

# Pressure relief valve, pilot operated DB6K, DB10K



K4278-1

- ▶ Sizes 6 and 10
- ▶ Series 4X
- ▶ Maximum working pressure 350 bar
- ▶ Maximum flow
  - Size 6: 60 l/min
  - Size 10: 100 l/min

## Features

- ▶ Cartridge valve
- ▶ 4 pressure stages
- ▶ 4 adjustment types, optionally:
  - Sleeve with hexagon and protective cap
  - Rotary knob
  - Rotary knob with scale
  - Lockable rotary knob with scale

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## Type code

|           |    |          |    |          |           |          |    |    |          |
|-----------|----|----------|----|----------|-----------|----------|----|----|----------|
| 01        | 02 | 03       | 04 | 05       | 06        | 07       | 08 | 09 | 10       |
| <b>DB</b> |    | <b>K</b> |    | <b>/</b> | <b>4X</b> | <b>/</b> |    |    | <b>*</b> |

### Valve type

|    |                                       |           |
|----|---------------------------------------|-----------|
| 01 | Pressure relief valve, pilot operated | <b>DB</b> |
|----|---------------------------------------|-----------|

### Size

|    |         |           |
|----|---------|-----------|
| 02 | Size 6  | <b>6</b>  |
|    | Size 10 | <b>10</b> |

### Design

|    |                 |          |
|----|-----------------|----------|
| 03 | Cartridge valve | <b>K</b> |
|----|-----------------|----------|

### Adjustment type

|    |                                                |          |
|----|------------------------------------------------|----------|
| 04 | Rotary knob                                    | <b>1</b> |
|    | Sleeve with hexagon and protective cap         | <b>2</b> |
|    | Rotary knob with scale, lockable <sup>1)</sup> | <b>3</b> |
|    | Rotary knob with scale                         | <b>7</b> |

### Series

|    |                                                                        |           |
|----|------------------------------------------------------------------------|-----------|
| 05 | Series 4X (40 to 49: unchanged installation and connection dimensions) | <b>4X</b> |
|----|------------------------------------------------------------------------|-----------|

### Pressure stage

|    |                                |            |
|----|--------------------------------|------------|
| 06 | Setting pressure up to 50 bar  | <b>50</b>  |
|    | Setting pressure up to 100 bar | <b>100</b> |
|    | Setting pressure up to 200 bar | <b>200</b> |
|    | Setting pressure up to 315 bar | <b>315</b> |
|    | Setting pressure up to 350 bar | <b>350</b> |

### Pilot oil

|    |                                                         |           |
|----|---------------------------------------------------------|-----------|
| 07 | Internal pilot oil supply, external pilot oil return    | <b>Y</b>  |
|    | Internal pilot oil supply and external pilot oil return | <b>XY</b> |

### Corrosion resistance

|    |                                                                                                                        |                |
|----|------------------------------------------------------------------------------------------------------------------------|----------------|
| 08 | None                                                                                                                   | <b>No code</b> |
|    | High corrosion protection (720 h salt spray test according to EN ISO 9227), only for adjustment type "2" <sup>2)</sup> | <b>J5</b>      |

### Sealing material

|    |                           |                |
|----|---------------------------|----------------|
| 09 | NBR (nitrile rubber)      | <b>No code</b> |
|    | FKM (fluorocarbon rubber) | <b>V</b>       |

|    |                               |          |
|----|-------------------------------|----------|
| 10 | Further details in plain text | <b>*</b> |
|----|-------------------------------|----------|

<sup>1)</sup> H-key with material no. R900008158 is included in the scope of delivery.

<sup>2)</sup> The protective cap for the spindle adjustment is not included in the "J5" version.

## Preferred types

| Type              | Material number |
|-------------------|-----------------|
| DB 6 K2-4X/50YV   | R900487903      |
| DB 6 K2-4X/100YV  | R900483440      |
| DB 6 K2-4X/200YV  | R900486196      |
| DB 6 K2-4X/315YV  | R900483441      |
| DB 10 K2-4X/50YV  | R900422817      |
| DB 10 K2-4X/100YV | R900453240      |
| DB 10 K2-4X/200YV | R900438123      |
| DB 10 K2-4X/315YV | R900438126      |

### Notice

Other preferred types and standard units are contained in the EPS (standard price list).

