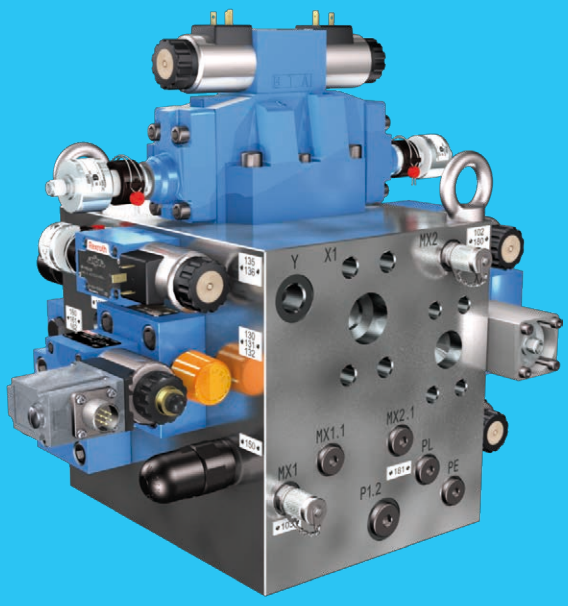
rexroth
A Bosch Company

General operating instructions

Press modules for hydraulic presses

Type IH04



RE 63124-B, Edition: 08.2021, Replaces: -, EN

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 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:

- Press modules for hydraulic presses, type IH04C, -D, -E and -N

This documentation is intended for assemblers, service engineers, machine manufacturers and machine end-users.
This documentation contains important information on the safe and proper transport, assembly, commissioning, use, maintenance, disassembly and simple troubleshooting of the product.

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

1.2 Required and additional 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 additional documentation

	Title	Document number	Document type
🕮	Press module, type IH04C	63142	Data sheet
🕮	Assembly instructions for press modules, type IH04C[1)]	-	Assembly instructions
🕮	Press module, type IH04D	63125	Data sheet
🕮	Assembly instructions for press modules, type IH04D[1)]	-	Assembly instructions
🕮	Press modules, type IH04E	63129	Data sheet
🕮	Assembly instructions for press modules, type IH04E[1)]	-	Assembly instructions
🕮	Press modules, type IH04N[1)]	-	Data sheet
🕮	Assembly instructions for press modules, type IH04N[1)]	-	Assembly instructions
🕮	General Operating Instructions for Hydraulic Power Units and Assemblies	07009-B	Operating instructions
🕮	Manifolds and modules	07601-B	Operating instructions
🕮	General product information on hydraulic products	07008	Operating instructions
🕮	Assembly, commissioning and maintenance of hydraulic systems	07900	Data sheet
🕮	Installation, commissioning and maintenance of industrial valves	07300	Data sheet
🕮	Installation, commissioning and maintenance of servo valves and high-response valves	07700	Data sheet
🕮	Installation, commissioning and maintenance of proportional valves	07800	Data sheet
🕮	Reliability characteristics MTTFd regarding the functional safety according to EN ISO 13849	08012	Data sheet

[1)] This document is presently in preparation.

The press module is a system component.

- Also observe the instructions for the other system components and the system manufacturer's documentation for the overall machine/system.

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 indicated whenever sequences of actions are explained which bear the risk 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 or medium (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
AOS	Active opto-electronic safeguard
BDC	Bottom dead centre
BWS	Contactless safeguard
RE	**R**exroth document in the **E**nglish language
REXXXXX-MON	**R**exroth assembly instructions in the **E**nglish language
TDC	Top dead centre

2 Safety instructions

2.1 About this chapter

The press module was designed and manufactured according to the generally accepted code 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 press module.
- ▶ Keep this documentation in a location where it is accessible to all users at all times.
- ▶ Always include the required documentation when you pass the press module on to third parties.
- ▶ Additionally, please observe the safety instructions for the overall machine/system.

The safety instructions in these instructions only refer to the scope of delivery. Due to the interaction between the press module and the overall machine/system, the installation of the press module into the machine involves additional hazards. This applies in particular to the influence of hydraulic and electric controls on hydraulic drives which generate mechanical movements. It is therefore essential for the manufacturer of the overall machine/system to have undertaken an independent risk assessment. Furthermore, the manufacturer must on this basis have prepared operating instructions for the overall machine/system.

These operating instructions do not serve as replacement of the operating instructions of the overall machine/system.

2.2 Intended use

The product is a hydraulic control block. It is intended for use in industrial machines only. You may use the product as follows:

- in a hydraulic press according to ISO 16092-1, par. 3.1 and plastic presses according to EN 289, par. 3.1, designed or intended to transfer energy hydraulically by a vertical linear movement between closing upper and lower dies
- complying with the application and environmental conditions according to the relevant data sheet
- complying with the specified performance limits according to the circuit diagram and the relevant data sheet
- use in the original condition and/or without damage.

All operating modes such as automatic mode, single stroke and set-up/jog mode with slow closing speed (<10 mm/s) are allowed. They work according to a fixed working cycle specified in the type-specific data sheet.

Classification according to Directive 2006/42/EC

The press module is a safety-related component intended only to be incorporated into or assembled with machinery or partly completed machinery to form, together with them, a machine within the meaning of Directive 2006/42/EC.
The press module is neither a machine, nor a safety component nor a partly completed machinery in terms of Directive 2006/42/EC - article 2.
The press module may be commissioned only if it is integrated in the machine for which it is designed, and only if this machine fully complies with the basic safety and health requirements of Directive 2006/42/EC.

The press module is technical work equipment and not intended for private use.

Intended use includes having read and understood this documentation, especially chapters 2 "Safety instructions" and 3 "General information on damage to property and damage to product".

2.3 Improper use

Any use deviating from the intended use is improper and thus not admissible.

Improper use of the press module further includes:
- Use of the press module for operation in explosive environments
- Use of the press module under aggressive oder corrosive environmental conditions

Bosch Rexroth AG does not assume any liability for damage caused by improper use. The user assumes responsibility for all risks surrounding improper use.

2.4 Qualification of personnel

The activities described in this documentation require basic knowledge of mechanics and hydraulics as well as knowledge of the appropriate technical terms. 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 can 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 hydraulic expert knowledge.
Hydraulic expert knowledge means, among other things:

- Reading and completely understanding hydraulic circuit drawings,
- 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 in specific fields.
An overview over the training contents can be found online 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 any hazard to persons due to unsuitable accessories and 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 states in the application, 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, see chapter 4 "Scope of delivery", or if the safe suitability of the product in the application is confirmed by a separate conformity procedure for the end product, e.g. 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/system) where the Rexroth products are installed complies with the country-specific provisions, safety regulations and standards of the application.
- Never remove or damage lead seals that have been fitted at the factory.
- Make sure that all safety equipment included in the scope of delivery is present, has been installed properly and is functional. You must not suppress or disable position switches on the valve.

