HSME®
Valves & Fittings

VC & VPC Series Check Valves

Up to 10 000psig (689 bar)
Stainless Steel, Steel, and Brass

Catalog No. VC-4
July 2015

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

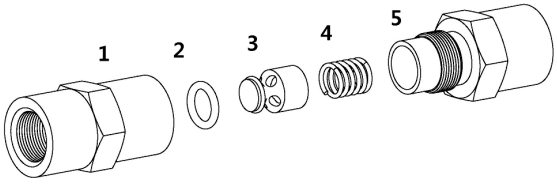
Fixed Cracking Pressure

Working Pressure: 3000 psig (206 bar)

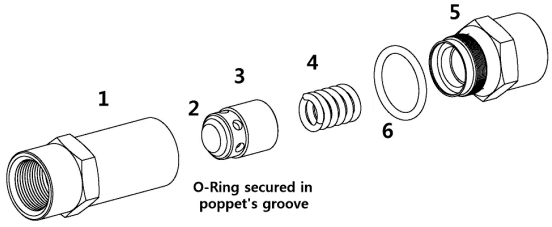
Features

- 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.

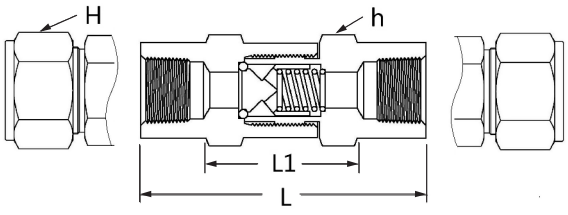
Spring Designator / Cracking and Reseal Pressure @70 °F (21 °C)

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

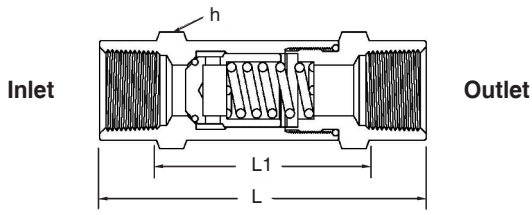
Pressure-Temperature Ratings

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	55.60 (2.19)	25.00 (0.98)	7/16	5/8
	A4T-	1/4 in. OD M Tube Fitting		0.47	60.00 (2.36)		9/16	
	A6M-	6mm OD M Tube Fitting					14mm	
	F2N-	1/8 in. Female NPT			46.50 (1.83)		-	
	M2N-	1/8 in. Male NPT			44.40 (1.75)		-	
	M4N-	1/4 in. Male NPT			53.40 (2.10)		-	
	MA4N4T-	1/4 in. Male NPT / 1/4 in. OD M Tube Fitting			56.40 (2.22)		9/16	
VC3B-	A6T-	3/8 in. OD M Tube Fitting		1.47	65.50 (2.58)	27.10 (1.07)	11/16	3/4
	A10M-	10mm OD M Tube Fitting					19mm	
	F4N-	1/4 in. Female NPT			56.80 (2.24)		-	
	M6N-	3/8 in. Male NPT			55.50 (2.19)		-	
VC3C-	A8T-	1/2 in. OD M Tube Fitting		1.68	80.20 (3.16)	36.20 (1.43)	7/8	7/8
	A12M-	12mm OD M Tube Fitting					22mm	
	F6N-	3/8 in. Female NPT			63.80 (2.51)		-	
	M8N-	1/2 in. Male NPT			74.40 (2.93)		-	
VC3D-	A10T-	5/8 in. OD M Tube Fitting		1.68	91.80 (3.61)	48.10 (1.89)	1	1 1/8
	F8N-	1/2 in. Female NPT			84.70 (3.33)		-	
VC3E-	A12T-	3/4 in. OD M Tube Fitting		4.48	110.70 (4.35)	67.00 (2.64)	1 1/8	1 1/4
	F12N-	3/4 in. Female NPT			103.00 (4.06)		-	
	M12N-	3/4 in. Male NPT			105.30 (4.15)		-	
VC3F-	A16T-	1 in. OD M Tube Fitting		4.48	121.10 (4.77)	68.40 (2.69)	1 1/2	1 3/8
	F16N-	1 in. Female NPT			111.40 (4.39)		-	
	M16N-	1 in. Male NPT			116.20 (4.57)		-	1 5/8

