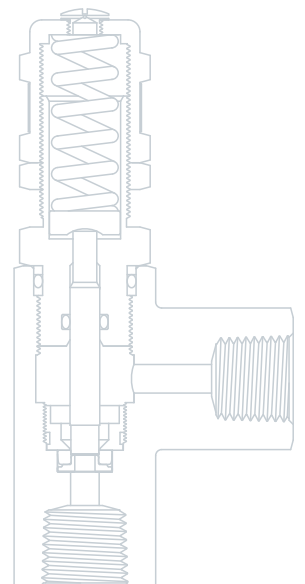
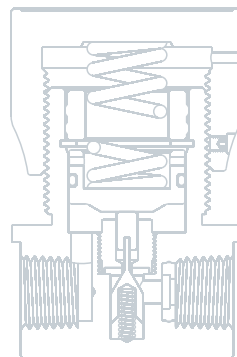
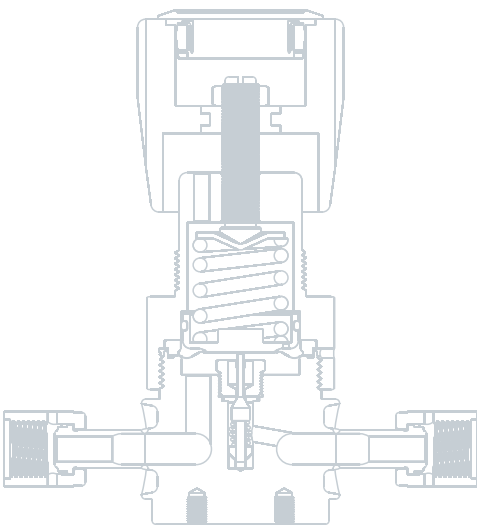


# FITOK

Full Technical Catalog  
For Specialty Gas Application



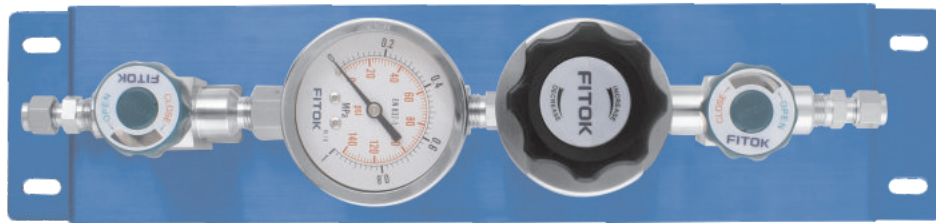
## Cylinder Pressure Regulators



## Line Pressure Regulators



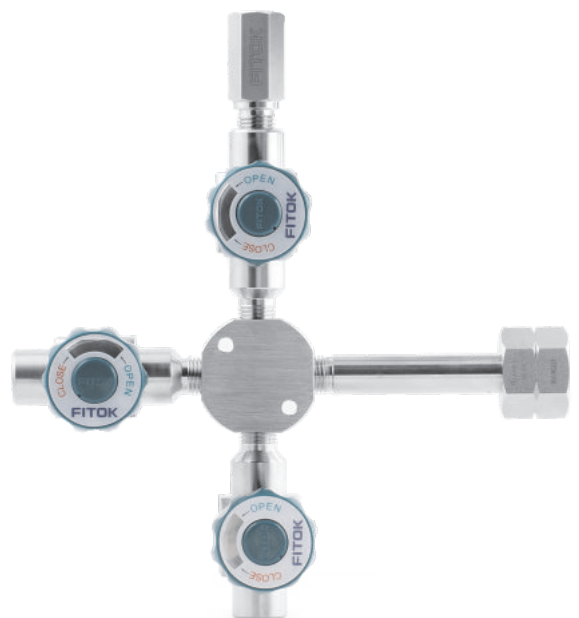
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## Changeover Systems



## Purge Assemblies



## Diaphragm Valves



## Ball Valves



## Needle Valves



## Check Valves



## Relief Valves



## Filters



## Fittings



## Cylinder Connections



A

Gas Control Equipment

B

Related Products

C

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# Gas Control Equipment



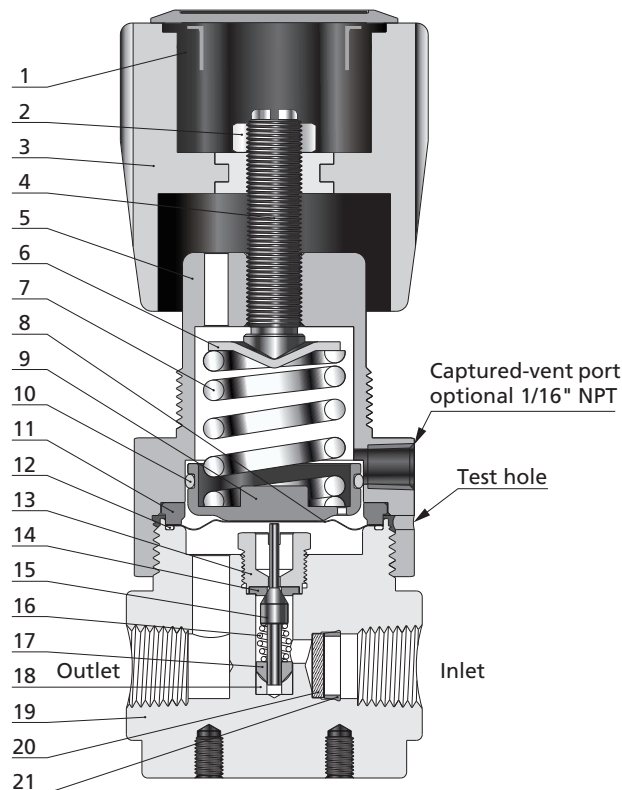
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# Regulators General Introduction

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.

## Diaphragm Regulators



Item	Component	Material/Specification
1	Hole Plug	ABS
2	Nut	Brass
3	Knob Handle	ABS
4	Range Screw	304 SS/ASTM A479 or Brass
5	Bonnet	304 SS/ASTM A479 or Brass
6	Spring Button	304 SS/ASTM A276
7	Range Spring	Alloy
8	Diaphragm	Hastelloy
9	Spring Plate	Aluminium alloy
10	O-ring	Buna-N
11	Gland	304 SS/ASTM A479
12	Seal Ring	PTFE/ASTM D1710
13	Seat Retainer	316L SS/ASTM A276
14	Seat	PCTFE/ASTM D1430
15	Lift Poppet	N10276/ASTM B574
16	Poppet Spring	Alloy X-750
17	Poppet Damper	PTFE/ASTM D1710
18	Friction Sleeve	316L SS/ASTM A479
19	Body	316L SS/ASTM A479 or 316 SS/ASTM A479 or Brass
20	Filter	316L SS
21	Retaining Ring	PTFE/ASTM D1710

## Features

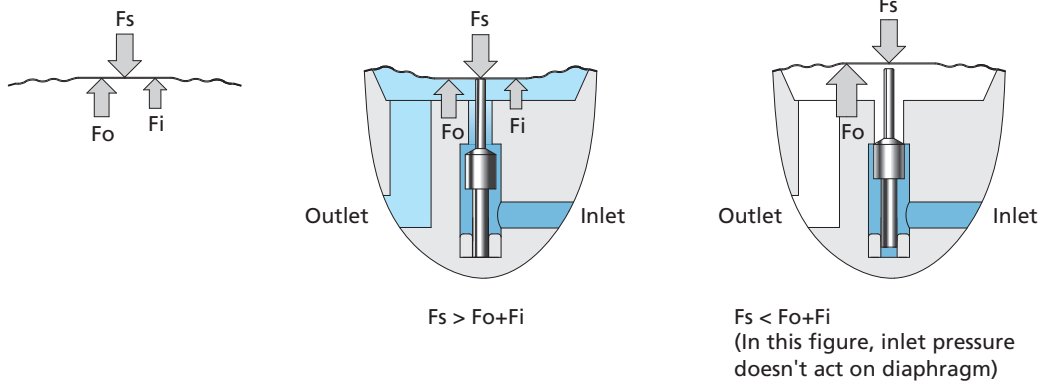
- Metal diaphragm pressure sensing mechanism ensures excellent sensitivity and set point pressure stability. Piston sensing mechanism (shown on the next page) capable of withstanding higher pressures
- The valve stem is designed with fine threads, allowing for precise adjustment of outlet pressure with low torque
- Poppet damper keeps the poppet positioned accurately and reduces vibration
- The regulator seat is easily damaged by contaminants in the system. 40  $\mu\text{m}$  filter is installed at the inlet to protect the regulator. FLR-3, FLR-5, and HPL-06 series are not fitted with filter, if there are particles in the media, a filter should be installed upstream
- FCR-1S, FLR-3, and FLR-5 series diaphragm regulators are fitted with a captured-vent port through which the media can be discharged to a designated location in the event of an accidental rupture of the regulator diaphragm

## Principle for Pressure Reducing

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

When the outlet pressure ( $F_o$ ) 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.

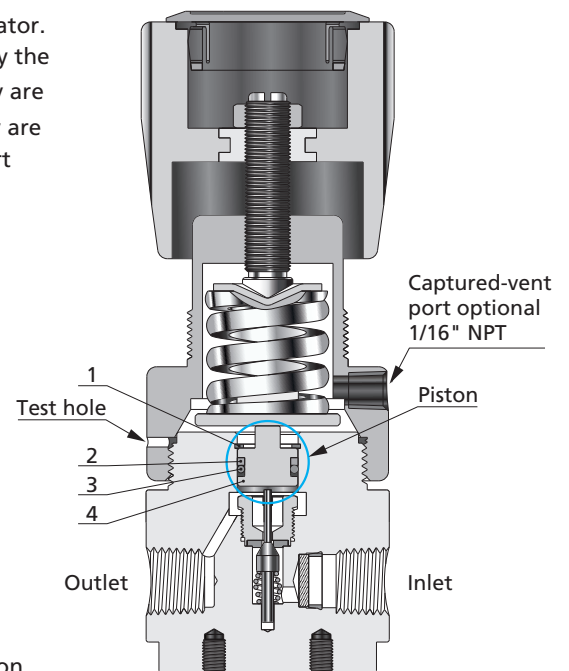
As soon as the outlet pressure ( $F_o$ ) exceeds the set pressure, the excess upstream force shall lift the poppet back to the seat to limit high pressure gas entering, so as to reduce the outlet pressure.



## Piston Regulators

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. Piston sensing mechanisms typically are used to regulate higher pressures than a diaphragm can withstand. They are also more resistant to damage caused by pressure spikes and have a short stroke to maximize cycle life.

Item	Component	Material/Specification
1	Circlips for Bores	Stainless Steel
2	Retaining Ring	PTFE/ASTM D1710
3	O-ring	FKM or FFKM
4	Piston	316L SS/ASTM A479



## Features

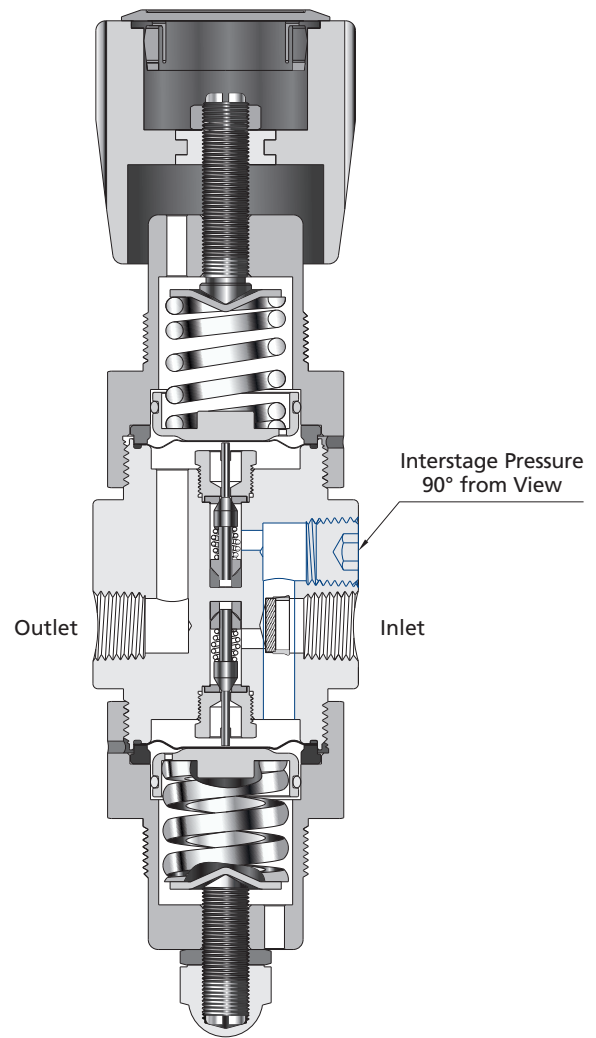
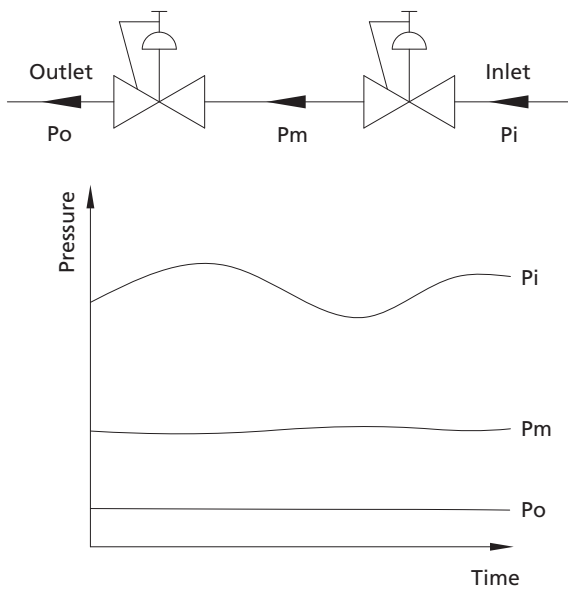
- ⦿ The piston sensing mechanism can withstand higher pressures, so piston regulators have a larger outlet pressure control range
- ⦿ FCR-2 and FLR-2 series piston regulators are fitted with a captured-vent port, through which the media can be discharged to a designated location in the event of accidental failure of the piston seal of the regulators
- ⦿ Piston regulators, except for FRB-1 series, are available with optional self-venting to allow excessive outlet pressure to be discharged



## Dual-Stage Diaphragm Regulators

When the inlet pressure ( $P_i$ ) decreases, the outlet pressure ( $P_o$ ) shall increase. Even though the increase may not be significant, the dual-stage regulator would be a better option when more stable pressure is 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.

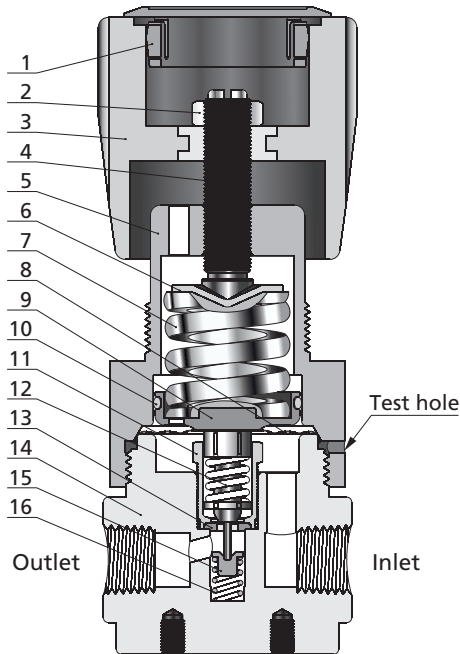


# Back Pressure Regulators

## General Introduction

Back pressure regulators control inlet pressure by balancing an adjustable spring force against the force of the inlet pressure. The spring force is adjusted by turning the handle/stem, which sets the desired inlet pressure.

### Back Pressure Diaphragm Regulators



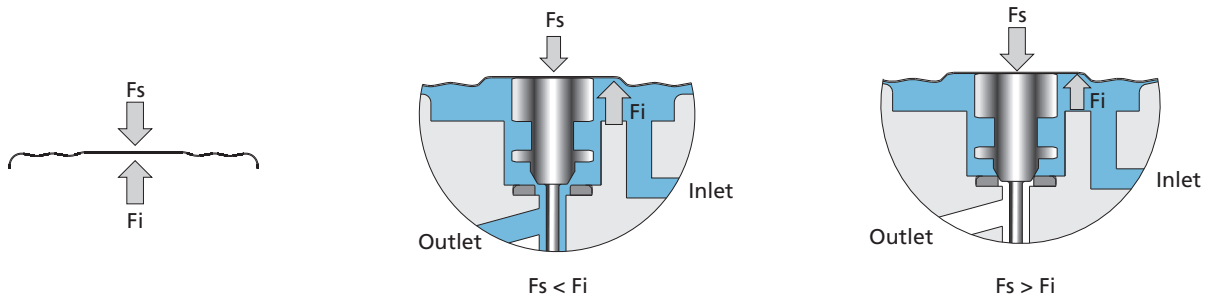
Item	Component	Material/Specification
1	Hole Plug	ABS
2	Nut	C36000/ASTM B16
3	Knob Handle	ABS
4	Range Screw	304 SS/ASTM A479 or Brass
5	Bonnet	304 SS/ASTM A479 or Brass
6	Spring Button	304 SS/ASTM A240
7	Range Spring	Alloy
8	Diaphragm	316L SS
9	Spring Plate	Aluminium alloy
10	O-ring	NBR
11	Seat Retainer	316L SS/ASTM A479
12	Lift Poppet	316L SS/ASTM A479
13	Seat	PCTFE/ASTM D1430
14	Body	316L SS/ASTM A479 or 316 SS/ASTM A479 or Brass
15	Friction Sleeve	316L SS/ASTM A479
16	Poppet Spring	316L SS/ASTM A313

### Features

- ☉ Metal diaphragm pressure sensing mechanism to ensure excellent sensitivity and stable set point pressures
- ☉ Stem designed with fine-pitch threads to enable precise spring adjustment with low torque
- ☉ Metal-to-metal diaphragm seal minimizes the potential for leakage

### Working Principle

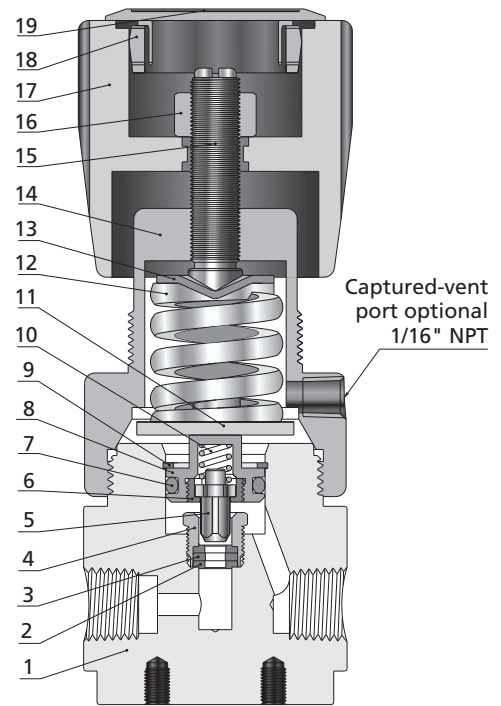
When the force ( $F_s$ ) acting on the diaphragm by the range spring is less than the force ( $F_i$ ) acting on the diaphragm by the inlet pressure, the lift poppet and the seat seal are separated, where the channel opens. When the force ( $F_s$ ) acting on the diaphragm by the range spring is greater than the force ( $F_i$ ) acting on the diaphragm by the inlet pressure, the lift poppet and the seat seal fit, where the channel closes.



## Back Pressure Piston Regulators

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. Piston sensing mechanisms typically are used to regulate higher pressures than a diaphragm can withstand. They are also more resistant to damage caused by pressure spikes and have a short stroke to maximize cycle life.

Item	Component	Material/Specification
1	Body	316L SS/ASTM A479 or Brass
2	Seat	PCTFE/ASTM D1430
3	Seat Gasket	316L SS/ASTM A479
4	Seat Retainer	316L SS/ASTM A479
5	Lift Poppet	316L SS/ASTM A479
6	Piston Nut	316L SS/ASTM A479
7	O-ring	NBR or FKM or FFKM
8	Piston	316L SS/ASTM A479
9	Circlips for Bores	304 SS/GB 893.126
10	Poppet Spring	316L SS
11	Spring Plate	Brass
12	Range Spring	Alloy
13	Spring Button	304 SS/ASTM A479
14	Bonnet	304 SS/ASTM A479 or Brass
15	Range Screw	Brass
16	Nut	Brass
17	Knob Handle	ABS
18	Hole Plug	ABS
19	Label	PVC



## Features

- Piston sensing mechanism can withstand higher pressures, so piston back pressure regulators have a larger inlet pressure adjustment range
- Stem designed with fine-pitch threads enables precise spring adjustment with low torque
- BPR-2 series piston back pressure regulators are equipped with capture-venting holes. When the piston seal of the back pressure regulator fails accidentally, the media can be released to a designated location through the capture-venting holes

## Series of Products

### Cylinder Pressure Regulators

Cylinder pressure regulators are typically used to reduce the high pressure in cylinders to a desired lower pressure.

### Line Pressure Regulators

Line pressure regulators are typically used to reduce the high pressure in pipelines to a desired lower pressure.

### Pressure Control Panels

The pressure control panels consist of a cylinder pressure regulator (FCR-1 or FCR-2 series) and a three-way diaphragm valve with cut-off, pressure reducing and vent functions. They are typically installed in gas storage areas to depressurize high pressure media from cylinders or tanks to a desired lower pressure.

### Changeover Systems

The changeover system switches between the two gas sources and selects one of them to supply gas to ensure the continuity of gas consumption.

There are manual changeover system and automatic changeover system.

Manual changeover system, when a gas source is exhausted, you need to manually switch to another gas supply.

Automatic changeover system, when a gas source is exhausted, the system automatically switches to another gas supply.

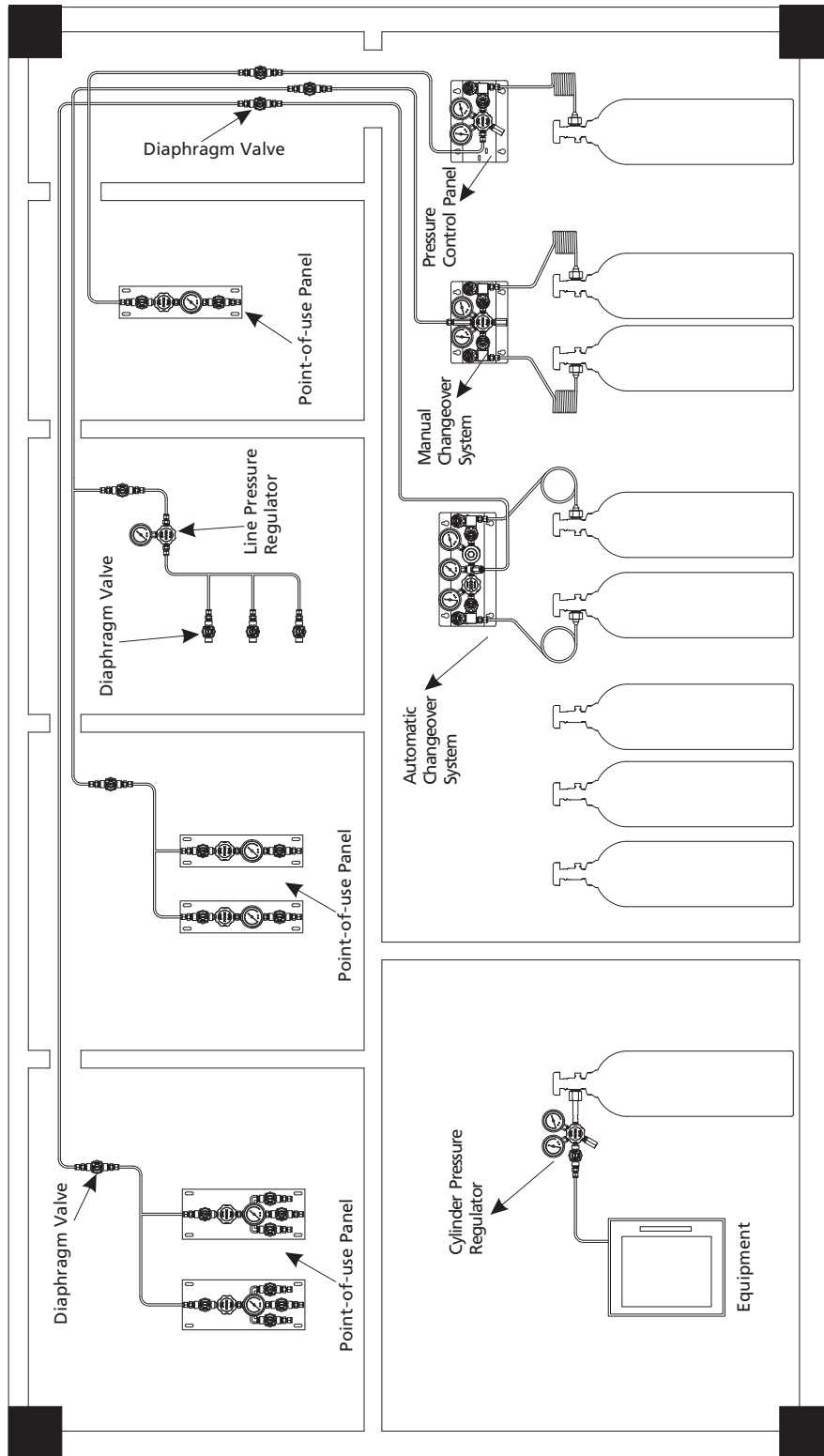
### Point-of-Use Panels

The point-of-use panels consist of a line pressure regulator (FCR-1 series or FCR-1S series) and a diaphragm valve with cut-off and pressure reducing functions. They are typically installed in a gas point to precisely adjust the system to a desired pressure.

### Back Pressure Regulators

Back pressure regulators are used to control system back pressure and are typically used in analytical and metering systems.

# Products Practical Application



## Pressure Regulator Selection Guide

Select diaphragm regulators when the outlet pressure < 500 psig.

Select piston regulators when the outlet pressure  $\geq$  500 psig.

Dual-stage diaphragm regulators are recommended when the inlet pressure fluctuates frequently but no outlet pressure variation is desired.

Type	Series	Sensing Mechanism	Maximum Inlet Pressure psig	Outlet Pressure Range psig	Flow Rate Cv
Cylinder Pressure Regulators	FCR-1	Diaphragm	4500	0-500	0.06
	FCR-1S	Diaphragm	4500	0-200	0.06
	FCR-2	Piston	6000	0-2500	0.06
	FCR-1D	Dual-stage Diaphragm	4500	0-250	0.05
Line Pressure Regulators	FLR-1	Diaphragm	1500	0-250	0.14
	FLR-2	Piston	4500	0-1000	0.06 0.1 (Vent)
	FLR-3	Diaphragm	3000	0-200	1.0
	FLR-5	Diaphragm	500	0-150	1.8
	FBR-1	Piston	6000	0-1800	0.06
	HPR-10	Piston	10000	10-10000	0.06
	HPL-06	Piston	4500	0-1500	2.0
High Performance High Purity Pressure Regulators	FHR-1	Diaphragm <sup>①</sup>	3500	0-150	0.06 0.15 (Inlet pressure 600, 1000)
Ultra High Purity Miniature Pressure Regulators	FHR-M	Diaphragm <sup>①</sup>	145	0-60	0.06
Steam Heated Vaporizing Pressure Regulators	VPR	Diaphragm	3600	0-500	0.06
Pressure Control Panels <sup>②</sup>	FSR-1	Diaphragm	4500	0-500	0.06
	FSR-2	Piston	4500	0-2500	0.06 0.1 (Vent)
Changeover Systems <sup>②</sup>	FDR-1	Diaphragm	4500	0-500	0.06
	FDR-2	Piston	4500	0-2500	0.06 0.1 (Vent)
	CEPR	Diaphragm	4500	85-265	0.06
	FDR-1L	Diaphragm	4500	85-265	0.06
	DPPR	Diaphragm	4500	0-150	0.06
	FDR-1T	Diaphragm	4500	0-150	0.06
Point-of-Use Panels <sup>②</sup>	FPR-1	Diaphragm	1500	0-500	0.14
	FPR-1S	Diaphragm	1500	0-200	0.06
Back Pressure Regulators	BPR-1	Diaphragm	250	0-250	0.3
	BPR-2	Piston	1000	10-1000	0.3
	BPR-3	Piston	10000	5-10000	0.25

### Notes:

① Tied Diaphragm.

② Sensing mechanism of pressure control panels, changeover systems and point-of-use panels refers to the sensing mechanism of the pressure regulator.

## User's Guide

1. Pressure regulators are sensitive components, so handle them gently and do not bump them.
2. Pressure regulators with bottom mounting or panel mounting type available, when panel mounting is selected, handles of some series products need to be removed for installation. When removing the handle, ensure that the handle and stem positions are not changed, otherwise the outlet pressure range will not be the same as the factory setting.
3. Before the pressure regulators are connected to the piping system, the system must be purged to remove impurities from the system, such as iron filings from tubing cutting or welding slag from tubing welding.
4. If the media contain impurities, a filter must be installed upstream, otherwise the impurities will damage the pressure regulators, which will lead to the failure of the pressure regulating function of the pressure regulators and the continuous increase of downstream pressure. The downstream pressure will continue to rise and damage the downstream pressure gauge or other equipment. FITOK FT series 15  $\mu\text{m}$  filters are recommended.
5. Do not allow any loose thread sealing tape or thread sealant to enter the pressure regulators when it is installed.
6. Figure out the inlet and outlet when installing the pressure regulators.
7. After the pressure regulators are connected to the pipeline, make sure that the pressure regulators are in the closed position by turning the handle before using the pressure regulators. For pressure regulators, turn the handle counterclockwise until it is loosened to the closed position.
8. Check connections for leakage by applying leak detection fluid to all connections, turning the handle clockwise to set the outlet pressure to the desired pressure, and observing the connections for leakage.
9. If the pressure regulators are used for liquid media, the filter element installed at the inlet of the pressure regulators may clog and cause a pressure drop and flow reduction. It is recommended to remove the filter element and install a filter upstream the inlet of the pressure regulators.

# Cylinder Pressure Regulators

## FCR-1 Series General Diaphragm Regulators

### Features

- ⦿ Excellent sensitivity and set point pressure stability
- ⦿ Reduced inner capacity
- ⦿ 40 µm filter installed at inlet (face seal connection excluded)
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

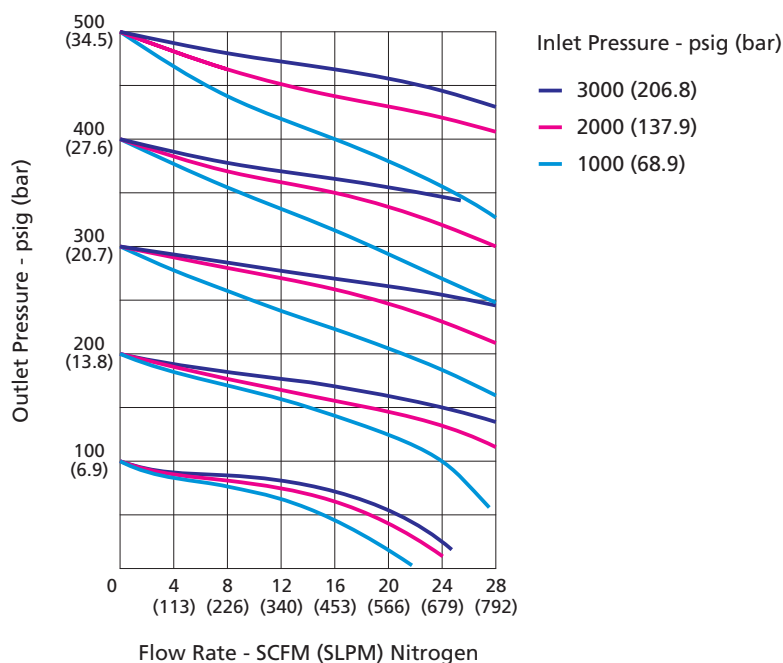


Model: FCR-16L-30-100-C330-B-B-00-R-P

### 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 (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.06
- ⦿ Weight (regulator only):  $\approx 1.98$  lbs (0.9 kg)

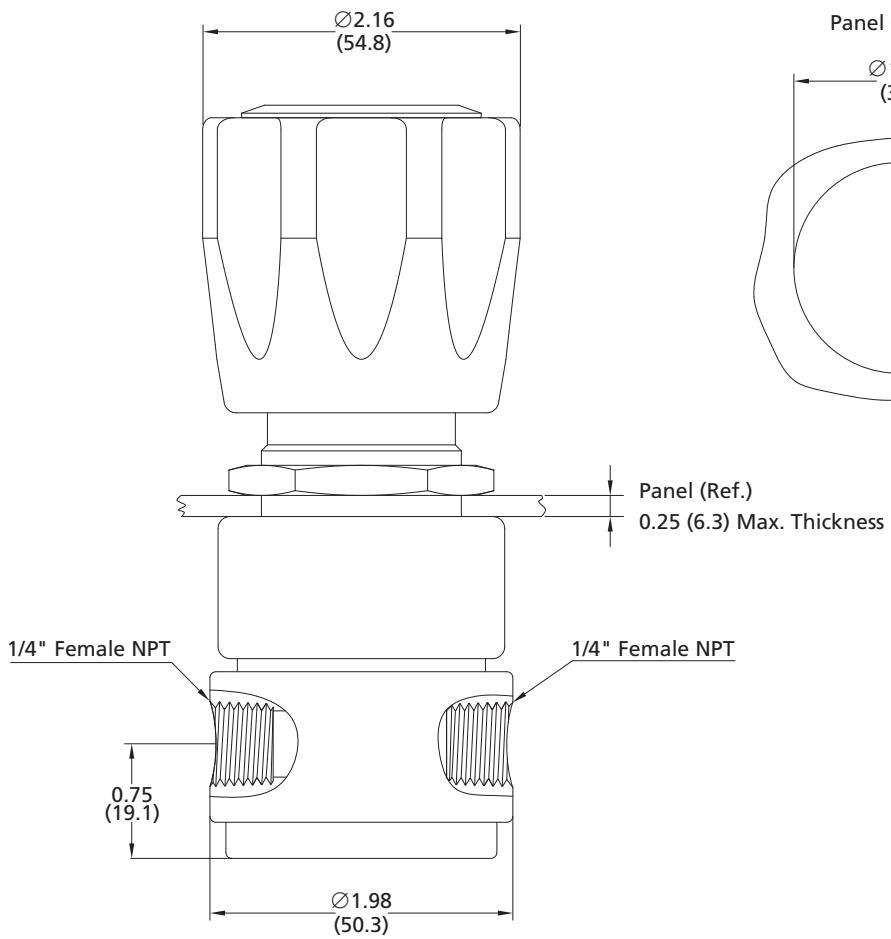
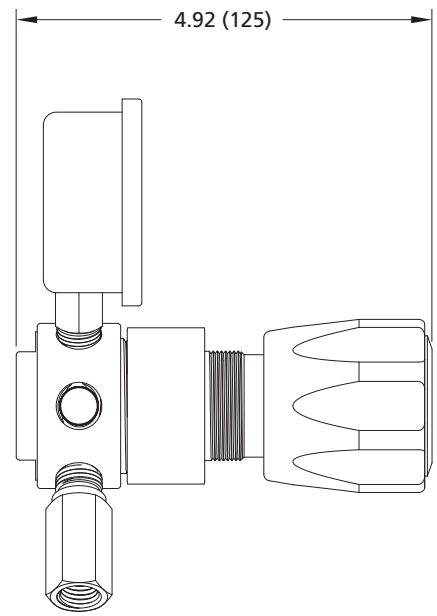
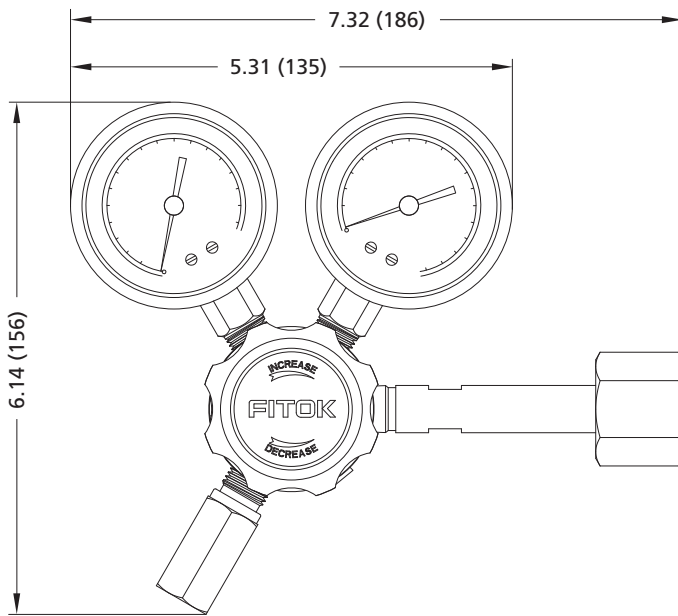
### Typical Flow Chart

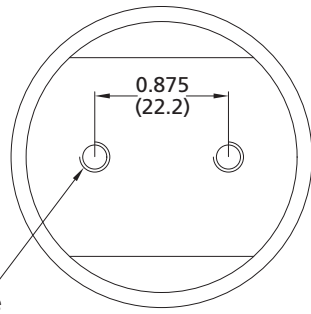




## Dimensions

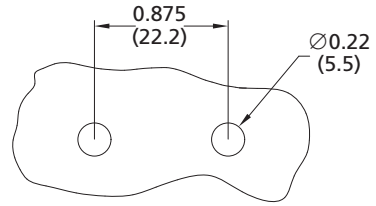
Dimensions, in inches (millimeters), are for reference only.



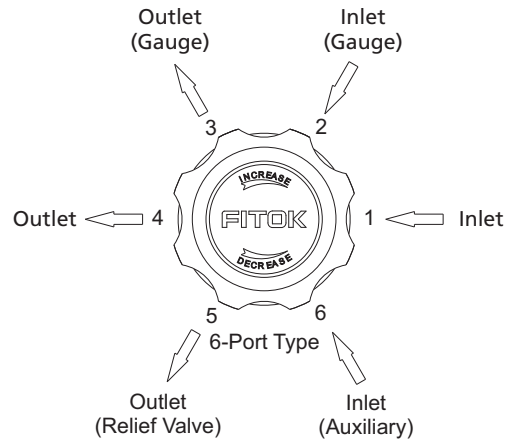
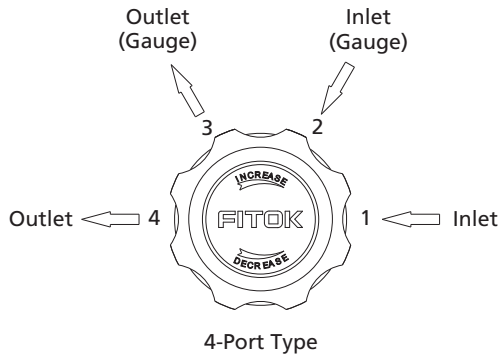
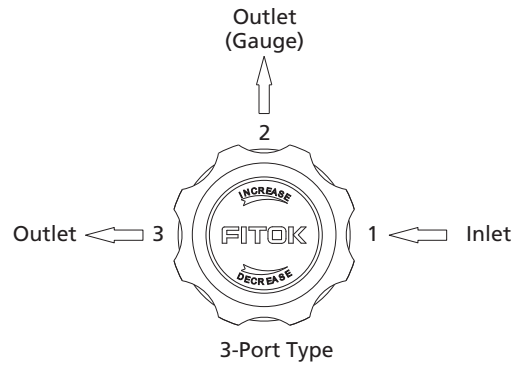
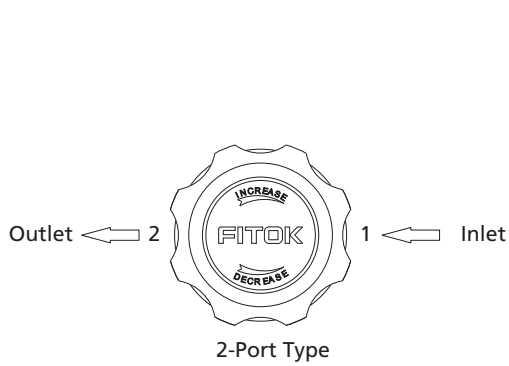


2×M5×0.8-6H Thread  
The holes are compatible with 10-32 mounting screws

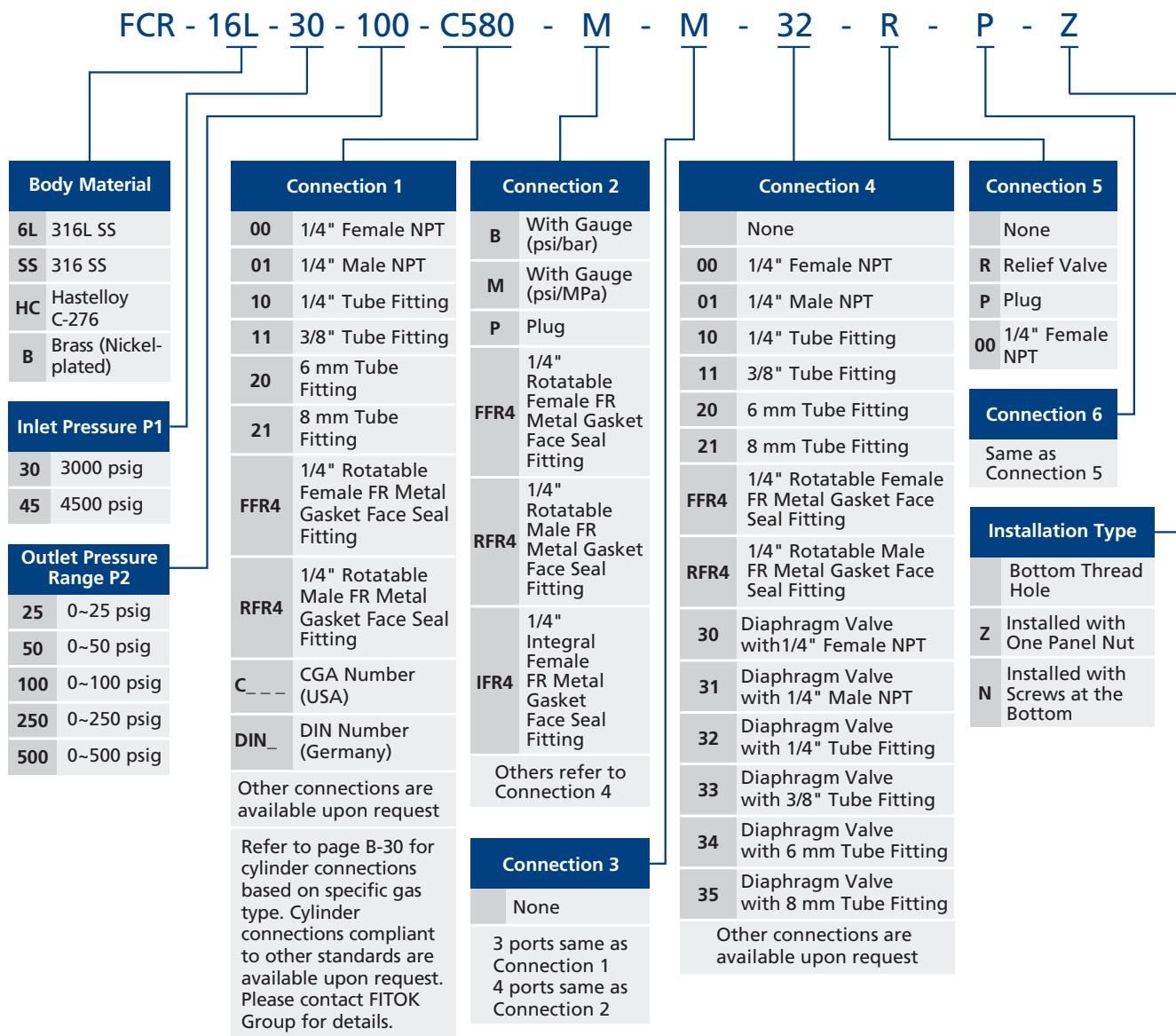
Bottom Panel Cut-Out



## Port Configurations



## Ordering Number Description



**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. For face seal connection, the connection and body are orbital-welded integral structure. The pressure gauge is installed on "RFR4" connection by default.
4. For connections other than face seal connection, the body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

Examples of part number:

- a. 2-port type (1 in, 1 out): FCR-16L-45-100-C580-00, FCR-16L-45-100-RFR4-RFR4
- b. 3-port type (1 in, 2 out): FCR-16L-30-500-C330-B-00, FCR-16L-45-100-FFR4-B-FFR4
- c. 4-port type (2 in, 2 out): FCR-1B-45-250-00-B-B-34, FCR-16L-45-250-RFR4-B-B-RFR4

# Cylinder Pressure Regulators

## FCR-1S Series Sensitive Diaphragm Regulators

### Features

- ⦿ Large diameter convoluted diaphragm to increase pressure sensitivity
- ⦿ 40 µm filter installed at inlet
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

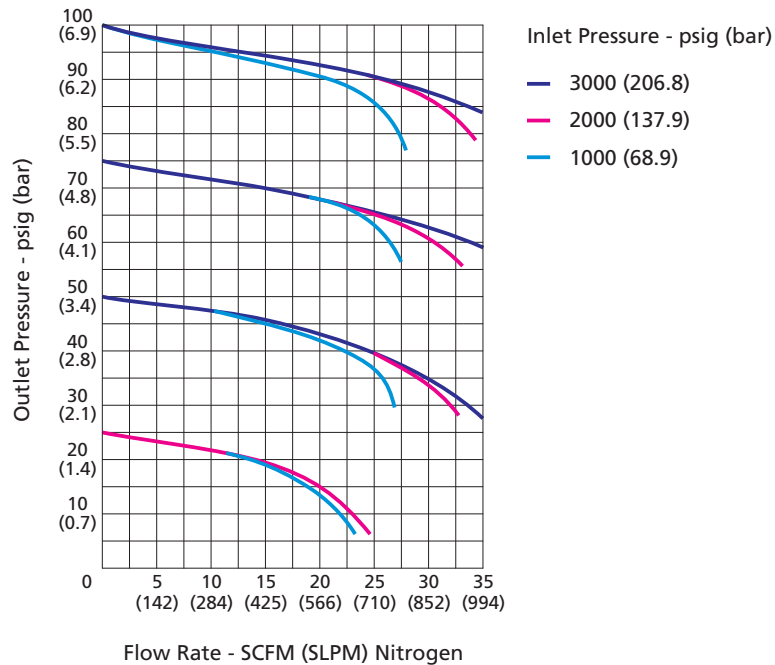
### Technical Data

- ⦿ 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: Hastelloy
  - Filter: 316L
- ⦿ Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- ⦿ Leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.06
- ⦿ Weight (regulator only):  $\approx 2.87$  lbs (1.3 kg)



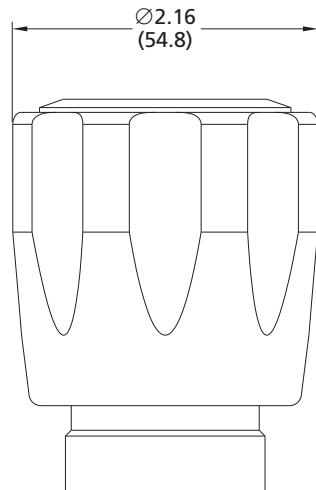
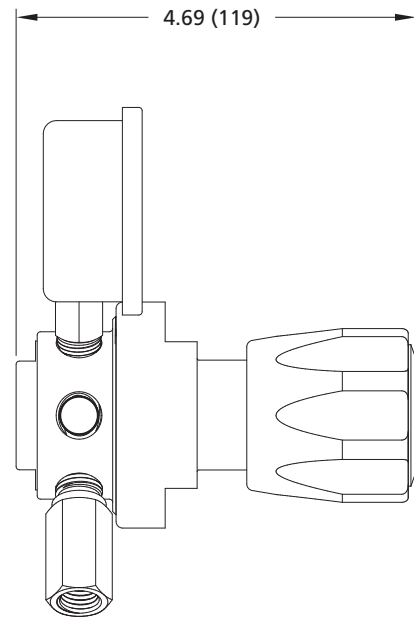
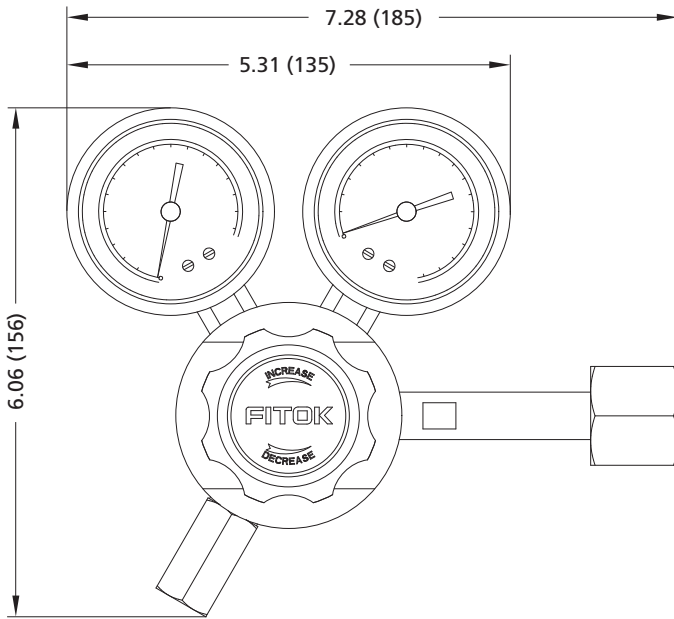
Model: FCR-156L-30-50-C580-B-B-00-R-P

### Typical Flow Chart

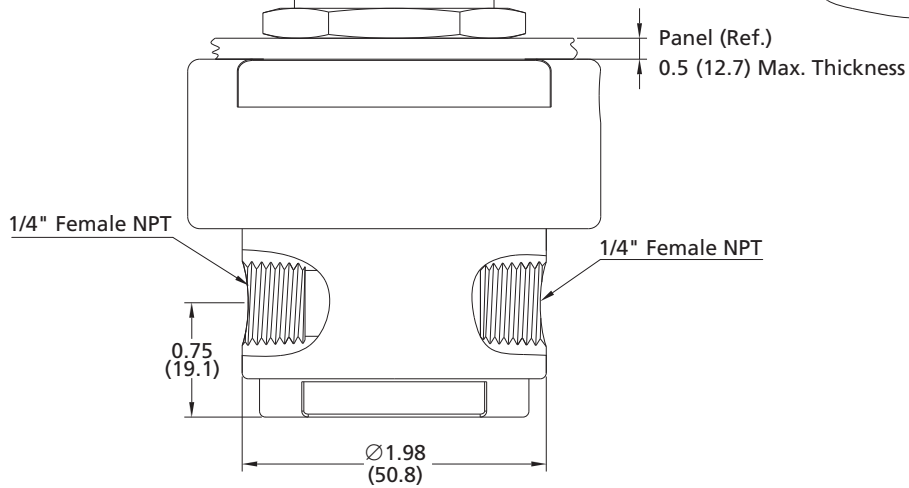
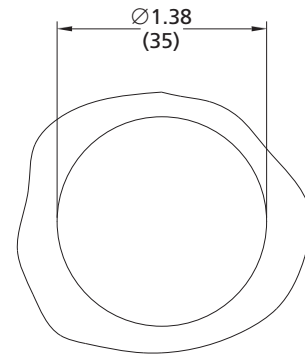


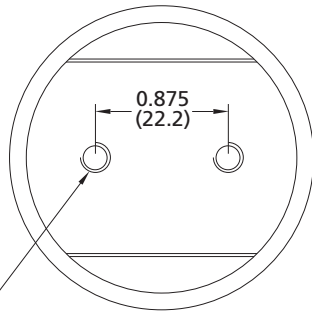
## Dimensions

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



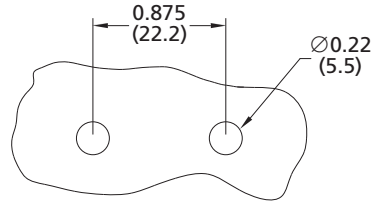
Panel Cut-Out



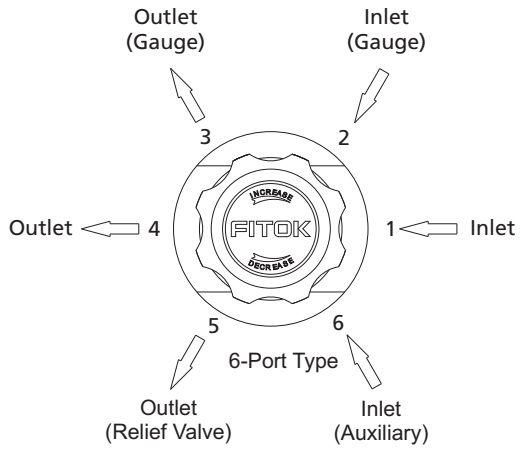
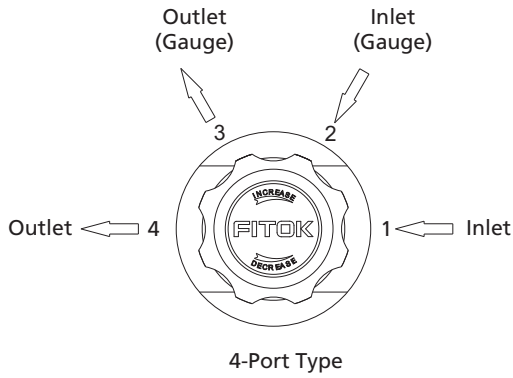
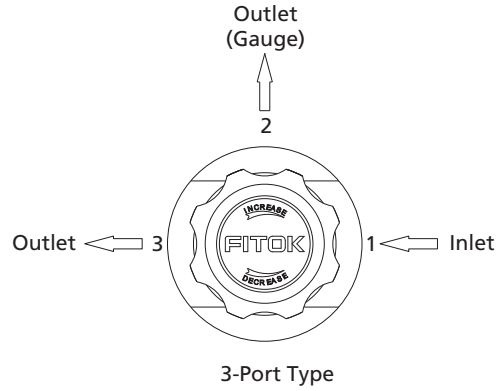
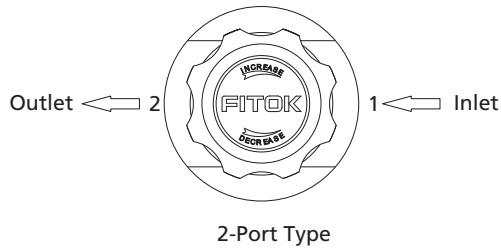


