

4/3, 4/2 and 3/2 directional valve with manual actuation

RE 22280-XC-B2/07.09

Type WMM 6...XC

Size 6
Component series 5X
Maximum operating pressure 315 bar
Maximum flow 60 l/min



ATEX devices
For explosive areas

Part II Technical data sheet



Explosion protection information:

- Area of application according to explosion protection directive and ignition protection type
- Area of application according to directive 94/9/EC **IM2, II2G, II2D, II3G, II3D**
 - Ignition protection type of the valve: c (EN 13463-5:2004-03)

What you should know about these operating instructions

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

- Part I General information RE 07010-X-B1
Part II Technical data sheet RE 22280-XC-B2
Part III Product-specific instructions RE 22280-XC-B3

RE 22280-XC-B0

Further information regarding the correct handling of hydraulic products of Rexroth is contained in our publication "General product information on hydraulic products" RE 07008.

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Features

- Direct operated directional spool valve for the intended use in explosive atmospheres
- Actuating elements:
Handle-operated lever
- Porting pattern according to DIN 24340 form A (without locating hole)
- Porting pattern according to ISO 4401-03-02-0-05 (with locating hole)

Ordering code and scope of delivery

	WMM	6	5X/	XC			
3 main connections	= 3						
4 main connections	= 4						
Type of actuation							
Handle-operated lever	= WMM						
Size 6		= 6					
Spool symbols e.g. C, E, EA, EB, etc.							
Possible designs see page 3							
Component series 50 to 59 (50 to 59: unchanged installation and connection dimensions)			= 5X				
with spring return					= No code		
with detent						= F	
							No code = without locating hole
							/60¹⁾ = with locating hole
							/62 = with locating hole and grooved pin ISO 8741-3x8-St
							Seal material
							No code = NBR seals
						V =	FKM seals
							Note: Observe compatibility of seals with hydraulic fluid used!
							No code = without throttle insert
						B08²⁾ =	Throttle Ø 0.8 mm
						B10²⁾ =	Throttle Ø 1.0 mm
						B12²⁾ =	Throttle Ø 1.2 mm
						XC =	Valve in explosion-proof design, for details see explosion protection information page 6

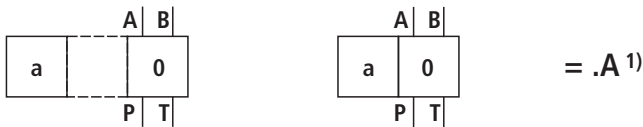
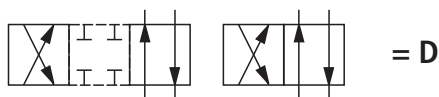
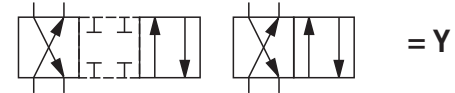
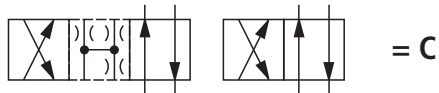
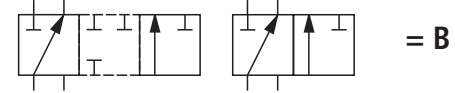
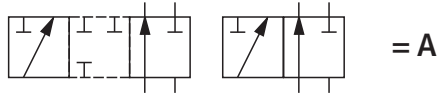
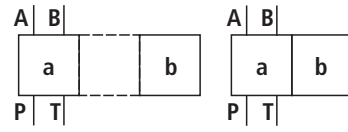
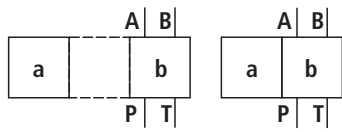
¹⁾ Grooved pin ISO 8741-3x8-St-A2C, material no. **R900005076** (separate order)

²⁾ Application in case of flow > performance limit of the valve, effective in the P channel.

