



# STEAM PRESSURE REDUCING VALVE

## MODEL COSR-3/COSR-16

### SELF-ACTUATED PRESSURE REDUCING VALVE WITH PATENTED PISTON DESIGN

#### Benefits

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

1. Patented 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. Patented 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 teflon 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.



U.S. Pat. 4,921,215

#### Specifications

Model	COSR-3		COSR-16	
	Screwed	Flanged	Screwed	Flanged
Connection				
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 – 45		30 – 250	
Adjustable Differential Pressure (psi)	not applicable		10 – 120	
Pressure Adjustment Range (psig)	1.5 – 7		5 – 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 50 through 85 as shown in the Capacity Tables)	
Minimum Adjustable Flow Rate	5% of rated flow rate for ½" – 2"; 10% of rated flow rate for 2½" – 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.

**Capacity Tables**

<b>Capacity Table COSR-16 (With standard external sensing line)</b>												<b>lb/h</b>
Primary Steam Pressure (psig)	Secondary (Set) Steam Pressure (psig)	Nominal Valve Size										
		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	
Cv Values***		3.8	6.9	11.1	15.5	24	37.2	59.3	85	128	275	
30	**20	200	365	590	860	1335	2070	3300	4730	7125	15305	
	16	235	425	680	950	1470	2280	3640	5215	7850	16870	
	*4 – 14	240	440	700	980	1515	2350	3745	5370	8085	17370	
40	**30	205	370	595	980	1515	2350	3740	5365	8080	17355	
	25	275	500	800	1115	1730	2680	4270	6125	9220	19815	
	*4 – 20	295	535	855	1195	1850	2870	4575	6560	9875	21210	
50	**40	225	410	660	1080	1675	2595	4135	5930	8925	19175	
	30	335	605	970	1360	2100	3255	5190	7440	11205	24070	
	*5 – 25	350	635	1020	1420	2200	3410	5435	7790	11730	25205	
60	**50	245	440	715	1175	1820	2815	4490	6435	9695	20825	
	45	285	520	835	1370	2120	3285	5235	7505	11300	24280	
	40	370	670	1075	1500	2325	3600	5740	8230	12395	26625	
	*5 – 30	405	735	1175	1645	2545	3945	6285	9010	13570	29155	
75	**63	290	530	855	1400	2170	3365	5365	7685	11575	24870	
	60	320	580	930	1530	2370	3670	5855	8390	12635	27140	
	50	445	810	1300	1815	2810	4350	6940	9945	14975	32175	
	*5 – 38	485	880	1410	1970	3050	4730	7540	10805	16270	34955	
85	**71	390	705	1135	1585	2455	3800	6060	8685	13080	28110	
	70	400	725	1165	1630	2520	3905	6230	8930	13445	28885	
	50	525	950	1520	2125	3290	5100	8130	11655	17550	37705	
	*5 – 42	540	980	1570	2195	3400	5270	8400	12040	18130	38950	
100	**84	445	805	1300	1810	2805	4345	6930	9930	14955	32135	
	80	485	880	1415	1975	3060	4740	7555	10825	16305	35025	
	60	600	1085	1740	2435	3770	5840	9310	13340	20090	43160	
	*10 – 50	620	1120	1805	2520	3900	6045	9640	13815	20805	44695	
125	**105	545	985	1590	2220	3435	5325	8485	12165	18315	39355	
	100	595	1075	1730	2415	3740	5800	9245	13250	19950	42865	
	80	710	1290	2075	2900	4490	6955	11085	15890	23930	51415	
	*13 – 63	750	1360	2190	3060	4735	7340	11700	16775	25260	54270	
150	**126	645	1170	1880	2625	4060	6295	10040	14390	21665	46550	
	125	655	1190	1910	2665	4130	6400	10200	14620	22015	47300	
	100	825	1495	2405	3355	5195	8050	12835	18400	27705	59525	
	*30 – 75	885	1605	2580	3600	5575	8640	13775	19745	29735	63880	
175	**147	740	1350	2170	3030	4690	7270	11585	16610	25010	53735	
	145	760	1385	2225	3110	4815	7465	11900	17060	25690	55195	
	120	935	1695	2730	3810	5895	9140	14565	20885	31445	67555	
	*55 – 88	1015	1840	2965	4140	6405	9930	15830	22690	34170	73410	
200	**168	840	1530	2460	3435	5315	8240	13135	18825	28350	60910	
	150	990	1795	2885	4030	6240	9675	15420	22105	33290	71515	
	130	1085	1970	3170	4430	6855	10625	16935	24275	36560	78545	
	*80 – 100	1150	2080	3350	4680	7240	11225	17895	25650	38625	82980	
225	**189	940	1710	2750	3840	5940	9210	14680	21045	31690	68090	
	175	1060	1930	3100	4330	6705	10395	16570	23750	35770	76845	
	150	1200	2180	3500	4885	7565	11730	18695	26795	40350	86690	
	*105 – 111	1280	2325	3740	5220	8085	12530	19975	28630	43115	92625	
250	**210	1040	1890	3040	4240	6570	10180	16230	23265	35035	75265	
	150	1375	2495	4015	5605	8680	13450	21445	30735	46285	99440	
	*130	1405	2555	4110	5735	8885	13770	21950	31460	47380	101790	