2.5.1 General safety instructions for press modules

Pay particular attention to the hazards specified in par. 4 of EN ISO 16092 and EN 289 standards, such as:
- crushing and shearing between moving parts, such as tools, press slides, ejectors, or components attached to the lower die to perform special functions
- danger of entrapment (hazard due to being caught) in moving parts of the machine, separating protective devices, motor and drive machinery, mechanical handling equipment
- ejection of machine components

Pay attention to the main hazard zones specified in par. 4 of EN ISO 16092 and EN 289 standards, such as:
- die area with moving parts
- mechanical handling devices

The installation of the press module is only admissible if a leakage speed of 5mm/s is not exceeded when opening the measuring port on the load-supporting side.
For hydraulic presses according to EN ISO 16092-3 and use of a PLC for valve monitoring, the PLC must meet the specification profile (such as SRP/CS) according to EN ISO 13849-1 PL "e" (category 4).

For maintenance and repair, the user must additionally ensure a mechanical restraint device between the tools, see EN ISO 16092, 5.3.6 and/or EN 289, 5.4.1.1.3.

For hydraulic presses according to EN289 with a depth of the clamping plate greater than 800 mm and stroke greater than 500 mm, a mechanical restraint device according to EN 289, 5.4.1.1.3. is required.

2.6 Product- and technology-dependent safety instructions

The following safety instructions apply to chapters 6 to 15.

⚠ WARNING

Uncontrolled moving parts due to incorrect control and unexpected start-up when safety functions are bypassed or functional safety is not observed!
Danger to life! Risk of injury! Danger of entanglement, ejection or crushing of persons!

- Note the requirements of EN ISO 13849 as well as the relevant product standards EN ISO 16092 and EN 289 when setting up functional safety.
- Mount EMERGENCY stop devices, a safety door, light barriers, light curtains and/or two-hand control device.
- Immediately replace defective safety-related components.

Leakage of (pressurized) hydraulic fluid and oil mist!
Danger to life! Risk of injury! Explosion hazard, risk of fire, health hazard, environmental pollution! Damage to property!

- Switch the machine/system off immediately (emergency off switch).
- Identify and remedy the leakage.
- Never try to stop or seal the leakage or the oil jet using a cloth.
- Avoid direct contact with the leaking hydraulic fluid.
- Use your personal protective equipment, e. g safety goggles.
- Do not use the press module in areas with open fire (e.g. ignition sources ...) and only at a sufficient distance to hot heat sources.
- When dealing with hydraulic fluids, you must implicitly observe the information of the hydraulic fluid manufacturer.

Unexpected press movements due to functional failures (overheating of the solenoid coil, drift error in the integrated electronics of proportional valves) of the press module when the intended maximum temperatures are exceeded!
Danger to life! Risk of injury! Damage to property!

- Only use the press module within the approved environmental and hydraulic fluid temperature range.

Rapid aging of seals and permanent leakage of valves when the press module is used outside the approved temperature range!
Danger to life! Risk of injury! Damage to property!

- Only use the press module within the approved hydraulic fluid temperature range.
- In case of leakage, immediately replace damaged seal rings and/or the affected valve.

⚠ WARNING

Resonance or fluid noise, e.g. loud whistling and vibrations in case of unfavorable arrangement of the press module in the press!

Danger of hearing damage! Material damage to the valves!

- Wear ear protection.
- In this case, contact a service engineer.

⚠ CAUTION

Hot surfaces at press modules, e.g. at valves and valve solenoid coils!

Risk of burning!

- Avoid contact with the press module during operation.
- Only touch the surfaces of the press module with heat-resistant protective clothing, e. g. gloves, or do not work at hot surfaces.
- Allow the valves to cool down sufficiently before touching them.
- Observe the protective measures of the system manufacturer.
- If necessary, attach protective covers.

Contact with hydraulic fluid!

Health hazard/impairment of health, e.g. eye injuries, skin lesions, poisoning due to inhalation and swallowing!

- Avoid contact with hydraulic fluids.
- When dealing with hydraulic fluids, you must implicitly observe the safety instructions of the hydraulic fluid manufacturer.
- Use your personal protective equipment, e. g safety goggles.
- If however hydraulic fluid comes into contact with the eyes or enters the bloodstream or is swallowed, consult a doctor immediately.

Slip hazard due to oily surfaces!

Risk of injury!

- Protect and mark the danger zone.
- Immediately remove leaked hydraulic fluid.
- Use an oil binding agent in order to bind the leaked hydraulic fluid.
- Remove and dispose of the contaminated oil binding agent, see chapter 13 "Disposal".
- Wear the protective equipment, e.g. safety shoes, prescribed for your activity.

⚠ CAUTION

Improperly laid pipes, hoses and cables!

Risk of injury! Risk of stumbling!

- Lay pipes, hoses and cables so that no-one can trip over them.
- Fasten cables and lines in order to prevent them from getting loose due to vibrations.
- Do not assemble hydraulic hoses close to heat sources.

Malfunction or unexpected system movements due to functional failures, e.g. jamming of valve spools, leakage in poppet seats or clogging of nozzles, due to contaminated hydraulic fluid!

Risk of injury!

- Comply with the cleanliness classes required in the relevant data sheet.
- If necessary, flush the hydraulic system for commissioning.

2.7 Personal protective equipment

During maintenance work as well as during installation and removal of the press module, always wear the following personal protective equipment:

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

2.8 Information of the machine manufacturer

The machine manufacturer must provide the following information:

- the intended use for which the machine is designed
- the frequency of inspection and functional testing of the non-separating guards and the indicators
- the necessary maintenance of the guarding
- the procedures required for maintenance and/or repair, especially if guarding has been rendered ineffective
- a list of safety-relevant components, which must not be modified or replaced by the machine end-user
- the intervals for the replacement of safety-relevant components
- the frequency of checking for external leakage
- the frequency and procedure for testing the function of the hydraulic system to detect internal leakages
- the maximum weight and the maximum dimensions of the tools which may used for the press

2.9 Obligations of the machine end-user

The machine end-user of the press must provide training for personnel on a regular basis regarding the following subjects:

- Observation and use of the machine manufacturer’s operating instructions and the legal regulations
- Observation of the intended operation (incl. maintenance) of the press module
- Observation of factory security officers’ instructions and operating instructions of the machine end-user
- Behavior in case of emergency
- Effects of an emergency stop, how to free a person who has become entrapped in the die area, in particular as a result of bypassing or misuse of the safety equipment or after an emergency stop has been triggered, see EN 289, par. 7.2.3

3 General information on damage to property and damage to product

The following information applies to chapters 6 to 15:

NOTICE

Impermissible mechanical load due to impact or shock forces on assembled valves!
Damage to property!
- Do not place/put the press module on the attachment parts (e.g. valves).
- Never use the assembled valves as a handle or step.
- Do not place/put any objects on top of the press module.

Contamination of the hydraulic fluid by fluids and foreign particles!
Early wear and malfunctions! Damage to property!
- It is imperative that the working environment at the site of installation is free of dust and foreign substances in order to prevent foreign particles (e.g. welding beads or metal chips) from getting into the hydraulic lines and causing wear or malfunctions at the press module.
- Make sure that all connections, hydraulic lines and attachment parts (e.g. valves) are clean and free of chips.
- For removing lubricants or any other contamination, use industrial residue-free wipes.
- No contamination must enter when closing the connections.
- Before commissioning, ensure that all hydraulic connections are tight and that all seals and caps of the plug-in connections are installed correctly and undamaged in order to prevent fluids and foreign particles from penetrating the press module.

