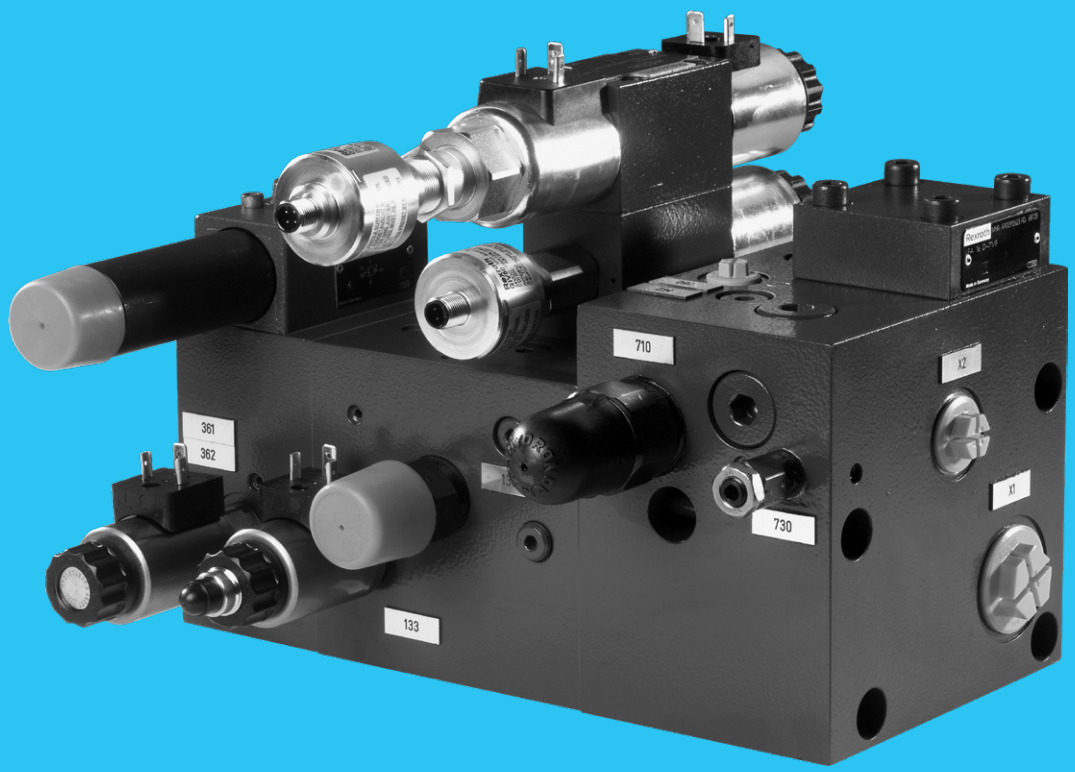
rexroth
A Bosch Company

Operating instructions

Manifolds and modules



RE 07601-B, Edition: 2024-08, replaces: 12.2013

The data specified above only serve to describe the product. As our products are constantly being further developed, 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 shows an example configuration. The product supplied may therefore differ from the figure shown.

The original operating instructions were prepared in German.

Contents

1 About this documentation

1.1 Validity of the documentation

This documentation applies to the following products:

- Manifolds and modules for industrial applications

This documentation is intended for assemblers, system end-users, machine and system manufacturers.

This documentation contains important information on how to transport, assemble, commission, operate, use, maintain, dismantle and dispose of the product safely and correctly and how to rectify simple faults yourself.

▶ Read this documentation thoroughly, and in particular chapter 2 "Safety instructions" and chapter 3 "General information on damage to property and damage to the product", before handling the product.

1.2 Required and amending documentation

▶ The product must not be commissioned until you have been provided with the documentation marked with the book symbol 🕮 and you have understood and observed it.

Table 1: Required and amending documentation

	Title	Document number	Document type
🕮	Order confirmation		
🕮	Installation drawing with parts list		Drawing
	General product information on hydraulic products	07008	Data sheet
	Assembly, commissioning and maintenance of hydraulic systems	07900	Data sheet
	Hydraulic valves and hydroelectric pressure switches for industrial applications; on/off valves, continuous control valves, pressure switches	07600-B	Operating instructions
	Hydraulic fluids based on mineral oils and related hydrocarbons; application notes and application requirements for Rexroth hydraulic components	90220	Data sheet
	Environmentally compatible hydraulic fluids; includes application notes and requirements for Rexroth hydraulic components	90221	Data sheet
	Flame-resistant, water-free hydraulic fluids (HFDR/HFDU); application notes and requirements for Rexroth hydraulic components	90222	Data sheet
	Flame-resistant hydraulic fluids - water-containing (HFAE, HFAS, HFB, HFC); application notes and application requirements for Rexroth hydraulic components	90223	Data sheet

1.3 Representation of information

Uniform safety instructions, symbols, terms and abbreviations are used so that you can quickly and safely work with your product using this documentation.
For a better understanding, they are explained in the following sections.

1.3.1 Safety instructions

In this documentation, safety instructions are contained in chapter 2.6 "Product- and technology-dependent safety instructions" and in chapter 3 "General information on damage to property and damage to the product" and wherever a sequence of actions or instructions are explained which bear the danger of personal injury or damage to property. The measures described for hazard avoidance must be observed.

