DATA SHEET

T 8113 EN

Series V2001 Valves · Type 3323 Three-way Valve

With electropneumatic, pneumatic or electric actuator

DIN version

CE Ex certified

Application

Mixing and diverting valve designed for use in industrial plants

Nominal size	**DN 15 to 100**
Pressure rating	**PN 16 and 40**
Temperatures	**-10 to +300 °C**



Fig. 1: *Type 3323-PP*



Fig. 2: *Type 3323-IP with Type 3725 Positioner, 120 cm²*



Fig. 3: *Type 3323-IP with limit switch*



Fig. 4: *Type 3323-E1*



Fig. 5: *Type 3323-E3*

Special features

The Type 3323 Three-way Valve (mixing or diverting valve) can be combined with either electric or pneumatic actuators:

- Electropneumatic actuators for Type 3323-IP
- Pneumatic actuators for Type 3323-PP
- Electric actuators for Type 3323-E1 or Type 3323-E3

Valve body made of

- Cast iron for PN 16
- Spheroidal graphite iron for PN 25
- Cast steel for PN 40 (up to DN 50) as well as for PN 16 and 40 (DN 65 and larger)
- Stainless steel for PN 40 (up to DN 50) as well as for PN 16 (DN 65 and larger)

Metal-seated valve plug

Mixing valves in DN 15 to 25 can also be used for diverting service.

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Versions

- **Type 3323-IP** Electropneumatic Valve (mixing or diverting valve) for Heat Transfer Oil (Fig. 2) · With Type 3372 Pneumatic Actuator, with Type 3725 Positioner · Tight-closing function for completely venting or filling the actuator with air · 4 to 20 mA set point · Max. 6 bar supply air · Fail-safe position actuator stem extends or retracts · Optionally with Type 4744-2 Limit Switch (Fig. 3) and Series 3730 Positioner
- **Type 3323-PP Pneumatic Valve (mixing or diverting valve)** (Fig. 1) · With Type 3371 Pneumatic Actuator, 120 cm² (DN 15 to 100, 15 mm travel) or Type 3371 Pneumatic Actuator, 350 cm² (DN 65 to 100), fail-safe position actuator stem extends or retracts, optionally with Type 4744-20 Limit Switch
- **Type 3323-E1 Electric Valve (mixing or diverting valve)** (Fig. 4) · With Type 5827-N3 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit contacts, resistance transmitter, positioner
- **Type 3323-E3 Electric Valve (mixing and diverting valve)** (Fig. 5) · With Type 3374 Electric Actuator for 230 V/50 Hz, 230 V/60 Hz, 24 V/50 Hz or 24 V/60 Hz, optionally with fail-safe action (tested according to DIN EN 14597 with actuator stem extends), limit contacts, resistance transmitter, positioner

Further versions

- **Explosion-protected version** with electric actuators · On request
- **ANSI version of Type 3323** · See Data Sheet ▶ T 8114

Principle of operation

Depending on the version, the three-way valve can be used either as a mixing or diverting valve.

In mixing valves, the process media to be mixed enter at valve ports **A** and **B**. The combined flow exits the valve at port **AB** (see Fig. 6). The flow rate from ports A or B to AB depends on the cross-sectional area of flow between the seats and plugs.

In diverting valves, the process medium enters at the valve port **AB** and the partial flows exit at ports **A** and **B** (see Fig. 7).