## Functional description

### General

Pressure valves type DB..K.. are pilot operated pressure relief valves for installation in block constructions. They are used to limit a system pressure. The system pressure is set via the adjustment type (4).

### Function

In the initial position, the valves are closed. The pressure in connection **P** acts on the control spool (1). At the same time, the pressure is applied via the orifice (2) on the spring-loaded side of the control spool (1) and the orifice (3) to the pilot poppet (6).

If the pressure in port **P** exceeds the value set at the

spring (5), the pilot poppet opens (6). Hydraulic fluid flows from the spring-loaded side of the control spool (1) via the orifice (3) and channel (7) into the port **Y**. The resulting pressure gradient displaces the control spool (1) and thus opens the connection from port **P** to **T** while maintaining the pressure set on the spring (5).

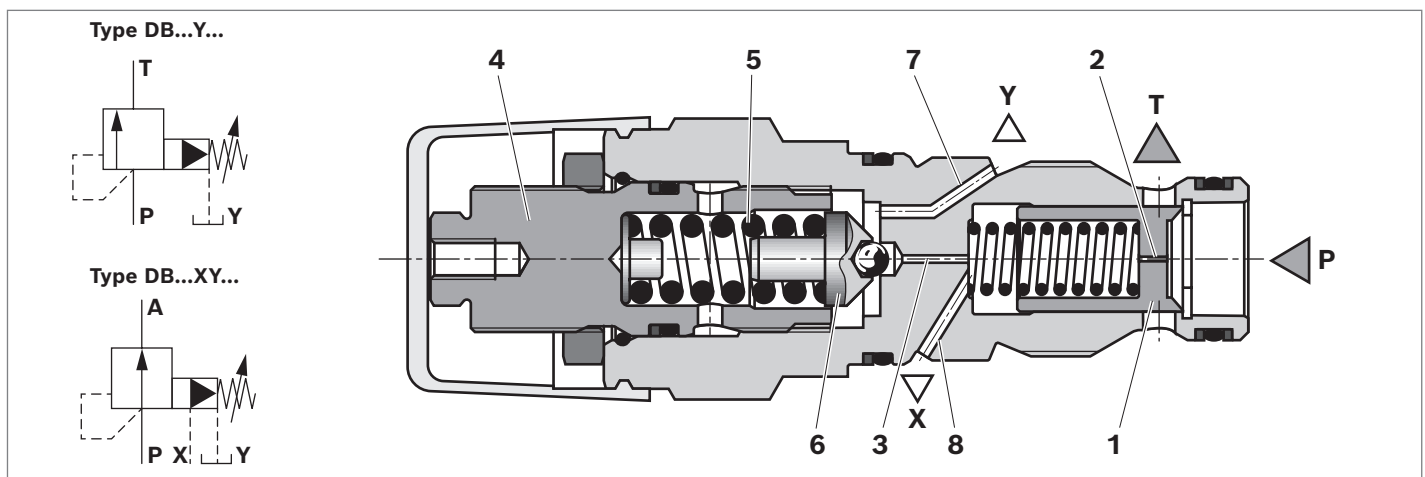
The pilot oil return from the two spring chambers is effected externally via the port **Y**.

The pressure relief valve can be relieved or switched over to another pressure (second pressure stage) via port **X** (8) (version "XY").

### Notice

Counter pressures (port **Y**) add up to the set pressure.

### ▼ Section and symbol



- 1 Control spool
- 2 Orifice
- 3 Orifice
- 4 Adjustment type

- 5 Spring
- 6 Pilot poppet
- 7 Channel Y
- 8 Channel X (only for version "XY")

