



# AUTOMATIC MULTI-CONTROL VALVE

## MODEL MC-COSR-3/MC-COSR-16

### DUCTILE CAST IRON, CAST IRON

#### CONTROLLER OPERATED AND MOTORIZED STEAM VALVE

#### Features

The MC-COSR multi control valve consists of the COSR pressure reducing valve and a motorized actuator. They are used to condition steam and control either steam pressure or the temperature\* of processes heated by steam.

1. When combined with the control algorithms of TLV's SC-F71 controller the rapid response brushless motor precisely adjusts the valve position to ensure extremely accurate pressure control, even during adverse process conditions.
2. Large surface area integral screen for pilot valve extends trouble-free service.
3. Can be used in conjunction with standard PID controllers as a replacement for a standard control valve to significantly improve T&P control performance.
4. Internal secondary pressure-sensing channel makes external sensing line unnecessary.
5. MC-COSR-16 sizes DN 65 and larger have a silencer for noise reduction.

\* MC-COSR-3 cannot be used for temperature control applications.



#### Pressure Equipment Directive (PED)

Classification according to PED 2014/68/EU, fluid group 2

Size	Category	CE marking
DN 15 to DN 40	—*	Art. 4, Sec. 3 (sound engineering practice), CE marking not allowed
DN 50 to DN 80	I	With CE marking and Declaration of Conformity
DN 100, DN 150	II	With CE marking and Declaration of Conformity

\* Manufactured in accordance with sound engineering practice

#### Specifications

Model		MC-COSR-3		MC-COSR-16	
Connection		Flanged			
Size		DIN	ASME	DIN	ASME
		DN 20, 25, 32, 40, 50		DN 15, 20, 25, 32, 40, 50, 65, 80, 100, 150	
Body Material		Ductile Cast Iron* (GGG40.3/EN 5.3103)	Cast Iron (JIS FC250) (equivalent to GG-25/EN-JL1040)	Ductile Cast Iron* (GGG40.3/EN 5.3103)	Cast Iron (JIS FC250) (equivalent to GG-25/EN-JL1040)
Control Valve	Max. Operating Pressure (barg) PMO	3		16	13
	Max. Operating Temperature (°C) TMO	220	200	220	200
	Primary Pressure Range (barg)	1 - 3		2 - 16	2 - 13
	Adjustable Pressure Range (all conditions must be met)	0.1 - 0.5 barg		Within 10 - 84% of primary pressure but with a minimum pressure of 0.3 barg	
Minimum Adjustable Flow Rate	5% of rated flow rate		Differential Pressure between 0.7 - 8.5 barg		
Fluid		Steam			
Input	Valve Opening Input	4 - 20 mA DC (input impedance 250 Ω)			
	Line Voltage	Free between 100 V AC and 240 V AC (50/60 Hz)			
Power	Power Consumption	max. 75 VA			
	Insulation	Between each terminal and ground: 500 V DC min. 100 MΩ			
	Withstand Voltage	Between power terminal and ground terminal: 1800 V AC for 1 second			
Environment	Ambient Temperature	0 - 50 °C			
	Ambient Humidity	10 - 90 % RH (without dew)			
	Vibration Resistance	max. 0.5 G			
	Water Resistance	Rain-resistant			
	Drive System	Positional control by DC brushless motor			
Others	Thermal Protection	Built-in overcurrent protection circuit			
	Open/Close Time	Fully closed → fully open: approximately 15 seconds			
	Emergency Action	When operation signal input is cut off: fully closed			
	Manual Operation	When input power is cutoff: held at position just before power cutoff			
		Possible with power OFF			

\* Cast stainless steel up to size DN 50 available on request.

