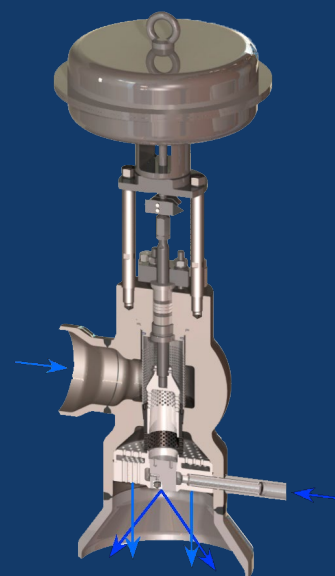


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## Steam-converting Valve Type DUP

and spray water valve



## Application

Steam-converting valve for power stations and industrial plants combined with a spray water valve in one unit

Inlet:	DN 40 a 500 PN 16 a 630	NPS 1½ a 20 Classe 150 a 2500
Outlet:	DN 80 a 1600 PN 16 a 250	NPS 3 a 64 Classe 150 a 1500
Temperatures	Up to 560°	Up to 1040°F

### Steam-converting valve with

- Samson type 3271 pneumatic actuator or Type 3277 (see T 8310-1 / -2).

### Materials:

- Forged steel C22.8 / A105 or
- Heat-resisting forged steel 16Mo13, 13CrMo4-5, 11CrMo9-10 / A182F12Cl.2, A182F22Cl.3

### The valves have the following special features

- Perforated plug with controlled pressure reduction in two stages
- One or more attenuation plates providing uncontrolled pressure reduction
- Integrated atomiser unit
- Welding ends
- Angle-style body permits vertical stem orientation
- Balanced or unbalanced perforated plug

## Versions

**Normal version** Angle valve body with welding ends for steam temperatures up to 560 °C (1040 °F).

**Nominal inlet** size DN 40 to 500 (NPS 1½ to 20), nominal pressure PN 16 to 630 (Class 150 to 2500).

**Nominal outlet** size DN 80 to 1600 (NPS 3 to 64), nominal pressure PN 16 to 250 (Class 150 to 1500)

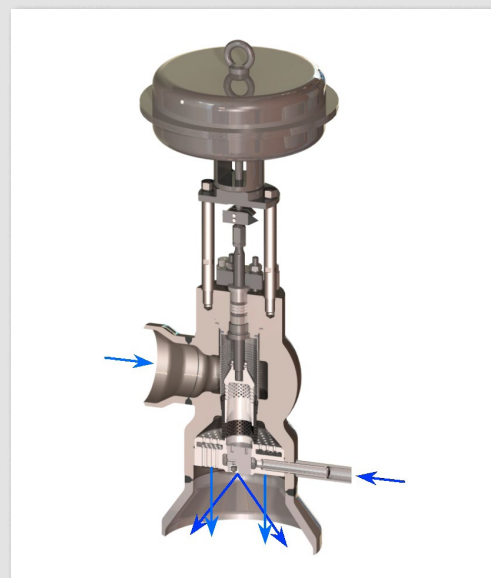


Fig. 1  
Type DUP Steam-converting Valve

## Other versions

- Flanged connections
- Electric actuators
- Hydraulic actuators
- Globe-style body (see Figs. 4 and 5)
- Special sizes, special applications concerning DN/NPS, PN/Class, materials and temperatures are available on request

## Principle of operation

When the perforated plug (1) leaves its closed position and the steam inlet holes (2) of the first stage of controlled pressure reduction are opened a certain amount of steam flows through these holes.

This special amount of steam passes directly through axial holes in the atomising unit (3) and is used to atomise the spray water (4). The second stage (5) is first released when the required amount of atomising steam is achieved. As the perforated plug continues to lift (0 to 100%), more steam inlet holes are released in a pattern corresponding to the desired opening characteristic. In short, the perforated plug is used to control the pressure and flow rate of steam.

After the second stage of controlled pressure reduction, the steam impinges on the attenuation plates (6), causing a further pressure reduction and reducing the overall noise. After exiting the last attenuation plate, any steam that has not yet been cooled is cooled by the fine atomised mixture of spray water and atomizing steam. The temperature sensor located at a suitable distance downstream on the valve outlet measures the steam temperature at that point. The temperature signal is fed back to the spray water valve used to regulate the flow rate of spray water to achieve the required temperature set point.

