

## Series 240

# Type 3241-1 and Type 3241-7 Pneumatic Control Valves

## Type 3241 Globe Valve

DIN version



### Application

Control valve for process engineering and industrial applications

<b>Nominal size</b>	<b>DN 15 to 300</b>
<b>Nominal pressure</b>	<b>PN 10 to 40</b>
<b>Temperatures</b>	<b>-196 to 450 °C</b>



Type 3241 Globe Valve operated with

- Type 3271 Pneumatic Actuator (Type 3241-1 Control Valve) or
- Type 3277 Pneumatic Actuator (Type 3241-7 Control Valve)

Valve body made of

- Cast iron
- Spheroidal graphite iron
- Cast steel, cast stainless steel or cast cold-resisting steel
- Forged steel or forged stainless steel
- Special materials

Undivided valve bonnet up to DN 150

Valve plug

- Metal seal
- Soft seal
- High-performance metal seal

The control valves, designed according to the modular assembly principle, can be equipped with various accessories:

Positioners, limit switches, solenoid valves and other accessories according to IEC 60534-6-1 and NAMUR recommendation. Refer to Information Sheet ▶ T 8350 for more details.

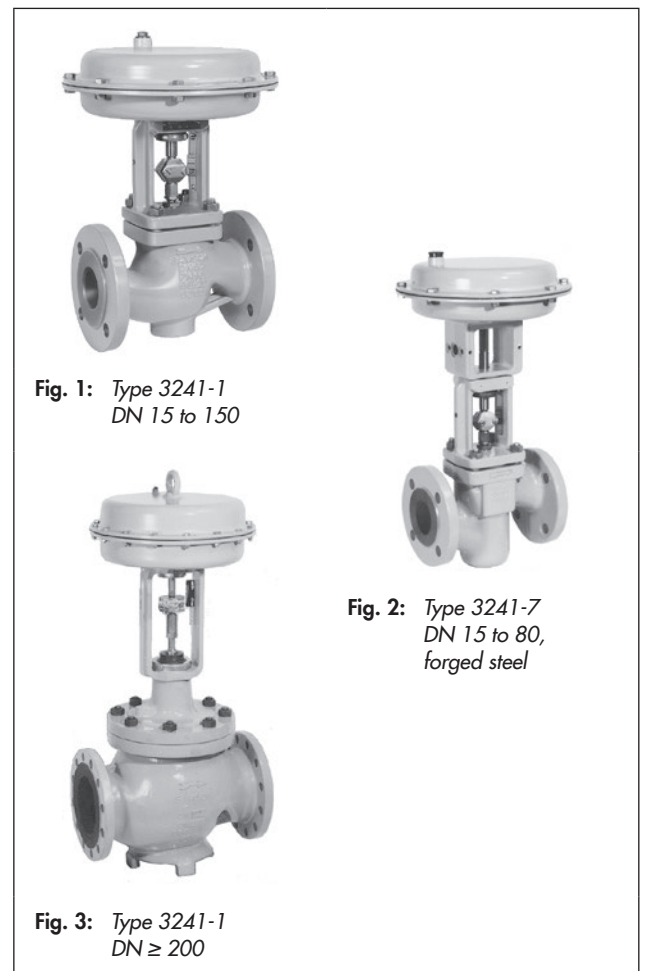
### Versions

Standard version for temperatures ranging from -10 to 220 °C

- **Type 3241-1** (Figs. 1 and 3) · DN 15 to 300 with Type 3271 Pneumatic Actuator (see Data Sheets ▶ T 8310-1, ▶ T 8310-2, ▶ T 8310-3)
- **Type 3241-7** (Fig. 2) · DN 15 to 150 with Type 3277 Pneumatic Actuator for integral positioner attachment (see Data Sheet ▶ T 8310-1)

### Further versions

- **Welding ends**
- **Adjustable packing** · See Information Sheet ▶ T 8000-1
- **Flow divider or AC-1/AC-2 Trim** for noise reduction · See ▶ T 8081 and ▶ T 8082
- **Perforated plug** · See ▶ T 8086
- **Valve plug with pressure balancing** · See Technical data



