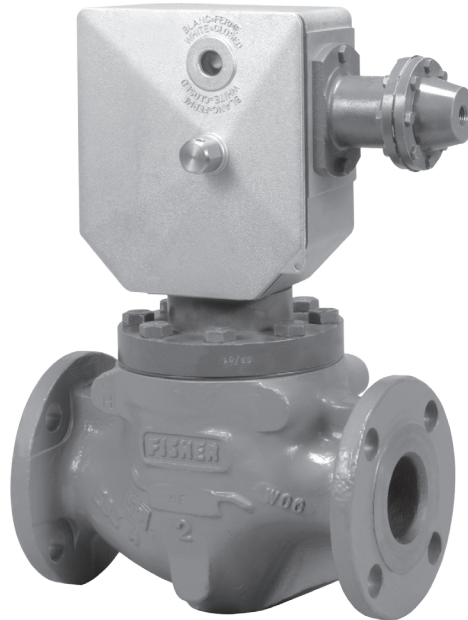


September 2017

# Type OSE Slam-Shut Valve



P2223

Figure 1. Type OSE Slam-Shut Valve

## Features and Benefits

- **Overpressure and Underpressure Protection**—Type OSE can be equipped for **OverPressure ShutOff (OPSO)**, **UnderPressure ShutOff (UPSO)**, **Overpressure and UnderPressure ShutOff (OPSO/UPSO)**.
- **High Shock and Vibration Resistance**—Type OSE incorporates a two-stage tripping mechanism that significantly reduces nuisance tripping caused by vibrations or inlet pressure variations commonly experienced by other shut-off valves.
- **NPS 1 through 10 / DN 25 through 250 Body Sizes**
- **High Accuracy**—Maintains up to  $\pm 1\%$  accuracy regardless of inlet pressure, flowrate and the size of the slam-shut.
- **Easy In-Line Maintenance**—Top entry design reduces maintenance time and manpower requirements; parts can be inspected and replaced without removing the body from the line.
- **Water Tight**—Type OSE is water tight to 10 ft / 3.0 m.
- **Positive Shutoff**—After closing, the slam-shut valve stays closed until the system is shut down and the valve is manually reset. An O-ring on the valve plug seal provides tight shutoff.

- **Remote Alarm Capability**—A limit switch is available that detects when the Type OSE slam-shut valve is tripped.
- **Remote Shutoff Capability**—Remote Tripping can be achieved by combining the Type OSE with a 3-way solenoid valve. Manual tripping is also possible using the Manual Push Button Trigger Switch option.

## Introduction

The purpose of the Type OSE slam-shut device is to totally and rapidly cut the flow of gas when the inlet and/or outlet pressure in the system either exceed or drop below setpoints. Type OSE consists of a valve, a mechanism box (BM1 or BM2) and either one or two manometric sensing devices (Type BMS1 or BMS2).

Incorporated in the Type OSE NPS 1 through 6 / DN 25 through 150 valve plug is an automatic internal bypass valve mechanism, which balances pressures on both sides of the plug when resetting. For sizes NPS 8 and 10 / DN 200 and 250 the bypass is external.

# Type OSE

## Specifications

This section lists the specifications for the Type OSE slam-shut valve. Factory specifications are stamped on the nameplate fastened on the valve at the factory.

### Body Sizes and End Connection Styles

#### WCC Steel

1 and 2 NPT; NPS 1, 2, 3, 4, 6, 8 and 10 / DN 25, 50, 80, 100, 150, 200 and 250; CL150 RF, CL300 RF or CL600 RF

#### Cast Iron

1 and 2 NPT; NPS 1, 2, 3, 4 and 6 / DN 25, 50, 80, 100 and 150; CL125 FF or CL250 FF

### Maximum Inlet Pressure<sup>(1)(2)</sup>

1470 psig / 101 bar or maximum body rating, whichever is lower

### Outlet Pressure Ranges

See Table 3

### Maximum Set Pressure

1470 psig / 101 bar or maximum body rating, whichever is lower

### Minimum Set Pressure

4.02 in. w.c. / 10 mbar

### Manometric Sensing Device Specifications

See Table 3

### Flow Capacities

See Table 4

### Maximum Shutoff Pressure Differential

1470 psig / 101 bar or maximum body rating, whichever is lower

### Representative Wide-Open Flow Coefficients

BODY SIZE	PORT DIAMETER		FLOW COEFFICIENT			BYPASS FLOW COEFFICIENT		IEC SIZING COEFFICIENT				
	NPS	DN	In.	mm	C <sub>0</sub>	C <sub>v</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>1</sub>	X <sub>1</sub>	F <sub>d</sub>	F <sub>1</sub>
1	25	1.83	30	505	14.4	35	25.7	35	0.775	1.0	0.89	
2	50	2.00	51	2210	60.6	35	25.7	35	0.775	1.0	0.89	
3	80	3.15	80	4670	141	33	25.7	35	0.689	1.0	0.89	
4	100	3.94	100	7860	244	32	25.7	35	0.648	1.0	0.89	
6	150	5.91	150	14,850	454	33	25.7	35	0.648	1.0	0.89	
8	200	7.87	200	28,830	833	34.6	133	32.8	0.580	1.0	0.89	
10	250	9.84	250	42,180	1188	35.5	133	32.8	0.797	1.0	0.89	

### Maximum Flowing Pressure Differential<sup>(2)</sup>

BODY SIZE		MAXIMUM FLOWING PRESSURE DIFFERENCE	
NPS	DN	psig	bar
1	25	360	24.8
2	50	360	24.8
3	80	360	24.8
4	100	150	10.3
6	150	85	5.9
8	200	119	8.2
10	250	67	4.6

### Pressure Registration

External

### Accuracy

+/-2.5% for trip points at or below 1.45 psig / 0.10 bar,  
+/-1% for trip points above 1.45 psig / 0.10 bar or  
+/-5% for the piston Types 27 and 17

### Response Time

<1 second

### Valve Plug Travel and Stem Diameter

BODY SIZE		VALVE PLUG TRAVEL		VALVE PLUG STEM DIAMETER	
NPS	DN	In.	mm	In.	mm
1	25	1/2	13	0.138	3.5
2	50	1/2	13		
3	80	1-1/8	29		
4	100	2	51		
6	150	2	51	0.276	7.0
8	200	2-3/4	70		
10	250	3-1/4	82		

