# Bosch Rexroth DBDS 6 K1X/25 direct-operated pressure relief valve

Manufacturer: Bosch Rexroth

Manufacturer part number / published order designation: R900420245

Published model: DBDS 6 K1X/25

## About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

## Execution notes and conditions

The published designation has no certified safety-valve E option; its separate PED diagrams are omitted. Threaded G and subplate P dimensions are not K cartridge dimensions.

## Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

## Source A: Rexroth Dbd Direct Operated Pressure Relief Valves Re25402

| Original pages | Compiled pages | Relevant content |
|---|---|---|
| 2-8 | 2-8 | Existing DBDS size, K cartridge, 1X series, pressure-range and S hex-adjustment coding. Published execution: DBDS 6 K1X/25.; Pressure-range, size, adjustment and seal/material compatibility footnotes.; Direct-operated relief principle and pressure setting.; Actual size operating pressure, flow, backpressure, temperature and installation limits.; Fluid/seal, viscosity and cleanliness compatibility and restrictions.; Relevant size 6/10 minimum-set-pressure curves with test conditions.; Relevant size 6/10 pressure/flow branches for the actual pressure range. |
| 10-11 | 9-10 | K screw-in cartridge mechanical drawing; S hex adjustment and applicable size variant.; Cartridge dimension table, O-ring interfaces, mounting/adjustment torque and mass. |
| 13 | 11 | Exact size 6/10 installation-bore tolerances and sealing surfaces. |

## Ordering code

| 01 | 02 | 03 | 04 | 05 | | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DBD** | | | | **1X** | **/** | | | | | | ***** |

| | | |
|---|---|---|
| 01 | Pressure relief valve, direct operated | **DBD** |

**Adjustment type for pressure adjustment**

| 02 | | NG6 | NG8 | NG10 | NG15 | NG20 | NG25 | NG30 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bushing with hexagon and protective cap | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **S** | ◇ |
| | Rotary knob [1)] | ✓ | ✓ | ✓ | ✓ | ✓ | – | – | **H** | |
| | Hand wheel [2)] | – | – | – | – | – | ✓ | ✓ | **H** | |
| | Lockable rotary knob [1; 3; 4)] | ✓ | ✓ | ✓ | ✓ | ✓ | – | – | **A** | |

| | | | |
|---|---|---|---|
| 03 | Size 6 (port G1/4) | **6** | ◇ |
| | Size 8 (port G3/8) | **8** | |
| | Size 10 (port G1/2) | **10** | ◇ |
| | Size 15 (port G3/4) | **15** | |
| | Size 20 (port G1) | **20** | ◇ |
| | Size 25 (port G1 1/4) | **25** | |
| | Size 30 (port G1 1/2) | **30** | ◇ |

**Type of connection**

| 04 | | NG6 | NG8 | NG10 | NG15 | NG20 | NG25 | NG30 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | As screw-in cartridge valve (cartridge) | ✓ | – | ✓ | – | ✓ | – | ✓ | **K** | ◇ |
| | For threaded connection | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **G** | ◇ |
| | For subplate mounting | ✓ | – | ✓ | – | ✓ | – | ✓ | **P** | |

| | | | |
|---|---|---|---|
| 05 | Component series 10 ... 1Z (10 ... 1Z: unchanged installation and connection dimensions) | **1X** | |

**Pressure rating** [5)]

| 06 | | NG6 | NG8 | NG10 | NG15 | NG20 | NG25 | NG30 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Set pressure up to 25 bar | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **25** | |
| | Set pressure up to 50 bar | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **50** | |
| | Set pressure up to 100 bar | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **100** | ◇ |
| | Set pressure up to 200 bar | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **200** | ◇ |
| | Set pressure up to 315 bar | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | **315** | ◇ |
| | Set pressure up to 400 bar | ✓ | ✓ | ✓ | ✓ | ✓ | – | – | **400** | |
| | Set pressure up to 630 bar [6)] | – | – | ✓ | – | – | – | – | **630** | |

**Corrosion resistance** (for availability see table on page 3)

| 07 | | | |
|---|---|---|---|
| | None | **no code** | ◇ |
| | Improved corrosion protection (240 h salt spray test according to EN ISO 9227) | **J3** | |
| | High corrosion protection (720 h salt spray test according to EN ISO 9227) | **J5** | |

**Seal material** (observe compatibility of seals with hydraulic fluid used, see page 6)

| 08 | | | |
|---|---|---|---|
| | NBR seals | **no code** | ◇ |
| | FKM seals | **V** | |

