Pargrip PFA Products and Assembly Instructions

Parker Veriflo

ENGINEERING YOUR SUCCESS.

Partek PFA/PTFE Valves

Catalog 4182/USA

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

ENGINEERING YOUR SUCCESS.

Table of Contents

Overview

Partek produces products that are made from only the finest Fuoropolymers available. These Fluoropolymers are resistant to numerous chemicals and solvents. This information provides only a brief technical overview . For more comprehensive technical and chemical compatibility information, please ask for Technical Bulletin 0002-T1/USA.

Fluorinated Polymers

Chemical Properties
- Resistivity to corrosive agents
- Non-solubility
- Long term weatherability
- Non-adhesiveness
- Nonflammability

Electrical Properties
- Low dielectric constant
- Low dissipation factor
- High arc resistance
- High surface resistance
- High volume resistivity

Mechanical Properties
- Flexibility at low temperatures
- Low coefficient of friction
- Stability at high temperatures

PTFE is a fluorocarbon resin that is isostatically compression molded into various shapes and configurations. It is chemically resistant to all chemicals and solvents with the exception of some molten alkali metals, molten sodium hydroxide, elemental fluorine and certain fluorinating agents. At Partek we use PTFE for machining the bodies and components of various valves and manifolds. It offers chemical resistance and stability at high temperatures.

Modified PTFE material is used primarily for diaphragms and bellows in our products. This material has the same processing and chemically resistant characteristics as the standard product but offers superior cycle life and integrity in diaphragm products.

PFA is a copolymer of tetrafluoroethylene and perfluoroalkyl vinyl ether. The resultant polymer contains the carbon-fluorine backbone chain typical of PTFE, but unlike PTFE, does not require special fabricating techniques. PFA pellets have good melt flow characteristics that allow for processing via extrusion, compression, blow, transfer and injection molding methods. It has outstanding chemical and solvent resistant characteristics over a temperature range even greater than PTFE. PFA is offered in various grades of purity and cleanliness making it the material of choice for the semiconductor market.

C_V and K_V Formulas

$$Q = C_V \sqrt{\frac{\Delta P}{SG}}$$

Q = Flow (GPM)
ΔP = Pressure Drop (PSIG)
SG = Specific Gravity

$$Q = K_V \sqrt{\frac{\Delta P}{Y}}$$

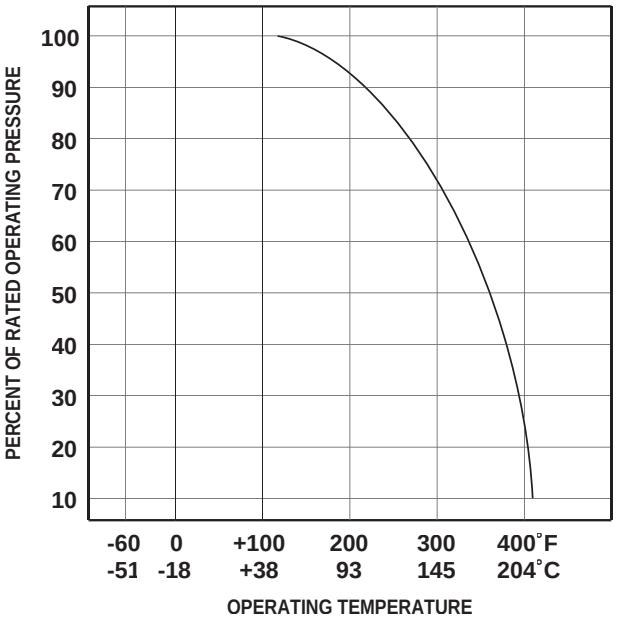
Q = Flow (LPM)
ΔP = Pressure Drop (BAR)
Y = Specific Gravity (kg/cm^3)

$$1\ K_V = 14.26\ C_V$$

"C_V" flow factor is the number of gallons of fluid that pass through a given orifice area in one minute, at a pressure drop of 1 PSIG.

"K_V" flow factor is the number of liters of fluid that pass through a given orifice area in one minute, at a pressure drop of 1 bar.

PERCENT OF RATED PRESSURE VS. TEMPERATURE



For operation at temperatures above ambient conditions, please refer to the chart above for reduced pressure ratings.

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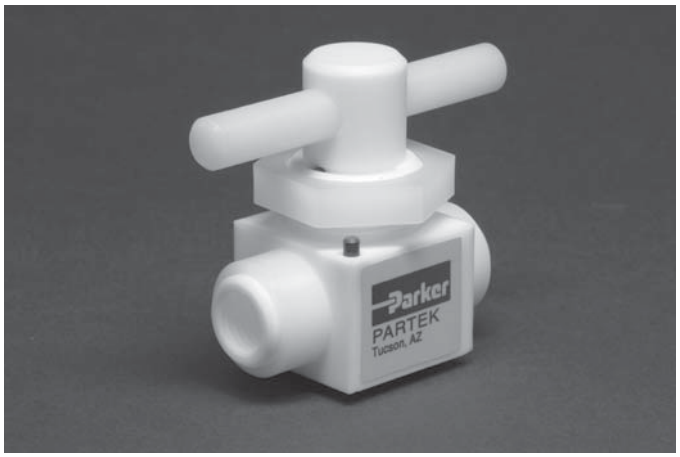
MV-1 Manual Stop Cock Valve

Product Overview

The MV-1 PTFE Stop Cock Valve is designed for use in high purity semiconductor fluid applications, and is also ideally suited for ultra-pure water and aggressive chemicals. A precision-machined PTFE body with a straight through flowpath is combined with a PTFE full flow orifice stem for maximum flow, minimum pressure drop and 1/4" turn operation. The MV-1 is offered for inline and panel mounted applications.



Features	Benefits
Full flow orifice.	**Maximum flow at the desired size.**
The precision machined stem and body provide tight shut off and 1/4 turn operation.	**Minimum pressure drop. High cycle life.**
Parofluor O-Ring stem seals.	**Positive body to stem seal.**

Specifications

Materials of Construction

Wetted: PTFE, Parker Parofluor™
Non-wetted: HDPE, PFA, PVC, PVDF, Titanate

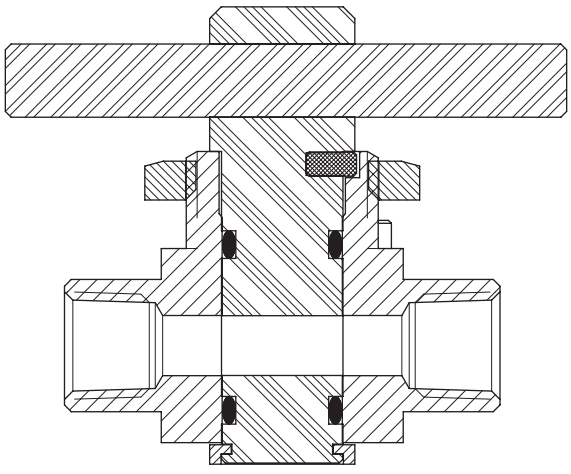
Pressure Ranges

0 to 60 PSIG (4.1 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: -60° - 212° F (-51° - 100° C)
Fluid: -60° - 400° F (-51° - 204° C)



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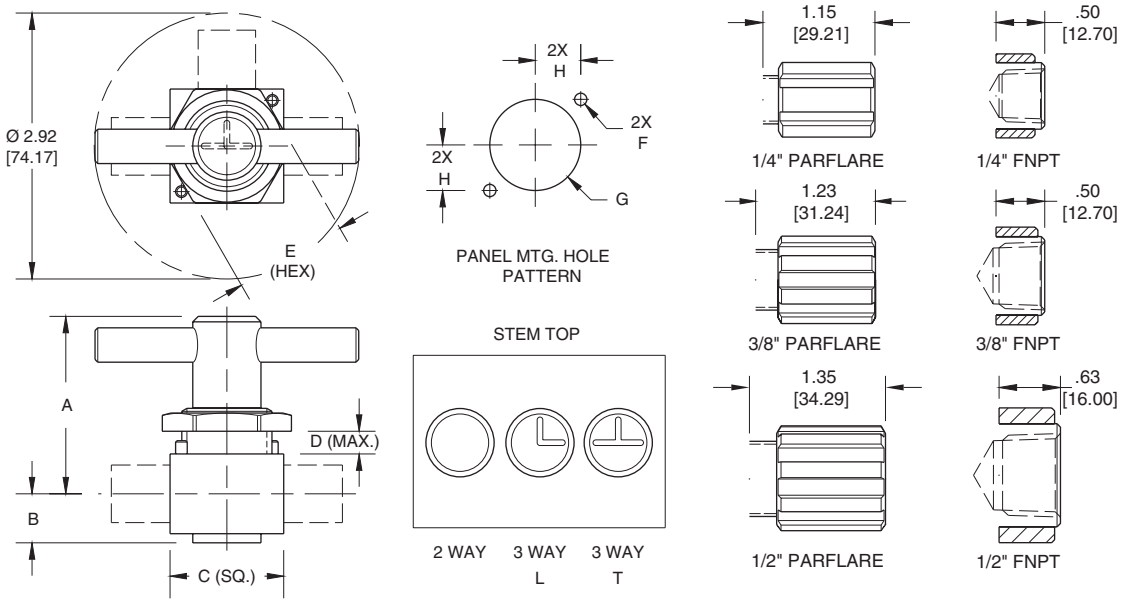
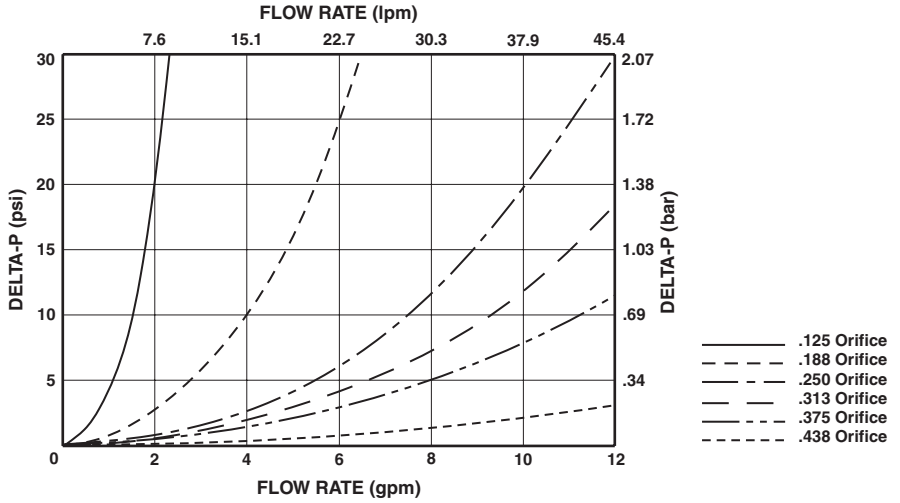
BRACKETED DIMENSIONS ARE IN mm.



Model Number	Cv	Kv	Orifice	Flow Config.	Port Config.	Dimensions in [mm]							
						A	B	C	D	E	F	G	H
MV-1-1414	1.95	27.8	.250	2 WAY	1/4" FNPT	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-1424	1.95	27.8	.250	3 WAY L	1/4" FNPT	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-1434	1.95	27.8	.250	3 WAY T	1/4" FNPT	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-6214	.36	5.1	.125	2 WAY	1/4" Parflare	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-6224	.36	5.1	.125	3 WAY L	1/4" Parflare	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-6234	.36	5.1	.125	3 WAY T	1/4" Parflare	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-1616	3.00	42.8	.375	2 WAY	3/8" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-1626	3.00	42.8	.375	3 WAY L	3/8" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-1636	3.00	42.8	.375	3 WAY T	3/8" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-6416	1.95	27.8	.250	2 WAY	3/8" Parflare	1.78 [45.21]	.61 [15.49]	1.25 [31.75]	.25 [6.35]	1.31 [33.27]	Ø .14 [3.56]	Ø 1.00 [25.40]	.50 [12.70]
MV-1-6426	1.95	27.8	.250	3 WAY L	3/8" Parflare	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-6436	1.95	27.8	.250	3 WAY T	3/8" Parflare	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-1818	6.55	93.4	.438	2 WAY	1/2" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-1828	6.55	93.4	.438	3 WAY L	1/2" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-1838	6.55	93.4	.438	3 WAY T	1/2" FNPT	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-6618	3.00	42.8	.375	2 WAY	1/2" Parflare	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [5.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-6628	2.50	35.7	.313	3 WAY L	1/2" Parflare	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [.08]	Ø 1.44 [36.58]	.60 [15.24]
MV-1-6638	2.50	35.7	.313	3 WAY T	1/2" Parflare	2.24 [56.90]	.74 [18.80]	1.50 [38.10]	.50 [12.70]	1.75 [44.45]	Ø .20 [.08]	Ø 1.44 [36.58]	.60 [15.24]

Parflare model numbers are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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MV-6 Manual Ball Valve

Product Overview

The MV-6 PTFE Ball Valves are designed for use in high purity semiconductor applications, and are also ideally suited for use in ultra-pure water and aggressive chemicals. All sizes have wetted parts made entirely of PTFE. All valves are designed full port for minimal flow restrictions and are operated 1/4 turn with minimal torque.

Features

Floating ball design without o-rings ensures bubble tight sealing at high pressure.

Full port design; 1/4 turn operation with low torque tee handle.

Panel mounting is an option on all sizes.

Benefits

Bidirectional flow to 120 psi liquid or gas; High cycle life.

Ideal for quick shut-off in contamination-free applications.

Ideal for process instrumentation applications.

Specifications

Materials of Construction

Wetted: PTFE
Non-wetted: HDPE, PVDF and PVC

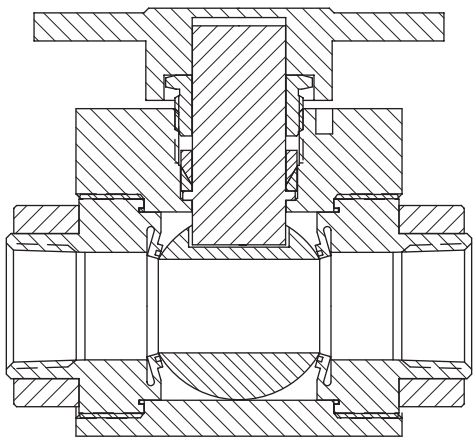
Pressure Ranges

25” HG vacuum (846 mbar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 41° - 104° F (5° - 40° C)
Fluid: 41° - 104° F (5° - 40° C)



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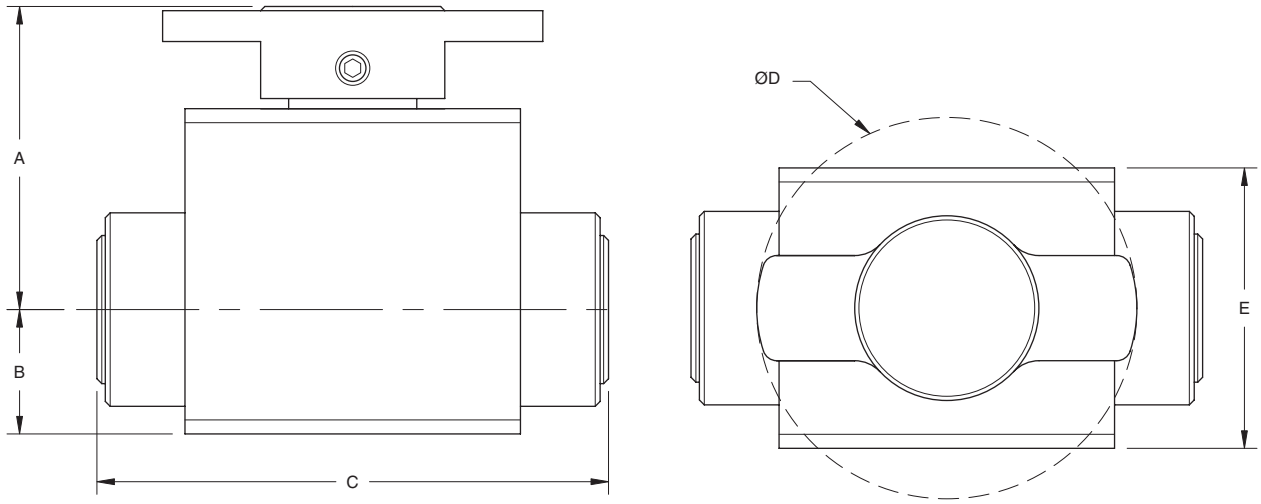
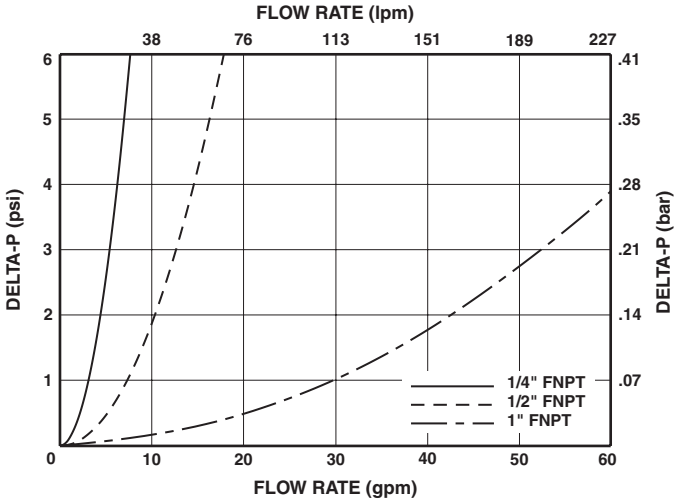
BRACKETED DIMENSIONS ARE IN mm.



Model Number	Cv	Kv	Flow Config.	Port Config.	Dimensions in [mm]				
					A	B	C	D	E
MV-6-1414-0	1.88	26.81	ON/OFF	1/4" FNPT	1.73 [43.94]	.66 [16.76]	2.91 [73.91]	Ø 1.98 [50.29]	1.31 [33.27]
MV-6-1818-0	6.59	93.97		1/2" FNPT	2.24 [56.89]	.89 [22.60]	3.72 [94.49]	Ø 2.72 [69.08]	2.00 [50.80]
MV-6-116116-0	28.06	400.14		1" FNPT	3.18 [80.77]	1.39 [35.30]	5.00 [127.00]	Ø 4.40 [111.76]	2.53 [64.26]

PRESSURE DROP VS. FLOW RATE



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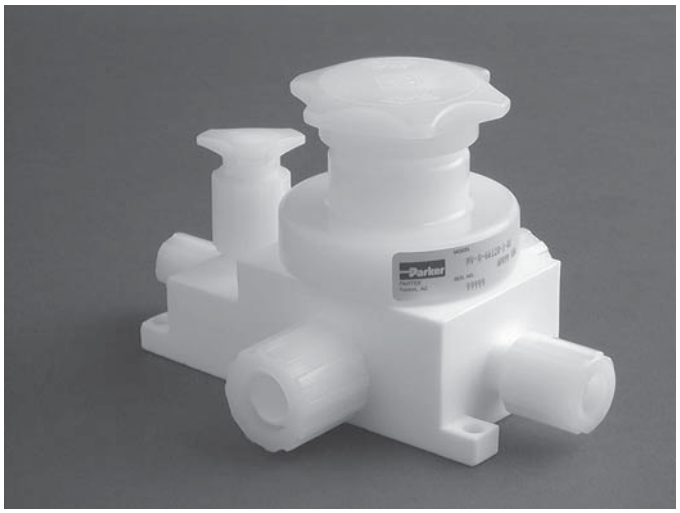
MV-8 Manual Sampling Valve

Product Overview

The MV-8 PTFE Sampling Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water or aggressive chemicals. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve incorporates a full flow through port with a low dead volume down leg. The purge port option makes this the valve of choice for valve manifold boxes and distribution systems.



Features

One piece precision machined diaphragm manufactured from the latest technology modified PTFE, provides over five times the flexural life as compared to conventional PTFE.

Full flow through port.

Purge port option.

Benefits

Higher cycle life resulting in less downtime and lower replacement costs.

Reduced pressure drop.

Allows system maintenance downstream of valve without disrupting main flow.

Specifications

Materials of Construction

Wetted: PTFE, Modified PTFE
Non-wetted: PVDF

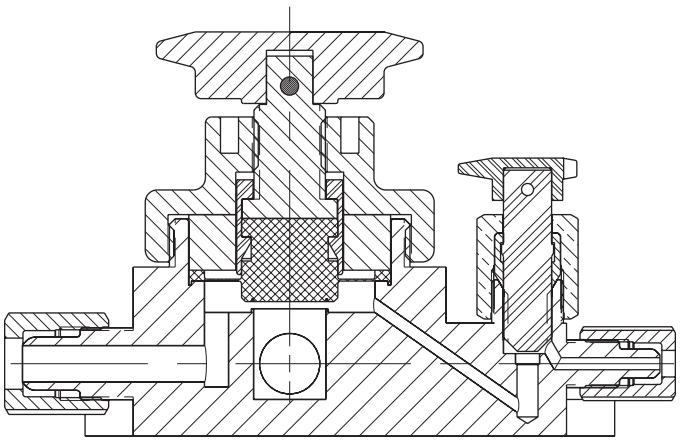
Pressure Ranges

27" HG vacuum (913 mbar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 212° F (17° -100° C)
Fluid: 0° - 400° F (17° - 204° C)



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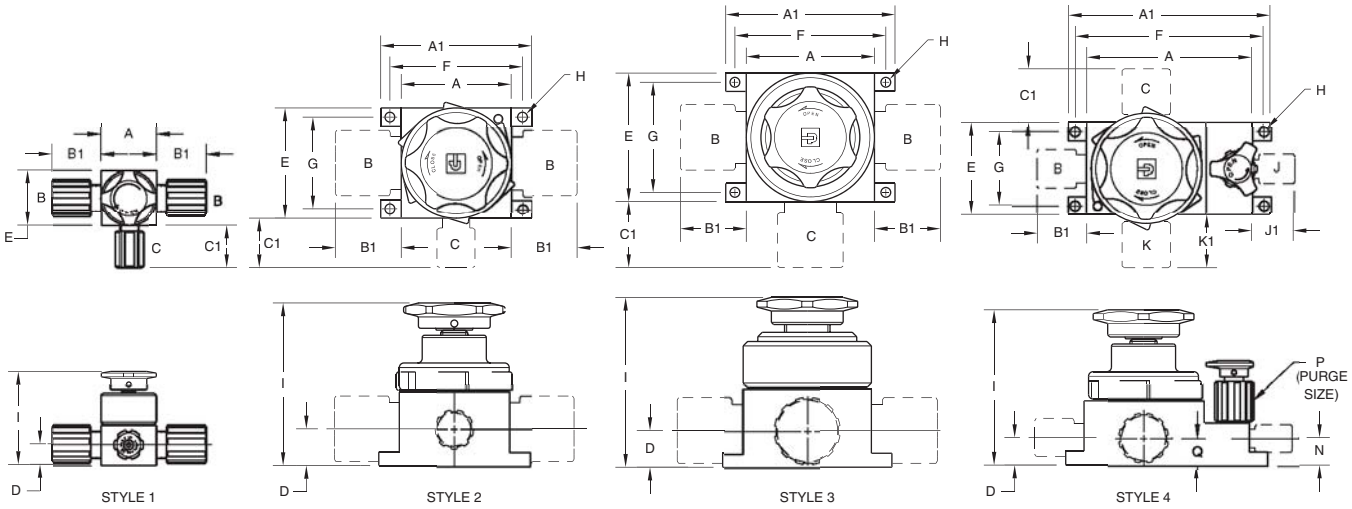


DIMENSIONS (in)

	STYLE	A	A1	B	B1	C	C1	D	E	F	G	H	I	J	J1	K	K1	N	P	Q
MV-8-6684-1	1	1.50	-	1/2"	1.35	1/4"	1.15	.56	1.50	-	-	-	2.57							
MV-8-661212-1	2	3.50	4.62	3/4"	1.46	3/4"	1.46	1.00	3.50	4.12	3.00	Ø .266	4.51							
MV-8-66128-1	2	3.00	4.12	3/4"	1.46	1/2"	1.35	1.00	3.00	3.62	2.50	Ø .266	4.51							
MV-8-66164-1	2	3.00	4.12	1"	1.80	1/4"	1.15	1.00	3.00	3.62	2.50	Ø .266	4.51							
MV-8-661616-1	3	3.50	4.12	1"	1.80	1"	1.80	1.00	3.50	4.12	3.00	Ø .266	4.63							
MV-8-66128-1-01	4	4.50	5.50	1/2'	1.35	3/4"	1.46	.75	2.50	5.13	2.00	Ø .266	4.50	1/4"	1.15	3/4"	1.46	.75	1/4"	.75
MV-8-66128-1-05	4	4.63	5.75	1/2'	1.35	3/4"	1.46	.75	2.50	5.37	2.00	Ø .266	4.50	1/2"	1.35	3/4"	1.46	.88	1/2"	.92
MV-8-661212-1-01	4	4.50	5.50	3/4"	1.46	3/4"	1.46	.75	2.50	5.13	2.00	Ø .266	4.50	1/4"	1.15	3/4"	1.46	.75	1/4"	.75
MV-8-66168-1-01	4	4.63	5.75	1/2"	1.35	1"	1.80	.75	3.00	5.37	2.00	Ø .266	4.60	1/2"	1.35	1"	1.80	.88	1/2"	.92
MV-8-661612-1-01	4	4.50	5.50	3/4"	1.46	1"	1.80	.93	3.00	5.13	2.04	Ø .266	4.60	1/4"	1.15	1"	1.80	.75	1/4"	.93
MV-8-661616-1-01	4	4.50	5.50	1"	1.80	1"	1.80	.93	3.00	5.13	2.54	Ø .266	4.60	1/4"	1.15	1"	1.80	.75	1/4"	.93

DIMENSIONS (mm)

	STYLE	A	A1	B	B1	C	C1	D	E	F	G	H	I	J	J1	K	K1	N	P	Q
MV-8-6684-1	1	38.1	-	1/2"	34.3	1/4"	29.2	14.2	38.1	-	-	-	65.3							
MV-8-661212-1	2	88.9	117.3	3/4"	37.1	3/4"	37.1	25.4	88.9	104.6	76.2	Ø 6.76	114.6							
MV-8-66128-1	2	76.2	104.6	3/4"	37.1	1/2"	34.3	25.4	76.2	91.9	63.5	Ø 6.76	114.6							
MV-8-66164-1	2	76.2	104.6	1"	45.7	1/4"	29.2	25.4	76.2	91.9	63.5	Ø 6.76	114.6							
MV-8-661616-1	3	88.9	104.6	1"	45.7	1"	45.7	25.4	88.9	104.6	76.2	Ø 6.76	117.6							
MV-8-66128-1-01	4	114.3	139.7	1/2'	34.3	3/4"	37.1	19.1	63.5	130.3	50.8	Ø 6.76	114.3	1/4"	29.2	3/4"	37.1	19.1	1/4"	19.1
MV-8-66128-1-05	4	117.6	146.0	1/2'	34.3	3/4"	37.1	19.1	63.5	136.4	50.8	Ø 6.76	114.3	1/2"	34.3	3/4"	37.1	22.4	1/2"	23.4
MV-8-661212-1-01	4	114.3	139.7	3/4"	37.1	3/4"	37.1	19.1	63.5	130.3	50.8	Ø 6.76	114.3	1/4"	29.2	3/4"	37.1	19.1	1/4"	19.1
MV-8-66168-1-01	4	117.6	146.0	1/2"	34.3	1"	45.7	19.1	76.2	136.4	50.8	Ø 6.76	116.8	1/2"	34.3	1"	45.7	22.4	1/2"	19.1
MV-8-661612-1-01	4	114.3	139.7	3/4"	37.1	1"	45.7	23.6	76.2	130.3	51.8	Ø 6.76	116.8	1/4"	29.2	1"	45.7	19.1	1/4"	23.6
MV-8-661616-1-01	4	114.3	139.7	1"	45.7	1"	45.7	23.6	76.2	130.3	64.5	Ø 6.76	116.8	1/4"	29.2	1"	45.7	19.1	1/4"	23.6

Model Number	*Through Port*			*Sampling Port*			*Purge Port*			*Through Port*	*Sampling Port*	*Purge Port*
	Cv	*Kv*	*Orifice*	*Cv*	*Kv*	*Orifice*	*Cv*	*Kv*	*Orifice*			
MV-8-6684-1	3.2	45.7	.375	.2	2.8	.125	N/A	N/A	N/A	1/2" Parflare	1/4" Parflare	N/A
MV-8-661212-1	13.0	185.6	.625	4.6	65.7	.625	N/A	N/A	N/A	3/4" Parflare	3/4" Parflare	N/A
MV-8-66128-1	13.0	185.6	.625	2.3	32.8	.375	N/A	N/A	N/A	3/4" Parflare	1/2" Parflare	N/A
MV-8-66164-1	37.3	532.6	.875	.2	2.8	.125	N/A	N/A	N/A	1" Parflare	1/4" Parflare	N/A
MV-8-661616-1	37.3	532.6	.875	7.2	102.8	.875	N/A	N/A	N/A	1" Parflare	1" Parflare	N/A
MV-8-66128-1-01	13.0	185.6	.625	2.3	32.8	.375	.2	2.8	.125	3/4" Parflare	1/2" Parflare	1/4" Parflare
MV-8-66128-1-05	13.0	185.6	.625	2.3	32.8	.375	1.1	15.7	.375	3/4" Parflare	1/2" Parflare	1/2" Parflare
MV-8-661212-1-01	13.0	185.6	.625	4.6	65.7	.625	.2	2.8	.125	3/4" Parflare	3/4" Parflare	1/4" Parflare
MV-8-66168-1-01	37.3	532.6	.875	2.3	32.8	.375	1.1	15.7	.375	1" Parflare	1/2" Parflare	1/2" Parflare
MV-8-661612-1-01	37.3	532.6	.875	4.6	65.7	.625	.2	2.8	.125	1" Parflare	3/4" Parflare	1/4" Parflare
MV-8-661616-1-01	37.3	532.6	.875	7.2	102.8	.875	.2	2.8	.125	1" Parflare	1" Parflare	1/4" Parflare

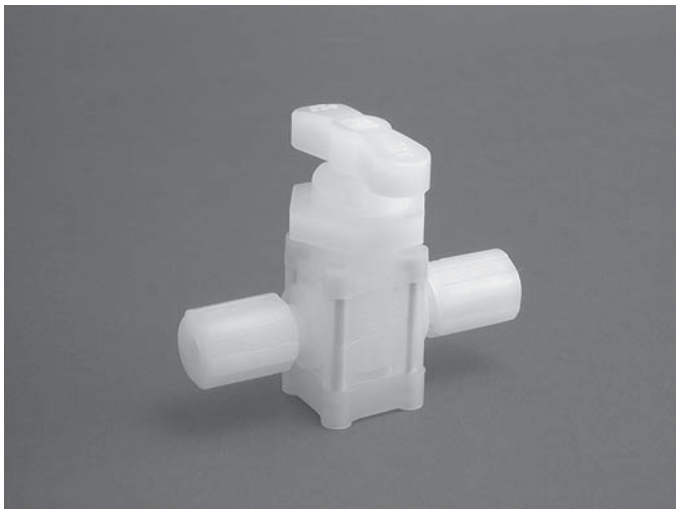
Parflare model numbers are supplied with PVDF nuts. For PFA nuts add -T to model number.

