

# Игольчатые вентили серии VND

## Техническое описание.

**По вопросам продаж и поддержки обращайтесь:**

Архангельск (8182)63-90-72  
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Белгород (4722)40-23-64  
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Эл. почта: [awf@nt-rt.ru](mailto:awf@nt-rt.ru)

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# INTEGRAL BONNET NEEDLE VALVES. VND SERIES

## I. FEATURES

- Pressure rating up to 410 bar (6000 psig) @ 38°C (100°F)
- Temperature rating from -54°C to 232°C (-65°F to 450°F) with standard PTFE packing and up to 648°C (1200°F) with optional Grafoil packing
- Body materials available in 316 stainless steel, carbon steel, and alloy 400
- 100% factory tested.

### Handle

- is available in black aluminum bar, stainless steel bar, and black phenolic knob.

### Stem Threads

- are rolled and hard chrome-plated for maximum service life.

### Panel Mounting Nut

- allows easy mounting, (standard).

### Rugged Body

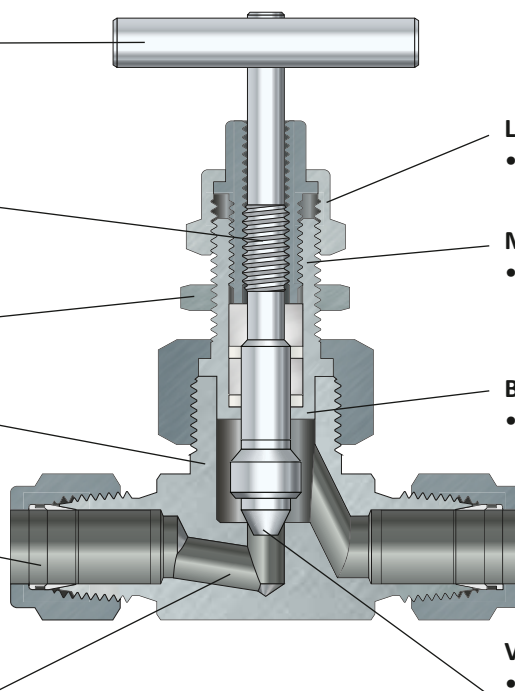
- Is available with straight and angle pattern.

### Variety of End Connections

- include A-Flok tube fittings, male/female NPT threads, male/female ISO threads, and socket weld Ends.

### Variety of Orifice Sizes

- Include 4.0mm (VND1 series), 6.4mm (VND2 series), 11.0mm (VND3 series).



### Locking Nut

- prevents packing bolt from loosening.

### Metal Seal Bonnet-to-Body Construction

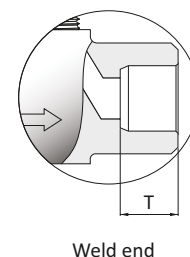
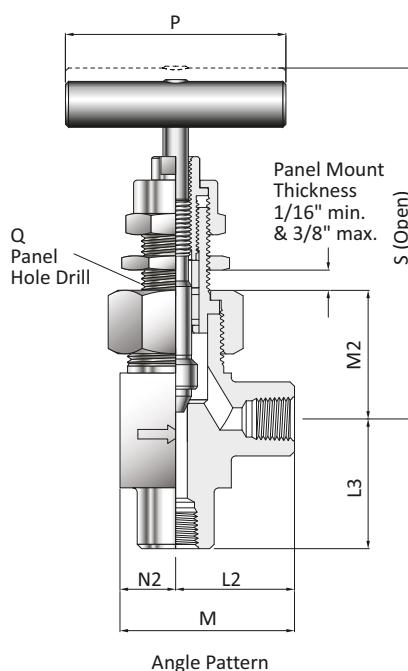
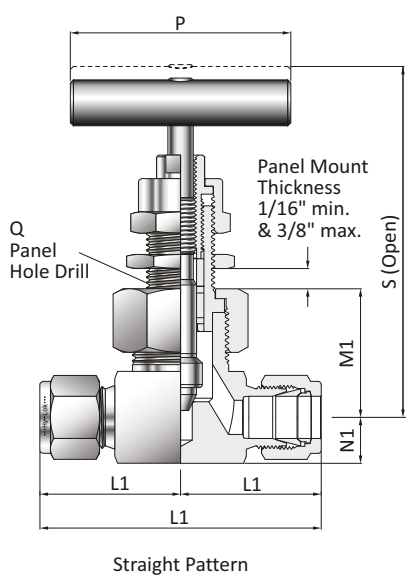
- ensures safety.

### Back Seating

- provides anti - blow out of stem.