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
VCHC6 Series CNG/NGV Check Valves

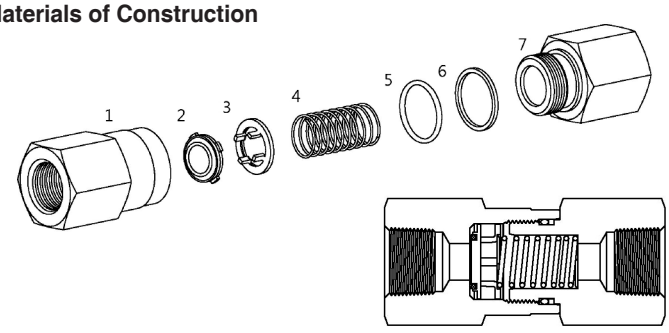
Fixed Cracking Pressure

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
2	**Poppet**	SS316/A276, A479
	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

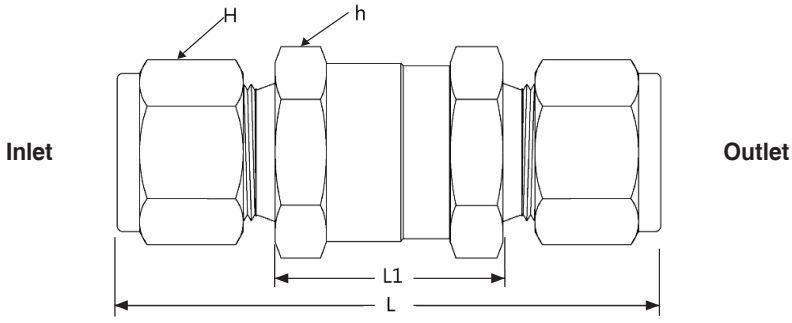
VCHC6 Series CNG/NGV Check Valves

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				14mm		
	F4N-SS	1/4 in. Female NPT		54.1 (2.13)	-	-		
	M2N-SS	1/8 in. Male NPT		45.5 (1.79)	26.4 (1.04)	-		
	M4N-SS	1/4 in. Male NPT		55.1 (2.17)		-		
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)	31.2 (1.23)	-	1	
	M8N-SS	1/2 in. Male NPT		69.3 (2.73)		-		
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)	45.5 (1.79)	1-1/2		
	A22M-SS	22mm OD M Tube Fitting		88.4 (3.48)		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

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	1/2 in. OD	5.4	1.47	60 mm (2.36 in.)
	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			
VPCC-	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.

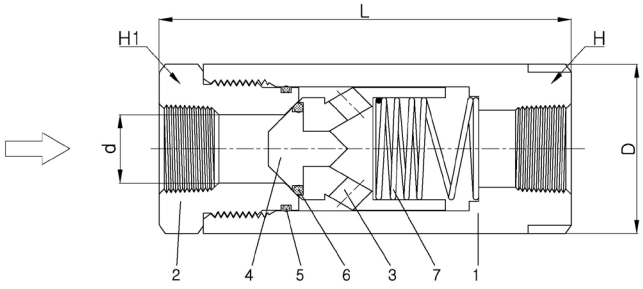
Lubrication:

- 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	10.0 (0.39)	116.4 (4.58)			
	F4N-1BAR-SS	1/4 in. Female NPT		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

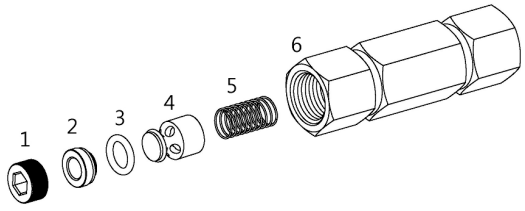
Fixed Cracking Pressure

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

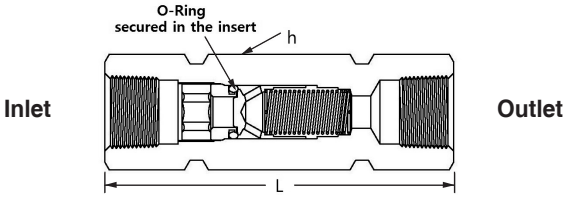
Wetted components listed in **BOLD** letters.

