Rexroth
Bosch Group

4/3, 4/2 and 3/2 directional valves and 2/2, 3/2 and 4/2 directional poppet valves, direct operated with mechanical, manual and fluidic actuation

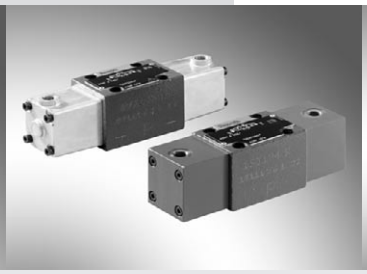
Type W..6...32, M-.S.6...10

RE 23001-B/07.09

English

Operating instructions

H7114
WM...6, WMR6, WMD6



H6875
WH...6, WP...6

H5554
WMM10

Applies to the following types:

3WP.6	4WP.6		
3WH.6	4WH.6		
3WMR6	3WMR6...QM	3WMR10	3WMR10.../J
3WMRZ6	3WMRZ6...QM	3WMU10	3WMU10.../J
3WMU6	3WMU6...QM	3WMM10	3WMM10.../J
3WMM6	3WMM6...QM	3WMD10	3WMD10.../J
3WMD6	3WMD6...QM	3WMDA10	3WP10.../J
3WMDA6	3WMDA6...QM	3WN10	3WHP10.../J
		3WP10	
		3WHP10	
4WMR6	4WMR6...QM	4WMR10	4WMR10.../J
4WMRZ6	4WMRZ6...QM	4WMU10	4WMU10.../J
4WMU6	4WMU6...QM	4WMM10	4WMM10.../J
4WMM6	4WMM6...QM	4WMD10	4WMD10.../J
4WMD6	4WMD6...QM	4WMDA10	4WP10.../J
4WMDA6	4WMDA...Q	4WN10	4WHP10.../J
		4WP10	
		4WHP10	

M2SH6	M2SH6...QM	M2SH10	M2SH10...QM
M2SP6	M2SP6...QM	M2SP10	M2SP10...QM
M2SMM6	M2SMM6...QM	M2SMM10	M2SMM10...QM
M2SMR6	M2SMR6...QM	M2SMR10	M2SMR10...QM
M3SH6	M3SH6...QM	M3SH10	M3SH10...QM
M3SP6	M3SP6...QM	M3SP10	M3SP10...QM
M3SMM6	M3SMM6...QM	M3SMM10	M3SMM10...QM
M3SMR6	M3SMR6...QM	M3SMR10	M3SMR10...QM
M4SH6	M4SH6...QM	M4SH10	M4SH10...QM
M4SP6	M4SP6...QM	M4SP10	M4SP10...QM
M4SMM6	M4SMM6...QM	M4SMM10	M4SMM10...QM
M4SMR6	M4SMR6...QM	M4SMR10	M4SMR10...QM
H-4WMM16			
H-4WMM22			
H-4WMM32			

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.

The cover page shows a sample configuration. The delivered product may thus differ from the figure.

The original operating instructions have been written in German.

Content

Content

1 About this document

This operating instructions applies to Rexroth

- 4/3, 4/2 and 3/2 directional spool valves, direct operated and
- 2/2, 3/2 and 4/2 directional poppet valves, direct operated
  - with mechanical actuation
  - with manual actuation
  - with fluidic actuation

This instructions contains important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the valve.

Read these instructions completely, especially chapter “2 General safety instructions” on page 6 before working with the valve.

Target group of this operating instructions

The target group of this operating instructions comprises all groups of persons installing, operating, servicing, and maintaining the products or systems of Bosch Rexroth.

Product scope

Table 1: Main product features

Valve type	Size	Component series	Max. operating pressure P, A, B	Max. operating pressure T	Rated flow
WMR6, WMU6	6	5X	315 bar	60 bar	60 l/min
WMM6, WMD6, WMDA6	6	5X	315 bar	160 bar	60 l/min
WMRZ6	6	6X	315 bar	60 bar	60 l/min
WH...6	6	5X	315 bar	160 bar	60 l/min
WP...6	6	6X	315 bar	160 bar	60 l/min
M-.S..6	6	3X	420/630 bar	100 bar	25 l/min
WM...10, WN10, WP10, WHD10	10	3X	315 bar	160 bar	120 l/min
M-.S..10	10	3X	420/630 bar	100 bar	40 l/min
WMM16	16	7X	350 bar	250 bar[1)]	300 l/min
WMM22	25	7X	350 bar	250 bar[2)]	450 l/min
WMM32	32	5X	350 bar	250 bar[2)]	1100 l/min

[1)] Use the “L” leakage oil connection.

[2)] Use the “Y” leakage oil connection.

1.1 Related documents

The valve is a system component. Also observe the instructions for the other system components. Also observe the instructions in the following manuals:

- System documentation from the system manufacturer
- Technical data sheets, see table 2

Table 2: Technical data sheets

Valve type	Technical data sheet
WMR6, WMRZ6, WMU6, WMM6, WMD6, WMDA6	RE 22280
WM...6...QM...	RE 24830 including RE 22280
WH...6, WP...6	RE 22282
WM...10, WN10, WP10, WHD10	RE 22331
WM...10...J, WP10...J, WHD10...J	RE 22331-M
M-.S..6, M-.S..10	RE 22340
M-.S..6...QM..., M-.S..10...QM...	RE 24830 including RE 22340
WMM16, WMM22, WMM32	RE 22371

You will find the “Technical data sheet” for the valves on the Internet under **http://www.boschrexroth.com/Rexroth-IHD/.**

Also observe the generally applicable, legal or otherwise binding regulations of the European or national legislation and the rules for the prevention of accidents and for environmental protection applicable in your country.

2 General safety instructions

The valve has been manufactured according to the accepted rules of current technology. There is, however, still a risk of personal injury or damage to equipment if the following general safety instructions and the warnings before the steps contained in these instructions are not complied with.

- ▶ Read these instructions completely and thoroughly before working with the valve.
- ▶ Keep these instructions in a location where they are accessible to all users at all times.
- ▶ Always include the operating instructions when you pass the valve on to third parties.

2.1 Intended use

The valve is exclusively intended for being integrated in a machine or system or for being assembled with other components to form a machine or system. The product may be commissioned only if its integrated in the machine/system for which it is designed.

Observe the operating conditions and performance limits specified in the technical data.

The valve is a work appliance and not designed for private use.

Intended use includes having read and understood this instructions, especially the chapter “2 General safety instructions”.

Valves with spool position monitoring ...Q...

The valves with spool position monitoring in safety-relevant controls may only assembled and commissioned by hydraulically and electrically trained experts.

Servicing works may only be carried out by authorized experts or by Bosch Rexroth.

After disassembly of the spool position monitoring, the complete valve may only be assembled and re-adjusted by authorized experts or by Bosch Rexroth.

2.2 Improper use

Any use of the valve other than described in section “2.1 Intended use” on page 6 is considered as improper.

No rebuilding works must be implemented exceeding the extent described in this operating instructions.

The valve is not suitable for being operated in explosive environments.

2.3 Personnel qualifications

Assembly, commissioning and operation, disassembly, service (including maintenance and repair) require basic mechanical and hydraulic knowledge, as well as knowledge of the appropriate technical terms. In order to ensure operating safety, these activities may therefore only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel.

Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area.

2.4 Safety instructions in this document

In this instructions, there are safety instructions before the steps whenever there is a risk of personal injury or damage to the equipment. The measures described to avoid these hazards must be observed.

Safety instructions are set out as follows:

SIGNAL WORD 	**Type of risk!** Consequences ▶ Precautions

- Safety sign (warning triangle): Draws attention to the risk
- Signal word: Identifies the degree of hazard
- Type of risk: Identifies the type or source of the hazard
- Consequences: Describes what occurs when the safety instructions are not complied with
- Precautions: States how the hazard can be avoided

The signal words have the following meaning:

Table 3: Signal words/warning signs

Signal word	Application
DANGER! 	Indicates an imminently hazardous situation which, if not avoided, will certainly result in death or serious injury.
WARNING! 	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION! 	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to equipment.
	If this information is disregarded, the operating procedure may be impaired.

