

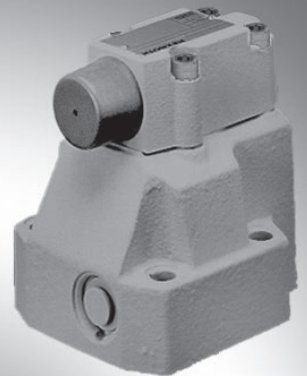
Pressure reducing valve, pilot operated

RE 26892/05.11
Replaces: 02.03

1/12

Type DR

Size 10 to 32
 Component series 5X
 Maximum operating pressure 350 bar
 Maximum flow 400 l/min



K4660/9

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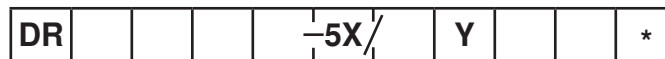
Features

- For subplate mounting
- Porting pattern according to ISO 5781
- For threaded connection
- As cartridge valve
- 4 adjustment types, optional:
 - Rotary knob
 - Bushing with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- 5 pressure ratings
- Check valve, optional (only subplate mounting)
- More information:
 - Subplates

Data sheet 45062

Information on available spare parts:
www.boschrexroth.com/spc

Ordering code



Complete valve = **no code**
 (Subplate mounting or threaded connection)
 Pilot valve = **C**
without main spool insert (cartridge valve)
 (do **not** enter size)
 Pilot valve = **C**
with main spool insert (cartridge valve)
 (enter valve size 30)

| Size | Ordering code | |
|------|-----------------------|-------------------------|
| | Subplate mounting "-" | Threaded connection "G" |
| 10 | = 10 | = 10 (G1/2) |
| 16 | - | = 15 (G3/4) |
| 25 | = 20 | = 20 (G1) |
| 25 | - | = 25 (G1 1/4) |
| 32 | = 30 | = 30 (G1 1/2) |

As cartridge valve = **no code**
 (version "C", **without** main spool insert)
 As cartridge valve = **-**
 (version "C", **with** main spool insert)
 For subplate mounting = **-**
 For threaded connection = **G**

Adjustment type for pressure adjustment

Rotary knob = **4**
 Bushing with hexagon and protective cap = **5**
 (always with maximum pressure adjustment)
 Lockable rotary knob with scale = **6¹⁾**
 Rotary knob with scale = **7**

¹⁾ H-key with Material no. **R900008158** is included in the delivery.

Further details in the plain text

Seal material
No code = NBR seals
V = FKM seals
 (other seals upon request)
 Attention!
 Observe compatibility of seals with hydraulic fluid used!

No code = **With** check valve
 (only for subplate mounting)

M = **Without** check valve

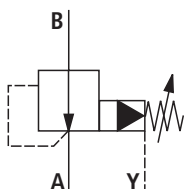
Pilot oil supply
Y = Pilot oil supply internal,
 pilot oil return external

50 = Set pressure up to 50 bar
100 = Set pressure up to 100 bar
200 = Set pressure up to 200 bar
315 = Set pressure up to 315 bar
350 = Set pressure up to 350 bar
 (only version "M")

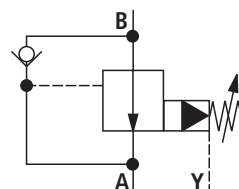
5X = Component series 50 to 59
 (50 to 59: unchanged installation and connection dimensions)

Symbols

Type DR...YM



Type DR...Y



Function, section

Pressure valves type DR are pilot operated pressure reducing valves that are controlled from the secondary circuit.

The pressure reducing valves basically comprise of a main valve (1) with main spool insert (3) and pilot control valve (2) with pressure adjustment element.

Basic principle:

In rest position, the valves are open. Hydraulic fluid flows from channel B via the main spool insert (3) to channel A without obstructions. The pressure available in channel A acts on the lower main spool side. At the same time, the pressure is applied to the spring-loaded side of the main spool (3) via the nozzle (4) and at the ball (6) in the pilot control valve (2) via the channel (5). It also acts on the ball (6) via nozzle (7), control line (8), check valve (9) and nozzle (10). Depending on the spring (11) setting, a pressure builds up in