2xM5x0.8-6H Thread  
The holes are compatible with 10-32 mounting screws

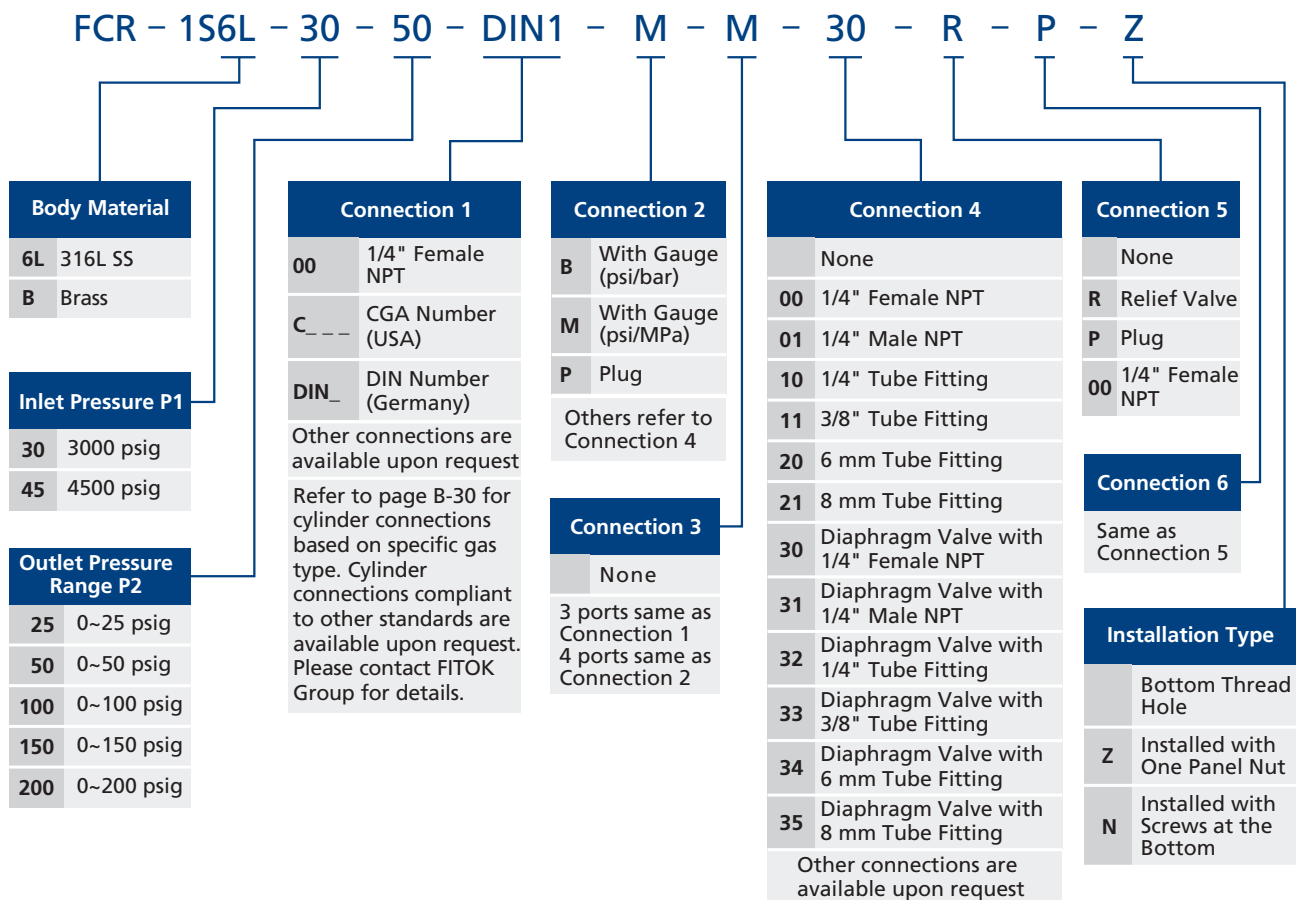
Bottom Panel Cut-Out



## Port Configurations



## Ordering Number Description



Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

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 General Piston Regulators

### Features

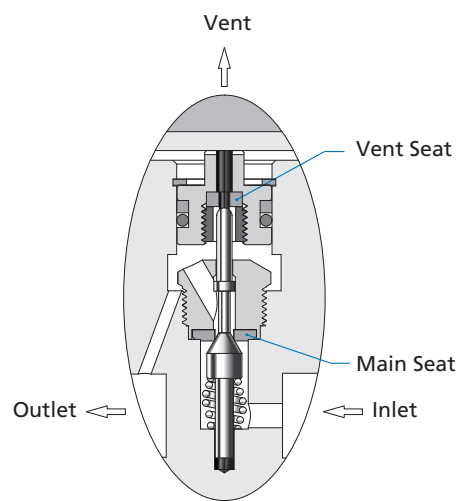
- ⦿ Piston sensing design with greater outlet pressure adjustment range
- ⦿ Reduced inner capacity
- ⦿ 40 µm filter installed at inlet
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres



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

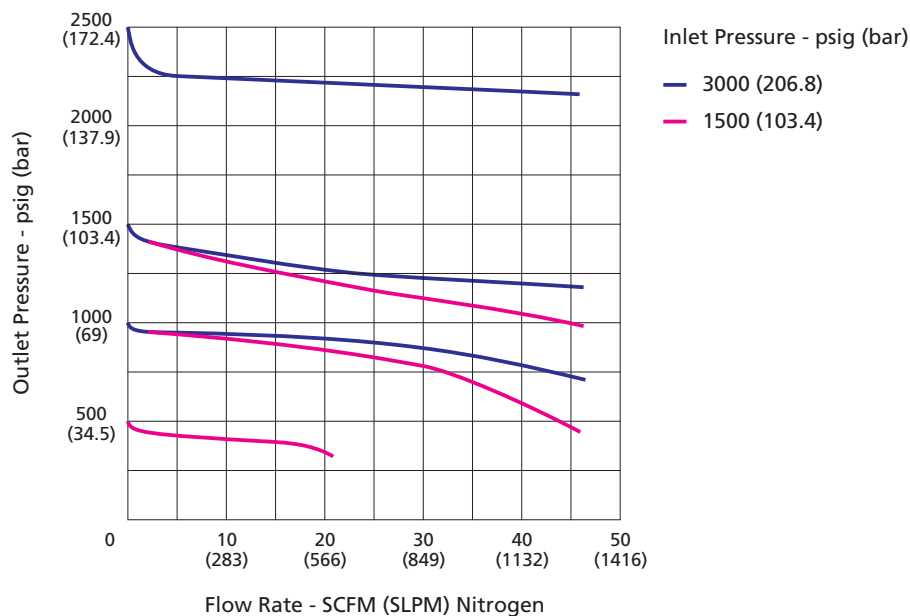
### Technical Data

- ⦿ 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:
  - Without venting Model: Main seat PCTFE
  - Venting Model: Main seat PEEK, vent seat PCTFE
  - Vent Seat: PCTFE
  - Piston: 316L
  - O-ring: FKM or FFKM
  - 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)



Construction Drawing with Venting Model

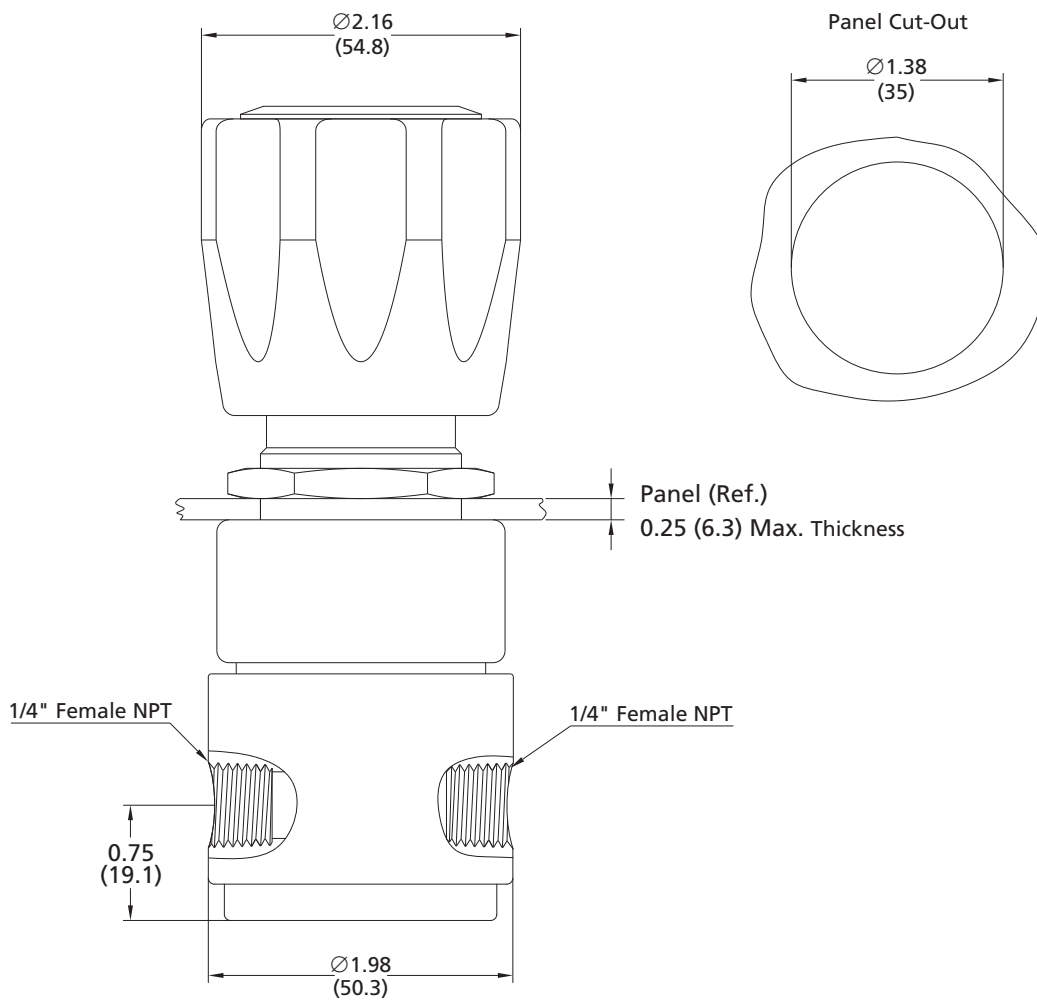
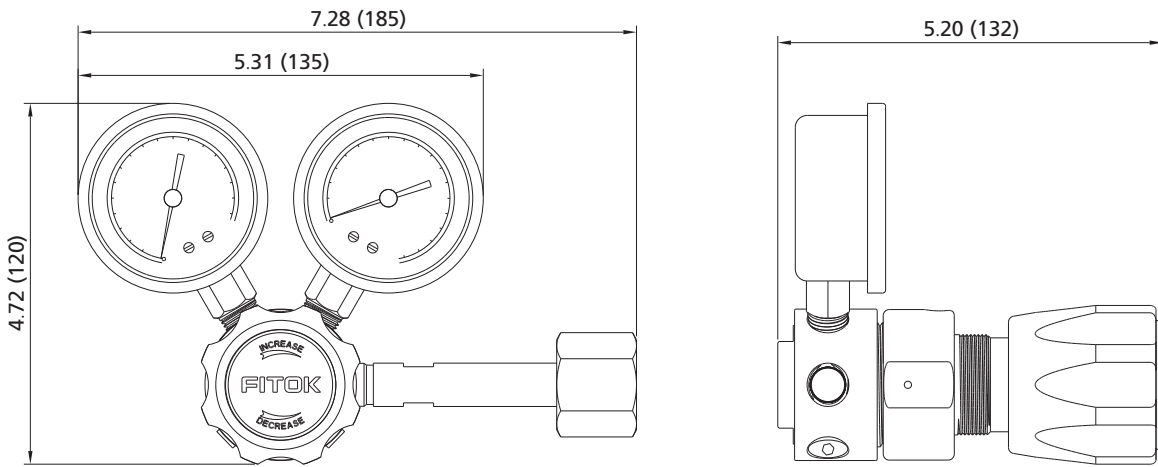
### Typical Flow Chart

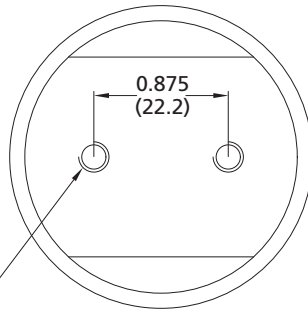




## Dimensions

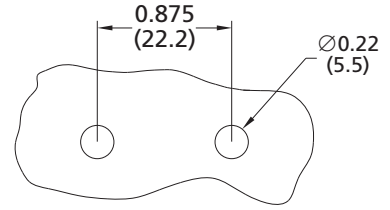
Dimensions, in inches (millimeters), are for reference only.



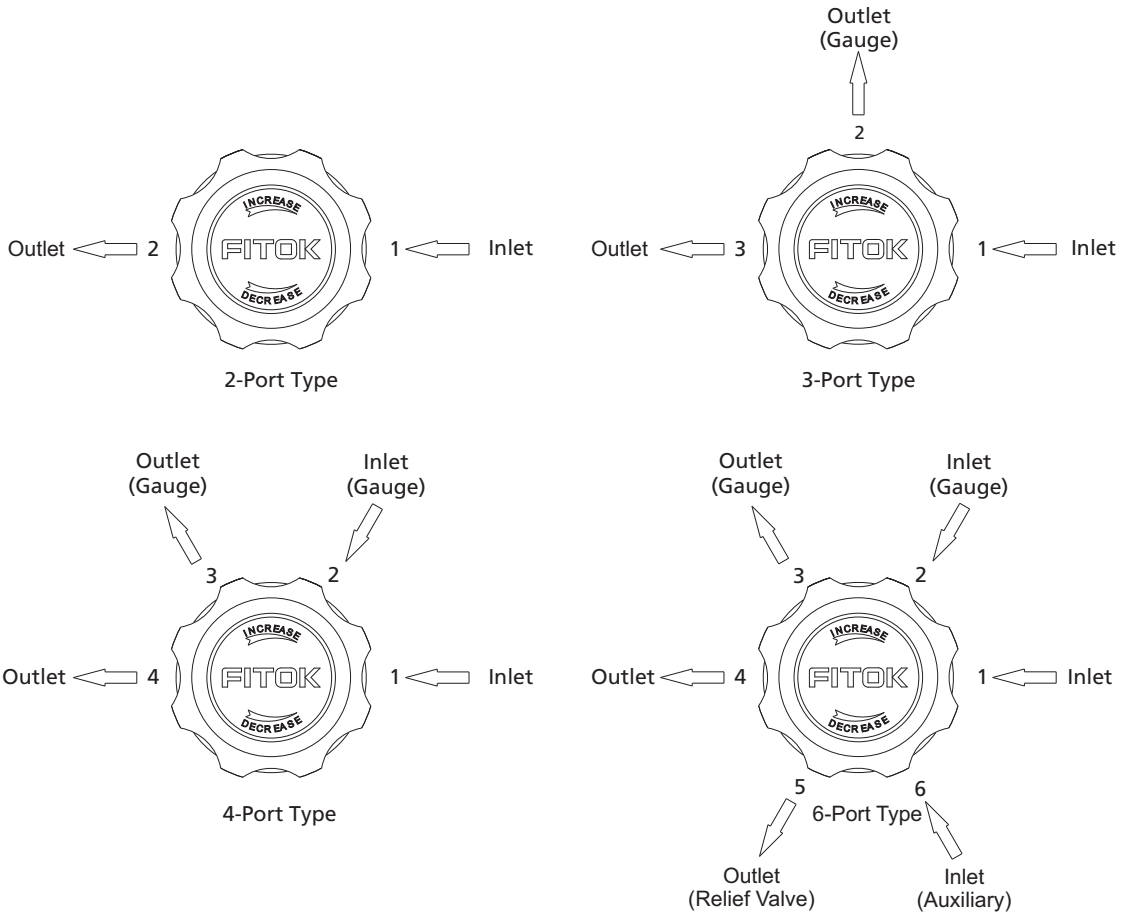


2×M5×0.8-6H Thread  
The holes are compatible with 10-32 mounting screws

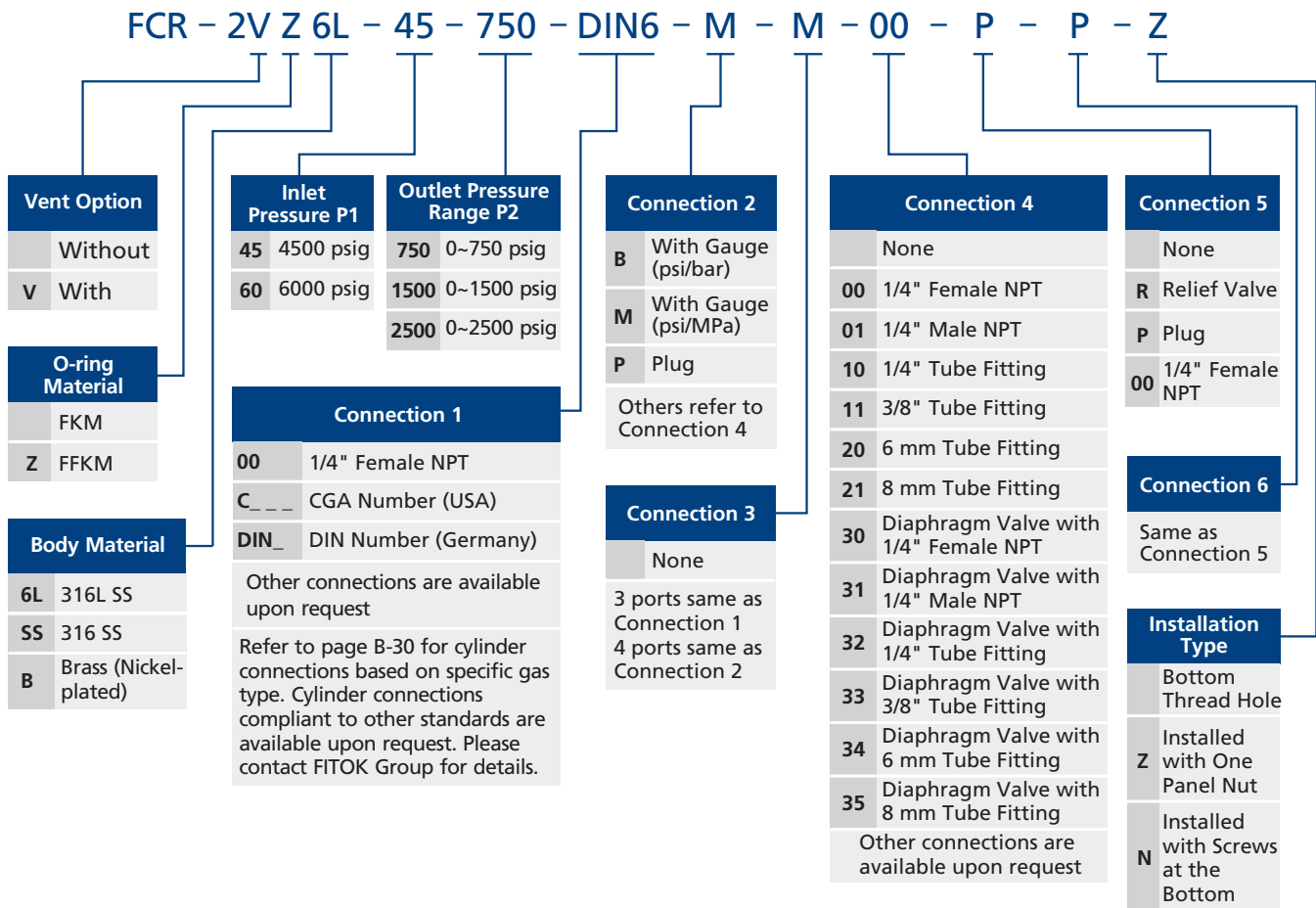
Bottom Panel Cut-Out



## Port Configurations



## Ordering Number Description



**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. The body Connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

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
- ⦿ 40 µm filter installed at inlet (face seal connection excluded)
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

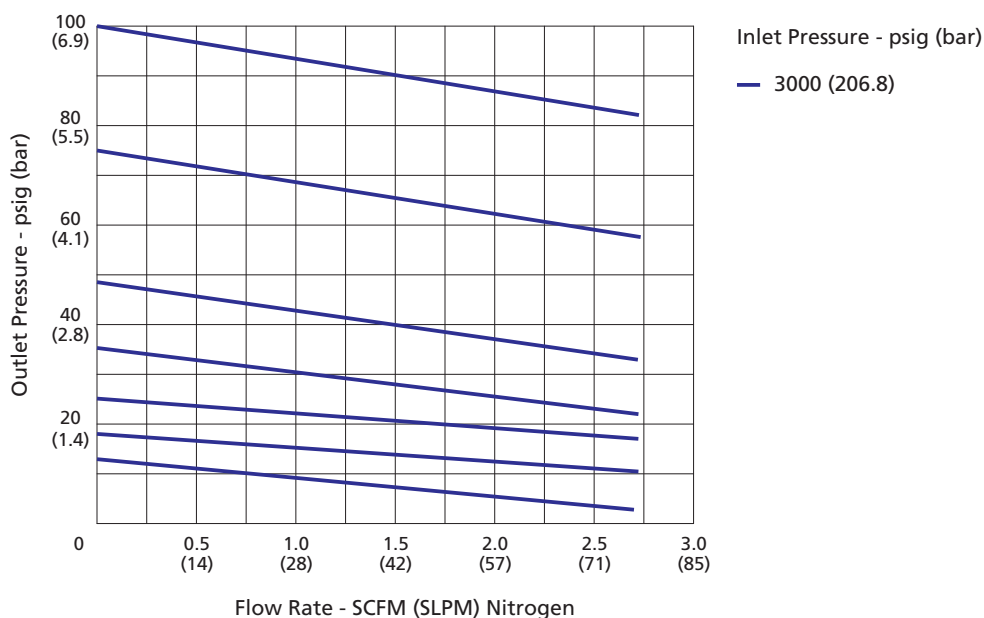


Model: FCR-1D6L-30-100-C660-B-B-00-R-P

### Technical Data

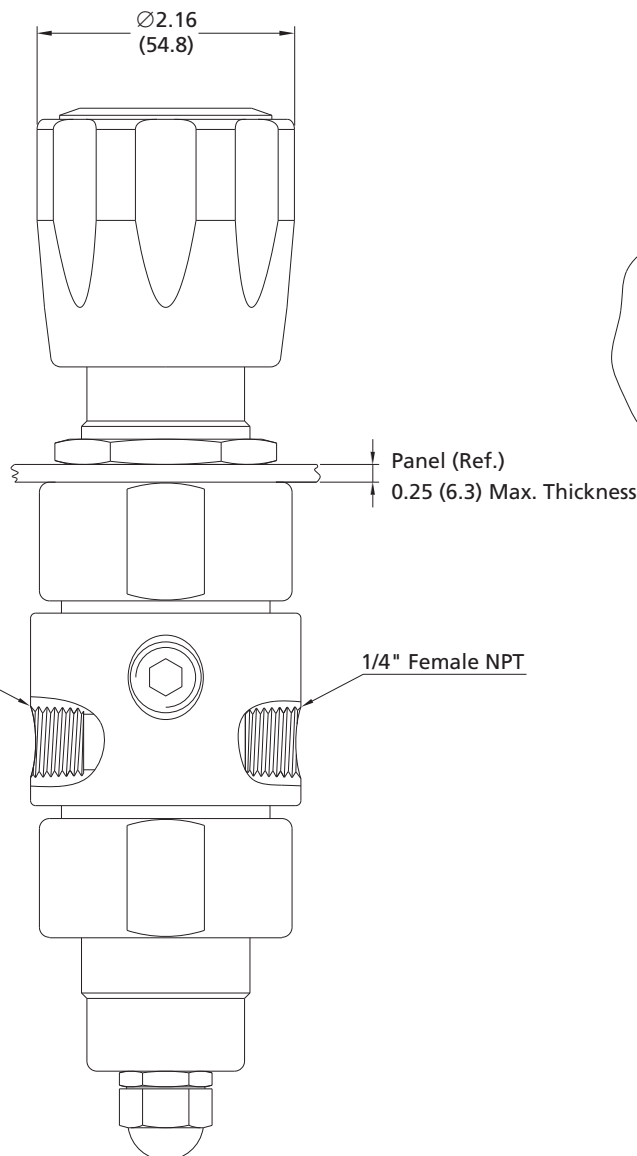
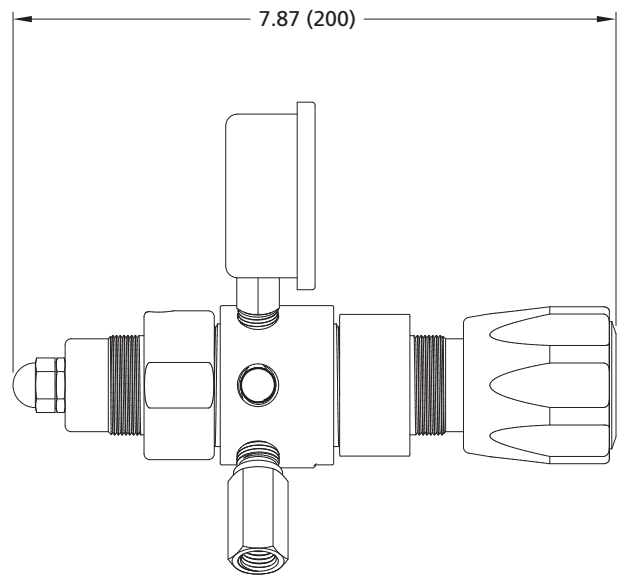
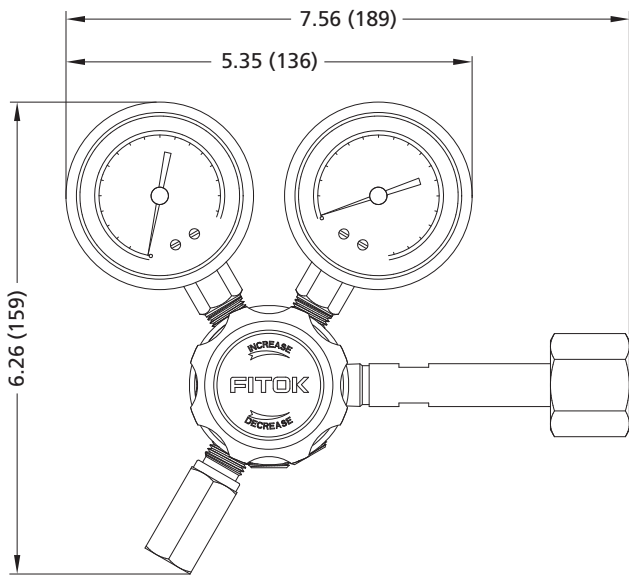
- ⦿ Maximum inlet pressure: 3000 or 4500 psig
- ⦿ 1st stage outlet pressure range: 480 ~ 500 psig  
2nd stage outlet pressure range: 0 ~ 25, 0 ~ 50, 0 ~ 100, 0 ~ 150, 0 ~ 250 psig
- ⦿ Material of the internal components:  
Seat: PCTFE  
Diaphragm: Hastelloy  
Filter: 316L
- ⦿ Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- ⦿ Leak rates (helium):  
Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s  
External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.05
- ⦿ Weight (regulator only):  $\approx 3.3$  lbs (1.5 kg)

### Typical Flow Chart

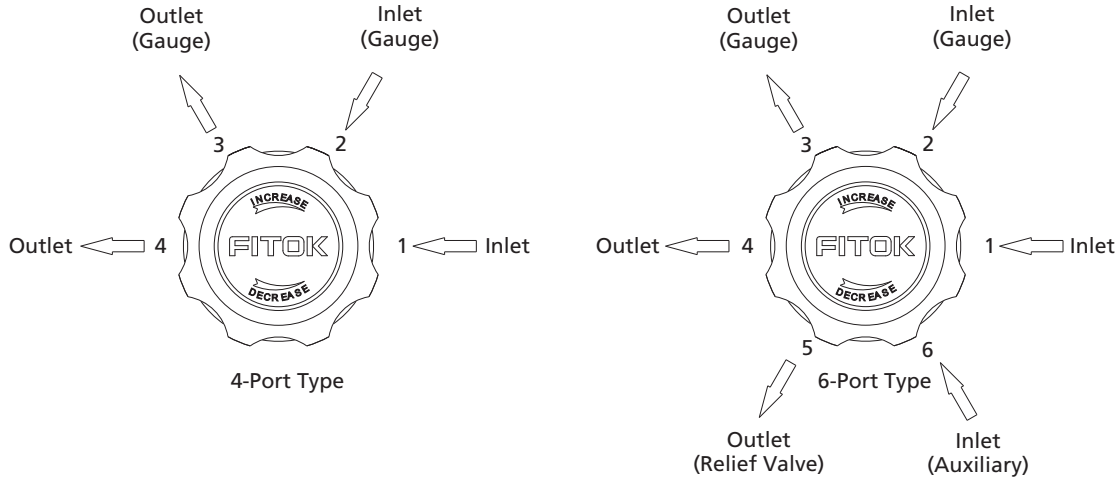


## Dimensions

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



## Port Configurations



## Ordering Number Description

F C R - 1 D 6 L - 3 0 - 1 0 0 - C 3 5 0 - B - B - 3 0 - R - P - Z

Body Material	Connection 1	Connection 2	Connection 4	Connection 5
6L 316L SS	00 1/4" Female NPT	B With Gauge (psi/bar)	None	None
SS 316 SS	C_--- CGA Number (USA)	M With Gauge (psi/MPa)	00 1/4" Female NPT	R Relief Valve
HC Hastelloy C-276	DIN_ DIN Number (Germany)	P Plug	01 1/4" Male NPT	P Plug
B Brass (Nickel-plated)	FFR4 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	00 1/4" Female NPT	10 1/4" Tube Fitting	00 1/4" Female NPT
	RFR4 1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	FFR4 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	11 3/8" Tube Fitting	
	Other connections are available upon request	RFR4 1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	20 6 mm Tube Fitting	<b>Connection 6</b>
	Refer to page B-30 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.	IFR4 1/4" Integral Female FR Metal Gasket Face Seal Fitting	21 8 mm Tube Fitting	Same as Connection 5
		Others refer to Connection 4	FFR4 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	<b>Panel Mounting</b>
			RFR4 1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	No
			30 Diaphragm Valve with 1/4" Female NPT	Z Yes
			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	

Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.
- For face seal connection, the connection and body are orbital-welded integral structure. The pressure gauge is installed on "RFR4" connection by default.
- For connections other than face seal connection, the body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

Examples of part number: a. 4-port type (2 in, 2 out): FCR-1DB-45-150-DIN1-B-B-30, FCR-1D6L-45-150-FFR4-B-B-FFR4  
 b. 6-port type (3 in, 3 out): FCR-1D6L-30-50-C580-B-B-00-R-P

# Line Pressure Regulators

## FLR-1 Series General Diaphragm Regulators

### Features

- ⦿ Excellent sensitivity and set point pressure stability
- ⦿ Reduced inner capacity
- ⦿ 40 μm filter installed at inlet (face seal connection excluded)
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

### 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 (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.14
- ⦿ Weight (regulator only):  $\approx 1.98$  lbs (0.9 kg)



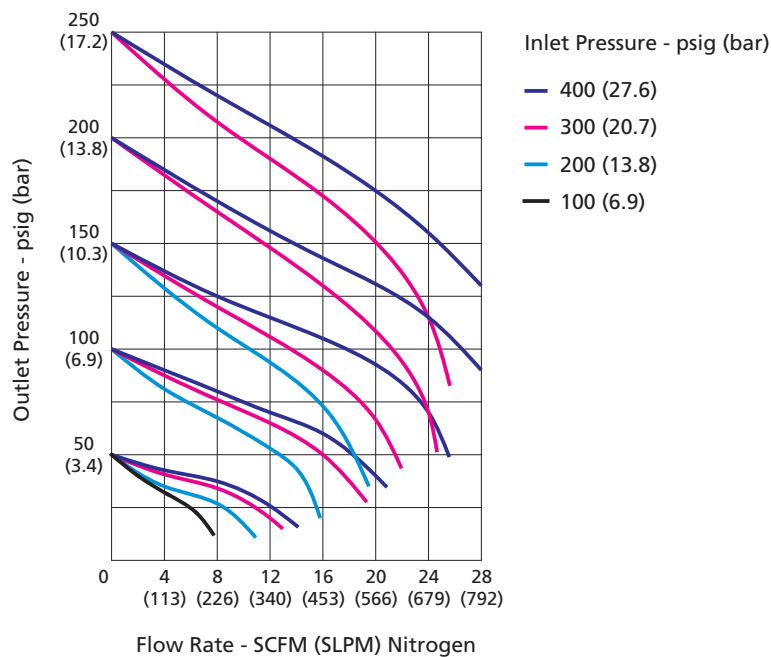
Model: FLR-16L-15-100-00-00-Z

Gas Control Equipment

Related Products

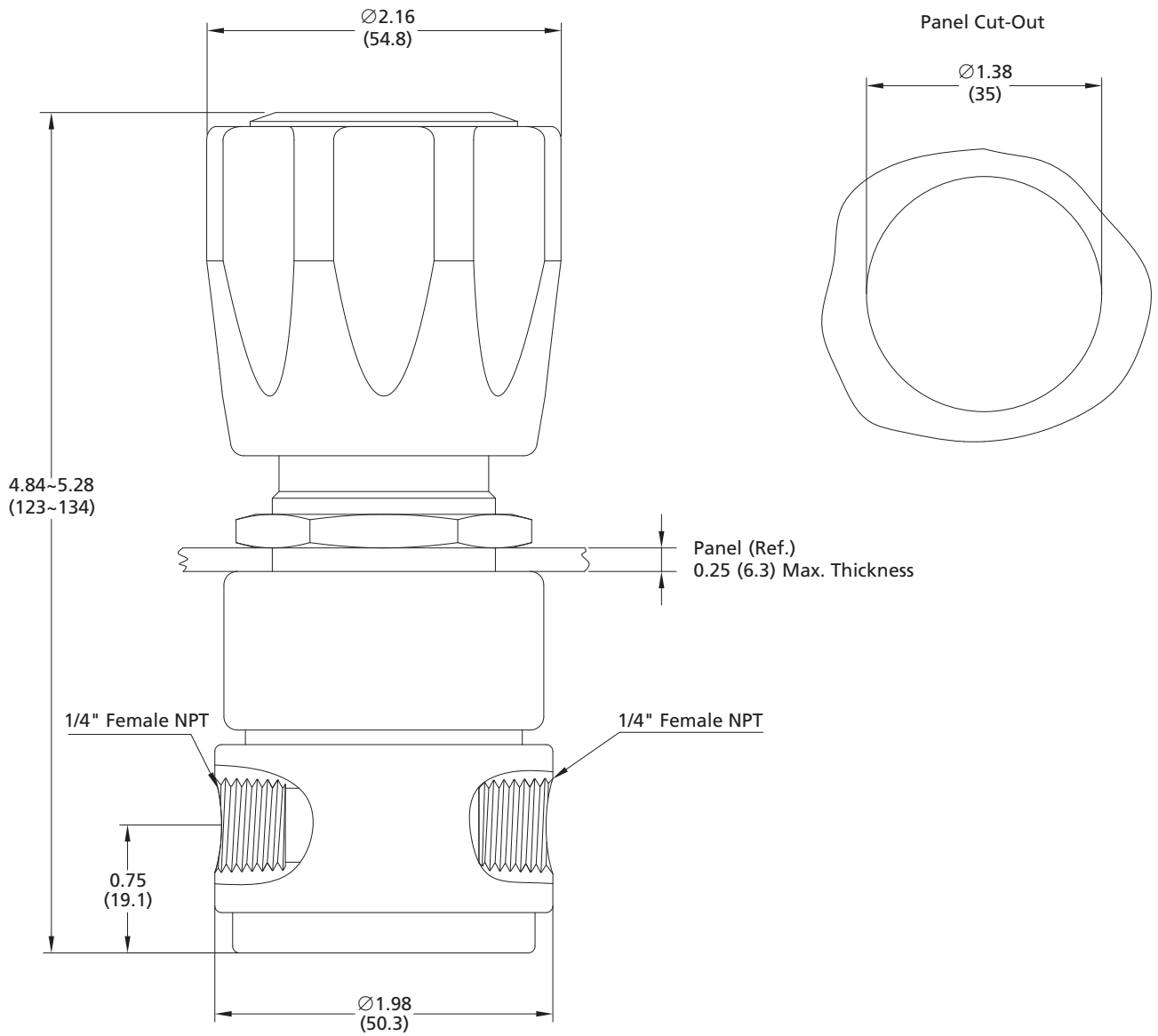
Technical References

### Typical Flow Chart

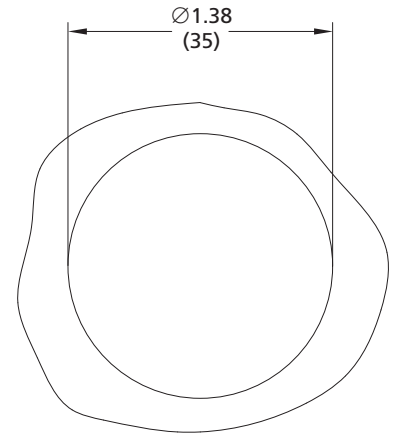


## Dimensions

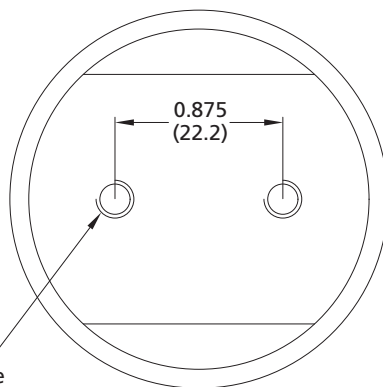
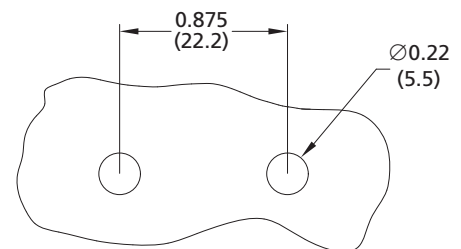
Dimensions, in inches (millimeters), are for reference only.



Panel Cut-Out



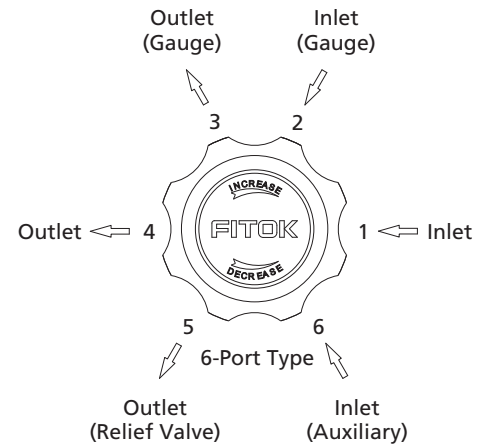
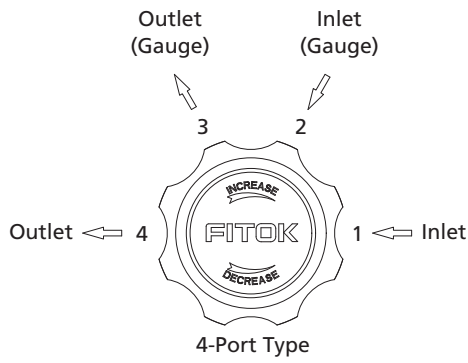
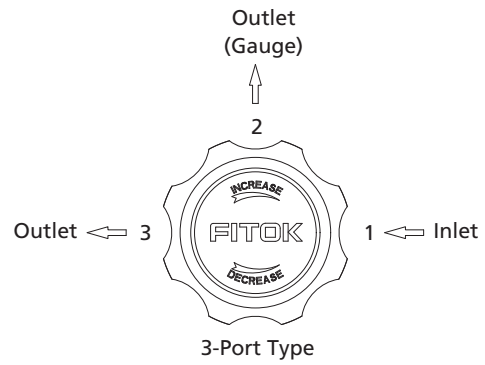
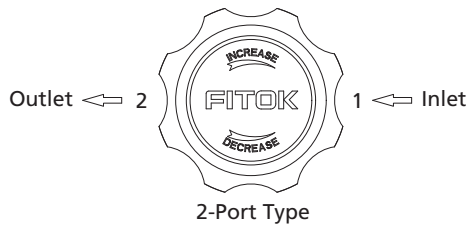
Bottom Panel Cut-Out



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

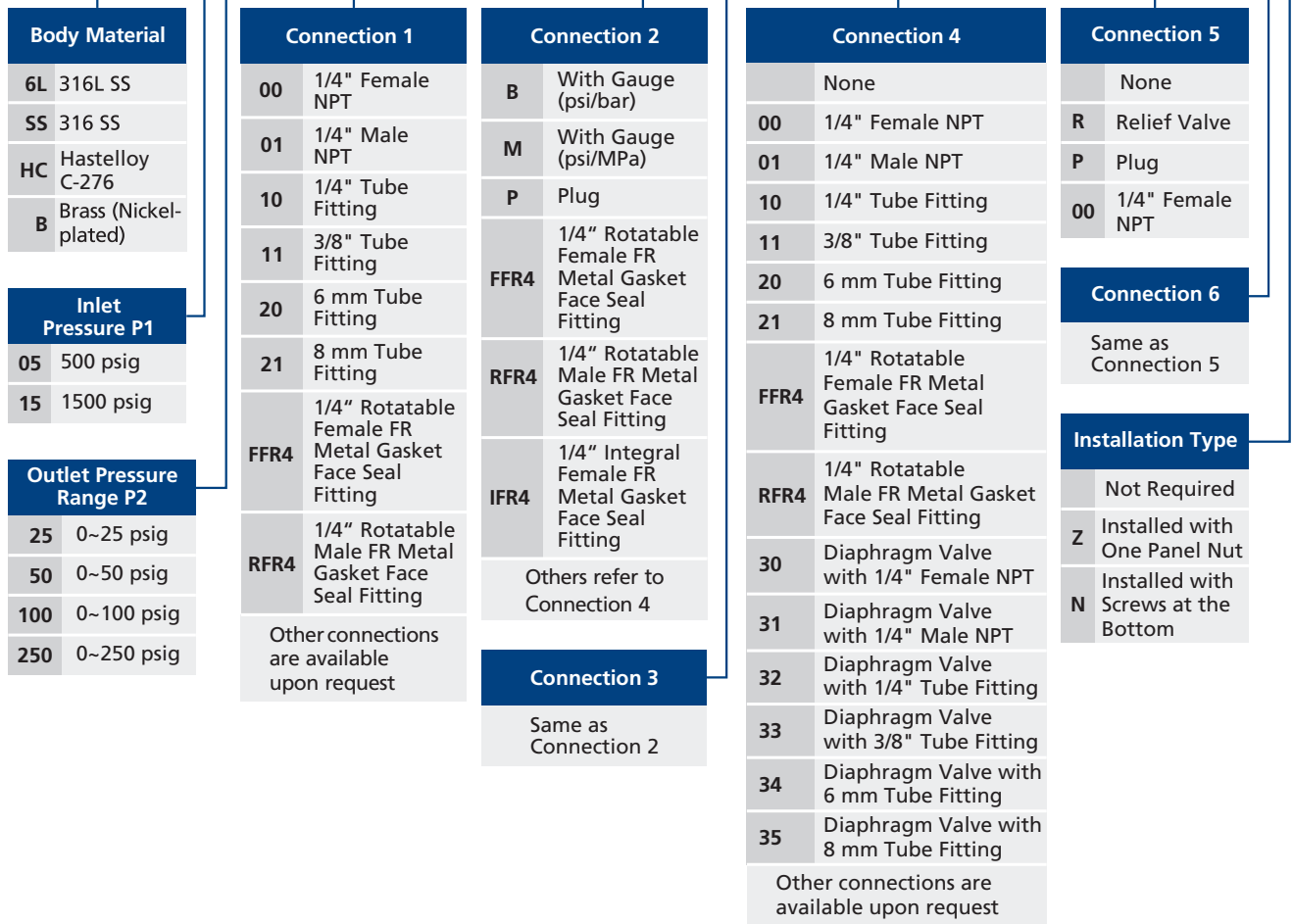


## Port Configurations



## Ordering Number Description

FLR - 16L - 05 - 100 - 00 - M - M - 00 - R - P - Z



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.
- For face seal connection, the connection and body are orbital-welded integral structure. The pressure gauge is installed on "RFR4" connection by default.
- For connections other than face seal connection, the body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.  
Examples of part number:
  - 2-port type (1 in, 1 out): FLR-16L-05-100-00-00, FLR-16L-05-100-RFR4-RFR4
  - 3-port type (1 in, 2 out): FLR-16L-15-500-10-B-10, FLR-16L-15-100-FFR4-B-FFR4
  - 4-port type (2 in, 2 out): FLR-1B-15-250-00-B-B-20, FLR-16L-15-250-RFR4-B-B-RFR4

# Line Pressure Regulators

## FLR-2 Series General Piston Regulators

### Features

- ⦿ Piston sensing design with greater outlet pressure adjustment range
- ⦿ Reduced inner capacity
- ⦿ 40  $\mu\text{m}$  filter installed at inlet
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

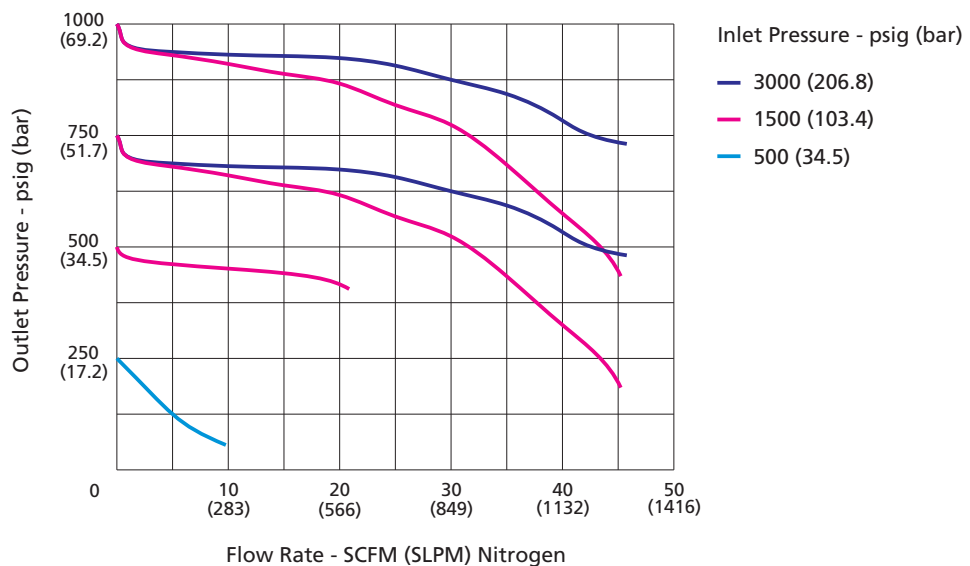
### Technical Data

- ⦿ 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:
  - Without venting Model: Main seat PCTFE
  - Venting Model: Main seat PEEK, vent seat PCTFE
  - Vent Seat: PCTFE
  - Piston: 316L
  - O-ring: FKM or FFKM
  - 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):  $\approx$  1.98 lbs (0.9 kg)



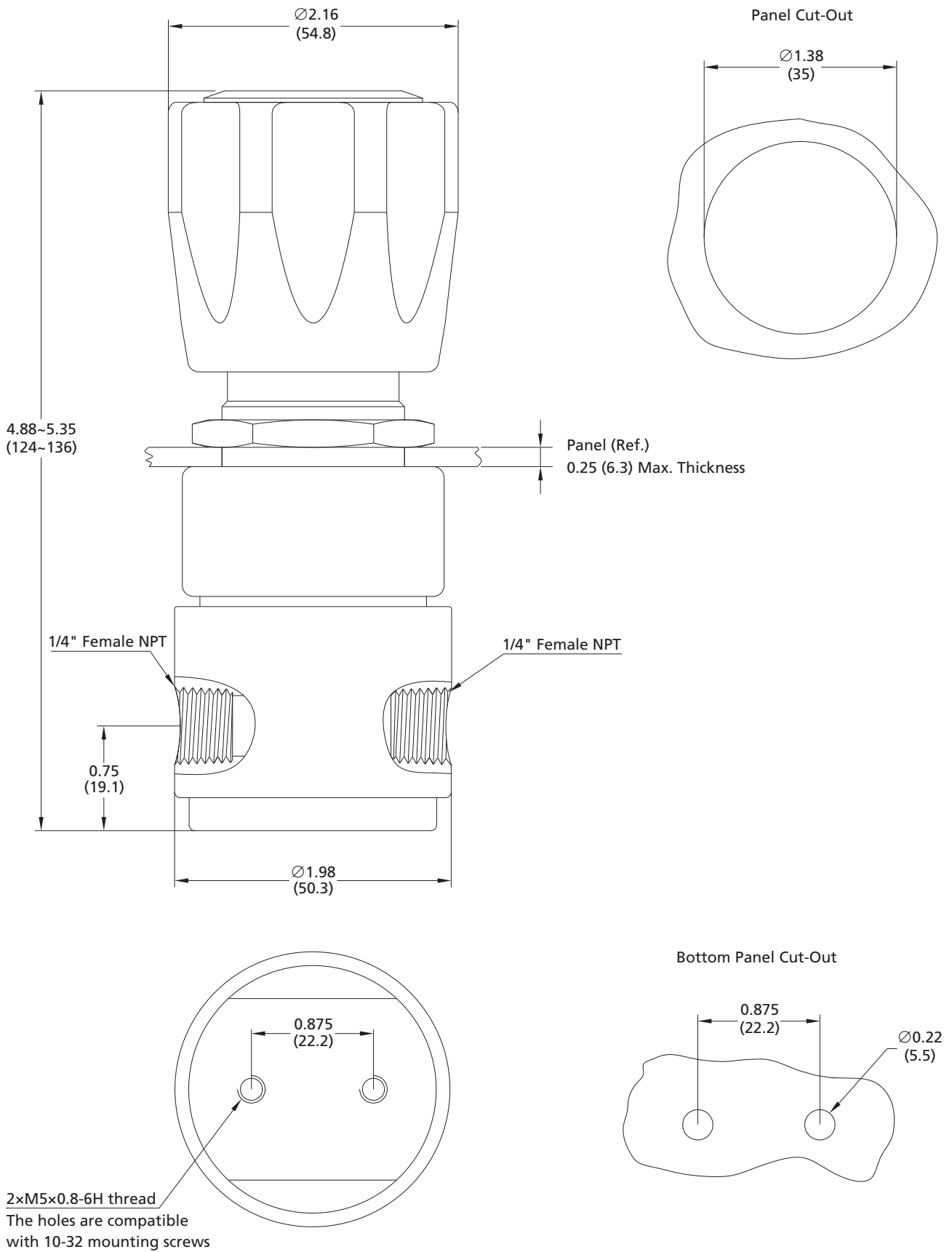
Model: FLR-2SS-45-1000-00-00-Z

### Typical Flow Chart

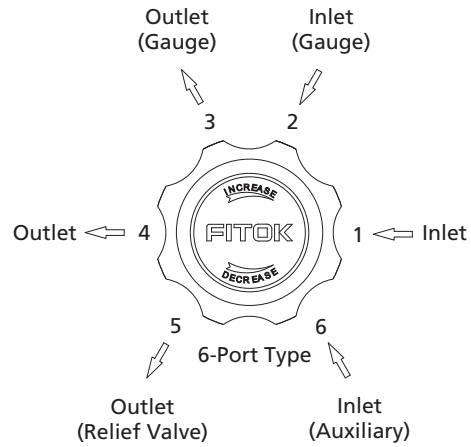
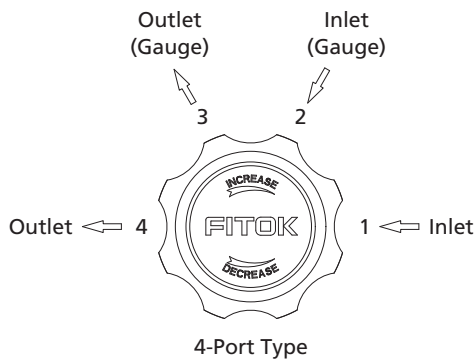
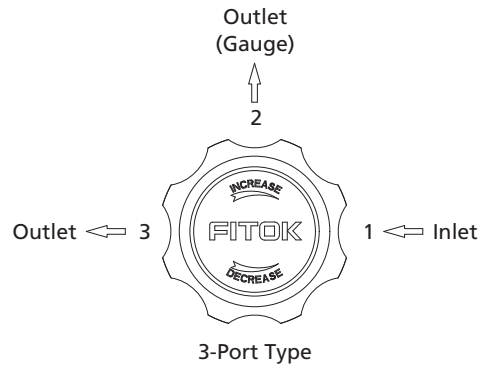
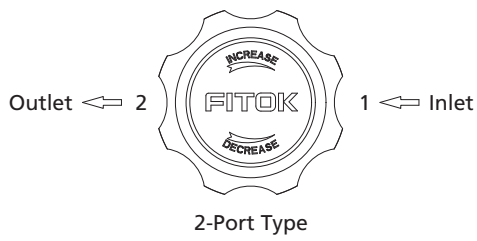


