

## Series 240

# Types 3241-1 PSA, -7 PSA, -9 PSA Pneumatic Control Valves Type 3241 PSA Globe Valve

SAMSON

ANSI version

### Application

Control valves for PSA plants (Pressure Swing Adsorption)

|                        |                                       |
|------------------------|---------------------------------------|
| <b>Valve sizes</b>     | <b>NPS ½ to 6</b>                     |
| <b>Pressure rating</b> | <b>Class 150 to 300</b>               |
| <b>Temperatures</b>    | <b>-20 to 430 °F (-29 to +220 °C)</b> |
| <b>Standards</b>       | <b>ANSI, ASME and ASTM</b>            |

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 3275 Pneumatic Piston Actuator (Type 3241-9 Control Valve)

Valve body made of

- Cast stainless steel according to ASTM specifications
- Forged steel or forged stainless steel
- Cast stainless steel

Undivided valve bonnet

Valve plug

- Soft seal or
- High-performance metal seal

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

Positioners, 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 -20 to 430 °F (-29 to 220 °C)

- **Type 3241-1 PSA** (Fig. 1) · NPS ½ to 3 with Type 3271 Actuator (see Data Sheet ▶ T 8310-1)
- **Type 3241-7 PSA** (Fig. 2 and Fig. 4) · NPS ½ to 3, valve in forged steel up to NPS 3, with Type 3277 Actuator for integral positioner attachment (▶ T 8310-1)
- **Type 3241-9 PSA** (Fig. 3) · NPS ½ to 6, with Type 3275 Piston Actuator (▶ T 8314), for integral attachment of a positioner and/or limit switch

### Further versions

- **Flow divider** for noise reduction in both directions of flow
- **DIN version** · See Data Sheet ▶ T 8015-1
- **Versions with dimensions according to Japanese Industry Standard (JIS)** · Details on request



Fig. 1: Type 3241-1 PSA  
NPS ½ to 3



Fig. 2: Type 3241-7 PSA  
NPS ½ to 3



Fig. 3: Type 3241-9 PSA  
NPS ½ to 6

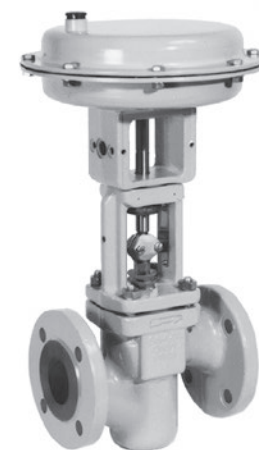


Fig. 4: Type 3241-7 PSA,  
NPS ½ to 3  
forged steel body

### 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.

### Fail-safe position

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 effective upon air supply failure:

#### Actuator stem extends (fail-close)

The valve closes when the supply air fails.

#### Actuator stem retracts (fail-open)

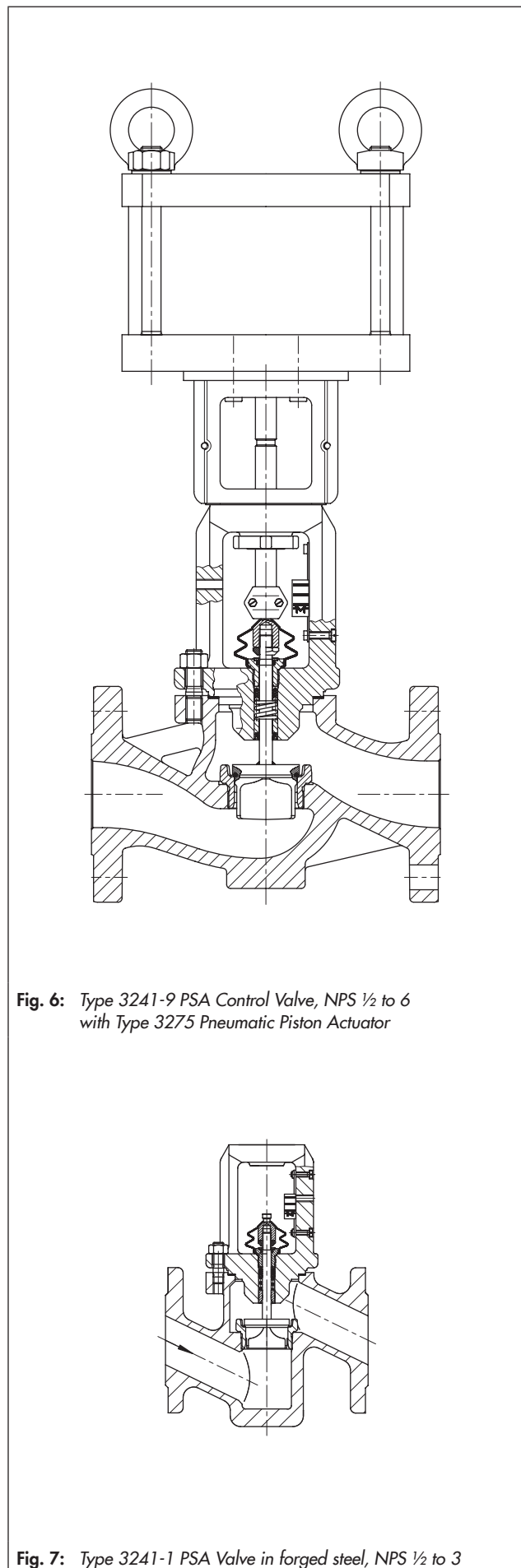
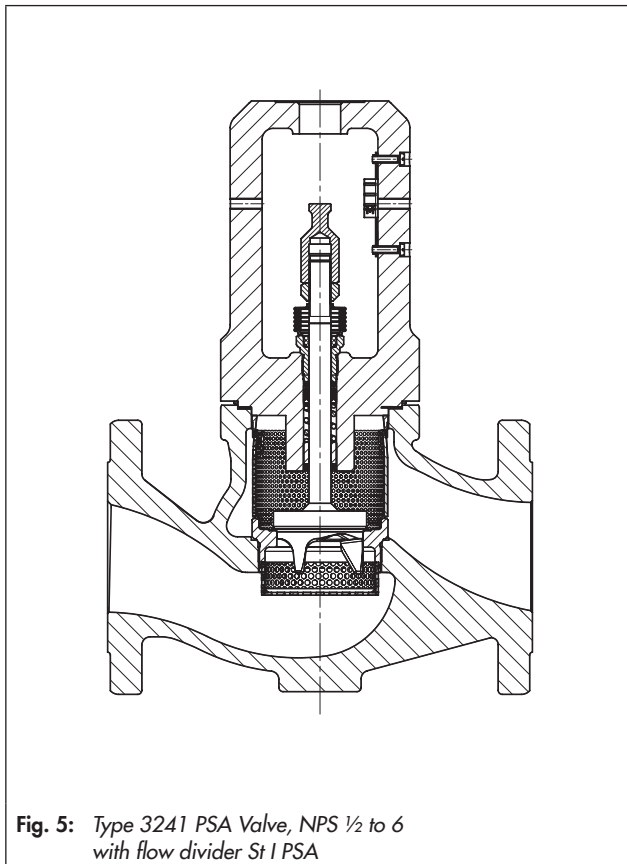
The valve opens when the supply air fails.

