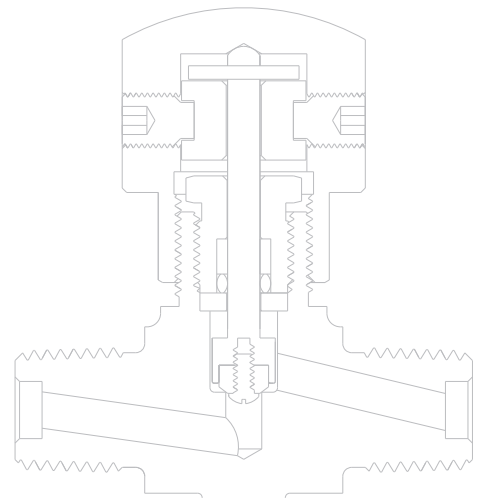
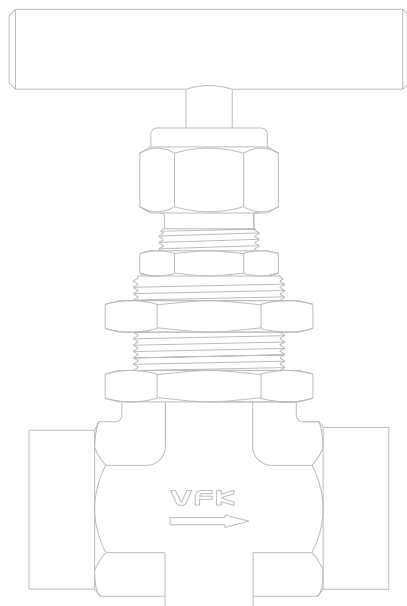


# Needle Valves



Climate Control  
Electromechanical  
Filtration  
Fluid & Gas Handling  
Hydraulics  
Process Control  
Sealing & Shielding



**VFK**  
Advanced Fluid Control

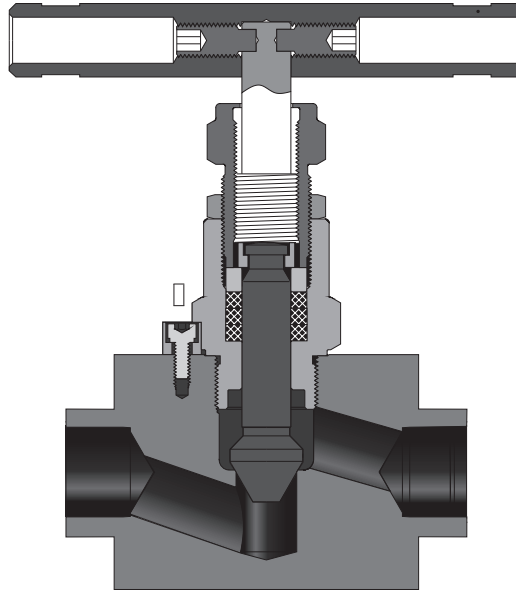
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## Needle Valves

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# General Utility Service

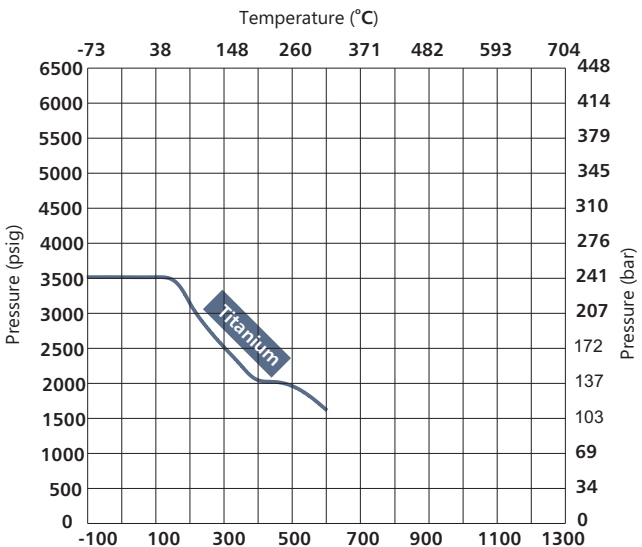
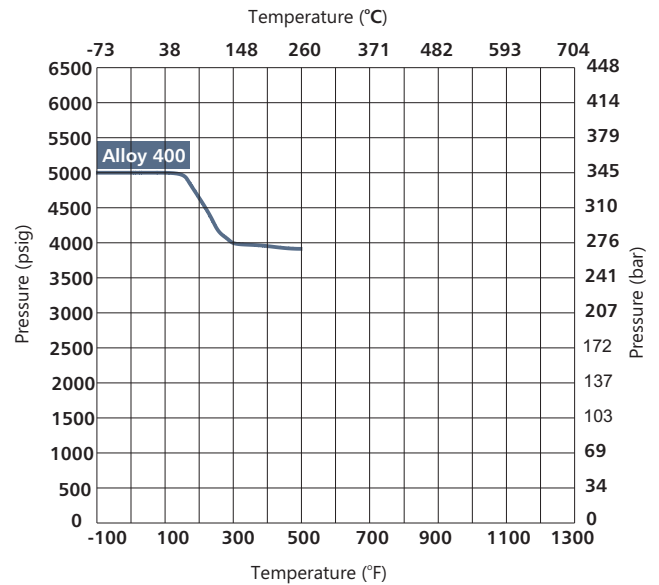
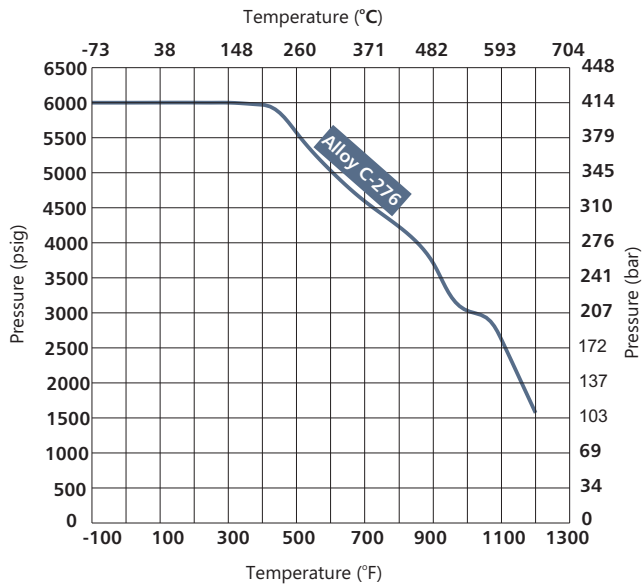
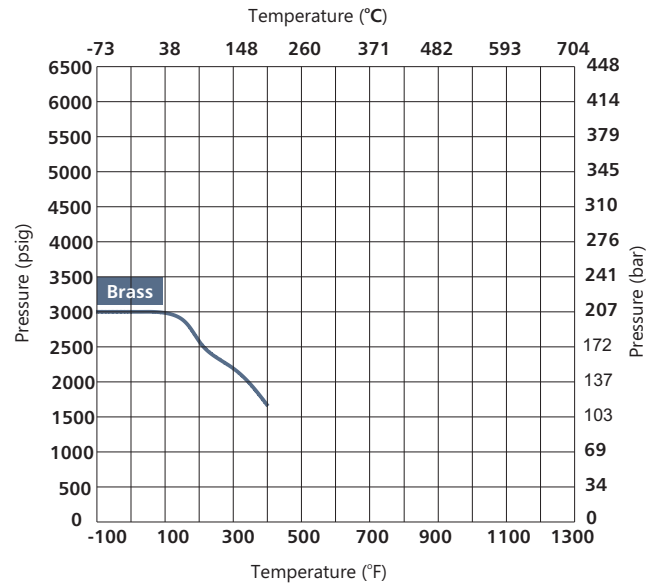
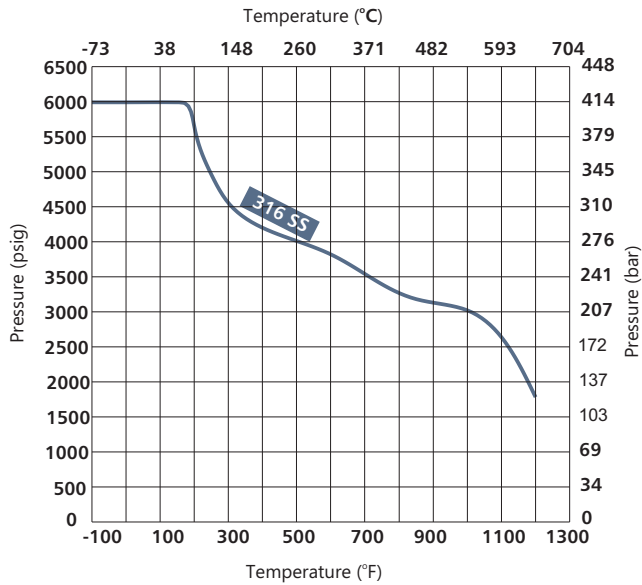
## Needle Valves



### 31 Series

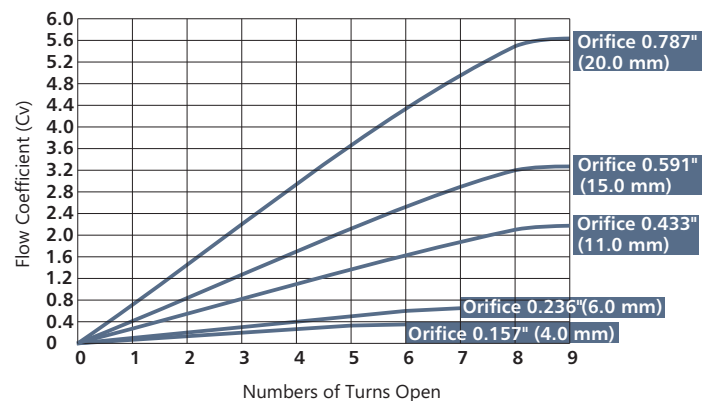
- 31 series needle valves are for use in general-purpose applications to isolate or vent system media.
- The hardened stainless steel, nonrotating needle promotes leak-tight shutoff and long service life.
- The up stem threads are cold rolled for high strength and smooth operation.
- The valve stem threads are isolated from the media.
- Straight and angle patterns, compact design.
- Stainless steel and other alloy steel body materials can be selected.
- Safety back-seating needle seals in fully open position.
- Two piece knuckle joint provides nonrotating needle feature. Joint is located above the packing, protected from system media.
- Pressures up to 6000 psig (413 bar).
- Temperatures up to 450° F (232° C) with PTFE packing; up to 1200° F (649° C) with optional graphite packing.
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.
- Every valve is 100% factory tested with nitrogen.

## Pressure vs. Temperature

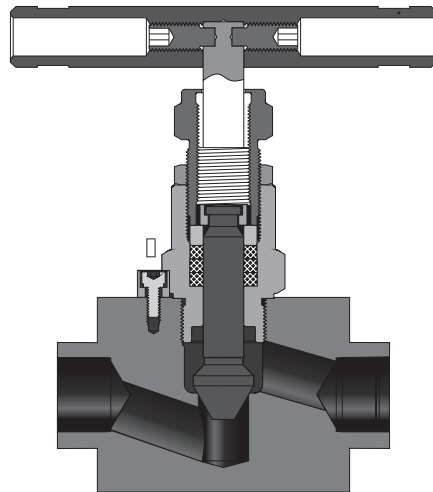


## Flow Data at 100°F (37°C)

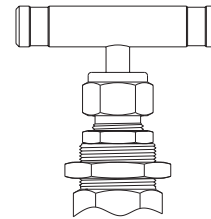
Regulating Stem



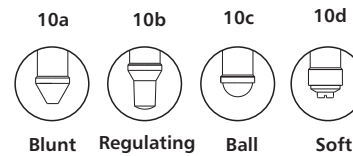
## Standard Materials of Construction



Panel Mounting

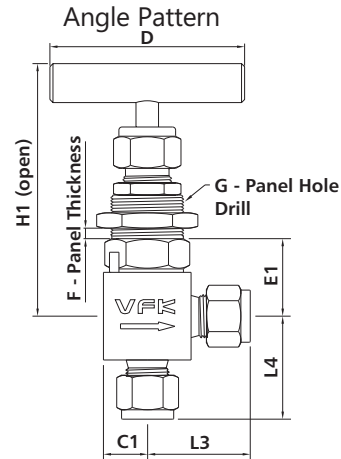
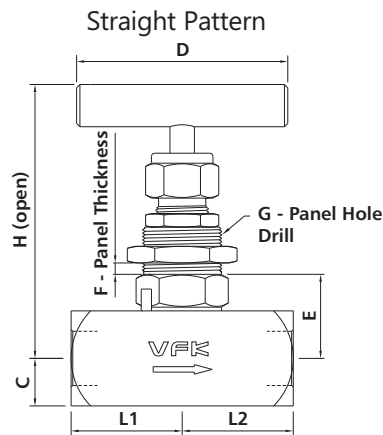


Stem Type



| Item                     | Component     | Valve Body Material                                |                              |                                             |                  |                              |
|--------------------------|---------------|----------------------------------------------------|------------------------------|---------------------------------------------|------------------|------------------------------|
|                          |               | 316 SS                                             | Alloy 400                    | Titanium                                    | Alloy C-276      | Brass                        |
| 1                        | Handle        | Anodized aluminum or stainless steel or black knob |                              |                                             |                  |                              |
| 2                        | Set Screw     | Nickel cadmium-plated steel                        |                              |                                             |                  |                              |
| 3                        | Packing Bolt  | 321 SS/A276                                        |                              |                                             |                  | Brass 360/B16                |
| 4                        | Upper Stem    | 316 SS/A276                                        |                              |                                             |                  |                              |
| 5                        | Lock Nut      | 316 SS/B783                                        |                              |                                             |                  | Brass 360/B16                |
| 6                        | Bonnet        | 316 SS/A479                                        | Alloy R-405/B164             | Titanium Gr 4/B348                          | Alloy C-276/B574 | Brass 360/B16                |
| 7                        | Panel Nut     | 316 SS/B783                                        |                              |                                             |                  | Brass 360/B16                |
| 8                        | Gland         | 316 SS/A276                                        |                              |                                             |                  |                              |
| 9                        | Packing       | PTFE or PEEK or graphite                           |                              |                                             |                  |                              |
| 10a<br>10b<br>10c<br>10d | Lower Stem    | Chrome-plated<br>316 SS/A276                       | Alloy R-405/B164             | Titanium Gr 4/B348                          | Alloy C-276/B574 | Chrome-plated<br>316 SS/A276 |
|                          |               | Optional                                           |                              |                                             |                  |                              |
| 11                       | Body          | 316 SS/A479<br>316 SS/A182                         | Alloy 400/B164,<br>B127,B564 | Titanium Gr 4/B348<br>or titanium Gr 4/B381 | Alloy C-276/B564 | Brass 360/B16                |
|                          | Seat          | Weld stellite optional                             |                              |                                             |                  |                              |
| 12                       | Lock Pin      | 304 SS/A276                                        |                              |                                             |                  |                              |
| 13                       | Screw         | 304 SS/A276                                        |                              |                                             |                  |                              |
| 14                       | Spring Washer | 304 SS/A276                                        |                              |                                             |                  |                              |
| 15                       | Bush          | 304 SS/A276                                        |                              |                                             |                  |                              |
|                          | Lubricant     | Molybdenum disulfide-based                         |                              |                                             |                  |                              |

