

T 8052 EN

Series 250 · Type 3251-1 and Type 3251-7 Pneumatic Control Valves

Type 3251 Globe Valve · ANSI version



Application

Control valve for process engineering applications with high industrial requirements

| | |
|------------------------|---|
| Valve size | NPS ½ to 20 |
| Pressure rating | Class 150 to 2500 |
| Temperatures | -325 to +1022 °F (-196 to +550 °C) |

Type 3251 Globe Valve operated with

- Type 3271 Pneumatic Actuator (Type 3251-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3251-7 Control Valve) for integral positioner attachment

Valve body made of

- Cast steel
- Cast stainless steel, high-temperature cast steel or cast cold-resisting steel
- Special materials

Low-noise valve plug

- Metal seal
- Soft seal up to Class 300
- High-performance metal seal
- Balanced to handle high differential pressures

The control valves, designed according to the modular assembly principle, can be equipped with various accessories: Positioners, limit switches, solenoid valves, and other accessories according to IEC 60534-6-1¹⁾ and NAMUR recommendation (see Information Sheet ▶ T 8350).

Versions

Standard version with PTFE packing for temperatures from 14 to 428 °F (-10 to +220 °C) or with adjustable high-temperature packing from 14 to 662 °F (-10 to +350 °C), valve size NPS ½ to 20, pressure rating Class 150 to 2500 (see Table 1)

- **Type 3251-1** (Fig. 1) · Type 3251 Valve and Type 3271 Actuator with 350 to 2800 cm² actuator area (see Data Sheets ▶ T 8310-1, ▶ T 8310-2 and ▶ T 8310-3)
- **Type 3251-7** · Type 3251 Valve and Type 3277 Actuator with 350 to 750v2 cm² actuator area for integral positioner attachment (see Data Sheet ▶ T 8310-1)

Further versions

- **Welding ends or welding-neck ends** acc. to ANSI B16.25

¹⁾ Accessories required. See associated actuator documentation.

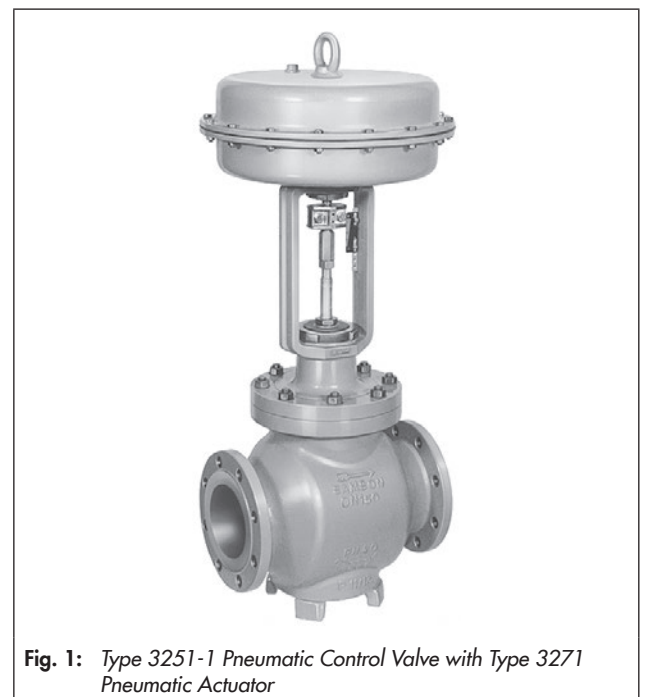


Fig. 1: Type 3251-1 Pneumatic Control Valve with Type 3271 Pneumatic Actuator

- **Flow divider or AC-1/AC-2/AC-3 Trim** for noise reduction (see Data Sheets ▶ T 8081, ▶ T 8082 and ▶ T 8083)
- **Valve plug with pressure balancing** · See Table 3
- **Perforated plug** · See Data Sheet ▶ T 8086
- **Insulating section or bellows seal** · See Technical data
- **Heating jacket** · Details on request
- **Additional handwheel** · See Data Sheet ▶ T 8310-1
- **DIN version** · DN 15 to 500, PN 16 to 400 · See Data Sheet ▶ T 8051
- **Type 3251 Valve with Type 3273 Hand-operated Actuator** · For valves with max. 30 mm rated travel and side-mounted handwheel for travel > 30 mm · See Data Sheet ▶ T 8312
- **Type 3251-2 Electric Control Valve** · Details on request

Principle of operation

The medium flows through the valve in the direction indicated by the arrow. The valve plug determines the cross-sectional area of flow. The version with bellows seal (Fig. 4) is fitted with a test connection to monitor the stainless steel bellows.

The valves can be equipped with a flow divider (► T 8081) for noise reduction.

Pressure balancing must be used when high pressures or differential pressures act on the plug (Fig. 3).

Fail-safe action

Depending on how the springs are arranged in the pneumatic actuator (see Data Sheets ► T 8310-1, ► T 8310-2 and ► T 8310-3), 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.

Differential pressures

The permissible differential pressures can be found in the Information Sheet ► T 8000-4.

Fig. 2 to Fig. 4 show configuration examples.