2.5 Adhere to the following instructions

General instructions

- Observe the regulations for accident prevention and environmental protection for the country where the product is used and at the workplace.
- Exclusively use Rexroth valves in good technical order and condition.
- Check the valve for visible defects, for example cracks in the housing or missing lead seals, screws, covers or seals.
- Do not modify or retrofit the valve.
- Only use the valve within the performance range provided in the technical data.
- Persons who assemble, operate, disassemble or maintain Rexroth valves must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to respond.
- Make sure that all safety equipment belonging to the valve is present, has been installed properly and is fully functional. Do not displace, bypass or disable the safety equipment.

- The valve is no safety equipment. The valve alone must not be assigned the holding of a position; there must be another monitoring feature.
- The valve could block in an undefined position due to internal pollution – e.g. through polluted hydraulic fluid, abrasion dust or residual dirt. As a result, the actuated consumer may no longer be under the operator's control.
- Provide the appropriate emergency stop function to make sure that the actuated consumer can be set to a safe position (e.g. by stopping it immediately).
- Please comply with the specified cleanlineless class 20/18/15 in accordance with ISO 4406 (c).
- If it should be necessary to disable any safety equipment temporarily, for example for commissioning or maintenance work, always take the appropriate measures to ensure that no hazard to a person's life or health or to property may occur. Also observe the superordinate operating instructions of the machine or system.
- Works or modifications at the spool position monitoring may only be carried out by Bosch Rexroth.

CAUTION!

Risk of burning!

The valve considerably heats up during operation.

- ▶ Allow the valve to cool down sufficiently before touching it.
- ▶ Wear heat-protective gloves or other protective clothing, e.g. gloves.
- ▶ Provide for a suitable touch guard.
- ▶ Please also observe ISO 13732-1 and EN 982.

- The warranty only applies to the delivered configuration.
- The warranty will not apply if the product is incorrectly assembled.
- Do not expose the valve to any mechanical loads under any circumstances. Never use the valve as a handle or step. Do not place any objects on it.

During assembly

- Make sure the relevant system component is not under pressure or voltage before assembling the valve or when connecting and disconnecting plugs. Protect the system component against being switched on.
- Lay cables and lines so that they cannot be damaged.
- Before commissioning, make sure that all the connection seals and plugs are installed correctly to ensure that they are leakproof and fluids and foreign bodies are prevented from penetrating the valve, with valve types **...Q...**.
- When assembling, provide for absolute cleanness in order to prevent welding beats or metal cuttings from getting into the hydraulic lines and causing valve wear or malfunctions.

During commissioning

- Let the valve acclimate itself for several hours before commissioning, otherwise water may condense in the housing.
- Make sure that all electrical and hydraulic connections are either used or covered. Commission the valve only if it is installed completely.

During cleaning

- Cover all openings with the appropriate protective equipment in order to prevent detergents from penetrating the system.
- Never use solvents or aggressive detergents. Only clean the valve using a slightly damp, lint-free cloth. Only use water to do this and, if necessary, a mild detergent.
- Do not use a high-pressure cleaner for cleaning.

During maintenance

- Perform the prescribed maintenance work at the intervals specified in the operating instructions.
- Make sure that no lines, connectors or components are disconnected as long as the system is under pressure and voltage. Protect the system against being switched on.

Disposal

- Dispose of the valve in accordance with the currently applicable national regulations in your country.
- Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- Dispose of hydraulic fluid residues according to the applicable safety data sheets for hydraulic fluids.

2.6 Operator's obligations

The operator of the valve from Bosch Rexroth is bound to provide for personnel training on a regular basis regarding the following subjects:

- Observation and use of the operating instructions and the legal regulations
- Intended use and operation of the Bosch Rexroth valve
- Observation of the instructions from the factory security offices and of the work instructions from the operator
- How to behave in case of emergency

Bosch Rexroth offers training support for special fields. You can find an overview of the training contents in the Internet under **http://www.boschrexroth.com/didactic**.

2.7 Safety labels

Table 4: Warning signs

Warning signs	Meaning
	Hot surface warning

During operation of the valve, high surface temperatures may occur; thus, the “Hot surface warning” warning sign must be applied to the end product by the machine/system manufacturer.

2.8 Safety equipment

Personal safety equipment

The operator must provide personal safety equipment (e.g. gloves, safety shoes, eye protectors, overall, etc.).

Touch guard

As protection against the hot solenoid surfaces, Bosch Rexroth recommends the installation of a touch guard so that unwanted contact with the hot surface can be avoided.

3 Delivery contents

The delivery contents include:

- Valve in accordance with “Technical data sheet” and “Order specification”

Check the delivery contents for completeness, particularly the seal rings at the valve connection surfaces.
Check the delivery contents for possible transport damage, also see chapter “5 Transport” on page 14.
Check whether the operating instructions is suitable for the valve.

4 Product description

4.1 Performance description

See “Technical data sheet”

The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

4.2 Device description

See “Technical data sheet”

The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

4.3 Product identification

Details on the nameplate

The meaning of the details on the nameplate can be found on the basis of the enumerated fields from the following figures and the table.

The position of the nameplate at the valve is shown in the technical data sheet.