## Technical data

| General                                                                                                 |               |             |                              |                        |
|---------------------------------------------------------------------------------------------------------|---------------|-------------|------------------------------|------------------------|
| Weight (approx.)                                                                                        | Size 6        |             | kg                           | 0.15                   |
|                                                                                                         | Size 10       |             | kg                           | 0.2                    |
| Installation position                                                                                   |               |             | Any                          |                        |
| Ambient temperature range                                                                               |               |             | °C                           | −20 ... +80            |
|                                                                                                         |               |             |                              |                        |
| Hydraulic                                                                                               |               |             |                              |                        |
| Maximum working pressure <sup>1)</sup>                                                                  | Port <b>P</b> | $p$         | bar                          | 350                    |
| Maximum set pressure                                                                                    | Port <b>P</b> | $p_E$       | bar                          | 50; 100; 200; 315; 350 |
| Maximum permissible counter-pressure <sup>1)</sup>                                                      | Port <b>T</b> | $p$         | bar                          | 315                    |
|                                                                                                         | Port <b>Y</b> | $p$         | bar                          | 315                    |
|                                                                                                         | Port <b>X</b> | $p$         | bar                          | 315                    |
| Maximum flow                                                                                            | Size 6        | $q_V$       | l/min                        | 60                     |
|                                                                                                         | Size 10       | $q_V$       | l/min                        | 100                    |
| Hydraulic fluid                                                                                         |               |             | See table below              |                        |
| Hydraulic fluid temperature range                                                                       |               | $\vartheta$ | °C                           | −20 ... +80            |
| Viscosity range                                                                                         |               | $\nu$       | mm <sup>2</sup> /s           | 10 ... 800             |
| Maximum admissible degree of contamination of the hydraulic fluid<br>Cleanliness level per ISO 4406 (c) |               |             | Level 20/18/15 <sup>2)</sup> |                        |

### Notice

For applications outside these values, please consult us!

## Hydraulic fluid

| Hydraulic fluid            |                    | Classification | Suitable sealing materials | Standards | Data sheet |
|----------------------------|--------------------|----------------|----------------------------|-----------|------------|
| Mineral oils               |                    | HL, HLP        | FKM                        | DIN 51524 | 90220      |
| Environmentally acceptable | Insoluble in water | HEES           | FKM                        | ISO 15380 | 90221      |
|                            | Soluble in water   | HEPG           | FKM                        | ISO 15380 | 90221      |

### Notice

- Further information and details on using other hydraulic fluids are available in the above data sheets or on request.
- Restrictions are possible with the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.)!
- **Environmentally acceptable:** If environmentally acceptable hydraulic fluids are used that are also zinc-dissolving, there may be an accumulation of zinc.

- 1) The maximum working pressure is the aggregate of set pressure and counter pressure!  
In the event of alternating pressure loads between port **P** and **T**, the permissible load cycles are reduced as follows:

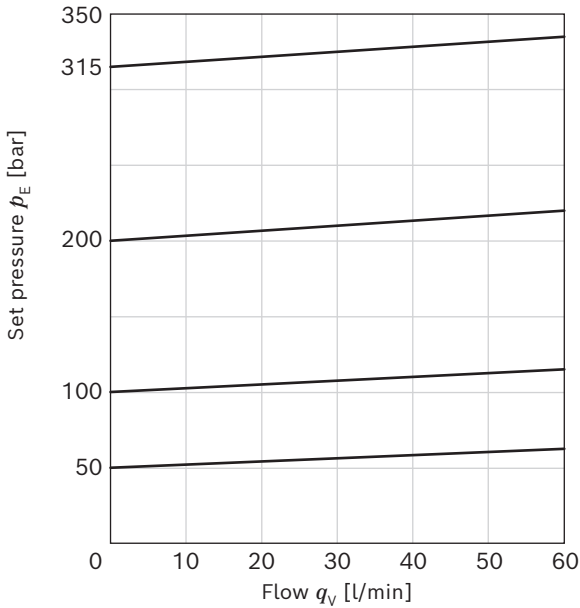
| Size  | Permissible load cycles | at max. working pressure |
|-------|-------------------------|--------------------------|
| DB6K  | 300 000 cycles          | 350 bar                  |
| DB10K | 300 000 cycles          | 350 bar                  |
|       | 1 million cycles        | 315 bar                  |

- 2) Cleanliness levels specified for the components must be maintained in the hydraulic systems. Effective filtration prevents malfunctions and simultaneously extends the service life of the components.