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

### Notes on the differential pressure tables

The differential pressure tables have been prepared under the following conditions:

- The maximum permissible supply pressure is 4 bar (60 psi) for valves in sizes NPS ½ to 2 and actuators with an effective diaphragm area of 700 cm<sup>2</sup>
- Process medium in flow-to-open direction
- Version with PTFE packing
- The leakage rates specified in Table 1 are not exceeded with the maximum differential pressures specified.
- The specified differential pressure may be restricted by the pressure-temperature diagram.



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

| Valve size   | NPS  | ½ to 6           | ½, 1, 1½, 2, 3   | ½ to 6           | ½, 1, 1½, 2, 3   |
|--|--|------------------|------------------|------------------|------------------|
| ASTM material  |  | A216 WCC         | A105             | A351 CF8M        | A182 F316        |
| Type of end connections  |  | Flange           | Flange           | Flange           | Flange           |
| Flange type  |  | RF <sup>1)</sup> | RF <sup>1)</sup> | RF <sup>1)</sup> | RF <sup>1)</sup> |
| Pressure rating (ANSI Class)   |  | 150/300          | 300              | 150/300          | 300              |
| Seat/plug seal   | Soft seal or high-performance metal seal   |                  |                  |                  |                  |
| Characteristic   | Equal percentage or linear                 |                  |                  |                  |                  |
| Rangeability   | 50:1 for NPS ½ to 2 · 30:1 for NPS 2½ to 6 |                  |                  |                  |                  |
| Compliance   | <b>CE · EAC</b>                            |                  |                  |                  |                  |
| <b>Temperature ranges</b> in °C (°F) · Permissible operating pressures acc. to pressure-temperature diagram (see Information Sheet ► T 8000-2) |  |                  |                  |                  |                  |
| Valve  | -29 to 220 °C (-20 to 430 °F)              |                  |                  |                  |                  |
| <b>Leakage class</b> according to ANSI/FCI 70-2  |  |                  |                  |                  |                  |
| Valve plug   | Soft seal                                  |                  |                  |                  | VI               |
|  | High-performance metal seal                |                  |                  |                  | V                |

<sup>1)</sup> Other versions on request

**Table 2: Materials**

| Standard version         |  |                      |                                   |                                     |
|--------------------------|--|----------------------|-----------------------------------|-------------------------------------|
| Valve body <sup>1)</sup> | Cast steel<br>A216 WCC   | Forged steel<br>A105 | Cast stainless steel<br>A351 CF8M | Forged stainless steel<br>A182 F316 |
| Valve bonnet             | A105   | A105                 | A182 F316                         | A182 F316                           |
| Seat and plug            | 1.4006   | 1.4006               | 1.4404                            | 1.4404                              |
|                          | Seal ring for soft-seated plug: PTFE with glass fiber                    |                      |                                   |                                     |
| Guide bushings           | 1.4104   | 1.4104               | 1.4404                            | 1.4404                              |
| Packing                  | V-ring packing: PTFE with carbon · Spring: 1.4310 · Stem protective ring |                      |                                   |                                     |
| Body gasket              | Graphite on metal core   |                      |                                   |                                     |

<sup>1)</sup> Refer to pressure-temperature diagram, other materials available on request

**Table 3:**  $C_V$  and  $K_{VS}$  coefficients**Table 3.1:** Overview (with flow divider St I PSA ( $C_V I$ ,  $K_{VS} I$ ))

| $C_V$      |    | 2    | 3    | 5    | 7.5   | 12    | 20   | 30   | 47   | 70   | 75   | 95   | 120  | 190  | 300  |
|------------|----|------|------|------|-------|-------|------|------|------|------|------|------|------|------|------|
| $K_{VS}$   |    | 1.6  | 2.5  | 4.0  | 6.3   | 10    | 16   | 25   | 40   | 60   | 63   | 80   | 100  | 160  | 260  |
| $C_V I$    |    | 1.5  | 2.3  | 3.7  | 6     | 9.5   | 15   | 23   | 37   | 56   | 60   | 75   | 95   | 145  | 245  |
| $K_{VS} I$ |    | 1.3  | 2    | 3.2  | 5     | 8     | 13   | 20   | 32   | 48   | 50   | 63   | 80   | 125  | 210  |
| Seat<br>ØD | in | 0.47 | 0.47 | 0.47 | 0.945 | 0.945 | 1.22 | 1.5  | 1.9  | 2.48 | 2.48 | 3.15 | 3.15 | 3.94 | 5.12 |
|            | mm | 12   | 12   | 12   | 24    | 24    | 31   | 38   | 48   | 63   | 63   | 80   | 80   | 100  | 130  |
| Travel     | in | 0.59 | 0.59 | 0.59 | 0.59  | 0.59  | 0.59 | 0.59 | 0.59 | 0.59 | 1.18 | 0.59 | 1.18 | 1.18 | 1.18 |
|            | mm | 15   | 15   | 15   | 15    | 15    | 15   | 15   | 15   | 15   | 30   | 15   | 30   | 30   | 30   |

