

Integrated Gas Systems



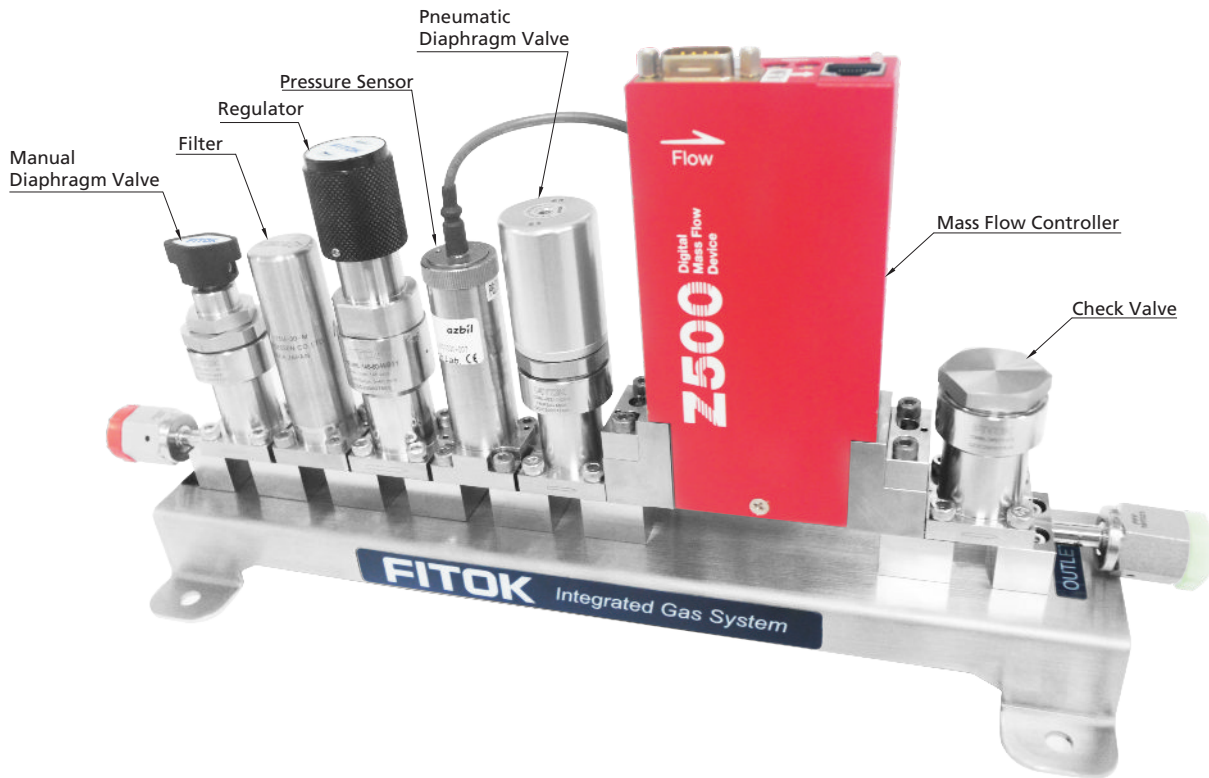
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Integrated Gas Systems

Features

FITOK Integrated Gas System is a device used for gas control in the semiconductor industry. As semiconductor manufacturing processes become more advanced, the requirements for gas control device are also increasing. FITOK Integrated Gas System uses SEMI compliant surface-mounted components and is modularly designed. While reducing the size of the device, installation and maintenance become easier.



Modular design

According to the customer's Piping & Instrumentation Diagram, the design can be completed by installing standard substrate, valves (diaphragm valves, check valves, regulators), flowmeters, filters, pressure sensors and other components on the panel.

Surface mounting

All components are surface mounted in accordance with SEMI standard, and installation with silver-plated screws and later maintenance can be completed with simple tools.

Miniaturization

The size is about 1/3 the traditional panel, and the corresponding flow path size is also reduced for better contamination control.

SEMI standard material, electropolishing process and orbital welding

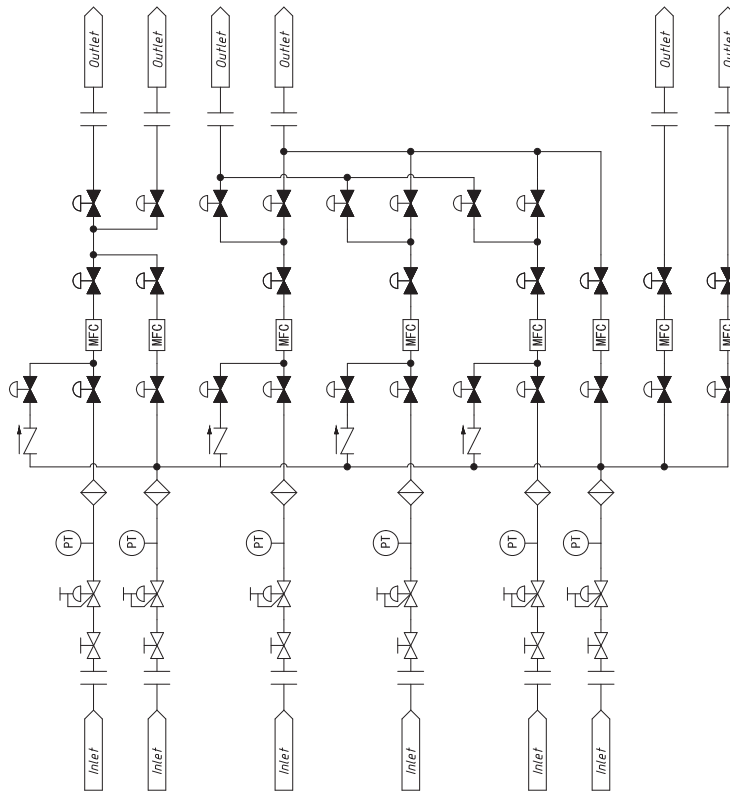
The wetted components are all SEMI standard stainless steel, the flow paths are all electropolished (Ra 5 µm. / Ra 0.13 µm) and the fittings are all orbital welded.

