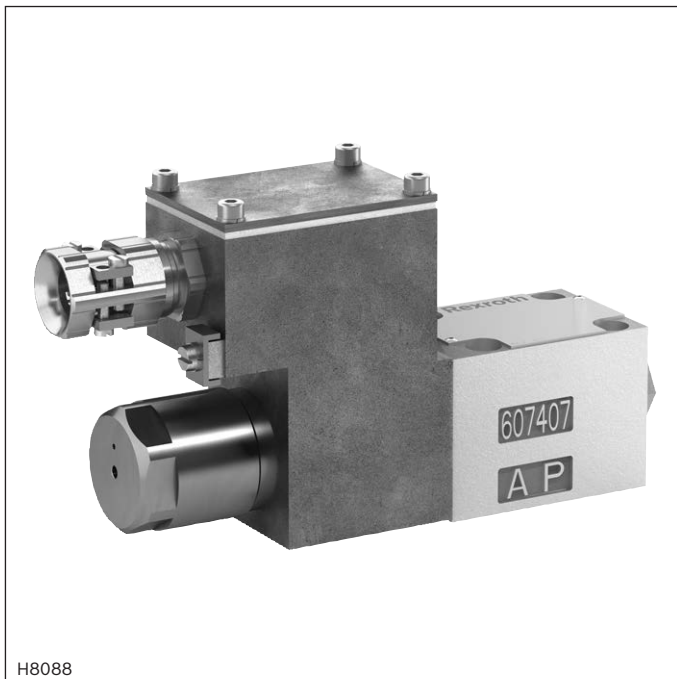


Directional seat valves, direct-operated with solenoid actuation

Type SED ...XE...710



- ▶ Size 6
- ▶ Component series 1X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 25 l/min

EAC

For potentially explosive atmospheres



Information on explosion protection:


- ▶ Explosion protection marking according to technical rules EAC TR CU 012/2011:
2Ex e mc IIC T4 Gc X

Features

- ▶ 3/2-way version
- ▶ For intended use in potentially explosive atmosphere
- ▶ Wet-pin DC solenoids
- ▶ Electrical connection with terminal box and cable gland
- ▶ With concealed manual override, optional

Contents

Features	1
Ordering code	2
Function, section, symbols	3
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Dimensions	7, 8
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Over-current fuse and switch-off voltage peaks	11
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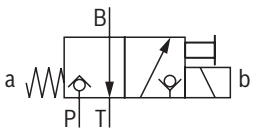
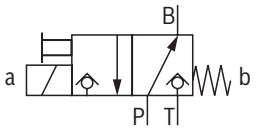
 **Notice:** The documentation version with which the product was supplied is valid.

Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
M	-	3	SED	6		1X	/	350	C	G24	N9	XE	Z2		SO710

01	Mineral oil	M
02	3 main ports	3
03	Seat valve	SED
04	Size 6	6

Symbols

05		CK
		UK

06	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions)	1X
07	Operating pressure 350 bar	350
08	Wet-pin solenoid with detachable coil	C
09	Direct voltage 24 V	G24
10	With concealed manual override	N9

Explosion protection

11	"Increased safety" For details, see information on the explosion protection, page 5	XE
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Electrical connection

12	Solenoid with terminal box and cable gland For details of electrical connections, see page 10	Z2
13	Without check valve insert, without throttle insert	no code

Seal material (observe compatibility of seals with hydraulic fluid used, see page 4)

14	NBR seals	no code
15	Area of application according to technical rules EAC TR CU 012/2011: (Suitable for low temperature range and silicone oil; special connection diagram)	SO710



Notice:

Representation of the symbols according to ISO 1219-1.

Function, section, symbols

General information

Directional valves of the type SED are direct operated directional seat valves with solenoid actuation. They control start, stop and direction of flow.

Directional valves basically comprise the housing (1), the solenoid (2), the valve seats (7) and (11) and the control spool (4).

The manual override (6) allows for the switching of the valve without solenoid energization.

