

LUKAS

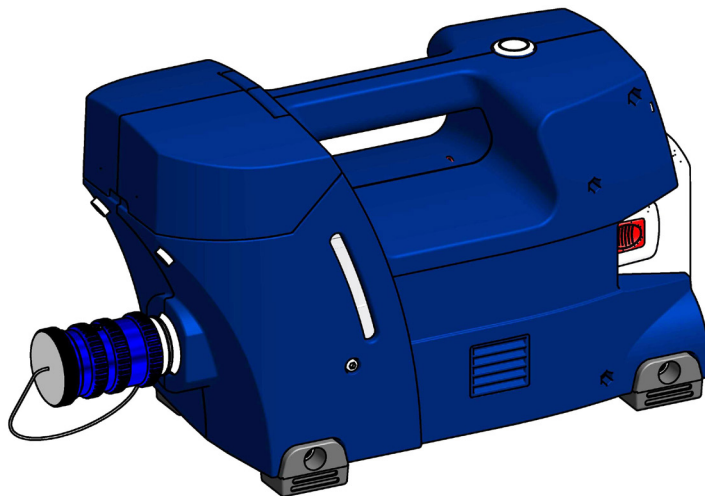
Because you never get a second chance

Instruction manual for rescue equipment

CE



Hydraulic power unit P 600 OE



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1. Danger classes

We distinguish between various categories of safety instructions. The table below provides an overview of the symbols (pictograms) and signal words assigned to the specific danger and also the possible consequences.

Pictogram	Damage / injury to	Key word	Definition	Consequences
	Persons	DANGER!	Immediate danger	Death or severe injury
		WARNING!	Potentially dangerous situation	Potential death or serious injury
		CAUTION!	Less dangerous situation	Minor or slight injury
	Property	ATTENTION!	Danger of damage to property/ environment	Damage to the equipment, damage to the environment, damage to surroundings
	-	NOTE	Handling tips and other important/ useful information and advice	No injury/damage to persons/ environment/ device



Wear a helmet with a face guard



Wear protective gloves



Wear safety shoes



Proper recycling



Observe principles of environmental protection



Read and observe operating instructions

2. Product safety

LUKAS products are developed and manufactured to guarantee the best performance and quality when used properly.

Operator safety is the most important aspect of the product design. Moreover, the operating instructions are intended to aid the safe use of LUKAS products.

The generally applicable legal and other binding regulations pertaining to the prevention of accidents and protection of the environment apply and are to be complied with in addition to the operating instructions.

The device may only be operated by persons with appropriate training in the safety aspects of such equipment – otherwise, there is a danger of injury occurring.

We would like to point out to all users that they should read the operating instructions carefully before using the equipment and fully comply with the instructions therein.

We further recommend having a qualified trainer showing you how to use the product.



WARNING / CAUTION!

The operating instructions for the hoses, the accessories and the connected hydraulic equipment must also be observed!

Even if you have already received instruction, you should read the following safety instructions again.



WARNING / CAUTION!

Ensure that the accessories used and the connected equipment are suitable for the maximum operating pressure!



Make sure that no body parts or clothing get between the openly visible moving parts of the device.

The department responsible must be informed immediately of any apparent changes (including the operating behaviour). If necessary, the equipment is to be deactivated immediately and secured!



Wear protective clothing, protective helm with visor, safety shoes and protective gloves.

Inspect the device before and after use for visible defects or damage.



Working under loads is prohibited if they are raised exclusively with hydraulic devices. If this work is unavoidable, suitable mechanical supports are also required.

Inspect all cables, hoses and screwed connections for leaks and externally visible damage! If necessary, repair immediately! Squirting hydraulic fluid can result in injuries and fires.



 	In the event of malfunctions, shut down the device immediately and make it safe. Repair the fault immediately.	Do not carry out any changes (additions or conversions) to the equipment without obtaining the approval of LUKAS beforehand.	
 	Observe all safety and danger information on the device and in the operating instructions.	All safety and danger information on the device must always be complete and in a legible condition.	 
 	Make sure that all safety covers are present on the device and in proper working condition.	Any mode of operation which compromises the safety and/or stability of the device is forbidden!	 
 	Safety equipment must never be disabled!	The maximum permissible operating pressure must not be changed.	 
	Make sure before switching on/starting up the device and during its operation, that this will put no one in danger.	Observe all intervals for recurring tests and/or inspections that are prescribed or stated in the operating instructions.	
 	When working in the vicinity of live components and cables, appropriate measures must be taken to avoid a transfer of current or high-voltage arcing to the device.	Use only original LUKAS accessories and replacement parts when carrying out repairs.	
		When working with this equipment or when transporting it, ensure that you do not get caught up in the hose or cable loops and trip.	
 	The build-up of static charge and therefore possible sparking must be avoided when handling the device.	All damaged electrical components e.g. scorched cables, etc. are to be replaced immediately!	 

	When setting up the units, it must be ensured that they are not impaired by the influences of extreme temperatures.	Damage to electrical components may only be repaired by a qualified electrician in compliance with all applicable national and international safety guidelines and regulations.	
 	The device is filled with hydraulic fluid. These hydraulic fluids can be harmful to your health if swallowed or if their vapours are inhaled. Direct contact with the skin must be avoided for the same reason. Please also note that hydraulic fluids can also adversely affect biological systems.	When working with or storing the device, ensure that the function and the safety is not adversely affected by external extremes of temperature and that the equipment is not damaged. Please note that the device can also heat up over a long period of use.	
	Ensure adequate lighting when you are working.	Before transporting the device, always check to see that the accessories are positioned securely to prevent the possibility of an accident.	
	Always keep these operating instructions easily accessible at the place of operation.	Make sure you properly dispose of all removed parts, leftover hydraulic fluid, leftover oil and packing materials.	 