## Dimensions

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

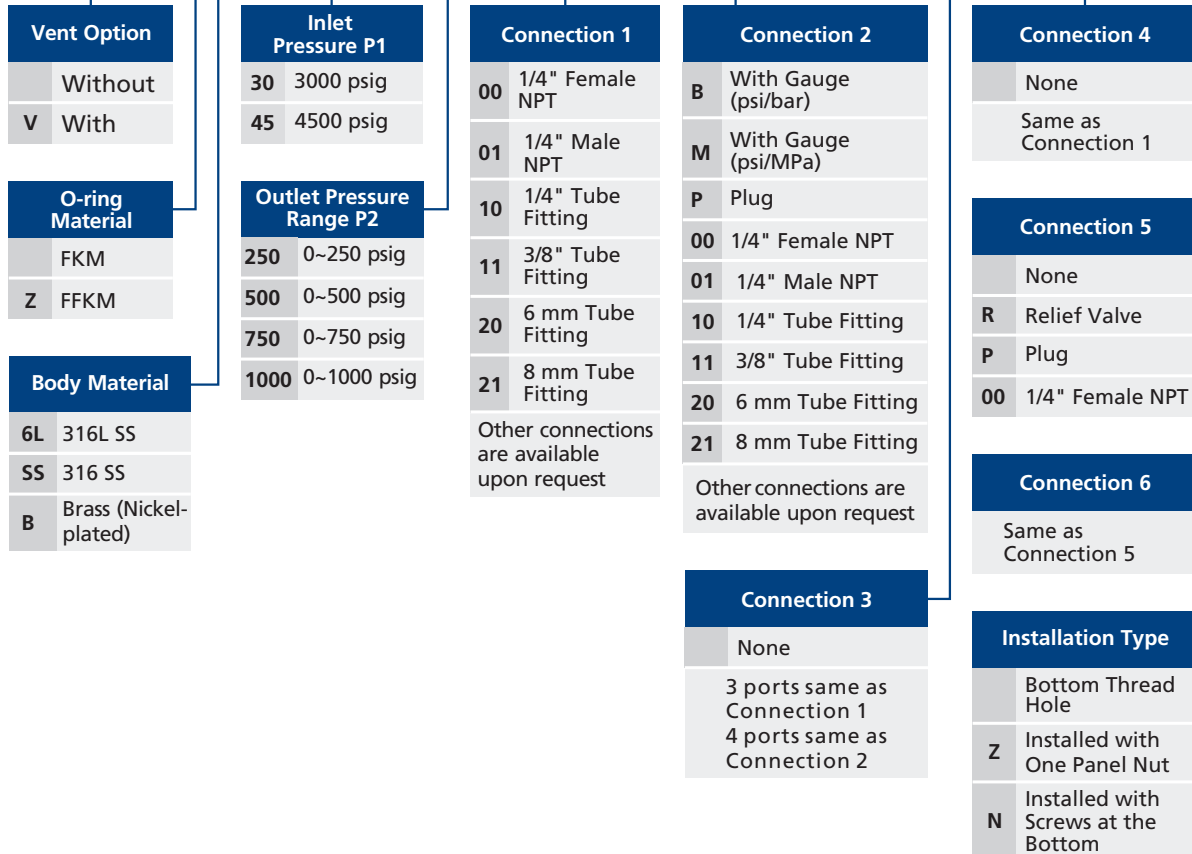


## Port Configurations



## Ordering Number Description

FLR - 2V Z 6L - 45 - 500 - 10 - B - B - 10 - R - P - Z



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.
- The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

Examples of part number:

- 2-port type (1 in, 1 out): FLR-26L-30-250-00-00
- 3-port type (1 in, 2 out): FLR-2VB-45-1000-00-00-00
- 4-port type (2 in, 2 out): FLR-2VZSS-30-1000-00-B-B-10

# Line Pressure Regulators

## FLR-3 Series Medium Flow Regulators

### Features

- ⦿ High flow (Cv 1.0) and high sensitivity
- ⦿ Large diameter convoluted diaphragm to increase pressure sensitivity
- ⦿ Balanced poppet to minimize supply pressure effect
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

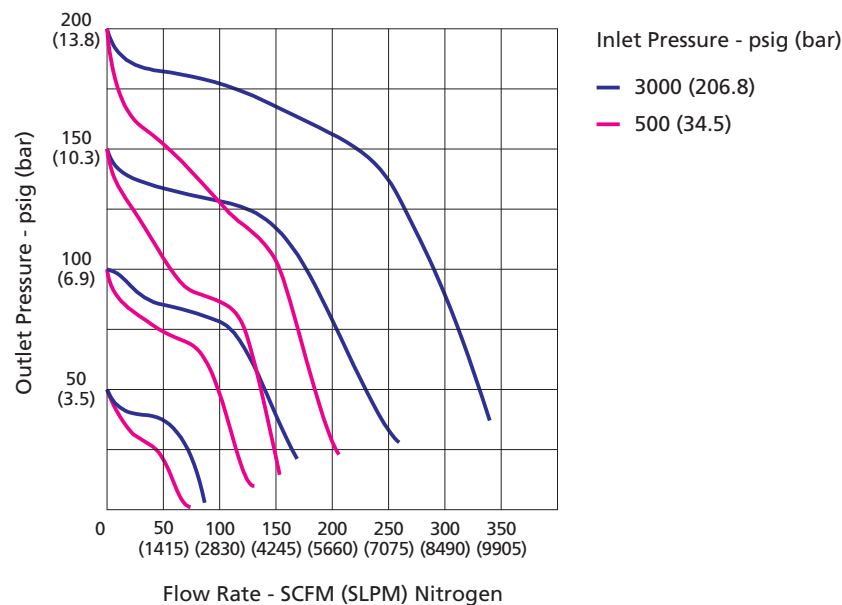
### Technical Data

- ⦿ 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 (helium):  
Internal: Bubble-tight  
External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 1.0
- ⦿ Weight (regulator only):  $\approx 3.53$  lbs (1.6 kg)



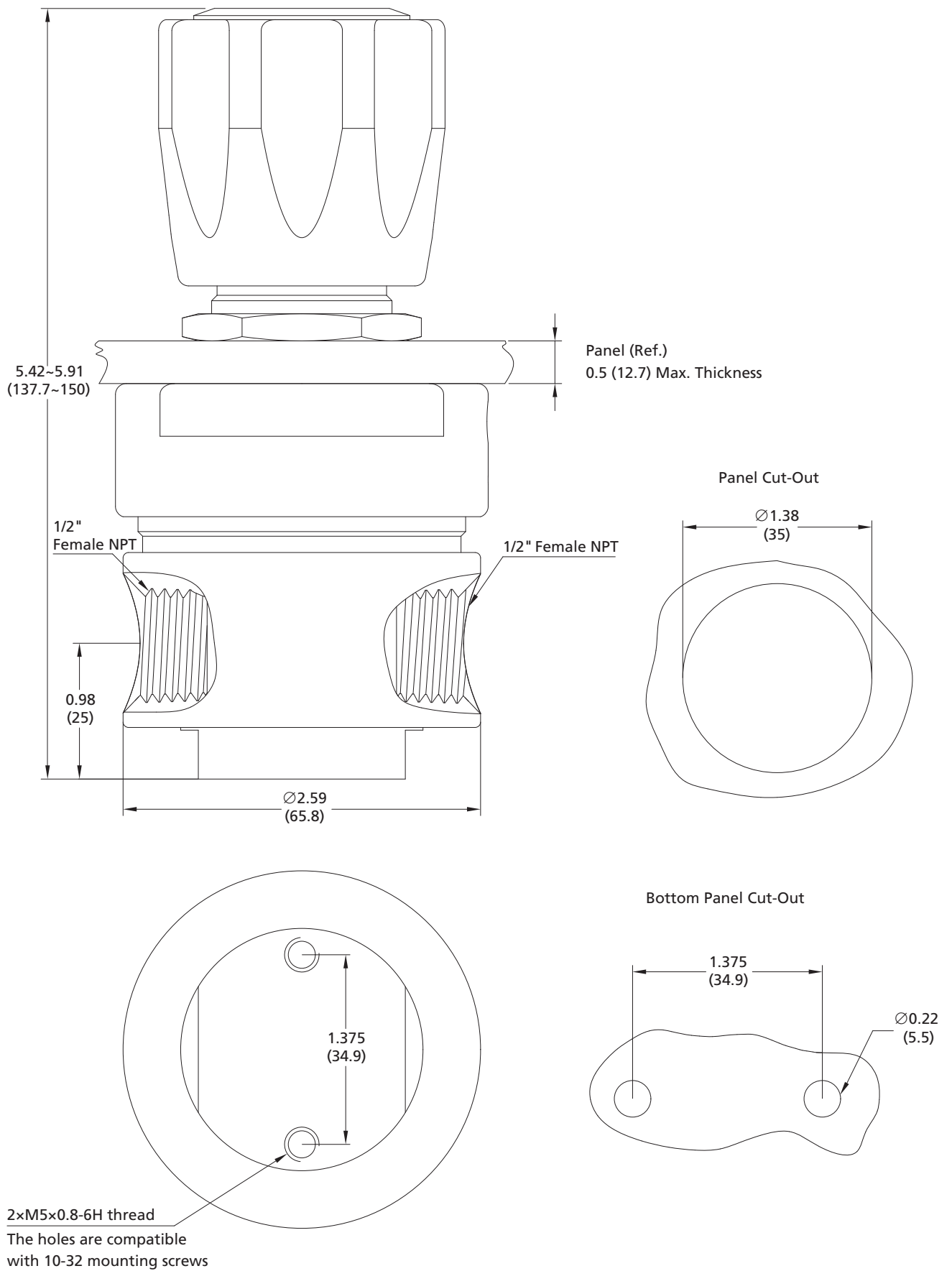
Model: FLR-3SS-30-100-04-04-Z

### Typical Flow Chart



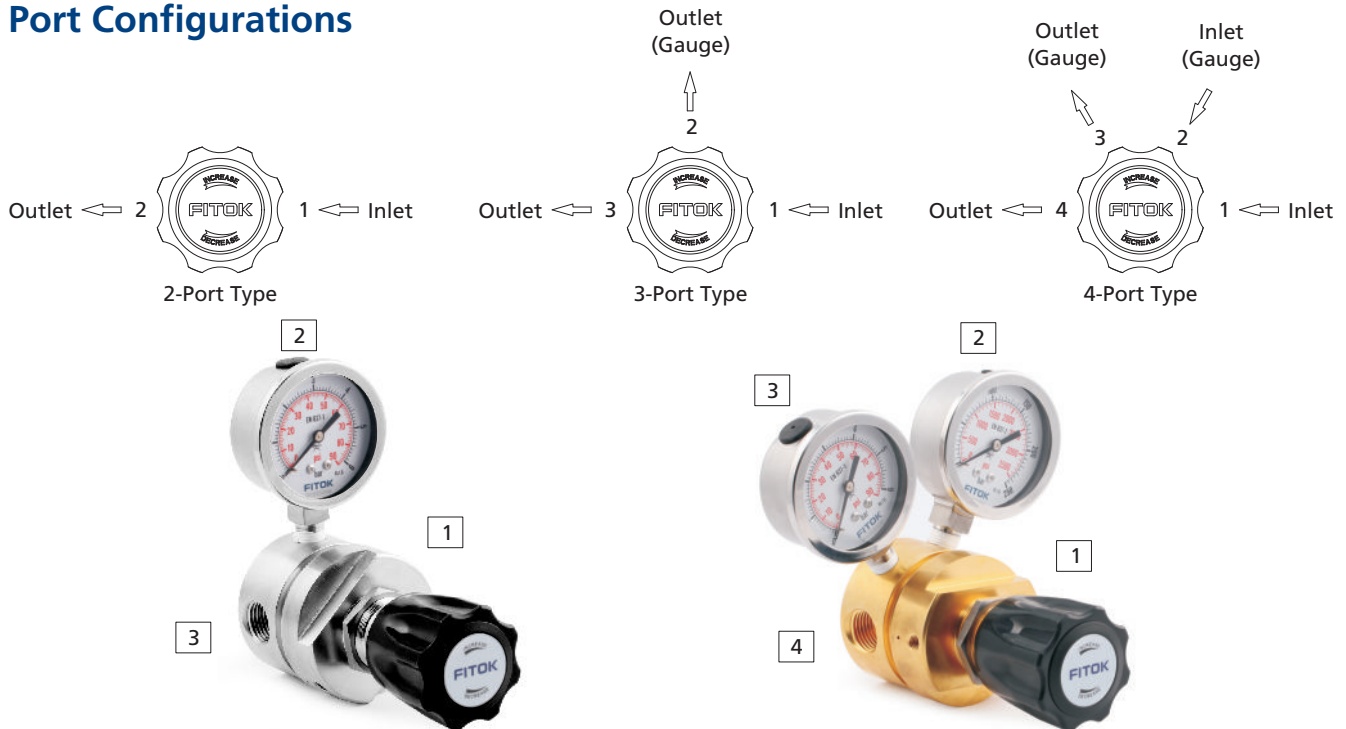
## Dimensions

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





## Port Configurations



## Ordering 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
FFR8	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting
RFR8	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting
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 (psi/MPa)
P	Plug
00	1/4" Female NPT
04	1/2" Female NPT
FFR8	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting
RFR8	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting
IFR4	1/4" Integral Female FR Metal Gasket Face Seal Fitting
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	
None	
3 Ports Same as Connection 1	
4 Ports Same as Connection 2	

Connection 4	
None	
Same as Connection 1	

Installation Type	
	Bottom Thread Hole
Z	Installed with One Panel Nut
M	Installed with Two Panel Nuts
N	Installed with Screws at the Bottom

Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.
- For face seal connection, the connection and body are orbital-welded integral structure. The pressure gauge is installed on "RFR4" connection by default.
- For connections other than face seal connection, the body inlet and outlet connections default to 1/2" Female NPT, the gauge connection defaults to 1/4" Female NPT, and all other connections are adapted from the corresponding Male NPT.

Examples of part number:

- 2-port type (1 in, 1 out): FLR-36L-30-100-04-04, FLR-36L-30-100-FFR8-FFR8
- 3-port type (1 in, 2 out): FLR-3SS-05-150-04-00-04, FLR-36L-05-150-RFR8-RFR4-RFR8
- 4-port type (2 in, 3 out): FLR-3B-05-200-04-00-00-04, FLR-36L-05-200-FFR8-RFR4-RFR4-FFR8

# Line Pressure Regulators

## FLR-5 Series High Flow Regulators

### Features

- ⦿ Suitable for low pressure and high flow applications
- ⦿ Large diameter convoluted diaphragm to increase pressure sensitivity
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

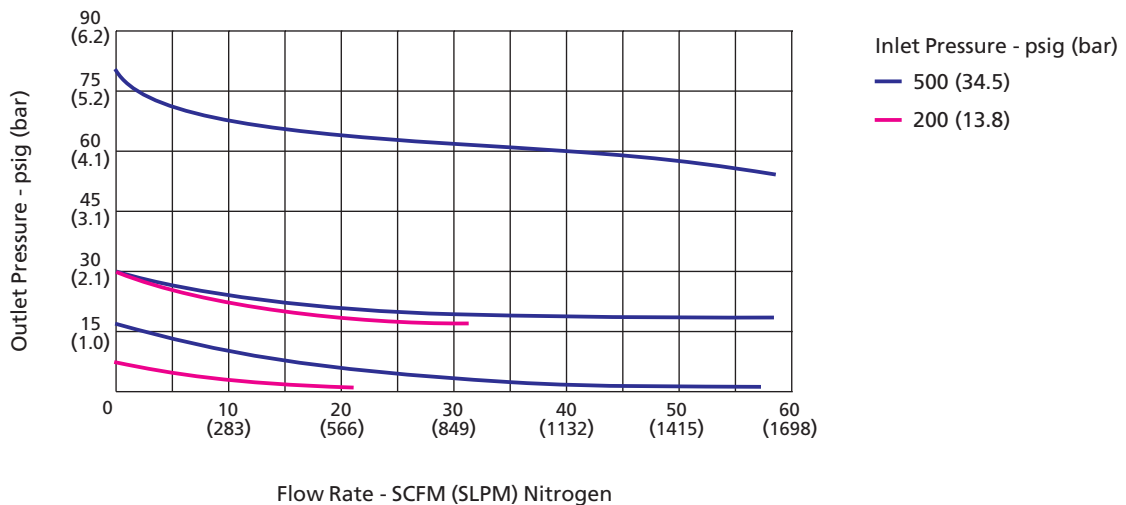
### Technical Data

- ⦿ 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 (helium):
  - Internal: Bubble-tight
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 1.8
- ⦿ Weight (regulator only):  $\approx 5.95$  lbs (2.7 kg)



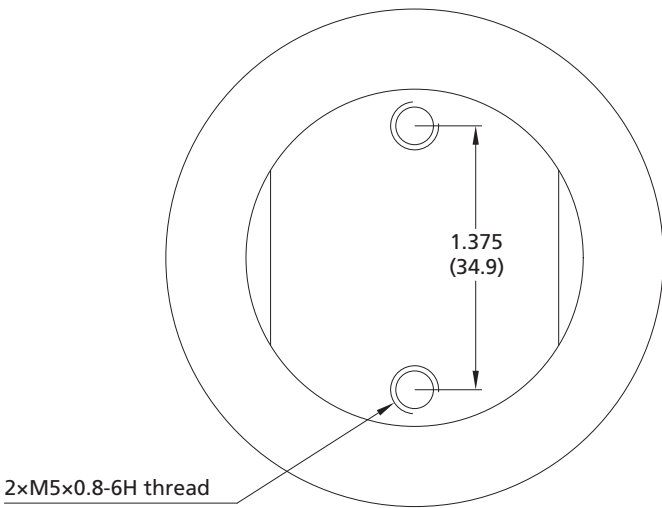
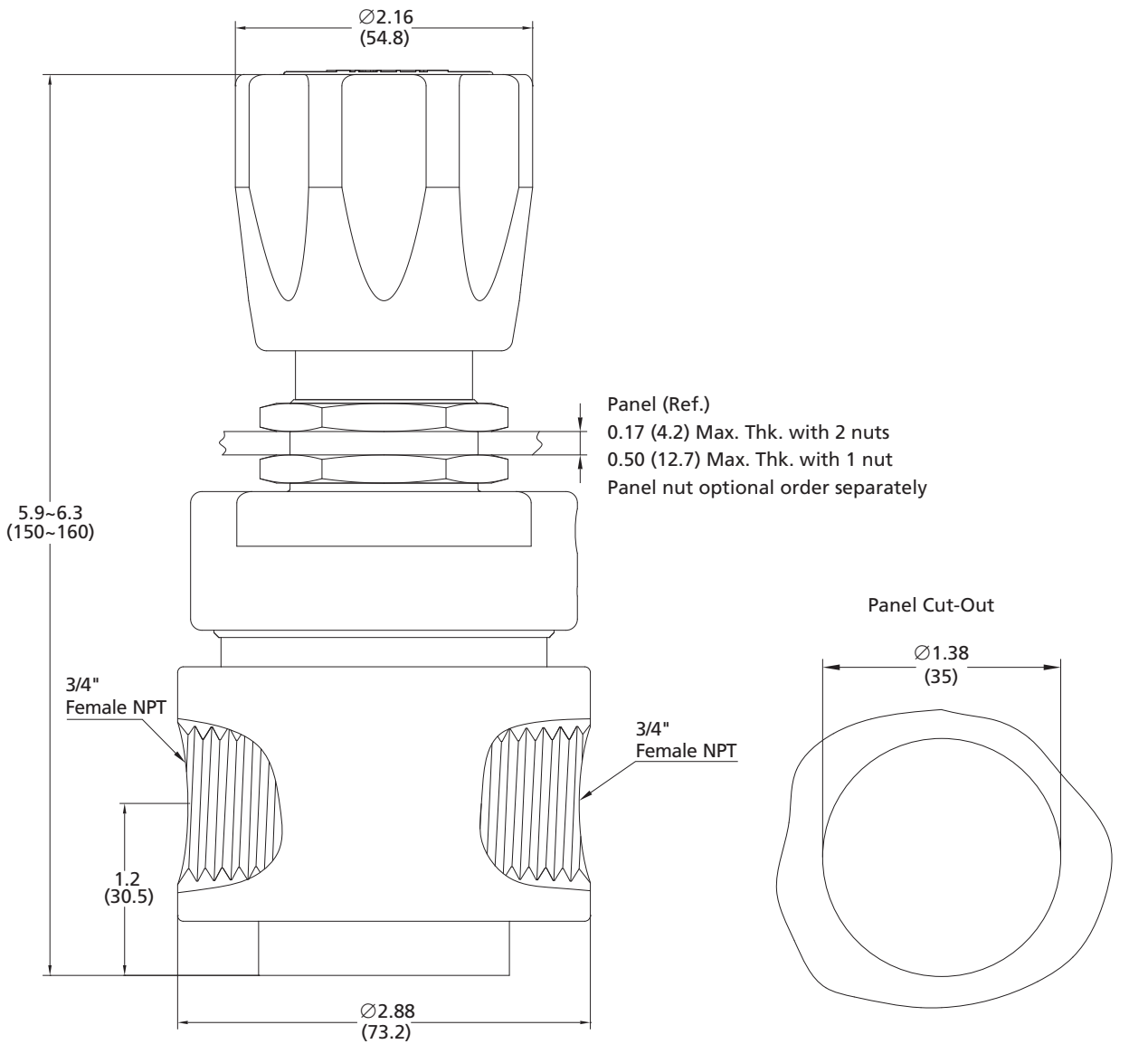
Model: FLR-56L-05-150-04-04-Z

### Typical Flow Chart

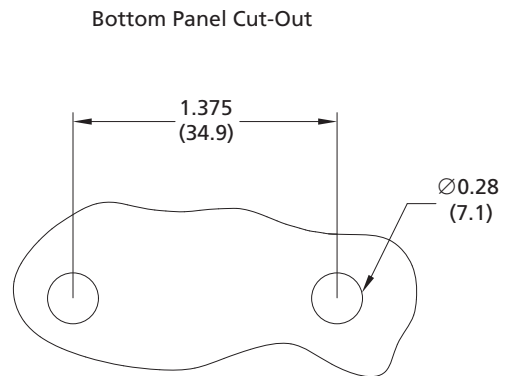


## Dimensions

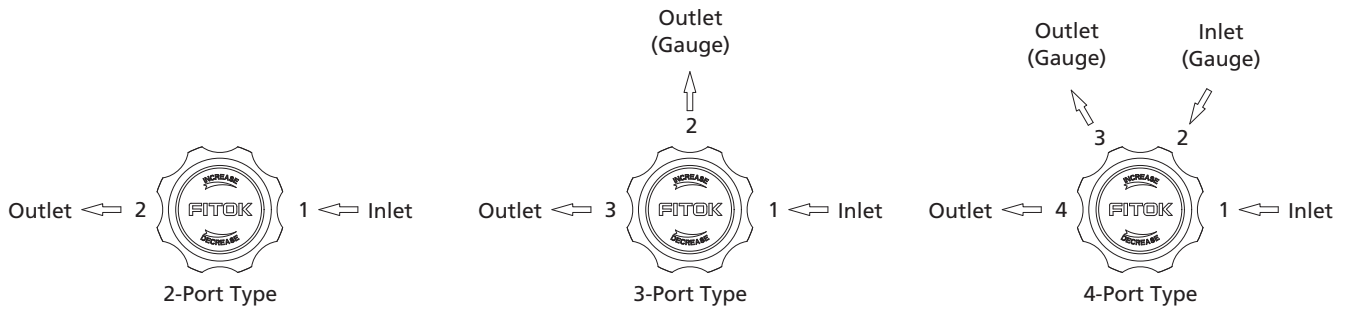
Dimensions, in inches (millimeters), are for reference only.



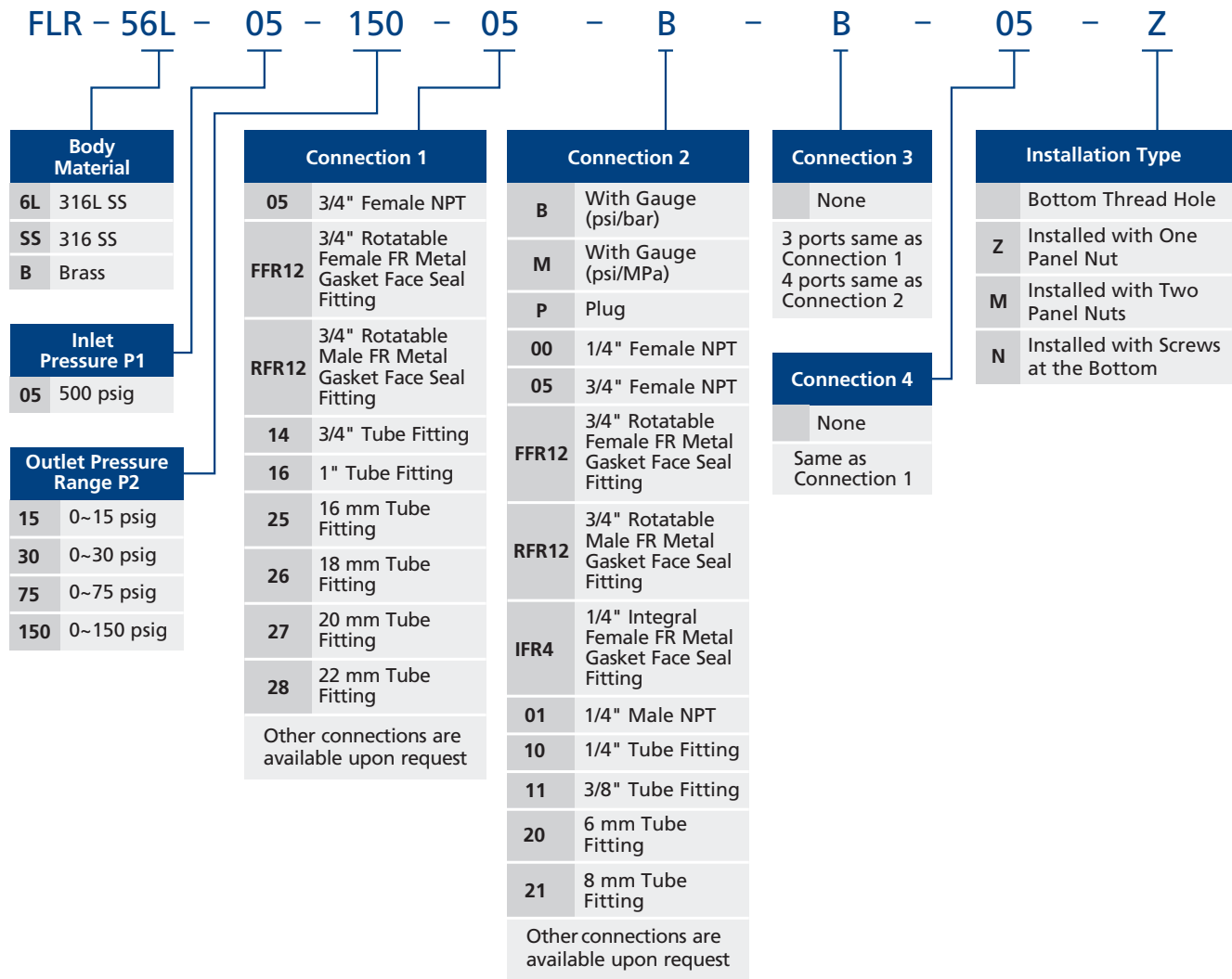
2×M5×0.8-6H thread  
 The holes are compatible  
 with 10-32 mounting screws



## Port Configurations



## Ordering Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.
- For face seal connection, the connection and body are orbital-welded integral structure. The pressure gauge is installed on "RFR4" connection by default.
- For connections other than the face seal connection, the body inlet and outlet connections default to 3/4" Female NPT, the gauge connection defaults to 1/4" Female NPT, and all other connections are adapted from the corresponding Male NPT.

Examples of part number:

- 2-port type (1 in, 1 out): FLR-56L-05-15-05-05, FLR-56L-05-15-FFR12-FFR12
- 3-port type (1 in, 2 out): FLR-5SS-05-30-05-00-05, FLR-56L-05-30-RFR12-RFR4-RFR12
- 4-port type (2 in, 2 out): FLR-5B-05-75-05-B-B-05, FLR-56L-05-75-FFR12-RFR4-RFR4-RFR12

# Line Pressure Regulators

## FBR-1 Series Miniature Piston Regulators

### Features

- ⦿ Compact design with small dimension
- ⦿ Reduced inner capacity
- ⦿ 40 µm filter installed at inlet
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

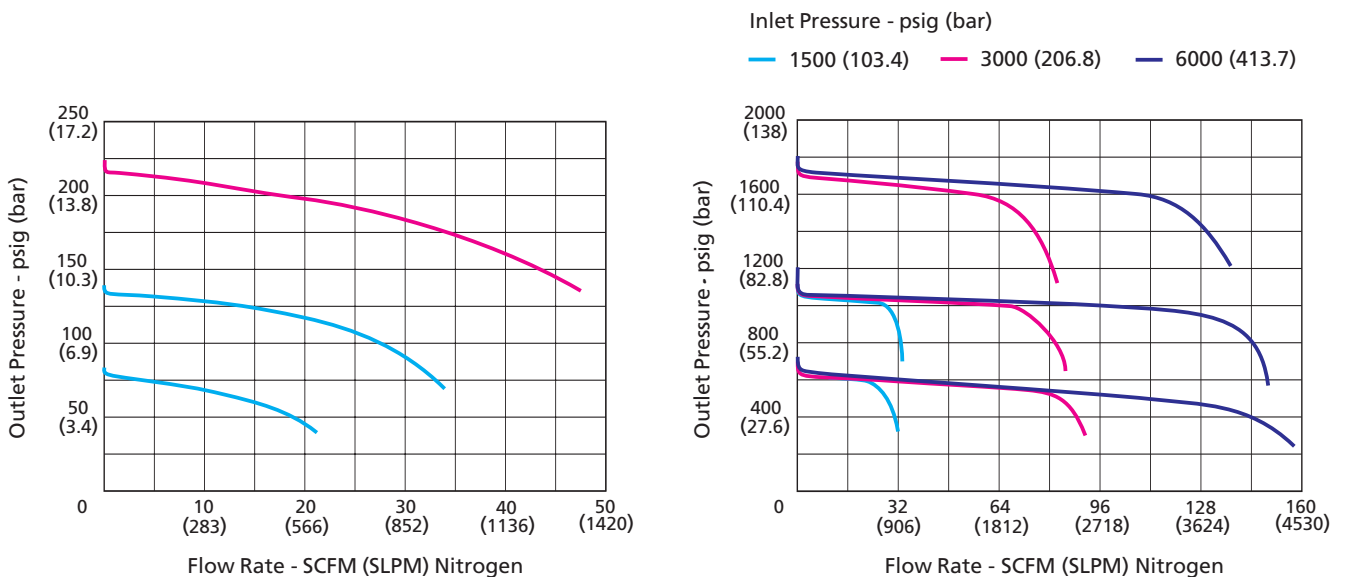
### Technical Data

- ⦿ Material of the internal components:
  - Seat: PCTFE, PEEK or Polyimide
  - Piston: 316L
  - O-ring: FKM, FFKM or NBR
  - 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)



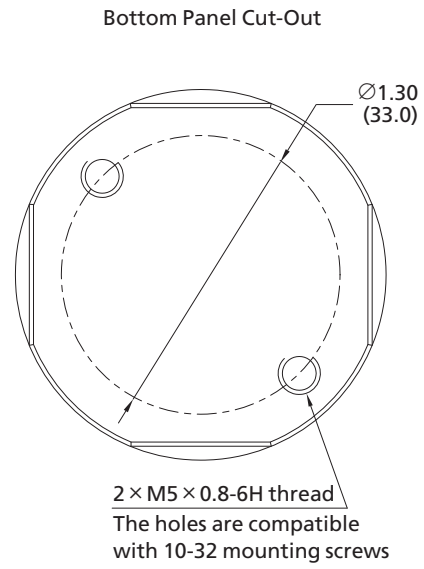
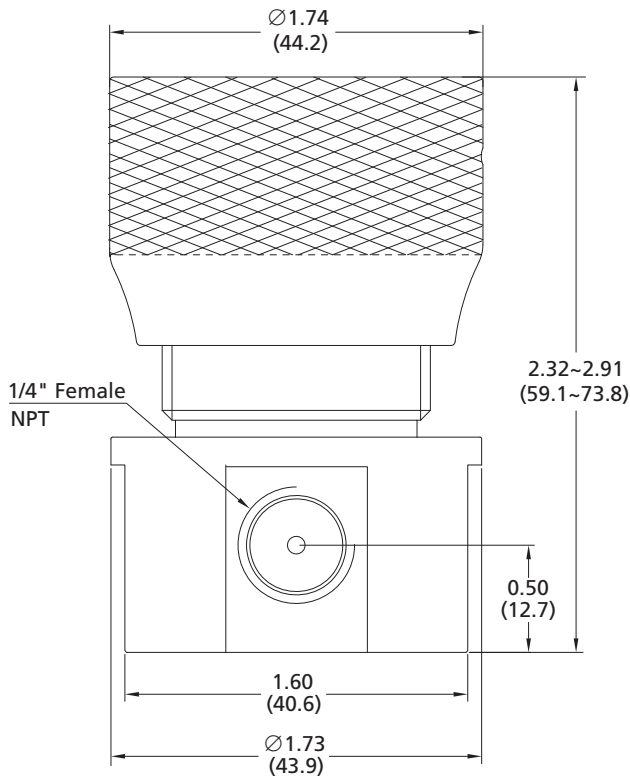
Model: FBR-15S-60-220-00-00-00

### Typical Flow Chart

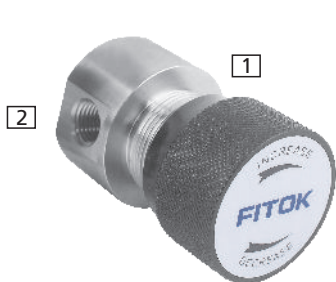
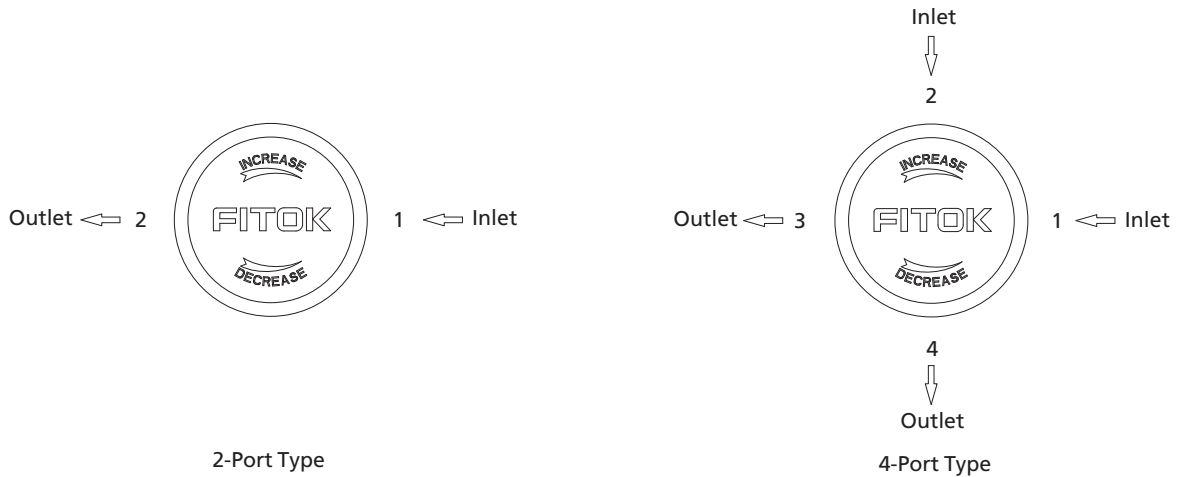


## Dimensions

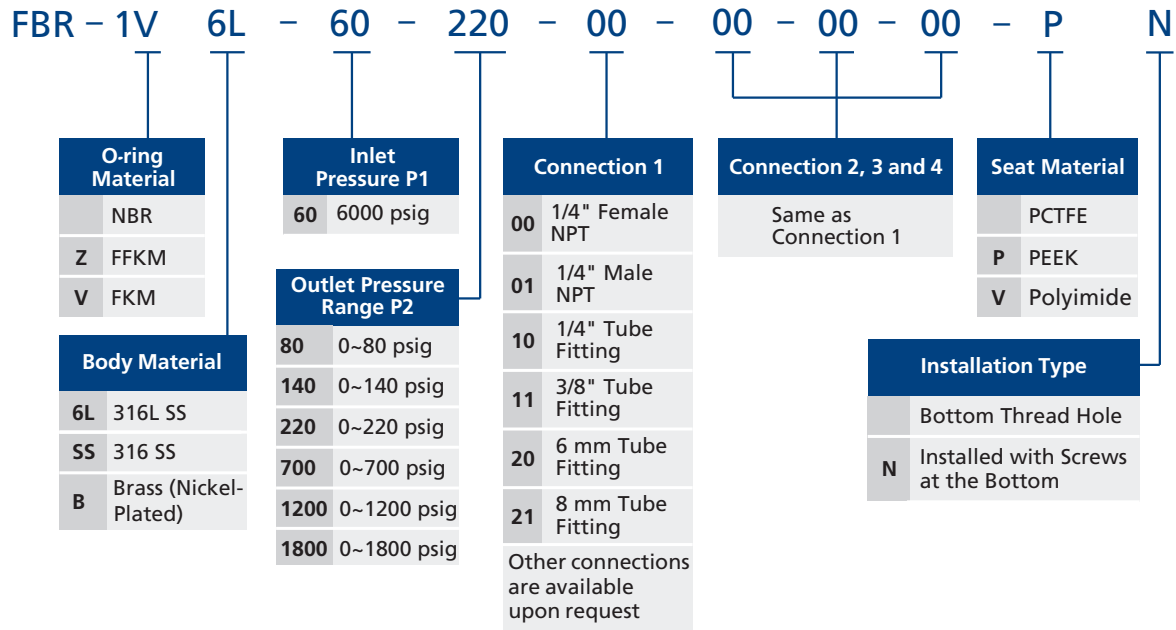
Dimensions, in inches (millimeters), are for reference only.



## Port Configurations



## Ordering Number Description



**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

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

- ⦿ Maximum inlet pressure 10000 psig
- ⦿ Piston sensing design with greater outlet pressure adjustment range
- ⦿ 40 μm filter installed at inlet

### 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: 316
  - O-rings: FKM 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)



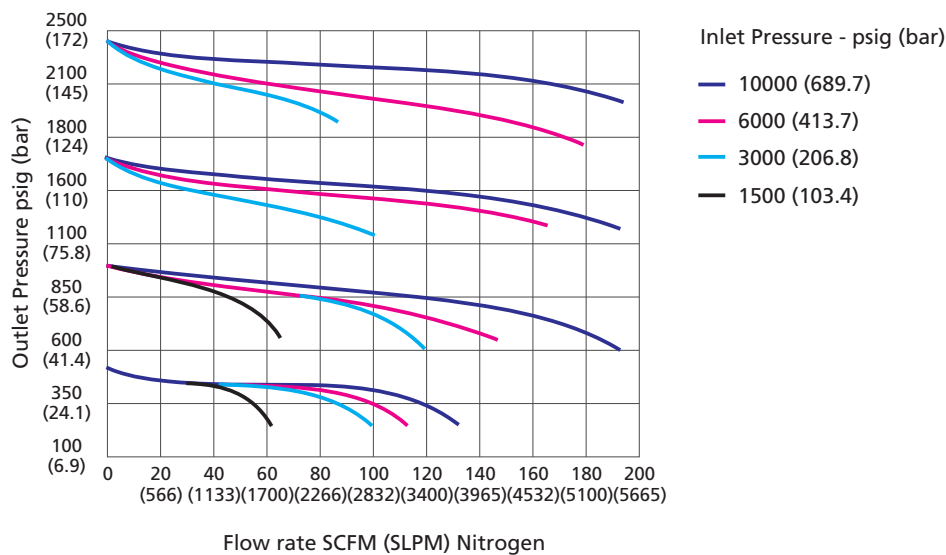
Model: HPR-10SSN-100-100-00-00-ZV

Gas Control Equipment

Related Products

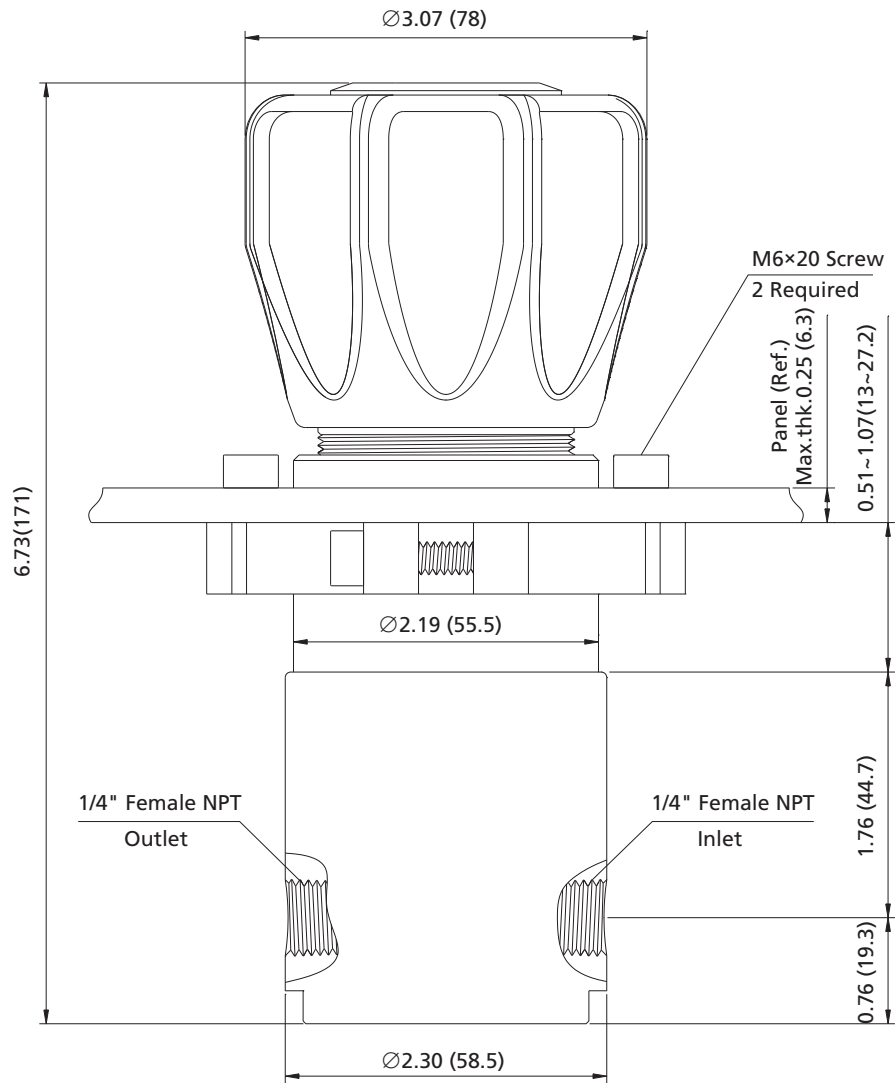
Technical References

### Flow Chart



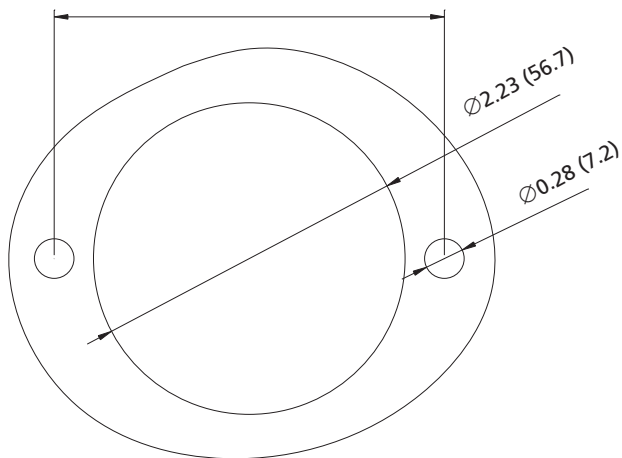
## Dimensions

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

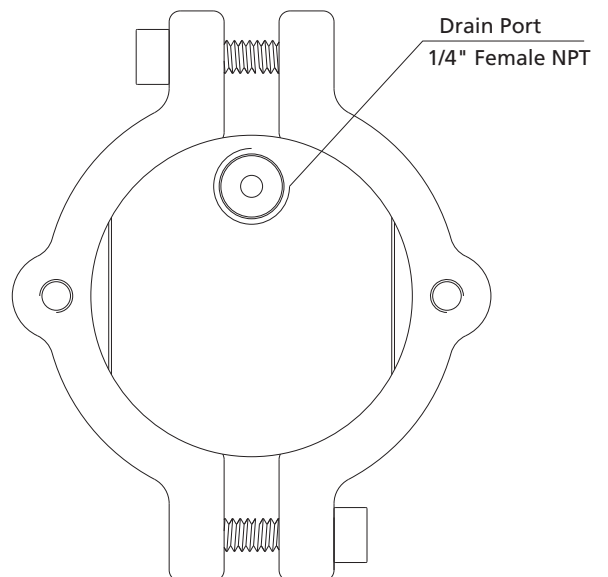


Panel Cut-Out

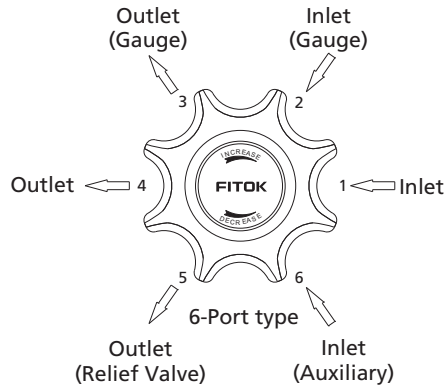
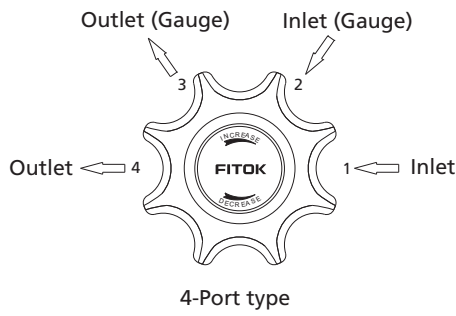
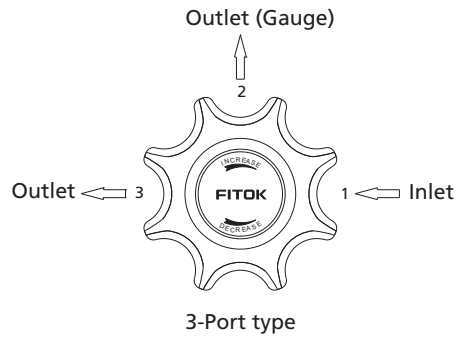
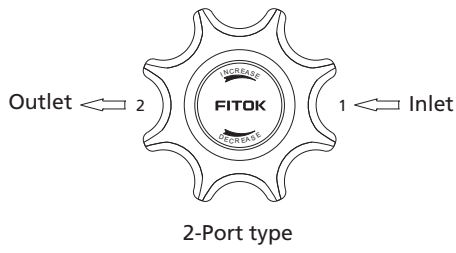
2.79 (71.0)



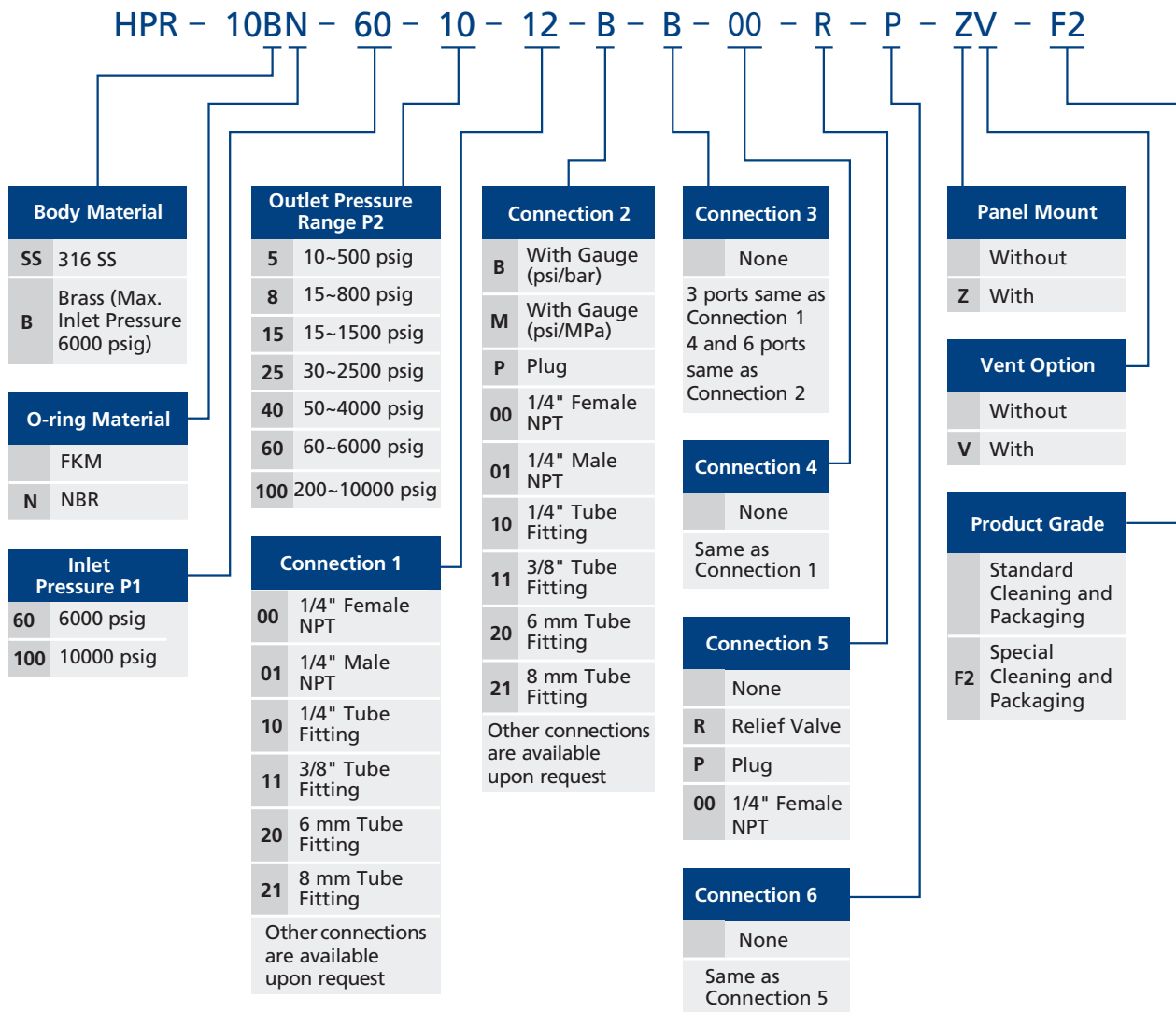
Bottom View



# Port Configurations



## Ordering Number Description



Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Drain port at the bottom of the regulator can not be blocked.
3. Select the vent option for different media:
  - (1) For liquid services with fewer residual media downstream, install the regulator with the drain port pointing vertically down, and the media could drain from the drain port at the bottom with vent option.
  - (2) For gas services, the media could vent directly to atmosphere from below the handle with vent option.
  - (3) Fully captured-vent option is available upon request. Contact FITOK Group or our authorized distributors for more information.
4. Before ordering, please read **User's Guide** on A-11.
5. The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

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 Flow Piston Regulators

### Features

- ⦿ For high flow applications
- ⦿ Piston sensing design with greater outlet pressure adjustment range
- ⦿ Large piston sensor gives excellent sensitivity
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

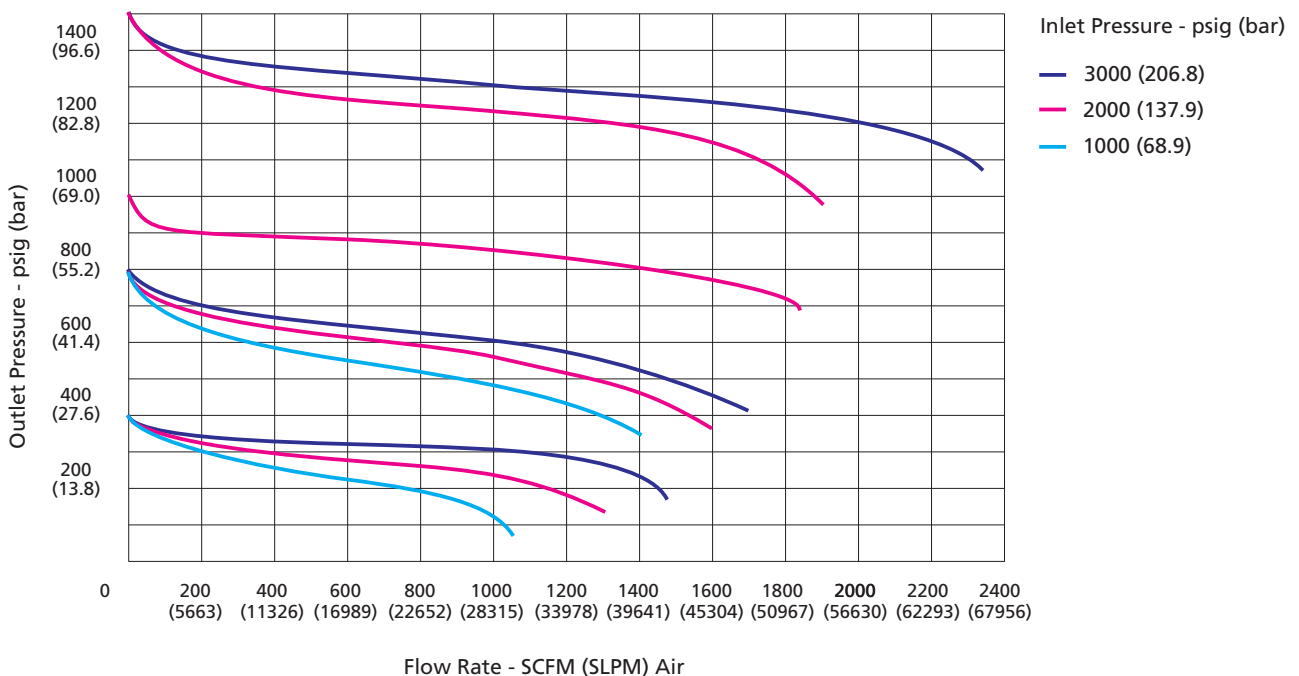
### Technical Data

- ⦿ 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 internal components:  
Seat: PCTFE  
Piston: 316  
O-rings: FKM or FFKM
- ⦿ 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)



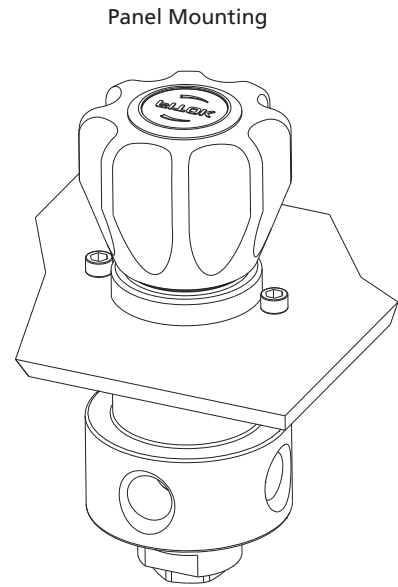
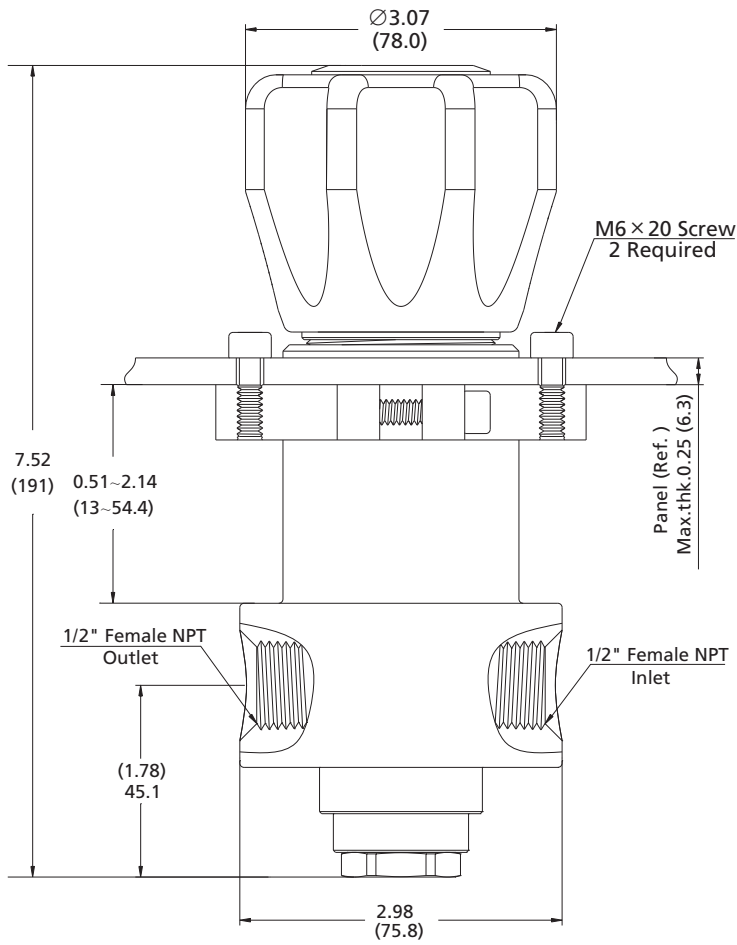
Model: HPL-06SS-45-1000-04-04-Z

### Typical Flow Chart

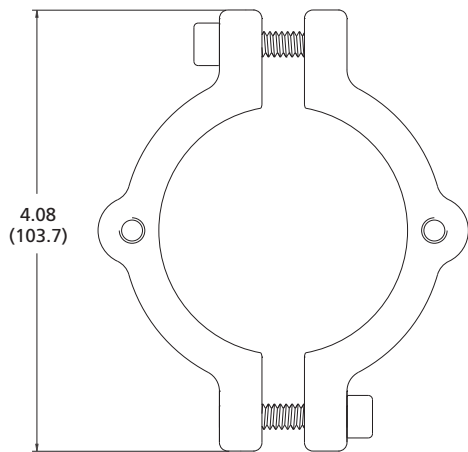


# Dimensions

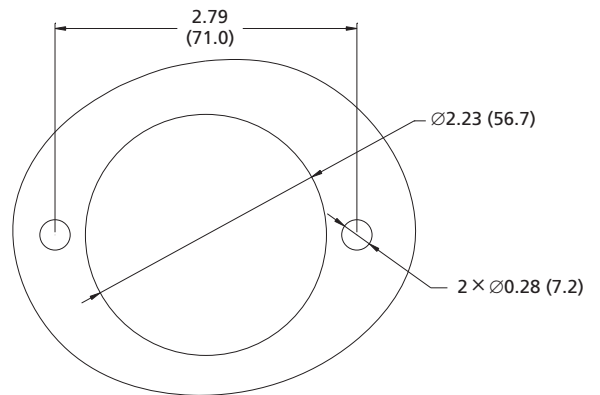
Dimensions, in inches (millimeters), are for reference only.