W-seal / C-seal

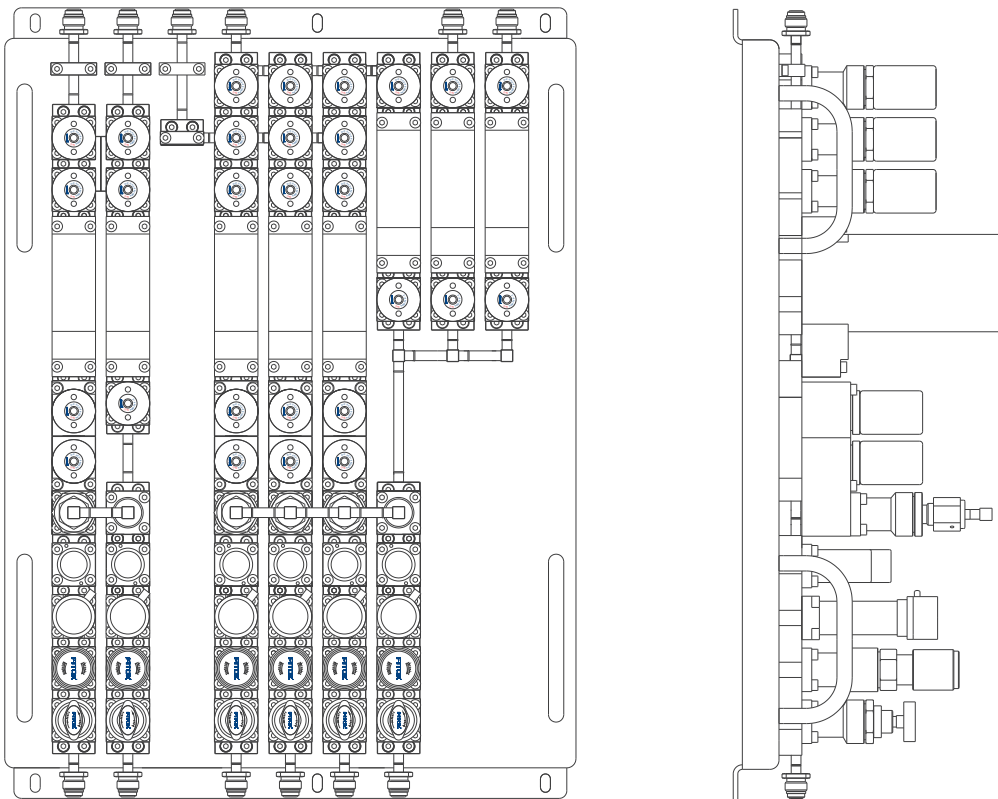
W-seal / C-seal between the components and the substrate, the sealing faces are independent of components receiving external forces, thus achieving the optimal sealing effect.

Configuration

P & ID



GA



Product Technology Grade

Technology	Process Specification
	Ultra High Purity (F3)
Material / Specification	316L SS/SEMI F20 316L VAR/SEMI F20 316L VIM-VAR/SEMI F20
Wetted Surface Roughness	Ra 5 µin. (0.13 µm)
Polishing Process	Electropolished
Process Specification	FC-03 Ultra High Purity Process Specification
Cleaning	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	In ISO Class 4/Federal Class 10 cleanroom
Packaging	Double bagged in cleanroom

Diaphragm Valves

DI Series

Features

- ⦿ Cobalt alloy diaphragm improves strength and corrosion resistance
- ⦿ W-seal and C-seal optional
- ⦿ No packing diaphragm seal ensures high purity
- ⦿ No dead zone for easy purging
- ⦿ Pneumatic actuator optional
- ⦿ Wetted components electropolished to a surface finish of 5 µin. (0.13 µm) Ra max.

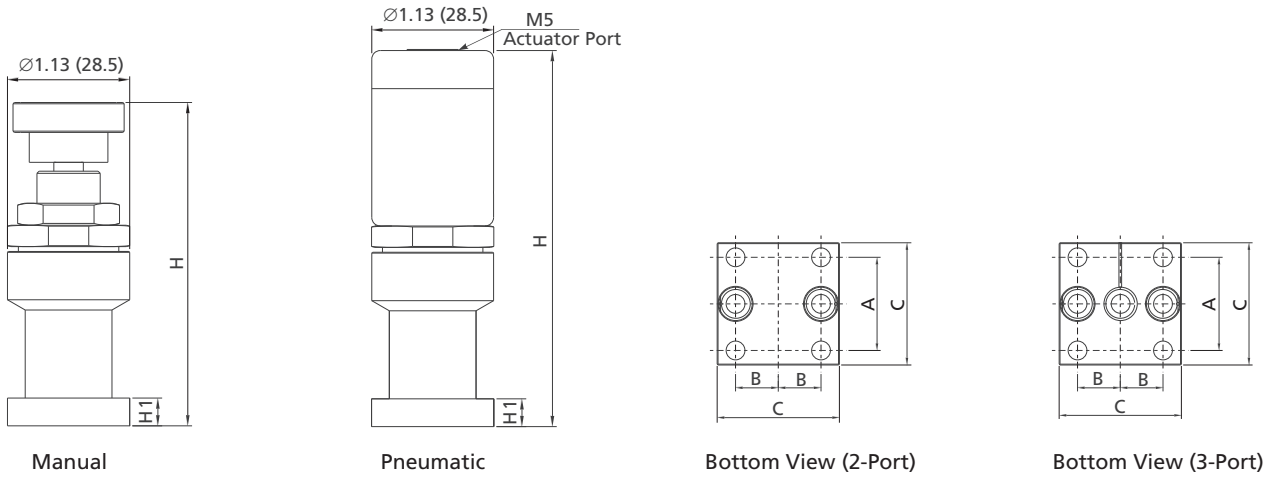


Technical Data

Max. Working Pressure	Manual	145 psig (10 bar)
	Pneumatic	
Working Temperature	PCTFE: 14~176°F (-10~80°C) PFA: 14~302°F (-10~150°C)	
Flow Coefficient (Cv)	0.2	
Pneumatic Actuator Working Pressure	60~90 psig (4.2~6.2 bar)	
Leakage Rate (Helium)	Internal	≤1x10 ⁻⁹ mbar-l/s (1x10 ⁻¹⁰ Pa·m ³ /s)
	External	≤1x10 ⁻⁹ mbar-l/s (1x10 ⁻¹⁰ Pa·m ³ /s)
Wetted Surface Roughness	Ra 5 µin. (0.13 µm)	

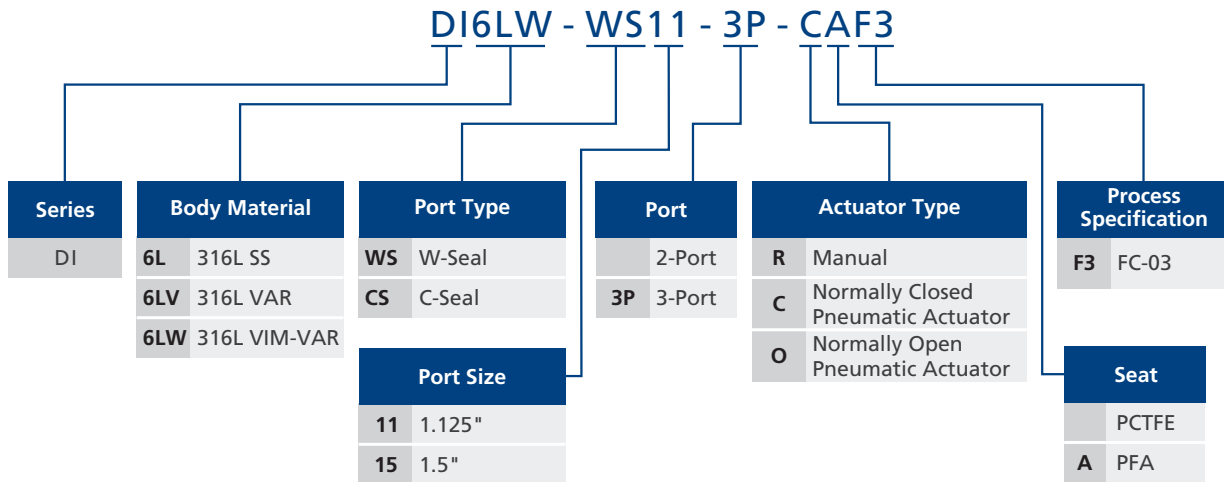
Dimensions and Ordering Information

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



Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)				
		A	B	C	H	H1
DI□□-WS11-RF3	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	2.99 (76.0)	0.26 (6.5)
DI□□-WS11-CF3	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	3.46 (88.0)	0.26 (6.5)
DI□□-WS11-OF3						
DI□□-WS11-3P-CF3						
DI□□-WS11-3P-OF3						

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.
- Mounting screws and gasket are not included, please contact FITOK Group or our authorized distributors if you have any requests.