Parker Hannifin Corporation
Partek Operation
Tucson, AZ

MV-10 1/4” Manual 2 Way Valve

Product Overview

The MV-10 PFA 2 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.



Features	Benefits
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Quarter turn operation with removable handle for tamper resistance.	**Eliminates need for separate lockout device.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

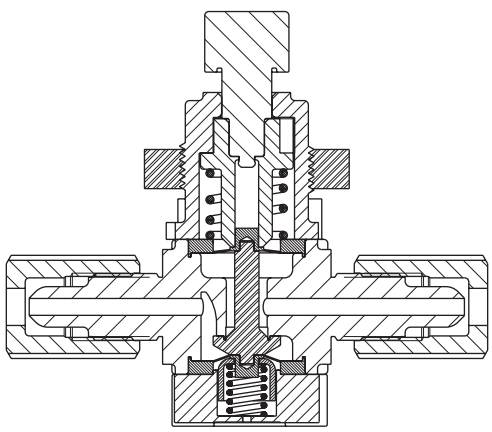
Pressure Ranges

Forward:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Backward:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (17° - 66° C)
Fluid:	0° - 266° F (17° - 130° C)



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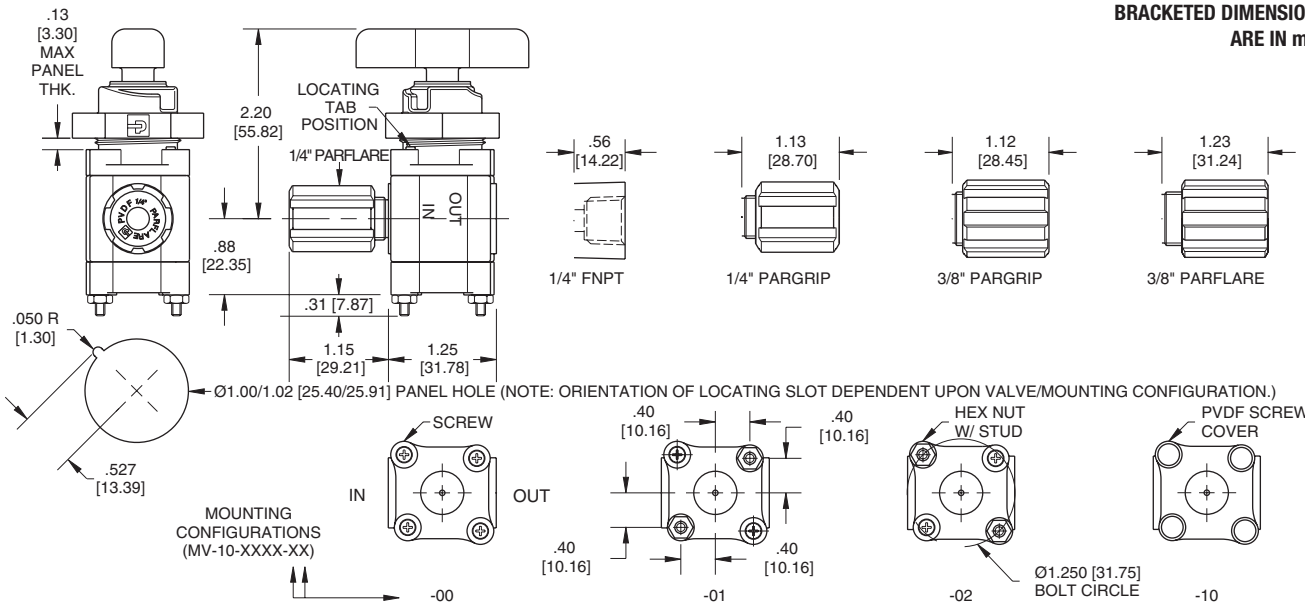
Partek Operation
Tucson, AZ

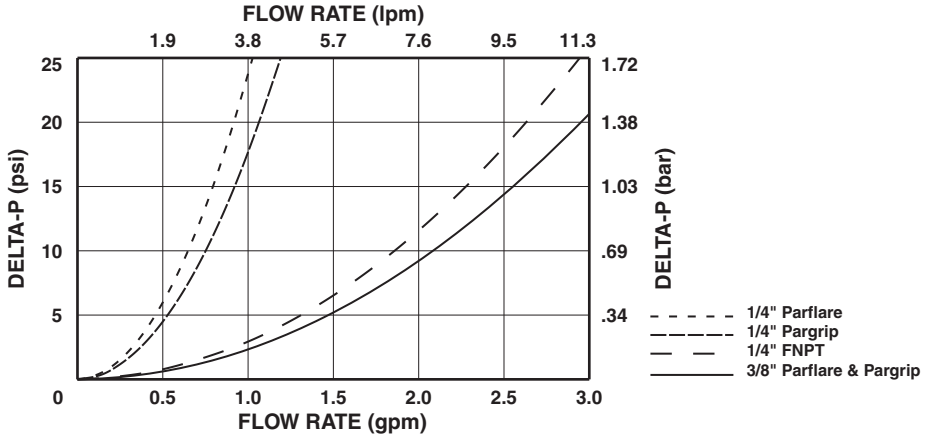
BRACKETED DIMENSIONS ARE IN mm.



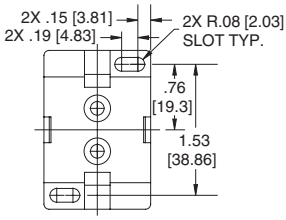
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Mounting Configuration-XX (Depicted Above)*
MV-10-1044-XX	.60	8.6	ON/OFF	1/4" FNPT	00 = Screw 01 = Screw/Stud .80 Square 02 = Screw/Stud Ø1.25 Bolt Circle 10 = PVDF Screw Covers
MV-10-2034-XX	.24	3.4		1/4" Pargrip	
MV-10-2046-XX	.62	8.8		3/8" Pargrip	
MV-10-6024-XX	.20	2.8		1/4" Parflare	
MV-10-6046-XX	.62	8.8		3/8"" Parflare	

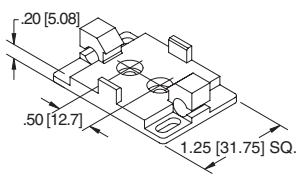
Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

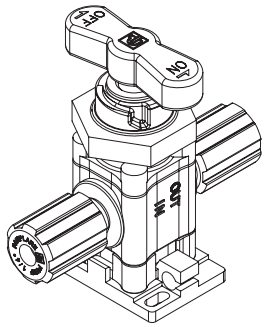
PRESSURE DROP VS. FLOW RATE



Accessories	*Description*
SB-10	PVDF Snap-in Mounting Base. For use with MV-10-XXXX-00 and MV-10-XXXX-10 models only. (Sold separately)







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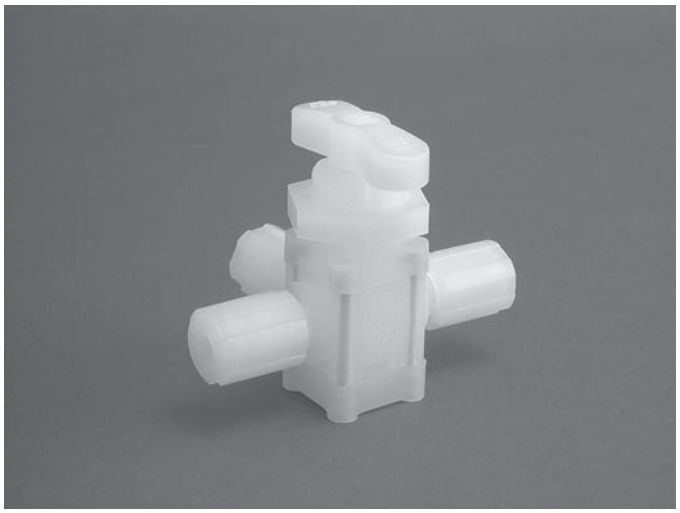
Tucson, AZ

MV-10 1/4" Manual 3 Way Valve

Product Overview

The MV-10 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4" orifice provides maximum flow capability in a compact package.



Features	Benefits
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Quarter turn operation with removable handle for tamper resistance.	**Eliminates need for separate lockout device.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

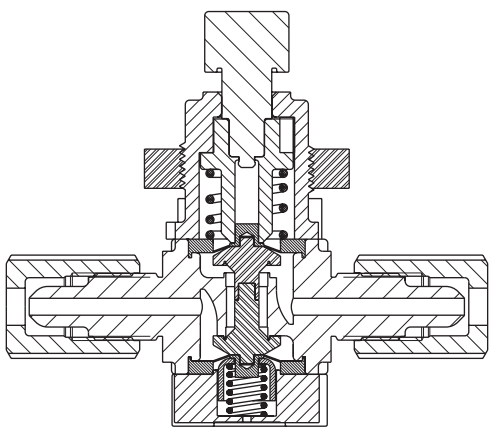
Pressure Ranges

Forward:	27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Backward:	27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

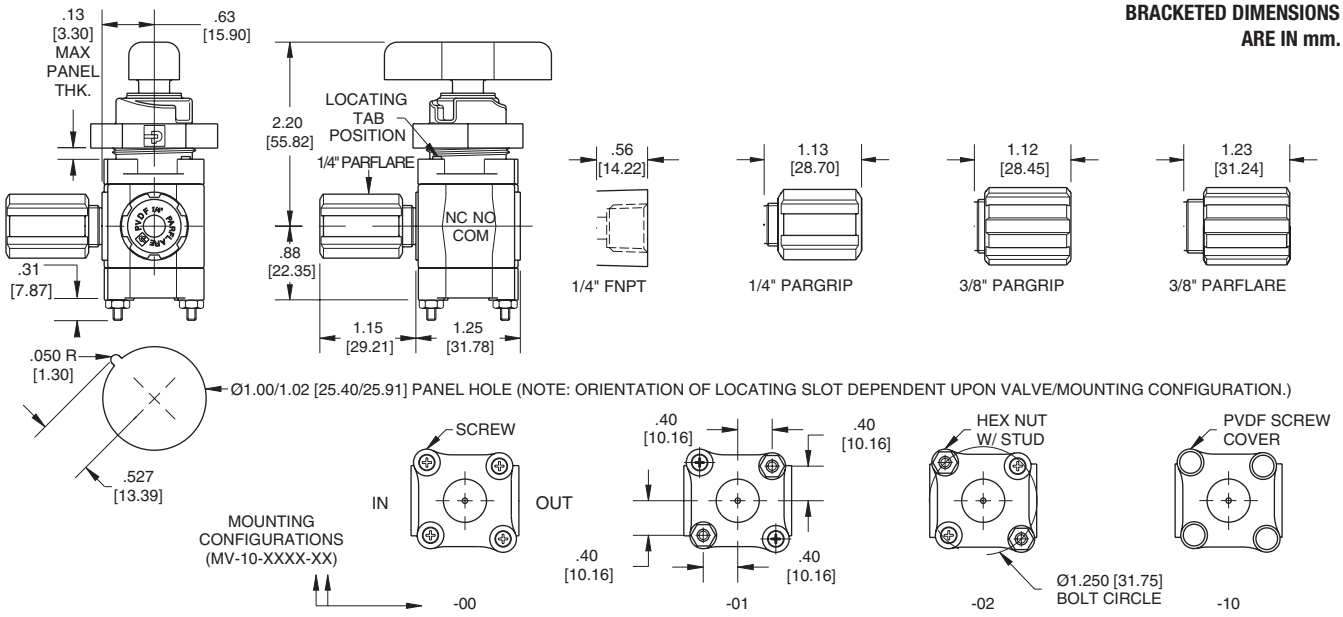
Temperature Ranges

Ambient:	0° - 150° F (17° - 66° C)
Fluid:	0° - 266° F (17° - 130° C)



Parker Hannifin Corporation
Partek Operation
Tucson, AZ

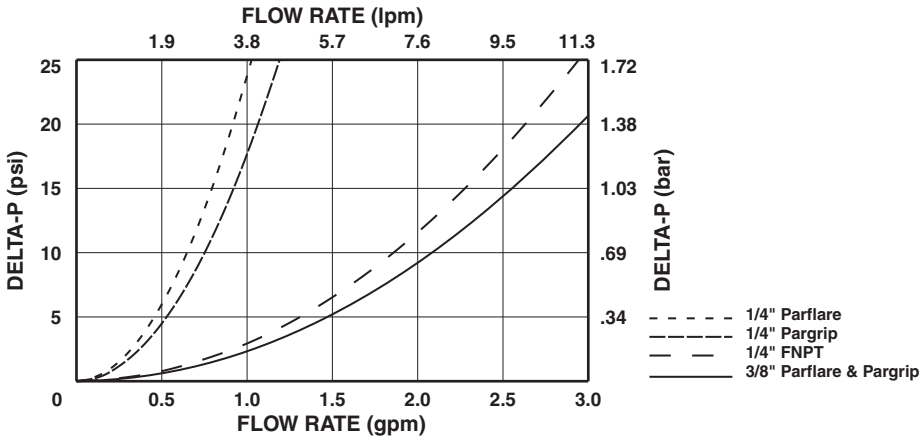
BRACKETED DIMENSIONS ARE IN mm.



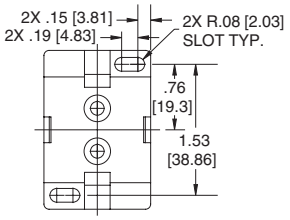
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Mounting Configuration-XX (Depicted Above)*
MV-10-1344-XX	.60	8.6	3 WAY	1/4" FNPT	00 = Screw 01 = Screw/Stud .80 Square 02 = Screw/Stud Ø1.25 Bolt Circle 10 = PVDF Screw Covers
MV-10-2334-XX	.24	3.4		1/4" Pargrip	
MV-10-2346-XX	.62	8.8		3/8" Pargrip	
MV-10-6324-XX	.20	2.8		1/4" Parflare	
MV-10-6346-XX	.62	8.8		3/8"" Parflare	

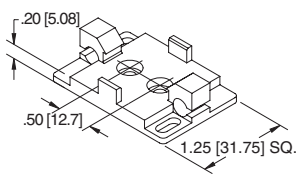
Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

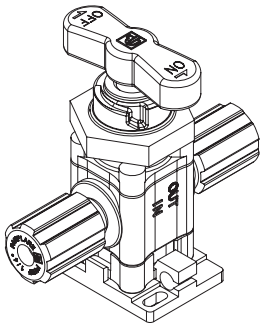
PRESSURE DROP VS. FLOW RATE



Accessories	*Description*
SB-10	PVDF Snap-in Mounting Base. For use with MV-10-XXXX-00 and MV-10-XXXX-10 models only. (Sold separately)







Parker Hannifin Corporation
Partek Operation
Tucson, AZ

MV-11 1/2" Manual 2 Way Valve

Product Overview

The MV-11 PFA 2 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/2" orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Submergible option isolates all valve components from the external environment.	**Valve remains functional while operating in wet or gaseous corrosive environments.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

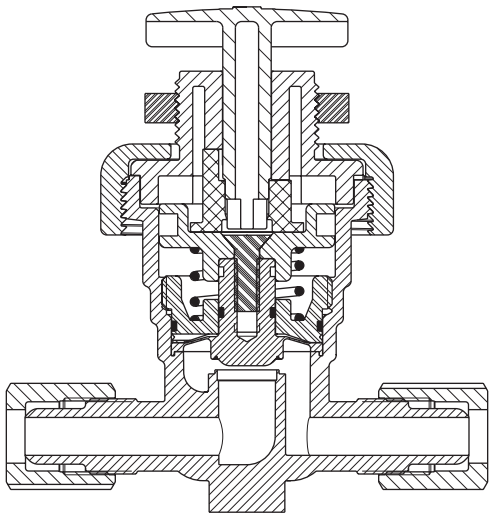
Pressure Ranges

Forward: 27" HG vacuum (913 mbar) to 100 PSIG (7 bar)
Backward: 27" HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)



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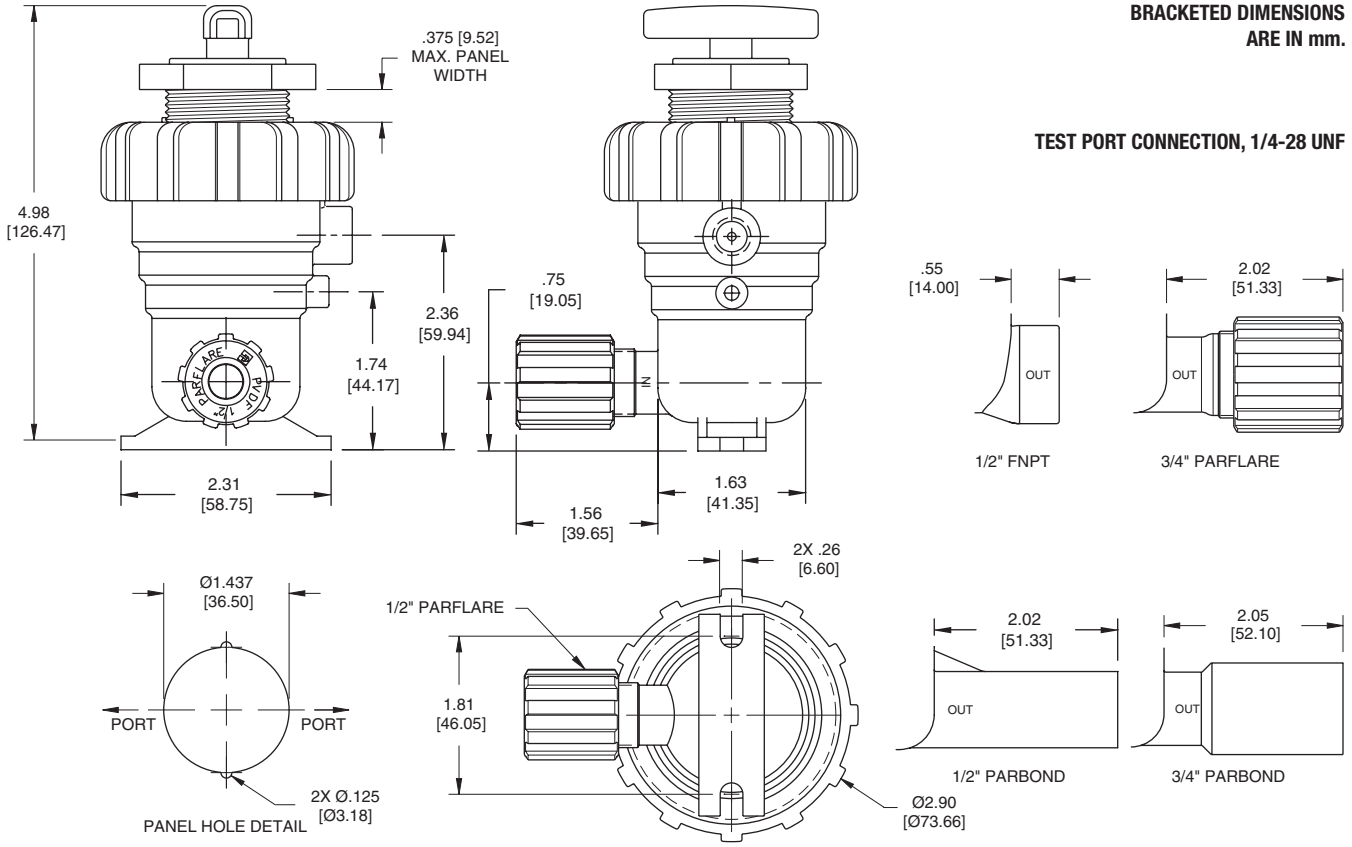
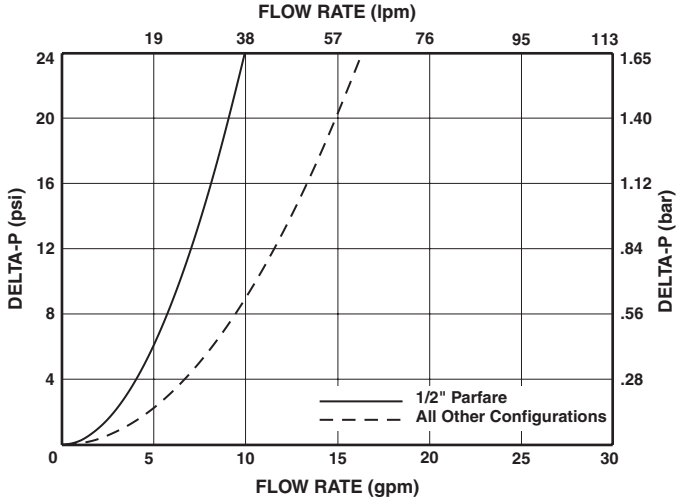


Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
MV-11-001	2.3	32.8	ON/OFF	1/2" Parflare
MV-11-002	3.7	52.8		3/4" Parflare
MV-11-003	3.7	52.8		1/2" Parbond
MV-11-004	3.7	52.8		3/4" Parbond
MV-11-005	3.7	52.8		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



Parker Hannifin Corporation
Partek Operation
Tucson, AZ

MV-11 1/2" Manual 3 Way Valve

Product Overview

The MV-11 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/2" orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Submergible option isolates all valve components from the external environment.	**Valve remains functional while operating in wet or gaseous corrosive environments.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

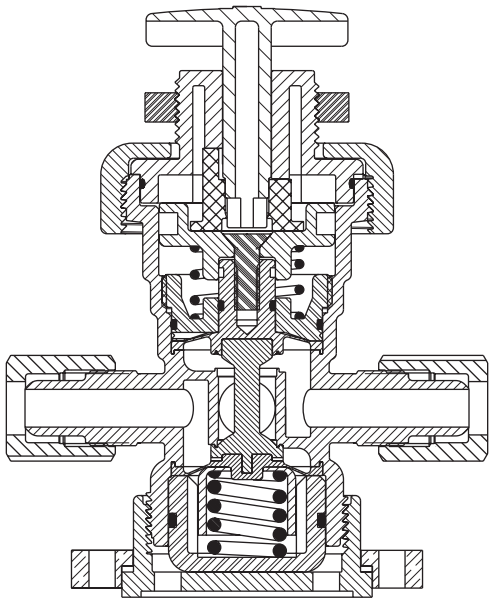
Pressure Ranges

COM to NO:	27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
COM to NC:	27" HG vacuum (913 mbar) to 25 PSIG (1.7 bar) minimum
NC to COM:	27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (17° - 66° C)
Fluid:	0° - 266° F (17° - 130° C)



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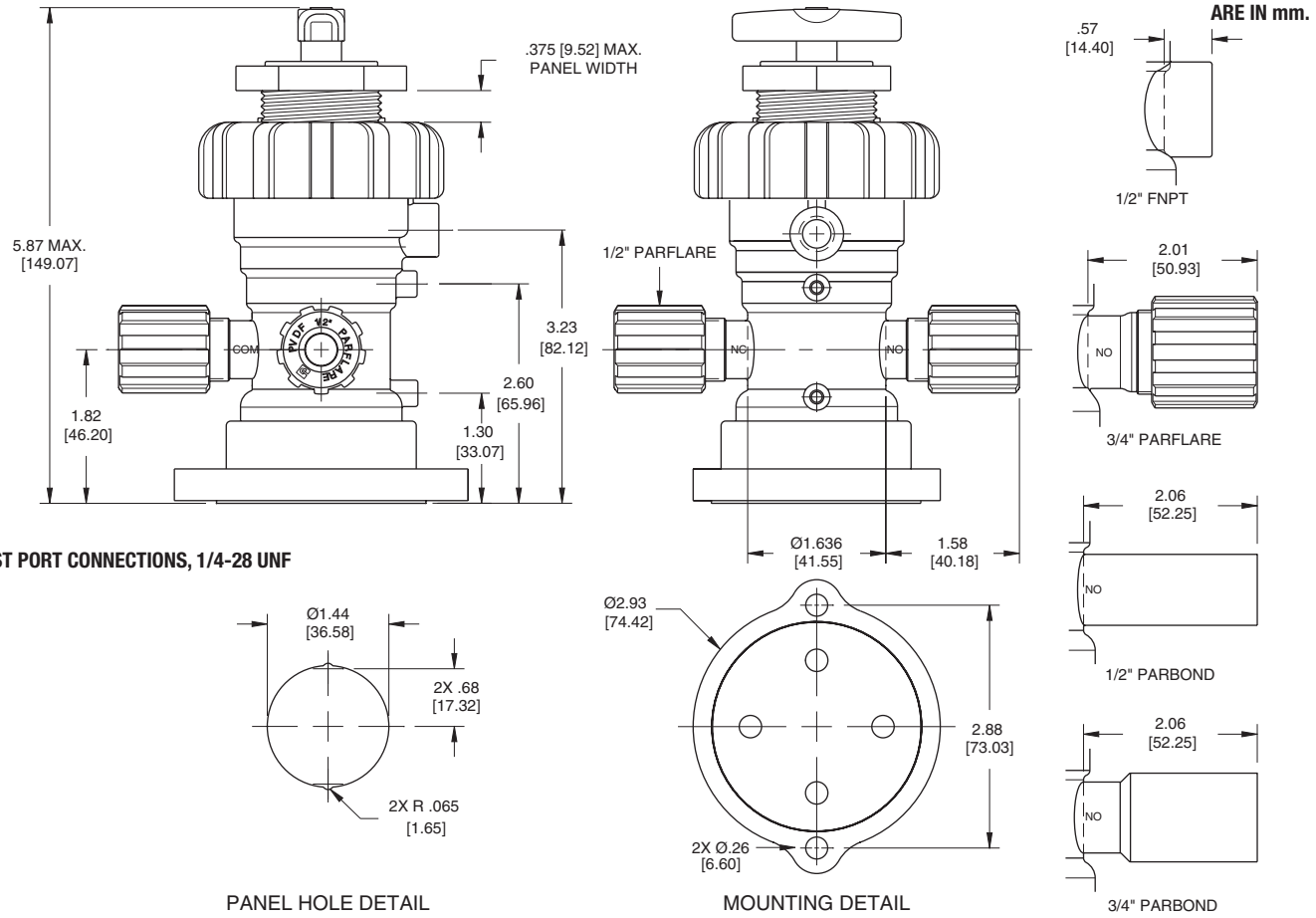
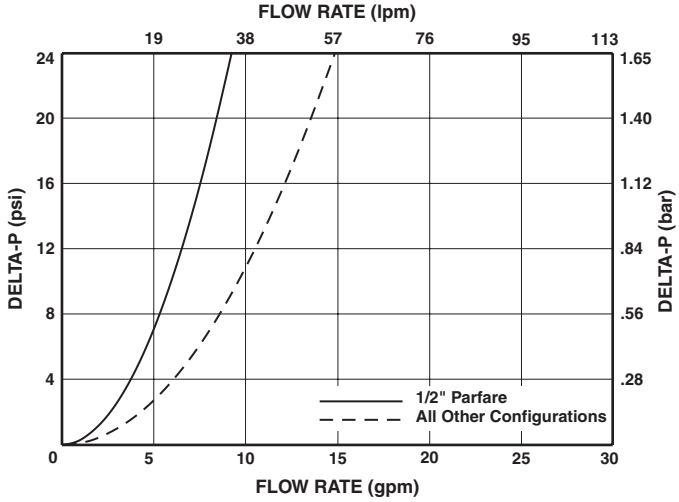
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
MV-11-021	1.9	27.1	3 WAY	1/2" Parflare
MV-11-022	2.8	40.0		3/4" Parflare
MV-11-023	2.8	40.0		1/2" Parbond
MV-11-024	2.8	40.0		3/4" Parbond
MV-11-025	2.8	40.0		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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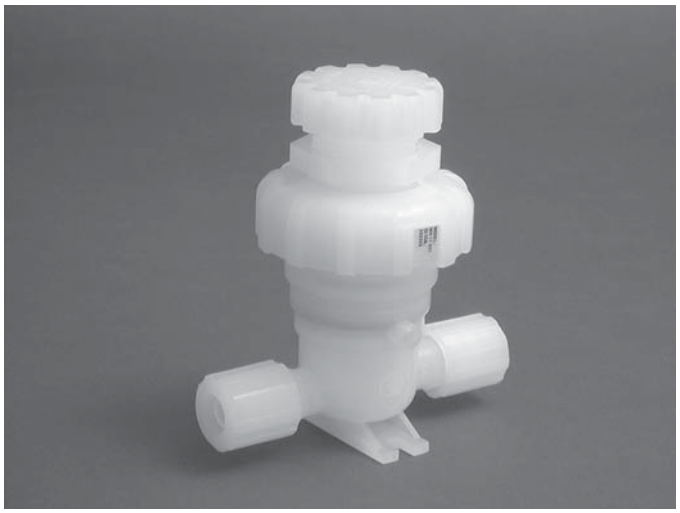
Partek Operation
Tucson, AZ

MV-11 1/2" Manual 2 Way Adjustable Valve

Product Overview

The MV-11 PFA Adjustable Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. Multi-turn capability allows precise flow adjustment. A full 1/2" orifice provides maximum flow capability in a compact package.



Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove diaphragm to body seal assures leak free operation.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Multi-turn operation.	**Precise flow adjustment.**
Removable handle.	**Eliminates need for separate lockout device.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

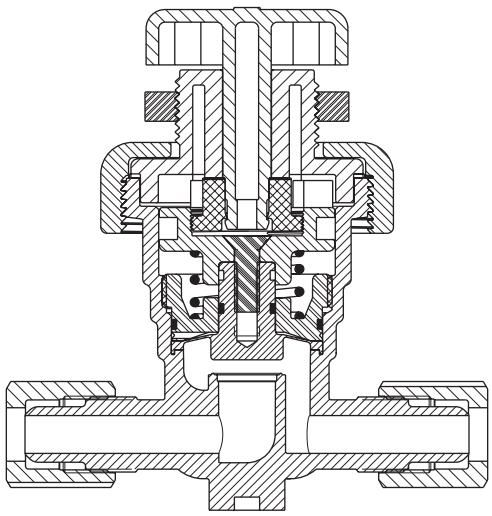
Pressure Ranges

Forward:	27" HG vacuum (913 mbar) to 100 PSIG (7 bar)
Backward:	27" HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (17° - 66° C)
Fluid:	0° - 266° F (17° - 130° C)



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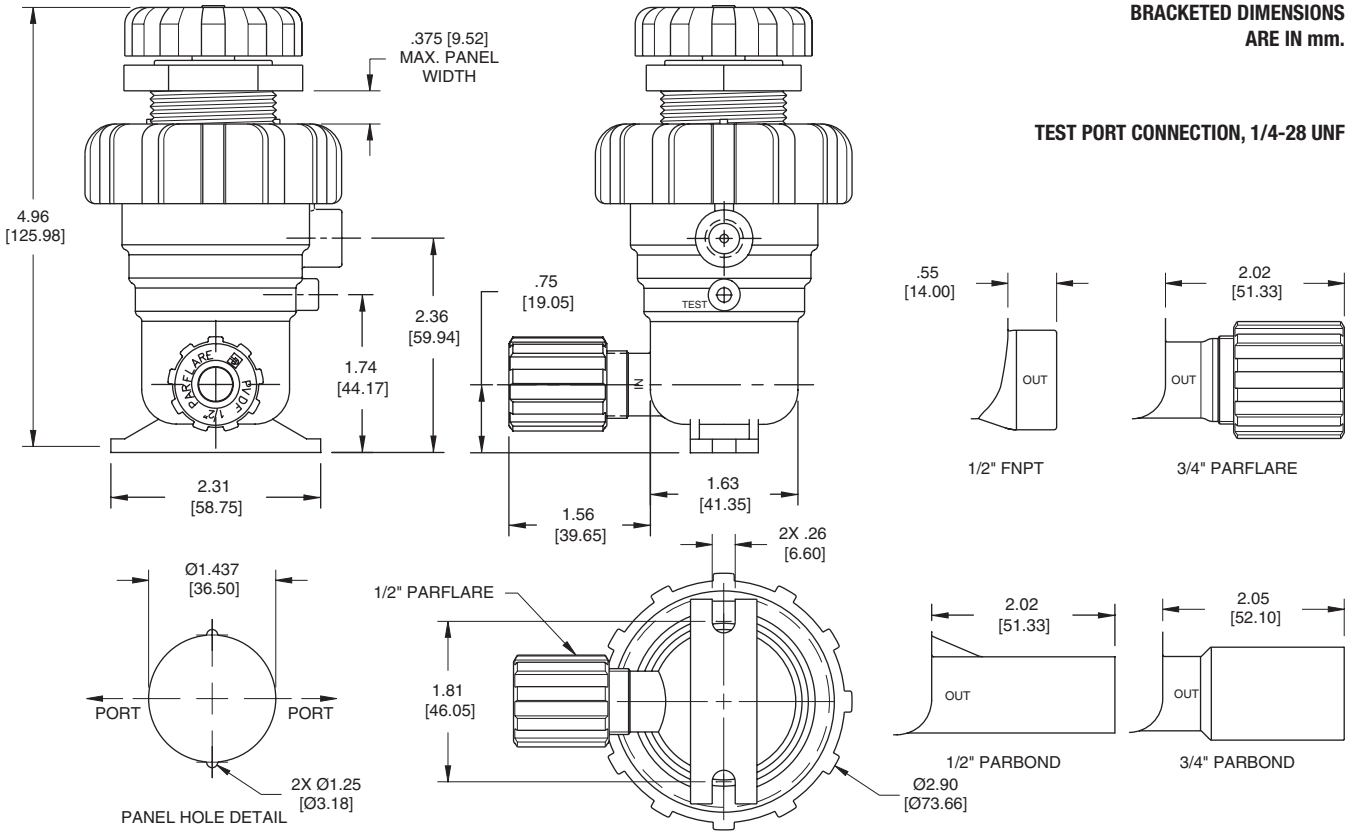
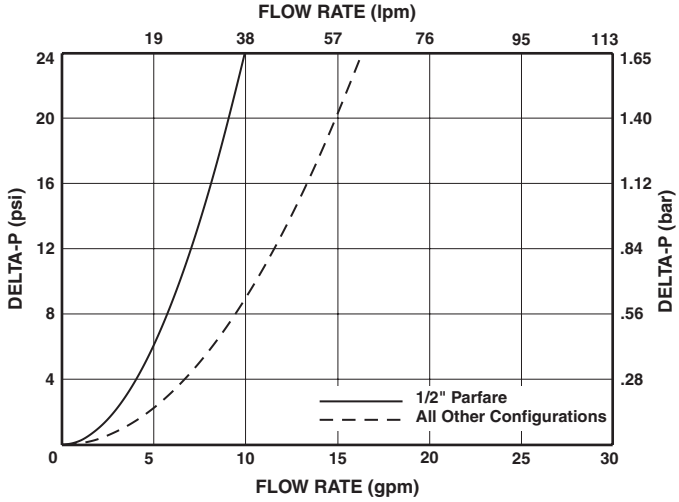


Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
MV-11-201	2.3	32.8	ADJ.	1/2" Parflare
MV-11-202	3.7	52.8		3/4" Parflare
MV-11-203	3.7	52.8		1/2" Parbond
MV-11-204	3.7	52.8		3/4" Parbond
MV-11-205	3.7	52.8		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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Tucson, AZ

MV-12 1” Manual 2 Way Valve

Product Overview

The MV-12 PFA Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve requires three full turns from the fully closed to fully open position. A full 1” orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Submergible option isolates all valve components from the external environment.	**Valve remains functional while operating in wet or gaseous corrosive environments.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

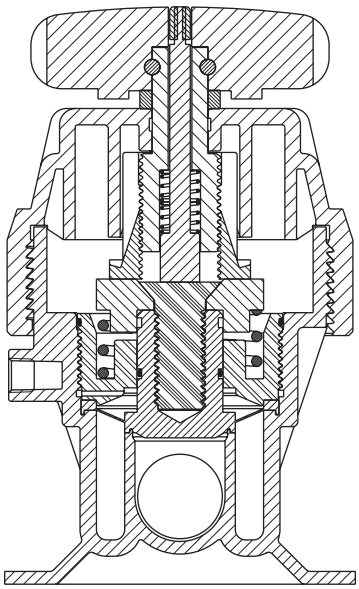
Pressure Ranges

Forward:	27” HG vacuum (913 mbar) to 100 PSIG (7 bar)
Backward:	27” HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

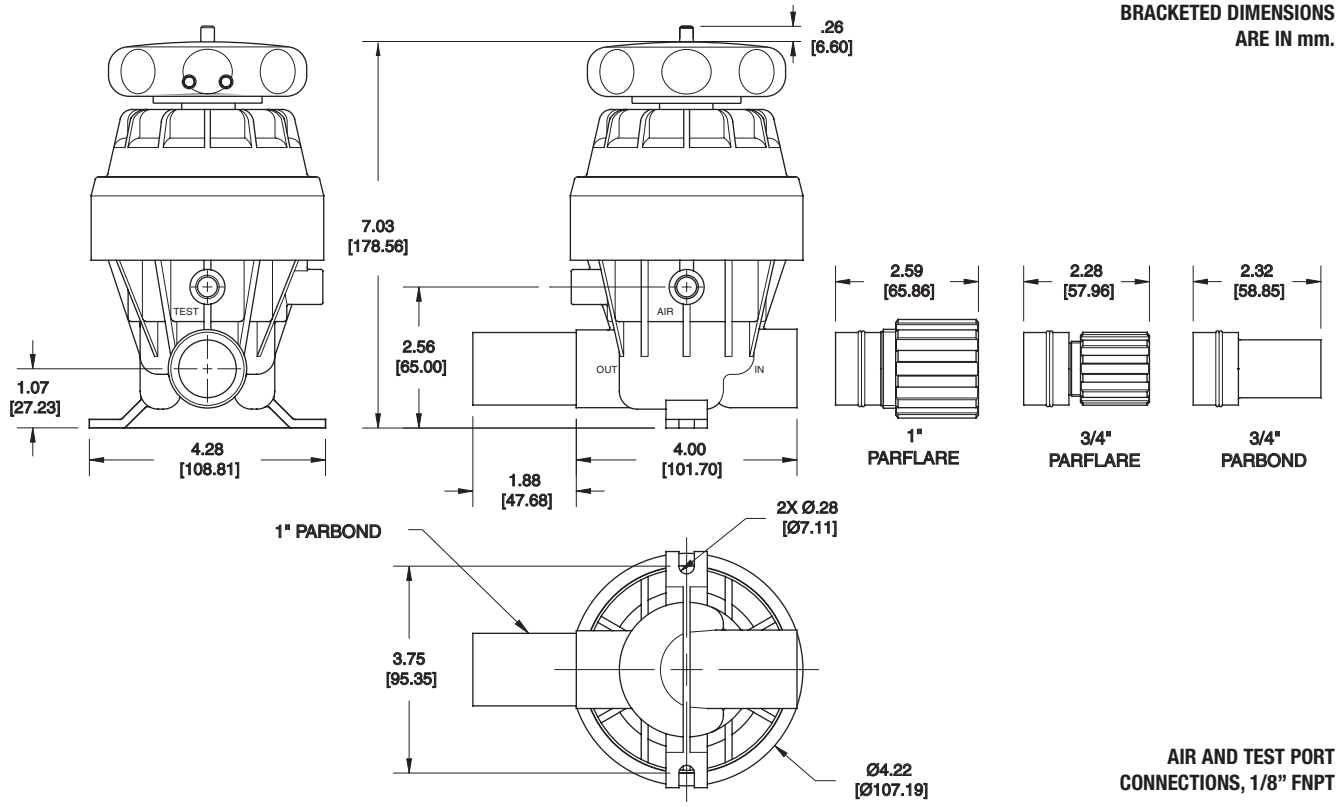
Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



Parker Hannifin Corporation
Partek Operation
Tucson, AZ

BRACKETED DIMENSIONS
ARE IN mm.

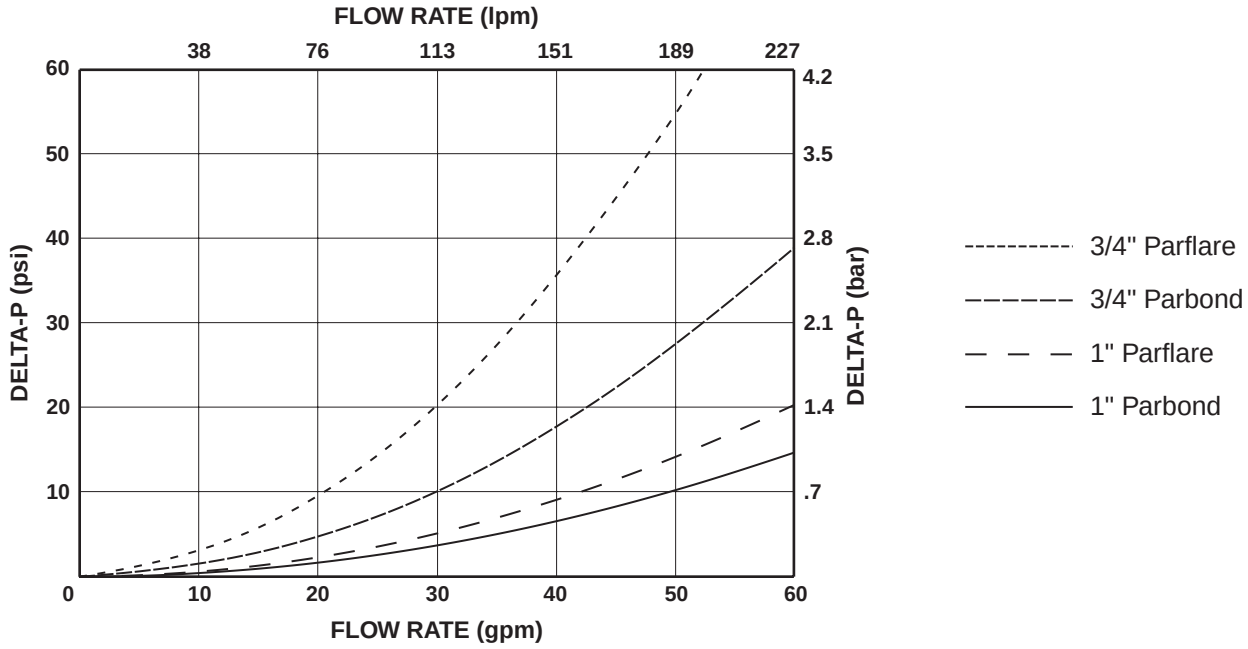


AIR AND TEST PORT
CONNECTIONS, 1/8” FNPT

Part Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
MV-12-001	15.7	224.2	ON/OFF	1” Parbond
MV-12-002	13.3	189.9		1” Parflare
MV-12-003	9.6	142.8		3/4” Parbond
MV-12-004	6.8	142.8		3/4” Parflare

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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Partek Operation
Tucson, AZ

MV-13 Manual Needle Valve

Product Overview

The MV-13 PFA Needle Valve is designed for high purity or aggressive chemical and gas applications. The design utilizes a molded high purity PFA body and stem as the only wetted components. The stem sealing area is precision machined for smooth, consistent flow. A PTFE ferrule assures a leak tight seal between stem and body. A PFA stem stop prevents removal of stem from body during operation. The MV-13 is available in straight through and angle configurations, several orifice sizes, and numerous end connections.

Features

One piece PFA stem/ handle and bodies.

PFA stem stop.

Angle and straight through configurations, with numerous end configurations including Parflare available.

Benefits

High strength and corrosion resistance.

Safer operation.

Reduces connections, mounting space, and overall cost.

Specifications

Materials of Construction

Wetted: PFA, PTFE
Non-wetted: PFA, ETFE, PVDF

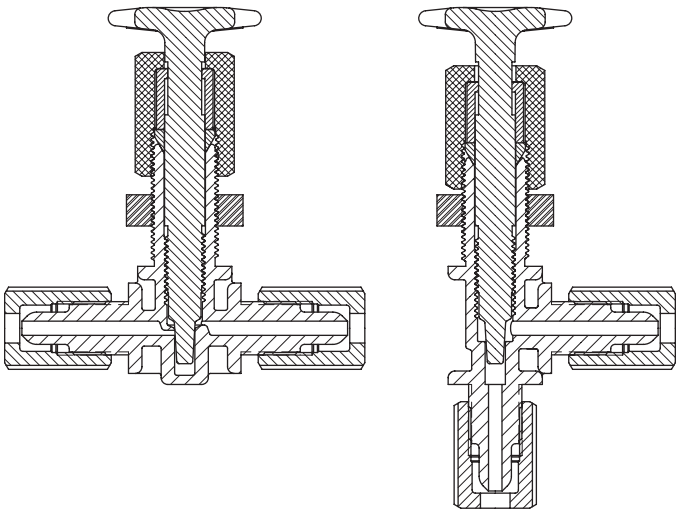
Pressure Ranges

27” HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 212° F (17° - 100° C)
Fluid: 0° - 266° F (17° - 130° C)



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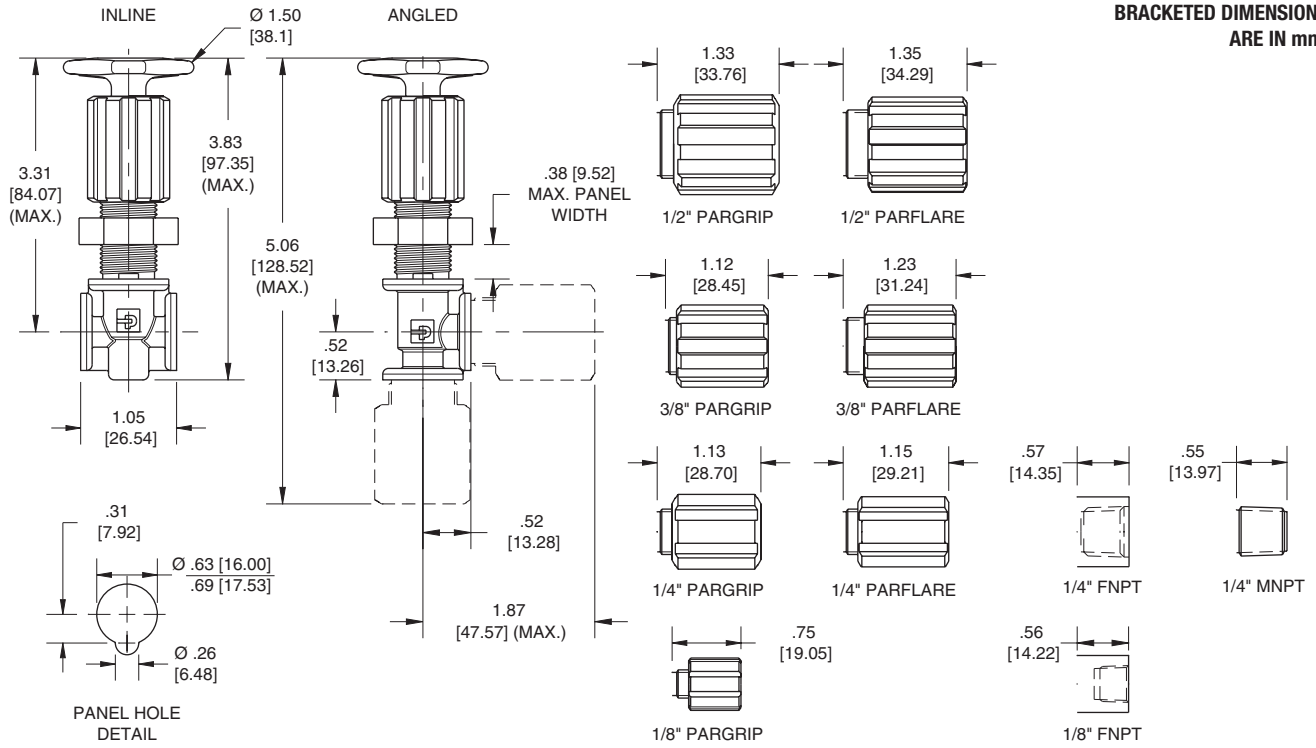
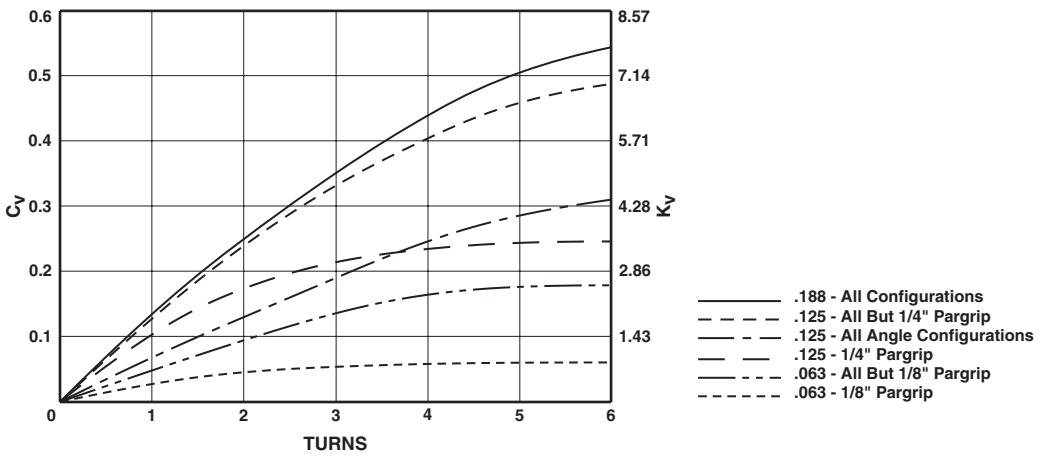
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Orifice Size*	*Inlet / Outlet Port Configuration*	*Flow Configuration*
MV-13-100	.063	1/8" Pargrip X 1/8" Pargrip	Straight
MV-13-104	.063	1/4" Parflare X 1/4" Parflare	
MV-13-105	.063	1/4" MNPT X 1/4" Parflare	
MV-13-120	.125	1/4" Pargrip X 1/4" Pargrip	
MV-13-124	.125	3/8" Parflare X 3/8" Parflare	
MV-13-125	.125	1/2" Parflare X 1/2" Parflare	
MV-13-126	.125	1/8" FNPT X 1/8" FNPT	
MV-13-163	.188	3/8" Pargrip X 3/8" Pargrip	
MV-13-166	.188	1/2" Pargrip X 1/2" Pargrip	
MV-13-170	.188	1/4" FNPT X 1/4" FNPT	
MV-13-222	.125	1/4" Parflare X 1/4" Parflare	Angle
MV-13-223	.125	1/4" FNPT X 1/4" FNPT	
MV-13-225	.125	3/8" Parflare X 3/8" Parflare	

Parflare and Pargrip model numbers are supplied with PFA nuts.

C_V / K_V vs. TURNS



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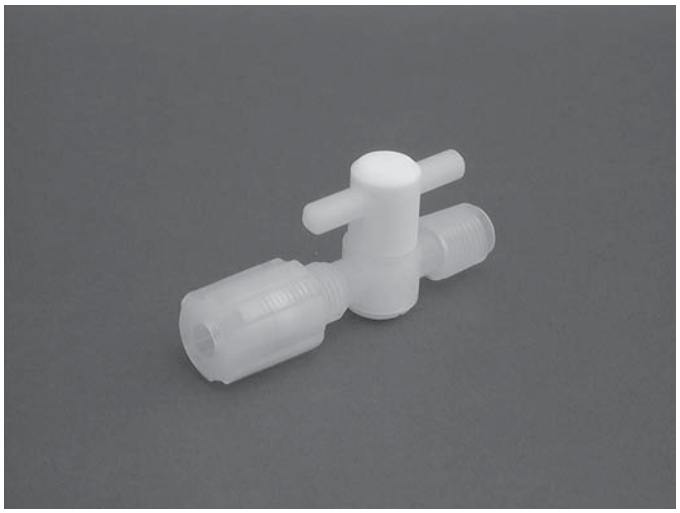
MV-14 Manual 2 Way Stop Cock Valve

Product Overview

The MV-14 PFA 2 Way Stop Cock Valve is designed for use in high purity semiconductor applications. The design utilizes a molded high purity PFA body, and a machined PTFE stem. The press-fit stem assures a leak tight seal between it and the body during operation. Valve operates with a quick 90° turn operation and has a full 1/8" orifice.



Features	Benefits
One piece precision machined stem and molded high purity PFA body.	**Maintains system purity.**
All components made of chemical resistant materials.	**Suitable for use in corrosive environments.**
Numerous end configurations, including Parflare available.	**Allows direct installation, minimizing additional connections, reducing cost.**

Specifications

Materials of Construction

Wetted: PFA, PTFE
Non-wetted: PFA, PVDF

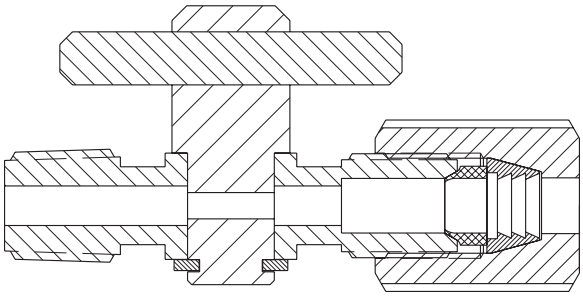
Pressure Ranges

0 to 60 PSIG (4.1 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)



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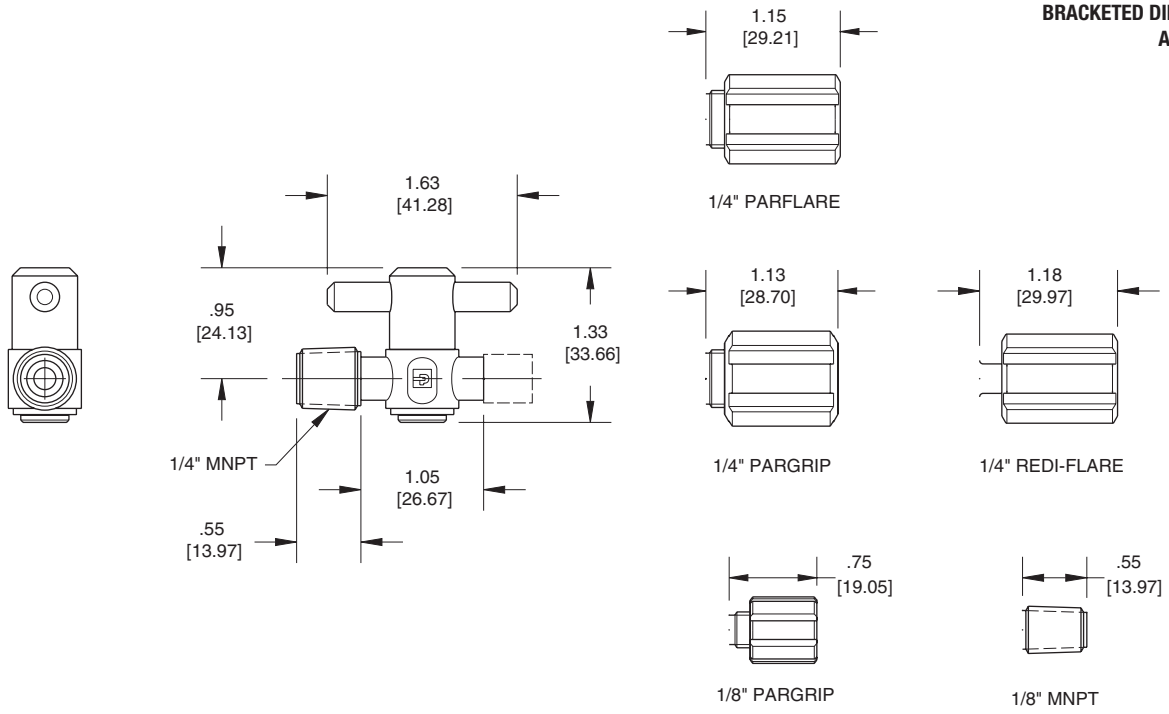
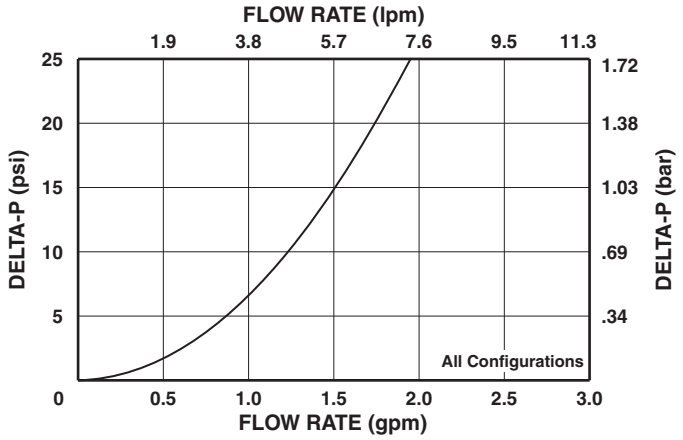
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Cv*	*Kv*	*Flow Configuration*	*Inlet Port*	*Outlet Port*
MV-14-003	.27	3.85	ON/OFF	1/4" Pargrip	1/4" Pargrip
MV-14-004	.27	3.85		1/4" Pargrip	1/8" MNPT
MV-14-005	.27	3.85		1/4" Pargrip	1/4" MNPT
MV-14-006	.27	3.85		1/4" MNPT	1/4" MNPT
MV-14-007	.27	3.85		1/4" Parflare	1/4" Parflare
MV-14-015	.27	3.85		1/4" Parflare	1/4" MNPT
MV-14-016	.27	3.85		1/4" Parflare	1/4" Redi-flare
MV-14-018	.27	3.85		1/8" Pargrip	1/8" Pargrip

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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MV-16 3/4” Manual PFA 2 Way Valve

Product Overview

The MV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16’s multi-turn capability allows precise flow adjustment. A full 3/4” orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

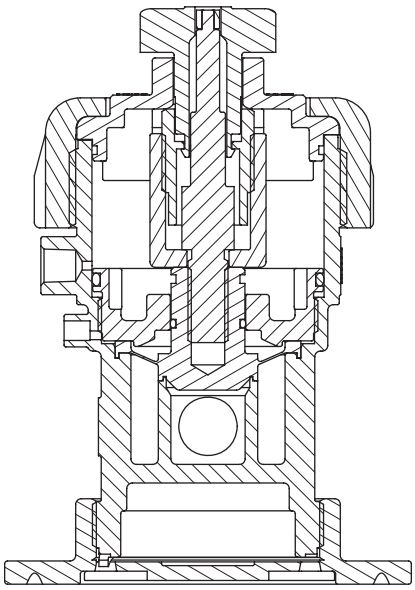
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



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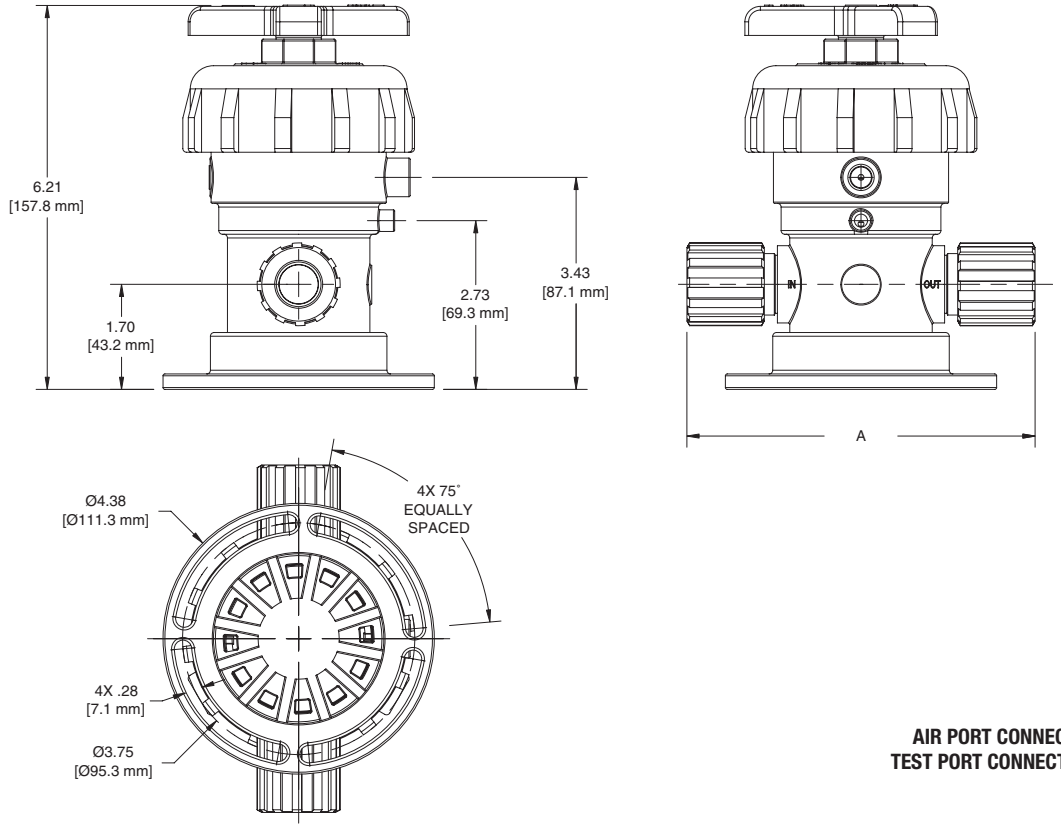
BRACKETED DIMENSIONS ARE IN mm.

