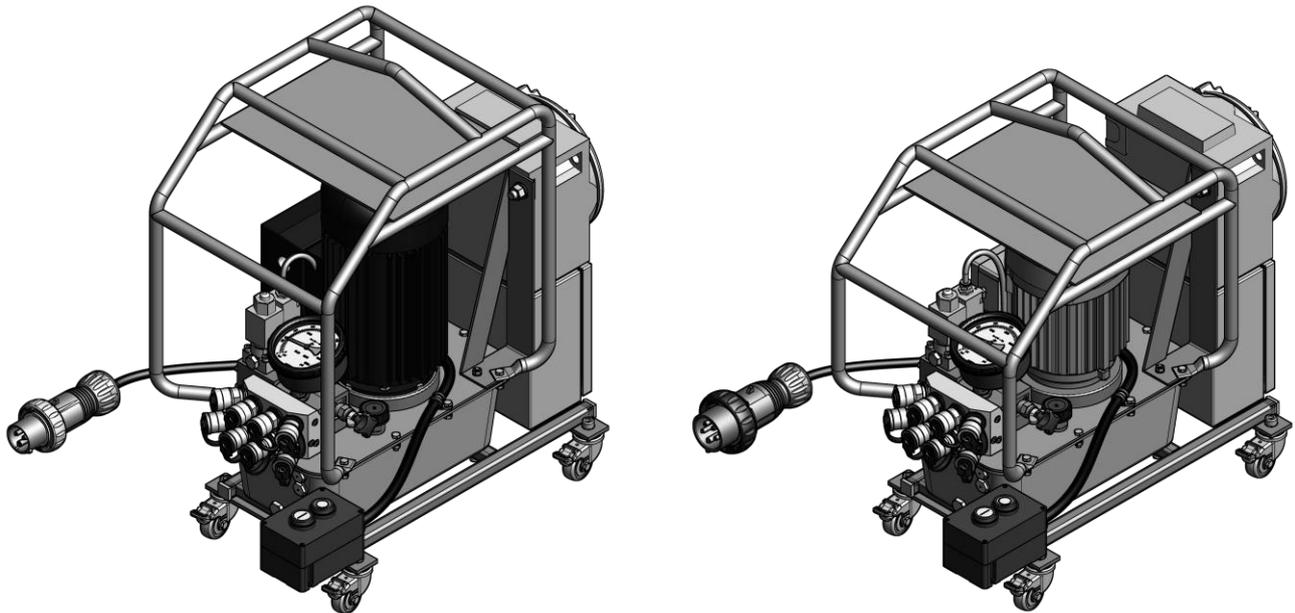


## Hydraulic unit

### HY-Ex



## English translation of the original German operating instructions

for qualified and authorized operating personnel

Status 11/2017

Always store these operating instructions together at the hydraulic unit. Ensure that the operating instructions are available for the qualified and authorized operating personnel. Read and comply with the operating instructions.

Non-observance can lead to injury and possibly death.

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We reserve the right to make technical changes in the course of further development.

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## Notes concerning this manual and the manufacturer

These instructions help using the HY-Ex hydraulic unit safely.

The HY-Ex hydraulic unit is hereinafter referred to as "unit".

### Keep the manual available

These operating instructions are a part of the unit. Make sure that the operating instructions are always accessible for the user at the site and are in legible condition. Enclose the operating instructions when you sell the unit or transfer it in any other way.

### Design features of this manual

Various elements of these operation manual have fixed design characteristics. These allow you to easily distinguish the following elements:

Normal text

- Lists
- ▶ Action steps

References to headers are set in quotation marks.

'Labels' of switches or other elements are set in inverted commas.

**Table titles** are set in bold.

 Tips. Contains additional information.

## Referenced documents

<b>⚠ WARNING</b>	
	<p>Risk of injury from non-compliance with the applicable documentation.</p> <ul style="list-style-type: none"><li>▶ Prior to working with the unit, read all applicable documents and comply with them.</li><li>▶ These can be found in the documentation folder of the unit.</li></ul>

More information, instructions and details about the unit components can be found in the documentation from the respective manufacturers. These documents are regarded as a part of these instructions. Store these documents together with this manual. Hand over these documents when selling the unit or passing it on in other ways.

Applicable documents are especially the following document types:

- Operating instructions
- Assembly instructions
- Maintenance and repair manuals
- Circuit diagrams
- Terminal layouts
- Hydraulic layouts
- Safety data sheets
- Drawings
- Spare parts lists
- Declarations of conformity or declarations of incorporation
- ▶ Please heed and comply with the information from the applicable documents.

These can be found in the documentation folder of the unit.

## Manufacturer's address

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## Person responsible for documentation

HYTORC Technologies  
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Kleinbeckstr 3–17  
D-45549 Sprockhövel  
Germany

## **Warranty and liability**

In general our General Terms and Conditions apply. Warranty and liability claims for personal injury or property damage are always excluded if they are due to one or more of the following causes:

- Improper use of the unit
- Improper transport, installation, commissioning, operation and maintenance of the unit
- Ignoring the instructions in this manual
- Ignoring the hazard notices on the unit
- Unauthorized modifications of the unit
- Inadequate monitoring of components which are subject to wear.
- Incorrectly executed repairs
- Disasters caused by outside intervention or an act of God.

## Safety

<b>⚠ WARNING</b>	
	<p>Severe injuries or death caused by accidents due to disregard of the instructions in this guide.</p> <p>In particular the failure to observe the instructions in the Chapter on Safety, can lead to accidents.</p> <p>► Read and follow all instructions in this manual before you begin working with or on the unit.</p>

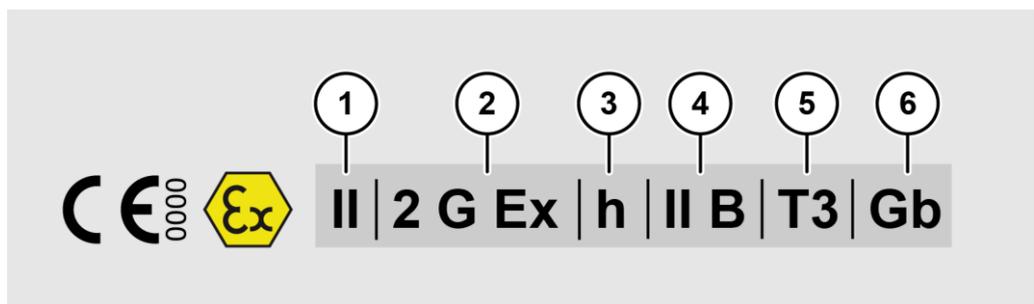
In addition to the notes in these operating instructions, also follow, in any case, the statutory and other regulations, e.g.:

- Accident prevention regulations
- Regulations for safe and professional work
- The applicable on-site regulations for explosion protection and fire protection

### ATEX marking

The ATEX marking contains notes on the permissible use of the unit in potentially explosive atmospheres. The following information is displayed:

- Equipment group (1)
- Equipment category (2)
- Ignition protection type (3)
- Explosion group according to DIN EN ISO 80079-36: 2016, DIN EN ISO 80079-37: 2016 (4)
- Temperature class (5)
- Equipment protection level (EPL) (6)



#### Equipment group (1)

Equipment that is intended for operation in a potentially explosive atmosphere is classified into two groups. Group I includes equipment that is used in mines susceptible to firedamp, e.g. in coal mines. The unit belongs to equipment group II and can therefore be used in all potentially explosive areas except for mining.

### Equipment category (2)

Equipment category II comprises equipment that was designed in such a way that ensures a high level of safety if the equipment is used as intended with the prescribed parameters. Equipment of this category can be used in areas where a potentially explosive atmosphere of gases, vapors, mists or dust/air mixtures occurs occasionally. This is indicated with the letter G. Equipment of category III is also included if it is likely that a potentially explosive atmosphere will only occur rarely or for a short period of time. The unit falls under equipment category II. Equipment of this category may only be used in zones 1 and 2 and/or zones 21 and 22.

### Ignition protection type (3)

The ignition protection type represents the design principle followed in the unit's development with regard to explosion protection. The ignition protection type "h" stands for "constructional safety" of non-electrical equipment. Constructional safety means that constructional measures have been taken to reduce hazards caused by ignitable temperatures or sparks to a very low level.

### Explosion group (4)

Equipment of group II can also be classified according to the type of potentially explosive atmosphere where the equipment may be used. The subgroups IIA, IIB and IIC are used for this purpose. This classification is based on the maximum experimental safe gap (MESG) and the minimum ignition current ratio (MICR) of the gas mixture.

### Temperature class (5)

Flammable gases and vapors are split into different temperature classes according to their level of flammability (see table). The maximum surface temperature of a piece of electrical equipment must always be below the ignition temperature of the gas, vapor or air mixture where it is used. Equipment that meets the requirements of a higher temperature class (e. g. T5) is naturally also permitted for applications that require a lower temperature class (e. g. T2 or T3).

Temperature - class	Ignition temperature of gases and vapors in °C	Maximum surface temperature of equipment in °C
T1	> 450	450
T2	> 300 to 450	300
T3	> 200 to 300	200
T4	> 135 to 200	135
T5	> 100 to 135	100
T6	> 85 to 100	85

## Equipment protection level (6)

The abbreviation “EPL” stands for “equipment protection level”. According to the 2007 issue of IEC 60079-0, equipment for potentially explosive areas is classified into three different protection levels:

- EPL Ga or Da:  
Equipment with a “very high” protection level for use in potentially explosive areas which do not represent an ignition hazard in normal operation or in the event of foreseeable or rare faults / malfunctions.
- EPL Gb or Db:  
Equipment with a “high” protection level for use in potentially explosive areas which do not represent an ignition hazard in normal operation or in the event of foreseeable faults / malfunctions.
- EPL Gc or Dc:  
Equipment with an “increased” protection level for use in potentially explosive areas which do not represent an ignition hazard in normal operation and which are provided with several additional protective measures to prevent the risk of ignition in the event of commonly foreseeable faults in the equipment.

## ATEX marking of the unit

According to DIN EN ISO 80079-36. 2016, Section 11:

EX II 2 G Ex h IIB T3 Gb

This ATEX marking is valid for the following HY-Ex unit types:

- 115 V:1PH100–115/50 Hz
- 115 V:1PH100–115/60 Hz
- 230 V:1PH200–230/50 Hz
- 230 V:1PH200–230/60 Hz
- 400 V:3PH380–460/50 Hz
- 400 V:3PH380–460/60 Hz

## **Responsibilities of the operating company**

- The operator must ensure that all accident prevention regulations are complied with.
- The operator must ensure that only qualified and authorized operating personnel performs work on and with the unit.

## **Persons at particular risk**

The following groups of persons must not be granted access to the unit as they might sustain serious or lethal injuries:

- children
- persons with physical or mental limitations
- persons under the influence of drugs and medication
- persons under the influence of alcohol
- unauthorized persons, e. g. pedestrians
- People without the qualifications specified in the following section.

## Qualification of personnel

These operating instructions are addressed to qualified and authorized operating personnel.

The following sections list the necessary qualification for each activity on or with the unit.

### Power supply connection

The following skills and experience are required for the operating personnel:

- have been taught and trained for the work
- know that improper operation, maintenance and repairs can cause accidents
- can assess hazards that arise from electrical voltage and power
- can assess hazards that arise from noise and heat
- can provide the unit's power connection using the provided power cable
- can assess hazards that may arise from potentially explosive atmospheres.

### Tool connection

The following skills and experience are required for the operating personnel:

- have been taught and trained for the work
- know that improper operation, maintenance and repairs can cause accidents
- can assess risks and environmental damage that could be caused by hydraulic oil
- can assess risks that may arise from the high pressure components
- can assess hazards that arise from noise and heat
- can detect leaks
- can handle screw couplings to connect tools to the unit
- can assess hazards that may arise from potentially explosive atmospheres.

### Setting pressure/torque

The following skills and experience are required for the operating personnel:

- have been taught and trained for the work
- know that improper operation, maintenance and repairs can cause accidents
- can assess risks that may arise from the high pressure components
- can assess hazards that arise from noise and heat
- can set a predetermined pressure on the unit

## Assessing the state of the unit

The following skills and experience are required for the operating personnel:

- have been taught and trained for the work
- know that improper operation, maintenance and repairs can cause accidents
- can assess hazards that arise from electrical voltage and power
- can assess risks and environmental damage that could be caused by hydraulic oil
- can assess risks that may arise from the high pressure components
- can assess hazards that arise from noise and heat
- can detect errors in the condition of the unit by performing a visual inspection prior to commissioning
  - Leaks
  - Kinks in electric lines
  - Kinks in hydraulic hoses
  - External damage to electrical lines
  - External damage to hydraulic hoses
  - Incorrect fill level in the unit
  - Improperly closed cover on the pressure-resistant housing.
- can assess hazards that may arise from potentially explosive atmospheres.

## Ban of unauthorized conversions

Unauthorized conversions or changes on the unit may lead to serious or even lethal injuries. This applies in particular to changing and altering safety devices.

- ▶ Never bypass or shunt any safety devices.

## Personal protective equipment

Feet may be crushed when moving the unit.

- ▶ Wear safety shoes with steel toe caps.

Slipping and thereby risk of fractures when performing hydraulic work is possible!

- ▶ Wear safety shoes with non-slip soles.

Skin irritation and eye damage when in contact with hydraulic oil and hydraulic components is possible!

- ▶ Wear oil resistant nitrile gloves and chemical-resistant goggles.

Burns on contact with hot fluids and components are possible!

- ▶ Wear protective gloves against thermal risks.

Cuts and abrasions of the skin on sharp-edged components are possible!

- ▶ Wear protective gloves against mechanical risks.

Hearing impairments while unit is running are possible!

- ▶ In areas with high noise wear hearing protection.

Risk of poisoning possible in poorly ventilated rooms! The unit may overheat. In this case, oil mist and oil vapors can form.

- ▶ If this is the case, wear a respirator.

## Basic safety information

### Preventing serious injury or death

Avoid severe injury or death caused by failure of tools or hoses. Tools or hoses that do not match the tool and hose specifications may fail.

- ▶ Only use tools and hoses, which the manufacturer of the unit allows as an accessory.

### Preventing explosion hazards

Connecting tools to or changing tools at the unit in a potentially explosive atmosphere can lead to serious injury or death.