Check Valves

CI Series

Features

- ⦿ W-seal and C-seal optional
- ⦿ Wetted components electropolished to a surface finish of 5 µin. (0.13 µm) Ra max.



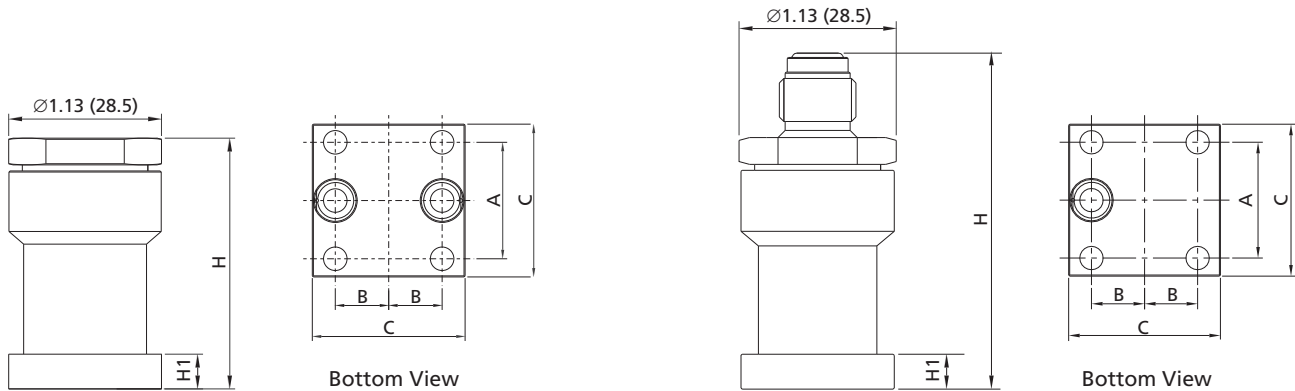
Technical Data

Max. Working Pressure	145 psig (10 bar)	
Working Temperature	14~176°F (-10~80°C)	
Flow Coefficient (Cv)	0.2	
Nominal Cracking Pressure ①	0.33 psig (2.26 kPa)	
Leakage Rate (Helium)	Internal	≤1x10 ⁻⁹ mbar·l/s (1x10 ⁻¹⁰ Pa·m ³ /s)
	External	≤1x10 ⁻⁹ mbar·l/s (1x10 ⁻¹⁰ Pa·m ³ /s)
Wetted Surface Roughness	Ra 5 µin. (0.13 µm)	

① If the check valve is not actuated for a period of time, its initial cracking pressure may be higher than set cracking pressure.

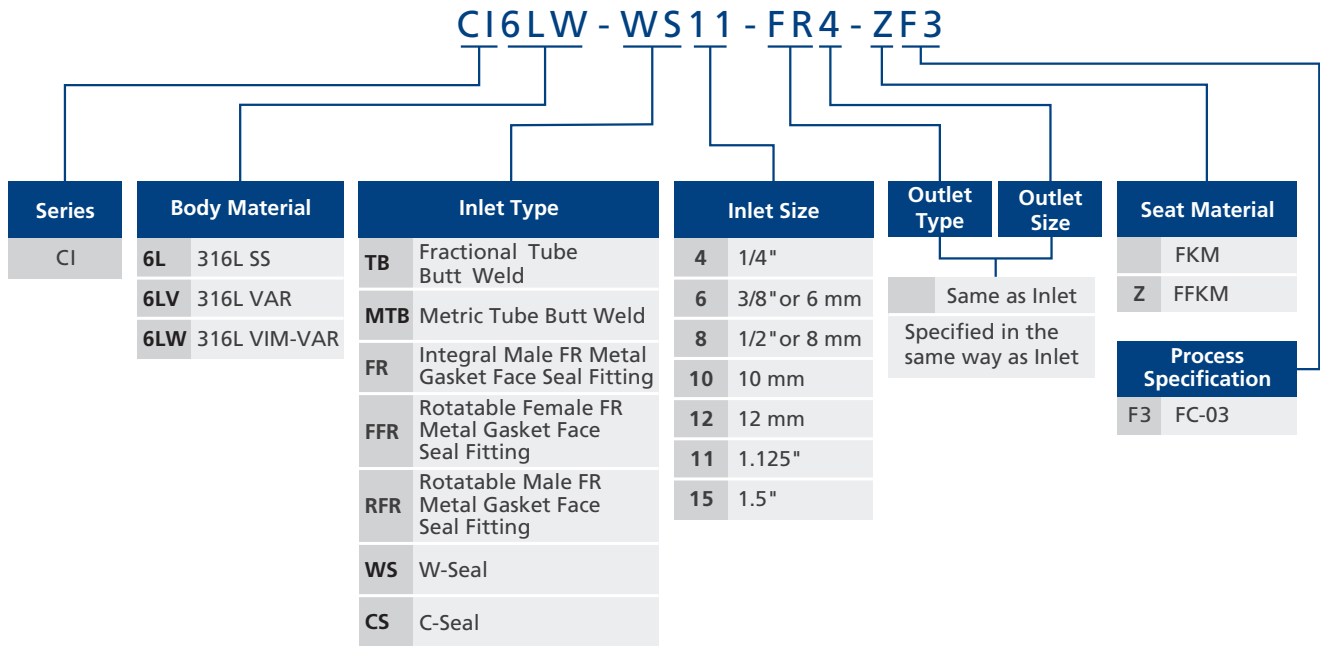
Dimensions and Ordering Information

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



Basic Ordering Number	Inlet Type and Size	Outlet Type and Size	Dimension, in. (mm)				
			A	B	C	H	H1
CI□□-WS11-F3	1.125" W-Seal	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	1.85 (47.0)	0.26 (6.5)
CI□□-FR4-WS11-F3	1/4" Integral Male FR	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	2.47 (62.7)	0.26 (6.5)
CI□□-WS11-FR4-F3	1.125" W-Seal	1/4" Integral Male FR				3.28 (83.4)	
CI□□-FFR4-WS11-F3	1/4" Female FR	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	3.28 (83.4)	0.26 (6.5)
CI□□-WS11-FFR4-F3	1.125" W-Seal	1/4" Female FR					
CI□□-RFR4-WS11-F3	1/4" Rotatable Male FR	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	3.31 (84.2)	0.26 (6.5)
CI□□-WS11-RFR4-F3	1.125" W-Seal	1/4" Rotatable Male FR					

Ordering Number Description



Note:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Mounting screws and gasket are not included, please contact FITOK Group or our authorized distributors if you have any requests.

