



COSPECT® PNEUMATIC CONTROL VALVE FOR STEAM

MODEL PN-COS-16
DUCTILE CAST IRON, CAST IRON
CAST STAINLESS STEEL

REMOTELY CONTROLLABLE PNEUMATICALLY ACTUATED CONTROL VALVE

Features

The PN-COS is a pneumatic control valve designed for remotely controlling steam pressure based on the structure of the TLV COS pressure reducing valve. As it includes integrated screens, separator, and steam trap, it also conditions steam quality, and is suitable for use in steam heating processes.*

1. The rapid response pneumatic actuator precisely adjusts the valve position to ensure accurate pressure control.
2. 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.
3. Large surface area integral screens for pilot valve and main valve extend trouble-free service.
4. Combining with a controller and an electropneumatic transducer enables automatic PID operation.
5. When combined with an air regulator it can be used as a pressure reducing valve to set secondary pressure remotely, and 2 point pressure switching is possible as well.
6. By adjusting the internal spring load, steam can continue to be supplied at the required lowest set pressure even with motive air cut off (emergency case).

* Can be used to control processes temperature if desired temperature is controllable using secondary pressure within the adjustable pressure range.



Pressure Equipment Directive (PED)

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

Size	Category	CE marking
DN 15 to DN 25, DN 40	—*	Art. 4, Sec. 3 (sound engineering practice), CE marking not allowed
DN 50	I	With CE marking and Declaration of Conformity

* Manufactured in accordance with sound engineering practice

Specifications

Model	PN-COS-16		
Body Material	Cast Iron (JIS FC250) (equiv. GG-25/EN-JL1040)	Ductile Cast Iron (GGG40.3/EN 5.3103)	Cast Stainless Steel (A351/A351M Gr.CF8 or CF8M) (equiv. 1.4312 or 1.4410)
Connection	Flanged		
	ASME	DIN	
Size	DN 15, 20, 25, 40, 50		
Max. Operating Pressure (barg) PMO	13	16	
Max. Operating Temperature (°C) TMO	200	220	
Primary Pressure Range (barg)	2 – 13	2 – 16	
Adjustable Pressure Range (all conditions must be met)	Within 10 – 84% of primary pressure but with a minimum pressure of 0.3 barg		
	Max. pressure: [Motive air pressure minus 1] barg		
	Differential Pressure between 0.7 – 8.5 bar		
Minimum Adjustable Flow Rate	5% of rated flow rate		
Motive Medium	Oil-free air, filtered to 5 µm		
Required Motive Air Pressure	[Desired secondary pressure + 1] barg or higher (but not exceeding 16 barg)		

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):

Maximum Allowable Pressure (barg) PMA: 13 (FC250), 21 (GGG40.3/EN 5.3103 or CF8/CF8M)
Maximum Allowable Temperature (°C) TMA: 200 (FC250), 220 (GGG40.3/EN 5.3103 or CF8/CF8M)
Minimum Allowable Temperature (°C): 0 (FC250, GGG40.3/EN 5.3103), -40 (CF8/CF8M)

