



## Valves, Fittings and Tubing for Hydrogen Service



Precision High Pressure, LLC

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# About Us

Precision High Pressure is an American manufacturer and innovator of high-pressure valves, valve systems, fittings, and tubing with pressures up to 100,000 psi. Our products are required to perform under critical conditions of pressure, flow, and cleanliness in order to satisfy the demanding technical requirements of industries across the globe.

PHP's primary markets served include on and offshore oil exploration and extraction, hydrogen generation and refueling stations, power generation, industrial gases, waterjet blasting/cutting, and a wide variety of OEM applications where accurate and safe control of high pressure gases and liquids is important.



# Needle Valves for 20,000 PSI

## Specifications

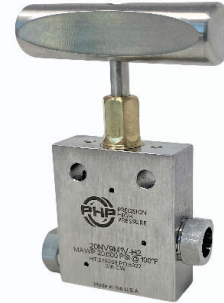
- ATEX compliant
- Cone & Threaded Connections with MAWP up to 20,000 PSI (1379 bar)
- Standard Temperature Ratings: -100°F to 400°F (-73°C to 204°C) with optional extended housing for -423° F (-253°C)

## Options

- -LT: low temp. extended housing for -423° F (-253°C)
- Pneumatic actuators, see next page

## Materials

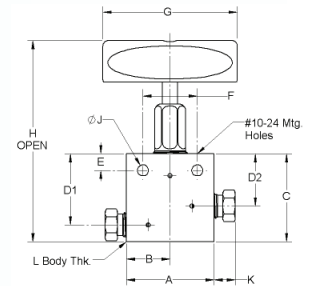
- Body - SS316/316L CW
- Packing – Glass filled Teflon
- Handle – Stainless steel or aluminum available
- Lower Stem - SS316/316L CW
- Additional lower stem materials available by request



## 2-Way Straight

Dimensions in. (mm)

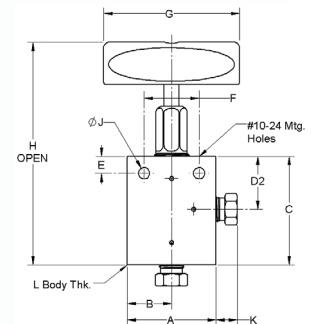
Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	CV	A	B	C	D1	D2	E	F	G	H	J	K	L
1/4"	Medium Pressure Cone & Thread 20,000 PSI MAWP	20NV4M1V-H2	0.125 (3.2)	0.31	2.00 (50.8)	1.00 (25.4)	2.00 (50.8)	1.63 (41.3)	1.19 (30.2)	0.38 (9.7)	1.24 (31.5)	3.00 (76.2)	4.84 (123.0)	0.25 (6.4)	0.38 (9.7)	1.00 (25.4)
3/8"		20NV6M1V-H2	0.203 (5.1)	0.75	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-H2	0.312 (7.9)	1.75	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-H2	0.438 (11.1)	2.80	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 (102.9)	7.07 (179.6)	0.44 (11.2)	0.59 (15.0)	1.38 (35.1)
1"		20NV16M1V-H2	0.562 (14.3)	5.20	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)	1.74 (44.5)



## 2-Way Angle

Dimensions in. (mm)

Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	CV	A	B	C	D1	D2	E	F	G	H	J	K	L
1/4"	Medium Pressure Cone & Thread 20,000 PSI MAWP	20NV4M2V-H2	0.125 (3.2)	0.47	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)
3/8"		20NV6M2V-H2	0.203 (5.1)	1.13	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-H2	0.312 (7.9)	2.63	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-H2	0.438 (11.1)	4.20	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 (102.9)	7.56 (192.0)	0.44 (11.2)	0.59 (15.0)	1.38 (35.1)
1"		20NV16M2V-H2	0.562 (14.3)	7.80	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)	1.74 (44.5)



\*Other configurations available by request

# Air Actuators for Needle Valves

Air Actuators allow for remote operation of needle valves using air pressure. PHP's actuators feature direct mount technology which eliminates the need for brackets. This reduces the overall size of the valve, increases reliability, simplifies installation and maintenance.

