

## Series 250

# Type 3256-1 and Type 3256-7 Pneumatic Control Valves

## Type 3256 Angle Valve

ANSI version



### Application

Control valve for process engineering applications with high industrial requirements

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



Type 3256 Angle Valve with

- Type 3271 Pneumatic Actuator (Type 3256-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3256-7 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 and NAMUR recommendation. Details in 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 3256-1** (Fig. 1) · Type 3256 Valve and Type 3271 Actuator with 350 to 2800 cm<sup>2</sup> actuator area (see Data Sheets ▶ T 8310-1, ▶ T 8310-2, and ▶ T 8310-3)
- **Type 3256-7** · Type 3256 Valve and Type 3277 Pneumatic Actuator with 350 to 750v2 cm<sup>2</sup> actuator area, for integral positioner attachment (see Data Sheet ▶ T 8310-1)

### Further versions

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



**Fig. 1:** Type 3256-1 Control Valve with Type 3271 Pneumatic Actuator, positioner and solenoid valve

- **Perforated plug** · See Data Sheet ▶ T 8086
- **Ceramic or carbide trim** · See Data Sheet ▶ T 8071
- **Special version for flashing service**
- **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 8065

- Type 3256 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 3256-2 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. 3) 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. 4).

#### Fail-safe position

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.

Note: Fig. 2 to Fig. 5 show configuration examples.