**Table 3.2:** Versions without flow divider

| $C_V$                |     | 2   | 3   | 5   | 7.5 | 12 | 20 | 30 | 47 | 70 | 75 | 95 | 120 | 190 | 300 |
|----------------------|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|-----|-----|-----|
| $K_{VS}$             |     | 1.6 | 2.5 | 4.0 | 6.3 | 10 | 16 | 25 | 40 | 60 | 63 | 80 | 100 | 160 | 260 |
| Valve size<br>NPS/DN |     |     |     |     |     |    |    |    |    |    |    |    |     |     |     |
| ½                    | 15  | •   | •   | •   |     |    |    |    |    |    |    |    |     |     |     |
| ¾                    | 20  |     | •   | •   | •   |    |    |    |    |    |    |    |     |     |     |
| 1                    | 25  |     |     | •   | •   | •  |    |    |    |    |    |    |     |     |     |
| 1½                   | 40  |     |     |     |     | •  | •  | •  |    |    |    |    |     |     |     |
| 2                    | 50  |     |     |     |     |    | •  | •  | •  |    |    |    |     |     |     |
| 2½                   | 65  |     |     |     |     |    |    | •  | •  | •  |    |    |     |     |     |
| 3                    | 80  |     |     |     |     |    |    |    | •  | •  |    | •  |     |     |     |
| 4                    | 100 |     |     |     |     |    |    |    |    |    | •  |    | •   | •   |     |
| 6                    | 150 |     |     |     |     |    |    |    |    |    |    |    | •   | •   | •   |

**Table 3.3:** Versions with flow divider St I PSA ( $C_V I$ ,  $K_{VS} I$ ) · Versions with cast bodies only

| $C_V I$              |     | 1.5 | 2.3 | 3.7 | 6 | 9.5 | 15 | 23 | 37 | 56 | 60 | 75 | 95 | 145 | 245 |
|----------------------|-----|-----|-----|-----|---|-----|----|----|----|----|----|----|----|-----|-----|
| $K_{VS} I$           |     | 1.3 | 2   | 3.2 | 5 | 8   | 13 | 20 | 32 | 48 | 50 | 63 | 80 | 125 | 210 |
| Valve size<br>NPS/DN |     |     |     |     |   |     |    |    |    |    |    |    |    |     |     |
| ½                    | 15  | •   | •   | •   |   |     |    |    |    |    |    |    |    |     |     |
| ¾                    | 20  | •   | •   | •   |   |     |    |    |    |    |    |    |    |     |     |
| 1                    | 25  | •   | •   | •   | • |     |    |    |    |    |    |    |    |     |     |
| 1½                   | 40  |     |     |     | • | •   | •  | •  |    |    |    |    |    |     |     |
| 2                    | 50  |     |     |     |   |     | •  | •  | •  |    |    |    |    |     |     |
| 2½                   | 65  |     |     |     |   |     |    | •  | •  | •  |    |    |    |     |     |
| 3                    | 80  |     |     |     |   |     |    |    | •  | •  |    | •  |    |     |     |
| 4                    | 100 |     |     |     |   |     |    |    |    |    | •  |    | •  | •   |     |
| 6                    | 150 |     |     |     |   |     |    |    |    |    |    |    | •  | •   | •   |

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.) =  $K_V$  (m<sup>3</sup>/h)/0.865

**Table 4:** Differential pressure tables for Type 3271 and Type 3277 Actuators with Type 3241 PSA Valve

**Permissible differential pressures  $\Delta p$  for unbalanced plug with high-performance metal seal when  $p_2 = 0$**

- Values specified in the gray-shaded columns correspond to the standard application cases, i.e. operation with rated travel
- Differential pressures specified in the white columns apply to maximum pretensioned springs
- Values in parentheses are valid for 50 % travel.

**Table 4.1:** Fail-close valve · Pressures in bar

| Bench range (bar)<br>with actuator |                |                             | 240 cm <sup>2</sup>           | 0.3 to 1.1 | 0.4 to 2.0<br>(1.2 to 2.0) | 0.6 to 2.2 | 0.6 to 3.0 <sup>1)</sup><br>(1.8 to 3.0) | 0.9 to 3.3 | –          | –                           |                            |
|------------------------------------|----------------|-----------------------------|-------------------------------|------------|----------------------------|------------|--|------------|------------|-----------------------------|----------------------------|
|                                    |                |                             | 120 cm <sup>2</sup>           |            |                            | 0.2 to 1.0 |  | 0.8 to 2.4 | 1.2 to 3.6 | 1.4 to 2.3<br>(1.85 to 2.3) | 2.1 to 3.3<br>(2.7 to 3.3) |
| Required supply pressure (bar)     |                |                             |                               | 1.2        | 1.4                        | 2.2        | 2.6                                      | 3.2        | 3.8        | 2.5                         | 3.5                        |
| Valve size<br>NPS                  | C <sub>v</sub> | Actuator<br>cm <sup>2</sup> | $\Delta p$ when $p_2 = 0$ bar |            |                            |            |  |            |            |                             |                            |
| ½ to 1                             | 2              | 120                         | –                             | –          | 28                         | –          | –  | –          | 50         | –                           |                            |
|                                    | 3              | 240                         | 28                            | 47         | 50                         | 50         | 50                                       | 50         | –          | –                           |                            |
|                                    | 5              | 350                         | 45                            | 50         | 50                         | 50         | 50                                       | –          | 50         | –                           |                            |
| ¾ to 1½                            | 7.5            | 120                         | –                             | –          | –                          | –          | –  | –          | 30         | 46                          |                            |
|                                    |                | 240                         | –                             | –          | 14.8                       | 24         | 24                                       | 39         | –          | –                           |                            |
|                                    | 12             | 350                         | –                             | –          | 24                         | 38         | 38                                       | 50         | 50         | 50                          |                            |
|                                    |                | 700                         | –                             | –          | (50)                       | –          | –  | –          | –          | –                           |                            |
| 1 and 2                            | 20             | 240                         | –                             | –          | –                          | 14         | 14                                       | 23         | –          | –                           |                            |
|                                    |                | 350                         | –                             | 13.5       | 13.5                       | 30         | 22                                       | 47         | 50         | 50                          |                            |
|                                    |                | 700                         | –                             | –          | (50)                       | –          | (50)                                     | –          | –          | –                           |                            |
| 1½ to 2½                           | 30             | 350                         | –                             | –          | –                          | 20         | 14                                       | 31         | 37         | 50                          |                            |
|                                    |                | 700                         | –                             | –          | (50)                       | –          | (50)                                     | –          | –          | –                           |                            |
| 2 to 3                             | 47             | 350                         | –                             | –          | –                          | 12         | 8.5                                      | 19         | 23         | 35                          |                            |
|                                    |                | 700                         | –                             | –          | (50)                       | –          | (50)                                     | –          | –          | –                           |                            |
| 2½ and 3                           | 70             | 700                         | –                             | –          | (23)                       | –          | (35)                                     | –          | (36)       | (50)                        |                            |
| 3                                  | 95             | 700                         | –                             | –          | 1.4                        | –          | (21)                                     | –          | (22)       | (33)                        |                            |

