

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

Nominal size	DN 15 to 100
Pressure rating	PN 16 to 40
Temperature range	-10 to +300 °C

Type 3321 Globe Valves can be equipped with either electropneumatic, 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)

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

Metal or soft-seated valve plug

The control valves can optionally be 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 cm² 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 cm² (DN 15 to 50) or Type 3371 with 350 cm² (DN 65 to 100), fail-close or fail-open, optionally with limit switch
- **Type 3321-E1 Electric Globe Valve** (Fig. 5) · Nominal size DN 15 to 50, with Type 5827-N3 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit contacts, resistance transmitters, positioner



Fig. 1: Type 3321-IP



Fig. 2: Type 3321-PP



Fig. 3: Type 3321-IP, up to DN 50, with Type 3725 Positioner



Fig. 4: Type 3321-IP, DN 65 and larger, with Type 3725 Positioner



Fig. 5: Type 3321-E1



Fig. 6: Type 3321-E3

- **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 position

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.

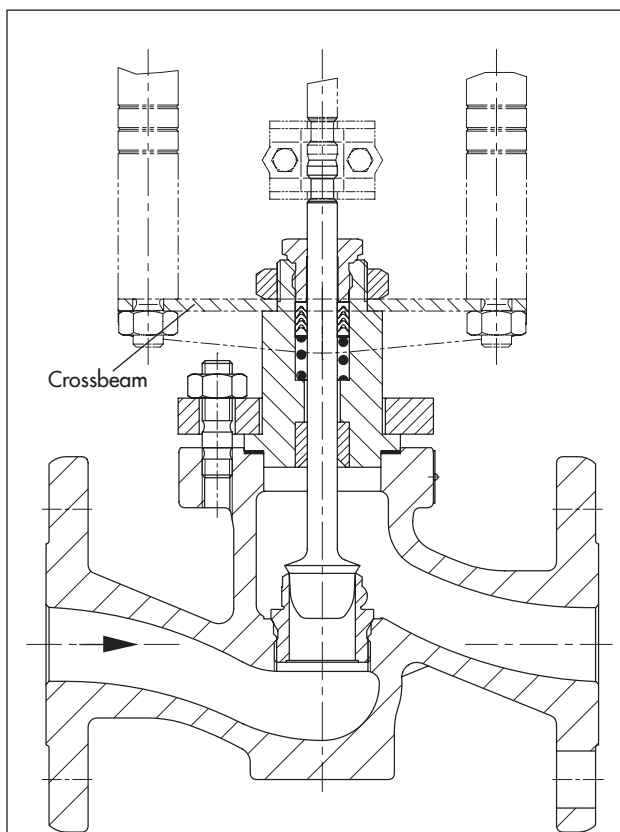


Fig. 7: Type 3321 Globe Valve, DN 15 to 50

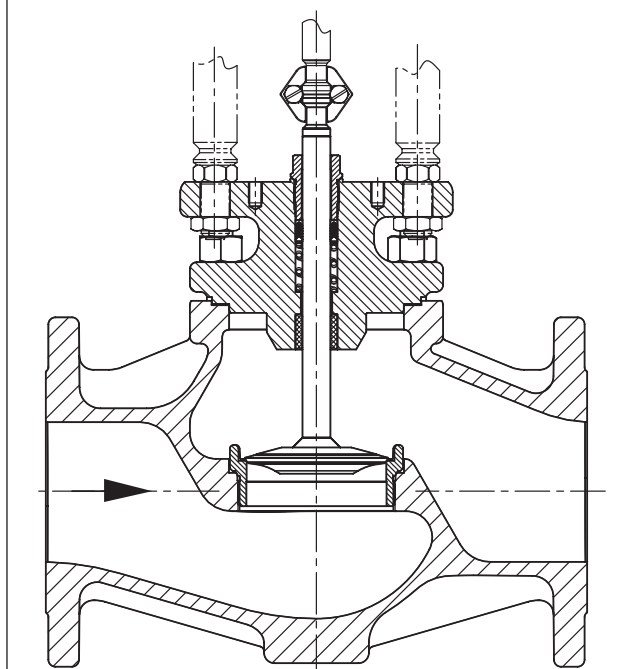


Fig. 8: Type 3321 Globe Valve, DN 65 to 100

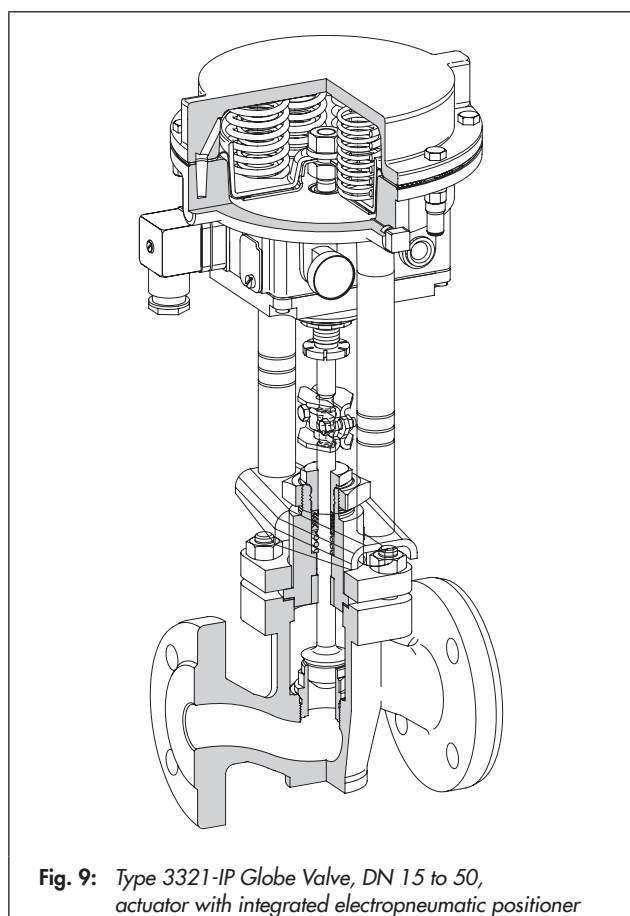


Fig. 9: Type 3321-IP Globe Valve, DN 15 to 50, actuator with integrated electropneumatic positioner

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
► EB 8313-3 Actuator for Type 3321-IP
- EB 8317 Actuator for Type 3321-PP
- EB 5827-1 Actuator for Type 3321-E1
- 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	Spheroidal 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	
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 · 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 ¹⁾		-10 to +300 °C					
Leakage class according to IEC 60534-4		Metal seal: IV Soft seal: VI					
Conformity		CE					

¹⁾ Not in stainless steel with DN 65 to 100

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

