

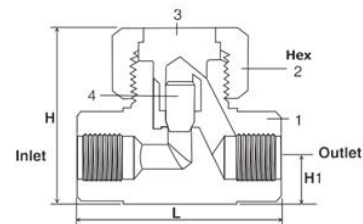
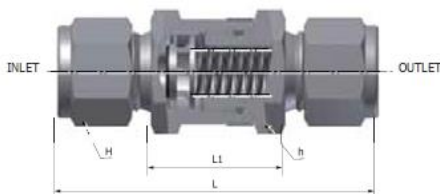
# CHECK VALVES



## Western Valve & Fitting

(925-443-8500)

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## Table of Contents

Poppet Check Valves	Page 4
One-Piece Check Valves	Page 5
One-Piece Adjustable Check Valves	Page 8
In-Line Adjustable Check Valves	Page 8
CNG/NGV Check Valves	Page 10
High Pressure Check Valves	Page 10
Lift Check Valves	Page 11

## Features

## Technical Information

Valve Series	CV3 Series		CVP3 Series	CVA3 Series	CVH3 Series	
	CV3 1/8"- 5/8"	CV3 3/4"-1"	CVP3	CVA3	CVH3 1/8"-1/2"	CVH3 3/4"- 1"
Materials	SS316 & Brass	SS316   Brass	SS316 & Brass	SS316 & Brass	SS316	SS316
Working Pressure @ 70°F (21°C) Unit : psig (bar)	3000 (206)	2000 (137)   1500 (103)	3000 (206)	3000 (206)	6000 (413)	5000 (344)
Temperature Ratings °F (°C)	Seal Material	Designator	Rating	Seal Material	Designator	Rating
	FKM O-ring	VT	-10 to 375 (-23 to 190) <sup>(a)</sup>	EPDM O-ring	EP	-50 to 300 (-45 to 148)
	NBR O-ring	BN	-10 to 250 (-23 to 121)	FFKM O-ring	KZ	-10 to 600 (-23 to 315)
	· FKM is standard for SS316 valves. · NBR is standard for Brass valves.					
Cracking Pressure	Refer to spring table of each valve series					

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

- **Cracking Pressure:** Valve poppet is actuated when the pressure difference between the inlet (upstream) and the outlet (downstream) reaches the range of cracking pressure.
- **Reseal Pressure :** Valves that have higher cracking pressure can be resealed to bubble-tight by the spring force. The reseal pressure is the pressure at the same flow direction, but lower than the cracking pressure.
- **Back Pressure :** Valves that have cracking pressure of 5 psig (0.34 bar) and lower may not be able to return to the bubble-tight seal. This may require back pressure to press the seal to form a bubble-tight contact in addition to the spring force.

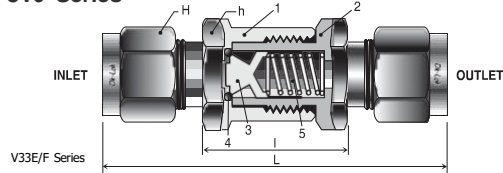
## Class Ratings

Valve Series	CV3 Series				CVP3, CVA3 Series		CVH3 Series	
	CV3 1/8"- 5/8"		CV3 3/4"-1"		CVP3, CVA3		CVH3 1/8"- 1/2"	CVH3 3/4"- 1"
Temperature, °F (°C)	Working Pressure, psig (bar)							
	SS316	Brass	SS316	Brass	SS316	Brass	SS316	Brass
-18 to 100 (-28 to 38)	3000 (206)	3000 (206)	2000 (137)	1500 (103)	3000 (206)	3000 (206)	6000 (413)	5000 (344)
200 (93)	2575 (177)	2600 (179)	1715 (118)	1300 (89)	2575 (177)	2600 (179)	5160 (355)	4290 (295)
225 (175)	2510 (172)	2500 (172)	1670 (115)	1250 (86)	2510 (172)	2500 (172)	5030 (346)	4180 (288)
250 (121)	2450 (168)	2405 (165)	1630 (112)	1200 (82)	2450 (168)	2405 (165)	4910 (338)	4080 (281)
300 (148)	2325 (160)	-	1545 (106)	-	2325 (160)	-	4660 (321)	3875 (267)
350 (176)	2255 (155)	-	1490 (102)	-	2255 (155)	-	4470 (308)	3720 (256)
375 (190)	2185 (150)	-	1450 (99)	-	2185 (150)	-	4375 (301)	3640 (250)
400 (204)	-	-	-	-	-	-	4280 (294)	3560 (245)