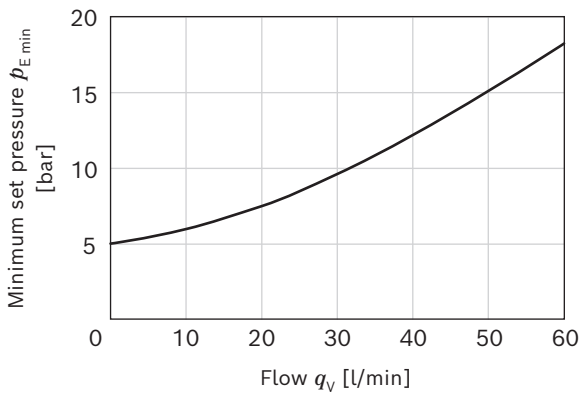
## Characteristic curves

### Size 6

#### ▼ $p_E$ - $q_V$ characteristic curves

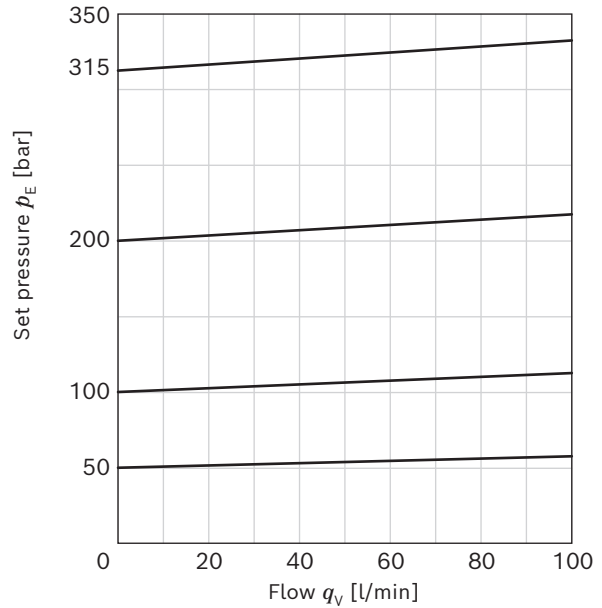


#### ▼ $p_{E \min}$ - $q_V$ characteristic curve

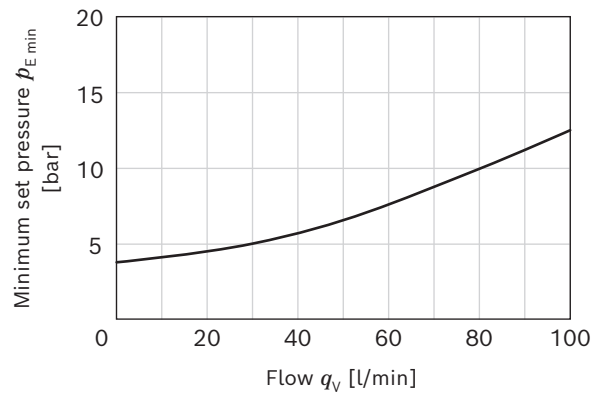


### Size 10

#### ▼ $p_E$ - $q_V$ characteristic