Power units

Basic version, oil reservoir V = 27 l, 40 l and 63 l

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1 Description of the product

Description of the gear pump

The gear pump of the power unit generates a constant flow rate which is limited to an adjustable pressure.
The power unit may only be operated in a cycling mode or in unpressurised cycle.
If the set operating pressure is reached, the pump switches off or the unpressurised cycle switches on (valve will be deenergised).
If the operating pressure drops by more than 10%, the pump or the valve “unpressurised cycle” will be activated to supply oil.

Description of the piston pump

The power unit generates a constant flow rate which is limited to an adjustable pressure.
The flow rate of the piston pump continues pressure build up until the adjusted value has been achieved.
The power unit may only be operated in a cycling mode or in unpressurised cycle.
If the set operating pressure is reached, the pump switches off or the unpressurised cycle switches on (valve will be deenergised).
If the operating pressure drops by more than 10%, the pump or the valve “unpressurised cycle” will be activated to supply oil.

Two-stage-pump with a gear pump and a piston pump

The power unit generates a constant flow rate which is limited to an adjustable pressure (see technical characteristics).
In case of the two-stage pump the gear pump is switched to unpressurised cycles by the integrated idling control valve as soon as a pressure of 80bar is exceeded; thereby the flow rate will be reduced correspondingly.
Depending on the design there are two types of operation for the power unit:

- in a cycling mode: As soon as the adjusted operating pressure is obtained, the pump switches off. The pump switches on again, if the operating pressure drops by more than 10%. The adjusted operating pressure will be kept by a check valve. The check valve is mounted in the plate of the pressure switch.
- in unpressurised mode: As soon as the adjusted operating pressure is obtained, a valve, which returns the flow rate unpressurised to the reservoir, switches. The adjusted operating pressure will be kept by a check valve. The check valve is mounted in the plate of the pressure switch.

Description of the high pressure filter

The reliability of a hydraulic system depends for the most part on the cleanness of the hydraulic fluids. It is the task of a high-pressure filter to clean the returning oil from fixtures, etc., which is contaminated (from piping, assembly dirt, etc.), before it will flow again through the hydraulic components of the system (valves, etc.). Thereby the contamination rate is reduced to a minimum, the individual elements are protected against premature wear and the reliability of the system is increased.
The oil filter is installed directly behind the pump in the pressure line of the power unit (see hydraulic circuit diagram). The filter

is equipped with a bypass valve to avoid troubles of functioning in case of blocked filter pores.
Through the bypass valve, unfiltered hydraulic fluid can enter into the system.

Description of the return filter
The reliability of a hydraulic system depends for the most part on the cleanness of the hydraulic fluids. It is the task of a return filter to clean the returning oil from fixtures, etc., which is contaminated (from piping, assembly dirt, etc.), before it will flow again through the hydraulic components of the system (valves, etc.). Thus the contamination rate is reduced to a minimum, and the individual elements are protected against premature wear.
Thereby the individual elements are protected against premature wear and the reliability of the system is increased.
The return filter is mounted at the reservoir cover. The filter has a bypass valve to avoid troubles of functioning in case of blocked filter pores.
The bypass valve reroutes the polluted oil to the clean oil side and prevents scrubbing of dirt particles from the filter element.

Description of the high-pressure filter control
Electrical signal for filter contamination in the high-pressure filter of the power unit.
Due to increasing contamination of the high-pressure filter the cross section for the oil flow becomes smaller and smaller. Thereby the pressure in front of the filter element increases.
To monitor the pressure increase the pressure in front of and behind the oil filter is measured. The filter control is pressurised with both pressures. Due to the rising differential pressure, a spring-loaded piston in the interior of the element is displaced and operates a limit switch which can trigger switching processes. On static conditions (no oil flow) of the system, the piston and the switch return to its initial position.

2 Validity of the documentation

Power units of the data sheet D 8.031.
The following types or part numbers are concerned:

Power units with gear pump
8142 120, 8144 120, 8144 140, 8145 120, 8145 140, 8145 160, 8152 120, 8154 120, 8154 140, 8155 120, 8155 140, 8155 160, 8156 120, 8156 140, 8157 120, 8157 140, 8157 160, 8158 120, 8158 140, 8158 160, 8159 140, 8159 160, 8164 120, 8164 140, 8164 160, 8165 120, 8165 140, 8165 160, 8166 140, 8166 160, 8167 140, 8167 160, 8168 140, 8168 160, 8174 120, 8174 140, 8174 160, 8175 120, 8175 140, 8175 160, 8176 140, 8176 160, 8177 140, 8177 160, 8178 140, 8178 160, 8185 120, 8185 140, 8185 160, 8186 140, 8186 160, 8187 140, 8187 160, 8188 140, 8188 160, 8189 160

Power units with piston pump
8223 120, 8223 140, 8252 120, 8252 140, 8252 160, 8253 140, 8253 160, 8254 120, 8254 140, 8255 120, 8255 140, 8256 120, 8256 140, 8256 160, 8257 140, 8257 160, 8258 140, 8258 160, 8267 140, 8267 160, 8268 140, 8268 160, 8269 140, 8269 160, 8275 120, 8275 140, 8276 120, 8276 140, 8277 140, 8277 160, 8278 140, 8278 160, 8279 140, 8279 160,

Double power unit with combined gear and piston pumps
8280 125, 8280 145, 8281 125, 8281 145, 8283 145, 8284 145, 8285 145, 8286 145, 8286 165, 8287 145, 8287 165, 8288 165, 8289 165, 8290 165,

3 Target group of this document

3.1 Operator

Tasks:
Operation in setting or automatic mode.

Qualification
No special requests, introduction on the basis of the operating instructions, danger instruction, minimum age 18 years.

3.2 Qualified personnel

Tasks:
Transport, installation, start up, setting mode, trouble shooting, putting out of service, checks, maintenance works.

- Specialists, fitters and set-up men of machines and installations with hydraulic expert knowledge.
- Specialists, fitters and set-up men of machines and installations with expert knowledge in electrical engineering.

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 (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** 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.

3.3 Expert / qualified person

Tasks:
Maintenance and test of safety equipments.

Qualification
The specifications in the operating safety regulations (BetrSichV) after professional training and prompt professional activity are as follows:
- Technical professional training, e. g. as skilled worker,
- At least two years work experience,
- After classification of the dangerousness corresponding tests passed,
- Regular further training,
- Knowledge of relevant rules and standards (regulations, standards),
- Involvement in the handling of the corresponding products and regular test activities.

An expert / qualified person is a person who has sufficient knowledge in design, control and applications due to their professional education and experience:
- Safety devices as:
  - Two-hand control,
  - Safety light curtains and light grids
  - Separating safety devices,

- etc.

- Hydraulic components as:
  - Safety-related parts of controls,
  - Hydraulic hoses,
  - Accumulators,
  - etc.
- Electric components as:
  - Safety-related parts of controls,
  - etc.
- Technical professional training, e. g. as skilled worker,
- etc.

and is familiar with the respective national work safety regulations, accident prevention directions, guidelines and generally accepted technical rules and regulations (e. g. DIN standards, VDE regulations, technical rules of other EC member states) so that he is in the position to judge the working safety and to carry out the delegated tasks.

4 Symbols and signal words

⚠ DANGER

Danger of life / heavy health damages

Stands for an imminent danger.
If it is not avoided, death or very severe injuries will result.

