

## Series 240

# Type 3248-1 and Type 3248-7 Pneumatic Control Valves Type 3248 Cryogenic Valve



DIN version

### Application

Globe or angle valve for cryogenic applications · Easy to service due to top-entry design

|                          |                       |
|--------------------------|-----------------------|
| <b>Nominal size</b>      | <b>DN 25 to 150</b>   |
| <b>Nominal pressure</b>  | <b>PN 16 to 100</b>   |
| <b>Temperature range</b> | <b>-273 to +65 °C</b> |



The Type 3248 Cryogenic Valve is specially designed to meet the requirements of cryogenic applications.

- Standard metal bellows to meet strict emission requirements
- Minimized heat leak thanks to the use of a bellows seal and a cryogenic extension bonnet
- Globe or angle-style valve body
- Installation in vacuum-insulated pipelines, air separation plants, and peripheral plants made possible by a cover plate on the cryogenic extension bonnet
- Valve maintenance possible without removing it from the pipeline
- Top entry through the cryogenic extension bonnet allows easy access to the seat, plug, and bellows after removal of the actuator
- The  $K_{VS}$  coefficients can be modified in wide ranges by replacing the seat and valve plug

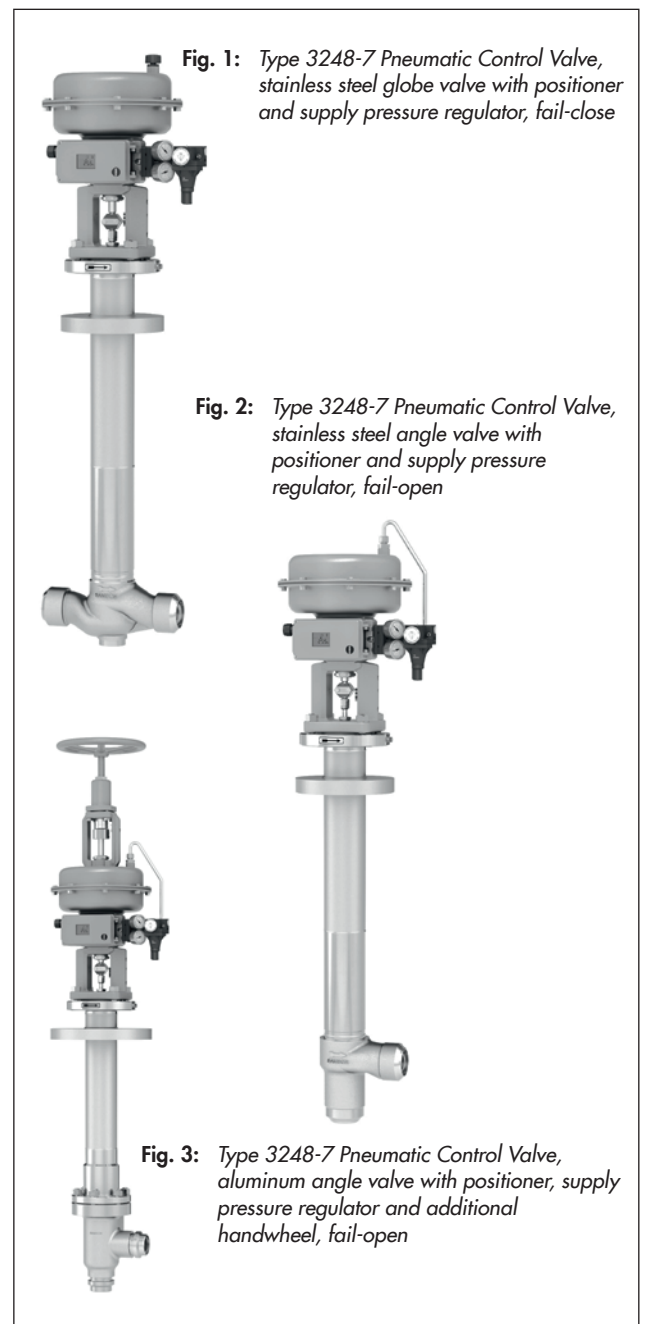
### Versions

**Standard version** · Temperature range from -196 to +65 °C  
Stem sealed by metal bellows and self-adjusting V-ring packing made of pure PTFE or PTFE/carbon

