DATA SHEET

T 8111 EN

Series V2001 Valves · Type 3321 Globe Valve

With electropneumatic, pneumatic or electric actuator

DIN version

Ex certified

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**
Temperatures	**-10 to +300 °C**



Fig. 1: *Type 3321-IP, up to DN 50/NPS 2, with Type 3725 Positioner*



Fig. 2: *Type 3321-IP, DN 65/NPS 2½ and larger, with Type 3725 Positioner*



Fig. 3: *Type 3321-PP*



Fig. 4: *Type 3321-E1*



Fig. 5: *Type 3321-E3*

Special features

The Type 3321 Globe Valve can be equipped with either electropneumatic, pneumatic or electric actuators:

- Electropneumatic actuators with mounted i/p positioner for Type 3321-IP
- Pneumatic actuators for Type 3321-PP
- Electric actuators for Type 3321-E1 or Type 3321-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) as well as for PN 16 and 40 (DN 65 and larger)
- Stainless steel for PN 40 (up to DN 50) as well as for 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.

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Versions

- **Type 3321-IP Electropneumatic Globe Valve** · With Type 3372 Electropneumatic Actuator, with Type 3725 Positioner (Fig. 1 and Fig. 2) · Tight-closing function to completely vent the actuator or fill the actuator with air · 4 to 20 mA set point · Max. 6 bar supply air · Fail-close or fail-open · Optionally with limit switch
- **Type 3321-PP Pneumatic Globe Valve** (Fig. 3) · 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. 4) 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 transmitter, positioner
- **Type 3321-E3 Electric Globe Valve** (Fig. 5) · 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
- **ANSI version of Type 3321** · 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.

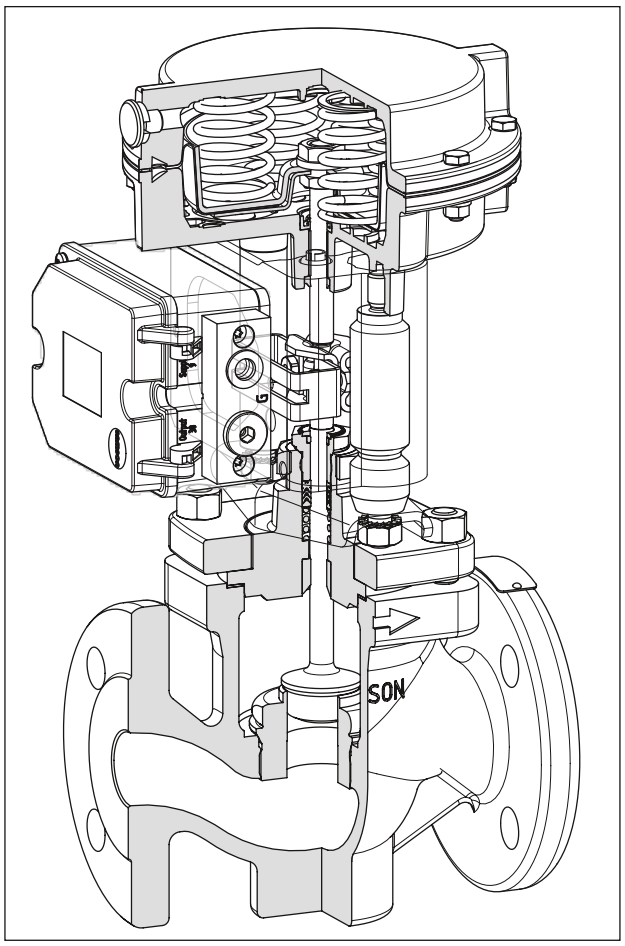


Fig. 6: *Type 3321-IP Globe Valve, with actuator with electropneumatic positioner*