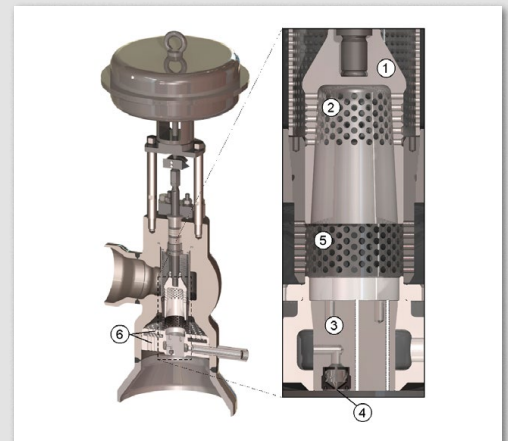


Figura 2  
Válvula conversora de vapor, redução da pressão em dois estágios, corpo angular

Tabel 1 - Technical data

Type DUP		All nominal sizes			
Body material	DIN	1.0460	1.5415	1.7335	1.7380
	ASTM	A105	–	A182F12CL.2	A182F22CL.3
Nominal pressure		All pressure ratings			
End connections		Welding ends - Flanges			
Perforated plug		Two-stage perforated plug and one or more attenuation plates (depending on total pressure drop)			
Seat/plug seal		Metal sealing			
Characteristic		Linear / linear modified / gl.%			
Materials and temperature limits					
Body		425 °C	500 °C	530 °C	560 °C
Seat and plug		1.4122: Up to 400 °C - 1.4922: Up to 560 °C			
Guide bushing		1.4122: Up to 400 °C - 1.4922: Up to 560 °C			
Packing		Graphite braid and graphite strip			
Body gasket		Spiral-wound gasket			
Leakage class according to DIN EN 12266-1 / ANSI/FCI 70-2					
Perforated plug	Not balanced	Standard: D / IV - for higher requirements: B / V			
	Balanced	Standard: E / III - with pistons rings for pressure relief For higher requirements: B / V - with balancing check valve for pressure relief			

Table 2 -  $K_{vs}$  - and  $C_v$  - guide values

$K_{vs}$	10	20	35	55	70	100	170	235	400	600	850	1140
Seat Ø mm	30	40	50	60	70	80	100	120	150	180	210	240
Travel mm	30				60				120			
$C_v$	11,6	23,2	41	64	81	116	197	273	464	696	986	1322

Table 3 - Guide values for dimensions in mm and weights in kg

SeatØ	Inlet <sup>1)</sup>		Outlet <sup>1)</sup>		Spray water valve		Dimensions in mm (Fig. 3)				Actuator <sup>2)</sup> Type-cm <sup>2</sup>	Valve <sup>3)</sup> weight approx. kg
	in mm	DN	NPS	DN	NPS	DN	NPS	A <sup>4)</sup>	B	C <sup>4)</sup>		
30	40	1½	150	6	25	1	250 ... 350	175	120 ... 200	200	u 3271-700 3277-355 3277-700	120
	50	2	200	8								
	65	2½	250	10								
	80	3	300	12								
	100	4										
40	50	2	150	6	25	1	250 ... 350	175	120 ... 200	200	u 3271-700 3277-355 3277-700	120
	65	2½	200	8								
	80	3	250	10								
	100	4	300	12								
50	65	2½	150	6	25	1	250 ... 350	175	120 ... 200	200	u-e 3271-700 3277-355 3277-700 3271-1400	200
	80	3	200	8								
	100	4	250	10								
	125	5	300	12								
60	65	2½	150	6	25	1	250 ... 350	175	120 ... 200	200	u-e 3271-700 3277-355 3277-700 3271-1400	200
	80	3	200	8								
	100	4	250	10								
	125	5	300	12								
70	80	3	200	8	40	1½	350 ... 475	275	150 ... 250	250	u-e 3271-1400	300
	100	4	250	10								
	125	5	300	12								
	150	6	350	14								
	200	8	400	16								
80	100	4	200	8	40	1½	350 ... 475	275	150 ... 250	250	u-e 3271-1400	300
	125	5	250	10								
	150	6	300	12								
	200	8	350	14								
			400	16								
		500	20									