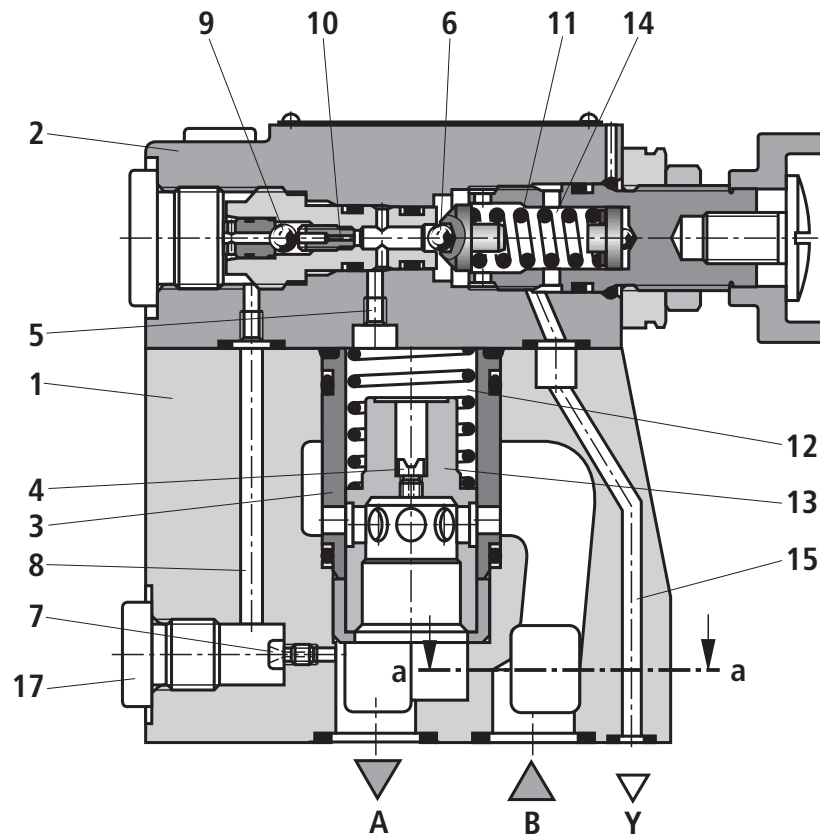
front of the ball (6), in the channel (5) and in the spring chamber (12), which keeps the control spool (13) in opened position. The hydraulic fluid in channel B can flow via the main spool insert (3) to channel A without obstructions until a pressure builds up in channel A that exceeds the value set at the spring (11) and opens the ball (6). The control spool (13) moves in closing direction.

The desired reduced pressure is achieved if there is a state of equilibrium between the pressure in channel A and the pressure set at the spring (11).

The pilot oil return from the spring chamber (14) is always effected externally via the control line (15) into the tank.

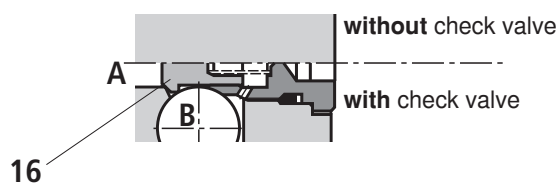
For the free flow back from channel A to channel B, you can optionally install a check valve (16).

A pressure gauge connection (17) allows for the control of the reduced pressure in channel A.



Type DR..-4-5X/...Y...

Section a - a




Technical Data (For applications outside these parameters, please consult us!)**general**

| | | | | | | | | |
|---------------------------|---------------------|--|----|-----|---------------------|---------------------|-----|-----|
| Size | | | 10 | 16 | 25 (type DR..20) | 25 (type DR..25) | 32 | |
| Weight | Subplate mounting | – Type DR . . – | kg | 3.4 | – | 5.3 | – | 8.0 |
| | Cartridge valve | – Type DRC | kg | 1.2 | | | | |
| | | – Type DRC 30 | kg | 1.5 | | | | |
| | Threaded connection | – Type DR . . G | kg | 5.3 | 5.2 | 5.1 | 5.0 | 4.8 |
| Installation position | Any | | | | | | | |
| Ambient temperature range | °C | –30 to +50 (NBR seals) –20 to +50 (FKM seals) | | | | | | |

hydraulic

| | | | | | | | |
|--|------------------------------|--|---|-----|-----|-----|-----|
| Maximum operating pressure | – Port B | bar | 350 ¹⁾ | | | | |
| Maximum inlet pressure | – Port B | bar | 350 ¹⁾ | | | | |
| Maximum outlet pressure | – Port ... | bar | 350 ¹⁾ | | | | |
| Operating pressure range | – Port A | bar | 10 to 350 ¹⁾ | | | | |
| Maximum backpressure | – Port Y | bar | 350 ¹⁾ | | | | |
| Minimal set pressure | | bar | Flow-dependent (see characteristic curves page 5) | | | | |
| Maximum set pressure | | bar | 50; 100; 200; 315; 350 ¹⁾ | | | | |
| Maximum flow | – Subplate mounting | l/min | 150 | – | 300 | – | 400 |
| | – Threaded connection | l/min | 150 | 300 | 300 | 400 | 400 |
| Hydraulic fluid | See table below | | | | | | |
| Hydraulic fluid temperature range | °C | –30 to +80 (NBR seals) –20 to +80 (FKM seals) | | | | | |
| Viscosity range | mm ² /s | 10 to 800 | | | | | |
| Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c) | Class 20/18/15 ²⁾ | | | | | | |

| Hydraulic fluid | Classification | Suitable sealing materials | Standards |
|---------------------------------------|----------------------|---|-----------|
| Mineral oils and related hydrocarbons | HL, HLP, HLPD | NBR, FKM | DIN 51524 |
| Environmentally compatible | – Insoluble in water | HETG | ISO 15380 |
| | | HEES | |
| | – Soluble in water | HEPG | ISO 15380 |
| Flame-resistant | – Water-free | HFDU, HFDR | ISO 12922 |
| | – Water-containing | HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620) | ISO 12922 |

