

# 3/4" Integra® Valves

*Provide reliable service in CMP and UHP chemical applications where space is limited and high flow is required*

## VALVE INNOVATION

Entegris is dedicated to providing reliable, cost-saving solutions that increase the productivity of your fluid handling systems. It is this dedication coupled with over 35 years of material science and high-purity valve design experience that enables us to provide the 3/4" Integra® valve. Leveraging our materials science expertise and semiconductor application knowledge, we have designed this valve to meet the strict processing requirements of today while providing extendability for tomorrow.

## INCREASE FLOW

The 3/4" Integra valve incorporates the ability to support CMP slurry and high-purity chemical distribution systems in one cost-effective and reliable package. We accomplished this through extensive engineering research, incorporating polymer science, Failure Mode and Effect Analysis (FMEA), numerical software analysis and rigorous product qualification testing. The end result is an Entegris valve innovation that provides reliable service and high flow in a small package.

## EXCELLENT RESISTANCE TO BASE PH CHEMISTRIES

Entegris offers the option for Integra valve external, non-wetted components to be made from Halar® ECTFE, ethylene-chlorotrifluoroethylene. ECTFE is a partially fluorinated polymer and considered one of the most chemically resistant. It is a high crystalline polymer with small spherulites, which make it work well in caustic environments such as TMAH, NH<sub>4</sub>OH, KOH, and NaOH.



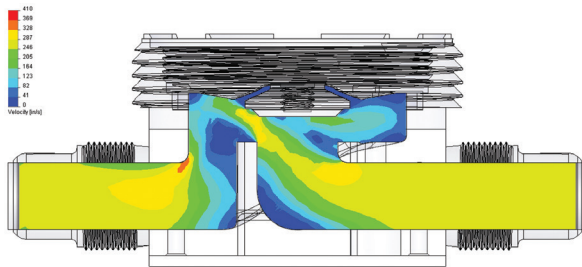
*Leveraging over 35 years of valve development and innovation, Entegris designed the 3/4" Integra valve to protect and transport valuable slurries, high-purity chemicals and ultrapure water. Customers can trust Entegris to supply reliable, high-performance valves for all their fluid control needs.*

Integra valves with ECTFE components are ideal for use in chemical distribution units, valve box manifolds, and wet processing equipment where there is external exposure to extreme base fumes and/or where direct external contact with the base solution is inevitable. Under severe base solution applications, using Integra valves with ECTFE components will extend valve life and maintain system uptime while decreasing your cost of ownership.

## IMPROVE FAB EFFICIENCY

Entegris designed the  $\frac{3}{4}$ " Integra valve to reliably control flow. In addition, we developed the valve with the goal of helping fabs improve fluid system efficiencies by:

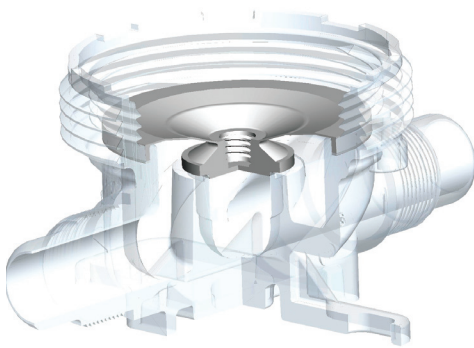
- Increasing flow capacity
- Saving valuable space
- Increasing operator and equipment safety
- Reducing preventive maintenance by providing reliable service



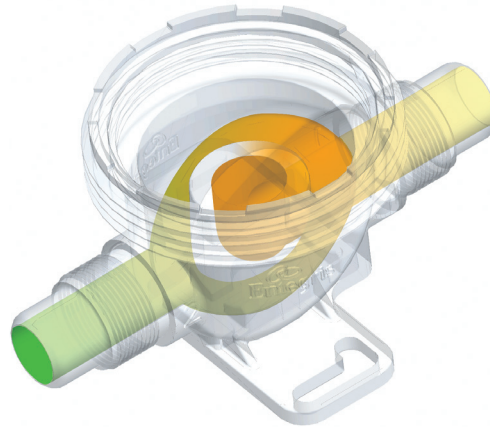
The  $\frac{3}{4}$ " Integra valve's fully swept flow path increases flow capacity, decreases pressure drop and reduces shear, thereby improving overall fab efficiency.

