



AUTOMATIC MULTI-CONTROL VALVE

MODEL MC-COS-3/MC-COS-16

HIGH-PRECISION CONTROLLER OPERATED AND MOTORIZED STEAM VALVE

Benefits

The MC-COS-3/16 multi-control valve consists of the COS-3/16 pressure reducing valve with integrated separator and steam trap and a motorized actuator. It is used to control either steam pressure or the temperature* of processes heated by steam.

1. Combination conditioning system includes control valve, condensate separator, and steam trap.
2. Unique SCE separator's 98% efficiency can deliver high quality steam of 99.8% dryness, which improves heat transfer efficiency, enhances product quality, speeds batch times, and extends valve life.
3. Unique double guided piston delivers stable secondary pressure, maintaining high accuracy during severe conditions of varying primary pressure and fluctuating flow rates.
4. Rapid response actuator with brushless DC servo-motor allows precision control of the valve position for maintaining desired steam pressure within ± 1 psi or process temperature within ± 1 °F.
5. Internal screens for pilot and main valves extend maintenance-free service.
6. Sizes 3" and larger have internal noise silencers for quiet operation.
7. Designed with PTFE gaskets for inspection ease.
8. Allows highly responsive, high-speed process control when combined with the TLV SC-F71 controller.

* MC-COS-3 cannot be used for temperature control applications



Specifications

Model		MC-COS-3		MC-COS-16	
Connection		Screwed	Flanged	Screwed	Flanged
Size (in)		3/4, 1	1, 1 1/4, 1 1/2, 2	1/2, 3/4, 1	1, 1 1/4, 1 1/2, 2, 3, 4
Body Material		Cast Iron			
Max. Operating Pressure (psig)		PMO	45		250
Max Operating Temperature (°F)		TMO			428
Max. Allowable Pressure (psig)		PMA			250
Max. Allowable Temperature (°F)		TMA			428
Control Valve	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 up through 85 psi 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" – 4"
	Accuracy of Regulation (psi) AOR				± 1 (under steady flow conditions)
	Seat Leakage Rating				Less than 0.1% of Rated Flow Rate
	Applicable Fluid				Steam
	Actuator	Input	Valve Opening Input	4 – 20 mA DC (input impedance 250 Ω)	
Power		Line Voltage	Free between 100 – 240 V AC (50/60 Hz)		
		Power Consumption	max. 75 VA		
		Insulation	Between each terminal and ground: 500 V DC min. 100 M Ω		
		Withstand Voltage	Between power terminal and ground terminal: 1800 V AC for 1 second		
Environment		Ambient Temperature	32 – 122 °F		
		Ambient Humidity	10 – 90 % RH (without dew)		
		Vibration Resistance	max. 0.5 G		
		Water Resistance	Rain-proof		
Others		Drive System	Positional control by DC brushless motor		
		Thermal Protection	Built-in overcurrent protection circuit		
		Open/Close Time	Fully closed → fully open: approximately 15 sec.		
		Emergency Action	When operation signal input is cut off: fully closed When input power is cut off: held at position just before power cutoff		
	Manual Operation	Possible with power OFF			

Connections and sizes in bold are standard

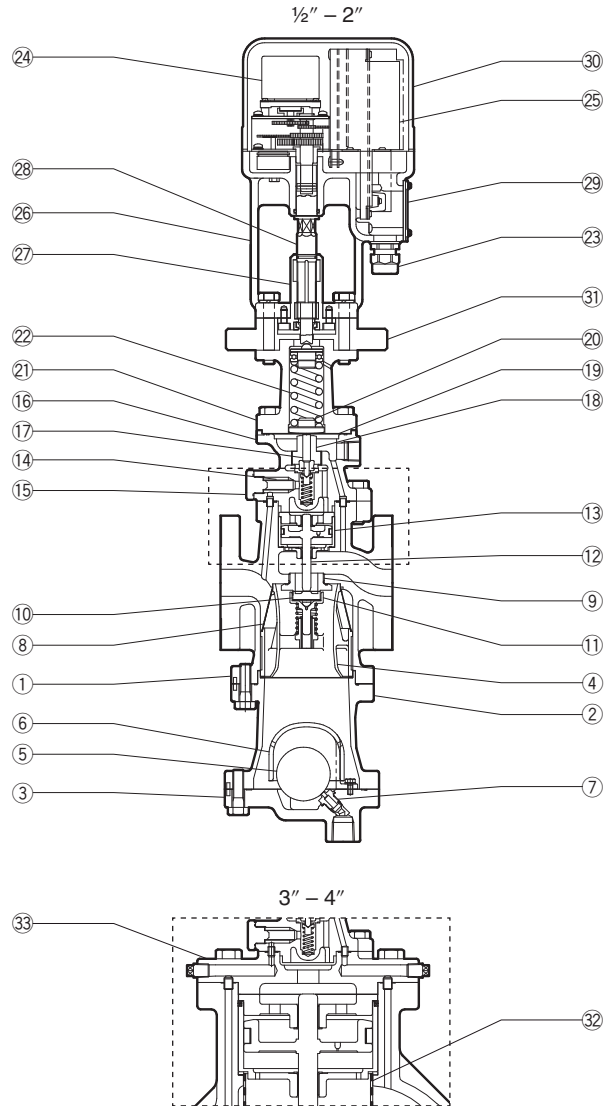


To avoid abnormal operation, accidents or serious injury, DO NOT use products outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