### Temperature Capabilities<sup>(2)</sup>

-20 to 150°F / -29 to 66°C

### Pressure Sensing Connections

1/4 NPT

### Vent Connection

1/4 NPT

### Construction Materials

**Body:** WCC Steel or Cast iron

**Bonnet:** Steel

**Valve Plug:** Stainless steel

**Valve Plug Seal O-ring:** Nitrile (NBR)

**Seat Ring:** Stainless Steel

**Mechanism Box:** Aluminum

**First and Second Stage Mechanism:** Steel

**Diaphragm:** Reinforced Nitrile (NBR)

**Bellows:** 316 Stainless steel

**Piston:** 316 Stainless steel

### Approximate Weights

BODY SIZE		APPROXIMATE WEIGHT	
NPS	DN	lbs	kg
1	25	36	16
2	50	70	32
3	80	121	55
4	100	216	98
6	150	445	202
8	200	785	356
10	250	1272	577

### Options

- Explosion-proof limit switch
- Manual Push Button Trigger Switch<sup>(3)</sup>
- Additional manometric device for extra pressure sensing

1. Relief pressure plus maximum allowable buildup over setting.

2. The pressure/temperature limits in this Bulletin or any applicable standard limitation should not be exceeded.

3. The push button connects at the same BM2 port as a Type BMS2 would.

**Table 1. Main Valve Body Sizes, End Connection Styles and Body Pressure Ratings**

MAIN VALVE BODY SIZE		MAIN VALVE BODY MATERIAL	END CONNECTION STYLE <sup>(1)</sup>	STRUCTURAL DESIGN RATING <sup>(2)</sup>	
NPS	DN			psig	bar
1 2 3 4 6	25 50 80 100 150	Cast Iron	NPT <sup>(3)</sup>	400	27.6
			CL125 FF	200	13.8
			CL250 RF	500	34.5
1 2 3 4 6	25 50 80 100 150	WCC Steel	NPT <sup>(3)</sup>	1500	103
			CL150 RF	290	20.0
			CL300 RF	750	51.7
			CL600 RF	1500	103
8 10	200 250	LCC Steel	CL150 RF	290	20.0
			CL300 RF	750	51.7
			CL600 RF	1500	103

1. Ratings and end connections for other than ASME standard can usually be provided. Contact your local Sales Office for assistance.  
2. See Specifications and Table 2 for additional pressure ratings.  
3. Available with NPS 1 and 2 / DN 25 and 50 only.

Type OSE slam-shut valve can be used for all pressure ranges from 4.02 in. w.c. to 1470 psig / 10 mbar to 101 bar by simply replacing the manometric sensing device. In addition, Type OSE can be configured for overpressure shutoff (OPSO), underpressure shutoff (UPSO), overpressure and underpressure shutoff (OPSO/UPSO), manual shutoff or remote shutoff.

### Mechanism Box (BM1 or BM2)

The mechanism box (BM1 or BM2, see Figure 3) is designed to close the slam-shut valve. The detection of pressure variances is sensed by a double-stage trip mechanism (see Figure 3). The first stage is the detection stage and will only trip when the system pressure reaches the set pressure of the manometric sensing device. The second stage is the power stage and once tripped by the first stage, the closing spring causes the valve plug to slam shut and remains closed until the valve is manually reset. If there are any inlet pressure variances or vibrations subjected to the second stage components, they are not transmitted to the first stage trip mechanism. This unique double-stage trip mechanism virtually eliminates nuisance tripping commonly found in other shut-off devices.

### Manometric Sensing Device (Type BMS1 or BMS2)

Pressure from the system is sensed through control lines into the manometric sensing devices (Type BMS1 only, Type BMS2 only or Types BMS1 and BMS2, see Figure 3). Depending on the configuration, the Types BMS1 and BMS2 will transmit these pressure fluctuations to the mechanism box. If these fluctuations reach the setpoint of the manometric sensing device, the device will activate the tripping mechanism in the mechanism box (BM1 or BM2) and cause the valve to slam shut.

The BM1 can be configured with only the Type BMS1 to trip on overpressure (OPSO), underpressure (UPSO) or overpressure and underpressure (OPSO/UPSO). The BM2 can be configured with the Type BMS1 to trip on

overpressure only (OPSO) and the Type BMS2 to trip on overpressure (OPSO), underpressure (UPSO) and overpressure and underpressure (OPSO/UPSO) (refer to application and construction guide in Table 2).

### Remote Shutoff

Remote Tripping is accomplished using a 3-way solenoid valve installed in the control line of a Type BMS1 or BMS2 manometric device configured for underpressure protection (UPSO) or overpressure and underpressure protection (OPSO/UPSO). When de-energized, the solenoid valve allows the Type BMS manometric device to monitor the controlled pressure as if the solenoid valve was not present. When energized, the solenoid valve will be repositioned to connect the Type BMS manometric device to atmospheric pressure tripping the underpressure protection slam-shut setting.

### Principle of Operation

Type OSE slam-shut valve serves to provide overpressure and/or underpressure protection by shutting down the flow to the downstream system. The slam-shut valve is typically installed upstream of a pressure reducing regulator as shown in Figures 4 and 6.

Pressure is registered on one side of the diaphragm, piston or bellows and is opposed by the setpoint control spring of the manometric sensing device. Type OSE slam-shut valve tripping pressure is determined by the setting of the control spring.

**Overpressure:** when the sensed pressure increases above the setpoint, the pressure on top of the diaphragm overcomes the spring setting and moves the manometric device stem.

**Underpressure:** when the sensed pressure decreases below the setpoint, the control spring pressure below the diaphragm overcomes the downstream pressure and pushes the diaphragm which moves the manometric device stem.

# Type OSE

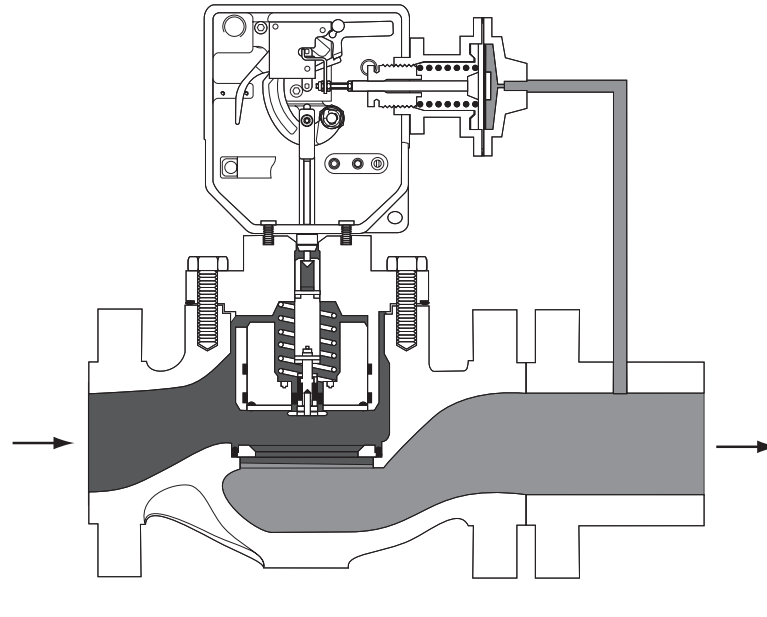


Figure 2. Type OSE Operational Schematic

Table 2. Applications and Construction Guide (See Figure 3)

APPLICATION	MECHANISM BOX REQUIRED	MANOMETRIC SENSING DEVICE REQUIRED	
		Type BMS1	Type BMS2
Overpressure Shutoff (OPSO)	BM1	Type BMS1	----
Underpressure Shutoff (UPSO)		Type BMS1	----
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)		Type BMS1	----
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)	BM2	Type BMS1	Type BMS2
Overpressure Shutoff (OPSO), Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)		Type BMS1	Type BMS2

1. When using one manometric sensing device for both overpressure and underpressure shutoff, make sure that the difference between set pressures falls below the maximum range shown in Table 3.  
 2. When using a Type BMS1 and a Type BMS2, the Type BMS1 can only be used for high trip.

