

## T 8111 EN

### Series V2001 Valves · Type 3321 Globe Valve with electropneumatic, pneumatic or electric actuators

DIN version



#### Application

Control valves designed for mechanical and plant engineering. Suitable for liquids, gases and steam

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

Type 3321 Globe Valves can be equipped with either electro-pneumatic, pneumatic or electric actuators:

- Electropneumatic actuators with integrated or mounted i/p positioner (Type 3321-IP Control Valve)
- Pneumatic actuators (Type 3321-PP Control Valve)
- Electric actuators (Type 3321-E1 or Type 3321-E3 Control Valve)

Valve body materials

- 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)

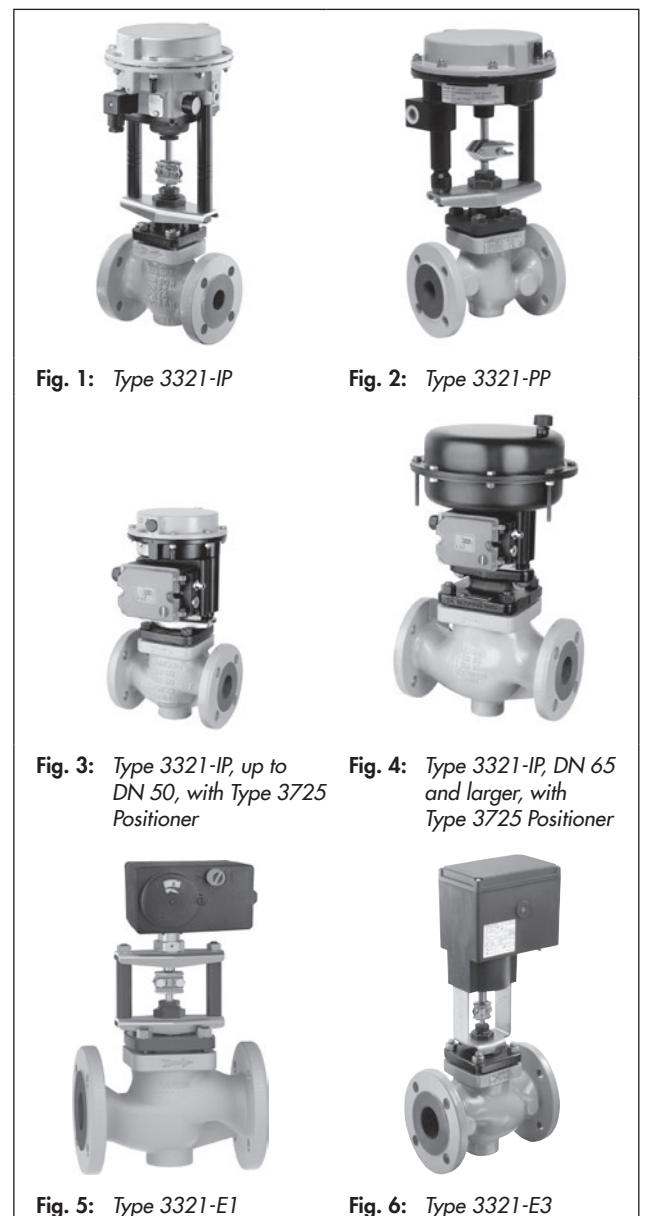
Valve sizes DN 15 to 100 each with two  $K_{VS}$  coefficients

Metal or soft-seated valve plug

The control valves can be optionally equipped with positioners, limit switches or contacts and resistance transmitters.

#### Versions

- **Type 3321-IP Electropneumatic Globe Valve** · With Type 3372 Electropneumatic Actuator, optionally with integrated positioner (120 cm<sup>2</sup> only, with plug connector, see Fig. 1) or Type 3725 Positioner (Fig. 3, Fig. 4), tight-closing function for completely venting or filling the actuator with air, 4 to 20 mA reference variable, max. 6 bar supply air, fail-close or fail-open, optionally with limit switch
- **Type 3321-PP Pneumatic Globe Valve** (Fig. 2) · With Type 3371 Pneumatic Actuator with 120 cm<sup>2</sup> (DN 15 to 50) or Type 3371 with 350 cm<sup>2</sup> (DN 65 to 100), fail-close or fail-open, optionally with limit switch
- **Type 3321-E1 Electric Globe Valve** (Fig. 5) · Valve size DN 15 to 50, with Type 5824-30 or Type 5827-N3 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit contacts, resistance transmitter, positioner



