Series 240

Pneumatic Control Valve Type 3241-1 and Type 3241-7
Globe Valve Type 3241

Application
Control valve for process engineering and industrial applications

Nominal size	**DN 15 to DN 300**
Nominal pressure	**PN 10 to PN 40**
Temperatures	**–196 to 450 °C**

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 with:
- Metal sealing
- Soft sealing

The modular design of the control valves allows them to be equipped with various accessories:
Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation. See Information Sheet T 8350 EN for 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 T 8310-1/-2 EN)
– **Type 3241-7** (Fig. 2) · DN 15 to 150
with Type 3277 Pneumatic Actuator for integral positioner attachment (see T 8310-1 EN)

Additional versions with:
– **Welding ends**
– **Adjustable packing** · See Information Sheet T 8000-1 EN
– **Flow divider or AC-1/AC-2 Trim** for noise reduction · See Data Sheets T 8081 EN and T 8082 EN
– **Perforated plug** · On request
– **Valve plug with pressure balancing** · See Technical data
– **Extension bonnet or bellows seal** · See Technical data
– **Heating jacket** · On request
– **Stainless steel actuator** · See T 8310-1 EN
– **Additional handwheel** · See Data Sheet T 8310-1/-2 EN

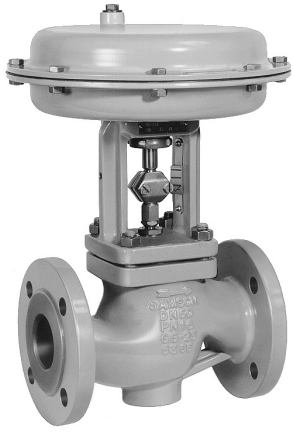


Fig. 1 · Type 3241-1
DN 15 to 150

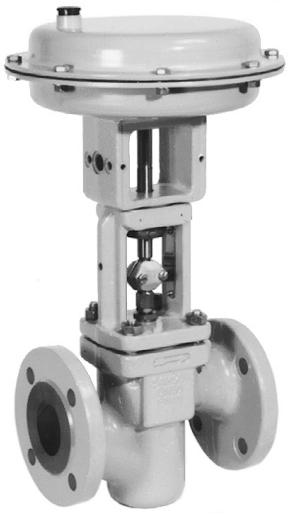


Fig. 2 · Type 3241-7
DN 15 to 80,
forged steel

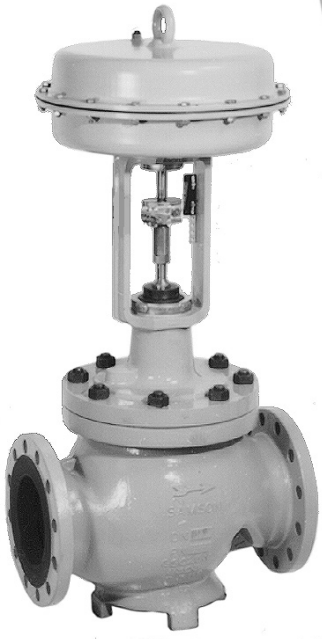


Fig. 3 · Type 3241-1
≥ DN 200

Associated Information Sheets **T 8000-x EN**
Associated Data Sheets for Pneumatic Actuators **T 8310-1/-2 EN**

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Data Sheet **T 8015 EN**

– **Type 3241 DWA** · Version for PSA plants (pressure swing adsorption) · See T 8012-1 EN and T 8015-1 EN
– **Typetested version** · For application in heating systems (see Data Sheet T 8016 EN), DIN/DVGW-tested version for gas (see Data Sheet T 8020 EN), liquid fuels and liquefied petroleum gas in the liquid phase (see Data Sheet T 8022 EN)
– **ANSI version** · See Data Sheet T 8012 EN
– **Versions with dimensions according to Japanese Industry Standard (JIS)** · Details on request

Principle of operation

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

Fail-safe positions

Depending on how the compression springs are arranged in the actuator (see Data Sheets T 8310-1 EN and T 8310-2 EN for details), the control valve has two different fail-safe positions which become effective upon supply air failure:

Actuator stem extends (FA)
The actuator springs close the valve when the supply air fails.

