

Pneumatic Control Valve Type 3259-1 and 3259-7 Angle Valve Type 3259

Application

Control valve for industrial high pressure plants according to the IG standard

| | |
|-------------------|-----------------------|
| Nominal sizes | DN 16 to DN 90 |
| Nominal pressure | PN 325 |
| Temperature range | -200 to 450 °C |

Type 3259 Angle Valve optionally operated with:

- Type 3271 Pneumatic Actuator as Type 3259-1 Control Valve or
- Type 3277 Pneumatic Actuator as Type 3259-7 Control Valve for integral positioner attachment.

The valve body is made of forged stainless steel. The end connections are screwed flanges with lens ring gaskets.

Valve plug optionally with:

- Metal sealing or
- Lapped-in metal.

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

Positioners, limit switches, solenoid valves and other equipment according to IEC 60534-6 and NAMUR recommendation (see Information Sheet T 8350 EN for details).

Versions

Standard version with spring-loaded double packing for temperatures between -10 and 220 °C; nominal sizes DN 16, 24, 30, 45, 58, 70 and 90; nominal pressure PN 325.

Body of 1.4571 with intermediate flanges made of 1.7258, end connections with screwed flanges and lens ring gaskets.

- **Type 3259-1** · Type 3259 Valve and Type 3271 Actuator with 350 to 2800 cm² effective area (see T 8310-1 EN and T 8310-2 EN)
- **Type 3259-7** · Type 3259 Valve and Type 3277 Actuator with 350 and 700 cm² effective area for the integral positioner attachment (see T 8310-1 EN)

Additional versions with

- **Adjustable high-temperature packing** · For temperatures from -10 to 350 °C
- **Insulating section** · For temperatures from -200 to 450 °C (see pressure-temperature diagram for pressures and temperatures)
- **Heating jacket** · Available on request
- **Metal bellows seal** · Material 2.4819 with additional backup packing and test connection
- **Nominal size DN 120** · Available on request
- **Nominal sizes DN 6 and DN 10** · As Type 3510 Micro-flow Valve version



Fig. 1 · Type 3259-1 Control Valve, DN 70, PN 325 according to the IG standard, pneumatic actuator with 2800 cm² effective diaphragm area

Principle of operation

The medium flows through the valve in the flow-to-open direction. The position of the valve plug determines the cross-sectional area of flow between the valve seat and plug. The plug stem is sealed with a spring-loaded double PTFE packing.

A metal bellows seal (Fig. 3) can be used for higher requirements.

A test connection is available on request for both versions.

The actuators are designed for pressure from both sides (see Tables 4b and 5b).

Fail-safe position

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

Actuator stem "extends":

When the air supply fails, the valve is closed (fail-close).

Actuator stem "retracts":

When the air supply fails, the valve is opened (fail-open).