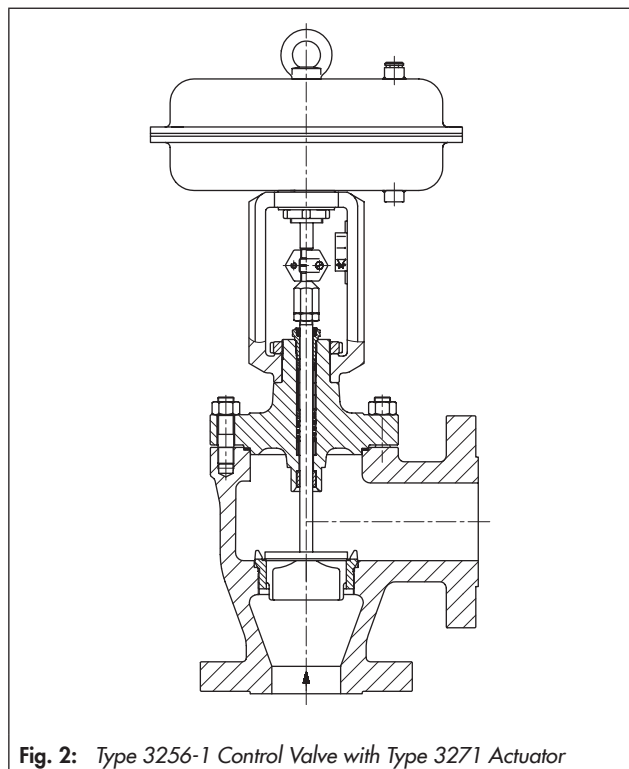


Fig. 2: Type 3256-1 Control Valve with Type 3271 Actuator

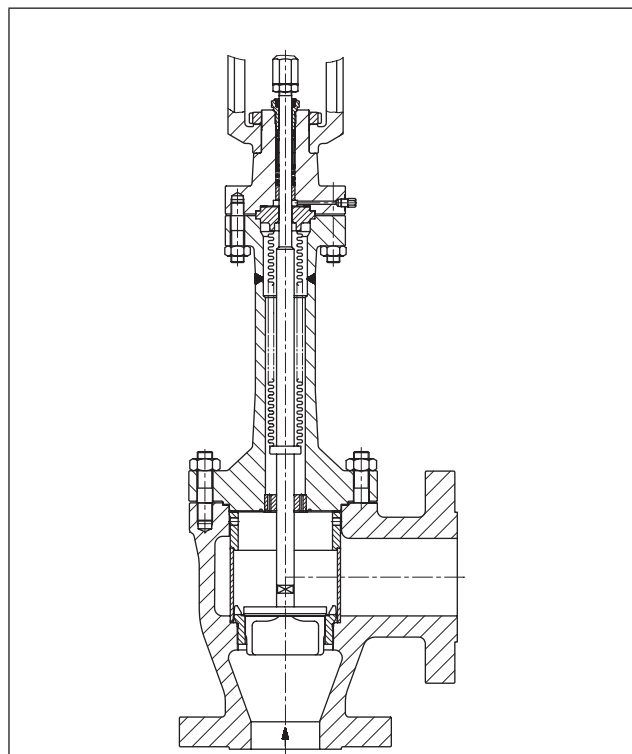


Fig. 3: Type 3256 Valve with bellows seal and flow divider ST 1

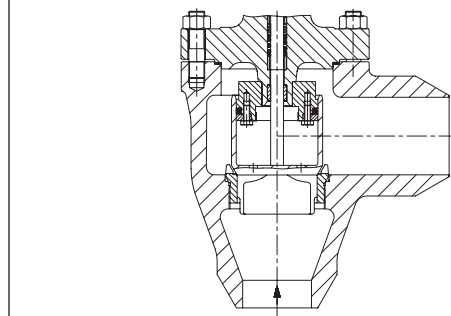


Fig. 4: Type 3256 Valve with balanced plug

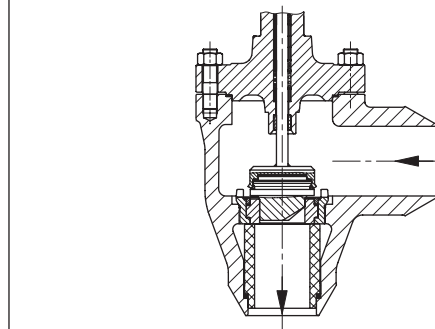


Fig. 5: Type 3256 Valve with ceramic trim and ceramic anti-wear pipe

**Table 1: Technical data for Type 3256**

| 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<br>NPS 16 to 20 on request                              |  |                                       |
| 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   |  |                                       |
| <b>Temperature ranges</b> in °F (°C) · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet ▶ T 8000-2) |                             |  |  |                                       |
| Body without insulating section  |                             | 14 to 428 °F (-10 to 220 °C) · Up to 660 °F (up to 350 °C) with high-temperature packing |  |                                       |
| Body with insulating section or bellows seal   |                             | -20 to +800 °F<br>(-29 to +427 °C)   | -20 to +932 °F<br>(-29 to +500 °C)               | -325 to +1022 °F<br>(-196 to +550 °C) |
| Valve plug <sup>1)</sup>   | Standard                    | Metal seal   | -325 to +1022 °F (-196 to +550 °C) <sup>2)</sup> |                                       |
|  |                             | Soft seal  | -325 to +428 °F (-196 to +220 °C) <sup>2)</sup>  |                                       |
|  | Balanced with PTFE ring     | -58 to +428 °F (-50 to +220 °C) <sup>3)</sup>  |  |                                       |
|  | Balanced with graphite ring | 428 to 1022 °F (220 to +550 °C)  |  |                                       |
| <b>Leakage class</b> 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   |  |                                       |

<sup>1)</sup> Only in combination with suitable body material

<sup>2)</sup> Note: The temperature limits are not directly converted temperatures.

<sup>3)</sup> Lower temperatures on request

**Table 2: Materials**

| Standard version            |                    | Cast steel A216 WCC   | Cast steel A217 WC6     | Cast stainless steel A351 CF8M |
|-----------------------------|--------------------|---|-------------------------|--------------------------------|
| Body <sup>1)</sup>          |                    |   |                         |                                |
| Valve bonnet                |                    | A216 WCC/A 105  | A217 WC6/A182 F12 Cl. 2 | A351 CG8M/A182 F316            |
| Seat and plug <sup>2)</sup> | 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   |                         |                                |
|                             |                    |   |                         |                                |
| Guide bushings              |                    | 1.4112  |                         | 2.4610                         |
| Packing <sup>3)</sup>       |                    | V-ring packing: PTFE with carbon, spring: 302 or high-temperature packing |                         |                                |
| Body gasket                 |                    | Graphite seal on metal core   |                         |                                |
| Insulating section          |                    | A216 WCC/A 105  | A217 WC6/A182 F12 Cl. 2 | A351 CF8M/A 182 F316           |
| <b>Metal bellows seal</b>   |                    |   |                         |                                |
| Intermediate piece          |                    | A216 WCC/A 105  | A217 WC6/A182 F12 Cl. 2 | A351 CF8M/A 182 F316           |
| Metal bellows               |                    | 1.4571 <sup>4)</sup>  |                         |                                |
| Heating jacket              |                    | A240 316L   |                         |                                |

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

<sup>2)</sup> Seats and metal-seated plug also with Stellite® facing or plug made of solid Stellite® available (up to max. C<sub>v</sub> 735/K<sub>vS</sub> 630)

<sup>3)</sup> Other packings on request (▶ T 8000-1)

<sup>4)</sup> Other bellows material on request

**Table 3:** Available  $C_v/K_{vs}$  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 | 0.75 | 1.2 | 2   | 3    | 5   | 7.5 | 12   | 20   | 30   | 47   | 75 | 120 | 190 | 290 | 420 | 735  | 1150 | 1730 |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
|-----------|------|------|-----|-----|------|-----|-----|------|------|------|------|----|-----|-----|-----|-----|------|------|------|------|------|--|------|--|--|------|--|--|------|--|--|------|--|--|------|--|--|------|--|--|-------|--|--|
|           | 0.2  |      |     |     |      |     |     |      |      |      |      |    |     |     |     |     |      |      |      |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $K_{vs}$  | 0.1  | 0.63 | 1.0 | 1.6 | 2.5  | 4   | 6.3 | 10   | 16   | 25   | 40   | 63 | 100 | 160 | 250 | 360 | 630  | 1000 | 1500 |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
|           | 0.16 |      |     |     |      |     |     |      |      |      |      |    |     |     |     |     |      |      |      |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
|           | 0.3  |      |     |     |      |     |     |      |      |      |      |    |     |     |     |     |      |      |      |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
|           | 0.5  |      |     |     |      |     |     |      |      |      |      |    |     |     |     |     |      |      |      |      |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $C_{v1}$  |      | -    |     |     | 1.7  | 2.6 | 4.2 | 7    | 10.5 | 17   | 26   | 42 | 67  | 105 | 170 | 265 | 375  | 650  | 1040 | 1560 |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $K_{vs1}$ |      | -    |     |     | 1.45 | 2.2 | 3.6 | 5.7  | 9    | 14.5 | 22   | 36 | 57  | 90  | 144 | 225 | 320  | 560  | 900  | 1350 |      |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $C_{v2}$  |      | -    |     |     |      |     |     | 3.7  | 6.0  | 9.5  | 15   | 23 | 37  | 60  | 95  | 145 | 230  | 335  | 580  | 928  | 1392 |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $K_{vs2}$ |      | -    |     |     |      |     |     | 3.2  | 5.0  | 8    | 13.0 | 20 | 32  | 50  | 80  | 125 | 200  | 290  | 500  | 800  | 1200 |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $C_{v3}$  |      | -    |     |     |      |     |     | 3.5  | 5.6  | 9    | 14   | 23 | 35  | 55  | 90  | 140 | 220  | 315  | 560  | 880  | -    |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| $K_{vs3}$ |      | -    |     |     |      |     |     | 3.0  | 4.8  | 7.5  | 12   | 20 | 30  | 47  | 75  | 120 | 190  | 270  | 480  | 750  | -    |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| Seat      | in   | 0.24 |     |     | 0.47 |     |     | 0.94 |      |      | 1.22 |    |     | 1.5 |     |     | 1.97 |      |      | 2.48 |      |  | 3.15 |  |  | 3.94 |  |  | 4.92 |  |  | 5.91 |  |  | 7.87 |  |  | 9.84 |  |  | 11.81 |  |  |
| Ø         | mm   | 6    |     |     | 12   |     |     | 24   |      |      | 31   |    |     | 38  |     |     | 50   |      |      | 63   |      |  | 80   |  |  | 100  |  |  | 125  |  |  | 150  |  |  | 200  |  |  | 250  |  |  | 300   |  |  |
| Rated     | in   | 0.59 |     |     |      |     |     |      |      |      |      |    |     |     |     |     | 1.18 |      |      | 2.36 |      |  | 4.72 |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |
| travel    | mm   | 15   |     |     |      |     |     |      |      |      |      |    |     |     |     |     | 30   |      |      | 60   |      |  | 120  |  |  |      |  |  |      |  |  |      |  |  |      |  |  |      |  |  |       |  |  |

