

# CR4 3-Way Series Pneumatically Operated Valves

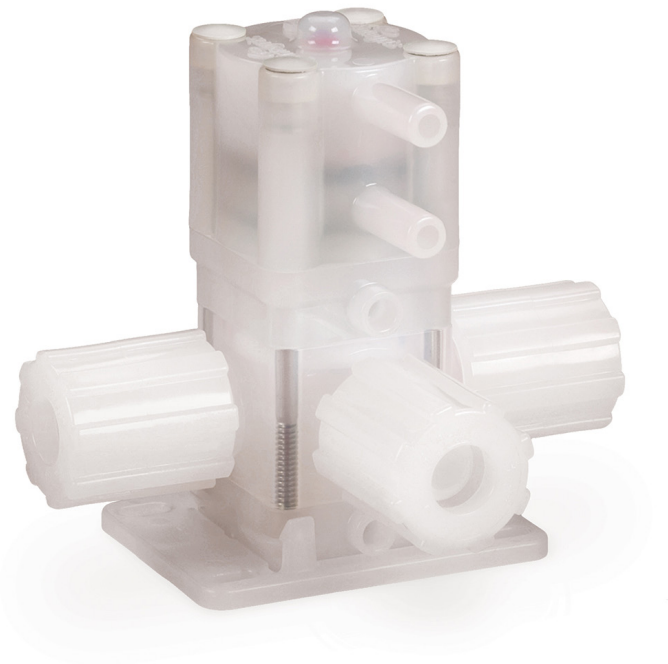
*For corrosive environments in  
wet etch and clean applications*

Smaller than most comparable valves, 1/4" CR4 Series valves are ideal for handling corrosive, wet etch and clean process chemicals. These 3-way valves are designed to divert one media stream into two directions or alternate two media streams into one, minimizing the footprint. These durable valves effectively handle temperatures up to 130°C (266°F) at 276 kPa (40 psig) media on the common port, and 207 kPa (30 psig) on the normally open/closed ports.

Users have a variety of connection options available in 1/4" and 3/8" port sizes. Without exposed metal hardware, the valve is completely sealed and protected from harsh chemical environments. The end result is a highly effective valve that simplifies your system design and increases product longevity.

## APPLICATIONS

- High-purity corrosive chemical handling
- All semiconductor wet clean process chemicals
- Transporting and protecting your high-purity chemicals
- Chemical line sizes 3/8" or smaller
- Luer design is suited for medical and laboratory applications



## FEATURES & BENEFITS

<b>Three-ported directional valve design</b>	Enables simplification of piping system design while minimizing footprint
<b>Smallest available all-PFA/PTFE wetted 3-way valve</b>	Reduced footprint saves valuable space
<b>Sealed actuator with vent port</b>	Eliminates chemical exposure of the valve spring
<b>One piece poppet and diaphragm construction</b>	Unique design increases product reliability
<b>Stand-alone mounting base</b>	Allows installation and removal of the valve without tools
<b>Valves withstand corrosive and harsh chemical environments</b>	Product longevity and reliability
<b>Valves offered in a variety of connection options: Flaretek®, Flaretek "SpaceSaver," PureBond®, Super 300 Type Pillar®, tube stub</b>	Versatility and ease in system design

## SPECIFICATIONS

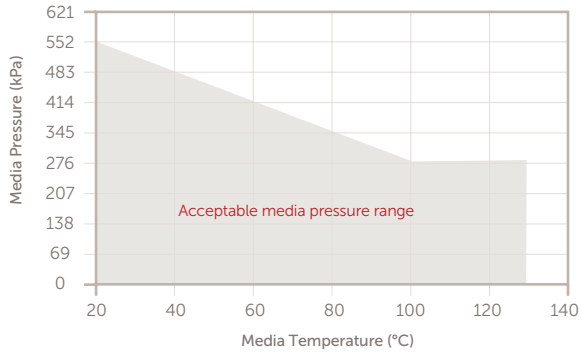
<b>Materials</b>	All-wetted parts	PTFE, PFA
	Exterior actuator parts	PVDF, Viton®
	Interior actuator parts	PVDF, SST, Viton
	Mounting base	PVDF
<b>Operating conditions</b>	Media pressure:	
	All ports: 552 kPa (80 psig) @ 21°C (70°F) <sup>1</sup>	
	Common ports: 276 kPa (40 psig) @ 130°C (266°F) <sup>1</sup>	
	Normally open/closed ports: 207 kPa (30 psig) @ 130°C (266°F) <sup>1,2</sup>	
	Actuation pressure:	
414 – 552 kPa (60 – 80 psig) @ 21°C (70°F) <sup>1</sup>		
414 – 483 kPa (60 – 70 psig) @ 130°C (266°F) <sup>1</sup>		
Temperature range:		
Ambient: 21 – 50°C (70 – 122°F) <sup>1</sup>		
Fluid: 21 – 130°C (70 – 266°F) <sup>1</sup>		
<b>Pneumatic supply port</b>	¼" tube stub; accepts one-touch (push to connect) type fittings or molded female Luer lug style	
<b>Environmental compliance</b>	RoHs, WEE	

<sup>1</sup> Actual valve performance varies with pressure and temperature; refer to actual ratings in performance data.