<sup>1)</sup> Not for actuator with 120 cm<sup>2</sup> (18.6 in<sup>2</sup>) diaphragm area

**Table 4.2:** Fail-close valve · Pressures in psi

| Bench range (psi)<br>with actuator |                | 240 cm <sup>2</sup>   | 3 to 15                        | 4 to 17 | 6 to 30<br>(18 to 30) | 9 to 32  | 9 to 44 <sup>1)</sup><br>(26 to 44) | 13 to 48 | –                      | –                      |
|------------------------------------|----------------|---|--------------------------------|---------|-----------------------|----------|-------------------------------------|----------|------------------------|------------------------|
|                                    |                | 120 cm <sup>2</sup><br>350 cm <sup>2</sup><br>700 cm <sup>2</sup> |                                | 6 to 18 |                       | 12 to 35 |                                     | 18 to 52 | 20 to 34<br>(26 to 34) | 30 to 40<br>(39 to 50) |
| Required supply pressure (psi)     |                |   | 18                             | 21      | 33                    | 38       | 47                                  | 55       | 38                     | 55                     |
| Valve size<br>NPS                  | C <sub>v</sub> | Actuator<br>cm <sup>2</sup>                                       | Δp when p <sub>2</sub> = 0 psi |         |                       |          |                                     |          |                        |                        |
| 1½ to 1                            | 2              | 120   | –                              | –       | 405                   | –        | –                                   | –        | 725                    | –                      |
|                                    | 3              | 240   | 406                            | 680     | 725                   | 725      | 725                                 | 725      | –                      | –                      |
|                                    | 5              | 350   | 650                            | 725     | 725                   | 725      | 725                                 | –        | 725                    | –                      |
| ¾ to 1½                            | 7.5            | 120   | –                              | –       | 80                    | –        | –                                   | –        | 435                    | 667                    |
|                                    |                | 240   | –                              | –       | 215                   | 350      | 350                                 | 565      | –                      | –                      |
|                                    | 12             | 350   | –                              | –       | 350                   | 550      | 550                                 | 725      | 725                    | 725                    |
|                                    |                | 700   | –                              | –       | (725)                 | –        | –                                   | –        | –                      | –                      |
| 1½ and 2                           | 20             | 240   | –                              | –       | –                     | 200      | 200                                 | 335      | –                      | –                      |
|                                    |                | 350   | –                              | 195     | 195                   | 435      | 320                                 | 680      | 725                    | 725                    |
|                                    |                | 700   | –                              | –       | (725)                 | –        | (725)                               | –        | –                      | –                      |
| 1½ to 3                            | 30             | 350   | –                              | –       | –                     | 290      | 200                                 | 450      | 535                    | 725                    |
|                                    |                | 700   | –                              | –       | (725)                 | –        | (725)                               | –        | –                      | –                      |
| 2 to 2½                            | 47             | 350   | –                              | –       | –                     | 175      | 123                                 | 275      | 330                    | 507                    |
|                                    |                | 700   | –                              | –       | (725)                 | –        | (725)                               | –        | –                      | –                      |
| 2½ and 3                           | 70             | 700   | –                              | –       | (333)                 | –        | (507)                               | –        | (520)                  | (725)                  |
| 3                                  | 95             | 700   | –                              | –       | 20                    | –        | (305)                               | –        | (320)                  | (475)                  |

<sup>1)</sup> Not for actuator with 120 cm<sup>2</sup> (18.6 in<sup>2</sup>) diaphragm area

**Table 4.3:** Fail-open valve · Pressures in bar and psi  
Valve closed with required signal pressure

| Bench range (bar/psi) with actuator (cm <sup>2</sup> ) |                |                          | Pressures in bar               |     |    | Pressures in psi               |     |     |
|--|----------------|--------------------------|--------------------------------|-----|----|--------------------------------|-----|-----|
|  |                |                          | 0.2 to 1.0                     |     |    | 3 to 15                        |     |     |
| Required supply pressure (bar/psi)                     |                |                          | 1.2                            | 2.4 | 4  | 18                             | 36  | 58  |
| Valve size NPS   | C <sub>v</sub> | Actuator cm <sup>2</sup> | Δp when p <sub>2</sub> = 0 bar |     |    | Δp when p <sub>2</sub> = 0 psi |     |     |
| ½ to 1   | 2              | 120                      | –                              | 50  | –  | –                              | 725 | –   |
|  | 3              | 240                      | 28                             | 50  | –  | 410                            | 725 | –   |
|  | 5              | 350                      | 46                             | 50  | –  | 667                            | 725 | –   |
| ¾ to 1½  | 7.5            | 120                      | –                              | 31  | 50 | 10                             | 450 | 725 |
|  |                | 240                      | –                              | 50  | 50 | –                              | 725 | 725 |
|  | 12             | 350                      | –                              | 50  | 50 | –                              | 725 | 725 |
|  |                | 700                      | 24                             | 50  | –  | 350                            | 725 | –   |
| 1½ and 2   | 20             | 120                      | –                              | 18  | 40 | –                              | 260 | 580 |
|  |                | 240                      | –                              | 37  | 50 | –                              | 540 | 725 |
|  |                | 350                      | –                              | 50  | 50 | –                              | 725 | 725 |
|  |                | 700                      | –                              | 50  | –  | –                              | 725 | –   |
| 1½ to 3  | 30             | 120                      | –                              | –   | 28 | –                              | –   | 410 |
|  |                | 240                      | –                              | 24  | 50 | –                              | 350 | 725 |
|  |                | 350                      | –                              | 37  | 50 | –                              | 540 | 725 |
|  |                | 700                      | –                              | 50  | 50 | –                              | 725 | 725 |
| 2 to 2½  | 47             | 240                      | –                              | 15  | 34 | –                              | 220 | 490 |
|  |                | 350                      | –                              | 23  | 50 | –                              | 330 | 725 |
|  |                | 700                      | –                              | 47  | 50 | –                              | 680 | 725 |
| 2½ and 3   | 70             | 240                      | –                              | –   | 20 | –                              | –   | 290 |
|  |                | 350                      | –                              | 13  | 29 | –                              | 190 | 420 |
|  |                | 700                      | –                              | 27  | 50 | –                              | 390 | 725 |
| 3  | 95             | 240                      | –                              | –   | 12 | –                              | –   | 170 |
|  |                | 350                      | –                              | –   | 18 | –                              | –   | 260 |
|  |                | 700                      | –                              | 16  | 37 | –                              | 230 | 540 |

