RE 23193
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rexroth
A Bosch Company

Directional spool valves, direct-operated, with solenoid actuation

Type Z4WE

H8168

- Size 6
- Component series 3X
- Maximum operating pressure 315 bar
- Maximum flow 50 l/min

Features

- 4/2 and 4/3 directional shut-off valve
- Sandwich plate valve
- As straight-through valve or short-circuit valve
- Porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole)
- Wet-pin DC or AC solenoids
- Cartridge optionally equipped with PWM connector (fast switching amplifier, energy reduction)
- Manual override, optional
- Spool position monitoring, optional
- CE conformity according to the Low-Voltage Directive 2014/35/EU for electrical voltages > 50 VAC or > 75 VDC

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Ordering code

01	02	03		04		05	06	07	08	09	10	11	12	13	14
Z4WE	**6**		**–**	**3X**	**/**	**E**			**K4**						*****

01	Shut-off valve, sandwich plate design	**Z4WE**
02	Size 6	**6**
03	Symbols; possible version see page 6 ... 9	
04	Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimension)	**3X**
05	High-power wet-pin solenoid with detachable coil	**E**

Electrical voltages

06	For ordering code see page 4 ... 5	e.g. **G24**

Manual override [1)]

07	**Without** manual override	**no code**
	With lockable manual override "mushroom button" (small)	**N4** [2)]
	With lockable manual override "mushroom button" (large)	**N5** [2)]
	With concealed manual override (standard)	**N9** [2)]

Electrical connection

08	**Without** mating connector; connector DIN EN 175301-803	**K4** [3)]
	Without mating connector; connector according to DIN EN 175301-803 (coil with potted-in connector base and sealing element to valve housing (IP67))	**K4K** [3; 4)]

Spool position monitoring

09	**Without** position switch	**no code**
	Monitored spool position "a"	**QMAG24**
	Monitored spool position "b"	**QMBG24**
	Monitored rest position	**QM0G24**
	For further details, see data sheet 24830	

Seal material (observe compatibility of seals with hydraulic fluid used, see page 14)

10	NBR seals	**no code**
	FKM seals	**V**
	Recommended for operation with HFC hydraulic fluids	**MH**
11	**Without** locating hole	**no code**
	With locating hole and locking pin ISO 8752-3x8-St	**/62**
12	Standard	**no code**
	Approval according to CSA C22.2 No. 139-1982	**= CSA**

1) The manual override cannot be allocated a safety function. It may only be used up to a tank pressure of 50 bar.

2) DC voltage only

3) Mating connectors, separate order, see page 24 and data sheet 08006.

4) With additional sealing between solenoid coil and housing.

Ordering code

01	02	03		04		05	06	07	08	09	10	11	12	13	14
Z4WE	**6**		**–**	**3X**	**/**	**E**			**K4**						*****

13	Standard	**no code**
	DC or AC voltage (symbols "E...") [5]	
	Special housing with connection A①–B① (in housing and control spool); symbol "E147" only	**SO10**
	Orifice function Ø0.6 mm	**SO742**
	Orifice function Ø0.8 mm	**SO744**
	Orifice function Ø0.9 mm	**SO749**
	Orifice function Ø1.2 mm	**SO746**
	Orifice function Ø1.3 mm	**SO747**
	Orifice function Ø1.45 mm	**SO65**
	Orifice function Ø1.5 mm	**SO748**
	Control spool with integrated orifice Ø1.2 mm. Coil rotated by 180°. The electrical connection of the coil points in direction T.	**SO765**
	DC voltage (symbols "X...") [5]	
	Special housing with orifice Ø2.0 mm between P and working port as well as Ø2.0 mm between working port and T. The electrical connection of the coil points in direction T.	**SO60**
	Special housing with orifice Ø0.8 mm between P and working port as well as Ø0.8 mm between working port and T. The electrical connection of the coil points in direction T.	**SO61**
	Special housing with orifice Ø1.3 mm between P and working port as well as Ø2.0 mm between working port and T. The electrical connection of the coil points in direction T.	**SO64**
	Control spool with integrated orifice Ø0.6 mm between A① and B① as well as orifice Ø1.3 mm between A② and B②; symbol "X258" only	**SO63**

14	Further details in the plain text	*****

[5] Symbols see page 6 ... 11.

Ordering code: DC voltage – individual connection

Electrical connections and available voltages

(Special voltages available upon request)

Connector		Ordering code	Electrical voltages: 12 V	24 V	26 V	48 V	96 V	110 V	125 V	205 V	220 V	Protection class according to DIN EN 60529 [1]	Protection class according to VDE 0580
			Ordering code: G12	G24	G26	G48	G96	G110	G125	G205	G220		
Connector 3-pole (2 + PE) according to DIN EN 175301-803	▶ Standard	**K4**	✓	✓	–	✓	✓	✓	✓	✓	✓	IP65	I [2]
	▶ With potted-in plug base and sealing element	**K4K**	✓	✓	✓	–	–	–	–	–	–	IP65	I [2]

Maximum admissible overvoltages according to DIN EN 60664-1:2008-01 (VDE 0110-1) (overvoltage category II):										
Nominal voltage U_{Nom}	in V	12	24	26	48	96	110	125	205	220
Rated current I_{Nom}	in A	2.5	1.25	1.17	0.66	0.33	0.25	0.17	0.16	0.14
Maximum admissible switch-off overvoltage according to VDE 0580	in V	500	500	500	500	500	500	500	500	500
Recommended interference protection circuit with 2 x mains voltage	in V	24	48	52	96	192	220	250	410	440

1) Only with correctly mounted valve with a mating connector suitable for the protection class.

2) Protection class I with properly connected protective grounding conductor (PE) and valve mounting surface connected to the protective grounding conductor system.

3) With protection class III, a protective extra-low voltage with isolation transformer (PELV, SELV) is to be provided.

☞ **Notice:**
Solenoid valves induce voltage peaks during switch-off. In order to prevent electro-magnetic interference at the system and damage to the valve control, an interference protection circuit has to be provided on the system side. Alternatively, you can also select a connector with integrated interference protection circuit.

Ordering code: Alternating voltage – individual connection

Electrical connections and available voltages

(Special voltages available upon request)

Connector		Ordering code	Electrical voltages: 100 V 50/60 Hz	100 V 50/60 Hz	110 V 50/60 Hz	110 V 50/60 Hz	120 V 60 Hz	120 V 60 Hz	200 V 50 Hz	200 V 50 Hz	230 V 50/60 Hz	230 V 50/60 Hz	Protection class according to DIN EN 60529 [1]	Protection class according to VDE 0580
			Ordering code: G96	W100	G96	W110	G110	W110	G180	W200	G205	W230		
Connector, 3-pole (2 + PE) according to DIN EN 175301-803	▶ Standard	**K4**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	IP65	I [2]
Rectifier required (see page 24)			✓	–	✓	–	✓	–	✓	–	✓	–		
Maximum admissible overvoltages according to DIN EN 60664-1:2008-01 (VDE 0110-1) (overvoltage category II):														
Nominal voltage U_{Nom}		in V	100	100	110	110	120	120	200	200	230	230		
Rated current I_{Nom}	▶ 50 Hz	in A	0.31	0.56	0.34	0.52	–	–	0.18	0.29	0.16	023		
	▶ 60 Hz	in A	0.31	0.44	0.34	0.39	0.30	0.45	–	–	0.16	017		
Lower rated current I_1	▶ 50 Hz	in A	–	0.65	–	0.6	–	–	–	0.33	–	0.27		
	▶ 60 Hz	in A	–	0.51	–	0.45	–	0.52	–	–	–	0.2		
Upper rated current I_2	▶ 50 Hz	in A	–	0.9	–	0.9	–	–	–	0.6	–	0.36		
	▶ 60 Hz	in A	–	0.9	–	0.6	–	0.9	–	–	–	0.36		
Maximum admissible switch-off overvoltage according to VDE 0580		in V	500	500	500	500	500	500	500	500	500	500		
Recommended interference protection circuit with 2 x mains voltage		in V	200	200	220	220	240	240	400	400	460	460		

