

Design

- VC and VPC Series Check Valves are designed to prevent reverse flow and keep the fluid in one direction.
- Valves provide bubble tight in the flow reverse direction.
- Three (3) types of valves are available; fixed & adjustable cracking pressure and lift check valves.



Fixed Cracking Pressure Valves

- | | | |
|--|-----------------------|---|
| ● VC3 Series Poppet Check Valves | 3000 psig (206 bar) | 2 |
| ● VCH6 Series High Pressure Check Valves | 6000 psig (413 bar) | 4 |
| ● VPC Series Port Connector Check Valves | 6000 psig (413 bar) | 6 |
| ● VC10 Series 10K Check Valves | 10 000 psig (689 bar) | 7 |
| ● VCP3 Series 1-Piece Check Valves | 3000 psig (206 bar) | 8 |

Adjustable Cracking Pressure Valves

- | | | |
|--|---------------------|----|
| ● VCPA3 Series 1-Piece Adjustable Check Valves | 3000 psig (206 bar) | 9 |
| ● VCA3 Series Adjustable Check Valves | 3000 psig (206 bar) | 10 |

Lift Check Valves

- | | | |
|---------------------------------|---------------------|----|
| ● VCL6 Series Lift Check Valves | 6000 psig (413 bar) | 12 |
|---------------------------------|---------------------|----|

Operation

Upstream (Inlet) pressure pushes the poppet from a closed to open position when upstream pressure is greater than downstream (Outlet) pressure plus the spring force. The only time downstream pressure can be greater than upstream pressure is when the valve is in closed position. In a static condition, where equal pressure is present at both upstream and downstream, the valve would be in closed due to the force of the spring.

Working Pressure

The internal pressure the valve can handle at a maximum at room temperature.

Cracking Pressure

When upstream pressure is greater than downstream pressure plus the spring force, the upstream pressure becomes cracking pressure that pushes the poppet to open position.

Back Pressure

When downstream pressure is greater than upstream pressure, the differential pressure becomes back pressure.

Reseal Pressure

Valves are resealed by the spring force when upstream cracking pressure falls down below the cracking pressure. Valves that have lower cracking pressure may require back pressure to reseal.

Factory Test

Every valve is factory tested for cracking and resealing performance with a liquid leak detector.

- Fixed cracking pressure valves are tested cracking and resealing performance minimum 2 times.
- Adjustable cracking pressure valves are tested at minimum and maximum cracking pressure of the spring in the valve.
- All valves at room temperature ensure resealing within 5 seconds at the appropriate reseal pressure.

Cleaning and Packaging

Valves are cleaned and packaged in accordance with HSME cleaning standard CS-01.

Dimensions

Dimensions shown in this catalog are reference only and subject to change. Dimensions with M Tube Fitting nuts are in finger-tight position.

VC3 Series Poppet Check Valves

VC3 Series Poppet Check Valves

Fixed Cracking Pressure

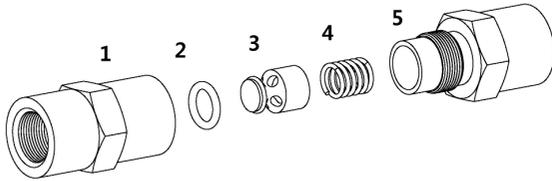
Working Pressure: 3000 psig (206 bar)



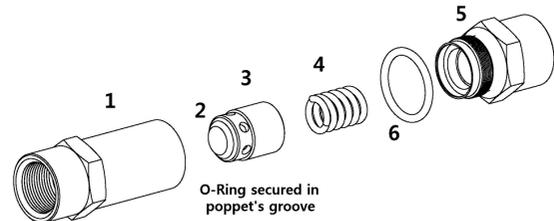
Features

- Valves are available in stainless steel, brass, and carbon steel. F8
- Wide range of end connections includes Two Ferrule M Tube Fittings, Male & Female NPT threads up to 1 in.
- O-Ring in VC3E & VC3F Series is securely clamped in the poppet's groove that eliminates the possibility of dislodging the O-Ring in high velocity.
- O-Ring in VC3A, 3B, 3C and 3D Series is positioned on the poppet without clamped that can be possibly displaced in high velocity. VCH6 and VCP3 Series could be considered as an alternative to VC3A thru. VC3D Series.

VC3A,3B,3C & 3D Series



VC3E & 3F Series



Materials of Construction

Components	Valve Body Materials		
	Stainless Steel	Carbon Steel	Brass
Material Grade/ASTM			
1 Inlet Body	SS316/A276, A479	ASTM A108, JIS G4051 S20C - S48C	C36000/B16, C3604/JIS H3250
2 O-Ring	FKM	FKM	NBR
3 Poppet	SS316/A276, A479	ASTM A108, JIS G4051 S20C - S48C	C36000/B16, C3604/JIS H3250
4 Spring	SS302/A313		
5 Outlet Body	SS316/A276, A479	ASTM A108, JIS G4051 S20C - S48C	C36000/B16, C3604/JIS H3250
6 Outlet Body Seal	FKM	NBR	NBR

Wetted components are listed in **BOLD** letters.

Lubrication:

- Silicon-based lubricant on poppet and O-Ring.
- Molybdenum dry film on inlet and outlet body threads.

