

Medium Pressure Needle Valve

20NV Series, 20,000 psi (1379 bar)



- ❖ Maximum working pressure up to 20,000 psig (1379 bar)
- ❖ Working temperature from -325°F to 1200°F (-198°C to 649°C)
- ❖ Non-rotating stem and bar stock body design
- ❖ Tubing sizes available for 1/4", 3/8", 9/16", 3/4", 1"
- ❖ 316 stainless steel body material

Features

- ❖ Tubing sizes available for 1/4", 3/8", 9/16", 3/4", 1"
- ❖ Non-rotating stem and rising stem design
- ❖ Metal-to-metal seating achieves bubble-tight shutoff, longer stem/seat service life in abrasive flow, greater durability for repeated on/off cycles
- ❖ PTFE is the standard packing material, RPTFE glass, Graphite are available
- ❖ Graphite packing working Temperatures up to 1200°F (649°C)
- ❖ Stem sleeve and packing gland materials have been selected to achieve extended thread cycle life and reduced handle torque
- ❖ Cold-worked type 316 stainless steel body and aluminum bronze packing gland
- ❖ Vee or Regulating stem tips for options
- ❖ Packing below the thread of valve stem
- ❖ The locking device of packing gland is reliable
- ❖ Five body patterns are available

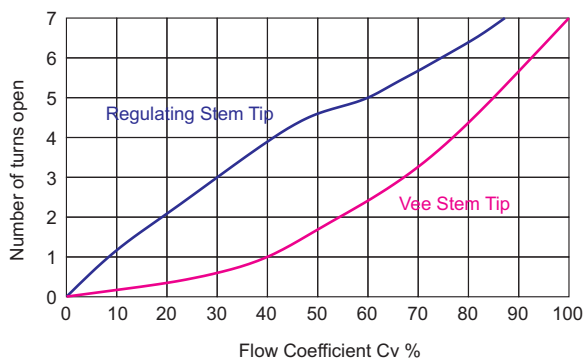
Technical Data

| Tube OD in. | Connection Type | Orifice in. (mm) | Cv | Working Pressure psig (bar) |
|-------------|-----------------|------------------|------|-----------------------------|
| 1/4 | MPF4 | 0.125 (3.18) | 0.31 | 20,000 (1379) |
| 3/8 | MPF6 | 0.219 (5.56) | 0.75 | 20,000 (1379) |
| 9/16 | MPF9 | 0.312 (7.92) | 1.30 | 20,000 (1379) |
| 3/4 | MPF12 | 0.438 (11.13) | 2.50 | 20,000 (1379) |
| 1 | MPF16 | 0.562 (14.27) | 4.40 | 20,000 (1379) |

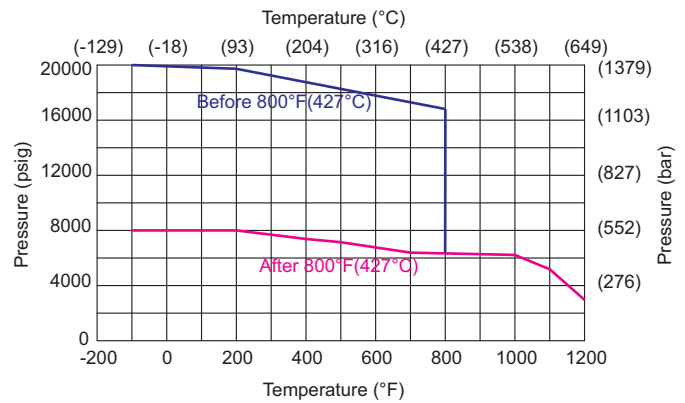
Notes:

- ❖ Cv value shown are for 2-way straight valve pattern.
Cv value of for 2-way angle pattern will be increase about 50% (Base on water).
- ❖ Working Temperatures
PTFE packing : -100°F (-73°C) to 450°F (232°C).
RPTFE glass packing : -100°F (-73°C) to 600°F (316°C).
Graphite packing : 0°F -100°F (-73°C) to 1200°F (649°C).

Flow Data at 100°F (38°C)

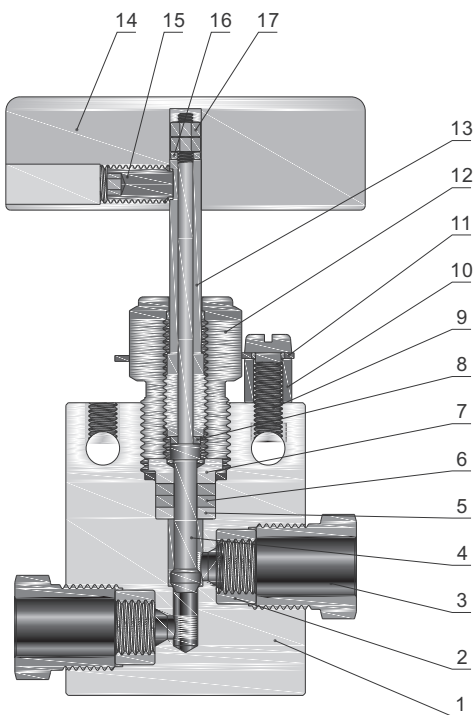


Pressure & Temperature



When exceeding 800°F (427°C), use the pink curve as its cold-worked rating for future operating of the components.