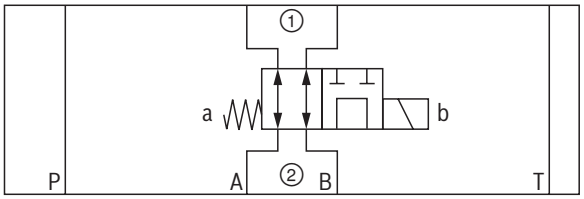
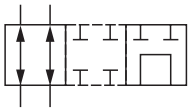
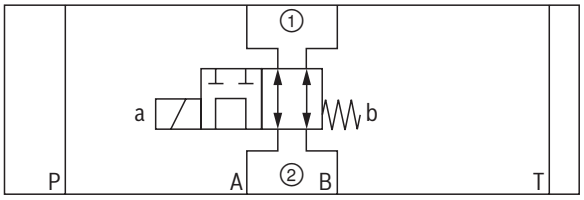
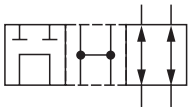
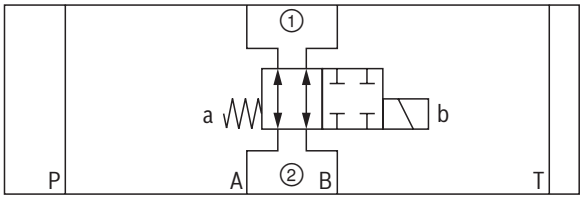
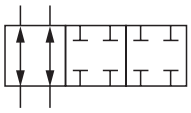
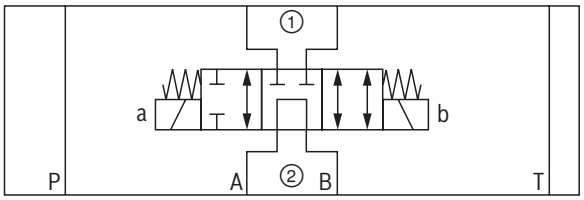
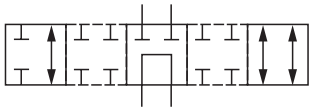
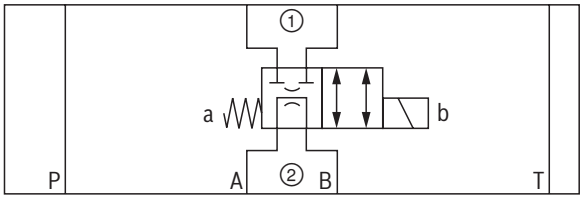
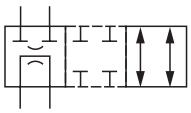
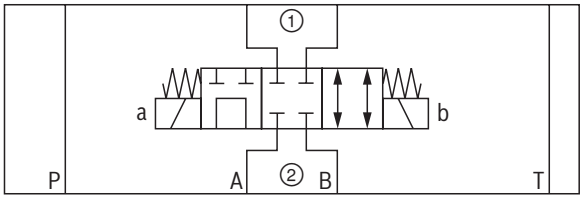
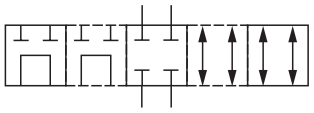
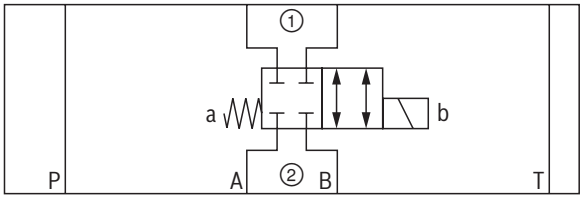
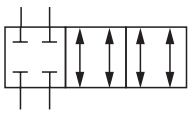
1) Only with correctly mounted valve with a mating connector suitable for the protection class.

2) Protection class I with properly connected protective grounding conductor (PE) and valve mounting surface connected to the protective grounding conductor system.

Notices:

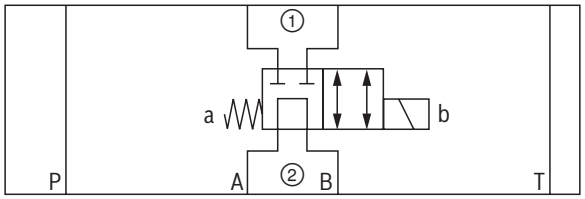
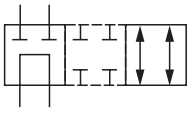
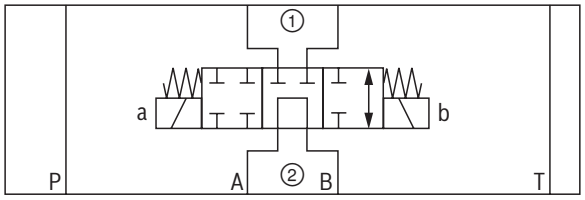
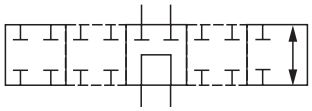
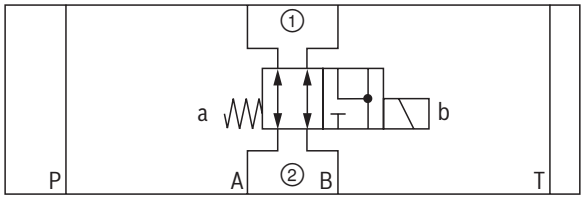
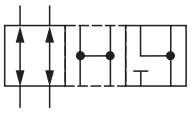
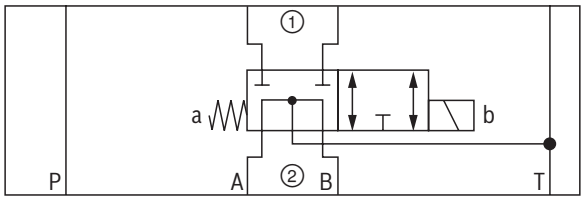
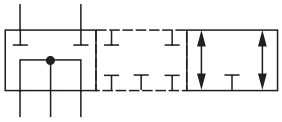
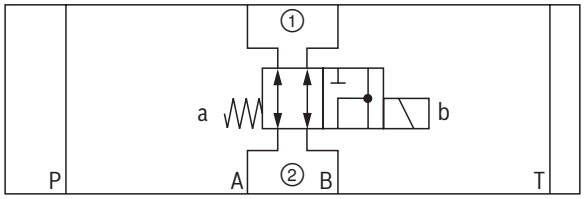
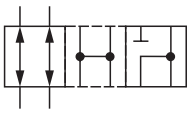
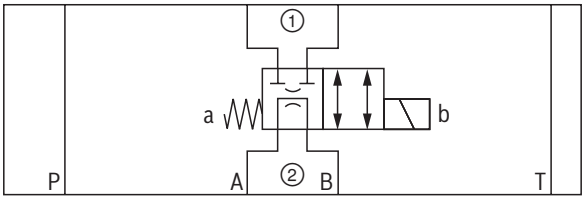
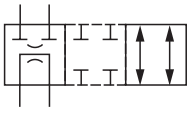
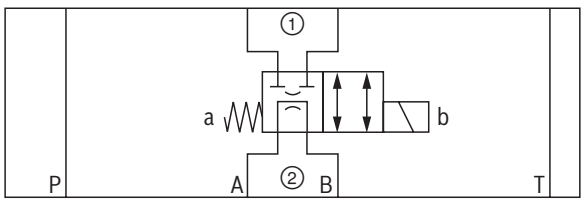
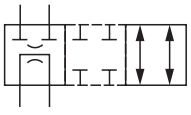
- Solenoid valves induce voltage peaks during switch-off. In order to prevent electro-magnetic interference at the system and damage to the valve control, an interference protection circuit has to be provided on the system side. Alternatively, you can also select a connector with integrated interference protection circuit.
- Dependent on the rated current I_{Nom}, circuit breakers according to tripping characteristic "K" are to be provided. Within a time interval of 0.6s, the tripping current must be 8 to 10 times the nominal power supply.
  The required non-tripping current of the fuse must not fall below the "lower rated current" value I_1 (see table above).
  The maximum tripping current must not exceed the "upper rated current" value I_2 (see table above).
  The temperature dependence of the tripping behavior of the circuit breakers has to be observed according to the manufacturer's specifications.

