

# COSPECT<sup>®</sup> MOTORIZED STEAM PRESSURE REDUCING VALVE

## MODEL M-COS-3/M-COS-16

MOTOR ACTUATED SELF-ACTUATED PRESSURE REDUCING VALVE WITH SHOCK-ABSORBING PISTON

### Features

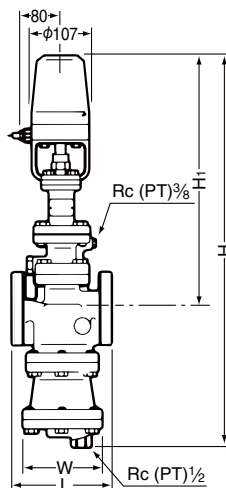
The technologically advanced pilot operated pressure reducing valve incorporates a separator and a steam trap together with a motorized actuator for remote adjustment of secondary pressure set point.

1. Space-saving unit simplifies system layout, piping and maintenance.
2. Self-aligning shock-absorbing spherical piston and advanced pilot regulator designs maintain secondary steam pressure accuracy, even during adverse process conditions.
3. Built-in cyclone separator, with condensate separation efficiency as high as 98%, and self-modulating free float steam trap provide dry, high-quality steam supply.
4. Major internal components made of stainless steel for long service life.
5. Large surface area integral screens for pilot valve and main valve extend trouble-free service.
6. Internal secondary pressure-sensing channel makes external sensing line unnecessary.
7. M-COS-16, sizes 65 mm and larger have a silencer for noise reduction.
8. The MC-2 controller is equipped with secondary pressure display, pressure locking and upper pressure limit setting functions.
9. A locking device is included to prevent accidental changes to set pressure.



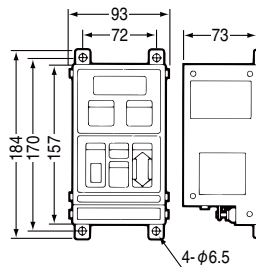
### Dimension

#### Valve



#### Controller

#### MC-2



#### M-COS-3 / M-COS-16 Flanged (mm)

Size	L				H	H <sub>1</sub>	W	Weight* (kg)
	ASME Class							
	125FF	(150RF)	250RF	(300RF)				
(15)**	—	170	—	170	680	470	105	[18]
(20)	—	182	—	182				[19]
25	176	188	188	192	707	467	150	24
32	206	220	220	220	757	487	165	28
40	209		222	224				30
50	255	255	260	261	820	500	195	46
65**	362	372	377	378	1055	595	280	72
80**	365	374	383	384				75
100**	434	434	450	450				108

( ) 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 Class 250 RF [300 RF]

\*\* M-COS-16 only

Size 15 - 50 mm shown.

Configuration of larger sizes differs slightly.

Specifications

Model		M-COS-3	M-COS-16	
Valve	Connection	Flanged		
	Size (mm)	20 – 50	15 – 150	
	Body Material	Cast Iron		
	Maximum Operating Pressure (MPaG) PMO	0.3	1.6	
	Maximum Operating Temperature (°C) TMO	220		
	Primary Pressure Range (MPaG)	0.1 – 0.3	0.2 – 1.6	
	Adjustable Pressure Range (all conditions must be met)	0.01 – 0.05 MPaG	Within 10 – 84% of primary pressure but with a minimum pressure of 0.03 MPaG Differential pressure between 0.07 – 0.85 MPa	
Minimum Adjustable Flow Rate	5 % of rated flow rate	5% of rated flow rate (For 65 mm – 100 mm: 10% of rated flow rate)		
Actuator	Drive System	ON/OFF control of reversible motor		
	Line Voltage	100/110 VAC±10% or 200/220 VAC±10% (50/60 Hz) (Supplied from controller) (Single phase)		
	Power Consumption	Included in Controller		
	Withstand Voltage	Between power terminal and ground terminal: 1800 VAC (60 Hz) for 1 second		
	Insulation Resistance	Between power terminal and ground terminal: Min. 100 MΩ (500 VDC)		
	Operation Conditions	Ambient Temperature	0 – 60 °C	
		Water Resistance	JIS Rain-proof type (Motor must not come into contact with dew)	
		Vibration Resistance	Max. 0.5 G	
	Cable Heat Resistance	70 °C (Cable must not come into contact directly with steam piping)		
	Thermal Protection	Motor with built-in 120 °C thermal protector		
	Open/Close Time	Approx. 40 seconds		
	Continual Actuator Operation	Approx. 5 minutes maximum		
Manual Operation	Possible			

