

Electric Drives
and Controls

Hydraulics

Linear Motion and
Assembly Technologies

Pneumatics

Service

Rexroth
Bosch Group

1/10

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

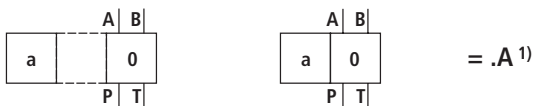
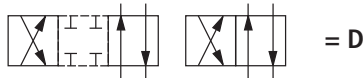
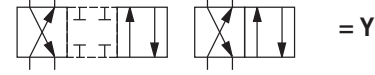
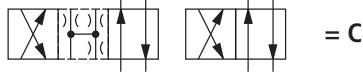
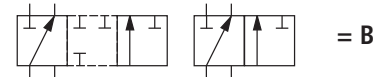
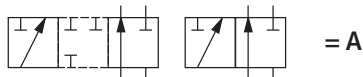
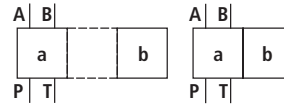
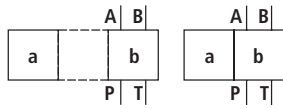
These operating instructions apply to Rexroth valves in explosion-proof design and consist of the following three parts:

- 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.

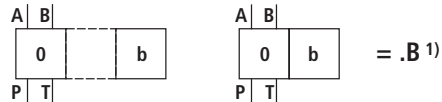
Spool symbols



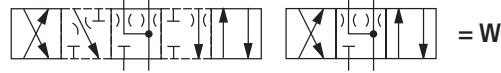
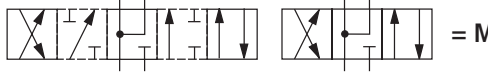
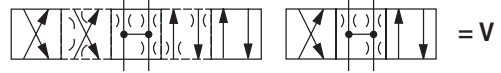
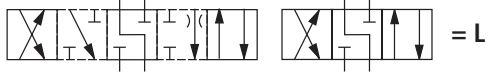
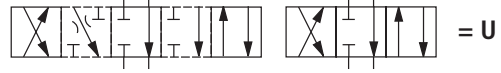
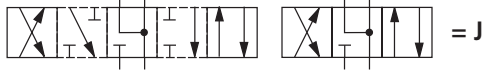
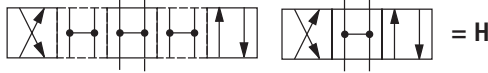
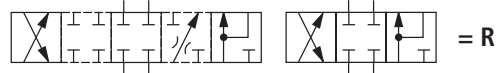
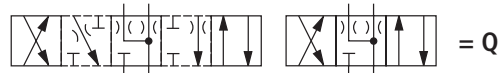
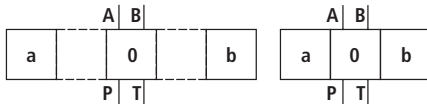
1) Example:

- 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).

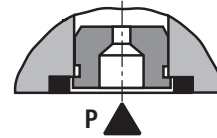
By means of the actuating elements, the control spool (3) is pushed in the desired spool position.

Detent

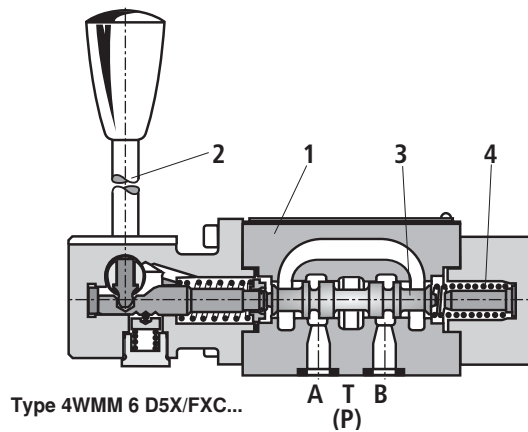
Directional valves with handle-operated lever are optionally available as 2- or 3-position valves with detent. When using actuating elements with detent, each spool position can be fixed, depending on the valve type.

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 biodegradable 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.

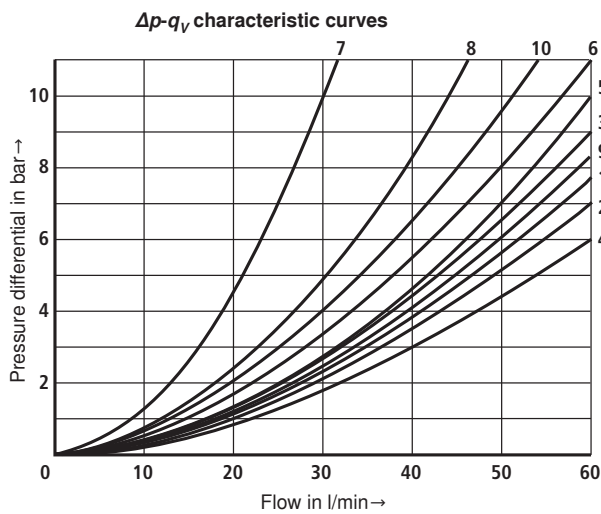
Actuating force/torque

| | | 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:

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

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



| 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 |

More characteristic curves:

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

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).