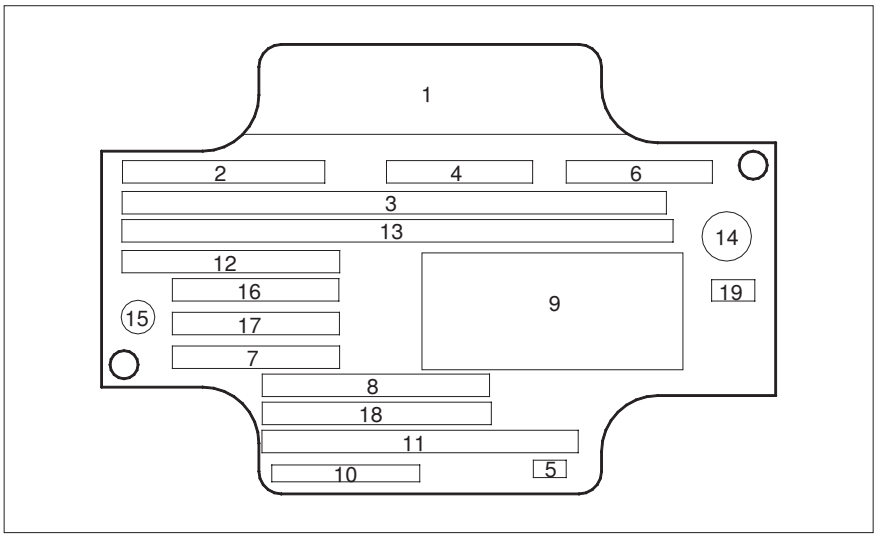


Fig. 1: Nameplate for type W..6 and W..10

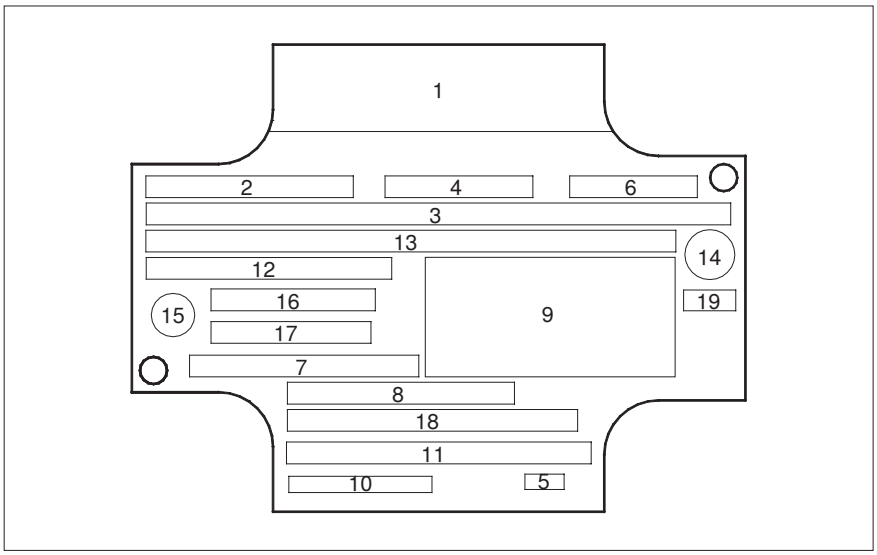


Fig. 2: Nameplate for type M-.S.6 and M-.S.10

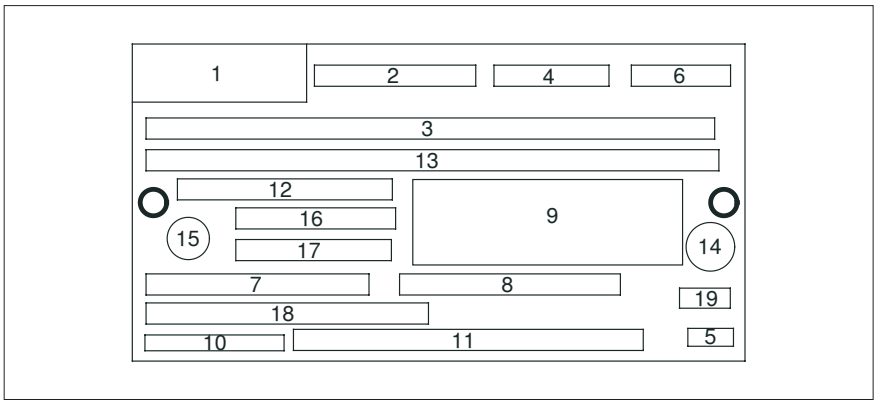


Fig. 3: Nameplate for type W..16

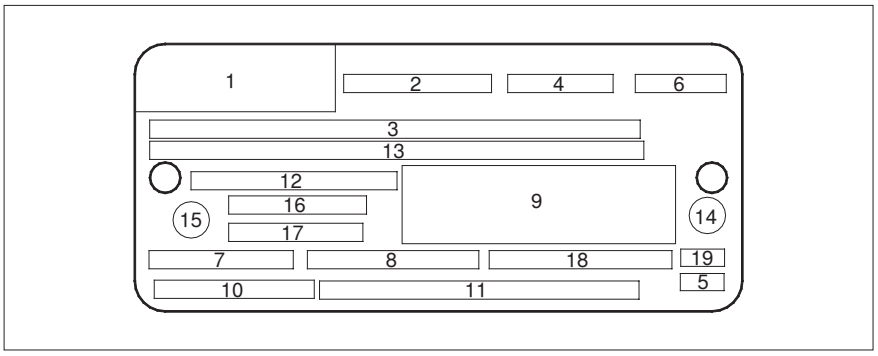


Fig. 4: Nameplate for type W..25 and W..32

Table 5: About the nameplate

No.	Type of detail	Detail or example
1	Manufacturer's logo	**Rexroth**
2	Material no. of the valve (= ordering code)	e.g.: **MNR: R900387206**
3	Type designation complete valve	e.g.: **4WMM6R5X//V**
4	---	---
5	Number of the manufacturing plant	e.g.: **7080**
6	Manufacturing date (year and week)	e.g.: **FD: 03W01**
7	Maximum operating pressure	e.g.: **Pmax = 315 bar**
8	---	---
9	Hydraulic symbol according to ISO 1219	Graphics
10	Designation of origin	**Made in Germany**
11	Name and address of the manufacturer	**BOSCH REXROTH AG D-97816 LOHR**
12	Customer or manufacturing order number	e.g.: 123456789012345678
13	Customer material number or additional details	e.g.: **CNR: 1234567890**
14	---	---
15	---	---
16	---	---
17	---	---
18	---	---
19	---	---

[1] For the meaning of the individual details of the type designation please refer to the “Technical data sheet” of the corresponding valve.

5 Transport and storage

DANGER!

Risk of damage to persons and property!

In case of improper transport, the valve may fall down and cause damage to the valve and/or injuries as the components may be sharp-edged, oily, unstable, loose and bulky.

- ▶ Provide for a stable position during transport to the place of installation.
- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).
- ▶ Comply with the national laws and regulations regarding occupational health and safety and transport.

CAUTION!

Risk of health hazards!

When lifting the valves with high weight, there is the risk of health hazards.

- ▶ In manual transport, use a suitable lifting, putting down and moving technique or use suitable lifting gear.

There are the following possibilities for the transport, depending on the weight:

- Transport by hand (valves with low weight; in case of short-term lifting, the latter should not exceed 15 kg for women and 25 kg for men).
- Transport by means of lifting gear and corresponding accessories (valves with high weight and in case of longer transport).

The information on the weight of your valve is contained in the technical data sheet.

Transport damage must be reported within one week to Bosch Rexroth to the following address:

Bosch Rexroth AG
Service Industriehydraulik [Industrial hydraulics]
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany

Phone +49 (93 52) 18-46 66
Fax +49 (93 52) 18-33 63

For transporting and storing the product always observe the ambient conditions specified in the technical data (see “Technical data sheet”).

5.1 Transport by hand

DANGER!

Risk of damage to persons and property!

In case of improper transport, the valve may fall down and cause damage to the valve and/or injuries.

- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).
- ▶ Don't transport the valve using components with little stability, e.g. solenoids, plugs and cables.

In case of transport by hand, the following points are to be observed:

- ▶ Use a suitable lifting, putting down and moving technique.
- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).
- ▶ Don't transport the valve using components with little stability, e.g. solenoids, plugs and cables.
- ▶ Don't jam the valve.
- ▶ Put the valve carefully onto the contact surface in order not to damage it.

5.2 Transport using lifting gear

WARNING!

Crush injuries and fractures!

Valves that are falling down may cause serious injuries, e.g. crush injuries, fractures.

- ▶ Use suitable lifting gear for the transport.
- ▶ Observe the prescribed position of lifting straps.

DANGER!

Risk of damage to persons and property!

In case of improper transport, the valve may fall down and cause damage to the valve and/or injuries. Parts of the valve may be torn off or deformed.

- ▶ For transporting the valve, don't fasten it at components with little stability, e.g. solenoids, connectors and cables.
- ▶ Make sure that the lifting accessories don't contact components with little stability, e.g. solenoids, connectors and cables.

In transport, consider the following aspects:

- Properties of the load (e.g. weight, center of gravity, mounting and attachment points).
- Type of attachment or pick-up of the load.

Ensure that the lifting gear's lifting capacity is sufficient in order to transport the valve without risk.

Use textile lifting accessories - according to DIN EN 1492-2.

More information regarding the transport is available from Bosch Rexroth.

- Put a lifting strap around the valve so that it does not lie over the add-on units, see figure 5.