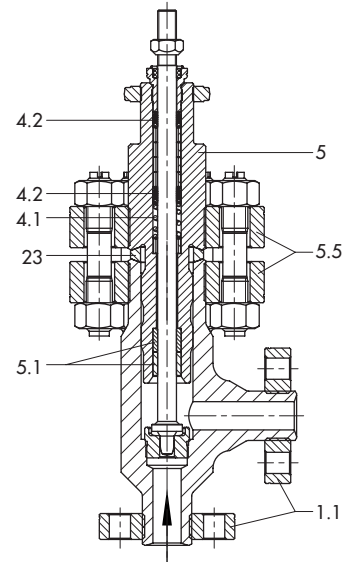


Fig. 2 · Type 3259 Valve as standard version

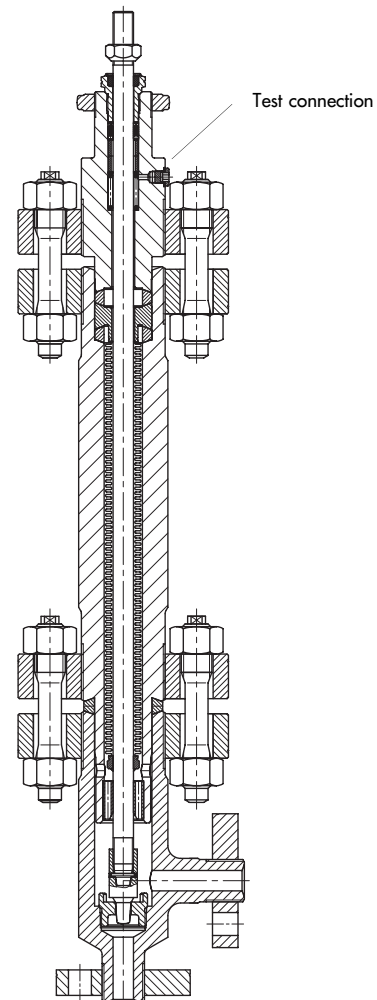


Fig. 3 · Type 3259 Valve with metal bellows seal and test connection

Legend to Fig. 2

- 1.1 Connecting flange
- 4.1 Spring
- 4.2 PTFE V-ring packing (double)
- 5 Bonnet
- 5.1 Guide bushing
- 5.5 Intermediate flange
- 23 Lens ring gasket

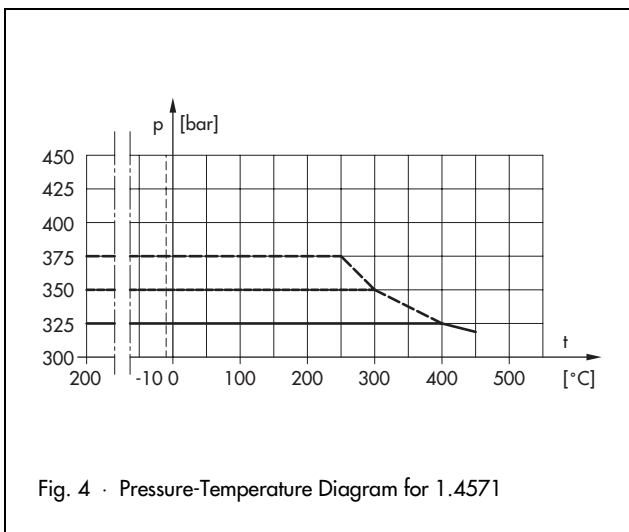


Table 1 · Technical data

| | | |
|---|--------------------|---|
| Nominal size | DN | 16 · 24 · 30 · 45 · 58 · 70 · 90 |
| Nominal pressure | PN | 325 |
| End connection | | Screwed flanges with lens ring gaskets according to the IG standard |
| Seat/plug sealing | | Metal sealing or lapped-in metal |
| Characteristic | | Equal percentage or linear |
| Rangeability | | 50 : 1 with $K_{vs} \geq 1$ · 30 : 1 with $K_{vs} < 1$ |
| Temperature ranges in °C · Permissible operating pressures according to Pressure-Temperature Diagram | | |
| Body without insul. section | PTFE packing | -10 ... 220 °C |
| | HT packing | -10 ... 350 °C |
| Body with insulating section | Insulating section | -200 ... 450 °C |
| | Bellows seal | -200 ... 450 °C |
| Leakage rate acc. to DIN EN 1349 | | |
| Valve plug | Metal sealing | IV |
| | Lapped-in metal | IV-S2 |

Table 2 · Materials

| | | |
|----------------------|--|---|
| Standard version | | 1.4571 /1.0460 |
| Body | | 1.4571 /1.0460 |
| Flanges | | 1.7258 |
| Bolts | | 1.7258 |
| Seat and plug | | 1.4571 Seat: 1.4571 stellite · Plug: Stellite 6 1.4112 hardened |
| Guide bushings | | 2.4610 /1.4112 |
| Stuffing box packing | | V-ring packing PTFE carbon compound |
| Body gasket | | Lens ring gaskets 1.4571/1.0460 |
| Insulating section | | 1.4571/1.0460 |
| Metal bellows seal | | |
| Intermediate piece | | 1.4571/1.0460 |
| Metal bellows | | 2.4819 |

Table 3 · K_{vs} coefficients
Table 3a · Overview

| K_{vs} | 0.1 · 0.16 0.25 · 0.4 | 0.63 | 1.0 | 1.6 | 2.5 | 4 | 6.3 | 10 | 16 | 25 | 40 | 63 | 100 |
|---------------------|--------------------------|------|-----|-----|-----|---|-----|----|----|----|----|----|-----|
| Seat- \varnothing | 6 | | 12 | | 24 | | | 31 | 38 | 50 | 63 | 80 | |
| Travel | 15 | | | | | | | | | 30 | | | |