The generally applicable, legal and other binding national and international regulations pertaining to the prevention of accidents and protection of the environment apply and are to be implemented in addition to the operating instructions.



WARNING / CAUTION / ATTENTION!

If you still injure yourself on the hydraulic unit, clean the wound immediately and consult a doctor to have it attended to!



If you get hydraulic fluid in your eye, rinse it immediately several times with clear, clean water and consult a doctor!

Also, if you swallow hydraulic fluid you should consult a doctor!

WARNING / CAUTION / ATTENTION!

The device is intended **exclusively** for the **purpose stated in the operating instructions (see chapter "Proper Use")**. **Any other use is not in accordance** with its designated use. The manufacturer/supplier cannot be held liable for any damage resulting from such use. The risk of such misuse lies entirely with the user. Proper use includes observance of the operating instructions and compliance with the inspection and maintenance conditions.



Never work when you are overtired or intoxicated!



3. Intended use

The P600OE hydraulic unit is designed specially to supply hydraulic fluid to a double-acting LUKAS rescue unit.

The special feature of the P600OE is its compact lightweight construction. This means that it is possible to work with hose-bound rescue equipment even in difficult to reach locations.

When working with this hydraulic unit, you must also observe all the regulations and directives for safe and proper deployment of the connected rescue equipment.

The P600OE is **NOT** suitable for underwater deployment.



WARNING / CAUTION / ATTENTION!

The P600OE hydraulic unit is **not** explosion protected!

When using the equipment in explosion risk areas **you must** make sure that operation of the unit does not trigger an explosion!

The responsibility for explosion prevention or for ruling out work with the P600OE rests with the operator of the device or with the person responsible at the place of use.

When working in areas at risk of explosion, all applicable legal, national and international regulations, standards and safety rules for preventing explosions must be observed without exception!

The equipment should not come into contact with acids or alkalis. If this is unavoidable, clean the equipment immediately afterwards with a suitable cleaning agent.

You can order replacement parts and accessories for LUKAS equipment from your authorised LUKAS dealer!

4. Functional description

4.1 Description

The P600OE is a compact lightweight electrically driven hydraulic pump. It is designed for supplying hydraulic power to a double-acting LUKAS rescue unit.

Their use for supplying pressure / fluid to rescue equipment of other manufacturers is possible, yet requires the technical inspection and approval by LUKAS in each individual case.

CAUTION!



When selecting the units to connect to the unit, bear in mind that the maximum possible useable volume of hydraulic fluid is limited.

The max. required operating volume (hydraulic fluid) of the connected unit must not exceed the maximum possible useable volume of the hydraulic pump!

The volume of the tank on the P600OE is designed so that all LUKAS cutters, spreaders, combi tools and the R410 and R412 rescue cylinders that are fitted with Streamline can be operated. The energy source for the P600OE can be either a mains power unit or an accumulator battery. The mains power units and accumulator batteries that fit into this hydraulic unit can also be used for the LUKAS eDRAULIC units. When working with the P600OE you can choose which energy source to use. Both the accumulator battery and the mains power unit can be inserted in the opening provided in the body of the tool. Both will lock in place automatically.



NOTE:

When connecting to the mains, if a very long connecting cable is used, the power supply to the motor may be reduced as a result of the resistance in the cable.

This will reduce the power of the motor.

The hydraulic unit operates in two modes, the WORKING mode and the ECO mode. It switches to mode required automatically.

In the WORKING mode, the P600OE provides the rescue unit with maximum volume flow of the hydraulic fluid at maximum pressure. In the ECO mode, we employ a special speed drop facility. This mode facilitates a very long pump running time with the battery charge. The speed drop facility reduces the volume flow of hydraulic fluid to a minimum. The P600OE automatically switches to the ECO mode after 2-3 seconds if the control valve on the connected rescue unit is not being operated, in other words, when it is in neutral setting. As soon as the control valve on the rescue unit is actuated, the pump switches automatically to the WORKING mode. You now have the maximum power of the P600OE available. The response time of the switchover from ECO to WORKING mode is less than 0.5 s and is therefore hardly noticeable. The noise of the motor tells you which mode the hydraulic unit is using.

At reduced temperatures (from approx. 5 °C) it does not switch to the ECO mode. The P600OE then runs permanently in WORKING mode. As soon as the oil has heated up, the normal function is available again.

In addition, the P600OE is fitted with LED lighting as standard in order to make working under reduced visibility conditions easier.

The light-emitting diodes attached on the connection side light up the coupling area. The main switch has also been provided with a light, so that you can see at a glance whether the device is switched on.

The hydraulic tank is also lit. This allows you to see the fill level at any time if the lighting conditions are poor.

The P600OE is fitted with a single flow pump with two pressure stages, a low pressure stage and a high pressure stage.

Low pressure stage (LP) = up to 14 MPa*

*) 1 MPa = 10 bar)

High pressure stage (HP) = up to 70 MPa*

The changeover from low pressure to high pressure is carried out automatically in the pump. The maximum pressure is limited by a pressure limiting valve.

Connection with the rescue equipment is via extension hose pairs or a hose reel. They are supplied in various lengths and kink-protection colours. The individual hoses in a pair of hoses can be distinguished by their different colours.

(For specific details, please consult the LUKAS range of accessories or contact your LUKAS dealer.

Lukas recommends that you do not use more than 10 m of total hose length between the hydraulic pump and the rescue unit.



