



Hydraulic pump

manually operated, max. operating pressure 100, 200 and 500 bar



1 Description of the product

The hydraulic clamping pump unit is particularly suitable for smaller hydraulic clamping and assembly fixtures with single-acting hydraulic elements. In addition, these pumps can be used for lifting of loads, for adjusting and locking of tables as well as other operating processes.

The hydraulic pump can be operated by hand or by foot. By operating the pump lever, the hydraulic elements is extended or retracted. The desired maximum operating pressure can be adjusted at the integrated pressure relief valve.

In case of a pressure drop on the oil side, the pump does not supply oil.

2 Validity of the documentation

This document applies to the following products:

Hydraulic pumps of data sheet D 8.800. The following types or part numbers are concerned:

Hydraulic pumps:

8804 006, 8804 016, 8804 026,
8805 006, 8805 016, 8805 026
8806 006, 8806 016, 8806 026
8807 006, 8807 016, 8807 026
8808 006, 8808 016, 8808 026
8816 006, 8816 016, 8816 026

3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydro-mechanical expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge of function and design of the corresponding components.

A specialist is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

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4 Symbols and signal words

WARNING

Person damage

Stands for a possibly dangerous situation.

If it is not avoided, death or very severe injuries will result.

CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.

If it is not avoided, minor injuries or material damages will result.



Hazardous to the environment

The symbol stands for important information for the proper handling with materials that are hazardous to the environment.

Ignoring these notes can lead to heavy damages to the environment.

Note

This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

5 For your safety

5.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will :

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

5.2 Safety instructions

The product was manufactured in accordance with the generally accepted rules of the technology.

Observe the safety instructions and the operating instructions given in this manual, in order to avoid personal damage or material damage.

- Read these operating instructions thoroughly and completely, before you work with the product.
- Keep these operating instructions so that they are accessible to all users at any time.
- Pay attention to the current safety regulations, regulations for accident prevention and environmental protection of the country in which the product will be used.
- Use the ROEMHELD product only in perfect technical condition.
- Observe all notes on the product.
- Use only accessories and spare parts approved by the manufacturer in order to exclude danger to persons because of not suited spare parts.
- Respect the intended use.

- You only may start up the product, when it has been found that the incomplete machine or machine, in which the product shall be mounted, corresponds to the country-specific provisions, safety regulations and standards.
- Perform a risk analysis for the incomplete machine, or the machine.

Due to the interactions between the product and the machine/fixture or the environment, risks may arise that only can be determined and minimized by the user, e.g. :

- generated forces,
- generated movements,
- Influence of hydraulic and electrical control,
- etc.

5.3 Product-specific safety instructions

WARNING

Injuries due to non-compliance of the operating instructions!

- The product may only be operated, if the operating instructions - especially the chapter "Safety instructions" have been read and understood.

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

- Before start up, read the operating instructions!

Poisoning due to contact with hydraulic oil!

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Injuries, material damages or malfunctions!

- The product must never be opened. At the product no changes must be made, except the ones expressly mentioned in the operating instructions!

Injury by crushing!

Components of the product make a movement while they are in operation.

- This can cause injuries.
- Keep parts of the body and items out of the working area!

CAUTION

Work by qualified personnel

- Works only to be effected by authorised personnel.

Performance of the product!

The admissible performance data of the product, see chapter "Technical characteristics", may not be exceeded.

Aggressive cleaning agents

The product must not be cleaned with:

- Corrosive or corroding components or

- Organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), because this can destroy the seals.

Note

Qualification of personnel

All works may only be effected by qualified personnel familiar with the handling of hydraulic components.

6 Application

6.1 Intended use

The products are used to generate pressure for smaller hydraulic applications: Clamping of workpieces, lifting of loads, displacing and clamping of tables or comparable actuations.

The products are used to generate hydraulic pressure in industrial applications for bending or clamping of workpieces and / or to operate fixtures alternatively hydraulic actuators within closed, low in dust rooms.

Furthermore the following belongs to possible uses:

- Use within the capacity indicated in the technical characteristics (see data sheet).
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

6.2 Misapplication

WARNING

Injuries, material damages or malfunctions!

