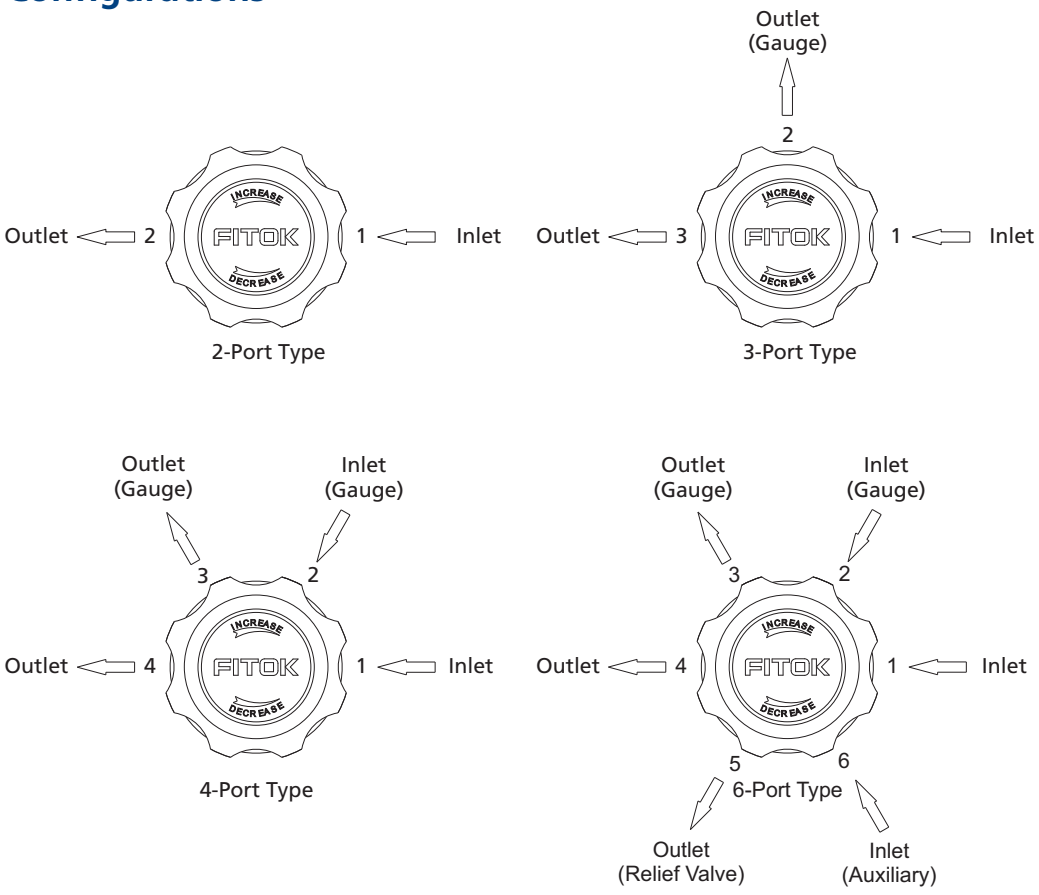


Dimensions

Dimensions, in inches (millimeters), are for reference only.



Porting Configurations



Part Number Description

FCR – 16L – 30 – 100 – C580 – M – M – 32 – R – P

Body Material	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig
500	0~500 psig

Connection 1	
00	1/4" Female NPT
C_ _ _	CGA Number (USA)
DIN_	DIN Number (Germany)

Refer to page B-28 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug

Others refer to Connection 4

Connection 3

Same as Connection 2

Connection 4	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5	
R	Relief Valve
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FCR-16L-45-100-C580-00
b. 3-port type (1 in, 2 out): FCR-1SS-30-500-C330-B-00
c. 4-port type (2 in, 2 out): FCR-1B-45-250-00-B-B-34

Cylinder Pressure Regulators

FCR-1S Series Sensitive Diaphragm Regulators

Features

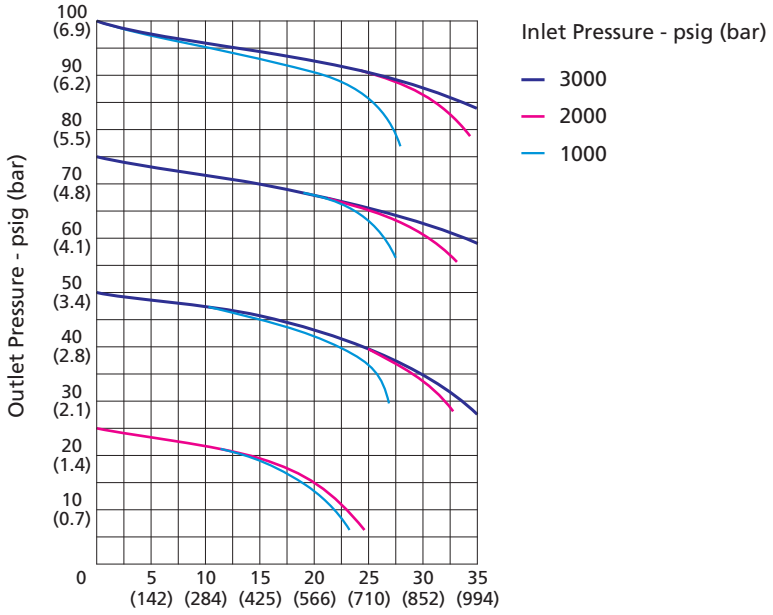
- ◎ Large diameter convoluted diaphragm to increase pressure sensitivity and minimize pressure drop
- ◎ Fitted with captured vent as standard
- ◎ 316L SS and Brass available for valve
- ◎ With special cleaning and packaging, applicable to oxygen-enriched environments
- ◎ Die spring for stable outlet pressure
- ◎ 20 μm filter installed at inlet

Model: FCR-1S6L-30-50-C580-B-B-00-R-P

Technical Data

- ◎ Single-stage regulator
- ◎ Maximum inlet pressure: 3000 or 4500 psig
- ◎ Outlet pressure range: 0~25, 0~50, 0~100, 0~150 or 0~200 psig
- ◎ Material of the internal components:
  Seat: PCTFE
  Diaphragm: 316L
  Filter: 316L
- ◎ Temperature: -40°F~+165°F (-40°C~+74°C)
- ◎ Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- ◎ Flow coefficient (Cv): 0.06
- ◎ Weight (regulator only): ≈2.87 lbs (1.3 kg)
- ◎ Body ports: 1/4" female NPT for inlet, outlet, gauge and relief valve

Typical Flow Chart



Dimensions

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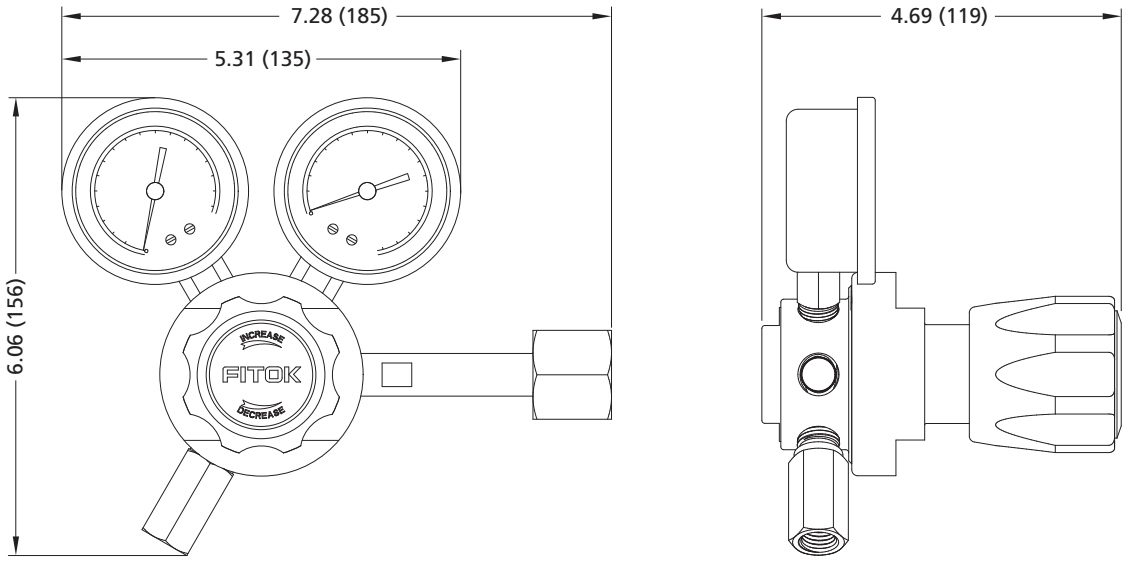
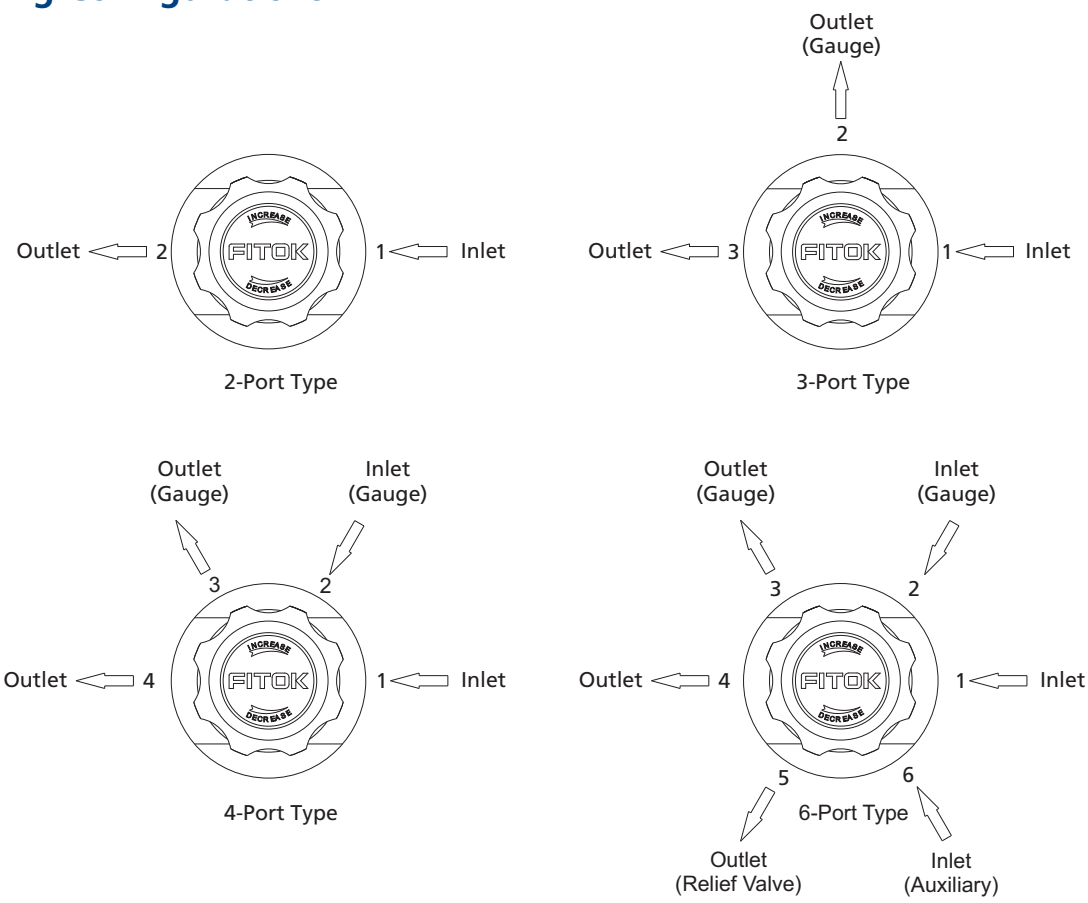


Porting Configurations



Part Number Description

FCR – 1S6L – 30 – 50 – DIN1 – M – M – 30 – R – P

Body Material	
6L	316L SS
B	Brass

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
150	0~150 psig
200	0~200 psig

Connection 1	
00	1/4" Female NPT
C_ _ _	CGA Number (USA)
DIN_	DIN Number (Germany)

Refer to page B-28 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug

Others refer to Connection 4

Connection 3

Same as Connection 2

Connection 4	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5	
R	Relief Valve
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FCR-1S6L-45-25-C580-00
b. 3-port type (1 in, 2 out): FCR-1SB-30-150-C330-B-00
c. 4-port type (2 in, 2 out): FCR-1SB-45-200-00-00-00-00

Cylinder Pressure Regulators

FCR-2 Series High Pressure Piston Regulators

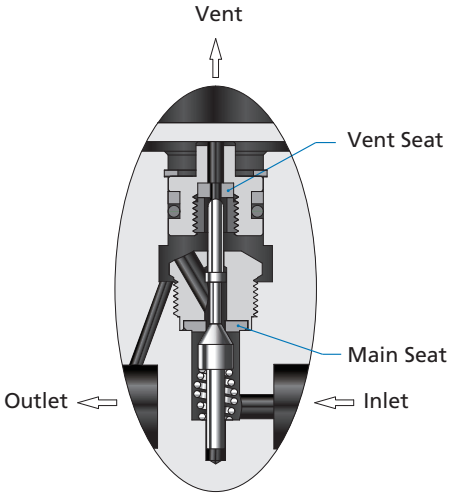
Features

- For high pressure applications
- Robust piston-sensed design to ensure safety and reliability
- 316L SS or Nickel-plated Brass body optional
- For non-corrosive gases (due to seal limit)
- With special cleaning and packaging, applicable to oxygen-enriched environments
- Venting model available
- 20 μm filter installed at inlet

Model: FCR-26L-45-750-DIN8-B-B-00-P-P

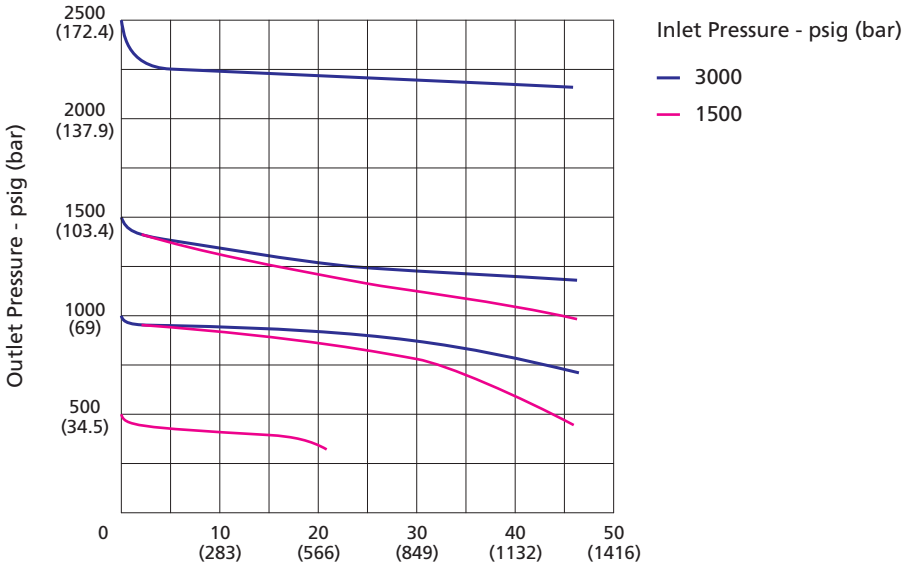
Technical Data

- Single-stage regulator
- Maximum inlet pressure: 4500 or 6000 psig
- Outlet pressure range: 0~750, 0~1500 or 0~2500 psig
- Material of the internal components:
  Main Seat: PCTFE (PEEK for Venting Model)
  Vent Seat: PCTFE
  Piston: 316L
  O-ring: Viton or Kalrez
  Filter: 316L
- Temperature: -15°F~+165°F (-26°C~+74°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (Cv):
  Without vent: 0.06
  Vent: 0.1
- Weight (regulator only): ≈1.98 lbs (0.9 kg)
- Body ports: 1/4" female NPT for inlet, outlet and gauge



Construction Drawing
with Venting Model

Typical Flow Chart



Dimensions

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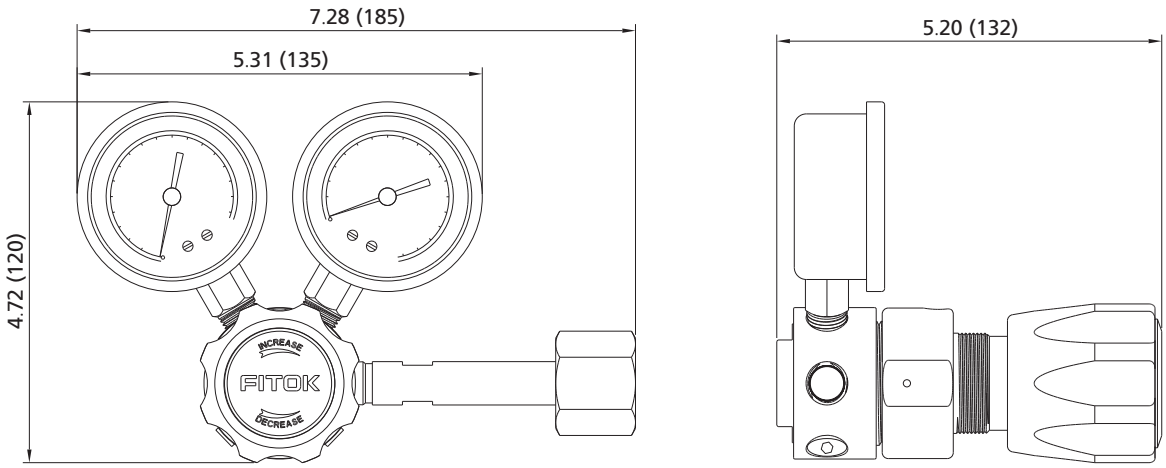
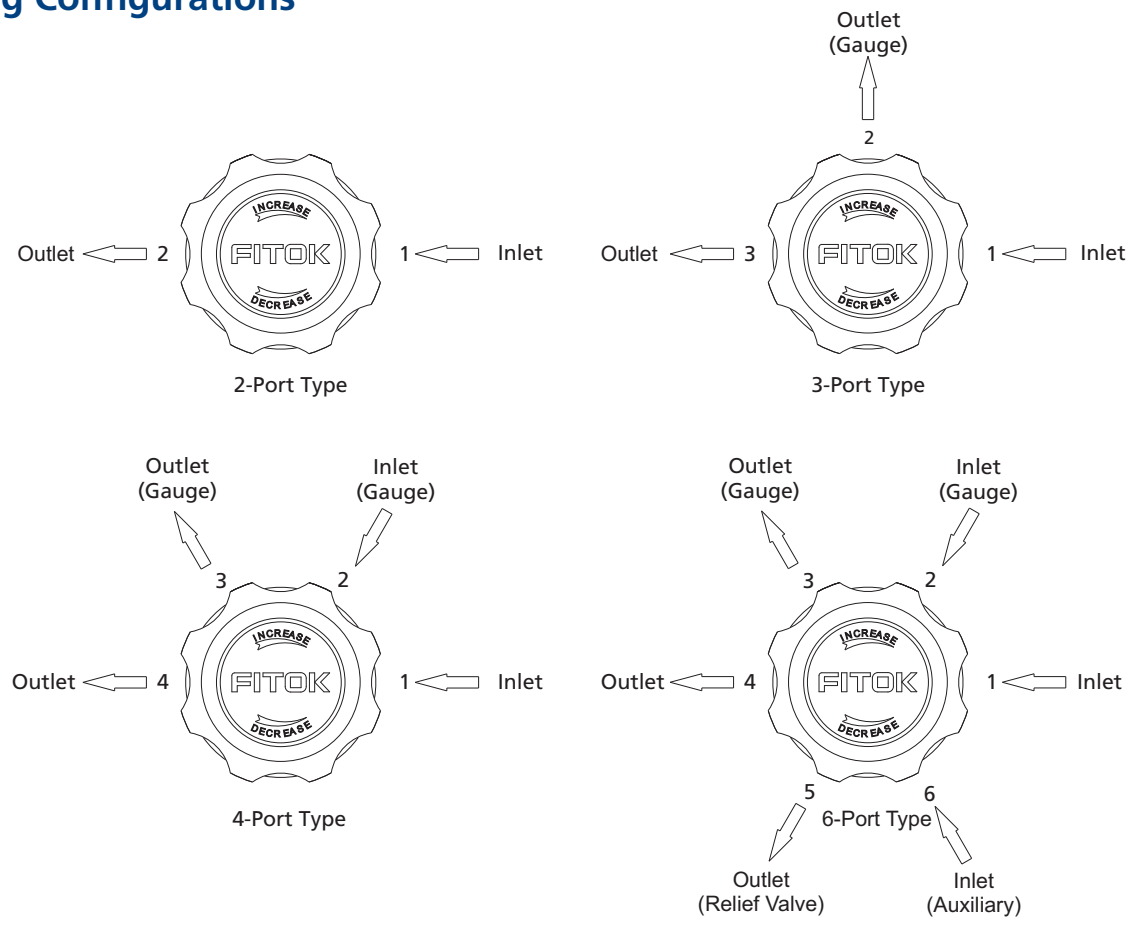


Porting Configurations



Part Number Description

FCR − 2V Z 6L − 45 − 750 − DIN6 − M − M − 00 − P − P

Vent Option	
	Without
V	With

O-ring Material	
	Viton
Z	Kalrez

Body Material	
6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

Inlet Pressure P1	
45	4500 psig
60	6000 psig

Outlet Pressure Range P2	
750	0~750 psig
1500	0~1500 psig
2500	0~2500 psig

Connection 1	
00	1/4" Female NPT
C_ _ _	CGA Number (USA)
DIN_	DIN Number (Germany)

Refer to page B-28 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug

Others refer to Connection 4

Connection 3

Same as Connection 2

Connection 4	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5	
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FCR-26L-45-1500-C580-00
b. 3-port type (1 in, 2 out): FCR-2VB-45-750-C660-00-00
c. 4-port type (2 in, 2 out): FCR-2VZSS-60-2500-00-B-B-32

Cylinder Pressure Regulators

FCR-1D Series Dual-stage Diaphragm Regulators

Features

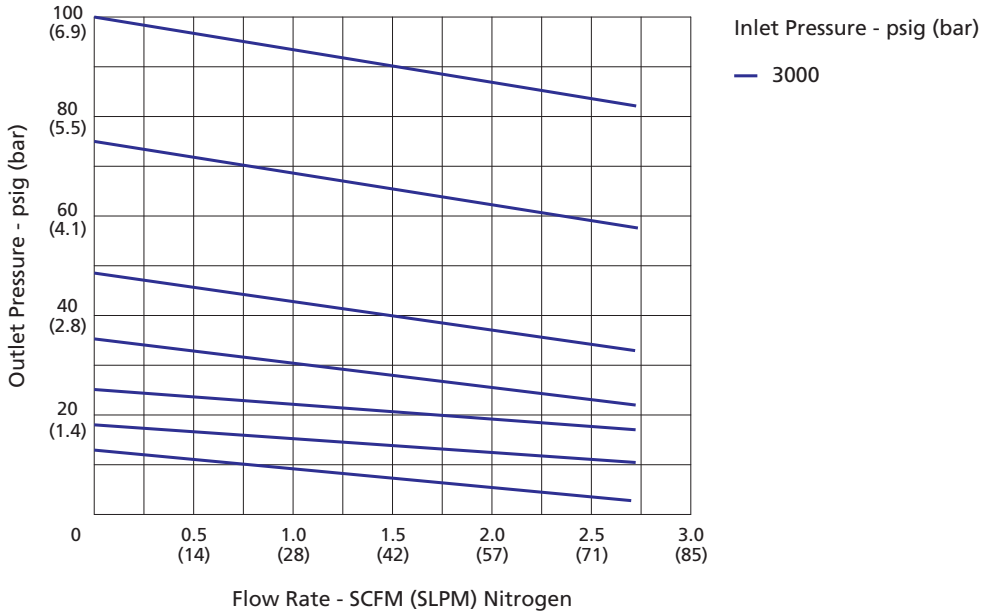
- ◎ Compact design
- ◎ Dual-stage pressure reducing construction to provide accurate and stable pressure
- ◎ 20 μm filter installed at inlet
- ◎ With special cleaning and packaging, applicable to oxygen-enriched environments

Model: FCR-1D6L-30-100-C660-B-B-00-R-P

Technical Data

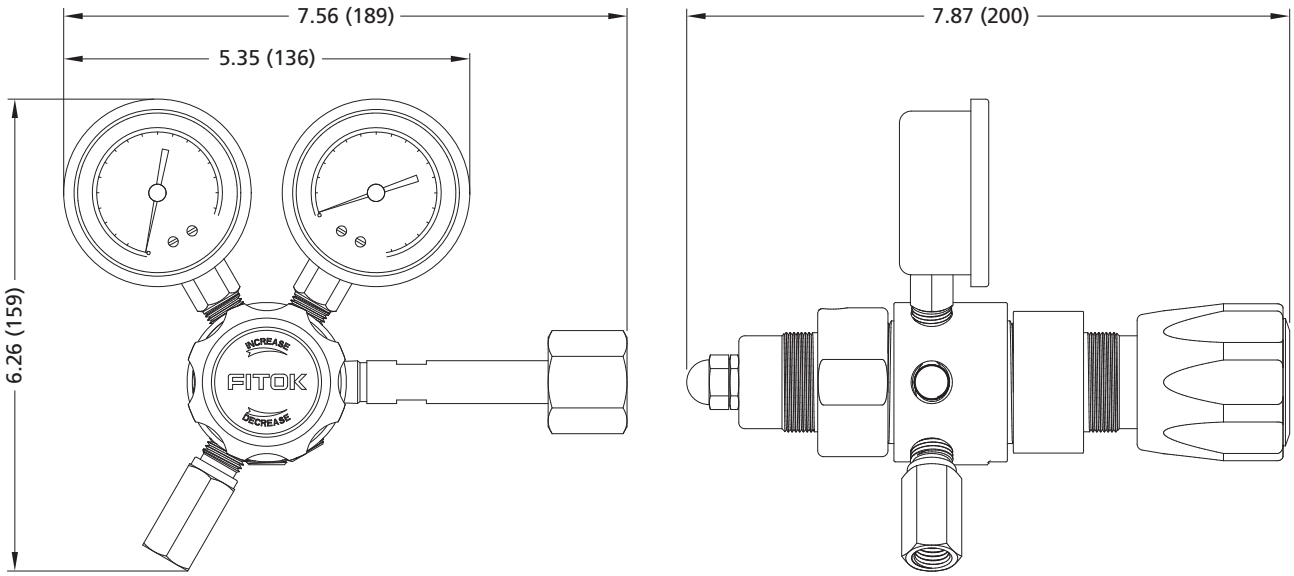
- ◎ Maximum inlet pressure: 3000 or 4500 psig
- ◎ 1st stage outlet pressure range: 480~500 psig
  2nd stage outlet pressure range: 0~25, 0~50, 0~100, 0~150, 0~250 psig
- ◎ Material of the internal components:
  Seat: PCTFE
  Diaphragm: Hastelloy
  Filter: 316L
- ◎ Temperature: -40°F~+165°F (-40°C~+74°C)
- ◎ Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- ◎ Flow coefficient (Cv): 0.05
- ◎ Weight (regulator only): ≈3.3 lbs (1.5 kg)
- ◎ Body ports: 1/4" female NPT for inlet, outlet, gauge and relief valve

Typical Flow Chart

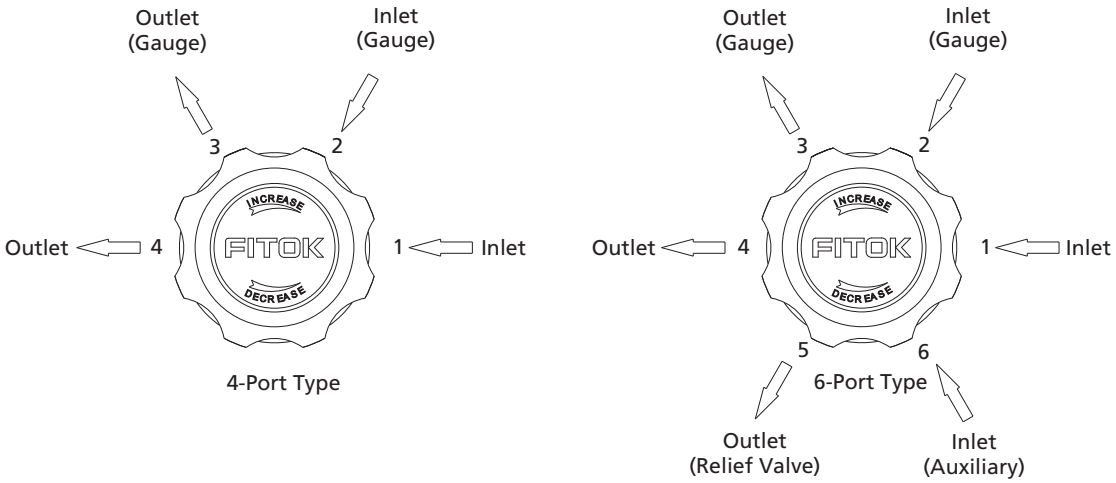


Dimensions

Dimensions, in inches (millimeters), are for reference only.



Porting Configurations



Part Number Description

FCR – 1D6L – 30 – 100 – C350 – B – B – 30 – R – P

Body Material

6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1

30	3000 psig
45	4500 psig

Outlet Pressure Range P2

25	0~25 psig
50	0~50 psig
100	0~100 psig
150	0~150 psig
250	0~250 psig

Connection 1

00	1/4" Female NPT
C_ _ _	CGA Number (USA)
DIN_	DIN Number (Germany)

Refer to page B-28 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3

Same as Connection 2

Connection 4

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5

R	Relief Valve
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

Note: Most configurations are available.
Examples of part number:
a. 4-port type (2 in, 2 out): FCR-1DB-45-150-DIN1-B-B-30
b. 6-port type (3 in, 3 out): FCR-1DSS-30-50-C580-B-B-00-R-P

Line Pressure Regulators

FLR-1 Series Compact Diaphragm Regulators

Features

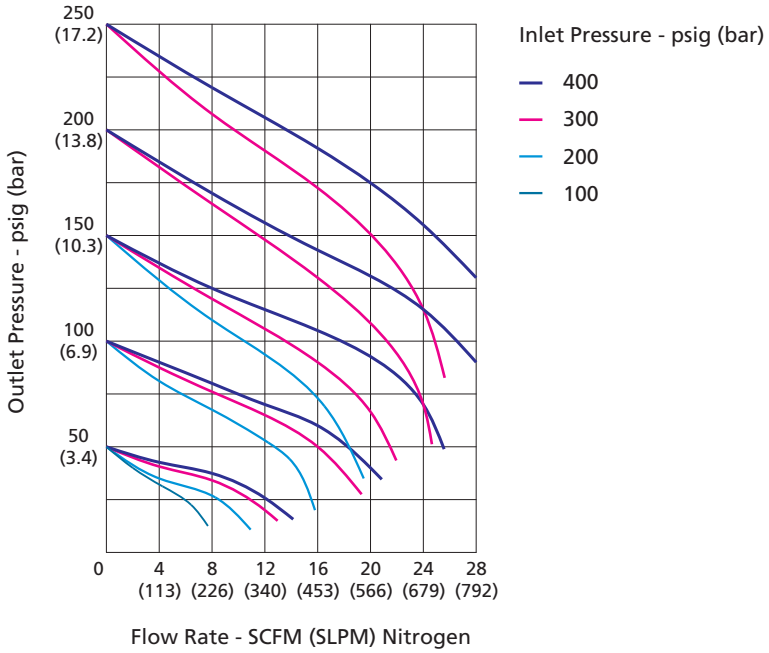
◎ Similar to FCR-1 Series Regulators with larger orifice to provide higher flow capacity
◎ Three porting configurations available
◎ 316L SS body for corrosive or toxic gases,
Nickel-plated Brass body for non-corrosive gases
◎ With special cleaning and packaging, applicable to
oxygen-enriched environments
◎ Configuration with filter installed at inlet as standard
◎ Panel mounted or installed with screw at the bottom

Model: FLR-16L-15-100-00-00-Z

Technical Data

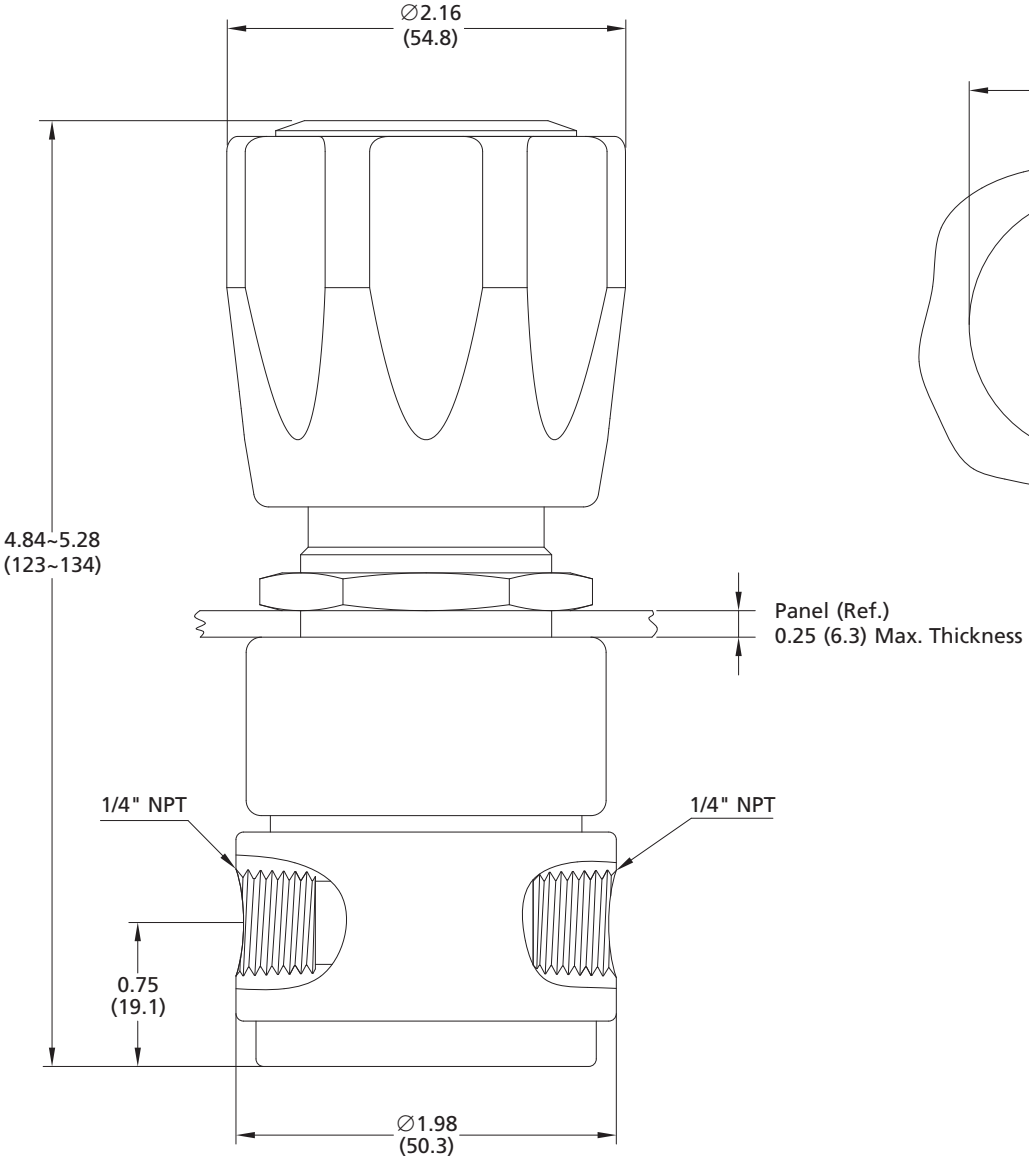
◎ Single-stage regulator
◎ Maximum inlet pressure: 500 or 1500 psig
◎ Outlet pressure range: 0~25, 0~50, 0~100 or 0~250 psig
◎ Material of the internal components:
Seat: PCTFE
Diaphragm: Hastelloy
Filter: 316L
◎ Temperature: -40°F~+165°F (-40°C~+74°C)
◎ Leak rates:
Internal: ⩽1x10^{-7} mbar·l/s helium
External: ⩽1x10^{-9} mbar·l/s helium
◎ Flow coefficient (Cv): 0.14
◎ Weight (regulator only): ≈1.98 lbs (0.9 kg)
◎ Body ports: 1/4" female NPT for inlet, outlet and gauge

Typical Flow Chart

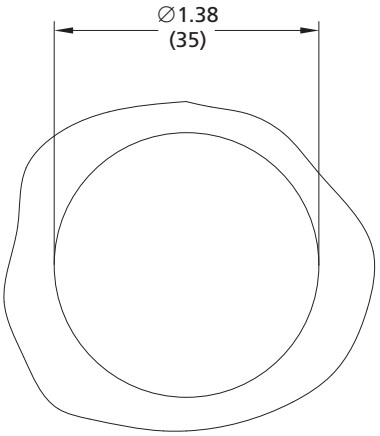


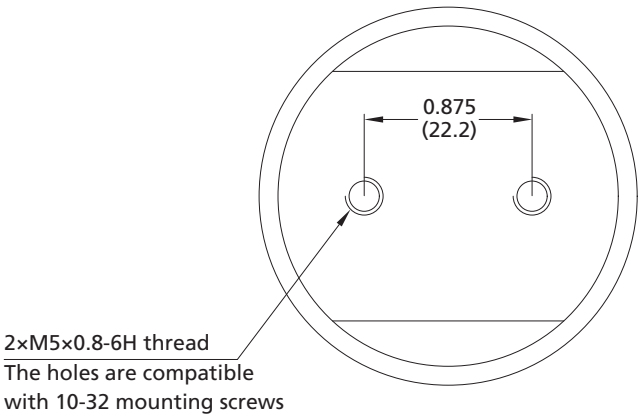
Dimensions

Dimensions, in inches (millimeters), are for reference only.

