

## T 8113 EN

### Series V2001 Valves · Type 3323 Three-way Valve with electropneumatic, pneumatic or electric actuator · DIN version



#### Application

Mixing and diverting valve designed for use in industrial plants

|                          |                       |
|--------------------------|-----------------------|
| <b>Nominal size</b>      | <b>DN 15 to 100</b>   |
| <b>Pressure rating</b>   | <b>PN 16 and 40</b>   |
| <b>Temperature range</b> | <b>-10 to +300 °C</b> |

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

- Electropneumatic actuators with integrated i/p positioner for Type 3323-IP
- Pneumatic actuators for Type 3323-PP
- Electric actuators for Type 3323-E1 or Type 3323-E3

Valve body made of

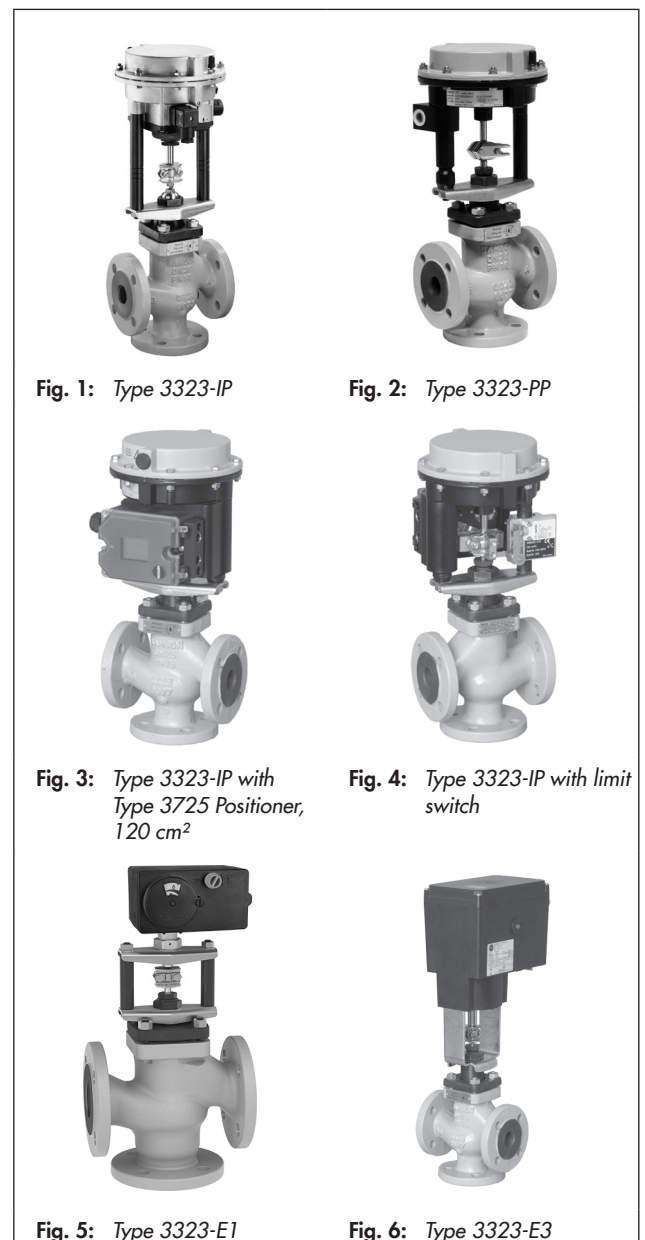
- Cast iron for PN 16
- Spheroidal graphite iron for PN 25
- Cast steel for PN 40 (up to DN 50) and PN 16 and 40 (DN 65 and larger)
- Stainless steel for PN 40 (up to DN 50) and PN 16 (DN 65 and larger)