### Improve Flow Dynamics

As the leader in materials science, Entegris continues to lead valve innovations. Use of tools such as Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD) and Moldflow® analysis enable us to remove sharp inside corners and optimize the outer radius of the new swept flow path, eliminating dead spots and decreasing pressure loss. The net result of these innovations is increased flow, complete drainability, and reduced fluid shear rates that impact slurry health.



The  $\frac{3}{4}$ " Integra valve's diaphragm design minimizes entrapment areas.

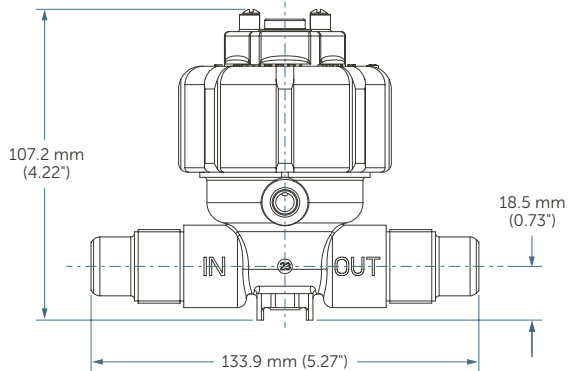


The flow path enables complete drainability, providing both high reliability and high flow in a compact size.

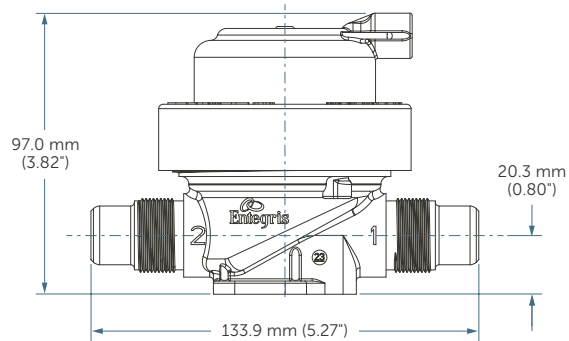
### Save Valuable Equipment Space

By applying years of valve innovation experience, Entegris successfully designed the  $\frac{3}{4}$ " Integra valve with an overall footprint that is smaller than most  $\frac{1}{2}$ " orifice valves on the market, and has two to three times the flow capacity.

Typical  $\frac{1}{2}$ " Valve:  $C_v = 2$  to  $3$



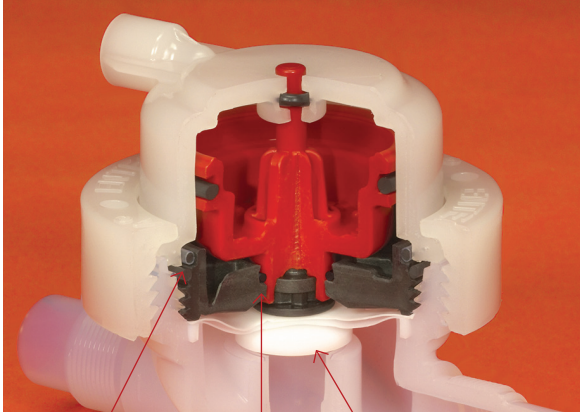
Integra  $\frac{3}{4}$ " Valve:  $C_v = 6.7$  to  $10.9$



The  $\frac{3}{4}$ " Integra valve is smaller than most  $\frac{1}{2}$ " valves with two to three times the flow capacity.

## Increase Operator and Equipment Safety

Entegris is dedicated to protecting the integrity of your valuable critical materials and process equipment, while ensuring your personal safety. The 3/4" Integra valve is designed with secondary fluid containment and an integrated safety lock-out feature to safeguard against accidental altering or tampering during shutdown.



Viton® seal    Viton® O-ring seal    PTFE poppet/diaphragm

*Secondary fluid containment protects valuable equipment and assures chemical integrity.*



*A safety lock-out feature increases equipment and operator safety.*

## Reduce Preventive Maintenance by Providing Reliable Service

Entegris' Technology Characterization Laboratory is committed to characterizing material handling products and technologies to assure product performance, reliability and safety. This focus and a streamlined product design, enables our customers to reduce preventive maintenance – lowering their cost of ownership. As with all new product innovations, the 3/4" Integra valve was subjected to the following stringent reliability testing protocol.