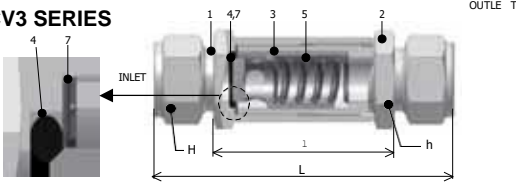
### Features

- Working pressure up to 3,000 psig (206 bar)

### CV3 Series



### CV3 SERIES



### Material of Construction

Component	Valve Body Materials		Wetted parts are listed in <b>RED</b> . 4. O-ring* on CV3 Series is secured in poppet groove.  <b>Lubrication :</b> • Silicon-based Lubricant for Poppet. • Molybdenum Dry Film Lubricant for SS316 Body Threads.
	Stainless Steel	Brass	
	Material Grade/ASTM		
1. Body	SS316	Brass	
2. Connector	/A276, A479	360 /B16	
3. Poppet			
4. O-ring*	FKM	NBR	
5. Spring	SS302/A313		
6. O-ring seal	FKM	NBR	
7. Washer	SS316 With PTFE Coating		

### Ordering Information and Dimensions

Basic Ordering		End Connections		Orifice mm (in.)	Cv	Dimensions mm (in.)				
Number		Inlet	Outlet			h-Hex	H-Hex	L	I	
CV3-	C-1/8	1/8 in. compression		4.8 (0.19)	0.16	15.88 (5/8)	11.11 (7/16)	55.60 (2.19)	25.00 (0.98)	
	M-1/8	1/8 in. Male NPT					-	44.40 (1.75)	-	
	F-1/8	1/8 in. Female NPT			-		46.50 (1.83)	-		
	C-1/4	1/4 in. compression			0.47		14.29 (9/16)	60.00 (2.36)	25.00 (0.98)	
	CM-6mm	6 mm compression					14.00			
	MxComp	1/4 in. Male NPT	1/4 in. compression				14.29 (9/16)	56.40 (2.22)		
	M-1/4	1/4 in. Male NPT			-		53.40 (2.10)	-		
CV3-	F-1/4	1/4 in. Female NPT		7.1 (0.28)	1.48	19.05 9898 1q1(3/4)	17.46 (11/16)	65.50 (2.58)	27.10 (1.07)	
	C-3/8	3/8 in.					19.00	-		
	CM-10mm	10 mm compression					-	55.50 (2.19)	-	
	M-1/4	3/8 in. Male NPT					-	63.80 (2.51)	-	
CV3-	F-3/8	3/8 in. Female NPT		10.0 (0.39)	1.7	22.22 (7/8)	22.22 (7/8)	80.20 (3.16)	36.20 (1.43)	
	CM-12mm	12 mm compression					22.00	-		
	M-1/2	1/2 in. Male NPT					-	74.40 (2.93)	-	
CV3-	F-1/2	1/2 in. Female NPT		13.5 (0.53)	2.6	28.58 (1-1/8)	-	84.70 (3.33)	-	
	C-5/8	5/8 in.					25.40 (1)	91.80 (3.61)	48.10 (1.89)	
CV3-	C-3/4	3/4 in.		16.0 (0.63)	5.2	31.75 (1-1/4)	28.58(1-1/8)	110.70 (4.35)	66.1 (2.6)	
	M-3/4	3/4 in. Male NPT					-	105.30 (4.15)	-	
	F-3/4	3/4 in. Female NPT					-	103.00 (4.06)	-	
CV3-	C-1	1 in.		18.0 (0.71)	8.0	34.93 (1-3/8)	38.1 (1-1/2)	120.8 (4.75)	68 (2.68)	
	M-1	1 in. Male NPT					-	115.8 (4.56)		-
	F-1	1 in. Female NPT					41.28 (1-5/8)	-		111 (4.37)

