



VT86 Series Trunnion Ball Valves

VT86 Series Pressure Rating up to 413bar (6000 psig)
 VTH86 Series pressure Rating up to 689bar (10 000psig)

Catalog No VT86-3
 March 2009



VT86 Series 2-Way



VTH86 Series 2-Way

Features

- The Trunnion ball design is featured by cylindrical extensions at the top and bottom of the ball.
- The trunnion prevents the ball from shifting and permits the ball to rotate on a vertical axis.
- Integral ball stem machined from single piece of bar stock eliminates the backlash during handle actuation.
- Blowout-proof, bottom-loaded trunnion ball
- Panel mounting nut is standard permitting valve to panel or actuator.

Technical Data

Valve Series	Seat Material	Temperature Rating	Pressure Rating at 37 °C (100 °F)
VT86	PCTFE	-17 to 121 °C 0 to 250 °F	413bar (6000psig)
	PEEK	-17 to 204 °C	413bar (6000psig)
	PTFE	0 to 399 °F	103bar (1500psig)
VTH86	PEEK	-17 to 204 °C 0 to 399 °F	413 to 689bar (6000 to 10 000psig)

- Valves that have not been actuated for a period of time may have a higher initial actuation torque.
- VT86 Series ball valves are designed to control fluid in full open and full closed position.

VT86 Series Pressure- Temperature Ratings

Body material		316 Stainless steel					
Seat material		PCTFE		PTFE		PEEK	
Temperature		bar	psig	bar	psig	bar	psig
°C	°F	Working Pressure					
-17 to 37	0 to 100	413	6000	103	1500	413	6000
65	150	206	3000	77.5	1125	399	5800
93	200	137	2000	51.6	750	344	5000
121	250	69	1000	43	625	282	4100
148	300			34.4	500	220	3200
176	350			25.8	375	158	2300
204	399			17.2	250	96.4	1400

VTH86 Series Pressure-Temperature Ratings

Body material		316 Stainless steel											
End connection	DK-LOK	6M, 1/4 in.	8M	12M	3/8 in.	1/2 in.	10M						
Seat Material	Female NPT	1/8, 1/4 in.	-	-	-	-	-	PEEK					
Temperature		Working Pressure											
°C	°F	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig
-17 to 37	0 to 100	689	10000	516	7500	454	6600	447	6500	461	6700	413	6000
65	150	516	7500	516	7500	454	6600	447	6500	461	6700	406	5900
93	200	344	5000	344	5000	344	5000	344	5000	344	5000	344	5000
121	250	282	4100	282	4100	282	4100	282	4100	282	4100	282	4100
148	300	220	3200	220	3200	220	3200	220	3200	220	3200	220	3200
176	350	158	2300	158	2300	158	2300	158	2300	158	2300	158	2300
204	400	96.4	1400	96.4	1400	96.4	1400	96.4	1400	96.4	1400	96.4	1400

Factory Test

Every valve is factory tested with nitrogen gas at 68.9bar (1000psig) for leakage to a maximum allowable leak rate of 0.1 SCCM at seat. Hydraulic shell test is optionally performed at 1.5 times the working pressure to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and packaging

Every valve is cleaned and packaged in accordance with DK cleaning standard DC-01.

ECE R110 Manual Valves

- Classification: Class 0
- Service Pressure: 200 bar (2900 psig)
- Working Pressure: 260 bar (3770 psig)
- Temperature: -40 to 85°C (-40 to 185°F)



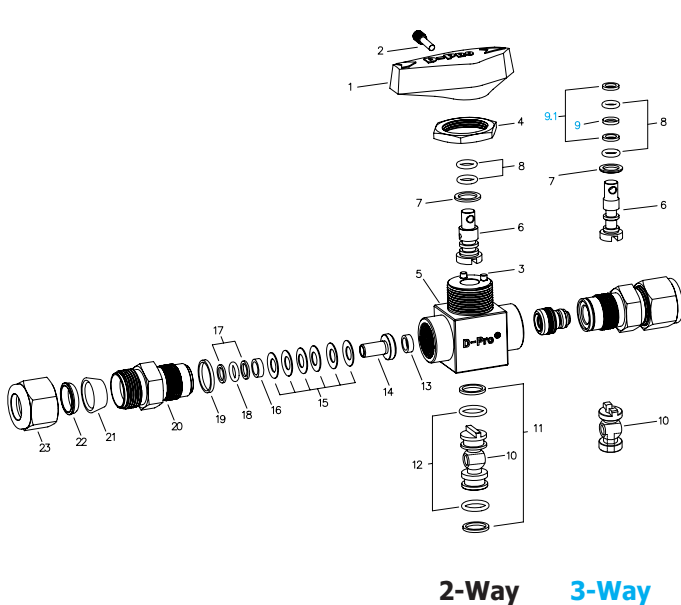
VCT86/VCT863 series CNG ball valves

VCT86 valve provides leak-tight integrity in both low and high pressure systems. VCT86 series standard PAI seat and HNBR O-ring are compatible with CNG application.