Safety instructions are structured as follows:

⚠ SIGNAL WORD

Type and source of danger
Consequences in case of non-compliance
- ▶ Hazard avoidance measures
- ▶ <Enumeration>

- **Warning sign:** Draws attention to the danger
- **Signal word:** Identifies the degree of danger
- **Type and source of danger:** Specifies the type and source of danger
- **Consequences:** Describes the consequences of non-compliance
- **Precaution:** Specifies how the danger can be prevented

Table 2: Risk classes according to ANSI Z535.6-2006

Warning sign, signal word	Meaning
⚠ DANGER	Indicates a dangerous situation which will cause death or severe injury if not avoided.
⚠ WARNING	Indicates a dangerous situation which may cause death or severe injury if not avoided.
⚠ CAUTION	Indicates a dangerous situation which may cause minor to moderate (personal) injury if not avoided.
NOTICE	Damage to property: the product or the environment could be damaged.

1.3.2 Symbols

The following symbols indicate notes which are not safety-relevant but increase the comprehensibility of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is not observed, the product cannot be optimally used and/or operated.
▶	Individual, independent action
1. **2.** **3.**	Numbered instruction: The numbers indicate that the actions must be carried out one after the other.

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Table 4: Abbreviations

Abbreviation	Meaning
ANSI	American National Standards Institute
EMC	Electro-magnetic Compatibility
PE	Protective Earth (protective grounding conductor)
QR	Quick Response

1.3.4 Designations

The following designations are used in this documentation:

Table 5: Designations

Designation	Meaning
Non-pressure-resistant closure elements	Closure elements to be removed for protection against dust, dirt and leaks, such as plastics protective caps, sheet metal flange covers, magnetic plates, cork and cardboard covers, foils
Pressure-resistant closure elements	Closure elements remaining on the product for auxiliary bores or for unneeded ports, such as plug screws, blind flanges, cover plates

2 Safety instructions

2.1 About this chapter

The product has been manufactured according to the generally accepted codes of practice. However, there is still the danger of personal injury and damage to property if you do not observe this chapter and the safety instructions in this documentation.

- Read this documentation completely and thoroughly before working with the product.
- Keep this documentation in a location where it is accessible to all users at all times.
- Always include the required documentation when passing the product on to third parties.

2.2 Intended use

2.2.1 Information on the use of the product

The product is a hydraulic system component. It is designed for use in industrial machines and systems.

You may use the product to control movement on machines and systems in compliance with the operating and environmental conditions and the specified performance limits in accordance with the relevant technical specification.
You must only use the product in its original state without damage.
Repairs by customers are not admissible.

The product is intended only for professional use and not for private use.

Intended use also means that you have fully read and understood this documentation and in particular chapters 2 "Safety instructions" and 3 "General information on damage to property and damage to the product".

2.2.2 Information on the use of hydraulic fluids

Manifolds and modules from Rexroth are usually developed and approved for operation with hydraulic oils of category / classification HLP.

When using bio-degradable or flame-resistant – water-free/containing – hydraulic fluids, for example, of the HFDU and HFC categories, the application notes and application requirements contained in data sheets 90221, 90222, and 90223 must be observed. Please refer to the respective technical specification for the release of the specific manifolds and modules for the application with corresponding hydraulic fluids.

2.3 Improper use

Any use deviating from the intended use is improper and thus not admissible. Bosch Rexroth AG does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

Improper use of the product includes:
- Use in potentially explosive environments
- Use outside the technical data stated in the technical specification

2.4 Qualification of personnel

The activities described in this documentation require basic knowledge of mechanics, electrics and hydraulics as well as knowledge of the appropriate technical terms. For transporting and handling the product, additional knowledge of how to handle lifting gear and the necessary attachment devices is required. In order to ensure safe use, these activities may only be carried out by an expert in the respective field or an instructed person under the direction and supervision of an expert.
Experts are those who are able to recognize potential dangers and apply 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 undertaken. An expert must observe the relevant specific professional rules and have the necessary expert knowledge.
Expert knowledge means for example for hydraulic products:
- Reading and completely understanding hydraulic schemes,
- in particular, completely understanding the relationships regarding the safety equipment, and
- having knowledge of the function and set-up of hydraulic components.

Bosch Rexroth offers training measures in specific fields.
Please find an overview of the training contents on the internet at:
www.boschrexroth.com/de/de/academy

2.5 General safety instructions

- Observe the valid regulations on accident prevention and environmental protection.
- Observe the safety regulations and provisions of the country in which the product is used/applied.
- Only use Rexroth products in technically perfect condition.
- Observe all notes on the product.
- Persons who assemble, operate, disassemble or maintain Rexroth products must not be under the influence of alcohol, drugs or pharmaceuticals that may affect their ability to react.
- Only use accessories and spare parts approved by the manufacturer in order to exclude hazards to persons due to unsuitable spare parts.
- Comply with the technical data and environmental conditions specified in the product documentation.
- The installation or use of inappropriate products in safety-relevant applications could result in unintended operating conditions when being used which in turn could cause personal injuries and/or damage to property. Therefore, only use a product for safety-relevant applications if this use is expressly specified and permitted in the documentation of the product, or if the safe suitability of the product in the application is confirmed by a separate conformity assessment procedure for the end product, for example, in explosion-protected areas or in safety-related parts of control systems (functional safety).
- Do not commission the product until you can be sure that the end product (for example, a machine or system) in which the Rexroth product is installed complies with the country-specific provisions, safety regulations and standards of application.

2.6 Product- and technology-dependent safety instructions

⚠ WARNING

Incorrect control or unexpected startup due to mechanical and electric faults, e.g. failure of the energy supply!

Danger to life! Risk of injury! Danger of people being caught or thrown! Danger of crushing!

- When setting up your circuit, observe functional safety e.g. according to EN ISO 13849.
- Install light barriers or protective grids, if necessary.
- Immediately exchange defective components.

Pressurized system parts, e.g. accumulator, cylinder!

