STEAM PRESSURE REDUCING VALVE

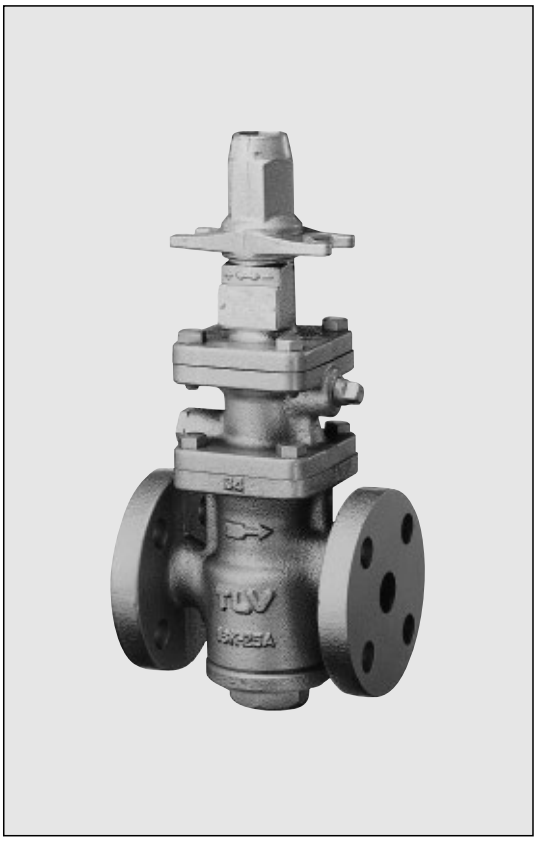
MODEL COSR-21 DUCTILE CAST IRON STAINLESS STEEL

SELF-ACTUATED PRESSURE REDUCING VALVE WITH SHOCK-ABSORBING PISTON

Features

Technologically advanced, pilot operated pressure reducing valve for accurate control in process steam systems.

1. Self-aligning shock-absorbing spherical piston and advanced pilot regulator designs maintain secondary steam pressure accuracy, even during adverse process conditions.
2. Major internal components made of stainless steel for long service life.
3. Large surface area integral screen for pilot valve extends trouble-free service.
4. Internal secondary pressure-sensing channel makes external sensing line unnecessary.
5. Sizes DN 65 and larger have a silencer for noise reduction.



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	II	With CE marking and Declaration of Conformity

* Manufactured in accordance with sound engineering practice

Specifications

Model		COSR-21		
Body Material		Ductile Cast Iron (JIS FCD450) (equivalent to GGG40/EN 5.3106)	Ductile Cast Iron (GGG40.3/EN 5.3103)	Cast Stainless Steel (A351/A351M Gr.CF8 or CF8M) (equivalent to 1.4312 or 1.4410)
Connection		Flanged		
		ASME Class 150RF, 300RF	DIN 2501 PN 25/40	
Size		DN 15, 20, 25, 32, 40, 50, 65, 80, 100		DN 15, 20, 25, 32, 40, 50
Maximum Operating Pressure (barg)	PMO	21		
Maximum Operating Temperature (°C)	TMO	220		
Primary Pressure Range (barg)		13.5 – 21		
Adjustable Pressure Range (all conditions must be met)		From 5.5 barg to 84% of primary pressure		
		Maximum differential pressure 8.5 bar		
Minimum Adjustable Flow Rate		5% of rated flow rate (For DN 65 - DN 100: 10% of rated flow rate)		

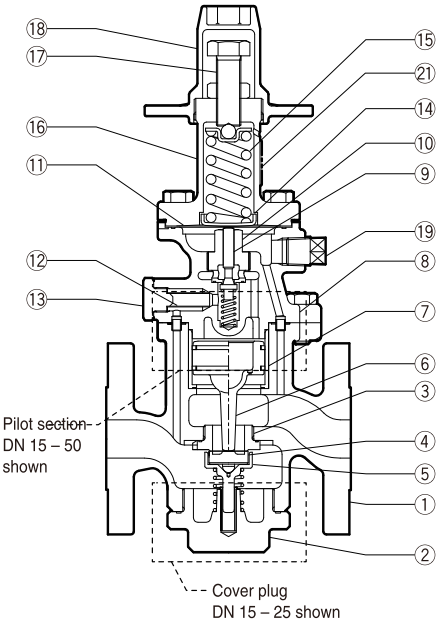
PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): **1 bar = 0.1 MPa**
Maximum Allowable Pressure (barg) PMA: 21
Maximum Allowable Temperature (°C) TMA: 220
Minimum Allowable Temperature (°C): 0 (FCD450, GGG40.3/EN 5.3103), -40 (CF8/CF8M)

CAUTION 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.