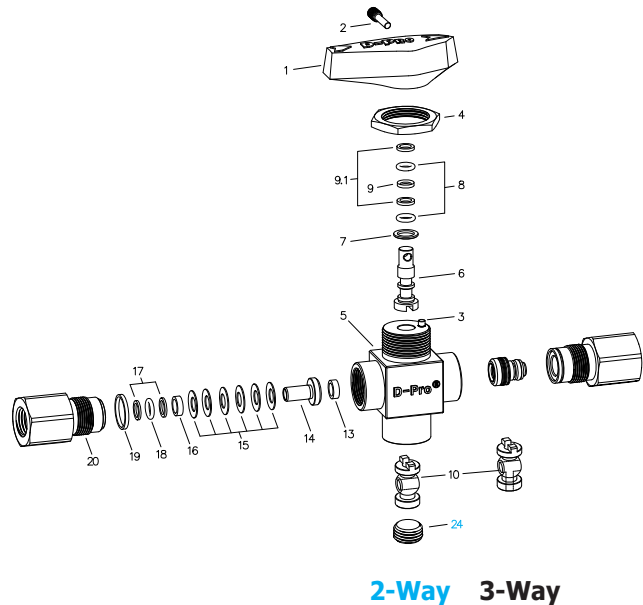
- End Connections:
- Dk-Lok tube port 6 to 12mm OD (1/4 to 1/2 in. OD)
 - Pipe Thread 1/4 to 1/2 in.

VT86 Series

VTH86 Series



2-Way 3-Way



2-Way 3-Way



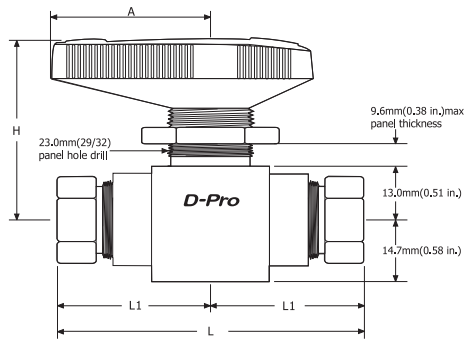
6. Stem:

A flow direction on top of the stem helps set a direction of the valve when handle is removed for panel mounting.

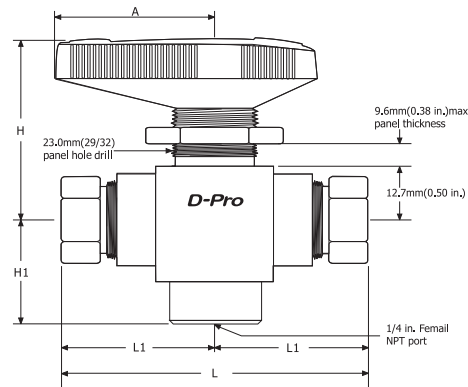
Materials of Construction

Component	VT86		VTH86	
	2-Way	3-Way	2-Way	3-Way
	Grade/ASTM Specification			
1. Handle	Nylon with brass insert			
2. Set screw	SS316/A276			
3. Stop pin (2-Way: 2ea, 3-Way: 1ea)	Stainless steel 316			
4. Panel nut	SS316/A479 or A276			
5. Body	SS316/A479 or A276			
6. Stem	SS316/A479 or A276			
7. Stem bearing	PEEK			
8. Stem O-rings (2)	FKM O-ring (HNBR for VCT86/VCT863 Series)		FKM O-ring	
9. Stem support ring	-	PEEK		
9.1. Stem backup rings (2)	-	PTFE/D1710, type 1		
10. Trunnion ball	SS316/A479 or A276			
11. Trunnion ball back-up rings (2)	Reinforced PTFE		-	
12. Trunnion ball O-rings (2)	FKM O-ring (HNBR for VCT86/VCT863 series)		-	
13. Seats (2)	Standard PCTFE, optional PTFE, PEEK (PAI for VCT86/VCT863 Series)		PEEK	
14. Seat carriers (2)	SS316/A479 or A276			
15. Seat springs (12)	Alloy X-750/AMS 5542			
16. Seat carrier guides (2)	SS316/A479 or A276			
17. Seat carrier back-up rings (4)	Reinforced PTFE			
18. Seat carrier O-rings (2)	FKM O-ring (HNBR for VCT86/VCT863 Series)		FKM O-ring	
19. End screw seals (2)	PTFE/D1710, type 1			
20. End connectors (2)	SS316/A479 or A276			
21. Front ferrules (2)	SS316/A479 or A276			
22. Back ferrules (2)	SS316/A479 or A276			
23. Nuts (2)	SS316/A479 or A276			
24. Plug	-	SS316/A479 or A276		-

