

Valve Series V2001

Globe Valve Type 3321 with Pneumatic or Electric Actuator



Application

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

Nominal size DN 15 to DN 100
Nominal pressure PN 16 to PN 40
Temperature range -10 to 220 °C



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

- Electropneumatic actuator with integrated i/p positioner for Type 3321-IP or
- Pneumatic actuator for Type 3321-PP
- Electric actuators for Type 3321-E1 or Type 3321-E3

Valve body materials

- Cast iron for PN 16 or
- Cast steel for PN 16 and PN 40 and
- Stainless steel for PN 40 (up to DN 50) and PN 16 (DN 65 and higher)
- Nominal sizes DN 15 to DN 100 each with two K_{vs} coefficients
- Valve plug either with metal or soft sealing.

The control valves can be optionally equipped with positioners, limit switches and potentiometers.

Versions

Type 3321-IP Electropneumatic Globe Valve (Figs. 1 and 3) with Type 3372 Electropneumatic Actuator, plug connector, tight-closing function for completely venting or filling the actuator with air, reference variable 4 to 20 mA, max. 6 bar supply air, fail-safe position valve CLOSED or valve OPEN, optionally with limit switches

Type 3321-PP Pneumatic Globe Valve (Fig. 2) with Type 3372 Pneumatic Actuator (DN 15 to 50) or Type 3371 (DN 65 to 100), fail-safe position valve CLOSED or valve OPEN, optionally with limit switches

Type 3321-E1 Electric Globe Valve (Fig. 4) Nominal size DN 15 to 50 with Type 5824-30 Electric Actuator for 230 V/50 Hz or 24 V/50 Hz, optionally with limit switches, potentiometer, positioner

Type 3321-E3 Electric Globe Valve (Fig. 5) with Type 3374 Electric Actuator for 230 V or 24 V/50 Hz, 110 V/60 Hz, optionally with safety function (typetested), limit switches, potentiometers, positioners

Other versions

- **Explosion-protected version** with electric actuators
- **Type 3321 according to ANSI standards** · See T 8112 EN
- **Insulating section** on request
- **Flow divider I** for noise reduction on request



Fig. 1 · Type 3321-IP



Fig. 2 · Type 3321-PP



Fig. 3 · Type 3321-IP
for DN 65 and larger



Fig. 5 · Type 3321-E3



Fig. 4 · Type 3321-E1

Principle of operation

The process medium flows through the valve in the direction indicated by the arrow (Figs. 7, 8) in the flow-to-open direction. 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 with pneumatic actuators

Depending on how the springs are arranged in the electropneumatic or pneumatic actuator, the control valve has two different fail-safe positions that become effective when the supply air fails:

Actuator stem extends (FA)

The valve closes when the supply air fails.

Actuator stem retracts (FE)

The valve opens when the supply air fails.

Associated documentation

The valve and actuator are not assembled together upon delivery. Instructions on how to mount the valve on the actuator can be found in the mounting and operating instructions delivered with the product:

- EB 8111/2 EN Type 3321 Globe Valve
- EB 8313 EN Actuator for Type 3321-IP and Type 3321-PP
- EB 5824 EN Electric Actuator for Type 3321-E1
- EB 8331-1 EN Electric Actuator for Type 3321-E3