### Spring Cracking, Reseal and Back Pressure @ 70 °F (21 °C) (for V33)

Spring Nominal Cracking Pressure Designator		Cracking Pressure Ranges				Reseal Pressures psig (bar)
		Min. Pressure		Max. Pressure		
psig	bar	psig	bar	psig	bar	
1/3	0.02	0	0	3	0.21	Up to 6 (0.41) Back pressure
1	0.07	0	0	4	0.28	Up to 6 (0.41) Back pressure
3	0.21	2	0.14	7	0.48	Up to 4 (0.28) Back pressure
10	0.69	7	0.48	15	1.03	Minimum 3 (0.21) Reseal pressure
25	1.72	20	1.38	30	2.07	Minimum 17 (1.17) Reseal pressure
50	3.45	40	2.76	60	4.14	Minimum 35 (2.41) Reseal pressure
75	5.17	60	4.14	90	6.20	Minimum 53 (3.65) Reseal pressure
100	6.89	80	5.51	120	8.27	Minimum 70 (4.82) Reseal pressure

## One-Piece Check Valves

### Features

- O-ring seal blow-out proof design
- One piece body construction.
- Working pressure up to 3,000 psig (206 bar)

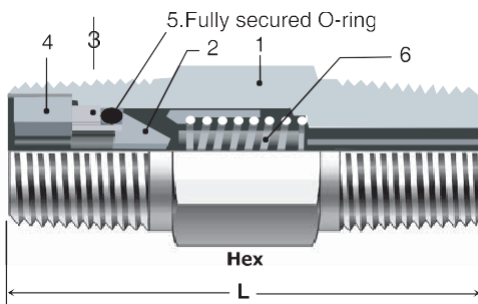
### Materials of Construction

Component	Valve Body Materials	
	Stainless Steel	Brass
	Material Grade/ASTM	
1. Body	SS316 / A276, A479	Brass 360 / B16
2. Poppet		
3. O-ring Holder		
4. Locking Screw		
5. O-ring	FKM	NBR
6. Spring	SS302/A316 3	

Wetted parts are listed in Red.

### Lubrication :

- Silicon-based Lubricant on Poppet
- Molybdenum Dry Film Lubricant on SS316 Locking Screw.



### Ordering Information and Dimensions

Basic Ordering Number		End Connections		Cv	Dimensions mm (in.)	
		Inlet	Outlet		L	Hex.
CVP3-	M-1/4	1/4 in. Male NPT		0.35	41 (1.62)	14.28 (9/16)
	ISO-1/4	1/4 in. ISO Male Tapered			61 (2.41)	19.05 (3/4)
	F-1/4	1/4 in. Female NPT				
	FISO-1/4	1/4 in. ISO Female Tapered				
	MF-1/4	1/4 in. Male NPT	1/4 in. Female NPT		44 (1.75)	26.98 (1-1/16)
	FM-1/4	1/4 in. Female NPT	1/4 in. Male NPT		58 (2.28)	
CVP3-	M-1/2	1/2 in. Male NPT		1.20	58 (2.28)	22.22 (7/8)
	F-1/2	1/2 in. Female NPT			94 (3.71)	26.98 (1-1/16)
	MF-1/2	1/2 in. Male NPT	1/2 in. Female NPT		72 (2.83)	

**Spring Cracking, Reseal and Back Pressure @ 70°F (21°C)**

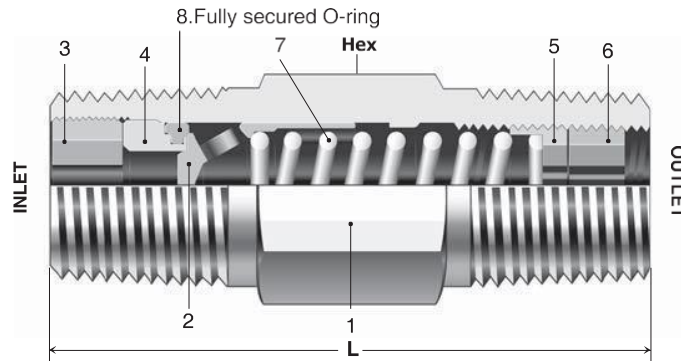
Spring Nominal Cracking Pressure Designator		Cracking Pressure Ranges				Reseal Pressures psig (bar)
		Min. Pressure		Max. Pressure		
psi g	bar	psig	bar	psig	bar	
1/3	0.02	0	0	3	0.21	6 to 20 (0.41 to 1.38) back pressure
1	0.07	0	0	4	0.28	5 to 20 (0.34 to 1.38) back pressure
10	0.69	7	0.48	13	0.90	3 to 10 (0.21 to 0.69) back pressure
25	1.72	21	1.45	29	2.00	Minimum 5 (0.34) Reseal pressure

