

C891 and C897 Series Jet Bleed Internal™ Valves

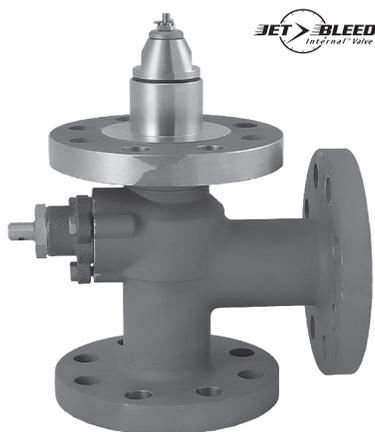


Figure 1. C891 Series Flanged Valves

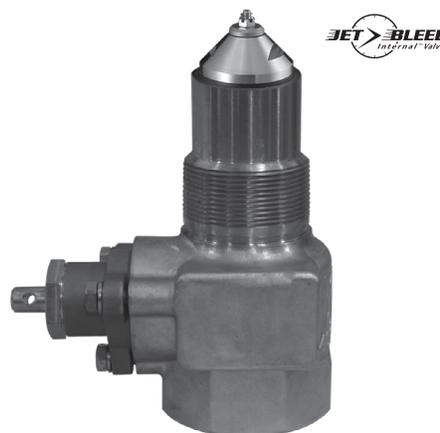


Figure 2. C897 Series Threaded Valves

Introduction

C891 and C897 Series Jet Bleed Internal™ Valves are designed to provide rapid equalization of tank pressure and downstream line pressure, providing a fast valve response time for quick valve opening. The C891 Series provide a sturdy and compact means of directly mounting a pump or piping connection and are typically used on the inlets and outlets of transport trucks and on large stationary storage tanks. The stainless steel body design and multiple trim options are designed for use on specialty compressed gases, however, the user should always check with the factory to make sure the valve materials are suitable for the intended service. The C891 Series internal valves are available in 2 and 3 in. body sizes with CL300 RF Flange end connection. The C897 Series internal valves are available in 2 and 3 in. NPT end connections. C891 Series internal valves have a built-in excess flow valve that reduces the chance of uncontrolled product discharge when flow exceeds the rated flow capacity.

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Features

- **Patented rapid equalization bleed area**—Provides fast valve response for quick opening.
- **Unique Serviceability Features**—Stainless trim parts and poppet designed with integral wrench flat for easy maintenance.
- **Durable Design**—Stainless poppet and stem interface smoothly for a long wear life.
- **Excess Flow Closure**—Functions when flow exceeds the valves rated capacity or piping is sheared off at the valve. (See ratings on Page 2.)
- **Back Check Feature**—Allows reverse flow, fill with or without actuator device. (See Reverse Flow specifications on Page 7.)
- **Spring loaded Polytetrafluoroethylene (PTFE) stub shaft packing**
- **PTFE wear pads and Rulon® Bushings at critical wear points**
- **Manual, Cable or Air Open/Close Control**
- **Thermal Fusible links or plugs melt at 212 to 220°F / 100 to 104°C and allow valve closure in the event of a fire at the valve.**



Specifications

Available Configurations⁽¹⁾

Type C891-16: 2 in. tee body internal valve with Nitrile (NBR) disc material

Type C897-16: 2 in. MNPT x 2 in. FNPT straight through flow internal valve with Nitrile (NBR) disc material

Type C891-24: 3 in. tee body internal valve with Nitrile (NBR) disc material

Type C897-24: 3 in. MNPT x 3 in. FNPT straight through flow internal valve with Nitrile (NBR) disc material

Body Size and End Connection Style

C891 Series

Inlet x Outlet: 2 or 3 in. CL300 RF Flange

C897 Series

Inlet x Outlet: 2 in. MNPT x 2 in. FNPT or 3 in. MNPT x 3 in. FNPT

Number of Outlets

C891 Series: 2 (side and straight through)

C897 Series: 1 (straight through)