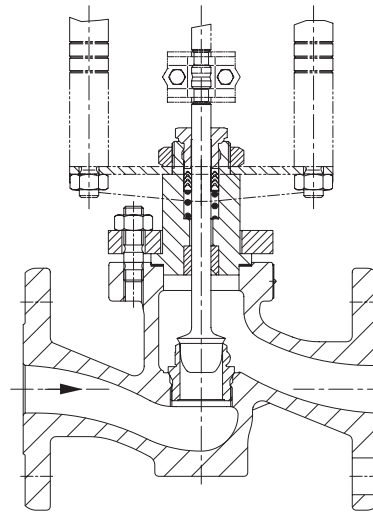


Fig. 7 · Type 3321 Globe Valve in valve sizes DN 15 to 50

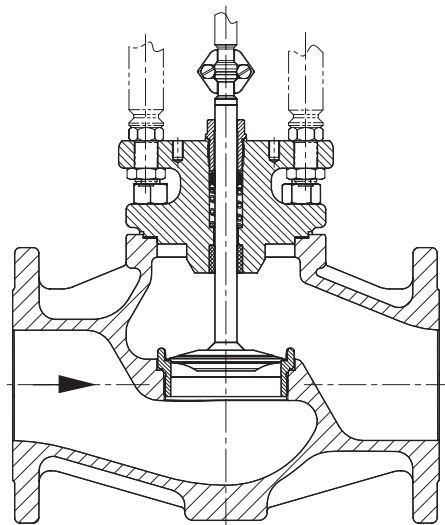


Fig. 8 · Type 3321 Globe Valve in valve sizes DN 65 to 100

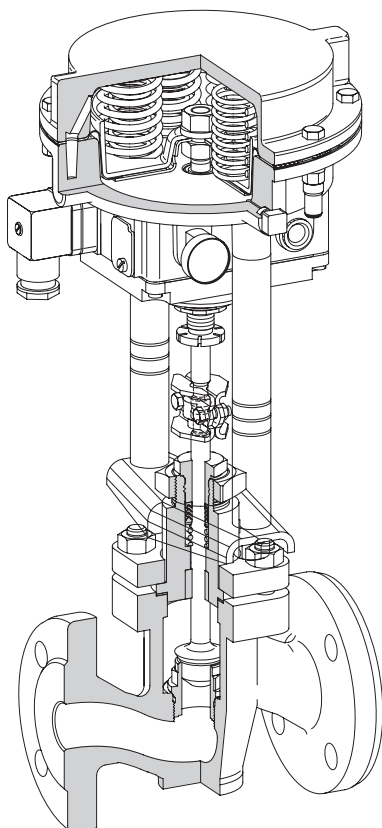


Fig. 6 · Type 3321-IP Globe Valve in valve sizes DN 15 to 50, actuator with integrated i/p positioner

1. Type 3321 Globe Valve

Table 1.1 · Technical data

Nominal size	DN	15 · 20 · 25 · 32 · 40 · 50 · 65 · 80 · 100						
Material		Cast iron · EN-JL1040			Cast steel · 1.0619		Stainless steel · 1.4581	
Connection	Flanges	Acc. to DIN EN 1092-2			Acc. to DIN EN 1092-1			
Nominal pressure	PN	16			16 · 40		16 · 40	
Seat/plug sealing		Metal or soft sealing						
Characteristic		Equal percentage						
Rangeability		50 : 1			50 : 1			
Temperature range		-10 to 220 °C						
Leakage class acc. to DIN EN 1349		Metal sealing:		IV		Soft sealing:		VI

Table 1.2 · Materials · (Former material number in parentheses)

Nominal size	DN	15 · 20 · 25 · 32 · 40 · 50 · 65 · 80 · 100					
Valve body		Cast iron · EN-JL 1040 (0.6025)			Cast steel · 1.0619		Stainless steel · 1.4581
Valve bonnet		1.0460 (C22.8)			1.0305 (St 35.8)		1.4408
Seat and plug	Seat	1.4305 or 1.4104			1.4305 or 1.4104		DN 50 and lower: 1.4305/1.4104 DN 65 and higher: in body
	Plug	DN 50 and lower: 1.4305 DN 65 and higher: 1.4404			DN 50 and lower: 1.4305 DN 65 and higher: 1.4404		DN 50 and lower: 1.4305 DN 65 and higher: 1.4404
Sealing ring for soft sealing		PTFE					
Guide bushing		1.4104					
Packing		V-ring packing PTFE with carbon; spring 1.4310					
Body gasket		Metal graphite					

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

Nominal size	DN	15				20		25		32		40		50		65		80		100	
		0.25	0.63	1.6	4	2.5	6.3	4	10	6.3	16	10	25	16	35	40	80	40	100	40	160
K_{VS}																					
Seat \varnothing	mm	3	6	12	12	24	12	24	24	32	24	38	32	48	48	80	48	80	48	80	80
Rated travel	mm	15																			30