- **Insulating section or bellows seal** · See Technical data
- **Heating jacket** · On request
- **Stainless steel actuator** · See ▶ T 8310-1
- **Additional handwheel** · See ▶ T 8310-1, ▶ T 8310-2 and ▶ T 8310-3
- **Type 3241 PSA** · Version for pressure swing adsorption plants · See ▶ T 8015-1 and ▶ T 8012-1

- **Typetested version** · For heating systems (see ▶ T 8016) or DIN/DVGW-tested version for gas (see ▶ T 8020)
- **ANSI version** · See ▶ T 8012
- **Versions with dimensions according to Japanese Industry Standard (JIS)** · Details on request

#### Principle of operation

The medium flows through the valve in the direction indicated by the arrow on the body. The valve plug position determines the cross-sectional area between the seat and plug.

#### Fail-safe position

Depending on how the springs are arranged in the pneumatic actuator (see Data Sheets ▶ T 8310-1 and ▶ T 8310-2), the valve has two different fail-safe positions effective upon air supply failure.

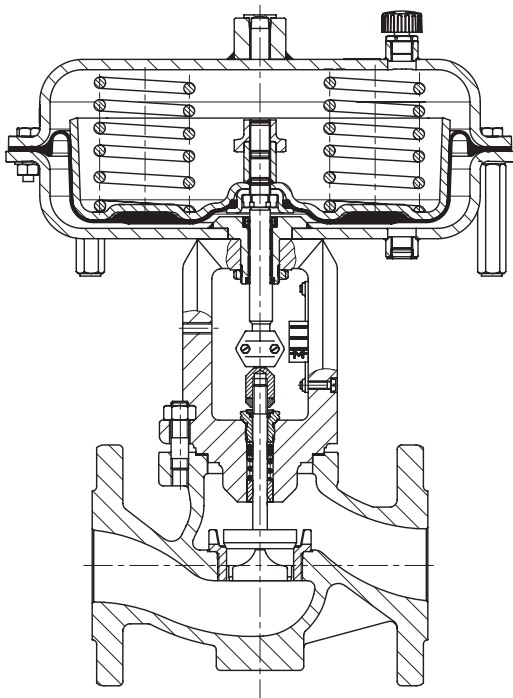
- **Actuator stem extends (fail-close)**  
The valve closes when the supply air fails.
- **Actuator stem retracts (fail-open)**  
The valve opens when the supply air fails.

#### Differential pressures

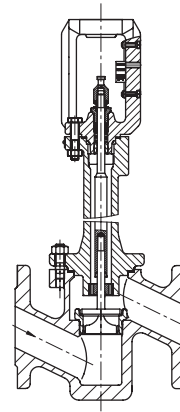
Permissible differential pressures are listed in Information Sheet ▶ T 8000-4.

#### Note

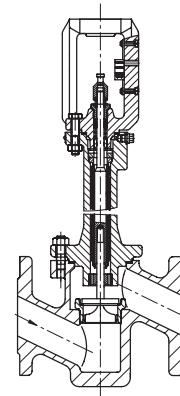
Fig. 4 to Fig. 7 show configuration examples.



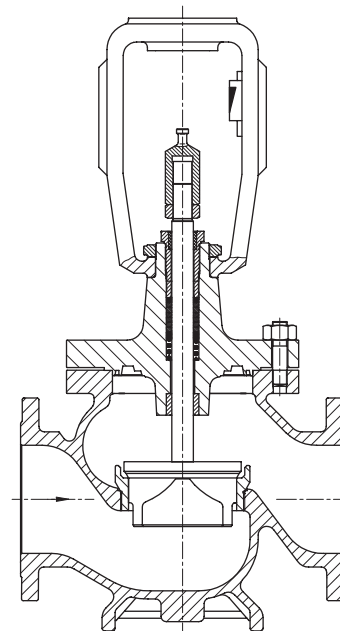
**Fig. 4:** Type 3241-1 Control Valve, DN 15 to 150, with Type 3271 Actuator



