Regulators

FHR-1 Series High Performance High Purity Regulators

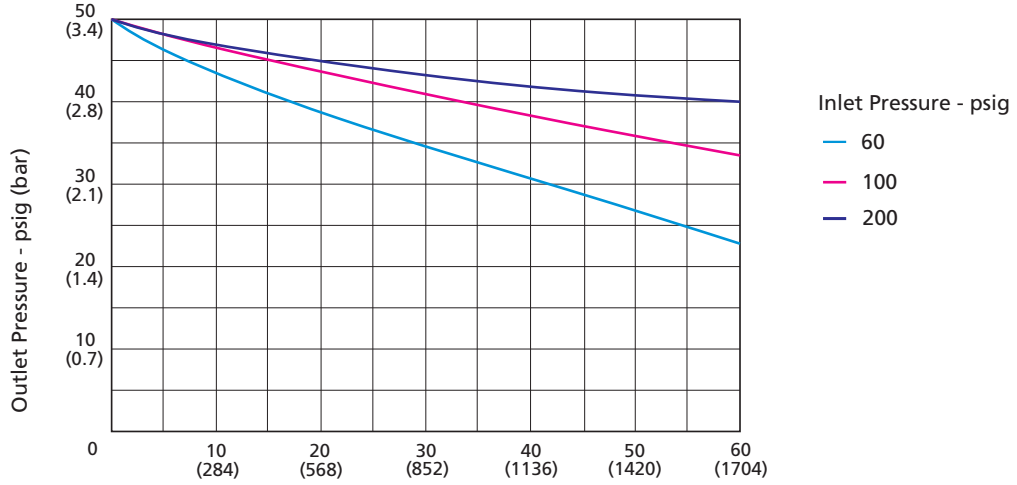
Features

- ◎ 316L stainless steel body for corrosive gases and toxic gases
- ◎ Standard Hastelloy poppet and diaphragm
- ◎ Tied diaphragm for added safety
- ◎ Metal to metal diaphragm to body seal
- ◎ No springs or threads are exposed to the wetted area
- ◎ Internal surfaces are finished with Ra 10 µin. (0.25 µm) or Ra 5 µin. (0.13 µm) to ensure minimal particle generation
- ◎ Every step of assembly, welding, testing, final cleaning and packaging is conducted in Class 100 cleanroom
- ◎ Ultra High Purity applications

Technical Data

Port Size		1/4" , 3/8" or 1/2"
Max. Working Pressure		3500 psig
Outlet Pressure Range		0~30, 0~60, 0~100, 0 ~150 psig
Flow Coefficient (Cv)		3500 psig Inltet: 0.06 600,1000 psig Inlet: 0.15
Temperature		PCTFE: -40~149°F (-40~65°C) Vespel: -15~302°F (-26~150°C)
Leak Rate (Helium)	**Internal**	≤5x10^{-8}mbar l/s
	External	≤1x10^{-9}mbar l/s
Weight (regulator only)		≈1.5 lbs (0.7 kg)