Spring Designator / Cracking and Reseal Pressure @ 70 °F (21 °C)

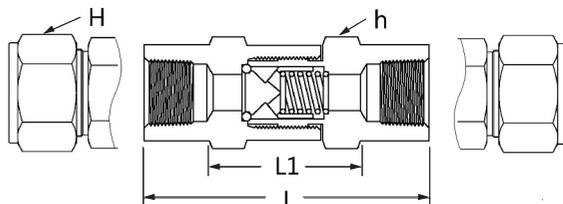
Nominal Cracking Pressure, psig (bar)	Designator	Cracking Pressure Range, psig (bar)	Reseal Pressure, psig (bar)
1/3 (0.03)	1/3	Up to 3 (0.21)	Up to 6 (0.42) back pressure
1 (0.07)	1	Up to 4 (0.28)	Up to 6 (0.42) back pressure
3 (0.21)	3	Up to 6 (0.41)	Up to 4 (0.28) back pressure
10 (0.69)	10	7 to 15 (0.49 to 1.1)	Minimum 3 (0.21) upstream pressure
25 (1.8)	25	20 to 30 (1.4 to 2.1)	Minimum 17 (1.2) upstream pressure

Pressure-Temperature Ratings

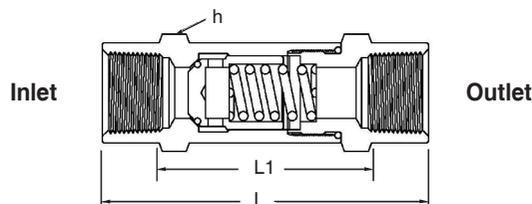
Valve Series	VC3A, 3B, 3C, and 3D Series			VC3E, and 3F Series		
Valve Material	SS316	Steel	Brass	SS316	Steel	Brass
O-Ring Material	FKM	FKM	NBR	FKM	FKM	NBR
Temperature, °F (°C)	Working Pressure, psig (bar)					
- 10 to 100 (-23 to 37)	3000 (206)	3000 (206)	3000 (206)	2000 (137)	2000 (137)	1500 (103)
200 (93)	2575 (177)	2575 (177)	2600 (179)	1715 (118)	1715 (118)	1300 (89.6)
250 (121)	2450 (168)	2450 (168)	2405 (165)	1630 (112)	1630 (112)	1200 (82.7)
300 (148)	2325 (160)	2325 (160)	-	1545 (106)	1545 (106)	-
350 (176)	2232 (153)	2232 (153)	-	1481 (102)	1481 (102)	-
375 (190)	2185 (150)	-	-	1450 (99.9)	-	-

Fixed Cracking Pressure Valves

Working Pressure: 3000 psig (206 bar)



VC3A, 3B, 3C & 3D Series



VC3E & VC3F Series

Ordering Information and Dimensions

Basic Ordering Number		End Connections		Cv	Dimensions, mm (in.)				
		Inlet	Outlet		L	L1	H	h	
VC3A-	A2T-	1/8 in. OD M Tube Fitting		0.10	54.30 (2.14)	25.00 (0.98)	7/16	5/8	
	F2N-	1/8 in. Female NPT			48.00 (1.89)		-		
	M2N-	1/8 in. Male NPT			43.40 (1.71)		-		
VC3B-	A4T-	1/4 in. OD M Tube Fitting		0.47	59.70 (2.35)	27.10 (1.07)	9/16	5/8	
	A6M-	6mm OD M Tube Fitting			59.90 (2.36)		14mm		
	F4N-	1/4 in. Female NPT			54.60 (2.15)		-	3/4	
	M4N-	1/4 in. Male NPT			53.10(2.09)		-	5/8	
	MA4N4T-	1/4 in. Male NPT / 1/4 in. OD M Tube Fitting			56.40 (2.22)		9/16		
VC3C-	A6T-	3/8 in. OD M Tube Fitting		1.47	80.50(3.17)	36.20 (1.43)	11/16	7/8	
	F6N-	3/8 in. Female NPT			75.70(2.98)		-		
	M6N-	3/8 in. Male NPT			70.60 (2.78)		-		
VC3D-	A8T-	1/2 in. OD M Tube Fitting		1.68	86.90(3.42)	48.10 (1.89)	7/8	7/8	
	A10M-	10mm OD M Tube Fitting			84.30(3.32)		19mm		
	A12M-	12mm OD M Tube Fitting			86.90(3.42)		22mm	1 1/8	
	F8N-	1/2 in. Female NPT			90.90(3.58)		-		
	M8N-	1/2 in. Male NPT			80.30 (3.16)		-		7/8
	A10T-	5/8 in. OD M Tube Fitting			87.70(3.45)		1		
VC3E-	A12T-	3/4 in. OD M Tube Fitting		4.48	110.00 (4.32)	67.00 (2.64)	1 1/8	1 1/4	
	F12N-	3/4 in. Female NPT			104.00(4.08)		-		
	M12N-	3/4 in. Male NPT			104.00(4.08)		-		
VC3F-	A16T-	1 in. OD M Tube Fitting		4.48	120.00 (4.74)	68.40 (2.69)	1 3/8	1 3/8	
	F16N-	1 in. Female NPT			123.00 (4.84)		-	1 5/8	
	M16N-	1 in. Male NPT			115.00 (4.52)		-		

To order, follow the steps below.

Step 1. Select a valve basic ordering number. Example: VC3A-A2T-

Step 2. Select an applicable spring designator, and add it to the ordering number: VC3A-A2T-1/3-

Step 3. Suffix an applicable body material designator to the ordering number: VC3A-A2T-1/3-SS

SS316: **SS**, Carbon Steel: **C**, and Brass: **B**

VCH6 Series High Pressure Check Valves

VCH6 Series High Pressure Check Valves

VCHC6 Series CNG/NGV Check Valves

Fixed Cracking Pressure

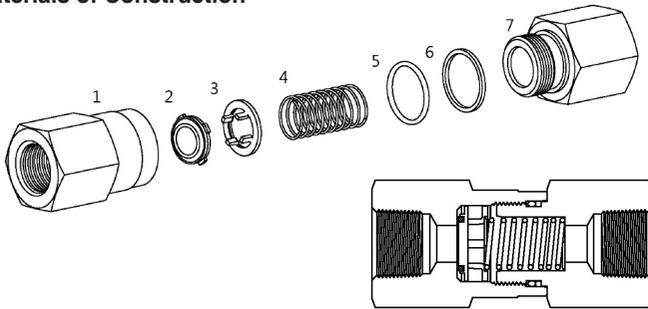
Working Pressure: 6000 psig (413 bar)



Features

- High pressure application up to 6000 psig (413 bar).
- 2-piece design reduces potential leak path.
- FKM bonded to poppet retains the seal in sealing position against pressure pulses, surges, or shock.
- End connections include Two Ferrule M Tube Fitting up to 1 in. & 25mm OD, Male & Female NPT up to 1 in.