Maximum Allowable Inlet Pressure⁽²⁾

C891 Series: 500 psig / 34.5 bar WOG

C897 Series: 400 psig / 27.6 bar

Excess Flow Springs

2 In. / DN 50 Size: 105, 150 and 250 GPM / 397, 568 and 946 l/min Propane

3 In. / DN 80 Size: 160, 265, 375 and 460 GPM / 606, 1003, 1419 and 1741 l/min Propane

Temperature Capabilities⁽²⁾⁽³⁾

-20 to 150°F / -29 to 66°C

Closing Flow and Vapor Capacity

See Tables 2, 3 and 4

Construction Materials

Stainless steel	Disc Holder, Springs, Cotter Pin, Stub Shaft, Stem, Drive Screw, Plug Holder, Stop Tube, Body, Gland, Pins, Screws, Bolts, Nut Washer, Spring Seat, Disc Retainer, Disc Holder and Retainer
Plated steel	Nameplate and Drive Pin
Polyurethane (PU)	Rod Wiper
PTFE	Gland Packing, Liner Brushing, Washer and Wear Plug
Nitrile (NBR) (Standard Construction)	Disc and O-rings
Other Disc and O-ring Material Available from Factory	PTFE, Neoprene (CR), Fluorocarbon (FKM), EPDM, FFKM (Kalrez [®] available if specified) and Low-Temperature Nitrile (NBR)

Approximate Weights

2 In. / DN 50:

Type C891-16: 20 lbs. / 9.1 kg

Type C897-16: 9 lbs. / 4.1 kg

3 In. / DN 80:

Type C891-24: 32 lbs. / 15 kg

Type C897-24: 16 lbs. / 7.3 kg

Note: Temperature ratings vary based on product configuration. Please contact your local Fisher LP-Gas Equipment supplier.

1. C891 and C897 Series have different Trim options available. Please refer to the Numbering System (Figure 5) on Page 4 for more information.

2. The pressure/temperature limits in this Bulletin, and any applicable standard or code limitation for this internal valve should not be exceeded.

3. Product has passed Fisher[®] testing for leakage down to -40°F / -40°C.

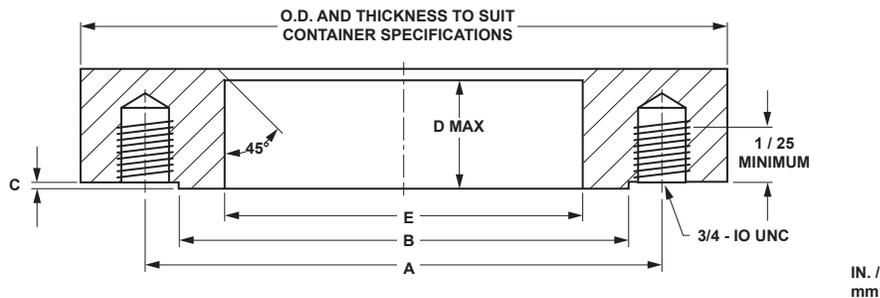


Figure 3. Tank Connection Flanges Dimensions

Table 1. Tank Connection Flanges Dimensions for C891 Series

TANK CONNECTION FLANGES—DIMENSIONS																
CL300 RF Flange		A-BOLTING					B RF		C RF		D		E		Mating Flange O.D.	
		DBC		No.	Size		In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
In.	DN	In.	mm		In.	mm										
2	50	5.0	127	8	5/8	16	3.62	92	0.06	1.5	1.45	37	2.46	62	6.50	165
3	80	6.62	168	8	3/4	19	5.75	146	0.06	1.5	1.50	38	4.62	117	8.25	210