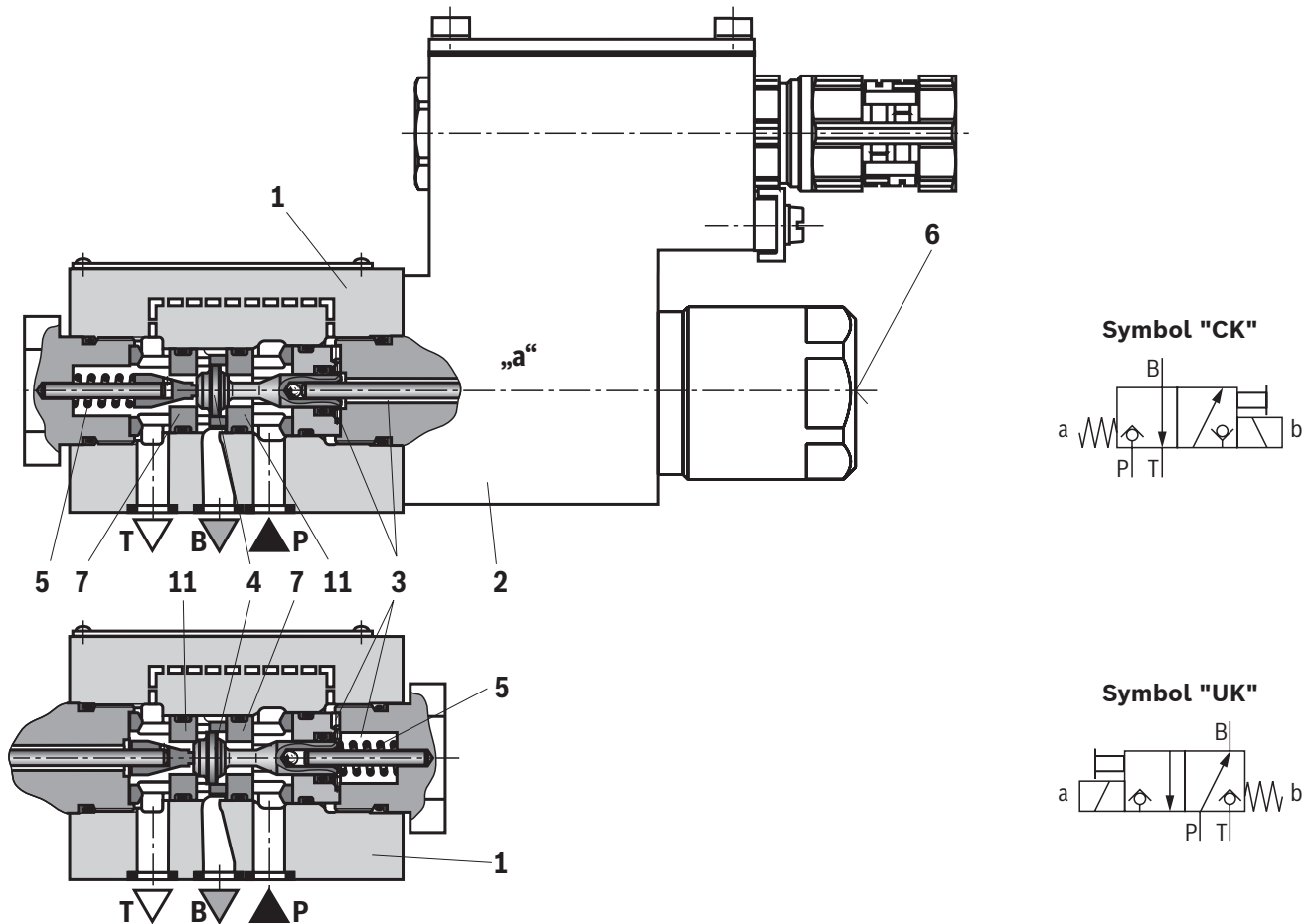
For unobjectionable functioning, the hydraulic system has to be bled properly.

Basic principle

The initial position of the valve (normally open "UK" or normally closed "CK") is determined by the arrangement of the spring (5). The chamber (3) behind the control spool (4) is connected to port T and sealed against port P. Thus, the valve is pressure-compensated in relation to the actuating forces (solenoid and spring).

