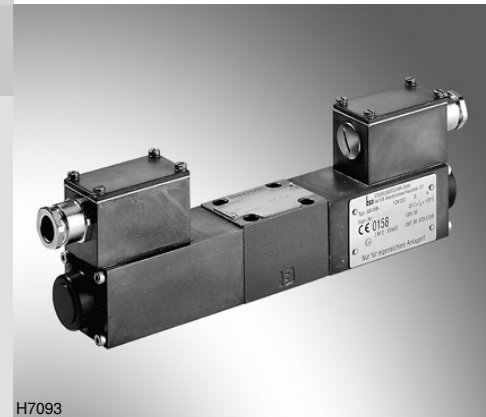


# 4/3, 4/2 and 3/2 directional valves with wet-pin DC solenoids

**RE 23177-XH-B2/11.12**  
Replaces: 04.12

**Type WE 6 ../.B..X...**

Size 6  
Component series 5X  
Maximum operating pressure 210 bar  
Maximum flow 20 l/min



**ATEX units**  
**For explosive areas**

**Part II Data sheet**



**Information on explosion protection:**

- Area of application in accordance with the Explosion Protection Directive 94/9/EC: **I M2; II 2G**
- Type of protection of the valve solenoids:  
Ex ib I Mb / Ex ib IIC T6 Gb according to  
EN 60079-0:2009 / EN 60079-11:2007

## What you need to know about these operating instructions

These operating instructions apply to the explosion-proof version of Rexroth valves and consist of the following three parts:

- Part I General information 07010-X-B1
- Part II Data sheet 23177-XH-B2
- Part III Product-specific instructions 23177-XH-B3

**Operating instructions 23177-XH-B0**

You can find further information on the correct handling of Rexroth hydraulic products in our publication "General product information on hydraulic products" 07008.

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## Features

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- Direct operated directional spool valve with solenoid actuation for proper use in explosive atmospheres
- Porting pattern according to ISO 4401-03-02-0-05
- Subplates available in FE/ZN version (see page 10)
- Wet-pin DC solenoids
- Electrical connection optionally with:
  - Individual connection with cable gland
  - 2 m connection line
  - Connector
- With manual override

