

Series V2001 Valves

Type 3323 Three-way Valve with pneumatic or electric actuator

DIN version

SAMSON

Application

Mixing and diverting valve designed for use in industrial plants

| | |
|-------------------|----------------|
| Valve size | DN 15 to 100 |
| Nominal pressure | PN 16 and 40 |
| Temperature range | -10 to +300 °C |



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

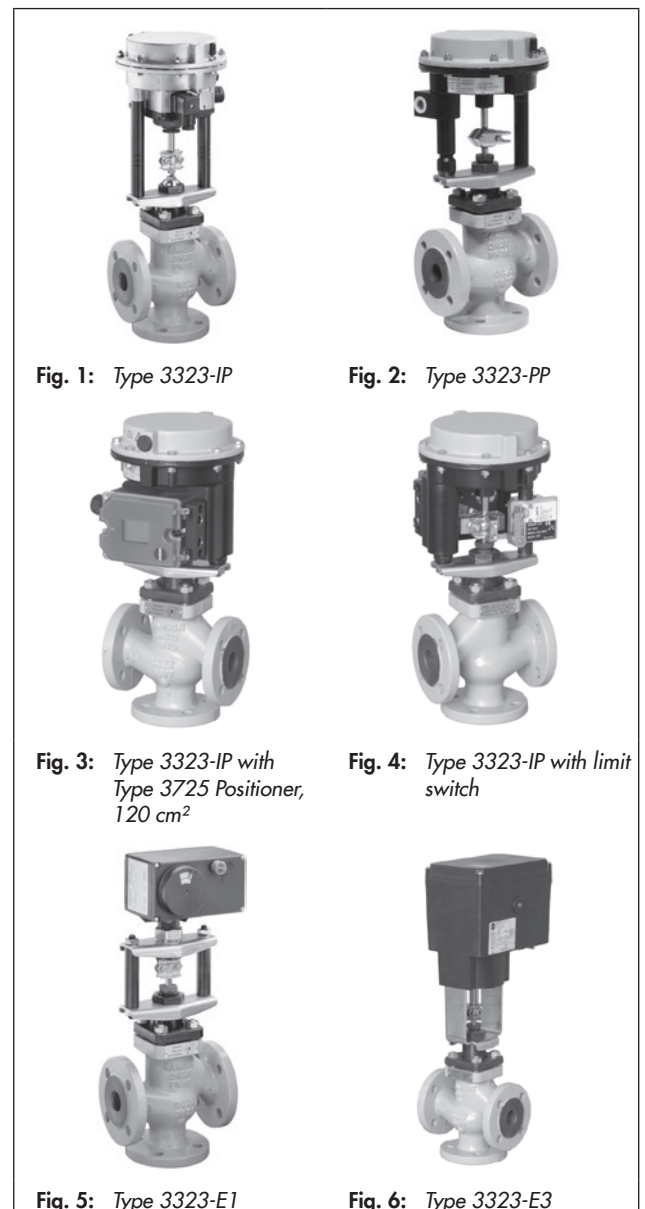
- Cast iron for PN 16
- Spheroidal graphite iron for PN 25
- Cast steel for PN 40 (up to DN 50) and PN 16 and 40 (DN 65 and larger)
- Stainless steel for PN 40 (up to DN 50) and PN 16 (DN 65 and larger)

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 cm² only, with plug connector) or Type 3725 Positioner (Fig. 3), tight-closing function to completely vent or fill the actuator with air, reference variable 4 to 20 mA, 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 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 4744-2 Limit Switch
- **Type 3323-E1 Electric Valve (mixing or diverting valve)** (Fig. 5) · With Type 5824-30 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit contacts, resistance transmitters, 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 transmitters, positioner

Further versions

- **Explosion-protected version** with electric actuators on request
- **Type 3323 according to ANSI standards** · See Data Sheet [U 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).