- Wetted components and lubricants are listed in **BLUE**.
- Lubricants: Molybdenum disulfide and fluorinated based.



2-Way



3-Way

Ordering Information and Table of Dimensions

VT86 Series Basic Ordering Number	Cv	Orifice mm (in.)	VT86 Series Basic Ordering Number	Cv	Orifice mm (in.)	End Connection	Dimensions, mm (in.)							
							L	L1	H	H1	A			
2-Way														
VT86- VCT86-	F2N-	1.2	VTH86-	F2N-	1.2	1/8 in. Female NPT	74.7 (2.94)	37.3 (1.47)	48.0 (1.89)	-	38.0 (1.50)			
	F4N-	1		F4N-	1	1/4 in. Female NPT	99.8 (3.93)	50.0 (1.97)		-				
	F8N-	1.2		-	-	1/2 in. Female NPT	108 (4.25)	54.1 (2.13)		-				
	D4T-	1.6		D4T-	1.6	1/4 in. DK-LOK	105 (4.14)	52.6 (2.07)		-				
	D6T-	1.4		D6T-	1.4	3/8 in. DK-LOK	112 (4.39)	55.6 (2.19)		-				
	D8T-	1		D8T-	1	1/2 in. DK-LOK	117 (4.60)	58.4 (2.30)		-				
	D6M-	1.6		D6M-	1.6	6mm DK-LOK	105 (4.14)	52.6 (2.07)		-				
	D8M-	1.5		D8M-	1.5	8mm DK-LOK	105 (4.15)	52.6 (2.07)		-				
	D10M-	1.3		D10M-	1.3	10mm DK-LOK	112 (4.41)	55.9 (2.20)		-				
	D12M-	1		D12M-	1	12mm DK-LOK	117 (4.60)	58.4 (2.30)		-				
3-Way														
VT863- VCT863-	F2N-	0.75	VTH863-	F2N-	0.75	1/8 in. Female NPT	74.7 (2.94)	37.3 (1.47)	48.0 (1.89)	26.9 (1.06)	38.0 (1.50)			
	F4N-			-		1/4 in. Female NPT	74.7 (2.94)	37.3 (1.47)						
	-			F4N-		1/4 in. Female NPT	99.8 (3.93)	50.0 (1.97)						
	D4T-			D4T-		1/4 in. DK-LOK	105 (4.14)	52.6 (2.07)						
	D6T-			D6T-		3/8 in. DK-LOK	112 (4.39)	55.6 (2.19)						
	D8T-			D8T-		1/2 in. DK-LOK	117 (4.60)	58.4 (2.30)						
	D6M-			D6M-		6mm DK-LOK	105 (4.14)	52.6 (2.07)						
	D8M-			D8M-		8mm DK-LOK	105 (4.15)	52.6 (2.07)						
	D10M-			D10M-		10mm DK-LOK	112 (4.41)	55.9 (2.20)						
	D12M-			D12M-		12mm DK-LOK	117 (4.60)	58.4 (2.30)						

All dimensions shown are for reference only and are subject to change. Dimension with DK-LOK nuts are in finger-tight position.

* **CNG valve ordering number** : basic ordering numbers listed in blue represents VCT86/VCT863 as well as VC86/VC863.