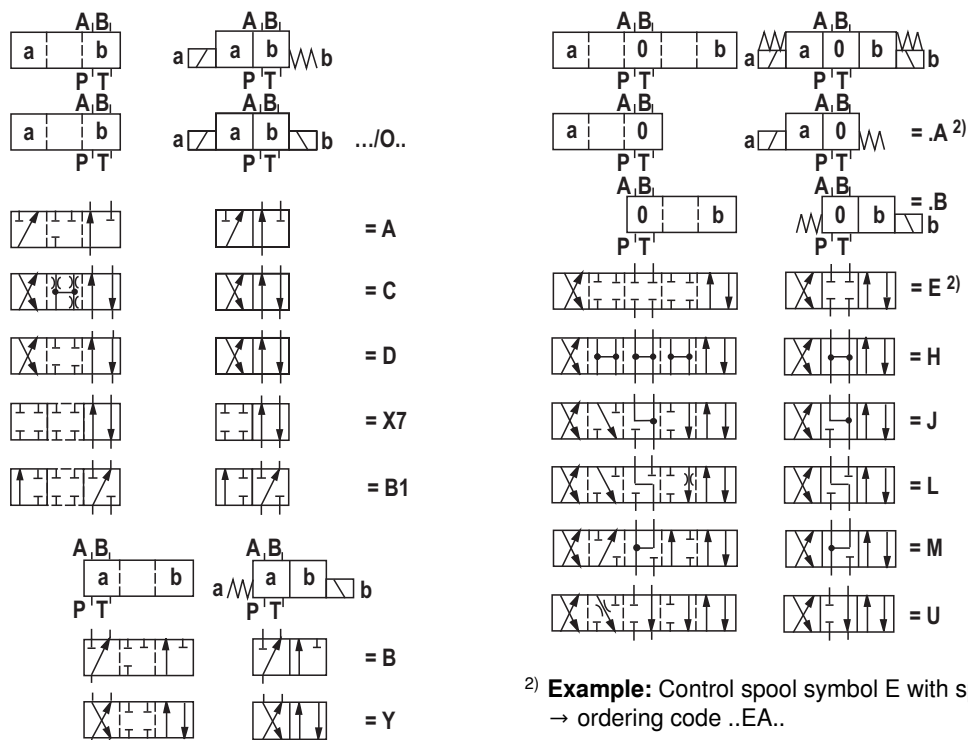
### Ordering code and scope of delivery

		<b>WE</b>	<b>6</b>		<b>5X</b> /	<b>B</b>		<b>N</b>		/				
3 main ports	= 3											no code =	NBR seals	
4 main ports	= 4											V =	FKM seals	
Size 6	= 6												<b>Important:</b> Observe compatibility of seals with hydraulic fluid used!	
Control spool symbol e.g. C, E, EA, EB etc. possible versions see below												no code =	Without throttle insert	
Component series 50 to 59 (50 to 59: unchanged installation and connection dimensions)	= 5X											<b>B08 =</b>	Throttle Ø 0.8 mm	
Spring return	= no code											<b>B10 =</b>	Throttle Ø 1.0 mm	
Without spring return	= O											<b>B12 =</b>	Throttle Ø 1.2 mm	
High-power solenoid wet-pin	= B												Use if flow > performance limit of the valve, effective in channel P	
Solenoid, direct voltage 12 V													Electrical connection	
Nominal power supply 120 mA	= G12-12											<b>CKL =</b>	Solenoid with 2 m connection line	
Nominal power supply 130 mA	= G12-13											<b>Z2 =</b>	Solenoid with terminal box and cable gland	
Nominal power supply 190 mA	= G12-19											<b>K20L =</b>	Solenoid with connector	
Depending on the electrical connection, see page 7													For details see chapter Electrical connection	
<b>Important:</b> For possible combinations for the ordering code "Solenoid", "Electrical connection" and "Explosion protection" please refer to the table on page 7.												<b>XH =</b>	Explosion protection "Intrinsically safe", for component group II (all, except for mining)	
												<b>XM =</b>	Explosion protection "Intrinsically safe" for component group I (mining) Details see information on the explosion protection page 6	
												<b>N =</b>	With manual override (standard)	

#### Included in the scope of delivery:

Valve operating instructions with declaration of conformity  
in part III

### Control spool symbols



## Function, section

Directional valves of type WE are solenoid operated directional spool valves. They control the start, stop and direction of a fluid flow.

The directional valves basically consist of housing (1), one or two solenoids (2), control spool (3), and one or two return springs (4).

In the de-energized condition, control spool (3) is held in the central position or in the initial position by the return springs (4) (except for impulse spool). The control spool (3) is actuated by wet-pin solenoids (2).

**To ensure proper functioning, care must be taken that the pressure chamber of the solenoid is filled with oil.**

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. This enables the necessary direction of flow from P → A and B → T or P → B and A → T.

After solenoid (2) was de-energized, return spring (4) pushes control spool (3) back to its rest position.

A manual override (6) allows control spool (3) to be moved without solenoid energization.

**Type 4WE 6.. 5X/O...X** (only possible with symbols A, C and D)

This version is a directional valve with two spool positions and two solenoids without detent. In the de-energized condition, there is no defined spool position.