- **Type 3248-1** · With Type 3271 Pneumatic Actuator, 175 to 2800 cm<sup>2</sup> effective diaphragm area
- **Type 3248-7** · With Type 3277 Pneumatic Actuator for integral positioner attachment, 175 to 750 cm<sup>2</sup> effective diaphragm area

### Further versions

- Temperature range from -196 down to -273 °C
- Temperatures above 65 °C · On request
- Free of oil and grease for oxygen service
- Version for ultrapure gas
- Pipe jacketing for installation in vacuum-insulated plant components
- Pneumatic actuator with additional handwheel
- Cryogenic valves according to ANSI standard in NPS 1 to 6, Class 150 to 600 · See Data Sheet ▶ T 8093-1



**Fig. 1:** Type 3248-7 Pneumatic Control Valve, stainless steel globe valve with positioner and supply pressure regulator, fail-close

**Fig. 2:** Type 3248-7 Pneumatic Control Valve, stainless steel angle valve with positioner and supply pressure regulator, fail-open

**Fig. 3:** Type 3248-7 Pneumatic Control Valve, aluminum angle valve with positioner, supply pressure regulator and additional handwheel, fail-open

## Principle of operation

The medium flows through the cryogenic valve in the direction indicated by the arrow. The position of the valve plug (5) in relation to the seat (4) determines the flow rate.

The metal bellows seal (37) guarantees that the medium has no direct contact with the V-ring packing (15). The packing to seal the stem to the atmosphere is self-adjusting.

The stem seal can be checked at any time for leakage by removing the screw plug at the test connection (42).

## Installation

We recommend mounting the valve at an angle between 15° and 25° to the horizontal plane. Please contact SAMSON for smaller mounting angles as additional measures are required in this case. Avoid attaching the bracket or support in the area around bellows nut (41) (refer to the Mounting and Operating Instructions ► EB 8093).

The medium must flow through the valve in the direction indicated by the arrow on the valve body (1).

## Fail-safe position

Depending on how the springs are arranged in the pneumatic actuator (see Data Sheet ► T 8310-1), the valve has two different fail-safe positions effective upon air supply failure:

- **Actuator stem extends (FA)**  
When the air supply fails, the spring force moves the stem downward causing the valve to close.
- **Actuator stem retracts (FE)**  
When the air supply fails, the spring force moves the stem upwards causing the valve to open.

## Differential pressures

Permissible differential pressures are listed in Information Sheet ► T 8000-4:

- Valves in PN 16 to 40 according to Tables 1.1 to 1.3
- PN 63 to 100 according to Tables 2.1 to 2.3