## Specifications

- ATEX compliant
- Anodized aluminum housing
- 1/8" FNPT position adjustable Air Inlet
- Open/Close position indicator standard

## Configurations

- Normally Closed - Air is required to open valve
- Normally Open - Air is required to close valve

**Ordering Example:** 20NV6M1V-NC5-H2

Valve Model	MAWP/Required PSI	Normally Closed (Air-to-Open)			Normally Open (Air-to-Close)		
		NC5	NC6	NC5	NO5	NO6	NO8
NV4M	Valve MAWP psi (bar)	20,000 (1739)			20,000 (1739)		
	Actuator air inlet pressure psi (bar)	100 (7.0)			100 (7.0)		
NV6M	Valve MAWP psi (bar)	20,000 (1739)			20,000 (1739)		
	Actuator air inlet pressure psi (bar)	100 (7.0)			90 (6.2)		
NV9M	Valve MAWP psi (bar)	10,000 (689)	20,000 (1379)		17,000 (1172)	20,000 (1379)	
	Actuator air inlet pressure psi (bar)	110 (7.6)	100 (7.0)		110 (7.6)	80 (5.5)	
NV12M	Valve MAWP psi (bar)			17,000 (1172)			20,000 (1379)
	Actuator air inlet pressure psi (bar)			90 (6.2)			100 (7.0)
NV16M	Valve MAWP psi (bar)			10,000 (689)			13,000 (896)
	Actuator air inlet pressure psi (bar)			100 (7.0)			100 (7.0)

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



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



# Ball Valves for Hydrogen Service

## Specifications

- Cone & Threaded Connections with MAWP up to 15,000 PSI (1034 bar)
- Standard Temperature Ratings: -40°F to 250°F (-40°C to 121°C)

## Features

- ATEX compliant
- Tested to 100,000 cycles at 15,000 PSI with no leakage or failures
- Two-piece stem and trunnion design ensures uniform seat stress
- Fixed end adapters minimizes the chance of misadjustment during installation
- Double stem o-rings with triple backup rings
- Pneumatic actuator option available

## Materials

- Body - SS316/316L CW
- Trunnion –SS316/316L CW
- End adapters - SS316/316L CW
- O-rings – V1090 compound FKM (Viton)
- Seat seal - PEEK PVX



## 0.250" Orifice 2-Way Trunnion

Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	MAWP (psi)
1/4"	Medium Pressure Cone & Thread	15BVHD4T4MF-H2	0.250 (6.4)	15,000 (1034)
3/8"		15BVHD4T6MF-H2	0.250 (6.4)	15,000 (1034)
9/16"		15BVHD4T9MF-H2	0.250 (6.4)	15,000 (1034)

## 0.375" Orifice 2-Way Trunnion

Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	MAWP (psi)
9/16"	Medium Pressure Cone & Thread	15BVHD6T9MF-H2	0.375 (9.5)	15,000 (1034)
3/4"		15BVHD6T12MF-H2	0.375 (9.5)	15,000 (1034)
1"		15BVHD6T16MF-H2	0.375 (9.5)	15,000 (1034)

# Block and Bleed Needle Valves

## Specifications

- Cone & Threaded Connections with MAWP up to 20,000 PSI (1379 bar)
- Standard Temperature Ratings: -100°F to 400°F (-73°C to 204°C)

## Materials

- Body - SS316/316L CW
- Packing – Glass filled Teflon
- Handle – Stainless steel or aluminum available
- Lower Stem - SS316/316L CW
- Additional lower stem materials available by request

## Single Block and Bleed

### Needle x Needle

Inlet/Outlet Connection	Vent Connection	Part Number	Flow Orifice in. (mm)	Vent Orifice in. (mm)	MAWP (psi)
1/4" MP	1/4" MP	20SBN4M4MV-H2	0.125 (3.2)	0.125 (3.2)	20,000
3/8" MP	1/4" MP	20SBN6M4MV-H2	0.203 (5.1)	0.125 (3.2)	20,000
9/16" MP	1/4" MP	20SBN9M4MV-H2	0.312 (7.9)	0.125 (3.2)	20,000



## Double Block and Bleed

### Needle x Needle x Needle

Inlet/Outlet Connection	Vent Connection	Part Number	Flow Orifice in. (mm)	Vent Orifice in. (mm)	MAWP (psi)
1/4" MP	1/4" MP	20DBN4M4MV-H2	0.125 (3.2)	0.125 (3.2)	20,000
3/8" MP	1/4" MP	20DBN6M4MV-H2	0.203 (5.1)	0.125 (3.2)	20,000
9/16" MP	1/4" MP	20DBN9M4MV-H2	0.312 (7.9)	0.125 (3.2)	20,000