**Line connection**

| 09 | | | |
|---|---|---|---|
| | Pipe thread according to ISO 228/1 | **no code** | ◇ |
| | SAE thread | **/12** | |

**Equipment Directive**

| 10 | | | |
|---|---|---|---|
| | Without type-examination procedure | **no code** | ◇ |
| | Type-examination tested safety valves according to Pressure Equipment Directive 2014/68/EU [7)] | **E** | |

| | | |
|---|---|---|
| 11 | Further details in the plain text | |

## Ordering code

1) For size 15 and 20, only available for the pressure ratings 25, 50 or 100 bar.
2) Available for the pressure ratings 25, 50 or 100 bar only.
3) Key with material no. **R900008158** is included in the scope of delivery.
4) Not for type-examination tested safety valves "E".
5) When selecting the pressure rating, please observe the characteristic curves and notes on page 8.
6) With version "G" and "P," only available as "SO292," see page 9 and 12.
7) See ordering code on page 14.

☞ **Notice:** ◊ = Preferred type

**Availability corrosion resistance** (Without type-examination procedure; only adjustment type "S")

| Type of connection | NG6 | NG8 | NG10 | NG15 | NG20 | NG25 | NG30 |
|---|---|---|---|---|---|---|---|
| As screw-in cartridge valve "K" | no code, J5 | – | no code, J5 | – | no code, J5 | – | no code, J5 |
| For threaded connection "G" | no code, J3 | no code | no code, J3 | no code | no code, J3 | no code | no code, J3 |
| For subplate mounting "P" | no code, J3 | – | no code, J3 | – | no code, J3 | – | no code, J3 |

☞ **Notice:**
Deviating ordering code for type-examination tested safety valves "E" can be found on page 14.

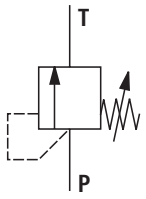
## Function, section, symbol

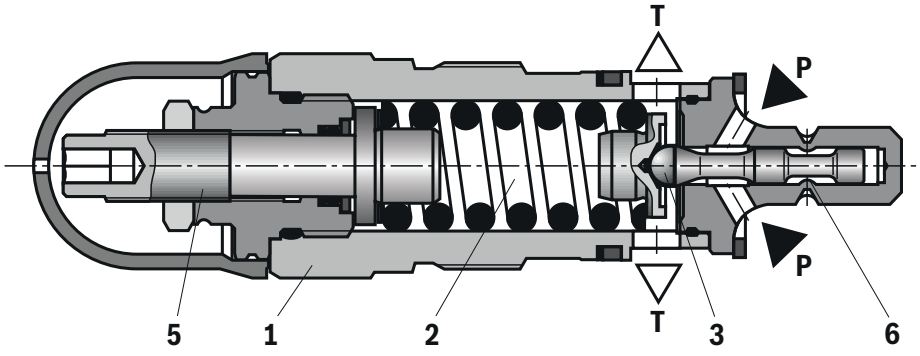
Pressure relief valve type DBD are direct operated seat valves. They are used for limiting a system pressure.
The valves basically consist of a sleeve (1), spring (2), poppet with damping piston (3) (pressure rating 25 ... 400 bar) or ball (4) (pressure rating 630 bar) and adjustment type (5). The system pressure can be set steplessly via the adjustment type (5). The spring (2) pushes the poppet (3) or the ball (4) onto the seat. Channel P is connected to the system. The pressure existing in the system acts on the poppet surface (or the ball).
If the pressure in channel P exceeds the value set at the spring (2), the poppet (3) or the ball (4) opens against the spring (2). Now, hydraulic fluid from channel P flows into channel T. The stroke of the poppet (3) is limited by the embossing (6).

In order to achieve good pressure adjustment over the entire pressure range, the entire pressure range has been divided into 7 pressure ratings. One pressure rating corresponds to a certain spring for a maximum operating pressure that can be set by means of that spring.

