



Premier Manufacturer of High Pressure
Valves, Fittings, Tubing, and Accessories



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HIGH
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Precision High Pressure is the premier manufacturer of high pressure valves, fittings, tubing, and accessories with pressures up to 100,000 PSI.

PHP specializes in the oil and gas and waterjet markets with typical applications including Hydrogen, Subsea & Surface, Chemical Injection

Systems, Process Control Systems, Control Panels, Hydraulic Power Units (HPUs), Hydrostatic Test Systems, Water Blasting and Waterjet Cutting.

With over 60 years of cumulative experience in design and manufacturing of various high tech products, the PHP team looks forward to continuing our tradition of delivering high quality products and dependable services to our customers across the globe.





TABLE OF CONTENTS

Pipe Needle Valves	4
Pipe Check Valves	7
Pipe Filters	8
Pipe Fittings	10
Medium and High Pressure Needle Valves	13
Medium and High Pressure Check Valves	17
Medium and High Pressure Filters	18
Medium and High Pressure Fittings	20
Air Actuators	25
Ball Valves	27
Medium and High Pressure Tubing	32
Block and Bleed	33
Manifolds	34
Adaptors	35

Standard Type

Specifications

- MAWP up to 15,000 PSI (1034 bar).
- Temperature Ratings: 0°F to 400°F (-18°C to 204°C).
- Female NPT connections are standard.
- Vee type stem is standard.

Features & Benefits

- Standard valve fully opens in 4 1/2 turns.
- Standard 3/4" and 1" valve fully opens in as little as 3 turns, compared to 9 turns for industry standard valves.
- Two-piece, heavy-duty, non-rotating stem for a robust and reliable assembly.
- Bi-directional flow capability. Simplifies system designs.
- Packing gland consists of a preload locking internal thread form that is resistant to vibration. Eliminates the need for an external locking device.
- Double-sided weep holes for easier leakage verification.



Quick Open Type Additional Features

- Valve is fully open in as little as 1 3/4 turns.
- Stem is lifted off of the seat a minimum of 2X faster than conventional valves, which reduces throttling and therefore increases seat life.
- Less than half the number of turns to fully open compared to competitor's valves.

Options

- Solid Stainless Steel or Aluminum Handle.
- Replaceable Seat design for use in harsh environments.
- Air Actuators for Remote Valve Actuator.
- Grafoil Packing for temperature up to 800°F.
- Extended Stuffing Box for temperatures up to 1200°F.
- Extended Stuffing Box for temperatures down to -423°F.
- Can be manufactured to meet NACE MR-01-75.
- Wide range of construction materials available.

Standard Materials

- Body - 316 cold worked stainless steel.
- Packing - Glass filled Teflon.
- Stem - 17-4 PH.

PIPE NEEDLE VALVES

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Orifice in. (mm)	Dimensions, in. (mm)											Valve Dimensions
					A	B	C	D1	D2	D3	E	F	G	H	J	L

2-WAY STRAIGHT

1/4	Female NPT	15,000 PSI	15NV4N1V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.63 (41.28)	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	4.84 (123.0)	0.25 (6.4)	1.00 (25.4)	See Figure 1
3/8			15NV6N1V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	2.88 (73.2)	2.38 (60.4)	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.46 (139.0)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N1V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.00 (76.2)	2.38 (60.4)	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.58 (142.0)	0.34 (8.7)	1.25 (31.6)	
3/4		10,000 PSI	10NV12N1V	0.438 (11.1)	3.00 (76.2)	1.50 (38.1)	3.75 (95.3)	3.00 (76.2)	2.25 (57.2)	-	0.62 (15.7)	1.75 (44.5)	8.07 (204.0)	7.07 (179.6)	0.44 (11.2)	1.38 (35.1)	
1			10NV16N1V	0.562 (14.3)	4.12 (104.6)	2.06 (52.3)	4.75 (120.7)	3.75 (95.3)	2.82 (71.6)	-	1.12 (28.4)	2.50 (63.5)	10.29 (261.4)	8.96 (227.6)	0.56 (14.2)	1.75 (44.5)	

2-WAY ANGLE

1/4	Female NPT	15,000 PSI	15NV4N2V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)	-	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	1.00 (25.4)	See Figure 2
3/8			15NV6N2V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)	-	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (152.0)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N2V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)	-	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (152.0)	0.34 (8.7)	1.25 (31.6)	
3/4		10,000 PSI	10NV12N2V	0.438 (11.1)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	-	2.25 (57.2)	-	0.62 (15.7)	1.75 (44.5)	8.07 (204.0)	7.57 (182.3)	0.44 (11.2)	1.38 (35.1)	
1			10NV16N2V	0.562 (14.3)	4.12 (104.6)	2.06 (52.3)	5.13 (130.3)	-	2.82 (71.6)	-	1.12 (28.4)	2.50 (63.5)	10.29 (261.4)	8.96 (227.6)	0.56 (14.2)	1.75 (44.5)	

3-WAY/2 ON PRESSURE

1/4	Female NPT	15,000 PSI	15NV4N3V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	2.62 (66.5)	1.63 (41.3)	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.46 (139.0)	0.25 (6.4)	1.00 (25.4)	See Figure 3
3/8			15NV6N3V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.62 (85.9)	2.38 (60.4)	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	6.20 (157.5)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N3V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.62 (85.9)	2.38 (60.4)	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	6.20 (157.5)	0.34 (8.7)	1.25 (31.6)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

*For quick open version insert "Q" after "NV" in part number. Example: 15NVQ8N1V

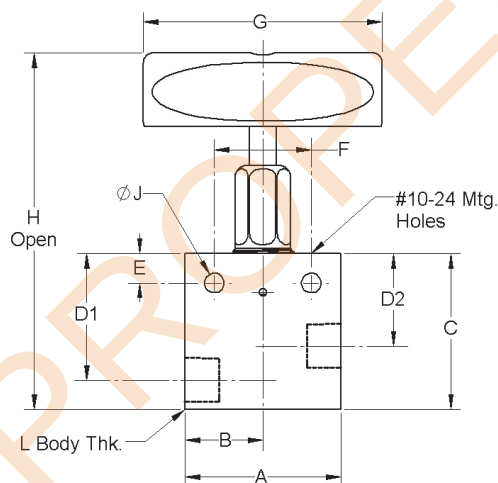


Figure 1

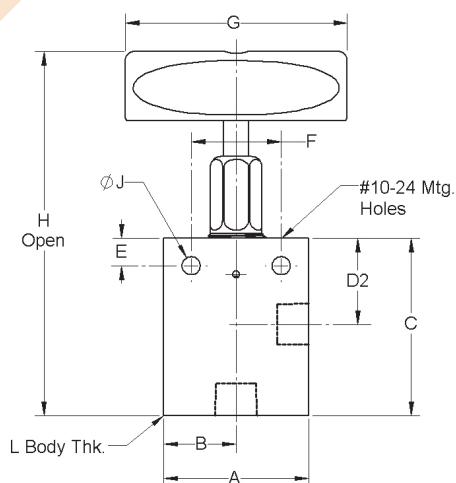


Figure 2

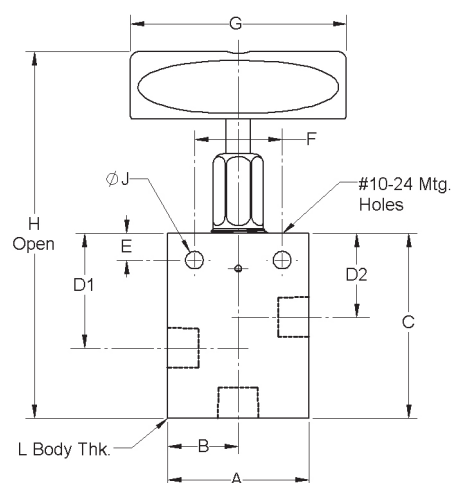


Figure 3

PIPE NEEDLE VALVES

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Orifice in. (mm)	Dimensions, in. (mm)											Valve Dimensions
					A	B	C	D1	D2	D3	E	F	G	H	J	

3-WAY/1 ON PRESSURE

1/4	Female NPT	15,000 PSI	15NV4N4V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)	1.19 (30.2)	-	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	1.00 (25.4)	See Figure 4
3/8			15NV6N4V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)	1.75 (44.5)	-	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (152.0)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N4V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)	1.75 (44.5)	-	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (152.0)	0.34 (8.7)	1.25 (31.6)	

3-WAY/2-STEM MANIFOLD

1/4	Female NPT	15,000 PSI	15NV4N5V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	3.38 (85.9)	1.69 (42.9)	1.19 (30.2)	1.19 (30.2)	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	9.06 (230.1)	0.25 (6.4)	1.00 (25.4)	See Figure 5
3/8			15NV6N5V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	5.12 (130.0)	2.56 (65.0)	1.75 (44.5)	1.75 (44.5)	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	10.28 (261.1)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N5V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	5.12 (130.0)	2.56 (65.0)	1.75 (44.5)	1.75 (44.5)	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	10.28 (261.1)	0.34 (8.7)	1.25 (31.6)	

2-WAY ANGLE/REPLACEABLE SEAT

1/4	Female NPT	15,000 PSI	15NV4N6V	0.25 (6.4)	2.00 (50.8)	1.00 (25.4)	3.30 (83.8)	-	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	6.19 (157.2)	0.25 (6.4)	1.00 (25.4)	See Figure 6
3/8			15NV6N6V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	4.51 (114.6)	-	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	7.09 (180.1)	0.34 (8.7)	1.00 (25.4)	
1/2			15NV8N6V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	4.62 (117.3)	-	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	7.20 (182.9)	0.34 (8.7)	1.50 (38.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

*For quick open version insert "Q" after "NV" in part number. Example: 15NVQ8N1V

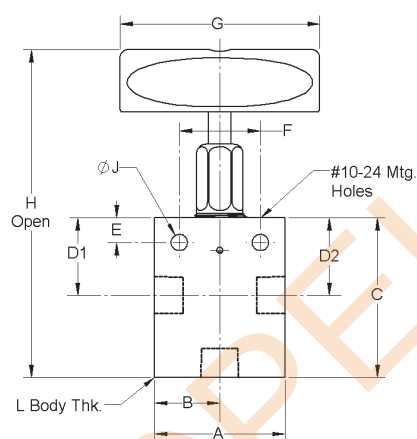


Figure 4

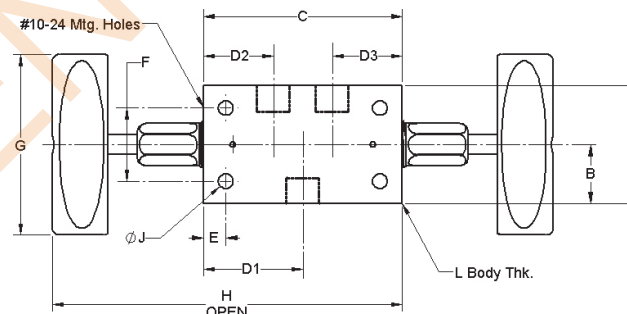


Figure 5

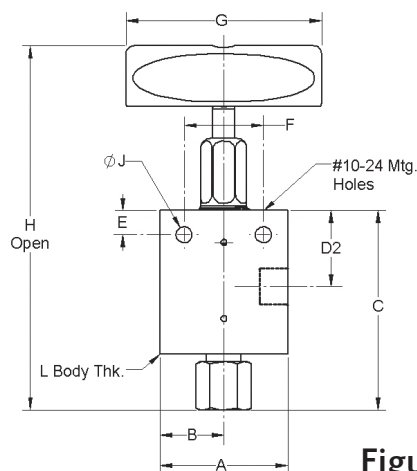


Figure 6

PIPE CHECK VALVES

Specifications

- MAWP up to 15,000 PSI (1034 bar).
- Temperature Ratings
Metal Seat: 0°F to 400°F (-18°C to 204°C).
Soft Seat: 0°F to 400°F (-18°C to 204°C).
- Nominal Cracking Pressure: 15 PSI (1 bar).
- Female NPT end connections are standard.

Features

- Prevents reverse flow which may cause damage to a pressure system.
- Metal Seat offers metal-to-metal seat for rapid cycling or severe environments.
- Soft Seat offers PEEK seat with metal back-up for fast shutoff and reliable seal.
- Can be manufactured to meet NACE MR-01-75.

Materials

- 316 cold worked stainless steel is standard.
- PEEK 450G is standard material of soft seat poppet seal.



End Connection Size in.	Connection Type	Pressure Rating	Part Number Metal Seat	Part Number Soft Seat	Orifice in. (mm)	Dimension in. (mm)			Valve Dimensions
						A	B	C	
1/4	Female NPT	15,000 PSI	15CV4NFM	15CV4NFS	0.188 (4.78)	3.20 (81.3)	2.50 (63.5)	1.00 (25.4)	See Figure 1
3/8			15CV6NFM	15CV6NFS	0.219 (5.56)	3.56 (90.4)	2.66 (66.0)	1.13 (28.7)	
1/2			15CV8NFM	15CV8NFS	0.359 (9.12)	4.63 (117.6)	3.50 (88.9)	1.38 (35.1)	
3/4		10,000 PSI	10CV12NFM	10CV12NFS	0.516 (13.11)	5.63 (143.00)	4.38 (111.25)	1.75 (44.45)	
1			10CV16NFM	10CV16NFS	0.688 (17.48)	7.00 (177.8)	5.25 (133.35)	2.13 (54.10)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

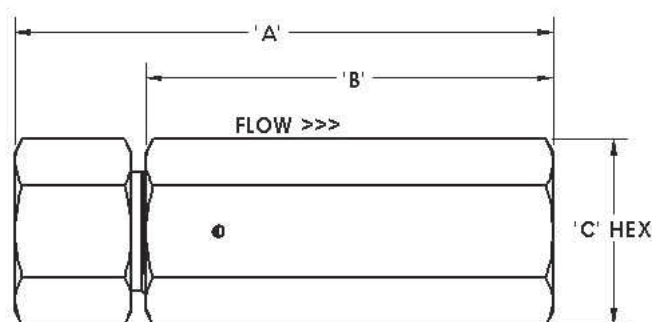


Figure 1

Specifications

- MAWP up to 15,000 PSI (1034 bar).
- Female NPT end connections are standard.

