General Tied Diaphragm Springless Regulators

RTGC Series

Introduction

RTGC Series General Tied Diaphragm Springless Regulators feature a single-stage pressure reduction design. Their tied diaphragm construction provides positive shutoff. With no threads or springs in wetted areas, these regulators are ideal for high purity and ultra high purity applications ranging from low to medium flow.

Features

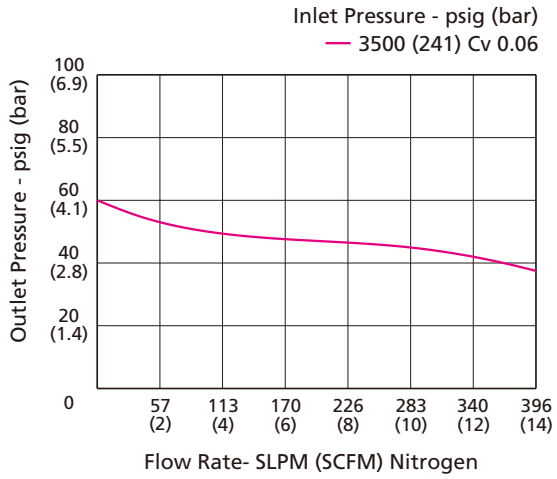
◎ Lightweight, compact design
◎ Lift poppet and diaphragm are made of Alloy 22, offering excellent corrosion resistance
◎ Metal-to-metal seal between valve body and diaphragm ensures reliable sealing performance
◎ Reinforced diaphragm improves sealing performance and extends service life
◎ Tied diaphragm construction offers positive shutoff for added safety
◎ Bonnet with a captured vent port allows media to be vented to a designated location in the event of diaphragm rupture

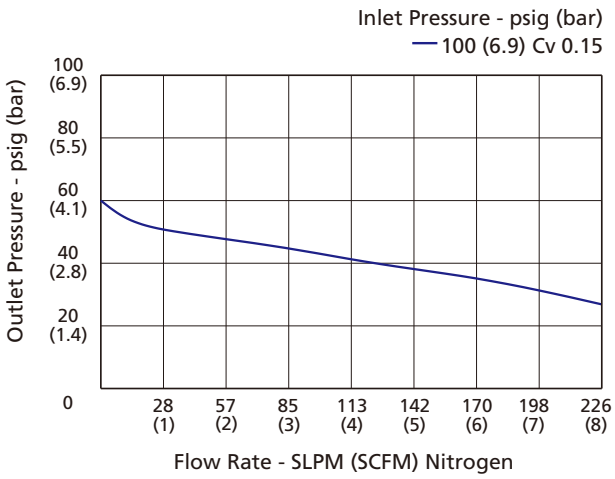
Technical Data

Port Size			1/4", 3/8" or 1/2"
Max. Working Pressure			3500 psig (241 bar)
Outlet Pressure Range			0 ~ 30 psig (0 ~ 2.1 bar)
			0 ~ 60 psig (0 ~ 4.2 bar)
			0 ~ 100 psig (0 ~ 6.9 bar)
			0 ~ 150 psig (0 ~ 10.3 bar)
Flow Coefficient (Cv)			3500 psig Inlet: 0.06 (241 bar Inlet: 0.06)
			600, 1000 psig Inlet: 0.15 (41.4, 69.0 bar Inlet: 0.15)
Working Temperature ①			PCTFE：-40 ~ 160 °F (-40 ~ 71 °C)
			Polyimide：-40 ~ 350.6 °F (-40 ~ 177 °C)
SPE (Supply Pressure Effect)			0.6 psig per 100 psig source pressure change
Leak Rate (Helium)	**External**	**Inboard**	$\leqslant 2\times10^{-10}$ std·cm^3/s
		Outboard	$\leqslant 2\times10^{-9}$ std·cm^3/s
	Internal		$\leqslant 2\times10^{-9}$ std·cm^3/s

① For the working temperature of products equipped with a pressure gauge, please refer to the **catalog for Pressure Gauges.**