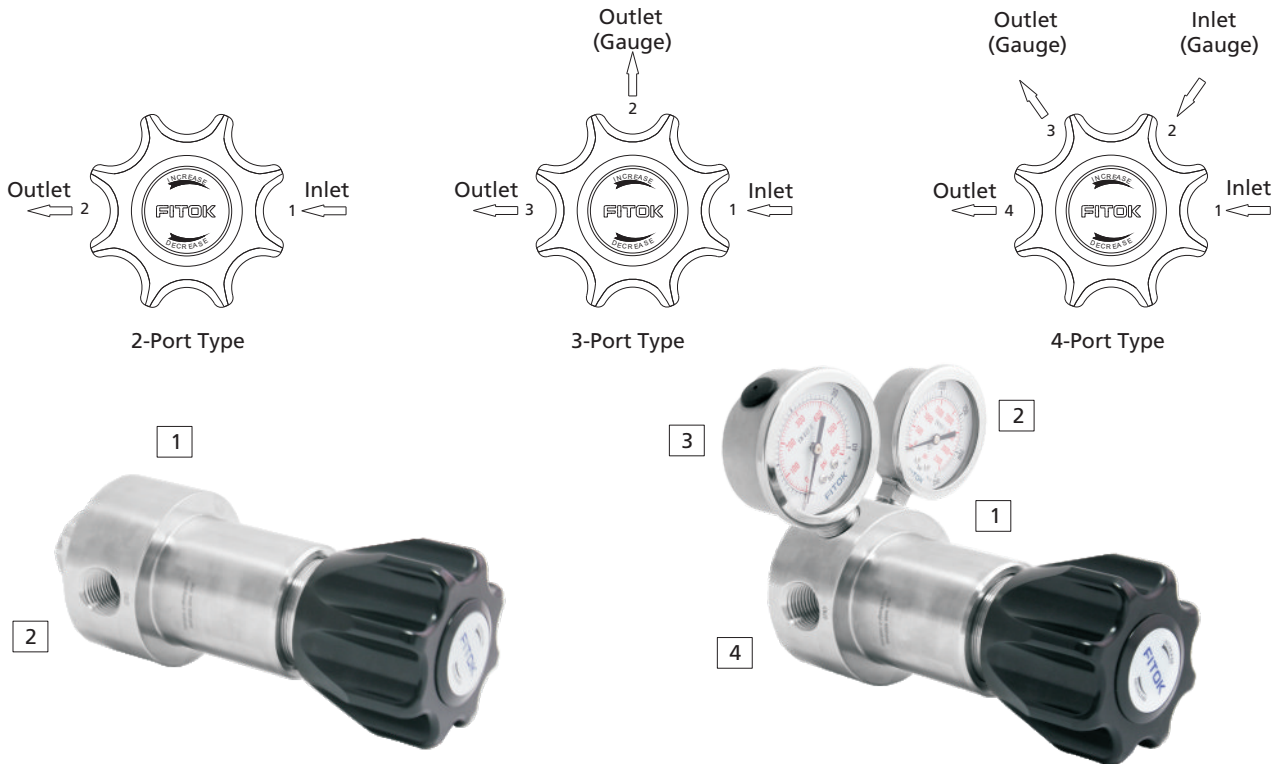
Panel Mounting Kit



Panel Cut-Out



## Port Configurations



## Ordering Number Description

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

Vent Option	Body Material	Inlet Pressure P1	Connection 1	Connection 2	Connection 3	
Without	SS 316 SS	37 3750 psig	04 1/2" Female NPT	B With Gauge (psi/bar)	None	
V With	6L 316L SS	45 4500 psig	05 3/4" Female NPT	M With Gauge (psi/MPa)	3 ports same as Connection 1	
O-ring Material	B Brass (Max. Inlet Pressure 3750 psig)	Outlet Pressure Range P2	14 3/4" Tube Fitting	P Plug	4 and 6 ports same as Connection 2	
FKM		300 0~300 psig	25 16 mm Tube Fitting	00 1/4" Female NPT		
Z FFKM		600 0~600 psig	26 18 mm Tube Fitting	01 1/4" Male NPT	Connection 4	
		1000 0~1000 psig	Other connections are available upon request	10 1/4" Tube Fitting	None	Same as Connection 1
		1500 0~1500 psig		11 3/8" Tube Fitting		
			20 6 mm Tube Fitting	Panel Mount	Without	
			21 8 mm Tube Fitting	Other connections are available upon request	Z With	

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. When using the vent function, media will be discharged into the atmosphere from beneath the handle.
4. The body connections are 1/2" female NPT by default and the gauge mounting connections are 1/4" female NPT by default. The other options are adapted from corresponding male NPT.

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-06L-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

### Features

- ⦿ With a FCR-1 Series Regulator
- ⦿ With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

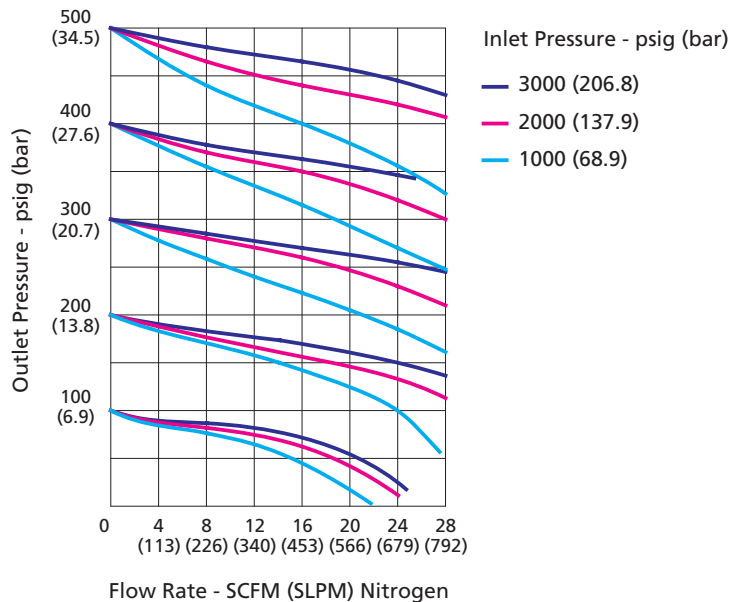
### Technical Data

- ⦿ 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), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
  - Filter: 316L
- ⦿ Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- ⦿ Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (regulator Cv): 0.06



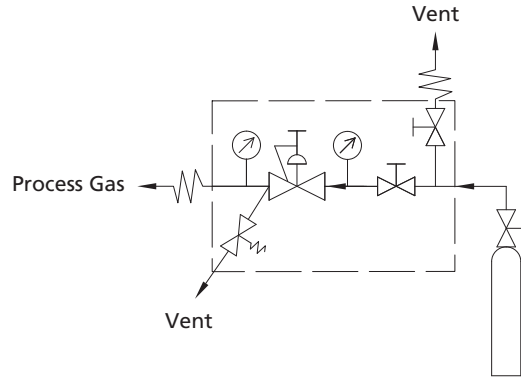
Model: FSR-16L-45-100-00-B-B-00-R-P

### Typical Flow Chart



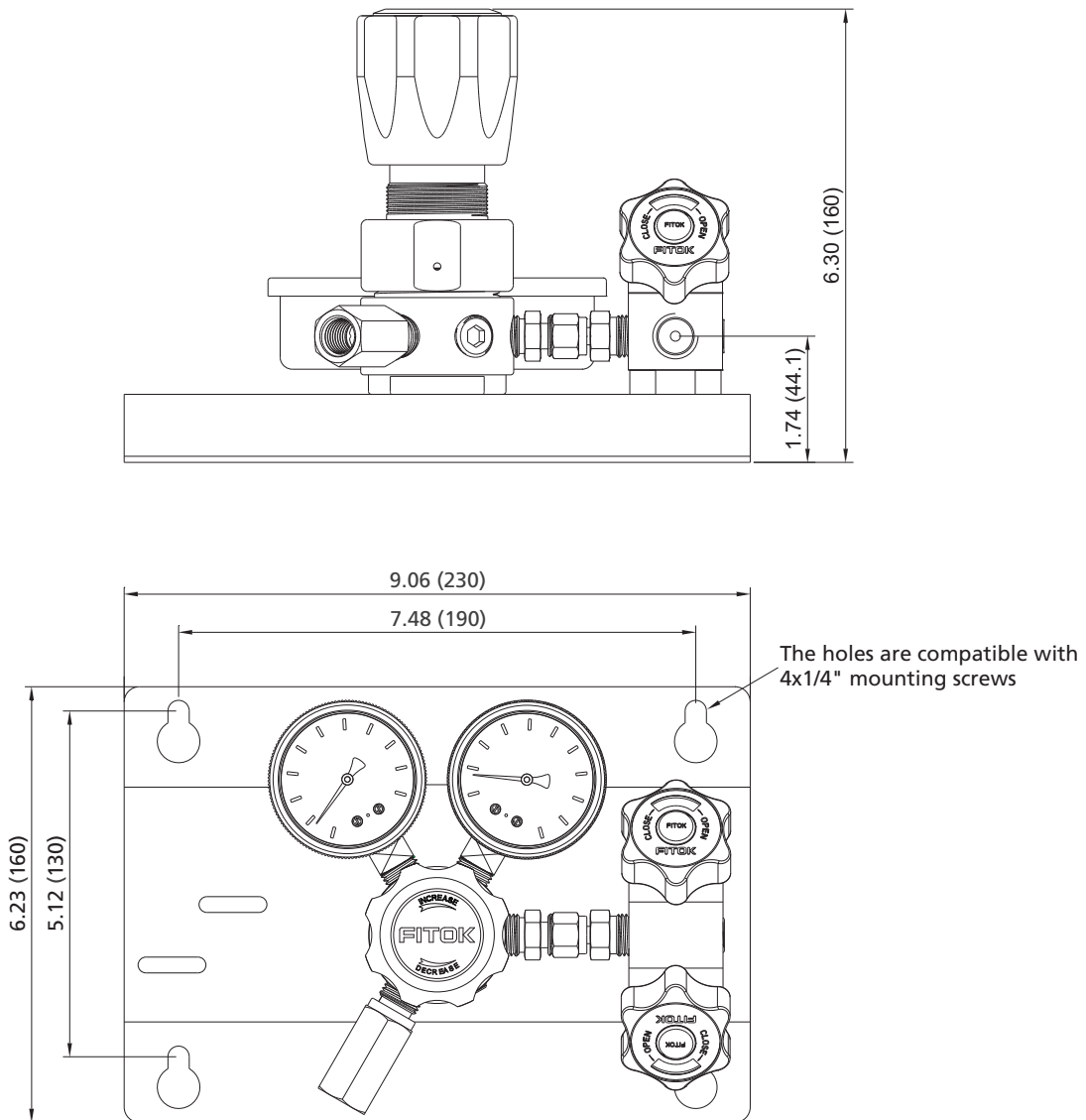


## Flow Schematic

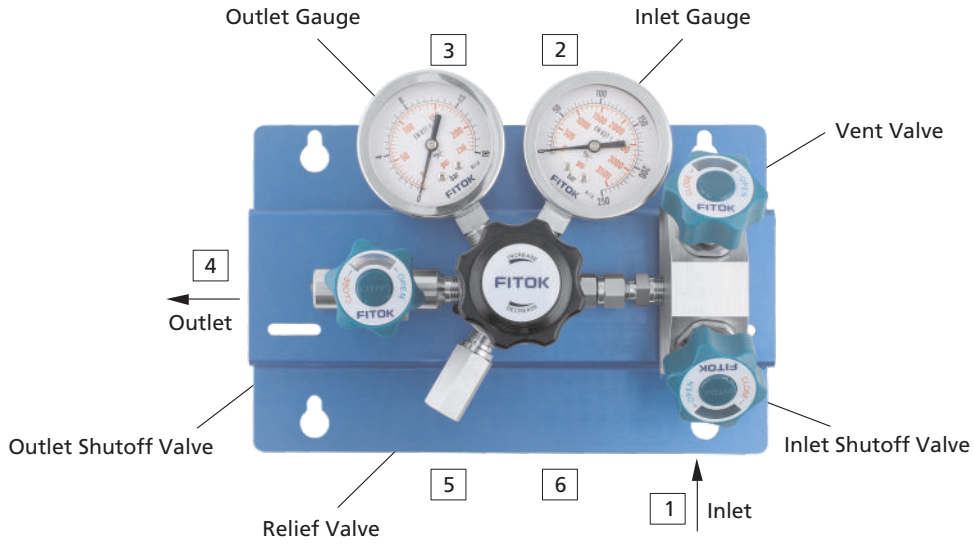


## Dimensions

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



# Components Introduction



## Ordering Number Description

**FSR - 16L - 30 - 50 - 00 - B - B - 30 - R - P**

Body Material (Regulator)		Connection 1		Connection 2		Connection 4		Connection 5	
6L	316L SS	00	1/4" Female NPT	B	With Gauge (psi/bar)	00	1/4" Female NPT	R	Relief Valve
SS	316 SS	01	1/4" Male NPT	M	With Gauge (psi/MPa)	01	1/4" Male NPT	P	Plug
HC	Hastelloy C-276	10	1/4" Tube Fitting	P	Plug	10	1/4" Tube Fitting	00	1/4" Female NPT
B	Brass (Nickel-plated)	11	3/8" Tube Fitting	00	1/4" Female NPT	11	3/8" Tube Fitting	<b>Connection 6</b> Same as Connection 5	
		20	6 mm Tube Fitting	<b>Connection 3</b> Same as Connection 2		20	6 mm Tube Fitting		
		21	8 mm Tube Fitting			21	8 mm Tube Fitting		
		Other connections are available upon request				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			

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

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.

# Pressure Control Panels

## FSR-2 Series Pressure Control Panels

### Features

- ⦿ With a FCR-2 Series Regulator
- ⦿ With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

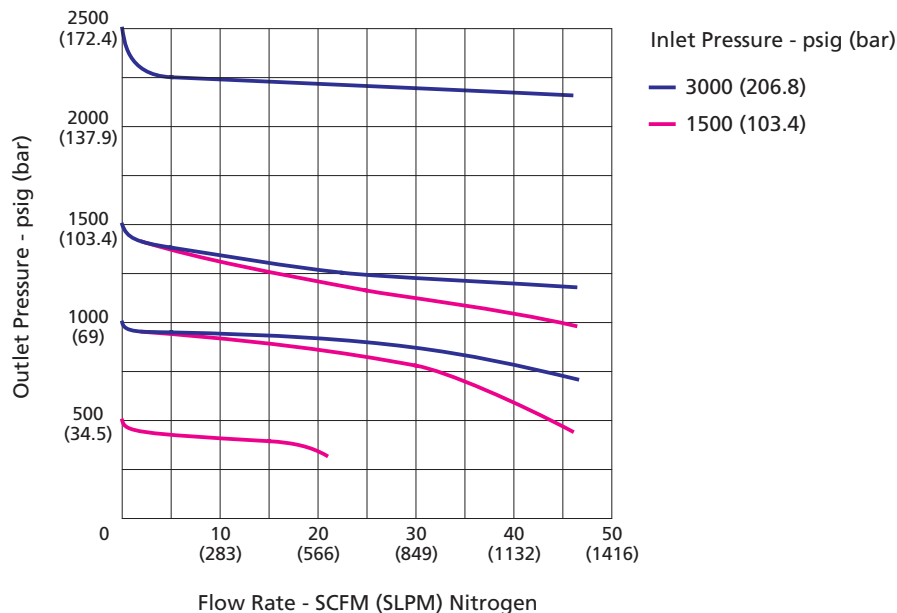
### Technical Data

- ⦿ Maximum inlet pressure: 3000 or 4500 psig
- ⦿ Outlet pressure range: 0 ~ 750, 0 ~ 1500 or 0 ~ 2500 psig
- ⦿ Material of the internal components:  
Without venting Model: Main seat PCTFE  
Venting Model: Main seat PEEK, vent seat PCTFE  
Vent seat: PCTFE  
Piston: 316L  
O-ring: FKM or FFKM  
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

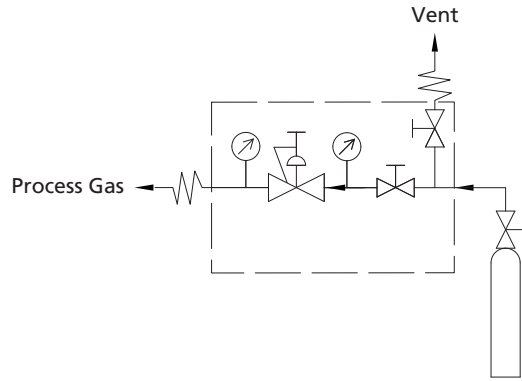


Model: FSR-2Z6L-45-750-00-B-B-00-P-P

### Typical Flow Chart

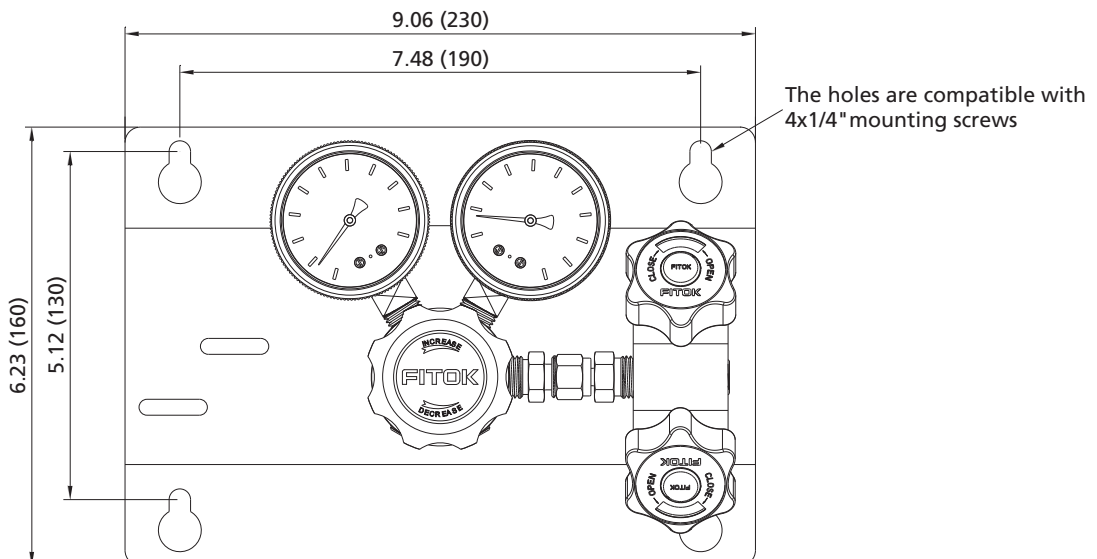
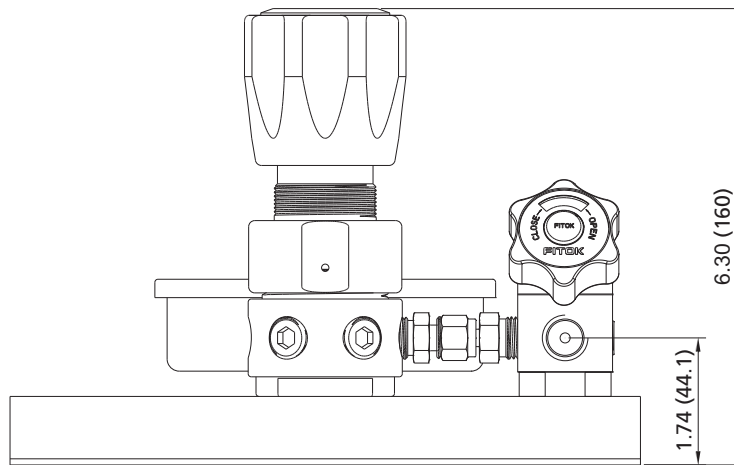


## Flow Schematic

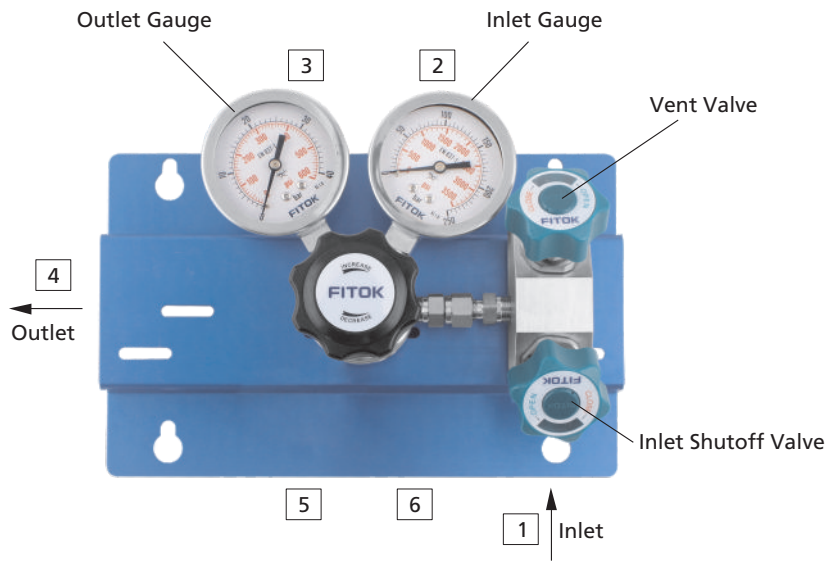


## Dimensions

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



## Components Introduction



## Ordering Number Description

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

Vent Option	Inlet Pressure P1	Connection 1	Connection 2	Connection 4	Connection 5
Without	30 3000 psig	00 1/4" Female NPT	B With Gauge (psi/bar)	00 1/4" Female NPT	R Relief Valve
V With	45 4500 psig	01 1/4" Male NPT	M With Gauge (psi/MPa)	01 1/4" Male NPT	P Plug
		10 1/4" Tube Fitting	P Plug	10 1/4" Tube Fitting	00 1/4" Female NPT
		11 3/8" Tube Fitting	00 1/4" Female NPT	11 3/8" Tube Fitting	
		20 6 mm Tube Fitting		20 6 mm Tube Fitting	
		21 8 mm Tube Fitting		21 8 mm Tube Fitting	
		Other connections are available upon request		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	

O-ring Material	Outlet Pressure Range P2	Connection 3	Connection 6
FKM	750 0~750 psig	Same as Connection 2	Same as Connection 5
Z FFKM	1500 0~1500 psig		
	2500 0~2500 psig		

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

Notes:

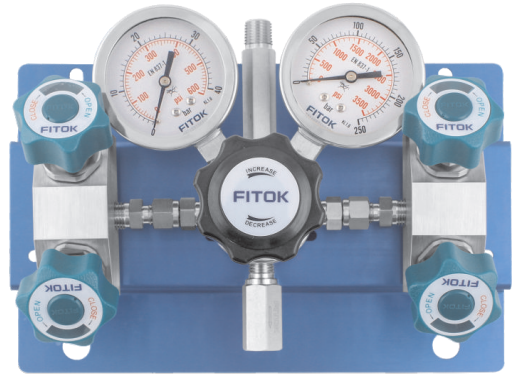
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.

# Changeover Systems

## FDR-1 Series Manual Changeover System

### Features

- ⦿ Two gas sources are connected to the system, when the pressure of one gas source is lower than the switching pressure, manually switch to the other gas source to ensure continuous gas supply
- ⦿ With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

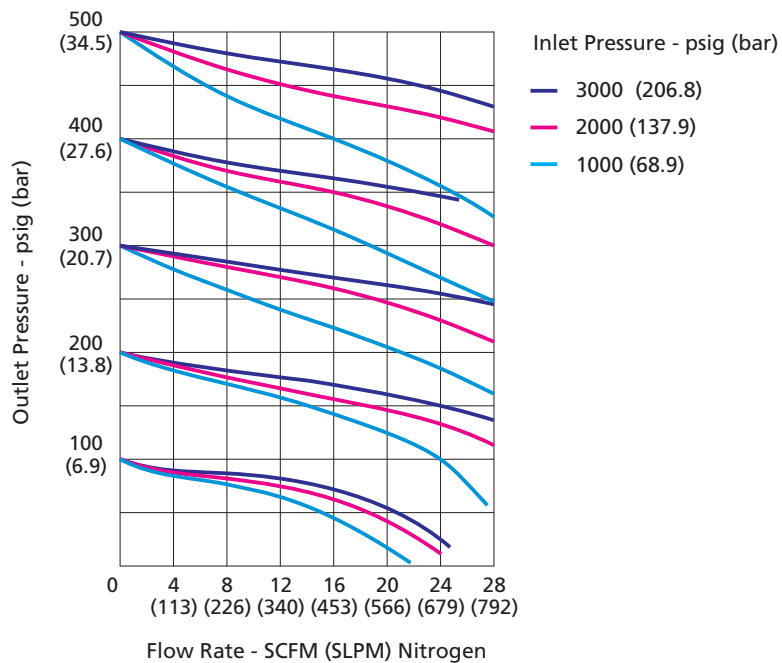


Model: FDR-16L-30-500-00-B-B-01-00-R

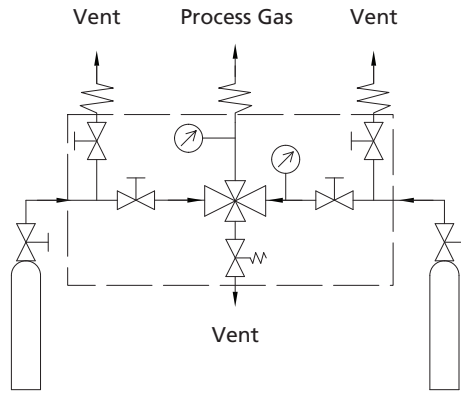
### Technical Data

- ⦿ 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), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
  - O-ring: FKM
- ⦿ Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- ⦿ Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (regulator Cv): 0.06

### Typical Flow Chart

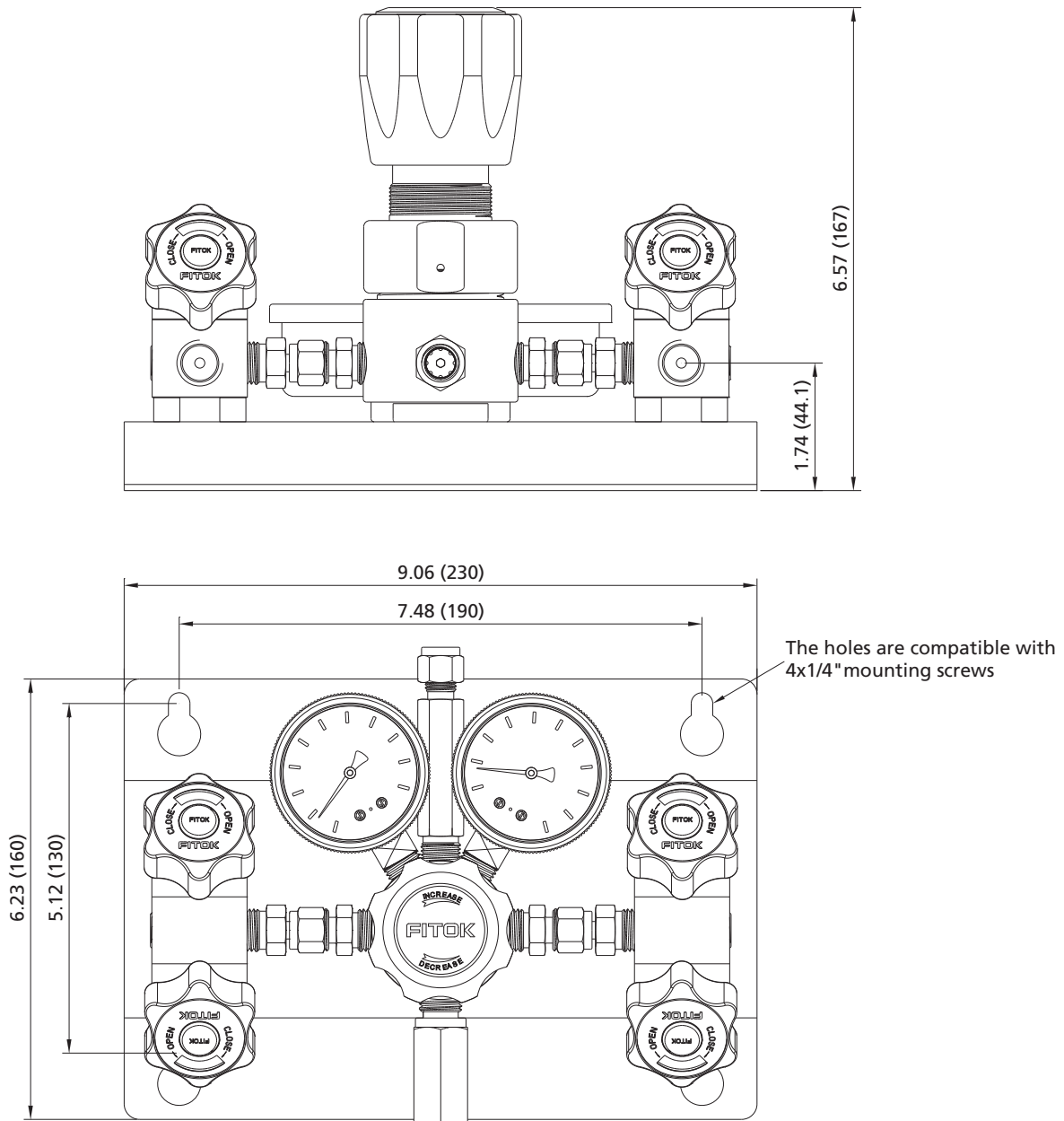


## Flow Schematic

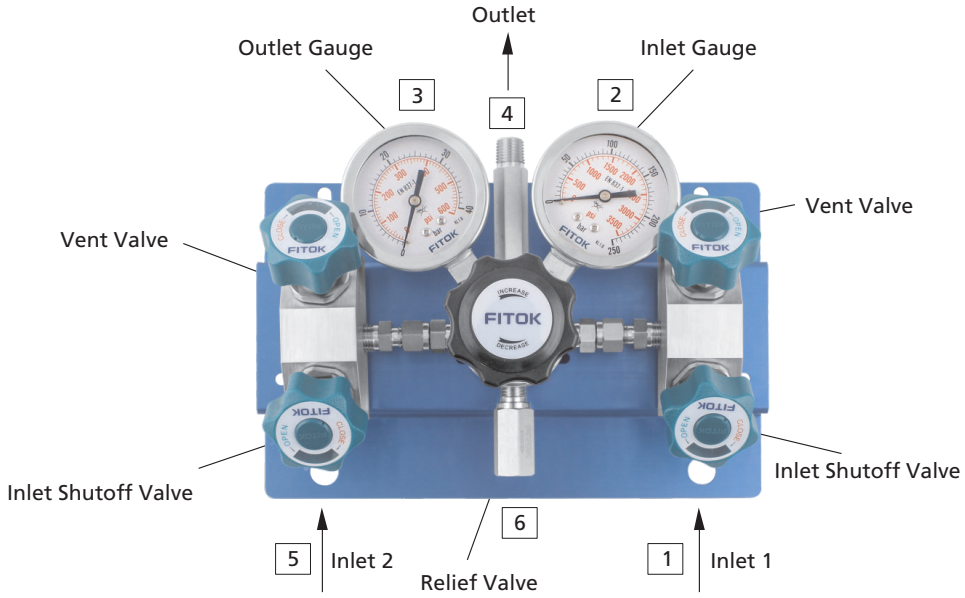


## Dimensions

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



# Components Introduction



## Ordering 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 (psi/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 6	
R	Relief Valve
P	Plug
00	1/4" Female NPT

**Connection 5**  
Same as Connection 1

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.



# Changeover Systems

## FDR-2 Series Manual Changeover System

### Features

- Two gas sources are connected to the system, when the pressure of one gas source is lower than the switching pressure, manually switch to the other gas source to ensure continuous gas supply
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres

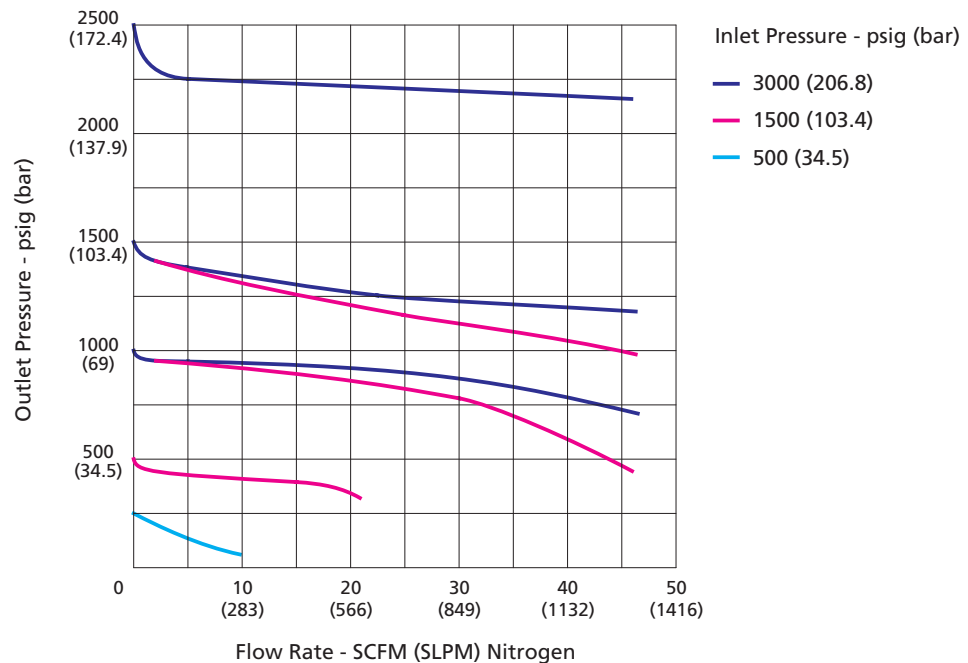


Model: FDR-2VSS-45-2500-00-B-B-01-00

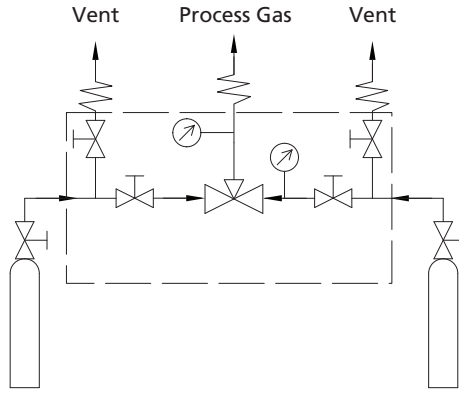
### Technical Data

- 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: cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
  - O-ring: FKM or FFKM
  - 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

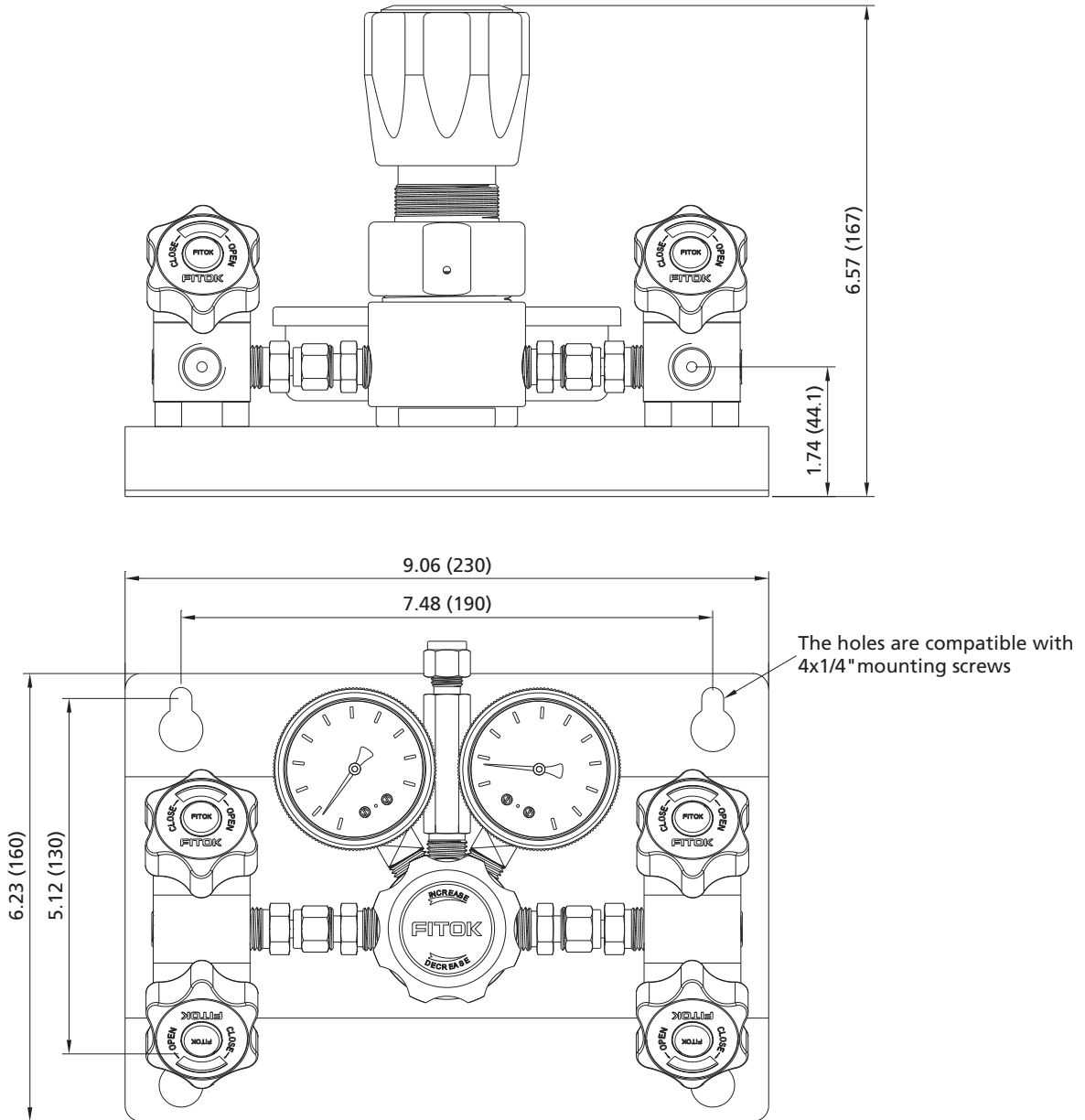


# Flow Schematic

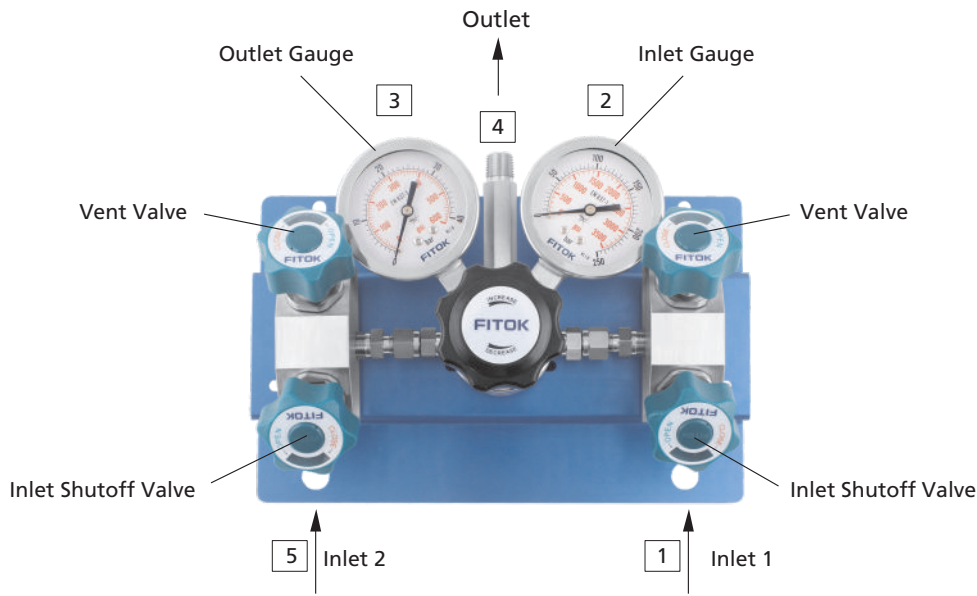


# Dimensions

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



# Components Introduction



## Ordering Number Description

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

Vent Option	Inlet Pressure P1	Connection 1	Connection 2	Connection 4	Connection 5
Without	30 3000 psig	00 1/4" Female NPT	B With Gauge (psi/bar)	00 1/4" Female NPT	Same as Connection 1
V With	45 4500 psig	01 1/4" Male NPT	M With Gauge (psi/MPa)	01 1/4" Male NPT	
		10 1/4" Tube Fitting	P Plug	10 1/4" Tube Fitting	
		11 3/8" Tube Fitting	00 1/4" Female NPT	11 3/8" Tube Fitting	
		20 6 mm Tube Fitting		20 6 mm Tube Fitting	
		21 8 mm Tube Fitting		21 8 mm Tube Fitting	
		Other connections are available upon request		Other connections are available upon request	
			Connection 3		
			Same as Connection 2		

O-ring Material	Outlet Pressure Range P2
FKM	750 0~750 psig
Z FFKM	1500 0~1500 psig
	2500 0~2500 psig

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

Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.

# Changeover System

## CEPR Series Automatic Changeover System

The CEPR series automatic changeover system, suitable for uninterrupted gas supply, uses dual gas sources of main supply cylinder and backup cylinder. When the pressure of one gas source drops below the set pressure, the changeover system will automatically switch from the depleted source to the backup source, thus achieving a continuous gas supply.

### Features

- ⦿ Two gas sources are connected to regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas, thus ensuring continuous gas supply
- ⦿ Excellent sensitivity and set point pressure stability

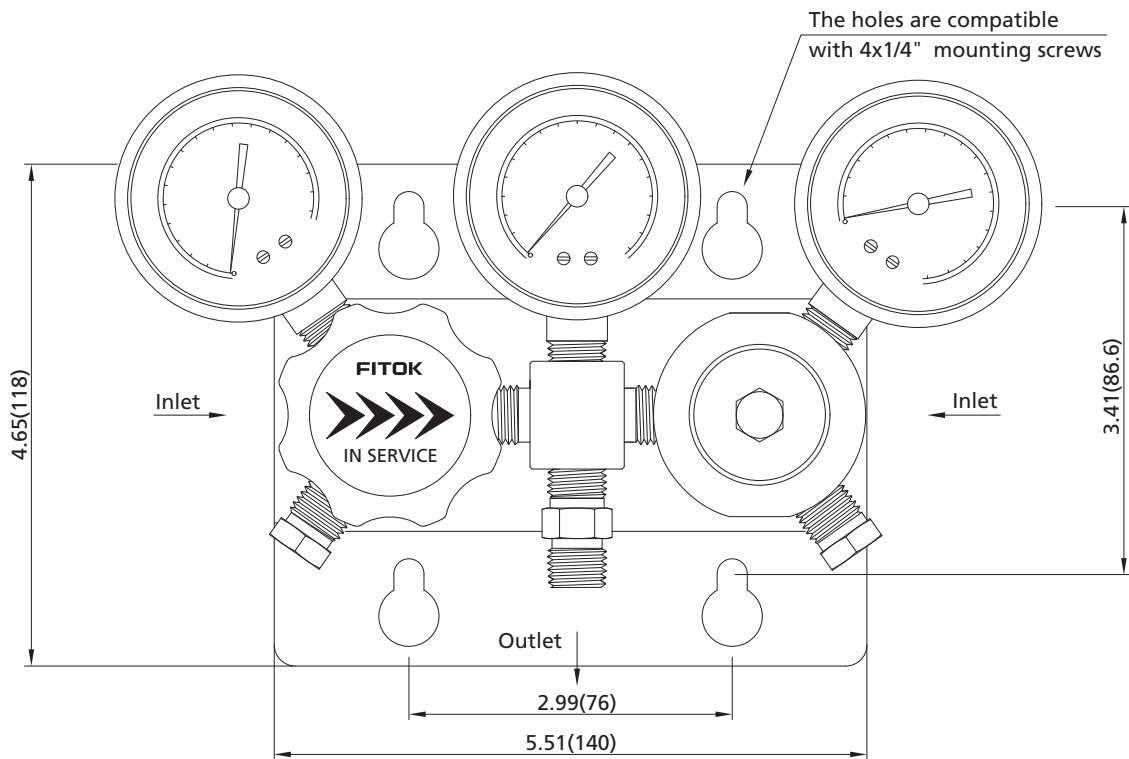
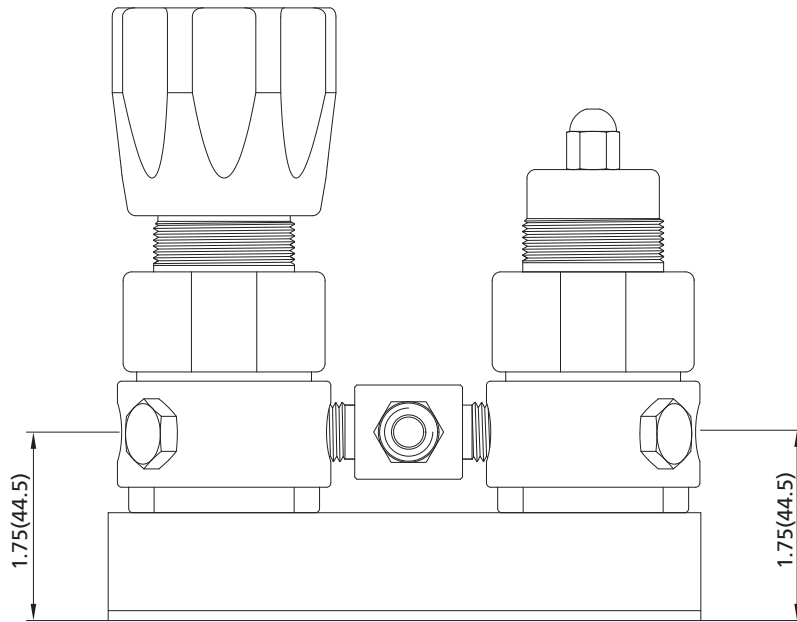


### Technical Data

- ⦿ Maximum inlet pressure: 3000 psig
- ⦿ Nominal changeover pressure: 100, 150, 200 and 250 psig
- ⦿ Outlet pressure ranges: 85 ~ 115, 135 ~ 165, 185 ~ 215, 235 ~ 265 psig
- ⦿ Material of the internal components:
  - Seat: PCTFE
  - Diaphragm: Hastelloy
  - Filter: 316L
- ⦿ Working Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- ⦿ Valve leak rates (helium):
  - Internal: Bubble-tight
  - External:  $\leq 2 \times 10^{-8}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.06
- ⦿ Weight:  $\approx 5.07$  lbs (2.3 kg)

## Dimensions

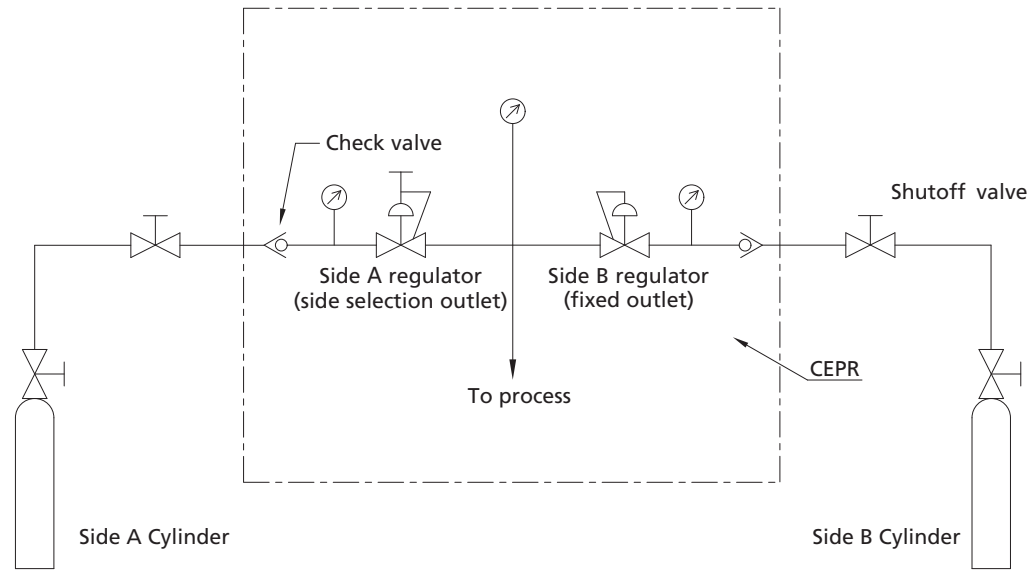
Dimensions, in inches (millimeters), are for reference only.