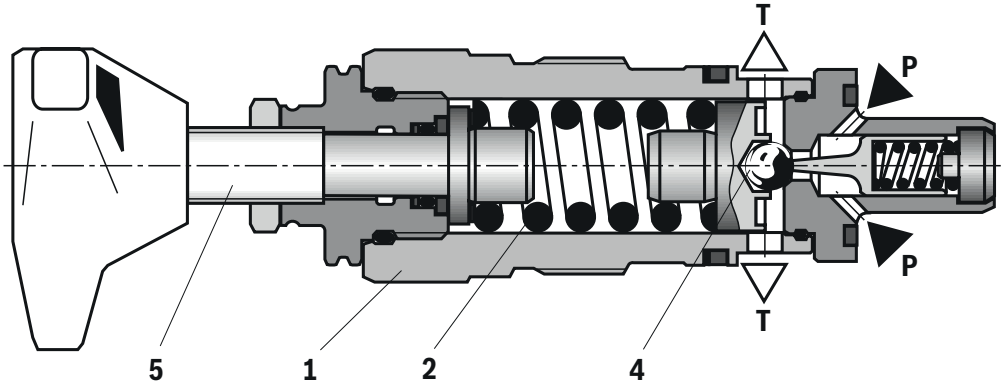
☞ **Notice:**
The adjustment type (5) is constructed so that it cannot be lost. Due to the gimbal-mounting, the adjustment element remains loose (movable) in the adjustment type (5) in case of complete unloading.
Pressure rating "25":
If despite completely unloaded adjustment type, the minimum pressure does not settle, the adjustment element has to be "pulled back" to the stop due to the low spring and/or restoring force.
For pressure adjustment / increase, the adjustment element can then be screwed in again.

**Symbol**




**Type DBDS..K1X/...**
Version with pressure rating 25 ... 400 bar (poppet seat valve)




**Type DBDH 10 K1X/...**
Version with pressure rating 630 bar (ball seat valve, only NG10)

## Technical data
(For applications outside these values, please consult us!)

| **General** | | | | | |
|---|---|---|---|---|---|
| Size | NG | 6, 8 | 10 | 15, 20 | 25, 30 |
| Type of connection | | Subplate mounting; threaded connection; screw-in cartridge valve | | | |
| Weight | | See pages 9, 11 and 12 | | | |
| Installation position | | Any | | | |
| Ambient temperature range | °C | –20 ... +80 (NBR seals)<br>–15 ... +80 (FKM seals) | | | |
| $MTTF_D$ values according to EN ISO 13849 | Years | 150 ... 1200 (for more information see data sheet 08012) | | | |

| **Hydraulic** | | | | | | |
|---|---|---|---|---|---|---|
| Maximum operating pressure | ▶ Port P | | | | | |
| | – Standard | bar | 400 | 400 | 400 | 315 |
| | – Version "630" | bar | – | 630 | – | – |
| | ▶ Port T | bar | 315 | 315 | 315 | 315 |
| Hydraulic fluid | | | See table page 6 | | | |
| Hydraulic fluid temperature range | | °C | –20 ... +80 (NBR seals)<br>–15 ... +80 (FKM seals) | | | |
| Viscosity range | | $mm^2/s$ | 10 ... 800 | | | |
| Maximum admissible degree of contamination of the hydraulic fluid; cleanliness class according to ISO 4406 (c) | | | Class 20/18/15 [1] | | | |
| Maximum flow (standard valves) | | | See characteristic curves page 8 | | | |
| Minimum set pressure | | | See characteristic curves page 7 | | | |

[1] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

☞ **Notice:**
- ▶ Hydraulic counter pressures in port T add 1:1 to the response pressure of the valve set at the adjustment type.
  **Example:**
  - – Pressure adjustment of the valve due to spring preload (item 2 on page 4) $\boldsymbol{p}_{spring}$ **= 200 bar**
  - – Hydraulic counter pressure in port T: $\boldsymbol{p}_{hydraulic}$ **= 50 bar**
  - – ⇒ Response pressure = $\boldsymbol{p}_{spring}$ + $\boldsymbol{p}_{hydraulic}$ **= 250 bar**
- ▶ Deviating technical data for type-examination tested safety valves can be found on page 15.

## Technical data
(For applications outside these values, please consult us!)

| Hydraulic fluid | | Classification | Suitable sealing materials | Standards | Data sheet |
|---|---|---|---|---|---|
| Mineral oils | | HL, HLP, HLPD, HVLP, HVLPD | NBR, FKM | DIN 51524 | 90220 |
| Bio-degradable | ▶ Insoluble in water | HETG | FKM | ISO 15380 | 90221 |
| | | HEES | FKM | | |
| | ▶ Soluble in water | HEPG | FKM | ISO 15380 | |
| Flame-resistant | ▶ Water-free | HFDU (glycol base) | FKM | ISO 12922 | 90222 |
| | | HFDU (ester base) | FKM | | |
| | | HFDR | FKM | | |
| | ▶ Containing water | HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046) | NBR | ISO 12922 | 90223 |