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

| $C_v$    | 0.12 | 0.75  | 1.2 | 2        | 3   | 5 | 7.5  | 12 | 20 | 30              | 47              | 75  | 120             | 190             | 290             | 420             | 735             | 1150            | 1730            |   |
|----------|------|---|-----|----------|-----|---|------|----|----|-----------------|-----------------|-----|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|
|          | 0.2  |   |     |          |     |   |      |    |    |                 |                 |     |                 |                 |                 |                 |                 |                 |                 |   |
| $K_{vs}$ | 0.1  | 0.63  | 1.0 | 1.6      | 2.5 | 4 | 6.3  | 10 | 16 | 25              | 40              | 63  | 100             | 160             | 250             | 360             | 630             | 1000            | 1500            |   |
|          | 0.16 |   |     |          |     |   |      |    |    |                 |                 |     |                 |                 |                 |                 |                 |                 |                 |   |
|          | 0.3  |   |     |          |     |   |      |    |    |                 |                 |     |                 |                 |                 |                 |                 |                 |                 |   |
|          | 0.5  |   |     |          |     |   |      |    |    |                 |                 |     |                 |                 |                 |                 |                 |                 |                 |   |
| NPS      | DN   |   |     |          |     |   |      |    |    |                 |                 |     |                 |                 |                 |                 |                 |                 |                 |   |
| 1/2      | 15   | •   | •   | •        | •   | • | •    | •  | •  | •               | •               | •   | •               | •               | •               | •               | •               | •               | •               | • |
| 1        | 25   | •   | •   | •        | •   | • | •    | •  | •  | •               | •               | •   | •               | •               | •               | •               | •               | •               | •               | • |
| 1 1/2    | 40   | •   | •   | •        | •   | • | •    | •  | •  | • <sup>1)</sup> | •               | •   | •               | •               | •               | •               | •               | •               | •               | • |
| 2        | 50   |   |     |          |     | • | •    | •  | •  | •               | • <sup>1)</sup> | •   | •               | •               | •               | •               | •               | •               | •               | • |
| 3        | 80   |   |     |          |     | • | •    | •  | •  | •               | •               | •   | • <sup>1)</sup> | •               | •               | •               | •               | •               | •               | • |
| 4        | 100  |   |     |          |     |   |      |    |    | •               | •               | •   | •               | • <sup>1)</sup> | •               | •               | •               | •               | •               | • |
| 6        | 150  |   |     |          |     |   |      |    |    |                 |                 | •   | •               | •               | •               | • <sup>1)</sup> | •               | •               | •               | • |
| 8        | 200  |   |     |          |     |   |      |    |    |                 |                 |     | •               | •               | • <sup>2)</sup> | •               | • <sup>1)</sup> | •               | •               | • |
| 10       | 250  |   |     |          |     |   |      |    |    |                 |                 |     | •               | •               | • <sup>2)</sup> | •               | •               | • <sup>1)</sup> | •               | • |
| 12       | 300  |   |     |          |     |   |      |    |    |                 |                 |     | •               | •               | • <sup>3)</sup> | •               | •               | •               | • <sup>1)</sup> | • |
| 1)       |      | Reduced $C_v/K_{vs}$ coefficients with Class 900 to 2500: |     | $C_v$    | 4.2 | - | 10.5 | -  | 26 | 42              | -               | 105 | 170             | -               | 375             | 650             | 1040            | 1560            |                 |   |
|          |      |   |     | $K_{vs}$ | 3.6 | - | 9    | -  | 22 | 36              | -               | 90  | 144             | -               | 320             | 560             | 900             | 1350            |                 |   |

- 2) Pressure balancing only for  $\geq$  Class 600
- 3) Pressure balancing only for Class 600/900

