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# 4/2 directional seat valve, pilot operated

RE 22069/05.11 1/12

**Type M-Z4SEH**


H7761+7762

Size 10 and 16
Component series 2X
Maximum operating pressure 315 bar
Maximum flow 300 l/min

## Table of contents



## Features

- Sandwich plate valve
- Electro-hydraulic actuation
- Porting pattern according to ISO 4401-05-05-0-05 (size 10) and ISO 4401-07-07-0-05 (size 16)
- Wet-pin DC solenoid
- Pilot oil supply optionally internal or external
- Different combinations of the blocking and pass-through functions
- With manual override, optional
- Electrical connection as individual connection

- More information:
  - 3/2 directional seat valve type KSDE (pilot control valve) Data sheet 18136-21
  - Subplates size 10 Data sheet 45054
  - Subplates size 16 Data sheet 45056
  - Sandwich plates, type HSZ, size 10 Data sheet 48052
  - Sandwich plates, type HSZ, size 16 Data sheet 48054
  - Hydraulic fluids on mineral oil basis Data sheet 90220

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## Ordering code

| M | – | Z | 4 | SEH | | | –2X | / | 3 | C | | | | | K4 | / | | * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Mineral oil = **M**

Sandwich plate = **Z**

4 main ports = **4**

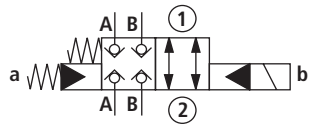
**Type of actuation**

Electro-hydraulic = **SEH**

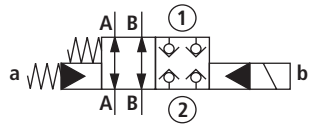
Size 10 = **10**

Size 16 = **16**

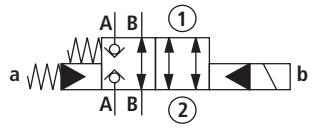
**Symbols**



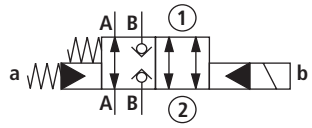

= **E**




= **E1**




= **A**




= **B**

Component series 20 to 29 = **2X**
(20 to 29: unchanged installation and connection dimensions)

**Pilot control valve**

3/2 directional seat valve type KSDE = **3**
(see data sheet 18136-21)

Wet-pin DC solenoid with detachable coil = **C**

**Seal material**

**N =** NBR seals

**F =** FKM seals

(other seals upon request)

Attention!
Observe compatibility of seals with the hydraulic fluids used!

**Electrical connection**

**K4** [1; 2] **= Without** mating connector, individual connection with connector according to DIN EN 175301-803

**XY =** Pilot oil supply external, pilot oil return external

**PY =** Pilot oil supply internal, pilot oil return external

**PT =** Pilot oil supply internal, pilot oil return internal

**XT =** Pilot oil supply external, pilot oil return internal

For more information see page 11.

**No Code =** **Without** manual override

**N9 =** **With** concealed manual override

**N11 =** **With** screwable manual override (operation by means of knurled screw)

**G24 =** Direct voltage 24 V

**G205 =** Direct voltage 205 V

**G96 =** Direct voltage 96 V

Further details in the plain text

| AC voltage mains (permissible voltage tolerance ±10 %) | **Nominal voltage of the DC solenoid in case of operation with alternating voltage** | Ordering code |
|---|---|---|
| 110 V - 50/60 Hz | 96 V | **G96** |
| 230 V - 50/60 Hz | 205 V | **G205** |

[1] For the connection to AC voltage mains, a DC voltage solenoid **must** be used, which is controlled via a rectifier (see table on the left).

In the case of individual connection, a large mating connector with integrated rectifier can be used (separate order, see page 3).

[2] Mating connectors, separate order, see page 3.

① = component side

② = plate side

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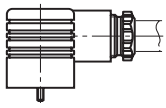
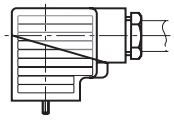
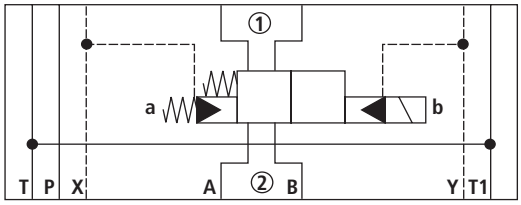
## **Mating connectors** according to DIN EN 175301-803

