

Pneumatic Control Valve Type RVG Globe valve and angle valve

Application

Control valve for feedwater and steam applications in power plant engineering and the petrochemical industry

Nominal size DN 25 to 150 · NPS 1 to 6
Nominal pressure PN 16 to 400 · Class 150 to 2500

Type RVG Globe Valve equipped with

- Type 3271 Pneumatic Actuator

Valve body made of

- Forged steel 1.0460 / A105
- High-temperature forged steel 1.7335 / A182 F12 or 1.5415 / A182 F1

Special properties

- No cavitation
- No oscillation or vibrations
- Long service life
- Exact characteristics
- Easy-to-replace internal parts

Versions

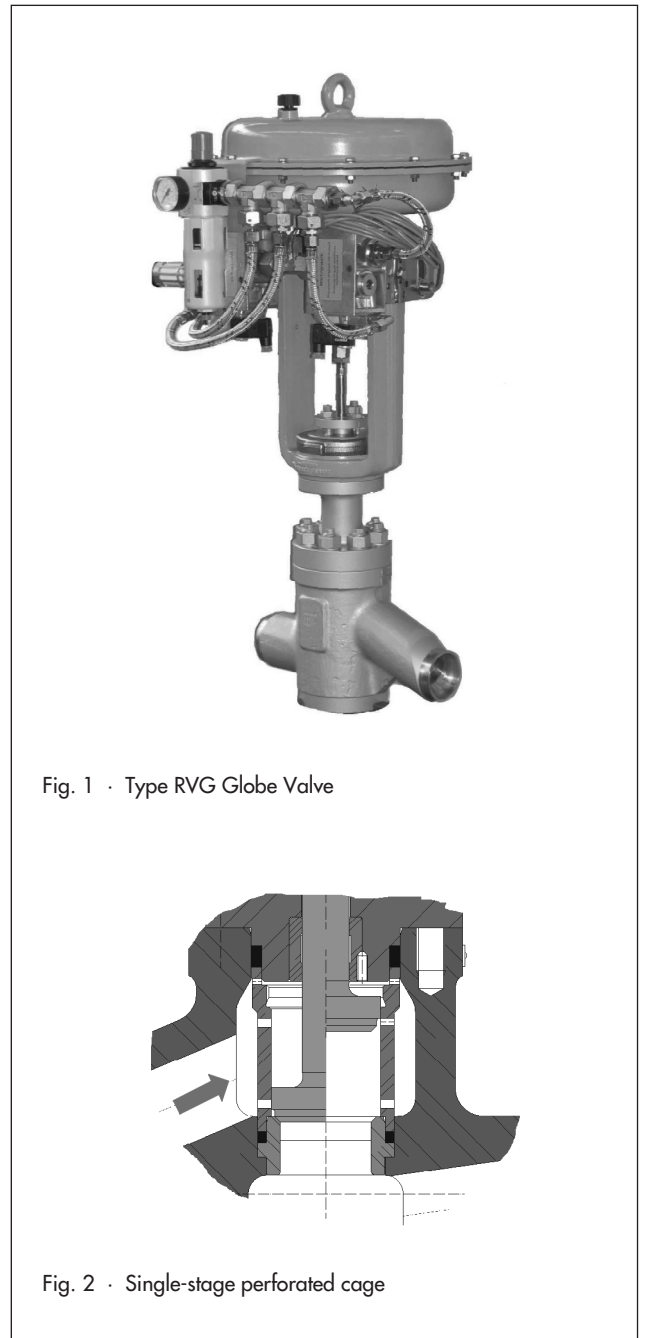
- **Type RVG** · Standard version in globe or angle body style with single-stage, two-stage, or three-stage perforated plug, with welding ends

Special versions

- Electric actuators
- Pressure-balanced plugs
- 4-stage to 10-stage plugs for very high pressure letdown

Application limits for multi-stage plugs

- $\Delta p < 50 \text{ bar} / 725 \text{ psi}$ - single-stage plug
- $\Delta p < 100 \text{ bar} / 1450 \text{ psi}$ - two-stage plug
- $\Delta p < 150 \text{ bar} / 2175 \text{ psi}$ - three-stage plug



Principle of operation

The process medium flows through the valve in the direction indicated by the arrow. The cross-sectional area of flow across the perforated cage is determined by the edge of the valve plug. The arrangement and size of the bores in the perforated cage determine the valve characteristic and the flow coefficient. With two-stage plugs, the pressure is further reduced by a downstream perforated plug.