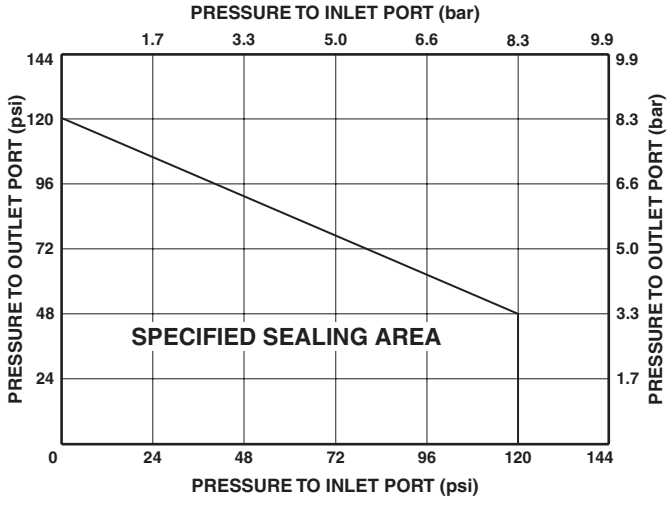


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

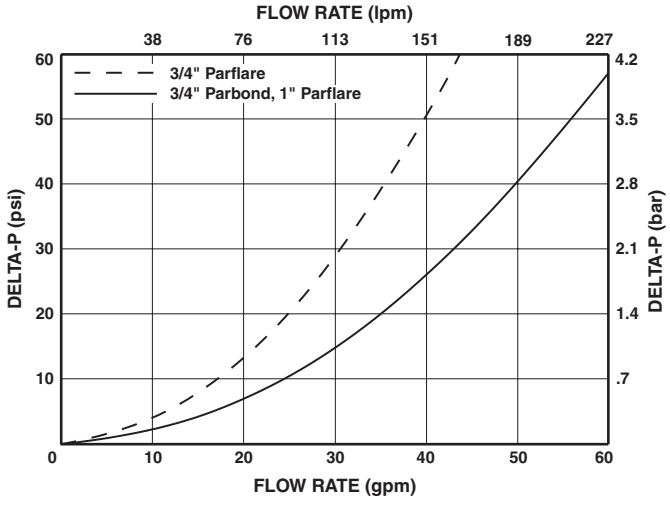
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Dimension in [mm] A*
MV-16-0612	5.8	82.7	ON/OFF	3/4" Parflare	5.54 [140.72]
MV-16-0612-01	5.8	82.7		3/4" Parflare Long	6.48 [164.59]
MV-16-0616	7.9	112.6		1" Parflare*	9.12 [231.65]
MV-16-0712	7.9	112.6		3/4" Parbond	5.90 [149.86]

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.
*Ends are fused on.

CRACKING PRESSURE



PRESSURE DROP VS. FLOW RATE



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Partek Operation
Tucson, AZ

MV-16 3/4" Manual PFA 3 Way Valve

Product Overview

The MV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16's multi-turn capability allows precise flow adjustment. A full 3/4" orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

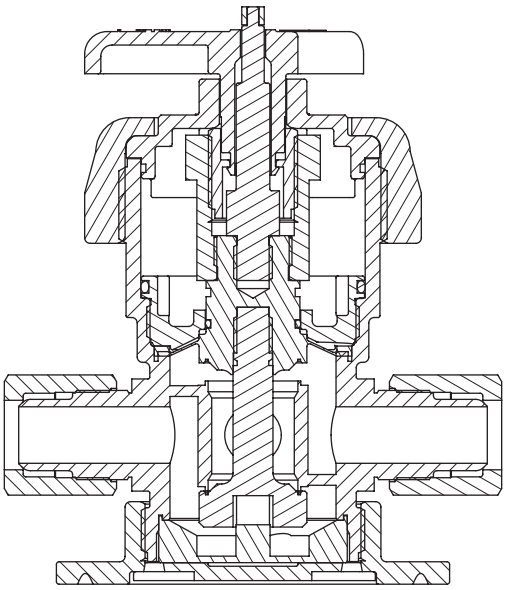
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.

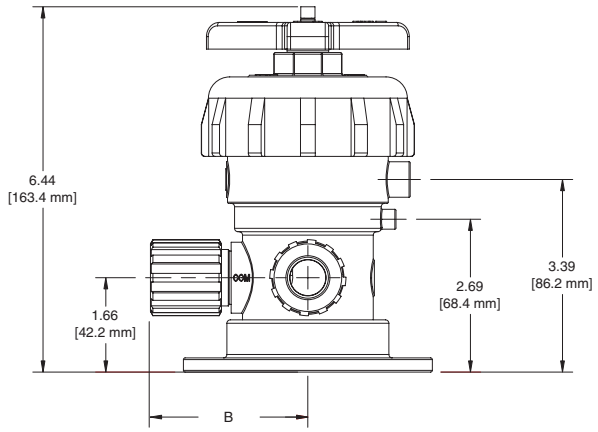
Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

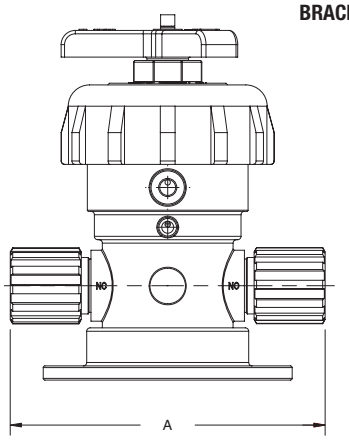
Temperature Ranges

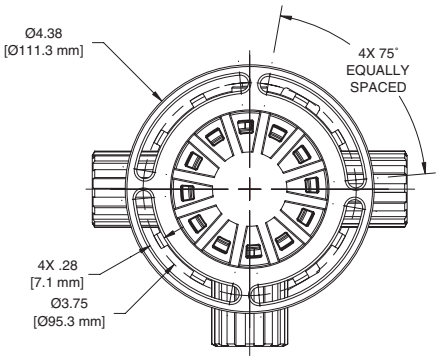
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



BRACKETED DIMENSIONS ARE IN mm.





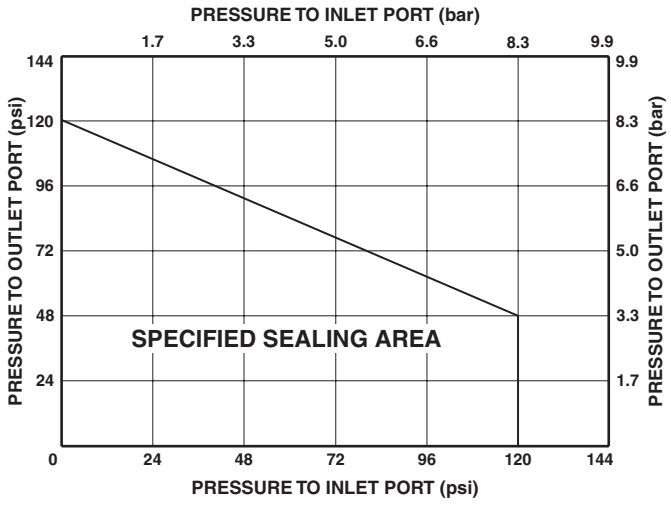


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

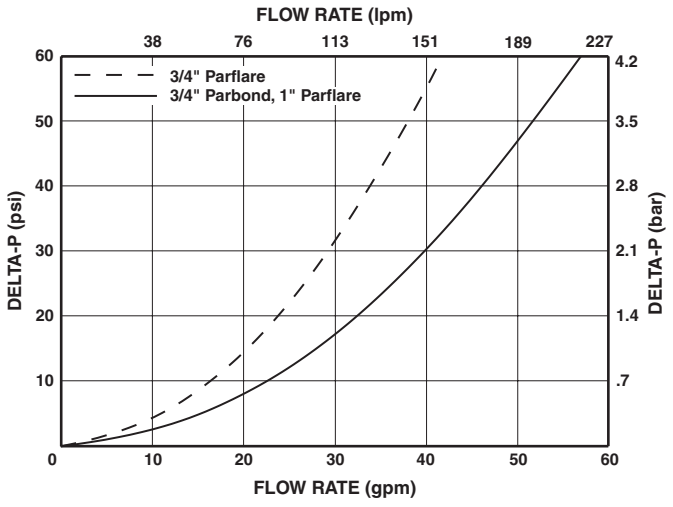
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Dimensions in [mm]*	
					A	*B*
MV-16-3612	5.4	77.0	3 WAY COM NC NO	3/4" Parflare	5.54 [140.72]	2.81 [71.37]
MV-16-3612-01	5.4	77.0		3/4" Parflare Long	6.48 [164.59]	2.81 [71.37]
MV-16-3616	7.3	104.1		1" Parflare*	9.12 [231.65]	4.56 [115.82]
MV-16-3712	7.3	104.1		3/4" Parbond	5.90 [149.86]	2.95 [74.93]
MV-16-4612	5.4	77.0	3 WAY Reversed Ports COM NO NC	3/4" Parflare	5.54 [140.72]	2.81 [71.37]
MV-16-4612-01	5.4	77.0		3/4" Parflare Long	6.48 [164.59]	2.81 [71.37]
MV-16-4616	7.3	104.1		1" Parflare*	9.12 [231.65]	4.56 [115.82]
MV-16-4712	7.3	104.1		3/4" Parbond	5.90 [149.86]	2.95 [74.93]

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.
*Ends are fused on.

CRACKING PRESSURE



PRESSURE DROP VS. FLOW RATE



Parker Hannifin Corporation
Partek Operation
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MV-16 3/4" Manual PFA Sampling Valve

Product Overview

The MV-16 PFA sampling valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16's multi-turn capability allows precise flow adjustment. The valve incorporates a full flow through port with a low dead volume down leg.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**
Full flow through port.	**Reduced pressure drop.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PVDF, Viton, PTFE coated SS spring

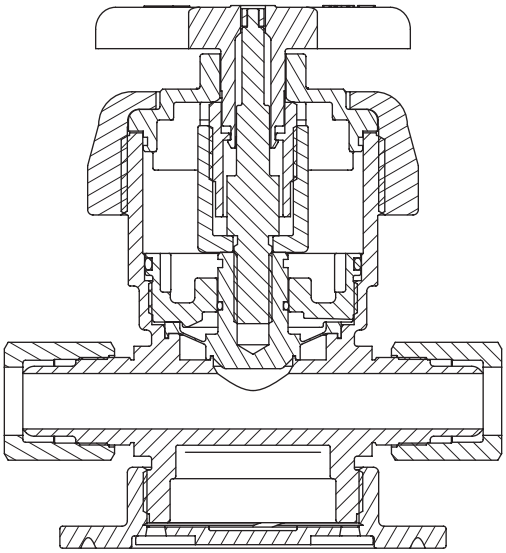
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.

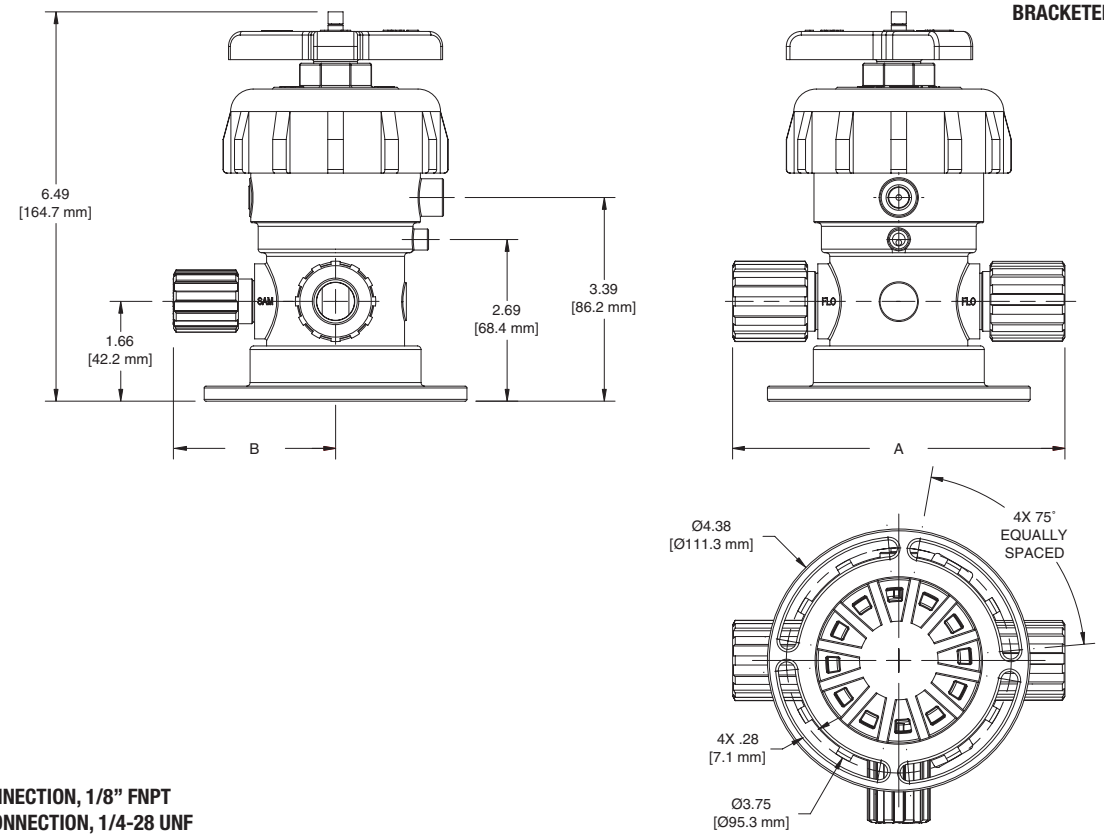
Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



BRACKETED DIMENSIONS ARE IN mm.

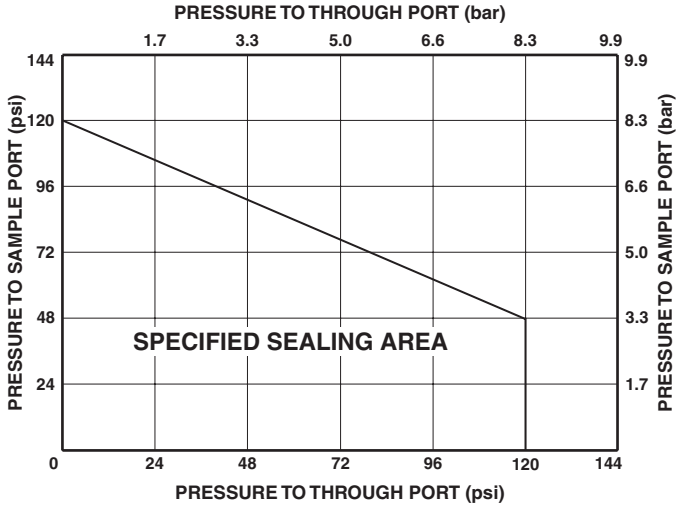


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

Model Number	Through Port		Sample Port		Through Port	Sample Port	Dimensions in [mm]	
	Cv	Kv	Cv	Kv			A	B
MV-16-5612-608	13.0	185.4	2.3	32.8	3/4" Parflare	1/2" Parflare	5.54 [140.72]	2.71 [68.83]
MV-16-5612-612	13.0	185.4	4.6	65.6	3/4" Parflare	3/4" Parflare	5.54 [140.72]	2.81 [71.37]
MV-16-5612-712	13.0	185.4	6.9	98.7	3/4" Parflare	3/4" Parbond	5.54 [140.72]	2.95 [74.93]
MV-16-5712-608	25.2	359.92	2.3	32.8	3/4" Parbond	1/2" Parflare	5.90 [149.86]	2.71 [68.83]
MV-16-5712-612	25.2	359.92	4.6	65.6	3/4" Parbond	3/4" Parflare	5.90 [149.86]	2.81 [71.37]
MV-16-5712-712	25.2	359.92	6.9	98.7	3/4" Parbond	3/4" Parbond	5.90 [149.86	2.95 [74.93]

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

CRACKING PRESSURE



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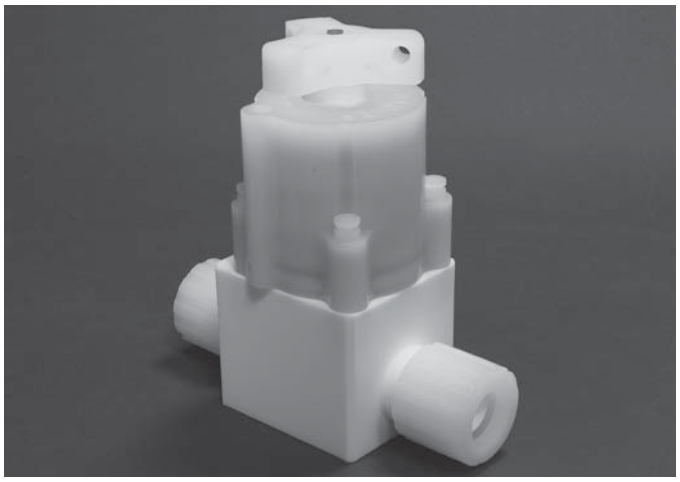
MV-20 1/4" - 1" Manual PTFE Slurry Valve

Product Overview

The MV-20 slurry valve is designed for use slurry applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. The valve is offered in 3 orifice sizes (1/4", 1/2" and 1") and port sizes ranging from 1/4" to 1 1/4".



Features	Benefits
Fully swept open bowl diaphragm seat area.	**Minimizes fluid shear and smooth flow transition.**
Self draining design.	**Minimizes area for entrapment and stagnation of media.**
High load point seat seal.	**Improves sealing mechanism for aggressive chemicals, deionized water and abrasive slurry media.**
	Minimizes particle contribution of valve.
Angled and rounded internal flow path.	**Provides faster purging and cleaning of valve.**
	Less pressure drop allows for lower pressure requirements upstream.
	Improves fluid flow dynamics.
One piece precision machined diaphragm manufactured from modified PTFE.	**Improves cycle life, less shear than standard PTFE material, lower replacement costs, less downtime.**
Evenly distributed seat sealing forces.	**Minimized diaphragm and valve seat strain.**
	Stabilizes valve back pressure capability.
Maximized diaphragm thickness.	**Minimizes potential for permeation while maximizing cycle life.**

Specifications

Materials of Construction

Wetted: PTFE, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

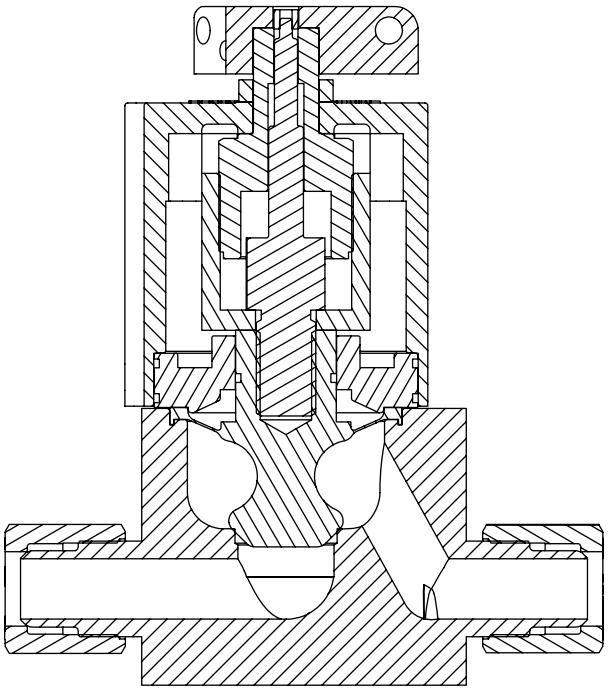
Pressure Ranges

1/4" Orifice: 27" HG vacuum (913 mbar) - 80 PSIG (5.5 bar)
1/2" Orifice: 27" HG vacuum (913 mbar) - 100 PSIG (7 bar)
1" Orifice: 27" HG vacuum (913 mbar) - 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



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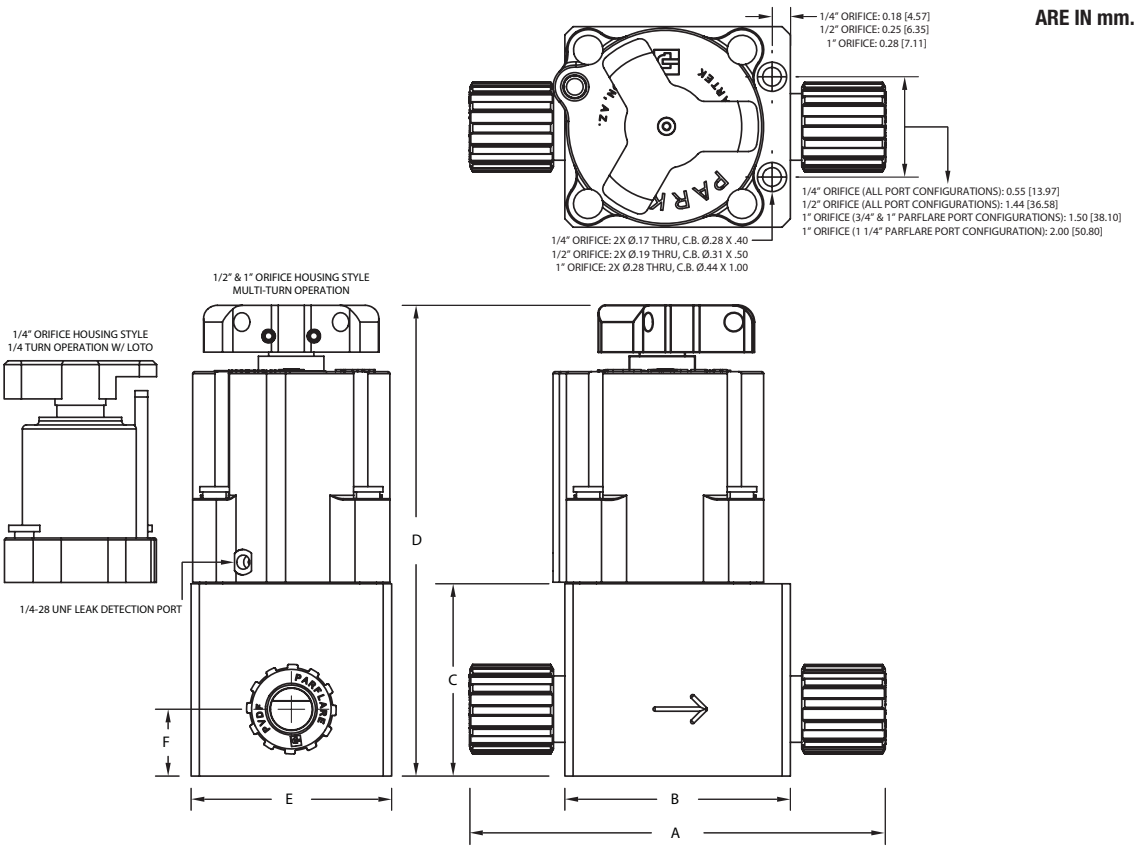
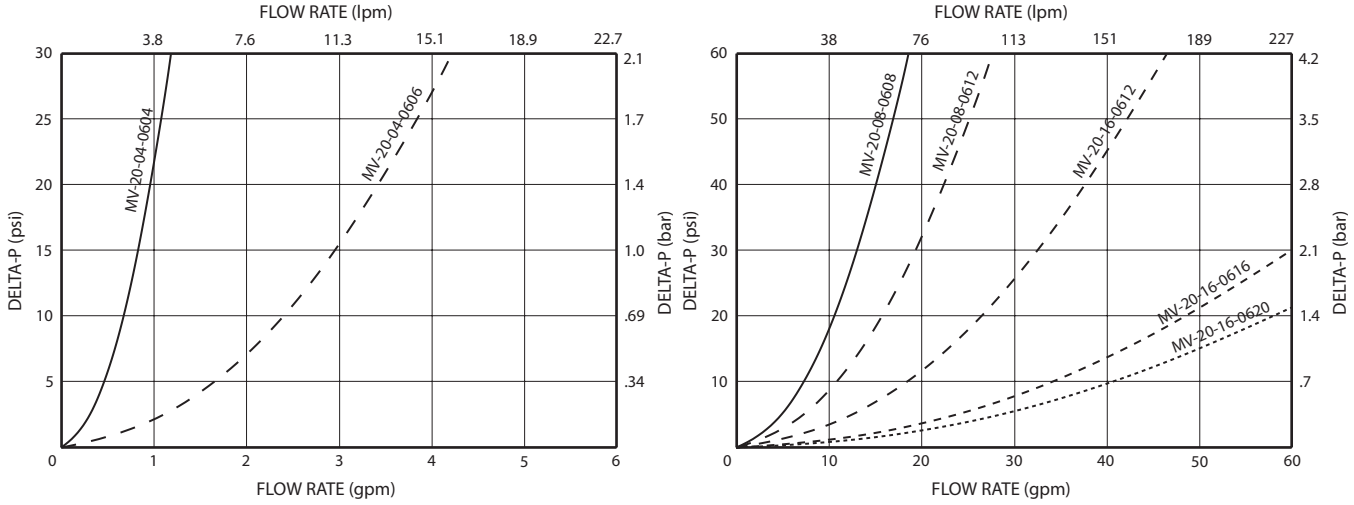
BRACKETED DIMENSIONS ARE IN mm.



Part Number	Cv	Kv	Body Size	Valve Type	Port Configuration	A		B		C		D		E		F	
						inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
MV-20-04-0604	.20	2.8	1/4”	1/4 TURN LOTO	1/4” Parflare	3.80	96.52	1.50	38.10	1.15	29.21	2.91	73.91	1.25	31.75	0.50	12.70
MV-20-04-0606	.76	10.8	1/4”		3/8” Parflare	3.96	100.58	1.50	38.10	1.15	29.21	2.91	73.91	1.25	31.75	0.50	12.70
MV-20-08-0608	2.4	34.2	1/2”	MULTI-TURN	1/2” Parflare	5.20	132.08	2.50	63.50	1.80	45.72	5.04	128.02	2.00	50.80	0.78	19.81
MV-20-08-0612	3.9	55.8	1/2”		3/4” Parflare	5.35	135.89	2.50	63.50	2.00	50.80	5.24	133.10	2.00	50.80	0.83	20.96
MV-20-16-0612	6.4	91.5	1”		3/4” Parflare	6.22	157.99	3.38	85.85	2.88	73.15	7.05	179.07	3.00	76.20	1.00	25.40
MV-20-16-0616	10.9	155.4	1”		1” Parflare	6.98	177.29	3.38	85.85	2.88	73.15	7.05	179.07	3.00	76.20	1.00	25.40
MV-20-16-0620	13.5	192.9	1”		1 1/4” Parflare	8.07	204.98	3.75	95.25	3.25	82.55	7.43	188.72	3.00	76.20	1.25	31.75

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number. Contact factory for Pillar end connections.

PRESSURE DROP VS. FLOW RATE

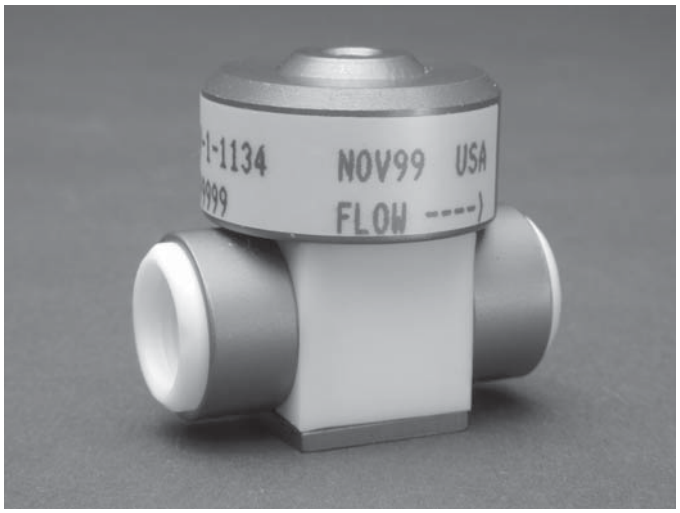


Parker Hannifin Corporation
Partek Operation
Tucson, AZ

PV-1 Miniature Pneumatic Valve

Product Overview

The PV-1 PTFE Miniature Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical systems. The design utilizes a machined modified PTFE body, seat and diaphragm ensuring excellent flexibility and long life. The valve is available in 2 and 3 way configurations. It is ideal for low flow and small dose injection applications.