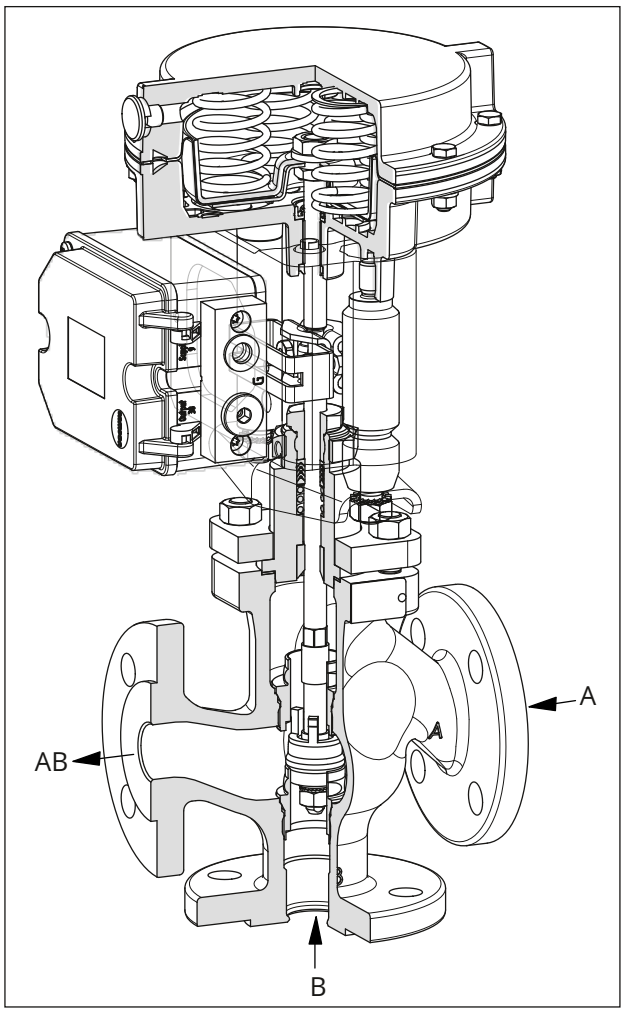


Fig. 6: *Type 3323-IP Electropneumatic Valve (mixing valve) in DN 15 to 50/NPS ½ to 2*

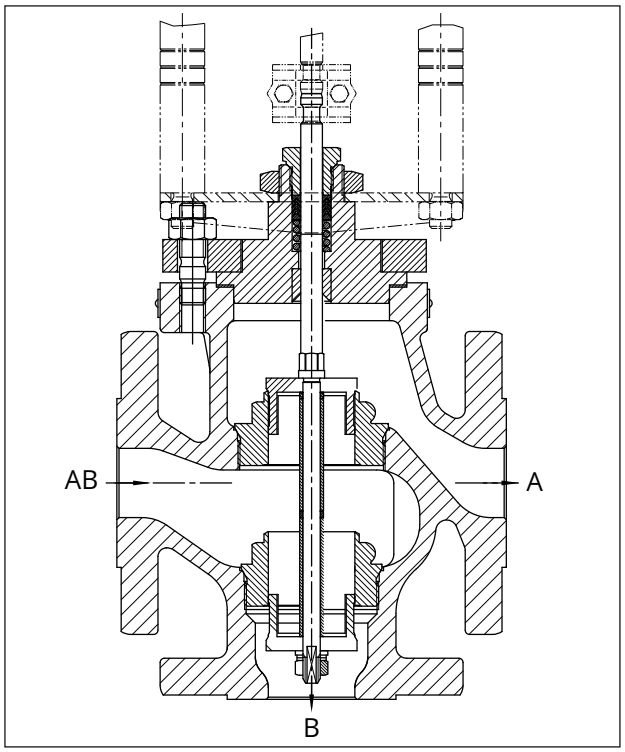


Fig. 7: *Type 3323-IP (diverting valve) in DN 32 to 50/NPS 1½ to 2*

Fail-safe positions

The control valve has two different fail-safe positions that become effective when the supply air fails:

– **Actuator stem extends:**
  Port **B** in mixing valves is closed and port **A** in diverting valves is closed when the supply air fails.
  Port **B** of diverting valves in DN 15 to 25 (NPS ½ to 1) is closed since these valves have the same construction as mixing valves.

– **Actuator stem retracts:**
  Port **A** in mixing valves is closed and port **B** in diverting valves is closed when the supply air fails.
  Port **A** of diverting valves in DN 15 to 25 (NPS ½ to 1) is closed since these valves have the same construction as mixing valves.

