



# STEAM PRESSURE REDUCING VALVE

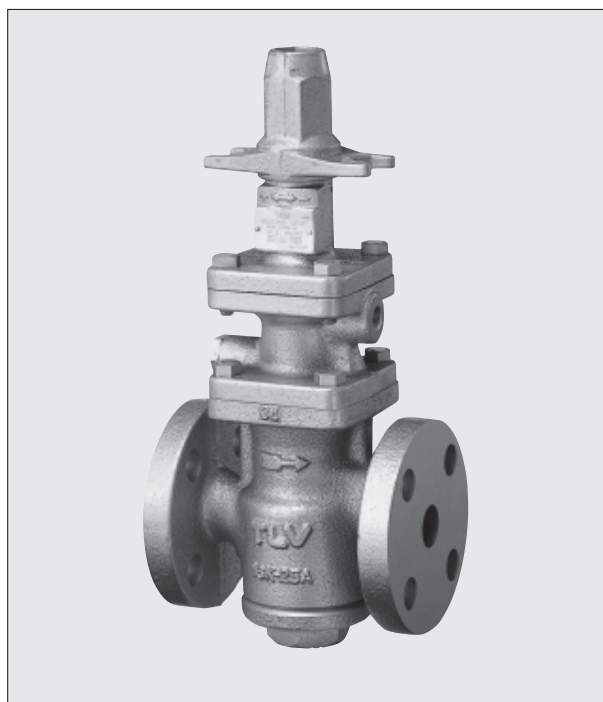
## MODEL COSR-3/COSR-16

### SELF-ACTUATED PRESSURE REDUCING VALVE WITH SHOCK-ABSORBING PISTON

#### Benefits

Technologically advanced pressure reducing valve for accurate control in process steam systems.

1. Unique Shock-Absorbing Spherical (SAS) piston delivers stable secondary pressure.
2. Valve maintains high accuracy during severe conditions of varying primary pressure and fluctuating flow rates.
3. Unique self-aligning piston design provides for maximum reliability.
4. Unique two-piece pilot and main valve designs assure seal tight shut-off in dead end service.
5. Internal screen for pilot valve extends maintenance-free service.
6. Designed with PTFE gaskets for inspection ease.
7. Sizes 2½" and larger have internal noise silencers for quiet operation.
8. Capable of internal secondary pressure sensing for compact space installation.



#### Specifications

Model	COSR-3		COSR-16	
	<b>Screwed</b>	<b>Flanged</b>	<b>Screwed</b>	<b>Flanged</b>
Connection	<b>Screwed</b>	<b>Flanged</b>	<b>Screwed</b>	<b>Flanged</b>
Size (in)	<b>¾, 1, 1¼, 1½, 2</b>	<b>1, 1½, 2</b>	<b>½, ¾, 1, 1¼, 1½, 2</b>	<b>1, 1½, 2, 2½, 3, 4, 6</b>
Body Material	Cast Iron			
Maximum Operating Pressure (psig) PMO	45		250	
Maximum Operating Temperature (°F) TMO			428	
Maximum Allowable Pressure (psig) PMA			250	
Maximum Allowable Temperature (°F) TMA			428	
Primary Pressure Range (psig)	15 to 45		30 to 250	
Adjustable Differential Pressure (psi)	not applicable		10 to 120	
Pressure Adjustment Range (psig)	1.5 to 7		5 to 210	
Maximum Adjustable Secondary Pressure (psig)	7		84% of Primary Pressure (or Primary Pressure minus 10 psi, whichever is lower)	
Minimum Adjustable Secondary Pressure (psig)	1.5		10% of Primary Pressure (or Primary Pressure minus 120 psi, whichever is higher) (except primary pressures up through 85 psig as shown in the Capacity Tables)	
Minimum Adjustable Flow Rate	5% of rated flow rate for ½" to 2"; 10% of rated flow rate for 2½" to 6"			
Accuracy of Regulation (psi) AOR	±1 (under steady flow conditions)			
Seat Leakage Rating	Less than 0.1% of Rated Flow Rate			