Flow Data

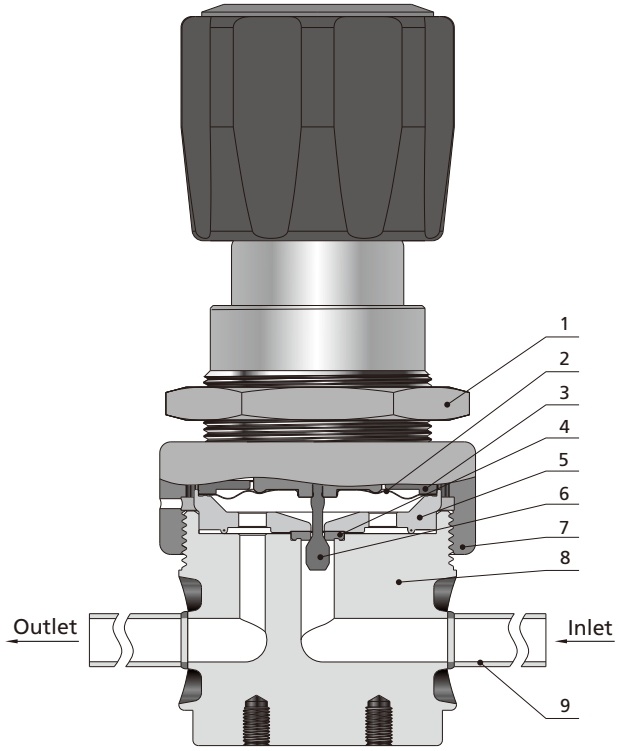




Process Specification

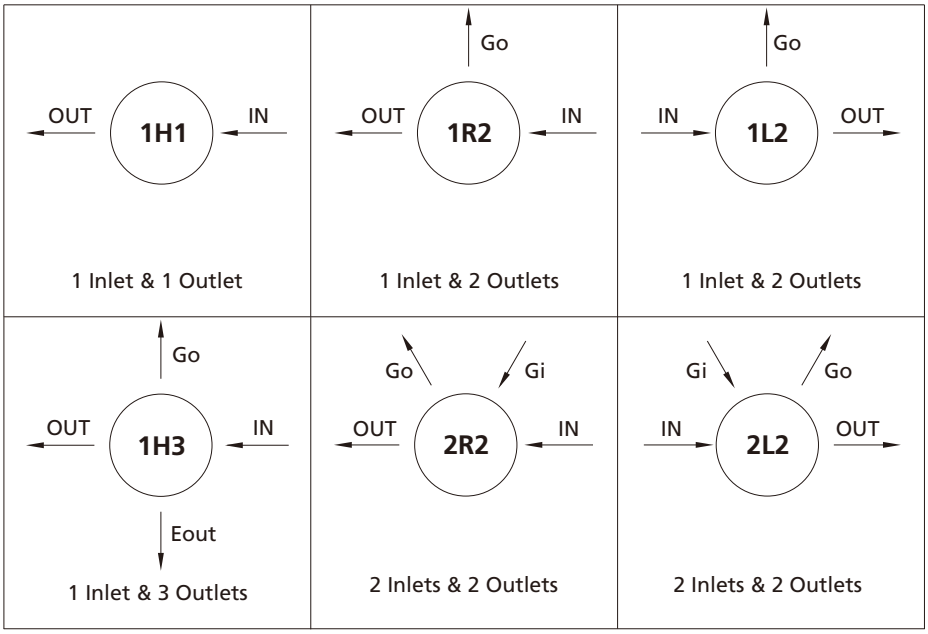
Item \ Process Specification	Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
Material	316L SS	316L SS, 316L SS VAR, 316L SS VIM-VAR
Wetted Surface Roughness	Ra 10 µin. (0.25 µm)	Ra 5 µin. (0.13 µm)
Polishing Process	Machine Finished	Electropolished
Assembly Environment	In specially cleaned areas	ISO Class 4 (FS 209E Class 10 equivalent) cleanroom
Packaging	Double bagged	Double bagged in cleanroom