- **Type 3321-E3 Electric Globe 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 3321 according to ANSI standards** · See Data Sheet ▶ T 8112
- **Insulating section**
- **Flow divider ST 1** for noise reduction

#### Principle of operation

The process medium flows through the valve in the direction indicated by the arrow in the flow-to-open direction (Fig. 7, Fig. 8). The valve plug position determines the cross-sectional area between the seat and plug. The plug stem is connected to the actuator stem by the stem connector and sealed with a self-adjusting packing.

#### Fail-safe action

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

- **Actuator stem extends (fail-close):** The valve closes when the supply air fails.
- **Actuator stem retracts (fail-open):** The valve opens when the supply air fails.

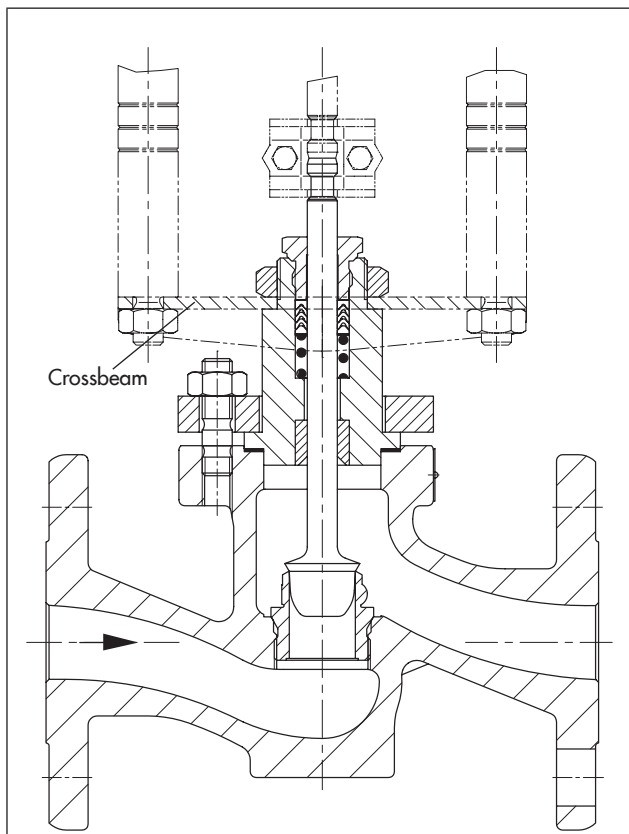


Fig. 7: Type 3321 Globe Valve in valve size DN 15 to 50

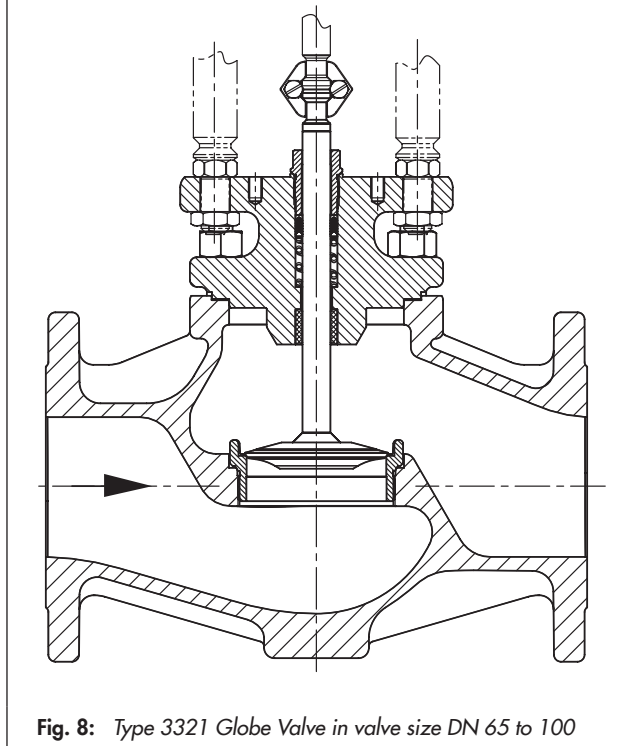


Fig. 8: Type 3321 Globe Valve in valve size DN 65 to 100

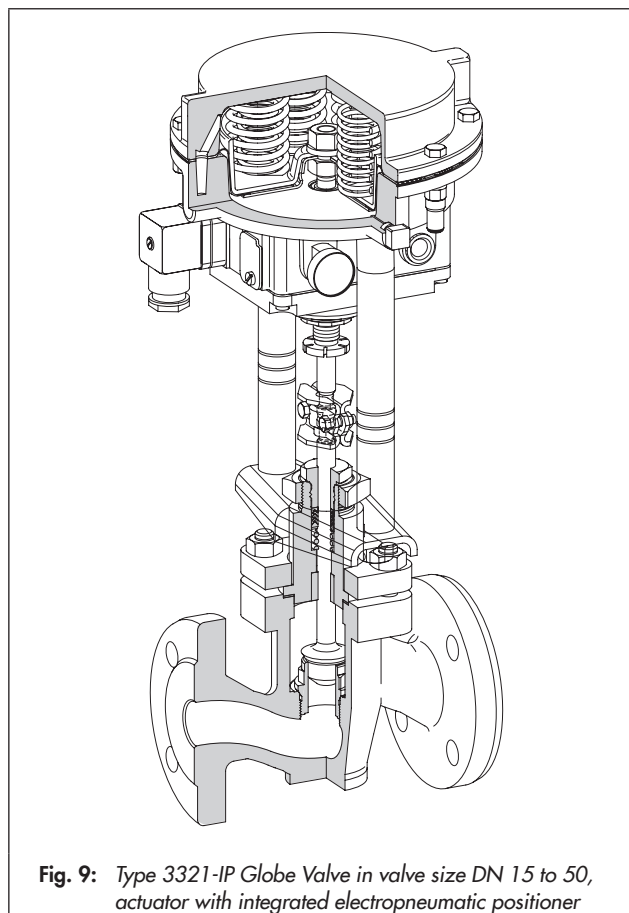


Fig. 9: Type 3321-IP Globe Valve in valve size DN 15 to 50, actuator with integrated electropneumatic positioner

### 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:

- ▶ EB 8111           Type 3321 Globe Valve
- ▶ EB 8313-1 and    Actuator for Type 3321-IP
- ▶ EB 8313-3

- ▶ EB 8317           Actuator for Type 3321-PP
- ▶ EB 5824-1
- ▶ EB 5824-2        Actuator for Type 3321-E1
- ▶ EB 5827-1
- ▶ EB 5827-2
- ▶ EB 8331-1        Actuator for Type 3321-E3
