

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

Nominal size	DN 15 to 100
Pressure rating	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, 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 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 5827-N3 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit contacts, resistance transmitter, positioner



Fig. 1: Type 3323-IP



Fig. 2: Type 3323-PP



Fig. 3: Type 3323-IP with Type 3725 Positioner, 120 cm²



Fig. 4: Type 3323-IP with limit switch



Fig. 5: Type 3323-E1



Fig. 6: Type 3323-E3

- **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).

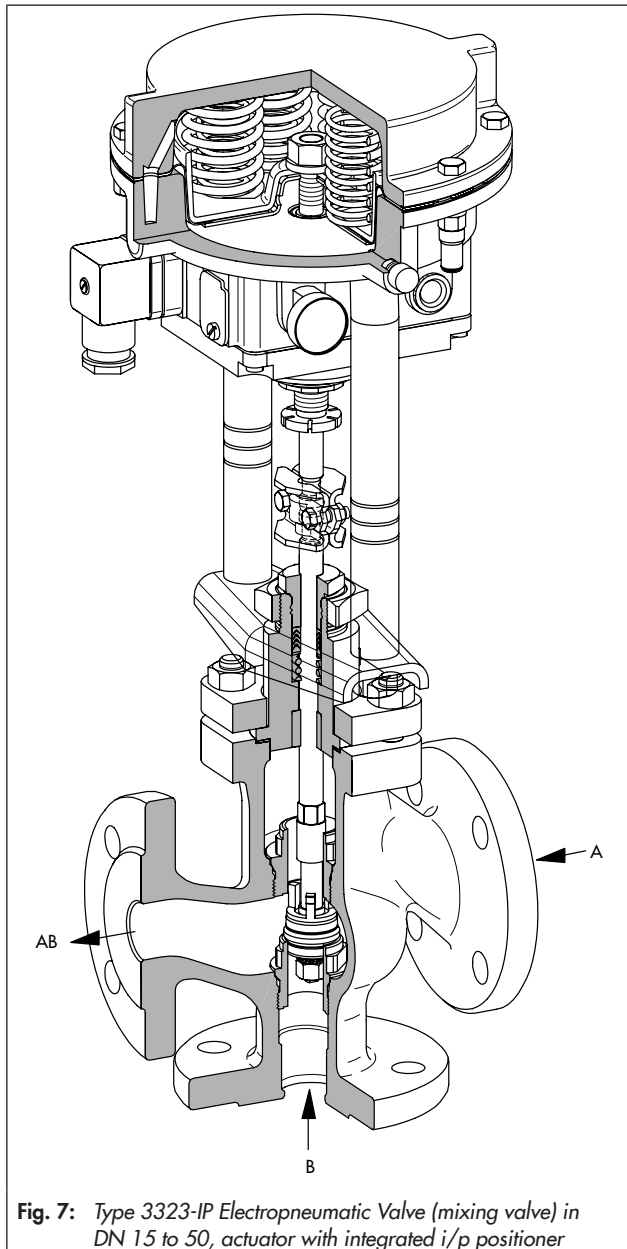


Fig. 7: Type 3323-IP Electropneumatic Valve (mixing valve) in DN 15 to 50, actuator with integrated i/p positioner

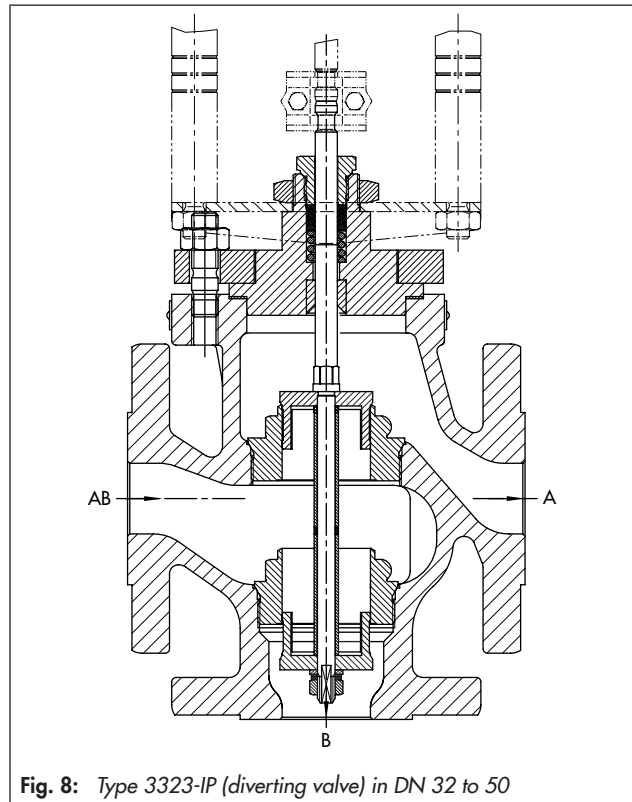


Fig. 8: Type 3323-IP (diverting valve) in DN 32 to 50

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 ¹⁾		-10 to +300 °C ²⁾					
Leakage class acc. to IEC 60534-4		Metal seal: I (0.05 % of K _{VS})					
Conformity		CE					