Associated documentation

Valve and actuator are delivered separately. Instructions on how to mount the valve on the actuator can be found in the mounting and operating instructions:

- EB 8113/8114 Type 3323 Three-way Valve
- EB 8313-3 Actuator for Type 3323-IP
- EB 5827-1 Actuator for Type 3323-E1
- EB 5827-2 Actuator for Type 3323-E1
- EB 8331-3 Actuator for Type 3323-E3
- EB 8331-4 Actuator for Type 3323-E3
- EB 8317 Actuator for Type 3323-PP

Table 1: *Technical data for Type 3323 · DIN version*

Material		Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619		Stainless steel 1.4408	
Nominal size	DN	15 to 100	15 to 100	15 to 50	65 to 100	15 to 50	65 to 100
Pressure rating	PN	16	25	40	16 and 40	40	16
Seat-plug seal		Metal seal					
Characteristic		Linear					
Rangeability		30:1 up to DN 25 · 50:1 for DN 40 and larger					
Conformity		CE					
Temperature range		-10 to +220 °C					
With insulating section[1]		-10 to +300 °C[2]					
Leakage class according to DIN EN 60534-4		Metal seal: I (0.05 % of K_{VS})					

1) Not in stainless steel with DN 65 to 100

2) Version for lower temperatures on request

Table 2: *Materials for Type 3323 · DIN version*

Valve body	Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619	Stainless steel 1.4408
Valve bonnet	Up to DN 50: 1.0460 DN 65 and larger: EN-GJL-250	Up to DN 50: 1.0460 DN 65 and larger: EN-GJL-250	Up to DN 50: 1.0460 DN 65 and larger: 1.0619	Up to DN 50: 1.4404 DN 65 and larger: 1.4408
Valve flange[1]	1.0460			
Seat	DN 15 to 25: 1.4104[2] DN 32 to 50: 1.4104 DN 65 and larger: 1.4006			DN 15 to 25: 1.4104[2] DN 32 and larger: 1.4401/1.4404
Plug	Up to DN 50: 1.4305 DN 65 and larger: 1.4006			1.4404
Guide bushing	1.4104			
Packing	PTFE			
Body gasket	Graphite on metal core			

1) No contact with process medium; only up to DN 50. For DN 65 and larger: one-pieced (see valve bonnet for material)

2) Top seat made of 1.4305

Flow coefficients and seat diameters

Table 3: *Type 3323 (as mixing valve)*

Nominal size	DN	15	20	25	32	40	50	65	80	100
Flow rate	**K_{VS}**	**4**	**6.3**	**8**	**16**	**20**	**32**	**60**	**80**	**160**
Seat Ø	mm	24	24	24	40	40	40	63	75	100
Rated travel	mm	15	15	15	15	15	15	15	15	30

Table 4: *Type 3323 (as diverting valve)*

Nominal size	DN	15	20	25	32	40	50	65	80	100
Flow rate	**K_{VS}**	**–**	**–**	**–**	**16**	**20**	**32**	**60/40**	**80/60**	**160/100**
Seat Ø	mm	–	–	–	40	40	40	63/48	75/63	100/80
Rated travel	mm	–	–	–	15	15	15	15	15	30

Pneumatic actuators with Type 3323

Table 5: *Technical data for pneumatic actuators*

Valve/actuator		Type 3323-IP with Type 3372 Actuator		Type 3323-PP with Type 3371 Actuator	
Actuator area		120 cm²	350 cm²	120 cm²	350 cm²
Mounting on Type 3323	DN	15 to 50	65 to 100	15 to 50	65 to 100
Fail-safe action		Actuator stem extends (FA) or actuator stem retracts (FE)			
Set point		4 to 20 mA		–	
Bench range/ rated travel	Stem extends (FA)	1.4 to 2.3 bar/15 mm	2.2 to 3.8 bar/30 mm	1.4 to 2.3 bar/15 mm	2.2 to 3.8 bar/30 mm
	Stem retracts (FE)	1.4 to 2.3 bar/15 mm	1.5 to 2.7 bar/30 mm	1.4 to 2.3 bar/15 mm	1.5 to 2.7 bar/30 mm
Characteristic		Linear, deviation from terminal-based linearity ≤2 %		–	
Hysteresis		≤1 %		–	
Variable position		≤7 %		–	
Degree of protection		IP66 with Type 3725		–	
Permissible ambient temperature		Standard:	-20 to +80 °C	-35 to +90 °C	
		With metal cable gland:	-30 to +80 °C		