- ▶ EB 8331-4

**Table 1:** Type 3321 Globe Valve

**Table 1.1:** Technical data

Material		Cast iron · EN-GJL-250	Sph. graphite iron EN-GJS-400-18-LT	Cast steel · 1.0619		Stainless steel · 1.4408	
Connection	Flanges	According to DIN EN 1092-2	According to DIN EN 1092-2	According to DIN EN 1092-1		According to DIN EN 1092-1	
Valve 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 · 40	40	16
Seat-plug seal		Metal or soft sealing					
Characteristic		Inherent characteristic according to ▶ T 8000-3					
Rangeability		50:1 for DN 15 to 50 30:1 for DN 65 to 100					
Medium temperature range		-10 to +220 °C					
With insulating section <sup>1)</sup>		-10 to +300 °C					
Leakage class according to IEC 60534-4		Metal seal: IV Soft seal: VI					
Conformity							

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

**Table 1.2:** Materials · (previous material designation written in parentheses)

Valve size	DN	15 · 20 · 25 · 32 · 40 · 50 · 65 · 80 · 100								
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: 1.4401 DN 65 and larger: 1.4408			
Valve flange <sup>1)</sup>		1.0460								
Seat and plug	Seat	DN 15 to 50: 1.4104 DN 65 and larger: 1.4006					DN 15 to 50: 1.4401 · 1.4404 <sup>2)</sup> DN 65 and larger: in valve body			
	Plug	1.4401 · 1.4404 <sup>2)</sup>								
Seal for soft-seated plug		PTFE								
Guide bushing		1.4104					1.4404			
Packing		V-ring packing: PTFE with carbon; spring: 1.4310								
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> Material double stamping