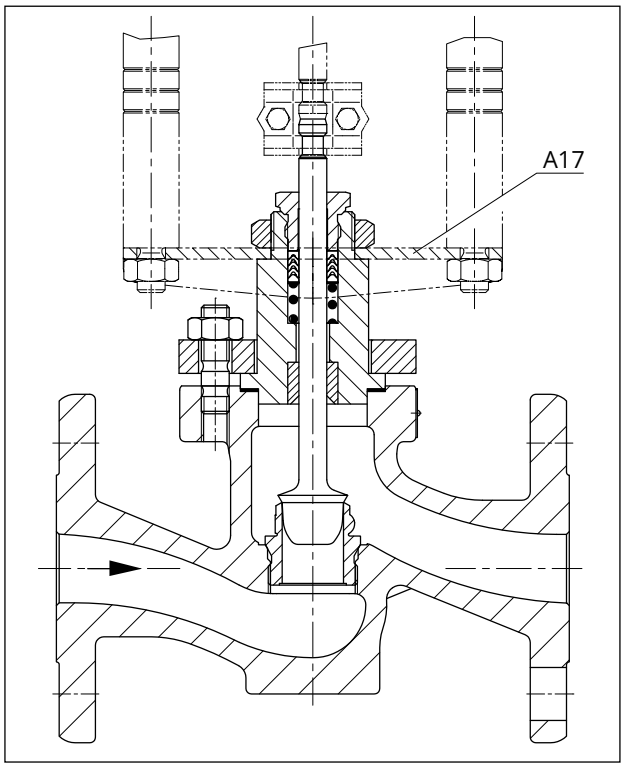


Fig. 7: *Type 3321 Globe Valve in nominal sizes DN 15 to 50/NPS ½ to 2*

A17 Crossbeam

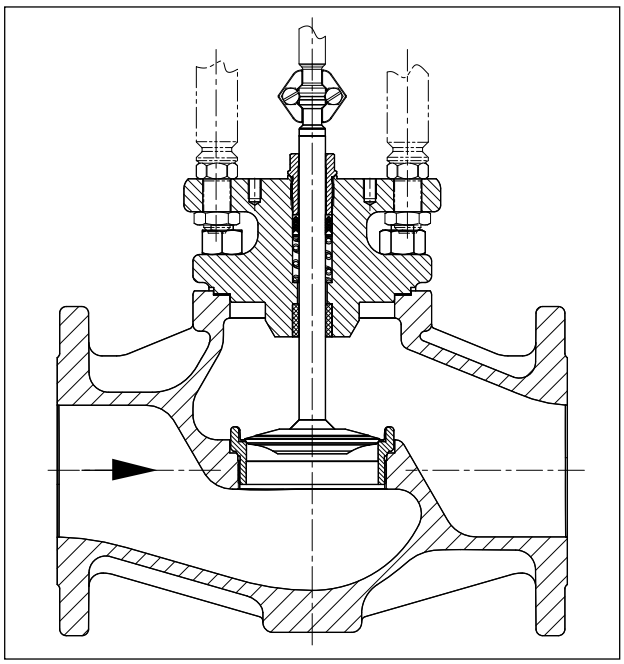


Fig. 8: *Type 3321 Globe Valve in nominal sizes DN 65 to 100/NPS 2½ to 4*

Fail-safe positions

When the valve is combined with a pneumatic actuator with integrated springs or an electric actuator with fail-safe action, the control valve has two different fail-safe positions that become effective when the supply air or control signal fails:

- **Actuator stem extends (fail-close):**
  When the signal pressure is reduced or the air supply fails, the springs move the actuator stem downward. The valve closes upon fail-safe action.
- **Actuator stem retracts (fail-open):**
  When the signal pressure is reduced or the air supply fails, the springs move the actuator stem upward. The valve opens upon fail-safe action.

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 8111/8112 Type 3321 Globe Valve
- EB 8313-3 Actuator for Type 3321-IP
- EB 5827-1 Actuator for Type 3321-E1
- EB 5827-2 Actuator for Type 3321-E1
- EB 8331-3 Actuator for Type 3321-E3
- EB 8331-4 Actuator for Type 3321-E3
- EB 8317 Actuator for Type 3321-PP

Table 1: *Technical data for Type 3321 · DIN version*

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 and 40	40	16
Seat-plug seal		Metal or soft seal					
Characteristic		Inherent characteristic according to ▶ T 8000-3					
Rangeability		50:1 for DN 15 to 50 30:1 for DN 65 to 100					
Conformity		CE EAC					
Temperature range		-10 to +220 °C					
With insulating section[1]		-10 to +300 °C					
Leakage class according to DIN EN 60534-4		Metal seal: IV Soft seal: VI					