- ▶ Only connect tools to the unit in areas where there is no potentially explosive atmosphere.
- ▶ Only change tools at the unit in areas where there is no potentially explosive atmosphere.

Maintaining the unit in a potentially explosive atmosphere can lead to serious injury or death.

- ▶ Maintain the unit only in areas where there is no potentially explosive atmosphere.

Damaged electrical lines in a potentially explosive atmosphere can lead to serious injury or death.

- ▶ Use the unit only if all electrical lines are in perfect condition.

## **Preventing electric shock**

Severe injury or death from electrical shock is possible!

- ▶ Check the electrical supply line for damage.
- ▶ Use the unit only with immaculate lead.
- ▶ Immediately have a damaged electrical lead replaced by authorized personnel.
- ▶ Make sure that the ground wire connection (green yellow cable) on the unit is properly designed and properly connected.
- ▶ Connect the power plug of the unit only to a properly grounded electrical outlet with the correct electrical voltage and frequency.
- ▶ Unplug the power cord from the wall outlet before performing any electrical work on the unit or cleaning the unit. For this, only hold the plug.
- ▶ Only dry clean the unit. Do not clean the unit with a pressure washer, cold cleaner or water.
- ▶ Never immerse the unit in water or other liquids.

## **Preventing burns from fire**

A short circuit could cause a fire and cause severe burns.

- ▶ When not in use and before any maintenance work pull the mains plug from the wall outlet. For this, only hold the plug.
- ▶ Remove all unneeded and flammable materials from the work area.
- ▶ Make sure that a fire extinguisher with powder or foam extinguishing agent is available.

## **Preventing burns from oil and hot surfaces**

During and after operation, burns on metallic surfaces or from hydraulic oil are possible.

- ▶ When working on or with the unit wear protective gloves against thermal risks.

## Preventing poisoning

The unit may overheat. In this case, oil mist and oil vapors can form.

- ▶ Make sure there is sufficient ventilation.
- ▶ In poorly ventilated areas and upon formation of oil mist and oil vapors, wear a respirator.
- ▶ Switch the unit off when it overheats.
- ▶ Allow the unit to cool down.
- ▶ With the help of a non-contact infrared thermometer, ensure that the unit is cooled down to 25 °C (77 °F).
- ▶ Check the unit for possible damage.
- ▶ Have the unit repaired, if damaged, by qualified personnel before recommissioning.

When fluids leak, proceed as follows:

- ▶ Wear temperature- and media-resistant gloves.
- ▶ Take up liquid spills immediately with a suitable binding agent and a rag.
- ▶ Dispose of the binding agent and rag environmentally correct.

## Preventing bone fractures and crushing

Bone fractures and crushing possible. An unstable set-up can lead to the unit toppling over.

Risk of slipping on leaked liquids and therefore of bone fractures!

- ▶ Never reach into moving parts.
- ▶ Always set up the unit on a flat, solid and stable base.
- ▶ Secure the unit and tools against falling.
- ▶ Secure the unit against unintended movement on site by locking the rollers.
- ▶ Wear safety shoes with steel toe caps when moving the unit.
- ▶ Wear safety shoes with non-slip soles when working on hydraulics.
- ▶ Clean up liquid spillages.

## Preventing eye damage

At pressures of more than 700 bar (10,000 psi) and operating the unit outside of the tool and tubing specifications can lead to bursting of the hydraulic hoses and spraying of hydraulic oil.

- ▶ Make sure that the permissible pressure defined by the manufacturer is not exceeded.
- ▶ Observe the tool and hose manufacturer's specifications.
- ▶ Observe and follow the operating instructions of the tools and hose specifications.
- ▶ Wear chemical-resistant goggles.

## Preventing skin irritation

Contact with hydraulic oil may cause skin irritation.

- ▶ Always provide a strong and tight connection between the unit and hydraulic tools.
- ▶ Wear nitrile gloves at work where you might come in contact with hydraulic oil.
- ▶ Make sure that the permissible pressure defined by the manufacturer is not exceeded.
- ▶ Observe the tool and hose manufacturer's specifications.
- ▶ Observe and follow the operating instructions for the hydraulic tool.

## Preventing material damage

- ▶ Avoid soiling the couplings by installing the protective caps and protective plugs when the couplings are not in use.
- ▶ Always set the hydraulic tool down safely.

## Intended use

The unit is used exclusively for driving hydraulic assembly tools for screws and nuts in the commercial sector. With the screwing assembly tool, screw connections can be loosened or tightened with a predetermined torque.

Intended use also includes observing and following all instructions in this manual, especially the safety instructions. Any other use is considered to be improper and will void the warranty and liability claims.

The unit may be used with a connected screwing tool in potentially explosive areas in accordance with its marking. The screwing tool and the hoses used must be approved for use in potentially explosive areas by the manufacturer.

## Ambient conditions

Make sure that the unit is used under the following environmental conditions:

- Temperature range: -20 °C to +40 °C (-4 °F to 104 °F)
- Humidity non-condensing

Make sure that the unit is stored and transported under the following environmental conditions:

- Temperature range: -30 °C to +60 °C (-22 °F to 140 °F)
- Humidity non-condensing

## Design characteristics of warning information

 <b>DANGER</b>	
	Sections with the word DANGER warn of imminent dangerous situations that lead to death or serious injury.
 <b>WARNING</b>	
	Sections with the word WARNING warn of imminent dangerous situations that may lead to death or serious injury.
 <b>CAUTION</b>	
	Sections with the word CAUTION warn of dangerous situations that may lead to minor or moderate injuries.

Special symbols may be used in the warnings, in addition to the general danger signs. These symbols indicate the possible danger. The meanings of the individual symbols are found in the following section.

## Explanation of symbols



Hazard from electric shock



Slipping hazard from leaked media



Burning hazard, scalding hazard



Risk of explosion in potentially explosive areas



Risk of eye damage due to splashing liquid



Risk of explosion and explosive media discharge

## Design of information about property damage

### **ATTENTION!**

These notes warn of situations that can lead to property damage and limited functionality.

## Warning and information signs

- ▶ Make sure that all warnings and signs attached to the unit are clearly visible and legible.
- ▶ Replace damaged or lost warnings and signs immediately.

The following labels are affixed to the unit:

### Warning or information sign

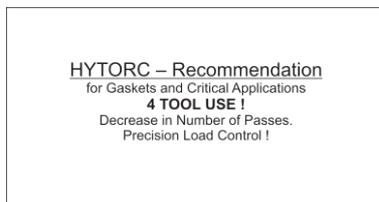


### Meaning or explanation

- ▶ Change the oil as required or after every major application.
- ▶ Use oil of Class 46.



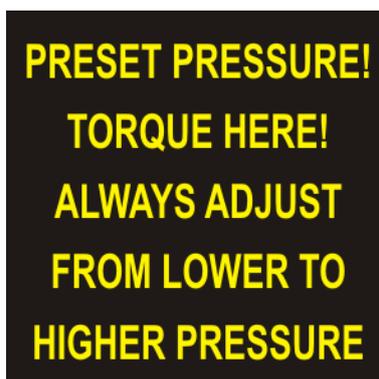
The remote control may only be operated by the tool user.



Recommendation of the manufacturer for seals and other critical applications:

When using four tools simultaneously.

- ▶ Reduce the number of cycles per workpiece and ensure in this way a more accurate pretension force.
- ▶ Set the pressure or torque here.
- ▶ Always set the pressure from low to high pressure.



The unit switches itself off automatically after 20 seconds in the return stroke position.

Warning or information sign

**TURN-OFF  
IF NOT IN USE!**

Meaning or explanation

- ▶ Switch off the unit when not in use.

**Adjust torque  
valve only with  
connected  
hoses**

- ▶ Use the torque valve only when hydraulic hoses are connected.

## Description

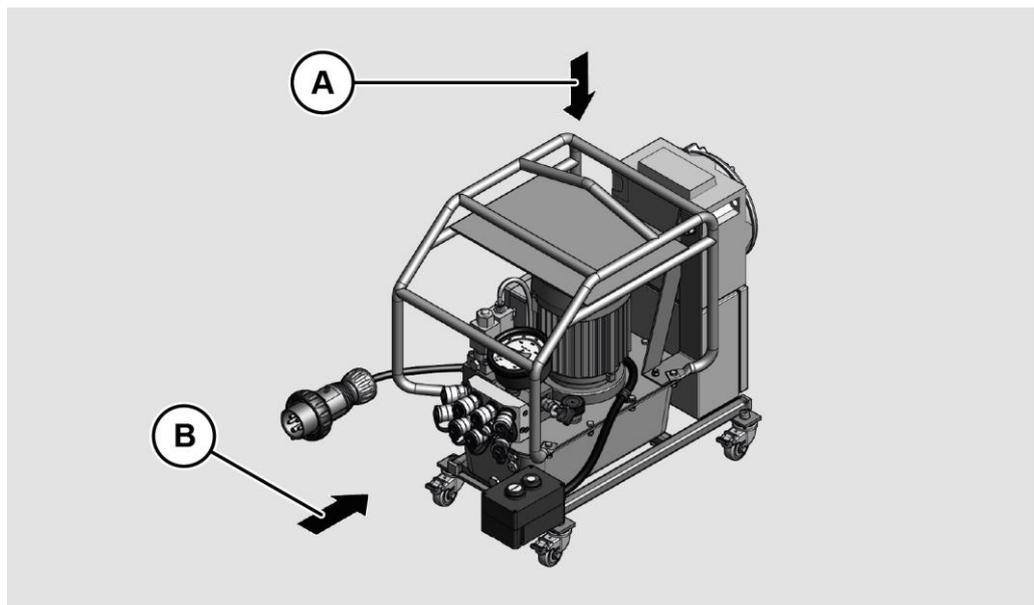
The hydraulic unit can be delivered with one or four tool connections. It is possible for you to expand an existing hydraulic unit with one tool connection to four tool connections. For this, please contact the manufacturer.

- ⓘ The illustrations and descriptions in this manual refer to a hydraulic unit with four tool connections. The hydraulic unit with one tool connection differs only in the number of tool connections.

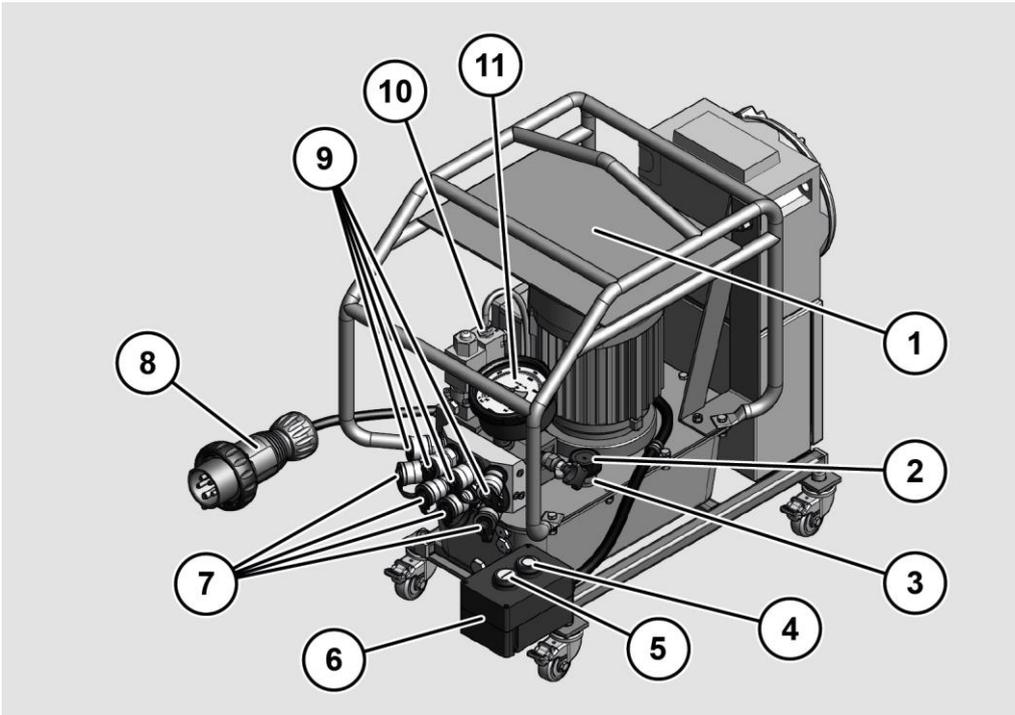
## Directional data

In these instructions, the following directions are defined for the unit:

- Front: On the front side (B), you can see the couplings.
- Rear: On the rear side, you can see the switch and terminal box.
- Right: On the right side, you can see the torque valve.
- Left: On the left side, you can see the solenoid valve.
- Top: On the top side (A), you can see the roof on top of the electric motor.
- Bottom: On the bottom side, the rollers are arranged.