Materials of Construction



Components		Valve Body Material
		Stainless Steel
		Material Grade/ASTM
1	Inlet Body	SS316/A276, A479
	Poppet	
2	Bonded Seal	FKM, optional EPDM HNBR for CNG Valves
3	Poppet Stop	SS316/A240
4	Spring	SS302/A313
5	O-Ring	FKM
6	Backup Ring	PTFE/D1710
7	Outlet Body	SS316/A276, A479

Wetted components listed in **BOLD** letters.

Lubrication:

- Silicon-based lubricant on poppet and bonded seal.
- Molybdenum dry film on Inlet and outlet body threads.

Pressure-Temperature Ratings

VCH6 Series High Pressure Check Valves

Valve Material	SS316	
Seal Material	FKM	
Valve Series	VCH6A, VCH6B	VCH6C
Temperature, °F (°C)	Working Pressure, psig (bar)	
- 10 to 100 (-23 to 37)	6000 (413)	5000 (344)
200 (93)	5160 (355)	4290 (295)
250 (121)	4910 (338)	4080 (281)
300 (148)	4660 (321)	3875 (266)
400 (204)	4280 (294)	3560 (245)

Pressure-Temperature Ratings

VCHC6 Series CNG/NGV Check Valves

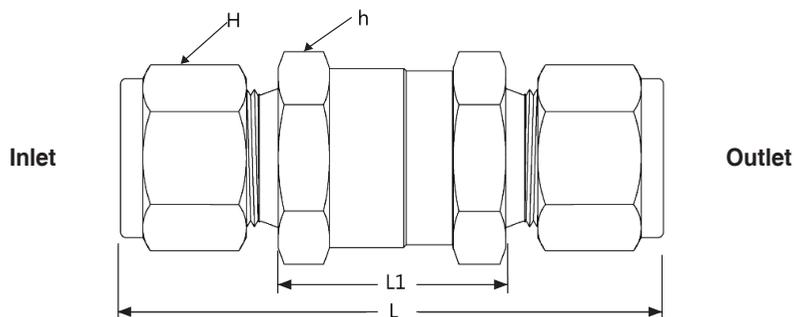
CNG/NGV Standards	ECE R110
Temperature	-40 to 120 °C
Working Pressure	274 bar @ 120 °C

Spring Designator / Cracking and Reseal Pressure @70 °F (21 °C)

Nominal Cracking Pressure, psig (bar)	Designator	Cracking Pressure Range psig (bar)	Reseal Pressure psig (bar)
1/3 (0.03)	1/3	Up to 3 (0.21)	Up to 6 (0.42) back pressure
1 (0.07)	1	Up to 4 (0.28)	Up to 6 (0.42) back pressure
5 (0.35)	5	3 to 9 (0.21 to 0.63)	Up to 2 (0.14) back pressure
10 (0.69)	10	7 to 15 (0.49 to 1.1)	Minimum 3 (0.21) upstream pressure
25 (1.8)	25	20 to 30 (1.4 to 2.1)	Minimum 17 (1.2) upstream pressure

Fixed Cracking Pressure Valves

Working Pressure: 6000 psig (413 bar)



Ordering Information and Dimensions

Basic Ordering Number		End Connections	Cv	Dimensions, mm (in.)				Pressure Rating, psig (bar)	
				L	L1	H	h		
VCH6A- VCHC6A-	A2T-SS	1/8 in. OD M Tube Fitting	0.67	57.7 (2.27)	26.4 (1.04)	7/16	11/16	6000 (413)	
	A4T-SS	1/4 in. OD M Tube Fitting		61.7 (2.43)		9/16			
	A6M-SS	6mm OD M Tube Fitting		54.1 (2.13)		14mm			
	F4N-SS	1/4 in. Female NPT		45.5 (1.79)	-	-			
	M2N-SS	1/8 in. Male NPT		55.1 (2.17)	26.4 (1.04)	-			
	M4N-SS	1/4 in. Male NPT		-	-	-			
VCH6B- VCHC6B-	A6T-SS	3/8 in OD M Tube Fitting	1.8	69.9 (2.75)	31.2 (1.23)	11/16	1	6000 (413)	
	A8T-SS	1/2 in. OD M Tube Fitting		75.2 (2.96)		7/8			
	A8M-SS	8mm OD M Tube Fitting		68.6 (2.70)		16mm			
	A10M-SS	10mm OD M Tube Fitting		71.1 (2.80)		19mm			
	A12M-SS	12mm OD M Tube Fitting		75.2 (2.96)		22mm			
	F6N-SS	3/8 in. Female NPT		64.8 (2.55)	-	-			
	F8N-SS	1/2 in. Female NPT		77.0 (3.03)	-	-			1 1/16
	M6N-SS	3/8 in. Male NPT		59.9 (2.36)	-	-			1
	M8N-SS	1/2 in. Male NPT		69.3 (2.73)	31.2 (1.23)	-			1
VCH6C- VCHC6C-	A12T-SS	3/4 in. OD M Tube Fitting	4.7	89.4 (3.52)	45.2 (1.78)	1-1/8	1 5/8	5000 (344)	
	A16T-SS	1 in. OD M Tube Fitting		98.6 (3.88)		1-1/2			
	A22M-SS	22mm OD M Tube Fitting		88.4 (3.48)	45.5 (1.79)	32mm			
	A25M-SS	25mm OD M Tube Fitting		98.6 (3.88)	40mm				
	F12N-SS	3/4 in. Female NPT		82.0 (3.23)	82.0 (3.23)	-			
	F16N-SS	1 in. Female NPT		97.3 (3.83)	97.3 (3.83)	-			
	M12N-SS	3/4 in. Male NPT		83.6 (3.29)	45.5 (1.79)	-			
	M16N-SS	1 in. Male NPT		93.2 (3.67)	45.7 (1.80)	-			

To order, follow the steps below.