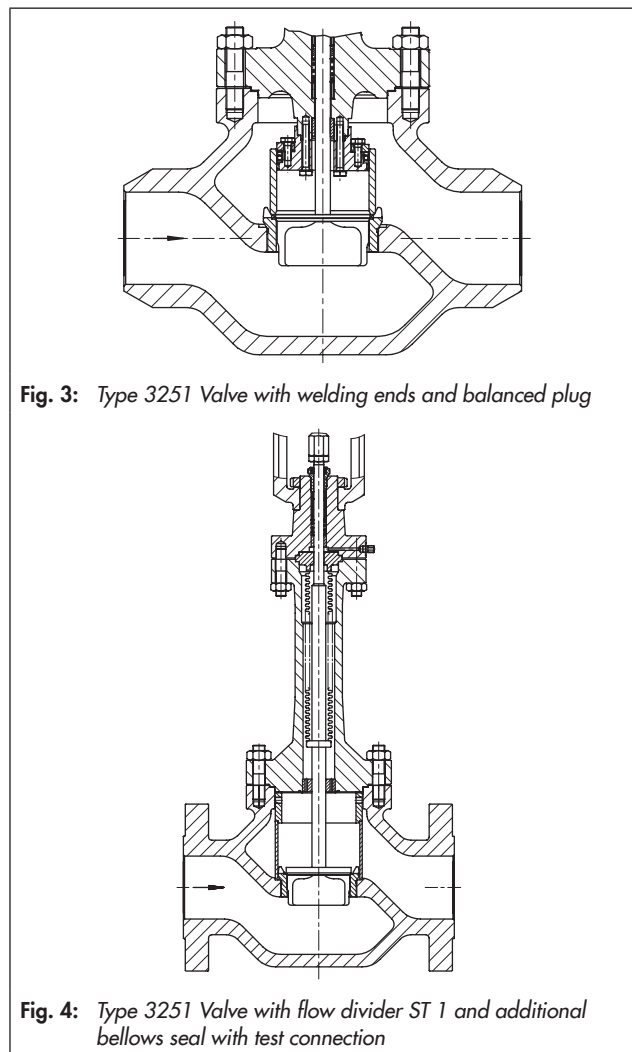
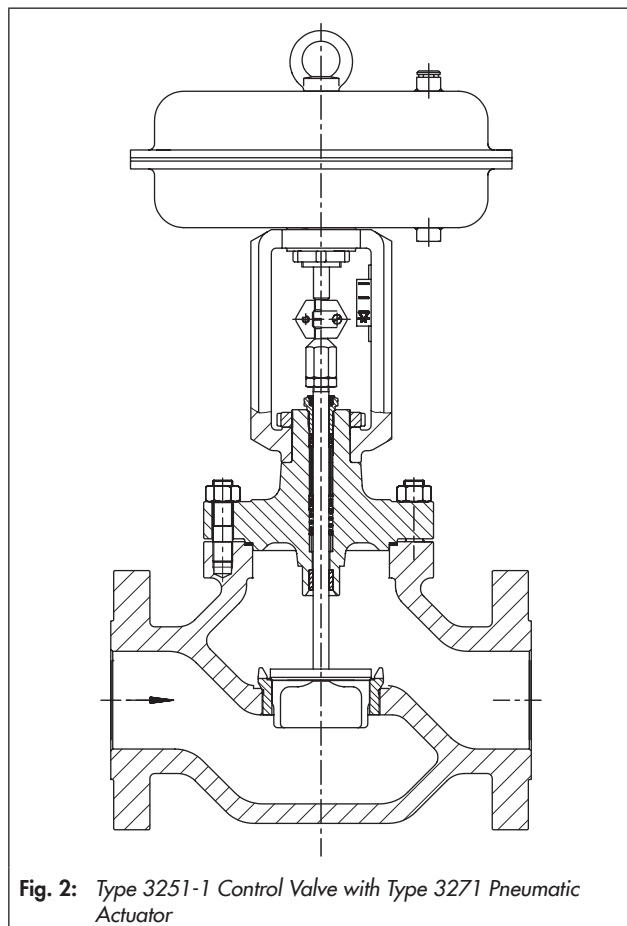


Table 1: Technical data for Type 3251

| Material | | Cast steel A216 WCC | Cast steel A217 WC6 | Cast stainless steel A351 CF8M |
|--|---------------------------------------|---|---|---|
| Valve size and pressure rating | | NPS ½ to 12 in Class 150 to 2500 NPS 14 in Class 150 to 600 NPS 16 to 20 in Class 150 to 1500 | | |
| Type of connection | Flanges | All ANSI versions | | |
| | Welding ends | According to ANSI B16.25 | | |
| Seat-plug seal | | Metal seal · Soft seal · High-performance metal seal | | |
| Characteristic | | Equal percentage · Linear · Quick opening (▶ T 8000-3) | | |
| Rangeability | | 50:1 | | |
| Compliance | | CE · EAC | | |
| Temperature ranges in °F (°C) · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet ▶ T 8000-2) | | | | |
| Body without insulating section | | 14 to 428 (-10 to +220) · Up to 662 (350) with high-temperature packing | | |
| Body with | Insulating section or bellows seal | -20 to +800 (-29 to +425) | -20 to +932 (-29 to +500) | -325 to +1022 (-196 to +550) ²⁾ |
| Valve plug ¹⁾ | Standard | Metal seal | -325 to +1022 (-196 to +550) ²⁾ | |
| | | Soft seal | -325 to +428 (-196 to +220) ²⁾ | |
| | Balanced with PTFE ring | -58 to +428 (-50 to +220) ³⁾ | | |
| | Balanced with graphite ring | 428 to 932 (220 to 500) ⁴⁾ | | |
| Leakage class according to ANSI/FCI 70-2 | | | | |
| Valve plug | Standard | Metal seal | Standard: IV · High-performance metal seal: V | |
| | | Soft seal | VI | |
| | Balanced, metal seal | With PTFE ring (standard): IV · High-performance metal seal: V With graphite ring: IV | | |

1) Only in combination with suitable body material

2) Note: The temperature limits are not directly converted temperatures.