Metal-seated valve plug

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

#### Versions

- **Type 3323-IP Electropneumatic Valve (mixing or diverting valve)** (Fig. 1) · With Type 3372 Electropneumatic Actuator, optionally with integrated positioner (120 cm<sup>2</sup> only, with plug connector) or Type 3725 Positioner (Fig. 3), tight-closing function to completely vent or fill the actuator with air, 4 to 20 mA reference variable, max. 6 bar supply air, fail-safe position stem extends or retracts, optionally with Type 4744-2 Limit Switch (Fig. 4) and Type 3730 Positioner
- **Type 3323-PP Pneumatic Valve (mixing or diverting valve)** (Fig. 2) · With Type 3371 Pneumatic Actuator, 120 cm<sup>2</sup> (DN 15 to 100, 15 mm travel) or Type 3371 Pneumatic Actuator, 350 cm<sup>2</sup> (DN 65 to 100), fail-safe position actuator stem extends or retracts, optionally with Type 4744-2 Limit Switch
- **Type 3323-E1 Electric Valve (mixing or diverting valve)** (Fig. 5) · 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. 6) · 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
- **Type 3323 according to ANSI standards** · 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 (Fig. 7). 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 (Fig. 8).

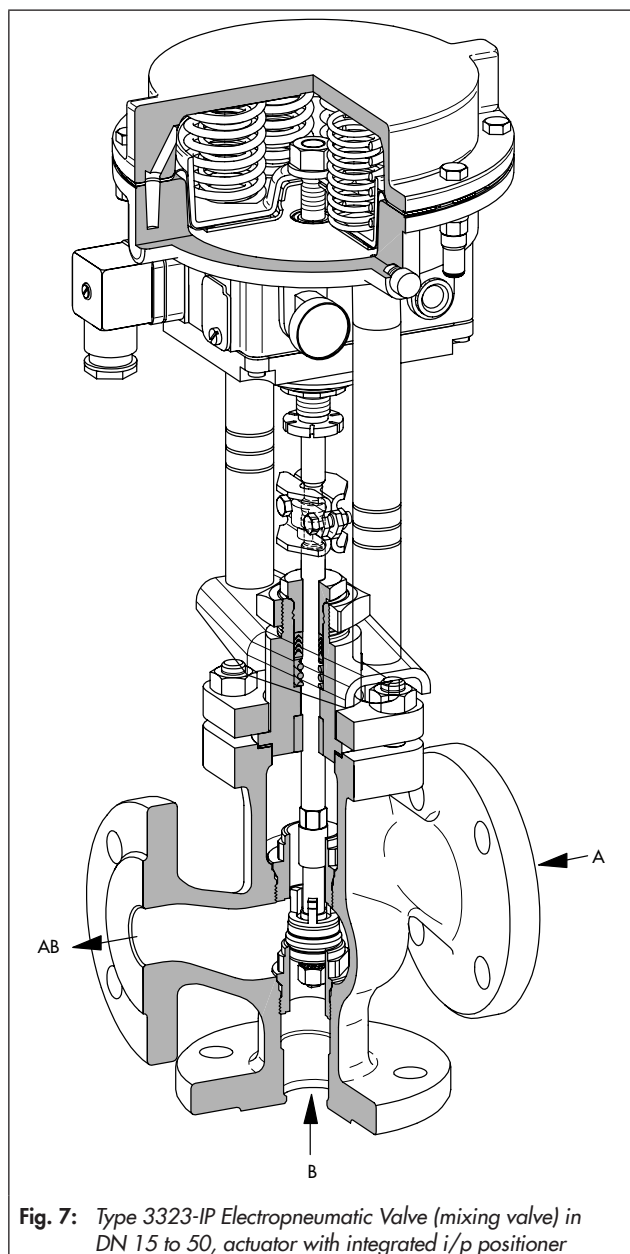


Fig. 7: Type 3323-IP Electropneumatic Valve (mixing valve) in DN 15 to 50, actuator with integrated i/p positioner