Nominal 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 ¹⁾		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 ²⁾ DN 65 and larger: in the valve body
	Plug	1.4401 · 1.4404 ²⁾			
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			

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

²⁾ Material double stamping

Table 1.3: Nominal sizes, K_{VS} coefficients and seat diameters

Nominal 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 ¹⁾		—		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

¹⁾ 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 ²	350 cm ² for K _{VS} 160	350 cm ² for K _{VS} 40 and 100	120 cm ²	350 cm ² for K _{VS} 160	350 cm ² for K _{VS} 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
	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
Hysteresis	≤1 %			–		
Variable position	≤7 %			–		
Degree of protection	IP54 with integrated positioner (only for 120 cm ²) IP66 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 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 2.3: *Permissible differential pressures for metal-seated plug · · Fail-close · All pressures in bar*

Actuator area	cm ²	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 _{v5} coefficients		Δp when p ₂ = 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 ¹⁾	34	–
100		3 ¹⁾	10	–
160		–	–	10

¹⁾ 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 ²	120			350			
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 _{V5} coefficients		Δp when p ₂ = 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 ¹⁾	9 ¹⁾	15 ¹⁾	27	–	40	–
100		–	3 ¹⁾	4.5 ¹⁾	9.5	–	22	–
160		–	–	–	–	9.5	–	22

¹⁾ 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 ²	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 _{VS} coefficients		Δp when p ₂ = 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 ¹⁾	36	–
100		3 ¹⁾	10	–

¹⁾ 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 ²	120			350			
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 _{V5} coefficients		Δp when p ₂ = 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 ¹⁾	10 ¹⁾	15 ¹⁾	29	–	40	–
100		–	3 ¹⁾	5.5 ¹⁾	10	–	23	–