3) Lower temperatures on request

4) Higher temperatures on request

Table 2: Materials

| Standard version Body ¹⁾ | | Cast steel A216 WCC | Cast steel A217 WC6 | Cast stainless steel A351 CF8M |
|--|--------------------|---|-------------------------|-----------------------------------|
| Valve bonnet | | A216 WCC/A 105 | A217 WC6/A 182 F12 Cl.2 | A351 CF8M/A 182 F316 |
| Seat and plug ²⁾ | Metal seal | 410-2/1.4008 | | 316 L/CF3M |
| | Soft seal | PTFE with 15 % glass fiber | | |
| Seal ring for | Pressure balancing | PTFE with carbon · Graphite | | |
| | | 1.4112 | | 2.4610 |
| Guide bushings | | V-ring packing: PTFE with carbon, spring: 302 or high-temperature packing | | |
| Packing ³⁾ | | Graphite seal on metal core | | |
| Body gasket | | | | |
| Insulating section | | A216 WCC/A 105 | A217 WC6/A 182 F12 Cl.2 | A351 CF8M/A 182 F316 |
| Metal bellows seal⁵⁾ | | | | |
| Intermediate piece | | A216 WCC/A 105 | A217 WC6/A 182 F12 Cl.2 | A351 CF8M/A 182 F316 |
| Metal bellows | | 1.4571 ⁴⁾ | | |
| Heating jacket | | A240 316L | | |

1) Other materials (e.g. for high-temperatures or low temperatures) as well as special materials for applications with sea water, such as 1.4538, duplex 1.4470, nickel-based alloy 9.4610, see pressure-temperature diagrams in Information Sheet ▶ T 8000-2

2) Seats and metal-seated plug also with Stellite® facing or plug made of solid Stellite® available (up to max. K_{VS} 630)

3) Other packings on request (▶ T 8000-1)

4) Other bellows materials on request

5) Bellows in combination with >NPS 8 and >Class 600 on request

Table 3: C_V and K_{VS} coefficients · Versions highlighted in gray also available with balanced plug

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

Table 3.1: Overview with flow divider ST 1 (C_V1/K_{VS1}), ST 2 (C_V2/K_{VS2}) and ST 3 (C_V3/K_{VS3})

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--------------------------|------|-----|------|-----|-----|-------|------|------|------|-----|------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| C_V | 0.12 · 0.2 0.3 · 0.5 | 0.75 | 1.2 | 2 | 3 | 5 | 7.5 | 12 | 20 | 30 | 47 | 75 | 120 | 190 | 290 | 420 | 735 | 1150 | 1730 | 2300 | 2900 | 4200 | |
| 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 | 160 | 250 | 360 | 630 | 1000 | 1500 | 2000 | 2500 | 3600 | |
| C_V1 | - | | | 1.7 | 2.6 | 4.2 | 7 | 10.5 | 17 | 26 | 42 | 67 | 105 | 170 | 265 | 375 | 650 | 1040 | 1560 | 2080 | 2600 | 3700 | |
| K_{VS1} | - | | | 1.45 | 2.2 | 3.6 | 5.7 | 9 | 14.5 | 22 | 36 | 57 | 90 | 144 | 225 | 320 | 560 | 900 | 1350 | 1800 | 2250 | 3200 | |
| C_V2 | - | | | - | | | 3.7 | 6.0 | 9.5 | 15 | 23 | 37 | 60 | 95 | 145 | 235 | 335 | 580 | 950 | 1400 | 1860 | 2300 | - |
| K_{VS2} | - | | | - | | | 3.2 | 5.0 | 8 | 13 | 20 | 32 | 50 | 80 | 125 | 200 | 290 | 500 | 800 | 1200 | 1600 | 2000 | - |
| C_V3 | - | | | - | | | 3.5 | 5.6 | 9 | 14 | 23 | 35 | 55 | 90 | 140 | 220 | 315 | 560 | 880 | 1280 | 1730 | 2200 | - |
| K_{VS3} | - | | | - | | | 3 | 4.8 | 7.5 | 12 | 20 | 30 | 47 | 75 | 120 | 190 | 270 | 480 | 750 | 1100 | 1500 | 1900 | - |
| Seat Ø [in] | 0.24 | | | 0.47 | | | 0.945 | | | 1.22 | 1.5 | 1.97 | 2.48 | 3.15 | 3.94 | 4.92 | 5.91 | 7.87 | 9.84 | 11.81 | 13.78 | 15.75 | 19.69 |
| Seat Ø [mm] | 6 | | | 12 | | | 24 | | | 31 | 38 | 50 | 63 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 |
| Rated travel [in] | 0.59 | | | | | | | | | | | 1.18 | | | 2.36 | | | 4.72 | | | | | |
| Rated travel [mm] | 15 | | | | | | | | | | | 30 | | | 60 | | | 120 | | | | | |

Table 3.2: Versions without flow divider · Class 150 to 2500

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--------------------------|------|-----|----------|-----|---|-----------------|-----------------|-----------------|-----------------|----|-----------------|-----------------|-----------------|-----------------|-----|-----------------|-----------------|------|-----------------|------|-----------------|--|--|
| C_V | 0.12 · 0.2 0.3 · 0.5 | 0.75 | 1.2 | 2 | 3 | 5 | 7.5 | 12 | 20 | 30 | 47 | 75 | 120 | 190 | 290 | 420 | 735 | 1150 | 1730 | 2300 | 2900 | 4200 | | |
| 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 | 160 | 250 | 360 | 630 | 1000 | 1500 | 2000 | 2500 | 3600 | | |
| NPS | DN | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | 15 | • | • | • | • | • | • ¹⁾ | | | | | | | | | | | | | | | | | |
| 1 | 25 | • | • | • | • | • | • | • ¹⁾ | | | | | | | | | | | | | | | | |
| 1 1/2 | 40 | • | • | • | • | • | • | • | • ¹⁾ | | | | | | | | | | | | | | | |
| 2 | 50 | | | | | • | • | • | • | • ¹⁾ | | | | | | | | | | | | | | |
| 3 | 80 | | | | | • | • | • | • | • | • | • ¹⁾ | | | | | | | | | | | | |
| 4 | 100 | | | | | | | | • | • | • | • ¹⁾ | | | | | | | | | | | | |
| 6 | 150 | | | | | | | | | • | • | • | • ¹⁾ | | | | | | | | | | | |
| 8 | 200 | | | | | | | | | | • | • | • ²⁾ | • | • ¹⁾ | | | | | | | | | |
| 10 | 250 | | | | | | | | | | | • | • | • ²⁾ | • | • | • ¹⁾ | | | | | | | |
| 12 | 300 | | | | | | | | | | | | • | • ³⁾ | • | • | • | • ¹⁾ | | | | | | |
| 14 | - | | | | | | | | | | | | | | • | • | • | • | • | • ⁴⁾ | | | | |
| 16 | 400 | | | | | | | | | | | | | | • | • | • | • | • | • | • | • ¹⁾ | | |
| 20 | 500 | | | | | | | | | | | | | | | • | • | • | • | • | • | • ¹⁾ | | |
| | | | | C_V | 4.2 | - | 10.5 | - | 26 | 42 | - | 105 | 170 | - | 375 | 650 | 1040 | 1560 | - | 2600 | 3700 | | | |
| | | | | K_{VS} | 3.6 | - | 9 | - | 22 | 36 | - | 90 | 144 | - | 320 | 560 | 900 | 1350 | - | 2250 | 3200 | | | |