**Table 3.3:** Versions with flow divider ST 1 · Class 150 to 900<sup>1)</sup>

| $C_{v1}$ | $K_{vs1}$ | -   |     |     |   |      |    |    |    |    |     |     |     |     |                 |      |      |   |   |   |
|----------|-----------|-----|-----|-----|---|------|----|----|----|----|-----|-----|-----|-----|-----------------|------|------|---|---|---|
|          |           | 1.7 | 2.6 | 4.2 | 7 | 10.5 | 17 | 26 | 42 | 67 | 105 | 170 | 265 | 375 | 650             | 1040 | 1560 |   |   |   |
| NPS      | DN        |     |     |     |   |      |    |    |    |    |     |     |     |     |                 |      |      |   |   |   |
| 1/2      | 15        |     |     | •   | • | •    | •  | •  | •  | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 1        | 25        |     |     | •   | • | •    | •  | •  | •  | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 1 1/2    | 40        |     |     |     | • | •    | •  | •  | •  | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 2        | 50        |     |     |     |   | •    | •  | •  | •  | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 3        | 80        |     |     |     |   | •    | •  | •  | •  | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 4        | 100       |     |     |     |   |      |    |    |    | •  | •   | •   | •   | •   | •               | •    | •    | • | • | • |
| 6        | 150       |     |     |     |   |      |    |    |    |    |     | •   | •   | •   | •               | •    | •    | • | • | • |
| 8        | 200       |     |     |     |   |      |    |    |    |    |     |     | •   | •   | • <sup>2)</sup> | •    | •    | • | • | • |
| 10       | 250       |     |     |     |   |      |    |    |    |    |     |     | •   | •   | • <sup>2)</sup> | •    | •    | • | • | • |
| 12       | 300       |     |     |     |   |      |    |    |    |    |     |     | •   | •   | • <sup>3)</sup> | •    | •    | • | • | • |

- 1) Class 1500 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 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   | 0.75 | 1.2 | 2    | 3   | 5    | 7.5 | 12  | 20   | 30  | 47   | 75   | 120  | 190  | 290  | 420  | 735  | 1150 | 1730  |
|--------------|--------|------|-----|------|-----|------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-------|
|              | 0.2    |      |     |      |     |      |     |     |      |     |      |      |      |      |      |      |      |      |       |
| $K_{VS}$     | 0.1    | 0.63 | 1.0 | 1.6  | 2.5 | 4    | 6.3 | 10  | 16   | 25  | 40   | 63   | 100  | 160  | 250  | 360  | 630  | 1000 | 1500  |
|              | 0.16   |      |     |      |     |      |     |     |      |     |      |      |      |      |      |      |      |      |       |
|              | 0.25   |      |     |      |     |      |     |     |      |     |      |      |      |      |      |      |      |      |       |
| $C_V3$       | 0.4    |      |     |      |     |      |     |     |      |     |      |      |      |      |      |      |      |      |       |
|              | $C_V1$ | –    |     |      | 1.7 | 2.6  | 4.2 | 7   | 10.5 | 17  | 26   | 42   | 67   | 105  | 170  | 265  | 375  | 650  | 1040  |
| $K_{VS1}$    | –      |      |     | 1.45 | 2.2 | 3.6  | 5.7 | 9   | 14.5 | 22  | 36   | 57   | 90   | 144  | 225  | 320  | 560  | 900  | 1350  |
| $C_V2$       | –      |      |     |      |     | 3.7  | 6.0 | 9.5 | 15   | 23  | 37   | 60   | 95   | 145  | 230  | 335  | 580  | 928  | 1392  |
| $K_{VS2}$    | –      |      |     |      |     | 3.2  | 5.0 | 8   | 13.0 | 20  | 32   | 50   | 80   | 125  | 200  | 290  | 500  | 800  | 1200  |
| $C_V3$       | –      |      |     |      |     | 3.5  | 5.6 | 9   | 14   | 23  | 35   | 55   | 90   | 140  | 220  | 315  | 560  | 880  | –     |
| $K_{VS3}$    | –      |      |     |      |     | 3.0  | 4.8 | 7.5 | 12   | 20  | 30   | 47   | 75   | 120  | 190  | 270  | 480  | 750  | –     |
| Seat         | in     | 0.24 |     | 0.47 |     | 0.94 |     |     | 1.22 | 1.5 | 1.97 | 2.48 | 3.15 | 3.94 | 4.92 | 5.91 | 7.87 | 9.84 | 11.81 |
|              | Ø mm   | 6    |     | 12   |     | 24   |     |     | 31   | 38  | 50   | 63   | 80   | 100  | 125  | 150  | 200  | 250  | 300   |
| Rated travel | in     | 0.59 |     |      |     |      |     |     |      |     | 1.18 |      |      | 2.36 |      |      | 4.72 |      |       |
|              | mm     | 15   |     |      |     |      |     |     |      |     | 30   |      |      | 60   |      |      | 120  |      |       |

**Table 3.4:** Versions with flow divider ST 2 · Class 150 to 900 <sup>1)</sup>

| $C_V2$    |     | –   |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
|-----------|-----|-----|-----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|------|--|--|--|--|
| $K_{VS2}$ |     | 3.7 | 6.0 | 9.5 | 15 | 23 | 37 | 60 | 95 | 145 | 230 | 335 | 580 | 928 | 1392 |  |  |  |  |
| NPS       | DN  | 3.2 | 5.0 | 8   | 13 | 20 | 32 | 50 | 80 | 125 | 200 | 290 | 500 | 800 | 1200 |  |  |  |  |
| 2         | 50  |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 3         | 80  |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 4         | 100 |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 6         | 150 |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 8         | 200 |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 10        | 250 |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |
| 12        | 300 |     |     |     |    |    |    |    |    |     |     |     |     |     |      |  |  |  |  |

<sup>1)</sup> Class 1500 to 2500 with flow divider ST 2 and pressure balancing on request