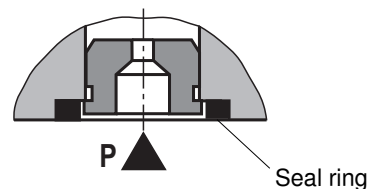
**Important:**

**The tank line must not be allowed to run empty. With corresponding installation conditions, a pre-charge valve (pre-charging pressure approx. 2 bar) must be installed.**

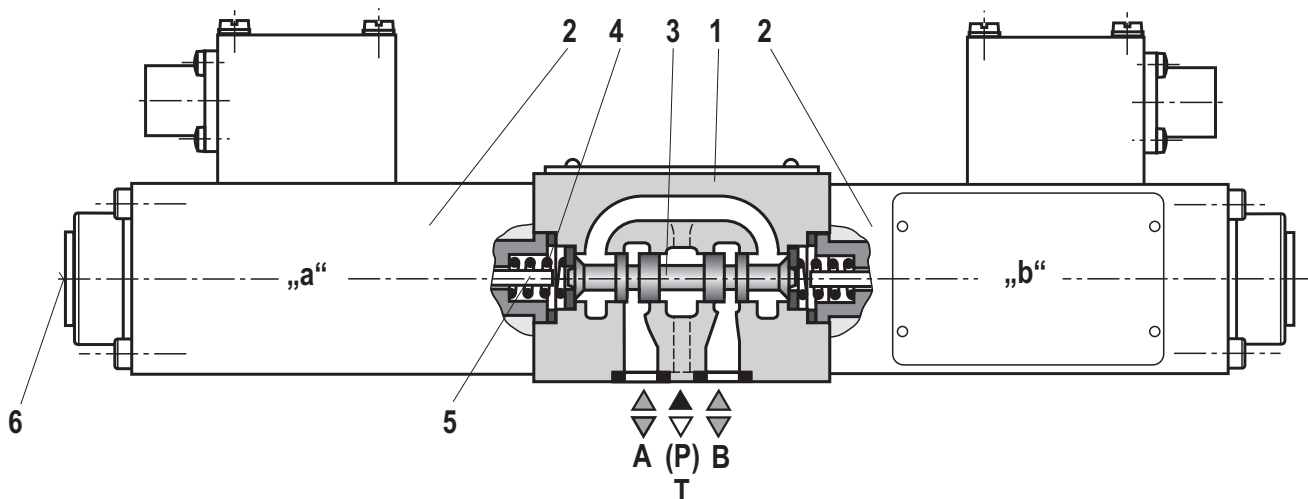
**Throttle insert** (valve type 4WE 6..5X/...X.../B..)

The use of a throttle insert is required when due to prevailing operating conditions, flows can occur during the switching processes, which exceed the performance limit of the valve.

It is inserted in channel P of the directional valve.



**Example: Type 4WE 6 E5X/.B.X.K20L/..**



## Technical data

### general

Installation position		Any
Ambient temperature range	°C	-20 ... +50
Storage temperature range	°C	+15... +30
Admissible vibration load		20 ... 2000 Hz amplitude 0.05 g <sup>2</sup> /Hz (10 g RMS)
Weight	kg	2.6 (with 1 solenoid); 4.2 (with 2 solenoids)
Surface protection	Valve body	Galvanically coated
	Solenoid	Galvanically coated

### hydraulic

Maximum surface temperature	°C	See information on the explosion protection, page 6
Maximum operating pressure	Port A, B, P	bar 210
	Port T	bar 100 With symbols A and B, port T must be used as leakage oil connection if the operating pressure exceeds the admissible tank pressure.
Maximum flow	l/min	20
Hydraulic fluid		Mineral oil (HL, HLP) according to DIN 51524 <sup>1)</sup> ; fast bio-degradable hydraulic fluids according to VDMA 24568 (see also data sheet 90221); HETG (rape seed oil) <sup>1)</sup> ; HEPG (polyglycols) <sup>2)</sup> ; HEES (synthetic esters) <sup>2)</sup> ; flame-resistant hydraulic fluid HFC according to ISO 12922 <sup>3)</sup> Other hydraulic fluids upon request Ignition temperature > 130 °C
Hydraulic fluid temperature range	°C	-20 ... +80 (NBR seals)
		-15 ... +50 (FKM seals)
Viscosity range	mm <sup>2</sup> /s	2.8 ... 500
Maximum admissible degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>4)</sup>

<sup>1)</sup> Suitable for NBR **and** FKM seals

<sup>2)</sup> Suitable **only** for FKM seals

<sup>3)</sup> Only in connection with NBR seals  
For more information, please ask our sales staff.