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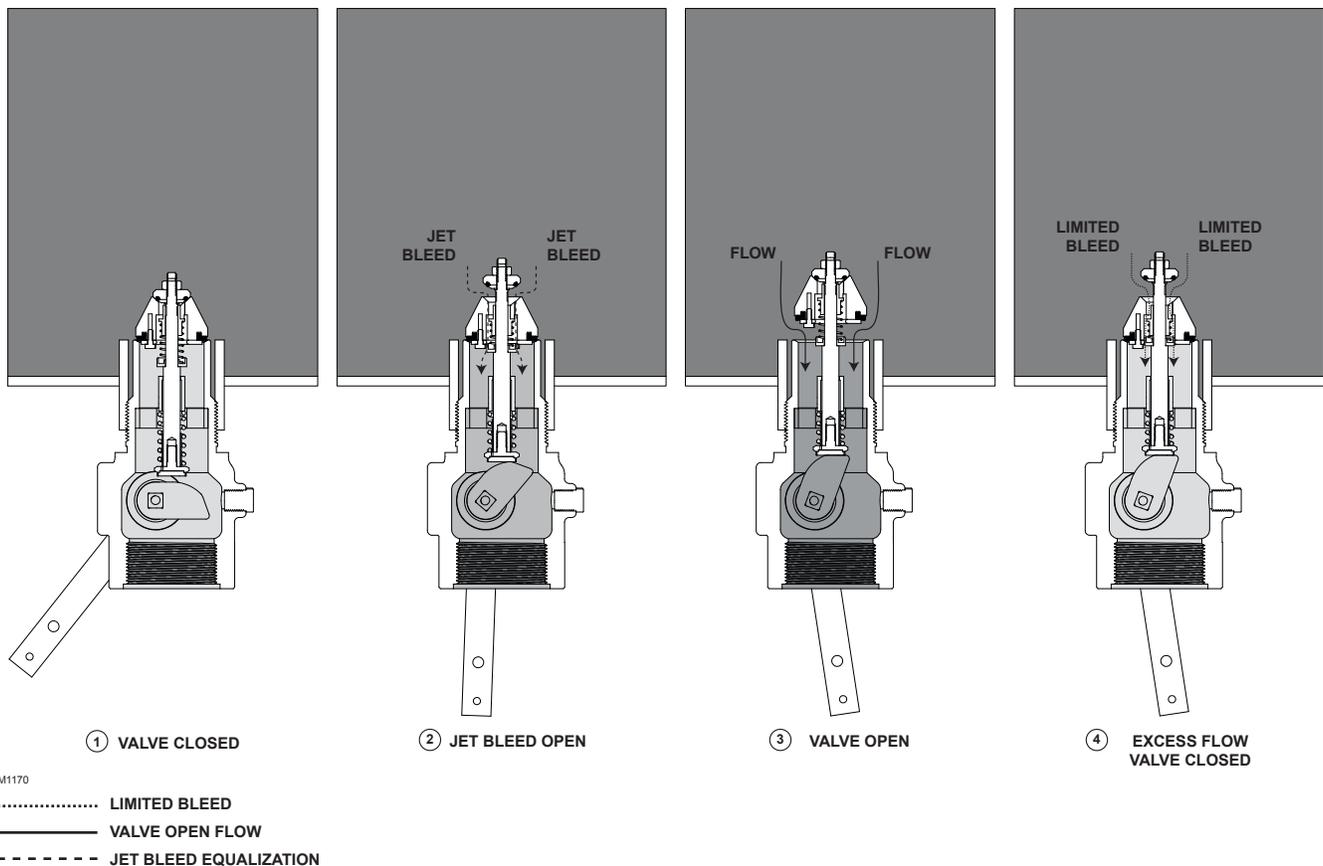


Figure 4. Typical Operational Schematic

Principle of Operation

The operational schematic above (Figure 4) depicts threaded valves, however flanged styles operate in the same manner. For detailed information, refer to the Instruction Manual provided with the valve. In **view #1**, the valve is held closed by both tank pressure and the valve's closing spring. There is no leakage past the resilient seats in the poppet to the valve outlet. The valve is opened by moving the operating lever to approximately midpoint in its 70° travel (**view #2**). This allows the cam to place the rapid equalization portion of the valve stem in the pilot opening, permitting a larger amount of product to bleed downstream than if the operating lever were moved to the full open position. When tank and downstream pressure are nearly equal after a few seconds, the excess flow spring pushes open the main poppet (**view #3**) and the operating lever can be moved to the full open position.

Note

If tank pressure is greater than the valve's outlet pressure, the main poppet will remain in the closed position. If valve outlet piping is closed off by other valves, however, product bleeding through the pilot will increase until it nearly equals tank pressure and the main poppet opens. The main poppet will not open if valve outlet piping is not closed off so that the outlet pressure can approach tank pressure.

Once the main poppet opens, a flow greater than the valve's excess flow spring rating or a sufficient surge in flow forces the main poppet closed against the excess flow spring (**view #4**). The pilot valve allows a small amount of product to bleed, but much less than **view #2** where the rapid equalization portion of the stem is placed in the pilot opening. When the operating lever is moved to the closed position, the valve closes completely and seals tightly (**view #1**).