Actuator stem retracts (FE)
The actuator springs open the valve when the supply air fails.

Differential pressures

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

Note

Figs. 4 to 6 show configuration examples.

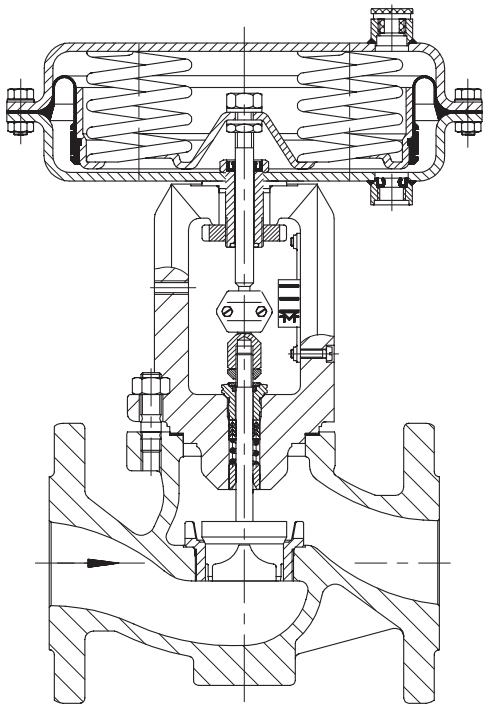


Fig. 4 · Type 3241-1 Control Valve
DN 15 to 150 with Type 3271 Pneumatic Actuator

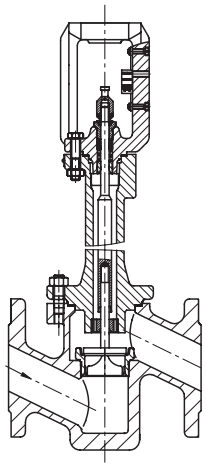


Fig. 5 · Type 3241 Valve, forged steel version
DN 15 to 80 with extension bonnet

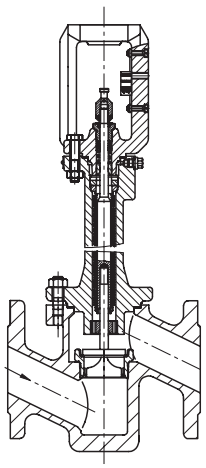


Fig. 6 · Type 3241 Valve, forged steel version
DN 15 to 80 with metal bellows seal

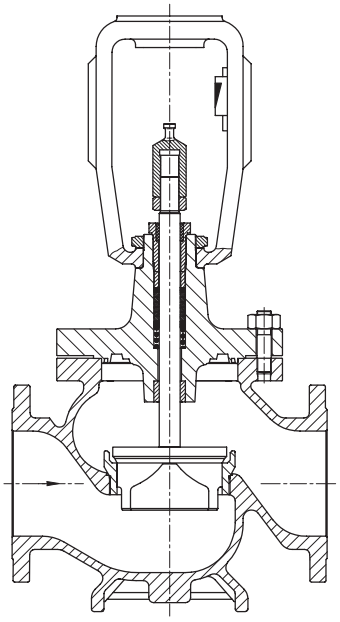


Fig. 7 · Type 3241 Control Valve, DN 200 to 300

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-JL1040	Sph. graphite iron EN-JS1049	Cast steel 1.0619	Stainless cast steel 1.4408	Cast steel 1.6220	Stainless cast steel 1.4308	Forged steel 1.0460	Stainless forged steel 1.4571
Nominal pressure	PN	10 · 16	16 · 25	10 · 16 · 25 · 40					
End connections	Flanges	All DIN versions							
	Welding ends	–		DIN EN 12627 Fig. 2 only for DN 25, 40, 50, 80, 100, 150, 200, 250, 300				–	
Seat/plug sealing		Metal sealing · Soft sealing · High-performance metal sealing							
Characteristic		Equal percentage · Linear							
Rangeability		50 : 1 for DN 15 to 50 · 30 : 1 for DN 65 to 150 · 50 : 1 for DN 200 and higher							
Heating jacket	Up to DN 100	PN 25							
	≥ DN 125	PN 16							