Connections and sizes in bold are standard

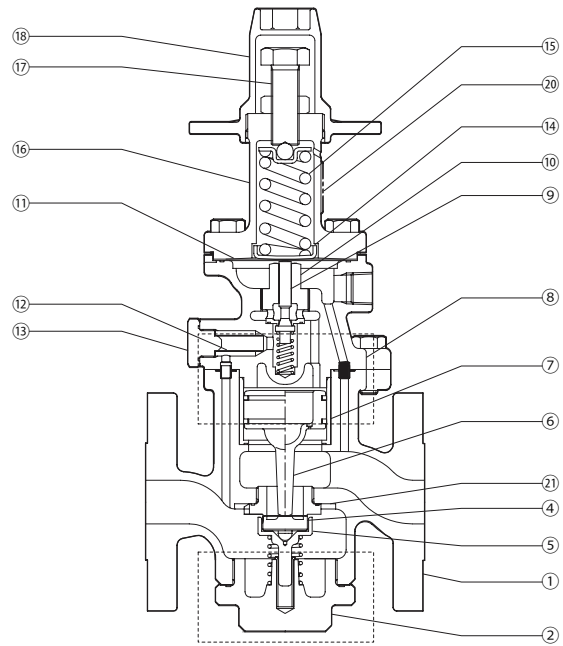


To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

**Configuration**

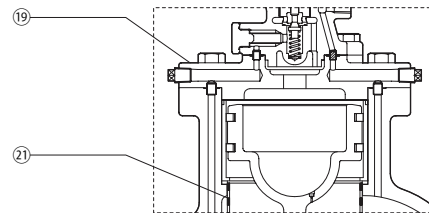
No.	Description	Material	
①	Main Body	Cast Iron	
②	Cover Plug	1/2" to 2"	Cast Iron
	Cover	1 1/4" to 6"	Cast Iron
③	Main Valve Seat	Stainless Steel	
④	Main Valve	Stainless Steel	
⑤	Main Valve Holder	Stainless Steel	
⑥	Piston	Stainless Steel	
⑦	Cylinder	Stainless Steel	
⑧	Pilot Valve Body	Ductile Cast Iron	
⑨	Pilot Valve	Stainless Steel	
⑩	Pilot Valve Seat	Stainless Steel	
⑪	Diaphragm	Stainless Steel	
⑫	Pilot Screen	Stainless Steel	
⑬	Pilot Screen Holder	Carbon Steel	
⑭	Diaphragm Support	Brass	
⑮	Coil Spring	Carbon Steel	
⑯	Spring Housing	Cast Iron	
⑰	Adjustment Screw	Cr-Mo Steel	
⑱	Spanner Cap	Die Cast Aluminium	
⑲	Pilot Cover	Cast Iron	
⑳	Nameplate	Stainless Steel	
㉑	Silencer	Stainless Steel	

Contact TLV for available replacement parts. All gaskets are PTFE.



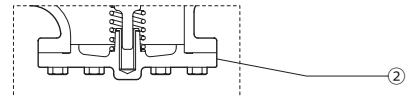
Pilot Section

2 1/2" to 6"



Cover

1 1/4" to 6"



The parts configuration of sizes 3" to 6" differs slightly from that of sizes 1/2" to 2".

**Capacity Table COSR-3**

With external (factory standard) or internal (option) secondary pressure-sensing line or channel (lb/h)  
 (Parts to activate the internal pressure-sensing channel are available from TLV)

Primary Steam Pressure (psig)	Secondary (Set) Steam Pressure (psig)		Nominal Valve Size				
	External Line	Internal Channel (option)	3/4"	1"	1 1/4"	1 1/2"	2"
15 to less than 29	*7 – **1.5	*7	240	380	1100	1500	2100
		6	250	400	1080	1450	2000
		4.5	260	410	1060	1400	1950
		3	270	430	830	1100	1450
		**1.5	220	400	620	840	1060
29 to 45	*7 – **1.5	*7	550	760	1100	1500	2100
		6	540	750	1080	1450	2000
		4.5	530	730	1060	1400	1950
		3	340	540	830	1100	1450
		**1.5	220	400	620	840	1060

\* Maximum adjustable secondary pressure \*\* Minimum adjustable secondary pressure



Cv Values

	Nominal Valve Size									
	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"
Cv (US)	3.8	6.9	11.1	15.5	24.0	37.2	59.3	85.0	128	275
Cv (UK)	3.2	5.7	9.2	12.9	20.0	31.0	49.4	70.8	107	229
Kvs (DIN)	3.3	5.9	9.5	13.3	20.6	31.9	50.8	72.9	110	236

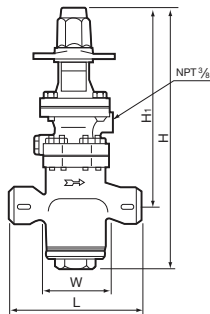
\*COSR-16 only



The Cv & Kvs values shown are for the valve in the full fail open position. These values are not to be used for COSR sizing, and instead may be used as one of the factors in calculations for safety valve selection.

Dimensions

Screwed



• COSR-3 Screwed\* (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)	
¾	6 <sup>7</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>16</sub>	11¼	3 <sup>7</sup> / <sub>16</sub>	19	
1	7½		11 <sup>1</sup> / <sub>8</sub>	3 <sup>11</sup> / <sub>16</sub>	22	
1¼	8 <sup>11</sup> / <sub>16</sub>	15 <sup>3</sup> / <sub>16</sub>	11 <sup>5</sup> / <sub>8</sub>	5	25	
1½						2