**Fig. 5:** Type 3241 Valve, forged steel version, DN 15 to 80, with insulating section



**Fig. 6:** Type 3241 Valve, forged steel version, DN 15 to 80, with bellows seal



**Fig. 7:** Type 3241 Valve, DN 200 to 300

**Table 1: Technical data for Type 3241**

Nominal size	DN	15 to 250	15 to 150	15 to 300				15 · 25 · 40 · 50 · 80		
Material		Cast iron EN-GJL-250 (EN-JL1040)	Spheroidal graphite iron EN-GJS- 400-18-LT (EN-JS1049)	Cast steel 1.0619	Cast stain- less steel 1.4408	Cast steel 1.6220/ 1.1138	Cast stain- less steel 1.4308	Forged steel 1.0460	Forged stainless steel 1.4571	
Nominal pressure	PN	10 · 16	16 · 25	10 · 16 · 25 · 40						
Type of end connection	Flanges	All DIN versions								
	Welding ends	-			DIN EN 12627 only for DN 25, 40, 50, 80, 100, 150, 200, 250, 300				-	
Seat/plug seal		Metal seal · Soft seal · High-performance metal seal								
Characteristic		Equal percentage · Linear (according to Information Sheet ► T 8000-3)								
Rangeability		50:1 for DN 15 to 50 · 30:1 for DN 65 to 150 · 50:1 for DN 200 and larger								
Heating jacket	Up to DN 100	PN 25								
	DN 125 and higher	PN 16								
Compliance		<b>CE · EAC</b>								
<b>Temperature ranges in °C · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet ► T 8000-2)</b>										
<b>Body without insulating section</b>		-10 to 220 °C								
Body with	Insulating section	Short	-10 to 300	-10 to 350	-10 to 400	-50 to 450	-50 to 300	-50 to 300	-10 to 400	-50 to 450
		Long	-			-196 to 450	-	-196 to 300	-	-196 to 450
	Bellows seal	Short	-10 to 300	-10 to 350	-10 to 400	-50 to 450	-50 to 300	-50 to 300	-10 to 400	-50 to 450
		Long	-			-196 to 450	-	-196 to 300	-	-196 to 450
Valve plug	Standard	Metal seal	-196 to 450 °C							
		Soft seal	-196 to 220 °C							
	Balanced	With PTFE ring	-50 to 220 °C · Lower temperatures on request							
		With graphite ring	220 to 450 °C							
Leakage class according to IEC 60534-4										
Valve plug	Metal seal	Standard: IV · High-performance metal seal: V								
	Soft seal	VI								
	Balanced Metal seal	Standard: IV · With PTFE or graphite pressure-balancing ring Special version: V · For high-performance metal seal (only with PTFE balancing ring) on request								

**Table 2: Materials**

Standard version									
Valve body <sup>1)</sup>		Cast iron EN-GJL-250 (EN-JL1040)	Spheroidal graphite iron EN-GJS- 400-18-LT (EN-JS1049)	Cast steel 1.0619	Cast stainless steel 1.4408	Cast steel 1.6220/ 1.1138	Cast stainless steel 1.4308	Forged steel 1.0460	Forged stainless steel 1.4571
Valve bonnet		1.0460/ EN-GJL-250	1.0460/1.0619		1.4408/ 1.4401	1.0566 1.6220	1.4308 1.4301	1.0460	1.4401
Seat <sup>2)</sup>		1.4006/1.4008			1.4404/ 1.4409	1.4006/ 1.4008	1.4301/ 1.4308	1.4006/ 1.4008	1.4404/ 1.4409
Plug <sup>2)</sup>		1.4006 (1.4404)/1.4008			1.4404/ 1.4409	1.4006 (1.4404)/ 1.4008	1.4301/ 1.4308	1.4006 (1.4404)/ 1.4008	1.4404/ 1.4409
Plug seal		Seal ring for soft-seated plug: PTFE with glass fiber							
		Seal ring for balanced plug: PTFE with carbon or graphite ring						-	
Guide bushing		1.4104			1.4571	1.4571	1.4301	1.4104	1.4571
Packing <sup>3)</sup>		V-ring packing: PTFE with carbon · Spring: 1.4310							
Body gasket		Graphite on metal core							
<b>Insulating section</b>		1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
<b>Bellows seal</b>	Intermediate piece	1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
	Metal bellows	1.4571 <sup>4)</sup>					1.4541	1.4571 <sup>4)</sup>	
Heating jacket		-			1.4404				