Line Filters

- Line Filters are used to remove contaminating particles from fluid. Each line filter is provided with two filter elements. The upstream element to filter out larger particles, and the downstream element to filter smaller particles.
- Filter elements are available in nominal ratings of 0.5, 2, 5, 10, 20, 40 and 100 Micron.

Cup Filters

- Cup Filters offer maximum filtration surface area for removal of contaminating particles from the fluid system. They may be used in systems which require high flow rates with minimum pressure drop.
- Filter elements are available in nominal ratings of 5, 10, 20, 40 and 100 Micron.

Materials

- 316 cold worked stainless steel is standard.
- Filter discs are made from 300 series stainless steel.

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)			Fitting Dimensions
				A	B	C	

LINE FILTER

1/4	Female NPT	15,000 PSI	15LF4NF-*/*	2.13 (54.1)	1.50 (38.1)	1.00 (25.4)	See Figure 1
3/8			15LF6NF-*/*	2.50 (63.5)	1.63 (41.4)	1.13 (28.7)	
1/2			15LF8NF-*/*	3.25 (82.55)	2.06 (52.32)	1.38 (35.1)	
3/4		10,000 PSI	10LF12NF-*/*	4.06 (103.12)	2.88 (73.15)	1.75 (44.45)	
1			10LF16NF-*/*	5.00 (127)	3.30 (83.82)	2.13 (54.10)	

*Insert desired upstream/downstream micron filter

Example: 15LF8NF-20/5 is a 1/2" FNPT Cup Filter with 20 micron upstream filter and 5 micron downstream filter.

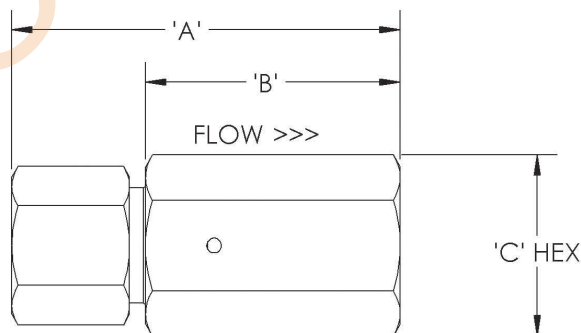


Figure 1

PIPE FILTERS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)			Fitting Dimensions
				A	B	C	

CUP FILTER

1/4	Female NPT	15,000 PSI	15CF4NF-*	3.20 (81.3)	2.50 (63.5)	1.00 (25.4)	See Figure 2
3/8			15CF6NF-*	3.56 (90.4)	2.66 (66.0)	1.13 (28.7)	
1/2			15CF8NF-*	4.63 (117.6)	3.50 (88.9)	1.38 (35.1)	
3/4		10,000 PSI	10CF12NF-*	5.63 (143.00)	4.38 (111.25)	1.75 (44.45)	
1			10CF16NF-*	7.00 (177.8)	5.25 (133.35)	2.13 (54.10)	

*Insert desired micron filter

Example: 15CF8NF-5 is a 1/2" FNPT Cup Filter with 5 micron filter

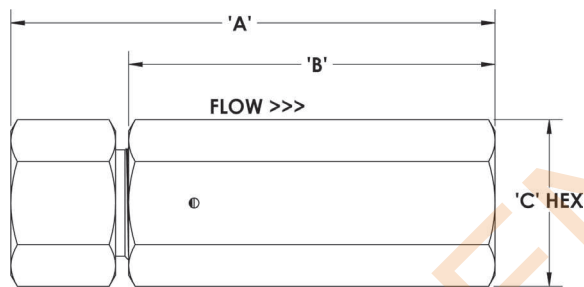


Figure 2

Specifications

- NPT Fittings with MAWP up to 15,000 PSI (1034 bar).
- Female and Male NPT connections are standard.

Features

- Can be manufactured to meet NACE MR-01-75.

Materials

- 316 stainless steel is standard.
- Other materials available by request.



End Connection Size in.	Pressure Rating	Part Number	Dimension, in. (mm)					Block Thickness	Fitting Dimensions	
			A	B	C	D				
FEMALE ELBOW										
1/8	15,000 PSI	15L2NF	1.13 (28.7)	1.00 (25.4)	0.75 (19.1)	0.62 (15.7)	0.62 (15.7)	See Figure 1		
1/4		15L4NF	1.50 (38.1)	1.25 (31.8)	1.00 (25.4)	0.81 (20.6)	0.75 (19.1)			
3/8		15L6NF	1.50 (38.1)	1.50 (38.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)			
1/2		15L8NF	1.75 (44.4)	1.75 (44.4)	1.25 (31.8)	1.25 (31.8)	1.25 (31.8)			
3/4	10,000 PSI	10L12NF	2.62 (66.5)	2.12 (53.8)	1.31 (33.3)	1.38 (35.1)	1.50 (38.1)			
1		10L16NF	3.00 (76.2)	2.56 (65.0)	1.69 (68.3)	1.69 (68.3)	1.75 (44.4)			
FEMALE TEE										
1/8	15,000 PSI	15T2NF	1.50 (38.1)	1.00 (25.4)	0.75 (19.1)	0.62 (15.7)	0.62 (15.7)	See Figure 2		
1/4		15T4NF	2.00 (50.8)	1.25 (31.8)	1.00 (25.4)	0.81 (20.6)	0.75 (19.1)			
3/8		15T6NF	2.00 (50.8)	1.50 (38.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)			
1/2		15T8NF	2.50 (63.5)	1.75 (44.4)	1.25 (31.8)	1.25 (31.8)	1.25 (31.8)			
3/4	10,000 PSI	10T12NF	2.62 (66.5)	2.12 (53.8)	1.31 (33.3)	1.38 (35.1)	1.50 (38.1)			
1		10T16NF	3.38 (85.9)	2.56 (65.0)	1.69 (68.3)	1.69 (68.3)	1.75 (44.4)			
FEMALE CROSS										
1/8	15,000 PSI	15X2NF	1.50 (38.1)	1.50 (38.1)	0.75 (19.1)	0.75 (19.1)	0.62 (15.7)	See Figure 3		
1/4		15X4NF	2.00 (50.8)	2.00 (50.8)	1.00 (25.4)	1.00 (25.4)	0.75 (19.1)			
3/8		15X6NF	2.00 (50.8)	2.00 (50.8)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)			
1/2		15X8NF	2.50 (63.5)	2.50 (63.5)	1.25 (31.8)	1.25 (31.8)	1.25 (31.8)			
3/4	10,000 PSI	10X12NF	2.70 (68.6)	2.70 (68.6)	1.31 (33.3)	1.31 (33.3)	1.50 (38.1)			
1		10X16NF	4.12 (104.6)	4.12 (104.6)	2.06 (52.3)	2.06 (52.3)	1.75 (44.4)			

Dimensions, in inches (millimeters), are for reference only and are subject to change.

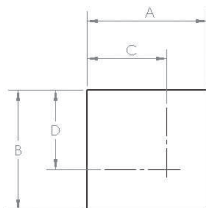


Figure 1

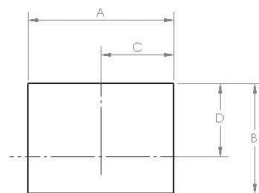


Figure 2

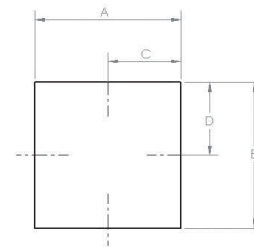


Figure 3

PIPE FITTINGS

End Connection Size in.	Pressure Rating	Part Number	Dimension, in. (mm)		Fitting Dimensions
			A	B	

COUPLING

1/4	15,000 PSI	15CU4NF	1.25 (31.8)	0.75 (19.1)	See Figure 4
3/8		15CU6NF	1.38 (35.1)	1.00 (25.4)	
1/2		15CU8NF	1.50 (38.1)	1.38 (35.1)	
3/4	10,000 PSI	10CU12NF	1.75 (44.4)	1.38 (35.1)	
1		10CU16NF	2.18 (55.4)	1.75 (44.4)	

CAP

1/8	15,000 PSI	15CA2NF	0.75 (19.1)	0.62 (15.7)	See Figure 5
1/4		15CA4NF	1.00 (25.4)	0.75 (19.1)	
3/8		15CA6NF	1.00 (25.4)	1.00 (25.4)	
1/2		15CA8NF	1.25 (31.8)	1.38 (35.1)	
3/4	10,000 PSI	10CA12NF	1.50 (38.1)	1.38 (35.1)	
1		10CA16NF	1.68 (42.7)	1.75 (44.4)	

PLUG

1/8	15,000 PSI	15PL2NM	1.00 (25.4)	0.50 (12.7)	See Figure 6
1/4		15PL4NM	1.13 (28.7)	0.62 (15.7)	
3/8		15PL6NM	1.13 (28.7)	0.75 (19.1)	
1/2		15PL8NM	1.50 (38.1)	1.00 (25.4)	
3/4	10,000 PSI	10PL12NM	1.50 (38.1)	1.38 (35.1)	
1		10PL16NM	1.88 (47.6)	1.38 (35.1)	

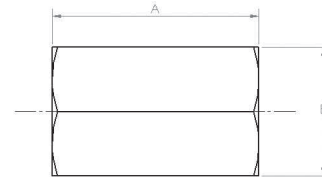


Figure 4

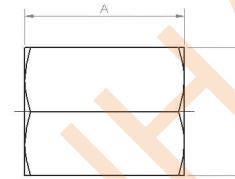


Figure 5

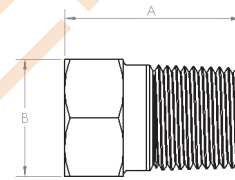


Figure 6

Dimensions, in inches (millimeters), are for reference only and are subject to change.

End Connection Size in.	Pressure Rating	Part Number	Dimension, in. (mm)						Fitting Dimensions
			A	B	C	D	E	F	

BULKHEAD

1/4	15,000 PSI	15BU4NF	2.00 (50.8)	0.62 (15.7)	1.00 (25.4)	1.00 (25.4)	0.94 (23.9)	0.38 (9.7)	See Figure 7
3/8		15BU6NF	2.62 (66.5)	0.79 (20.1)	1.38 (35.1)	1.38 (35.1)	1.25 (31.6)	0.38 (9.7)	
1/2		15BU8NF	2.62 (66.5)	0.91 (23.1)	1.88 (47.8)	1.88 (47.8)	1.37 (34.8)	0.38 (9.7)	
3/4	10,000 PSI	10BU12NF	2.62 (66.5)	0.91 (23.1)	1.88 (47.8)	1.88 (47.8)	1.69 (42.9)	0.38 (9.7)	
1		10BU16NF	3.50 (88.9)	1.50 (38.1)	2.13 (54.1)	2.13 (54.1)	1.94 (49.3)	0.38 (9.7)	

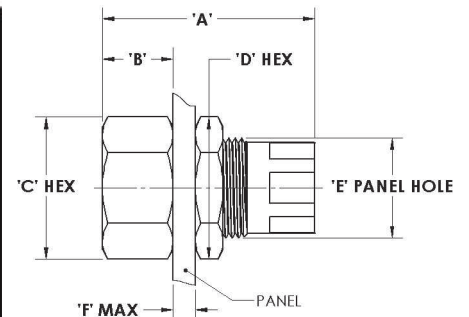


Figure 7

Dimensions, in inches (millimeters), are for reference only and are subject to change.

