

## T 8015-1 EN

### Series 240 · Types 3241-1 PSA, -7 PSA, -9 PSA Pneumatic Control Valves

#### Type 3241 PSA Globe Valve

DIN version



#### Application

Control valves for PSA (Pressure Swing Adsorption) plants

<b>Valve sizes</b>	<b>DN 15 to 150</b>
<b>Pressure rating</b>	<b>PN 10 to 40</b>
<b>Medium temperatures</b>	<b>-10 to +150 °C</b>

#### 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) for integral positioner attachment
- Type 3275A Pneumatic Piston Actuator (Type 3241-9 Control Valve)

Valve body made of

- Cast steel
- Cast stainless steel or cast cold-resisting steel
- Forged steel
- Forged stainless steel

Undivided valve bonnet

Valve plug

- 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:

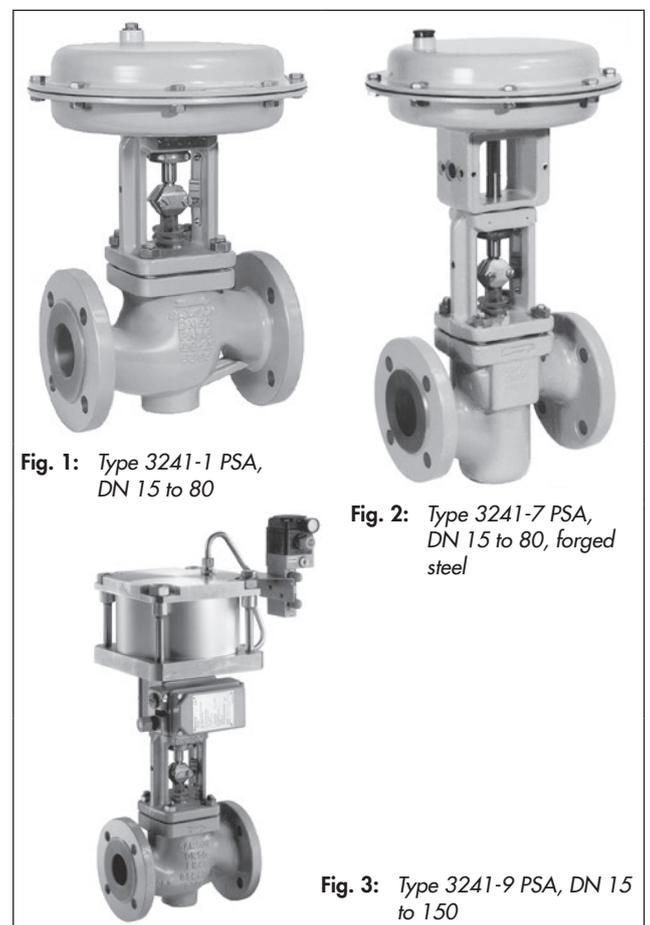
Positioners, solenoid valves and other valve accessories according to IEC 60534-6-1<sup>1)</sup> and NAMUR recommendation. Refer to Information Sheet ▶ T 8350 for more details.

#### Versions

**Standard version** for medium temperatures from -10 to +150 °C

- **Type 3241-1 PSA** (Fig. 1) · DN 15 to 80 with Type 3271 Actuator (see Data Sheet ▶ T 8310-1)
- **Type 3241-7 PSA** (Fig. 2) · DN 15 to 80 with Type 3277 Actuator for integral positioner attachment (see Data Sheet ▶ T 8310-1)
- **Type 3241-9 PSA** (Fig. 3) · DN 15 to 150, with Type 3275A Piston Actuator (see Data Sheet ▶ T 8314-1), for integral attachment of a positioner or limit switch

<sup>1)</sup> Accessories required. See associated actuator documentation.