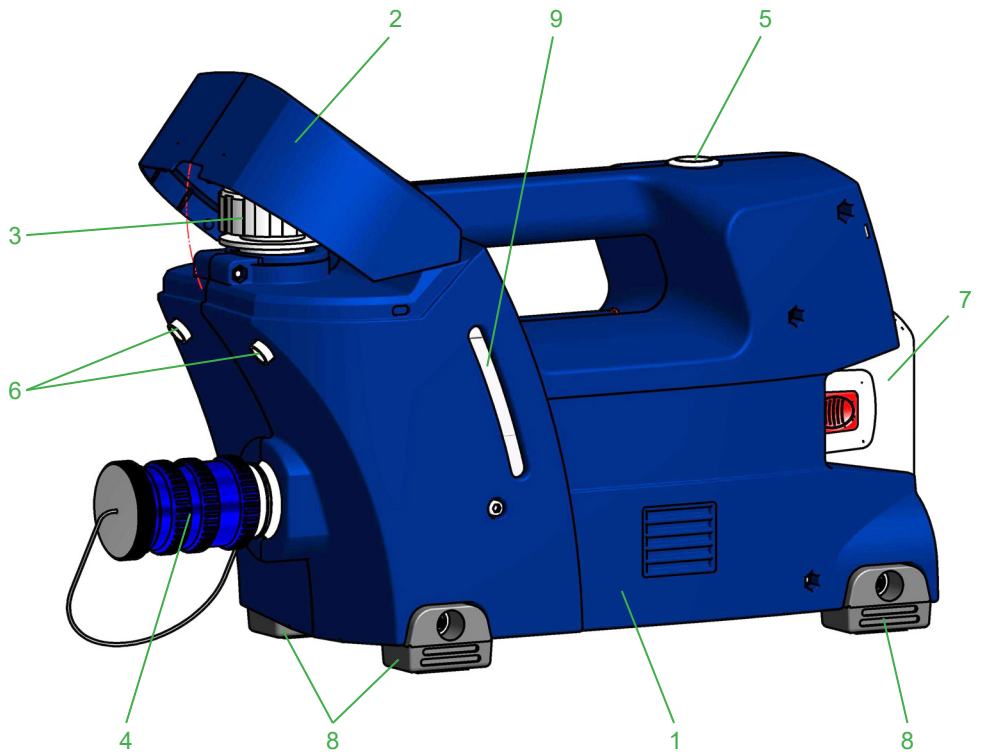
NOTE:

Always register your hydraulic unit on the LUKAS Hydraulik GmbH internet site. Only then are you entitled to the extended guarantee.

Before you use couplings from a different company, you must contact LUKAS or an authorised dealer.

You can order replacement parts and accessories for the P600OE from your authorised LUKAS dealer!

4.2 Structure of P600OE



- 1 Casing
- 2 Filler cover
- 3 Filler cap
- 4 Mono-coupling sleeve with dust cap
- 5 Main switch
- 6 LED lighting
- 7 Battery or mains power unit
- 8 Rubber buffer
- 9 Fill level display (illuminated)

5. Connecting the hoses / devices



CAUTION!

When connecting the hose assemblies / units, always ensure that the connection components are not soiled. If necessary, clean immediately!

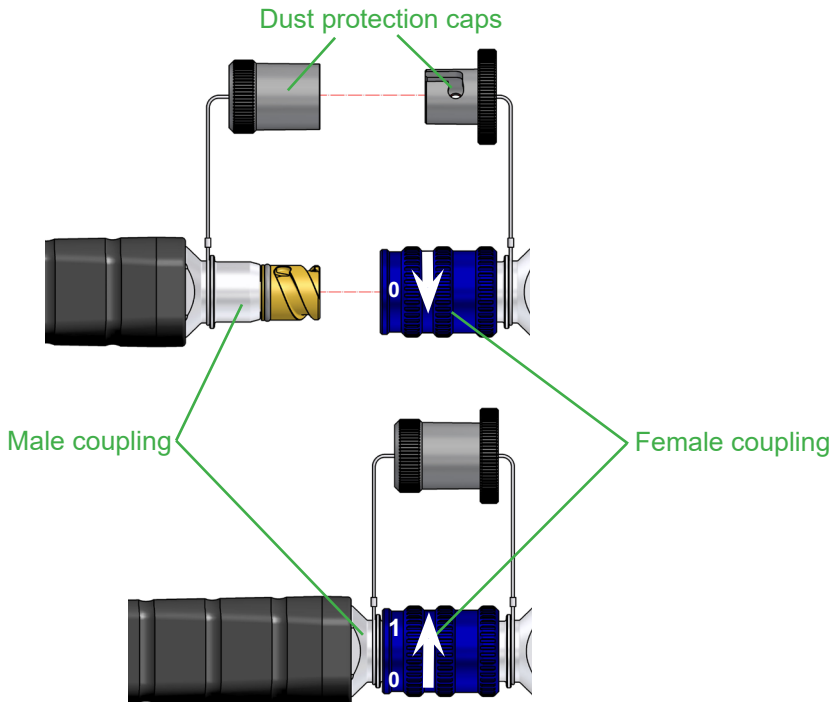


WARNING / CAUTION / ATTENTION!



Before connecting equipment, make sure that **all the components used** are suitable for the **maximum operating pressure of the hydraulic unit!** In cases of doubt, you **must** consult LUKAS directly before connecting the equipment!

The hose lines / units are connected via quick-disconnect coupling halves (female and male) to the hydraulic pump in such a way that they cannot be reversed.



Remove the dust caps before coupling together. Then push the male and female parts together and turn the locking sleeve on the female coupling in the direction "1" until the locking sleeve clicks in place. The connection has now been made and locked. Uncoupling is accomplished by turning the locking sleeve in direction "0".