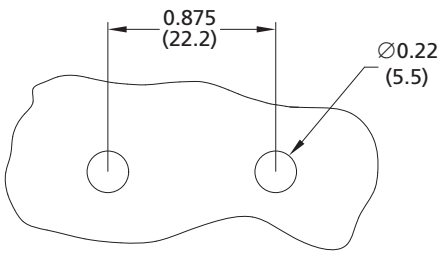


Panel Cut-out

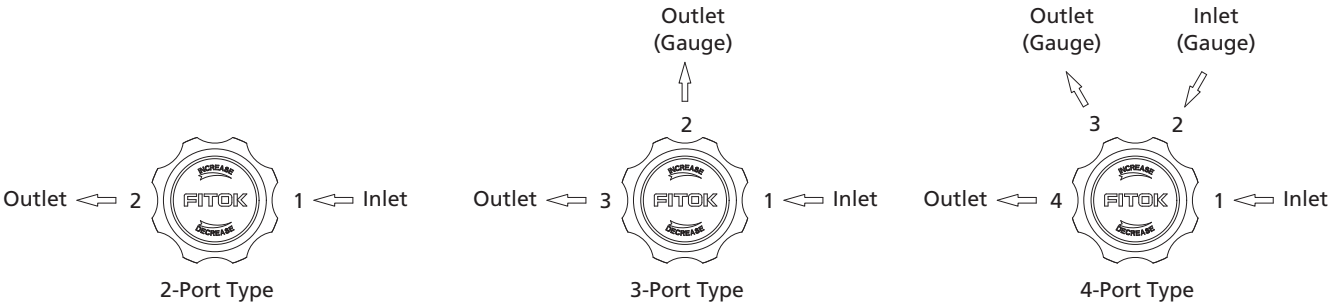




Bottom Panel Cut-outs



Porting Configurations



Part Number Description

FLR – 16L – 15 – 100 – 00 – B – B – 00 – Z

Body Material	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
05	500 psig
15	1500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3
Same as Connection 2

Connection 4
Same as Connection 1

Installation Type	
	Not Required
Z	Installed with One Panel Nut
N	Installed with Screws at the Bottom

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FLR-16L-15-25-00-00
b. 3-port type (1 in, 2 out): FLR-16L-05-100-00-B-00

Line Pressure Regulators

FLR-2 Series Piston Regulators

Features

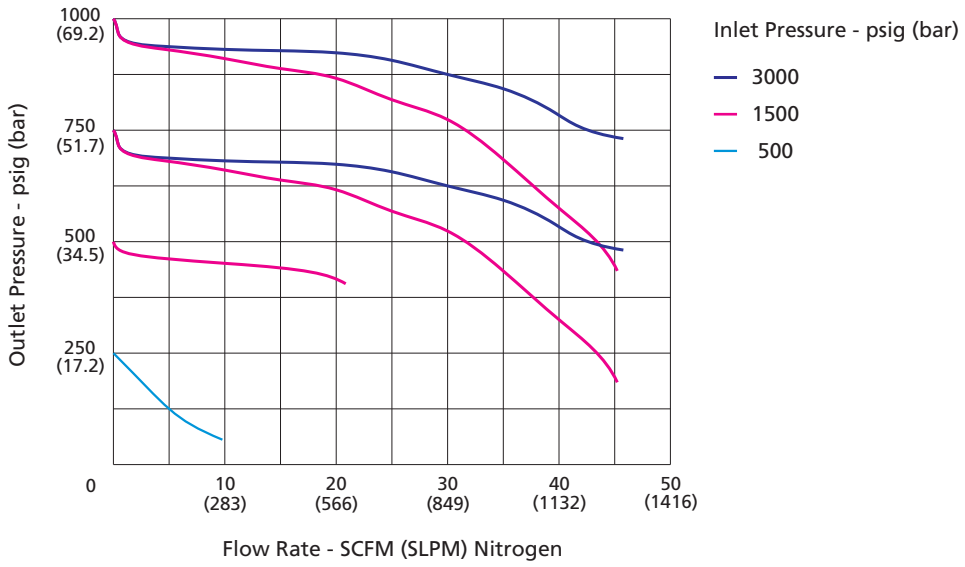
- Applicable to non-corrosive gases or low-viscosity liquids
- Easy to assemble and disassemble, convenient replacement of springs with different output ranges
- Robust piston-sensed design to provide safety and reliability
- With special cleaning and packaging, applicable to oxygen-enriched environments
- Three porting configurations available
- Panel mounted or installed with screws at the bottom

Model: FLR-2SS-45-1000-00-00-Z

Technical Data

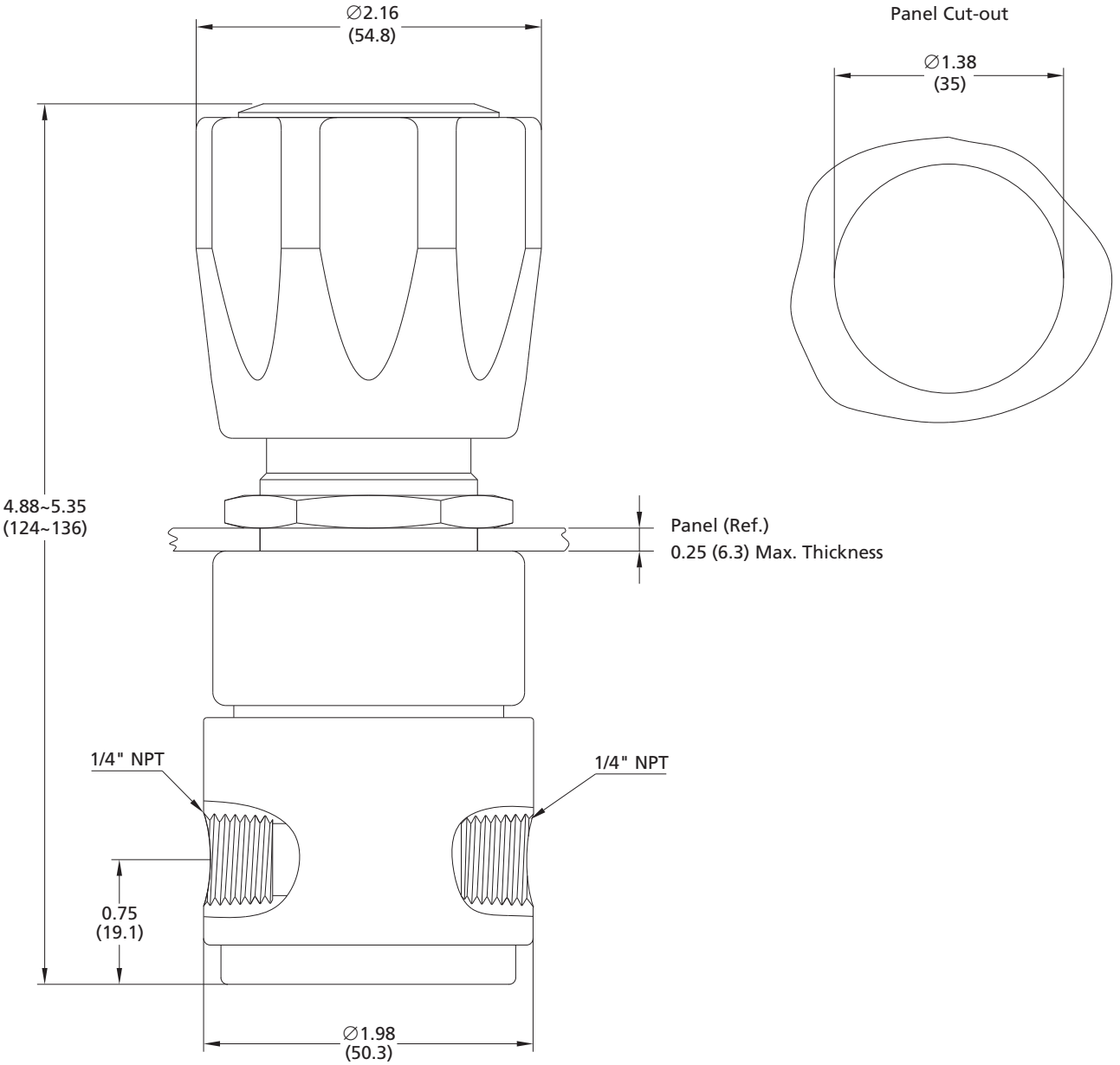
- Single-stage regulator
- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0~250, 0~500, 0~750 or 0~1000 psig
- Material of the internal components:
  Main Seat: PCTFE (PEEK for Venting Model)
  Vent Seat: PCTFE
  Piston: 316L
  O-ring: Viton or Kalrez
  Filter: 316L
- Temperature: -15°F~+165°F (-26°C~+74°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (Cv):
  Without vent: 0.06
  Vent: 0.1
- Weight (regulator only): ≈1.98 lbs (0.9 kg)
- Body ports: 1/4" female NPT for inlet, outlet and gauge

Typical Flow Chart

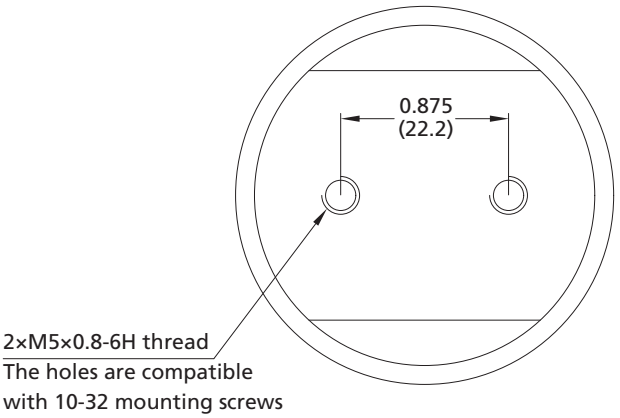


Dimensions

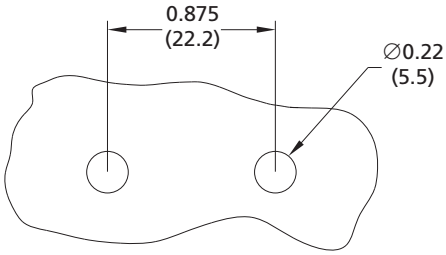
Dimensions, in inches (millimeters), are for reference only.



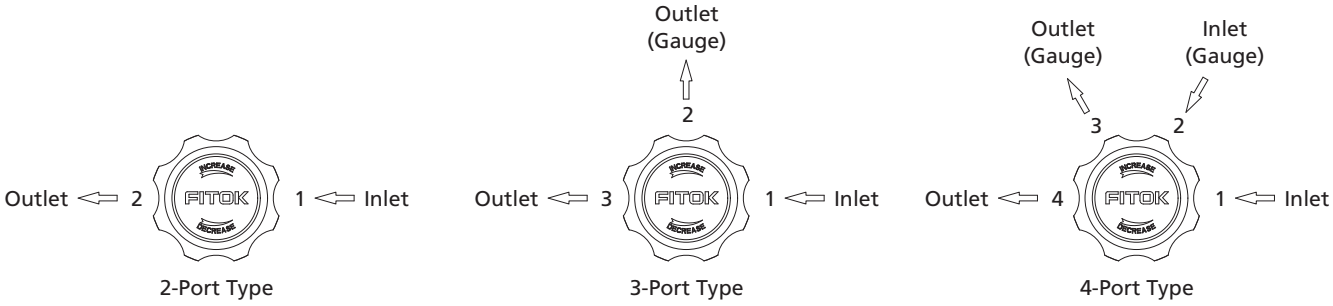
Panel Cut-out



Bottom Panel Cut-out



Porting Configurations



Part Number Description

FLR – 2V Z 6L – 45 – 500 – 10 – B – B – 10 – Z

Vent Option

	Without
V	With

O-ring Material

	Viton
Z	Kalrez

Body Material

6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

Inlet Pressure P1

30	3000 psig
45	4500 psig

Outlet Pressure Range P2

250	0~250 psig
500	0~500 psig
750	0~750 psig
1000	0~1000 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3

Same as Connection 2

Connection 4

Same as Connection 1

Installation Type

	Not Required
Z	Installed with One Panel Nut
N	Installed with Screws at the Bottom

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FLR-26L-30-250-00-00
b. 3-port type (1 in, 2 out): ,FLR-2SS-45-1000-00-00-00

Line Pressure Regulators

FLR-3 Series Medium Flow Diaphragm Regulators

Features

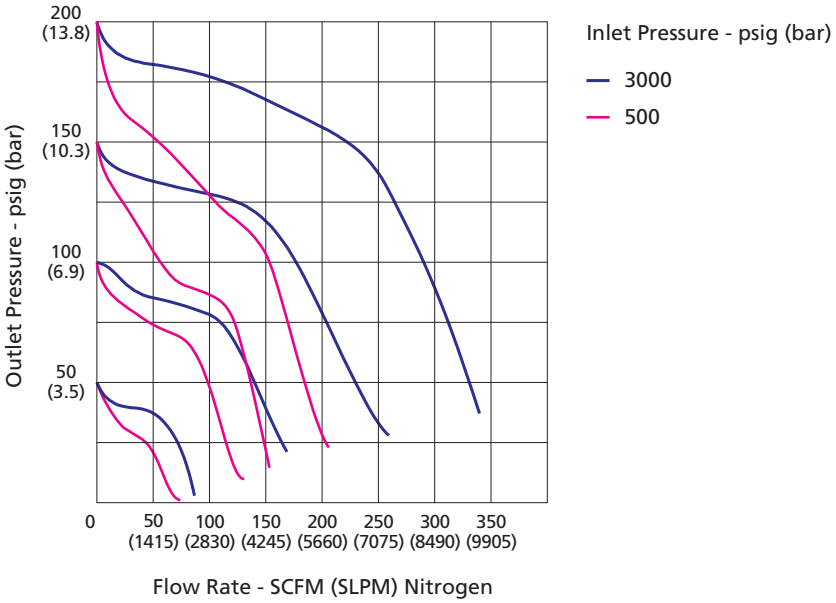
- For high inlet pressure applications
- Balanced poppet
- With large orifice to minimize outlet pressure change when inlet pressure reduces
- Large diameter convoluted diaphragm to increase pressure sensitivity
- 316L SS body for corrosive or toxic gases, Brass body for non-corrosive gases
- With special cleaning and packaging, applicable to oxygen-enriched environments
- Three porting configurations available
- Panel mounted or installed with screws at the bottom
- Fitted with captured vent as standard

Model: FLR-3SS-30-100-04-04-Z

Technical Data

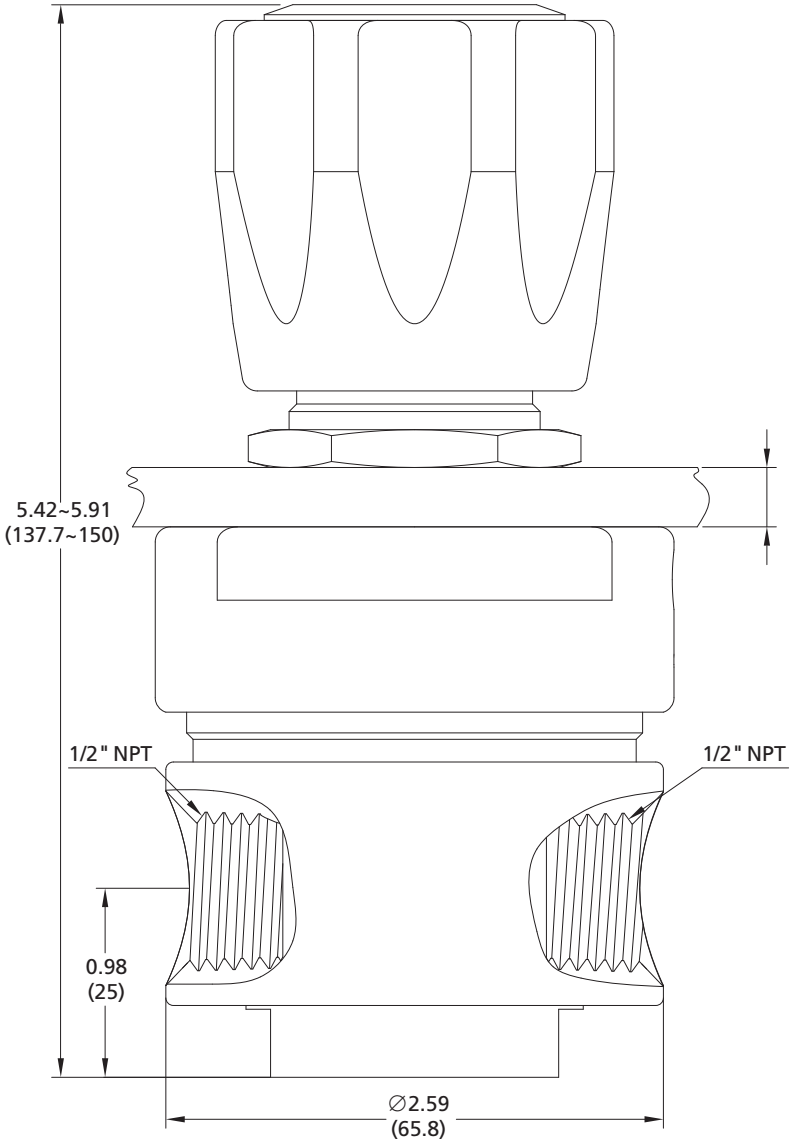
- Single-stage regulator
- Maximum inlet pressure: 500 or 3000 psig
- Outlet pressure range: 0~25, 0~50, 0~100, 0~150 or 0~200 psig
- Material of the internal components:
  Seat: PCTFE
  Diaphragm: Hastelloy
- Temperature: -40°F~+140°F (-40°C~+60°C)
- Leak rates:
  Internal: Bubble-tight
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (Cv): 1.0
- Weight (regulator only): ≈3.53 lbs (1.6 kg)
- Body ports: 1/2" female NPT for inlet, outlet
  1/4" female NPT for gauge

Typical Flow Chart

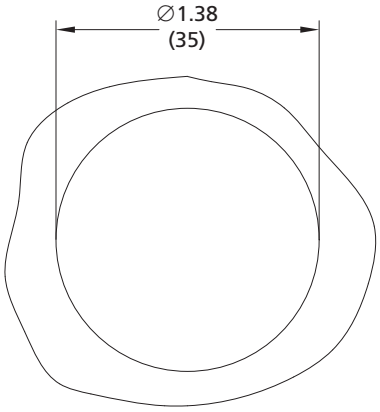


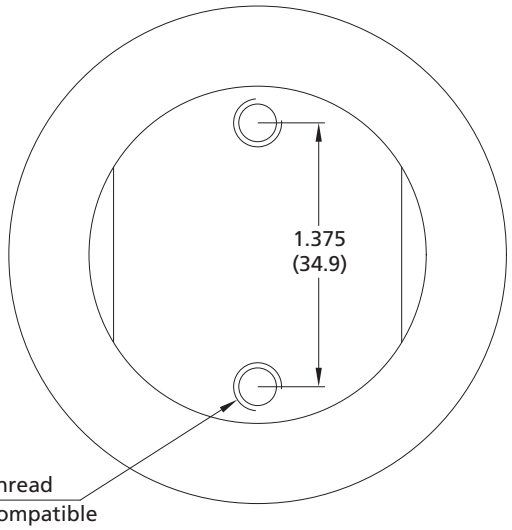
Dimensions

Dimensions, in inches (millimeters), are for reference only.



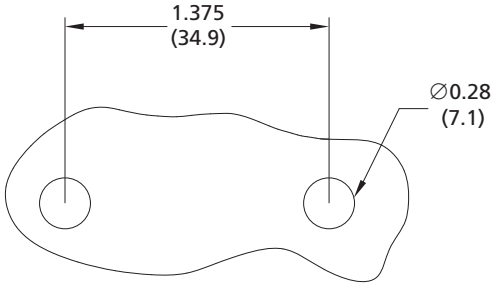
Panel Cut-out



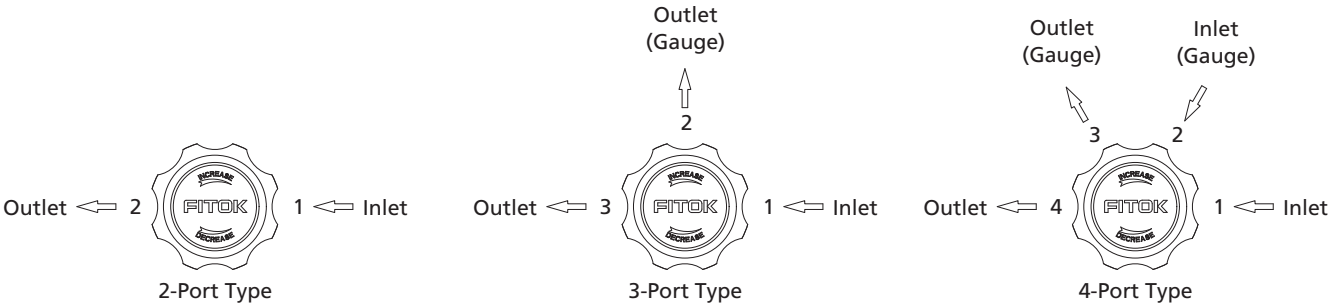


2×M5×0.8-6H thread
The holes are compatible
with 10-32 mounting screws

Bottom Panel Cut-out



Porting Configurations



Part Number Description

FLR – 3B – 30 – 100 – 04 – B – B – 04 – Z

Body Material

6L	316L SS
SS	316 SS
B	Brass

Inlet Pressure P1

05	500 psig
30	3000 psig

Outlet Pressure Range P2

25	0~25 psig
50	0~50 psig
100	0~100 psig
150	0~150 psig
200	0~200 psig

Connection 1

04	1/2" Female NPT
11	3/8" Tube Fitting
12	1/2" Tube Fitting
22	10 mm Tube Fitting
23	12 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3

3 Ports Same as Connection 1
4 Ports Same as Connection 2

Connection 4

Same as Connection 1

Installation Type

	Not Required
Z	Installed with One Panel Nut
M	Installed with Two Panel Nuts
N	Installed with Screws at the Bottom

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FLR-36L-30-150-04-04
b. 3-port type (1 in, 2 out): FLR-3SS-05-200-04-00-04

Line Pressure Regulators

FLR-5 Series High Flow Diaphragm Regulators

Features

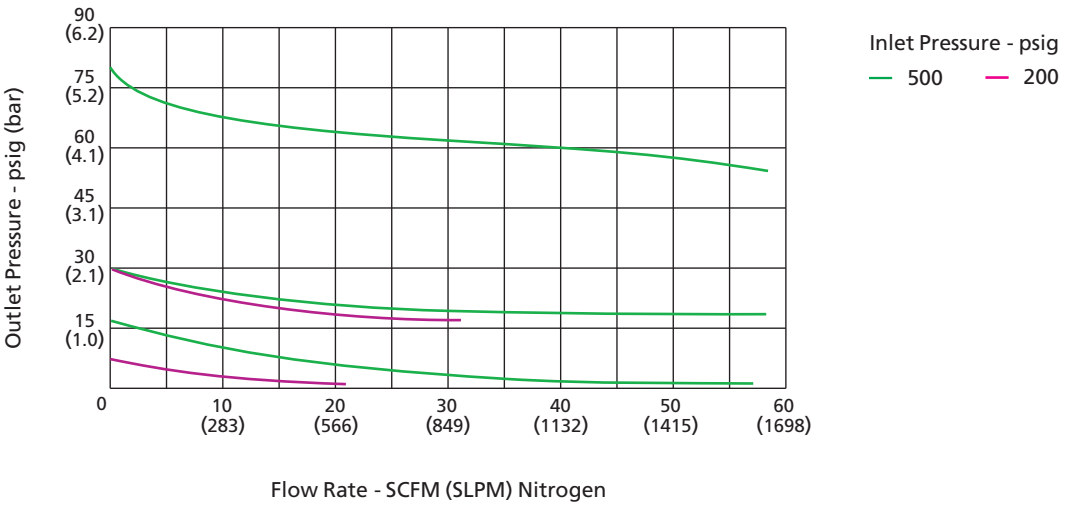
- ◎ Suitable for low pressure and high flow applications
- ◎ Large diameter convoluted diaphragm to increase pressure sensitivity
- ◎ 316L SS body for corrosive gases, and Brass body for non-corrosive gases
- ◎ Fitted with captured vent as standard
- ◎ With special cleaning and packaging, applicable to oxygen-enriched environments
- ◎ Panel mounted or installed with screws at the bottom

Model: FLR-56L-05-100-04-04-Z

Technical Data

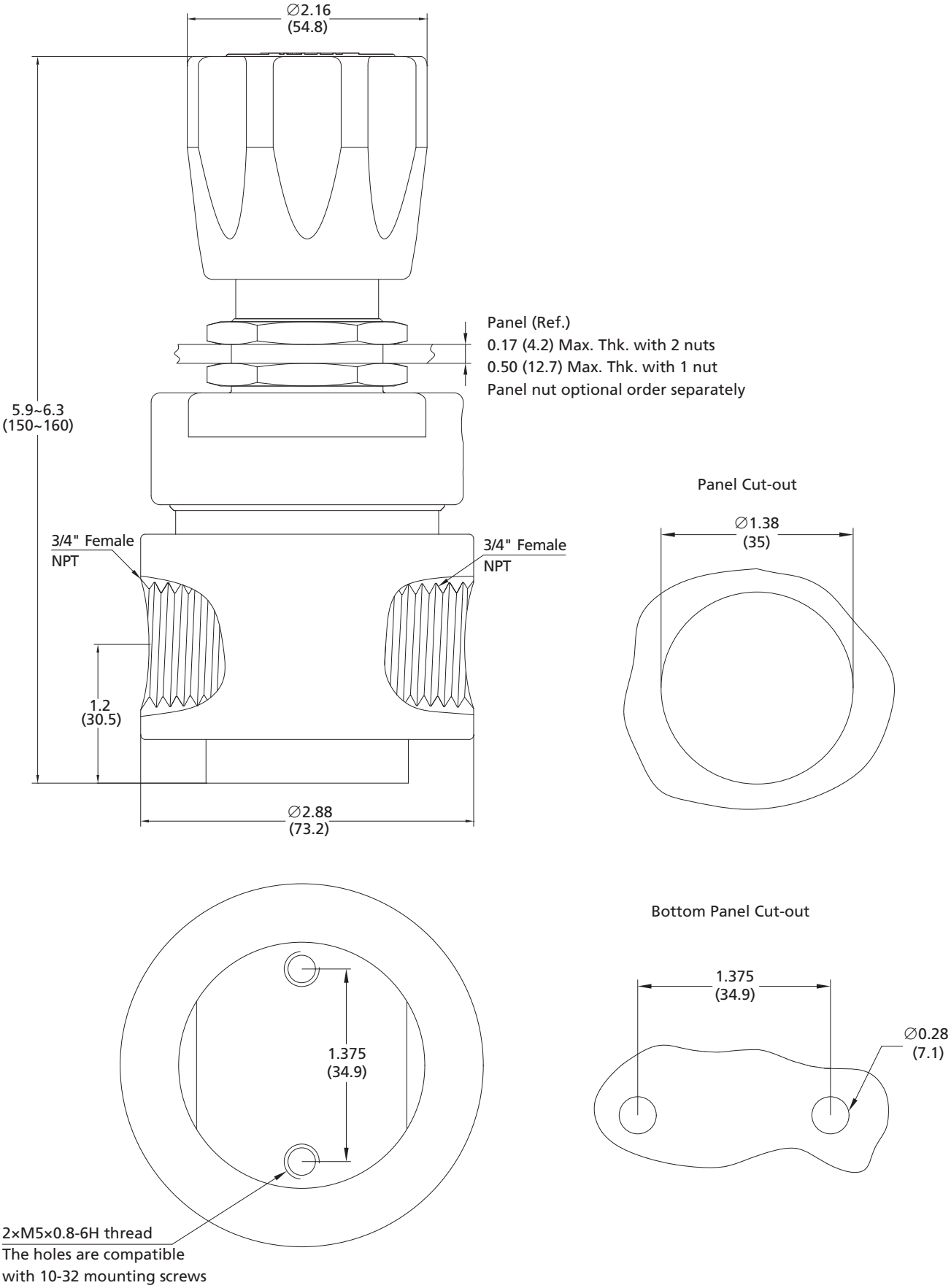
- ◎ Single-stage regulator
- ◎ Maximum inlet pressure: 500 psig
- ◎ Outlet pressure ranges: 0~15, 0~30, 0~75, 0~150 psig
- ◎ Material of the internal components:
  Seat: PCTFE
  Diaphragm: Hastelloy
- ◎ Temperature: -40°F~+165°F (-40°C~+74°C)
- ◎ Leak rates:
  Internal: Bubble-tight
  External: ⩽1×10^{-9} mbar.l/s helium
- ◎ Flow coefficient (Cv): 1.8
- ◎ Weight (regulator only): ≈5.95 lbs (2.7 Kg)
- ◎ Body ports: 3/4"female NPT for inlet, outlet,
  1/4"female NPT for gauge

Typical Flow Chart

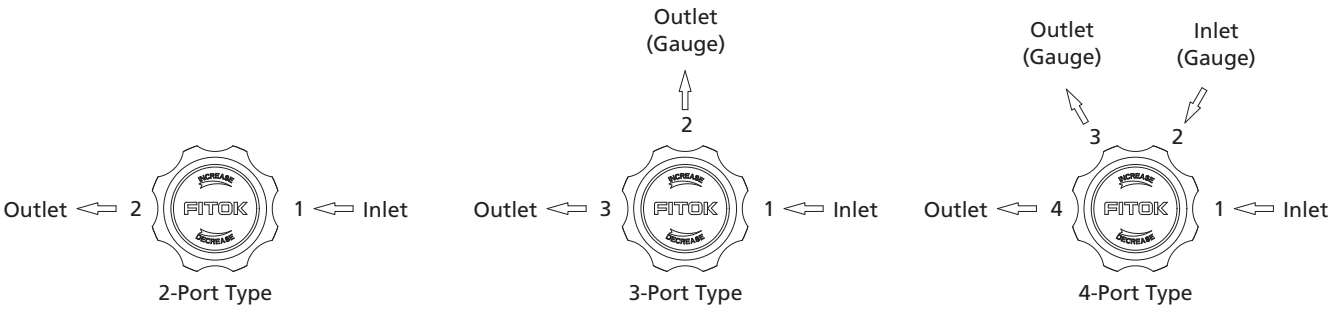


Dimensions

Dimensions, in inches (millimeters), are for reference only.



Porting Configurations



Part Number Description

FLR – 56L – 05 – 150 – 05 – B – B – 05 – Z

Body Material	
6L	316L SS
SS	316 SS
B	Brass

Inlet Pressure P1	
05	500 psig

Outlet Pressure Range P2	
15	0~15 psig
30	0~30 psig
75	0~75 psig
150	0~150 psig

Connection 1	
05	3/4" Female NPT
14	3/4" Tube Fitting
16	1" Tube Fitting
25	16 mm Tube Fitting
26	18 mm Tube Fitting
27	20 mm Tube Fitting
28	22 mm Tube Fitting

Other connections are available upon request

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3
Same as Connection 2

Connection 4
Same as Connection 1

Installation Type	
	Not Required
Z	Installed with One Panel Nut
M	Installed with Two Panel Nuts
N	Installed with Screws at the Bottom

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FLR-56L-05-15-05-05
b. 3-port type (1 in, 2 out): FLR-56L-05-30-05-B-05
c. 4-port type (2 in, 2 out): FLR-5SS-05-150-05-B-B-05

Line Pressure Regulators

FBR-1 Series Miniature Piston Regulators

Features

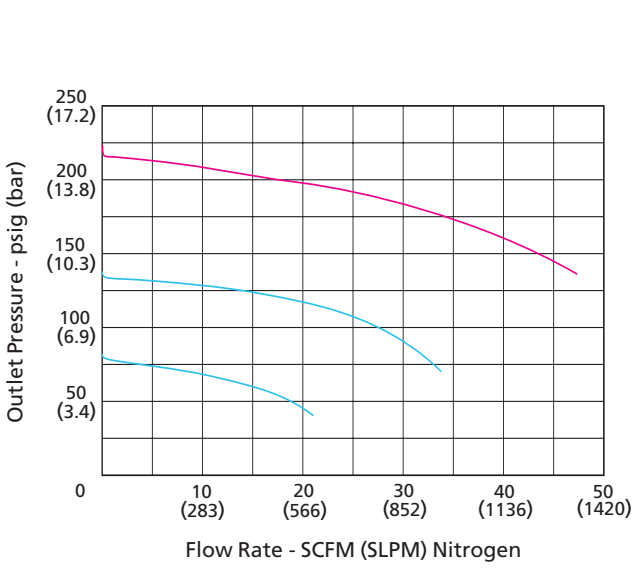
- Applicable to non-corrosive gases or low-viscosity liquids
- Easy to assemble and disassemble, convenient replacement of springs with different output ranges
- Robust piston-sensed design to provide safety and reliability
- With special cleaning and packaging, applicable to oxygen-enriched environments

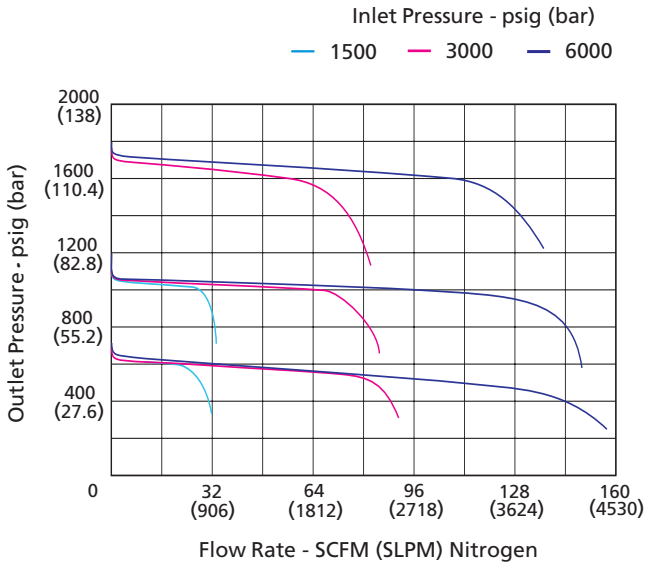
Model: FBR-1SS-60-220-00-00-00-00

Technical Data

- Media contact materials
  Body: 316, 316L or Brass (Nickel-plated)
  Seat: PCTFE, PEEK or Vespel
  Piston: Aluminium Alloy
  O-ring: Viton, Kalrez or Buna-N
  Filter: 316L
- Operating conditions
  Maximum rated inlet pressure: 6000 psig
  Outlet pressure ranges: 0~80, 0~140, 0~220, 0~700, 0~1200, 0~1800 psig
  Temperature: -15°F~+165°F (-26°C~+74°C)
- Functional performance
  Test pressure: 150% of maximum rated pressure
  Burst pressure: 300% of maximum rated pressure
  Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (Cv): 0.06
- Weight(regulator only): 0.93 lbs (0.4 kg)
- Body ports: 1/4" female NPT for inlet and outlet

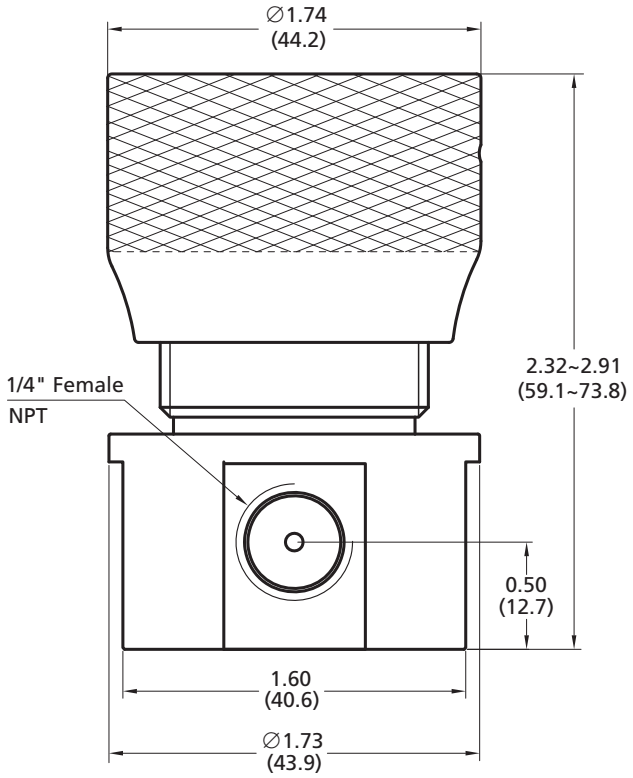
Typical Flow Chart



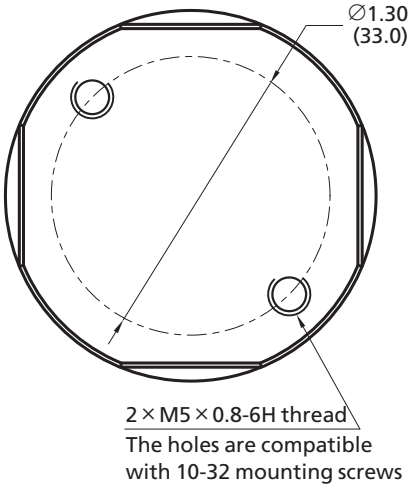


Dimensions

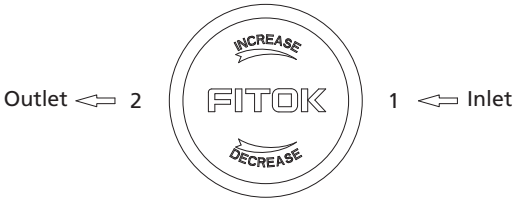
Dimensions, in inches (millimeters), are for reference only.