¹⁾ 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	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_{VS} coefficients		Δp when $p_2 = 0$ 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 ¹⁾		–	–	–	3 ²⁾
Actuator data	See Data Sheet	► T 5827	► T 8331		

¹⁾ With 30 mm travel²⁾ 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	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_{VS} coefficients		Δp when $p_2 = 0$ 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 5827	► T 8331		

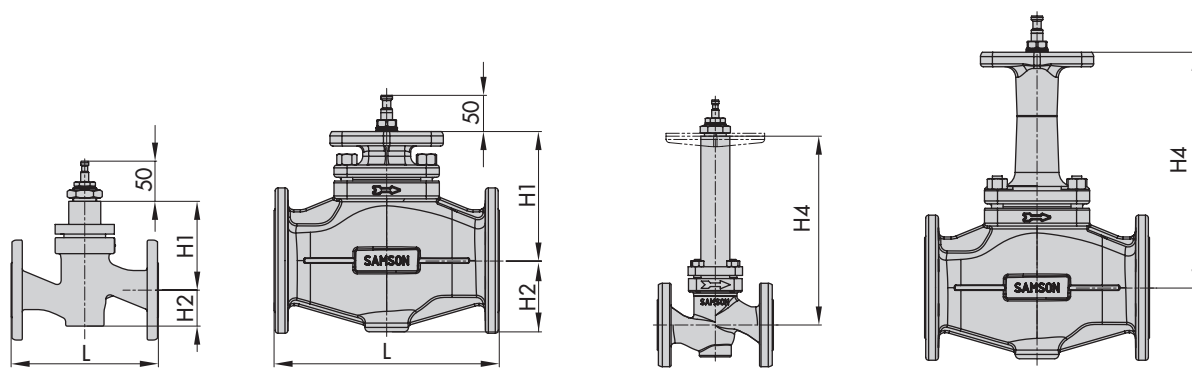
Table 4: Type of attachment and required adapter

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 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)
			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