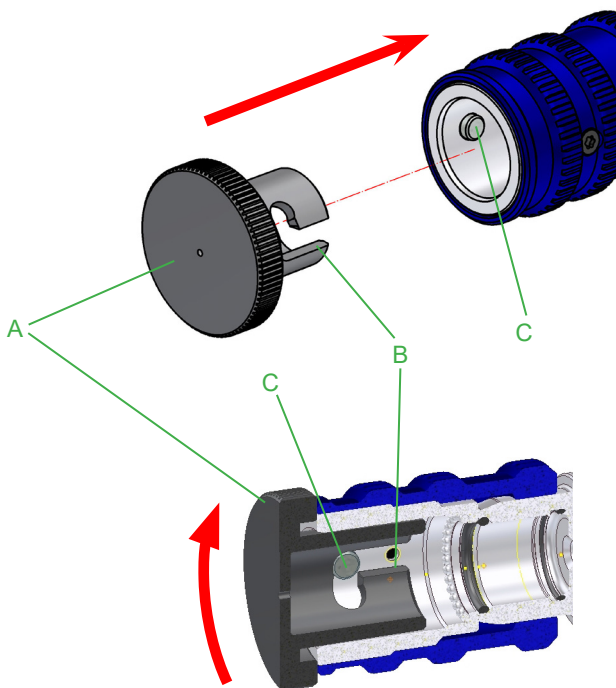
**NOTE:**

Couple together only when in ECO mode, or when the P600OE is switched off!

For dust protection, the supplied dust protection caps must be refitted.

Fitting the dust protection caps:

The dust protection caps "A" have two external grooves "B". The dust protection caps must be inserted in the female coupling in such a way that the grooves can be guided over the pins "C". Screw in the dust protection caps to the limit stop to fix in the female couplings.



6. Set-up and start-up

6.1 Installation



WARNING / CAUTION / ATTENTION!

The LUKAS Mini electric pump is **not** explosion protected!



When using the equipment in explosion risk areas **you must** make sure that operation of the unit does not trigger an explosion!

The unit is to be set up in a suitable location (safe location / flat surface / sufficient distance from vehicles, loads, sources of ignition, etc.).

LUKAS units work perfectly at an angle of up to 20°. However, in order to guarantee maximum safety and fluid withdrawal, they should be operated in as horizontal a position as possible. The P600OE is designed in such a way that, when deactivated and with correctly fitted filler cap, no hydraulic fluid can leak out, even if the pump were to tip over.

6.2 Commissioning



NOTE:

When delivered the hydraulic fluid in the P600OE has a special High-Tech running in additive mixed in. This can be seen with the different colour of the hydraulic fluid when the pump is delivered.

The additive optimises the running-in behaviour and the hydraulic function of the pump. When topping up or filling with hydraulic fluid, you should always observe Item 12.3 in this manual.

Before starting up for the first time, the battery (if fitted) must be fully charged in an external charger.

Commissioning procedure:

1. First check the condition of the pump.
 - The casing should not be damaged.
 - Hydraulic fluid should not be coming out in an uncontrolled manner.
 - The coupling should not be damaged.
 - The battery connection slot should not exhibit any function-inhibiting damage.
2. Then check the level of hydraulic fluid in the in the pump.

The fluid levels can be read off on the fill level indicator on the side of the unit. There are 3 marks on the fill level indicator. For precise reading off of the fluid levels and for filling, the hydraulic unit should be as level as possible.



Maximum fill level

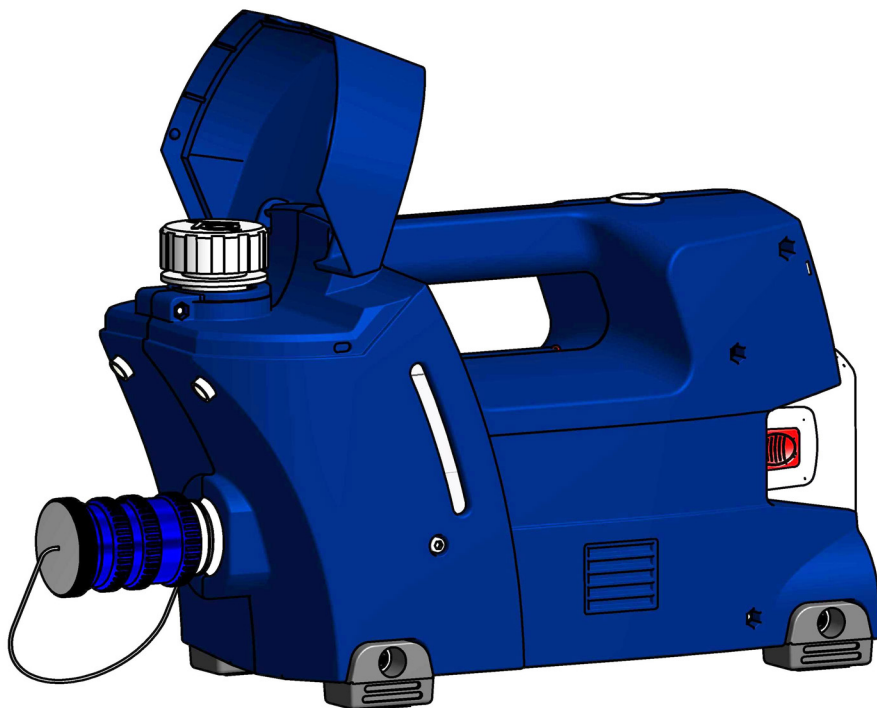
Minimum fill level

The hydraulic fluid level should never fall below this level, even when the unit is running, since otherwise the pump will be damaged!