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.
- Check the compatibility of the various hydraulic fluids and their compatibility with the components and seals. Mixing of hydraulic fluids may occur for example due to hydraulic fluid residues in a component.

NOTICE

Improper cleaning!

Damage to property!

- Cover all openings with the appropriate protective fittings / plugs / protective caps in order to prevent cleaning agents from penetrating the system.
- Check that all seals and electric plug-in connectors are firmly fitted to prevent the penetration of cleaning agents.
- Do not use aggressive and/or easily inflammable cleaning agents for cleaning. Clean the product using a suitable cleaning liquid and residue-free industrial wipes.

Leaking or spilled hydraulic fluid!

Environmental pollution and contamination of the ground water!

- Immediately remedy possible leakage.
- If hydraulic fluid is spilled, use an oil binding agent.
- Observe the information in the safety data sheet of the hydraulic fluid and the system manufacturer's provisions.

Environmental pollution caused by incorrect disposal!

Environmental pollution! Damage to property!

- Dispose of the press module, the hydraulic fluid and the packaging in accordance with the applicable national regulations in your country.
- Dispose of the hydraulic fluid according to the applicable safety data sheet of the hydraulic fluid.

ONLY FOR ELECTRIC COMPONENTS!

Uncontrolled disconnection and connection of plug-in connectors!

Damage to property!

- Before installation works, separate the device from the mains or from the voltage source or de-energize it.
- Do not plug in or pull off the electric plug-in connector as long as the voltage supply is activated.

4 Scope of delivery

In addition to the order-related press module, the scope of delivery consists of the general documentation and the product-specific documentation.

Table 5: Scope of delivery of the documentation[1)]

Scope of delivery of the documentation	
General documentation	General operating instructions for press modules
Product-specific documentation	Type-specific assembly instructions for the press module
	Type-specific data sheet for the press module
	Hydraulic circuit diagram
	Parts list
	Installation drawing

1) For further information on the supplied documentation, refer to chapter 1.2 “Required and additional documentation”.

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.

5 Product information

5.1 Product description

The surface of the press module is chromium VI-free thick film passivated in accordance with ROHS and WEEE directives and offers a high level of corrosion protection.

A detailed description of the press module can be found in the respective data sheet and the product-related documentation, see chapter 1.2 "Required and additional documentation" and chapter 4 "Scope of delivery".

5.2 Normative description

The press module is a hydraulic control according to EN ISO 4413, EN ISO 16092 and EN 289 consisting of:

- a basic module
- safety-related hydraulic valves with limit switches
- assembled extension module(s), if required

5.3 Product identification

The press module can be identified by its name plate.

Fig. 1: Exemplary representation of a name plate

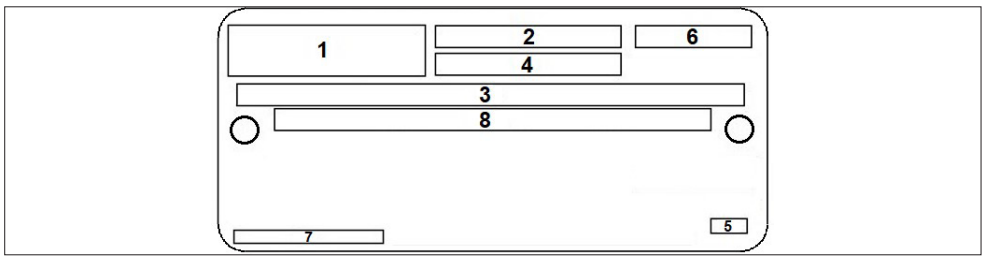


Fig. 2: Schematic illustration of a name plate

1 Manufacturer's logo
2 Material number
3 Type designation
4 Serial number
5 Area / works number
6 Date of production
7 Designation of origin
8 Customer material number

6 Transport and storage

- During transport and storage, always comply with the required environmental conditions specified in the technical data of the data sheet.
- Observe the transport instructions on the packaging.

The press module is delivered secured on a pallet.
For notes on unpacking, refer to chapter 7.1 "Unpacking".

6.1 Transporting the press module

⚠ WARNING

Falling over, falling down, or uncontrolled position change of the unsecured press module!

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

- Wear your personal protective equipment.
- Use original packaging for transport (crate with plate fixation), if possible.
- Use the intended two attachment points when lifting (without packaging), see Fig. 3.
- Check the weight with packaging from the delivery note and without packaging from the assembly drawing.
- Determine the position of the center of gravity and ensure a stable loading position until the place of installation is reached.
- Carefully position the press module on the contact surface to prevent any damage.

Closing of openings

- Before transport, close all openings using the supplied protective caps/covers in order to prevent dirt or humidity from penetrating the press module, and leaking of any oil residues due to oil-wetted surfaces within the press module.

6.1.1 Use of attachment points

⚠ WARNING

Falling over, falling down, or uncontrolled position change of the press module due to the use of instable and/or inappropriate attachment points!

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

- Use the two ring bolts supplied by the factory, see Fig. 3.
- Check the ring bolts for hand-tight seat.
- Observe the maximum length and load-bearing capacity of the attachment devices.

Two ring bolts already attached to the press module at the factory serve as attachment points.

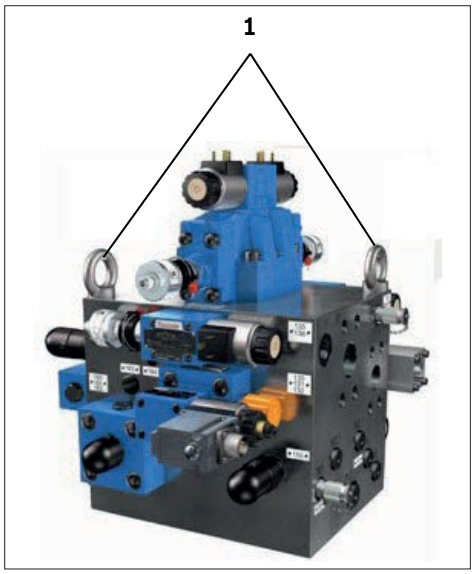


Fig. 3: Example of type IH04C module with ring bolts

1 Ring bolt

6.1.2 Transport using forklifts and similar floor conveyors

WARNING

Falling or uncontrolled position change of the press module!

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

- Ensure a stable center of gravity position for the transport with floor conveyors.
- Observe the maximum load-bearing capacity of the floor conveyors used.
- If necessary, secure the press module against acceleration forces.

The transport of a press module with floor conveyors may only be carried out by personnel who are qualified for the respective device including safety training.

To transport the press module using forklifts proceed as follows:

- With packed press modules, move the fork of the forklift under the pallet.
- Carefully lift the load to check the center of gravity position. Ensure a stable center of gravity position.
- Make sure that the press module cannot move out of the intended position.
- Only lift the press module as far off the floor as necessary for the transport.
- Carefully set down the press module.

6.1.3 Transport using cranes and similar lifting gear

WARNING

Falling or uncontrolled position change of the press module!