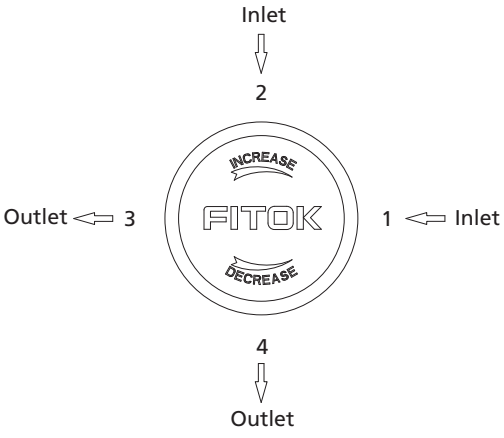
Bottom Panel Cut-outs



Porting Configurations



2-Port Type



4-Port Type

Part Number Description

FBR – 1V 6L – 60 – 220 – 00 – 00 – 00 – 00 – P N

O-ring Material

	Buna-N
Z	Kalrez
V	Viton

Body Material

6L	316L SS
SS	316 SS
B	Brass (Nickel-Plated)

Inlet Pressure P1

60	6000 psig

Outlet Pressure Range P2

80	0~80 psig
140	0~140 psig
220	0~220 psig
700	0~700 psig
1200	0~1200 psig
1800	0~1800 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2, 3 and 4

Same as Connection 1

Seat Material

	PCTFE
P	PEEK
V	Vespel

Installation Type

	Not Required
N	Installed with Screws at the Bottom

Note: Most configurations are available.
Examples of part number:
a. 2-port type (1 in, 1 out): FBR-16L-60-80-00-00
b. 4-port type (2 in, 2 out): FBR-16L-60-80-00-00-00-00

High Pressure Regulators

HPR-10 Series High Pressure Piston Regulators

Features

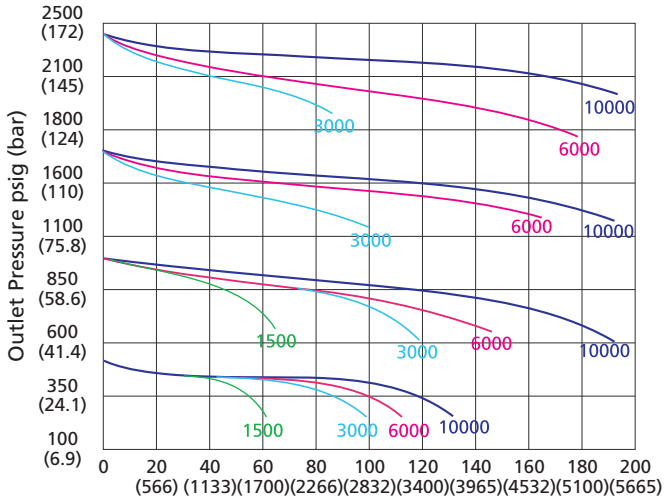
- 316 Stainless steel or brass body optional
- Robust piston sensed design
- Stable outlet pressure and easy tune
- 7 different outlet pressure ranges
- All pressure ranges can be vented to 0 psig
- Applicable to general gases or liquid
- Panel mountable

Model: HPR-10SSN-100-100-00-00-ZV

Technical Data

- Maximum inlet pressure:
  Stainless: 10000 psig
  Brass: 6000 psig
- Outlet pressure range: 10~500, 15~800, 15~1500, 30~2500, 50~4000, 60~6000 or 200~10000 psig
- Materials of the internal components:
  Seat: PEEK
  Piston: 316L
  O-rings: Viton or NBR
  Filter: 316L
- Temperature: -15°F~+165°F (-26°C~+74°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (Cv): 0.06
- Weight: ≈5.75 lbs (2.6 kg)
- Body ports: 1/4" female NPT for inlet, outlet and gauge

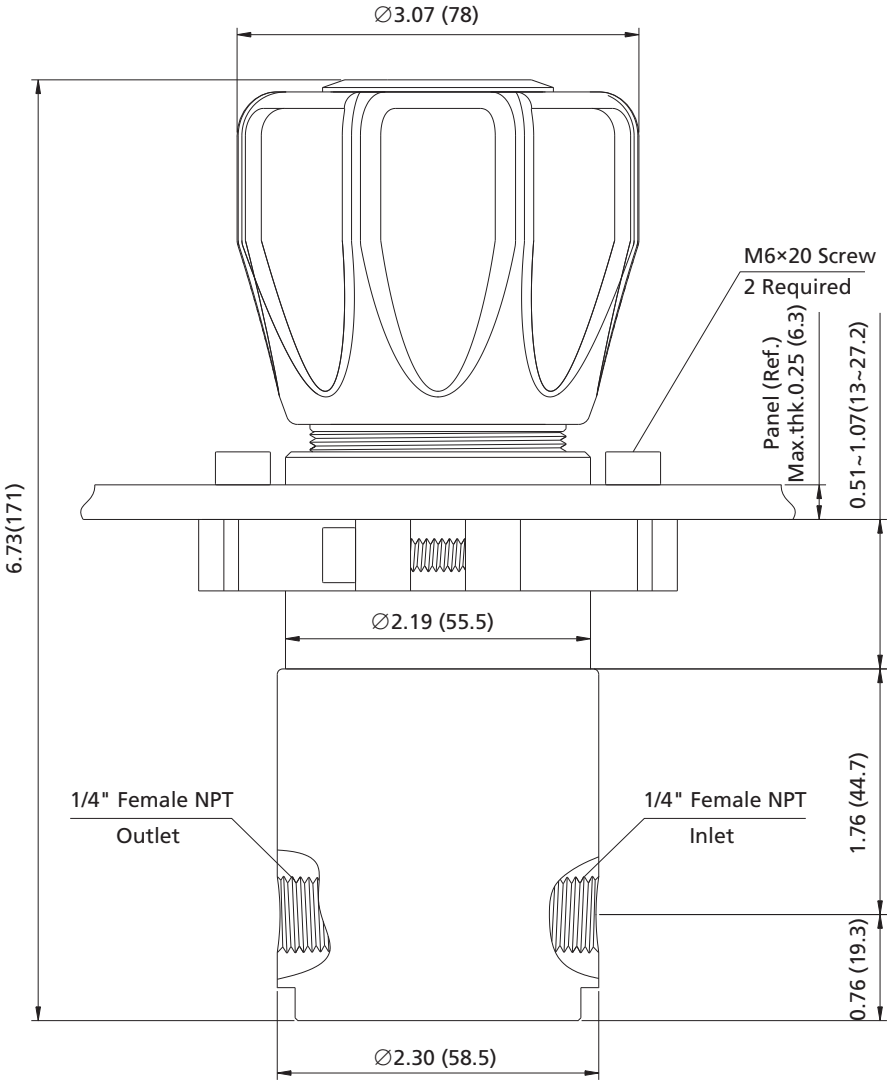
Flow Chart



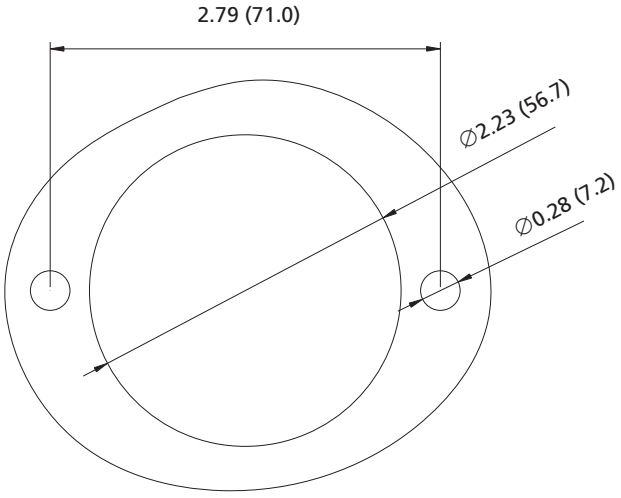
Flow rate SCFM (SLPM) Nitrogen

Dimensions

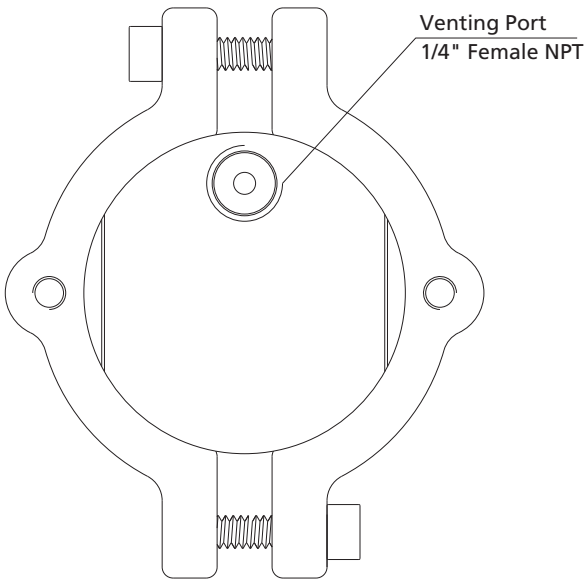
Dimensions, in inches (millimeters), are for reference only.



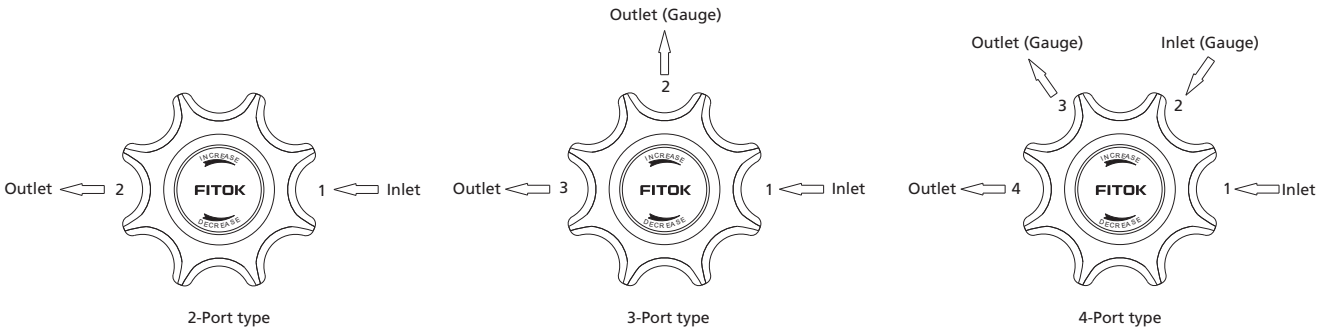
Panel Cut-outs



Bottom View



Porting Configurations



Part Number Description

HPR – 10BN – 60 – 10 – 12 – B – B – 00 – ZV–F2

Body Material

SS	316 SS
B	Brass (Max. Inlet Pressure 6000 psig)

O-ring Material

	Viton
N	NBR

Inlet Pressure P1

60	6000 psig
100	10000 psig

Outlet Pressure Range P2

5	10~500 psig
8	15~800 psig
15	15~1500 psig
25	30~2500 psig
40	50~4000 psig
60	60~6000 psig
100	200~10000 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3

Same as Connection 2

Connection 4

Same as Connection 1

Panel Mount

	Without
Z	With

Vent Option

	Without
V	With

Product Technology Grade

	General Purpose
F2	Special Cleaning and Packaging

Note: Most configurations are available but not everyone.
Venting port can not be blocked.
For liquid services, install the regulator with the venting port pointed vertically down.
Examples of part number:
a. 2-port type (1 in, 1 out): HPR-10SS-60-40-00-00
b. 3-port type (1 in, 2 out): HPR-10B-60-60-00-B-00
c. 4-port type (2 in, 2 out): HPR-10SS-100-25-00-B-B-00

Line Pressure Regulators

HPL-06 Series High Pressure High Flow Regulators

Features

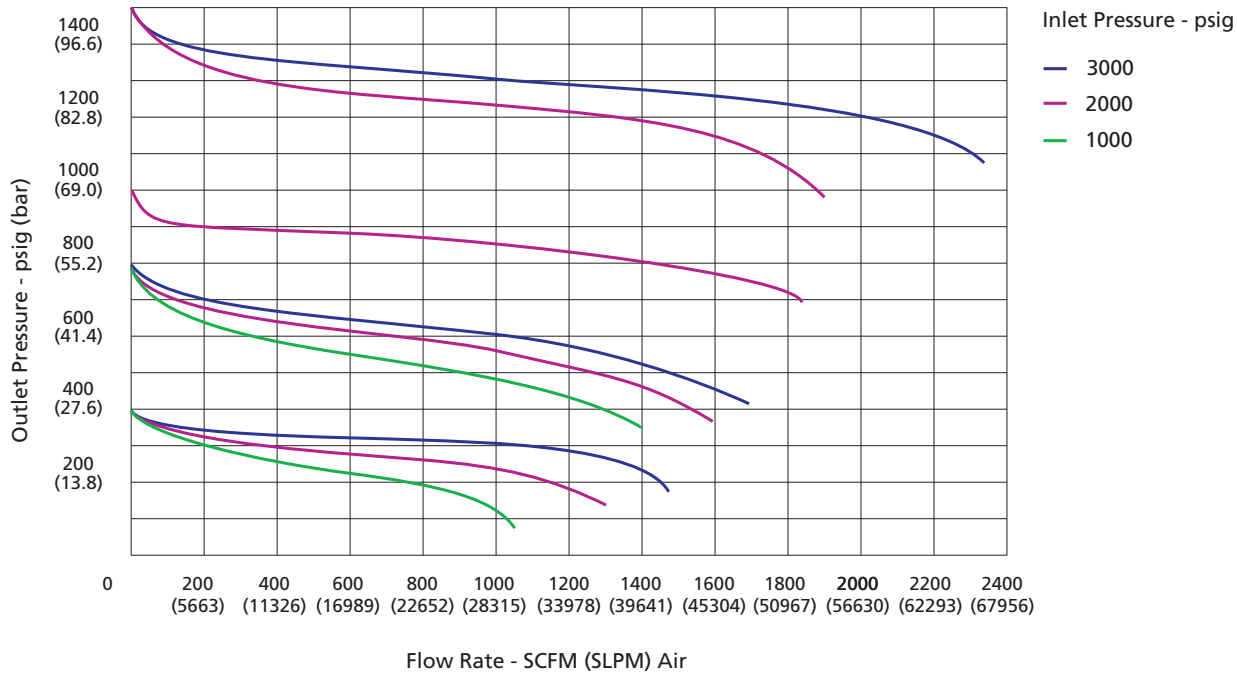
- For high pressure and high flow applications
- Large piston sensor gives excellent sensitivity
- Balanced valve design ensures stable downstream pressure
- Three porting configurations available
- Panel mounting available
- With special cleaning and packaging, applicable to oxygen-enriched environments

Model: HPL-06SS-45-1000-04-04-Z

Technical Data

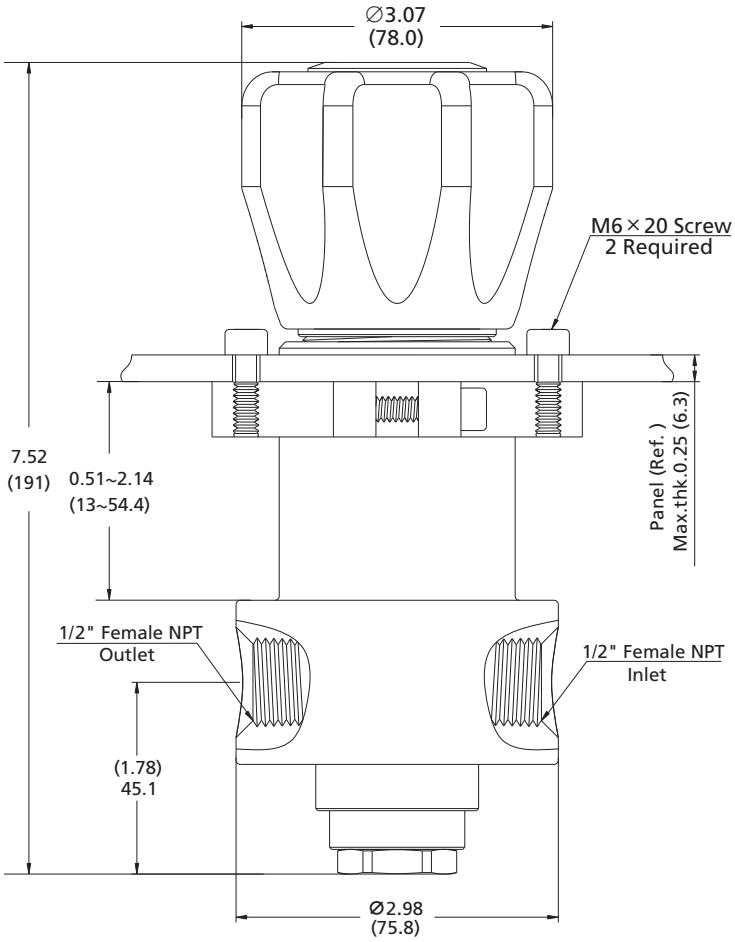
- Maximum inlet pressure:
  Stainless steel: 4500 psig
  Brass: 3750 psig
- Outlet pressure ranges: 0~300, 0~600, 0~1000, 0~1500 psig
- Material of the main components:
  Body: 316 SS or brass
  Seat: PCTFE
  Piston: 316L
  O-rings: Viton or Kalrez
- Temperature: -15°F~+220°F (-26°C~+104°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (Cv): 2.0
- Weight (regulator only): ≈ 6.25 lbs (2.83 Kg)
- Body ports: 1/2" female NPT for inlet, outlet,
  1/4" female NPT for gauge

Typical Flow Chart

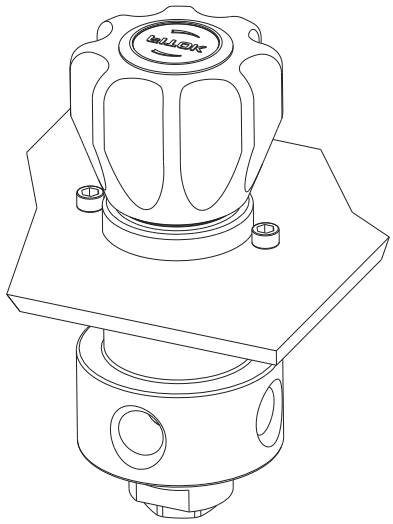


Dimensions

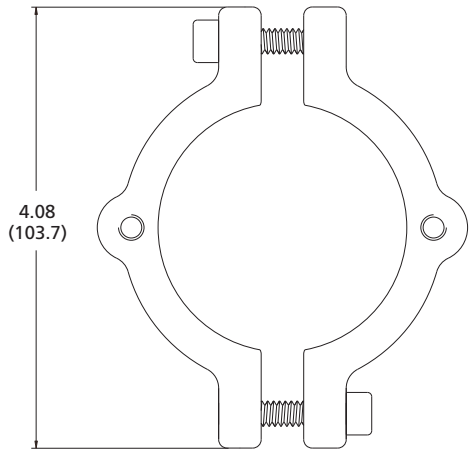
Dimensions, in inches (millimeters), are for reference only.



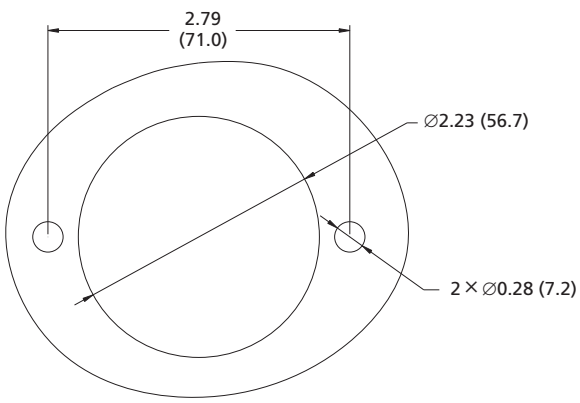
Panel Mounting



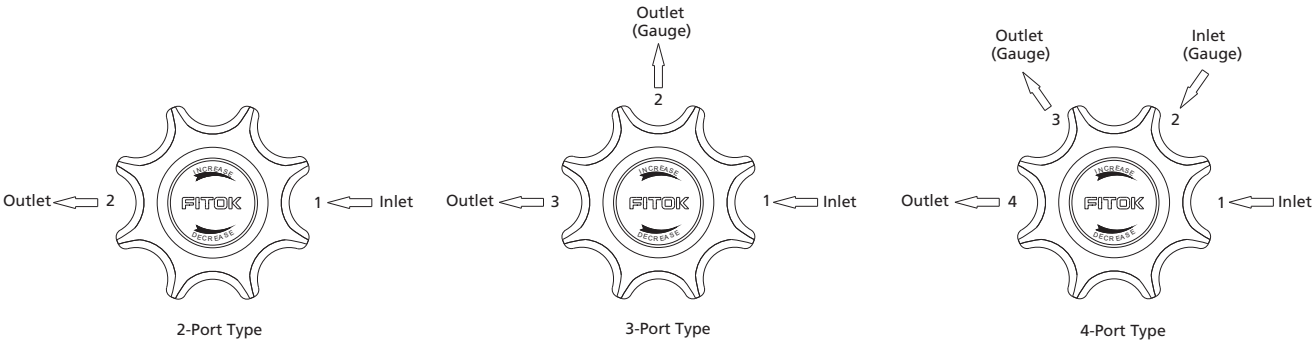
Panel Mounting Kit



Panel Cut-out



Porting Configurations



Part Number Description

HPL – 06V Z 6L – 45 – 600 – 04 – B – B – 04 – Z

Vent Option	
	Without
V	With

O-ring Material	
	Viton
Z	Kalrez

Body Material	
SS	316 SS
6L	316L SS
B	Brass (Max. Inlet Pressure 3750 psig)

Inlet Pressure P1	
37	3750 psig
45	4500 psig

Outlet Pressure Range P2	
300	0~300 psig
600	0~600 psig
1000	0~1000 psig
1500	0~1500 psig

Connection 1	
04	1/2" Female NPT
05	3/4" Female NPT
14	3/4" Tube Fitting
25	16 mm Tube Fitting
26	18 mm Tube Fitting

Other connections are available upon request

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3
Same as Connection 2

Connection 4
Same as Connection 1

Panel Mount	
	Without
Z	With

Note: Most configurations are available.
Examples of part number:
a. 2-Port type (1 in, 1 out): HPL-06B-37-600-04-04
b. 3-Port type (1 in, 2 out): HPL-066L-45-1000-04-B-04
c. 4-Port type (2 in, 2 out): HPL-06SS-45-1500-04-B-B-04

Pressure Control Panels

FSR-1 Series Pressure Control Panels for Single Cylinder

Features

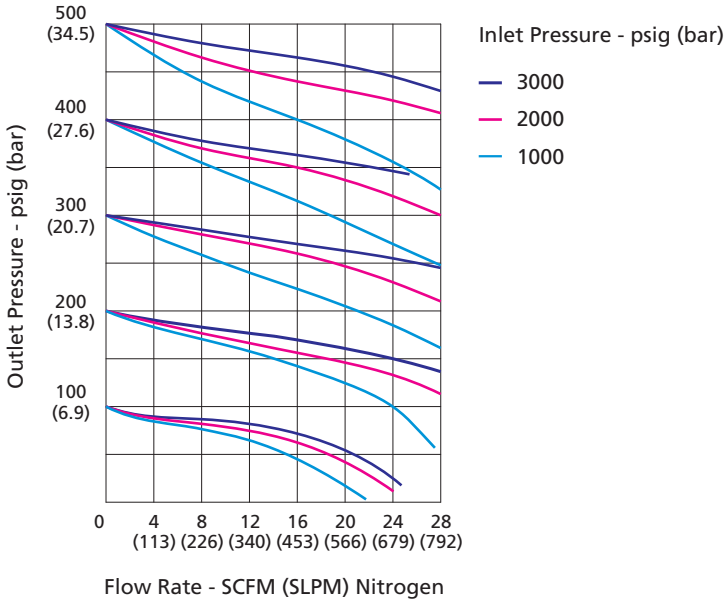
- ◎ With a FCR-1 Series Regulator
- ◎ Maximum inlet pressure up to 4500 psig
- ◎ With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- ◎ Anodized Aluminium panel
- ◎ Bracket mounting as standard

Model: FSR-16L-45-100-00-B-B-00-R-P

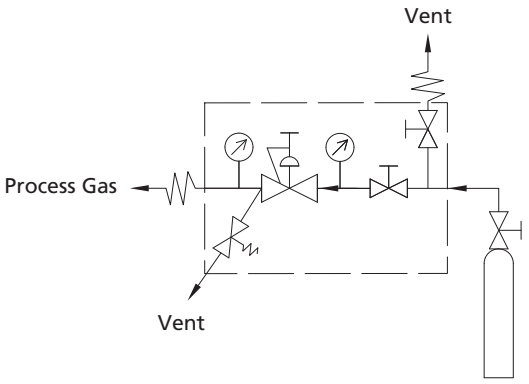
Technical Data

- ◎ Maximum inlet pressure: 3000 or 4500 psig
- ◎ Outlet pressure range: 0~25, 0~50, 0~100, 0~250 or 0~500 psig
- ◎ Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: Hastelloy (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  Filter: 316L
- ◎ Temperature: -10°F~+150°F (-23°C~+65°C)
- ◎ Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- ◎ Flow coefficient (regulator Cv): 0.06

Typical Flow Chart

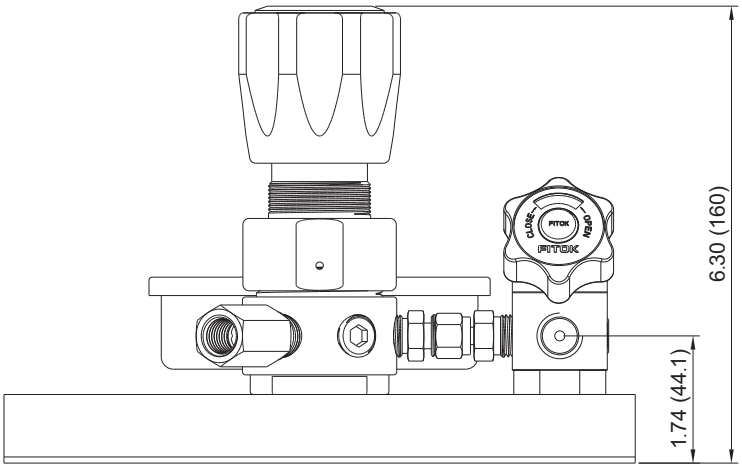


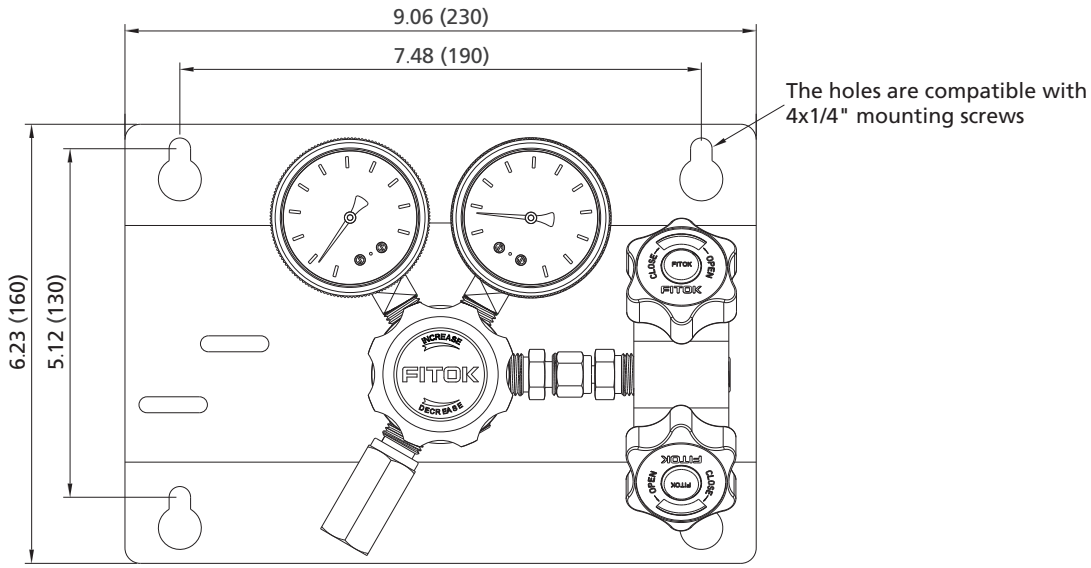
Flow Schematic



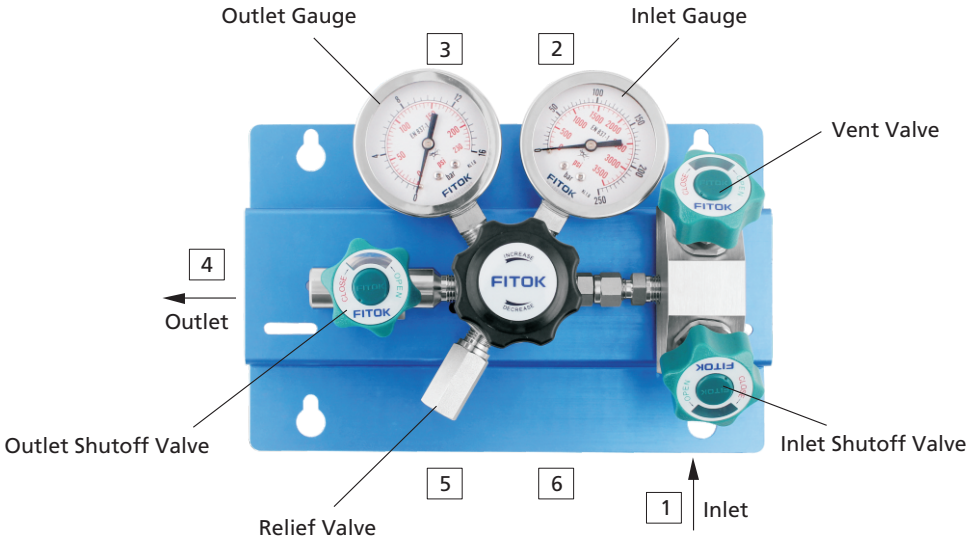
Dimensions

Dimensions, in inches (millimeters), are for reference only.





Components Introduction



Part Number Description

FSR – 16L – 30 – 50 – 00 – B – B – 30 – R – P

Body Material (Regulator)

6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1

30	3000 psig
45	4500 psig

Outlet Pressure Range P2

25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig
500	0~500 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3

Same as Connection 2

Connection 4

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5

R	Relief Valve
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

Note: Most configurations are available.

Pressure Control Panels

FSR-2 Series High Pressure Control Panels for Single Cylinder

Features

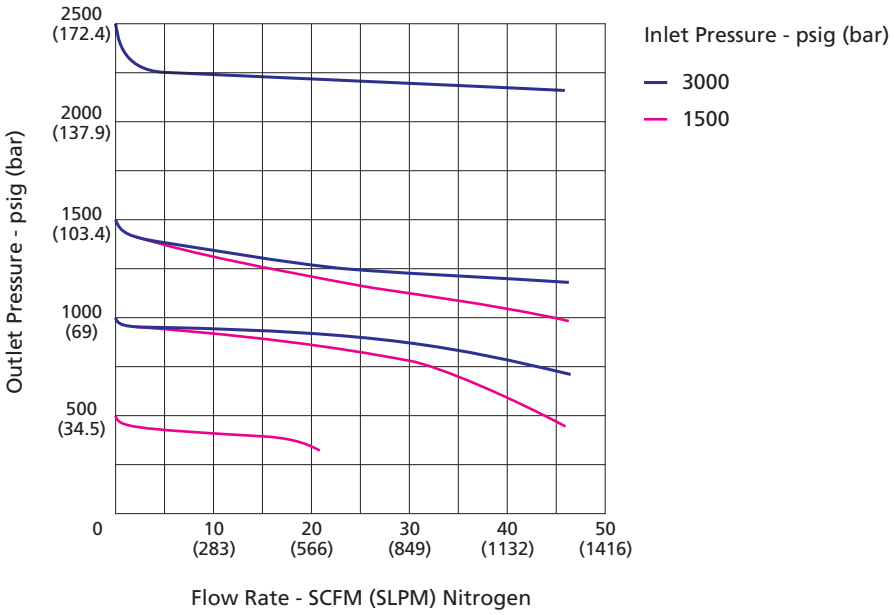
- With a FCR-2 Series Regulator
- Applicable to non-corrosive gases or low-viscosity liquids
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- Venting model available
- Anodized Aluminium panel
- Bracket mounting as standard

Model: FSR-2Z6L-45-750-00-B-B-00-P-P

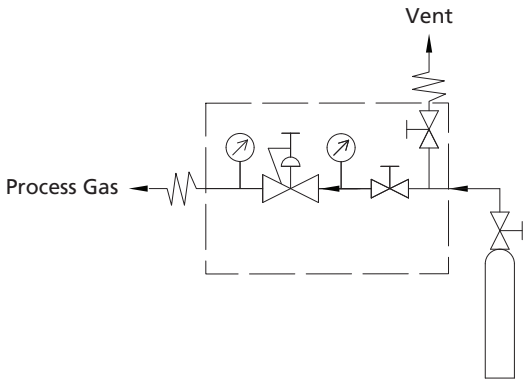
Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0~750, 0~1500 or 0~2500 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Piston: 316L
  Diaphragm: Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  O-ring: Viton or Kalrez
  Filter: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (regulator Cv):
  Without vent: 0.06
  With vent: 0.1

Typical Flow Chart

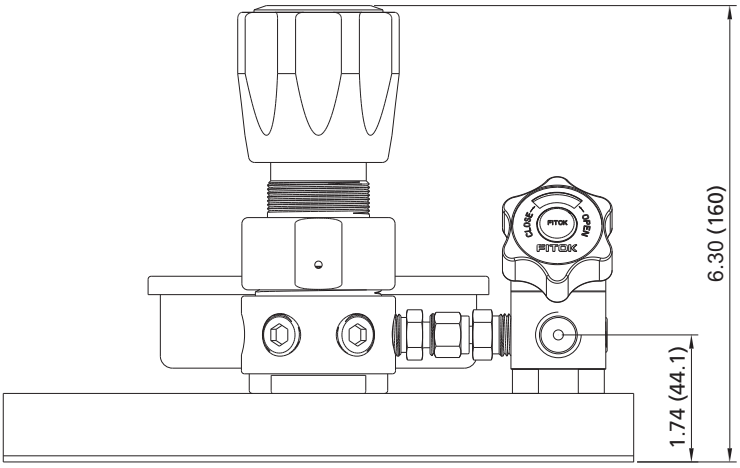


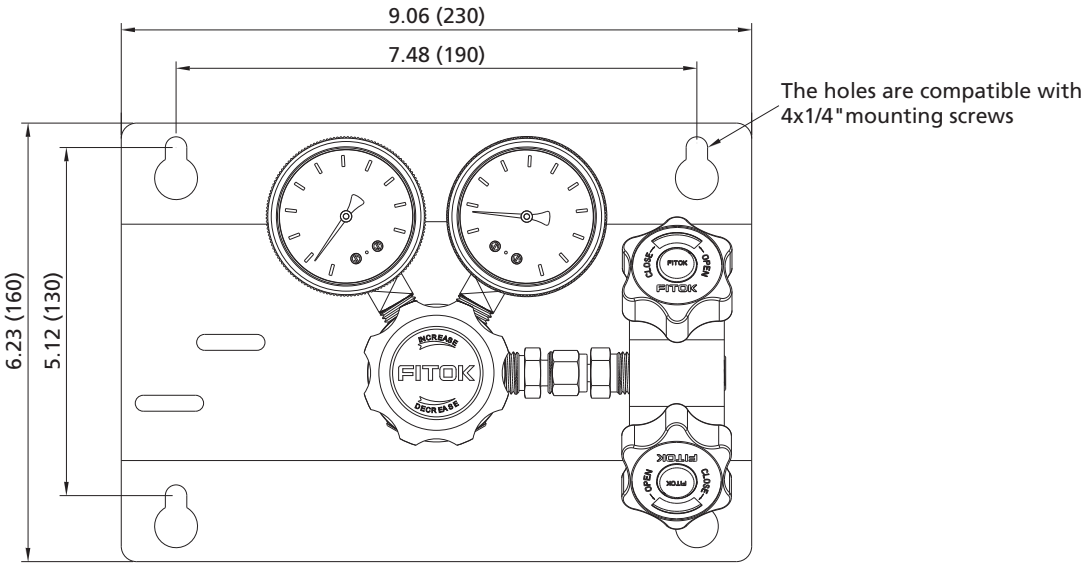
Flow Schematic



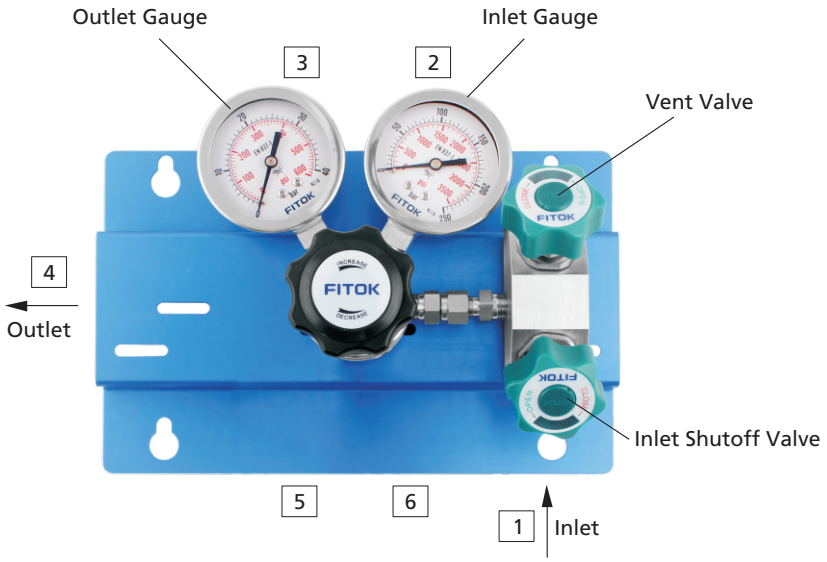
Dimensions

Dimensions, in inches (millimeters), are for reference only.