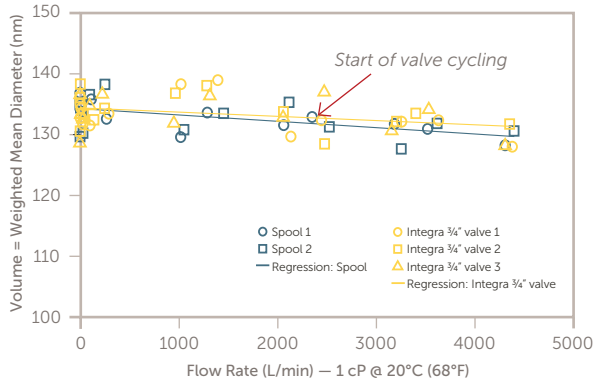


*Minimal component design using state-of-the-art materials increases product reliability, decreasing cost of ownership.*

## RELIABILITY TESTING

Test type		Test conditions	Test criteria	Test results
Pressure envelope cyclic		827 kPa (120 psig) proof pressure @ 21°C (70°F) for PVDF, and @ 24°C (75°F) for ECTFE	1 million cycles	PASS = PVDF PASS = ECTFE
		414 kPa (60 psig) proof pressure @ 100°C (212°F) for PVDF		PASS = PVDF N/A = ECTFE
		310 kPa (45 psig) proof pressure @ 165°C (329°F) for PVDF		PASS = PVDF N/A = ECTFE
Actuation cyclic		552 kPa (80 psig) media pressure @ 21°C (70°F) for PVDF, and 379 kPa (55 psig) media pressure @ 38°C (100°F) for ECTFE	2.1 million cycles, 95% confidence and reliability, for PVDF normally open and normally closed  .5 million cycles, 25% TMAH, for ECTFE normally open  1.0 million cycles, 25% TMAH, for ECTFE normally closed	PASS = PVDF PASS = ECTFE
		276 kPa (40 psig) media pressure @ 100°C (212°F) for PVDF	2.1 million cycles, 95% confidence and reliability	PASS = PVDF N/A = ECTFE
		207 kPa (30 psig) media pressure @ 165°C (329°F) for PVDF	1 million cycles, zero failures	PASS = PVDF N/A = ECTFE
Secondary containment		Expose secondary containment to concentrated sulfuric, hydrochloric and ammonium hydroxide	Actuate after 7 days	
Burst testing	21°C (70°F)	Pressurize valve until burst	4137 kPa (600 psig)	
	65°C (150°F)	Pressurize valve until burst	3827 kPa (555 psig)	
Particle testing	Flush testing	DI water flush to 1000 liters	Contact Entegris for results	
	Cyclic testing	Cyclic valve testing in DI water to 10,000 cycles		
Slurry testing	Working particle size distribution	Steady flow and cyclic testing	No significant impact (see graph on page 5)	
	Large particle tail	Steady flow and cyclic testing	Average of 1.3 particles added to slurry	

### Slurry Working Particle Size Distribution



Note: Test results show no statistical difference between a spool baseline and the 3/4" Integra valve on slurry working particle size. Over time, slurry health or working particle size distribution is not significantly impacted by the 3/4" Integra valve. Using the 3/4" Integra valve in distribution or process systems will maintain the planarization rate of your slurry.

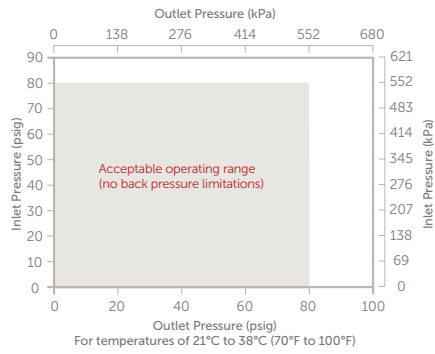
### SPECIFICATIONS

<b>Materials</b>	Wetted parts	PFA or PTFE
	Exterior parts	PVDF or ECTFE
<b>Pressure range</b>	980 mbar (29" Hg vacuum) to 551.6 kPa (80 psig) rating at inlet or outlet port*	
<b>Temperature range</b>	Ambient (PVDF actuator): 21° to 38°C (70° to 100°F)	
	Ambient (ECTFE actuator): 21° to 38°C (70° to 100°F)	
	Fluid (PVDF actuator): 21° to 165°C (70° to 330°F)	
	Fluid (ECTFE actuator): 21° to 38°C (70° to 100°F)	
<b>Pneumatic supply pressure</b>	Normally closed (PVDF and ECTFE actuators)	448.2 kPa (65 psig) minimum to 551.6 kPa (80 psig) maximum
	Normally open (PVDF actuator)	482.6 kPa (70 psig) minimum to 551.6 kPa (80 psig) maximum 482.6 kPa (70 psig) maximum at maximum media temperature
	Normally Open (ECTFE actuator)	482.6 kPa (70 psig) minimum
<b>Pneumatic supply port</b>	1/8" FNPT (normally closed valves)	