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: 1.6 1 MPa = 10.197 kg/cm<sup>2</sup>  
Maximum Allowable Temperature (°C) TMA: 220



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.

Controller

Model		MC-2
Pressure Display Function	Yes (select between displays of measured pressure and upper pressure)	
Pressure Upper Limit Setting Function	Setting is possible	
Power Source Voltage	100/110 VAC±10% or 200/220 VAC±10% (50/60 Hz)	
Power Consumption	While motor is stopped	7 VA
	While motor is in operation	(TYP.) 65 VA (MAX.) 75 VA
Withstand Voltage	Between power terminal and ground terminal: 1800 VAC (60 Hz) for 1 second	
Insulation Resistance	Between ground terminal and each terminal: Min. 100 MΩ (500 VDC)	
Operating Conditions	Ambient Temperature	0 – 50 °C
	Ambient Humidity	5 – 90% RH (without dew, indoor use)
	Vibration Resistance	Max. 0.5 G
Dimensions (Unit: mm)	93 (W) x 184 (H) x 73 (D)	
Weight	1.1 kg	
Installation	Wall mounting (M5 screw x 4)	
Material/Coating	Steel plate/black melamine	
Pressure Indication	Indication Range	0 – 1999 kPaG
	Indication Accuracy	±0.5% F.S.
	Pressure Sensor	Standard type
	Allowable Pressure Setting Range	0 – 1999 kPaG

Pressure Sensor (Standard type)

Model	M-COS-3	M-COS-16
Pressure Measurement Range	0 – 0.5 MPaG (500 kPaG) type	0 – 2.0 MPaG type 0 – 0.5 MPaG (500 kPaG) type*
Signal Output	4 – 20 mA DC (load resistance 250 Ω/15 VDC)	
Measurement Accuracy	±0.3% F.S.	
Temperature Drift	±0.02% F.S./°C	
Maximum Allowable Pressure	2 times the maximum value of the measurement range	
Ambient Temperature	–40 – +85 °C (Sensor must not come into contact with dew)	
Water Resistance	JIS Rain-proof type	
Material for Wetted Parts	AISI 316 / DIN W. No. 1.4401	
Connection Thread	G (PF) 3/8	
Weight	Approx. 400 g	
Accessories	Siphon Tube (connector screw for piping installation end: R (PT) 3/8)	

\* When the secondary pressure is 0.03 MPaG or less, choose a 0 – 0.5 MPaG (500 kPaG) type sensor