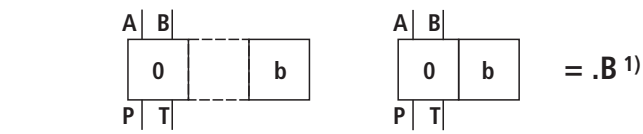
Included in the scope of delivery:

Valve operating instructions with declaration of conformity in part III

Spool symbols

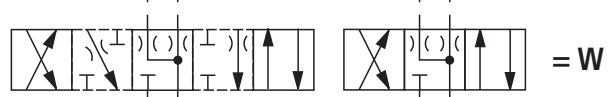
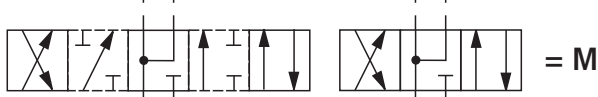
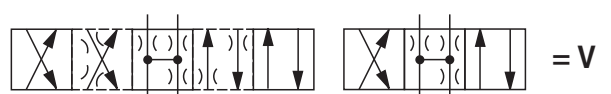
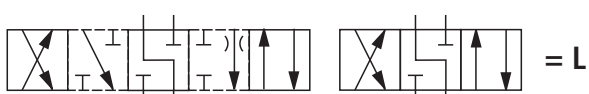
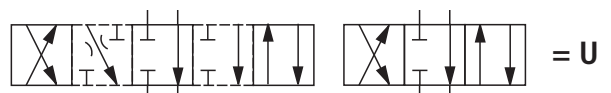
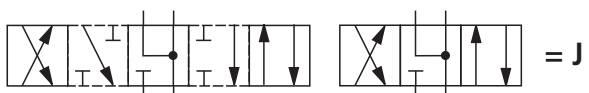
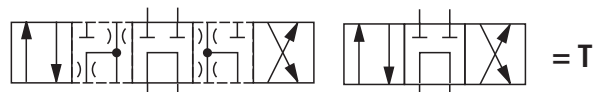
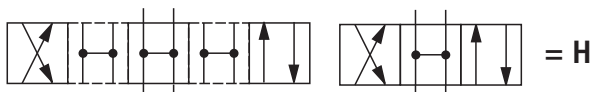
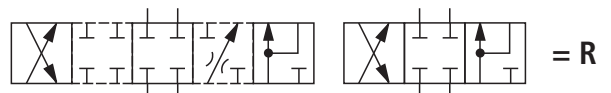
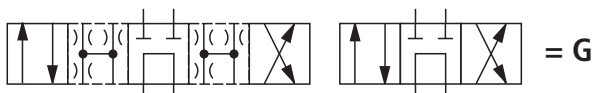
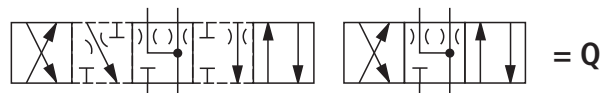
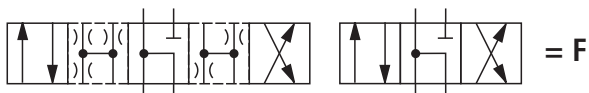
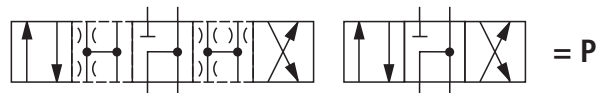
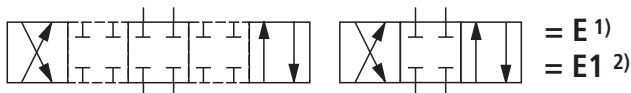
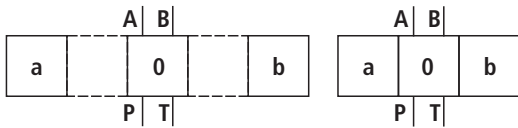


1) **Example:**
 - Spool E with spool position "a" → ordering code **..EA..**
 - Spool E with spool position "b" → ordering code **..EB..**