In the initial position, the control spool (4) is pressed onto the seat (11) by the spring (5), in spool position, it is pressed onto the seat (7) by the solenoid (2).

Seat valves can be used according to the symbols as well as the assigned operating pressures and flows (see performance limits on page 6).



Technical data

(for applications outside these values, please consult us!)

General	
Installation position	any
Ambient temperature range	°C -10 ... +60 (normal operation) ¹⁾ -43 ... -10 (maximum of 50 switching cycles per valve life cycle)
Storage temperature range	°C +5 ... +40
Maximum storage time	Years 1
Maximum admissible acceleration a_{\max}	g 10
Weight	kg 3.1
Surface protection	Galvanized
Maximum surface temperature	°C See information on explosion protection, page 5
Maximum relative humidity (in operation at 25 °C)	% 90

Hydraulic	
Maximum operating pressure	bar See table page 6
Maximum flow	l/min 25
Hydraulic fluid	See table below
Hydraulic fluid temperature range	°C -10 ... +60 (normal operation) ¹⁾ -43 ... -10 (maximum of 50 switching cycles per valve life cycle)
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 ²⁾

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP	NBR	DIN 51524	90220
Silicone oil	PMS-20KG, EMS-20PK	NBR	-	-

**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.).

- ▶ Ignition temperature of used hydraulic fluid >180 °C. Self-ignition temperature of used hydraulic fluid >320 °C.

¹⁾ Please observe the "Special application conditions for safe application" on page 5.

²⁾ 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!)

Electric				
Voltage type	Direct voltage			
Available voltages	V 24			
Voltage tolerance (nominal voltage)	% -5/+10			
Admissible residual ripple	% < 5			
Duty cycle / operating mode according to VDE 0580	S1 (continuous operation)			
Switching times according to ISO 6403 ³⁾	▶ ON	Pressure change 5%	ms	60 ... 100
		Pressure change 95%	ms	70 ... 160
	▶ OFF	Pressure change 5%	ms	15 ... 25
		Pressure change 95%	ms	20 ... 80
Maximum switching frequency	1/h	3600		
Nominal power at ambient temperature 20 °C	W	17		
maximum power with 1.1 x nominal voltage and ambient temperature 20 °C	W	20.6		
Protection class according to EN 60529		IP65 (With correctly installed electrical connection)		

Information on explosion protection – Technical rules EAC TR CU 012/2011	
Type of protection marking of valve	2Ex e mc IIC T4 Gc X
Maximum surface temperature ⁴⁾	°C 100
Temperature class	T4
Certificate of conformity (Valve including valve solenoid)	RU C-DE.BH02.B.00381/20

³⁾ The switching times were determined in horizontal position at a hydraulic fluid temperature of 40 °C and a viscosity of 46 cSt. Deviating hydraulic fluid temperatures can result in different switching times. Switching times change dependent on operating time and application conditions.

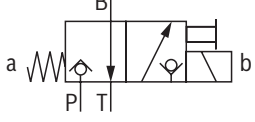
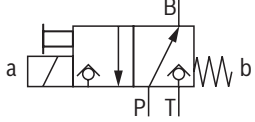
⁴⁾ Surface temperature >50 °C, provide contact protection.

 **Special application conditions for safe application:**

- ▶ Connection lines must be passed in a strain-relieved way. The first mounting point must be within 150 mm of the cable and line entry.
- ▶ The maximum temperature of the surface of the valve jacket is 100 °C. This has to be considered when selecting the connection cable and/or contact of the connection cable with the surface of the jacket is to be prevented.
- ▶ In case of bank assembly on valve subplate, neither both solenoids on the same valve subplate nor any solenoids next to each other may be energized (see page 9).
- ▶ In case of bank assembly on manifold, only one solenoid may be energized at a time (see page 9).