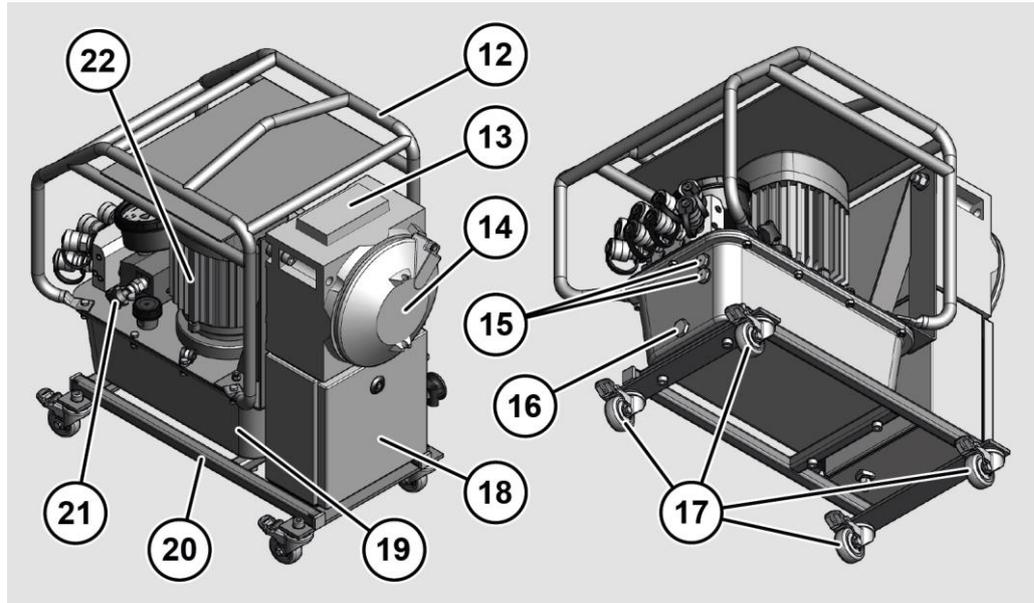


## Overview front right



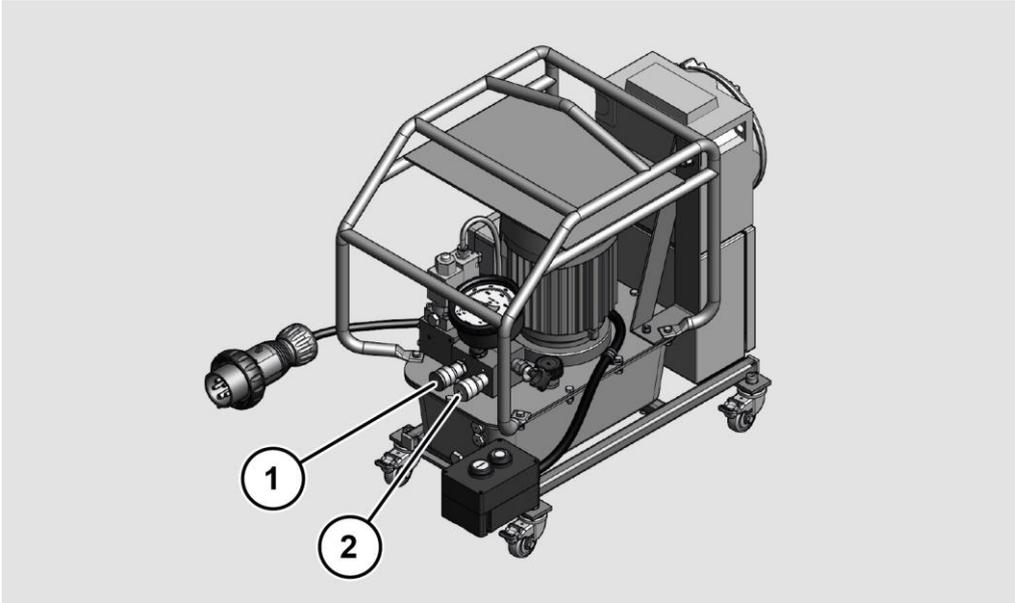
No.	Name
1	Roof on top of the electric motor
2	Ventilation and bleed valve
3	Oil filler neck
4	Stop button (switch unit to Standby mode)
5	Start button (build pressure, actuate connected tool)
6	Remote control
7	Couplings (return stroke)
8	Power plug
9	Couplings (forward stroke)
10	Solenoid valve
11	Pressure gage

## Overview rear right



No.	Name
12	Protective bar
13	Pressure-resistant electric control housing
14	Cover
15	Oil inspection glasses
16	Oil drain screw
17	Lockable rollers
18	Terminal box
19	Oil container
20	Base frame
21	Torque valve
22	Electric motor of motor pump unit

## Overview of the hydraulic unit with one tool connection



No.	Name
1	Coupling (return stroke)
2	Coupling (forward stroke)

## Layout

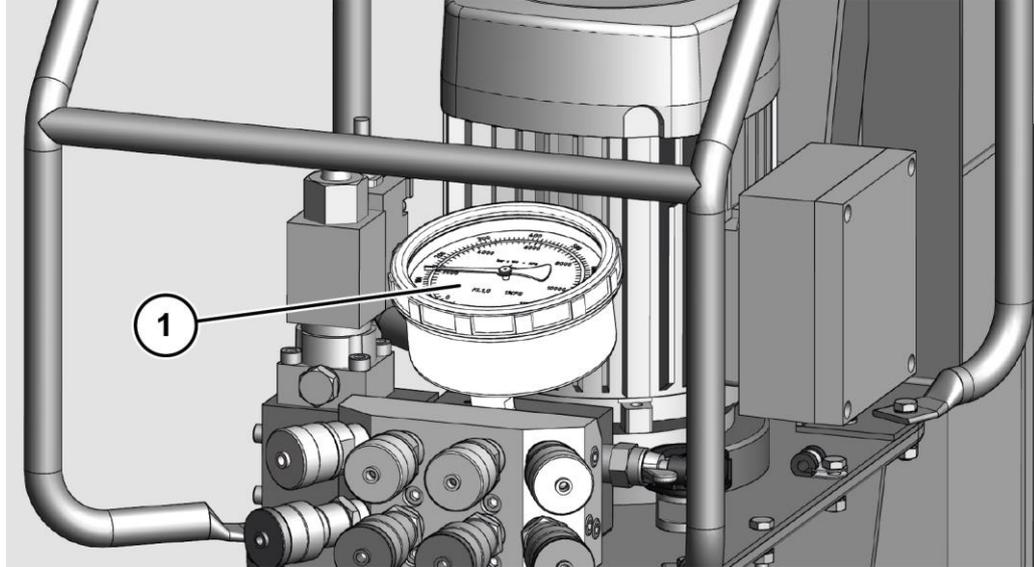
The unit consists of the following main components:

- Electric motor pump unit
- Oil container
- Valve block
- Oil cooler
- Couplings
- Base frame
- Protective bar

## Display and operating elements

### Pressure gage

The pressure gage (1) shows the current pressure in bar or psi.



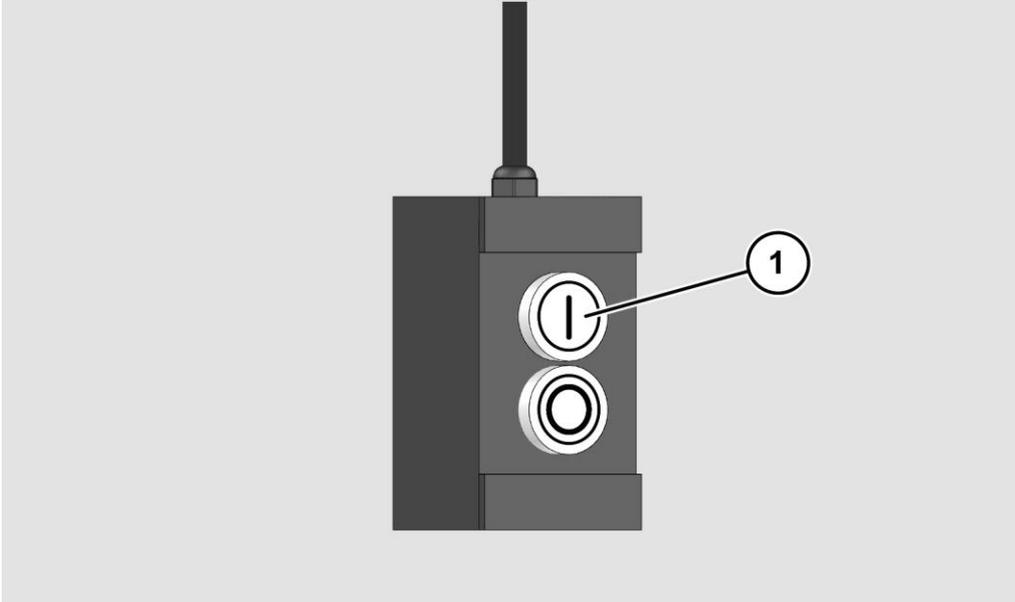
### Couplings

The couplings are arranged on the front side of the unit. The couplings are used to connect the tools. Using screw caps provides a tight connection between the tool and the unit.

## Remote control

The remote control is used to:

- Switch the pump on and off
- Operate the tool

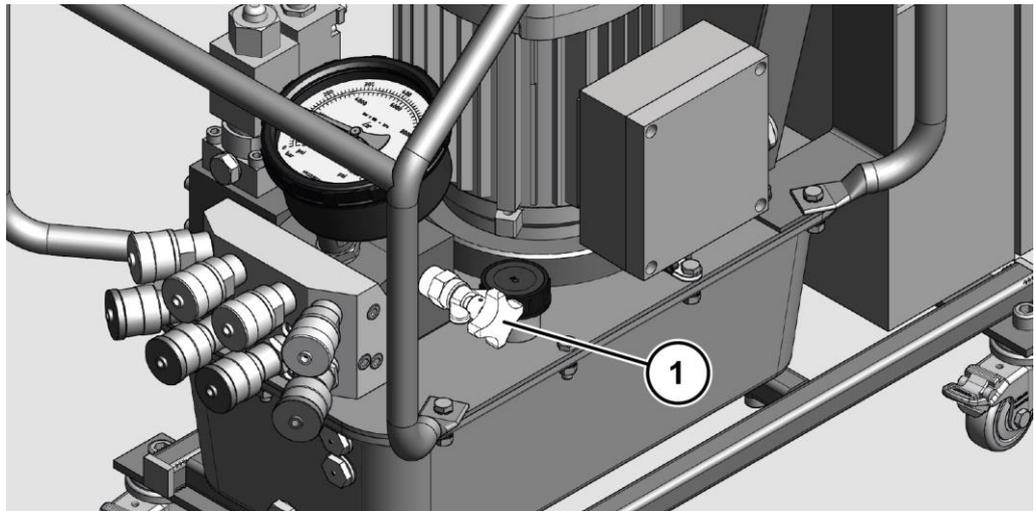


Remote control functions:	
<p>In Standby mode:</p> <ul style="list-style-type: none"> <li>▶ Press the Start button (1), then release</li> </ul>	<p>The motor is started. The connected screwing tool is moved into the starting position (return stroke).</p>
<ul style="list-style-type: none"> <li>▶ Press and hold the Start button (1)</li> </ul>	<p>The screwing process is performed with the tool (forward stroke).</p>
<ul style="list-style-type: none"> <li>▶ Release the Start button (1)</li> </ul>	<p>The connected screwing tool is moved into the starting position (return stroke).</p>
<ul style="list-style-type: none"> <li>▶ Press the Stop button (2), then release</li> </ul>	<p>The unit is switched to Standby mode. The motor is stopped and the system depressurized.</p>

## Torque valve

The torque valve (1) serves for adjusting the required oil pressure. For information on the pressure required for a given torque, refer to the operating instructions of the screwing assembly tool. Alternatively, visit the download area on the HYTORC website.

- ▶ If necessary, loosen the wing nut.
- ▶ To increase the pressure, turn the T-handle of the torque valve clockwise.
- ▶ To decrease the pressure, turn the T-handle of the torque valve counterclockwise.
- ▶ To save the setting, turn the wing nut clockwise until it stops, see also, starting from page 46.



## Type plate

The type plate is attached as a sticker on the cover next to the torque valve. The type plate contains the following information:

- Name of model
- Serial number
- Note for use in potentially explosive areas
- ATEX marking
- Electrical voltage
- Frequency
- Output
- Year of construction
- Name of manufacturer
- Manufacturer country
- IP class
- CE marking
- Operating mode

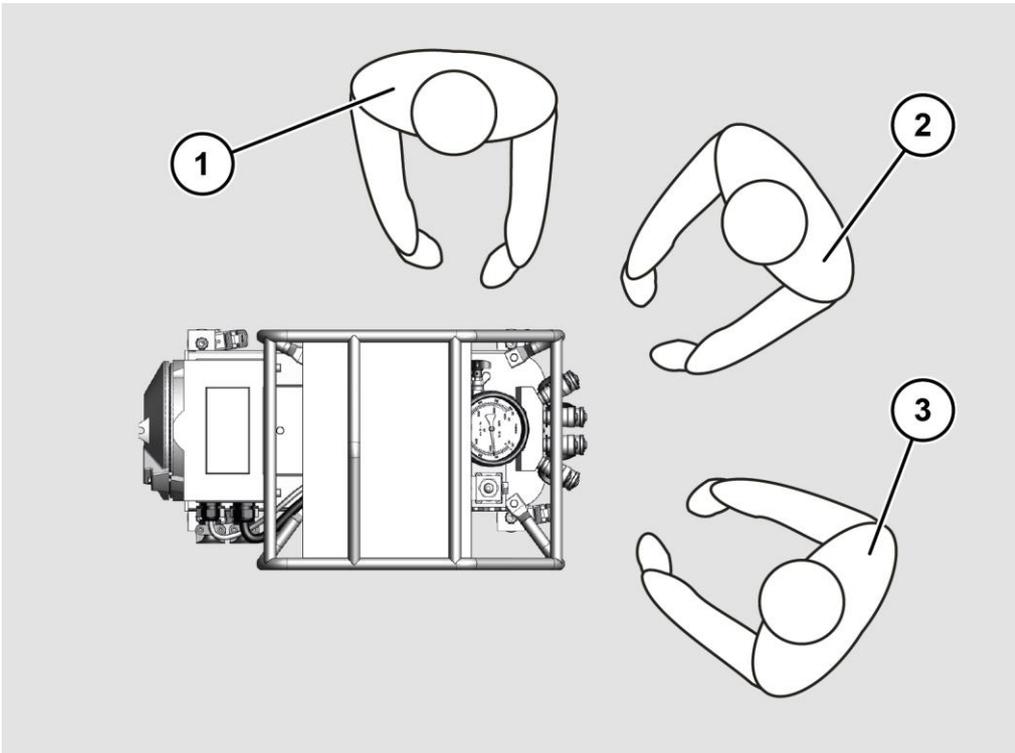
## Available accessories

The unit may be used with a connected screwing tool in potentially explosive areas in accordance with its marking. The screwing tool and the hoses used must be approved for use in potentially explosive areas by the manufacturer.

Your local HYTORC branch will provide you with information on suitable screwing tools.

- ⓘ The use of HYTORC standard screwing tools with the unit is permitted outside of the potentially explosive area.

## Workspaces and positions



No.	Name
1	Add oil
2	Connect tools, read pressure, set pressure, drain oil
3	Connect tools, read pressure, drain oil

## Purpose and function

The unit is used to drive hydraulic screwing tools.

A screwing tool can be connected to the design with two couplings.

Up to four screwing tools of the same type can be connected simultaneously to the design with eight couplings. The upper four couplings are designed as male connectors and are responsible for the feed stroke of the connected screwing tools. The bottom four couplings are designed as female connectors and are responsible for the return stroke of the connected screwing tools.