PIPE FITTINGS

End Connection Size in.	Pressure Rating	Part Number	Dimension, in. (mm)				Block Thickness	Fitting Dimensions
			A	B	C	D		

STREET ELBOW

1/8	15,000 PSI	15L2NM2NF	1.12 (28.5)	1.00 (25.4)	0.81 (20.6)	0.75 (19.1)	0.62 (15.7)	See Figure 8
1/4		15L4NM4NF	1.50 (38.1)	1.50 (38.1)	1.13 (28.7)	1.00 (25.4)	1.00 (25.4)	
3/8		15L6NM6NF	1.75 (44.4)	1.50 (38.1)	1.25 (31.8)	1.00 (25.4)	1.00 (25.4)	
1/2		15L8NM8NF	2.25 (57.2)	2.00 (50.8)	1.63 (41.4)	1.20 (30.5)	1.25 (31.8)	
3/4	10,000 PSI	10L12NM12NF	2.50 (63.5)	2.62 (66.5)	1.75 (44.4)	1.31 (33.3)	1.50 (38.1)	
1		10L16NM16NF	3.00 (76.2)	2.88 (73.2)	2.12 (53.8)	1.68 (42.7)	1.75 (44.4)	

MALE TEE

1/8	15,000 PSI	15T2NM	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.81 (20.6)	0.62 (15.7)	See Figure 9
1/4		15T4NM	2.25 (57.2)	1.50 (38.1)	1.13 (28.7)	1.13 (28.7)	0.75 (19.1)	
3/8		15T6NM	2.50 (63.5)	1.75 (44.4)	1.25 (31.8)	1.25 (31.8)	1.00 (25.4)	
1/2		15T8NM	3.00 (76.2)	2.00 (50.8)	1.50 (38.1)	1.50 (38.1)	1.00 (25.4)	
3/4	10,000 PSI	10T12NM	3.50 (88.9)	2.62 (66.5)	1.75 (44.4)	1.75 (44.4)	1.50 (38.1)	
1		10T16NM	4.25 (108.0)	3.00 (76.2)	2.12 (53.8)	2.12 (53.8)	1.75 (44.4)	

MALE RUN TEE

1/8	15,000 PSI	15T2NF2NM2NF	1.50 (38.1)	1.13 (28.7)	0.62 (15.7)	0.75 (19.1)	0.62 (15.7)	See Figure 10
1/4		15T4NF4NM4NF	2.00 (50.8)	1.38 (35.1)	0.81 (20.6)	1.00 (25.4)	0.75 (19.1)	
3/8		15T6NF6NM6NF	2.50 (63.5)	1.50 (38.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)	
1/2		15T8NF8NM8NF	2.75 (69.9)	1.75 (44.4)	1.25 (31.8)	1.25 (31.8)	1.38 (35.1)	
3/4	10,000 PSI	10T12NF12NM12NF	3.12 (79.2)	2.62 (66.5)	1.31 (33.3)	1.31 (33.3)	1.50 (38.1)	
1		10T16NF16NM16NF	4.25 (108.0)	3.00 (76.2)	2.12 (53.8)	2.12 (53.8)	1.75 (44.4)	

MALE BRANCH TEE

1/8	15,000 PSI	15T2NF2NF2NM	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.81 (20.6)	0.62 (15.7)	See Figure 11
1/4		15T4NF4NF4NM	2.00 (50.8)	1.50 (38.1)	1.00 (25.4)	1.13 (28.7)	0.75 (19.1)	
3/8		15T4NF6NF6NM	2.00 (50.8)	1.75 (44.4)	1.00 (25.4)	1.25 (31.8)	1.00 (25.4)	
1/2		15T8NF8NF8NM	2.50 (63.5)	2.25 (57.2)	1.25 (31.8)	1.63 (41.4)	1.25 (31.8)	
3/4	10,000 PSI	10T12NF12NF12NM	2.62 (66.5)	2.50 (63.5)	1.31 (33.3)	1.75 (44.4)	1.50 (38.1)	
1		10T16NF16NF16NM	3.37 (85.6)	3.00 (76.2)	1.69 (42.9)	2.13 (54.1)	1.75 (44.4)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

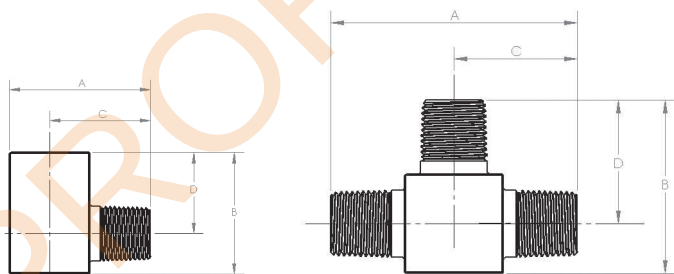


Figure 8

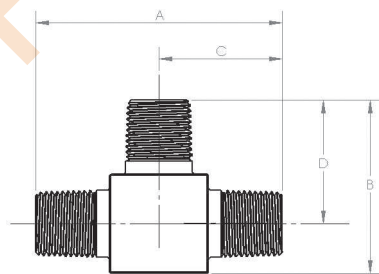


Figure 9

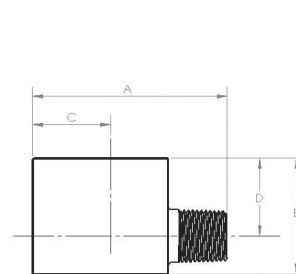


Figure 10

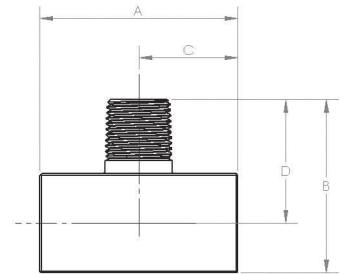


Figure 11

Standard Type

Specifications

- MAWP up to 100,000 PSI (6894 bar).
- Temperature Ratings: 0°F to 400°F (-18°C to 204°C).
- Female Cone and Thread connections are standard.
- Vee type stem is standard.

Features & Benefits

- Standard valve fully opens in 4 1/2 turns.
- Standard 3/4" and 1" valve fully opens in as little as 3 turns, compared to 9 turns for industry standard valves.
- Two-piece, heavy-duty, non-rotating stem for a robust and reliable assembly.
- Bi-directional flow capability. Simplifies system designs.
- Packing gland consists of a preload locking internal thread form that is resistant to vibration. Eliminates the need for an external locking device.
- Double-sided weep holes for easier leakage verification.



Quick Open Type Additional Features

- Valve is fully open in as little as 1 3/4 turns.
- Stem is lifted off of the seat a minimum of 2X faster than conventional valves, which reduces throttling and therefore increases seat life.
- Less than half the number of turns to fully open compared to competitor's valves.

Options

- Solid Stainless Steel or Aluminum Handle.
- Replaceable Seat design for use in harsh environments.
- Air Actuators for Remote Valve Actuator.
- Grafoil Packing for temperature up to 800°F.
- Extended Stuffing Box for temperatures up to 1200°F.
- Extended Stuffing Box for temperatures down to -423°F.
- Can be manufactured to meet NACE MR-01-75.
- Wide range of construction materials available.

Standard Materials

- Body - 316 cold worked stainless steel.
- Packing - Glass filled Teflon.
- Stem - 17-4 PH.

MEDIUM AND HIGH PRESSURE NEEDLE VALVES

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Orifice in. (mm)	Dimensions, in. (mm)												Valve Dimensions	
					A	B	C	D1	D2	D3	E	F	G	H	J	K		L
2-WAY STRAIGHT																		
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M1V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.63 (41.3)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	4.84 (123.0)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)	See Figure 1
3/8			20NV6M1V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.63 (41.3)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	4.84 (123.0)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)	
9/16			20NV9M1V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	2.88 (73.2)	2.38 (60.5)	1.75 (44.5)		0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.46 (138.7)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)	
3/4			20NV12M1V	0.438 (11.13)	3.00 (76.2)	1.50 (38.1)	3.75 (95.3)	3.00 (76.2)	2.25 (57.2)		0.62 (15.7)	1.75 (44.5)	8.07 (204.0)	7.07 (179.6)	0.44 (11.2)	0.59 (15.0)	1.38 (35.1)	
1			20NV16M1V	0.562 (14.27)	4.12 (104.6)	2.06 (52.3)	4.75 (120.7)	3.75 (95.3)	2.82 (71.6)		1.12 (28.4)	2.50 (63.5)	10.29 (261.4)	8.96 (227.6)	0.56 (14.2)	0.74 (18.8)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H1V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.50 (38.1)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.74 (120.4)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			30NV6H1V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.50 (38.1)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.74 (120.4)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			30NV9H1V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	2.44 (62.0)	1.56 (39.6)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.18 (131.6)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H1V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.12 (53.8)	1.69 (42.9)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.89 (124.2)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			60NV6H1V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.25 (57.2)	1.69 (42.9)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.02 (127.5)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			60NV9H1V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	2.50 (63.5)	1.75 (44.5)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.27 (133.9)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	
2-WAY ANGLE																		
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M2V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)		1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)	See Figure 2
3/8			20NV6M2V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)		1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)	
9/16			20NV9M2V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)		1.75 (44.5)		0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (151.4)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)	
3/4			20NV12M2V	0.438 (11.13)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)		2.25 (57.2)		0.62 (15.7)	1.75 (44.5)	8.07 (204.0)	7.56 (192.0)	0.44 (11.2)	0.59 (15.0)	1.38 (35.1)	
1			20NV16M2V	0.562 (14.27)	4.12 (104.6)	2.06 (52.3)	5.13 (130.3)		2.82 (71.6)		1.12 (28.4)	2.50 (63.5)	10.29 (261.4)	9.45 (240.0)	0.56 (14.2)	0.74 (18.8)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H2V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)		1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.74 (120.4)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			30NV6H2V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.12 (53.8)		1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.86 (123.4)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			30NV9H2V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	2.44 (62.0)		1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.18 (131.6)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H2V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.38 (60.5)		1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.15 (130.8)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			60NV6H2V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.62 (66.5)		1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.39 (136.9)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			60NV9H2V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	2.81 (71.4)		1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.58 (141.7)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

MEDIUM AND HIGH PRESSURE NEEDLE VALVES

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Orifice in. (mm)	Dimensions, in. (mm)												Valve Dimensions	
					A	B	C	D1	D2	D3	E	F	G	H	J	K		L
3-WAY/2 ON PRESSURE																		
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M3V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.62 (66.5)	1.63 (41.3)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.46 (138.7)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)	See Figure 3
3/8			20NV6M3V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	2.62 (66.5)	1.63 (41.3)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.46 (138.7)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)	
9/16			20NV9M3V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.63 (92.2)	1.75 (44.5)	1.75 (44.5)		0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	6.21 (157.7)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)	
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H3V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	2.12 (53.8)	1.50 (38.1)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.86 (123.4)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			30NV6H3V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.50 (63.5)	1.50 (38.1)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.24 (133.1)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			30NV9H3V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	2.88 (73.2)	1.56 (39.6)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.62 (142.7)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H3V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.38 (60.5)	1.69 (42.9)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.15 (130.8)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			60NV6H3V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.75 (69.9)	1.69 (42.9)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.52 (140.2)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			60NV9H3V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	3.03 (77.0)	1.75 (44.5)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.82 (147.8)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	
3-WAY/1 ON PRESSURE																		
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M4V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)	1.19 (30.2)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)	See Figure 4
3/8			20NV6M4V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	2.44 (62.0)	1.19 (30.2)	1.19 (30.2)		0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	5.28 (134.1)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)	
9/16			20NV9M4V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	3.38 (85.9)	1.75 (44.5)	1.75 (44.5)		0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	5.96 (151.4)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)	
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H4V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.12 (28.5)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.74 (120.4)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			30NV6H4V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	2.12 (53.8)	1.12 (28.5)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	4.86 (123.4)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			30NV9H4V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	2.44 (62.0)	1.12 (28.5)	1.12 (28.5)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.18 (131.6)	0.28 (7.1)	1.00 (25.4)	1.00 (25.4)	
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H4V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.38 (60.5)	1.31 (33.3)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.15 (130.8)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)	
3/8			60NV6H4V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	2.62 (66.5)	1.31 (33.3)	1.31 (33.3)		0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.39 (136.9)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)	
9/16			60NV9H4V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	2.81 (71.4)	1.31 (33.3)	1.31 (33.3)		0.38 (9.7)	1.50 (38.1)	3.00 (76.2)	5.58 (141.7)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