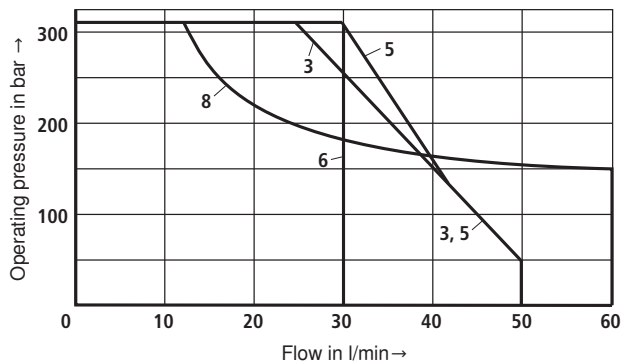
Due to the flow forces acting within the valves, the permissible switching power limits may be considerably lower with only one direction of flow (e.g. from P to A while port B is blocked)! In such cases, please consult us.

Type WMM 6...XC - Spring return



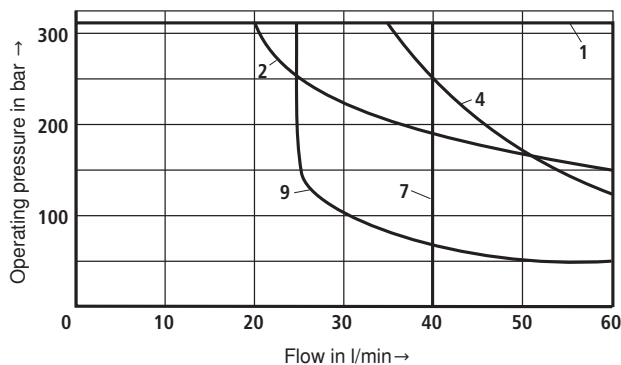
| Characteristic curve | Spool symbol |
|----------------------|---|
| 1 | E, E1, M, J, L, Q, U, W, C, D, Y, G, H, R |
| 2 | A, B |
| 3 | V |
| 4 | F, P |
| 5 | T |

Type WMM 6...XC - with detent



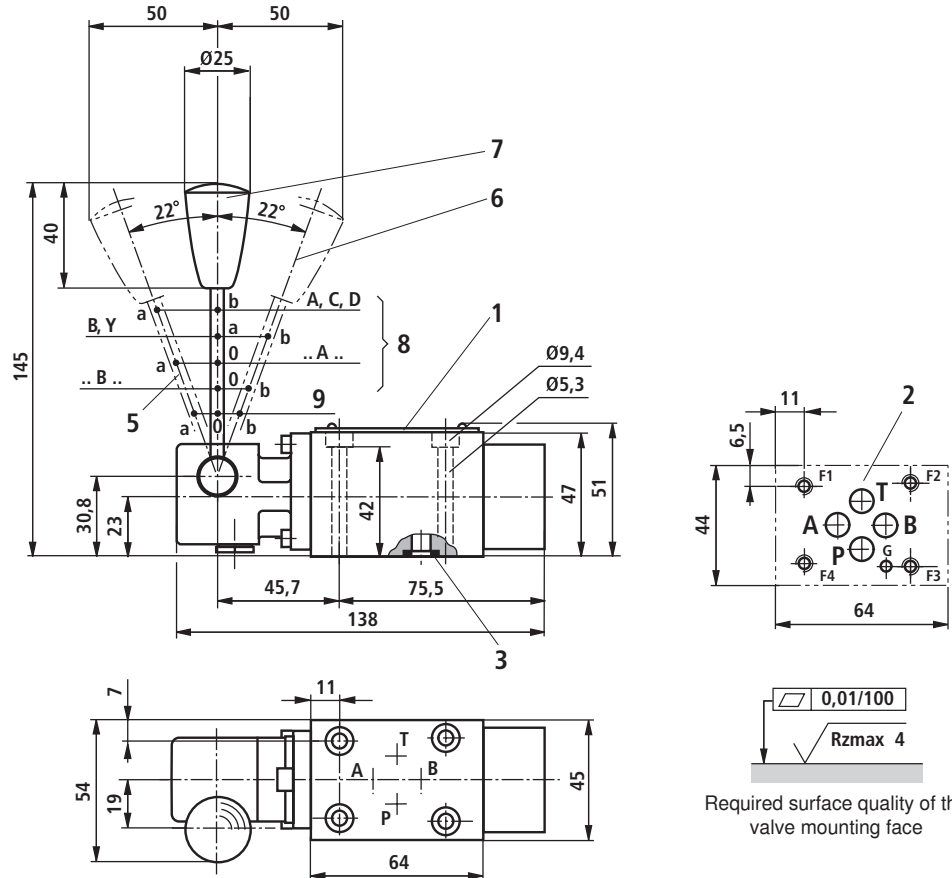
| Characteristic curve | Spool symbol |
|----------------------|--------------|
| 3 | A, B |
| 5 | F |
| 6 | V |
| 8 | R |

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)



0,01/100
Rzmax 4

Required surface quality of the valve mounting face

- 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-flZn-240h-L

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

Material no. R913000064 (must be ordered separately)

Notes

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.