Symbols: DC or AC voltage (① = component side, ② = plate side)

	Symbol	Interim positions	Notices
D24			–
D27			–
E51			–
E53			–
E56			–
E62			–
E63			–

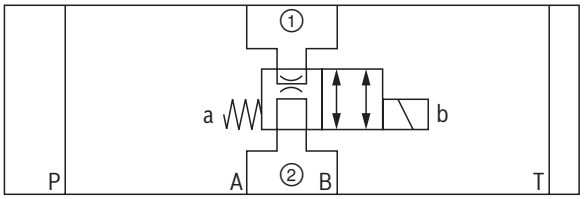
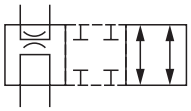
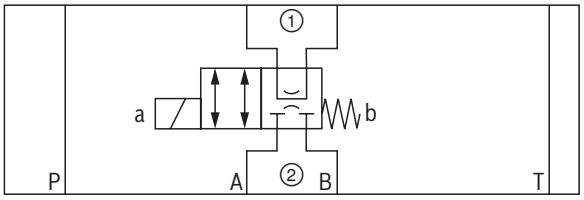
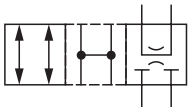
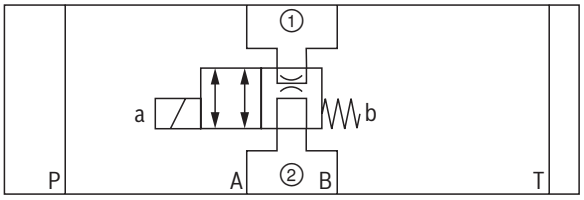
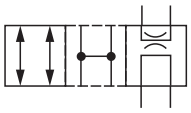
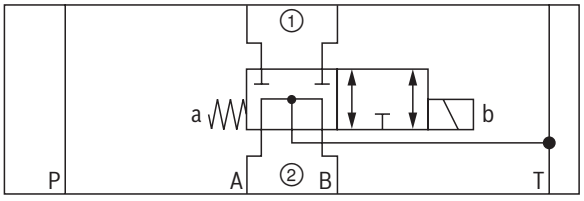
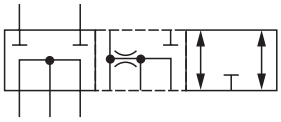
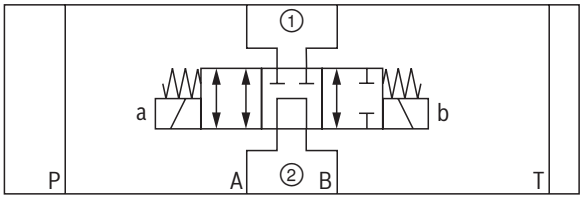
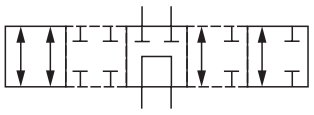
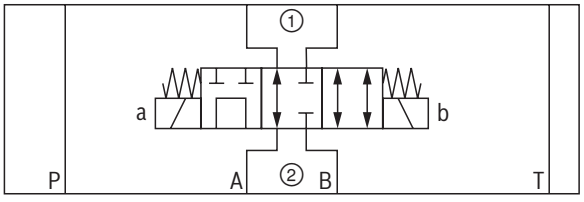
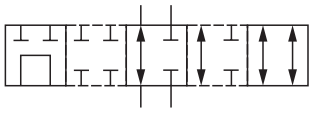
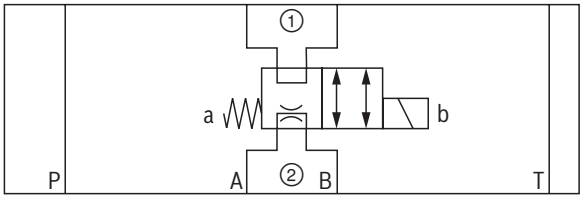
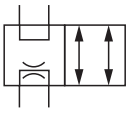
☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Symbols: DC or AC voltage (① = component side, ② = plate side)

	Symbol	Interim positions	Notices
E68			–
E127			–
E130			–
E131			–
E132			–
E135			Only possible with SO number, see "Ordering code" on page 3.
E136			Function with orifice Ø1.3 mm

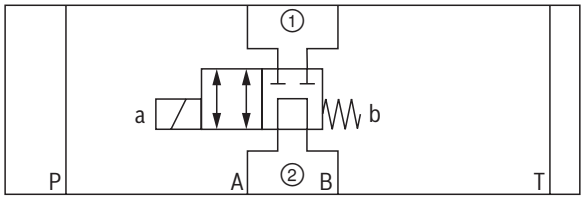
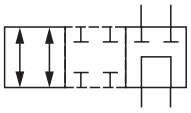
☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Symbols: DC or AC voltage (① = component side, ② = plate side)

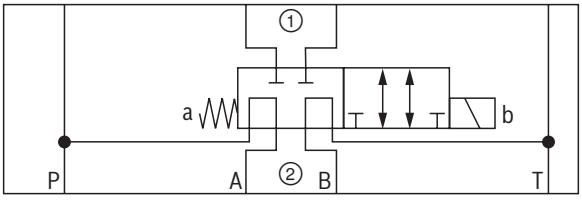
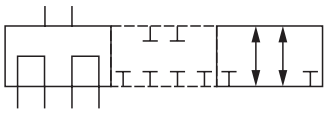
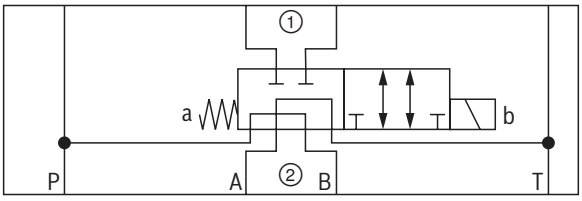
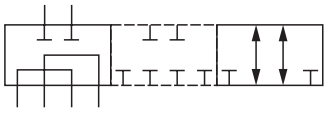
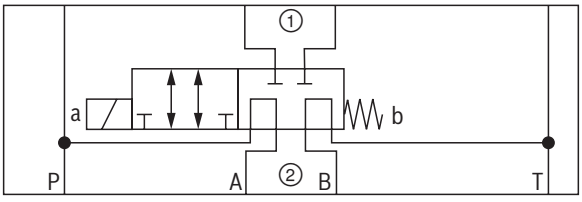
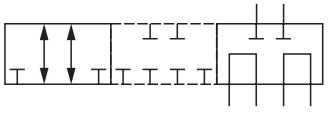
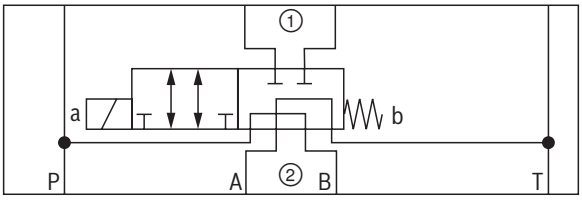
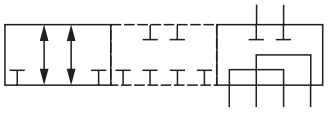
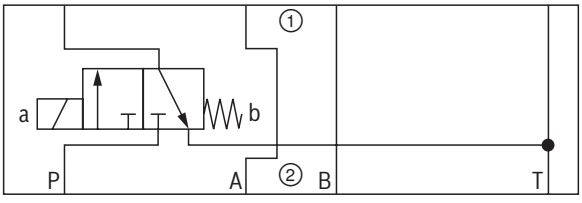
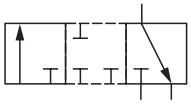
	Symbol	Interim positions	Notices
E137			Function with orifice Ø1.7 mm
E138			Only possible with SO number, see "Ordering code" on page 3.
E140			Only possible with SO number, see "Ordering code" on page 3.
E144			–
E145			–
E146			–
E147			Only possible with version "SO10", see "Ordering code" on page 3.

☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Symbols: DC or AC voltage (① = component side, ② = plate side)