Table 1.4 · K_{VS} coefficients and associated nominal sizes

K_{VS}	0.25	0.63	1.6	2.5	4	6.3	10	16	25	35	40	80	100	160
DN														
15	•	•	•		•									
20				•		•								
25					•		•							
32						•		•						
40							•		•					
50								•		•				
65											•	•		
80											•		•	
100											•			•

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	120 cm ²	350 cm ²	
Fail-safe position	Valve CLOSED or valve OPEN				
Reference variable	4 to 20 mA		–		
Signal range	Valve CLOSED	2.1 to 3.3 bar	2.2 to 3.8 bar	2.1 to 3.3 bar	2.2 to 3.8 bar
	Valve OPEN	0.4 to 1.4 bar	1.5 to 2.7 bar	0.4 to 1.4 bar	1.5 to 2.7 bar
Characteristic	Linear, deviation from terminal-based conformity ≤ 2 %		–		
Hysteresis	≤ 1 %		–		
Variable position	≤ 7 %		–		
Degree of protection	IP 54 with integrated positioner IP 66 with Type 3730-0/-1		–		
Permissible ambient temperature	Standard: -20 to 80 °C With metal cable gland: -30 to 80 °C		-35 to 90 °C		

Table 2.2 · Materials

Actuator	Type 3372		Type 3371		
Actuator area	120 cm ²	350 cm ²	120 cm ²	350 cm ²	
Actuator case	GD-ALSi12	1.0330	GD-ALSi12	1.0330	
Diaphragm	NBR		NBR		
Actuator stem	1.4305	1.4571	1.4305	1.4571	
Positioner housing	POM-GF	GD-ALSi12	–		
Yoke	Stem	9SMn28K	1.0715+C	9SMn28K	1.0715+C
	Bracket	1.4301	–	1.4301	–

Table 2.3 · Permissible differential pressures

Table 2.3.1 · Plug with metal sealing, all pressures in bar

Fail-safe position	Valve CLOSED		Valve OPEN					
Actuator area	cm ²	120	350	120			350	
Bench range	bar	2.1 to 3.3	2.2 to 3.8	0.4 to 1.4			1.5 to 2.7	
Supply pressure	bar	3.7 to 6.0	4.3 to 6.0	2.5	3.5	6.0	4.0	6.0
Kvs		Δp when p ₂ = 0 bar						
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	–	40	40	40	–	–
6.3 · 10		40	–	22	40	40	–	–
16		25	–	11	25	40	–	–
25		17	–	8	17	40	–	–
35		10	–	4.5	10	25	–	–
40		–	34	–	–	–	27	40
80 · 100 · 160		–	10	–	–	–	9.5	22

Table 2.3.2 · Plug with soft sealing, all pressures in bar

Fail-safe position	Valve CLOSED		Valve OPEN					
Actuator area	cm ²	120	350	120			350	
Bench range	bar	2.1 to 3.3	2.2 to 3.8	0.4 to 1.4			1.5 to 2.7	
Supply pressure	bar	3.7 to 6.0	4.3 to 6.0	2.5	3.5	6.0	4.0	6.0
Kvs		Δp when p ₂ = 0 bar						
0.25 · 0.63 · 1.6 · 2.5 · 4.0		40	–	40	40	40	–	–
6.3 · 10		40	–	25	40	40	–	–
16		27	–	14	27	40	–	–
25		19	–	9.5	19	40	–	–
35		12	–	6	12	27	–	–
40		–	36	–	–	–	29	40
80 · 100 · 160		–	10	–	–	–	10	23

3. Electric actuators

Table 3.1 · Technical data

Actuator	for	Type 3321-E1	Type 3321-E3	
Nominal thrust		0.7 kN	2.5 kN Type 3374-11	2.0 kN Type 3374-21/31 ¹⁾
Transit time for rated travel		90 s	120 s · Other transit times on request	
Power supply	230, 24 V/50 Hz	•	•	
	110 V/60 Hz	–	•	
Power consumption	Motor	3 VA	7.5 VA	10.5 VA
	With positioner	–	9.5 VA	12.5 VA
Manual override		•	•	
Degree of protection		IP 54 when vertically installed	IP 54 · IP 65 with cable gland	
	Mounting position	Suspended mounting position not permitted (see EB 5824 EN and EB 8331-1 EN)		
Permissible ambient temperature		0 to 50 °C	5 to 60 °C	
Additional electrical equipment				
Limit switch		2	2	
Potentiometer (not for version with positioner)		1 0 to 1000 Ω	2 0 to 1000 Ω	
Positioner		Analog	Digital	
Control signal		4(0) to 20 mA · 0(2) to 10 V		