Features

Precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seal for positive diaphragm to body seal.

Compact design actuator works on as little as 20 psi.

Benefits

High cycle life.

Lower replacement costs.

Less downtime.

Isolates media from actuator.

Ease of installation and maintenance.

Specifications

Materials of Construction

Wetted:	PTFE, Modified PTFE
Non-wetted:	Anodized Aluminum, SS, Nitrile

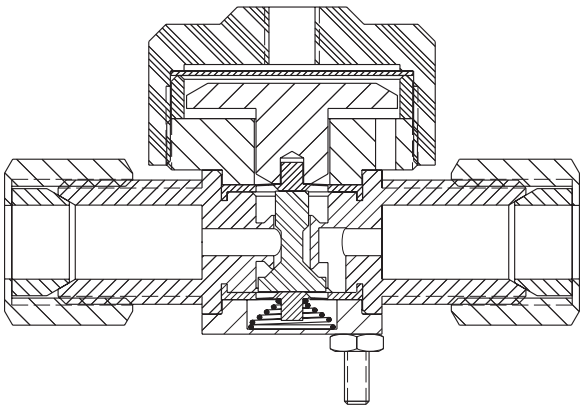
Pressure Ranges

Forward:	25” HG vacuum (846 mbar) to 20 PSIG (1.4 bar)
Back:	25” HG vacuum (846 mbar) to 20 PSIG (1.4 bar)
Actuator:	20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	-60° - 212° F (-51° - 100° C)
Fluid:	-60° - 400° F (-51° - 204° C)



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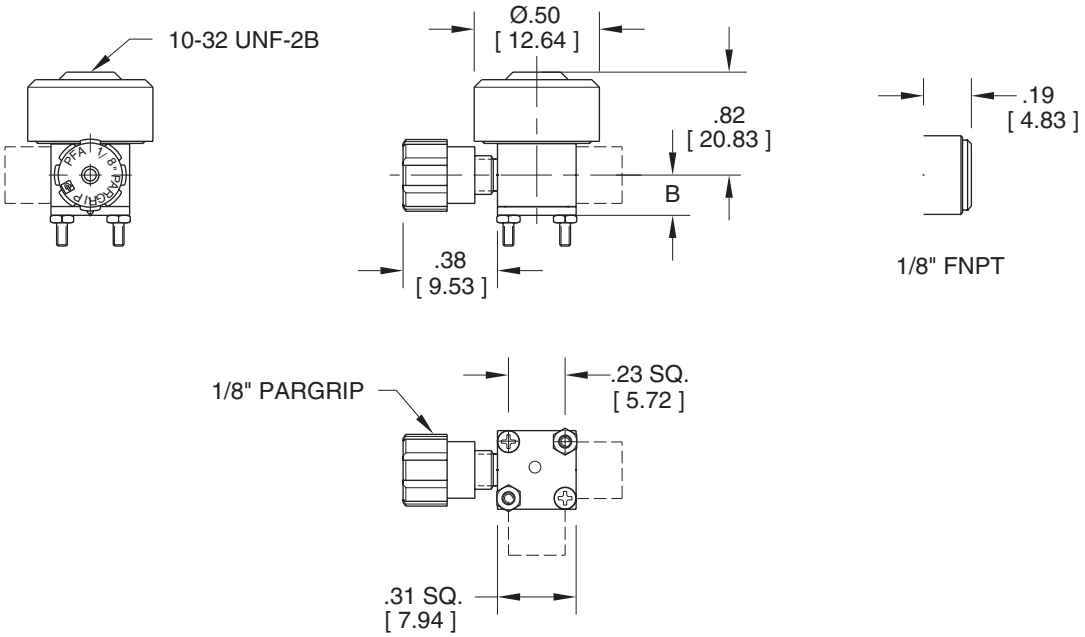
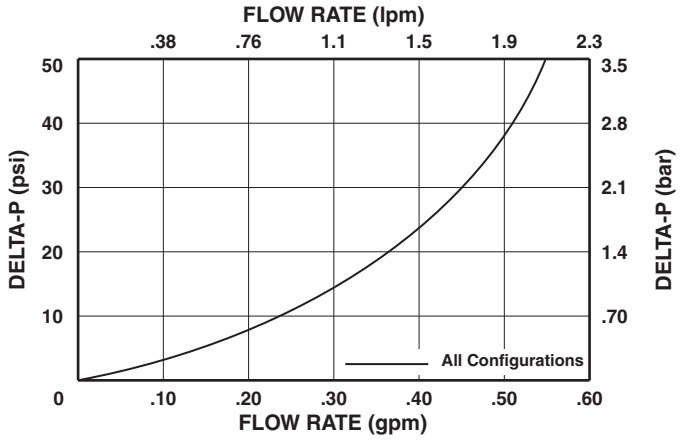
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Cv*	*Kv*	*Flow Configuration*	*Orifice Size*	*Port Configuration*	*Dimension B*
PV-1-1134	.08	1.1	NC	.094	1/8" FNPT	.38 [9.65]
PV-1-1334-03	.08	1.1	3 WAY	.094	1/8" FNPT	.38 [9.65]
PV-1-2134	.08	1.1	NC	.094	1/8" Pargrip	.32 [8.13]
PV-1-2334-03	.08	1.1	3 WAY	.094	1/8" Pargrip	.32 [8.13]

PRESSURE DROP VS. FLOW RATE



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PV-10 1/4” Pneumatic 2 Way Valve

Product Overview

The PV-10 PFA Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.

Features

One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

PVDF coated stainless steel spring.

Benefits

High cycle life.

Lower replacement costs.

Less downtime.

Reduces effects of corrosive environments.

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

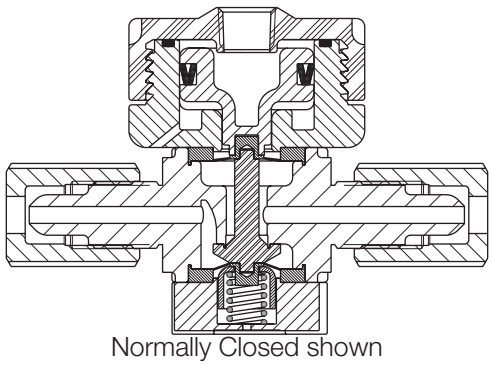
Pressure Ranges

Forward:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Back:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Actuator:	20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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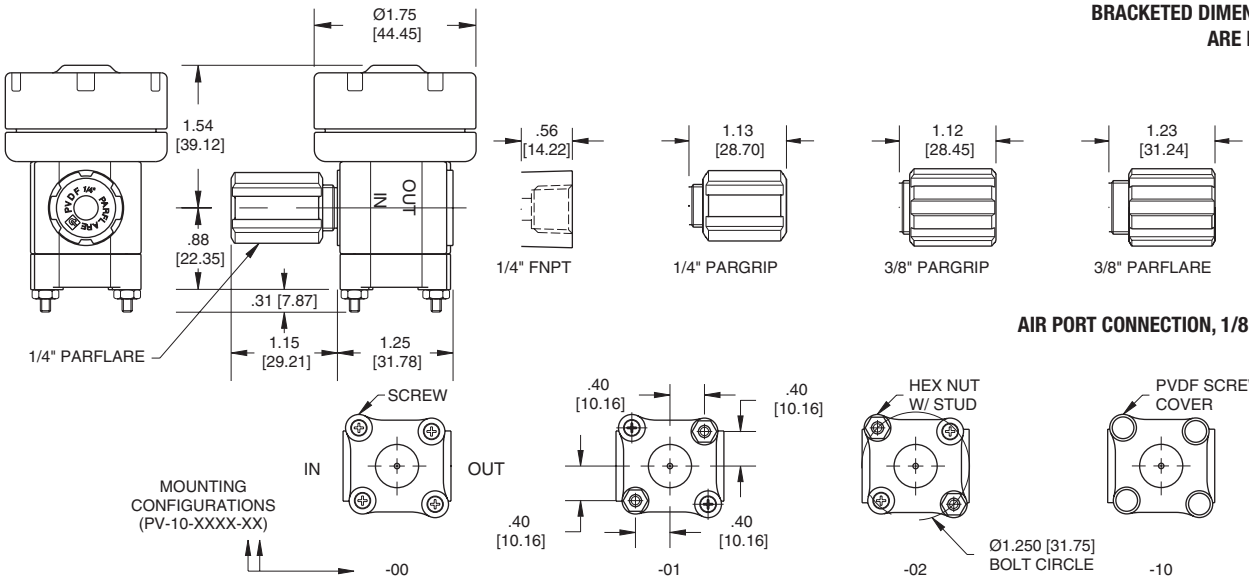
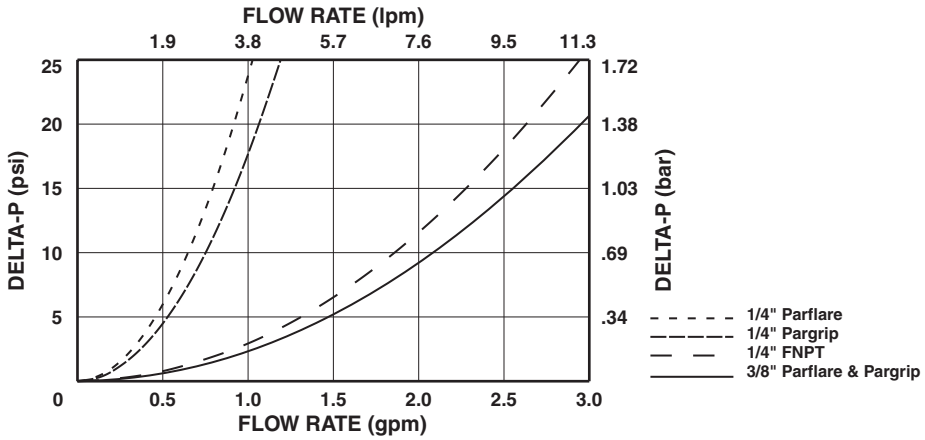
BRACKETED DIMENSIONS ARE IN mm.



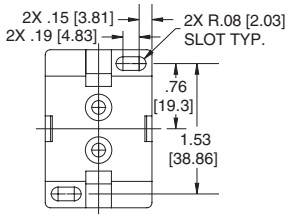
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Mounting Configuration-XX (Depicted Above)*
PV-10-1144-XX	.60	8.6	NC	1/4" FNPT	00 = Screw 01 = Screw/Stud .80 Square 02 = Screw/Stud Ø1.25 Bolt Circle 10 = PVDF Screw Covers
PV-10-1244-XX	.60	8.6	NO	1/4" FNPT	
PV-10-2134-XX	.24	3.4	NC	1/4" Pargrip	
PV-10-2234-XX	.24	3.4	NO	1/4" Pargrip	
PV-10-2146-XX	.62	8.8	NC	3/8" Pargrip	
PV-10-2246-XX	.62	8.8	NO	3/8" Pargrip	
PV-10-6124-XX	.20	2.8	NC	1/4" Parflare	
PV-10-6224-XX	.20	2.8	NO	1/4" Parflare	
PV-10-6146-XX	.62	8.8	NC	3/8"" Parflare	
PV-10-6246-XX	.62	8.8	NO	3/8"" Parflare	

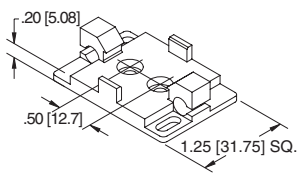
Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

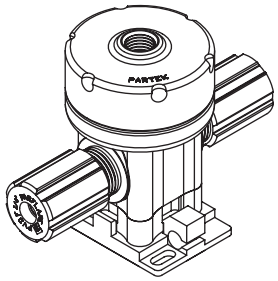
PRESSURE DROP VS. FLOW RATE



Accessories	*Description*
SB-10	PVDF Snap-in Mounting Base. For use with PV-10-XXXX-00 and PV-10-XXXX-10 models only. (Sold separately)







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PV-10 1/4” Pneumatic 3 Way Valve

Product Overview

The PV-10 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	High cycle life. Lower replacement costs. Less downtime.
PVDF coated stainless steel springs.	Reduces effects of corrosive environments.

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

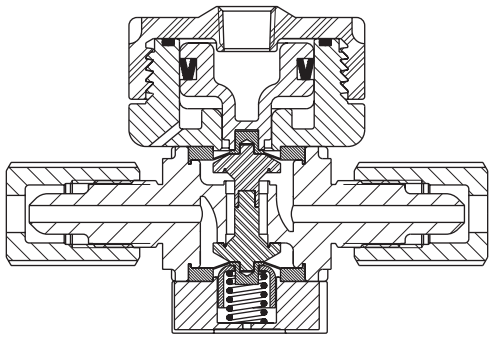
Pressure Ranges

Forward:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Back:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Actuator:	20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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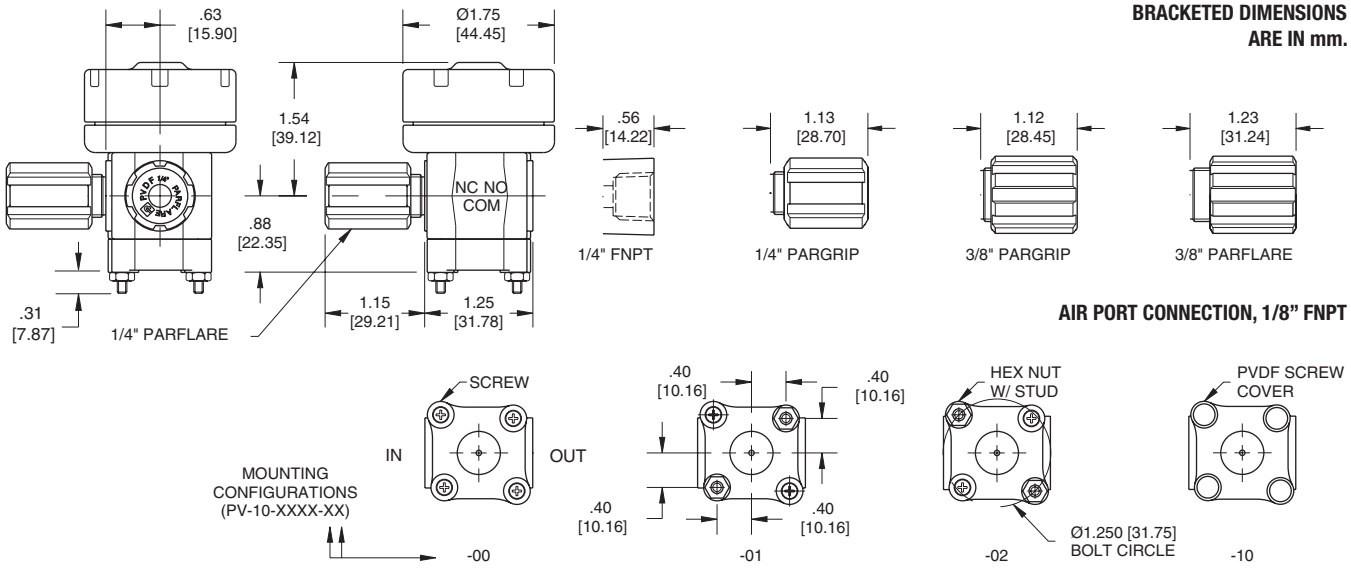
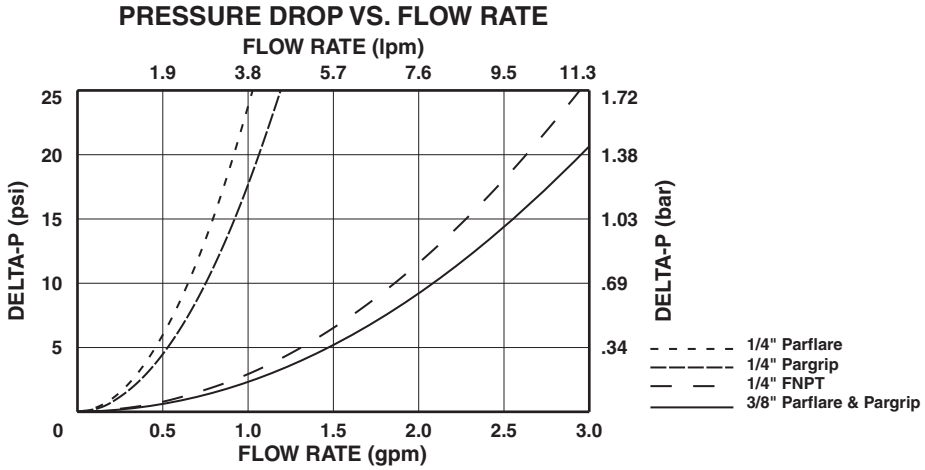
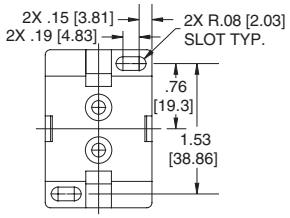


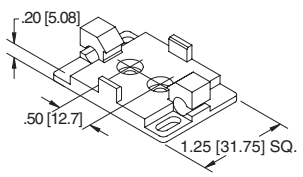
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Mounting Configuration-XX (Depicted Above)*
PV-10-1344-XX	.60	8.6	3 WAY	1/4" FNPT	00 = Screw 01 = Screw/Stud .80 Square 02 = Screw/Stud Ø1.25 Bolt Circle 10 = PVDF Screw Covers
PV-10-2334-XX	.24	3.4		1/4" Pargrip	
PV-10-2346-XX	.62	8.8		3/8" Pargrip	
PV-10-6324-XX	.20	2.8		1/4" Parflare	
PV-10-6346-XX	.62	8.8		3/8"" Parflare	

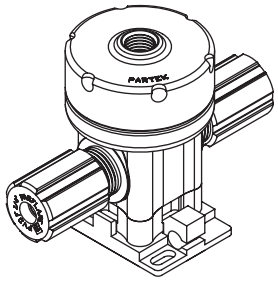
Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.



Accessories	*Description*
SB-10	PVDF Snap-in Mounting Base. For use with PV-10-XXXX-00 and PV-10-XXXX-10 models only. (Sold separately)







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PV-11 1/2” Pneumatic 2 Way Valve

Product Overview

The PV-11 PFA Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

Features

One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

PVDF coated stainless steel spring.

Submergible option isolates all valve components from the external environment.

Benefits

High cycle life.

Lower replacement costs.

Less downtime.

Reduces effects of corrosive environments.

Valve remains functional while operating in wet or gaseous corrosive environments.

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

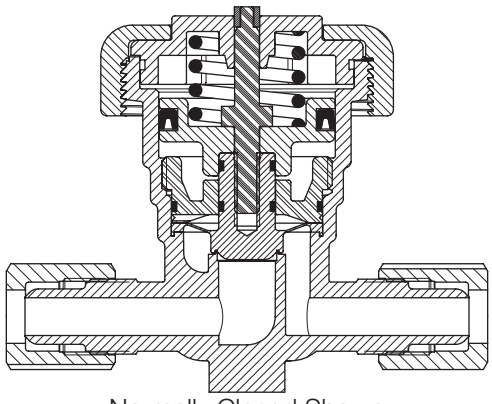
Pressure Ranges

Forward:	27” HG vacuum (913 mbar) to 100 PSIG (7 bar)
Back:	80 PSIG (5.5 bar) with 80 PSIG (5.5 bar) inlet pressure
Actuator:	60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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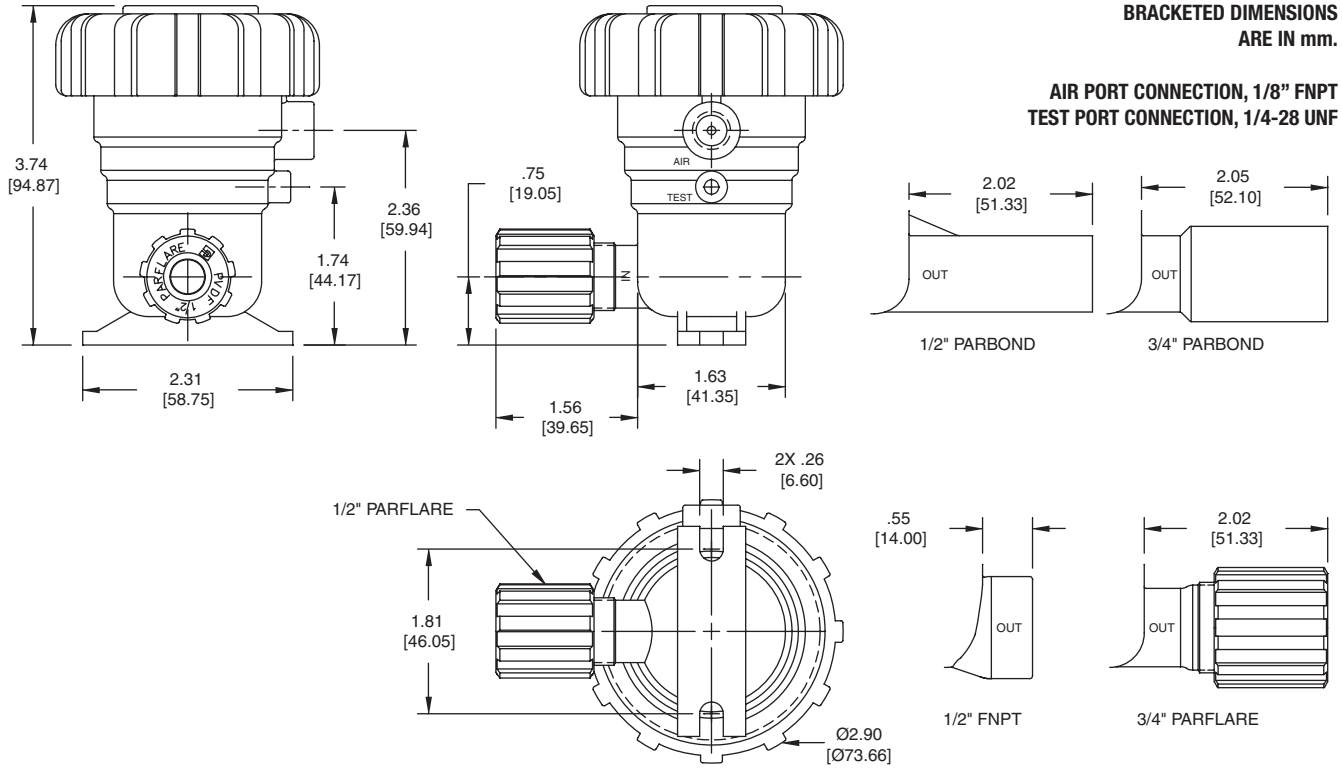
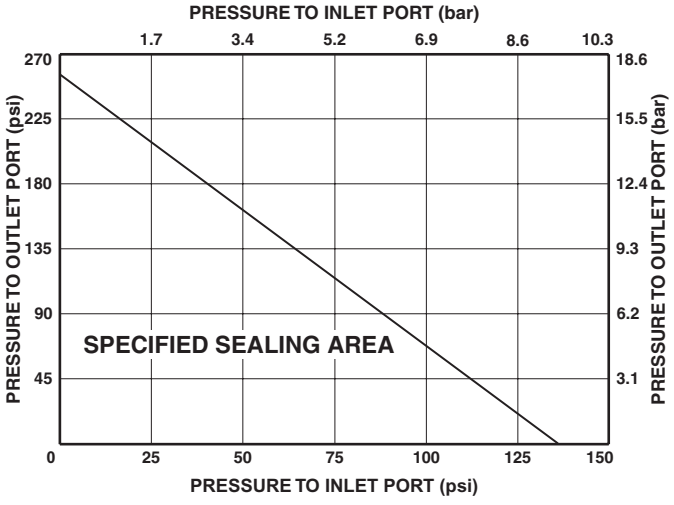


Model Number	Cv	Kv	Flow Config.	Port Config.
PV-11-001	2.3	32.8	N C	1/2" Parflare
PV-11-002	3.7	52.8		3/4" Parflare
PV-11-003	3.7	52.8		1/2" Parbond
PV-11-004	3.7	52.8		3/4" Parbond
PV-11-005	3.7	52.8		1/2" FNPT

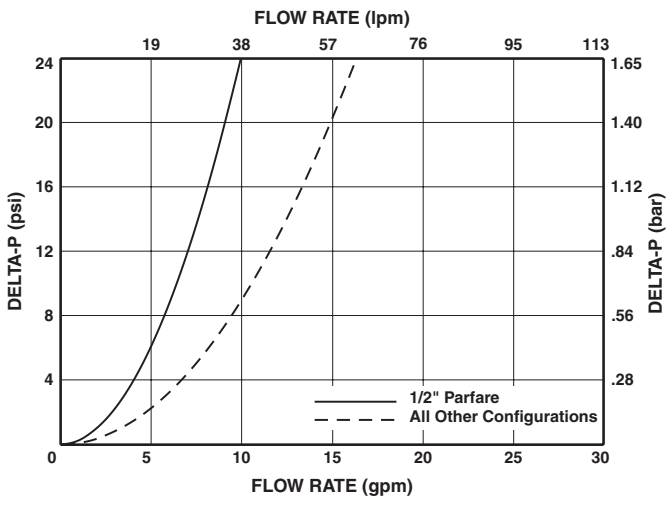
Model Number	Cv	Kv	Flow Config.	Port Config.
PV-11-011	2.3	32.8	N O	1/2" Parflare
PV-11-012	3.7	52.8		3/4" Parflare
PV-11-013	3.7	52.8		1/2" Parbond
PV-11-014	3.7	52.8		3/4" Parbond
PV-11-015	3.7	52.8		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

CRACKING PRESSURE



PRESSURE DROP VS. FLOW RATE



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PV-11 1/2” Pneumatic 3 Way Valve

Product Overview

The PV-11 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel springs.	**Reduces effects of corrosive environments.**
Submergible option isolates all valve components from the external environment.	**Valve remains functional while operating in wet or gaseous corrosive environments.**
Multi-position mounting base.	**Allows for more mounting flexibility and connector fitting reduction.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

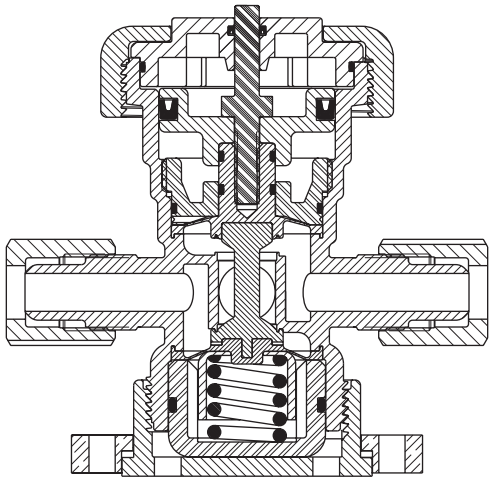
Pressure Ranges

COM to NO:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
NO to COM:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
COM to NC:	27” HG vaccum (913 mbar) to 80 PSIG (5.5 bar) with 20 PSIG (1.4 bar) maximum back pressure
NC to COM:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure
Actuator:	60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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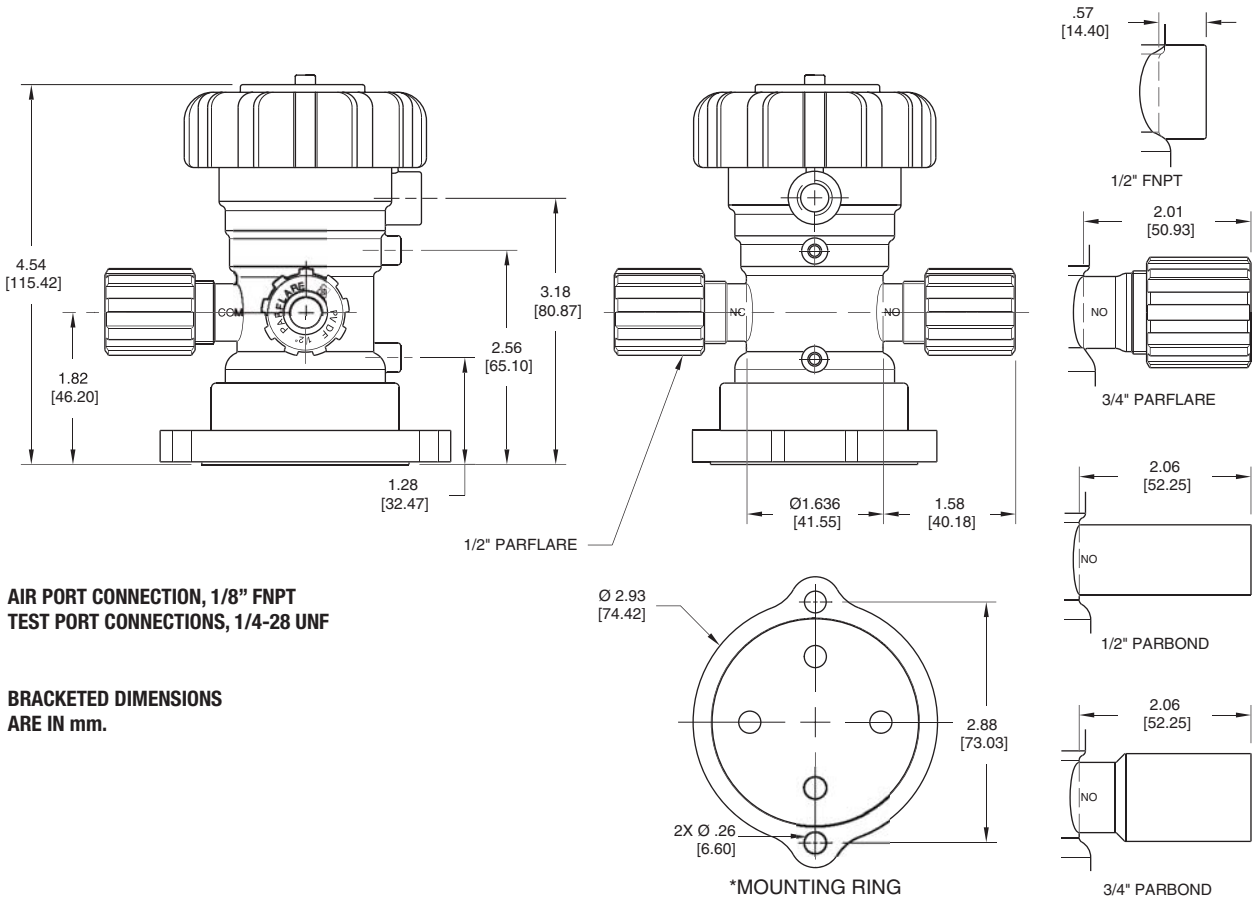


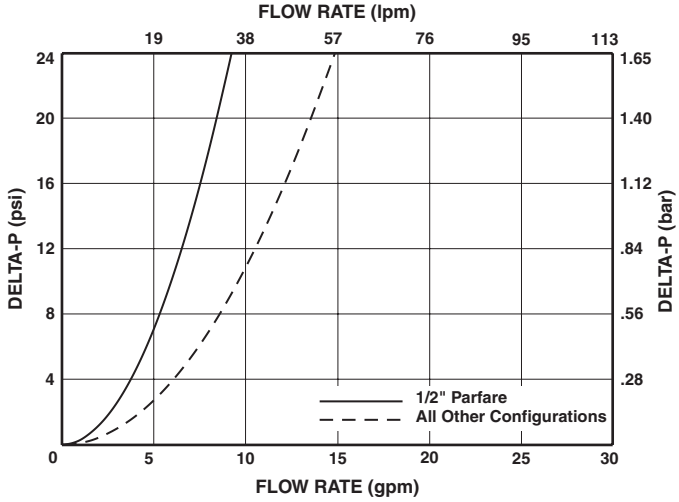
AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTIONS, 1/4-28 UNF

BRACKETED DIMENSIONS ARE IN mm.

Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
PV-11-021	1.9	27.1	3 WAY	1/2" Parflare
PV-11-022	2.8	40.0		3/4" Parflare
PV-11-023	2.8	40.0		1/2" Parbond
PV-11-024	2.8	40.0		3/4" Parbond
PV-11-025	2.8	40.0		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.
*To order part without mounting ring add -01 to model number.

PRESSURE DROP VS. FLOW RATE



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PV-11 1/2” Pneumatic Adjustable Bypass Valve

Product Overview

The PV-11 Adjustable Bypass Valve is designed for use in ultra-pure water applications. The design utilizes a molded high purity PFA body with precision machined seats. A machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The integral bypass valve prevents the stagnation and deadheading of media in an ultra-pure water system.

Features	Benefits
Precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel spring.	**Reduces effects of corrosive environment.**
Bypass integral to valve body to prevent stagnation of ultra-pure water.	**Prevents contamination of media.**
Modified flow configurations with numerous end connections including Parflare available.	**Reduces connections, mounting space, and overall cost.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

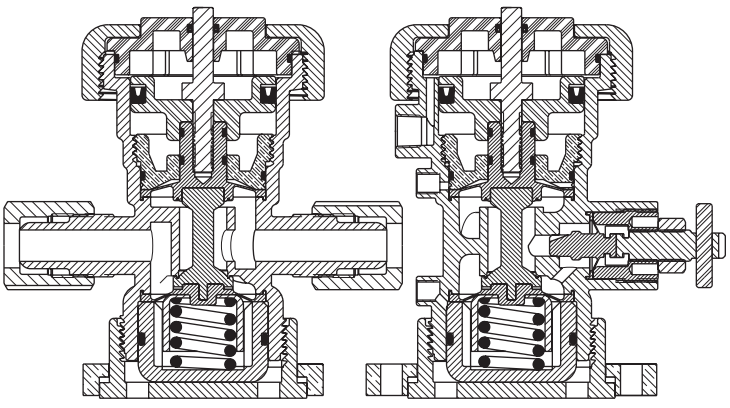
Pressure Ranges

Forward:	27” HG vaccum (913 mbar) to 80 PSIG (5.5 bar) with 20 PSIG (1.4 bar) maximum back pressure
Backward:	27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure
Actuator:	60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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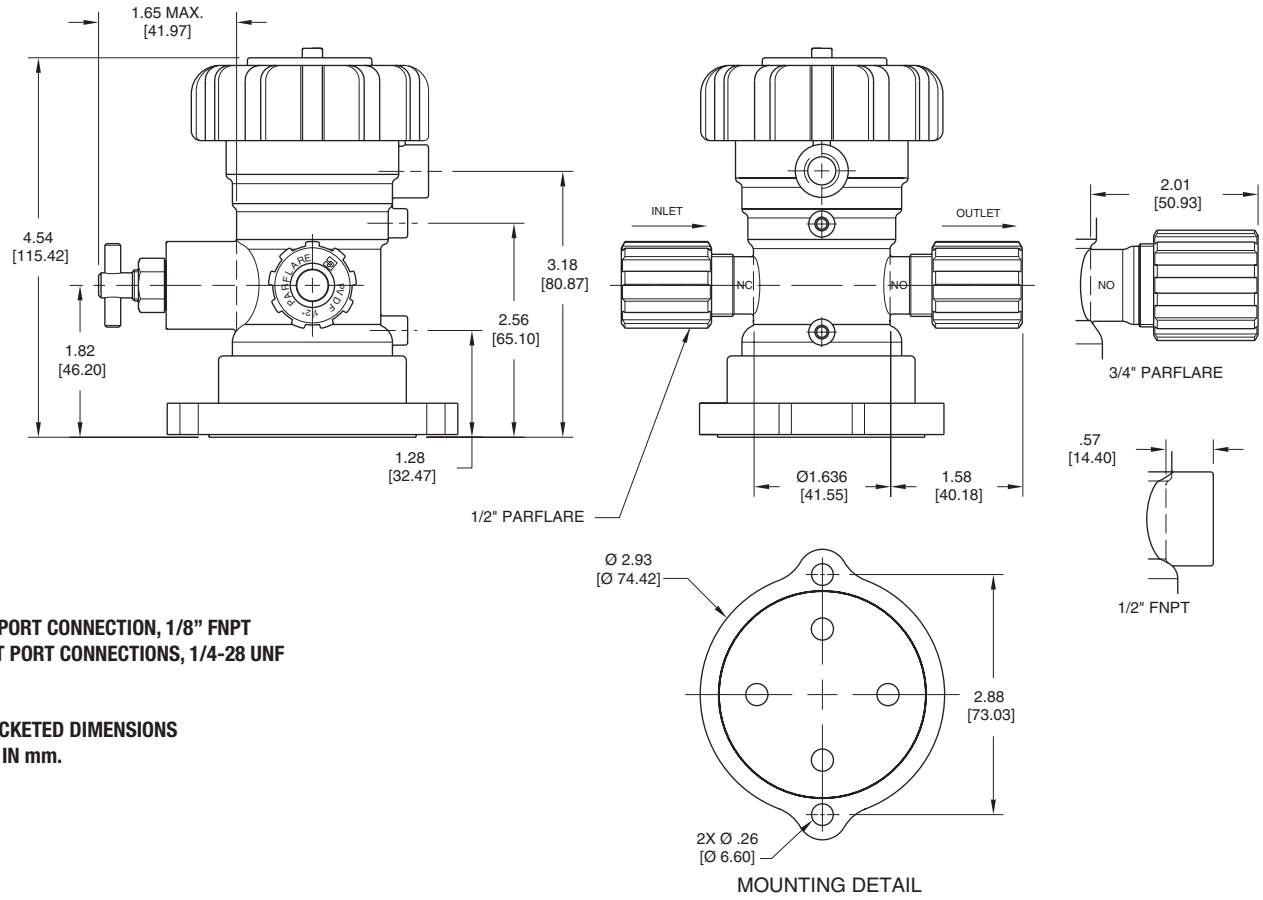


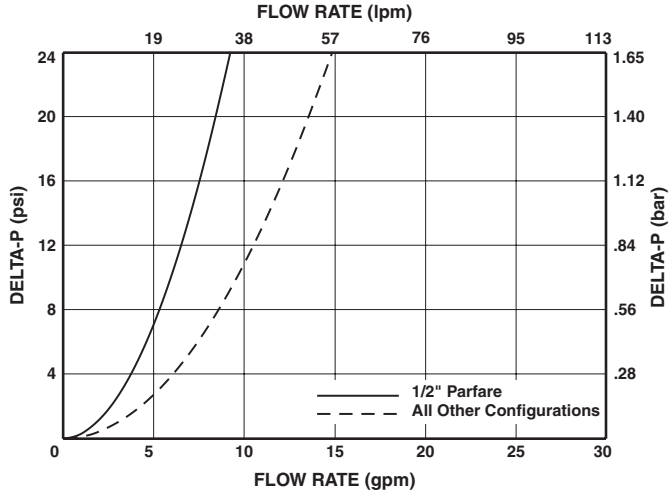
AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTIONS, 1/4-28 UNF

BRACKETED DIMENSIONS
ARE IN mm.

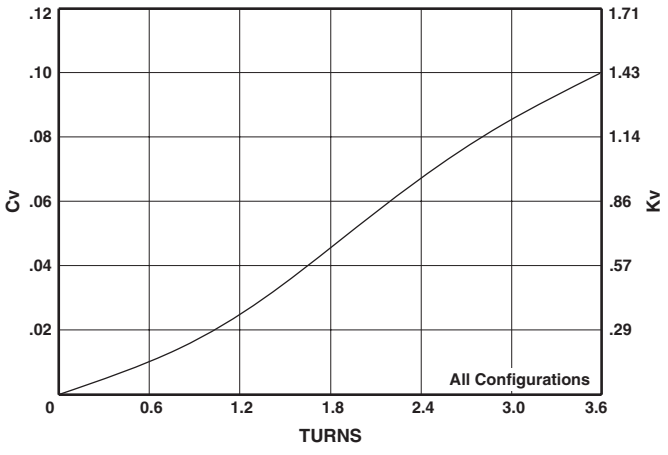
Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*
PV-11-301	1.9	27.1	NC	1/2" Parflare
PV-11-302	2.8	40.0		3/4" Parflare
PV-11-305	2.8	40.0		1/2" FNPT

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



Cv / Kv vs. TURNS FOR BYPASS PORT



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PV-12 1” Pneumatic 2 Way Valve

Product Overview

The PV-12 Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1” orifice provides maximum flow capability in a compact package.

Features / Benefits

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.** **Lower replacement costs.** **Less downtime.**
PVDF coated stainless steel spring.	**Reduces effects of corrosive environments.**
Submergible option isolates all valve components from the external environment.	**Valve remains functional while operating in wet or gaseous corrosive environments.**

Specifications

Materials of Construction

Wetted:	PFA, Modified PTFE
Non-wetted:	PFA, PVDF, Viton seals, PTFE coated SS springs

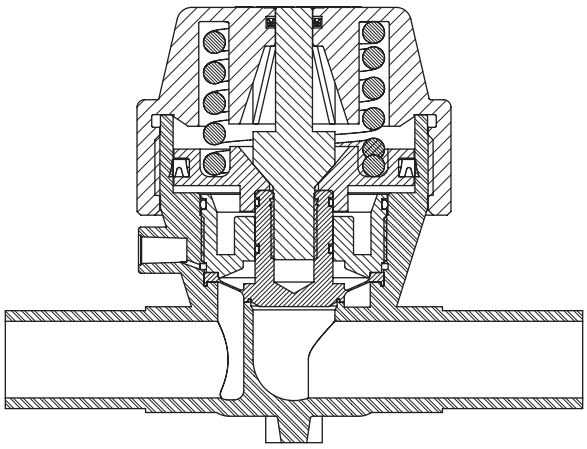
Pressure Ranges

Forward:	27” HG vaccum (913 mbar) to 100 PSIG (7 bar)
Backward:	80 PSIG (5.5 bar) with 100 PSIG (3.4 bar) inlet pressure 100 PSIG (7 bar) with 60 PSIG (4.2 bar) inlet pressure
Actuator:	60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



Normally Closed shown

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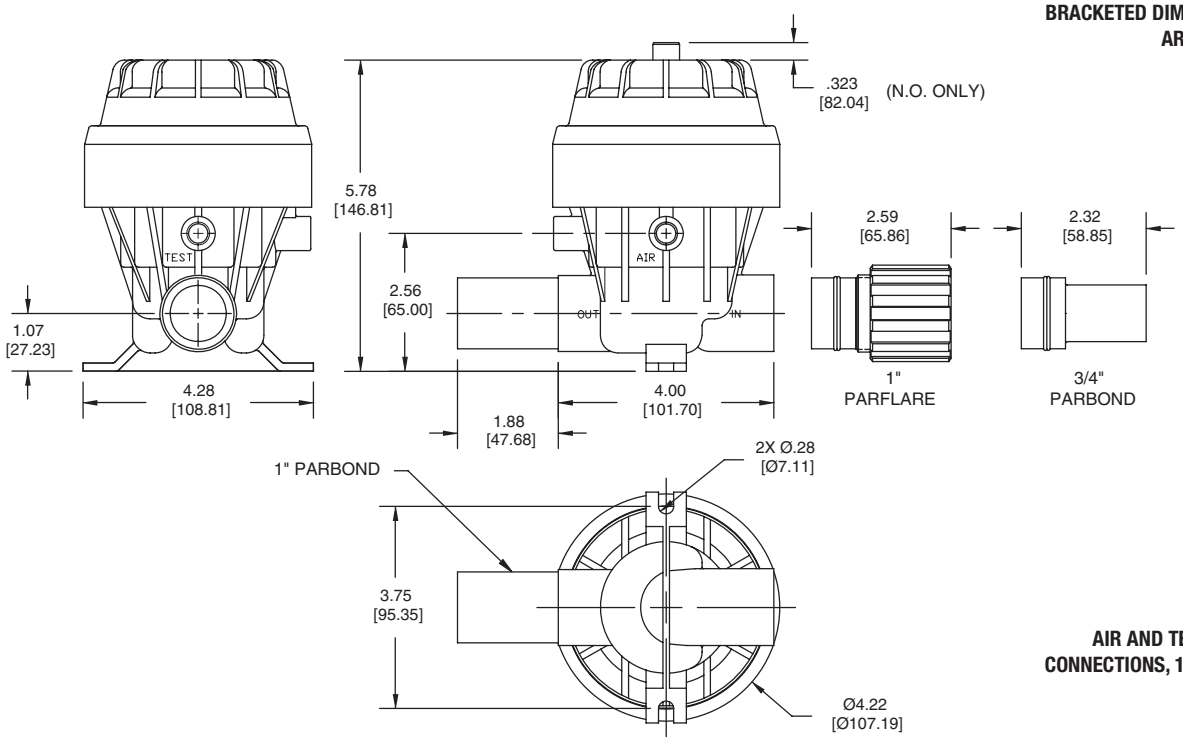
BRACKETED DIMENSIONS ARE IN mm.



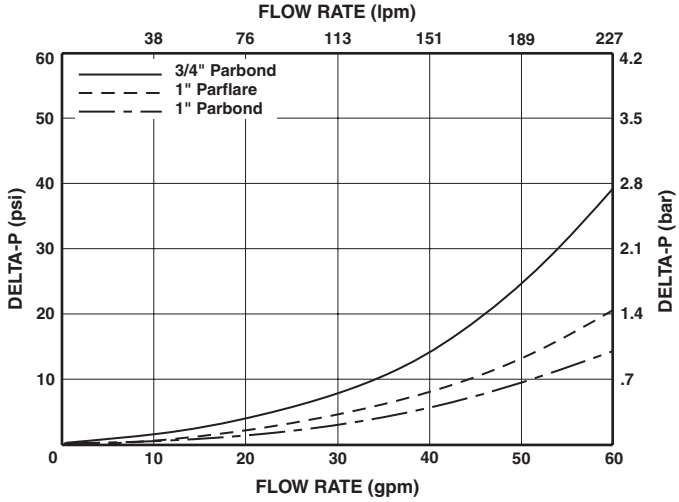
AIR AND TEST PORT CONNECTIONS, 1/8" FNPT

Model Number	*Cv*	*Kv*	*Flow Config.*	*Port Config.*
PV-12-001	15.7	224.2	N C	1" Parbond
PV-12-002	13.3	189.9		1" Parflare
PV-12-003	9.6	142.8		3/4" Parbond

Model Number	*Cv*	*Kv*	*Flow Config.*	*Port Config.*
PV-12-005	15.7	224.2	N O	1" Parbond
PV-12-006	13.3	189.9		1" Parflare
PV-12-007	9.6	142.8		3/4" Parbond

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE



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PV-16 3/4" Pneumatic PFA 2 Way Valve

Product Overview

The PV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 3/4" orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

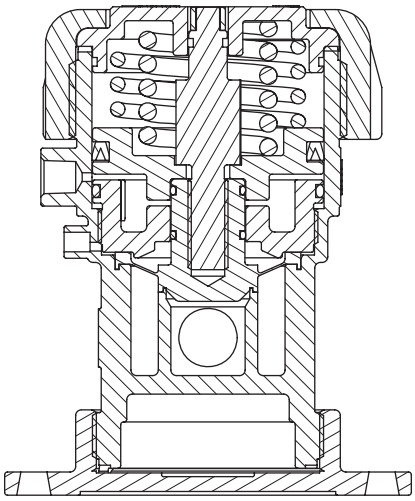
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



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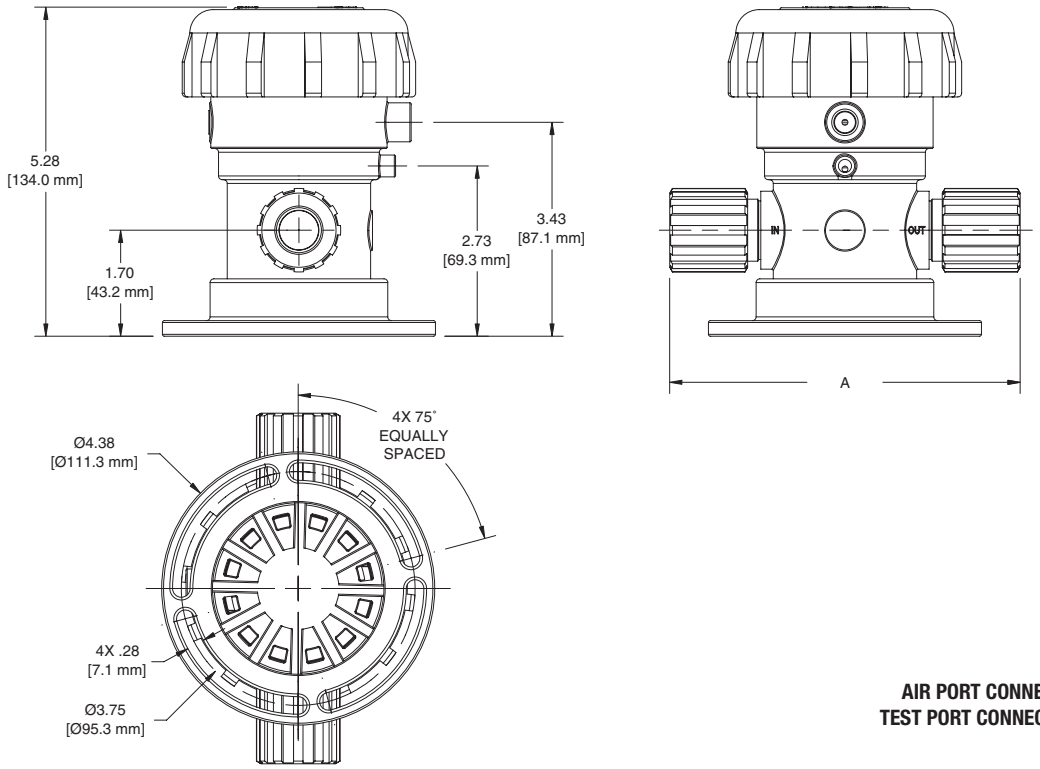
BRACKETED DIMENSIONS ARE IN mm.

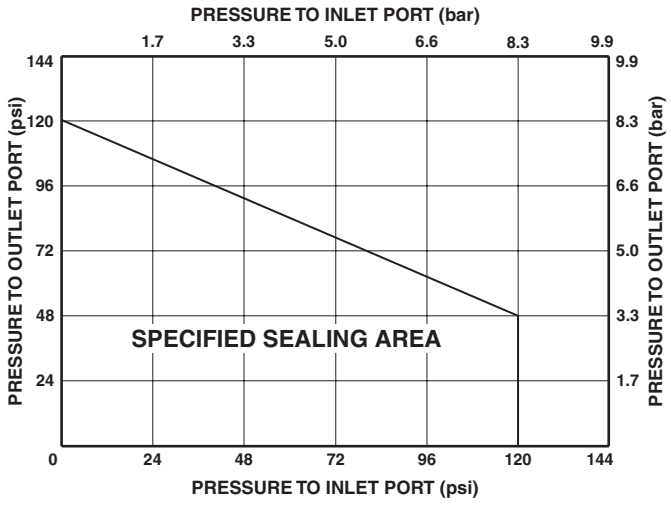


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

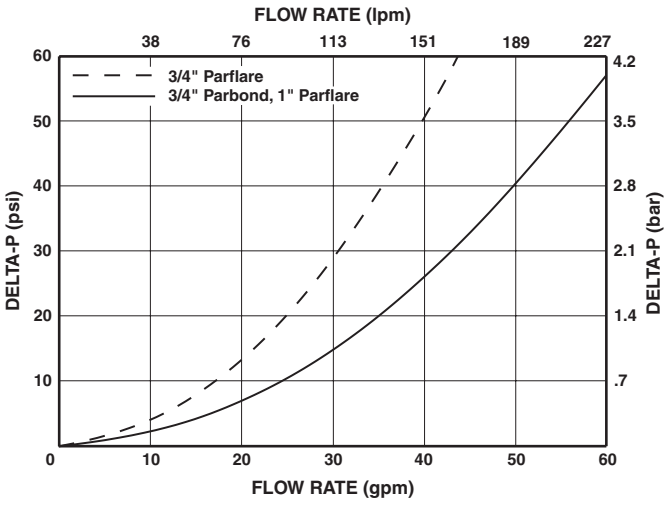
Model Number	*Cv*	*Kv*	*Flow Configuration-X*	*Port Configuration*	*Dimension in [mm] A*
PV-16-X612	5.8	82.7	1 = NC 2 = NO	3/4" Parflare	5.54 [140.72]
PV-16-X612-01	5.8	82.7		3/4" Parflare Long	6.48 [164.59]
PV-16-X616	7.9	112.6		1" Parflare*	9.12 [231.65]
PV-16-X712	7.9	112.6		3/4" Parbond	5.90 [149.86]

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.
*Ends are fused on.

CRACKING PRESSURE



PRESSURE DROP VS. FLOW RATE



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PV-16 3/4" Pneumatic PFA 3 Way Valve

Product Overview

The PV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 3/4" orifice provides maximum flow capability in a compact package.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

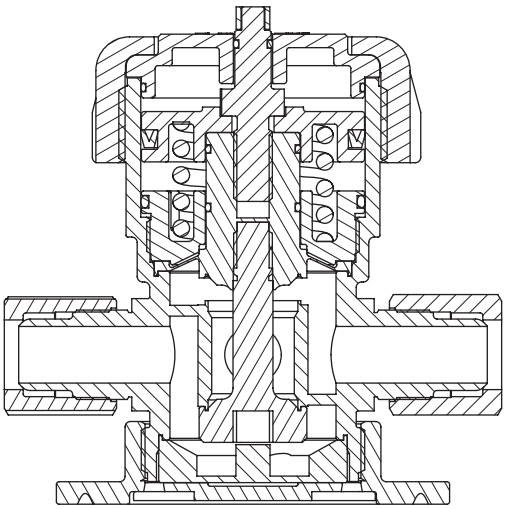
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



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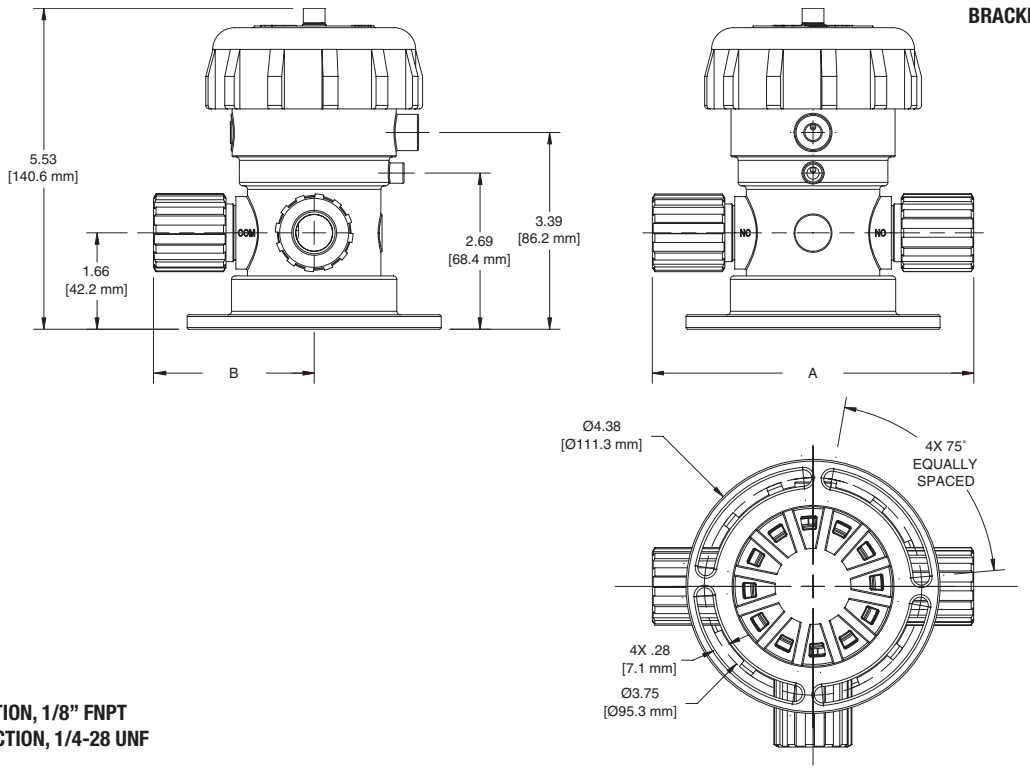
BRACKETED DIMENSIONS ARE IN mm.

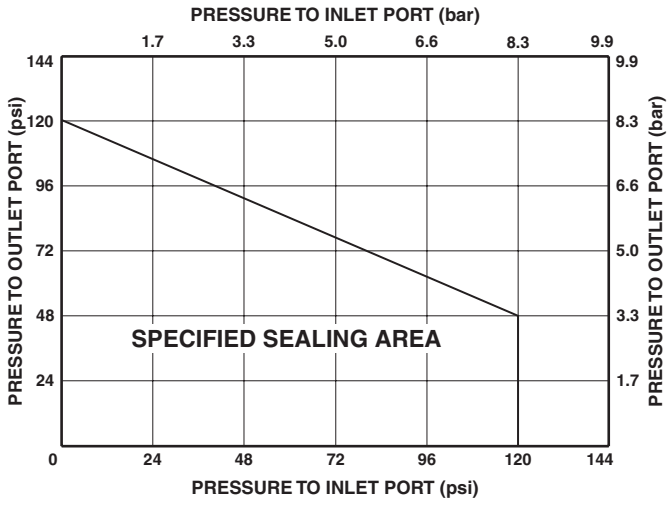


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

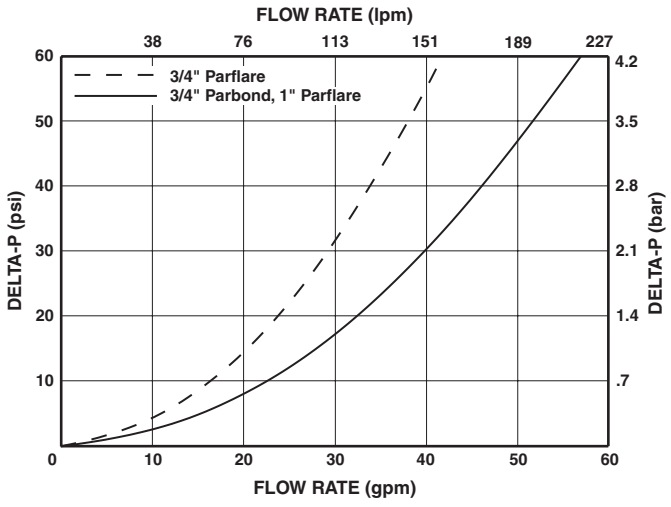
Model Number	Cv	Kv	Flow Configuration	Port Configuration	Dimensions A	Dimensions B
PV-16-3612	5.4	77.0	3 WAY COM NC NO	3/4" Parflare	5.54" [140.72 mm]	2.81" [71.37 mm]
PV-16-3612-01	5.4	77.0		3/4" Parflare Long	6.48" [164.59 mm]	2.81" [71.37 mm]
PV-16-3616	7.3	104.1		1" Parflare*	9.12" [231.65 mm]	4.56" [115.82 mm]
PV-16-3712	7.3	104.1		3/4" Parbond	5.90" [149.86 mm]	2.95" [74.93 mm]
PV-16-4612	5.4	77.0	3 WAY Reversed Ports COM NO NC	3/4" Parflare	5.54" [140.72 mm]	2.81" [71.37 mm]
PV-16-4612-01	5.4	77.0		3/4" Parflare Long	6.48" [164.59 mm]	2.81" [71.37 mm]
PV-16-4616	7.3	104.1		1" Parflare*	9.12" [231.65 mm]	4.56" [115.82 mm]
PV-16-4712	7.3	104.1		3/4" Parbond	5.90" [149.86 mm]	2.95" [74.93 mm]

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.
*Ends are fused on.