Step 1. Select a valve basic ordering number. Example: VCH6A-A2T-SS

Step 2. Select an applicable spring designator, and insert it into the ordering number: VCH6-A2T-1/3-SS

Port Connector Check Valves

VPC Series Port Connector Check Valves

Fixed Cracking Pressure

Working Pressure: 6000 psig (413 bar)

Patented Products

Features

- Port connector has a built-in check valve inside.
- Two notches on both ends ensure leak-tight installation.
- 1-Piece tube design eliminates leak paths.
- No threading nor welding is required for installation.
- No skilled worker nor special tool required for installation.
- Significant reduction in installation time saves overall installation cost.
- Enables to add flow direction control easily to standard tube fittings and valves.
- Outstanding solution especially where space is tight.
- Reduces system dimension.



Two notches on both ends assist leak-tight installation.

Materials of Construction

Components		Valve Body Material
		Stainless Steel
		Material Grade/ASTM
1	Body	SS316/A276, A479
2	Poppet	
3	O-Ring	FKM
4	Spring	SS302/A313

Pressure – Temperature Rating

Material	SS316
O-Ring Material	FKM
Temperature, °F (°C)	Working Pressure, psig (bar)
- 10 to 100 (-23 to 37)	6000 (413)
200 (93)	5160 (355)
250 (121)	4910 (338)
300 (148)	4660 (321)
400 (204)	4280 (294)

Ordering Information

Complete Ordering Number	End Connections Inlet / Outlet	Orifice	Cv	Overall Length	
					VPCA-8T-10PSI-SS
12M-10PSI-SS	12 mm OD				
VPCB-	10T-10PSI-SS	5/8 in. OD	7.1	1.67	64 mm (2.52 in.)
	15M-10PSI-SS	15 mm OD			
	16M-10PSI-SS	16 mm OD			
VPC-	12T-10PSI-SS	3/4 in. OD	8.26	2.30	68 mm (2.67 in.)
	20M-10PSI-SS	20 mm OD			
VPCD-	16T-10PSI-SS	1 in. OD	11.0	4.48	87 mm (3.42 in.)
	25M-10PSI-SS	25 mm OD			

Spring Designator / Cracking and Reseal Pressure @ 70 °F (21 °C)

Nominal Cracking Pressure, psig (bar)	Designator	Cracking Pressure Range psig (bar)	Reseal Pressure psig (bar)
1 (0.07)	1PSI	Up to 4 (0.28)	5 to 20 (0.34 to 1.37) back pressure
10 (0.69)	10PSI	7 to 13 (0.49 to 0.90)	3 to 10 (0.20 to 0.69) back pressure
25 (1.8)	25PSI	21 to 29 (1.5 to 2.0)	Minimum 5 (0.34) upstream pressure

To order valve with the standard 10 psi cracking pressure, select a complete ordering number. Example: VPCA-8T-10PSI-SS

To order 1 or 25 psi cracking pressure valve, replace the 10PSI with 1PSI or 25PSI in the ordering number. Example: VPCA-8T-1PSI-SS

Application

Apply to tube fitting or valve that has tube port. Keep the outlet port on top in vertical installation.

M Tube Fitting to Needle Valve



M Tube Fitting to M Tube Fitting



Installation Instruction

1. Fully insert the valve end up to the tube shoulder in the fitting or valve.
2. Hand-tighten the nut.
3. Spanner-tighten the nut 1 1/4 turns beyond the finger-tight position.

VC10 Series 10K Check Valves

1 Bar (14.5 psi) Fixed Cracking Pressure

Working Pressure: 10 000 psig (689 bar)

Features

- High pressure up to 10 000 psig (689 bar) working pressure to ASME B31.3 Process Piping Code.
- 2-Piece construction minimizes leak paths.
- Valves are randomly hydrostatic tested @ 10 000 psig (689 bar).
- Cracking Pressure is pre-set to 1 bar (14.5 psi).
- Back pressure up to 3.5 bar (50 psig) is required to reseal the valve.
- Standard FKM seal material, alternative FFKM and EPDM available.



Materials of Construction

Components	Valve Body Material	
	Stainless Steel	Material Grade/ASTM
1 Inlet Body	SS316/A276, A479	
2 Outlet Body		
3 Poppet		
4 Poppet Cap		
5 Body Seal	FKM	
6 Poppet Seal		
7 Spring	SS302/A313	

Wetted components listed in **BOLD** letters.

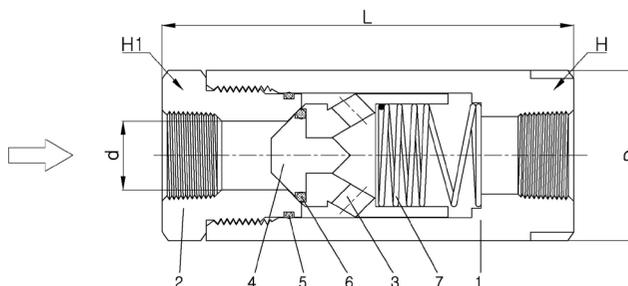
Lubrication:

- Silicon-based lubricant on poppet and O-Ring.

Pressure-Temperature Ratings

Rating as per ASME B31.3 Process Piping Code.

Valve Series	VB10A, VB10B	VB10C
Valve Material	Stainless Steel	
O-Ring Material	FKM	
Temperature, °C (°F)	Working Pressure, bar (psi)	
-23 to 38 (-10 to 100)	689 (10000)	413 (6000)
93 (200)	689 (10000)	413 (6000)
121 (250)	689 (10000)	413 (6000)
148 (300)	689 (10000)	413 (6000)
176 (350)	677 (9825)	406 (5895)
190 (375)	671 (9735)	402 (5840)