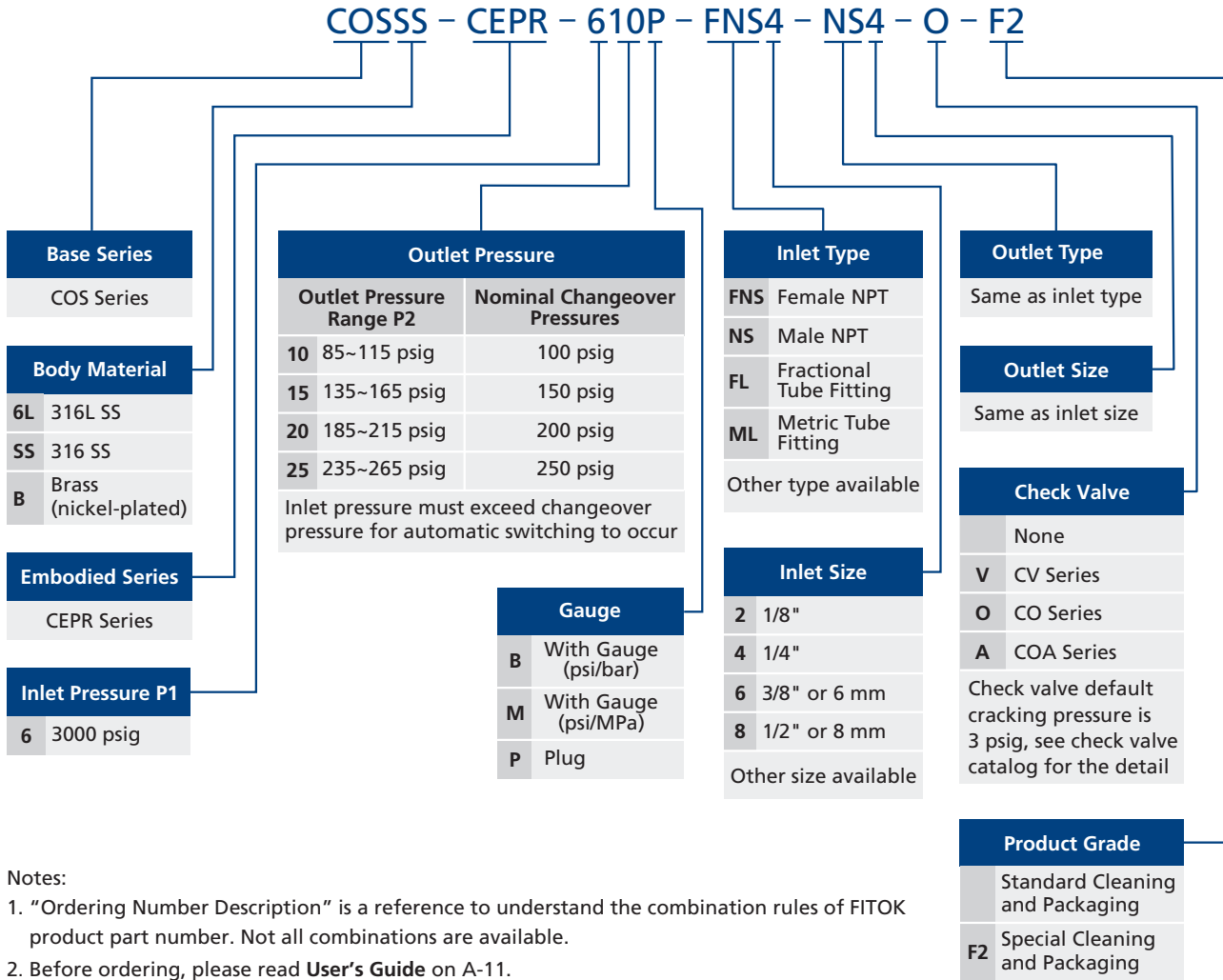
## Operation Overview

The CEPR series changeover system consists of two separate regulators. The two regulators are respectively attached to separate source cylinders. One of the regulators has an adjusting handle which can swivel to enable source side selection.

The other regulator is preset to an appropriate setting for the system outlet range. The source selection handle adjusts the outlet pressure to be either above or below the preset side within 15 ~ 30 psig. When the handle is turned to point to the standby side, the standby side continues to supply gas due to the change in differential pressure to achieve continuous and uninterrupted gas supply. When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply.



# Ordering Number Description



**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.

# Changeover Systems

## FDR-1L Series Automatic Changeover System

### Features

- With CEPR series automatic changeover device
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres

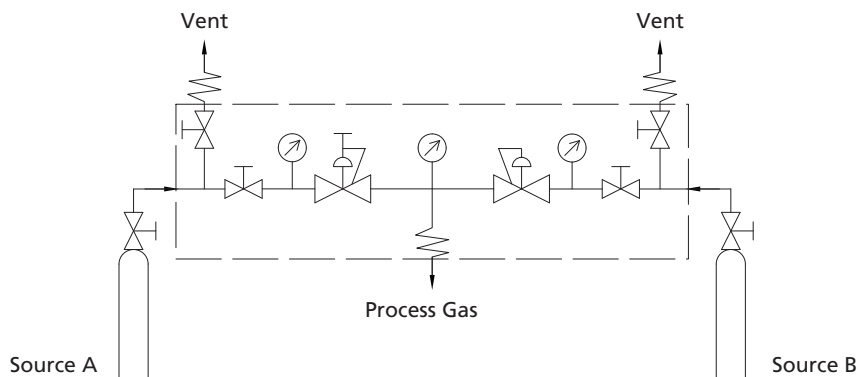


Model: FDR-1L6L-30-10-B-00-00-00

### Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Nominal changeover pressure: 100, 150, 200 and 250 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), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- Flow coefficient (regulator Cv): 0.06
- Weight:  $\approx 12.1$  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.

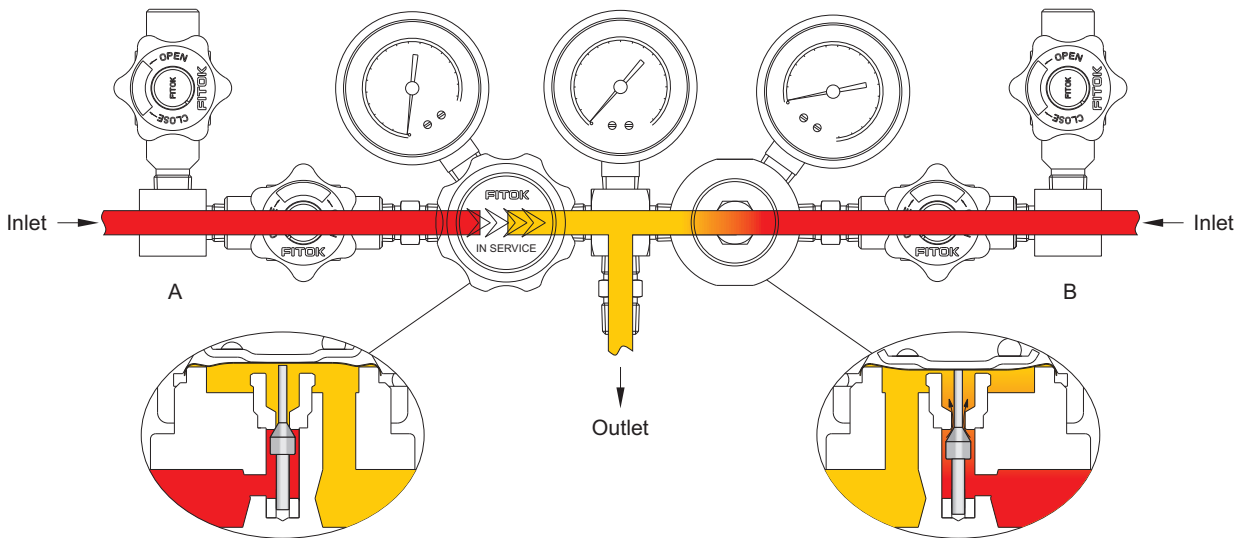


Fig. 1

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.

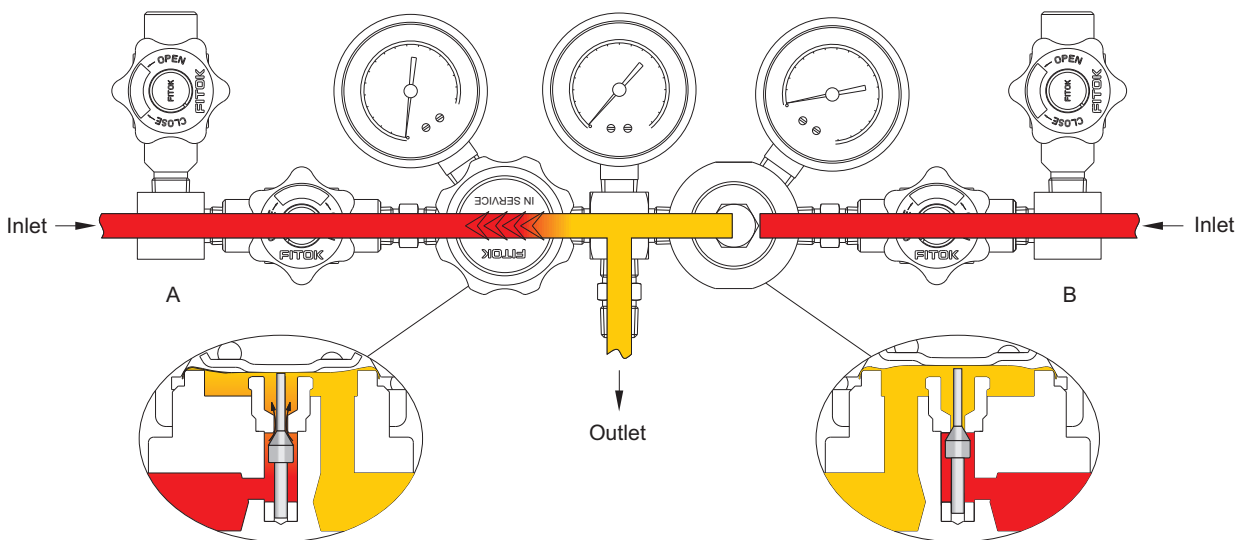


Fig. 2

## A-70 Gas Control Equipment

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

Fig. 1 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 as shown in Fig. 3

Gas from side A will flow back into side B. At this time, replace to a new gas source of side B, close the shutoff valve and open the vent valve to exhaust the remaining pressure, then replace to a new gas source. After the replacement, if not rotating the handle, the gas supply will return to the status as of Fig. 1. And if rotating the handle to the status as shown in Fig. 2, the gas supply will be changed to the status as of Fig. 2.

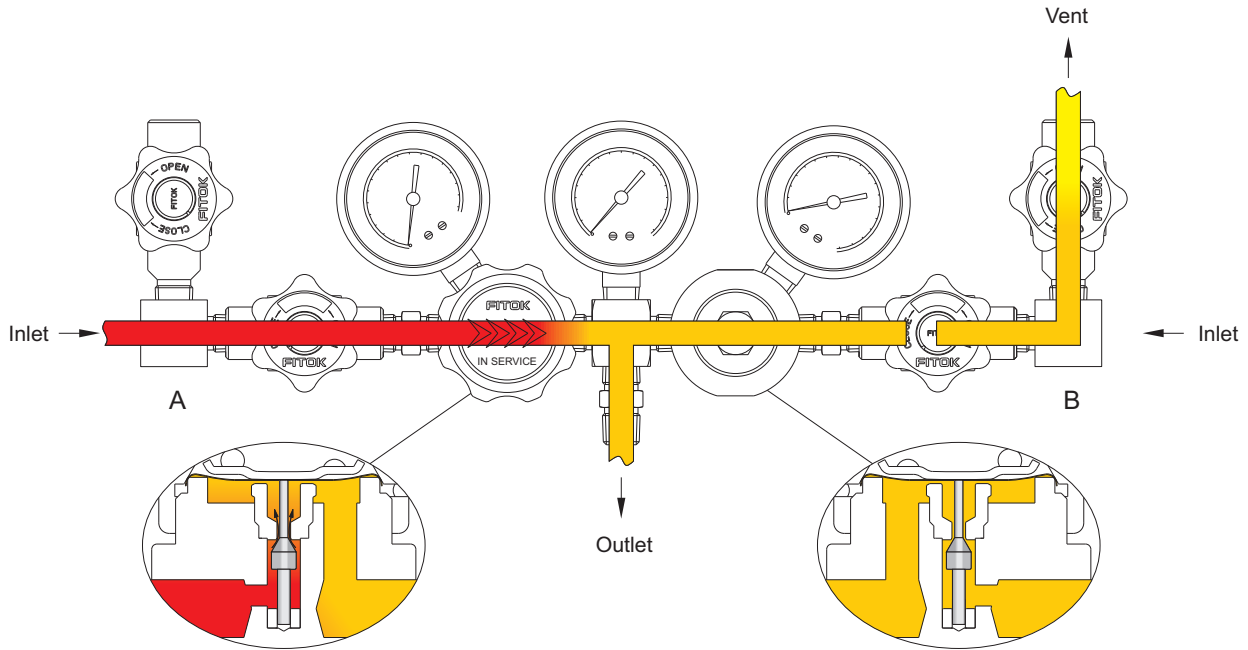
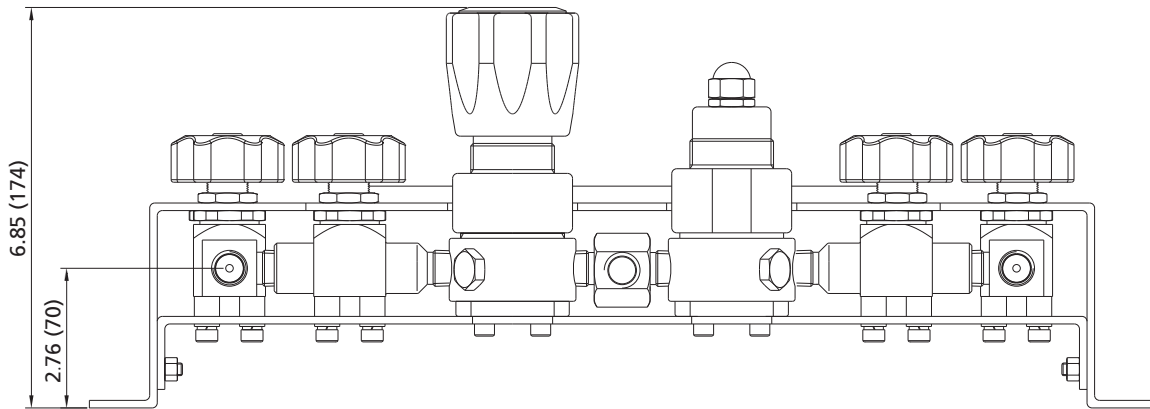
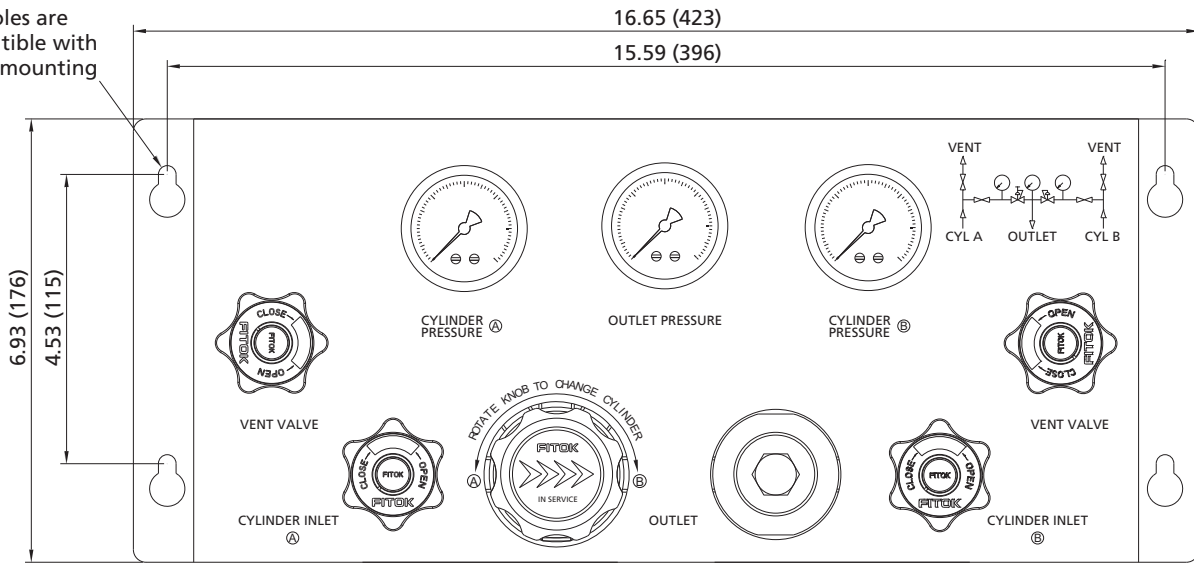


Fig. 3

## Dimensions

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

The holes are compatible with 4x1/4" mounting screws



## Ordering 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)

Outlet Pressure	
Outlet Pressure Range P2	Nominal Changeover Pressures
10	85~115 psig / 100 psig
15	135~165 psig / 150 psig
20	185~215 psig / 200 psig
25	235~265 psig / 250 psig

Gauge Scale	
B	With Gauge (psi/bar)
M	With Gauge (psi/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

Inlet B	
Same as Inlet A	
Outlet	
Same as Inlet A	

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Inlet pressure must exceed changeover pressure for automatic switching to occur

Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-11.

Other connections are available upon request

# Changeover Systems

## DPPR Series Automatic Changeover System

The DPPR series automatic changeover system, suitable for uninterrupted gas supply, uses dual gas sources of main supply cylinder and backup cylinder. When the pressure of one gas source drops below the set pressure, the changeover system will automatically switch from the depleted source to the backup source, thus achieving a continuous gas supply.

### Features

- Two gas sources are connected to regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas, thus ensuring continuous gas supply.
- Excellent sensitivity and set point pressure stability

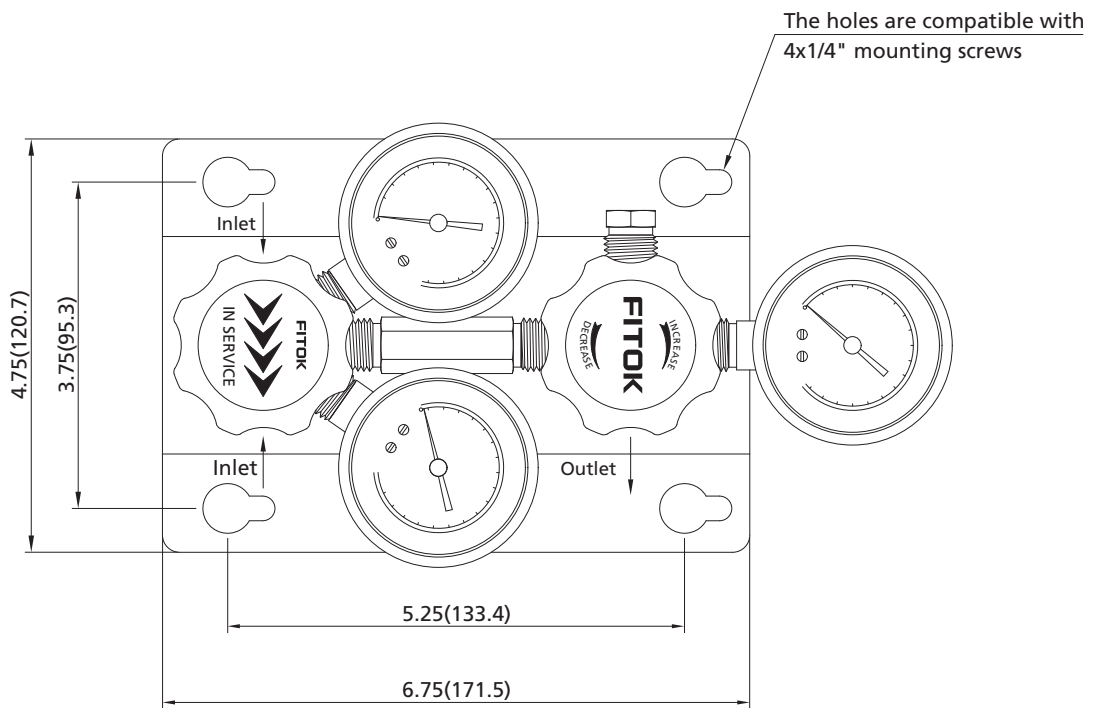
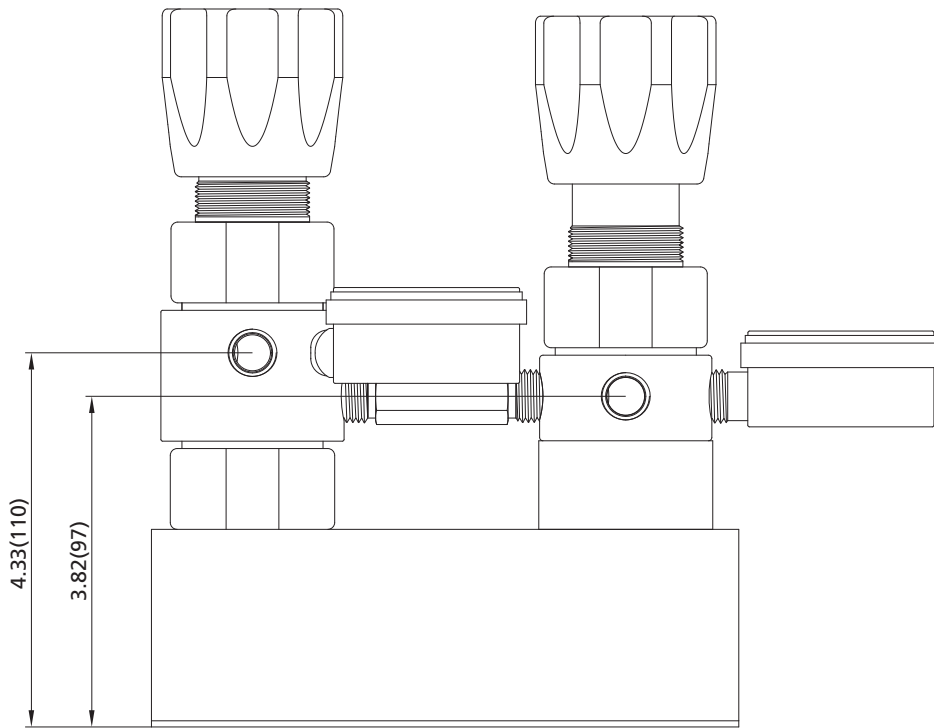


### Technical Data

- Maximum inlet pressure: 3000 psig
- Nominal changeover pressures: 250 psig
- Outlet pressure ranges: 0 ~ 25, 0 ~ 50, 0 ~ 100, 0 ~ 150 psig
- Material of the internal components:
  - Seat: PCTFE
  - Diaphragm: Hastelloy
  - Filter: 316L
- Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- Valve leak rates (helium):
  - Internal: Bubble-tight
  - External:  $\leq 2 \times 10^{-8}$  std cm<sup>3</sup>/s
- Flow coefficient (Cv): 0.06
- Weight:  $\approx 5$  lbs (2.3 kg)

## Dimensions

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

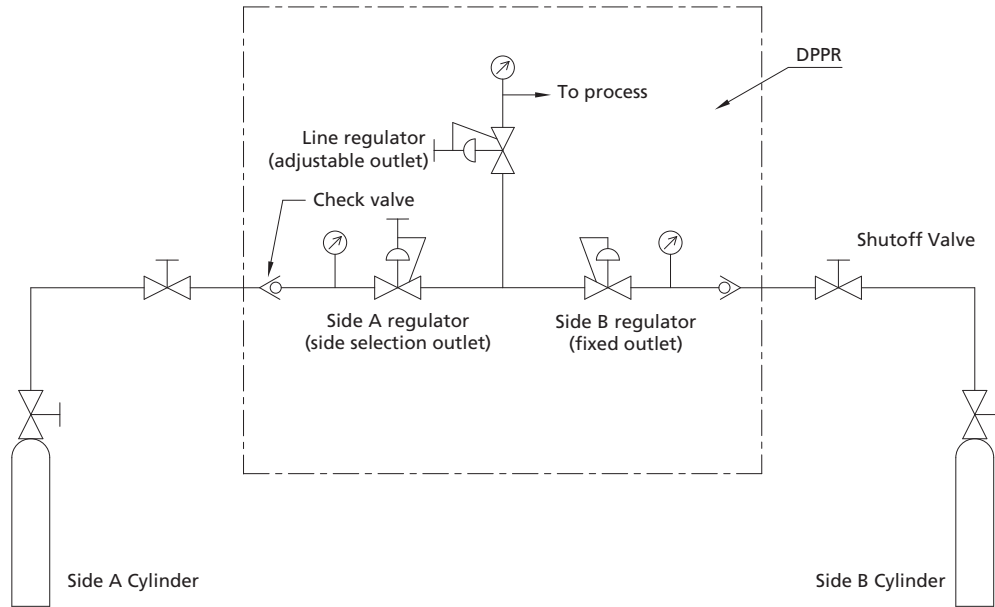


## Operation Overview

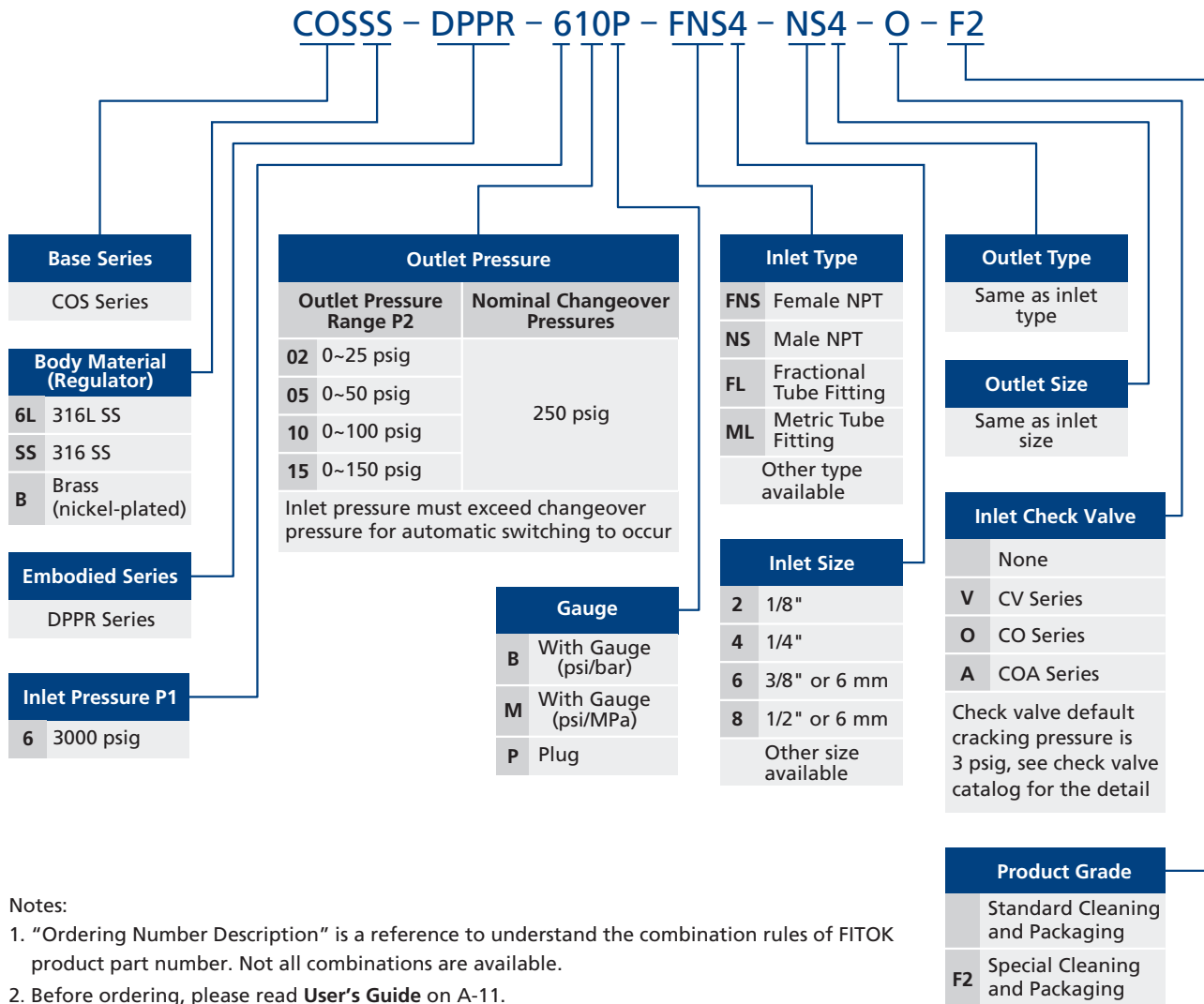
The DPPR series changeover system consists of three pressure regulators, housing two single-stage regulators in a single body and a line regulator. The two single-stage regulators are each attached to separate source cylinders. The adjusting handle can swivel to enable source side selection. The other regulator is preset to an appropriate setting for the system outlet range.

The source selection handle adjusts the outlet pressure to be either above or below the preset side within 15 ~ 30 psig. When the handle is turned to point to the standby side, the standby side continues to supply gas due to the change in differential pressure to achieve continuous and uninterrupted gas supply.

When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply. At this time, the main gas cylinder can be changed for continuous uninterrupted gas supply.



## Ordering Number Description



**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.

# Changeover Systems

## FDR-1T Series Automatic Changeover System

### Features

- ⦿ Two gas sources are connected to pressure regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas to ensure continuous gas supply
- ⦿ Excellent sensitivity and set point pressure stability
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

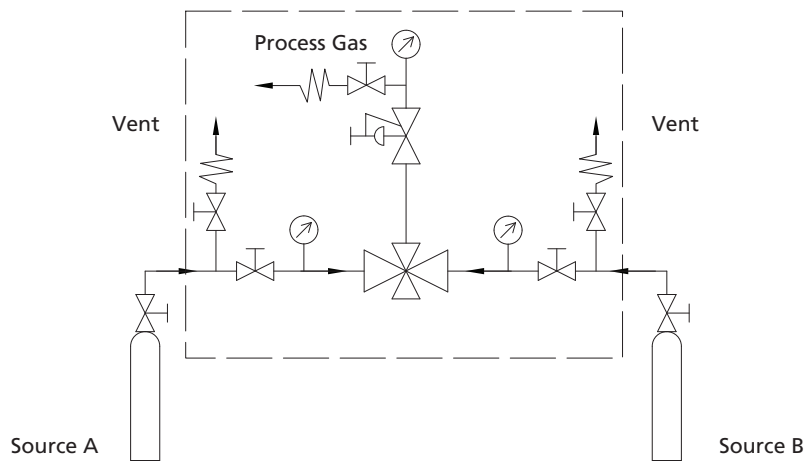


Model: FDR-1T6L-45-150-B-00-00-00

### Technical Data

- ⦿ Maximum inlet pressure: 3000 or 4500 psig
- ⦿ Nominal changeover pressures: 250 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), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
- ⦿ Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- ⦿ Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (regulator Cv): 0.06
- ⦿ Weight:  $\approx 19.6$  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.

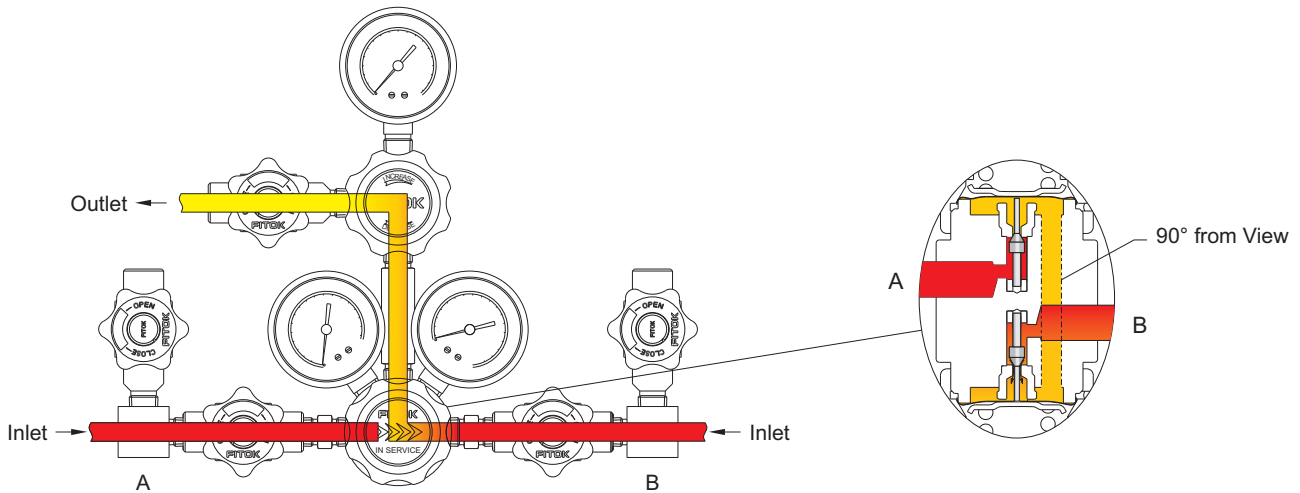


Fig. 1

*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.

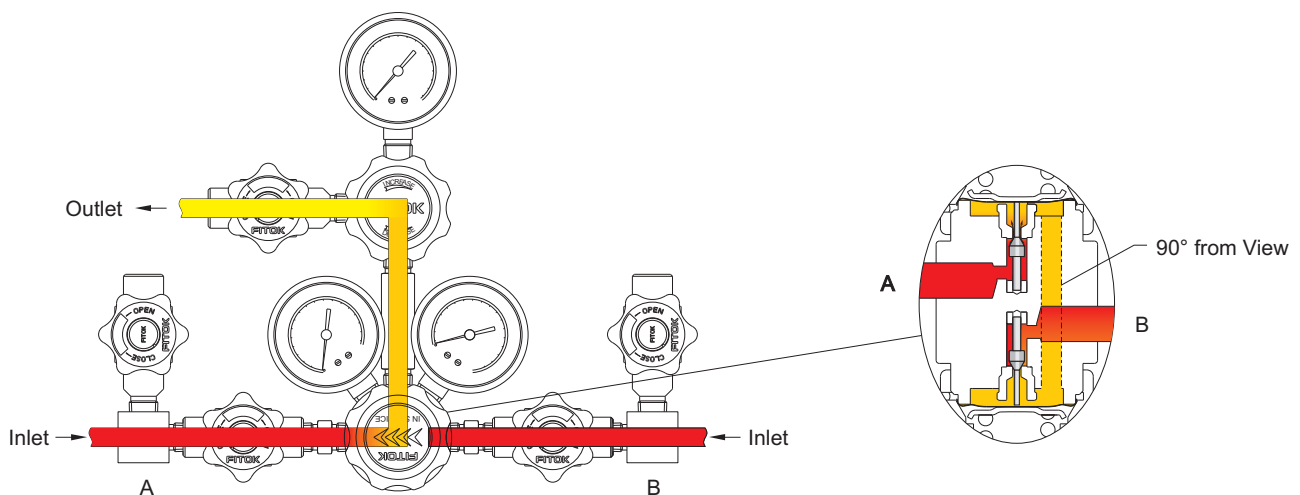


Fig. 2

## A-78 Gas Control Equipment

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.*

*Gas from side A will flow back into side B. At this time, replace to a new gas source of side B, close the shutoff valve and open the vent valve to exhaust the remaining pressure, then replace to a new gas source. After the replacement, if not rotating the handle, the gas supply will return to the status as of Fig. 1. And if rotating the handle to the status as shown in Fig. 2, the gas supply will be changed to the status as of Fig. 2.*

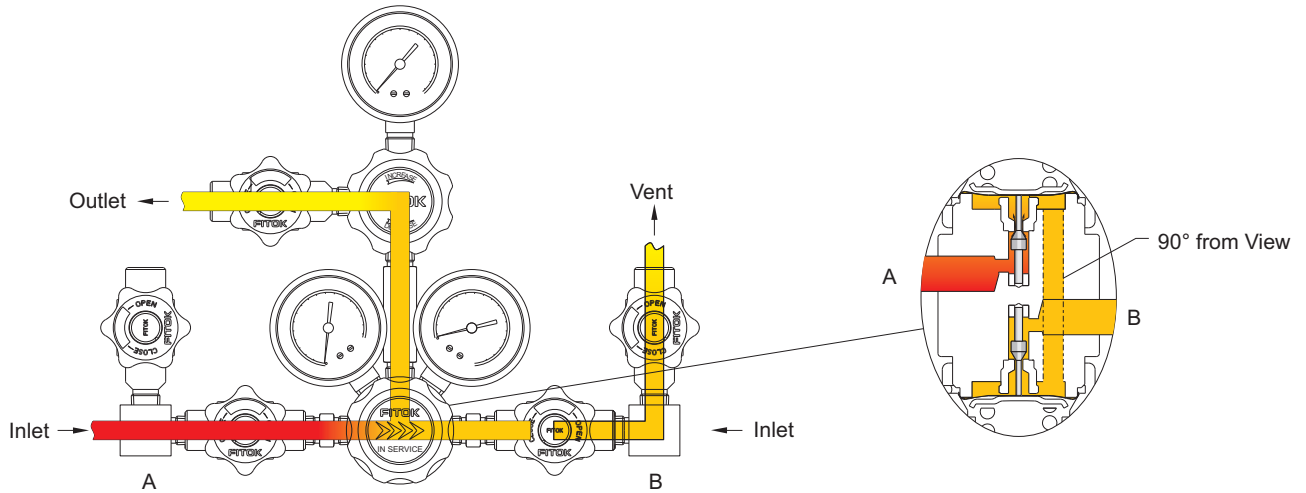
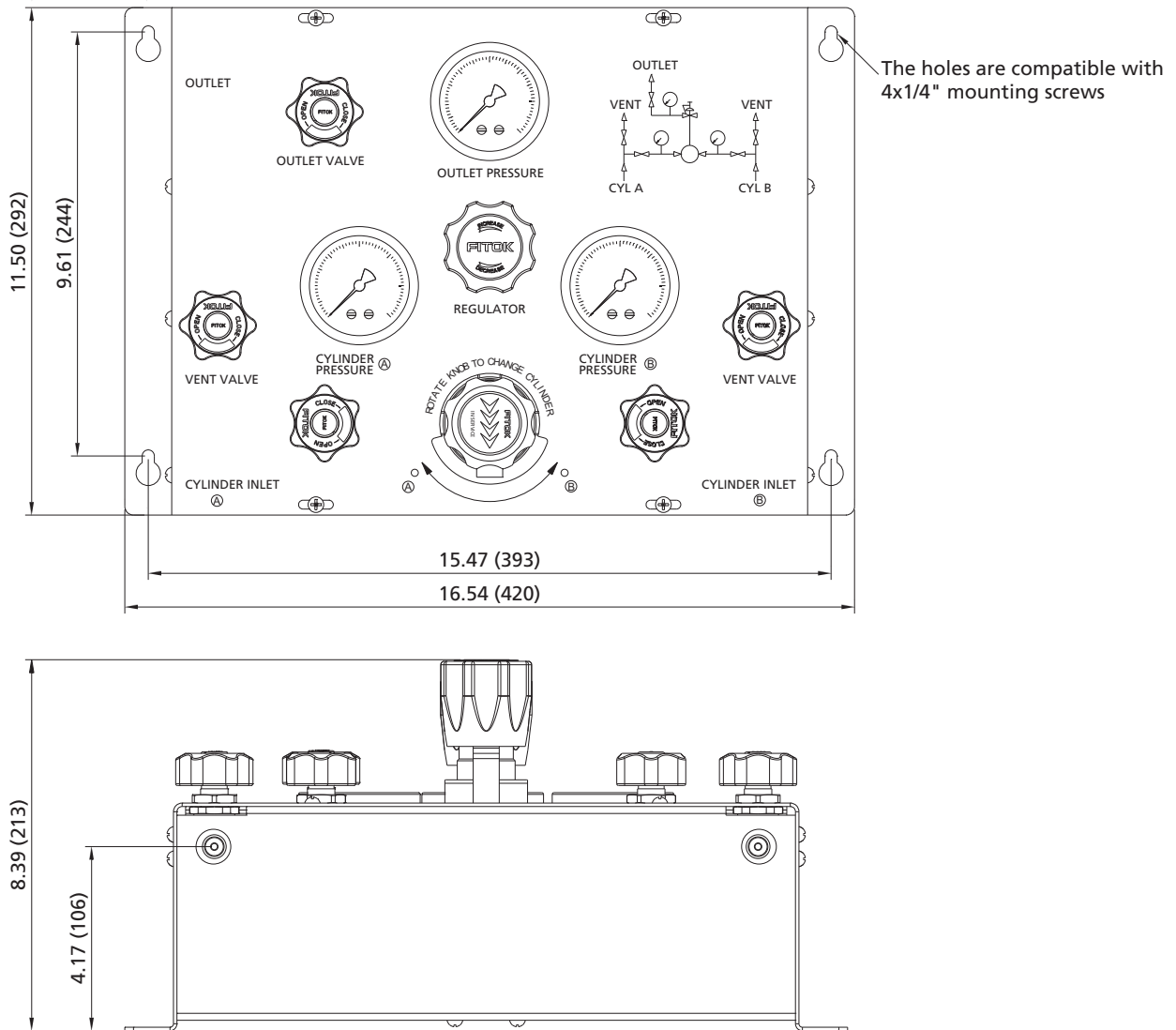


Fig. 3

## Dimensions

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



Gas Control Equipment

Related Products

Technical References

## Ordering Number Description

FDR - 1T6L - 30 - 25 - B - 10 - 00 - 00

Body Material (Regulator)	Outlet Pressure		Gauge Scale	Inlet A		Inlet B
6L 316L SS	Outlet Pressure Range P2	Nominal Changeover Pressures	B With Gauge (psi/bar)	00 1/4" Female NPT	Other connections are available upon request	Same as Inlet A
SS 316 SS	25 0~25 psig	250 psig	M With Gauge (psi/MPa)	01 1/4" Male NPT		
HC Hastelloy C-276	50 0~50 psig			10 1/4" Tube Fitting		
B Brass (Nickel-plated)	100 0~100 psig		11 3/8" Tube Fitting			
	150 0~150 psig					
Inlet Pressure P1	Inlet pressure must exceed changeover pressure for automatic switching to occur				Outlet	Same as Inlet A
30 3000 psig						
45 4500 psig						

Notes: 1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

2. Before ordering, please read **User's Guide** on A-11.

# Point-of-Use Panels

## FPR-1 Series General Point-of-Use Panels

### Features

- With a FLR-1 Series Regulator
- With diaphragm valve to cut off the gas supply
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres

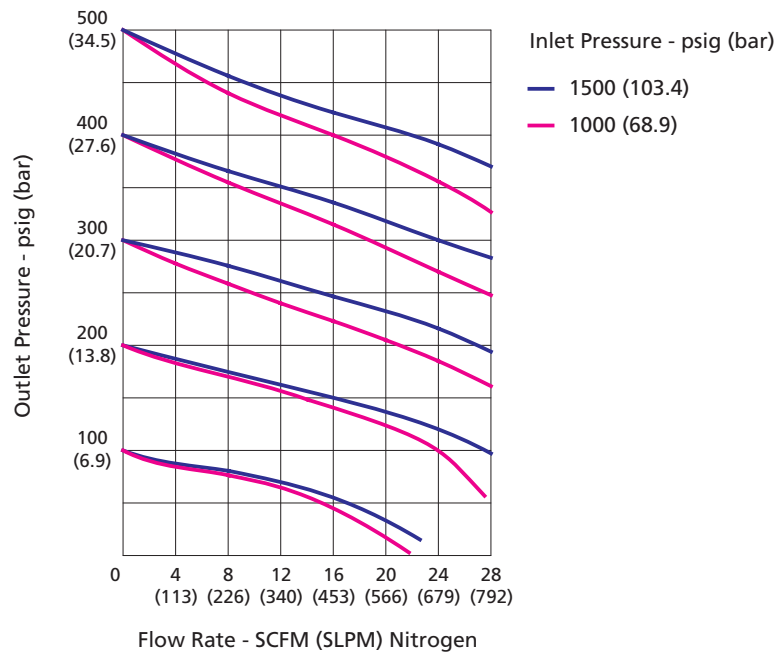
### Technical Data

- 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), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
  - Filter: 316L
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- Flow coefficient (regulator Cv): 0.14



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

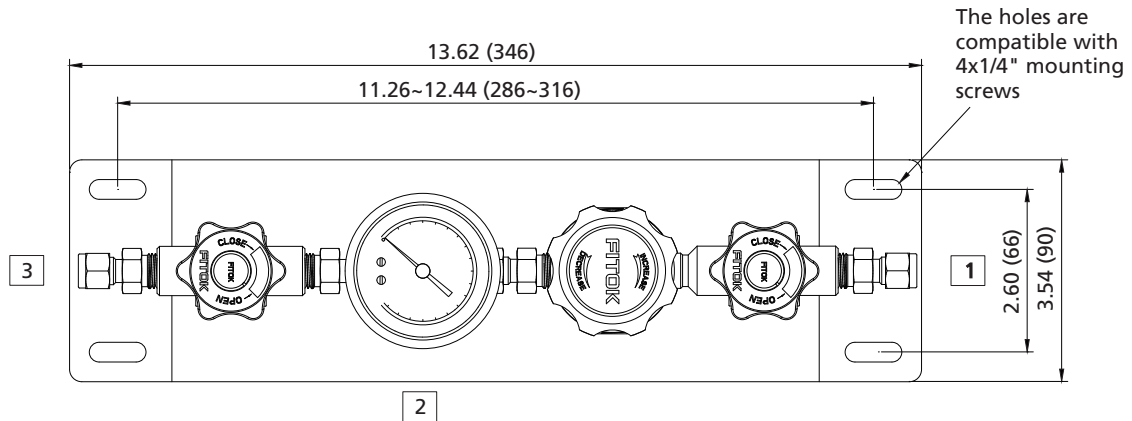
### Typical Flow Chart



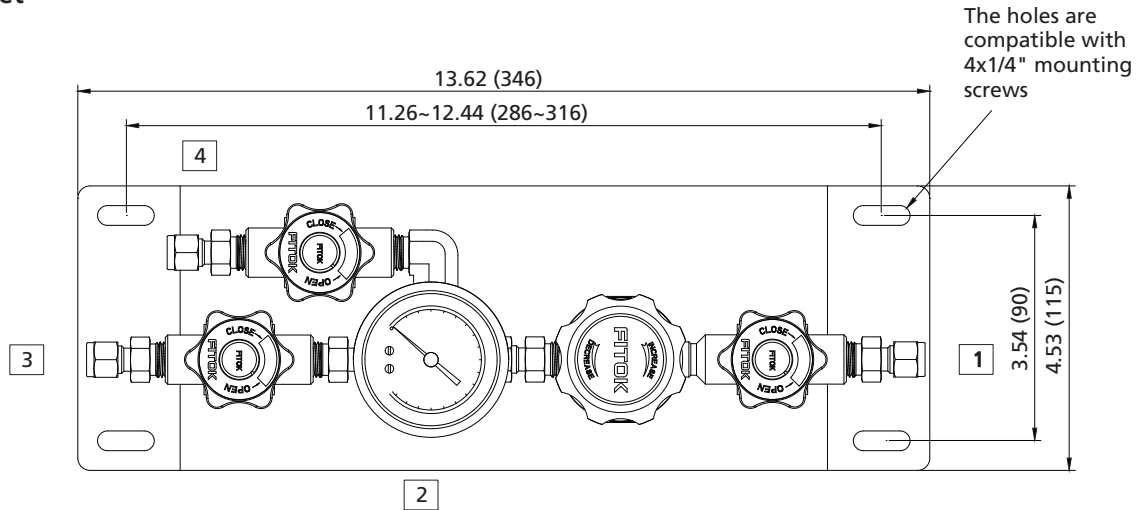
## Dimensions

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

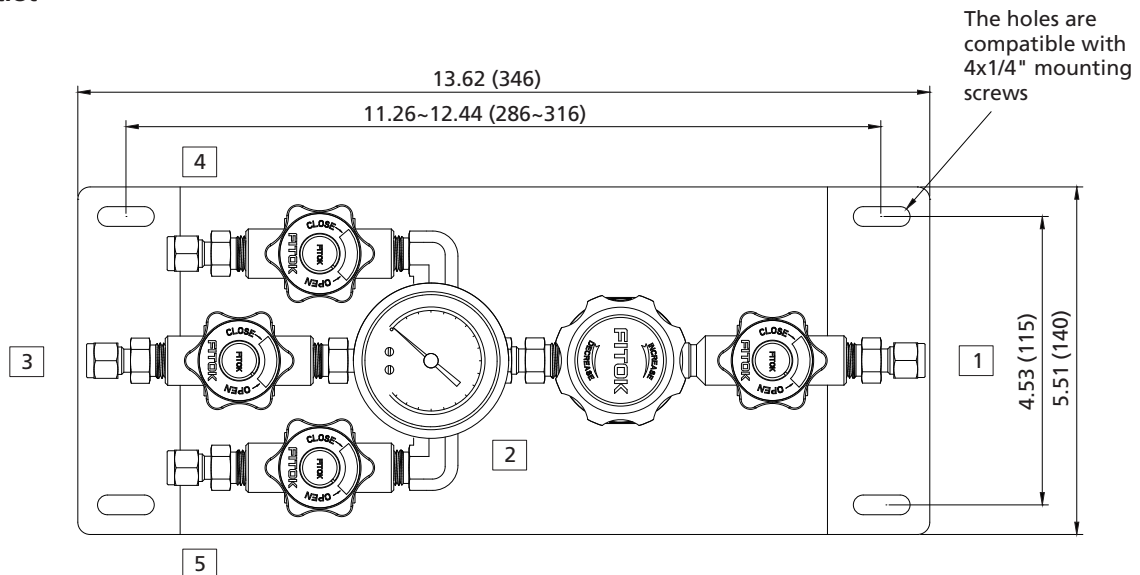
### Single-outlet



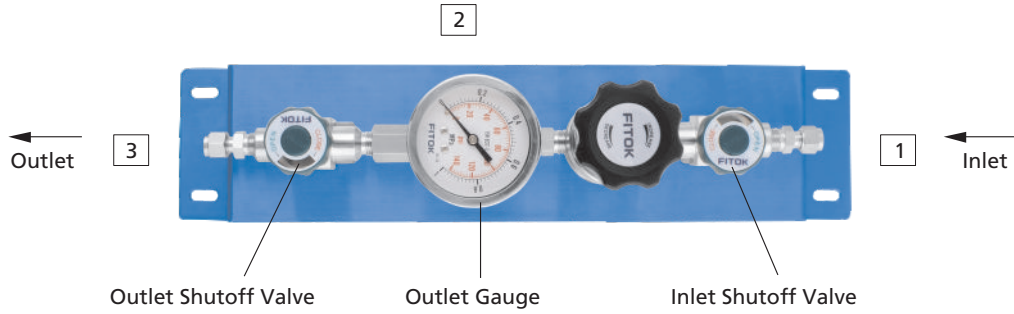
### Dual-outlet



### Triple-outlet



# Components Introduction



## Ordering Number Description

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

Outlet Option		Inlet Pressure P1		Connection 1		Connection 2		Connection 3		Connection 4	
U	Single-outlet	15	1500 psig	00	1/4" Female NPT	B	With Gauge (psi/bar)	Same as Connection 1		None	
T	Dual-outlet	Outlet Pressure Range P2		01	1/4" Male NPT	M	With Gauge (psi/MPa)	Same as Connection 1		Same as Connection 1	
C	Triple-outlet			10	1/4" Tube Fitting	P	Plug			Same as Connection 1	
Body Material (Regulator)		25	0~25 psig	11	3/8" Tube Fitting	00	1/4" Female NPT	Same as Connection 1		Connection 5	
6L	316L SS	50	0~50 psig	20	6 mm Tube Fitting	Other connections are available upon request				None	
SS	316 SS	100	0~100 psig	21	8 mm Tube Fitting			Same as Connection 1			
HC	Hastelloy C-276	250	0~250 psig								
B	Brass (Nickel-plated)	500	0~500 psig								

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.  
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 Point-of-Use Panels

### Features

- ⦿ With a FCR-1S Series sensitive diaphragm regulator
- ⦿ With diaphragm valve to cut off the gas supply
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

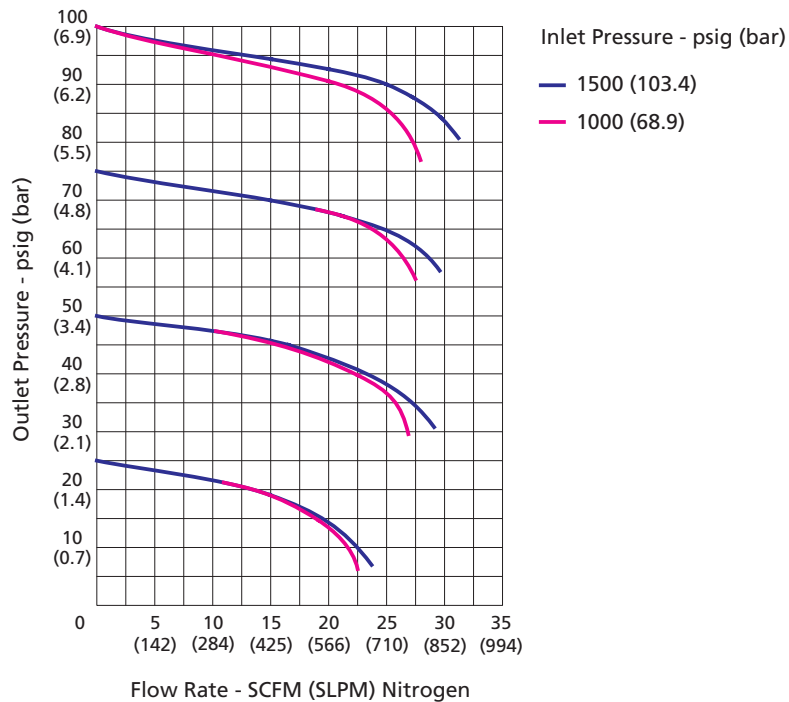
### Technical Data

- ⦿ 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: Hastelloy (regulator), cobalt alloy (diaphragm valve)
  - Diaphragm valve body: 316L
  - Filter: 316L
- ⦿ Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- ⦿ Valve leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-7}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (regulator Cv): 0.06



