

VT86 Series Trunnion Ball Valves

No.VT86-4 June 2013

VT86 Series Pressure Rating up to 413bar (6,000 psig) VTH86 Series pressure Rating up to 689bar (10,000 psig) VCT86 Series CNG/NGV Valves



Features

- The Trunnion ball valve is featured by blowout-proof design with 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.
- Panel mounting nut is standard permitting valve to panel or actuator.

Technical Data

Valve Series	Seat Material	Temperature Rating °C (°F)	Pressure Rating at 37 °C (100°F)
	PCTFE	-17 to 121 (0 to 250)	413bar (6,000psig)
VT86	PEEK	- 17 to 232	413bar (6,000psig)
	PTFE	(0 to 450)	103bar (1,500psig)
VTH86	PEEK	-17 to 232 (0 to 450)	413 to 689bar (6,000 to 10,000psig)

Operation

- 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.

Factory Test

Every valve is factory tested with nitrogen gas at 68.9bar (1,000psig) 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-Lok cleaning standard DC-01. Special cleaning and packaging in accordance with DK-Lok standard DC-11 ensures compliance with product cleaning of ASTM G93 Level C is available on request for valves with PCTFE and PTFE seats.

CNG/NGV Certifications

VCT86 and VCT863 Series valve provides leak-tight integrity in both low and high pressure systems in CNG and NGV applications. Valves with PAI seat and HNBR O-ring are compatible with CNG fluid.

Valve Series	Certificates	ECE R110	ANSI / AGA NGV 3.1-1995 CGV NGV 12.3-M95	ANSI /IAS NGV 4.6-1999 CSA 12.56-M99	ISO 15500
	Certificate No.	110R-000184	2010-REPORT-005 (00)	2010-REPORT-006 (00)	2010-REPORT-004 (00)
VCT86 Series 2-way ball valves	Classification	Class 0	manual valve	manual valve (Class B)	manual valve
	Temperature	-40 to 120 °C (-40 to 250 °F)	- 40 to 121 °C (-40 to 250 °F)	-40 to 65 °C (-40 to 150 °F)	- 40 to 121 °C (-40 to 250 °F)
	Working Pressure	274 bar @ 120 °C	273 bar @ 121 °C	293 bar @ 65 ℃	273 bar @ 121 °C
	Certificate No.	110R-000185	2010-REPORT-011 (00)	2010-REPORT-012 (00)	2010-REPORT-010 (00)
VCT863 Series	Classification	Class 0	manual valve	manual valve (Class B)	manual valve
3-way ball valves	Temperature	40 to 120 ℃	- 40 to 121 °C	-40 to 65 °C	- 40 to 121 °C
	Working Pressure	274 bar @ 120 ℃	273 bar @ 121 °C	293bar @ 65 °C	273 bar @ 121 °C













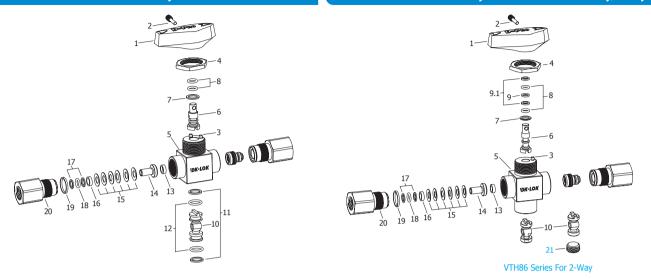






VT86 / VCT86 Series For 2-Way

VT86 / VCT86 Series For 3-Way & VTH86 Series For 2-Way, 3-Way





3-Way valve with an arrow marking on the top of 6. stem.

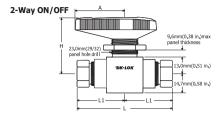
The arrow marking helps set a direction of the valve handle after the handle is removed from its mounting panel.