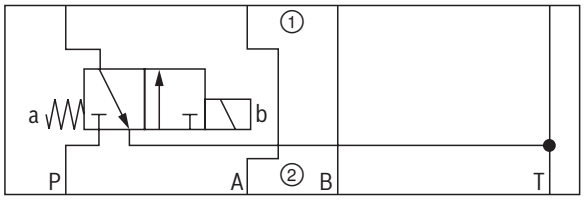
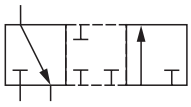
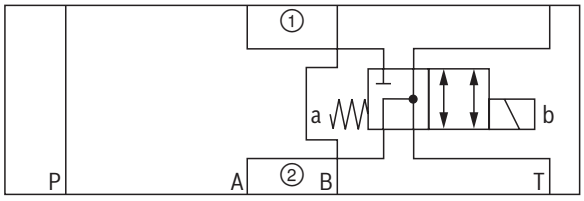
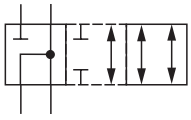
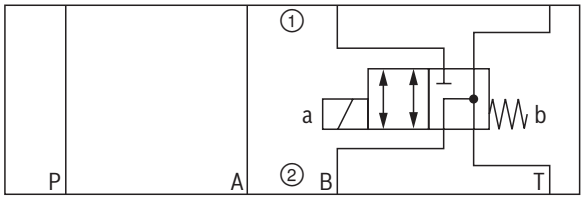
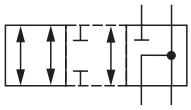
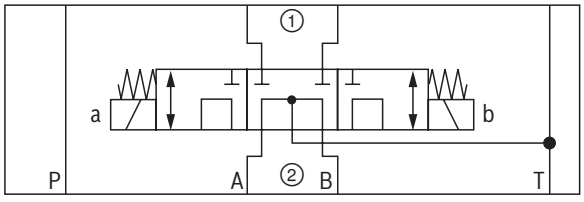
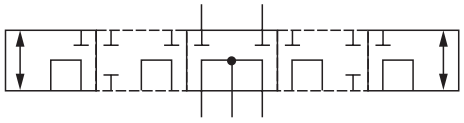
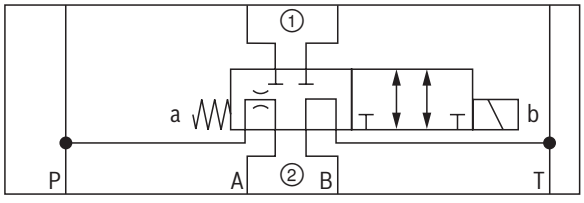
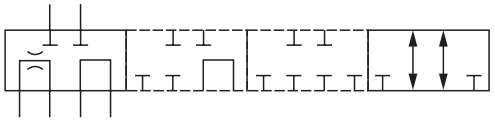
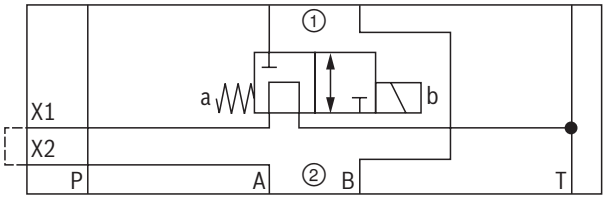
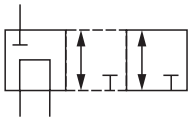
Symbol		Interim positions	Notices
E166			–

Symbols: DC voltage (① = component side, ② = plate side)

Symbol		Interim positions	Notices
X161			Only possible with SO number, see "Ordering code" on page 3.
X163			Only possible with SO number, see "Ordering code" on page 3.
X181			Only possible with SO number, see "Ordering code" on page 3.
X183			Only possible with SO number, see "Ordering code" on page 3.
X250			–

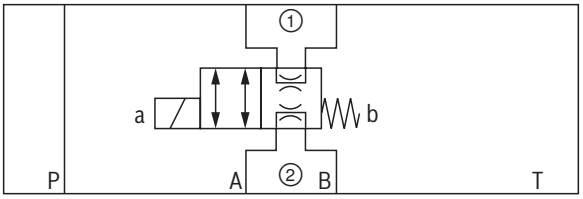
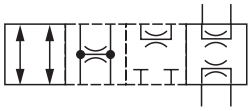
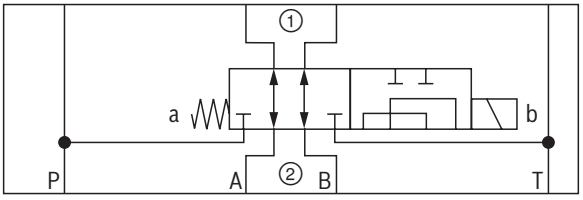
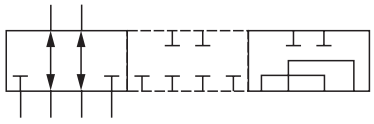
☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Symbols: DC voltage (① = component side, ② = plate side)

	Symbol	Interim positions	Notices
X252			–
X253			–
X254			–
X255			–
X256			Function with orifice Ø1.4 mm
X257			–

☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Symbols: DC voltage (① = component side, ② = plate side)

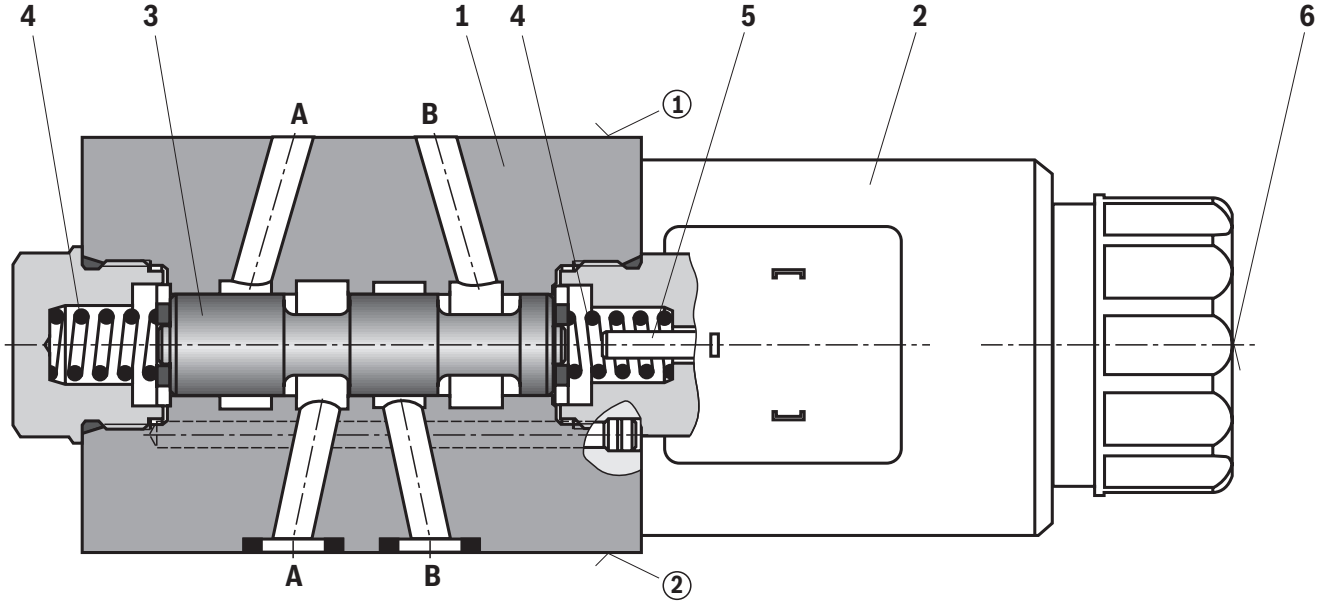
	Symbol	Interim positions	Notices
X258			Only possible with version "SO63", see "Ordering code" on page 3.
X259			–

☞ **Notice:**
Representation dimensions according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Function, section

The directional valves type Z4WE are solenoid-actuated directional spool valves. They control start, stop and direction of a flow.
The directional valves basically consist of the housing (1), one or two solenoids (2), the control spool (3), and two return springs (4).
In de-energized condition, the control spool (3) is held in the central position or in the initial position by the return springs (4). The control spool (3) is actuated by wet-pin solenoids (2).
For unobjectionable functioning, the hydraulic system has to be bled properly.
The force of solenoid (2) acts via plunger (5) on control spool (3) and pushes the latter from its rest position to the required end position. In this way, the required direction of flow from A② to A① and from B② to B① is enabled.
After de-excitation of the solenoid (2), the return spring (4) pushes the control spool (3) back to its rest position.
An optional manual override (6) allows the control spool (3) to be moved without solenoid energization.

☞ **Notice:**
Due to the design principle, internal leakage is inherent to the valves, which may increase over the life cycle.
For admissible shock and vibration loads,
see data sheet 08012.



Type Z4WE 6 ...

① = component side
② = plate side

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

General			
Weight	▶ Valve with one solenoid	kg	1.2
	▶ Valve with two solenoids	kg	1.6
Installation position			any (with suspended installation, higher sensitivity to contamination; horizontal installation is recommended)
Ambient temperature range		°C	–20 ... +50 (NBR seals) –15 ... +50 (FKM seals)
Storage temperature range		°C	+5 ... +40
$MTTF_d$ values according to EN ISO 13849		years	150 (for further details, see data sheet 08012)
Admissible shock and vibration loads			see data sheet 08012

Hydraulic			
Maximum operating pressure	▶ Port P, A, B	bar	315
	▶ Port T	bar	210 with DC voltage 160 with AC voltage
Maximum flow		l/min	50
Hydraulic fluid			see table page 14
Hydraulic fluid temperature range (at the valve working ports)		°C	–20 ... +80 (NBR seals) –15 ... +80 (FKM seals) –20 ... +50 (HFC hydraulic fluid)
Viscosity range		mm^2/s	2.8 ... 500
Maximum admissible degree of contamination of the hydraulic fluid Cleanliness class according to ISO 4406 (c)			Class 20/18/15 [1)]

1) The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.
Available filters can be found at www.boschrexroth.com/filter.

