



COSPECT[®] 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 COS-3

Model	COS-3	
Connection	Screwed	Flanged
Size (in)	¾, 1	1, 1½, 2
Body Material	Cast Iron	
Max. Operating Pressure (psig) PMO	45	
Max. Operating Temperature (°F) TMO	428	
Max. Allowable Pressure (psig) PMA	250	
Max. Allowable Temperature (°F) TMA	428	
Primary Pressure Range (psig)	15 to 45	
Adjustable Differential Pressure (psi)	not applicable	
Pressure Adjustment Range (psig)	1.5 to 7	
Max. Adjustable Secondary Pressure (psig)	7	
Min. Adjustable Secondary Pressure (psig)	1.5	
Min. Adjustable Flow Rate	5% of rated flow rate for ½"- 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.

Specifications COS-16

Model	COS-16		
Connection	Screwed	Flanged	
Size (in)	½, ¾, 1	1, 1¼, 1½, 2, 2½, 3, 4	½, ¾, 1, 1½, 2
Body Material	Cast Iron		Cast Stainless Steel
Max. Operating Pressure (psig) PMO	250		
Max. Operating Temperature (°F) TMO	428		
Max. Allowable Pressure (psig) PMA	250		
Max. Allowable Temperature (°F) TMA	428		
Primary Pressure Range (psig)	30 to 250		
Adjustable Differential Pressure (psi)	10 to 120		
Pressure Adjustment Range (psig)	5 to 210		
Max. Adjustable Secondary Pressure (psig)	84% of Primary Pressure (or Primary Pressure minus 10 psi, whichever is lower)		
Min. Adjustable Secondary Pressure (psig)	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)		
Min. Adjustable Flow Rate	5% of rated flow rate for ½" – 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



CAUTION

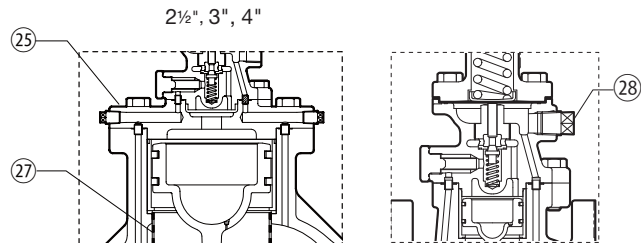
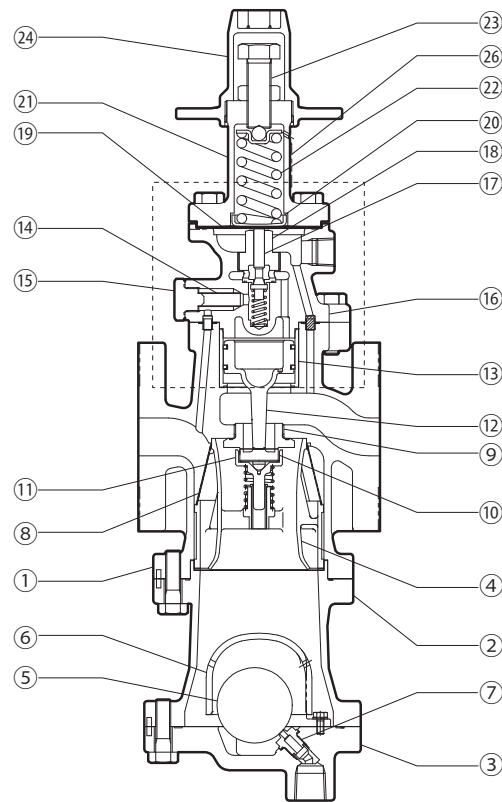
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Configuration