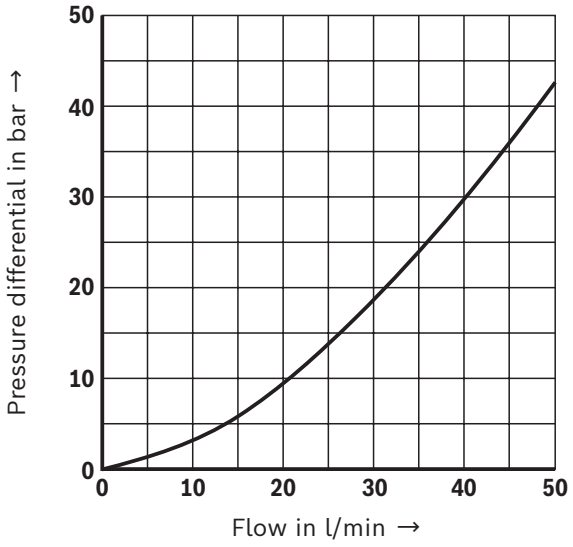
☞ **Important information on hydraulic fluids:**

- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.
- **Bio-degradable and flame-resistant – containing water:**
  If components with galvanic zinc coating (e.g., version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves – particularly in connection with local heat input.
- **Flame-resistant – containing water**:
  Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP.
  In order to reduce the cavitation effect, it is recommended – if possible specific to the installation – backing up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

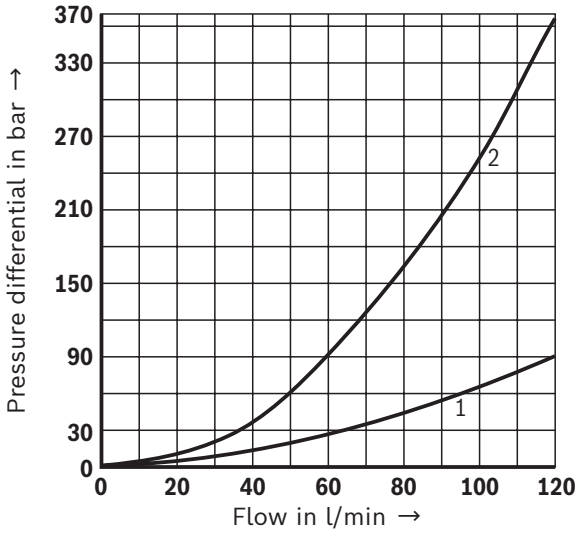
## Characteristic curves
(measured with HLP46, $\vartheta_{oil}$ = 40±5 °C)