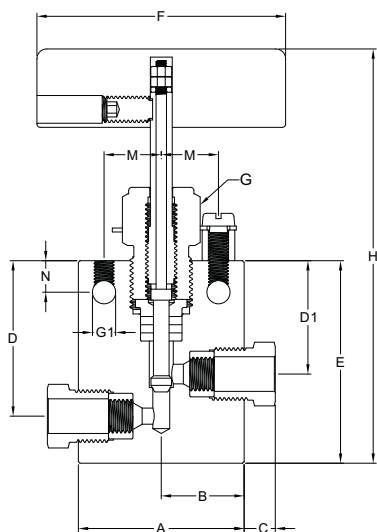
Standard Materials of Construction



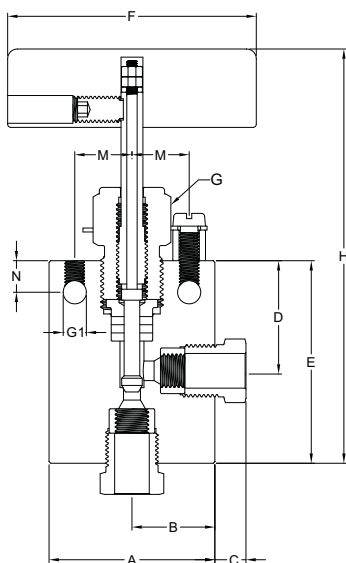
| Item | Component | Material Grade/ASTM Specification |
|------|--------------|-----------------------------------|
| 1 | Body | 316 S.S./A479 |
| 2 | Collar | 316 S.S./A479 |
| 3 | Nut | 316 S.S./A479 |
| 4 | Stem | S17400/A564 |
| 5 | Gland | 316 S.S./A479 |
| 6 | Packing | PTFE/RPTFE/Graphite |
| 7 | Packing ring | 316 S.S./A479 |
| 8 | Gland | 316 S.S./A479 |
| 9 | Screw | 304 S.S. |
| 10 | Ring | 316 S.S./A276 |
| 11 | Lock plate | 304 S.S./A240 |
| 12 | Bonnet | 316 S.S./A479 |
| 13 | Stem guard | 316 S.S./A479 |
| 14 | Handle | Aluminum |
| 15 | Screw | 304 S.S. |
| 16 | Gland | 316 S.S./A276 |
| 17 | Nut | 304 S.S. |

Dimensions

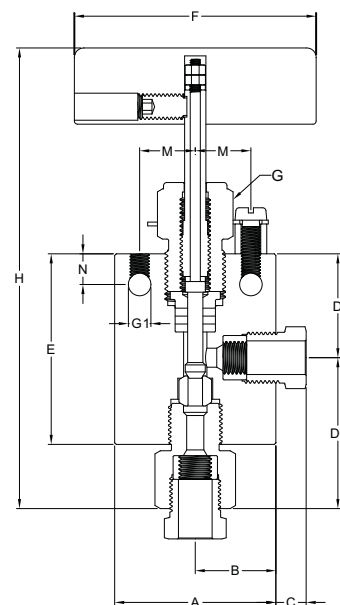
Straight



Angle



Angle(replaceable)



Dimensions (Straight)

| Basic Ordering Number | Connection Type | Orifice in. (mm) | in. (mm) | | | | | | | | | | | | | Thickness |
|-----------------------|-----------------|------------------|-----------------|----------------|----------------|----------------|----------------|-----------------|------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------|
| | | | A | B | C | D | D1 | E | F | G | G1 | H | M | N | | |
| 20NV-MPF4- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.62 (41.2) | 1.19 (30.2) | 2.00 (50.8) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.69 (119.1) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF6- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.62 (41.2) | 1.19 (30.2) | 2.00 (50.8) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.69 (119.1) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF9- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 2.38 (60.5) | 1.75 (44.5) | 2.88 (73.2) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 5.93 (150.9) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) | |
| 20NV-MPF12- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 3.00 (76.2) | 2.25 (57.2) | 3.75 (95.3) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 7.00 (177.8) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) | |
| 20NV-MPF16- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 3.75 (95.3) | 2.81 (71.4) | 4.63 (117.6) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 9.00 (228.6) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) | |

