

Steam-converting Valve Type DUV-C3

Application

Steam-converting valve for power stations and industrial plants

Inlet: DN 80 to 500 · NPS 3 to 20
PN 16 to 630 · Class 150 to 2500 (4500)

Outlet: DN 100 to 1600 · NPS 4 to 64
PN 16 to 100 · Class 150 to 900

Temperatures: up to 560 °C · up to 1040 °F

Type DUV-C3 Steam-converting Valve with

- Type 3271 Pneumatic Actuator (refer to T 8310-1/-2 EN)
- Valve body made of
- Forged steel 1.0460 (A105)
 - Heat-resisting forged steel 1.5415, 1.7335 (A 182 F12) or 1.7380 (A 182 F22)

Special features

- Perforated plug with controlled pressure reduction in two or more stages
- One or more attenuation plates providing uncontrolled pressure reduction
- Integrated atomizing steam cooler
- Welding ends
- Angle-style valve body
- Pure graphite packing

Versions

- **Standard version** · Angle valve body with welding ends for steam temperatures up to 560 °C (1040 °F)
Inlet: nominal sizes DN 80 to 500 (NPS 3 to 20), nominal pressures PN 16 to 630 (Class 150 to 2500 (4500))
Outlet: nominal sizes DN 100 to 1600 (NPS 4 to 64), nominal pressures PN 16 to 100 (Class 150 to 900)

Further versions · On request

- Pressure-balanced plug
- Electric actuator
- Hydraulic actuator
- Temperatures >560 °C (>1040 °F)

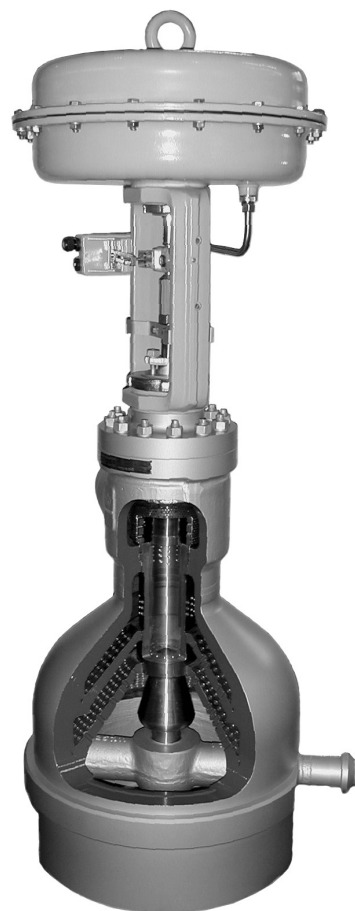


Fig. 1 · Type DUV-C3 Steam-converting Valve with Type 3271 Pneumatic Actuator

Principle of operation

When the perforated plug leaves its seat, the steam inlet bores of the first controlled stage are opened, and steam is admitted into the central chamber. From there, it passes into the atomizing steam cooler through bores at the bottom of the chamber. As the perforated cylinder has only moved a short distance (<20 % of the total travel), the bores for the second stage pressure drop are not yet released. This ensures that adequate steam always flows to the atomizing steam cooler, eliminating the risk of water droplets inadvertently being injected into the system.

As the perforated plug continues to lift, more steam inlet bores are released in a pattern corresponding to the desired opening characteristic.

Once the perforated plug has lifted more than 20 %, the bores for the second controlled stage are opened, allowing steam to flow from the central chamber through the second stage bores, and into the throttling cylinder. This pressure reduced steam flows through the uncontrolled perforated attenuation plates for further pressure reduction, and continues downstream to the temperature sensor.

When the steam comes into contact with the temperature sensor, a signal is sent to the spray water control valve, opening the valve and admitting spray water into the steam cooler. This spray water is atomized by the kinetic energy of the steam, which is continuously flowing through the cooler. The atomized water is instantly vaporized by the superheated steam. The flow from the second controlled stage passes through the perforated attenuation plates, and comes in contact with the flow from the atomizing steam cooler. Here the two flows mix, ensuring total evaporation of the spray water. This completes both the pressure and temperature reduction.