**Minimum set pressure**

**Size 6**



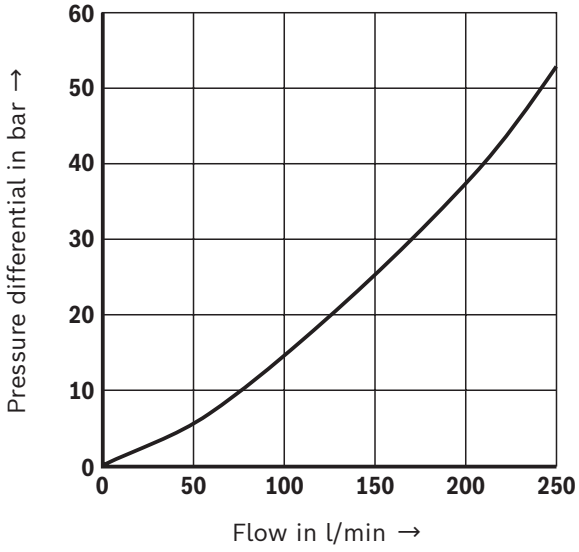

**Size 8 and 10**



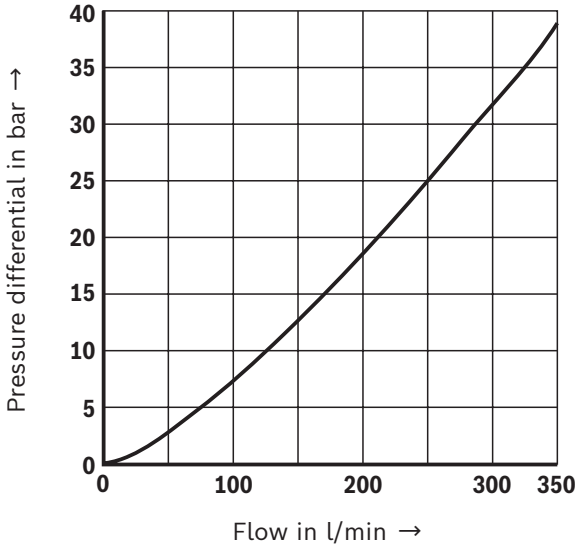

**1** Pressure rating 25 ... 400 bar

**2** Pressure rating 630 bar

**Size 15 and 20**




**Size 25 and 30**

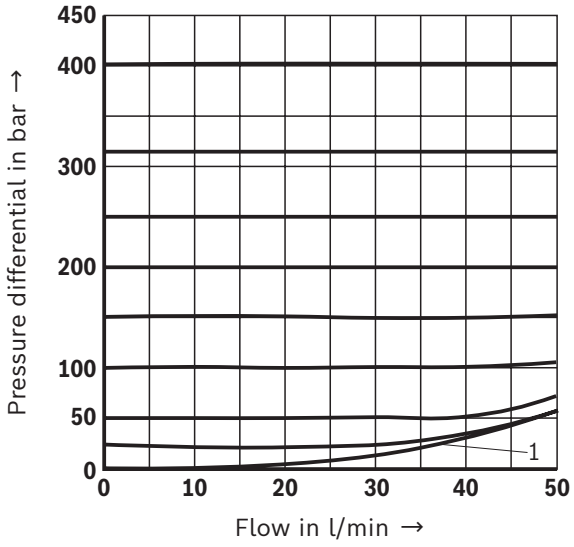



☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

## Characteristic curves
(measured with HLP46, $\vartheta_{oil}$ = 40±5 °C)

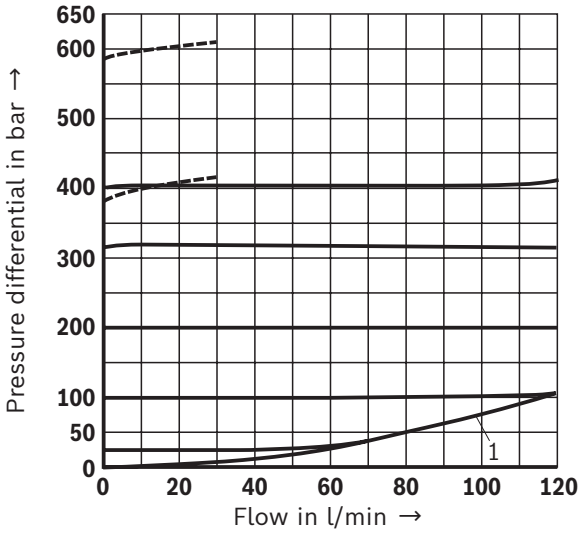
### $\Delta p$-$q_V$ characteristic curves