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

\*\*\* NOTE: The Cv 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.

## Capacity Tables

The **COSPECT Pressure Reducing Valve** is designed to use either an external pressure sensing line (Standard) or a built-in internal pressure sensing channel. Parts to activate the latter are available from TLV.

Capacity Table COSR-16 (With optional internal sensing channel)											lb/h
Primary Steam Pressure (psig)	Secondary (Set) Steam Pressure (psig)	Nominal Valve Size									
		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
Cv Values***		3.8	6.9	11.1	15.5	24	37.2	59.3	85	128	275
30	**20, 16	See table on the preceding page									
	14	240	440	700	980	1515	2350	3745	5370	8085	17370
	9	105	285	680	950	1470	2275	3630	5200	7835	16830
	*4	95	245	645	900	1390	2155	3440	4930	7425	15950
40	**30, 25	See table on the preceding page									
	20	295	535	855	1195	1850	2870	4575	6560	9875	21210
	12	145	520	825	1150	1780	2760	4400	6305	9500	20405
	*4	105	285	745	1045	1615	2505	3995	5725	8620	18520
50	**40, 30	See table on the preceding page									
	25	350	635	1020	1420	2200	3410	5435	7790	11730	25205
	15	215	575	930	1300	2010	3115	4970	7120	10725	23040
	*5	120	310	815	1140	1770	2740	4370	6265	9435	20270
60	**50, 45, 40	See table on the preceding page									
	30	405	735	1175	1645	2545	3945	6285	9010	13570	29115
	18	340	650	1040	1455	2255	3495	5570	7985	12025	25830
	*5	125	335	875	1220	1890	2935	4675	6695	10085	21670
75	**63, 60, 50	See table on the preceding page									
	38	485	880	1410	1970	3050	4730	7540	10805	16270	34955
	23	415	735	1180	1645	2550	3955	6300	9035	13605	29230
	*5	130	375	915	1275	1985	3070	4885	7015	10560	22700
85	**71, 70, 50	See table on the preceding page									
	42	540	980	1570	2195	3400	5270	8400	12040	18130	38950
	25	450	770	1240	1735	2685	4165	6640	9515	14325	30780
	*5	135	385	930	1300	2015	3130	4990	7160	10795	23185
100	**84, 80, 60	See table on the preceding page									
	50	620	1120	1805	2520	3900	6045	9640	13815	20805	44695
	30	545	860	1380	1930	2990	4630	7385	10585	15940	34245
	*10	150	495	950	1325	2050	3180	5070	7270	10950	23520
125	**105, 100, 80	See table on the preceding page									
	63	750	1360	2190	3060	4735	7340	11700	16775	25260	54270
	35	515	915	1470	2065	3180	4945	7885	11300	17020	36545
	*13	180	555	910	1270	1970	3050	4865	6970	10500	22555
150	**126, 125, 100	See table on the preceding page									
	75	885	1605	2580	3600	5575	8640	13775	19745	29735	63880
	50	840	1515	2425	3405	5270	8140	12995	18665	27995	60190
	*30	420	745	1215	1705	2635	4085	6510	9330	14000	30095
175	**147, 145, 120	See table on the preceding page									
	88	1015	1840	2965	4140	6405	9930	15830	22690	34170	73410
	70	805	1475	2385	3325	5145	7960	12700	18220	27330	58945
	*55	645	1150	1850	2570	3990	6160	9860	14200	21170	45820
200	**168, 150, 130	See table on the preceding page									
	100	1150	2080	3350	4680	7240	11225	17895	25650	38625	82980
	80	875	1575	2540	3570	5505	8530	13615	19665	29350	63240
225	**189, 175, 150	See table on the preceding page									
	111	1280	2325	3740	5220	8085	12530	19975	28630	43115	92625
	*105	1180	2125	3405	4755	7350	11430	18175	26100	39285	84305
250	**210, 150, *130	See table on the preceding page									

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

\*\*\* NOTE: The Cv 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.

