

Hydraulic power unit CytroPac

Operating instructions
RE 51055-B/06.17

Replaces: -.-
English



The data specified serves to describe the product. If information on the use of the product is given, it is only to be regarded as application examples and recommendations. Catalog information does not constitute warranted properties. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to a natural process of wear and aging.

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The cover shows an example configuration. The product supplied may therefore differ from the figure shown.

The original operating instructions were prepared in German.

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1 About this documentation

1.1 Validity of this documentation

This documentation applies to the following product:

- Hydraulic power unit type CytroPac, for material numbers, refer to data sheet 51055.

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

This documentation contains important information on the safe and proper transport, assembly, commissioning, operation, use, maintenance, disassembly and simple troubleshooting of the product.

- ▶ Read this documentation completely and particularly chapter 2 "Safety instructions" and chapter 3 "General information on damage to property and damage to product" before working with the hydraulic power unit.

1.2 Required and amending documentation











- ▶ Also observe the operating instructions and documentation of the overall machinery/system.
- ▶ The hydraulic power unit 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 |
|---|--|------------------------|------------------------|
|  | CytroPac hydraulic power unit Technical data, operating conditions, performance limits and project planning information | 51055 | Data sheet |
|  | Hydraulic Fluids Based on Mineral Oils and Related Hydrocarbons Describes the requirements on hydraulic fluids on mineral oil basis and related hydrocarbons for operation with Rexroth hydraulic components and helps you to select a hydraulic fluid for your hydraulic system | 90220 | Data sheet |
|  | Environmentally Acceptable Hydraulic Fluids Application notes and requirements for Rexroth hydraulic components | 90221 | Data sheet |
|  | General product information on hydraulic products Contains general information on hydraulic products | 07008 | Operating instructions |
|  | Installation, commissioning, maintenance of hydraulic systems General information on assembly, commissioning and maintenance Hydraulic systems | 07900 | Data sheet |
|  | External gear pumps AZPS-... | 10095 | Data sheet |
|  | Sytronix FcP 5020, frequency-controlled pump drive system | R912006684 | Quick guide |
|  | Frequency converter EFC 3610 / EFC 5610 | R912005854 | Operating instructions |
|  | Frequency converter Multi-Ethernet card | R912006860 | Operating instructions |

1.3 Representation of information

Consistent safety instructions, symbols, terms and abbreviations are used in this documentation so that you can quickly and safely work with your hydraulic power unit. For better understanding, they are explained in the following sections.

1.3.1 Safety instructions




In this documentation, safety instructions are given in chapter 2.6 "Product-specific safety instructions" and in chapter 3 "General information on damage to property and damage to product" and whenever sequences of actions or instructions are explained which bear the danger of personal injury or damage to property. The hazard avoidance measures described must be observed.

Safety instructions are structured as follows:

|  SIGNAL WORD |
|--|
| <p>Type and source of danger! Consequences in case of non-compliance</p> <ul style="list-style-type: none"> ▶ 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
- Precautions: 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 notices 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 used and/or operated optimally. |
| ▶ | Individual, independent action |
| 1. | Numbered instruction: The numbers indicate that the actions must be carried out one after the other. |
| 2. | |
| 3. | |

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Table 4: Abbreviations

| Abbreviation | Meaning |
|--------------|---|
| BR | Bosch Rexroth |
| DBV | Pressure relief valve |
| NG | Size |
| RE | Rexroth document in English language |
| REXXXXX-B | Rexroth operating instructions in English |
| PE | Protected earth |

2 Safety instructions

2.1 General information on this chapter

The hydraulic power unit 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 hydraulic power unit.
- ▶ 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 hydraulic power unit on to third parties.

Due to the interaction between the hydraulic power unit and the complete machine, the installation of the hydraulic power unit into the overall machinery/system will result in additional potential hazards. This applies in particular to the influence of hydraulic and electric controls on hydraulic drives generating mechanical movements. It is therefore essential for the manufacturer of the overall machinery/system to have undertaken an independent risk assessment. Furthermore, the manufacturer must on this basis have prepared operating instructions for the complete machinery.



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

2.2 Intended use

The hydraulic power unit is a hydraulic system component.

You may use the product as follows:

The hydraulic power unit constitutes partly completed machinery in the sense of the EC Machinery Directive 2006/42/EC and respectively not usable.

The hydraulic power unit is exclusively intended for integration into a machine or system or for assembly with other components to form a machine or a system. The product may be commissioned only if it has been integrated into the machine or system for which it is designed and if the machine or system fully complies with the requirements of the EC Machinery Directive.

The hydraulic power unit serves for controlled or regulated generation of hydraulic flow and hydraulic pressure.



The hydraulic power unit is not considered to be a safety component in the sense of the EC Machinery Directive 2006/42/EC.

The hydraulic power unit must not exceed the operating conditions and performance limits specified in the technical data.

The hydraulic power unit is technical equipment exclusively intended for professional and not for private use.

Intended use also includes having read and understood these documentation completely, especially chapter 2 "Safety instructions" and chapter 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.

Bosch Rexroth AG does not assume any liability for damage caused by improper use.

The user assumes all risks involved with improper use.

The hydraulic power unit is not suitable for operation in explosive environments.

Improper use of the hydraulic power unit includes:

- ▶ Non-compliance with the technical data, operating conditions, performance limits and environmental conditions specified in chapter 16.
- ▶ Operation of the hydraulic power unit with hydraulic fluid not complying with the specifications in chapter 16.
- ▶ Use of spare parts that are not approved by the manufacturer.
- ▶ Mechanical modification of the hydraulic power unit.
- ▶ Welding or soldering works at the hydraulic power unit.

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 hydraulic power unit, 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 a corresponding expert 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 hydraulic and electrical expert knowledge.



Bosch Rexroth offers measures supporting training in specific fields. An overview of the training contents is available on the Internet via the following link:
<http://www.boschrexroth.de/training>.

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.
- Exclusively use Rexroth products in technically perfect condition.
- Observe all notices on the product.
- Persons assembling, operating, disassembling or maintaining Rexroth products must not be under the influence of alcohol, other drugs or medications influencing the 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, 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 or system) where the Rexroth product is installed complies with the country-specific provisions, safety regulations and standards of the application.
- Only persons who have been authorized by the machine end-user may be granted access to the direct operating range of the machine/system. This also applies during any standstill of the machine/system.

2.6 Product-specific safety instructions

WARNING

Pressurized hydraulic power unit, pressurized machine/system!

Danger to life, risk of injury, severe injury when working at running machines/systems, burning, environmental pollution, damage to property!

- ▶ Ensure that all relevant components of the hydraulic system are depressurized and that the electrical control is de-energized. For doing so, observe the specifications of the machine/system manufacturer and/or end-user.
- ▶ Do not disconnect line connections, connections or components as long as the hydraulic system is pressurized.
- ▶ Make sure that appropriate safety measures are implemented to prevent any dangerous situations for personnel and real assets if commissioning or maintenance work requires decommissioning of safeguard like fuses, pressure relief valves or covers (frequency converter).
- ▶ Make sure that all safeguards like fuses, pressure relief valves or covers (frequency converter) of the hydraulic power unit are in place, properly installed and functional on re-commissioning.

High electrical voltage!

Danger to life, risk of injury caused by electric shock or severe injury!

- ▶ Make sure the relevant system part is de-energized when working at the system.
- ▶ Secure the system against restarting.
- ▶ Operate the hydraulic power unit only with a permanently installed protective grounding conductor.
- ▶ Observe the discharge time (at least 30 minutes) of capacitors.

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 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.
- ▶ Carry out visual inspections for leak-tightness of the hydraulic power unit and the oil-containing components on a regular basis.
- ▶ Use your personal protective equipment.
- ▶ Keep open fire and ignition sources away from the hydraulic power unit.
- ▶ When dealing with hydraulic fluids, you must imperatively observe the notices of the manufacturer.
- ▶ Make sure that the grounding (electric welding circuit) during welding works at the system is not lead via the hydraulic power unit.

WARNING

Unexpected start-up due to malfunctions/incorrect operation!

Danger to life! Risk of injury!

- ▶ Ensure that the hydraulic power unit is secured against unexpected start-up.
- ▶ Regularly check the hardware and software.
- ▶ Make sure that required measures for decommissioning are implemented by the machine manufacturer as the hydraulic power unit is not equipped with direct measures (e.g. switches) for decommissioning of the product.

Direct contact with live components in case of fault, e.g. loose terminals, insulation defects, missing grounding, malfunction of fuses or damaged lines, components or terminals!

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

- ▶ Before any maintenance work, de-energize the relevant system part.
- ▶ Ensure continuous connection of the protective grounding conductor.
- ▶ Observe the operating conditions and limits of performance limits specified in the technical data.
- ▶ Work at electric equipment may only be performed by specialized electricians.
- ▶ Comply with the recommended inspection and maintenance intervals.

Overheating of the hydraulic power unit (electric motor, frequency converter, hydraulic components and central plate) and pressure line!

Danger to life! Risk of injury! Explosion hazard!

- ▶ De-energized the relevant system part immediately.
- ▶ Correct the cause of overheating.
- ▶ Do not use the hydraulic power unit in potentially explosive atmospheres.

Functional restrictions of the hydraulic power unit due to EMC emissions!

Danger due to uncontrolled machine movements due to electro-magnetic radiation of unshielded connection lines.

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

Overheating of electric lines and components or short-circuit!

Danger to life! Risk of injury! Risk of fire!

- ▶ Observe the operating conditions and limits of performance limits and safeguards specified in the technical data.

CAUTION

Hydraulic power unit has hot surfaces!

Risk of injury! Risk of burning!

- ▶ Allow the hydraulic power unit to cool down sufficiently before touching it.
- ▶ Wear heat-resistant gloves or protective clothing. During or after the operation, temperatures may rise to values higher than 60 °C, depending on the operating conditions.
- ▶ Observe the protective measures of the machine/system manufacturer and/or operator.

Leaked hydraulic fluid, oily surfaces!

Risk of injury! Slip hazard!

- ▶ Protect and mark the danger zone.
- ▶ Immediately remove hydraulic fluid that has leaked out.
- ▶ 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 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 nevertheless hydraulic fluid comes into contact with the eyes or gets into the bloodstream or is swallowed, please consult a doctor immediately.

Electro-magnetic/magnetic fields!

Health hazard for persons with cardiac pacemakers, metal implants or hearing aids!

- ▶ Make sure that above specified personnel are prevented from accessing areas where drive components are installed and operated or arrange consultation with a doctor for approval.

Sharp edges!

Risk of injury!

- ▶ Wear your personal protective equipment.

Loud noise due to high sound pressure level (in case of malfunction)!

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.

2.7 Personal protective equipment

During operation and maintenance work as well as during installation and removal of the hydraulic power unit, 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 Obligations of the machine end-user

In order to ensure safety when handling the hydraulic power unit and its components, the machine end-user of the system must:

- guarantee the intended use of the hydraulic power unit and its components according to chapter 2.2 "Intended use".
- instruct the operating personnel regularly in all items of the operating instructions and make sure that they are observed.
- ensure compliance with the instructions on occupational safety and with the operating instructions.
- ensure compliance with operating data (admissible operating temperature, maximum operating pressure).

The machine end-user of the Bosch Rexroth hydraulic power unit is obliged to provide personnel training on a regular basis regarding the following subjects:

- Observation and use of the operating instructions as well as the legal regulations.
- Intended operation of the Bosch Rexroth product.
- Observation of the instructions of factory security officers and of the operating instructions of the machine end-user.
- Behavior in case of emergency.

3 General information on damage to property and damage to 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!

- ▶ You may only use the hydraulic power unit according to section 2.2 "Intended use".
- ▶ Do not expose the hydraulic power unit to any mechanical loads under any circumstances.
- ▶ Do not place/put any objects on top of the hydraulic power unit.
- ▶ Never use the hydraulic power unit as a handle or step.
- ▶ Do not apply any external loads on the hydraulic power unit.

Unauthorized changes to the frequency converter parameters!

Damage to property!

- ▶ Only change the parameters specified in chapter 8.3 "Parameter settings" according to your application and system requirements.
- ▶ Coordinate the any changes of other parameters with the Bosch Rexroth customer service.

Operation with lack of hydraulic fluid!

Damage to property!

- ▶ When commissioning or re-commissioning the machine/system the oil tank, as well as suction and working lines of the hydraulic power unit and components must be filled and remain filled with hydraulic fluid during operation according to manufacturer's specifications.
- ▶ Observe the machine/system manufacturer's specifications regarding the point "Control of the hydraulic fluid" and the prescribed remedial measures for the control result.

Leaking or spilled hydraulic fluid!

Environmental pollution and pollution of the ground water!

- ▶ Use an oil binding agent in order to bind the leaked hydraulic fluid.
- ▶ When filling and draining the hydraulic fluid, always put a collecting pan under the hydraulic power unit.
- ▶ Observe the information in the safety data sheet of the hydraulic fluid and the machine/system manufacturer's regulations.

NOTICE

Mixing hydraulic fluids!

Damage to property!

- ▶ Any mixing of hydraulic fluids of different manufacturers and/or of different types of the same manufacturer is generally not admissible.

Contamination by fluids and foreign particles!

Early wear and malfunctions!

Take the following measures to protect hydraulic power unit:

- ▶ During assembly, provide for cleanliness in order to prevent foreign particles e.g. welding beads or metal chips from getting into the hydraulic lines and causing wear or malfunctions in the hydraulic power unit.
- ▶ Make sure that all connections, hydraulic lines and attachment parts (e.g. measuring devices) are clean and free of chips.
- ▶ For removing lubricants or any other contamination, use industrial residue-free wipes.
- ▶ Only complete cleaning processes at the hydraulic power unit if the hydraulic connections are closed.
- ▶ Before commissioning, ensure that all hydraulic and mechanical connections have been made.
- ▶ Ensure that no pollutants are able to penetrate when sealing the measuring ports.

Improper cleaning!

Damage to property!

- ▶ Cover all openings with the appropriate protective threads in order to prevent cleaning agents from penetrating the system.
- ▶ Check that all seals and electric plug-in connections are firmly fitted to prevent the penetration of cleaning agents.
- ▶ Do not use aggressive cleaning agents for cleaning. Clean the hydraulic power unit using a suitable cleaning liquid.
- ▶ Do not use a high-pressure washer.
- ▶ Do not use compressed air for the cleaning at functional interfaces.
- ▶ Make sure that the cover is turned to "closed position" after cleaning. See also fig. 1, left view.

Environmental pollution caused by incorrect disposal!

Environmental pollution! Damage to property!

- ▶ Dispose of the hydraulic power unit, 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.

4 Scope of delivery

Included within the scope of delivery:

- CytoPac hydraulic power unit
- Operating instructions (this document) including EC declaration of incorporation



For further information on optional components, refer to chapter 17.3 "Accessories".

5 Product information

5.1 Performance description

- Fields of application** The CytroPac is a compact drive system (smaller tank, cooling system) for hydraulic machines and particularly machine tools and assembly lines under limited space conditions.
- Low noise level** The CytroPac is particularly quiet due to plastic enclosure of all noise sources.
- Cost-effective operation** The frequency converter of the variable speed pump drive ensures dynamic adjustment of the power/speed and the flow to current requirements to reduce the operating costs.
- Various configurations** In "Basic" configuration, the filling level, temperature and filter contamination sensors must be wired by the customer for evaluation via the customer-side machine control system.

In "Advanced" configuration, the frequency converter serves as sensor node and bundles all measured values of filling level, temperature and filter contamination sensors and forwards these values via a mating connector to the customer-side machine control system. The status of the hydraulic power unit is also indicated via the integrated LED strip.