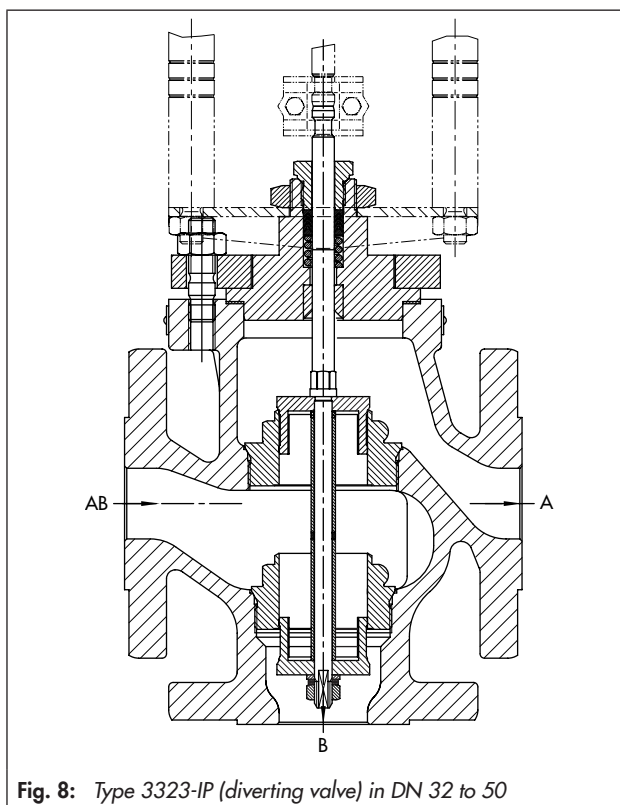


Fig. 8: Type 3323-IP (diverting valve) in DN 32 to 50

#### Fail-safe position

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

- **Actuator stem extends:** when the supply air fails, port B is closed in mixing valves and port A is closed in diverting valves.  
Port B of diverting valves in sizes DN 15 to 25 is closed as these valves have the same construction as mixing valves.
- **Actuator stem retracts:** when the supply air fails, port A is closed in mixing valves and port B is closed in diverting valves.  
Port A of diverting valves in sizes DN 15 to 25 is closed as 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 Type 3323 Three-way Valve
- ▶ EB 8313-1 Electropneumatic actuator for Type 3323-IP (with integrated positioner)
- ▶ EB 8313-3 Electropneumatic actuator for Type 3323-IP (with Type 3725 Positioner)
- ▶ EB 5827-1 Electric actuator for Type 3323-E1
- ▶ EB 5827-2 Electric actuator for Type 3323-E1
- ▶ EB 8331-3 Electric actuator for Type 3323-E3
- ▶ EB 8331-4 Electric actuator for Type 3323-E3
- ▶ EB 8317 Pneumatic actuator for Type 3323-PP

**Table 1: Type 3323 Three-way Valve****Table 1.1: Technical data**

| 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 |   |                     |           |                        |           |
| Temperature range                     |    | -10 to +220 °C                               |   |                     |           |                        |           |
| With insulating section <sup>1)</sup> |    | -10 to +300 °C <sup>2)</sup>                 |   |                     |           |                        |           |
| Leakage class acc. to IEC 60534-4     |    | Metal seal: I (0.05 % of $K_{VS}$ )          |   |                     |           |                        |           |
| Conformity                            |    | CE · UK · EAC                                |   |                     |           |                        |           |

