

## INSTRUMENT

### Integral Bonnet Needle Valves VN5

#### Needle Valves

VN5 Needle Valve .....	149
VN6 Needle Valve .....	157
VU6 Union Bonnet Valve .....	161



# Integral Bonnet Needle Valves VN5

## CONTENTS

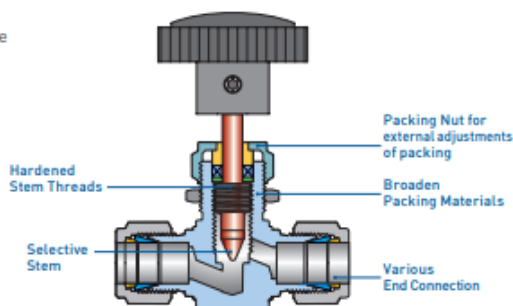
Features	150
Materials of Construction	150
Application	151
Cleaning	151
Testing	151
Important Notification	151
How To Order	151

VN5 series	152
VN5A series	154
Pressure-Temperature Rating	155
Handle Turns-Flow Coefficient	155
Stem Types	156
Handle Types	156

## Features

- Pressure rating up to 5000psig [340bar] @38°C [100°F]
- Temperature rating from -53°C (-65°F) to 232°C (450°F) with standard PTFE packing, up to 315°C (600°F) with PEEK packing
- Compact forged body with straight and angle pattern for design of miniaturized fluid systems
- Hardened stem threads and forged body for long cycle life

- Integral bonnet design to eliminate unintentional stem back-out
- Panel mounting without packing disruption
- Wide choices of port sizes and end connections



## Materials of Construction

No.	Description	Materials		
Body Material		316SS	Brass	Alloy 400
1	Body	316SS	Brass	Alloy 400
2	Nut	316SS	Brass	Alloy 400
3	Front Ferrule	316SS	Brass	Alloy 400
4	Back Ferrule	316SS	Brass	Alloy 400
5	Stem	316SS	Brass	Alloy R-405/B164
6	Packing Ring	316SS	Brass	Alloy R-405/B164
7	Packing	PTFE		
8	Packing Gland	316SS	Brass	Alloy R-405/B164
9	Packing Nut	316SS	Brass	Alloy R-405/B164
10	Panel Nut	316SS	Brass	316SS
11	Handle	Nylon with brass insert		
12	Handle Screw	304SS		

## Application

Regulation and shut-off of fluids and gases for wide range of general purpose

Sampling systems, laboratories, corrosive and high pressure service, valves - pressure gauge and cylinder, panel board instrumentation

## Sour Environment Services

UNILOK valves comply with NACE MR-0175/ISO 15156 for sour oilfield application or NACE MR-0103 for petroleum refining operations.

To order, add -N to the end of part number.

## Cleaning

UNILOK valves are free from machine oils, loose particles and grease throughout the close cleaning process.

## How To Order

UNILOK VN5 series needle valves are ordered by part number as shown below.

## Testing

Every valve is 100% factory tested with air and nitrogen at 1000psig(69bar) for leakage at the seat and packing. Each test is performed to a maximum allowable leak rate of 0.1scm/min.

## Important Notification

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.

The packing adjustment may be required during the valve's service life.

**Example:** The following part number, **VN52U-04T-SS** is designated for VN5 series needle valve with both 1/4" UNILOK tube fitting, 316SS, round handle.

<b>V</b>	<b>N52</b>	<b>U</b>	-	<b>04T</b>	-	<b>SS</b>	-		-		-	
UNILOK Valve	Valve Type	Connection Type		Connection Size		Body Materials		Stem Type		Packing Materials		Handle Type

Valve Type	
N5	Straight Pattern
N5A	Angle Pattern

Connection Size	
Fractional(Inch) Tube O.D. Designation	
Tube O.D.	inch
1/8	1/4
3/8	1/2
1	3/4
1.317	6.35
9.52	12.70
19.05	25.40
Designator	
02T	04T
06T	08T
12T	16T

Body Materials	
SS	316SS
BS	Brass
MO	Alloy 400

Other alloys are available upon request.

