

# Integral Bonnet Needle Valves

SINV Series

## Features

- Compact design
- Low operating torques
- Panel mountable
- Variety of stem tips
- Variety of End Connections
- Straight and Angle flow patterns
- Each and every valve is tested at the factory



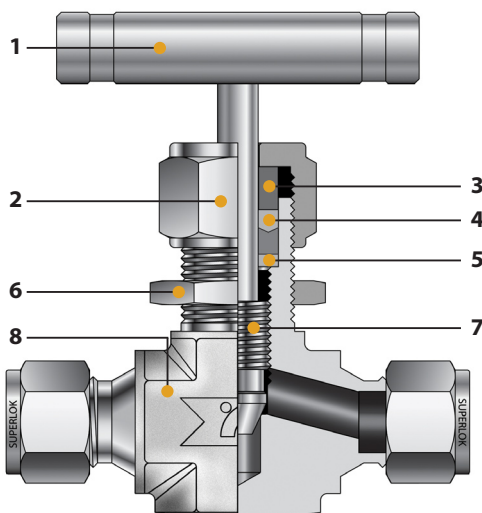
## Specifications

|                           |   |
|---------------------------|---|
| <b>Pressure rating</b>    | 5000psig (345bar) @100°F(38°C)  |
| <b>Temperature rating</b> | -65 to 450°F (-54 to 232 °C) with PTFE packing and 600°F(315°C) with PEEK packing |
| <b>Body material</b>      | 316 stainless steel, alloy400 and brass   |
| <b>Port connections</b>   | 1/8" to 3/4" and 3mm to 12mm Variety of end connection                            |
| <b>Orifice</b>            | 0.08" to 0.375" (2.0mm to 9.5mm)  |

## Testing

- Each Valve is tested with nitrogen at 1000psig(69bar) to maximum allowable leak rate of 0.1 SCCM.
- Hydrostatic shell test is performed at 1.5 times of the working pressure. (OPTION)

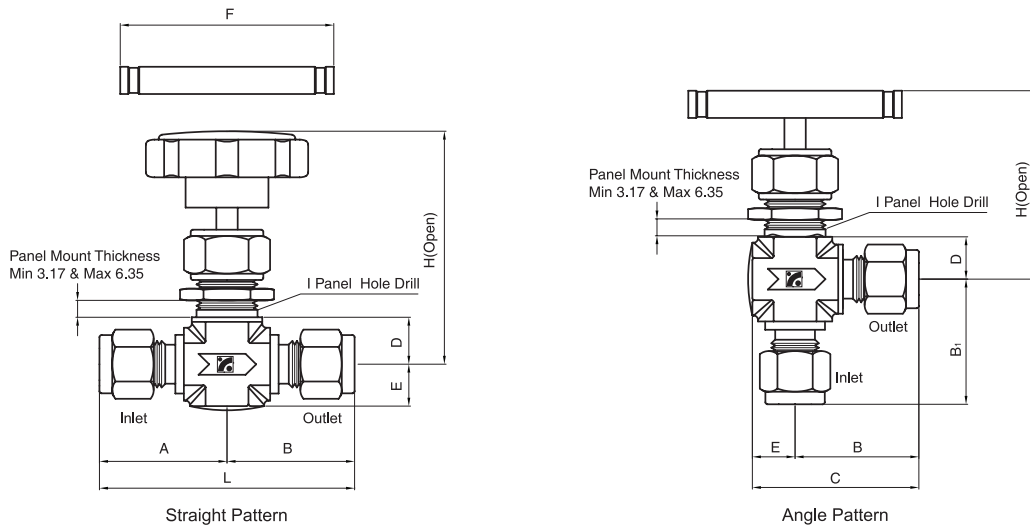
## Materials of Construction



| No. | Component                 | Material Grade / ASTM Specification |                  |                    |
|-----|---------------------------|-------------------------------------|------------------|--------------------|
|     |                           | Stainless Steel                     | Brass            | Alloy 400          |
| 1   | Bar Handle                | Stainless Steel                     |                  |                    |
|     | Knob Handle               | Phenolic with brass insert          |                  |                    |
|     | Set Screw                 | Stainless Steel                     |                  |                    |
| 2   | Packing Nut               | SS316 / A276                        | BRASS 360 / B16  | Alloy R-405 / B164 |
| 3   | Packing Gland             | SS316 / A276                        | BRASS 360 / B16  | Alloy R-405 / B164 |
| *4  | Packing                   | PTFE (Standard) , PEEK (Optional)   |                  |                    |
| 5   | Packing Support           | SS316 / A276                        | BRASS 360 / B16  | Alloy R-405 / B164 |
| 6   | Panel Nut                 | SS316 / A276                        | BRASS 360 / B16  | Alloy R-405 / B164 |
| *7  | Vee Stem                  | Chrome-plated<br>SS316 / A276       | SS316 / A276     | Alloy R-405 / B164 |
|     | Regulating Stem           |                                     |                  |                    |
|     | Soft Seat Stem with PCTFE |                                     |                  |                    |
| *8  | Body                      | SS 316 / A182                       | BRASS 377 / B283 | Alloy R-400 / B564 |

