



# COSPECT<sup>®</sup>

## STEAM PRESSURE REDUCING VALVE

### MODEL COS-3/COS-16

SELF-ACTUATED STEAM CONDITIONING SYSTEM WITH UNIQUE PISTON DESIGN

#### Benefits

Technologically advanced COSPECT Pressure Reducing Valve provides accurate control and steam conditioning to maximize process steam system performance.

1. Combination conditioning system includes pressure reducing valve, condensate separator, and steam trap.
2. Unique SCE cyclone separator's 98% efficiency can deliver high quality steam of 99.8% dryness.
3. Resulting dry steam improves heat transfer efficiency, enhances product quality, speeds batch times, and extends down-stream valve life.
4. Unique Shock-Absorbing Spherical (SAS) piston delivers stable secondary pressure.
5. Valve maintains high accuracy during severe conditions of varying primary pressure and fluctuating flow rates.
6. Internal screens for pilot and main valves extend maintenance-free service.
7. Sizes 3" and larger have internal noise silencers for quiet operation.
8. Designed with PTFE gaskets for inspection ease.



#### Specifications

Model	COS-3		COS-16	
	Screwed	Flanged	Screwed	Flanged
Connection	<b>3/4, 1</b>	1, 1½, 2	<b>1/2, 3/4, 1</b>	<b>1, 1½, 2, 3, 2½, 4</b>
Size (in)	<b>3/4, 1</b>	1, 1½, 2	<b>1/2, 3/4, 1</b>	<b>1, 1½, 2, 3, 2½, 4</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 1/2"– 2"; 10% of rated flow rate for 3" and 4"			
Accuracy of Regulation (psi) AOR	±1 (under steady flow conditions)			
Seat Leakage Rating	Less than 0.1% of Rated Flow Rate			

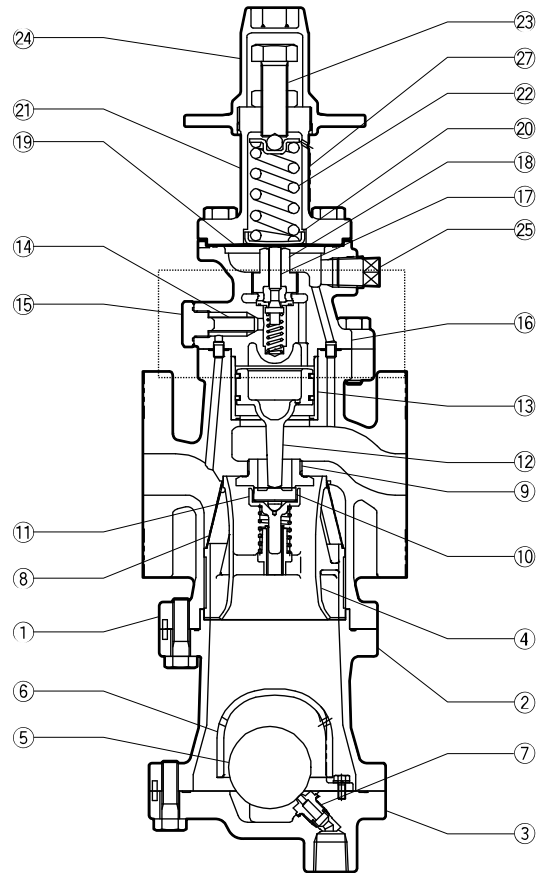
Connections and sizes in bold are standard



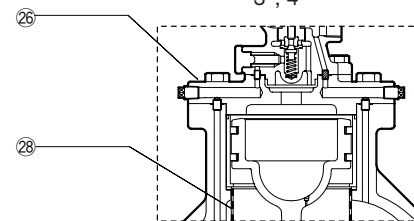
To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