When the sensed pressure increases above set pressure (or drops below the set pressure) the manometric device senses the pressure change and triggers the detection stage which activates the second stage releasing the slam-shut valve plug. A tight and total shutoff is ensured by the plug seal O-ring closing on the seat ring and is helped by the “dash pot” effect between the bonnet skirt and the valve plug. A “dash pot” effect occurs when the valve plug closes by having both the closing spring and the inlet pressure pushing on top of the valve plug. This is accomplished by ports around the skirt of the bonnet allowing inlet pressure above the valve plug.

## Installation

The Type OSE should be installed in a horizontal position only, with the flow going down through the seat ring (flow arrow on body) with the mechanism box above the body. See Figure 6 for typical piping installations.

The Type OSE can be used along with a token relief valve to minimize unnecessary shutoff. The relief valve is set to open before the Type OSE slam-shut valve activates.

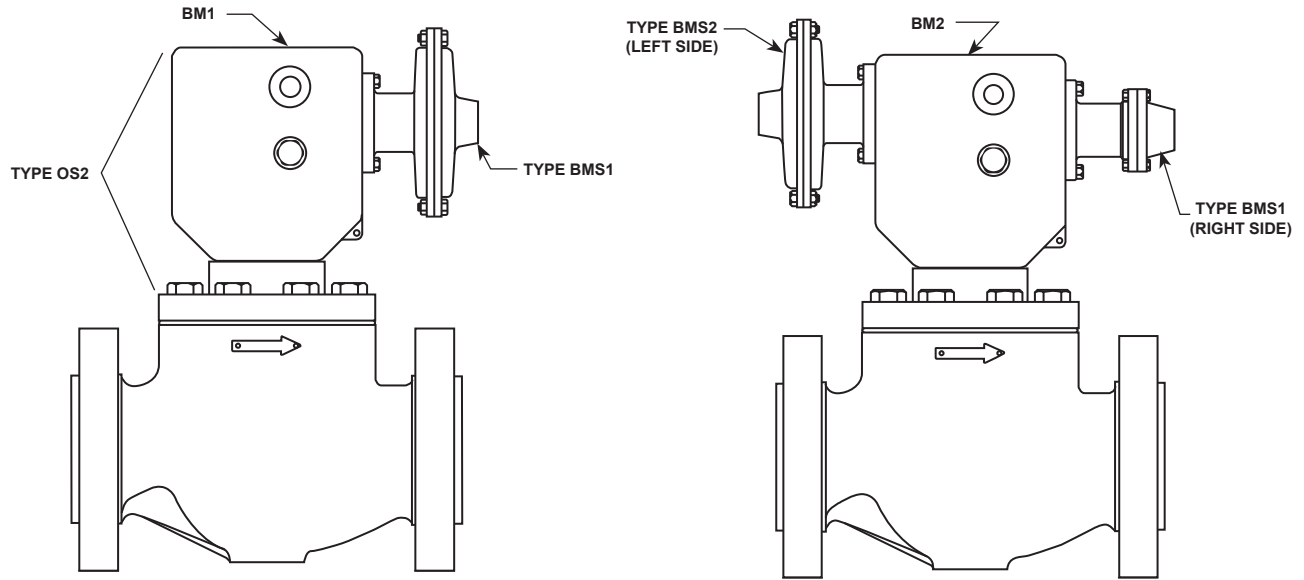
This arrangement allows the relief valve to handle minor overpressure problems such as gas thermal expansion or seat leakage due to dirt moving through the system which may move out of the regulator during the next operating cycle. The slam-shut valve will activate if the regulator has a major malfunction with excessive gas flow that exceeds the token relief capacity.

## Capacity Information

Flows are in thousands of SCFH at 60°F and 14.7 psia and in thousands of Nm<sup>3</sup>/h at 0°C and 1.01325 bar of 0.6 specific gravity natural gas.

To determine equivalent capacities for air, propane, butane or nitrogen, multiply the capacity by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity.

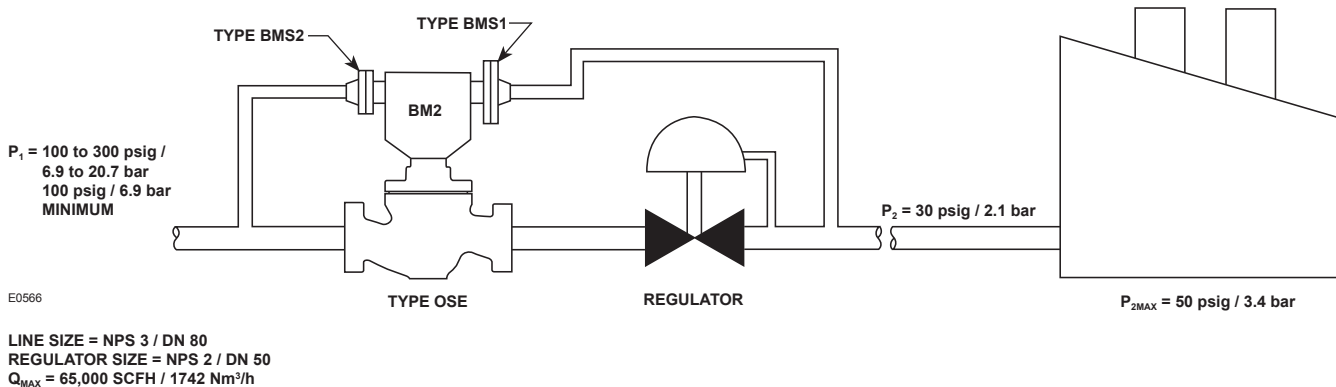
If the capacity is desired in normal cubic meters per hour (Nm<sup>3</sup>/h) at 0°C and 1.01325 bar, multiply SCFH by 0.0268.