⚠ 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.

Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

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 to information and avoidance of dangers for transport, operation 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 product can be guaranteed.
Furthermore, the consideration of the operating instructions will result in:

- avoid injuries
- reduced down times and repair costs,
- increased service life of the products.

6 Safety instructions

⚠ DANGER

Unexpected start of the connected cylinders when switching on the power units!

- When switching on, the operating pressure will be generated and in the process the cylinders can move!
- Secure the working area adequately!

Injury due to movement of the connected drives!

- The pump motor starts running again after the clamping process and a pressure drop of 10% to maintain the clamping pressure!
- Connected drives can carry out a movement!
- Secure the working area of the drives!

⚠ WARNING

Injuries caused by missing safety devices!

- To avoid injuries appropriate safety devices must be provided by the customer.

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!

Injury due to overturning product!

- Overturning product due to inappropriate means of transportation.
- Do not stand below the load during lifting and lowering, stay outside the danger zone.
- Use suitable means of transportation.
- Pay attention to the weight of the equipment.
- Pay attention that the product is safely located (centre of gravity see instruction sign).

Poisoning due to contact with hydraulic oil!

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

Injury due to pressure intensification due to incorrectly actuated valves!

Valves are represented in off-position (de-energised).
When connecting double-acting hydraulic elements to two identical valves, these must be actuated alternately!
Unequal valves must be activated together!

⚠ 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.

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!

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

Injury / burning due to contact with energized parts!

- Before working on electric equipment, the energized parts must be de-energized and secured.
- Do not open protection covers at electric parts.
- All electrical works must only be realised by electricians.

⚠ 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.

Hydraulic power unit can be damaged!

- Stick absolutely to the indicated direction of the rotary field.

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.

6.1 Personal protective equipment

For works at and with the product, wear safety goggles!

For works at and with the product, wear protective gloves!

For works at and with the product, wear safety shoes!

For all works at the product, the operator has to make sure that the necessary protection equipment will be worn.

6.2 Safety devices

Figure 1: Safety device, warning at the terminal box of the motor / electric control

7 Application

7.1 Intended use

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.

7.2 Misapplication

⚠ WARNING

Injuries, material damages or malfunctions!

- Do not modify the product!

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 physical / chemical effects (vibrations, welding currents or others) 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.

- Advise on gear pumps:
  gear pumps are due to their design not applicable for punching and stamping.

8 Transport

⚠ WARNING

Injury due to overturning product!

- Overturning product due to inappropriate means of transportation.
- Do not stand below the load during lifting and lowering, stay outside the danger zone.
- Use suitable means of transportation.
- Pay attention to the weight of the equipment.
- Pay attention that the product is safely located (centre of gravity see instruction sign).

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

The product is secured and delivered on a pallet for transport.
The product fixed on the pallet for transport may only be transported to the place of installation by means of a corresponding conveyor (pay attention to the min. lifting force).
Pay attention that the product is safely located on the hand-lift truck or fork lift truck.
The pallet must be lifted from the pallet by means of a conveyor. It is important to pay attention to the centre of gravity of the product

9 Assembly

⚠ WARNING

Injuries caused by missing safety devices!

- To avoid injuries appropriate safety devices must be provided by the customer.

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.

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

9.1 Overview of components

9.1.1 Representation of all components in the overview

In the following representation, all possible components are represented.

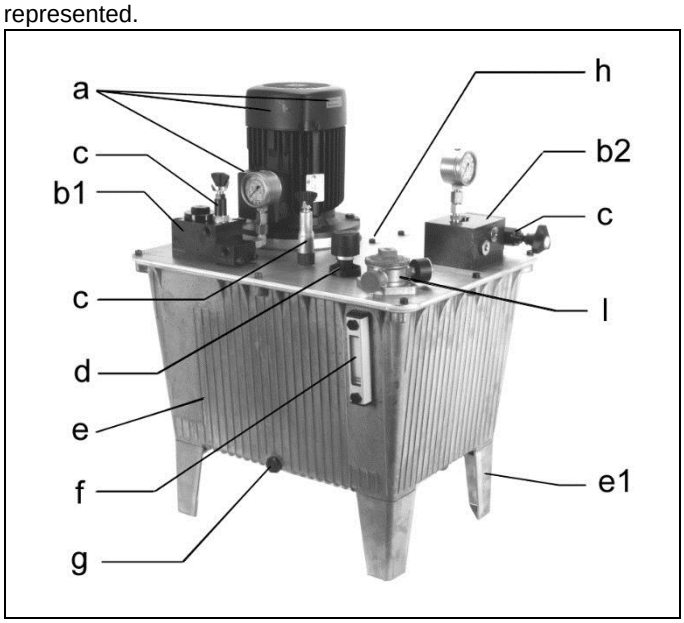


Figure 2: Principle figure of all possible components with accessories

a	Electric motor with pump, terminal strip and arrow for the control of the motor's sense of rotation	e	Oil reservoir
b1	Connecting block with pressure relief valve and high-pressure filter	e1	Oil reservoir foot with the possibility for fixing
b2	Connecting block with pressure relief valve	f	Oil level gauge
c	Pressure relief valve	g	Oil drain plug
d	Air filter and oil filler neck with instruction signs	h	Bleeding screw with sign (only for piston pumps and two-stage pumps)
		l	Return filter with contamination indicator

9.1.2 Power unit with connecting block and return filter

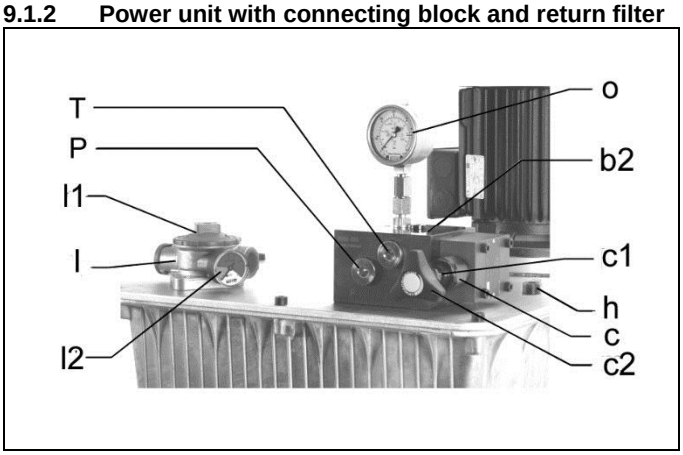


Figure 3: Principle figure of the pressure relief valve and the return filter

b2 Connecting block with pressure relief valve	l Return filter
c Pressure relief valve	l1 Screw cap, to change the filter cartridge
c1 Lock nut	l2 Contamination indicator
c2 Adjusting screw of the pressure relief valve	o Pressure gauge for system pressure display
h Bleeding screw with sign (only for piston pumps and two-stage pumps)	P Connection of pressure line
	T Connection of reservoir / return line