# Dimensions



| Basic Ordering Number                                                                          | Connection Type and Size |                    | Orifice in.(mm) | Cv             | Dimension, in.(mm) |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|------------------------------------------------------------------------------------------------|--------------------------|--------------------|-----------------|----------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|---------------|----------------|----------------|---------------|----------------|----------------|----------------|
|                                                                                                | Inlet                    | Outlet             |                 |                | L1                 | L2             | L3             | L4              | C               | C1              | D             | E              | E1             | F             | G              | H              | H1             |
|  31-FN2-4     | 1/8 Female NPT           | 1/8 Female NPT     | 0.157<br>(4.0)  | 0.35           | 1.00<br>(25.4)     | 1.00<br>(25.4) | 1.00<br>(25.4) | 0.563<br>(14.3) | 0.5<br>(12.7)   | 0.5<br>(12.7)   | 2.17<br>(55)  | 0.84<br>(21.4) | 0.9<br>(23.0)  | 0.25<br>(6.4) | 0.77<br>(19.6) | 2.85<br>(72.4) | 2.91<br>(74.0) |
|  31-FN4-4     | 1/4 Female NPT           | 1/4 Female NPT     |                 |                | 1.06<br>(26.9)     | 1.06<br>(26.9) |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-N4-4      | 1/4 Male NPT             | 1/4 Male NPT       |                 |                | 1.03<br>(26.2)     | 1.03<br>(26.2) | 1.06<br>(26.9) | 1.06<br>(26.9)  |                 |                 |               |                |                |               |                |                |                |
|  31-N6-4      | 3/8 Male NPT             | 3/8 Male NPT       |                 |                | 1.19<br>(30.2)     | 1.19<br>(30.2) |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FX4-4     | 1/4" VFK                 | 1/4" VFK           |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MX6-4   | 6 mm VFK                 | 6 mm VFK           |                 |                | 1.20<br>(30.5)     | 1.20<br>(30.5) | 1.20<br>(30.5) | 1.20<br>(30.5)  |                 |                 |               |                | 0.84<br>(21.4) |               |                |                | 2.85<br>(72.4) |
|  31-MX8-4   | 8 mm VFK                 | 8 mm VFK           |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FP4-4   | 1/4 Female BSPP          | 1/4 Female BSPP    |                 |                | 1.06<br>(26.9)     | 1.06<br>(26.9) |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FR4-4   | 1/4 Female BSPT          | 1/4 Female BSPT    |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FN4-6   | 1/4 Female NPT           | 1/4 Female NPT     | 0.236<br>(6.0)  | 0.85           | 1.12<br>(28.6)     | 1.12<br>(28.6) | 1.12<br>(28.6) | 0.63<br>(15.9)  | 0.563<br>(14.3) | 0.563<br>(14.3) | 2.5<br>(63.5) | 1.0<br>(25.4)  | 1.06<br>(27.0) | 0.38<br>(9.7) | 0.96<br>(24.4) | 3.5<br>(88.9)  | 3.56<br>(90.5) |
|  31-FN6-6   | 3/8 Female NPT           | 3/8 Female NPT     |                 |                |                    |                |                | 1.12<br>(28.6)  |                 |                 |               |                |                |               |                |                |                |
|  31-N6-6    | 3/8 Male NPT             | 3/8 Male NPT       |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FX6-6   | 3/8" VFK                 | 3/8" VFK           |                 |                | 1.41<br>(35.8)     | 1.41<br>(35.8) | 1.32<br>(33.6) | 1.32<br>(33.6)  |                 |                 |               |                |                |               |                |                |                |
|  31-FX8-6   | 1/2" VFK                 | 1/2" VFK           |                 |                | 1.52<br>(38.6)     | 1.52<br>(38.6) | 1.42<br>(36.1) | 1.42<br>(36.1)  |                 |                 |               |                |                |               |                |                |                |
|  31-MX10-6  | 10 mm VFK                | 10 mm VFK          |                 |                | 1.42<br>(36.1)     | 1.42<br>(36.1) | 1.33<br>(33.8) | 1.33<br>(33.8)  |                 |                 |               |                |                |               |                |                |                |
|  31-MX12-6  | 12 mm VFK                | 12 mm VFK          |                 |                | 1.52<br>(38.6)     | 1.52<br>(38.6) | 1.42<br>(36.1) | 1.42<br>(36.1)  |                 |                 |               |                |                |               |                |                |                |
|  31-MX14-6  | 14 mm VFK                | 14 mm VFK          |                 |                | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-TS6-6   | 3/8" TS                  | 3/8" TS            |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-TS8-6   | 1/2" TS                  | 1/2" TS            |                 |                | 1.13<br>(28.6)     | 1.13<br>(28.6) | 1.13<br>(28.6) | 1.13<br>(28.6)  |                 |                 |               |                | 1.0<br>(25.4)  |               |                |                | 3.5<br>(88.9)  |
|  31-MTS12-6 | 12 mm MTS                | 12 mm MTS          |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MTS14-6 | 14 mm MTS                | 14 mm MTS          |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MTS16-6 | 16 mm MTS                | 16 mm MTS          |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MTB14-6 | 14 mm MTB                | 14 mm MTB          |                 |                | 1.50<br>(38.1)     | 1.50<br>(38.1) | 1.50<br>(38.1) | 1.50<br>(38.1)  |                 |                 |               |                |                |               |                |                |                |
|  31-MTB16-6 | 16 mm MTB                | 16 mm MTB          |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-UMB14-6 | 14 mm UMB                | 14 mm UMB          |                 |                | 2.92<br>(74.1)     | 2.92<br>(74.1) |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-UMB16-6 | 16 mm UMB                | 16 mm UMB          |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FN8-6   | 1/2 Female NPT           | 1/2 Female NPT     | 1.13<br>(28.6)  | 1.13<br>(28.6) |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-FR8-6   | 1/2 Female BSPT          | 1/2 Female BSPT    | 1.56<br>(39.7)  | 1.56<br>(39.7) |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MS20-6  | M20 x 1.5 Male ISO       | M20 x 1.5 Male ISO | 1.50<br>(38.1)  | 1.50<br>(38.1) |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |
|  31-MS22-6  | M22 x 1.5 Male ISO       | M22 x 1.5 Male ISO |                 |                |                    |                |                |                 |                 |                 |               |                |                |               |                |                |                |

| Basic Ordering Number | Connection Type and Size |                  | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
|-----------------------|--------------------------|------------------|-----------------|------|--------------------|----------------|----------------|----------------|-----------------|-----------------|---------------|----------------|-----------------|---------------|----------------|-----------------|----------------|
|                       | Inlet                    | Outlet           |                 |      | L1                 | L2             | L3             | L4             | C               | C1              | D             | E              | E1              | F             | G              | H               | H1             |
| □□31-FN8-11           | 1/2 Female NPT           | 1/2 Female NPT   | 0.433<br>(11.0) | 2.18 |                    |                | 1.63<br>(41.3) |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FN12-11          | 3/4 Female NPT           | 3/4 Female NPT   |                 |      | 1.75<br>(44.5)     | 1.75<br>(44.5) |                | 1.50<br>(38.1) |                 |                 |               |                |                 |               |                |                 |                |
| □□31-N12-11           | 3/4 Male NPT             | 3/4 Male NPT     |                 |      |                    |                | 1.50<br>(38.1) |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FX12-11          | 3/4" VFK                 | 3/4" VFK         |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MX14-11          | 14 mm VFK                | 14 mm VFK        |                 |      | 1.97<br>(50.0)     | 1.97<br>(50.0) | 1.61<br>(41.0) | 1.61<br>(41.0) |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MX16-11          | 16 mm VFK                | 16 mm VFK        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MX18-11          | 18 mm VFK                | 18 mm VFK        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MTS14-11         | 14 mm MTS                | 14 mm MTS        |                 |      |                    |                |                |                | 0.875<br>(22.2) | 0.75<br>(19.05) | 3.5<br>(88.9) | 1.38<br>(34.9) | 1.25<br>(31.75) | 0.38<br>(9.7) | 1.08<br>(27.5) | 4.12<br>(104.8) | 4.0<br>(101.6) |
| □□31-MTS16-11         | 16 mm MTS                | 16 mm MTS        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-TS12-11          | 3/4" TS                  | 3/4" TS          |                 |      | 1.75<br>(44.5)     | 1.75<br>(44.5) |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MTB14-11         | 14 mm MTB                | 14 mm MTB        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MTB16-11         | 16 mm MTB                | 16 mm MTB        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-UMB14-11         | 14 mm UMB                | 14 mm UMB        |                 |      | 2.98<br>(75.7)     | 2.98<br>(75.7) |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FP12-11          | 3/4 Female BSPP          | 3/4 Female BSPP  |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FR8-11           | 1/2 Female BSPT          | 1/2 Female BSPT  |                 |      | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MS27-11          | M27 x 2 Male ISO         | M27 x 2 Male ISO |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FN12-15          | 3/4 Female NPT           | 3/4 Female NPT   | 0.591<br>(15.0) | 3.27 |                    |                | 1.75<br>(44.5) | 1.14<br>(29.0) |                 |                 |               |                |                 |               |                |                 |                |
| □□31-TS16-15          | 1" TS                    | 1" TS            |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MTS25-15         | 25 mm MTS                | 25 mm MTS        |                 |      | 1.75<br>(44.5)     | 1.75<br>(44.5) | 1.75<br>(44.5) | 1.75<br>(44.5) | 1.14<br>(29.0)  | 0.875<br>(22.2) | 5.0<br>(127)  | 1.7<br>(43.2)  | 1.43<br>(36.4)  | 0.38<br>(9.7) | 1.28<br>(32.5) | 5.0<br>(127)    | 4.72<br>(120)  |
| □□31-MTS28-15         | 28 mm MTS                | 28 mm MTS        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-PS12-15          | 3/4 PS                   | 3/4 PS           |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MX20-15          | 20 mm VFK                | 20 mm VFK        |                 |      | 2.35<br>(59.7)     | 2.35<br>(59.7) | 2.35<br>(59.7) | 2.0<br>(51.0)  |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MX22-15          | 22 mm VFK                | 22 mm VFK        | 0.787<br>(20.0) | 5.65 |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-FN16-20          | 1 Female NPT             | 1 Female NPT     |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-MTS25-20         | 25 mm MTS                | 25 mm MTS        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-TS16-20          | 1" TS                    | 1" TS            |                 |      | 1.97<br>(50.0)     | 1.97<br>(50.0) |                |                | 1.25<br>(31.75) |                 | 5.5<br>(140)  |                |                 |               |                | 5.2<br>(132)    |                |
| □□31-MTS28-20         | 28 mm MTS                | 28 mm MTS        |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-PS12-20          | 3/4 PS                   | 3/4 PS           |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |
| □□31-PS16-20          | 1 PS                     | 1 PS             |                 |      |                    |                |                |                |                 |                 |               |                |                 |               |                |                 |                |

## 31 Series How to Order

| A             | B            | C          | D          | E          | F          | G            |
|---------------|--------------|------------|------------|------------|------------|--------------|
| Body Material | Valve Series | Inlet Type | Inlet Size | Inlet Type | Inlet Size | Orifice Size |
| SS            | 31           | FN         | 8          | MTS        | 10         | 6            |

| H             | I                | J              | K            | L           |
|---------------|------------------|----------------|--------------|-------------|
| Seat Material | Packing Material | Panel Mounting | Flow Pattern | NACE MR0175 |
| W             | G                | Y              | A            | SG          |

| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |
| CS:  | Carbon Steel  |

| B   | Valve Series            |
|-----|-------------------------|
| 31: | 31 Series Needle Valves |

| CE  | Inlet/Outlet Type                  |
|-----|------------------------------------|
| FN  | Female NPT                         |
| N   | Male NPT                           |
| FR  | Female BSPT                        |
| RT  | Male BSPT                          |
| FM  | Female ISO (for MRP)               |
| MS  | Male ISO (for MRG)                 |
| FP  | Female BSPP (for RP)               |
| BP  | Male BSPP (for RG)                 |
| TS  | Fractional Tube Socket Weld        |
| MTS | Metric Tube Socket Weld            |
| TB  | Fractional Tube Butt Weld          |
| MTB | Metric Tube Butt Weld              |
| PS  | Pipe Socket Weld                   |
| PB  | Pipe Butt Weld                     |
| FX  | Fractional Tube Fitting            |
| MX  | Metric Tube Fitting                |
| UFB | Nut-Gasket Fractional Bulge Nipple |
| UMB | Nut-Gasket Metric Bulge Nipple     |

| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
| 4  | 1/4"                         |
| 6  | 3/8" or 6 mm                 |
| 8  | 1/2" or 8 mm                 |
| 10 | 10 mm                        |
| 12 | 3/4" or 12 mm                |
| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |
| 22 | 22 mm or M22 x 1.5           |
| 24 | M24 x 1.5                    |
| 25 | 25 mm                        |
| 27 | M27 x 2                      |
| 28 | 28 mm                        |

| G   | Orifice Size    |
|-----|-----------------|
| 4:  | 0.157" (4.0 mm) |
| 6:  | 0.236" (6.0 mm) |
| 11: | 0.433" (11 mm)  |
| 15: | 0.591" (15 mm)  |
| 20: | 0.787" (20 mm)  |

| H | Seat Material |
|---|---------------|
|---|---------------|

Standard Same as Body

|   |                    |
|---|--------------------|
| W | Stellite           |
| X | Customer Specified |

| I | Packing Material |
|---|------------------|
|---|------------------|

Standard chevron PTFE

|   |          |
|---|----------|
| P | PEEK     |
| G | Graphite |

| J | Panel Mounting |
|---|----------------|
|---|----------------|

Standard with no Panel Mounting

|   |     |
|---|-----|
| Y | Yes |
|---|-----|

| K | Flow Pattern |
|---|--------------|
|---|--------------|

Standard is Straight Flow

|   |       |
|---|-------|
| A | Angle |
|---|-------|

| L | NACE MR0175 |
|---|-------------|
|---|-------------|

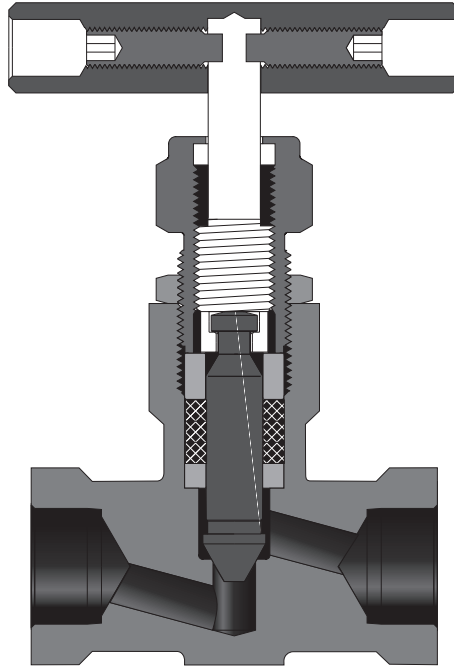
Standard with no NACE applicable

|    |                  |
|----|------------------|
| SG | With NACE MR0175 |
|----|------------------|

Remark:

- Standard thread pitch for metric threads are as follows:  
M10 and below: 1 mm  
M12 to M24: 1.5 mm  
M27 and above: 2 mm  
Standard thread pitch should be ignored in the ordering number, others should be specified.

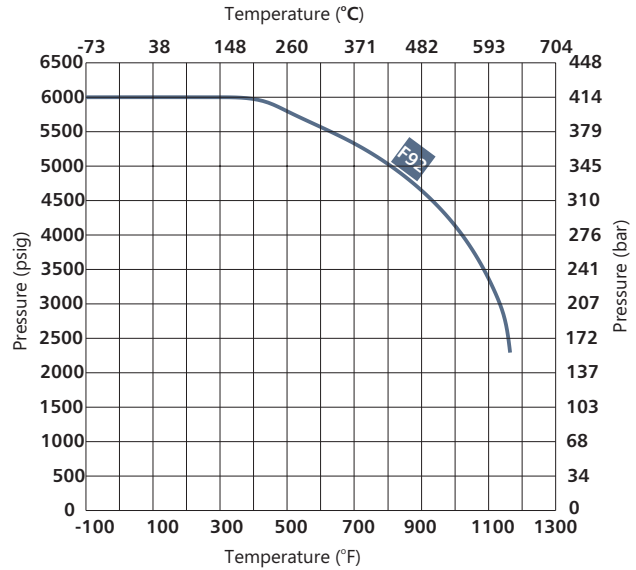
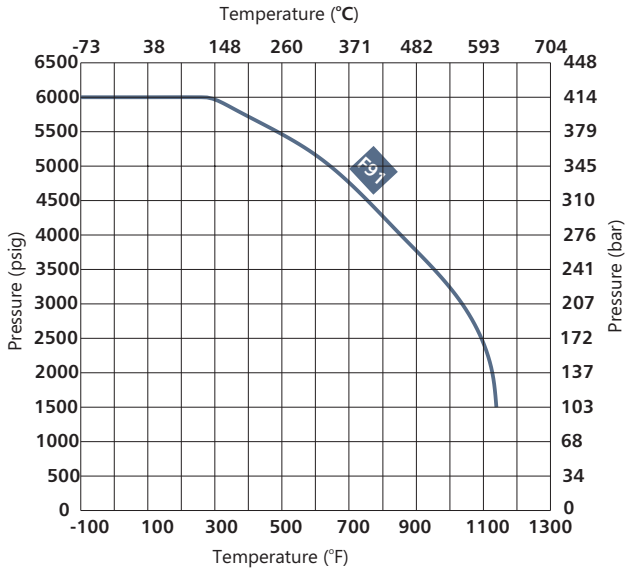
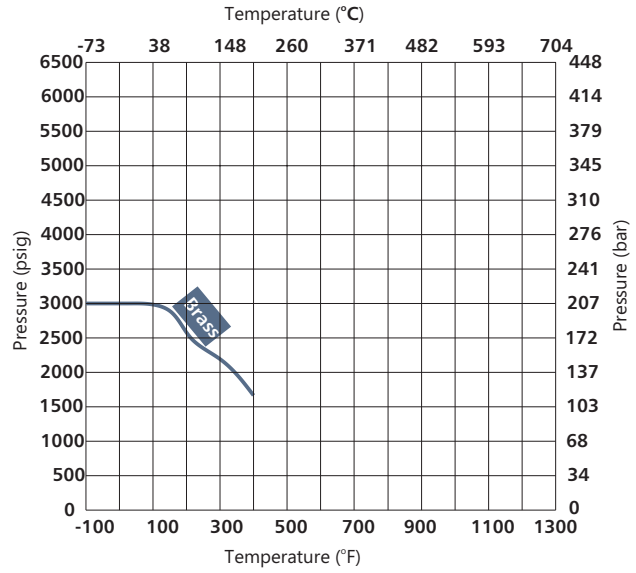
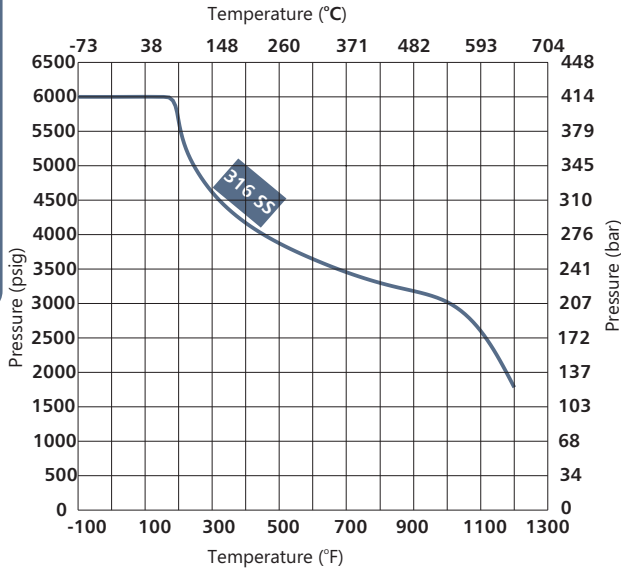
# Forged Service Needle Valves