¹⁾ Actuators with fail-safe action: Type 3374-21 actuator stem extends; Type 3374-31 actuator stem retracts (15 mm travel only)

Table 3.2 · Permissible differential pressures

Table 3.2.1 · Plugs with metal sealing, all pressures in bar

Actuator	for	Type 3321-E1	Type 3321-E3	
Nominal thrust		0.7 kN	2.5 kN	2.0 kN
	K _{VS}	Δp when p ₂ = 0 bar		
	0.25 · 0.63 · 1.6 · 2.5 · 4.0	40	40	40
	6.3 · 10	9	32	40
	16	4.5	17	25
	25	3	12	17
	35	1.5	7	10
	40	–	7.5	10
	80	–	2	3
	100	–	2	3
	160	–	2	–

Table 3.2.2 · Plugs with soft sealing, all pressures in bar

Actuator	for	Type 3321-E1	Type 3321-E3	
Nominal thrust		0.7 kN	2.5 kN	2.0 kN
	K _{VS}	Δp when p ₂ = 0 bar		
	0.25 · 0.63 · 1.6 · 2.5 · 4.0	40	40	40
	6.3 · 10	12	32	40
	16	6.5	17	27
	25	4.5	12	19
	35	3	7	12
	40	–	9	10
	80	–	3	4
	100	–	3	4
	160	–	3	–

4. Dimensions in mm and weights in kg · Type 3321 Globe Valve

Nominal size	DN	15	20	25	32	40	50	65	80	100
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Table 4.1 · Type 3321-IP Electropneumatic Control Valve · Dimensions for fail-safe position valve OPEN or valve CLOSED

L (Installation length)	mm	130	150	160	180	200	230	290	310	350
Installation height										
H1 (valve CLOSED)	mm	346			351			409	409	432
H1 (valve OPEN)	mm	431			436			409	409	432
H2	mm	44			72			98	98	118
H3 (valve CLOSED)	mm	110			110			110	190	190
H3 (valve OPEN)	mm	210			210			110	190	190
Weight ¹⁾										
Weight ¹⁾	kg	8.7	9.7	10.7	14.7	15.7	18.7	45	51	63

Table 4.2 · Type 3321-PP Pneumatic Control Valve · Dimensions valid for both fail-safe positions

L (Installation length)	mm	130	150	160	180	200	230	290	310	350
Installation height										
H1 (valve CLOSED/OPEN)	mm	346			351			409	409	432
H2	mm	44			72			98	98	118
H3 (minimum distance)	mm	110			110			110	190	190
Weight ¹⁾										
Weight ¹⁾	kg	8.3	9.3	10.3	14.3	15.3	18.3	43	49	61

Table 4.3 · Type 3321-E1 Electric Control Valve

L (Installation length)	mm	130	150	160	180	200	230	–			
Installation height											
H1	mm	304			309			–			
H2	mm	44			72			–			
H3 (minimum distance)	mm	110			110			–			
Weight ¹⁾											
Weight ¹⁾	kg	6.5	7.5	8.5	12.5	13.5	16.5	–			