¹⁾ Reduced C_V/K_{VS} coefficients with Class 900 to 2500:

²⁾ Pressure balancing only for \geq Class 600
³⁾ Pressure balancing only for Class 600/900
⁴⁾ For Class 150 to 600 only

Table 3.3: Versions with flow divider ST 1 · Class 150 to 900 ¹⁾

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----|--|--|------|-----|-----|-----|------|------|----|----|----|-----|-----|-----------------|-----|-----|------|------|------|------|------|---|---|
| C_V1 | - | | | 1.7 | 2.6 | 4.2 | 7 | 10.5 | 17 | 26 | 42 | 67 | 105 | 170 | 265 | 375 | 650 | 1040 | 1560 | 2080 | 2600 | 3700 | | |
| K_{VS1} | - | | | 1.45 | 2.2 | 3.6 | 5.7 | 9 | 14.5 | 22 | 36 | 57 | 90 | 144 | 225 | 320 | 560 | 900 | 1350 | 1800 | 2250 | 3200 | | |
| NPS | DN | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | 15 | | | • | • | • | | | | | | | | | | | | | | | | | | |
| 1 | 25 | | | • | • | • | • | • | | | | | | | | | | | | | | | | |
| 1 1/2 | 40 | | | | • | • | • | • | • | • | | | | | | | | | | | | | | |
| 2 | 50 | | | | | • | • | • | • | • | • | | | | | | | | | | | | | |
| 3 | 80 | | | | | | • | • | • | • | • | • | • | • | | | | | | | | | | |
| 4 | 100 | | | | | | | | | • | • | • | • | • | | | | | | | | | | |
| 6 | 150 | | | | | | | | | | • | • | • | • | • | • | | | | | | | | |
| 8 | 200 | | | | | | | | | | | • | • | • | • ²⁾ | • | • | | | | | | | |
| 10 | 250 | | | | | | | | | | | | • | • | • ²⁾ | • | • | • | • | | | | | |
| 12 | 300 | | | | | | | | | | | | | • | • ³⁾ | • | • | • | • | | | | | |
| 14 | - | | | | | | | | | | | | | | | • | • | • | • | | | | | |
| 16 | 400 | | | | | | | | | | | | | | | • | • | • | • | • | • | • | • | • |
| 20 | 500 | | | | | | | | | | | | | | | | • | • | • | • | • | • | • | • |

¹⁾ Class 150 to 2500 with flow divider ST 1 and pressure balancing on request
²⁾ Pressure balancing only for \geq Class 600
³⁾ Pressure balancing only for Class 600/900

Table 4: Dimensions for Type 3251-1 and Type 3251-7 Pneumatic Control Valves in standard version

Table 4.1: Type 3251 Valve · Face-to face dimensions according to ANSI/ISA-75.08.01 for Class 600 and lower and according to ASME B16.10 for Class 900 and higher