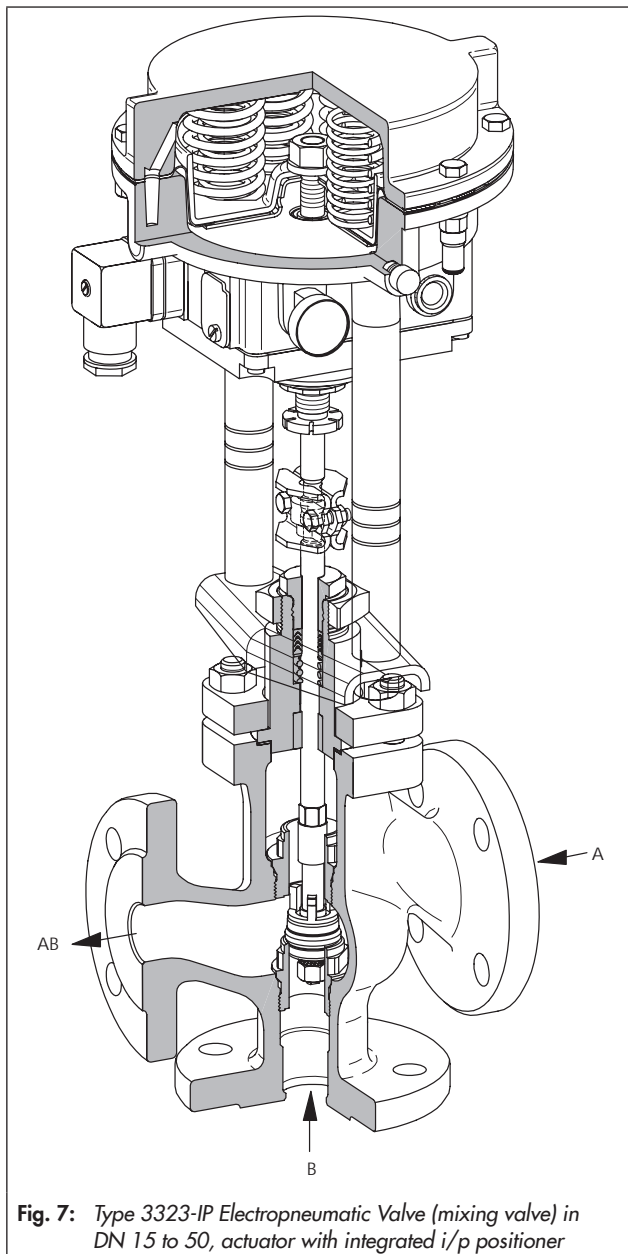


Fig. 7: Type 3323-IP Electropneumatic Valve (mixing valve) in DN 15 to 50, actuator with integrated i/p positioner

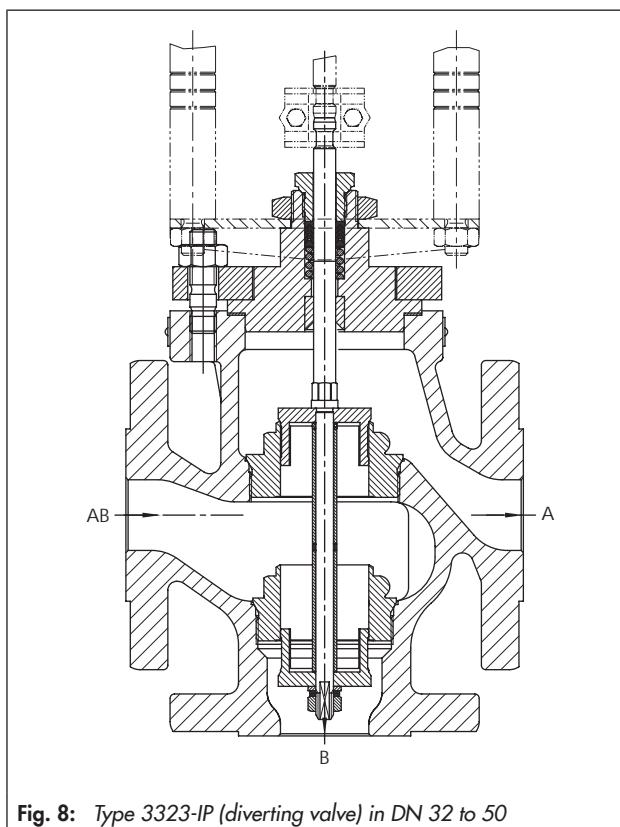


Fig. 8: Type 3323-IP (diverting valve) in DN 32 to 50

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.
- **Actuator stem retracts:** when the supply air fails, port A is closed in mixing valves and port B is closed in diverting 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 delivered with the product:

- [U EB 8113](#) Type 3323 Three-way Valve
- [U EB 8313-1](#) Electropneumatic actuator for Type 3331-IP (with integrated positioner)
- [U EB 8313-3](#) Electropneumatic actuator for Type 3323-IP (with Type 3725 Positioner)
- [U EB 5824-1](#) Electric actuator for Type 3323-E1
- [U EB 5824-2](#) Electric actuator for Type 3323-E1
- [U EB 8331-3](#) Electric actuator for Type 3323-E3
- [U EB 8331-4](#) Electric actuator for Type 3323-E3
- [U 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 | |
|--|----|--|---|---------------------|-----------|------------------------|-----------|
| Valve size | DN | | | 15 to 100 | 15 to 100 | 15 to 50 | 65 to 100 |
| Nominal pressure | 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 ¹⁾ | | -10 to +300 °C | | | | | |
| Leakage class according to IEC 60534-4 | | Metal seal: I (0.05 % of K _{VS}) | | | | | |
| Compliance | | CE · EAC | | | | | |

