

# Union Bonnet Needle Valves

## SUNV Series

### Features

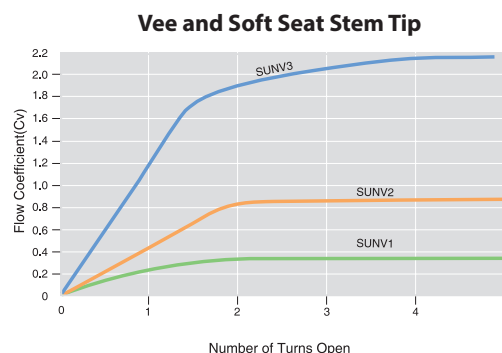
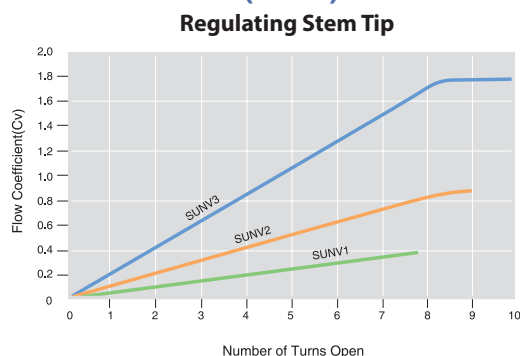
- Compact design
- Low operating torques
- Panel mountable
- Straight and angle flow patterns
- Non rotating vee stem tip
- Three stem type are available



### Specifications

| Temperature Ratings            | PCTFE Stem Tip                      | : -65°F to 200°F (-53°C to 93°C)   |            |             |             |  |
|--------------------------------|-------------------------------------|------------------------------------|------------|-------------|-------------|--|
|                                | PTFE Packing                        | : -65°F to 450°F (-53°C to 232°C)  |            |             |             |  |
|                                | PEEK Packing                        | : -65°F to 600°F (-53°C to 315°C)  |            |             |             |  |
|                                | Graphite Packing                    | : -65°F to 1200°F (-53°C to 648°C) |            |             |             |  |
| Orifice Size                   | From 0.156" to 0.437" (4mm to 11mm) |                                    |            |             |             |  |
| Flow Coefficients (Cv)         | From 0.35 to 2.2                    |                                    |            |             |             |  |
| End Connection Size            | From 1/4" to 1", 6mm to 25mm        |                                    |            |             |             |  |
| Pressure - Temperature Ratings |                                     |                                    |            |             |             |  |
| Material Group                 | 2.2                                 | 3.4                                | 3.1        | 3.5         | 3.8         |  |
| Material                       | 316 SS                              | Alloy 400                          | Alloy 20   | Alloy 600   | Alloy C-276 |  |
| Temperature, °F(°C)            | Working Pressure, psig (bar)        |                                    |            |             |             |  |
| -20 (-28) to 100 (37)          | 6000 (413)                          | 5000 (344)                         | 5000 (344) | 6000 (413)  | 6000 (413)  |  |
| 200 (93)                       | 5160 (355)                          | 4400 (303)                         | 4640 (319) | 5600 (385)  | 6000 (413)  |  |
| 250 (121)                      | 4910 (338)                          | 4260 (293)                         | 4500 (310) | 5460 (376)  | 6000 (413)  |  |
| 300 (148)                      | 4660 (321)                          | 4120 (283)                         | 4360 (300) | 5320 (366)  | 6000 (413)  |  |
| 350 (176)                      | 4470 (307)                          | 4050 (279)                         | 4185 (288) | 5220 (359)  | 5975 (411)  |  |
| 400 (204)                      | 4280 (294)                          | 3980 (274)                         | 4010 (276) | 5120 (352)  | 5880 (405)  |  |
| 450 (232)                      | 4130 (284)                          | 3970 (273)                         | 3955 (272) | 5030 (346)  | 5710 (393)  |  |
| 500 (260)                      | 3980 (274)                          | 3960 (272)                         | 3900 (268) | 4940 (340)  | 5540 (381)  |  |
| 600 (315)                      | 3760 (259)                          | -                                  | 3790 (261) | 4780 (329)  | 5040 (347)  |  |
| 650 (343)                      | 3700 (254)                          | -                                  | 3750 (258) | 4700 (323)  | 4905 (337)  |  |
| 700 (371)                      | 3600 (248)                          | -                                  | 3710 (255) | 4640 (319)  | 4730 (325)  |  |
| 750 (398)                      | 3520 (242)                          | -                                  | 3665 (252) | 4430 (305)  | 4430 (305)  |  |
| 800 (426)                      | 3460 (238)                          | -                                  | 3600 (248) | 4230 (291)  | 4230 (291)  |  |
| 850 (454)                      | 3380 (232)                          | -                                  | -          | 4060 (279)  | 4060 (279)  |  |
| 900 (482)                      | 3280 (225)                          | -                                  | -          | 3745 (258)  | 3745 (258)  |  |
| 950 (510)                      | 3220 (221)                          | -                                  | -          | 2725 (187)  | 3220 (221)  |  |
| 1000 (537)                     | 3030 (208)                          | -                                  | -          | 1800 (124)  | 3030 (208)  |  |
| 1050 (565)                     | 3000 (206)                          | -                                  | -          | 1155 (79.5) | 3000 (206)  |  |
| 1100 (593)                     | 2685 (184)                          | -                                  | -          | 770 (53.0)  | 2685 (184)  |  |
| 1150 (621)                     | 2285 (157)                          | -                                  | -          | 565 (38.9)  | 2285 (157)  |  |
| 1200 (648)                     | 1715 (118)                          | -                                  | -          | 515 (35.4)  | 1715 (118)  |  |