- The product must never be opened. At the product no changes must be made, except the ones expressly mentioned in the operating instructions!

The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to vibrations or other physical / chemical effects damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
 - For the use on fun fairs and in leisure parks.
 - In food processing or in areas with special hygiene regulations.
 - For military purposes.
 - In mines.
 - In explosive and aggressive environments (e.g. ATEX).
 - In medical engineering.
 - In the aerospace industry.
 - For passenger transport.
- For other operating and environmental conditions e.g.:
 - Higher operating pressures than indicated on the data sheet or installation drawing.

- With hydraulic fluids that do not correspond to the specifications.

7 Transport

The product is delivered in a solid carton box. When unpacking check the hydraulic pump for possible damage.

Dents and fissures, etc. at the product may lead to oil leakages.

In this case do not install the pump!

The empty packaging must be disposed in accordance with the statutory regulations in the given country (see chapter disposal).

The pump is delivered with oil charge.

8 Installation

WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

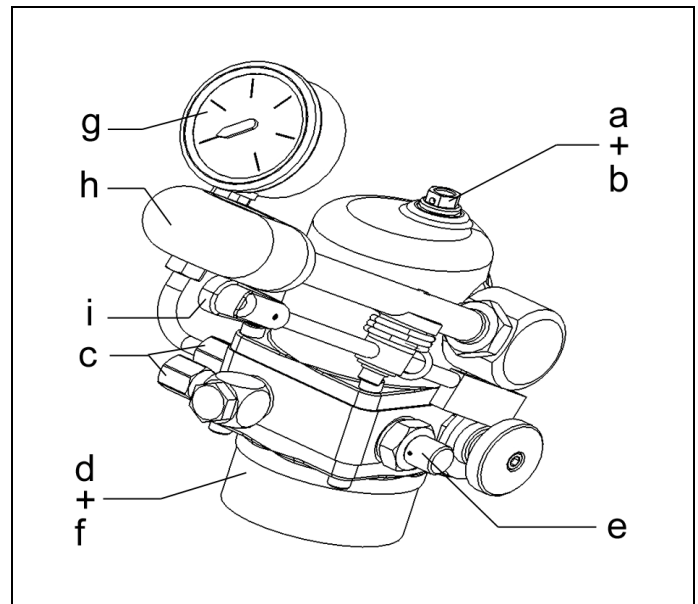


Figure 1: Overview of the components (principle figure 8804, 8805, 8808, 8816)

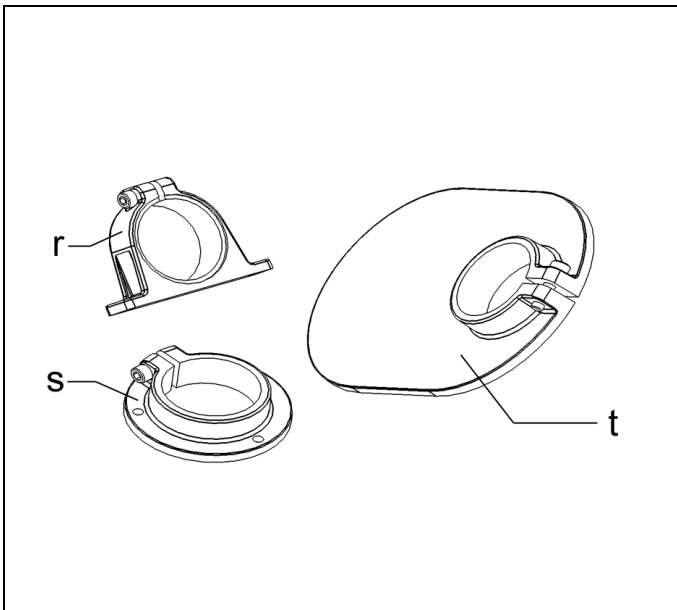


Figure 2: Overview of the components (fixing possibilities (accessories))