Performance limits

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

	Symbol	Comment	Operating pressure in bar				Flow in l/min
			P	A	B	T	
3-way circuit	CK 		350		350	30	25
	UK 		350		350	30	25

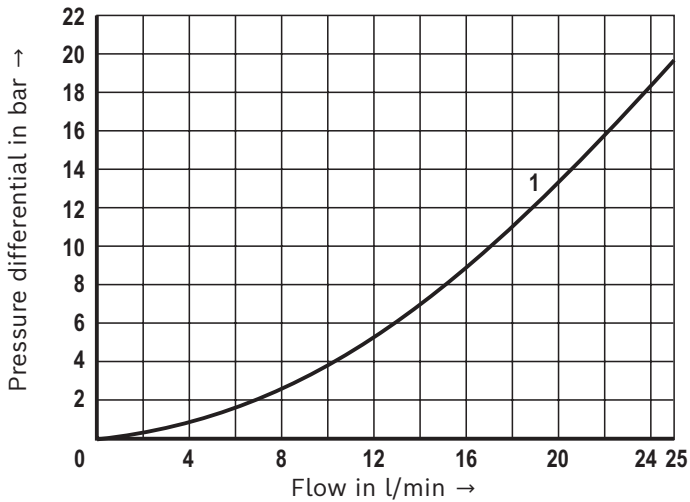
Notices:

- ▶ Please observe the general information, page 9.
- ▶ The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank preloading.

Characteristic curves

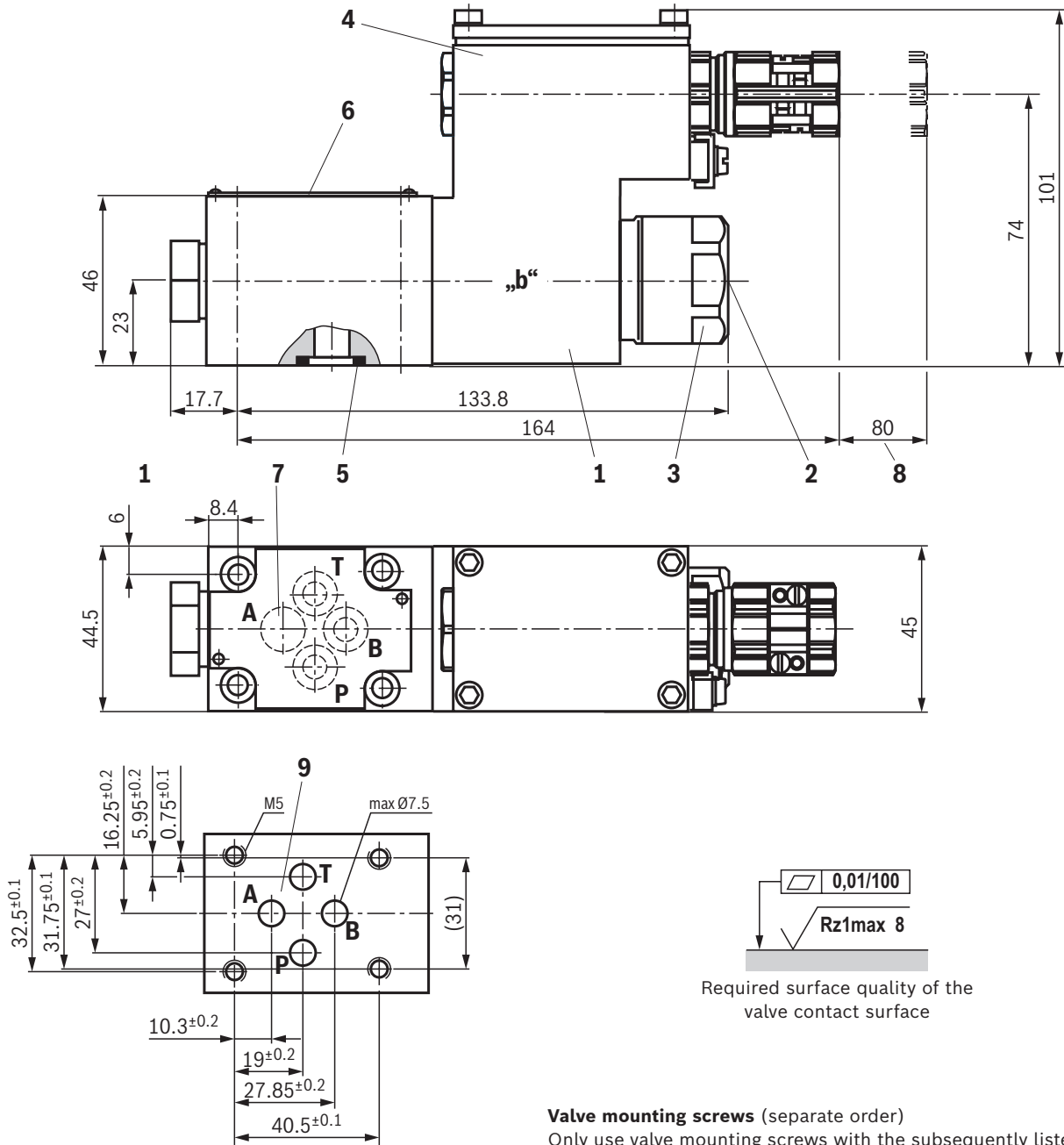
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