Flow Data



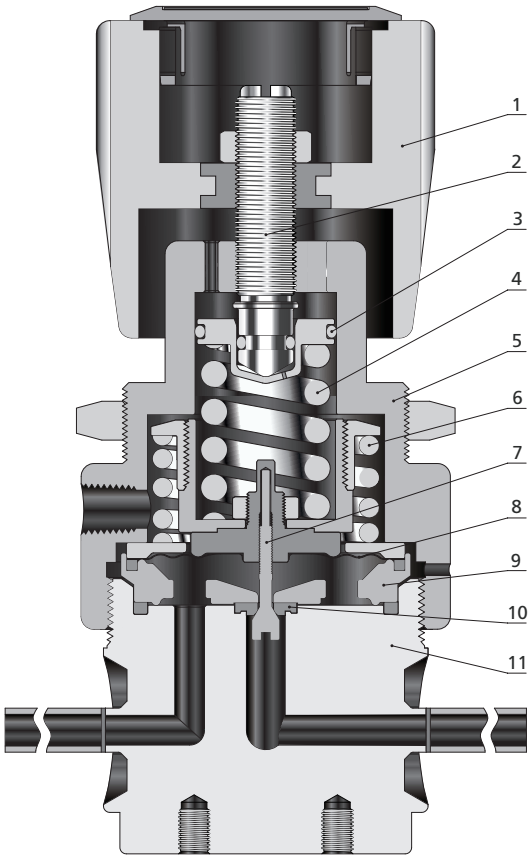
Flow Rate - SCFM (SLPM) Nitrogen

Product Technology Grade

Technology \ Product Grade	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316L SS/ASTM A479		316L VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm)①		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished①		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

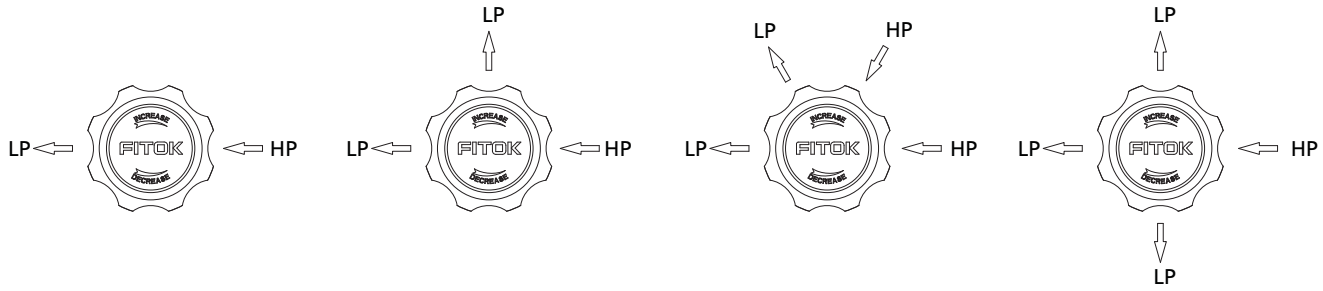
① For FR connections and tube butt connections, the standard polishing process is electropolishing and the internal surface roughness is finished to an average of Ra 5 μin. (0.13 μm).

Major Materials of Construction



Item	Component	Material/Specification
1	Handle	Aluminum
2	Stem	C36000/ASTM B16
3	O-ring	Viton
4	Range Spring	S17700/ASTM A313
5	Bonnet	304 SS/ASTM A479
6	Back Move Spring	302 SS/ASTM A313
7	Lift Poppet	N06022/ASTM B574
8	Diaphragm	Hastelloy
9	Support	316L SS/ASTM A479
10	Seat	PCTFE/ASTM D1430 or Vespel
11	Body	316L SS/ASTM A479 or 316L VAR /SEMI F20 or 316L VIM-VAR /SEMI F20