# Check Valves for 20,000 PSI

## Specifications

- Cone & Threaded Connections with MAWP up to 20,000 PSI (1379 bar)
- Standard Temperature Ratings: -65°F to 250°F (-54°C to 121°C) with options for -423° F to +1200°F (-253°C to +648°C)
- Nominal Cracking Pressure 15 PSI (1 bar)

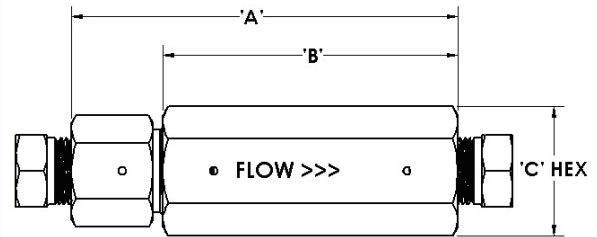
## Materials

- Body - SS316/316L CW
- Seal – PEEK 450G
- Poppet- SS316/316L CW



Dimensions in. (mm)

Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	CV	A	B	C
1/4"	Medium Pressure Cone & Thread 20,000 PSI MAWP	20CV4MFS-H2	0.125 (3.2)	0.25	3.07 (78.0)	2.50 (63.5)	1.00 (25.4)
3/8"		20CV6MFS-H2	0.219 (5.6)	0.80	3.48 (88.4)	2.66 (66.0)	1.13 (28.7)
9/16"		20CV9MFS-H2	0.359 (9.1)	2.30	4.76 (120.9)	3.50 (88.9)	1.38 (35.1)
3/4"		20CV12MFS-H2	0.516 (13.1)	3.40	5.63 (143.0)	4.38 (111.3)	1.75 (44.5)
1"		20CV16MFS-H2	0.688 (17.5)	7.40	7.00 (177.8)	5.25 (133.4)	2.13 (54.1)



# Sintered Cup Filters for 20,000 PSI

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 minimal pressure drop.

## Specifications

- Cone & Threaded Connections with MAWP up to 20,000 PSI (1379 bar)
- 5, 10, 20, 40 and 100 micron filter elements available

## Materials

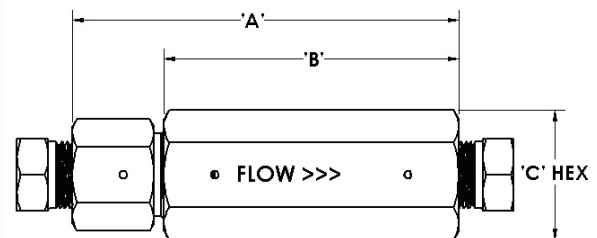
- Body - SS316/316L CW
- Filter Element - 300 series stainless steel

## Ordering Information

- \*-10: 10 Micron Filter
- Example: 20CF9MF-10

Dimensions in. (mm)

Connection Size OD in.	Connection Type	Part Number	Orifice in. (mm)	Effective area of Filter Element	A	B	C
1/4"	Medium Pressure Cone & Thread 20,000 PSI MAWP	20CF4MF-*	0.125 (3.2)	13.70 in <sup>2</sup> 348 mm <sup>2</sup>	3.07 (78.0)	2.50 (63.5)	1.00 (25.4)
3/8"		20CF6MF-*	0.219 (5.6)	25.16 in <sup>2</sup> 639 mm <sup>2</sup>	3.48 (88.4)	2.66 (66.0)	1.13 (28.7)
9/16"		20CF9MF-*	0.359 (9.1)	37.32 in <sup>2</sup> 948 mm <sup>2</sup>	4.76 (120.9)	3.50 (88.9)	1.38 (35.1)
3/4"		20CF12MF-*	0.516 (13.1)	44.45 in <sup>2</sup> 1129 mm <sup>2</sup>	5.63 (143.0)	4.38 (111.3)	1.75 (44.5)
1"		20CF16MF-*	0.688 (17.5)	123.43 in <sup>2</sup> 3135 mm <sup>2</sup>	7.00 (177.8)	5.25 (133.4)	2.13 (54.1)