1) Not in stainless steel with DN 65 to 100

Table 2: *Materials for Type 3321 · DIN version*

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 50: 1.4104 DN 65 and larger: 1.4006			DN 15 to 50: 1.4401 · 1.4104[2] DN 65 and larger: in the valve body
	Plug	1.4401 · 1.4104[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

Flow coefficients

Table 3: *Overview for Type 3321: Nominal sizes, flow coefficients and seat Ø*

Nominal size	**DN**	**15**				**20**		**25**		**32**		**40**		**50**		**65**		**80**		**100**	
Flow coefficients	**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**
Flow coefficients with ST 1[1]	K_{VS}-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	12	24	12	24	24	32	24	38	32	48	48	80	48	80	48	80
Rated travel	mm	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	30

1) Flow divider ST 1

Pneumatic actuators with Type 3321

Table 4: *Technical data for pneumatic actuators*

Valve/actuator		Type 3321-IP with Type 3372 Actuator			Type 3321-PP with Type 3371 Actuator		
Actuator area		120 cm²	350 cm² for K_{VS} 160	350 cm² for K_{VS} 40 and 100	120 cm²	350 cm² for K_{VS} 160	350 cm² for K_{VS} 40 and 100
Fail-safe action		Actuator stem extends (FA) or actuator stem retracts (FE) Fail-close or fail-open					
Set point		4 to 20 mA			–		
Bench range/rated travel	FA: 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
	FE: 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		IP66 with Type 3725			–		
Permissible ambient temperature		Standard:	-20 to +80 °C		-35 to +90 °C		
		With metal cable gland:	-30 to +80 °C				
See data sheet for actuator data		▶ T 8313			▶ T 8317		

Table 5: *Materials for pneumatic actuators*

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				
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 6: *Permissible differential pressures · Type 3321/3371 or Type 3321/3372 Pneumatic Control Valve · Metal-seated plug · Fail-close*

Actuator area	**cm²**	**120**	**350**	**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**	**4.3 to 6.0**
	K_{VS}	**Δp when p_2 = 0 bar**		
	0.25 to 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), see ▶ EB 8313-3 and ▶ EB 8317

Table 7: *Permissible differential pressures · Type 3321/3371 or Type 3321/3372 Pneumatic Control Valve · Metal-seated plug · Fail-open*

Actuator area	**cm²**	**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_{VS}	**Δp when p_2 = 0 bar**						
	0.25 to 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), see ▶ EB 8313-3 and ▶ EB 8317

Table 8: *Permissible differential pressures · Type 3321/3371 or Type 3321/3372 Pneumatic Control Valve · Soft-seated plug · Fail-close*

Actuator area	**cm²**	**120**	**350**	**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**	**4.3 to 6.0**
	K_{VS}	**Δp when p_2 = 0 bar**		
	0.25 to 4.0	40	–	–
	6.3 · 10	40	–	–
	16	27	–	–
	25	19	–	–
	35	12	–	–
	40	10[1)]	36	–
	100	3[1)]	10	–
	160	–	–	–

[1)] Mounting without crossbeam on actuator (form C), see ▶ EB 8313-3 and ▶ EB 8317

Table 9: *Permissible differential pressures · Type 3321/3371 or Type 3321/3372 Pneumatic Control Valve · Soft-seated plug · Fail-open*

Actuator area	**cm²**	**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_{VS}	**Δp when p_2 = 0 bar**						
	0.25 to 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	–
	160	–	–	–	–	–	–	–

[1)] Mounting without crossbeam on actuator (form C), see ▶ EB 8313-3 and ▶ EB 8317

Electric actuators with Type 3321

Table 10: *Permissible differential pressures for metal-seated plug*

Globe valve	**Type 3321-E1**	**Type 3321-E3**		
Type ... Actuator	**5827-N3**	**3374-10/-11**	**3374-21/-31**	**3374-10/-11**
Positioning force	**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**	**Δp when p_2 = 0 bar**		
0.25 to 4.0	40	40	40	40
6.3 to 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)]
See data sheet for actuator data	▶ T 5827	▶ T 8331		