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 this hydraulic fluid is used, small amounts of dissolved zinc may get into the hydraulic system.
- ▶ **Flame-resistant – containing water:**
  - – Due to 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 - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.
  - – Dependent on the hydraulic fluid used, the maximum ambient and hydraulic fluid temperature must not exceed 50 °C. In order to reduce the heat input into the component, a maximum duty cycle of 50% in continuous operation has to be set for on/off valves (measuring period 300 s). If this is impossible due to the function, an energy-reducing control of these components is recommended, e.g. via a PWM plug-in amplifier.

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

Electric				
Voltage type			DC voltage	alternating voltage 50/60 Hz
Nominal voltages according to VDE 0580 [2]		V	see page 4	see page 5
Voltage tolerance (nominal voltage)		%	±10	
Power consumption		W	30 [3]	–
Holding power		VA	–	50
Switch-on power		VA	–	220
Duty cycle (ED)		%	100 (S1 according to VDE 0580)	
Switching time according to ISO 6403 [4]	▶ ON		20 ... 45	10 ... 20
	▶ OFF		10 ... 25	15 ... 40
Maximum switching frequency		1/h	15000	7200
Maximum surface temperature of the coil [5]		°C	120	
Protection class according to DIN EN 60529			see page 4 ... 5	
Insulation class according to VDE 0580			see page 4 ... 5	
Electrical protection			Maximum admissible switch-off overvoltage see page 4 ... 5 Every solenoid must be protected individually, using a suitable fuse with tripping characteristics K (inductive loads).	
Protective grounding conductor and screening			The valve must be installed on a surface that is included in the equipotential bonding. Connector pin assignment (CE-compliant installation) see page 24	
Conformity			CE according to Low-Voltage Directive 2014/35/EU tested according to EN 60204-1:2006-01 and DIN VDE 0580, classified as component	

[2] Special voltages available upon request

[3] Reduction of the nominal power by approx. 40% if a 24 V-coil with connector switching amplifier type VT-SSBA1-PWM-1X/V00**2**/5 is used (separate order, material no. **R901290194**, see page 24 and data sheet 30362)

[4] Measured without flow.
The **switching times** were determined for a hydraulic fluid temperature of 40 °C and a viscosity of 46 cSt. Switching times change dependent on hydraulic fluid temperatures, operating time and application conditions.

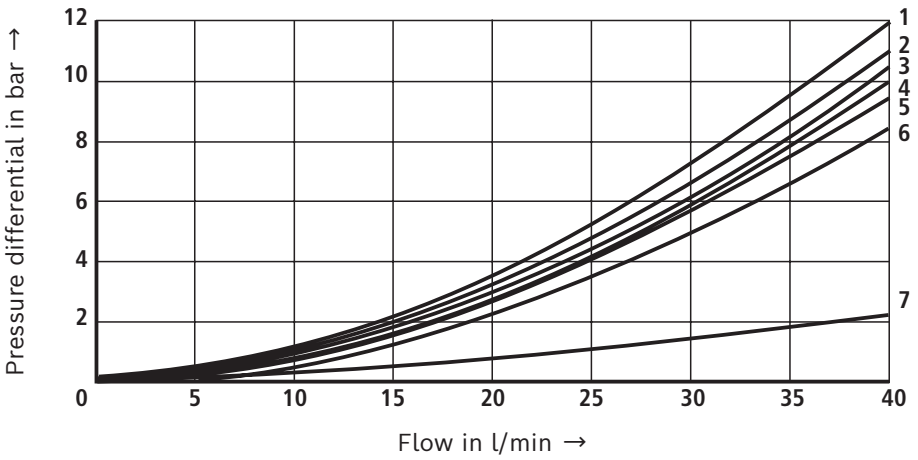
[5] Due to the arising **surface temperatures** of the solenoid coils, the standards ISO 13732-1 and ISO 4413 are to be observed. The specified surface temperature in AC solenoids is valid for fault-free operation. In the error case (e.g. blocking of the control spool), the surface temperature may increase above 180 °C. Thus, the system must be checked for possible dangers considering the ignition temperature of the hydraulic fluid used. As protection, circuit breakers (see table page 4 ... 5) must be used, unless the creation of an ignitable atmosphere can be excluded in a different way. Thus, the surface temperature can – in the error case – be limited to maximally 220 °C.
You have to use cables that have been approved of for a working temperature of more than 50 °C (individual connection) and/or 90 °C (central connection).

☞ **Notices:**
- Actuation of the manual override is only possible up to a tank pressure of approx. 50 bar. Avoid damage to the bore of the manual override. (Special tool for the operation, separate order, material no. **R900024943**). When the manual override is blocked, the operation of the solenoid must be prevented!
- Simultaneous actuation of the solenoids must be prevented.

Characteristic curves

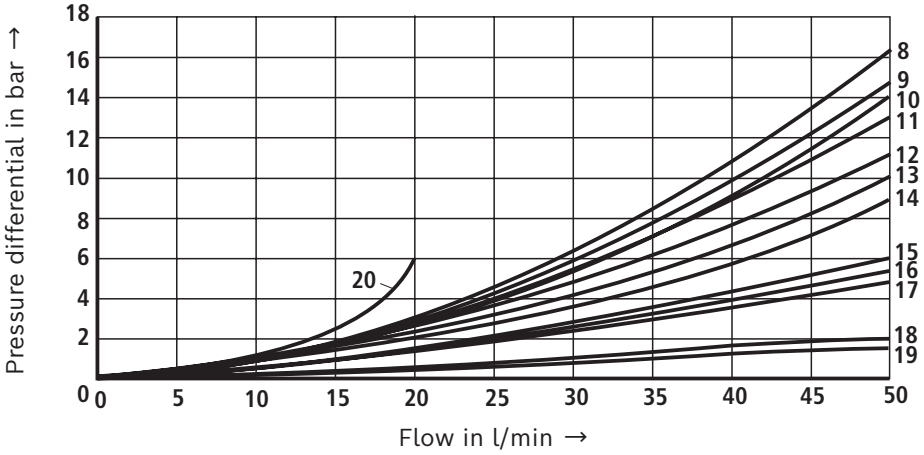
(measured with HLP46, ϑ_{oil} = 40 ±5 °C)

***Δp-q*$_V$ characteristic curves**



Further characteristic curves upon request

Symbol	A②–A①	A①–A②	B②–B①	B①–B②	A②–B②	B②–A②	T②–T①	P②–P①
D24	4	1	2	4	3	2	7	7
E51	3	1	1	3	–	–	7	7
E53	2	2	2	2	5	2	7	7
E63	2	5	5	3	–	–	7	7
E68	4	4	6	5	4	5	7	7
E137	1	4	3	2	5	6	7	7



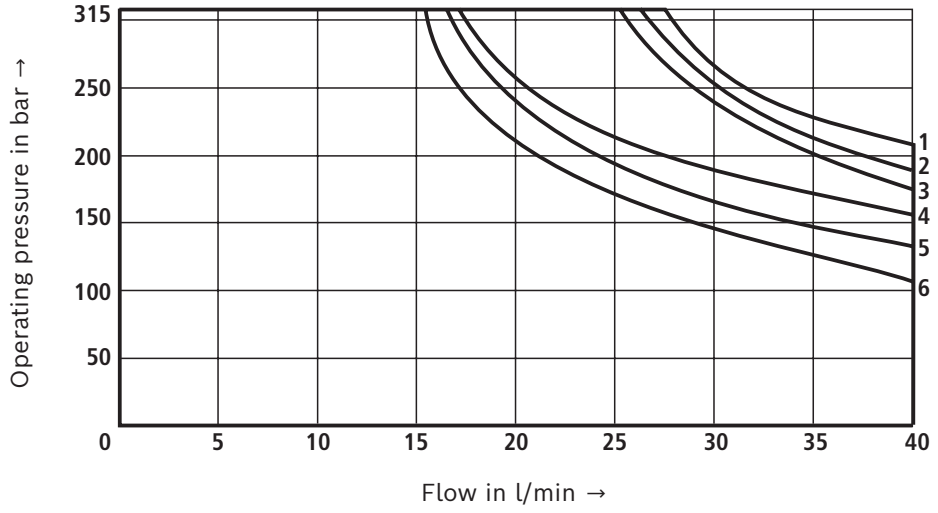
Further characteristic curves upon request