¹⁾ Not in stainless steel with DN 65 to 100

²⁾ 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 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 and plug	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 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 ²	350 cm ²	120 cm ²	350 cm ²
Attachment to Type 3323	DN	15 to 50	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 (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
	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
Characteristic	Linear, deviation from terminal-based linearity ≤2 %		–	
Hysteresis	≤1 %		–	
Variable position	≤7 %		–	
Degree of protection	IP54 with integrated positioner (for 120 cm ² only) 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 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	1.4305	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 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	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_{VS} coefficients			Δp when $p_2 = 0$ bar		
4 to 8			10	5	18 ¹⁾
16 to 32			3	1.2	6 ¹⁾
60			–	–	2 ¹⁾
80			–	–	3.2
160			–	–	1.9
Actuator data		See Data Sheet	► 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)

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 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 ¹⁾ 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

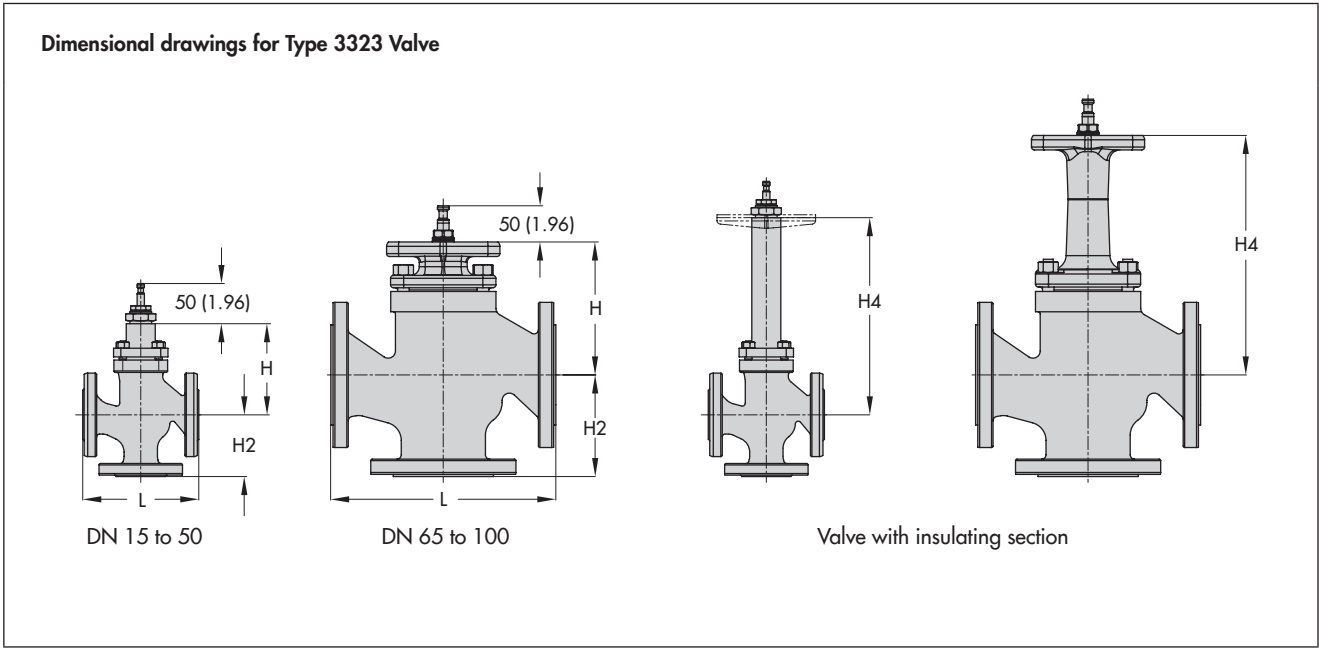
Table 6.2: Valve with insulating section