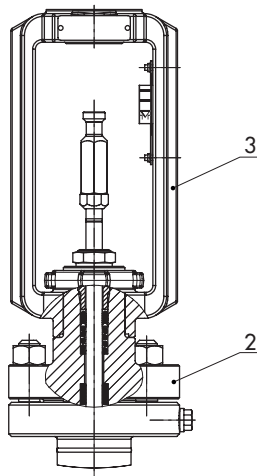


Fig. 4: Bonnet and yoke for PN 100

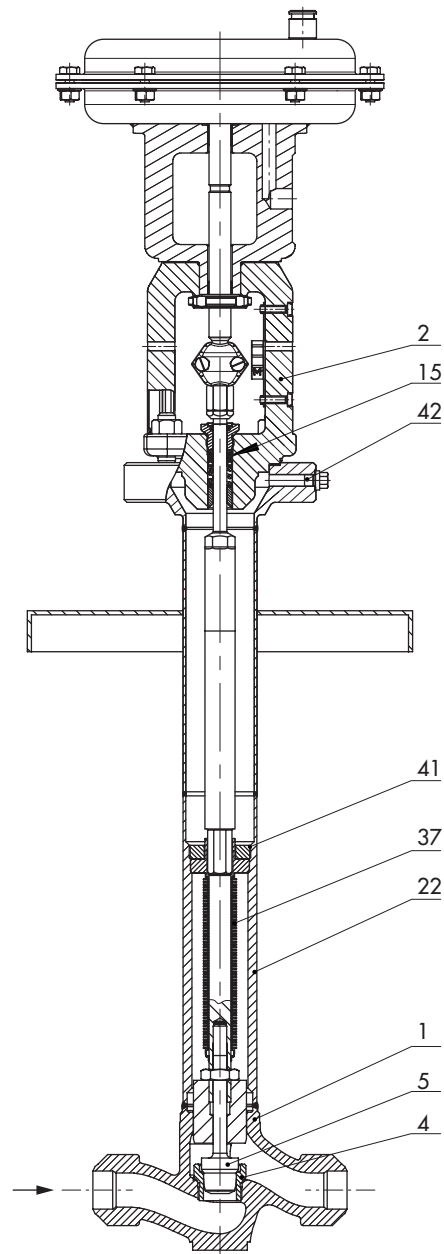


Fig. 5: Type 3248-7 (globe valve), PN 40

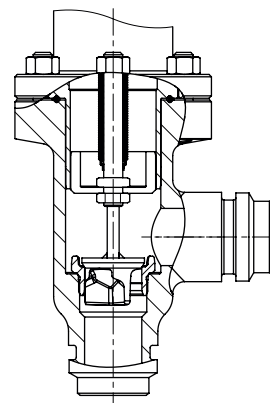



Fig. 6: Type 3248 Angle Valve with aluminum body, PN 40

**Legend for Fig. 4 and Fig. 5**

|   |        |    |                        |
|---|--------|----|------------------------|
| 1 | Body   | 15 | V-ring packing         |
| 2 | Bonnet | 22 | Bellows seal           |
| 3 | Yoke   | 37 | Plug stem with bellows |
| 4 | Seat   | 41 | Bellows nut            |
| 5 | Plug   | 42 | Test connection        |

**Table 1: Technical data for Type 3248 Cryogenic Valve**

| Version                                    | DIN EN   |                                    |                                       |
|--|--|------------------------------------|---------------------------------------|
| Body style                                 | Globe valve  | Angle valve                        |                                       |
| Body material                              | Steel  | Steel                              | Aluminum                              |
| Nominal size                               | DN 25 to 150   | DN 25 to 150                       | DN 25 to 150                          |
| Nominal pressure                           | PN 16 to 100   | PN 16 to 100                       | PN 16 to 40                           |
| End connections for globe and angle valves | Welding ends according to EN 12627   | Welding ends according to EN 12627 | Welding ends according to EN ISO 9692 |
| Seat-plug seal                             | Metal seal · Soft seal · High-performance metal seal                               |                                    |                                       |
| Characteristic                             | Equal percentage or linear   |                                    |                                       |
| Rangeability                               | 50:1 up to DN 50<br>30:1 for DN 80 to 150  |                                    |                                       |
| Temperature range                          | -196 to +65 °C · Down to -273 °C on request  |                                    |                                       |
| Leakage class according to IEC 60534-4     | Metal seal: IV · Soft seal: VI · High-performance metal seal: V                    |                                    |                                       |
| Compliance                                 |  |                                    |                                       |

**Table 2: Material**

| Valve  | Globe valve                   | Angle valve                             |            |
|--|-------------------------------|---|------------|
| Valve body   | 1.4308                        | 1.4308                                  | EN AW-5083 |
| Seat <sup>1)</sup>   | CrNiMo steel                  | CrNiMo steel                            |            |
| Plug <sup>1)</sup>   | Metal seal                    | CrNiMo steel                            |            |
|  | Soft seal                     | Seal ring made of PTFE with glass fiber |            |
| V-ring packing   | PTFE with carbon or pure PTFE |   |            |
| Cryogenic extension bonnet, metal bellows, bushings, plug stem | CrNiMo steel                  |   |            |

<sup>1)</sup> Seats and plugs without soft seal also with Stellite® facing · Plug up to seat bore 48 made of solid Stellite® available.