SeatØ	Inlet <sup>1)</sup>		Outlet <sup>1)</sup>		Spray water valve		Dimensions in mm (Fig. 3)				Actuator <sup>2)</sup>	Valve <sup>3)</sup> weight approx. kg
	in mm	DN	NPS	DN	NPS	DN	NPS	A <sup>4)</sup>	B	C <sup>4)</sup>	D	
100	100	4	200	8	50	2	375 ... 500	300	175 ... 250	275	e 3271-1400	550
	125	5	250	10								
	150	6	300	12								
	200	8	350	14								
			400	16								
500	20											
120	150	6	250	10	50	2	375 ... 500	300	175 ... 250	275	e 3271-1400	550
	200	8	300	12								
	250	10	350	14								
			400	16								
			500	20								
600	24											
150	200	8	400	16	80	3	575 ... 725	450	250 ... 450	450	e 3271-1400 3271-2800	1400
	250	10	500	20								
	300	12	600	24								
			700	28								
			800	32								
180	250	10	400	16	80	3	575 ... 725	450	250 ... 450	450	e 3271-1400 3271-2800	1400
	300	12	500	20								
	350	14	600	24								
			700	28								
			800	32								
210	250	10	400	16	80	3	600 ... 750	475	300 ... 500	500	e 3271-1400 3271-2800	2000
	300	12	500	20								
	350	14	600	24								
			700	28								
			800	32								
240	250	10	400	16	80	3	600 ... 750	475	300 ... 500	500	e 3271-1400 3271-2800	2000
	300	12	500	20								
	350	14	600	24								
			700	28								
			800	32								

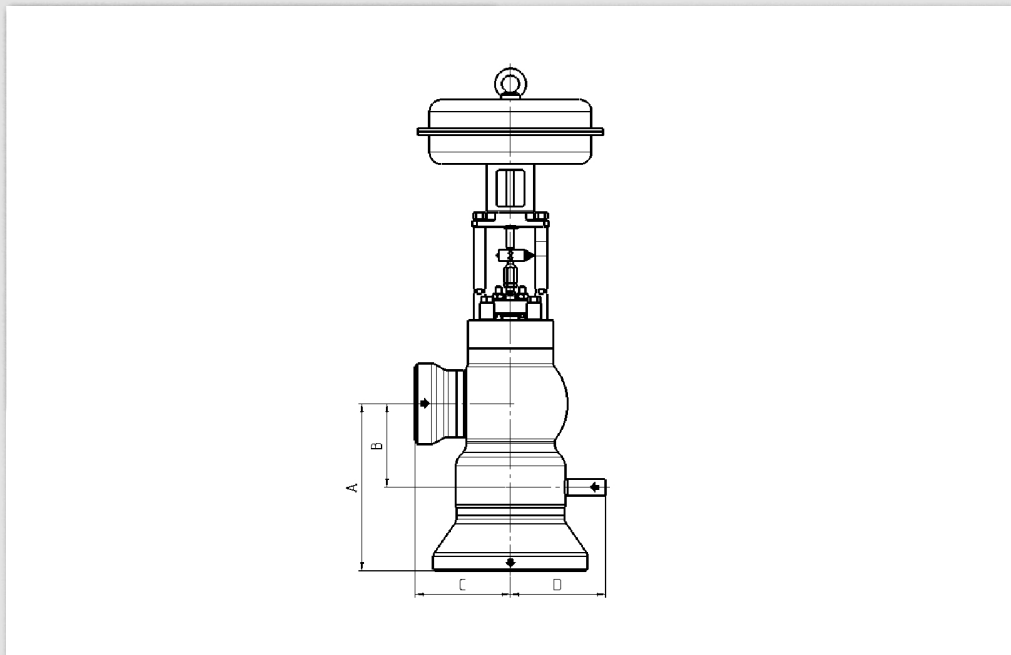
<sup>1)</sup> Nominal inlet and outlet sizes can be combined as required