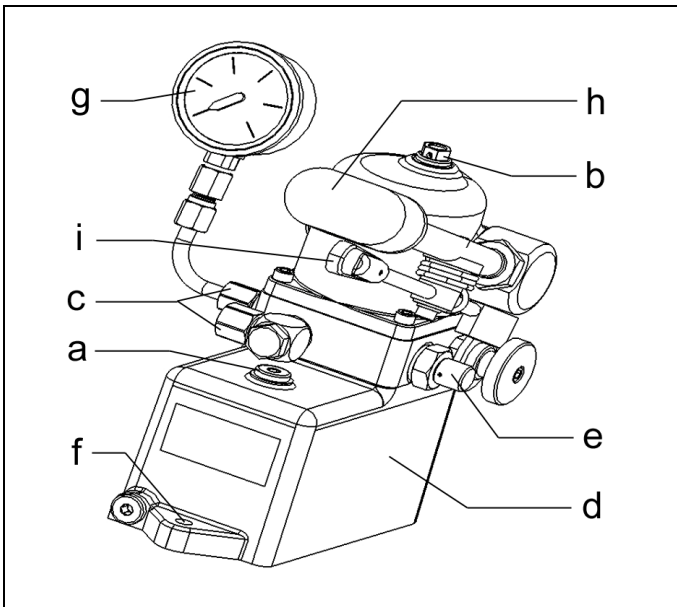


Figure 3: Overview of the components (principle figure 8806, 8807)

a Oil port	g Pressure gauge (accessory)
b Vent screw	h Foot pedal (accessory)
c Pressure port	i Safety pedal (accessory)
d Oil reservoir	r Bracket (accessory)
e Pressure relief valve	s Flange (accessory)
f Fixing possibilities	t Base (accessory)

The power unit has to be mounted in upright position. Bleeding of the hydraulic system is facilitated, when the hydraulic pump is arranged below the cylinder level (see 9.2).

An air bleeding possibility has to be provided at the highest or remotest point of the installation.

- Install the pump unit at an appropriate place.
- Pump units have to be fixed at the provided flange diameters / clips at the bottom of the reservoir (see chapter overview of the components). For mobile use, the accessory base has to be used.

For mounting on the bottom a base or bracket is required, for mounting at a machine a flange or bracket is available as accessory (see data sheet).

In the case of foot lever operation, a depth stop has to be provided on the site to protect the pump against mechanical overload, if the pump lever is not supported in the lower position by the floor.

8.1 Installation

⚠ CAUTION

Malfunctions!

Chips, coolants and cutting fluids can cause malfunctions.

- Protect the power units against penetration of chips, coolants and cutting fluids!

ℹ Note

Dirt from entering the system

- With increasing dirt penetration into the hydraulic system, additional high-pressure filters have to be provided in front of the connections.

8.2 Connection of the hydraulic equipment

1. Connect hydraulic lines to qualifying standards and pay attention to scrupulous cleanliness!
2. For mobile use use high-pressure hoses

ℹ Note

More details

- See ROEMHELD data sheets A 0.100, F 9.300, F 9.310 and F 9.360.

Screwed Plug

- Use only fittings "screwed plug B and E" as per DIN 3852 (ISO 1179).

hydraulic connection

- Do not use sealing tape, copper rings or coned fittings.

9 Start up

9.1 Charging with hydraulic oil

⚠ WARNING

Poisoning due to contact with hydraulic oil!

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.



For works with operating fluids, pay attention to the safety data sheets!



For works at and with the product, wear suitable protection equipment!

Note

The product is delivered with oil filling.

Filling of the system must only be made when the connected hydraulic actuators and accumulators are in off-position. Otherwise the stored oil volume in the actuators or accumulators may lead to oil escaping!



For gear and piston pump combinations

Use hydraulic oil as per DIN 51524-2 HLP 32.

Hydraulic fluids

Operation of the products with hydraulic fluids that do not correspond to the specifications is inadmissible. See technical characteristics:

Impurities in the oil tank to avoid!

No impurities must enter into the oil reservoir. Use clean filter cloth!