**Δp - q_v characteristic curves
3/2 directional seat valve**



1 P → B, B → T

Dimensions: Version "CK"
(dimensions in mm)



Required surface quality of the valve contact surface

- 1 Solenoid coil
- 2 Concealed manual override "N9"
- 3 Mounting nut with hexagon SW32
- 4 Terminal box
- 5 Identical seal rings for ports P, A, B, T
- 6 Name plate
- 7 Port A is designed as blind counterbore
- 8 Space required to remove the solenoid coil
- 9 Special connection diagram

Valve mounting screws (separate order)

Only use valve mounting screws with the subsequently listed thread diameters and strength properties:

4 hexagon socket head cap screws

ISO 4762 - M5 x 50 - 10.9

(friction coefficient $\mu_{total} = 0.09 \dots 0.14$);

Tightening torque $M_A = 7 \text{ Nm} \pm 10\%$,

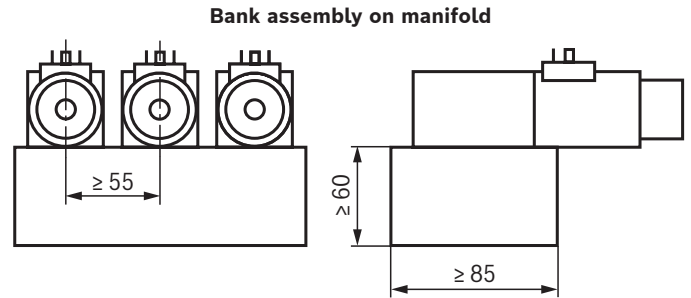
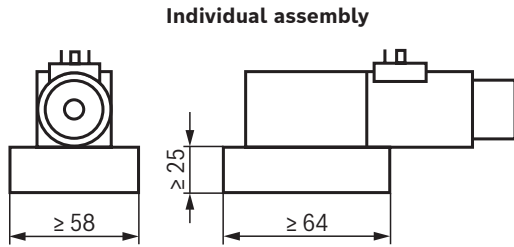
Material no. **R913043758**

Notice:

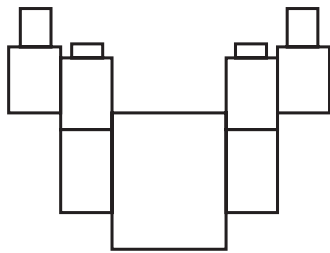
The dimensions are nominal dimensions which are subject to tolerances.

Installation conditions
(dimensions in mm)

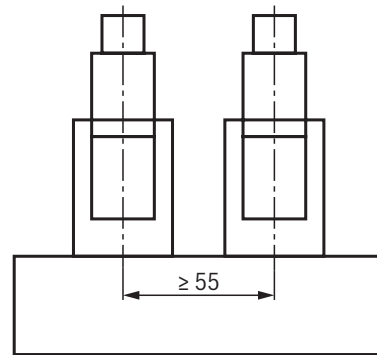
	Individual assembly	Bank assembly
Subplate dimensions	Minimum dimensions length ≥ 64 , width ≥ 58 , height ≥ 25	Minimum cross-section height ≥ 60 , width ≥ 85
Thermal conductivity of the subplate	≥ 36.2 W/mK	
Minimum distance between the longitudinal valve axes	≥ 55	



Individual assembly on valve subplate (type HSA...SO710)



Bank assembly on valve subplate (type HSA...SO710)



Notice:

Observe the "Special application conditions for safe application" on page 5 with regard to the hydraulic fluid temperature.