Components Introduction



Part Number Description

FSR – 2V Z 6L – 30 – 1500 – 00 – B – B – 30 – P – P

Vent Option

	Without
V	With

O-ring Material

	Viton
Z	Kalrez

Body Material (Regulator)

6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

Inlet Pressure P1

30	3000 psig
45	4500 psig

Outlet Pressure Range P2

750	0~750 psig
1500	0~1500 psig
2500	0~2500 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3

Same as Connection 2

Connection 4

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
30	Diaphragm Valve with 1/4" Female NPT
31	Diaphragm Valve with 1/4" Male NPT
32	Diaphragm Valve with 1/4" Tube Fitting
33	Diaphragm Valve with 3/8" Tube Fitting
34	Diaphragm Valve with 6 mm Tube Fitting
35	Diaphragm Valve with 8 mm Tube Fitting

Other connections are available upon request

Connection 5

R	Relief Valve
P	Plug
00	1/4" Female NPT

Connection 6

Same as Connection 5

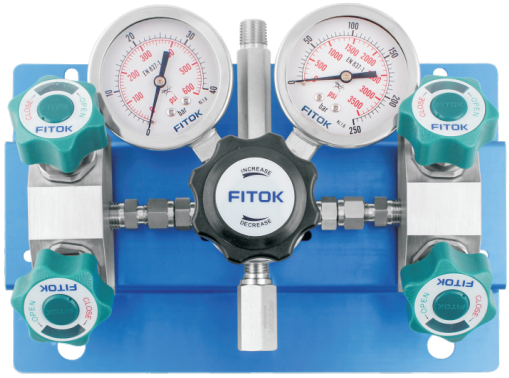
Note: Most configurations are available.

Changeover Systems

FDR-1 Series Manual Changeover System (up to 500 psig)

Features

- A small manual changeover system with a regulator similar to FCR-1 Series Regulators
- Connecting with two independent gas sources at a time, gas source selected through diaphragm valves
- Applicable to corrosive or toxic gases
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- Anodized Aluminium panel

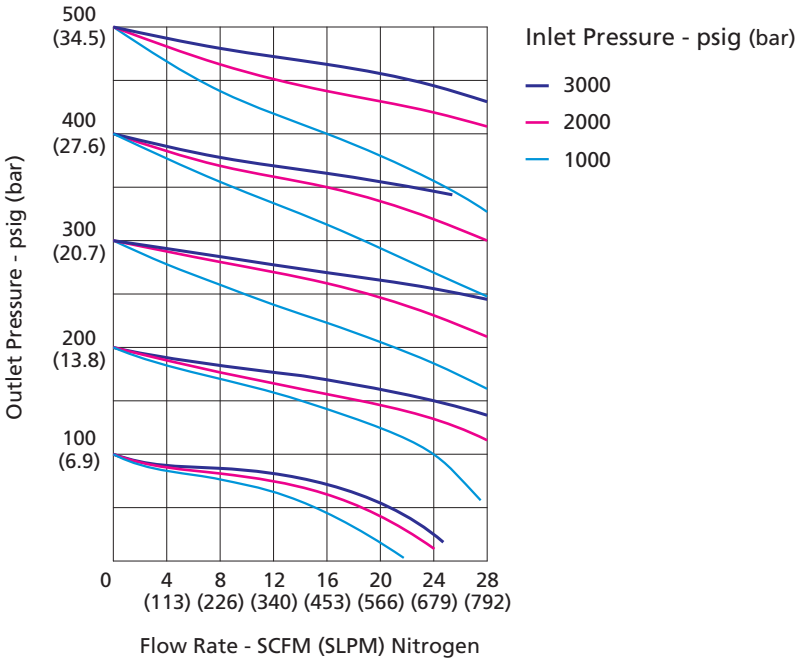


Model: FDR-16L-30-500-00-B-B-01-00-R

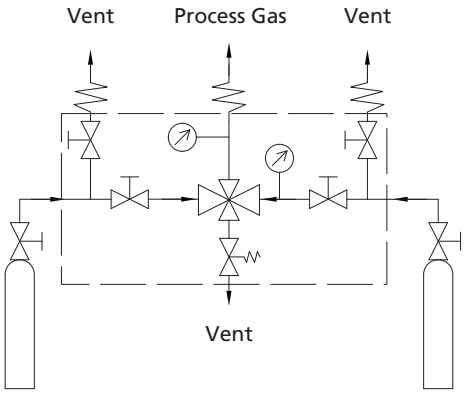
Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0~25, 0~50, 0~100, 0~250 or 0~500 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: Hastelloy (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  O-ring: Viton
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (regulator Cv): 0.06

Typical Flow Chart

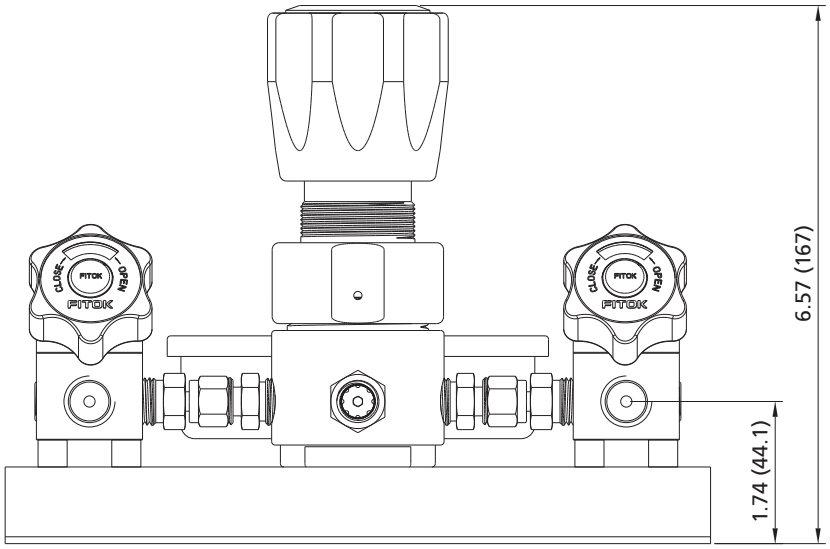


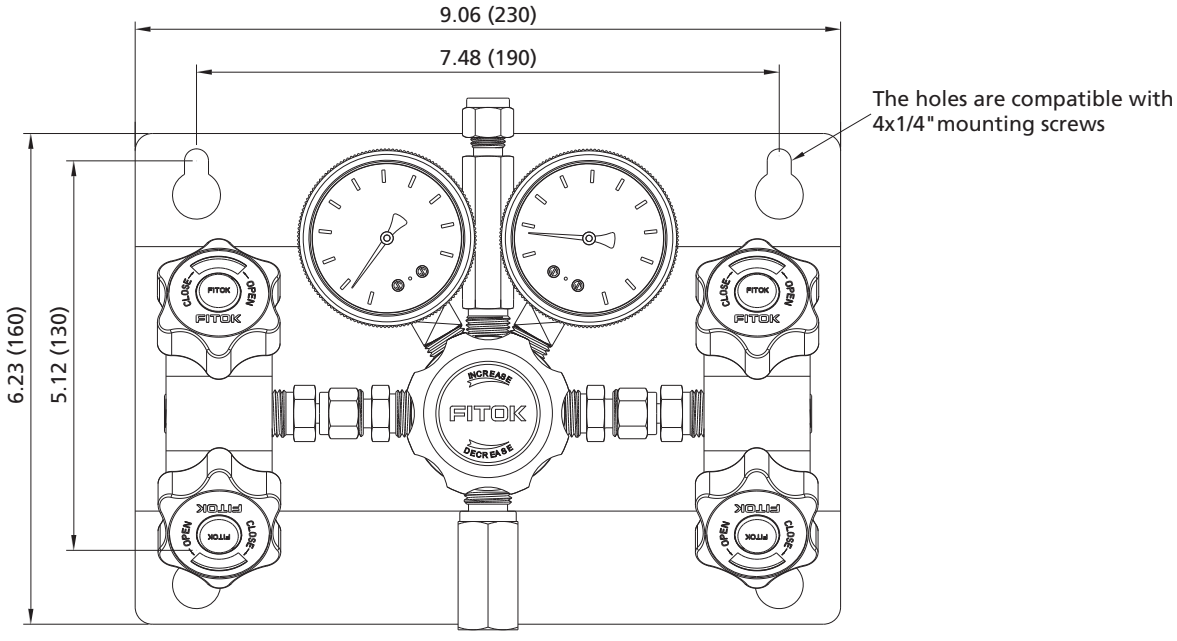
Flow Schematic



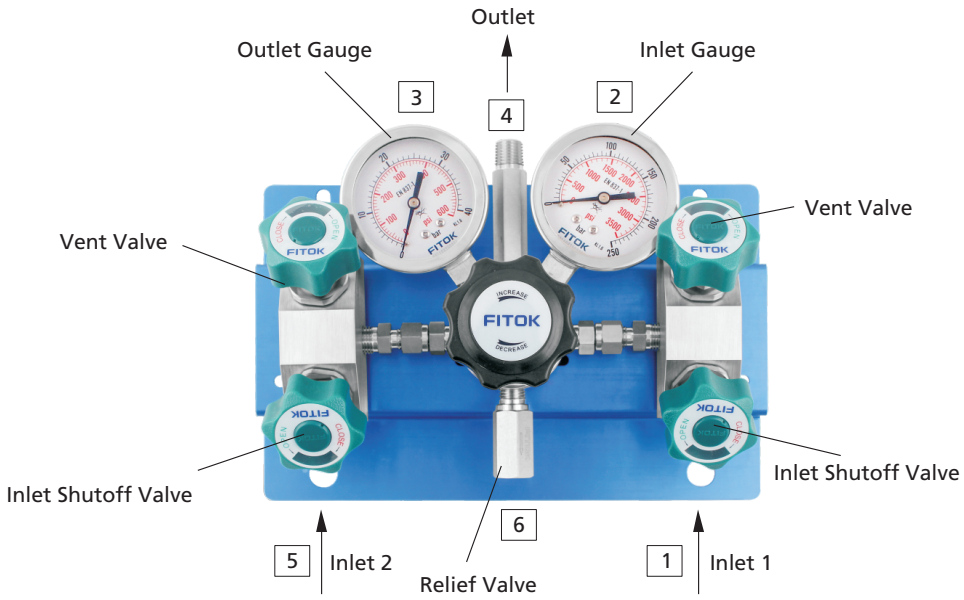
Dimensions

Dimensions, in inches (millimeters), are for reference only.





Components Introduction



Part Number Description

FDR – 16L – 30 – 250 – 00 – B – B – 01 – 00 – R

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig
500	0~500 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3
Same as Connection 2

Connection 4	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 5
Same as Connection 1

Connection 6	
R	Relief Valve
P	Plug
00	1/4" Female NPT

Changeover Systems

FDR-2 Series Manual Changeover System (up to 2500 psig)

Features

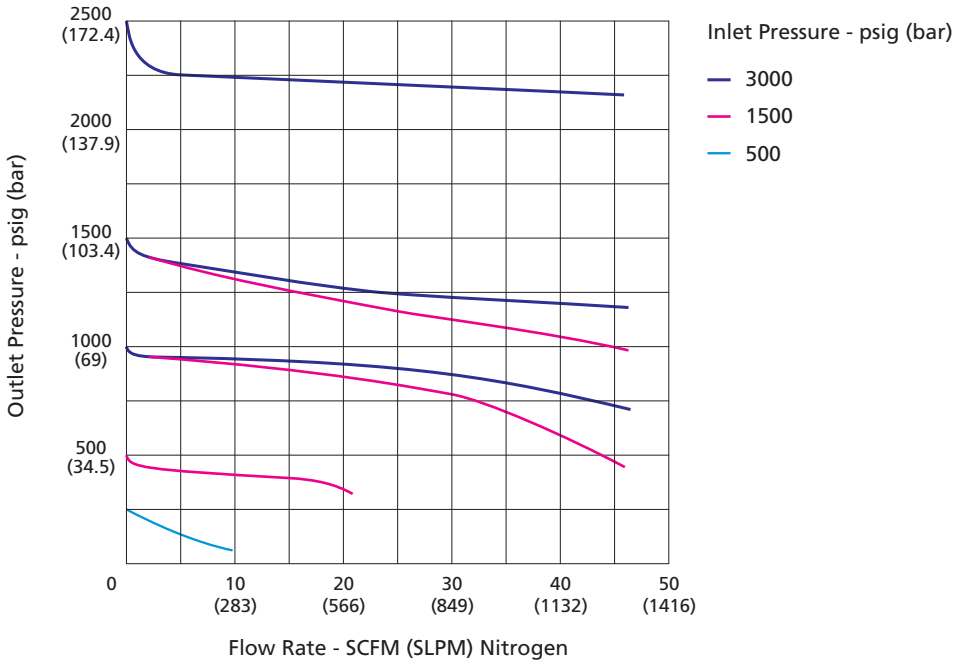
- A small manual changeover system with a regulator similar to FCR-2 Series Regulators
- Connecting with two independent gas sources at a time, gas sources switched through diaphragm valves
- Applicable to non-corrosive gases
- Venting model available
- Anodized Aluminium panel

Model: FDR-2VSS-45-2500-00-B-B-01-00

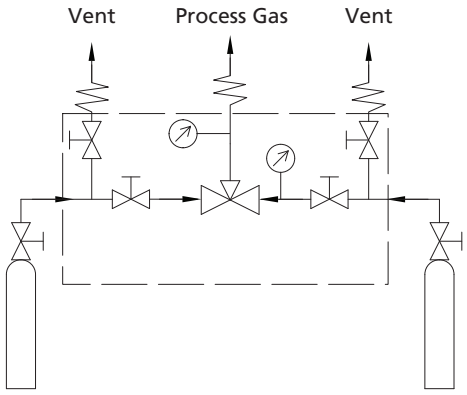
Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0~750, 0~1500 or 0~2500 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Piston: 316L
  Diaphragm: Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  O-ring: Viton or Kalrez
  Filter: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- Flow coefficient (regulator Cv):
  Without vent: 0.06
  Vent: 0.1

Typical Flow Chart

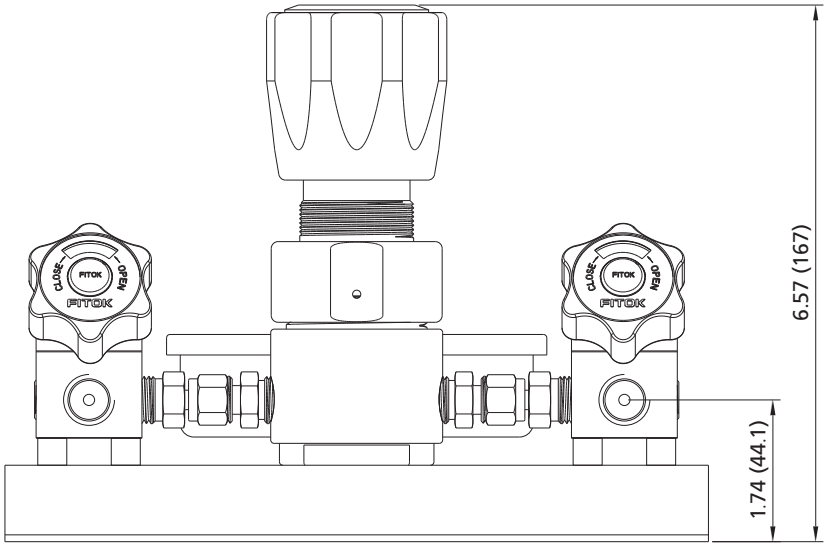


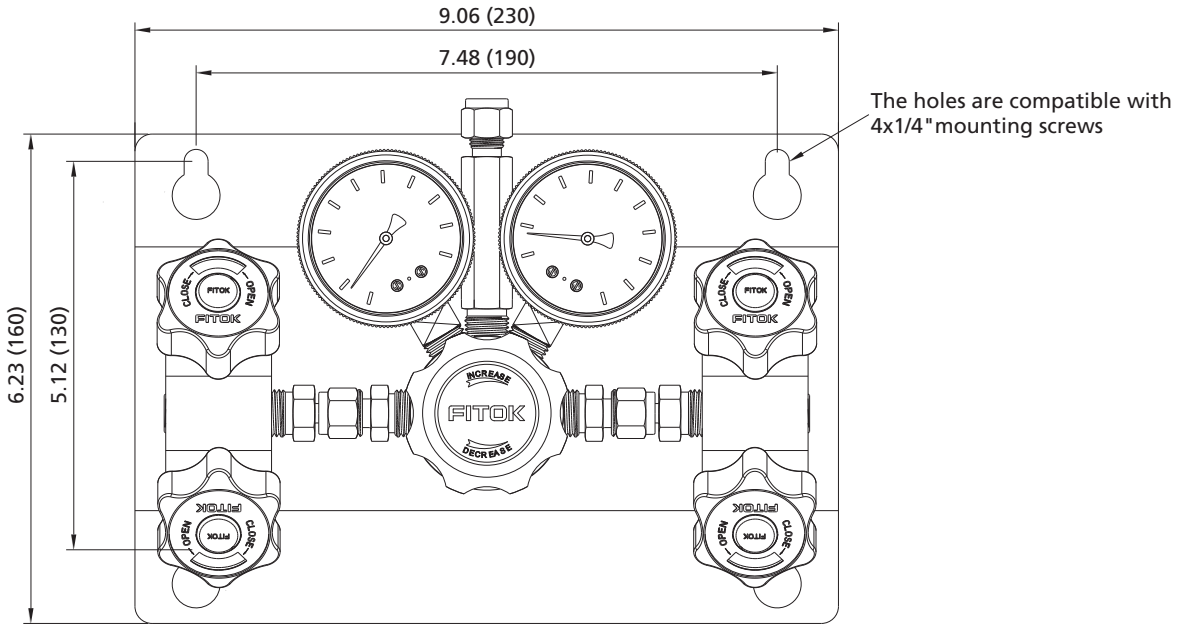
Flow Schematic



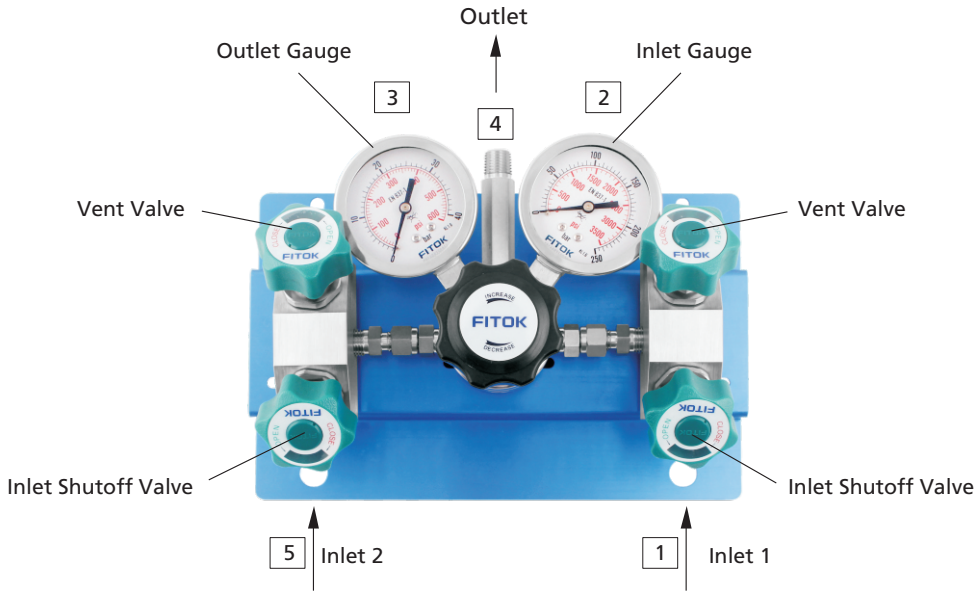
Dimensions

Dimensions, in inches (millimeters), are for reference only.





Components Introduction



Part Number Description

FDR – 2V Z 6L – 30 – 750 – 00 – B – B – 01 – 00

Vent Option

	Without
V	With

O-ring Material

	Viton
Z	Kalrez

Body Material (Regulator)

6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

Inlet Pressure P1

30	3000 psig
45	4500 psig

Outlet Pressure Range P2

750	0~750 psig
1500	0~1500 psig
2500	0~2500 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3

Same as Connection 2

Connection 4

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 5

Same as Connection 1

Changeover Systems

FDR-1L Series Automatic Changeover System without Line Pressure Regulator

Features

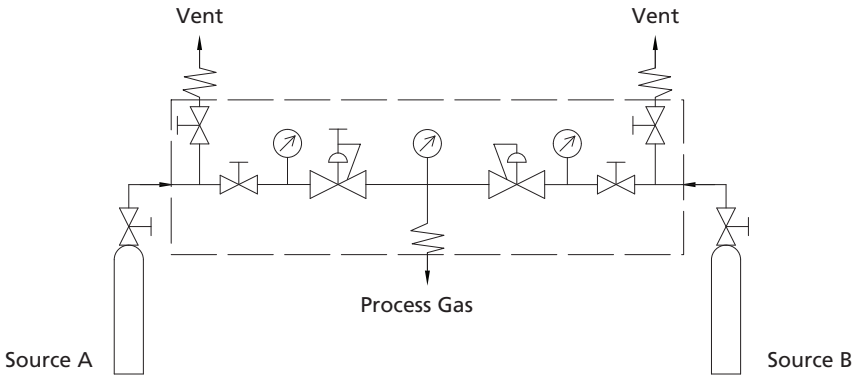
- With 2 regulators similar to FCR-1 Series Regulators
- Anodized Aluminium box with clearly marked panel
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- Automatic switching of gas source to ensure continuous gas supply
- Four fixed outlet pressure ranges available
- With special cleaning and packaging, applicable to oxygen-enriched environments

Model: FDR-1L6L-30-10B-00-00-00

Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 85~115, 135~165, 185~215 or 235~265 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: Hastelloy (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (regulator Cv): 0.06
- Weight: ≈12.1 lbs (5.5 kg)

Flow Schematic



Operation Overview

The FDR-1L Series Changeover System is mainly comprised of one adjustable outlet pressure regulator together with one fixed outlet pressure regulator.

When the 2 inlets are both open, the one side that the "IN SERVICE" arrow is pointing at by turning the handle would be the 1st source for gas supply.

Fig. 1 When the "In Service" arrow is pointing at side B, side B would be the gas source. At this time, the fixed outlet pressure of side B is higher than the set pressure of side A. Consequently, the diaphragm of side A regulator moves to enable the stem to close the regulator.

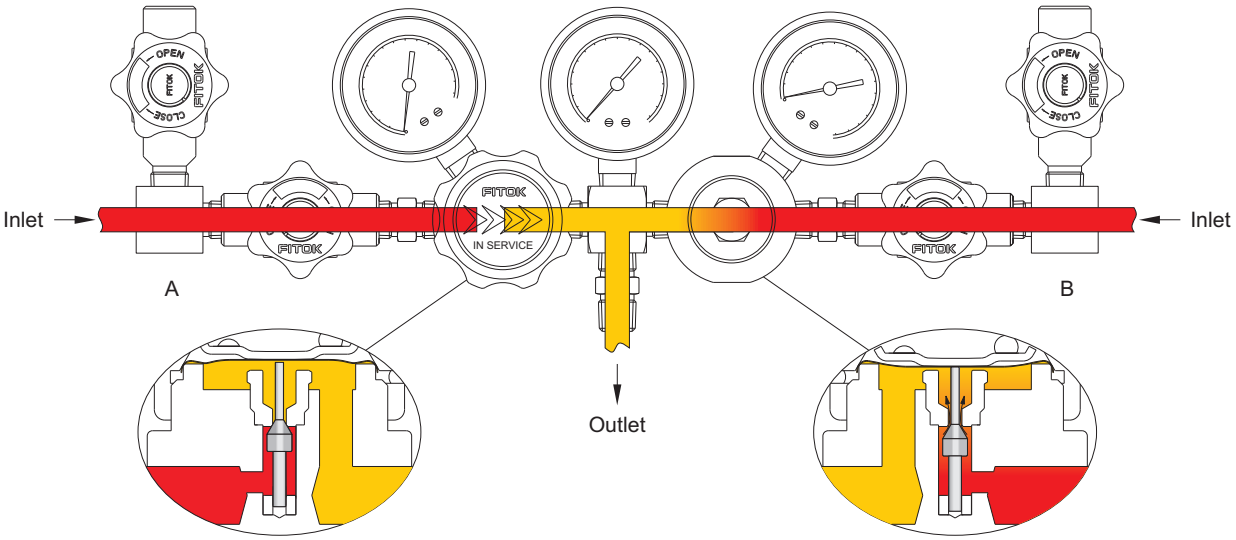


Fig. 1

Fig. 2 If side A is chosen as the gas source, the handle should be turned clockwise until the "IN SERVICE" arrow is pointing at side A. At this time, the set pressure of side A is higher than the fixed outlet pressure of side B. Consequently, the diaphragm of side B regulator moves to enable stem to close the regulator.

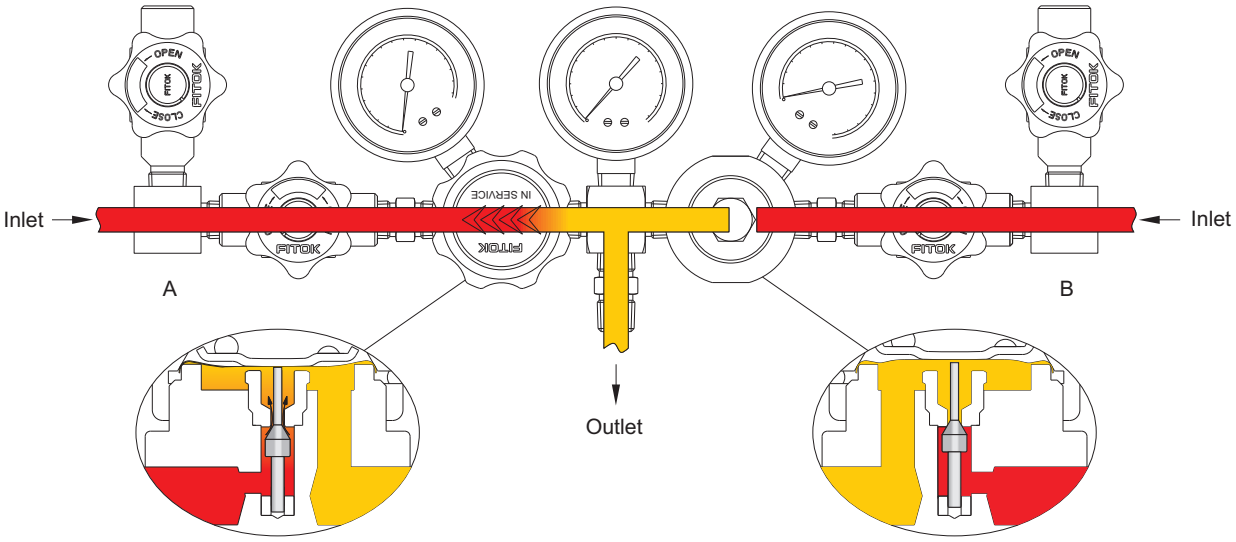


Fig. 2

When gas source of one side is depleted, gas source would automatically change to the other side.

Fig. 3 When "IN SERVICE" arrow is pointing at side B, but gas source of side B is depleted, its outlet pressure shall decrease to be lower than the set pressure of side A. By the force of spring, side A regulator will be opened to begin gas supply.

Before replacing new gas source of side B, the diaphragm valve should be turned off. Otherwise, gas from side A will flow back into side B. Then open the vent valve to exhaust the remaining pressure.

After the replacement, if the "IN SERVICE" arrow still points at side B, side B would be the gas source. If the arrow is turned towards side A, side A would thus be the gas source.

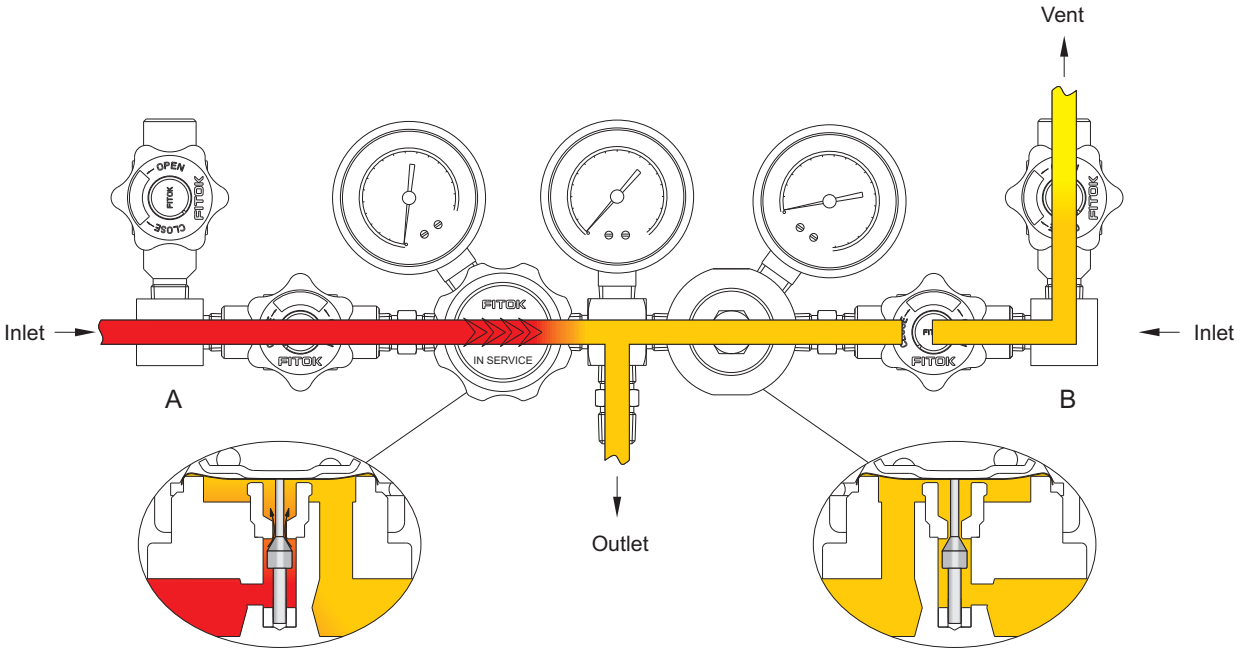
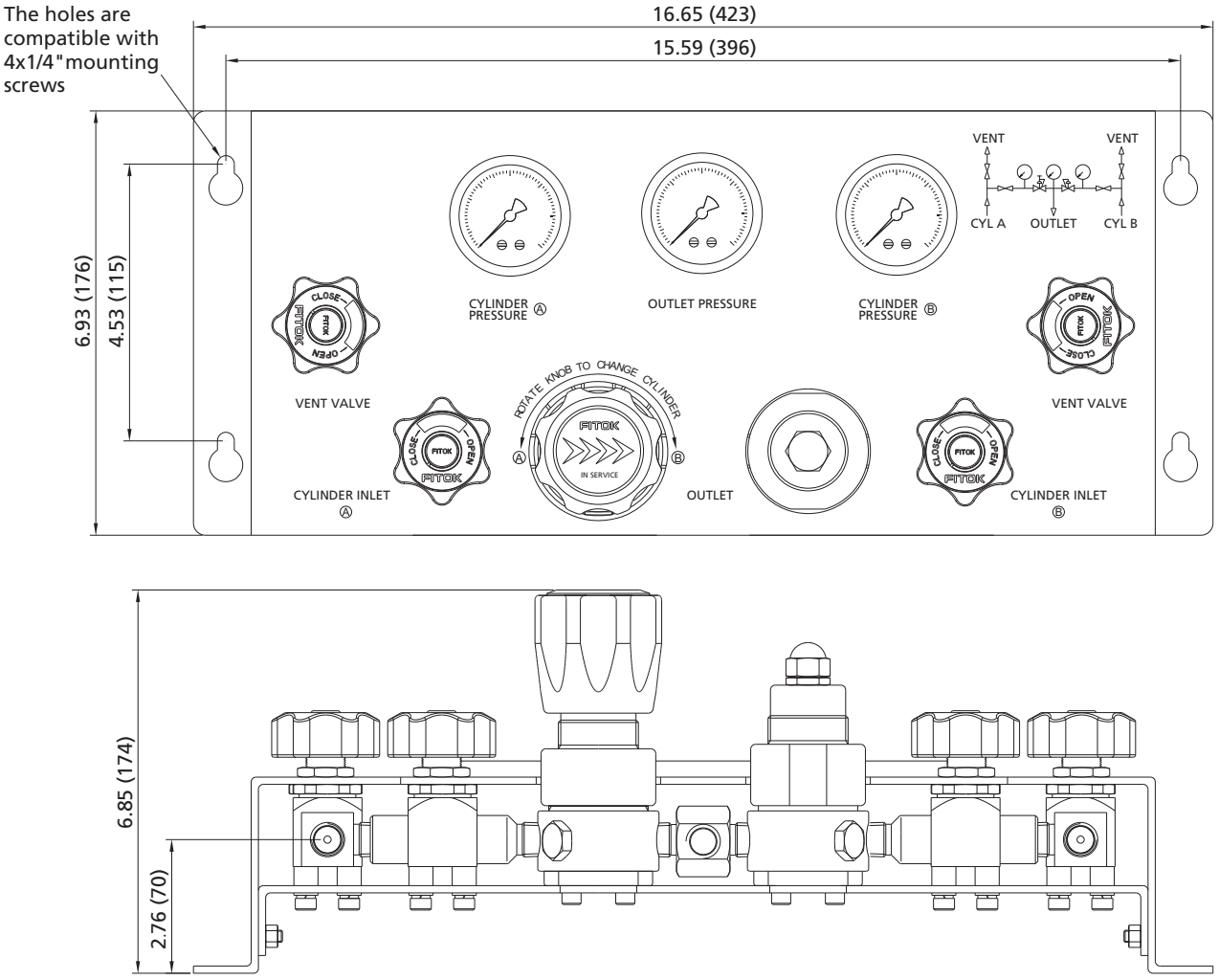


Fig. 3

Dimensions

Dimensions, in inches (millimeters), are for reference only.



Part Number Description

FDR – 1L6L – 30 – 20 B – 10 – 00 – 00

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
10	85~115 psig
15	135~165 psig
20	185~215 psig
25	235~265 psig

Gauge Scale	
B	psig/bar
M	MPa

Inlet A	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Inlet B
Same as Inlet A

Outlet
Same as Inlet A

Changeover Systems

FDR-1T Series Automatic Changeover System with Line Pressure Regulator

Features

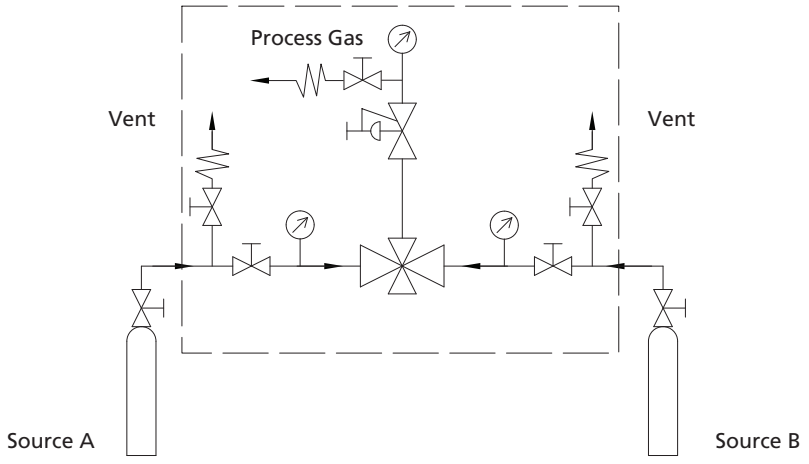
- With a FCR-1 Series Regulator and a FLR-1 Series Regulator to enable outlet pressure adjustment
- Anodized Aluminium box with clearly marked panel
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- Automatic switching of gas source to ensure continuous gas supply
- With special cleaning and packaging, applicable to oxygen-enriched environments

Model: FDR-1T6L-45-150B-00-00-00

Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0~25, 0~50, 0~100 or 0~150 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: Hastelloy (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (regulator Cv): 0.05
- Weight: ≈19.6 lbs (8.9 kg)

Flow Schematic



Operation Overview

The FDR-1T Series Changeover System is mainly comprised of one adjustable outlet pressure regulator and one fixed outlet pressure regulator, together with a line pressure regulator on the outlet port.

When the 2 inlets are both open, the one side that the "IN SERVICE" arrow is pointing at by turning the handle would be the 1st source for gas supply.

Fig. 1 When the "In Service" arrow is pointing at side B, side B would be the gas source. At this time, the fixed outlet pressure of side B is higher than the set pressure of side A. Consequently, the diaphragm of side A regulator moves to enable the stem to close the regulator.