Dimensions (Angle)

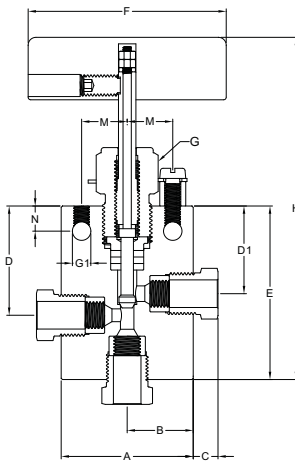
| Basic Ordering Number | Connection Type | Orifice in. (mm) | in. (mm) | | | | | | | | | | | | | Thickness |
|-----------------------|-----------------|------------------|-----------------|----------------|----------------|----------------|----|-----------------|------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------|
| | | | A | B | C | D | D1 | E | F | G | G1 | H | M | N | | |
| 20NV-MPF4-A- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.19 (30.2) | — | 2.44 (61.9) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.81 (122.3) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF6-A- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.19 (30.2) | — | 2.44 (61.9) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.81 (122.3) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF9-A- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 1.75 (44.5) | — | 3.38 (85.9) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 6.43 (163.6) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) | |
| 20NV-MPF12-A- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 2.25 (57.2) | — | 4.25 (108.0) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 7.50 (190.5) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) | |
| 20NV-MPF16-A- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 2.81 (71.4) | — | 5.12 (130.1) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 9.00 (228.6) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) | |

Dimensions (Angle/replaceable seat)

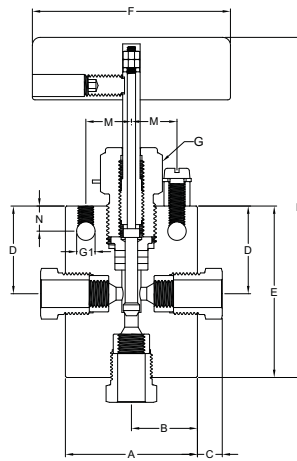
| Basic Ordering Number | Connection Type | Orifice in. (mm) | A | B | C | D | D1 | E | F | G | G1 | H | M | N | Thickness |
|-----------------------|-----------------|------------------|--------------|-------------|-------------|-------------|--------------|--------------|---------------|-------------|-------------|---------------|-------------|-------------|-------------|
| | | | in. (mm) | | | | | | | | | | | | |
| 20NV-MPF4-AR- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.19 (30.2) | 2.13 (54.0) | 2.25 (57.2) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 5.75 (146.1) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) |
| 20NV-MPF6-AR- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.19 (30.2) | 2.13 (54.0) | 2.25 (57.2) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 5.75 (146.1) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) |
| 20NV-MPF9-AR- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 1.75 (44.5) | 2.50 (63.5) | 3.13 (79.4) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 7.34 (186.7) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) |
| 20NV-MPF12-AR- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 2.25 (57.2) | 3.44 (87.4) | 4.25 (108.0) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 9.00 (228.6) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) |
| 20NV-MPF16-AR- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 2.69 (68.3) | 4.38 (111.1) | 5.25 (133.4) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 11.00 (279.7) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) |

Dimensions

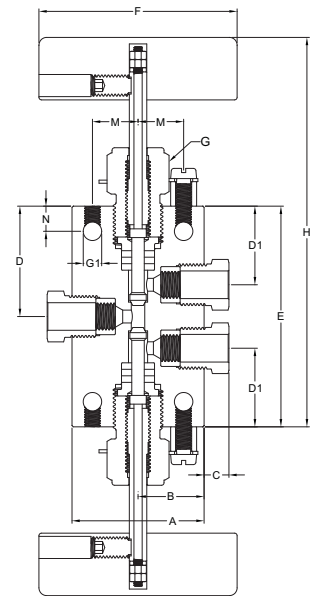
3-way/2 on pressure



3-way/1 on pressure



3-way/2 stem manifold



Dimensions (3-way/2 on pressure)

| Basic Ordering Number | Connection Type | Orifice in. (mm) | A | B | C | D | D1 | E | F | G | G1 | H | M | N | Thickness |
|-----------------------|-----------------|------------------|--------------|-------------|-------------|-------------|-------------|--------------|---------------|-------------|-------------|--------------|-------------|-------------|-------------|
| | | | in. (mm) | | | | | | | | | | | | |
| 20NV-MPF4-3A- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.63 (41.3) | 1.19 (30.2) | 2.63 (66.7) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 5.00 (127.0) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) |
| 20NV-MPF6-3A- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.63 (41.3) | 1.19 (30.2) | 2.63 (66.7) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 5.00 (127.0) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) |
| 20NV-MPF9-3A- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 2.38 (60.5) | 1.75 (44.5) | 3.63 (92.1) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 6.51 (165.6) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) |
| 20NV-MPF12-3A- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 3.00 (76.2) | 2.25 (57.2) | 4.63 (117.5) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 7.88 (200.0) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) |
| 20NV-MPF16-3A- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 3.75 (95.3) | 2.81 (71.4) | 5.88 (149.4) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 9.75 (247.9) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) |