Ordering Information and Dimensions

Complete Ordering Number	End Connections inlet / Outlet	Orifice mm (in.)	Dimensions, mm (in.)			
			L	D	H Hex	H1 Hex
VC10A-	A4T-1BAR-SS	1/4 in. OD M Tube Fitting	4.82 (0.19)	107.6 (4.24)	38.0 (1.50)	32.0 (1.25)
	A6T-1BAR-SS	3/8 in. OD M Tube Fitting	7.11 (0.28)	110.7 (4.36)		
	A8T-1BAR-SS	1/2 in. OD M Tube Fitting		116.4 (4.58)		
	F4N-1BAR-SS	1/4 in. Female NPT	10.0 (0.39)	75.0 (2.95)		
	F6N-w1BAR-SS	3/8 in. Female NPT	82.0 (3.23)			
	F8N-1BAR-SS	1/2 in. Female NPT	93.0 (3.66)			
VC10B-	F12N-1BAR-SS	3/4 in. Female NPT	20.0 (0.79)	106.0 (4.17)	62.0 (2.44)	50.0 (1.97)
	F16N-1BAR-SS	1 in. Female NPT		126.0 (4.96)		
VC10C-	F20N-1BAR-SS	1 1/4 in. Female NPT	32.0 (1.26)	142.0 (5.59)	80.0 (3.15)	70.0 (2.76)
	F24N-1BAR-SS	1 1/2 in. Female NPT		156.0 (6.14)		
	F32N-1BAR-SS	2 in. Female NPT		184.0 (7.24)		

To order, select a complete ordering number. Example: VC10-A4T-SS

Factory Test

- All valves at room temperature are tested for resealing performance within 5 seconds at the back pressure up to 3.5 bar (50 psig).

VCP3 Series 1-Piece Check Valves

VCP3 Series 1-Piece Check Valves

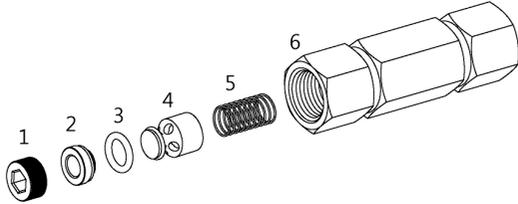
Fixed Cracking Pressure

Working Pressure: 3000 psig (206 bar)

Features

- 1-Piece design eliminates leak path.
- End connection includes Male & Female NPT up to 1/2 in.
- O-Ring is designed to be in the sealing position against high velocity, pressure pulses, surges, or shock.

Materials of Construction



Components		Valve Body Materials	
		Stainless Steel	Brass
		Material Grade/ASTM	
1	Insert Lock Screw	SS316/A276, A479	C36000/B16, C3604/JIS H3250
2	Insert		
3	O-Ring	FKM	NBR
4	Poppet	SS316/A276, A479	C36000/B16, C3604/JIS H3250
5	Spring		SS302/A313
6	Body	SS316/A276, A479	C36000/B16, C3604/JIS H3250

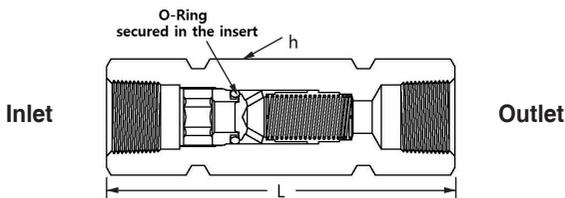
Wetted components listed in **BOLD** letters.

Lubrication:

- Silicon-based lubricant on poppet and O-Ring.
- Molybdenum dry film on insert lock screw threads.

Spring Designator / Cracking and Reseal Pressure @70 °F (21 °C)

Nominal Cracking Pressure, psig (bar)	Designator	Cracking Pressure Range psig (bar)	Reseal Pressure psig (bar)
1/3 (0.03)	1/3	Up to 3 (0.21)	6 to 20 (0.41 to 1.37) back pressure
1 (0.07)	1	Up to 4 (0.28)	5 to 20 (0.34 to 1.37) back pressure
10 (0.69)	10	7 to 13 (0.49 to 0.90)	3 to 10 (0.20 to 0.69) back pressure
25 (1.8)	25	21 to 29 (1.5 to 2.0)	Minimum 5 (0.35) upstream pressure



Pressure-Temperature Ratings

Valve Material	SS316	Brass
O-Ring Material	FKM	NBR
Temperature, °F (°C)	Working Pressure, psig (bar)	
- 10 to 100 (-23 to 37)	3000 (206)	3000 (206)
200 (93)	2575 (177)	2600 (179)
250 (121)	2450 (168)	2405 (165)
300 (148)	2325 (160)	-
375 (190)	2185 (150)	-

Ordering Information and Dimensions

Basic Ordering Number	End Connections		Cv	Dimensions, mm (in.)		
	Inlet	Outlet		L	H	
VCP3A-	F4N-	1/4 in. Female NPT	0.35	61.2 (2.41)	3/4	
	F4R-	1/4 in. ISO Female Tapered		64.5 (2.54)		
	M4N-	1/4 in. Male NPT		41.1 (1.62)	9/16	
	M4R-	1/4 in. ISO Male Tapered				
	FM4N-	1/4 in. Female NPT		1/4 in. Male NPT	57.9 (2.28)	3/4
	MF4N-	1/4 in. Male NPT		1/4 in. Female NPT	44.4 (1.75)	
VCP3B-	F8N-	1/2 in. Female NPT	1.20	94.2 (3.71)	1 1/16	
	M8N-	1/2 in. Male NPT		57.9 (2.28)	7/8	
	MF8N-	1/2 in. Male NPT		1/2 in. Female NPT	71.9 (2.83)	1 1/16

To order, follow the steps below.

Step 1. Select a valve basic ordering number. Example: VCP3A-F4N-

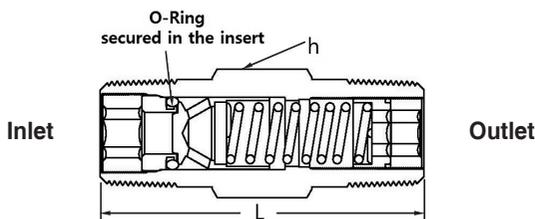
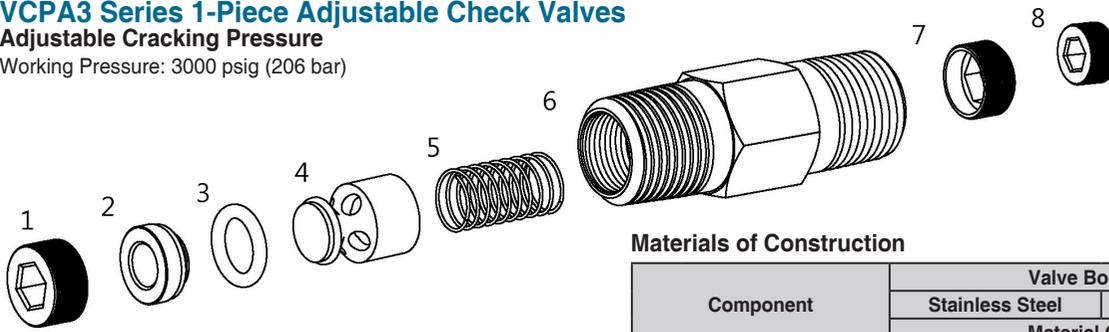
Step 2. Select an applicable spring designator, and add it to the ordering number: VCP3A-F4N-1/3-