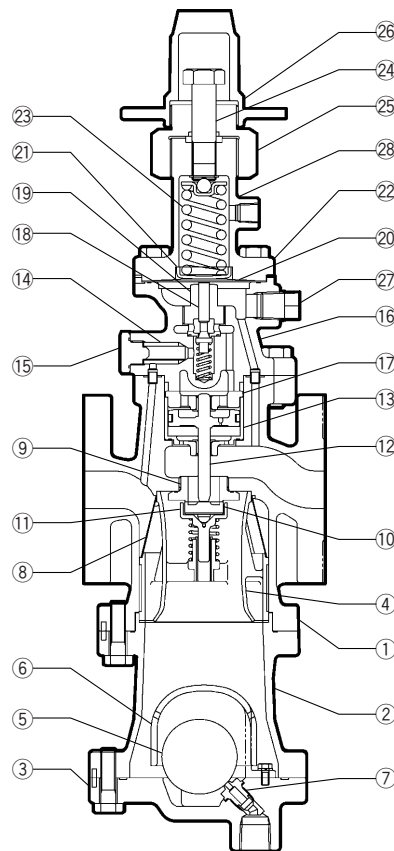
1 bar = 0.1 MPa



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	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	
		Cast Stainless Steel A351/ A351M Gr.CF8 or CF8M	1.4312 or 1.4410	—	
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	Cast Iron/Ductile Cast Iron Body	Cast Iron	—	—
		Cast Stainless Steel Body	Cast Stainless Steel	—	—
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	Cast Iron/Ductile Cast Iron Body	Carbon Steel S25C	1.1158	A1025
		Cast Stainless Steel Body	Stainless Steel SUS303 or A351/A351M Gr.CF8M	1.4305 or 1.4410	AISI303 or —
⑯	Pilot Body	Same material as Main Body			
⑰	Piston Guide	DN 15-25	Stainless Steel	—	—
		DN 40, 50	Cast Stainless Steel	—	—
⑱	Pilot Valve	Stainless Steel	—	—	
⑲	Pilot Valve Seat	Stainless Steel	—	—	
⑳	Diaphragm	Stainless Steel	—	—	
㉑	Diaphragm Support	Brass	—	—	
㉒	Spring Housing	Cast Stainless Steel A351/A351M Gr.CF8	1.4312	—	
㉓	Coil Spring	Carbon Steel	—	—	
㉔	Adjustment Screw	Carbon Steel	—	—	
㉕	Packing Retainer	Stainless Steel	—	—	
㉖	Spanner Cap	Cast Iron/Ductile Cast Iron Body	Die Cast Aluminium	—	—
		Cast Stainless Steel Body	Cast Stainless Steel	—	—
㉗	Plug - Sensing Line Port	Cast Iron/Ductile Cast Iron Body	Carbon Steel SS400	1.0037	A6
		Cast Stainless Steel Body	Stainless Steel SUS304 or A182/A182M F316	1.4301 or 1.4401	AISI304 or —
㉘	Nameplate	Stainless Steel	—	—	



* Equivalent material

Cv & Kvs Values

	Nominal Valve Size (DN)				
	15	20	25	40	50
Kvs (DIN)	3.3	5.9	9.5	20.6	31.9
Cv (UK)	3.2	5.7	9.2	20.0	31.0
Cv (US)	3.8	6.9	11.1	24.0	37.2



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

Capacity Table

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

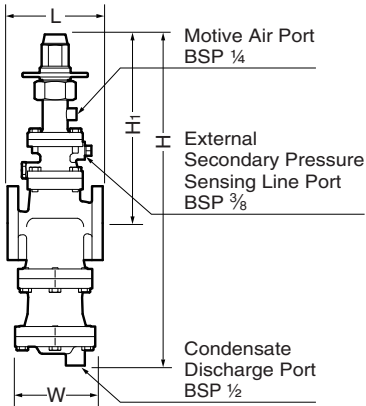
Primary Steam Press. (barg)	Secondary (Set) Steam Pressure (barg)		Nominal Valve Size (DN)				
	Internal Channel	External Line (option)	15	20	25	40	50
2	*1.3	*1.3	170	240	340	670	920
	1.1	1.1	180	260	370	720	990
	1	**0.3 - 1	185	270	380	730	1010
	0.7		60	160	360	700	1000
	**0.3		50	140	340	660	990
3	*2.3	*2.3	190	280	400	710	1090
	2	2	200	290	430	800	1240
	1.5	**0.3 - 1.5	210	310	450	880	1370
	1		80	190	400	840	1300
	**0.3		50	140	340	740	1150
4	*3.3	*3.3	200	290	410	800	1250
	3	3	220	310	450	920	1420
	2.5	2.5	230	320	480	1040	1610
	2	**0.4 - 2	240	350	520	1130	1750
	1		80	280	440	960	1490
	**0.4		60	150	390	850	1310
5	*4.2	*4.2	220	320	370	940	1460
	4	4	240	340	470	1030	1590
	3	3	260	380	590	1270	1980
	2.5	**0.5 - 2.5	270	400	620	1350	2080
	1.5		170	320	520	1120	1730
	**0.5		60	150	410	890	1380
6	*5	*5	250	350	520	1120	1740
	4	4	280	410	660	1420	2210
	3.5	3.5	290	440	690	1500	2330
	3	**0.6 - 3	300	460	720	1560	2420
	1.5		170	320	480	1030	1600
	**0.6		60	150	420	920	1420
7	*5.8	*5.8	250	370	600	1300	2020
	5	5	290	450	720	1560	2420
	4	4	330	500	800	1720	2670
	3.5	**0.7 - 3.5	350	510	820	1780	2750
	2		200	380	610	1310	2040
	**0.7		70	230	430	930	1450
8	*6.7	*6.7	280	410	670	1440	2230
	6	6	300	480	780	1680	2610
	5	5	340	540	870	1890	2930
	4	**0.8 - 4	400	570	920	1990	3090
	2		200	380	610	1310	2040
	**0.8		70	160	410	900	1390
10	*8.4	*8.4	310	500	810	1750	2720
	7	7	390	630	1010	2180	3380
	6	6	470	670	1080	2340	3620
	5	**1.5 - 5	500	700	1120	2420	3750
	3		300	460	740	1600	2480
	**1.5		170	320	480	970	1510
12	*10	*10	350	610	980	2110	3270
	8	8	500	760	1230	2650	4110
	7	7	570	800	1290	2780	4310
	6	**3.5 - 6	600	820	1320	2850	4420
	5		500	680	1090	2370	3670
	**3.5		360	550	890	1930	2980
13	*10.9	*10.9	360	650	1040	2250	3490
	10	10	410	740	1190	2560	3970
	8	8	470	850	1360	2950	4570
	6.5	**4.5 - 6.5	480	880	1410	3060	4740
	5.5		400	730	1180	2550	3950
	**4.5		320	580	940	2020	3140
14	*11.7	*11.7	410	700	1120	2430	3760
	10	10	540	840	1360	2940	4550
	8	8	670	980	1490	3220	4990
	7	**5.5 - 7	730	1050	1520	3280	5090
	6		600	840	1240	2690	4170
	**5.5		550	770	1130	2450	3790
16	*13.4	*13.4	470	790	1270	2740	4250
	10	10	730	1100	1650	3560	5520
	9	9	790	1200	1750	3650	5660
	8	**7.5 - 8	880	1300	2000	3710	5750
	**7.5		820	1250	1800	3400	5260