MECHANISM BOX (BM1) WITH 1 MANOMETRIC SENSING DEVICE (TYPE BMS1)

MECHANISM BOX (BM2) WITH 2 MANOMETRIC SENSING DEVICES (TYPES BMS1 AND BMS2)

**Figure 3.** Types of Installation (Mounting on Horizontal Pipeline Only)



**Figure 4.** Type OSE Sizing Example

## Sizing Example

Refer to Figure 4. In this example, natural gas is being supplied to a single factory. The normal pressure supplied to the factory is 30 psig / 2.1 bar and maximum inlet pressure to the equipment in the factory is 50 psig / 3.5 bar. A Type OSE slam-shut valve will be used to protect the equipment in case of an overpressure incident. The slam-shut valve will also be used to shut off the flow on underpressure in case the transmission line falls to 100 psig / 6.9 bar inlet pressure (thus preventing further loss of transmission line pressure and possible loss of all line pressure). The regulator has been sized with the assumption that 5 psig / 0.34 bar will be the maximum pressure drop across the slam-shut valve.

1. Gather necessary data:

Conditions:

$$P_{1\text{max}} = 300 \text{ psig} / 20.7 \text{ bar}$$

$$P_{1\text{min}} = 100 \text{ psig} / 6.9 \text{ bar}$$

$$P_{2\text{reg set}} = 30 \text{ psig} / 2.1 \text{ bar}$$

$$P_{2\text{max}} = 50 \text{ psig} / 3.4 \text{ bar}$$

$$\Delta P_{\text{slam-shut}} = 5 \text{ psig} / 0.34 \text{ bar}$$

End connections: CL300 RF flanged  
 Natural Gas  
 $SG = 0.6$   
 $Q_{\text{max}} = 65,000 \text{ SCFH} / 1742 \text{ Nm}^3/\text{h}$

2. Determine appropriate body size of Type OSE:  
 Using the maximum flow of 65,000 SCFH / 1742 Nm<sup>3</sup>/h and an allowable pressure drop of 5 psig / 0.34 bar),

# Type OSE

**Table 3. Spring Ranges, Part Numbers and Maximum and Minimum Pressures for Types BMS1 and BMS2**

SPRING RANGE	SPRING COLOR	SPRING PART NUMBER	MANOMETRIC SENSING DEVICE TYPE	MANOMETRIC SENSING DEVICE STYLE	MAXIMUM SENSING INLET PRESSURE, psig / bar	SETPOINT TOLERANCE, psig / bar <sup>(1)</sup>	MAXIMUM DIFFERENCE BETWEEN OVERPRESSURE AND UNDERPRESSURE, psig / bar <sup>(2)</sup>	SPRING WIRE DIAMETER, IN. / mm	SPRING FREE LENGTH, IN. / mm
4.02 to 14.1 in. w.c. / 10 to 35 mbar	Purple	FA113195X12	162	Diaphragm	74 / 5.1	1.61 in. w.c. / 4 mbar	4.02 in. w.c. / 10 mbar	0.080 / 2.03	2.36 / 59.9
9.97 to 33.2 in. w.c. / 25 to 83 mbar	Orange	FA113196X12				2.02 in. w.c. / 5 mbar	10 in. w.c. / 25 mbar	0.105 / 2.67	2.36 / 59.9
18 in. w.c. to 2.0 psig / 45 mbar to 0.14 bar	Red	FA113197X12				4.02 in. w.c. / 10 mbar	20.1 in. w.c. / 50 mbar	0.120 / 3.05	2.36 / 59.9
1.0 to 3.5 psig / 70 mbar to 0.24 bar	Yellow	FA113198X12				5.62 in. w.c. / 14 mbar	24.1 in. w.c. / 60 mbar	0.135 / 3.43	2.36 / 59.9
1.7 to 5.6 psig / 0.12 to 0.39 bar	Green	FA113199X12				7.23 in. w.c. / 18 mbar	2.18 / 0.15	0.156 / 3.96	2.36 / 59.9
2 to 11 psig / 0.14 to 0.76 bar	Gray	FA113201X12				20.1 in. w.c. / 50 mbar	5.08 / 0.35	0.192 / 4.88	2.36 / 59.9
4 to 19 psig / 0.28 to 1.3 bar	Brown	FA113202X12				1.16 / 80 mbar	8.70 / 0.60	0.207 / 5.26	2.36 / 59.9
7 to 33 psig / 0.48 to 2.3 bar	Black	FA114139X12				2.47 / 0.17	16.0 / 1.1	0.250 / 6.35	2.36 / 59.9
15 to 75 psig / 1.0 to 5.2 bar	Blue	FA113200X12	71		235 / 16.2	5.08 / 0.35	36.3 / 2.5	0.177 / 4.50	2.36 / 59.9
31 to 161 psig / 2.1 to 11.1 bar	Brown	FA113202X12				10.2 / 0.70	79.8 / 5.5	0.207 / 5.26	2.36 / 59.9
59 to 235 psig / 4.1 to 16.2 bar	Black	FA114139X12				23.2 / 1.6	145 / 10.0	0.250 / 6.35	2.36 / 59.9
235 to 323 psig / 16.2 to 22.3 bar	Brown	FA113202X12	27	Piston	1450 / 100	43.5 / 3.0	Requires use of Type BMS1 or BMS2	0.207 / 5.26	2.36 / 59.9
323 to 588 psig / 22.3 to 40.5 bar	Black	FA114139X12				94.3 / 6.5		0.250 / 6.35	2.36 / 59.9
588 to 808 psig / 40.5 to 55.7 bar	Brown	FA113202X12	17	1450 / 100	102 / 7.0	0.207 / 5.26		2.36 / 59.9	
808 to 1450 psig / 55.7 to 100 bar	Black	FA114139X12			174 / 12.0	0.250 / 6.35		2.36 / 59.9	
81 to 323 psig / 5.6 to 22.3 bar	Brown	FA113202X12	236	Bellows	514 / 35.4	14.5 / 1.00	145 / 10.0	0.207 / 5.26	2.36 / 59.9
122 to 514 psig / 8.41 to 35.4 bar	Black	FA114139X12				36.3 / 2.5	290 / 20.0	0.250 / 6.35	2.36 / 59.9
257 to 1058 psig / 17.7 to 73.0 bar	Gray	FA113201X12	315		1058 / 73.0	72.5 / 5.0	479 / 33.0	0.192 / 4.88	2.36 / 59.9

1. Minimum suggested difference between slam-shut set pressure and normal operating pressure of the system.  
2. Maximum difference between overpressure and underpressure when using one manometric device (Type BMS1) with tripping hook. For underpressure and overpressure points greater than this maximum number, use a second manometric device (Type BMS2) for underpressure protection.

