



V15 Series Needle Valves

Forged body, Pressure Rating up to 5000psig (345bar)

Catalog No. V15-5
JUNE 2006

Integral Bonnet Needle Valves FOR REGULATING and SHUT-OFF

6. Stem

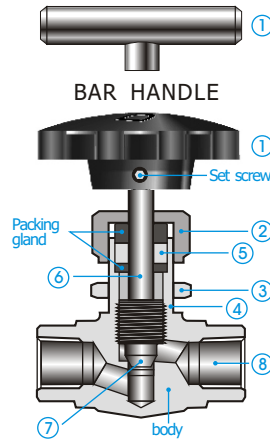
Hard chrome plated stem threads assures extended service life

7. Choice of Fluid Control

- Metal to metal Vee & Regulating stems for elevated temperatures
- Repetitive soft seat for gas leak-tight

8. Variety of end connections

- Reliabel DK-LOK® Tube Fitting Ends
- NPT & ISO Male & Female



1. Positive Driven Handle

Choice of Round handle and Bar Handle

2. Packing Nut

Allows external adjustments of packing

3. Panel Nut

Allows panel installation without disrupting the packing

4. Integral Bonnet Design

To eliminate inadvertent stem back-out

5. Packing

- Low operating torque.
- Standard PTFE
- Optional PEEK for high Temperature

Materials of Construction

Components	VALVE BODY MATERIALS		
	Material Grade / ASTM Specification		
	SS316	BRASS	ALLOY400
1 Round handle	Nylon with brass insert		
1 Bar handle	SS316/A276		
Set Screw	SS304/A276		
2 Packing Nut	SS316/A276	Brass/B16	Alloy R-405/B164
3 Panel Nut	SS316/A276	Brass/B16	Alloy R-405/B164
Packing Gland	SS316/A276	Brass/B16	Alloy R-405/B164
5 Packing	Standard PTFE, Optional PEEK		
6,7 Regulating Stem	SS316/A276		Alloy R-405
6,7 Vee Stem	Hard Chrome-plated on stem tip and threads		
6,7 Soft Seat Stem	SS316/A276 Hard Chrome-plated on threads		
7 Stem tip (Soft Seat)	Kel-F		
Body	SS316/A182	Brass/B124	Alloy 400/B564

Wetted parts and lubricant are listed in blue.

Lubrication: Molybdenum disulfide with hydrocarbon coating

Design

- Designed to the requirements of ASME B16.34
- Designed for a wide range of general purpose in gas and liquid applications
- Forged Body with Inline and Angle pattern
- Integral Bonnet design to eliminate inadvertent stem back-out
- Standard metal seal for pressure tightness at elevated temperatures
- Standard PTFE packing, and optional PEEK packing for higher temperature service
- Packing nut allows external packing adjustment to ensure leak-free packing on stem
- Broad choices of end connections include reliable DK-LOK, NPT & ISO Male & Female pipe threads



Operation


- Pressure rating up to 5000psig (345bar) @100°F (38°C)
- Temperature rating up to 450°F (232°C) with standard PTFE packing; up to 600oF (315°C) with optional PEEK packing
- Panel mounting without packing disruption
- Standard SS316 and Brass material valve construction
- DK-LOK® Gap gauge allows easy inspection for sufficient tube pull-up before a system is pressurized
- Valves for Sour Gas Service meeting the requirements of NACE MR0175 are available

Factory Test

- Every valve is tested with the nitrogen @1000psig (68bar) for leakage at the seat to a maximum allowable leak rate of 0.1 scc/min. The packing is tested for no detectable leakage.

Panel Mounting

Valve disassembly and reassembly for panel mounting.



Panel Nut

Valve Series	Panel Hole Drill	Panel Thickness	
		Min.	Max.
V15A	13.5 (0.53)	3.17 (0.12)	6.35 (0.25)
V15B	13.5 (0.53)		
V15C	20.0 (0.78)		
V15D	26.2 (1.03)		

Disassembly

- Loosen the handle set screw using an allen key and remove the handle

- Handle Set Screw Allen Key

Valve Series	Allen Key	
	Round Handle	Bar Handle
V15A & V15B	Hex.2.5mm	Hex. 4.0mm
V15C	Hex.3.0mm	
V15D		Hex. 5.0mm

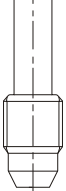
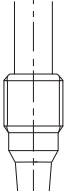
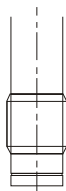
- Remove the packing nut & panel nut and set aside for later use.
- Place the valve bonnet in the panel hole.

Reassembly

- Tighten the panel nut onto the valve bonnet.
- Keep the panel nut always on the external portion of the panel.
- Finger tighten the packing nut onto the valve body.
- Place the handle on the stem. Align the set screw with the groove on the side of the stem. Tighten the set screw.
- Fully close the valve and retract the stem two or three turns before torque the packing nut to the torque value below.

Valve Series	Torque	
	lbf.ft	kgf.cm
V15A, V15B	5.2	71
V15C	10.6	146
V15D	25.1	347

Choice of Stem Tip

Vee Stem	Regulating Stem	Soft seat
		
Metal to metal Vee stem for pressure tightness at elevated temperature.	Regulating stem for flow rate control	KEL-F soft seat for repetitive shut-off on gas. • Round Handle is recommended for soft seat valve.

Note: Soft seat packing adjustment may be required during service to compensate the physical compression of soft seat after repeated shut-off.

Ordering Information and Table of Dimensions



Unit : mm (inch)

Valve Basic Ordering Number	End Connections		Orifice	Cv	Dimensions									
	Inlet	Outlet			A	B	L	L1	L2	E	D	H	H1	
V15 A	F-2N-	1/8" Female NPT	2.0 (.08)	0.09	60 (2.36)	21 (.83)	42 (1.65)	21 (.83)	21 (.83)	20 (.79)	9.5 (.37)	11 (.43)	36 (1.42)	32 (1.26)
	M-2N-	1/8" Male NPT												
	MD-2N2T-	1/8" Male NPT 1/8" Dk-Lok												
	D-2T-	1/8" Dk-Lok												
	D-3M-	3mm Dk-Lok												
V15 B	F-2N-	1/8" Female NPT	4.4 (.172)	0.37	60 (2.36)	21 (.83)	42 (1.65)	21 (.83)	25 (.98)	25 (.98)	9.5 (.37)	11 (.43)	36 (1.42)	45 (1.77)
	M-2N-	1/8" Male NPT												
	M-4N-	1/4" Male NPT												
	MD-4N4T-	1/4" Male NPT 1/4" Dk-Lok												
	D-6M-	6mm Dk-Lok												
	D-4T-	1/4" Dk-Lok												
	D-8M-	8mm Dk-Lok												
V15 C	F-4N-	1/4" Female NPT	6.4 (.25)	0.73	71 (2.80)	28 (1.10)	56 (2.20)	28 (1.10)	28 (1.10)	29 (1.14)	13 (.51)	13.5 (.53)	50 (1.97)	64 (2.52)
	F-4R-	1/4" Female ISO Tapered												
	MF-4N-	1/4" Male NPT 1/4" Female NPT												
	MD-4N6T-	1/4" Male NPT 3/8" Dk-Lok												
	M-6N-	3/8" Male NPT												
	MD-6N6T-	3/8" Male NPT 3/8" Dk-Lok												
	MD-6N8T-	3/8" Male NPT 1/2" Dk-Lok												
	D-10M-	10mm Dk-Lok												
	D-6T-	3/8" Dk-Lok												
	D-12M-	12mm Dk-Lok												
	D-8T-	1/2" Dk-Lok												
V15 D	F-6N-	3/8" Female NPT	9.5 (.375)	1.80	99 (3.90)	38 (1.50)	76 (2.99)	38 (1.50)	38 (1.50)	49 (1.93)	19 (.75)	19 (.75)	66 (2.06)	76 (3.00)
	F-6R-	3/8" Female ISO Tapered												
	F-8N-	1/2" Female NPT												
	F-8R-	1/2" Female ISO Tapered												
	M-8N-	1/2" Male NPT												
	MF-8N-	1/2" Male NPT 1/2" Female NPT												
	D-8T-	1/2" Dk-Lok												
	D-12T-	3/4" Dk-Lok												

All dimensions shown are for reference only and are subject to change. Dimensions with DK-LOK nuts are in finger-tight position. Patterns: To order angle pattern, use -A as a suffix to the valve ordering number. Example : V15A-F-2N-A

Technical Data

Working pressure

The class rating and rated working pressure are the way that ASME standards simplify the design process. The pressure rating is governed by the allowable stress of different material group, class rating, and service temperature.