Symbol	Spool position	A①–A② A②–A①	B①–B②	B②–B①	T②–T①	P②–P①	P①–T②	B②–T②	P②–P①	A②–T②	P②–A② B②–T①
X250		16	17	17	18	13	11	–	–	–	–
X252		16	17	17	18	9	10	–	–	–	–
X253		13	14	14	19	18	–	–	–	8	–
X254		16	12	13	18	18	–	12	–	–	–
X255	0	–	–	–	15	–	–	8	–	8	–
	a	12	–	–	–	–	–	13	–	–	–
	b	–	12	12	–	–	–	–	–	13	–
X256		12	9	9	18	–	–	–	18	–	20

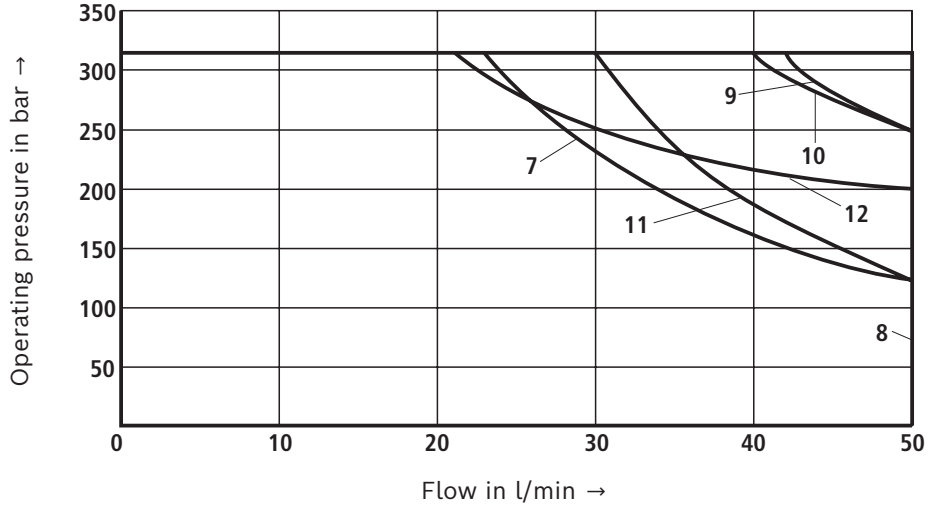
Performance limits

(measured with HLP46, ϑ_{oil} = 40 ±5 °C and 24 V DC voltage)

☞ **Notice:**
The specified performance limits are valid for operation with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).
Due to the flow forces acting within the valves, the achievable performance limit may be considerably lower with only one direction of flow (e.g. from P to A while port B is blocked)!
The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank preloading.



1 E63
2 E68
3 E53
4 E51
5 E137
6 D24

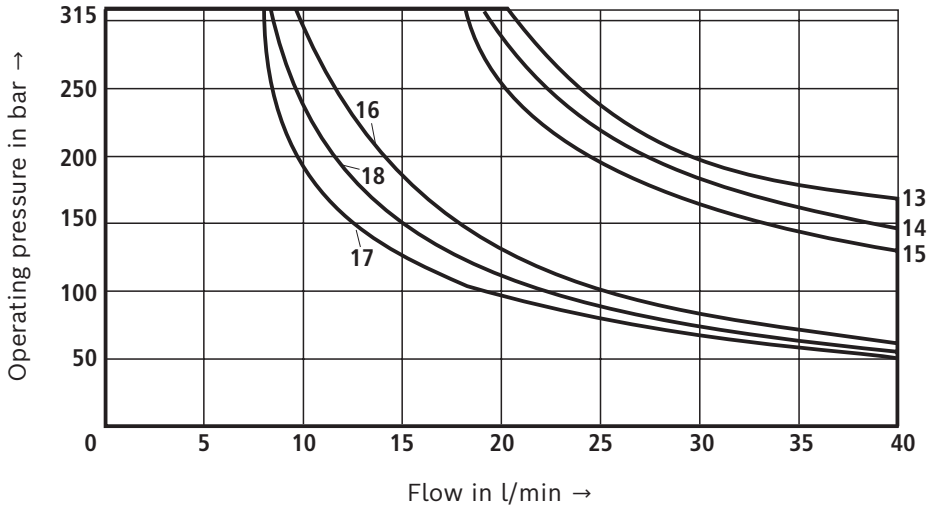


7 X250
8 X252
9 X253
10 X254
11 X255
12 X256

Further characteristic curves upon request

Performance limits

(measured with HLP46, ϑ_{oil} = 40 ±5 °C and 230 V AC voltage)

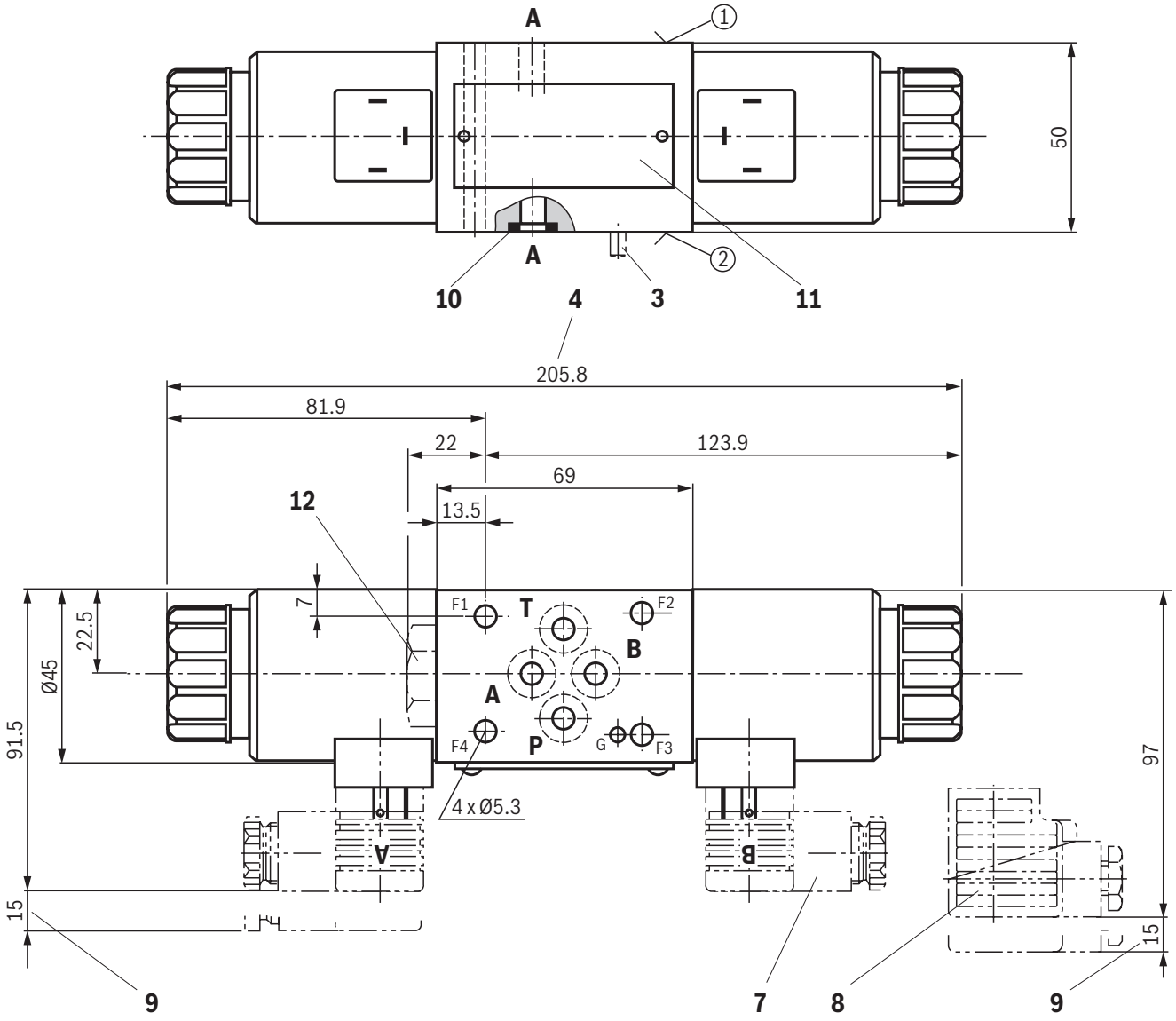


Symbol	W230-50Hz	W230-60Hz
E63	13	16
E68	14	18
E53	15	18
E137	17	17
E51	17	17
D24	17	17

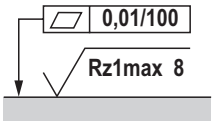
Further characteristic curves upon request

Dimensions: DC voltage
(dimensions in mm)

Symbols D24, E51, E53, E63, E68, E137, ...