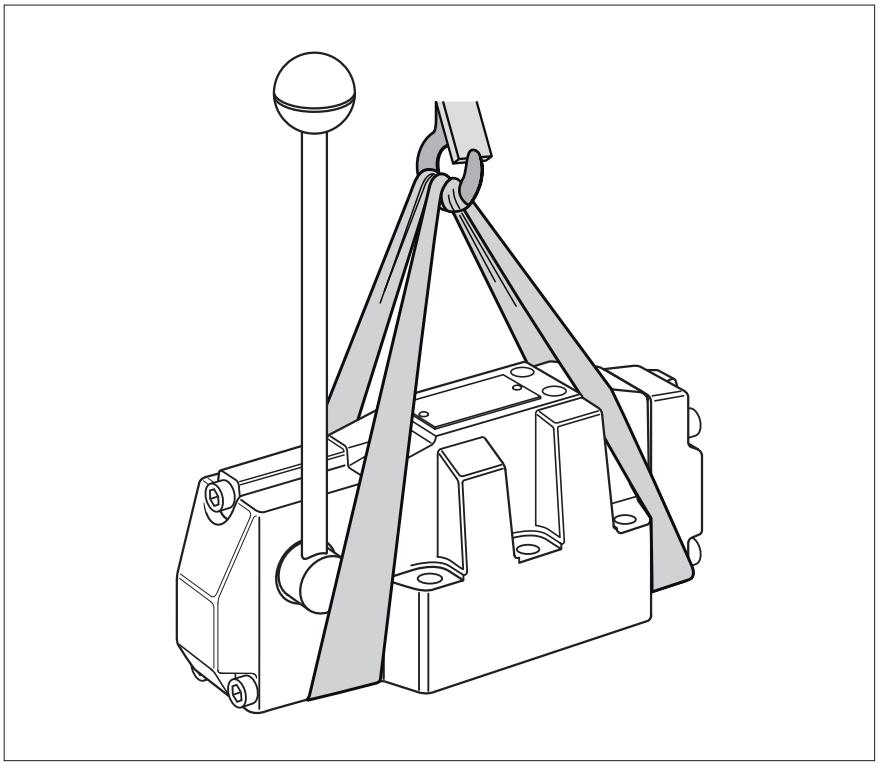


Fig. 5: Position of the lifting strap

5.3 Storage

Coming from the works, the valve is suitable for being stored up to six months according to the following criteria:

- Do not store outside, but only under a roof or in a well-ventilated room
- Protect against soil humidity: Store in shelves or on a wood pallet
- Cover with foil as protection against dust and dirt
- All connections at the valve must be covered with plugs
- At all contact surfaces and blank parts, there must be preservative protection. If there is no or insufficient preservative protection, they are to be preserved using Bran-O-Rost protective oil
- After opening the transport packaging, it must be closed properly again for the storage.

In case of storage of more than six months or in case of sea transport, coordination with Bosch Rexroth is required.

6 Assembly

6.1 Unpacking

Dispose of the packing in accordance with the currently applicable national regulations in your country.

Risk of damage to persons and property!

In case of improper opening of the packaging, components of the valve may fall out and cause damage to the components or even injuries as the components may be sharp-edged, oily, unstable, loose and bulky.

- Put the packaging on a level ground with sufficient load carrying capacity.
- Take the device out and provide for a stable position during transport to the place of installation.
- Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).

6.2 Coating the valve before installation

If the valve is to be painted before being assembled, please observe the following:

- Protect the hydraulic ports against paint application by screwing-in plastic threaded plugs completely beforehand.
- Protect the mounting bores against paint application.
- Mask the valve connection surfaces as well as the connection and end plates carefully before coating so that no dirt or paint may enter.
- Protect the nameplate against paint application.
- Protect existing information signs against paint application.
- Mask the connector of the electrical connections and make sure not to cause any damage to the connector.

For the valve types **...QM...**, the spool position monitoring must not be painted.

When removing the coating protection and the plastic threaded plugs make sure that no paint chips or other foreign bodies enter the valve.
The nameplate must be readable after coating.

If you want to coat the valve after the installation, the same points as for coating the valve before installation have to be observed

6.3 Installation conditions

For installing the product always observe the ambient conditions specified in the technical data (see “Technical data sheet”).

Installation position

See “Technical data sheet”

The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

Requirements for the valve connection plate

For recommended connection plates, see section “13.1 Optional accessories” on page 38.

Notes on valve installation

- Please observe the following notes during project planning:

WARNING!

Damage to the valve, the feed line, and other hydraulic components

Please observe the possible pressure intensification when the valve is connected to the piston-side chamber of a single-rod cylinder. If the discharge of the hydraulic medium from this chamber is blocked, pressure intensification can occur in case of pressure on the cylinder, which may damage cylinder chamber, feed line, and valve.

- Provide for sufficient mechanical screen against a high-pressure water jet possibly used during cleansing works.

CAUTION!

Safety-related control components

Signals provided by the control electronics or sent to the same (command value signal, actual value signal) must not be used to deactivate safety-relevant machine functions!

- Please observe DIN EN ISO 13849-1, -2.

Notes on the use of the throttle insert

The following notes do not apply to the valve type **WMM16...32**, as for this valve type, no throttle inserts can be used.

If due to the operating conditions to be expected during the switching actions flows must be anticipated lying outside the valve's performance limits evident from the characteristic curve, a throttle insert must be used in channel P for flow limitation.

In order to switch the valve safely and/or to keep it in its spool position, the condition

$P \geq A \geq T$

has to be satisfied for the pressure at the respective connections, also see table 1 on page 5.

Ports P and T in the 2/2 directional poppet valve, P, A and T in the 3/2 directional poppet valve and/or P, A, B and T in the 4/2 directional poppet valve are clearly fixed according to their function and must not be swapped or closed arbitrarily. The flow is only permitted in the direction of the arrow specified in the Technical data sheet.

With 3- and 4-way spool position, port T must always be connected.

With valve type **M4...**, you must moreover observe the notes in section “Notes on the use of the throttle insert with valve type M4...”.

Notes on the use of the throttle insert with valve type M4...

Also observe the notes in section “Notes on the use of a throttle insert” on page 18.

With a 4/2 directional poppet valve with Plus 1 plate, the throttle insert for flow limitation doesn't have to be plugged into port P at the valve body but into port P of the Plus 1 plate.

If a check valve insert is to be used with a 4/2 directional poppet valve with Plus 1 plate, it doesn't have to be plugged into port P at the valve body but instead into port P of the Plus 1 plate.

The counterpressure at port T must not exceed the value specified in the Technical data sheet under Performance limits.
With a 4/2 directional poppet valve with Plus 1 plate, the minimum pressure must be 8 bar and the minimum flow 3 l/min.

6.4 Required tools

In order to install the valve, you need standard tools only.

For information on the screws, see section “6.5 Required accessories” on page 20.

Assembly

6.5 Required accessories

- Valve mounting screws
  Due to reasons of stability, only the following valve mounting screws have to be used.

Table 6: Valve mounting screws for clamping length 42 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WMR6, WMRZ6, WMU6, WMM6, WMD6, WMDA6	metric ISO 4762 - M5 × 50 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)	4	7 Nm ± 10%[2)]	R913000064
WH...6, WP...6	UNC 10-24 UNC × 2”	4	7 Nm ± 10%[2)]	R978800693
	metric ISO 4762 - M5 × 50 - 10.9 (friction coefficient μ_{total} = 0.12 to 0.17)	4	8.1 Nm ± 10%[3)]	Self procurement
M-2S.6, M-3S.6	ISO 4762 - M5 × 50 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[4)]	4	7 Nm ± 10%[2)]	R913000064
	ISO 4762 - M6 × 60 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[5)]	4	12.5 Nm ± 10%[2)]	R913000151
M-4S.6,	ISO 4762 - M5 × 95 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[4)]	4	7 Nm ± 10%[2)]	R913000223
	ISO 4762 - M6 × 95 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[5)]	4	12.5 Nm ± 10%[2)]	R913000549

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.
2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101
3) Friction coefficient μ_{Total} 0.12 - 0.17 according to VDA 235-101
4) with 420 bar
5) with 630 bar

Table 7: Valve mounting screws for clamping length 22 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WMR6, WMRZ6, WMU6, WMD6, WMDA6	metric ISO 4762 - M5 × 30 - 10.9-flZn-240h-L (friction coefficient μ_{total} = 0.09 to 0.14)	4	7 Nm ± 10%[2)]	R913000316
WH...6, WP...6	UNC 10-24 UNC ×1 1/4”	4	7 Nm ± 10%[2)]	R978802879
	Metric ISO 4762 - M5 × 50 - 10.9 (friction coefficient μ_{total} = 0.12 to 0.17)	4	8.1 Nm ± 10%[3)]	Self procurement

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.
2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101
3) Friction coefficient μ_{Total} 0.12 - 0.17 according to VDA 235-101

Table 8: Valve mounting screws for clamping length 30 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WM...10, WN10, WP10, WHD10	metric ISO 4762 - M6 × 40 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)	4	12.5 Nm ± 10%[2)]	R913000058
WM...10...J[4)], WP10...J, WHD10...J	UNC 1/4-20 UNC × 1-1/2”	4	12.5 Nm ± 10%[2)]	R978800710
	metric ISO 4762 - M6 × 40 - 10.9 (friction coefficient μ_{total} = 0.12 to 0.17)	4	15.5 Nm ± 10%[3)]	Self procurement

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.
2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101
3) Friction coefficient μ_{Total} 0.12 - 0.17 according to VDA 235-101
3) Except for WMM10...J, see table 9

Table 9: Valve mounting screws for clamping length 82 mm

Valve type	Hexagon screws	Quantity	Tigthening torque[1)]	Material no.
WMM10...J	metric ISO 4762 - M6 × 90 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)	4	12.5 Nm ± 10%[2)]	Self procurement

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.