In valves with three-stage plugs (only for liquids), an additional stage is located downstream of the seat ring. The seat ring is kept inside the body by the cage and can be removed without special tools.

Fail-safe action

Depending on how the compression springs are arranged in the actuator (for details refer to Data Sheets T 8310-1 EN and T 8310-2 EN), the control valve provides two fail-safe actions that become effective when the supply air fails.

Actuator stem extends (FA):

The valve is closed when the supply air fails.

Actuator stem retracts (FE):

The valve is opened when the supply air fails.

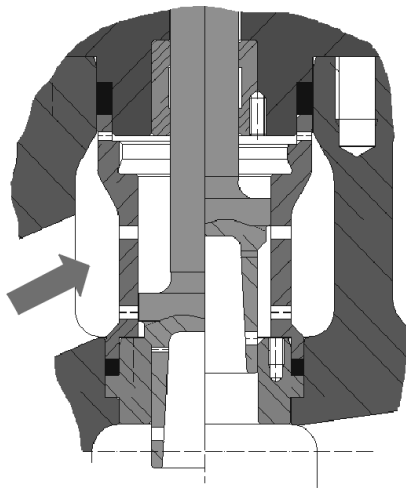


Fig. 3 · Two-stage plug

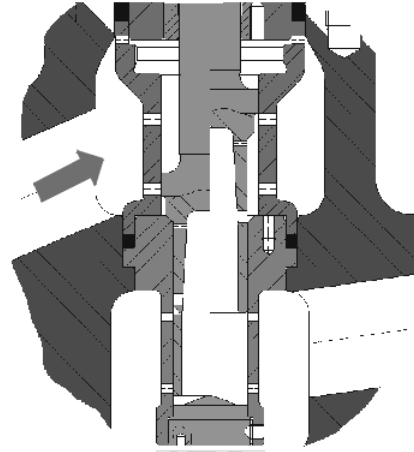


Fig. 4 · Three-stage plug

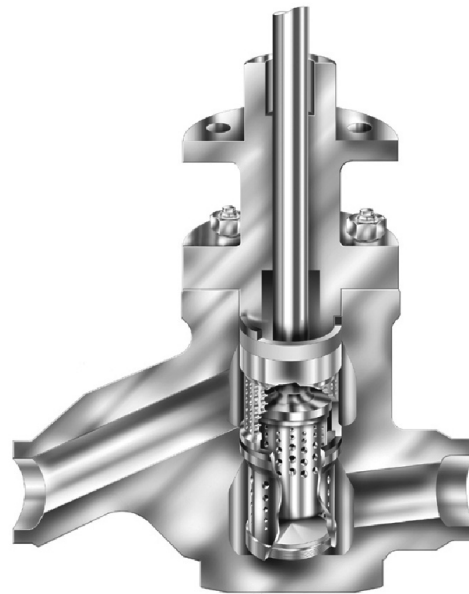


Fig. 5 · Type RVG with three-stage plug, sectional drawing

Table 1 · Technical data

| | | | | |
|------------------------------------|--------------------|--|---------------------------|-------------------|
| Material | | 1.0460 · A105 | 1.7335 · A182 F12 Class 2 | 1.5415 (≅A181 F1) |
| Nominal size | | DN 25 ... 150 · NPS 1 ... 6 | | |
| Nominal pressure | | PN 16 ... 400 · Class 150 ... 2500 | | |
| Connection | Flanges | All DIN and ANSI flanges on request | | |
| | Welding ends | DIN · ANSI | | |
| Seat-plug seal | | Metal sealing | | |
| Characteristic | | Equal percentage · Linear | | |
| Throttling element | | Perforated plug, single-stage to three-stage | | |
| Rangeability | | 1 : 30 (higher rangeabilities on request) | | |
| Temperature range | PTFE | ≤ 260 °C · ≤ 500 °F | | |
| | Graphite | > 260 °C · > 500 °F | | |
| Leakage class according to EN 1349 | | | | |
| Valve plug | Metal sealing | V | | |
| | Pressure balancing | IV | | |