•Wetted components are marked "\*"

# SINV Series



## Table of Dimensions

| Order Number |          | Orifice (mm) | Cv  | End Connections |                 | Dimensions (mm) |      |      |      |      |      |      |      |      |      |      |
|--------------|----------|--------------|-----|-----------------|-----------------|-----------------|------|------|------|------|------|------|------|------|------|------|
| Series       | Part No. |              |     | Inlet           | Outlet          | L               | A    | B    | B1   | C    | D    | E    | F    | I    | H    |      |
| SINV1        | F        | 2N           | 2.0 | 0.09            | 1/8" Female NPT |                 | 47.8 | 23.9 | 23.9 | 23.9 | 31.8 | 11.2 | 7.9  | 32.0 | 11.9 | 55.0 |
|              | M        | 2N           |     |                 | 1/8" Male NPT   |                 | 38.1 | 19.1 | 19.1 | 19.1 | 27.0 |      |      |      |      |      |
|              | MS       | 2N-2         |     |                 | 1/8" Male NPT   | 1/8" SUPERLOK   | 43.8 |      | 24.7 | 24.7 | 32.6 |      |      |      |      |      |
|              | S        | 2            |     |                 | 1/8" SUPERLOK   |                 | 49.4 |      |      |      |      |      |      |      |      |      |
|              | S        | 3M           |     |                 | 3mm SUPERLOK    |                 |      |      |      |      |      |      |      |      |      |      |
| SINV2        | F        | 2N           | 4.4 | 0.37            | 1/8" Female NPT |                 | 41.2 | 20.6 | 20.6 | 20.6 | 30.3 | 11.2 | 9.7  | 45.0 | 13.5 | 51.5 |
|              | M        | 2N           |     |                 | 1/8" Male NPT   |                 | 49.8 | 24.9 | 24.9 | 24.9 | 34.6 |      |      |      |      |      |
|              | M        | 4N           |     |                 | 1/4" Male NPT   |                 | 53.6 |      |      |      |      |      |      |      |      |      |
|              | MS       | 4N-4         |     |                 | 1/4" Male NPT   | 1/4" SUPERLOK   | 57.4 | 28.7 | 28.7 | 38.4 |      |      |      |      |      |      |
|              | S        | 6M           |     |                 | 6mm SUPERLOK    |                 | 59.4 |      |      |      |      |      |      |      |      |      |
|              | S        | 4            |     |                 | 1/4" SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
|              | S        | 8M           |     |                 | 8mm SUPERLOK    |                 |      |      |      |      |      |      |      |      |      |      |
| SINV3        | F        | 4N           | 6.3 | 0.73            | 1/4" Female NPT |                 | 53.8 | 26.9 | 26.9 | 26.9 | 39.6 | 12.7 | 12.7 | 64.0 | 20.0 | 63.5 |
|              | F        | 4R           |     |                 | 1/4" ISO Female |                 | 61.5 | 32.8 | 28.7 | 28.7 | 45.5 |      |      |      |      |      |
|              | MF       | 4N           |     |                 | 1/4" Male NPT   | 1/4" Female NPT | 57.4 |      |      |      |      |      |      |      |      |      |
|              | MS       | 4N-6         |     |                 | 1/4" Male NPT   | 3/8" SUPERLOK   | 61.5 |      |      |      |      |      |      |      |      |      |
|              | M        | 6N           |     |                 | 3/8" Male NPT   |                 | 64.3 | 35.6 | 48.3 | 14.2 |      |      |      |      |      |      |
|              | MS       | 6N-6         |     |                 | 3/8" Male NPT   | 3/8" SUPERLOK   | 65.6 |      |      |      |      |      |      |      |      |      |
|              | MS       | 6N-8         |     |                 | 3/8" Male NPT   | 1/2" SUPERLOK   | 71.2 |      |      |      |      |      |      |      |      |      |
|              | S        | 10M          |     |                 | 10mm SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
|              | S        | 6            |     |                 | 3/8" SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
|              | S        | 12M          |     |                 | 12mm SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
|              | S        | 8            |     |                 | 1/2" SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
| SINV4        | F        | 6N           | 9.5 | 1.80            | 3/8" Female NPT |                 | 76.2 | 38.1 | 38.1 | 38.1 | 57.2 | 19.1 | 19.1 | 76.0 | 26.2 | 99.5 |
|              | F        | 6R           |     |                 | 3/8" ISO Female |                 |      |      |      |      |      |      |      |      |      |      |
|              | F        | 8N           |     |                 | 1/2" Female NPT |                 |      |      |      |      |      |      |      |      |      |      |
|              | F        | 8R           |     |                 | 1/2" ISO Female |                 |      |      |      |      |      |      |      |      |      |      |
|              | M        | 8N           |     |                 | 1/2" Male NPT   |                 |      |      |      |      |      |      |      |      |      |      |
|              | MF       | 8N           |     |                 | 1/2" Male NPT   | 1/2" Female NPT |      |      |      |      |      |      |      |      |      |      |
|              | S        | 8            |     |                 | 1/2" SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |
|              | S        | 12           |     |                 | 3/4" SUPERLOK   |                 |      |      |      |      |      |      |      |      |      |      |