<sup>4)</sup> 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](http://www.boschrexroth.com/filter).

## Technical data

### electric

Nominal voltage	V	12		
Voltage type		Direct voltage (DC)		
Admissible residual ripple	%	< 5		
Voltage tolerance	%	±10		
Duty cycle / operating mode according to VDE 0580		100 % / S1 (DB)		
Information on the rated current in the ordering code		<b>G12-12</b>	<b>G12-13</b>	<b>G12-19</b>
Rated current	mA	120	130	190
Coil resistance with solenoid temperature 20 °C	Ω	89		59
Minimum current for achieving the hydraulic switching power	mA	88	96	143
Switching times according to ISO 6403	On	145		105
	Off	80		100
Switch-off voltage peak Solenoid	V	Max. -3		
Protection class according to EN 60529 <sup>1)</sup>		IP 65		

### Information on explosion protection

Ordering code	G12-12		G12-13		G12-19
Ordering code	XM	XH	XM	XH	XM
Area of application as per directive 94/9/EC	I M2	II 2G	I M2	II 2G	I M2
Type of protection valve solenoid according to EN 60079-0:2009 / EN 60079-11:2007	Ex ib I Mb	Ex ib IIC T6 Gb	Ex ib I Mb	Ex ib IIC T6 Gb	Ex ib I Mb
Maximum surface temperature <sup>2)</sup>	80		80		80
Temperature class	-	T6	-	T6	-
Type examination certificate Solenoid	BVS 08 ATEX E 023				
"IEC Certificate of Conformity" Solenoid	IECEX BVS 07.0008				
Type of protection Valve	c (EN 13463-5:2011)				
Special operating conditions for a safe application	In case of valves with two solenoids, maximally one of the solenoids may be energized at a time.				

<sup>1)</sup> With correctly installed electrical connection

<sup>2)</sup> Surface temperature > 50 °C, provide contact protection

## Technical data

### Information on explosion protection (continued)

Safety-related maximum values of the solenoids depending on the component group and the type of the electrical connection

Component group	I (mining)			II (all, except for mining)		
Ordering code for explosion protection	XM			XH		
Ordering code for solenoid	G12-12	G12-13	G12-19	G12-12	G12-13	G12-19

#### Electrical connection CKL

Maximum voltage $U_i$	V DC			15	15			27		
Maximum current $I_i$	A			2	2			2		
Maximum input power $P$	W	Version not available				Version not available		3	Version not available	
Effective inner inductivity $L_i$ <sup>1)</sup>	nH/m		820	820	820					
Effective inner capacity $C_i$ <sup>1)</sup>	pF/m		145	145	145					
Ambient temperature range	°C		-20...+50	-20...+50	-20...+50					

#### Electrical connection Z2

Maximum voltage $U_i$	V DC	15			27		
Maximum current $I_i$	A	2			2		
Effective inner inductivity $L_i$	nH	Neglectable	Version not available	Version not available	Neglectable	Version not available	Version not available
Effective inner capacity $C_i$	pF	Neglectable			Neglectable		
Ambient temperature range	°C	-20...+50			-20...+50		

#### Electrical connection K20L

Maximum voltage $U_i$	V DC			15				
Maximum current $I_i$	A			2				
Effective inner inductivity $L_i$	nH	Version not available	Version not available	Neglectable	Version not available	Version not available	Version not available	Version not available
Effective inner capacity $C_i$	pF			Neglectable				
Ambient temperature range	°C			-20...+50				

<sup>1)</sup> Measured with connection line 2 x 0.75 mm<sup>2</sup>, maximum length 10 m