2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101

Table 10: Valve mounting screws for clamping length 55 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
M-3S.10	ISO 4762 - M6 × 65 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[3)]	4	12.5 Nm ± 10%[2)]	R913000127
	ISO 4762 - M8 × 65 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[4)]	4	30 Nm ± 10%[2)]	R913000368
M-4S.10,	ISO 4762 - M6 × 115 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[3)]	4	12.5 Nm ± 10%[2)]	R900018811
	ISO 4762 - M8 × 115 - 10.9-flZn-24h-L (friction coefficient μ_{total} = 0.09 to 0.14)[4)]	4	30 Nm ± 10%[2)]	R913000398

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.

2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101

3) with 420 bar

4) with 630 bar

Table 11: Valve mounting screws for clamping length 43 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WMM16	ISO 4762 - M10 × 60 - 10.9	4	58 Nm ± 10%[2)]	R913000116
	ISO 4762 - M6 × 60 - 10.9	2	12.5 Nm ± 10%[2)]	R913000115

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.

2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101

Table 12: Valve mounting screws for clamping length 41 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WMM22	ISO 4762 - M12 × 60 - 10.9	6	100 Nm ± 10%[2)]	R913000121

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.

2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101

Table 13: Valve mounting screws for clamping length 49 mm

Valve type	Hexagon socket head cap screws	Quantity	Tigthening torque[1)]	Material no.
WMM32	ISO 4762 - M20 × 80 - 10.9	6	340 Nm ± 10%[2)]	R901035246

1) Please use a torque wrench with a tolerance of ≤ 10% for tightening purposes.

2) Friction coefficient μ_{Total} 0.09 - 0.14 according to VDA 235-101

- Subplates

Information on the subplates is contained in the “Technical data sheet” of the subplates. The assignment of the valves to the “Technical data sheet” of the subplates is contained in table 14.

Table 14: Subplates

Size	Technical data sheet
Size 6	RE 45052
Size 10	RE 45054
Size 16	RE 45056
Size 25	RE 45058, RE 45059
Size 32	RE 45060

Ordering address for accessories and valves

The addresses of our responsible sales companies can be found on the Internet at **http://www.boschrexroth.com**

and in section “16.2 Address directory” on page 42.

6.6 Assembling the valve

Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

DANGER!

Risk of damage to persons and property!

Incorrectly assembled valves can cause substantial material damage and personal injuries. An improperly attached valve may move in an uncontrolled manner and damage other system components and also cause errors in the hydraulic circuit or may lose oil and pollute the environment.

- Before implementing any assembly or disassembly works at the valve, the hydraulic system has to be depressurized and the electrical control system has to be de-energized.
- Assembly of the valve requires basic mechanical and hydraulic knowledge. Only qualified personnel (see section “2.3 Personnel qualifications” on page 7) is authorized to assemble the valve.
- Ensure that the valve is attached securely.

CAUTION!

Wear and malfunctions!

The cleanness of the hydraulic fluid has a considerable impact on the cleanness and service life of the hydraulic system. Any pollution of the hydraulic fluid leads to wear and malfunctions. In particular, foreign bodies like e.g. welding beats or metal cuttings in the hydraulic lines may damage the valve.

- Provide for absolute cleanness.
- Assemble the valve free from any pollution.
- Make sure that all connections, hydraulic lines and add-on units (e.g. measuring instruments) are clean.
- Make sure that no pollutants may penetrate when sealing the connections.
- Take care that no detergents get into the hydraulic system.
- Do not use cotton waste or linty cloth for cleaning.
- Do not use hemp as sealant under no circumstances.

Installing the valve in the system

CAUTION!

Risk due to the use of an improper valve

Installing an improper valve may result in uncontrolled activities and in personal injuries or damages to other system components.

- Please check if you have the right valve type by means of the type designation on the nameplate of the valve.
- Check the delivery contents for completeness, particularly the seal rings at the valve connection surfaces.
- Check the delivery contents for possible transport damage.
- Check whether the operating instructions is suitable for the valve.
- Please observe all safety instructions.

1. Before assembly and disassembly, it is imperative that you provide for a clean environment, so that no dirt can enter the oil circuit. Only use non-linting fabric or special paper for cleansing.
2. Remove existing preservative agent.
3. Check valve mounting face for required surface quality (see “Technical data sheet”, unit dimensions). Remove protective plate from the valve and keep it for return shipments in case of possibly occurring repair requirements.
4. Dry the valve connection surface using suitable cleaning materials.
5. Check the seal rings at the valve connection surface for completeness. Other sealants are inadmissible.
6. Check if at the subplate, the pressure port line is connected to P and the return line is connected to T.

Confusing P and T can lead to damage at the valve when the system is pressurized.

7. Place the valve onto the valve mounting face.
8. When using the connection plates mentioned in section “6.5 Required accessories” on page 20 or when installing on comparable cast iron installation surfaces, tighten all mounting screws with a torque wrench and to the specified torque, see section “6.5 Required accessories” on page 20.

This tightening torque refers to the maximum admissible operating pressure.

If the valve is to be used with reduced maximum pressure and installed on valve contact surfaces made of another material, a lower tightening torque has to be used to rule out damage, if necessary.

WARNING!

Risk of material damage and personal injuries due to improper installation!

The use of mounting material not approved of by Bosch Rexroth and erroneous installation may result in damage to the valve, adjacent components, as well as personal injuries due to escaping pressurized hydraulic oil.

- Always fasten the valve using all mounting screws as otherwise, tightness is not guaranteed. See “Technical data sheet”.
- Due to reasons of stability, only the valve mounting screws mentioned in section “6.5 Required accessories” on page 20 have to be used.
- Check the design of the hydraulic product on the basis of the circuit diagrams, unit lists, and assembly plans.
- Clarify possible discrepancies with the responsible persons.

Hydraulic connection of the valve

1. Depressurize the relevant part of the system.

CAUTION!

Risk of injuries when assembling under pressure!

If you do not switch off the pressure before assembling the product, you might get injured and damage the unit or system components.

- Depressurize the corresponding part of the system before installing the valve.

CAUTION!

Missing seals and caps will lead to non-compliance with protection class IP ...!

Liquids and foreign bodies may penetrate and damage the valve.

- Prior to assembling make sure that all seals and plugs of the plug-in connections are tight.

Protection class IP ... results from the mating connector used, see “Technical data sheet RE 08006”.
The “Technical data sheet” for the mating connectors is available in the Internet at
http://www.boschrexroth.com/Rexroth-IHD/.

CAUTION!

Damage to the valve!

When assembling hydraulic lines and hoses under mechanical stress, they are exposed to additional mechanical forces during operation which reduce the service life of the valve and the entire machine or system.

- Assemble hydraulic lines and hoses without mechanical stress.

2. Establish all connections; in this connection, observe the operating instructions of the system.
3. Ensure that pipes and/or hoses are connected to all ports and/or that the ports are closed by means of plug screws.

4. Ensure that the cap nuts and flanges are tightened properly on pipe fittings and flanges by checking the same.

Mark all checked fittings, e.g. with permanent markers.