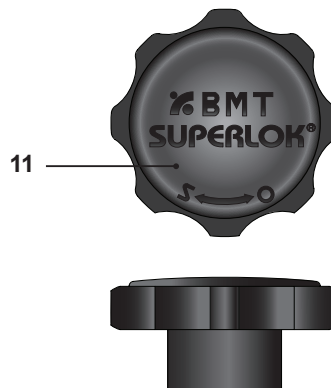
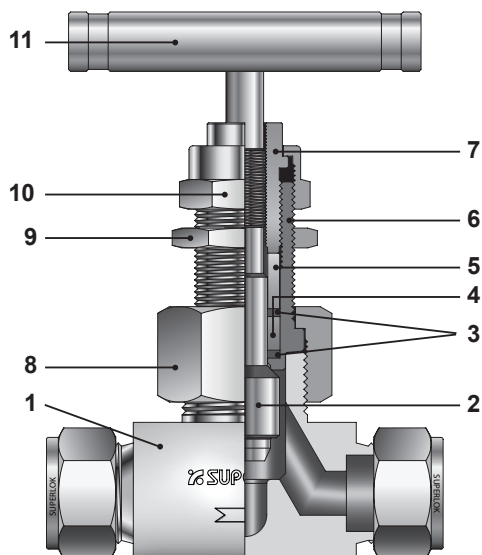
### Flow Data at 100°F (37°C)



## Testing

- Each and every Valve is tested with nitrogen at 1000psig (69bar).
- Valve have max allowable leak rate of 0.1 cm<sup>3</sup>/min.
- Shell testing is performed on demand.

## Materials of Construction






Round knob handle

| No. | Component             | Material                   |                   |                   |
|-----|-----------------------|----------------------------|-------------------|-------------------|
|     |                       | Stainless Steel            | Alloy 400         | Alloy C-276       |
| *1  | Body                  | ASTM A479 Type316          | ASTM B164         | ASTM B574         |
| *2  | Non rotating vee stem | ASTM A276 Type316          | ASTM B164         | ASTM B574         |
|     | Regulating stem       | ASTM A276 Type316          | ASTM B164         | ASTM B574         |
|     | Soft seat stem        | ASTM A276 Type316 + PCTFE  | ASTM B164 + PCTFE | ASTM B574 + PCTFE |
| *3  | Packing support       | Glass filled PTFE          | Glass filled PTFE | Glass filled PTFE |
| *4  | Packing               | PTFE                       | PTFE              | PTFE              |
| 5   | Packing gland         | ASTM A276 Type316          | ASTM B164         | ASTM B574         |
| *6  | Bonnet                | ASTM A276 Type316          | ASTM B164         | ASTM B574         |
| 7   | Packing bolt          | ASTM A276 Type316          | ASTM A276 Type316 | ASTM A276 Type316 |
| 8   | Union nut             | ASTM A276 Type316          | ASTM A276 Type316 | ASTM A276 Type316 |
| 9   | Panel nut             | ASTM A276 Type316          | ASTM A276 Type316 | ASTM A276 Type316 |
| 10  | Packing nut           | ASTM A276 Type316          | ASTM A276 Type316 | ASTM A276 Type316 |
| 11  | Bar handle            | Stainless Steel            |                   |                   |
|     | Round knob handle     | Phenolic with brass insert |                   |                   |
|     | Set screw             | Stainless Steel            |                   |                   |

Wetted components are marked " \* " .