Materials of Construction

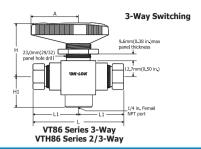
	VT86/VCT	86 Series	VTH86 Series				
Component	2-Way	3-Way	2-Way	3-Way			
	Grade/ASTM Specification						
1. Handle		Nylon with	brass insert				
2. Set screw		SS316	6/A276				
3. Stop pin (2-Way - 2, 3-Way - 1)		SS:	316				
4. Panel nut		SS316/A4	79 or A276				
5. Body		SS316/A4	79 or A276				
6. Stem		SS316/A4	79 or A276				
7. Stem bearing		PE	EK				
8. Stem O-rings (2)	FKM O-ring (HNBR for \	/CT86/VCT863 Series)	FKM (O-ring			
9. Stem support ring	-	- PEEK					
9.1. Stem backup rings (2)	- PTFE/D1710, type 1						
10. Trunnion ball		SS316/A4	79 or A276				
11. Trunnion ball back-up rings (2)	Reinforced PTFE		-				
12. Trunnion ball O-rings (2)	FKM O-ring (HNBR for VCT86 Series)		-				
13. Seats (2)	PCTFE, option (PAI for VCT86/\		PEEK				
14. Seat carriers (2)		SS316/A4	79 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 connector seals (2)	PTFE/D1710,type 1						
20. End connectors (2)		SS316/A4	79 or A276				
21. Plug	- SS316/A479 or A276 -						

[•] Wetted components and lubricants are listed in BLUE.

[•] Lubricants: Molybdenum disulfide and fluorinated based.



VT86 Series 2-Way



Ordering Information and Dimensions

VT86 Ser	ies Basic			VTH86 Se	ries Basic		Cv Orifice End Connection		Di	mensions, mr	n (in.)	
Ordering		Cv	Orifice mm (in.)	Ordering		Cv			L	L1	Н	Α
2-W	/ay			2-W	/ay							
	F2N-	1.2			F2N-	1.2		1/8 in. Female NPT	76.2(3)	3.81(1.5)		
	F4N-	1			-	1		1/4 in. Female NPT	70.2(3)	3.01(1.3)		
	-	-			F4N-	1		1/4 in. Female NPT	98.5(3.88)	49.3(1.94)		
	F8N-	1.2			-	-		1/2 in. Female NPT	81.2(3.2)	40.6(1.6)		
VT86-	D4T-	1.6	4.75		D4T-	1.6	4.75	1/4 in. DK-Lok	105 (4.14)	52.6 (2.07)	46.7	20.0
V186- VCT86-	D6T-	1.4	(0.187)	VTH86-	D6T-	1.4	1.4 1 1.6	3/8 in. DK-Lok	112 (4.39)	55.6 (2.19)	(1.83)	38.0 (1.50)
VC100-	D8T-	1	(0.167)		D8T-	1		1/2 in. DK-Lok	117 (4.60)	58.4 (2.30)		(1.50)
	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 (4.14)	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(4.6)	58.4(2.3)		
3-V	/ay			3-W	/ay							
	F2N-				F2N-			1/8 in. Female NPT	76.2(3)	3.81(1.5)		
	F4N-				-			1/4 in. Female NPT	76.2(3)	38.1(1.5)		
	-				F4N-			1/4 in. Female NPT	81.2(3.2)	40.6(1.6)		
	D4T-				D4T-			1/4 in. DK-Lok	105 (4.14)	52.6 (2.07)		
VT863-	D6T-	0.75	4.75	VTH863-	D6T-	0.75	4.75	3/8 in. DK-Lok	112 (4.39)	55.6 (2.19)	46.7	38.0
VCT863-	D8T-	0./5	(0.187)	V I П803-	D8T-	0.75	(0.187)	1/2 in. DK-Lok	117 (4.60)	58.4 (2.30)	(1.83)	(1.50)
	D6M-				D6M-			6mm DK-Lok	105 (4.14)	52.6 (2.07)		
	D8M-				D8M-			8mm DK-Lok	105 (4.14)	52.6 (2.07)		
	D10M-				D10M-			10mm DK-Lok	112 (4.41)	55.9 (2.20)		
	D12M-				D12M-			12mm DK-Lok	117(4.6)	58.4(2.3)		

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

Flow Rate

VT86 series Flow Data @ 21 °C (70 °F)

-1 -	Pressure Drop to	3-Way	2-Way						
Flow Rate	Atmosphere (△P) in bar (psig)	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)	19.3 (5.1)	
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)	42.7 (11.3)	
(U.S.GPM)	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)	60.5 (16.0)	
Air	0.68 (10)	226 (8.0)	311 (11.0)	396 (14.0)	424 (15.0)	453 (16.0)	481 (17.0)	509 (18.0)	
std L/min	3.4 (50)	651 (23.0)	849 (30.0)	1019 (36.0)	1104 (39.0)	1189 (42.0)	1274 (45.0)	1359 (48.0)	
(SCFM)	6.8 (100)	1132 (40.0)	1500 (53.0)	1812 (64.0)	1953 (69.0)	2095 (74.0)	2265 (80.0)	2406 (85.0)	