Step 3. Suffix an applicable body material designator to the ordering number: VCP3A-F4N-1/3-SS

SS316: **SS**, Brass: **B**

VCPA3 Series 1-Piece Adjustable Check Valves Adjustable Cracking Pressure

Working Pressure: 3000 psig (206 bar)



Materials of Construction

Component	Valve Body Materials	
	Stainless Steel	Brass
	Material Grade/ASTM	
1 Insert Lock Screw	SS316/A276, A479	C36000/B16, C3604/JIS H3250
2 Insert		
3 O-Ring	FKM	NBR
4 Poppet	SS316/A276, A479	C36000/B16, C3604/JIS H3250
5 Spring	SS302/A313	
6 Body		
7 Adjusting Screw	SS316/A276, A479	C36000/B16, C3604/JIS H3250
8 Locking Screw		

Wetted components listed in **BOLD** letters.

Lubrication:

- Silicon-based lubricant on poppet and O-Ring.
- Molybdenum dry film on insert lock screw, adjusting screw, and locking screw threads.

Ordering Information and Dimensions

Basic Ordering Number	End Connection	Cv	Dimensions, mm (in.)	
			L	h
VCPA3A-	F4N- 1/4 in. Female NPT	0.35	75.7 (2.98)	3/4
	M4N- 1/4 in. Male NPT		41.1 (1.62)	9/16
	M4R- 1/4 in. ISO Male Tapered			
VCPA3B-	M8N- 1/2 in. Male NPT	1.20	65.0 (2.56)	7/8
	M8R- 1/2 in. ISO Male Tapered			

To order, follow the steps below.

Step 1. Select a valve basic ordering number.

Example: VCPA3A-F4N-

Step 2. Select an applicable spring designator, and add it to the ordering number: VCP3A-F4N-3-

Step 3. Suffix an applicable body material designator to the ordering number: VCP3A-F4N-3-SS
SS316: **SS**, Brass: **B**

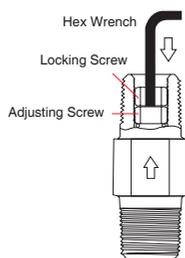
Spring Designator

Cracking Pressure, psig (bar)	Designator
3 to 50 (0.21 to 3.5)	3
50 to 150 (3.5 to 10.4)	50
150 to 350 (10.4 to 24.2)	150
350 to 600 (24.2 to 41.4)	350

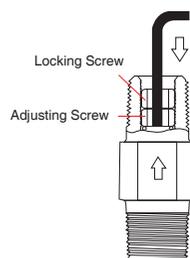
Pressure-Temperature Ratings

Valve Material	SS316	Brass
O-Ring Material	FKM	NBR
Temperature, °F (°C)	Working Pressure, psig (bar)	
- 10 to 100 (-23 to 37)	3000 (206)	3000 (206)
200 (93)	2575 (177)	2600 (179)
250 (121)	2450 (168)	2405 (165)
300 (148)	2325 (160)	-
375 (190)	2185 (150)	-

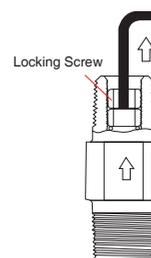
Cracking-Pressure Adjustment Procedure



1. Slightly unscrew locking screw by turning ccw.



2. Gently slide hex wrench into adjusting screw.
3. Turn both locking & adjusting screws, to increase cw, to decrease ccw.



4. Pull out hex wrench into locking screw and tighten cw to lock.
5. Verify the adjusted cracking pressure.

Hex Wrenches

Valve Series	Hex Wrench
VCA3	5/32 in.
VCPA3A	
VCPA3B	5/16 in.

Legends

- **cw**: clockwise
- **ccw**: counter clockwise

VCA3 Series Adjustable Check Valves

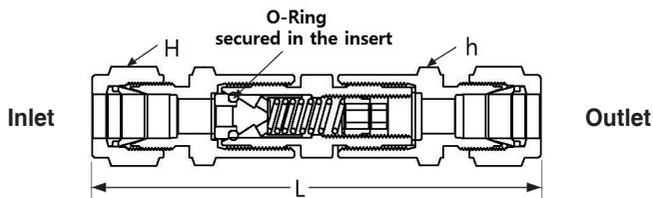
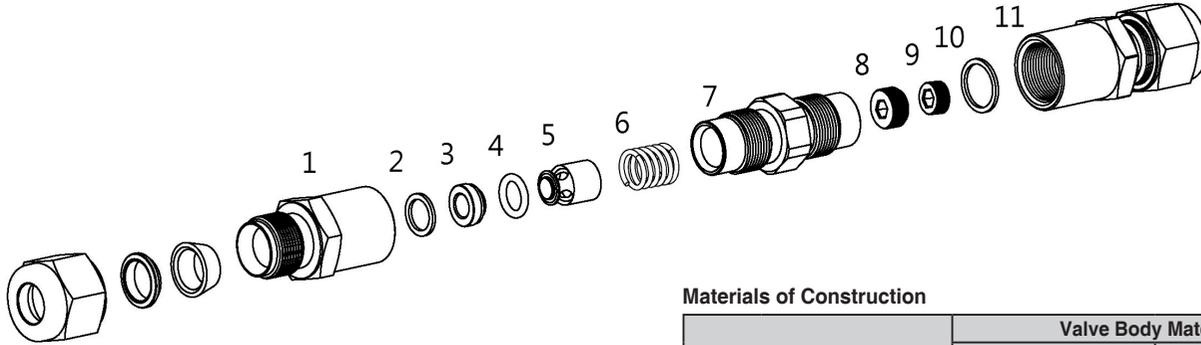
VCA3 Series Adjustable Check Valves

Adjustable Cracking Pressure

Working Pressure: 3000 psig (206 bar)

Features

- Adjustable cracking pressure valves are designed for Two Ferrule M Tube Fitting ends.
- Internal components; poppet, spring, adjusting screw, and locking screw are intermixable with VCPA3A Series.