Connection Type	
U	UNILOK Tube Fitting
F	Female NPT or ISO7/1(P)
M	Male NPT or ISO7/1(P)
WS-	Socket Weld - Tube
WS-	Socket Weld - Pipe

Metric Tube O.D. Designation	
Tube O.D.	mm
6	8
10	12
16	
Designator	
M06T	M08T
M10T	M12T
M16T	

Stem Type	
None	Vee Stem
R	Regulating Stem
S	Soft-seat Stem

Pipe Size Designation (NPT or ISO7/1-PT)	
Pipe Size	1/8
1/4	3/8
1/2	
Designator	
02N/R	04N/R
06N/R	08N/R

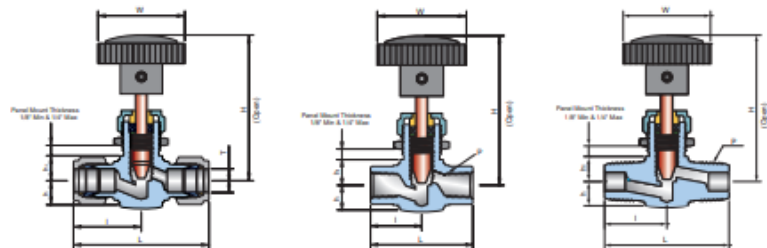
Packing Materials	
None	PTFE
PK	PEEK

Weld Size Designation	
Tube Size	1/4
3/8	1/2
Designator	
04T	06T
08T	
Pipe Size	1/4
3/8	1/2
Designator	
04P	06P
08P	

Handle Type	
None	Nylon Round Handle
B	Bar Handle

## VN5 series

(Straight Pattern, Both UNILOK Tube Fittings or Both Female or Male Threads)



### Ordering Information & Dimensions

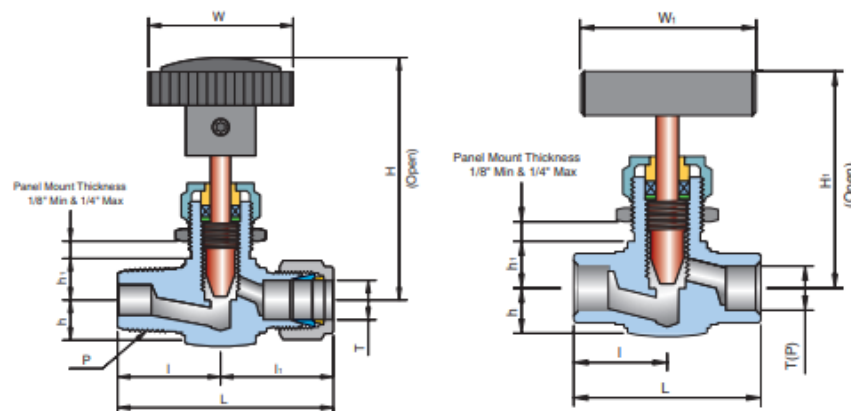
Part No.	End Connections		Orifice	CV	Dimensions (mm)							Panel Hole Drill Size
	Inlet	Outlet			L	I	h	h1	Round Handle			
VN51	U-02T-	1/8" UNILOK	2.0	0.09	49.3	24.9	11.2	7.9	57.9	25.4		11.9
	U-M03T-	3mm UNILOK			49.3	24.9						12.2
	F-02N-	1/8" Female NPT			47.8	23.9						11.9
	M-02N-	1/8" Male NPT			38.1	19.1						
VN52	U-04T-	1/4" UNILOK	4.3	0.37	56.3	28.2	9.5	9.5	65.9	34.7		13.5
	U-M06T-	6mm UNILOK			56.8	28.4						
	U-M08T-	8mm UNILOK			59.0	29.5						
	F-02N-	1/8" Female NPT			42.0	21.0						
VN53	M-02N-	1/8" Male NPT	6.3	0.73	41.2	20.6	12.5	13.5	80.6	46.7		20.0
	M-04N-	1/4" Male NPT			50.0	25.5						
	U-06T-	3/8" UNILOK			67.8	33.9						
	U-08T-	1/2" UNILOK			73.2	36.6						
VN54	U-M10T-	10mm UNILOK	9.5	1.80	67.4	33.7	17.0	17.0	97.0	55.5		23.0
	U-M12T-	12mm UNILOK			73.4	36.7						
	F-04N-	1/4" Female NPT			54.0	27.0						
	M-06N-	3/8" Male NPT			53.0	26.5						
VN55	MF-04N-	1/4" Male NPT 1/4" Female NPT	12.7	3.20	55.6	26.5	20.0	20.0	86.7*	85*		29.0
	U-08T-	1/2" UNILOK			83.2	41.6						
	U-12T-	3/4" UNILOK			83.2	41.6						
	F-06N-	3/8" Female NPT			65.0	30.0						
VN56	F-08N-	1/2" Female NPT	12.7	3.20	65.0	32.5	20.0	20.0	86.7*	85*		29.0
	M-08N-	1/2" Male NPT			66.0	33.0						
	MF-08N-	1/2" Male NPT 1/2" Female NPT			66.0	33.0						
	U-16T-	1" UNILOK			99.2	49.6						