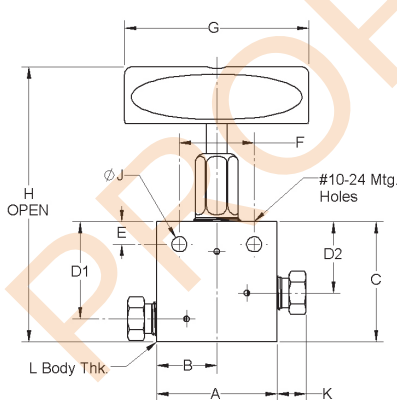


Figure 1

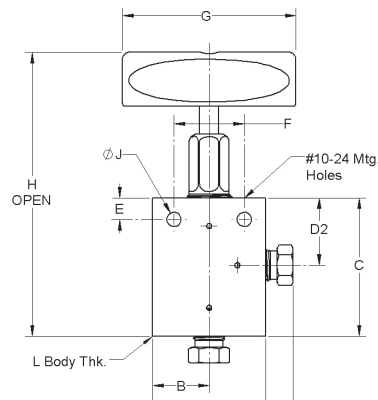


Figure 2

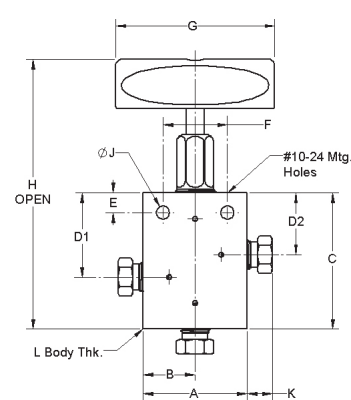


Figure 3

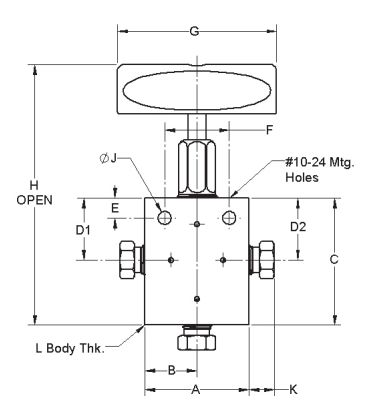


Figure 4

MEDIUM AND HIGH PRESSURE NEEDLE VALVES

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Orifice in. (mm)	Dimensions, in. (mm)												Valve Dimensions
					A	B	C	D1	D2	D3	E	F	G	H	J	K	
3-WAY/2-STEM MANIFOLD																	
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M5V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	3.38 (85.9)	1.69 (42.9)	1.19 (30.2)	1.19 (30.2)	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	9.06 (230.1)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)
3/8			20NV6M5V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	3.38 (85.9)	2.56 (65.0)	1.75 (44.5)	1.75 (44.5)	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	9.06 (230.1)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)
9/16			20NV9M5V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	5.12 (130.0)	2.56 (65.0)	1.75 (44.5)	1.75 (44.5)	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	10.28 (261.1)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H5V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	3.06 (77.7)	1.53 (38.9)	1.12 (28.4)	1.12 (28.4)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	8.54 (216.9)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)
3/8			30NV6H5V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	3.25 (82.6)	1.62 (41.2)	1.12 (28.4)	1.12 (28.4)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	8.73 (221.7)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)
9/16			30NV9H5V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	3.75 (95.3)	1.88 (47.8)	1.12 (28.4)	1.12 (28.4)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	9.23 (234.4)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H5V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	3.44 (87.4)	1.72 (43.7)	1.31 (33.3)	1.31 (33.3)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	8.98 (228.1)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)
3/8			60NV6H5V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	3.75 (95.3)	1.88 (47.8)	1.31 (33.3)	1.31 (33.3)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	9.29 (236.0)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)
9/16			60NV9H5V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	4.12 (104.7)	2.06 (52.3)	1.31 (33.3)	1.31 (33.3)	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	9.66 (245.4)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)
2-WAY ANGLE/REPLACEABLE SEAT																	
1/4	Medium Pressure Cone & Thread	20,000 PSI	20NV4M6V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	3.30 (83.8)	-	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	6.04 (153.4)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)
3/8			20NV6M6V	0.20 (5.1)	2.00 (50.8)	1.00 (25.4)	3.30 (83.8)	-	1.19 (30.2)	-	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	6.04 (153.4)	0.25 (6.4)	0.48 (12.2)	1.00 (25.4)
9/16			20NV9M6V	0.312 (7.9)	2.50 (63.5)	1.25 (31.8)	4.63 (117.6)	-	1.75 (44.5)	-	0.50 (12.7)	1.38 (35.0)	4.00 (102.0)	7.21 (183.1)	0.34 (8.7)	0.68 (17.3)	1.00 (25.4)
1/4	High Pressure Cone & Thread	30,000 PSI	30NV4H6V	0.093 (2.4)	2.00 (50.8)	1.00 (25.4)	3.12 (79.2)	-	1.12 (28.5)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	5.83 (148.1)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)
3/8			30NV6H6V	0.125 (3.2)	2.00 (50.8)	1.00 (25.4)	3.39 (86.1)	-	1.12 (28.5)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	6.09 (154.7)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)
9/16			30NV9H6V	0.125 (3.2)	2.62 (66.5)	1.31 (33.3)	3.82 (97.0)	-	1.19 (30.2)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	6.52 (165.6)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)
1/4	High Pressure Cone & Thread	60,000 PSI	60NV4H6V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	3.45 (87.6)	-	1.31 (33.3)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	6.19 (157.2)	0.28 (7.1)	0.59 (15.0)	1.00 (25.4)
3/8			60NV6H6V	0.062 (1.6)	2.00 (50.8)	1.00 (25.4)	3.75 (95.25)	-	1.31 (33.3)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	6.49 (164.8)	0.28 (7.1)	0.72 (18.3)	1.00 (25.4)
9/16			60NV9H6V	0.012 (0.03)	2.62 (66.5)	1.31 (33.3)	4.00 (101.6)	-	1.31 (33.3)	-	0.38 (9.7)	1.38 (35.0)	3.00 (76.2)	6.74 (171.2)	0.28 (7.1)	1.00 (25.4)	1.50 (38.1)

Dimensions, in inches (millimeters), are for reference only and are subject to change.

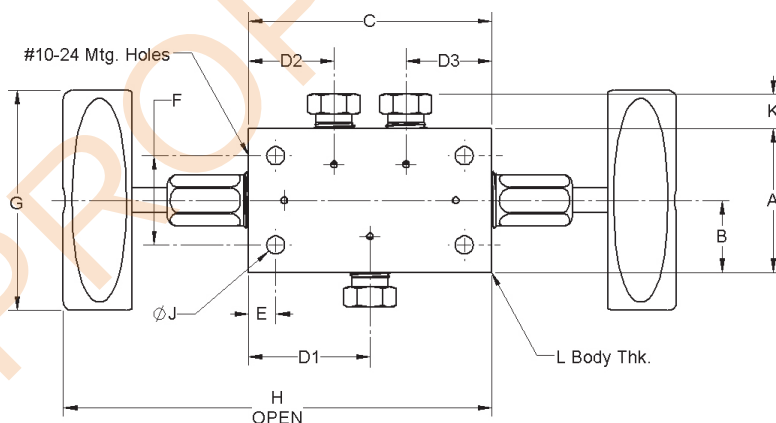


Figure 5

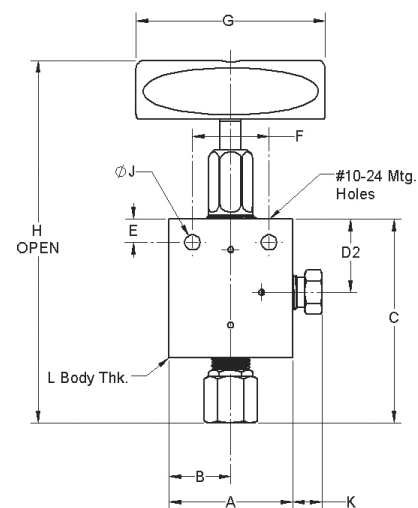


Figure 6

Specifications

- MAWP up to 100,000 PSI (6895 bar).
- Temperature Ratings
Metal Seat: -420°F to 1200°F (-251°C to 648°C)
Soft Seat: -65°F to 250°F (-54°C to 121°C).
Nominal Cracking Pressure: 15 PSI (1 bar).
- Female Cone and Thread connections are standard.



Features

- Prevents reverse flow which may cause damage to a pressure system.
- Metal Seat offers metal-to-metal seat for rapid cycling or severe environments.
- Soft Seat offers PEEK seat with metal back-up for fast shutoff and reliable seal.
- Can be manufactured to meet NACE MR-01-75.

Materials

- 316 cold worked stainless steel is standard.
- PEEK 450G is standard material of soft seat poppet seal.

End Connection Size in.	Connection Type	Pressure Rating	Part Number Metal Seat	Part Number Soft Seat	Orifice in. (mm)	Dimension in. (mm)			Valve Dimensions
						A	B	C	
MEDIUM PRESSURE									
1/4	Medium Pressure Cone & Thread	20,000 PSI	20CV4MFM	20CV4MFS	0.125 (3.18)	3.07 (78.0)	2.50 (63.5)	1.00 (25.4)	See Figure 1
3/8			20CV6MFM	20CV6MFS	0.219 (5.56)	3.48 (88.4)	2.66 (66.0)	1.13 (28.7)	
9/16			20CV9MFM	20CV9MFS	0.359 (9.12)	4.76 (120.9)	3.50 (88.9)	1.38 (35.1)	
3/4			20CV12MFM	20CV12MFS	0.516 (13.11)	5.63 (143.00)	4.38 (111.25)	1.75 (44.45)	
1			20CV16MFM	20CV16MFS	0.688 (17.48)	7.00 (177.8)	5.25 (133.35)	2.13 (54.10)	
HIGH PRESSURE									
1/4	High Pressure Cone & Thread	60,000 PSI	60CV4HFM	60CV4HFS	0.094 (2.39)	3.26 (82.8)	2.50 (63.5)	1.25 (31.8)	See Figure 2
3/8			60CV6HFM	60CV6HFS	0.125 (3.18)	3.75 (95.25)	2.75 (69.9)	1.25 (31.8)	
9/16			60CV9HFM	60CV9HFS	0.188 (4.78)	4.63 (117.6)	3.38 (85.9)	1.50 (38.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

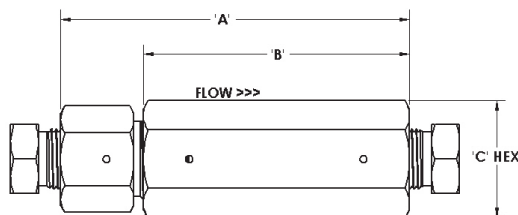


Figure 1

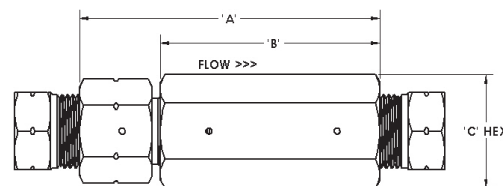


Figure 2

Specifications

- MAWP up to 60,000 PSI (4136 bar).
- Female Cone and Thread connections are standard.

Line Filters

- Line Filters are used to remove contaminating particles from fluid. Each line filter is provided with two filter elements. The upstream element to filter out larger particles, and the downstream element to filter smaller particles.
- Filter elements are available in nominal ratings of 0.5, 2, 5, 10, 20, 40 and 100 Micron.

Cup Filters

- Cup Filters offer maximum filtration surface area for removal of contaminating particles from the fluid system. They may be used in systems which require high flow rates with minimum pressure drop.
- Filter elements are available in nominal ratings of 5, 10, 20, 40 and 100 Micron.

Materials

- 316 cold worked stainless steel is standard.
- Filter discs are made from 300 series stainless steel.

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)			Fitting Dimensions
				A	B	C	
LINE FILTER							
1/4	Medium Pressure Cone & Thread	20,000 PSI	20LF4MF-*/*	2.13 (54.1)	1.50 (38.1)	1.00 (25.4)	See Figure 1
3/8			20LF6MF-*/*	2.50 (63.5)	1.63 (41.4)	1.13 (28.7)	
9/16			20LF9MF-*/*	3.25 (82.55)	2.06 (52.3)	1.38 (35.1)	
3/4			20LF12MF-*/*	4.06 (103.1)	2.88 (73.15)	1.75 (44.45)	
1			20LF16MF-*/*	5.00 (127.0)	3.30 (83.82)	2.13 (54.10)	
1/4	High Pressure Cone & Thread	60,000 PSI	60LF4HF-*/*	3.00 (76.2)	2.13 (54.1)	1.25 (31.8)	See Figure 2
3/8			60LF6HF-*/*	3.00 (76.2)	2.13 (54.1)	1.25 (31.8)	
9/16			60LF9HF-*/*	3.88 (98.6)	2.63 (66.8)	1.50 (38.1)	

*Insert desired micron filter

Example: 20LF9MF-5/20 is a 9/16" MP Line Filter with 5 micron upstream filter and 20 micron downstream filter.

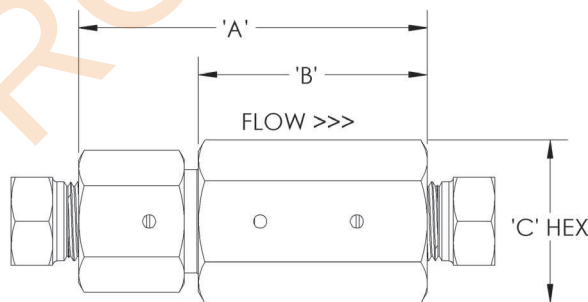


Figure 1

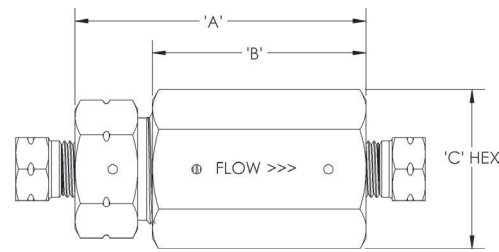


Figure 2

MEDIUM AND HIGH PRESSURE FILTERS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)			Fitting Dimensions
				A	B	C	
CUP FILTER							
1/4	Medium Pressure Cone & Thread	20,000 PSI	20CF4MF-*	3.07 (78.0)	2.50 (63.5)	1.00 (25.4)	See Figure 3
3/8			20CF6MF-*	3.48 (88.4)	2.66 (66.0)	1.13 (28.7)	
9/16			20CF9MF-*	4.76 (120.9)	3.50 (88.9)	1.38 (35.1)	
3/4			20CF12MF-*	5.63 (143.00)	4.38 (111.25)	1.75 (44.45)	
1			20CF16MF-*	7.00 (177.8)	5.25 (133.35)	2.13 (54.10)	
1/4	High Pressure Cone & Thread	60,000 PSI	60CF4HF-*	3.26 (82.8)	2.50 (63.5)	1.25 (31.8)	See Figure 4
3/8			60CF6HF-*	3.75 (95.25)	2.75 (69.9)	1.25 (31.8)	
9/16			60CF9HF-*	4.63 (117.6)	3.38 (85.9)	1.50 (38.1)	

*Insert desired micron filter

Example: 20CF9MF-5 is a 9/16" MP Cup Filter with 5 micron filter

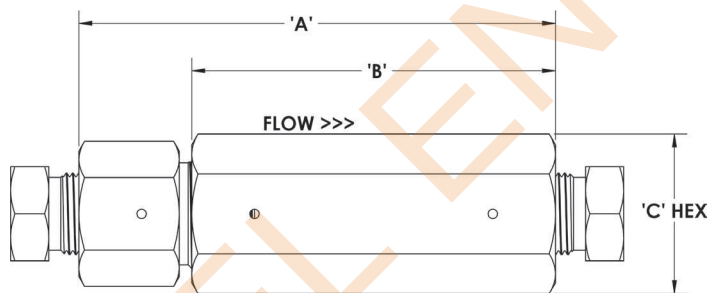


Figure 3

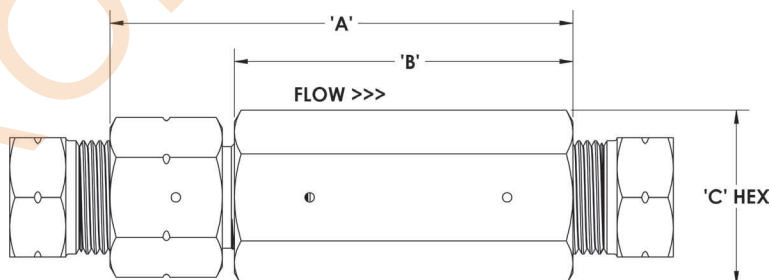


Figure 4

Specifications

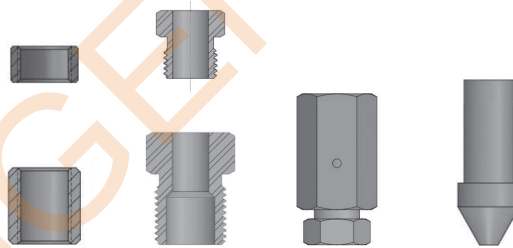
- Cone & Threaded Fittings with MAWP up to 100,000 PSI (6895 bar).