**Table 1.3:** Valve sizes,  $K_{VS}$  coefficients and seat diameters

Valve size	DN	15		20		25		32		40		50		65		80		100			
$K_{VS}$		0.25	0.63	1.6	4	2.5	6.3	4	10	6.3	16	10	25	16	35	40	100	40	100	40	160
$K_{VS}1$ <sup>1)</sup>		-		1.45	3.6	2.2	5.7	3.6	9	5.7	14.5	9	22	14.5	31	36	90	36	90	36	144
Seat Ø	mm	3	6	12		12	24	12	24	24	32	24	38	32	48	48	80	48	80	48	80
Rated travel	mm	15																			30

<sup>1)</sup> With flow divider ST 1

**Table 2:** *Pneumatic actuators***Table 2.1:** *Technical data*

Valve/actuator		Type 3321-IP/Type 3372			Type 3321-PP/Type 3371		
Actuator area		120 cm <sup>2</sup>	350 cm <sup>2</sup> for K <sub>Vs</sub> 160	350 cm <sup>2</sup> for K <sub>Vs</sub> 40 and 100	120 cm <sup>2</sup>	350 cm <sup>2</sup> for K <sub>Vs</sub> 160	350 cm <sup>2</sup> for K <sub>Vs</sub> 40 and 100
Fail-safe position		Fail-close or fail-open					
Reference variable		4 to 20 mA			-		
Bench range/rated travel	Fail-close	2.1 to 3.3 bar/15 mm	2.2 to 3.8 bar/30 mm	2.1 to 2.7 bar/15 mm	2.1 to 3.3 bar/15 mm	2.2 to 3.8 bar/30 mm	2.1 to 2.7 bar/15 mm
	Fail-open	0.4 to 1.4 bar/15 mm	1.5 to 2.7 bar/30 mm	1.5 to 2.1 bar/15 mm	0.4 to 1.4 bar/15 mm	1.5 to 2.7 bar/30 mm	1.5 to 2.1 bar/15 mm
Hysteresis		≤1 %			-		
Variable position		≤7 %			-		
Degree of protection		IP 54 with integrated positioner (only for 120 cm <sup>2</sup> ) IP 66 with Type 3725			-		
Permissible ambient temperature		Standard: -20 to +80 °C With metal cable gland: -30 to +80 °C			-35 to +90 °C		
Actuator data		▶ T 8313			▶ T 8317		

**Table 2.2:** *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
Bracket	1.4301	-	1.4301	-
Mounting bracket for Type 3725	Aluminum		-	

**Table 2.3:** *Permissible differential pressures for metal-seated plug · · Fail-close · All pressures in bar*

Actuator area	cm <sup>2</sup>	120	350	
Bench range	bar	2.1 to 3.3	2.1 to 2.7	2.2 to 3.8
Valve travel	mm	15	15	30
Supply pressure	bar	3.7 to 6.0	4.3 to 6.0	
K <sub>Vs</sub> coefficients		Δp when p <sub>2</sub> = 0 bar		
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	-	-
6.3 · 10		40	-	-
16		25	-	-
25		17	-	-
35		11	-	-
40		10 <sup>1)</sup>	34	-
100		3 <sup>1)</sup>	10	-
160		-	-	10

<sup>1)</sup> Mounting without crossbeam on actuator (form C attachment), see ▶ EB 8313-3 and ▶ EB 8317

**Table 2.4:** Permissible differential pressures for metal-seated plug · Fail-open · All pressures in bar

Actuator area	cm <sup>2</sup>	120			350			
		0.4 to 1.4			1.5 to 2.1	1.5 to 2.7	1.5 to 2.1	1.5 to 2.7
Bench range	bar	0.4 to 1.4			1.5 to 2.1	1.5 to 2.7	1.5 to 2.1	1.5 to 2.7
Valve travel	mm	15			15	30	15	30
Supply pressure	bar	2.5	3.5	4.4	4.0		6.0	
K <sub>VS</sub> coefficients		Δp when p <sub>2</sub> = 0 bar						
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	40	40	–	–	–	–
6.3 · 10		22	40	40	–	–	–	–
16		11	25	34	–	–	–	–
25		8	17	24	–	–	–	–
35		4.5	10	15	–	–	–	–
40		4 <sup>1)</sup>	9 <sup>1)</sup>	15 <sup>1)</sup>	27	–	40	–
100		–	3 <sup>1)</sup>	4.5 <sup>1)</sup>	9.5	–	22	–
160		–	–	–	–	9.5	–	22