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**-

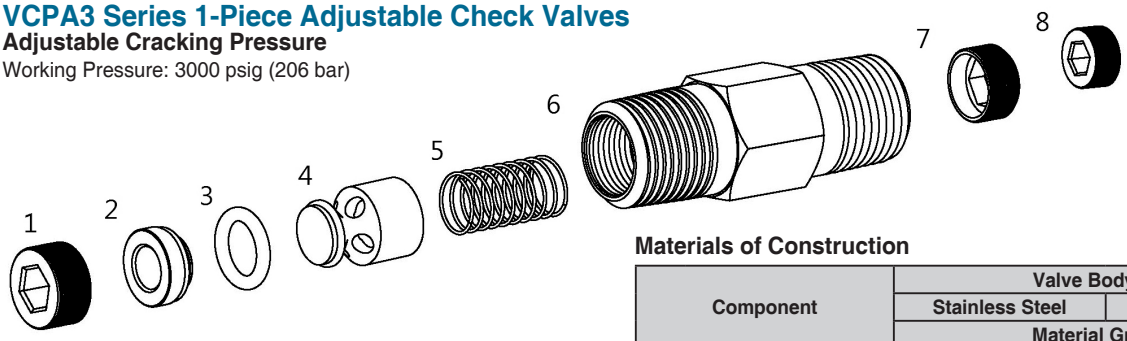
Step 3. Suffix an applicable body material designator to the ordering number: VCP3A-F4N-1/3-**SS**

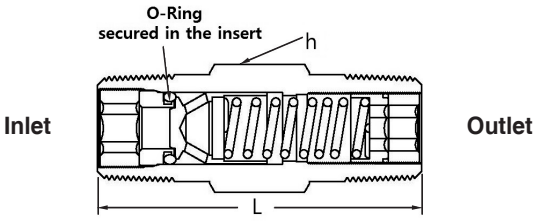
SS316: **SS**, Brass: **B**

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**	SS316/A276, A479	C36000/B16, C3604/JIS H3250
7	**Adjusting Screw**		
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**