1 bar = 0.1 MPa

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS): Maximum Allowable Pressure (barg) PMA: 21 (GGG40.3/EN 5.3103), 13 (FC250)  
 Maximum Allowable Temperature (°C) TMA: 220 (GGG40.3/EN 5.3103), 200 (FC250)  
 Minimum Allowable Temperature (°C): 0

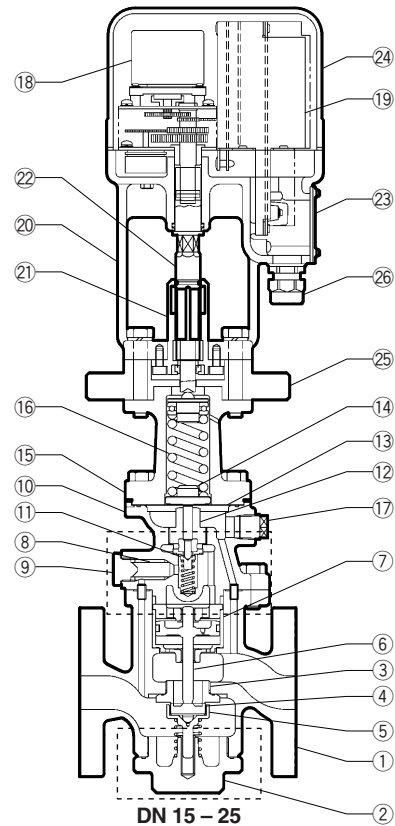


To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

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### Configuration

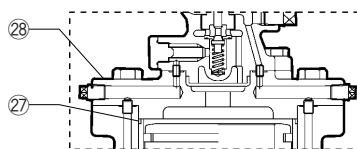
No.	Description	Material	DIN*	ASTM/AISI*
①	Main Body	Cast Iron FC250	0.6025	A126 Cl.B
		Ductile Cast Iron GGG40.3/EN 5.3103 (EN-GJS-400-18-LT)	0.7043	A395 Gr.60-40-18
②	Cover Plug DN 15 - 25	Same material as Main Body**		
	Cover DN 32 - 150			
③	Main Valve Seat	Stainless Steel	—	—
④	Main Valve	Stainless Steel	—	—
⑤	Main Valve Holder	Stainless Steel	—	—
⑥	Piston	Stainless Steel	—	—
⑦	Cylinder	Stainless Steel	—	—
⑧	Pilot Screen	Stainless Steel	—	—
⑨	Pilot Screen Holder	Carbon Steel S25C	1.1158	A1025
⑩	Pilot Body	Same material as Main Body		
⑪	Pilot Valve	Stainless Steel	—	—
⑫	Pilot Valve Seat	Stainless Steel	—	—
⑬	Diaphragm	Stainless Steel	—	—
⑭	Diaphragm Support	Brass	—	—
⑮	Spring Housing	Same material as Main Body		
⑯	Coil Spring	Carbon Steel	—	—
⑰	Plug – Sensing Line Port	Stainless Steel SS400	1.0037	A6
⑱	Motor Unit	—	—	—
⑲	Drive Unit	—	—	—
⑳	Mounting Plate	Cast Iron	—	—
㉑	Adjustment Screw Guide	Stainless Steel	—	—
㉒	Adjustment Screw	Stainless Steel	—	—
㉓	Terminal Block Cover	Steel Plate	—	—
㉔	Motor Cover	Cast Aluminum	—	—
㉕	Insulation Plate	Non-Asbestos Cement	—	—
㉖	Cable Lock	Nylon	—	—
㉗	Seal Ring	Flourine Resin	—	—
㉘	Pilot Cover	Same material as Main Body		
㉙	Slencer***	Stainless Steel	—	—



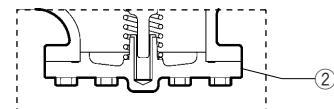
DN 15 – 25

\* Equivalent \*\* DN 150 uses Ductile Cast Iron only \*\*\* DN 65 - 150 Not shown

Pilot Section



DN 32 – 150



DN 32 – 150

### Capacity Table MC-COSR-3

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

Primary Steam Pressure (barg)	Secondary (Set) Steam Pressure (barg)		Nominal Valve Size (DN)				
	Internal Channel	External Line (option)	20	25	32	40	50
1 to less than 2	*0.5	*0.5 - **0.1	120	180	540	750	950
	0.4	/	130	190	520	700	920
	0.3		135	195	510	680	900
	0.2		140	200	390	500	690
	**0.1		100	180	290	380	500
2 - 3	*0.5	*0.5 - **0.1	240	340	540	750	950
	0.4	/	230	330	520	700	920
	0.3		220	320	510	680	900
	0.2		160	250	390	500	690
	**0.1		100	180	290	380	500