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		MODEL NUMBER					SIZE	SPRING RATE	
Example:		C	8	9	1	S	- 24	- 26	
Symbol Description									
C	Product Family								
4	Underwriters Laboratories (UL®) Listed								
8	Non UL® Listed								
7	Ductile Iron Body								
8	Steel Body								
9	Stainless Body								
7	Straight Through Flow								
3	Double Flanged Body								
4	Single Flanged Body								
1	Tee Body (Flanged and NPT)								
Nitrile (NBR) (Standard, Only Nitrile (NBR) has UL® Approval)									
V	Fluorocarbon (FKM) Trim								
T	PTFE Trim								
N	Neoprene (CR) Trim								
S	Stainless Steel Body/Gland ⁽¹⁾								
M	Manual Latch Factory Installed								
L	Low-Temperature Nitrile (NBR)								
16	2 In / DN 50								
24	3 In / DN 80								
10	105 GPM / 397 l/min								
15	150 GPM / 568 l/min								
16	160 GPM / 606 l/min								
25	250 GPM / 946 l/min								
26	265 GPM / 1003 l/min								
37	375 GPM / 1419 l/min								
46	460 GPM / 1741 l/min								
<p>1. The Type C891 has Stainless steel body as Standard. 'S' callout on a Type C891 stands for a Stainless steel Gland. For each product family, not all options are available. To check the availability of type numbers specified above, contact or visit your local LP-Gas Equipment distributor.</p>									

Figure 5. Fisher® Internal Valve Numbering System

Table 2. Closing Flow of C891 Series - Liquid Capacity

SIZE		TYPE NUMBER	CLOSING FLOW GPM / l/min PROPANE			
			Bottom of Tank Position ⁽¹⁾		Top of Tank Position ⁽¹⁾	
			Tee Body	GPM	l/min	GPM
2 in.	DN 50	C891-16-10	105	397	120	454
		C891-16-15	150	568	170	643
		C891-16-25	250	946	250	946
3 in.	DN 80	C891-24-16	160	606	180	681
		C891-24-26	265	833	290	909
		C891-24-37	375	1003	395	1097
		C891-24-46	460	1741	460	1741

1. See Internal Valve Flow Positions (Figure 6) for description of Bottom of Tank, Top of Tank and Horizontal Flow Positions.