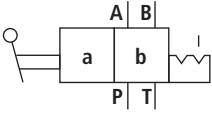
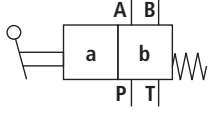
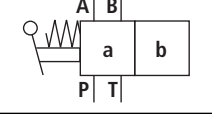
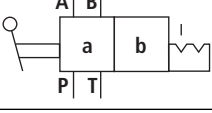
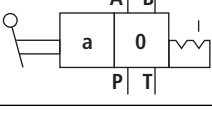
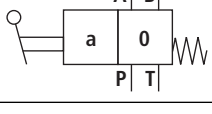
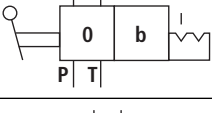
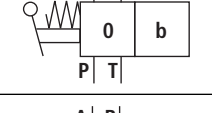
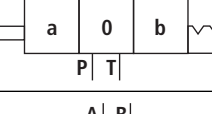
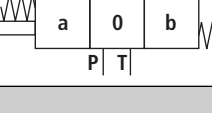


2) **Symbol E1-:** P → A/B pre-opening

Be careful because of the pressure intensification with single-rod cylinders!



Types of actuation

Spool symbol	Ordering code		Type of actuation
	Actuation side	Detent	Handle-operated lever Type WMM 6...XC
A, C, D,		../F..	
			
B, Y,			
		../F..	
E, E1, F, G, H, J, L M, P, Q, R, T, U, V, W	"a" 1) = .A	../F..	
			
	"b" 1) = .B	../F..	
			
		../F..	
			

1) See spool symbols page 3

Function, section

Valves of type WMM 6...XC are manually actuated directional spool valves.

They control the start, stop and direction of a flow.

The directional valves basically consist of housing (1), an actuating element (2) (handle-operated lever), the control spool (3), and one or two return springs (4).

In the de-energized condition, control spool (3) is held in the central or initial position by the return springs (4).

By means of the actuating elements, the control spool (3) is pushed in the desired spool position.

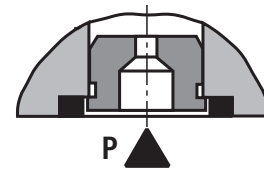
Detent

Directional valves with handle-operated lever are optionally available as 2- or 3-position valves with detent. When using actuating elements with detent, each spool position can be fixed, depending on the valve type.

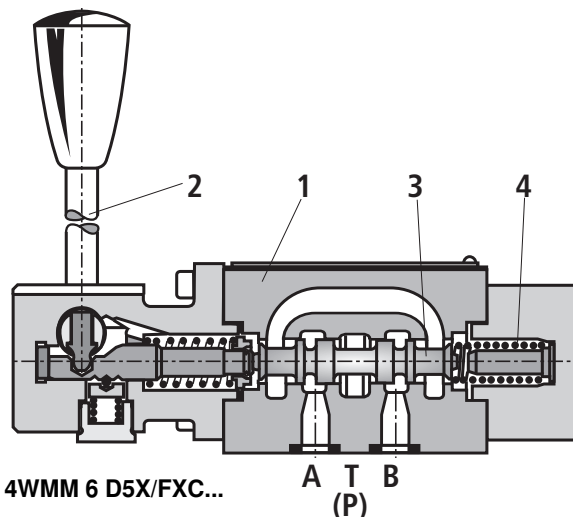
Throttle insert

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

It is inserted in channel P of the directional valve.



Type . WMM 6 ..5X/..B..



Type 4WMM 6 D5X/FXC...

Technical data

general			
Weight		kg	ca. 1.4
Installation position			Any
Ambient temperature range		°C	-30 ... +80 (NBR seals) -20 ... +80 (FKM seals)
hydraulic			
Maximum operating pressure	- Port A, B, P	bar	315
	- Port T	bar	100 With symbols A or B, port T must be used as leakage port if the operating pressure exceeds the admissible tank pressure, 2 bar minimum pre-load pressure required.
Maximum flow		l/min	60
Flow cross-section	- Spool symbol Q		6 % of nominal cross-section
	- Spool symbol W		3 % of nominal cross-section
Hydraulic fluid	Mineral oil (HL, HLP) according to DIN 51524 ¹⁾ ; quickly bio-degradable hydraulic fluids according to VDMA 24568 (also see RE 90221); HETG (rape seed oil ¹⁾ ; HEPG (polyglycols) ²⁾ ; HEES (synthetic ester) ²⁾ ; HFC according to ISO 12922 ³⁾ ; other hydraulic fluids upon request		
Hydraulic fluid temperature range		°C	-30 ... +80 (NBR seals) -20 ... +80 (FKM seals)
Viscosity range		mm ² /s	2.8 ... 500
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)	Class 20/18/15 ⁴⁾		