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

**Table 3.1: Overview**

| $K_{VS}$  | 0.1 to 0.25 | 0.4 to 1 | 1.6 to 4 | 6.3 to 10 | 16 | 25 | 40 | 60 | 80 | 63 | 100 | 160 | 260 |
|-----------|-------------|----------|----------|-----------|----|----|----|----|----|----|-----|-----|-----|
| Seat Ø mm | 3           | 6        | 12       | 24        | 31 | 38 | 48 | 63 | 80 | 63 | 80  | 100 | 130 |
| Travel mm | 15          | 15       | 15       | 15        | 15 | 15 | 15 | 15 | 15 | 30 | 30  | 30  | 30  |

**Table 3.2: Nominal sizes and associated  $K_{VS}$  coefficients**

| $K_{VS}$ | 0.1<br>0.16<br>0.25 | 0.4<br>0.63<br>1 | 1.6<br>2.5<br>4 | 6.3<br>10 | 16 | 25 | 40 | 60 | 80 | 63 | 100 | 160 | 260 |
|----------|---------------------|------------------|-----------------|-----------|----|----|----|----|----|----|-----|-----|-----|
| DN       |                     |                  |                 |           |    |    |    |    |    |    |     |     |     |
| 25       | •                   | •                | •               | •         |    |    |    |    |    |    |     |     |     |
| 40       |                     | •                | •               | •         | •  | •  |    |    |    |    |     |     |     |
| 50       |                     | •                | •               | •         | •  | •  | •  |    |    |    |     |     |     |
| 80       |                     |                  |                 |           |    | •  | •  | •  | •  |    |     |     |     |
| 100      |                     |                  |                 |           |    |    |    |    |    | •  | •   | •   |     |
| 150      |                     |                  |                 |           |    |    |    |    |    | •  | •   | •   | •   |

**Table 4:** Dimensions in mm and weights in kg for Type 3248 Globe Valve**i Note**

Height H7 is the minimum clearance for service work. The actuator dimensions and the height H3 in Table 6.1 must also be observed. The largest value applies.

Height H1 and the specified weights are reference values. The exact dimensions and weights depend on various factors, e.g. actuator size and overall height.

**Table 4.1:** Stainless steel valve body, PN 16 to 40 according to EN (Fig. 7, Fig. 8)

| Valve                                      | DN | 25          | 40          | 50          | 80        | 100        | 150          |
|--|----|-------------|-------------|-------------|-----------|------------|--------------|
| L  | mm | 210         | 251         | 286         | 337       | 394        | 508          |
| H1   | mm | 854         | 864         | 864         | 1052      | 1147.5     | 1188.5       |
| H2   | mm | 44          | 71          | 71          | 93        | 111        | 174          |
| H4 <sup>1)</sup>                           | mm | 600         | 600         | 600         | 700       | 800        | 800          |
| H5   | mm | 708         | 714         | 714         | 824       | 933.5      | 974.5        |
| H7   | mm | 1050        | 900         | 900         | 900       | 1100       | 1100         |
| Ød   | mm | 282         | 282         | 282         | 282       | 282        | 282          |
| Welding ends/pipe connection <sup>1)</sup> |    | Ø33.7 x 2.3 | Ø48.3 x 2.6 | Ø60.3 x 3.2 | Ø88.9 x 4 | Ø114.3 x 5 | Ø168.3 x 5.6 |
| Weight without actuator                    | kg | 17          | 30          | 30          | 55        | 96         | 131          |

<sup>1)</sup> Deviating dimensions on request

**Table 4.2:** Stainless steel valve body, PN 63 to 100 according to EN (Fig. 7, Fig. 8)

| Valve                                      | DN | 25          | 40          | 50        | 80          | 100          | 150          |
|--|----|-------------|-------------|-----------|-------------|--------------|--------------|
| L  | mm | 210         | 251         | 286       | 337         | 394          | 508          |
| H1   | mm | 822         | 817         | 817       | 832         | 984          | 1298         |
| H2   | mm | 44          | 71          | 71        | 93          | 111          | 174          |
| H4 <sup>1)</sup>                           | mm | 600         | 600         | 600       | 600         | 650          | 800          |
| H5   | mm | 734         | 734         | 734       | 734         | 786          | 923          |
| H7   | mm | 1050        | 900         | 900       | 900         | 1100         | 1100         |
| Ød   | mm | 282         | 282         | 282       | 282         | 282          | 282          |
| Welding ends/pipe connection <sup>1)</sup> |    | Ø33.7 x 3.2 | Ø48.3 x 3.6 | Ø60.3 x 4 | Ø88.9 x 5.6 | Ø114.3 x 6.3 | Ø168.3 x 7.1 |
| Weight without actuator                    | kg | 19          | 35          | 35        | 80          | 108          | 190          |