Table 3b · Versions

| K_{vs} | 0.1 · 0.16 0.25 · 0.4 | 0.63 | 1.0 | 1.6 | 2.5 | 4 | 6.3 | 10 | 16 | 25 | 40 | 63 | 100 |
|----------|--------------------------|------|-----|-----|-----|---|-----|----|----|----|----|----|-----|
| DN | | | | | | | | | | | | | |
| 16 | • | • | • | • | • | • | | | | | | | |
| 24 | • | • | • | • | • | • | • | • | | | | | |
| 30 | • | • | • | • | • | • | • | • | | | | | |
| 45 | | | | • | • | • | • | • | • | • | | | |
| 58 | | | | | | • | • | • | • | • | | | |
| 70 | | | | | | | | | • | • | • | • | |
| 90 | | | | | | | | | • | • | • | • | • |

Table 4a · Actuator sizing for Type 3259 Valve without bellows seal; fail-safe position "actuator stem extends" (fail-close)

| DN | K _{vs} | Actuator/cm ² | Bench range in bar applicable when | | | |
|----------|-----------------|--------------------------|------------------------------------|-------------|--------------|-------------|
| | | | Δp=50 bar | Δp=100 bar | Δp=200 bar | Δp=325 bar |
| 16 | 0.1 to 1.0 | 350 | 0.4 ... 1.2 | 0.8 ... 2.4 | 1.4 ... 2.3 | 2.1 ... 3.3 |
| | | 700 | – | – | 0.8 ... 1.2 | 1.6 ... 2.4 |
| | 1.6 to 2.5 | 350 | 0.4 ... 1.2 | 0.8 ... 2.4 | 1.4 ... 2.3 | 2.1 ... 3.3 |
| | | 700 | – | 0.8 ... 1.2 | 0.8 ... 1.2 | 1.6 ... 2.4 |
| 16 to 58 | 4.0 to 10 | 1400 | – | – | – | 1.0 ... 1.2 |
| | | 350 | 0.8 ... 2.4 | 2.1 ... 3.3 | – | – |
| | | 700 | – | 1.6 ... 2.4 | 1.6 ... 2.4 | 2.7 ... 3.3 |
| 45 to 90 | 16 | 1400 | – | – | 1.0 ... 1.2 | 2.0 ... 2.4 |
| | | 350 | 1.4 ... 2.3 | – | – | – |
| | | 700 | 0.8 ... 1.2 | 1.6 ... 2.4 | 2.7 ... 3.3 | – |
| | 25 | 350 | 2.1 ... 3.3 | – | – | – |
| | | 700 | 1.6 ... 2.4 | 2.7 ... 3.3 | – | – |
| | | 1400 | – | 1.0 ... 1.2 | 2.0 ... 2.4 | – |
| | | 2800 | – | – | – | 2.2 ... 2.4 |
| 70 to 90 | 40 | 700 | 2.1 ... 3.3 | – | – | – |
| | | 1400 | 0.8 ... 1.2 | 1.6 ... 2.4 | – | – |
| | | 2800 | – | – | 2.0 ... 2.43 | 3.0 ... 3.6 |
| | 63 | 700 | 2.6 ... 4.3 | – | – | – |
| | | 1400 | 1.6 ... 2.4 | – | – | – |
| | | 2800 | – | 2.0 ... 2.4 | 2.5 ... 3.0 | – |
| | | 2x2800 | – | – | – | 2.0 ... 2.4 |
| 90 | 100 | 1400 | 2.0 ... 3.0 | – | – | – |
| | | 2800 | 1.0 ... 1.2 | 2.0 ... 2.4 | – | – |
| | | 2x2800 | – | – | 2.0 ... 2.4 | 3.3 ... 3.9 |