For oil filling proceed as follows:

1. Make sure that all hydraulic actuators (hydro-cylinders, etc.) are retracted in off-position!
2. Depressurise the system e.g. by pressing the emergency stop at the valves (depending on the type).
3. Unscrew vent screw and fill with oil.
4. Insert clean funnel with filter or filter cloth (see purity class) in oil filler neck.
5. Fill with hydraulic oil (quantity, see technical data).
6. Screw in vent screw.
7. Operate the fixture several times. (For the first start up pay attention to the chapter "Bleeding of the hydraulic system".)
8. Check oil level and refill hydraulic oil, if necessary.

9.2 Bleeding of the hydraulic system

After filling the hydraulic oil there is still residual air in the internal and external pipes and the hydraulic drives (hydraulic cylinders, etc).

Air in hydraulic systems has among other things the following undesirable effects:

- longer extending and retracting times e.g. of the hydro-cylinder.
- short cycling
- Accelerated ageing of the oil.
- Increased wear at seals and pump.

To avoid these undesirable effects the whole hydraulic system (power unit, valves, drives and piping) have to be bled by repeated operation of the hydraulic drive!

Procedure:

1. For bleeding the oil pressure has to be reduced to a very low value!
2. Adjust pressure relief valve to the lowest possible value by screwing counterclockwise (see section "Adjust operating pressure" in the chapter "Start up").
3. Pressurise clamping line.
4. Loosen carefully a bleeding screw or a fitting at the highest or remotest point of the fixture.
5. Pump until bubble free oil comes out.
6. Close bleeding point.
7. If double-acting elements are used, bleeding has to be effected also for the unclamping line.
8. Refill lost oil.

9.3 Adjust operating pressure

WARNING

Injury due to movement of the connected drives!

- Connected drives can carry out a movement.
- Secure the working area of the drives.

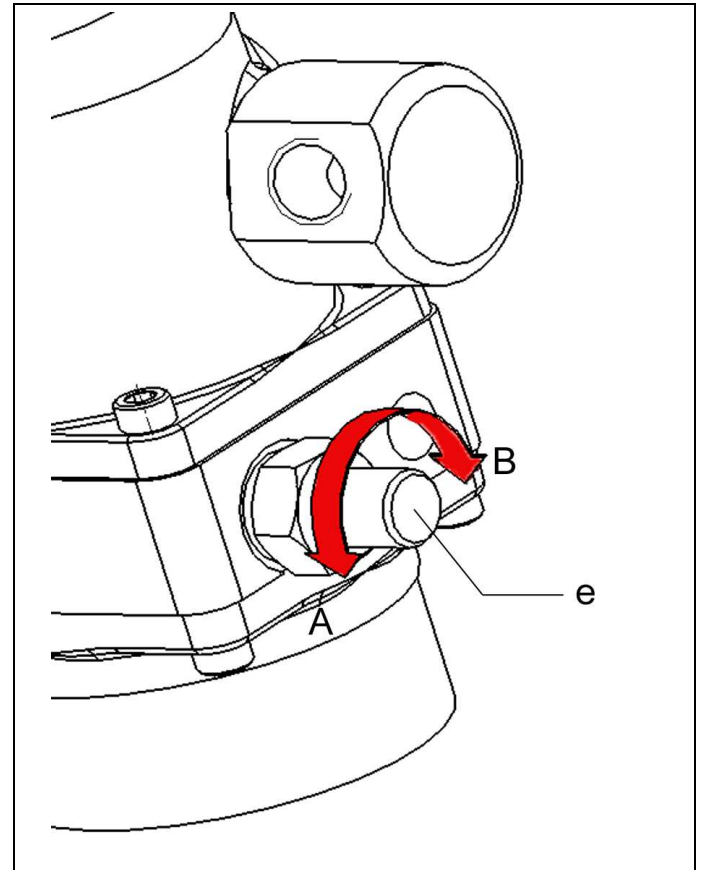


Figure 4: Adjust the operating pressure at the pressure relief valve

e Pressure relief valve	
A Reduce pressure	B Increase pressure

The pressure relief valve (knurled screw) has been adjusted in the factory to the maximum operating pressure (see technical characteristics).