Danger to life and risk of serious injury when working on machines/systems that have not been shut down! Damage to property!

- Only use authorized specialist personnel for maintenance and troubleshooting.
- Before working on the hydraulic product, ensure that all parts of the hydraulic system are depressurized and that electrical control is de-energized.
- Do not disconnect, open, or cut any pressurized lines or dismantle any pressurized components.
- Secure the system against unintended restarting.

Leakage of (pressurized) hydraulic fluid and oil mist!

Danger to life! Risk of injury! Explosion hazard! Risk of fire! Environmental pollution! Damage to property!

- Switch the system off immediately (emergency off switch).
- Identify and eliminate the leakage (cracks or fractures on the block or on assembled components).
- Never try to stop or seal the leakage or the oil jet using a cloth.
- Avoid direct contact with the leaking hydraulic fluid.
- Carry out regular visual inspections for leak-tightness in the manifold/module and the oil-carrying components.
- Wear your personal protective equipment.
- Keep open fire and ignition sources away from the manifold/module.
- Do not use manifolds and modules in areas with open fire and only at a sufficient distance to hot heat sources.
- When dealing with hydraulic fluids, you must imperatively observe the manufacturer's information.

⚠ WARNING

Ejection of parts due to component failure caused by impermissibly high pressure in the system!

Danger to life! Risk of injury! Damage to property!

- Use an overpressure element, e.g. a pressure relief valve, to limit the maximum admissible pressure in the system.
- Ensure that these pressure relief valves are correctly set and verify reliable pressure relief before commissioning the hydraulic system.
- Lead the tank line to the tank freely, without reduction of the cross-section and blocking.
- Use hydraulic lines and connections in accordance with the maximum operating pressure.

⚠ CAUTION

Leaked hydraulic fluid, oily surfaces!

Risk of injury! Risk of slipping! Environmental pollution! Damage to property!

- Secure and mark the danger zone.
- Immediately remove leaked hydraulic fluid and dispose of it properly.
- Do not remove the non pressure-resistant closure elements of the hydraulic connections until shortly before installation.
- After disassembly, fit the hydraulic connections with suitable closure elements, see Table 5.
- Wear the personal protective equipment prescribed for your activity.
- Perform a leak test.

Contact with hydraulic fluid!

Health hazard/impairment of health, e.g. eye injuries, skin lesions, intoxication upon inhalation or due to swallowing, sensitization!

- Avoid contact with hydraulic fluids.
- When dealing with hydraulic fluids, you must imperatively observe the safety instructions of the hydraulic fluid manufacturer.
- Use your personal protective equipment (like e.g. safety goggles, protective gloves, suitable working clothes, safety shoes).
- If hydraulic fluid nevertheless comes into contact with the eyes or gets into the bloodstream or is swallowed, please consult a doctor immediately.

High noise pollution due to resonance or fluid noise!

Danger of hearing damage (temporary/permanent), stress/loss of attention! Fault in voice communication and acoustic signals!

- Wear your ear protection.
- Consult the machine manufacturer or Bosch Rexroth to identify any malfunction if applicable.

⚠ CAUTION

Uncontrolled movement or malfunction of the actuated cylinder or motor due to ingress of dirt, foreign particles, contamination and metal particles!

Risk of injury!

- Only install the manifolds and modules in a clean environment.
- Do not remove the non-pressure-resistant closure elements until shortly before assembly!
- Make sure that no dirt gets into the hydraulic system

For electrically controlled manifolds/modules:

⚠ WARNING

High electrical voltage for manifolds/modules with add-on components with a supply voltage!

Danger to life! Risk of injury caused by electric shock!

- Ensure that manifolds/modules are only electrically connected by a specialized electrician or under their supervision.
- Observe the requirements of the Low-Voltage Directive and other relevant standards, e.g. IEC 61140.
- Observe the country-specific requirements.
- For connection, observe the data sheets for the associated surface-mounted and add-on components.
- Use suitable plug-in connectors and cables.
- Switch off the voltage supply before all maintenance, repair or installation works and secure it against restarting.
- Provide for proper, safe PE connection.
- Only use power supply units with safe voltage separation. Safe isolation can be achieved with isolation transformers, safe optocouplers or mains-free battery operation.

Malfunctions or uncontrolled machine movements due to lack of equipotential bonding!

Danger to life! Risk of injury! Damage to property!

- Provide for correct grounding and proper equipotential bonding.

Valve malfunction and/or unexpected hydraulic system movement due to ingress of water and humidity!

Risk of injury! Damage to property!

- Only use the manifold/module within the intended IP protection class or lower.
- Before assembly, ensure that all seals and caps of the plug-in connections are tight and intact.

⚠ WARNING

Malfunctions, e.g. overheating of the valve solenoids, and/or unexpected system movements if the maximum temperatures are exceeded!

Risk of injury!

- Only use the hydraulic valves within the ambient and hydraulic fluid temperature specified for them.

Uncontrolled machine movements due to electro-magnetic radiation from unshielded connection lines!

Risk of injury!

- Observe the EMC limit values.
- Only use recommended electrical connection lines in accordance with the EMC Directive and shield the valve electronics from the source of interference.
- Provide for proper grounding.

Leakage at the hydraulic valves in case of incorrect working temperatures!

Risk of injury from escaping hydraulic fluid jet! Damage to property!

- Only use the manifolds/modules within the environmental and fluid temperatures intended for that purpose.
- In case of leakage, immediately exchange damaged seal rings and/or the hydraulic valve.

⚠ CAUTION

Hot surfaces on hydraulic valves and valve solenoids of a manifold/module!