**Fig. 1:** Type 3241-1 PSA, DN 15 to 80

**Fig. 2:** Type 3241-7 PSA, DN 15 to 80, forged steel

**Fig. 3:** Type 3241-9 PSA, DN 15 to 150

Further versions:

- **Flow divider** · For cast valves for noise reduction in both directions of flow
- **ANSI version** · See Data Sheet ▶ T 8012-1
- **Versions with dimensions according to Japanese Industry Standard (JIS)** · Details on request

## Design and principle of operation

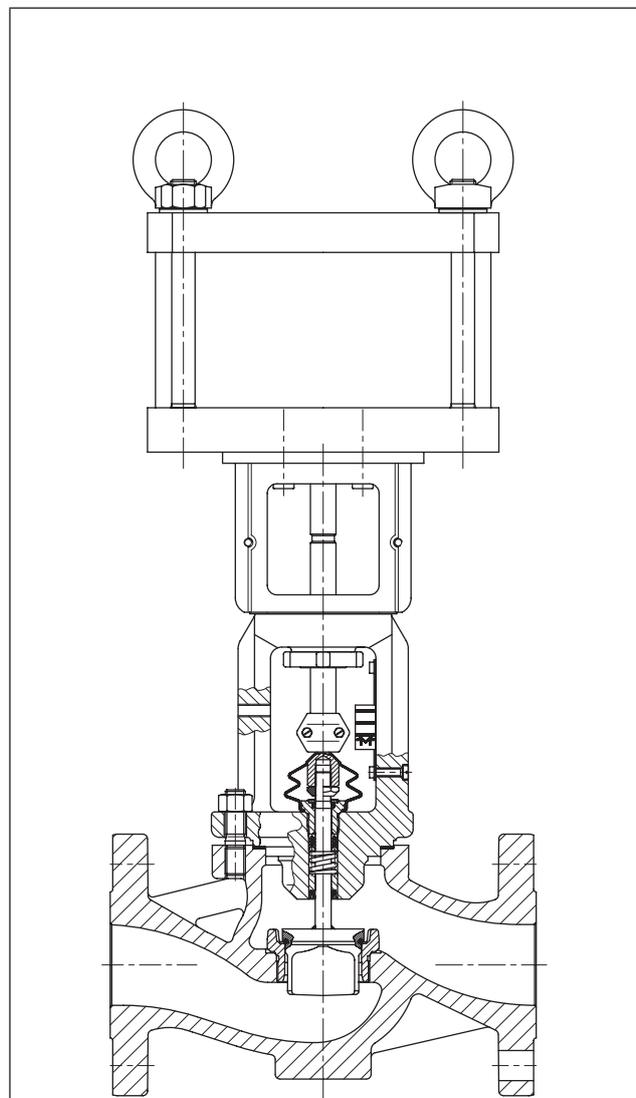
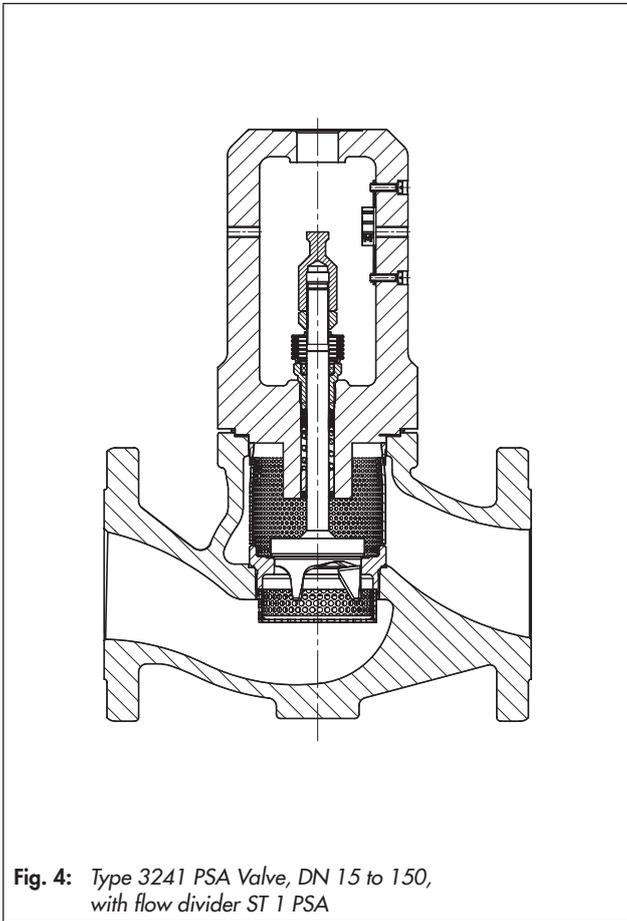
The process medium flows through the valve in both directions. The valve plug position determines the cross-sectional area between the seat and plug.