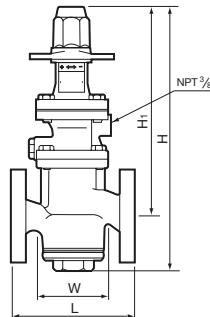
\* NPT, other standards available

• COSR-16 Screwed\* (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)	
½	6 <sup>7</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>16</sub>	11¼	3 <sup>7</sup> / <sub>16</sub>	18	
¾					19	
1	7½	8 <sup>11</sup> / <sub>16</sub>	15 <sup>3</sup> / <sub>16</sub>	11 <sup>5</sup> / <sub>8</sub>	5	22
1¼	25					
1½	2	10¼	16 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>16</sub>	28

\* NPT, other standards available

Flanged



• COSR-3 Flanged (in)

Size	L		H	H <sub>1</sub>	W	Weight* (lb)
	Connects to ASME Class					
	125FF	<b>250RF</b>				
1	6 <sup>15</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>8</sub>	3 <sup>11</sup> / <sub>16</sub>	29
1½	8¼	8¾	15 <sup>3</sup> / <sub>16</sub>	11 <sup>7</sup> / <sub>8</sub>	5	42
2	9 <sup>3</sup> / <sub>4</sub>	10¼	16 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>16</sub>	57

Other standards available, but length and weight may vary  
\* Weight is for Class 250 RF

• COSR-16 Flanged (in)

Size	L		H	H <sub>1</sub>	W	Weight* (lb)
	Connects to ASME Class					
	125FF	<b>250RF</b>				
1	6 <sup>15</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>8</sub>	3 <sup>11</sup> / <sub>16</sub>	29
1½	8¼	8¾	15 <sup>3</sup> / <sub>16</sub>	11 <sup>7</sup> / <sub>8</sub>	5	42
2	9¾	10¼	16 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>16</sub>	57
2½	14¼	14 <sup>13</sup> / <sub>16</sub>	21 <sup>13</sup> / <sub>16</sub>	16 <sup>13</sup> / <sub>16</sub>	8 <sup>11</sup> / <sub>16</sub>	121
3	14 <sup>3</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>				130
4	17 <sup>1</sup> / <sub>16</sub>	17 <sup>11</sup> / <sub>16</sub>	24 <sup>15</sup> / <sub>16</sub>	17 <sup>5</sup> / <sub>8</sub>	10 <sup>7</sup> / <sub>16</sub>	209
6	23 <sup>5</sup> / <sub>8</sub>	24½	31 <sup>7</sup> / <sub>8</sub>	20 <sup>7</sup> / <sub>8</sub>	13	452

Other standards available, but length and weight may vary  
\* Weight is for Class 250 RF

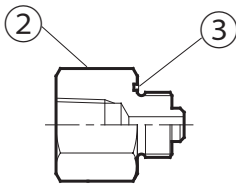
Sizes ½" to 1" shown.  
Configuration of larger sizes differs slightly.

Flange classes in bold are standard

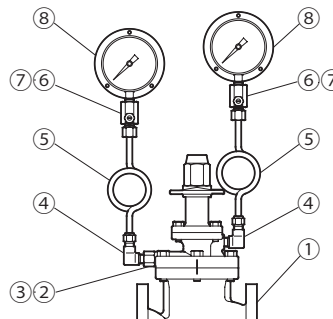
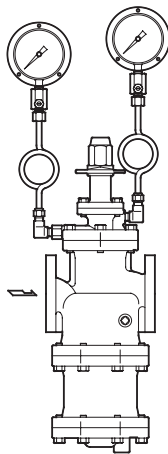
**Option**

Pressure Gauge Unit	Replaces the standard screen holder plug to enable installation of a pressure gauge of the user's choice. Primary side: M16 holder plug (male/female), BSP/Rc(PT)/NPT 3/8. An elbow is required for pressure gauge installation. Secondary side: Rc(PT) 3/8 mounting port for elbow and pressure gauge installation.
Elbows, pressure gauge and connecting parts must be purchased separately.	

**• Configuration**



**• Installation Example**



NOTE: For explanation purposes, a siphon tube style pressure gauge will be used. However, the instructions also apply to cooling tower-style pressure gauges.

No.	Part Name	No.	Part Name
1	Valve Body	5	Siphon Tube*
2	Holder Plug	6	Dampener*
3	Holder Plug Gasket	7	Dampener Gasket*
4	Elbow (male/female)*	8	Pressure Gauge*

\* Purchase separately



**DO NOT DISASSEMBLE OR REMOVE THIS PRODUCT WHILE IT IS UNDER PRESSURE.**  
Allow internal pressure of this product to equal atmospheric pressure and its surface to cool to room temperature before disassembling or removing. Failure to do so could cause burns or other injury. READ INSTRUCTION MANUAL CAREFULLY.

**TLV CORPORATION**

13901 South Lakes Drive, Charlotte, NC 28273-6790  
Tel: 704-597-9070 Fax: 704-583-1610  
E-mail: [tlv@tlvengineering.com](mailto:tlv@tlvengineering.com) <https://www.tlv.com>  
For Technical Service 1-800 "TLV TRAP"



**Manufacturer**  
**TLV CO., LTD.**  
Kakogawa, Japan  
is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001  
ISO 14001