For information on the meaning of the LED signals, refer to fig. 3 "Name plate" and chapter 10.3 "Warning devices".

In "Premium" configuration, the frequency converter serves as sensor node and bundles all measured values of filling level, temperature and filter contamination sensors and forwards these values via a multi-Ethernet interface, e.g. Sercos or PROFINET, to the machine control system. This ensures reading of all parameters required for condition monitoring. CytroPac enables easy integration in Industry 4.0 applications. The status of the hydraulic power unit is also indicated via the integrated LED strip.



For information on the meaning of the LED signals, refer to fig. 3 "Name plate" and chapter 10.3 "Warning devices".



For an overview of components of the various configurations, refer to data sheet 51055 section "Selection of sensors and interfaces", see chapter 1.2 "Required and amending documentation".

Parameter adjustment during running time In "Premium" configuration, the pressure command value can be changed via the superior machine control system during the running time. The new settings are automatically implemented by the hydraulic power unit via the frequency converter.

Space-saving installation In "Advanced" and "Premium" configurations, all sensors and the motor in the hydraulic power unit are wired to the frequency converter. For this reason, only the following interfaces are required at the hydraulic power unit:

- Interface for feed-in/voltage supply (12X1)
- Interface for enable signal 24 VDC (15X1)
- Hydraulic connection/oil drain
- Connection to the cooling water supply
- Multi-Ethernet interface ("Premium" only, 21X1, 21X2)

Additional functions Prestart control:

By means of a control signal, the drive unit is already accelerated before hydraulic actuators are connected. This reduces the collapse of pressure and you can possibly do without a hydraulic accumulator.

Sleep function:

By means of the integrated pressure monitoring, the hydraulic power unit is automatically switched off if the command pressure is reached at a current flow below the set threshold value or respectively switched on if the pressure is dropping. This increases the energy efficiency and you can, for example, realize an accumulator charging circuit without additional control signals.



For further information, refer to the Sytronix quick guide. See chapter 1.2 "Required and amending documentation".

5.2 Product description

The CytroPac is a frequency-controlled hydraulic power unit consisting of a frequency converter, electric motor, hydraulic pump, oil tank, cooling system and sensor technology. The cooling system consists of the heat exchanger for motor and frequency converter cooling as well as optional cooling packages for hydraulic fluid cooling.

The cooling power can be selected by the number of cooling packages in the oil tank according to data sheet 51055. Refer to chapter 1.2 "Required and amending documentation".

Thanks to the flow-optimized design of the oil tank, the required hydraulic fluid volume was reduced to 20 liters. The cooling system integrated in the oil tank extracts heat energy from the hydraulic fluid and transfers it to the cooling water. The ring-shaped oil tank includes the motor-pump group and additionally reduces the operating noise.

The hydraulic power unit serves for controlled or regulated generation of hydraulic flow and hydraulic pressure.

5.3 Component overview

The CytroPac hydraulic power unit basically consists of the following components:

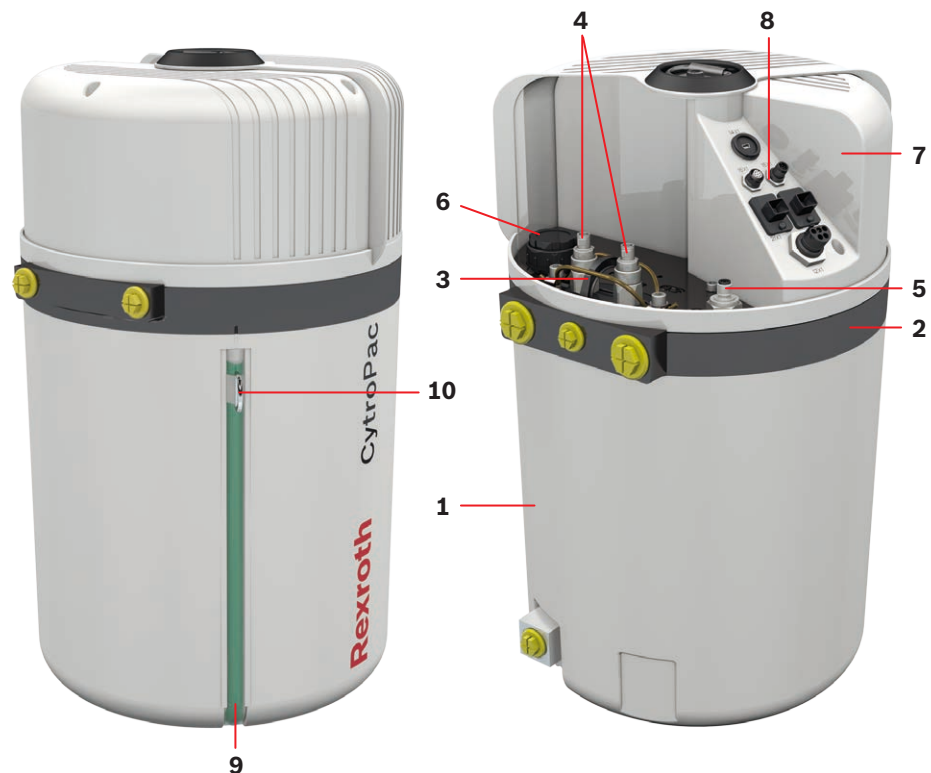


Fig. 1: Component overview

- 1 Oil tank with motor-pump group (optional cooling packages)
- 2 Central plate (integrated heat exchanger)
- 3 Return flow filter
- 4 Filter contamination sensors
- 5 Filling level and temperature sensor
- 6 Filling and breathing filters
- 7 Cover with frequency converter below
- 8 Electrical connections (see fig. 19 to 21)
- 9 Visual oil level check and hydraulic fluid draining
Hydraulic fluid hose with LED strip for status display (for information on the meaning of the LED signals, refer to fig. 3, pos. 11 and chapter 10.3 "Warning devices", "Advanced" and "Premium" configurations only)
- 10 Clip (for removal of the hydraulic fluid hose for hydraulic fluid draining)

5.4 Circuit diagram, hydraulic

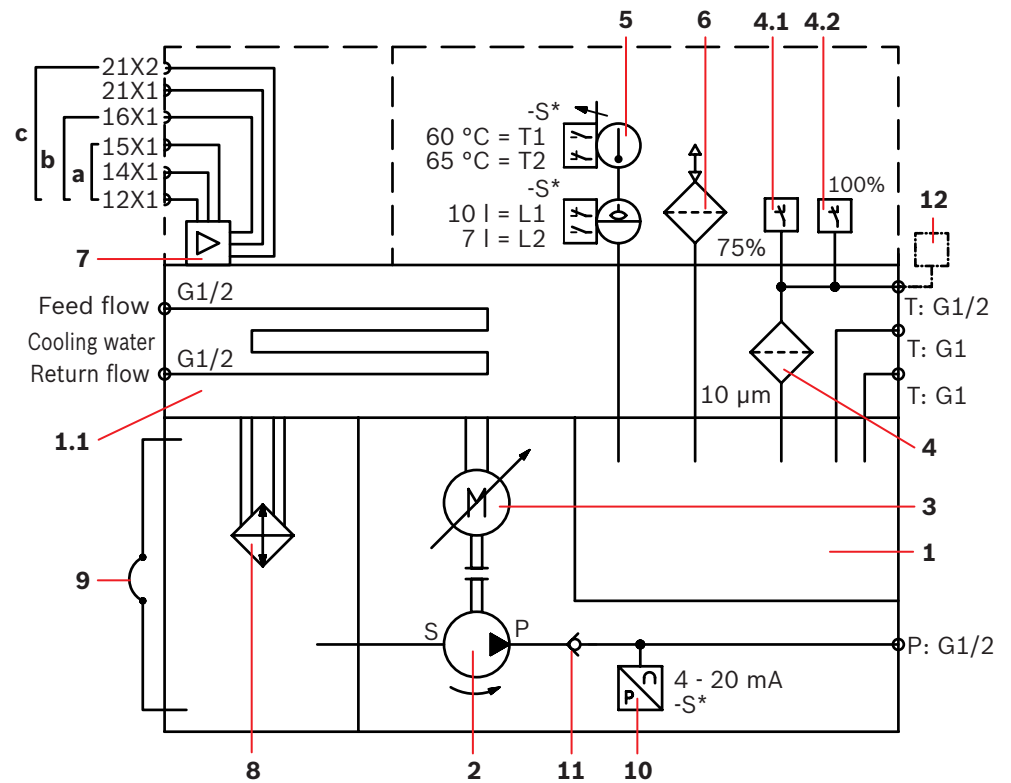


Fig. 2: Circuit diagram

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Oil tank 1.1 Central plate (integrated heat exchanger) 2 Pump 3 Motor 4 Return flow filter 4.1 Filter contamination sensor 75% 4.2 Filter contamination sensor 100% 5 Filling level and temperature sensor 6 Filling and breathing filters 7 Frequency converter 8 Cooling package (optional) 9 Visual oil level check and hydraulic fluid draining 10 Pressure load cell 11 Check valve 12 Filling coupling (optional) | <p>Electrical connections (fig. 19 to 21)</p> <ul style="list-style-type: none"> a) Sensor configuration: "Basic": 12X1: Feed-in/voltage supply 14X1: Mini USB service interface 15X1: Enable signal 24 VDC (M12 x 1, customer interface) b) Sensor configuration: "Advanced": 16X1: M12 x 1 Sensor evaluation (wired at the plant) c) Sensor configuration: "Premium": 21X1: Multi-Ethernet interface (network input) 21X2: Multi-Ethernet interface (network output) |
|--|--|

5.5 Product identification

The hydraulic power unit can be identified by its name plate. The following figure shows an example:

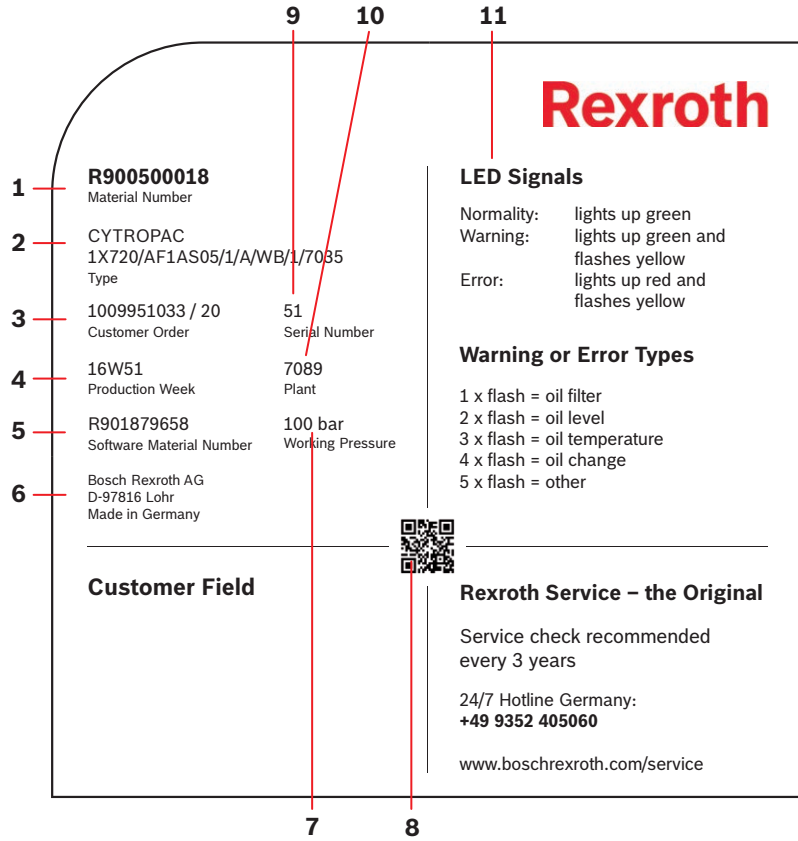


Fig. 3: Example: Name plate

- | | | | |
|----------|---------------------------------|-----------|----------------------------|
| 1 | Material number | 7 | Pre-set operating pressure |
| 2 | Material short text | 8 | QR code |
| 3 | Customer order number | 9 | Serial number |
| 4 | Date of production | 10 | Area / works number |
| 5 | Software material number | 11 | LED signals |
| 6 | Manufacturer, country of origin | | |

6 Transport and storage

- ▶ Observe the transport instructions on the packaging.
- ▶ During storage and transport, the environmental conditions specified in chapter 16 "Technical data" must be observed.
- ▶ If the package has to be opened e.g. for inspection purposes, you should reseal the packaging to the condition in which it was supplied.
- ▶ Ensure that the hydraulic power unit is only transported in an upright position.

6.1 Transporting the hydraulic power unit

WARNING

Falling, tumbling or uncontrolled position change of the hydraulic power unit!

Risk of injury! Damage to property!

- ▶ Use the original packaging of the hydraulic power unit for transport.
- ▶ Check the weight of the hydraulic power unit.
- ▶ Make sure that the hydraulic power unit cannot fall due to its decentralized center of gravity.
- ▶ Transport the hydraulic power unit using a floor conveyor or suitable lifting gear.
- ▶ For fixation and lifting of the hydraulic power unit with lifting gear, only use the intended eyebolt.
- ▶ Transport the hydraulic power unit in an upright position using a floor conveyor.
- ▶ Observe the maximum load-bearing capacity of the attachment devices and floor conveyors.
- ▶ Never step or reach below suspended loads.
- ▶ Wear personal protective equipment, e.g. safety shoes.
- ▶ Ensure that no unauthorized persons are within the danger zone.
- ▶ Comply with the national laws and regulations regarding occupational health and safety and transport.

Damage to pressurized and functional components!

Risk of injury! Damage to property!

- ▶ During transport, make sure that these components do not come into contact with attachment devices and lifting gear.
- ▶ Ensure that the hydraulic power unit is not attached or lifted at these components.

! CAUTION

Heavy loads with a weight of more than 15 kg!

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

- ▶ Use a forklift or suitable lifting gear e.g. lifting slings or lifting straps to transport the hydraulic power unit.
- ▶ During transport, secure the hydraulic power unit against falling.
- ▶ Carefully position the hydraulic power unit on the contact surface to prevent any damage.

6.1.1 Preparing for transport

Prior to transport, make the following preparations:

- ▶ Check the space required for installation of the hydraulic power unit at the place of use.
- ▶ Check the transport route.
- ▶ Depending on the type of transport, ensure additional space besides and over the hydraulic power unit.

Transport after previous operation



- ▶ For transportation after operation, drain the hydraulic fluid from the oil tank.

To prevent air in the suction line, a low level of hydraulic fluid is always inside the tank.

6.1.2 Transport using forklifts and similar floor conveyors

To transport the hydraulic power unit using a forklift, proceed as follows:

1. Move the fork of the forklift under the packaging of the hydraulic power unit or under the hydraulic power unit secured for transport.
2. Carefully lift the load for checking the center of gravity position. Ensure a stable center of gravity position.
3. Make sure that the hydraulic power unit cannot move out of the intended position.
4. Secure the hydraulic power unit against the occurring acceleration forces and the related undesired motion of the hydraulic power unit.
5. During transport, only lift the hydraulic power unit as far off the floor as necessary for transport.

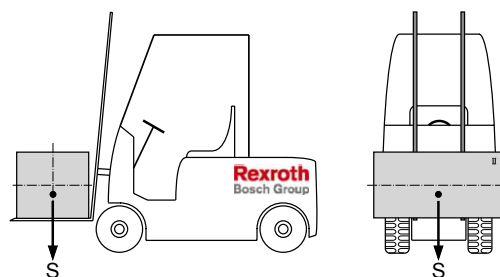


Fig. 4: Transport using a forklift

6.1.3 Transport using lifting gear

For transport, the hydraulic power unit can be connected to lifting gear.

