# 4/2 directional seat valve, pilot operated

**RE 22069/05.11** 1/12

### Type M-Z4SEH

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



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### **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)

6 - 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 Data sheet 18136-21

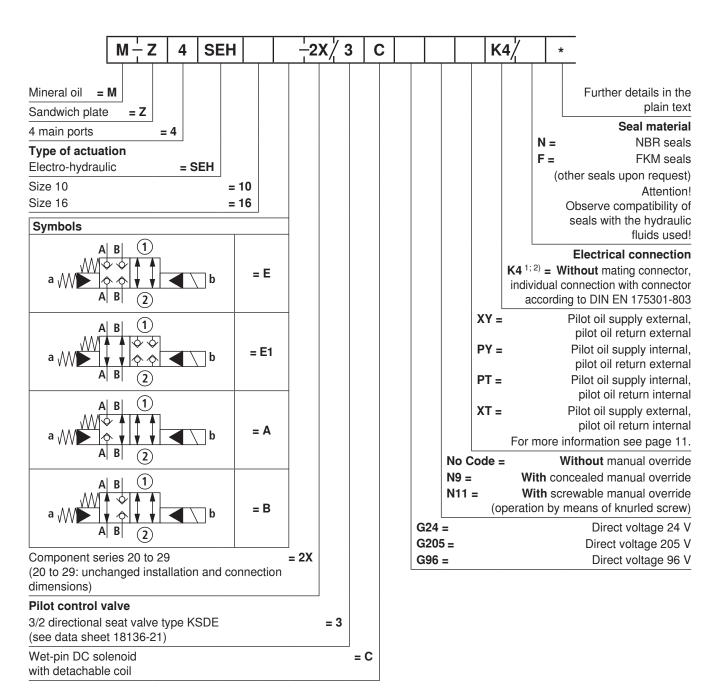
(pilot control valve)

Subplates size 10 Data sheet 45054Subplates 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

### Ordering code



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

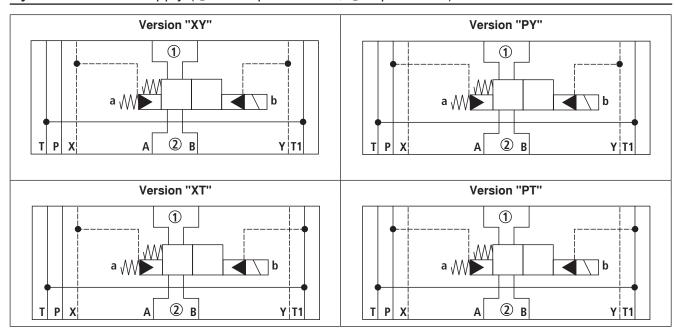
- <sup>1)</sup> For the connection to AC voltage mains, a DC voltage solenoid **must** be used, which is controlled via a rectifier (see table on the left).
  - In the case of individual connection, a large mating connector with integrated rectifier can be used (separate order, see page 3).
- 2) Mating connectors, separate order, see page 3.