Explosion protection information

Area of application according to directive 94/9/EC		IM2; II2G; II2D; II3G; II3D
Ignition protection type Valve		c (EN 13463-5:2004-03)
Maximum surface temperature ⁵⁾ Temperature class ⁵⁾	°C	100 T4
Special conditions for a safe use		
Ambient temperature range	°C	-20 ... +80

¹⁾ Suitable for NBR **and** FKM seals

²⁾ Suitable **only** for FKM seals

³⁾ Suitable **only** for NBR seals

⁴⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and at the same time increases the service life of the components. For the selection of filters, see data sheets RE 50070, RE 50076, and RE 50081.

⁵⁾ The specified max. temperature or temperature class refers to the max. permitted fluid and ambient temperature. A max. pressure drop across the valve results in a surface temperature 20 K above the fluid temperature, i.e. application in T6 is possible if the fluid and ambient temperature is max. 60 °C.

Note:

The ignition temperature of the hydraulic fluid used must be 50 K higher than the surface temperature of the valve.

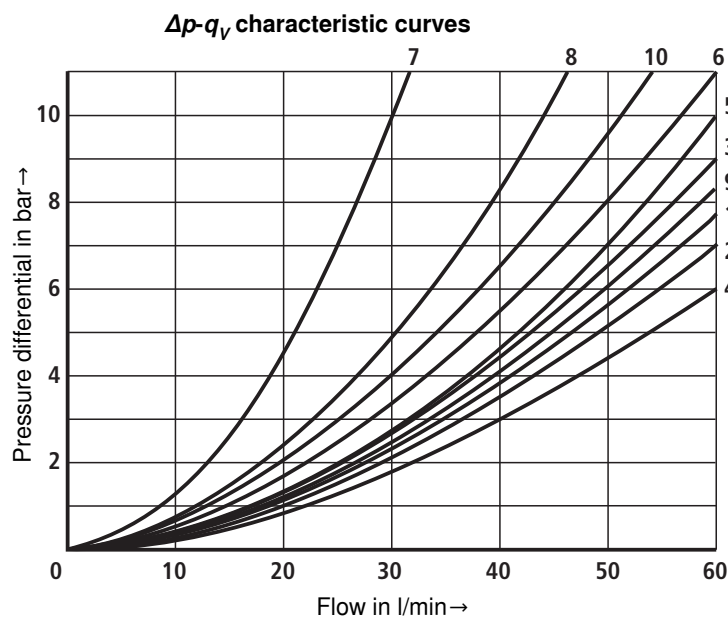
Actuating force/torque

		Type WMM 6...XC
Maximum actuating torque	Ncm	–
Actuating force	– without tank pressure, with/without detent	20
	– with tank pressure 150 bar	30

Calculation formula for actuating force at the roller plunger (F_R) with tank pressure:

$$F_R = F_{\text{w/o t pressure}} + p_T \times 1.4 \text{ N/bar}$$

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



More characteristic curves:

- 7 Spool symbol "R" in spool position "b" (A → B)
- 8 Spool symbols "G" and "T" in central position (P → T)

Spool symbols	Flow direction			
	P-A	P-B	A-T	B-T
A	3	3	–	–
B	3	3	–	–
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	–
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2
Y	5	5	3	3