For lifting and transport of the hydraulic power unit, proceed as follows:

1. Make sure that the lifting gear's lifting capacity is sufficiently dimensioned in order to safely bear the weight of the hydraulic power unit.
2. Use the pre-assembled eyebolt at the hydraulic power unit for transport.
See fig. 5.
3. Make sure that the eyebolt is securely tightened.
4. Make sure that the cover is closed during transport. See fig. 5.
5. Attach a suitable lifting gear to the eyebolt.
6. Attach the lifting gear to a crane hook.
7. Slowly and carefully lift the hydraulic power unit in order to avoid swinging.



Fig. 5: Eyebolt

6.2 Storage of the hydraulic power unit

- Storage conditions**
- ▶ Store the hydraulic power unit in a dry location at constant temperature and in its original packaging if possible.
Ideal storage temperature: +5 °C to +25 °C
 - ▶ Provide for 100 % UV protection.
 - ▶ Store the hydraulic power unit protected against shocks.
 - ▶ Store the hydraulic power unit in an upright position.
 - ▶ Make sure that the cover of the hydraulic power unit is closed during storage.

Maximum storage time The maximum storage time of the hydraulic power unit is 12 months.



If the storage time exceeds 12 months, check the function of the hydraulic power unit and flush it with suitable cleaning liquid prior to commissioning. Carry out the flushing procedure as described in chapter 8.1.6 "Flushing the hydraulic system".

7 Assembly

7.1 Unpacking the hydraulic power unit

- ▶ Only open the packaging from the top.
- ▶ Before opening the packaging and/or loosening the tension belts, make sure that the hydraulic power unit cannot fall over.
- ▶ Remove the packaging of the hydraulic power unit.
- ▶ Check the hydraulic power unit for obvious defects, for example transport damage, leakage or other external damage, and for completeness. See chapter 4 "Scope of delivery".
- ▶ Use the hydraulic power unit only in technically perfect condition.
- ▶ Dispose of the packaging material in accordance with the national regulations in your country and/or your company-internal specifications/procedures.

7.2 Installing the hydraulic power unit

WARNING

Falling, tumbling or uncontrolled position change of the hydraulic power unit!

Risk of injury! Damage to property!

- ▶ Make sure that the hydraulic power unit is only installed and assembled by qualified personnel. See chapter 2.4 "Qualification of personnel".
- ▶ Observe the information on handling the product in chapter 6 "Transport and storage".
- ▶ Position the hydraulic power unit on a suitable foundation.
- ▶ Observe the specifications on the total weight.

NOTICE

Damage to the surface/oil tank due to rough handling and incorrect positioning!

Damage to property!

- ▶ Make sure that the hydraulic power unit is correctly positioned.
- ▶ Make sure that the clip of the assembly aid is correctly positioned. See also fig. 9 and 10.

Vibrations in the environment!

Damage to property!

- ▶ Use vibration dampers like damping mats.
- ▶ Connect the hydraulic power unit to the machine via hydraulic hoses. Do not use any rigid pipelines.

To install the hydraulic power unit you should proceed as follows:

- ▶ Place the hydraulic power unit on a level surface, preferably an installation plate (mounting kit, optionally available, see chapter 17.3 "Accessories").



Bosch Rexroth recommends using an installation plate. For installation without installation plate, position the hydraulic power unit on a level surface and use a damping mat. Make sure that the hydraulic power unit is secured against falling.

- Level the hydraulic power unit so that its longitudinal and transverse axes are horizontal.

7.2.1 Dimensions of the hydraulic power unit

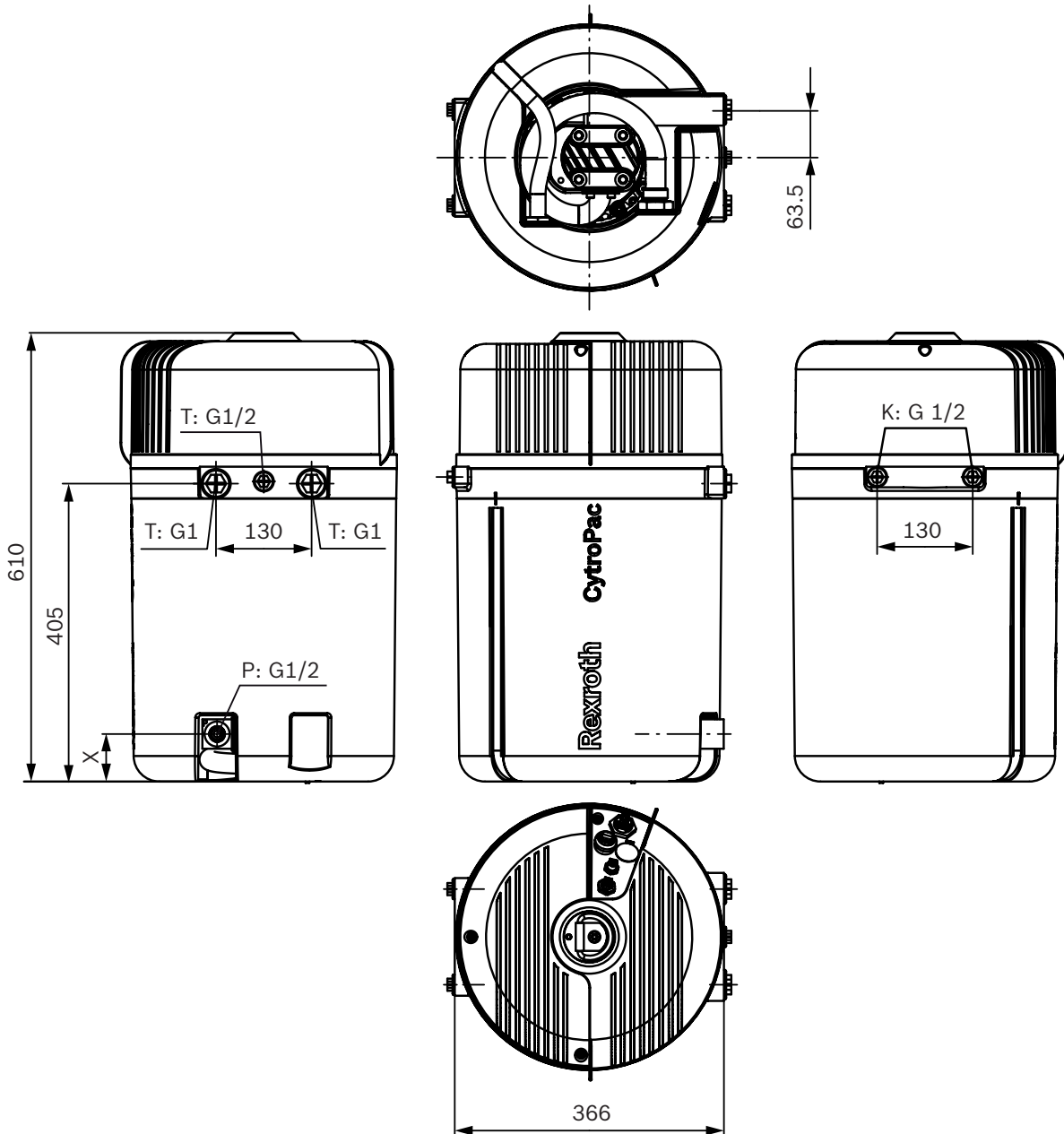


Fig. 6: Dimensions (dimensions in mm)

| Dimension "X" - Pressure connection "P" | NG of the installed pump |
|---|--------------------------|
| 65 | AS04 |
| 64 | AS05 |
| 61 | AS08 |
| 58 | AS11 |
| 57 | AS14 |

7.2.2 Fixation of the hydraulic power unit

For fixation of the hydraulic power unit, an optional installation plate (mounting kit including installation plate and M6 x 430 screw, see chapter 17.3 "Accessories") is available.

- ▶ Bend the clip by 90° as illustrated in fig. 7 and fig. 10.
- ▶ Place the installation plate in correct position on a level surface. This defines the arrangement of the hydraulic power unit.
- ▶ Attach the installation plate with four mounting screws, e.g. M8 x 20 (not included in the scope of delivery) at the contact area.
- ▶ Position the hydraulic power unit on the installation plate. Thanks to the embossed locking mechanisms, the hydraulic power unit slides on the installation plate.

If the hydraulic power unit is not positioned completely on the installation plate like illustrated in fig. 9 and fig. 10 but on the locking mechanisms, the hydraulic power unit can be slightly rotated into the correct position.

- ▶ Attach the hydraulic power unit with the screw M6 x 430 and the toothed washer, see fig. 8 and fig. 9, to the installation plate. Tighten the hexagon socket head cap screw with a maximum of 2 Nm and a thread locker.

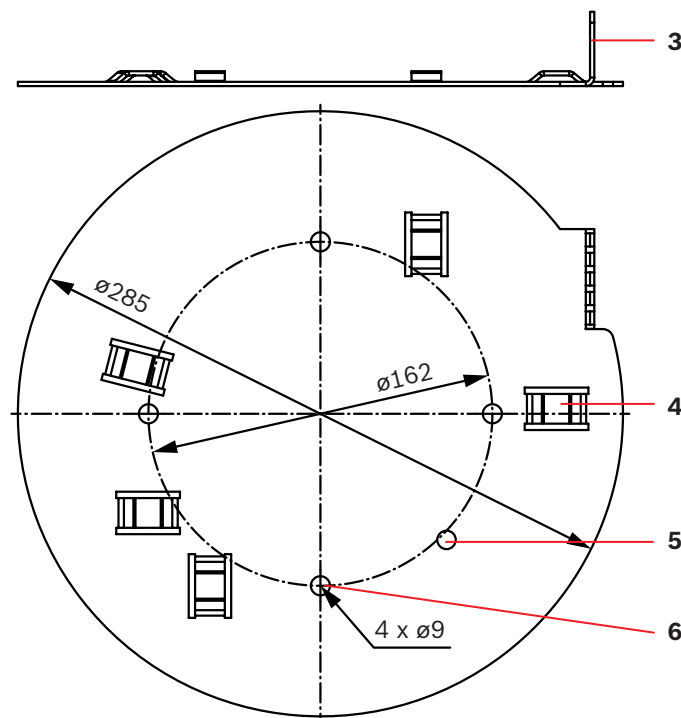


Fig. 7: Installation plate (optional)



Fig. 8: Screw/toothed washer for fastening of the hydraulic power unit at the installation plate



- 1** M6 x 430 screw
- 2** Toothed washer
- 3** Clip bent by 90°
- 4** Locking mechanisms
- 5** Tapped hole for M6 x 430 screw
- 6** 4 x $\varnothing 9$ through hole for hexagon socket head cap screw, e.g. M8 x 20

Fig. 9: Installation position of the screw

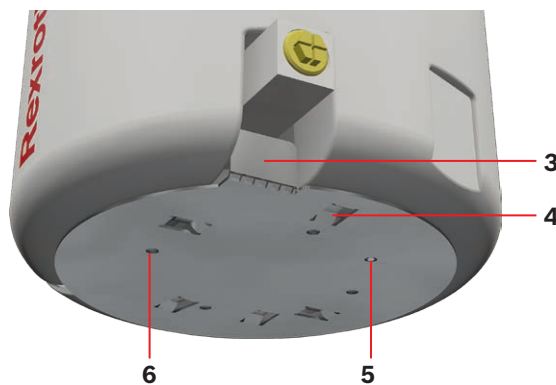


Fig. 10: Installation position of the installation plate

7.3 Hydraulic supply connection

WARNING

Pressurized system!

Danger to life, risk of injury, damage to property!

- ▶ Before assembling the hydraulic power unit, depressurize all relevant system components.

Exceeded nominal pressure of a component!

Danger to life, risk of injury, damage to property!

- ▶ Make sure that the maximum operating pressure of 240 bar is not exceeded.
- ▶ Dimension the hose lines according to the maximum operating pressure.
- ▶ Only use components, e.g. fittings, that are approved for the required operating pressure.
- ▶ Make sure that only fittings with threads measured in inches are used.

NOTICE

Damage to the hydraulic power unit!

Damage to property!

- ▶ Make sure that the connection between the hydraulic power unit and the machine is only realized via hose lines. Do not use any rigid pipelines.
- ▶ Install the hose lines without any tension stress.



The operating pressure pre-set at the factory is specified on the name plate. See fig. 3, pos. 7.

- Preparation**
- ▶ Remove the blanking plugs (colored plastic) and replace them by pressure-resistant fittings.
 - ▶ Observe the installation information of the fitting manufacturers to prevent any external leakage. Bosch Rexroth recommends fittings with elastic seals.

- Hose lines**
- Install the hose lines in such a way that
- kinking and tensile load at the hose is prevented during operation.
 - the hose is not twisted.
 - the outer layer of the hose is not subject to abrasion or impacts.
 - the weight of the hose line does not lead to inadmissible loads.

- Pressure line**
- ▶ Connect the pressure line with a G1/2 fitting via the pressure port G1/2. See fig. 11, pos. 3.
 - ▶ Install a pressure relief valve in the pressure line.
The pressure relief valve must be installed directly at the pressure output. No valves or similar components may be installed between the pressure output and the pressure relief valve.
 - ▶ Set the pressure relief valve to 10 % over the operating pressure, however, to a **maximum of 260 bar**.
- Return line**
- ▶ Connect the return line via the return flow filter to the oil tank port G1/2. See fig. 11, pos. 1. Close unused ports with blanking plugs.
- Back pressure-protected oil tank ports**
- ▶ The back pressure-protected oil tank ports G1, see fig. 11, pos. 2, can be optionally connected for rotary transmission leadthrough. Close unused ports with blanking plugs.



Fig. 11: Connection lines

- 1** Oil tank port G1/2
- 2** Oil tank ports 2 x G1
- 3** Pressure port G1/2



If failure of a hose line may cause hazards caused by whipping, installation of a hose safety catch is recommended.
If the hose lines are equipped with tear-proof fittings, a hose safety catch is not required.

7.4 Water supply connection

For motor and frequency converter cooling, the hydraulic power unit must be connected to a cooling water supply.

- ▶ Connect the lines to the intended cooling water ports, see fig. 12, pos. 1, according to the circuit diagram.
- ▶ Tighten the fittings according to manufacturer specifications.
- ▶ Make sure that the cooling water supply temperature does not fall below the dewpoint of the ambient air around the hydraulic power unit.
- ▶ Observe the following requirements:
 - Maximum cooling water temperature: 25 °C.
 - Minimum cooling water flow: 10 l/min.
 - Maximum glycol content: 30 %.



Fig. 12: Cooling water ports

- 1** Cooling water ports 2 x G1/2

7.5 Electrical interface assignment

- ▶ For electric installation, proceed according to applicable regulations for electrical engineering.
- ▶ You must ensure that the power supply is disconnected and also safeguarded against being switched on unintentionally.
- ▶ Unintended activation should be prevented by means of a warning sign indicating that work is carried out at the electrical system.

For operation of the hydraulic power unit, at least the following electrical connections are required:

1. 12X1: Feed-in/voltage supply (fig. 13)
2. 15X1: Enable signal 24 VDC (fig. 14 and 16).
3. 21X1: Multi-Ethernet interface ("Premium" configuration only)

In "Basic" configuration, the filling level and temperature sensor as well as the filter contamination sensors (fig. 15) must also be connected for respective evaluation via the machine control system.



Make sure that the switch-off signals of the oil temperature, filling level and filter contamination initiate deactivation of the hydraulic power unit "Basic" configuration. For example, by means of deactivation of the 24 VDC enable or the electric power supply.