**i** The unit is not suitable for operation with screwing tools from other manufacturers.

The unit may be used with a connected tool in the potentially explosive area in accordance with its ATEX marking. Only tools approved by the manufacturer may be used.

The electric motor pump unit generates hydraulic pressure. This can be adjusted with the torque valve. The maximum adjustable pressure is 700 bar and is limited by a pressure relief valve. A pressure gage is available for controlling the current pressure. The required torque is set on the screwing tool via the pressure. For information on the pressure required for a given torque, refer to the operating instructions of the screwing tool.

The unit is equipped with an electric control. It monitors the operation and controls the connected actuators, electric motor and solenoid valve, as well as the display elements. The electric control is encased in a pressure-resistant housing.

## Unpacking and checking the delivery

### Unpacking

The unit is supplied in a cardboard box on a disposable pallet. The cardboard box is secured onto the disposable pallet with two tensioning straps. To unpack the unit, proceed as follows:

- ▶ Remove the tensioning straps.
- ▶ Open the cardboard box.
- ▶ Remove the supplied documents.
- ▶ Remove the foam padding.

The unit is packaged in a plastic bag.

- ▶ Take the unit out of the box and place it on a flat, solid and stable base.
- ▶ Remove the plastic bag.
- ▶ Dispose of the packaging material according to the rules and regulations applicable on site.

### Checking package and condition

- ▶ Check the delivery against the delivery note for accuracy and completeness.
- ▶ In case of deviations contact the manufacturer.
- ▶ Check the delivery for any damage.
- ▶ If you notice any damage, please indicate this on the delivery note.
- ▶ Have the damage confirmed by the signature of the supplier.
- ▶ Photograph the damage.
- ▶ Report the damage immediately to the manufacturer.

## Storing the unit

- ▶ Store the unit in an upright position on its locked rollers in a dry, dust-free room with stable temperature.

The permissible temperature range is  $-30\text{ °C}$  to  $+60\text{ °C}$  ( $-22\text{ °F}$  to  $+140\text{ °F}$ ).  
The humidity may not be condensing.

## Moving the unit

To move the unit on site, proceed as follows:

- ▶ Release the roller lock.
- ▶ Hold the unit with both hands at the protective bar.
- ▶ Push the unit to the desired position.
- ▶ Lock the rollers.

## Commissioning the unit

When commissioning the unit, we distinguish between the initial commissioning and daily commissioning. Depending on the type of commissioning, you must perform different work tasks.

### Initial commissioning

For initial commissioning, perform the work outside of the potentially explosive area.

If you want to take the unit for the first time in operation after delivery, you must first fill hydraulic oil in the oil tank of the unit. Also, the work tasks of the daily commissioning must be performed.

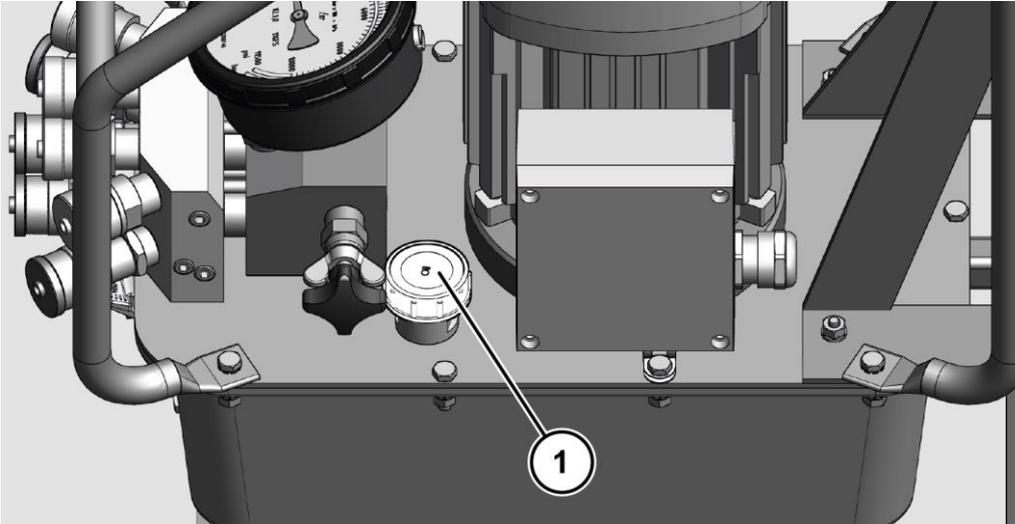
<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <ul style="list-style-type: none"> <li>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</li> </ul>
<b>⚠ CAUTION</b>	
	<p>Risk of slipping due to leaked oil.</p> <ul style="list-style-type: none"> <li>▶ Take up spilled oil with a suitable binder agent.</li> <li>▶ Wear safety shoes with non-slip soles.</li> </ul>
<b>ATTENTION!</b>	
	<p>The use of hydraulic oils that do not meet the manufacturer's recommendation may cause damage to the unit. Warranty claims can become invalid.</p> <ul style="list-style-type: none"> <li>▶ Only use hydraulic oil recommended by the manufacturer.</li> </ul>

 The manufacturer-approved oils can be found starting on page 67.

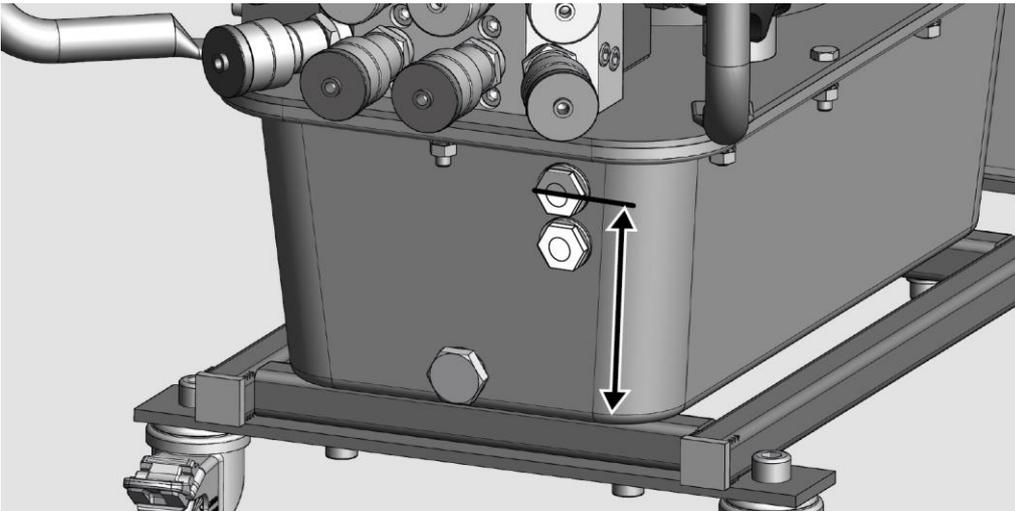
## Commissioning the unit

To fill the hydraulic oil in the oil tank of the unit, proceed as follows:

- ▶ Make sure that the unit stands securely on a flat surface.
- ▶ Remove the bleed and ventilation valve (1) of the unit's filling opening.



- ▶ Slowly fill fresh hydraulic oil into the oil container until the oil fills the upper sight glass half up.



- ▶ Put the bleed and ventilation valve on the filler opening.
- ▶ Tighten the bleed and ventilation valve by hand.

The remaining work tasks are no different from those in the daily operation.

- ▶ Proceed as described in the following section.

## Daily commissioning

In daily use, you must perform the following tasks:

- Remove protective caps and plugs and connect tools
- Connect mains plug
- Bleed screw system consisting of unit, hose and tool
- Check oil level
- Check functioning of the manometer

## Tool connection

<b>⚠ DANGER</b>	
	<p>Risk of explosion when connecting and removing tools. Connecting tools to or removing tools from the unit in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"> <li>▶ Only connect tools to the unit outside of the potentially explosive area.</li> <li>▶ Only remove tools from the unit outside of the potentially explosive area.</li> <li>▶ Only use tools that are expressly approved by the manufacturer for operation with the unit in the potentially explosive area.</li> </ul>
<b>⚠ WARNING</b>	
	<p>Risk to life when using tools or hydraulic hoses that do not comply with the tool and hose specifications. Unsuitable tools or hydraulic hoses can fail.</p> <ul style="list-style-type: none"> <li>▶ Only use tools and hydraulic hoses which the manufacturer of the unit allows as an accessory.</li> <li>▶ Observe and follow the operating instructions of the tools and the hose specification.</li> </ul>
<b>ATTENTION!</b>	
	<p>Damage and contamination of unprotected couplings. The couplings can become leaky and hydraulic oil will escape.</p> <ul style="list-style-type: none"> <li>▶ Protect the couplings when not in use with the protective caps and plugs against damage and contamination.</li> </ul>

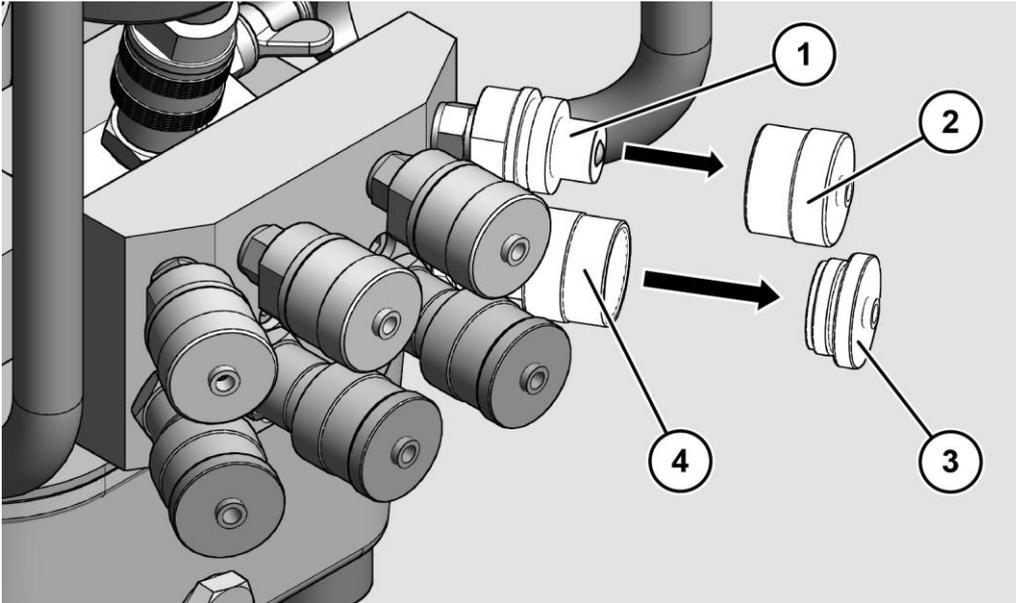
## Commissioning the unit

Before you can connect a tool, you must remove the protective cap and the protective plug of two stacked couplings. Proceed as follows:

- ▶ Screw the safety cap (2) counterclockwise from the corresponding connection (1).
- ▶ Screw the protective plug (3) counterclockwise from the corresponding connection (4).

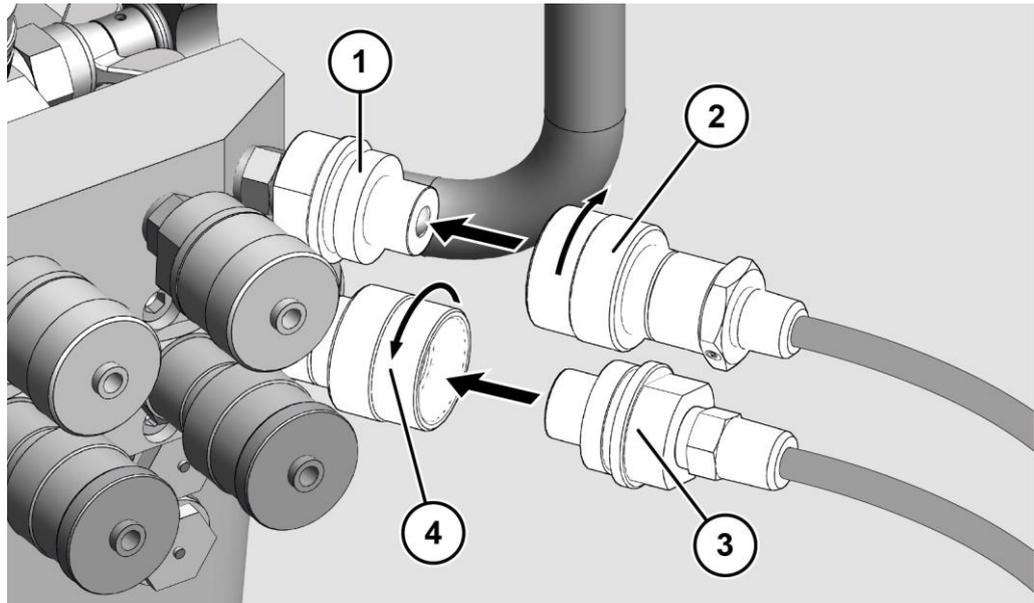
The cap and the protective plugs are permanently connected to the corresponding coupling.

You can now connect a tool.



To connect a tool to the unit, proceed as follows:

- ▶ Ensure that the hydraulic hoses are not damaged.
- ▶ Plug the male connector (3) on the hydraulic hose of the tool on the female connection (4) of the unit.
- ▶ Screw the connection with the union nut hand-tight.
- ▶ Plug the female connection (2) on the hydraulic hose of the tool on the male connection (1) of the unit.
- ▶ Screw the connection with the union nut hand-tight.



## Connect mains plug

### ATTENTION!

Damage caused by connecting the unit to the mains outlet with incorrect electrical voltage and frequency. Incorrect electrical voltage and frequency destroys the electrical control.

- ▶ Make sure that the unit is only connected to a suitable grounded electrical outlet.

The voltage and frequency of the mains socket must match the information on the unit's type plate.

- ▶ Ensure that the power cable is not damaged.
- ▶ Connect the power plug of the unit only to a suitable grounded electrical outlet.

The unit is ready for operation (standby).