**Table 5:** Permissible differential pressures for Type 3275 Piston Actuator with Type 3241 PSA Valve

**Table 5.1:** Type 3241-9 PSA Valve, plug with high-performance metal seal · Pressures in bar

| Valve size<br>NPS | Flow<br>coefficient<br>C <sub>v</sub> | Actuator<br>cm <sup>2</sup> | Supply pressure [bar] |      |      |      |      |      |      |      |
|-------------------|---------------------------------------|-----------------------------|-----------------------|------|------|------|------|------|------|------|
|                   |                                       |                             | 1.4                   | 2    | 2.5  | 3    | 3.5  | 4    | 5    | 6    |
| ¾ to 1½           | 7.5 to 12                             | 314                         | 50                    | –    | –    | –    | –    | –    | –    | –    |
| 1½ to 2           | 20                                    | 314                         | 26.5                  | 47.3 | 50   | –    | –    | –    | –    | –    |
|                   |                                       | 490                         | 50                    | –    | –    | –    | –    | –    | –    | –    |
| 1½ to 2           | 30                                    | 314                         | 14.4                  | 28.2 | 39.8 | 50   | –    | –    | –    | –    |
|                   |                                       | 490                         | 32.5                  | 50   | –    | –    | –    | –    | –    | –    |
| 2                 | 47                                    | 314                         | 6.1                   | 14.8 | 22.0 | 29.3 | 36.5 | 43.7 | 50   | –    |
|                   |                                       | 490                         | 17.5                  | 31.0 | 42.3 | 50   | –    | –    | –    | –    |
| 3                 | 47                                    | 314                         | 6.0                   | 14.7 | 21.9 | 29.1 | 36.4 | 43.6 | 50   | –    |
|                   |                                       | 490                         | 17.3                  | 30.9 | 42.2 | 50   | –    | –    | –    | –    |
| 3                 | 70                                    | 314                         | 1.0                   | 6.0  | 10.2 | 14.4 | 18.6 | 22.8 | 31.2 | 39.6 |
|                   |                                       | 490                         | 7.5                   | 15.4 | 22.0 | 28.5 | 35.1 | 41.6 | 50   | –    |
| 3                 | 95                                    | 314                         | –                     | 1.9  | 4.5  | 7.2  | 9.8  | 12.4 | 17.6 | 22.8 |
|                   |                                       | 490                         | 2.9                   | 7.8  | 11.8 | 15.9 | 20.0 | 24.0 | 32.2 | 40.3 |
| 4                 | 75                                    | 314                         | 1.0                   | 6.0  | 10.2 | 14.4 | 18.6 | 22.8 | 31.2 | 39.6 |
|                   |                                       | 490                         | 7.5                   | 15.4 | 22.0 | 28.5 | 35.1 | 41.6 | 50   | –    |
|                   |                                       | 804                         | 19.3                  | 32.2 | 42.9 | 50   | –    | –    | –    | –    |
| 4                 | 120                                   | 314                         | –                     | 1.9  | 4.5  | 7.2  | 9.8  | 12.4 | 17.6 | 22.8 |
|                   |                                       | 490                         | 2.9                   | 7.8  | 11.8 | 15.9 | 20.0 | 24.0 | 32.2 | 40.3 |
|                   |                                       | 804                         | 10.2                  | 18.2 | 24.9 | 31.5 | 38.2 | 44.9 | 50   | –    |
| 4 to 6            | 190                                   | 314                         | –                     | –    | 1.6  | 3.2  | 4.9  | 6.6  | 9.9  | 13.2 |
|                   |                                       | 490                         | 0.5                   | 3.6  | 6.2  | 8.8  | 11.4 | 14.0 | 19.2 | 24.4 |
|                   |                                       | 804                         | 5.2                   | 10.3 | 14.6 | 18.8 | 23.1 | 27.4 | 35.9 | 44.4 |
| 6                 | 300                                   | 314                         | –                     | –    | –    | 0.7  | 1.7  | 2.7  | 4.7  | 6.6  |
|                   |                                       | 490                         | –                     | 1.0  | 2.5  | 4.1  | 5.6  | 7.1  | 10.2 | 13.3 |
|                   |                                       | 804                         | 1.9                   | 4.9  | 7.4  | 10.0 | 12.5 | 15.0 | 20.1 | 25.1 |



**Table 5.2:** Type 3241-9 PSA Valve, plug with high-performance metal seal · Pressures in psi

| Valve size<br>NPS | Flow<br>coefficient<br>C <sub>v</sub> | Actuator<br>cm <sup>2</sup> | Supply pressure [psi] |       |       |       |       |       |       |       |
|-------------------|---------------------------------------|-----------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|                   |                                       |                             | 20                    | 30    | 38    | 44    | 55    | 60    | 75    | 90    |
| ¾ to 1½           | 7.5 to 12                             | 314                         | 725                   | –     | –     | –     | –     | –     | –     | –     |
| 1½ to 2           | 20                                    | 314                         | 384.0                 | 685.7 | 725   | –     | –     | –     | –     | –     |
|                   |                                       | 490                         | 725                   | –     | –     | –     | –     | –     | –     | –     |
| 1½ to 2           | 30                                    | 314                         | 208.7                 | 409.5 | 576.8 | 725   | –     | –     | –     | –     |
|                   |                                       | 490                         | 471.3                 | 725   | –     | –     | –     | –     | –     | –     |
| 2                 | 47                                    | 314                         | 88.8                  | 214.7 | 319.5 | 424.4 | 529.3 | 634.1 | 725   | –     |
|                   |                                       | 490                         | 253.4                 | 449.8 | 613.4 | 725   | –     | –     | –     | –     |
| 3                 | 47                                    | 314                         | 88.8                  | 214.7 | 319.5 | 424.4 | 529.3 | 634.1 | 725   | –     |
|                   |                                       | 490                         | 253.4                 | 449.8 | 613.4 | 725   | –     | –     | –     | –     |
| 3                 | 70                                    | 314                         | 15.0                  | 88.1  | 148.9 | 209.8 | 270.7 | 331.6 | 453.3 | 575.1 |
|                   |                                       | 490                         | 110.6                 | 224.5 | 319.5 | 414.5 | 509.5 | 604.5 | 725   | –     |
| 3                 | 95                                    | 314                         | –                     | 28.9  | 66.7  | 104.4 | 142.2 | 179.9 | 255.4 | 330.9 |
|                   |                                       | 490                         | 42.9                  | 113.6 | 172.5 | 231.4 | 290.3 | 349.2 | 467.0 | 584.9 |
| 4                 | 75                                    | 314                         | 15.0                  | 88.1  | 148.9 | 209.8 | 270.7 | 331.6 | 453.3 | 575.1 |
|                   |                                       | 490                         | 110.6                 | 224.5 | 319.5 | 414.5 | 509.5 | 604.5 | 725   | –     |
|                   |                                       | 804                         | 281.0                 | 468.0 | 623.9 | 725   | –     | –     | –     | –     |
| 4                 | 120                                   | 314                         | –                     | 28.9  | 66.7  | 104.4 | 142.2 | 179.9 | 255.4 | 330.9 |
|                   |                                       | 490                         | 42.9                  | 113.6 | 172.5 | 231.4 | 290.3 | 349.2 | 467.0 | 584.9 |
|                   |                                       | 804                         | 148.6                 | 264.6 | 361.2 | 457.9 | 554.6 | 651.2 | 725   | –     |
| 4 to 6            | 190                                   | 314                         | –                     | –     | 23.3  | 47.5  | 71.7  | 95.8  | 144.1 | 192.5 |
|                   |                                       | 490                         | 8.1                   | 53.3  | 91.0  | 128.8 | 166.5 | 204.2 | 279.6 | 355.0 |
|                   |                                       | 804                         | 75.8                  | 150.0 | 211.9 | 273.7 | 335.6 | 397.4 | 521.2 | 644.9 |
| 6                 | 300                                   | 314                         | –                     | –     | –     | 10.9  | 25.2  | 39.5  | 68.1  | 96.7  |
|                   |                                       | 490                         | –                     | 14.4  | 36.7  | 59.0  | 81.3  | 103.6 | 148.3 | 192.9 |
|                   |                                       | 804                         | 27.7                  | 71.6  | 108.2 | 144.8 | 181.4 | 218.0 | 291.2 | 364.4 |