<sup>1)</sup> Special materials for applications with sea water: 1.4538, duplex 1.4470; nickel-based alloy: 9.4610; other special materials on request.

<sup>2)</sup> All seats and metal-seated plug also with Stellite® facing; for ≤ DN 100 plug up to seat bore 38 made of solid Stellite® available.

<sup>3)</sup> Other packings on request (see ► T 8000-1).

<sup>4)</sup> Other materials on request.

**Table 3:**  $K_{VS}$  coefficients

Terms for control valve sizing according to IEC 60534, Parts 2-1 and 2-2:  $F_L = 0.95$ ,  $X_T = 0.75$

**Table 3.1:** Overview with flow divider ST 1 ( $K_{VS1}$ ), ST 2 ( $K_{VS2}$ ) or ST 3 ( $K_{VS3}$ )

$K_{VS}$	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000 <sup>1)</sup>	1500 <sup>1)</sup>
$K_{VS1}$	-			1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900 <sup>1)</sup>	1350 <sup>1)</sup>	
$K_{VS2}$	-								8	13	20	32	48	63	50	80	125	160	210	200	290	500	800	-
$K_{VS3}$	-								7.5	12	20	30	-	-	47	75	120	-	-	190	270	480	750	-
Seat Ø[mm]	3	6			12			24	31	38	48	63	80	63	80	100	110	130	125	150	200	250	300	
Travel [mm]	15												30					60				120		

<sup>1)</sup> Not available with valve body made of cast iron (EN-GJL-250).

**Table 3.2:** Versions without flow divider · Areas highlighted in gray indicate versions also with pressure balancing

$K_{VS}$	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000	1500
DN																								
15	•	•	•	•	•	•	•																	
20	•	•	•	•	•	•	•	•																
25	•	•	•	•	•	•	•	•	•															
32		•	•	•	•	•	•	•	•	•														
40		•	•	•	•	•	•	•	•	•	•													
50		•	•	•	•	•	•	•	•	•	•	•												
65											•	•	•											
80										•	•	•	•	• <sup>1)</sup>										
100															•	•	•							
125															•	•	•	•						
150															•	•	•		•					
200																•	•			•	•	•		
250																•	•			•	•	•	• <sup>2)</sup>	
300																	•			•	•	•	•	•

<sup>1)</sup> With 19 mm overtravel (not with bellows seal)

<sup>2)</sup> DN 250 with  $K_{VS} = 1000$  not available with valve body made of cast iron (EN-GJL-250).

**Table 3.3:** Versions with flow divider ST 1 ( $K_{VS1}$ ) · Areas highlighted in gray indicate versions also with pressure balancing

$K_{VS1}$	-	1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900	1350	
DN																						
15		•	•	•																		
20		•	•	•																		
25		•	•	•																		
32					•	•	•															
40					•	•	•	•														
50					•	•	•	•	•													
65								•	•	•												
80								•	•	•	•											
100												•	•	•								
125												•	•	•	•							
150												•	•	•		•						
200													•	•			•	•	•			
250													•	•			•	•	•	• <sup>1)</sup>		
300														•			•	•	•	•	•	•

<sup>1)</sup> DN 250 with  $K_{VS1} = 900$  not available with valve body made of cast iron (EN-GJL-250).