* Maximum adjustable secondary pressure ** Minimum adjustable secondary pressure

1 bar = 0.1 MPa

Dimensions

● **PN-COS-16** Flanged

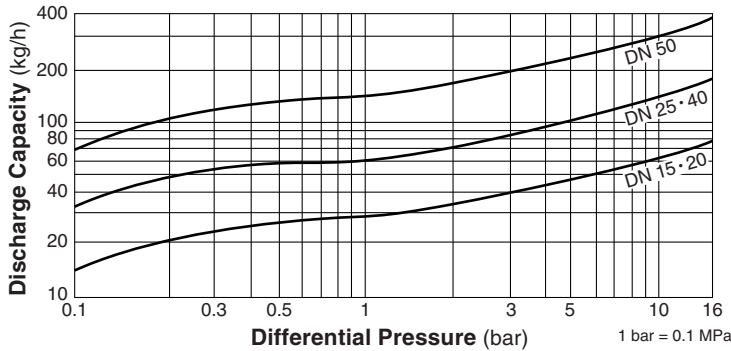


PN-COS-16 Flanged (mm)

DN	L					H	H ₁	W	Weight* (kg)
	DIN 2501	ASME Class							
	PN25/40	125FF	(150RF)	250RF	(300RF)				
(15)**	150	—	170	—	170	537	327	105	17
(20)		—	182	—	182				18
25	160	176	188	188	192	564	324	150	23
40	200	209	220	222	224	614	344	165	29
50	230	255	255	260	261	677	357	195	44

() 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 PN 25/40
 ** Flange to flange dimension of DN 15 not according to DIN standard, due to size of separator and steam trap

Trap Discharge Capacity



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 PN-COS inlet and its trap outlet pressure.

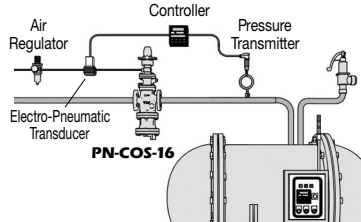


DO NOT use this product under conditions that exceed maximum differential pressure, as condensate backup will occur!

Usage Examples

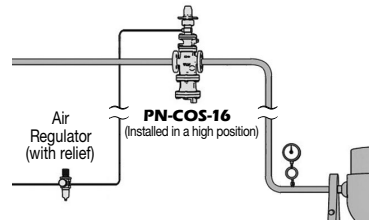
As a Control Valve

Automatic PID Control System (Pressure Control)

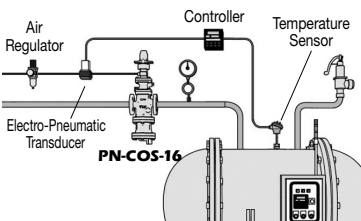


As a Pressure Reducing Valve

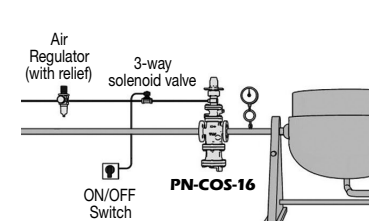
Manual Remote System



Automatic PID Control System (Temperature Control*)



2 Point Pressure Switching



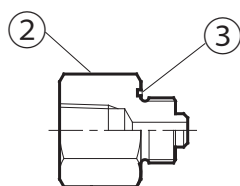
* Can be used to control process temperature if desired temperature is controllable using secondary pressure within the Adjustable Pressure Range.

For explanation purposes only, not intended as installation designs.

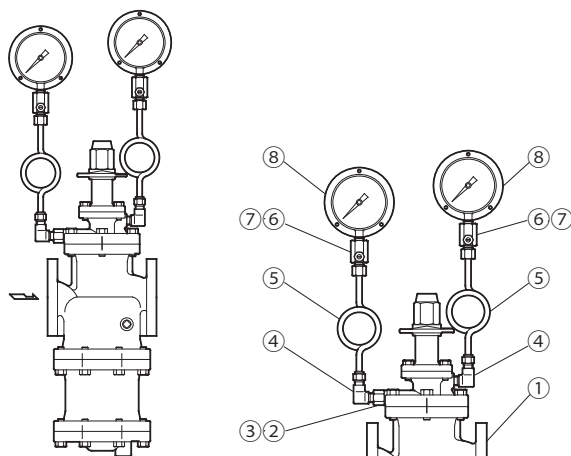
Option

<p>Pressure Gauge Unit</p>	<p>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.</p> <hr/> <p>Elbows, pressure gauge and connecting parts must be purchased separately.</p>
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● **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

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