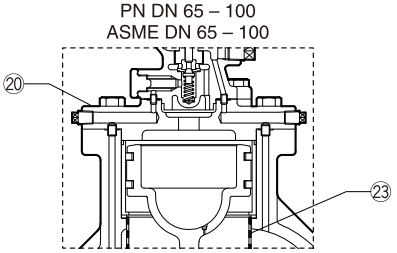
Configuration

No.	Description		Material	DIN*	ASTM/AISI*
①	Main Body	Flanged PN DN 15 - 100	Ductile Cast Iron GGG40.3/ EN 5.3103 (EN-GJS-400-18-LT)	0.7043	A395 Gr.60-40-18
		Flanged PN DN 15 - 50	Cast Stainless Steel A351/ A351M Gr.CF8 or CF8M	1.4312 or 1.4410	—
		Flanged ASME	Ductile Cast Iron FCD450	0.7040	A536
②	Cover Plug	Flanged PN DN 15 - 25	Same material as main body		
	Cover	Flanged PN DN 32 - 100			
		Flanged ASME DN 32 - 100			
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 Body		Same material as main body		
⑨	Pilot Valve		Stainless Steel	—	—
⑩	Pilot Valve Seat		Stainless Steel	—	—
⑪	Diaphragm		Stainless Steel	—	—
⑫	Pilot Screen		Stainless Steel	—	—
⑬	Pilot Screen Holder	Ductile Cast Iron Models	Carbon Steel S25C	1.1158	AISI1025
		Cast Stainless Steel Model	Stainless Steel SUS303 or A351/A351M Gr.CF8M	1.4305 or 1.4410	AISI303 or —
⑭	Diaphragm Support		Brass	—	—
⑮	Coil Spring		Carbon Steel	—	—
⑯	Spring Housing	Flanged ASME	Cast Iron FC250	0.6025	A126 Cl.B
		Flanged PN	Same material as main body		
⑰	Adjustment Screw		Cr-Mo Steel	—	—
⑱	Spanner Cap	Ductile Cast Iron Models	Die Cast Aluminium	—	—
		Cast Stainless Steel Model	Stainless Steel	—	—
⑲	Plug – Sensing Line Port	Ductile Cast Iron Models	Carbon Steel SS400	1.0037	A6
		Cast Stainless Steel Model	Stainless Steel SUS304 or A193/A193M Gr.B8M	1.4301 or 1.4401	AISI304 or —
⑳	Pilot Cover		Same material as main body		
㉑	Nameplate		Stainless Steel	—	—
㉒	Plug – Blow Line Port		Carbon Steel SS400	1.0037	A6
㉓	Silencer		Stainless Steel	—	—

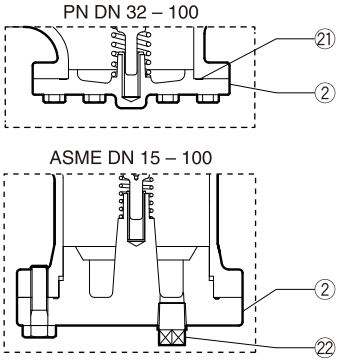
* Equivalent materials
Contact TLV for available replacement parts. All gaskets are PTFE.



Pilot Section



Cover



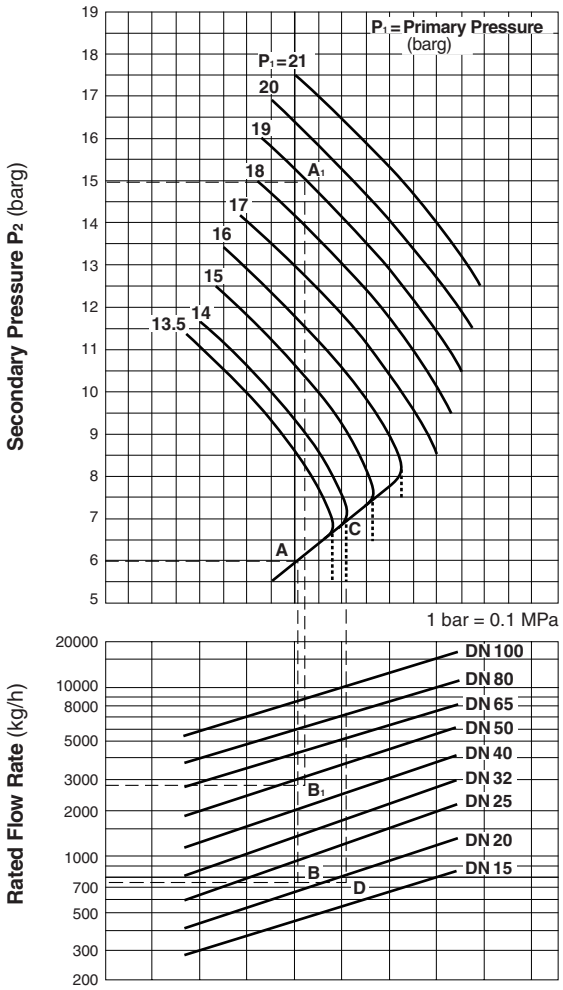
The parts configuration of sizes DN 65 – 150 differs slightly from that of sizes DN 15 – 50.