Table 2 · Materials

| | | | | |
|------------------|--|------------------------------------|---------------------------|-------------------|
| Standard version | | 1.0460 · A105 | 1.7335 · A182 F12 Class 2 | 1.5415 (≅A181 F1) |
| Nominal pressure | | PN 16 ... 400 · Class 150 ... 2500 | | |
| Valve body | | 1.0460 | 1.7335 | 1.5415 (≅A181 F1) |
| Bonnet | | 1.0460 | 1.7335 | 1.5415 (≅A181 F1) |
| Seat and plug | | 1.4122 | | |
| Guide bushing | | Mehanite | | |
| Packing | | Pure graphite | | |
| Body gasket | | Graphite on metal core (1.4541) | | |

Table 3 · Available K_{VS} and C_V coefficients

Versions marked * are only available in PN 40 to PN 250 or Class 300 to 1500.

Reduced K_{VS} coefficients apply when used with two-stage plugs in steam applications (details on request).

Table 3a · Globe valve with single-stage plug

| | | | | | | | | | | | |
|---------------------------------------|-----|-----|-----|-----|-----|------|------|------|------|-------|--------|
| K _{VS} | | 1.2 | 1.8 | 4.1 | 6.9 | 10.5 | 25 | 36 | 53 | 120 | 165* |
| C _V | | 1.4 | 2.1 | 4.7 | 8.0 | 12.1 | 28.9 | 41.6 | 61.3 | 138.7 | 190.8* |
| Flow cross-section (cm ²) | | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 10 | 15.7 | 22.6 | 50 | 72 |
| Seat Ø (mm) | | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 110 |
| Travel (mm) | | 20 | | 25 | | 35 | | 50 | | 75 | |
| DN | NPS | | | | | | | | | | |
| 25 | 1 | • | • | • | • | | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | | |
| 40 | 1½ | | • | • | • | • | • | | | | |
| 50 | 2 | | | • | • | • | • | | | | |
| 65 | 2½ | | | | • | • | • | • | | | |
| 80 | 3 | | | | | | • | • | • | • | |
| 100 | 4 | | | | | | | • | • | • | |
| 125 | 5 | | | | | | | | | • | • |
| 150 | 6 | | | | | | | | | • | • |

Table 3b · Globe valve with two-stage plug

| | | | | | | | | | | | | | |
|---------------------------------------|------|-----|-----|-----|-----|------|------|------|------|------|-------|-------|--------|
| K _{Vs} | 0.85 | 1.2 | 2.9 | 5.2 | 8 | 13 | 22 | 34 | 60 | 76 | 92 | 111 | 128* |
| C _v | 1.0 | 1.4 | 3.4 | 6.0 | 9.2 | 15.0 | 25.4 | 39.3 | 69.4 | 87.9 | 106.4 | 128.3 | 148.0* |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 6.2 | 10.6 | 17.7 | 29.6 | 35.6 | 48.9 | 58 | 70 |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 90 | 100 | 110 | 120 |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | 75 | | | | |
| DN | NPS | | | | | | | | | | | | |
| 25 | 1 | • | • | • | • | • | | | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | | | | |
| 40 | 1½ | • | • | • | • | • | • | | | | | | |
| 50 | 2 | • | • | • | • | • | • | | | | | | |
| 65 | 2½ | | | | | • | • | • | • | | | | |
| 80 | 3 | | | | | | • | • | • | • | | | |
| 100 | 4 | | | | | | • | • | • | • | • | | |
| 125 | 5 | | | | | | | | • | • | • | • | • |
| 150 | 6 | | | | | | | | • | • | • | • | • |

Table 3c · Globe valve with three-stage plug

| | | | | | | | | | | | | | |
|---------------------------------------|------|-----|-----|-----|-----|------|------|------|------|------|------|--------|--------|
| K _{Vs} | 0.72 | 1.0 | 2.5 | 5.2 | 7 | 11 | 18 | 30 | 52 | 66 | 81 | 97* | 114* |
| C _v | 0.8 | 1.2 | 2.9 | 6.0 | 8.1 | 12.7 | 20.8 | 34.7 | 60.1 | 76.3 | 93.6 | 112.1* | 131.8* |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 6.2 | 10.6 | 17.7 | 29.6 | 38.6 | 48.9 | 58 | 70 |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 90 | 100 | 110 | 120 |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | 75 | | | | |
| DN | NPS | | | | | | | | | | | | |
| 25 | 1 | • | • | • | • | • | | | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | | | | |
| 40 | 1½ | | • | • | • | • | • | | | | | | |
| 50 | 2 | | • | • | • | • | • | | | | | | |
| 65 | 2½ | | | | | • | • | • | | | | | |
| 80 | 3 | | | | | | • | • | • | • | | | |
| 100 | 4 | | | | | | • | • | • | • | • | | |
| 125 | 5 | | | | | | | | • | • | • | • | • |
| 150 | 6 | | | | | | | | • | • | • | • | • |