\* Dimensions for bar handle. Round handle for these sizes are not available.  
ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VN5 series valves.  
Add "R" as a suffix instead of "N".

Dimensions are for reference only and are subject to change without prior notice.

## VN5 series

(Straight Pattern, Male/UNILOK Tube Fitting or Both Tube or Pipe Socket Welds)



### Ordering Information & Dimensions

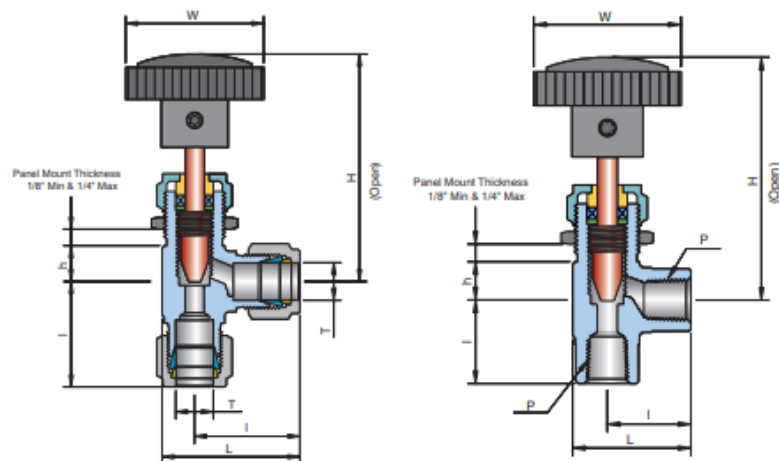
Part No.	End Connections		Orifice	CV	Dimensions (mm)							Panel Hole Drill Size
	Inlet	Outlet			L	I	h	h1	Bar Handle			
VN52	MU-04N02T-	1/4" Male NPT 1/8" UNILOK	4.3	0.37	51.3	25.0	9.5	9.5	54.3	45.0		13.5
	MU-04N04T-	1/4" Male NPT 1/4" UNILOK			53.3	25.0						
	WS-04T	1/4" Tube			42.0	21.0						
VN53	MU-04N06T-	1/4" Male NPT 3/8" UNILOK	6.3	0.73	60.4	26.5	12.5	13.5	67.5	50.6		20.0
	MU-06N06T-	3/8" Male NPT 3/8" UNILOK			60.4	26.5						
	MU-06N08T-	3/8" Male NPT 1/2" UNILOK			63.1	26.5						
	WS-06P	3/8" Tube			54.0	27.0						
VN54	WS-08P	1/2" Tube	9.5	1.80	54.0	27.0	17.0	17.0	83.8	62.5		23.0
	WS-04P	1/4" Pipe			54.0	27.0						
	WS-06P	3/8" Pipe			60.0	30.0						
	WS-08P	1/2" Pipe			65.0	32.5						

Male ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VN5 series valves.  
Add "R" as a suffix instead of "N".