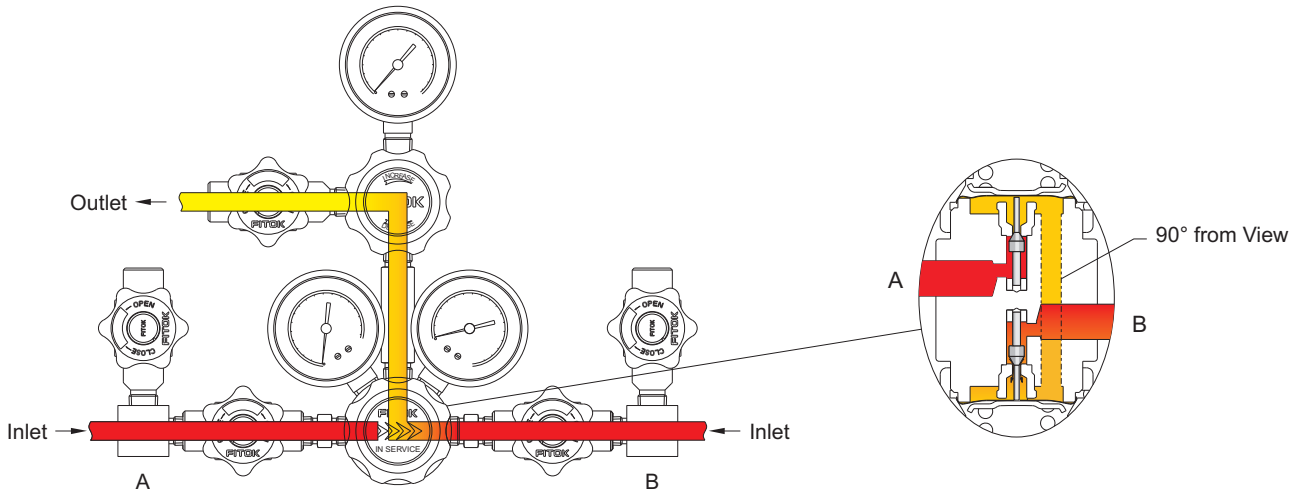


Fig. 1

Fig. 2 If side A is chosen as the gas source, the handle should be turned clockwise until the "IN SERVICE" arrow is pointing at side A. At this time, the set pressure of side A is higher than the fixed outlet pressure of side B. Consequently, the diaphragm of side B regulator moves to enable the stem to close the regulator.

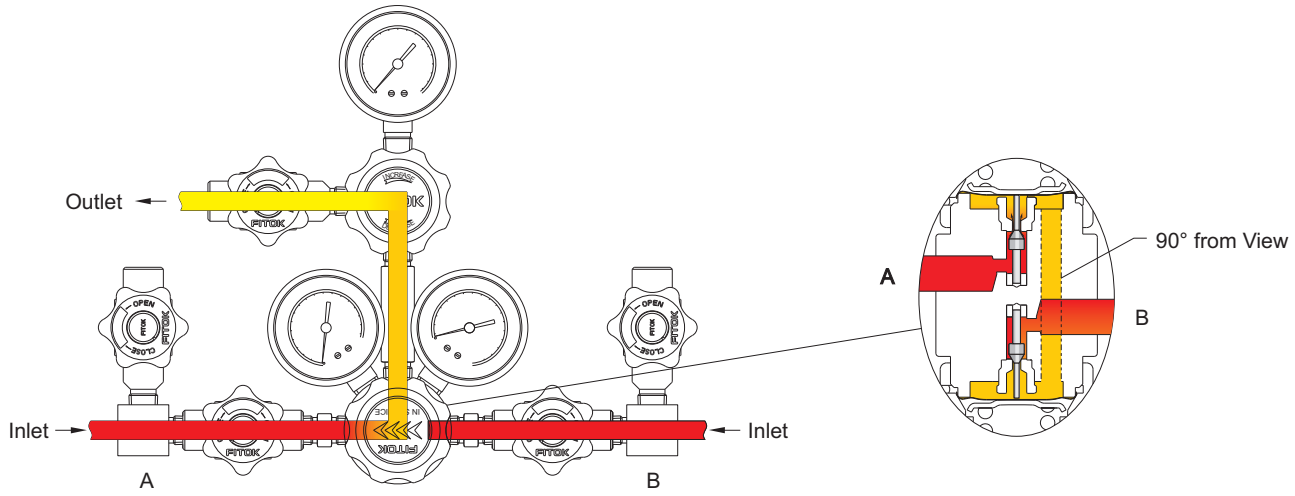


Fig. 2

When gas source of one side is depleted, gas source would automatically change to the other side.

Fig. 3 When "IN SERVICE" arrow is pointing at side B, but gas source of side B is depleted, its outlet pressure shall decrease to be lower than the set pressure of side A. By the force of spring, side A regulator will be opened to begin gas supply.

Before replacing new gas source of side B, the diaphragm valve should be turned off. Otherwise, gas from side A will flow back into side B. Then open the vent valve to exhaust the remaining pressure.

After the replacement, if the "IN SERVICE" arrow still points at side B, side B would be the gas source. If the arrow is turned towards side A, side A would thus be the gas source.

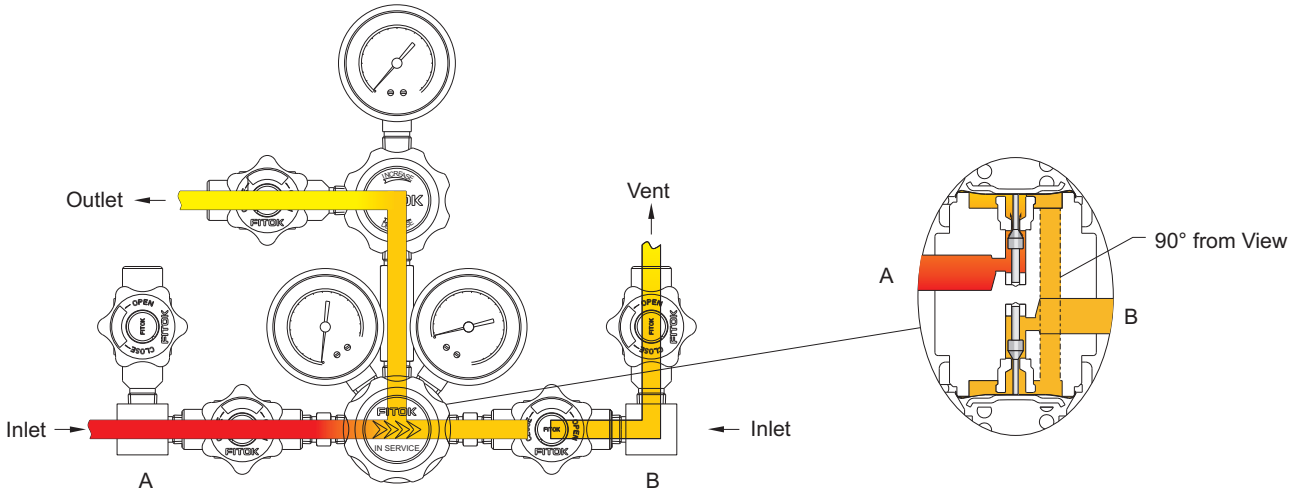
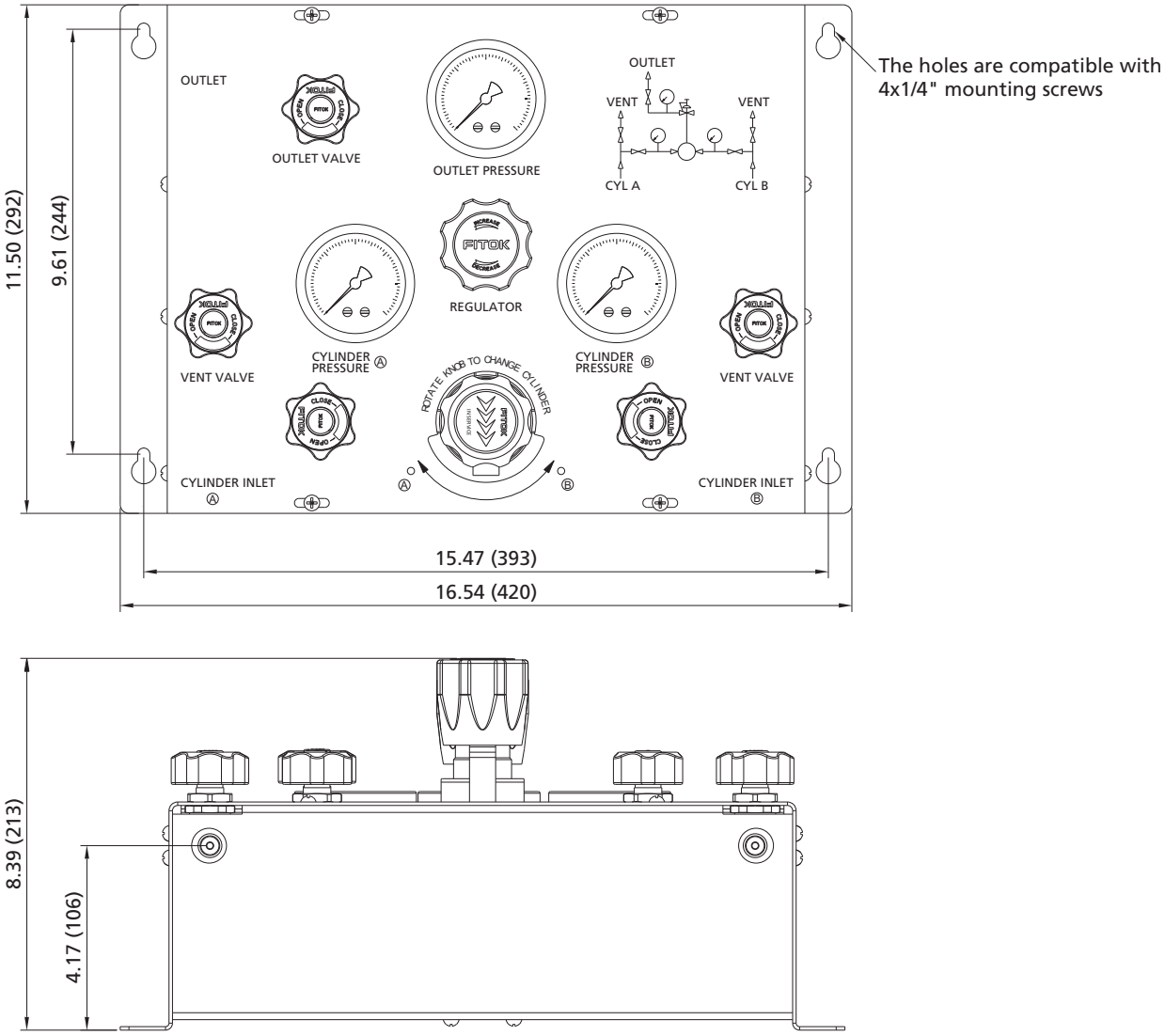


Fig. 3

Dimensions

Dimensions, in inches (millimeters), are for reference only.



Part Number Description

FDR – 1T6L – 30 – 25 B – 10 – 00 – 00

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
150	0~150 psig

Gauge Scale	
B	psig/bar
M	MPa

Inlet A	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
Other connections are available upon request	

Inlet B
Same as Inlet A

Outlet
Same as Inlet A

Point-of-use Panels

FPR-1 Series Compact Regulators for Low Pressure

Features

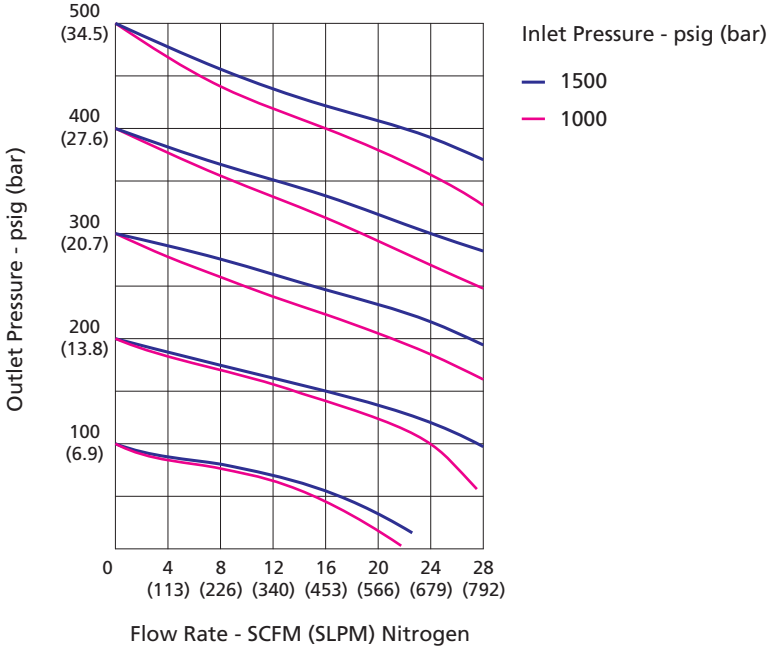
- With a FLR-1 Series Regulator
- With metal diaphragm regulators
- Shutoff valves with window to visually indicate open and closed states
- Anodized Aluminium panel, easy to install
- Regulator body of 316L SS or Brass optional
- Three configurations available

Model: FPR-1U6L-15-50-11-B-11

Technical Data

- Maximum inlet pressure: 1500 psig
- Outlet pressure range: 0~25, 0~50, 0~100, 0~250 or 0~500 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: Hastelloy (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  Filter: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (regulator Cv): 0.14

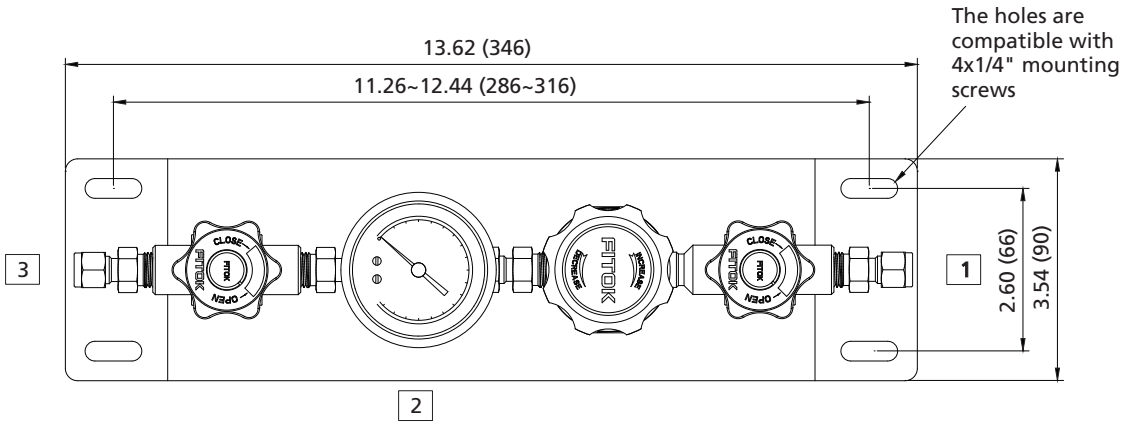
Typical Flow Chart



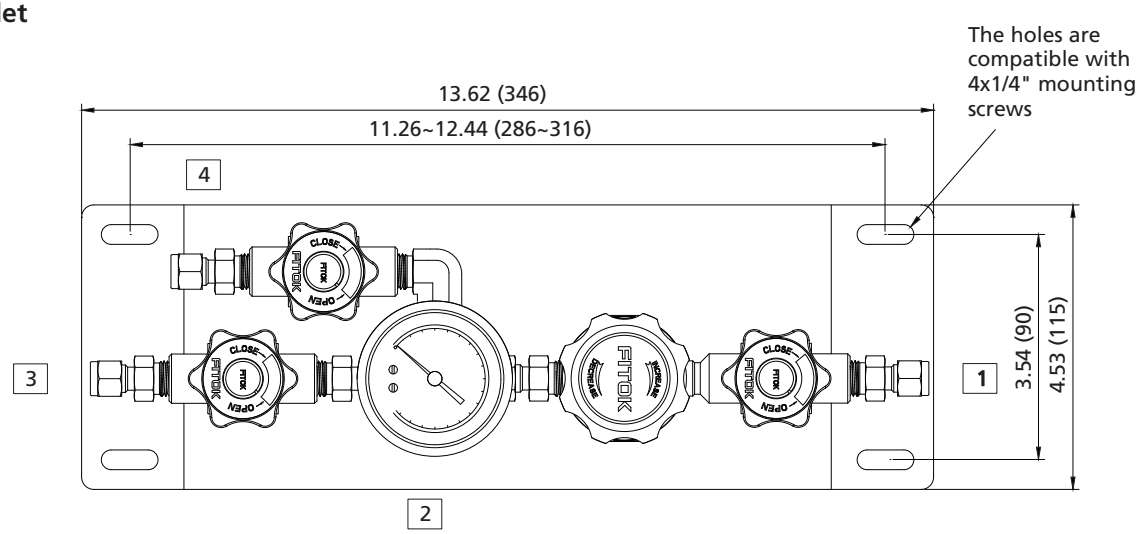
Dimensions

Dimensions, in inches (millimeters), are for reference only.

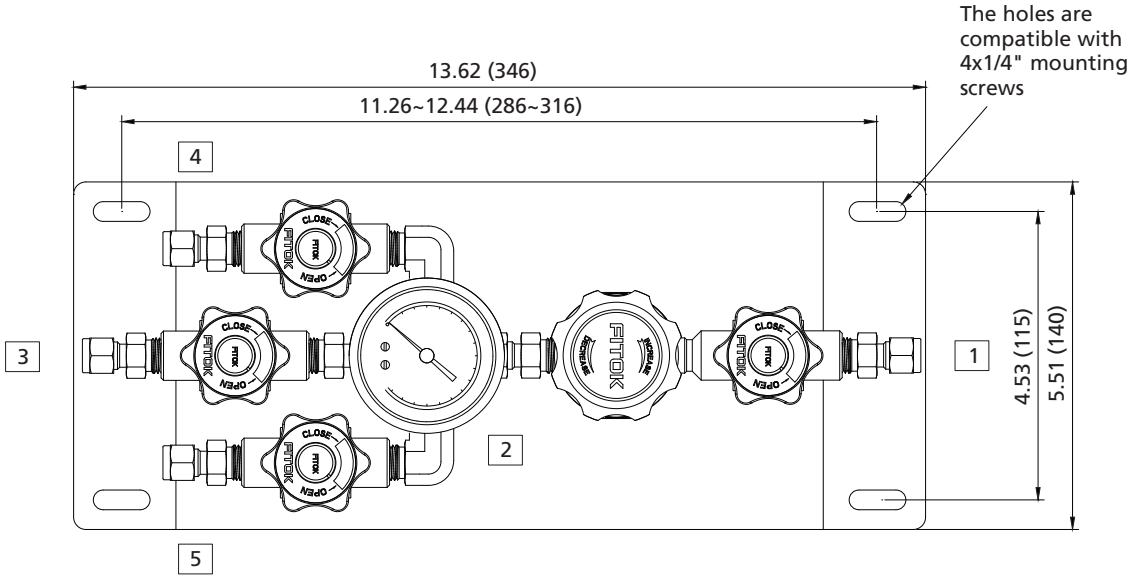
Single-outlet



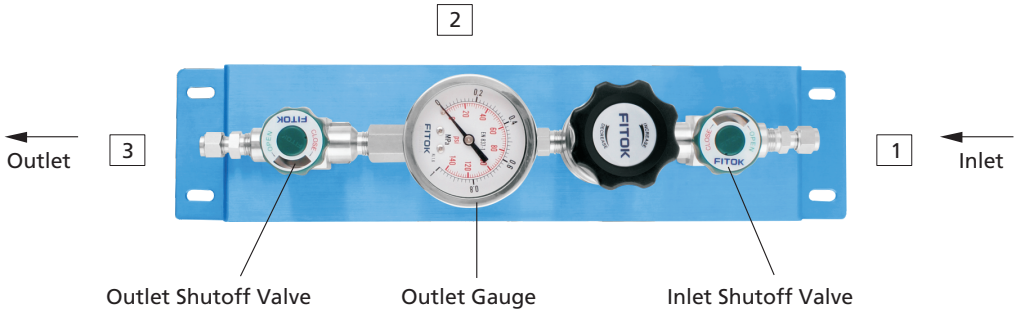
Dual-outlet



Triple-outlet



Components Introduction



Part Number Description

FPR – 1C 6L – 15 – 100 – 10 – M – 10 – 00 – 00

Oulet Option	
U	Single-outlet
T	Dual-outlet
C	Triple-outlet

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
15	1500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig
500	0~500 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 4
Same as Connection 1

Connection 5
Same as Connection 1

Examples of part number:
a. 2-port type (1 in, 1 out): FPR-1U6L-15-50-11-B-11
b. 3-port type (1 in, 2 out): FPR-1TSS-15-100-00-B-00-00

Point-of-use Panels

FPR-1S Series Sensitive Regulators for Low Pressure

Features

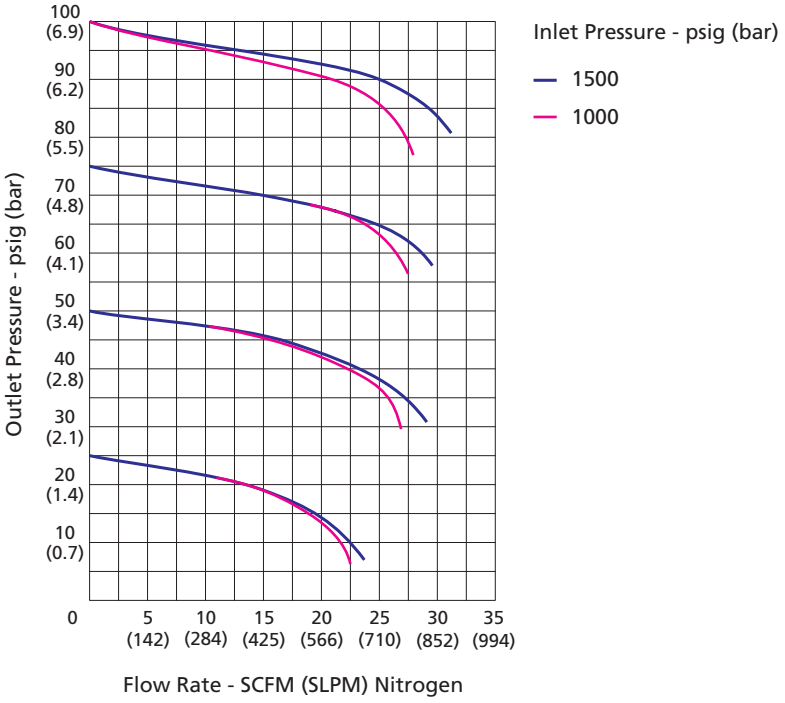
- With a FCR-1S Series Regulator of large diameter metal diaphragm to provide accurate pressure control
- Shutoff valves with window to visually indicate open and closed states
- Anodized Aluminium panel, easy to install
- Three porting configurations available

Model: FPR-1SUSS-15-50-10-B-10

Technical Data

- Maximum inlet pressure: 1500 psig
- Outlet pressure range: 0~25, 0~50, 0~100, 0~150 or 0~200 psig
- Material of the main components:
  Seat: PCTFE (regulator and diaphragm valve)
  Diaphragm: 316L (regulator), Elgiloy (diaphragm valve)
  Diaphragm valve body: 316L
  Filter: 316L
- Temperature: -10°F~+150°F (-23°C~+65°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-7}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (regulator Cv): 0.06

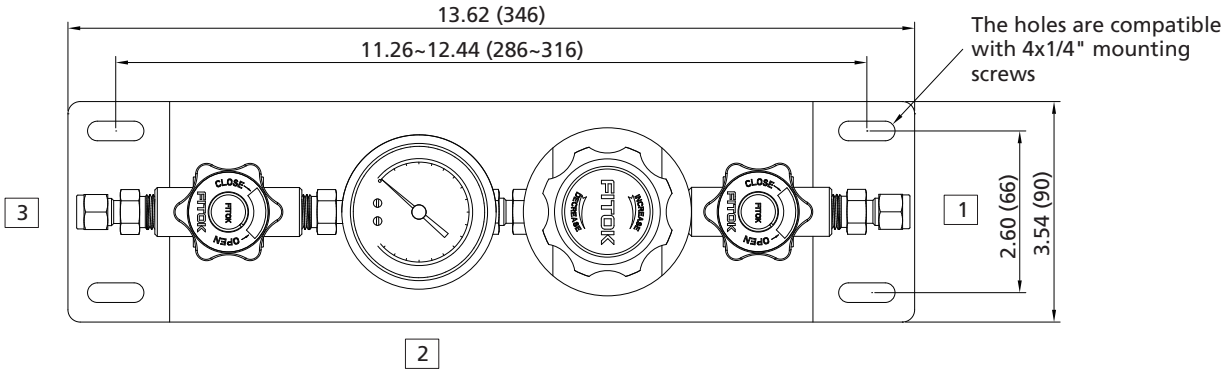
Typical Flow Chart



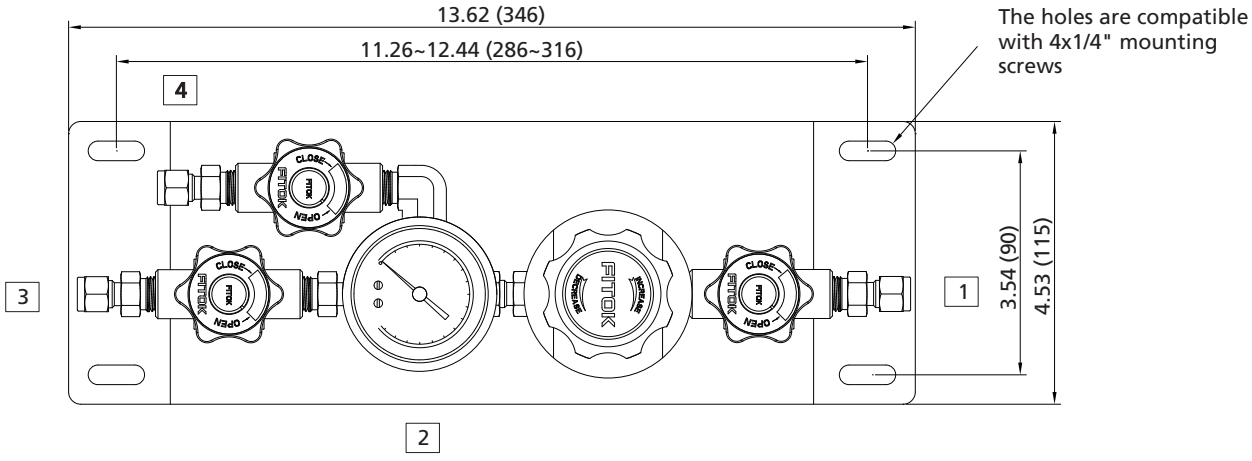
Dimensions

Dimensions, in inches (millimeters), are for reference only.

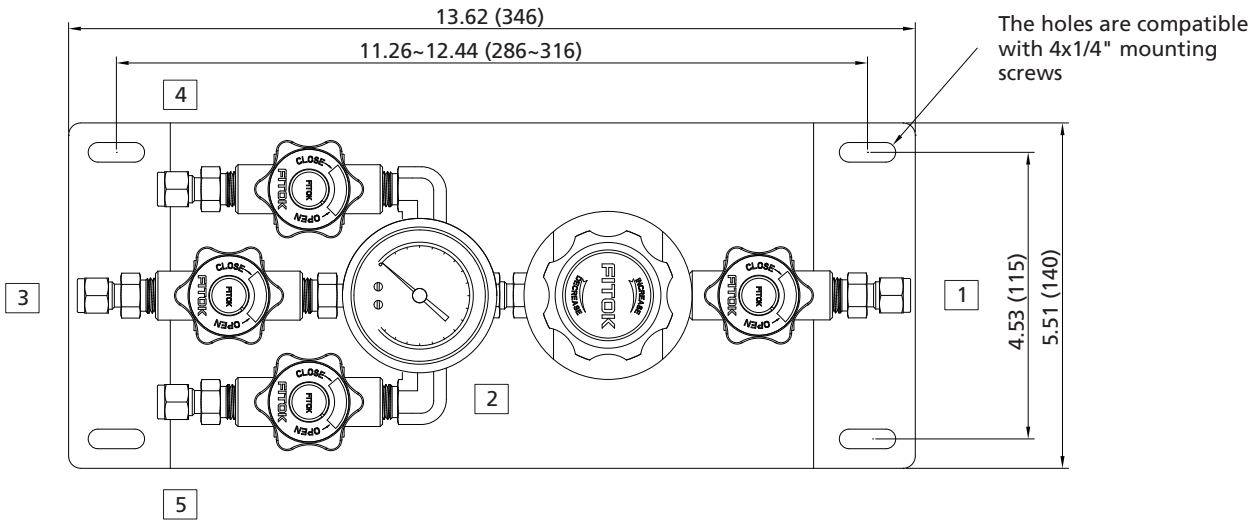
Single-outlet



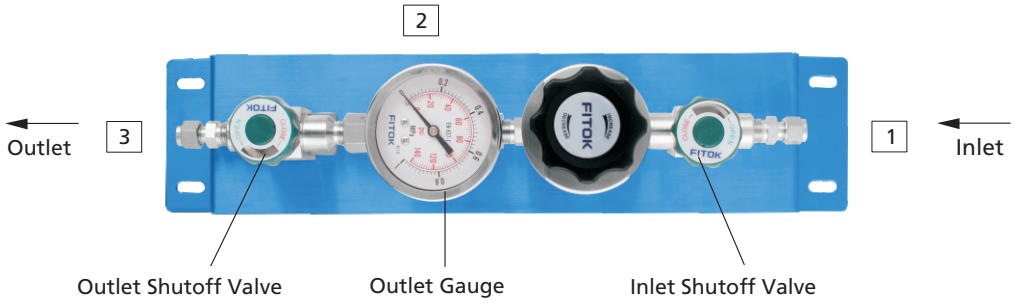
Dual-outlet



Triple-outlet



Components Introduction



Part Number Description

FPR – 1SC 6L – 15 – 100 – 10 – M – 10 – 00 – 00

Oulet Option	
U	Single-outlet
T	Dual-outlet
C	Triple-outlet

Body Material (Regulator)	
6L	316L SS
SS	316 SS
B	Brass

Inlet Pressure P1	
15	1500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
150	0~150 psig
200	0~200 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT

Connection 3	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 4
Same as Connection 1

Connection 5
Same as Connection 1

Examples of part number:
a. 2-port type (1 in, 1 out): FPR-1SU6L-15-25-00-B-20
b. 3-port type (1 in, 2 out): FPR-1STB-15-200-10-M-10-10

Back Pressure Regulators

BPR-1 Series Back Pressure Diaphragm Regulators

Features

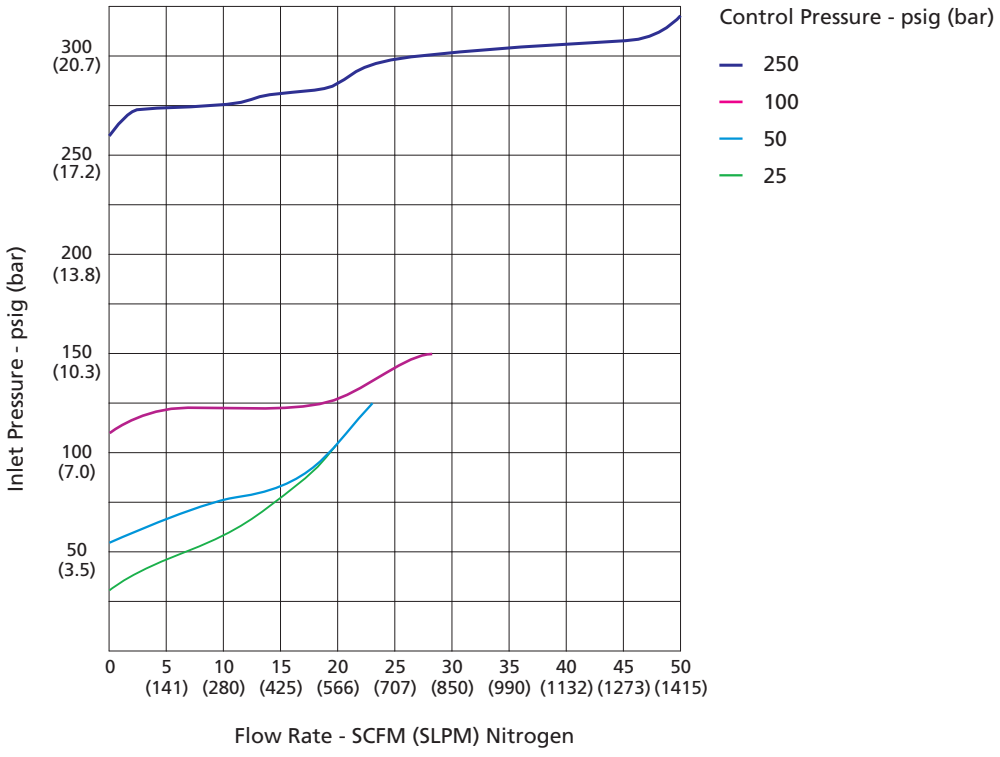
- Metal-to-metal seal with convoluted diaphragm
- Close pressure differential between crack and reseat
- Panel mounting available

Model: BPR-16L-250-00-00-Z

Technical Data

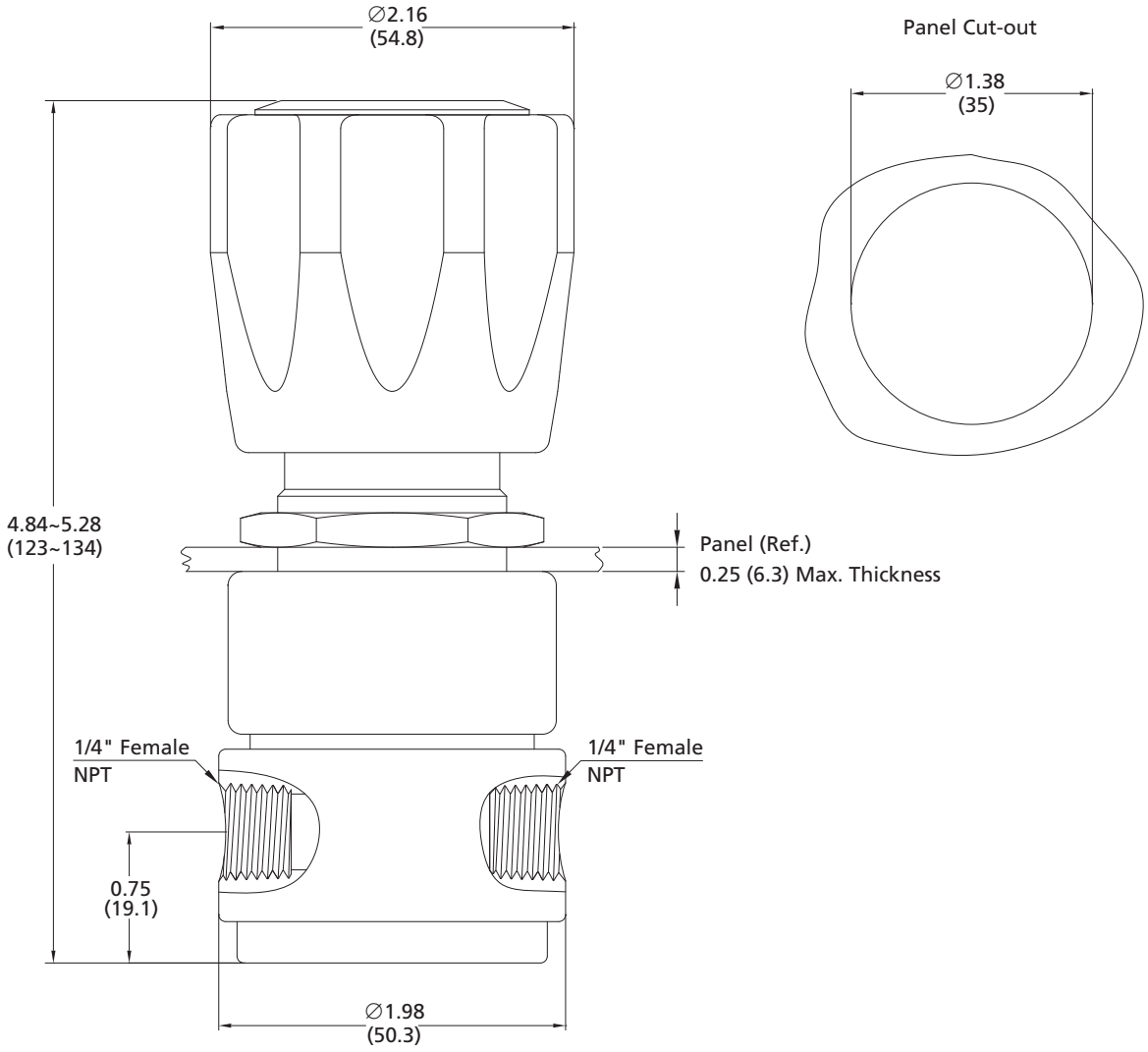
- Maximum control pressure: 250 psig
- Pressure control range: 0~25, 0~50, 0~100 or 0~250 psig
- Material of the main components:
  Seat: PCTFE
  Diaphragm: Hastelloy
- Temperature: -40°F~+140°F (-40°C~+60°C)
- Leak rates:
  Internal: Bubble-tight
  External: $\leqslant 1x10^{-9}$ mbar · l/s helium
- Flow coefficient (Cv): 0.3
- Weight: ≈1.98 lbs (0.9 kg)
- Body ports: 1/4" female NPT for inlet, outlet and gauge

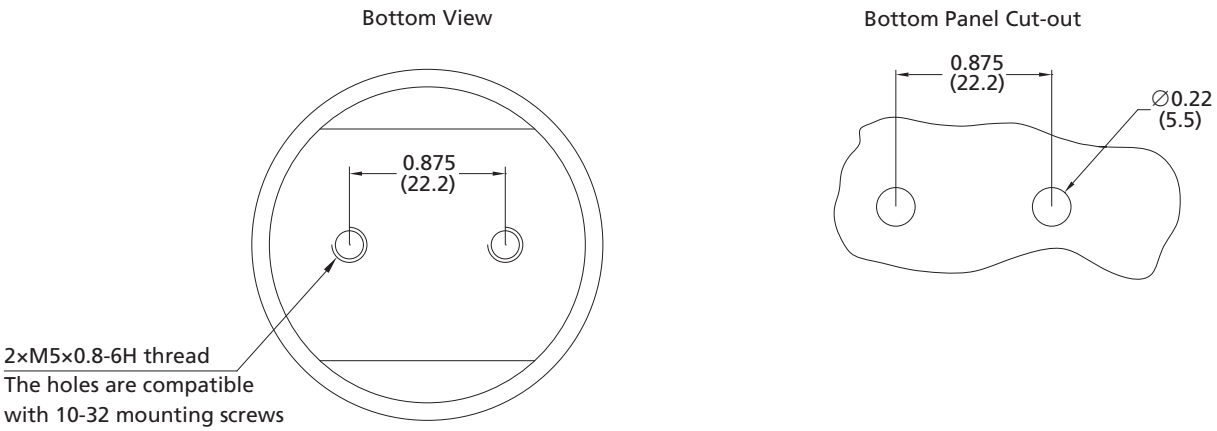
Typical Flow Chart



Dimensions

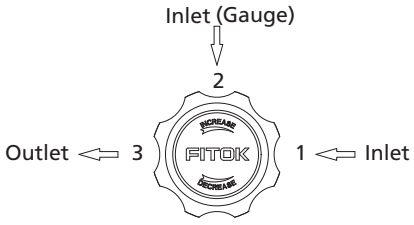
Dimensions, in inches (millimeters), are for reference only.