## Electrical connection

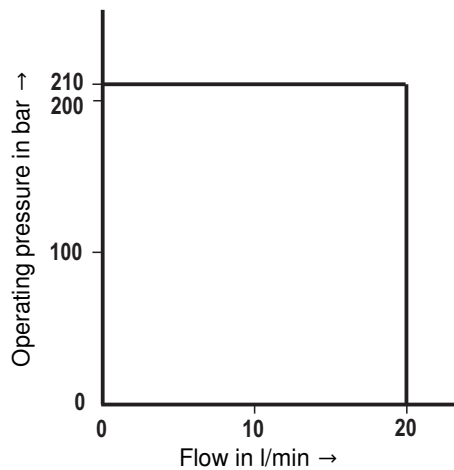
The type-examination tested valve solenoid of the valve is equipped with an electrical connection according to the following table. The electrical connection of the solenoid is polarity-independent.

Ordering code for the electrical connection	Type of connection Description	Circuit diagram	Ordering code for the solenoid, availability	
<b>CKL</b>	<ul style="list-style-type: none"> <li>– Electrical connection via non-exchangeable, two-core connection line, blue</li> <li>– Operating display via light emitting diode (LED), red</li> </ul>		<b>G12-13</b> (130 mA) <b>G12-19</b> (190 mA)	
	Connection line, two-core			
	Line cross-section			mm <sup>2</sup> 0.75 finely stranded
	Line diameter			mm approx. 5.6
	Length	m 2		
<b>Z2</b>	<ul style="list-style-type: none"> <li>– Electrical connection via 2-pole terminal in terminal box</li> <li>– with cable gland</li> <li>– without operating display</li> </ul>		<b>G12-12</b> (120 mA)	
	Cable gland			
	Threaded connection			M20x1.5
	Line diameter			mm 6.5...9.5 <sup>1)</sup>
	Sealing			Outer sheath sealing
Connection terminal Solenoid				
	For line cross-section	mm <sup>2</sup> 0.75 ... 1.5		
<b>K20L</b>	<ul style="list-style-type: none"> <li>– Electrical connection via connector, 3-pole with pin contacts, type 845-11-1125-001, FCI/Souriau</li> <li>– Operating display via light emitting diode (LED), red</li> <li>– Suitable mating connector, type 845-11-8522-001, FCI/Souriau, must be ordered separately</li> </ul>		<b>G12-19</b> (190 mA)	
				12 V DC

<sup>1)</sup> Larger diameters upon request



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



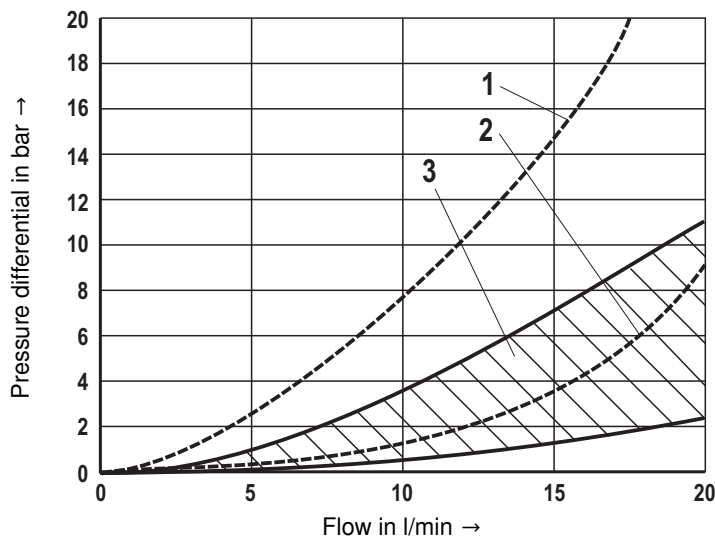
**Important:**

The specified switching power limits are valid for operation with two directions of flow (e.g. from P → A and simultaneous return flow from B → T).