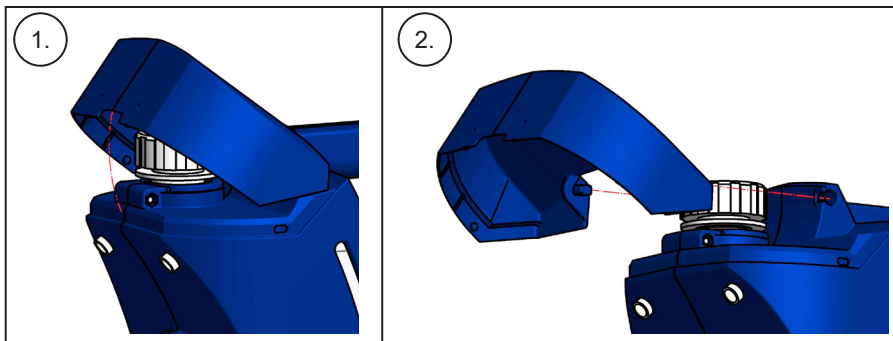
3. If necessary, fill with hydraulic fluid up to the maximum level.

Filling with hydraulic fluid is carried out as possible:

- a) Open the filler cover completely. Slight resistance must be overcome to open it. This is designed to prevent inadvertent opening of the cover.



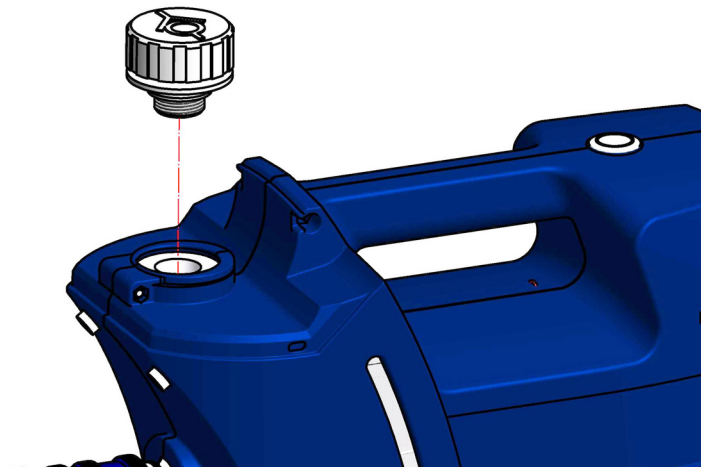
The filler cover can also be removed completely to make filling easier. To do this open the filler cover by approx. 35° and pull the cover off towards the coupling. Do not use force since this could damage the cover.



NOTE:

Do not fill up to the maximum mark because otherwise hydraulic fluid could come out of the filler cap when running.

- b) Open the filler cap on the fluid tank.



- c) Fill with hydraulic fluid up to the maximum mark.
You should use a funnel for filling to prevent spilling the hydraulic fluid.
- d) Close the tank again with the filler cap and remove any spilled hydraulic fluid with a suitable cloth.
- e) Replace the filler cover (if removed) and close completely. It clicks into place when closed.

4. Now insert the battery or the mains adapter into the unit (if not already fitted). The mains adapter must then be connected to the power supply.
5. The hydraulic unit must now be bled. This takes place fully automatically on the P600OE. To carry out bleeding you just have to switch the hydraulic pump on at the main switch and let it run for two to three minutes without having a unit connected to it. The filler cap is also fitted with a vent which automatically bleeds the tank when the pump is running.
6. After bleeding, check the level of fluid in the tank again. Top up if necessary.
7. Finally, you can now connect the extension hoses or hose reels and/or connect the rescue equipment directly.

7. Operation

7.1 Operating the P600OE

The P600OE has been designed to provide the user with the simplest method of operation. For this reason, the pump only needs to be switched on and off and the rescue unit be connected to it. All the other functions are carried out fully automatically.

However, always connect the rescue unit before switching the hydraulic unit on. After switching on, the initiation sequence on the unit is run. This takes approx. 3 seconds. During this period the LED in the main switch flashes and the motor runs for approx. 1.5 secs. in ECO mode and approx. 1.5 secs. in WORKING mode. As soon as the LED lights up permanently in the main switch you can start working with the connected rescue equipment. If the connected unit is not actuated, the unit switches back to the ECO mode after a few seconds.



CAUTION!

If a rescue unit is actuated during the initiation sequence, the pump could inadvertently switch to the ECO mode during operation. To restore full functionality switch the pump off, switch it on again and allow the initiation sequence to run as described above.

7.2 Battery operation

The battery switches off after a specific time period for safety reasons (depending on the type of battery, approx. 10 minutes to 60 minutes) after the pump is switched off at the main switch.

If the battery remains in the pump after main switch on the pump is switched off, the pump cannot be started again by switching the main switch on again.

In order to start the pump you need to actuate the query button on the battery, or to remove the battery and reinsert it. The main switch can then be actuated again and the pump will start.

LUKAS recommends that **you always remove the battery from the P600OE after the pump has been used.**

This also prevents the battery from pronounced self-discharge.

7.3 Safety instructions

World-wide, safety guidelines pertaining to the specific country must be observed and complied with. In the Federal Republic of Germany, regular safety inspections according to the legal accident insurance regulations (GUV - Gesetzliche Unfallversicherung) are mandatory.

Wear the following when working with the unit:

- protective clothing,
- safety helmet with visor or protective goggles,
- protective gloves
- and, if necessary, ear protection

Always make sure that, before actuating the unit, no participating and/or non-participating persons will be exposed to danger by the work with the unit or by working with the connected rescue equipment!



WARNING / CAUTION!

When working, hydraulic fluid can be emitted by damage to the unit or the hoses. Since the units operate at a very high hydraulic pressure, hydraulic fluid being emitted can cause severe to the severest injury to persons. Those not involved in the rescue operation should therefore **keep at a distance appropriate to the situation**. Any trapped or enclosed persons must be protected.

In order to prevent such dangers, all measures must be taken to prevent damage to the units and hoses!

8. Dismantling the equipment / deactivation following operation

Procedure:

1. When the work is completed, the connected units must be returned to the starting position.
This should mean that the hydraulic tank on the P600OE has the starting volume of hydraulic fluid.
2. Then switch off the device at the main switch.
3. Separate the connected unit from the hydraulic unit.
4. After each use, the pump must be cleaned externally and wiped down with a damp cloth.