| Valve | NPS | | ½ | 1 | 1½ | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | |
|--|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------------|---------------------|-------------------|------------|--------------------------|------------|-------|
| | DN | | 15 | 25 | 40 | 50 | 80 | 100 | 150 | 200 | 250 | 300 | - | 400 | 500 | |
| Length L (flanges RF and welding ends) | Class 150 | in | 7.25 | 7.25 | 8.75 | 10.00 | 11.75 | 13.88 | 17.75 | 21.38 | 26.50 | 29.00 | 35.00 | 40.00 | On req. | |
| | | mm | 184 | 184 | 222 | 254 | 298 | 352 | 451 | 543 | 673 | 737 | 889 | 1016 | | |
| | Class 300 | in | 7.50 | 7.75 | 9.25 | 10.50 | 12.50 | 14.50 | 18.62 | 22.38 | 27.88 | 30.50 | 36.50 | 41.62 | On req. | |
| | | mm | 190 | 197 | 235 | 267 | 318 | 368 | 473 | 568 | 708 | 775 | 927 | 1057 | | |
| | Class 600 | in | 8.00 | 8.25 | 9.88 | 11.25 | 13.25 | 15.50 | 20.00 | 24.00 | 29.62 | 32.25 | 38.25 | 43.62 | On req. | |
| | | mm | 203 | 210 | 251 | 286 | 337 | 394 | 508 | 610 | 752 | 819 | 972 | 1108 | | |
| | Class 900 | in | 8.50 | 10.00 | 12.00 | 14.50 | 15.00 | 18.00 | 24.00 | 29.00 | 33.00 | 38.00 | - | On request | | |
| | | mm | 216 | 254 | 305 | 368 | 381 | 457 | 610 | 737 | 838 | 965 | | | | |
| | Class 1500 | in | 8.50 | 10.00 | 12.00 | 14.50 | 18.50 | 21.50 | 27.75 | 32.75 | 39.00 | 44.50 | - | On request | | |
| | | mm | 216 | 254 | 305 | 368 | 470 | 546 | 705 | 832 | 991 | 1130 | | | | |
| Class 2500 | in | 10.38 | 12.12 | 15.12 | 17.75 | 22.75 | 26.50 | 36.00 | 40.25 | On request | | - | | | | |
| | mm | 264 | 308 | 384 | 451 | 578 | 673 | 914 | 1022 | | | | | | | |
| Height H4 | Class 150 to 600 | in | 5.98 | 5.98 | 6.46 | 8.54 | 8.74 | 9.53 | 12.36 | 15.24 | 17.40 ¹⁾ | 25.79 | 25.20 | 25.20 | On req. | |
| | | mm | 152 | 152 | 164 | 217 | 222 | 242 | 314 | 387 | 442 ¹⁾ | 655 | 640 | 640 | | |
| | Class 900 | in | 7.32 | 7.32 | 7.68 | 9.88 | 8.74 | 9.53 | 12.36 | 15.24 | 20.43 ²⁾ | 25.79 | - | On request | | |
| | | mm | 186 | 186 | 195 | 251 | 222 | 242 | 314 | 387 | 519 ²⁾ | 655 | | | | |
| | Class 1500 to 2500 | in | 7.32 | 7.32 | 7.68 | 9.88 | 11.34 | 13.7 | 18.35 | 22.44 | On request | | - | Class 1500 On request | | |
| | | mm | 186 | 186 | 195 | 251 | 288 | 348 | 466 | 570 | | | | | | |
| H8 for actuator | 350 cm ² | in | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | - | | | | | | | |
| | | mm | 240 | 240 | 240 | 240 | 240 | 240 | | | | | | | | |
| | 355v2 cm ² | in | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 16.46 | - | | | | | | |
| | | mm | 240 | 240 | 240 | 240 | 240 | 240 | 418 | | | | | | | |
| | 700 cm ² | in | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 16.46 | 16.46 | 16.46 | - | | | | |
| | | mm | 240 | 240 | 240 | 240 | 240 | 240 | 418 | 418 | 418 | | | | | |
| | 750v2 cm ² | in | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 9.45 | 16.46 | 16.46 | 16.46 | - | | | | |
| | | mm | 240 | 240 | 240 | 240 | 240 | 240 | 418 | 418 | 418 | | | | | |
| | 1000 cm ² | in | - | | | | 11.61 | 11.61 | 11.61 | 16.46 | 16.46 | On request | | | | |
| | | mm | | | | | 295 | 295 | 295 | 418 | 418 | | | | | |
| | 1400- 60 cm ² | in | - | | | | 11.61 | 11.61 | 11.61 | 16.46 | 16.46 | On request | | | | |
| | | mm | | | | | 295 | 295 | 295 | 418 | 418 | | | | | |
| | 1400- 120 cm ² | in | - | | | | 18.90 | 18.90 | 18.90 | 19.80 | 19.80 | 19.80 | 25.59 | 25.59 | 25.59 | 25.59 |
| | | mm | | | | | 480 | 480 | 480 | 503 | 503 | 503 ³⁾ | 650 | 650 | 650 | 650 |
| 2800 cm ² | in | - | | | | 18.90 | 18.90 | 18.90 | 19.80 | 19.80 | 19.80 | 25.59 | 25.59 | 25.59 | 25.59 | |
| | mm | | | | | 480 | 480 | 480 | 503 | 503 | 503 ³⁾ | 650 | 650 | 650 | 650 | |
| 2x 2800 cm ² | in | - | | | | 18.90 | 18.90 | 18.90 | 19.80 | 19.80 | 19.80 | 25.59 | 25.59 | 25.59 | 25.59 | |
| | mm | | | | | 480 | 480 | 480 | 503 | 503 | 503 ³⁾ | 650 | 650 | 650 | 650 | |
| H2 (DN 100/ NPS 4 and larger with foot) | Class 150 | in | 1.97 | 2.36 | 3.05 | 3.54 | 3.94 | 6.3 | 8.66 | 9.84 | 12.21 | 14.57 | 15.16 | 16.34 | On req. | |
| | | mm | 50 | 60 | 80 | 90 | 100 | 160 | 220 | 250 | 310 | 370 | 385 | 415 | | |
| | Class 300 to 600 | in | 2.36 | 2.76 | 3.54 | 3.94 | 4.72 | 7.09 | 9.25 | 10.63 | 11.82 | 15.35 | On request | | | |
| | | mm | 60 | 70 | 90 | 100 | 120 | 180 | 235 | 270 | 300 | 390 | | | | |
| | Class 900 | in | 2.76 | 3.05 | 3.94 | 4.33 | 4.72 | 7.09 | 9.25 | On request | | | - | On request | | |
| | | mm | 70 | 80 | 100 | 110 | 120 | 180 | 235 | | | | | | | |
| | Class 1500 | in | 2.76 | 3.05 | 3.94 | 4.33 | 5.51 | 8.66 | 11.22 | On request | | | - | On request | | |
| | | mm | 70 | 80 | 100 | 110 | 140 | 220 | 285 | | | | | | | |
| | Class 2500 | in | 2.95 | 3.54 | 4.33 | 4.72 | 6.3 | 9.33 | 12.6 | On request | | | - | On request | | |
| | | mm | 75 | 90 | 110 | 120 | 160 | 237 | 320 | | | | | | | |

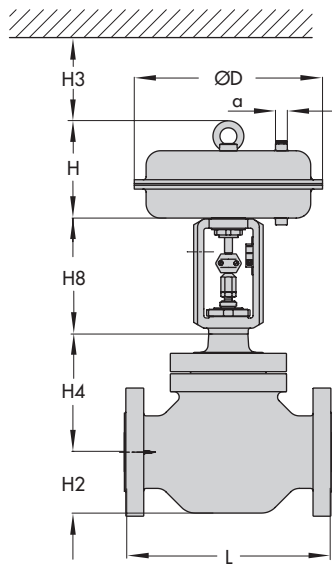
¹⁾ NPS 10, Class 150 to 300: 442 mm or 17.40"

²⁾ NPS 10, Class 600 to 900: 519 mm or 20.43"