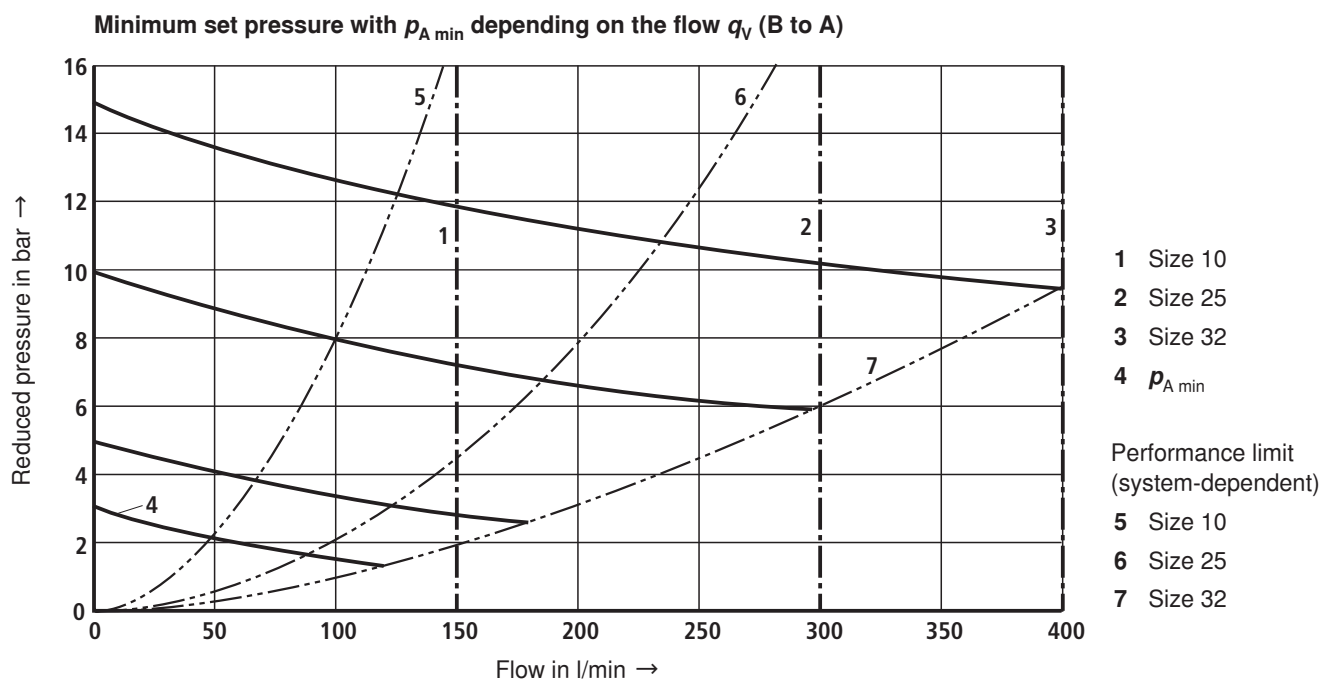
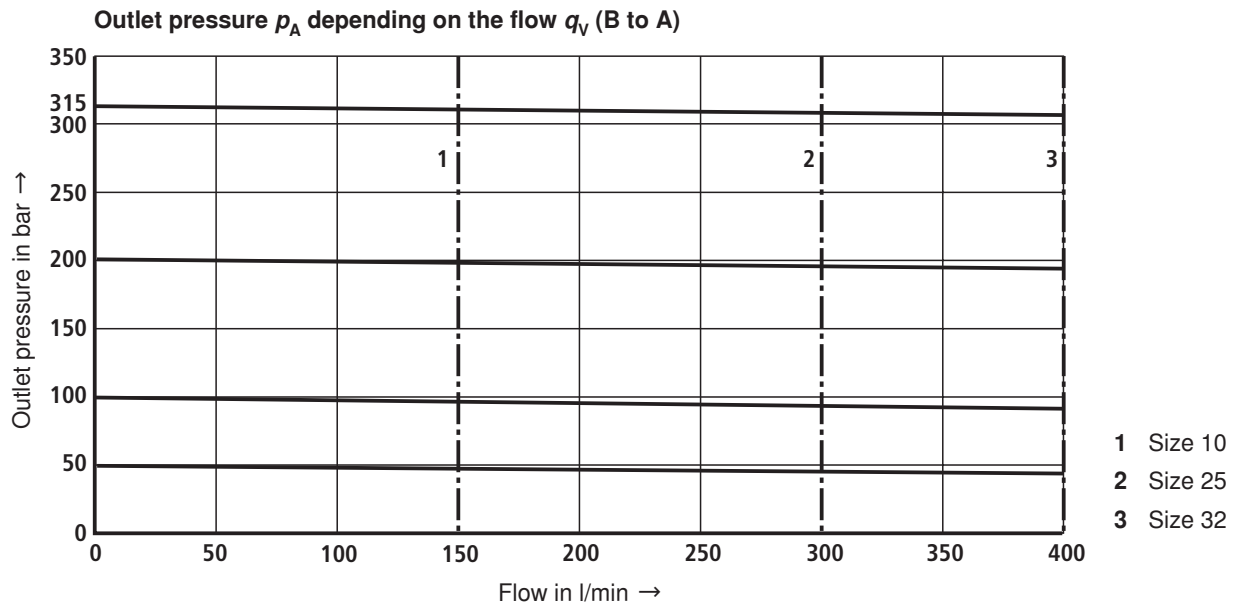
| | |
|--|--|
|  Important information on hydraulic fluids! – For more information and data on the use of other hydraulic fluids refer to data sheet 90220 or contact us! – There may be limitations regarding the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.)! | – Flame-resistant – water-containing: <ul style="list-style-type: none"> • Maximum operating pressure 210 bar • Maximum hydraulic fluid temperature 60 °C • Expected service life as compared to HLP hydraulic oil 30 % to 100 % |
|--|--|