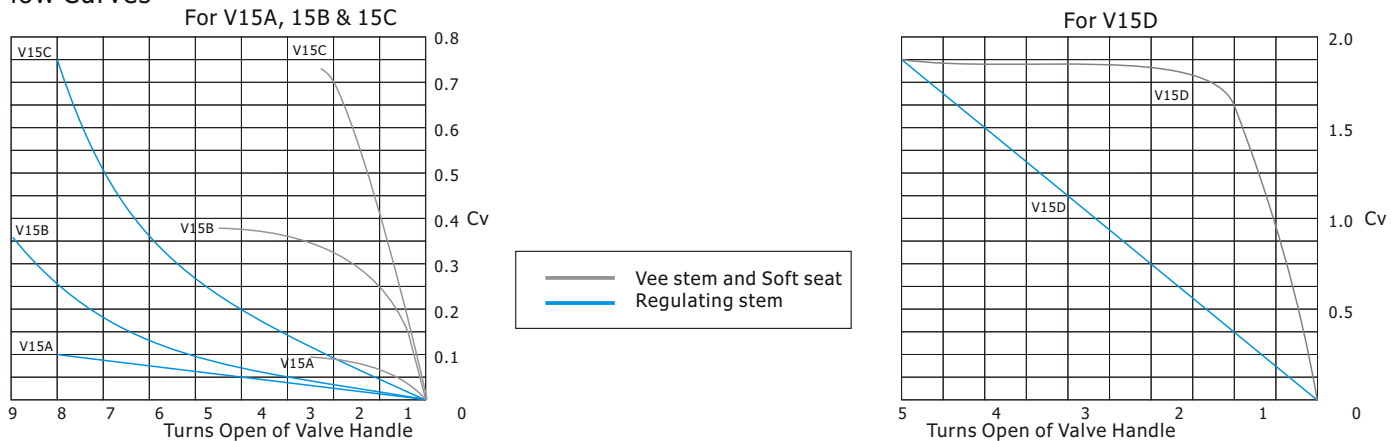
ASME Material Group	TABLE 2-2.2		N/A		TABLE 2-3.4		
Material Name	SS316		Brass		Alloy 400		
ASME CLASS Rating	2080		N/A		1500		
Temperature @ pressure	psig	bar	psig	bar	psig	Bar	
-65°F (-54°C) to	100°F (38°C)	5000	345	3000	207	3000	206
	200°F (93°C)	4293	296	2353	162	2640	181
	300°F (148°C)	3877	267	2059	142	2470	170
	350°F (176°C)	3719	256	1471	101	2430	167
	400°F (204°C)	3562	246	392	27	2390	164
450°F (232°C)	3437	237	-	-	2380	163	

Note : Pressure rating of valve is sometimes limited to the working pressure of pipe ends and the tubing connected. Refer to DK-LOK Tube Fitting catalog for the details of working pressures in various tubing sizes, materials and wall thickness.

Temperature and Pressure Rating with standard PTFE and Optional PEEK packing

Valve Material	Stem	with PTFE packing		with PEEK packing	
		Temperature Rating	Pressure Rating @100°F (38°C)	Temperature Rating	Pressure Rating @100°F (38°C)
SS316	Metal to metal (Vee & Regulating)	-65°F to 450°F (-54°C to 232°C)	5000 psig (345 bar)	-65°F to 600°F (-54°C to 315°C)	3130 psig (215 bar)
	Soft Seat (Kel-F)	-65°F to 200°F (-54°C to 93°C)		-65°F to 200°F (-54°C to 93°C)	
Brass	Metal to metal (Vee & Regulating)	-65°F to 400°F (-54°C to 204°C)	3000 psig (207 bar)	-65°F to 400°F (-54°C to 204°C)	3000 psig (207 bar)
	Soft Seat (Kel-F)	-65°F to 200°F (-54°C to 93°C)		-65°F to 200°F (-54°C to 93°C)	
Alloy 400	Metal to metal (Vee & Regulating)	-65°F to 450°F (-54°C to 232°C)	3000 psig (207 bar)	-65°F to 500°F (-54°C to 260°C)	2370 psig (162 bar)
	Soft Seat (Kel-F)	-65°F to 200°F (-54°C to 93°C)		-65°F to 200°F (-54°C to 93°C)	

Flow Curves



How to order

Select applicable Valve Pattern, Stem Tip, Handle and Body material from designators listed below.

Valve Pattern	Stem Packing Designator	Stem Designator	Handle Designator	Body Material Designator
<ul style="list-style-type: none"> • Nil : Inline pattern • A : Angle pattern 	<ul style="list-style-type: none"> • Nil : Standard PTFE • PK : PEEK 	<ul style="list-style-type: none"> • Nil : Standard Vee stem tip • R : Regulating tip • K : Kel-F Soft seat 	<ul style="list-style-type: none"> • Nil : Nylon Round Handle • BH : Bar Handle 	<ul style="list-style-type: none"> • S : SS316 • B : Brass • M : Alloy 400
Handle for Soft Seat Round Handle is recommended for soft seat valve to prevent the valve from excessive torque.				

Examples : V15B-F-2N-BH-B for Inline Pattern, Standard Vee tip with bar Handle and Brass Body
 V15B-F-2N-A-PK- K-S for Angle Pattern, Peek packing, Soft tip with Bar Handle and SS316 Body

A : Angle Pattern
 PK : Peek stem Packing
 S : SS316 body
 K : Kel-F soft Tip

We reserve the right to change specifications stated in this catalog for our continuing program of improvement.

Safe Valve Selection

The selection of a valve for any application or system design must be considered to ensure safe performance. Valve function, valve rating, material compatibility, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. Dk Tech accepts no liability for any improper selection, installation, operation or maintenance.



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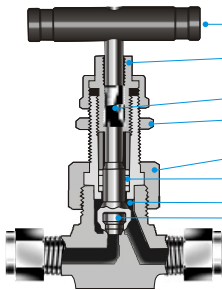
V16 Series Severe Service Union Bonnet Valves

Pressure Rating up to 6000psig

Catalog No. V16-2
Sept. 2004

Features

- Pressure up to 6000 psig (413 bar) @ 37C (100F).
- High Temperatures up to 300C (572F) with standard PTFE packing; up to 649C (1200F) with Grafoil packing.
- Standard S316 stainless steel, optional Alloy 20, and Alloy C276 construction.
- Valve stem back seating against the beveled edge of bonnet ensures safety in severe service, this also prevents max. leakage thru. bonnet when a packing fails.
- Standard non-rotating stem tip and stem packing below the threads design.