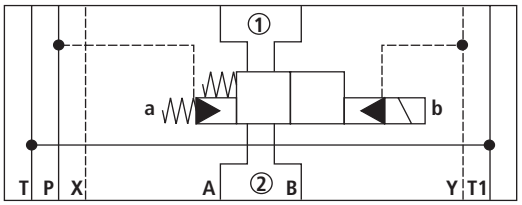
| Details and more mating connectors see data sheet 08006 |  |  | | |
|---|---|---|---|---|
| | **Material no.** | | | |
| **Color** | without circuitry | with indicator light 12 … 240 V | with rectifier 12 … 240 V | with indicator light and Zener diode suppression circuit 24 V |
| Gray | **R901017010** | – | – | – |
| Black | **R901017011** | **R901017022** | **R901017025** | **R901017026** |

## **Symbols:** Pilot oil supply (① = component side, ② = plate side)

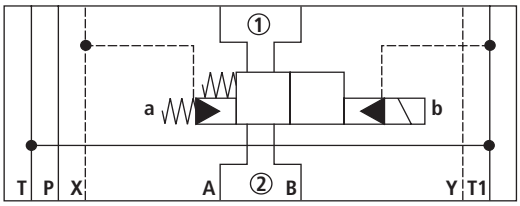
**Version "XY"**



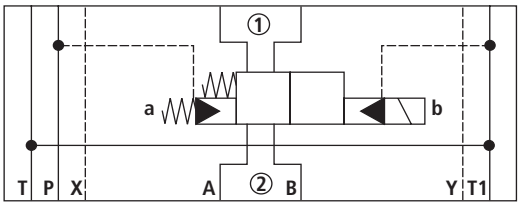

**Version "PY"**




**Version "XT"**




**Version "PT"**



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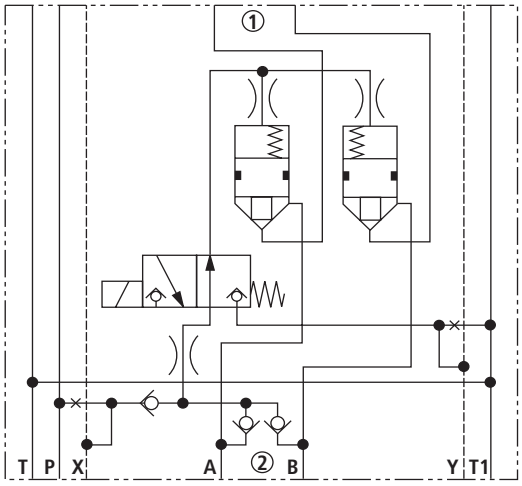
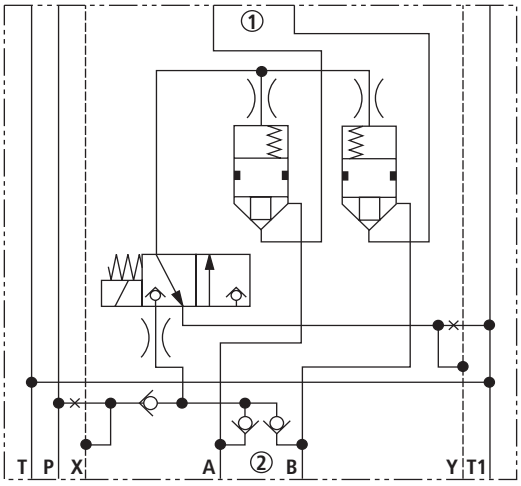
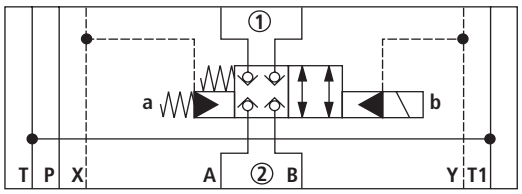
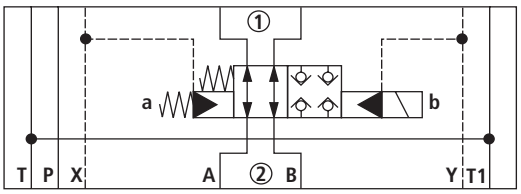
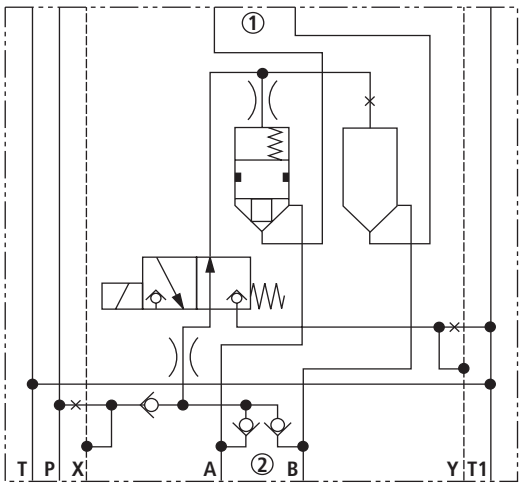
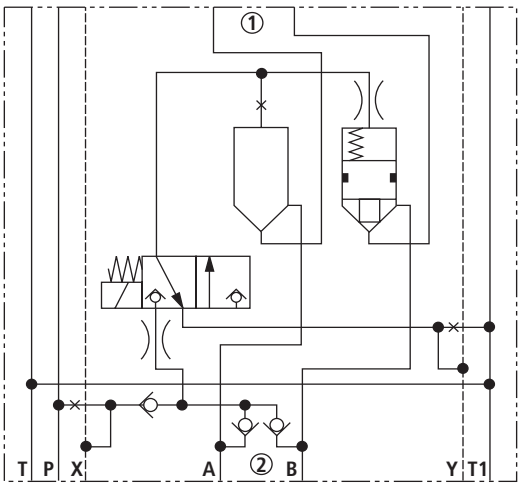
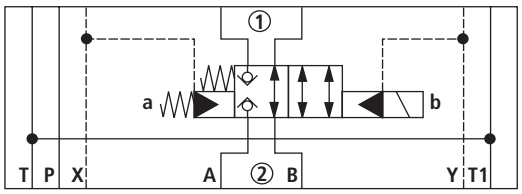
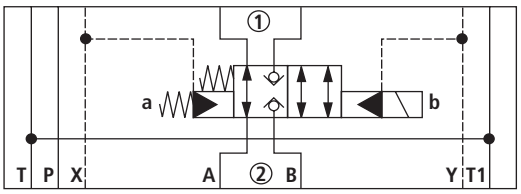
**Symbols:** Size 10 (① = component side, ② = plate side)