The CytroPac is equipped with the Rexroth EFC 5610 frequency converter that can be connected via Mini USB cable to an external PC. The frequency converter can be accessed and configured via the ConverterWorks or IndraWorksDS software. The software is available for download on the Bosch Rexroth website. See chapter 17.3 "Accessories".

7.5.1 Mating connector assignment to port 12X1:

Feed-in/voltage supply

- ▶ Connect the mating connector (optionally available, refer to chapter 17.3 "Accessories") for power supply as illustrated in fig. 13.
- ▶ Make sure that the supply connection complies with the below specified requirements.

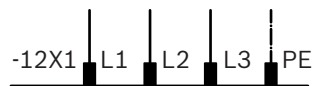


Fig. 13: Feed-in/voltage supply

- ▶ Feed-in/voltage supply including fuse and mains contactor are to be realized by the customer.

| | |
|-----------------------|---|
| Voltage | 3P 380 V ... 480 VAC (-15 % / +10 %) |
| Frequency | 50/60 Hz |
| Assignment | L1/L2/L3/PE |
| Rotating field | Rotating field right |
| Pre-fuse, | Power 1.5 kW → maximum 10 A |
| customer side | Power 2.2 kW → maximum 16 A Power 3.0 kW → maximum 20 A Power 4.0 kW → maximum 20 A |

**7.5.2 Mating connector assignment to port 15X1:
Enable signal 24 VDC (M12 x 1, customer side)**

► Connect the mating connector (optionally available, refer to chapter 17.3 "Accessories") for power supply, see fig. 14, as interface to the superior machine control system:

- Pin 1: 24 VDC supply for the hydraulic power unit
- Pin 2: 24 VDC output if the hydraulic power unit is ready for operation (machine-side bridging with pin 3 without additional enable signal)
- Pin 3: 24 VDC input for external enable signal: Hydraulic power unit is put into operation
- Pin 4: 0 VDC (reference ground pin 1)
- Pin 5: 24 VDC input for acknowledgment of faults/errors
- Pin 6: "Advanced" and "Premium" configuration only
- Pin 7: 24 VDC inputs for selection of up to four and pre-set parameter sets,
- Pin 8: see table 5, for various pressure ratings

"Basic" configuration

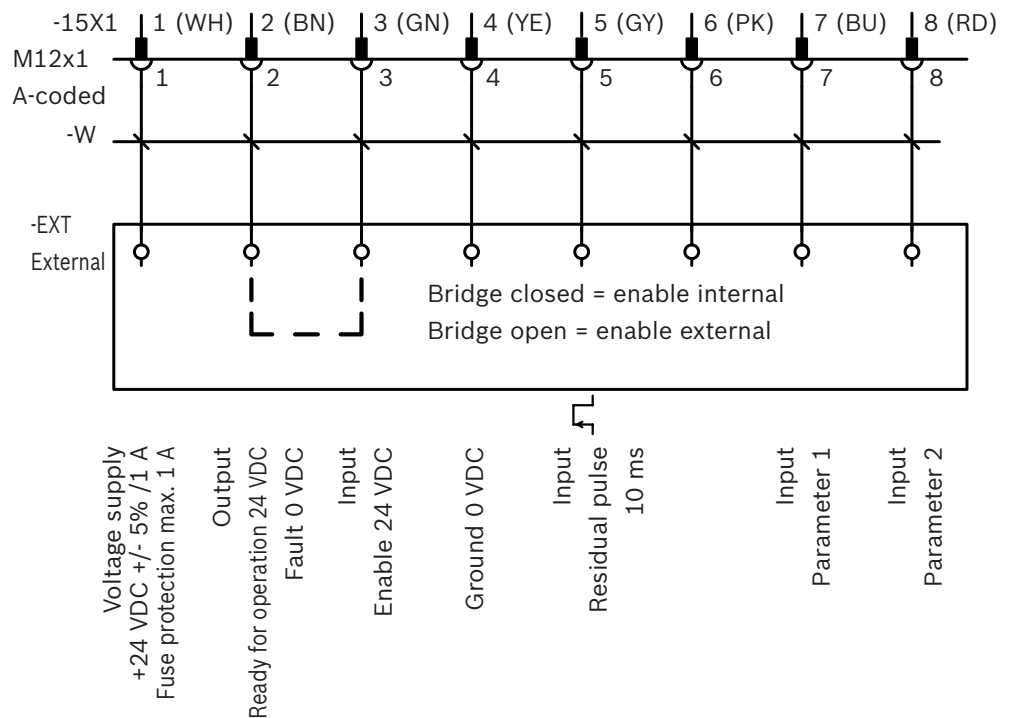


Fig. 14: Assignment of port 15X1: Enable signal 24 VDC

7.5.3 Mating connector assignment: Filling level/temperature sensor, filter contamination sensors ("Basic" configuration)

For status monitoring, the hydraulic power unit is equipped with the following sensors:

- Filling level and temperature sensor with two switching points each:
 - Pin 1: 24 VDC supply
 - Pin 2: 24 VDC output for filling level warning (normally open contact)
Warning in case of 24 VDC
 - Pin 3: 24 VDC output for filling level or thermal shutdown (normally closed contact)
 - Pin 4: 24 VDC output for temperature warning (normally open contact)
- Filter contamination sensor 75 %
 - Pin 1: 24 VDC supply
 - Pin 2: 24 VDC output for filter contamination warning (normally closed contact)
- Filter contamination sensor 100 %
 - Pin 1: 24 VDC supply
 - Pin 3: 24 VDC output for filter contamination shutdown (normally closed contact)

In "Basic" configuration, the three sensors must be wired to the superior machine control system for evaluation.

In case of shutdown, the enable signal of the hydraulic power unit must be canceled.

In the "Advanced" and "Premium" configuration, the warning and shutdown signals are internally wired and evaluated via port 16X1.



For information on the meaning of the LED signals, refer to fig. 3 "Name plate" and chapter 10.3 "Warning devices".

The status is visualized via the flashing sequence and color of the integrated LED strip, see name plate fig. 3.

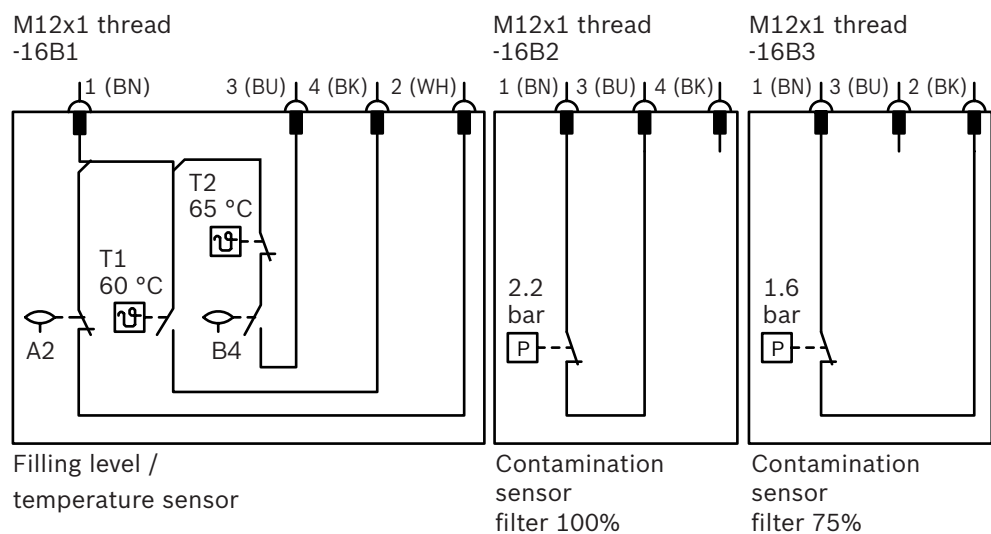


Fig. 15: Filling level/temperature sensor, filter contamination sensors

7.5.4 Mating connector assignment to port 15X1:

Enable signal 24 VDC (M12 x 1, customer side)

- ▶ Connect the mating connector (optionally available, refer to chapter 17.3 "Accessories") for power supply, see fig. 16, as interface to the superior machine control system:

- Pin 1: 24 VDC supply for the hydraulic power unit
- Pin 2: 24 VDC output if the hydraulic power unit is ready for operation (machine-side bridging with pin 3 without additional enable signal)
- Pin 3: 24 VDC input for external enable signal: Hydraulic power unit is put into operation
- Pin 4: 0 VDC (reference ground pin 1)
- Pin 5: 24 VDC input for acknowledgment of faults/errors
- Pin 6: 24 VDC output for warning, e.g. filter contamination, oil level, temperature
- Pin 7: 24 VDC inputs for selection of up to and four pre-set parameter sets,
- Pin 8: see table 5, for various pressure ratings.

**Configurations
"Advanced" and "Premium"**

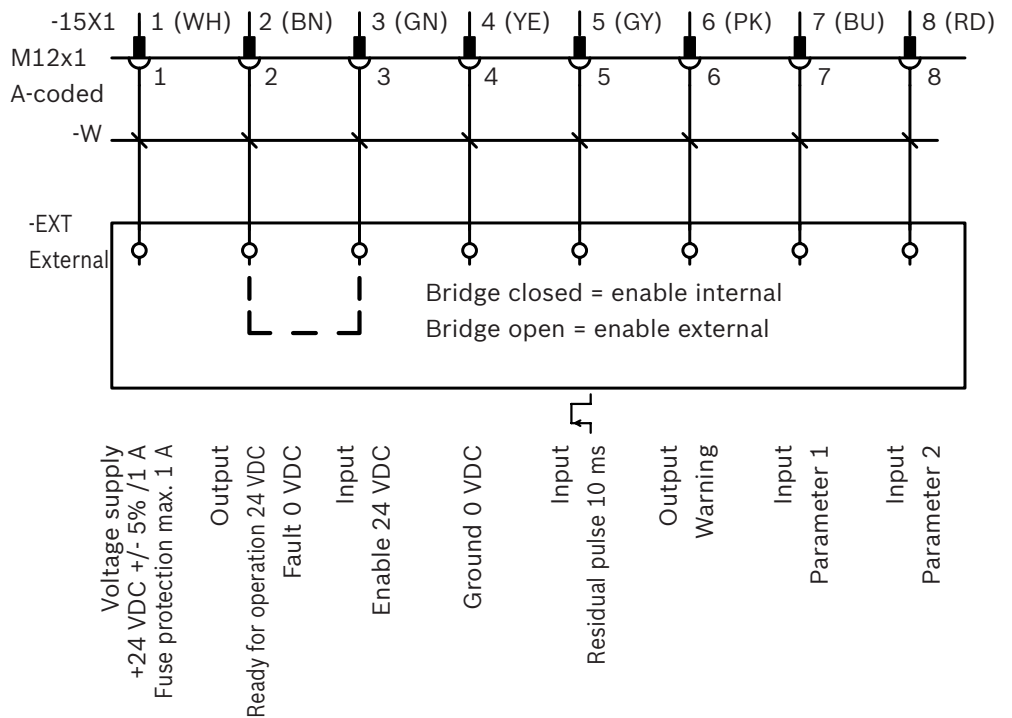


Fig. 16: Assignment of port 15X1: Enable signal 24 VDC

All "Basic", "Advanced" and "Premium" configurations

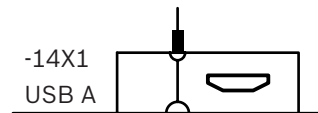
The parameter set is pre-set and can be adjusted by the customer using ConverterWorks. F1.03 = 1, see also chapter 8.3 "Parameter settings".

Table 5: Parameter sets (pin assignment of port 15X1)

| | | Pin 7 | Pin 8 |
|-----------------|-------|-------|-------|
| Parameter set 1 | F1.05 | 0 | 0 |
| Parameter set 2 | F1.06 | 0 | 1 |
| Parameter set 3 | F1.07 | 1 | 0 |
| Parameter set 4 | F1.08 | 1 | 1 |

7.5.5 Mini USB service interface 14X1 for frequency converter ("Advanced" and "Premium" configuration)

Reading or configuration of parameters or reading of errors can be realized via the mini USB service interface, see fig. 17, and the ConverterWorks or IndraWorksDS software.

**Fig. 17: Mini USB service interface****7.5.6 Multi-Ethernet interfaces**

In "Premium" configuration, the hydraulic power unit can be connected to the superior machine control system via multi-Ethernet interfaces 21X1 (pos. 15) and 21X2 (pos. 16), see fig. 18.

Interface 21X1 (network input) is always connected.

The 21X2 interface (network output) serves for connection of additional devices. If it is not required, close the port to maintain the protection class.

7.6 Electrical interface connection

! WARNING

High electrical voltage!

Danger to life, risk of injury, damage to property!

- ▶ Make sure that any work at the electrical equipment is only carried out by specialized electrician.
- ▶ For any work at the electric operating equipment, only use suitable insulated tools (German Social Accident Insurance DGUV regulation 3).
- ▶ Before assembling the hydraulic power unit, de-energize all relevant system components. Observe the five safety rules (according to DIN VDE 0105-100).
- ▶ Make sure that only suitable fuses are used.
- ▶ After establishing the feed-in connection and prior to switching on the protective grounding conductor connection to the power unit, particularly check the central plate (verification by means of test records according to DIN EN 60204-1 VDE 0113-1, end-to-end connection of the protective grounding conductor system, or DIN VDE 0701-0702, protective grounding conductor inspection).

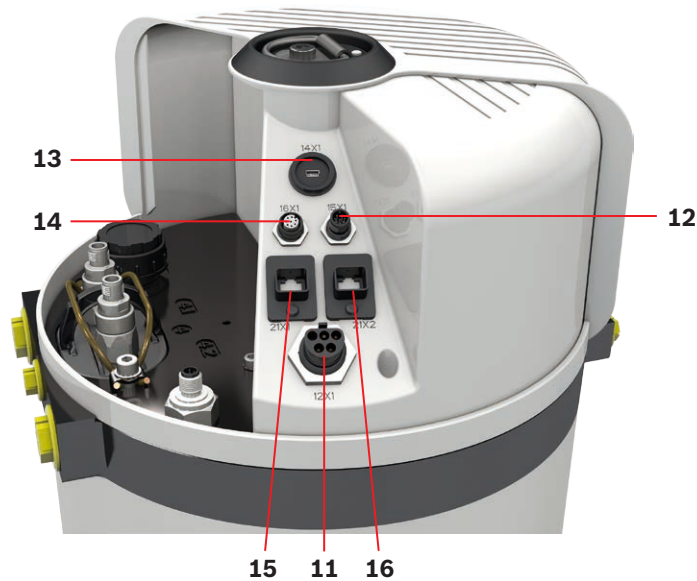


Fig. 18: Electrical connections

Sensor configuration: "Basic":

- 11** 12X1: Feed-in/voltage supply
- 12** 15X1: Enable signal 24 VDC (M12 x 1, 8-pole) – Customer interface
- 13** 14X1: Mini USB service interface

Sensor configuration: "Advanced":

- 14** 16X1: M12 x 1 sensor evaluation (wired at the plant)

Sensor configuration: "Premium"

- 15** 21X1: Multi-Ethernet interface, network input
- 16** 21X2: Multi-Ethernet interface, network input

7.6.1 "Basic" configuration

In "Basic" configuration, ports pos. 14, 15 and 16 are not used.



Fig. 19: "Basic" configuration electrical connections

To connect the power supply, proceed as follows.

- ▶ Connect the filter contamination sensors, see fig. 19, pos. 4.1 and 4.2, and the filling level and temperature sensors, see fig. 19, pos. 5, (customer side).
- ▶ Connect the connector plug for the enable interface (15X1) with the superior machine control system via port pos. 12.
- ▶ Connect the connector plug for the feed-in/voltage supply (12X1) to port pos. 11.