General information

Seat valves can be used according to the symbols as well as the assigned operating pressures and flows (see performance limits on page 6).

In order to ensure safe functioning, it is absolutely necessary to observe the following:

- ▶ Seat valves have a negative spool overlap, i.e. during the switching process, there is leakage oil. However, this process takes place within such a short time that it is irrelevant in nearly all applications.

- ▶ The specified maximum flow must not be exceeded (use a throttle insert for flow limitation in the subplate, if necessary).

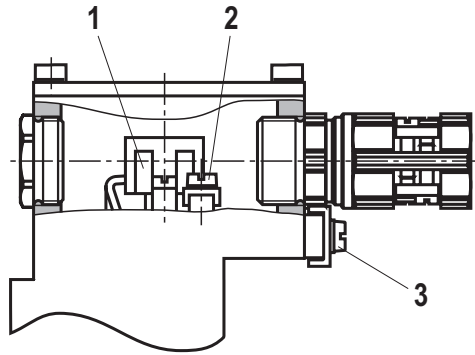
Electrical connection

The tested valve solenoid of the valve is equipped with one terminal box and a type-tested cable entry. The connection is polarity-independent.



Notice:

When establishing the electrical connection, the protective grounding conductor (PE \perp) has to be connected properly.



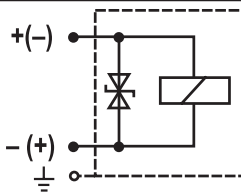
Properties of the connection terminals and mounting elements

Position	Function	Connectable line cross-section
1	Operating voltage connection	single-wire 0.75 ... 2.5 mm ² finely stranded 0.75 ... 1.5 mm ²
2	Connection for protective grounding conductor	single-wire max. 2.5 mm ² finely stranded max. 1.5 mm ²
3	Connection for potential equalization conductor	single-wire max. 6 mm ² finely stranded max. 4 mm ²

Connection line

Line type		non-armored cables and lines (outer sheath sealing)
Temperature range	°C	-43 ... +110
Line diameter	mm	7 ... 10.5

Direct voltage, polarity-independent



Notice:

Only use finely stranded conductors if they have pressed-on wire end ferrules.

Over-current fuse and switch-off voltage peaks

Voltage data in the valve type code	Nominal voltage valve solenoid	Rated current Valve solenoid	Rated current for external miniature fuse: Medium time-lag (M) according to EN/IEC 60127	Rated voltage for external miniature fuse: Medium time-lag (M) according to EN/IEC 60127	Maximum voltage value when switching off	Interference protection circuit
G24	24 V DC	0.708 A DC	800 mA	250 V	-90 V	Suppressor diode bi-directional

Notice:

Corresponding to the rated current, a fuse according to EN/IEC 60127 has to be connected upstream of every valve solenoid (max. $3 \times I_{rated}$).
The shut-off threshold of the fuse has to match the prospective short-circuit current of the supply source.
The prospective short-circuit current of the supply source may amount to a maximum of 1500 A.

This fuse may only be installed outside the potentially explosive atmospheres or must be of an explosion-proof design. When inductivities are switched off, voltage peaks result which may cause faults in the connected control electronics.

Accessories (separate order)

Subplates

Version	Type of subplate	Material number
"CK"	HSA 06 R071-3X/P18MT00-SO710	R901231724
	HSA 06 R071-3X/P08MT00-SO710	R901333462
	HSA 06 R071-3X/MT00-SO710	R901517496
"UK"	HSA 06 R075-3X/P08MT00-SO710	R901338319

Notice:

Valve mounting screws are included with the subplates.

Further information

- ▶ Hydraulic fluids on mineral oil basis
- ▶ Directional seat valves, direct-operated, with solenoid actuation
- ▶ Selection of filters
- ▶ Information on available spare parts

Data sheet 90220
Operating instructions 22049-XE-710-B
www.boschrexroth.com/filter
www.boschrexroth.com/spc

Notes

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