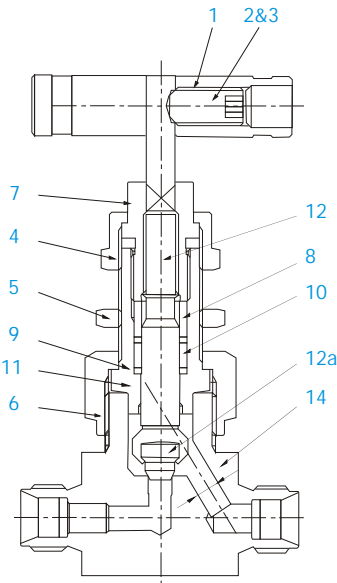


- **Handle-** standard S316 bar handle, optional knob, and Aluminum Bar Handle.
- **External Packing Bolt-** allows packing adjustment without the valve disassembly.
- **Roll threaded and hard chrome plated stem-** is for long valve life.
- **Panel Mounting Nut-** is standard and permits valve to panel or actuator.
- **Union Nut-** prevents accidental disassembly of the valve in service..
- **Stem Packing below the threads-** prevents media contamination and thread lubricant washout.
- **Back Seating Stem-** is blow-out proof design in severe service.
- **Non-Rotating Stem Tip at Closure-** is for maximum metal seat life and positive seal.

Materials of Construction

Component	Valve Body Materials		
	S316	Alloy 20	Alloy C276
	Material Grade/ASTM Specification		
1. Handle	S316/A276		
2. Handle pin	Molybdenum disulfide coated S316/A276		
3. Set Screw	Nickel cadmium-plated steel		
4. Cap nut	S316/A276 or A479		
5. Panel nut	S316/A276		
6. Union nut	S316/A276		
7. Packing bolt	S316/A276		
8. Gland	S316/A276	Alloy 20/B473	C276/B574
9. Packing supports	Glass-filled PTFE. It differs from optional packing		
10. Packing	PTFE/D1710, optional PEEK & Grafoil		
11. Bonnet	S316/A479	Alloy 20/B473	C276/B574
12. Globe Stem	Hard Chrome-plated S316/A276	Alloy 20/B473	C276/B574
12a. Globe Stem tip	S316/S17400	Alloy 20/B473	C276/B574
13. Regulating Stem	Hard Chrome-plated S316/A276	Alloy 20/B473	C276/B574
14. Body	F316/A182	Alloy 20/B473	C276/B574

Note: 1. wetted parts and lubricants are listed in blue.
2. Nickel anti-seize lubricant for PTFE packed valves, Molybdenum disulfide lubricant for PEEK packed valves, and Fluorinated tungsten disulfide-based lubricant for Grafoil packed valves.



Technical Data

Ratings are for valves with standard PTFE packing. Please refer to valve ratings with optional packing on Page 3.

Valve Material	Stem Designator	Temperature Rating	Pressure Rating @ -53 to 37C (-63 to 100F)
S316, Alloy C276	Globe: -G Regulating:-R	-53 to 232C (-65 to 449F)	6000 psig (413 bar)
Alloy 20		-53 to 232C (-65 to 449F)	5000 psig (344 bar)

Packing Adjustment and Actuation Torque

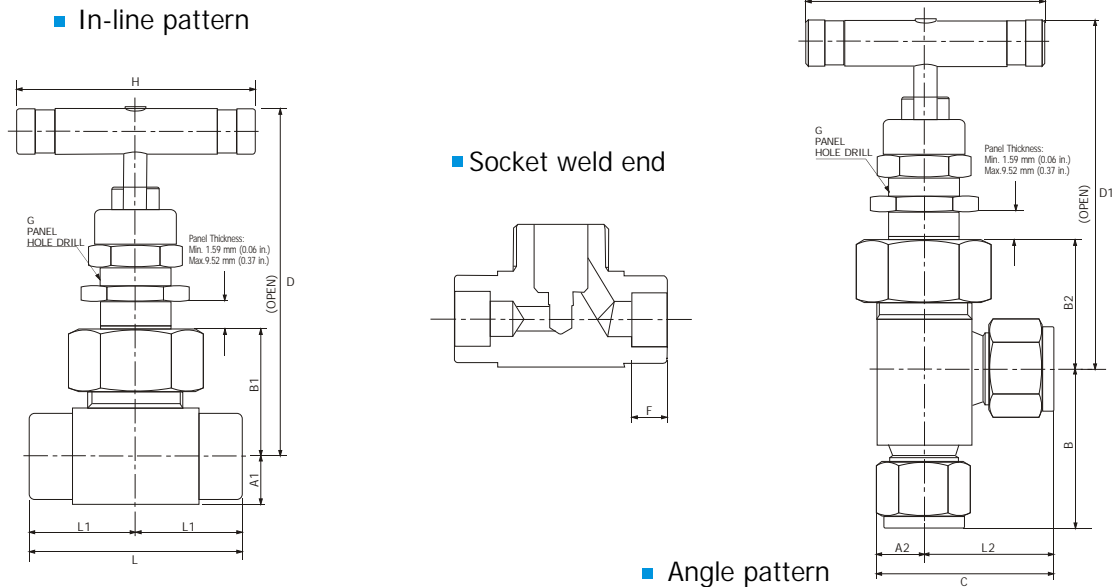
- Extreme temperature fluctuations while valve in service may require packing adjustment.
- Valves that have not been actuated for a period of time may have a higher initial actuation torque.

Factory Test

- Every valve is tested with the nitrogen @ 1000 psig (68 bar) for leakage at the seat to a maximum allowable leak rate of 0.1 scc/min. The packing is tested for no detectable leakage. Optional hydrostatic shell test with additional cost is performed with pure water at 1.5 times the working pressure.

Quality System Approval 	DK-Lok Tube Fitting Certification Listing 	D-Pro Valve Certification Listing 	 V16 Series www.dklok.com www.dklokusa.com
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Ordering Information and Table of Dimensions