¹⁾ 350 bar only possible with version without check valve

²⁾ 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 service life of the components.

For the selection of the filters see www.boschrexroth.com/filter.

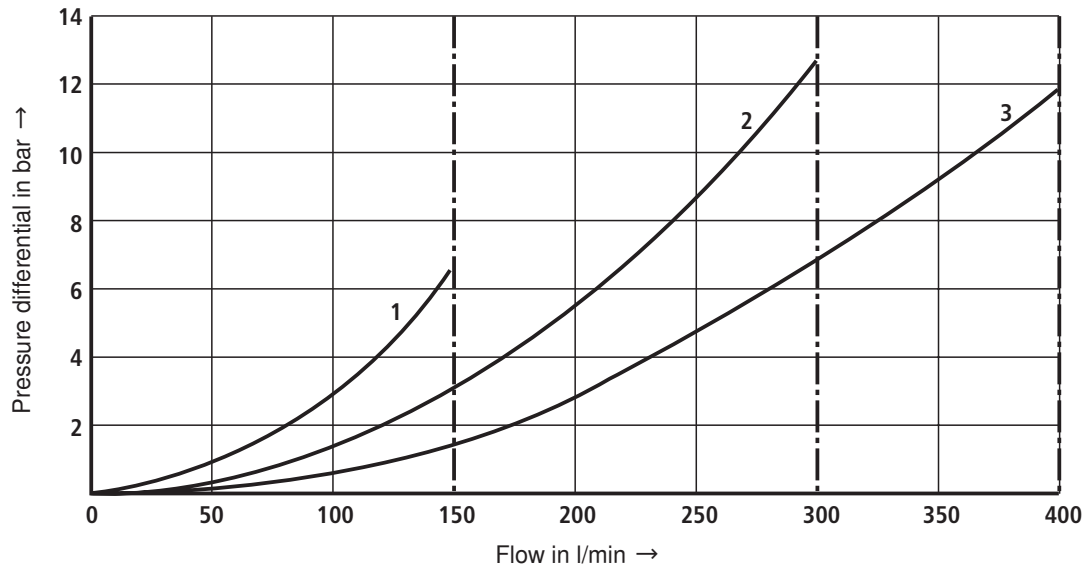
Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$)



The characteristic curves apply to the pressure at the valve output $p_T = 0$ bar across the entire flow range.

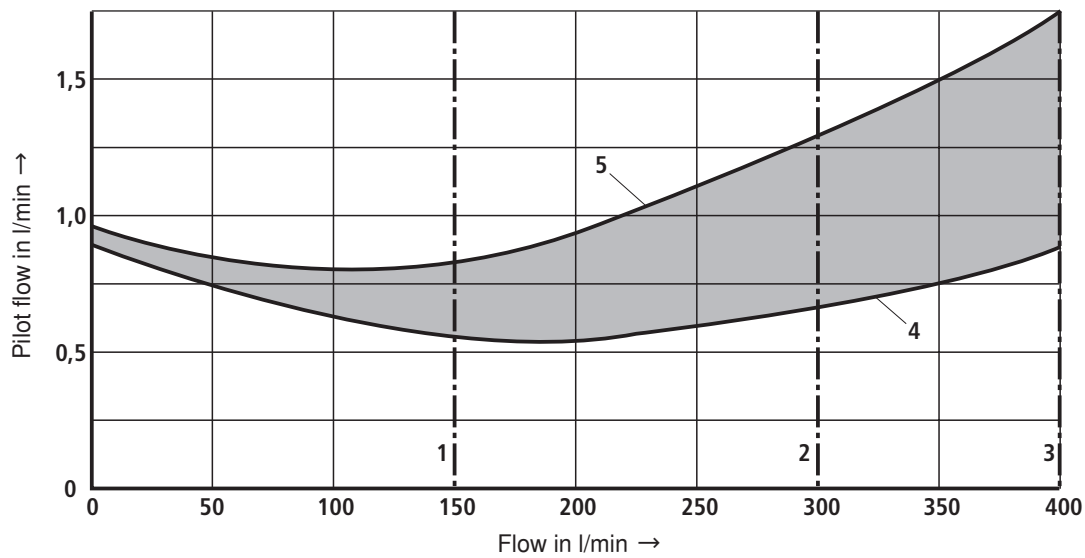
Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$)