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

- Ensure a stable center of gravity position for the transport with lifting gear.
- During transport, make sure that components do not come into contact with attachment devices or lifting gear.
- Do not lift the press module by the attached components, e.g. by the attached extension module.
- Observe the maximum load-bearing capacity of the lifting gear used.
- Attach suitable securing and/or safety gear if necessary.

Transport with cranes is carried out using attachment devices such as lifting straps, belts or chains. The edges of the press module can permanently damage the straps.

- Therefore, use edge protection.

The use of bare chains may cause scuffing to the surface.

- Protect these surfaces with appropriate means such as blankets.

- Lift and lower the press module slowly and carefully.
- Only lift the press module as far off the floor as necessary.

6.2 Storing the press module

- Comply with the storage conditions specified in the following table.

Storage conditions

Table 6: Storage conditions

Denomination	Range
Temperature range	+10 to +40 °C
Relative air humidity (no condensation)	Max. 65%

Storage up to 6 months

The press module is suitable for storage for up to 6 months under the following conditions:

- Do not store the press module outdoors but in a well-ventilated room. Avoid high light irradiation.
- Protect the press module against humidity, particularly ground humidity. Store the press module on a shelf or on a pallet.
- Observe the admissible load-bearing capacities of your storage system.
- Store the press module in the original packaging or comparable packaging.
- Make sure that all connections on the press module are closed with cap elements.
- After opening the transport packaging, it must be closed properly again for storage. Use the original packaging for storage.
- Do not remove covers from the hydraulic connections on the press module until just before assembly.

Storage longer than 6 months

- For storage periods longer than 6 months, consult with Bosch Rexroth.

After expiry of the maximum storage time, Bosch Rexroth recommend having the press module checked by your competent Rexroth service.

7 Assembly

For information regarding the installation into the overall machine/system, particularly regarding its overall function and logic mode of operation, please refer to the operating instructions of the machine manufacturer. Additional information on preparation and execution of assembly can be found in data sheets 07008, 07300, 07700, 07800 and 07900, see chapter 1.2 "Required and additional documentation".

7.1 Unpacking

- Open the press module packaging.
- Check the press module for transport damage and completeness, see chapter 4 "Scope of delivery".
- Dispose of the packaging in accordance with the currently applicable national provisions in your country.

7.2 Installation conditions

- For installation, always observe the environmental conditions specified in the IH04 data sheets, see chapter 1.2 "Required and additional documentation".
- It is imperative to provide for absolute cleanliness. Contamination of the hydraulic fluid may considerably impair the operating life of the hydraulic component.
- Select the installation position according to your technical requirements. Overhead installation is excluded.

7.3 Assembling the press module

⚠ WARNING

Pressurized press components due to stored pressure energy (e.g. press slide working under gravity, pressurized lines over 50 bar according to EN 289, par. 4.3.1.2) even after switching off the energy supply! Ejection of valves and leakage of pressurized hydraulic fluid!

Danger to life! Risk of injury! Explosion hazard, risk of fire, health hazard, environmental pollution! Damage to property!

- Before working on the press module, check that the EMERGENCY stop on the press is effective and that the power circuit is disconnected from the press module. Gravity-loaded axes must be in the lowest position, if possible, or the load must be held securely by a mechanical restraint device.
- Secure the press against restarting by selecting the OFF operating mode and then removing the key.
- Never try to stop or seal the leakage or the hydraulic fluid jet using a cloth.
- Do not disconnect pipe/hose connections, connections or components as long as the press module is pressurized.
- Check the pressure at the provided measuring ports only after the hydraulic fluid jet has subsided.

⚠ CAUTION

Insufficient assembly space!

Risk of injury! Danger of crushing! Danger of trapping your limbs!

- Wear your personal protective equipment.
- Make sure that connections, valves, mechanical actuators and plug-in connectors are easily accessible.

7.3.1 Installing the press module

⚠ WARNING

Falling down of the press module due to incomplete fastening or fastening with insufficient stability!

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

- Assemble the press module only on a stable mounting surface. Pay attention to the weight of the press module and the vibrations or movements of the pipeline.
- Only use mounting screws listed in the assembly drawing. Comply with the specified tightening torque and screw material grade.
- Assemble the press module using a manual torque wrench.
- If necessary, pay attention to the tank penetration shown in the installation drawing.

To install the press module, proceed as follows:

- ▶ Use lifting gear (load chains/lifting sling) and a manual torque wrench including attachable tools to assemble the press module.
- ▶ Attach the press module to the intended place.

The mounting surface at the machine (e.g. tank penetration) must be designed so that any stress of the press module in the installed condition is avoided. The mounting surface and elements at the machine must be able to absorb the occurring forces.

- ▶ Make sure that the individual components are not damaged during installation.
- ▶ Use the mounting screws specified in the assembly drawing to install the press module in the overall machine/system.

7.3.2 Hydraulically connecting the press module

⚠ WARNING

Ejection and whipping of pipe and hose lines not properly fastened.
Danger to life! Risk of injury! Damage to property!

- ▶ Assemble pipe and hose lines without stress.
- ▶ Install a hose safety catch when using hose lines to prevent whip hazards.
- ▶ Only pressurize the machine/system after all hydraulic lines have been completely and properly mounted.
- ▶ Make sure that, on fittings and flanges, all cap nuts, 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 the hydraulic connection of the press module, also observe data sheet 07900, see chapter 1.2 "Required and additional documentation" and ISO standard EN ISO 16092-1, par. 5.2.1 and standard EN 289, par. 5.3.1.1.

Provisions according to EN ISO 16092-1, par. 5.2.1

According to EN ISO 16092-1, par. 5.2.1, the following points must be observed for the hydraulic connection of the press module:

- All pipelines and pipe fittings must be free of burrs or foreign particles that could cause damage to the machine/system, see EN ISO 4413:2010, 5.4.4.3.4.
- Pipelines shall be uninterrupted from one component to the next wherever possible.
- Precautions must be taken to prevent damage due to thermal expansion. Rigid pipelines shall be securely fastened at short intervals to prevent vibration and movement.

- Hose lines must not be used where a pressure drop can lead to an unintended dangerous movement of the press slide.
- Pipe connections shall not be made of a clamp ring fitting, bonded rings or similar parts, but shall be made as positive connections or as welded flange connections.

Provisions according to EN 289, par. 5.3.1.1

According to EN 289, par. 5.3.1.1, one or more of the following options must be used to prevent whipping of hose lines for hydraulic fluids with pressures higher than 50 bar:

- **Option 1:**
  Use of a tear-proof hose line:
  - Certificate including drawing and test report required
  - Use of hose lines with at least two steel cord layers required to achieve a tear-proof connection
  - Ratio of bursting pressure of hose and fitting to maximum pressure in hydraulic circuit must not be less than 3.5
- **Option 2:**
  Use of a fixed casing, see EN 953:1997+A1:2009, 3.2.1;
- **Option 3:**
  Fastening of the hose lines with additional means, e.g. with a chain, see EN ISO 4413:2010.

In addition, to prevent unintended loosening from the connection points, cutting ring connections must not be used. Suitable connections are, for example, flange connections, flared or sealing cone fittings.