### Variety of Stem Tips

- include non-rotating Vee (standard) non-rotating ball, soft seat, regulating soft seat and non-rotating regulating tip. (optional)



II. TABLE OF DIMENSIONS

| Basic Part No. |    |     | Orifice | Cv   | End Connections                  | Dimensions |      |      |      |      |      |      |      |      |    |      |            |         |   |
|----------------|----|-----|---------|------|----------------------------------|------------|------|------|------|------|------|------|------|------|----|------|------------|---------|---|
|                |    |     |         |      | Inlet / Outlet                   | L          | L1   | L2   | L3   | M    | M1   | M2   | N1   | N2   | P  | Q    | S Straight | S Angle | T |
| VND1           | F  | 2N  | 4.0     | 0.35 | 1/8" Female NPT                  | 50.8       | 25.4 | 23.0 | 25.4 | 32.6 | 27.8 | 32.6 | 9.6  | 9.6  | 45 | 15.1 | 77.8       | 82.6    | - |
|                | F  | 4N  |         |      | 1/4" Female NPT                  | 52.4       | 26.2 |      |      |      |      |      |      |      |    |      |            |         |   |
|                | M  | 4N  |         |      | 1/4" Male NPT                    | 50.8       | 25.4 | 25.4 | 32.6 |      |      |      |      |      |    |      |            |         |   |
|                | MF | 4N  |         |      | 1/4" Male NPT<br>1/4" Female NPT | 52.4       | 26.2 | 23.0 |      | 32.6 |      |      |      |      |    |      |            |         |   |
|                | A  | 6M  |         |      | 6mm A-Flok                       | 61.9       | 31.0 | 29.4 | 37.3 |      |      | 38.9 |      |      |    |      |            |         |   |
|                | A  | 4T  |         |      | 1/4" A-Flok                      | 46.0       | 23.0 | 22.3 | 30.2 | 31.8 |      |      |      |      |    |      |            |         |   |
|                | SW | 4T  |         |      | 1/4" Tube Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | A  | 8M  |         |      | 8mm A-Flok                       | 61.9       | 31.0 | 29.4 | 37.3 | 38.9 |      |      |      |      |    |      |            |         |   |
| VND2           | F  | 4N  | 6.4     | 0.86 | 1/4" Female NPT                  | 57.2       | 28.6 | 25.4 | 28.6 | 38.1 | 34.1 | 37.3 | 12.7 | 12.7 | 64 | 19.9 | 93.7       | 96.9    | - |
|                | F  | 6N  |         |      | 3/8" Female NPT                  |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | A  | 10M |         |      | 10 mm A-Flok                     | 73.0       | 36.5 | 33.3 | 39.7 | 46.1 |      |      |      |      |    |      |            |         |   |
|                | A  | 6T  |         |      | 3/8" A-Flok                      | 77.8       | 38.9 | 35.7 | 42.1 | 48.4 |      | 47.6 |      |      |    |      |            |         |   |
|                | A  | 12M |         |      | 12 mm A-Flok                     |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | A  | 8T  |         |      | 1/2" A-Flok                      | 57.2       | 28.6 | 25.4 | 28.6 | 38.1 |      |      |      |      |    |      |            |         |   |
|                | SW | 4P  |         |      | 1/4" Pipe Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | SW | 6T  |         |      | 3/8" Tube Weld                   | 57.2       | 28.6 | 25.4 | 25.4 | 38.1 |      |      |      |      |    |      |            |         |   |
|                | SW | 8T  |         |      | 1/2" Tube Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
| VND3           | F  | 8N  | 11.0    | 2.2  | 1/2" Female NPT                  | 79.4       | 39.7 | 33.3 | 39.7 | 50.8 | 46.1 | 50.8 | 15.9 | 17.5 | 89 | 26.2 | 121.5      | 126.2   | - |
|                | F  | 12N |         |      | 3/4" Female NPT                  | 82.6       | 41.3 | -    | -    | -    | 48.4 | -    | 19.9 | -    |    |      |            |         |   |
|                | F  | 16N |         |      | 1" Female NPT                    | 92.1       | 46.0 | -    | -    | -    | 54.0 | -    | 25.4 | -    |    |      |            |         |   |
|                | MF | 8N  |         |      | 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 |    |      |            |         |   |
|                | MF | 12N |         |      | 3/4" Male NPT 3/4" Female NPT    | 82.6       | 41.3 | -    | -    | -    | 48.4 | -    | 19.9 | -    |    |      |            |         |   |
|                | MF | 16N |         |      | 1" Male NPT 1" Female NPT        | 92.1       | 46.0 | -    | -    | -    | 54.0 | -    | 25.4 | -    |    |      |            |         |   |
|                | A  | 12M |         |      | 12mm A-Flok                      | 100.0      | 50.0 | 43.7 | 53.2 | 61.1 | 46.0 | 47.6 | 20.0 | 17.5 |    |      |            |         |   |
|                | A  | 8T  |         |      | 1/2" A-Flok                      |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | A  | 12T |         |      | 3/4" A-Flok                      |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | A  | 16T |         |      | 1" A-Flok                        |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | SW | 8P  |         |      | 1/2" Pipe Weld                   | 79.4       | 39.7 | 33.3 | 39.7 | 42.9 | 50.8 | 47.6 | 50.8 | 20.0 |    |      |            |         |   |
|                | SW | 8T  |         |      | 1/2" Tube Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | SW | 12T |         |      | 3/4" Tube Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |
|                | SW | 12T |         |      | 3/4" Tube Weld                   |            |      |      |      |      |      |      |      |      |    |      |            |         |   |