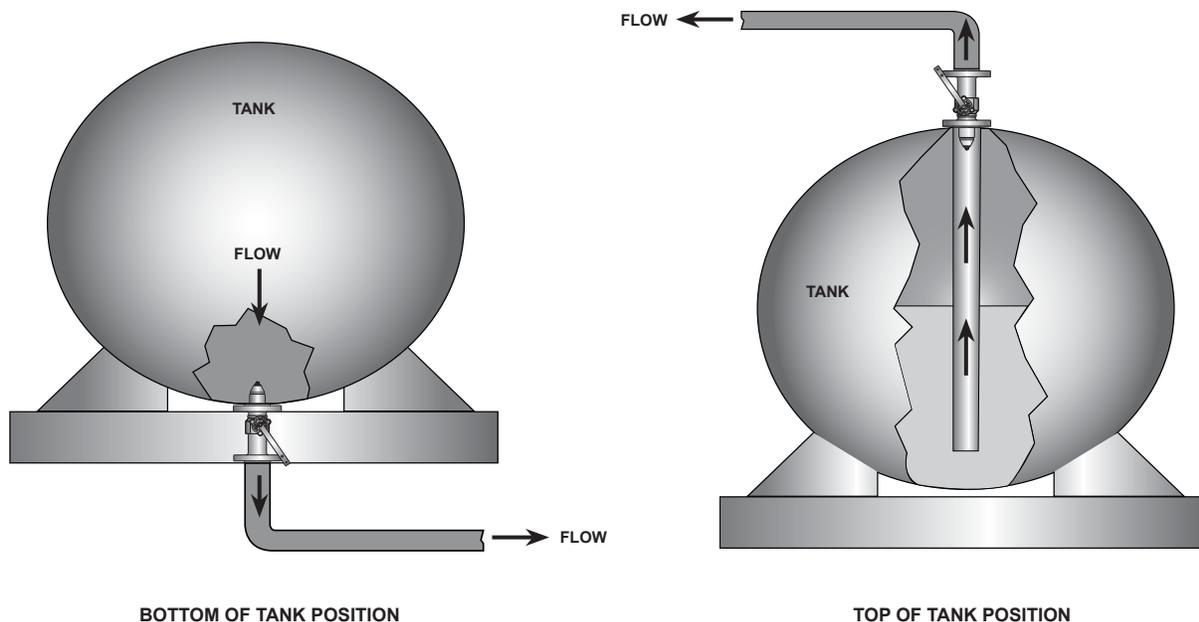


Figure 6. Internal Valve Flow Positions

Table 3. Closing Flow of C897 Series—Propane and NH₃

SIZE		TYPE NUMBER	CLOSING FLOW GPM / L/min PROPANE			CLOSING FLOW GPM / L/min NH ₃	
In.	DN		Straight through Flow	Half Coupling, Bottom of Tank Position ⁽¹⁾	Full Coupling, Bottom of Tank Position ⁽¹⁾	Half Coupling, Top of Tank Position ⁽¹⁾	Half Coupling, Bottom of Tank Position ⁽¹⁾
2	50	C897-16-10		105 / 397	60 / 227	120 / 454	95 / 360
		C897-16-15		150 / 568	80 / 303	170 / 643	135 / 511
		C897-16-25		250 / 946	130 / 492	250 / 946	226 / 855
3	80	C897-24-16		160 / 606	120 / 454	180 / 681	145 / 549
		C897-24-26		265 / 1003	230 / 871	290 / 1098	239 / 905
		C897-24-37		375 / 1419	320 / 1211	395 / 1495	339 / 1283
		C897-24-46		460 / 1741	380 / 1438	460 / 1741	415 / 1571

1. See Internal Valve Flow Positions (Figure 6) for description of Bottom of Tank, Top of Tank and Horizontal Flow Positions.

Table 4. Closing Flow—Vapor Capacity

SIZE		TYPE NUMBER		VAPOR CAPACITY SCFH / SCMh PROPANE					
In.	DN	Straight through Flow	Tee Body	100 psig / 6.9 bar Inlet, Bottom of Tank Position ⁽¹⁾		100 psig / 6.9 bar Inlet, Horizontal Position ⁽¹⁾		100 psig / 6.9 bar Inlet, Top of Tank Position ⁽¹⁾	
				SCFH	SCMH	SCFH	SCMH	SCFH	SCMH
2	50	C897-16-10	C891-16-10	45,000	1274	49,000	1388	66,000	1869
		C897-16-15	C891-16-15	69,000	1954	69,000	1954	88,000	2492
		C897-16-25	C891-16-25	Not Listed		Not Listed		Not Listed	
3	80	C897-24-16	C891-24-16	71,000	2011	71,000	2011	96,000	2718
		C897-24-26	C891-24-26	127,000	3596	127,000	3596	148,000	4191
		C897-24-37	C891-24-37	178,000	5040	178,000	5040	186,000	5267
		C897-24-46	C891-24-46	Not Listed		Not Listed		Not Listed	

1. See Internal Valve Flow Positions (Figure 6) for description of Bottom of Tank, Top of Tank and Horizontal Flow Positions.