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

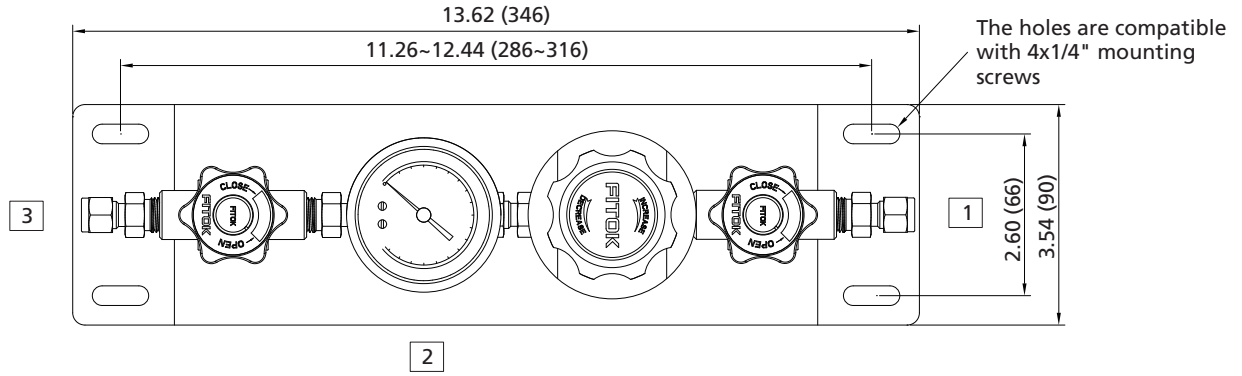
### Typical Flow Chart



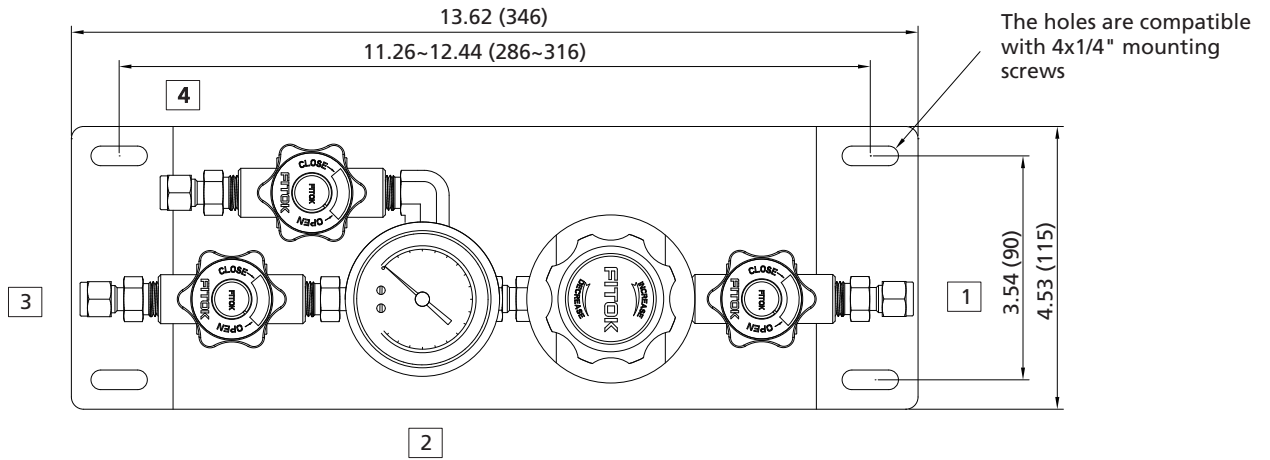
## Dimensions

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

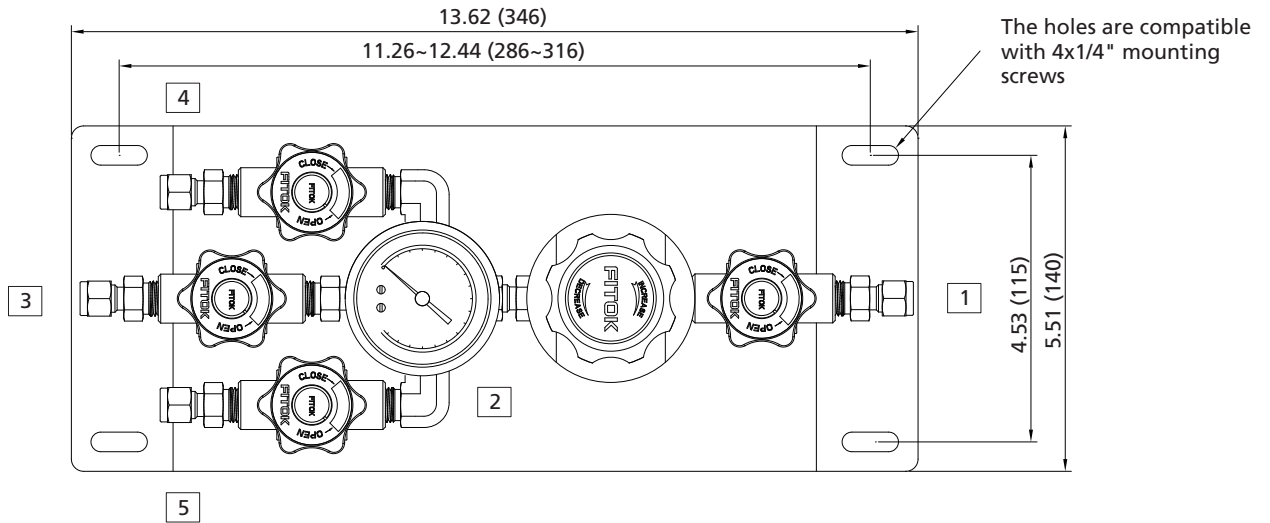
### Single-outlet



### Dual-outlet

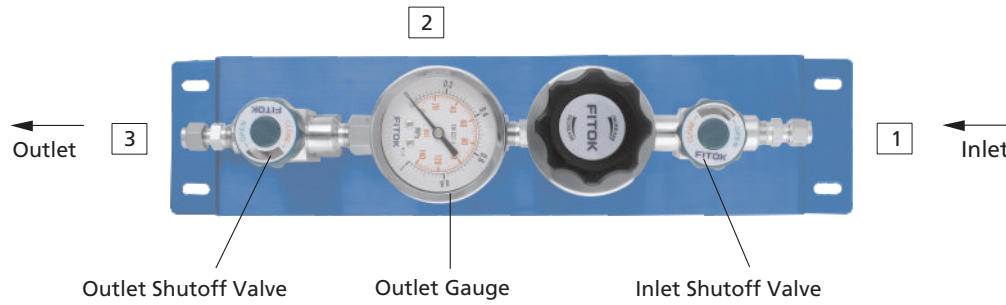


### Triple-outlet





## Components Introduction



## Ordering Number Description

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

Outlet Option		Inlet Pressure P1		Connection 1		Connection 2		Connection 3		Connection 4	
U	Single-outlet	15	1500 psig	00	1/4" Female NPT	B	With Gauge (psi/bar)	Same as Connection 1		None	
T	Dual-outlet	<b>Outlet Pressure Range P2</b> 25 0~25 psig 50 0~50 psig 100 0~100 psig 150 0~150 psig 200 0~200 psig		01	1/4" Male NPT	M	With Gauge (psi/MPa)			Same as Connection 1	
C	Triple-outlet			10	1/4" Tube Fitting	P	Plug				
<b>Body Material (Regulator)</b> 6L 316L SS SS 316 SS B Brass				11	3/8" Tube Fitting	00	1/4" Female NPT			<b>Connection 5</b> None Same as Connection 1	
				20	6 mm Tube Fitting						
				21	8 mm Tube Fitting						
				Other connections are available upon request							

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.  
 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-15TB-15-200-10-M-10-10

# Back Pressure Regulators

## BPR-1 Series Back Pressure Diaphragm Regulators

### Features

- ⦿ Excellent sensitivity and set point pressure stability
- ⦿ Reduced inner capacity
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

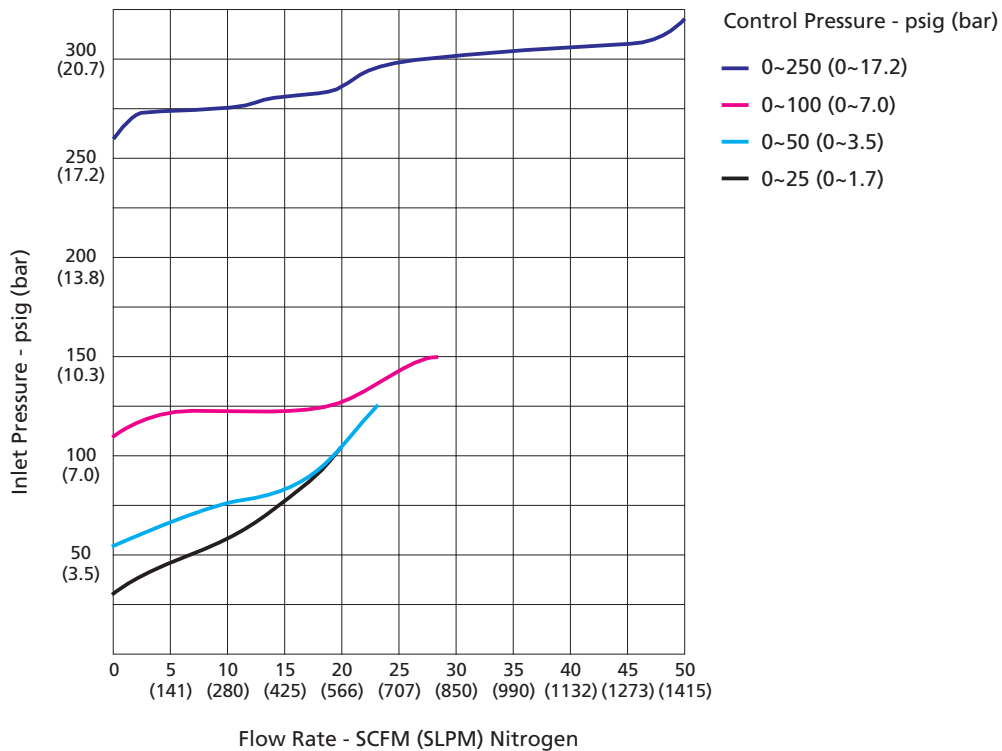
### Technical Data

- ⦿ 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: 316L
- ⦿ Temperature: -40 °F ~ 140 °F (-40 °C ~ 60 °C)
- ⦿ Leak rates (helium):
  - Internal: Bubble-tight
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Flow coefficient (Cv): 0.3
- ⦿ Weight:  $\approx 1.98$  lbs (0.9 kg)



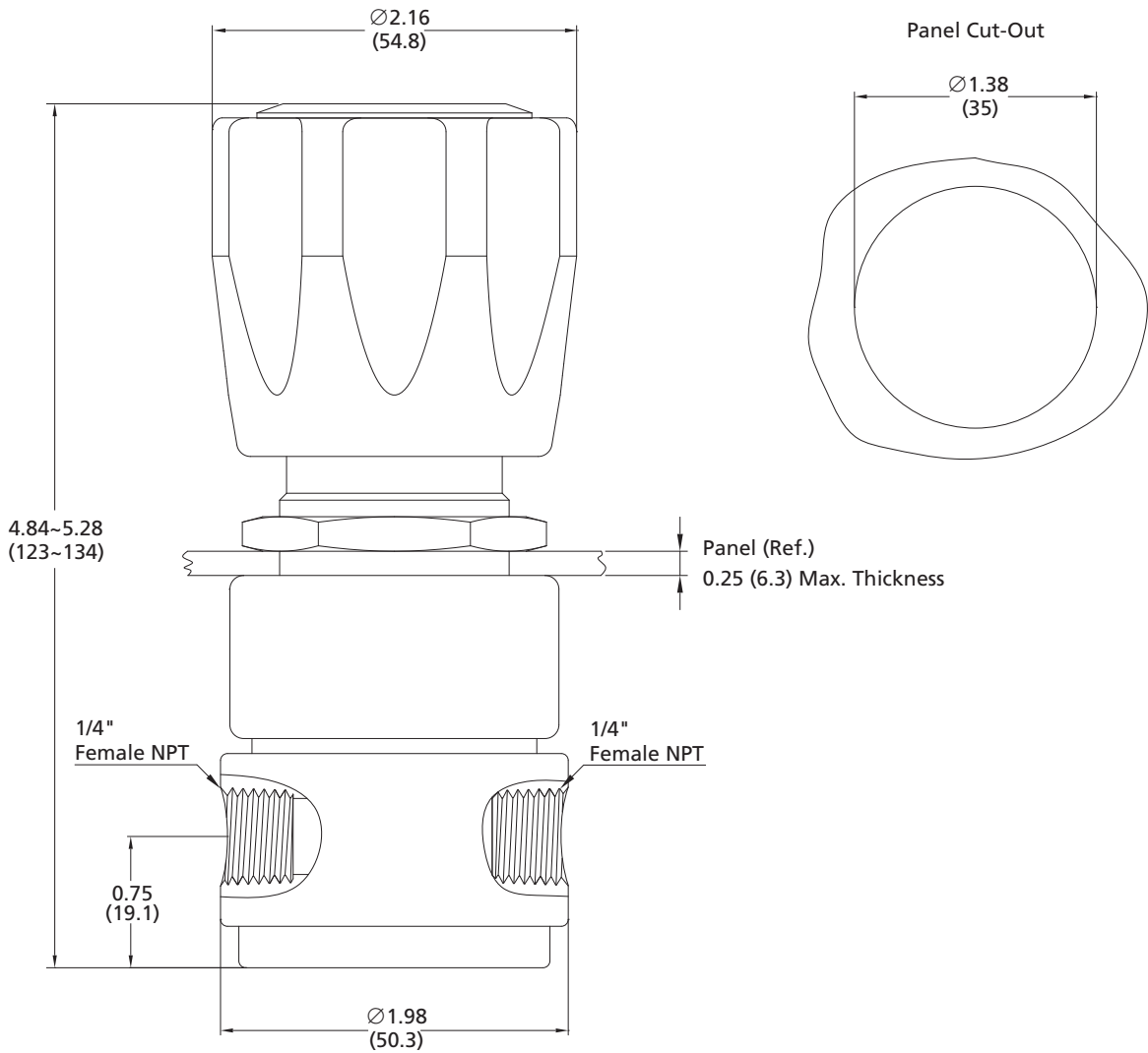
Model: BPR-16L-250-00-00-Z

### Typical Flow Chart

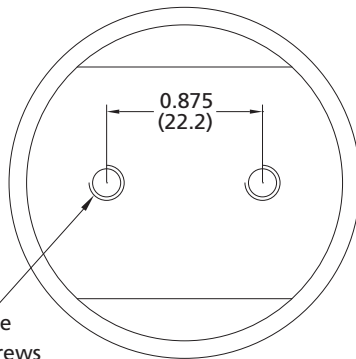


## Dimensions

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

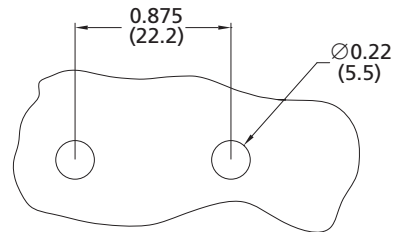


Bottom View

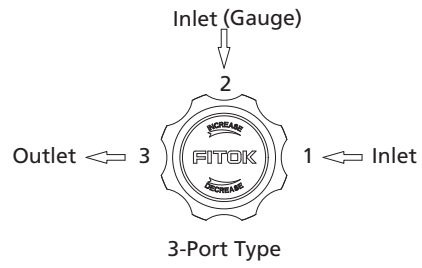
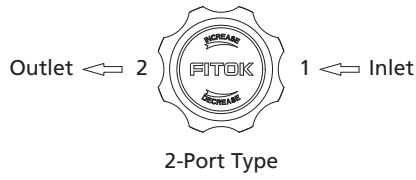


2×M5×0.8-6H thread  
The holes are compatible with 10-32 mounting screws

Bottom Panel Cut-Out

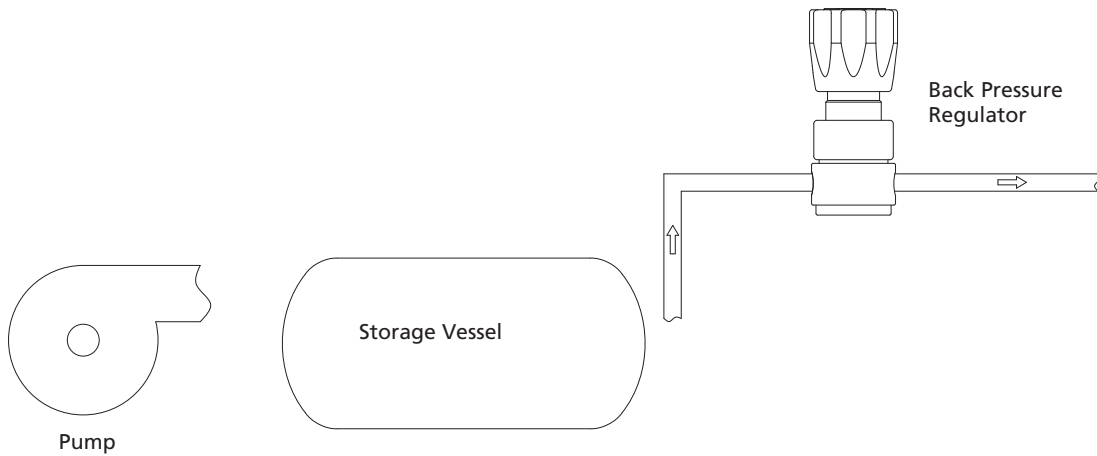


### Port Configurations

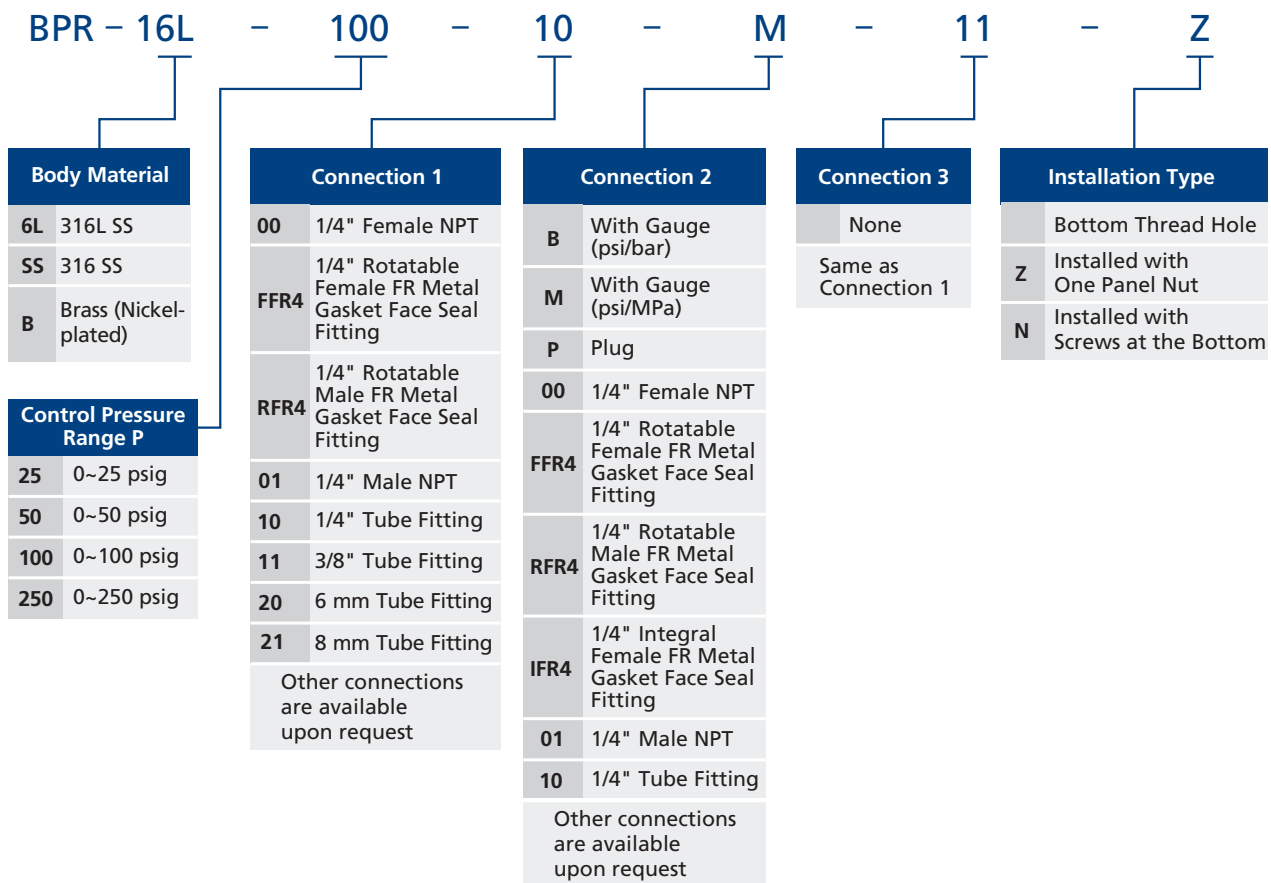


### Typical Application

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.



## Ordering Number Description



Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. For face seal connection, the connection and body are orbital-welded integral structure. The pressure is installed on "RFR4" connection by default.
4. For connections other than face seal connection, the body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.

Examples of part number:

- a. 2-port type (1 in, 1 out): BPR-16L-25-00-00, BPR-16L-25-RFR4-RFR4
- b. 3-port type (2 in, 1 out): BPR-16L-50-00-00-00, BPR-16L-50-FFR4-RFR4-FFR4

# Back Pressure Regulators

## BPR-2 Series Back Pressure Piston Regulators

### Features

- ⦿ Piston sensing design with greater pressure control range
- ⦿ Reduced inner capacity
- ⦿ With special cleaning and packaging, applicable to oxygen-enriched atmospheres

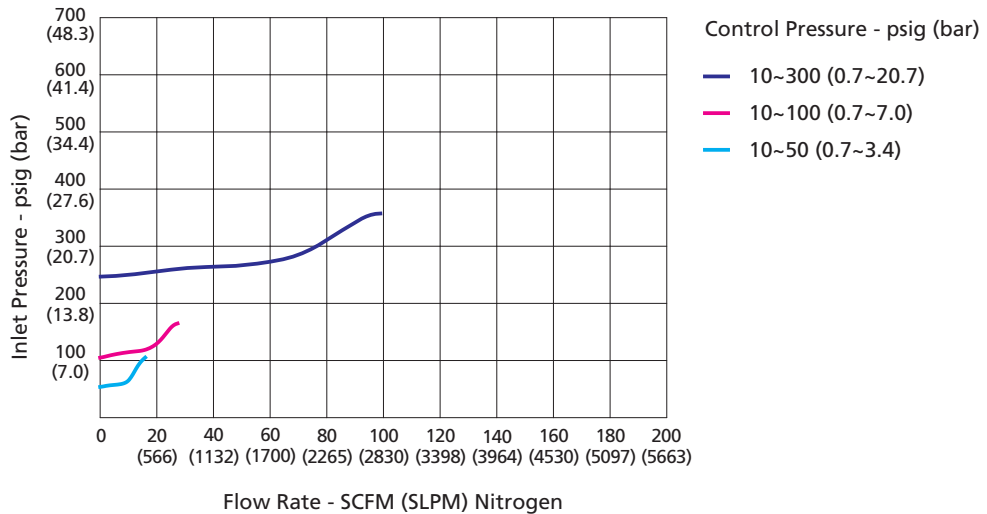
### Technical Data

- ⦿ 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: FKM or FFKM
- ⦿ 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)



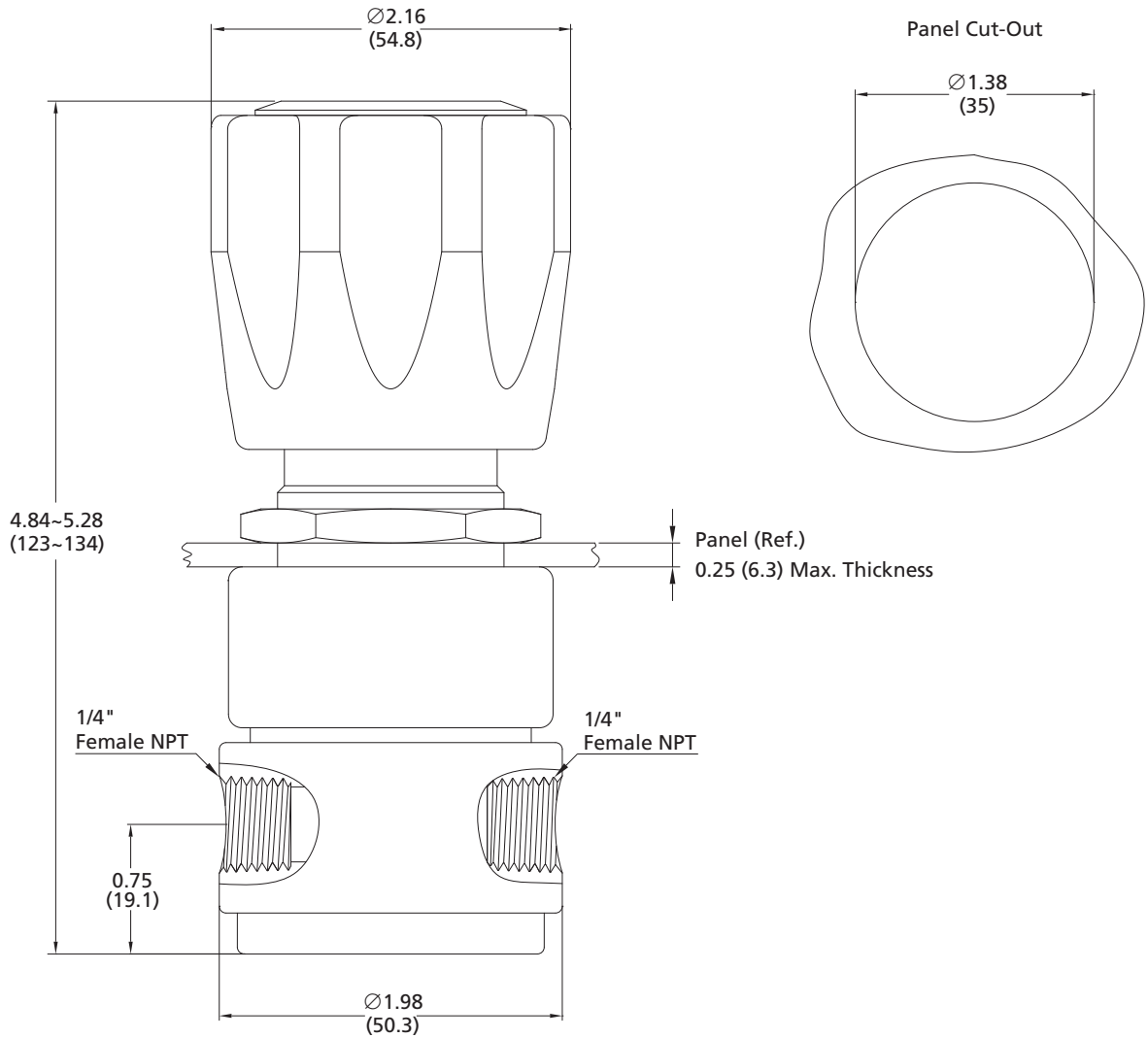
Model: BPR-26LZ-300-00-00-Z

### Typical Flow Chart

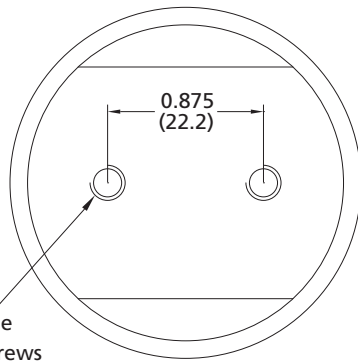


## Dimensions

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

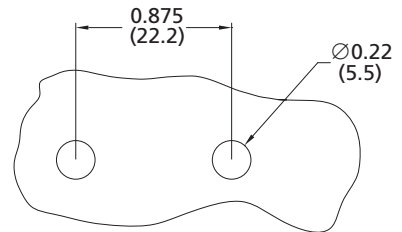


Bottom View

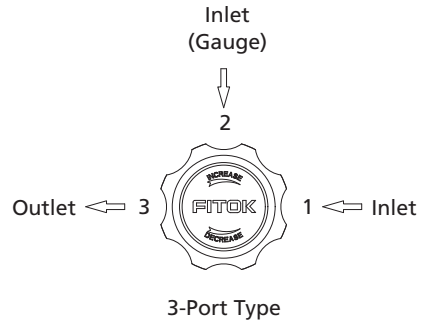
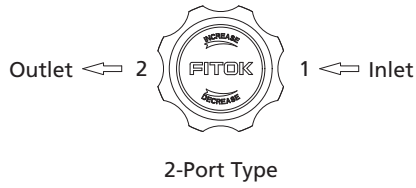


**2xM5x0.8-6H thread**  
 The holes are compatible  
 with 10-32 mounting screws

Bottom Panel Cut-Out

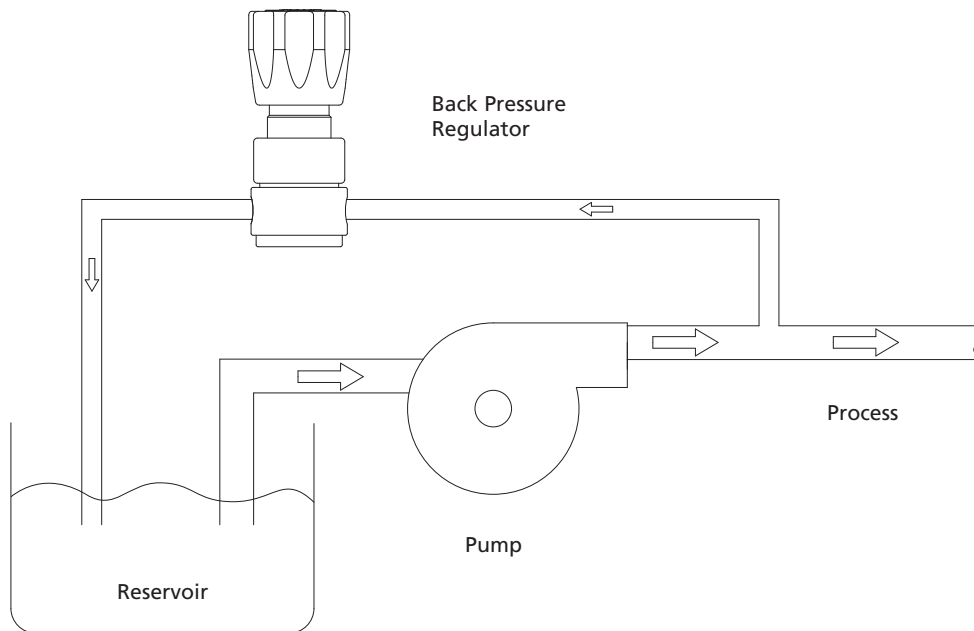


## Port Configurations



## 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.





## Ordering Number Description

BPR - 26L Z - 300 - 10 - M - 11 - Z

Body Material		Control Pressure Range P		Connection 1		Connection 2		Connection 3		Installation Type	
6L	316L SS	300	10~300 psig	00	1/4" Female NPT	B	With Gauge (psi/bar)		None		Bottom Thread Hole
SS	316 SS	500	10~500 psig	01	1/4" Male NPT	M	With Gauge (psi/MPa)		Same as Connection 1	Z	Installed with One Panel Nut
B	Brass (Nickel-plated)	1000	10~1000 psig	10	1/4" Tube Fitting	P	Plug			N	Installed with Screws at the Bottom
				11	3/8" Tube Fitting	00	1/4" Female NPT				
				20	6 mm Tube Fitting	01	1/4" Male NPT				
				21	8 mm Tube Fitting	10	1/4" Tube Fitting				
				Other connections are available upon request		Other connections are available upon request					

O-ring Material	
	FKM
Z	FFKM

**Notes:**

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT.  
Examples of part number:
  - a. 2-port type (1 in, 1 out): BPR-25S-300-00-00
  - b. 3-port type (2 in, 1 out): BPR-26LZ-500-00-B-00

# Back Pressure Regulators

## BPR-3 Series Back Pressure Piston Regulators

### Features

- Piston sensing design with greater pressure control range
- Thrust roller bearings make operation easier

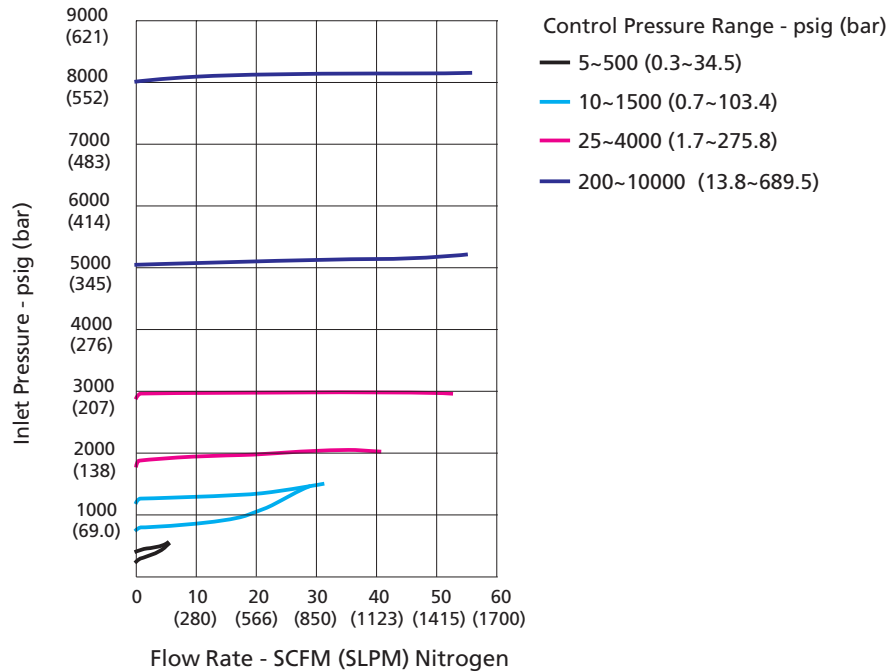
### Technical Data

- 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: 316 SS  
O-rings: FKM or FFKM
- Temperature: -15 °F ~ 165 °F (-26 °C ~ 74 °C)
- Leak rates:  
Internal: Bubble-tight  
External: Bubble-tight
- Flow coefficient (Cv): 0.25
- Weight(regulator): ≈5.7 lbs (2.6 kg)



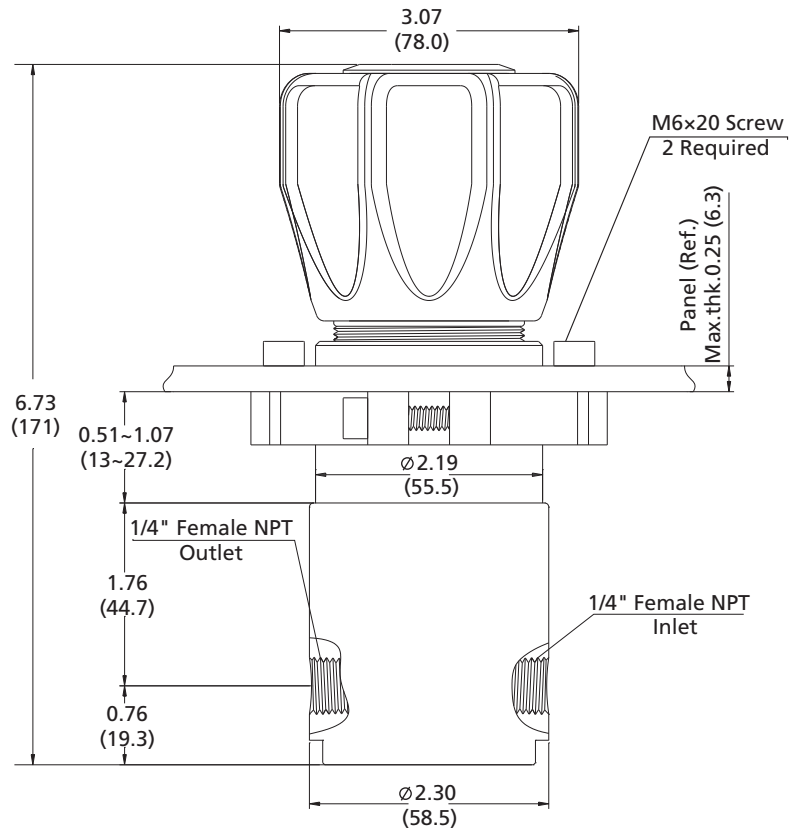
Model: BPR-355-40-00-00-Z

### Typical Flow Chart

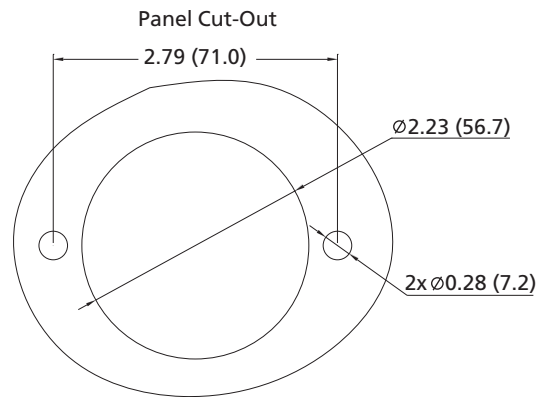
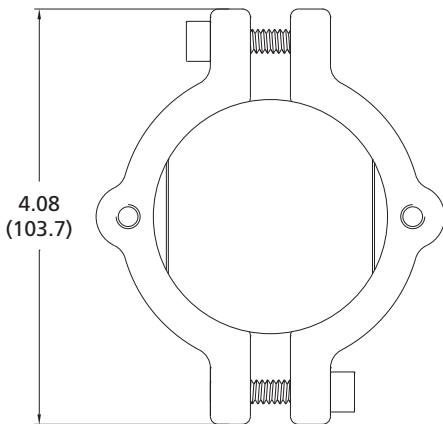


## Dimensions

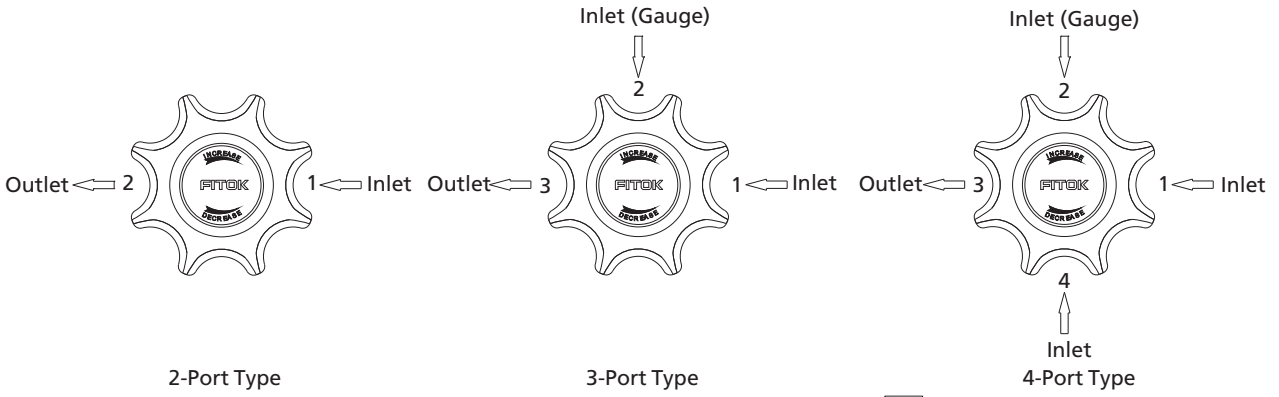
Dimensions, in inches (millimeters), are for reference only.



Bottom View

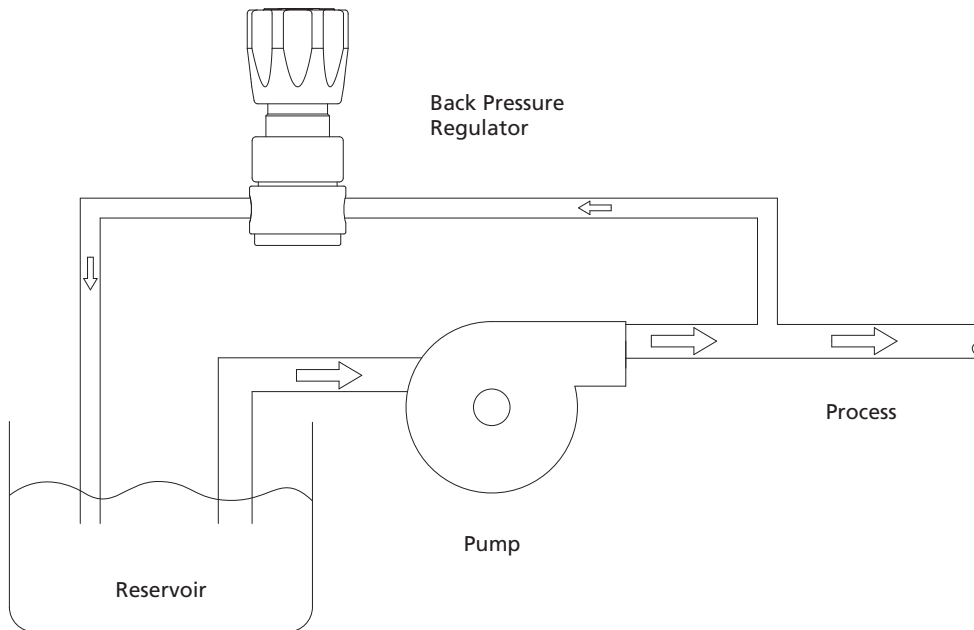


## Port Configurations

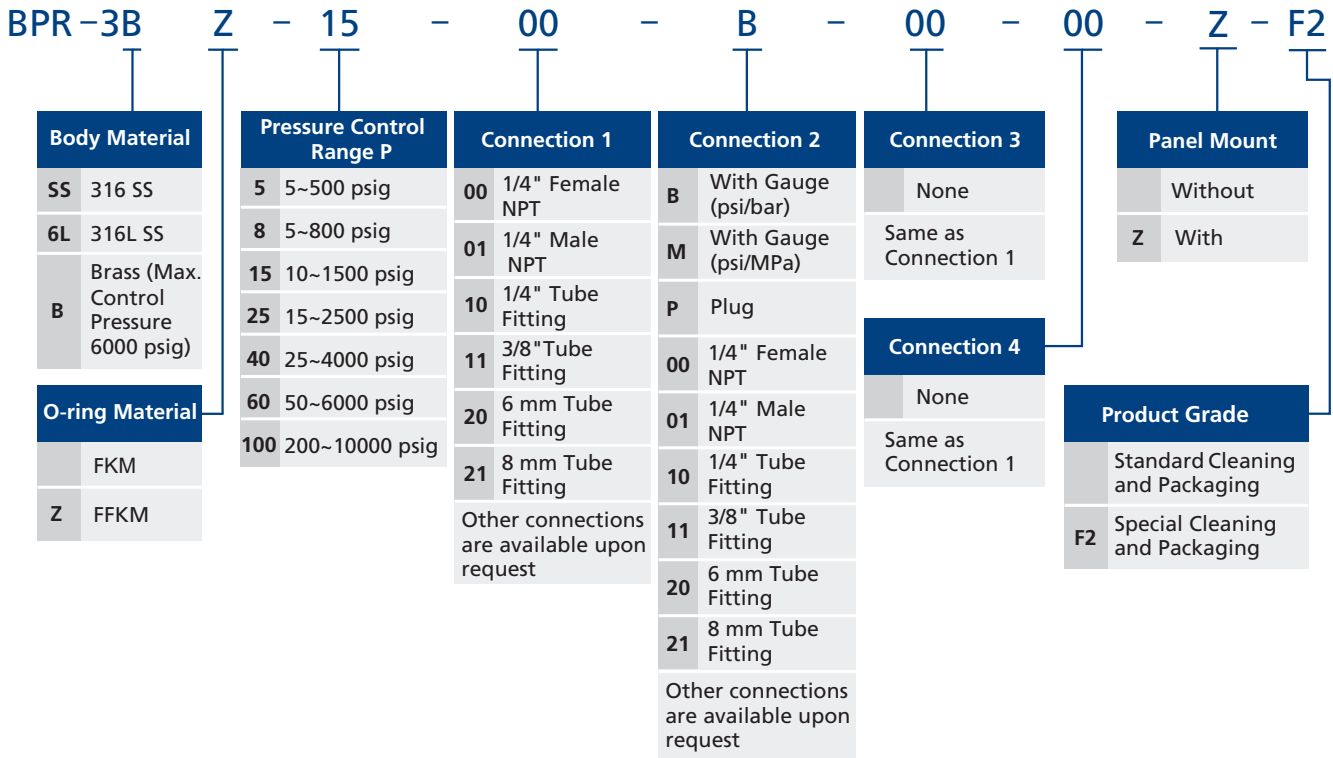


## Typical Application

BPR-3 Series Back Pressure Regulators maintain the required pipeline pressure to ensure the Pump to output fluid stably when system pressure fluctuates.



## Ordering Number Description



Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-11.
3. The body connections are 1/4" Female NPT by default. Other options are adapted from 1/4" Male NPT. 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-07
Check Valves . . . . .	B-09
Relief Valves . . . . .	B-12
Filters . . . . .	B-14
6D Series Tube Fittings . . . . .	B-23
Metal Flexible Hoses . . . . .	B-26
Cylinder Connections . . . . .	B-28

# Purge Assemblies

## FPV-1 Series

### Technical Data

- ⦿ Maximum working pressure: 4500 psig
- ⦿ Material of the main components:
  - Seat: PCTFE (diaphragm valve)
  - Diaphragm: cobalt alloy (diaphragm valve)
- ⦿ Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- ⦿ Leak rates (helium):
  - Internal:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
  - External:  $\leq 1 \times 10^{-9}$  std cm<sup>3</sup>/s
- ⦿ Minimum orifice:  $\Phi 0.13$ " (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.

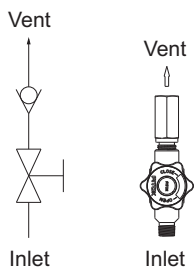


Fig. 1-1

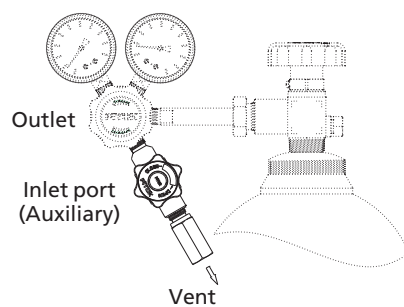


Fig. 1-2

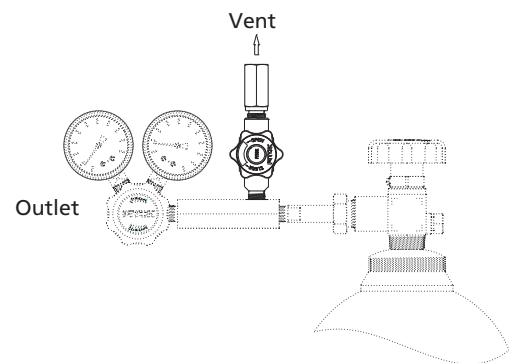


Fig. 1-3

#### ⦿ 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

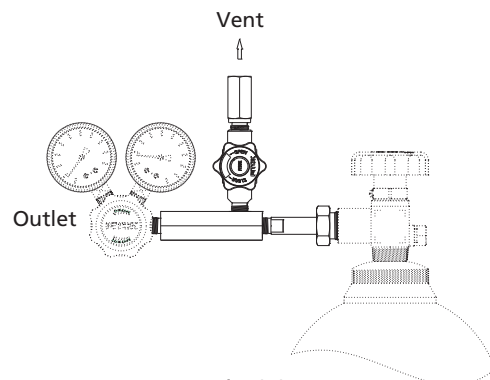


Fig. 2-2

## B-03 Related Products

### ⦿ 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.

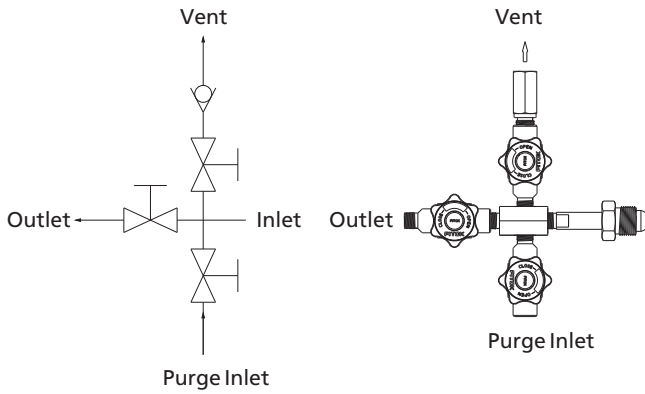


Fig. 3-1

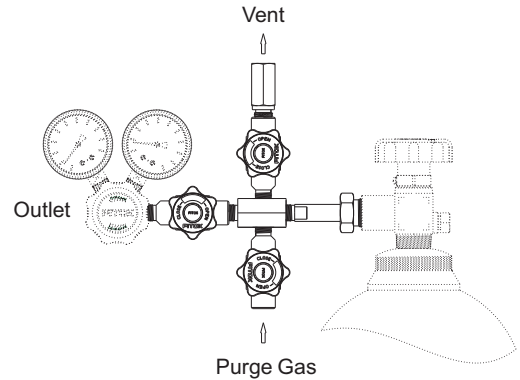


Fig. 3-2

## Part Number Description

FPV - 1C		6L		- DIN1		- 00		- 00		- 00	
Product Type		Body Material		Inlet Port		Vent Port		Outlet Port		Purge Inlet	
S	Straight Purge Assemblies	6L	316L SS	00	1/4" Female NPT	00	1/4" Female NPT	Same as Vent Port		Same as Vent Port	
T	Tee Purge Assemblies	SS	316 SS	01	1/4" Male NPT	01	1/4" Male NPT				
C	Cross Purge Assemblies			C_ _ _	CGA Number (USA)	10	1/4" Tube Fitting				
				DIN_	DIN Number (Germany)	20	6 mm Tube Fitting				
					Refer to page B-30 for cylinder connections based on specific gas type. Cylinder connections compliant to other standards are available upon request. Please contact FITOK Group for details.	21	8 mm Tube Fitting				
							Other connections are available upon request				



# High Pressure Compact Diaphragm Valves

## DS Series

### Features

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



### Technical Data

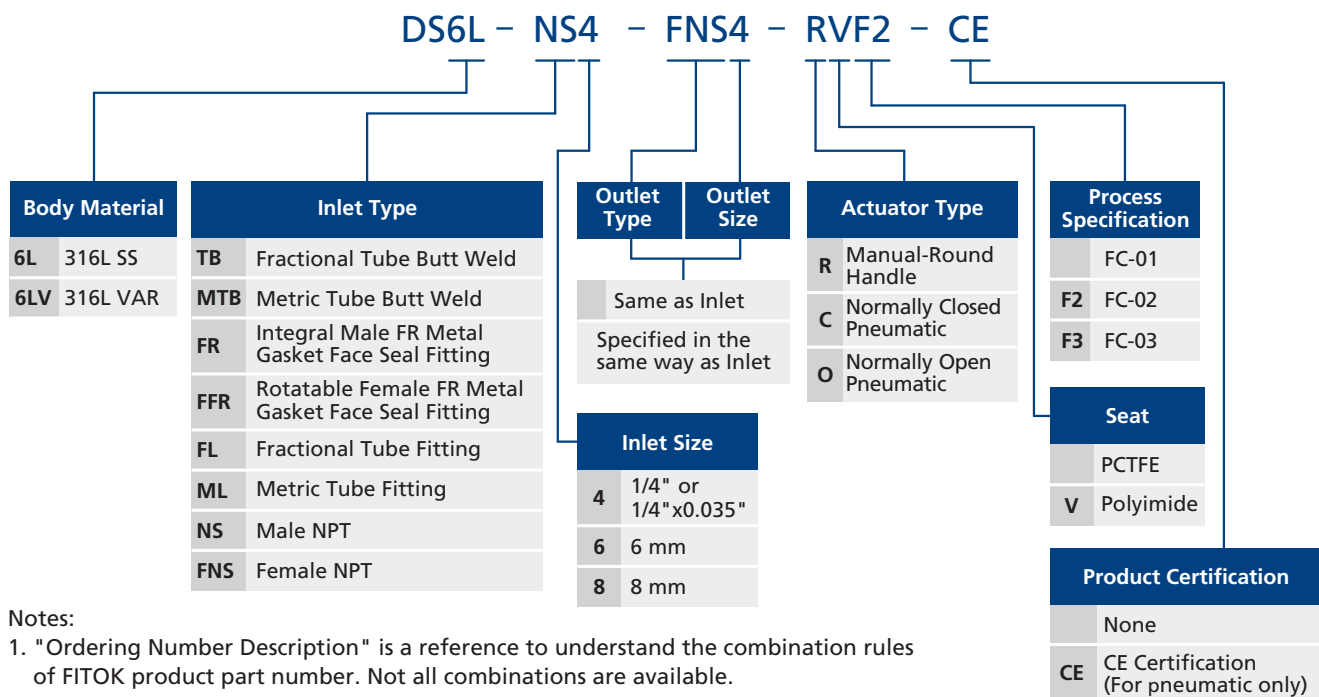
<b>Port Size</b>		1/4" to 3/8" or 6 mm to 8 mm
<b>Flow Coefficient (Cv)</b>		0.17
<b>Orifice Size</b>		0.12 in. (3.0 mm)
<b>Max. Working Pressure</b>	<b>Manual</b>	4500 psig (310 bar)
	<b>Pneumatic</b>	3000 psig (206 bar)
<b>Pneumatic Actuator Operating Pressure</b>		60 to 90 psig (4.2 to 6.2 bar)
<b>Temperature</b>		PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -10 ~ 250 °F (-23 ~ 121 °C)
<b>Leak Rate (Helium)</b>	<b>Internal</b>	≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s
	<b>External</b>	≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s

### Flow Data

Air @ 70 °F (21 °C)  
Water @ 60 °F (16 °C)

Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	55	1.9
50 (3.4)	150	4.5
100 (6.8)	260	6.4

### Ordering Number Description



# One-Piece Instrumentation Ball Valves

## BO Series

### Features

- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -65°F to 300°F (-54°C to 148°C)
- ⦿ End connections:  
1/4 to 1/2 thread  
1/16" to 3/4" and 3 mm to 18 mm tube fitting
- ⦿ 2-, 3-, 4-, 5-, 6- and 7-way models for on-off, switching and crossover service available
- ⦿ One-piece body and one-piece ball stem
- ⦿ No dead space
- ⦿ Top-loaded design to allow adjustment with the valve in-line
- ⦿ Thermal cycle performance improved and wear compensated by live-loaded design
- ⦿ Any reasonable connections available
- ⦿ Pneumatic and electric actuator available
- ⦿ Handle color options available
- ⦿ Full operating pressure at any port
- ⦿ Leak-tight performance testing with nitrogen or compressed air for every valve at the rated pressure to meet the requirement of no visible leak
- ⦿ The inlet can be any port except for valves with vent ports



#### Notes:

1. To prevent seat leakage, packing adjustment may be required periodically during the service life of the valve.
2. A higher initial actuation torque may happen to the valves that have not been actuated for a period of time.
3. Before installation, instrumentation ball valves exposed to dynamic temperature conditions may lose their initial packing load. Stem packing adjustment should be required.