- 1 = component side
- 2 = plate side

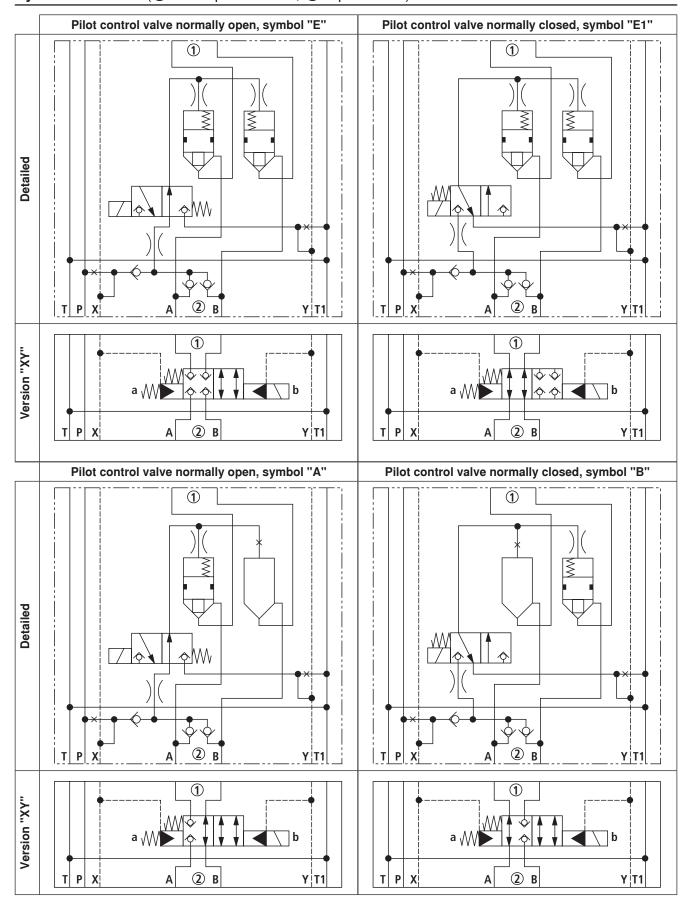
### Mating connectors according to DIN EN 175301-803

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

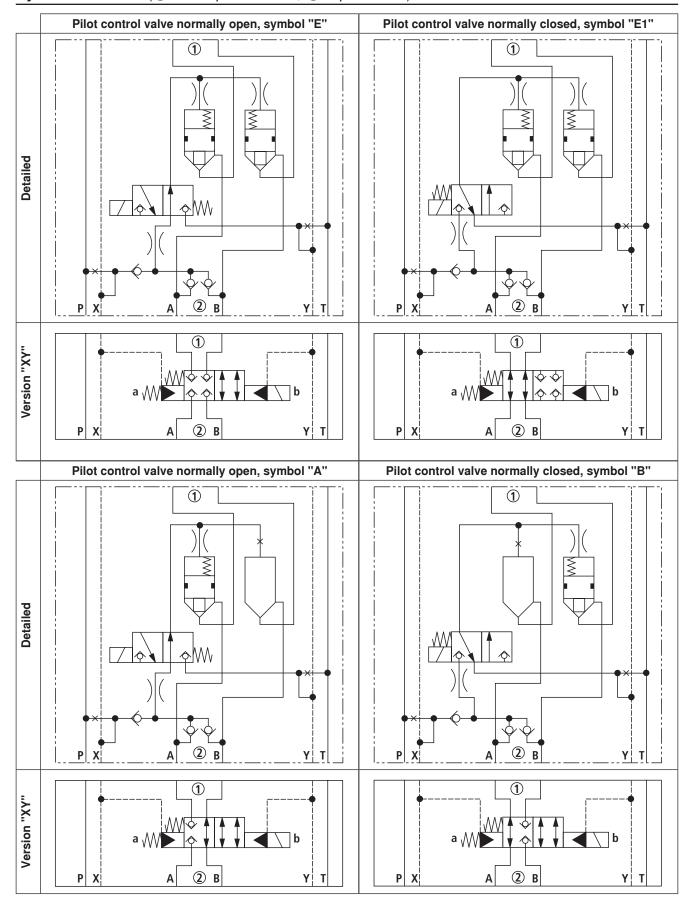
# Symbols: Pilot oil supply (1) = component side, 2) = plate side)