Depending on how the springs are arranged in the Type 3271 or Type 3277 Actuator (▶ T 8310-1), the valve has two different fail-safe positions that become effective when the supply air fails:

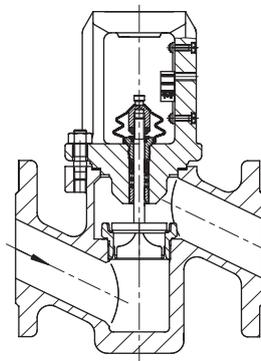
- **Actuator stem extends (fail-close)**  
The valve closes when the supply air fails.
- **Actuator stem retracts (fail-open)**  
The valve opens when the supply air fails.

The double-acting Type 3275A Piston Actuator does not have a fail-safe action (▶ T 8314-1).

Fig. 4, Fig. 5 and Fig. 6 show configuration examples.



**Fig. 5:** Type 3241-9 PSA Control Valve, DN 15 to 150, with Type 3275A Pneumatic Piston Actuator



**Fig. 6:** Type 3241-1 PSA Valve in forged steel, DN 15 to 80

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

Valve size	DN	15, 20 <sup>1)</sup> , 25, 32 <sup>1)</sup> , 40, 50, 65 <sup>1)</sup> , 80, 100, 125 <sup>1)</sup> , 150		15, 25, 40, 50, 80	
Material		Cast steel GP240GH 1.0619	Cast stainless steel 1.4408	Forged steel P250GH 1.0460	Forged stainless steel 1.4404
Type of connection		Flange (all DIN versions)			
Pressure rating PN		10, 16, 25, 40			
Seat-plug seal		Soft seal or high-performance metal seal			
Characteristic		Equal percentage or linear			
Rangeability		50:1 for DN 15 to 50 · 30:1 for DN 65 and larger			
RFID tag (optional)		Application range according to the technical specifications and the explosion protection certificates. Documents ► <a href="http://www.samsongroup.com">www.samsongroup.com</a> > Service & Support > Electronic nameplate			
Conformity		<b>CE · UK · EAC</b>			
<b>Medium temperature</b> in °C · Permissible operating pressures acc. to pressure-temperature diagram (see Information Sheet ► T 8000-2)					
Valve		-10 to +150 °C			
RFID tag (optional)		Max. permissible temperature at the RFID tag: 85 °C			
<b>Leakage class</b> according to IEC 60534-4					
Valve plug	Soft seal	VI			
	High-performance metal seal	V			

<sup>1)</sup> Valve sizes on request

**Table 2: Materials**

<b>Standard version</b>				
Pressure rating	<b>PN 16 to 40</b>			
Valve body <sup>1)</sup>	Cast steel GP240GH 1.0619	Cast stainless steel 1.4408	Forged steel P250GH 1.0460	Forged stainless steel 1.4404
Valve bonnet	1.0460	1.4401 · 1.4404 <sup>2)</sup>	1.0460	1.4571
Seat and plug	1.4006	1.4404	1.4406	1.4404
	Seal ring for soft-seated plug: PTFE with glass fiber			
Guide bushings	1.4104	1.4404	1.4104	1.4404
Packing	V-ring packing: PTFE with carbon · Spring: 1.4310 · Stem protective ring			
Body gasket	Graphite on metal core			

<sup>1)</sup> Special materials on request

<sup>2)</sup> Material double stamping

**Table 3:**  $K_{VS}$  coefficientsTerms 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 PSA ( $K_{VS}$ )

$K_{VS}$	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	
$K_{VS}$	1.3	2	3.2	5	8	13	20	32	48	63	50	80	125	160	210	
Seat $\varnothing$ mm	12			24			31	38	48	63	80	63	80	100	110	130
Travel mm	15										30					