9.1.3 Power unit with connecting block and high-pressure filter

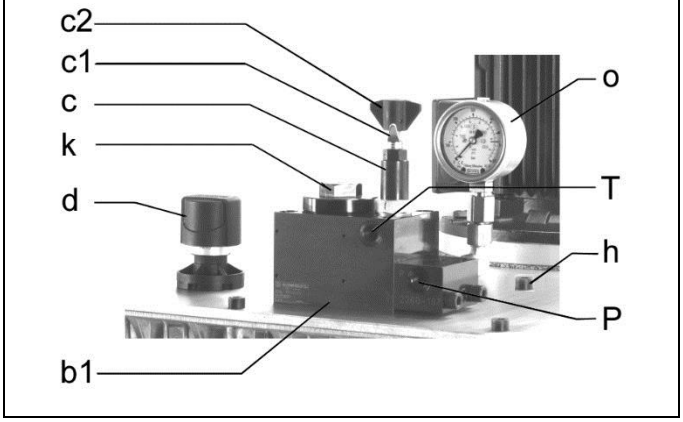


Figure 4: Principle figure of connecting block and of filling and ventilation filter

b1 Connecting block with pressure relief valve and high-pressure filter	h Bleeding screw with sign (only for piston pumps and two-stage pumps)
c Pressure relief valve	k High-pressure filter with screw cap to change the filter cartridge
c1 Lock nut	o Pressure gauge with system pressure display
c2 Adjusting screw of the pressure relief valve	P Connection of pressure line
d Filling and ventilation filter with signs	T Connection of reservoir / return line

9.1.4 Power unit without connecting block, with return filter

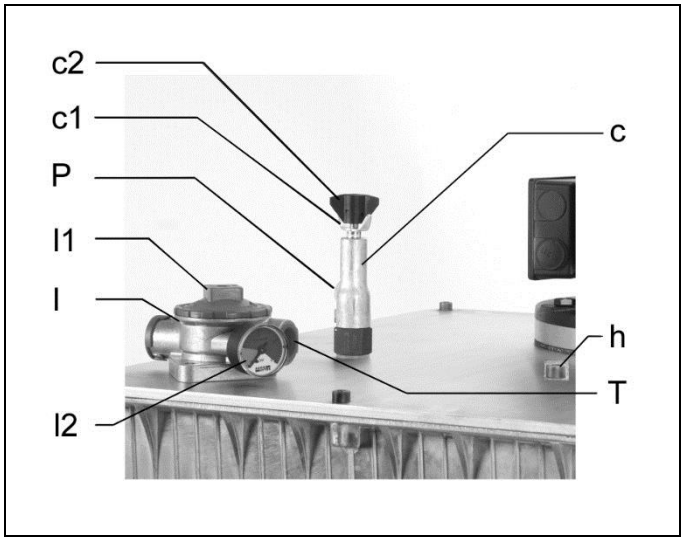


Figure 5: Principle figure of connecting block and of filling and ventilation filter

c Pressure relief valve	l Return filter
c1 Lock nut	l1 Screw cap, to change the filter cartridge with signs
c2 Adjusting screw of the pressure relief valve	l2 Contamination indicator
h Bleeding screw with sign (only for piston pumps and two-stage pumps)	T Connection of reservoir / return line
	P Connection of pressure line

10 Installation

⚠ CAUTION

Malfunctions!

Chips, coolants and cutting fluids can cause malfunctions.

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

The power unit has to be mounted in upright position, if possible above the installation or fixture.

If the power unit will be installed below the fixture, an air bleeding possibility has to be provided at the highest point of the installation.

- Install the power unit at an appropriate place.
- If required mount at the provided holes / plates at the bottom of the reservoir (see chapter Overview of components).

10.1 Connection of the hydraulic equipment

1. Connect hydraulic lines to qualifying standards and pay attention to scrupulous cleanness (A = Extend, B = Retract)!

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.

Pressure fluids
- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

NOTE

Connection of the hydraulic

Further connection data, plans or similar (e. g. hydraulic, electric circuit diagrams or electrical parameters) see enclosures!

10.2 Electric connection

⚠ WARNING

Injury / burning due to contact with energized parts!
- Before working on electric equipment, the energized parts must be de-energized and secured.
- Do not open protection covers at electric parts.
- All electrical works must only be realised by electricians.

⚠ CAUTION

Work by qualified personnel
- Works only to be effected by authorised personnel.

Note

Pay attention to the enclosed electric circuit diagram and electrical characteristics!

1. Check if the electric connection is in accordance with the operating voltage of the motor (see name plate).
2. In case of power units with electric control put the main switch to "0".
3. Open the cover of the terminal box / electric control.
4. For power units with terminal box:
   Insert the motor connecting line into the provided fitting and connect it to the terminals L1, L2, L3 and PE.
   For power units with electric control:
   Insert the mains connecting line into the provided fitting and connect it to the terminals L1, L2, L3 and PE.
5. Insert the lines for machine tool interlock into the provided fittings and connect them to the provided terminals.
6. Close the cover of the terminal box / electric control.

Sense of rotation of the electric motor

The following senses of rotation must be kept:
- for radial piston pump any direction,
- for gear pump clockwise,
- for two-stage pump counterclockwise,

(viewed from above onto drive shaft, see arrow at the electric motor)

10.3 Oil level and oil temperature control

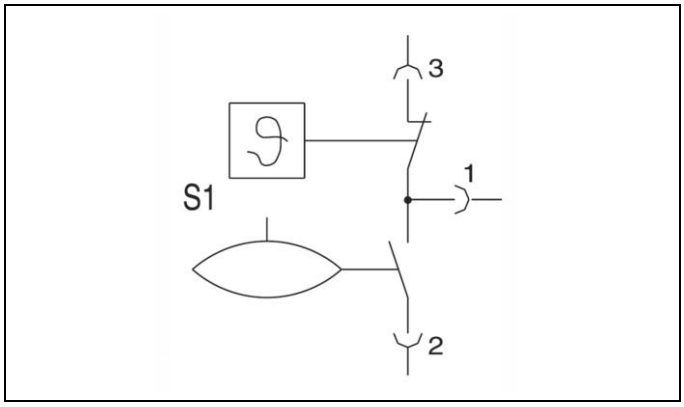


Figure 6: Circuit diagram, oil level and oil temperature control (accessory)

11 Start up

11.1 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 pressure generator is delivered without oil filling.
- Filling must only be made when the connected hydraulic actuators and accumulators are in off-position.
- Accumulated oil volume in actuators or accumulators can lead to overflowing of the oil reservoir!

Hydraulic fluids

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

Pressure fluids
- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

Impurities in the oil reservoir to avoid!

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

Follow the signs

NOTE

Attention!
Before filling the oil, unscrew bleeding screw M6. Screw in again after filling.

(Used for piston pumps or combinations)

Note
Fill with oil here.

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).

For piston pumps
Use hydraulic oil as per DIN 51524-2 HLP 22.

For gear and piston pump combinations
Use hydraulic oil as per DIN 51524-2 HLP 32.

For gear pumps
Use hydraulic oil as per DIN 51524-2 HLP 46.