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	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	Cable Lock	Nylon
㉔	Motor Unit	—
㉕	Drive Unit	—
㉖	Mounting Plate	Cast Iron
㉗	Adjustment Screw Guide	Stainless Steel
㉘	Adjustment Screw	Stainless Steel
㉙	Terminal Block Cover	Steel Plate
㉚	Motor Cover	Cast Aluminum
㉛	Insulation Plate	Non-Asbestos Cement
㉜	Silencer	Stainless Steel
㉝	Pilot Cover	Cast Iron

Configuration differs slightly depending on connection size.



Capacity Table MC-COS-3

With external (factory standard) or internal (option) secondary pressure-sensing channel or line (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 1/2"	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 – 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 MC-COS-16

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

Primary Steam Press. (psig)	Secondary (Set) Steam Pressure (psig)		Nominal Valve Size							
	External Line	Internal Channel (option)	½"	¾"	1"	1¼"	1½"	2"	3"	4"
30	*20	**20	200	365	590	860	1335	2070	4730	7125
	16	16	235	425	680	950	1470	2280	5215	7850
	**5 – 14	14	240	440	700	980	1515	2350	5370	8085
		9	105	285	680	950	1470	2275	5200	7835
		**5	95	245	645	900	1390	2155	4930	7425
40	*30	*30	205	370	595	980	1515	2350	5365	8080
	25	25	275	500	800	1115	1730	2680	6125	9220
	**5 – 20	20	295	535	855	1195	1850	2870	6560	9875
		12	145	520	825	1150	1780	2760	6305	9500
		*5	105	285	745	1045	1615	2505	5725	8620
50	*40	*40	225	410	660	1080	1675	2595	5930	8925
	30	30	335	605	970	1360	2100	3255	7440	11205
	**5 – 25	25	350	635	1020	1420	2200	3410	7790	11730
		15	215	575	930	1300	2010	3115	7120	10725
		**5	120	310	815	1140	1770	2740	6265	9435
60	*50	*50	245	440	715	1175	1820	2815	6435	9695
	45	45	285	520	835	1370	2120	3285	7505	11300
	40	40	370	670	1075	1500	2325	3600	8230	12395
	**5 – 30	30	405	735	1175	1645	2545	3945	9010	13570
		18	340	650	1040	1455	2255	3495	7985	12025
	**5	125	335	875	1220	1890	2935	6695	10085	
75	*63	*63	290	530	855	1400	2170	3365	7685	11575
	60	60	320	580	930	1530	2370	3670	8390	12635
	50	50	445	810	1300	1815	2810	4350	9945	14975
	**5 – 38	38	485	880	1410	1970	3050	4730	10805	16270
		23	415	735	1180	1645	2550	3955	9035	13605
	**5	130	375	915	1275	1985	3070	7015	10560	
85	*71	*71	390	705	1135	1585	2455	3800	8685	13080
	70	70	400	725	1165	1630	2520	3905	8930	13445
	50	50	525	950	1520	2125	3290	5100	11655	17550
	**5 – 42	42	540	980	1570	2195	3400	5270	12040	18130
		25	450	770	1240	1735	2685	4165	9515	14325
	**5	135	385	930	1300	2015	3130	7160	10795	
100	*84	*84	445	805	1300	1810	2805	4345	9930	14955
	80	80	485	880	1415	1975	3060	4740	10825	16305
	60	60	600	1085	1740	2435	3770	5840	13340	20090
	**10 – 50	50	620	1120	1805	2520	3900	6045	13815	20805
		30	545	860	1380	1930	2990	4630	10585	15940
	**10	150	495	950	1325	2050	3180	7270	10950	
125	*105	*105	545	985	1590	2220	3435	5325	12165	18315
	100	100	595	1075	1730	2415	3740	5800	13250	19950
	80	80	710	1290	2075	2900	4490	6955	15890	23930
	**13 – 63	63	750	1360	2190	3060	4735	7340	16775	25260
		35	515	915	1470	2065	3180	4945	11300	17020
	**13	180	555	910	1270	1970	3050	6970	10500	
150	*126	*126	645	1170	1880	2625	4060	6295	14390	21665
	125	125	655	1190	1910	2665	4130	6400	14620	22015
	100	100	825	1495	2405	3355	5195	8050	18400	27705
	**30 – 75	75	885	1605	2580	3600	5575	8640	19745	29735
		50	840	1515	2425	3405	5270	8140	18665	27995
	**30	420	745	1215	1705	2635	4085	9330	14000	
175	*147	*147	740	1350	2170	3030	4690	7270	16610	25010
	145	145	760	1385	2225	3110	4815	7465	17060	25690
	120	120	935	1695	2730	3810	5895	9140	20885	31445
	**55 – 88	88	1015	1840	2965	4140	6405	9930	22690	34170
		70	805	1475	2385	3325	5145	7960	18220	27330
	*55	645	1150	1850	2570	3990	6160	14200	21170	
200	*168	*168	840	1530	2460	3435	5315	8240	18825	28350
	150	150	990	1795	2885	4030	6240	9675	22105	33290
	130	130	1085	1970	3170	4430	6855	10625	24275	36560
	**80 – 100	100	1150	2080	3350	4680	7240	11225	25650	38625
		**80	875	1575	2540	3570	5505	8530	19665	29350
225	*189	*189	940	1710	2750	3840	5940	9210	21045	31690
	175	175	1060	1930	3100	4330	6705	10395	23750	35770
	150	150	1200	2180	3500	4885	7565	11730	26795	40350
	**105 – 111	111	1280	2325	3740	5220	8085	12530	28630	43115
		**105	1180	2125	3405	4755	7350	11430	26100	39285
250	*210	*210	1040	1890	3040	4240	6570	10180	23265	35035
	150	150	1375	2495	4015	5605	8680	13450	30735	46285
	**130	**130	1405	2555	4110	5735	8885	13770	31460	47380