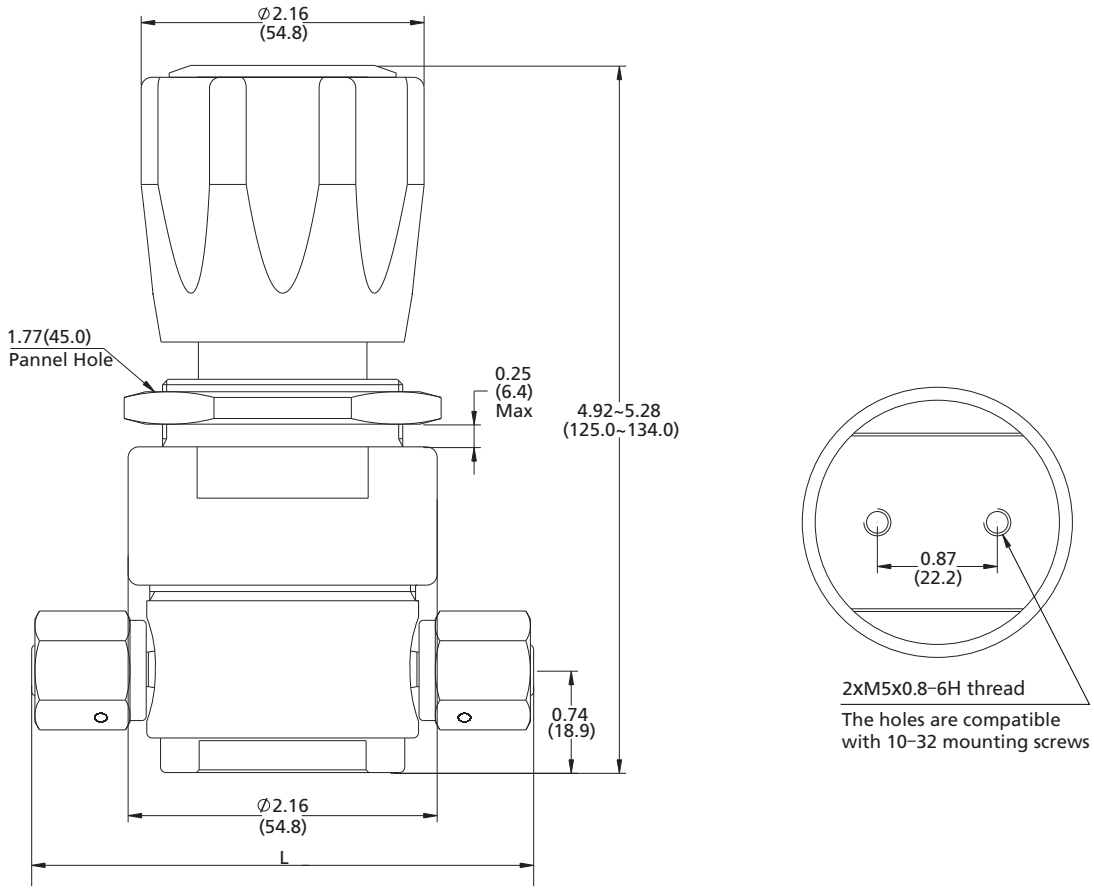
Porting Configurations



2 Ports (2P) | **3 Ports (3P)** | **4 Ports (4P)** | **4 Ports (4C)**

Dimensions

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



Connection Code	Connection Type and Size	L
C4	1/4" Fractional Tube Fitting	4.97"(126.2)
C6	3/8" Fractional Tube Fitting	5.99"(152.1)
T4	1/4" Fractional Tube Butt Weld	3.70 (94.0)
T6	3/8" Fractional Tube Butt Weld	
F4	1/4" Female Face Seal	
F8	1/2" Female Face Seal	4.75"(120.6)
M4	1/4" Rotatable Male Face Seal	3.70 (94.0)
M8	1/2" Rotatable Male Face Seal	4.75"(120.6)
IF4	1/4" Internal Female Face Seal	1.09"(27.7)

Ordering Number Description

FHR – 16L – 35 – 100 – 4P – B – M4M4M4M4 – ZV – F2

Body Material	
6L	316L SS
6LV	316L VAR

Inlet Pressure P1	
06	600 psig
10	1000 psig
35	3500 psig

Outlet Pressure Range P2	
30	0~30 psig
60	0~60 psig
100	0~100 psig
150	0~150 psig

Porting	
2P	2 ports (no gauge port)
3P	3 ports (gauge port at outlet)
4P	4 ports (gauge ports at inlet and outlet)
4C	4 ports (gauge port at outlet)

Gauge	
	Without gauge
B	With gauge (psi/bar)
M	With gauge (psi/MPa)

Connection Type and Size	
C4	1/4" Fractional Tube Fitting
C6	3/8" Fractional Tube Fitting
T4	1/4" Fractional Tube Butt Weld
T6	3/8" Fractional Tube Butt Weld
F4	1/4" Female Face Seal
F8	1/2" Female Face Seal
M4	1/4" Rotatable Male Face Seal
M8	1/2" Rotatable Male Face Seal
IF4	1/4" Internal Female Face Seal
Other connections are available upon request	

Optional Feature	
	None
Z	Panel nut
N	Bolts for assembly
V	Vespel seat

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

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