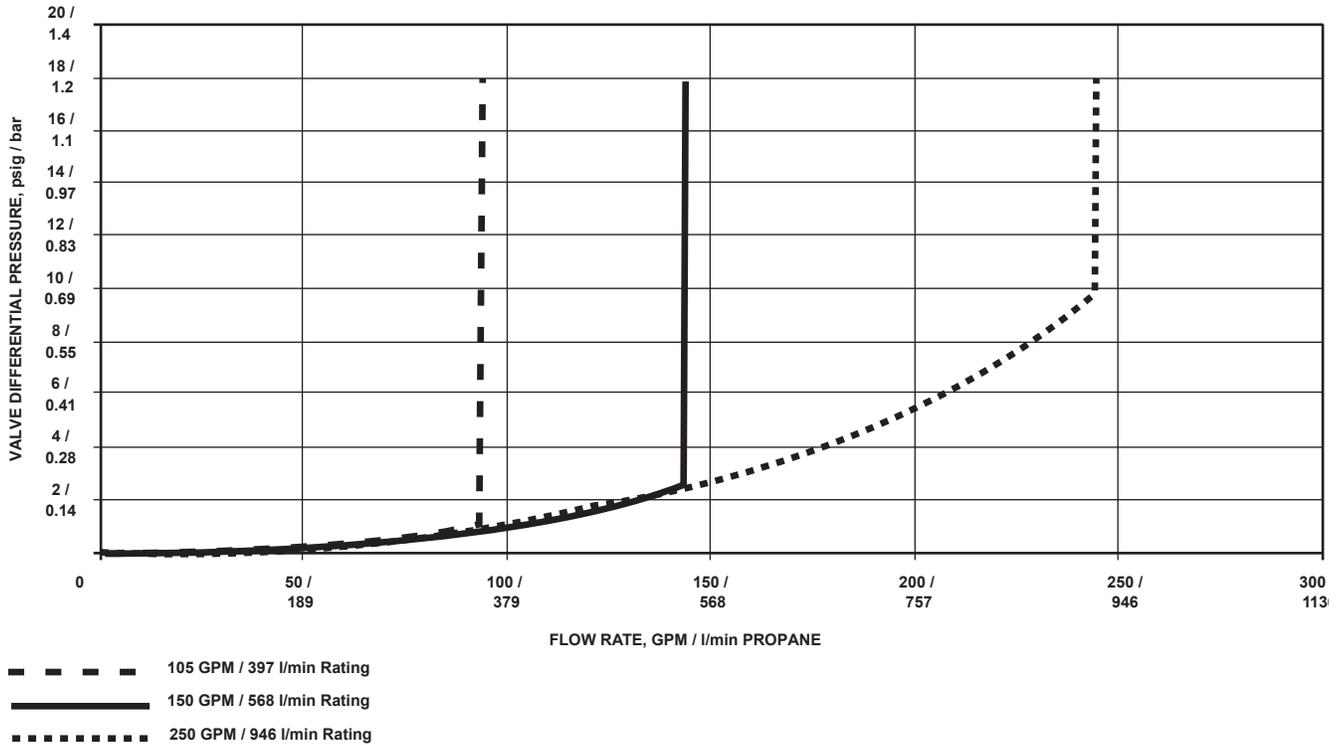


Figure 7. Type C891/C897-16 Top of Tank Position Flow Curve

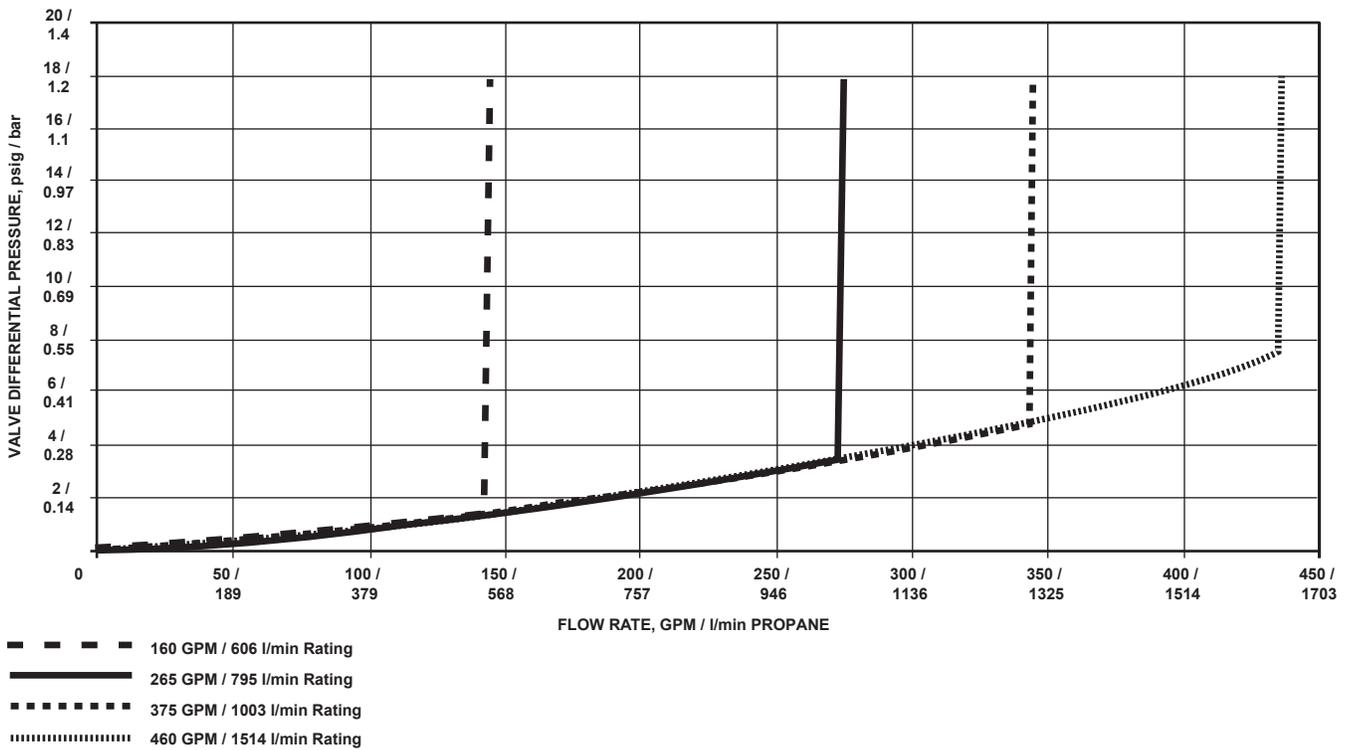


Figure 8. Type C891/C897-24 Top of Tank Position Flow Curve

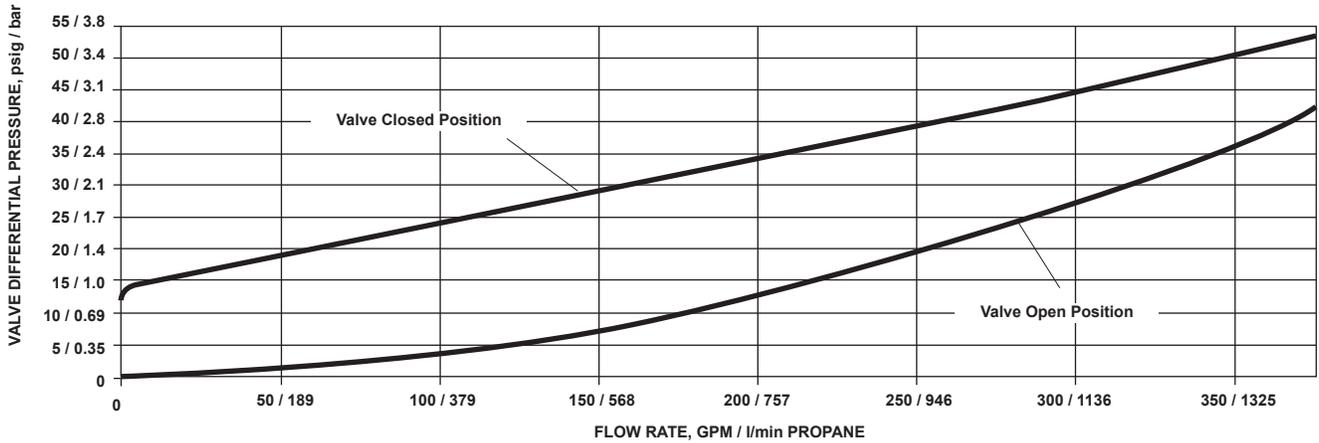


Figure 9. Typical 2 In. Internal Valve Reverse Flow Curve

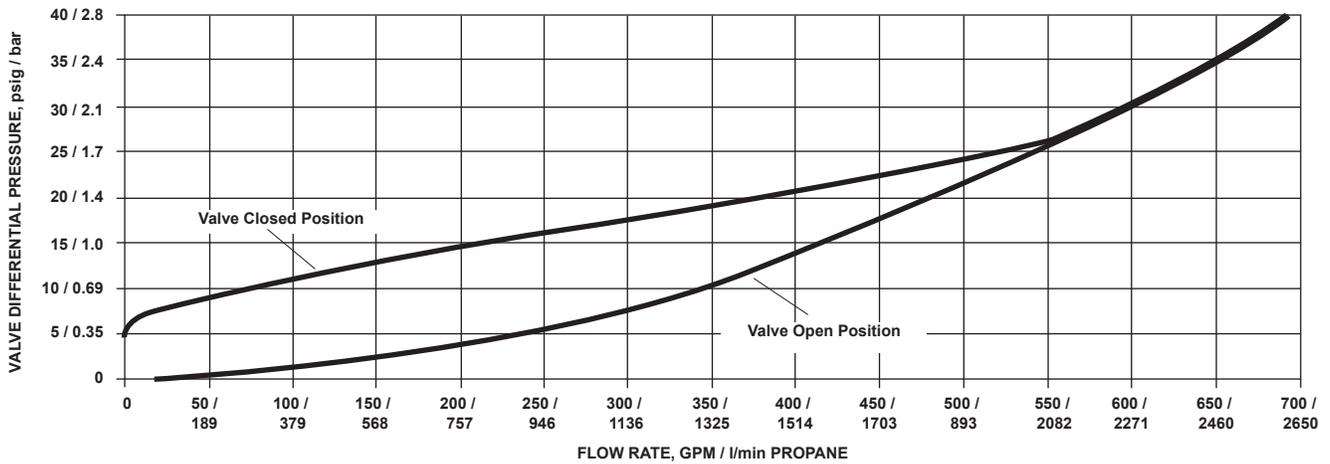


Figure 10. Typical 3 In. Internal Valve Reverse Flow Curve

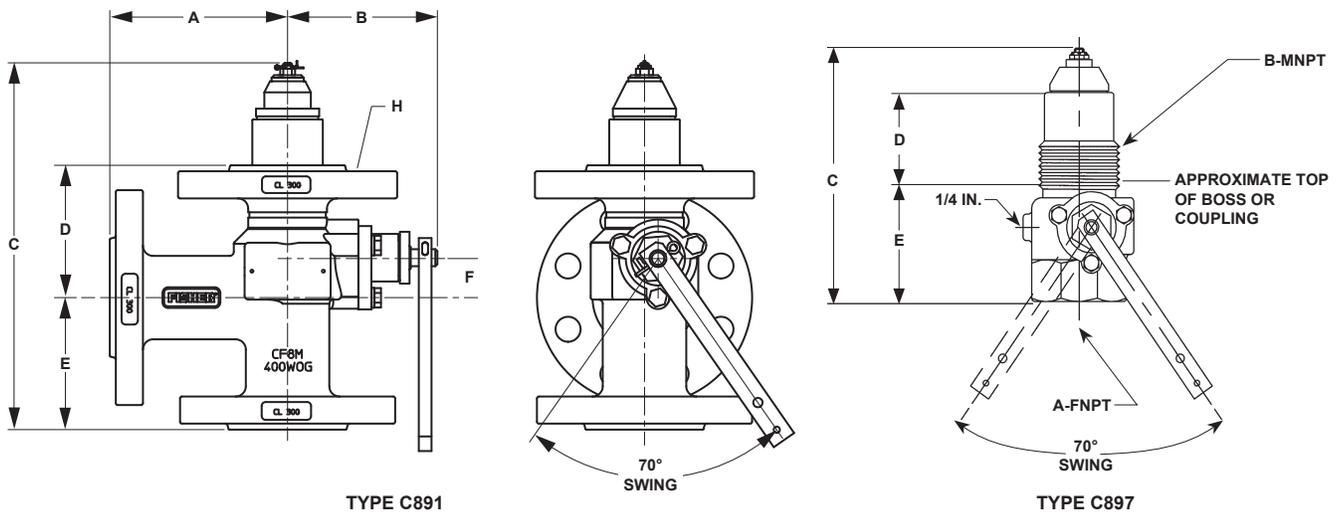


Figure 11. Dimensions

Table 5. Dimensions

TYPE NUMBER	DIMENSIONS, IN. / mm								APPROXIMATE WEIGHT
	A	B	C	D	E	F	G	H	
C891-16	5.52 / 140	4.41 / 112	10.94 / 278	3.88 / 98	3.88 / 98	1.18 / 30	0.42 / 11	2 / 51, CL300 RF	20 lbs. / 9.1 kg