Table 4 shows that the NPS 2 / DN 50 Type OSE can pass a flow of 109,000 SCFH / 2921 Nm<sup>3</sup>/h.

3. Select appropriate manometric device:

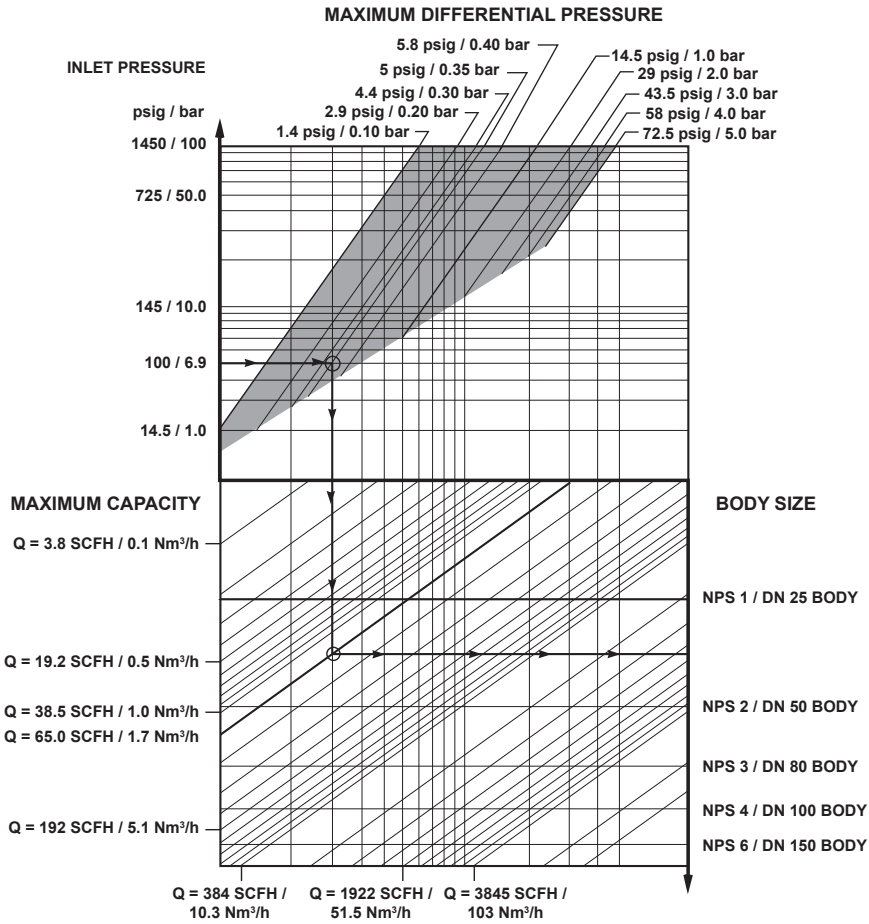
Table 3 lists the different selections for the manometric sensing device (Type BMS1 or BMS2). For the overpressure protection setting of 50 psig / 3.5 bar, choose a Type 071 manometric device with a 15 to 75 psig / 1.0 to 5.2 bar spring. This spring is chosen because it has less setpoint drift than the 30 to 160 psig / 2.1 to 11.0 bar spring.

For the underpressure protection of the transmission line, a separate manometric device must be used. A Type 236 manometric device can be used with a 81 to 323 psig / 5.6 to 22.3 bar spring setting for underpressure protection.

4. Check the pressure ratings:

Because of the flange limitations Type OSE with CL300 RF flanged end connections has a maximum pressure rating of 750 psig / 51.7 bar, which will safely handle the 300 psig / 20.7 bar maximum inlet pressure. The Type 071 manometric device will hold pressure up to 235 psig / 16.2 bar (see Table 3). The slam-shut valve will shut the pressure off at 50 psig / 3.5 bar, preventing an overpressure of the Type 071 and the downstream equipment. The Type 236 for underpressure protection could see the full inlet pressure of 300 psig / 20.7 bar. Table 3 shows that the maximum pressure rating for the Type 236 is 514 psig / 35.4 bar, so it will safely handle the maximum inlet pressure.





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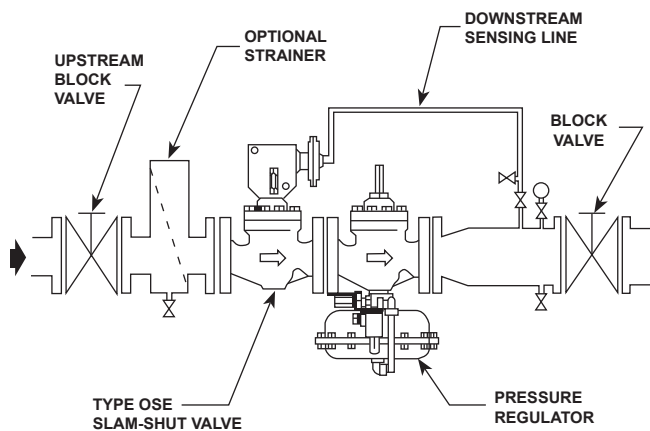
**FLOW CAPACITIES IN THOUSANDS OF SCFH / Nm<sup>3</sup>/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS**