Table 4.4 · Type 3321-E3 Electric Control Valve

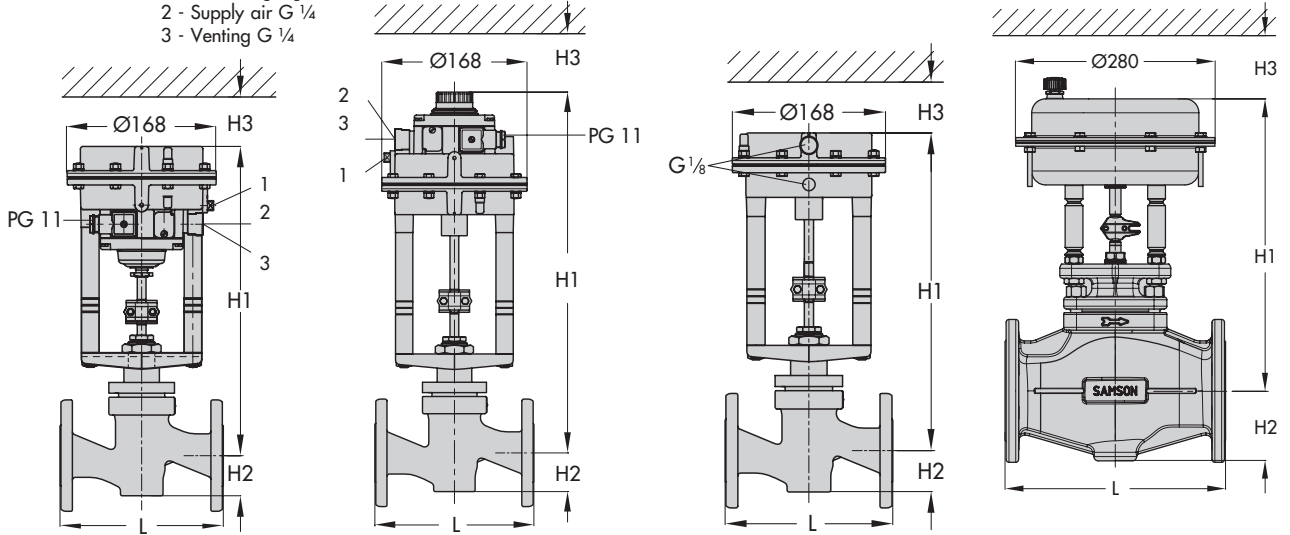
L (Installation length)	mm	130	150	160	180	200	230	290	310	350
Installation height										
H1	mm	404			409			474	474	494
H2	mm	44			72			98	98	118
H3 ²⁾ (minimum distance)	mm	110			110			110	190	190
Weight ¹⁾										
Weight ¹⁾	kg	8.5	9.5	10.5	14.5	15.5	18.5	29	35	47

¹⁾ The indicated weight increases by approx. 15 % for versions in PN 40.

²⁾ Note! Cover screws are inserted from the top.

Dimensional diagrams and terminal connections

- 1 - Pressure gauge G 1/8
- 2 - Supply air G 1/4
- 3 - Venting G 1/4

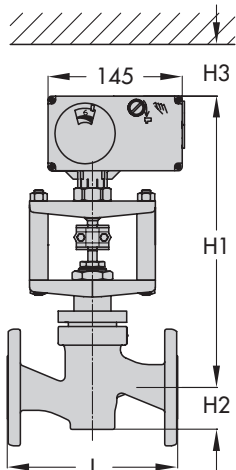


Type 3321-IP, valve CLOSED
DN 15 to DN 20

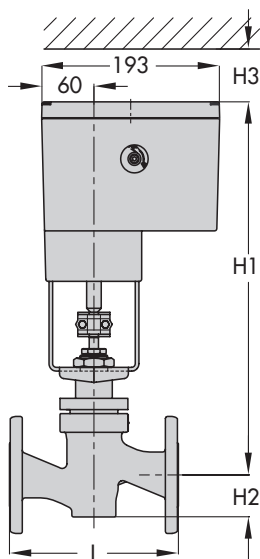
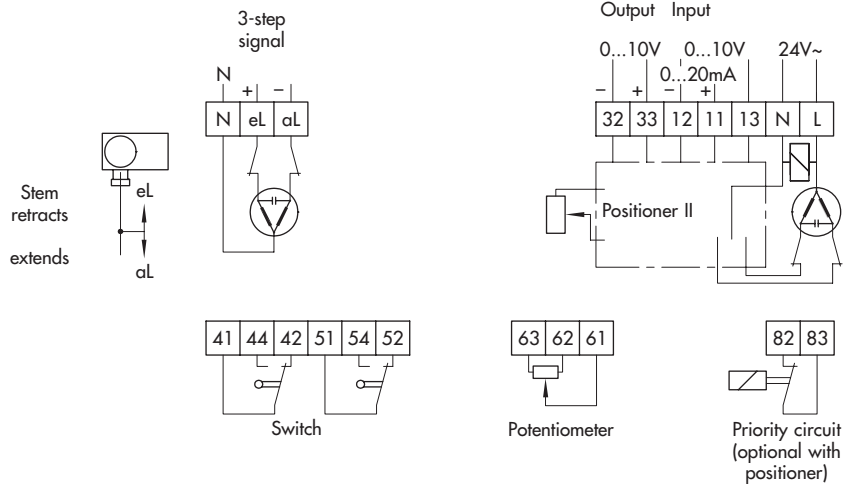
Type 3321-PP, valve OPEN
DN 15 to DN 50