**Size 6**



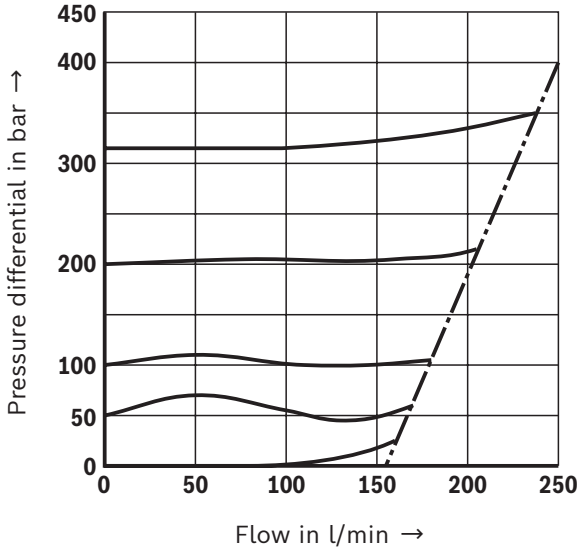

**1** minimum adjustable pressure

**Size 8 and 10**

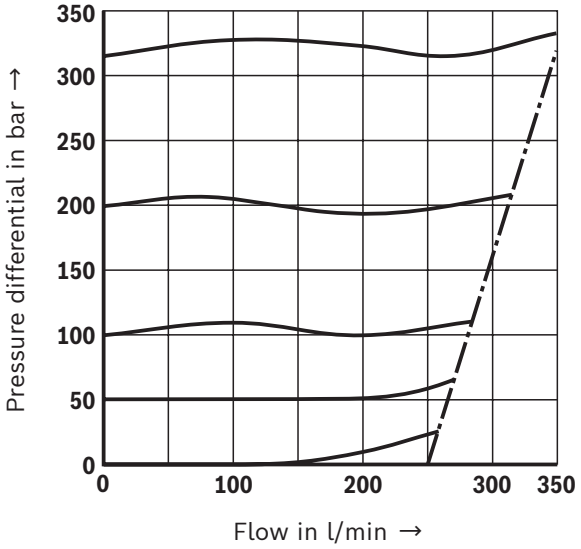



– – – – Pressure rating 630 bar (NG10 only)