[1)] With 30 mm travel

[2)] Only with Type 3374-10

Table 11: *Permissible differential pressures for soft-seated plug*

Globe valve	Type 3321-E1	Type 3321-E3		
Type ... Actuator	**5827-N3**	**3374-10/-11**	**3374-21/-31**	**3374-10/-11**
Positioning force	**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**	**Δp when p_2 = 0 bar**		
0.25 to 4.0	40	40	40	40
6.3 to 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
160[1)]	–	–	–	–
See data sheet for actuator data	▶ T 5827	▶ T 8331		

1) With 30 mm travel

Mounting actuators

Table 12: *Type of mounting and required adapter*

Type 3321 Valve			DN 15 to 50	DN 65 to 100
Type 3372 Actuator with Type 3725 Positioner	Version:	IP	Mounting with crossbeam (form B)	Mounting without crossbeam (form C)
Type 5827-N3 Actuator		E1	With adapter (1400-7414)	–
Type 3374-11/-21/-31 Actuator		E2	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)	Mounting without crossbeam (form C)

Dimensions

Table 13: *Dimensions for Type 3321 Valve · DIN version*

Valve	DN	15	20	25	32	40	50	65	80	100
With standard bonnet										
Length L	mm	130	150	160	180	200	230	290	310	350
Height H1	mm	110			115			178		201
Height H2	mm	40			72			98		118
With insulating section										
Height H4	mm	261			265			325		325

Dimensional drawings of valve

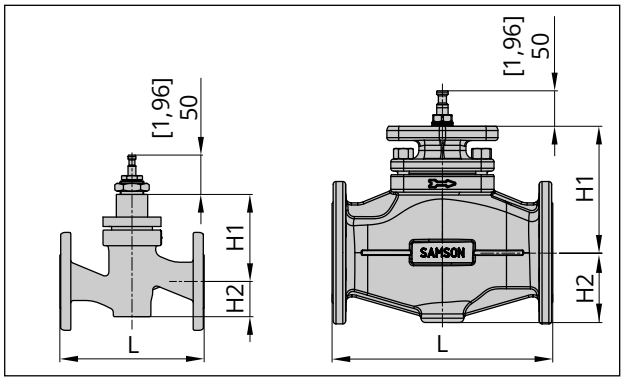


Fig. 9: *Type 3321 Globe Valve · Specifications in mm [inch]*
Left: DN 15 to 50/NPS ½ to 2
Right: DN 65 to 100/NPS 2½ to 4

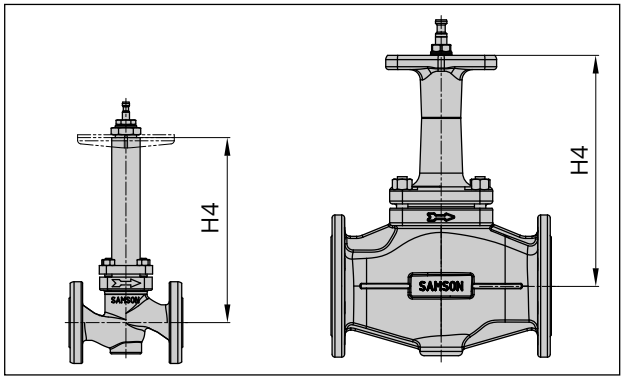


Fig. 10: *Type 3321 Globe Valve with insulating section*
Left: DN 15 to 50/NPS ½ to 2
Right: DN 65 to 100/NPS 2½ to 4

Dimensional drawings · Actuators for electropneumatic control valves

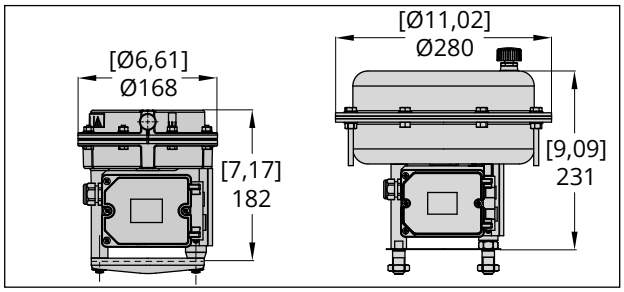


Fig. 11: *Specifications in mm [inch]*
Left: Type 3372/120 cm² with Type 3725 Positioner
Right: Type 3372/350 cm² with Type 3725 Positioner
fail-open/fail-close