<sup>2)</sup> Pressure balancing only for  $\geq$  Class 600

<sup>3)</sup> Pressure balancing only for Class 600/900

**Table 3.5:** Versions with flow divider ST 3 · Class 150 to 900 <sup>1)</sup>

| $C_V3$          |                  | –   |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
|-----------------|------------------|-----|-----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|---|--|--|--|---|
| $K_{VS3}$       |                  | 3.5 | 5.6 | 9   | 14 | 23 | 35 | 55 | 90 | 140 | 220 | 315 | 560 | 880 | – |  |  |  |   |
| NPS             | DN               | 3.0 | 4.8 | 7.5 | 12 | 20 | 30 | 47 | 75 | 120 | 190 | 270 | 480 | 750 | – |  |  |  |   |
| 2 <sup>1)</sup> | 50 <sup>1)</sup> |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 3               | 80               |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 4               | 100              |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 6               | 150              |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 8               | 200              |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 10              | 250              |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  |   |
| 12              | 300              |     |     |     |    |    |    |    |    |     |     |     |     |     |   |  |  |  | – |

<sup>1)</sup> Class 1500 to 2500 with flow divider ST 3 and pressure balancing on request

<sup>2)</sup> Pressure balancing only for  $\geq$  Class 600

<sup>3)</sup> Pressure balancing only for Class 600/900

**Table 4:** Dimensions in inches and mm for standard versions of Type 3256-1 and Type 3256-7 Pneumatic Control Valves

**Table 4.1:** Type 3256 Valve

| Valve                  | NPS                      | ½  | 1    | 1½   | 2    | 3     | 4     | 6     | 8     | 10         | 12                |                   |       |            |  |
|------------------------|--------------------------|----|------|------|------|-------|-------|-------|-------|------------|-------------------|-------------------|-------|------------|--|
|                        |                          | DN | 15   | 25   | 40   | 50    | 80    | 100   | 150   | 200        | 250               | 300               |       |            |  |
| Length L               | Class 150                | in | 3.62 | 3.62 | 4.37 | 5.00  | 5.88  | 6.94  | 8.88  | 10.69      | On request        |                   |       |            |  |
|                        |                          | mm | 92   | 92   | 111  | 127   | 149   | 176   | 225   | 272        |                   |                   |       |            |  |
|                        | Class 300                | in | 3.75 | 3.88 | 4.62 | 5.25  | 6.25  | 7.25  | 9.31  | 11.19      |                   |                   |       |            |  |
|                        |                          | mm | 95   | 99   | 117  | 133   | 159   | 184   | 236   | 284        |                   |                   |       |            |  |
|                        | Class 600                | in | 3.98 | 4.12 | 4.94 | 5.62  | 6.62  | 7.75  | 10.00 | 12.00      |                   |                   |       |            |  |
|                        |                          | mm | 101  | 105  | 125  | 143   | 168   | 197   | 254   | 305        |                   |                   |       |            |  |
|                        | Class 900                | in | 4.25 | 5.00 | 6.00 | 7.25  | 7.50  | 9.00  | 12.00 | 14.50      |                   |                   |       |            |  |
|                        |                          | mm | 108  | 127  | 152  | 184   | 190   | 229   | 305   | 368        |                   |                   |       |            |  |
|                        | Class 1500               | in | 4.25 | 5.00 | 6.00 | 7.25  | 9.25  | 10.75 | 13.88 | 16.38      |                   |                   |       |            |  |
|                        |                          | mm | 108  | 127  | 152  | 184   | 235   | 273   | 353   | 416        |                   |                   |       |            |  |
|                        | Class 2500               | in | 5.19 | 6.06 | 7.56 | 8.88  | 11.38 | 13.25 | 18.00 | 20.12      |                   |                   |       |            |  |
|                        |                          | mm | 132  | 154  | 192  | 226   | 289   | 337   | 457   | 511        |                   |                   |       |            |  |
| Height H4              | Class 150 to 600         | in | 5.28 | 5.08 | 5.08 | 6.89  | 6.30  | 6.69  | 9.13  | On request |                   |                   |       |            |  |
|                        |                          | mm | 134  | 129  | 129  | 175   | 160   | 170   | 210   |            |                   |                   |       |            |  |
|                        | Class 900                | in | 6.89 | 6.69 | 6.69 | 8.70  | 6.30  | 6.69  | 9.13  |            |                   |                   |       |            |  |
|                        |                          | mm | 175  | 170  | 170  | 221   | 160   | 170   | 210   |            |                   |                   |       |            |  |
|                        | Class 1500 to 2500       | in | 6.89 | 6.69 | 6.69 | 8.70  | 9.53  | 11.65 | 14.61 |            |                   |                   | 21.54 | On request |  |
|                        |                          | mm | 175  | 170  | 170  | 221   | 242   | 296   | 371   |            |                   |                   | 547   |            |  |
| H8 for actuator        | 350 cm <sup>2</sup>      | in | 9.45 | 9.45 | 9.45 | 9.45  | 9.45  | 9.45  | -     |            |                   |                   |       |            |  |
|                        |                          | mm | 240  | 240  | 240  | 240   | 240   | 240   |       |            |                   |                   |       |            |  |
|                        | 355v2 cm <sup>2</sup>    | 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 <sup>2</sup>      | 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 <sup>2</sup>    | 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 <sup>2</sup>     | in | -    |      |      |       | 11.61 | 11.61 | 11.61 | 16.46      | 16.46             | On request        |       |            |  |
|                        |                          | mm |      |      |      |       | 295   | 295   | 295   | 418        | 418               |                   |       |            |  |
|                        | 1400-60 cm <sup>2</sup>  | in | -    |      |      |       | 11.61 | 11.61 | 11.61 | 16.46      | 16.46             | On request        |       |            |  |
|                        |                          | mm |      |      |      |       | 295   | 295   | 295   | 418        | 418               |                   |       |            |  |
|                        | 1400-120 cm <sup>2</sup> | in | -    |      |      |       | 18.90 | 18.90 | 18.90 | 19.80      | 19.80             | 19.80             | 25.60 |            |  |
|                        |                          | mm |      |      |      |       | 480   | 480   | 480   | 503        | 503               | 503 <sup>1)</sup> | 650   |            |  |
| 2800 cm <sup>2</sup>   | in                       | -  |      |      |      | 18.90 | 18.90 | 18.90 | 19.80 | 19.80      | 19.80             | 25.60             |       |            |  |
|                        | mm                       |    |      |      |      | 480   | 480   | 480   | 503   | 503        | 503 <sup>1)</sup> | 650               |       |            |  |
| 2x2800 cm <sup>2</sup> | in                       | -  |      |      |      | 18.90 | 18.90 | 18.90 | 19.80 | 19.80      | 19.80             | 25.60             |       |            |  |
|                        | mm                       |    |      |      |      | 480   | 480   | 480   | 503   | 503        | 503 <sup>1)</sup> | 650               |       |            |  |