Cv & Kvs Values

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

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

Sizing Chart



Sizing Examples

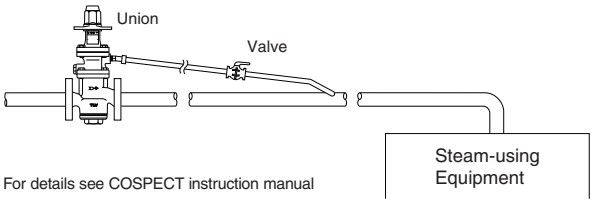
For P_1 over 16 barg

For primary pressure of 19 barg, set pressure 15 barg, and saturated steam flow rate 2800 kg/h, select an appropriate size.

1. Locate intersecting point A_1 of 19 barg primary pressure and 15 barg set pressure. Go to point A_1 and down until 2800 kg/h, point B_1 is reached.
2. Since point B is located between DN 40 and DN 50, the larger size, DN 50, should be chosen.

Special Instructions for P_1 under 16 barg

The vertical dotted lines in the graph represent the increased capacity often achievable when the internal sensing features of COSR-21 are enhanced by the installation of a 3/8 inch external secondary pressure-sensing line (condition: $P_2 < \frac{1}{2} P_1$).



For details see COSPECT instruction manual

For primary pressure of 14 barg, set pressure 6 barg, and saturated steam flow rate 750 kg/h, select an appropriate size.

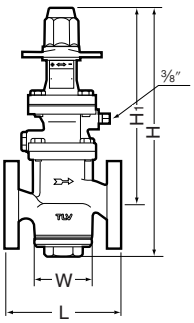
With internal secondary pressure-sensing channel

1. Locate intersecting point A of 14 barg primary pressure and 6 barg set pressure. Go to point A and down until 750 kg/h, point B, is reached.
2. Since point B is located between DN 20 and DN 25, the larger size, DN 25, should be chosen.

With external secondary pressure-sensing line

1. Obtain intersecting point C of 14 barg primary pressure. Go straight down from point C to 6 barg set pressure, and continue until 750 kg/h, point D, is reached.
2. Since point D is located between DN 15 and DN 20, the larger size, DN 20, should be chosen.

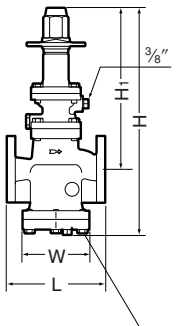
Dimensions



DN 15 - 50 shown. Configuration of larger sizes differs slightly.

COSR-21 Flanged **DIN** (mm)

DN	L DIN 2501 PN 25/40	H	H_1	W	Weight (kg)
15	130	377	305	88	9
20	150				9.7
25	160		302	93	11
32	180	405	322	126	17
40	200				
50	230	432	335	157	24
65	290	576	433	220	51
80	310				52
100	350	655	470	265	81



3/8″ (DN 15 –50)
1/2″ (DN 65 –100)

ASME Class 150RF/300RF, DN 15 – 50 shown. Configuration of larger sizes differs slightly.

COSR-21 Flanged **ASME** (mm)

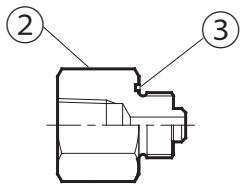
DN	L ASME Class 150RF	L ASME Class 300RF	H	H_1	W	Weight* (kg)
(15)	161	167	405	305	105	11
(20)	172	178				13
25	181	187	422	302	125	15
32	212	219	457	322	150	19
40	215	222				21
50	254	260	490	335	195	36
65	371	377	655	430	280	59
80	374	384				62
100	434	450	768	468	350	95

( ) No ASME standard exists for ductile cast iron; machined to fit steel flanges
Other standards available, but length and weight may vary
*Weight is for Class 300 RF

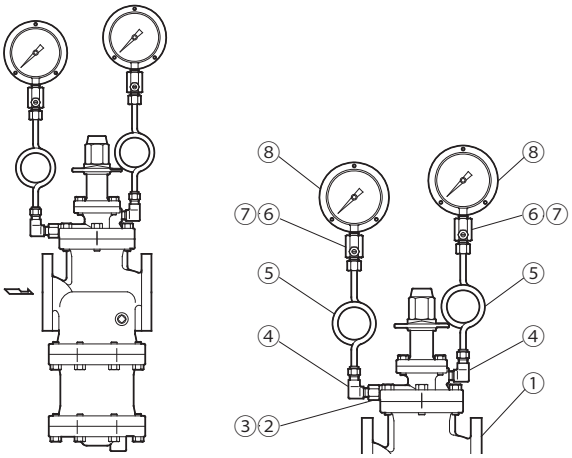
Option

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 ⅜. An elbow is required for pressure gauge installation. Secondary side: Rc(PT) ⅜ mounting port for elbow and pressure gauge installation.
	Elbows, pressure gauge and connecting parts must be purchased separately.

• 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

ISO 9001
ISO 14001
LRQA CERTIFIED

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