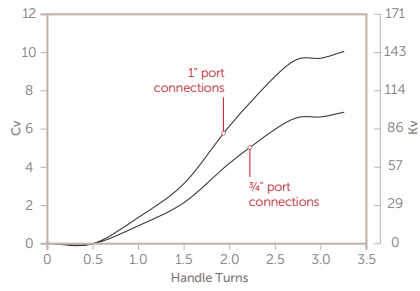
\*Actual valve performance varies with pressure and temperature. Refer to actual ratings in performance data.

## PERFORMANCE DATA

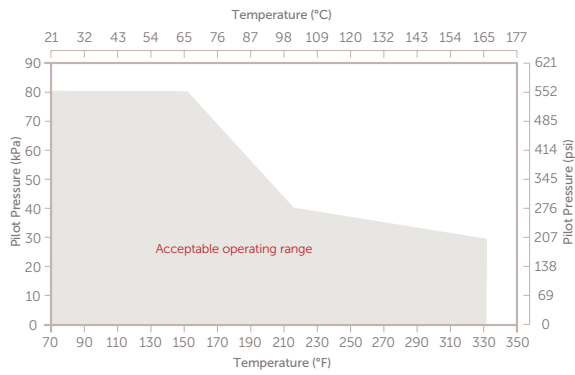
**Inlet vs. Outlet Pressure for Port-to-port Seal, Manual 2-way Valves**



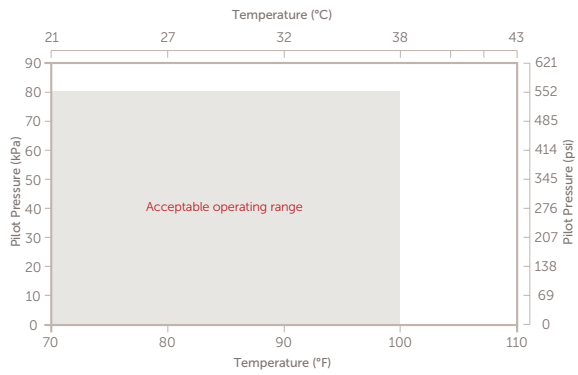
**C<sub>v</sub>/K<sub>v</sub> vs. Number of Handle Turns, Manual 2-way Valves**



**Temperature vs. Media Pressure (PVDF Actuator)**



**Temperature vs. Media Pressure (ECTFE Actuator)**

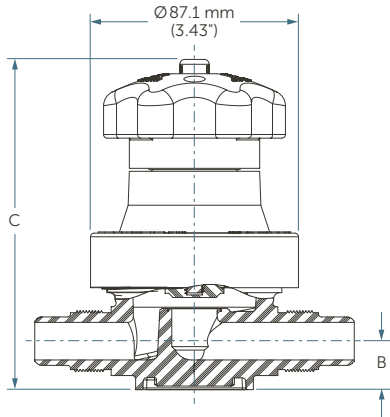


Note: Normally open valves have been tested to 100°C (212°F).

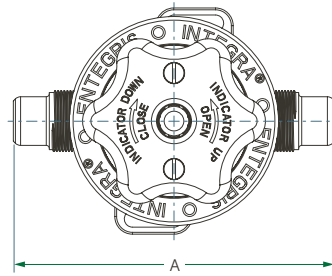
## DIMENSIONS

### Manual Valve

Front View



Top View



### DIMENSIONS

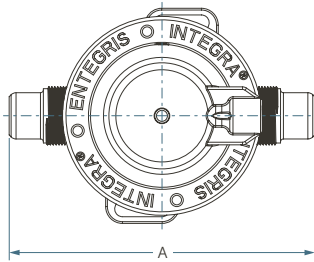
Port Connection	Flow Factor $C_v$	Flow Factor $K_v$	DIMENSIONS		
			A	B	C
3/4" Flaretek	6.7	95.7	133.9 mm (5.27")	20.3 mm (0.80")	138.9 mm (5.47")
3/4" Super 300 Type Pillar*	6.7	95.7	133.4 mm (5.25")	20.3 mm (0.80")	138.9 mm (5.47")
3/4" PrimeLock	6.7	95.7	150.4 mm (5.92")	24.4 mm (0.96")	148.1 mm (5.83")
3/4" PureBond pipe	8.2	117.1	167.4 mm (6.59")	20.3 mm (0.80")	138.9 mm (5.47")
1" Flaretek	9.8	140.0	145.8 mm (5.74")	24.4 mm (0.96")	148.1 mm (5.83")
1" Super 300 Type Pillar*	9.8	140.0	146.1 mm (5.75")	26.4 mm (1.04")	150.1 mm (5.91")
1" PrimeLock	9.8	140.0	159.0 mm (6.26")	28.4 mm (1.12")	152.1 mm (5.99")
1" PureBond pipe	10.9	155.7	167.4 mm (6.59")	24.4 mm (0.96")	148.1 mm (5.83")