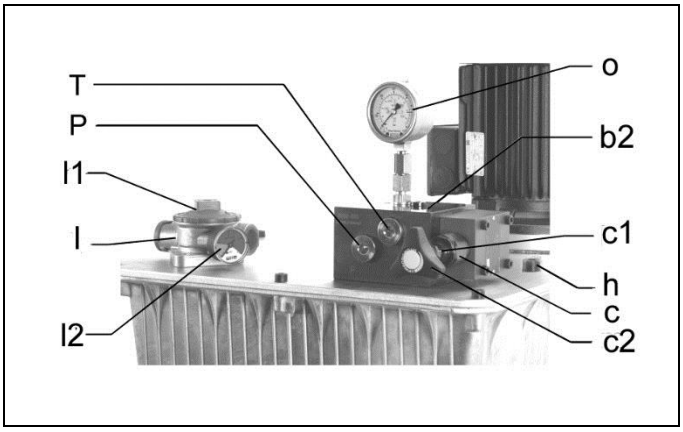


Figure 7: Power unit with connecting block and return filter

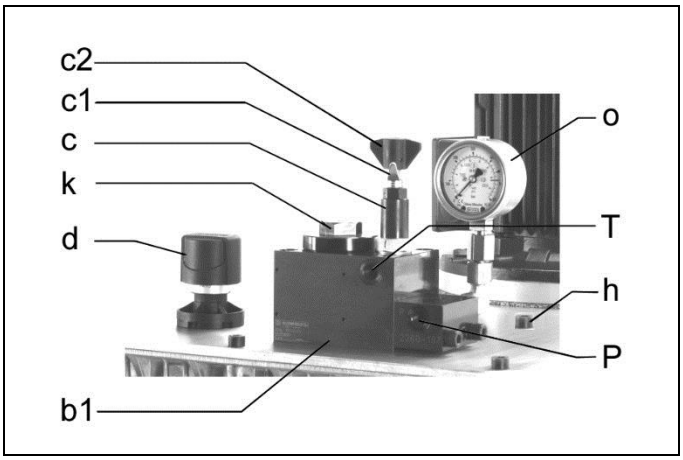


Figure 8: Power unit with connecting block and high-pressure filter

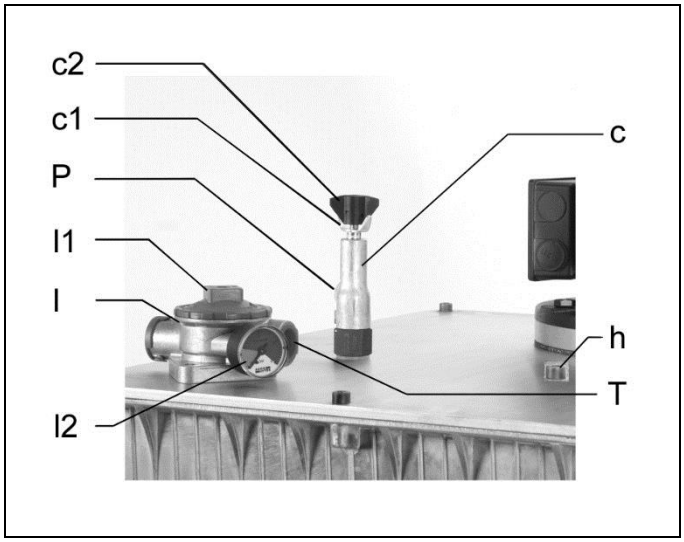


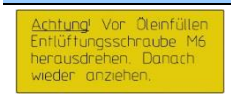
Figure 9: Power unit without connecting block, with return filter

b1	Connecting block with pressure relief valve and high-pressure filter	k	High-pressure filter with screw cap to change the filter cartridge
b2	Connecting block with pressure relief valve	l	Return filter with contamination indicator
c	Pressure relief valve	l1	Screw cap, to change the filter cartridge
c1	Oil reservoir foot with the possibility for fixing	l2	Contamination indicator
c2	Adjusting screw of the pressure relief valve	o	Pressure gauge for system pressure display
d	Air filter and oil filler neck with instruction signs	P	Connection of pressure line
h	Bleeding screw with sign (only for piston pumps and two-stage pumps)	T	Connection of reservoir / return line

For oil filling 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).
4. • Unscrew the cover for oil filling at the return filter or the filling and air filter.

NOTE



Attention!
Before filling the oil, unscrew bleeding screw M6. Screw in again after filling.

(Used for piston pumps or combinations)

5. Insert clean funnel with filter or filter cloth (see purity class) in oil filler neck.
6. Filling of hydraulic oil until hydraulic oil can be seen between the two markings at the oil level gauge.
7. Screw in cover.
8. Operate the fixture several times.
   (For the first start up pay attention to "Bleeding of the hydraulic system".)
9. Check oil level and refill hydraulic oil, if necessary.

11.2 Bleeding of the hydraulic system

Only for piston pumps

⚠ CAUTION

Malfunction caused by air in the system

Before filling the oil, unscrew bleeding screw M6.
Screw in again bleeding screw after filling.

Piston pumps must be bled:

1. Before filling the oil, unscrew bleeding screw M6.
2. Fill with oil.
3. Screw in again bleeding screw approx. 15 minutes after filling.

For all pumps

After filling the hydraulic oil there is still 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:

- prolongation of the extending and retracting times of consumer elements
- 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 suitable measures!

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.
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.

NOTE

Carry out function test.

- The operating direction of the control units must be obvious to the direction of motion of the plant.

11.3 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.

If a separate pressure switch is available for machine tool interlock (see hydraulic circuit diagram) the following procedure is required:

- first adjust machine tool interlock (see section "Adjust machine tool interlock (optional)“,
- then adjust the operating pressure.

11.4 Adjust machine tool interlock (optional)

11.4.1 Adjustment of machine tool interlock(MB) with mechanical pressure switch

The pressure switch is adjusted to approx. 80% of the operating pressure or the pressure indicated on the hydraulic circuit diagram.

For use as machine release, it is electrically interlinked with the control of the machining machine.

So the machine tool interlock can only start if the fixture is clamped.

On the other hand, the machine tool is immediately switched off if the pressure in the system drops by more than 20%.

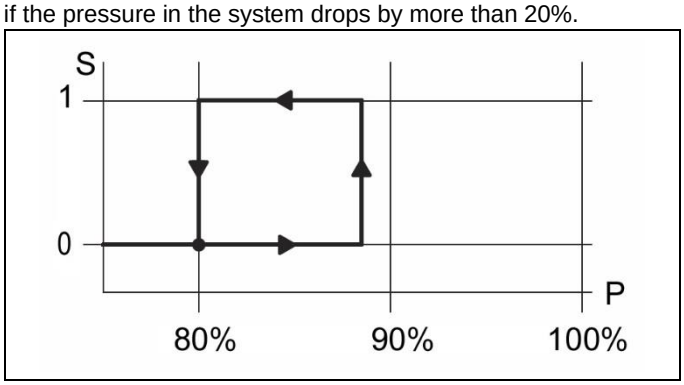


Figure 10: Switching points for machine tool interlock

S Switching output	P Operating pressure

Procedure for adjustment:

- Adjust the pressure relief valve (system pressure) to 80% of the operating pressure.
  For this purpose, adjust the pressure switch to switch off the pump motor to the max. setting value (“Reset”- function for teach-In pressure switches).
  The pump motor must permanently run against pressure.
  - Perform the following adjustment procedure as far as possible without interruption, as the oil is now strongly heated.
- Operate the corresponding control valve for pressurising the pressure switch to be adjusted.
- Turn the pressure switch **counterclockwise** until the switching point is obtained (LED illuminates green)
- Turn the pressure switch **counterclockwise** until the switching point is obtained (LED illuminates yellow)

After the adjustment of the pressure switch (MB), the operating pressure has to be set again.