<sup>1)</sup> Not in stainless steel with DN 65 to 100

<sup>2)</sup> Version for lower temperatures on request

**Table 1.2: Materials**

| 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<br>DN 65 and larger:<br>EN-GJL-250                               | Up to DN 50: 1.0460<br>DN 65 and larger:<br>EN-GJL-250 | Up to DN 50: 1.0460<br>DN 65 and larger: 1.0619 | Up to DN 50: 1.4404<br>DN 65 and larger: 1.4408                         |
| Valve flange <sup>1)</sup> |      | 1.0460   |  |   |   |
| Seat and plug              | Seat | DN 15 to 25: 1.4104 <sup>2)</sup><br>DN 32 to 50: 1.4104<br>DN 65 and larger: 1.4006 |  |   | DN 15 to 25: 1.4104 <sup>2)</sup><br>DN 32 and larger:<br>1.4401/1.4404 |
|                            | Plug | Up to DN 50: 1.4305<br>DN 65 and larger: 1.4006                                      |  |   | 1.4404  |
| Guide bushing              |      | 1.4104   |  |   |   |
| Packing                    |      | PTFE   |  |   |   |
| Body gasket                |      | Graphite on metal core   |  |   |   |

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

<sup>2)</sup> Top seat 1.4305

**Table 2: Nominal sizes,  $K_{VS}$  coefficients and seat diameters****Table 2.1: Type 3323 as mixing valve**

| Nominal size | DN | 15 | 20  | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
|--------------|----|----|-----|----|----|----|----|----|----|-----|
| $K_{VS}$     |    | 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 2.2: Type 3323 as diverting valve**

| Nominal size | DN | 15 | 20 | 25 | 32 | 40 | 50 | 65    | 80    | 100     |
|--------------|----|----|----|----|----|----|----|-------|-------|---------|
| $K_{VS}$     |    | –  | –  | –  | 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      |

**Table 3: Pneumatic actuators****Table 3.1: Technical data**

| Valve/actuator                  | Type 3323-IP with Type 3372 Actuator   |                      | Type 3323-PP with Type 3371 Actuator |                      |                      |
|---------------------------------|--|----------------------|--------------------------------------|----------------------|----------------------|
| Actuator area                   | 120 cm <sup>2</sup>  | 350 cm <sup>2</sup>  | 120 cm <sup>2</sup>                  | 350 cm <sup>2</sup>  |                      |
| Attachment to Type 3323 DN      | 15 to 50   | 65 to 100            | 15 to 50                             | 65 to 100            |                      |
| Fail-safe position              | Actuator stem extends (FA) or actuator stem retracts (FE)                                |                      |                                      |                      |                      |
| Reference variable              | 4 to 20 mA   |                      | -                                    |                      |                      |
| Bench range/<br>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            | IP54 with integrated positioner<br>(for 120 cm <sup>2</sup> only)<br>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 3.2: Materials**

| Actuator                       | Type 3372             |                     | Type 3371           |                     |
|--------------------------------|-----------------------|---------------------|---------------------|---------------------|
| Actuator area                  | 120 cm <sup>2</sup>   | 350 cm <sup>2</sup> | 120 cm <sup>2</sup> | 350 cm <sup>2</sup> |
| Actuator housing               | GD-ALSi12             | 1.0330              | GD-ALSi12           | 1.0330              |
| Diaphragm                      | NBR                   |                     | NBR                 |                     |
| Actuator stem                  | 1.4305                | 1.4571              | 1.4305              | 1.4571              |
| Positioner housing             |                       |                     |                     |                     |
| Integrated version             | POM-GF                | -                   | -                   |                     |
| 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 3.3: Permissible differential pressures for metal-seated plug**

| Fail-safe position                            | Actuator stem extends          |  | Actuator stem retracts         |  |
|---|--------------------------------|--|--------------------------------|--|
| Actuator area                                 | 120 cm <sup>2</sup>            | 350 cm <sup>2</sup>                      | 120 cm <sup>2</sup>            | 350 cm <sup>2</sup>                      |
| Bench range in bar<br>Travel (in parentheses) | 1.4 to 2.3                     | 2.2 to 3.8 (30 mm)<br>2.1 to 2.7 (15 mm) | 1.4 to 2.3                     | 1.5 to 2.7 (30 mm)<br>1.5 to 2.1 (15 mm) |
| K <sub>VS</sub> coefficients                  | Δp when p <sub>2</sub> = 0 bar |  | Δp when p <sub>2</sub> = 0 bar |  |
| 4.0 to 8                                      | 16                             | -  | 16                             | -  |
| 16 to 32                                      | 10                             | -  | 10                             | -  |
| 60  | -                              | 10                                       | -                              | 10                                       |
| 80  | -                              | 10                                       | -                              | 10                                       |
| 160   | -                              | 10                                       | -                              | 10                                       |