Table 3d · Angle valve with single-stage plug

| | | | | | | | | | | |
|---------------------------------------|-----|-----|-----|-----|------|------|------|------|-------|--------|
| K _{Vs} | 1.2 | 1.8 | 4.1 | 7.1 | 11.1 | 28 | 38 | 63 | 101 | 130* |
| C _v | 1.4 | 2.1 | 4.7 | 8.2 | 12.8 | 32.4 | 43.9 | 72.8 | 116.8 | 150.3* |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 12.5 | 15.7 | 26.5 | 47.5 | 56.7 |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | 60 | 75 |
| DN | NPS | | | | | | | | | |
| 25 | 1 | • | • | • | • | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | |
| 40 | 1½ | • | • | • | • | • | • | | | |
| 50 | 2 | | • | • | • | • | • | • | | |
| 65 | 2½ | | | | • | • | • | • | • | |

| | | | | | | | | | | |
|---------------------------------------|-----|-----|-----|-----|------|------|------|------|-------|--------|
| K _{Vs} | 1.2 | 1.8 | 4.1 | 7.1 | 11.1 | 28 | 38 | 63 | 101 | 130* |
| C _V | 1.4 | 2.1 | 4.7 | 8.2 | 12.8 | 32.4 | 43.9 | 72.8 | 116.8 | 150.3* |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 12.5 | 15.7 | 26.5 | 47.5 | 56.7 |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | 60 | 75 |
| DN | NPS | | | | | | | | | |
| 80 | 3 | | | | | • | • | • | • | |
| 100 | 4 | | | | | • | • | • | • | • |
| 125 | 5 | | | | | | | | | • |

Table 3e · Angle valve with two-stage plug

| | | | | | | | | | | |
|---------------------------------------|-----|------|-----|-----|-----|------|------|------|-------|--------|
| K _{Vs} | 0.9 | 1.37 | 3.1 | 5.4 | 7.9 | 12.9 | 22.4 | 38 | 94 | 112* |
| C _V | 1.0 | 1.6 | 3.6 | 6.2 | 9.1 | 14.9 | 25.9 | 43.9 | 108.7 | 129.5* |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 6.2 | 10.6 | 18.2 | 29 | 48.9 |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | 60 | 75 |
| DN | NPS | | | | | | | | | |
| 25 | 1 | • | • | • | • | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | |
| 40 | 1½ | • | • | • | • | • | • | | | |
| 50 | 2 | | • | • | • | • | • | • | | |
| 65 | 2½ | | | | • | • | • | • | • | |
| 80 | 3 | | | | | | • | • | • | • |
| 100 | 4 | | | | | | • | • | • | • |
| 125 | 5 | | | | | | | | | • |

Table 3f · Angle valve with three-stage plug (for water only)

| | | | | | | | | | | |
|---------------------------------------|------|------|-----|-----|-----|------|------|------|------|--|
| K _{Vs} | 0.72 | 1.08 | 2.5 | 4.3 | 6.8 | 11.6 | 19 | 32 | 51 | |
| C _V | 0.8 | 1.2 | 2.9 | 5.0 | 7.9 | 13.4 | 22.0 | 37.0 | 59.0 | |
| Flow cross-section (cm ²) | 0.4 | 0.6 | 1.4 | 2.4 | 3.8 | 6.2 | 10.6 | 17.7 | 29.6 | |
| Seat Ø (mm) | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | |
| Travel (mm) | 20 | | 25 | | 35 | | 50 | | | |
| DN | NPS | | | | | | | | | |
| 25 | 1 | • | • | • | • | | | | | |
| 32 | 1¼ | • | • | • | • | • | | | | |
| 40 | 1½ | • | • | • | • | • | • | | | |
| 50 | 2 | | • | • | • | • | • | • | | |
| 65 | 2½ | | | | • | • | • | • | • | |
| 80 | 3 | | | | | | • | • | • | |
| 100 | 4 | | | | | | • | • | • | |