CRACKING PRESSURE



PRESSURE DROP VS. FLOW RATE



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PV-16 3/4" Pneumatic PFA Sampling Valve

Product Overview

The PV-16 PFA sampling valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve incorporates a full flow through port with a low dead volume down leg.

Features	Benefits
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.	**High cycle life.**
	Lower replacement costs.
	Less downtime.
Halar coated stainless steel spring.	**Reduces effects of corrosive environments.**
Full flow through port.	**Reduced pressure drop.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

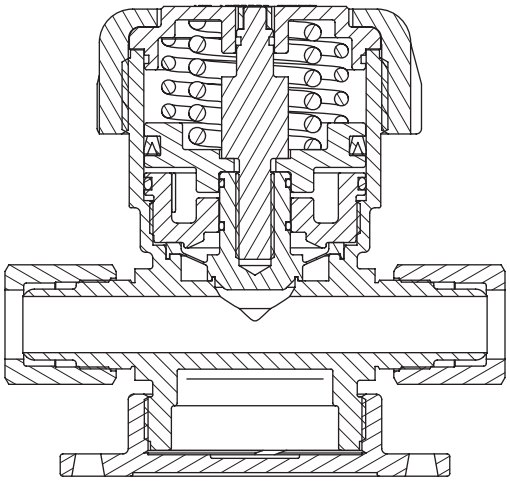
Pressure Ranges

0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)



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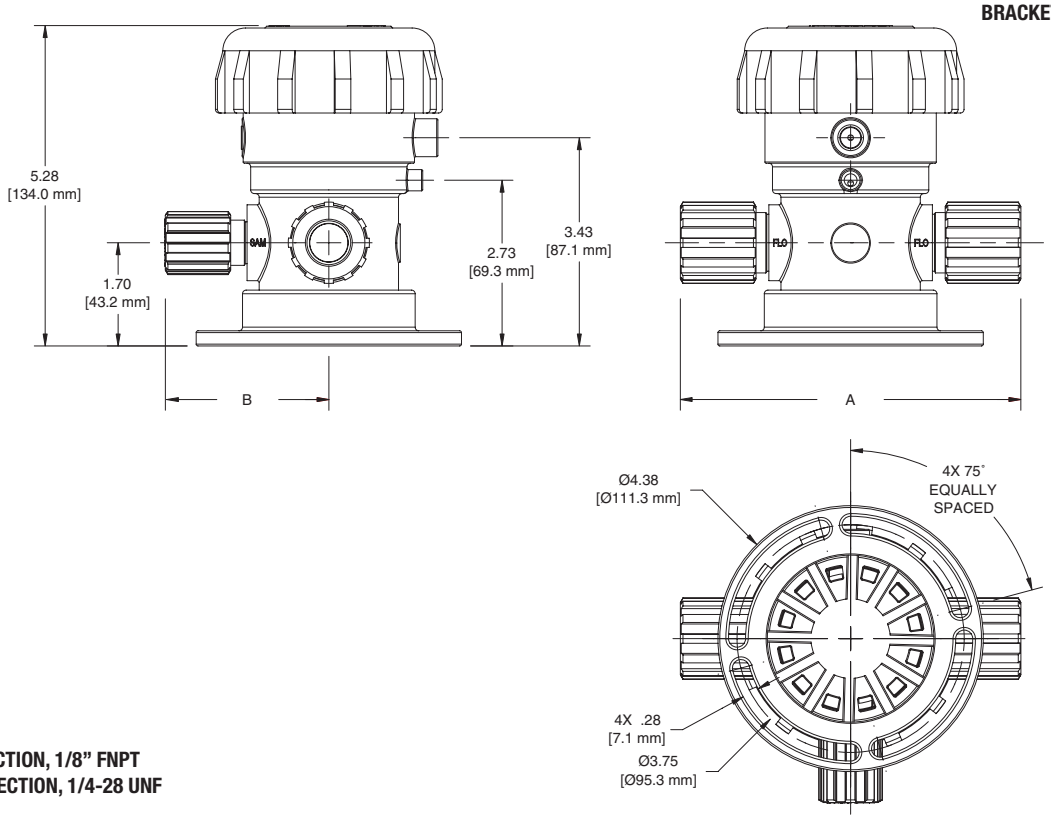
BRACKETED DIMENSIONS ARE IN mm.

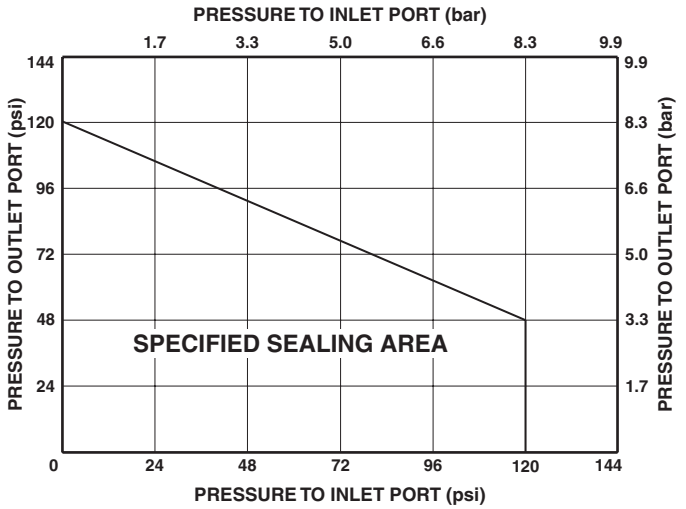


AIR PORT CONNECTION, 1/8" FNPT
TEST PORT CONNECTION, 1/4-28 UNF

Model Number	Through Port		Sample Port		Through Port	Sample Port	Dimensions	
	Cv	Kv	Cv	Kv			A	B
PV-16-5612-608	13.0	185.4	2.3	32.8	3/4" Parflare	1/2" Parflare	5.54" [140.72 mm]	2.71" [68.83 mm]
PV-16-5612-612	13.0	185.4	4.6	65.6	3/4" Parflare	3/4" Parflare	5.54" [140.72 mm]	2.81" [71.37 mm]
PV-16-5612-712	13.0	185.4	6.9	98.7	3/4" Parflare	3/4" Parbond	5.54" [140.72 mm]	2.95 [74.93 mm]
PV-16-5712-608	25.2	359.92	2.3	32.8	3/4" Parbond	1/2" Parflare	5.90" [149.86 mm]	2.71" [68.83 mm]
PV-16-5712-612	25.2	359.92	4.6	65.6	3/4" Parbond	3/4" Parflare	5.90" [149.86 mm]	2.81" [71.37 mm]
PV-16-5712-712	25.2	359.92	6.9	98.7	3/4" Parbond	3/4" Parbond	5.90" [149.86 mm]	2.95 [74.93 mm]

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.

CRACKING PRESSURE



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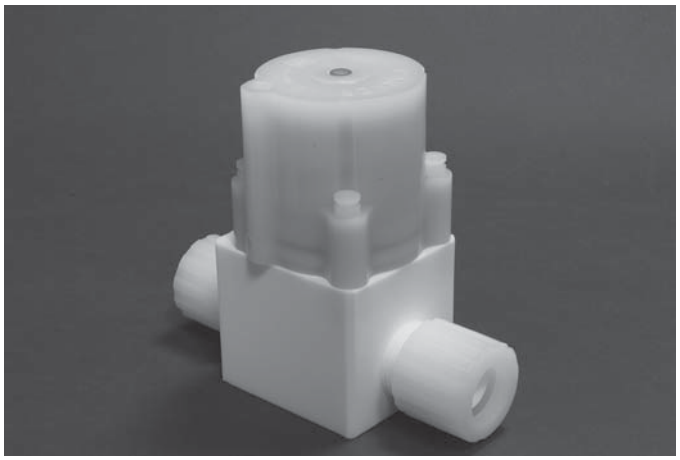
PV-20 1/4" - 1" Pneumatic PTFE Distribution Valve

Product Overview

The PV-20 distribution valve is designed for use in slurry applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. The valve is offered in 3 orifice sizes (1/4", 1/2" and 1") and port sizes ranging from 1/4" to 1 1/4".



Features	Benefits
Fully swept open bowl diaphragm seat area.	**Minimizes fluid shear and smooth flow transition.**
Self draining design.	**Minimizes area for entrapment and stagnation of media.**
High load point seat seal.	**Improves sealing mechanism for aggressive chemicals, deionized water and abrasive slurry media.**
	Minimizes particle contribution of valve.
	Provides faster purging and cleaning of valve.
Angled and rounded internal flow path.	**Less pressure drop allows for lower pressure requirements upstream.**
	Improves fluid flow dynamics.
One piece precision machined diaphragm manufactured from modified PTFE.	**Improves cycle life, less shear than standard PTFE material, lower replacement costs, less downtime.**
Evenly distributed seat sealing forces.	**Minimized diaphragm and valve seat strain.**
	Stabilizes valve back pressure capability.
Maximized diaphragm thickness.	**Minimizes potential for permeation while maximizing cycle life.**

Specifications

Materials of Construction

Wetted:	PTFE, Modified PTFE
Non-wetted:	PVDF, Viton, PTFE coated SS spring

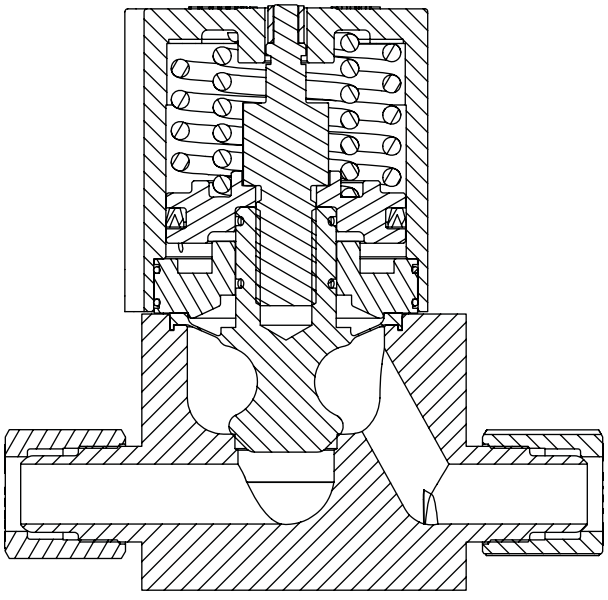
Pressure Ranges

1/4" Orifice:	27" HG vacuum (913 mbar) - 80 PSIG (5.5 bar)
1/2" Orifice:	27" HG vacuum (913 mbar) - 100 PSIG (7 bar)
1" Orifice:	27" HG vacuum (913 mbar) - 100 PSIG (7 bar)
Actuation:	60 PSIG (4.1 bar) - 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient:	0° - 150° F (-17° - 66° C)
Fluid:	0° - 266° F (-17° - 130° C)



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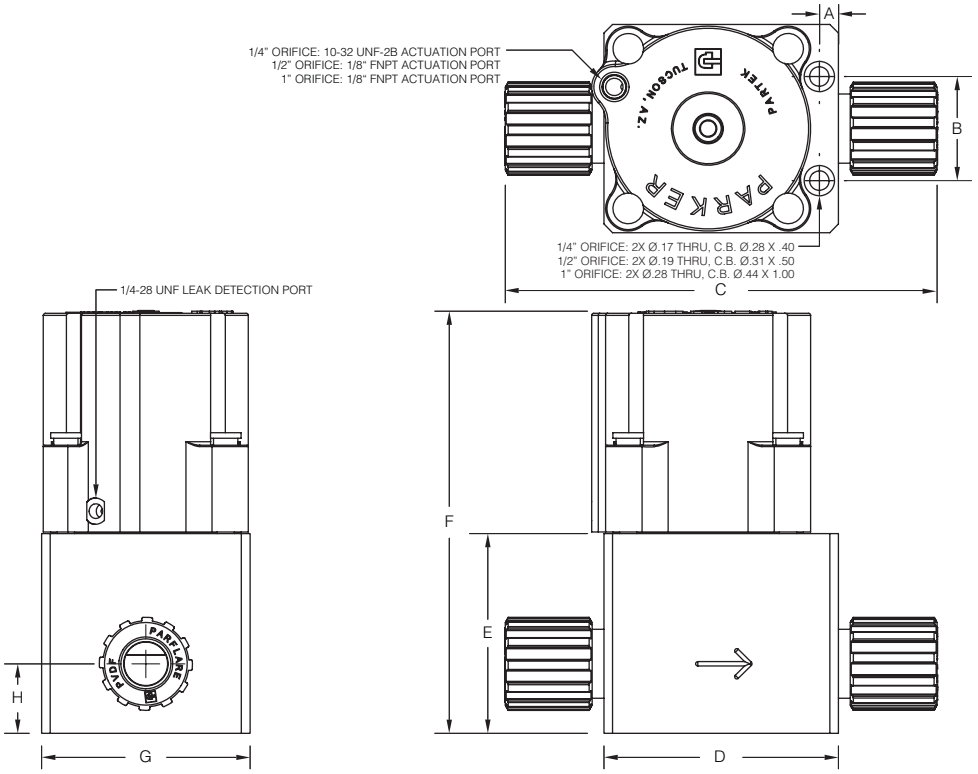
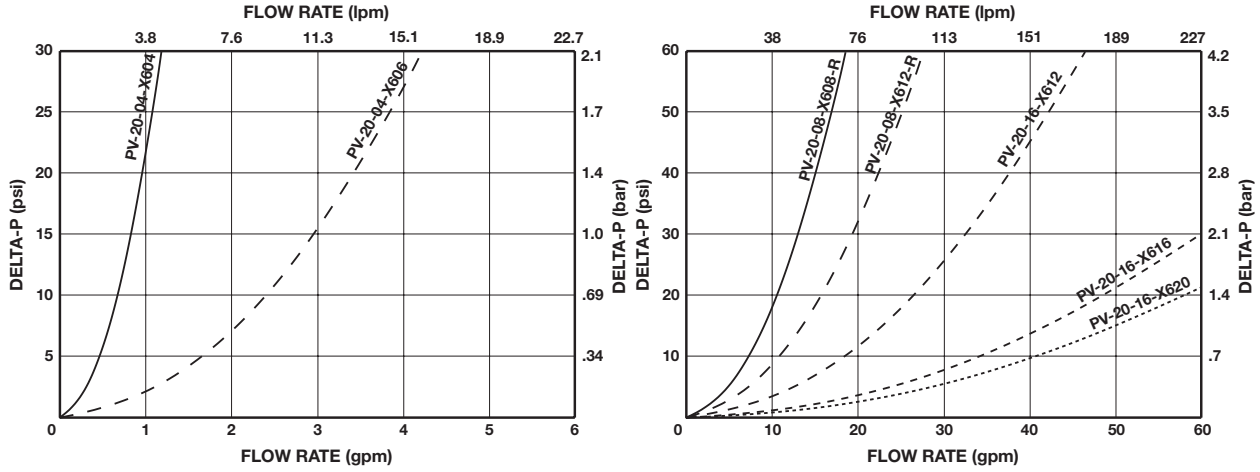


Part Number	Cv	Kv	Body Size	Valve Type	Port Configuration	A		B		C		D		E		F		G		H	
						inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
PV-20-04-1604	.20	2.8	1/4"	NC	1/4" Parflare	.18	4.57	.55	13.97	3.80	96.52	1.50	38.10	1.15	29.21	2.28	57.91	1.25	31.75	.50	12.70
PV-20-04-1606	.76	10.8	1/4"		3/8" Parflare	.18	4.57	.55	13.97	3.96	100.58	1.50	38.10	1.15	29.21	2.28	57.91	1.25	31.75	.50	12.70
PV-20-08-1608-R	2.4	34.2	1/2"		1/2" Parflare	.25	6.35	1.44	36.58	5.20	132.08	2.50	63.50	1.80	45.72	4.14	105.16	2.00	50.80	.78	19.81
PV-20-08-1612-R	3.9	55.8	1/2"		3/4" Parflare	.25	6.35	1.44	36.58	5.35	135.89	2.50	63.50	2.00	50.80	4.34	110.24	2.00	50.80	.83	20.96
PV-20-16-1612	6.4	91.5	1"		3/4" Parflare	.28	7.11	1.50	38.10	6.22	157.99	3.38	85.85	2.88	73.15	6.08	154.43	3.00	76.20	1.00	25.40
PV-20-16-1616	10.9	155.4	1"		1" Parfare	.28	7.11	1.50	38.10	6.98	177.29	3.38	85.85	2.88	73.15	6.08	154.43	3.00	76.20	1.00	25.40
PV-20-16-1620	13.5	192.9	1"		1 1/4" Parflare	.28	7.11	1.50	38.10	8.07	204.98	3.75	95.25	3.25	82.55	6.45	163.83	3.00	76.20	1.25	31.75
PV-20-04-2604	.20	2.8	1/4"	NO	1/4" Parflare	.18	4.57	.55	13.97	3.80	96.52	1.50	38.10	1.15	29.21	2.28	57.91	1.25	31.75	.50	12.70
PV-20-04-2606	.76	10.8	1/4"		3/8" Parflare	.18	4.57	.55	13.97	3.96	100.58	1.50	38.10	1.15	29.21	2.28	57.91	1.25	31.75	.50	12.70
PV-20-08-2608-R	2.4	34.2	1/2"		1/2" Parflare	.25	6.35	1.44	36.58	5.20	132.08	2.50	63.50	1.80	45.72	4.14	105.16	2.00	50.80	.78	19.81
PV-20-08-2612-R	3.9	55.8	1/2"		3/4" Parflare	.25	6.35	1.44	36.58	5.35	135.89	2.50	63.50	2.00	50.80	4.34	110.24	2.00	50.80	.83	20.96
PV-20-16-2612	6.4	91.5	1"		3/4" Parflare	.28	7.11	1.50	38.10	6.22	157.99	3.38	85.85	2.88	73.15	6.08	154.43	3.00	76.20	1.00	25.40
PV-20-16-2616	10.9	155.4	1"		1" Parfare	.28	7.11	1.50	38.10	6.98	177.29	3.38	85.85	2.88	73.15	6.08	154.43	3.00	76.20	1.00	25.40
PV-20-16-2620	13.5	192.9	1"		1 1/4" Parflare	.28	7.11	1.50	38.10	8.07	204.98	3.75	95.25	3.25	82.55	6.45	163.83	3.00	76.20	1.25	31.75

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number. Contact factory for Pillar end connections.

PRESSURE DROP VS. FLOW RATE



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CV-1 Check Valve

Product Overview

The CV-1 PTFE Check Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes machined PTFE components to provide superior chemical resistance and purity without requiring o-rings for sealing. The machined PTFE spring allows for low cracking pressure operation and minimal back pressure for resealing.

Features	Benefits
Polished sealing surfaces.	**Long life and superior sealing characteristics.**
Tongue and groove external seal.	**Eliminates o-rings and compatibility problems.**
Machined PTFE spring.	**Low cracking pressure.**
Numerous end configurations available including Parflare. Available with different configurations on either end.	**Reduces connections, mounting space, and overall cost.**

Specifications

Materials of Construction

Wetted: PTFE
Non-wetted: PFA, PVDF, ETFE

Cracking Pressure

0.25 PSIG (.017 bar) - 0.75 PSIG (.052 bar)

Back Check Sealing Pressure

5.0 PSIG (.35 bar)

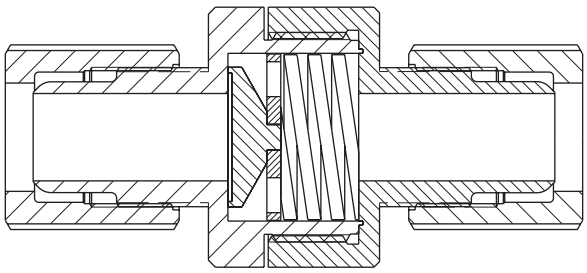
Pressure Range

27” Hg vacuum (913 mbar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Style 1: 32° - 212° F (0° - 100° C) Ambient
32° - 266° F (0° - 130° C) Fluid
Style 2 & 3: 50° - 212° F (10° - 100° C) Ambient
50° - 266° F (10° - 130° C) Fluid
Style 4 & 5: 60° - 212° F (15° - 100° C) Ambient
60° - 266° F (15° - 130° C) Fluid



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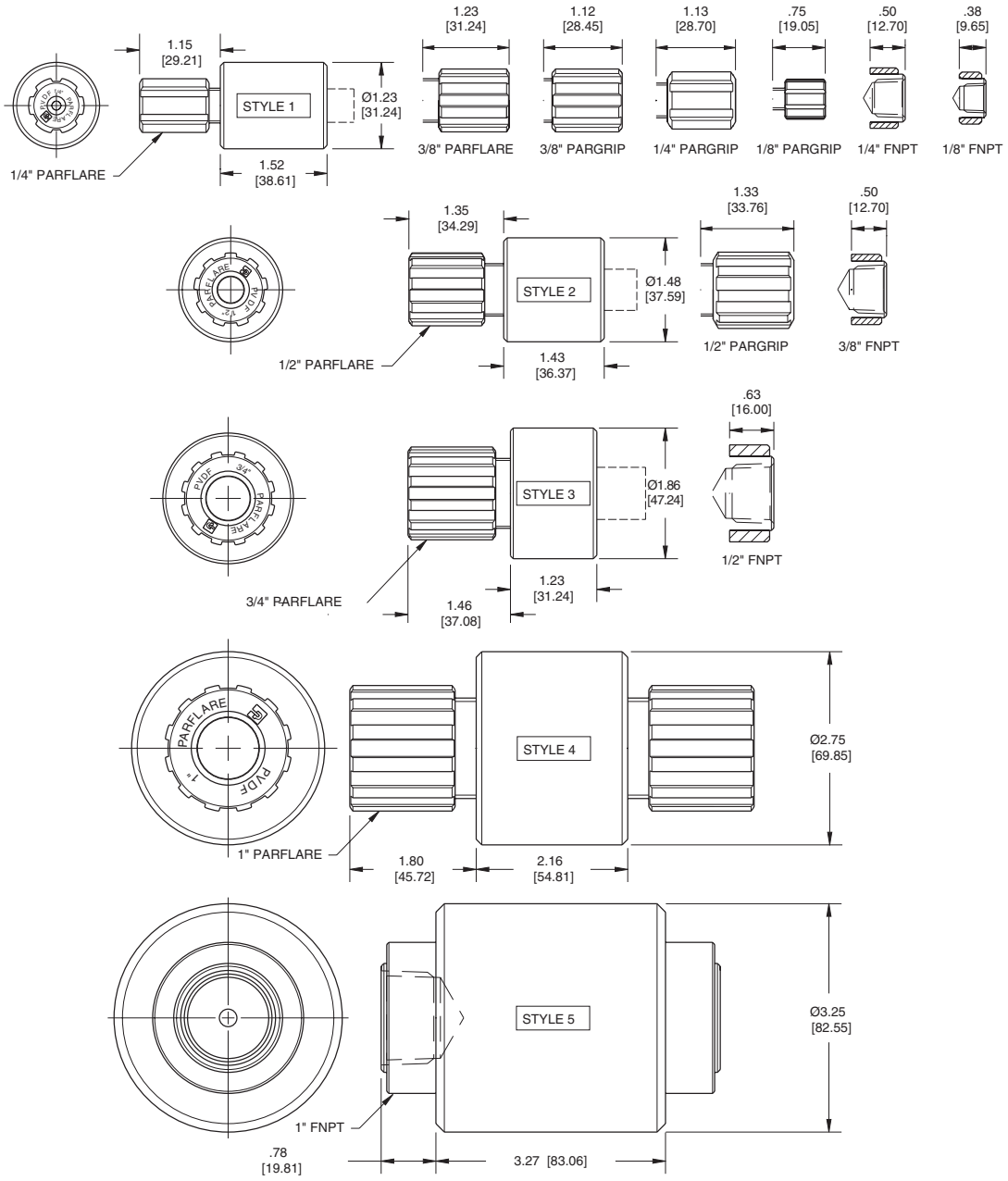
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Cv*	*Kv*	*Style*	*Port Configuration*
CV-1-1122	0.61	8.78	1	1/8" FNPT
CV-1-1144	1.51	21.74	1	1/4" FNPT
CV-1-1166	2.43	35.00	2	3/8" FNPT
CV-1-1188	4.22	60.77	3	1/2" FNPT
CV-1-111616	14.00	201.6	5	1" FNPT
CV-1-2222	0.02	0.29	1	1/8" Pargrip
CV-1-2244	0.34	4.90	1	1/4" Pargrip
CV-1-2266	.98	14.11	1	3/8" Pargrip
CV-1-2288	2.17	31.25	2	1/2" Pargrip
CV-1-6644	.26	3.74	1	1/4" Parflare
CV-1-6666	1.11	15.84	1	3/8" Parflare
CV-1-6688	2.03	29.23	2	1/2" Parflare
CV-1-661212	4.13	59.47	3	3/4" Parflare
CV-1-661616	11.85	170.6	4	1" Parflare

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

Parker Hannifin Corporation
Partek Operation
Tucson, AZ

RV Relief Valve

Product Overview

The RV Relief Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemicals. The design utilizes a molded PFA body with precision-machined PTFE seats and diaphragm poppet. When a field set relief pressure is reached, the valve opens and permits flow. The valve resets when 25% of original setpoint is reached.

Features	Benefits
One piece precision machined diaphragm poppet manufactured from the latest technology modified PTFE.	**High cycle life.**
	Lower replacement costs.
Provides over five times the flexural life as compared to conventional PTFE.	**Less downtime.**
Tongue and groove seat and diaphragm poppet for positive through flow shut off and diaphragm to body seal.	**Isolates media from adjusting screw.**
Field adjustable relief pressure.	**Prevent over pressurization in critical applications.**

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: PVDF, SS, Brass, ABS, HDPE

Pressure Ranges

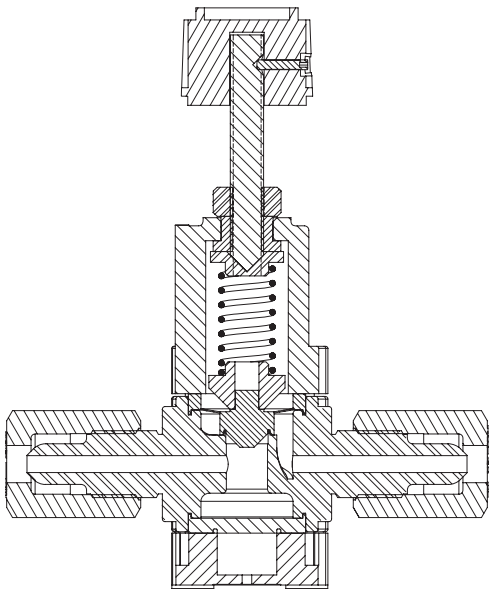
15 PSIG (1.03 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)

Note: The RV Series Relief Valves ***should only*** be used to protect Article 3, Paragraph 3 category equipment as defined in Pressure Equipment Directive 97/23/EC Dated 29, May 1997.



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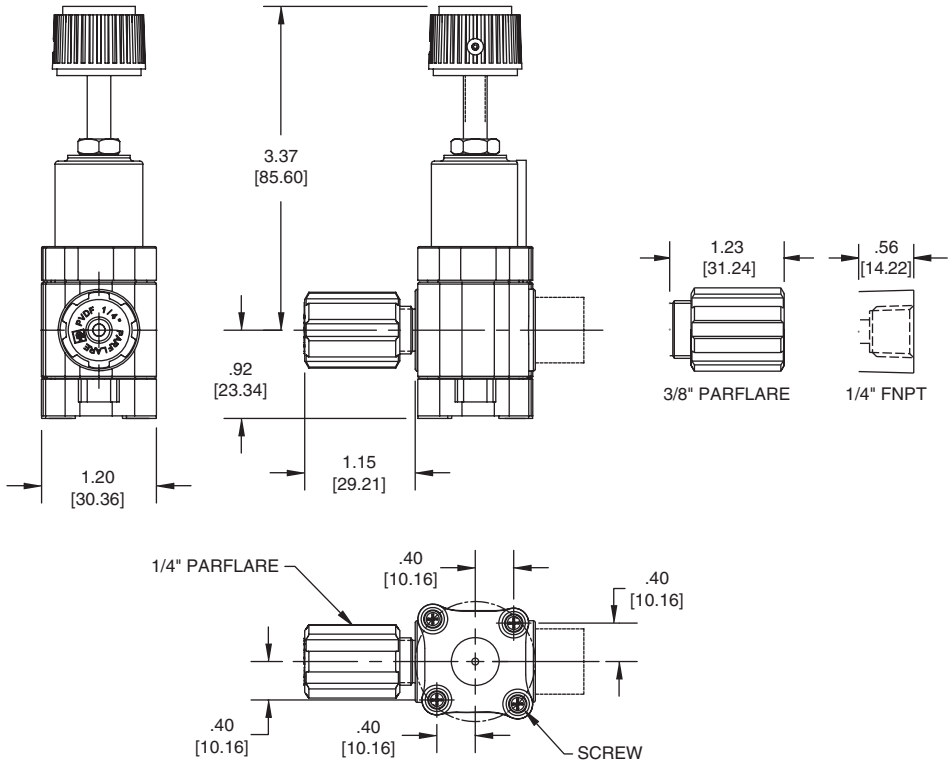
BRACKETED DIMENSIONS ARE IN mm.



Model Number	*Cv*	*Kv*	*Flow Configuration*	*Port Configuration*	*Relieving Pressure Range-XX*
RV-144-XX	.78	11.3	ON/OFF	1/4" FNPT	01 - 15 to 60 PSIG 02 - 60 to 120 PSIG
RV-624-XX	.24	3.5		1/4" Parflare	
RV-646-XX	.70	10.2		3/8" Parflare	

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.

Parker Hannifin Corporation
Partek Operation
Tucson, AZ

SV-2 1/4" Solenoid Valve

Product Overview

The SV-2 Solenoid Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemicals. The design utilizes a molded high purity PFA body with precision machined areas. A one-piece machined modified PTFE diaphragm is also utilized for excellent flexibility and long life. The valve is offered in 2 and 3 way configurations, in 3 orifice sizes, and in 2 standard voltages.