# Fittings for 20,000 PSI

## Specifications

- Cone & Threaded Connections with MAWP up to 20,000 PSI (1379 bar)
- Fittings come standard with glands and collars when applicable

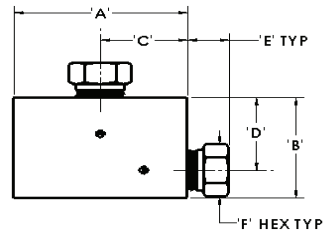
## Materials

- SS316/316L CW

## Elbow

Dimensions in. (mm)

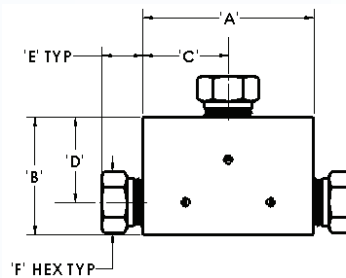
Connection Size OD in.	Part Number	A	B	C	D	E	F	Block Thickness
1/4"	20L4MF	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)
3/8"	20L6MF	2.00 (50.8)	1.38 (35.1)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)
9/16"	20L9MF	2.50 (63.5)	1.75 (44.5)	1.25 (31.8)	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)



## Tee

Dimensions in. (mm)

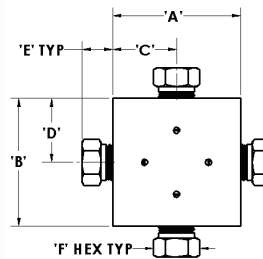
Connection Size OD in.	Part Number	A	B	C	D	E	F	Block Thickness
1/4"	20T4MF	1.50 (38.1)	1.13 (28.7)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)
3/8"	20T6MF	2.00 (50.8)	1.38 (35.1)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)
9/16"	20T9MF	2.50 (63.5)	1.75 (44.5)	1.25 (31.8)	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)



## Cross

Dimensions in. (mm)

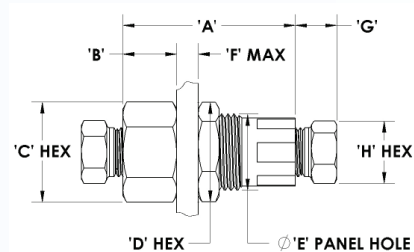
Connection Size OD in.	Part Number	A	B	C	D	E	F	Block Thickness
1/4"	20X4MF	1.50 (38.1)	1.50 (38.1)	0.75 (19.1)	0.75 (19.1)	0.35 (8.9)	0.50 (12.7)	0.62 (15.7)
3/8"	20X6MF	2.00 (50.8)	2.00 (50.8)	1.00 (25.4)	1.00 (25.4)	0.47 (11.9)	0.62 (15.7)	0.75 (19.1)
9/16"	20X9MF	2.50 (63.5)	2.50 (63.5)	1.25 (31.8)	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)



## Bulkhead

Dimensions in. (mm)

Connection Size OD in.	Part Number	A	B	C	D	E	F	G
1/4"	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)
3/8"	20BU6MF	2.00 (50.8)	0.62 (15.7)	1.00 (25.4)	1.00 (25.4)	0.94 (23.9)	0.38 (9.7)	0.44 (11.2)
9/16"	20BU9MF	2.62 (66.5)	0.78 (19.8)	1.38 (35.1)	1.38 (35.1)	1.25 (31.8)	0.38 (9.7)	0.53 (13.5)
3/4"	20BU12MF	2.62 (66.5)	0.91 (23.1)	1.88 (47.8)	1.88 (47.8)	1.69 (42.9)	0.38 (9.7)	0.62 (15.7)
1"	20BU16MF	3.50 (88.9)	1.50 (38.1)	2.13 (54.0)	2.13 (54.0)	2.00 (50.8)	0.38 (9.7)	0.72 (18.3)