| | Pilot control valve normally open, symbol "E" | Pilot control valve normally closed, symbol "E1" |
|---|---|---|
| Detailed |  |  |
| Version "XY" |  |  |

| | Pilot control valve normally open, symbol "A" | Pilot control valve normally closed, symbol "B" |
|---|---|---|
| Detailed |  |  |
| Version "XY" |  |  |

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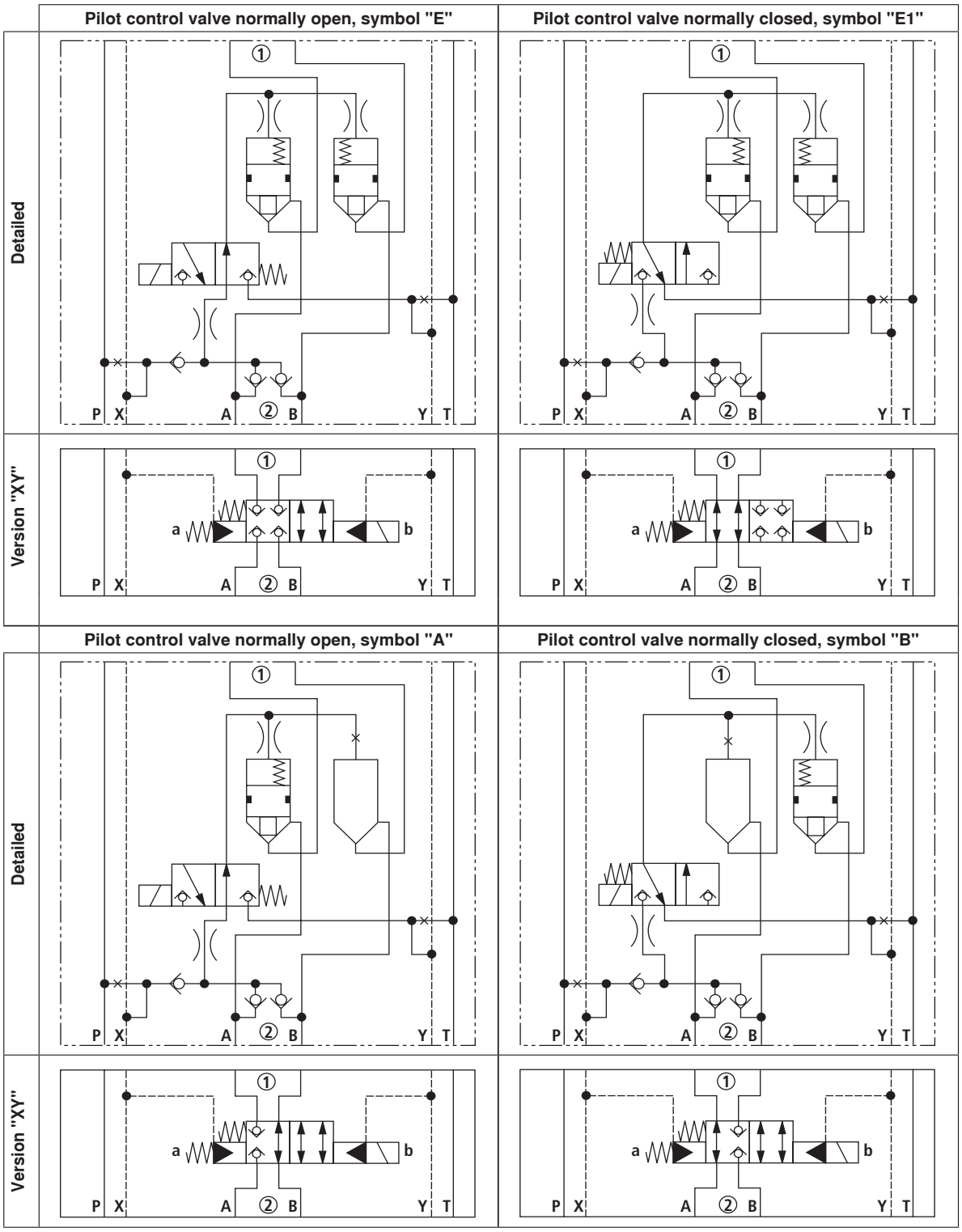
**Symbols:** Size 16 (① = component side, ② = plate side)