No.	Description	Material
①	Main Body	Cast Iron
		Cast Stainless Steel
②	Trap Body	Same material as main body
③	Trap Cover	Same material as main body
④	Separator	Cast Stainless Steel
⑤	Float	Stainless Steel
⑥	Float Cover	Same material as main body
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	Cast Stainless Steel
⑬	Cylinder	Stainless Steel
⑭	Pilot Screen	Stainless Steel
⑮	Pilot Screen Holder	Carbon Steel
		Stainless Steel
⑯	Pilot Valve Body	Same material as main body
⑰	Pilot Valve	Stainless Steel
⑱	Pilot Valve Seat	Stainless Steel
⑲	Diaphragm	Stainless Steel
⑳	Diaphragm Support	Brass
㉑	Spring Housing	Same material as main body
㉒	Coil Spring	Carbon Steel
㉓	Adjustment Screw	Cr-Mo Steel
㉔	Spanner Cap	Die Cast Aluminium
		Cast Stainless Steel
㉕	Pilot Cover	Cast Iron/Cast Stainless Steel
㉖	Nameplate	Stainless Steel
㉗	Silencer	2½", 3", 4" Stainless Steel
㉘	Plug - Sensing Line Port*	Carbon Steel

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

* For optional internal sensing only



The parts configuration of sizes 2½", 3" and 4" differs slightly from that of sizes ½" to 2".

Internal Sensing Option

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)	¾"	1"	1½"	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"	2½"	3"	4"
30	* 20	* 20	350	485	685	1365	1875	2975	4255	6395
	16	16	400	575	820	1590	2190	3475	4980	7525
	** 5 - 14	14	350	545	830	1595	2220	3545	5090	7665
		9	130	345	785	1530	2200	3525	5065	7645
		** 5	110	310	750	1455	2180	3505	5050	7625
40	* 30	* 30	415	610	880	1610	2435	3760	5555	8370
	25	25	435	630	930	1750	2665	3965	6060	9135
	** 5 - 20	20	445	655	950	1840	2805	4385	6390	9625
		12	155	385	840	1755	2685	4290	6155	9255
		** 5	110	310	750	1595	2465	3930	5650	8490
50	* 40	* 40	415	615	865	1565	2425	3910	5540	8335
	30	30	475	685	1010	2045	3175	4955	7250	10920
	** 5 - 25	25	485	715	1045	2140	3325	5280	7580	11425
		15	175	500	915	1955	3035	4840	6930	10430
		** 5	115	305	785	1715	2655	4230	6075	9125
60	* 50	* 50	475	675	940	1965	3045	4850	6950	10475
	45	45	505	715	1050	2220	3435	5460	7860	11845
	40	40	515	725	1085	2325	3605	5710	8245	12430
	** 5 - 30	30	505	780	1180	2560	3960	6315	9040	13635
		18	265	660	1035	2255	3495	5565	7960	12000
		** 5	115	275	845	1840	2840	4525	6495	9765
75	* 63	* 63	440	660	595	1875	2930	4650	6680	10030
	60	60	475	695	760	2020	3145	5000	7175	10790
	50	50	555	800	1195	2590	4020	6265	9165	13820