**Table 3.1:** Overview with flow divider ST 1 ( $K_{VS1}$ ), ST 2 ( $K_{VS2}$ ) or ST 3 ( $K_{VS3}$ )

$K_{VS}$	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000 <sup>1)</sup>	1500 <sup>1)</sup>
$K_{VS1}$	-			1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900 <sup>1)</sup>	1350 <sup>1)</sup>	
$K_{VS2}$	-								8	13	20	32	48	63	50	80	125	160	210	200	290	500	800	-
$K_{VS3}$	-								7.5	12	20	30	-	-	47	75	120	-	-	190	270	480	750	-
Seat Ø [mm]	3	6		12			24		31	38	48	63	80	63	80	100	110	130	125	150	200	250	300	
Travel [mm]	15												30				60			120				

<sup>1)</sup> Not available with valve body made of cast iron (EN-GJL-250).

**Table 3.4:** Versions with flow divider ST 2 ( $K_{VS2}$ ) · Areas highlighted in gray indicate versions also with pressure balancing

$K_{VS2}$	-								8	13	20	32	48	-	50	80	125	160	210	200	290	500	800	-
DN																								
15																								
20																								
25																								
32								•	•															
40								•	•	•														
50								•	•	•														
65										•	•	•												
80										•	•	•												
100														•	•	•								
125															•	•	•							
150														•	•	•		•						
200															•	•			•	•	•			
250															•	•			•	•	•			
300																•			•	•	•	•		

**Table 3.5:** Versions with flow divider ST 3 ( $K_{VS3}$ ) · Areas highlighted in gray indicate versions also with pressure balancing

$K_{VS3}$	-								7.5	12	20	30	-	-	47	75	120	-	-	190	270	480	750	-
DN																								
15																								
20																								
25																								
32																								
40																								
50								• <sup>1)</sup>																
65									•	•	•													
80									•	•	•													
100														•										
125															•									
150														•	•	•								
200															•	•			•	•	•			
250														•	•	•			•	•	•	•		
300																•			•	•	•	•	•	

<sup>1)</sup> Not with bellows seal or insulating section

**Table 4:** Dimensions in mm for standard version of Type 3241-1 and Type 3241-7 with flanges or welding ends**Table 4.1:** Dimensions for Type 3241 Valve up to DN 150 · Without actuator

Valve	DN	15	20	25	32	40	50	65	80	100	125	150	
Length L	mm	130	150	160	180	200	230	290	310	350	400	480	
H1 for actuator	≤ 750v2 cm <sup>2</sup>	222			223			262		354	363	390	
	1000 cm <sup>2</sup> 1400-60 cm <sup>2</sup>	-									413	423	450
	1400-120 cm <sup>2</sup> 2800 cm <sup>2</sup>	-											
H2 for	Cast steel	44			72			98		118	144	175	
	Forged steel	53	-	70	-	92	98	-	128	-			

**Table 4.2:** Dimensions for Type 3241 Valve, DN 200 and higher · Without actuator

Valve	DN	200	250/cast iron	250 up to 200 mm seat bore	250 seat bore 250 mm and larger	300
Length L	mm	600	730	730	730	850
H4	mm	390	390	451	451	652
H8 <sup>1)</sup> for actuator	1000 cm <sup>2</sup>	418	418	418	503	503
	1400-60 cm <sup>2</sup>					
	1400-120 cm <sup>2</sup>	503	503	503	650	650
	2800 cm <sup>2</sup>					
H2	mm	245	270	310	310	370

<sup>1)</sup> Add 170 mm to H8 for valves with K<sub>V5</sub> 250, 360 or 630 and 60 mm rated travel operating with overtravel.

**Table 4.3:** Dimensions in mm for Type 3271 and Type 3277 Pneumatic Actuators

Actuator area	cm <sup>2</sup>	120	175v2	240	350	355v2	700	750v2	1000	1400-60	1400-120	2800
Diaphragm ØD	mm	168	215	240	280	280	390	394	462	530	534	770
H <sup>1)</sup>	mm	69	78	62	82	121	199	236	403	333	490 <sup>3)</sup> / 580 <sup>4)</sup>	630 <sup>3)</sup> / 695 <sup>4)</sup>
H3 <sup>2)</sup>	mm	110	110	110	110	110	190	190	610	610	650	650
H5	Type 3277 mm	88	101	101	101	101	101	101	-	-	-	-
Thread	Type 3271	M30 x 1.5							M60 x 1.5		M100 x 2	
	Type 3277	M30 x 1.5							-	-	-	-
α	Type 3271	G 1/8 (1/8 NPT)	G 1/4 (1/4 NPT)	G 1/4 (1/4 NPT)	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/8 (3/8 NPT)	G 3/4 (3/4 NPT)	G 3/4 (3/4 NPT)	G 1 (1 NPT)	G 1 (1 NPT)
α2	Type 3277	-	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	G 3/8	-	-	-	-