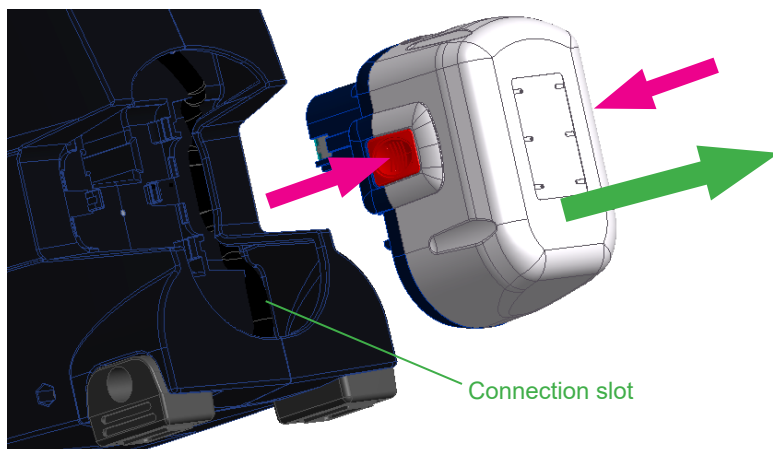


CAUTION!

The electric contacts in the connection slot, on the battery and on the mains power unit must not be cleaned with damp cloths! There are suitable agents to provide corrosion protection for the electrical contacts.

5. Unplug the power supply (if used) by pulling the mains plug.
6. Fully press down the two unlocking buttons and carefully pull the battery or power supply out of the device.

Do not use force!



NOTE:

You should not store the hydraulic unit with the battery in place. Bear in mind that, if the unit is stored for an extended period, the hydraulic fluid in the tank will age and needs to be replaced at regular intervals. Do not store the pump, the battery and the mains power unit in a damp or dusty environment!

9. Tests

9.1 General points

The P600OE is subject to very high levels of mechanical loading as a result of the high operating pressure. A visual inspection must therefore be carried out after every use and at least one visual inspection must be carried out every six months. These inspections enable the early detection of wear and tear, which means that punctual replacement of these wearing parts prevents damage.



CAUTION!

Clean off any dirt before checking the device!

When cleaning the equipment, take care not to use any cleaning agent with a pH value outside the range 5 - 8!



WARNING / CAUTION / ATTENTION!

In order to carry out maintenance and repair work, tools appropriate for the job and personal protection equipment must be used.



The maintenance and repair staff must have adequate technical and specialised knowledge. LUKAS offers appropriate training courses for this.

9.2 Testing the devices

An annual inspection of the tool is due once per year. This inspection must be performed by a person with the necessary expertise. This means that the person must possess adequate specialist knowledge and experience in the fields of electrical engineering and hydraulics, so that they can objectively assess the condition of the tool.

At least every 3 years or when there might be doubts regarding the safety or reliability of the unit, an additional function check is to be carried out (in this connection, comply with the applicable national and international regulations with regard to the maintenance intervals of rescue equipment). In the Federal Republic of Germany, regular safety inspections according to the legal accident insurance regulations (GUV - Gesetzliche Unfallversicherung) are mandatory.

We recommend carrying out a function check at the following intervals:

<i>Operating time per day</i>	<i>Functional check</i>
up to 1 hour	1 x annually
up to 8 hours	1 x per quarter
up to 24 hours	1 x per month

In addition to these test intervals you need to carry out a function test if:

- *the unit makes suspicious noises,*
- *there is a justified suspicion of internal damage to the unit.*

If the noises and suspicions referred to above arise several times in a month, or if maximum pressure cannot be achieved during the function test, you need to contact LUKAS customer service immediately. The contact details are given in the Chapter "Fault analysis".

Inspections to be carried out:

Visual inspection

- No visible damage to the housing,
- General tightness (leaks),
- Main switch in proper working order, undamaged,
- Couplings must be easy to couple,
- Dust protection caps must be present,
- Labels completely existent and legibly,
- Illumination of main switch, work area and tank illumination fully functional.

Battery and power supply

- Casing undamaged,
- Electrical contact surfaces clean and undamaged
- Cable undamaged
- Battery(-ies) fully charged (when used)
- Charging state display of lithium/ion battery(-ies) fully functional

Functional check

- no suspicious noises,
- tests at maximum load. When the maximum pressure is achieved, the pump switches to the ECO mode after a short time. As soon as the pressure drops slightly, the pump automatically switches back to the WORKING mode.

(Recommendation: use the LUKAS test kit, including testing instructions, for the function test).

10. Maintenance and repair

10.1 General points



NOTE:

Always register your tool on the LUKAS Hydraulik GmbH internet site. Only then are you entitled to the extended guarantee.

Because of the complex construction and the high hydraulic pressure, repair work must only be carried out by the unit manufacturer or by personnel specially trained by the unit manufacturer and by authorised LUKAS dealers.

For these reasons, only simple maintenance work is listed in this manual.

Components of the unit must only ever be replaced by genuine LUKAS spare parts. The components that can be replaced are shown in the spare parts list. Also, any necessary special tools, installation instructions, safety aspects, tests that always need to be observed can be found in the spare parts list.

During assembly, make especially sure that all components are clean, since dirt can damage the rescue tool!



WARNING / CAUTION / ATTENTION!

Protective clothes must be worn when repairs are being carried out, since the devices may also be pressurised when not in operation.

10.2 Preventive maintenance

10.2.1 Care instructions

The unit should be cleaned externally with a damp cloth from time to time (**not the electrical contacts in the connection slot, on the battery and on the mains unit**)

There are special agents for treating the electrical contacts, that are suitable for cleaning and providing corrosion protection for the electrical contacts. Use must only use these agents on the contacts.