The pump motor must be correctly switched off or the pump must be relieved by an "unpressurised cycle".

* Only possible for power units with an external motor.

11.4.2 Adjust operating pressure with electronic Teach-In system pressure switch.

Figure 11: Design of the pressure switch with Teach-In function

1 Pressure increase

- Main switch ON (connect operating voltage).
  The device is automatically in RUN mode
  The current pressure is displayed.
- Simultaneously actuate the push-buttons at the pressure switch ▲ and ▼ (Reset/Esc) for at least 3 seconds (see operating instructions of the Teach-In pressure switch).
- Thus the TEACH mode is activated.
  The digital display extinguishes cyclically in TEACH mode and the pump
  runs in continuous operation against pressure.
- Adjust at the pressure relief valve ("I") the desired higher pressure by clockwise turning of the knurled screw. Control by digital display.
- Tighten lock nut.
- Actuate push-button Enter/Set.
  The digital display now shows permanently the current system pressure.

Now the pump switches off and/or the valve (optional) for unpressurized cycle
* relieves the pump (clearly audible).

After a pressure drop of 10% (return switching point pressure switch) the pump supplies again.

* Only possible for power units with external motor.

Note

A pressure reduction is not possible in this cylce. See next section.

2 Pressure reduction

- Simultaneously actuate the push-buttons at the pressure switch ▲ and ▼ (Reset/Esc) for at least 3 seconds (see operating instructions of the Teach-In pressure switch).
- Turn out the knurled screw at the pressure relief valve ("I") by some counterclockwise turns
- Operate for a short time the cylinder control for the pressure relief of the system.
- The current pressure is displayed.
- Adjust at the pressure relief valve the desired higher pressure by clockwise turning of the knurled screw. Control by digital display.
- Tighten lock nut.
- Actuate push-button Enter/Set.
  The digital display now shows permanently the current system pressure.

Note

Check and readjust, if required, the adjustment in warm operating mode.

Note

The pressure gauge or the digital display shows the corresponding current pressure.

1 Pressure increase

- Connect operating voltage.
  At the plug of the pressure switch there is a luminous diode, which should be lit in green after the pressure built-up. If the switching point is not reached, the LED illuminates yellow.
- Adjust the pressure switch by several clockwise turns. The pump must now supply in continuous operation against pressure.
- Adjust the wing screw at the pressure relief valve clockwise until the desired pressure is obtained.
- Tighten lock nut.
- Adjust the pressure switch counterclockwise until the LED at the plug of the pressure switch switches from yellow to green.
  Then turn a further quarter of a turn counterclockwise (internal switching tolerance) to maintain a secure switching point.
  Check the pressure again.

Now the pump switches off and/or the valve (optional) for unpressurised cycle relieves the pump (clearly audible).

After a pressure drop of 10% (return switching point pressure switch) the pump supplies again.

Note

A pressure reduction is not possible in this cylce. See next section.

2 Pressure reduction

- Adjust the pressure switch by several clockwise turns. The pump must now supply in continuous operation against pressure.
- Turn out the wing screw at the pressure relief valve by some counterclockwise turns.
- Operate for a short time the cylinder control for the pressure relief of the system.
- Adjust the wing screw at the pressure relief valve clockwise until the desired pressure is obtained.
- Tighten lock nut.
- Adjust the pressure switch counterclockwise until the LED at the plug of the pressure switch switches from yellow to green.
  Then turn a further quarter of a turn counterclockwise.
  Check the pressure again.

Note

Check and readjust, if required, the adjustment in warm operating mode.

11.5 Pressure switch

11.5.1 Brief instruction for the Teach-In function

1. Connect operating voltage.
   The device is now automatically in RUN mode

2.

Press the key Reset / Esc for at least 3 s. → Activation of the TEACH mode (Press arrow key up and arrow key down at the same time.	

The device is now in TEACH mode (display extinguishes cyclically).

3. Now the pressure can be adjusted at the pressure generator and can be checked at the display of the pressure switch.

4.

Shortly press Enter/Set key.	

The device is now again automatically in RUN mode, the switching points were newly calculated and saved.

NOTE

System pressure

If the system pressure is reduced, a pressure relief must be planned at the side of the consumer elements!

This is required to relieve the integrated check valve, otherwise the function is impaired.

12 Operation

⚠ WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

⚠ CAUTION

Avoid overheating of the system

In order to avoid overheating of the system the maximum running time (relative duty cycle) must not be exceeded.

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

Duty cycle (ED)

The relative duty cycle depends on the selected operating pressure and the losses in valves, etc.

Indications for 100% and 40% ED see chart in chapter technical characteristics.

The calculation of the relative duty cycle is based on a cycle time of 10 min. With 40% ED, e.g. the maximum load within the cycle should not exceed 4 min. During the remaining time the motor can carry a load of up to 50% of the nominal output and should run continuously.

Different versions on request:

Other data see chart and data sheet A 0.100.

Note

Duty cycle (ED)

The reachable duty cycle refers only to the electric motor.

The running time of the pump at max. pressure depends on the occurring power losses.

The oil is led by the pressure relief valve to the oil reservoir, if the power unit is operated with 100% duty cycle and no consumer elements are operated. The oil warms up.

Pay attention that the oil temperature does not exceed 70° C.

13 Maintenance

⚠ WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

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

NOTE

Operating instructions

- Further operating instructions for individual components are available in the internet (www.ROEMHELD.com) or on request!

13.1 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 the hydraulic fluid after start up	after 250 operating hours or 3 months	Qualified personnel
Check the hydraulic fluids, if required, exchange the hydraulic fluid and the filter	after 1250 operating hours or 6 months	Qualified personnel
Change the hydraulic fluid and the filter	After 2500 operating hours, at the latest after 24 months, or in case of damage	Qualified personnel
Repair		ROEMHELD service personnel

NOTE

Rest period

- Observe the rest period of at least 1 hour after changing the hydraulic fluid!

13.2 Regular checks

Checks by the operator have to be effected as follows:

13.2.1 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 - re-tighten fittings, if required.
- Hydraulic hoses must not get in contact with substances which can cause a damage (acids, lys, solvents, ...).
- Check the oil level of the hydraulic power unit (see chapter Charging of the hydraulic power unit with oil) - if required re-fill oil (specifications see chapter Technical characteristics).
- Check safety devices as per chapter Safety devices.

13.2.2 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.

13.3 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.

13.4 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.

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	≤ 20 µm
Proportional pressure and flow control valves	7 (recommended: 5 up to 6)	18 / 16 / 13	≤ 10 µm

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

Especially with proportional valves, the repetitive accuracy depends especially on the purity degree of the hydraulic fluid.

Note

New hydraulic fluid

- Please note that a new hydraulic fluid "on tap" does not meet the requirements of cleanness. If necessary, use cleaned oil.

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.

13.5 Oil change

Hazardous to the environment

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

⚠ 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!

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

⚠ CAUTION

Short circuit of internal components!

In case of high water entry (condensation, coolants, etc.) into the oil reservoir, a short circuit can result.

- It is imperative to stick to the interval for the oil change!

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

NOTE

- Oil changes must only be made in depressurised mode.

Hydraulic oil use according sign

Use hydraulic oil as per sign at the oil filler neck (see also technical characteristics).

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).