Due to the flow forces acting within the valves, the admissible switching power limit may be considerably lower with only one direction of flow (e.g. from P → A while port B is blocked)! (In such cases, please consult us.)

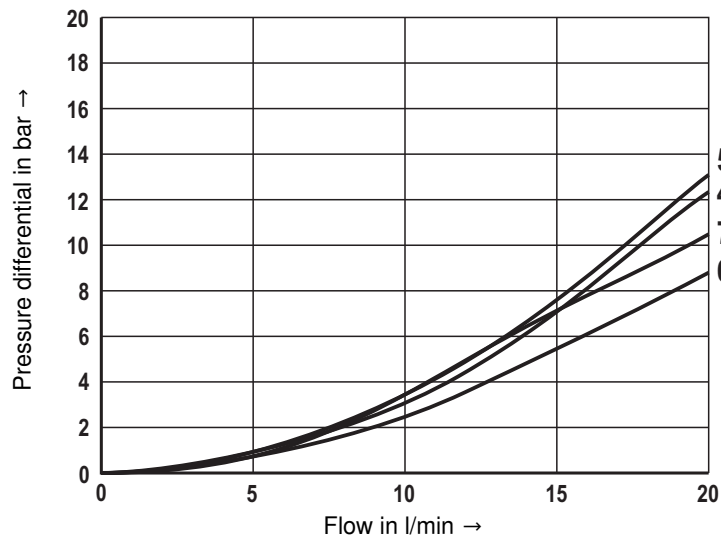
The switching power limit was established while the solenoids were at operating temperature, at 10 % undervoltage and without tank pre-loading.

**Characteristic curves** (measured with HLP46,  $\vartheta_{oil} = 40 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$  and  $p = 100 \text{ bar}$ )