<sup>1)</sup> H8 = 650 mm with 250 mm seat bore

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

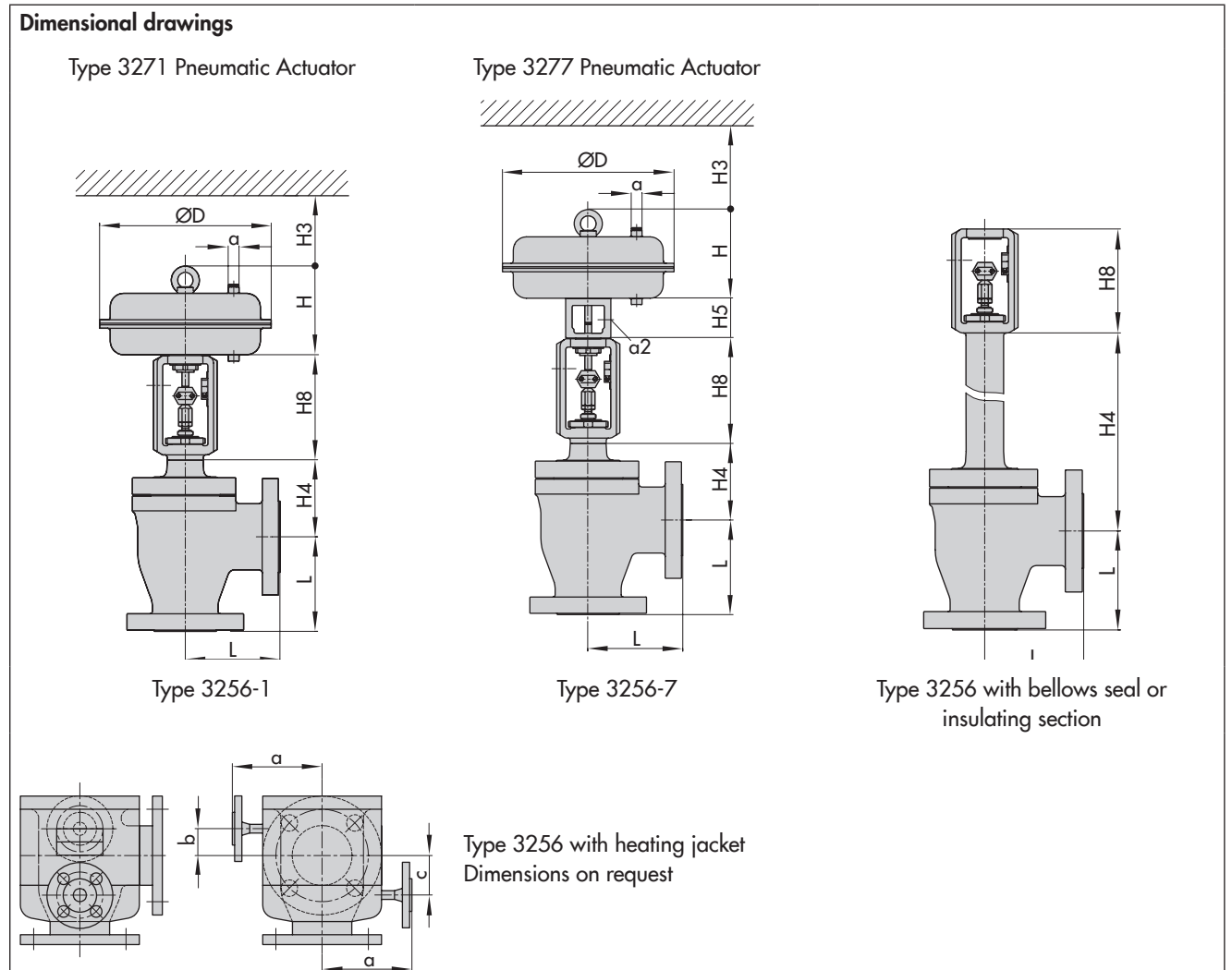
| Actuator area    | cm <sup>2</sup> | 350                | 355v2              | 700                | 750v2              | 1000               | 1400-60            | 1400-120                                     | 2800   | 2 x 2800                                     |
|------------------|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|--|--|
| 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 <sup>1)</sup>  | in              | 3.23               | 4.76               | 7.83               | 9.29               | 15.87              | 13.1               | 19.29 <sup>3)</sup> /<br>22.83 <sup>4)</sup> | 24.80 <sup>3)</sup> /<br>27.36 <sup>4)</sup> | 44.49 <sup>3)</sup> /<br>47.05 <sup>4)</sup> |
|                  | mm              | 82                 | 121                | 199                | 236                | 403                | 333                | 490 <sup>3)</sup> /<br>580 <sup>4)</sup>     | 630 <sup>3)</sup> /<br>695 <sup>4)</sup>     | 1130 <sup>3)</sup> /<br>1195 <sup>4)</sup>   |
| H3 <sup>2)</sup> | 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<br>(3/8 NPT) | G 3/8<br>(3/8 NPT) | G 3/8<br>(3/8 NPT) | G 3/8<br>(3/8 NPT) | G 3/4<br>(3/4 NPT) | G 3/4<br>(3/4 NPT) | G 1<br>(1 NPT)                               | G 1<br>(1 NPT)                               | G 1<br>(1 NPT)                               |
|                  | Type 3277       | G 3/8              | G 3/8              | G 3/8              | G 3/8              | -                  | -                  | -  | -  | -  |