Features

- Safety weep holes standard on all connections.
- Supplied with collars and glands when applicable.
- Can be manufactured to meet NACE MR-01-75.

Materials

- 316 cold worked stainless steel is standard.
- Other materials available by request.
- Contact us for additional 100,000 psi fitting information.



End Connection Size in.	Connection Type	Pressure Rating	Collar	Gland	Cap	Plug
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CONNECTION COMPONENTS

1/4	Medium Pressure Cone & Thread	20,000 PSI	20CL4M	20GL4M	20CA4M	20PL4M
3/8			20CL6M	20GL6M	20CA6M	20PL6M
9/16			20CL9M	20GL9M	20CA9M	20PL9M
3/4			20CL12M	20GL12M	20CA12M	20PL12M
1			20CL16M	20GL16M	20CA16M	20PL16M
1/4	High Pressure Cone & Thread	60,000 PSI	60CL4H	60GL4H	60CA4H	60PL4H
3/8			60CL6H	60GL6H	60CA6H	60PL6H
9/16			60CL9H	60GL9H	60CA9H	60PL9H

MEDIUM AND HIGH PRESSURE FITTINGS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)						Block Thickness	Fitting Dimensions
				A	B	C	D	E	F		

ELBOW

1/4	Medium Pressure Cone & Thread	20,000 PSI	20L4MF	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)	See Figure 1
3/8			20L6MF	2.00 (50.8)	1.38 (35.1)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)	
9/16			20L9MF	2.50 (63.5)	1.75 (44.5)	1.25 (31.8)	1.25 (31.8)	0.66 (16.8)	0.88 (22.4)	1.00 (25.4)	
3/4			20L12MF	3.00 (76.2)	2.25 (57.2)	1.50 (38.1)	1.50 (38.1)	0.55 (14.0)	1.18 (30.0)	1.38 (35.1)	
1			20L16MF	4.12 (104.6)	3.00 (76.2)	2.06 (52.3)	2.06 (52.3)	0.69 (17.5)	1.38 (35.1)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	60,000 PSI	60L4HF	1.50 (38.1)	1.00 (25.4)	0.88 (22.4)	0.62 (15.7)	0.50 (12.7)	0.62 (15.7)	0.75 (19.1)	
3/8			60L6HF	2.00 (50.8)	1.50 (38.1)	1.25 (31.8)	1.00 (25.4)	0.60 (15.2)	0.81 (20.6)	1.00 (25.4)	
9/16			60L9HF	2.62 (66.5)	1.88 (47.8)	1.88 (47.8)	1.13 (28.7)	0.81 (20.6)	1.18 (30.0)	1.50 (38.1)	

TEE

1/4	Medium Pressure Cone & Thread	20,000 PSI	20T4MF	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)	See Figure 2
3/8			20T6MF	2.00 (50.8)	1.38 (35.1)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)	
9/16			20T9MF	2.50 (63.5)	1.75 (44.5)	1.25 (31.8)	1.25 (31.8)	0.66 (16.8)	0.88 (22.4)	1.00 (25.4)	
3/4			20T12MF	3.00 (76.2)	2.25 (57.2)	1.50 (38.1)	1.50 (38.1)	0.55 (14.0)	1.18 (30.0)	1.38 (35.1)	
1			20T16MF	4.12 (104.6)	3.00 (76.2)	2.06 (52.3)	2.06 (52.3)	0.69 (17.5)	1.38 (35.1)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	60,000 PSI	60T4HF	2.00 (50.8)	1.25 (31.8)	1.00 (25.4)	0.88 (22.4)	0.50 (12.7)	0.62 (15.7)	1.00 (25.4)	
3/8			60T6HF	2.00 (50.8)	1.56 (39.6)	1.00 (25.4)	1.06 (26.9)	0.60 (15.2)	0.81 (20.6)	1.00 (25.4)	
9/16			60T9HF	2.62 (66.5)	2.12 (53.8)	1.31 (33.3)	1.38 (35.1)	0.81 (20.6)	1.18 (30.0)	1.50 (38.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

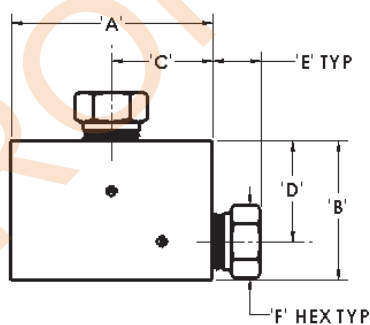


Figure 1

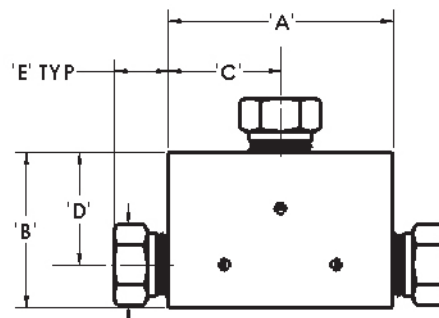


Figure 2

MEDIUM AND HIGH PRESSURE FITTINGS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)							Fitting Dimensions
				A	B	C	D	E	F	G	

CROSS

1/4	Medium Pressure Cone & Thread	20,000 PSI	20X4MF	1.50 (38.1)	1.50 (38.1)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)	See Figure 3
3/8			20X6MF	2.00 (50.8)	2.00 (50.8)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)	
9/16			20X9MF	2.50 (63.5)	2.50 (63.5)	1.25 (31.8)	1.25 (31.8)	0.66 (16.8)	0.88 (22.4)	1.00 (25.4)	
3/4			20X12MF	3.00 (76.2)	3.00 (76.2)	1.50 (38.1)	1.50 (38.1)	0.55 (14.0)	1.18 (30.0)	1.38 (35.1)	
1			20X16MF	4.12 (104.6)	4.12 (104.6)	2.06 (52.3)	2.06 (52.3)	0.69 (17.5)	1.38 (35.1)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	60,000 PSI	60X4HF	2.00 (50.8)	1.25 (31.8)	1.00 (25.4)	0.62 (15.7)	0.50 (12.7)	0.62 (15.7)	1.00 (25.4)	
3/8			60X6HF	2.00 (50.8)	2.12 (53.8)	1.00 (25.4)	1.06 (26.9)	0.60 (15.2)	0.81 (20.6)	1.00 (25.4)	
9/16			60X9HF	2.62 (66.5)	2.75 (69.9)	1.31 (33.3)	1.38 (35.1)	0.81 (20.6)	1.18 (30.0)	1.50 (38.1)	

BULKHEAD

1/4	Medium Pressure Cone & Thread	20,000 PSI	20BU4MF	2.00 (50.8)	0.53 (13.5)	1.00 (25.4)	1.00 (25.4)	0.88 (22.4)	0.38 (9.7)	0.38 (9.7)	See Figure 4
3/8			20BU6MF	2.00 (50.8)	0.62 (15.7)	0.94 (23.9)	0.94 (23.9)	0.94 (23.9)	0.38 (9.7)	0.44 (11.2)	
9/16			20BU9MF	2.62 (66.5)	0.78 (19.8)	1.25 (31.8)	1.25 (31.8)	1.25 (31.8)	0.38 (9.7)	0.53 (13.5)	
3/4			20BU12MF	2.62 (66.5)	0.91 (23.1)	1.69 (42.9)	1.69 (42.9)	1.69 (42.9)	0.38 (9.7)	0.62 (15.7)	
1			20BU16MF	3.50 (88.9)	1.50 (38.1)	2.00 (50.8)	2.00 (50.8)	2.00 (50.8)	0.38 (9.7)	0.72 (18.3)	
1/4	High Pressure Cone & Thread	60,000 PSI	60BU4HF	2.00 (50.8)	0.50 (12.7)	1.00 (25.4)	1.00 (25.4)	0.94 (23.9)	0.38 (9.7)	0.50 (12.7)	
3/8			60BU6HF	2.38 (60.4)	0.78 (19.8)	1.38 (35.1)	1.38 (35.1)	1.12 (28.4)	0.38 (9.7)	0.53 (13.5)	
9/16			60BU9HF	2.75 (69.9)	1.00 (25.4)	1.88 (47.8)	1.88 (47.8)	1.69 (42.9)	0.38 (9.7)	0.81 (20.6)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

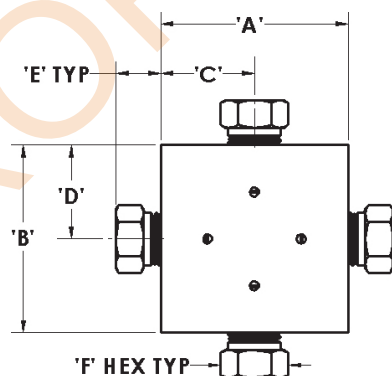


Figure 3

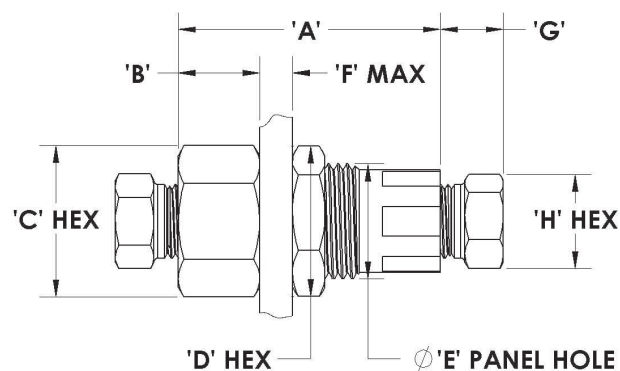


Figure 4

MEDIUM AND HIGH PRESSURE FITTINGS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in.		Fitting Dimensions
				A	B	
COUPLING						
1/4	Medium Pressure Cone & Thread	20,000 PSI	20CU4MF	1.50 (38.1)	0.63 (16.0)	See Figure 5
3/8			20CU6MF	1.75 (44.5)	0.75 (19.1)	
9/16			20CU9MF	2.12 (53.9)	1.00 (25.4)	
3/4			20CU12MF	2.50 (63.5)	1.38 (35.1)	
1			20CU16MF	3.50 (88.9)	1.75 (44.5)	
1/4	High Pressure Cone & Thread	60,000 PSI	60CU4HF	1.38 (35.1)	0.75 (19.1)	
3/8			60CU6HF	1.75 (44.5)	1.00 (25.4)	
9/16			60CU9HF	2.19 (55.6)	1.38 (35.1)	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

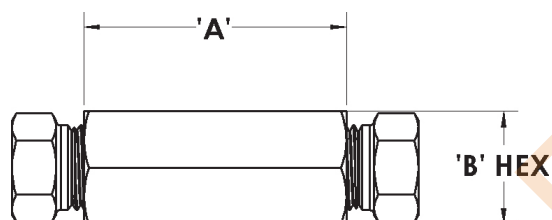


Figure 5

MEDIUM AND HIGH PRESSURE FITTINGS

End Connection Size in.	Connection Type	Pressure Rating	Part Number	Dimension, in. (mm)			Fitting Dimensions
				A	B	C	
ANTI-VIBRATION ASSEMBLIES							
1/4	Medium Pressure Cone & Thread	20,000 PSI	20AV4M	1.14 (29.0)	0.62 (15.7)	0.62 (15.7)	See Figure 6
3/8			20AV6M	1.42 (36.1)	0.75 (19.1)	0.75 (19.1)	
9/16			20AV9M	1.74 (44.2)	0.94 (23.9)	0.94 (23.9)	
3/4			20AV12M	1.97 (50.0)	1.38 (35.1)	1.38 (35.1)	
1			20AV16M	2.34 (59.4)	1.50 (38.1)	1.50 (38.1)	
1/4	High Pressure Cone & Thread	60,000 PSI	60AV4H	0.81 (20.6)	0.62 (15.7)	-	See Figure 7
3/8			60AV6H	1.12 (28.4)	0.81 (20.6)	-	
9/16			60AV9H	1.50 (38.1)	1.18 (30.0)	-	

Dimensions, in inches (millimeters), are for reference only and are subject to change.