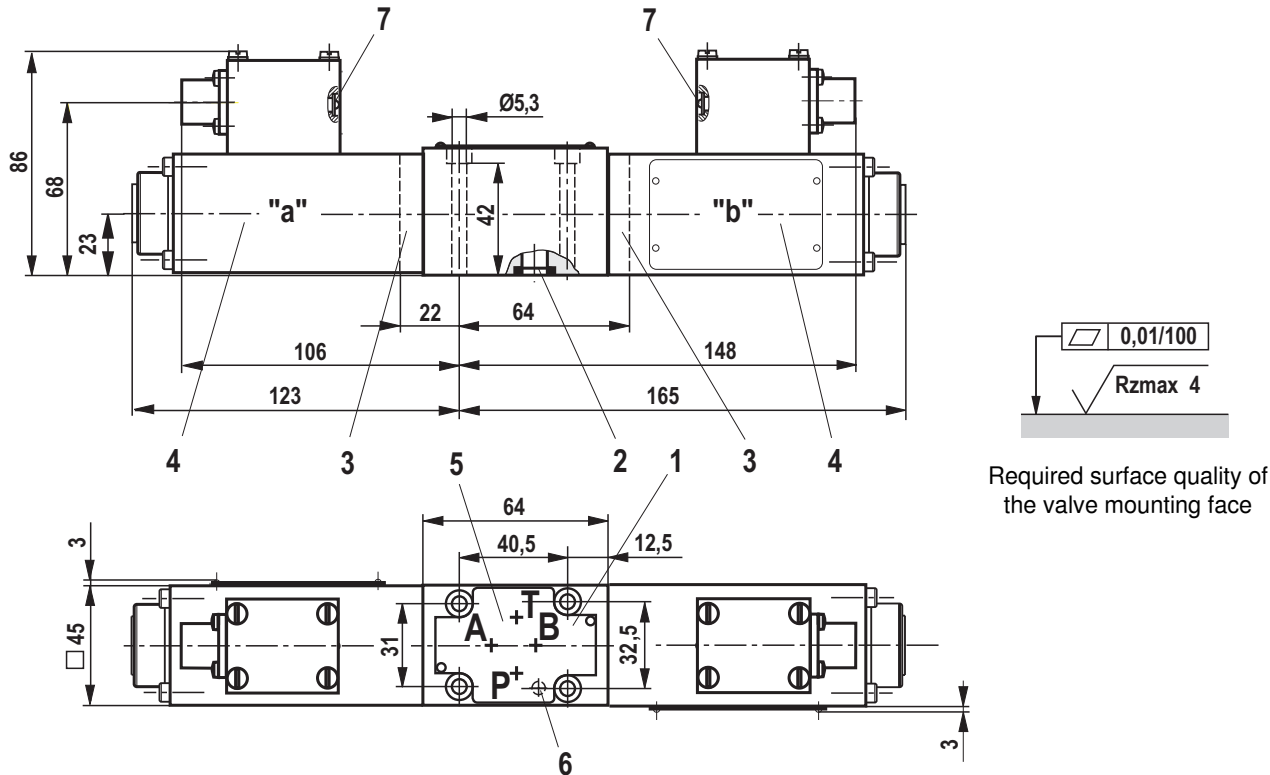
**Characteristic curve selection**

Control spool symbols	Characteristic curves for direction of flow			
	P-A	P-B	A-T	B-T
D, Y	1	1	2	2
A, B, C, E, H, J, L, M, U	3			
B1	5	4	-	-
X7	7	-	-	6



## Unit dimensions (dimensions in mm)

### Type WE 6 ../.B..X.K20L/...



- 1 Name plate
- 2 Identical seal rings for ports A, B, P, T
- 3 Cover for valves with one solenoid
- 4 Valve solenoid
- 5 Porting pattern according to ISO 4401-03-02-0-05
- 6 Receiving hole for locating pin according to ISO 4401-03-02-0-05, (locating pin must be ordered separately, mat. no. **R900005694**)
- 7 Red LED for displaying the operating condition, or plug screw (see also page 11)

#### Subplates

( <b>without</b> locating hole)	G 341/01 FE/ZN (G1/4)
	G 342/01 FE/ZN (G3/8)
	G 502/01 FE/ZN (G1/2)
( <b>with</b> locating hole)	G 341/60 FE/ZN (G1/4)
	G 342/60 FE/ZN (G3/8)
	G 502/60 FE/ZN (G1/2)

with dimensions as in the data sheet 45052  
(must be ordered separately)

#### Important:

Subplates are no components in the sense of directive 94/9/EC and can be used after the manufacturer of the overall system has assessed the risk of ignition.

The G...FE/ZN versions are free from aluminum and/or magnesium and galvanized.

#### Valve mounting screws

For reasons of stability, exclusively use the following valve mounting screws:

#### 4 hexagon socket head cap screws

#### ISO 4762-M5x50-10.9-fIZn-240h-L

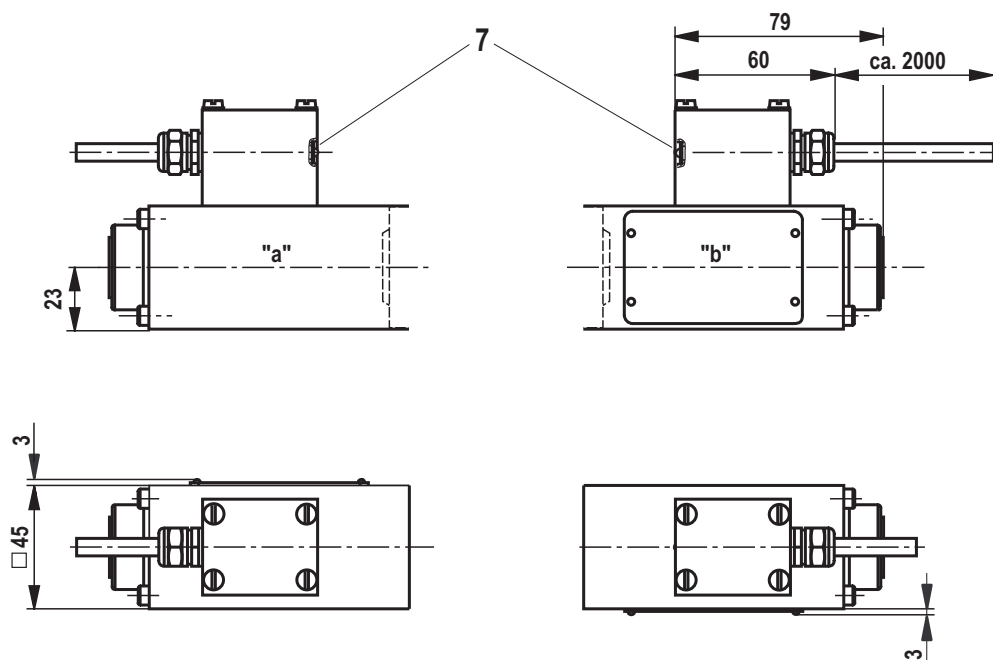
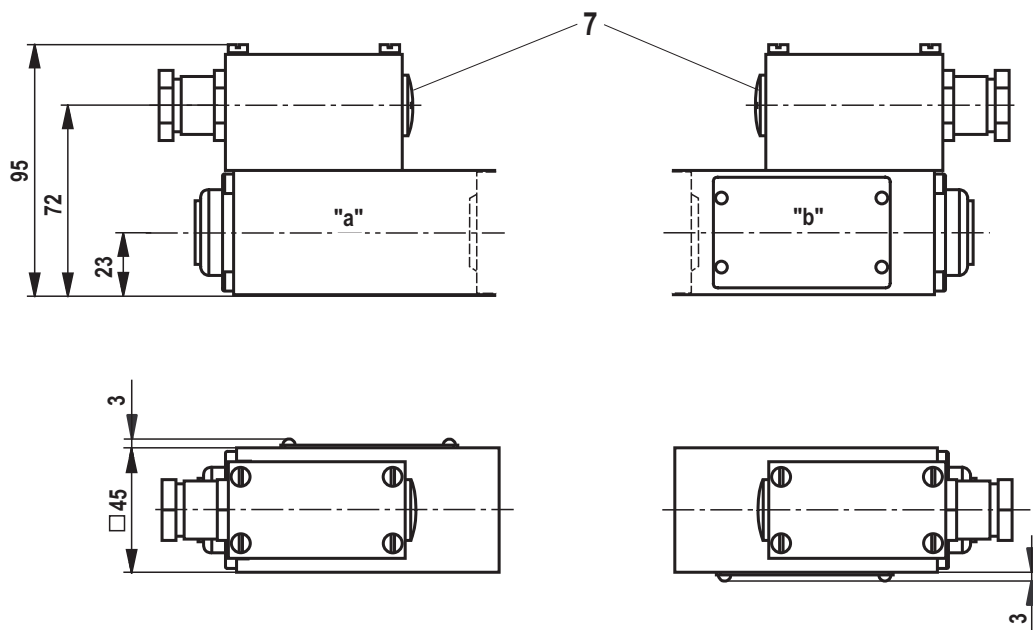
(friction coefficient 0.09 – 0.14 according to VDA 235-101)

Mat. no. **R913000064**

(must be ordered separately)

**Unit dimensions** (dimensions in mm)

Item explanations see page 10

**Type WE 6../B.X.CKL/...** (readily assembled with 2 x 2 m connection line)**Type WE 6../B.X.Z2/...** (with terminal box and cable gland)

**Installation conditions** (dimensions in mm)

	Individual assembly	Bank assembly
Subplate dimensions	Minimum dimensions Length $\geq 64$ , width $\geq 58$ , height $\geq 25$	Minimum cross-section Height $\geq 60$ , width $\geq 85$
Heat conductivity of the subplate	$\geq 38$ W/mK (EN-GJS-500-7)	
Minimum distance between the longitudinal valve axes	$\geq 55$ mm	

**Schematic diagram**