7.6.2 "Advanced" configuration

In "Advanced" configuration, ports pos. 15 and 16 are not used.

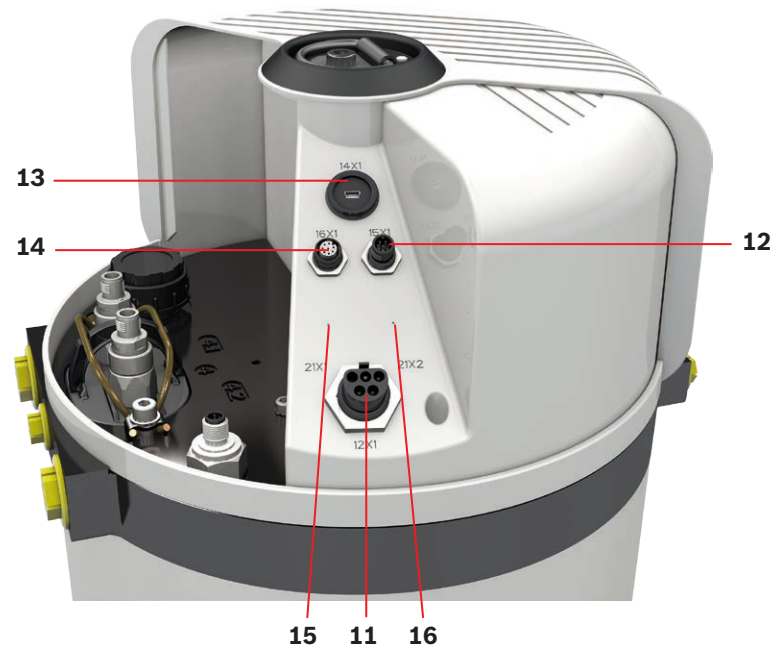


Fig. 20: "Advanced" configuration electrical connections

To connect the power supply, proceed as follows:

- ▶ Connect the connector plug for the enable interface (15X1) with the superior machine control system via port pos. 12.
- ▶ Connect the connector plug for the feed-in/voltage supply (12X1) to port pos. 11.

7.6.3 "Premium" configuration

In "Premium" configuration, all ports are used.

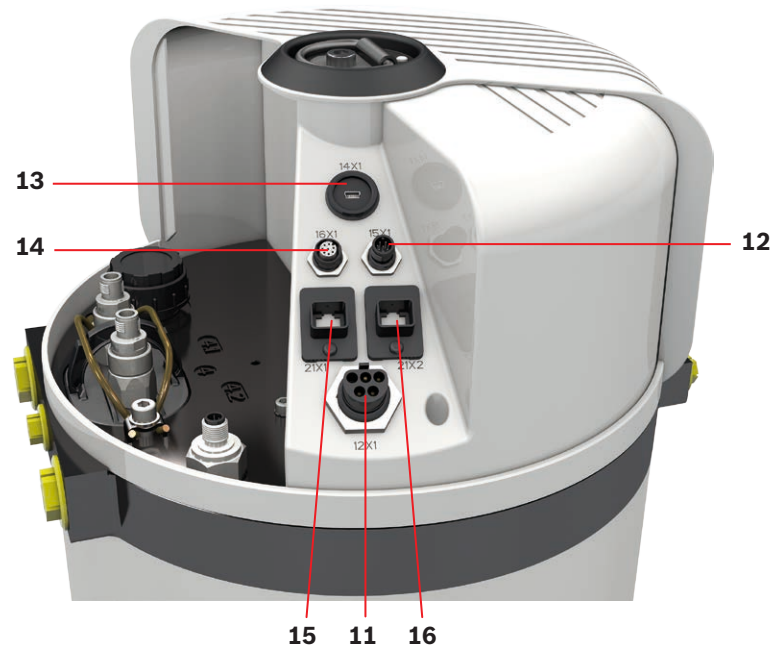


Fig. 21: "Premium" configuration electrical connections

To connect the power supply, proceed as follows:

- ▶ Connect the connector plug for the enable interface (15X1) with the superior machine control system via port pos. 12.
 - ▶ Connect the connector plug for the feed-in/voltage supply (12X1) to port pos. 11.
 - ▶ Connect the connector plug for the multi-Ethernet interface (21X1) to the superior machine control system with port pos. 15.
- Only use suitable connectors in compliance with the required protection class. Refer to chapter 17.3 "Accessories".
- ▶ Close any unused interfaces with the respective protective cap.

7.6.4 All configurations

To connect the mini USB service interface (14X1, port pos. 13), proceed as follows:

- ▶ Connect the hydraulic power unit with a mini USB cable (Bosch Rexroth recommends a shielded cable with ferrite ring) via the mini USB service interface to a PC.

The CytroPac is equipped with an integrated EFC 5610 frequency converter for connection to an external PC via mini USB cable.

The frequency converter can be accessed and configured via the ConverterWorks or IndraWorksDS software.

The software is available for download on the Bosch Rexroth website. See chapter 17.3 "Accessories".

8 Commissioning

WARNING

Leakage of hydraulic fluid under high pressure due to faulty assembly of the hydraulic power unit!

Risk of injury, damage to property!

- ▶ Ensure that the hydraulic power unit has been mounted by an expert, see chapter 2.4 "Qualification of personnel", completely and without any tension stress before commissioning of the hydraulic power unit.



According to EC Machinery Directive 2006/42/EC, commissioning must not be undertaken until it has been determined that the machine to be equipped with the hydraulic power unit complies with the provisions of all relevant directives. Combination of components may lead to additional/other types of hazards. For commissioning of the hydraulic power unit, always observe the operating instructions of the overall machinery/system. This particularly applies for "Mechanical hazards" due to mechanical motions of the machine initiated by the hydraulic power units and drives (cylinder, motor).

8.1 First commissioning

8.1.1 Before commissioning

- ▶ Check the safe condition of electric and hydraulic lines.
- ▶ Make sure that the cooling water system is in operation.
- ▶ Make sure that the pressure relief valve is installed in the pressure line.



The hydraulic power unit is not equipped with an integrated pressure relief valve. Make sure that the pressure line is secured with a pressure relief valve set to the correct value (**10 %** over operating pressure).



Manual operation for mating connector R901460889 (see chapter 17.3 "Accessories") can be used for commissioning, however, must be removed in operation.

8.1.2 Filling the hydraulic system

► Make sure that the maximum filling pressure does not exceed 2 bar.

The hydraulic power unit can be filled as follows, see fig. 22:

1. Via the filling and breathing filter (standard).
2. Via a filling coupling (optional filling device, see chapter 17.3 "Accessories") installed at the return flow (G1/2).
 - Install the filling coupling at the hydraulic power unit as illustrated in fig. 22.
 - Replace the air filter in the assembly kit against the filling and breathing filter and ensure that filling is no longer realized via the air filter.



The filling level must be within the marking on the filling level indicator.



Fig. 22: Filling options



Recommendation: Experience has shown that the cleanliness class required for the operation of the machine/system is already exceeded with new hydraulic fluids in the original packing drum.

If you want to ensure the cleanliness class, carry out the filling of the hydraulic power unit using a special filling unit, if necessary, or use a filter station with a 10 µm fine filter.

8.1.3 Activating the power supply

For activation, proceed in the following order:

1. Establish 24 VDC supply via enable interface.
2. Switch on feed-in/voltage supply.
3. Activate 24 VDC enable interface.



The plug-in connection of the feed-in/voltage supply (12X1) must never be operated under load.

The power unit must be activated and deactivated by means of a respective switching device of the superior machine control system (mains contactor, circuit breaker).



For further information, refer to chapter 7.5 "Electrical interface assignment", chapter 7.6 "Electrical interface connection" and the operating instructions of the machine/system manufacturer.

8.1.4 Bleeding the entire hydraulic system of the machine

For further information, refer to the operating instructions of the machine/system manufacturer.

- ▶ Bleed the hydraulic system at the highest point of the hydraulic components.

8.1.5 Commissioning

! DANGER

Activation of machine functions by means of commissioning!

Danger to life, risk of injury!

- ▶ Before commissioning of the hydraulic power unit, make sure that all electrical, mechanical and hydraulic connections are properly installed and connected as described in the superior instructions of the machine/system manufacturer.
- ▶ Make sure that the safeguards are activated.

Proceed as follows unless superior commissioning instructions must be observed on machine level.

For commissioning of the hydraulic power unit, proceed as follows:

- ▶ Flush the hydraulic system as described in chapter 8.1.6.
- ▶ Operate the directional valves and extend and retract the actuators several times.
- ▶ Repeat the bleeding process.



Bleeding is ensured if no foaming of hydraulic fluid in the oil tank, no jerky motions at the actuator and no irregular noise occur.

- ▶ Observe the fluid level in the oil tank and top up, if necessary.
- ▶ Monitor the operating temperature development if the machine is fully in operation for several hours.
- ▶ Check the hydraulic power unit for external leakage and correct as necessary.
- ▶ Check the connection points for leakage after several operating hours.

Problems during commissioning

To support systematic inspection for and reduction of errors, refer to the matrix provided in table 11 "Impact of defects, potential causes and remedies" in chapter 15 "Troubleshooting".

8.1.6 Flushing the hydraulic system

- ▶ Flush the hydraulic system to achieve a defined cleanliness of the hydraulic fluid. This prevents faults and simultaneously increases the life cycle of the components.
- ▶ Make sure that the minimum requirements of the cleanliness class for the components are fulfilled after installation of the hydraulic power unit into the machine and after integration into the hydraulic system.



Hydraulic systems in general industrial applications require a cleanliness class of 20/18/15 according to ISO 4406. Hydraulic systems with servo valve or sophisticated high-response valves have even stricter requirements regarding the cleanliness class, e.g. 19/16/13.



Observe the cleanliness requirement of the components according to the manufacturer data sheets for definition of the targeted condition after flushing.

Required material

Preparations:

- Provision replacement or flushing filter elements
- If required: Provision of additional pipeline and hose material for flushing and short-circuit links
- Provision of flushing plates, alternative directional valves
- As applicable: Provision of flushing fluid (see information below)

Information on flushing fluid

The same medium can be used as in later operation of the hydraulic system. If a different hydraulic fluid is used, it must be compatible with the operating medium intended for the hydraulic system and with materials and particularly the seals used in the hydraulic system. A maximum admissible residual amount (e.g. 0.5 percent by volume) of flushing fluid in the operating medium can be defined (see manufacturer's specifications). In this case, it must be ensured by thorough draining of the flushing fluid prior to filling with operating medium.



In case of comprehensive hydraulic systems with ring and branch lines, detailed planning of the flushing procedure and thorough processing is required.

The following instructions refer to flushing with the hydraulic power unit described in these operating instructions.

For use of a separate flushing unit, the respective operating instructions must be observed!

Flushing temperature For flushing, the hydraulic power unit is to be set to operating temperature and operated at reduced pressure. Please note that any pressure control circuits must be deactivated during the flushing phase or prepared for low flushing pressures.

Flushing time No general statement can be made on the duration of the flushing process. During flushing, regular hydraulic fluid samples should be taken and analyzed for cleanliness. A suitable sampling point is the return line upstream of the return flow filter.
Based on the result, it is to be decided whether flushing can be stopped (target cleanliness reached) or must be continued.

After flushing After completion of the flushing process, the operating conditions of the hydraulic power unit must be restored, flushing connections removed and connections closed pressure-tight.

8.1.7 Common faults during commissioning

- The oil tank is not checked.
- Hydraulic fluid is filled without filtering.
- The hydraulic system is not bled properly.
- Pressure relief valve set with insufficient difference to the operating pressure (closing pressure difference not observed).
- The switching hysteresis of pressure switches is not observed for setting.
- Parameter changes from the condition as supplied of the hydraulic power unit, e.g. operating pressure, are not documented.

8.2 Re-commissioning after longer standstill

For re-commissioning after longer standstill, proceed as follows:

- ▶ Check:
 - the hydraulic fluid level
 - hydraulic components and line systems for tightness
- ▶ Switch on components with increased caution.
- ▶ Bleed the hydraulic system.
- ▶ Observe the information in the operating instructions of the machine/system manufacturer.

8.3 Parameter settings

NOTICE

Damage to the hydraulic power unit due to improper operation!

Damage to property, malfunction!

- ▶ Make sure that the parameter settings at the frequency converter are only set by qualified personnel.
- ▶ Make sure that only parameters specified in table 6 are modified. Any modification of other parameters must be coordinated with the Bosch Rexroth customer service.



If no customer-specific requirements apply, the CytroPac is delivered with factory settings. See name plate in chapter 5.5.

The CytroPac is equipped with an integrated Rexroth EFC 5610 frequency converter with the ASF firmware (Sytronix) for connection to an external PC via mini USB cable. The frequency converter can be accessed and configured via the ConverterWorks or IndraWorksDS software.

The software is available for download on the Bosch Rexroth website. See chapter 17.3 "Accessories". Also observe the help functions of the software.

Consult the Sytronix quick guide, see chapter 1.2 "Required and amending documentation".

For parameter settings, proceed as follows:

1. Connect the hydraulic power unit to the voltage supply.
Please note the information provided in chapter 8.1.3 "Activating the power supply".
2. Connect the hydraulic power unit with a mini USB cable via interface 14X1 to an external PC.
3. Open the ConverterWorks or IndraWorksDS software.
4. Switch the connection online.
5. Modify the required parameters.
6. Document the modifications made (e.g. by saving the parameter set).

Table 6: Modification of approved parameters

| Code | Name |
|-------|--|
| E0.26 | Acceleration time |
| E0.27 | Delay time |
| F1.03 | Pressure command value, source |
| F1.05 | Pressure command value 0 |
| F1.06 | Pressure command value 1 |
| F1.07 | Pressure command value 2 |
| F1.08 | Pressure command value 3 |
| F1.11 | Flow command value, source |
| F1.12 | Flow command value |
| F2.19 | Function input X4 |
| F2.20 | Function input X5 |
| F3.12 | Proportional amplification, p/Q controller |
| F3.13 | Integral time, p/Q controller |
| F3.16 | Differential amplification, p/Q controller |
| F3.17 | Filter time for differential amplification |
| F4.45 | Boost for pressure drop compensation |
| H3.20 | Station name (PROFINET) |

8.3.1 Digital interface settings

Changing the operating pressure:

- ▶ Make sure that all system components can work with the required operating pressure.
- ▶ Make sure that the pressure limitation settings for the intended operating pressure are correct (10 % over max. operating pressure).
- ▶ The pressure command value can also be changed during running operation. Command values entered in the software become immediately effective in the process!

Pressure command value change (applies for "Basic" and "Advanced" configurations):

1. Make sure that parameter F1.03 is set to 0.
2. Set the required operating pressure in parameter F1.05.

Change of up to four pressure ratings (applies for "Basic" and "Advanced" configurations):

1. Make sure that parameter F1.03 is set to 1 (parameter F1.04 indicates the status of the pre-selected pressure).
2. Set the required operating pressure for stage 1 in parameter F1.05.
3. Set the required operating pressure for stage 2 in parameter F1.06.
4. Set the required operating pressure for stage 3 in parameter F1.07.
5. Set the required operating pressure for stage 4 in parameter F1.08.
6. Set the function of the digital inputs 15X1 at pin 7 and pin 8:
 - Parameter F2.19 = 1 (pressure command value selection bit 0)
 - Parameter F2.20 = 2 (pressure command value selection bit 1)



In "Premium" configuration, the pressure command value is defined via the multi-Ethernet interface.

Prestart function

With the prestart function, a drop in operating pressure can be compensated. This occurs, if larger actuators are connected.