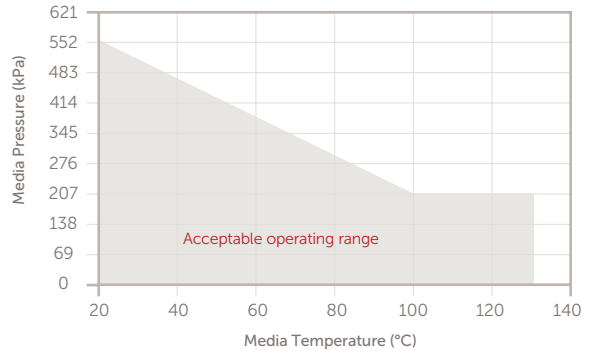
<sup>2</sup> If media temperatures are 100°C (212°F) or more, it is recommended to remove or cycle actuation pilot pressure when temperature is reduced to 30°C (86°F) or less.

## PERFORMANCE DATA

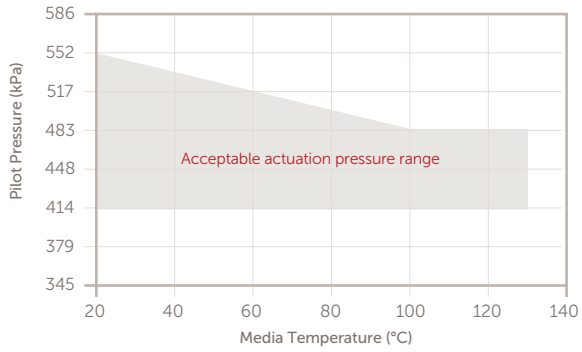
Media Temperature vs. Media Pressure:  
Common Port