## One-Piece Adjustable Check Valves / In-Line Adjustable Check Valves

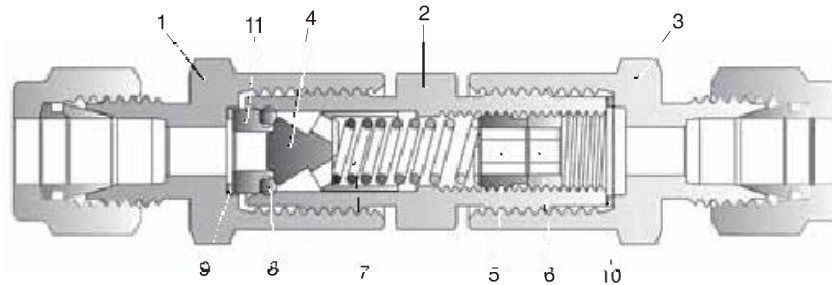
### Features

- Cracking pressure adjustable from 3 to 600 psig (0.2 to 41.3 bar)
- Working pressure up to 3,000 psig (206 bar)
- Temperature up to 190°C (375°F) with FKM O-ring
- Standard materials: 316 stainless steel and brass.

### CV3 Series



### CVA3 Series



### Materials of Construction

Component		Valve Body Materials	
		Stainless Steel	Brass
		Material Grade/ASTM	
CV3 Series	CVA3 Series	SS316 /A276, A479	Brass 360 / B16
1. Body	1. Inlet body 2. Center body 3. Outlet body		
2. Poppet 360 / B16	4. Poppet		
3. Insert locking screw	-		
4. Insert	11. Insert		
5. Adjustable screw	5. Adjustable screw		
6. Locking screw	6. Locking screw		
7. Spring	7. Spring	SS302/A313	
8. O-ring	8. O-ring	FKM, Optional FFKM	NBR
	9. Inlet gasket 10. Outlet gasket	TFE coated SS316	

Wetted parts are listed in red.

### Lubrication :

- Silicon-based Lubricant on Poppet
- Molybdenum Dry Film Lubricant on SS316 Locking Screw and Insert Locking Screw.



### CVA3 Series Ordering Information and Dimensions

Basic Ordering Number	End Connections	Cv	L		Hex	
			mm	in.		
CVA3-	F-1/4	1/4 in. Female NPT	0.35	75.7	2.98	3/4
	M-1/4	1/4 in. Male NPT		41.1	1.62	9/16
	MT-1/4	1/4 in. ISO Male Tapered		41.1	1.62	9/16
CVA3-	M-1/2	1/2 in. Male NPT	1.2	65.0	2.56	7/8
	MT-1/2	1/2 in. ISO Male Tapered		65.0	2.56	7/8

### CVA3 Series Ordering Information and Dimensions

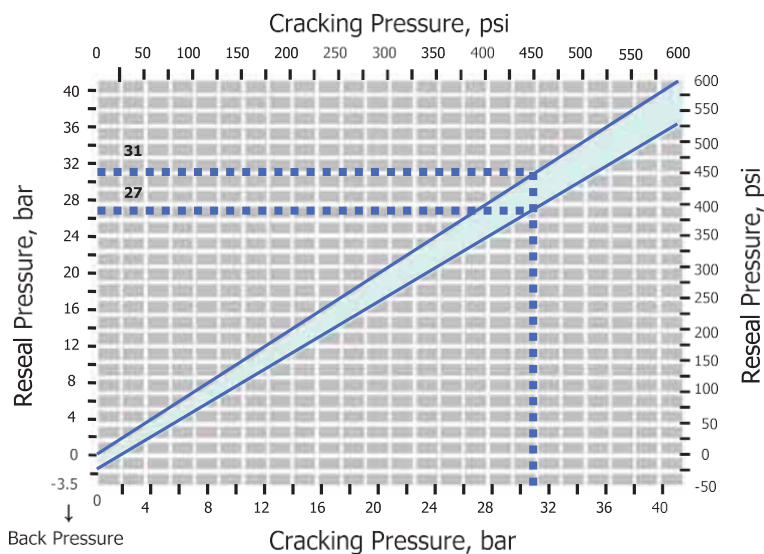
Basic Ordering Number	End Connections		Cv	Dimensions mm(in.)		
	Inlet	Outlet		L	H	h
CVA3-	C-1/4	1/4 in. Compression	0.37	82.0(3.23)	9/16 in.	5/8 in.
	CM-6MM	6mm Compression		82.0(3.23)	14mm	
	CM-8MM	8mm Compression		84.3(3.32)	16mm	
	MXCOMP	1/4 in. Male NPT / 1/4 in. Compression		79.2(3.12)	9/16 in.	