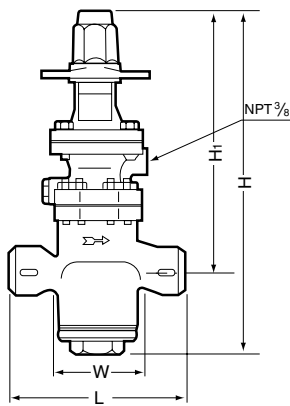
**Capacity Table**

<b>Capacity Table COSR-3</b>				<b>lb/h</b>				
Pressure Sensing Method	Primary Steam Pressure (psig)	Secondary (Set) Steam Pressure (psig)	Nominal Valve Size					
			3/4"	1"	1 1/4"	1 1/2"	2"	
Cv Values***			6.9	11.1	15.5	24.0	37.2	
With Standard External Sensing Line	15 – 28	**7 – *1.5	240	380	1100	1500	2100	
	29 – 45	**7 – *1.5	550	760	1100	1500	2100	
With Optional Internal Sensing Channel	15 – 28	**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 – 45	**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	

\* Minimum adjustable secondary pressure \*\* Maximum adjustable secondary pressure \*\*\* See NOTE on previous page

**Dimensions**

Screwed



● **COSR-3** Screwed\* (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)
3/4	6 7/8	14 1/16	11 1/4	3 7/16	19
1	7 1/2		11 1/8	3 1/16	22
1 1/4	8 11/16	15 3/16	11 5/8	5	25
1 1/2					
2	10 1/4	16 3/16	12 3/8	6 3/16	28

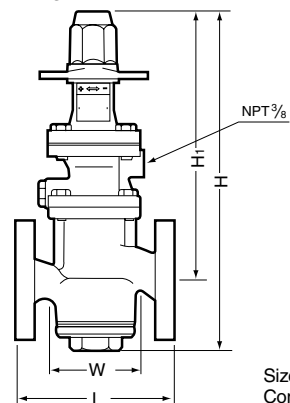
\* NPT, other standards available

● **COSR-16** Screwed\* (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)
1/2	6 7/8	14 1/16	11 1/4	3 7/16	18
3/4					19
1	7 1/2	15 3/16	11 5/8	3 1/16	22
1 1/4	8 11/16				5
1 1/2	10 1/4	16 3/16	12 3/8	6 3/16	28
2					

\* NPT, other standards available

Flanged



● **COSR-3** Flanged (in)

Size	L		H	H <sub>1</sub>	W	Weight* (lb)
	ASME Class 125FF	250RF				
1	6 15/16	7 3/8	14 1/16	11 1/8	3 1/16	29
1 1/4	8 1/8	8 1/16	15 3/16	11 7/8	5	38
1 1/2	8 3/4	8 3/4				42
2	9 3/4	10 1/4	16 3/16	12 3/8	6 3/16	57

Class 125 FF can connect to 150 RF, 250RF can connect to 300 RF  
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)
	ASME Class 125FF	250RF				
1	6 15/16	7 3/8	14 1/16	11 1/8	3 1/16	29
1 1/4	8 1/8	8 1/16	15 3/16	11 7/8	5	38
1 1/2	8 3/4	8 3/4				42
2	9 3/4	10 1/4	16 3/16	12 3/8	6 3/16	57
2 1/2	14 1/4	14 13/16	21 13/16	16 13/16	8 1/16	121
3	14 3/8	15 1/16				130
4	17 1/16	17 1/16	24 15/16	17 5/8	10 7/16	209
6	23 5/8	24 1/2	31 7/8	20 7/8	13	452

Class 125 FF can connect to 150 RF, 250RF can connect to 300 RF  
Other standards available, but length and weight may vary  
\* Weight is for Class 250 RF  
**Flange classes in bold are standard**

Size 1/2" – 1" shown.  
Configuration of larger sizes differs slightly.

**TLV CORPORATION**

13901 South Lakes Drive, Charlotte, NC 28273-6790  
Phone: 704-597-9070 Fax: 704-583-1610  
E-mail: tl@tlvengineering.com  
For Technical Service 1-800 "TLV TRAP"



Manufacturer

ISO 9001/ISO 14001



is approved by LRQA Ltd. to ISO 9001/14001