<sup>1)</sup> Mounting without crossbeam on actuator (form C attachment), see ► EB 8313-3 and ► EB 8317

**Table 2.5:** Permissible differential pressures for soft-seated plug · Fail-close · All pressures in bar

Actuator area	cm <sup>2</sup>	120		350	
		2.1 to 3.3		2.1 to 2.7	2.2 to 3.8
Bench range	bar	2.1 to 3.3		2.1 to 2.7	2.2 to 3.8
Valve travel	mm	15		15	30
Supply pressure	bar	3.7 to 6.0		4.3 to 6.0	
K <sub>VS</sub> coefficients		Δp when p <sub>2</sub> = 0 bar			
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40		–	–
6.3 · 10		40		–	–
16		27		–	–
25		19		–	–
35		12		–	–
40		10 <sup>1)</sup>		36	–
100		3 <sup>1)</sup>		10	–

<sup>1)</sup> Mounting without crossbeam on actuator (form C attachment), see ► EB 8313-3 and ► EB 8317

**Table 2.6:** Permissible differential pressures for soft-seated plug · Fail-open · All pressures in bar

Actuator area	cm <sup>2</sup>	120			350			
		0.4 to 1.4			1.5 to 2.1	1.5 to 2.7	1.5 to 2.1	1.5 to 2.7
Bench range	bar	0.4 to 1.4			1.5 to 2.1	1.5 to 2.7	1.5 to 2.1	1.5 to 2.7
Valve travel	mm	15			15	30	15	30
Supply pressure	bar	2.5	3.5	4.4	4.0		6.0	
K <sub>VS</sub> coefficients		Δp when p <sub>2</sub> = 0 bar						
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	40	40	–	–	–	–
6.3 · 10		25	40	40	–	–	–	–
16		14	27	36	–	–	–	–
25		9.5	19	26	–	–	–	–
35		6	12	16	–	–	–	–
40		4.5 <sup>1)</sup>	10 <sup>1)</sup>	15 <sup>1)</sup>	29	–	40	–
100		–	3 <sup>1)</sup>	5.5 <sup>1)</sup>	10	–	23	–

<sup>1)</sup> Mounting without crossbeam on actuator (form C attachment), see ► EB 8313-3 and ► EB 8317

**Table 3: Electric actuators**

**Table 3.1: Permissible differential pressures for metal-seated plug · All pressures in bar**

Globe valve	Type	3321-E1	3321-E3		
With actuator	Type	5824-30/5827-N3	3374-10/-11	3374-21/-31	3374-10/-11
Thrust		0.7 kN	1.25 kN	Stem extends: 2.0 kN Stem retracts: 0.5 kN	2.5 kN
K <sub>VS</sub> coefficients		Δp when p <sub>2</sub> = 0 bar			
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	40	40	40
6.3 · 10		9	18	32	40
16		4.5	9	17	25
25		3	6	12	17
35		1.5	3	7	10
40		–	3	7.5	10
100		–	–	2	3
160 <sup>1)</sup>		–	–	–	3 <sup>2)</sup>
Actuator data	See Data Sheet	▶ T 5824/▶ T 5827		▶ T 8331	