Port Configurations

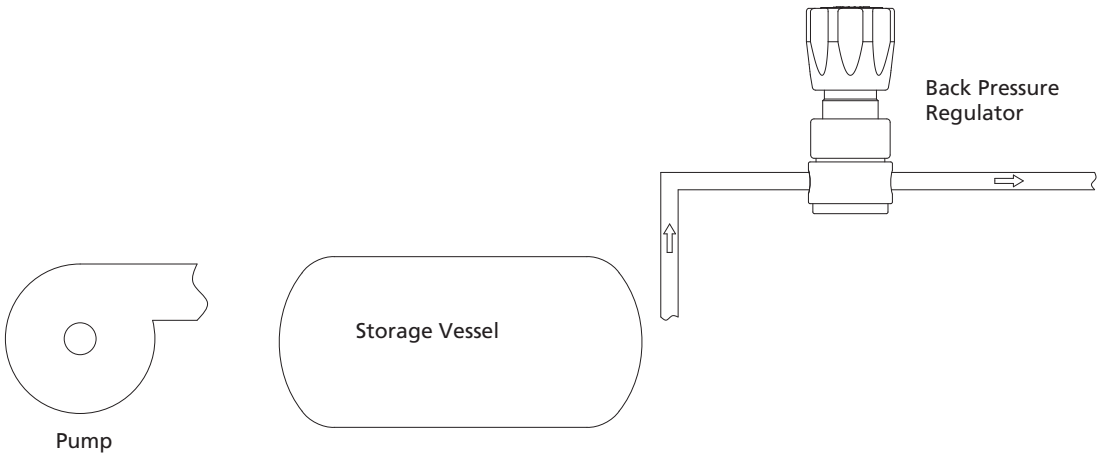
2-Port Type



3-Port Type

Typical Application

When the system pressure is lower than the set pressure, the diaphragm obstructs the flow by the force of spring. When the system pressure is higher than the set pressure, the diaphragm compresses the inner spring to connect the flow so as to allow the fluid to pass through the back pressure regulator to keep the pressure of the Storage Vessel stable.



Part Number Description

BPR – 16L – 100 – 10 – M – 11 – Z

Body Material	
6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

Control Pressure Range P	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
Other connections are available upon request	

Connection 3
Same as Connection 1

Installation Type	
	Not Required
Z	Installed with One Panel Nut
N	Installed with Screws at the Bottom

Examples of part number:
a. 2-port type (1 in, 1 out): BPR-16L-25-00-00

Back Pressure Regulators

BPR-2 Series Back Pressure Piston Regulators

Features

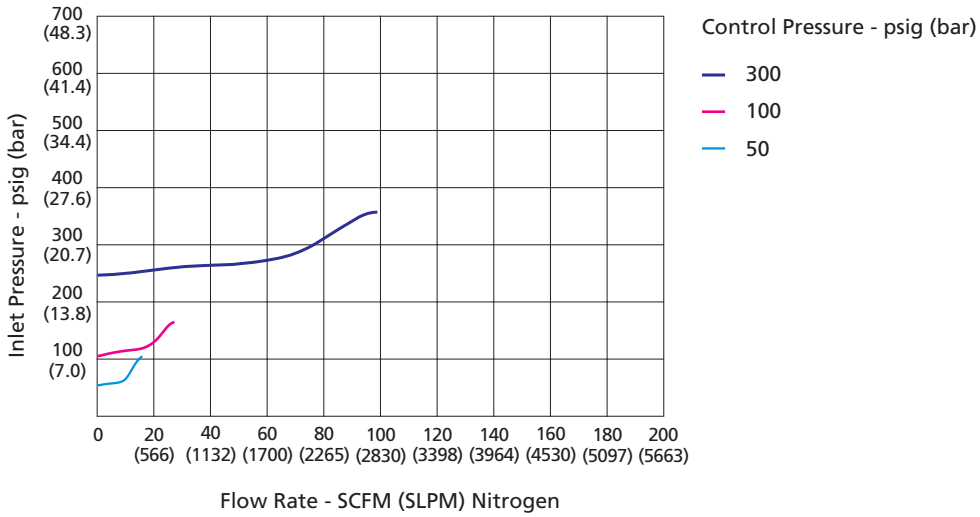
- ◎ Durable piston-sensed design
- ◎ Bubble-tight shutoff at all reseating pressure
- ◎ Low operating torque
- ◎ Panel mounting available
- ◎ With special cleaning and packaging, applicable to oxygen-enriched environments

Model: BPR-26LZ-300-00-00-Z

Technical Data

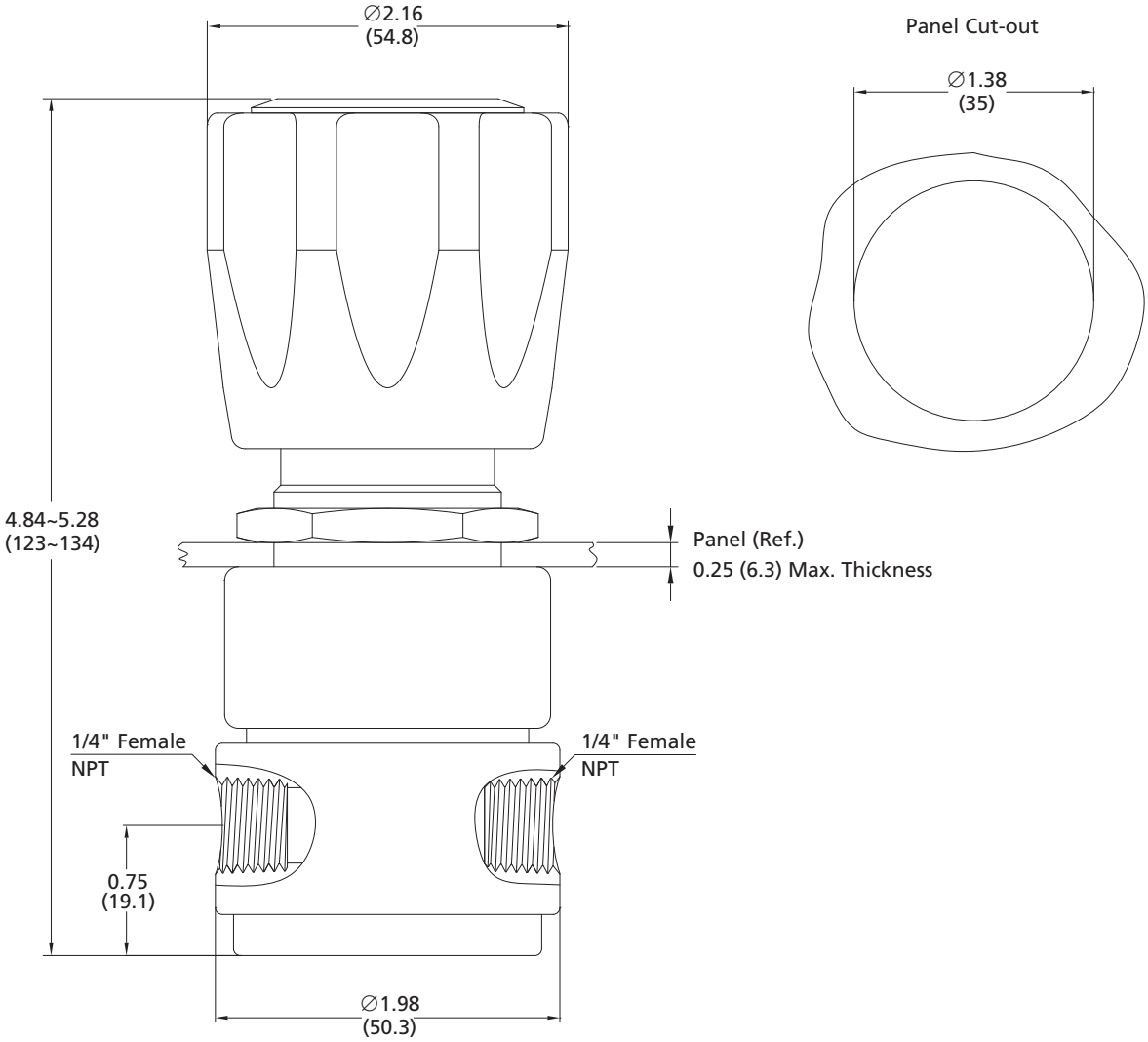
- ◎ Maximum control pressure: 1000 psig
- ◎ Pressure control range: 10~300, 10~500 or 10~1000 psig
- ◎ Material of the main components:
  Seat:PCTFE
  Piston: 316L
  O-rings: Viton or Kalrez
- ◎ Temperature: -15°F~+165°F (-26°C~+74°C)
- ◎ Leak rates:
  Internal: Bubble-tight
  External: Bubble-tight
- ◎ Flow coefficient (Cv): 0.3
- ◎ Weight: ≈1.98 lbs (0.9 kg)
- ◎ Body ports: 1/4" female NPT for inlet, outlet and gauge

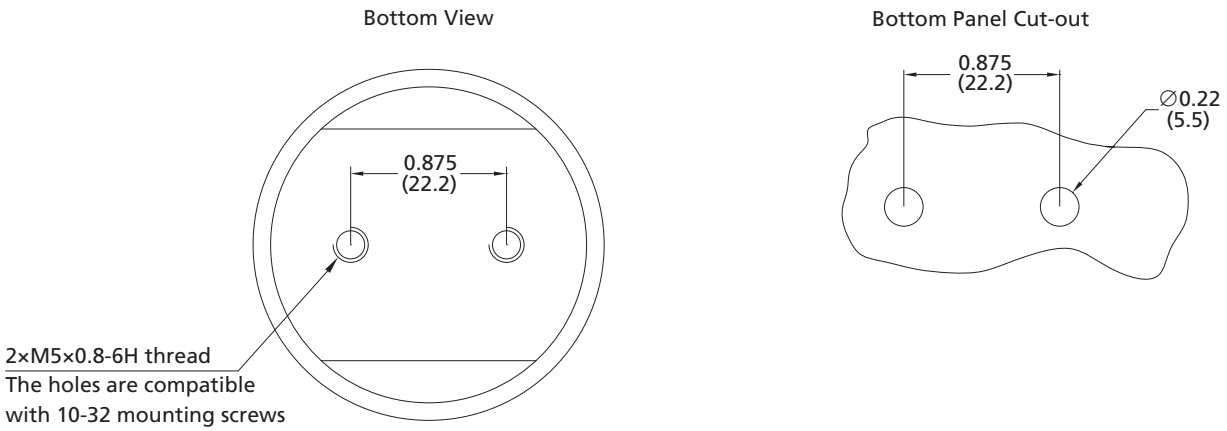
Typical Flow Chart



Dimensions

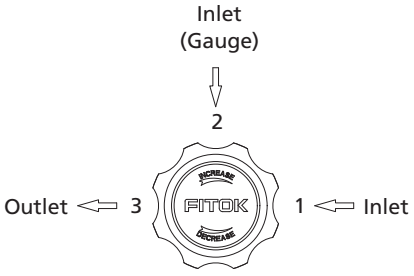
Dimensions, in inches (millimeters), are for reference only.





Port Configurations

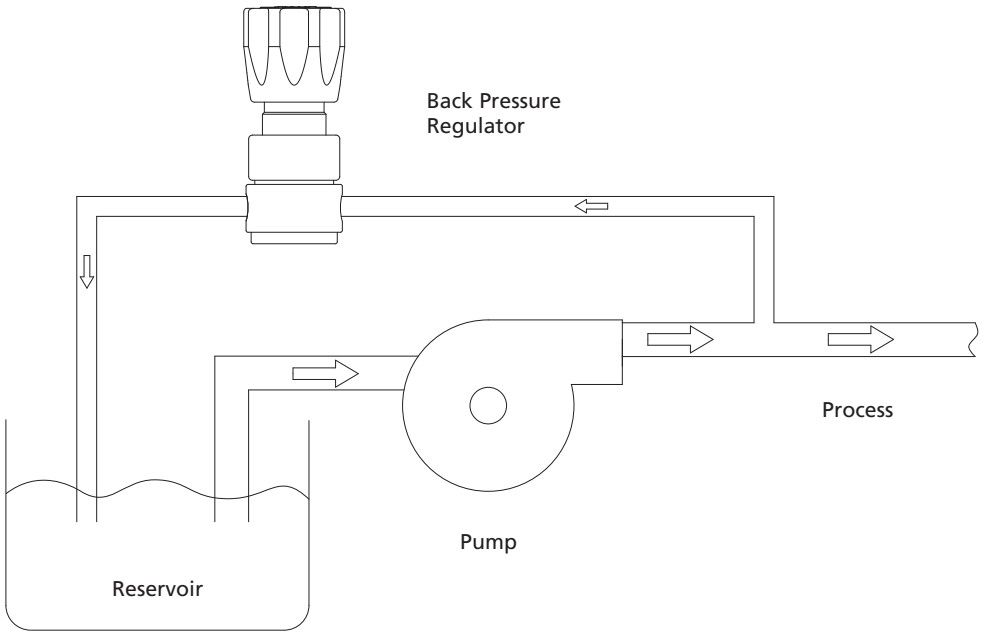
2-Port Type



3-Port Type

Typical Application

BPR-2 Series Back Pressure Regulators maintain the required pipeline pressure to ensure the Pump to output fluid stably when system pressure fluctuates.



Part Number Description

BPR – 26L Z – 300 – 10 – M – 11 – Z

Body Material	
6L	316L SS
SS	316 SS
B	Brass (Nickel-plated)

O-ring Material	
	Viton
Z	Kalrez

Control Pressure Range P	
300	10~300 psig
500	10~500 psig
1000	10~1000 psig

Connection 1	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
Other connections are available upon request	

Connection 3
Same as Connection 1

Installation Type	
	Not Required
Z	Installed with One Panel Nut
N	Installed with Screws at the Bottom

Examples of part number:
a. 2-port type (1 in, 1 out): BPR-2SS-500-00-00

Back Pressure Regulators

BPR-3 Series Back Pressure Piston Regulators

Features

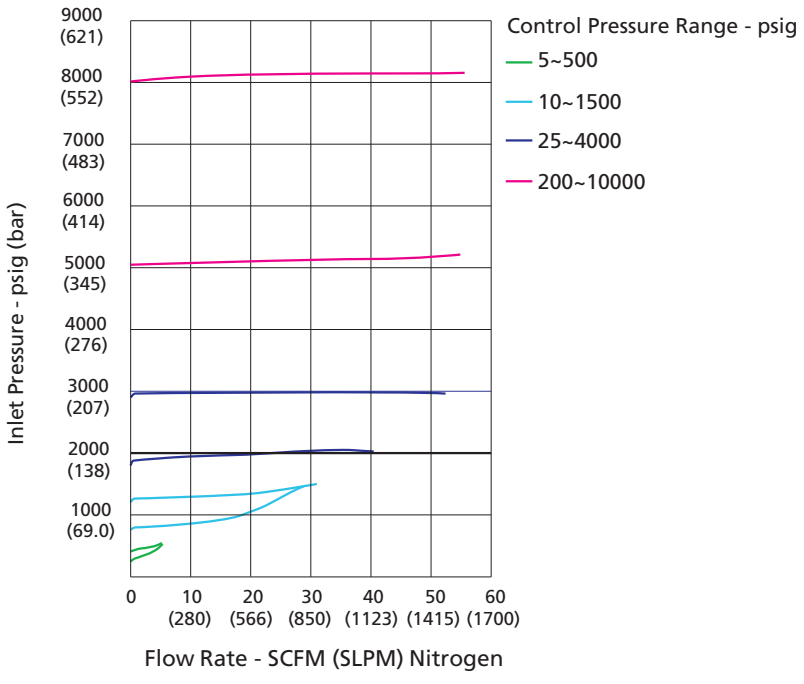
◎ Control of back-pressure up to 10000 psig for gas or liquid application
◎ Safe and reliable piston sensing
◎ 7 pressure control ranges
◎ Panel mounting available
◎ Special cleaning and packaging available
for application in oxygen-enriched environments

Model: BPR-3SS-40-00-00-Z

Technical Data

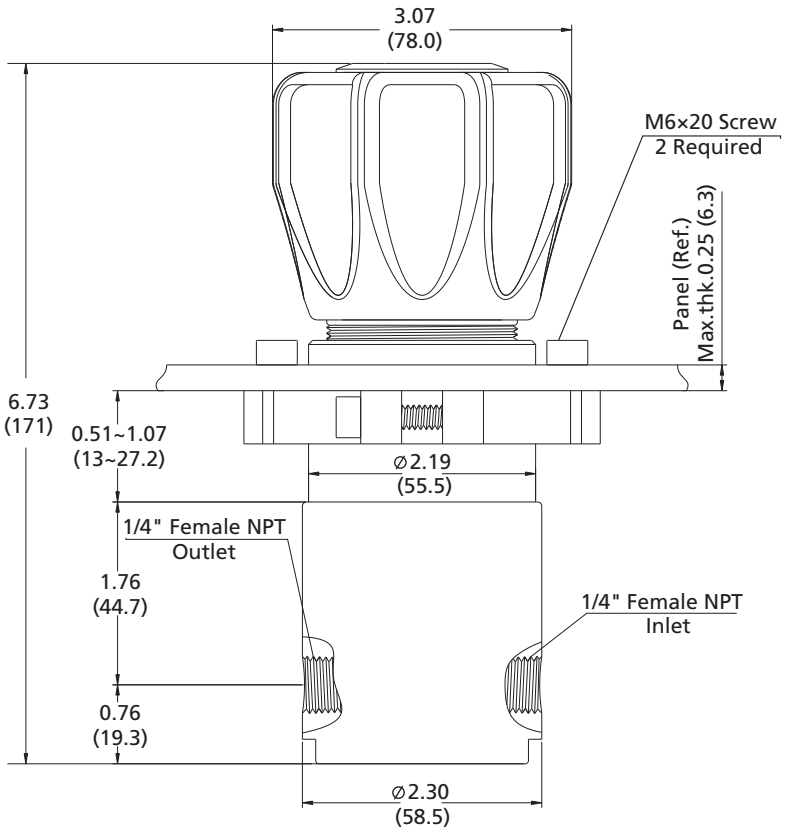
◎ Maximum control pressure:
Stainless steel: 10000 psig
Brass: 6000 psig
◎ Pressure control ranges: 5~500, 5~800, 10~1500, 15~2500, 25~4000, 50~6000, 200~10000 psig
◎ Material of the main components:
Body: 316 SS or brass
Seat: PEEK
Piston: 316L
O-rings: Viton or Kalrez
◎ Temperature: -15°F~+165°F (-26℃~+74℃)
◎ Leak rates:
Internal: Bubble-tight
External: Bubble-tight
◎ Flow coefficient (Cv): 0.25
◎ Weight(regulator): ≈5.7 lbs (2.6 Kg)
◎ Body ports: 1/4" female NPT for inlet, outlet, and gauge

Typical Flow Chart

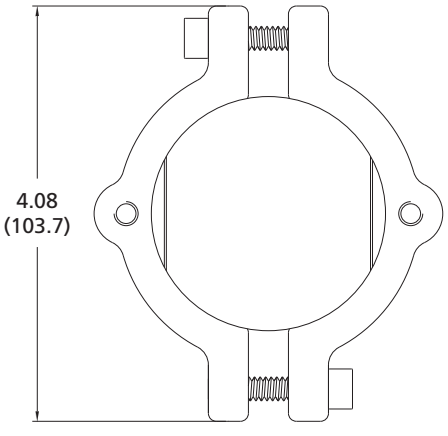


Dimensions

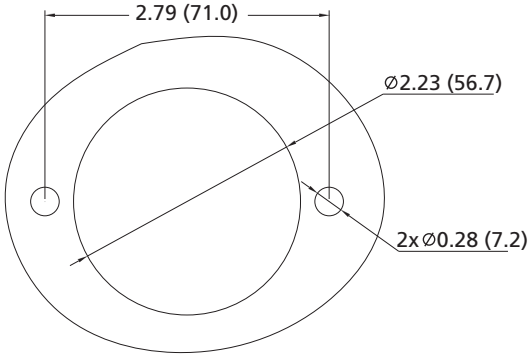
Dimensions, in inches (millimeters), are for reference only.



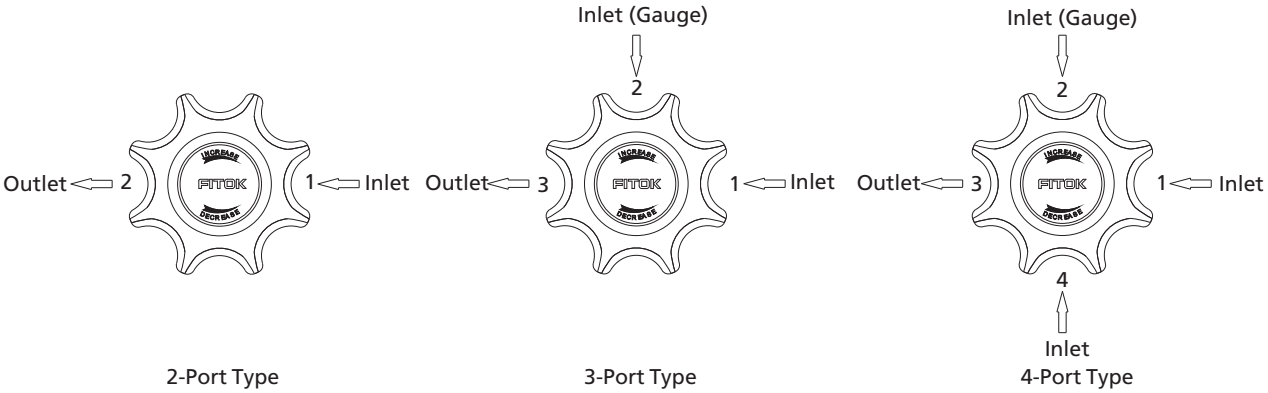
Bottom View



Panel Cut-out



Port Configurations



2-Port Type　　3-Port Type　　4-Port Type

Part Number Description

BPR – 3B　Z　–　15　–　00　–　B　–　00　–　00　–　Z　–　F2

Body Material

SS	316 SS
6L	316L SS
B	Brass (Max. Control Pressure 6000 psig)

O-ring Material

	Viton
Z	Kalrez

Pressure Control Range P

5	5~500 psig
8	5~800 psig
15	10~1500 psig
25	15~2500 psig
40	25~4000 psig
60	50~6000 psig
100	200~10000 psig

Connection 1

00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8"Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 2

B	With Gauge (psi/bar)
M	With Gauge (MPa)
P	Plug
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Connection 3

Same as Connection 1

Connection 4

Same as Connection 1

Panel Mount

	Without
z	With

Product Technology Grade

	General Purpose
F2	Special Cleaning and Packaging

Examples of part number:
a. 2-Port type (1 in, 1 out): BPR-3B-25-00-00
b. 3-Port type (2 in, 1 out): BPR-3B-40-00-M-00
C. 4-Port type (3 in, 1 out): BPR-3B-60-00-M-00-00

B Related Products

Purge Assemblies B-02

Diaphragm Valves B-04

Ball Valves B-05

Needle Valves B-06

Check Valves B-07

Relief Valves B-08

Filters B-09

Fittings B-10

Metal Flexible Hoses B-13

Cylinder Connections B-14

Purge Assemblies

FPV-1 Series

Technical Data

◎ Maximum working pressure: 4500 psig
◎ Material of the main components:
Seat: PCTFE (diaphragm valve)
Diaphragm: Elgiloy (diaphragm valve)
◎ Temperature: -10°F~+150°F (-23°C~+65°C)
◎ Leak rates:
Internal: ≤1x10^{-9} mbar·l/s helium
External: ≤1x10^{-9} mbar·l/s helium
◎ Minimum orifice: Φ0.13" (3.2 mm)

Product Types

◎ Straight Purge Assemblies
Consisting of a diaphragm valve and a check valve (see Fig. 1-1).
Connecting the auxiliary inlet port (see Fig. 1-2) of the regulator or in between the regulator and the cylinder (see Fig. 1-3) to allow the corrosive or toxic gas to be vented through to a safe location.

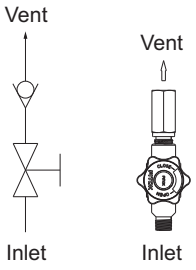


Fig. 1-1

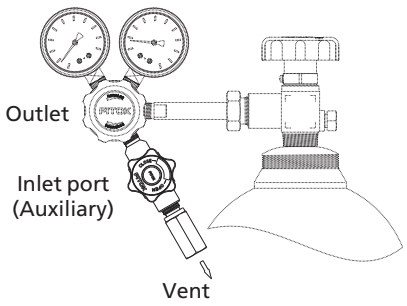


Fig. 1-2

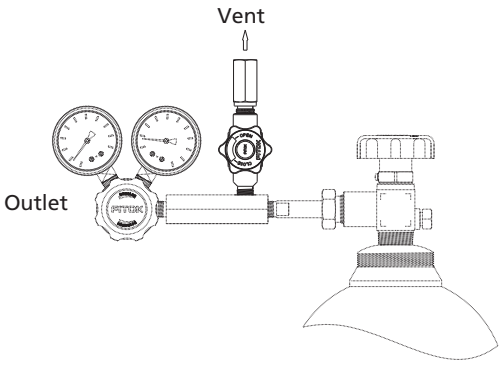


Fig. 1-3

◎ Tee Purge Assemblies
Consisting of a diaphragm valve, check valve, tee, and cylinder connections (see Fig. 2-1).
Connecting the cylinder with the regulator. Before installing a new cylinder, open the diaphragm valve, and the remaining gas is vented safely; or after a new cylinder is installed, close the regulator and open the diaphragm valve, enabling the process gas inside the cylinder to purge the atmospheric contamination between the cylinder and the regulator (see Fig. 2-2).

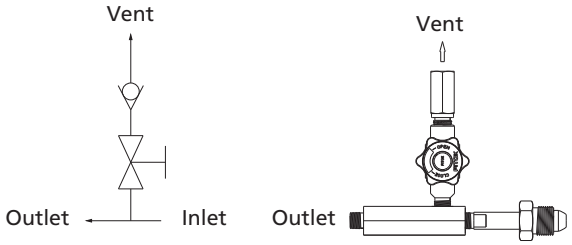


Fig. 2-1

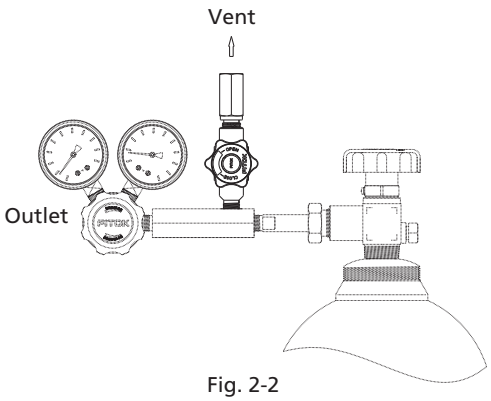


Fig. 2-2

◎ Cross Purge Assemblies

Consisting of a tee purge assembly and two additional diaphragm valves (see Fig. 3-1).

Except for process gas, purging is also made possible with inert gas from outside (see Fig. 3-2). The steps are as follows:

Before installing a new cylinder, close the diaphragm valve beside the regulator, and open the shutoff diaphragm valve on the vent line to release the residual pressure.

After installing a new cylinder, open the diaphragm valve on the bottom, allowing the inert gas from outside to purge the atmospheric contaminations between the cylinder and the diaphragm valve.

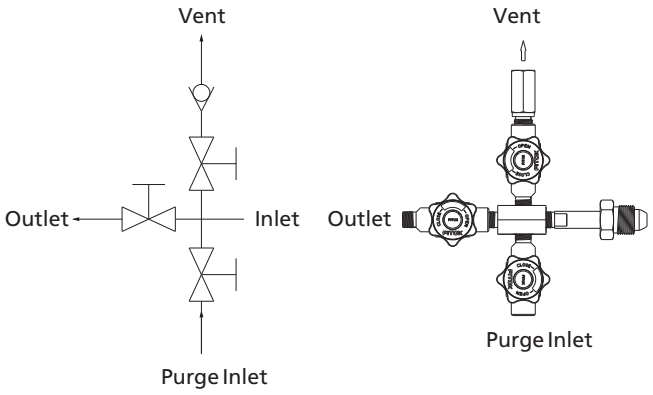


Fig. 3-1

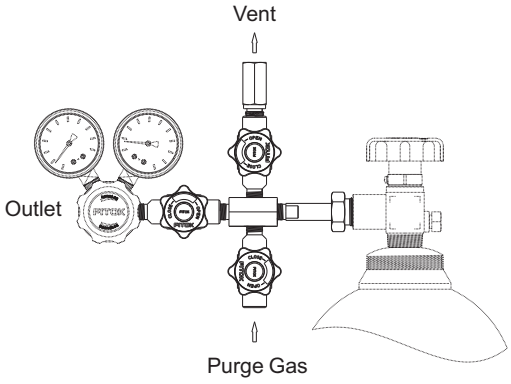


Fig. 3-2

Part Number Description

FPV − 1C | 6L | − | DIN1 | − | 00 | − | 00 | − | 00

Product Type	
S	Straight Purge Assemblies
T	Tee Purge Assemblies
C	Cross Purge Assemblies

Body Material	
6L	316L SS
SS	316 SS

Inlet Port	
00	1/4" Female NPT
01	1/4" Male NPT
C_ _ _	CGA Number (USA)
DIN_	DIN Number (Germany)

Refer to page B-28 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.

Vent Port	
00	1/4" Female NPT
01	1/4" Male NPT
10	1/4" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting

Other connections are available upon request

Outlet Port
Same as Same as Vent Port

Purge Inlet
Same as Same as Vent Port

Diaphragm Valves

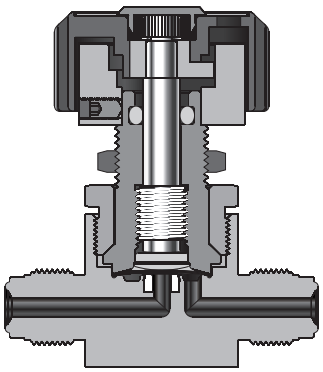
DS Series

Features

- Reduced inner capacity
- Packless diaphragm seal design for high purity
- Minimized number of components
- Manual and pneumatic actuators available
- Aluminum piston to increase operation speed

Technical Data

- Maximum working pressure: 4500 psig
- Material of the internal components:
  Seat: PCTFE or Vespel
  Diaphragm: Elgiloy
- Temperature:
  PCTFE: -10°F~+150°F (-23°C~+65°C)
  Vespel: -10°F~+250°F (-23°C~+121°C)
- Leak rates:
  Internal: $\leqslant 1x10^{-9}$ mbar·l/s helium
  External: $\leqslant 1x10^{-9}$ mbar·l/s helium
- Flow coefficient (Cv): 0.17



Part Number Description

DS 6L – NS 4 – FNS 4 – R V F2

Body Material	
6LW	316L VIM-VAR
6L	316L SS
SS	316 SS

Inlet Type	
TB	Fractional Tube Butt Weld
MTB	Metric Tube Butt Weld
FR	Male FR Fitting
FFR	Female FR Fitting
FL	Fractional Tube Fitting
ML	Metric Tube Fitting
NS	Male NPT
FNS	Female NPT

Inlet Size	
4	1/4"
6	6 mm or 3/8"
8	8 mm

Outlet Type	
	Same as Inlet

Specify in the same way as inlet type

Outlet Size	
	Same as Inlet

Specify in the same way as inlet size

Actuator Type	
R	Handle
C	Pneumatic Normally Closed
O	Pneumatic Normally Open

Technology Grade	
	General Purpose
F2	Special Cleaning and Packaging
F3	Ultra High Purity

Seat	
	PCTFE
V	Vespel

Ball Valves

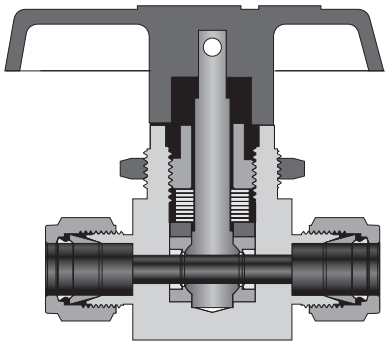
BO Series

Features

- One-piece body and one-piece ball stem
- No dead zone, such as in the area between the ball and valve chamber
- In-line inspection and repair with top entry design
- Thermal cycle performance improved and wear compensated by live-loaded design
- Multiple connections available
- Pneumatic and electric actuators available

Technical Data

- Maximum working pressure: 3000 psig (207 bar)
- Temperature: -65°F to 300°F (-54°C to 148°C)
- Seat material: PTFE



Part Number Description

BO 6L – NS 4 – FNS 4 – H03 – U A – F2

Body Material	
6L	316L SS
SS	316 SS
B	Brass

Connection 1 Type	
FNS	Female NPT
NS	Male NPT
FR	Male FR Fitting
FL	Fractional Tube Fitting
ML	Metric Tube Fitting

Connection 1 Size	
4	1/4"
6	6 mm or 3/8"
8	8 mm or 1/2"

Connection 2 Type	
	Same as Connection 1
	Specify in the same way as inlet type

Connection 2 Size	
	Same as Connection 1
	Specify in the same way as inlet size

Orifice Size	
02	0.09" (2.4 mm)
03	0.13" (3.2 mm)
05	0.19" (4.8 mm)
07	0.28" (7.1 mm)
10	0.41" (10.3 mm)

Seat Material	
	PTFE
H	UHMWPE
A	PFA

Flow Pattern	
	Straight
A	Angle

Handle	
	Black Nylon
C	Red Nylon
F	Green Nylon
J	Blue Nylon
U	Black Aluminium

Technology Grade	
	General Purpose
F2	Special Cleaning and Packaging

Needle Valves

ND Series

Features

- One-piece forged body
- Straight and angle patterns
- Compact design
- Non-rotating stem
- Specially designed handle to stop contamination from entering into the valve

Technical Data

- Maximum working pressure: 3000 psig (207 bar)
- Temperature:
  PCTFE stem tip: -20°F to 200°F (-28°C to 93°C)
  PEEK stem tip: -20°F to 450°F (-28°C to 232°C)

Part Number Description

ND SS – FNS 4 – NS 4 – 7 P E – A F2

Body Material

6L	316L SS
SS	316 SS
B	Brass

Inlet Type

FNS	Female NPT
NS	Male NPT
FL	Fractional Tube Fitting
ML	Metric Tube Fitting

Inlet Size

4	1/4"
6	6 mm or 3/8"
8	8 mm or 1/2"

Outlet Type

	Same as Inlet Type
	Specify in the same way as inlet type

Outlet Size

	Same as Inlet Size
	Specify in the same way as inlet size

Tip Material

	PCTFE
P	PEEK

Orifice Size

5	0.08" (2.0 mm)
7	0.16" (4.0 mm)
8	0.22" (5.6 mm)

Flow Pattern

	Straight
A	Angle

O-ring Material

	FKM
B	Buna-N
E	Ethyene Propylene

Technology Grade

	General Purpose
F2	Special Cleaning and Packaging

Check Valves

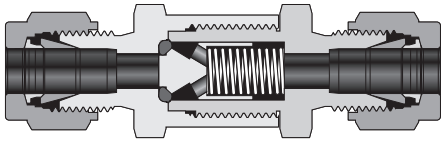
CV, CO and COA Series

Features

- Resilient O-ring seat design for leak-free sealing
- Maximum working pressure: 3000 psig (207 bar)
- Temperature: -10°F to 375°F (-23°C to 190°C)
- PTFE-coated spring available

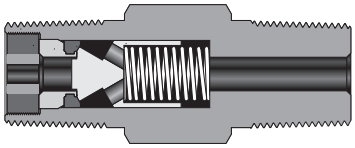
CV Series

- Fixed cracking pressure: 1/3 to 25 psig (0.02 to 1.7 bar)



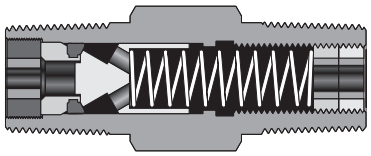
CO Series

- Compact design with one-piece body
- Fixed cracking pressure: 1/3 to 25 psig (0.02 to 1.7 bar)



COA Series

- Adjustable cracking pressure: 3 to 600 psig (0.02 to 41.4 bar)
- A variety of springs available



Part Number Description

CV SS – FNS 4 – NS 4 – B – A F2

Series

CV	
CO	
COA	

Body Material

6L	316L SS
SS	316 SS
B	Brass

Inlet Type

FNS	Female NPT
NS	Male NPT
FL	Fractional Tube Fitting (only for CV Series)
ML	Metric Tube Fitting (only for CV Series)
FR	Male FR Fitting (only for CV Series)

Inlet Size

4	1/4"
6	6 mm or 3/8"
8	8 mm or 1/2"

Outlet Type

	Same as Inlet Type

Specify in the same way as inlet type

Outlet Size

	Same as Inlet Size

Specify in the same way as inlet size

Seal Material

	FKM
B	Buna-N
N	Neoprene
E	Ethyene Propylene
Z	Kalrez

Cracking Pressure

	3 psig	CV and CO
1	1/3 psig	CV and CO
2	1 psig	CV and CO
3	10 psig	CV and CO
4	25 psig	CV and CO
	3 to 50 psig	COA
5	50 to 150 psig	COA
6	150 to 350 psig	COA
7	350 to 600 psig	COA

Technology Grade

	General Purpose
F2	Special Cleaning and Packaging

Relief Valves

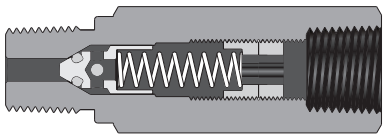
RUV and RV Series

Introduction

Relief valve opens when system pressure exceeds the set pressure, allowing the medium to flow out to relieve the system pressure and closes when the system pressure decreases to the resealing pressure.