### Configuration

No.	Description	Material
①	Main Body	Cast Iron
②	Trap Body	Cast Iron
③	Trap Cover	Cast Iron
④	Separator	Stainless Steel
⑤	Float	Stainless Steel
⑥	Float Cover	Cast Iron
⑦	Trap Valve Seat	Stainless Steel
⑧	Separator Screen	Stainless Steel
⑨	Main Valve Seat	Stainless Steel
⑩	Main Valve	Stainless Steel
⑪	Main Valve Holder	Stainless Steel
⑫	Piston	Stainless Steel
⑬	Cylinder	Stainless Steel
⑭	Pilot Screen	Stainless Steel
⑮	Pilot Screen Holder	Carbon Steel
⑯	Pilot Valve Body	Ductile Cast Iron
⑰	Pilot Valve	Stainless Steel
⑱	Pilot Valve Seat	Stainless Steel
⑲	Diaphragm	Stainless Steel
⑳	Diaphragm Support	Brass
㉑	Spring Housing	Cast Iron
㉒	Coil Spring	Carbon Steel
㉓	Adjustment Screw	Cr-Mo Steel
㉔	Spanner Cap	Die Cast Aluminium
㉕	Plug – Sensing Line Port	Carbon Steel
㉖	Pilot Cover	Cast Iron
㉗	Nameplate	Stainless Steel
㉘	Silencer	Stainless Steel



3", 4"



The parts configuration of sizes 3" and 4" differs slightly from that of sizes 1/2" to 2".

### Capacity Table COS-3

With external (factory standard) or internal (option) secondary pressure-sensing line or channel (lb/h)

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

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

## Capacity Table COS-16

With external (factory standard) or internal (option) secondary pressure-sensing line or channel (lb/h)

Primary Steam Press. (psig)	Secondary (Set) Steam Pressure (psig)		Nominal Valve Size						
	External Line	Internal Channel (option)	½"	¾"	1"	1½"	2"	3"	4"
30	* 20	* 20	350	485	685	1365	1875	4255	6395
	16	16	400	575	820	1590	2190	4980	7525
	** 5 - 14	14	350	545	830	1595	2220	5090	7665
		9	130	345	785	1530	2200	5065	7645
40		** 5	110	310	750	1455	2180	5050	7625
	* 30	* 30	415	610	880	1610	2435	5555	8370
	25	25	435	630	930	1750	2665	6060	9135
	** 5 - 20	20	445	655	950	1840	2805	6390	9625
		12	155	385	840	1755	2685	6155	9255
		** 5	110	310	750	1595	2465	5650	8490
50	* 40	* 40	415	615	865	1565	2425	5540	8335
	30	30	475	685	1010	2045	3175	7250	10920
	** 5 - 25	25	485	715	1045	2140	3325	7580	11425
		15	175	500	915	1955	3035	6930	10430
		** 5	115	305	785	1715	2655	6075	9125
60	* 50	* 50	475	675	940	1965	3045	6950	10475
	45	45	505	715	1050	2220	3435	7860	11845
	40	40	515	725	1085	2325	3605	8245	12430
	** 5 - 30	30	505	780	1180	2560	3960	9040	13635
		18	265	660	1035	2255	3495	7960	12000
		** 5	115	275	845	1840	2840	6495	9765
75	* 63	* 63	440	660	595	1875	2930	6680	10030
	60	60	475	695	760	2020	3145	7175	10790
	50	50	555	800	1195	2590	4020	9165	13820
	** 5 - 38	38	585	865	1345	2910	4505	10295	15515
		23	405	730	1180	2545	3930	8975	13520
		** 5	85	255	855	1860	2890	6565	9890
85	* 71	* 71	565	800	1210	2600	4045	9225	13895
	70	70	565	805	1225	2635	4095	9340	14070
	50	50	645	980	1535	3335	5175	11820	17800
	** 5 - 42	42	640	990	1545	3345	5190	11885	17865
		25	420	755	1145	2465	3830	9015	13165
		** 5	50	205	880	1945	3000	6760	10330
100	* 84	* 84	540	795	1290	2795	4345	9910	14920
	80	80	585	880	1420	3080	4785	10915	16440
	60	60	705	1075	1720	3705	5750	13145	19795
	** 10 - 50	50	750	1105	1775	3855	5960	13625	20535
		30	440	835	1345	2890	4495	10275	15455
		** 10	155	505	945	2050	3195	7295	10980
125	* 105	* 105	670	1045	1695	3655	5675	12970	19475
	100	100	710	1120	1810	3905	6060	13860	20815
	80	80	890	1335	2150	4660	7220	16500	24910
	** 13 - 63	63	970	1375	2210	4780	7410	16955	25465
		35	550	925	1490	3205	4980	11520	17120
		** 13	260	525	975	2045	3175	7235	10890
150	* 126	* 126	600	970	1585	3425	5330	12160	18375
	125	125	605	980	1595	3450	5370	12255	18520
	100	100	860	1390	2225	4805	7450	17040	25575
	** 30 - 75	75	1100	1545	2470	5335	8265	18915	28440
		50	750	1120	1800	3890	6025	13995	20715
		** 30	470	810	1250	2600	4040	9295	13860
175	* 147	* 147	865	1445	2330	5020	7780	17790	26720
	145	145	875	1460	2350	5065	7850	17955	26975
	120	120	1085	1670	2700	5820	9025	20640	31130
	** 55 - 88	88	1360	1880	2970	6415	9955	22735	34230
		70	1050	1475	2330	5060	7835	17905	26935
		** 55	895	1325	2100	4560	7045	16120	24300
200	* 168	* 168	880	1515	2420	5260	8135	18585	26715
	150	150	1190	1850	3000	6480	10030	22930	34390
	130	130	1305	1975	3110	6730	10420	23810	35805
	** 80 - 100	100	1610	2315	3350	7230	11220	25575	38580
		** 80	1210	1695	2490	5400	8355	19090	28660
225	* 189	* 189	990	1675	2710	5855	9080	20750	30995
	175	175	1155	1880	2960	6390	9905	22630	33915
	150	150	1540	2330	3530	7620	11815	26975	40650
	** 105 - 111	111	1860	2745	4170	7910	12255	27935	42195
		** 105	1755	2625	3870	7390	11440	26095	39355
250	* 210	* 210	1155	1915	3085	6630	10295	23525	36275
	150	150	1945	2885	4150	8940	13880	31660	47885
	** 130	** 130	2105	3120	4490	8885	13770	31350	47445