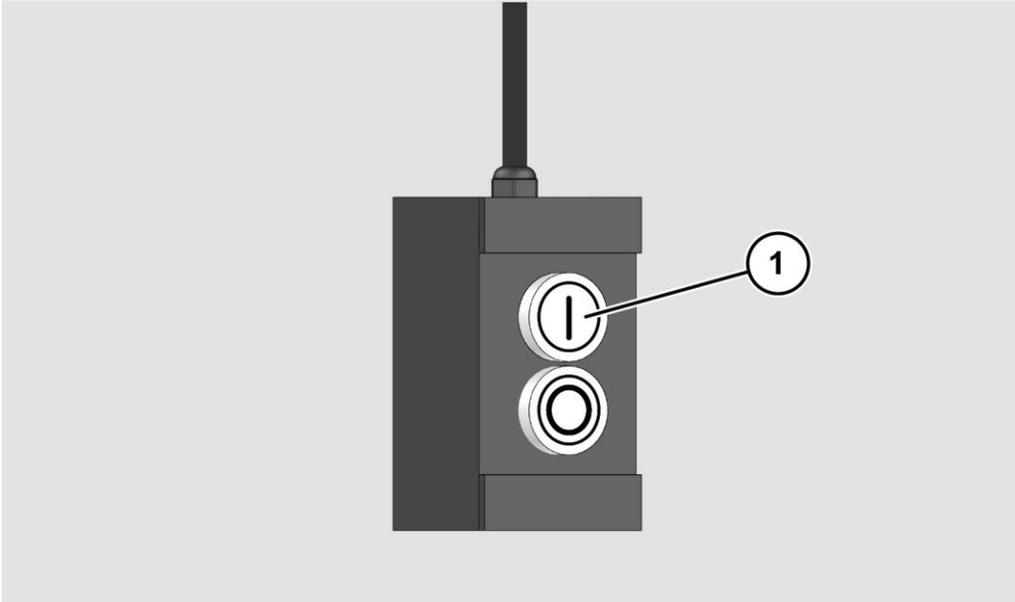
## Bleeding the screw system (generator, hose, tools)

When connecting the tools, air can pass into the hydraulic circuit. To ensure a smooth and safe operation, you need to vent the screw system. Proceed as follows:

- ▶ Press and release the button (1) on the remote control several times.

The connected screwing tool moves back and forth.

If the connected screwing tool moves back and forth without interruption, the screwing system is vented.



## Check oil level

<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <ul style="list-style-type: none"> <li>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</li> </ul>
<b>⚠ CAUTION</b>	
	<p>Risk of slipping due to leaked oil.</p> <ul style="list-style-type: none"> <li>▶ Take up spilled oil with a suitable binder agent.</li> <li>▶ Wear safety shoes with non-slip soles.</li> </ul>
<b>ATTENTION!</b>	
	<p>The use of hydraulic oils that do not meet the manufacturer's recommendation may cause damage to the unit. Warranty claims can become invalid.</p> <ul style="list-style-type: none"> <li>▶ Only use hydraulic oil recommended by the manufacturer.</li> </ul>

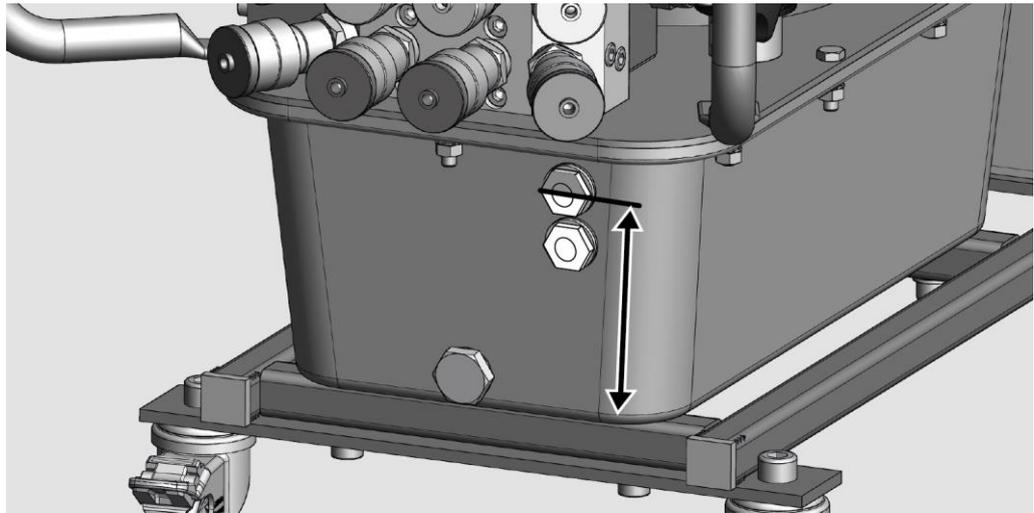
❶ The manufacturer-approved oils can be found starting on page 67.

To check the oil level, proceed as follows:

- ▶ Make sure that the unit stands securely on a flat surface.
- ▶ Check if the hydraulic oil is visible in the upper sight glass.
- ▶ Ensure that the hydraulic oil is clear and not white in color.

If the hydraulic oil is colored white, water has entered into the hydraulic oil.

- ▶ In this case, you need to change the hydraulic oil.
- ▶ When the hydraulic oil is not visible in the upper sight glass, top up fresh hydraulic oil recommended by the manufacturer, as described on page 35.



### Checking functioning of the manometer

To check the function of the pressure gage, proceed as follows:

- ▶ Press alternately the button start on the remote control and let the button start go again.

The pressure gage needle must move.

- ▶ If the gage needle does not move, stop using the unit.
- ▶ Replace a defective pressure gage for a faultless one of the same type.

### Performing a test run

After commissioning, you must perform a test run to make sure that no oil leaks occur and all components are working properly. Proceed as follows:

- ▶ Set the pressure to max. 700 bar (10,000 psi) see page 46.
- ▶ Move the connected tool forward and back a few times.
- ▶ Check the unit and connected tools for proper function.
- ▶ Check the unit and connected tools for visible leaks.
- ▶ Use only a unit that is working properly and has no leakage.
- ▶ Use only tools according to manufacturer recommendation, which function properly and have no leakage.

## Operating the unit

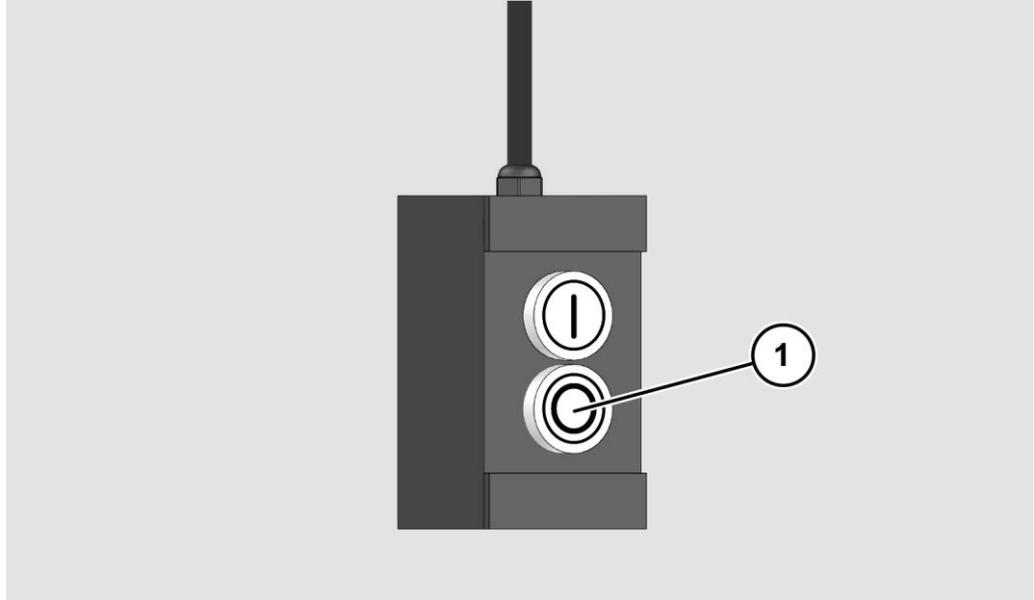
To operate the unit, proceed as follows:

- ▶ Make sure that the unit stands on a dry, level, solid and stable base.
- ▶ Turn the torque valve counterclockwise and set the pressure to 0 bar.

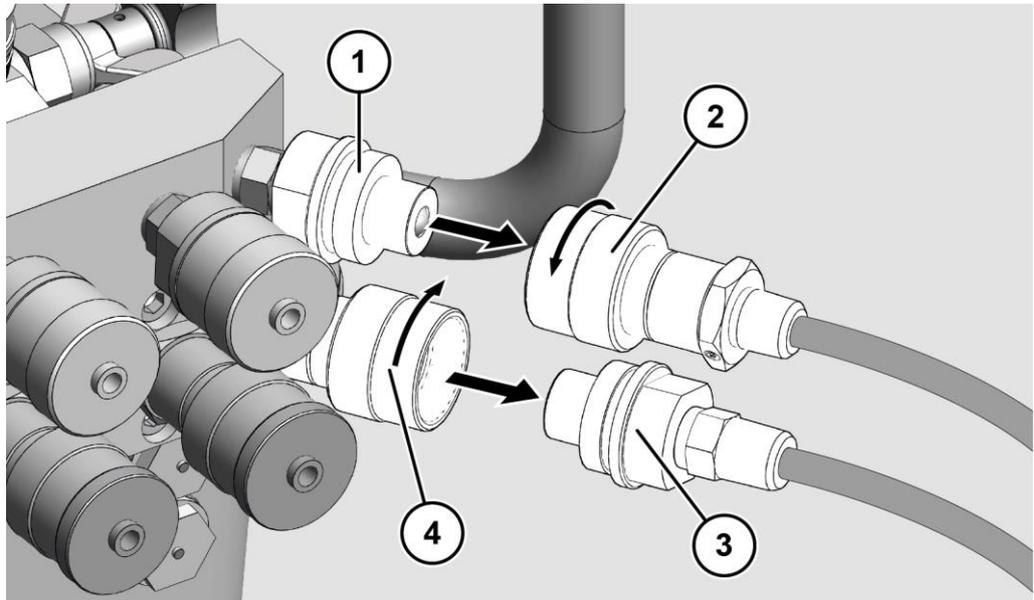
## Changing tools

 <b>DANGER</b>	
	<p>Risk of explosion when connecting and removing tools. Connecting tools to or removing tools from the unit in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"><li>▶ Only connect tools to the unit outside of the potentially explosive area.</li><li>▶ Only remove tools from the unit outside of the potentially explosive area.</li><li>▶ Only use tools that are expressly approved by the manufacturer for operation with the unit in the potentially explosive area.</li></ul>
 <b>WARNING</b>	
	<p>Serious injury or death due to hydraulic oil under high pressure spouting.</p> <ul style="list-style-type: none"><li>▶ Always switch off the unit with the button stop on the remote control.</li><li>▶ Ensure the unit is de-pressurized.</li></ul>

- ▶ Press the button (1) stop on the remote control several times, if need be. The unit is in stand-by. The pressure decreases.
- ▶ Wait until the pressure gage pressure shows no pressure anymore.
- ▶ Press the button (1) stop several times if necessary.



- ▶ Loosen the union nut (2).
- ▶ Pull the female connector (2) from the male connector (1) of the unit.
- ▶ Loosen the union nut at the female connector (4).
- ▶ Pull the male connector (3) from the female connector (4) of the unit.



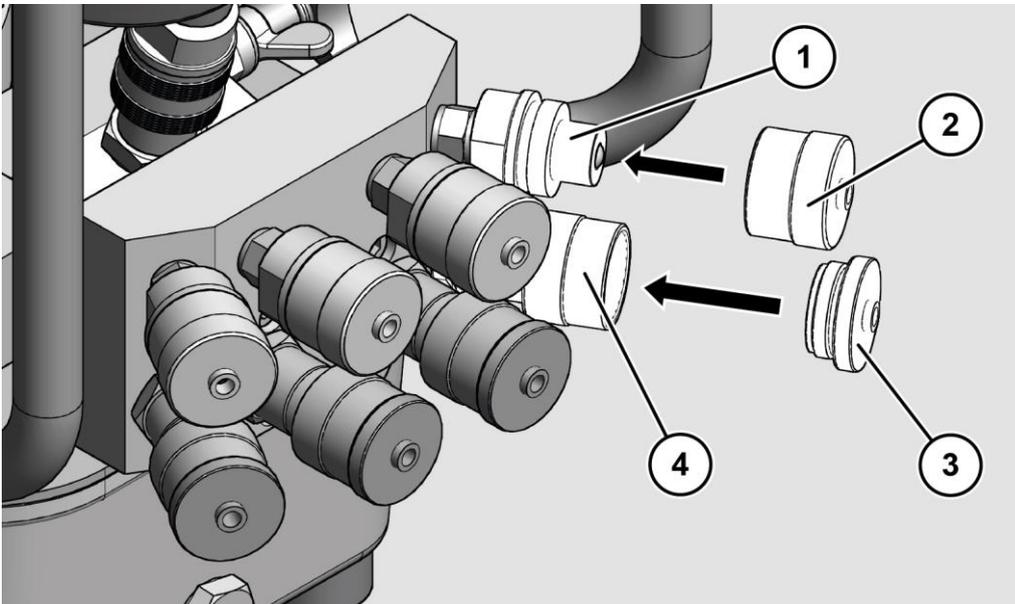
If you want to install the new tool at the same couplings, proceed as follows:

- ▶ Plug the male connector on the hydraulic hose of the tool on the female connection of the unit.
- ▶ Screw the connection with the union nut hand-tight.
- ▶ Plug the female connection on the hydraulic hose of the tool on the male connection of the unit.
- ▶ Screw the connection with the union nut hand-tight.

If you want to install the new tool at another coupling, proceed as follows:

If you have pulled a tool from the connection, you have to close the connection with a cap and protection plug to prevent damage. Proceed as follows:

- ▶ Screw the safety cap (2) clockwise on the corresponding connection (1).
- ▶ Screw the safety plug (3) clockwise on the corresponding connection (4).