- For Moly-Coated parts add -MC to end of part number
- Collars are not included in assembly and must be ordered separately

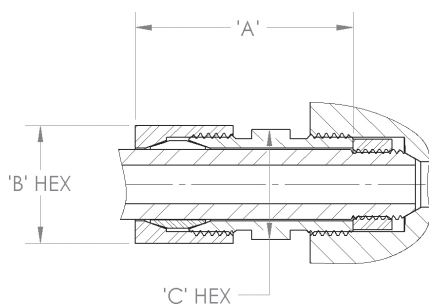


Figure 6

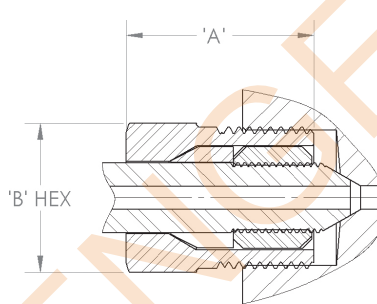


Figure 7



End Connection Size in.	Connection Type	Pressure Rating	Part Number
TUBE NIPPLES			
1/4	Medium Pressure Cone & Thread	20,000 PSI	20N4M-*
3/8			20N6M-*
9/16			20N9M-*
3/4			20N12M-*
1			20N16M-*
1/4	High Pressure Cone & Thread	60,000 PSI	60N4H-*
3/8			60N6H-*
9/16			60N9H-*

* Insert desired tube nipple length in inches Example:
60N9H-6.00 is equal to 9/16" HP Tube Nipple, 6" Length

Air Actuators for Remote Valve Operation

Types

- Normally Closed – Air is required to open the valve.
- Normally Open – Air is required to close the valve.
- Double Action – Open or close the valve using air pressure.

Features

- Direct mount technology for reduced size and increased reliability.
- Aluminum housing for reduced weight.
- 360° user adjustable air supply inlet position
- Actuator to valve direct mount technology for simplified installation.

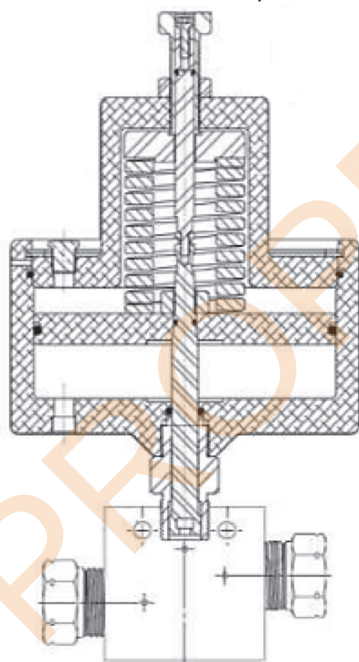
Options

- Electric Actuator.
- Electronic switch for remote open/close position indication.
- Stainless steel housing.
- Replaceable Seat available for improved valve life.

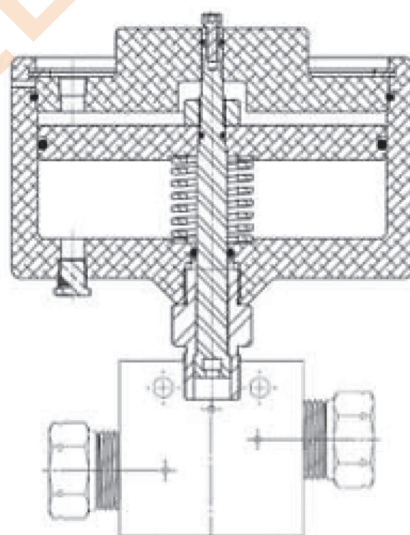
Ordering Information

- Normally Closed (Air-to-Open): -NC5.
- Normally Open (Air-to-Close): -NO5.
- Double Acting: -DA5.

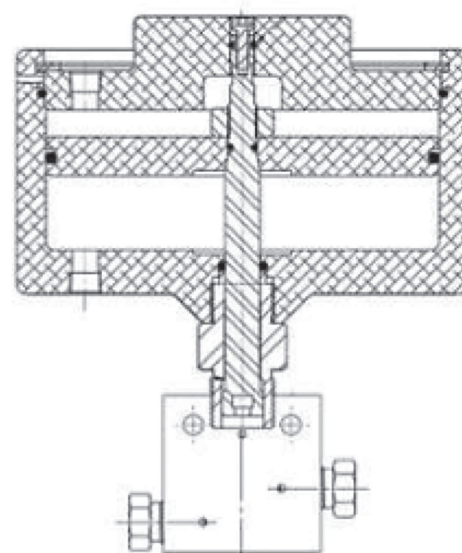
Example: 30NV6H1V becomes 30NV6H1V-NO5



**Normally Closed
(Air-to-Open)**



**Normally Open
(Air-to-Close)**



Double Acting

AIR ACTUATORS

Needle Valve Model Number		Normally Closed Air-to-Open			Normally Open Air-to-Close			Double Acting		
		NC5	NC6	NC8	NO5	NO6	NO8	DA5	DA6	DA8
		MAWP psi (bar)			MAWP psi (bar)			MAWP psi (bar)		
15NV4N	MAWP psi (bar)	15,000 (1034)			15,000 (1034)			15,000 (1034)		
	actuator pressure	80 (5.5)			80 (5.5)			70 (5.0)		
15NV6N	MAWP psi (bar)	14,000 (970)	15,000 (1034)		15,000 (1034)			15,000 (1034)		
	actuator pressure	100 (7.0)	85 (6.2)		100 (7.0)			100 (7.0)		
15NV8N	MAWP psi (bar)	14,000 (970)	15,000 (1034)		15,000 (1034)			15,000 (1034)		
	actuator pressure	110 (7.6)	85 (6.2)		110 (7.6)			110 (7.6)		
20NV4M	MAWP psi (bar)	20,000 (1380)	100 (7.0)		20,000 (1380)			20,000 (1380)		
	actuator pressure	100 (7.0)			90 (6.2)			80 (5.5)		
20NV6M	MAWP psi (bar)	20,000 (1380)			20,000 (1380)			20,000 (1380)		
	actuator pressure	100 (7.0)			90 (6.2)			80 (5.5)		
20NV9M	MAWP psi (bar)	14,000 (970)	20,000 (1380)		18,000 (1240)	20,000 (1380)		20,000 (1380)		
	actuator pressure	110 (7.6)	100 (7.0)		110 (7.6)	80 (5.5)		100 (7.0)		
20NV12M	MAWP psi (bar)			17,000 (1172)			20,000 (1380)			20,000 (1380)
	actuator pressure			90 (6.2)			100 (7.0)			80 (5.5)
20NV16M	MAWP psi (bar)			10,000 (690)			13,000 (896)			16000 (1103)
	actuator pressure			100 (7.0)			100 (7.0)			100 (7.0)
30NV4H	MAWP psi (bar)	30,000 (2068)			30,000 (2068)			30,000 (2068)		
	actuator pressure	90 (6.2)			80 (5.5)			70 (5.0)		
30NV6H	MAWP psi (bar)	30,000 (2068)			30,000 (2068)			30,000 (2068)		
	actuator pressure	90 (6.2)			80 (5.5)			70 (5.5)		
30NV9H	MAWP psi (bar)	30,000 (2068)			30,000 (2068)			30,000 (2068)		
	actuator pressure	90 (6.2)			80 (5.5)			70 (5.5)		
60NV4H	MAWP psi (bar)	60,000 (4137)			60,000 (4137)			60,000 (4137)		
	actuator pressure	110 (7.6)			110 (7.6)			90 (6.2)		
60NV6H	MAWP psi (bar)	60,000 (4137)			60,000 (4137)			60,000 (4137)		
	actuator pressure	110 (7.6)			110 (7.6)			90 (6.2)		
60NV9H	MAWP psi (bar)	60,000 (4137)			60,000 (4137)			60,000 (4137)		
	actuator pressure	110 (7.6)			110 (7.6)			90 (6.2)		

Specifications

- MAWP up to 20,000 PSI (1379 bar).
- Temperature Ratings: -15°F to 400° F (-26°C to 204°C).
- Port Sizes: $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ " or $\frac{1}{2}$ ".
- Flow Pattern: 2-Way, 3-Way Switching, 3-Way Diverting.

Connection Types

- NPT.
- MP and HP Cone & Threaded.

Features & Benefits

- Bi-directional trunnion style for optimal performance.
- Two standard mounting options.

Standard Materials

- Body/Side Adapter/Trunnion - 316 cold worked stainless steel.
- Packing - O-ring with PVX backup ring.
- Seats - PVX.
- Seals - Viton.
- Bearings - PVX.



2-WAY TRUNNION

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number
-------------------------	---------------------	-----------------	------------------	-------------

1/4" ORIFICE

1/4	Female NPT	15,000 PSI	0.250 (6.35)	15BV4T4NF
3/8				15BV4T6NF
1/2				15BV4T8NF
1/4	Medium Pressure Cone & Thread	20,000 PSI		20BV4T4MF
3/8				20BV4T6MF
9/16				20BV4T9MF
1/4	High Pressure Cone and Thread			20BV4T4HF
3/8				20BV4T6HF
9/16				20BV4T9HF

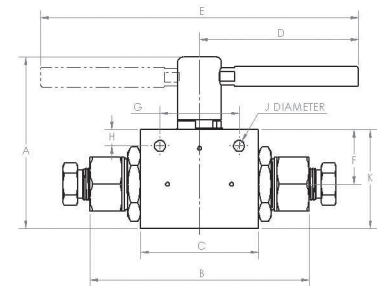


Figure 1

Dimensions, in. (mm)											Valve Dimensions
A	B	C	D	E	F	G	H	J	K	Thickness	
3.83 (97.3)	4.35 (110.5)	2.00 (50.8)	3.98 (101.1)	-	1.13 (28.7)	1.50 (38.1)	0.44 (11.2)	0.28 (7.1)	2.00 (50.8)	1.00 (25.4)	See Figure 1

Dimensions, in inches (millimeters), are for reference only and are subject to change.

BALL VALVES

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number
----------------------------	------------------------	--------------------	---------------------	----------------

3/8" ORIFICE

1/4	Female NPT	15,000 PSI	0.375 (9.53)	15BV6T4NF
3/8				15BV6T6NF
1/2				15BV6T8NF
3/8	Medium Pressure Cone & Thread	20,000 PSI		20BV6T6MF
9/16				20BV6T9MF
3/4				20BV6T12MF

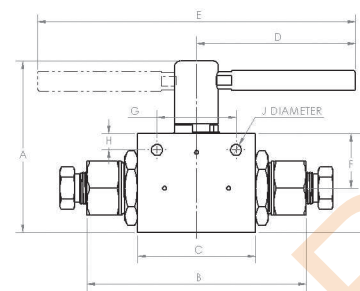


Figure 1

Dimensions, in. (mm)											Valve Dimensions
A	B	C	D	E	F	G	H	J	K	Thickness	
4.34 (110.2)	5.54 (140.7)	3.00 (76.2)	4.02 (102.1)	-	1.38 (35.1)	2.00 (50.8)	0.41 (10.4)	0.28 (7.1)	2.50 (63.5)	1.38 (35.1)	See Figure 1

Dimensions, in inches (millimeters), are for reference only and are subject to change.

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number
----------------------------	------------------------	--------------------	---------------------	----------------

1/2" ORIFICE

1/2	Female NPT	15,000 PSI	0.500 (12.7)	15BV8T8NF
3/4		10,000 PSI		10BV8T12NF
1				10BV8T16NF
3/4	Medium Pressure Cone & Thread	15,000 PSI		15BV8T12MF
1				15BV8T16MF

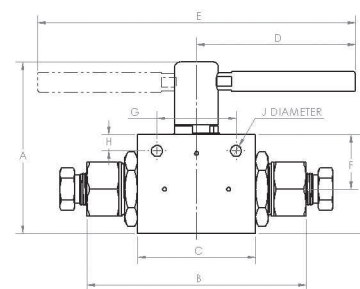


Figure 1

Dimensions, in. (mm)											Valve Dimensions
A	B	C	D	E	F	G	H	J	K	Thickness	
5.57 (141.5)	7.69 (195.3)	4.13 (104.9)	5.13 (130.3)	10.26 (260.6)	1.76 (44.7)	3 (76.2)	0.50 (12.7)	0.28 (7.1)	3.09 (78.5)	1.75 (44.5)	See Figure 1

Dimensions, in inches (millimeters), are for reference only and are subject to change.