curves



#### ▼ $p_{E \min}$ - $q_V$ characteristic curve

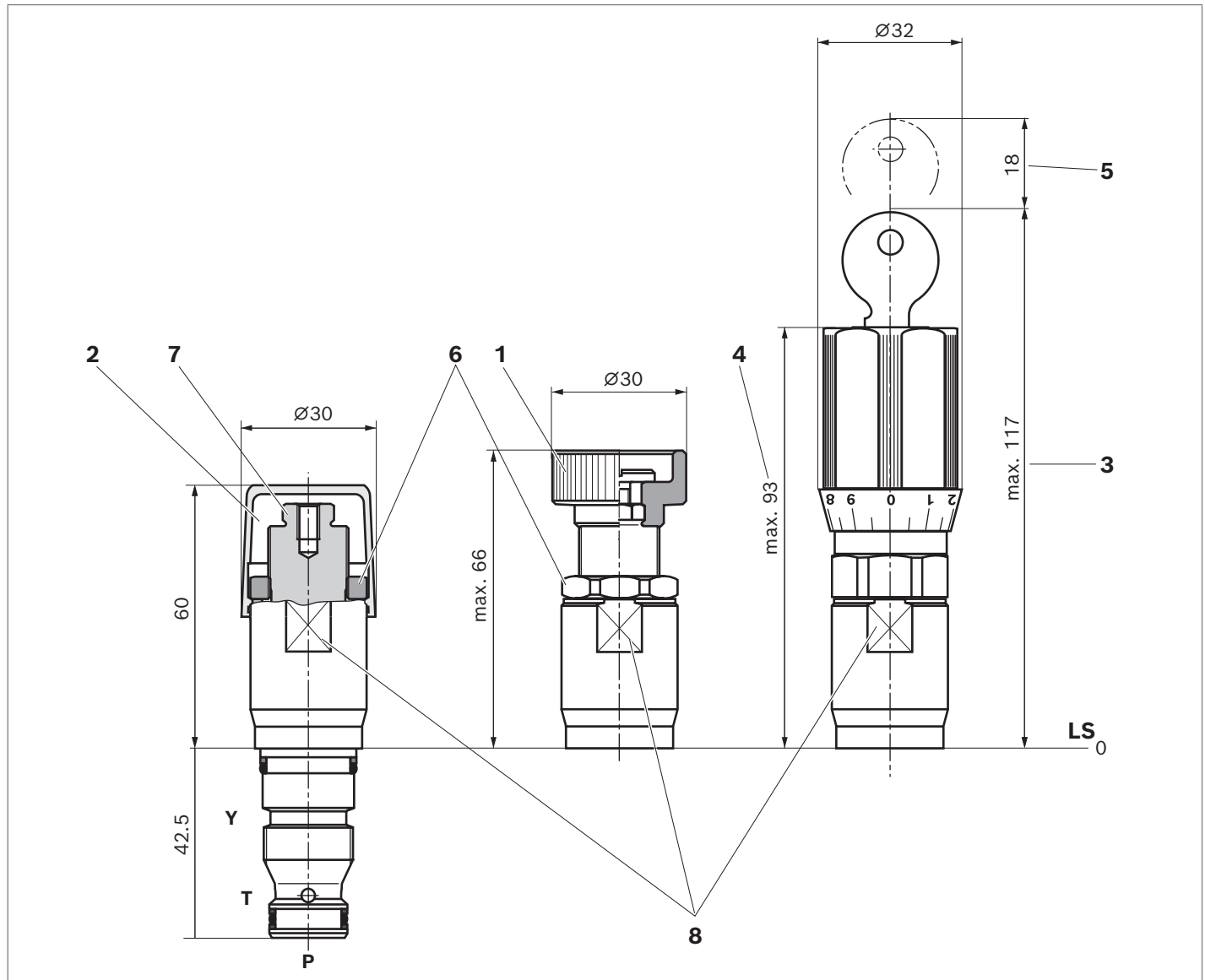


#### Notice

- The characteristic curves have been measured with HLP46,  $\vartheta_{oil} = 40 \pm 5^\circ\text{C}$ .
- The characteristic curves apply to output pressure = zero in the entire flow range!