Basic Ordering Number	End Connections		Orifice mm (in.)	Cv	Dimensions mm (inch)													
	Inlet	Outlet			L	L1	L2	B	C	B1	B2	A1	A2	H	G	D	D1	F
V16A-	F-2N-	1/8 Female NPT	4.0 (0.156)	0.35	50.8(2.00)	25.4(1.00)	22.6(0.89)	25.4(1.00)	32.3(1.27)	27.7(1.09)	32.5(1.28)	9.7(0.38)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	82.0(3.23)	-
	F-4N-	1/4 Female NPT			52.3(2.06)	26.2(1.03)	22.6(0.89)	25.4(1.00)	32.3(1.27)	27.7(1.09)	32.5(1.28)	9.9(0.39)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	82.0(3.23)	-
	M-4N-	1/4 Male NPT			50.8(2.00)	25.4(1.00)	25.4(1.00)	25.4(1.00)	35.1(1.38)	27.7(1.09)	27.7(1.09)	9.7(0.38)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	77.2(3.04)	-
	MF-4N-	1/4 Male to Female NPT			51.6(2.03)	26.2(1.03)	22.6(0.89)	25.4(1.00)	32.3(1.27)	27.7(1.09)	32.5(1.28)	9.9(0.39)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	82.0(3.23)	-
	D-6M-	6mm Dk-Lok			61.0(2.40)	30.5(1.20)	29.5(1.16)	37.6(1.48)	39.1(1.54)	27.7(1.09)	27.7(1.09)	9.7(0.38)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	77.2(3.04)	-
	D-4T-	1/4 Dk-Lok			61.0(2.40)	30.5(1.20)	29.5(1.16)	37.6(1.48)	39.1(1.54)	27.7(1.09)	27.7(1.09)	9.7(0.38)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	77.2(3.04)	-
	SW-4T-	1/4 TSW			46.2(1.82)	23.1(0.91)	22.4(0.88)	30.2(1.19)	31.8(1.25)	27.7(1.09)	27.7(1.09)	9.7(0.38)	9.7(0.38)	44.4(1.75)	15.1(19/32)	77.2(3.04)	77.2(3.04)	7.1(0.28)
	D-8M-	8 mm Dk-Lok			61.0(2.40)	30.5(1.20)	-	-	-	27.7(1.09)	-	9.7(0.38)	-	44.4(1.75)	15.1(19/32)	77.2(3.04)	-	-
V16B-	F-4N-	1/4 Female NPT	6.4 (0.25)	0.86	57.2(2.25)	28.4(1.12)	25.4(1.00)	28.4(1.12)	38.1(1.50)	34.0(1.34)	37.3(1.47)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	97.0(3.82)	-
	F-6N-	3/8 Female NPT			57.2(2.25)	28.4(1.12)	25.4(1.00)	28.4(1.12)	38.1(1.50)	34.0(1.34)	37.3(1.47)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	97.0(3.82)	-
	D-10M-	10mm Dk-Lok			72.4(2.85)	36.1(1.42)	33.0(1.30)	39.4(1.55)	45.7(1.80)	34.0(1.34)	34.3(1.35)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	93.7(3.69)	94.2(3.71)	-
	D-6T-	3/8 Dk-Lok			71.9(2.83)	35.8(1.41)	32.8(1.29)	42.2(1.66)	45.5(1.79)	34.0(1.34)	31.0(1.22)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	90.7(3.57)	-
	D-12M-	12mm Dk-Lok			77.2(3.04)	38.6(1.52)	35.6(1.40)	41.9(1.65)	48.3(1.90)	34.0(1.34)	34.0(1.34)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	94.0(3.70)	-
	D-8T-	1/2 Dk-Lok			77.2(3.04)	38.6(1.52)	35.6(1.40)	41.9(1.65)	48.3(1.90)	34.0(1.34)	34.0(1.34)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	94.0(3.70)	-
	SW-4P-	1/4 PSW			57.2(2.25)	28.4(1.12)	25.4(1.00)	28.4(1.12)	38.1(1.50)	34.0(1.34)	37.3(1.47)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	97.0(3.82)	9.7(0.38)
	SW-6T-	3/8 TSW			57.2(2.25)	28.4(1.12)	25.4(1.00)	31.8(1.25)	38.1(1.50)	34.0(1.34)	34.0(1.34)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	94.0(3.70)	7.9(0.31)
	SW-8T-	1/2 TSW			57.2(2.25)	28.4(1.12)	25.4(1.00)	25.4(1.00)	38.1(1.50)	34.0(1.34)	35.6(1.40)	12.7(0.50)	12.7(0.50)	63.5(2.50)	19.8(25/32)	94.0(3.70)	95.5(3.76)	9.7(0.38)
V16C-	F-8N-	1/2 Female NPT	11.1 (0.437)	2.20	79.2(3.12)	39.6(1.56)	33.3(1.31)	39.6(1.56)	50.8(2.00)	46.2(1.82)	50.8(2.00)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	126(4.97)	-
	F-12N-	3/4 Female NPT			82.6(3.25)	41.1(1.62)	-	-	-	48.5(1.91)	-	19.8(0.78)	-	88.9(3.50)	26.2(1-1/32)	124(4.88)	-	-
	F-16N-	1" Female NPT			91.9(3.62)	46.0(1.81)	-	-	-	54.1(2.13)	-	25.4(1.00)	-	88.9(3.50)	26.2(1-1/32)	129(5.10)	-	-
	MF-8N-	1/2 Male to Female NPT			79.2(3.12)	39.6(1.56)	33.3(1.31)	39.6(1.56)	50.8(2.00)	46.2(1.82)	50.8(2.00)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	126(4.97)	-
	MF-12N-	3/4 Male to Female NPT			82.6(3.25)	41.1(1.62)	-	-	-	48.5(1.91)	-	19.8(0.78)	-	88.9(3.50)	26.2(1-1/32)	124(4.88)	-	-
	MF-16N-	1" Male to Female NPT			91.9(3.62)	46.0(1.81)	-	-	-	54.1(2.13)	-	25.4(1.00)	-	88.9(3.50)	26.2(1-1/32)	129(5.10)	-	-
	D-12M-	Dk-Lok 12mm			99.6(3.92)	49.8(1.96)	42.7(1.68)	52.8(2.08)	60.2(2.37)	46.2(1.82)	47.8(1.88)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	123(4.85)	-
	D-8T-	1/2 Dk-Lok			99.6(3.92)	49.8(1.96)	42.7(1.68)	52.8(2.08)	60.2(2.37)	46.2(1.82)	47.8(1.88)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	123(4.85)	-
	D-12T-	3/4 Dk-Lok			99.6(3.92)	49.8(1.96)	42.7(1.68)	52.8(2.08)	60.2(2.37)	46.2(1.82)	47.8(1.88)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	123(4.85)	-
	D-16T-	1 Dk-Lok			104(4.09)	51.8(2.04)	-	-	-	47.8(1.88)	-	17.5(0.69)	-	88.9(3.50)	26.2(1-1/32)	121(4.78)	123(4.85)	-
	SW-8P-	1/2 PSW			79.2(3.12)	39.6(1.56)	33.3(1.31)	39.6(1.56)	50.8(2.00)	47.8(1.88)	50.8(2.00)	17.5(0.69)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	123(4.85)	126(4.97)	9.7(0.38)
	SW-8T-	1/2 TSW			79.2(3.12)	39.6(1.56)	33.3(1.31)	42.9(1.69)	50.8(2.00)	46.2(1.82)	47.8(1.88)	15.7(0.62)	17.5(0.69)	88.9(3.50)	26.2(1-1/32)	121(4.78)	123(4.85)	9.7(0.38)
	SW-12T-	3/4 TSW			79.2(3.12)	39.6(1.56)	-	-	-	46.2(1.82)	-	15.7(0.62)	-	88.9(3.50)	26.2(1-1/32)	121(4.78)	-	11.2(0.44)

All dimensions shown are for reference only and are subject to change. Dimensions with Dk-Lok nuts are in finger-tight position. Non-rotating globe pattern stem providing repetitive leak tight shut-off is standard. Patterns: To order Angle Pattern, use A as a suffix to the basic ordering number. Please refer to the ordering information.

Class Ratings

Material groups, Class ratings, and Temperatures are based on ASME codes. The class rating and the pressure rating represent two different design data. Please contact Dk-Lok distributor for further details. Valve minimum wall thickness and additional thickness are determined by ASME codes.

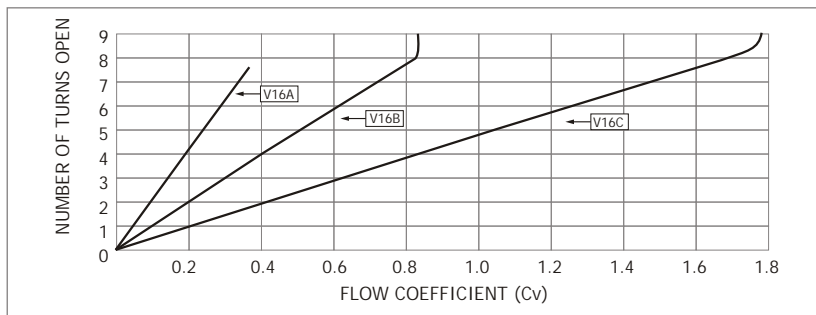
ASME Class	2500		
Material Group	2.2	3.1	3.8
Material Name	S316	Alloy 20	C276
Temperature	Working pressure, psig (bar)		
-53 to 38(-65 to 100F)	6000 (413)	5000 (344)	6000 (413)
93C(200F)	5160 (355)	4350 (299)	6000 (413)
148C(300F)	4660 (321)	4080 (281)	6070 (418)
204C(400F)	4280 (294)	4080 (281)	5880 (405)
260C(500F)	3980 (274)	4080 (281)	5540 (381)
315C(600F)	3760 (259)	4080 (281)	5040 (347)
343C(650F)	3700 (254)	4080 (281)	4950 (347)

Valve ratings with Dk-Lok® end connections

Valve ratings may be limited to the maximum working pressure of pipe ends and tubing connected.