<sup>1)</sup> Deviating dimensions on request

Dimensional drawings

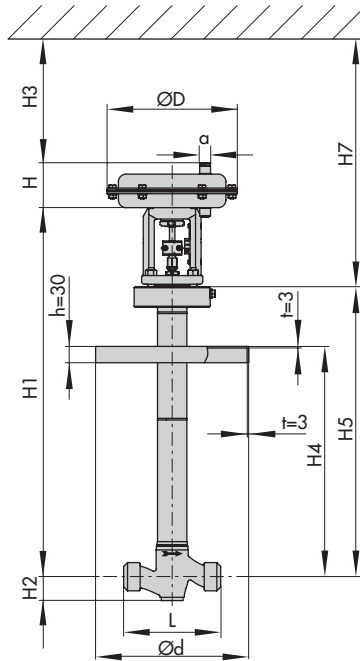


Fig. 7: Type 3248-1 Globe Valve with stainless steel valve body

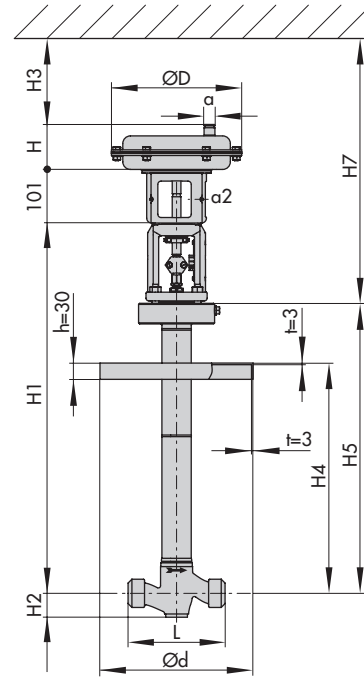


Fig. 8: Type 3248-7 Globe Valve with stainless steel valve body

**Table 5:** Dimensions in mm and weights in kg for Type 3248 Angle Valve**i Note**

Height H7 is the minimum clearance for service work. The actuator dimensions and the height H3 in Table 6.1 must also be observed. The largest value applies.

Height H1 and the specified weights are reference values. The exact dimensions and weights depend on various factors, e.g. actuator size and overall height.

**Table 5.1:** Type 3248 Angle Valve with aluminum body, PN 16 to 40<sup>1)</sup> (Fig. 9)

| Valve                        | DN | 25        | 40      | 50      | 80      | 100      | 150      |
|------------------------------|----|-----------|---------|---------|---------|----------|----------|
| L                            | mm | 98        | 133     | 133     | 159     | 184      | 236      |
| H1                           | mm | 825       | 827     | 827     | 1035    | 1120     | 1149     |
| H4                           | mm | 600       | 600     | 600     | 700     | 800      | 800      |
| H5                           | mm | 679       | 677     | 677     | 807     | 906      | 935      |
| H7                           | mm | 1050      | 900     | 900     | 900     | 1100     | 1100     |
| Ød                           | mm | 282       | 282     | 282     | 282     | 282      | 282      |
| Welding ends/pipe connection |    | Ø35 x 3.5 | Ø50 x 4 | Ø60 x 4 | Ø89 x 5 | Ø114 x 6 | Ø162 x 8 |
| Weight without actuator      | kg | 19        | 31      | 31      | 51      | 95       | 115      |