¹⁾ Not for stainless steel with DN 65 to 100

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 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 material: 1.4305

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

| Valve size | DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
|-----------------------------|----|----|-----|----|----|----|----|----|----|-----|
| K _{VS} coefficient | | 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

| Valve size | DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
|-----------------------------|----|----|----|----|----|----|----|-------|-------|---------|
| K _{VS} coefficient | | – | – | – | 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 ² | 350 cm ² | 120 cm ² | 350 cm ² | |
| 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/ rated travel | Stem extends | 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 | 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 | IP 54 with integrated positioner (for 120 cm ² only) IP 66 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 ² | 350 cm ² | 120 cm ² | 350 cm ² |
| 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 |
| Bracket | 1.4301 | - | 1.4301 | - |
| Mounting bracket for Type 3725 | Aluminum | | - | |

Table 3.3: *Permissible differential pressures for metal-seated plug*

| Fail-safe action | Actuator stem extends | | Actuator stem retracts | |
|---|--------------------------------|--|--------------------------------|--|
| Actuator area | 120 cm ² | 350 cm ² | 120 cm ² | 350 cm ² |
| Bench range in bar Travel (in parentheses) | 1.4 to 2.3 | 2.2 to 3.8 (30 mm) 2.1 to 2.7 (15 mm) | 1.4 to 2.3 | 1.5 to 2.7 (30 mm) 1.5 to 2.1 (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 |

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

| Three-way valve | | Type | Type 3323-E1 | Type 3323-E3 | |
|------------------------------|----------------|------|--------------------------------|--------------|-------------|
| Actuator | Type | | 5824-30 | 3374-21/-31 | 3374-10/-11 |
| Thrust | Stem retracts | | 0.7 kN | 0.5 kN | 2.5 kN |
| | Stem extends | | 0.7 kN | 2.0 kN | 2.5 kN |
| K _{Vs} coefficients | | | Δp when p ₂ = 0 bar | | |
| 4 to 8 | | | 10 | 18 | 25 |
| 16 to 32 | | | 3.5 | 6 | 10 |
| 60 | | | – | 2 | 5.5 |
| 80 | | | – | – | 3.2 |
| 160 | | | – | – | 3.1 |
| Actuator data | See Data Sheet | | u T 5824 | u T 8331 | |

Table 5: Type of attachment and required adapter

| Type 3323 Valve | | | DN 15 to 50 | DN 65 to 100 |
|--|----------|----|----------------------------------|---------------------------------------|
| Type 3372 Actuator with connector | Version: | 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 5824-30 Actuator | | E1 | With adapter (1400-7414) | – |
| Type 3374-11/-21/-31 Actuator | | E3 | Mounting with crossbeam (form B) | With adapter (1400-9515) |
| Type 3374-10 Actuator | | E3 | – | With adapter (1400-9515) |
| Type 3371 Actuator | | PP | Mounting with crossbeam (form B) | Attachment without crossbeam (form C) |

Table 6: Dimensions and weights for Type 3323 Three-way Valve

Table 6.1: Valve with standard bonnet

| Valve 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 | 110 | | | 115 | | | 135 | | |
| Height H2 | mm | 70 | 80 | 85 | 100 | 105 | 120 | 130 | 140 | 150 |
| Weight | kg (approx.) | 5 | 6 | 7 | 11 | 12 | 15 | 31 | 37 | 49 |

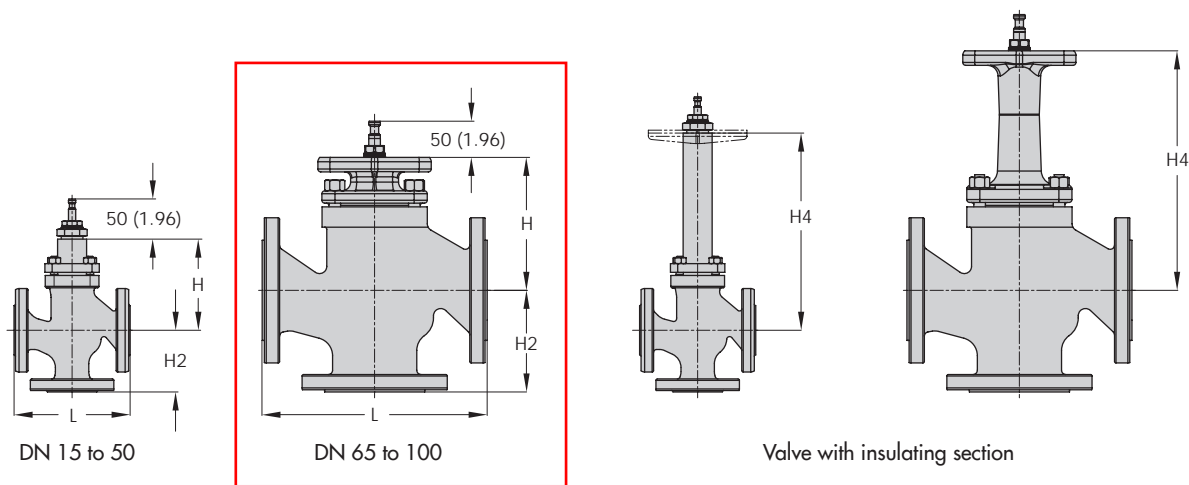
Table 6.2: Valve with insulating section

| Valve 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 | 369 | | | 374 | | | 402 | | |
| Weight | kg (approx.) | 8 | 9 | 10 | 17 | 18 | 21 | 40 | 45 | 68 |

