DATA SHEET

T 8012-2 EN

Series 240 · Type 3241-1 and Type 3241-7 Pneumatic Control Valves
Type 3241 Globe Valve

JIS version

Application

Control valve for process engineering and industrial applications

Valve size	**DN 15A to 150A**
Pressure rating	**JIS 10K and 20K**
Temperatures	**–196 to +425 °C**

Special features

Type 3241 Globe Valve operated with

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

Valve body made of

- Cast 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 150A

Valve plug

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

Optional with RFID tags with unique identification according to DIN SPEC 91406.

The control valves with their modular design can be equipped with various accessories:

Positioners, limit switches, solenoid valves and other accessories according to IEC 60534-6-1 [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** (Fig. 1) · DN 15A to 150A with Type 3271 Pneumatic Actuator (see Data Sheet ▶ T 8310-1)

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

[1] Accessories required. See associated actuator documentation.

Fig. 1: *Type 3241-1, DN 15A to 150A*

Fig. 2: *Type 3241-7, DN 15A to 150A*

Fig. 3: *Type 3241-7, DN 15A to 150A, forged steel*

Further versions:

– **Adjustable packing** · See Information Sheet ▶ T 8000-1

– **Flow divider or AC-1** for noise reduction · See Data Sheets ▶ T 8081 and ▶ T 8082

– **Valve plug with pressure balancing** · See Technical data

– **Insulating section or bellows seal** · See Technical data

– Heating jacket · On request

– **Stainless steel actuator** · See Data Sheet ▶ T 8310-1

– **Additional handwheel** · See Data Sheet ▶ T 8310-1

– **Type 3241 PSA** · Version for pressure swing adsorption plants · See Data Sheets ▶ T 8015-1 and ▶ T 8012-1

SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507 · samson@samsongroup.com · www.samsongroup.com

Edition July 2021

- **DIN version** · See Data Sheet ▶ T 8015
- **ANSI version** · See Data Sheet ▶ T 8012
- **Special version** in NPS ½B to 6B · On request
- Version with **Type 3271 Actuator with 1000 or 1400-60 cm²** actuator area (see Data Sheets ▶ T 8310-2 and ▶ T 8310-3) · On request

Design and principle of operation

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

Depending on how the springs are arranged in the pneumatic actuator (▶ T 8310-1), the 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. 4 and Fig. 5 show configuration examples.

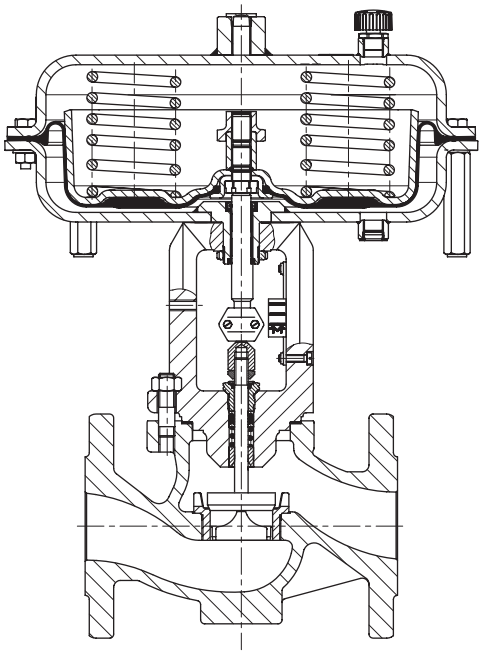


Fig. 4: *Type 3241-1 Control Valve, DN 15A to 150A, with Type 3271 Actuator*

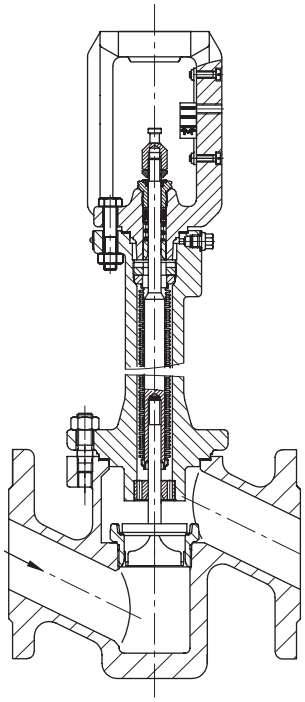


Fig. 5: *Type 3241 Valve, forged steel version, DN 15A to 80A, with bellows seal*