(In case of doubt, contact your authorised LUKAS dealer or LUKAS directly!)

10.2.2 Functional and stress test

If there is any doubt regarding the safety or reliability of the equipment, a function and stress test must also be performed.

LUKAS offers appropriate testing equipment for this.

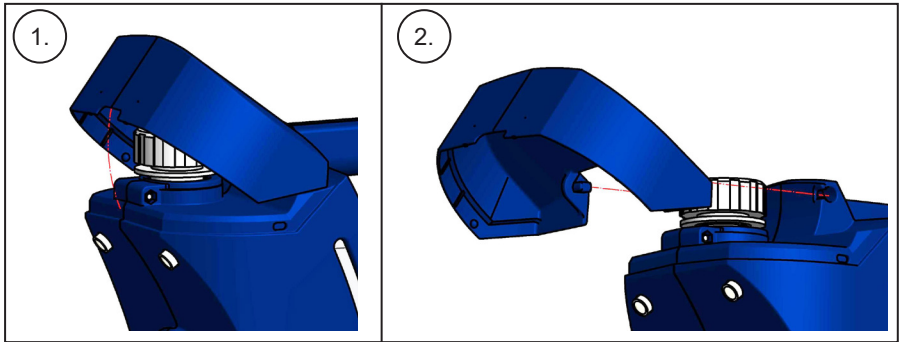
10.3 Changing the hydraulic fluid

After approx. 200 deployments, but after three years at the latest, replace the hydraulic fluid. The fluid should be replaced when it is warmed up. When replacing the hydraulic fluid, the pump must be deactivated and the battery or the mains unit must be removed from the connection slot.

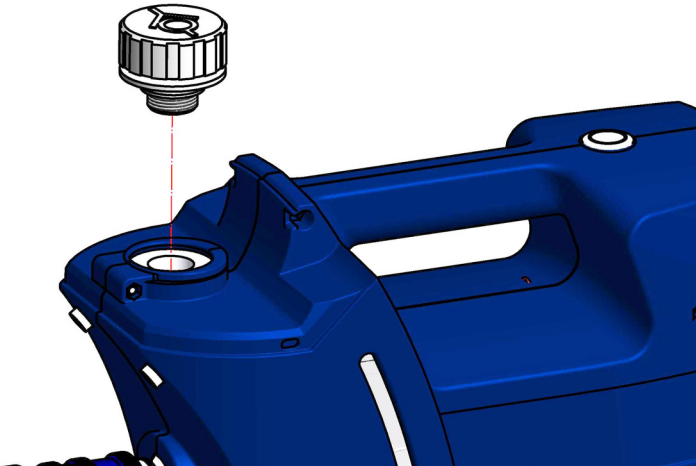
The old hydraulic fluid must be disposed of properly.

Procedure:

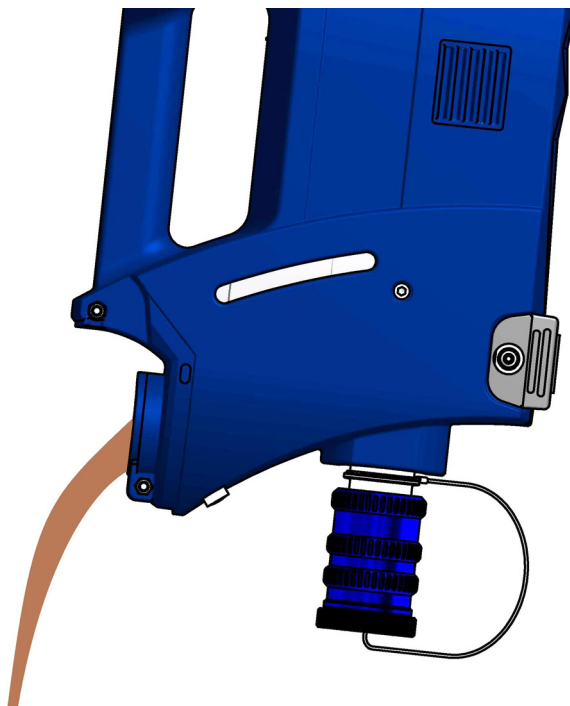
1. Open the filler cover. Removal of the filler cover will make the subsequent tasks easier.



2. Remove the filler cap on the fluid tank.



3. Pour the hydraulic fluid into a suitable collection vessel.



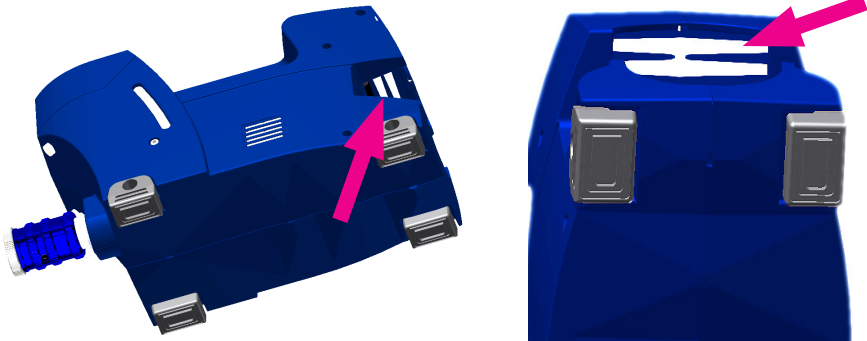
4. Place the P600OE on level, flat ground and fill up to the maximum mark.
5. Then close the tank again with the filler cap and insert the battery into the connection slot or connect the pump to the power supply.
6. Switch the pump on and let it run for approx. 2-3 minutes. This bleeds the pump.
7. Check the level in the tank again and top up if necessary.
8. Then fit the filler cover back in place and close off the tank access on the unit.