Materials of Construction

Components		Valve Body Materials	
		Stainless Steel	Brass
Material Grade/ASTM			
1	Inlet Body	SS316/A276, A479	C36000/B16, C3604/JIS H3250
7	Center Body		
11	Outlet Body		
2	Inlet Gasket	PTFE Coated SS316/A240	
3	Insert	SS316/A276, A479	C36000/B16, C3604/JIS H3250
4	O-Ring	FKM	NBR
5	Poppet	SS316/A276, A479	C36000/B16, C3604/JIS H3250
6	Spring	SS302/A313	
8	Adjusting Screw	SS316/A276, A479	
9	Locking Screw		
10	Outlet Gasket	PTFE Coated SS316/A240	

Wetted components listed in **BOLD** letters.

Lubrication:

- Silicon-based lubricant on poppet and O-Ring.
- Molybdenum dry film on the threads of inlet, center, and outlet body, adjusting screw, and locking screw.

Ordering Information and Dimensions

Basic Ordering Number	End Connections		Cv	Dimensions, mm (in.)		
	Inlet	Outlet		L	H	h
VCA3-	A4T-SS	1/4 in. OD M Tube Fitting	0.37	82.0 (3.23)	9/16	5/8
	A6M-SS	6mm OD M Tube Fitting			14mm	
	A8M-SS	8mm OD M Tube Fitting		16mm		
	MA4N4T-SS	1/4 in. Male NPT		1/4 in. OD M Tube Fitting	79.2 (3.12)	

To order, follow the steps below.

Step 1. Select a basic ordering number. Example: VCA3-A4T-SS

Step 2. Select an applicable spring designator, and insert it into the ordering number: VCA3-A4T-3-SS

Spring Designator

Cracking Pressure, psig (bar)	Designator
3 to 50 (0.21 to 3.5)	3
50 to 150 (3.5 to 10.4)	50
150 to 350 (10.4 to 24.2)	150
350 to 600 (24.2 to 41.4)	350

Pressure-Temperature Ratings

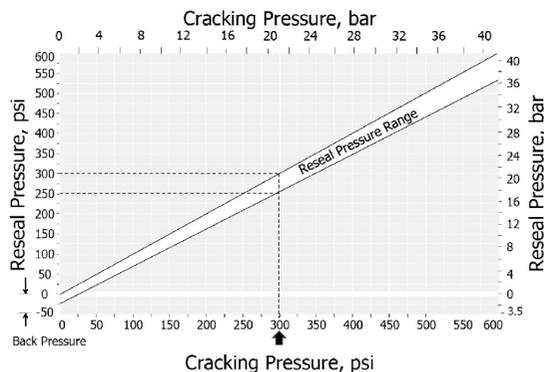
Valve Material	SS316	Brass
O-Ring Material	FKM	NBR
Temperature, °F (°C)	Working Pressure, psig (bar)	
- 10 to 100 (-23 to 37)	3000 (206)	3000 (206)
200 (93)	2575 (177)	2600 (179)
250 (121)	2450 (168)	2405 (165)
300 (148)	2325 (160)	-
375 (190)	2185 (150)	-

Cracking and Reseal Pressure @ 70 °F (21 °C)

VCPA3 & VCA3 Series
Adjustable Cracking Pressure Valves

How to Use Graph

The adjustable valve is set to crack at 300 psi, the minimum 250 psi upstream pressure would need to reseal the valve.



Option



Deflector Cap

The deflector cap changes the inline check valve to purge to atmosphere rather than directs fluids to a different location in the system. Deflector cap made of red-anodized aluminum is applicable to male NPT thread of VCP & VCPA Series outlet port. The maximum pressure the deflector cap retains is 300 psig @ 100 °F (20.6 bar @ 37 °C).

To order valve with deflector cap option, insert "DCN" into the valve ordering number. Example: VCPA3A-F4N-3-DCN-SS

To order deflector cap separate, use the ordering number in the table.

Example: DC4N

Ordering Number	Applicable Thread
DC4N	1/4 in. Male NPT
DC8N	1/2 in. Male NPT



Maintenance Kits

Spring Kits

One spring and two labels are contained in the kit. To order, select spring kit number. Example: MK-A1/3-302

Spring Kits for VC3 & VCP3 Series

Valve Series		Cracking Pressure psi (bar)	Kit Ordering Number
VC3	VCP3		
VC3A, VC3B	VCP3A	1/3 (0.03)	MK-A1/3-302
		1 (0.07)	MK-A1-302
		3 (0.21)	MK-A3-302
		10 (0.69)	MK-A10-302
		25 (1.8)	MK-A25-302
VC3C, VC3D	VCP3B	1/3 (0.03)	MK-B1/3-302
		1 (0.07)	MK-B1-302
		3 (0.21)	MK-B3-302
		10 (0.69)	MK-B10-302
		25 (1.8)	MK-B25-302
VC3E, VC3F	-	1/3 (0.03)	MK-C1/3-302
		1 (0.07)	MK-C1-302
		3 (0.21)	MK-C3-302
		10 (0.69)	MK-C10-302
		25 (1.8)	MK-C25-302