- The prestart function is activated via digital signal 15X1 at pin 7. This way, no more than two pressure ratings (15X1 at pin 8) are available for selection.
- By means of the prestart function, the operating pressure can be increased depending on the time-related switching of actuators. Make sure that the possible increase in operating pressure does not cause any undesired effects.

For activation, proceed as follows:

1. Make sure that parameter F1.03 is set to 1.
2. Set the function of the digital input 15X1 at pin 7:
– Parameter F2.19 = 20 (pressure drop compensation trigger)
3. Set the function for pressure drop compensation in parameter F4.45,
e.g. F4.45 = 50 (corresponds to a pressure command value increase of 50 bar).



Experience has shown that the lowest pressure drop occurs at prestart activation of 50 to 100 ms prior to connection of hydraulic actuators. For further information, refer to chapter 7.9.4 of the Sytronix quick guide, see chapter 1.2 "Required and amending documentation".

Flow command value adjustment

The admissible flow command value (maximum speed) depends on various factors like pump size, power unit performance class or operating pressure and must be set in compliance with application-specific requirements.

- Use the performance diagram specified in the CytroPac document 51055 or contact the Bosch Rexroth customer service.
- Inadmissibly set flow command values can lead to an overload of the power unit.
- The flow command value can also be changed during running operation. Command values entered in the software become immediately effective in the process!

Flow command value adjustment for "Basic" and "Advanced" configurations:

1. Make sure that parameter F1.11 is set to 0.
2. Set the required flow command value (maximum speed) in parameter F1.12.



In "Premium" configuration, the flow command value is defined via the multi-Ethernet interface.

8.3.2 Multi-Ethernet interface settings, PROFINET operating mode

- The multi-Ethernet interface is only available in "Premium" configuration.



Bosch Rexroth recommends parameterization of the communication settings in the frequency converter of the power unit before establishing communication with the control system.

The following general parameter settings are pre-set for PROFINET communication:

- Parameter E0.01 = 2
- Parameter E0.03 = 2
- Parameter E8.00 = 1
- Parameter F1.03 = 3
- Parameter F1.11 = 2
- Parameter H3.40 = PN

Table 7: Process data output (status words)

| Process | Status word |
|---|---|
| H3.30 [0] = H0.01 | Bit 0: Backwards (low = forwards) |
| | Bit 1: Start |
| | Bit 2: Jog mode |
| | Bit 3: Acceleration |
| | Bit 4: Deceleration |
| | Bit 5: Overvoltage limitation |
| | Bit 6: Over-current limitation |
| | Bit 7: Error |
| | Bit 8 to 15: Error code |
| | H3.30 [1] = d0.01 |
| H3.30 [2] = d0.82 | Actual pressure value in bar (one decimal digit) |
| H3.30 [3] = d0.88 | Process warnings |
| | Bit 0: No active warning |
| | Bit 1: Actual pressure limit value exceeded |
| | Bit 2: Pressure command limit value exceeded |
| | Bit 3: Flow command limit value exceeded |
| | Bit 4: Warning! Oil filter contaminated |
| | Bit 5: Warning! Oil filling level too low |
| | Bit 6: Warning! Oil temperature too high |
| | Bit 7: Warning! Oil exchange required |
| | Bit 8: Backup |
| | Bit 9: Warning! Pump-temperature protection |
| Bit 10: Warning! Pump performance limit reached | |
| H3.30 [4] = d0.89 | Process faults |
| | Bit 0: no active fault |
| | Bit 2: Error! Pressure sensor |
| | Bit 3: Error! Parameter value error |
| | Bit 4: Error! Oil filter contaminated |
| | Bit 5: Error! Oil filling level too low |
| | Bit 6: Error! Oil temperature too high |
| | Bit 7: Error! Oil exchange required |
| | Bit 8: Error! Oil filling level too low or oil temperature too high |
| | Bit 9: Error! Pump temperature protection |

Table 8: Process data input (control words)

| Process | Control words |
|-------------------|---|
| H3.31 [0] = H0.00 | Bit 0: Start |
| | Bit 1: Jog mode |
| | Bit 2: Backwards (low = forwards) |
| | Bit 3: Stop |
| | Bit 4: Emergency stop |
| | Bit 5: Reset error |
| | Bit 6: Stop acceleration/delay |
| | Bit 7: Control word active |
| | Bit 8: Rundown |
| | Bit 9 to 15: Reserved |
| H3.31 [1] = F0.22 | Speed command value in rpm (without decimal digits) |
| H3.31 [2] = F0.21 | Pressure command value in bar (one decimal digit) |

To integrate the hydraulic power unit into the machine control system via PROFINET, proceed as follows:

1. Install the respective GSDML file (xFC0x 01V01 GSDML V2.0).
2. Add the device to your project.
3. Define the communication data lengths, standard status word, control word:
 - Input 05 Words
 - Output 03 Words

9 Operation

The hydraulic power unit is intended as partly completed machinery for installation into a machine/system.

The hydraulic power unit has no direct function (e.g. switch) to put the product out of operation. Make sure that required measures for decommissioning are implemented by the machine/system manufacturer.

Information on operating the hydraulic power unit can only be provided in connection with the machine/system. For this information, please refer to the operating instructions of the machine/system manufacturer.

10 Maintenance and repair

Maintenance tasks (inspection, maintenance, repair) must be defined according to system-specific requirements, operating conditions (pressures, temperatures, environmental conditions) and the operating life (duty cycle, cycle times, shift operation).

The declarations made in this chapter are based on climate conditions in Central Europe and common environments in the metal-processing industry.

A negative trend of test parameters like hydraulic fluid temperature, short replacement intervals of filter elements or noise indicate changes. The troubleshooting matrix in chapter 15, table 11, provides support for the identification of issues.

Slow increase in temperature and/or shorter filter replacement intervals indicate potential wear at the pump, seals as well as aging of hydraulic fluid and should initiate inspection of all relevant components.

Immediate strong increases in temperature are alarming and require immediate inspection of the machine/system.



For further information on the scope and time intervals for maintenance and repair of the overall machinery/system, please refer to the operating instructions of the machine/system manufacturer.

10.1 Cleaning and care

For cleaning and care of the hydraulic power unit, observe the following:

- ▶ Make sure that all seals and electric plug-in connections are firmly fitted to prevent the penetration of cleaning agents and/or humidity into the hydraulic power unit.
- ▶ Do not use aggressive cleaning agents for cleaning. Clean the hydraulic power unit using a suitable cleaning liquid.
- ▶ Do not use a high-pressure washer.
- ▶ Do not use compressed air for the cleaning at functional interfaces.
- ▶ Remove external coarse dirt and keep sensitive and important parts like electrical connections clean.
- ▶ For the cleaning, use a damp, non-linting cloth or residue-free industrial wipes.

10.2 Inspection

Bosch Rexroth recommends documenting the inspection results

- so that considering functionality and economy, the inspection and maintenance intervals can be adjusted to the actual operating conditions.
 - so that by comparing the documented values, you can identify faults at an early point in time.
- ▶ Before any inspection work, clean the hydraulic power unit as necessary.
 - ▶ Carry out the following visual inspections for clearly apparent defects:
 - Illegible notices or warning signs
 - Leakage
 - Loose and/or missing parts
 - Indications of external force effects

10.3 Warning devices

The "Advanced" and "Premium" configurations of the hydraulic power unit are equipped with a LED strip for status display:

- Normal operation: LED strip illuminated in green
- Warning: LED strip illuminated in green and flashing yellow
- Error: LED strip illuminated in red and flashing yellow

Warnings and error displays are realized via the flashing sequence of the LED strip:

- 1 x flashing: Oil filter
- 2 x flashing: Oil level
- 3 x flashing: Oil temperature
- 4 x flashing: Oil exchange
- 5 x flashing: Other



Precise reading of error messages is possible via the mini USB service interface and the ConverterWorks or IndraWorksDS software.

10.4 Maintenance schedule



Observe the status display for oil filter, oil level, oil temperature and oil exchange of the LED strip at the hydraulic power unit.

Table 9: Maintenance schedule

| Activity/maintenance interval | 1/2 y. | 1 y. | Alternative: Operating hours |
|--|--------|----------------|---------------------------------|
| Visual inspection External leakage, cracking, force effect, corrosion (oil tank, hose lines, fittings, central plate) | X | | |
| Checking Electric components/installation | | X | |
| Checking Pressure values | X | | |
| Checking (oil sample) Quality control of the hydraulic fluid | | X ¹ | |
| Replacement Return flow filter element | | X ¹ | |
| Visual inspection/replacement Filling and breathing filters | | X ¹ | |
| Exchange Hydraulic fluid | | | 20,000 |

¹⁾ These components/substances or materials are subject to natural wear. It is therefore very important to permanently check the components' condition. If necessary, these components are to be replaced outside the maintenance intervals.

10.5 Maintenance

10.5.1 Checking the electric components/installation

- ▶ Have the entire electric installation regularly checked by a specialized electrician.
- ▶ Additionally, carry out regular machine and system inspections according to DIN EN 60204-1 (VDE 0113 part 1) or DIN VDE 0701-0702.
- ▶ Check the power unit housings, cables and plug-in connections and connector contacts for damage.



Inadmissible damage includes breaks, cracks, abrasion, deformation or discoloration.

The hydraulic power unit may only be operated if the electric components are not damaged.

10.5.2 Filling level monitoring

The filling level is monitored via the integrated filling level sensor with two switching points (warning and shutdown). In "Basic" configuration, it must be evaluated by the machine control system and shutdown of the hydraulic power unit must be ensured if the shutdown limit is fallen below.

Measures if the maximum filling level is exceeded:

1. Expansion due to temperature increase
(rough determination: $\Delta V = \text{Thermal expansion coefficient} \times \Delta T$)
 - Correct the filling level
2. Exceeding of the maximum filling level due to presumed water ingress
 - Close water valves (locking of the cooling water supply)
 - Take a hydraulic fluid sample from the bottom of the oil tank and check it for water content
 - If water ingress is confirmed, finish the working cycle of the machine and put it out of operation under safe conditions
 - Carry out additional control measures and take the following measures depending on the results:
 - Correct the cause of the water ingress
 - Clean or drain and change hydraulic fluid
 - If necessary, flush the system
 - Check the hydraulic fluid for its admissible water content

Measures if the minimum filling level is fallen below:

- Identify and correct the cause of the leakage.
- Afterwards, fill in hydraulic fluid to the correct filling level

10.5.3 Oil temperature monitoring

The oil temperature is monitored via an integrated filling sensor with two switching points (warning and shutdown). In "Basic" configuration, it must be evaluated by the machine control system and shutdown of the hydraulic power unit must be ensured if the shutdown temperature is exceeded.

Possible causes for temperature increase

- Possible causes for temperature increase include:
- Heat exchanger malfunction
 - Change in cooling water conditions
 - Malfunction or incorrect setting of pressure valves
(e.g. maximum pressure limit, pump control, pressure reducing valve)
 - Error at the pump (wear, increased leakage)
 - Changed environmental conditions (e.g. increased ambient temperature)
 - Changed load conditions at drives

In case of inadmissible temperature increases, the causes must be determined and corrected.

10.5.4 Filter element contamination monitoring (return flow filter)



Be critical if the filter contamination sensors do not indicate any change over multiple inspection intervals. Of course, this may always be an indicator that the hydraulic fluid is clean. However, it may also have the following causes:

- The contamination indicator is defective.
- The filter element is defective.

Measure: Plan and carry out replacement of the filter element at the end of the shift. Shorten the intervals between the required replacement of filter elements, identify the cause of the deposition of dirt and correct it.

Exchanging the return flow filter element:

Proceed as follows:

1. Before starting to work, provide receptacles for the hydraulic fluid and the filter element.
2. Depressurize the hydraulic power unit and secure it against unintentional start-up.
3. Fold out the spring clip with a screwdriver or similar.
4. Remove the filter cover.
5. Pull the filter element out of the clip.
6. Insert a new filter element (see chapter 17.3 "Accessories").
7. Apply the filter cover again.
8. Slide the spring clip with a screwdriver into the locking position of the filter cover.
9. Dispose of the filter element in accordance with national or company-specific regulations.



Fig. 23: Exchanging the filter element

10.5.5 Visual inspection of the filling and breathing filter (see fig. 1, pos. 6)

- ▶ Carry out an annual visual inspection and replace the filling and breathing filter as necessary.
- ▶ If the air filter is used as described in chapter 8.1.2 "Filling the hydraulic system", annually carry out a visual inspection and replace the air filter in case of contamination and/or damage.

10.5.6 Pressure value check

The pressure values need to be checked in case of any changes in drive behavior (e.g. increased cycle time, end product quality, etc.). Otherwise, semi-annual inspections are recommended.



Bosch Rexroth recommends documentation of pressure values in the maintenance documentation.

10.5.7 Hydraulic fluid care

The hydraulic fluid should be analyzed at least annually.

For analyzing the hydraulic fluid a thorough hydraulic fluid sample must be taken.

The hydraulic fluid sample must be checked in a qualified laboratory according to the applicable manufacturer's specifications for the hydraulic fluid.

Measures: Depending on the result, additional measures need to be taken. E.g.:

- Additional filtering measures
- Dehydration
- Replacement



The use of treated and recycled hydraulic fluid (secondary raffinate hydraulic fluid) is to be avoided.

For hydraulic fluid change, proceed as follows:

- ▶ Fully drain the hydraulic fluid. Refer to chapter 11.1 "Preparing for decommissioning".
- ▶ In this connection, ensure complete draining of the lines and actuators.
- ▶ If necessary, carry out bleeding measures.
- ▶ Fill the system as for initial filling with subsequent bleeding of the hydraulic system. See chapter 8.1.2 "Filling the hydraulic system".

10.5.8 Visual inspection for leakage, cracking, force effects and corrosion

External inspection is visual inspection and needs to be carried out at least semi-annually (or more often depending on operating conditions and use).

Clean the system before visual inspection as necessary.

Visual inspection is carried out for:

- Leakage
- Cracking
- Corrosion
- Dents due to external force effects

Leakage In case of leakage at screwed-in components, these must be tightened and documented. If leakage still occurs at this position, the contact must be thoroughly checked for the cause of leakage. Depending on the result, seals and/or the component must be replaced.

Cracking and resulting leakage In case of cracking and resulting leakage, the cause must be identified and corrected. Afterwards, affected components must be replaced or thoroughly repaired.

External force effects In case of indications of external force effects, the cause must be identified and corrected. Afterwards, the component and enclosing components must be checked for damage and assessed for further reliable use. As required, these components are to be replaced or thoroughly repaired.

Corrosion In case of indications of corrosion, the component must be checked for damage and assessed for further reliable use. As required, this component is to be replaced or thoroughly repaired. In any case, corrosion protection must be ensured.

10.5.9 Checking the heat exchanger

The heat exchanger does not require specific maintenance. The set-up of the heat exchanger is robust and does not lead to any increased requirements for the cooling water unit. Dirt particle must not exceed 1 mm.