	** 5 - 38	38	585	865	1345	2910	4505	7105	10295	15515
		23	405	730	1180	2545	3930	6270	8975	13520
	** 5	85	255	855	1860	2890	4575	6565	9890	
85	* 71	* 71	565	800	1210	2600	4045	6435	9225	13895
	70	70	565	805	1225	2635	4095	6520	9340	14070
	50	50	645	980	1535	3335	5175	8245	11820	17800
	** 5 - 42	42	640	990	1545	3345	5190	8280	11885	17865
		25	420	755	1145	2465	3830	6105	9015	13165
	** 5	50	205	880	1945	3000	4770	6760	10330	
100	* 84	* 84	540	795	1290	2795	4345	6925	9910	14920
	80	80	585	880	1420	3080	4785	7620	10915	16440
	60	60	705	1075	1720	3705	5750	9165	13145	19795
	** 10 - 50	50	750	1105	1775	3855	5960	9510	13625	20535
		30	440	835	1345	2890	4495	7165	10275	15455
	** 10	155	505	945	2050	3195	5090	7295	10980	
125	* 105	* 105	670	1045	1695	3655	5675	9040	12970	19475
	100	100	710	1120	1810	3905	6060	9660	13860	20815
	80	80	890	1335	2150	4660	7220	11520	16500	24910
	** 13 - 63	63	970	1375	2210	4780	7410	11820	16955	25465
		35	550	925	1490	3205	4980	7935	11520	17120
	** 13	260	525	975	2045	3175	5045	7235	10890	
150	* 126	* 126	600	970	1585	3425	5330	8475	12160	18375
	125	125	605	980	1595	3450	5370	8545	12255	18520
	100	100	860	1390	2225	4805	7450	11880	17040	25575
	** 30 - 75	75	1100	1545	2470	5335	8265	13205	18915	28440
		50	750	1120	1800	3890	6025	9605	13995	20715
	** 30	470	810	1250	2600	4040	6415	9295	13860	
175	* 147	* 147	865	1445	2330	5020	7780	12415	17790	26720
	145	145	875	1460	2350	5065	7850	12530	17955	26975
	120	120	1085	1670	2700	5820	9025	14405	20640	31130
	** 55 - 88	88	1360	1880	2970	6415	9955	15875	22735	34230
		70	1050	1475	2330	5060	7835	12495	17905	26935
	** 55	895	1325	2100	4560	7045	11250	16120	24300	
200	* 168	* 168	880	1515	2420	5260	8135	12980	18585	26715
	150	150	1190	1850	3000	6480	10030	16005	22930	34390
	130	130	1305	1975	3110	6730	10420	16615	23810	35805
	** 80 - 100	100	1610	2315	3350	7230	11220	17880	25575	38580
		** 80	1210	1695	2490	5400	8355	13315	19090	28660
225	* 189	* 189	990	1675	2710	5855	9080	14470	20750	30995
	175	175	1155	1880	2960	6390	9905	15790	22630	33915
	150	150	1540	2330	3530	7620	11815	18840	26975	40650
	** 105 - 111	111	1860	2745	4170	7910	12255	19545	27935	42195
		** 105	1755	2625	3870	7390	11440	18245	26095	39355
250	* 210	* 210	1155	1915	3085	6630	10295	16385	23525	36275
	150	150	1945	2885	4150	8940	13880	22115	31660	47885
	** 130	** 130	2105	3120	4490	8885	13770	21975	31350	47445