Spring Kits for VCH6 Series

Valve Series	Cracking Pressure	Kit Ordering Number
	psi (bar)	
VCH6A	1/3 (0.03)	MK-HA1/3-302
	1 (0.07)	MK-HA1-302
	5 (0.35)	MK-HA5-302
	10 (0.69)	MK-HA10-302
	25 (1.8)	MK-HA25-302
VCH6B	1/3 (0.03)	MK-HB1/3-302
	1 (0.07)	MK-HB1-302
	5 (0.35)	MK-HB5-302
	10 (0.69)	MK-HB10-302
	25 (1.8)	MK-HB25-302
VCH6C	1/3 (0.03)	MK-HC1/3-302
	1 (0.07)	MK-HC1-302
	5 (0.35)	MK-HC5-302
	10 (0.69)	MK-HC10-302
	25 (1.8)	MK-HC25-302

Spring Kits for VCPA3 & VCA3 Series

Valve Series		Cracking Pressure psi (bar)	Kit Ordering Number
VCA3	VCPA3		
VCA3	VCPA3A	3 to 50 (0.21 to 3.5)	MK-AA3-302
		50 to 150 (3.5 to 10.4)	MK-AA50-302
		150 to 350 (10.4 to 24.2)	MK-AA150-302
		350 to 600 (24.2 to 41.4)	MK-AA350-302
-	VCPA3B	3 to 50 (0.21 to 3.5)	MK-AB3-302
		50 to 150 (3.5 to 10.4)	MK-AB50-302
		150 to 350 (10.4 to 24.2)	MK-AB150-302
		350 to 600 (24.2 to 41.4)	MK-AB350-302

Temperature Ratings of Elastomer Seals

When combining seal material, the temperature rating of seal may become the limiting factor on the temperature rating of the valve.

Seal Material	Designator	Temperature Rating	
		°F	°C
NBR	BN	-10 to 250	-23 to 121
FKM	VT	-10 to 375	-23 to 190
EPDM	EP	-40 to 298	-40 to 148

Lift Check Valves

VCL6 Series Lift Check Valves

Non-Return Valves

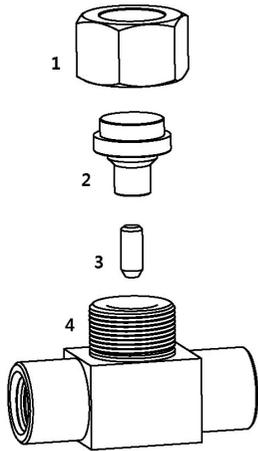
Working Pressure: 6000 psig (413 bar)

Features

- Keeps the flow in one direction with spring-less poppet in the valve.
- Simple 4-piece construction provides metal-to-metal seal.
- Provides lesser pressure drop across the valve.

Operation

- Valve opens by forward flow and is resealed by back pressure plus gravity assisted poppet.
- Valve is designed to use in liquid systems due to the spring-less poppet design.
- Valve mounting must be horizontally, keeping the bonnet nut on top.
- If a slight amount of leakage is acceptable, the valve can be used in heavy gases.
- By the design of the valve, valve in resealed position allows a slight amount of leakage being not more than 1% of forward flow coefficient.

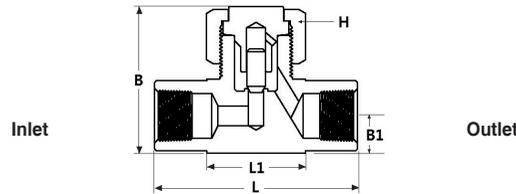


Materials of Construction

Components		Valve Body Material
		Stainless Steel Material Grade/ ASTM
1	Bonnet Nut	SS316/A276, A479
2	Bonnet	
3	Poppet	Type 630/A564
4	Body	SS316/A276, A479

Wetted Component listed in **BOLD** letters

- Lubricant: Silicon-based lubrication



Pressure-Temperature Ratings

ASME Class	2500
Material Group	2.2
Material Name	SS316
Temperature °F (°C)	Working Pressure, psig (bar)
-65 to 100 (-53 to 37)	6000 (413)
200 (93)	5160 (355)
300 (148)	4660 (321)
400 (204)	4280 (294)
500 (260)	3980 (274)
600 (315)	3760 (259)
700 (371)	3600 (248)
800 (426)	3460 (238)
900 (482)	3280 (225)

Ordering Information and Dimensions

Complete Ordering Number	End Connections Inlet / Outlet	Orifice mm (in.)	Cv	Dimensions, mm (in.)					
				L	L1	B	B1	H	
VCL6A-	A4T-SS	1/4 in. OD M Tube Fitting	4.0 (0.156)	0.30	61.0 (2.40)	25.7 (1.01)	37.3 (1.47)	9.9 (0.39)	7/8
	A6M-SS	6mm OD M Tube Fitting							
	F2N-SS	1/8 in. Female NPT			50.8 (2.00)				
	F4N-SS	1/4 in. Female NPT			52.3 (2.06)				
	AF4T4N-SS	1/4 in. OD M Tube Fitting / 1/4 in. Female NPT			56.6 (2.23)				
	SW4T-SS	1/4 in. Tube Socket Weld			46.0 (1.81)				
VCL6B-	A6T-SS	3/8 in. OD M Tube Fitting	6.4 (0.250)	0.64	71.9 (2.83)	33.3 (1.31)	47.0 (1.85)	12.7 (0.50)	1 1/4
	F4N-SS	1/4 in. Female NPT			57.2 (2.25)	31.8 (1.25)			
	SW6T-SS	3/8 in. Tube Socket Weld							
	SW8T-SS	1/2 in. Tube Socket Weld							
VCL6C	A8T-SS	1/2 in. OD M Tube Fitting	11.1 (0.437)	2.20	99.6 (3.92)	55.6 (2.19)	62.0 (2.44)	15.7 (0.62)	1 1/2
	A12T-SS	3/4 in. OD M Tube Fitting			79.2 (3.12)	47.2 (1.86)			
	F6N-SS	3/8 in. Female NPT							
	F8N-SS	1/2 in. Female NPT							
	SW8T-SS	1/2 in. Tube Socket Weld							

To order, select a complete ordering number. Example: VCL6A-A4T-SS

Factory Test

Every valve is factory tested for open and reseat performance, using hydraulic fluid.

Safe Valve Selection

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