Risk of injury! Risk of burning!

- Avoid contact with the hydraulic valves and their solenoids during operation. During or after operation, temperatures may rise to values higher than 70 °C, depending on the operating conditions.
- Allow hydraulic valves to cool down before touching them or wear heat-resistant protective gloves.
- If necessary, attach protective covers.

Unexpected system movements due to malfunctions, e.g. sticking or clogging of nozzles or components on the manifold/module due to contaminated hydraulic fluid!

Risk of injury!

- Ensure adequate hydraulic fluid cleanliness according to the cleanliness classes of the hydraulic valve over the entire operating range.
- Replace the filter elements according to the maintenance schedule or as required.
- If necessary, flush the hydraulic system.

Improperly laid lines and cables!

Risk of stumbling!

- Lay cables and lines so that nobody can trip over them.
- Fasten cables and lines in order to prevent them from getting loose during vibrations.

2.7 Personal protective equipment

The following personal protective equipment must be worn for all work on the product, e.g. installation, commissioning, operating and maintenance work as well as when installing and removing the manifolds/modules:

- Heat or cold-resistant protective gloves
- Ear protection
- Safety shoes
- Perfectly fitting safety goggles
- Protective helmet
- Protective clothing

3 General information on damage to property and damage to the product

The warranty only applies to the delivered configuration. The claim to warranty expires if the product is assembled, commissioned and operated incorrectly, not used as intended and/or handled improperly.

NOTICE

Danger due to improper handling!

Damage to property!

- Only use the manifold/module in accordance with chapter 2.2 "Intended use".
- Do not expose the manifold/module to any inadmissible mechanical load under any circumstances.
- Do not place/put the manifold/module onto the attachment parts.
- Never use attachment parts as handle or step. Do not place/put any objects on top of it.

Contamination by fluids and foreign particles!

Premature wear and malfunctions!

- During assembly, ensure utmost cleanliness in order to prevent foreign particles such as welding beads or metal chips from getting into the hydraulic lines.
- Check before commissioning whether all hydraulic connections are tight and that all the seals and caps of the plug-in connections are correctly installed and undamaged.
- Ensure that no cleaning agents are able to enter the hydraulic system.
- Use residue-free industrial wipes for cleaning.

Mixing hydraulic fluids!

Damage to property!

- Generally avoid any mixing of hydraulic fluids of different manufacturers and/or of different types of the same manufacturer. Mixing of hydraulic fluids may occur, for example, due to hydraulic fluid residues in the manifold/module.
- Allow oil residue to drip out of the manifold/module before assembly.
- Check the compatibility of the various hydraulic fluids and their compatibility with the components and seals.

NOTICE
Contact with saltwater! Damage to property! ▶ Take suitable corrosion protection measures.
ONLY FOR ELECTRIC COMPONENTS! **Uncontrolled disconnection and connection of plug-in connectors!** Damage to property! ▶ Disconnect the manifold/module from the mains or the voltage source before carrying out installation work or de-energize it safely. ▶ Do not plug in or pull off the electric plug-in connector as long as the voltage supply is activated.

4 Scope of delivery

For scope of delivery information, refer to the packing slip or technical specification or the installation drawing of your manifold/module.

- ▶ Check the scope of delivery for completeness.
  – To unpack, proceed as described in chapter 7.1.
- ▶ Check the scope of delivery for possible transport damage, see chapter 6 "Transport and storage".

In case of complaints, please contact Bosch Rexroth AG, see chapter 16.1 "List of addresses".

5 Product information

Manifolds/modules for industrial applications are intended for stationary, non-mobile operation. They fulfil different functions depending on the design.

Please refer to the installation drawing, hydraulic circuit diagram and technical specification for a functional, power and product description of your manifold/ module.
For further information on the attached and installed components, please refer to the related data sheets at: www.boschrexroth.com/mediadirectory

5.1 Product identification

The following figure shows a schematic name plate as an example:

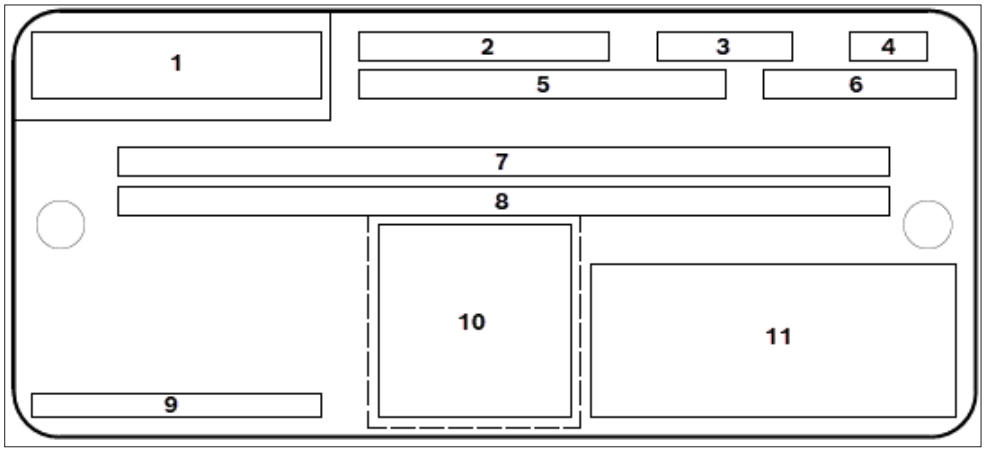


Abb. 1: Name plate

1 Rexroth logo
2 Material number
3 Date of production
4 Producing plant
5 Serial number
6 Customer, production, repair order or project number
7 Type designation (SAP short text)
8 Customer's material number or additional information
9 Designation of origin
10 QR code
11 Symbol according to ISO 1219

In case of questions regarding your manifold or/ module, please specify the material number and the serial number. You should preferably take a picture of the name plate and transmit it to Bosch Rexroth.