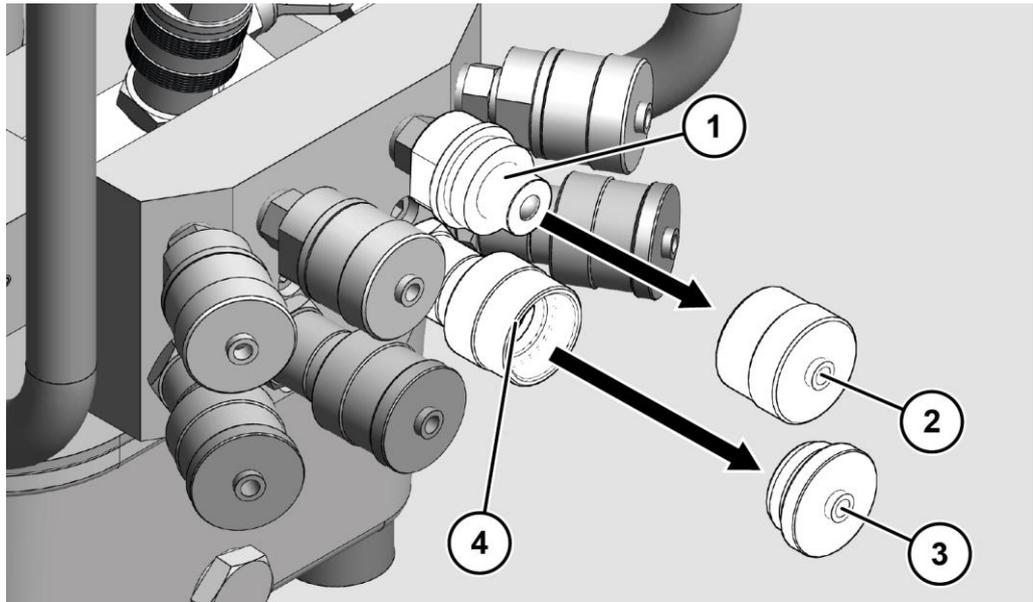


Before you can connect a tool, you must remove the protective cap and the protective plug of two stacked couplings. Proceed as follows:

- ▶ Screw the safety cap (2) counterclockwise from the corresponding connection (1).
- ▶ Screw the protective plug (3) counterclockwise from the corresponding connection (4).

The cap and the protective plugs are permanently connected to the corresponding coupling.

You can now connect a tool.



- ▶ Plug the female connection on the hydraulic hose of the tool on the male connection of the unit.
- ▶ Screw the connection with the union nut hand-tight.
- ▶ Plug the male connector on the hydraulic hose of the tool on the female connection of the unit.
- ▶ Screw the connection with the union nut hand-tight.

## Setting the pressure

<b>⚠ WARNING</b>	
	<p>Risk to life from incorrect procedure when setting the pressure on the unit.</p> <p>Faulty adjustment of the pressure causes an incorrect adjustment of the torque for the screwing process.</p> <p>▶ Always set the pressure from a low value to a high value.</p>
<b>⚠ CAUTION</b>	
	<p>Risk of eye damage during pressure of more than 700 bar (10,000 psi)</p> <p>Pressure exceeding 700 bar (10,000 psi) can lead to bursting hydraulic hoses and hydraulic oil can squirt out.</p> <p>▶ Ensure that the permissible pressures are not exceeded.</p> <p>▶ Wear chemical-resistant goggles.</p>

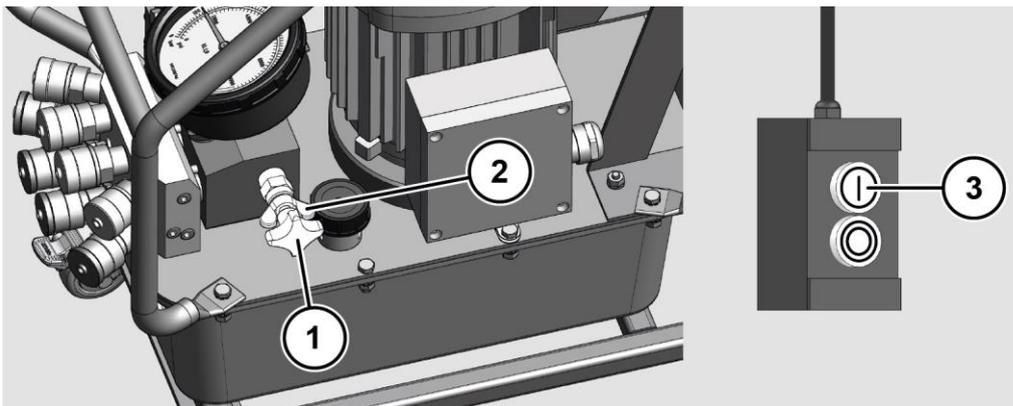
ⓘ The pressure to be set for the desired torque can be found in the operating instructions of the screwing tool.

To adjust the required pressure, proceed as follows:

- ▶ Make sure that the unit is fully connected and the proper power supply is available.
- ▶ Place the connected screwing tool safely on the ground.
- ▶ Loosen the wing nut (2).
- ▶ Turn the torque valve (1) counter-clockwise until it stops.
- ▶ Press the button start (3) on the remote control and hold it down.

The motor-pump unit is switched on. Hydraulic pressure is built up in the unit.

- ▶ At the same time, turn the torque valve clockwise.



The current pressure is visible on the pressure gage.

- ▶ If the pressure exceeds the required value, release the push button start.
- ▶ Turn the torque valve (1) counter-clockwise.
- ▶ Press the button start again to display the current pressure.
- ▶ If the pressure is still higher than the required value, repeat the previous steps.
- ▶ Press and hold the button start.
- ▶ Turn the torque valve clockwise until the desired pressure is displayed on the pressure gage.
- ▶ Tighten the wing nut (2), so that the set pressure can not be changed inadvertently.

The required pressure is set.

- ▶ Release the button start.

The unit can be used with the connected screwing tool to perform screwing processes.

## Performing a screwing process

To perform a screwing process, proceed as follows:

- ▶ Ensure that the screwing tool is connected.
- ▶ Ensure that the pressure required for the screw connection is set on the unit.
- ▶ Place the screwing tool onto the screw connection so that the tool cannot fall off.
- ▶ Press and hold the Start button on the remote control.

The screwing tool tightens the screw connection.

- ▶ Release the Start button when the screwing tool no longer moves.

The cylinder in the screwing tool moves back into its starting position.

- ▶ Repeat the process above until the screwing tool does not tighten the screw connection any further.

## Checking the pressure during operation

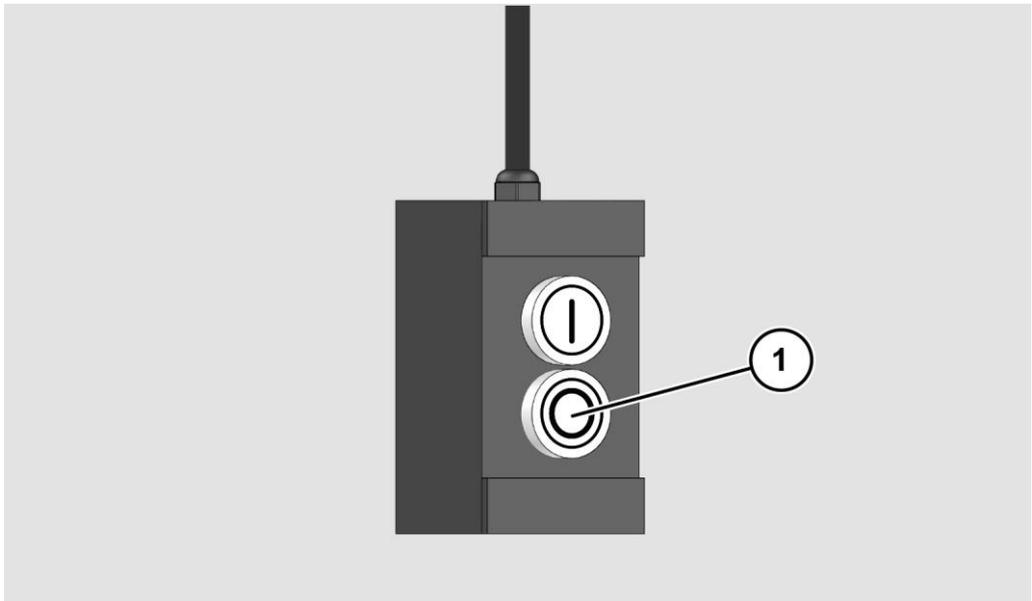
During operation, the unit's set operating pressure can change independently due to thermal effects. The pressure drops as the operating temperature increases. To ensure a perfect screwing process, you must manually readjust the pressure to these changes.

- ▶ Check the pressure regularly during the screwing process on the unit's pressure gage.
- ▶ Reset the pressure in the event of deviations, see page 46.

## After use

<b>⚠ DANGER</b>	
	<p>Risk of explosion when connecting and removing tools. Connecting tools to or removing tools from the unit in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"><li>▶ Only connect tools to the unit outside of the potentially explosive area.</li><li>▶ Only remove tools from the unit outside of the potentially explosive area.</li><li>▶ Only use tools that are expressly approved by the manufacturer for operation with the unit in the potentially explosive area.</li></ul>
<b>⚠ WARNING</b>	
	<p>Serious injury or death due to hydraulic oil under high pressure spouting.</p> <ul style="list-style-type: none"><li>▶ Always switch off the unit with the button stop on the remote control.</li><li>▶ Ensure the unit is de-pressurized.</li></ul>

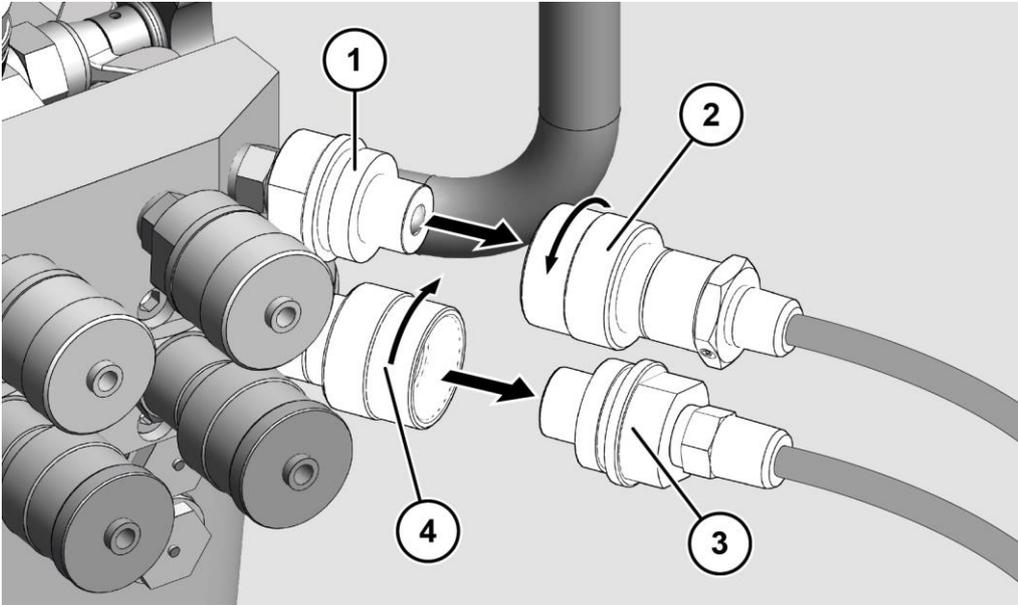
- ▶ Press the button (1) stop on the remote control several times, if need be. The unit is in stand-by. The pressure decreases.
- ▶ Wait until the pressure gage pressure shows no pressure anymore.
- ▶ Press the button (1) stop several times if necessary.



- ▶ Unplug the power cord from the wall outlet.

To remove the connected screwing tools, proceed as follows:

- ▶ Loosen the union nut (2).
- ▶ Pull the female connector (2) from the male connector (1) of the unit.
- ▶ Loosen the union nut at the female connector (4).
- ▶ Pull the male connector (3) from the female connector (4) of the unit.



- ▶ Screw the protective caps and plugs on the couplings.
- ▶ You can now store or transport the unit.

## Decommissioning the unit

To take the unit out of operation for more than three months, proceed as follows:

- ▶ Switch off the unit by pressing the button stop of the remote control.
- ▶ Unplug the power cord from the wall outlet.
- ▶ Remove attached screwing tools, see starting page 49.
- ▶ Empty the oil tank.

The emptying is described in section "Changing the hydraulic oil" starting from page 53.

- ▶ Dispose of the hydraulic oil according to the rules and regulations applicable on site.
- ▶ Store the unit as described starting on page 33.

## Servicing the unit

### Maintenance schedule

Interval	Component	Action
prior to every operation	Electrical connection lines	<ul style="list-style-type: none"> <li>▶ Check electrical connection cables for visible damage, twists and kinks.</li> <li>▶ Eliminate twists.</li> <li>▶ Have defective or kinked electrical leads replaced by qualified personnel.</li> </ul>
	Hydraulic hoses	<ul style="list-style-type: none"> <li>▶ Check the hydraulic hoses for visible damage, twists and kinks.</li> <li>▶ Eliminate twists.</li> <li>▶ Have defective or kinked hydraulic hoses replaced by qualified personnel.</li> </ul>
	Pressure gage	<ul style="list-style-type: none"> <li>▶ Check the if pressure gage display responds after switching on the unit.</li> <li>▶ Replace a defective pressure gage for a faultless one of the same type.</li> </ul>
before each coupling	Couplings	<ul style="list-style-type: none"> <li>▶ Clean the couplings with a dry cloth.</li> </ul>
As necessary	Unit	<ul style="list-style-type: none"> <li>▶ Clean the unit with a dry cloth.</li> </ul>
Every 500 hours of operation	Oil container	<ul style="list-style-type: none"> <li>▶ Change the hydraulic oil, see page 53.</li> </ul>