# Ordering Number Description

BOSS - ML6 - FL4 - ML8 - H05 - DXHQ3L - BLH - FL4 - SF2

Series	Body Material	Connection 1 Type	Connection 1 Size	Connection 2 to 7 Type	Connection 2 to 7 Size	Seat Material	Orifice Size	Handle/Actuator	For Actuator	Flow Pattern	Panel Installation	Locking Device	Vent Port	Special Application	Cleaning and Packaging				
BO	SS 316 SS	FNS Female NPT	1 1/16"	Same as connection 1	Specified in the same way as the connection 1 type and size	PTFE	00 0.05" (1.3 mm)	Black Nylon Handle	NO	Straight	A Angle	No vent port	NO	NO					
	S4 304 SS	NS Male NPT	2 1/8"				01 0.06" (1.6 mm)	I Red Nylon Handle	H Mechanical Limit Switch							3L 3-way	FL2 1/8" tube fitting	S NACE MR0175	
	S1 321 SS	FRT Female BSPT	3 3 mm				02 0.09" (2.4 mm)	F Green Nylon Handle	N Inductive Limit Switch							3HL 3-way	FL4 1/4" tube fitting	SI SilcoNert® 2000 (Sulfinert®) Coating	
	6L 316L SS	RT Male BSPT	4 1/4"				03 0.13" (3.2 mm)	J Blue Nylon Handle	Q Solenoid Valve							4L 4-way	FL6 3/8" tube fitting	CE CE Certification	
	B Brass	FMS Female Metric Thread (for RG-M)	6 3/8" or 6 mm				05 0.19" (4.8 mm)	U Black Aluminium Handle	HQ Mechanical Limit Switch and Solenoid Valve							4C 4-way	ML3 3 mm tube fitting	FC-01	
	M Alloy 400		8 1/2" or 8 mm				07 0.28" (7.1 mm)	C 90° Normally Closed Pneumatic Actuator	NQ Inductive Limit Switch and Solenoid Valve							4H 4-way	ML6 6 mm tube fitting		
		MS Male Metric Thread (for RG-M)	10 10 mm				10 0.41" (10.3 mm)	O 90° Normally Open Pneumatic Actuator	Panel nut							4HL 4-way	ML8 8 mm tube fitting	FC-02	
		FRP Female BSPP (for RP)	12 3/4" or 12 mm					D 90° Double Acting Pneumatic Actuator								5L 5-way	LH Yes		FC-02 without Lubrication
		FL Fractional Tube Fitting	14 14 mm					LX 180° Left End Normally Open Pneumatic Actuator								5HL 5-way	LK Yes		
		ML Metric Tube Fitting	16 16 mm					RX 180° Right End Normally Open Pneumatic Actuator								5LV 5-way			
	FO Male FO Fitting	18 18 mm		DX 180° Double Acting Pneumatic Actuator	6L 6-way														
	FR Male FR Fitting			E 90° Electric Actuator	6C 6-way														
				EX 180° Electric Actuator	7L 7-way														
					B Bottom screw														

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- For oxygen-enriched atmosphere or hazardous media service, contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for general industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
- For more information about pneumatic actuator ball valves, please refer to the catalog **Automatic Control Ball Valves**.
- SilcoNert® 2000 (Sulfinert®) Coating: Wetted metal components SilcoNert® 2000 (Sulfinert®) coated.
- CE certification is available. For more information, please contact FITOK group or our authorized distributors.

FITOK

Related Products B-06

# Nonrotating-Stem Needle Valves

**ND Series:** Working pressure up to 3000 psig

**NDH Series:** Working pressure up to 5000 psig

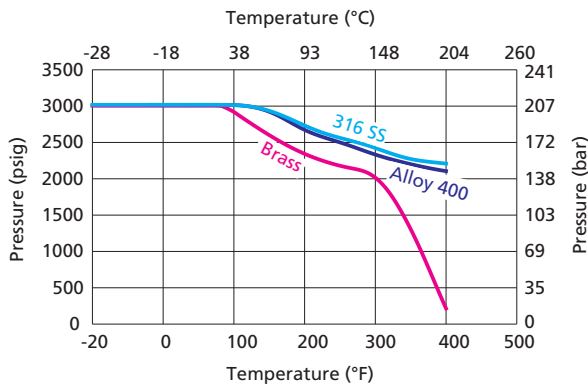
## Features

- ⦿ One-piece forged body
- ⦿ Straight and angle pattern
- ⦿ Compact design
- ⦿ Non-rotating stem
- ⦿ Specially designed handle to stop contamination from entering into the valve
- ⦿ Every valve leak tested with nitrogen or compressed air at the maximum allowable working pressure
- ⦿ Working pressure up to:
  - ND Series—Stainless steel: 3000 psig (207 bar)
  - Brass: 3000 psig (207 bar)
  - NDH Series—Stainless steel: 5000 psig(345 bar)
- ⦿ Working temperature with stem tip:
  - PCTFE stem tip: -20°F to 200°F (-28°C to 93°C)
  - PEEK stem tip: -20°F to 400°F (-28°C to 204°C)
- ⦿ Working temperature with O-ring:
  - Fluorocarbon Rubber (FKM) : -20°F to 400°F (-28°C to 204°C)
  - Nitrile Butadiene Rubber (NBR) : -20°F to 212°F (-28°C to 100°C)
  - Ethylene Propylene Diene Rubber (EPDM): -20°F to 300°F (-28°C to 148°C)

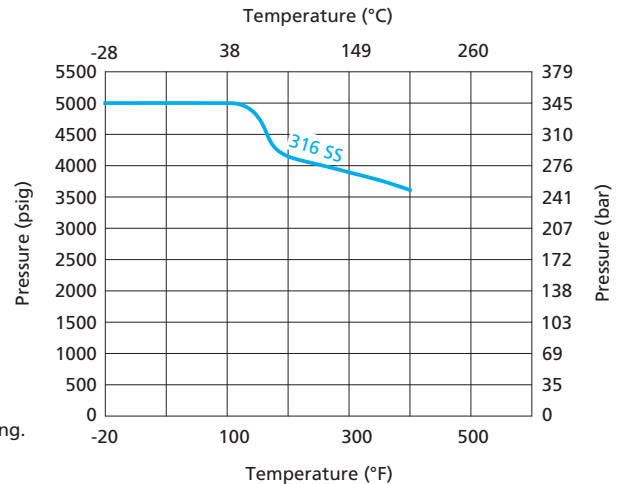


## Pressure vs. Temperature

ND Series

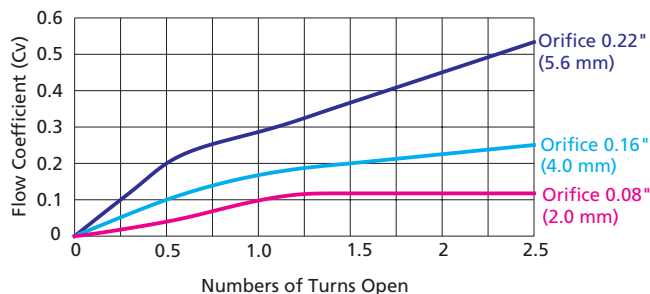


NDH Series

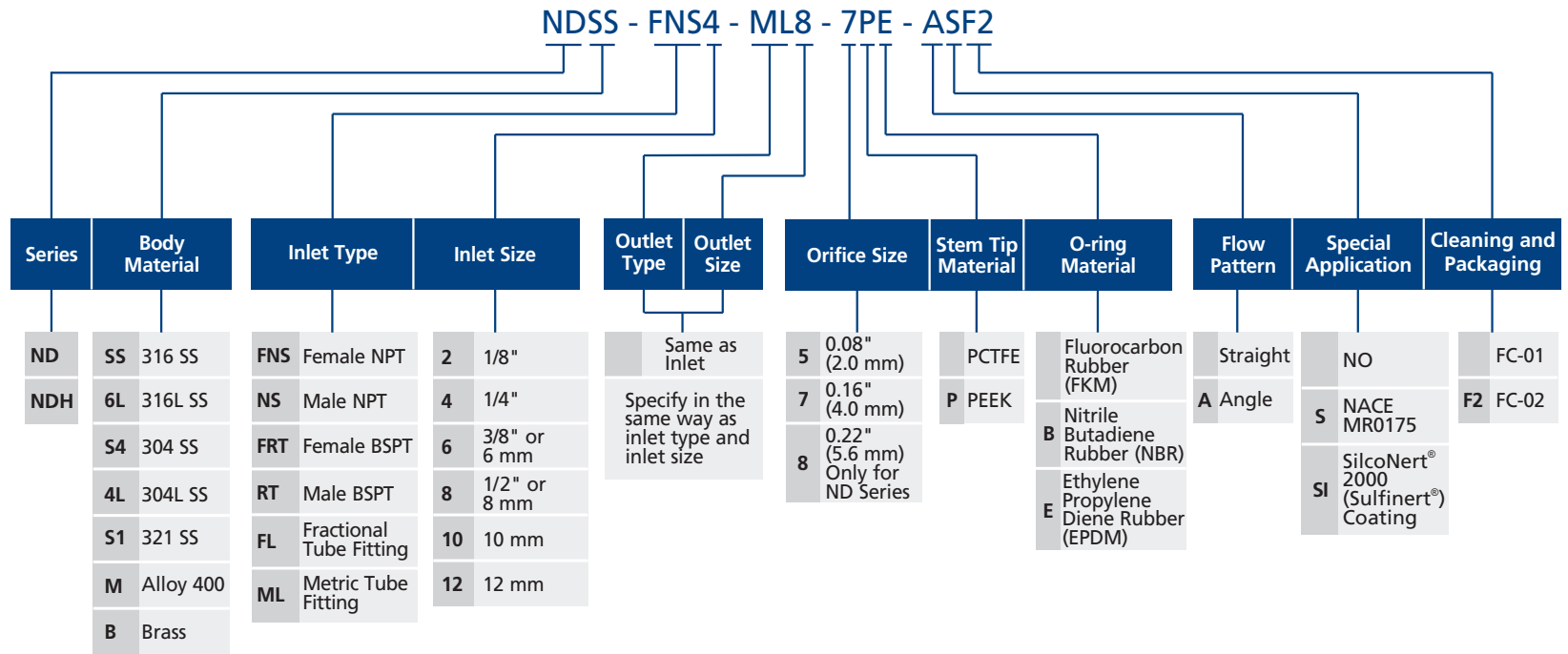


- The graphs are based on PEEK stem tip and Fluorocarbon rubber (FKM) O-ring.
- Contact FITOK Group or our authorized distributors for curve graph of other materials.

## Flow Data at 100 °F (38 °C)



# Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for general industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
2. Special Application:
  - Plural special application designators available in one ordering number, example: NDSS-NS4-7-SSI.
  - SilcoNert® 2000 (Sulfinert®) coating: Wetted metal components SilcoNert® 2000 (Sulfinert®) coated.

# Check Valves

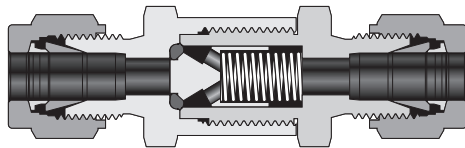
## CV, CO and COA Series



### Features

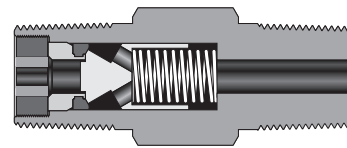
#### CV Series

- ⦿ Resilient O-ring seat design for leak free sealing
- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -10°F to 375°F (-23°C to 190°C)
- ⦿ Cracking pressure: 1/3 to 25 psig (0.02 to 1.7 bar)
- ⦿ Variety of end connections and materials available
- ⦿ Non-adjustable cracking pressure, mountable in any directions



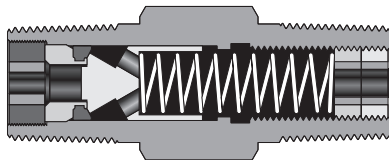
#### CO Series

- ⦿ Compact design, one-piece body
- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -10°F to 375°F (-23°C to 190°C)
- ⦿ Cracking pressure: 1/3 to 25 psig (0.02 to 1.7 bar)
- ⦿ Variety of end connections and materials available
- ⦿ Non-adjustable cracking pressure, mountable in any directions



#### COA Series

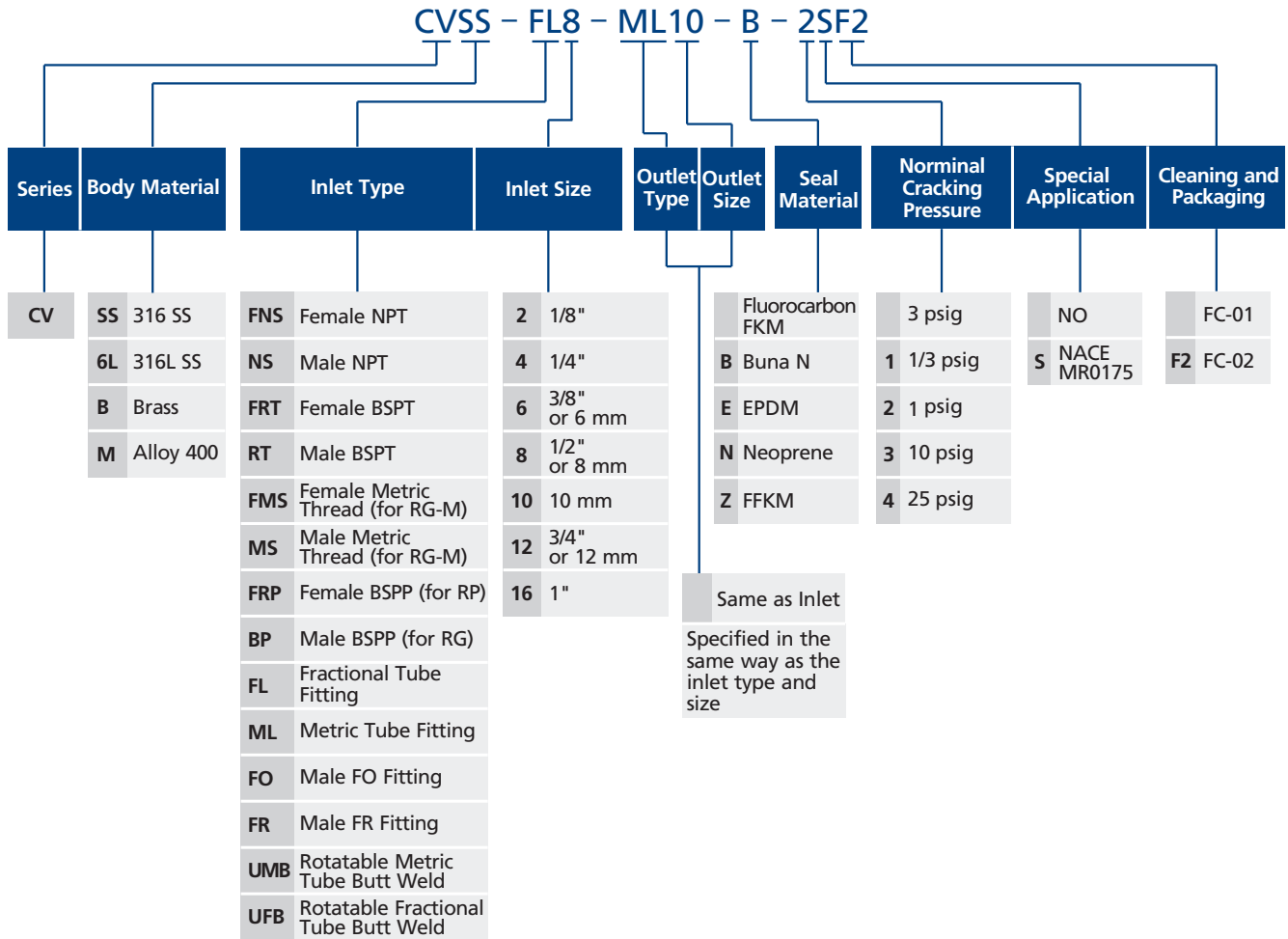
- ⦿ Compact design, one-piece body
- ⦿ Working pressure up to: 3000 psig (207 bar)
- ⦿ Working temperature: -10°F to 375°F (-23°C to 190°C)
- ⦿ Cracking pressure: 3 to 600 psig (0.21 to 41.4 bar)
- ⦿ Variety of end connections and materials available
- ⦿ Various springs available
- ⦿ Adjustable cracking pressure, mountable in any directions



#### Notes:

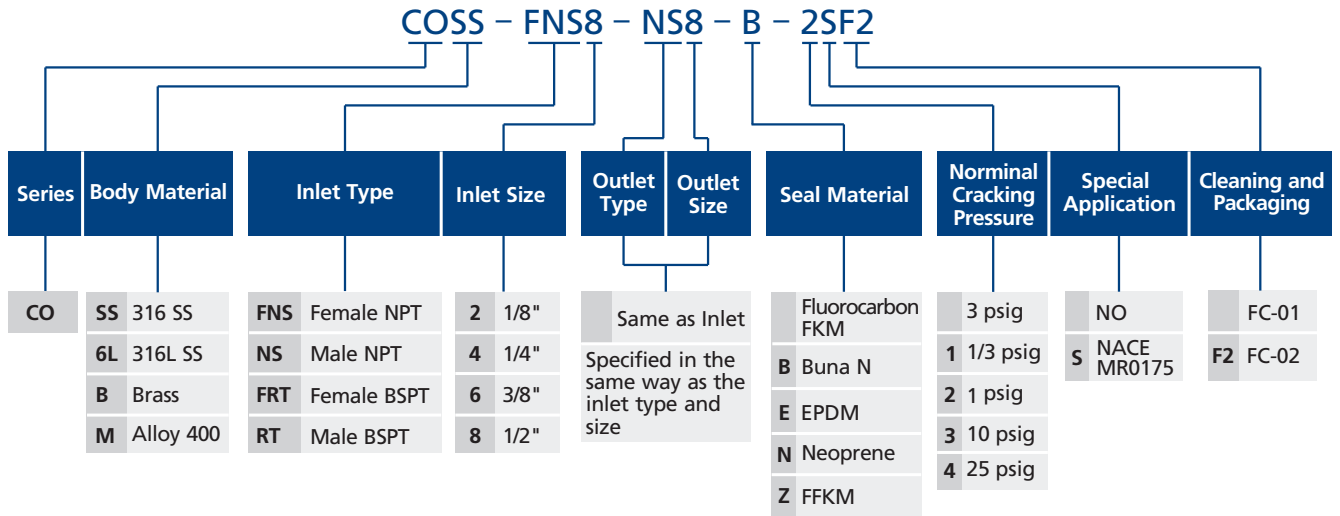
1. Check valves are all coated with lubricants like silicone base and molybdenum disulfide base.
2. Please contact FITOK Group or our authorized distributors for other materials.
3. PTFE-coated spring is an option for CV, CO and COA series check valves. For more details, please contact FITOK Group or our authorized distributors.
4. Every valve is tested with nitrogen for leak-tight performance at its maximum working pressure.

## Ordering Number Description



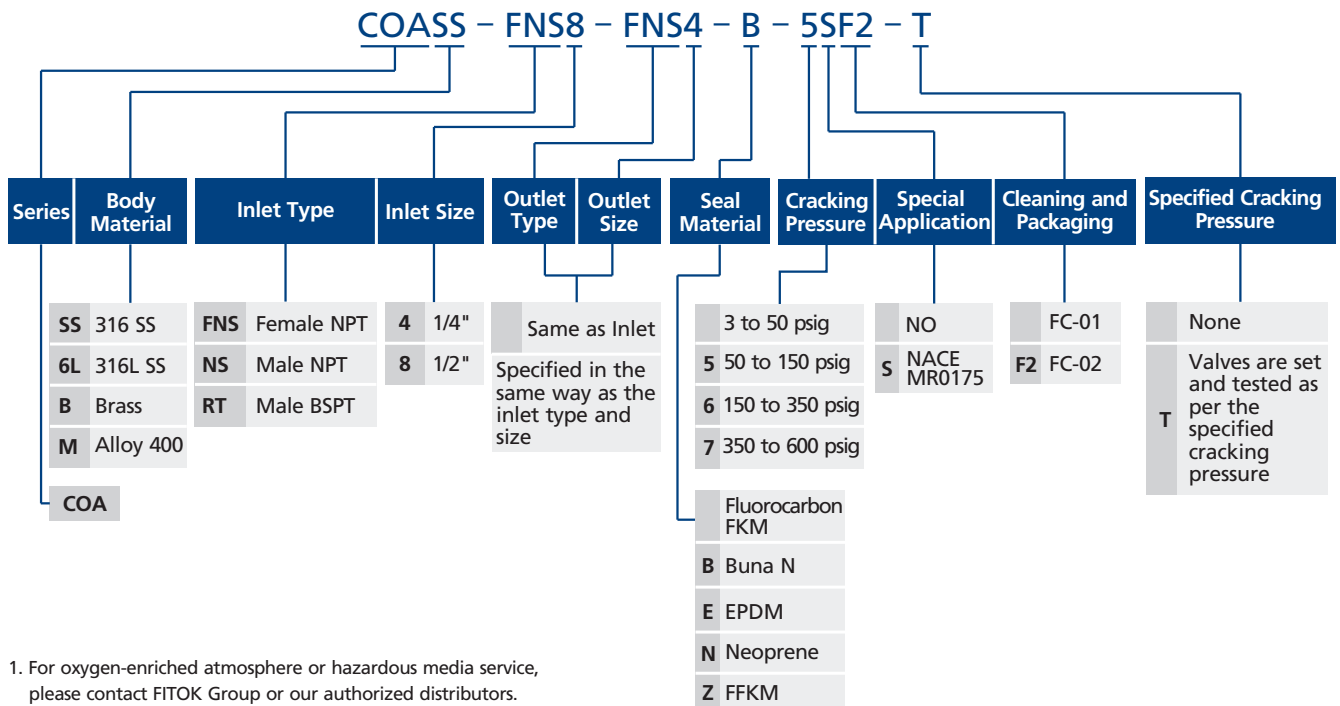
- Standard thread pitch for metric threads are as follows:  
 M10 and below: 1 mm  
 M12 to M24: 1.5 mm  
 M27 and above: 2 mm  
 Standard thread pitch should be omitted in the ordering number, others should be specified.
- For oxygen-enriched atmosphere or hazardous media service, please contact FITOK Group or our authorized distributors.
- Cleaning and Packaging:  
 FC-01: Standard cleaning and packaging for general industrial procedures.  
 FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
- The materials, connection types and sizes listed in the "Ordering Number Description" are standard. For other materials and end connections, please contact FITOK Group or our authorized distributors.
- PTFE-coated gasket can be chosen to reduce the possibility of O-ring's moving in system caused by the pressure fluctuations, vibration or pulsating. For more details, please contact FITOK Group or our authorized distributors.
- Check valve is designed with unidirectional flow path, it can't be used as safety relief valve.
- If the check valve is not opened for a period of time, its initial cracking pressure may be higher than set cracking pressure.

## Ordering Number Description



1. For oxygen-enriched atmosphere or hazardous media service, please contact FITOK Group or our authorized distributors.
2. Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for general industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
3. The materials, connection types and sizes listed in the "Ordering Number Description" are standard. For other materials and end connections, please contact FITOK Group or our authorized distributors.
4. Check valve is designed with unidirectional flow path, it can't be used as safety relief valve.
5. If the check valve is not opened for a period of time, its initial cracking pressure may be higher than set cracking pressure.

## Ordering Number Description



1. For oxygen-enriched atmosphere or hazardous media service, please contact FITOK Group or our authorized distributors.
2. Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for general industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement of ASTM G93 Level C.
3. The materials, connection types and sizes listed in the "Ordering Number Description" are standard. For other materials and end connections, please contact FITOK Group or our authorized distributors.
4. Check valve is designed with unidirectional flow path, it can't be used as safety relief valve.
5. If the check valve is not opened for a period of time, its initial cracking pressure may be higher than set cracking pressure.
6. For the specified cracking pressure of check valve, please indicate its value to be set when ordering.



# Relief Valves

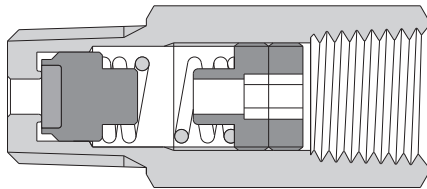
## RUV and RV Series

### 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

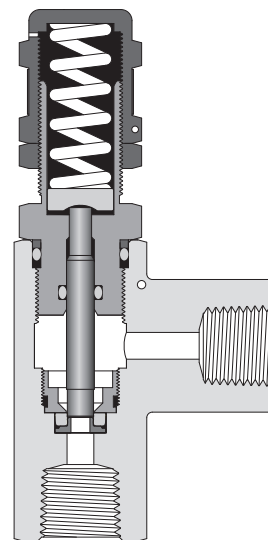


### RV Series

- ⦿ Set pressure: 7 color-coded springs available for a wide range of set pressures, 50 to 6000 psig @ 70°F (3.4 to 414 bar @ 20°C)
- ⦿ Maximum outlet pressure:RV series: 1500 psig (103 bar)
- ⦿ Orifice size: RV series: 0.14" (3.6 mm)
- ⦿ Back pressure:
  - Back pressure is the pressure of the outlet of valves. It increases the set pressure of proportional relief valves.
  - RV series: Balanced stem design to eliminate the effect of system back pressure
- ⦿ Working temperature: -40°F to 300°F (-40°C to 148°C)
- ⦿ Variety of end connections
- ⦿ Liquid or gas service
- ⦿ Adjustable bonnet cap and adjustable set pressure
- ⦿ Lead seal lock wire through lock wire holes to lock proportional relief valve so as to secure a set pressure effectively
- ⦿ Variety of seal materials
- ⦿ Label identifies the set pressure range

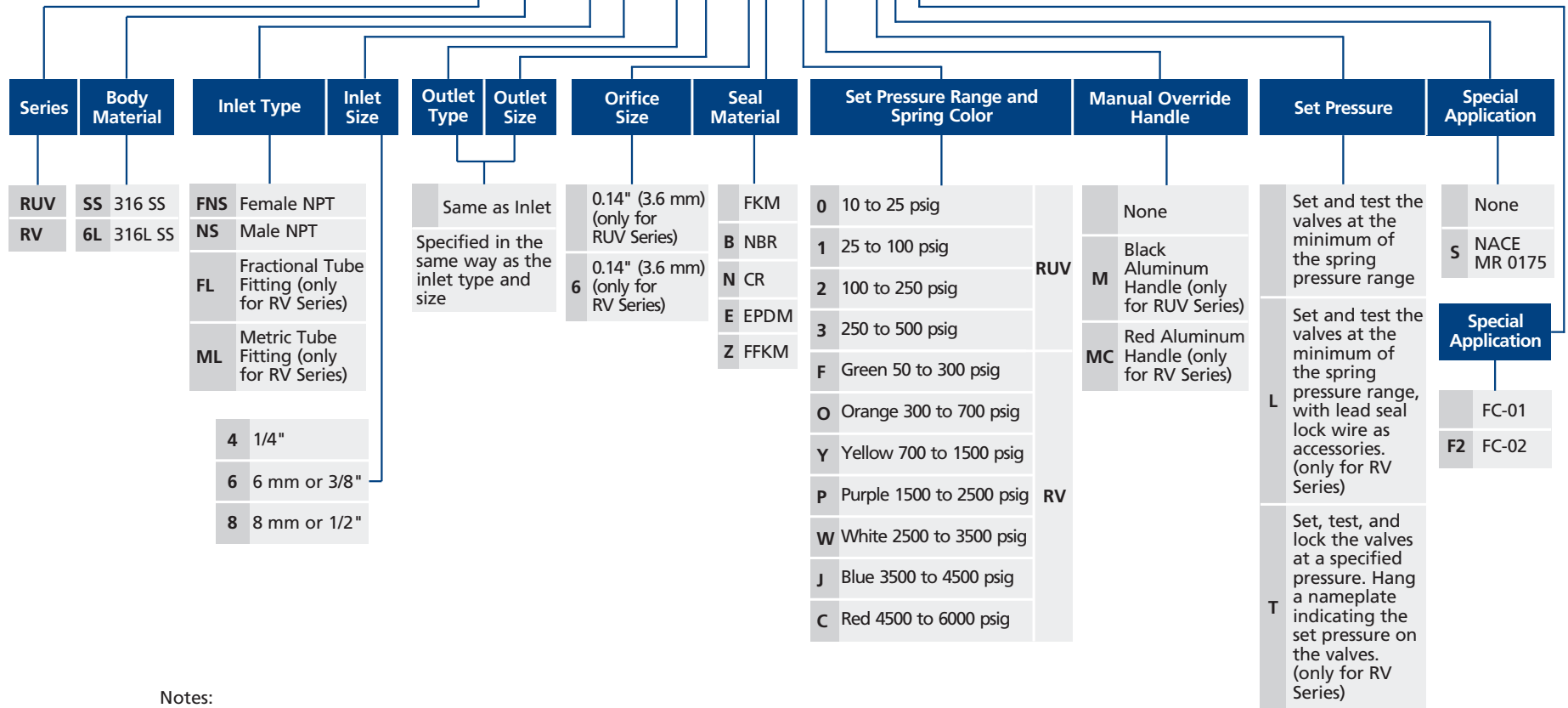
### Temperature Range of Sealing Material

O-ring Material	Temperature Range °F (°C)
FKM	25 to 250 (-4 to 121)
NBR	0 to 212 (-17 to 100)
CR	-10 to 300 (-23 to 148)
EPDM	30 to 250 (-1 to 121)



## Ordering Number Description

RUVSS - FNS4 - NS4 - 6B- 1M - TSF2



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Set pressure can be factory set upon request, please leave a note of desired set pressure when ordering.

# Filters

## Tee-Type Filters

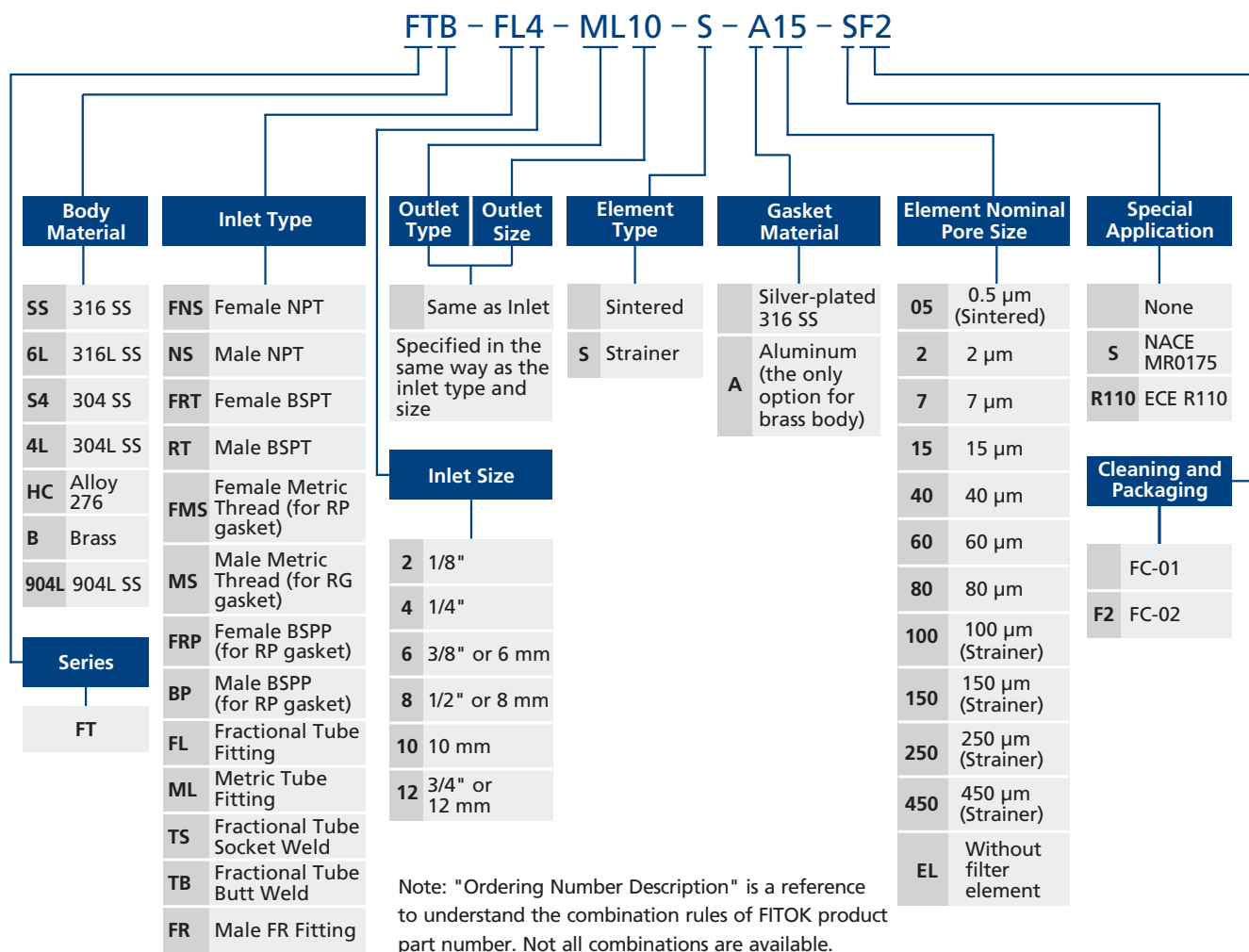
### FT Series

#### Features

- Filtration area type: 4 and 8
- Union bonnet design to prevent lock nut from falling off and offer added safety
- Working pressure up to: 6000 psig (414 bar)
- Working temperature: -20 °F to 900 °F (-28 °C to 482 °C)
- Variety of end connections available

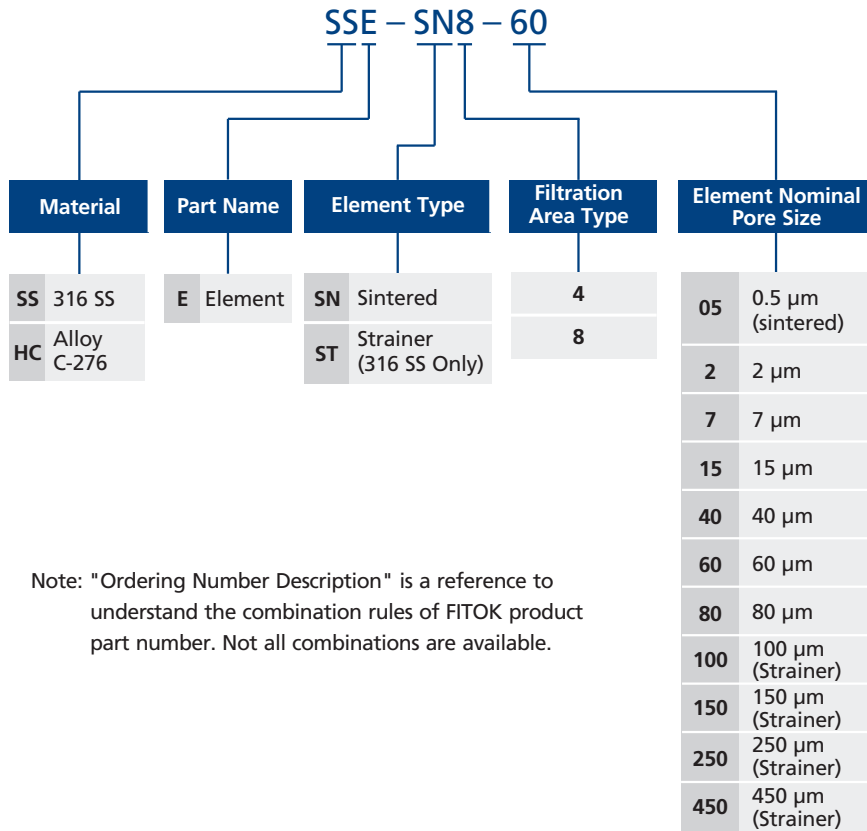


#### Filters Ordering Number Description



- Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for basic industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance requirement as stated in ASTM G93 Level C.
- Standard thread pitch for metric threads are as follows:
  - M10 and below: 1 mm
  - M12 to M24: 1.5 mm
  - M27 and above: 2 mm
 Standard thread pitch should be ignored in the ordering number, others should be specified.

## Elements Ordering Number Description



# Bypass Filters

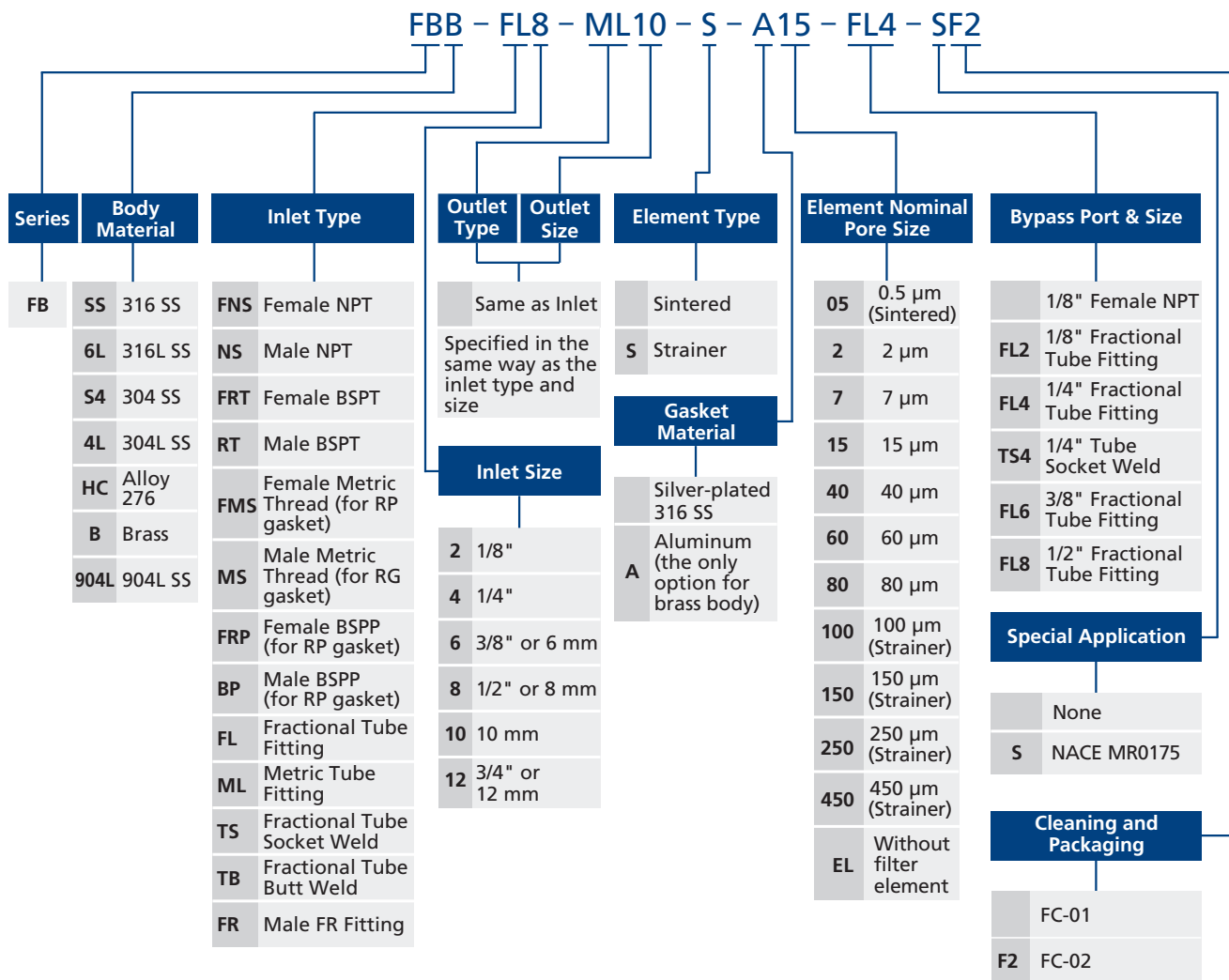
## FB Series

### Features

- Filtration area type: 4 and 8
- Union bonnet design to prevent lock nut from falling off and offer added safety
- Working pressure up to: 6000 psig (414 bar)
- Working temperature: -20 °F to 900 °F (-28 °C to 482 °C)
- Variety of end connections available



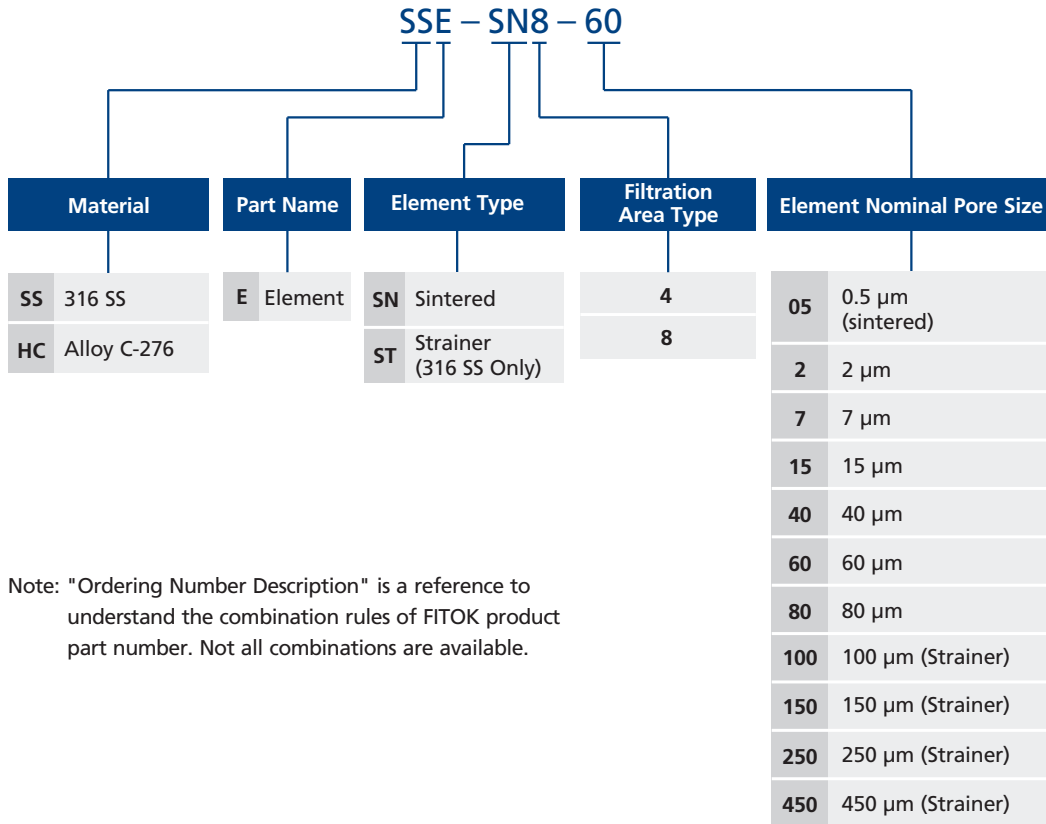
### Filters Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for basic industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance requirement as stated in ASTM G93 Level C.
- Standard thread pitch for metric threads are as follows:
  - M10 and below: 1 mm
  - M12 to M24: 1.5 mm
  - M27 and above: 2 mm
 Standard thread pitch should be ignored in the ordering number, others should be specified.

## Elements Ordering Number Description



# In-Line Filters

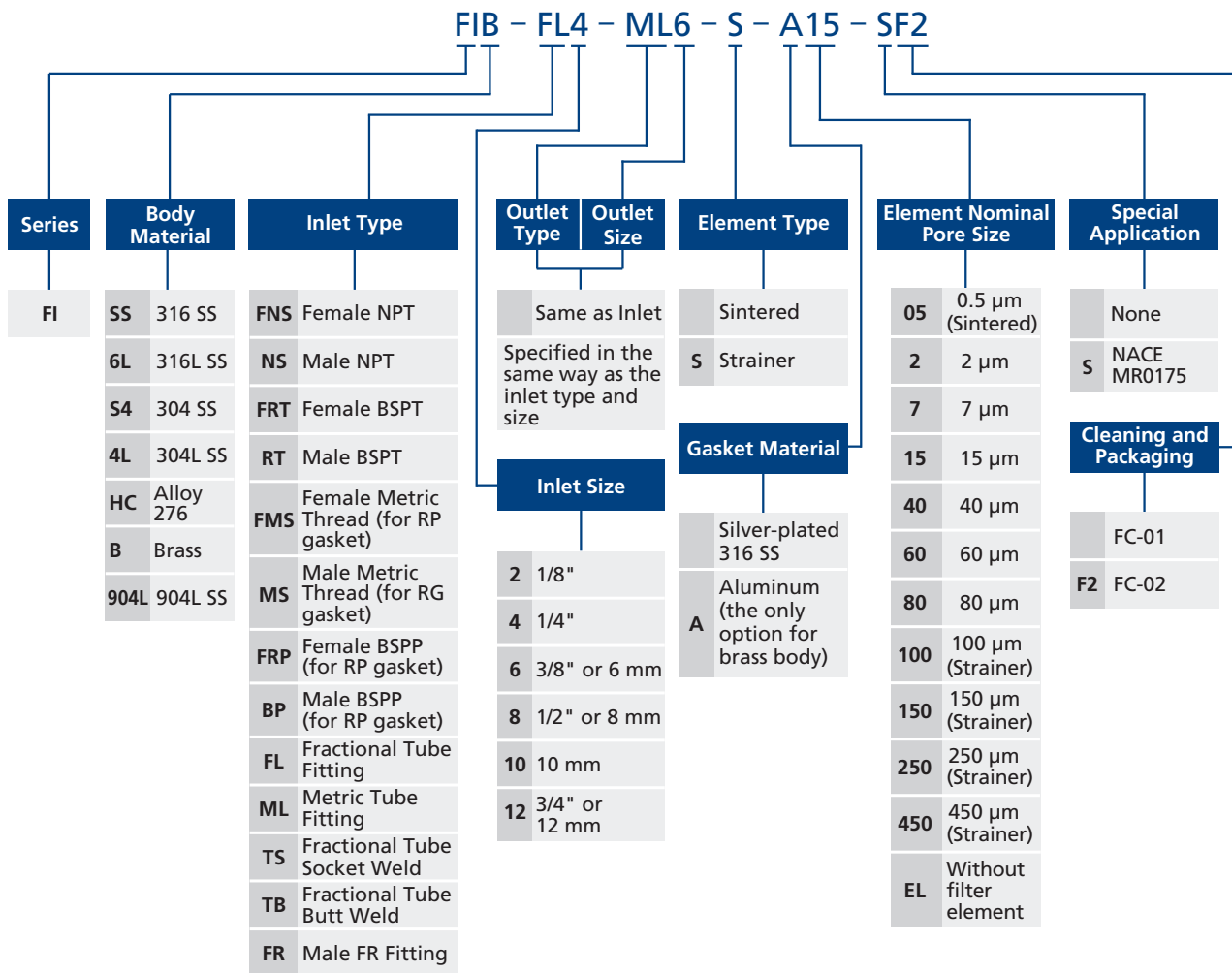
## FI Series

### Features

- Filtration area type: 2, 4 and 8
- Compact and space-saving design
- Working pressure up to: 3000 psig (207 bar)
- Working temperature: -20 °F to 900 °F (-28 °C to 482 °C)
- Variety of end connections available



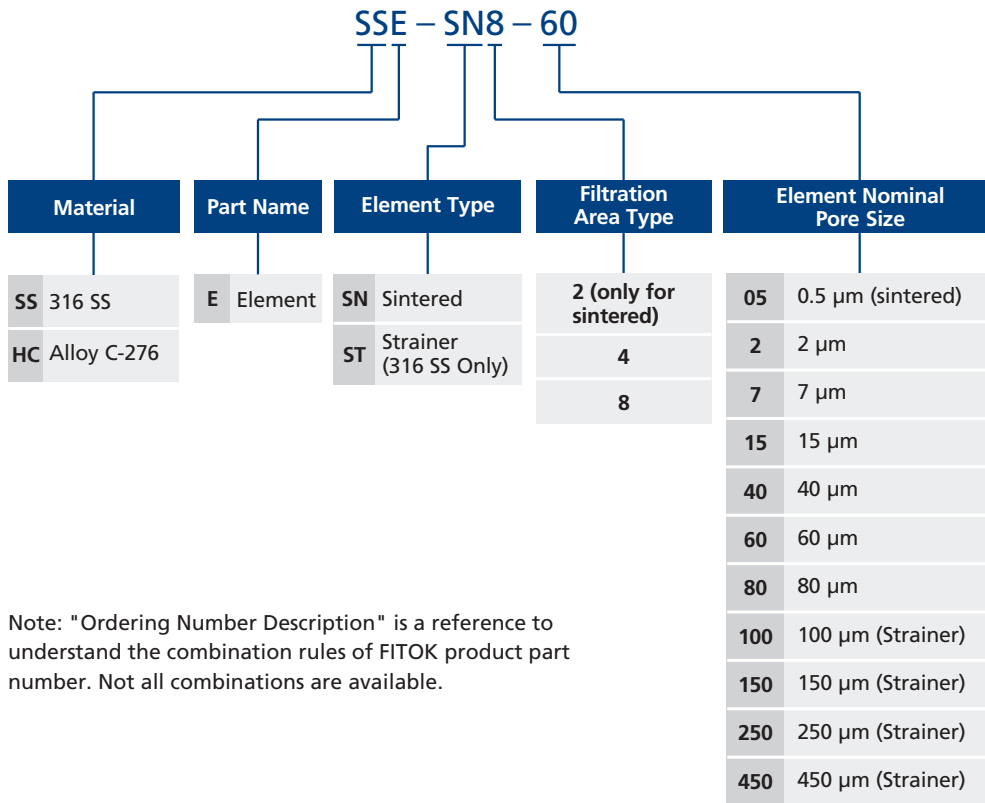
### Filters Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for basic industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance requirement as stated in ASTM G93 Level C.
- Standard thread pitch for metric threads are as follows:
  - M10 and below: 1 mm
  - M12 to M24: 1.5 mm
  - M27 and above: 2 mm
 Standard thread pitch should be ignored in the ordering number, others should be specified.

## Elements Ordering Number Description





# All-Welded In-Line Filters

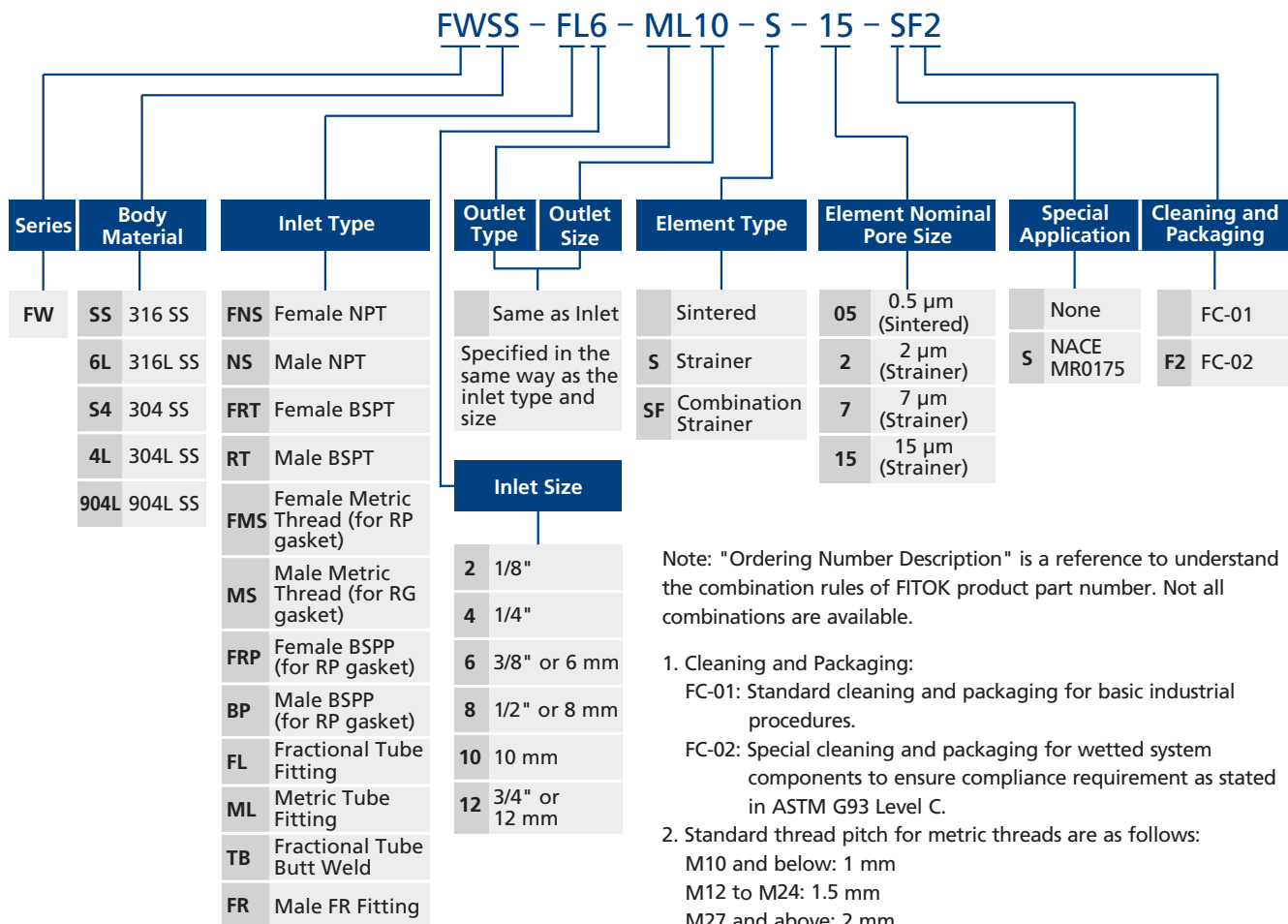
## FW Series

### Features

- ⦿ Full-penetration weld between body and filter element
- ⦿ Working pressure up to: 6000 psig (414 bar)
- ⦿ Working temperature: -20 °F to 900 °F (-28 °C to 482 °C)
- ⦿ Variety of end connections available



### Filters Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

- Cleaning and Packaging:
  - FC-01: Standard cleaning and packaging for basic industrial procedures.
  - FC-02: Special cleaning and packaging for wetted system components to ensure compliance requirement as stated in ASTM G93 Level C.
- Standard thread pitch for metric threads are as follows:
  - M10 and below: 1 mm
  - M12 to M24: 1.5 mm
  - M27 and above: 2 mm
 Standard thread pitch should be ignored in the ordering number, others should be specified.