6 Transport and storage

- During transport and storage, always comply with the environmental conditions specified in the technical data (see technical specification and installation drawing).

6.1 Transporting the manifold/module

Bosch Rexroth manifolds/modules are high-quality products. In order to prevent damage to these products, transport the manifolds/modules in the original packaging or with equivalent transport protection.

⚠ WARNING

Unsecured manifolds and modules may topple over or fall down!

Danger to life! Risk of injury! Damage to property!

- If possible, use the original packaging of the manifolds/modules for transport.
- Check the weight of the manifold/module.
- Provide for a stable position during transport to the place of installation.
- Transport the manifold/module using a forklift truck or sufficiently dimensioned lifting gear.
- Transport the manifold/module by the lifting eyes and lifting points provided and not by parts with low stability, e.g. valves, solenoids, connectors and cables.
- Secure the manifold/module by the lifting eyes and attachment points provided until it is fully assembled.
- Never step or reach below suspended loads.
- Wear your personal protective equipment.
- Ensure that no unauthorized persons are within the danger zone.
- Comply with the national laws and regulations regarding occupational health and safety and transport.

⚠ CAUTION

Heavy loads with a weight of more than 15 kg!

Risk of injury! Danger to health! Damage to property!

- Use a suitable lifting, putting down and moving technique.
- Use suitable lifting gear for transporting heavy manifolds/modules.
- During transport, secure the manifold/module against toppling over.
- Put the manifold/module carefully onto the contact surface in order not to damage it.

6.1.1 Transport using forklifts and similar floor conveyors

To transport the manifold/module using a forklift, proceed as follows:

1. Guide the fork of the forklift truck under the packaging of the manifold/module or under the manifold/module secured for transport in the recesses provided.
2. Carefully lift the load to check the center of gravity position. Ensure a stable center of gravity position.
3. Make sure that the manifold/module cannot move out of the intended position.
4. Secure the manifold/module against the occurring acceleration forces and the related undesired movements of the manifold/module.
5. During transport, only lift the manifold/module as far off the floor as necessary for transport.

6.1.2 Transport using lifting gear

For transport, consider the following aspects:

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

▶ Ensure that the lifting capacity of the lifting gear is sufficient to transport the manifold/module without any risk.
▶ Use textile attachment devices according to DIN EN 1492-2.

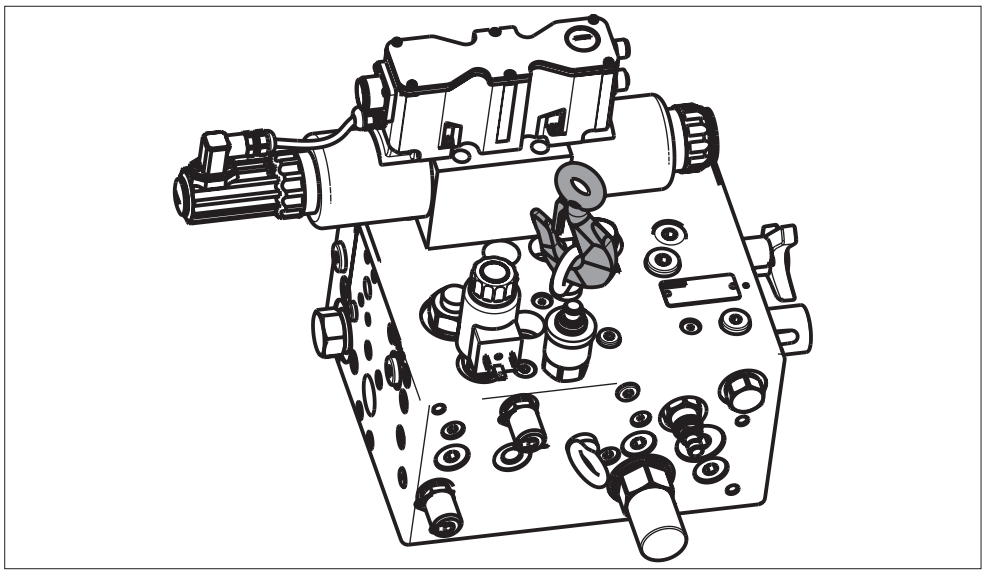


Abb. 2: Lifting the manifold (exemplary representation)

6.2 Storing the manifold/module

Improper storage may damage the manifold/module. If there is no separate information in the technical specification or in the installation drawing, maintain a storage temperature of -20 ℃ to +50 ℃.

Manifolds/modules are suitable for storage for up to 6 months under the following conditions:

- Do not store the manifold/module outdoors, but in a well-ventilated room. Avoid high light irradiation.
- Protect the manifold/module from humidity, especially from soil moisture. Store the manifold/module on the shelf or on a pallet.
- Manifolds/modules can be very heavy. Please observe the admissible load-bearing capacity of your storage system.
- Store the manifold/module in the original packaging or comparable packaging to protect it from dust and dirt.
- All ports on the manifold/module must be closed with closure elements, see Table 5.
- After opening the transport packaging, it has to be closed properly again for storage. Use the original packaging for storage.
- Do not remove any non-pressure-resistant closure elements from the hydraulic ports on the manifold/module until installation.

If the storage period exceeds six months or if sea transport is necessary, please contact Bosch Rexroth.

Bosch Rexroth recommends that you have the manifold/module checked by your responsible Rexroth service after the maximum storage time has expired.