For valve rating with Dk-Lok Tube Fitting end connections, please refer to Dk-Lok catalog providing suggested working pressures for various tubing ODs, materials and wall thicknesses.

Flow Data @ 38°C (100°F) for valves with regulating stem



Non-Rotating Globe Stem Flow Data

Non-rotating globe stem is designed for use in a fully open or fully closed position. Please refer to Cv of Globe Stem in the ordering information and Table of dimensions table on Page 2.

Cv reduction

Valve flow may be reduced by the restriction of pipe and tubing connected.

Valve Ratings with optional Stem Packing

Valves with optional packing may affect the valve rating depending on the valve material. Please see the table below for the rating of valves with optional packing materials. To order valves with factory-assembled optional packing, use the packing material designator from the table below as a suffix. Please refer to ordering information on Page 4.

PEEK PVX (polyetheretherketon) packing is coming with PEEK packing supports. PEEK packing is not for use with normally open or normally closed pneumatic actuating valves.

Grafoil (Flexible Graphite) is a high temperature packing material that requires a load on the material to generate a seal. Grafoil packing is not for use with pneumatic actuating valves.

Stem Packing Material	Packing Material Designator	Valve Material	Temperature Rating	Pressure rating @ max. Temperature* psig (bar)
Standard PTFE	-PE	S316	-53 to 232C (-65 to 449F)	3980 (274)
		Alloy 20	-53 to 232C (-65 to 449F)	4080 (281)
		Alloy C276	-53 to 232C (-65 to 449F)	5540 (381)
Optional PEEK	-PK	S316	-53 to 300C (-65 to 572F)	3760 (259)
		Alloy 20	-53 to 300C (-65 to 572F)	4080 (281)
		Alloy C276	-53 to 300C (-65 to 572F)	5040 (347)
Optional Grafoil	-GF	S316	-53 to 648C (-65 to 1200F)	1545 (106)
		Alloy 20	-53 to 423C (-65 to 793F)	4080 (281)
		Alloy C276	-53 to 648C (-65 to 1200F)	1545 (106)

*Pressure at the maximum temperature information is based on ASME B16 code.

Grafoil rating information: In air, Grafoil upper use temperature is 523C (973F), in steam, Grafoil can go up to the maximum temperature 648C (1200F).

Sour Gas Valves

Cracking of low or high strength materials in the presence of hydrogen sulfide and water in combination with a tensile stress is called sulfide stress cracking (SCC). For use valves in sour gas, materials for wetted components are selected to NACE MR0175. To order, use designator -SG as a suffix to the basic ordering number. Sour Gas valves are available for valves with male & female pipe end connections. Please refer to ordering information below.



Actuators

Pneumatic Air Acuator and Mounting Bracket are available. For details, please contact the authorized Dk-Lok® distributor in your region.

Optional Handles

S316 bar handles are standard. Optional anodized black aluminum bar handles and black colored plastic knob are available. To order valves with factory-assembled optional handle, use the packing material designator below as a suffix. Please refer to ordering information below

AH: Black Aluminum Bar Handle, BK: Black Color Plastic Handle.

Valve Series	Handle Ordering Number for Field Assembly		
	Standard S316 Bar Handle	Black Aluminum Bar Handle	Black Color Plastic Knob
V16A	V16A-BH	V16A-AH	V16A-BK
V16B	V16B-BH	V16B-AH	V16B-BK
V16C	V16C-BH	V16C-AH	V16C-BK

Ordering Information

Select the desired valve basic ordering number, pattern, options and body material.

V16B-D-6T-	A		-R		-S	
V16C-MF-12N-		-GF		-AH	-SG	-L20
Body Pattern Designator	Packing Material Designator	Stem Designator	Handle Designator	Sour Gas Designator	Valve material Designator	
·Nil: In-line Pattern ·A: Angle Pattern	·Nil: PTFE ·PK: PEEK ·GF: Grafoil*	·Nil: Globe Pattern ·R: Regulating Stem	·Nil: S316 bar handle ·AH: Black Aluminum Bar Handle ·BK: Black Color Plastic Knob	·Nil: no Sour Gas ·SG: Sour Gas	·S: S316 ·L20: Alloy 20 ·HC: Alloy C276	

We reserve the right to change specifications stated in this catalog for our continuing program of improvement.

Safe Valve Selection

The selection of a valve for any application or system design must be considered to ensure safe performance. Valve function, valve rating, material compatibility, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. Dk Tech accepts no liability for any improper selection, installation, operation or maintenance.

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Features

Two-piece chevron-style PTFE stem packing design with compensating disc springs

- reduces packing friction wear
- reduces valve operating torque
- reduces load to seal

Packing is supported by lower and upper Glands as well as compensating disc springs

- reduces need for packing adjustment

Temperature and Pressure Ratings

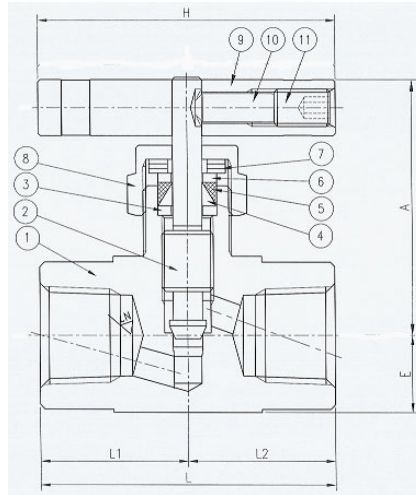
Ratings are based on valves with PFA chevron packing.

Valve Series	Stem	Temperature Rating °C (°F)	Pressure Rating At 38 °C (100°F)
V16A	Vee	-53 to 232 (-65 to 450)	413 bar (6000 psi)
V16B	PCTFE Soft Seat	-53 to 93 (-65 to 200)	

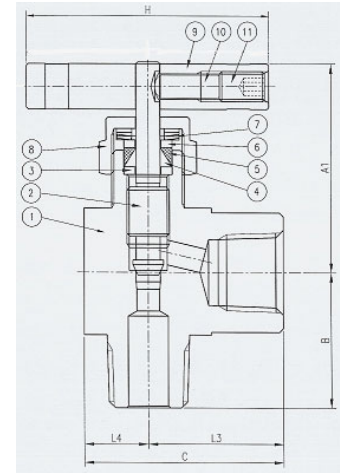
Material of Construction

No.	Component	Material
1	Body	S316L
2	Stem	S316L
3	Lower Gland	S316L
4	Lower Packing	PTFE
5	Upper Packing	PTFE
6	Upper Gland	S316L
7	Packing Springs	17-7PH
8	Gland Nut	S316L
9	Bar Handle	S316
10	Locking Pin	S316
11	Set Screw	S316

Inline pattern



Angle pattern

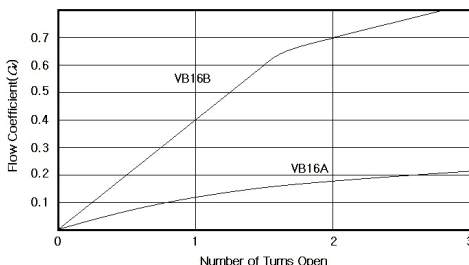


Ordering Information and Table of Dimensions

Unit: mm (in.)