<sup>2)</sup> Recommended actuator: u → Unbalanced perforated plug · e → Balanced perforated plug

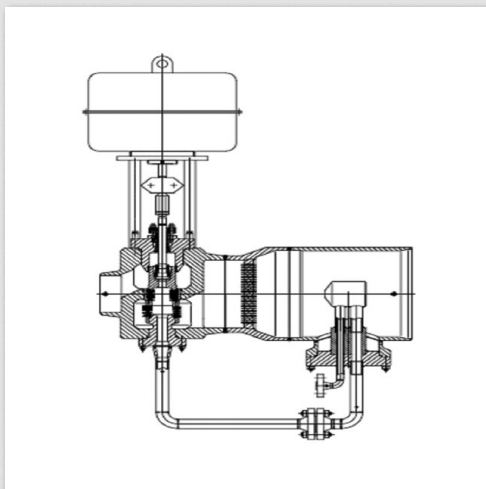
<sup>3)</sup> Valve weight without actuator

<sup>4)</sup> Small dimension → No weld-end socket at the outlet · Large dimension → Weld-end socket at the outlet

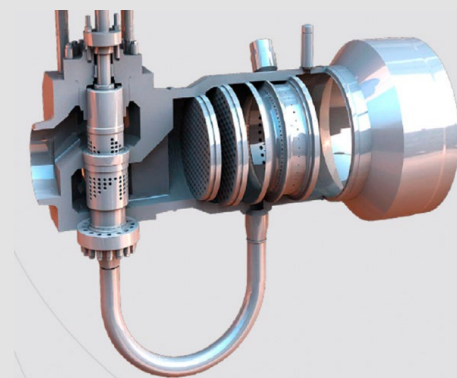
## Dimensional drawing



**Fig. 3**  
Dimensional drawing of Type DUP Steam-converting Valve



**Fig. 4**  
Steam-converting valve with globe-style body



**Fig. 5**  
Steam-converting valve  
Globe-style body with injection of large quantities of water

# Spray water valve

## Application

Regulation of the flow rate of spray water for the Type DUP Steam-converting Valve

Nominal size	DN 15 a 100	NPS ½ a 3
Nominal pressure	PN 25 a 400	Classe 150 a 2500
Medium temperature	Ambiente até 220 °C	Até 430 °F

Globe valve with:

- Atuador pneumático do tipo 3271 ou
- Samson type 3271 pneumatic actuator or Type 3277 (see T 8310-1) for direct attachment of positioners or limit switches

Valve body made from:

- Forged steel C22.8 / A105 or
- Heat-resisting forged steel 16Mo3, 13CrMo4-5 / A182F12Cl.2

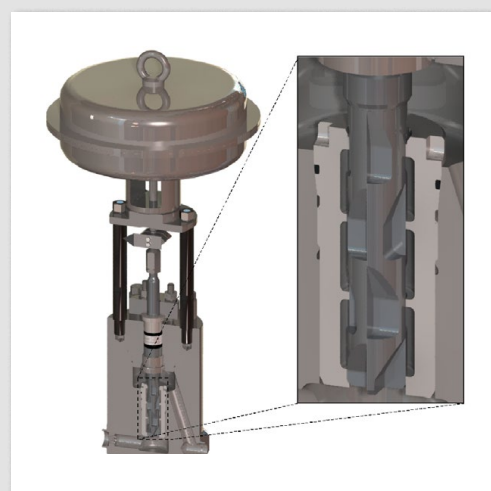
## Versions

**Normal version** · Globe valve with welded ends, controlled pressure reduction in one to four stages, PTFE/graphite packing, equal percentage characteristic

## Other versions

- Body with flanged connections
- Angle-style body
- Medium temperatures above 220 °C on request
- Linear or modified linear characteristic
- Electric actuators
- Hydraulic actuators

**Note:** The spray water valve belonging to the steam-converting valve is part of the steam converter unit. The spray water valve is sized taking all load cases of the station into account. If the spray water valve is ordered separately, then the proper temperature regulation for the steam-converting valve cannot be guaranteed.



**Fig. 6**  
Spray water valve with four-stage controlled pressure reduction

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