<sup>1)</sup> With 30 mm travel

<sup>2)</sup> Only with Type 3374-10

**Table 3.2: Permissible differential pressures for soft-seated plug · All pressures in bar**

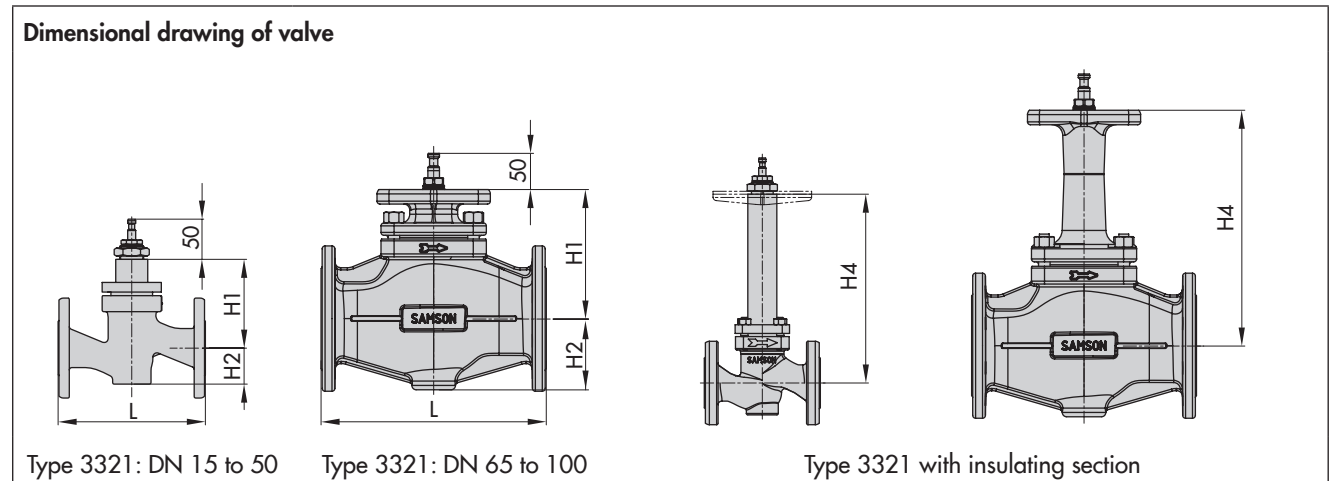
Globe valve	Type	3321-E1	3321-E3		
With actuator	Type	5824-30/5827-N3	3374-10/-11	3374-21/-31	3374-10/-11
Thrust		0.7 kN	1.25 kN	Stem extends: 2.0 kN Stem retracts: 0.5 kN	2.5 kN
K <sub>VS</sub> coefficients		Δp when p <sub>2</sub> = 0 bar			
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	40	40	40
6.3 · 10		12	16	32	40
16		6.5	9	17	27
25		4.5	6	12	19
35		3	4	7	12
40		–	3	9	10
100		–	–	3	4
Actuator data	See Data Sheet	▶ T 5824/▶ T 5827		▶ T 8331	

**Table 4: Type of attachment and required adapter**

Type 3321 Valve		DN 15 to 50	DN 65 to 100
Type 3372 Actuator with connector (Fig. 1)	IP	Mounting with crossbeam (form B)	–
Type 3372 Actuator with Type 3725 Positioner (Fig. 3, Fig. 4)	IP	Mounting with crossbeam (form B)	Mounting without crossbeam (form C)
Type 5824-30 or Type 5827-N3 Actuator (Fig. 5)	Version:	E1	With adapter (1400-7414)
Type 3374-11/-21/-31 Actuator (Fig. 6)		E3	Mounting with crossbeam (form B)
Type 3374-10 Actuator		E3	–
Type 3371 Actuator (Fig. 2)		PP	Mounting with crossbeam (form B)
			With adapter (1400-9515)
			Mounting without crossbeam (form C)