Only for piston pumps

⚠ CAUTION

Malfunction caused by air in the system

Before filling the oil, unscrew bleeding screw M6.
Screw in again bleeding screw after filling.

Piston pumps must be bled:

1. Before filling the oil, unscrew bleeding screw M6.
2. Fill with oil.
3. Screw in again bleeding screw approx. 15 minutes after filling.

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).
4. Unscrew oil drain plug.
5. Drain oil completely.
6. Apply oil drain plug - if required screw in new screw (see spare parts list).
7. • Unscrew the cover for oil filling at the return filter or the filling and air filter.
8. Unscrew bleeding screw M6.
9. Insert clean funnel with filter or filter cloth (see purity class) in oil filler neck.
10. Filling of hydraulic oil until hydraulic oil can be seen between the two markings at the oil level gauge.
11. Screw in cover.
12. Operate the fixture several times.
    (For the first start up pay attention to "Bleeding of the hydraulic system".)
13. Check oil level and refill hydraulic oil, if necessary.
14. Screw in the venting screw after 15 min.

NOTE

Rest period

- Observe the rest period of at least 1 hour after changing the hydraulic fluid!

Oil change

It is recommended to exchange always the oil filter when changing the oil.

13.6 Exchange oil filter (pressure filter)

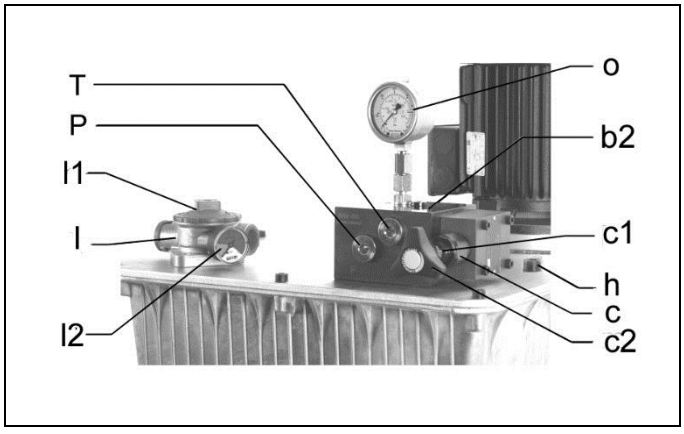


Figure 12: Power unit with connecting block and return filter

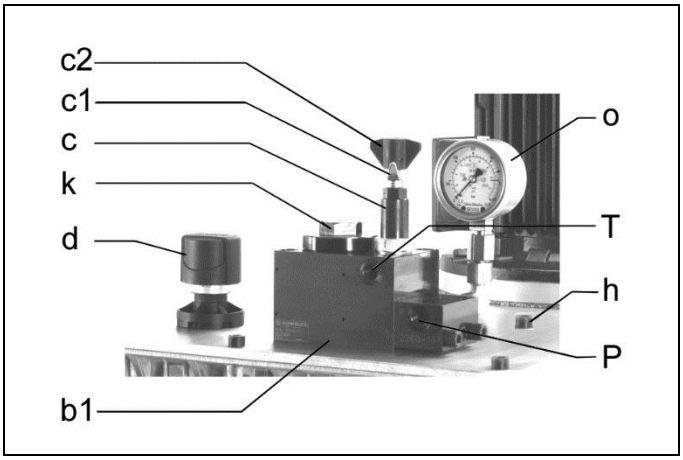


Figure 13: Power unit with connecting block and high-pressure filter

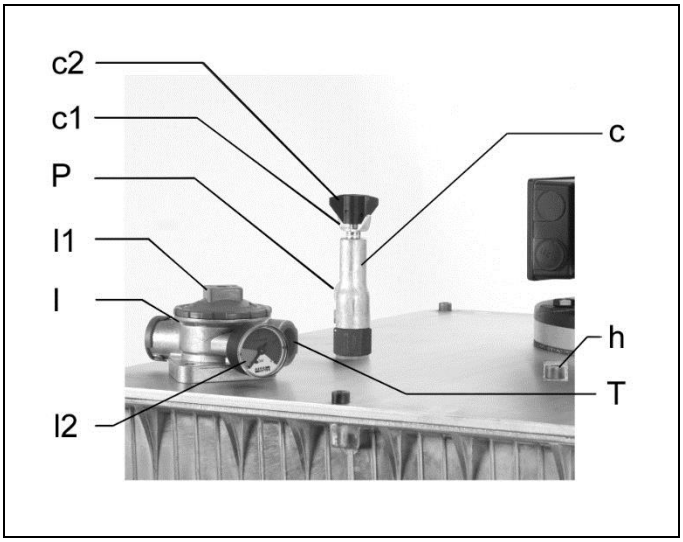


Figure 14: Power unit without connecting block, with return filter

b1	Connecting block with pressure relief valve and high-pressure filter	k	High-pressure filter with screw cap to change the filter cartridge
b2	Connecting block with pressure relief valve	l	Return filter with contamination indicator
c	Pressure relief valve	l1	Screw cap, to change the filter cartridge
c1	Oil reservoir foot with the possibility for fixing	l2	Contamination indicator
c2	Adjusting screw of the pressure relief valve	o	Pressure gauge for system pressure display
d	Air filter and oil filler neck with instruction signs	P	Connection of pressure line
h	Bleeding screw with sign (only for piston pumps and two-stage pumps)	T	Connection of reservoir / return line

13.7 Exchange pressure filter

1. Switch power unit to voltage-free mode.
2. Depressurise the system e.g. by pressing the emergency stop at the valves.
3. Unscrew screw cap of the oil filter with a fork spanner.
4. Check filter cartridge if it is contaminated, replace it, if required.
5. Screw screw cap of the oil filter with a fork spanner.

NOTE

- For tight connection of a new pressure filter also O-ring and back-up ring have to be exchanged (included in the exchange kit pressure filter).

6. Clean the magnetic disk.
7. Insert filter cartridge.
8. Screw on screw cap.

Spare parts

Spare part	Part no.
Exchange kit pressure filter	3887-107

13.8 Exchange return filter

1. Switch power unit to voltage-free mode.
2. Depressurise the system e.g. by pressing the emergency stop at the valves.
3. Unscrew screw cap of the oil filter with a fork spanner.
4. Check filter cartridge if it is contaminated, replace it, if required.
5. Screw screw cap of the oil filter with a fork spanner.

When using a contamination indicator, the date for filter maintenance is indicated and thus an optimum use of filter lifetime is obtained.

Filter elements

Flow from the outside inwards. Result of the star folding of the filter material:

- large filter surfaces
- low pressure losses
- high dirt capacities
- especially long maintenance intervals

Spare parts

Filter cartridge for the delivery of the pump	Part no.
≤ 12 l/min	3887-109 (16ym)
> 12 l/min	3887-111 (16ym)

13.9 Clean oil screens (if available)

Note

The screen disks are in the hydraulic ports.

In case of strong contamination, the screen disks must be cleaned.

1. Remove fittings at the hydraulic ports.
2. Unscrew the screen disk with a pointed tool (scriber).
3. Clean the disk and refit.
4. Screw in fitting.