7 Assembly

7.1 Unpacking

⚠ CAUTION

Parts falling out!
Risk of injury! Damage to property!
- ▶ Put the packaging on level, bearing ground.
- ▶ Only open the packaging from the top.

The manifold/module is delivered packed in a suitable protective packing.

- ▶ Dispose of the packaging in accordance with the currently applicable national provisions in your country.

7.2 Before assembly

1. Before assembling the manifold/module, check compliance of the type designation on the name plate with your order or order number.
2. Pay attention to the maximum operating pressure in the technical specification.

If the material number of the manifold/module does not match the number in the order confirmation, contact Rexroth service for clarification; for the address, see chapter 10.3 "Spare parts".

3. Check the scope of delivery for completeness and transport damage.
4. Make sure that all required seals are available and have been properly installed.

7.3 Installation conditions

- ▶ When installing, always observe the environmental conditions specified in the technical specification/installation drawing.
- ▶ It is imperative to ensure absolute cleanliness. Hydraulic components must be protected from dirt during installation. Contamination of the hydraulic fluid may considerably impair the life cycle of the hydraulic component.
- ▶ Observe the installation position specified in the technical specification or in the installation drawing.

7.4 Required tools

In order to assemble the manifold/module, you need standard tools only.

7.5 Assembling the manifold/module

⚠ WARNING

Faulty mounting at the place of use!

Risk of injury! Damage to property!

- ▶ Completely assemble the manifold/module according to the assembly specifications by means of suitable assembly aids.
- ▶ Only assemble the manifold/module on the specified mounting surfaces.
- ▶ Use mounting screws with appropriate dimensions and property classes.
- ▶ Comply with tightening torques and screw stabilities.

Faulty installation of closure elements and cables!

Danger to life! Risk of injury!

- ▶ Do not pressurize your system until all closure elements, see Table 5, and lines have been completely and properly installed according to specifications.
- ▶ Ensure that the manifold/module is not pressurized with the non-pressure-resistant closure elements for protection against dust, dirt, and leakage.

⚠ CAUTION

Insufficient assembly space!

Risk of injury! Danger of jamming and bruising!

- ▶ Ensure that the installation space is sufficient and that plug-in connectors, actuating and operating and adjustment elements as well as display and mounting elements are easily accessible.

Incorrect connection of electric components!

Risk of injury! Risk of short-circuit and damage!

- ▶ Ensure that electrical components are connected by a specialized electrician according to the electrical wiring diagram and pin assignment.

Hydraulic lines and hoses installed under tension stress!

Risk of injury! Damage to property!

- ▶ Assemble lines and hoses without stress.

7.5.1 Mechanical assembly of the manifold/module

The mounting possibilities on the manifold/module are designed exclusively for fixing the manifold/module. Attachment parts such as pipes and hoses must be attached or secured separately.

To assemble the manifold/module mechanically, proceed as follows:

- ▶ Select a clean, stable, and flat installation surface for final assembly.
- ▶ Avoid external stresses, such as piping, and/or vibration.
- ▶ Use an appropriate substructure/console as a support for the manifold/module.
  - – Ideally, attach the manifold/module horizontally to a console.

Depending on the product, e.g. in the case of manifolds HSR, front-side mounting possibilities for vertical installation are also provided.
See the respective data sheet for further information.

- ▶ Fully attach the manifold/module to the designated fixing holes.

Bosch Rexroth recommends using property class 10.9 screws.
In cast blocks/modules, Bosch Rexroth recommends a screw-in depth of at least 1.5 x D (D = nominal diameter of the screw) and for steel blocks/modules at least 1.0 x D.
When using through holes to secure the manifold/module, ensure the correct screw length and appropriate fixation to the site of installation.

- – Provide additional support for the manifold/module or secure the manifold/module with additional brackets to avoid overstressing the mounting screws, particularly in the case of long stacking assembly or a large number of installed valves.
- – When designing the fastening for wall or ceiling mounting, take into account that the mounting screws are not loaded evenly.
- – Use all provided mounting possibilities such as threads or through holes for mounting.

- ▶ Select the necessary tightening torques taking into account the specifications in VDI 2230, e.g. coatings, frictional torques, selected tightening method.

7.5.2 Connecting the manifold/module hydraulically

To connect the manifold/module hydraulically, proceed as follows:

1. Depressurize the relevant system part.
2. Connect all connections.
   – Note the hydraulic circuit diagrams, assembly instructions and the technical specification of the installation and the manifolds and modules used.
3. Make sure that pipes or hoses are attached to all ports, or that ports and openings that are not required are closed with pressure-resistant closure elements, see Table 5.
4. Carry out a special check to make sure that the cap nuts and flanges are correctly tightened at the pipe fittings and flanges.
5. Make sure that all pipes and hose lines and every combination of connection pieces, couplings or connection points with hoses or pipes are checked for their operational safety by a person with appropriate knowledge and experience.

For manifolds/ modules with electric components:

7.5.3 Connecting the manifold/module electrically

To connect the manifold/module electrically, proceed as follows:

- ▶ Ensure that the manifold/module is only connected by a specialized electrician.
- ▶ Make sure that the pipes used are suitable for operating temperatures of -20 °C...+100 °C.
- ▶ De-energize the connection line before assembly.
- ▶ Correctly connect the protective grounding conductor and the grounding.
- ▶ Ensure that there are no sharp bends in the connection line and braided wires to avoid short-circuits and interruptions.
  – Only assemble the cable and line entries according to the assembly instructions.
- ▶ Before installation, check that all the individual components of the cable and line entry are present and that the sealing elements are undamaged.
- ▶ During installation, ensure that there are no leaks between the cable and the cable and line entry.
- ▶ Route the connection line(s) in a strain-relieved form.