The perforated attenuation plates installed after the second controlled stage, provide additional pressure drop, noise reduction, and lower outlet velocity.

Figures 2 and 3 show possible versions of the Type DUV-C3 Steam-converting Valve.



Fig. 2 · Cutaway of the Type DUV-C3 Steam-converting Valve

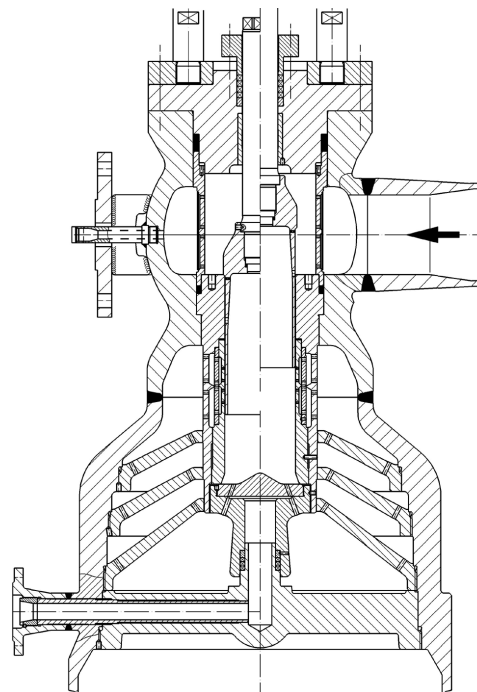


Fig. 3 · Type DUV-C3 Steam-converting Valve

Table 1 · Technical data

Nominal size	Inlet		Outlet	
	DN 80 to 500 · NPS 3 to 20		DN 100 to 1600 · NPS 4 to 64	
Materials	1.0460/A 105 · 1.5415 · 1.7335/A 182 F12 · 1.7380/A 182 F22			
End connection	Welding ends in all versions			
Min. pressure ratio ¹⁾ $\frac{p^2}{p_1}$	Three stages: <0.25 · Four stages: <0.15			
Nominal pressure	PN 16 to 630 · Class 150 to 2500 (4500)		PN 16 to 100 · Class 150 to 900	
Seat-plug seal	Metal sealing · Leakage class IV			
Characteristic	Equal percentage or linear			
Pressure reduction	Perforated plug provides controlled pressure reduction in two stages Additionally, one or two attenuation plates provide uncontrolled pressure reduction			
Rangeability	1 : 50			

1) For different pressure ratios, contact SAMSON.

Table 2 · Materials

Standard version				
Nominal pressure	Inlet		Outlet	
	PN 16 to 630 · Class 150 to 2500 (4500)		PN 16 to 100 · Class 150 to 900	
Body	1.0460/A 105 · 1.5415 · 1.7335/A 182 F12 · 1.7380/A 182 F22			
Seat and plug	1.4122			
Guide bushing	1.7380			
Packing	Pure graphite			
Body gasket	Camprofile (serrated) gasket			

Table 3 · K_{vs} and C_v coefficients available

K_{vs}		23	30.5	52	85.5	112	161	252	374	441	580	673	
C_v		26.9	35.7	60.8	100	131	188	294.8	437.6	516	678	787	
Seat Ø	mm	45	55	65	80	90	110	135	160	180	230	260	
Travel	mm	35	40	50	60	75	75	100	120	120	150	150	
Flow cross-section	First stage	cm ²	8	10.5	18	29.5	38.5	55.5	87	129	152	200	232
		in ²	1.24	1.63	2.79	4.60	5.97	8.60	13.48	19.99	23.55	30.99	35.95
	Second stage	cm ²	14	18	32.5	52	68	97	152	225	268	350	405
		in ²	2.17	2.79	5.04	8.06	10.54	15.03	23.55	34.86	41.52	54.23	62.75

Table 4 · Dimensions for Type DUV-C3 Steam-converting Valve (in mm and inch)