<sup>1)</sup> Height with welded-on lifting eyelet or height of eyebolt according to DIN 580. Height of the swivel lifting hook may differ. Actuators up to 355v2 cm<sup>2</sup> without lifting eyelet

<sup>2)</sup> Minimum clearance required to remove the actuator

<sup>3)</sup> Height for version with welded-on lifting eyelet (material EN-JS1030)

<sup>4)</sup> Height for version with female thread (material 1.5638/A352 LC3)

**Table 4.4:** Weights in kg for standard version of Type 3241-1 and Type 3241-7

Valve	DN	15	20	25	32	40	50	65	80	100	125	150	200	250 cast iron	250 -60/-120	300
Weight without actuator in kg		6	7.5	8	12	14	18	29	34	52	81	108	430	468	858	920

Actuator	cm <sup>2</sup>	120	175v2	240	350	355v2	700	750v2	1000	1400-60	1400-120	2800
Type 3271 Actuator	Without hand-wheel	2.5	6	5	8	15	22	36	80	70	175	450
	Handwheel ≤ 80 mm travel	4	10	9	13	20	27	41	180	175	300	575
	Handwheel ≤ 160 mm travel	-									425	700
Type 3277 Actuator	Without hand-wheel	3.2	10	9	12	19	26	40	-			
	Handwheel	4.5	14	13	17	24	31	45	-			

**Table 5:** Dimensions and weights for Type 3241 with insulating section or bellows seal · Without actuator**Table 5.1:** Type 3241 Valve, up to DN 150 · Without actuator

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150	
Insulating section/bellows seal													
H4 for actuator	≤ 750v2 cm <sup>2</sup>	Short	409			410		451		636	645	672	
		Long	713			714		755		877	886	913	
	1000 cm <sup>2</sup> / 1400-60 cm <sup>2</sup>	Short	-							695	705	732	
		Long	-							936	946	973	
	1400-120 cm <sup>2</sup> / 2800 cm <sup>2</sup>	Short	-										
		Long	-										
Weight in kg	Short with bellows	9	10.5	11	18	20	24	37	42	70	106	138	
	Long with bellows	13	14.5	15	22	24	28	41	46	78	114	146	

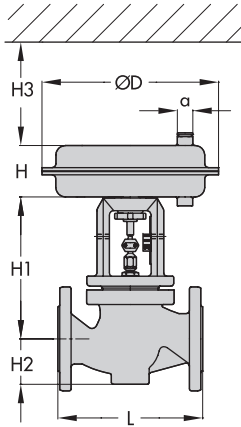
**Table 5.2:** Dimensions and weights for Type 3241 Valve, DN 200 and larger · Without actuator

Version with		Insulating section				Metal bellows					
Valve DN (travel)	mm	200	250 (cast iron)	250 up to 200 mm seat bore	250 250 mm seat bore	300	200	250 (cast iron)	250 up to 200 mm seat bore	250 250 mm seat bore	300
Height H4	mm	830	830	1065	1065	1150	1036	1036	1492	1492	1520
H8 for actuator	1000 cm <sup>2</sup>	418	418	418	503	503	418	418	418	503	503
	1400-60 cm <sup>2</sup>										
	1400-120 cm <sup>2</sup>	503	503	503	650	650	503	503	503	650	650
2800 cm <sup>2</sup>											
Weight	approx. kg	478	928			963	520	975			1010