**Table 6:** Permissible differential pressures for Type 3241-9 PSA Control Valve

**Table 6.1:** Type 3241-9 PSA Valve with soft-seated plug · Pressures in bar

| Valve size<br>NPS | Flow<br>coefficient<br>$C_v$ | Actuator<br>$cm^2$ | Supply pressure [bar] |      |      |      |      |      |      |      |
|-------------------|------------------------------|--------------------|-----------------------|------|------|------|------|------|------|------|
|                   |                              |                    | 1.4                   | 2    | 2.5  | 3    | 3.5  | 4    | 5    | 6    |
| ¾ to 1½           | 7.5 to 12                    | 314                | 50                    | –    | –    | –    | –    | –    | –    | –    |
| 1½ to 2           | 20                           | 314                | 47.8                  | 50   | –    | –    | –    | –    | –    | –    |
| 1½ to 2           | 30                           | 314                | 31.8                  | 45.6 | 50   | –    | –    | –    | –    | –    |
|                   |                              | 490                | 50                    | –    | –    | –    | –    | –    | –    | –    |
| 2                 | 47                           | 314                | 19.9                  | 28.6 | 35.8 | 43.0 | 50   | –    | –    | –    |
|                   |                              | 490                | 31.2                  | 44.8 | 50   | –    | –    | –    | –    | –    |
| 3                 | 47                           | 314                | 19.7                  | 28.4 | 35.6 | 42.9 | 50   | –    | –    | –    |
|                   |                              | 490                | 31.1                  | 44.6 | 50   | –    | –    | –    | –    | –    |
| 3                 | 70                           | 314                | 11.4                  | 16.5 | 20.7 | 24.9 | 29.1 | 33.3 | 41.6 | 50   |
|                   |                              | 490                | 18.0                  | 25.9 | 32.4 | 39.0 | 45.5 | 50   | –    | –    |
| 3                 | 95                           | 314                | 7.1                   | 10.2 | 12.8 | 15.4 | 18.0 | 20.6 | 25.8 | 31.0 |
|                   |                              | 490                | 11.2                  | 16.0 | 20.1 | 24.2 | 28.2 | 32.3 | 40.4 | 48.5 |
| 4                 | 75                           | 314                | 11.4                  | 16.5 | 20.7 | 24.9 | 29.1 | 33.3 | 41.6 | 50   |
|                   |                              | 490                | 18.0                  | 25.9 | 32.4 | 39.0 | 45.5 | 50   | –    | –    |
|                   |                              | 804                | 29.8                  | 42.7 | 50   | –    | –    | –    | –    | –    |
| 4                 | 120                          | 314                | 7.1                   | 10.2 | 12.8 | 15.4 | 18.0 | 20.6 | 25.8 | 31.0 |
|                   |                              | 490                | 11.2                  | 16.0 | 20.1 | 24.2 | 28.2 | 32.3 | 40.4 | 48.5 |
|                   |                              | 804                | 18.4                  | 26.4 | 33.1 | 39.8 | 46.4 | 50   | –    | –    |
| 4 to 6            | 190                          | 314                | 4.5                   | 6.5  | 8.2  | 9.8  | 11.5 | 13.2 | 16.5 | 19.8 |
|                   |                              | 490                | 7.1                   | 10.2 | 12.8 | 15.4 | 18.0 | 20.6 | 25.8 | 31.0 |
|                   |                              | 804                | 11.8                  | 16.9 | 21.2 | 25.4 | 29.7 | 34.0 | 42.5 | 50   |
| 6                 | 300                          | 314                | 2.7                   | 3.8  | 4.8  | 5.8  | 6.8  | 7.8  | 9.8  | 11.7 |
|                   |                              | 490                | 4.2                   | 6.1  | 7.6  | 9.1  | 10.7 | 12.2 | 15.3 | 18.4 |
|                   |                              | 804                | 7.0                   | 10.0 | 12.5 | 15.0 | 17.6 | 20.1 | 25.1 | 30.2 |