Table 1: *Technical data for Type 3241*

Valve size **DN**		**15A to 150A**				**15A · 25A · 40A · 50A · 80A** [1]	
Material		Cast iron FC 250	Cast steel A216 WCC	Cast stainless steel A351 CF8M	Cast steel A352 LCC	Forged steel A105	Forged stainless steel A182 F316
Pressure rating	JIS	10K	10K · 20K			20K	
Type of connection	Flanges	FF	RF [2]			RF [2]	
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 15A to 50A · 30:1 for DN 50A and larger					

Valve size DN			**15A to 150A**				**15A · 25A · 40A · 50A · 80A** [1]	
Material			Cast iron FC 250	Cast steel A216 WCC	Cast stainless steel A351 CF8M	Cast steel A352 LCC	Forged steel A105	Forged stainless steel A182 F316
RFID tag (optional)			Application range according to the technical specifications and the explosion protection certificates. Documents ▶ *www.samsongroup.com > Service & Support > Electronic nameplate*					
Temperature ranges in °C · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet ▶ T 8000-2)								
Body without insulating section			–10…+220					
Body with	Insulating section	Short	–29…+220	–29 to +425	–50 to +425	–29 to +425	–29 to +425	–50 to +425
		Long	–	–	–196 to +425	–	–	–196 to +425
	Bellows seal	Short	–29 to +220	–29 to +425	–50 to +425	–29 to +425	–29 to +425	–50 to +425
		Long	–	–	–196 to +425	–	–	–196 to +425
Valve plug	Standard	Metal seal	–196 to +425					
		Soft seal	–196 to +220					
	Balanced	With PTFE ring	–50 to +220 · Lower temperatures on request					
		With graphite ring	10 to 425					
RFID tag (optional)			Max. permissible temperature at the RFID tag: 185 °F (85 °C)					
Leakage class according to IEC 60534-4								
Valve plug	Standard	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 (only with PTFE balancing ring) on request					

1) DN 80A only available in forged steel A105
2) Optional versions (on request)

Table 2: *Materials*

Standard version							
Valve body [1]		Cast iron FC 250	Cast steel A216 WCC	Cast stainless steel A351 CF8M	Cast steel A352 LCC	Forged steel A105	Forged stainless steel A182 F316
Valve bonnet		A105/FC 250	A105/ A216 WCC	A182 F316 A351 CF8M A182 F316L	A350 LF2 A352 LCC	A105	A182 F316 A182 F316L
Seat [2]		Cr steel UNS S41000/ 1.4008		A182 F316L/ A351 CF3M	Cr steel UNS S41000/ 1.4008	Cr steel UNS S41000/ 1.4008	A182 F316L/ A351 CF3M
Plug [2]		Cr steel UNS S41000 (A182 F316L)/ 1.4008		A182 F316L/ A351 CF3M	Cr steel UNS S41000/ 1.4008	Cr steel UNS S41000 (A182 F316L)/ 1.4008	A182 F316L/ A351 CF3M
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		A582 430F		316L A182 F316L	316L A182 F316L	A582 430F	316L A182 F316L
Packing [3]		V-ring packing with carbon · Spring: A479 302					
Body gasket		Graphite on metal core					
Insulating section		A105		A182 F316 A182 F316L	A350 LF2	A105	A182 F316 A182 F316L
Metal bellows seal	Intermediate piece	A105		A182 F316 A182 F316L	A350 LF2	A105	A182 F316 A182 F316L
	Metal bellows	1.4571 [4]				1.4571	
Heating jacket		–					

1) Special materials for applications with seawater: N 08904, duplex A995 4A; nickel-based alloy: A494 LW-21M; other special materials on request.
2) Seats and metal-seated plug also with Stellite® facing; for ≤DN 100A plug up to seat bore 38 made of solid Stellite® available.
3) Other packings on request (see Information Sheet ▶ T 8000-1)
4) Other materials on request

Table 3: *C_V and K_{VS} coefficients*

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

Conversion of flow coefficients: C_V (US gallons/min.) = 1.17 x K_{VS} (m^3/h) or $K_{VS}/C_V = 0.865$

Table 3.1: *Overview with flow divider ST 1 (C_V-1, K_{VS}-1), ST 2 (C_V-2, K_{VS}-2) or ST 3 (C_V-3, K_{VS}-3)*

C_V	0.12	0.2	0.3	0.5	0.75	1.2	2.0	3.0	5.0	7.5	12	20	30	47	70	95	75	120	190	300
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	260
C_V-1	–						1.7	2.6	4.2	7.0	10.5	17	26	42	62	85	67	105	170	275
K_{VS}-1	–						1.45	2.2	3.6	5.7	9.0	14.5	22	36	54	72	57	90	144	234
C_V-2	–										9.5	15	23	37	56	–	60	95	145	245
K_{VS}-2	–										8.0	13	20	32	48	–	50	80	125	210
C_V-3											9.0	14	23	35	–	–	55	90	140	–
K_{VS}-3	–										7.5	12	20	30	–	–	47	75	120	–
Seat Ø [mm]	3			6			12			24		31	38	48	63	80	63	80	100	130
Travel in mm	15																30			