Table 4b · Actuator sizing for Type 3259 Valve without bellows seal; fail-safe position "actuator stem retracts" (fail-open)

| DN | K _{vs} | Actuator/cm ² | Bench range | Required supply pressure in bar applicable when | | | |
|----------|-----------------|--------------------------|-------------|---|------------|------------|------------|
| | | | | Δp=50 bar | Δp=100 bar | Δp=200 bar | Δp=325 bar |
| 16 | 0.1 to 1.0 | 350 | 0.2 ... 1.0 | 1.5 | 1.8 | 2.4 | 3.1 |
| | | 700 | | – | – | 1.4 | 1.8 |
| 16 | 1.6 to 2.5 | 350 | 0.2 ... 1.0 | 1.5 | 1.8 | – | – |
| | | 700 | | – | – | 1.4 | 1.8 |
| 16 to 58 | 4.0 to 10 | 350 | 0.2 ... 1.0 | 1.9 | 2.5 | – | – |
| | | 700 | | 1.1 | 1.5 | 2.1 | 2.9 |
| | | 1400 | 0.4 ... 2.0 | – | – | 1.7 | 2.0 |
| 45 to 90 | 16 | 350 | 0.2 ... 1.0 | 2.2 | – | – | – |
| | | 700 | | 1.4 | 1.9 | 2.0 | – |
| | | 1400 | 0.4 ... 2.0 | – | 1.5 | 2.1 | 2.8 |
| | 25 | 350 | 0.2 ... 1.0 | 2.8 | – | – | – |
| | | 700 | | 1.6 | 2.5 | – | – |
| | | 1400 | 0.4 ... 2.0 | – | 1.8 | 2.6 | 3.7 |
| 70 to 90 | 40 | 700 | 0.2 ... 1.0 | 2.6 | – | – | – |
| | | 1400 | | 2.0 | 2.2 | – | – |
| | | 2800 | 0.4 ... 2.0 | – | 1.7 | 2.4 | 3.3 |
| | 63 | 700 | 0.2 ... 1.0 | 3.5 | – | – | – |
| | | 1400 | | 2.1 | 3.1 | – | – |
| | | 2800 | 0.4 ... 2.0 | – | 2.1 | 3.2 | – |
| 90 | 100 | 2x2800 | 0.4 ... 2.0 | – | – | 2.1 | 2.8 |
| | | 1400 | 0.2 ... 1.0 | 2.6 | – | – | – |
| | | 2800 | 0.4 ... 2.0 | 2.0 | 2.8 | – | – |
| | | | | – | 1.9 | 2.8 | 4.0 |

Table 5a · Actuator sizing for Type 3259 Valve with bellows seal; fail-safe position "actuator stem extends" (fail-close)

| DN | K _{vs} | Actuator/cm ² | Bench range applicable when | | | |
|----------|-----------------|--------------------------|-----------------------------|-------------|-------------|--------------|
| | | | Δp=50 bar | Δp=100 bar | Δp=200 bar | Δp=325 bar |
| 16 | 0.1 to 1.0 | 350 | 0.8 ... 2.4 | 1.4 ... 2.3 | – | – |
| | | 700 | – | – | 1.6 ... 2.4 | 2.4 ... 3.6 |
| | 1.6 to 2.5 | 350 | 0.8 ... 2.4 | 1.4 ... 2.3 | – | – |
| | | 700 | – | – | 1.6 ... 2.4 | 2.4 ... 3.6 |
| 16 to 58 | 4.0 to 10 | 350 | 1.4 ... 2.3 | 2.1 ... 3.3 | – | – |
| | | 700 | – | 1.6 ... 2.4 | 1.6 ... 2.4 | 2.7 ... 3.3 |
| | | 1400 | – | – | 1.0 ... 1.2 | 2.0 ... 2.4 |
| 45 to 90 | 16 | 350 | 2.1 ... 3.3 | – | – | – |
| | | 700 | – | 2.7 ... 3.3 | – | – |
| | | 1400 | – | – | 2.0 ... 2.4 | 2.0 ... 2.4 |
| | 25 | 350 | 2.1 ... 3.3 | – | – | – |
| | | 700 | 1.6 ... 2.4 | 2.7 ... 3.3 | – | – |
| | | 1400 | – | 1.0 ... 1.2 | 2.0 ... 2.4 | 2.83 ... 3.2 |
| 70 to 90 | 40 | 700 | 2.1 ... 3.3 | – | – | – |
| | | 1400 | 1.0 ... 1.2 | 2.0 ... 3.0 | – | – |
| | | 2800 | – | 1.0 ... 1.2 | 2.0 ... 2.4 | 3.0 ... 3.8 |
| | 63 | 700 | 2.6 ... 4.3 | – | – | – |
| | | 1400 | 2.0 ... 2.4 | – | – | – |
| | | 2800 | – | 2.0 ... 2.4 | 3.0 ... 3.6 | – |
| | | 2x2800 | – | – | 2.0 ... 2.4 | 2.5 ... 3.0 |
| 90 | 100 | 1400 | 2.5 ... 3.0 | – | – | – |
| | | 2800 | 2.0 ... 2.4 | 2.5 ... 3.0 | 3.0 ... 3.8 | – |
| | | 2x2800 | – | – | – | 3.3 ... 3.8 |