Valve	End Connection		Dimensions, mm (inch)														
	Ordering Number	Inlet	Outlet	A	A1	E	B	L	L1	L2	C	L3	D	H			
VB16A- Cv 0.21 Orifice: 3.2mm (0.125 in.)	F-4N	1/4" Female NPT		41.7 (1.64)	42.2 (1.66)	11.2 (0.44)	25.4 (1.00)	47.8 (1.88)	23.9 (0.94)		36.6 (1.44)	25.4 (1.00)	10.7 (0.42)	44.4 (1.75)			
	M-4N	1/4" Male NPT						49.3 (1.94)	24.6 (0.97)								
	F-4R	1/4" Female ISO 7/1						47.8 (1.88)	23.9 (0.94)								
	MF-4N	1/4" Male NPT	1/4" Female NPT			26.2 (1.03)		48.5 (1.91)	24.6 (0.97)	23.9 (0.94)	36.6 (1.44)	25.4 (1.00)					
	D-4T	1/4" Dk-Lok			42.2 (1.66)	11.2 (0.44)	29.5 (1.16)	62.5 (2.46)	31.2 (1.23)		39.9 (1.57)	28.7 (1.13)					
	MD-4N4T	1/4" Male NPT	1/4" Dk-Lok			25.4 (1.00)		-	-	-							
VB16B- Cv 0.73 Orifice: 6.4mm (0.250 in.)	F-6N	3/8" Female NPT		58.7 (2.31)	-	-	-	71.4 (2.81)	31.8 (1.25)		-	35.8 (1.41)	16.8 (0.66)	64.0 (2.52)			
	F-8N	1/2" Female NPT			58.7 (2.31)	16.8 (0.66)	35.8 (1.41)				52.3 (2.06)						
	F-8R	1/2" Female ISO 7/1										31.8 (1.25)					
	MF-6N	3/8" Male NPT	3/8" Female NPT		58.7 (2.31)	16.8 (0.66)	31.0 b (1.22)					52.3 (2.06)			35.8 (1.41)		
	MF-8N	1/2" Male NPT	1/2" Female NPT				35.8 (1.41)				64.8 (2.55)	33.0 (1.30)			31.8 (1.25)	35.6 (1.40)	
	MF-12N8N	3/4" Male NPT	1/2" Female NPT								63.5 (2.50)	31.8 (1.25)					
	D-6T	3/8" Dk-Lok									78.2 (3.08)	39.1 (1.54)					
	D-8T	1/2" Dk-Lok									83.8 (3.30)	41.9 (1.65)					

Flow Coefficient at Turns Open



Flow Data

Cv are measured at the valve. Therefore restrictions in end connections may reduce flow.

Factory Test

Every valve is tested with the nitrogen @68 bar (1000 psig) for leakage at the seat to a maximum allowance leak rate of 0.1 scc/min. The stem packing is tested for no detectable leakage.

Dk Tech Corporation

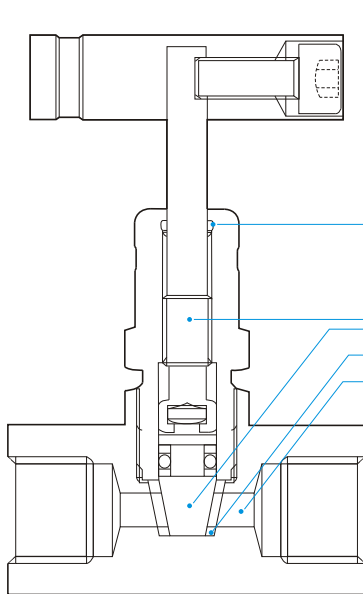
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D-Pro

V96 Series Rising Plug Valves

Valves for Pressure Ratings up to 6000 psig
Catalog No. V96-2 Oct. 2003

Design Features



- Internal bonnet O-ring protects threads from external contamination
- Isolated threads located above sealing packing prevents media contamination and thread lubricant washout
- Non-rotating Stem Tip for positive sealing and maximum soft seat life
- Replaceable seat design: DELRIN seat standard, optional PEEK and PFA
- Straight-through orifice, hence roddable for easy cleaning

Materials of Construction

Component	Material / ASTM Specification
Handle	S316 / A276
Wiper O-ring	Fluorocarbon FKM
Bonnet	S316 / A276
Lock Nut	S316 / A276
Stem Shank	S316 / A564
Stem tip	S316 / A276
O-ring	Fluorocarbon FKM
Backup Rings	PTFE/D1710
Seat	DELRIN, optional PEEK, PFA
Body	S316 / A479

Wetted components are listed in bold letters.
Lubrication: Fluorocarbon base on threads, silicone base on soft parts

Technical Data

Ratings are based on valves with fluorocarbon FKM O-rings and PTFE backup rings.

Valve Material	Seat Material		Valve Temperature Rating, F(C)	Pressure Rating at 100F(37C), psig (bar)	Pressure Rating at 400F(204C), psig (bar)
	Material	Designator			
S316	Standard DELRIN	DL	-20 to 250 (-28 to 121)	6000 (413)	N/A
	Optional PEEK	PK	-20 to 400 (-28 to 204)		1000 (68.9)
	Optional TFE PFA	PA		750 (52)	100 (6.8)

S316 Valve Pressure-Temperature Ratings

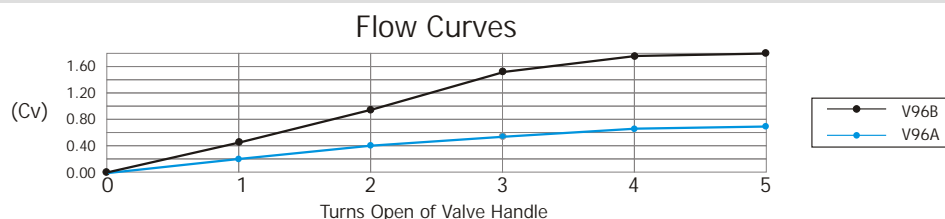
with standard Delrin seat

Temperature, F(C)	Working Pressure
-65 to 100 (-53 to 37)	6000 psig (413 bar)
200 (93)	2650 psig (182 bar)
250 (121)	1000 psig (68.9 bar)

Optional Stem O-ring

O-ring Material	Designator	Temperature Rating F(C)
Buna-N	BN	-28 to 121 (-20 to 250)
EPDM	EP	
Kalrez	KZ	-28 to 204 (-20 to 400)

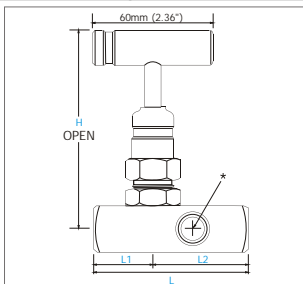
Flow Coefficiency at 100F(37C)



Testing

Every valve is factory tested with the nitrogen @ 1000 psig (68 bar) for leakage at the seat to a maximum allowable leak rate of 0.1 scc/min. Stem seals are tested to a requirement of no detectable leakage using a liquid leak detector.

Ordering information



Gage Port Model:
V96-G4- and V96-G8-



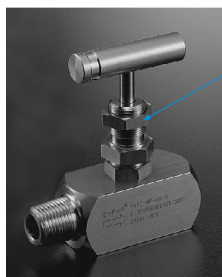
Standard Model

Ordering Number	End Connections		Orifice mm(in.)	Cv	Dimensions, mm(in.)				
	Inlet	Outlet			L	L1	L2	H	
V96A-	F-4N	1/4" Female NPT		4.8	0.63	56.9 (2.24)	28.4 (1.12)	95.8 (3.77)	
	MF-4N	1/4" Male NPT	1/4" Female NPT			73.4 (2.90)	45.2 (1.78)		28.4 (1.12)
	MF-8N4N	1/2" Male NPT	1/4" Female NPT			76.5 (3.01)	48.0 (1.89)		28.4 (1.12)
V96A-G4-*	F-4N	1/4" Female NPT		(-0.187)	0.63	72.9 (2.87)	28.4 (1.12)	44.4 (1.75)	
	MF-8N4N	1/2" Male NPT	1/4" Female NPT			124 (4.87)	79.2 (3.12)		44.4 (1.75)
	F-8N	1/2" Female NPT				67.6 (2.66)	33.8 (1.33)		97.3 (3.83)
MF-8N	1/2" Male NPT	1/2" Female NPT	88.6 (3.49)	54.9 (2.16)	33.8 (1.33)				
MF-12N8N	3/4" Male NPT	1/2" Female NPT	90.9 (3.58)	33.8 (1.33)	57.2 (2.25)				
V96B-G8-*	F-8N	1/2" Female NPT		6.4 (-0.25)		1.8	142 (5.58)	84.6 (3.33)	
	MF-8N	1/2" Male NPT	1/2" Female NPT				90.9 (3.58)	33.8 (1.33)	57.2 (2.25)
	MF-12N8N	3/4" Male NPT	1/2" Female NPT		142 (5.58)		84.6 (3.33)	57.2 (2.25)	

All dimensions shown are for reference only and are subject to change.