Regulators

RTC Series

Features

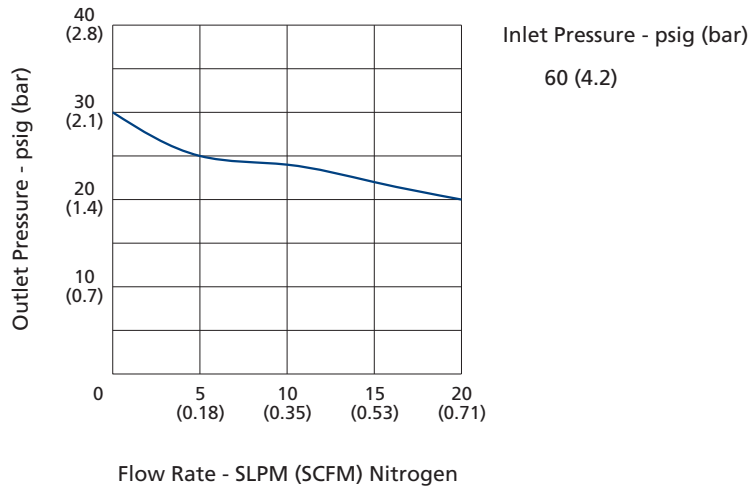
- ⦿ Hastelloy poppet and diaphragm
- ⦿ Metal-to-metal diaphragm seal design
- ⦿ FR metal gasket face seal, W-seal and C-seal optional
- ⦿ Reinforced diaphragm design improves sealing performance and service life
- ⦿ Internally springless for easy purging
- ⦿ Wetted components electropolished to a surface finish of 5 µin. (0.13 µm) Ra max.



Technical Data

Max. Working Pressure		145 psig (10 bar)
Working Temperature		PCTFE: -40~160 °F (-40~71 °C)
Outlet Pressure Range		0~100 psig (0~6.9 bar)
Flow Coefficient (Cv)		0.08
Leak Rate (Helium)	Internal	≤2x10 ⁻⁹ std cm ³ /s
	External	≤1x10 ⁻⁹ std cm ³ /s
Wetted Surface Roughness		Ra 5 µin (0.13 µm)

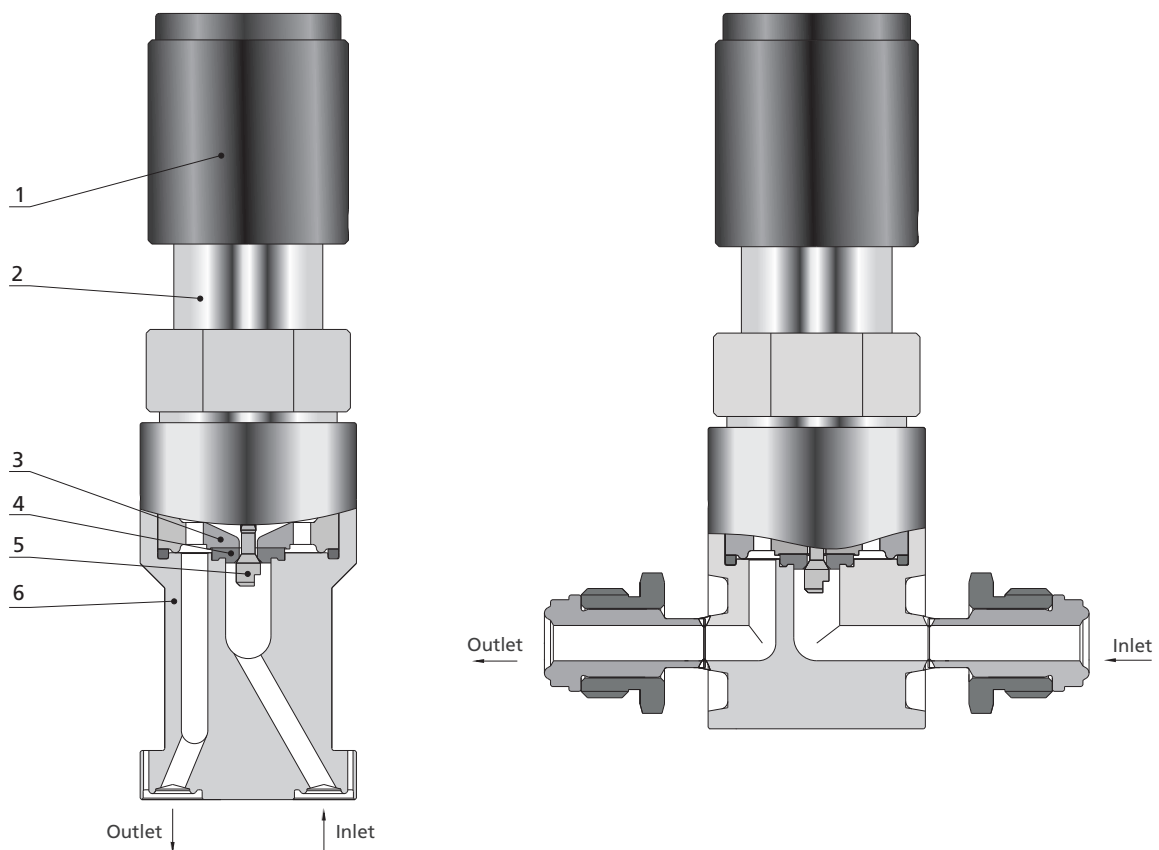
Flow Data



Process Specification

Technology	Ultra High Purity (F3)
Material/Specification	316L SS/SEMI F20 316L VAR/SEMI F20 316L VIM-VAR/SEMI F20
Wetted Surface Roughness	Ra 5 µin. (0.13 µm)
Polishing Process	Electropolished
Assembly Environment	ISO Class 4 / Federal Class 10 Clean Room
Packaging	Double bagged, inner bag packing in the cleanroom