**Table 6.2:** Type 3241-9 PSA Valve with soft-seated plug · Pressures in psi

| Valve size<br>NPS | Flow<br>coefficient<br>C <sub>v</sub> | Actuator<br>cm <sup>2</sup> | Supply pressure [psi] |       |       |       |       |       |       |       |
|-------------------|---------------------------------------|-----------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|                   |                                       |                             | 20                    | 30    | 38    | 44    | 55    | 60    | 75    | 90    |
| ¾ to 1½           | 7.5 to 12                             | 314                         | 725                   | –     | –     | –     | –     | –     | –     | –     |
| 1½ to 2           | 20                                    | 314                         | 692.8                 | 725   | –     | –     | –     | –     | –     | –     |
| 1½ to 2           | 30                                    | 314                         | 460.6                 | 661.4 | 725   | –     | –     | –     | –     | –     |
|                   |                                       | 490                         | 725                   | –     | –     | –     | –     | –     | –     | –     |
| 2                 | 47                                    | 314                         | 288.2                 | 414.1 | 518.9 | 623.8 | 725   | –     | –     | –     |
|                   |                                       | 490                         | 452.8                 | 649.2 | 725   | –     | –     | –     | –     | –     |
| 3                 | 47                                    | 314                         | 288.2                 | 414.1 | 518.9 | 623.8 | 725   | –     | –     | –     |
|                   |                                       | 490                         | 452.8                 | 649.2 | 725   | –     | –     | –     | –     | –     |
| 3                 | 70                                    | 314                         | 167.0                 | 240.0 | 300.9 | 361.8 | 422.6 | 483.5 | 605.3 | 725   |
|                   |                                       | 490                         | 262.5                 | 376.5 | 471.5 | 566.5 | 661.5 | 725   | –     | –     |
| 3                 | 95                                    | 314                         | 103.3                 | 148.6 | 186.3 | 224.1 | 261.8 | 299.6 | 375.1 | 450.6 |
|                   |                                       | 490                         | 162.5                 | 233.2 | 292.1 | 351.0 | 410.0 | 468.9 | 586.7 | 704.5 |
| 4                 | 75                                    | 314                         | 167.0                 | 240.0 | 300.9 | 361.8 | 422.6 | 483.5 | 605.3 | 725   |
|                   |                                       | 490                         | 262.5                 | 376.5 | 471.5 | 566.5 | 661.5 | 725   | –     | –     |
|                   |                                       | 804                         | 432.9                 | 620.0 | 725   | –     | –     | –     | –     | –     |
| 4                 | 120                                   | 314                         | 103.3                 | 148.6 | 186.3 | 224.1 | 261.8 | 299.6 | 375.1 | 450.6 |
|                   |                                       | 490                         | 162.5                 | 233.2 | 292.1 | 351.0 | 410.0 | 468.9 | 586.7 | 704.5 |
|                   |                                       | 804                         | 268.2                 | 384.2 | 480.9 | 577.6 | 674.2 | 725   | –     | –     |
| 4 to 6            | 190                                   | 314                         | 65.9                  | 94.9  | 119.1 | 143.2 | 167.4 | 191.5 | 239.9 | 288.2 |
|                   |                                       | 490                         | 103.8                 | 149.1 | 186.8 | 224.5 | 262.2 | 299.9 | 375.3 | 450.7 |
|                   |                                       | 804                         | 171.5                 | 245.7 | 307.6 | 369.4 | 431.3 | 493.2 | 616.9 | 725   |
| 6                 | 300                                   | 314                         | 38.8                  | 56.0  | 70.3  | 84.6  | 98.9  | 113.2 | 141.8 | 170.4 |
|                   |                                       | 490                         | 61.3                  | 88.0  | 110.3 | 132.7 | 155.0 | 177.3 | 221.9 | 266.5 |
|                   |                                       | 804                         | 101.3                 | 145.2 | 181.8 | 218.4 | 255.0 | 291.6 | 364.9 | 438.1 |

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

**Table 7.1:** Type 3241-1 PSA Valve

| Valve                                   | NPS                                    | 1/2  | 3/4  | 1    | 1 1/2 | 2    | 2 1/2 | 3                 | 4                 | 6                 |                   |
|---|--|------|------|------|-------|------|-------|-------------------|-------------------|-------------------|-------------------|
|   | DN                                     | 15   | 20   | 25   | 40    | 50   | 65    | 80                | 100               | 150               |                   |
| Length<br>L                             | Class 150 RF                           | in   | 7.25 | 7.25 | 7.25  | 8.75 | 10.0  | 10.88             | 11.75             | 13.88             | 17.75             |
|   |  | mm   | 184  | 184  | 184   | 222  | 254   | 276               | 298               | 352               | 451               |
|   | Class 300 RF                           | in   | 7.50 | 7.62 | 7.75  | 9.25 | 10.50 | 11.50             | 12.50             | 14.50             | 18.62             |
|   |  | mm   | 191  | 194  | 197   | 235  | 267   | 292               | 318               | 368               | 473               |
| H1                                      | ≤ 700 cm <sup>2</sup> and<br>Type 3275 | in   | 8.66 | 8.66 | 8.66  | 8.66 | 8.66  | 13.00             | 13.00             | 13.78             | 15.34             |
|   |  | mm   | 220  | 220  | 220   | 220  | 220   | 330 <sup>1)</sup> | 330 <sup>1)</sup> | 350 <sup>1)</sup> | 390 <sup>1)</sup> |
| H2 (approx.)                            | in                                     | 1.77 | 1.77 | 1.77 | 2.84  | 2.84 | 3.86  | 3.86              | 4.45              | 6.89              |                   |
|   | mm                                     | 45   | 45   | 45   | 72    | 72   | 98    | 98                | 113               | 175               |                   |
| H2<br>Forged steel version<br>(approx.) | in                                     | 2.1  | –    | 2.75 | 3.6   | 3.85 | –     | 5.05              | –                 | –                 |                   |
|   | mm                                     | 53   | –    | 70   | 92    | 98   | –     | 128               | –                 | –                 |                   |

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

**Table 7.2:** Type 3271 and Type 3277 Pneumatic Actuators

| Actuator area    | cm <sup>2</sup> | 120             | 350             | 700             |
|------------------|-----------------|-----------------|-----------------|-----------------|
| Diaphragm ØD     | in              | 6.61            | 11.02           | 15.35           |
|                  | mm              | 168             | 280             | 390             |
| H <sup>1)</sup>  | in              | 2.71            | 3.23            | 7.83            |
|                  | mm              | 69              | 82              | 199             |
| H3 <sup>2)</sup> | in              | 4.33            | 4.33            | 7.48            |
|                  | mm              | 110             | 110             | 190             |
| H5               | Type 3277 in    | 3.46            | 3.98            | 3.98            |
|                  | Type 3277 mm    | 88              | 101             | 101             |
| Thread           | Type 3271       | M30 x 1.5       |                 |                 |
|                  | Type 3277       | M30 x 1.5       |                 |                 |
| α                | Type 3271       | G 1/8 (1/8 NPT) | G 3/8 (3/8 NPT) | G 3/8 (3/8 NPT) |
| α2               | Type 3277       | –               | 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 355 cm<sup>2</sup> without lifting eyelet