Provisions according to DIN 3387

Before installation, care must be taken in accordance with DIN 3387 to ensure that the pipe ends to be connected are free of burrs, undeformed and without threads. Paint coatings and contamination must be removed. The fitting can be reused after replacing the combi-seal.

Maximum admissible pressure

The maximum admissible pressure depends on the pipeline (manufacturer's specifications) or hose line used (manufacturer, product standard, hose type, operating pressure, date of manufacture) and the tightening torque of the fitting. The angle of rotation is not a suitable value for reliable assembly.
Furthermore, the maximum admissible pressure depends on the steel pipe used (specifications from the manufacturer) and the screw material grade of the flange (with welded connection...).

▶ When assembling pipelines, proceed according to the instructions of the suppliers of flanges and fittings (e.g. Voss):
  - Determination of the tightening torque
  - Pipe preparation
  - Oiling the steel pipes
  - Pipe deformation
  - Check and final assembly

Smallest admissible bending radius of hose lines

- Take precautions preventing the kinking of hoses.
- Make sure that the smallest bending radius is above the minimum bending radius of the respective hose.

If the minimum bending radius is not reached, the hose can kink and narrow in cross-section or even be squeezed, which prevents the hydraulic fluid from flowing out. This may result in excessive stress. This may reduce the working life of the hose or result in its failure.

Installation procedure

Proceed as follows to hydraulically connect the press module:

1. Depressurize the relevant system part.
2. Establish all connections observing the hydraulic circuit diagrams of the machine/system.
3. Make sure that pipes and/or hoses are connected to all ports and/or that the ports are closed with plug screws.
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 pipe 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.

7.3.3 Electrically connecting the press module

⚠ WARNING

Electrical voltage!

Danger to life and risk of injury caused by electric shock!

- Make sure that the press module is connected by a specialized electrician only.
- Use suitable plug-in connectors and cables.
- Switch off the voltage supply before all maintenance, repair or commissioning works and secure it against restarting.
- Provide for proper, safe connection of the protective grounding conductor.
- Only use power supply units with safe voltage separation such as isolation transformers or safe optocouplers.

Missing equipotential bonding!

Danger to life! Risk of injury!

- Provide for correct grounding and provide for proper equipotential bonding.

Uncontrolled machine movements or malfunctions of the valves due to penetrating water and humidity!

Danger to life! Risk of injury! Risk of corrosion!

- Use protection class IP65 plug-in connectors.
- Before assembly ensure that all seals and caps of the plug-in connectors are tight and intact.

Uncontrolled machine movements caused by signal interference due to electro-magnetic radiation of unshielded connection lines!

Danger to life! Risk of injury!

- Only use recommended electrical connection lines according to the EMC Directive and shield the valve electronics from the source of interference, if necessary.
- Observe the EMC limit values.
- Provide for proper grounding.

NOTICE

Short-circuit or damage to the integrated electronic card due to incorrect connection of electric components!

Damage to property!

- Connect the electric components according to the electric circuit diagram and the pin assignment.

Before starting work

The electric system must comply with EN 60204-01:2018.

- Check whether the limit values of the energy supply and the operating conditions of the individual components differ from those in sections 4.3 and 4.4 of IEC 60204-1:2005.

  In this case, components must be selected accordingly.

Procedure

Proceed as follows to electrically connect the press module:

- Make sure that the electric cables used are suitable for operating temperatures from -20 °C to +100 °C.
- Ensure that there are no sharp bends in the connection cable and braided wires to avoid short-circuits and interruptions.
- Assemble the cable and cable glands according to the assembly instructions.
- Before assembly check that the sealing elements are undamaged.
  During the assembly, ensure leak-tightness between cable and cable gland.
- Route the connection cable(s) in a strain-relieved form. The first mounting point must be within 15 cm of the cable entry.
- Use finely stranded conductors only if they have pressed-on insulated wire end ferrules.

Digital output (24 V) connection

Solenoid coils of valves such as WE and H-WEH can be connected in a polarity-independent way.

- For the technical data such as mating connectors, please refer to the data sheet of the respective valve.
- Observe the assembly instructions printed on the packaging of the mating connector and the tightening torques specified in the same.

Analog outputs (+/-10 V, 0...10 V) connection

Valves such as 4WREEM, 4WRTE, 4WRDE or DBETE are exclusively equipped with integrated electronics.

- For pin assignment, please refer to the data sheet of the respective valve.

The electrical signals (e.g. actual value) transmitted via valve electronics must not be used for switching off safety-related machine functions.

8 Commissioning

⚠ WARNING

Leakage of hydraulic fluid due to incorrectly mounted press module!
Danger to life! Risk of injury!

- Only commission your machine/system after all hydraulic connections and the press module have been completely and properly mounted according to the specifications.
- Look out for defective sealing points and replace defective seal rings immediately.
- Wear personal protective equipment during the initial commissioning.

Bursting of the press module or ejection of the cap elements due to inadmissible 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 machine/system cannot be exceeded.
- Ensure that in your machine/system, the maximum admissible operating pressure is secured by means of pressure limitation equipment.

NOTICE

Uncontrolled connection or disconnection of electrical component plug-in connectors!
Damage to property!

- Before installation works, separate the press module from the mains or from the voltage source or de-energize it.
- Do not plug in or pull off the electric plug-in connector as long as the voltage supply is activated.

Wear and malfunctions caused by contaminated hydraulic fluid!
Damage to property!

- During commissioning, absolute cleanliness must be ensured.
- Make sure that the hydraulic system is only filled with a filtered hydraulic fluid.
- Ensure that no contaminations are able to penetrate when sealing the ports.

For commissioning of the press module, always observe the operating instructions of the overall machine/system.

For commissioning, proceed as follows:

- Make sure that all hydraulic connections are closed and all electrical connections are connected.
- Immediately depressurize the machine/system if hydraulic fluid still leaks despite proper assembly.
- Commission hydraulic components only if they are fully installed.
- Allow the press module with integrated electronics to acclimatize for some time prior to commissioning as the electronics might be damaged by the generation of condensed water.
- Electrical connections must be checked for proper condition by or under the guidance and supervision of a specialized electrician before the initial or any 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 press module on a machine/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.

Ensure a mechanical restraint function between the tools (EN ISO 16092, par. 5.3) or move the cylinder piston to a fall-proof parking position if the guarding of the overall machine/system are not active during initial commissioning.

8.1 Bleeding the hydraulic system

- For bleeding the overall system, observe the operating instructions of the machine and/or system into which the press module is installed.
- Switch the press module several times under 50% of the operating pressure before placing it into full operation so that air which has remained in the press module can exit.

  Mechanical damage due to inadmissibly high acceleration of the hydraulic fluid and the valve spools is thus avoided and the press module's life cycle is increased.

9 Operation

⚠ WARNING

Uncontrolled movement of the press!

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

- ▶ Ensure that the braking distance and stopping time for light curtains, two-hand control devices and interlocking guards without guard locking are checked at least once a year, see EN 289, par. 7.2.5 (Operator responsibility).