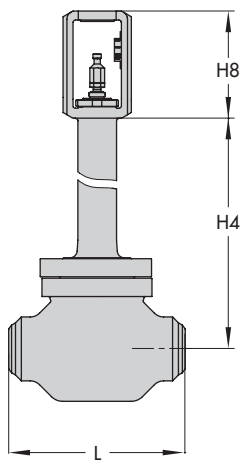
³⁾ H8 = 650 mm with 250 mm seat bore

Dimensional drawings

Type 3271 Pneumatic Actuator

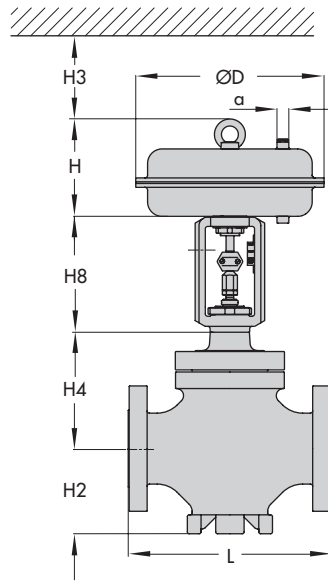


Type 3251-1
Up to NPS 3 without foot

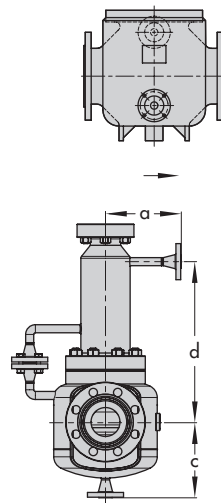


Type 3251 with bellows seal
or insulating section

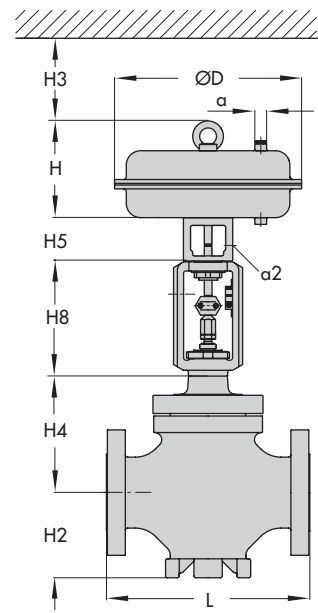
Type 3271 Pneumatic Actuator



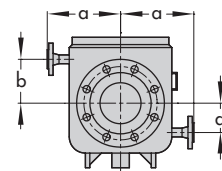
Type 3251-1
NPS 4 and larger



Type 3277 Pneumatic Actuator



Type 3251-7



Type 3251 with heating jacket
Dimensions on request

Table 4.2: Types 3271 and 3277 Pneumatic Actuators

| Actuator area | cm ² | 350 | 355v2 | 700 | 750v2 | 1000 | 1400-60 | 1400-120 | 2800 | 2 x 2800 | |
|------------------|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------|----------------|----------------|--|
| Diaphragm ØD | in | 11.02 | 11.02 | 15.35 | 15.51 | 18.19 | 20.87 | 21.02 | 30.32 | 30.32 | |
| | mm | 280 | 280 | 390 | 394 | 462 | 530 | 534 | 770 | 770 | |
| H ¹⁾ | in | 3.23 | 4.76 | 7.83 | 9.29 | 15.87 | 13.27 | 23.54 | 28.07 | 47.76 | |
| | mm | 82 | 121 | 199 | 236 | 403 | 337 | 598 | 713 | 1213 | |
| H3 ²⁾ | in | 4.33 | 4.33 | 7.48 | 7.48 | 24.02 | 24.02 | 25.59 | 25.59 | 25.59 | |
| | mm | 110 | 110 | 190 | 190 | 610 | 610 | 650 | 650 | 650 | |
| H5 | Type 3277 in | 3.98 | 3.98 | 3.98 | 3.98 | - | - | - | - | - | |
| | Type 3277 mm | 101 | 101 | 101 | 101 | - | - | - | - | - | |
| Thread | Type 3271 | M30 x 1.5 | | | | M60 x 1.5 | | M100 x 2 | | | |
| | Type 3277 | M30 x 1.5 | | | | - | - | - | - | - | |
| α | Type 3271 | G 3/8 (3/8 NPT) | G 3/8 (3/8 NPT) | G 3/8 (3/8 NPT) | G 3/8 (3/8 NPT) | G 3/4 (3/4 NPT) | G 3/4 (3/4 NPT) | G 1 (1 NPT) | G 1 (1 NPT) | G 1 (1 NPT) | |
| α2 | Type 3277 | G 3/8 | G 3/8 | G 3/8 | G 3/8 | - | - | - | - | - | |

1) Height including lifting eyelet or female thread and eyebolt according to DIN 580. Height of the swivel lifting hook may differ. Actuators up to 350v2 cm² without lifting eyelet or female thread

2) Minimum clearance required to remove the actuator

Table 5: Weights for Type 3251-1 and Type 3251-7 in standard version
Table 5.1: Type 3251 Valve

| Valve | NPS | 1/2 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 |
|------------|-----|---------|----|-------|-----|-----|-----|------|------|------------|---------|------------|------------|---------|
| | | DN | 15 | 25 | 40 | 50 | 80 | 100 | 150 | 200 | 250 | 300 | - | 400 |
| Class 150 | lbs | 26 | 31 | 42 | 66 | 110 | 152 | 342 | 948 | 1892 | 2028 | 2965 | 3197 | 3638 |
| | kg | 12 | 14 | 19 | 30 | 50 | 69 | 155 | 430 | 858 | 920 | 1345 | 1450 | 1650 |
| Class 300 | lbs | 33 | 35 | 57 | 95 | 170 | 247 | 694 | 948 | 1892 | 2028 | 3010 | 3197 | 3638 |
| | kg | 15 | 16 | 26 | 43 | 77 | 112 | 315 | 430 | 858 | 920 | 1365 | 1450 | 1650 |
| Class 600 | lbs | 33 | 35 | 57 | 95 | 170 | 247 | 694 | 1096 | 1609 | 2535 | On request | | |
| | kg | 15 | 16 | 26 | 43 | 77 | 112 | 315 | 497 | 730 | 1150 | | | |
| Class 900 | lbs | 33 | 35 | 57 | 95 | 170 | 247 | 694 | 1157 | 2844 | 3263 | - | 5732 | On req. |
| | kg | 15 | 16 | 26 | 43 | 77 | 112 | 315 | 525 | 1290 | 1480 | | 2600 | |
| Class 1500 | lbs | On req. | 75 | 126 | 159 | 348 | 496 | 1235 | 1949 | 4630 | On req. | - | On request | |
| | kg | | 34 | 57 | 72 | 158 | 225 | 560 | 884 | 2100 | | | | |
| Class 2500 | lbs | On req. | 93 | 163 | 238 | 379 | 604 | 2198 | 3990 | On request | | - | - | |
| | kg | | 42 | 74 | 108 | 172 | 274 | 997 | 1810 | | | | | |