1. Adjust the operating pressure at the pressure relief valve (knurled screw):
Increase pressure screwing in, reduce pressure by unscrewing the knurled screw.
2. Check operating pressure at the pressure gauge.
3. Carry out a functional test, pump several times until the pressure no longer increases.

10 Operation

⚠ WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil under high pressure.

- Before using them make a visual control.

Injury by crushing!

Components of the product make a movement while they are in operation.

- This can cause injuries.
- Keep parts of the body and items out of the working area!

The hydraulic pumps can be operated by hand or by foot. The pump lever is returned to the zero position by means of a spring return.

Clamping

1. Operate the pump lever several times (press downwards by 40°).
2. Release the pump lever as soon as the clamping process (the motion) has been made and the operating pressure is displayed at the pressure gauge.

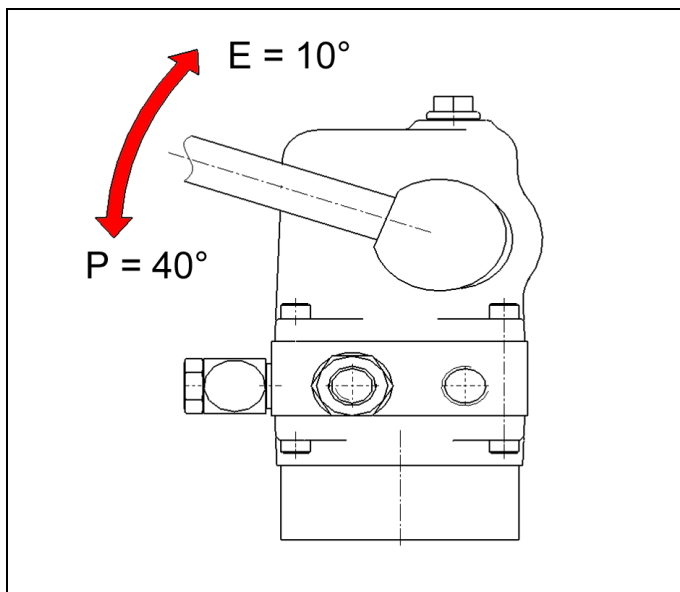


Figure 5: Clamping (P) and unclamping (E)

Unclamping

1. Pull the pump lever upwards by 10°.
2. Release the pump lever when the pressure is reduced and the cylinders are returned to the off-position.

i NOTE

Hydraulic pumps with safety detent lever (hand or foot lever) can only be released after unlocking.

11 Maintenance

11.1 Plan for maintenance

Maintenance works	Interval	Realisation
Cleaning	As required	Operator
Check	daily	Operator
Checking of hydraulic system and components	yearly	Qualified personnel
Exchange of hydraulic fluids	in case of damages	Qualified personnel
Repair		ROEMHELD service staff

11.1.1 Daily checks

- Check all fixing screws, retighten if required.
- Check all cable fixings and fittings, retighten if required.
- Check if hydraulic hoses, pipes and cables are damaged, or have chafe marks, etc.).
- Check hydraulic components for external leakage - retighten fittings, if required.
- Hydraulic hoses must not get in contact with substances which can cause a damage (acids, lys, solvents,).

11.1.2 Yearly checks

Hydraulic system, hydraulic hoses

An expert has to check all hydraulic components at least once a year if they are still work-proof. Assessed damages have to be repaired immediately.

The following checks and works have to be effected:

- An expert has to check all hydraulic hoses at least once a year if they are still work-proof. Assessed damages have to be repaired immediately.
- The hydraulic hoses of the device have to be exchanged as per BGR 237 at least after 6 years by new ones.

11.2 Cleaning

⚠ WARNING

Injury by flying out components or oil!

- For cleaning works always wear safety goggles, protective shoes and safety gloves.

⚠ CAUTION

Aggressive cleaning agents

The product must not be cleaned with:

- Corrosive or corroding components or
- Organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), because this can destroy the seals.