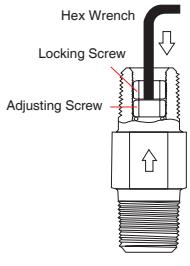
Spring Designator

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

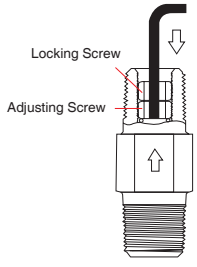
Pressure-Temperature Ratings

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)	-

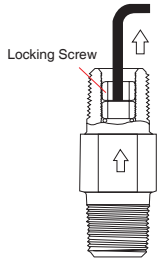
Cracking-Pressure Adjustment Procedure



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

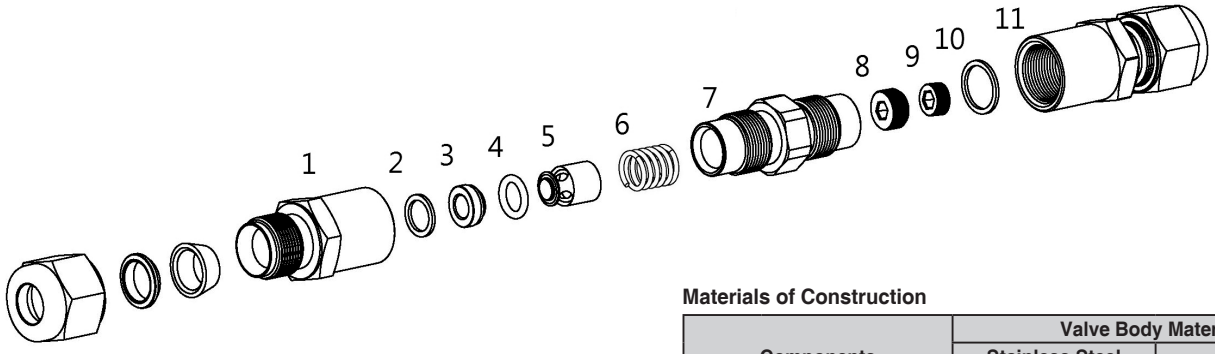
VCA3 Series Adjustable Check Valves

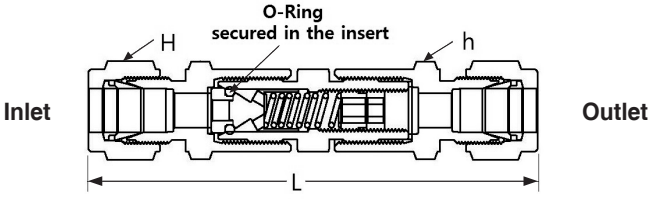
Adjustable Cracking Pressure

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			84.3 (3.32)	16mm	
	MA4N4T-SS	1/4 in. Male NPT	1/4 in. OD M Tube Fitting		79.2 (3.12)	9/16	

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

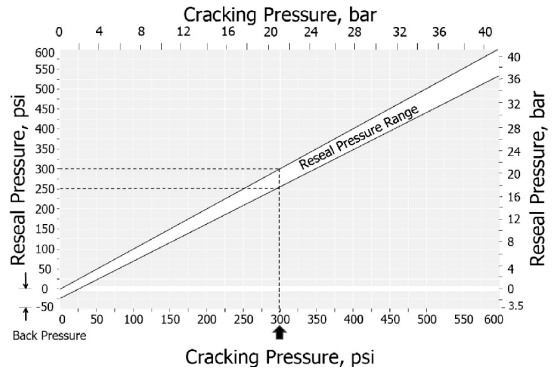
Cracking Pressure, psig (bar)	Designator
3 to 50 (0.21 to 3.5)	3
50 to 150 (3.5 to 10.4)	50
150 to 350 (10.4 to 24.2)	150
350 to 600 (24.2 to 41.4)	350

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.

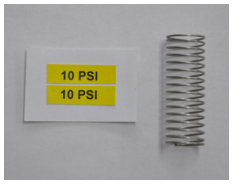


Option

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 psi (bar)	Kit Ordering Number
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	Kit Ordering Number
VCA3	VCPA3	psi (bar)	
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

VCL6 Series Lift Check Valves

Non-Return Valves

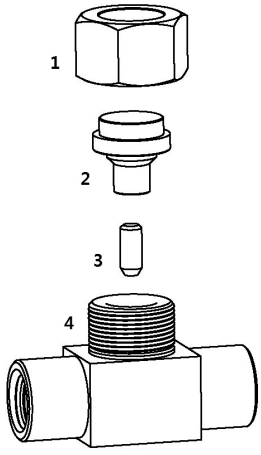
Working Pressure: 6000 psig (413 bar)

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.

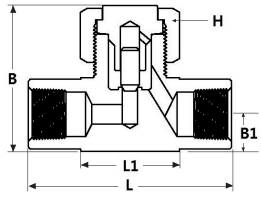


Materials of Construction

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



Inlet Outlet

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)	23.9 (0.94)			
	AF4T4N-SS	1/4 in. OD M Tube Fitting / 1/4 in. Female NPT			56.6 (2.23)	24.6 (0.97)			
	SW4T-SS	1/4 in. Tube Socket Weld			46.0 (1.81)	22.9 (0.90)			
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							
	F6N-SS	3/8 in. Female NPT			79.2 (3.12)	47.2 (1.86)			
	F8N-SS	1/2 in. Female NPT							
	SW8T-SS	1/2 in. Tube Socket Weld			79.5 (3.13)	47.8 (1.88)			

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

Factory Test

Every valve is factory tested for open and reseal 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.