III. TECHNICAL DATA

MATERIALS OF CONSTRUCTION

| Description      | Grade / ASTM Specification |               |                    |
|------------------|----------------------------|---------------|--------------------|
|                  | Vave Body Materials        |               |                    |
|                  | SS 316                     | Carbon Steel  | Alloy 400          |
| Handle           | Stainless Steel            | Aluminium     | Stainless Steel    |
| Lock Nut         | SS316 / A479               | 12L14 / A108  | Alloy R-405 / B164 |
| Packing Bolt     | SS316 / A479               |               |                    |
| Packing Gland    | SS 316 / A479              |               | Alloy R-405 / B164 |
| Packing Support* | Glass Filled PTFE          |               |                    |
| Packing *        | PTFE                       |               |                    |
| Bonnet*          | SS316 / A479               | 12L14 / A108  | Alloy R 405 / B164 |
| Stem*            | Vee Tip                    | SS 316 / A479 | Alloy R-405 / B164 |
|                  | Ball Tip                   |               |                    |
|                  | Soft Tip                   |               |                    |
|                  | Regulating                 |               |                    |
| Body*            | SS316 / A479               | 12L14 / A108  | Alloy 400 / B164   |

Note: "\*"marked are wetted parts.

Nickel anti-seize lubricant for PTFE packed valves and fluorinated grease for PEEK and Grafol packed valves.

## TEMPERATURE vs WORKING PRESSURE

| Temperature   | Pressure bar (psig) @ Temperature Rating |                     |                     |                     |
|---------------|--|---------------------|---------------------|---------------------|
|               | ANSI Group                               | 2.2                 | NA                  | 3.4                 |
|               | Materials                                | SS316               | Carbon steel*       | Alloy 400           |
|               | ANSI Class                               | 2500                | NA                  | 2500                |
| -54°C (-65°F) | 38°C (100°F)                             | 414 bar (6000 psig) | 414 bar (6000 psig) | 345 bar (5000 psig) |
|               | 93°C (200°F)                             | 356 bar (5160 psig) | 374 bar (5420 psig) | 303 bar (4400 psig) |
|               | 148°C (300°F)                            | 321 bar (4660 psig) | 367 bar (5320 psig) | 284 bar (4120 psig) |
|               | 176°C (350°F)                            | 308 bar (4470 psig) | 361 bar (5230 psig) | 279 bar (4050 psig) |
|               | 204°C (403°F)                            | 295 bar (4280 psig) | -                   | 274 bar (3980 psig) |
|               | 232°C (450°F)                            | 285 bar (4130 psig) | -                   | 273 bar (3970 psig) |

\* Rated at a low temperature of -29°C (-20°F)

- To determine kPa, multiply psig by 6.89 and bar by 0.0689.
- When valves with A-Flok fitting end connections are connected to tubing, the working pressure of tubing must be considered in the calculation of total system working pressure.

## SOUR GAS SERVICE

- is provided to meet NACE Standard MR-01-75.

## TESTING

- Each valve is tested with nitrogen @ 69bar (1000psig) to a max leak rate of 0.1SCCM.
- Hydrostatic shell test is performed at 1.5 times the working pressure.
- Optional tests are available upon request.

## TEMPERATURE AND PRESSURE RATING

| Body Material       | Stem Tip                    | Temperature Rating              | Pressure Rating @ -54°C to 38°C (65°F to 100°F) |
|---------------------|-----------------------------|---------------------------------|---|
| 316 Stainless Steel | NR Vee, NR Ball Regulating  | -54°C to 232°C (-65°F to 450°F) | 414 bar (6000 psig)                             |
|                     | NR Soft seat (Kel-F)        | -54°C to 93°C (-65°F to 200°F)  |   |
| Carbon Steel        | NR Vee, NR Ball, Regulating | -29°C to 176°C (-20°F to 350°F) | 414 bar (6000 psig)                             |
|                     | NR Soft Seat (Kel-F)        | -29°C to 93°C (-20°F to 200°F)  |   |
| Alloy 403 (monel)   | NR Vee, NR Ball, Regulating | -54°C to 232°C (-65°F to 450°F) | 344 bar (5000 psig)                             |
|                     | NR Soft Seat (Kel-F)        | -54°C to 93°C (-65°F to 203°F)  |   |

- NR stands for non-rotating.
- The above ratings are for a standard valve with PTFE packing. For optional packing materials, refer to the table shown below.
- Extreme temperature fluctuations may require packing adjustment.