## Stem Type

|                       |   |                 |   |                |   |
|-----------------------|---|-----------------|---|----------------|---|
| Non Rotating Vee Stem |  | Regulating Stem |  | Soft Seat Stem |  |
|-----------------------|---|-----------------|---|----------------|---|

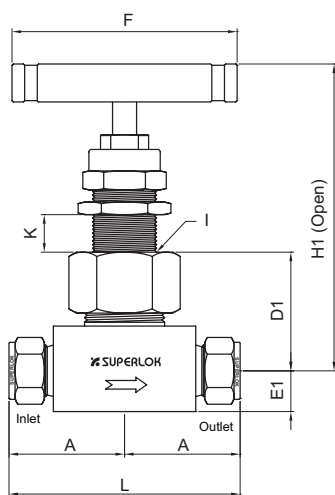
## Packing

PTFE packing is standard. PEEK and Graphite packing is optional.

## Handle

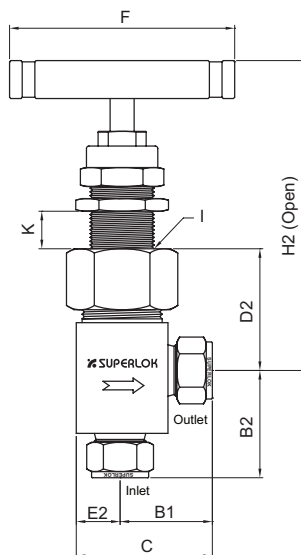
- 316 stainless steel, alloy 400 and alloy C-276 body valve - Stainless steel bar handles are standard.
- Black round knob handles are optional. (SUNV1 and SUNV2 Series)
- Anodized black aluminum bar handles are optional.

## SUNV Series



Straight Flow Pattern

## SUNV A Series



Angle Flow Pattern

- I : Panel Hole Drill
- J : Socket weld end connection depth
- K : Panel Mount Thickness  
1/16" (1.6) min, 3/8" (9.5) max