<sup>1)</sup> Higher nominal pressures on request

**Table 5.2:** Type 3248 Angle Valve in stainless steel version, PN 16 to 40 (Fig. 10)

| Valve                        | DN | 25          | 40          | 50          | 80        | 100        | 150          |
|------------------------------|----|-------------|-------------|-------------|-----------|------------|--------------|
| L                            | mm | 98          | 133         | 133         | 159       | 184        | 236          |
| H1                           | mm | 830         | 845         | 845         | 1017      | 1108       | 1101         |
| H4                           | mm | 600         | 600         | 600         | 650       | 750        | 750          |
| H5                           | mm | 684         | 695         | 695         | 788       | 893        | 887          |
| H7                           | mm | 1050        | 900         | 900         | 900       | 1100       | 1100         |
| Ød                           | mm | 282         | 282         | 282         | 282       | 282        | 282          |
| Welding ends/pipe connection |    | Ø33.7 x 2.3 | Ø48.3 x 2.6 | Ø60.3 x 3.2 | Ø88.9 x 4 | Ø114.3 x 5 | Ø168.3 x 5.6 |
| Weight without actuator      | kg | 16.5        | 27          | 27          | 57        | 98         | 127          |

**Table 5.3:** Type 3248 Angle Valve in stainless steel version, PN 63 to 100 (Fig. 10)

| Valve                        | DN | 25          | 40          | 50        | 80          | 100          | 150          |
|------------------------------|----|-------------|-------------|-----------|-------------|--------------|--------------|
| L                            | mm | 98          | 133         | 133       | 159         | 184          | 236          |
| H1                           | mm | 798         | 798         | 798       | 795.5       | 943          | 1210         |
| H4 <sup>1)</sup>             | mm | 400/600     | 400/600     | 400/600   | 400/600     | 500/600      | 550/600      |
| H5 <sup>1)</sup>             | mm | 510/710     | 515/715     | 515/715   | 498/698     | 645/745      | 649/699      |
| H7                           | mm | 1050        | 900         | 900       | 900         | 1100         | 1100         |
| Ød                           | mm | 282         | 282         | 282       | 282         | 282          | 282          |
| Welding ends/pipe connection |    | Ø33.7 x 3.2 | Ø48.3 x 3.6 | Ø60.3 x 4 | Ø88.9 x 5.6 | Ø114.3 x 6.3 | Ø168.3 x 7.1 |
| Weight without actuator      | kg | 18          | 31          | 31        | 61          | 107          | 186          |