## Dimensions

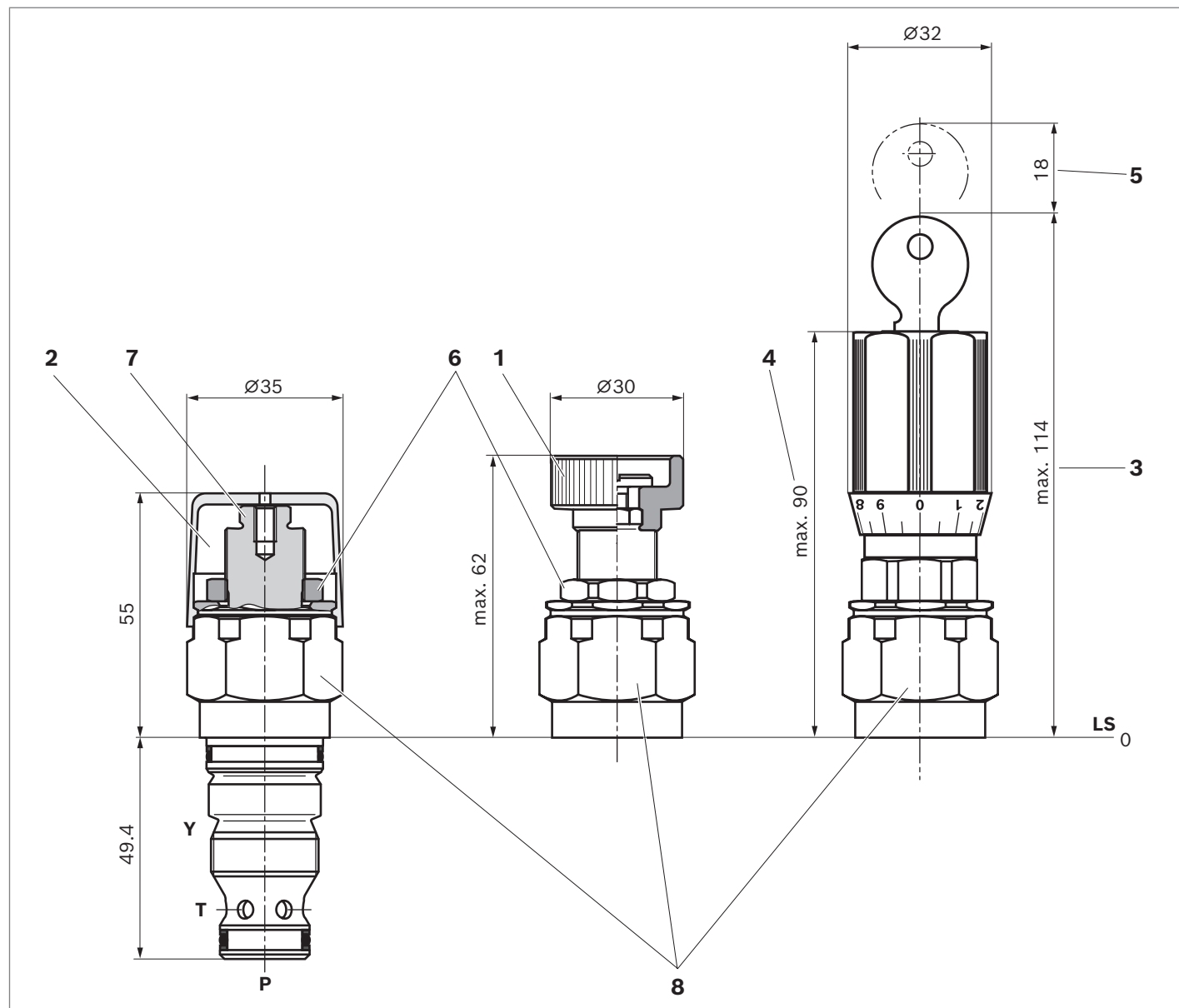
### ▼ Size 6



- 1 Adjustment type "1" – rotary knob
- 2 Adjustment type "2" – sleeve with hexagon and protective cap
- 3 Adjustment type "3" – rotary knob with scale, lockable
- 4 Adjustment type "7" – rotary knob with scale
- 5 Space required to remove key
- 6 Lock nut SW24
- 7 Hexagon SW10
- 8 Width across flats SW24, tightening torque  $M_A = 50 \text{ Nm}$

LS = location shoulder

▼ **Size 10**



- 1 Adjustment type **"1"** – rotary knob
- 2 Adjustment type **"2"** – sleeve with hexagon and protective cap
- 3 Adjustment type **"3"** – rotary knob with scale, lockable
- 4 Adjustment type **"7"** – rotary knob with scale
- 5 Space required to remove key
- 6 Lock nut SW24
- 7 Hexagon SW10
- 8 Hexagon SW30, tightening torque  $M_A = 50 \text{ Nm}$