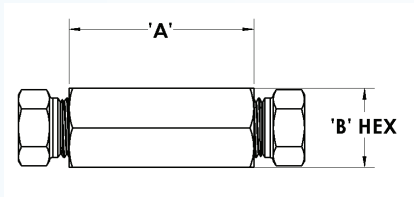




# Fittings for 20,000 PSI

## Coupling Dimensions in. (mm)

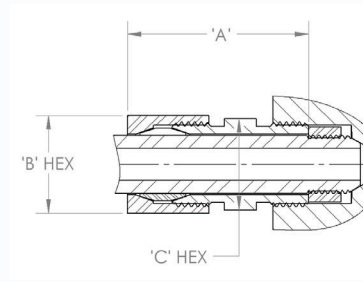
Connection Size OD in.	Part Number	A	B
1/4"	20CU4MF	1.50 (38.1)	0.63 (16.0)
3/8"	20CU6MF	1.75 (44.5)	0.75 (19.1)
9/16"	20CU9MF	2.12 (63.5)	1.00 (25.4)
3/4"	20CU12MF	2.50 (63.5)	1.38 (35.1)
1"	20CU16MF	3.50 (88.9)	1.75 (44.5)



## Anti-Vibration Assemblies

Connection Size OD in.	Part Number	A	B	C
1/4"	20AV4M	1.14 (29.0)	0.62 (15.7)	0.62 (15.7)
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)

Dimensions in. (mm)



## Connection Components

Connection Size OD in.	Gland	Collar	Cap	Plug	Tube Nipple
1/4"	20GL4M	20CL4M	20CA4M	20PL4M	20N4M-*
3/8"	20GL6M	20CL6M	20CA6M	20PL6M	20N6M-*
9/16"	20GL12M	20CL9M	20CA9M	20PL9M	20N9M-*
3/4"	20GL12M	20CL12M	20CA12M	20PL12M	20N12M-*
1"	20GL16M	20CL16M	20CA16M	20PL16M	20N16M-*

\* Insert desired length in.

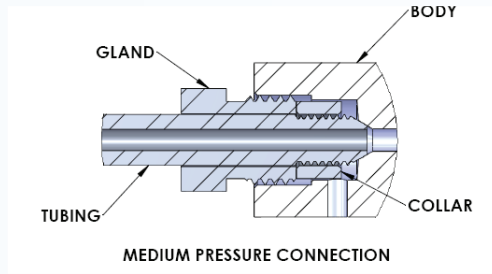
## 316SS/316L Stainless Steel Tubing

Connection Size OD in.	Part Number	OD in. (mm)	ID in. (mm)	Wall Thickness in. (mm)	MAWP (psi)
1/4"	20TU4M	0.250 (6.4)	0.109 (2.8)	0.070 (1.8)	20,000
3/8"	20TU6M	0.375 (9.5)	0.203 (5.2)	0.086 (2.2)	20,000
9/16"	20TU9M	0.563 (14.2)	0.312 (7.9)	0.125 (3.2)	20,000
3/4"	20TU12M	0.750 (19.1)	0.438 (11.1)	0.156 (3.9)	20,000
1"	20TU16M	1.00 (25.4)	0.562 (14.3)	0.219 (5.6)	20,000

# Torque Tables

## Collar and Gland Minimum Required Torque

Connection Size OD in.	Torque ft/lbs (Nm)
1/4" MP	<b>20 (27)</b>
3/8" MP	<b>30 (41)</b>
9/16" MP	<b>55 (75)</b>
3/4" MP	<b>90 (122)</b>
1" MP	<b>125 (170)</b>



## Needle Valve Packing Gland Required Torque

Valve Model	Torque ft/lbs (Nm)
20NV4M	<b>70 (95)</b>
20NV6M	<b>70 (95)</b>
20NV9M	<b>105 (142)</b>
20NV12M	<b>85 (115)</b>
20NV16M	<b>95 (129)</b>

## Air Operated Needle Valve Packing Gland Required Torque

Valve Model	Torque ft/lbs (Nm)
20NV4M	<b>55 (75)</b>
20NV6M	<b>55 (75)</b>
20NV9M	<b>65 (88)</b>
20NV12M	<b>100 (136)</b>
20NV16M	<b>115 (156)</b>

## Check Valve Gland Required Torque

Valve Model	Torque ft/lbs (Nm)
20CV4MFS	<b>70 (95)</b>
20CV6MFS	<b>70 (95)</b>
20CV9MFS	<b>80 (108)</b>
20CV12MFS	<b>110 (149)</b>
20CV16MFS	<b>150 (203)</b>