**Size 15 and 20**

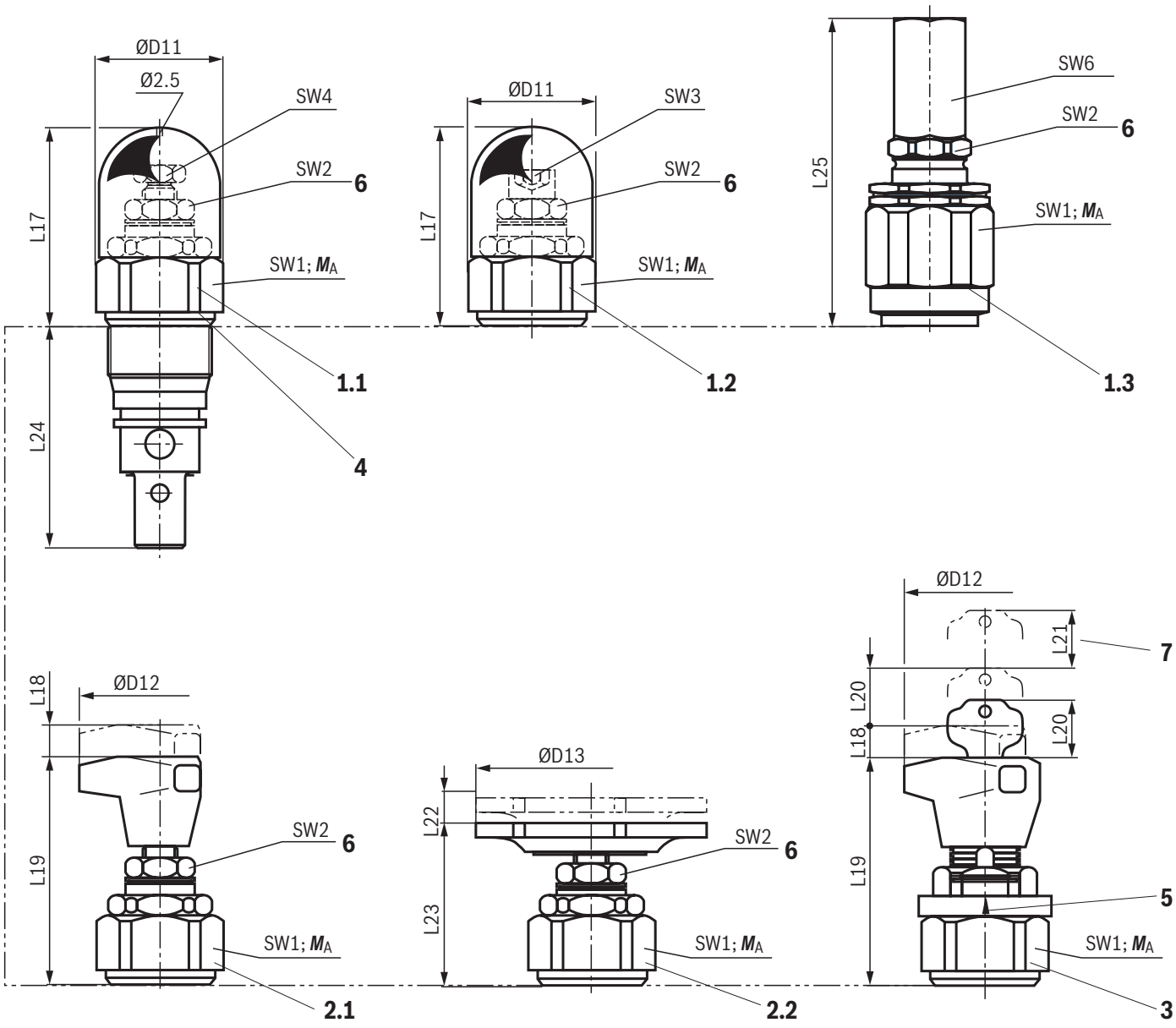



**Size 25 and 30**




☞ **Notice:**
- The characteristic curves apply for output pressure $p_T$ = 0 bar in the entire flow range.
- The characteristic curves only apply with the specified environmental and temperature conditions. It has to be noted that any deviations from the specified boundary conditions will affect the characteristic curve.
- The characteristic curves refer to the specified pressure ratings (e.g. 200 bar). The more the set pressure value differs from the nominal pressure rating (e.g. <200 bar), the larger the pressure increase with increasing flow gets.
- Typical characteristic curves which are subject to tolerance variations.

## **Dimensions:** Screw-in cartridge valve (dimensions in mm)




**1.1** Adjustment type "S" – Sleeve with hexagon and protective cap (NG30)

**1.2** Adjustment type "S" – Sleeve with internal hexagon and protective cap (NG6 ... NG20)

**1.3** Adjustment type "S" – Sleeve with hexagon and protective cap; version "J3" and "J5"

**2.1** Adjustment type "H" – rotary knob (NG6 ... NG20)

**2.2** Adjustment type "H" – hand wheel (NG30)

**3** Adjustment type "A" – lockable rotary knob NG6 ... NG10 (NG20 ... 100 bar)

**4** Type designation

**5** Marking (adjustment of the zero position after the valve has been screwed in; then fixing of the ring by horizontal shifting until it engages on the plug screw SW6).

**6** Lock nut, tightening torque $M_A = 10^{+5}$ Nm

**7** Space required to remove the key

**Dimensional tables** see page 11, **installation bore** see page 13.

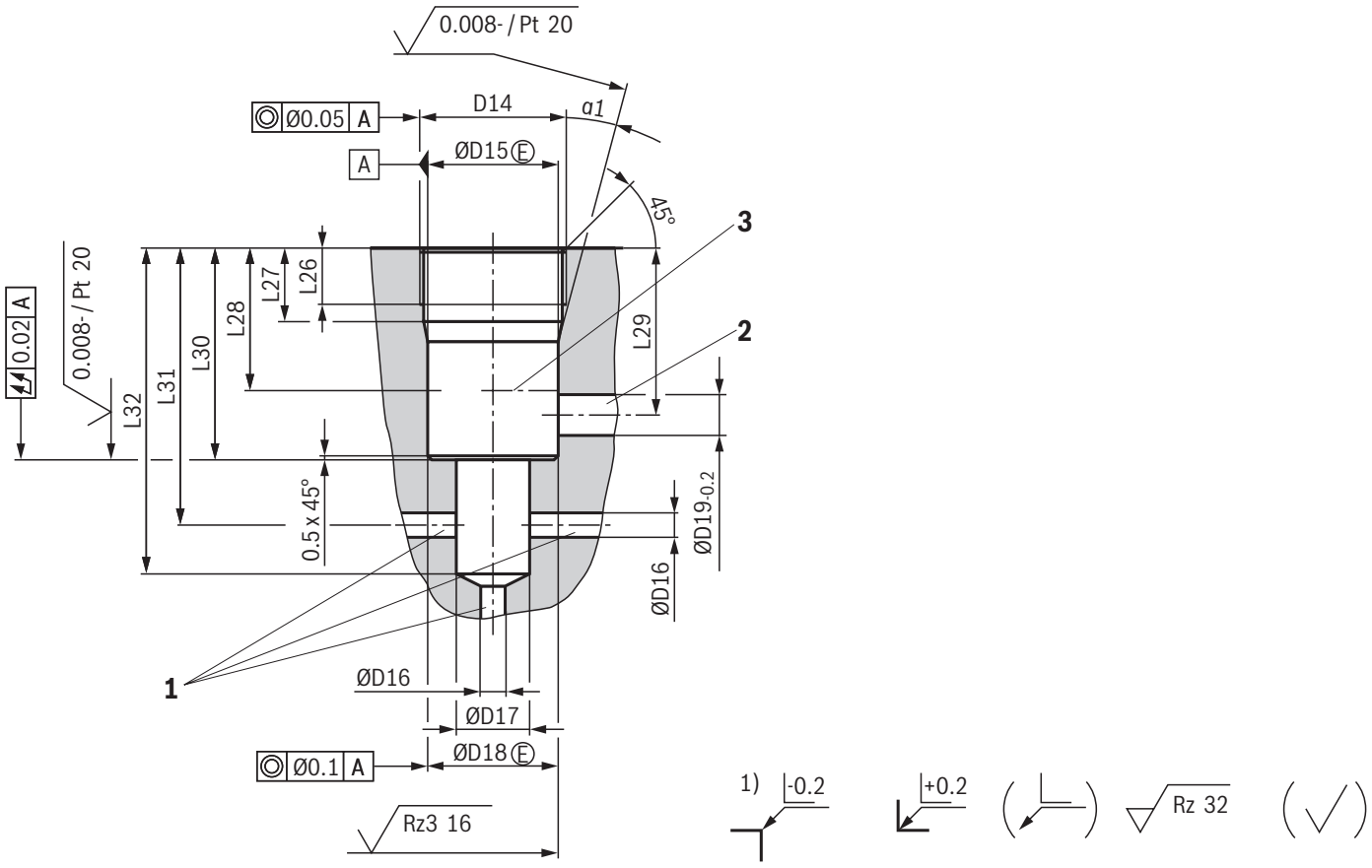
## **Dimensions:** Screw-in cartridge valve (dimensions in mm)