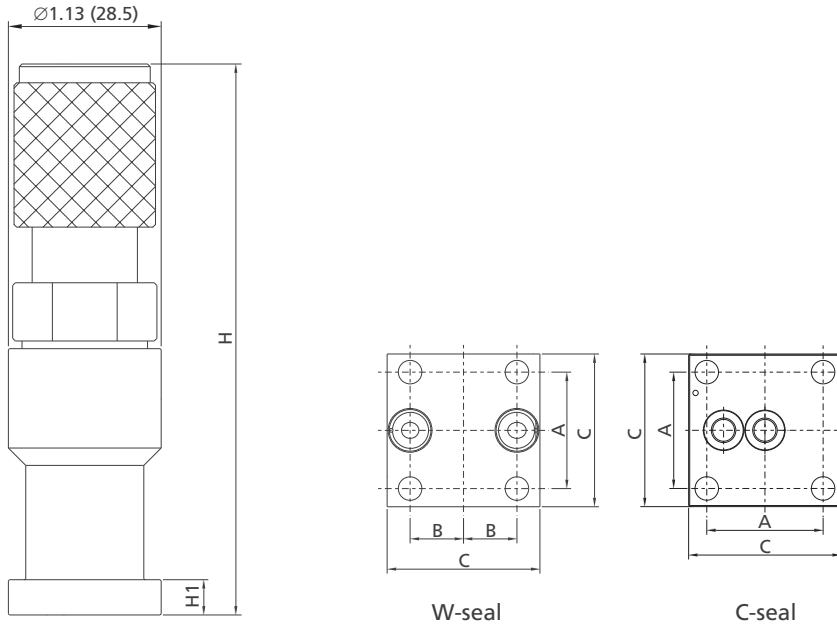
Major Materials of Construction



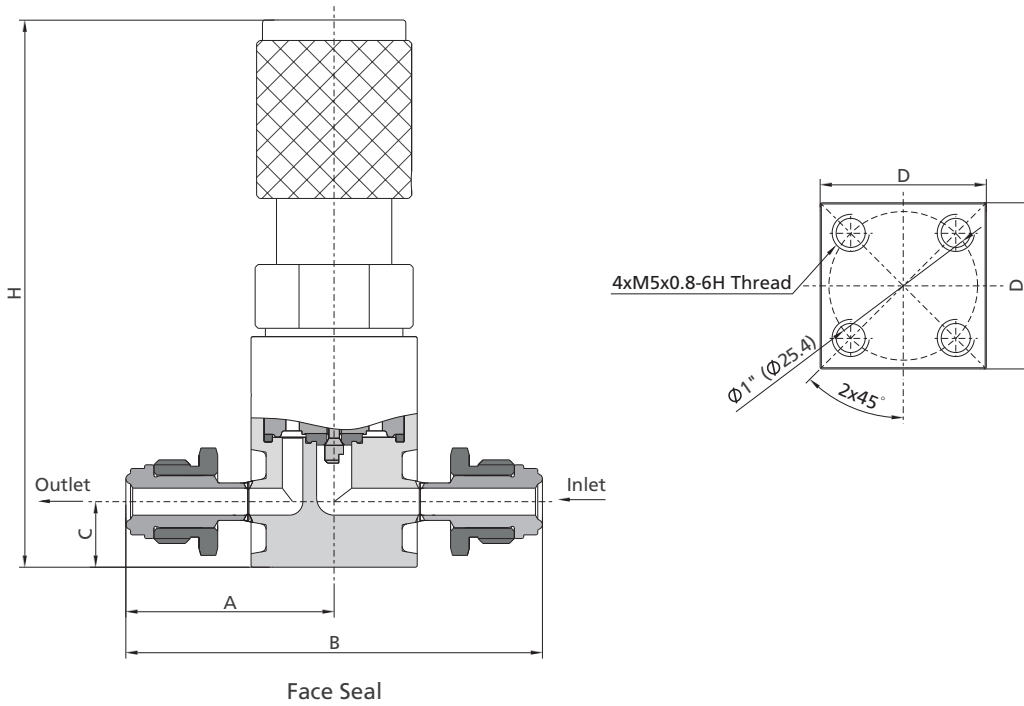
Item	Component	Material / Specification
1	Handle	Aluminum
2	Bonnet	316 SS/ASTM A479
3	Support	316L SS/SEMI F20 or 316L VAR/SEMI F20 or 316L VIM-VAR/SEMI F20
4	Seat	PCTFE/ASTM D1430
5	Lift Poppet	Alloy C-22/ASTM B574
6	Body	316L SS/SEMI F20 or 316L VAR/SEMI F20 or 316L VIM-VAR/SEMI F20

Dimensions and Ordering Information

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

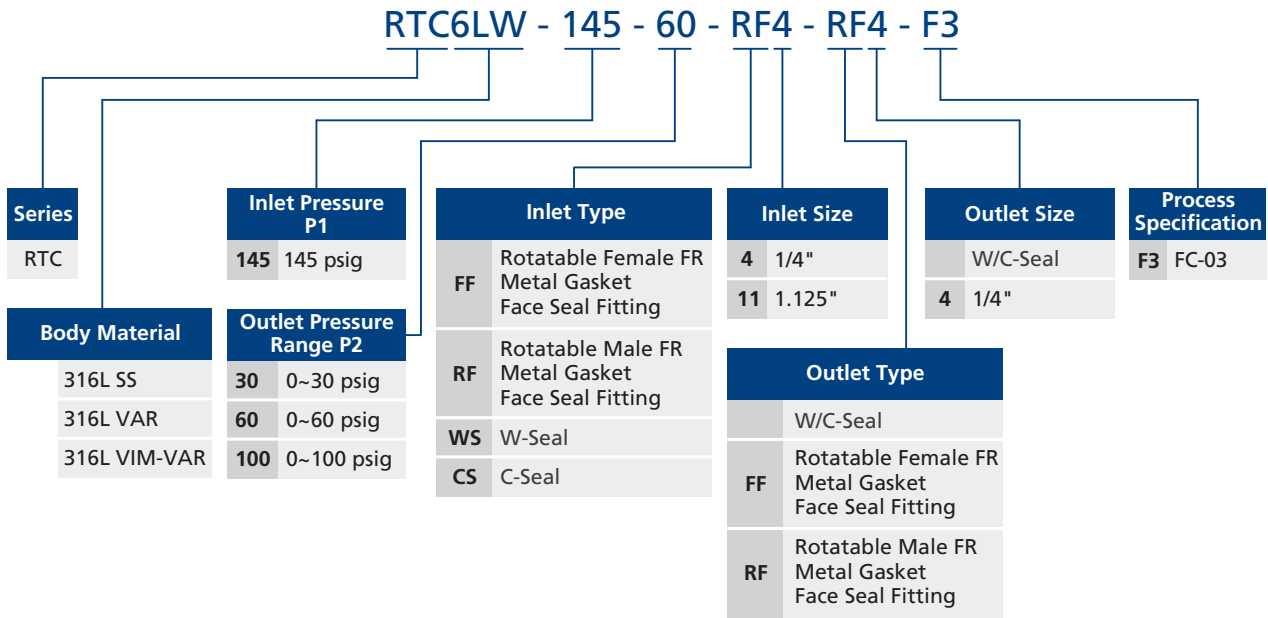


Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)				
		A	B	C	H	H1
RTC□□-145-60-WS11-F3	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	4.10 (104.0)	0.26 (6.5)



Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)				
		A	B	C	D	H
RTC□□-145-60-RF4-RF4-F3	1/4" FR Metal Gasket Face Seal	1.39 (35.3)	2.78 (70.6)	0.44 (11.2)	1.12 (28.4)	3.68 (93.5)

Ordering Number Description



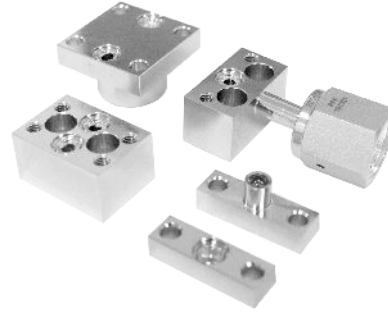
Note:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Mounting screws and gasket are not included, please contact FITOK Group or our authorized distributors if you have any requests.