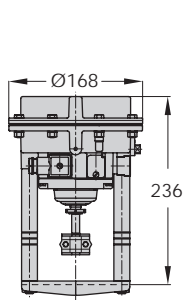
Table 6.3: Weights of Type 3371, Type 3372, Type 5824 and Type 3374 Actuators

| Actuator type | Pneumatic | | Electropneumatic | | | Electric | | |
|---------------|--------------|----------|------------------|-----------|----------|----------------------|---------|--------|
| Type | 3371/120 | 3371/350 | 3372/120 | 3372/120 | 3372/350 | E1/5824 | E3/3374 | |
| Positioner | - | | Integrated | Type 3725 | | Optional, integrated | | |
| Weight | kg (approx.) | 4 | 13 | 6 | 7 | 16 | 1.25 | Max. 4 |

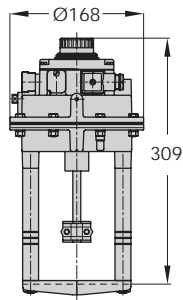
Dimensional drawings for Type 3323 Valve



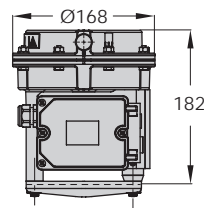
Dimensional drawings for actuators



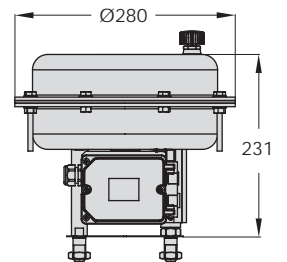
Type 3372/120 cm²
Integrated, stem extends



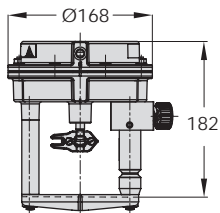
Type 3372/120 cm²
Integrated, stem retracts



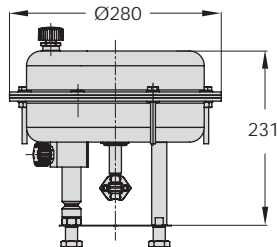
Type 3372/120 cm²
With Type 3725
Actuator stem extends/retracts



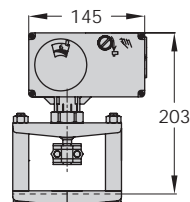
Type 3372/350 cm²
With Type 3725
Actuator stem extends/retracts



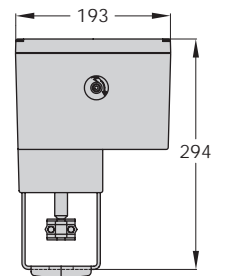
Type 3371/120 cm²



Type 3371/350 cm²



Actuator E1
Type 5824



Actuator E3
Type 3374

Ordering text

The following specifications are required on ordering:

| Valve | |
|---|--|
| Type 3323 Three-way Valve | |
| Version as | Mixing valve or diverting valve |
| Valve size | DN ... |
| Pressure rating | PN ... |
| Flow coefficient | K_{VS} ... |
| Body material | Cast iron, spheroidal graphite iron, cast steel, or stainless steel |
| Seat-plug seal | Metal seal |
| Actuators | |
| For Type 3323-IP : Type 3372 Electropneumatic Actuator | |
| With integrated positioner | 4 to 20 mA |
| With positioner | Type 3725, Type 3730-x |
| Optional | Intrinsically safe Ex ia |
| Additional equipment | 1 or 2 limit switches |
| For Type 3323-PP : Type 3371 Pneumatic Actuator | |
| Fail-safe position | Actuator stem extends or retracts |
| Signal pressure range | 1.4 to 2.3 bar |
| Additional equipment | 1 or 2 limit switches |
| For Type 3323-E1 : Type 5824-30 Electric Actuator | |
| Power supply | - 230 V/50 Hz - 24 V/50 Hz |
| Additional equipment | - Two 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) |
| Power supply | - 230 V/50 Hz - 230 V/60 Hz - 24 V/50 Hz - 24 V/60 Hz |
| Additional equipment | - Two 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 |

Specifications subject to change without notice



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