Table 4 · Parameters for flow rate and noise level calculation

| | | | | | | | | | | |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| Travel [%] | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| F _L | 0.84 | 0.84 | 0.84 | 0.85 | 0.86 | 0.87 | 0.88 | 0.89 | 0.90 | 0.91 |
| x _{Fz} | 0.45 | 0.44 | 0.44 | 0.43 | 0.41 | 0.41 | 0.41 | 0.41 | 0.40 | 0.40 |

Table 5 · Permissible differential pressures

Note! Required supply pressure $p_{supply} = 4 \text{ bar}$ · Differential pressure Δp at $p_2 = 0 \text{ bar}$ · Actuators marked E require the use of pressure-balanced valve plugs · Actuator sizing on request

| Bench range [bar] for actuator [cm ²] | | | 350 cm ² (0.6 ... 3.0 bar) | | | | | | 700 cm ² (0.6 ... 3.0 bar) | | | | 1400 cm ² (0.5...2.5 bar/1.3...2.8 bar) | | | | | |
|---|--------------------|----------|--|----|----|------|----|----|--|----|----|-------|---|--------|-----|-----|-----|-----|
| | | | Δp at $p_2 = 0 \text{ bar}$ | | | | | | | | | | | | | | | |
| p_1 | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 |
| DN | Seat \varnothing | Actuator | | | | | | | | | | | | | | | | |
| See Table 3a to Table 3f | 8 | 350 | | | | | | | | | | 700 E | | | | | | |
| | 10 | 350 | | | | | | | | | | 700 E | | | | | | |
| | 12 | 350 | | | | | | | | | | 700 E | | | | | | |
| | 15 | 350 | | | | | | | | | | 700 E | | | | | | |
| | 20 | 350 | | | | | | | | | | 700 E | | | | | | |
| | 25 | - | | | | | | | | | | - | | | | | | |
| | 32 | 700 | | | | 1400 | | | | | | | | - | | | | |
| | 40 | 700 | | | | 1400 | | | | | | | | - | | | | |
| | 50 | 700 | | | | 1400 | | | | | | | | - | | | | |
| | 65 | 700 | | | | 1400 | | | | | | | | - | | | | |
| | 80 | 700 | | | | 1400 | | | | | | | | - | | | | |
| | 90 | 700 | | | | 1400 | | | | | | | | 1400 E | | | | |
| | 100 | 700 | | | | 1400 | | | | | | | | 1400 E | | | | |
| 110 | - | | | | - | | | | | | | | - | | | | | |
| 120 | - | | | | - | | | | | | | | - | | | | | |