Table 6: *Materials for pneumatic actuators*

Actuator	Type 3372		Type 3371	
Actuator area	120 cm²	350 cm²	120 cm²	350 cm²
Actuator housing	GD-AlSi12	1.0330	GD-AlSi12	1.0330
Diaphragm	NBR		NBR	
Actuator stem	1.4305	1.4571	1.4571	1.4571
Positioner housing				
Type 3725	Polyphthalamide (PPA)		–	–
Yoke				
Stem	9SMn28K	1.0715+C	9SMn28K	1.0715+C
Crossbeam	1.4301	–	1.4301	–
Mounting bracket for Type 3725	Aluminum		–	–

Table 7: *Permissible differential pressures for metal-seated plug*

Fail-safe action	Actuator stem extends		Actuator stem retracts	
Actuator area	120 cm²	350 cm²	120 cm²	350 cm²
Bench range Travel (in parentheses)	1.4 to 2.3 bar	2.2 to 3.8 bar (30 mm) 2.1 to 2.7 bar (15 mm)	1.4 to 2.3 bar	1.5 to 2.7 bar (30 mm) 1.5 to 2.1 bar (15 mm)
K_{VS} coefficients	Δp when p_2 = 0 bar		Δp when p_2 = 0 bar	
4.0 to 8	16	–	16	–
16 to 32	10	–	10	–
60	–	10	–	10
80	–	10	–	10
160	–	10	–	10

Electric actuators with Type 3323

Table 8: *Permissible differential pressures for metal-seated plug*

Three-way valve	**Type 3323-E1**	**Type 3323-E3**		
Type ... Actuator	**5827-N3**	**3374-21/-31**		**3374-10/-11**
Thrust (actuator stem retracts)	0.7 kN	0.5 kN		2.5 kN
Thrust (actuator stem extends)	0.7 kN	2.0 kN		2.5 kN
K_{VS} coefficients	Δp when p_2 = 0 bar			Δp when p_2 = 0 bar
4.0 to 8	10	5	18[1)]	25
16 to 32	3	1.2	6[1)]	10
60	–	–	2[1)]	5.5
80	–	–		3.2
160	–	–		1.9
See data sheet for actuator data	▶ T 5827	▶ T 8331		

1) Applies to diverting valves (identical outlet pressure at port A and port B) and mixing valves (identical inlet pressure at port A and port B)

Mounting actuators

Table 9: *Type of mounting and required adapter*

Type 3323 Valve			**DN 15 to 50**	**DN 65 to 100**
Type 3372 Actuator with Type 3725 Positioner	Version:	IP	Mounting with crossbeam (form B)	Mounting without crossbeam (form C)
Type 5827-N3 Actuator		E1	With adapter (1400-7414) and spacer (0340-3031)	–
Type 3374-11/-21/-31 Actuator		E2	Mounting with crossbeam (form B)	With adapter (1400-9515) and spacer (0340-3031)
Type 3374-10 Actuator		E3	–	With adapter (1400-9515) and spacer (0340-3031)
Type 3371 Actuator		PP	Mounting with crossbeam (form B)	Mounting without crossbeam (form C)

Dimensions

Table 10: *Dimensions for Type 3323 Valve · DIN version*

Valve	DN	15	20	25	32	40	50	65	80	100
With standard bonnet										
Length L	mm	130	150	160	180	200	230	290	310	350
Height H	mm	123			126			182		206
Height H2	mm	70	80	85	100	105	120	130	140	150
With insulating section										
Length L	mm	130	150	160	180	200	230	290	310	350
Height H4	mm	274			278			330		330