Dimensions (3-way/1 on pressure)

| Basic Ordering Number | Connection Type | Orifice in. (mm) | in. (mm) | | | | | | | | | | | | | Thickness |
|-----------------------|-----------------|------------------|-----------------|----------------|----------------|----------------|----|-----------------|------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------|
| | | | A | B | C | D | D1 | E | F | G | G1 | H | M | N | | |
| 20NV-MPF4-3B- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.19 (30.2) | — | 2.44 (61.9) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.81 (122.3) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF6-3B- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.19 (30.2) | — | 2.44 (61.9) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 4.81 (122.3) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF9-3B- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 1.75 (44.5) | — | 3.38 (85.9) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 6.31 (160.5) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) | |
| 20NV-MPF12-3B- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 2.25 (57.2) | — | 4.25 (108.0) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 7.5 (190.5) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) | |
| 20NV-MPF16-3B- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 2.81 (71.4) | — | 5.12 (130.1) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 9.09 (231.1) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) | |

Dimensions (3-way/2 stem manifold)

| Basic Ordering Number | Connection Type | Orifice in. (mm) | in. (mm) | | | | | | | | | | | | | Thickness |
|-----------------------|-----------------|------------------|-----------------|----------------|----------------|----------------|----------------|-----------------|------------------|----------------|----------------|------------------|----------------|----------------|----------------|-----------|
| | | | A | B | C | D | D1 | E | F | G | G1 | H | M | N | | |
| 20NV-MPF4-3C- | MPF4 | 0.125 (3.18) | 2.00 (50.8) | 1.00 (25.4) | 0.38 (9.7) | 1.69 (42.9) | 1.19 (30.2) | 3.38 (85.7) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 8.13 (206.4) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF6-3C- | MPF6 | 0.219 (5.56) | 2.00 (50.8) | 1.00 (25.4) | 0.47 (11.9) | 1.69 (42.9) | 1.19 (30.2) | 3.38 (85.7) | 3.00 (76.2) | 0.75 (19.1) | 0.22 (5.6) | 8.13 (206.4) | 0.62 (15.8) | 0.38 (9.7) | 0.75 (19.1) | |
| 20NV-MPF9-3C- | MPF9 | 0.312 (7.92) | 2.50 (63.5) | 1.25 (31.8) | 0.53 (13.5) | 2.56 (65.1) | 1.75 (44.5) | 5.13 (130.2) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 11.31 (287.6) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4) | |
| 20NV-MPF12-3C- | MPF12 | 0.438 (11.13) | 3.00 (76.2) | 1.50 (38.1) | 0.62 (15.8) | 3.00 (76.2) | 2.25 (57.2) | 6.50 (165.1) | 10.25 (260.4) | 1.19 (30.2) | 0.44 (11.2) | 13.0 (330.2) | 0.88 (22.4) | 0.63 (16.0) | 1.38 (35.1) | |
| 20NV-MPF16-3C- | MPF16 | 0.562 (14.27) | 4.12 (104.6) | 2.06 (52.3) | 0.63 (16.0) | 3.75 (95.3) | 2.81 (71.4) | 7.50 (190.5) | 10.25 (260.4) | 1.62 (41.2) | 0.56 (14.2) | 15.44 (292.4) | 1.25 (31.8) | 1.13 (28.7) | 1.75 (44.5) | |

Notes:

1. G is the drill dimension of packing gland mounting hole.
2. G1 is the dimension of bracket mounting hole.
3. Panel mounting drill size: 0.25" all valves.
4. The dimension of stem in closed position.

How to Order

20NV— MPF4 — R — R — A — 316

| Series | Connector Sizes | Stem Tips | Packing | Flow Patterns | Body Material |
|--------|-----------------|---------------------|------------------|--|--------------------------------|
| 20NV | MPF4 1/4" | Vee R Regulating | PTFE | Straight | 316 316 S.S. A825 Alloy 825 |
| | MPF6 3/8" | | R RPTFE Glass | A Angle | |
| | MPF9 9/16" | | G Graphite | AR Angle, replaceable seat | |
| | MPF12 3/4" | | | 3A 3-way, 2 on pressure | |
| | MPF16 1" | | | 3B 3-way, 1 on pressure 3C 3-way, 2 stem manifold | |