NOTICE

Wear and malfunctions caused by contaminated hydraulic fluid!

Damage to property!

- ▶ Ensure regular filtration of the hydraulic fluid to avoid contamination that has a detrimental effect on the safety-relevant functions of the hydraulic system, see EN 289, par. 5.3.7 (operator responsibility).

Information on operating the press module can only be provided in connection with the machine/system. For this information, please refer to the operating instructions of the overall machine/system.

Pay attention to the various operating modes and their effects and/or protective measures, see EN ISO 16092-1, appendix E.

The press module is designed as follows:

- for the operating modes set-up, jog mode, single stroke and automatic mode
- for production with manual or automatic loading and unloading above 10 mm/s
- for slow closing speed with hold-to-run device below 10 mm/s (optional and only for press modules type C and E)
- for a temporary muting of the safety functions according to EN ISO 16092-1, par. 5.4.2 (optional and only for press modules type-C and D)

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 press module before maintenance works.

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

For further information regarding maintenance and repair of the overall machine/system, particularly regarding its overall function and logical mode of operation, please refer to the operating instructions of the machine manufacturer. General information on maintenance and repair can be found in data sheets 07008, 07300, 07700, 07800 and 07900, see chapter 1.2 "Required and additional documentation".

10.1 Cleaning and care

NOTICE

Damage to seals when using solvents or aggressive cleaning agents!
Damage to property!
- Only ph neutral cleaning agents may be used for cleaning.

Malfunctions due to penetrating dirt and fluids!
Damage to property!
- Do not use a high-pressure washer for cleaning.
- Do not use compressed air for the cleaning at functional interfaces such as sealing areas.

For cleaning and care of the press module, observe the following:
- Check that all seals and caps of the plug-in connectors are firmly fitted to prevent the penetration of moisture while cleaning.
- Remove external coarse dirt and keep sensitive and important parts such as solenoid coils, valve electronics, pressure/temperature displays and warning signs clean.
- Use residue-free industrial wipes for cleaning.
- Before loosening fittings and components, clean the external area using residue-free industrial wipes.

10.2 Inspection

The inspection on the press module can only be made in connection with the machine/system.

- ▶ Document mandatory or unscheduled inspection work in a meaningful way and retain it for verification purposes.
- ▶ For the scope and time intervals of inspection of the overall machine/system, please refer to the operating instructions of the machine manufacturer.

The following inspection work is required for the press module:

Table 7: Inspection of the "press module"

Inspection activity	Implementation	Inspection interval
Pressure measurement with suitable pressure gauge with suitable measurement range and with hose and connection coupling	▶ Check the required pressure.	Regularly
Visual inspection	▶ Check all components for tight seat, damage/corrosion, leakage (oil drop formation). ▶ Check the seals on the attached and mounted valves[1)]. ▶ Check for oil runs at connection surfaces of the valves, flanges or fittings. ▶ Check whether all warning and information signs are present.	Regularly

[1)] The seals of attached and mounted valves are subject to a natural process of wear and aging. Bosch Rexroth recommends replacement at appropriate time intervals. The intervals are mainly determined by the operating conditions such as temperature and the cleanliness of the hydraulic fluid.

10.3 Maintenance schedule

The following maintenance work is required for the press module and must be included in the maintenance schedule of the machine manufacturer/end-user.

Table 8: Maintenance schedule for the "press module"

Maintenance activity	Implementation	Maintenance interval
Hydraulic system		
Control of the hydraulic fluid	▶ Check the hydraulic fluid level in the tank.	Electric monitoring
Hydraulic fluid samples or analyses	▶ Take a hydraulic fluid sample. ▶ Observe the safety data sheet of the hydraulic fluid. ▶ Document the product name including batch number.	• After flushing • 50 operating hours after flushing • 4 weeks after flushing • 12 weeks after flushing • Every six months
Change of hydraulic fluid	▶ Change the hydraulic fluid using a filter (5 µm).	According to manufacturer's specifications
Temperature control	▶ Check the operating temperature (comparable load condition).	Electric monitoring
Visual inspection	▶ Check all components for safe seat, damage, wear, leakage, existence of all warning and information signs.	At least once annually

Table 8: Maintenance schedule for the "press module"

Maintenance activity	Implementation	Maintenance interval
Acoustic check	▶ Check the running, flow and operating noise of the hydraulic system and the components.	Weekly
Tactile inspection	▶ Check for uncontrolled local vibrations.	Weekly
Pressure gauges	▶ Check for the specified pressure range, damage and leakage.	Weekly
Pipe and hose lines	▶ Check the hose lines for leakage and inflection. ▶ Replace the hose lines at regular intervals according to manufacturer's specifications, see EN 289, par. 7.2.6. ▶ Check the pipelines for leakage and corrosion.	Weekly Every 3 years at the latest Every six months
Press module		
Seals	▶ As a precaution, replace the seals at reasonable time intervals.[1)]	As required

[1)] The seals of attached and mounted valves are subject to a natural process of wear and aging. Bosch Rexroth recommends replacement at appropriate time intervals. The intervals are mainly determined by the operating conditions such as temperature and the cleanliness of the hydraulic fluid.

10.4 Maintenance

Maintenance on the press module must be carried out in connection with the overall machine/system.

- ▶ For the scope and time intervals of maintenance of the overall machine/system, please refer to the maintenance schedule of the machine manufacturer.
- ▶ Document mandatory or unscheduled maintenance in a meaningful way and retain it for verification purposes.

Replacement of seals

Since seals are subject to a natural process of wear and aging, they must be replaced as required. Oil stains between the base area of the valve and the manifold block are the first signs.

Bosch Rexroth recommends replacing seals during maintenance.

Replacement of wear parts

The intervals for the replacement of wear parts must be defined by the machine manufacturer.

10.5 Repair

The press module may only be repaired by specialist personnel according to chapter 2.4 "Qualification of personnel".
Bosch Rexroth has an extensive service offer regarding the repair of valves. Part tested and pre-assembled original Rexroth assemblies allow for successful repair works requiring only little time.

If you have any questions regarding spare parts and repair, please contact your local Bosch Rexroth service or the service department of the press module manufacturer's factory:

Bosch Rexroth AG
Service
Bgm.-Dr.-Nebel-Str. 8
97816 Lohr am Main
Phone: +49 (0) 9352 - 40 - 50 60
service@boschrexroth.de

For the addresses of our sales and service network, please refer to www.boschrexroth.com

10.6 Spare parts

NOTICE

Malfunction of the press module/machine due to the use of incorrect spare parts!
Damage to property!

- Only use components listed in the product-specific documentation (parts list).
- Only use new seals with the required media compatability.
- As the sealing material may differ despite being of identical appearance, the material number should be checked.

In case of questions, please contact Bosch Rexroth or your local Rexroth distribution organization in any case.
For the addresses, please refer to www.boschrexroth.com.

Ordering spare parts

- Order spare parts in writing. In urgent cases you can also order by phone, but you are kindly requested to confirm your order in writing.
- Please provide the following information when ordering spare parts:
  - Material number and order number of the press module (name plate)
  - Material number of the respective component
  - Required quantity
  - The desired type of dispatch (e.g. as parcel, freight, air freight, by courier service, etc.)