Dimensional drawing of valve

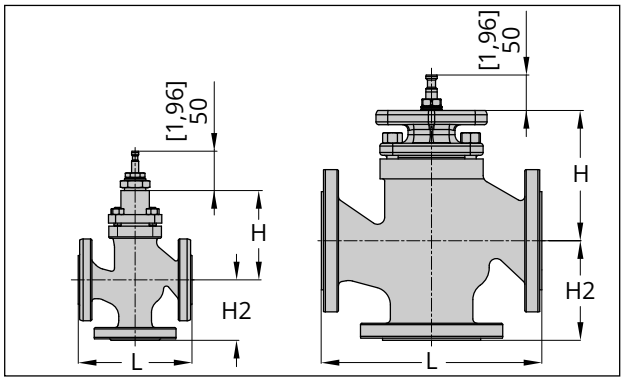


Fig. 8: *Type 3323 Three-way Valve · Specifications in mm [inch]*
Left: DN 15 to 50/NPS ½ to 2
Right: DN 65 to 100/NPS 2½ to 4

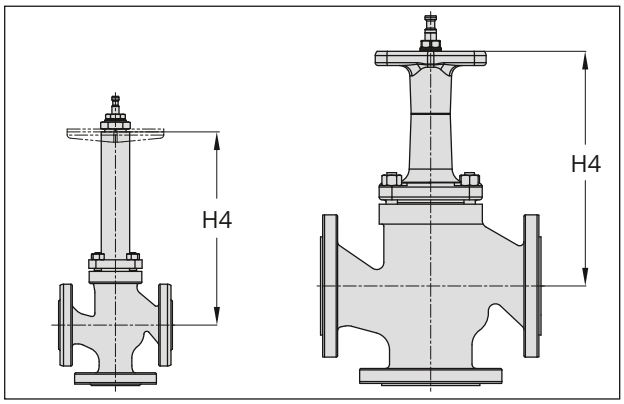


Fig. 9: *Type 3323 Three-way Valve with insulating section*
Left: DN 15 to 50/NPS ½ to 2
Right: DN 65 to 100/NPS 2½ to 4

Dimensional drawings · Actuators for electropneumatic control valves

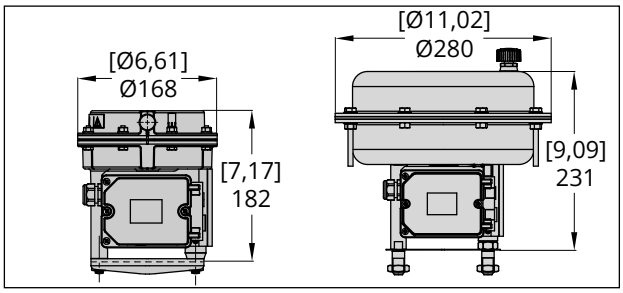


Fig. 10: *Specifications in mm [inch]*
Left: Type 3372/120 cm² with Type 3725 Positioner
Right: Type 3372/350 cm² with Type 3725 Positioner, fail-safe action: stem retracts/extends

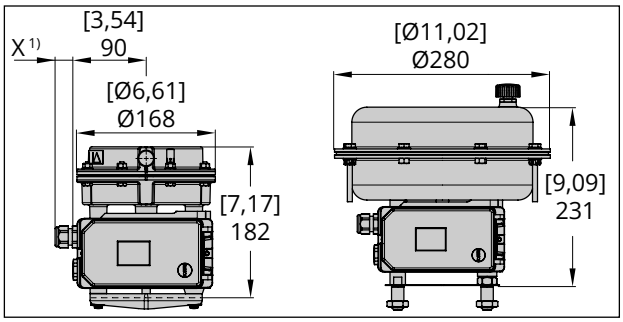


Fig. 11: *Specifications in mm [inch]*
Left: Type 3372/120 cm² with Series 3730 Positioner, fail-safe action: stem retracts/extends
Right: Type 3372/350 cm² with Series 3730 Positioner, fail-safe action: stem retracts/extends

1) The dimension X depends on the cable gland used.