Table 5b · Actuator sizing for Type 3259 Valve with bellows seal; fail-safe position "actuator stem retracts" (fail-open)

| DN | K _{vs} | Actuator/cm ² | Bench range | Required supply pressure in bar applicable when | | | |
|----------|-----------------|--------------------------|-------------|---|------------|------------|------------|
| | | | | Δp=50 bar | Δp=100 bar | Δp=200 bar | Δp=325 bar |
| 16 | 0.1 to 1.0 | 350 | 0.2 ... 1.0 | 1.9 | 2.5 | – | – |
| | | 700 | | – | – | 1.9 | 2.6 |
| | 1.6 to 2.5 | 350 | 0.2 ... 1.0 | 1.9 | 2.5 | – | – |
| | | 700 | | – | 1.5 | 1.9 | 2.6 |
| 16 to 58 | 4.0 to 10 | 350 | 0.2 ... 1.0 | 2.1 | 2.7 | – | – |
| | | 700 | | – | 1.5 | 2.2 | 3.0 |
| | | 1400 | 0.4 ... 2.0 | – | – | 1.5 | 2.1 |
| 45 to 90 | 16 | 350 | 0.2 ... 1.0 | 2.5 | – | – | – |
| | | 700 | | – | 2.0 | 3.0 | – |
| | | 1400 | | 0.4 ... 2.0 | – | 1.6 | 2.1 |
| | 25 | 350 | 0.2 ... 1.0 | 3.0 | – | – | – |
| | | 700 | | 1.7 | 2.5 | – | – |
| | | 1400 | | 0.4 ... 2.0 | – | 1.8 | 2.7 |
| 70 to 90 | 40 | 700 | 0.2 ... 1.0 | 2.7 | – | – | – |
| | | 1400 | | 2.0 | 2.7 | – | – |
| | | 2800 | | 0.4 ... 2.0 | – | 1.7 | 2.4 |
| | 63 | 700 | 0.2 ... 1.0 | 3.6 | – | – | – |
| | | 1400 | | 2.4 | 3.5 | – | – |
| | | 2800 | 0.4 ... 2.0 | – | 2.1 | 3.3 | – |
| | | 2x2800 | | – | – | 2.1 | 2.8 |

Table 6 · Dimensions in mm for Type 3259-1 and Type 3259-7 as standard version

| Valve | DN | 16 | 24 | 30 | 45 | 58 | 70 | 90 |
|----------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|
| Length L | | 95 | 110 | 120 | 150 | 170 | 200 | 235 |
| H1 for actuator with | 350 cm ² | 470 | 470 | 470 | 560 | 560 | – | |
| | 700 cm ² | 470 | 470 | 470 | 560 | 560 | 820 | 820 |
| | 1400 cm ² | 525 | | | 615 | 615 | 820 | 820 |
| | 2800 cm ² | – | | | 800 | 800 | 905 | 905 |
| | 2x2800 cm ² | – | | | | | 905 | 905 |

| Actuator | cm ² | 350 | 700 | 1400 | 2800 | 2 x 2800 |
|------------------------------|-----------------|-----------------|-----|-----------------|-------------|----------|
| Diaphragm Ø D | | 280 | 390 | 530 | 770 | |
| H ¹⁾ | | 82 | 200 | 287 | 620 | 1130 |
| H3 ²⁾ | | 110 | 190 | 610 | 648 | |
| Thread | | M 30 x 1.5 | | M 60 x 1.5 | M 100 x 2 | |
| α (with Type 3271 Actuator) | | G 3/8 (3/8 NPT) | | G 3/4 (3/4 NPT) | G 1 (1 NPT) | |
| α2 (with Type 3277 Actuator) | | G 3/8 (3/8 NPT) | | – | | |