C891-24	6.75 / 171	5.13 / 130	12.50 / 317	4.63 / 118	4.63 / 118	1.38 / 35	0.42 / 11	3 / 76, CL300 RF	32 lbs. / 15 kg
C897-16	2 / 51	2 / 51	8.07 / 205	2.40 / 61	4.05 / 103	----	----	----	9 lbs. / 4.1 kg
C897-24	3 / 76	3 / 76	9.00 / 229	2.60 / 66	4.57 / 116	----	----	----	16 lbs. / 7.3 kg

Bulletin:C891/C897

Ordering Information

To order, refer to the table below and specify the type number that satisfies your requirement. Then, contact or visit your local LP-Gas Equipment Distributor for availability.

Ordering Guide

SIZE	TYPE NUMBER	FLANGE CONNECTION SIZE		ACTUATION METHOD AND DEVICE	
		Inlet	Outlet	Air	Manual with Thermal Latch
2 / 50	C891-16-10	2 in. / DN 50 CL300 RF Flange	2 in. / DN 50 CL300 RF Flange	Type P639	Type P340
	C891-16-15				
	C891-16-25				
	C897-16-10	2 in. MNPT / DN 50 Straight through Flow	2 in. FNPT / DN 50 Straight through Flow		
	C897-16-15				
	C897-16-25				
3 / 80	C891-24-16	3 in. / DN 80 CL300 RF Flange	3 in. / DN 80 CL300 RF Flange	Type P639	Type P340
	C891-24-26				
	C891-24-37				
	C891-24-46				
	C897-24-16	3 in. MNPT / DN 80 Straight through Flow	3 in. FNPT / DN 80 Straight through Flow		
	C897-24-26				
	C897-24-37				
	C897-24-46				

Please contact your local LP-Gas Equipment Distributor for availability of non-standard options.

LP-Gas Equipment

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