Substrates

Features

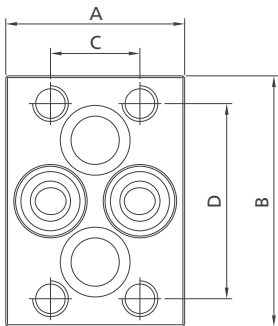
- ⊙ W-seal and C-seal optional
- ⊙ Non-fixed installation to ensure the sealing effect
- ⊙ Wetted components electropolished to a surface finish of 5 μin. (0.13 μm) Ra max.



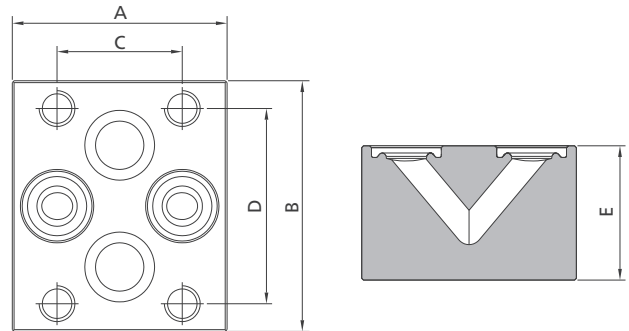
Dimensions and Ordering Information

Substrates

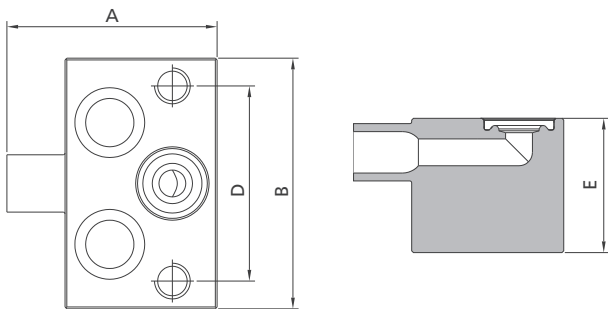
Basic Ordering Number	Substrate Type	Port Type and Size	Dimensions, in. (mm)				
			A	B	C	D	E
-IVB-WS11-10-F3	Standard Substrate	1.125"W-Seal	0.79 (20.0)	1.10 (28.0)	0.39 (10.0)	0.86 (21.8)	0.59 (15.0)
-IVB-WS11-14-F3	Standard Substrate		0.94 (24.0)	1.10 (28.0)	0.55 (14.0)	0.86 (21.8)	0.59 (15.0)
-IEB-WS11-F3	End Substrate		0.93 (23.5)	1.10 (28.0)	/	0.86 (21.8)	0.59 (15.0)
-ISB-LR-WS11-F3	1-Path Bypass Substrate		0.67 (17.0)	1.40 (35.6)	/	0.86 (21.8)	0.59 (15.0)
-IDB-LR-WS11-14-F3	2-Path Bypass Substrate		0.94 (24.0)	1.40 (35.6)	0.55 (14.0)	0.86 (21.8)	0.59 (15.0)
-ITB-LR-WS11-14-F3	3-Path Bypass Substrate		1.34 (34.0)	1.40 (35.6)	0.55 (14.0)	0.86 (21.8)	0.59 (15.0)
-ITC-WS11-F3	Transition Substrate		1.13 (28.6)	1.13 (28.6)	0.79 (20.0)	0.86 (21.8)	0.71 (18.0)
-IEC-WS11-F3	Plug		0.34 (8.6)	1.13 (28.6)	/	0.86 (21.8)	0.26 (6.5)