* - G4- for 1/4" Female NPT gage ports, and -G8- for 1/2" Female NPT gage ports.

* Gage port models with extended body allowing 50.8mm(2.0") pipe insulation are listed in bold letter



Panel Mounting option

Panel Hole drill size is 19.8mm (25/32") and Max. panel thickness is 12.7mm (1/2"). To order, use -PM as a suffix to the valve ordering number. Example: V96A-F-4N-PM

Sour Gas Service option

Materials are selected in accordance with NACE MR0175 and wetted stainless steel parts are annealed. To order, use -SG as a suffix to the ordering number. Example: V96A-F-4N-SG

How to order

Select valve ordering number, and applicable options from designators listed below.

Example : V96A-F-4N

-PK **-EP** **-PM** **-SG** **-S**

Seat Designator	O-ring Designator	Panel mounting Designator	Sour Gas Service Designator	Body Material Designator
Nil: DELRIN PK: PEEK PA: Teflon PFA	Nil: FKM O-ring EP: EPDM KZ: Kalrez	PM: Panel Mounting	SG: Sour Gas	S: S316

Safe Valve Selection

The selection of a valve for any application or system design must be considered to ensure safe performance. Valve function, valve rating, material compatibility, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. Dk Tech accepts no liability for any improper selection, installation, operation or maintenance.

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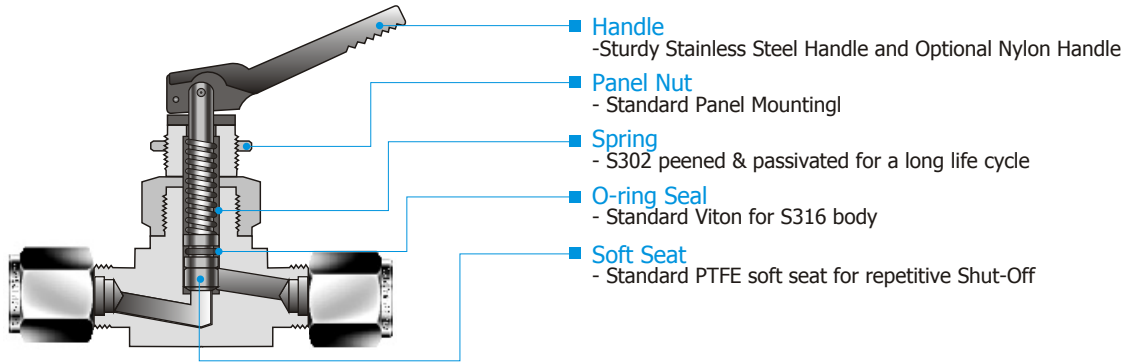


V103 Series Toggle Valves

Forged body, Pressure Ratings up to 300 psig

Catalog No. V103-2
May. 2004

Toggle Valves for Quick Shut-Off



Design

D-Pro Toggle Valves are designed to instantaneously open and close the flow of fluids, Gases or vacuum applications
 D-Pro Toggle Valves are ideally suited for use in gas sampling and analysis systems as well as test equipment
 Standard S316 and Brass construction and Standard Forged Body with Inline and Angle pattern Panel mounting is standard
 This valve is O-ring sealed to eliminate leakage and maintenance. The O-ring is positioned between the operating mechanism and the seat, and the seals protect the mechanism from contamination.

Factory test

Every Valve is factory tested at 200 psig (13 bar) with nitrogen for leakage at the seat and seal.

Technical Data

Pressure and Temperature Ratings

Valve Body	Orifice Size	Pressure rating @37 C (100)	Temperature Rating
V103A	2.0mm	300psig	-28 C to 93 C (-20 F to 200 F)
V103B	3.2mm		
V103C	6.4mm	200psig	

These Temperature and Pressure Ratings are for valves with standard Stem Seal and Stem tip. Optional O-Seal shall affect the temperature Ratings.

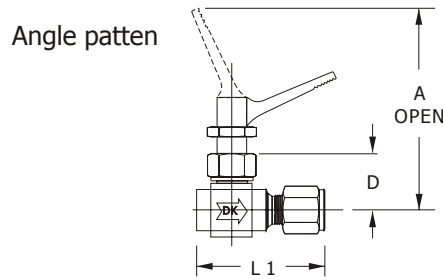
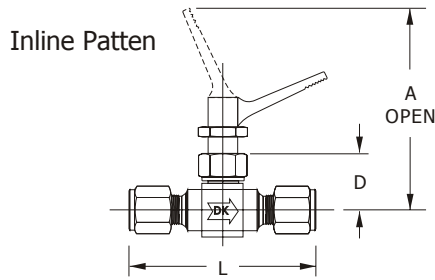
For Materials of Construction
 Wetted parts are listed in bold letters
 Viton - TM Dupont

Materials of Construction

Parts	Materials	
	S316	Brass
Body	S316	Brass
packing nut	S316	brass
spring	Stainless steel	Stainless steel
stem seal	Viton	Buna-n
stem	S316	
stem washer	Stainless Steel	
handle	Standard Stainless Optinal Nylon	
stem tip	PTFE	
panel nut	S316	Brass

Optional Stem O-ring Seals

Viton O-ring is standard for S316 body and Buna-N is standard for Brass body. Optional O-ring materials for low and high temperature service are available. Valves for low temperature service -53 C to 93 C (-65 F to 200 F), Buna-C O-ring ,and Valves for high temperature -30 C to 316 C (-30 F to 600 F), Kalrez O-ring is recommended. Copyright 2002, Dk-Tech Co, Ltd. All Right Reserved.



Ordering information and table of dimensions

valve ordering Number	End Connection		Oriifice		Cv	Dimensions (mm)				
	inlet	outlet	mm	In		L	L1	A	D	
V103A	M-2N	1/8" Male NEPT	2.0	0.080	0.11	38	27	73	23	
	D-2T	1/8" Dk-Lok	2.0	0.080	0.11	50	33	73	23	
	D-3M	3mm DK-Lok	2.0	0.080	0.11	50	33	73	23	
	MD-2N2T	1/8" Male NPT	2.0	0.080	0.11	44	33	73	23	
V103B	F-2N	1/8" Female NPT	1/8" Dk-Lok	3.2	0.125	0.20	41	30	71	22
	M-2N	1/8" Male NPT		3.2	0.125	0.20	44	32	71	22
	M-4N	1/4" Male NPT		3.2	0.125	0.20	50	35	71	22
	D-4T	1/4 Dk-Lok		3.2	0.125	0.20	57	38	71	22
	D-6M	6mm Dk-Lok		3.2	0.125	0.20	57	38	71	22
	D-8M	8mm Dk-Lok		3.2	0.125	0.20	56	37	71	22
	MF-2N	1/8" Male NPT	1/8" Female NPT	3.2	0.125	0.20	41	30	71	22
	MD-4N4T	1/4" Male NPT	1/4" Dk-Lok	3.2	0.125	0.20	54	38	71	22
V103C	F-4N	1/4" Female NPT		6.4	0.250	0.70	54	40	90	27
	M-6N	3/8" Male NPT		6.4	0.250	0.70	57	41	90	27
	D-6T	3/8" Dk-Lok		6.4	0.250	0.70	66	45	90	27
	D-8T	1/2" Dk-Lok		6.4	0.250	0.70	71	49	90	27
	D-10M	10mm Dk-Lok		6.4	0.700	0.70	69	48	90	27
	D-12M	12mm Dk-Lok		6.4	0.700	0.70	74	50	90	27

All dimensions shown are for reference only and are subject to change. Dimensions with Dk-Lok nuts are in finger-tight position. Patterns: To order angle pattern, use -A as a suffix to the valve ordering number. Example: V103A-M-2N-A

How To Order

Select applicable Valve pattern, O-ring and body material designators listed below.