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



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



### 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.

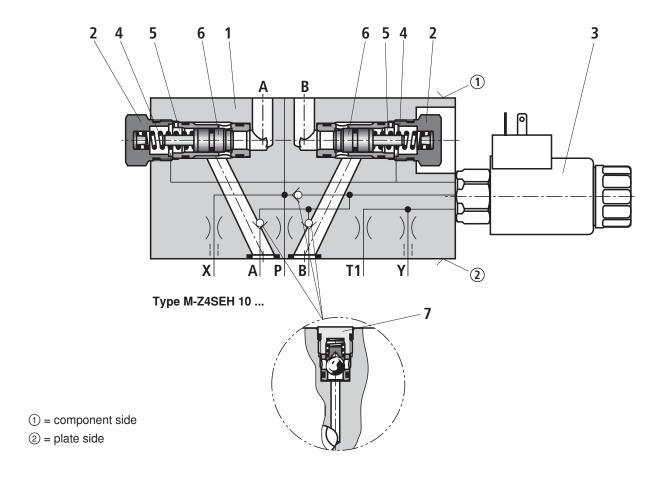
### **Function**

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).

### Mote!

Nozzles and plug fitting see page 12

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



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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) -20 to +80 (FKM seals)	

### hydraulic

Maximum operating pressure bar	315	
Maximum flow I/min	140	300
Hydraulic fluid	See table below	
Hydraulic fluid temperature range °C (at the valve working ports)	-30 to +80 (NBR seals) -20 to +80 (FKM seals)	
Viscosity range mm²/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 material	Standards
Mineral oils and rela	ated hydrocarbons	HL, HLP, HLPD	NBR, FKM	DIN 51524
Environmentally compatible	- Insoluble in water	HEES	NBR, FKM	ISO 15380
		HEPR	FKM	130 15360
	- Soluble in water	HEPG	FKM	ISO 15380
Flame-resistant	<ul><li>– Water-free</li></ul>	HFDU, HFDR	FKM	ISO 12922
	- Water-containing	HFC	NBR	150 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.)!
- 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.

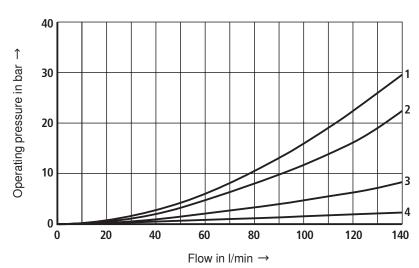
When establishing the electrical connection, the protective earthing conductor (PE  $\frac{1}{-}$ ) has to be connected properly.



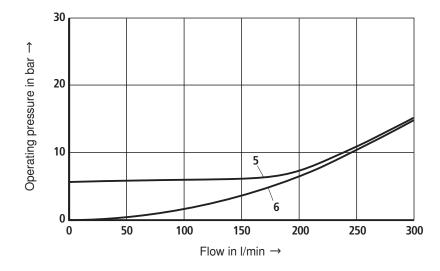
For more technical data of the pilot control valve type KSDE see data sheet 18136-21.

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



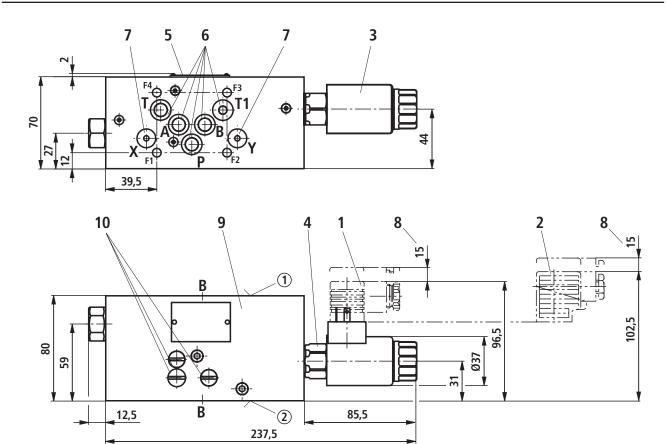


# $\Delta p$ - $q_{\rm V}$ characteristic curves Size 16



- **1** B① → B②
- **2** A① → A②
- **3** T(1) → T(2)
- **4** P① → P②
- **5**  $A(2) \rightarrow A(1); B(2) \rightarrow B(1)$
- 6 A① → A②; B① → B②
- 1 = component side
- 2 = plate side