Flow Rate

VT86 series Flow Data @21 °C (70 °F)

Pressure Drop to Atmosphere (P) in bar (psig)	3-Way			2-Way			
	Cv 0.75	Cv 1	Cv 1.2	Cv 1.3	Cv 1.4	Cv 1.5	Cv 1.6
Water	0.68 (10)	9.0(2.4)	12.1 (3.2)	14.3 (3.8)	15.5 (4.1)	17.8 (4.4)	17.8 (4.7)
U.S.GPM (std L/min)	3.4 (50)	20.0 (5.3)	26.8 (7.1)	32.1 (8.5)	34.8 (9.2)	37.4 (9.9)	40.1 (10.6)
Air	6.8 (100)	28.3 (7.5)	37.8 (10.0)	45.4 (12.0)	49.2 (13.0)	53.0 (14.0)	56.7 (15.0)
SCFM (std L/min)	0.68 (10)	226 (8.0)	311 (11.0)	396 (14.0)	424 (15.0)	453 (16.0)	481 (17.0)
	3.4 (50)	651 (23.0)	849 (30.0)	1019 (36.0)	1104 (39.0)	1189 (42.0)	1274 (45.0)
	6.8 (100)	1132 (40.0)	1500 (53.0)	1812 (64.0)	1953 (69.0)	2095 (74.0)	2265 (80.0)

VTH86 series Flow Data @21 °C (70 °F)

Pressure Drop to Atmosphere (P) in bar (psig)	3-Way			2-Way			
	Cv 0.75	Cv 1	Cv 1.2	Cv 1.3	Cv 1.4	Cv 1.5	Cv 1.6
Water	10.3 (150)	34.8 (9.2)	45.4 (12)	56.7 (15)	60.5 (16)	64.3 (17)	68.1 (18)
U.S.GPM (std L/min)	41.3 (600)	69.1 (18)	94 (25)	109 (29)	121 (32)	128 (34)	140 (37)
Air	68.9 (1000)	90.8 (24)	143 (38)	143 (38)	155 (41)	166 (44)	178 (47)
SCFM (std L/min)	10.3 (150)	1614 (57)	2152 (76)	2805 (92)	2803 (99)	3029 (107)	3256 (115)
	41.3 (600)	5946 (210)	8070 (285)	9627 (340)	10 505 (371)	11 298 (399)	12 119 (428)
	68.9 (1000)	9912 (350)	13 308(470)	16 140 (570)	17 272 (610)	18 688 (660)	19 821 (700)

Options

VT86 Series 2-Way External Vent Options

A downstream or upstream vent option on VT86 series 2-Way ball is available. The external vent port is constructed on the trunnion ball. The vent does not activate when the valve is in open position. But the pressure rating with the vent port is reduced to 34.4bar (500 psig).

Downstream Vent (Ordering designator - DV)



When a downstream vent valve is closed, full shutoff at the upstream seat occurs. Downstream system media flows through the vent hole in the trunnion ball and vents to atmosphere through the bottom of the trunnion ball.

Upstream Vent (Ordering designator - UV)



When an upstream vent valve is closed, full shut-off at the downstream seat occurs. Upstream system media flows through the vent hole in the trunnion ball and vents to atmosphere through the bottom of the trunnion ball.

Low Temperature Service Ball Valves

VT86 and VTH86 series ball valves are applicable to a temperature rating of -40 to 93 °C (-40 to 200 °F). Low-temperature valves have low-temperature O-rings. All other materials remain same as those of standard valves. To order low-temperature service valve, insert designator **L** in the applicable valve ordering number. Examples: VTL86-D4T-S, VTHL86-D4T-S.

VTL86 Series Pressure-Temperature Ratings

Body Material	SS316	
Seat Material	PCTFE, PEEK	PTFE
Temperature	Working Pressure	
-40 to -17 °C (-40 to 0 °F)	413bar 6000psig	103bar 1500psig

VTHL86 Series Pressure-Temperature Ratings

Body Material		SS316					
End Connection	DK-LOK Female NPT	6M, 1/4 in. 1/8 in, 1/4 in.	8M -	12M -	3/8 in. -	1/2 in. -	10M -
Temperature		Working Pressure					
-40 to -17 °C (-40 to 0 °F)		689bar 10 000psig	516bar 7500psig	454bar 6600psig	447bar 6500psig	461bar 6700psig	413bar 6000psig

How to Order

Select applicable valve basic ordering number, options and body material designator listed below.

Seat Materials	Seat Materials	External Vent Options	Body Material	Complete Ordering Number Examples
Nil: Standard PCTFE for VT86 Series Nil: Standard PEEK for VTH86 Nil: Standard PAI for VCT86, VCT863 Series ● PC: PCTFE ● PK: PEEK ● PE: PTFE	● FKM is standard for VT86 and VTH86 series ● HNBR is standard for VCT86 and VCT863 series	● DV: Downstream Vent ● UV: Upstream Vent Note: 1. Vent option available only on VT86 series 2-Way ball valves. 2. Vent option is not applicable to Low Temperature service valve.	● S: 316 Stainless steel	VT86-D4T-PE-DV-S VTH863-D4T-PC-S VCT86-F4N-S

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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