| NG | ØD11 | ØD12 | ØD13 | L17 | L18 | L19 | L20 | L21 | L22 | L23 | L24 | L25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **6** | 34 | 60 | – | 72 | 11 | 83 | 28 | 20 | – | – | 64.5 | 82.2 |
| **10** | 38 | 60 | – | 68 | 11 | 79 | 28 | 20 | – | – | 77 | 78.5 |
| **20** | 48 | 60 | – | 65 | 11 | 77 | 28 | 20 | – | – | 106 | 75 |
| **30** | 63 | – | 80 | 83 | – | – | – | – | 11 | 56 | 131 | 94.3 |

| NG | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | **Tightening torques $M_A$ in Nm for screw-in cartridge valves** [2] Pressure rating in bar | | | **Weight**, approx. in kg |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **up to 200** | **up to 400** | **up to 630** | |
| **6** | 32 | 19 | 6 | – | 30 | 19 | $50^{\pm 5}$ | $80^{\pm 5}$ | – | 0.4 |
| **10** | 36 | 19 | 6 | – | 30 | 19 | $100^{\pm 5}$ | $150^{\pm 10}$ | $200^{\pm 10}$ | 0.5 |
| **20** | 46 | 19 | 6 | – | 30 | 19 | $150^{\pm 10}$ | $300^{\pm 15}$ | – | 1 |
| **30** | 60 | 19 | – | 13 | – | 19 | $350^{\pm 20}$ | $500^{\pm 30}$ | – | 2.2 |

[2] The tightening torques are guidelines with a friction coefficient $\mu_{total}$ = 0.12 and when using a manual torque wrench.

## **Dimensions:** Installation bore (dimensions in mm)




**1** Port P, at any place at the circumference or at the front side

**2** Port T, at any place at the circumference

**3** Depth of fit

1) All seal ring insertion faces are rounded and free of burrs
Tolerance for all angles ±0.5°

| NG | D14 | ØD15 | ØD16 | ØD17 | ØD18 | ØD19 |
|---|---|---|---|---|---|---|
| **6** | M28 x 1.5 | 25H9 | 6 | 15 | $24.9^{+0.152}_{-0.2}$ | 12 |
| **10** | M35 x 1.5 | 32H9 | 10 | 18.5 | $31.9^{+0.162}_{-0.2}$ | 15 |
| **20** | M45 x 1.5 | 40H9 | 20 | 24 | $39.9^{+0.162}_{-0.2}$ | 22 |
| **30** | M60 x 2 | 55H9 | 30 | 38.75 | $54.9^{+0.174}_{-0.2}$ | 34 |

| NG | L26 | L27 | L28 | L29 | L30 | L31 | L32 | a1 |
|---|---|---|---|---|---|---|---|---|
| **6** | 15 | 19 | 30 | 36 | 45 | $56.5^{\pm 5.5}$ | 65 | 15° |
| **10** | 18 | 23 | 35 | 41.5 | 52 | $67.5^{\pm 7.5}$ | 80 | 15° |
| **20** | 21 | 27 | 45 | 55 | 70 | $91.5^{\pm 8.5}$ | 110 | 20° |
| **30** | 23 | 29 | 45 | 63 | 84 | $113.5^{\pm 11.5}$ | 140 | 20° |