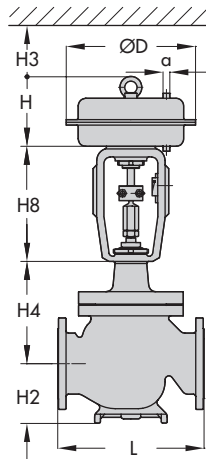
**Table 6:** Dimensions in mm for Type 3241 with heating jacket · Not for valves with body materials EN-GJL-250 or EN-GJS-400-18-LT

Nominal size	DN	25	40/50	80	100	150	200 to 300
a	mm	110	140	180	200	265	On request
b	mm	15	20	35	50	80	
c	mm	140	170	215	255	130	
d	mm	190	190	230	320	355	

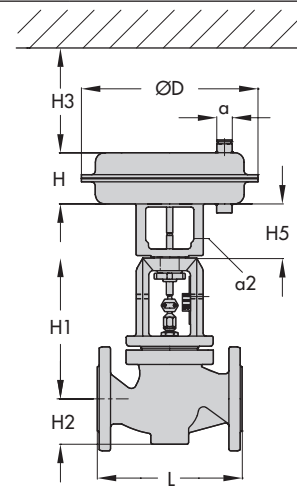
## Dimensional drawings



Type 3241-1 · DN 15 to 150

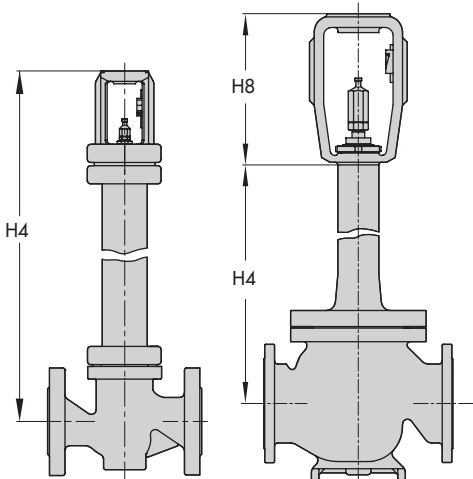


Type 3241-1 · DN 200 to 300



Type 3241-7 · DN 15 to 150

### Type 3241 with insulating section or bellows seal

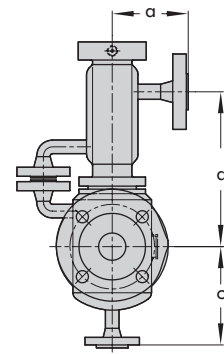
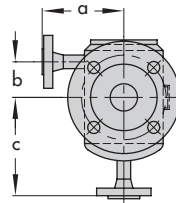
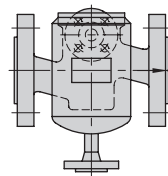


DN 15 to 150

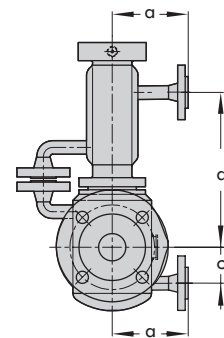
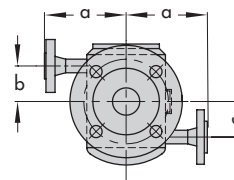
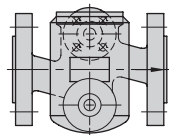
DN 200 to 300

### Type 3241 with heating jacket

DN 25 to 100



DN 150 to 300



Flanges, DIN 2635

Bellows seal version with heating jacket

## Ordering text

Globe valve	Type 3241, DN ..., PN ...
Body material	According to Table 2
Type of end connection	Flanges or welding ends
Seat and plug	Metal seal/soft seal/ high-performance metal seal
Characteristic	Equal percentage or linear
Pneumatic actuator	Type 3271 or Type 3277
Fail-safe position	Fail-close or fail-open

Process medium

Max. flow rate

Pressure

Accessories

Density and temperature

in kg/h oder m<sup>3</sup>/h

p<sub>1</sub> and p<sub>2</sub> in bar (absolute pressure)

Positioner/limit switch

Specifications subject to change without notice



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