**Capacity Table M-COS-16**

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

Primary Steam Press. (MPaG)	Secondary (Set) Steam Press. (MPaG)		Nominal Valve Size (mm)								
	Internal Channel	External Line (option)	15	20	25	32	40	50	65	80	100
0.2	*0.13	*0.13	170	240	340	540	670	920	1460	2090	3150
	0.11	0.11	180	260	370	570	720	990	1570	2250	3400
	0.1	**0.03 - 0.1	185	270	380	580	730	1010	1610	2310	3480
	0.07		60	160	360	560	700	1000	1600	2300	3470
	**0.03		50	140	340	520	660	990	1590	2290	3460
0.3	*0.23	*0.23	190	280	400	600	710	1090	1740	2500	3760
	0.2	0.2	200	290	430	620	800	1240	1790	2820	4250
	0.15	**0.03 - 0.15	210	310	450	660	880	1370	2180	3120	4700
	0.1		80	190	400	600	840	1300	2080	2980	4480
	**0.03		50	140	340	520	740	1150	1830	2630	3950
0.4	*0.33	*0.33	200	290	410	610	800	1250	1980	2840	4280
	0.3	3	220	310	450	650	920	1420	2270	3250	4900
	0.25	0.25	230	320	480	690	1040	1610	2570	3960	5560
	0.2	**0.04 - 0.2	240	350	520	730	1130	1750	2790	3990	6020
	0.1		80	280	440	620	960	1490	2370	3390	5110
	**0.04		60	150	390	550	850	1310	2090	3000	4510
0.5	*0.42	*0.42	220	320	370	610	940	1460	2320	3330	5010
	0.4	0.4	240	340	470	660	1030	1590	2530	3630	5470
	0.3	0.3	260	380	590	820	1270	1980	3050	4510	6800
	0.25	**0.05 - 0.25	270	400	620	870	1350	2080	3320	4760	7170
	0.15		170	320	520	720	1120	1730	2760	3950	5950
	**0.05		60	150	410	570	890	1380	2190	3140	4730
0.6	*0.5	*0.5	250	350	520	720	1120	1740	2770	3970	5980
	0.4	0.4	280	410	660	920	1420	2210	3520	5040	7590
	0.35	0.35	290	440	690	970	1500	2330	3710	5320	8010
	0.3	**0.06 - 0.3	300	460	720	1010	1560	2420	3860	5530	8330
	0.15		170	320	480	670	1030	1600	2550	3800	5500
	**0.06		60	150	420	590	920	1420	2260	3250	4890
0.7	*0.58	*0.58	250	370	600	840	1300	2020	3220	4610	6940
	0.5	0.5	290	450	720	1010	1560	2420	3850	5520	8320
	0.4	0.4	330	500	800	1110	1720	2670	4260	6110	9200
	0.35	**0.07 - 0.35	350	510	820	1150	1780	2750	4390	6290	9480
	0.2		200	380	610	850	1310	2040	3250	4660	7010
	**0.07		70	230	430	600	930	1450	2310	3310	4980
0.8	*0.67	*0.67	280	410	670	930	1440	2230	3550	5100	7620
	0.6	0.6	300	480	780	1090	1680	2610	4160	5970	8980
	0.5	0.5	340	540	870	1220	1890	2930	4670	6690	10100
	0.4	**0.08 - 0.4	400	570	920	1290	1990	3090	4920	7060	10600
	0.2		200	380	610	850	1310	2040	3250	4660	7010
	**0.08		70	160	410	580	900	1390	2220	3180	4780
1.0	*0.84	*0.84	310	500	810	1130	1750	2720	4330	6210	9360
	0.7	0.7	390	630	1010	1410	2180	3380	5390	7730	11600
	0.6	0.6	470	670	1080	1510	2340	3620	5780	8280	12500
	0.5	**0.15 - 0.5	500	700	1120	1560	2420	3750	5990	8580	12900
	0.3		300	460	740	1030	1600	2480	3950	5790	8520
	**0.15		170	320	480	680	970	1510	2390	3430	5170
1.2	*1.0	*1.0	350	610	980	1360	2110	3270	5220	7480	11300
	0.8	0.8	500	760	1230	1710	2650	4110	6560	9400	14200
	0.7	0.7	570	800	1290	1800	2780	4310	6870	9850	14800
	0.6	**0.35 - 0.6	600	820	1320	1840	2850	4420	7050	10100	15200
	0.5		500	680	1090	1530	2370	3670	5850	8380	12600
	**0.35		360	550	890	1240	1930	2980	4760	6820	10300
1.4	*1.17	*1.17	410	700	1120	1570	2430	3760	6000	8590	12400
	1.0	1.0	540	840	1360	1900	2940	4550	7260	10400	15600
	0.8	0.8	670	980	1490	2300	3220	4990	7950	11400	17200
	0.7	**0.55 - 0.7	730	1050	1520	2450	3280	5090	8110	11600	17500
	0.6		600	840	1240	2000	2690	4170	6650	9530	14300
	**0.55		550	770	1130	1580	2450	3790	6040	8660	13000
1.6	*1.34	*1.34	470	790	1270	1770	2740	4250	6770	9710	14600
	1.0	1.0	730	1100	1650	2400	3560	5520	8800	12600	19000
	0.9	0.9	790	1200	1750	2600	3650	5660	9030	12900	19500
	0.8	**0.75 - 0.8	880	1300	2000	2700	3710	5750	9170	13100	19800
	**0.75		820	1250	1800	2600	3400	5260	8390	12000	18100