Dimensional drawing of valve



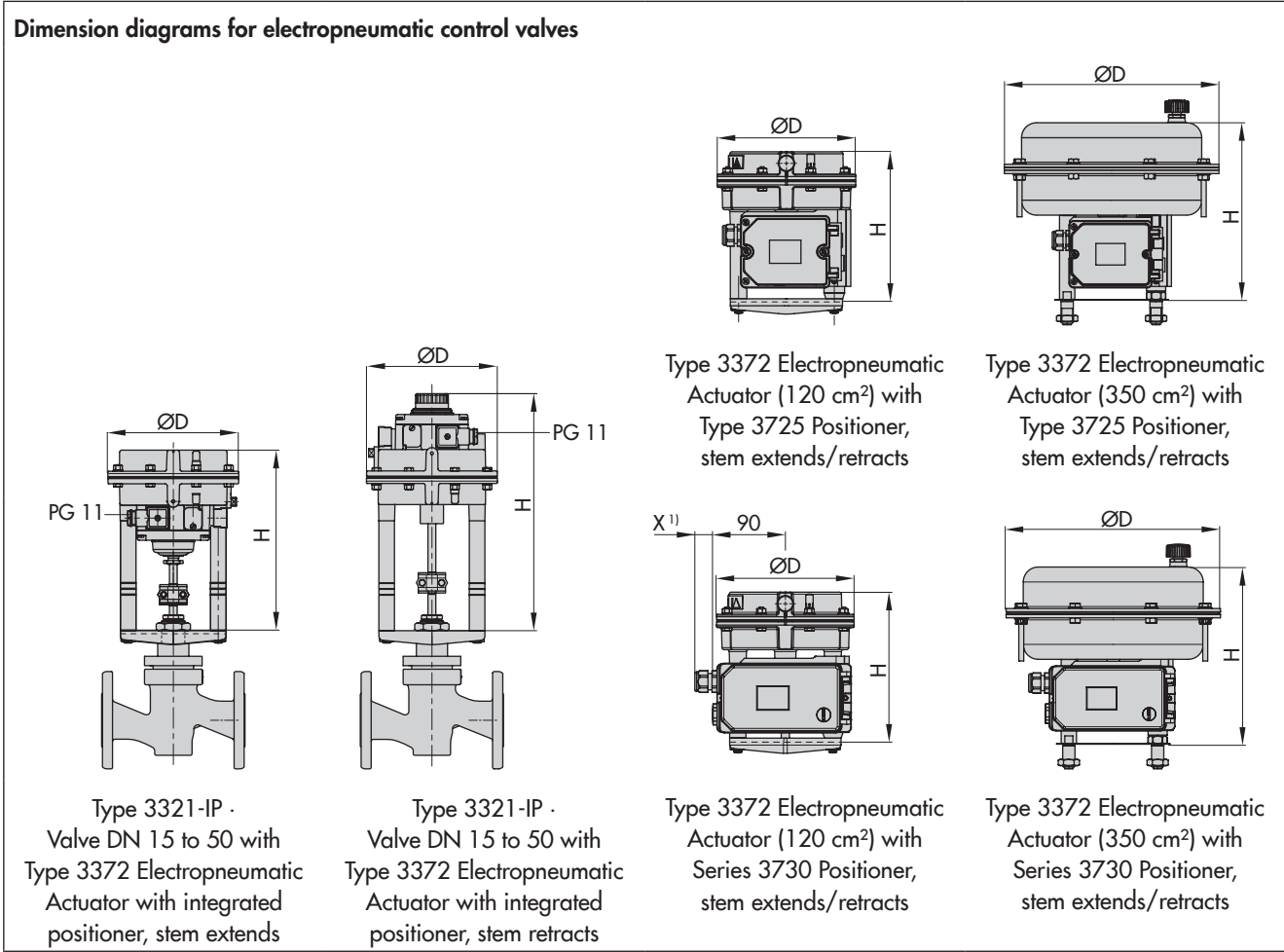
Type 3321: DN 15 to 50

Type 3321: DN 65 to 100

Type 3321 with insulating section

Table 6: Dimensions and weights for Type 3372 Electropneumatic Actuator

Positioner		Integrated		Type 3725	
Actuator area	cm ²	120	120	120	350
Fail-safe position ¹⁾		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

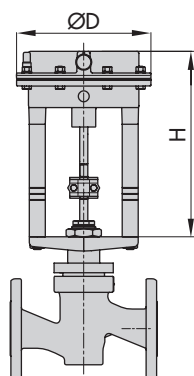


¹⁾ The dimension X depends on the cable gland used.

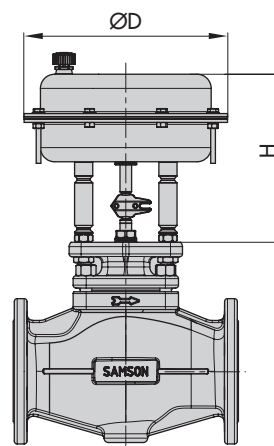
Table 7: Dimensions and weights for Type 3371 Pneumatic Actuator

Actuator area	cm ²	120	350
Fail-safe position		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 cm²), stem extends/retracts

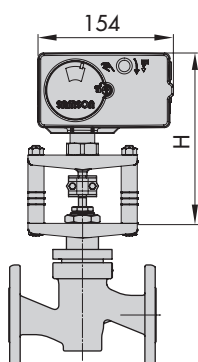


Type 3321-PP ·
Valve DN 65 to 100 with Type 3371 Pneumatic Actuator
(350 cm²), stem extends/retracts

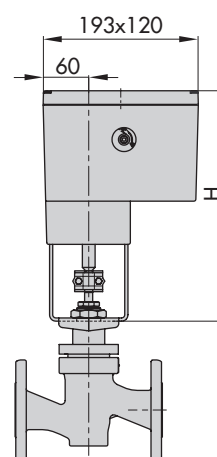
Table 8: Dimensions and weights for Type 5827 and Type 3374 Electric Actuators

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

Dimension diagrams for electric control valves



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	
Nominal size	DN ...
Flow coefficients	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 cm² actuator area:	
– with integrated positioner, 4 to 20 mA – with Type 3725/Series 3730 Positioner	
350 cm² actuator area:	
– with Type 3725/Series 3730 Positioner	
Optional	Intrinsically safe EEx 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 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 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 Ω – Digital positioner with input and output 0/4 to 20 mA or 0/2 to 10 V