1) 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 355v2 cm<sup>2</sup> without lifting eyelet

2) Minimum clearance required to remove the actuator

3) Height for version with welded-on lifting eyelet (material EN-JS1030)

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



**Table 5:** Weights in lbs and kg for standard versions of Type 3256-1 and Type 3256-7 Pneumatic Control Valves

**Table 5.1:** Type 3256 Valve

| Valve                            |                    | NPS | ½          | 1  | 1½  | 2   | 3   | 4          | 6          | 8          | 10         | 12  |  |  |
|----------------------------------|--------------------|-----|------------|----|-----|-----|-----|------------|------------|------------|------------|-----|--|--|
|                                  |                    | DN  | 15         | 25 | 40  | 50  | 80  | 100        | 150        | 200        | 250        | 300 |  |  |
| Valve without actuator (approx.) | Class 150          | lbs | 26         | 33 | 49  | 77  | 128 | 165        | 419        | On request |            |     |  |  |
|                                  |                    | kg  | 12         | 15 | 22  | 35  | 58  | 75         | 190        |            |            |     |  |  |
|                                  | Class 300          | lbs | On request |    |     |     |     |            |            |            |            |     |  |  |
|                                  |                    | kg  | On request |    |     |     |     |            |            |            |            |     |  |  |
|                                  | Class 600          | lbs | On request |    |     |     | 128 | 203        | On request |            | On request |     |  |  |
|                                  |                    | kg  | On request |    |     |     | 58  | 92         |            |            |            |     |  |  |
|                                  | Class 900          | lbs | On request | 84 | 126 | 201 | 243 | On request |            |            |            |     |  |  |
|                                  |                    | kg  |            | 38 | 57  | 91  | 110 |            |            |            |            |     |  |  |
|                                  | Class 1500 to 2500 | lbs | On request |    |     |     |     |            |            |            |            |     |  |  |
|                                  |                    | kg  | On request |    |     |     |     |            |            |            |            |     |  |  |

**Table 5.2:** Types 3271 and 3277 Pneumatic Actuators

| Actuator            |                   | cm <sup>2</sup> | 350 | 355v2 | 700 | 750v2 | 1000 | 1400-60 | 1400-120                                 | 2800                                       | 2x2800     |
|---------------------|-------------------|-----------------|-----|-------|-----|-------|------|---------|--|--|------------|
| 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 <sup>1)</sup> /<br>937 <sup>2)</sup> | 1268 <sup>1)</sup> /<br>1543 <sup>2)</sup> | On request |
|                     |                   | kg              | 13  | 20    | 27  | 41    | 190  | 175     | 300 <sup>1)</sup> /<br>425 <sup>2)</sup> | 575 <sup>1)</sup> /<br>700 <sup>2)</sup>   |            |
| 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    |      |         |  |  |            |

<sup>1)</sup> Side-mounted handwheel up to 80 mm travel

<sup>2)</sup> Side-mounted handwheel above 80 mm travel



**Table 6:** Dimensions in inch and mm and weights in lbs and kg for Type 3256 Valve with insulating section · Without actuator

| Valve size                    |                    | NPS | ½          | 1     | 1½    | 2     | 3     | 4     | 6     | 8          | 10         | 12  |  |  |
|-------------------------------|--------------------|-----|------------|-------|-------|-------|-------|-------|-------|------------|------------|-----|--|--|
|                               |                    | DN  | 15         | 25    | 40    | 50    | 80    | 100   | 150   | 200        | 250        | 300 |  |  |
| Height<br>H4                  | Class 150 to 600   | in  | 13.19      | 12.99 | 13.03 | 17.52 | 16.93 | 17.32 | 22.05 | On request |            |     |  |  |
|                               |                    | mm  | 335        | 330   | 331   | 445   | 430   | 440   | 560   |            |            |     |  |  |
|                               | Class 900          | in  | 14.57      | 14.41 | 14.41 | 19.13 | 16.93 | 17.32 | 22.05 |            |            |     |  |  |
|                               |                    | mm  | 370        | 366   | 366   | 486   | 430   | 440   | 560   |            |            |     |  |  |
|                               | Class 1500 to 2500 | in  | 14.57      | 14.41 | 14.41 | 19.13 | 19.69 | 21.5  | 28.23 |            |            |     |  |  |
|                               |                    | mm  | 370        | 366   | 366   | 486   | 500   | 546   | 717   |            |            |     |  |  |
| Weight<br>without<br>actuator | Class 150/300      | lbs | 66         | 79    | 97    | 159   | 243   | 344   | 794   | 1411       | On request |     |  |  |
|                               |                    | kg  | 30         | 36    | 44    | 72    | 110   | 156   | 360   | 640        |            |     |  |  |
|                               | Class 600          | lbs | On request |       |       |       |       |       |       |            |            |     |  |  |
|                               |                    | kg  | On request |       |       |       |       |       |       |            |            |     |  |  |
|                               | Class 900          | lbs | 95         | 108   | 150   | 231   | 287   | 397   | 882   | 1609       |            |     |  |  |
|                               |                    | kg  | 43         | 49    | 68    | 105   | 130   | 180   | 400   | 730        |            |     |  |  |
|                               | Class 1500 to 2500 | lbs | On request |       |       |       |       |       |       |            |            |     |  |  |
|                               |                    | kg  | On request |       |       |       |       |       |       |            |            |     |  |  |