### Spring Cracking Pressure Range Designator

Cracking Pressure Range @21 °C (70 °F)		Designator
psig	bar	
3 to 50	0.2 to 3.4	3
50 to 150	3.4 to 10.3	50
150 to 350	10.3 to 24.1	150
350 to 600	24.1 to 41.3	350

### Cracking Pressure vs. Reseal pressure

CVA3 Series valves set to crack at 20 psig(1.3 bar) or lower may require back pressure(downstream pressure) to reseal the valve bubble tight.



Example shown : For a valve set to crack at 31 bar (450 psig), the minimum reseal pressure would be 27 bar (390psig).

### How to adjust cracking pressure

Step 1	Step	Step 3
<p>Slightly unscrew the locking screw counter-clockwise.</p>	<ol style="list-style-type: none"> <li>Gently slide the allen key up to adjustable screw position.</li> <li>Adjust cracking pressure. <ul style="list-style-type: none"> <li>To increase cracking pressure, turn adjustable screw clockwise.</li> <li>To decrease cracking pressure, turn adjustable screw counter-</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>Move out the allen key up to the locking screw position.</li> </ol>

## High Pressure Check Valves

### Features

- High pressure 6,000 psig (413 bar)
- Seal blow-out proof design with the bonded seal on poppet.



### Materials of Construction

Component	Valve Body Material	Wetted parts are listed in <b>red</b> . * Indicator ring bears the information of spring designator.  <b>Lubrication :</b> • Silicon-based Lubricant on Poppet • Molybdenum Dry Film Lubricant on SS316 Connector threads
	Stainless Steel	
	Material Grade/ASTM	
1. Body	SS316 /A479, A276	
2. Connector		
3. Poppet stop		
4. Poppet with bonded seal	Poppet: SS316 /A479, A276 Bonded Seal : FKM, optional EPDM & Kalrez HNBR standard for VCH36 Series	
5. Spring	SS302 /A313	
6. Indicator ring*	SS316 /A276	
7. O-ring	FKM / HNBR standard for VCH36 Series	
8. Backup ring	PTFE /D1710	
9, 10, 11. DK-Lok Front & Back Ferrule and Nut	SS316 /A479, A276	

### Spring Cracking, Reseal and Back Pressure @ 70 °F (21 °C)

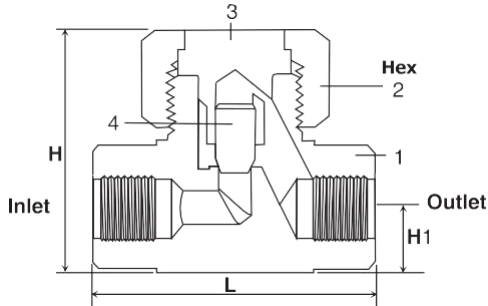
Spring Nominal Cracking Pressure Designator		Cracking Pressure Ranges				Reseal Pressures psig (bar)
		Min. Pressure		Max. Pressure		
psi g	bar	psig	bar	psig	bar	
1/3	0.02	0	0	3	0.21	Up to 6 (0.41) back pressure
1	0.07	0	0	4	0.28	Up to 5 (0.35) back pressure
5	0.34	3	0.21	9	0.62	Up to 2 (0.14) back pressure
10	0.69	7	0.48	15	1.03	Minimum 3 (0.21) Reseal pressure
25	1.72	20	1.38	30	2.07	Minimum 17 (1.2) Reseal pressure