Dimensions are for reference only and are subject to change without prior notice.

## VN5A series

(Angle Pattern, Both UNILOK Tube Fittings or Both Female Threads)



## Ordering Information & Dimensions

Part No.		End Connections		Orifice	CV	Dimensions (mm)					Panel Hole Drill Size
		Inlet	Outlet			L	I	h	Round Handle		
									H(open)	W	
VN52A	U-04T-	1/4" UNILOK	4.3	0.37	38.9	30.2	10.1	61.1	34.7	13.5	
	U-M06T-	6mm UNILOK			39.1	30.5					
	U-M08T-	8mm UNILOK			39.3	30.7					
	F-02N-	1/8" Female NPT			29.6	21.0					9.8
VN53A	U-06T-	3/8" UNILOK	6.3	0.73	44.2	33.1	12.2	78.4	46.7	20.0	
	U-08T-	1/2" UNILOK			46.9	35.8					
	U-M10T-	10mm UNILOK			44.8	33.7					
	U-M12T-	12mm UNILOK			46.9	35.8					
	F-04N-	1/4" Female NPT			37.0	26.0					
VN54A	F-06N-	3/8" Female NPT	9.5	1.80	53.5	39.7	15.9	92.2	55.5	23.0	
	F-08N-	1/2" Female NPT									

Female ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VN5 series valves. Add "R" as a suffix instead of "N".

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## Pressure - Temperature Ratings by Packing Materials

Body Material	Stem	PTFE packing				PEEK packing			
		Temperature Rating		Pressure Rating		Temperature Rating		Pressure Rating	
		°C	°F	psig	bar	°C	°F	psig	bar
316SS	metal to metal (vee & regulating)	-54~232	-65~450	5000	345	-54~315	-65~600	3130	215
	soft-seat (Kel-F)	-54~93	-65~200			-54~93	-65~200		
Brass	metal to metal (vee & regulating)	-54~204	-65~400	3000	207	-54~204	-65~400	3000	207
	soft-seat (Kel-F)	-54~93	-65~200			-54~93	-65~200		
Alloy 400	metal to metal (vee & regulating)	-54~232	-65~450	3000	207	-54~260	-65~500	2370	162
	soft-seat (Kel-F)	-54~93	-65~200			-54~93	-65~200		

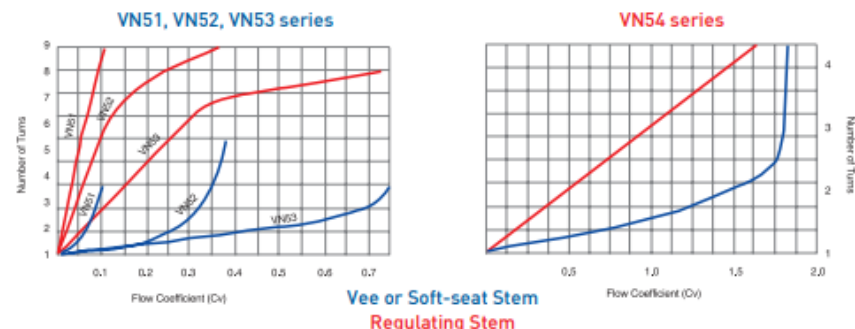
Packing adjustment to be required for extreme temperature variations

For the service with aromatic heat transfer fluids or concentrated sulfuric and nitric acids, PEEK is not recommended.

## Working Pressure at Temperature

Temperature		Working Pressure							
°C	°F	psig	bar	psig	bar	psig	bar	psig	bar
-54 to	38	100	5000	345	3000	207	3000	207	207
	93								
	148								
	176								
	204								
	232								
		450	3430	237	-	-	2380	165	165
Materials		316SS		Brass		Alloy 400			

## Number of Handle Turns - Flow Coefficient (Cv)

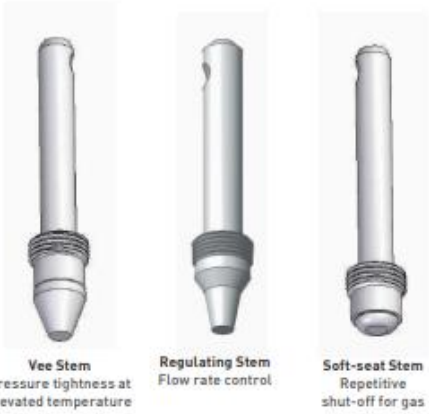


Stem Types

Metal to metal vee stem is standard for pressure tightness even at elevated temperature. Regulating stem and soft-seat stem with KEL-F are available as optional. The excessive force when closing valve may damage both seat and stem tip, particularly soft-seat stem.