**Table 5: Dimensions and weights for Type 3321 Valve**

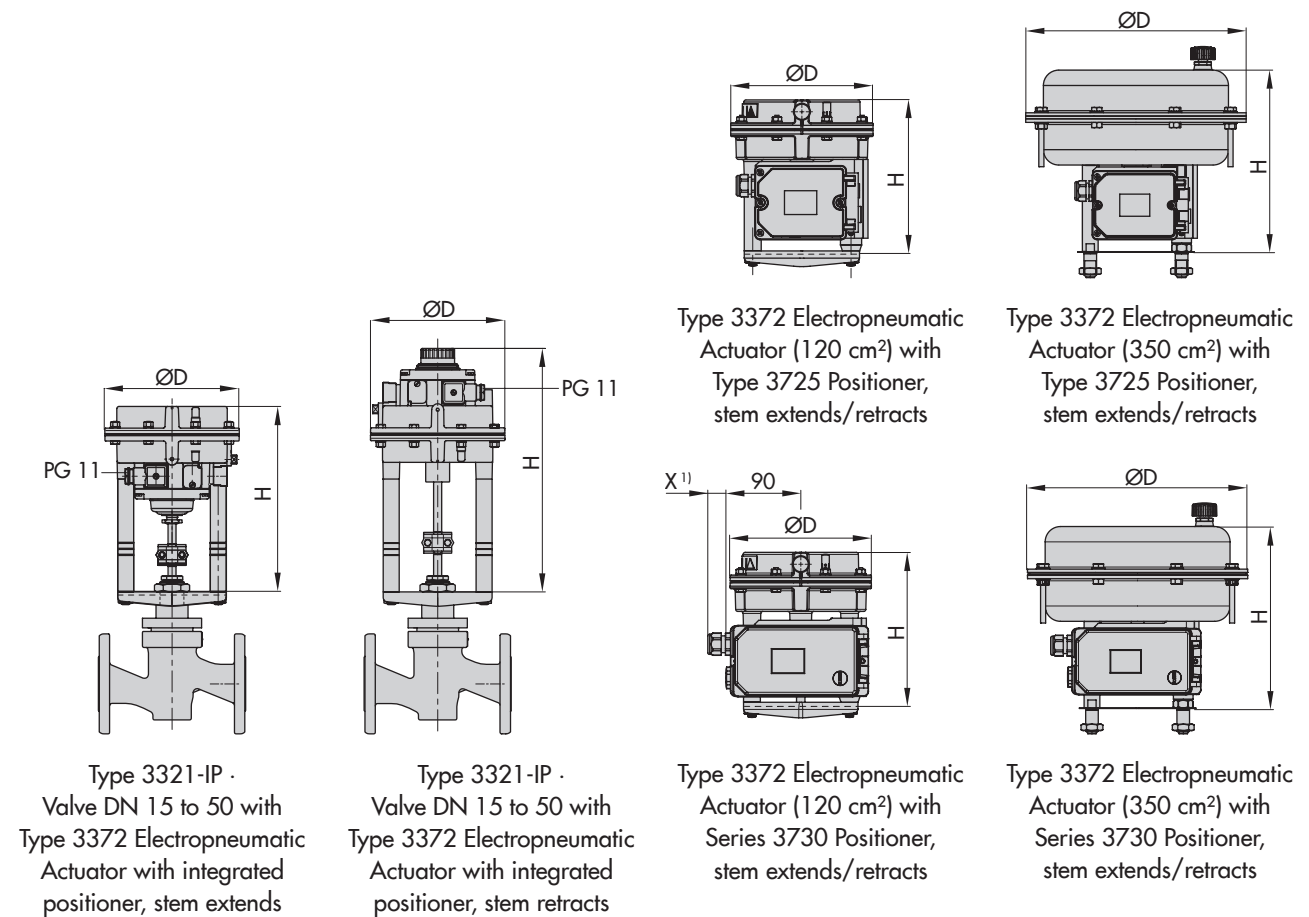
Valve	DN	15	20	25	32	40	50	65	80	100
L	mm	130	150	160	180	200	230	290	310	350
H1	mm	110	110	110	115	115	115	178	178	201
H2	mm	40	40	40	72	72	72	98	98	118
H4 (with insulating section)	mm	261	261	261	265	265	265	325	325	325
Weight	kg	5	6	7	11	12	15	24	30	42
Weight (with insulating section)	kg	8	9	10	17	18	21	32	38	60



**Table 6: Dimensions and weights for Type 3372 Electropneumatic Actuator**

Positioner		Integrated		Type 3725	
Actuator area	cm <sup>2</sup>	120	120	120	350
Fail-safe position <sup>1)</sup>		Stem extends	Stem retracts	Stem extends/retracts	
Height H	mm	236	309	182	231
ØD	mm	168	168	168	280
Weight (without positioner)	kg	3.7	3.7	3.3	15

**Dimension diagrams for electropneumatic control valves**



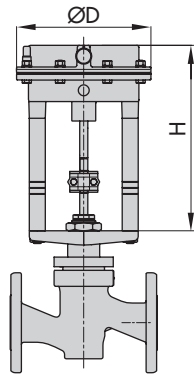
<sup>1)</sup> The dimension X depends on the cable gland used.