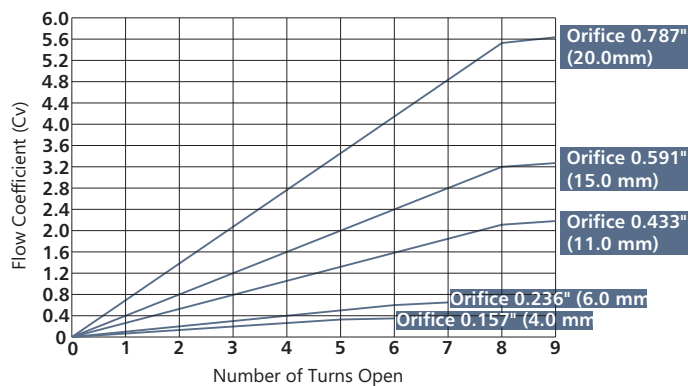
## 32 and 32H Series

- 32 and 32H series needle valves are for use in one-piece forged valve body.
- The hardened stainless steel, nonrotating needle promotes leak-tight shutoff and long service life.
- The up stem threads are cold rolled for high strength and smooth operation.
- The valve stem threads are isolated from the media.
- Straight and angle patterns, compact design.
- Stainless steel and other alloy steel body materials can be selected.
- Safety back-seating needle seals in fully open position.
- Two piece knuckle joint provides nonrotating needle feature. Joint is located above the packing, protected from system media.
- 32 series standard pressures up to 6000 psig (413 bar). 32H series maximum working pressure up to 10 000 psig (689 bar).
- Temperatures up to 450° F (232° C) with PTFE packing; up to 1200° F (649° C) with optional graphite packing.
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.
- Every valve is 100% factory tested with nitrogen.

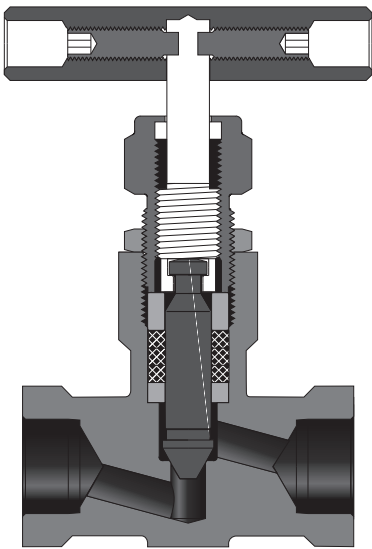
## Pressure vs. Temperature



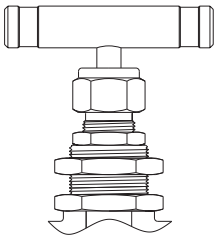
## Regulating Stem Flow Data at 100°F (37°C)



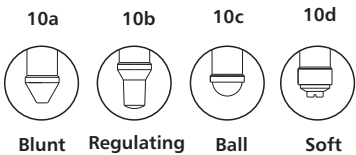
Standard Materials of Construction



Panel Mounting

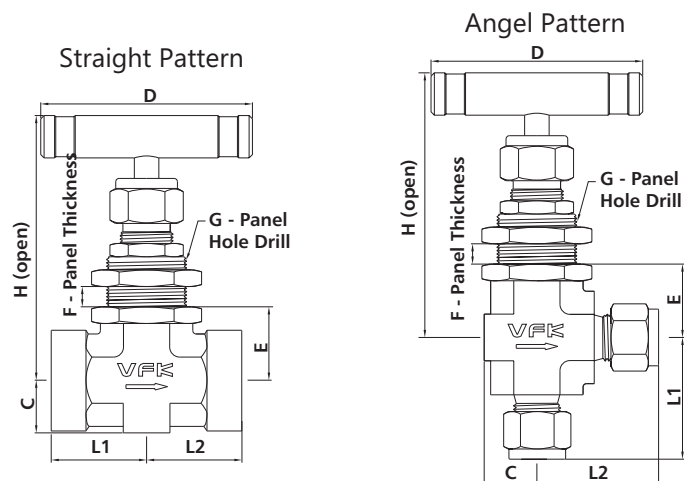


Stem Type



| Item                     | Component      | Valve Body Material                                |                           |                           |                              |
|--------------------------|----------------|----------------------------------------------------|---------------------------|---------------------------|------------------------------|
|                          |                | 316 SS                                             | F91                       | F92                       | Brass                        |
| 1                        | Handle         | Anodized aluminum or stainless steel or black knob |                           |                           |                              |
| 2                        | Set Screw      | Nickel cadmium-plated steel                        |                           |                           |                              |
| 3                        | Packing Bolt   | 321 SS/A276                                        |                           |                           |                              |
| 4                        | Upper Stem     | 316 SS/A276                                        | F91/A182                  | F92/A182                  | Brass 360/B16                |
| 5                        | Lock Nut       | 316 SS/B783                                        |                           |                           |                              |
| 6                        | Panel Nut      | 316 SS/B783                                        |                           |                           |                              |
| 7                        | Gland          | 316 SS/A276                                        | F91/A182                  | F92/A182                  | Brass 360/B16                |
| 8                        | Packing        | PTFE or PEEK or graphite                           |                           |                           |                              |
| 9                        | Packing Washer | 316 SS/A276                                        | F91/A182                  | F92/A182                  | Brass 360/B16                |
| 10a<br>10b<br>10c<br>10d | Lower Stem     | Chrome-plated<br>316 SS/A276                       | Chrome-plated<br>F91/A182 | Chrome-plated<br>F92/A182 | Chrome-plated<br>316 SS/A276 |
|                          |                | Optional                                           |                           |                           |                              |
| 11                       | Body           | 316 SS/A182                                        | F91/A182                  | F92/A182                  | Brass 377/B283               |
|                          | Seat           | Weld stellite seat optional                        |                           |                           |                              |
| Lubricant                |                | Molybdenum disulfide-based                         |                           |                           |                              |

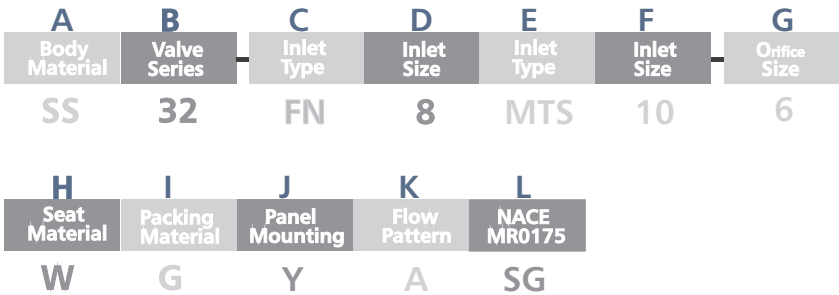
## Dimensions



| Basic Ordering Number | Connection Type and Size |                    | Orifice in.(mm) | Cv   | Dimension, in.(mm)       |                          |                |                |                |                |               |                |
|-----------------------|--------------------------|--------------------|-----------------|------|--------------------------|--------------------------|----------------|----------------|----------------|----------------|---------------|----------------|
|                       | Inlet                    | Outlet             |                 |      | L1                       | L2                       | H              | D              | C              | E              | F             | G              |
| □□32-FN2-4            | 1/8 Female NPT           | 1/8 Female NPT     | 0.157<br>(4.0)  | 0.35 | 1.00<br>(25.4)           | 1.00<br>(25.4)           | 2.85<br>(72.5) | 2.17<br>(55)   | 0.53<br>(13.5) | 0.71<br>(18.0) | 0.25<br>(6.4) | 0.77<br>(19.6) |
| □□32-FN4-4            | 1/4 Female NPT           | 1/4 Female NPT     |                 |      | 1.03<br>(26.2)           | 1.03<br>(26.2)           |                |                |                |                |               |                |
| □□32-FX4-4            | 1/4" VFK                 | 1/4" VFK           |                 |      | 1.22<br>(30.9)           | 1.22<br>(30.9)           |                |                |                |                |               |                |
| □□32-MX6-4            | 6 mm VFK                 | 6 mm VFK           |                 |      | 1.25<br>(31.75)          | 1.25<br>(31.75)          |                |                |                |                |               |                |
| □□32-MX8-4            | 8 mm VFK                 | 8 mm VFK           |                 |      | 1.19<br>(30.2)           | 1.19<br>(30.2)           |                |                |                |                |               |                |
| □□32-N6-4             | 3/8 Male NPT             | 3/8 Male NPT       |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-FN4-6            | 1/4 Female NPT           | 1/4 Female NPT     | 0.236<br>(6.0)  | 0.85 | 1.13<br>(28.6)           | 1.13<br>(28.6)           | 3.38<br>(85.8) | 2.50<br>(63.5) | 0.62<br>(15.8) | 0.87<br>(22.0) | 0.38<br>(9.7) | 0.96<br>(24.4) |
| □□32-FN6-6            | 3/8 Female NPT           | 3/8 Female NPT     |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-N6-6             | 3/8 Male NPT             | 3/8 Male NPT       |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-FX6-6            | 3/8" VFK                 | 3/8" VFK           |                 |      | 1.44<br>(36.5)           | 1.44<br>(36.5)           |                |                |                |                |               |                |
| □□32-MX10-6           | 10 mm VFK                | 10 mm VFK          |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-MX12-6           | 12 mm VFK                | 12 mm VFK          |                 |      | 1.53<br>(38.9)           | 1.53<br>(38.9)           |                |                |                |                |               |                |
| □□32-MX14-6           | 14 mm VFK                | 14 mm VFK          |                 |      | 1.56<br>(39.7)           | 1.56<br>(39.7)           |                |                |                |                |               |                |
| □□32-FN8-6            | 1/2 Female NPT           | 1/2 Female NPT     |                 |      | 1.26<br>(32.0)           | 1.26<br>(32.0)           |                |                |                |                |               |                |
| □□32-N8-6             | 1/2 Male NPT             | 1/2 Male NPT       |                 |      | 1.50<br>(38.1)           | 1.50<br>(38.1)           |                |                |                |                |               |                |
| □□32-FJ8-6            | 1/2" VFK                 | 1/2" VFK           |                 |      | 1.53<br>(38.9)           | 1.53<br>(38.9)           |                |                |                |                |               |                |
| □□32-TS6-6            | 3/8" TS                  | 3/8" TS            |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-TS8-6            | 1/2" TS                  | 1/2" TS            |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-MTS12-6          | 12 mm MTS                | 12 mm MTS          |                 |      | 1.13<br>(28.6)           | 1.13<br>(28.6)           |                |                |                |                |               |                |
| □□32-MTS14-6          | 14 mm MTS                | 14 mm MTS          |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-MTS16-6          | 16 mm MTS                | 16 mm MTS          |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-MTB14-6          | 14 mm MTB                | 14 mm MTB          |                 |      | 1.50<br>(38.1)           | 1.50<br>(38.1)           |                |                |                |                |               |                |
| □□32-MTB16-6          | 16 mm MTB                | 16 mm MTB          |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-UMB14-6          | 14 mm UMB                | 14 mm UMB          |                 |      | 2.92<br>(74.1)<br>(39.7) | 2.92<br>(74.1)<br>(39.7) |                |                |                |                |               |                |
| □□32-UMB16-6          | 16 mm UMB                | 16 mm UMB          |                 |      | 1.50<br>(38.1)           | 1.50<br>(38.1)           |                |                |                |                |               |                |
| □□32-MS20-6           | M20 x 1.5 Male ISO       | M20 x 1.5 Male ISO |                 |      |                          |                          |                |                |                |                |               |                |
| □□32-MS22-6           | M22 x 1.5 Male ISO       | M22 x 1.5 Male ISO |                 |      |                          |                          |                |                |                |                |               |                |

| Basic Ordering Number | Connection Type and Size |                  | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
|-----------------------|--------------------------|------------------|-----------------|------|--------------------|----------------|----------------|---------------|---------------|----------------|---------------|----------------|--|--|--|--|--|--|--|
|                       | Inlet                    | Outlet           |                 |      | L1                 | L2             | H              | D             | C             | E              | F             | G              |  |  |  |  |  |  |  |
| □□32-FN8-11           | 1/2 Female NPT           | 1/2 Female NPT   | 0.433<br>(11.0) | 2.18 | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-FN12-11          | 3/4 Female NPT           | 3/4 Female NPT   |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-N8-11            | 1/2 Male NPT             | 1/2 Male NPT     |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-N12-11           | 3/4 Male NPT             | 3/4 Male NPT     |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-FX12-11          | 3/4" VFK                 | 3/4" VFK         |                 |      | 1.97<br>(50.0)     | 1.97<br>(50.0) |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX14-11          | 14 mm VFK                | 14 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX16-11          | 16 mm VFK                | 16 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX18-11          | 18 mm VFK                | 18 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX20-11          | 20 mm VFK                | 20 mm VFK        |                 |      |                    |                | 3.86<br>(98.0) | 3.5<br>(88.9) | 0.8<br>(20.2) | 1.1<br>(28.3)  | 0.38<br>(9.7) | 1.08<br>(27.5) |  |  |  |  |  |  |  |
| □□32-MX25-11          | 25 mm VFK                | 25 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS14-11         | 14 mm MTS                | 14 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS16-11         | 16 mm MTS                | 16 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS18-11         | 18 mm MTS                | 18 mm MTS        |                 |      | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-TS12-11          | 3/4" TS                  | 3/4" TS          |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-PS8-11           | 1/2 PS                   | 1/2 PS           |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTB14-11         | 14 mm MTB                | 14 mm MTB        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTB16-11         | 16 mm MTB                | 16 mm MTB        |                 |      | 2.98<br>(75.7)     | 2.98<br>(75.7) |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-UMB14-11         | 14 mm UMB                | 14 mm UMB        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-UMB16-11         | 16 mm UMB                | 16 mm UMB        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MS27-11          | M27 x 2 Male ISO         | M27 x 2 Male ISO |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-FN12-15          | 3/4 Female NPT           | 3/4 Female NPT   | 0.591<br>(15.0) | 3.27 | 1.97<br>(50.0)     | 1.97<br>(50.0) | 6.5<br>(165)   | 5.0<br>(127)  | 1.3<br>(33.0) | 1.61<br>(41.0) | 0.38<br>(9.7) | 1.45<br>(36.8) |  |  |  |  |  |  |  |
| □□32-TS16-15          | 1" TS                    | 1" TS            |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS25-15         | 25 mm MTS                | 25 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS28-15         | 28 mm MTS                | 28 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-PS12-15          | 3/4 PS                   | 3/4 PS           |                 |      | 2.35<br>(59.7)     | 2.35<br>(59.7) |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-PB12-15          | 3/4 PB                   | 3/4 PB           |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-FX12-15          | 3/4" VFK                 | 3/4" VFK         |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-FX16-15          | 1" VFK                   | 1" VFK           |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX20-15          | 20 mm VFK                | 20 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX22-15          | 22 mm VFK                | 22 mm VFK        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MX25-15          | 25 mm VFK                | 25 mm VFK        | 0.787<br>(20.0) | 5.65 | 1.97<br>(50.0)     | 1.97<br>(50.0) | 6.5<br>(165)   | 5.5<br>(165)  | 1.3<br>(33.0) | 1.61<br>(41.0) | 0.38<br>(9.7) | 1.45<br>(36.8) |  |  |  |  |  |  |  |
| □□32-FN16-20          | 1 Female NPT             | 1 Female NPT     |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-TS16-20          | 1" TS                    | 1" TS            |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS25-20         | 25 mm MTS                | 25 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-MTS28-20         | 28 mm MTS                | 28 mm MTS        |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-PS12-20          | 3/4 PS                   | 3/4 PS           |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |
| □□32-PB16-20          | 1 PB                     | 1 PB             |                 |      |                    |                |                |               |               |                |               |                |  |  |  |  |  |  |  |