10.6 Spare and wear parts

► For a list of spare and wear parts for the hydraulic power unit, refer to fig. 24 and table 10:

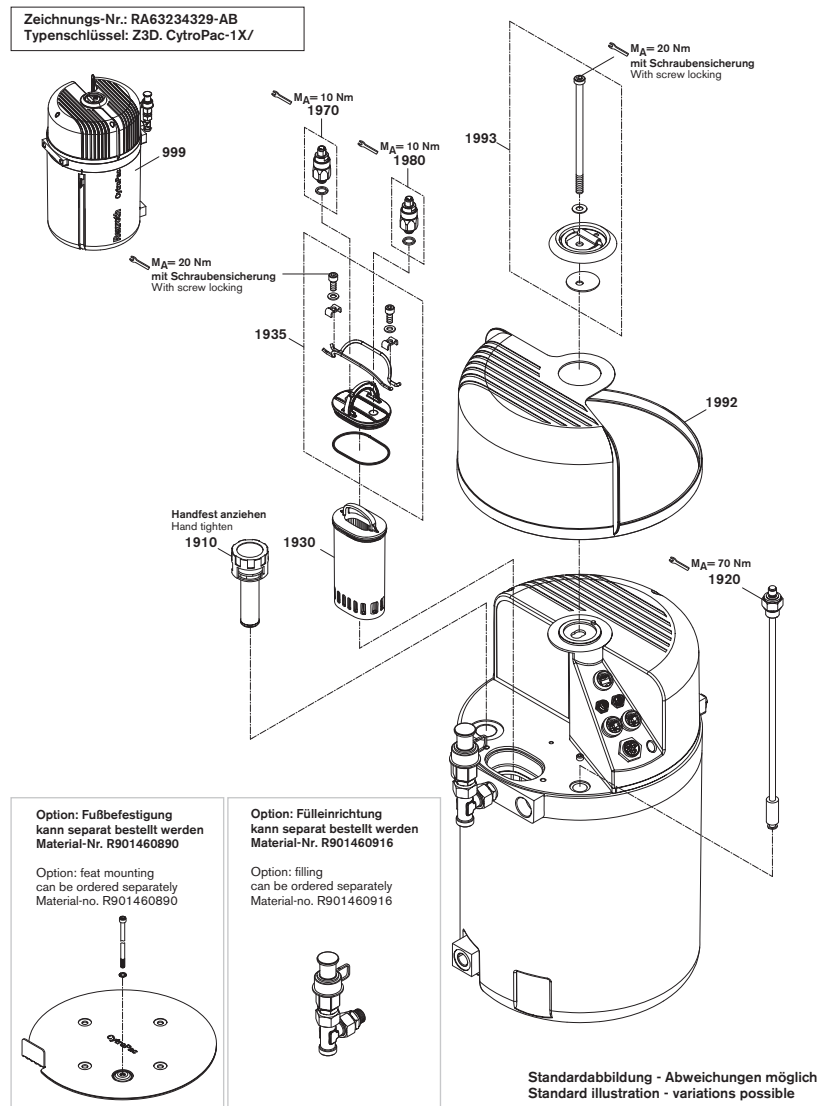


Fig. 24: Spare parts

Table 10: Spare and wear parts

| Material number | Denomination | Comment | Assembly |
|-----------------|------------------------------------|---|----------|
| R928035258 | 35.0035CP H10XL-R00-0-M | Filter element | 1930 |
| R901473309 | ASSEMBLY KIT CYTROPAC LIFTING EYE | Lifting device service module | 1993 |
| R901473314 | ASSEMBLY KIT CYTROPAC FILPOL 75% | Filter pre-warning 75% service module | 1970 |
| R901473317 | ASSEMBLY KIT CYTROPAC FILTPOL 100% | Filter shutdown 100% service module | 1980 |
| R901473318 | ASSEMBLY KIT CYTROPAC FILTER COVER | Filter cover service module | 1935 |
| R901451898 | COVER CYTROPAC-DREH RAL7035 | Rotatable cover RAL7035 | 1992 |
| R901470062 | AIR FILTER TMDF/1/BRC | Filling and breathing filters | 1910 |
| R901471242 | AIR FILTER TMDF/1/BR | Air filter from filling device assembly kit | |
| R901456587 | FLOAT SWITCH M60.1.A2.B4.270.320.& | Float switch | 1920 |

Please send any spare part orders to your nearest Bosch Rexroth service center or directly contact the headquarters.

For the addresses, please refer to www.boschrexroth.com.

- Spare parts order**
- ▶ 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 e.g. by fax.
 - ▶ Please provide the following information when ordering spare parts:
 - Material number and order number of the hydraulic power unit (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.).

11 Decommissioning

11.1 Preparing for decommissioning

- ▶ Provide collecting containers that are large enough to accommodate the total volume of the hydraulic fluid.



The total volume of the hydraulic system comprises the volumes of the oil tank, the line system, the drives, etc.

- ▶ Always observe applicable instructions for the overall machinery/system.
- ▶ Unless these operating instructions provide different information, proceed as follows:
 - Prevent any hazards due to machinery in the vicinity.
 - Unauthorized personnel must not be allowed access to the working area.
 - Lower and securely support all loads.

11.2 Decommissioning process

- ▶ Switch off the power supply and secure the system against restarting.
- ▶ Switch off the hydraulic pressure supply and secure it.
- ▶ Make sure that all relevant system parts are depressurized and de-energized.
- ▶ Disconnect the hydraulic fluid draining hose using the clip, refer to fig. 1, pos. 10, and drain the hydraulic fluid into the provided collecting container.
In this connection, ensure complete draining of the lines and actuators. If necessary, carry out bleeding measures.

Overall machinery/system Decommission the overall machinery/system as described in the overall machinery/system operating instructions.

12 Disassembly and replacement



Only assemble device parts if it is required to carry out the necessary work. In general, all disassembled parts should be reassembled properly at the intended position.

12.1 Preparing for disassembly

- ▶ Ensure sufficient stability of the hydraulic power unit.
- ▶ Observe the weight and the position of the center of gravity of the hydraulic power unit.
- ▶ Do not loosen the fixation of the hydraulic power unit before the stability of the machine is ensured.
- ▶ Prior disassembly, drain the hydraulic fluid from the hydraulic power unit as described in chapter 11 "Decommissioning".
- ▶ Use the intended eyebolt. See fig. 5.
- ▶ Check secure fitting of the eyebolt if the hydraulic power unit is to be transported after disassembly.
- ▶ Please note that the hydraulic power unit may be mounted on an optional installation plate. See fig. 10.
- ▶ To remove the hydraulic power unit from the installation plate, untighten the screw. See fig. 8.

Safety measures:

- ▶ Always observe applicable instructions for the overall machinery/system.
- ▶ Unless these instructions provide different information, proceed as follows:
 - Carry out decommissioning as described in chapter 11 of these operating instructions.
 - Unauthorized personnel must not be allowed access to the working area.

12.2 Disassembly process

- ▶ For disassembly, carry out the work steps described in chapter 7 "Installation" in reverse order.
- ▶ Hydraulic fluid will run out of the hydraulic line system of the hydraulic power unit or hydraulic system even after draining. For this reason, close all outlets of lines with suitable blanking plugs.



After disassembly, observe the information on safe transport of the product in chapter 6 "Transport and storage".

13 Disposal

13.1 Environmental protection

Careless disposal of the hydraulic power unit, its components, the hydraulic fluid and the packaging material can lead to environmental pollution.

Please therefore observe the following points:

- ▶ Fully drain the hydraulic power unit prior to disposal.
- ▶ Dispose of the hydraulic power unit and the packaging material in accordance with the applicable national regulations in your country.
- ▶ Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country. Also observe the applicable safety data sheets.

14 Extension and modification

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

Declarations become invalid

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



For hydraulic power units, this has the following consequence:

Hydraulic power units are partly completed machinery in the sense of the EC Machinery Directive 2006/42/EC. For this product, a declaration of incorporation was received with the product-specific documentation.

In case of extension or modification of the hydraulic power unit, this declaration will become invalid. Please send any queries you may have to your nearest Bosch Rexroth service center or directly to the headquarters.

For the addresses, please refer to www.boschrexroth.com.

15 Troubleshooting

WARNING

Deactivated safeguards!

Danger to life! Risk of injury!

- ▶ Make sure that all safeguards, e.g. fuses, protective grounding conductor, pressure relief valves, covers (frequency converter) are active.
- ▶ Proceed with extreme caution if safeguards need to be deactivated or covers removed for troubleshooting.
- ▶ If possible, operate the machine/system with reduced performance data in set-up mode for identification of errors.

Successful troubleshooting within the hydraulic power unit requires precise knowledge on the set-up and the function of individual components. The combination of hydraulics with an electrical system and electronics makes troubleshooting very complex.

Circuit diagrams (hydraulic and electric), parts lists, functional diagrams as applicable and other documentation must be available for effective troubleshooting.

15.1 How to proceed for troubleshooting

- ▶ Always work systematically and purposefully, even when under time pressure. Random, thoughtless disassembly and changing of settings can, in the worst-case-scenario, result in the inability to determine the original cause of the error.
- ▶ First, get a general idea of the function of the hydraulic power unit in combination with the overall machinery/system.
- ▶ Try to find out whether the hydraulic power unit has worked properly in combination with the overall machinery/system before the error occurred first.
- ▶ Try to determine any changes of the overall machinery/system, in which the hydraulic power unit is integrated:
- ▶ Were there any changes to the application conditions or area of application of the hydraulic power unit?

Control questions

- Have modifications (e.g. refittings) or repair works been carried out on the overall system (machine/system, electrical system, control) or on the hydraulic power unit?
 - If yes: What were they?
 - Was the hydraulic power unit or the machine/system used as intended?
 - How did the fault become apparent?
 - Try to clarify the cause of error.
- ▶ Ask the direct (machine) operator.

15.1.1 Overview of the impact of defects

Table 11: Impact of defects

| Error | Possible cause | Remedy |
|--|--|---|
| Excessive noise level | Insufficient hydraulic fluid in the oil tank. | <ul style="list-style-type: none"> ▶ Check the hydraulic fluid level. ▶ Check for and correct any leakage. ▶ As necessary, refill hydraulic fluid to ensure that the filling level is between the markings on the filling level indicator. |
| | Hydraulic power unit is positioned on a vibrating surface. | ▶ Make sure that the hydraulic power unit is positioned on a secure and non-vibrating surface. |
| | The hydraulic power unit is connected to the machine via pipelines. | ▶ Route out the hydraulic connections between the hydraulic power unit and the machine with hose lines. |
| Pressure fluctuations in the pressure line. | Vibration of the control system, e.g. pressure controller. | ▶ Check the controller settings and specifically the parameters of the power amplification in F3.12 following. For further information, refer to chapter 7.7 "p/Q PID control" of the Sytronix quick guide, see chapter 1.2 "Required and amending documentation". |
| Incorrect operating pressure. | Incorrect pressure command value presetting. | <ul style="list-style-type: none"> ▶ Check and adjust the pressure command value as applicable. CytroPac "Basic" and "Advanced" configuration: <ul style="list-style-type: none"> ▶ Check parameter F1.05. ▶ If only one pressure rating is intended, make sure that F1.03 and F1.04 are set to 0. For further information, refer to chapter 7.3 "Pressure value processing" of the Sytronix quick guide, see chapter 1.2 "Required and amending documentation". |
| | Excessive pressure loss due to incorrect dimensioning of hose lines. | ▶ Replace the hose lines against larger nominal widths. |
| Pressure command value is not reached or insufficient flow. | Speed limit too low. | <ul style="list-style-type: none"> ▶ As applicable, change the flow limitation parameter F1.12. For further information, refer to chapter 7.2 "Flow command value processing" of the Sytronix quick guide, see chapter 1.2 "Required and amending documentation". ▶ Observe the maximum admissible speed of the application (if necessary, contact the Bosch Rexroth customer service). |
| Frequency converter overload during operation. | Drive insufficiently dimensioned. | <ul style="list-style-type: none"> ▶ Check the motor current d0.98 and compare it with the limit values for continuous load (1.5 kW 4.0 A; 2.2 kW 5.6 A; 3.0 kW 7.4 A; 4.0 kW 9.7 A). ▶ Make sure that the operating point is within the continuous characteristic curves. For further information on continuous characteristic curves, refer to data sheet 51055, see chapter 1.2 "Required and amending documentation". |
| Frequency converter overload when disconnecting hydraulic actuators. | Pressure relief valve set too high. | ▶ Make sure that the pressure relief valve is set 10 % over the operating pressure. |
| | Generator-based drive effect (due to rotor inertia). | ▶ Extend the delay ramp E0.27. |

Table 11: Impact of defects

| Error | Possible cause | Remedy |
|---|--|---|
| Frequency converter over-current when connecting hydraulic actuators. | Motor current during acceleration too high. | <ul style="list-style-type: none"> ▶ Extend the acceleration ramp E0.26. |
| Drive overtemperature | Insufficient cooling water flow, cooling water temperature too high, insufficient cooling water in the system, inlet pressure too low or deposits in the heat exchanger. | <ul style="list-style-type: none"> ▶ Make sure that the coolant complies with the requirements of the technical specifications. |
| The hydraulic fluid temperature is too high | Insufficient cooling power of hydraulic fluid. | <ul style="list-style-type: none"> ▶ Calculate the heat introduction in the hydraulic system, e.g. by calculation of the hydraulic power loss of valves, rotary transmission leadthrough, etc. ▶ Compare the results with the selected oil cooling power of the hydraulic power unit. ▶ Reduce the cooling water temperature, increase the cooling water flow or replace the hydraulic power unit against a model with higher oil cooling power. |
| | Incorrect and usually too low pressure valve setting. A part of the pump delivery volume is returned back to the oil tank via the pressure relief valve. | <ul style="list-style-type: none"> ▶ Make sure that the pressure relief valve is set 10 % over the operating pressure. |
| | Extreme heat introduction into the hydraulic fluid. | <ul style="list-style-type: none"> ▶ Check whether external heat sources are positioned too close to the hydraulic system. ▶ If necessary, separate the heat sources from the hydraulic system. |
| | Insufficient cooling water flow, cooling water temperature too high, insufficient cooling water in the system, inlet pressure too low or deposits in the heat exchanger. | <ul style="list-style-type: none"> ▶ Make sure that the coolant complies with the requirements of the technical specifications. |
| | Increased efficiency losses due to changed conditions including wear. | <ul style="list-style-type: none"> ▶ Carry out maintenance and replace affected components as necessary. |
| | Increased filter contamination | Deposition of dirt due to insufficiently cleaning of components during installation. |
| Deposition of dirt during filling of hydraulic fluids. | | <ul style="list-style-type: none"> ▶ Fill the hydraulic system via a filling unit with integrated filter. |
| Abrasion at components. | | <ul style="list-style-type: none"> ▶ Make sure that all components are operated according to their specifications. |
| Filling and breathing filter contaminated | Contaminated ambient air. | <ul style="list-style-type: none"> ▶ Clean or replace the breathing filter, see table 10 "Spare and wear parts". |
| Filling level not in the specified range | Leakage | <ul style="list-style-type: none"> ▶ Check and correct the cause for the loss of hydraulic fluid. ▶ If necessary, refill hydraulic fluid (also refer to the error "Pressure fluctuations in the pressure line"). |
| | Oscillating volume too high | <ul style="list-style-type: none"> ▶ Make sure that the sum of the required oscillating volume of the plunger or differential cylinder complies with the specifications of the hydraulic power unit. |
| | Water ingress | <ul style="list-style-type: none"> ▶ Check the function of the externally installed heat exchanger. |

Table 11: Impact of defects

| Error | Possible cause | Remedy |
|------------------------------------|--|--|
| Too high hydraulic fluid viscosity | Insufficient hydraulic fluid temperature or viscosity class too high | <ul style="list-style-type: none"><li data-bbox="836 286 1422 344">▶ Increase the temperature of the hydraulic power unit before starting the machine function.<li data-bbox="836 344 1422 405">▶ If necessary, use hydraulic fluid with a lower viscosity class. |

16 Technical data

| General | | |
|---|-----------------|---|
| Installation position | | vertical |
| Line connections | ▶ Pressure port | G1/2 |
| | ▶ Return flow | G1/2 (via filter) G1 (2x, direct) |
| Place of installation | | Industrial building; stationary application |
| Ambient temperature range (during operation) | °C | +10 ... +40 |
| Material | ▶ Oil tank | PA66 GF30 |
| | ▶ Hood | PA66 GF30 |
| | ▶ Central plate | GG with corrosion protection |
| Weight (depending on configuration level) without oil | kg | 60 ... 65 |

| Hydraulic | | | |
|--|-----------------------------------|--|---|
| Maximum operating pressure | bar | 240 | |
| Maximum flow | l/min | See characteristic curves on page 10 of data sheet 51055 | |
| Oscillating volume | l | 10 | |
| Tank capacity | l | 20 | |
| Maximum return flow via return flow filter | l/min | 35 | |
| Temperature range hydraulic fluid | °C | +10 ... +65 | |
| Admissible hydraulic fluids | | See table "Hydraulic fluid" below | |
| Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c) | | Class 20/18/15 ¹⁾ | |
| Return flow filter | | Type HC10XL-R00-0-M | |
| | ▶ Filter rating | µm | 10 |
| | ▶ Cold start | °C | < 10 → maximum flow 10 l/min |
| | ▶ Warning | % | 75 |
| | ▶ Shutdown | % | 100 |
| Filling level monitoring | ▶ Warning | l | 10 (residual volume) |
| | ▶ Shutdown | l | 7 (residual volume) |
| Temperature monitoring | ▶ Warning | °C | 60 |
| | ▶ Shutdown | °C | 65 |
| Pump | ▶ Minimum flow | l/min | 1 |
| | ▶ Viscosity range hydraulic fluid | mm ² /s | 12 ... 800 (admissible range, for start at most 2000) 20 ... 100 (recommended range) |

| Hydraulic fluid | Classification | Suitable sealing materials | Standards | Data sheet |
|-----------------|--------------------------------|----------------------------|-----------|------------|
| Mineral oils | HLP ISO VG 32 HLP ISO VG 46 | NBR, FKM | DIN 51524 | 90220 |

¹⁾ The cleanliness classes specified for the components must be adhered to in the hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components. For the selection of the filters, see www.boschrexroth.com/filter.