Handle Types

Black nylon round handle is standard. For the valves with brass body and soft-seat stem, standard round handle is recommended. Optional stainless steel bar handle is available.



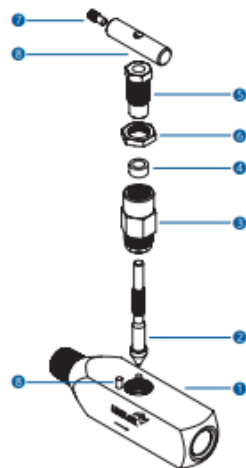
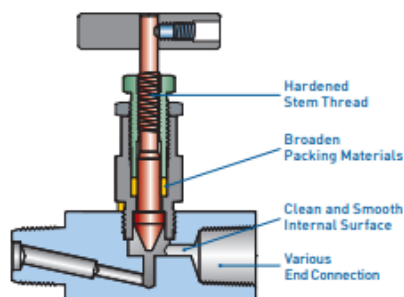
INSTRUMENT

High Pressure Bar Stock  
Needle Valves  
VN6



## Features

- Pressure rating up to 6000psig (413bar) @38°C(100°F)
- Temperature rating from -53°C(-65°F) to 232°C(450°F) with standard PTFE packing, up to 315°C(600°F) with PEEK packing
- High temperature application is available Grafoil packing, up to 648°C(1200°F)
- Compact body design
- Hardened stem threads and forged body for long cycle life
- Integral bonnet design to eliminate unintentional stem back-out
- Stop pin to prevent accidental bonnet disengagement



## Materials of Construction

No.	Description	Materials	
Body Material		316SS	Alloy 400
1	Body	316SS	Alloy 400
2	Stem	316SS	Alloy R-405/B164
3	Body Bonnet	316SS	Alloy R-405/B164
4	Packing	PTFE	
5	Spindle Bushing	316SS	Alloy R-405/B164
6	Jam Nut	316SS	Alloy R-405/B164
7	Set Screw	304SS	
8	Bar Handle	304SS	
9	Stop Pin	304SS	

## Pressure - Temperature Rating

Body Material	Stem	PTFE packing			
		Temperature Rating		Pressure Rating @ 38°C	
		°C	°F	psig	bar
316SS	Vee (metal to metal)	-54~232	-65~450	6000	413
	Soft-seat (Kel-F)	-54~93	-65~200		
Alloy 400	Vee (metal to metal)	-54~232	-65~450	5000	345
	Soft-seat (Kel-F)	-54~93	-65~200		

Packing Material	Body Material	Temperature Rating		Pressure Rating @ Max. Temperature	
		°C	°F	psig	bar
PTFE	316SS	-54~232	-65~450	4130	285
	Alloy 400	-54~232	-65~450	3970	274
PEEK	316SS	-54~315	-65~600	3760	260
	Alloy 400	-54~260	-65~500	3960	273

For the service with aromatic heat transfer fluids or concentrated sulfuric and nitric acids, PEEK is not recommended.

## Application

Severe service application, steam service in power plant, hot condensates

## Sour Environment Services

UNILOK valves comply with NACE MR-0175/ISO 15156 for sour oilfield application or NACE MR-0103 for petroleum refining operations. To order, add -N to the end of part number.

## Cleaning

UNILOK valves are free from machine oils, loose particles and grease throughout the close cleaning process.

## How To Order

UNILOK VN6 series needle valves are ordered by part number as shown below.