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## Function, section

### General

Directional valve types SEH are directional seat valves with electro-hydraulic operation. Depending on the order version, one- or two-channel connection or shut-off is possible.

The directional valve basically comprises of housing (1), pilot operated check valve installation kit (2), pilot control valve (3) as well as blanking plug for the pilot oil supply. The valve is free-flowing irrespective of the direction and opened or blocked in a leakage-free form depending on the spool position of the pilot control valve and the pressure conditions.

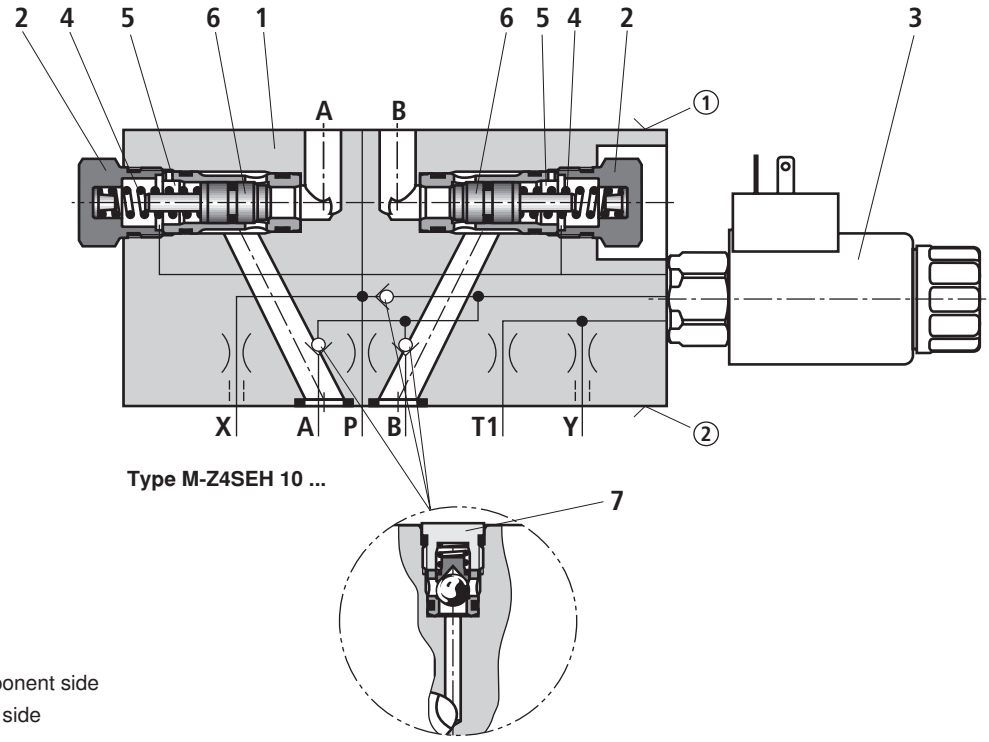
### Function

The function of the valve depends on the pressure. The force of the compression spring (4) as well as the compressive force in the control chamber (5) act in closing direction, the compressive forces in channels A and B in opening direction of the valve spool (6) with spool sealing. The effective direction of the resulting force of opening and closing forces determines the spool position of the check valve installation kits (2). The pilot pressure is applied and/or discharged via the pilot control valve (3) depending on the pilot oil supply selection. The pilot oil is supplied via the highest pressure from channels A, B, P or X and is secured by means of a check valve (7).

☞ **Note!**

Nozzles and plug fitting see page 12

**Pilot oil supply** see page 11.
**Symbols** see page 3.




**Type M-Z4SEH 10 ...**

① = component side
② = plate side

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

### general

| | | | |
|---|---|---|---|
| Size | Size | 10 | 16 |
| Weight | kg | 6 | 14 |
| Installation position | | Any | |
| Ambient temperature range | °C | –30 to +80 (NBR seals)<br>–20 to +80 (FKM seals) | |

### hydraulic

| | | | |
|---|---|---|---|
| Maximum operating pressure | bar | 315 | |