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

1 bar = 0.1 MPa

### Capacity Table MC-COSR-16

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

Primary Steam Press. (barg)	Secondary (Set) Steam Pressure (barg)		Nominal Valve Size (DN)									
	Internal Channel	External Line (option)	15	20	25	32	40	50	65	80	100	150
2	*1.3	*1.3	170	240	340	540	670	920	1460	2090	3150	6780
	1.1	1.1	180	260	370	570	720	990	1570	2250	3400	7290
	1	**0.3 - 1	185	270	380	580	730	1010	1610	2310	3480	7480
	0.7		60	160	360	560	700	1000	1600	2300	3470	7470
	**0.3		50	140	340	520	660	990	1590	2290	3460	7430
3	*2.3	*2.3	190	280	400	600	710	1090	1740	2500	3760	8090
	2	2	200	290	430	620	800	1240	1790	2820	4250	9140
	1.5	**0.3 - 1.5	210	310	450	660	880	1370	2180	3120	4700	10100
	1		80	190	400	600	840	1300	2080	2980	4480	9640
	**0.3		50	140	340	520	740	1150	1830	2630	3950	8490
4	*3.3	*3.3	200	290	410	610	800	1250	1980	2840	4280	9200
	3	3	220	310	450	650	920	1420	2270	3250	4900	10500
	2.5	**0.4 - 2.5	230	320	480	690	1040	1610	2570	3690	5560	11900
	2		240	350	520	730	1130	1750	2790	3990	6020	12900
	**0.4		80	280	440	620	960	1490	2370	3390	5110	11000
5	*4.2	*4.2	220	320	370	610	940	1460	2320	3330	5010	10800
	4	4	240	340	470	660	1030	1590	2530	3630	5470	11800
	3	3	260	380	590	820	1270	1980	3050	4510	6800	14600
	2.5	**0.5 - 2.5	270	400	620	870	1350	2080	3320	4760	7170	15400
	1.5		170	320	520	720	1120	1730	2760	3950	5950	12800
6	*5	*5	250	350	520	720	1120	1740	2770	3970	5980	12900
	4	4	280	410	660	920	1420	2210	3520	5040	7590	16300
	3.5	**0.6 - 3.5	290	440	690	970	1500	2330	3710	5320	8010	17200
	3		300	460	720	1010	1560	2420	3860	5530	8330	17900
	1.5		170	320	480	670	1030	1600	2550	3800	5500	11800
7	*5.8	*5.8	250	370	600	840	1300	2020	3220	4610	6940	14900
	5	5	290	450	720	1010	1560	2420	3850	5520	8320	17900
	4	4	330	500	800	1110	1720	2670	4260	6110	9200	19800
	3.5	**0.7 - 3.5	350	510	820	1150	1780	2750	4390	6290	9480	20400
	2		200	380	610	850	1310	2040	3250	4660	7010	15100
8	*6.7	*6.7	280	410	670	930	1440	2230	3550	5100	7620	16500
	6	6	300	480	780	1090	1680	2610	4160	5970	8980	19300
	5	5	340	540	870	1220	1890	2930	4670	6690	10100	21600
	4	**0.8 - 4	400	570	920	1290	1990	3090	4920	7060	10600	22800
	2		200	380	610	850	1310	2040	3250	4660	7010	15100
10	*8.4	*8.4	310	500	810	1130	1750	2720	4330	6210	9360	20100
	7	7	390	630	1010	1410	2180	3380	5390	7730	11600	25000
	6	6	470	670	1080	1510	2340	3620	5780	8280	12500	26800
	5	**1.5 - 5	500	700	1120	1560	2420	3750	5990	8580	12900	27800
	3		300	460	740	1030	1600	2480	3950	5790	8520	18300
12	*10	*10	350	610	980	1360	2110	3270	5220	7480	11300	24200
	8	8	500	760	1230	1710	2650	4110	6560	9400	14200	30400
	7	7	570	800	1290	1800	2780	4310	6870	9850	14800	31900
	6	**3.5 - 6	600	820	1320	1840	2850	4420	7050	10100	15200	32700
	5		500	680	1090	1530	2370	3670	5850	8380	12600	27100
13	*10.9	*10.9	360	650	1040	1450	2250	3490	5560	7960	12000	25800
	10	10	410	740	1190	1660	2560	3970	6330	9080	13700	29400
	8	8	470	850	1360	1910	2950	4570	7290	10500	15700	33800
	6.5	**4.5 - 6.5	480	880	1410	1970	3060	4740	7550	10800	16300	35000
	5.5		400	730	1180	1640	2550	3950	6290	9010	13600	29200
14	*11.7	*11.7	410	700	1120	1570	2430	3760	6000	8590	12400	27800
	10	10	540	840	1360	1900	2940	4550	7260	10400	15600	33700
	8	8	670	980	1490	2300	3220	4990	7950	11400	17200	36900
	7	**5.5 - 7	730	1050	1520	2450	3280	5090	8110	11600	17500	37600
	6		600	840	1240	2000	2690	4170	6650	9530	14300	30800
16	*13.4	*13.4	470	790	1270	1770	2740	4250	6770	9710	14600	31400
	10	10	730	1100	1650	2400	3560	5520	8800	12600	19000	40800
	9	9	790	1200	1750	2600	3650	5660	9030	12900	19500	41900
	8	**7.5 - 8	880	1300	2000	2700	3710	5750	9170	13100	19800	42500
	**7.5		820	1250	1800	2600	3400	5260	8390	12000	18100	38900