BALL VALVES

3-WAY TRUNNION

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number	
				90° Diverting	180° Switching

3/16" ORIFICE

1/4	Female NPT	15,000 PSI	0.188 (4.78)	15BV3D4NF	15BV3S4NF
3/8				15BV3D6NF	15BV3S6NF
1/2				15BV3D8NF	15BV3S8NF
1/4	Medium Pressure Cone & Thread	20BV3D4MF		20BV3S4MF	
3/8		20BV3D6MF		20BV3S6MF	
9/16		20BV3D9MF		20BV3S9MF	
1/4	High Pressure Cone and Thread	20,000 PSI		20BV3D4HF	20BV3S4HF
3/8				20BV3D6HF	20BV3S6HF
9/16				20BV3D9HF	20BV3S9HF

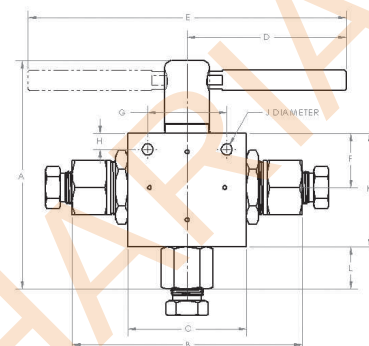


Figure 2

Dimensions, in. (mm)												Valve Dimensions
A	B	C	D	E	F	G	H	J	K	L	Block Thickness	
5.78 (146.8)	5.80 (147.3)	3.00 (76.2)	4.02 (102.1)	-	1.38 (35.1)	2.00 (50.8)	0.41 (10.4)	0.28 (7.1)	2.88 (73.2)	1.06 (26.9)	1.38 (35.1)	See Figure 2

Dimensions, in inches (millimeters), are for reference only and are subject to change.

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number	
				90° Diverting	180° Switching

3/8" ORIFICE

1/4	Female NPT	15,000 PSI	0.375 (9.53)	15BV6D4NF	15BV6S4NF	
3/8				15BV6D6NF	15BV6S6NF	
1/2				15BV6D8NF	15BV6S8NF	
3/8	Medium Pressure Cone & Thread			15BV6D6MF	15BV6S6MF	
9/16				15BV6D9MF	15BV6S9MF	
3/4				15BV6D12MF	15BV6S12MF	

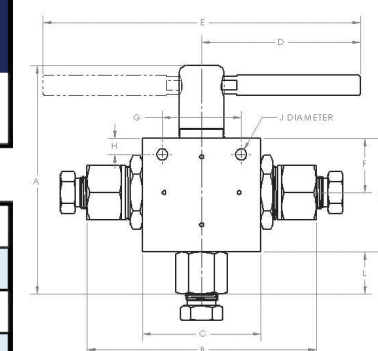


Figure 2

Dimensions, in. (mm)												Valve Dimensions
A	B	C	D	E	F	G	H	J	K	L	Block Thickness	
5.78 (146.8)	5.80 (147.3)	3.00 (76.2)	4.02 (102.1)	-	1.38 (35.1)	2.00 (50.8)	0.41 (10.4)	0.28 (7.1)	2.88 (73.2)	1.06 (26.9)	1.38 (35.1)	See Figure 2

Dimensions, in inches (millimeters), are for reference only and are subject to change.

BALL VALVES

End Connection Size in.	End Connection Type	Pressure Rating	Orifice in. (mm)	Part Number	
				90° Diverting	180° Switching

1/2" ORIFICE

1/2	Female NPT	10,000 PSI	0.500 (12.7)	15BV8D8NF	15BV8S8NF	
3/4				10BV8D12NF	10BV8S12NF	
1				10BV8D16NF	10BV8S16NF	
3/4	Medium Pressure Cone & Thread			10BV8D12MF	10BV8S12MF	
1				10BV8D16MF	10BV8S16MF	

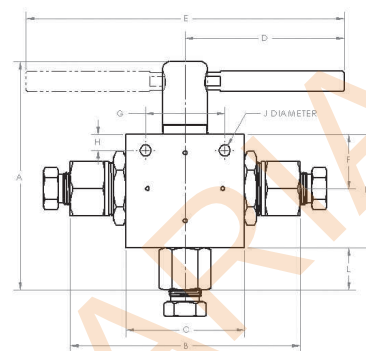


Figure 2

Dimensions, in. (mm)												Valve Dimensions
A	B	C	D	E	F	G	H	J	K	L	Block Thickness	
7.83 (198.9)	7.77 (197.4)	4.13 (104.9)	5.12 (130.0)	10.25 (260.35)	1.66 (42.2)	3.00 (76.2)	0.50 (12.7)	0.28 (7.1)	3.34 (84.8)	1.70 (43.2)	1.75 (44.5)	See Figure 2

Dimensions, in inches (millimeters), are for reference only and are subject to change.



ADJUSTABLE RELIEF VALVES

Precision High Pressure adjustable relief valves are designed to protect against over pressure of gas and liquids.

These proportional relief valves are designed to open gradually as the pressure increases. They do not have a capacity rating at given pressure increases, and therefore these relief valves are not certified to ASME code requirements.

Specifications

- Set Pressure from 1,000 PSI to 20,000 PSI (69 to 1379 bar).
- Temperature Ratings: -40°F to 300°F (-40°C to 150°C).
- Inlet Connection – 1/4" FNPT (10RV) and 1/4" HPF (20RV) are standard. Other connections sizes and types are available by request.
- Outlet Connection – 1/4" Female NPT.

Features

- Field Adjustable.
- Suitable for Gas or Liquid.

Materials

- Body – 316SS stainless steel.
- Seat Gland/Outlet – 316 stainless steel.
- Stem – 17-4PH.
- Seal Materials – PTFE packing/EPDM.
- Soft Seat – Nylon.



Set Pressure Range	Orifice Size, in.	Inlet Connection	Outlet Connection	Part Number	Dimension, in. (mm)							Valve Dimensions
					A	B	C	D	E	F	G	
1,000 to 10,000 PSI	0.070	1/4" FNPT	1/4" FNPT	10RV4NF	5.22 (132.6)	1.56 (39.6)	1.06 (26.9)	1.50 (38.1)	0.56 (14.2)	1/4" FNPT	1.38 (35.1)	See Figure 1
10,001 - 20,000 PSI		1/4" HPF		20RV4HF	7.55 (191.8)	2.13 (54.1)	1.68 (42.7)	2.00 (50.8)	0.56 (14.2)	1/4" FNPT	1.63 (41.4)	

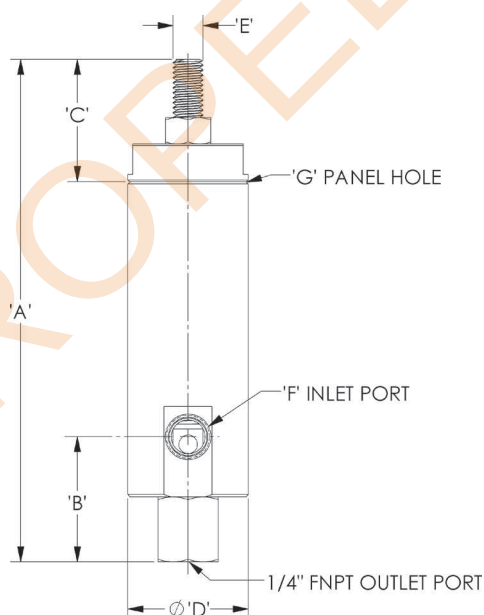


Figure 1

Specifications

- Size ranges from 1/4" OD to 1 1/2" OD.
- MAWP up to 100,000 PSI (6895 bar).

Features

- Stocked in USA for short delivery times.
- Tubing is also available for direct shipment from our European Mill.
Contact us for more information.
- Tubing can be cut and shipped in shorter lengths when requested.

Materials

- 316SS/316L is standard material.
- 304L also available.
- Other materials available by request.



Pressure Rating	Connection Type	Tube Material	Part Number	Tube OD in. (mm)	Tube ID in. (mm)	Wall Thickness in. (mm)	Tolerance/Outside Diameter in. (mm)
15,000 PSI	Medium Pressure Cone & Thread	316SS/316L	15TU16M	1 (25.4)	0.688 (17.5)	0.156 (3.9)	0.995/0.990 (25.27/25.14)
			15TU24M	1-1/2 (38.1)	0.937 (23.8)	0.281 (7.12)	1.495/1.490 (37.98/37.85)
20,000 PSI	Medium Pressure Cone & Thread	316SS/316L	20TU4M	1/4 (6.4)	0.109 (2.8)	0.070 (1.78)	0.248/0.243 (6.30/6.17)
			20TU6M	3/8 (9.5)	0.203 (5.2)	0.086 (2.2)	0.370/0.365 (9.40/9.27)
			20TU9M	9/16 (14.2)	0.312 (7.9)	0.125 (3.2)	0.557/0.552 (14.15/14.02)
			20TU12M	3/4 (19.1)	0.438 (11.1)	0.156 (3.9)	0.745/0.740 (18.92/18.80)
			20TU16M	1 (25.4)	0.562 (14.3)	0.219 (5.6)	0.995/0.990 (25.27/25.14)
60,000 PSI	High Pressure Cone & Thread	316SS/316L	60TU4H	1/4 (6.4)	0.083 (2.1)	0.083 (2.1)	0.248/0.243 (6.30/6.17)
			60TU6H	3/8 (9.5)	0.125 (3.2)	0.125 (3.2)	0.370/0.365 (9.40/9.27)
			60TU9H	9/16 (14.29)	0.188 (4.8)	0.187 (4.6)	0.557/0.552 (14.15/14.02)
100,000 PSI	High Pressure Cone & Thread	316SS/316L	100TU4H	1/4 (6.4)	0.083 (2.1)	0.083 (2.1)	0.248/0.243 (6.30/6.17)
			100TU6H	3/8 (9.5)	0.125 (3.2)	0.125 (3.2)	0.370/0.365 (9.40/9.27)

Dimensions, in inches (millimeters), are for reference only and are subject to change.

BLOCK & BLEED VALVES

Specifications

- MAWP up to 20,000 PSI (1379 bar).
- Temperature Ratings: 0°F to 400°F (-18°C to 204°C).

Connection Types

- NPT
- MP and HP Cone & Threaded.

Features & Benefits

- PHP Standard Needle and Ball Valve Internals.

Configurations

- Single Block and Bleed: Needle x Needle
- Double Block and Bleed: Ball x Needle x Ball.
- Double Block and Bleed: Needle x Needle x Needle.

Materials

- Body - 316 stainless steel.
- Packing - O-ring with PEEK backup ring.
- Seats - PEEK.
- Stem - 17-4 PH.
- Other materials available by request.

Contact us for ordering information



MANIFOLDS

Precision High Pressure manufactures custom designed manifolds to meet the unique needs of each individual customer. Manifolds reduce installation time, minimize potential leak ports, and reduce space requirements.

Specifications

- MAWP up to 60,000 PSI (4136 bar).
- Available in a wide range of connection sizes and types including NPT and Cone & Thread.
- Lengths up to 45" are available.
- Available in a wide variety of materials.

Features & Benefits

- Basic block for fluid distribution.
- Manifolds with needle valve assemblies for flow control.
- Both standard and quick open needle valves assemblies available.
- Replaceable seats available for ease of repair, minimizing long term costs.

Consult factory representative for additional details and availability.



Specifications

- MAWP up to 60,000 PSI (4140 bar).
- Connection size ranges from 1/8" to 1 1/2".

Features

- Supplied complete with collars and glands when applicable.
- Material Traceability.
- Can be manufactured to NACE MR-01-75.

Materials

- 316 cold worked stainless steel is standard.
- Other materials available by request.

Available Connection Types

MM	Medium Pressure Male.
HM	High Pressure Male.
MF	Medium Pressure Female.
HF	High Pressure Female.
NF	NPT Female.
NM	NPT Male.
RM	Type M Hose.
JM	JIC Male.



Other connections types may be available by request.

MALE X MALE

		JIC Male				
JIC Male		1/4"	3/8"	1/2"	3/4"	1"
	1/4"	20AD4JM	20AD4JM6JM	20AD4JM8JM	15AD4JM12JM	15AD4JM16JM
	3/8"		20AD6JM	20AD6JM8JM	15AD6JM12JM	15AD6JM16JM
	1/2"			20AD8JM	15AD8JM12JM	15AD8JM16JM
	3/4"				15AD12JM	15AD12JM16JM
	1"					15AD16JM

		NPT Male				
JIC Male		1/4"	3/8"	1/2"	3/4"	1"
	1/4"	15AD4JM4NM	15AD4JM6NM	15AD4JM8NM	10AD4JM12NM	10AD4JM16NM
	3/8"	15AD6JM4NM	15AD6JM6NM	15AD6JM8NM	10AD6JM12NM	10AD6JM16NM
	1/2"	15AD8JM4NM	15AD8JM6NM	15AD8JM8NM	10AD8JM12NM	10AD8JM16NM
	3/4"	15AD12JM4NM	15AD12JM6NM	15AD12JM8M	10AD12JM12NM	10AD12JM16NM
	1"	15AD16JM4NM	15AD16JM6NM	15AD16JM8NM	10AD16JM10NM	10AD16JM16NM

		Medium Pressure Male				
JIC Male		1/4"	3/8"	1/2"	3/4"	1"
	1/4"	20AD4JM4MM	15AD4JM6MM	15AD4JM8MM	10AD4JM12MM	10AD4JM16MM
	3/8"	15AD6JM4MM	15AD6JM6MM	15AD6JM8MM	10AD6JM12MM	10AD6JM16MM
	1/2"	15AD8JM4MM	15AD8JM6MM	15AD8JM8MM	10AD8JM12MM	10AD8JM16MM
	3/4"	15AD12JM4MM	15AD12JM6MM	15AD12JM8M	10AD12JM12MM	10AD12JM16MM
	1"	15AD16JM4MM	15AD16JM6MM	15AD16JM8MM	10AD16JM10MM	10AD16JM16MM