| Maximum flow | l/min | 140 | 300 |
| Hydraulic fluid | | See table below | |
| Hydraulic fluid temperature range (at the valve working ports) | °C | –30 to +80 (NBR seals)<br>–20 to +80 (FKM seals) | |
| Viscosity range | $mm^2/s$ | 10 to 380 | |
| Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c) | | Class 20/18/15 [1] | |

| Hydraulic fluid | | Classification | Suitable sealing materials | Standards |
|---|---|---|---|---|
| Mineral oils and related hydrocarbons | | HL, HLP, HLPD | NBR, FKM | DIN 51524 |
| Environmentally compatible | – Insoluble in water | HEES | NBR, FKM | ISO 15380 |
| | | HEPR | FKM | |
| | – Soluble in water | HEPG | FKM | ISO 15380 |
| Flame-resistant | – Water-free | HFDU, HFDR | FKM | ISO 12922 |
| | – Water-containing | HFC | NBR | |

☞ **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.)!
- **Environmentally compatible:** When using environmentally compatible hydraulic fluids that are simultaneously zinc-solving, zinc may accumulate in the medium (700 mg zinc per pole tube).

### electric

| | | |
|---|---|---|
| Voltage type | | Direct voltage |
| Available voltages | V | 24; 96; 205 |
| Power consumption | W | 22 |
| Duty cycle (ED) | | Continuous operation up to ambient temperature 85 °C |
| Protection class according to EN 60529 | | IP 65 with mating connector mounted and locked |

[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 service life of the components.
For the selection of the filters see www.boschrexroth.com/filter.

**When establishing the electrical connection, the protective earthing conductor (PE ⏚) has to be connected properly.**

☞ **Note!**
For more technical data of the pilot control valve type KSDE see data sheet 18136-21.

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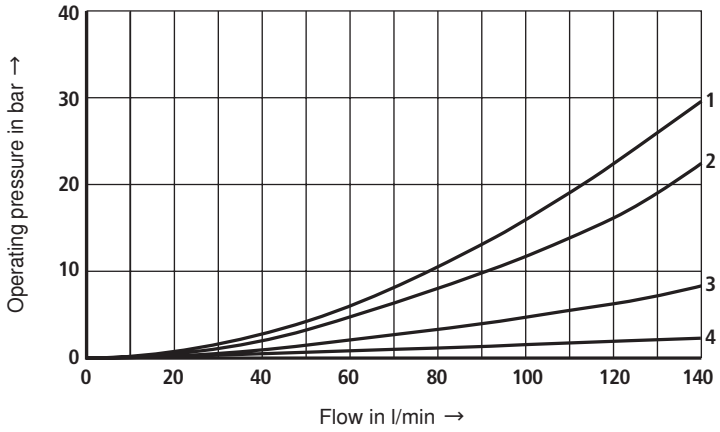
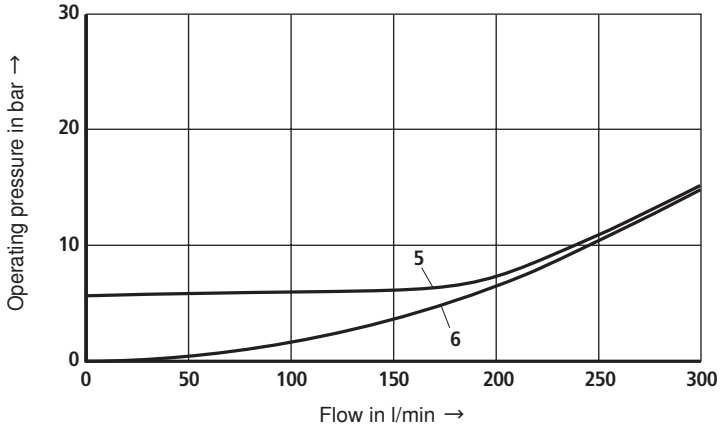
## **Characteristic curves** (measured with HLP46, $\vartheta_{oil}$ = 40 °C ± 5 °C)