Table 5.2: Types 3271 and 3277 Pneumatic Actuators

| Actuator | cm ² | 350 | 355v2 | 700 | 750v2 | 1000 | 1400-60 | 1400-120 | 2800 | 2 x 2800 | |
|---------------------|-------------------|-----|-------|-----|-------|------|---------|----------|--------------------------------------|--|------------|
| Type 3271 (approx.) | Without handwheel | lbs | 18 | 33 | 49 | 80 | 187 | 154 | 386 | 992 | 2094 |
| | | kg | 8 | 15 | 22 | 36 | 85 | 70 | 175 | 450 | 950 |
| | With handwheel | lbs | 29 | 44 | 60 | 91 | 419 | 386 | 661 ¹⁾ /937 ²⁾ | 1268 ¹⁾ /1543 ²⁾ | On request |
| | | kg | 13 | 20 | 27 | 41 | 190 | 175 | 300 ¹⁾ /425 ²⁾ | 575 ¹⁾ /700 ²⁾ | |
| Type 3277 (approx.) | Without handwheel | lbs | 26 | 42 | 57 | 88 | - | | | | |
| | | kg | 12 | 19 | 26 | 40 | | | | | |
| | With handwheel | lbs | 37 | 53 | 68 | 98 | | | | | |
| | | kg | 17 | 24 | 31 | 45 | | | | | |

1) Side-mounted handwheel up to 80 mm travel

2) Side-mounted handwheel above 80 mm travel

Table 6: Dimensions and weights for Type 3251 with insulating section · Without actuator

| Valve size | | NPS | ½ | 1 | 1½ | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | | | | | | |
|--------------------------------------|-----------------------|-----|------------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|--------------------------|------------|------------|--|--|------------|--|--|
| | | DN | 15 | 25 | 40 | 50 | 80 | 100 | 150 | 200 | 250 | 300 | – | 400 | 500 | | | | | | |
| Height H4 | Class 150 to 600 | in | 13.9 | 13.9 | 14.37 | 19.17 | 19.37 | 20.16 | 26.18 | 37.28 | 42.01 | 45.32 | On req. | 44.76 | On req. | | | | | | |
| | | mm | 353 | 353 | 365 | 487 | 492 | 512 | 665 | 947 | 1067 | 1151 | | 1137 | | | | | | | |
| | Class 900 | in | 15.04 | 15.04 | 15.39 | 20.32 | 19.37 | 20.16 | 26.18 | 37.28 | 42.01 | On req. | – | On request | | | | | | | |
| | | mm | 382 | 382 | 391 | 516 | 492 | 512 | 665 | 947 | 1067 | | – | On request | | | | | | | |
| | Class 1500 to 2500 | in | 15.04 | 15.04 | 15.39 | 20.32 | 21.5 | 23.54 | 31.10 | 42.13 | On request | | – | Class 1500 On request | | | | | | | |
| | | mm | 382 | 382 | 391 | 516 | 546 | 598 | 790 | 1070 | | | – | Class 1500 On request | | | | | | | |
| Weight without actuator for | Class 150 | lbs | 35 | 40 | 51 | 79 | 130 | 172 | 412 | 1054 | 2046 | 2123 | On request | | | | | | | | |
| | | kg | 16 | 18 | 23 | 36 | 59 | 78 | 187 | 478 | 928 | 963 | | | | | | | | | |
| | Class 300 | lbs | 42 | 44 | 66 | 108 | 190 | 267 | 774 | 1054 | 2046 | 2123 | | | | On request | | | | | |
| | | kg | 19 | 20 | 30 | 49 | 86 | 121 | 351 | 478 | 928 | 963 | | | | | | | | | |
| | Class 600 | lbs | 42 | 44 | 66 | 108 | 190 | 267 | 774 | 1191 | 2641 | 2635 | | | | | | | On request | | |
| | | kg | 19 | 20 | 30 | 49 | 86 | 121 | 351 | 540 | 1198 | 1195 | | | | | | | | | |
| | Class 900 | lbs | 42 | 44 | 66 | 108 | 190 | 267 | 774 | 1254 | 2657 | On req. | – | On request | | | | | | | |
| | | kg | 19 | 20 | 30 | 49 | 86 | 121 | 351 | 569 | 1205 | | – | On request | | | | | | | |
| | Class 1500 | lbs | On req. | 79 | 130 | 172 | 375 | 545 | 1314 | 2094 | On request | | – | On request | | | | | | | |
| | | kg | | 36 | 59 | 78 | 170 | 247 | 596 | 950 | | | – | On request | | | | | | | |
| | Class 2500 | lbs | On req. | 97 | 168 | 247 | 401 | 653 | 2277 | 4090 | On request | | – | – | | | | | | | |
| | | kg | | 44 | 76 | 112 | 182 | 296 | 1033 | 1855 | | | – | – | | | | | | | |