Spare part

Spare part	Order-No.
Screen disk G1/4	3887 009 (0,63mm)
Screen disk G3/8	3300 097 (0,63mm)
Screen disk G1/2	3887 120 (0,63mm)

14 Trouble shooting

Trouble	Cause	Remedy
Power unit does not start:	Safety fuse defect	Check and exchange, if required
	Pressure switch misaligned	Adjustment (see "Adjust operating pressure")
	Electric control is not o.k., e.g. overload current, parting of cable	⚠ **Caution ! Works only to be effected by authorised personnel.** Reset protection switch
	Oil level too low or oil temperature too high, the light in the door of the control box or at the main switch is lit	Refill oil or let cool oil
Motor does not switch off after reaching operating pressure	Pressure switch misaligned	Adjustment (see "Adjust operating pressure")
	Pressure switch defect	Exchange pressure switch

Note:
Pressure switches are optionally available as accessories.

Trouble	Cause	Remedy
Operating pressure will not be obtained	Pressure relief valve adjusted too low	Adjustment (see section "Adjust operating pressure")
	External leakage	Eliminate leak, e.g. by tigthening fittings or replacing pipes or hoses.
	Solenoid valves are leaky	Replace solenoid valve(s)
	Pump defect	Exchange pump or return power unit for repair
	Leckage of a hydraulic drive	Check which drive is leaky.
	Pressure switch misaligned	Adjustment (see section "Adjust operating pressure")
Pump motor will be switched on and off in short intervals in position "Clamping" and "Unclamping":	Check valve in subplate of the pressure switch is leaky	Loosen nuts from connecting bolts, dismantle the valve block and exchange complete mounting plate with built-in check valve
	Leakage at the cylinder (clamping element/ cylinder or similar)	Squeeze pressure line to locate the leakage, exchange seal or element.
	Fittings are leaky	Retighten fittings
	Pump not bleeded (only for piston pumps)	Drain off completely the oil and refill (see section "Oil filling")
	Solenoid valve(s) are leaky (internal leakage)	Replace solenoid valves
Pump does not deliver:	Oil level is too low	refill oil
	Pump not bleeded (only for piston pumps)	Drain off completely the oil and refill (see section "Oil filling")
	Direction of rotation incorrect (for gear pumps and two-stage pumps)	Check electrical connection, see arrow of sense of rotation on the ventilator cowl of the electric motor

Note

After the exchange or the repair of hydraulic components, their function must be tested.

15 Technical characteristics

Hydraulic fluids

Details of the hydraulic fluids to be used are attached to the oil filler neck.

For piston pumps
Use hydraulic oil as per DIN 51524-2 HLP 22.

For gear and piston pump combinations
Use hydraulic oil as per DIN 51524-2 HLP 32.

For gear pumps
Use hydraulic oil as per DIN 51524-2 HLP 46.

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	≤ 20 µm
Proportional pressure and flow control valves	7 (recommended: 5 up to 6)	18 / 16 / 13	≤ 10 µm

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

Especially with proportional valves, the repetitive accuracy depends especially on the purity degree of the hydraulic fluid.

Note

New hydraulic fluid

- Please note that a new hydraulic fluid "on tap" does not meet the requirements of cleanness. If necessary, use cleaned oil.

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.

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.

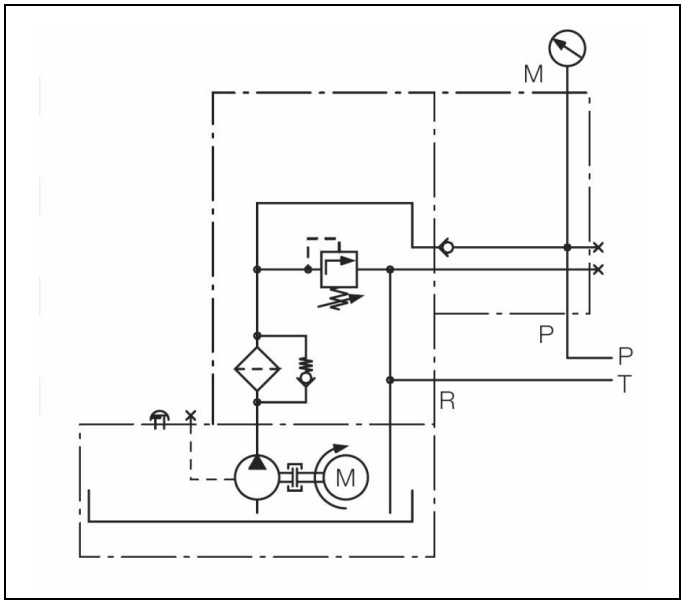


Figure 15: Hydraulic circuit diagram, piston pump and pressure filter

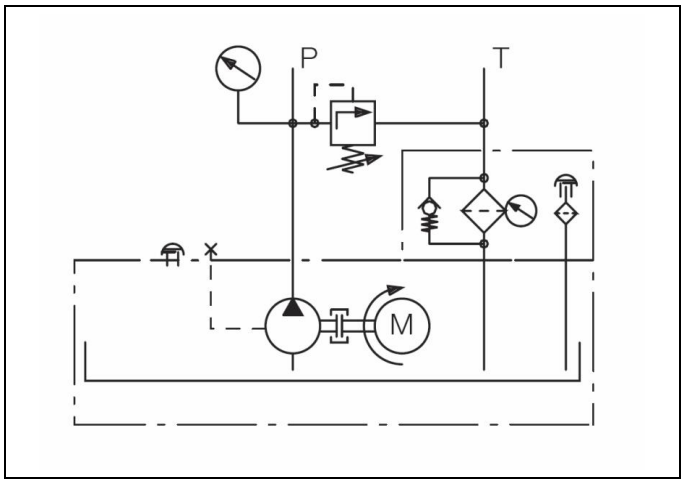


Figure 16: Hydraulic circuit diagram, piston pump and return filter

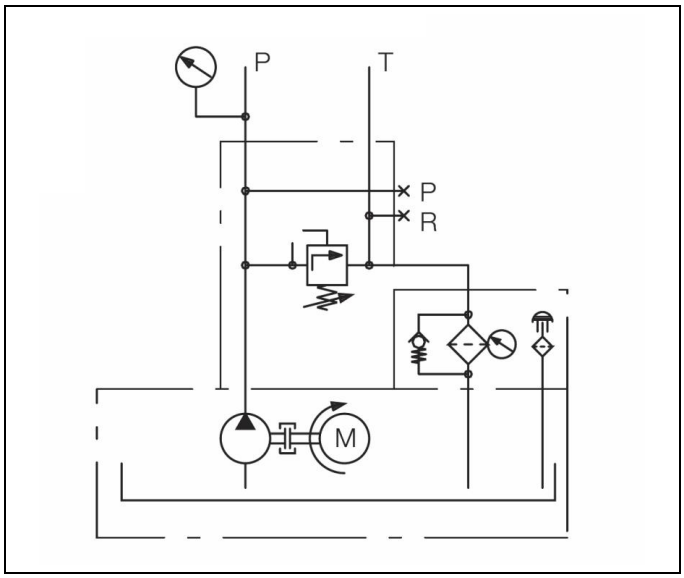


Figure 17: Hydraulic circuit diagram, gear pump and return filter

Figure 18: Hydraulic circuit diagram, double pump with combined gear and piston pumps and return filter