The following cleaning works have to be effected daily at the mechanical components:

- Clean the product only with cleaning clothes.
- Afterwards lubricate slightly movable components (piston rods, guides etc.) and not coated steel components.

11.2.1 Clean oil screens (if available)

Note

The screen disks are in the hydraulic ports.

11.2.2 Maintenance and check of the hydraulic fluid

Important factors that influence the degree of contamination of the hydraulics fluid are:

- Contamination of the surroundings
- Size of the hydraulic system
- Design of the hydraulic system as specified
- Number of consumer elements,
- Cycle time,
- Number of fluid circulations through the filter per time unit,
- Implementation of the maintenance schedules,
- Training of the maintenance personnel.

They change the operating characteristics of hydraulic fluids and lead to their ageing.

The monitoring of the condition and a filtration adapted to the requirements of the application (if necessary, draining and degasification) are indispensable for the maintenance of the operating characteristics and guarantee of a long service life of hydraulic fluids and components.

The hydraulic fluid must be regularly exchanged or examined by the lubricant manufacturer and/or qualified staff.

A reference investigation according to the maintenance schedule with analysis as per ISO 4406 or mass of impurities with analysis as per E 12662 is recommended

Note

For guarantee, liability and warranty claims, maintenance proofs and/or the results of analysis of the hydraulic fluids have to be submitted to us.

Filtration and cleanliness level of the hydraulic fluid

Pay attention to the indication for filtration and purity class of the hydraulic fluid (see technical characteristics).

11.2.3 Oil change

WARNING

Burning due to hot oil!

- In operating conditions oil temperatures up to 70 °C can appear due to environment influences.
- All works must only be made in cool mode!

Poisoning due to contact with hydraulic oil!

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.



For works with operating fluids, pay attention to the safety data sheets!



For works at and with the product, wear suitable protection equipment!

Note

- Oil changes must only be made in depressurised mode.

Dirt from entering the system

- With increasing dirt penetration into the hydraulic system, additional high-pressure filters have to be provided in front of the connections.



For gear and piston pump combinations

Use hydraulic oil as per DIN 51524-2 HLP 32.

To change the oil proceed as follows:

1. Make sure that all hydraulic drives (hydro-cylinders, etc.) are retracted in off-position!
 2. Switch off main switch at the electric control, switching position "0", or disconnect from the mains.
 3. Depressurise the system e.g. by pressing the emergency stop at the valves (depending on the type).
- Unscrew oil drain plug.
 - Drain oil completely
 - Apply oil drain plug - if required screw in new screw (see spare parts list).

Fill with oil and bleed

See section "Start up".

12 Trouble shooting

Trouble	Cause	Remedy
Pressure is not built up after repeated pumping	Oil level is too low	Refill oil
	Internal failure	Repair required by ROEMHELD
Pressure is not reduced after pulling up the pump lever	Internal failure, drain valve damaged	Repair required by ROEMHELD
Pressure reduces under load	Internal leakage	Extend and retract the product several times by operating the pump lever
		Repair required by ROEMHELD
Emerging hydraulic oil	Customer's operating element (hand lever or foot lever) too heavy, drain valve is continuously operated.	Use original hand or foot lever
	External leakage in the system	Seal the connection again, replace pipe or hose
	Wear at the seals	Repair required by ROEMHELD

13 Repair

Note

Repair works

- Repair works, as e.g. the change of the interior lifting jack may only be effected by the ROEMHELD service technicians.

14 Technical characteristics

	8804 -006	8805 -006	8806 -006
Max. operating pressure [bar]	200	100	100
Range of adjustment, pressure relief valve	10 bar – max. operating pressure		
Displacement per stroke [cm ³]	4	8	8
Oil volume [cm ³]	300	300	970
Oil volume, useable [cm ³]	150	150	750
Weight [kg]	6.1	6.1	9.5
Max. operating force with standard lever [N]	500 ¹⁾		

	8807 -006	8808 -006	8816 -006
Max. operating pressure [bar]	200	200	500
Range of adjustment, pressure relief valve	10 bar – max. operating pressure		
Displacement per stroke [cm ³]	4	4	2
Oil volume [cm ³]	970	400	300
Oil volume, useable [cm ³]	750	250	150
Weight [kg]	9.5	6.4	6.1
Max. operating force with standard lever [N]	500 ¹⁾		600 ¹⁾

¹⁾ see force/operating pressure diagram on data sheet D 8.800.