**Table 3.2:** Versions without flow divider

$K_{VS}$	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260
Valve size DN															
15	•	•	•												
20 <sup>1)</sup>		•	•	•											
25			•	•	•										
32 <sup>1)</sup>				•	•	•									
40					•	•	•								
50						•	•	•							
65 <sup>1)</sup>							•	•	•						
80								•	•	•					
100											•	•	•		
125 <sup>1)</sup>												•	•	•	
150												•	•		•

<sup>1)</sup> Valve sizes on request**Table 3.3:** Versions with flow divider ST 1 PSA ( $K_{VS}$ ) · Versions with cast bodies only

$K_{VS}$	1.3	2	3.2	5	8	13	20	32	48	63	50	80	125	160	210
Valve size DN															
15	•	•	•												
20 <sup>1)</sup>	•	•	•												
25	•	•	•												
32 <sup>1)</sup>				•	•	•									
40					•	•	•								
50						•	•	•							
65 <sup>1)</sup>							•	•	•						
80								•	•	•					
100										•	•	•			
125 <sup>1)</sup>												•		•	
150												•	•		•

<sup>1)</sup> Valve sizes on request**Differential pressures**

The possible differential pressures must be calculated on a case-by-case basis when using the Type 3271, Type 3277 and Typ 3275A Actuators in combination with the Type 3241 PSA Valve depending on the given operating conditions.

**Table 4:** Dimensions for Type 3241-1 PSA, Type 3241-7 PSA and Type 3241-9 PSA in standard version**Table 4.1:** Type 3241 PSA Valve

Valve	DN	15	20 <sup>4)</sup>	25	32 <sup>4)</sup>	40	50	65 <sup>4)</sup>	80	100	125 <sup>4)</sup>	150		
Length L	mm	130	150	160	180	200	230	290	310	350	400	480		
H1	mm	220							330 <sup>1)</sup>	330 <sup>1)</sup>	354 <sup>1)</sup>	363 <sup>1)</sup>	390 <sup>1)</sup>	
H2 <sup>2)</sup> for version	Cast steel	mm			44 <sup>3)</sup>		72	72 <sup>3)</sup>		98	98 <sup>3)</sup>	118	144	175
	Forged steel	mm	53	–	70	–	94	100	–	132	–			

<sup>1)</sup> Add 65 mm to H1 when a Type 3275A Actuator with 804 cm<sup>2</sup> actuator area is mounted.

<sup>2)</sup> The H2 dimension is the distance from the middle of the flow path to the bottom of the valve body.

<sup>3)</sup> 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.

<sup>4)</sup> Valve sizes on request

**Table 4.2:** Type 3271 and Type 3277 Pneumatic Actuators

Actuator area	cm <sup>2</sup>	120	175v2	350v2	355v2	750v2
Diaphragm ØD	mm	168	215	280	280	394
H <sup>1)</sup>	mm	69	78	81	121	236
H3 <sup>2)</sup>	mm	110	110	110	110	190
H5	Type 3277	mm	88	101	101	101
Thread	Type 3271	M30x1.5				
	Type 3277	M30x1.5				
α	Type 3271	G 1/8 (1/8 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)
α2	Type 3277	–	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 hoist may differ. Actuators up to 350 cm<sup>2</sup> without lifting eyelet

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

**Table 4.3:** Type 3275A Piston Actuator

Actuator area	cm <sup>2</sup>	314	380	490	804
Piston ØD	mm	268	288	318	405
H	mm	207			214
H3 <sup>1)</sup>	mm	110			580
H5	mm	102			–
Thread		M30x1.5			M60x1.5

<sup>1)</sup> Minimum clearance required to remove the actuator

**Table 5:** Weights<sup>2)</sup> for Type 3241-1 PSA, Type 3241-7 PSA and Type 3241-9 PSA**Table 5.1:** Type 3241 PSA Valve

Valve	DN	15	20 <sup>1)</sup>	25	32 <sup>1)</sup>	40	50	65 <sup>1)</sup>	80	100	125 <sup>1)</sup>	150
Weight without actuator	kg	5	6	7	11	12	15	24	30	42	80	120