**Table 4:** Electric actuators · Permissible differential pressures for metal-seated plug

| Three-way valve              |                | Type | Type 3323-E1                   | Type 3323-E3 |                  |
|------------------------------|----------------|------|--------------------------------|--------------|------------------|
| Actuator                     |                | Type | 5827-N3                        | 3374-21/-31  | 3374-10/-11      |
| Thrust                       | Retracts       |      | 0.7 kN                         | 0.5 kN       | 2.5 kN           |
|                              | Extends        |      | 0.7 kN                         | 2.0 kN       | 2.5 kN           |
| K <sub>VS</sub> coefficients |                |      | Δp when p <sub>2</sub> = 0 bar |              |                  |
| 4 to 8                       |                |      | 10                             | 5            | 18 <sup>1)</sup> |
| 16 to 32                     |                |      | 3                              | 1.2          | 6 <sup>1)</sup>  |
| 60                           |                |      | –                              | –            | 2 <sup>1)</sup>  |
| 80                           |                |      | –                              | –            | 3.2              |
| 160                          |                |      | –                              | –            | 1.9              |
| Actuator data                | See Data Sheet |      | ▶ T 5827                       | ▶ T 8331     |                  |

<sup>1)</sup> 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)

**Table 5:** Type of attachment and required adapter

| Type 3323 Valve                              |    | DN 15 to 50                                     | DN 65 to 100                                    |
|--|----|---|---|
| Type 3372 Actuator with connector            | IP | Mounting with crossbeam (form B)                | –   |
| Type 3372 Actuator with Type 3725 Positioner | IP | Mounting with crossbeam (form B)                | Attachment without crossbeam (form C)           |
| Type 5827-N3 Actuator                        | E1 | With adapter (1400-7414) and spacer (0340-3031) | –   |
| Type 3374-11/-21/-31 Actuator                | E3 | 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)                | Attachment without crossbeam (form C)           |

**Table 6:** Dimensions and weights <sup>1)</sup> for Type 3323 Three-way Valve

**Table 6.1:** Valve with standard bonnet

| Nominal size             | DN | 15  | 20  | 25  | 32  | 40  | 50  | 65  | 80  | 100 |
|--------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Face-to-face dimension 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 |
| Weight, kg (approx.)     |    | 5   | 6   | 7   | 11  | 12  | 15  | 31  | 37  | 49  |