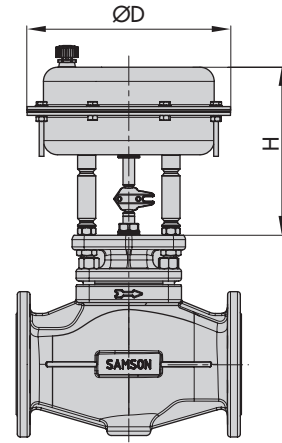
**Table 7:** Dimensions and weights for Type 3371 Pneumatic Actuator

Actuator area	cm <sup>2</sup>	120	350
Fail-safe action		Stem extends/retracts	Stem extends/retracts
Height H	mm	182	231
ØD	mm	168	280
Weight	kg	3.3	15

**Dimension diagrams for pneumatic control valves**



Type 3321-PP ·  
Valve DN 15 to 50 with Type 3371 Pneumatic Actuator  
(120 cm<sup>2</sup>), stem extends/retracts

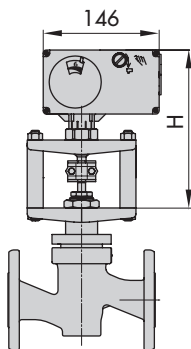


Type 3321-PP ·  
Valve DN 65 to 100 with Type 3371 Pneumatic Actuator  
(350 cm<sup>2</sup>), stem extends/retracts

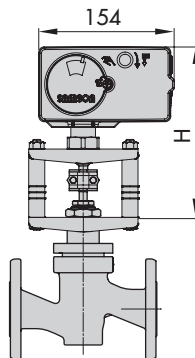
**Table 8:** Dimensions and weights for Type 5824, Type 5827 and Type 3374 Electric Actuators

Type		5824	5827	3374
Height H	mm	203	206	294
Weight (max.)	kg	1.25	1.25	4

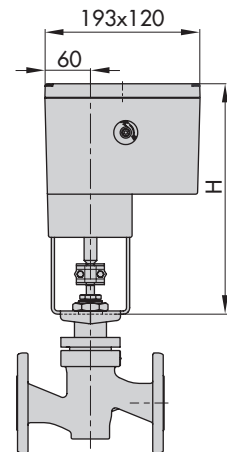
**Dimension diagrams for electric control valves**



Type 3321-E1 ·  
Valve with Type 5824 Electric Actuator



Type 3321-E1 ·  
Valve with Type 5827 Electric Actuator



Type 3321-E3 ·  
Valve with Type 3374 Electric Actuator

## Ordering text

The following specifications are required on ordering:

### Type 3321 Globe Valve

Valve size	DN ...
Flow coefficient	$K_{VS}$ ...
Pressure rating	PN ...
Body material	Cast iron, spheroidal graphite iron, cast steel, or stainless steel
Seat-plug seal	– Metal seal – Soft seal
Options	– Flow divider ST 1 – Insulating section

### Actuators

for **Type 3321-IP**: Type 3372 Electropneumatic Actuator

120 cm<sup>2</sup> actuator area:

- with integrated positioner, 4 to 20 mA
- with Type 3725/Series 3730 Positioner

350 cm<sup>2</sup> actuator area:

- with Type 3725/Series 3730 Positioner

Optional Intrinsicly safe Ex ia

Additional equipment 1 or 2 limit switches

for **Type 3321-PP**: Type 3371 Pneumatic Actuator

Fail-safe position Fail-close or fail-open

Bench range 1.4 to 2.3 bar

Additional equipment 1 or 2 limit switches

For **Type 3321-E1**: Type 5824-30 or 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  $\Omega$   
– Digital positioner:  
– Input: 0/4 to 20 mA or 0/2 to 10 V  
– Output: 0/2 to 10 V

For **Type 3321-E3**: Type 3374 Electric Actuator

Fail-safe action With fail-safe action: Actuator stem extends or retracts

Thrust

With fail-safe action 2 kN (actuator stem extends)  
500 N (actuator stem retracts)

Without fail-safe action 1.25 kN; 2.5 kN

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  $\Omega$   
– Digital positioner with input and output 0/4 to 20 mA or 0/2 to 10 V