<sup>1)</sup> Different overall height possible

## Dimensional drawings

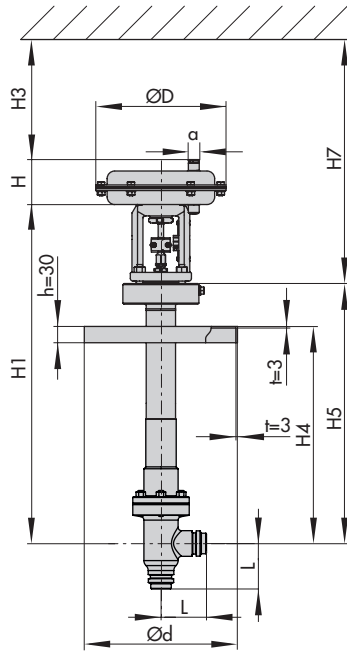


Fig. 9: Type 3248-1 Angle Valve with aluminum body

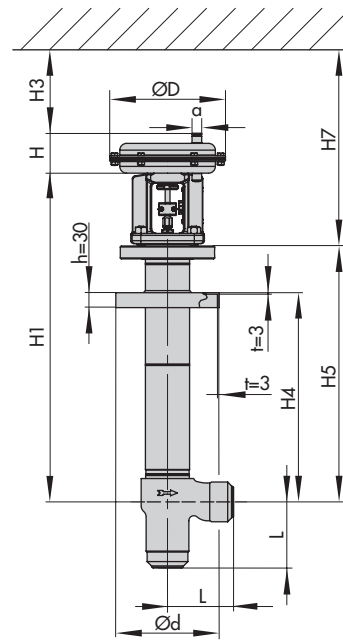


Fig. 10: Type 3248-1 Angle Valve with stainless steel body

Table 6: Dimensions and weights for Type 3271 and Type 3277 Pneumatic Actuators

Table 6.1: Dimensions in mm

| Actuator area    | cm <sup>2</sup> | 175            | 240            | 350            | 355            | 700            | 750            | 1000           | 1400-60        | 1400-120                                 | 2800                                     |
|------------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|--|
| Diaphragm ØD     | mm              | 215            | 240            | 280            | 280            | 390            | 394            | 462            | 530            | 534                                      | 770                                      |
| H <sup>1)</sup>  | mm              | 78             | 62             | 82             | 121            | 199            | 236            | 403            | 287            | 490 <sup>3)</sup> /<br>580 <sup>4)</sup> | 630 <sup>3)</sup> /<br>695 <sup>4)</sup> |
| H3 <sup>2)</sup> | mm              | 110            | 110            | 110            | 110            | 190            | 190            | 610            | 610            | 650                                      | 650                                      |
| Height of yoke   | Type 3277 mm    | 101            | 101            | 101            | 101            | 101            | 101            | -              | -              | -  | -  |
| Thread           | Type 3271       | M30 x 1.5      |                |                |                |                |                | M60 x 1.5      |                | M100 x 2                                 |  |
|                  | Type 3277       | M30 x 1.5      |                |                |                |                |                | -              | -              | -  | -  |
| a                | Type 3271       | G ¼<br>(¼ NPT) | G ¼<br>(¼ NPT) | G ⅜<br>(⅜ NPT) | G ⅜<br>(⅜ NPT) | G ⅜<br>(⅜ NPT) | G ⅜<br>(⅜ NPT) | G ¾<br>(¾ NPT) | G ¾<br>(¾ NPT) | G 1<br>(1 NPT)                           | G 1<br>(1 NPT)                           |
| a2               | Type 3277       | G ⅜            | G ⅜            | G ⅜            | G ⅜            | G ⅜            | G ⅜            | -              | -              | -  | -  |

<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 required to remove the actuator. Additionally observe H7 in Table 4 and Table 5. The largest value applies.

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

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

Table 6.2: Weights in kg

| Actuator area | cm <sup>2</sup> | 175 | 240 | 350 | 355 | 700 | 750 | 1000 | 1400-60 | 1400-120 | 2800 |
|---------------|-----------------|-----|-----|-----|-----|-----|-----|------|---------|----------|------|
| Weight        | Type 3271 kg    | 6   | 5   | 8   | 15  | 22  | 36  | 80   | 70      | 175      | 450  |
|               | Type 3277 kg    | 10  | 9   | 12  | 19  | 26  | 40  | -    |         |          |      |

**Table 7: Valve/actuator assignment****Table 7.1: PN 16 to 40**

| Valve size    | Stem diameter | Actuator area                  |
|---------------|---------------|--------------------------------|
| DN 25 to 50   | 10 mm         | 175 to 750 cm <sup>2</sup>     |
| DN 80         | 16 mm         | 350 to 750 cm <sup>2</sup>     |
| DN 100 to 150 | 16 mm         | 350 to 1400-60 cm <sup>2</sup> |

**Table 7.2: PN 63 to 100**

| Valve size  | Stem diameter | Actuator area                   |
|-------------|---------------|---------------------------------|
| DN 25       | 12 mm         | 175 to 750 cm <sup>2</sup>      |
| DN 40 to 80 | 16 mm         | 350 to 1400-60 cm <sup>2</sup>  |
| DN 100      | 16 mm         | 350 to 1400-120 cm <sup>2</sup> |
| DN 150      | 40 mm         | 1000 to 2800 cm <sup>2</sup>    |

**The following specifications are required on ordering:**

|                    |   |
|--------------------|---|
| Type 3248 Valve    | Globe or angle valve  |
| Nominal size       | DN ...  |
| Nominal pressure   | PN ...  |
| Flow coefficient   | K <sub>VS</sub> ...   |
| Characteristic     | Equal percentage or linear  |
| Body material      | According to Table 2  |
| Connection         | Welding-neck ends or welding ends<br>Pipe dimensions<br>Height<br>Cover plate |
| Pneumatic actuator | Type 3271 or Type 3277  |
| Actuator area      | ... cm <sup>2</sup>   |
| Bench range        | ... bar   |
| Fail-safe position | Fail-close or fail-open   |

Specifications subject to change without notice