**Table 6.2:** Valve with insulating section

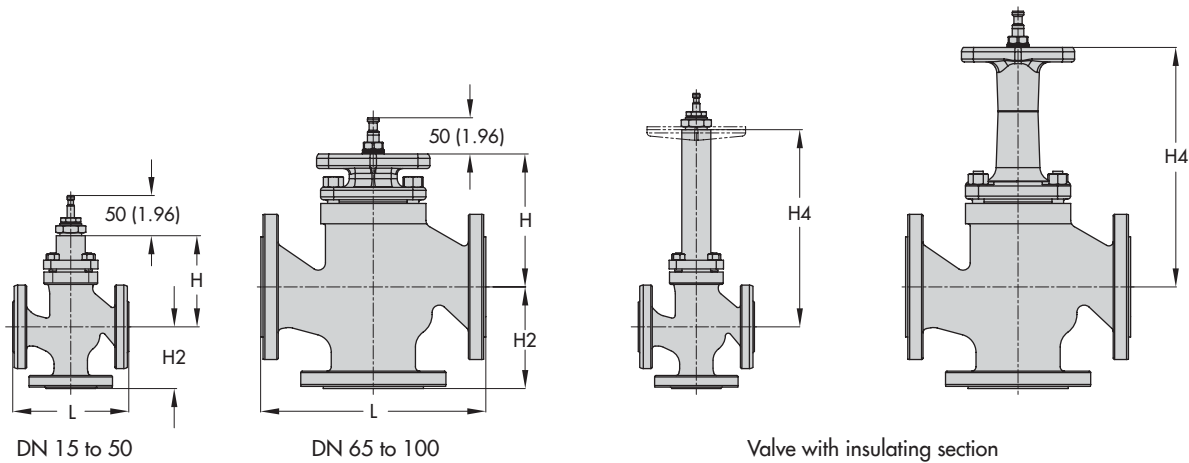
| Nominal size             | DN | 15  | 20  | 25  | 32  | 40  | 50  | 65  | 80  | 100 |
|--------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Face-to-face dimension L | mm | 130 | 150 | 160 | 180 | 200 | 230 | 290 | 310 | 350 |
| Height H4                | mm | 274 |     |     | 278 |     |     | 330 |     | 330 |
| Weight, kg (approx.)     |    | 8   | 9   | 10  | 17  | 18  | 21  | 40  | 45  | 68  |

**Table 6.3:** Weights of Type 3371, Type 3372, Type 5827 and Type 3374 Actuators

| Actuator type | Pneumatic    |            | Electropneumatic |           |          | Electric             |         |        |
|---------------|--------------|------------|------------------|-----------|----------|----------------------|---------|--------|
|               | Type         | Positioner | Weight           | Type      | Type     | Type                 | Type    |        |
| Type          | 3371/120     | 3371/350   | 3372/120         | 3372/120  | 3372/350 | E1/5827              | E3/3374 |        |
| Positioner    | -            |            | Integrated       | Type 3725 |          | Optional, integrated |         |        |
| Weight        | kg (approx.) | 4          | 13               | 6         | 7        | 16                   | 1.25    | Max. 4 |

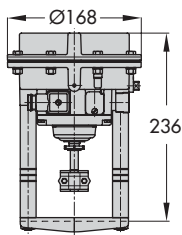
<sup>1)</sup> The weights specified apply to a specific standard device configuration. Weights of other valve configurations may differ depending on the version (material, trim etc.).

**Dimensional drawings for Type 3323 Valve**

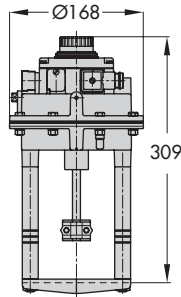


## Dimensional drawings for actuators

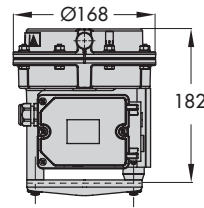
### Actuators for electropneumatic control valves



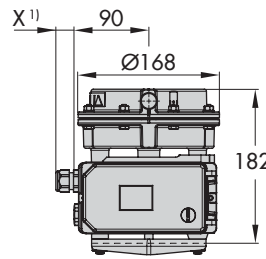
Type 3372/120 cm<sup>2</sup>  
Integrated, stem extends



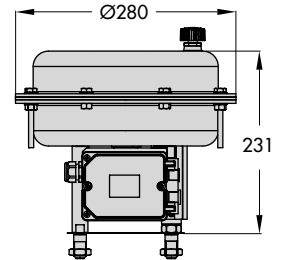
Type 3372/120 cm<sup>2</sup>  
Integrated, stem retracts



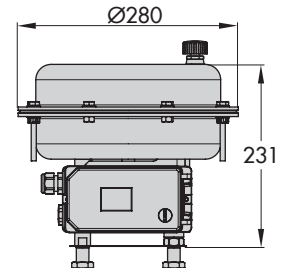
Type 3372/120 cm<sup>2</sup> with  
Type 3725 Positioner, stem  
extends/retracts