Dimensional drawings · Actuators for pneumatic control valves

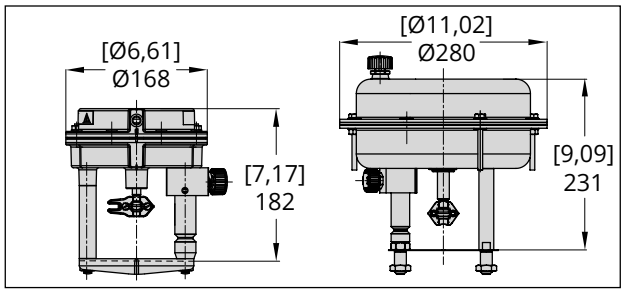


Fig. 12: *Specifications in mm [inch]*
Left: Type 3371/120 cm²
Right:Type 3371/350 cm²

Dimensional drawings · Actuators for electric control valves

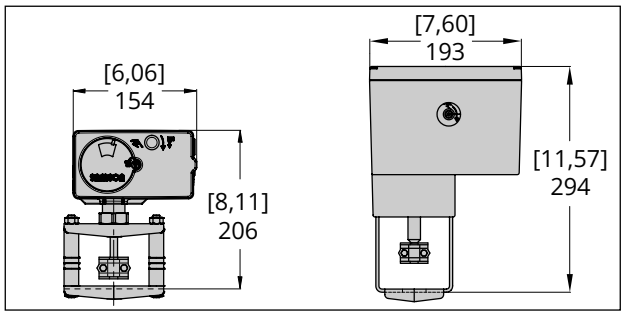


Fig. 13: *Specifications in mm [inch]*
Left: E1 actuator, Type 5827
Right: E3 actuator, Type 3374

Weights

Table 11: *Weights[1] for Type 3323 Valve*

Valve	DN	15	20	25	32	40	50	65	80	100
With standard bonnet										
Weight, approx.	kg	5	6	7	11	12	15	31	37	49
With insulating section										
Weight, approx.	kg	8	9	10	17	18	21	40	45	68

1) The weights specified apply to a specific standard device configuration. Weights of other valve configurations may differ depending on the version (material, trim etc.).

Table 12: *Weights of Type 3371, Type 3372, Type 5827 and Type 3374 Actuators*

Actuator type		Pneumatic		Electropneumatic		Electric	
Type		3371/120	3371/350	3372/120	3372/350	E1/5827	E3/3374
Positioner		–		Type 3725		Optional, integrated	
Weight, approx.	kg	4	13	7	16	1.25	Max. 4

Ordering text

The following specifications are required on ordering:

Valve	
Type 3323 Three-way Valve	Mixing or diverting valve
Nominal size	DN …
Pressure rating	PN …
Flow rate	K_{VS} …
Body material	See Table 2
Bonnet	Standard bonnet or insulating section
Seat-plug seal	Metal seal
Actuators	
for **Type 3323-IP:** Type 3372 Electropneumatic Actuator	
With positioner	Type 3725/Series 3730
Optional	Intrinsically safe Ex ia
Additional equipment	1 or 2 limit switches
for **Type 3323-PP:** Type 3371 Pneumatic Actuator	
Fail-safe action	Actuator stem extends or retracts
Bench range	1.4 to 2.3 bar
Additional equipment	1 or 2 limit switches
for **Type 3323-E1:** Type 5827-N3 Electric Actuator	
Supply voltage	– 230 V/50 Hz – 24 V/50 Hz

Additional equipment	– 2 limit contacts
	– Resistance transmitter 0 to 1000 Ω
	– Digital positioner
	  – Input: 0/4 to 20 mA or 0/2 to 10 V
	  – Output: 0/2 to 10 V

for **Type 3323-E3:** Type 3374 Electric Actuator	
Fail-safe action	With fail-safe action: Actuator stem extends or retracts
Thrust	
Without fail-safe action	1.25 kN; 2.5 kN
With fail-safe action	2 kN (actuator stem extends) 500 N (actuator stem retracts)
Supply voltage	– 230 V/50 Hz – 230 V/60 Hz – 24 V/50 Hz – 24 V/60 Hz
Additional equipment	– 2 limit contacts – Resistance transmitter 0 to 1000 Ω – Digital positioner with input and output: 0/4 to 20 mA or 0/2 to 10 V