# 32 and 32H Series How to Order



| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |
| CS:  | Carbon Steel  |

| B    | Valve Series             |
|------|--------------------------|
| 32:  | 32 Series Needle Valves  |
| 32H: | 32H Series Needle Valves |

| CE  | Inlet/Outlet Type                  |
|-----|------------------------------------|
| FN  | Female NPT                         |
| N   | Male NPT                           |
| FR  | Female BSPT                        |
| RT  | Male BSPT                          |
| FM  | Female ISO (for MRP)               |
| MS  | Male ISO (for MRG)                 |
| FP  | Female BSPP (for RP)               |
| BP  | Male BSPP (for RG)                 |
| TS  | Fractional Tube Socket Weld        |
| MTS | Metric Tube Socket Weld            |
| TB  | Fractional Tube Butt Weld          |
| MTB | Metric Tube Butt Weld              |
| PS  | Pipe Socket Weld                   |
| PB  | Pipe Butt Weld                     |
| FX  | Fractional Tube Fitting            |
| MX  | Metric Tube Fitting                |
| UFB | Nut-Gasket-Fractional Bulge Nipple |
| UMB | Nut-Gasket-Metric Bulge Nipple     |

| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
| 4  | 1/4"                         |
| 6  | 3/8" or 6 mm                 |
| 8  | 1/2" or 8 mm                 |
| 10 | 10 mm                        |
| 12 | 3/4" or 12 mm                |
| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |
| 22 | 22 mm or M22 x 1.5           |
| 24 | M24 x 1.5                    |
| 25 | 25 mm                        |
| 27 | M27 x 2                      |
| 28 | 28 mm                        |

| G   | Orifice Size    |
|-----|-----------------|
| 4:  | 0.157" (4.0 mm) |
| 6:  | 0.236" (6.0 mm) |
| 11: | 0.433" (11 mm)  |
| 15: | 0.591" (15 mm)  |
| 20: | 0.787" (20 mm)  |

| H                     | Seat Material      |
|-----------------------|--------------------|
| Standard Same as Body |                    |
| W                     | Stellite           |
| X                     | Customer Specified |

| I                     | Packing Material |
|-----------------------|------------------|
| Standard chevron PTFE |                  |
| P                     | PEEK             |
| G                     | Graphite         |

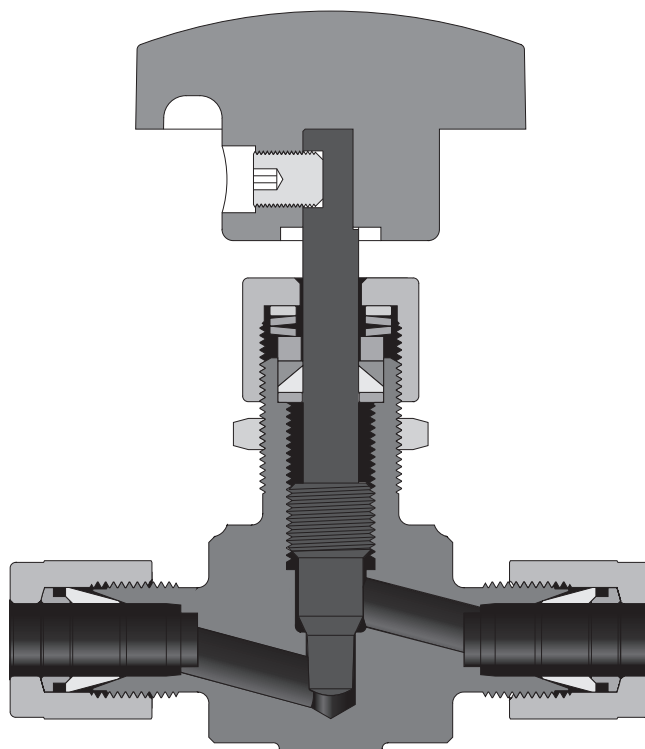
| J                               | Panel Mounting |
|---------------------------------|----------------|
| Standard with no Panel Mounting |                |
| Y                               | Yes            |

| K                         | Flow Pattern |
|---------------------------|--------------|
| Standard is Straight Flow |              |
| A                         | Angle        |

| L                                | NACE MR0175      |
|----------------------------------|------------------|
| Standard with no NACE applicable |                  |
| SG                               | With NACE MR0175 |

- Remark:
- 1. Standard thread pitch for metric threads are as follows:  
M10 and below: 1 mm  
M12 to M24: 1.5 mm  
M27 and above: 2 mm  
Standard thread pitch should be ignored in the ordering number, others should be specified.

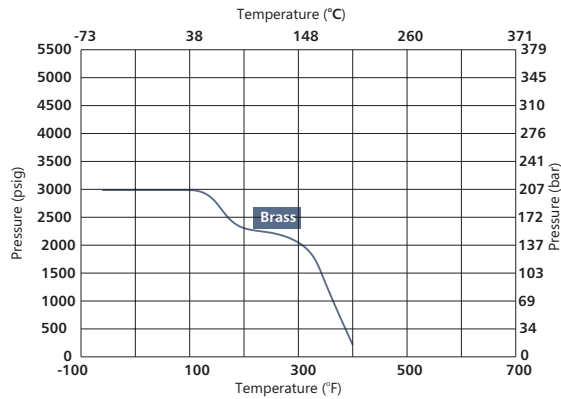
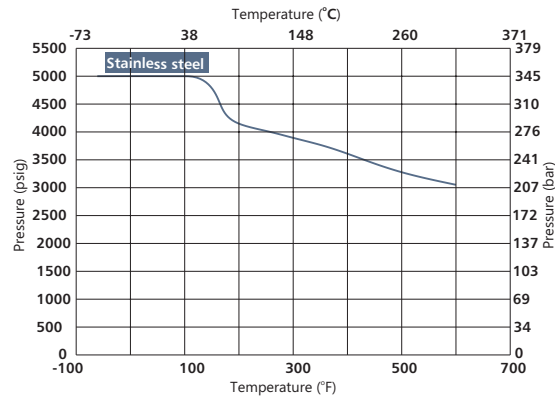
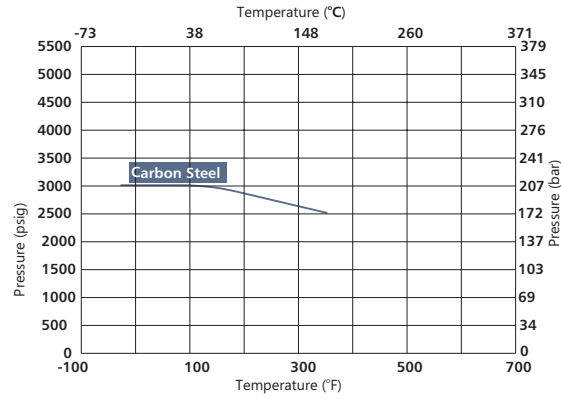
# General Purpose Service Needle Valves



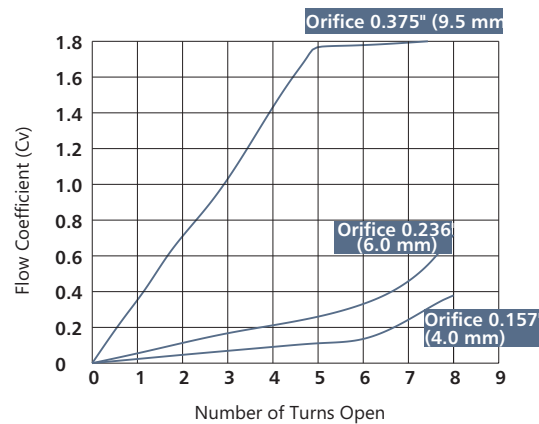
## 33 Series

- Live-loaded packing system. Integral-bonnet valve body design.
- Easy external adjustments by packing nut.
- The up stem threads are cold rolled for high strength and smooth operation.
- Compact design.
- Straight, angle and cross patterns can be choose.
- 2-piece chevron packing with disc springs:
  - Improves seal
  - Reduces friction wear
  - Compensates for wear
  - Reduces operating torque
- Standard maximum pressures:
  - Stainless steel: 6000 psig (413 bar).
  - Brass: 3000 psig (206 bar)
- Temperatures up to 450° F (232° C) with PTFE packing;
  - Other ratings are limited to:
    - 200°F (93°C) max with soft-seat stem with PCTFE stem tip.
    - 250°F (121°C) max with UHMWPE packing.
    - 450°F (232°C) max with PFA packing.
    - 500°F (260°C) max with PEEK packing
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.
- Every valve is 100% factory tested with nitrogen.

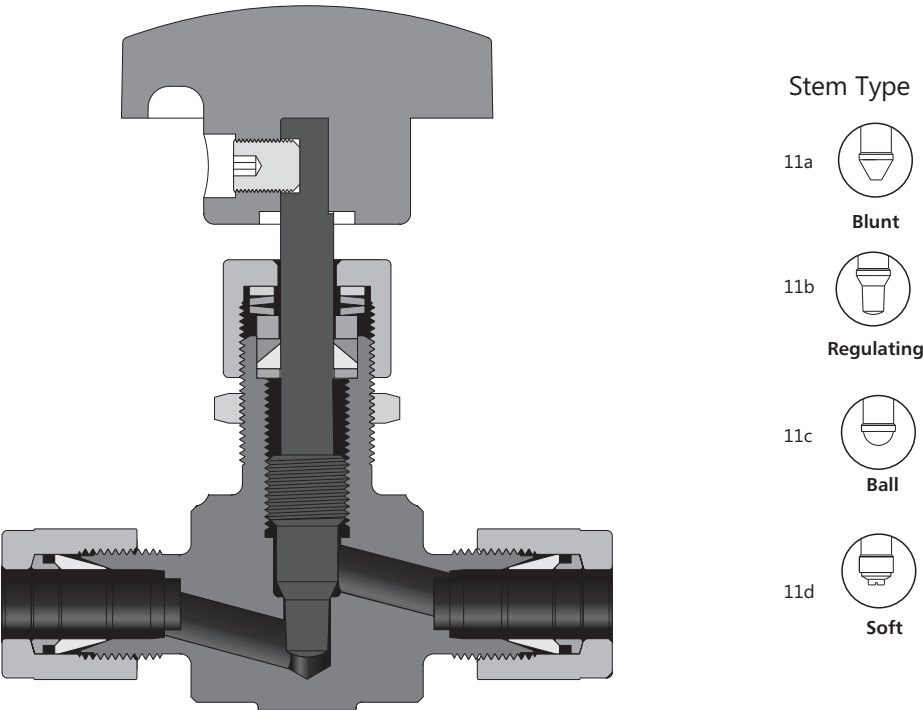
## Pressure vs. Temperature



## Regulating Stems Flow Data at 100°F (37°C)



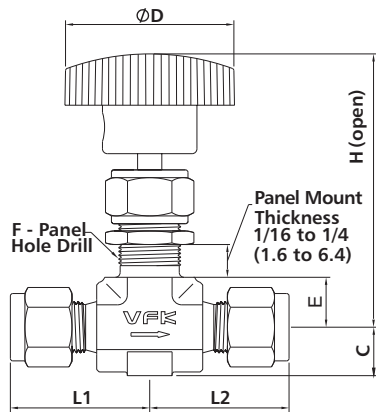
Standard Materials of Construction



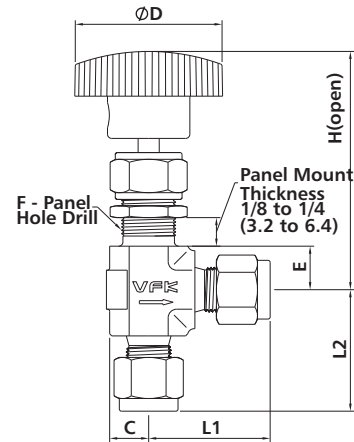
| Item                     | Component      | Valve Body Material                                |                |                             |
|--------------------------|----------------|----------------------------------------------------|----------------|-----------------------------|
|                          |                | 316 SS                                             | Brass          | Steel                       |
| 1                        | Handle         | Anodized aluminum or stainless steel or black knob |                |                             |
| 2                        | Set Screw      | Nickel cadmium-plated steel                        |                |                             |
| 3                        | Packing Nut    | 316 SS/A276                                        | Brass 360/B16  | 12L14/A108                  |
| 4                        | Gland          | 304 SS/A276                                        |                |                             |
| 5                        | Packing Spring | S17700/A693                                        |                |                             |
| 6                        | Packing Gland  | 304 SS/A276                                        |                |                             |
| 7                        | Upper Packing  | PTFE or PEEK                                       |                |                             |
| 8                        | Lower Packing  |                                                    |                |                             |
| 9                        | Lower Gland    | 316 SS/A276                                        |                |                             |
| 10                       | Panle Nut      | 316 SS/B783                                        |                |                             |
| 11a<br>11b<br>11c<br>11d | Stem           | Chrome-plated<br>316 SS/A276                       |                |                             |
| 12                       | Body           | 316 SS/A182                                        | Brass 377/B283 | Chrome-plated<br>11L17/A108 |
| Lubricants               |                | Molybdenum disulfide-based and silicone-based      |                |                             |

# Dimensions

Straight Pattern



Angle Pattern



| Basic Ordering Number | Connection Type and Size |                    | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                |                |                |                |                |                |
|-----------------------|--------------------------|--------------------|-----------------|------|--------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                       | Inlet                    | Outlet             |                 |      | L1                 | L2             | C              | D              | E              | F              | H              |
| □□33-FN2-2            | 1/8 Female NPT           | 1/8 Female NPT     | 0.08<br>(2.0)   | 0.09 | 0.81<br>(20.6)     | 0.81<br>(20.6) | 0.31<br>(7.9)  | 1.0<br>(25.4)  | 0.44<br>(11.2) | 0.47<br>(11.9) | 2.28<br>(57.9) |
| □□33-FX2-2            | 1/8" VFK                 | 1/8" VFK           |                 |      | 0.98<br>(25.0)     | 0.98<br>(25.0) |                |                |                |                |                |
| □□33-MX3-2            | 3 mm VFK                 | 3 mm VFK           |                 |      |                    |                |                |                |                |                |                |
| □□33-FN2-4            | 1/8 Female NPT           | 1/8 Female NPT     | 0.157<br>(4.0)  | 0.35 | 0.81<br>(20.6)     | 0.81<br>(20.6) | 0.39<br>(9.9)  | 1.38<br>(35.0) | 0.44<br>(11.2) | 0.53<br>(13.5) | 2.50<br>(63.5) |
| □□33-N2-4             | 1/8 Male NPT             | 1/8 Male NPT       |                 |      | 0.98<br>(25.0)     | 0.98<br>(25.0) |                |                |                |                |                |
| □□33-N4-4             | 1/4 Male NPT             | 1/4 Male NPT       |                 |      | 1.13<br>(28.7)     | 1.13<br>(28.7) |                |                |                |                |                |
| □□33-FX4-4            | 1/4" VFK                 | 1/4" VFK           |                 |      | 1.17<br>(29.7)     | 1.17<br>(29.7) |                |                |                |                |                |
| □□33-MX6-4            | 6 mm VFK                 | 6 mm VFK           |                 |      |                    |                |                |                |                |                |                |
| □□33-MX8-4            | 8 mm VFK                 | 8 mm VFK           | 0.25<br>(6.4)   | 0.70 | 1.06<br>(26.9)     | 1.06<br>(26.9) | 0.5<br>(12.7)  | 1.88<br>(47.8) | 0.5<br>(12.7)  | 0.78<br>(19.8) | 2.97<br>(75.4) |
| □□33-FN4-6            | 1/4 Female NPT           | 1/4 Female NPT     |                 |      | 1.12<br>(28.4)     | 1.12<br>(28.4) |                |                |                |                |                |
| □□33-FN6-6            | 3/8" Female NPT          | 3/8 Female NPT     |                 |      | 1.50<br>(38.1)     | 1.50<br>(38.1) |                |                |                |                |                |
| □□33-N6-6             | 3/8 Male NPT             | 3/8 Male NPT       |                 |      | 1.29<br>(32.8)     | 1.29<br>(32.8) |                |                |                |                |                |
| □□33-N8-6             | 1/2 Male NPT             | 1/2 Male NPT       |                 |      | 1.4<br>(35.6)      | 1.4<br>(35.6)  |                |                |                |                |                |
| □□33-FX6-6            | 3/8" VFK                 | 3/8" VFK           |                 |      | 1.3<br>(33.0)      | 1.3<br>(33.0)  |                |                |                |                |                |
| □□33-FX8-6            | 1/2" VFK                 | ½" VFK             |                 |      | 1.4<br>(35.6)      | 1.4<br>(35.6)  |                |                |                |                |                |
| □□33-MX10-6           | 10 mm VFK                | 10 mm VFK          |                 |      | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |                |                |                |                |
| □□33-MX12-6           | 12 mm VFK                | 12 mm VFK          |                 |      | 1.50<br>(38.1)     | 1.50<br>(38.1) |                |                |                |                |                |
| □□33-MX14-6           | 14 mm VFK                | 14 mm VFK          |                 |      |                    |                |                |                |                |                |                |
| □□33-MS20-6           | M20 x 1.5 Male ISO       | M20 x 1.5 Male ISO | 0.375<br>(9.5)  | 1.80 | 1.50<br>(38.1)     | 1.50<br>(38.1) | 0.75<br>(19.1) | 3.00<br>(76.2) | 0.75<br>(19.1) | 1.03<br>(26.2) | 3.91<br>(99.3) |
| □□33-FN8-10           | 1/2 Female NPT           | 1/2 Female NPT     |                 |      | 1.63<br>(41.3)     | 1.63<br>(41.3) |                |                |                |                |                |
| □□33-FN12-10          | 3/4 Female NPT           | 3/4 Female NPT     |                 |      | 1.90<br>(48.3)     | 1.90<br>(48.3) |                |                |                |                |                |
| □□33-N12-10           | 3/4 Male NPT             | 3/4 Male NPT       |                 |      |                    |                |                |                |                |                |                |
| □□33-FX8-10           | 1/2" VFK                 | 1/2" VFK           |                 |      |                    |                |                |                |                |                |                |
| □□33-FX12-10          | 3/4" VFK                 | 3/4" VFK           |                 |      |                    |                |                |                |                |                |                |
| □□33-MX14-10          | 14 mm VFK                | 14 mm VFK          |                 |      |                    |                |                |                |                |                |                |