ADAPTERS

MALE X MALE

High Pressure Male

	1/4"	3/8"	9/16"
JIC Male			
1/4"	20AD4JM4HM	20AD4JM6HM	20AD4JM9HM
3/8"	20AD6JM4HM	20AD6JM6HM	20AD6JM9HM
1/2"	20AD8JM4HM	20AD8JM6HM	20AD8JM9HM
3/4"	15AD12JM4HM	15AD12JM6HM	15AD12JM9HM
1"	15AD16JM4HM	15AD16JM6HM	15AD16JM9HM

NPT Male

	1/4"	3/8"	1/2"	3/4"	1"
NPT Male					
1/4"	15AD4NM	15AD4NM6NM	15AD4NM8NM	10AD4NM12NM	10AD4NM16NM
3/8"		15AD6NM	15AD6NM8NM	10AD6NM12NM	10AD6NM16NM
1/2"			15AD8NM	10AD8NM12NM	10AD8NM16NM
3/4"				10AD12NM	10AD12NM16NM
1"					10AD16NM

Type M Hose

	9/16"-18	3/4"-16	1"-12	1-5/16"-12
NPT Male				
1/4"	15AD4NM9RM	15AD4NM12RM	15AD4NM16RM	
3/8"	15AD6NM9RM	15AD6NM12RM	15AD6NM16RM	
1/2"	15AD8NM9RM	15AD8NM12RM	15AD8NM16RM	15AD8NM21RM
3/4"	10AD12NM9RM	10AD12NM12RM	10AD12NM16RM	10AD12NM21RM
1"	10AD16NM9RM	10AD16NM12RM	10AD16NM16RM	10AD16NM21RM

Medium Pressure Male

	1/4"	3/8"	9/16"	3/4"	1"
NPT Male					
1/4"	15AD4NM4MM	15AD4NM6MM	15AD4NM9MM	10AD4NM12MM	10AD4NM16MM
3/8"	15AD6NM4MM	15AD6NM6MM	15AD6NM9MM	10AD6NM12MM	10AD6NM16MM
1/2"	15AD8NM4MM	15AD8NM6MM	15AD8NM9MM	10AD8NM12MM	10AD8NM16MM
3/4"	10AD12NM4MM	10AD12NM6MM	10AD12NM9MM	10AD12NM12MM	10AD12NM16MM
1"	10AD16NM4MM	10AD16NM6MM	10AD16NM9MM	10AD16NM12MM	10AD16NM16MM

High Pressure Male

	1/4"	3/8"	1/2"
NPT Male			
1/4"	15AD4NM4HM	15AD4NM6HM	15AD4NM9HM
3/8"	15AD6NM4HM	15AD6NM6HM	15AD6NM9HM
1/2"	15AD8NM4HM	15AD8NM6HM	15AD8NM9HM
3/4"	10AD12NM4HM	10AD12NM6HM	10AD12NM9HM
1"	10AD16NM4HM	10AD16NM6HM	10AD16NM9HM

Type M Hose

	9/16"-18	3/4"-16	1"-12	1-5/16"-12
Type M Hose				
9/16"-18	40AD9RM	30AD9RM12RM	26AD9RM16RM	
3/4"-16		30AD12RM	26AD12RM16RM	
1"-12			26AD16RM	20AD16RM21RM
1-5/16"-12				20AD21RM

ADAPTERS

MALE X MALE

Type M Hose

	9/16"-18	3/4"-16	1"-12	1-5/16"-12
Medium Pressure Male	1/4"	20AD4MM9RM	20AD4MM12RM	20AD4MM16RM
	3/8"	20AD6MM9RM	20AD6MM12RM	20AD6MM16RM
	9/16"	20AD9MM9RM	20AD9MM12RM	20AD9MM16RM
	3/4"	20AD12MM9RM	20AD12MM12RM	20AD12MM16RM
	1"	20AD16MM9RM	20AD16MM12RM	20AD16MM16RM

High Pressure Male

	1/4"	3/8"	9/16"
Type M Hose	9/16"-18	40AD9RM4HM	40AD9RM6HM
	3/4"-16	30AD12RM4HM	30AD12RM6HM
	1"-12		26AD16RM6HM
	1-5/16"-12		20AD21RM9HM

Medium Pressure Male

	1/4"	3/8"	9/16"	3/4"	1"
Medium Pressure Male	1/4"	20AD4MM	20AD4MM6MM	20AD4MM9MM	20AD4MM12MM
	3/8"		20AD6MM	20AD6MM9MM	20AD6MM12MM
	9/16"			20AD9MM	20AD9MM12MM
	3/4"				20AD12MM
	1"				20AD16MM

High Pressure Male

	1/4"	3/8"	9/16"
Medium Pressure Male	1/4"	20AD4MM4HM	20AD4MM6HM
	3/8"	20AD6MM4HM	20AD6MM6HM
	9/16"	20AD9MM4HM	20AD9MM6HM
	3/4"	20AD12MM4HM	20AD12MM6HM
	1"	20AD16MM4HM	20AD16MM6HM

High Pressure Male

	1/4"	3/8"	9/16"
High Pressure Male	1/4"	60AD4HM	60AD4HM6HM
	3/8"		60AD6HM
	9/16"		60AD9HM

FEMALE X FEMALE

NPT Female

	1/4"	3/8"	1/2"	3/4"	1"
NPT Female	1/4"	15AD4NF6NF	15AD4NF8NF	10AD4NF12NF	10AD4NF16NF
	3/8"		15AD6NF8NF	10AD6NF12NF	10AD6NF16NF
	1/2"			10AD8NF12NF	10AD8NF16NF
	3/4"				10AD12NF16NF

Medium Pressure Female

	1/4"	3/8"	9/16"	3/4"	1"
NPT Female	1/4"	15AD4NF4MF	15AD4NF6MF	15AD4NF9MF	15AD4NF12MF
	3/8"	15AD6NF4MF	15AD6NF6MF	15AD6NF9MF	15AD6NF12MF
	1/2"	15AD8NF4MF	15AD8NF6MF	15AD8NF9MF	15AD8NF12MF
	3/4"	10AD12NF4MF	10AD12NF6MF	10AD12NF9MF	10AD12NF12MF
	1"	10AD16NF4MF	10AD16NF6MF	10AD16NF9MF	10AD16NF12MF

ADAPTERS

FEMALE X FEMALE

High Pressure Female

	1/4"	3/8"	9/16"
1/4"	15AD4NF4HF	15AD4NF6HF	15AD4NF9HF
3/8"	15AD6NF4HF	15AD6NF6HF	15AD6NF9HF
1/2"	15AD8NF4HF	15AD8NF6HF	15AD8NF9HF
3/4"	10AD12NF4HF	10AD12NF6HF	10AD12NF9HF
1"	10AD16NF4HF	10AD16NF6HF	10AD16NF9HF

Medium Pressure Female

	1/4"	3/8"	9/16"	3/4"	1"
1/4"		20AD4MF6MF	20AD4MF9MF	20AD4MF12MF	20AD4MF16MF
3/8"			20AD6MF9MF	20AD6MF12MF	20AD6MF16MF
9/16"				20AD9MF12MF	20AD9MF16MF
3/4"					20AD12MF16MF

High Pressure Female

	1/4"	3/8"	9/16"
1/4"	20AD4MF4HF	20AD4MF6HF	20AD4MF9HF
3/8"	20AD6MF4HF	20AD6MF6HF	20AD6MF9HF
9/16"	20AD9MF4HF	20AD9MF6HF	20AD9MF9HF
3/4"	20AD12MF4HF	20AD12MF6HF	20AD12MF9HF
1"	20AD16MF4HF	20AD16MF6HF	20AD16MF9HF

High Pressure Female

	1/4"	3/8"	9/16"
1/4"		60AD4HF6HF	60AD4HF9HF
3/8"			60AD6HF9HF

MALE X FEMALE

NPT Female

	1/4"	3/8"	1/2"	3/4"	1"
1/4"	15AD4NM4NF	15AD4NM6NF	15AD4NM8NF	15AD4NM12NF	15AD4NM16NF
3/8"	15AD6NM4NF	15AD6NM6NF	15AD6NM8NF	15AD6NM12NF	15AD6NM16NF
1/2"	15AD8NM4NF	15AD8NM6NF	15AD8NM8NF	15AD8NM12NF	15AD8NM16NF
3/4"	10AD12NM4NF	10AD12NM6NF	10AD12NM8NF	10AD12NM12NF	10AD12NM16NF
1"	10AD16NM4NF	10AD16NM6NF	10AD16NM8NF	10AD16NM12NF	10AD16NM16NF

Medium Pressure Male

	1/4"	3/8"	9/16"	3/4"	1"
1/4"	15AD4NM4MF	15AD4NM6MF	15AD4NM8MF	15AD4NM12MF	15AD4NM16MF
3/8"	15AD6NM4MF	15AD6NM6MF	15AD6NM8MF	15AD6NM12MF	15AD6NM16MF
1/2"	15AD8NM4MF	15AD8NM6MF	15AD8NM8MF	15AD8NM12MF	15AD8NM16MF
3/4"	10AD12NM4MF	10AD12NM6MF	10AD12NM8MF	10AD12NM12MF	10AD12NM16MF
1"	10AD16NM4MF	10AD16NM6MF	10AD16NM8MF	10AD16NM12MF	10AD16NM16MF

ADAPTERS

MALE X FEMALE

High Pressure Female

	1/4"	3/8"	9/16"	
NPT Male	1/4"	15AD4NM4HF	15AD4NM6HF	15AD4NM8HF
	3/8"	15AD6NM4HF	15AD6NM6HF	15AD6NM8HF
	1/2"	15AD8NM4HF	15AD8NM6HF	15AD8NM8HF
	3/4"	10AD12NM4HF	10AD12NM6HF	10AD12NM8HF
	1"	10AD16NM4HF	10AD16NM6HF	10AD16NM8HF

NPT Female

Medium Pressure Male		1/4"	3/8"	1/2"	3/4"	1"
	1/4"	15AD4MM4NF	15AD4MM6NF	15AD4MM8NF	15AD4MM12NF	15AD4MM16NF
	3/8"	15AD6MM4NF	15AD6MM6NF	15AD6MM8NF	15AD6MM12NF	15AD6MM16NF
	9/16"	15AD9MM4NF	15AD9MM6NF	15AD9MM8NF	15AD9MM12NF	15AD9MM16NF
	3/4"	10AD12MM4NF	10AD12MM6NF	10AD12MM8NF	10AD12MM12NF	10AD12MM16NF
	1"	10AD16MM4NF	10AD16MM6NF	10AD16MM8NF	10AD16MM12NF	10AD16MM16NF

NPT Female

High Pressure Male		1/4"	3/8"	1/2"	3/4"	1"
	1/4"	15AD4HM4NF	15AD4HM6NF	15AD4HM8NF	15AD4HM12NF	15AD4HM16NF
	3/8"	15AD6HM4NF	15AD6HM6NF	15AD6HM8NF	15AD6HM12NF	15AD6HM16NF
	9/16"	15AD9HM4NF	15AD9HM6NF	15AD9HM8NF	15AD9HM12NF	15AD9HM16NF

Medium Pressure Female

Medium Pressure Male		1/4"	3/8"	9/16"	3/4"	1"
	1/4"	20AD4MM4MF	20AD4MM6MF	20AD4MM9MF	20AD4MM12MF	20AD4MM16MF
	3/8"	20AD6MM4MF	20AD6MM6MF	20AD6MM9MF	20AD6MM12MF	20AD6MM16MF
	9/16"	20AD9MM4MF	20AD9MM6MF	20AD9MM9MF	20AD9MM12MF	20AD9MM16MF
	3/4"	20AD12MM4MF	20AD12MM6MF	20AD12MM9MF	20AD12MM12MF	20AD12MM16MF
	1"	20AD16MM4MF	20AD16MM6MF	20AD16MM9MF	20AD16MM12MF	20AD16MM16MF

High Pressure Female

Medium Pressure Male		1/4"	3/8"	9/16"
	1/4"	20AD4MM4HF	20AD4MM6HF	20AD4MM9HF
	3/8"	20AD6MM4HF	20AD6MM6HF	20AD6MM9HF
	9/16"	20AD9MM4HF	20AD9MM6HF	20AD9MM9HF
	3/4"	20AD12MM4HF	20AD12MM6HF	20AD12MM9HF
	1"	20AD16MM4HF	20AD16MM6HF	20AD16MM9HF

Medium Pressure Female

High Pressure Male		1/4"	3/8"	9/16"	3/4"	1"
	1/4"	20AD4HM4MF	20AD4HM6MF	20AD4HM9MF	20AD4HM12MF	20AD4HM16MF
	3/8"	20AD6HM4MF	20AD6HM6MF	20AD6HM9MF	20AD6HM12MF	20AD6HM16MF
	9/16"	20AD9HM4MF	20AD9HM6MF	20AD9HM9MF	20AD9HM12MF	20AD9HM16MF

High Pressure Female

High Pressure Male		1/4"	3/8"	9/16"
	1/4"	60AD4HM4HF	60AD4HM6HF	60AD4HM9HF
	3/8"	60AD6HM4HF	60AD6HM6HF	60AD6HM9HF
	9/16"	60AD9HM4HF	60AD9HM6HF	60AD9HM9HF



PRECISION
HIGH
PRESSURE

Office: 208-936-2063
E-mail: sales@precisionhighpressure.com
155 Shannon Drive
Nampa, ID 83687

www.precisionhighpressure.com