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

1 bar = 0.1 MPa

### Cv & Kvs Values

	Nominal Valve Size (DN)									
	15*	20	25	32	40	50	65*	80*	100*	150*
Kvs (DIN)	3.3	5.9	9.5	13.3	20.6	31.9	50.8	72.9	110	236
Cv (UK)	3.2	5.7	9.2	12.9	20.0	31.0	49.4	70.8	107	229
Cv (US)	3.8	6.9	11.1	15.5	24.0	37.2	59.3	85.0	128	275

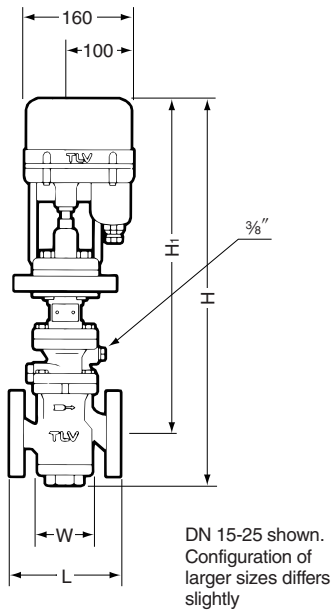
\* MC-COSR-16 only



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

### Dimensions

Flanged



### MC-COSR-3 / MC-COSR-16 Flanged

(mm)

DN	L					H	H <sub>1</sub>	W	Weight* (kg)
	DIN 2501	ASME Class							
	PN25/40	125FF	(150RF)	250RF	(300RF)				
(15)**	130	—	170	—	170	582	510	88	17
(20)	150	—	182	—	182				
25	160	176	188	188	192	610	507	93	19
32	180	206	220	220	220				
40	200	209		222	224	224	637	540	157
50	230	247	255	260	261				
65**	290	362	372	377	378	778	635	220	25
80**	310	365	374	383	384				
100**	350	434	434	450	450	857	672	265	32
150**	480	600	600	622	622				

( ) No ASME standard exists for cast iron; machined to fit steel flanges

Class 125 FF can connect to 150 RF, 250 RF can connect to 300 RF

Other standards available, but length and weight may vary

\* Weight is for DIN PN 25/40

\*\* MC-COSR-16 only

Manufacturer

**TLV** CO., LTD.  
Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001  
ISO 14001