## 33 Series How to Order

| A             | B            | C          | D          | E          | F          | G            |
|---------------|--------------|------------|------------|------------|------------|--------------|
| Body Material | Valve Series | Inlet Type | Inlet Size | Inlet Type | Inlet Size | Orifice Size |
| SS            | 33           | FN         | 8          | UMB        | 10         | 6            |

| H             | I                | J              | K            | L           |
|---------------|------------------|----------------|--------------|-------------|
| Seat Material | Packing Material | Panel Mounting | Flow Pattern | NACE MR0175 |
| W             | G                | Y              | A            | SG          |

| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |
| CS:  | Carbon Steel  |

| B   | Valve Series            |
|-----|-------------------------|
| 33: | 33 Series Needle Valves |

| CE  | Inlet/Outlet Type                   |
|-----|-------------------------------------|
| FN  | Female NPT                          |
| N   | Male NPT                            |
| FR  | Female BSPT                         |
| RT  | Male BSPT                           |
| FM  | Female ISO (for MRP)                |
| MS  | Male ISO (for MRG)                  |
| FP  | Female BSPP (for RP)                |
| BP  | Male BSPP (for RG)                  |
| FX  | Fractional Tube Fitting             |
| MX  | Metric Tube Fitting                 |
| UFB | Nut+Gasket+ Fractional Bulge Nipple |
| UMB | Nut+ Gasket+ Metric Bulge Nipple    |

| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
| 4  | 1/4"                         |
| 6  | 3/8" or 6 mm                 |
| 8  | 1/2" or 8 mm                 |
| 10 | 10 mm                        |
| 12 | 3/4" or 12 mm                |
| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |
| 22 | 22 mm or M22 x 1.5           |

| G   | Orifice Size    |
|-----|-----------------|
| 2:  | 0.082" (2.1 mm) |
| 4:  | 0.157" (4.0 mm) |
| 6:  | 0.236" (6.0 mm) |
| 10: | 0.374" (9.5 mm) |

| H | Seat Material         |
|---|-----------------------|
|   | Standard Same as Body |
| W | Stellite              |
| X | Customer Specified    |

| I | Packing Material      |
|---|-----------------------|
|   | Standard chevron PTFE |
| P | PEEK                  |

| J | Panel Mounting                  |
|---|---------------------------------|
|   | Standard with no Panel Mounting |
| Y | Yes                             |

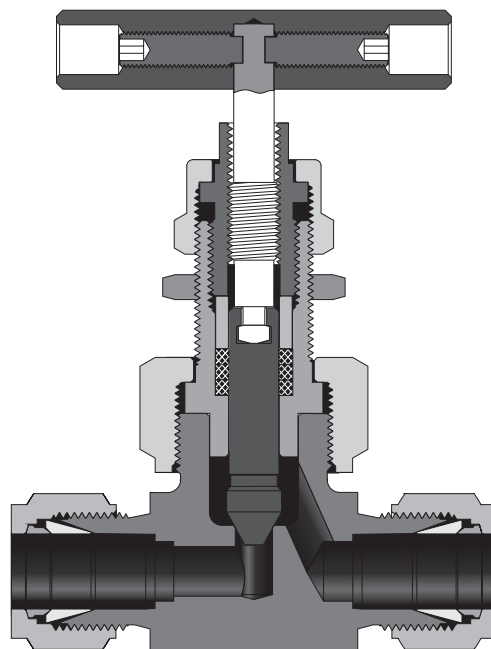
| K | Flow Pattern              |
|---|---------------------------|
|   | Standard is Straight Flow |
| A | Angle                     |

| L  | NACE MR0175                      |
|----|----------------------------------|
|    | Standard with no NACE applicable |
| SG | With NACE MR0175                 |

### Remark:

- Standard thread pitch for metric threads are as follows:  
M10 and below: 1 mm  
M12 to M24: 1.5 mm  
Standard thread pitch should be ignored in the ordering number, others should be specified.

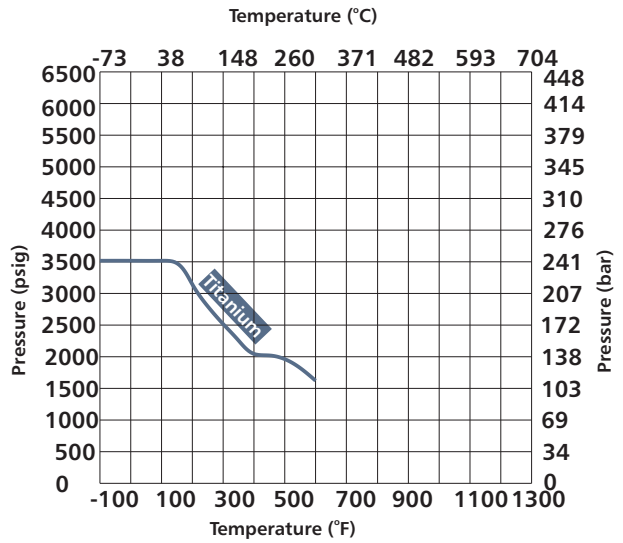
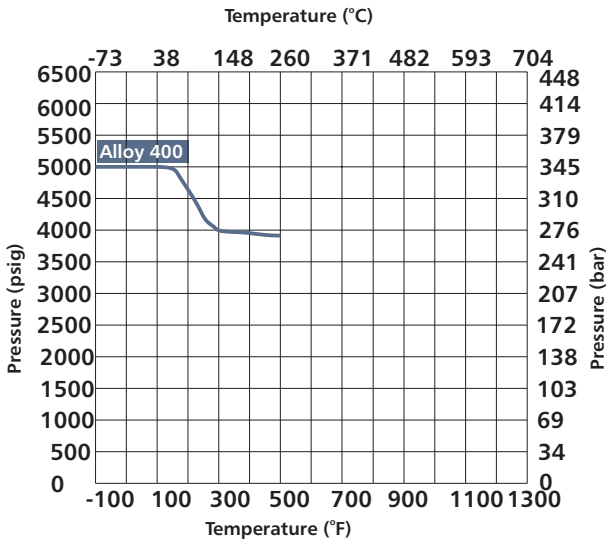
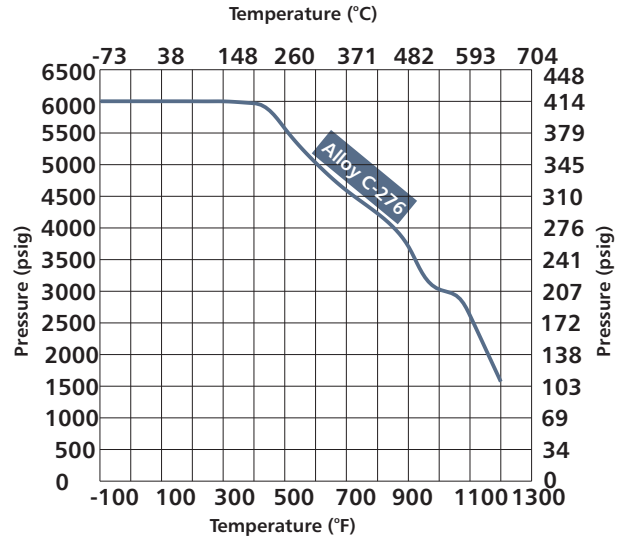
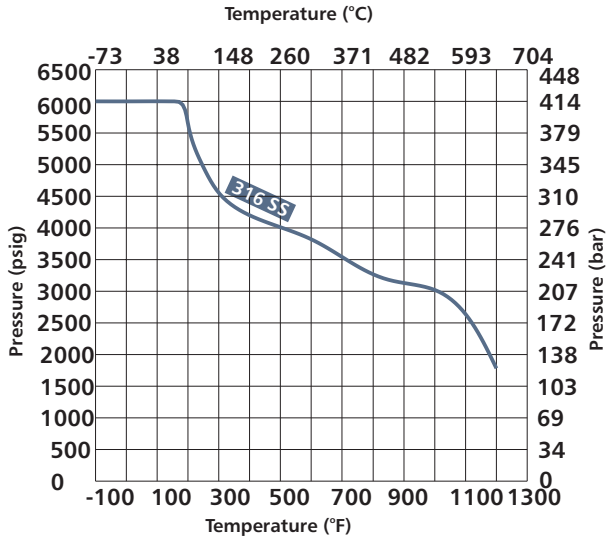
# Severe-Service Union Bonnet Needle Valves



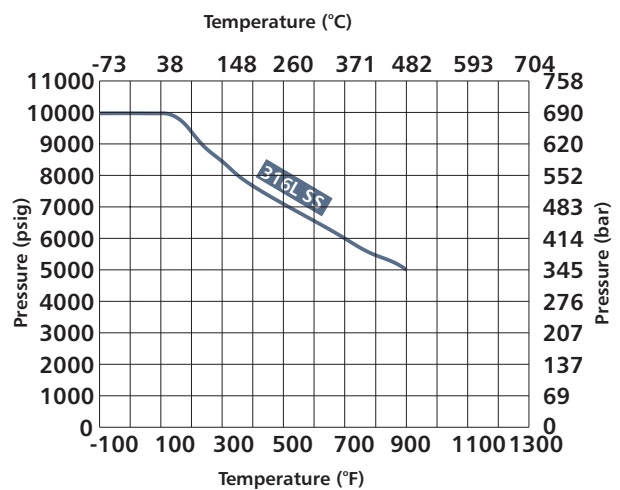
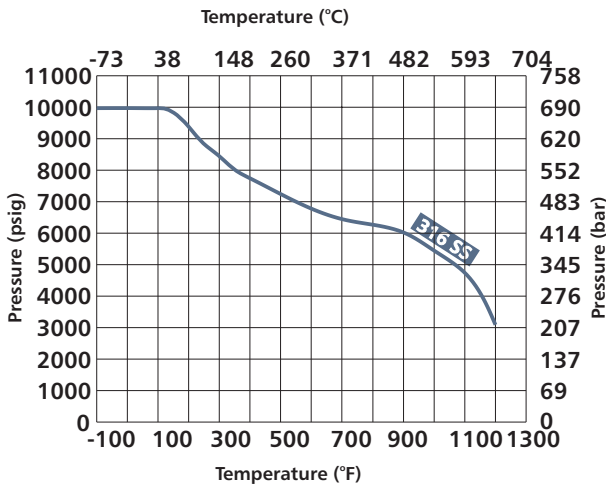
## 34 and 34H Series

- 34 and 34H series needle valves are for use in severe-service union-bonnet.
- The hardened stainless steel, nonrotating needle promotes leak-tight shutoff and long service life.
- Union-bonnet construction prevents accidental valve disassembly.
- Rolled and plated 316 SS up stem threads enhance cycle life.
- Straight and angle patterns, compact design.
- Stainless steel and other alloy steel body materials can be selected.
- Safety back-seating needle seals in fully open position.
- Two piece knuckle joint provides nonrotating needle feature. Joint is located above the packing, protected from system media.
- 34 series standard pressures up to 6000 psig (413 bar). 34H series maximum working pressure up to 10 000 psig (689 bar).
- Temperatures up to 450° F (232° C) with PTFE packing; up to 1200° F (649° C) with optional graphite packing.
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.

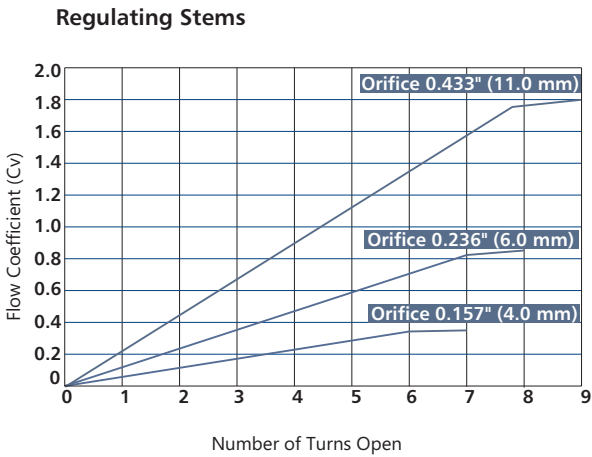
## 34 Series Pressure vs. Temperature



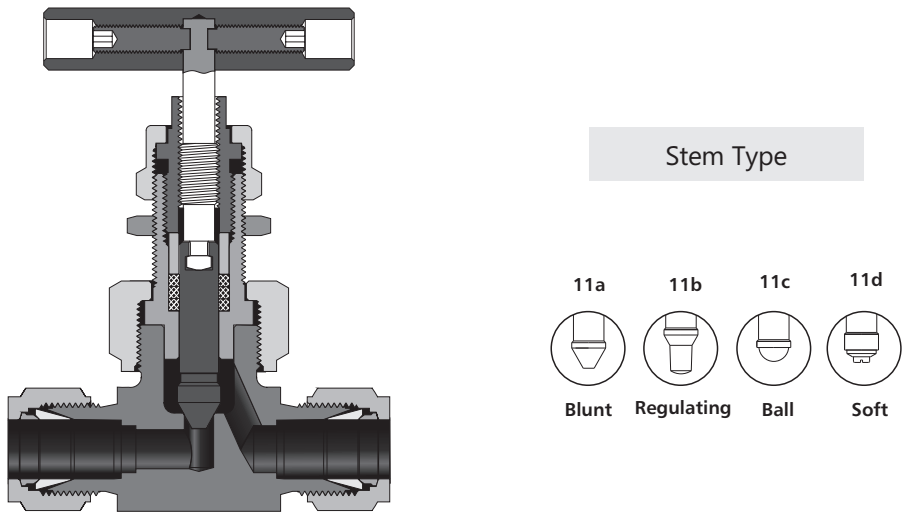
## 34H Series Pressure vs. Temperature



Regulating Stems Flow Data at 100°F (37°C)

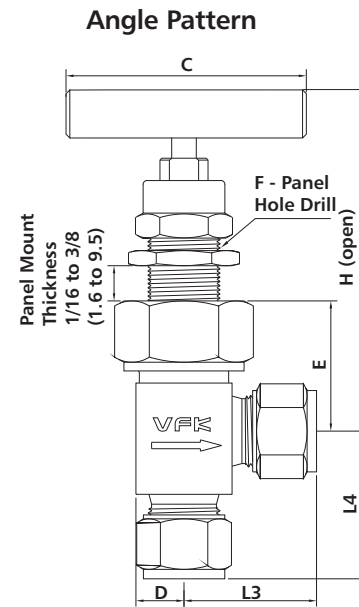
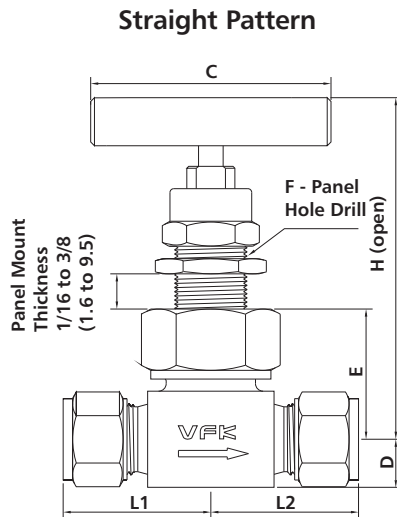