**Figure 5. Sizing Chart Example**

**Table 4. Capacities**

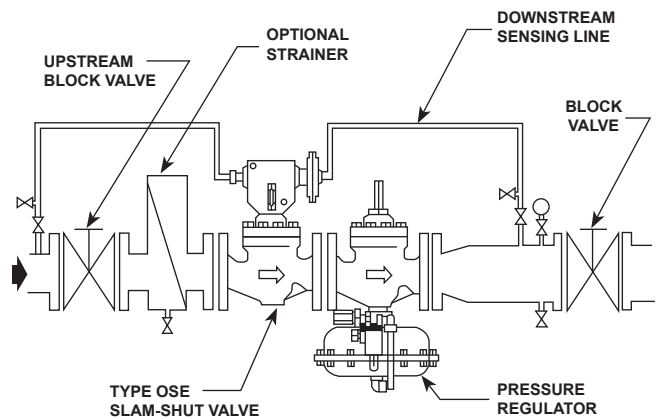
INLET PRESSURE, psig / bar	PRESSURE DROP, psig / bar	CAPACITIES IN THOUSANDS OF SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS						
		NPS 1 / DN 25	NPS 2 / DN 50	NPS 3 / DN 80	NPS 4 / DN 100	NPS 6 / DN 150	NPS 8 / DN 200	NPS 10 / DN 250
10 / 0.69	5 / 0.34	11.1 / 0.3	46.6 / 1.2	103 / 2.8	173 / 4.6	344 / 9.2	644 / 17.2	923 / 24.7
50 / 3.5		19.2 / 0.5	80.4 / 2.1	178 / 4.8	325 / 8.7	597 / 16.0	1111 / 29.8	1587 / 42.5
100 / 6.9		26.0 / 0.7	109 / 2.9	240 / 6.4	441 / 11.8	810 / 21.7	1504 / 40.3	2147 / 57.5
200 / 13.8		36.0 / 1.0	150 / 4.0	332 / 8.9	611 / 16.4	1121 / 30.0	2079 / 55.7	2966 / 79.5
300 / 20.7		43.7 / 1.2	182 / 4.9	404 / 10.8	743 / 19.9	1365 / 36.6	2526 / 67.7	3603 / 96.6
400 / 27.6		50.3 / 1.3	210 / 5.6	465 / 12.5	855 / 22.9	1567 / 42.0	2905 / 77.8	4144 / 111
500 / 34.5		56.1 / 1.5	234 / 6.3	518 / 13.9	954 / 25.6	1748 / 46.8	3240 / 86.8	4621 / 124
600 / 41.4		61.3 / 1.6	256 / 6.9	567 / 15.2	1040 / 27.9	1912 / 51.2	3544 / 95.0	5054 / 135
800 / 55.2		70.7 / 1.9	295 / 7.9	654 / 17.5	1203 / 32.2	2204 / 59.1	4084 / 109	5824 / 156
1000 / 69.0		78.9 / 2.1	330 / 8.8	730 / 19.6	1343 / 36.0	2462 / 66.0	4560 / 122	6503 / 174
50 / 3.5	20 / 1.4	34.2 / 0.9	143 / 3.8	329 / 8.8	565 / 15.1	1047 / 28.1	1937 / 51.9	2834 / 75.9
100 / 6.9		48.8 / 1.3	204 / 5.5	473 / 12.7	817 / 21.9	1506 / 40.4	2756 / 73.9	4032 / 108
200 / 13.8		69.5 / 1.9	290 / 7.8	678 / 18.2	1173 / 31.4	2157 / 57.8	3922 / 105	5737 / 154
300 / 20.7		85.4 / 2.3	357 / 9.6	835 / 22.4	1446 / 38.8	2655 / 71.2	4815 / 129	7045 / 189
400 / 27.6		98.8 / 2.6	413 / 11.1	966 / 25.9	1675 / 44.9	3074 / 82.4	5568 / 149	8146 / 218
600 / 41.4		121 / 3.2	506 / 13.6	1187 / 31.8	2058 / 55.2	3775 / 101	6830 / 183	9992 / 268
800 / 55.2		140 / 3.7	585 / 15.7	1372 / 36.8	2380 / 63.8	4365 / 117	7892 / 212	11,547 / 309
1000 / 69.0		156 / 4.2	655 / 17.6	1536 / 41.2	2664 / 71.4	4884 / 131	8828 / 237	12,916 / 346

# Type OSE



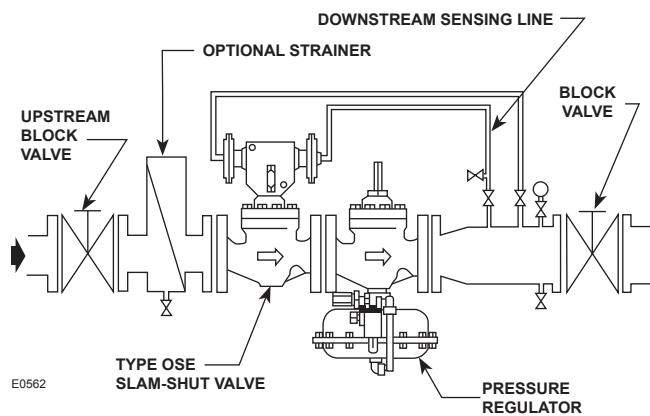
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**OVERPRESSURE AND UNDERPRESSURE SHUTOFF  
USING ONE MANOMETRIC DEVICE**