## Table of Dimensions

| Part Number | Orifice               | Cv   | End Connections |                       | Dimensions      |       |      |      |      |      |      |      |      |      |      |      |       |       |   |      |     |
|-------------|-----------------------|------|-----------------|-----------------------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|-------|-------|---|------|-----|
|             |                       |      | Inlet           | Outlet                | L               | A     | B1   | B2   | C    | D1   | D2   | E1   | E2   | F    | I    | H1   | H2    | J     |   |      |     |
| SUNV1       | S4                    | 4.0  | 0.35            | 1/4" SUPERLOK         |                 | 62.0  | 31.0 | 29.4 | 37.3 | 38.9 | 27.8 | 27.8 | 9.9  | 9.9  | 45.0 | 15.1 | 77.8  | 77.8  | - |      |     |
|             | S6M                   |      |                 | 6mm SUPERLOK          |                 | 62.0  | 31.0 | 29.4 | 37.3 | 38.9 |      | 27.8 |      |      |      |      |       |       |   |      |     |
|             | S8M                   |      |                 | 8mm SUPERLOK          |                 | 62.0  | 31.0 | 29.4 | 37.3 | 38.9 |      | 27.8 |      |      |      |      |       |       |   |      |     |
|             | M4N                   |      |                 | 1/4" Male NPT         |                 | 50.8  | 25.4 | 25.4 | 25.4 | 35.0 | 32.6 | 82.6 |      |      |      |      |       |       |   |      |     |
|             | F2N                   |      |                 | 1/8" Female NPT       |                 | 50.8  | 25.4 | 23.0 | 25.4 | 32.6 | 32.6 | 82.6 |      |      |      |      |       |       |   |      |     |
|             | F4N                   |      |                 | 1/4" Female NPT       |                 | 52.4  | 26.2 | 23.0 | 25.4 | 32.6 | 32.6 | 82.6 |      |      |      |      |       |       |   |      |     |
|             | M4N-F4N               |      |                 | 1/4" Male NPT         | 1/4" Female NPT | 52.4  | 26.2 | 23.0 | 25.4 | 32.6 | 32.6 | 82.6 |      |      |      |      |       |       |   |      |     |
|             | SW4T                  |      |                 | 1/4" Tube Socket Weld |                 | 46.0  | 23.0 | 22.3 | 30.2 | 31.8 | 27.8 | 77.8 |      |      |      |      |       |       |   | 7.2  |     |
| SUNV2       | S6                    | 6.0  | 0.86            | 3/8" SUPERLOK         |                 | 73.0  | 36.5 | 32.5 | 42.9 | 45.3 | 34.1 | 31.0 | 12.7 | 12.7 | 64.0 | 19.9 | 93.7  | 96.9  | - |      |     |
|             | S8                    |      |                 | 1/2" SUPERLOK         |                 | 77.8  | 38.9 | 34.9 | 42.1 | 47.6 |      | 34.2 |      |      |      |      |       |       |   | 93.7 |     |
|             | S10M                  |      |                 | 10mm SUPERLOK         |                 | 73.0  | 36.5 | 33.3 | 39.7 | 46.1 |      | 34.2 |      |      |      |      |       |       |   | 93.7 |     |
|             | S12M                  |      |                 | 12mm SUPERLOK         |                 | 77.8  | 38.9 | 35.7 | 42.1 | 48.4 |      | 34.2 |      |      |      |      |       |       |   | 93.7 |     |
|             | F4N                   |      |                 | 1/4" Female NPT       |                 | 57.2  | 28.6 | 25.4 | 28.6 | 38.1 |      | 37.3 |      |      |      |      |       |       |   | 96.9 |     |
|             | F6N                   |      |                 | 3/8" Female NPT       |                 | 57.2  | 28.6 | 25.4 | 25.4 | 38.1 |      | 37.3 |      |      |      |      |       |       |   | 96.9 |     |
|             | SW6T                  |      |                 | 3/8" Tube Socket Weld |                 | 57.2  | 28.6 | 25.4 | 28.6 | 38.1 |      | 37.3 |      |      |      |      |       |       |   | 93.7 | 8.0 |
|             | SW8T                  |      |                 | 1/2" Tube Socket Weld |                 | 57.2  | 28.6 | 25.4 | 25.4 | 38.1 |      | 35.7 |      |      |      |      |       |       |   | 95.3 | 9.6 |
| SW4P        | 1/4" Pipe Socket Weld |      | 57.2            | 28.6                  | 25.4            | 28.6  | 38.1 | 37.3 | 96.9 | 9.6  |      |      |      |      |      |      |       |       |   |      |     |
| SUNV3       | S8                    | 11.0 | 2.2             | 1/2" SUPERLOK         |                 | 100.0 | 50.0 | 43.7 | 53.2 | 61.1 | 46.0 | 47.6 | 15.9 | 17.5 | 89.0 | 26.2 | 121.5 | 123.1 | - |      |     |
|             | S12                   |      |                 | 3/4" SUPERLOK         |                 | 100.0 | 50.0 | 43.7 | 53.2 | 61.1 | 46.0 | 47.6 | 15.9 | 17.5 |      |      | 121.5 | 123.1 |   |      |     |
|             | S16                   |      |                 | 1" SUPERLOK           |                 | 100.0 | 50.0 | -    | -    | -    | 47.6 | -    | 17.5 | -    |      |      | 123.1 | -     |   |      |     |
|             | S12M                  |      |                 | 12mm SUPERLOK         |                 | 100.0 | 50.0 | -    | -    | -    | 46.0 | -    | 15.9 | -    |      |      | 121.5 | -     |   |      |     |
|             | F8N                   |      |                 | 1/2" Female NPT       |                 | 79.4  | 39.7 | 33.3 | 39.7 | 50.8 | 46.1 | 50.8 | 15.9 | 17.5 |      |      | 121.5 | 126.2 |   |      |     |
|             | F12N                  |      |                 | 3/4" Female NPT       |                 | 82.6  | 41.3 | -    | -    | -    | 48.4 | -    | 19.9 | -    |      |      | 123.9 | -     |   |      |     |
|             | F16N                  |      |                 | 1" Female NPT         |                 | 92.1  | 46.0 | -    | -    | -    | 54.0 | -    | 25.4 | -    |      |      | 129.4 | -     |   |      |     |
|             | M8N-F8N               |      |                 | 1/2" Male NPT         | 1/2" Female NPT | 79.4  | 39.7 | 33.3 | 39.7 | 50.8 | 46.0 | 50.8 | 15.9 | 17.5 |      |      | 121.5 | 126.2 |   |      |     |
|             | M12N-F12N             |      |                 | 3/4" Male NPT         | 3/4" Female NPT | 82.6  | 41.3 | -    | -    | -    | 48.4 | -    | 19.9 | -    |      |      | 123.9 | -     |   |      |     |
|             | M16N-F16N             |      |                 | 1" Male NPT           | 1" Female NPT   | 92.1  | 46.0 | -    | -    | -    | 54.0 | -    | 25.4 | -    |      |      | 129.4 | -     |   |      |     |
|             | SW8T                  |      |                 | 1/2" Tube Socket Weld |                 | 79.4  | 39.7 | 33.3 | 42.9 | 50.8 | 46.0 | 47.6 | 15.9 | 17.5 |      |      | 121.5 | 123.1 |   | 9.6  |     |
|             | SW12T                 |      |                 | 3/4" Tube Socket Weld |                 | 79.4  | 39.7 | -    | -    | -    | 46.0 | -    | 15.9 | -    |      |      | 121.5 | -     |   | 11.1 |     |
|             | SW8P                  |      |                 | 1/2" Pipe Socket Weld |                 | 79.4  | 39.7 | 33.3 | 39.7 | 50.8 | 47.6 | 50.8 | 17.5 | 17.5 |      |      | 123.1 | 123.1 |   | 9.6  |     |