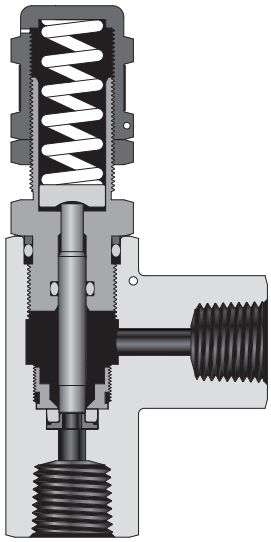
RUV Series

- Compact design with one-piece body
- Standard seat: FKM
- Temperature: -10°F to 300°F (-23°C to 148°C)
- Cracking pressure: 25 to 500 psig (1.7 to 34.5 bar)
- Set pressure by nut adjustment and spring replacement



RV Series

- Working temperature: -10°F to 300°F (-23°C to 148°C)
- Cracking pressure: 50 to 6000 psig
- Adjustable bonnet cap for pressure setting
- Lead-seal line protected



Temperature Range of Sealing Material

O-ring Material	Temperature Range °F (°C)
Fluorocarbon Rubber	25 to 250 (-4 to 121)
Buna-N Rubber	0 to 250 (-17 to 121)
Neoprene Rubber	-10 to 300 (-23 to 148)
Ethylene Propylene Rubber	30 to 250 (-1 to 121)

Part Number Description

RV SS – FNS 4 – NS 4 – 6 B – 1 F2

Series

RUV	
RV	

Body Material

6L	316L SS
SS	316 SS

Inlet Type

FNS	Female NPT
NS	Male NPT
FL	Fractional Tube Fitting (only for RV Series)
ML	Metric Tube Fitting (only for RV Series)

Inlet Size

4	1/4"
6	6 mm or 3/8"
8	8 mm or 1/2"

Outlet Type

	Same as Inlet Type
	Specify in the same way as inlet type

Outlet Size

	Same as Inlet Size
	Specify in the same way as inlet size

Orifice Size

	0.14" (3.6 mm) (only for RUV Series)
6	0.14" (3.6 mm) (only for RV Series)

Seal Material

	FKM
B	Buna-N
N	Neoprene
E	Ethyene Propylene
Z	Kalrez

Set Pressure

0	10 to 25 psig	RUV
1	25 to 100 psig	RUV
2	100 to 250 psig	RUV
3	250 to 500 psig	RUV
F	50 to 300 psig	RV
O	300 to 700 psig	RV
Y	700 to 1500 psig	RV
P	1500 to 2500 psig	RV
W	2500 to 3500 psig	RV
J	3500 to 4500 psig	RV
C	4500 to 6000 psig	RV

Technology Grade

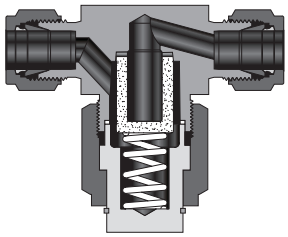
	General Purpose
F2	Special Cleaning and Packaging

Filters

FT Series

Tee-type Filters

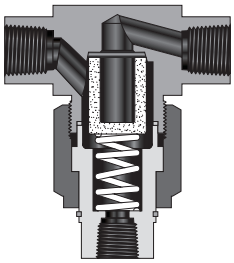
- Maximum working pressure: 6000 psig (414 bar)
- Temperature: -20 °F to 900 °F (-28°C to 482 °C)
- Filter element replaceable without removing body from system



FB Series

Bypass Filters

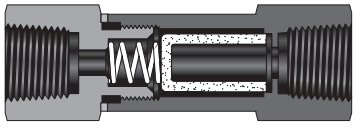
- Maximum working pressure: 6000 psig (414 bar)
- Temperature: -20 °F to 900 °F (-28°C to 482 °C)
- Bypass port at filter bottom for easy sampling and purging



FI Series

In-line Filters

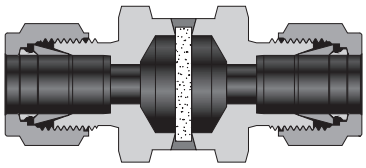
- Maximum working pressure: 3000 psig (207 bar)
- Temperature: -20 °F to 900 °F (-28°C to 482 °C)
- Compact and space-saving design



FW Series

All-welded In-line Filters

- Maximum working pressure: 6000 psig (414 bar)
- Temperature: -20 °F to 900 °F (-28°C to 482 °C)
- Large filtration area and high flow coefficient
- All-welded construction to eliminate leakage



Part Number Description

FB SS – FL 4 – NS 4 – S P 2 – FL 4 F2

Series
FT
FB
FI
FW

Body Material	
6L	316L SS
SS	316 SS

Inlet Type	
FNS	Female NPT
NS	Male NPT
FL	Fractional Tube Fitting
ML	Metric Tube Fitting
FR	Male FR Fitting

Inlet Size	
4	1/4"
6	6 mm or 3/8"
8	8 mm or 1/2"

Outlet Type
Same as Inlet Type
Specify in the same way as inlet type

Outlet Size
Same as Inlet Size
Specify in the same way as inlet size

Element Type	
	Sintered
S	Strainer

Gasket Material	
	Silver-plated 316 SS for FT, FB, FI Series
P	PTFE-plated 316 SS for FT, FB, FI Series
A	Aluminum for FT, FB, FI Series
W	Non-plated 316 SS for FT, FB, FI Series

Pore Size (μm)
05
2
7
15
40
60
80
100
150
250
400

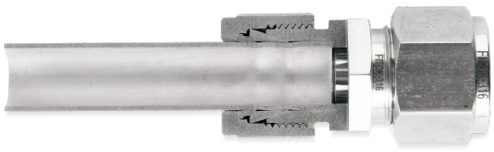
Bypass Port (for FB Series only)	
	1/8" Female NPT
FL 4	1/4" Fractional Tube Fitting
TS 4	1/4" Tube Socket Weld
FL 6	3/8" Fractional Tube Fitting

Technology Grade	
	General Purpose
F2	Special Cleaning and Packaging

Fittings

Features

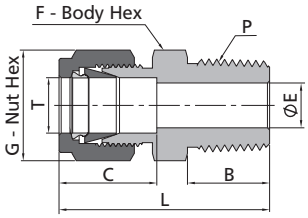
- Sizes ranging from 1/4" to 1/2" and 6 mm to 12 mm
- Diverse material and configurations available
- Precision machined components to ensure perfect deformation of the ferrules and tubing
- Hardened threads with smooth surface finish to avoid galling and to help extend the fitting cycle life
- Silver-plated female nut threads to reduce friction against the body threads
- Radius junction design with elbows to provide smooth flow path
- Every fitting marked with size, material and heat number



Ordering Information and Dimensions

Dimensions are shown with FITOK nuts finger-tight.

Male Connectors



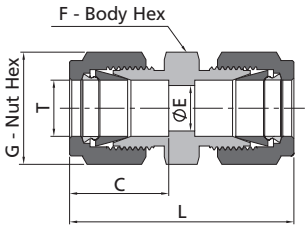
Fractional Tube — NPT Thread

T-Tube O.D. (in.)	P-NPT Size	Basic Ordering Number	Dimension, in. (mm)					
			L	B	C	E	G	F
1/4	1/4	-CM-FL4-NS4	1.49(37.8)	0.56(14.2)	0.60(15.2)	0.19(4.8)	0.56(14.3)	0.56(14.3)
3/8	3/8	-CM-FL6-NS6	1.57(39.9)	0.56(14.2)	0.66(16.8)	0.28(7.1)	0.69(17.5)	0.69(17.5)
1/2	1/2	-CM-FL8-NS8	1.93(49.0)	0.75(19.1)	0.90(22.9)	0.41(10.4)	0.87(22.2)	0.87(22.2)

Metric Tube — NPT Thread

T-Tube O.D. (mm)	P-NPT Size	Basic Ordering Number	Dimension, mm (in.)					
			L	B	C	E	G	F
6	1/4	-CM-ML6-NS4	37.9(1.49)	14.2(0.56)	15.3(0.60)	4.8(0.19)	14.0(0.55)	14.0(0.55)
8	3/8	-CM-ML8-NS6	39.3(1.55)	14.2(0.56)	16.2(0.64)	6.4(0.25)	16.0(0.63)	18.0(0.71)
10	3/8	-CM-ML10-NS6	40.9(1.61)	14.2(0.56)	17.2(0.68)	7.9(0.31)	19.0(0.75)	18.0(0.71)
12	1/2	-CM-ML12-NS8	49.0(1.93)	19.1(0.75)	22.8(0.90)	9.5(0.37)	22.0(0.87)	22.0(0.87)

Unions



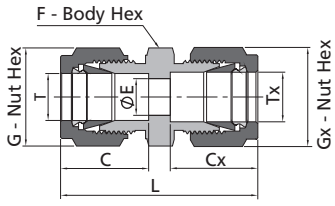
Fractional Tube

T-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)				
		L	C	G	F	E
1/4	-U-FL4	1.61(40.9)	0.60(15.2)	0.56(14.3)	0.50(12.7)	0.19(4.8)
3/8	-U-FL6	1.77(45.0)	0.66(16.8)	0.69(17.5)	0.63(15.9)	0.28(7.1)
1/2	-U-FL8	2.02(51.3)	0.90(22.9)	0.87(22.2)	0.81(20.6)	0.41(10.4)

Metric Tube

T-Tube O.D. (mm)	Basic Ordering Number	Dimension, mm (in.)				
		L	C	G	F	E
6	-U-ML6	41.0(1.61)	15.3(0.60)	14.0(0.55)	14.0(0.55)	4.8(0.19)
8	-U-ML8	43.2(1.70)	16.2(0.64)	16.0(0.63)	15.0(0.59)	6.4(0.25)
10	-U-ML10	46.2(1.82)	17.2(0.68)	19.0(0.75)	18.0(0.71)	7.9(0.31)
12	-U-ML12	51.2(2.02)	22.8(0.90)	22.0(0.87)	22.0(0.87)	9.5(0.37)

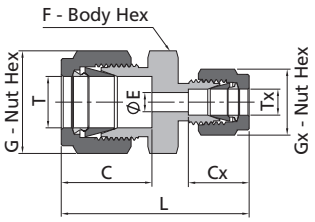
Conversion Unions



Metric Tube — Fractional Tube

T-Tube O.D. (mm)	Tx-Tube O.D. (in.)	Basic Ordering Number	Dimension, mm (in.)						
			L	C	G	F	E	Cx	Gx
6	1/4	-U-ML6-FL4	41.0(1.61)	15.3(0.60)	14.0(0.55)	14.0(0.55)	4.8(0.19)	15.2(0.60)	14.3(0.56)
8	1/4	-U-ML8-FL4	42.3(1.67)	16.2(0.64)	16.0(0.63)	15.0(0.59)	4.8(0.19)	15.2(0.60)	14.3(0.56)
8	3/8	-U-ML8-FL6	44.3(1.74)	16.2(0.64)	16.0(0.63)	16.0(0.63)	6.4(0.25)	16.8(0.66)	17.5(0.69)
10	1/4	-U-ML10-FL4	44.5(1.75)	17.2(0.68)	19.0(0.75)	18.0(0.71)	4.8(0.19)	15.2(0.60)	14.3(0.56)
10	3/8	-U-ML10-FL6	45.9(1.81)	17.2(0.68)	19.0(0.75)	18.0(0.71)	7.1(0.28)	16.8(0.66)	17.5(0.69)
12	3/8	-U-ML12-FL6	48.4(1.91)	22.8(0.90)	22.0(0.87)	22.0(0.87)	7.1(0.28)	16.8(0.66)	17.5(0.69)
12	1/2	-U-ML12-FL8	51.2(2.02)	22.8(0.90)	22.0(0.87)	22.0(0.87)	9.5(0.37)	22.9(0.90)	22.2(0.87)

Reducing Unions



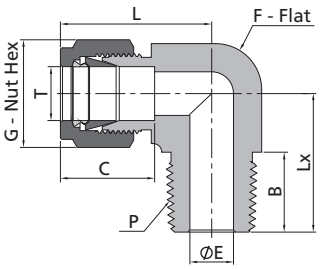
Fractional Tube

T-Tube O.D. (in.)	Tx-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)						
			L	C	G	F	E	Cx	Gx
3/8	1/4	-U-FL6-FL4	1.70(43.2)	0.66(16.8)	0.69(17.5)	0.63(15.9)	0.19(4.8)	0.60(15.2)	0.56(14.3)
1/2	1/4	-U-FL8-FL4	1.85(47.0)	0.90(22.8)	0.87(22.2)	0.81(20.6)	0.19(4.8)	0.60(15.2)	0.56(14.3)
1/2	3/8	-U-FL8-FL6	1.91(48.5)	0.90(22.8)	0.87(22.2)	0.81(20.6)	0.28(7.1)	0.66(16.8)	0.69(17.5)

Metric Tube

T-Tube O.D. (mm)	Tx-Tube O.D. (mm)	Basic Ordering Number	Dimension, mm (in.)						
			L	C	G	F	E	Cx	Gx
8	6	-U-ML8-ML6	42.3(1.67)	16.3(0.64)	16.0(0.63)	15.0(0.59)	4.8(0.19)	15.3(0.60)	14.0(0.55)
10	8	-U-ML10-ML8	45.1(1.78)	17.2(0.68)	19.0(0.75)	18.0(0.71)	6.4(0.25)	16.3(0.64)	16.0(0.63)
12	10	-U-ML12-ML10	48.7(1.92)	22.8(0.90)	22.0(0.87)	22.0(0.87)	7.9(0.31)	17.2(0.68)	19.0(0.75)

Male Elbows



Fractional Tube — NPT Thread

T-Tube O.D. (in.)	P-NPT Size	Basic Ordering Number	Dimension, in. (mm)						
			L	C	G	F	E	B	Lx
1/4	1/4	-LM-FL4-NS4	1.06(26.9)	0.60(15.2)	0.56(14.3)	0.50(12.7)	0.19(4.8)	0.56(14.2)	0.92(23.4)
3/8	3/8	-LM-FL6-NS6	1.23(31.2)	0.66(16.8)	0.69(17.5)	0.69(17.5)	0.28(7.1)	0.56(14.2)	1.03(26.2)
1/2	1/2	-LM-FL8-NS8	1.42(36.1)	0.90(22.9)	0.87(22.2)	0.81(20.6)	0.41(10.4)	0.75(19.1)	1.30(33.0)

Metric Tube — NPT Thread

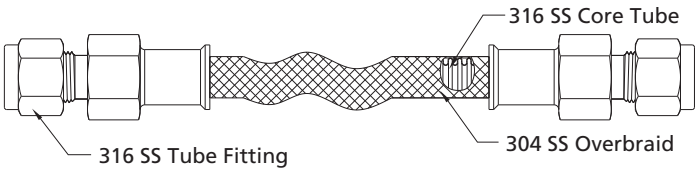
T-Tube O.D. (mm)	P-NPT Size	Basic Ordering Number	Dimension, mm (in.)						
			L	C	G	F	E	B	Lx
6	1/4	-LM-ML6-NS4	27.0(1.06)	15.3(0.60)	14.0(0.55)	12.7(0.50)	4.8(0.19)	14.2(0.56)	23.4(0.92)
8	3/8	-LM-ML8-NS6	30.6(1.20)	16.2(0.64)	16.0(0.63)	17.5(0.69)	6.4(0.25)	14.2(0.56)	26.2(1.03)
10	3/8	-LM-ML10-NS6	31.5(1.24)	17.2(0.68)	19.0(0.75)	17.5(0.69)	7.9(0.31)	14.2(0.56)	26.2(1.03)
12	1/2	-LM-ML12-NS8	36.0(1.42)	22.8(0.90)	22.0(0.87)	20.6(0.81)	9.5(0.37)	19.1(0.75)	33.0(1.30)

Metal Flexible Hoses

MH, MM Series

Features

- Core tube and fitting material: 316 SS
- Overbraid material: 304 SS
- For vacuum and positive pressure applications
- Maximum working pressure: 3100 psig (213 bar)
- Hose size: 1/4" to 1"
- Temperature: -325°F to 800°F (-200°C to 426°C)
- End connections:
  1/8 to 1 thread
  3/16" to 1" and 6 mm to 22 mm tube fitting
- Welded fitting-to-hose construction to ensure reliable seal
- Standard and custom length available



Hose Technical Data (MH Series)

Nominal Hose Size	Inside Diameter	Min. Bend Radius		Temperature Range	Working Pressure @ 70°F (20°C)	Burst Pressure @ 70°F (20°C)	Hose Series
		Static	Dynamic				
in. (mm)	in. (mm)	in. (mm)	in. (mm)	°F (°C)	psig (bar)	psig (bar)	
1/4 (6.4)	0.28 (7.1)	2.25 (57.2)	10.0 (254)	-325 to 800 (-200 to 426)	3100 (213)	12400 (854)	MH4
3/8 (9.7)	0.42 (10.6)	3.00 (76.2)	12.0 (305)		2000 (137)	8000 (551)	MH6
1/2 (12.7)	0.53 (13.5)	4.50 (114)	16.0 (406)		1800 (124)	7200 (496)	MH8
3/4 (19.0)	0.80 (20.3)	6.00 (152)	17.0 (432)		1500 (103)	6000 (413)	MH12
1 (25.4)	1.03 (26.0)	6.75 (171)	20.0 (508)		1200 (82.6)	4800 (330)	MH16

Hose Technical Data (MM Series)

Nominal Hose Size	Inside Diameter	Min. Bend Radius		Temperature Range	Working Pressure @ 70°F (20°C)	Burst Pressure @ 70°F (20°C)	Hose Series
		Static	Dynamic				
in. (mm)	in. (mm)	in. (mm)	in. (mm)	°F (°C)	psig (bar)	psig (bar)	
1/4 (6.4)	0.25 (6.4)	0.75 (19.0)	4.33 (110)	-325 to 800 (-200 to 426)	1600 (110)	6400 (440)	MM4
3/8 (9.7)	0.38 (9.5)	0.87 (22.1)	5.91 (150)		1470 (101)	6000 (413)	MM6
1/2 (12.7)	0.50 (12.7)	1.04 (26.4)	6.50 (165)		1110 (76.4)	4500 (310)	MM8
3/4 (19.0)	0.75 (19.0)	1.61 (40.9)	8.86 (225)		860 (59.2)	3500 (241)	MM12
1 (25.4)	1.00 (25.4)	1.89 (48.0)	10.2 (259)		680 (46.8)	2680 (184)	MM16

Cylinder Connections

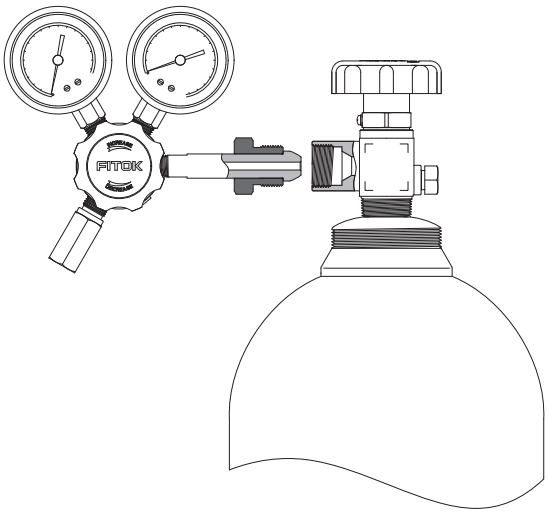
CGA DISS Series B-16

CGA Series B-20

DIN Series B-27

Gas Connection Assignment Table B-28

Features



- ◎ 100% visual inspection of critical surfaces
- ◎ Diverse material and configurations available
- ◎ Silver-plated nut threads to reduce installation torque
- ◎ Every fitting marked with size, material and heat number
- ◎ Cleaned and packaged for Oxygen and Ultra High Purity Service available
- ◎ Customized solutions available

Material

Series	Component	Material	Designator
CGA DISS	Nipples	316L SS	6L
	Nuts	304 SS	S4
	Gaskets	Nickel 200	NI
		PCTFE	K
		Aluminum	AL
	Plugs	316L SS	6L
	Adapters	316L SS	6L
	Caps	316L SS	6L
CGA DIN	Nipples	316L SS	6L
	Nuts	304 SS	S4
	Gaskets	PTFE	T
		PCTFE	K
	Plugs, Caps	316L SS	6L
	Adapters	316L SS	6L

Notes:
1. Nickel gasket heat treated; surface hardness＜HB 100
2. 316L SS in compliance with SEMI F20

Ordering information

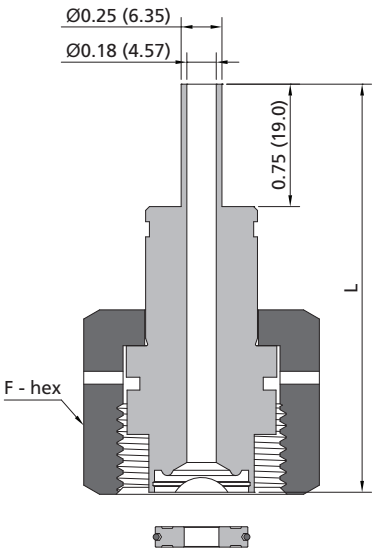
- ◎ Add material designator as a prefix to the basic ordering number to get the complete ordering number.
  Example: 6**L**-C634-L-FR4
- ◎ CGA, DIN Series
  PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
  Example: 6L-C350-NS4-**K**
- ◎ CGA DISS Series
  Nickel is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
  Example: 6L-C632-FR4-**K**

CGA DISS Series

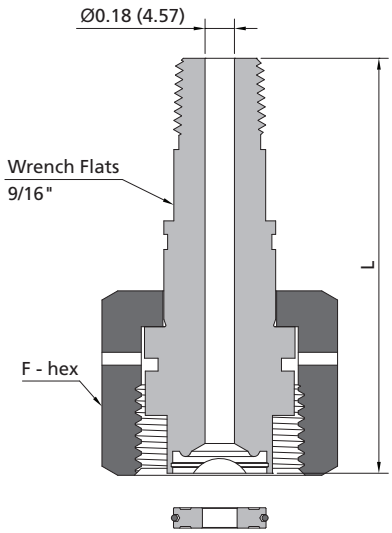
- Non-rotating design
- For nipples with TB or FR connections, inner surface electropolished to an average of Ra 9 µin. (0.23 µm); Ra 16 µin. (0.4 µm) for nipples with NPT connections
- Nipples with TB or FR connections cleaned for Ultra High Purity Service and packaged in a Class 100 clean room; Nipples with NPT connections packaged and cleaned for Oxygen service
- Maximum allowable leak rate: 1 x 10^{-9} mbar·l/s

Cylinder Connections (Including Nipples, Nuts and Gaskets)

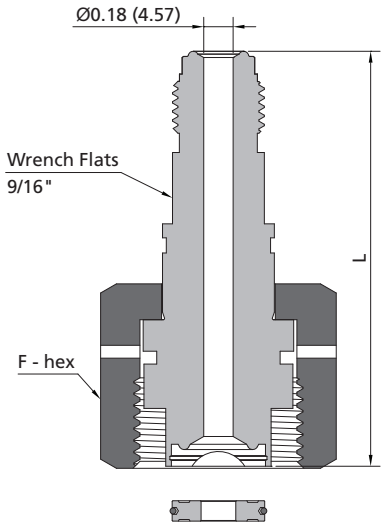
Dimensions are in. (mm).



1/4" Butt Weld (TB)



Male NPT



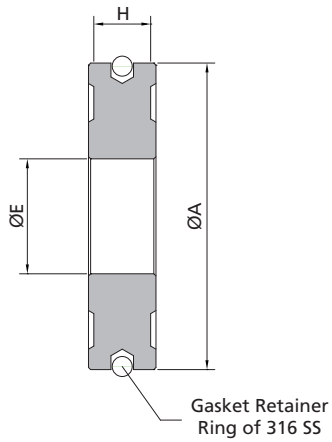
Male Face Seal (FR)

CGA Number	End Connection	Assembly Basic Ordering Number	Nipple Basic Ordering Number	Nut Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in. (mm)	
						L	F
632	1/4" TB	-C632-TB4	-C632-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C632-FR4	-C632-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C632-NS4	-C632-L-NS4			3 (76.2)	1 1/4 (31.8)
634	1/4" TB	-C634-TB4	-C634-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C634-FR4	-C634-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C634-NS4	-C634-L-NS4			3 (76.2)	1 1/4 (31.8)
636	1/4" TB	-C636-TB4	-C636-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C636-FR4	-C636-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C636-NS4	-C636-L-NS4			3 (76.2)	1 1/4 (31.8)
638	1/4" TB	-C638-TB4	-C638-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C638-FR4	-C638-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C638-NS4	-C638-L-NS4			3 (76.2)	1 1/4 (31.8)

CGA Number	End Connection	Assembly Basic Ordering Number	Nipple Basic Ordering Number	Nut Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in. (mm)	
						L	F
640	1/4" TB	-C640-TB4	-C640-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C640-FR4	-C640-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C640-NS4	-C640-L-NS4			3 (76.2)	1 1/4 (31.8)
642	1/4" TB	-C642-TB4	-C642-L-TB4	-C630-N	-C630-GT	2.5 (63.5)	1 1/4 (31.8)
	1/4" FR	-C642-FR4	-C642-L-FR4			3 (76.2)	1 1/4 (31.8)
	1/4" NPT	-C642-NS4	-C642-L-NS4			3 (76.2)	1 1/4 (31.8)
712	1/4" TB	-C712-TB4	-C712-L-TB4	-C710-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C712-FR4	-C712-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C712-NS4	-C712-L-NS4			3 (76.2)	1 3/8 (34.9)
714	1/4" TB	-C714-TB4	-C714-L-TB4	-C710-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C714-FR4	-C714-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C714-NS4	-C714-L-NS4			3 (76.2)	1 3/8 (34.9)
716	1/4" TB	-C716-TB4	-C716-L-TB4	-C710-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C716-FR4	-C716-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C716-NS4	-C716-L-NS4			3 (76.2)	1 3/8 (34.9)
718	1/4" TB	-C718-TB4	-C718-L-TB4	-C710-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C718-FR4	-C718-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C718-NS4	-C718-L-NS4			3 (76.2)	1 3/8 (34.9)
720	1/4" TB	-C720-TB4	-C720-L-TB4	-C720-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C720-FR4	-C720-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C720-NS4	-C720-L-NS4			3 (76.2)	1 3/8 (34.9)
722	1/4" TB	-C722-TB4	-C722-L-TB4	-C720-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C722-FR4	-C722-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C722-NS4	-C722-L-NS4			3 (76.2)	1 3/8 (34.9)
724	1/4" TB	-C724-TB4	-C724-L-TB4	-C720-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C724-FR4	-C724-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C724-NS4	-C724-L-NS4			3 (76.2)	1 3/8 (34.9)
726	1/4" TB	-C726-TB4	-C726-L-TB4	-C720-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C726-FR4	-C726-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C726-NS4	-C726-L-NS4			3 (76.2)	1 3/8 (34.9)
728	1/4" TB	-C728-TB4	-C728-L-TB4	-C720-N	-C630-GT	2.5 (63.5)	1 3/8 (34.9)
	1/4" FR	-C728-FR4	-C728-L-FR4			3 (76.2)	1 3/8 (34.9)
	1/4" NPT	-C728-NS4	-C728-L-NS4			3 (76.2)	1 3/8 (34.9)

Note:
Nickel is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
*Example: 6L-C638-TB4-**K***

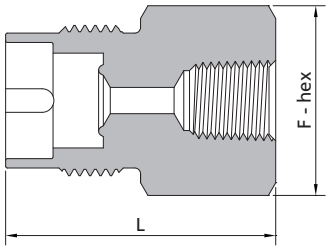
Gaskets



CGA Number	Gasket Ordering Number	Material	Dimensions					
			A		E		H	
			in.	mm	in.	mm	in.	mm
632~728	NI-C630-GT	Nickel 200	0.56	14.3	0.21	5.4	0.105	2.7
	K-C630-GT	PCTFE	0.56	14.3	0.21	5.4	0.125	3.2
	AL-C630-GT	Aluminum	0.56	14.3	0.21	5.4	0.105	2.7

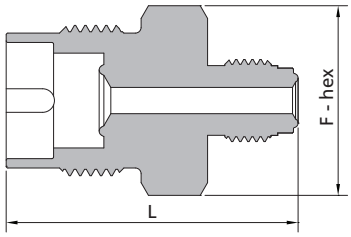
Outlet Adaptors

Female NPT



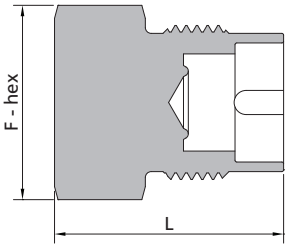
CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
632	-C632-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
634	-C634-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
636	-C636-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
638	-C638-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
640	-C640-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
642	-C642-A-FNS4	1.85 (47.0)	1 1/8 (28.6)
712	-C712-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
714	-C714-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
716	-C716-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
718	-C718-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
720	-C720-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
722	-C722-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
724	-C724-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
726	-C726-A-FNS4	1.85 (47.0)	1 1/4 (31.8)
728	-C728-A-FNS4	1.85 (47.0)	1 1/4 (31.8)

Male Face Seal (FR)



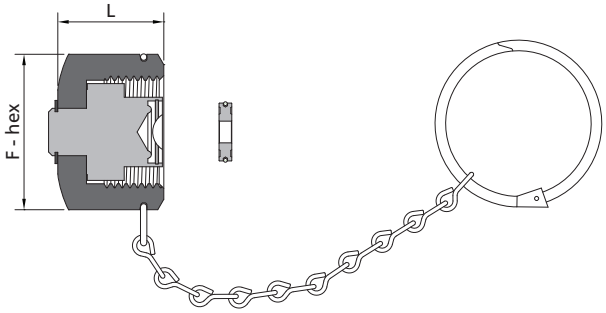
CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
632	-C632-A-FR4	2.0 (50.8)	1 1/8 (28.6)
634	-C634-A-FR4	2.0 (50.8)	1 1/8 (28.6)
636	-C636-A-FR4	2.0 (50.8)	1 1/8 (28.6)
638	-C638-A-FR4	2.0 (50.8)	1 1/8 (28.6)
640	-C640-A-FR4	2.0 (50.8)	1 1/8 (28.6)
642	-C642-A-FR4	2.0 (50.8)	1 1/8 (28.6)
712	-C712-A-FR4	2.0 (50.8)	1 1/4 (31.8)
714	-C714-A-FR4	2.0 (50.8)	1 1/4 (31.8)
716	-C716-A-FR4	2.0 (50.8)	1 1/4 (31.8)
718	-C718-A-FR4	2.0 (50.8)	1 1/4 (31.8)
720	-C720-A-FR4	2.0 (50.8)	1 1/4 (31.8)
722	-C722-A-FR4	2.0 (50.8)	1 1/4 (31.8)
724	-C724-A-FR4	2.0 (50.8)	1 1/4 (31.8)
726	-C726-A-FR4	2.0 (50.8)	1 1/4 (31.8)
728	-C728-A-FR4	2.0 (50.8)	1 1/4 (31.8)

Blank Plugs



CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
632	-C632-BP	1.53 (38.9)	1 1/8 (28.6)
634	-C634-BP	1.53 (38.9)	1 1/8 (28.6)
636	-C636-BP	1.53 (38.9)	1 1/8 (28.6)
638	-C638-BP	1.53 (38.9)	1 1/8 (28.6)
640	-C640-BP	1.53 (38.9)	1 1/8 (28.6)
642	-C642-BP	1.53 (38.9)	1 1/8 (28.6)
712	-C712-BP	1.53 (38.9)	1 1/4 (31.8)
714	-C714-BP	1.53 (38.9)	1 1/4 (31.8)
716	-C716-BP	1.53 (38.9)	1 1/4 (31.8)
718	-C718-BP	1.53 (38.9)	1 1/4 (31.8)
720	-C720-BP	1.53 (38.9)	1 1/4 (31.8)
722	-C722-BP	1.53 (38.9)	1 1/4 (31.8)
724	-C724-BP	1.53 (38.9)	1 1/4 (31.8)
726	-C726-BP	1.53 (38.9)	1 1/4 (31.8)
728	-C728-BP	1.53 (38.9)	1 1/4 (31.8)

Valve Outlet Caps (Including Chains, Rings and Gaskets)



CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
632	-C632-CP	0.98 (24.9)	1 1/4 (31.8)
634	-C634-CP	0.98 (24.9)	1 1/4 (31.8)
636	-C636-CP	0.98 (24.9)	1 1/4 (31.8)
638	-C638-CP	0.98 (24.9)	1 1/4 (31.8)
640	-C640-CP	0.98 (24.9)	1 1/4 (31.8)
642	-C642-CP	0.98 (24.9)	1 1/4 (31.8)
712	-C712-CP	0.98 (24.9)	1 3/8 (34.9)
714	-C714-CP	0.98 (24.9)	1 3/8 (34.9)
716	-C716-CP	0.98 (24.9)	1 3/8 (34.9)
718	-C718-CP	0.98 (24.9)	1 3/8 (34.9)
720	-C720-CP	0.98 (24.9)	1 3/8 (34.9)
722	-C722-CP	0.98 (24.9)	1 3/8 (34.9)
724	-C724-CP	0.98 (24.9)	1 3/8 (34.9)
726	-C726-CP	0.98 (24.9)	1 3/8 (34.9)
728	-C728-CP	0.98 (24.9)	1 3/8 (34.9)

Note:
Nickel is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
*Example: 6L-C632-CP-**K***

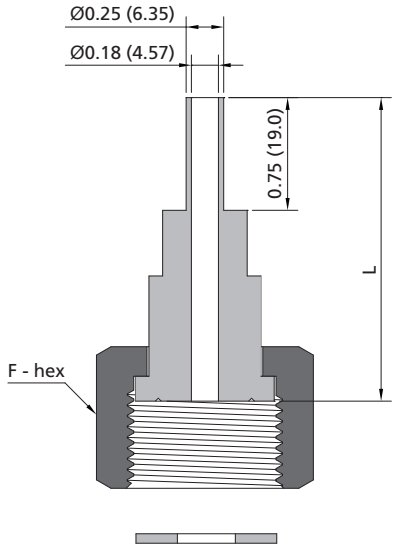
CGA Series

- ◎ CGA V-1-2005 compliant
- ◎ For nipples with TB or FR connections, inner surface electropolished to an average of Ra 9 µin. (0.23 µm); Ra 32 µin. (0.8 µm) for nipples with NPT connections
- ◎ Cleaned and packaged for Oxygen service
- ◎ Maximum allowable leak rate: 1 x 10^{-9} mbar·l/s

Cylinder Connections (Including Nipples, Nuts and Gaskets)

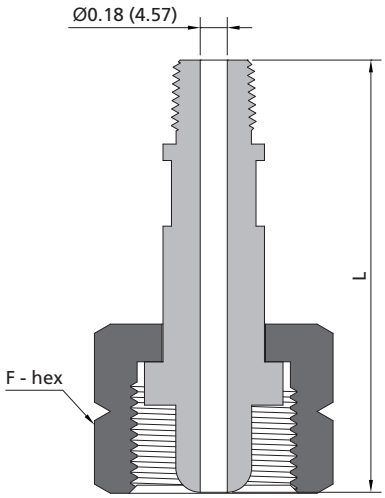
Dimensions are in. (mm).