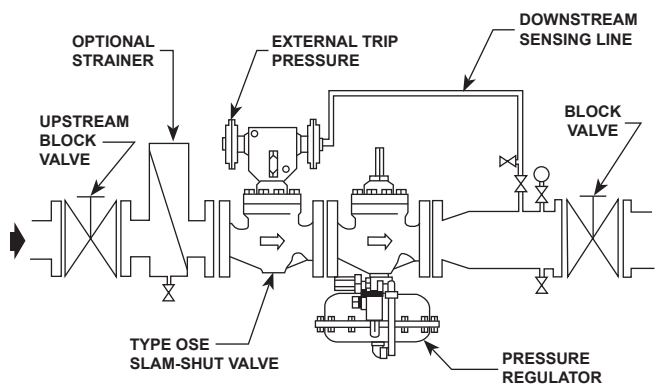
E0561

**MINIMUM/MAXIMUM UPSTREAM AND  
DOWNSTREAM PRESSURE**



E0562

**OVERPRESSURE AND UNDERPRESSURE SHUTOFF  
USING TWO MANOMETRIC DEVICES**



E0563

**EXTERNAL SIGNAL**

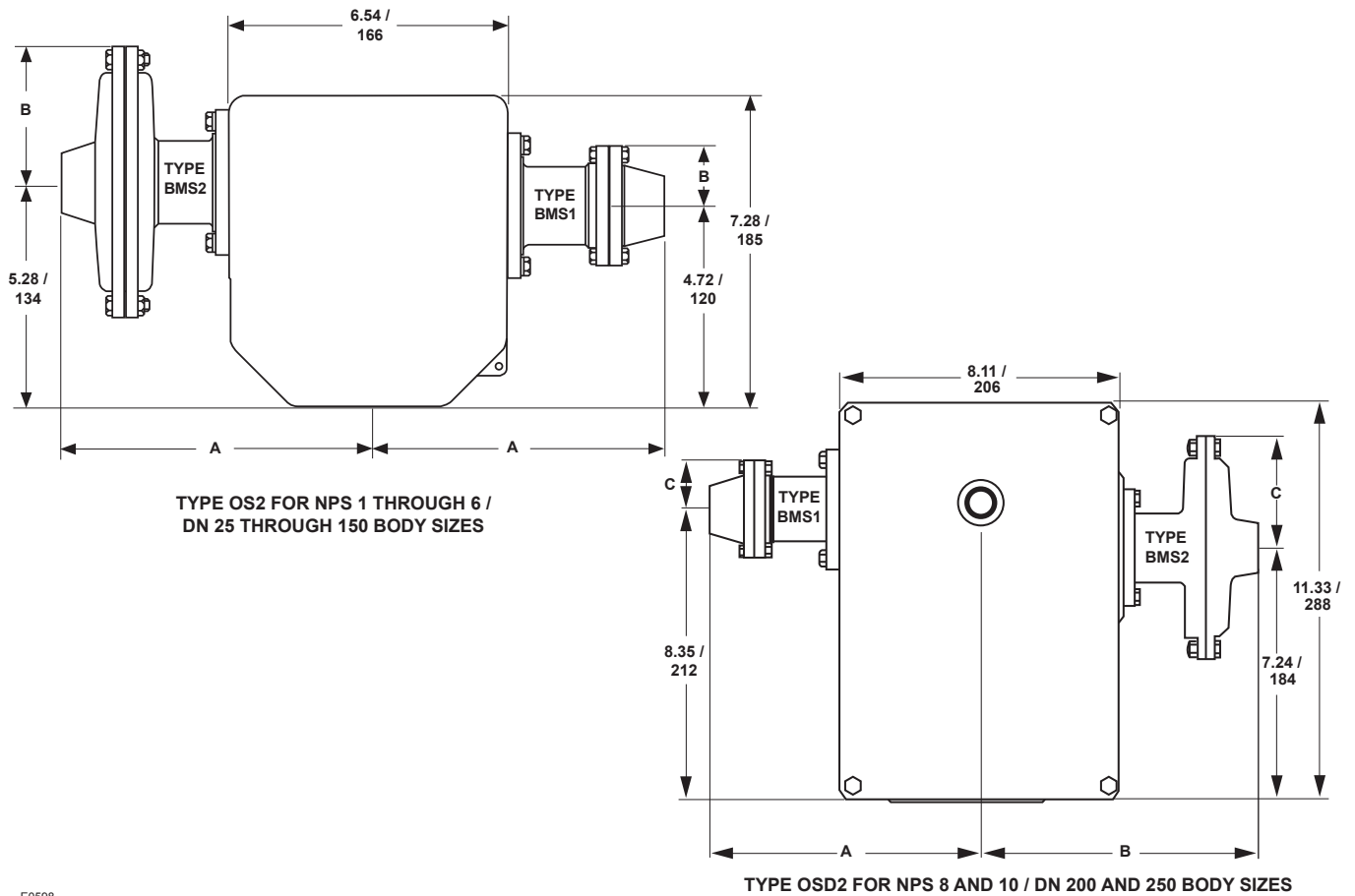
**Figure 6. Typical Installations**

## Sizing Example Using Figure 5

The illustration in Figure 5 is an alternative way to size the Type OSE slam-shut valve. The following steps can be taken to determine the proper size valve for a given set of conditions. The arrows shown in Figure 5 follow the parenthesis example given in each step.

1. Find the minimum inlet pressure for the application on the upper portion of the graph (i.e. 100 psig / 6.9 bar).
2. Move across to the maximum differential that can be tolerated across the valve for the given application (5 psig / 0.35 bar).
3. Trace down vertically to the diagonal line which shows the maximum flow required for the given application (65,000 SCFH / 1742 Nm<sup>3</sup>/h).
4. Move straight across to the right and the closest body size below the last point is the smallest body size for the given application (NPS 2 / DN 50 body size).
5. Check pressure and temperature ratings of the slam-shut valve and select the appropriate manometric devices and options.





E0598

IN. / mm

**Figure 7. Types OS2 and OSD2 Dimensions**

**Table 5. Types OS2 and OSD2 Dimensions**

TYPE OS2 FOR NPS 1 THROUGH 6 / DN 25 THROUGH 150 BODY SIZES					
	Type	Type	Dimension, in. / mm		Approximate Weight, lbs / kg
			A	B	
Mechanism Box (BM)	BM1	for 1 BMS	----		5.51 / 3
	BM2	for 2 BMS	----		5.51 / 3
Manometric Device (Type BMS)	162	Diaphragm	7.13 / 181	3.27 / 83	5.73 / 3
	71		6.89 / 175	1.42 / 36	2.65 / 1
	27 or 17	Piston	8.03 / 204	1.42 / 36	5.07 / 2
	236	Bellows	7.95 / 202	1.42 / 36	5.29 / 2
	315		8.78 / 223	1.42 / 36	6.17 / 3

TYPE OSD2 FOR NPS 8 AND 10 / DN 200 AND 250 BODY SIZES						
	Type	Type	Dimension, in. / mm			Approximate Weight, lbs / kg
			A	B	C	
Mechanism Box (BM)	BM1	for 1 BMS	----			10.36 / 5
	BM2	for 2 BMS	----			10.36 / 5
Manometric Device (Type BMS)	162	Diaphragm	7.52 / 191	8.31 / 211	3.27 / 83	5.73 / 3
	71	Diaphragm	7.28 / 185	8.07 / 205	1.42 / 36	2.65 / 1
	27 or 17	Piston	8.42 / 214	9.21 / 243	1.42 / 36	5.07 / 2
	236	Bellows	8.35 / 212	9.13 / 232	1.42 / 36	5.29 / 2
	315	Bellows	9.17 / 233	9.96 / 253	1.42 / 36	6.17 / 3