- All dimensions in millimeters unless specified as "inch". Dimension are for reference only, subject to change.
- Dimensions based on SUPERLOK nuts finger-tight.
- ISO Tapered Threads are available upon request.

## Ordering Information

Example : **SUNV1 - M4N - S4 - RS - GR - KH - SS**

1
2 3
2 3
4
5
6
7

### 1. Valve Series

#### Straight Flow Pattern

SUNV1: Orifice 4.0mm  
 SUNV2: Orifice 6.4mm  
 SUNV3: Orifice 11.0mm

#### Angle Flow Pattern

SUNV1A: Orifice 4.0mm  
 SUNV2A: Orifice 6.4mm  
 SUNV3A: Orifice 11.0mm

### 2. End Connection Type

S : SUPERLOK Tube Fitting  
 M : Male Pipe Thread  
 F : Female Pipe Thread  
 SW : Socket Weld

### 3. End connection Size

#### Pipe Thread Designation

|              |     |     |     |     |     |     |
|--------------|-----|-----|-----|-----|-----|-----|
| Size (inch)  | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1   |
| Screwed NPT  | 2N  | 4N  | 6N  | 8N  | 12N | 16N |
| Screwed BSPT | 2R  | 4R  | 6R  | 8R  | 12R | 16R |

#### Tube O.D Designation

|                 |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|
| Tube O.D (inch) | 1/4 | 3/8 | 1/2 | 3/4 | 1   |     |     |
| Designation     | 4   | 6   | 8   | 12  | 16  |     |     |
| Tube O.D (mm)   | 6   | 8   | 10  | 12  | 16  | 20  | 25  |
| Designation     | 6M  | 8M  | 10M | 12M | 16M | 20M | 25M |

### 4. Stem

Blank : Non Rotating Vee Stem (Standard)  
 RS : Regulating Stem  
 SS : Soft Seat Stem

### 5. Packing

Blank : PTFE Packing (Standard)  
 PE : PEEK Packing  
 GR : Graphite Packing

### 6. Handle

Blank : Stainless Steel Bar Handle (Standard)  
 KH : Black Round Knob Handle  
 AH : Anodized Black Aluminum Bar Handle

### 7. Body Material

SS : 316 Stainless Steel  
 M40 : Alloy 400 (Monel)  
 276 : Alloy C-276 (Hastelloy)

## Examples

#### ex1) SUNV1 - S4 - 276

Straight flow pattern, Orifice 4.0mm/ Inlet: SUPERLOK 1/4" / Outlet: SUPERLOK 1/4" / Non rotating vee stem / PTFE Packing  
 Stainless steel bar handle / Hastelloy body

#### ex2) SUNV2A - SW8T - RS - GR - SS

Angle flow pattern, Orifice 6.4mm/ Inlet: 1/2"Socket weld / Outlet: 1/2" Socket weld / Regulating stem / Graphite Packing  
 Stainless steel bar handle / 316 Stainless steel body

#### ex3) SUNV3 - M12N - F8N - SS

- Straight flow pattern, Orifice 11.0mm/ Inlet: 3/4"NPT Male / Outlet: 1/2"NPT Female / Non rotating vee stem / PTFE Packing  
 Stainless steel bar handle / 316 Stainless steel body