Major Materials of Construction



Item	Component	Material/Specification		
		6L	6LV	6LW
1	Panel Nut	304 SS		
2	Diaphragm	Alloy 22/ASTM B575		
3	Gland	630/ASTM A564		
4	Seat	PCTFE/ASTM D1430 or Polyimide		
5	Support	316L SS	316L SS VAR	316L SS VIM-VAR
6	Lift Poppet	Alloy 22/ASTM B574		
7	Bonnet Nut	304 SS		
8	Body	316L SS	316L SS VAR	316L SS VIM-VAR
9	Gland	316L SS	316L SS VAR	316L SS VIM-VAR

Porting Configurations



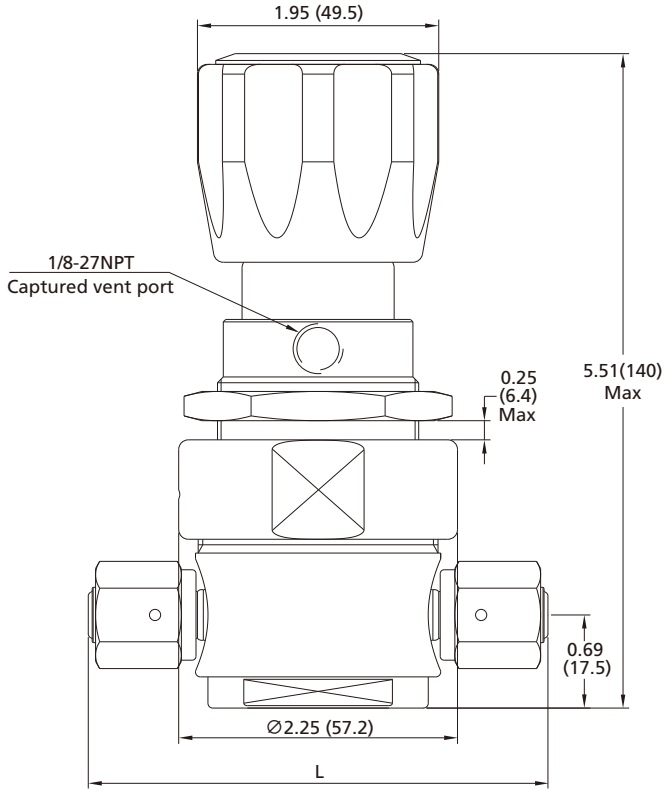
Porting Configuration Symbol

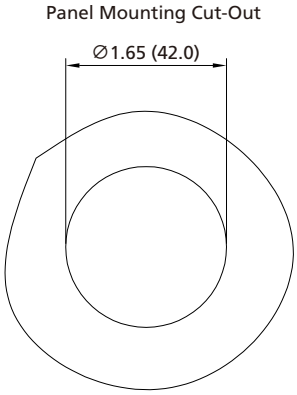
IN	OUT	Gi	Go	Eout
Inlet	Outlet	Inlet Pressure Gauge Port	Outlet Pressure Gauge Port	Auxiliary Outlet

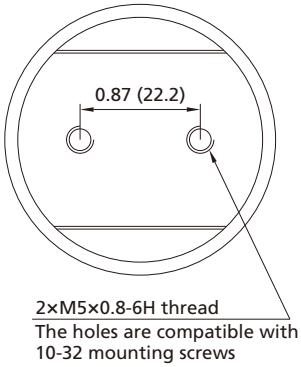
Notes:
1. IN and OUT are the inlet and outlet ports for connecting the valve to the system. Ports other than IN and OUT should not be used for system connections.
2. Porting configuration is viewed from the top.