# Type OSE

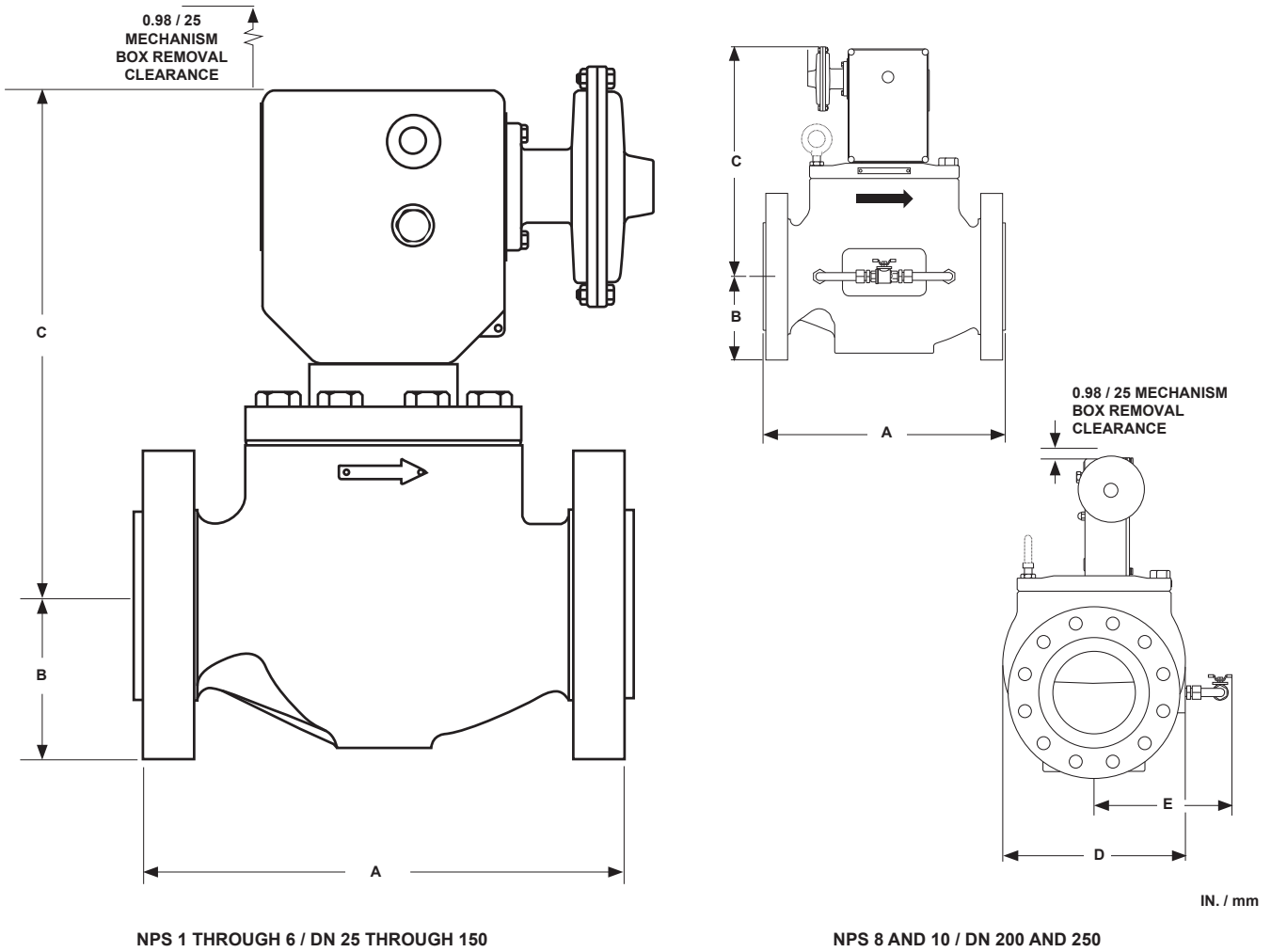


Figure 8. Type OSE Dimensions

Table 6. Type OSE Dimensions

BODY SIZE, NPS / DN	DIMENSION, IN. / mm										
	A				B			C	D		E
	NPT	CL125 FF, CL150 RF	CL250 RF, CL300 RF	CL600 RF	CL125 FF, CL150 RF	CL250 RF, CL300 RF	CL600 RF		CL125 FF, CL150 RF	CL250 RF, CL300 RF, CL600 RF	
1 / 25	8.25 / 210	7.25 / 184	7.75 / 197	8.25 / 210	2.2 / 56	2.5 / 63	2.5 / 63	12.6 / 320	4.6 / 117	4.9 / 124	----
2 / 50	11.25 / 286	10 / 254	10.5 / 267	11.25 / 286	3.0 / 76	3.3 / 84	3.3 / 84	13.2 / 335	6.0 / 152	6.5 / 165	
3 / 80	----	11.75 / 298	12.5 / 317	13.25 / 337	3.7 / 94	4.1 / 104	4.1 / 104	14.2 / 361	7.5 / 190	8.3 / 211	
4 / 100		13.88 / 353	14.5 / 368	15.5 / 394	4.5 / 114	5.0 / 127	5.0 / 127	16.0 / 406	9.0 / 229	10.0 / 254	
6 / 150		17.75 / 451	18.62 / 473	20 / 508	5.5 / 140	6.6 / 168	6.6 / 168	16.2 / 411	14.0 / 356	14.0 / 356	
8 / 200		21.38 / 543	22.38 / 568	24 / 610	6.8 / 173	7.5 / 190	8.2 / 208	22.8 / 579	17.6 / 447	17.6 / 447	
10 / 250		26.5 / 673	27.9 / 708	29.6 / 752	8.0 / 203	8.7 / 221	10.0 / 254	26.3 / 668	19.6 / 498	19.6 / 498	
										14.3 / 363	

## Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section on page 2. Review the description to the right of each specification and the

information in each referenced table or figure. Specify your choice whenever a selection is offered.

## Ordering Guide

### Body Size (Select One)

- NPS 1 / DN 25\*\*\*
- NPS 2 / DN 50\*\*\*
- NPS 3 / DN 80\*\*\*
- NPS 4 / DN 100\*\*\*
- NPS 6 / DN 150\*\*\*
- NPS 8 / DN 200 (WCC Steel Only)\*\*
- NPS 10 / DN 250 (WCC Steel Only)\*\*

### Body Material and End Connection Style (Select One)

#### Cast Iron Body

- 1 and 2 NPT only\*\*\*
- CL125 FF (NPS 1 to 6 / DN 25 to 150 only)\*\*
- CL250 RF (NPS 1 to 6 / DN 25 to 150 only)\*\*

#### WCC Steel Body

- 1 and 2 NPT only\*\*\*
- CL150 RF\*\*\*
- CL300 RF\*\*
- CL600 RF\*\*

### Slam-Shut Trip Pressure Setting (Select One)

#### Overpressure Protection Only (OPSO)

- Supply setpoint required \_\_\_\_\_

#### Underpressure Protection Only (UPSO)

- Supply setpoint required \_\_\_\_\_

#### Overpressure and Underpressure Protection (OPSO/UPSO)

- Supply overpressure setpoint required \_\_\_\_\_
- Supply underpressure setpoint required \_\_\_\_\_

#### Overpressure Protection (OPSO), Overpressure and Underpressure Protection (OPSO/UPSO)

- Supply overpressure setpoint required \_\_\_\_\_
- Supply overpressure setpoint required \_\_\_\_\_
- Supply underpressure setpoint required \_\_\_\_\_

### Explosion-Proof Limit Switch (Optional)

- Yes\*\*

### Manual Push Button Trigger Switch (Optional)

- Yes\*\*

### Additional Manometric Device (For Extra Pressure Sensing) (Optional)

- Yes\*\*

Regulators Quick Order Guide	
***	Readily Available for Shipment
**	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Specification Worksheet	
<b>Application:</b>	
Specific Use	_____
Line Size	_____
Gas Type and Specific Gravity	_____
Gas Temperature	_____
<b>Relief Valve Size:</b>	
Brand of upstream regulator?	_____
Orifice size of the upstream regulator?	_____
Wide-open coefficient of the upstream regulator?	_____
<b>Pressure:</b>	
Maximum Inlet Pressure ( $P_{1max}$ )	_____
Minimum Inlet Pressure ( $P_{1min}$ )	_____
Downstream Pressure Setting(s) ( $P_2$ )	_____
Maximum Flow ( $Q_{max}$ )	_____
<b>Performance Required:</b>	
Accuracy Requirements?	_____
Need for Extremely Fast Response?	_____
<b>Other Requirements:</b> _____	
_____	

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