5. Ensure that pipes and hose lines and any combination of connection pieces, couplings or connecting points with hoses or pipes are checked for a state that is safe for working purposes by a technical expert.

6.7 Connecting the spool position monitoring

The following description applies to the following valve types:
...QM....
Also observe the information in the Technical data sheets.
The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

- De-energize the relevant part of the system.

CAUTION!

Risk of injuries when assembling under voltage!

If you do not switch off voltage supply before assembling the product, you may get injured or the valve or system components may be damaged.

- Always switch off power supply to the relevant system component before assembling the valve.

CAUTION!

Risk of damage to persons and property!

Incorrect energy supply may lead to uncontrolled valve positions. These could result in possible malfunctions or failure of the valve and cause injuries.

- Always connect the earthing connections of the valve with the appropriate earthing system in your installation.
- Exclusively use a power pack with safe electrical isolation.
- Always comply with the country-specific regulations.

CAUTION!

Risk of short-circuit due to missing seals and caps!

Fluids may enter the valve and cause a short-circuit.

- Before commissioning, ensure that all seals and plugs of the plug-in connection are leak-proof.

Assembly

WARNING!

Risk due to improper connection wiring

The valve must only be connected by a specialized electrician or under supervision of the same.

The lines used have to be suitable for operating temperatures of –30 °C...+100 °C.

For details on suitable connection cables, see “Technical notes for the cable” in the “Technical data sheet” (RE 24830 and RE 08006).

- De-energize the connection line before installation.
- Connect the protective earthing conductor and the earthing properly.
- Avoid sharp bends in the connection line and the litz wires, in order to avoid short-circuits and interruptions.
- **Only mount the cable and line entry according to the assembly instructions. Check before the assembly whether the individual components of the cable and line entry are complete and whether the sealing elements are undamaged.**
- During the assembly, ensure leak-tightness between cable and cable and line entry.
- Route the connection line(s) using strain relief. The first attachment point must be located at a distance to the cable entry of 15 cm at most.
- Use fine-wired conductors with pressed-on wire end sleeves only.
- Only use lines meeting the requirements for the terminal areas of the connection terminals, see “Technical data sheet”.

Only the line sockets specified in the “Technical data sheet” (RE 24830 and RE 08006) or line sockets of the same type may be used.
Observe the installation instructions printed on the packaging of the line socket and the tightening torques specified there.

1. Cut heat shrinkable tubings to length and push the same over the litz wires of the pilot line to insulate the solder joints and the uncovered parts at a later point in time.
2. Solder the litz wires of the control line to the solder buckets of the contact sockets of the mating connector according to the specified connection wiring.
   Or
   Crimp the litz wires of the pilot line to the contact sockets of the mating connector according to the specified connection wiring.
3. Check for proper assignment of the litz wires to the contact sockets with the help of a continuity tester.
4. Position heat shrinkable tubings over solder joints and uncovered parts and shrink the same on.
5. Check the mutual isolation of the contact sockets by means of a continuity tester.
6. Assemble the mating connector according to the installation instructions.
7. Plug and subsequently screw the mating connector (on) to the connector of the spool position monitoring.

Observe the installation instructions printed on the packaging of the mating connector.

6.8 Connecting the pneumatic control

The following description applies only to valve types with pneumatic actuation.

1. Before assembly and disassembly, it is imperative that you provide for a clean environment, so that no dirt can enter the pneumatic system. Only use non-linting fabric or special paper for cleansing.
2. Screw in the fitting at the pneumatic connections and tighten it with the prescribed tightening torque, see table 15.

Table 15: Fitting

Thread	Tigthening torque Fitting
G1/4	40 Nm
G1/8	20 Nm

This tightening torque refers to the maximum admissible operating pressure.

3. Lay the connection lines according to the applicable technical rules.
4. Ensure that pipes and hose lines and any combination of connection pieces, couplings or connecting points with hoses or pipes are checked for a state that is safe for working purposes by a technical expert.

6.9 Connecting the hydraulic control

The following description applies only to valve types with hydraulic actuation.

1. Before assembly and disassembly, it is imperative that you provide for a clean environment, so that no dirt can enter the oil circuit. Only use non-linting fabric or special paper for cleansing.
2. Screw in the fitting at the hydraulic connections and tighten it with the prescribed tightening torque, see table 16.

Table 16: Fitting

Thread	Tigthening torque Fitting
G1/4	40 Nm
G1/8	20 Nm

This tightening torque refers to the maximum admissible operating pressure.

3. Lay the connection lines according to the applicable technical rules.
4. Ensure that pipes and hose lines and any combination of connection pieces, couplings or connecting points with hoses or pipes are checked for a state that is safe for working purposes by a technical expert.

6.10 Installing the touch guard

CAUTION!

Risk of burning!

The valve considerably heats up during operation. The valve gets so hot during operation that you may burn yourself.

- Install a touch guard.

As protection against the hot valve surfaces, Bosch Rexroth recommends the installation of a touch guard so that unwanted contact with the hot surface can be avoided.

7 Commissioning

CAUTION!

Risk of damage to persons and property!

Commissioning of the valve requires basic mechanical, hydraulic, pneumatic and electrical knowledge.

- Only qualified personnel (see section “2.3 Personnel qualifications” on page 7) is authorized to commission the valve.

7.1 First commissioning; re-commissioning after standstill

Proceed as follows to commission the valve:

Bleed the hydraulic system

Observe the operating instructions of the unit or system in which the valve is used.

- Before the actual operation, switch the valve several times with reduced pressure (50 % operating pressure). Thus, the remaining air in the valve is pressed out. Mechanical damage due to inadmissibly high acceleration of the fluid and the valve spool is thus avoided and the valve's service life is increased.

Do not switch the valve under operating pressure, as this may cause damage.

You can also achieve the switching movement of the valve spool necessary for the bleeding process by manual actuation of the manual override, see section “8.1 Operating the manual override” on page 29.

Performing the leak test

- Check whether during operation, hydraulic medium leaks at the valve and at the connections.
- Check whether there is an internal leakage. This has to be done according to the possibilities offered by the hydraulic system.

There may be an internal leakage due to the specific valve. This has, however, no influence on the valve's functionality.
For information regarding this topic, please contact Bosch Rexroth.

- Check whether during operation, air leaks at the valve and at the connections in case of valves with pneumatic actuation.

Performing the functional test

- If possible, firstly check hydraulic functions in a controlled form and with low pressure; observe the operating instructions of the hydraulic system into which the valve has been installed.

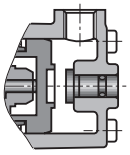
8 Operation

See operating instructions of the hydraulic system into which the valve has been installed.

8.1 Operating the manual override (only with valve types ...WPH...6)

Operation of the manual override is only applicable for the subsequently listed type, see table 17:
The type can be determined via the component in the type designation, see table 5 on page 13 or the “Technical data sheet”

Table 17: Explanation on the manual overrides

Type	Description	Figure
N	**Manual override**	

Per actuation side, the valves are provided with a manual override. Using this manual override, the switching function of the valve can be triggered.

The manual override is only intended for manual operation.

The manual override is located at the actuation side showing away from the valve.

A manual override is only reasonable with valves if the pressure in the tank channel of the valve does not exceed 50 bar. Above this pressure value, the actuating force that is to be applied is too large and there is a risk of injury if the tool slips.

DANGER!

Risk of damage to persons and property!

If the manual override is operated in an uncontrolled manner, there is the risk of damaging the system.

- ▶ **Only operated the manual override if it has been ensured that this will not trigger any dangerous working movement of the connected actuator!**

CAUTION!

Risk of damage to persons and property!

There is the risk of damaging the manual override.

The manual override is only intended for short-term manual operation and must not be brought into a certain spool position for a longer period or permanently by means of mechanical equipment.

- ▶ **Actuate the manual override using the tool**!

- ▶ Using the valve, push the manual override in the direction of the valve housing.

9 Maintenance

9.1 Definition

In accordance with DIN 31051:2003-6 the term maintenance means the combination of all technical and administrative measures and measures taken by the management during the life cycle of an item in order to maintain the functional condition or to return to the same, so that the item is able to meet the required function.

