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.

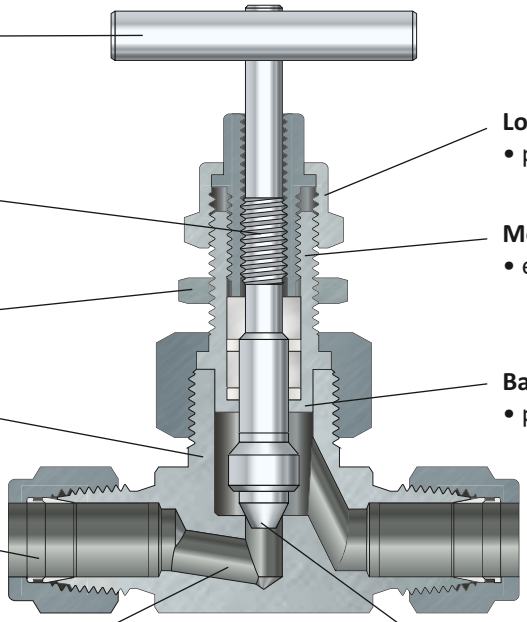
Stem Threads
• are rolled and hard chrome-plated for maximum service life.

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).

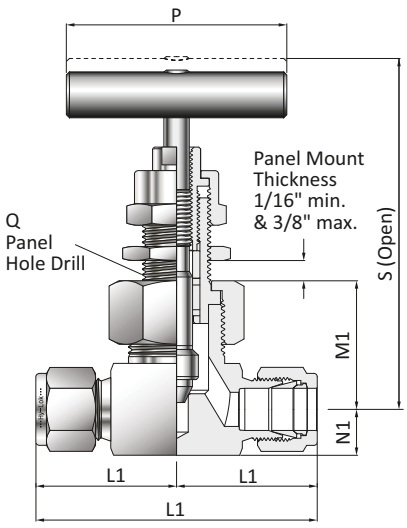


Locking Nut
• prevents packing bolt from loosening.

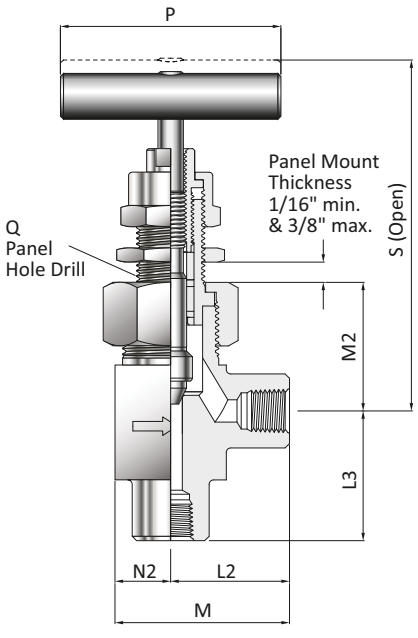
Metal Seal Bonnet-to-Body Construction
• ensures safety.

Back Seating
• provides anti - blow out of stem.

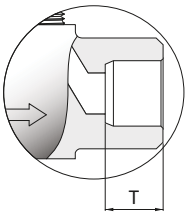
Variety of Stem Tips
• include non-rotating Vee(standard) non-rotating ball, soft seat, regulating soft seat and non-rotating regulating tip. (optional)



Straight Pattern



Angle Pattern



Weld end

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		35.0									
	MF	4N			1/4" Male NPT 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		27.8						77.8	
	A	4T			1/4" A-Flok														
	SW	4T			1/4" Tube Weld	46.0	23.0	22.3	30.2	31.8									7.2
	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		34.2						93.7	
	A	6T			3/8" A-Flok			32.5	42.9	45.3		31.0						90.5	
	A	12M			12 mm A-Flok	77.8	38.9	35.7	42.1	48.4		34.2						93.7	
	A	8T			1/2" A-Flok			34.9		47.6									
	SW	4P			1/4" Pipe Weld	57.2	28.6	25.4	28.6	38.1		37.3						93.7	9.6
	SW	6T			3/8" Tube Weld														8.0
	SW	8T			1/2" Tube Weld				25.4			35.7						95.3	9.6
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	-			123.9	-	
	F	16N			1" Female NPT	92.1	46.0	-	-	-	54.0	-	25.4	-			129.4	-	
	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			121.5	126.2	
	MF	12N			3/4" Male NPT 3/4" Female NPT	82.6	41.3	-	-	-	48.4	-	19.9	-			123.9	-	
	MF	16N			1" Male NPT 1" Female NPT	92.1	46.0	-	-	-	54.0	-	25.4	-			129.4	-	
	A	12M			12mm A-Flok	100.0	50.0	-	-	-	46.0	-	20.0	-			121.5	-	
	A	8T			1/2" A-Flok			43.7	53.2	61.1		47.6		17.5				123.1	
	A	12T			3/4" A-Flok														
	A	16T			1" A-Flok			-	-	-	47.6	-	22.0	-			123.1	-	9.6
	SW	8P			1/2" Pipe Weld	79.4	39.7	33.3	39.7	50.8		50.8	20.0	17.5				126.2	9.6
	SW	8T			1/2" Tube Weld				42.9		46 0	47.6	15.9				121.5	123.1	11.1
	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		SS3I6 / A479		
Packing Gland		SS 316 / A479		Alloy R-405 / B164
Packing Support*		Glass Filed 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 fluorlnated grease tor PEEK and Grafoll 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 Ciass	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 SERVIVE

• is provied 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 Bail, 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 Steal	–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 Threod
"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

Size Designator

NPT (ISO/BSP)

Thread (in.)	⅛	¼	⅜	½	¾	1
Designator	2N(R)	4N(R)	6N(R)	8N(R)	12N(R)	16N(R)

Tube

Fractional Tube	O.D. (in.)	⅛	¼	⅜	½	¾	1
	Designator	2T	4T	6T	8T	12T	16T
Metric Tube	O.D. (mm)	3	6	10	12	20	25
	Designator	3M	6M	10M	12M	20M	25M

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

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

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

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

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.