The first mounting point must be within 15 cm of the cable entry.

- ▶ Only use finely stranded cables with pressed-on wire end ferrules.

Solenoid coils can be connected in a polarity-independent way.

- ▶ Only use the mating connectors of the same type specified in the technical specification or the installation drawing.
  – Observe the assembly instructions printed onto the packaging of the mating connector and the tightening torques specified there.

7.6 Painting the manifold/module

NOTICE

Restriction of functionality or overheating of the manifold/module due to over coating!

Damage to property!

- Never paint measurement systems, cooling and contact surfaces.
- Protect the surface of valve solenoids against paint application.
- Close the hydraulic connections completely before the paint application.
- Protect the fixing holes and surfaces against paint application.
- Mask off the name plate and any information signs so that they remain legible after painting.
- Mask the connectors of the electrical connections with protective foil and make sure not to cause any damage to the connector.
- When removing the paint protection and the covers make sure that no paint chips or other foreign particles enter the manifold/module.

Depending on the product, manifolds/modules are delivered unpainted or with standard painting, unless customer specifications are provided.

8 Commissioning

⚠ WARNING

Incorrectly mounted manifold/module!
Risk of injury from escaping hydraulic fluid jet!
- Only commission your system after all hydraulic connections and the manifold and/or the module have been completely and properly mounted according to the specifications.
- Look out for defective sealing points and exchange defective seal rings immediately.
- Wear personal protective equipment during the initial commissioning.

Exceeding the maximum operating pressure!
Danger to life! Risk of injury! Danger of bursting!
- Before commissioning the hydraulic system, ensure that the maximum admissible pressure of the hydraulic components in the system is not exceeded by no means.
- Make sure that the maximum admissible operating pressure in your system is protected by an overpressure element, e.g. a pressure relief valve.

- Make sure that all hydraulic connections are closed and pressure-resistant and all electrical connections are connected.
- Immediately depressurize the system if hydraulic fluid still leaks despite proper assembly.
- Commission hydraulic components only if they are completely installed.
- Allow manifolds/modules with integrated electronics to acclimatize for some time prior to commissioning as the electronics might be damaged by the generation of condensed water.
- Have electrical connections checked for proper condition by a specialized electrician before initial operation or re-commissioning.
- Before switch on, check whether the protective grounding conductor of all electric devices is firmly connected according to the connection diagram.

When commissioning the manifold/module at a system, first of all commission the electronics that might exist and then the hydraulics. When commissioning the electronics, the hydraulics (power unit, valve etc.) must be switched off in order to prevent damage of the hydraulic components caused by incorrect wiring and malfunctions of the electronics.

8.1 Bleeding the hydraulic system

- To bleed the overall system, observe the operating instructions for the system in which the manifold/module is installed.
- Switch the manifold/module several times under 50% of the operating pressure before placing it into full operation so that air which has remained in the manifold/module can exit.

  Mechanical damage due to impermissibly high acceleration of the hydraulic fluid and the valve spool is thus avoided and the life cycle of the manifold/module is increased.

9 Operation

⚠ CAUTION

Moving actuation elements, e.g. hand levers, actuating rollers, on mechanically actuated hydraulic valves!

Risk of injury! Danger of entrapment or crushing of body parts!

- When switching the hydraulic valves, pay attention to moving actuation elements.
- Do not stand in the immediate vicinity of moving parts when operating hydraulic systems.
- Always wear your personal protective equipment.

For more information on the operation, please refer to the operating instructions for the hydraulic system into which the manifold or the module is installed.

10 Maintenance and repair

⚠ WARNING

Sudden movement of system parts and storage of potential energy in elastic parts, fluids or gases!
Danger to life! Risk of injury!
- De-energize all valves of the manifold/module before carrying out maintenance work.

Rexroth manifolds and modules require low maintenance.
Seals of attached and installed hydraulic components are subject to a natural process of wear and aging. Therefore, Bosch Rexroth recommends replacing them at appropriate time intervals. The intervals are mainly determined by the operating conditions and the cleanliness of the hydraulic fluid.

- Regularly check the product and connection surfaces for leak-tightness.
- As a precaution, exchange seals at reasonable time intervals.

Preventive maintenance (e.g. hydraulic fluid care) and compliance with pressure and temperature specifications extend the life cycle of the system or manifold/module.

10.1 Cleaning and care

NOTICE

Damage to surfaces and seals caused by solvents and aggressive cleaning agents!
Damage to property!
- Do not use solvents or aggressive cleaning agents.

Penetrating dirt and liquids!
Damage to property!
- Do not use high-pressure washers.
- Do not use compressed air for cleaning at functional interfaces.

For cleaning and care of the manifold/module, observe the following:
- Ensure that all seals and caps of the plug-in connections are firmly attached so that no humidity can penetrate the manifold/module during cleaning.
- Remove external coarse dirt and keep sensitive and important parts like solenoids, valves and indicators clean.
- Use residue-free industrial wipes for cleaning.

10.2 Repair

Rexroth offers you a comprehensive range of service offers for the repair of components. Partly tested and pre-assembled original Rexroth assemblies allow for successful repair works requiring only little time.

The repair may only be carried out by authorized, trained and instructed personnel.

- Only use original Rexroth spare parts for repairing Rexroth manifolds/modules.

10.3 Spare parts

- When ordering spare parts, please specify the material number of the parts or components to be replaced.

  It is usually indicated on a name plate or label or attached to the product.