Dimensions for manual overrides see page 21.
For item explanations, valve mounting screws and subplates, see page 23.

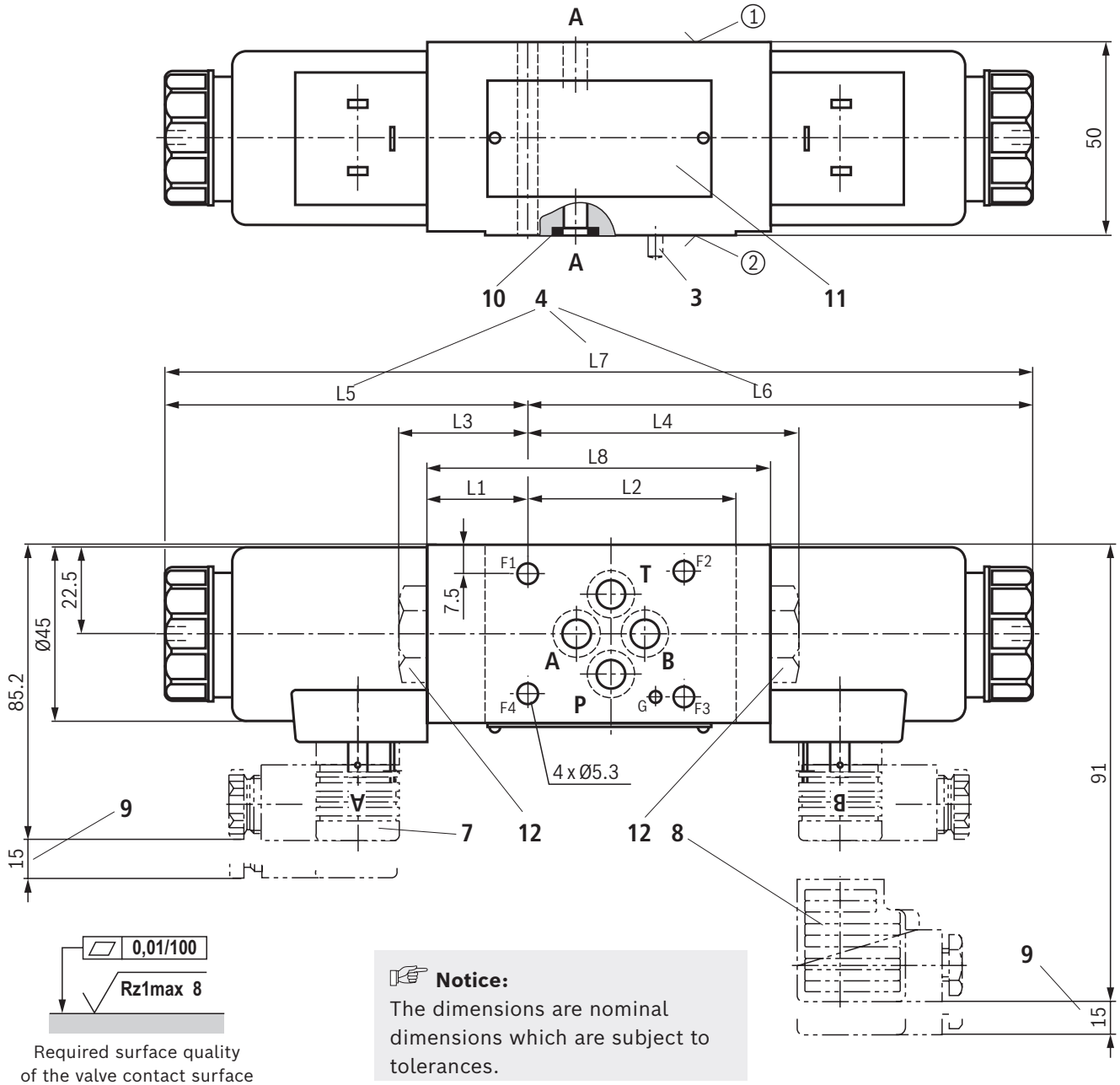


Required surface quality
of the valve contact surface

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: DC voltage
(dimensions in mm)

Symbols X250, X252, X253, X254, X255, X256, ...



Required surface quality
of the valve contact surface

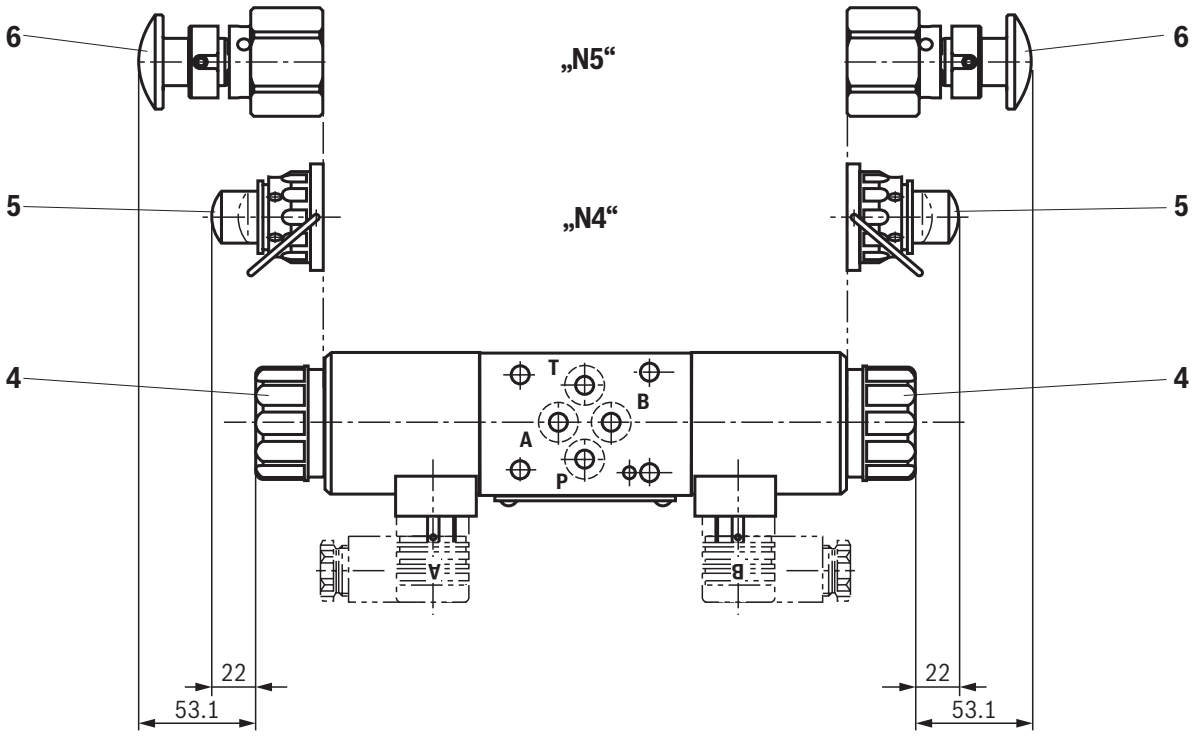
☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Symbol	Solenoid side a	Solenoid side b	L1	L2	L3	L4	L5	L6	L7	L8
X250	X		25.1	54.9	–	63.3	93.4	–	215.6	80
X252		X	25.1	54.9	33.5	–	–	123.2	215.6	80
X253		X	18.5	54.3	26.9	–	–	129.8	215.6	80
X254	X		18.5	54.3	–	69.9	86.8	–	215.6	80
X255	X	X	26.1	53.9	–	–	94.4	131.2	225.6	90
X256		X	12.2	54.8	20.6	–	–	136.1	225.6	80

Symbols X161, X163, X181, X183, X188 and X157 on request.

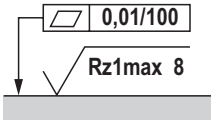
Dimensions for manual overrides see page 21. **For item explanations, valve mounting screws and subplates,** see page 23.