Standard Materials of Construction



| Item                     | Component    | Valve Body Material                                 |                               |                                             |                  |
|--------------------------|--------------|-----------------------------------------------------|-------------------------------|---------------------------------------------|------------------|
|                          |              | 316 SS                                              | Alloy 400                     | Titanium                                    | Alloy C-276      |
| 1                        | Handle       | Anodized aluminium or stainless steel or black knob |                               |                                             |                  |
| 2                        | Set Screw    | Nickel cadmium-plated steel                         |                               |                                             |                  |
| 3                        | Upper Stem   | 316 SS/A276                                         |                               |                                             |                  |
| 4                        | Packing Bolt | 321 SS/A276                                         |                               |                                             |                  |
| 5                        | Lock Nut     | 316 SS/A276                                         |                               |                                             |                  |
| 6                        | Panel Nut    | 316 SS/B783                                         |                               |                                             |                  |
| 7                        | Gland        | 316 SS/A276                                         | Alloy R-405/B164              | Titanium Gr 4/B348                          | Alloy C-276/B574 |
| 8                        | Packing      | PTFE or PEEK or graphite                            |                               |                                             |                  |
| 9                        | Bonnet       | 316 SS/A479                                         | Alloy R-405/B164              | Titanium Gr 4/B348                          | Alloy C-276/B574 |
| 10                       | Union Nut    | 316 SS/A276                                         |                               |                                             |                  |
| 11a<br>11b<br>11c<br>11d | Lower Stem   | Chrome-plated<br>316 SS/A276                        | Alloy R-405/B164              | Titanium Gr 4/B348                          | Alloy C-276/B574 |
|                          |              | Optional                                            |                               |                                             |                  |
| 12                       | Body         | 316 SS/A182                                         | Alloy 400/B164,<br>B127, B564 | Titanium Gr 4/B348<br>or titanium Gr 4/B381 | Alloy C-276/B564 |
|                          | Seat         | Weld stellite optional                              |                               |                                             |                  |
| Lubricant                |              | Molybdenum disulfide-based                          |                               |                                             |                  |

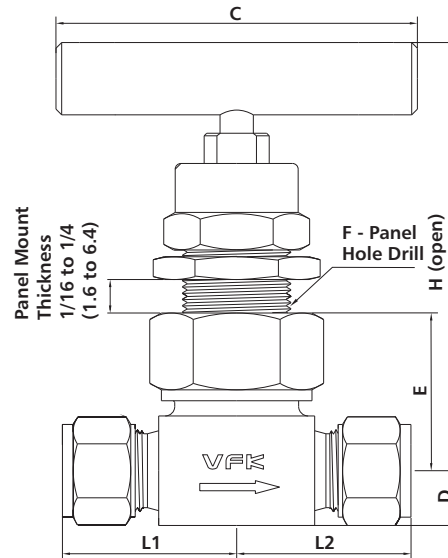
## Dimensions of NB Series



| Basic Ordering Number | Connection Type and Size |                 | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                |                |                |                |               |                |                 |                |
|-----------------------|--------------------------|-----------------|-----------------|------|--------------------|----------------|----------------|----------------|----------------|---------------|----------------|-----------------|----------------|
|                       | Inlet                    | Outlet          |                 |      | L1                 | L2             | L3             | L4             | C              | D             | E              | F               | H              |
| □□34-FN2-4            | 1/8 Female NPT           | 1/8 Female NPT  | 0.157<br>(4.0)  | 0.35 | 1.00<br>(25.4)     | 1.00<br>(25.4) | 0.89<br>(22.6) | 1.00<br>(25.4) | 1.75<br>(44.5) | 0.39<br>(9.9) | 1.09<br>(27.7) | 19/32<br>(15.1) | 3.04<br>(77.2) |
| □□34-FN4-4            | 1/4 Female NPT           | 1/4 Female NPT  |                 |      | 1.03<br>(26.2)     | 1.03<br>(26.2) |                |                |                |               |                |                 |                |
| □□34-N4FN4-4          | 1/4 Male NPT             | 1/4 Female NPT  |                 |      | 1.00<br>(25.4)     | 1.03<br>(26.2) |                |                |                |               |                |                 |                |
| □□34-N4-4             | 1/4 Male NPT             | 1/4 Male NPT    |                 |      | 1.00<br>(25.4)     | 1.00<br>(25.4) | 1.00<br>(25.4) |                |                |               |                |                 |                |
| □□34-N6-4             | 3/8 Male NPT             | 3/8 Male NPT    |                 |      | 1.03<br>(26.2)     | 1.03<br>(26.2) | 0.89<br>(22.6) |                |                |               |                |                 |                |
| □□34-FP4-4            | 1/4 Female BSPP          | 1/4 Female BSPP |                 |      | 1.00<br>(25.4)     | 1.22<br>(30.9) |                |                |                |               |                |                 |                |
| □□34-N4FX4-4          | 1/4 Male NPT             | 1/4" VFK        |                 |      | 1.03<br>(26.2)     | 1.22<br>(30.9) | 1.16<br>(29.5) |                |                |               |                |                 |                |
| □□34-FN4FX4-4         | 1/4 Female NPT           | 1/4" VFK        |                 |      | 1.22<br>(30.9)     | 1.22<br>(30.9) |                | 1.48<br>(37.6) |                |               |                |                 |                |
| □□34-FX4-4            | 1/4" VFK                 | 1/4" VFK        |                 |      | 1.22<br>(30.9)     | 1.22<br>(30.9) |                |                |                |               |                |                 |                |
| □□34-MX6-4            | 6 mm VFK                 | 6 mm VFK        |                 |      | 0.91<br>(23.1)     | 0.91<br>(23.1) | 0.88<br>(22.4) | 1.19<br>(30.2) |                |               |                |                 |                |
| □□34-MX8-4            | 8 mm VFK                 | 8 mm VFK        |                 |      |                    |                |                |                |                |               |                |                 |                |
| □□34-TS4-4            | 1/4" TS                  | 1/4" TS         |                 |      |                    |                |                |                |                |               |                |                 |                |
| □□34-FN4-6            | 1/4 Female NPT           | 1/4 Female NPT  | 0.236<br>(6.0)  | 0.8  |                    |                | 1.0<br>(25.4)  | 1.13<br>(28.6) |                |               |                |                 |                |
| □□34-FN6-6            | 3/8 Female NPT           | 3/8 Female NPT  |                 |      | 1.13<br>(28.6)     | 1.13<br>(28.6) | 1.06<br>(26.9) |                |                |               |                |                 |                |
| □□34-N6-6             | 3/8 Male NPT             | 3/8 Male NPT    |                 |      | 1.50<br>(38.1)     | 1.50<br>(38.1) | 1.25<br>(31.8) | 1.50<br>(38.1) |                |               |                |                 |                |
| □□34-N8-6             | 1/2 Male NPT             | 1/2 Male NPT    |                 |      | 1.41<br>(35.9)     | 1.41<br>(35.9) | 1.29<br>(32.8) | 1.66<br>(42.2) |                |               |                |                 |                |
| □□34-FX6-6            | 3/8" VFK                 | 3/8" VFK        |                 |      | 1.52<br>(38.6)     | 1.52<br>(38.6) | 1.40<br>(35.6) | 1.65<br>(41.9) |                |               |                |                 |                |
| □□34-FX8-6            | 1/2" VFK                 | 1/2" VFK        |                 |      | 1.42<br>(36.1)     | 1.42<br>(36.1) | 1.30<br>(33.0) | 1.55<br>(39.4) |                |               |                |                 |                |
| □□34-MX10-6           | 10 mm VFK                | 10 mm VFK       |                 |      |                    |                |                |                |                |               |                |                 |                |

| Basic Ordering Number | Connection Type and Size |                    | Orifice<br>in.(mm) | Cv  | Dimension, in.(mm) |                |                |                |                |                |                |                 |               |  |
|-----------------------|--------------------------|--------------------|--------------------|-----|--------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|---------------|--|
|                       | Inlet                    | Outlet             |                    |     | L1                 | L2             | L3             | L4             | C              | D              | E              | F               | H             |  |
| □□34-MX12-6           | 12 mm VFK                | 12 mm VFK          | 0.236<br>(6.0)     | 0.8 | 1.52<br>(38.6)     | 1.52<br>(38.6) | 1.40<br>(35.6) | 1.65<br>(41.9) | 2.50<br>(63.5) | 0.50<br>(12.7) | 1.34<br>(34.0) | 25/32<br>(19.8) | 3.70<br>(94)  |  |
| □□34-MX14-6           | 14 mm VFK                | 14 mm VFK          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-MX16-6           | 16 mm VFK                | 16 mm VFK          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-TS6-6            | 3/8" TS                  | 3/8" TS            |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-TS8-6            | 1/2" TS                  | 1/2" TS            |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-PS4-6            | 1/4 PS                   | 1/4 PS             |                    |     | 1.13<br>(28.6)     | 1.13<br>(28.6) | 1.00<br>(25.4) | 1.13<br>(28.6) |                |                |                |                 |               |  |
| □□34-MTS12-6          | 12 mm MTS                | 12 mm MTS          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-MTS14-6          | 14 mm MTS                | 14 mm MTS          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-MTS16-6          | 16 mm MTS                | 16 mm MTS          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-MTB14-6          | 14 mm MTB                | 14 mm MTB          |                    |     | 1.50<br>(38.1)     | 1.50<br>(38.1) | 1.25<br>(31.8) | 1.50<br>(38.1) |                |                |                |                 |               |  |
| □□34-MTB16-6          | 16 mm MTB                | 16 mm MTB          |                    |     | 2.92<br>(74.1)     | 2.92<br>(74.1) | 2.55<br>(64.7) | 2.92<br>(74.1) |                |                |                |                 |               |  |
| □□34-UMB14-6          | 14 mm UMB                | 14 mm UMB          |                    |     | 1.50<br>(38.1)     | 1.50<br>(38.1) | 1.13<br>(28.6) | 1.50<br>(38.1) |                |                |                |                 |               |  |
| □□34-MS20-6           | M20 x 1.5 Male ISO       | M20 x 1.5 Male ISO |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34-MS22-6           | M22 x 1.5 Male ISO       | M22 x 1.5 Male ISO |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -FN8-11          | 1/2 Female NPT           | 1/2 Female NPT     | 0.433<br>(11.0)    | 1.8 | 1.56<br>(39.6)     | 1.56<br>(39.6) | 1.31<br>(33.3) | 1.56<br>(39.6) | 3.50<br>(88.9) | 0.78<br>(19.8) | 1.91<br>(48.5) | 11/32<br>(26.2) | 4.85<br>(123) |  |
| □□34 -FN12-11         | 3/4 Female NPT           | 3/4 Female NPT     |                    |     | 1.63<br>(41.3)     | 1.63<br>(41.3) |                |                |                |                |                |                 |               |  |
| □□34 -FN16-11         | 1 Female NPT             | 1 Female NPT       |                    |     | 1.81<br>(46.0)     | 1.81<br>(46.0) | —              | —              |                |                |                |                 |               |  |
| □□34 -N12-11          | 3/4 Male NPT             | 3/4 Male NPT       |                    |     | 1.63<br>(41.3)     | 1.63<br>(41.3) |                |                |                |                |                |                 |               |  |
| □□34 -FX8-11          | 1/2" VFK                 | 1/2" VFK           |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -FX12-11         | 3/4" VFK                 | 3/4" VFK           |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MX14-11         | 14 mm VFK                | 14 mm VFK          |                    |     | 1.97<br>(50.0)     | 1.97<br>(50.0) | 1.68<br>(42.7) | 2.08<br>(52.8) |                |                |                |                 |               |  |
| □□34 -MX16-11         | 16 mm VFK                | 16 mm VFK          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MX18-11         | 18 mm VFK                | 18 mm VFK          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MX20-11         | 20 mm VFK                | 20 mm VFK          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MTS14-11        | 14 mm MTS                | 14 mm MTS          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MTS16-11        | 16 mm MTS                | 16 mm MTS          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -TS8-11          | 1/2" TS                  | 1/2" TS            |                    |     | 1.56<br>(39.7)     | 1.56<br>(39.7) | 1.31<br>(33.3) | 1.69<br>(42.9) |                |                |                |                 |               |  |
| □□34 -TS12-11         | 3/4" TS                  | 3/4" TS            |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MTB14-11        | 14 mm MTB                | 14 mm MTB          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -MTB16-11        | 16 mm MTB                | 16 mm MTB          |                    |     |                    |                |                |                |                |                |                |                 |               |  |
| □□34 -UMB14-11        | 14 mm UMB                | 14 mm UMB          |                    |     | 2.98<br>(75.7)     | 2.98<br>(75.7) | —              | —              |                |                |                |                 |               |  |
| □□34 -MS27-11         | M27 x 2 Male ISO         | M27 x 2 Male ISO   |                    |     | 1.56<br>(39.7)     | 1.56<br>(39.7) |                |                |                |                |                |                 |               |  |

## Dimensions of NHB Series



| Basic Ordering Number | Connection Type and Size |                | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                  |                |                |                |                  |                |  |  |
|-----------------------|--------------------------|----------------|-----------------|------|--------------------|------------------|----------------|----------------|----------------|------------------|----------------|--|--|
|                       | Inlet                    | Outlet         |                 |      | L1                 | L2               | C              | D              | E              | F                | H              |  |  |
| □□34H-FN2-4           | 1/8 Female NPT           | 1/8 Female NPT | 0.157<br>(4.0)  | 0.35 | 1.125<br>(28.58)   | 1.125<br>(28.58) | 2.5<br>(63.5)  | 0.5<br>(12.7)  | 1.34<br>(34.1) | 25/32<br>(19.8)  | 3.31<br>(84.1) |  |  |
| □□34H-FN4-4           | 1/4 Female NPT           | 1/4 Female NPT |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-N4FN4-4         | 1/4 Male NPT             | 1/4 Female NPT |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-N4-4            | 1/4 Male NPT             | 1/4 Male NPT   |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-N6-4            | 3/8 Male NPT             | 3/8 Male NPT   |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-N4FX4-4         | 1/4 Male NPT             | 1/4" VFK       |                 |      | 1.41<br>(35.7)     |                  |                |                |                |                  |                |  |  |
| □□34H-FN4FX4-4        | 1/4 Female NPT           | 1/4" VFK       |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-FX4-4           | 1/4" VFK                 | 1/4" VFK       |                 |      | 1.41<br>(35.7)     |                  |                |                |                |                  |                |  |  |
| □□34H-MX6-4           | 6 mm VFK                 | 6 mm VFK       |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-MX8-4           | 8 mm VFK                 | 8 mm VFK       |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-TS4-4           | 1/4" TS                  | 1/4" TS        |                 |      | 1.125<br>(28.58)   | 1.125<br>(28.58) |                |                |                |                  |                |  |  |
| □□34H-FN4-6           | 1/4 Female NPT           | 1/4 Female NPT | 0.25<br>(6.4)   | 0.86 | 1.56<br>(39.6)     | 1.56<br>(39.6)   | 3.50<br>(88.9) | 0.63<br>(16.0) | 1.81<br>(46.0) | 1 1/32<br>(26.2) | 4.13<br>(105)  |  |  |
| □□34H-N8-6            | 1/2 Male NPT             | 1/2 Male NPT   |                 |      | 1.63<br>(41.4)     | 1.63<br>(41.4)   |                | 0.78<br>(19.8) | 1.94<br>(49.3) |                  | 4.13<br>(105)  |  |  |
| □□34H-FN8-6           | 1/2 Female NPT           | 1/2 Female NPT |                 |      |                    |                  |                | 0.63<br>(16.0) | 1.81<br>(46.0) |                  | 4.25<br>(108)  |  |  |
| □□34H-N8FN8-6         | 1/2 Male NPT             | 1/2 Female NPT |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-FX8-6           | 1/2" VFK                 | 1/2" VFK       |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-MX12-6          | 12 mm VFK                | 12 mm VFK      |                 |      | 1.56<br>(39.7)     | 1.56<br>(39.7)   |                |                |                |                  |                |  |  |
| □□34H-TS8-6           | 1/2" TS                  | 1/2" TS        |                 |      |                    |                  |                |                |                |                  |                |  |  |
| □□34H-MTS12-6         | 12 mm MTS                | 12 mm MTS      |                 |      |                    |                  |                |                |                |                  |                |  |  |