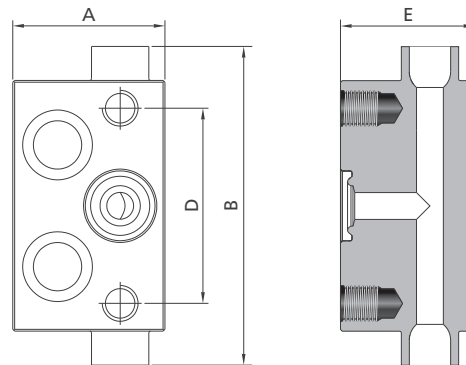
Standard Substrate



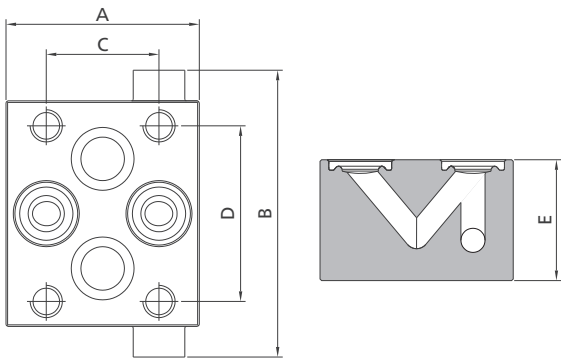
Standard Substrate



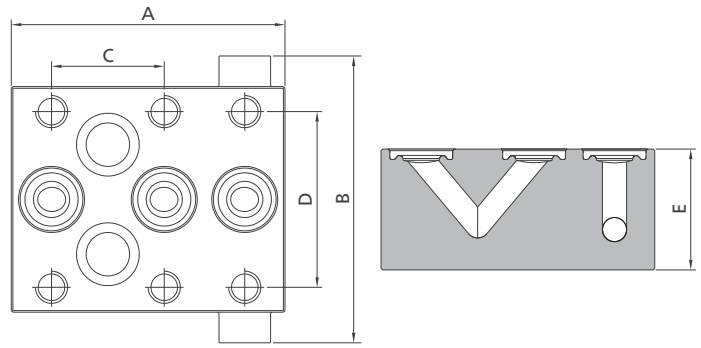
End Substrate



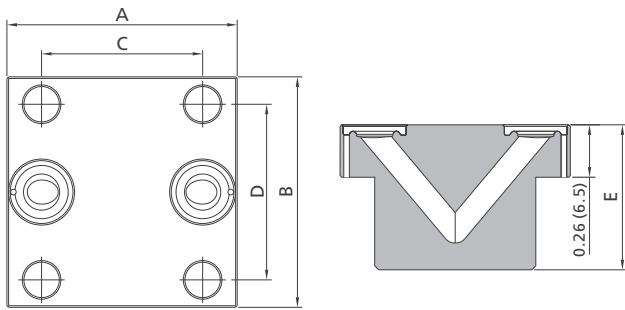
1-Path Bypass Substrate



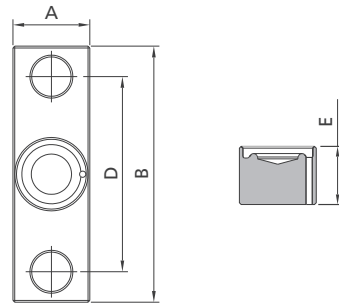
2-Path Bypass Substrate



3-Path Bypass Substrate



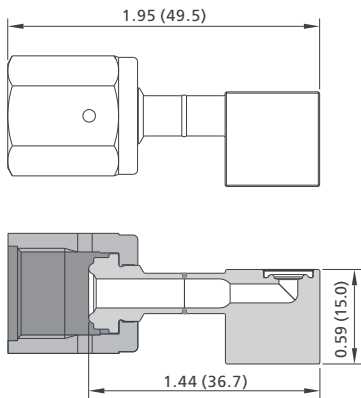
Transition Substrate



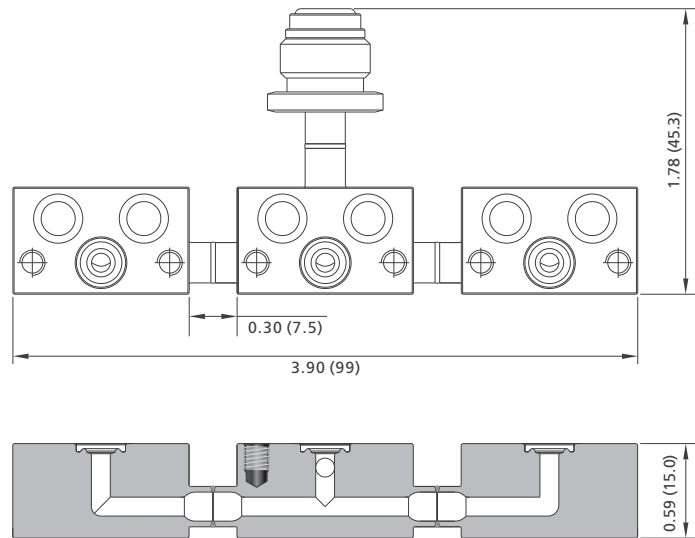
Plug

Substrate Assemblies

1. Views and dimensions are for reference only. Please contact FITOK Group or our authorized distributors for specific part numbers and specifications.
2. Dimensions, in inches (millimeters), are for reference only.

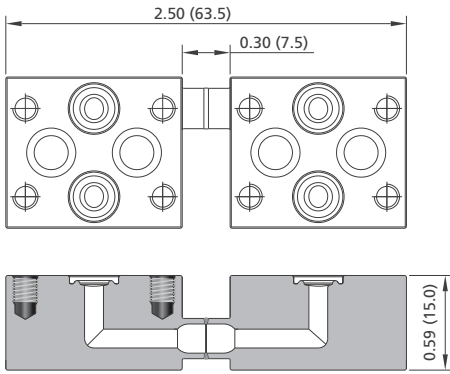


End Substrate Assembly

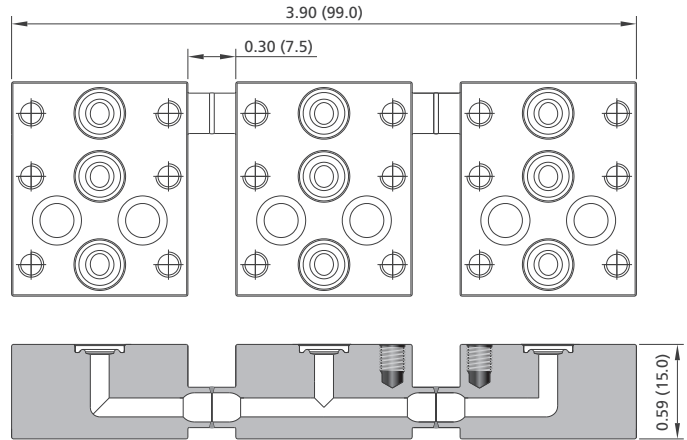


1-Path Bypass Substrate Assembly

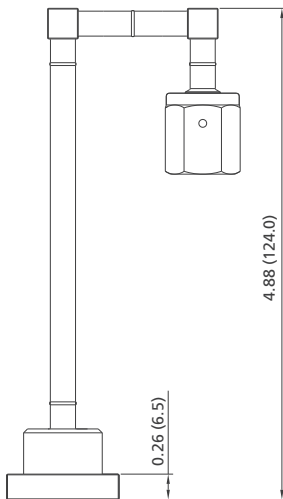
13 Integrated Gas Systems



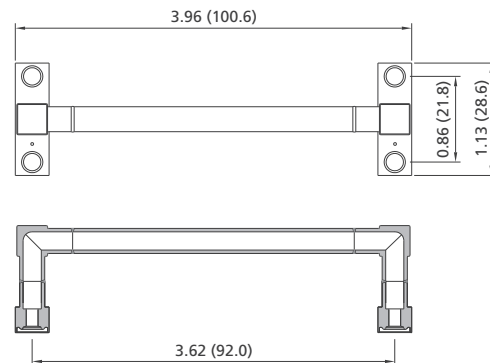
2-Path Bypass Substrate Assembly



3-Path Bypass Substrate Assembly



Transition Substrate Assembly



Plug Substrate Assembly

Ordering Number Description

6LW - IDB - LR - WS11 - 14 - F3

Body Material	Substrate Type	Bypass Type	Port Type	Port Distance
6L 316L SS	IVB Standard Substrate	None	WS W-Seal	None
6LV 316L VAR	IEB End Substrate	L Left Bypass	CS C-Seal	10 10 mm (Only for Standard Substrate)
6LW 316L VIM-VAR	ISB 1-Path Bypass Substrate	R Right Bypass	Port Size 11 1.125" 15 1.5"	14 14 mm
	IDB 2-Path Bypass Substrate	M Middle Bypass		
	ITB 3-Path Bypass Substrate	LR Left-Right Bypass		Process Specification F3 FC-03
	ITC Transition Substrate	LM Left-Middle Bypass		
	IEC Plug	RM Right-Middle Bypass		
		LMR Left-Middle-Right Bypass		

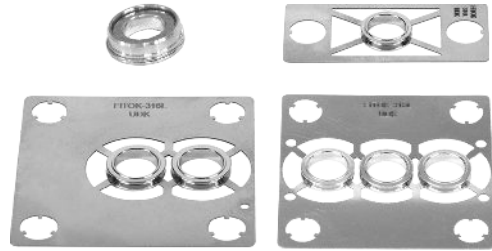
Note:

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- Mounting screws and gasket are not included, please contact FITOK Group or our authorized distributors if you have any requests.

Gasket

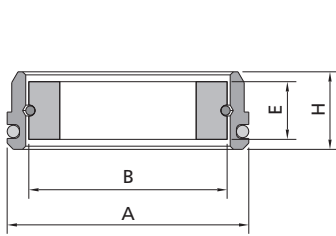
Features

- W-seal and C-seal optional
- Sealing faces independent of components receiving external forces
- Electropolished to a surface finish of Ra 5 µin. (0.13 µm) max

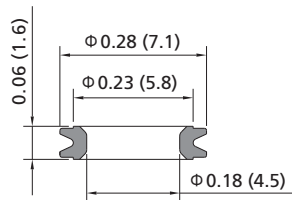


Dimensions and Ordering Information

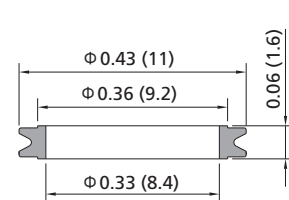
- Views and dimensions are for reference only. Please contact FITOK Group or our authorized distributors for specific part numbers and specifications.
- Dimensions, in inches (millimeters), are for reference only.