* Maximum adjustable secondary pressure ** Minimum adjustable secondary pressure

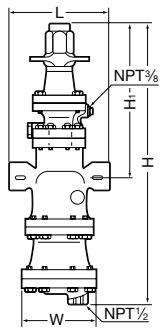
Cv Values

	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

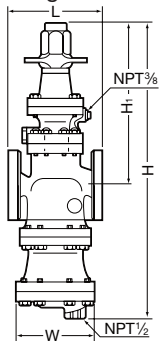
CAUTION The Cv values shown are for the valve in the full fail open position. These values are not to be used for COS sizing, and instead may be used as one of the factors in calculations for safety valve selection.

Dimensions

Screwed



Flanged



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

• **COS-3/COS-16 Screwed*** (in)

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

* NPT, other standards available
** COS-16 only

• **COS-3 Flanged** (in)

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

Other standards available, but length and weight may vary

• **COS-16 Flanged** (in)

Size	L				H ¹⁾	H ₁ ¹⁾	W ¹⁾	Weight ²⁾ (lb)
	Connects to ASME Class							
	125FF	150RF	250RF	300RF				
½ ³⁾	–	5 ⁹ / ₁₆	–	5 ¹³ / ₁₆	CS: 19½	CS: 11¼	CS: 4 ¹ / ₈	[35]
¾ ³⁾	–	5½	–	5¾				[38]
1	6 ¹⁵ / ₁₆	6	7 ³ / ₈	6¼	CI: 20 ⁹ / ₁₆ CS: 20 ⁹ / ₁₆	CI: 11 ¹ / ₈ CS: 11 ¹ / ₈	CI: 5 ⁷ / ₈ CS: 5 ⁵ / ₁₆	46
1¼ ⁴⁾	8 ¹ / ₈	–	8 ¹¹ / ₁₆	–	CI: 22½ CS: 22½	CI: 11 ⁷ / ₈ CS: 11 ⁷ / ₈	CI: 6½ CS: 6½	55
1½	8¼	7 ¹³ / ₁₆	8¾	8 ¹ / ₈	CI: 22½ CS: 22½	CI: 11 ⁷ / ₈ CS: 11 ⁷ / ₈	CI: 6½ CS: 5 ¹⁰ / ₁₆	60
2	10	10	10¼	10¼	CI: 25 CS: 25	CI: 12 ³ / ₈ CS: 12 ³ / ₈	CI: 7½ CS: 7 ¹¹ / ₁₆	95
2½ ⁴⁾	14¼	–	14 ¹³ / ₁₆	–	CI: 34¼	CI: 16 ¹ / ₈	CI: 11	152
3 ⁴⁾	14 ³ / ₈	–	15 ¹ / ₁₆	–	CI: 34¼	CI: 16 ¹ / ₈	CI: 11	159
4 ⁴⁾	17 ¹ / ₁₆	–	17 ¹¹ / ₁₆	–	CI: 40 ⁷ / ₁₆	CI: 17 ⁵ / ₈	CI: 13¾	231

Other standards available, but length and weight may vary

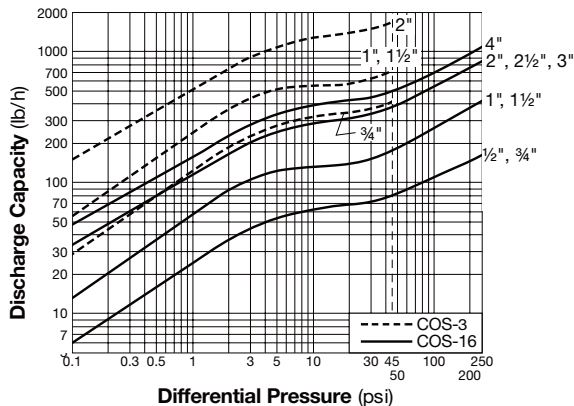
¹⁾ CS: Cast Stainless Steel, CI: Cast Iron. Flange material refers only to flanges.

²⁾ Weight is for Class 250RF [300 RF] ³⁾ COS-16 Cast Stainless Steel only

⁴⁾ COS-16 Cast Iron only.

Flange classes in bold are standard

Discharge Capacity of Steam Trap



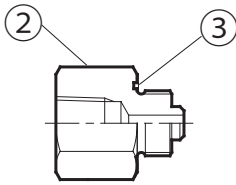
Note: 1. The discharge capacity is the maximum continuous condensate discharge 11 °F below saturated steam temperature.
2. The differential pressure is the difference between the COS inlet and its trap outlet pressure.

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

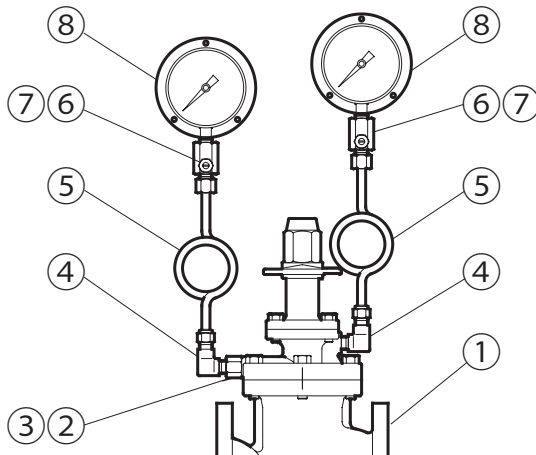
Option

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: NPT 3/8 mounting port for elbow and pressure gauge installation. Note: External sensing cannot be used when the pressure gauge unit is installed.
	Elbows, pressure gauge and connecting parts must be purchased separately.

● **Configuration**



● **Installation Example**

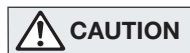


NOTES:

1. For explanation purposes, a siphon tube style pressure gauge will be used. However, the instructions also apply to cooling tower-style pressure gauges.
2. External sensing cannot be used when the pressure gauge unit is installed.

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.

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

ISO 9001
ISO 14001