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

C_V	0.12	0.2	0.3	0.5	0.75	1.2	2.0	3.0	5.0	7.5	12	20	30	47	70	95	75	120	190	300
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	260
DN																				
15A	•	•	•	•	•	•	•	•	•											
20A	•	•	•	•	•	•	•	•	•	•										
25A	•	•	•	•	•	•	•	•	•	•	•									
40A				•	•	•	•	•	•	•	•	•	•							
50A				•	•	•	•	•	•	•	•	•	•	•						
65A													•	•	•					
80A													•	•	•	•		• [1]		
100A																	•	•	•	
150A																	•	•	•	•

[1] With 19 mm overtravel (not with bellows seal)

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

C_V-1	–						1.7	2.6	4.2	7.0	10.5	17	26	42	62	85	67	105	170	275
K_{VS}-1	–						1.45	2.2	3.6	5.7	9.0	14.5	22	36	54	72	57	90	144	234
DN																				
15A							•	•	•											
20A							•	•	•											
25A							•	•	•											
40A										•	•	•	•							
50A										•	•	•	•	•						
65A													•	•	•					
80A													•	•	•	•				
100A																	•	•	•	
150A																	•	•	•	•

Table 3.1: *Overview with flow divider ST 1 (C_V-1, K_{VS}-1), ST 2 (C_V-2, K_{VS}-2) or ST 3 (C_V-3, K_{VS}-3)*

C_V	0.12	0.2	0.3	0.5	0.75	1.2	2.0	3.0	5.0	7.5	12	20	30	47	70	95	75	120	190	300
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	260
C_V-1	–						1.7	2.6	4.2	7.0	10.5	17	26	42	62	85	67	105	170	275
K_{VS}-1	–						1.45	2.2	3.6	5.7	9.0	14.5	22	36	54	72	57	90	144	234
C_V-2	–										9.5	15	23	37	56	–	60	95	145	245
K_{VS}-2	–										8.0	13	20	32	48	–	50	80	125	210
C_V-3											9.0	14	23	35	–	–	55	90	140	–
K_{VS}-3	–										7.5	12	20	30	–	–	47	75	120	–
Seat Ø [mm]	3			6			12			24	31	38	48	63	80		63	80	100	130
Travel in mm	15																30			

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

C_V-2	–										9.5	15	23	37	56	–	60	95	145	245
K_{VS}-2	–										8.0	13	20	32	48	–	50	80	125	210
DN																				
15A																				
20A																				
25A																				
40A											•	•	•							
50A											•	•	•	•						
65A													•	•	•					
80A													•	•	•					
100A																	•	•	•	
150A																	•	•	•	•

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

C_V-3											9.0	14	23	35	–	–	55	90	140	–
K_{VS}-3	–										7.5	12	20	30	–	–	47	75	120	–
DN																				
15A																				
20A																				
25A																				
40A																				
50A											• [1]									
65A												•	•	•						
80A												•	•	•						
100A																	•			
150A																	•	•	•	

[1] Not with bellows seal or insulating section

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

Table 4: *Dimensions for Type 3241-1 and Type 3241-7 Control Valves with flanges · Dimensions in mm*

Table 4.1: *Type 3241 Valve · Without actuator*

Valve		DN	15A	20A	25A	40A	50A	65A	80A	100A	150A
Length L	10K	mm	184	184	184	222	254	276	298	352	451
	20K	mm	190	194	197	235	267	292	318	368	473
H1 for actuator	≤750v2 cm²	mm	222			223		262		354	390
H2 [1] for	Cast steel	mm	44 [2]			72 [2]		98	98 [2]	118	175
	Forged steel	mm	53	–	70	94	100	–	132	–	

1) The H2 dimension is the distance from the middle of the flow path to the bottom of the valve body.
2) The H2 dimension in this valve is not the lowest point of the valve. This valve's lowest point is the bottom of the connecting flanges. The flange dimensions comply with the corresponding flange standard.