Temperature ranges in °C · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet T 8000-2 EN)

Body without extension bonnet			**–10 to 220 °C**							
Body with	Extension bonnet	Short	–10…300 °C	–10…350 °C	–10…400 °C[1]	–50…450 °C	–50…300 °C	–50…300 °C	–10…400 °C[1]	–50…450 °C
		Long	–			–196…450 °C	–	–196…300°C	–	–196…450 °C
	Bellows seal	Short	–10…300 °C	–10…350 °C	–10…400 °C[1]	–50…450 °C	–50…300 °C	–50…300 °C	–10…400 °C[1]	–50…450 °C
		Long	–			–196…450 °C	–	–196…300 °C	–	–196…450 °C
Valve plug	Standard	Metal sealing	–196 to 450 °C							
		Soft sealing	–196 to 220 °C							
	Balanced	with PTFE ring	–50 to 220 °C · Lower temperatures on request							
		w. graphite ring	220 to 450 °C							

Leakage class according to IEC 60534-4

Valve plug		Metal sealing	Standard: IV · High-performance metal sealing: V
		Soft sealing	VI
	Balanced	Metal sealing	Standard: IV · With PTFE or graphite pressure-balancing ring V · High-performance metal sealing: (only with PTFE balancing ring) on request

[1] Down to –50 °C at $p_{max} \leq 75$ % PN (acc. to AD W10)

Table 2 · Materials

Standard version								
Valve body [1]	Cast iron EN-JL1040	Sph. graphite iron EN-JS1049	Cast steel 1.0619	Stainless cast steel 1.4408	Cast steel 1.6220	Stainless cast steel 1.4308	Forged steel 1.0460	Stainless forged steel 1.4571
Valve bonnet	1.0460/ EN-JL1040	1.0460/1.0619		1.4408/ 1.4401	1.0566 1.6220	1.4308 1.4301	1.0460	1.4401
Seat [2]	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 [2]	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 sealing	Sealing ring for soft sealing: PTFE with glass fiber							
	Sealing 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 [3]	V-ring packing PTFE with carbon · Spring: 1.4310							
Body gasket	Metal/graphite							
Extension bonnet	1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
Bellows seal								
Intermediate piece	1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
Metal bellows	1.4571 [4]					1.4541	1.4571 [4]	
Heating jacket	–	1.4404						

[1] Special materials for applications with sea water: 1.4538, duplex 1.4470; nickel-based alloy: 9.4610; other special materials on request.
[2] All seats and metal-seated plug also with Stellite facing; for ≤ DN 100 plug up to seat bore 38 made of solid Stellite available.
[3] Other packings on request (refer to T 8000-1 EN)
[4] Other materials on request

Table 3 · K_{VS} coefficients

Table 3a · Overview (with Flow Divider St I (K_{VS} I), St II (K_{VS} II) or St III (K_{VS} III))

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 *
K_{VS}I	–				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 *
K_{VS}II	–								8	13	20	32	48	63	50	80	125	160	210	200	290	500	800	–
K_{VS}III	–								7.5	–	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	

* Not available with valve body made of cast iron (EN-JL1040)

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

Table 3b · 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											•	•	•				With 19 mm overtravel (not with bellows seal)							
80											•	•	•	•		•								
100															•	•	•							
125																•	•	•						
150															•	•	•		•					
200																•	•			•	•	•		
250																•	•			•	•	•	•*	
300																	•			•	•	•	•	•

Table 3c · Versions with Flow Divider St I (K_{VS} I) · Areas highlighted in gray indicate versions also with pressure balancing

K_{VS} I	–	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																	•	•	•	•*	
300																	•	•	•	•	•

* DN 250 with K_{VS}I = 900 not available with valve body made of cast iron (EN-JL1040)

Table 3d · Versions with Flow Divider St II (K_{VS} II) · Areas highlighted in gray indicate versions also with pressure balancing