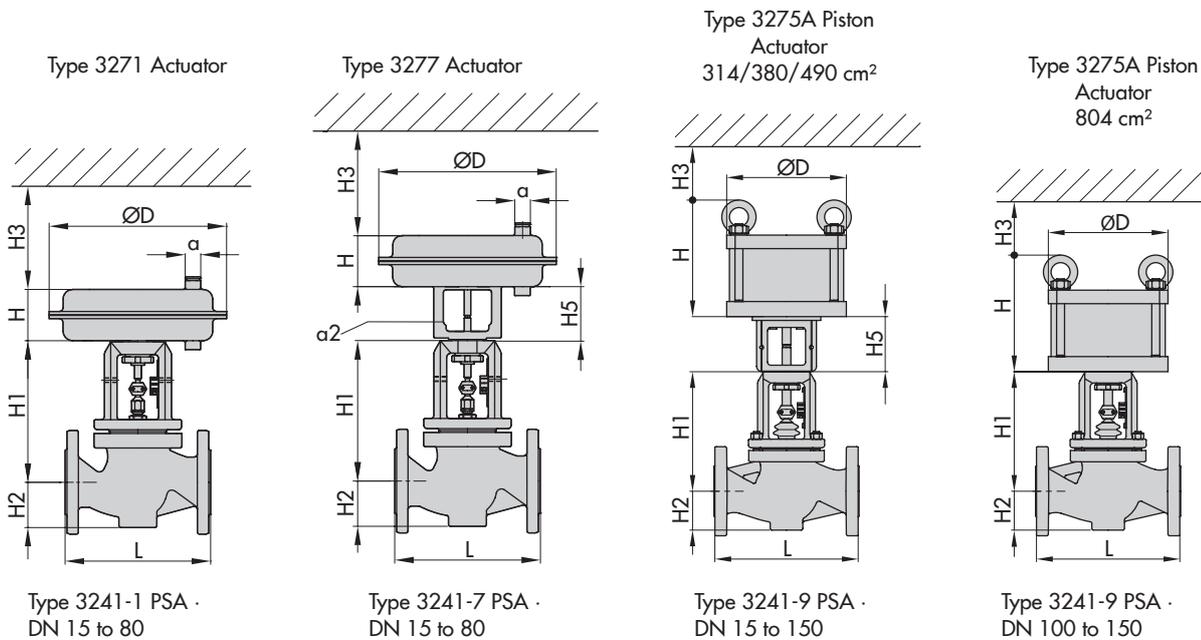
<sup>1)</sup> Valve sizes on request

**Table 5.2:** Type 3271, Type 3277 and Type 3275A Actuators

Actuator		Type 3271					Type 3277					Type 3275A				
Actuator area	cm <sup>2</sup>	120	175v2	350v2	355v2	750v2	120	175v2	350v2	355v2	750v2	314	380	490	804	
Weight, approx.	Standard	kg	2.5	6	11.5	15	36	3.2	10	15	19	40	17	20	23	41
	Heavy duty	kg	–					–					56	62	68	106

<sup>2)</sup> 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



### Ordering text

Globe valve	Type 3241 PSA
Valve size	DN ...
Pressure rating	PN ...
Body material	Refer to Table 2
Type of connection	Flanges
Seat-plug seal	Soft seal or high-performance metal seal
Characteristic	Equal percentage or linear
Actuator	Type 3271, Type 3277 or Type 3275A
Fail-safe action	Fail-close or fail-open
Process medium	Density in kg/m <sup>3</sup> and temperature in °C
Flow rate	in kg/h or m <sup>3</sup> /h in standard or operating state
Pressure	p <sub>1</sub> and p <sub>2</sub> in bar (absolute pressure p <sub>abs</sub> ), with minimum, normal and maximum flow rate
RFID tag	Yes/No
Valve accessories	Positioner and/or limit switch

### Associated Data Sheets for pneumatic actuators:

- Types 3271 and 3277 ▶ T 8310-1
- Type 3275A ▶ T 8314-1
- Associated Mounting and Operating Instructions ▶ EB 8015