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

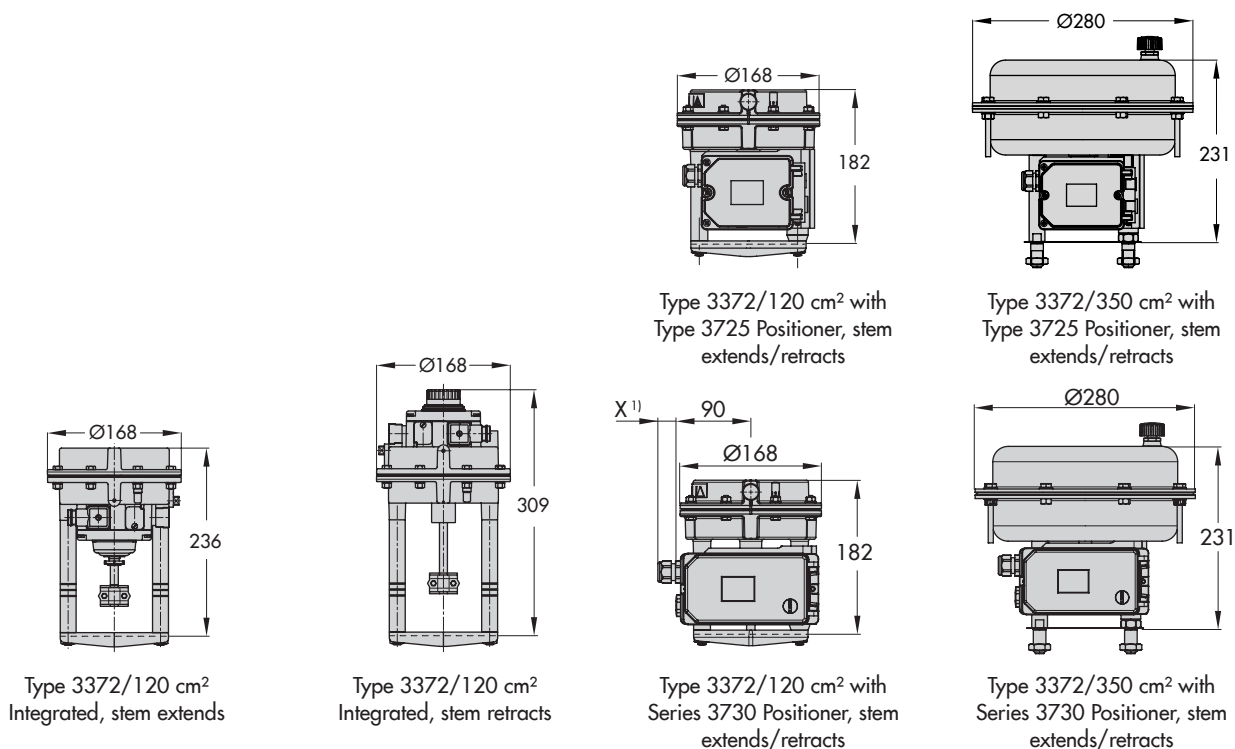
Actuator type	Pneumatic		Electropneumatic			Electric		
Type	3371/120	3371/350	3372/120	3372/120	3372/350	E1/5827	E3/3374	
Positioner	–		Integrated	Type 3725		Optional, integrated		
Weight	kg (approx.)	4	13	6	7	16	1.25	Max. 4

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.).

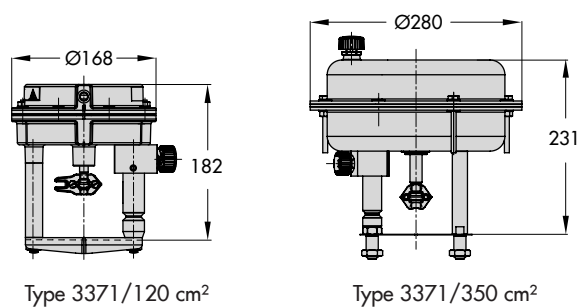


Dimensional drawings for actuators

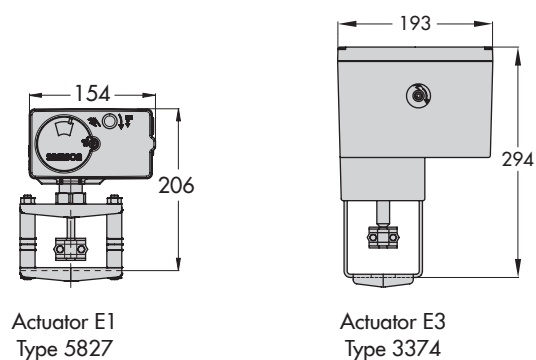
Actuators for electropneumatic control valves



Actuators for pneumatic control valves



Actuators for electric control valves



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

Ordering text

The following specifications are required on ordering:

Valve	
Type 3323 Three-way Valve	
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
Actuators	
for Type 3323-IP: 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 Type 3323-PP: 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 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 - With fail-safe action	1.25 kN; 2.5 kN 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