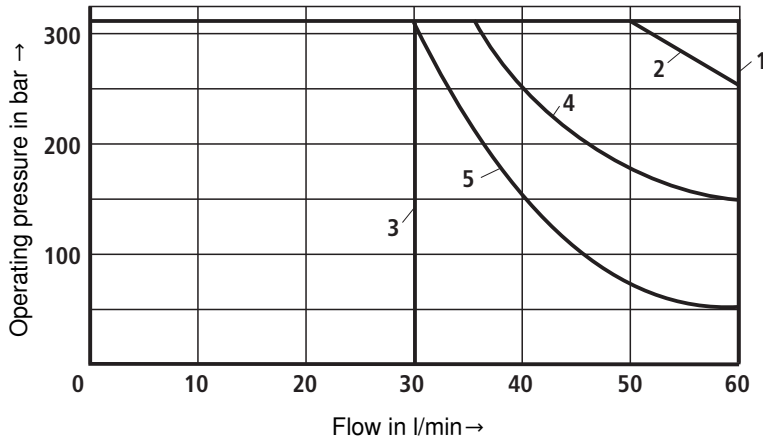
Performance limits (measured with HLP46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

The specified switching power 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 permissible switching power limits may be considerably lower with only one direction of flow (e.g. from P to A while port B is blocked)!

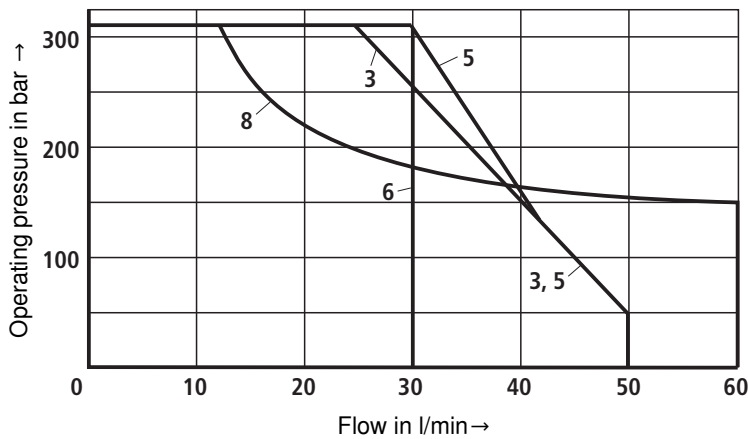
In such cases, please consult us.

Type WMM 6...XC - Spring return



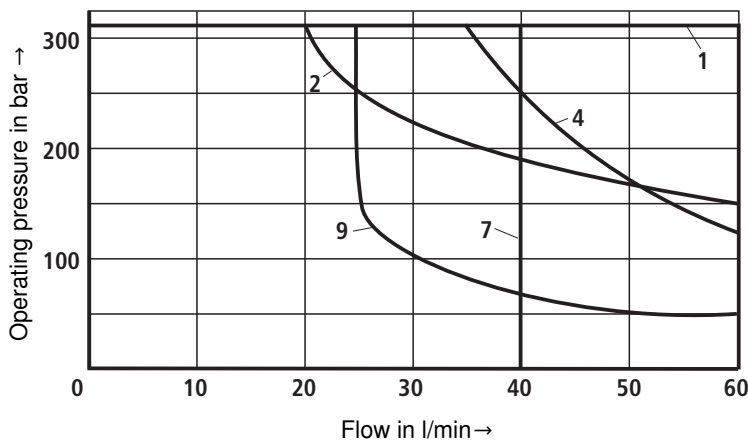
Characteristic curve	Spool symbol
1	E, E1, M, J, L, Q, U, W, C, D, Y, G, H, R
2	A, B
3	V
4	F, P
5	T