Fig.1



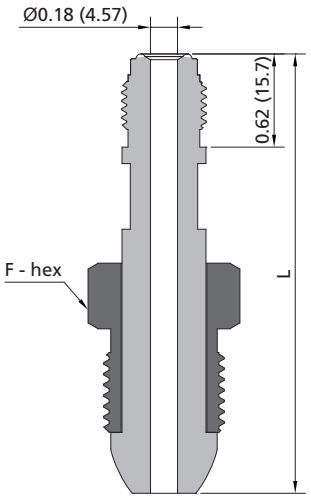
1/4" Butt Weld (TB)

Fig.2



Male NPT

Fig.3



Male Face Seal (FR)

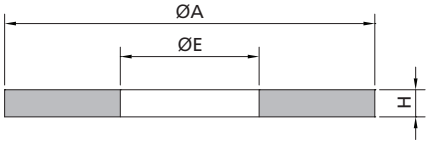
CGA Number	Ref. Fig.	End Connection	Assembly Basic Ordering Number	Nipple Basic Ordering Number	Nut Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in. (mm)	
							L	F
170	Fig.1	1/4" TB	-C170-TB4	-C170-L-TB4	-C170-N	-C170-GT	1.25 (31.8)	11/16 (17.5)
		1/8" NPT	-C170-NS2	-C170-L-NS2				
180	Fig.1	1/4" TB	-C180-TB4	-C180-L-TB4	-C180-N	-C180-GT	1.25 (31.8)	3/4 (19.1)
		1/8" NPT	-C180-NS2	-C180-L-NS2			1.75 (44.5)	
290	Fig.2	1/4" TB	-C290-TB4	-C290-L-TB4	-C290-N	——	2.63 (66.7)	1 (25.4)
		1/4" NPT	-C290-NS4	-C290-L-NS4			2.25 (57.2)	
296	Fig.3	1/4" TB	-C296-TB4	-C296-L-TB4	-C296-N	——	2.63 (66.7)	7/8 (22.3)
		1/4" NPT	-C296-NS4	-C296-L-NS4			3.5 (88.9)	
		1/4" FR	-C296-FR4	-C296-L-FR4			2.75 (69.9)	
320	Fig.1	1/4" TB	-C320-TB4	-C320-L-TB4	-C320-N	-C320-GT	1.75 (44.5)	1 1/8 (28.6)
		1/4" NPT	-C320-NS4	-C320-L-NS4			2.5 (63.5)	
		1/4" FR	-C320-FR4	-C320-L-FR4			1.75 (44.5)	

CGA Number	Ref. Fig.	End Connection	Assembly Basic Ordering Number	Nipple Basic Ordering Number	Nut Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in. (mm)	
							L	F
326	Fig.2	1/4" TB	-C326-TB4	-C326-L-TB4	-C326-N	——	2.25 (57.2)	1 1/8 (28.6)
		1/4" NPT	-C326-NS4	-C326-L-NS4			3.0 (76.2)	
		1/4" FR	-C326-FR4	-C326-L-FR4			2.25 (57.2)	
330	Fig.1	1/4" TB	-C330-TB4	-C320-L-TB4	-C330-N	-C320-GT	1.75 (44.5)	1 1/8 (28.6)
		1/4" NPT	-C330-NS4	-C320-L-NS4			2.5 (63.5)	
		1/4" FR	-C330-FR4	-C320-L-FR4			1.75 (44.5)	
346	Fig.2	1/4" TB	-C346-TB4	-C346-L-TB4	-C346-N	——	2.31 (58.7)	1 1/8 (28.6)
		1/4" NPT	-C346-NS4	-C346-L-NS4			3.0 (76.2)	
		1/4" FR	-C346-FR4	-C346-L-FR4			2.25 (57.2)	
350	Fig.2	1/4" TB	-C350-TB4	-C350-L-TB4	-C350-N	——	2.31 (58.7)	1 1/8 (28.6)
		1/4" NPT	-C350-NS4	-C350-L-NS4			3.0 (76.2)	
		1/4" FR	-C350-FR4	-C350-L-FR4			2.25 (57.2)	
510	Fig.3	1/4" TB	-C510-TB4	-C510-L-TB4	-C510-N	——	2.63 (66.7)	1 1/8 (28.6)
		1/4" NPT	-C510-NS4	-C510-L-NS4			3.5 (88.9)	
		1/4" FR	-C510-FR4	-C510-L-FR4			2.75 (69.9)	
540①	Fig.2	1/4" TB	-C540-TB4	-C540-L-TB4	-C540-N	——	2.25 (57.2)	1 1/8 (28.6)
		1/4" NPT	-C540-NS4	-C540-L-NS4			3.0 (76.2)	
		1/4" FR	-C540-FR4	-C540-L-FR4			2.25 (57.2)	
580	Fig.3	1/4" TB	-C580-TB4	-C510-L-TB4	-C580-N	——	2.63 (66.7)	1 1/8 (28.6)
		1/4" NPT	-C580-NS4	-C510-L-NS4			3.5 (88.9)	
		1/4" FR	-C580-FR4	-C510-L-FR4			2.75 (69.9)	
590	Fig.3	1/4" TB	-C590-TB4	-C510-L-TB4	-C590-N	——	2.63 (66.7)	1 1/8 (28.6)
		1/4" NPT	-C590-NS4	-C510-L-NS4			3.5 (88.9)	
		1/4" FR	-C590-FR4	-C510-L-FR4			2.75 (69.9)	
660	Fig.1	1/4" TB	-C660-TB4	-C660-L-TB4	-C660-N	-C660-GT	2.19 (55.6)	1 1/4 (31.8)
		1/4" NPT	-C660-NS4	-C660-L-NS4			2.5 (63.5)	
		1/4" FR	-C660-FR4	-C660-L-FR4			1.88 (47.6)	
670	Fig.1	1/4" TB	-C670-TB4	-C660-L-TB4	-C670-N	-C660-GT	2.19 (55.6)	1 1/4 (31.8)
		1/4" NPT	-C670-NS4	-C660-L-NS4			2.5 (63.5)	
		1/4" FR	-C670-FR4	-C660-L-FR4			1.88 (47.6)	
678	Fig.1	1/4" TB	-C678-TB4	-C678-L-TB4	-C678-N	-C678-GT	2.5 (63.5)	1 1/4 (31.8)
		1/4" NPT	-C678-NS4	-C678-L-NS4			2.5 (63.5)	
		1/4" FR	-C678-FR4	-C678-L-FR4			2.0 (50.8)	
679	Fig.1	1/4" TB	-C679-TB4	-C679-L-TB4	-C679-N	-C679-GT	2.5 (63.5)	1 1/4 (31.8)
		1/4" NPT	-C679-NS4	-C679-L-NS4			3.0 (76.2)	
		1/4" FR	-C679-FR4	-C679-L-FR4			2.0 (50.8)	

① Cleaned and packaged for Oxygen Service.

Note:
PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
*Example: 6L-C170-FR4-**K***

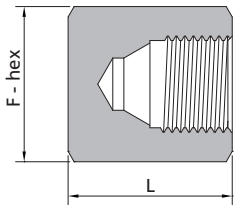
Gaskets



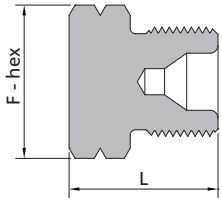
CGA Number	Gasket Basic Ordering Number	Dimensions					
		A		E		H	
		in.	mm	in.	mm	in.	mm
170	-C170-GT	0.43	11.0	0.19	4.8	0.10	2.5
180	-C180-GT	0.44	11.2	0.32	8.1	0.09	2.3
320, 330	-C320-GT	0.72	18.3	0.26	6.6	0.09	2.3
660, 670	-C660-GT	0.94	23.9	0.38	9.7	0.06	1.6
678	-C678-GT	0.61	15.5	0.30	7.6	0.06	1.6
679	-C679-GT	0.53	13.5	0.31	7.9	0.06	1.6

Outlet Adaptors, Blank Caps and Plugs

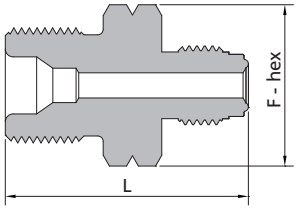
Blank Caps
CGA 580



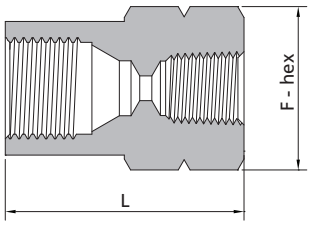
Blank Plugs
CGA 350



Male Face Seal (FR)
CGA 350



Female NPT
CGA 350

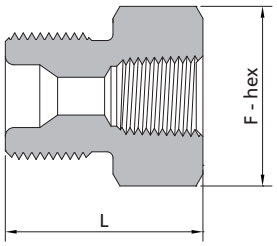


CGA Number	End Connection	Assembly Basic Ordering Number	Dimensions, in. (mm)	
			L	F
180	1/4" Female NPT	-C180-A-FNS4	1.38 (35.0)	3/4 (19.1)
296	Blank Cap	-C296-BC	1.37 (34.8)	1 1/8 (28.6)
	1/4" Female NPT	-C296-A-FNS4	2.0 (50.8)	
	1/4" FR	-C296-A-FR4	2.0 (50.8)	
320	Blank Plug	-C320-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C320-A-FNS4	1.12 (28.4)	
	1/4" FR	-C320-A-FR4	1.74 (44.2)	
326	Blank Plug	-C326-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C326-A-FNS4	1.31 (33.3)	
	1/4" FR	-C326-A-FR4	1.74 (44.2)	
330	Blank Plug	-C330-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C330-A-FNS4	1.31 (33.3)	
	1/4" FR	-C330-A-FR4	1.74 (44.2)	
346	Blank Plug	-C346-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C346-A-FNS4	1.31 (33.3)	
	1/4" FR	-C346-A-FR4	1.88 (47.8)	
350	Blank Plug	-C350-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C350-A-FNS4	1.31 (33.3)	
	1/4" FR	-C350-A-FR4	1.88 (47.8)	
510	Blank Cap	-C510-BC	1.37 (34.8)	1 1/4 (31.8)
	1/4" Female NPT	-C510-A-FNS4	2.0 (50.8)	
	1/4" FR	-C510-A-FR4	2.0 (50.8)	
540①	Blank Plug	-C540-BP	1.12 (28.4)	1 (25.4)
	1/4" Female NPT	-C540-A-FNS4	1.25 (31.8)	
	1/4" FR	-C540-A-FR4	1.87 (47.5)	
580	Blank Cap	-C580-BC	1.37 (34.8)	1 1/4 (31.8)
	1/4" Female NPT	-C580-A-FNS4	2.0 (50.8)	
	1/4" FR	-C580-A-FR4	2.0 (50.8)	

① *Cleaned and packaged for Oxygen Service.*

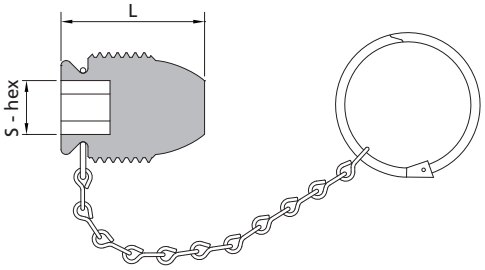
Female NPT

CGA 350

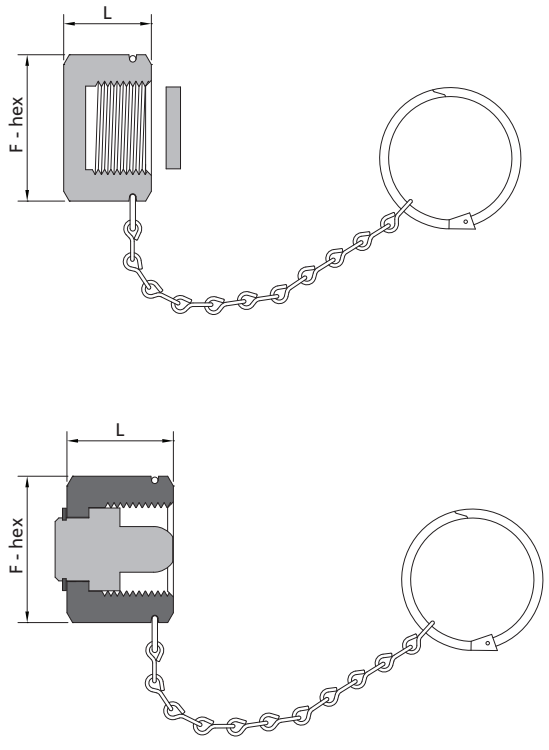


CGA Number	End Connection	Assembly Basic Ordering Number	Dimensions, in. (mm)	
			L	F
590	Blank Cap	-C590-BC	1.37 (34.8)	1 1/4 (31.8)
	1/4" Female NPT	-C590-A-FNS4	2.0 (50.8)	
	1/4" FR	-C590-A-FR4	2.0 (50.8)	
660	Blank Plug	-C660-BP	0.88 (22.4)	1 1/8 (28.6)
	1/4" Female NPT	-C660-A-FNS4	1.25 (31.8)	
	1/4" FR	-C660-A-FR4	1.5 (38.1)	
670	Blank Plug	-C670-BP	0.88 (22.4)	1 1/8 (28.6)
	1/4" Female NPT	-C670-A-FNS4	1.25 (31.8)	
	1/4" FR	-C670-A-FR4	1.5 (38.1)	
678	Blank Plug	-C678-BP	1.0 (25.4)	1 1/8 (28.6)
	1/4" Female NPT	-C678-A-FNS4	1.38 (35.1)	
	1/4" FR	-C678-A-FR4	1.5 (38.1)	
679	Blank Plug	-C679-BP	0.88 (22.4)	1 1/8 (28.6)
	1/4" Female NPT	-C679-A-FNS4	1.25 (31.8)	
	1/4" FR	-C679-A-FR4	1.75 (44.5)	

Cylinder Valve Outlet Plugs



CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	S
510	-C510-PG	1.0 (25.4)	3/8 (9.5)
580	-C580-PG	1.0 (25.4)	
590	-C590-PG	1.0 (25.4)	



CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
320	-C320-CP	0.54 (13.7)	1 (25.4)
326	-C320-CP	0.54 (13.7)	
330	-C330-CP	0.54 (13.7)	
346	-C320-CP	0.54 (13.7)	
660	-C660-CP	0.54 (13.7)	1 1/4 (31.8)
670	-C670-CP	0.54 (13.7)	
678	-C670-CP	0.54 (13.7)	
679	-C670-CP	0.54 (13.7)	

Notes:
1. *PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.*
   *Example: S4-C330-CP-**K***
2. *The caps listed above are only intended to keep valve outlets clean and protect its threads . They shouldn't be used to contain pressure if the valve leaks or is opened by mistake.*

CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
350	-C350-CP	0.82 (20.8)	1 1/8 (28.6)

Complete Pigtail Connections
(Including Nipples, Nuts, Gaskets and Blank Plugs or Caps)

Dimensions are in. (mm).

Fig.1

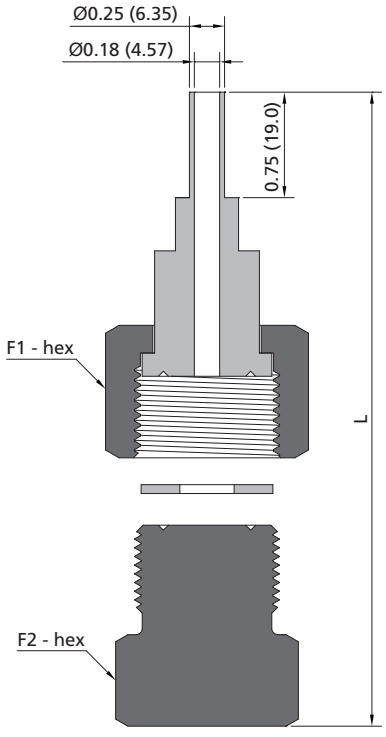
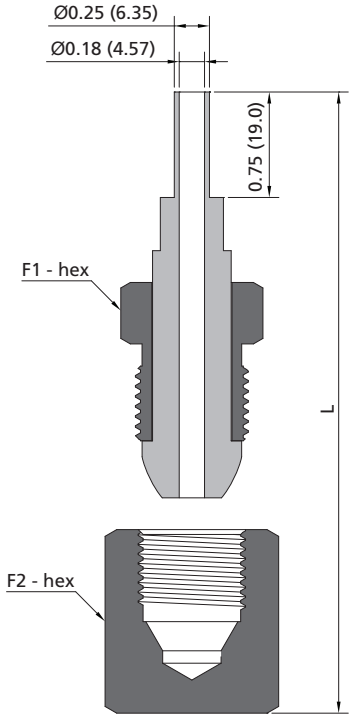


Fig.2



CGA Number	Ref. Fig.	Assembly Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in. (mm)		
				L	F1	F2
296	Fig.2	-C296-TB4-A	——	3.03 (77.0)	7/8 (22.3)	1 1/8 (28.6)
320	Fig.1	-C320-TB4-A	-C320-GT	2.96 (75.2)	1 1/8 (28.6)	1 (25.4)
326	Fig.1	-C326-TB4-A	——	3.01 (76.5)		
330	Fig.1	-C330-TB4-A	-C320-GT	2.96 (75.2)		
346	Fig.1	-C346-TB4-A	——	2.97 (75.4)		
350	Fig.1	-C350-TB4-A	——	2.96 (75.2)		
510	Fig.2	-C510-TB4-A	——	3.03 (77.0)		1 1/4 (31.8)
540①	Fig.1	-C540-TB4-A	——	2.96 (75.2)		1 (25.4)
580	Fig.2	-C580-TB4-A	——	3.03 (77.0)		1 1/4 (31.8)
590	Fig.2	-C590-TB4-A	——	3.03 (77.0)		
660	Fig.1	-C660-TB4-A	-C660-GT	2.96 (75.2)	1 1/4 (31.8)	1 1/8 (28.6)
670	Fig.1	-C670-TB4-A	-C660-GT	2.96 (75.2)		
678	Fig.1	-C678-TB4-A	-C678-GT	3.08 (78.2)		
679	Fig.1	-C679-TB4-A	-C679-GT	2.96 (75.2)		

① *Cleaned and packaged for Oxygen Service.*

Note:
PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.
*Example: 6L-C330-TB4-A-**K***

Assembly Torque For CGA Cylinder Connections

CGA NO.	Recommended Torque		CGA NO.	Recommended Torque	
	ft-lb	N·m		ft-lb	N·m
170①	10~15	14~20	510	35~50	47~68
180①	10~15	14~20	540	40~60	54~81
290	30~45	41~61	580	40~60	54~81
296	35~50	47~68	590	40~60	54~81
320①	20~30	27~41	660①	30~45	41~61
326	25~35	34~47	670①	30~45	41~61
330①	20~30	27~41	678①	25~35	34~47
346	35~50	47~68	679①	25~35	34~47
350	35~50	47~68			

CGA DISS NO.	Recommended Torque		Gasket Material
	ft-lb	N·m	
632-728	35~40	47~53.8	Nickel
	12~15	16~20.1	PCTFE

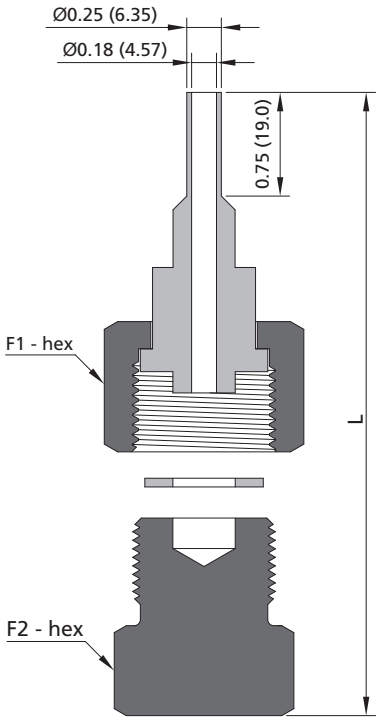
① *Gasket for seal: PTFE or PCTFE.*

DIN Series

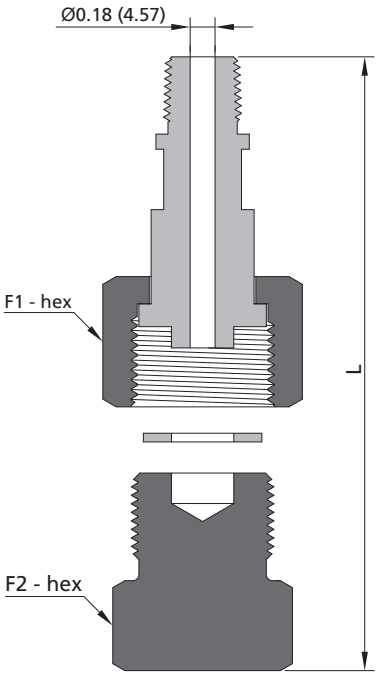
- DIN 477-1 compliant
- For nipples with TB or FR connections, inner surface electropolished to an average of Ra 9 µin. (0.23 µm); Ra 32 µin. (0.8 µm) for nipples with NPT connections
- Cleaned and packaged for Oxygen service
- Maximum allowable leak rate: 1 x 10^{-9} mbar·l/s

Complete Pigtail Connections (Including Nipples, Nuts, Gaskets and Blank Plugs)

Dimensions are in. (mm).



1/4" Butt Weld (TB)



Male NPT

DIN Number	Assembly Basic Ordering Number	Gasket Basic Ordering Number	Dimensions, in.(mm)		
			L	F1	F2
1	-DIN1-TB4-A	-DIN1-GT	2.96 (75.2)	1 1/4 (31.8)	1 1/4 (31.8)
	-DIN1-NS4-A		4.25 (108)		
5	-DIN5-TB4-A	-DIN5-GT	3.09 (78.5)		
	-DIN5-NS4-A		4.41 (112)		
6	-DIN6-TB4-A	-DIN1-GT	2.96 (75.2)		
	-DIN6-NS4-A		4.25 (108)		
8	-DIN8-TB4-A	-DIN5-GT	3.09 (78.5)		
	-DIN8-NS4-A		4.41 (112)		
11	-DIN11-TB4-A	-DIN11-GT	2.88 (73.2)	7/8 (22.3)	11/16 (17.5)
	-DIN11-NS4-A		4.14 (105.2)		
14	-DIN14-TB4-A		2.88 (73.2)	1 1/16 (27.0)	7/8 (22.3)
	-DIN14-NS4-A		4.15 (105.5)		

Notes:
1. Above components can be ordered separately.
*2. PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number. Example: 6L-D1N1-TB4-A-**K***

Gas Connection Assignment Table②

GAS	Formula	UHP CGA	CGA	DIN	JIS
Ammonia	NH_3	720	705	DIN6	22-R
Argon	Ar	718	580	DIN6	22-R or 23-R
Arsenic Pentafluoride	AsF_5	642	—	—	—
Arsine	AsH_3	632	350	—	22-L
Boron Trichloride	BCl_3	634	660	DIN8	—
Boron Trifluoride	BF_3	642	330	DIN8	22-L
Carbon Dioxide	CO_2	716	320	DIN6	—
Carbon Monoxide	CO	724	350	DIN5	22-L
Chlorine	Cl_2	728	—	DIN8	26-R
Diborane	B_2H_6	632	350	—	22-L
Dichlorosilane	SiH_2Cl_2	636	678①	DIN5	—
Diethlyzinc	$Zn(C_2H_5)_2$	726	510①	—	—
Diethyltelluride	$(C_2H_5)_2Te$	726	—	—	—
Dimethylzinc	$(CH_3)_2Zn$	726	—	—	—
Disilane	Si_2H_6	632	—	—	—
Germane	GeH_4	632	350 or 660	—	—
Halocarbon 11	CCl_3F	716	660	—	—
Halocarbon 115	$ClCF_2CF_3$	716	660	DIN6	—
Halocarbon 12	CCl_2F_2	716	660	DIN6	—
Halocarbon 13	$ClCF_3$	716	660	DIN6	—
Halocarbon 14	CF_4	716	320 or 580	DIN6	—
Halocarbon 23	CHF_3	716	660	DIN6	—
Halocarbon 116	F_3CCF_3	716	660	—	—
Helium	He	718	580	DIN6	22-R or 23-R
Hydrogen	H_2	724	350	DIN1	22-L
Hydrogen Bromide	HBr	634	330	DIN8	26-R
Hydrogen Chloride	HCl	634	330	DIN8	26-R
Hydrogen Fluoride	HF	638	660 or 670	—	26-R
Hydrogen Sulfide	H_2S	722	330	DIN5	—
Krypton	Kr	718	580	DIN6	22-R or 23-R
Neon	Ne	718	580	DIN6	22-R or 23-R
Nitrogen	N_2	718	580	DIN10	22-R or 23-R
Nitrogen Trifluoride	NF_3	640	330 or 670	DIN8	—
Nitrous Oxide	N_2O	712	326	DIN8	—
Oxygen	O_2	714	540	DIN9	22-R or 23-R
Perfluoropropane	$CF_2(CF_3)$	716	660	—	—
Phosphine	PH_3	632	350 or 660	DIN1	—
Phosphorus Pentafluoride	PF_5	642	330 or 660	—	—
Silane	SiH_4	632	350	—	—
Silicon Tetrachloride	$SiCl_4$	636	—	—	—
Silicon Tetrafluoride	SiF_4	642	330	—	22-L
Sulphur Hexafluoride	SF_6	716	590	DIN6	26-R
Trichlorosilane	$SiHCl_3$	636	—	—	—
Triethylaluminum	$(C_2H_5)_3Al$	726	510①	—	—
Tungsten Hexafluoride	WF_6	638	670	DIN8	—
Xenon	Xe	718	580	DIN6	22-R

① *Refer to CGA organization specification for pressure limits.*
② *Information in this table is for reference only.*

C Technical References

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Conversion Factors C-05

Material Compatibility for Gases C-06

Ordering Details for Specialty Gas Equipment C-08

Common Terms and Definitions

Inlet Pressure

The pressure of media of gas or liquid on the inlet port of the regulator or valve;
Typical units of measure: psig, bar and MPa.

Outlet Pressure

The pressure of media of gas or liquid on the outlet port of the regulator or valve.

Accuracy

The variation in control pressure which occurs under steady state conditions within the control range of a regulator.

Sensitivity

The ability of a pressure regulator to respond to change in discharge conditions: pressure, flow, temperature, etc.

Flow Coefficient (Cv)

A flow coefficient that is numerically equal to the number of U.S. Gallons of water at 60°F/16°C that will flow through a valve or regulator in one minute when the pressure differential between the inlet and outlet is 1 psi. When gas is used instead of liquid, the equation is modified to account for the use of a compressible fluid. For a regulator, Cv is determined when the regulator is wide open and not regulating. When determining flow performance use actual flow curves.

Leakage - External

The loss of fluid from the external surfaces or joints of a regulator or valve. Example: From the body-bonnet-diaphragm joint. Leakage to atmosphere. The leakage rate is measured in mbar l/s Helium.

Leakage - Internal

The loss of fluid through a regulator or valve, between pressure zones normally expected to be sealed. Example: Between the inlet pressure and the outlet pressure zones.

Load Element

One of the three basic elements of a pressure reducing regulator. It provides the means by which the operator can set the force that determines the control pressure of a regulator. This element includes the spring and the stem.

Sensing Element

One of the three basic elements of a pressure reducing regulator. It senses the changes of the outlet pressure and acts as a physical connection between the load element and control element.

Control Element

One of the three basic elements of a pressure regulator to reduce the high inlet pressure to a stable lower outlet pressure by adjusting the orifice.

Diaphragm

One type of sensing elements, which is sensitive in reacting to outlet pressure change, normally used for gas media. Common material include elastomeric and metallic.

Piston

One type of sensing element. Used in high pressure regulators. Normally with O-ring seals.

Unbalanced Main Valve

Inlet pressure provides the majority of the shutoff force. The function of the main valve is to reduce the high inlet pressure to a lower outlet pressure.

Balanced Valve

A main valve designed to relieve the inlet force loading on the seat.

Venting

When the load pressure is relieved, the vent valve shall be opened by the downstream force to vent the downstream pressure.

Gas Purity Values

Type	Degree	Purity Value	Max. Contamination (ppm)
Pure	2.5	99.5%	5000
	3.0	99.9%	1000
High Purity	3.5	99.95%	500
	4.0	99.99%	100
	4.5	99.995%	50
	5.0	99.999%	10
	5.5	99.9995%	5
	6.0	99.9999%	1.0
Ultra High Purity	7.0	99.99999%	0.1

How to Use the FITOK Flow Chart

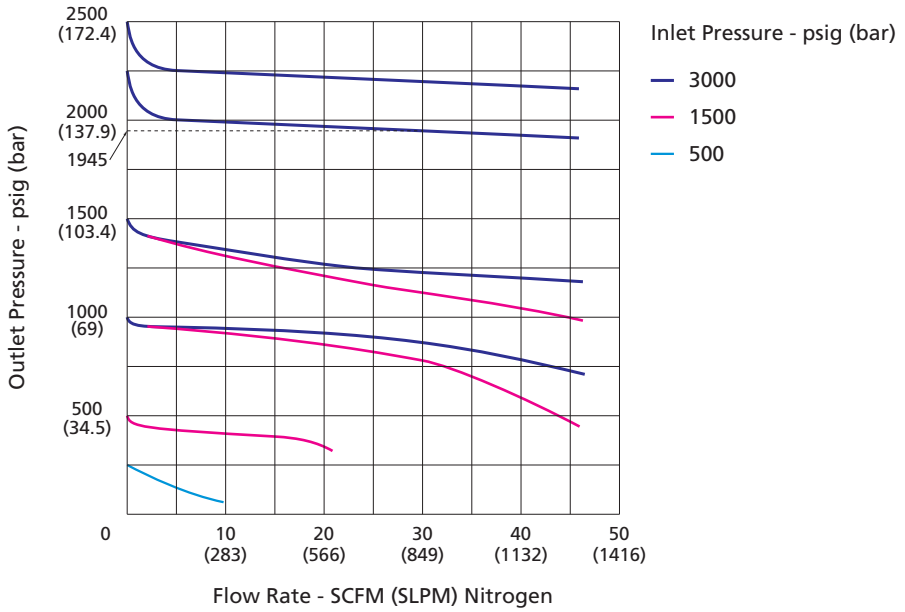
A FITOK Flow Chart is a graphic representation of test results, in curves, showing the changes in outlet pressure of a regulator with the varying flow rate basing on different inlet pressures. The regulator is so designed that at the time the outlet pressure reaches the set pressure, the flow rate would be zero. The inlet pressure is indicated on the right end of each curve.

To use the FITOK Flow Charts, the first step is to select the chart that fits the following:
- Regulator model
- Expected flow range
- Inlet pressure range
- Outlet pressure range

Subsequently, select a curve, if available, plotted for the exact inlet pressure and set pressure of the outlet (zero flow). Locate the set pressure on the vertical axis. Follow the curve until it crosses the vertical line corresponding to the desired flow rate. Read horizontally from the cross point to the vertical axis to locate the actual working pressure for this flow rate. If no curve is plotted for the exact pressure, extrapolate a new curve between and referring to the two closest existing curves.

Example:
Using the flow chart to determine the pressure drop (from the set pressure to the outlet pressure at 30 SCFM condition).
Given Conditions: Inlet pressure=3000 psig, Set pressure=2250 psig
Steps: 1. Locate the set pressure (2250 psig) with zero flow on the vertical axis;
2. Follow the curve until it crosses the vertical line corresponding to 30 SCFM;
3. Read horizontally from the cross point to the vertical axis. The corresponding pressure read is 1945 psig. Therefore, the pressure drop is 305 psig.

Flow Chart



Notes:
1. The performance of regulator is more accurate in the range where the curve is comparatively flat.
2. All test results on the FITOK Flow Charts are based on utilization of Nitrogen as a medium in standard testing conditions. Please contact FITOK for additional information.

Conversion Factors

Pressure

From \ To	psi	bar	atm	KPa	ft. of H_2O	in. of H_2O	mm of Hg	in. of Hg	Kg/cm^2
psi	1	0.068948	0.06805	6.89465	2.3089	27.708	51.175	2.036	0.070307
bar	14.5038	1	0.98692	100	33.4883	401.8596	750.062	29.53	1.0197
atm	14.696	1.01325	1	101.3171	33.932	407.1827	760	29.921	1.0332
KPa	0.14504	0.010	0.00987	1	0.33456	4.01472	7.5006	0.29613	0.0102
ft. of H_2O	0.433107	0.029891	0.02947	2.989	1	12	22.4198	0.882646	0.03048
in. of H_2O	0.03609	0.002499	0.00246	0.0249089	0.08333	1	1.86832	0.073556	0.00254
mm of Hg	0.019337	0.001333	0.00132	0.133322	0.044603	0.535240	1	0.03937	0.00136
in. of Hg	0.49115	0.033864	0.03342	3.376895	1.134	13.6	25.4	1	0.034532
Kg/cm^2	14.22334	0.980665	0.9678	98.03922	32.8084	393.7008	735.5592	28.95903	1

Flow

From \ To	cm^3/min	cm^3/sec	ft^3/hr	ft^3/min	m^3/hr	m^3/min	L/hr	L/min
cm^3/min	1	0.0166667	0.0021189	0.0000353	0.00006	0.000001	0.06	0.001
cm^3/sec	60	1	0.127134	0.0021189	0.0036	0.00006	3.6	0.06
ft^3/hr	471.9474	7.86579	1	0.0166667	0.0283168	0.0004719	28.31685	0.4719474
ft^3/min	28316.85	471.9474	60	1	1.699008	0.0283168	1699.008	28.31686
m^3/hr	16666.67	277.7778	35.31467	0.5885777	1	0.0166667	1000	16.66667
m^3/min	1000000	16666.67	2118.876	35.31467	60	1	60000	1000
L/hr	16.66667	0.2777778	0.0353147	0.0005885	0.001	0.0000167	1	0.0166667
L/min	1000	16.66667	2.118876	0.0353147	0.06	0.001	60	1

Density

From \ To	gms/cm^3	kg/m^3	lbs/ft^3	lbs/in^3	lbs/U.S. gal
gms/cm^3	1	1000	62.428	0.0361273	8.3454
kg/m^3	0.001	1	0.062428	3.61273×10^{-5}	0.0083454
lbs/ft^3	0.0160185	16.018463	1	5.78704×10^{-4}	0.13368
lbs/in^3	27.679905	27679.9	1728	1	231
lbs/U.S. gal	0.1198264	119.8264	7.4805195	0.004329	1

Material Compatibility for Gases

Media \ Material	Metals						Plastics				Elastomers	
	Copper	Brass	Aluminum	SS	Hastelloy C 22	Monel	PCTFE	Teflon PTFE	PEEK	Vespel	Viton	Buna-N
Acetylene	3	2	1	1	1	1	1	1	4	4	1	1
Ammonia	3	3	2	1	1	1	1	1	4	3	3	2
Argon	1	1	1	1	1	1	1	1	1	1	1	1
Argon/Methane	1	1	1	1	1	1	1	1	1	1	1	1
Arsine	3	2	3	1	1	1	1	1	4	4	1	4
Boron Trichloride	3	3	3	2	1	1	1	1	4	4	4	3
Boron Trifluoride	3	3	3	2	1	1	1	1	4	4	4	3
N-Butane	1	1	1	1	1	1	1	1	1	1	1	1
Carbon Dioxide	1	1	1	1	1	1	1	1	1	1	1	1
Carbon Monoxide	1	1	1	1	1	1	1	1	4	4	1	1
Chlorine	3	3	3	2	1	1	1	1	4	2	1	3
Deuterium	1	1	1	1	1	1	1	1	1	1	1	1
Diborane	1	1	1	1	1	1	1	1	1	1	1	3
Ethane	1	1	1	1	1	1	1	1	1	1	1	1
Ethylene	1	1	1	1	1	1	1	1	1	1	1	1
Fluorine	2	3	2	3	3	1	2	1	3	3	3	3
Hydrogen	1	1	1	1	1	1	1	1	1	1	1	1
Hydrogen Chloride	3	3	3	2	1	1	1	1	4	2	2	3
Hydrogen Flouride	3	3	3	3	2	1	1	1	4	4	4	3
Hydrogen Sulphide	3	3	3	1	1	4	4	4	4	4	1	4
Hydrogen Lodide	3	3	3	4	4	4	4	4	4	4	4	4
Helium	1	1	1	1	1	1	1	1	1	1	1	1
Hexafluoro Ethane	1	1	1	1	1	1	2	1	4	4	4	4

Codes

1 Recommended
2 Use with Limitations
3 Not Applicable
4 Insufficient Data

Material / Media	Metals						Plastics				Elastomers	
	Copper	Brass	Aluminum	SS	Hastelloy C 22	Monel	PCTFE	Teflon PTFE	PEEK	Vespel	Viton	Buna-N
Isobutene	1	1	1	1	1	1	1	1	1	1	1	1
Isobutane	1	1	1	1	1	1	1	1	1	1	1	1
Krypton	1	1	1	1	1	1	1	1	1	1	1	1
Methane	1	1	1	1	1	1	1	1	1	1	1	1
Methyl Chloride	4	4	3	1	1	4	4	1	4	4	1	3
Methyl Mercaptan	3	2	1	1	4	4	1	1	4	4	4	4
Neon	1	1	1	1	1	1	1	1	1	1	1	1
Nitrogen	1	1	1	1	1	1	1	1	1	1	1	1
Nitrous Oxide	1	1	1	1	1	1	2	1	1	1	1	1
Nitrogen Dioxide	4	2	2	1	4	2	1	1	4	4	4	4
Nitrogen Trifluoride	2	4	4	2	4	1	4	4	4	4	4	4
Nitrogen Monoxide	3	3	1	1	1	3	1	1	4	4	4	4
Phosphine	2	1	2	1	1	1	1	1	4	4	2	4
Propane	1	1	1	1	1	1	1	1	1	1	1	1
Propylene	1	1	1	1	1	1	1	1	1	1	1	3
Oxygen	1	1	1	1	1	1	1	1	1	1	1	1
Sulphur Dioxide	2	2	2	1	1	4	1	1	4	4	3	3
Sulphur Hexafluoride	1	1	1	1	1	1	1	1	1	1	1	1
Silane	1	1	1	1	1	1	1	1	4	4	1	4
Synthetic Air	1	1	1	1	1	1	1	1	1	1	1	1
Tetrafluoro Methane	1	1	1	1	1	1	1	1	4	4	1	4
Trifluoro Methane R23	1	1	1	1	1	1	1	1	4	4	4	4
Xenon	1	1	1	1	1	1	1	1	1	1	1	1

Codes

1 Recommended
2 Use with Limitations
3 Not Applicable
4 Insufficient Data

Ordering Details for Specialty Gas Equipment

Company _____

Name _____

Tel _____

E-mail _____

Application Information

Gas _____ Chemical formula _____ Purity _____

Upstream pressure _____ psig, _____ bar, _____ Mpa

Downstream pressure range _____ psig, _____ bar, _____ Mpa

Temperature _____°C _____°F Cv or flow rate _____

Application _____

_____

Pressure Regulator Data

Single-stage ☐ Dual-stage ☐

Material (mostly gas type dependent): Stainless Steel ☐ Brass ☐ Hastelloy ☐

◎ Cylinder pressure regulator ☐

Cylinder connection Yes ☐ No ☐

Purge unit Yes ☐ No ☐

◎ Panel and line pressure regulator ☐

2 ports ☐ 3 ports ☐ 4 ports ☐

◎ Pressure control panel ☐

Purge unit Yes ☐ No ☐

◎ Changeover system ☐

With line regulator Yes ☐ No ☐

◎ Point-of-use panel ☐

Warranty Information

FITOK products are backed by The FITOK Limited Lifetime Warranty. For a copy, contact FITOK Group or our authorized distributors.

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