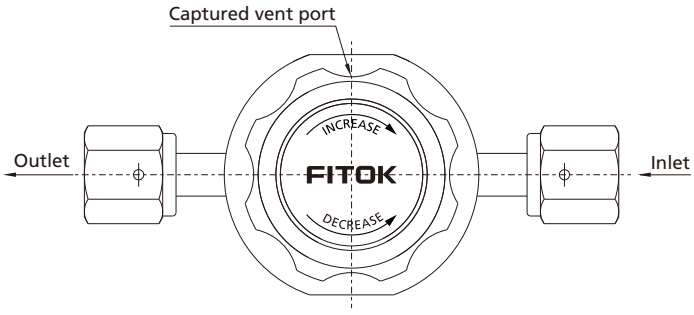
Dimensions

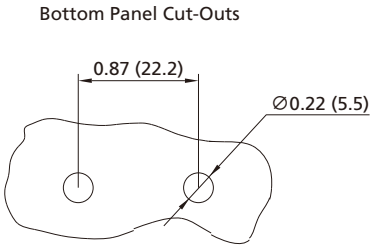
Dimensions, in inches (millimeters), are for reference only.











Note: Standard captured vent hole position is shown as above. For other positions, please contact FITOK or our authorized distributors.

Connection Designator	Connection Type and Size	Dimension, in. (mm)
		L
IFR4	1/4" Integral Female FR Fitting	1.06 (26.8)
FFR4	1/4" Rotatable Female FR Fitting	3.70 (94.0)
RFR4	1/4" Rotatable Male FR Fitting	
TB4	1/4"×0.035" Tube Butt Weld	
TB6	3/8"×0.035" Tube Butt Weld	
FFR8	1/2" Rotatable Female FR Fitting	4.75 (120.6)
RFR8	1/2" Rotatable Male FR Fitting	

Ordering Number Description

RTGC – 6L – 35H – 1H – 2R2 – FFR4 – RFR4 – IB – OBRP– V – PM – F3

Series
RTGC

Max. Inlet Pressure	
6H	600 psig (41.4 bar)
1K	1000 psig (69.0 bar)
35H	3500 psig (241 bar)

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

Outlet Pressure Range	
30	0~30 psig (0~2.1 bar)
60	0~60 psig (0~4.2 bar)
1H	0~100 psig (0~6.9 bar)
150	0~150 psig (0~10.3 bar)

Porting	
1H1	1 Inlet & 1 Outlet
1R2	1 Inlet & 2 Outlets
1L2	1 Inlet & 2 Outlets
1H3	1 Inlet & 3 Outlets
2R2	2 Inlets & 2 Outlets
2L2	2 Inlets & 2 Outlets

Inlet (IN)	
IFR4	1/4" Integral Female FR Fitting
TB4	1/4"×0.035" Tube Butt Weld
FFR4	1/4" Rotatable Female FR Fitting
RFR4	1/4" Rotatable Male FR Fitting
TB6	3/8"×0.035" Tube Butt Weld
FFR8	1/2" Rotatable Female FR Fitting
RFR8	1/2" Rotatable Male FR Fitting

Outlet (OUT)	
	Same as Inlet
Specified in the same way as Inlet	

Inlet Pressure Gauge Port (Gi)	
	Without pressure gauge, refer to Note 2
IB	Gauge (psi/bar)
IM	Gauge (psi/MPa)
IP	Plug

Outlet Pressure Gauge Port (Go)	
	Without pressure gauge, refer to Note 2
OB	Gauge (psi/bar)
OM	Gauge (psi/MPa)
OP	Plug

Auxiliary Outlet (Eout)	
	Without pressure gauge, refer to Note 2
RB	Gauge (psi/bar)
RM	Gauge (psi/MPa)
RP	Plug

Valve Seat	
	PCTFE
V	Polyimide

Installation Type	
	Threaded Hole at the Bottom
PM	Installed with Panel Nut
BS	Installed with Screws at the Bottom

Process Specification	
F2	FC-02
F3	FC-03

Notes:

1. "Ordering Number Description" is a reference to understanding the combination rules of FITOK product part numbers. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.
2. Without Gauge. Gauge Connection is 1/4" Rotatable Male FR Fitting.