**$\Delta p$-$q_V$ characteristic curves**
**Size 10**




**$\Delta p$-$q_V$ characteristic curves**
**Size 16**




**1** B① → B②
**2** A① → A②
**3** T① → T②
**4** P① → P②
**5** A② → A①; B② → B①
**6** A① → A②; B① → B②

① = component side
② = plate side

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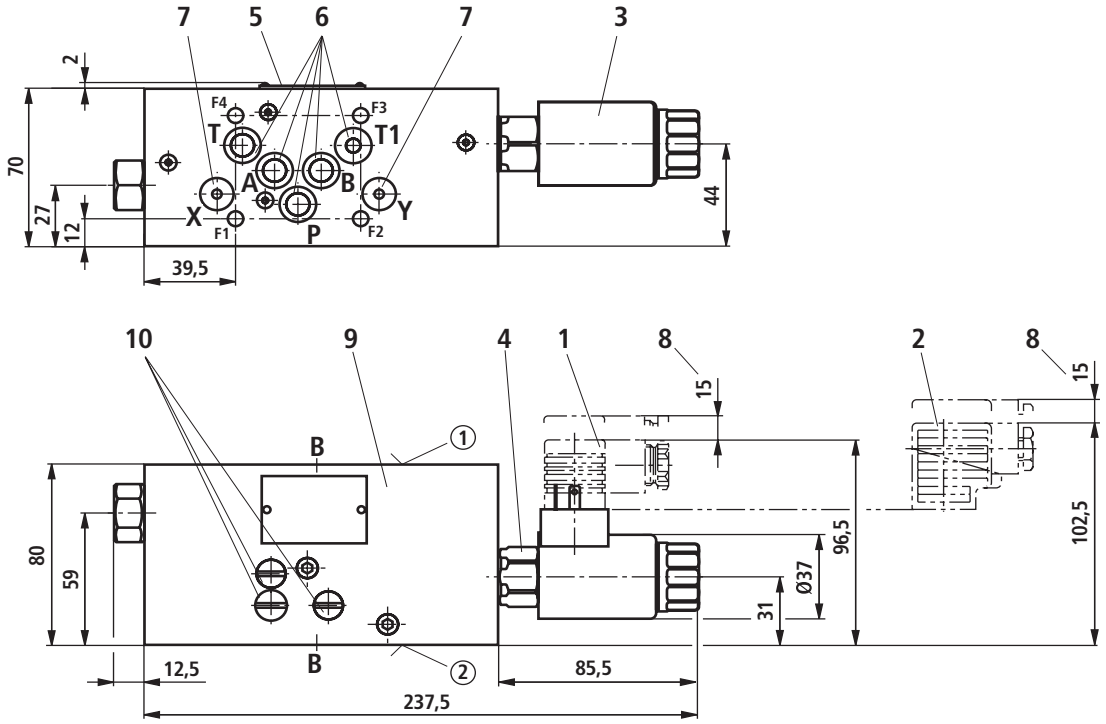
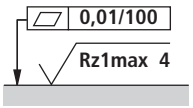
## Unit dimensions: Size 10 (dimensions in mm)




① Component side – porting pattern according to ISO 4401-05-05-0-05

② Plate side – porting pattern according to ISO 4401-05-05-0-05




Required surface quality of the valve mounting face

**1** Mating connector **without** wiring (separate order, see page 3)

**2** Mating connector **with** wiring (separate order, see page 3)

**3** DC solenoid "a" (mating connector color gray)

**4** 3/2 directional seat valve type KSDE (see data sheet 18136-21)

**5** Name plate

**6** Identical seal rings for ports A, B, P, T and T1

**7** Identical seal rings for ports X and Y

**8** Space required for removing the mating connector

**9** Main valve

**10** Plug screw or check valve, tightening torque $M_A$ = 8 Nm

**Subplates** according to data sheet 45054 (separate order)

**Valve mounting screws** (separate order)

**4 hexagon socket head cap screws ISO 4762 - M6 - 10.9**

☞ **Note!**

Length and tightening torque of the valve mounting screws must be calculated according to the components mounted under and over the sandwich plate valve.