\* Dimensions shown with SUPERLOK nuts measure in the finger - tight, where applicable.  
All dimensions are for reference only, subject to change.

# Technical Data

## Temperature and Pressure Rating

| Body Material     | Stem             | Pressure Rating                 | Pressure Rating @<br>-65°F ~ 100°F (-54°C ~ 38°C) |
|-------------------|------------------|---------------------------------|---|
| SS316             | Vee & Regulating | -65°F ~ 450°F (-54 °C ~ 232 °C) | 5000 psig (345 bar)                               |
|                   | Soft Seat        | -65°F ~ 200°F (-54 °C ~ 93 °C)  |   |
| Brass             | Vee & Regulating | -65°F ~ 400°F (-54 °C ~ 204 °C) | 3000 psig (207 bar)                               |
|                   | Soft Seat        | -65°F ~ 200°F (-54 °C ~ 93 °C)  |   |
| Alloy 400 (Monel) | Vee & Regulating | -65°F ~ 450°F (-54 °C ~ 232 °C) | 3000 psig (207 bar)                               |
|                   | Soft Seat        | -65°F ~ 200°F (-54 °C ~ 93 °C)  |   |

\* The above ratings are for a standard valve with PTFE packing. \* Extreme temperature fluctuations may require packing adjustment.

## Temperature vs Working Pressure

| Temperature Rating |                | Pressure psig(bar) @ Temperature Rating |                   |                   |
|--------------------|----------------|---|-------------------|-------------------|
|                    |                | SS316                                   | Brass             | Alloy 400 (Monel) |
| -65°F (-54 °C) to  | 100°F (38 °C)  | 5000psig (345bar)                       | 3000psig (207bar) | 3000psig (207bar) |
|                    | 200°F (93 °C)  | 4290psig (296bar)                       | 2600psig (179bar) | 2640psig (182bar) |
|                    | 300°F (148 °C) | 3870psig (267bar)                       | 2210psig (152bar) | 2470psig (170bar) |
|                    | 350°F (176 °C) | 3710psig (256bar)                       | 1470psig (101bar) | 2430psig (167bar) |
|                    | 400°F (204 °C) | 3560psig (245bar)                       | 740psig (51bar)   | 2390psig (165bar) |
|                    | 450°F (232 °C) | 3430psig (236bar)                       | -                 | 2380psig (163bar) |

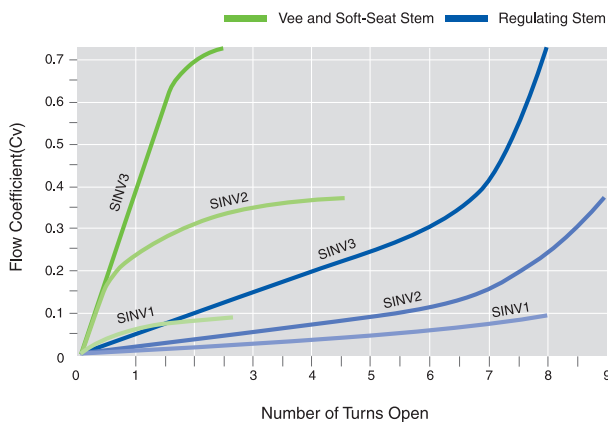
## Packing and Body materials vs Temperature and Pressure Rating

| Packing Material | Body Material | Temperature Rating              | Pressure Rating @ Max. Temperature |
|------------------|---------------|---------------------------------|------------------------------------|
| PTFE (Standard)  | SS316         | -65°F ~ 450°F (-54 °C ~ 232 °C) | 3430 psig (236 bar)                |
| PEEK (Optional)  | SS316         | -65°F ~ 600°F (-54 °C ~ 315 °C) | 3130 psig (216 bar)                |
|                  | Alloy 400     | -65°F ~ 500°F (-54 °C ~ 260 °C) | 2370 psig (163 bar)                |