10.7 Replacement of valves

⚠ WARNING

Pressurized and energized system parts!
Danger to life! Risk of injury caused by electric shock!
- ▶ Ensure that the hydraulic system is depressurized and the electrical control de-energized before disassembly.

⚠ CAUTION

Falling of not fully secured valves
Risk of injury!
- ▶ Secure valves to be disassembled against falling down.

Leaking hydraulic fluid!
Risk of injury! Risk of falling!
- ▶ After disassembly, seal the hydraulic fluid bores with suitable cap elements.
- ▶ Immediately remove leaked hydraulic fluid and dispose of it properly.
- ▶ Have sufficiently dimensioned collecting containers, residue-free industrial wipes and hydraulic fluid binding materials ready in order to collect or bind leaking hydraulic fluid.

Only use valves or safety-relevant components such as orifices listed in the product-related parts list.
In determining the achievable category and performance level, certain fault possibilities were excluded for the safety-relevant components. These fault exclusions are dependent on important design features of the components used. The safety-relevant components may only be replaced by components of the same type.

Spare parts from stock that have not been filled or treated with corrosion protection fluid may resinate. Clean them with grease solvent and build up a new oil film.

Proceed as follows when replacing a valve:

- Check the hydraulic circuit diagram to see which pressure line is affected and what the effects of removing the valve are.
- Observe the data sheet of the valve to be replaced, which is specified in the the parts list (e.g. tightening torque, material of the hexagon socket head cap screws ...).
- Make sure that the press module is depressurized by connecting a suitable measuring device to the provided measuring points.
- Please note that some pipeworks of the press module are still under pressure in the OFF operating mode.

Further information on this topic is included in the product-specific documentation of the respective press module, see chapter 1.2 "Required and additional documentation".

- Check whether the affected valve has cooled down sufficiently for you to dismantle it.
- Dispose of the defective valve, see chapter 13 "Disposal".
- Install the new valve.
- Check the reaction time of all safety-related valves after the replacement of a safety-relevant valve.

11 Decommissioning

- Decommission the overall machine/system as described in the overall machine/system operating instructions.
- Do not loosen any pipes/hoses, connections and components.
- Measure the pressure at the measuring points provided for this purpose.

In the decommissioning of the press module, the following must be observed:

- Move the cylinder piston to a fall-proof parking position, switch off pumps and electric motors, relieve the accumulators and secure the machine/system against restarting.
- Provide collecting containers that are large enough to accommodate the total hydraulic fluid volume at the press module including the pipework to the top oil tank.

Prepare disassembly of the press module as follows:

- Connect the pressure gauge to the measuring points Mxx and drain the hydraulic fluid into a suitable oil tray until the pressure has completely dissipated.
- Keep the disassembly tools and suitable lifting devices ready.

  You can now start the disassembly.

12 Disassembly and replacement

⚠ WARNING

Pressurized press components due to stored pressure energy (e.g. press slide working under gravity, pressurized lines over 50 bar according to EN 289, par. 4.3.1.2) even after switching off the energy supply!
Ejection of valves and leakage of pressurized hydraulic fluid!
Danger to life! Risk of injury! Explosion hazard, risk of fire, health hazard, environmental pollution! Damage to property!

- Before working on the press module, check that the EMERGENCY stop on the press is effective and that the power circuit is disconnected from the press module. Gravity-loaded axes must be in the lowest position, if possible, or the load must be held securely by a mechanical restraint device.
- Secure the press against restarting by selecting the OFF operating mode and then removing the key.
- Never try to stop or seal the leakage or the hydraulic fluid jet using a cloth.
- Do not disconnect line connections, connections or components as long as the press module is pressurized.
- Check the pressure at the provided measuring ports only after the hydraulic fluid jet has subsided.

12.1 Required tools

Observe the specifications of the machine manufacturer. You moreover need:
- Suitable tools for opening the screw connections
- Suitable lifting devices
- Oil pan

12.2 Preparing for disassembly

Prepare disassembly of the press module as follows:

- Decommission the overall machine/system as described in chapter 11.
- Keep the disassembly tools and suitable lifting devices ready.
- Have sufficiently dimensioned containers, residue-free industrial wipes and oil binding agent ready in order to collect or bind leaking hydraulic fluid.

12.3 Disassembly process

⚠ WARNING

Pressurized and energized system parts!
Danger to life! Risk of injury caused by electric shock!
- Ensure that the hydraulic system is depressurized and the electrical control de-energized before disassembly.

⚠ CAUTION

Falling of not fully secured press modules
Risk of injury!
- Secure the press module to be disassembled against falling down.

Leaking hydraulic fluid!
Risk of injury! Risk of falling!
- After disassembly, seal the hydraulic fluid bores with suitable cap elements.
- Immediately remove leaked hydraulic fluid and dispose of it properly.
- Have sufficiently dimensioned collecting containers, residue-free industrial wipes and hydraulic fluid binding materials ready in order to collect or bind leaking hydraulic fluid.

For disassembling the press module, you should proceed as follows:
- Get the product-specific documentation ready.
- Observe the safety instructions applicable to transport and assembly, see chapters 6 and 7.
- Ensure that the hydraulic system is depressurized.
- Check whether the press module has cooled down sufficiently so that it can be disassembled in a risk-free manner.
- De-energize the overall machine/system.
- Loosen and/or separate the electric connectors and connections.
- Disconnect the pipes/hoses and collect any leaking hydraulic fluid in the prepared collecting container (drip-tray).
- Shut off the supply (P, T and Y) from the tank to the press module.
- Completely drain the press module.
- Close all openings.
  – To do this, seal the connections with suitable plug screws and flange covers.
- Make sure that the individual components of the press module as well as the attached components are not damaged during disassembly.
- Screw the ring bolts, see Fig. 3, hand-tight into the tapped holes provided and attach lifting slings or load chains to them so that the press module is plane-parallel to the contact surface when it is lifted.
  – The weight is shown on the installation drawing.
- Loosen the mounting screws diagonally, crosswise, and remove them.
- Now slowly remove the press module from the contact surface.

13 Disposal

13.1 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 hydraulic fluid residues according to the applicable safety data sheets for these hydraulic fluids.
- Please observe the following notices for the environmentally-friendly disposal of the hydraulic components.

13.2 Return to Bosch Rexroth AG

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

13.3 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. Due to ecological reasons, disposable packaging should not be used for returning products to Bosch Rexroth.

13.4 Materials used

Hydraulic components from Bosch Rexroth do not contain any hazardous materials that could be released during intended use. Normally, no negative effects on human beings and on the environment are to be expected.
The press module mainly consists of:

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

13.5 Recycling

Due to the high metal content, 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 be recovered by means of special separation procedures as well.

14 Extension and modification

You are responsible for any extensions to or modifications of the product carried out by yourself.

Modifications to safety-relevant components such as orifices may only be carried out after consultation with the manufacturer and by authorized, trained and instructed personnel.

Certifications and declarations shall become invalid

If you undertake any extensions to or modifications of the product marketed by Bosch Rexroth, you are changing the condition as supplied. Any certifications and statements made by Bosch Rexroth regarding this product will then become invalid.