## Testing

Every valve is 100% factory tested with air and nitrogen at 1000psig(69bar) for leakage at the seat and packing. Each test is performed to a maximum allowable leak rate of 0.1sc/min.

## Important Notification

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. The packing adjustment may be required during the valve's service life.

**Example:** The following part number, **VN62MF-04N-SS** is designated for VN6 series needle valve with 1/4" male NPT to 1/4" female NPT, 316SS.



Connection Type	
U	UNILOK Tube Fitting
F	Female NPT or ISO7/11PT
M	Male NPT or ISO7/11PT

Connection Size				
Fractional(Inch) Tube O.D. Designation				
Tube O.D.	Inch	1/4	3/8	1/2
	mm	6.35	9.52	12.70
Designator		04T	06T	08T

Body Materials	
SS	316SS
MO	Alloy 400

Stem Type	
None	Vee Stem
S	Soft Seat Stem

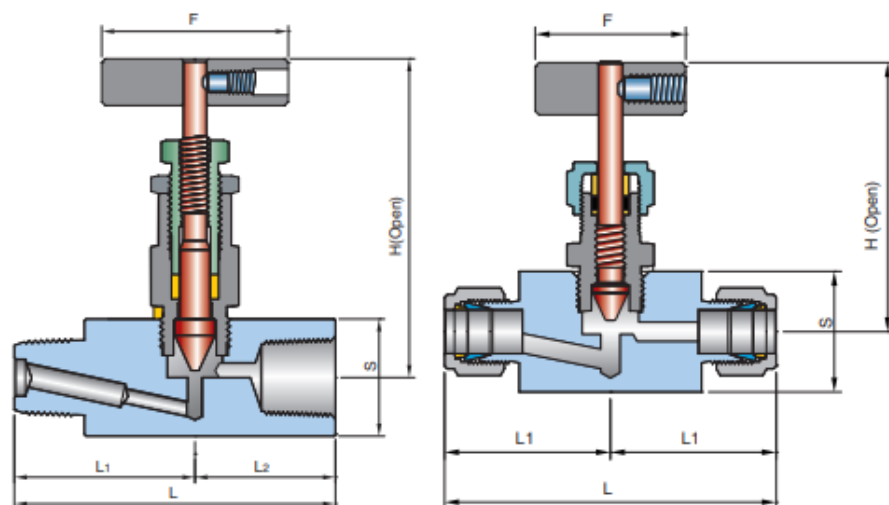
Metric Tube O.D. Designation					
Tube O.D.	mm	6	8	10	12
Designator		M06T	M08T	M10T	M12T

Pipe Size Designation (NPT or ISO7/1-PT)			
Pipe Size	1/4	3/8	1/2
Designator	04N/R	06N/R	08N/R

Packing Materials	
None	PTFE
PK	PEEK
GF	Grafoil



## VN6 series



### Ordering Information & Dimensions

Part No.		End Connections		Orifice	CV	Dimensions (mm)					
		Inlet	Outlet			L	L <sub>1</sub>	S	F	H	
VN61	U-04T-	1/4" UNILOK		4.0	0.35	76.2	38.1	25.4	45.0	56.7	
	U-06T-	3/8" UNILOK									
	U-08T-	1/2" UNILOK									
	U-M06T-	6mm UNILOK									
	U-M08T-	8mm UNILOK									
	U-M10T-	10mm UNILOK									
	U-M12T-	12mm UNILOK									
VN62	F-04N-	1/4" Female NPT		4.0	0.35	76.2	38.1	32.0	50.6	86.5	
	F-06N-	3/8" Female NPT									
	F-08N-	1/2" Female NPT									
	MF-04N-	1/4" Male NPT	1/4" Female NPT			82.2	44.1	32.0			
	MF-06N-	3/8" Male NPT	3/8" Female NPT								
	MF-08N-	1/2" Male NPT	1/2" Female NPT								
						87.1	49.0	32.0			

ISO7/1 Tapered Threads (PT) are available for all fractional sizes of VN6 series valves. Add "R" as a suffix instead of "N".

Dimensions are for reference only and are subject to change without prior notice.