\*Pillar nuts, inserts and gauge rings are supplied separately

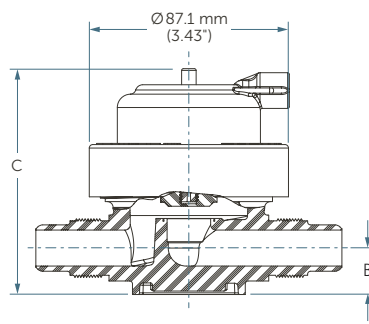
## DIMENSIONS (CONTINUED)

### Pneumatic Valve

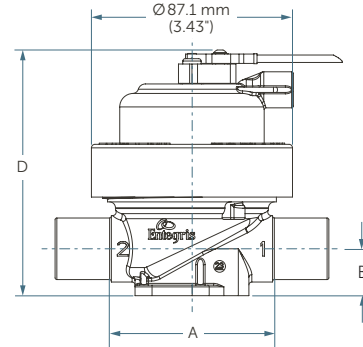
#### Top View



#### Front View



#### Front View with Position Sensor



Port Connection	Flow Factor $C_v$	Flow Factor $K_v$	DIMENSIONS			
			A	B	C	D
3/4" Flaretek	6.7	95.7	133.9 mm (5.27")	20.3 mm (0.80")	98.3 mm (3.87")	105.9 mm (4.17")
3/4" Super 300 Type Pillar*	6.7	95.7	133.4 mm (5.25")	20.3 mm (0.80")	98.3 mm (3.87")	105.9 mm (4.17")
3/4" PrimeLock	6.7	95.7	150.4 mm (5.92")	24.4 mm (0.96")	107.4 mm (4.23")	115.1 mm (4.53")
3/4" PureBond pipe	8.2	117.1	118.6 mm (4.67")	20.3 mm (0.80")	98.3 mm (3.87")	105.9 mm (4.17")
1" Flaretek	9.8	140.0	145.8 mm (5.74")	24.4 mm (0.96")	107.4 mm (4.23")	115.1 mm (4.53")
1" Super 300 Type Pillar*	9.8	140.0	146.1 mm (5.75")	26.4 mm (1.04")	109.5 mm (4.31")	117.1 mm (4.61")
1" PrimeLock	9.8	140.0	159.0 mm (6.26")	28.4 mm (1.12")	111.5 mm (4.39")	119.2 mm (4.69")
1" PureBond pipe	10.9	155.7	118.6 mm (4.67")	24.4 mm (0.96")	107.4 mm (4.23")	115.1 mm (4.53")

\*Pillar nuts, inserts and gauge rings are supplied separately



## SENSING OPTION DIMENSION INFORMATION

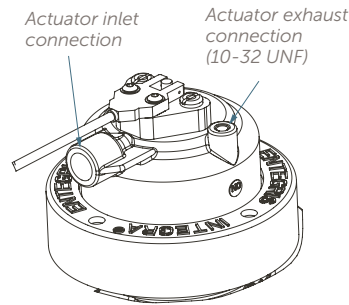
### Remote Position Indication Option

Electronic valve position sensing for monitoring valve open and closed positions.

NOTE: To enable the remote position indication option you must special order the Omron® sensor (-OM) on the valve. In addition, order Omron position sensor indicator (EE-SX77OR or EE-SX77OA), which is sold separately.

### DS12 with Position Sensor

For overall height with position sensor, reference pneumatic valve dimension D on previous page.