15.1 Weights

Power units with gear pumps – sense of rotation clockwise

Weight [kg]			Part-no.		
Reservoir volume V [l]					
27	40	63	27	40	63
34	–	–	8142-120	–	–
37	48	–	8144-120	8144-140	–
44	55	59	8145-120	8145-140	8145-160
34	–	–	8152-120	–	–
37	48	–	8154-120	8154-140	–
44	55	59	8155-120	8155-140	8155-160
35	46	–	8156-120	8156-140	–
38	49	55	8157-120	8157-140	8157-160
45	56	60	8158-120	8158-140	8158-160
–	60	64	–	8159-140	8159-160
38	49	55	8164-120	8164-140	8164-160
45	56	60	8165-120	8165-140	8165-160
–	60	64	–	8166-140	8166-160
–	68	72	–	8167-140	8167-160
–	77	82	–	8168-140	8168-160
39	50	56	8174-120	8174-140	8174-160
46	57	61	8175-120	8175-140	8175-160
–	61	65	–	8176-140	8176-160
–	69	73	–	8177-140	8177-160
–	78	83	–	8178-140	8178-160
46	57	61	8185-120	8185-140	8185-160
–	61	65	–	8186-140	8186-160
–	69	73	–	8187-140	8187-160
–	78	83	–	8188-140	8188-160
–	–	105	–	–	8189-160

Power units with piston pumps – sense of rotation any

Weight [kg]			Part-no.		
Reservoir volume V [l]					
27	40	63	27	40	63
–	71	75	–	8267-140	8267-160
–	79	83	–	8268-140	8268-160
–	104	108	–	8269-140	8269-160
46	57	–	8275-120	8275-140	–
53	64	–	8276-120	8276-140	–
–	71	75	–	8277-140	8277-160
–	79	83	–	8278-140	8278-160
–	104	108	–	8279-140	8279-160
36	47	–	8223-120	8223-140	–
39	50	–	8254-120	8254-140	–
48	59	–	8255-120	8255-140	–
53	64	68	8256-120	8256-140	8256-160
62	67	71	8252-120	8252-140	8252-160
–	75	79	–	8257-140	8257-160
–	77	81	–	8253-140	8253-160
–	84	88	–	8258-140	8258-160

Double power unit with combined gear and piston pumps – sense of rotation counterclockwise

Weight [kg]			Part-no.		
Reservoir volume V [l]					
27	40	63	27	40	63
42	53	–	8280-125	8280-145	–
42	53	–	8281-125	8281-145	–
43	54	–	–	–	–
52	63	–	–	8283-145	–
52	63	–	–	8284-145	–
53	64	–	–	8285-145	–
60	70	74	–	8286-145	8286-165
60	70	74	–	8287-145	8287-165
–	78	84	–	–	8288-165
–	78	84	–	–	8289-165
–	85	89	–	–	8290-165

15.2 Flow rate

Power units with gear pumps – sense of rotation clockwise

Flow rate		Part-no.		
		Reservoir volume V [l]		
[ccm/s]	[l/min]	27	40	63
75	4.5	8142-120	–	–
		8144-120	8144-140	–
		8145-120	8145-140	8145-160
102	6.2	8152-120	–	–
		8154-120	8154-140	–
		8155-120	8155-140	8155-160
146	8.8	8156-120	8156-140	–
		8157-120	8157-140	8157-160
		8158-120	8158-140	8158-160
		–	8159-140	8159-160
		8164-120	8164-140	8164-160
200	12	8165-120	8165-140	8165-160
		–	8166-140	8166-160
		–	8167-140	8167-160
		–	8168-140	8168-160
		8174-120	8174-140	8174-160
267	16	8175-120	8175-140	8175-160
		–	8176-140	8176-160

		–	8177-140	8177-160
		–	8178-140	8178-160
		8185-120	8185-140	8185-160
400	24	–	8186-140	8186-160
		–	8187-140	8187-160
		–	8188-140	8188-160
		–	–	8189-160

Power units with piston pumps – sense of rotation any

Flow rate		Part-no.		
		Reservoir volume V [l]		
[ccm/s]	[l/min]	27	40	63
100	6	–	8267-140	8267-160
140	8.4	–	8268-140	8268-160
200	12	–	8269-140	8269-160
60	3.6	8275-120	8275-140	–
70	4.2	8276-120	8276-140	–
100	6	–	8277-140	8277-160
140	8.4	–	8278-140	8278-160
200	12	–	8279-140	8279-160
25	1.5	8223-120	8223-140	–
43	2.6	8254-120	8254-140	–
43	2.6	8255-120	8255-140	–
61	3.7	8256-120	8256-140	8256-160
88	5.3	8252-120	8252-140	8252-160
88	5.3	–	8257-140	8257-160
123	7.4	–	8253-140	8253-160
123	7.4	–	8258-140	8258-160

Double power unit with combined gear and piston pumps – sense of rotation counterclockwise

Flow rate		Part-no.		
		Reservoir volume V [l]		
[ccm/s]	[l/min]	27	40	63
150/25	9.0/1.5	8280-125	8280-145	–
205/25	12.3/1.5	8281-125	8281-145	–
266/25	16.0/1.5	–	–	–
150/43	9.0/2.6	–	8283-145	–
205/43	12.3/2.6	–	8284-145	–
266/43	16.0/2.6	–	8285-145	–
150/61	9.0/3.7	–	8286-145	8286-165
205/61	12.3/3.7	–	8287-145	8287-165
150/88	9.0/5.3	–	–	8288-165
205/88	12.3/5.3	–	–	8289-165
150/123	9.0/7.4	–	–	8290-165

NOTE

Further information

- For further technical data see ROEMHELD data sheet. D8031

Valve control

Proposals for valve control see ROEMHELD data sheet.

16 Disposal

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.

17 Declaration of incorporation

Manufacturer

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Declaration of incorporation

The mentioned products 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.

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).

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.

If the product is modified and not approved by us, this declaration will become invalid.

List of the applied standards

2006/42/EC, Machinery directive [www.eur-lex.europa.eu]

2014/30/EU EMC - Electromagnetic compatibility [www.eur-lex.europa.eu]

2014/35/EC, Low voltage directive [www.eur-lex.europa.eu]

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 and 2)

DIN EN ISO 13732-1, 2008-12, Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces

DIN EN 614-1 a. 2, 2009-06, Safety of machinery - Ergonomic design principles

DIN EN ISO 14123-1, Safety of machinery - Reduction of risks to health resulting from hazardous substances emitted by machinery

DIN EN ISO 13849-1, 2008-12, Safety of machinery - Safety-related parts of control systems - General principles for design

DIN EN ISO 13849-2, 2008-09, Safety of machinery - Safety-related parts of control systems - Validation

DIN EN ISO 4413, 2011-04, Hydraulic fluid power - General rules and safety requirements for systems and their components

DIN EN ISO 11201, 2009-11, Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station

DIN EN 60073; 2003-05, Basic and safety principles for man-machine interface

DIN EN 60204-1; 2007-06, Safety of machinery - Electrical equipment of machines, Part 1: General requirements

DIN EN 60529; 2000-09, Degrees of protection provided by enclosures (IP- Codes)

DIN EN 61000-6-2; 2005, Electromagnetic compatibility, immunity for industrial environments

DIN EN 61310-1; 2008-09, Safety of machinery - Indication, marking and actuation. Requirements on signals

DIN EN 81714-2, 2007-08, Design of graphical symbols for use in the technical documentation of products

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Römheld GmbH
Friedrichshütte

Laubach, 26.06.2019

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