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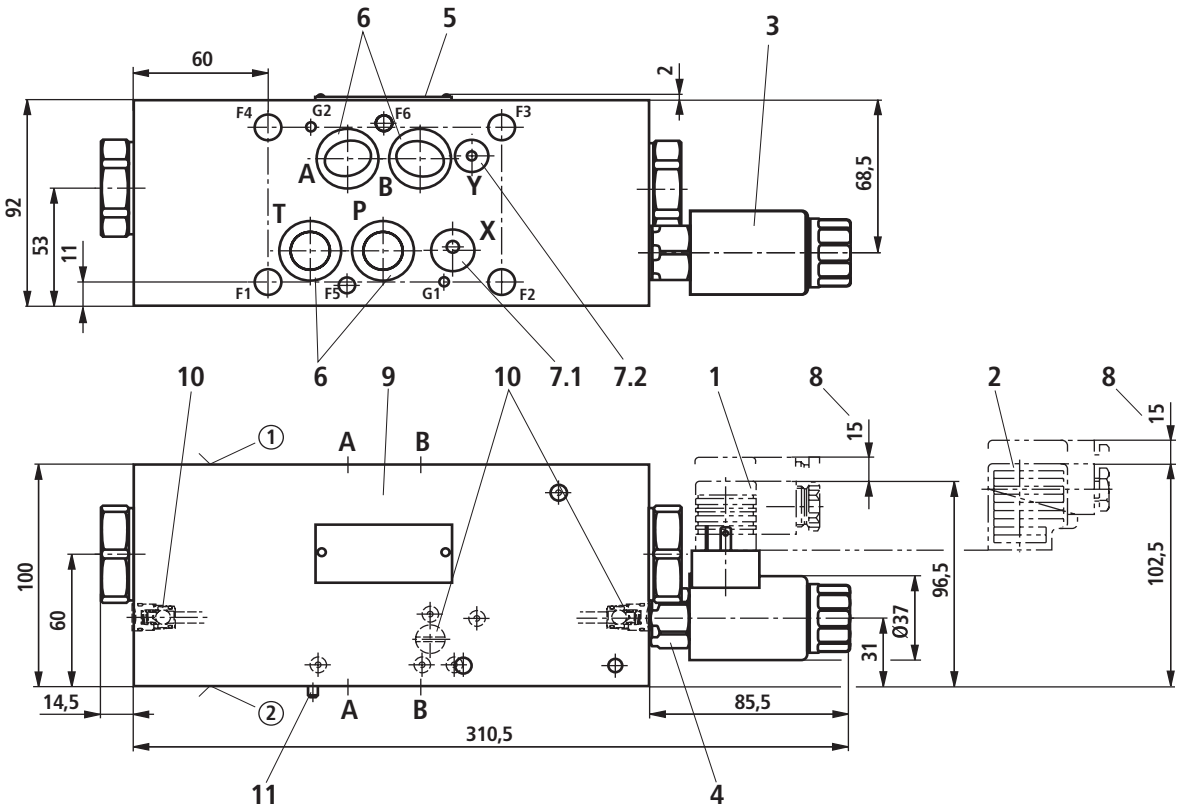
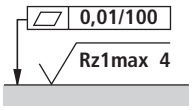
## **Unit dimensions:** Size 16 (dimensions in mm)




① Component side – porting pattern according to ISO 4401-07-07-0-05

② Plate side – porting pattern according to ISO 4401-07-07-0-05




Required surface quality of the valve mounting face

**1** Mating connector **without** wiring (separate order, see page 3)

**2** Mating connector **with** wiring (separate order, see page 3)

**3** DC solenoid "a" (mating connector color gray)

**4** 3/2 directional seat valve type KSDE (see data sheet 18136-21)

**5** Name plate

**6** Identical seal rings for ports A, B, P, and T

**7.1** Seal ring for port X

**7.2** Seal ring for port Y

**8** Space required for removing the mating connector

**9** Main valve

**10** Plug screw or check valve, tightening torque $M_A$ = 8 Nm

**11** Grooved pin

**Subplates** according to data sheet 45056 (separate order)

**Valve mounting screws** (separate order)

**4 hexagon socket head cap screws ISO 4762 - M10 - 10.9**

☞ **Note!**

Length and tightening torque of the valve mounting screws must be calculated according to the components mounted under and over the sandwich plate valve.