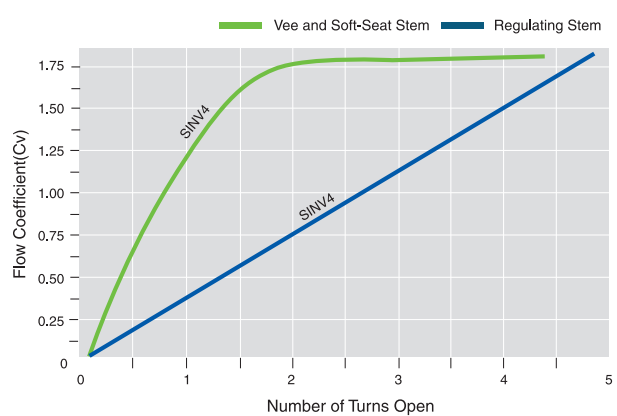
\* PEEK is not recommended for service with aromatic heat transfer or concentrated sulfuric and nitric acids. Other limitations may apply.

## Flow Data at 100°F(37°C)

### Flow Coefficient at Turns Open



[SINV1,SINV2, SINV3 Series]

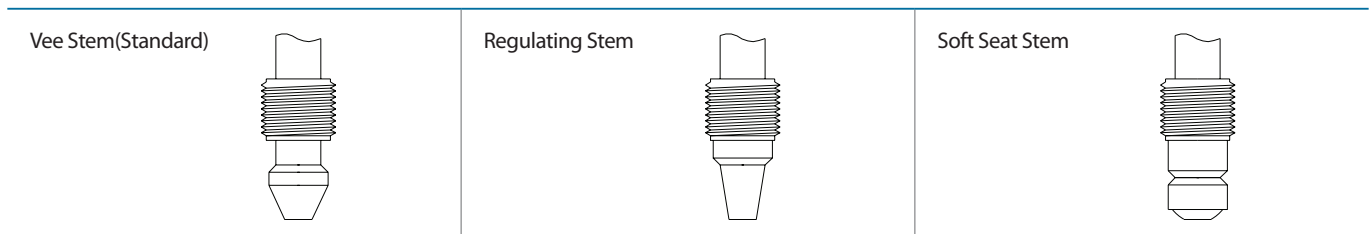


[SINV4 Series]

## Handle

- Stainless steel bar is standard on all SS316 and alloy 400 body valves.
- Phenolic knob is standard for brass body and soft seat stem valves.

## Available Stem Type



## Ordering Information

SINV3 - 
 MS - 
 6N - 
 8 - 
 KH - 
 A - 
 PERT - 
 SS

1  
 2  
 3  
 4  
 5  
 6  
 7  
 8

### 1. Valve Series

- SINV1 : 2.0mm Orifice
- SINV2 : 4.4mm Orifice
- SINV3 : 6.3mm Orifice
- SINV4 : 9.5mm Orifice

### 2. Port Type

- S : SUPERLOK Tube Fitting
- M : Male Pipe Thread
- F : Female Pipe Thread
- MS : Male Pipe Thread x SUPERLOK Tube Fitting
- MF : Male Pipe Thread x Female Pipe Thread

### 3. Port Size

#### ■ Pipe Thread Designation

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

#### ■ Tube O.D Designation

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

### 4. Handle

- Nil : Stainless Steel Bar Handle (Standard)
- KH : Phenolic Knob Handle

### 5. Flow Pattern

- Nil : Straight Pattern (Standard)
- A : Angle Pattern

### 6. Packing Material

- Nil : PTFE (Standard)
- PE : PEEK

### 7. Stem Type

- Nil : Vee Stem (Standard)
- RT : Regulating Stem
- ST : Soft Seat Stem

### 8. Body Material

- SS : 316 Stainless Steel
- B : Brass
- M : Alloy 400 (Monel)

#### ■ Examples

- ex1) SINV1 - S - 2 - SS  
 - SINV1 Series / [Inlet]SUPERLOK x [Outlet]SUPERLOK / Port Size: 1/8" x 1/8" / Stainless Steel Bar Handle  
 / Straight Pattern / PTFE packing / Vee Stem / 316 Stainless Steel Body
- ex2) SINV2 - MS - 4N - 4 - KH - A - RT - SS  
 - SINV2 Series / [Inlet]Male Pipe Thread x [Outlet]SUPERLOK / Port Size: 1/4"NPT x 1/4" / Phenolic Knob Handle  
 / Angle Pattern / PTFE packing / Regulating Stem / 316 Stainless Steel Body
- ex3) SINV4 - MF - 8N - KH - B  
 - SINV4 Series / [Inlet]Male Pipe Thread x [Outlet]Female Pipe Thread / Port Size: 1/2"NPT / Phenolic Knob Handle  
 / Straight Pattern / PTFE packing / Vee Stem / Brass Body