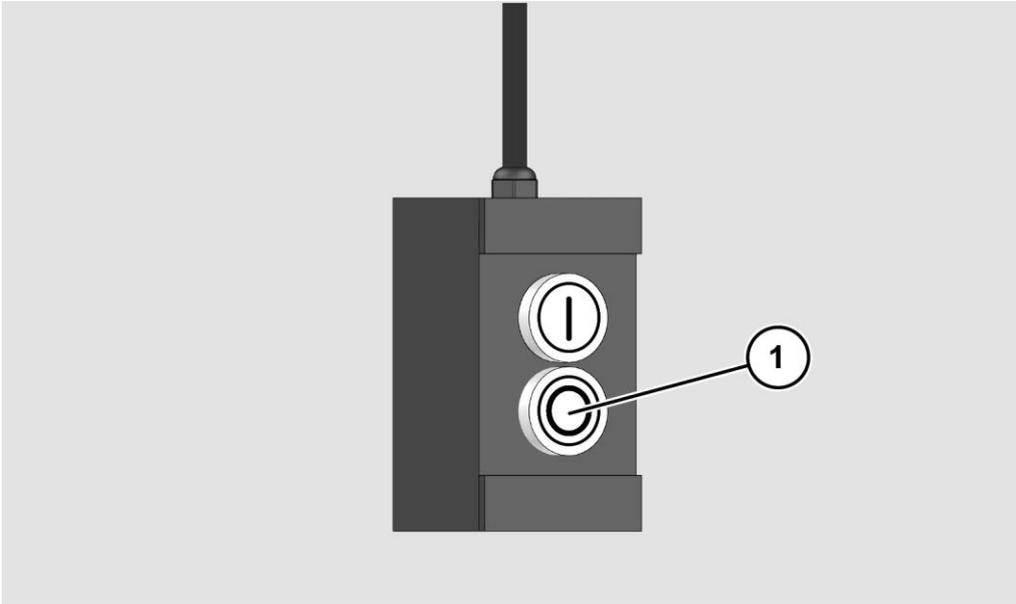
## Changing the hydraulic oil

<b>⚠ DANGER</b>	
	<p>Risk of explosion when carrying out maintenance work. Carrying out maintenance work in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"> <li>▶ Only carry out maintenance work outside of the potentially explosive area.</li> </ul>
<b>⚠ WARNING</b>	
	<p>Slipping hazard from leaked oil. Bruising and bone fractures possible.</p> <ul style="list-style-type: none"> <li>▶ Clean up any leaked oil with a cloth or suitable binding agents.</li> <li>▶ Wear safety shoes with non-slip soles.</li> </ul>
<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <ul style="list-style-type: none"> <li>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</li> </ul>
<b>ATTENTION!</b>	
	<p>The use of hydraulic oils that do not meet the manufacturer's recommendation may cause damage to the unit. Warranty claims can become invalid.</p> <ul style="list-style-type: none"> <li>▶ Only use hydraulic oil recommended by the manufacturer.</li> </ul>

**i** The manufacturer-approved oils can be found starting on page 67.

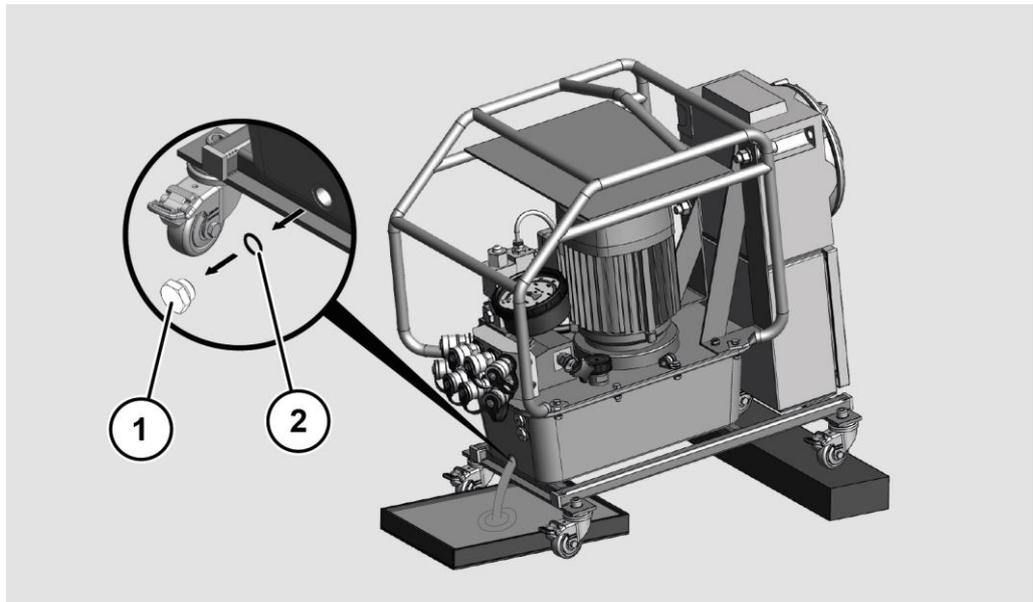
To change the hydraulic oil, proceed as follows:

- ▶ Always switch off the unit with the button (1) stop on the remote control.



- ▶ Unplug the power cord from the wall outlet.
- ▶ Remove attached screwing tools from the couplings, see page 49.
- ▶ Place the unit on a solid flat surface, for you to be able to put a container under the oil drain plug.
- ▶ Place the unit in a manner that it is tilted slightly forward.
- ▶ Allow the unit including hydraulic oil to cool down.
- ▶ Under the oil drain plug, place a container that can hold the amount of oil contained in the unit of up to 8 l (2.1 US.liq.gal).
- ▶ Remove the oil drain plug (1) and the seal (2).

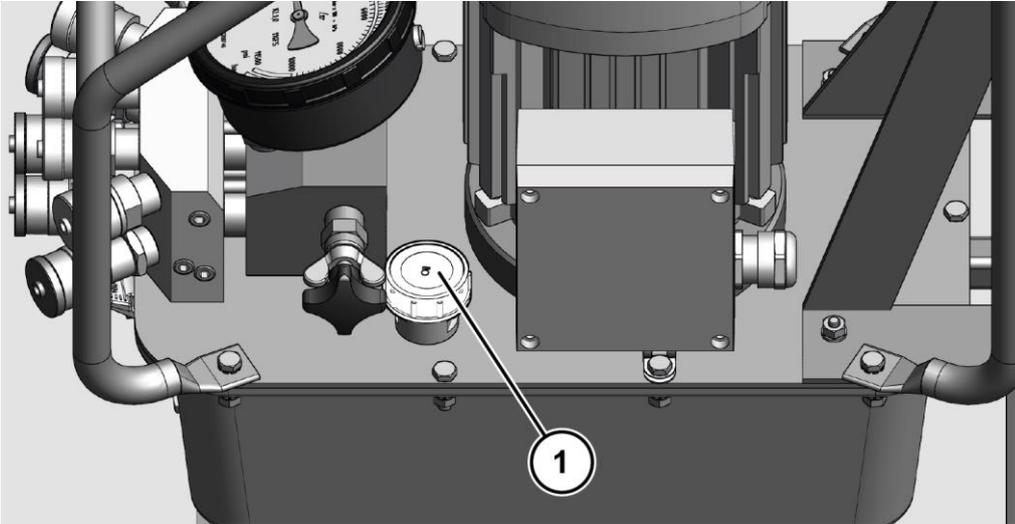
The hydraulic oil flows into the vessel.



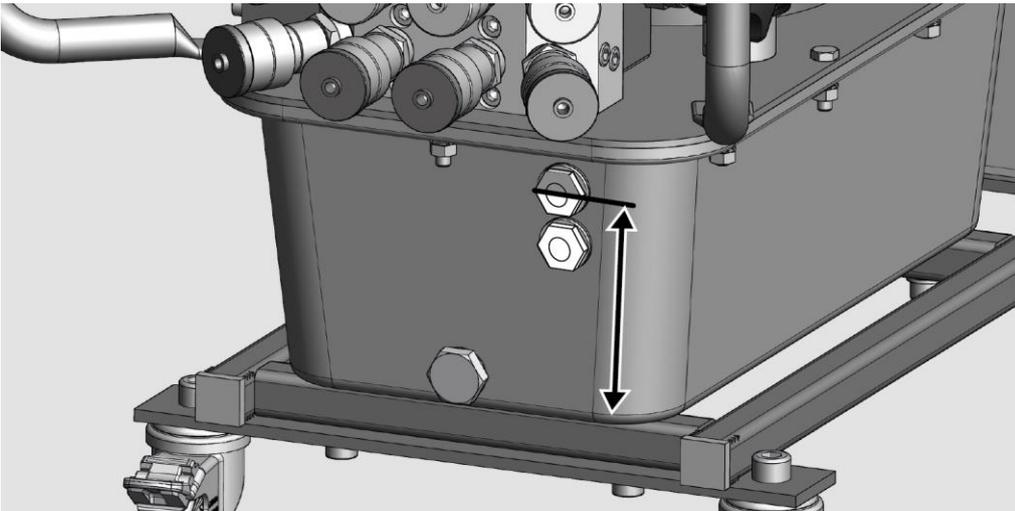
- ▶ Check the seal of the oil drain plug for damage.
- ▶ Replace a damaged seal.
- ▶ Wait until the hydraulic oil has completely drained out of the oil reservoir.
- ▶ Close the oil drain with the oil drain plug.
- ▶ Tighten the oil drain plug with a torque of 20 Nm.

To fill the hydraulic oil in the oil tank of the unit, proceed as follows:

- ▶ Make sure that the unit stands securely on a flat surface.
- ▶ Remove the bleed and ventilation valve (1) of the unit's filling opening.



- ▶ Slowly fill fresh hydraulic oil into the oil container until the oil fills the upper sight glass half up.



- ▶ Put the bleed and ventilation valve on the filler opening.
- ▶ Tighten the bleed and ventilation valve by hand.
- ▶ Dispose of the drained hydraulic oil according to the environmental regulations applicable on site.

## Cleaning the unit

<b>⚠ DANGER</b>	
	<p>Risk of explosion when carrying out maintenance work. Carrying out maintenance work in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"> <li>▶ Only carry out maintenance work outside of the potentially explosive area.</li> </ul>
<b>⚠ WARNING</b>	
	<p>Risk of injury from electric shock.</p> <ul style="list-style-type: none"> <li>▶ Prior to cleaning, pull the power plug from the socket.</li> </ul>
<b>⚠ WARNING</b>	
	<p>Slipping hazard from leaked oil. Bruising and bone fractures possible.</p> <ul style="list-style-type: none"> <li>▶ Clean up any leaked oil with a cloth or suitable binding agents.</li> <li>▶ Wear safety shoes with non-slip soles.</li> </ul>
<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <ul style="list-style-type: none"> <li>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</li> </ul>
<b>ATTENTION!</b>	
	<p>Damage or malfunctions caused by water or steam in the unit is possible.</p> <ul style="list-style-type: none"> <li>▶ Never clean the unit with a pressure washer, cold cleaner or water.</li> </ul>

- ▶ Clean the unit with a clean and absorbent cloth.
- ▶ Dispose of the cloth in an environmentally friendly manner.

## Remedying faults or malfunctions

**Table of faults**

Fault	Possible cause	Remedy
The pump does not work.	Electric components are damaged.	▶ Have the electrical components checked and, if necessary, replaced by qualified personnel.
	The power supply is interrupted.	▶ Have the power supply checked or serviced by qualified personnel.
	The remote control is defective.	▶ Have the remote control checked and, if necessary, replaced by qualified personnel.
The engine just hums.	The stator is defective.	▶ Have the motor windings checked by qualified personnel. ▶ Have a defective motor windings repaired by the manufacturer.
	A capacitor is defective.	▶ Have the amperage of the capacitors checked by qualified personnel. ▶ Have a defective capacitor replaced by qualified personnel.

Fault	Possible cause	Remedy
The pressure is less than 70 bar.	The solenoid valve is defective.	<ul style="list-style-type: none"> <li>▶ Have the solenoid valve checked electrically by qualified personnel.</li> <li>▶ Have the solenoid valve checked hydraulically by qualified personnel.</li> <li>▶ Have the defective solenoid valve exchanged by qualified personnel.</li> </ul>
	The torque valve is defective.	<ul style="list-style-type: none"> <li>▶ Have the torque valve checked hydraulically by qualified personnel.</li> <li>▶ Have a defective torque valve exchanged by qualified personnel.</li> </ul>
	Leakage at the pump flange.	<ul style="list-style-type: none"> <li>▶ Have the pump flange checked by qualified personnel.</li> <li>▶ Have defective pump flange repaired by the manufacturer.</li> </ul>
	The screen filter is clogged.	<ul style="list-style-type: none"> <li>▶ Have the screen filter checked by qualified personnel.</li> <li>▶ Have the screen filter cleaned by qualified personnel.</li> </ul>
	The maximum-pressure valve is leaking.	<ul style="list-style-type: none"> <li>▶ Have the maximum-pressure valve checked by qualified personnel.</li> <li>▶ Have a defective maximum-pressure valve exchanged by qualified personnel.</li> </ul>
	The piping is leaking.	<ul style="list-style-type: none"> <li>▶ Have the piping checked by qualified personnel.</li> <li>▶ Have leaky pipes replaced by qualified personnel.</li> <li>▶ Have leaky pipe joints sealed by qualified personnel.</li> </ul>
The pressure is only 70 bar.	The low-pressure switch-off valve is defective.	<ul style="list-style-type: none"> <li>▶ Have the low-pressure switch-off valve checked by qualified personnel.</li> <li>▶ Have a low-pressure switch-off valve exchanged by qualified personnel.</li> </ul>
	The piping is leaking.	<ul style="list-style-type: none"> <li>▶ Have the piping checked by qualified personnel.</li> <li>▶ Have leaky pipes replaced by qualified personnel.</li> <li>▶ Have leaky pipe joints sealed by qualified personnel.</li> </ul>

Fault	Possible cause	Remedy
<p>The pressure is only 70 – 80 bar.</p>	<p>The solenoid valve is defective.</p>	<ul style="list-style-type: none"> <li>▶ Have the solenoid valve checked electrically by qualified personnel.</li> <li>▶ Have the solenoid valve checked hydraulically by qualified personnel.</li> <li>▶ Have the defective solenoid valve exchanged by qualified personnel.</li> </ul>
	<p>The return pressure valve is leaky.</p>	<ul style="list-style-type: none"> <li>▶ Have the return pressure valve checked by qualified personnel.</li> <li>▶ Have a defective return pressure valve exchanged by qualified personnel.</li> </ul>
	<p>The piping is leaking.</p>	<ul style="list-style-type: none"> <li>▶ Have the piping checked by qualified personnel.</li> <li>▶ Have leaky pipes replaced by qualified personnel.</li> <li>▶ Have leaky pipe joints sealed by qualified personnel.</li> </ul>