VTH86 series Flow Data @21 °C (70°F)

	Pressure Drop to	3-Way	2-Way						
Flow Rate	Atmosphere (△P) in bar (psig)	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)	74.1 (19.6)	
L/min	41.3 (600)	69.1 (18)	94 (25)	109 (29)	121 (32)	128 (34)	140 (37)	147 (39)	
(U.S.GPM)	68.9 (1000)	90.8 (24)	143 (38)	143 (38)	155 (41)	166 (44)	178 (47)	189 (50)	
Air	10.3 (150)	1614 (57)	2152 (76)	2805 (92)	2803 (99)	3029 (107)	3256 (115)	3454 (122)	
std L/min	41.3 (600)	5946 (210)	8070 (285)	9627 (340)	10 505 (371)	11 298 (399)	12 119 (428)	12 912 (456)	
(SCFM)	68.9 (1000)	9912 (350)	13 308(470)	16 140 (570)	17 272 (610)	18 688 (660)	19 821 (700)	21 321 (750)	

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^{*} CNG/NGV valve ordering number: Basic ordering numbers listed in blue are for CNG/NGV valves as well.

VT86 Series Pressure-Temperature Ratings

Body m	316 Stainless steel						
Seat m	aterial	PC	TFE	PT	FE	PEEK	
Tempe	rature	bar	psig	bar	psig	bar	psig
°C	°F		V	/orking	Pressu	re	
-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	400	-	-	17.2	250	96.4	1400
232	450	-	-	8.6	125	34.4	500

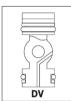
VTH86 Series Pressure-Temperature Ratings

Body r	316 Stainless steel									
End Con-	DK-Lok	6M,	1/4 in.	8M, 3	3/8 in.	12M,	1/2 in.	. 10M		
nection	Female NPT	1/8, 1/4 in.		-		-			-	
Seat N	/laterial				PE	EK				
Temp	erature	Working Pressure								
°C	°F	bar	psig	bar	psig	bar	psig	bar	psig	
-17 to 37	0 to 100	689	10000	516	7500	454	6600	413	6000	
65	150	516	7500	516	7500	454	6600	406	5900	
93	200	344	5000	344	5000	344	5000	344	5000	
121	250	282	4100	282	4100	282	4100	282	4100	
148	300	220	3200	220	3200	220	3200	220	3200	
176	350	158	2300	158	2300	158	2300	158	2300	
204	400	96.4	1400	96.4	1400	96.4	1400	96.4	1400	
232	450	34.4	500	34.4	500	34.4	500	34.4	500	

Options

VT86 Series 2-Way Valve External Vent Options

A downstream or upstream vent option on VT86 Series 2-Way ball valve is available. The vent port is constructed on trunnion ball. The vent port activates when the valve is in closed position. This option reduces the valve pressure rating to 34.4bar (500 psig).



Downstream Vent Ordering designator - DV

When a downstream vent valve in closed position, shutoff at the upstream seat occurs. Downstream system media flows into the vent hole and vents out to atmosphere through the valve bottom.



Upstream Vent Ordering designator - UV

When a upstream vent valve in closed position, shutoff at the downstream seat occurs. Upstream system media flows into the vent hole and vents out to atmosphere through the valve bottom.

IDK-LOK

-S

-S

VCT863 Series Ball Valve

Service Kit

For field assembly, service kit with a maintenance instruction is available. Service kit contains wetted parts including trunnion ball, stem assembly and seat carrier assembly. To order the service kit, prefix SK- to the valve series. i.e., SK-VCT863, SK-VTH863.

How to Order

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



V		V	V
Seat Materials	O-ring Materials	External Vent Options	Body Material
Nil: Standard PCTFE for VT86 Series Nil: Standard PEEK for VTH86 Series Nil: Standard PAI for VCT86 Series PC: PCTFE PK: PEEK PE: PTFE PI: PAI	Nil: Standard FKM for VT86 and VTH86 Series Nil: Standard HNBR for VCT86 Series Note: Optional O-rings applicable to; 8. Stem O-rings 12. Trunnion ball O-rings 18. Seat carrier O-rings	DV: Downstream Vent UV: Upstream Vent Note: Vent option available on VT86 2-Way ball valves.	S: Stainless steel 316

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-Lok accepts no liability for any improper selection, installation, operation or maintenance.