**Table 7:** Dimensions in inch and mm and weights in lbs and kg for Type 3256 with bellows seal · Without actuator

| Valve size       |                  | NPS          | ½             | 1          | 1½    | 2     | 3          | 4     | 6          | 8          | 10         | 12  |  |  |  |
|------------------|------------------|--------------|---------------|------------|-------|-------|------------|-------|------------|------------|------------|-----|--|--|--|
|                  |                  | DN           | 15            | 25         | 40    | 50    | 80         | 100   | 150        | 200        | 250        | 300 |  |  |  |
|                  |                  | Travel       |               |            |       |       |            |       |            |            |            |     |  |  |  |
| Height<br>H4     | Class 150        | in           | 0.59 to 2.36" | 13.5       | 13.31 | 13.35 | 22.28      | 22.09 | 21.3       | 23.86      | On request |     |  |  |  |
|                  |                  | mm           |               | 343        | 338   | 339   | 566        | 561   | 541        | 606        |            |     |  |  |  |
|                  | Class 300 to 900 | in           | 1.5 to 60 mm  | 13.5       | 13.31 | 13.35 | 22.28      | 22.09 | 21.3       | On request |            |     |  |  |  |
|                  |                  | mm           |               | 343        | 338   | 339   | 566        | 561   | 541        | request    |            |     |  |  |  |
|                  | Class 1500       | in           | 0.59          | 24.45      | 24.29 | 24.02 | 20.63      | 19.69 | On request |            |            |     |  |  |  |
|                  |                  | mm           | 15            | 621        | 617   | 610   | 524        | 500   | On request |            |            |     |  |  |  |
|                  |                  | in           | 1.18          | -          |       |       | 20.63      | 19.69 | On request |            |            |     |  |  |  |
|                  |                  | mm           | 30            | -          |       |       | 524        | 500   | On request |            |            |     |  |  |  |
|                  |                  | in           | 2.36          | -          |       |       |            |       |            | On req.    |            |     |  |  |  |
|                  |                  | mm           | 60            | -          |       |       |            |       |            | On req.    |            |     |  |  |  |
|                  | Class 2500       | in           | 0.59          | 24.45      | 24.29 | 24.02 | On request |       |            |            |            |     |  |  |  |
|                  |                  | mm           | 15            | 621        | 617   | 610   | On request |       |            |            |            |     |  |  |  |
|                  |                  | in           | 1.18          | -          |       |       | On request |       |            |            |            |     |  |  |  |
|                  |                  | mm           | 30            | -          |       |       | On request |       |            |            |            |     |  |  |  |
|                  |                  | in           | 2.36          | -          |       |       |            |       |            | On req.    |            |     |  |  |  |
|                  |                  | mm           | 60            | -          |       |       |            |       |            | On req.    |            |     |  |  |  |
|                  | Class 150 to 300 | in           | 1.18 to 4.72  | On request |       |       |            |       |            |            |            |     |  |  |  |
|                  |                  | mm           | 30 to 120     | On request |       |       |            |       |            |            |            |     |  |  |  |
| Class 600 to 900 | in               | 1.18 to 2.36 | On request    |            |       |       |            |       |            |            |            |     |  |  |  |
|                  | mm               | 30 to 60     | On request    |            |       |       |            |       |            |            |            |     |  |  |  |
| Class 600        | in               | 4.72         | On request    |            |       |       |            |       |            |            |            |     |  |  |  |
|                  | mm               | 120          | On request    |            |       |       |            |       |            |            |            |     |  |  |  |

| Valve size                    |                       | NPS | ½          | 1   | 1½  | 2   | 3   | 4   | 6   | 8             | 10         | 12  |
|-------------------------------|-----------------------|-----|------------|-----|-----|-----|-----|-----|-----|---------------|------------|-----|
|                               |                       | DN  | 15         | 25  | 40  | 50  | 80  | 100 | 150 | 200           | 250        | 300 |
| Weight<br>without<br>actuator | Class 150/300         | lbs | On request |     |     |     |     |     | 794 | On<br>request | On request |     |
|                               |                       | kg  | On request |     |     |     |     |     | 360 |               |            |     |
|                               | Class 600             | lbs | 66         | 79  | 97  | 159 | 243 | 344 | 794 | 1411          |            |     |
|                               |                       | kg  | 30         | 36  | 44  | 72  | 110 | 156 | 360 | 640           |            |     |
|                               | Class 900             | lbs | 95         | 108 | 150 | 231 | 287 | 397 | 882 | 1609          |            |     |
|                               |                       | kg  | 43         | 49  | 68  | 105 | 130 | 180 | 400 | 730           |            |     |
|                               | Class 1500 to<br>2500 | lbs | On request |     |     |     |     |     |     |               |            |     |
|                               |                       | kg  | On request |     |     |     |     |     |     |               |            |     |

### Selection and sizing of the control valve

1. Calculate the  $C_v/K_v$  coefficient according to IEC 60534.
2. Select the valve size and  $C_v$  ( $K_{vs}$ ) coefficient from Table 3.
3. Select the actuator and 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.

### Ordering data

|                    |  |
|--------------------|--|
| 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<br>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 <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           | $p_1$ and $p_2$ in bar (absolute pressure $p_{abs}$ ), with minimum, normal, and maximum flow rate |
| Valve accessories  | Positioner and/or limit switch   |

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

Specifications subject to change without notice



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