Valve Pattern	O-ring Designator	Body Mataterial
<ul style="list-style-type: none"> • Nil : Inline pattern • A : Angle pattern 	<ul style="list-style-type: none"> • Nil : Viton o-ring for S316 body Buna-N for Brass body • Kz : Kalrez • Bc : Buna-C 	<ul style="list-style-type: none"> • S : S316 • B : Brass

Example : V103A-M-2N-S for Inline pattern, Standard Viton O-ring and S316 body
V103A-M-2N-A-KZ-S for angle pattern, Kalrez O-ring and S316 body

We reserve the right to change specifications stated in this catalog for our continuing program of improvement.

Safe Valve Selection

The selection of a valve for any application or system design must be considered to ensure safe performance. Valve function, valve rating, material compatibility, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. Dk Tech accepts no liability for any improper selection, installation, operation or maintenance.

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VEX110 Needle Valves

Standard Sturdy Bar Handle
Maximum Working Pressure 10 000 psig (689 bar)

Spec. sheet #: VEX110-5

September, 2004

Features

- Premium four (4) sealing mechanism for severe service.
- Unique pressure reacting self-adjustable sealing design eliminates the need of packing adjustment during service.
- Sealing cup swells up in system pressure for full sealing contact in the bonnet.
- Backseat stem design prevents stem blowout.
- High precision machining provides low valve operating torque.
- Stem packing below the threads prevents thread lubricant washout and media contamination.

Temperature and Pressure Ratings

Valve Material	Optional Valve O-ring Designator	Standard Sealing Cup Material	Temp. Rating °C (°F)	Pressure Rating @ 38 °C (100°F)
S316	KZ*	PEEK	- 30 ~ 250 (-22 ~ 482)	689 bar (10 000 psi)
	VT*		-30~204 (-22 ~399)	

*KZ: Kalrez (Perfluoroelastomer), TM Dupont

*VT: Viton (Vinylidene fluoride-based fluoroelastomer), TM Dupont

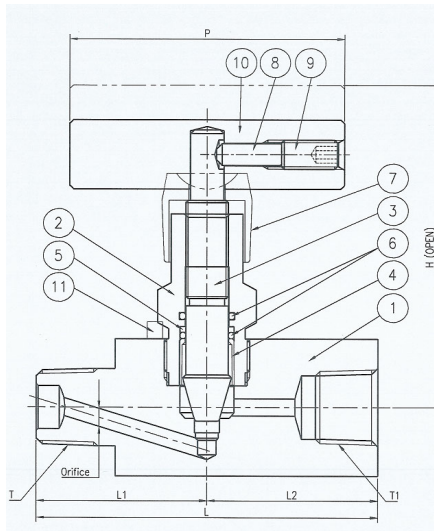
Material of Construction

#	Component	Material / ASTM
1	Body	S316/ A479, A276
2	Bonnet	S316/ A479, A276
3	Stem	S316/ A479, A276
4	Sealing Cup	Standard
5	Packing	Polyetheretherketon-PEEK
6	Upper & Lower O-ring seal	Kalrez or Viton
7	Handle guide	Poly Oxy Methylene-Copolymer- POM C
8	Handle pin	S316/ A479, A276
9	Set screw	
10	Bar Handle	
11	Bonnet Locking Pin	

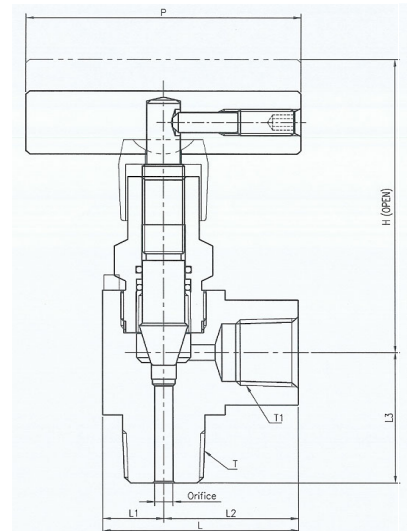
Lubrication: Molybdenum disulfide lubricant

Note: 1. Wetted components are marked in **blue**.
2. Sealing system is marked in **Red**.

In-line pattern



Angle pattern



Ordering Information and Table of Dimensions

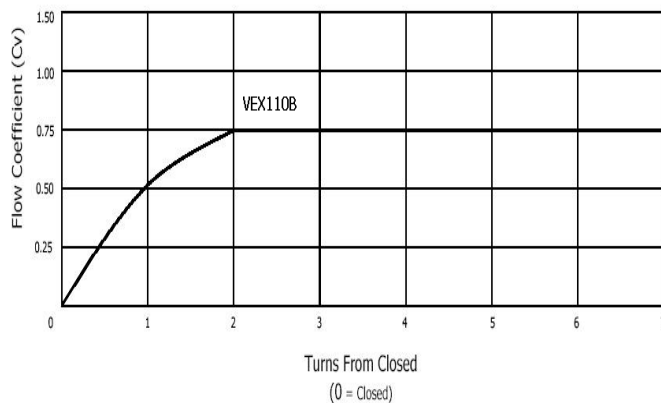
Basic Ordering Number		End Connections		Orifice mm (in.)	Cv	Dimensions, mm (inch)					
		Inlet	Outlet			L	L1	L2	L3	H	P
In-line pattern VEX 110B-	MF-4N-*-S	1/4" Male NPT	1/4" Female NPT	4.76 (0.19)	0.75	88.9 (3.5)	44.45 (1.75)	44.45 (1.75)	-	90.0 (3.54)	71.5 (2.81)
	MF-8N-*-S	1/2" Male NPT	1/2" Female NPT			88.9 (3.5)	44.45 (1.75)	44.45 (1.75)	-	90.0 (3.54)	71.5 (2.81)
Angle pattern VEX 110B-	MF-4N-A-*-S	1/4" Male NPT	1/4" Female NPT			88.9 (3.5)	44.45 (1.75)	44.45 (1.75)	-	90.0 (3.54)	71.5 (2.81)
	MF-8N-A-*-S	1/2" Male NPT	1/2" Female NPT			50.8 (2.0)	15.87 (0.62)	34.93 (1.38)	36.6 (1.44)	90.0 (3.54)	71.5 (2.81)

*Ordering information

To order valve with Viton o-ring, insert the designator "VT" to the valve ordering number. Example: VEX110B-MF-4N-VT-S.

To order valve with Kalrez o-ring, insert the designator "KZ" to the valve ordering number. Example: VEX110B-MF-8N-A-KZ-S

Flow Coefficient at Turns Open



Flow Data

Cv is measured at the valve. Restrictions in end connections may reduce the flow.

Factory Test

Every valve is tested with the nitrogen @ 68 bar (1000psig) at the seat to a maximum allowable leak rate of 0.1 scc/min. The packing is tested for no detectable leakage.



Model Shown: Angle Pattern
VEX110B-MF-8N-A-VT-S



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