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

### Cv Values

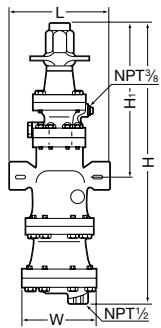
	Nominal Valve Size							
	½"	¾"	1"	1½"	2"	2½"	3"	4"
Cv (US)	3.8	6.9	11.1	24.0	37.2	59.3	85.0	128
Cv (UK)	3.2	5.7	9.2	20.0	31.0	49.4	70.8	107
Kvs (DIN)	3.3	5.9	9.5	20.6	31.9	50.8	72.9	110



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

### Dimensions

Screwed



• **COS-3 Screwed\*** (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)
¾"	6 <sup>7</sup> / <sub>8</sub>	19½"	11¼"	4 <sup>1</sup> / <sub>8</sub> "	33
1"	7½"	20 <sup>9</sup> / <sub>16</sub> "	11 <sup>1</sup> / <sub>8</sub> "	5 <sup>7</sup> / <sub>8</sub> "	44

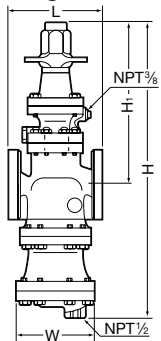
\* NPT, other standards available

• **COS-16 Screwed\*** (in)

Size	L	H	H <sub>1</sub>	W	Weight (lb)
½"	6 <sup>7</sup> / <sub>8</sub> "	19½"	11¼"	4 <sup>1</sup> / <sub>8</sub> "	32
¾"					33
1"	7½"	20 <sup>9</sup> / <sub>16</sub> "	11 <sup>1</sup> / <sub>8</sub> "	5 <sup>7</sup> / <sub>8</sub> "	44