Type WMM 6...XC - with detent



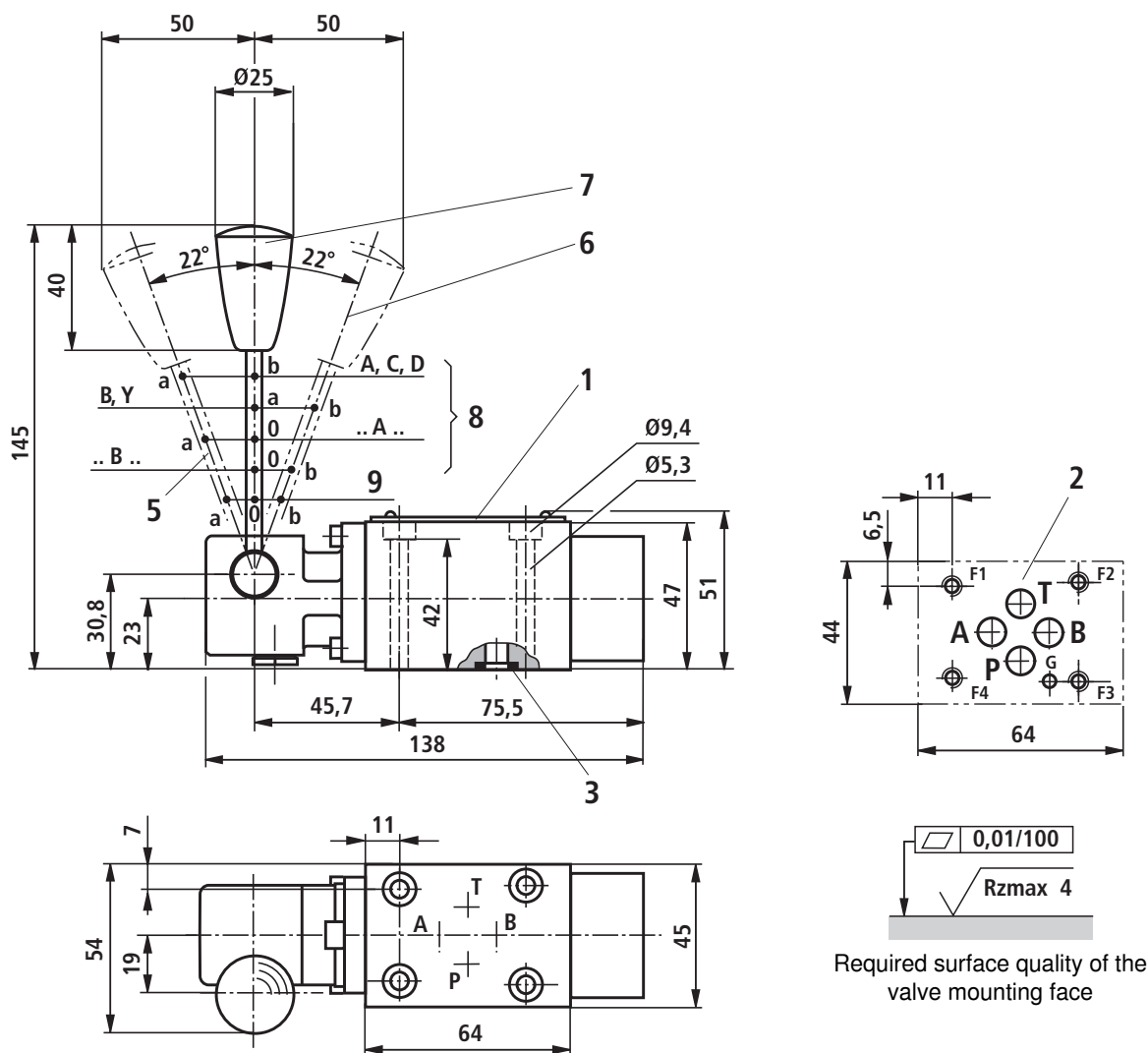
Characteristic curve	Spool symbol
3	A, B
5	F
6	V
8	R

Type WMM 6...XC - with detent



Characteristic curve	Spool symbol
1	E1, M, H, C, D, Y
2	E, J, Q, L, U, W
4	G, T
7	P
9	T

Unit dimensions (dimensions in mm)



- 1 Nameplate
- 2 Porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-05 (**with** locating hole)
- 3 Identical seal rings for ports A, B, P, and T
- 5 Spool position "a"
- 6 Spool position "b"
- 7 Spool position "0", "a", and "b"
(a and b with 2-position valves)
- 8 2-position valve
- 9 3-position valve

Valve mounting screws

For reasons of stability, only the following valve mounting screws may be used:

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)

Material no. R91300064 (must be ordered separately)

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52 / 18-0
Fax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

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Phone +49 (0) 93 52 / 18-0
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documentation@boschrexroth.de
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