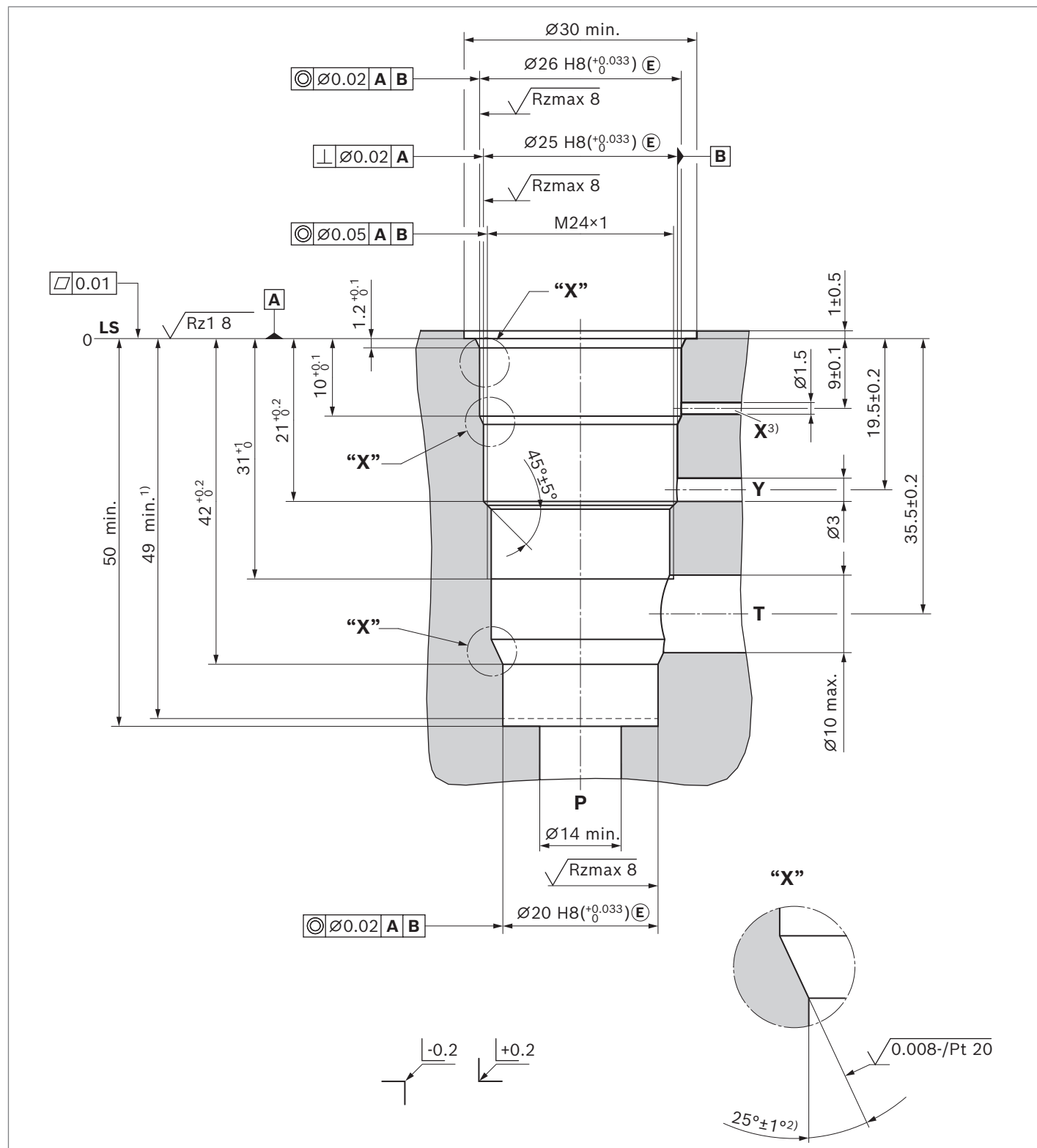
**LS** = location shoulder

▼ **Nominal size 6 – 3 main connections; thread M20×1**



- Bosch Rexroth AG, RE 25731/2025-11-21

▼ **Size 10 – 3 main ports; thread M24×1**



**LS** = location shoulder

- 1) Depth of fit
- 2) All seal ring insertion faces are rounded and free of burrs
- 3) Channel **X** only for version "XY"

## Related documentation

- ▶ Mineral oil-based hydraulic fluids
- ▶ Environmentally acceptable hydraulic fluids
- ▶ MTTF<sub>D</sub> values

Data sheet 90220

Data sheet 90221

Data sheet 90294

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