Table 4.2: *Type 3241 Valve with insulating section or bellows seal · Without actuator*

Valve		DN	15A	20A	25A	40A	50A	65A	80A	100A	150A
H4 for actuator	≤750v2 cm²	Short insulating section/ bellows seal	409			410		451		636	672
		Long insulating section/ bellows seal	713			714		755		877	913

Table 4.3: *Type 3271 and Type 3277 Pneumatic Actuators*

Actuator area		cm²	120	175v2	240	350	355v2	700	750v2
Diaphragm ØD		mm	168	215	240	280	280	390	394
H [1]		mm	69	78	62	82	121	199	236
H3 [2]		mm	110	110	110	110	110	190	190
H5	Type 3277	mm	88	101	101	101	101	101	101
Thread [3]	Type 3271		M30x1.5						
	Type 3277		M30x1.5						
a	Type 3271		G ⅛ (⅛ NPT)	G ¼ (¼ NPT)	G ¼ (¼ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)
a2	Type 3277		–	G ⅜	G ⅜	G ⅜	G ⅜	G ⅜	G ⅜

1) Height with welded-on lifting eyelet or height of eyebolt according to DIN 580. Height of the swivel hoist may differ. Actuators up to 355v2 cm² without lifting eyelet
2) Minimum clearance required to remove the actuator
3) 120 and 175v2 cm² actuator areas with connection for Type 3510 Micro-flow Valve: M20x1.5 thread

Table 5: *Weights [1] for Type 3241-1 and Type 3241-7 Control Valves with flanges · Weights in kg*

Table 5.1: *Type 3241 Valve · Without actuator*

Valve	DN	15A	20A	25A	40A	50A	65A	80A	100A	150A
Weight	kg	7	8	9	16	20	32	37	62	130

Table 5.2: *Type 3241 Valve with insulating section or bellows seal · Without actuator*

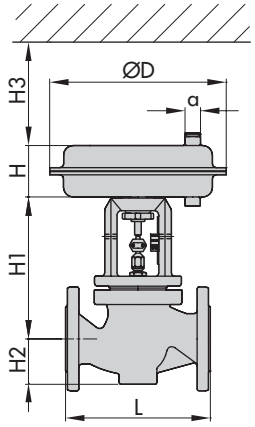
Valve	DN	15A	20A	25A	40A	50A	65A	80A	100A	150A
Weight	Short bellows seal	10	11	12	22	26	40	45	80	160
	Long bellows seal	14	15	16	26	30	44	49	88	168

Table 5.3: *Type 3271 and Type 3277 Pneumatic Actuators*

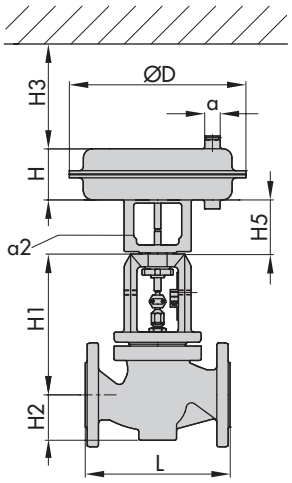
Actuator	cm^2	120	175v2	240	350	355v2	700	750v2
Type 3271	Without handwheel	2.5	6	5	8	15	22	36
	With handwheel	4	10	9	13	20	27	41
Type 3277	Without handwheel	3.2	10	9	12	19	26	40
	With handwheel	4.5	14	13	17	24	31	45

[4] The weights specified apply to a specific standard device configuration. Weights of other device configurations may differ depending on the version (material, trim or number of actuator springs etc.)

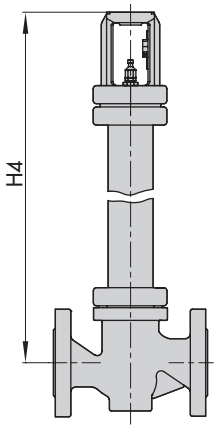
Dimensional drawings



Type 3241-1 · DN 15A to 150A



Type 3241-7 · DN 15A to 150A



Type 3241 · DN 15A to 150A
with insulating section or bellows seal

Ordering text

Globe valve	Type 3241
Valve size	DN …A
Pressure rating	JIS ...K
Body material	Refer to Table 2
Type of connection	Flanges
Seat-plug seal	Soft seal, metal seal or high-performance metal seal
Characteristic	Equal percentage or linear
Process medium	Density and temperature
Max. flow rate	in kg/h or m^3/h
Pressure	p_1 and p_2 in bar (absolute pressure)
Pneumatic actuator	Type 3271 or Type 3277
Fail-safe position	Fail-close or fail-open
Actuator area	… cm^2
RFID tag	Yes/No
Valve accessories	Positioner/limit switch

Associated Data Sheet for Pneumatic actuators: Type 3271 and Type 3277 ▶ T 8310-1

Associated Mounting and Operating Instructions ▶ EB 8012