## 34 and 34H Series How to Order

| A             | B            | C          | D          | E          | F          | G            |
|---------------|--------------|------------|------------|------------|------------|--------------|
| Body Material | Valve Series | Inlet Type | Inlet Size | Inlet Type | Inlet Size | Orifice Size |
| SS            | 34           | FN         | 8          | MTS        | 10         | 6            |

| H             | I                | J              | K            | L           |
|---------------|------------------|----------------|--------------|-------------|
| Seat Material | Packing Material | Panel Mounting | Flow Pattern | NACE MR0175 |
| W             | G                | Y              | A            | SG          |

| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |
| CS:  | Carbon Steel  |

| B    | Valve Series             |
|------|--------------------------|
| 34:  | 34 Series Needle Valves  |
| 34H: | 34H Series Needle Valves |

| CE  | Inlet/Outlet Type                  |
|-----|------------------------------------|
| FN  | Female NPT                         |
| N   | Male NPT                           |
| FR  | Female BSPT                        |
| RT  | Male BSPT                          |
| FM  | Female ISO (for MRP)               |
| MS  | Male ISO (for MRG)                 |
| FP  | Female BSPP (for RP)               |
| BP  | Male BSPP (for RG)                 |
| TS  | Fractional Tube Socket Weld        |
| MTS | Metric Tube Socket Weld            |
| TB  | Fractional Tube Butt Weld          |
| MTB | Metric Tube Butt Weld              |
| PS  | Pipe Socket Weld                   |
| PB  | Pipe Butt Weld                     |
| FX  | Fractional Tube Fitting            |
| MX  | Metric Tube Fitting                |
| UFB | Nut-Gasket-Fractional Bulge Nipple |
| UMB | Nut-Gasket-Metric Bulge Nipple     |

| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
| 4  | 1/4"                         |
| 6  | 3/8" or 6 mm                 |
| 8  | 1/2" or 8 mm                 |
| 10 | 10 mm                        |
| 12 | 3/4" or 12 mm                |
| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |
| 22 | 22 mm or M22 x 1.5           |
| 24 | M24 x 1.5                    |
| 25 | 25 mm                        |
| 27 | M27 x 2                      |
| 28 | 28 mm                        |

| G   | Orifice Size    |
|-----|-----------------|
| 4:  | 0.157" (4.0 mm) |
| 6:  | 0.25" (6.4 mm)  |
| 11: | 0.433" (11 mm)  |

| H | Seat Material         |
|---|-----------------------|
|   | Standard Same as Body |
| W | Stellite              |
| X | Customer Specified    |

| I | Packing Material      |
|---|-----------------------|
|   | Standard chevron PTFE |
| P | PEEK                  |
| G | Graphite              |

| J | Panel Mounting                  |
|---|---------------------------------|
|   | Standard with no Panel Mounting |
| Y | Yes                             |

| K | Flow Pattern              |
|---|---------------------------|
|   | Standard is Straight Flow |
| A | Angle                     |

| L  | NACE MR0175                      |
|----|----------------------------------|
|    | Standard with no NACE applicable |
| SG | With NACE MR0175                 |

Remark:

- Standard thread pitch for metric threads are as follows:

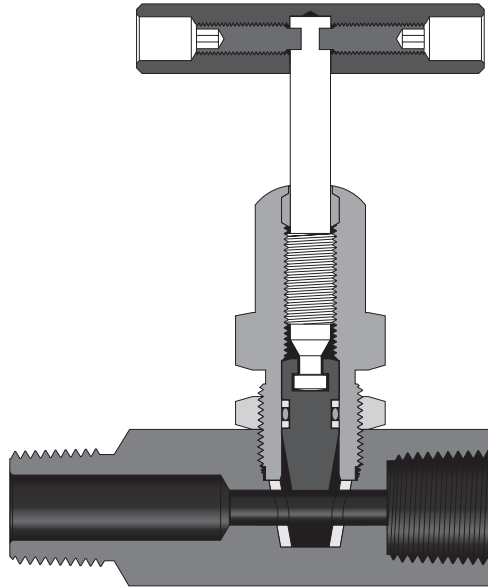
M10 and below: 1 mm

M12 to M24: 1.5 mm

M27 and above: 2 mm

Standard thread pitch should be ignored in the ordering number, others should be specified.

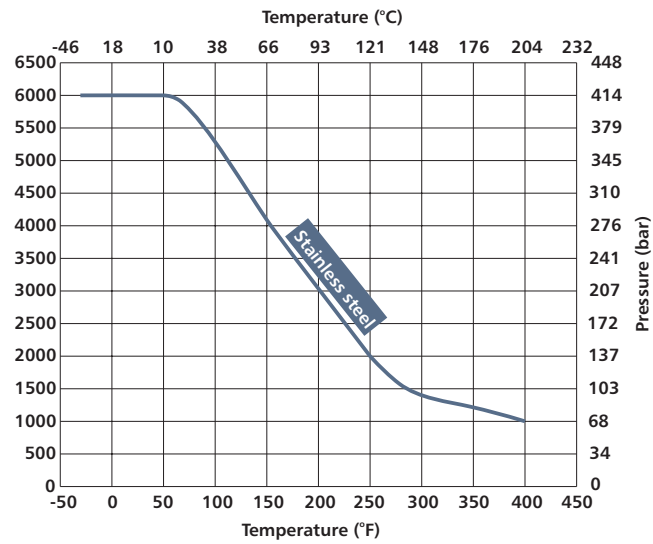
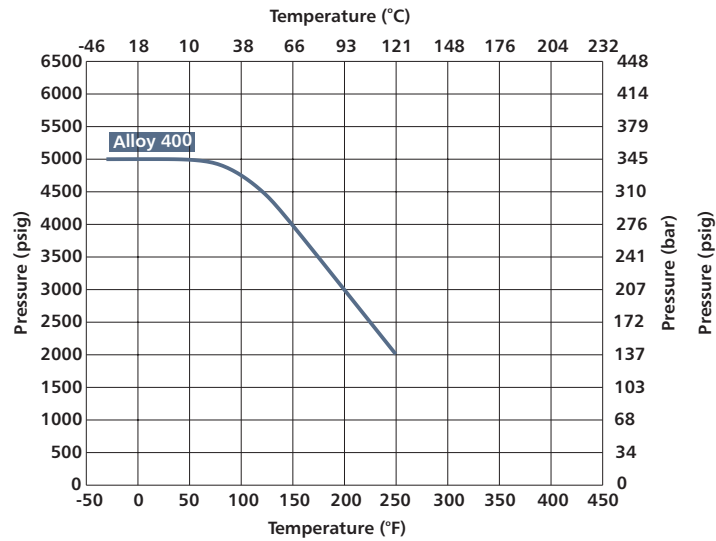
# Rising Plug Needle Valves



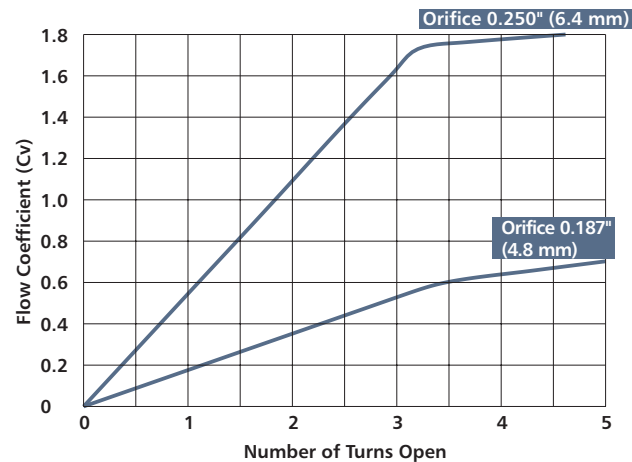
## 35 and 35G Series

- Roddable, straight-through orifice for maximum flow.
- Packing below the threads prevents lubricant washout.
- Positive stem retraction prevents sticking.
- Straight-through orifice is roddable for easy cleaning.
- Internal wiper ring protects threads from external contamination.
- Nonrotating stem tip creates positive seal.
- Replaceable seals, seat and tip design.
- Standard maximum pressures:  
Stainless steel: 6000 psig (413 bar).  
Alloy 400: 5000 psig (344 bar).
- Valves are standard with acetal seats, fluorocarbon FKM O-rings, and PTFE backup rings.  
250°F (121°C) max for fluids compatible with acetal seat material, except for water and steam, which are not recommended for temperatures greater than 200°F (93°C).  
Ratings extend to:  
-65°F (-53°C) with Buna C O-rings.  
400°F (204°C) with PEEK or PFA seat material and fluorocarbon FKM or Kalrez® O-rings.
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.
- Every valve is 100% factory tested with nitrogen.

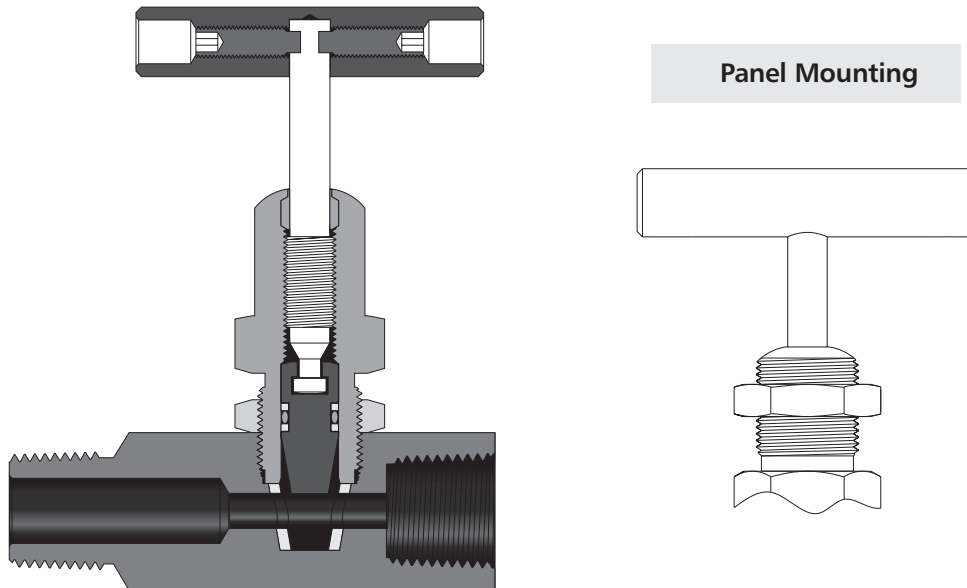
## Pressure vs. Temperature



## Flow Data at 100°F (37°C)

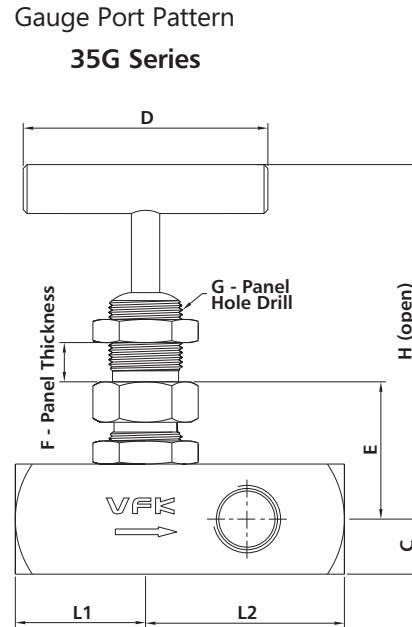
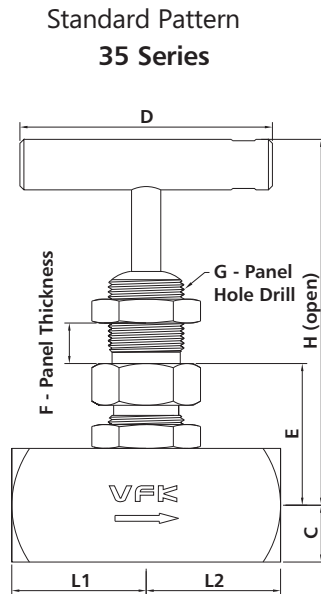


## Standard Materials of Construction



| Item       | Component   | Valve Body Material                                |             |             |                  |
|------------|-------------|----------------------------------------------------|-------------|-------------|------------------|
|            |             | 316 SS                                             | 304 SS      | 321 SS      | Alloy R-405      |
| 1          | Handle      | Anodized aluminum or stainless steel or black knob |             |             |                  |
| 2          | Set Screw   | Nickel cadmium-plated steel                        |             |             |                  |
| 3          | Wiper Ring  | PTFE/D1710                                         |             |             |                  |
| 4          | Upper Stem  | 316 SS/A276                                        | 304 SS/A276 | 321 SS/A276 | Alloy R-405/B164 |
| 5          | Panel Nut   | 316 SS/B783                                        |             |             |                  |
| 6          | Bonnet      | 316 SS/A479                                        | 304 SS/A479 | 321 SS/A479 | Alloy R-405/B164 |
| 7          | Backup Ring | PTFE/D1710                                         |             |             |                  |
| 8          | O-ring      | Fluorocarbon FKM                                   |             |             |                  |
| 9          | Lock Nut    | 316 SS/B783                                        |             |             |                  |
| 10         | Stem Tip    | 316 SS/A276                                        | 304 SS/A276 | 321 SS/A276 | Alloy R-405/B164 |
| 11         | Seat        | Acetal or PEEK or PFA                              |             |             |                  |
| 12         | Body        | 316 SS/A479                                        | 304 SS/A479 | 321 SS/A479 | Alloy R-405/B164 |
| Lubricants |             | Molybdenum disulfide-based and fluorocarbon-based  |             |             |                  |

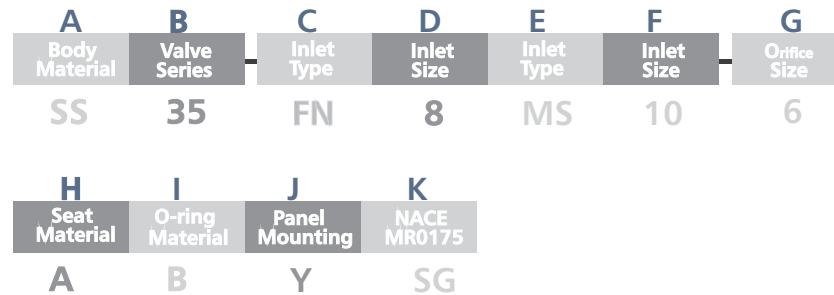
## Dimensions



| Basic Ordering Number | Connection Type and Size |                | Orifice<br>in.(mm) | Cv   | Dimension, in.(mm) |                |                |               |                |               |                |                |  |  |  |  |  |
|-----------------------|--------------------------|----------------|--------------------|------|--------------------|----------------|----------------|---------------|----------------|---------------|----------------|----------------|--|--|--|--|--|
|                       | Inlet                    | Outlet         |                    |      | L1                 | L2             | C              | D             | E              | F             | G              | H              |  |  |  |  |  |
| □□35-FN4-4            | 1/4 Female NPT           | 1/4 Female NPT | 0.187<br>(4.8)     | 0.63 | 1.12<br>(28.4)     | 1.12<br>(28.4) | 0.44<br>(11.1) | 2.17<br>(55)  | 1.08<br>(27.5) | 0.25<br>(6.4) | 0.65<br>(16.1) | 3.77<br>(95.8) |  |  |  |  |  |
| □□35-N4FN4-4          | 1/4 Male NPT             | 1/4 Female NPT |                    |      | 1.78<br>(45.2)     |                |                |               |                |               |                |                |  |  |  |  |  |
| □□35-N8FN4-4          | 1/2 Male NPT             | 1/4 Female NPT |                    |      | 1.89<br>(48.0)     |                |                |               |                |               |                |                |  |  |  |  |  |
| □□35G-FN4-4           | 1/4 Female NPT           | 1/4 Female NPT |                    |      | 1.12<br>(28.4)     | 1.75<br>(44.4) | 0.50<br>(12.7) |               |                |               |                |                |  |  |  |  |  |
| □□35G-N8FN4-4         | 1/2 Male NPT             | 1/4 Female NPT |                    |      |                    |                |                |               |                |               |                |                |  |  |  |  |  |
| □□35-FN8-6            | 1/2 Female NPT           | 1/2 Female NPT | 0.25<br>(6.4)      | 1.80 | 1.33<br>(33.8)     | 1.33<br>(33.8) | 0.56<br>(14.3) | 2.5<br>(63.5) | 1.4<br>(35.5)  | 0.38<br>(9.7) | 0.77<br>(19.6) | 3.83<br>(97.3) |  |  |  |  |  |
| □□35-N8FN8-6          | 1/2 Male NPT             | 1/2 Female NPT |                    |      | 2.16<br>(54.9)     |                |                |               |                |               |                |                |  |  |  |  |  |
| □□35-N12FN8-6         | 3/4 Male NPT             | 1/2 Female NPT |                    |      |                    |                |                |               |                |               |                |                |  |  |  |  |  |
| □□35G-FN8-6           | 1/2 Female NPT           | 1/2 Female NPT |                    |      | 3.33<br>(84.6)     | 2.25<br>(57.2) |                |               |                |               |                |                |  |  |  |  |  |
| □□35G-N12FN8-6        | 3/4 Male NPT             | 1/2 Female NPT |                    |      |                    |                |                |               |                |               |                |                |  |  |  |  |  |

1. Sizes and types listed are standard. Other sizes and types are available upon request.
2. For dimensions not shown above, please contact the authorized representative or VFK.