\* NPT, other standards available

Flanged



**COS-3 Flanged** (in)

Size	L		H	H <sub>1</sub>	W	Weight* (lb)
	ASME Class					
	125FF	250RF				
1"	6 <sup>15</sup> / <sub>16</sub> "	7 <sup>3</sup> / <sub>8</sub> "	20 <sup>9</sup> / <sub>16</sub> "	11 <sup>1</sup> / <sub>8</sub> "	5 <sup>7</sup> / <sub>8</sub> "	46
1½"	8¼"	8¾"	22½"	11 <sup>7</sup> / <sub>8</sub> "	6½"	60
2"	10"	10¼"	25"	12 <sup>3</sup> / <sub>8</sub> "	7½"	95

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

**COS-16 Flanged** (in)

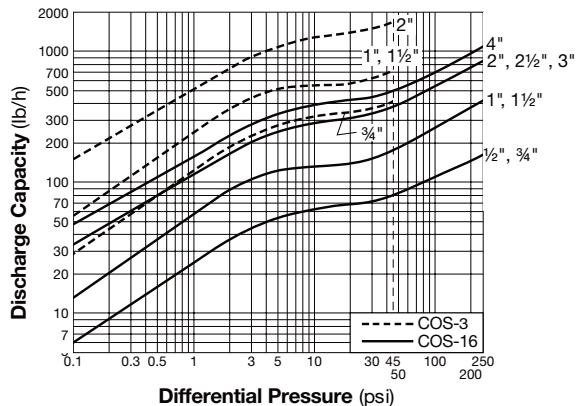
Size	L		H	H <sub>1</sub>	W	Weight* (lb)
	ASME Class					
	125FF	250RF				
1"	6 <sup>15</sup> / <sub>16</sub> "	7 <sup>3</sup> / <sub>8</sub> "	20 <sup>9</sup> / <sub>16</sub> "	11 <sup>1</sup> / <sub>8</sub> "	5 <sup>7</sup> / <sub>8</sub> "	46
1½"	8¼"	8¾"	22½"	11 <sup>7</sup> / <sub>8</sub> "	6½"	60
2"	10"	10¼"	25"	12 <sup>3</sup> / <sub>8</sub> "	7½"	95
2½"	14¼"	14 <sup>13</sup> / <sub>16</sub> "	34¼"	16 <sup>1</sup> / <sub>8</sub> "	11"	152
3"	14 <sup>3</sup> / <sub>8</sub> "	15 <sup>1</sup> / <sub>16</sub> "	34¼"	16 <sup>1</sup> / <sub>8</sub> "	11"	159
4"	17 <sup>1</sup> / <sub>16</sub> "	17 <sup>11</sup> / <sub>16</sub> "	40 <sup>7</sup> / <sub>16</sub> "	17 <sup>5</sup> / <sub>8</sub> "	13¾"	231

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

### Discharge Capacity of Steam Trap



- Note:
1. The discharge capacity is the maximum continuous condensate discharge 11 °F below saturated steam temperature.
  2. The differential pressure is the difference between the COS inlet and its trap outlet pressure.

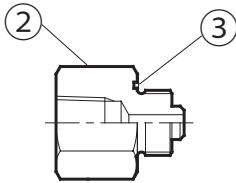


DO NOT use this product under conditions that exceed maximum differential pressure, as condensate backup will occur!

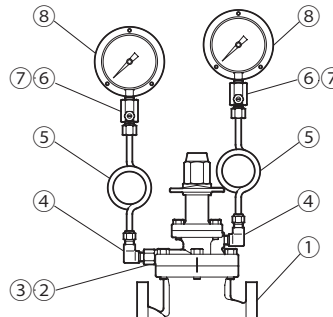
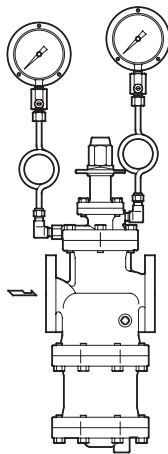
**Option**

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**

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

ISO 9001  
ISO 14001