In case of questions, please contact Bosch Rexroth or your local Rexroth distribution organization.
For the addresses, please refer to www.boschrexroth.com.

15 Troubleshooting

Use Table 9 for troubleshooting. This table is not exhaustive.
In practice, there may be problems that are not included here.
Further information on this topic is included in the respective product-specific documentation, see chapter 1.2 "Required and additional documentation".

15.1 How to proceed for troubleshooting

- Always work systematically and purposefully, even when under time pressure. Random, thoughtless disassembly and changing of settings might result in the inability to determine the original error cause.
- First, get a general idea of the function of the press module in connection with the overall machine/system.
- Try to find out whether the press module has worked properly in combination with the overall machine/system before the error occurred first.
- Try to determine any changes of the overall machine/system, in which the press module is integrated:
  - Were there any changes to the application conditions or area of application of the press module?
  - Has any maintenance work been performed recently? Is there an inspection or maintenance record?
  - Have modifications (e.g. refitting) or repair works been performed on the overall machine/system (machine/system, electrical system, control system) or the press module? If yes: What were they?
  - Was the hydraulic fluid changed?
  - Was the press module or the machine/system used as intended?
  - How did the fault become apparent on the control panel or visually on the press module?
- Try to get a clear idea of the cause of error. If necessary, ask the actual (machine) operator.
- Document all work done.
- If you could not remedy the occurred error, please contact one of the contact addresses you can find at www.boschrexroth.com or:

  Bosch Rexroth AG
  Service
  Bgm.-Dr.-Nebel-Str. 8
  97816 Lohr am Main
  Phone: +49 (0) 9352 - 40 - 50 60
  service@boschrexroth.de

Table 9: Fault table

Fault	Possible cause	Remedy
External leakage	Seals at connection surface damaged	▶ Remove the hydraulic component and replace it.
	Other leakage	▶ Replace the leaking hydraulic valves.
No function	Electrical connection interrupted	▶ Check whether the electrical plug-in connectors are correctly and completely mounted.
	Defective limit switch or no feedback information of position monitoring	▶ Replace the complete defective component. ▶ Return the component for repair. ▶ Have repair works of components with position monitoring performed by authorized personnel only.
	Cable break	▶ Replace the connection cable.
	Replace the connection cable	▶ Replace the solenoid connection plug.

In case of faults in individual components, please consult the documentation of the respective component.

16 Technical data

The permitted technical data of the respective press module, can be found in the respective data sheet, see chapter 1.2 "Required and additional documentation".

The data sheet can be found on the Internet at
www.boschrexroth.com/mediadirectory

For further information, refer to the online product catalog at
www.boschrexroth.com

17 Glossary

17.1 General terms for press components

Fig. 4: Example for hydraulic press

1 Die area
(danger zone at the press)
2 Dead points
a) bottom dead centre (BDC)
b) top dead centre (TDC)
3 Lower die
4 Press slide
5 Die cushion

Active opto-electronic guard (AOS)
Device whose detection function is performed by emitting and receiving opto-electronic components. By interrupting the reception of the optical beam generated in the device, the presence of an opaque object in the defined effective range is detected.

Contactless guard (BWS)
Arrangement of devices and/or components that work together to provide access protection or presence detection, including:
• a sensor element
• control/monitoring elements
• output devices
• all connection cables

Dead centres
Positions at which the upper die is located during its movement:
- Bottom dead centre (see Fig. 4, pos. 2.a):
  The upper die is closest to the lower die. In general, this corresponds to the end of the closing stroke.
- Top dead centre (see Fig. 4, pos. 2.a):
  The upper die is furthest away from the lower die. In general, this corresponds to the end of the opening stroke.

Die area (danger zone at the press)
Area between moving dies, moving press slide, moving die cushion and workpiece ejector.

Die cushion (see , pos. Fig. 4, pos. 5)
Auxiliary device for a lower die that accumulates and delivers or absorbs the required force for some forming operations with the press.

Gravity-loaded axis
Axes that can make unexpected dangerous movements due to gravity or stored energy as a result of failures.

Lower die (see Fig. 4, pos. 3)
Fixed part of the die on the clamping plate.

Press slide (see Fig. 4, pos. 4)
Main part of the press that performs the stroke movement and to which the upper die/punch is attached.

Upper die/punch
Movable part of the die.

17.2 General terms for press control functions

Braking performance of the overall system / overall response time
Time between the guarding being triggered and the dangerous movement being stopped or the machine reaching a safe state.

Direction control
Enabling device for selecting and maintaining opposite directions of movement.

Emergency stop
The actuation of emergency stop devices must stop any closing movement. The hydraulic accumulator must be emptied unless the pressure of the accumulators is necessary for freeing entrapped persons.

Jog mode
Manual initiation of a movement, e.g. by a two-hand control device, jog control or hand lever.

Monitoring
Safety function that ensures that a safety measure is initiated if the function of a safety-related valve can no longer be fully performed or if the process takes place under such changed conditions that hazards are created.

Muting
Temporary automatic suppression of a safety function by safety-related parts of the control system during otherwise safe conditions during normal operation of a machine.

Operational stop
Stop of machine movements in the production process.

Safe stop
Stop by interrupting the energy supply to the machine drives to prevent dangerous machine movements due to control system faults.

Secure operational stop
Stop with additional control system measures to prevent dangerous machine movements due to control system faults.

17.3 General terms for press operating modes

Function
Operating sequence of a machine or part of a machine, which is specific or required for the execution of an intended machine task.

Operating mode: automatic mode
Operating mode in which the press slide movement is repeated permanently or intermittently; all functions are executed after the start command without manual intervention in the hazardous area.

Operating mode: automatic mode with AOS, single interruption
Operating mode in which the press slide movement is repeated intermittently; all functions are executed after the start command without manual intervention in the hazardous area. The cycle is initiated after clearing the AOS after a single interruption (e.g. for manual loading and unloading).

Operating mode: automatic mode with AOS, double interruption
Operating mode in which the press slide movement is repeated intermittently; all functions are executed after the start command without manual intervention in the hazardous area. The cycle is initiated after releasing the AOS following a double interruption (e.g. for manual loading and unloading).

Operating mode: OFF
Operating mode in which the press is put out of operation.

Operating mode: set-up/jog mode (setting, inch, jog)
Operating mode for the purpose of installation or removal of dies, adjustment of dies, technical protective measures and other devices, as well as cleaning, inspection and maintenance, where the risks associated with the press slide movement are reduced accordingly by the permanent operation of a control device by the operator and technical protective measures to limit the press slide movement (for example, a slowed movement or interrupted movement of the press slide).

Operating mode: single stroke mode and/or test stroke
Operating mode for single cycle mode with manual loading and unloading. With test stroke, the movement includes the press slide functions but not the movement of the additional devices (e.g. transfer system), which must be started separately.

Working cycle
Complete motion sequence of the press slide and other components of the press used for production (e.g. die cushion, workpiece ejector) including the supply and removal of material or the workpiece; in the case of hydraulic presses along a programmed movement sequence from a start position until the same position is reached again.

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