Δp - q_v characteristic curves (B to A; lowest pressure differential adjustable)

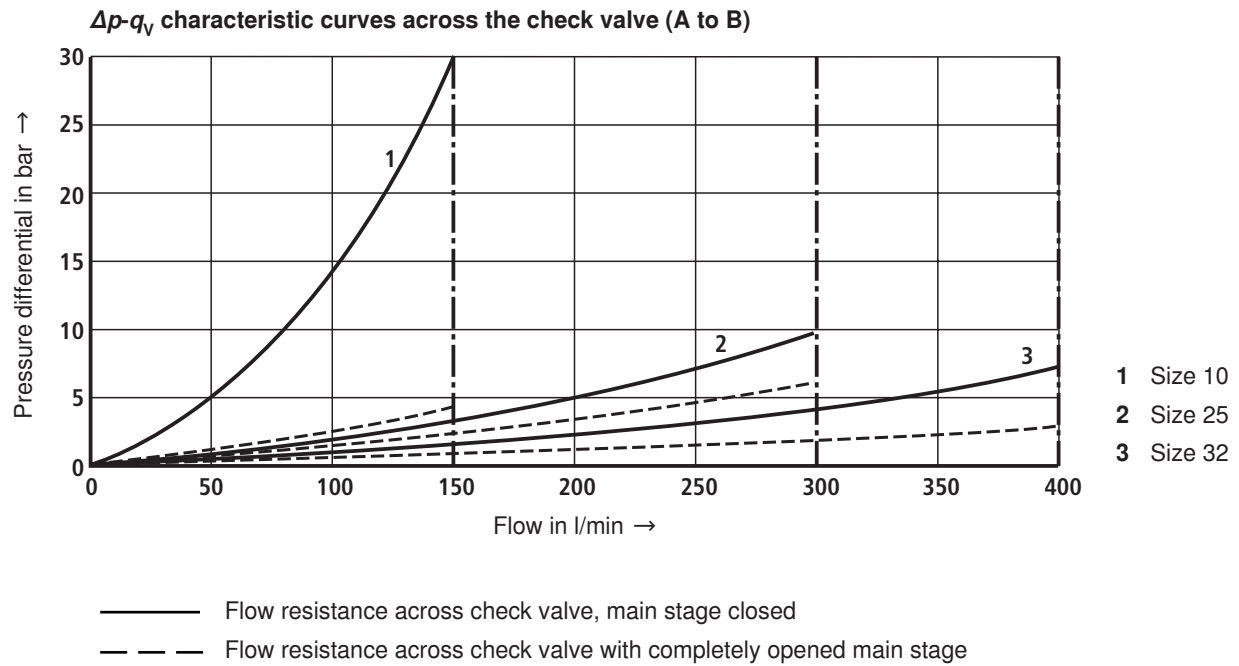


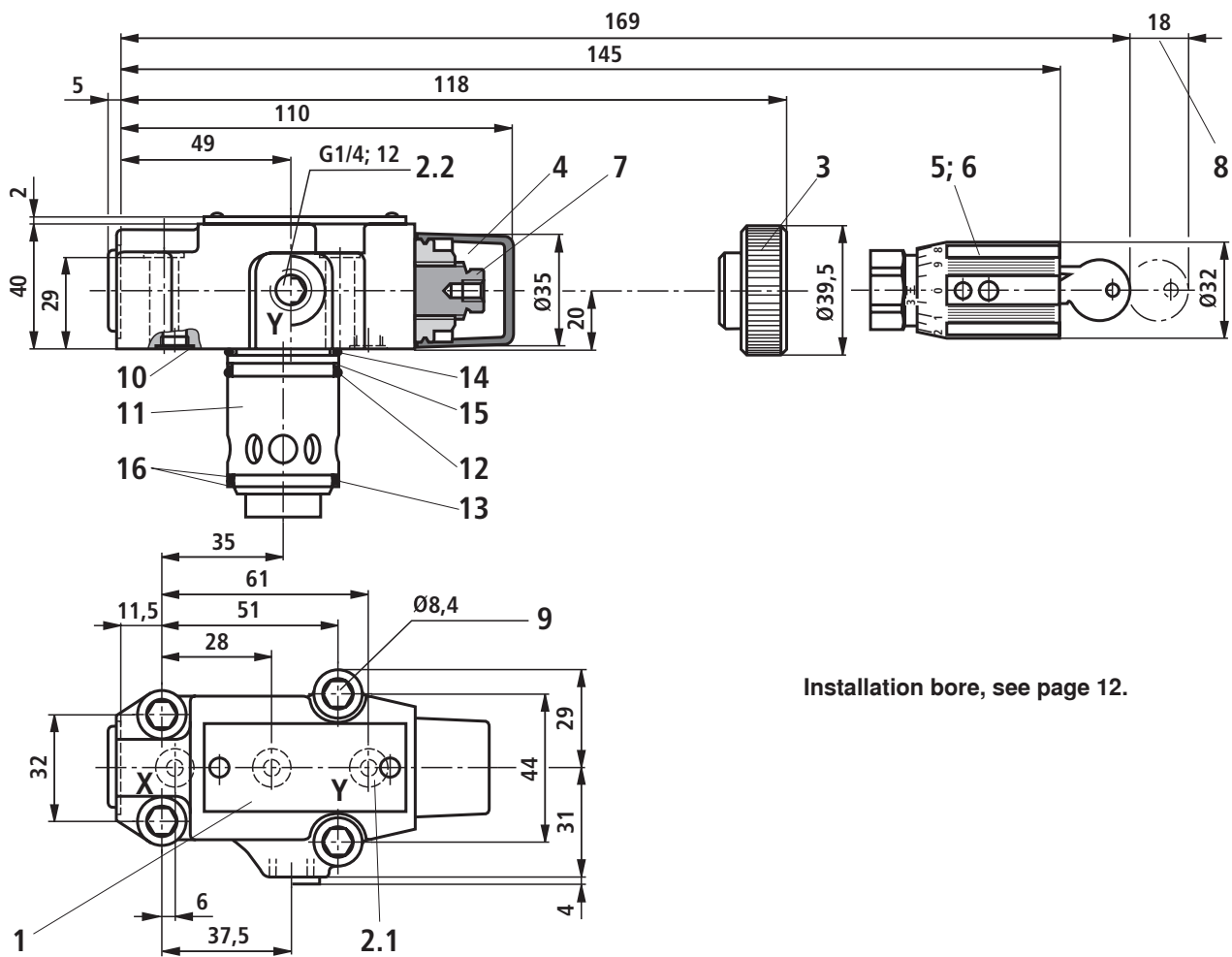
- 1 Size 10
- 2 Size 25
- 3 Size 32

Pilot flow depending on flow (B to A) and pressure differential



- 1 Size 10
- 2 Size 25
- 3 Size 32
- 4 $\Delta p = 50 \text{ bar}$
- 5 $\Delta p = 200 \text{ bar}$

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

Unit dimensions: Type DRC...; cartridge valve (dimensions in mm)

Installation bore, see page 12.

- 1 Name plate
- 2.1 Y port for pilot oil return external
- 2.2 Y port optionally for pilot oil return external
- 3 Adjustment type "4"
- 4 Adjustment type "5"
- 5 Adjustment type "6"
- 6 Adjustment type "7"
- 7 Hexagon SW10
- 8 Space required to remove the key
- 9 Valve mounting bores
- 10 Seal rings
- 11 Main spool insert
- 12 Seal ring
- 13 Seal ring
- 14 Seal ring
- 15 Support ring
- 16 Support ring

Valve mounting screws

(separate order)