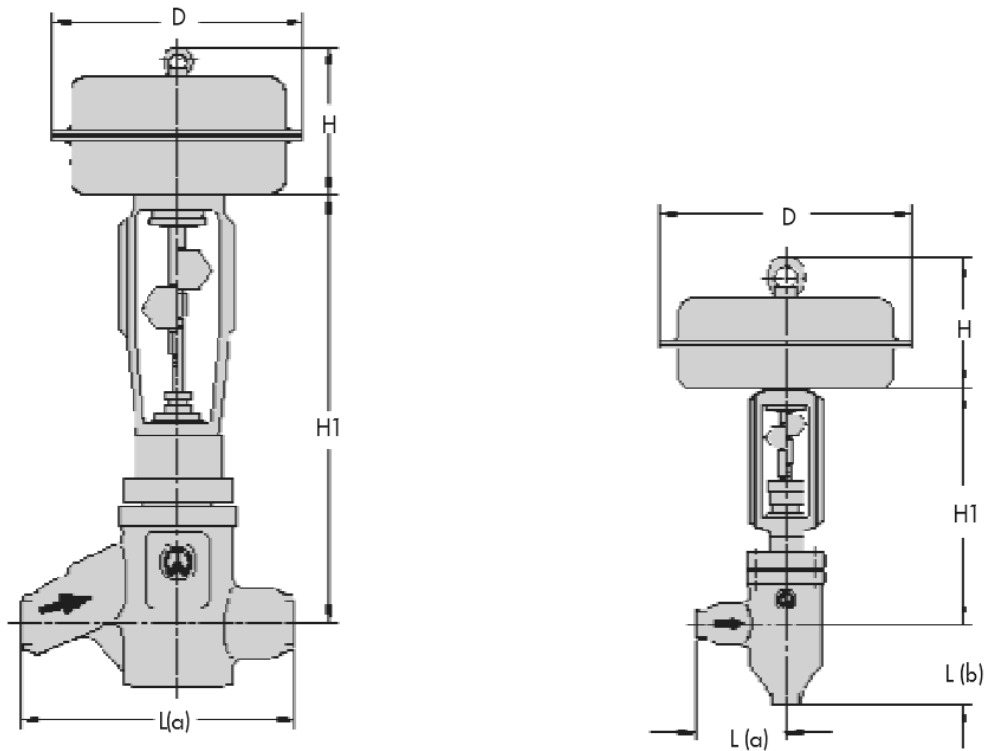


Fig. 6 · W&T Type RVG, dimensional drawings

Table 6 · Dimensions in mm/in and weights in kg/lbs**Table 6a · Globe valve with single-stage or two-stage plug**

| Valve | DN | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
|--------------|----------------|----------------|----|----|----|----------------|----|----------------|-----|-----|
| | NPS | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 |
| Length L (a) | | 350 mm / 13.8" | | | | 450 mm / 17.7" | | 560 mm / 22" | | |
| H1 | | 230 mm / 9" | | | | 295 mm / 11.6" | | 310 mm / 12.2" | | |
| Weight | PN 40...400 | 39 kg | | | | 84 kg | | 296 kg | | |
| | Cl. 300...2500 | 86 lbs | | | | 185 lbs | | 651 lbs | | |

Table 6b · Angle valve with single-stage or two-stage plug

| Valve | DN | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 |
|--------------|----------------|----------------|----|----|----|----------------|----|-----|-----|
| | NPS | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 |
| Length L (a) | | 175 mm / 6.88" | | | | 250 mm / 9.8" | | | |
| Length L (b) | | 150 mm / 5.9" | | | | 225 mm / 8.8" | | | |
| H1 | | 175 mm / 6.88" | | | | 220 mm / 8.66" | | | |
| Weight | PN 40...400 | 42 kg | | | | 120 kg | | | |
| | Cl. 300...2500 | 93 lbs | | | | 264 lbs | | | |

Table 6c · Angle valve with three-stage plug

| Valve | DN | 25 | 32 | 40 | 50 | 65 |
|--------------|----------------|----------------|----|----|----|----|
| | NPS | 1 | 1¼ | 1½ | 2 | 2½ |
| Length L (a) | | 175 mm / 6.88" | | | | |
| Length L (b) | | 325 mm / 12.8" | | | | |
| H1 | | 195 mm / 7.6" | | | | |
| Weight | PN 40...400 | 69 kg | | | | |
| | Cl. 300...2500 | 152 lbs | | | | |

Table 7 · Pneumatic actuator · Dimensions and weights

| Actuator | cm ² | 350 | 700 | 1400 |
|--|-----------------|-----------------|------------------|-------------------|
| Diaphragm Ø D | | 280 mm / 11" | 390 mm / 15.3" | 530 mm / 20.86" |
| H (700 cm ² and larger: including lifting ring) | | 85 mm / 3.35" | 200 mm / 7.87" | 287 mm / 11.3" |
| H3 (min. clearance for actuator disassembly) | | | 190 mm / 7.5" | 610 mm / 24" |
| Threads | | M30 x 1.5 | | M60 x 1.5 |
| a (for Type 3271 Actuator) | | G ¾ (¾ NPT) | | G ¾ (¾ NPT) |
| Weight | Type 3271 | 8 kg / 17.6 lbs | 22 kg / 48.5 lbs | 70 kg / 154.3 lbs |

Ordering text

| | |
|------------------|--|
| Valve Type RVG | Globe valve or angle valve |
| Nominal size | DN / NPS |
| Nominal pressure | PN / ANSI Class |
| Body material | According to Table 2 |
| Plug version | Standard or pressure-balanced single-stage to three-stage |
| Characteristic | Equal percentage or linear |
| Actuator | Type 3271 (see T 8310-1 EN or T 8310-2 EN) |
| Fail-safe action | Valve CLOSED or valve OPEN |
| Process medium | Density and temperature |
| Flow rate | During operation |
| Pressure | p_1 and p_2 in bar/psi (absolute pressure p_{abs}), each at minimum, standard, and maximum flow rate |
| Accessories | Positioner and/or limit switch |

Specifications subject to change without notice.