For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.

| Electric | | | |
|--|---|----------------------|--|
| Line connection | | | |
| | ▶ Performance class | kW | 1.5; 2.2; 3.0; 4.0 |
| | ▶ Voltage (according to IEC 60038) | V | 380 ... 480 AC (-15% / +10%) |
| | ▶ Frequency | Hz | 50/60 |
| Protection class according to DIN EN 60529 | | | IP 54 ¹⁾ |
| Maximum fuse (on the customer side) | ▶ Power 1.5 kW | max. A | 10 |
| | ▶ Power 2.2 kW | max. A | 16 |
| | ▶ Power 3.0 kW | max. A | 20 |
| | ▶ Power 4.0 kW | max. A | 20 |
| | ▶ Supply line cross-section | max. mm ² | 2.5 |
| Control port | | | |
| | ▶ Voltage | VDC | 24 ±5% |
| | ▶ Maximum fuse Characteristic: Circuit breakers A, B, C, Z Micro-fuses FF, F, M, T | max. A | 1 |
| | ▶ Supply line cross-section | max. mm ² | 0.34 (up to a length of 5 m, 0.25 is possible) |

¹⁾ Only with suitable connectors or protective caps, see chapter 17.3 "Accessories".

| Cooling water | | | |
|---|----------------------------------|-------|-----------|
| Cooling water supply requirements | ▶ Flow | l/min | > 10 |
| | ▶ Inlet temperature | °C | 15 ... 25 |
| | ▶ Ports | | G1/2 (2x) |
| | ▶ Maximum glycol content | % | 30 |
| | ▶ Maximum cooling water pressure | bar | 30 |



The cooling water supply for cooling the motor and the frequency converter must always be activated before the operation. It must be ensured that the cooling water supply temperature does not fall below the dewpoint of the ambient air of the power unit.

Use of other coolants possible after consultation.

17 Appendix

17.1 List of addresses

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

17.2 Declaration of incorporation

Rexroth
Bosch Group

Einbauerklärung

im Sinne der EG-Maschinenrichtlinie 2006/42/EG, Anhang II B

Dok.-Nr.: RD51055-EE

Datum: 03.05.2017

Hiermit erklärt der Hersteller,

Bosch Rexroth AG
Beckerstr. 31
09120 Chemnitz
GERMANY

dass die unvollständige Maschine

| | |
|-------------------------|---|
| Bezeichnung: | Hydraulikaggregat |
| Funktion: | Antriebseinheit für hydraulische Arbeitsmaschinen |
| Material-/Serialnummer: | R901500001 bis R901500240 |
| Typenschlüssel: | CYTROPAC-1X/20/... |

folgende grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG entsprechend Kapitelnummer nach Anhang I erfüllt: Anforderungen entsprechend Tabelle in der Anlage dieser Erklärung.

Die Anforderungen werden eingehalten, vorausgesetzt dass die Angaben in den Produktunterlagen (Montageanleitung, Betriebsanleitung, Unterlagen für Projektierung und Konfiguration) durch den Anwender des Produkts umgesetzt werden. Hier nicht angegebene Anforderungen des Anhangs I der Maschinenrichtlinie 2006/42/EG kommen nicht zur Anwendung und sind für das Produkt nicht relevant.

Ferner wird erklärt, dass die speziellen technischen Unterlagen für diese unvollständige Maschine nach Anhang VII Teil B erstellt wurden. Diese werden auf Verlangen den Marktaufsichtsbehörden in Form von Papierdokumenten / in elektronischer Form übermittelt.

Konformität mit den Bestimmungen weiterer EU-Richtlinien, Normen oder Spezifikationen:

EN ISO 12100:2010
EN ISO 4413:2010

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der EG-Maschinenrichtlinie 2006/42/EG entspricht, sofern nach dieser Richtlinie relevant.

Nachfolgende Person ist bevollmächtigt, die relevanten technischen Unterlagen zusammenzustellen:

Name: Andreas Günder
Anschrift: Bosch Rexroth AG, Zum Eisengießer 1, 97816 Lohr, GERMANY

Chemnitz
Ort

15.05.2017
Datum


Martin Laube
(Leitung Entwicklung)


Gerd Augustin
(Leitung Fertigung)

Änderungen im Inhalt der Einbauerklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.

Anlage zur Einbauerklärung:

Grundlegende Sicherheits- und Gesundheitsschutzanforderungen nach Maschinenrichtlinie 2006/42/EG, Anhang I

Hinweise:

- „angewendet“ bedeutet, dass die Anforderung zur Anwendung kommt und für das Produkt relevant ist (Kennzeichnung „X“ unter „angewendet“).
- Anforderungen mit der Kennzeichnung „-“ unter „angewendet“ kommen nicht zur Anwendung und sind nicht relevant für das Produkt.
- unter „erfüllt“ bedeuten: „X“= „ja, erfüllt“ und „-“= „nicht erfüllt“

| Nr. | Anforderung | angewendet | erfüllt |
|---------|---|------------|---------|
| | Allgemeine Grundsätze | | |
| 1. | Risikobeurteilung und Risikominderung | X | --- |
| | 1. Grundlegende Sicherheits- und Gesundheitsanforderungen | | |
| 1.1 | ALLGEMEINES | | |
| 1.1.1 | Begriffsbestimmungen | | |
| 1.1.2 | Grundsätze für die Integration der Sicherheit | X | X |
| 1.1.3 | Materialien und Produkte | X | X |
| 1.1.4 | Beleuchtung | --- | --- |
| 1.1.5 | Konstruktion der Maschine im Hinblick auf die Handhabung | X | X |
| 1.1.6 | Ergonomie | --- | --- |
| 1.1.7 | Bedienungsplätze | --- | --- |
| 1.1.8 | Sitze | --- | --- |
| 1.2 | STEUERUNGEN UND BEFEHLS-EINRICHTUNGEN | | |
| 1.2.1 | Sicherheit und Zuverlässigkeit von Steuerungen | X | --- |
| 1.2.2 | Stellteile | --- | --- |
| 1.2.3 | Ingangsetzen | --- | --- |
| 1.2.4 | Stillsetzen | | |
| 1.2.4.1 | Normales Stillsetzen | --- | --- |
| 1.2.4.2 | Betriebsbedingtes Stillsetzen | --- | --- |
| 1.2.4.3 | Stillsetzen im Notfall | --- | --- |
| 1.2.4.4 | Gesamtheit von Maschinen | --- | --- |
| 1.2.5 | Wahl der Steuerungs- oder Betriebsarten | --- | --- |
| 1.2.6 | Störung der Energieversorgung | --- | --- |
| 1.3 | SCHUTZMASSNAHMEN GEGEN MECHANISCHE GEFÄHRDUNGEN | | |
| 1.3.1 | Risiko des Verlusts der Standsicherheit | X | X |
| 1.3.2 | Bruchrisiko beim Betrieb | X | X |
| 1.3.3 | Risiken durch herabfallende oder herausgeschleuderte Gegenstände | X | X |
| 1.3.4 | Risiken durch Oberflächen, Kanten und Ecken | X | X |
| 1.3.5 | Risiken durch mehrfach kombinierte Maschinen | --- | --- |
| 1.3.6 | Risiken durch Änderung der Verwendungsbedingungen | X | X |
| 1.3.7 | Risiken durch bewegliche Teile | X | X |
| 1.3.8 | Wahl der Schutzeinrichtungen gegen Risiken durch bewegliche Teile | X | X |
| 1.3.8.1 | Bewegliche Teile der Kraftübertragung | X | X |
| 1.3.8.2 | Bewegliche Teile, die am Arbeitsprozess beteiligt sind | --- | --- |
| 1.3.9 | Risiko unkontrollierter Bewegungen | --- | --- |
| 1.4 | ANFORDERUNGEN AN SCHUTZEINRICHTUNGEN | | |
| 1.4.1 | Allgemeine Anforderungen | X | X |
| 1.4.2 | Besondere Anforderungen an trennende Schutzeinrichtungen | | |
| 1.4.2.1 | Feststehende trennende Schutzeinrichtungen | X | X |
| 1.4.2.2 | Bewegliche trennende Schutzeinrichtungen mit Verriegelung | --- | --- |
| 1.4.2.3 | Zugangsbeschränkende verstellbare Schutzeinrichtungen | --- | --- |
| 1.4.3 | Besondere Anforderungen an nichttrennende Schutzeinrichtungen | --- | --- |
| 1.5 | RISIKEN DURCH SONSTIGE GEFÄHRDUNGEN | | |
| 1.5.1 | Elektrische Energieversorgung | X | --- |
| 1.5.2 | Statische Elektrizität | X | X |
| 1.5.3 | Nichtelektrische Energieversorgung | --- | --- |
| 1.5.4 | Montagefehler | X | X |
| 1.5.5 | Extreme Temperaturen | X | --- |
| 1.5.6 | Brand | X | --- |
| 1.5.7 | Explosion | X | --- |
| 1.5.8 | Lärm | X | --- |
| 1.5.9 | Vibrationen | X | --- |
| 1.5.10 | Strahlung | X | --- |
| 1.5.11 | Strahlung von außen | X | X |
| 1.5.12 | Laserstrahlung | --- | --- |
| 1.5.13 | Emission gefährlicher Werkstoffe und Substanzen | X | X |
| 1.5.14 | Risiko, in einer Maschine eingeschlossen zu werden | X | X |
| 1.5.15 | Ausrutsch-, Stolper- und Sturzrisiko | X | --- |
| 1.5.16 | Blitzschlag | --- | --- |
| 1.6 | INSTANDHALTUNG | | |
| 1.6.1 | Wartung der Maschine | X | --- |
| 1.6.2 | Zugang zu den Bedienungsständen und den Eingriffspunkten für die Instandhaltung | X | --- |
| 1.6.3 | Trennung von den Energiequellen | X | --- |
| 1.6.4 | Eingriffe des Bedienungspersonals | --- | --- |
| 1.6.5 | Reinigung innen liegender Maschinenteile | X | X |
| 1.7 | INFORMATIONEN | | |
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| 1.7.1.2 | Warneinrichtungen | --- | --- |
| 1.7.2 | Warnung vor Restrisiken | X | X |
| 1.7.3 | Kennzeichnung der Maschinen | --- | --- |
| 1.7.4 | Betriebsanleitung | X | --- |
| 1.7.4.1 | Allgemeine Grundsätze für die Abfassung der Betriebsanleitung | X | X |
| 1.7.4.2 | Inhalt der Betriebsanleitung | X | --- |
| 1.7.4.3 | Verkaufsprospekte | X | X |

17.3 Accessories

Table 12: Accessories

| | Material number | Denomination | Comment |
|---------------|--------------------------------------|---|--|
| Electric | R901469479 | CONNECTION PLUG IE-PS-V04P-RJ45-FH | CytroPak connection: 21X1 and 21X2 Color: Black/orange Protection class: IP67 only with spec. socket Class: 6A Certificate: IP67 / cULus / RoHS |
| | R901471844 | NETWORK CABLE RJ45/IP67-RJ45 5M | CytroPak connection: 21X1 and 21X2 Length: 5 m Color: Green Protection class: IP67/IP20 Certificate: CAT 6A / cULus / RoHS |
| | R901471845 | NETWORK CABLE RJ45/IP67-RJ45 10M | CytroPak connection: 21X1 and 21X2 Length: 10 m Color: Green Protection class: IP67/IP20 Certificate: CAT 6A / cULus / RoHS |
| | R913002121 | PLUG-IN CONNECTOR 8P 7000-17121-2910500 | CytroPak connection: 15X1 Socket, straight, shielded, 8-pole M12, with free PUR line end, drag chain-compatible Length: 5 m (8 x 0.25 mm ² /d = 7.0 mm) 24 VAC/DC, max. 1.5 A IP67 |
| | R913002642 | PLUG-IN CONNECTOR 8P 7000-17121-2911000 | CytroPak connection: 15X1 Socket, straight, shielded, 8-pole M12, with free PUR line end, drag chain-compatible Length: 10 m (8 x 0.25 mm ² /d = 7.0 mm) 24V AC/DC, max. 1.5 A IP67 |
| | R901460889 | PLUG-IN CONNECTOR 0DEG *OPT.CYTROPAC | CytroPak connection: 12X1 Power connector, straight without cable |
| | R911379513 | USB CABLE, CABLE-USB/MINI-USB-3& | CytroPak connection: 14X1 USB cable with 3-m cable |
| Mechanical | R901460890 | FASTENING KIT BASE285 *OPT.CYTROPAC | Installation plate assembly kit |
| | R901460916 | CHARGING DEVICE MD-012-2*OPT.CYTROPAC | Filling device assembly kit |
| | R901460961 | CONNECTION SET HYDR.CON*OPT.CYTROPAC | Oil and water fitting assembly kit |
| | consisting of: | | |
| | 2x R900006158 | MALE CONNECTOR 24SDS-E-C-18L-G1/2-S& | Cooling connection |
| 1x R900762671 | MALE CONNECTOR 24SDS-E-S-18L-G1/2-S& | Pressure line connection | |
| 1x R900006158 | MALE CONNECTOR 24SDS-E-C-18L-G1/2-S& | Return flow connection via filter | |
| 2x R913011613 | SCREW PLUG ZN10001-G1A-F-ST | Return flow connection G1 | |



The accessories listed in table 12 can be ordered separately under the specified material numbers.



The frequency converter can be accessed and configured via the ConverterWorks or IndraWorksDS software.

- The ConverterWorks software is available for download under www.boschrexroth.com/frequencyconverter - EFC 5610 - Downloads.
- The IndraWorksDS software is available for download under www.boschrexroth.com/indraworks - Download.

18 Alphabetical index

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Notizen

Notizen

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