# High-Capacity Filters

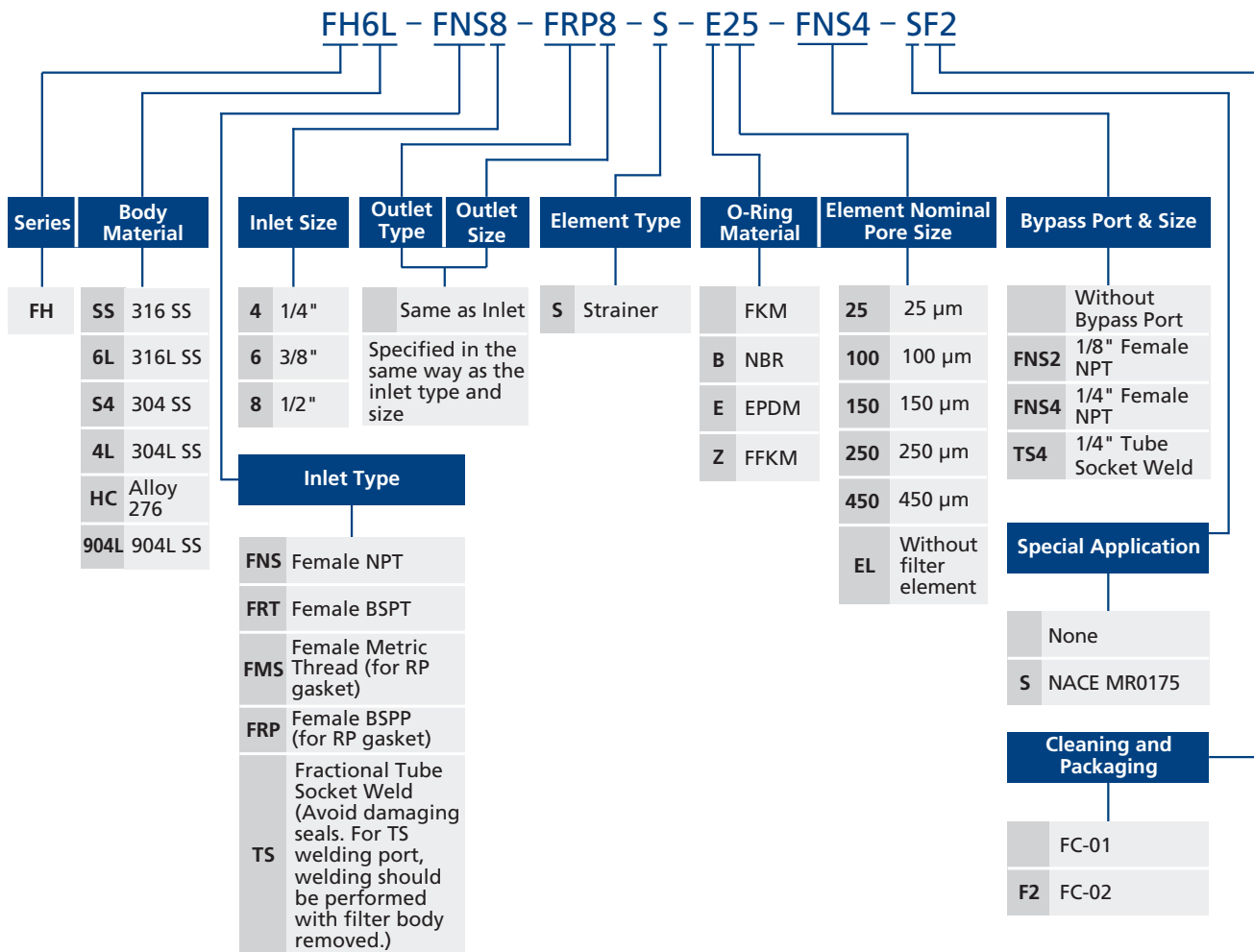
## FH Series

### Features

- Filtration area type: 4H and 8H
- Bypass port at filter bottom optional for the ease of sampling or purging
- Elements equipped with retention levers for easy disassembling, cleaning and replacement
- Standard seal materials: FKM and PTFE
- Working pressure up to 5000 psig
- Variety of end connections optional



### Filters Ordering Number Description



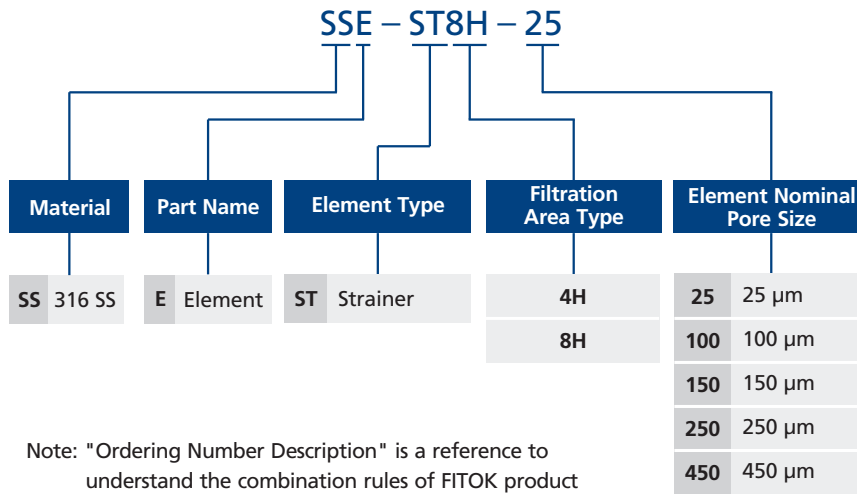
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

1. Cleaning and Packaging:

FC-01: Standard cleaning and packaging for basic industrial procedures.

FC-02: Special cleaning and packaging for wetted system components to ensure compliance requirement as stated in ASTM G93 Level C.

## Elements Ordering Number Description

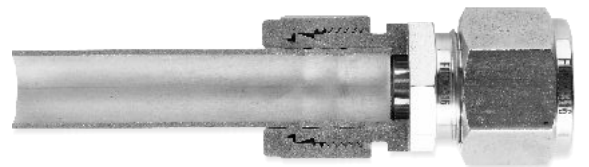


# 6D Series Tube Fittings



## Features

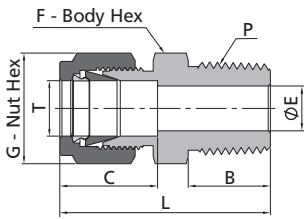
- ⦿ Sizes range from 1/16" to 2" and 2 mm to 50 mm
- ⦿ Diverse materials and configurations are available
- ⦿ Precision machined components ensure perfect deformation of the ferrules and tubing
- ⦿ Hardened threads with smooth surface finish avoid galling and help to extend the fitting service life
- ⦿ Female nut threads are silver-plated to reduce the friction against the body threads
- ⦿ Radius junction design for elbows provides smooth flow path
- ⦿ Every fitting is marked with size, material and heat number
- ⦿ Fittings are easy to disconnect and retighten
- ⦿ 1/8" to 5/8", 3 mm to 16 mm fittings available with EC-79 certification



# Ordering Information and Dimensions

Dimensions are for reference only and are subject to change; Dimensions are shown with FITOK nuts finger-tight.

## Male Connectors

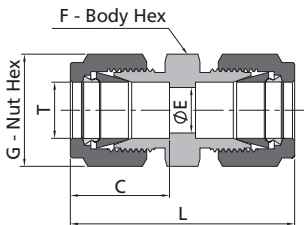


The E dimension refers to the smallest nominal orifice. It might be larger at tapered thread end, straight thread end.

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)

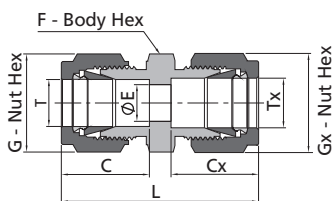
## Unions



Fractional Tube		Dimension, in. (mm)				
T-Tube O.D. (in.)	Basic Ordering Number	L	C	G	F	E
		1/4	-U-FL4	1.61(40.9)	0.60(15.2)	0.56(14.3)
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)

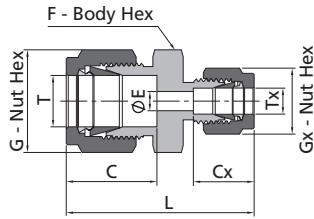
Metric Tube		Dimension, mm (in.)				
T-Tube O.D. (mm)	Basic Ordering Number	L	C	G	F	E
		6	-U-ML6	41.0(1.61)	15.3(0.60)	14.0(0.55)
8	-U-ML8	43.2(1.70)	16.2(0.64)	16.0(0.63)	15.0(0.59)	6.4(0.25)
10	-U-ML10	46.2(1.82)	17.2(0.68)	19.0(0.75)	18.0(0.71)	7.9(0.31)
12	-U-ML12	51.2(2.02)	22.8(0.90)	22.0(0.87)	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	1/8	-U-ML6-FL2	38.5(1.52)	15.3(0.60)	14.0(0.55)	14.0(0.55)	2.4(0.09)	12.7(0.50)	11.1(0.44)
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)
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)
16	5/8	-U-ML16-FL10	52.0(2.05)	24.4(0.96)	25.0(0.98)	24.0(0.94)	12.7(0.50)	24.4(0.96)	25.4(1.00)
20	1/2	-U-ML20-FL8	55.0(2.17)	26.0(1.02)	32.0(1.26)	30.0(1.18)	10.4(0.41)	22.9(0.90)	22.2(0.87)

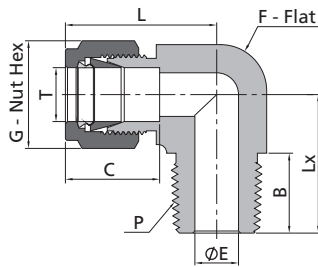
Reducing Unions



Fractional Tube			Dimension, in. (mm)							
T-Tube O.D. (in.)	Tx-Tube O.D. (in.)	Basic Ordering Number	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			Dimension, mm (in.)							
T-Tube O.D. (mm)	Tx-Tube O.D. (mm)	Basic Ordering Number	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)

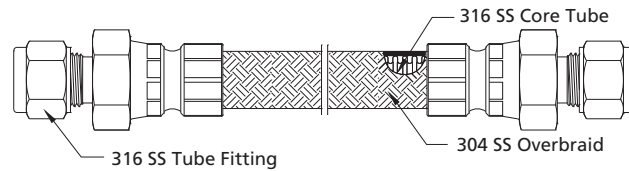
Metric Tube			NPT Thread						
T-Tube O.D. (mm)	P-NPT Size	Basic Ordering Number	Dimension, mm (in.)						
			L	C	G	F	E	B	Lx
6	1/4	-LM-ML6-NS4	27.0(1.06)	15.3(0.60)	14.0(0.55)	12.7(0.50)	4.8(0.19)	14.2(0.56)	23.4(0.92)
8	3/8	-LM-ML8-NS6	30.6(1.20)	16.2(0.64)	16.0(0.63)	17.5(0.69)	6.4(0.25)	14.2(0.56)	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, 316L stainless steel
- Overbraid material: 304 stainless steel (316 SS available)
- Vacuum and positive pressure applications
- Working pressure up to: 3100 psig (213 bar)
- Nominal hose size: 1/4" to 2"
- End connections:
  - 1/4" to 2" pipe thread
  - 1/4" to 2" and 6 mm to 50 mm tube fitting
- Working temperature: -325 °F to 800 °F (-200 °C to 426 °C)
- Welded fitting-to-hose construction to ensure reliable seal
- Standard and custom length available



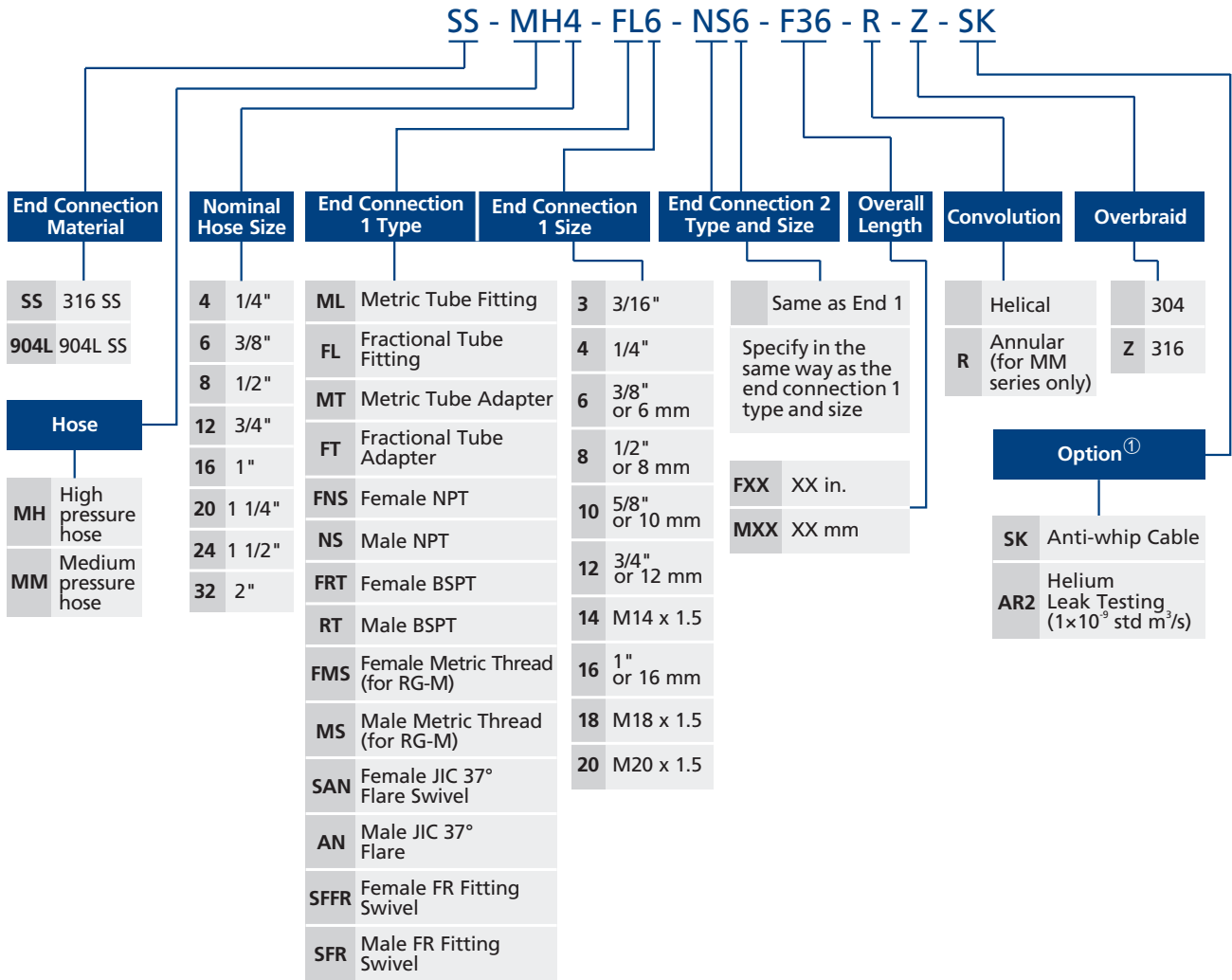
### Hose Technical Data (MH Series)

Nominal Hose Size	Inside Diameter	Min. Bend Radius		Temperature Range	Working Pressure at 70°F (20°C)	Min. Burst Pressure at 70°F (20°C)
		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)
3/8 (9.7)	0.42 (10.6)	3.00 (76.2)	12.0 (305)		2000 (137)	8000 (551)
1/2 (12.7)	0.53 (13.5)	4.50 (114)	16.0 (406)		1800 (124)	7200 (496)
3/4 (19.0)	0.80 (20.3)	6.00 (152)	17.0 (432)		1500 (103)	6000 (413)
1 (25.4)	1.03 (26.0)	6.75 (171)	20.0 (508)		1200 (82.6)	4800 (330)
1 1/4 (31.8)	1.30 (33.0)	8.86 (225)	23.0 (584)		950 (65.4)	3800 (261)
1 1/2 (38.1)	1.53 (38.9)	11.0 (280)	26.0 (660)		900 (62.0)	3600 (248)
2 (50.8)	2.05 (52.1)	13.8 (350)	32.0 (813)		500 (34.4)	2000 (137)

### Hose Technical Data (MM Series)

Nominal Hose Size	Inside Diameter	Min. Bend Radius				Temperature Range	Working Pressure at 70°F (20°C)	Min. Burst Pressure at 70°F (20°C)
		Helical Convoluted Core		Annular Convoluted Core				
		Static	Dynamic	Static	Dynamic			
in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	°F (°C)	psig (bar)	psig (bar)
1/4 (6.4)	0.25 (6.4)	1.38 (35)	8.66 (220)	0.79 (20)	4.33 (110)	-325 to 800 (-200 to 426)	1600 (110)	6400 (440)
3/8 (9.7)	0.38 (9.5)	2.36 (60)	10.40 (264)	0.98 (25)	5.91 (150)		1470 (101)	6000 (413)
1/2 (12.7)	0.50 (12.7)	2.95 (75)	11.89 (302)	1.18 (30)	4.88 (124)		1110 (76.4)	4500 (310)
3/4 (19.0)	0.75 (19.0)	3.54 (90)	13.58 (345)	1.50 (38)	6.65 (169)		860 (59.2)	3500 (241)
1 (25.4)	1.00 (25.4)	4.13 (105)	15.00 (381)	1.77 (45)	7.68 (195)		680 (46.8)	2680 (184)
1 1/4 (31.8)	1.25 (31.8)	4.72 (120)	16.22 (412)	/			680 (46.8)	2600 (179)
1 1/2 (38.1)	1.50 (38.1)	5.51 (140)	16.89 (429)				520 (35.8)	2200 (151)
2 (50.8)	2.00 (50.8)	6.30 (160)	18.43 (468)				450 (31.0)	1800 (124)

## Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

① To order multiple options, please add designators in alphabetical order and separate them with dashes.

**Example: SS-MH4-FT6-M710**

**SS:** End connection material is 316 stainless steel.

**MH4:** MH series, nominal hose size is 1/4".

**FT6:** End connection 1 is 3/8" tube adapter.

End connection 2 is 3/8" tube adapter.

**M710:** Overall length is 710 mm.

Connections are described based on the following rules:

1. Metric Tube Fitting - Fractional Tube Fitting - Metric Tube Adapters - Fractional Tube Adapters - NPT Threads - BSPT Threads - BSPP Threads - SAE/MS Parallel Threads - 37° Flare - Others
2. Put the sizes from the biggest down to the smallest if they are of the same type.
3. Put the female before male if they are of the same type and size.



# Cylinder Connections



CGA DISS Series

B-30

CGA Series

B-34

DIN Series

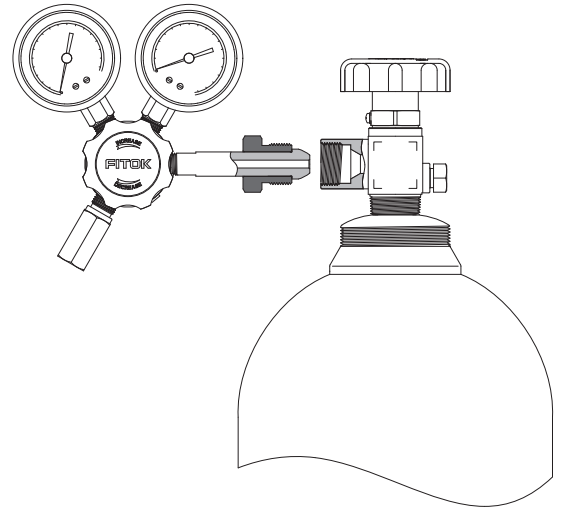
B-41

Gas Connection Assignment Table

B-42

## 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
- ⦿ 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

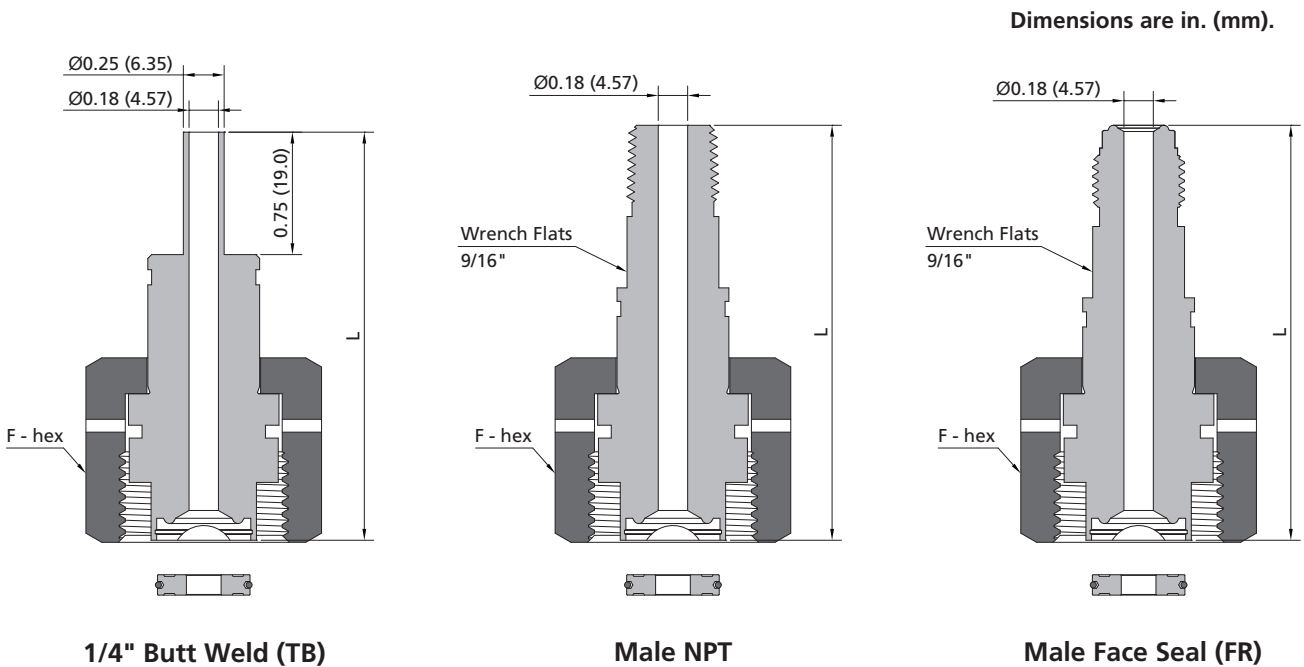
## Ordering information

- ⦿ Add material designator as a prefix to the basic ordering number to get the complete ordering number.  
Example: 6L-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), products comply with high purity process specification
- ⦿ For nipples with NPT connections, inner surface electropolished to an average of Ra 16 µin. (0.4 µm), products comply with special cleaning and packaging, applicable to oxygen-enriched atmospheres
- ⦿ Maximum allowable leak rate:  $1 \times 10^{-9}$  std cm<sup>3</sup>/s

## Cylinder Connections (Including Nipples, Nuts and Gaskets)



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)

B-31 Related Products

Gas Control Equipment

Related Products

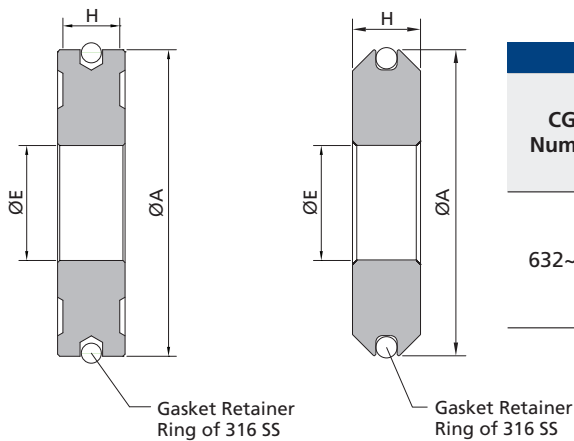
Technical References

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

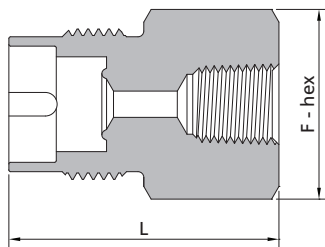
NI-C630-GT / AL-C630-GT K-C630-GT



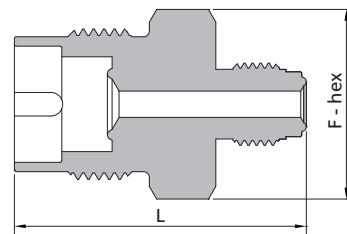
CGA Number	Gasket Ordering Number	Material	Dimensions					
			A		E		H	
			in.	mm	in.	mm	in.	mm
632~728	NI-C630-GT	Nickel 200	0.56	14.3	0.21	5.4	0.105	2.7
	K-C630-GT	PCTFE	0.56	14.3	0.21	5.4	0.125	3.2
	AL-C630-GT	Aluminum	0.56	14.3	0.21	5.4	0.105	2.7

## Outlet Adaptors

Female NPT



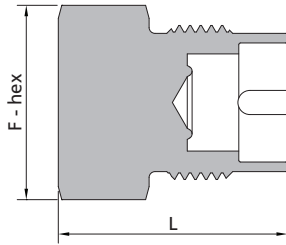
Male Face Seal (FR)



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)

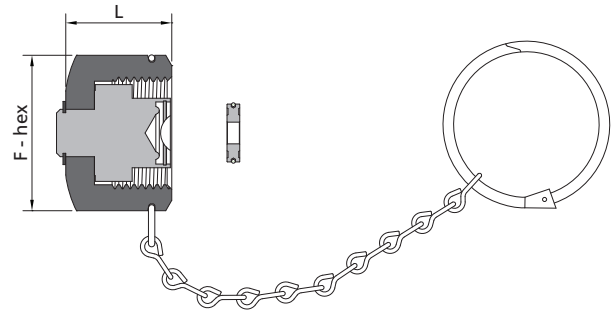
CGA Number	Basic Ordering Number	Dimensions, in. (mm)	
		L	F
632	-C632-A-FR4	2.0 (50.8)	1 1/8 (28.6)
634	-C634-A-FR4	2.0 (50.8)	1 1/8 (28.6)
636	-C636-A-FR4	2.0 (50.8)	1 1/8 (28.6)
638	-C638-A-FR4	2.0 (50.8)	1 1/8 (28.6)
640	-C640-A-FR4	2.0 (50.8)	1 1/8 (28.6)
642	-C642-A-FR4	2.0 (50.8)	1 1/8 (28.6)
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	1.13 (28.7)	1 1/4 (31.8)
634	-C634-CP	1.13 (28.7)	1 1/4 (31.8)
636	-C636-CP	1.13 (28.7)	1 1/4 (31.8)
638	-C638-CP	1.13 (28.7)	1 1/4 (31.8)
640	-C640-CP	1.13 (28.7)	1 1/4 (31.8)
642	-C642-CP	1.13 (28.7)	1 1/4 (31.8)
712	-C712-CP	1.13 (28.7)	1 3/8 (34.9)
714	-C714-CP	1.13 (28.7)	1 3/8 (34.9)
716	-C716-CP	1.13 (28.7)	1 3/8 (34.9)
718	-C718-CP	1.13 (28.7)	1 3/8 (34.9)
720	-C720-CP	1.13 (28.7)	1 3/8 (34.9)
722	-C722-CP	1.13 (28.7)	1 3/8 (34.9)
724	-C724-CP	1.13 (28.7)	1 3/8 (34.9)
726	-C726-CP	1.13 (28.7)	1 3/8 (34.9)
728	-C728-CP	1.13 (28.7)	1 3/8 (34.9)

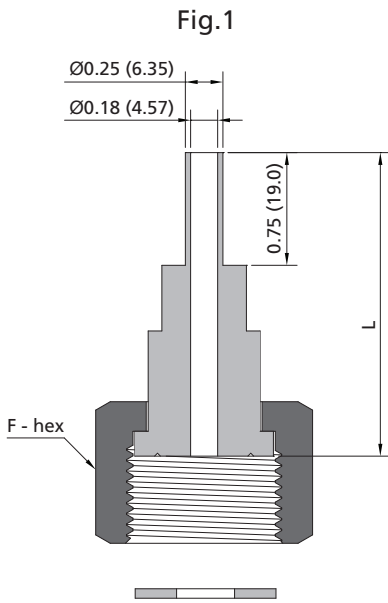
**Note:**  
 Nickel is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.  
 Example: 6L-C632-CP-K

# CGA Series

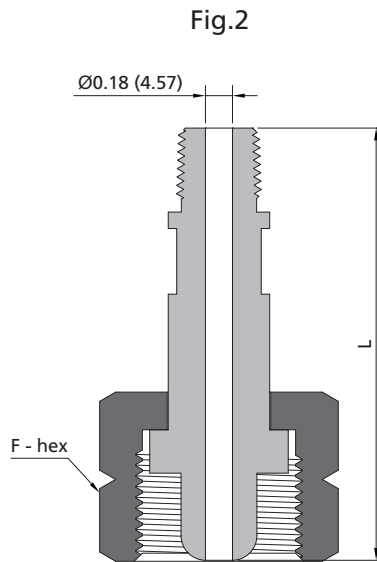
- CGA V-1-2005 compliant
- For nipples with TB or FR connections, inner surface electropolished to an average of Ra 9 µin. (0.23 µm); Ra 32 µin. (0.8 µm) for nipples with NPT connections
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres
- Maximum allowable leak rate:  $1 \times 10^{-9}$  std cm<sup>3</sup>/s

## Cylinder Connections (Including Nipples, Nuts and Gaskets)

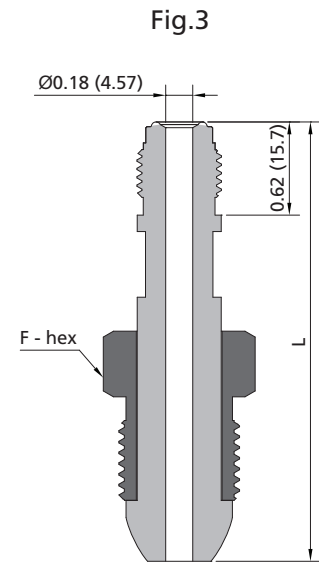
Dimensions are in. (mm).



1/4" Butt Weld (TB)



Male NPT



Male Face Seal (FR)

CGA Number	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				
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)	

B-35 Related Products

Gas Control Equipment

Related Products

Technical References

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)	
540 <sup>Ⓞ</sup>	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)	

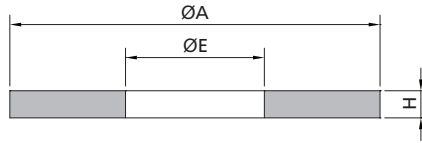
Note: PTFE is standard material for gasket. If PCTFE is required, please add a suffix of "-k" to the ordering number.

Example: 6L-C170-FR4-K

Ⓞ Cleaned and packaged for Oxygen Service.



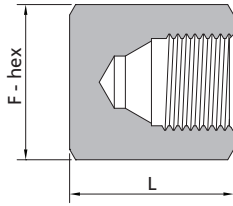
# Gaskets



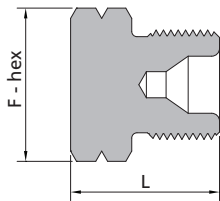
CGA Number	Gasket Basic Ordering Number	Dimensions					
		A		E		H	
		in.	mm	in.	mm	in.	mm
170	-C170-GT	0.43	11.0	0.19	4.8	0.10	2.5
180	-C180-GT	0.44	11.2	0.32	8.1	0.09	2.3
320, 330	-C320-GT	0.72	18.3	0.26	6.6	0.09	2.3
660, 670	-C660-GT	0.94	23.9	0.38	9.7	0.06	1.6
678	-C678-GT	0.61	15.5	0.30	7.6	0.06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

## Outlet Adaptors, Blank Caps and Plugs

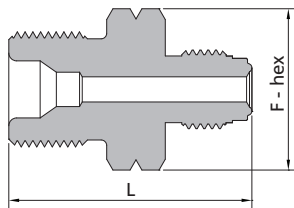
### Blank Caps CGA 580



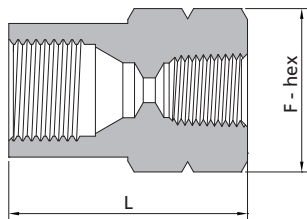
### Blank Plugs CGA 350



### Male Face Seal (FR) CGA 350



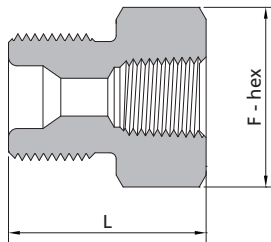
### Female NPT CGA 590



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)	
320	1/4" FR	-C296-A-FR4	2.0 (50.8)	1 (25.4)
	Blank Plug	-C320-BP	1.12 (28.4)	
	1/4" Female NPT	-C320-A-FNS4	1.12 (28.4)	
326	1/4" FR	-C320-A-FR4	1.74 (44.2)	1 (25.4)
	Blank Plug	-C326-BP	1.12 (28.4)	
330	1/4" Female NPT	-C326-A-FNS4	1.31 (33.3)	1 (25.4)
	1/4" FR	-C326-A-FR4	1.74 (44.2)	
	Blank Plug	-C330-BP	1.12 (28.4)	
346	1/4" Female NPT	-C330-A-FNS4	1.31 (33.3)	1 (25.4)
	1/4" FR	-C330-A-FR4	1.74 (44.2)	
	Blank Plug	-C346-BP	1.12 (28.4)	
350	1/4" Female NPT	-C346-A-FNS4	1.31 (33.3)	1 (25.4)
	1/4" FR	-C346-A-FR4	1.88 (47.8)	
	Blank Plug	-C350-BP	1.12 (28.4)	
510	1/4" Female NPT	-C350-A-FNS4	1.31 (33.3)	1 (25.4)
	1/4" FR	-C350-A-FR4	1.88 (47.8)	
	Blank Plug	-C510-BP	1.12 (28.4)	
540 <sup>①</sup>	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)	
580	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)	

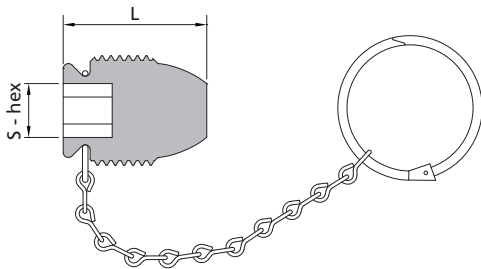
① Cleaned and packaged for Oxygen Service.

**Female NPT**  
CGA 350

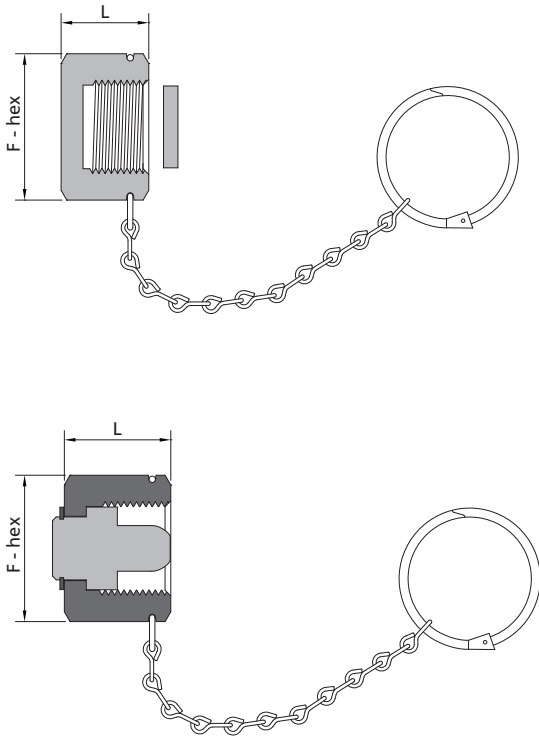


CGA Number	End Connection	Assembly Basic Ordering Number	Dimensions, in. (mm)	
			L	F
590	Blank Cap	-C590-BC	1.37 (34.8)	1 1/4 (31.8)
	1/4" Female NPT	-C590-A-FNS4	2.0 (50.8)	
	1/4" FR	-C590-A-FR4	2.0 (50.8)	
660	Blank Plug	-C660-BP	0.88 (22.4)	1 1/8 (28.6)
	1/4" Female NPT	-C660-A-FNS4	1.25 (31.8)	
	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)	

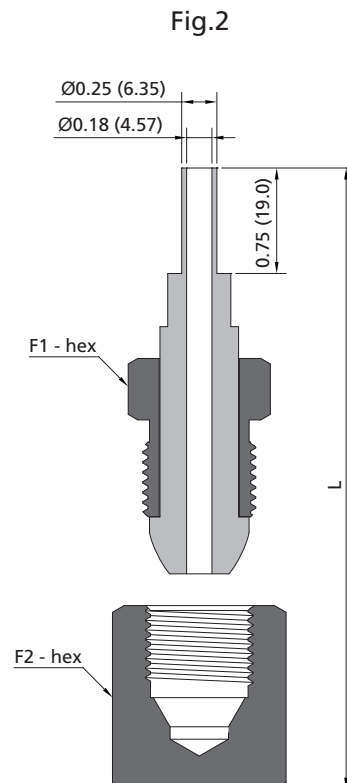
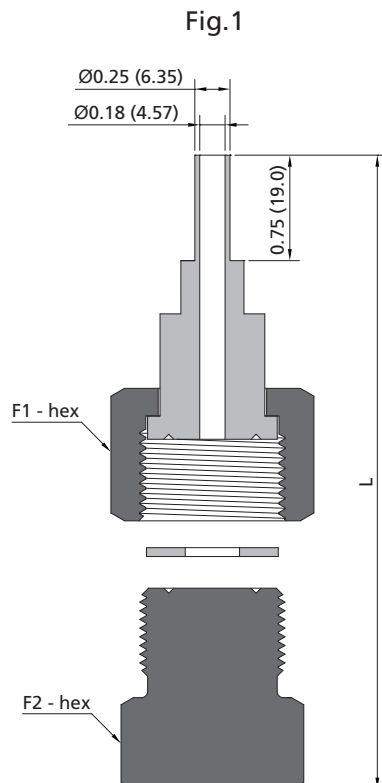
Notes:

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).



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)		
540 <sup>ⓐ</sup>	Fig.1	-C540-TB4-A	—	2.96 (75.2)		
580	Fig.2	-C580-TB4-A	—	3.03 (77.0)		
590	Fig.2	-C590-TB4-A	—	3.03 (77.0)		
660	Fig.1	-C660-TB4-A	-C660-GT	2.96 (75.2)		
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)		

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  
<sup>ⓐ</sup> Cleaned and packaged for Oxygen Service.

## Assembly Torque For CGA Cylinder Connections

CGA NO.	Recommended Torque		CGA NO.	Recommended Torque	
	ft-lb	N·m		ft-lb	N·m
170 <sup>ⓐ</sup>	10~15	14~20	510	35~50	47~68
180 <sup>ⓐ</sup>	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
320 <sup>ⓐ</sup>	20~30	27~41	660 <sup>ⓐ</sup>	30~45	41~61
326	25~35	34~47	670 <sup>ⓐ</sup>	30~45	41~61
330 <sup>ⓐ</sup>	20~30	27~41	678 <sup>ⓐ</sup>	25~35	34~47
346	35~50	47~68	679 <sup>ⓐ</sup>	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		

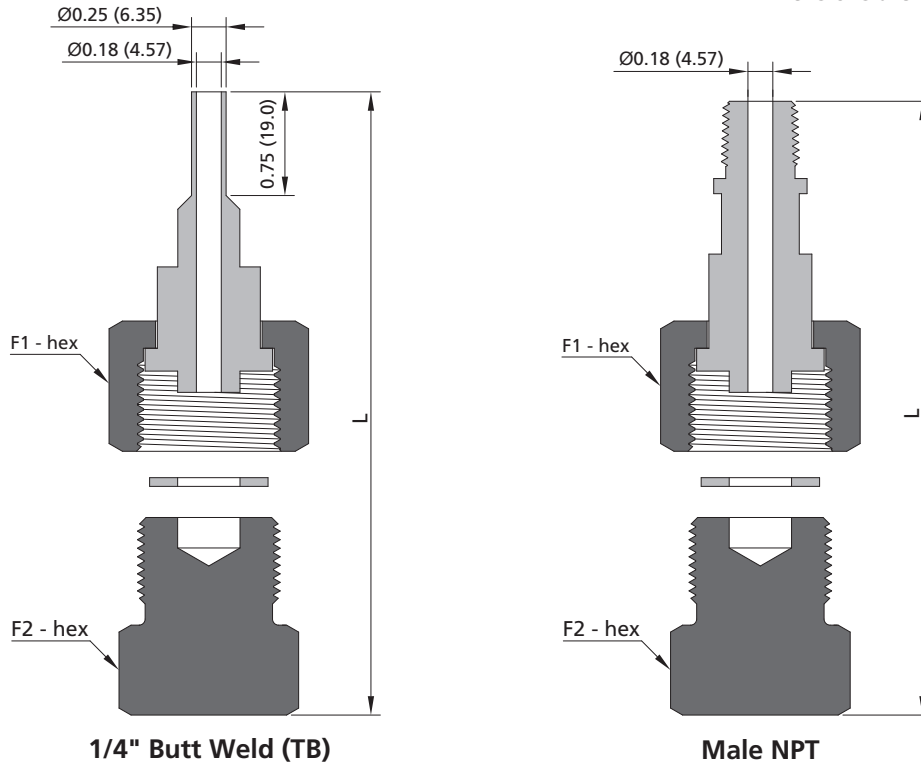
<sup>ⓐ</sup> Gasket for seal: PTFE or PCTFE.

# 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
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres
- Maximum allowable leak rate:  $1 \times 10^{-9}$  std cm<sup>3</sup>/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 Table<sup>①</sup>

GAS	Formula	CGA DISS	CGA	DIN	JIS
Ammonia	NH <sub>3</sub>	720	705	DIN6	22-R
Argon	Ar	718	580	DIN6	22-R or 23-R
Arsenic Pentafluoride	AsF <sub>5</sub>	642	—	—	—
Arsine	AsH <sub>3</sub>	632	350	—	22-L
Boron Trichloride	BCl <sub>3</sub>	634	660	DIN8	—
Boron Trifluoride	BF <sub>3</sub>	642	330	DIN8	22-L
Carbon Dioxide	CO <sub>2</sub>	716	320	DIN6	—
Carbon Monoxide	CO	724	350	DIN5	22-L
Chlorine	Cl <sub>2</sub>	728	—	DIN8	26-R
Diborane	B <sub>2</sub> H <sub>6</sub>	632	350	—	22-L
Dichlorosilane	SiH <sub>2</sub> Cl <sub>2</sub>	636	678 <sup>②</sup>	DIN5	—
Diethylzinc	Zn(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub>	726	510 <sup>②</sup>	—	—
Diethyltelluride	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> Te	726	—	—	—
Dimethylzinc	(CH <sub>3</sub> ) <sub>2</sub> Zn	726	—	—	—
Disilane	Si <sub>2</sub> H <sub>6</sub>	632	—	—	—
Germane	GeH <sub>4</sub>	632	350 or 660	—	—
Halocarbon 11	CCl <sub>3</sub> F	716	660	—	—
Halocarbon 115	ClCF <sub>2</sub> CF <sub>3</sub>	716	660	DIN6	—
Halocarbon 12	CCl <sub>2</sub> F <sub>2</sub>	716	660	DIN6	—
Halocarbon 13	ClCF <sub>3</sub>	716	660	DIN6	—
Halocarbon 14	CF <sub>4</sub>	716	320 or 580	DIN6	—
Halocarbon 23	CHF <sub>3</sub>	716	660	DIN6	—
Halocarbon 116	F <sub>3</sub> CCF <sub>3</sub>	716	660	—	—
Helium	He	718	580	DIN6	22-R or 23-R
Hydrogen	H <sub>2</sub>	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 <sub>2</sub> S	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 <sub>2</sub>	718	580	DIN10	22-R or 23-R
Nitrogen Trifluoride	NF <sub>3</sub>	640	330 or 670	DIN8	—
Nitrous Oxide	N <sub>2</sub> O	712	326	DIN8	—
Oxygen	O <sub>2</sub>	714	540	DIN9	22-R or 23-R
Perfluoropropane	CF <sub>2</sub> (CF <sub>3</sub> )	716	660	—	—
Phosphine	PH <sub>3</sub>	632	350 or 660	DIN1	—
Phosphorus Pentafluoride	PF <sub>5</sub>	642	330 or 660	—	—
Silane	SiH <sub>4</sub>	632	350	—	—
Silicon Tetrachloride	SiCl <sub>4</sub>	636	—	—	—
Silicon Tetrafluoride	SiF <sub>4</sub>	642	330	—	22-L
Sulphur Hexafluoride	SF <sub>6</sub>	716	590	DIN6	26-R
Trichlorosilane	SiHCl <sub>3</sub>	636	—	—	—
Triethylaluminum	(C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> Al	726	510 <sup>②</sup>	—	—
Tungsten Hexafluoride	WF <sub>6</sub>	638	670	DIN8	—
Xenon	Xe	718	580	DIN6	22-R

① Information in this table is for reference only.

② Refer to CGA organization specification for pressure limits.

# C

## Technical References

Common Terms and Definitions. . . . .	C-02
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# 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 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 std cm<sup>3</sup>/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.

## Unbalanced Poppet

A poppet where the effective area of the poppet is influenced by the inlet pressure.

## Balanced Poppet

A poppet where the effective area of the poppet is not influenced by the inlet 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 Charts

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

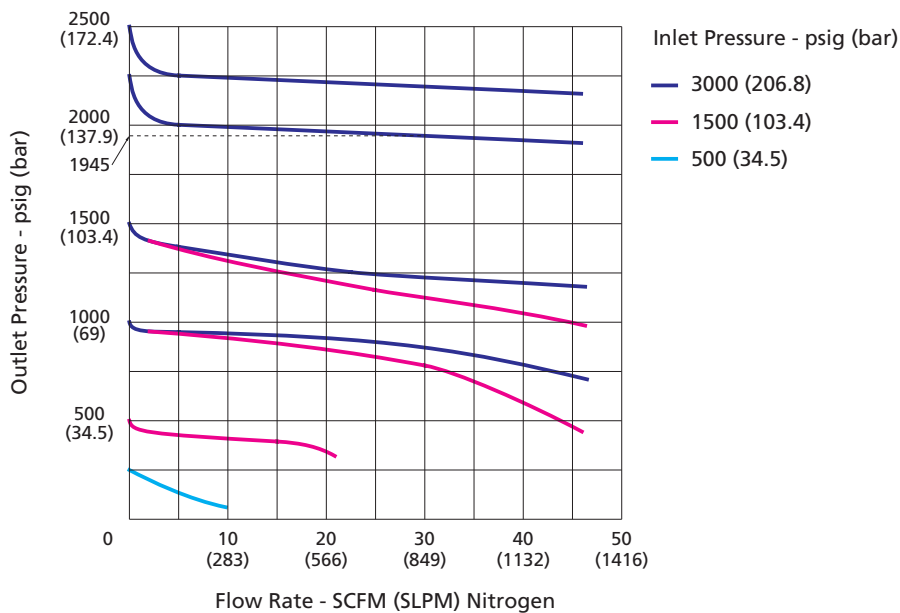
Steps: 1. Locate the curve based on inlet pressure (3000 psig) and set outlet pressure (2250 psig)

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 <sub>2</sub> O	in. of H <sub>2</sub> O	mm of Hg	in. of Hg	Kg/cm <sup>2</sup>
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 <sub>2</sub> O	0.433107	0.029891	0.02947	2.989	1	12	22.4198	0.882646	0.03048
in. of H <sub>2</sub> O	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 <sup>2</sup>	14.22334	0.980665	0.9678	98.03922	32.8084	393.7008	735.5592	28.95903	1

## Flow

From \ To	cm <sup>3</sup> /min	cm <sup>3</sup> /sec	ft <sup>3</sup> /hr	ft <sup>3</sup> /min	m <sup>3</sup> /hr	m <sup>3</sup> /min	L/hr	L/min
cm <sup>3</sup> /min	1	0.0166667	0.0021189	0.0000353	0.00006	0.000001	0.06	0.001
cm <sup>3</sup> /sec	60	1	0.127134	0.0021189	0.0036	0.00006	3.6	0.06
ft <sup>3</sup> /hr	471.9474	7.86579	1	0.0166667	0.0283168	0.0004719	28.31685	0.4719474
ft <sup>3</sup> /min	28316.85	471.9474	60	1	1.699008	0.0283168	1699.008	28.31686
m <sup>3</sup> /hr	16666.67	277.7778	35.31467	0.5885777	1	0.0166667	1000	16.66667
m <sup>3</sup> /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 <sup>3</sup>	kg/m <sup>3</sup>	lbs/ft <sup>3</sup>	lbs/in <sup>3</sup>	lbs/U.S. gal
gms/cm <sup>3</sup>	1	1000	62.428	0.0361273	8.3454
kg/m <sup>3</sup>	0.001	1	0.062428	3.61273×10 <sup>-5</sup>	0.0083454
lbs/ft <sup>3</sup>	0.0160185	16.018463	1	5.78704×10 <sup>-4</sup>	0.13368
lbs/in <sup>3</sup>	27.679905	27679.9	1728	1	231
lbs/U.S. gal	0.1198264	119.8264	7.4805195	0.004329	1

# Material Compatibility for Gases

## Codes

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

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

C-07 Technical References

Gas Control Equipment

Related Products

Technical References

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

# Ordering Details for Specialty Gas Application

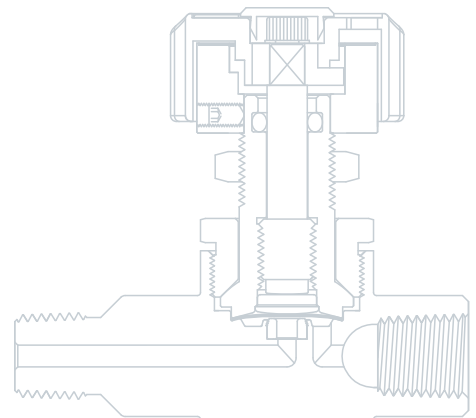
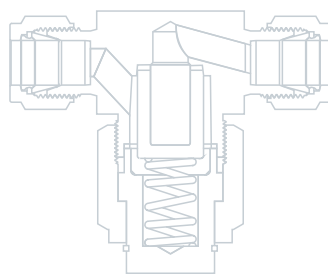
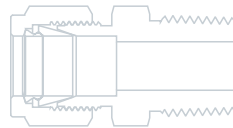
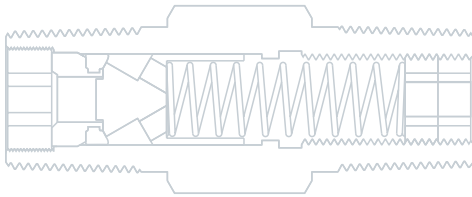
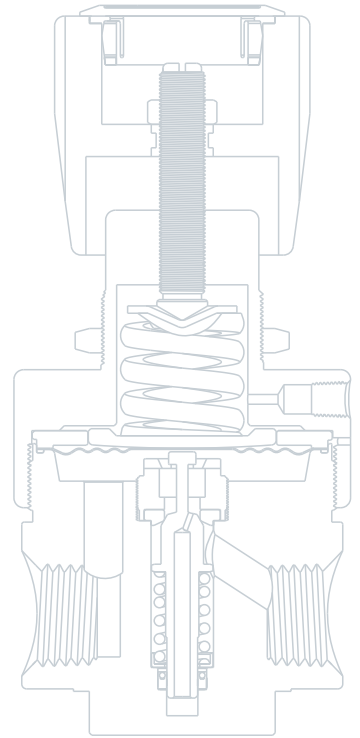
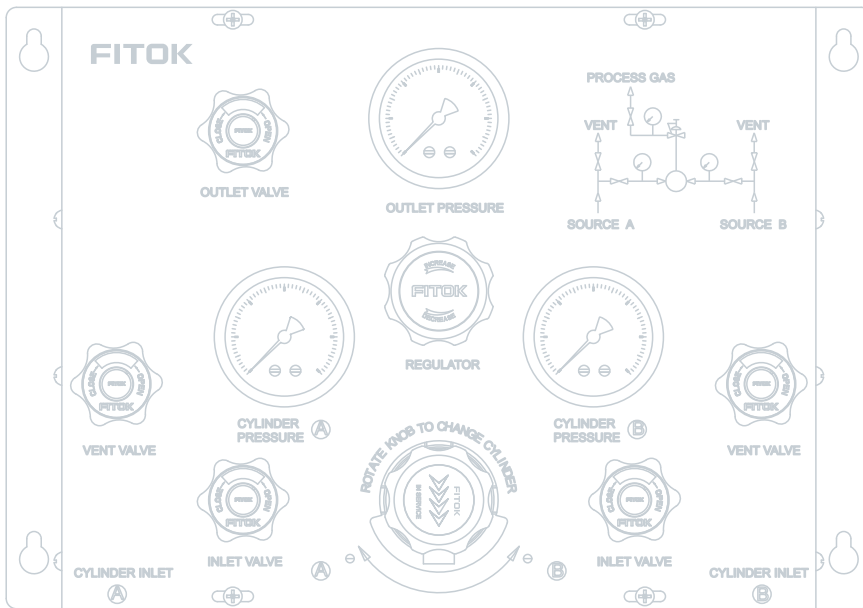
<p><b>Company</b> _____</p> <p><b>Name</b> _____</p> <p><b>Tel</b> _____</p> <p><b>E-mail</b> _____</p>
<b>Application Information</b>
<p>Gas _____      Chemical formula _____      Purity _____</p> <p>Upstream pressure _____ psig, _____ bar, _____ Mpa</p> <p>Downstream pressure range _____ psig, _____ bar, _____ Mpa</p> <p>Temperature _____ °C _____ °F      Cv or flow rate _____</p> <p>Application _____</p> <p>_____</p>
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<p>Single-stage <input type="checkbox"/>      Dual-stage <input type="checkbox"/></p>
<p>Material (mostly gas type dependent):    Stainless Steel <input type="checkbox"/>      Brass <input type="checkbox"/>      Hastelloy <input type="checkbox"/></p>
<p><input checked="" type="radio"/> Cylinder pressure regulator <input type="checkbox"/></p> <p style="padding-left: 20px;">Cylinder connection    Yes <input type="checkbox"/>    No <input type="checkbox"/></p> <p style="padding-left: 20px;">Purge unit      Yes <input type="checkbox"/>    No <input type="checkbox"/></p> <p><input checked="" type="radio"/> Panel and line pressure regulator <input type="checkbox"/></p> <p style="padding-left: 20px;">2 ports <input type="checkbox"/>    3 ports <input type="checkbox"/>    4 ports <input type="checkbox"/></p> <p><input checked="" type="radio"/> Pressure control panel <input type="checkbox"/></p> <p style="padding-left: 20px;">Purge unit      Yes <input type="checkbox"/>    No <input type="checkbox"/></p> <p><input checked="" type="radio"/> Changeover system <input type="checkbox"/></p> <p style="padding-left: 20px;">With line regulator    Yes <input type="checkbox"/>    No <input type="checkbox"/></p> <p><input checked="" type="radio"/> Point-of-use panel <input type="checkbox"/></p>

## Warranty Information

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

**FITOK**





info@fitok.com  
www.fitok.com