K_{VS} II	–								8	13	20	32	48	–	50	80	125	160	210	200	290	500	800	1200
DN																								
15																								
20																								
25																								
32									•	•														
40									•	•	•													
50									•	•	•													
65											•	•	•											
80											•	•	•											
100															•	•	•							
125																•	•							
150															•	•	•		•					
200																•	•			•	•			
250																•	•			•	•	•		
300																	•			•	•	•	•	

Table 3e · Versions with Flow Divider St III (K_{VS} III) · Areas highlighted in gray indicate versions also with pressure balancing

K_{VS} III	–								7.5	–	20	30	–	–	47	75	120	–	–	190	270	480	750	–
DN																								
15																								
20																								
25																								
32																								
40																								
50									•[1]															
65											•	•												
80											•	•												
100															•									
125																•								
150															•	•	•							
200																•	•			•	•			
250															•	•	•			•	•	•		
300																	•			•	•	•	•	

[1] Not with bellows seal

Table 4 · Dimensions in mm for standard version of Type 3241-1 and Type 3241-7 with flanges or welding ends

Valve	DN	15	20	25	32	40	50	65	80	100	125	150	200	250 cast iron	250-60 [1]	250-120 [1]	300
Length L	mm	130	150	160	180	200	230	290	310	350	400	480	600	730	730	730	850
H1 [2] for actuators	≤ 700 cm²	220						260		350	363	390	–				
	1400-60 cm²	–											815	815	870	–	1185
	1400-120 cm²	–											902	902	955	1104	1334
	2800 cm²	–											902	902	955	1104	1334 [2]
H2 for	Cast steel	44			72			98		118	144 [3]	175	245	260	270	310	350
	Forged steel	53	–	70	–	92	98	–	128	–							

1) Valve in DN 250-60 with 60 mm valve travel; DN 250-120 with 120 mm valve travel, not in cast iron
2) H1 increases by 170 mm for valves with K_{VS} 250, 360 or 630 and 60 mm rated travel operating with overtravel.
3) Version in PN 10/16: 148 mm

Actuator	cm²	120	240	350	700	1400-60	1400-120	2800
Diaphragm ∅ D	mm	168	240	280	390	530	534	770
H (700 cm² and larger inc. lifting ring)		70	62	82	200	287	490	630
H3 [1]	Type 3271	110			190	610	650	
	Type 3277					–		
H5	Type 3277	88	101			–		
Thread	Type 3271	M30x1.5				M60x1.5	M100x2	
	Type 3277					–		
a	Type 3271	G ¼ (¼ NPT)		G ⅜ (⅜ NPT)		G ¾ (¾ NPT)	G 1 (1 NPT)	
a2	Type 3277	–	G ⅜ (⅜ NPT)			–		

1) Minimum clearance required to remove the actuator

Table 5 · 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		5	6	7	11	12	15	24	30	42	80	120	396	468	608	872

Actuator	cm²	120	240	350	700	1400-60	1400-120	2800
Type 3271	Without handwheel	3	5	8	22	70	175	450
	W. handwheel ≤ 80 mm travel	–	9	13	27	175	300	575
	W. handwheel ≤ 160 mm travel	–					425	700
Type 3277	Without handwheel	5	9	12	26	–		
	With handwheel	–	13	17	31			

Table 6a · Dimensions and weights for Type 3241 with extension bonnet or bellows seal DN 15 to 150 - without actuator

Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150
Height H4	Short ext. bonnet or bellows seal	408			408			450		635	644	671
	Long ext. bonnet or bellows seal	710			712			754		883	885	912
Weight in kg	Short/with bellows	8	9	10	17	18	21	32	38	60	105	150
	Long/long with bellows	12	13	14	21	22	25	26	42	68	113	158

Table 6b · Dimensions and weights for Type 3241 with extension bonnet or bellows seal DN 200 to 300 - without actuator