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

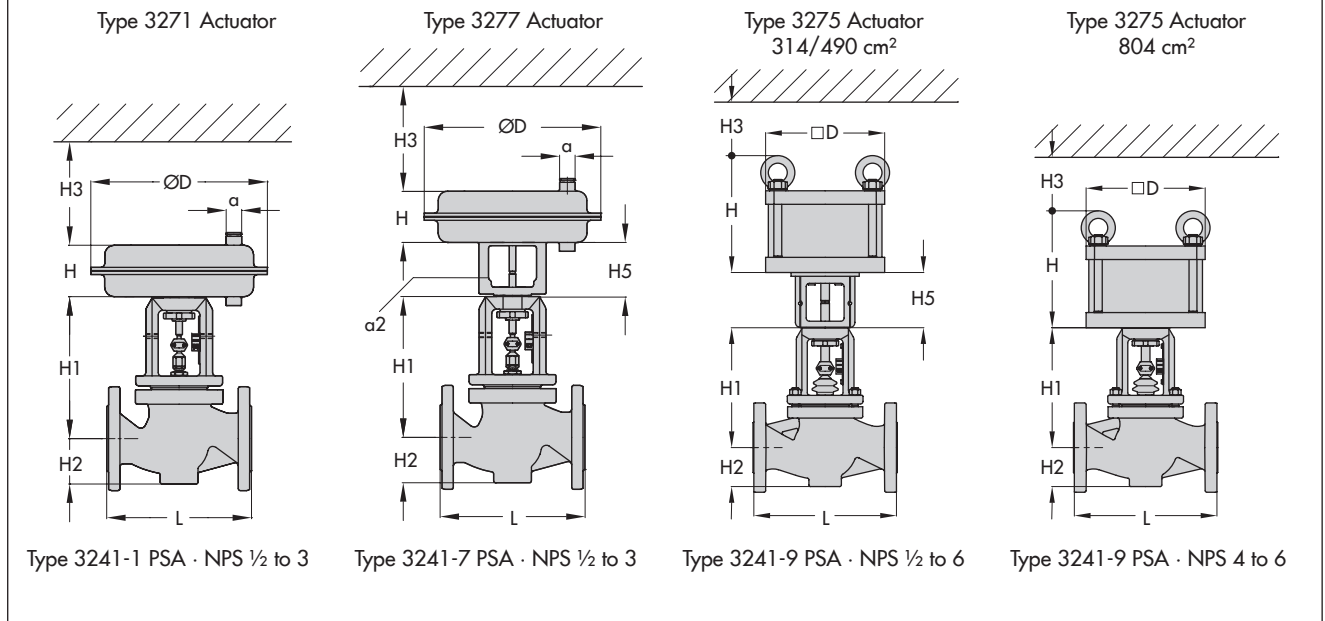
**Table 7.3:** Type 3275 Piston Actuator

| Actuator area    | cm <sup>2</sup> | 314               | 490               | 804       |
|------------------|-----------------|-------------------|-------------------|-----------|
| Diaphragm □D     | in              | 8.66              | 11.02             | 13.78     |
|                  | mm              | 220               | 280               | 350       |
| H                | in              | 8.86              | 9.84              | 11.26     |
|                  | mm              | 225 <sup>1)</sup> | 250 <sup>1)</sup> | 286       |
| H3 <sup>2)</sup> | in              | 4.33              | 4.33              | 7.48      |
|                  | mm              | 110               | 110               | 190       |
| H5               | in              | 3.98              | 3.98              | –         |
|                  | mm              | 101               | 101               | –         |
| Thread           |                 | M30 x 1.5         | M30 x 1.5         | M60 x 1.5 |

<sup>1)</sup> Dimensions may differ for special version (e.g. for low temperatures)

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

## Dimensions



**Table 8:** Weights for Type 3241-1 PSA, Type 3241-7 PSA and Type 3241-9 PSA

**Table 8.1:** Type 3241-1 PSA Valve

| Valve                   | NPS | ½  | ¾  | 1  | 1½ | 2  | 2½ | 3  | 4  | 6   |
|-------------------------|-----|----|----|----|----|----|----|----|----|-----|
|                         |     | DN | 15 | 20 | 25 | 40 | 50 | 65 | 80 | 100 |
| Weight without actuator | lbs | 11 | 13 | 15 | 26 | 33 | 53 | 66 | 92 | 264 |
|                         | kg  | 5  | 6  | 7  | 12 | 15 | 24 | 30 | 42 | 120 |

**Table 8.2:** Type 3271, Type 3277, and Type 3275 Actuators

| Actuator        | Type 3271      |                 |       | Type 3277 |      |       | Type 3275 |      |       |       |
|-----------------|----------------|-----------------|-------|-----------|------|-------|-----------|------|-------|-------|
|                 | Effective area | cm <sup>2</sup> | 120   | 350       | 700  | 120   | 350       | 700  | 314   | 490   |
| in <sup>2</sup> |                | 18.6            | 54.25 | 108.5     | 18.6 | 54.25 | 108.5     | 48.6 | 75.95 | 124.5 |
| Weight, approx. | lbs            | 6.6             | 18    | 48.5      | 7.7  | 26.5  | 57.5      | 22   | 37.5  | 46.5  |
|                 | kg             | 3               | 8     | 22        | 3.5  | 12    | 26        | 10   | 17    | 21    |

**Ordering text**

|                         |   |
|-------------------------|---|
| Globe valve             | Type 3241 PSA   |
| Valve size              | NPS ...   |
| Class                   | ...   |
| Body material           | According to Table 2  |
| Type of end connections | Flanges (RF or FF) or NPT thread  |
| Seat and plug           | Soft seal or high-performance metal seal  |
| Characteristic          | Equal percentage or linear  |
| Pneumatic actuator      | Type 3271. Type 3277 or Type 3275   |
| Fail-safe position      | Fail-close or fail-open   |
| Process medium          | Density in lb/cu.ft or kg/m <sup>3</sup> and temperature in °F or °C  |
| Flow rate               | lbs/h or kg/h or cu.ft/min or m <sup>3</sup> /h in standard or operating state                                |
| Pressure                | p <sub>1</sub> or p <sub>2</sub> in bar or psi (absolute pressure) with minimum, normal and maximum flow rate |
| Valve accessories       | Positioner and/or limit switch  |



Specifications subject to change without notice



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