### Ordering Information and Dimensions

Basic Ordering Number		End Connections	Cv	Dimensions mm (in.)				Pressure Rating psig ( <b>bar</b> )
				L	L1	H	h	
CVH3	C-1/8	1/8 in. Compression	0.67	57.7 (2.27)	26.4 (1.04)	11.11 (7/16)	11/16	6000 (413)
	C-1/4	1/4 in. Compression		61.7 (2.43)	26.4 (1.04)	14.29 (9/16)		
	CM-6mm	6 mm Compression		61.7 (2.43)	26.4 (1.04)	14		
	F-1/4	1/4 in. Female NPT		54.1 (2.13)	-	-		
	M-1/8	1/8 in. Male NPT		45.5 (1.79)	26.4 (1.04)	-		
	M-1/4	1/4 in. Male NPT		55.1 (2.17)	26.4 (1.04)	-		
CVH3	C-3/8	3/8 in. Compression	1.8	69.9 (2.75)	31.2 (1.23)	17.46 (11/16)	1	6000 (413)
	C-1/2	1/2 in. Compression		75.2 (2.96)	31.2 (1.23)	22.22 (7/8)	1	
	CM-8-mm	8 mm Compression		68.6 (2.70)	31.2 (1.23)	16	1	
	CM-10-mm	10 mm Compression		71.1 (2.80)	31.2 (1.23)	19	1	
	CM-12mm	12 mm Compression		75.2 (2.96)	31.2 (1.23)	22	1	
	F-3/8	3/8 in. Female NPT		64.8 (2.55)	-	-	1	
	F-1/2	1/2 in. Female NPT		77.0 (3.03)	-	-	1-1/16	4900 (337)
	M-3/8	3/8 in. Male NPT		59.9 (2.36)	31.2 (1.23)	-	1	6000 (413)
M-1/2	1/2 in. Male NPT	69.3 (2.73)	31.2 (1.23)	-	1			
CVH3	C-3/4	3/4 in. Compression	4.7	89.4 (3.52)	45.2 (1.78)	28.58 (1-1/8)	1-5/8	5000 (344)
	C-1	1 in. Compression		98.6 (3.88)	45.5 (1.79)	38.1 (1-1/2)		4700 (323)
	CM-22mm	22 mm Compression		88.4 (3.48)	45.5 (1.79)	32		4900 (337)
	CM-25mm	25 mm Compression		98.6 (3.88)	45.5 (1.79)	40		4600 (316)
	F-3/4	3/4 in. Female NPT		82.0 (3.23)	82.0 (3.23)	-		4600 (316)
	F-1	1 in. Female NPT		97.3 (3.83)	97.3 (3.83)	-		4400 (303)
	M-3/4	3/4 in. Male NPT		83.6 (3.29)	45.5 (1.79)	-		5000 (344)
	M-1	1 in. Male NPT		93.2 (3.67)	45.7 (1.80)	-		

### Features

- Working pressure up to 6,000 psig (413 bar)
- Temperature up to 900 °F (482 °C)
- Metal to metal seat



### Operation

- Operation of this valve heavily depends on gravity assistance. Thus mounting horizontally with bonnet nut upward to allow poppet to operate vertically.
- Reverse flow closes the valve, keeping poppet in the orifice.
- Forward flow opens the valve, lifting the poppet
- Lift check valve is primarily for use in liquid systems. If a slight amount of leakage can be tolerated it can be used with heavy gases.
- Reverse flow Cv is limited to less than 0.1% of forward Cv.

### Materials of Construction

Component	Valve Body Material
	Stainless Steel
	Material Grade/ASTM
1. Body	SS316/A276 or A479
2. Bonnet Nut	SS316/A276 or A479
3. Bonnet	TYPE630/A564
4. Poppet	SS316/A276 or A479



### Complete Ordering Number and Dimensions

Complete Ordering Number	End Connection	Orifice		Cv	Dimensions mm (in.)				
		mm	inch		L	H	H1	Hex	
		CVT3	C-1/4 CM-6mm F-1/8 F-1/4 SW-1/4		1/4 in. compression 6 mm compression 1/8 in. Female NPT 1/4 in. Female NPT 1/4 in. Tube Socket Weld	4.0	0.156	0.30	61.0 (2.40) 50.8 (2.00) 46.0 (1.81)
CVT3	C-3/8 F-1/4 SW-3/8 SW-1/2	3/8 in. compression 1/4 in. Female NPT 3/8 in. Tube Socket Weld 1/2 in. Tube Socket Weld	6.4	0.250	0.64	71.9 (2.83) 57.2 (2.25)	47.0 (1.85)	12.7 (.50)	1 1/4
CVT3	C-1/2 C-3/4 F-3/8 F-1/2 SW-1/2	1/2 in. compression 3/4 in. compression 3/8 in. Female NPT 1/2 in. Female NPT 1/2 in. Tube Socket Weld	11.1	0.437	2.20	99.6 (3.92) 79.2 (3.12) 79.5 (3.13)	62.0 (2.44)	15.7 (.62)	1 1/2

### Pressure-Temperature Ratings

ASME Class	2500
Material Group	2.2
Material Name	SS316
Temp. °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)