## ORDERING INFORMATION

3/4" Integra Valves: part number

DS12

### Length

- 12F = Port 1 (inlet), Port 2 (outlet) 3/4" Flaretek
- 12S2 = Port 1 (inlet) 3/4" Flaretek, Port 2 (outlet) 3/4" Flaretek "SpaceSaver"
- 12F12P = Port 1 (inlet) 3/4" Flaretek, Port 2 (outlet) 3/4" PureBond
- 12S12F = Port 1 (inlet) 3/4" Flaretek "SpaceSaver", Port 2 (outlet) 3/4" Flaretek
- 12S1S2 = Port 1 (inlet), Port 2 (outlet) 3/4" Flaretek "SpaceSaver"
- 12PS3 = Port 1 (inlet), Port 2 (outlet) 3/4" Super 300 Type Pillar
- 12PS312P = Port 1 (inlet) 3/4" Super 300 Type Pillar, Port 2 (outlet) 3/4" PureBond
- 12K = Port 1 (inlet), Port 2 (outlet) 3/4" PrimeLock
- 12KV = Port 1 (inlet) 3/4" PrimeLock, Port 2 (outlet) 3/4" PrimeLock "SpaceSaver"
- 12KP = Port 1 (inlet) 3/4" PrimeLock, Port 2 (outlet) 3/4" PureBond
- 12VK = Port 1 (inlet) 3/4" PrimeLock "SpaceSaver", Port 2 (outlet) 3/4" PrimeLock
- 12W = Port 1 (inlet), Port 2 (outlet) 3/4" PrimeLock "SpaceSaver"
- 12P = Port 1 (inlet), Port 2 (outlet) 3/4" PureBond
- 12P12F = Port 1 (inlet) 3/4" PureBond, Port 2 (outlet) 3/4" Flaretek
- 12P12PS3 = Port 1 (inlet) 3/4" PureBond, Port 2 (outlet) 3/4" Super 300 Type Pillar
- 12PK = Port 1 (inlet) 3/4" PureBond, Port 2 (outlet) 3/4" PrimeLock
- 12F-TS = Port 1 (inlet), Port 2 (outlet) 3/4" tube stub no nuts
- 16F = Port 1 (inlet), Port 2 (outlet) 1" Flaretek
- 16S2 = Port 1 (inlet) 1" Flaretek, Port 2 (outlet) 1" Flaretek "SpaceSaver"
- 16F16P = Port 1 (inlet) 1" Flaretek, Port 2 (outlet) 1" PureBond
- 16S1S2 = Port 1 (inlet), Port 2 (outlet) 1" Flaretek "SpaceSaver"
- 16S16F = Port 1 (inlet) 1" Flaretek "SpaceSaver", Port 2 (outlet) 1" Flaretek
- 16PS3 = Port 1 (inlet), Port 2 (outlet) 1" Super 300 Type Pillar
- 16PS316P = Port 1 (inlet) 1" Super 300 Type Pillar, Port 2 (outlet) 1" PureBond
- 16K = Port 1 (inlet), Port 2 (outlet) 1" PrimeLock
- 16KV = Port 1 (inlet) 1" PrimeLock, Port 2 (outlet) 1" PrimeLock "SpaceSaver"
- 16KP = Port 1 (inlet) 1" PrimeLock, Port 2 (outlet) 1" PureBond
- 16VK = Port 1 (inlet) 1" PrimeLock "SpaceSaver", Port 2 (outlet) 1" PrimeLock
- 16W = Port 1 (inlet), Port 2 (outlet) 1" PrimeLock "SpaceSaver"
- 16P = Port 1 (inlet), Port 2 (outlet) 1" PureBond
- 16P16F = Port 1 (inlet) 1" PureBond, Port 2 (outlet) 1" Flaretek
- 16P16PS3 = Port 1 (inlet) 1" PureBond, Port 2 (outlet) 1" Super 300 Type Pillar
- 16PK = Port 1 (inlet) 1" PureBond, Port 2 (outlet) 1" PrimeLock
- 16F-TS = Port 1 (inlet), Port 2 (outlet) 1" tube stub no nuts

### Actuator

- 2C = 2-way normally closed tube
- 2U = 2-way normally open tube
- 2M = 2-way manual multi-turn

### Special Order

- 3 = PFA\*
- 6 = CPFA\*
- II = FlareLock\*
- N = Pillar nuts, inserts, and gauge rings included\*\*
- OM = Omron sensor
- EC = ECTFE external actuator components and PFA nuts
- Blank = N/A

Note: Not all configurations are permitted. Consult Entegris if multiple special order features are required.

\*Available for Flaretek port connections only.

\*\*Available for Super 300 Type Pillar port connections only.

#### FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit [entegris.com](http://entegris.com) and select the [Contact Us](#) link to find the customer service center nearest you.

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