K _{vs}	C _v	Seat Ø in mm	Inlet: DN E DN · NPS	A	Outlet: DN A DN · NPS	B	C	D	E	Spray water Ø
23	26.9	45	50 · 2 65 · 2½ 80 · 3 100 · 4	225 mm/9"	200 · 8	475 mm/19"	350 mm 13.78"	225 mm/9"	750 mm 29.53"	25 mm 1"
					250 · 10			300 mm/12"		
					300 · 12			325 mm/13"		
					350 · 14					
					400 · 16					
30.5	35.7	55	65 · 2½ 80 · 3 100 · 4	250 mm/10"	200 · 8	475 mm/19"	350 mm 13.78"	225 mm/9"	885 mm 34.84"	25 mm 1"
					250 · 10			300 mm/12"		
					300 · 12			325 mm/13"		
					350 · 14					
					400 · 16					
52	60.8	65	80 · 3 100 · 4	250 mm/10"	300 · 12	550 mm/22"	400 mm 15.75"	325 mm/13"	900 mm 35.43"	40 mm 1½"
			125 · 5 150 · 6	275 mm/11"	350 · 14			350 mm/14"		
				400 · 16	375 mm/15"					
				500 · 20						
85.5	100	80	80 · 3 100 · 4 125 · 5	250 mm/10"	300 · 12	575 mm/23"	425 mm 16.73"	325 mm/13"	900 mm 35.43"	40 mm 1½"
			150 · 6	275 mm/11"	350 · 14			350 mm/14"		
				400 · 16	375 mm/15"					
				500 · 20						
112	131	90	100 · 4 125 · 5	275 mm/11"	300 · 12	575 mm/23"	425 mm 16.73"	325 mm/13"	1150 mm 45.28"	40 mm 1½"
			150 · 6	300 mm/12"	350 · 14			350 mm/14"		
				400 · 16	400 mm/16"					
				500 · 20	450 mm/18"					
				600 · 24						
161	188	110	125 · 5 150 · 6 200 · 8	375 mm/15"	300 · 12	600 mm/24"	450 mm 17.72"	325 mm/13"	1100 mm 43.31"	40 mm 1½"
					350 · 14			350 mm/14"		
					400 · 16					
					500 · 20	650 mm/26"	500 mm/19.69"	400 mm/16"		
					600 · 24	700 mm/28"	525 mm/20.67"	475 mm/19"		
					700 · 28	800 mm/32"	625 mm/24.61"	500 mm/20"		
					800 · 32			525 mm/21"		
252	294.8	135	150 · 6 200 · 8 250 · 10	400 mm/16" 425 mm/17" 450 mm/18"	400 · 16	650 mm/26"	525 mm/20.67"	350 mm/14"	1700 mm 66.93"	50 mm 2"
					500 · 20	750 mm/30"	550 mm/21.65"	400 mm/16"		
					600 · 24			450 mm/18"		
					700 · 28	800 mm/32"	600 mm/23.62"	500 mm/20"		
					800 · 32	850 mm/34"	650 mm/25.59"	550 mm/22"		
					900 · 36	900 mm/36"	700 mm/27.56"	575 mm/23"		
					1000 · 40	1000 mm/40"	750 mm/29.53"	600 mm/24"		