Features

One piece precision machined diaphragm manufactured from the latest technology modified PTFE.

Provides over five times the flexural life as compared to conventional PTFE.

Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits

High cycle life.

Lower replacement costs.

Less downtime.

Isolates media from solenoid.

Specifications

Materials of Construction

Wetted: PFA, Modified PTFE
Non-wetted: Coated Aluminum, Plated Steel, SS, PFA, PVDF, Titanate

Pressure Ranges

Forward: 0 - 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges

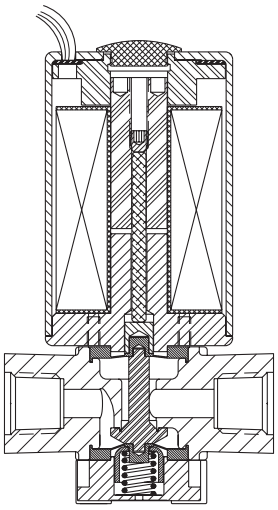
Ambient: -60° - 212° F (-51° - 100° C)
Fluid: -60° - 400° F (-51° - 204° C)

Solenoid Ratings

24 VDC, 115 VAC (Double Wire)
All models rated at 9 watts at 68°F (20°C)
Coil Duty Cycle: 100%, however, 100% continuous duty may affect performance of valve, therefore 50% continuous duty is recommended.

Orientation

All models must be mounted vertically as indicated by the label on the product.



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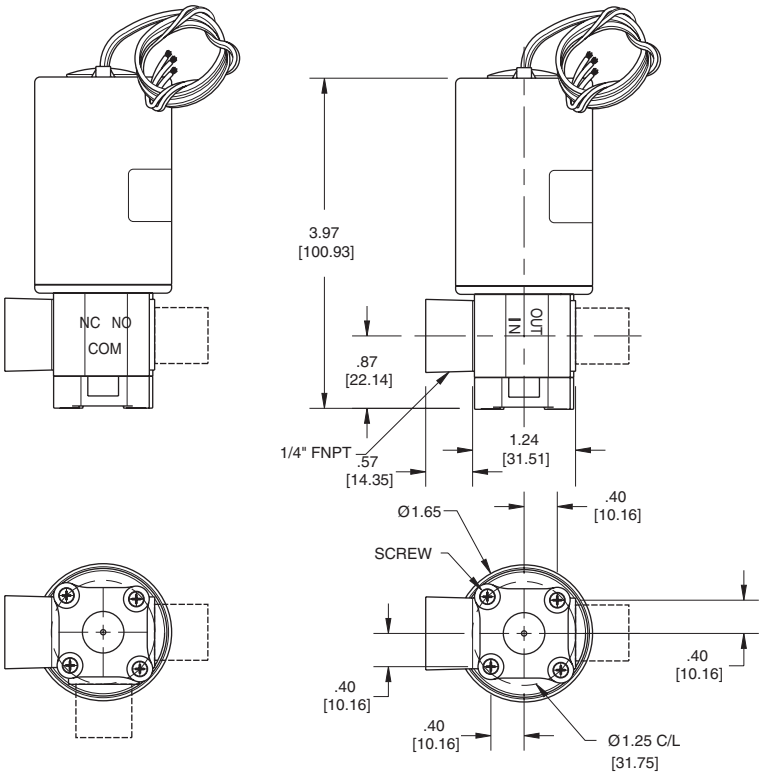
BRACKETED DIMENSIONS ARE IN mm.

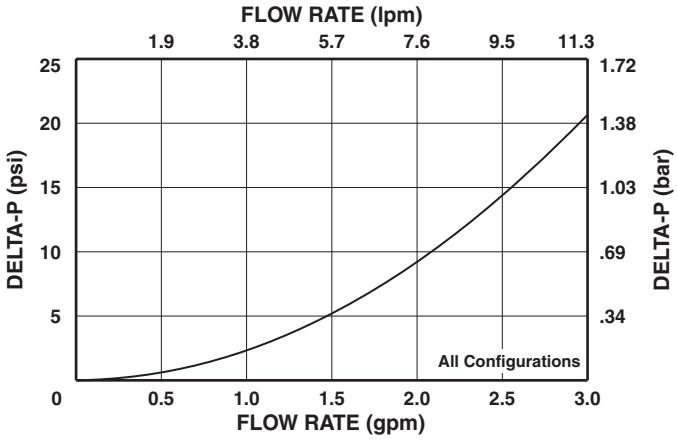


3-WAY VALVE

2-WAY VALVE

Model Number	*Cv*	*Kv*	*Flow Configuration*	*Orifice Size*	*Port Configuration*	*Solenoid Voltage-X*
SV-2-1144-X	.60	8.6	NC	.250	1/4" FNPT	2 = 24 VDC 7 = 115 VAC
SV-2-1244-X	.60	8.6	NO	.250	1/4" FNPT	
SV-2-1344-X	.60	8.6	3 WAY	.250	1/4" FNPT	

PRESSURE DROP VS. FLOW RATE



Parker Hannifin Corporation
Partek Operation
Tucson, AZ

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1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer, Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.
NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.

5. Limitation Of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INC.
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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace mar-kets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

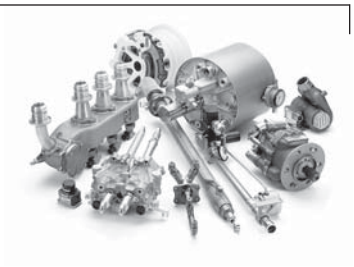
Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

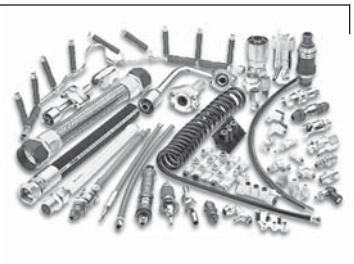
North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

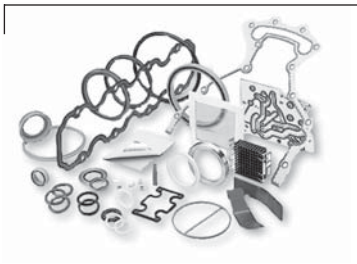
The Aerospace Group is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.

The Fluid Connectors Group designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.





The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.

The Hydraulics Group designs, produces and markets a full spectrum of hy-raulic components and systems to builders and users of industrial and mobile machinery and equipment.

The Filtration Group designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.

The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.

The Instrumentation Group is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.

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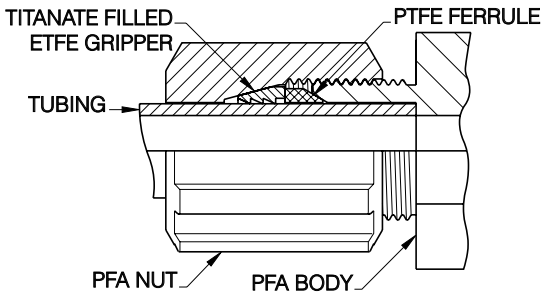
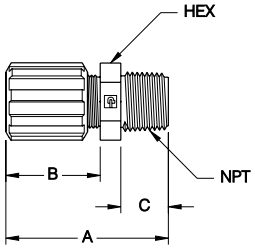
Pargrip PFA Tube Fittings

Assembly Procedure

1. Cut tubing evenly using a tube cutter:
   TCTR-1 for 1/8" - 1/2"
   TCTR-2 for 1/8" - 3/4".
2. Slip small end of the fitting nut over tubing.
3. Slip small end of the gripper onto tubing.
4. Slip large end of the ferrule onto tubing.
5. Slip tubing into the fitting body until bottomed out.
6. Tighten nut finger tight while assuring that tubing remains seated in bottom of fitting body.
7. Tighten nut at least one additional turn.

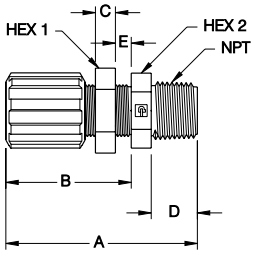


Adaptor
Male Straight



Part Number	Tube Size	NPT Size	Orifice		A		B		C		Hex Size
			inch	mm	inch	mm	inch	mm	inch	mm	
GAMS-22	1/8	1/8	0.09	2.29	1.59	40.39	0.75	19.05	0.55	13.97	1/2
GAMS-24	1/8	1/4	0.09	2.29	1.59	40.39	0.75	19.05	0.55	13.97	5/8
GAMS-42	1/4	1/8	0.18	4.57	2.06	52.32	1.22	30.99	0.55	13.97	5/8
GAMS-44	1/4	1/4	0.18	4.57	2.04	51.82	1.22	30.99	0.55	13.97	5/8
GAMS-46	1/4	3/8	0.18	4.57	2.09	53.09	1.26	32.00	0.55	13.97	13/16
GAMS-48	1/4	1/2	0.18	4.57	2.15	54.61	1.20	30.48	0.66	16.76	13/16
GAMS-412	1/4	3/4	0.18	4.57	2.08	52.83	1.13	28.70	0.67	17.02	1 3/16
GAMS-62	3/8	1/8	0.25	6.35	2.00	50.80	1.16	29.46	0.55	13.97	13/16
GAMS-64	3/8	1/4	0.25	6.35	1.93	49.02	1.11	28.19	0.55	13.97	13/16
GAMS-66	3/8	3/8	0.25	6.35	1.96	49.78	1.13	28.70	0.55	13.97	13/16
GAMS-68	3/8	1/2	0.25	6.35	2.06	52.32	1.11	28.19	0.65	16.51	15/16
GAMS-84	1/2	1/4	0.29	7.37	2.06	52.32	1.23	31.24	0.55	13.97	15/16
GAMS-86	1/2	3/8	0.38	9.65	2.07	52.58	1.23	31.24	0.55	13.97	15/16
GAMS-88	1/2	1/2	0.38	9.65	2.18	55.37	1.23	31.24	0.66	16.76	15/16
GAMS-812	1/2	3/4	0.38	9.65	2.15	54.61	1.23	31.24	0.65	16.51	1 3/16
GAMS-128	3/4	1/2	0.54	13.72	2.39	60.71	1.44	36.58	0.67	17.02	1 3/16
GAMS-1212	3/4	3/4	0.63	15.88	2.38	60.45	1.44	36.58	0.66	16.76	1 3/16

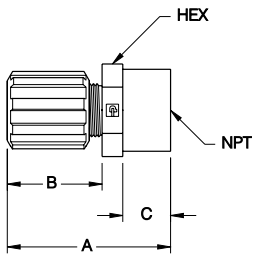
Adaptor
Male Straight, Panel Mount



Part Number	Tube Size	NPT Size	Orifice		A		B		C		D		E (max.)		Hole Size		Hex 1 Size	Hex 2 Size
			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		
GAMS-44-P	1/4	1/4	0.18	4.57	2.49	63.25	1.69	42.93	0.29	7.37	0.55	13.97	0.25	6.35	0.50	12.70	11/16	11/16
GAMS-66-P	3/8	3/8	0.25	6.35	2.40	60.96	1.56	39.62	0.29	7.37	0.55	13.97	0.25	6.35	0.63	16.00	15/16	13/16
GAMS-88-P	1/2	1/2	0.38	9.65	2.64	67.06	1.69	42.93	0.29	7.37	0.66	16.76	0.25	6.35	0.75	19.05	1 1/16	15/16
GAMS-1212-P	3/4	3/4	0.63	15.88	3.08	78.23	2.07	52.58	0.29	7.37	0.65	16.51	0.5	12.70	1.00	25.40	1 5/16	1 3/16

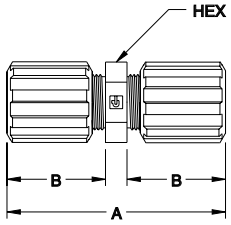
Pargrip PFA Tube Fittings

Adaptor Female Straight



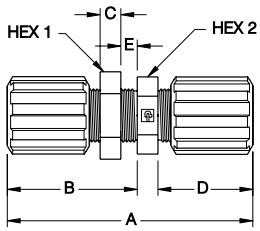
Part Number	Tube Size	NPT Size	Orifice		A		B		C		Hex Size
			inch	mm	inch	mm	inch	mm	inch	mm	
GAFS-22	1/8	1/8	0.09	2.29	1.60	40.64	0.75	19.05	0.56	14.22	5/8
GAFS-24	1/8	1/4	0.09	2.29	1.61	40.89	0.75	19.05	0.57	14.48	3/4
GAFS-42	1/4	1/8	0.18	4.57	1.98	50.29	1.13	28.70	0.56	14.22	5/8
GAFS-44	1/4	1/4	0.18	4.57	1.98	50.29	1.13	28.70	0.56	14.22	3/4
GAFS-46	1/4	3/8	0.18	4.57	1.97	50.04	1.13	28.70	0.55	13.97	15/16
GAFS-48	1/4	1/2	0.18	4.57	2.08	52.83	1.13	28.70	0.66	16.76	1 3/16
GAFS-64	3/8	1/4	0.25	6.35	1.96	49.78	1.13	28.70	0.56	14.22	3/4
GAFS-66	3/8	3/8	0.25	6.35	1.97	50.04	1.13	28.70	0.55	13.97	15/16
GAFS-68	3/8	1/2	0.25	6.35	2.06	52.32	1.11	28.19	0.67	17.02	1
GAFS-84	1/2	1/4	0.31	7.87	2.04	51.82	1.21	30.73	0.56	14.22	3/4
GAFS-86	1/2	3/8	0.38	9.65	2.03	51.56	1.21	30.73	0.55	13.97	15/16
GAFS-88	1/2	1/2	0.37	9.40	2.16	54.86	1.22	30.99	0.66	16.76	1 1/18
GAFS-812	1/2	3/4	0.38	9.65	2.15	54.61	1.23	31.24	0.67	17.02	1 3/16
GAFS-816	1/2	1	0.38	9.65	2.35	59.69	1.23	31.24	0.85	21.59	1 5/8
GAFS-1212	3/4	3/4	0.62	15.75	2.39	60.71	1.43	36.32	0.67	17.02	1 3/16

Straight Connector



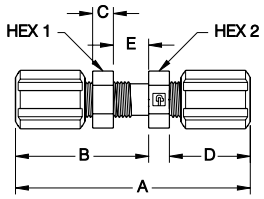
Part Number	Tube Size	Orifice		A		B		Hex Size
		inch	mm	inch	mm	inch	mm	
GSC-2	1/8	0.09	2.29	1.79	45.47	0.75	19.05	1/2
GSC-4	1/4	0.18	4.57	2.55	64.77	1.13	28.70	5/8
GSC-6	3/8	0.25	6.35	2.53	64.26	1.12	28.45	13/16
GSC-8	1/2	0.38	9.65	2.75	69.85	1.23	31.24	15/16
GSC-12	3/4	0.63	15.88	3.16	80.26	1.43	36.32	1 3/16

Straight Connector, Panel Mount



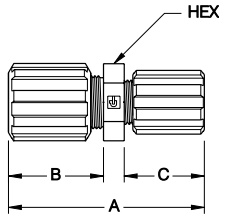
Part Number	Tube Size	Orifice		A		B		C		D		E (max.)		Hole Size		Hex 1 Size	Hex 2 Size
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		
GSC-2-P	1/8	0.09	2.29	2.28	57.91	1.24	31.50	0.19	4.83	0.75	19.05	0.25	6.35	0.32	8.13	1/2	1/2
GSC-4-P	1/4	0.18	4.57	3.11	78.99	1.67	42.42	0.29	7.37	1.15	29.21	0.25	6.35	0.50	12.70	11/16	11/16
GSC-6-P	3/8	0.25	6.35	2.95	74.93	1.54	39.12	0.29	7.37	1.12	28.45	0.25	6.35	0.63	16.00	15/16	13/16
GSC-8-P	1/2	0.38	9.65	3.21	81.53	1.72	43.69	0.29	7.37	1.21	30.73	0.25	6.35	0.75	19.05	1 1/16	15/16
GSC-12-P	3/4	0.63	16.00	3.82	97.03	2.08	52.83	0.29	7.37	1.45	36.83	0.25	6.35	1.00	25.40	1 5/16	1 3/16

Straight Connector Panel Mount, Extended



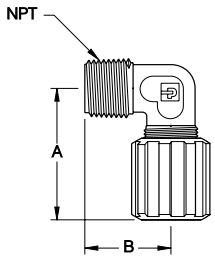
Part Number	Tube Size	Orifice		A		B		C		D		E (max.)		Hole Size		Hex 1 Size	Hex 2 Size
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		
GSC-4-PX	1/4	0.18	4.57	3.28	83.31	1.86	47.24	0.29	7.37	1.13	28.70	0.50	12.70	0.50	12.70	11/16	11/16

Straight Connector Reducer



Part Number	Tube Size	Orifice		A		B		C		Hex Size
		inch	mm	inch	mm	inch	mm	inch	mm	
GSCR-42	1/4 X 1/8	0.09	2.29	2.17	55.12	1.13	28.70	0.75	19.05	5/8
GSCR-64	3/8 X 1/4	0.18	4.57	2.54	64.52	1.12	28.45	1.13	28.70	11/16
GSCR-82	1/2 X 1/8	0.09	2.29	2.37	60.20	1.33	33.78	0.75	19.05	15/16
GSCR-84	1/2 X 1/4	0.18	4.57	2.67	67.82	1.23	31.24	1.15	29.21	15/16
GSCR-86	1/2 X 3/8	0.25	6.35	2.55	64.77	1.19	30.23	1.07	27.18	15/16
GSCR-128	3/4 X 1/2	0.37	9.40	2.92	74.17	1.42	36.07	1.21	30.73	1 3/16

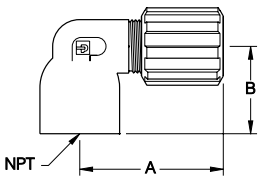
Adaptor Male Elbow



Part Number	Tube Size	NPT Size	Orifice		A		B	
			inch	mm	inch	mm	inch	mm
GAME-24	1/8	1/4	0.09	2.29	1.27	32.26	1.07	27.18
GAME-42	1/4	1/8	0.18	4.57	1.66	42.16	1.08	27.43
GAME-44	1/4	1/4	0.18	4.57	1.64	41.66	1.07	27.18
GAME-46	1/4	3/8	0.18	4.57	1.71	43.43	1.08	27.43
GAME-48	1/4	1/2	0.18	4.57	1.66	42.16	1.19	30.23
GAME-62	3/8	1/8	0.20	5.08	1.63	41.40	1.07	27.18
GAME-64	3/8	1/4	0.25	6.35	1.62	41.15	1.07	27.18
GAME-66	3/8	3/8	0.25	6.35	1.63	41.40	1.07	27.18
GAME-68	3/8	1/2	0.25	6.35	1.63	41.40	1.18	29.97
GAME-84	1/2	1/4	0.29	7.37	1.74	44.20	1.08	27.43
GAME-86	1/2	3/8	0.38	9.65	1.71	43.43	1.08	27.43
GAME-88	1/2	1/2	0.38	9.65	1.74	44.20	1.18	29.97
GAME-812	1/2	3/4	0.38	9.65	1.89	48.01	1.36	34.54
GAME-128	3/4	1/2	0.54	13.72	2.15	54.61	1.37	34.80
GAME-1212	3/4	3/4	0.63	16.00	2.13	54.10	1.35	34.29

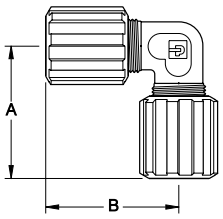
Pargrip PFA Tube Fittings

Adaptor Female Elbow



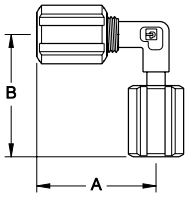
Part Number	Tube Size	NPT Size	Orifice		A		B	
			inch	mm	inch	mm	inch	mm
GAFE-22	1/8	1/8	0.09	2.29	1.45	36.83	0.83	21.08
GAFE-24	1/8	1/4	0.09	2.29	1.42	36.07	0.97	24.64
GAFE-44	1/4	1/4	0.16	4.06	1.82	46.23	0.97	24.64
GAFE-64	3/8	1/4	0.25	6.35	1.81	45.97	0.94	23.88
GAFE-66	3/8	3/8	0.25	6.35	1.81	45.97	1.00	25.40
GAFE-68	3/8	1/2	0.25	6.35	1.77	44.96	1.23	31.24
GAFE-88	1/2	1/2	0.38	9.55	1.93	49.02	1.23	31.24

Elbow Connector



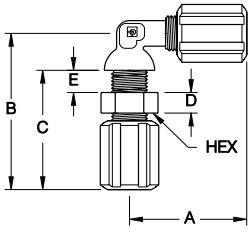
Part Number	Tube Size	Orifice		A		B	
		inch	mm	inch	mm	inch	mm
GEC-2	1/8	0.09	2.29	1.27	32.26	1.27	32.26
GEC-4	1/4	0.18	4.57	1.66	42.16	1.66	42.16
GEC-6	3/8	0.25	6.22	1.61	40.89	1.61	40.89
GEC-8	1/2	0.37	9.47	1.74	44.20	1.74	44.20
GEC-12	3/4	0.62	15.75	2.11	53.59	2.11	53.59

Elbow Connector, Redi-flare



Part Number	Tube Size	Orifice		A		B	
		inch	mm	inch	mm	inch	mm
GEC-4RF4	1/4 X 1/4	0.13	3.30	1.65	41.91	1.70	43.18

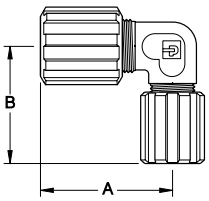
Elbow Connector, Panel Mount



Part Number	Tube Size	Orifice		A		B		C		D		E (max.)		Hole Size		Hex Size
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
GEC-4-P	1/4	0.18	4.57	1.63	41.40	2.20	55.88	1.68	42.67	0.29	7.37	0.25	6.35	0.50	12.70	11/16

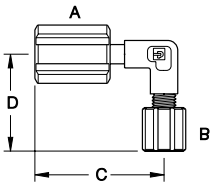
Pargrip PFA Tube Fittings

Elbow Connector Reducer



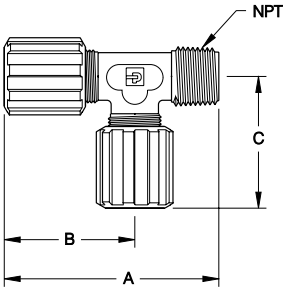
Part Number	Tube Size	Orifice		A		B	
		inch	mm	inch	mm	inch	mm
GECR-42	1/4 X 1/8	0.09	2.29	1.64	41.66	1.26	32.00
GECR-64	3/8 X 1/4	0.18	4.50	1.65	41.91	1.61	40.89
GECR-84	1/2 X 1/4	0.17	4.42	1.67	42.42	1.73	43.94
GECR-86	1/2 X 3/8	0.25	6.22	1.70	43.18	1.59	40.39

Elbow Connector Reducer, Redi-flare



Part Number	A	B	Orifice		C		D	
	Tube Size Redi-flare X Pargrip		inch	mm	inch	mm	inch	mm
GECR-4RF2	1/4	1/8	0.09	2.29	1.70	43.18	1.27	32.26

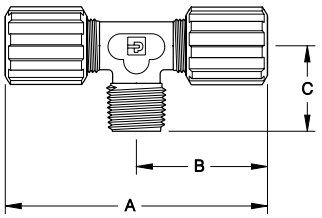
Adaptor Male Tee



Part Number	Tube Size	NPT Size	Orifice		A		B		C	
			inch	mm	inch	mm	inch	mm	inch	mm
GAMT-222	1/8 X 1/8	1/8	0.09	2.29	2.35	59.69	1.27	32.26	1.26	32.00
GAMT-242	1/8 X 1/8	1/4	0.09	2.29	2.35	59.69	1.27	32.26	1.26	32.00
GAMT-424	1/4 X 1/4	1/8	0.18	4.57	2.74	69.60	1.66	42.16	1.66	42.16
GAMT-444	1/4 X 1/4	1/4	0.18	4.57	2.74	69.60	1.66	42.16	1.65	41.91
GAMT-646	3/8 X 3/8	1/4	0.25	6.35	2.73	69.34	1.65	41.91	1.65	41.91
GAMT-848	1/2 X 1/2	1/4	0.29	7.37	2.81	71.37	1.74	44.20	1.74	44.20
GAMT-888	1/2 X 1/2	1/2	0.37	9.40	2.93	74.42	1.76	44.70	1.73	43.94

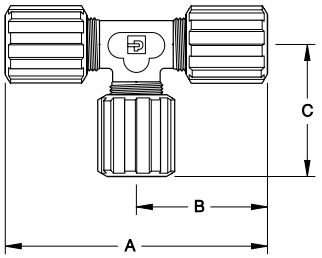
Pargrip PFA Tube Fittings

Branch Male Tee



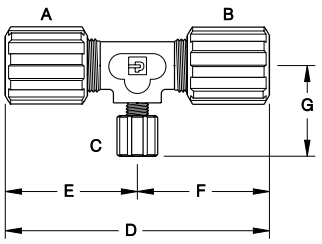
Part Number	Tube Size	NPT Size	Orifice		A		B		C	
			inch	mm	inch	mm	inch	mm	inch	mm
GBMT-222	1/8 X 1/8	1/8	0.09	2.29	2.55	64.77	1.28	32.51	1.07	27.18
GBMT-224	1/8 X 1/8	1/4	0.09	2.29	2.55	64.77	1.28	32.51	1.07	27.18
GBMT-442	1/4 X 1/4	1/8	0.18	4.57	3.39	86.11	1.69	42.93	1.08	27.43
GBMT-444	1/4 X 1/4	1/4	0.18	4.57	3.39	86.11	1.69	42.93	1.08	27.43
GBMT-662	3/8 X 3/8	1/8	0.25	6.35	3.26	82.80	1.63	41.40	1.07	27.18
GBMT-664	3/8 X 3/8	1/4	0.25	6.35	3.22	81.79	1.61	40.89	1.07	27.18
GBMT-666	3/8 X 3/8	3/8	0.25	6.35	3.26	82.80	1.63	41.40	1.07	27.18
GBMT-668	3/8 X 3/8	1/2	0.25	6.35	3.26	82.80	1.63	41.40	1.18	29.97
GBMT-884	1/2 X 1/2	1/4	0.29	7.37	3.47	88.14	1.74	44.20	0.88	22.35
GBMT-886	1/2 X 1/2	3/8	0.38	9.65	3.49	88.65	1.74	44.20	1.08	27.43
GBMT-888	1/2 X 1/2	1/2	0.37	9.47	3.48	88.39	1.74	44.20	1.17	29.72

Tee Connector



Part Number	Tube Size	Orifice		A		B		C	
		inch	mm	inch	mm	inch	mm	inch	mm
GTC-2	1/8	0.09	2.29	2.55	64.77	1.28	32.51	1.27	32.26
GTC-4	1/4	0.17	4.32	3.30	83.82	1.65	41.91	1.65	41.91
GTC-6	3/8	0.25	6.35	3.27	83.06	1.63	41.40	1.63	41.40
GTC-8	1/2	0.37	9.40	3.51	89.15	1.75	44.45	1.74	44.20
GTC-12	3/4	0.63	16.00	4.28	108.71	2.14	54.36	2.14	54.36

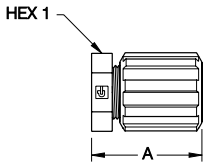
Tee Connector Reducer



Part Number	A	B	C	Orifice		D		E		F		G	
	Tube Size			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
GTCR-224	1/8	1/8	1/4	0.09	2.29	2.56	65.02	1.28	32.51	1.28	32.51	1.65	41.91
GTCR-442	1/4	1/4	1/8	0.09	2.29	3.32	84.32	1.66	42.16	1.66	42.16	1.27	32.26
GTCR-466	1/4	3/8	3/8	0.18	4.45	3.31	83.82	1.66	41.91	1.65	41.91	1.65	41.91
GTCR-664	3/8	3/8	1/4	0.18	4.45	3.22	81.78	1.61	40.89	1.61	40.89	1.69	42.93
GTCR-882	1/2	1/2	1/8	0.09	2.29	3.70	93.98	1.85	46.99	1.85	46.99	1.28	32.51

Pargrip PFA Tube Fittings

Tubing Plug

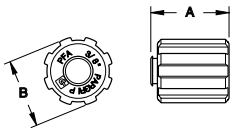


Part Number	Tube Size	A		Hex Size
		inch	mm	
GTPG-2	1/8	1.04	26.42	1/2
GTPG-4	1/4	1.42	36.07	11/16
GTPG-6	3/8	1.41	35.81	13/16
GTPG-8	1/2	1.56	39.62	3/4
GTPG-12	3/4	1.73	43.94	1 3/16

Gripper

Part Number	Tube Size
1207-0023	1/8
1207-0001	1/4
1207-0002	3/8
1207-0003	1/2
1207-0004	3/4

Fitting Cap

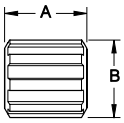


Part Number	Tube Size	A		B	
		inch	mm	inch	mm
GCAP-4	1/4	1.13	28.70	0.84	21.34
GCAP-6	3/8	1.09	27.69	0.97	24.64

Ferrule

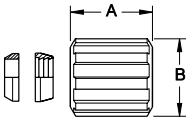
Part Number	Tube Size
1022-0002	1/8
1022-0004	1/4
1022-0006	3/8
1022-0008	1/2
1022-0012	3/4

Fitting Nut PFA



Part Number	Tube Size	A		B	
		inch	mm	inch	mm
1213-0302	1/8	0.57	14.48	0.57	14.48
1213-0304	1/4	0.97	24.64	0.84	21.34
1213-0306	3/8	0.98	24.89	0.94	23.88
1213-0308	1/2	1.13	28.70	1.10	27.94
1213-0312	3/4	1.23	31.24	1.41	35.81

Fitting Nut Assembly



Part Number	Tube Size	A		B	
		inch	mm	inch	mm
1202-0012	1/8	0.56	14.22	0.56	14.22
1202-0001	1/4	0.97	24.64	0.84	21.34
1202-0002	3/8	0.98	24.89	0.94	23.88
1202-0003	1/2	1.13	28.70	1.10	27.94
1202-0004	3/4	1.23	31.24	1.41	35.81

Notes

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