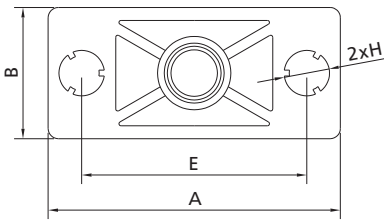
W-Seal Gasket



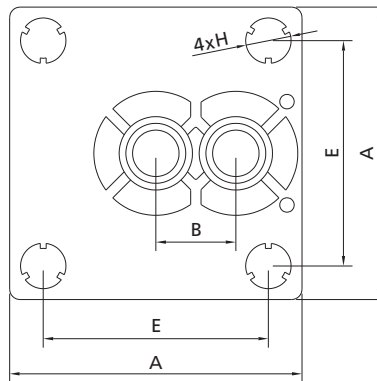
C-Seal Gasket Standard Flow



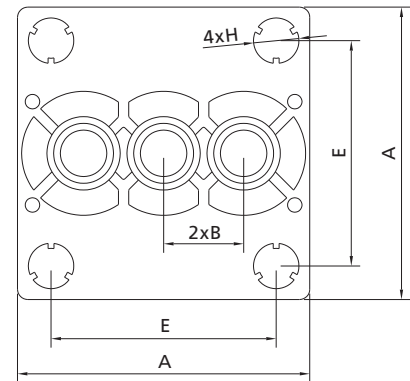
C-Seal Gasket High Flow



C-Seal Gasket Bracket 1P



C-Seal Gasket Bracket 2P

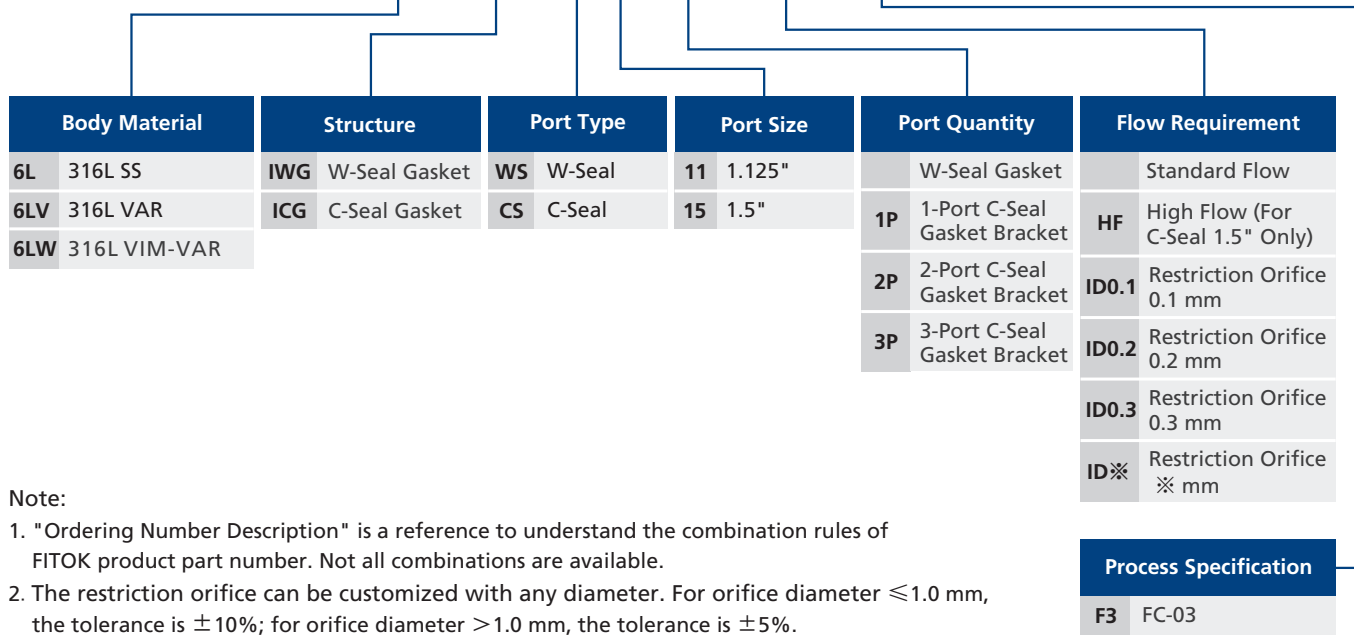


C-Seal Gasket Bracket 3P

Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)			
		A	B	E	H
-IWG-WS11-F3	1.125" W-Seal	0.31 (7.8)	0.25 (6.4)	0.07 (1.86)	0.10 (2.5)
-IWG-WS15-F3	1.5" W-Seal	0.39 (10)	0.29 (7.45)	0.07 (1.9)	0.15 (3.8)
-ICG-CS11-1P-F3	1.125" C-Seal (Standard Flow)	1.11 (28.3)	0.5 (12.7)	0.86 (21.8)	0.17 (4.4)
-ICG-CS11-2P-F3	1.125" C-Seal (Standard Flow)	1.11 (28.3)	0.31 (7.75)	0.86 (21.8)	0.17 (4.4)
-ICG-CS11-3P-F3	1.125" C-Seal (Standard Flow)	1.11 (28.3)	0.31 (7.75)	0.86 (21.8)	0.17 (4.4)
-ICG-CS15-1P-F3	1.5" C-Seal (Standard Flow)	1.48 (37.6)	0.5 (12.7)	1.18 (30.2)	0.2 (5.2)
-ICG-CS15-2P-F3	1.5" C-Seal (Standard Flow)	1.48 (37.6)	0.31 (7.75)	1.18 (30.2)	0.2 (5.2)
-ICG-CS15-3P-F3	1.5" C-Seal (Standard Flow)	1.48 (37.6)	0.31 (7.75)	1.18 (30.2)	0.2 (5.2)
-ICG-CS15-1P-HF-F3	1.5" C-Seal (High Flow)	1.48 (37.6)	0.5 (12.7)	1.18 (30.2)	0.2 (5.2)
-ICG-CS15-2P-HF-F3	1.5" C-Seal (High Flow)	1.48 (37.6)	0.46 (11.6)	1.18 (30.2)	0.2 (5.2)
-ICG-CS15-3P-HF-F3	1.5" C-Seal (High Flow)	1.48 (37.6)	0.46 (11.6)	1.18 (30.2)	0.2 (5.2)

Ordering Number Description

6LW - ICG - CS11 - 2P - ID0.2 - F3



Note:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. The restriction orifice can be customized with any diameter. For orifice diameter ≤1.0 mm, the tolerance is ±10%; for orifice diameter >1.0 mm, the tolerance is ±5%.

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