K _{vs}	C _v	Seat Ø in mm	Inlet: DN E DN · NPS	A	Outlet: DN A DN · NPS	B	C	D	E	Spray water Ø
374	437.6	160	200 · 8 250 · 10 300 · 12	500 mm/20" 525 mm/21" 550 mm/22"	400 · 16	750 mm/30"	575 mm/22.64"	350 mm/14"	1850 mm 72.83"	50 mm 2"
					500 · 20	775 mm/31"	600 mm/23.62"	400 mm/16"		
					600 · 24	825 mm/33"	625 mm/24.61"	450 mm/18"		
					700 · 28	850 mm/34"	650 mm/25.59"	500 mm/20"		
					800 · 32	875 mm/35"	675 mm/26.57"	550 mm/22"		
					900 · 36	900 mm/36"	700 mm/27.56"	575 mm/23"		
					1000 · 40	1000 mm/40"	750 mm/29.53"	600 mm/24"		
441	516	180	200 · 8 250 · 10 300 · 12	525 mm/21" 550 mm/22" 575 mm/23"	500 · 20	850 mm/34"	675 mm/26.57"	400 mm/16"	2100 mm 82.68"	65 mm 2½"
					600 · 24	875 mm/35"		450 mm/18"		
					700 · 28	900 mm/36"	700 mm/27.56"	500 mm/20"		
					800 · 32	950 mm/38"	775 mm/30.51"	550 mm/22"		
					900 · 36	1000 mm/40"		575 mm/23"		
					1000 · 40	1050 mm/42"	800 mm/31.50"	600 mm/24"		
580	678	230	300 · 12 400 · 16 500 · 20	550 mm/22" 575 mm/23" 625 mm/25"	600 · 24	925 mm/37"	750 mm/29.53"	450 mm/18"	2500 mm 98.43"	65 mm 2½"
					700 · 28	950 mm/38"	775 mm/30.51"	500 mm/20"		
					800 · 32			550 mm/22"		
					900 · 36	1025 mm/41"	800 mm/31.50"	575 mm/23"		
					1000 · 40	1050 mm/42"		600 mm/24"		
					1100 · 44	1075 mm/43"	825 mm/32.48"	650 mm/26"		
673	787	260	300 · 12 400 · 16 500 · 20	575 mm/23" 600 mm/24" 650 mm/26"	600 · 24	975 mm/39"	800 mm/31.50"	450 mm/18"	2500 mm 98.43"	65 mm 2½"
					700 · 28	1000 mm/40"	825 mm/32.48"	500 mm/20"		
					800 · 32			550 mm/22"		
					900 · 36	1075 mm/43"	850 mm/33.46"	575 mm/23"		
					1000 · 40	1100 mm/44"		600 mm/24"		
					1100 · 44	1125 mm/45"	875 mm/34.45"	650 mm/26"		

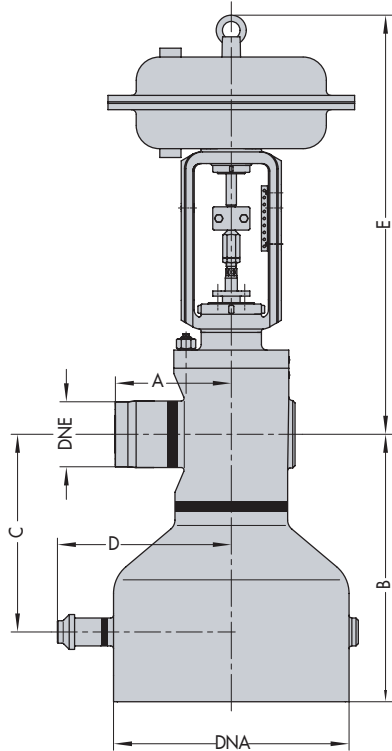


Fig. 4 · Dimension diagram of Type DUV-C3 Steam-converting Valve with Type 3271 Pneumatic Actuator

Ordering text

Steam-converting Valve Type	DUV-C3
Body material	acc. to Table 3
End connection	welding ends
Inlet: nominal size	DN ...
nominal pressure	PN ...
Outlet: nominal size	DN ...
nominal pressure	PN ...
Perforated attenuation plates	... pieces
Perforated plug	... stages standard or pressure-balanced plug
Characteristic	Equal percentage or linear
Pneumatic actuator	Type 3271 (T 8310-1 EN or T 8310-2 EN)
Fail-safe action	Valve CLOSED or OPEN
Flow rate	in kg/h or m ³ /h in standard or operating status
Pressure	p ₁ in bar absolute pressure p _{abs} p ₂ in bar absolute pressure p _{abs} at minimum, standard or maximum flow rate
Accessories	Positioner, position transmitter, limit switch

Specifications subject to change without notice.