Media Temperature vs. Media Pressure:  
Normally Open/Normally Closed Ports



Media Temperature vs. Actuator Pilot Pressure



## VALVE RELIABILITY TEST RESULTS

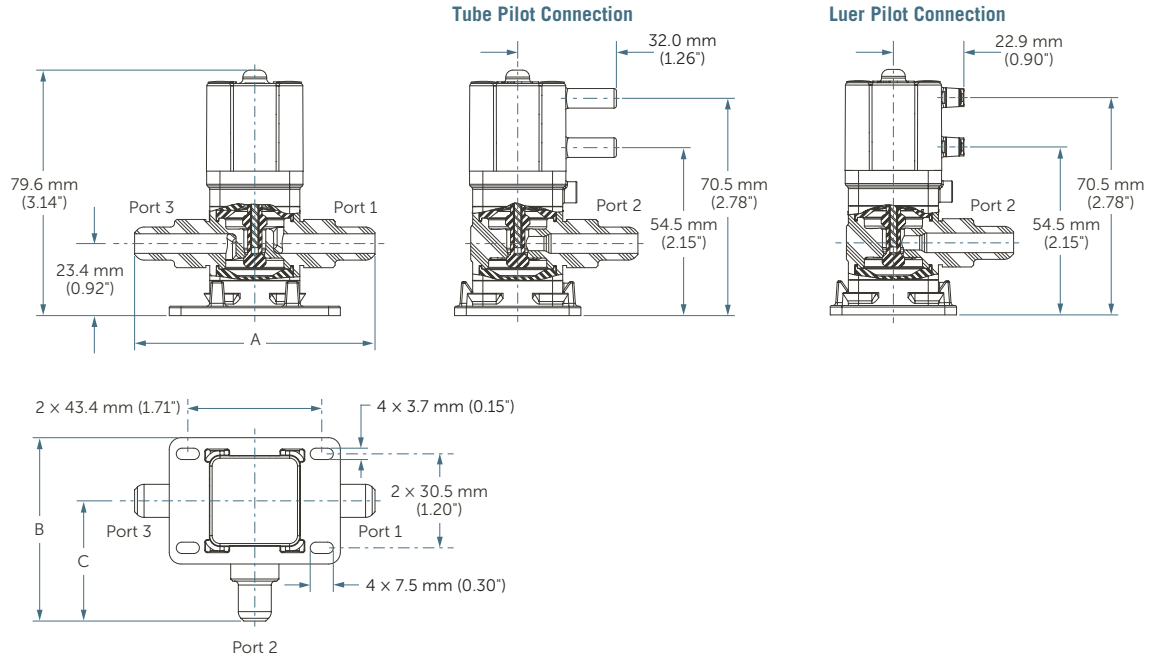
### Valve qualification test

Test type	Test conditions	Acceptance criteria	Test results
Burst pressure	Hydraulic oil pressure increased until leakage detected	Burst pressure must be >2 times rated pressure @ 23°C (73°F) and @ 130°C (266°F)	PASS
Pressure envelope	827 kPa (120 psig) water @ 23°C (73°F)	No external leakage failures for 1 million cycles @ 1.5 times rated pressure	PASS No external leakage
	414 kPa (60 psig) hydraulic oil @ 130°C (266°F)	No external leakage failures for 1 million cycles @ 1.5 times rated pressure	PASS No external leakage
Actuation cycle testing	552 kPa (80 psig) water @ 23°C (73°F) for 2 million cycles	No leakage in functional performance for up to 2.1 million cycles	PASS No external leakage No port-to-port leakage <0.050 CC H <sub>2</sub> O/hr
	276 kPa (40 psig) hydraulic oil @ 130°C (266°F) for 1 million cycles	No leakage in functional performance for up to 1 million cycles	PASS No external leakage No port-to-port leakage <0.050 CC H <sub>2</sub> O/hr

### 100% valve test procedure in production

Test type	Test conditions	Acceptance criteria
External media leak	552 kPa (80 psig) CDA	Zero bubbles per minute through 1/32" ID tube immersed in DI water
Port-to-port valve test	552 kPa (80 psig) CDA to common port. Tested at normally closed port and normally open port in actuated position.	Less than 4 bubbles per minute through 1/32" ID tube immersed in DI water
Valve actuation	Pressure decay 552 kPa (80 psig) CDA	Less than 7 kPa (1 psig/min) pressure drop

## DIMENSIONS



Port connection	Flow factor $C_v$	Flow factor $K_v$	DIMENSIONS		
			A	B	C
1/4" FNPT	0.6	8.6	49.8 mm (1.96")	45.5 mm (1.79")	24.9 mm (0.98")
1/4" Flaretek <sup>1</sup>	0.3	4.0	76.0 mm (2.99")	58.4 mm (2.30")	38.1 mm (1.50")
1/4" PureBond	0.6	8.6	76.2 mm (3.00")	58.7 mm (2.31")	38.1 mm (1.50")
3/8" Flaretek <sup>1</sup>	0.6	8.6	78.0 mm (3.07")	59.4 mm (2.34")	39.1 mm (1.54")
1/4" Super 300 Type Pillar <sup>2</sup>	0.3	4.0	59.4 mm (2.34")	50.3 mm (1.98")	29.7 mm (1.17")
3/8" Super 300 Type Pillar <sup>2</sup>	0.6	8.6	67.3 mm (2.85")	54.1 mm (2.23")	33.8 mm (1.43")

<sup>1</sup> Also available with Flaretek "SpaceSaver" connections.

<sup>2</sup> Pillar nuts, inserts, and gauge rings supplied separately.

## SENSING OPTION DIMENSIONS

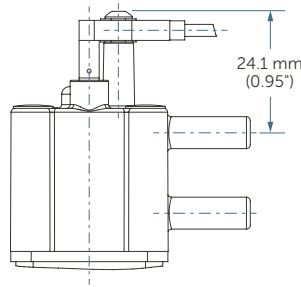
### Remote Position Indication Option

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 the Omron Position Sensor Indicator (EE-SX771R or EE-SX771A), which is sold separately.*

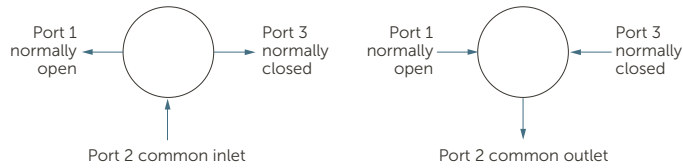
### CR4 Valve with Omron Sensor

Omron part number EE-SX771R or EE-SX771A



## PORT CONFIGURATIONS

Port 1 is the normally open port  
 Port 2 is the common port  
 Port 3 is the normally closed port



## ORDERING INFORMATION

CR4 3-way Valves: part number

CR4 - - - - -

- Port configurations**
- 4N = 1/4" FNPT
  - 4F = 1/4" Flaretek
  - 4P = 1/4" PureBond pipe
  - 6F = 3/8" Flaretek
  - 4PS3 = 1/4" Super 300 Type Pillar
  - 6PS3 = 3/8" Super 300 Type Pillar

- Actuator**
- 3C = 3-way tube pilot port
  - 3CL = 3-way Luer pilot port

- Options**
- 3 = PFA Flaretek nut
  - II = PFA FlareLock® II nut
  - N = Super 300 Type Pillar nut; inserts, and gauge rings included\*
  - OM = Omron position sensor
  - = NA

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

## Accessories

Part number	Description
01-006010	Mounting base (supplied with valve)

#### FOR MORE INFORMATION

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