Type 3321-PP
DN 15 to DN 50

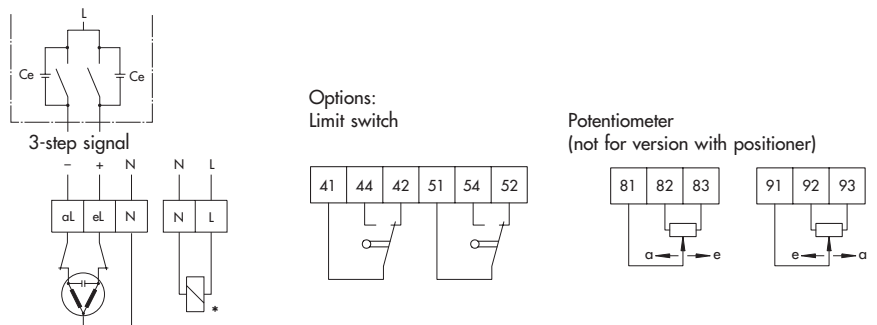
Type 3321-IP/-PP
DN 65 to DN 100



Type 3321-E1

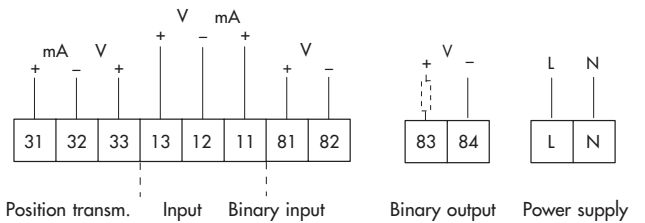


Type 3321-E3



* Magnet for version with fail-safe action

Terminal connections for version with positioner



5. Ordering text

When ordering, please indicate the following details:

Type 3321 Globe Valve

Nominal size and flow rate	DN ...	Kvs ...
Nominal pressure	PN ...	
Body material	Cast iron or cast steel	
Seat/plug sealing	Metal or soft sealing	

Actuators

for **Type 3321-IP**: Electropneumatic actuator

Actuator area 120 or 350 cm²

with integrated positioner 4 to 20 mA
or Type 3730-0 or Type 3730-1 Positioner

optionally

Intrinsically safe Ex II 2 G EEx ia IIC T6 acc. to ATEX

Accessories

Limit switches 1 or 2

for **Type 3321-PP**: Pneumatic actuator

Fail-safe position Valve CLOSED or valve OPEN

Bench range 1.4 to 2.3 bar

Accessories

Limit switches 1 or 2

for **Type 3321-E1**: Electric actuator

Power supply 230 V/50 Hz or 24 V/50 Hz

Accessories

Limit switches 2
Potentiometer 0 to 1000 Ω
Positioner input 4(0) to 20 mA or 0(2) to 10 V

for **Type 3321-E3**: Electric actuator

Fail-safe position Valve CLOSED or valve OPEN

Nominal thrust with safety function 2 kN
without safety function 2.5 kN

Power supply 230 V/50 Hz
24 V/50 Hz
110 V/60 Hz

Accessories

Limit switches 2
Potentiometer 0 to 1000 Ω
Digital positioner
Input and output 4(0) to 20 mA or 0(2) to 10 V

Specifications subject to change without notice.