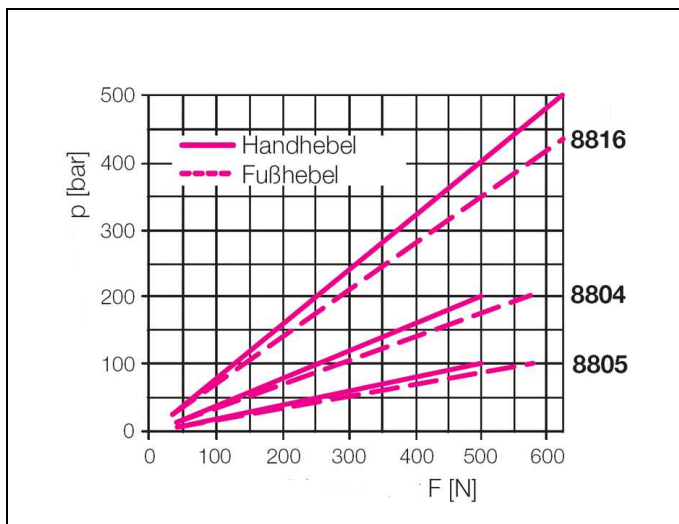


Figure 6: Obtainable operating pressure p as a function of the operating force F

Purity of the hydraulic fluids

The admissible contamination (unsolved impurities in the hydraulic fluid) depends on the component of the hydraulic system that is most sensitive to dirt. The indicated purity class is the maximally admissible value that should not be exceeded, with regard to the operating safety (clogging of gaps, orifices as well as the locking of the control piston) and the service life (wear reduction).

Application	Minimum purity as per NAS 1638	Minimum purity as per ISO 4406	attainable with filter fineness *
Radial piston and gear pumps, valves and cylinders	8 (recommended: 5 up to 7)	20 / 17 / 13	$\leq 20 \mu\text{m}$
Proportional pressure and flow control valves	7 (recommended: 5 up to 6)	18 / 16 / 13	$\leq 10 \mu\text{m}$

* Important influential factors see chapter: "Maintenance and check of the hydraulic fluid"

Note

New hydraulic fluid

- Please note that a new hydraulic fluid "on tap" does not meet the requirements of cleanliness. If necessary, use cleaned oil (Pour oil see 9.1).

Mixing of different types of hydraulic fluid

- Mixing of different types of hydraulic fluid can lead to unintended chemical reactions with mud formation resinification or similar.
- Therefore, the respective manufacturers should be consulted for a change between different hydraulic fluids.
- In any case, the entire hydraulic system is to be rinsed thoroughly.

15 Accessory

Note

Accessories

- See data sheet.

16 Storage

CAUTION

Storage of components!

- The product may not be exposed to direct solar radiation, because the UV light can destroy the seals.
- A storage differing from the storage conditions is inadmissible.
- In case of improper storage, the seals can embrittle and resinification of the anti-corrosive oil or corrosion at the element can occur.

The elements are tested by default with mineral oil. The exterior of the elements is treated with a corrosion inhibitor.

The oil film remaining after the test provides for a six-month interior corrosion protection, if stored in dry and uniformly tempered rooms.

For longer storage times, the element has to be filled with a non-resinifying corrosion inhibitor and the outside surfaces must be treated.

17 Disposal

DANGER



Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

The manufacturer commits to transmit the special documents of the products to state authorities on request.

The technical documentation as per appendix VII part B was prepared for the products.

Responsible person for the documentation:

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Römheld GmbH

Friedrichshütte

Laubach, 18.07.2013

18 Declaration of manufacture

18.1 Manufacturer

Manufacturer

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18.2 Declaration of manufacture

are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards.

In accordance with EC-MSRL, these products are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).