1) Actuator 350 cm² without lifting ring

2) Minimum clearance for actuator disassembly

Table 7 · Weights for Type 3259-1 and Type 3259-7 as standard version

| Valve | DN | 16 | 24 | 30 | 45 | 58 | 70 | 90 |
|-------------------------------------|----|----|----|----|------------------|------------------|-------------------|-------------------|
| Valve without actuator (approx. kg) | | 35 | 40 | 45 | 85 ¹⁾ | 90 ¹⁾ | 220 ¹⁾ | 230 ¹⁾ |

1) The weight increases by 30 kg with an actuator with 2800 cm² or 2x2800 cm²

| Actuator | cm ² | 350 | 700 | 1400 | 2800 | 2 x 2800 |
|--------------------------------------|-----------------|-----|-----|---|------|----------|
| Type 3271 (approx. kg) ¹⁾ | without | 8 | 22 | 70 | 450 | 950 |
| | with handwheel | 13 | 27 | Only with side-mounted handwheel, see T 8310-2 EN | | |
| Type 3277 (approx. kg) ¹⁾ | without | 12 | 26 | – | | |
| | with handwheel | 17 | 31 | | | |

1) Top row without handwheel, bottom row with handwheel

Table 8a · Dimensions and weights for Type 3259 as standard version with insulating section · Without actuator

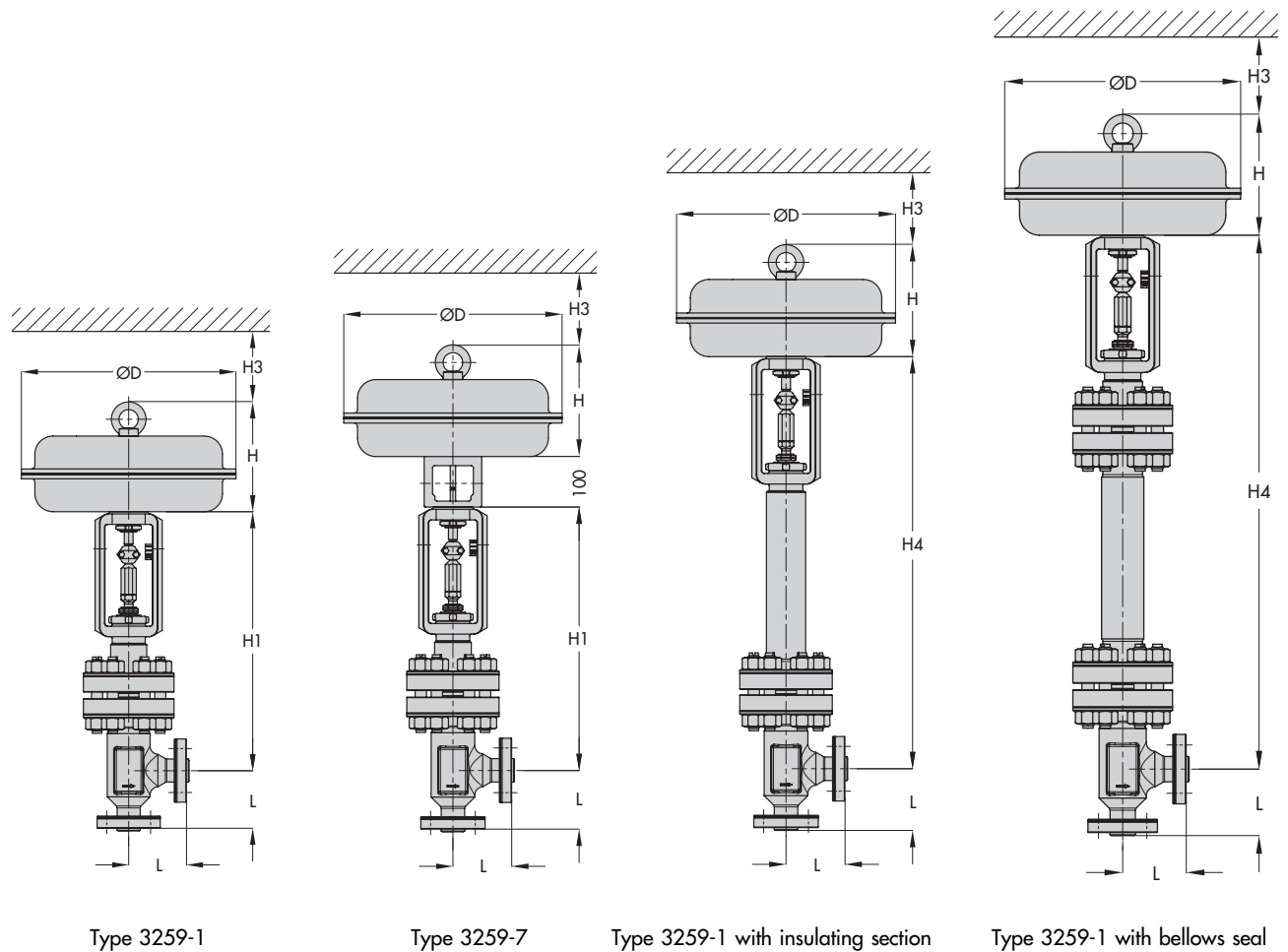
| Nominal size | DN | 16 | 24 | 30 | 45 | 58 | 70 | 90 |
|--------------------------------|------------------------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|
| Height H4 for actuator with | 350 cm ² | 735 | 735 | 735 | 810 | 810 | – | |
| | 700 cm ² | 735 | 735 | 735 | 810 | 810 | 1175 | 1175 |
| | 1400 cm ² | 790 | 790 | 790 | 865 | 865 | 1175 | 1175 |
| | 2800 cm ² | – | | | 1050 | 1050 | 1260 | 1260 |
| | 2x2800 cm ² | – | | | | | 1260 | 1260 |
| Weight without actuator | kg | 45 | 48 | 53 | 100 ¹⁾ | 105 ¹⁾ | 295 ¹⁾ | 305 ¹⁾ |