4 hexagon socket head cap screws

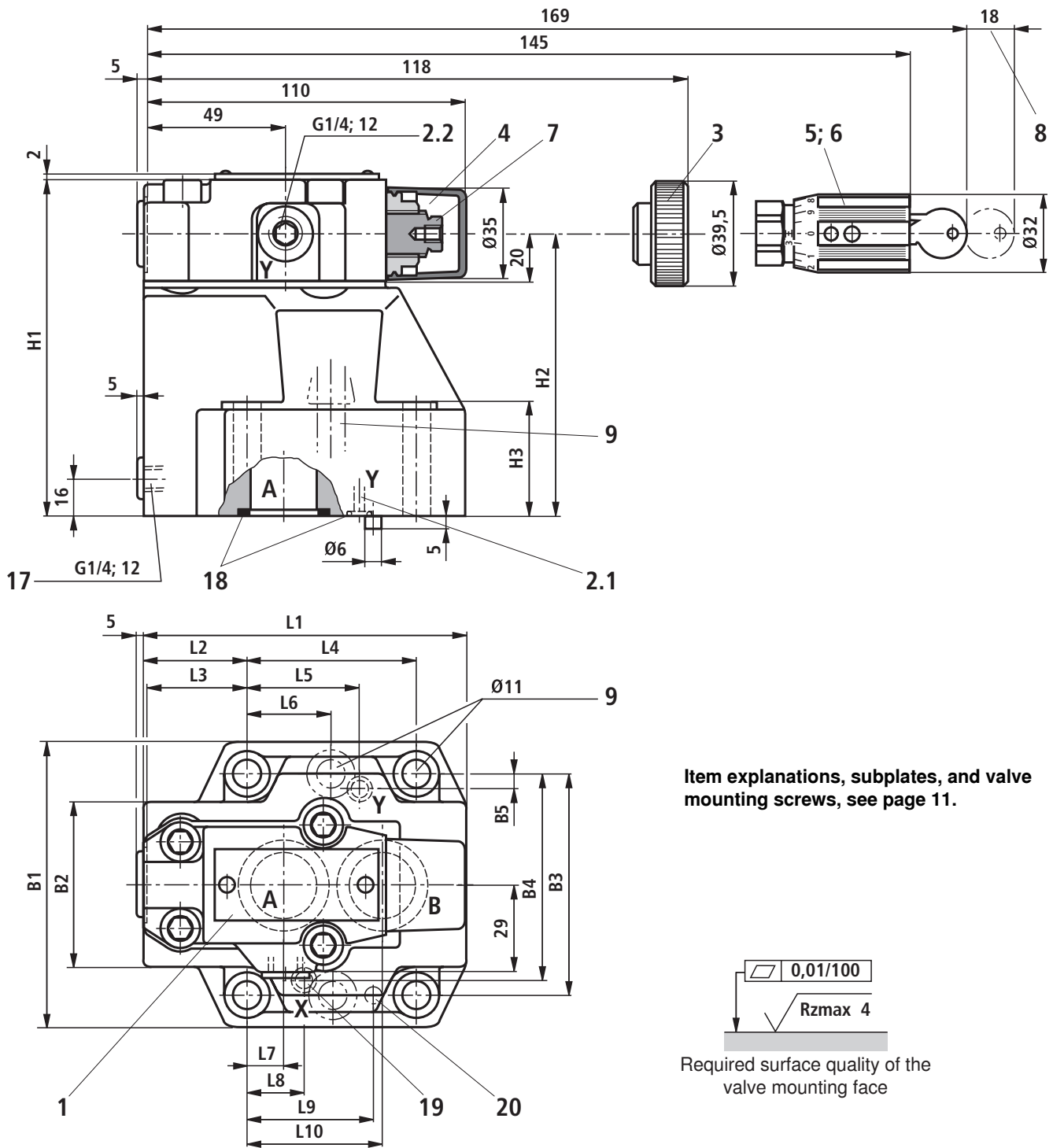
ISO 4762 - M8 x 40 - 10.9-fZn-240h-L

with friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14 ,

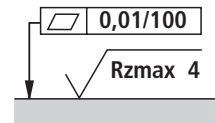
Tightening torque $M_A = 31 \text{ Nm} \pm 10 \%$,

Material No. **R913000205**

Unit dimensions: Type DR...; subplate mounting (dimensions in mm)



Item explanations, subplates, and valve mounting screws, see page 11.



Required surface quality of the valve mounting face

| Size | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 |
|------|-----|------|------|------|------|------|------|------|------|------|
| 10 | 96 | 35.5 | 33 | 42.9 | 21.5 | - | 7.2 | 21.5 | 31.8 | 35.8 |
| 25 | 116 | 37.5 | 35.4 | 60.3 | 39.7 | - | 11.1 | 20.6 | 44.5 | 49.2 |
| 32 | 145 | 33 | 29.8 | 84.2 | 59.5 | 42.1 | 16.7 | 24.6 | 62.7 | 67.5 |

| Size | B1 | B2 | B3 | B4 | B5 | H1 | H2 | H3 |
|------|-----|------|------|------|-----|-----|-----|----|
| 10 | 85 | 50 | 66.7 | 58.8 | 7.9 | 112 | 92 | 28 |
| 25 | 102 | 59.5 | 79.4 | 73 | 6.4 | 122 | 102 | 38 |
| 32 | 120 | 76 | 96.8 | 92.8 | 3.8 | 130 | 110 | 46 |

Unit dimensions

- 1 Name plate
- 2.1 Y port for pilot oil return external
- 2.2 Y port optionally for pilot oil return external
- 3 Adjustment type "4"
- 4 Adjustment type "5"
- 5 Adjustment type "6"
- 6 Adjustment type "7"
- 7 Hexagon SW10
- 8 Space required to remove the key
- 9 Valve mounting bore
- 17 Pressure gauge connection
- 18 Identical seal rings for ports A and B;
identical seal rings for ports X and Y
- 19 Port B without function (blind hole)
- 20 Locating pin

Subplate mounting:

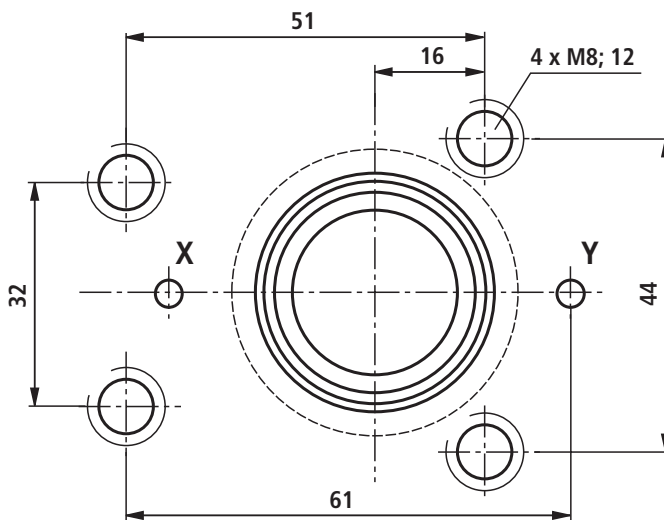
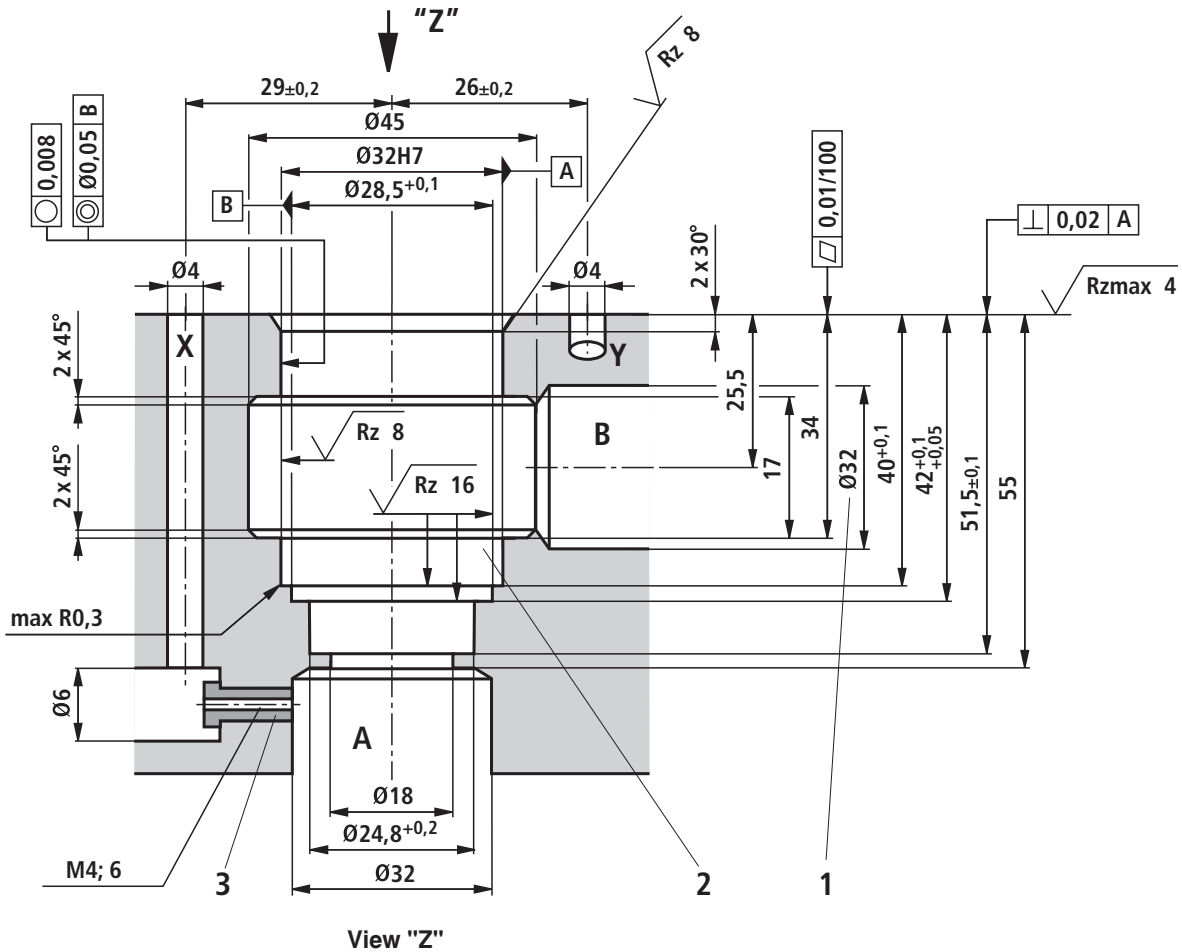
Subplates according to data sheet 45062
(separate order)

- Size 10 G 460/01 (G3/8)
 G 461/01 (G1/2)
- Size 20 G 412/01 (G3/4)
 G 413/01 (G1)
- Size 30 G 414/01 (G1 1/4)
 G 415/01 (G1 1/2)

Valve mounting screws (separate order)

- Size 10
**4 hexagon socket head cap screws metric
ISO 4762 - M10 x 50 - 10.9-fIZn-240h-L**
with friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14 ,
Tightening torque $M_A = 60 \text{ Nm} \pm 10 \%$,
Material no. **R913000471**
- Size 20
4 ISO 4762 - M10 x 60 - 10.9-fIZn-240h-L
with friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14 ,
Tightening torque $M_A = 60 \text{ Nm} \pm 10 \%$,
Material no. **R913000116**
- Size 30
6 ISO 4762 - M10 x 70 - 10.9-fIZn-240h-L
with friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14 ,
Tightening torque $M_A = 60 \text{ Nm} \pm 10 \%$,
Material no. **R913000126**

Installation bore (dimensions in mm)



1 Note!

The Ø32 bore can tap a Ø45 bore at any point. However, it must be observed that the connection bores and the valve mounting bores are not damaged!

2 A support ring and seal rings must be inserted into the bore before assembly of the main spool

3 Nozzle, separate order