* Maximum adjustable secondary pressure ** Minimum adjustable secondary pressure

Cv Values

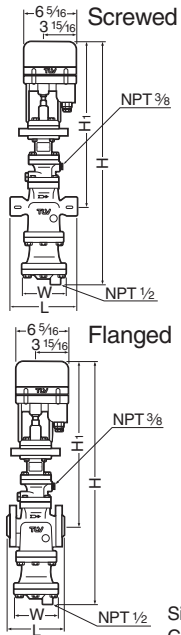
	Nominal Valve Size						
	1/2"*	3/4"	1"	1 1/2"	2"	3"*	4"*
Cv (US)	3.8	6.9	11.1	24.0	37.2	85	128
Cv (UK)	3.2	5.7	9.2	20.0	31.0	70.8	107
Kvs (DIN)	3.3	5.9	9.5	20.6	31.9	72.9	110

*MC-COS-16 only



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

Dimensions



● MC-COS-3 Screwed* (in)

Size	L	H	H ₁	W	Weight (lb)
3/4	6 7/8	28 3/8	19 7/8	4 1/8	44
1	7 1/2	29 7/16	20	5 7/8	55

* NPT, other standards available

● MC-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	29 7/16	20	5 7/8	60
1 1/4	8 1/8	8 11/16	31 3/8	20 3/4	6 1/2	71
1 1/2	8 1/4	8 3/4				
2	10	10 1/4	33 7/8	21 1/4	7 1/2	108

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

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

● MC-COS-16 Screwed* (in)

Size	L	H	H ₁	W	Weight (lb)
1/2	6 7/8	28 3/8	19 7/8	4 1/8	44
3/4					
1	7 1/2	29 7/16	20	5 7/8	55

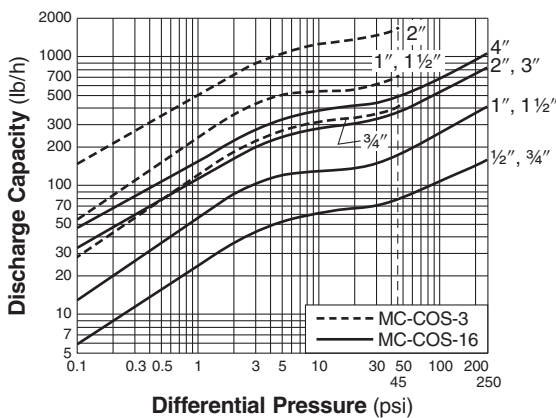
* NPT, other standards available

● MC-COS-16 Flanged (in)

Size	L		H	H ₁	W	Weight* (lb)
	Connects to ASME Class					
	125FF	250RF				
1	6 15/16	7 3/8	29 7/16	20	5 7/8	60
1 1/4	8 1/8	8 11/16	31 3/8	20 3/4	6 1/2	71
1 1/2	8 1/4	8 3/4				
2	10	10 1/4	33 7/8	21 1/4	7 1/2	108
3	14 3/8	15 1/16	43 3/8	25	11	159
4	17 1/16	17 11/16	49 5/16	26 1/2	13 3/4	214

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

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!



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