### 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  $M_A = 8 \text{ Nm}$

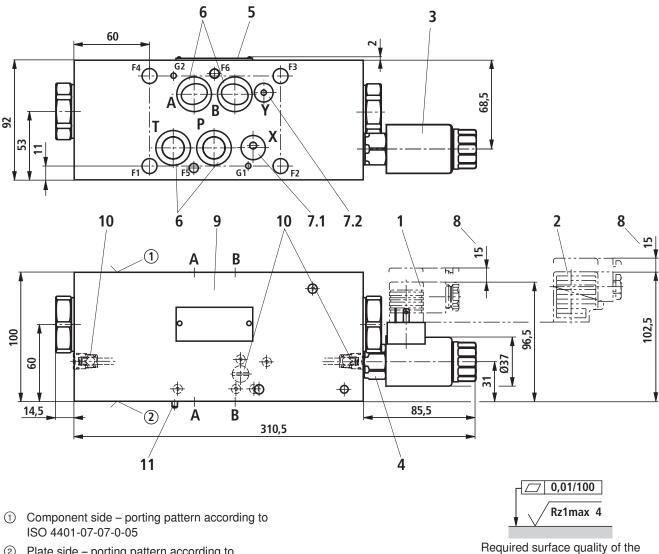
**Subplates** according to data sheet 45054 (separate order)

Valve mounting screws (separate order)
4 hexagon socket head cap screws ISO 4762 - M6 - 10.9

### Mote!

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

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



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

10 Plug screw or check valve, tightening torque
 M<sub>Δ</sub> = 8 Nm

valve mounting face

11 Grooved pin

- 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

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

Valve mounting screws (separate order)

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

### Mote!

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

### Pilot oil supply

### Version "XY"

The pilot oil supply is implemented  ${\it externally}$  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"

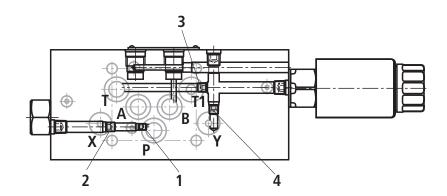
The pilot oil supply is implemented **externally** via channel X from a separate circuit.

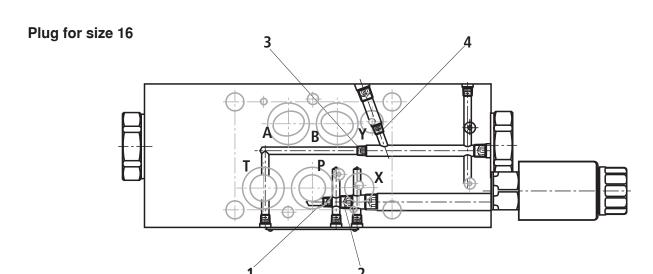
The pilot oil supply is implemented **internally** via channel T into the tank. In the subplate, port Y is closed.

		Port	Internal	External	Port in subplate closed
Version "XY"	Pilot oil supply	X	_	<b>✓</b>	
	Pilot oil return	Y	_	<b>✓</b>	-
Version "PY"	Pilot oil supply	Р	1	-	Х
	Pilot oil return	Y	-	<b>✓</b>	
Version "PT"	Pilot oil supply	Р	1	-	X and Y
	Pilot oil return	Т	1	_	
Version "XT"	Pilot oil supply	X	_	<b>✓</b>	V
	Pilot oil return	Т	1	_	T T

# Project planning information

### Plug for size 10





		Plug screw		
Item	Version	Size 10	Size 16	
1	"XY"	M4 x 5	M6	
3	_ A1	M6	M6	
2	"PY"	M6	M8 x 1	
3	Fi	M6	M6	
1	"PT"	M4 x 5	M6	
4	PI	M6	M6	
2	"XT"	M6	M8 x 1	
4	^1	M6	M6	

<b>Tightening torques M</b> <sub>A</sub> 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		