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

1 MPa = 10.197 kg/cm<sup>2</sup>

**Capacity Table M-COS-3**

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

Primary Steam Pressure (MPaG)	Secondary (Set) Steam Pressure (MPaG)		Nominal Valve Size (mm)				
	Internal Channel	External Line (option)	20	25	32	40	50
0.1 to less than 0.2	*0.05	*0.05 - **0.01	120	180	540	750	950
	0.04	/	130	190	520	700	920
	0.03		135	195	510	680	900
	0.02		140	200	390	500	690
	**0.01		100	180	290	380	500
0.2 - 0.3	*0.05	*0.05 - **0.01	240	340	540	750	950
	0.04	/	230	330	520	700	920
	0.03		220	320	510	680	900
	0.02		160	250	390	500	690
	**0.01		100	180	290	380	500
0.1 to less than 0.2	*0.05 - **0.01		120	180	540	750	950
0.2 - 0.3	*0.05 - **0.01		240	340	540	750	950

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

1 MPa = 10.197 kg/cm<sup>2</sup>

**Cv Values**

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

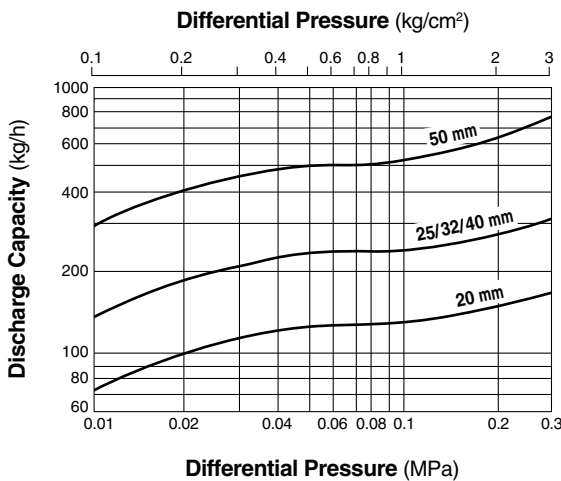
\* M-COS-16 only



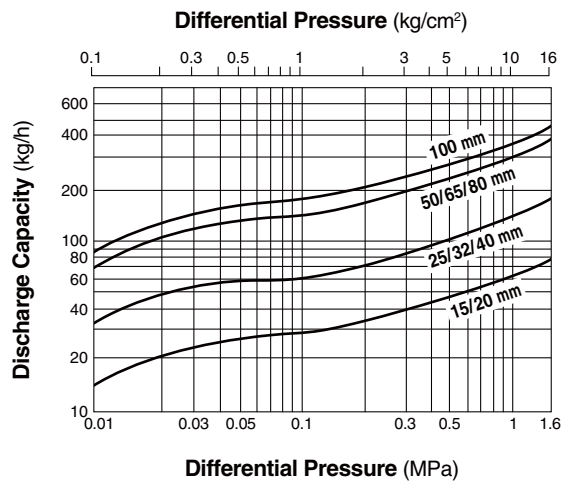
The Cv & Kvs values shown are for the valve in the full fail open position. These values are not to be used for M-COS sizing, and instead may be used as one of the factors in calculations for safety valve selection.

**Discharge Capacity**

**M-COS-3**



**M-COS-16**



- Note: 1. The discharge capacity is the maximum continuous condensate discharge 6 °C below saturated steam temperature.
- 2. The differential pressure is the difference between the M-COS inlet and its trap outlet pressure.



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

Manufacturer

ISO 9001/ISO 14001



Kakogawa, Japan  
is approved by LRQA Ltd. to ISO 9001/14001