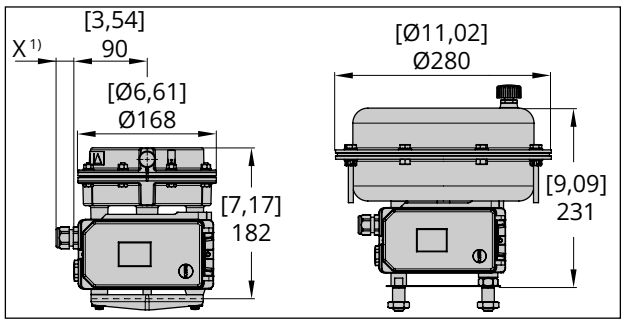


Fig. 12: *Specifications in mm [inch]*
Left: Type 3372/120 cm² with Series 3730 Positioner, fail-open/fail-close
Right: Type 3372/350 cm² with Series 3730 Positioner, fail-open/fail-close

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

Dimensional drawings · Actuators for pneumatic control valves

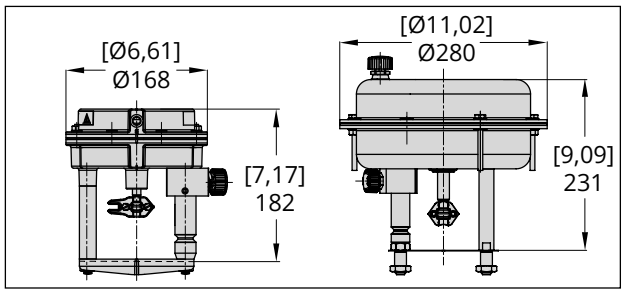


Fig. 13: *Specifications in mm [inch]*
Left: Type 3371/120 cm²
Right:Type 3371/350 cm²

Dimensional drawings · Actuators for electric control valves

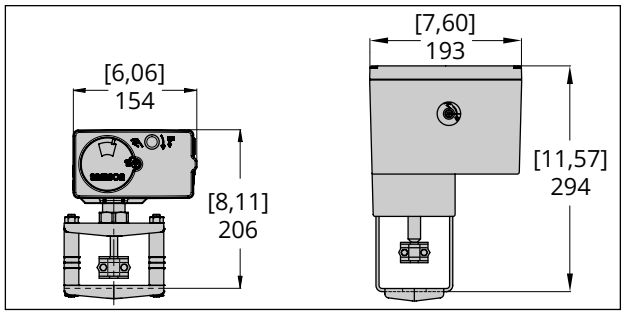


Fig. 14: *Specifications in mm [inch]*
Left: E1 actuator, Type 5827
Right: E3 actuator, Type 3374

Weights

Table 14: *Weights[1] for Type 3321 Valve · DIN version*

Valve	DN	15	20	25	32	40	50	65	80	100
With standard bonnet										
Weight, approx.	kg	5	6	7	11	12	15	24	30	42
With insulating section										
Weight, approx.	kg	8	9	10	17	18	21	32	38	60

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.).

Table 15: *Weights of Type 3371, Type 3372, Type 5827 and Type 3374 Actuators*

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

Ordering text

The following specifications are required on ordering:

Valve	
Type 3321 Globe Valve	
Nominal size	DN …
Pressure rating	PN …
Flow coefficients	K_{VS} …
Body material	See Table 2
Bonnet	Standard bonnet or insulating section
Flow divider ST 1	Yes/No
Seat-plug seal	Metal or soft seal
Actuators	
for **Type 3321-IP:** Type 3372 Electropneumatic Actuator	
With positioner	Type 3725/Series 3730
Optional	Intrinsically safe Ex ia
Additional equipment	1 or 2 limit switches
for **Type 3321-PP:** Type 3371 Pneumatic Actuator	
Fail-safe action	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	
Without fail-safe action	1.25 kN; 2.5 kN
With fail-safe action	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