Dimensions: DC voltage – manual overrides
(dimensions in mm)



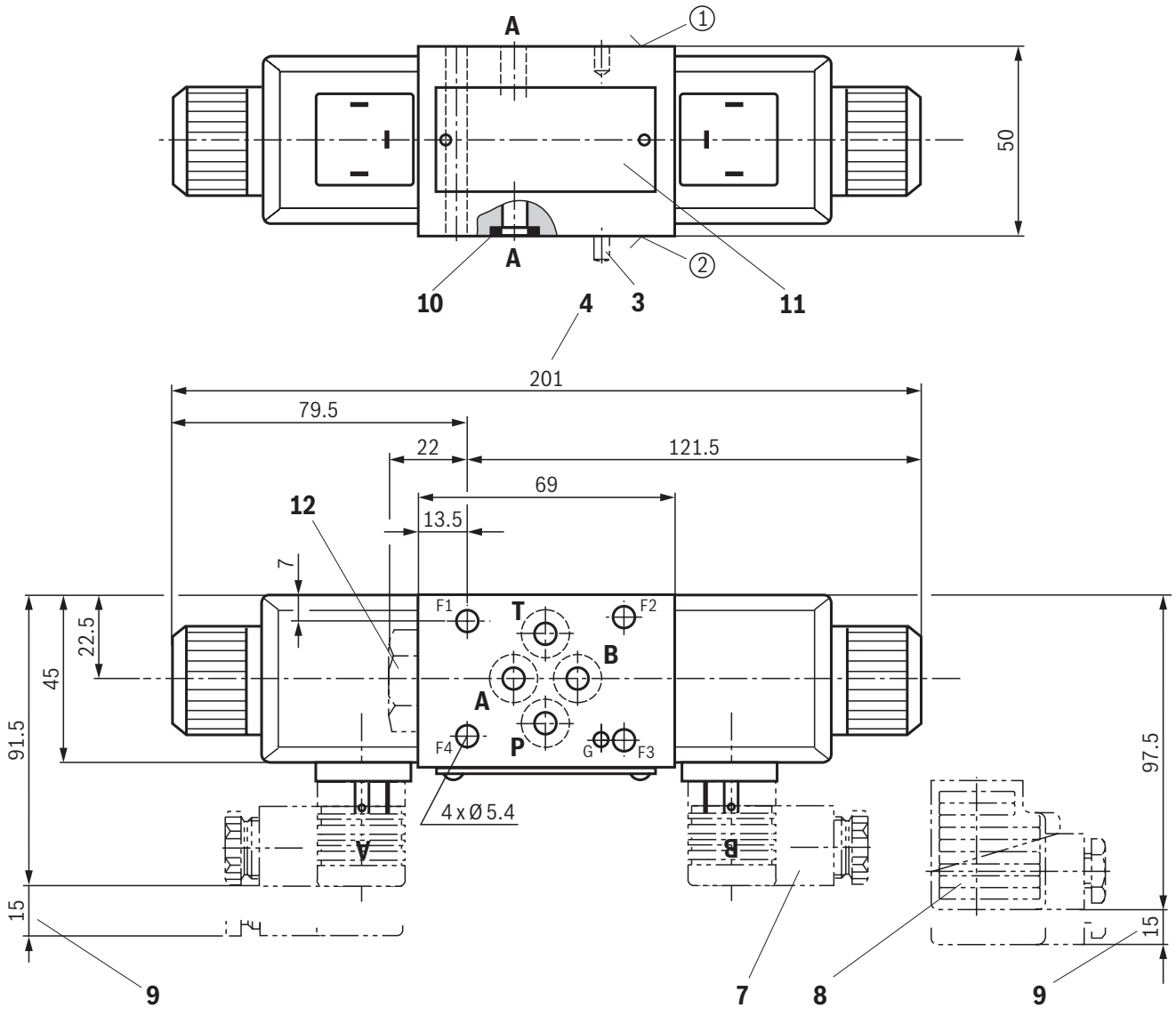
For item explanations, valve mounting screws and **subplates,** see **page 23.**

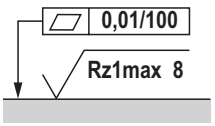
☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.



Required surface quality
of the valve contact surface

Dimensions: AC voltage
(dimensions in mm)





Required surface quality
of the valve contact surface

For item explanations, valve mounting screws and subplates, see page 23.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions
(dimensions in mm)

① Component side – porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole Ø3 x 5 mm deep)

② Plate side – porting pattern according to ISO 4401-03-02-0-05 (with locating hole for locking pin ISO 8752-3x8-St; version "/62")

3 Locking pin ISO 8752-3x8-St; only version "/62"

4 Dimension for solenoid **with concealed** manual override "**N9**" (standard) and for valve without manual override

5 Lockable manual override "mushroom button" (small) "**N4**"

6 Lockable manual override "mushroom button" (large) "**N5**"

7 Mating connector **without** circuitry (separate order, see page 24 and data sheet 08006)

8 Mating connector **with** circuitry (separate order, see page 24 and data sheet 08006)

9 Space required for removing the mating connector

10 Identical seal rings for ports A, B, P, T (plate side)

11 Name plate

12 Plug screw for valve with one solenoid

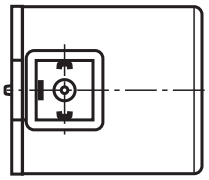
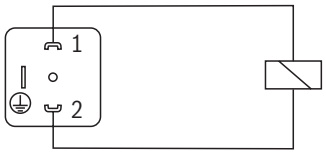
Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws
6	4	**ISO 4762 - M5 - 10.9** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 7 Nm ±10%
	or	
	4	**ISO 4762 - M5 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 8.1 Nm ±10%

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

Subplates (separate order) with porting pattern according to ISO 4401-03-02-0-05 see data sheet 45100.

Electrical connections, assignment

Ordering code connector		Top view	Circuit diagram	Pin	Connections, assignment
Connector 3-pole (2 + PE) according to DIN EN 175301-803	**K4**			1 2	Solenoid coil, polarity-independent
Connector 3-pole (2 + PE) according to DIN EN 175301-803 (with potted-in plug base and sealing element)	**K4K**[1]			⏚	Grounding

1) Coil with potted-in connector base and sealing element to valve housing (IP67)

2) Plug-in system suitable for mobile applications

In the electrical connection, the protective grounding conductor (PE ⏚) is to be properly connected.

☞ **Notices:**

- Electric lines must be routed in a strain-relieved manner.
- Cable glands are only suitable for permanently installed cables.
- Connectors are to be locked during operation. Not intended to be plugged in or disconnected during normal operation under load.
- Proper connection of the protective grounding conductor at ⏚.
- Protective grounding conductor cross-section equal to or greater than the line cross-section of the voltage supply.
- The valve mounting surface must be connected to the protective grounding conductor system.

Accessories (separate order)

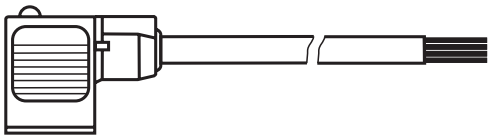
Mating connectors and cable sets

Item [1]	Designation	Version	Short designation	Material number	Data sheet
6, 7	Mating connector; for valves with "K4" connector, 2-pole + PE, design A	Without circuitry, M16 x 1.5, 12 ... 240 V, "a"	Z4	**R901017010**	08006
		Without circuitry, M16 x 1.5, 12 ... 240 V, "b"		**R901017011**	
		With indicator light, M16 x 1.5, 12 ... 240 V	Z5L	**R901017022**	
		With rectifier, M16 x 1.5, 80 ... 240 V	RZ5	**R901017025**	
		With indicator light and Z-diode-suppressor, M16 x 1.5, 24 V	Z5L1	**R901017026**	

1) See dimensions page 19 ... 22.

Accessories (separate order)

Energy savings and fast switching [1)]

Details see data sheet 30362			
		Material number	
		Type VT-SSBA1-PWM-1X/V00**1**/5 as fast switching amplifier (switching time reduction by approx. 50%) [2)]	Type VT-SSBA1-PWM-1X/V00**2**/5 for energy reduction (energy savings of approx. 40%) [3)]
a/b	black	**R901265633**	**R901290194**

1) Only with symbols E63, E68, X250 and X252
2) Only for version "G12" and "K4"
3) Only for version "G24" and "K4"

Cartridge with PWM connector according to data sheet 30362:

- Depending on the control spool, increasing the performance limit is possible.
- With version "G24" (energy saving), the coil temperature is reduced by ≥ 30 °C for 100% duty cycle.

Further information

▶ Subplates	Data sheet 45100
▶ Inductive position switch and proximity sensors (contactless)	Data sheet 24830
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Connector switching amplifier type VT-SSBA1	Data sheet 30362
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hydraulic valves for industrial applications	
▶ Selection of the filters	
▶ Information on available spare parts	