Type 3372/120 cm<sup>2</sup> with  
Series 3730 Positioner, stem  
extends/retracts

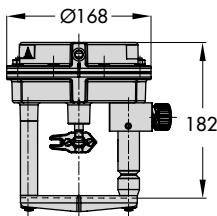


Type 3372/350 cm<sup>2</sup> with  
Type 3725 Positioner, stem  
extends/retracts

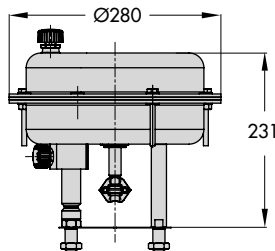


Type 3372/350 cm<sup>2</sup> with  
Series 3730 Positioner, stem  
extends/retracts

### Actuators for pneumatic control valves

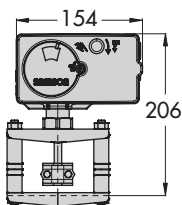


Type 3371/120 cm<sup>2</sup>

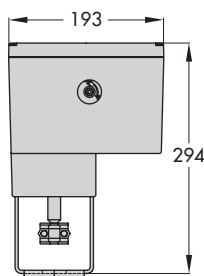


Type 3371/350 cm<sup>2</sup>

### Actuators for electric control valves



Actuator E1  
Type 5827



Actuator E3  
Type 3374

<sup>1)</sup> The dimension X depends on the cable gland used.

## Ordering text

The following specifications are required on ordering:

| Valve   |  |
|---|--|
| <b>Type 3323 Three-way Valve</b>                              |  |
| Version as  | Mixing valve or diverting valve  |
| Nominal size  | DN...  |
| Pressure rating   | PN ...   |
| Flow coefficients   | $K_{VS}$ ...   |
| Body material   | Cast iron, spheroidal graphite iron, cast steel, or stainless steel  |
| Seat-plug seal  | Metal seal   |
| <b>Actuators</b>  |  |
| for <b>Type 3323-IP</b> : Type 3372 Electropneumatic Actuator |  |
| With integrated positioner                                    | 4 to 20 mA   |
| With positioner   | Type 3725/Series 3730  |
| Optional  | Intrinsically safe Ex ia   |
| Additional equipment  | 1 or 2 limit switches  |
| for <b>Type 3323-PP</b> : Type 3371 Pneumatic Actuator        |  |
| Fail-safe position  | Actuator stem extends or retracts  |
| Bench range   | 1.4 to 2.3 bar   |
| Additional equipment  | 1 or 2 limit switches  |
| For <b>Type 3323-E1</b> : Type 5827-N3 Electric Actuator      |  |
| Supply voltage  | <ul style="list-style-type: none"><li>- 230 V/50 Hz</li><li>- 24 V/50 Hz</li></ul>   |
| Additional equipment  | <ul style="list-style-type: none"><li>- 2 limit contacts</li><li>- Resistance transmitter 0 to 1000 <math>\Omega</math></li><li>- Digital positioner<ul style="list-style-type: none"><li>- Input: 0/4 to 20 mA or 0/2 to 10 V</li><li>- Output: 0/2 to 10 V</li></ul></li></ul> |
| For <b>Type 3323-E3</b> : 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)<br>500 N (actuator stem retracts)   |
| Supply voltage  | <ul style="list-style-type: none"><li>- 230 V/50 Hz</li><li>- 230 V/60 Hz</li><li>- 24 V/50 Hz</li><li>- 24 V/60 Hz</li></ul>  |
| Additional equipment  | <ul style="list-style-type: none"><li>- 2 limit contacts</li><li>- Resistance transmitter 0 to 1000 <math>\Omega</math></li><li>- Digital positioner with input and output 0/4 to 20 mA or 0/2 to 10 V</li></ul>   |