These measures can be classified into:

- **Maintenance** (measures to delay the decrease of the existing wear reserve)
- **Inspection** (measures to determine and assess the actual condition of an item, including the determination of the cause of wear and the derivation of the required consequences for a future use)
- **Repair** (measures to return an item to a functional state, except improvements)
- **Improvement** (combination of all technical and administrative measures and measures taken by the management to increase the functional safety of an item, without modifying the function required)

9.2 Cleaning and care

CAUTION!

Any dirt or liquids penetrating the device lead to malfunctions!

Safe function of the valve is no longer ensured.

- ▶ Always provide for absolute cleanness when working on the valve.
- ▶ Do not use a high-pressure cleaner.

CAUTION!

Damage to the surface caused by solvents and aggressive detergents!

Aggressive detergents may damage the seals on the valve and let them age faster.

- Never use solvents or aggressive detergents.
- Do not use a high-pressure cleaner for cleaning.

CAUTION!

Damage to the hydraulic system and to the seals!

A high-pressure cleaner's water pressure could damage the hydraulic system and the seals of the valve. The water displaces the oil from the hydraulic system and seals.

- Do not use a high-pressure cleaner for cleaning.

- Cover all openings with the appropriate protective caps.
- Check that all seals and plugs for the plug-in connections are firmly fitted so that no humidity can penetrate the valve during cleaning.
- Only clean the valve using a damp, lint-free cloth. Only use water to do this and, if necessary, a mild detergent.

9.3 Inspection and maintenance

Dust accumulations on the valve have to be removed at regular intervals.

The following inspection, test, and maintenance works have to be implemented regularly. The intervals for the same have to be selected in a way - also depending on the operating conditions - that deficiencies that have to be anticipated are identified timely. However, the inspection has to be implemented at least every three years counting from the manufacturing date of the valve. The manufacturing date can be seen from the nameplate, see section “4.3 Product identification” on page 11.

The inspection must also be carried out if the valve is only stored but not used! Ordering details for seal kits can be found in section “9.5 Spare parts” on page 33.

Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

1. Switch off power supply to the electrical connection line (only with valve type **...QM...**).
2. Remove external coarse dirt.
3. Check all fittings for completeness.
4. Check the valve for external leakage, replace seals if applicable, see section “Remedying leakages” on page 32.

Information regarding the determination of the internal leakage is available from Bosch Rexroth.

Additional works with valves with spool position monitoring

The following description applies to the following valve types:
...QM....

1. Check the connection line for damage. If damage is visible, replace the connection line.
2. Loosen the mating connector and remove the mating connector.
3. Check the seal of the mating connector for damage. If damage is visible, the mating connector must be completely replaced. You will find ordering details for the line socket in section “9.5 Spare parts” on page 33, see also section “6.7 Connecting the spool position monitoring” on page 25.
4. Plug and subsequently screw the mating connector (on) to the connector of the spool position monitoring.

9.4 Repair

Bosch Rexroth offers a wide range of repair services for the valve.

- Only use genuine spare parts from Bosch Rexroth for repairing the Rexroth product.
- Tested and pre-assembled original Rexroth assembly groups allow for successful repair requiring only little time.

Safety instructions for servicing works

For repair works, the valve may only be disassembled to the extent described in the operating instructions.

Defective components may only be replaced by new, tested components identical in construction in original equipment quality.

- Clean the external environment of fittings and units before any disassembly works. Do not use cotton waste for cleansing purposes.
- Close all openings with protective caps.

Remedying leakages

External leakages at the valve connection surface can be remedied on site, see section “Remedying leakages at the valve connection surface”.

In case of internal leakages, the valve must be replaced completely.

Remedying leakage at the valve connection surface

- Disassemble the valve, see chapter “11 Disassembly and replacement” on page 36.
- Check countersinks for seal rings at the valve connection surface for cleanliness and intactness.
- Dry the valve connection surface and the valve mounting face using suitable cleaning materials.
- Install new seals.
- Re-assemble the valve on the valve contact surface, see chapter “6. Assembly” on page 17.

9.5 Spare parts

CAUTION!

Damage to persons and property due to faulty spare parts!

Spare parts that do not meet the technical requirements specified by Bosch Rexroth may cause damage to persons or property.

- Only use genuine spare parts from Bosch Rexroth.

- Order spare parts in writing. In urgent cases you can also order by phone, but are kindly requested to confirm your order in writing, e.g. by fax.
- Please send your spare parts order to the Bosch Rexroth service next to you or directly to the headquarters, see section “16.2 Address directory” on page 42.
- When ordering spare parts, please indicate the following information from the product's nameplate:
  - the serial number
- Please indicate the following details from the parts list:
  - the material number
- Additionally indicate:
  - the desired number of spare parts
  - the desired type of dispatch (e.g. as parcel, freight, air freight, by courier service, etc.).

The following spare parts are available for the valve:

- Seals

When selecting the seals, observe the information on the nameplate.

If your valve type is not listed in table 18 and 19, please contact Bosch Rexroth, see section “16.2 Address directory” on page 42.

Table 18: NBR seal kits

Valve type	Material no.
WMR6	R900357604
WMRZ6	R961004125
WMU6	R900357604
WMM6	R900357586
WMD6, WMDA6	R900357585
WH...6,	R900357583
WP...6	R900737911
M-2SH6.3X/..., M-3SH6.3X/...	R900051084
WMR10, WMR10...J, WMU10, WMU10...J	R900357607
WMM10, WMM10...J	R900357601
WMD10, WMD10...J, WMDA10, WMDA10...J	R900312578
WN10	R900312576
WP10, WP10...J, WHD10, WHD10...J	R900312599
M-.SP10.3X/...	R900207663
M-.SMM10.3X/F420...	R900056151
M-.SMR10.3X/...	R961000967
WMM16	R900309834
WMM22	R900315790
WMM32	On request

Table 19: FKM seal kits

Valve type	Material no.
WMR6	R900357605
WMRZ6	R961004127
WMU6	R900357605
WMM6	R900357587
WMD6, WMDA6	R900314093
WH...6	R900357584
WP...6	R900743442
M-2SH6.3X/...V, M-3SH6.3X/...V	R900051197
M-2SP6.3X/...V, M-3SP6.3X/...V	R900051198
M-2SMM6.3X/...V, M-3SMM6.3X/...V	R900051199
M-2SMR6.3X/...V, M-3SMR6.3X/...V	R900051201
WMR10...V, WMR10...JV, WMU10...V, WMU10...JV	R900357608
WMM10...V, WMM10...JV	R900357602
WMD10...V, WMD10...JV, WMDA10...V, WMDA10...JV	R900312579
WN10...V	R900312577
WP10...V, WP10...J, WHD10...V, WHD10...J	R900312575
M-.S..10	On request
WMM16	R900314427
WMM22	R900314438
WMM32	R900310763

Please observe the suitability of the sealing materials for the hydraulic medium used! See “Technical data sheet”.

For the addresses of our foreign subsidiaries, please refer to the Internet at **http://www.boschrexroth.com/service**

and in section “16.2 Address directory” on page 42.

10 Decommissioning

The valve is a component that does not require decommissioning. As a result, this chapter of the instructions does not contain any information.

For details about how to disassemble or replace the valve, please refer to chapter “11 Disassembly and replacement” on page 36.

10.1 Preparing the components for storage/further use

- Clean the valve as specified in section “9.2 Cleaning and care” on page 30.
- Please observe the notes in the “Technical data sheet”.

11 Disassembly and replacement

WARNING!

Risk of personal injuries and material damage due to pressurized and energized system components.

Works on pressurized and energized system components entail the risk of injuries caused by escaping hydraulic oil or electric shocks.

- Before disassembly, check if the hydraulic system is depressurized and if the electrical control is de-energized.

With valve types **...QM...**, the spool position monitoring must not be removed from the valve, see section “2.1 Intended use” on page 6.

Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

1. De-energize and depressurize the relevant part of the system.
2. Loosen the electrical connections professionally. Provide for a container to collect escaping hydraulic medium.
3. Only loosen the mounting screws of the valve with suitable tools.
4. Remove the mounting screws and take off the valve from the valve mounting face.
5. Collect escaping hydraulic oil in container mentioned above and dispose of the same properly.
6. If the valve is to be returned to the manufacturer for servicing purposes, close the valve connection surface with the provided protective plate or protect by means of equivalent packaging, in order to avoid contamination and damage.
7. Close subplate to avoid contamination.

If the valve is exchanged, the following steps are analog to those of the assembly, see chapter “6 Assembly” on page 17.

12 Disposal

12.1 Environmental protection

Careless disposal of the valve and the hydraulic fluid could lead to pollution of the environment.

- Thus, dispose of the valve and the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- Dispose of hydraulic fluid residues according to the respective safety data sheets valid for these hydraulic fluids.
- Please observe the following supplied notes for the environmentally-friendly disposal of the valve.

12.2 Return to Bosch Rexroth AG

The products manufactured by us can be returned to us for disposal purposes at no costs. However, the precondition is that there are no spurious adherences or any other contamination. The hydraulic products have to be discharged before the same are returned. Furthermore, there must be no inappropriate foreign matter or foreign bodies when products are returned.

The products have to be sent free to the door to the following address:

Bosch Rexroth AG

Service Industriehydraulik [Industrial hydraulics]

Bürgermeister-Dr.-Nebel-Straße 8

97816 Lohr am Main

Germany

12.3 Packagings

Upon request, reusable systems can be used for regular deliveries.

The materials for one-way packagings are mostly cardboard, wood, and styrofoam. These can be disposed of without any problems. Due to ecological reasons, one-way packagings should not be used for returning products to us.

12.4 Materials used

Our products do not contain any hazardous materials that could be released during intended use. Normally, no adverse effects on human beings and on the environment have to be suspected.

The products essentially consist of:

- Cast iron
- Steel
- Aluminum
- Plastic materials
- Elastomers

12.5 Recycling

Due to the high share of metals the products can mostly be recycled. In order to achieve an ideal metal recovery, disassembly into individual assemblies is required.

13 Extension and conversion

No rebuilding works must be implemented exceeding the extent described in this operating instructions.
Additional components like for example throttles, pre-charge or pressure relief valves must not be installed into the valve.
Such modifications may only be performed by persons authorized by the manufacturer.

13.1 Optional accessories

Subplates

Information on the subplates is contained in the “Technical data sheet” of the subplates. The assignment of the valves to the “Technical data sheet” of the subplates is contained in table 20.

Table 20: Subplates

Size	Technical data sheet
Size 6	RE 45052
Size 10	RE 45054
Size 16	RE 45056
Size 25	RE 45058, RE 45059
Size 32	RE 45060

Locking pin

Table 21: Locking pin for locating hole

Valve type	Locking pin	Quantity	Material no.
WMR6, WMRZ6, WMU6, WMM6, WMD6, WMDA6, WH...6, WP...6	ISO 8752-3 × 8ST	1	R900005694

Throttle inserts

Table 22: Throttle inserts

Size	Throttle diameter	Material no.
Size 6	0.8 mm	R900542131
	1.0 mm	R900152066
	1.2 mm	R900542133
	1.5 mm	R900542134
	1.8 mm	R900542128
	2.0 mm	R900542129
	2.2 mm	R900542157
Size 10	0.8 mm	R900121741
	1.0 mm	R900121747
	1.2 mm	R900306521
	1.5 mm	R900606523
	1.8 mm	R900606524
	2.0 mm	R900606525
	2.2 mm	R900320156

After a conversion of the throttle insert, the coded type designation printed on the nameplate of the valve does not specify the current status any more and must thus be corrected.
Thus, we recommend a conversion and the update of the nameplate by the Bosch Rexroth Service.

Check valve insert

Table 23: Check valve insert

Valve type	Material no.
M-4...	R900542143

Special tool for the manual override with valve type ..WPH...6

Table 24: Special tool

Valve type	Material no.
For all types with manual override	R900024943

Key for valve type ...WMDA...

Table 25: Key

Valve type	Material no.
.WMDA65X... (component series 50 to 52)	R900006980
.WMDA65X... (component series 53 to 60)	R900008158

Ordering address for accessories and valves

The addresses of our responsible sales companies can be found on the Internet at **http://www.boschrexroth.com**
and in section “16.2 Address directory” on page 42.

14 Troubleshooting

14.1 How to proceed for troubleshooting

- Always act systematically and targeted, even under pressure of time. Random and imprudent disassembly and readjustment of settings might result in the inability to restore the original error cause.
- First get a general idea of how your valve works in conjunction with the entire system.
- Try to find out whether the valve has worked properly in conjunction with the entire system before the troubles occurred first.
- Try to determine any changes of the entire system in which the valve is integrated:
  - Were there any changes to the valve's operating conditions or operating range?
  - Were there any changes or repair works on the entire system (machine/ system, electrics, control) or on the valve? If yes: Which?
  - Was the valve or machine used as intended?
  - How did the malfunction appear?
- Try to get a clear idea of the error cause. Directly ask the (machine) operator.

Malfunction table

The valve is not sensitive to faults if the specified operating conditions are met, particularly the oil quality.

Table 26: Malfunction table

Malfunction	Possible cause	Remedy
Valve does not switch	No pressure at P	Check and/or restore pressure at port P
	Valve spool is jammed due to contamination	Disassemble the valve and replace it by a new valve or with valve type **..WPH...**, try to release the spool by actuating the manual override, see section “8.1 Operating the manual override (only with valve types ...WPH...)” on page 29. If the spool cannot be released, remove the valve and replace it by a new valve.
	End switch is jammed	Remove the valve and replace it by a new one or send it to Bosch Rexroth for repair, (see section “16.2 Address directory” on page 42).
End switch does not provide a signal	End switch is jammed	Remove the valve and replace it by a new one or send it to Bosch Rexroth for repair, (see section “16.2 Address directory” on page 42).
External leakage	Seal at the valve connection surface is defective	Remove the valve and replace the seals
	Other leakages	Remove the valve and replace it by a new valve.

Additional malfunction table for spool position monitoring

The following description applies to the following valve types:
...QM...

Table 27: Malfunction table for spool position monitoring

Malfunction	Possible cause	Remedy
No signals from the spool position monitoring	Electrical connection interrupted, no current continuity, cable break	
	- Cable break	Replace connection cable.
	- Plug defective or damaged	Replace the plug.
	Faulty application	Contact Bosch Rexroth.
	Contaminated spool position monitoring	Clean the spool position monitoring.

In case of faults due to contamination, the oil quality has to be checked and improved, if applicable, by suitable measures, such as flushing or installing additional filters, in addition to the servicing works.

If you should not be able to remedy an occurred defect, please contact one of the addresses that you can find in the Internet under
http://www.boschrexroth.com
or in section “16.2 Address directory” on page 42.

15 Technical data

For details about the technical data of your valve please refer to the “Technical data sheet”.

The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

16 Appendix

16.1 Project/installation drawings

See “Technical data sheet”

The assignment of the valves to the technical data sheets is contained in table 2 on page 6.

16.2 Address directory

Please refer to for addresses of foreign subsidiaries.
http://www.boschrexroth.com

Contact person for service and spare parts

Bosch Rexroth AG
Service Industriehydraulik [Industrial hydraulics]
Bürgermeister-Dr.-Nebel-Str. 8
97816 Lohr am Main
Germany

Phone +49 (93 52) 18-11 64
Fax +49 (93 52) 18-33 63
http://www.boschrexroth.com/service

Ordering address for accessories and valves

Headquarters:
Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main
Germany

Phone +49 (93 52) 18-0
Fax +49 (93 52) 18-40
or the responsible sales companies in each case.
You will find the addresses on the internet at:
http://www.boschrexroth.com

Notes

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