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## Pilot oil supply

**Version "XY"**

The pilot oil supply is implemented **externally** via channel X from a separate circuit.

The pilot oil return is implemented **externally** via channel Y into the tank.

**Version "PY"**

The pilot oil supply is implemented **internally** from channel P of the main valve.

The pilot oil return is implemented **externally** via channel Y into the tank. In the subplate, port X is closed.

**Version "PT"**

The pilot oil supply is implemented **internally** from channel P of the main valve.

The pilot oil return is implemented **internally** via channel T into the tank. In the subplate, ports X and X are closed.

**Version "XT"**

The pilot oil supply is implemented **externally** via channel X from a separate circuit.

The pilot oil supply is implemented **internally** via channel T into the tank. In the subplate, port Y is closed.

| | | Port | Internal | External | Port in subplate closed |
|---|---|---|---|---|---|
| **Version "XY"** | Pilot oil supply | X | – | ✓ | – |
| | Pilot oil return | Y | – | ✓ | |
| **Version "PY"** | Pilot oil supply | P | ✓ | – | X |
| | Pilot oil return | Y | – | ✓ | |
| **Version "PT"** | Pilot oil supply | P | ✓ | – | X and Y |
| | Pilot oil return | T | ✓ | – | |
| **Version "XT"** | Pilot oil supply | X | – | ✓ | Y |
| | Pilot oil return | T | ✓ | – | |

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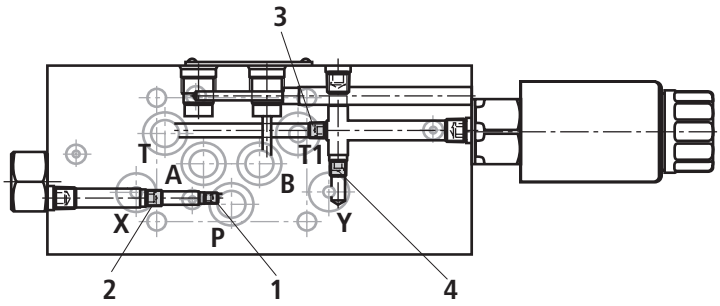
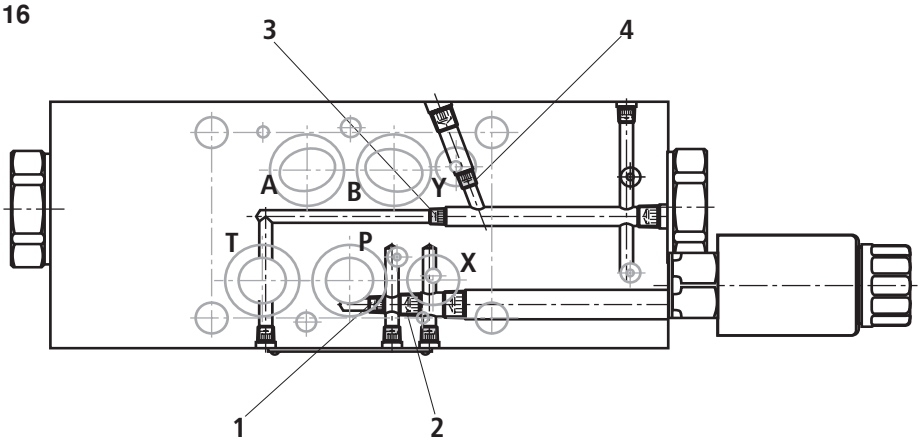
## Project planning information

### Plug for size 10




### Plug for size 16




| Item | Version | Plug screw | |
|---|---|---|---|
| | | Size 10 | Size 16 |
| 1 | "XY" | M4 x 5 | M6 |
| 3 | | M6 | M6 |
| 2 | "PY" | M6 | M8 x 1 |
| 3 | | M6 | M6 |
| 1 | "PT" | M4 x 5 | M6 |
| 4 | | M6 | M6 |
| 2 | "XT" | M6 | M8 x 1 |
| 4 | | M6 | M6 |

| Tightening torques $M_A$ in Nm | Size 10 | Size 16 |
|---|---|---|
| Plug or check valve (channel A, B, P and X) | 8 | 45 |
| 3/2 directional seat valve type KSDEU (see data sheet 18136-21) | 45 | 45 |
| Mounting screw coil | 4 | 4 |
| Plug screw 2-way cartridge valve | 25 | 100 |

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