1) The weight increases by 30 kg with an actuator with 2800 cm² or 2x2800 cm²**Table 8b · Dimensions and weights for Type 3259 as standard version with bellows seal · Without actuator**

| Nominal size | DN | 16 | 24 | 30 | 45 | 58 | 70 | 90 |
|--------------------------------|------------------------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|
| Height H4 for actuator with | 350 cm ² | 885 | 885 | 885 | 875 | 895 | – | |
| | 700 cm ² | 885 | 885 | 885 | 875 | 875 | 1485 | 1485 |
| | 1400 cm ² | 940 | 940 | 940 | 930 | 930 | 1485 | 1485 |
| | 2800 cm ² | – | | | 1115 | 1115 | 1570 | 1570 |
| | 2x2800 cm ² | – | | | | | 1570 | 1570 |
| Weight without actuator | kg | 50 | 53 | 55 | 100 ¹⁾ | 105 ¹⁾ | 357 ¹⁾ | 365 ¹⁾ |

1) The weight increases by 30 kg with an actuator with 2800 cm² or 2x2800 cm²

Dimensional diagrams



Selection and sizing of the control valve

1. Calculate the K_v coefficient according to IEC 60534.
2. Select the nominal size DN and K_{vs} coefficient according to Tables 3 to 5.
3. Determine the permissible differential pressure Δp according Tables 4 and 5.
4. Accessories according to Tables 1 and 2.

The following details are required on ordering

| | |
|-------------------|---|
| Nominal size | DN |
| Direction of flow | FTO or FTC |
| Plug | Metal sealing or lapped-in metal |
| Characteristic | Equal percentage or linear |
| Actuator | Type 3271 or Type 3277 (see T 8310-1 EN or T 8310-2 EN) |
| Fail-safe action | Valve CLOSED or valve OPEN |
| Process medium | Density in kg/m^3 and temperature in $^{\circ}\text{C}$ |
| Flow rate | kg/h or m^3/h in standard or operating condition |
| Pressure | p_1 and p_2 in bar (absolute pressure p_{abs}) both with minimum, standard and maximum flow |
| Accessories | Positioner and/or limit switches |

Specifications subject to change without notice.



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