- If you have any questions about spare parts, please contact your responsible Rexroth Service department, see chapter 16.1 "List of addresses".

  You can find the addresses of our sales and service network at www.boschrexroth.com.

Further information on available spare parts can be found at the following link: www.boschrexroth.com/ics/spc.

11 Disassembly and replacement

⚠ WARNING

Manifolds, modules or components that are not fully secured may fall!
Danger to life! Risk of injury! Damage to property!
- ▶ Secure parts to be disassembled against falling down.
- ▶ Wear your personal protective equipment.

Have sufficiently large collecting containers, residue-free industrial wipes and medium-binding materials ready to collect or bind escaping hydraulic fluid.

11.1 Required tools

The disassembly can usually be carried out with standard tools.
Special tools are not required.

11.2 Preparing for disassembly

1. Decommission the overall system as described in the overall machine or system instructions.
2. Discharge the pressure of the hydraulic system according to the specifications of the machine or system manufacturer.

11.3 Disassembly process

Proceed as follows to disassemble the manifold/module:
1. Observe the safety instructions applicable to the assembly.
2. Ensure that the hydraulic system is depressurized.
3. Check whether the manifold/module has cooled down sufficiently so that it can be disassembled in a risk-free manner.
4. De-energize the system.
5. Loosen and/or separate the electric connectors and connections.

NOTICE! Spilt or leaked hydraulic fluid!
Environmental pollution and contamination of the ground water!
- ▶ When draining the hydraulic fluid, always put a collecting pan under the manifold/module.
- ▶ Observe the information in the safety data sheet for the hydraulic fluid and the system manufacturer's provisions.

6. Disconnect the lines and collect any escaping hydraulic fluid in the provided tank.
7. Remove the manifold/module. If necessary, use suitable lifting gear.
8. Empty the manifold/module completely.
9. Close all openings.

- ▶ Ensure during all these steps that no dirt gets into the openings.

12 Disposal

12.1 Environmental protection

- Careless disposal of the hydraulic components and the hydraulic fluid could lead to environmental pollution.
- Thus, dispose of the product and the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- Dispose of any remaining hydraulic fluid in accordance with the applicable safety data sheets for this hydraulic fluid.

12.2 Return to Bosch Rexroth

The hydraulic products manufactured by us can be returned to us for disposal purposes free of charge. There must be no inappropriate foreign substances or third-party components when products are returned. Hydraulic valves have to be drained before being returned. The components have to be delivered free to the following address:
Bosch Rexroth AG
Industrial Hydraulics Service
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany

12.3 Packaging

Upon request, reusable systems can be used for regular deliveries.
The materials for disposable packaging are mostly cardboard, wood, and expanded polystyrene. They can be recycled without any problems. For ecological reasons, disposable packaging should not be used for returning products to Bosch Rexroth.

12.4 Materials used

Bosch Rexroth hydraulic components 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 expected.
The hydraulic valves essentially consist of:

- Cast iron
- Steel
- Aluminum
- Copper
- Plastics
- Electronics components and assemblies
- Elastomers

12.5 Recycling

Due to the high metal share, hydraulic products can mostly be recycled. In order to achieve an ideal metal recovery, disassembly into individual assemblies is required. The metals contained in electric and electronic assemblies can also be recovered by means of special separation procedures.

13 Extension and modification

You will be considered responsible for any extensions or modifications to the product.

Declarations lose their validity

By making extensions or modifications to the product marketed by Bosch Rexroth, you are making changes to the condition as supplied. Any declarations made by Bosch Rexroth regarding these products are no longer valid.

14 Troubleshooting

14.1 How to proceed for troubleshooting

- Proceed systematically and purposefully, even under time pressure. Indiscriminate, ill-considered dismantling and changing of setting values can, in the worst case, lead to no longer being able to determine the original cause of the fault.
- First get a general idea of how your product works in conjunction with the overall system.
- Try to find out whether the product has functioned properly in conjunction with the overall system before the error occurred first.
- Try to determine any changes of the overall system in which the product is integrated:
  - Were there any changes to the product's application conditions or area of application?
  - Have modifications (e.g. refittings) or repair works been carried out on the overall system (machine/system, electrical system, control) or on the product? If so: what were they?
  - Was the product or machine used as intended?
  - How did the fault become apparent?

- Try to get a clear idea of the cause of error.
- If you are unable to rectify the error, please contact one of the contact addresses listed under: www.boschrexroth.com.

14.2 Fault table

Manifolds and modules are usually not sensitive to faults if the prescribed application conditions and hydraulic fluid quality are complied with.

Table 6: Fault table

Fault	Possible cause	Remedy
External leakage	Seals at connection surface damaged	▶ Disassemble the hydraulic component and replace the seals.
	Other leakage	▶ Replace the leaking hydraulic valves.
No function	Electrical connection interrupted	▶ Check whether the electrical plug-in connectors are correctly and completely mounted. ▶ Replace the plug-in connector if necessary.
	Cable break	▶ Replace the connection cable.

15 Technical data

The technical data can be found in the respective technical specification or installation drawing for your manifold/module.

16 Appendix

16.1 List of addresses

Contacts for service and spare parts:

Bosch Rexroth AG
Industrial Hydraulics Service
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany

Phone: +49 (0) 9352/40 50 60
Email: service@boschrexroth.de

For service representatives in your area outside of Germany, please refer to www.boschrexroth.com.

Headquarters:

Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
Germany

Phone: +49 (0) 9352/40 30 20
Email: my.support@boschrexroth.com

The addresses of our sales and service network and sales organizations can be found at www.boschrexroth.com/Adressen.

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Bosch Rexroth AG
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