**PACKING AND BODY MATERIALS vs TEMPERATURE AND PRESSURE RATING**

| Packing Material | Body Material       | Temperature                      | Pressure @ Temp Rating |
|------------------|---------------------|----------------------------------|------------------------|
| PTFE (Standard)  | 316 Stainless Steel | -54°C to 232°C (-65°F to 450°F)  | 284 bar (4130 psig)    |
|                  | Alloy 400*          |                                  | 274 bar (3970 psig)    |
| PEEK**           | 316 Stainless Steel | -54°C to 315°C (-65°F to 600°F)  | 259 bar (3760 psig)    |
|                  | Alloy 400*          | -54°C to 260°C (-65°F to 500°F)  | 273 bar (3960 psig)    |
| Grafoi           | 316 Stainless Steel | -54°C to 648°C (-65°F to 1200°F) | 118 bar (1715 psig)    |
|                  | Carbon Steel        | -29°C to 176°C (-20°F to 350°F)  | 361 bar (5230 psig)    |
|                  | Alloy 400*          | -54°C to 260°C (-65°F to 600°F)  | 273 bar (3960 psig)    |

\* Not applicable over 260°C (500°F).

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

**HANDLES**

- Standards are black aluminium bar for carbon steel body and stainless steel bar for SS316 and Alloy 400 body.
- Black phenolic knob handle is available as an option for VND1, VND2 series.

**IV. ORDERING INFORMATION**

**VND2 - L - MA - 6N 8T - PK - RT - KH - SOG - SS**

**Series Designator by Orifice Size**  
 "VND1" – 4.0mm Orifice  
 "VND2" – 6.4mm Orifice  
 "VND3" – 11.0mm Orifice

**Body Pattern Designator**  
 "-" – Straight Pattern (Standard)  
 "L" – Angle Pattern

**End Connection Designator**  
 "F" – Both Ends Female Pipe Thread  
 "M" – Both Ends Male Pipe Thread  
 "MF" – Male & Female Pipe Thread  
 "A" – Both Ends A-Flok Tube Fittings  
 "SW" – Both Ends Socket Weld Ends  
 "MA" – Male Pipe Thread & A-Flok Tube Fittings

Inlet Outlet

**Packing Material Designator\***  
 "-" – PTFE (Standard)  
 "PK" – PEEK  
 "GR" – Grafoil

**Material Designator**  
 "SS" – 316 Stainless Steel  
 "CS" – Carbon Steel  
 "MO" – Alloy 400(Monel)  
 "BR" – Alloy

**Sour Gas Designator\***  
 "-" – Without (Standard)  
 "SOG" – NACE MR-01-75

**Handle Designator\***  
 "-" – Standard  
 "KH" – Block Phenolic Knob. Available only for VND1, and VND2 with soft seat stem

**Stem Tip Designator**  
 "-" – Non-Rotating Vee (Standard)  
 "RT" – Regulating  
 "ST" – Non-Rotating Soft Seat with Kei-F  
 "BT" – Non-Rotating Bal

**Size Designator**  
**NPT (ISO/BSP)**

| Thread (in.) | 1/8   | 1/4   | 3/8   | 1/2   | 3/4    | 1      |
|--------------|-------|-------|-------|-------|--------|--------|
| Designator   | 2N(R) | 4N(R) | 6N(R) | 8N(R) | 12N(R) | 16N(R) |

**Tube**

| Fractional Tube | O.D. (in.) | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1   |
|-----------------|------------|-----|-----|-----|-----|-----|-----|
|                 | Designator |     | 2T  | 4T  | 6T  | 8T  | 12T |
| Metric Tube     | O.D. (mm)  | 3   | 6   | 10  | 12  | 20  | 25  |
|                 | Designator |     | 3M  | 6M  | 10M | 12M | 20M |

**Note\***: No designator is required for standard, e.g. VND2MA-4N6T-SS.

**SAFETY IN VALVE SELECTION**

Proper Installation, materials compatibility, operation and maintenance of these valves are the responsibility of the user. The total system design must be taken into consideration to ensure optimal performance and safety.

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Ярославль (4852)69-52-93

**Эл. почта:** [awf@nt-rt.ru](mailto:awf@nt-rt.ru)

**Сайт:** <http://aflow.nt-rt.ru>