Table 7: Dimensions and weights for Type 3251 with bellows seal · Without actuator

| Valve size | | NPS | ½ | 1 | 1½ | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | |
|------------------|------------------|--------------|-------|-------|-------|-------|---------|---------|------------|-------|-------|-------|---------|------------|---------|--|
| | | DN | 15 | 25 | 40 | 50 | 80 | 100 | 150 | 200 | 250 | 300 | - | 400 | 500 | |
| | | Travel | | | | | | | | | | | | | | |
| Height H4 | Class 150 | in | 14.25 | 14.25 | 14.72 | 23.94 | 24.13 | 24.13 | 27.72 | | | | | | | |
| | | mm | 362 | 362 | 374 | 608 | 613 | 613 | 704 | | | | | | | |
| | Class 300 to 900 | in | 14.25 | 14.25 | 14.72 | 23.94 | 24.13 | 24.13 | 32.96 | | | | | | | |
| | | mm | 362 | 362 | 374 | 608 | 613 | 613 | 837 | | | | | | | |
| | Class 1500 | in | 0.59 | 24.92 | 24.92 | 25.0 | 33.62 | 34.02 | On request | | | | | | | |
| | | mm | 15 | 633 | 633 | 635 | 854 | 864 | | | | | | | | |
| | Class 1500 | in | 1.18 | - | | | 33.62 | 34.02 | On request | | | | | | | |
| | | mm | 30 | | | | 854 | 864 | | | | | | | | |
| | Class 1500 | in | 2.36 | - | | | | | On req. | | | | | | | |
| | | mm | 60 | | | | | | | | | | | | | |
| | Class 2500 | in | 0.59 | 24.92 | 24.92 | 25.0 | On req. | 40.16 | On request | | | | | | | |
| | | mm | 15 | 633 | 633 | 635 | On req. | 1020 | | | | | | | | |
| | Class 2500 | in | 1.18 | - | | | | 40.16 | On request | | | | | | | |
| | | mm | 30 | | | | | 1020 | | | | | | | | |
| Class 2500 | in | 2.36 | - | | | | | On req. | | | | | | | | |
| | mm | 60 | | | | | | | | | | | | | | |
| Class 150 to 300 | in | 1.18 to 4.72 | - | | | | | | | 41.22 | 59.13 | 60.20 | On req. | 59.69 | 62.60 | |
| | mm | 30 to 120 | | | | | | | | 1047 | 1502 | 1529 | On req. | 1516 | 1590 | |
| Class 600 to 900 | in | 1.18 to 2.36 | - | | | | | | | 62.24 | 62.68 | 64.96 | - | On request | | |
| | mm | 30 to 60 | | | | | | | | 1581 | 1592 | 1650 | - | | | |
| Class 600 | in | 4.72 | - | | | | | | | - | 94.65 | 91.42 | On req. | 90.16 | On req. | |
| | mm | 120 | | | | | | | | - | 2404 | 2322 | On req. | 2290 | On req. | |

| Valve size | | NPS | ½ | 1 | 1½ | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | |
|---------------|------------|---------|---------|-----|-----|---------|-----|------|------|------------|------------|---------|------------|------------|-----|--|
| | | DN | 15 | 25 | 40 | 50 | 80 | 100 | 150 | 200 | 250 | 300 | - | 400 | 500 | |
| Weight for | Class 150 | lbs | 46 | 51 | 62 | 97 | 176 | 220 | 430 | 1146 | 2150 | 2227 | On request | | | |
| | | kg | 21 | 23 | 28 | 44 | 80 | 100 | 195 | 520 | 975 | 1010 | | | | |
| | Class 300 | lbs | 53 | 55 | 77 | 126 | 236 | 317 | 794 | 1146 | 2150 | 2227 | | | | |
| | | kg | 24 | 25 | 35 | 57 | 107 | 144 | 360 | 520 | 975 | 1010 | | | | |
| | Class 600 | lbs | 53 | 55 | 77 | 126 | 236 | 317 | 794 | 1312 | 2740 | 2734 | | | | |
| | | kg | 24 | 25 | 35 | 57 | 107 | 144 | 360 | 595 | 1243 | 1240 | | | | |
| | Class 900 | lbs | 53 | 55 | 77 | 126 | 236 | 317 | 794 | 1354 | 2866 | On req. | - | On request | | |
| | | kg | 24 | 25 | 35 | 57 | 107 | 144 | 360 | 614 | 1300 | On req. | - | | | |
| | Class 1500 | lbs | On req. | 93 | 174 | On req. | 414 | 606 | 1411 | 2216 | On request | | | - | - | |
| | | kg | On req. | 42 | 79 | On req. | 188 | 275 | 640 | 1005 | On request | | | - | | |
| Class 2500 | lbs | On req. | 106 | 201 | 273 | 507 | 714 | 2337 | 4222 | On request | | | - | | | |
| | kg | On req. | 48 | 91 | 124 | 230 | 324 | 1060 | 1915 | On request | | | | | | |

Selection and sizing of the control valve

1. Calculate the C_v (K_v) coefficient according to IEC 60534-6.
2. Select valve size NPS and C_v (K_{vs}) coefficient from Table 3.
3. Determine the permissible differential pressure from the Information Sheet ► T 8000-4.
4. Select the valve body material from Table 1 and Table 2 as well as from the pressure-temperature diagrams (see Information Sheet ► T 8000-2).
5. Select accessories from Table 1 and Table 2.

Order specifications:

| | |
|--------------------|--|
| Valve size | NPS |
| Pressure rating | Class |
| Body material | According to Table 2 |
| Bonnet | Standard bonnet, insulating section or bellows seal |
| Type of connection | Flanges/welding ends |
| Plug | Standard or balanced Soft seal, metal seal or high-performance metal seal |
| Characteristic | Equal percentage, linear or quick opening |
| Actuator | Type 3271 or Type 3277 (see Data Sheets ► T 8310-1, ► T 8310-2, and ► T 8310-3) |
| Fail-safe position | Fail-close or fail-open |
| Process medium | Density in lb/cu.ft or kg/m ³ and temperature in °F (°C) |
| Flow rate | lbs/h or kg/h or cu.ft/min or m ³ /h in standard or operating state |
| Pressure | p_1 and p_2 in psi (bar) (absolute pressure p_{abs}) (with minimum, normal and maximum flow rate) |
| Valve accessories | Positioner and/or limit switch |

Associated Information Sheet ► T 8000-X

Associated Data Sheets for pneumatic actuators ► T 8310-1 to -3

Associated Mounting and Operating Instructions ► EB 8052

Note: The temperature limits for DIN and ANSI versions are not directly converted temperatures.