## 35 and 35G Series How to Order



| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |
| CS:  | Carbon Steel  |

| CE | Inlet/Outlet Type       |
|----|-------------------------|
| FN | Female NPT              |
| N  | Male NPT                |
| FR | Female BSPT             |
| RT | Male BSPT               |
| FM | Female ISO (for MRP)    |
| MS | Male ISO (for MRG)      |
| FP | Female BSPP (for RP)    |
| BP | Male BSPP (for RG)      |
| FX | Fractional Tube Fitting |
| MX | Metric Tube Fitting     |

| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
| 4  | 1/4"                         |
| 6  | 3/8" or 6 mm                 |
| 8  | 1/2" or 8 mm                 |
| 10 | 10 mm                        |
| 12 | 3/4" or 12 mm                |
| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |
| 22 | 22 mm or M22 x 1.5           |
| 24 | M24 x 1.5                    |

| H | Seat Material               |
|---|-----------------------------|
|   | Standard Material is Acetal |
| P | PEEK                        |
| A | PFA                         |

| I | O-ring Material      |
|---|----------------------|
|   | Standard chevron FKM |
| B | Buna-N               |
| E | Ethylene proylene    |

| J | Panel Mounting                  |
|---|---------------------------------|
|   | Standard with no Panel Mounting |
| Y | Yes                             |

| B    | Valve Series             |
|------|--------------------------|
| 35:  | 35 Series Needle Valves  |
| 35G: | 35G Series Needle Valves |

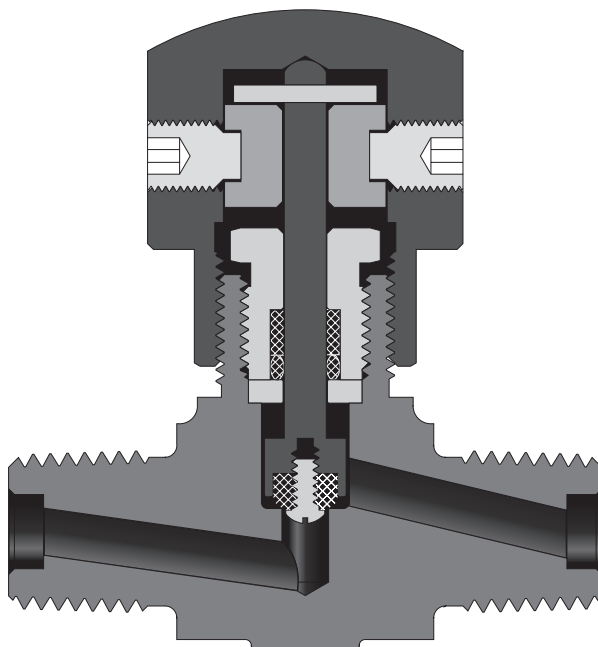
| G  | Orifice Size    |
|----|-----------------|
| 4: | 0.157" (4.0 mm) |
| 6: | 0.25" (6.4 mm)  |

| L  | NACE MR0175                      |
|----|----------------------------------|
|    | Standard with no NACE applicable |
| SG | With NACE MR0175                 |

### Remark:

- Standard thread pitch for metric threads are as follows:  
M10 and below: 1 mm  
M12 to M24: 1.5 mm  
Standard thread pitch should be ignored in the ordering NFmber, others should be specified.

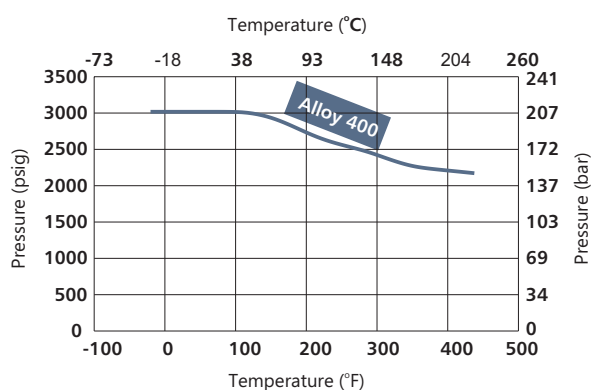
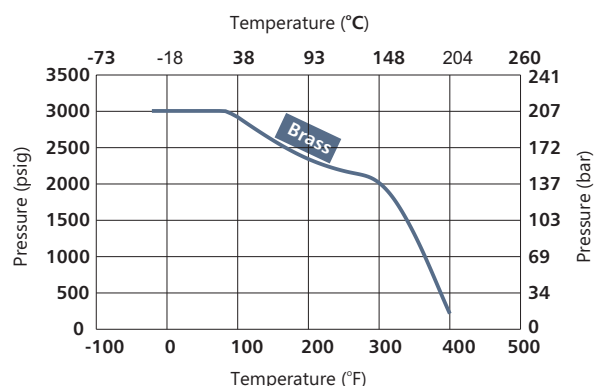
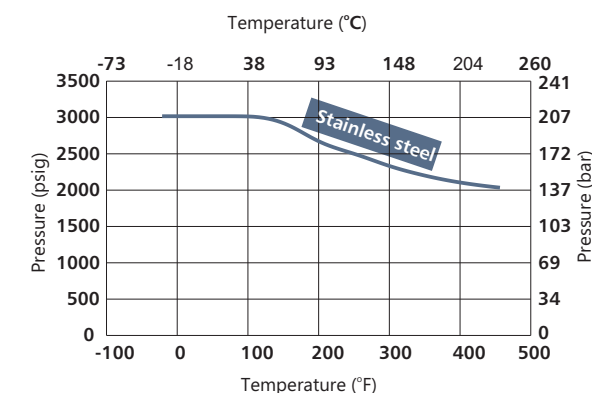
# Norotating–Stem Needle Valves



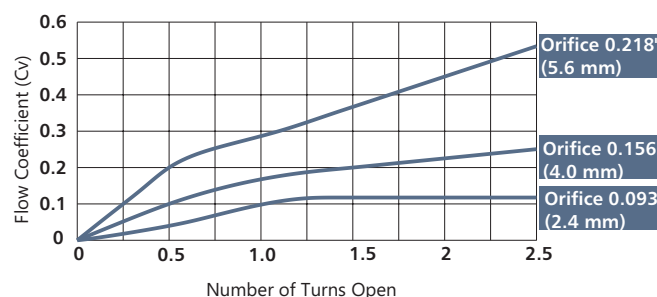
## 36 Series

- 36 series needle valves Compact, rugged design is available in straight and angle flow patterns.
- Nonrotating stem provides repetitive shutoff.
- Safety back seating seals in fully open position.
- Positive stem retraction promotes consistent flow control.
- Actuation threads isolated from system fluid enhance thread life.
- O-ring stem seal needs no adjustment.
- Replaceable stem tip facilitates maintenance.
- Straight and angle patterns, compact design.
- Stainless steel, brass and alloy 400 body materials.
- Orifice sizes from 0.093 to 0.218 in. (2.4 to 5.6 mm) are available.
- Flow coefficients (Cv) from 0.12 to 0.53 are available.
- Pressures up to 3000 psig (206 bar).
- Temperatures up to 450° F (232° C) with PEEK stem tip;
- Suitable for sour gas service; materials are selected in accordance with NACE MR0175/ISO 15156.
- Every valve is 100% factory tested with nitrogen.

## Pressure vs. Temperature



## Flow Data at 100°F (37°C)

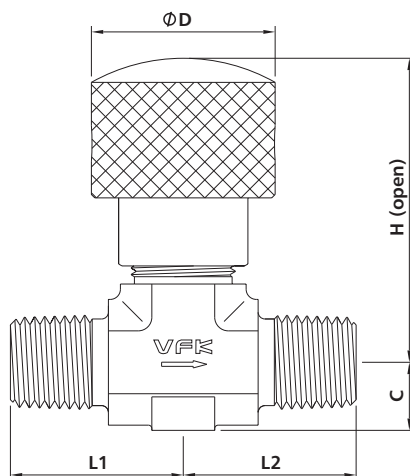


## Standard Materials of Construction

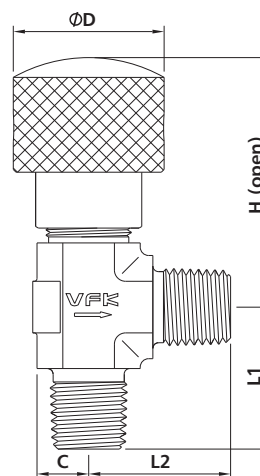
| Item      | Component     | Valve Body Material         |             |             |                |                  |
|-----------|---------------|-----------------------------|-------------|-------------|----------------|------------------|
|           |               | 316 SS                      | 304 SS      | 321 SS      | Brass          | Alloy 400        |
| 1         | Handle        | Anodized aluminum           |             |             |                |                  |
| 2         | Stop Pin      | Stainless steel             |             |             |                |                  |
| 3         | Spool         | Aluminum                    |             |             |                |                  |
| 4         | Set Screw     | Nickel cadmium-plated steel |             |             |                |                  |
| 5         | Packing Bolt  | 316 SS/A276                 | 304 SS/A276 | 321 SS/A276 | Brass 360/B16  | Alloy R-405/B164 |
| 6         | Backup Ring   | PTFE/D1710                  |             |             |                |                  |
| 7         | O-ring        | Fluorocarbon FKM            |             |             |                |                  |
| 8         | Washer        | 316 SS/A276                 |             |             |                | Alloy R-405/B164 |
| 9         | Stem          | 316 SS/A276                 |             |             |                | Alloy R-405/B164 |
| 10        | Machine Screw | 316 SS/A276                 |             |             |                | Alloy R-405/B164 |
| 11        | Stem Tip      | PCTFE or PEEK               |             |             |                |                  |
| 12        | Body          | 316 SS/A182                 | 316 SS/A182 | 316 SS/A182 | Brass 377/B283 | Alloy 400/B564   |
| Lubricant |               | Molybdenum disulfide-based  |             |             |                |                  |

# Dimensions

Straight Pattern



Angle Pattern



| Basic Ordering Number | Connection Type and Size |                    | Orifice in.(mm) | Cv   | Dimension, in.(mm) |                |               |                |                |
|-----------------------|--------------------------|--------------------|-----------------|------|--------------------|----------------|---------------|----------------|----------------|
|                       | Inlet                    | Outlet             |                 |      | L1                 | L2             | C             | D              | H              |
| □□36-N2-2             | 1/8 Male NPT             | 1/8 Male NPT       | 0.09<br>(2.4)   | 0.12 | 0.75<br>(19.0)     | 0.75<br>(19.0) | 0.31<br>(7.9) | 1.06<br>(26.9) | 1.86<br>(47.2) |
| □□36-N2FX2-2          | 1/8" Male NPT            | 1/8" VFK           |                 |      | 0.75<br>(19.0)     | 1.1<br>(27.9)  |               |                |                |
| □□36-FX2-2            | 1/8" VFK                 | 1/8" VFK           |                 |      | 1.1<br>(27.9)      | 1.1<br>(27.9)  |               |                |                |
| □□36-MX3-2            | 3 mm VFK                 | 3 mm VFK           |                 |      |                    |                |               |                |                |
| □□36-FN2-4            | 1/8 Female NPT           | 1/8 Female NPT     | 0.156<br>(4.0)  | 0.27 | 0.81<br>(20.6)     | 0.81<br>(20.6) | 0.39<br>(9.9) | 1.06<br>(26.9) | 1.86<br>(47.2) |
| □□36-N2-4             | 1/8 Male NPT             | 1/8 Male NPT       |                 |      | 0.86<br>(21.8)     | 0.86<br>(21.8) |               |                |                |
| □□36-N4-4             | 1/4 Male NPT             | 1/4 Male NPT       |                 |      | 25.0<br>(0.98)     | 25.0<br>(0.98) |               |                |                |
| □□36-N4FX4-4          | 1/4" Male NPT            | 1/4" VFK           |                 |      | 25.0<br>(0.98)     | 1.13<br>(28.7) |               |                |                |
| □□36-FX4-4            | 1/4" VFK                 | 1/4" VFK           |                 |      | 1.13<br>(28.7)     |                |               |                |                |
| □□36-MX6-4            | 6 mm VFK                 | 6 mm VFK           |                 |      |                    |                |               |                |                |
| □□36-MX8-4            | 8 mm VFK                 | 8 mm VFK           |                 |      |                    |                |               |                |                |
| □□36-FN4-6            | 1/4 Female NPT           | 1/4 Female NPT     | 0.218<br>(5.6)  | 0.53 | 1.06<br>(26.9)     | 1.06<br>(26.9) | 0.5<br>(12.7) | 1.12<br>(28.4) | 2.02<br>(51.3) |
| □□36-FN6-6            | 3/8 Female NPT           | 3/8 Female NPT     |                 |      | 1.12<br>(28.6)     | 1.12<br>(28.6) |               |                |                |
| □□36-N6-6             | 3/8 Male NPT             | 3/8 Male NPT       |                 |      | 1.29<br>(32.8)     | 1.29<br>(32.8) |               |                |                |
| □□36-FX6-6            | 3/8" VFK                 | 3/8" VFK           |                 |      | 1.4<br>(35.6)      | 1.4<br>(35.6)  |               |                |                |
| □□36-FX8-6            | 1/2" VFK                 | 1/2" VFK           |                 |      | 1.3<br>(33.0)      | 1.3<br>(33.0)  |               |                |                |
| □□36-MX10-6           | 10 mm VFK                | 10 mm VFK          |                 |      | 1.4<br>(35.6)      | 1.4<br>(35.6)  |               |                |                |
| □□36-MX12-6           | 12 mm VFK                | 12 mm VFK          |                 |      | 1.50<br>(38.1)     | 1.50<br>(38.1) |               |                |                |
| □□36-MS20-6           | M20 x 1.5 Male ISO       | M20 x 1.5 Male ISO |                 |      |                    |                |               |                |                |
| □□36-MS22-6           | M22 x 1.5 Male ISO       | M22 x 1.5 Male ISO |                 |      |                    |                |               |                |                |

## 36 Series How to Order

| A             | B            | C          | D          | E          | F          | G            |
|---------------|--------------|------------|------------|------------|------------|--------------|
| Body Material | Valve Series | Inlet Type | Inlet Size | Inlet Type | Inlet Size | Orifice Size |
| SS            | 36           | FN         | 8          | MS         | 10         | 6            |

| H               | I            | J           |
|-----------------|--------------|-------------|
| O-ring Material | Flow Pattern | NACE MR0175 |
| B               | Y            | SG          |

| A    | Body Material |
|------|---------------|
| SS:  | 316 SS        |
| 6L:  | 316L SS       |
| S4:  | 304 SS        |
| 4L:  | 304L SS       |
| S1:  | 321 SS        |
| 91:  | F91           |
| 92:  | F92           |
| D5:  | Duplex 2205   |
| D7:  | Duplex 2507   |
| TI:  | Titanium      |
| A20: | Alloy 20      |
| M:   | Alloy 400     |
| INC: | Alloy 600     |
| HC:  | Alloy C-276   |
| B:   | Brass         |

| B   | Valve Series            |
|-----|-------------------------|
| 36: | 36 Series Needle Valves |

| CE | Inlet/Outlet Type       |
|----|-------------------------|
| FN | Female NPT              |
| N  | Male NPT                |
| FR | Female BSPT             |
| RT | Male BSPT               |
| FM | Female ISO (for MRP)    |
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| FP | Female BSPP (for RP)    |
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| FX | Fractional Tube Fitting |
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| DF | Inlet/Outlet Size            |
|----|------------------------------|
| 2  | 1/8"                         |
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| 14 | 14 mm or M14 x 1.5           |
| 16 | 1" or 16 mm                  |
| 18 | 18 mm                        |
| 20 | 1 1/4" or 20 mm or M20 x 1.5 |

| G  | Orifice Size    |
|----|-----------------|
| 2: | 0.093" (2.4 mm) |
| 4: | 0.157" (4.0 mm) |
| 6: | 0.218" (5.6 mm) |

| H | O-ring Material |
|---|-----------------|
|---|-----------------|

Standard chevron FKM

|   |                   |
|---|-------------------|
| B | Buna-N            |
| E | Ethylene proylene |

| I | Flow Pattern |
|---|--------------|
|---|--------------|

Standard with Straight Flow

|   |       |
|---|-------|
| A | Angle |
|---|-------|

| J | NACE MR0175 |
|---|-------------|
|---|-------------|

Standard with no NACE applicable

|    |                  |
|----|------------------|
| SG | With NACE MR0175 |
|----|------------------|

Remark:

- Standard thread pitch for metric threads are as follows:  
M10 and below: 1 mm  
M12 to M20: 1.5 mm  
Standard thread pitch should be ignored in the ordering number, others should be specified.



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