Fault	Possible cause	Remedy
The max. pressure of 700 bar is not reached, though no visible leaks are present.	The torque valve is defective.	<ul style="list-style-type: none"> <li>▶ Have the torque valve checked for proper condition by qualified personnel.</li> <li>▶ Have a defective torque valve exchanged by qualified personnel.</li> </ul>
	One or more pump elements are defective.	<ul style="list-style-type: none"> <li>▶ Have the pump elements checked by qualified personnel.</li> <li>▶ Have the defective pump elements replaced by qualified personnel.</li> </ul>
	The piping is leaking.	<ul style="list-style-type: none"> <li>▶ Have the piping checked by qualified personnel.</li> <li>▶ Have leaky pipes replaced by qualified personnel.</li> <li>▶ Have leaky pipe joints sealed by qualified personnel.</li> </ul>
The motor switches off.	The motor temperature is too high.	<ul style="list-style-type: none"> <li>▶ Wait for about 10 minutes and switch the unit on.</li> <li>▶ If the motor again switches off, have the motor checked by qualified personnel.</li> </ul>
The indicator on the pressure gage varies greatly at about 700 bar.	The non-return valve is defective.	<ul style="list-style-type: none"> <li>▶ Have a defective non-return valve exchanged by qualified personnel.</li> </ul>
Oil mist and oil vapor is forming	The unit is overheating	<ul style="list-style-type: none"> <li>▶ Wear breathing protection if ventilation is insufficient.</li> <li>▶ Wear chemical-resistant safety goggles</li> <li>▶ Make sure there is sufficient ventilation.</li> <li>▶ Switch the unit off.</li> <li>▶ Have the unit valve checked by qualified personnel.</li> </ul>
	The piping is leaking.	<ul style="list-style-type: none"> <li>▶ Have the piping checked by qualified personnel.</li> <li>▶ Have leaky pipes replaced by qualified personnel.</li> <li>▶ Have leaky pipe joints sealed by qualified personnel.</li> </ul>

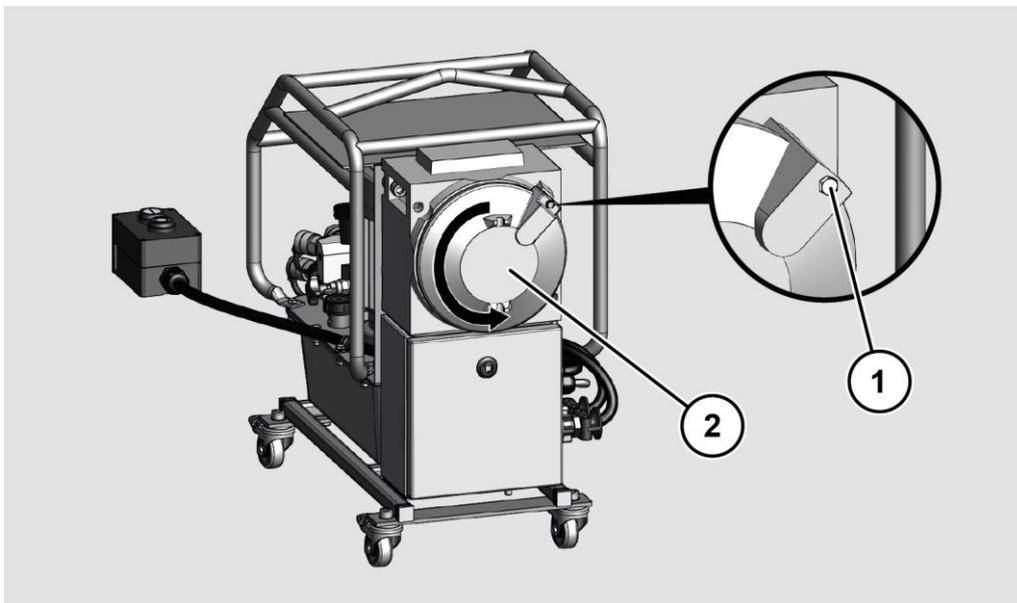
## Replacing fuses

<b>⚠ DANGER</b>	
	<p>Risk of explosion when carrying out maintenance work. Carrying out maintenance work in the potentially explosive area can lead to serious injury or death.</p> <ul style="list-style-type: none"><li>▶ Only carry out maintenance work outside of the potentially explosive area.</li></ul>
<b>⚠ WARNING</b>	
	<p>Risk of injury from electric shock caused by inexperienced work on the electrical equipment.</p> <ul style="list-style-type: none"><li>▶ Disconnect the mains plug from the socket.</li><li>▶ Have work on electrical equipment carried out only by specialist personnel who are qualified for these tasks.</li></ul>

### Prepare for fuse replacement

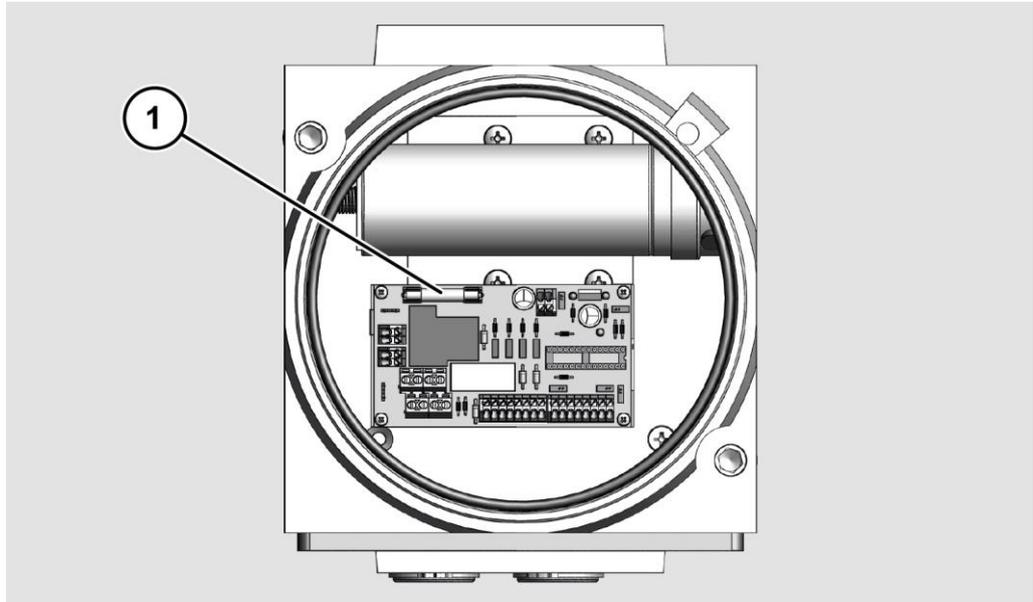
To prepare to replace defective fuses, proceed as follows:

- ▶ Unplug the power plug from the plug socket.
- ▶ Place the unit on stable ground.
- ▶ Loosen and remove the hex head screw (1) on the cover (2).
- ▶ Unscrew the cover from the housing in a counterclockwise direction.
- ▶ Leave the cover in a safe place.



## Replace 115 V/230 V fuse

- ▶ Remove fuse (1) F1.
- ▶ Check the condition of the fuses with a multimeter.
- ▶ If the fuse is defective, replace it.
- ▶ Make sure that the new fuse is of the same type and capacity as the fuse to be replaced.

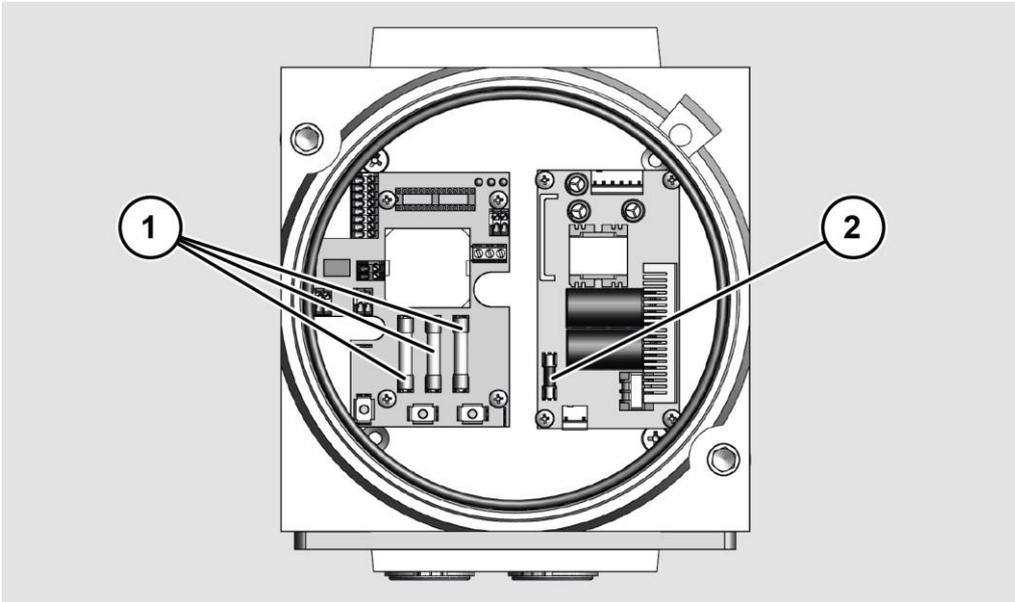


To close the housing, proceed as follows:

- ▶ Screw the cover into the housing as far as the stop in a clockwise direction.
- ▶ To secure the cover, affix the hex head screw to the housing.
- ▶ Ensure that the cover closes the housing so that it is pressure-tight.

## Replace 400 V fuse

- ▶ Remove fuses (1) F1, F2 and F3.
- ▶ Check the condition of the fuses with a multimeter.
- ▶ If one or several fuses are defective, replace them.
- ▶ Make sure that the new fuses are of the same type and capacity as the fuses to be replaced.



To close the housing, proceed as follows:

- ▶ Screw the cover into the housing as far as the stop in a clockwise direction.
- ▶ To secure the cover, affix the hex head screw to the housing.
- ▶ Ensure that the cover closes the housing so that it is pressure-tight.

## Disposal

### In the USA

Observe and follow the regulations for disposal. If in doubt, please consult your municipal or local authority.

<b>⚠ WARNING</b>	
	<p>Risk of poisoning from hydraulic oil Hydraulic oil can contaminate ground water and soil.</p> <ul style="list-style-type: none"> <li>▶ Always dispose of hydraulic oil in an environmentally friendly manner using a specialist firm.</li> </ul>
<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <ul style="list-style-type: none"> <li>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</li> </ul>

- ▶ Dispose of hydraulic oil in an environmentally friendly manner using a specialist firm.

Replaced wear parts and defective components consist of e. g. the following materials:

- steel
- rubber
- plastic
- copper

<b>⚠ WARNING</b>	
	<p>Risk of poisoning from hydraulic oil Hydraulic oil can contaminate ground water and soil.</p> <ul style="list-style-type: none"> <li>▶ Use a cloth to remove hydraulic oil from parts to be disposed of.</li> <li>▶ Dispose of the cloth in an environmentally friendly manner after use.</li> </ul>

- ▶ Remove any residue of hydraulic oil from the replaced wear parts or defective components with a cloth.
- ▶ Dispose of the cloth in an environmentally friendly manner.
- ▶ Dispose of the unit in an environmentally friendly manner through the manufacturer.

## In Europe

Observe and follow the regulations for disposal. If in doubt, please consult your municipal or local authority.

<b>⚠ WARNING</b>	
	<p>Risk of poisoning from hydraulic oil Hydraulic oil can contaminate ground water and soil.</p> <p>▶ Always dispose of hydraulic oil in an environmentally friendly manner using a specialist firm.</p>
<b>⚠ CAUTION</b>	
	<p>Health hazard from contact with hydraulic oil.</p> <p>▶ Wear nitrile gloves and chemical-resistant protective goggles during work that may include contact with hydraulic oil.</p>

- ▶ Dispose of hydraulic oil in an environmentally friendly manner using a specialist firm.

Replaced wear parts and defective components consist of e. g. the following materials:

- steel
- rubber
- plastic
- copper

<b>⚠ WARNING</b>	
	<p>Risk of poisoning from hydraulic oil Hydraulic oil can contaminate groundwater and soil.</p> <p>▶ Remove hydraulic oil from the parts to be disposed using a cloth.</p> <p>▶ Dispose of the cloth in an environmentally friendly manner after use.</p>

- ▶ With a cloth, remove traces of hydraulic oil from the unit, exchanged wearing parts or defective components.
- ▶ Dispose of the unit, replaced worn parts or defective components in accordance with environmental regulations.
- ▶ Dispose of the cloth in accordance with environmental regulations.



## Technical specifications

Dimensions and weights (one tool connection)	
Width:	623 mm (24.5 in)
Height:	647 mm (25.5 in)
Depth:	328 mm (13.0 in)
Weight:	approx. 51.0 kg (112.0 lbs) (without oil fill), 400 V approx. 71.0 kg (157.0 lbs) (without oil fill), 115/230 V

Dimensions and weights (four tool connections)	
Width:	623 mm (24.5 in)
Height:	647 mm (25.5 in)
Depth:	328 mm (13.0 in)
Weight:	approx. 52.5 kg (115.7 lbs) (without oil fill), 400 V approx. 72.5 kg (159.8 lbs) (without oil fill), 115/230 V

Electrical data	
Drive type:	Electric motor
Mains voltage:	115 V:1PH100–115/50 Hz 115 V:1PH100–115/60 Hz 230 V:1PH200–230/50 Hz 230 V:1PH200–230/60 Hz 400 V:3PH380–460/50 Hz 400 V:3PH380–460/60 Hz
Output:	115/230/400 V–50 : 1.1 kW (1.5 HP) 115/230/400 V–60 : 1.5 kW (2.0 HP)
Protection category:	IP55
Connecting plug type:	115 V: CEE-115V-16A-3p 230 V: CEE-230V-16A-3p 400 V: CEE-400V-16A-5p

Information about the hydraulics	
Oil recommendation <sup>1</sup> :	Hyspin HVI 32, alternatively Bio-Hydraulic oil on mineral oil basis, e. g., Shell Naturella HFE
Recommended viscosity grades:	Starting at +10 °C (50 °F) 32-46 mm <sup>2</sup> /s, below +10 °C (50 °F) 15-22 mm <sup>2</sup> /s
Tank volume:	8 l (2.1 US.liq.gal)
Working pressure:	max. 700 bar (10,000 psi)

- 1 Operate the unit exclusively with clean hydraulic oil based on mineral oil. Alternatively, you can operate the unit with bio-oil based on mineral oil such as Shell Naturella HFE. In order to use the bio-oil, all the equipment of the unit must be flushed with bio-oil.

The maximum surface temperature on the unit is 200 °C.

