Control Valves with Zero Travel 1 Trim for Type 3251 and Type 3256
DIN and ANSI versions

Application
Trim for single-stage high-pressure letdown

Valve size  DN 50 to 80 · NPS 2 to 3
Pressure rating  PN 16 to 400 · Class 150 to 2500
Medium temperature  −196 to +550 °C · −325 to +1022 °F

Further versions
- Higher leakage classes on request
- Higher differential pressures on request
- Other materials on request

The Zero Travel 1 Trim (ZT-1) is intended for a single-stage letdown in the FTC (flow-to-close) direction of flow. It is suitable for liquids, two-phase flows, or gases.

The benefit of the trim is that a single-stage letdown at differential pressures up to Δp = 250 bar can be achieved under certain conditions.

Typical applications include:
- High-pressure letdown
- Critical steam applications

Versions
Valves with leakage class IV
- ZT-1-I Trim for Type 3251 (Fig. 1) · Globe valve up to DN 80 and PN 400 (NPS 3 and Class 2500) · See Table 1 · See Data Sheets T 8051 and T 8052
- ZT-1-II Trim for Type 3256 (Fig. 2) · Angle valve up to DN 80 and PN 400 (NPS 3 and Class 2500) · See Table 1 · See Data Sheets T 8065 and T 8066
Principle of operation
The medium flows against the trim in the flow-to-close direction. The actual characteristic starts after the plug has passed through the zero travel.
The separation of the seating surface and throttling area increases the service life of the valve. Additionally, an additional guide in the seat area improves the stability.

![Graph: Comparison of equal percentage characteristics of a standard trim and a Zero Travel 1 Trim](image)

**Fig. 3:** Comparison: equal percentage characteristics of a standard trim and a Zero Travel 1 Trim

![CFD velocity profile for ZT-1-II in an angle valve](image)

**Fig. 4:** CFD velocity profile for ZT-1-II in an angle valve

![CFD velocity profile (detailed view)](image)

**Fig. 5:** CFD velocity profile (detailed view)
Fig. 6: Closed globe valve (ZT-1-I)

Fig. 7: Globe valve with zero travel (ZT-1-I)

Fig. 8: Open globe valve (ZT-1-I)

Fig. 9: Closed angle valve (ZT-1-II)

Fig. 10: Angle valve with zero travel (ZT-1-II)

Fig. 11: Open angle valve (ZT-1-II)
### Table 1: Technical data of ZT-1-I and ZT-1-II Trims

<table>
<thead>
<tr>
<th>Zero travel</th>
<th>DIN</th>
<th>ANSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve size</td>
<td>Type 3251</td>
<td>DN 50 to 80</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>Type 3251</td>
<td>PN 16 to 400</td>
</tr>
<tr>
<td>Temperature range (depending on the valve bonnet)</td>
<td>Type 3251</td>
<td>–196 to +550 °C</td>
</tr>
<tr>
<td>Max. permissible differential pressure</td>
<td>( \Delta p = 250 \text{ bar (3625 psi)} ) 1)</td>
<td></td>
</tr>
<tr>
<td>Direction of flow</td>
<td>FTC</td>
<td></td>
</tr>
<tr>
<td>Leakage class</td>
<td>Metal seal</td>
<td>Class IV according to IEC 60534-4 2)</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Equal percentage · Linear · ( \uparrow ) T 8000-3</td>
<td></td>
</tr>
<tr>
<td>Rangeability</td>
<td>( \uparrow ) T 8000-3</td>
<td></td>
</tr>
<tr>
<td>Valve bonnet</td>
<td>Standard · Insulating section · Bellows seal</td>
<td></td>
</tr>
</tbody>
</table>

#### Materials

- Seat and plug: Stellite® 6B
- Seat and plug: 1.4401/1.4404 with Stellite® facing · 316/316L with Stellite® facing
- Seat and plug: 1.4006 with Stellite® facing · 410 T

1) Higher differential pressures on request
2) Class V on request
3) The temperature limits are not directly converted temperatures.

### Table 2: \( K_{VS} \) and \( C_V \) coefficients for Type 3251 Globe Valve and Type 3256 Angle Valve · FTC direction of flow · Equal percentage and linear characteristics

| \( K_{VS} \) | 0.16 | 0.25 | 0.4 | 0.63 | 1.0 | 1.3 |
| \( C_V \) | 0.2 | 0.3 | 0.5 | 0.75 | 1.2 | 1.5 |
| Rangeability | 20:1 | 30:1 | 5:1 |
| Seat Ø mm | 6 | | 12 |
| Gasket diameter 1) mm | 16 | | 20 |
| Rated travel mm | 15 | | |
| Total travel mm | 19 | | 22 |

#### Valve size

<table>
<thead>
<tr>
<th>DN</th>
<th>NPS</th>
</tr>
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<tbody>
<tr>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>80</td>
<td>3</td>
</tr>
</tbody>
</table>

1) Decisive for actuator sizing

### Ordering text

- **Trim**
  - Zero Travel 1-II (ZT-1-II) for Type 3251
  - Zero Travel 1-II (ZT-1-II) for Type 3256

- **Body material**
  - See associated Data Sheet
  - \( \uparrow \) T 8051/\( \uparrow \) T 8052 for Type 3251
  - \( \uparrow \) T 8065/\( \uparrow \) T 8066 for Type 3256

- **Valve size**
  - DN …/NPS … according to Table 1

- **Pressure rating**
  - PN …/Class … according to Table 1

Specifications subject to change without notice