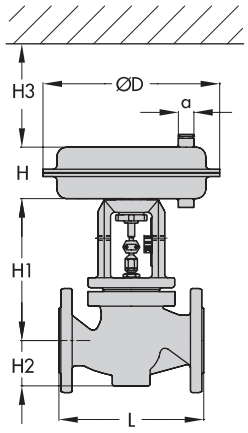
Version with		Extension bonnet			Bellows seal		
Actuator	cm^2	1400-60	1400-120	2800	1400-60	1400-120	2800
Height H4 in mm	DN 200	1260 [1]	1345 [1]		1467 [1]	1552 [1]	
	DN 250 60 mm	1494	1579	1579	1924	2009	2009
	DN 250 Travel = 120 mm	–	1728	1728	–	2158	2158
	DN 300	1683	1832		2055	2203	
Weight in kg	DN 200	440			485		
	DN 250 [2]	666			711		
	DN 300	950			1020		

1) Also for DN 250 in cast iron (EN-JL1040)
2) For cast iron (EN-JL1040) minus 140 kg

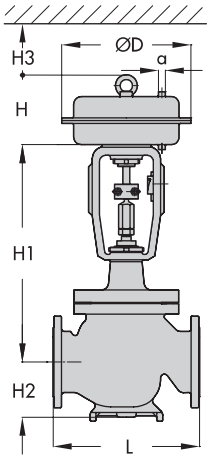
Table 6c · Dimensions in mm for Type 3241 with heating jacket - Not for valves with body materials EN-JL1040 or EN-JS1049

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

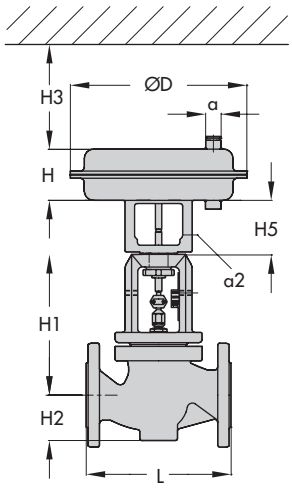
Dimensions in mm



Type 3241-1 · DN 15 to 150

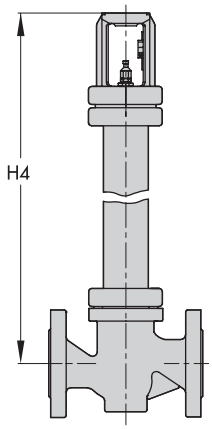


Type 3241-1 · DN 200 to 300

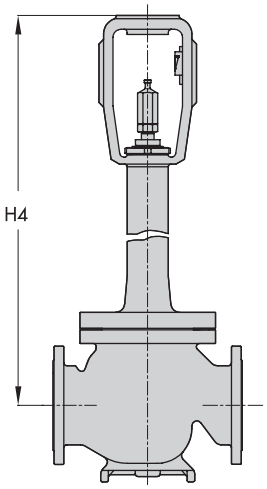


Type 3241-7 · DN 15 to 150

Type 3241 with extension bonnet or metal bellows seal

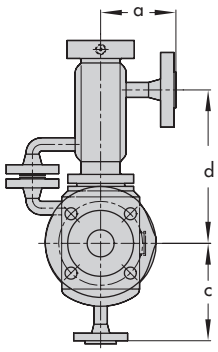


DN 15 to 150

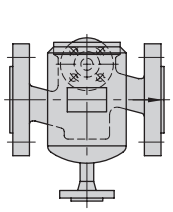


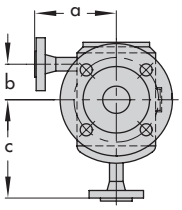
DN 200 to 300

Type 3241 with heating jacket



Bellows seal version with heating jacket





Flange DN 15 or 25, PN 25, DIN 2635

Ordering text

Globe valve	Type 3241, DN … PN …
Valve body material	According to Table 2
End connections	Flanges or welding ends
Seat and plug	Metal sealing/soft sealing/ high-performance metal sealing
Characteristic	Equal percentage or linear
Pneumatic actuator	Type 3271 or Type 3277
Fail-safe position	Valve CLOSED or OPEN
Process medium	Density and temperature
Maximum flow rate	in kg/h or m^3/h
Pressure	p_1 and p_2 in bar (absolute pressure)
Accessories	Positioner and/or limit switch

Specifications subject to change without notice.

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