10.4 Checking the filters

The air inlet filter should be checked at least once a year. The filter can be checked from the outside if the mains unit (or battery) is removed (see illustrations below). If the filter is severely contaminated, it will need to be replaced.

Procedure:

1. Tilt the P600OE as shown in the illustrations.
2. Check the status of the filter.



10.5 Changing the labels

All damaged and/or illegible labels (safety instructions, type plate, etc.) must be renewed.

Procedure:

1. Remove damaged and/or illegible labels.
2. Clean surfaces with industrial alcohol.
3. Affix new labels.

Take care to affix the labels in the correct positions. If you are no longer sure about this, then please contact your authorised LUKAS dealer or LUKAS itself.

11. Troubleshooting

Fault	Check	Cause	Solution
The PO600OE switches inadvertently to the ECO mode when working with a rescue unit		The initiation sequence period of 3 seconds is not allowed to be carried out	Switch the pump off and on again. Use the rescue unit only after the initiation sequence has been fully carried out. Flashing light in the main switch goes to permanent light (see also Paragraph 7.1)
Electric motor does not start following activation of the main switch	Was the battery inserted by more than 10 min before switching on?	Battery has switched off in the interim.	Switch the main switch off. Insert the battery and remove it again or actuate the query button. Switch the main switch on again.
	Battery or mains unit positioned correctly in the connection slot and locked in position	Battery or mains unit not inserted properly	Remove the battery or mains unit from the pump and re-insert.
	Check connection of mains unit	Mains unit cable not connected	Connect mains unit cable to the power supply
	Correct battery fitted?	Incorrect battery	Use stipulated battery
		Battery flat	Charge battery
		Battery or mains unit defective	Use a different battery or mains unit.
		Fault in power supply to the mains unit	Troubleshooting the power supply
			Use a different power supply
		P600OE defective	Shut down immediately and have repaired by authorised service facility, authorised dealer or directly by LUKAS

Fault	Check	Cause	Solution
P600OE stops during operation	Battery or mains unit positioned correctly in the connection slot and locked in position	Battery or mains unit not inserted properly	Remove the battery or mains unit from the pump and re-insert.
		Mains unit temperature too high as a result of continuous use and high ambient temperature	Allow mains unit to cool down (see operating instructions of mains unit)
Electric motor not providing full power	Check connection of mains unit	Mains unit not correctly connected	Re-insert the mains unit
		Cable losses in extension cable or cable drums too great (electrical resistance)	Use a different suitable extension cable or cable reel or connect directly to power supply
	Check battery charge status	Mains unit fault	Use a battery or different mains unit.
		Battery almost flat	Charge battery
		Battery defective	Replace battery
		Fault in power supply to the mains unit	Troubleshooting the power supply
			Use a different power supply
		P600OE defective	Shut down immediately and have repaired by authorised service facility, authorised dealer or directly by LUKAS

Fault	Check	Cause	Solution
Pump does not switch to WORKING mode after actuating the connected rescue unit		Initiation sequence not allowed to run completely	Switch unit off, then switch it on again and wait for initiation
		Control valve of connected rescue unit actuated too slowly or too tentatively.	Actuate the control valve again.
		Rescue unit not connected correctly (locking sleeve on the coupling not fully rotated to "1")	Turn the locking sleeve on the coupling fully to the end position "1".
Pump does not switch back to ECO mode		Too low ambient temperature	No repair or fault rectification required
The motor / engine is running, but the connected rescue equipment is not moving / moving very slowly upon activation of the valve.	Check hose	Hose assembly not connected properly or is damaged	Check connection of hose and reconnect if necessary.
	Connect a different unit and check whether it works when actuated	The previously connected unit is defective.	Rectification see operating instructions of the connected unit
		Mono-coupling (female) defective	Replace mono-coupling (female)
		P600OE defective	Shut down immediately and have repaired by authorised service facility, authorised dealer or directly by LUKAS

Fault	Check	Cause	Solution
The connected rescue equipment does not move on activation of the valve, or moves only very slowly or unevenly.	Connect a different unit and check whether it works when actuated	The previously connected unit is defective.	Rectification see operating instructions of the connected unit
		Air in the hydraulic supply	Vent the hydraulic system.
		Mono-coupling on connection hose is defective	Replace connection hose
		Mono-coupling (female) defective	Replace mono-coupling (female)
		P600OE defective	Shut down immediately and have repaired by authorised dealer, motor / engine manufacturer or directly by LUKAS
Leaks from pump body itself		P600OE defective	Shut down immediately and have repaired by authorised service facility, authorised dealer or directly by LUKAS
Connected rescue device does not reach its final position	Check hydraulic fluid volume in hydraulic reservoir	Insufficient fluid in the hydraulic reservoir	Top up hydraulic fluid to the maximum filling level
			Important! Before topping up the rescue equipment, return to the base position!
		Usable hydraulic fluid volume of the unit is insufficient	Use a different rescue device with a demand quantity below the maximum usable quantity of the unit

Fault	Check	Cause	Solution
Connected rescue device does not reach its specific performance data		Maximum permitted operating pressure of the pump is not reached	Have repaired by authorised service facility, authorised dealer or directly by LUKAS
		Connected unit defective	Rectification see operating instructions of the connected unit
During function test: A pressure gauge installed between the rescue equipment and the hydraulic power pack does not indicate the maximum operating pressure of the equipment.	Check the details of the rescue device	The operating pressure of the connected rescue device is locked internally	No repair or fault rectification required
		Connected rescue device is defective	Rectification see operating instructions of the connected unit
		Hydraulic unit defective	Have repaired by authorised service facility, authorised dealer or directly by LUKAS
Maximum pressure not achieved		Mono-coupling on connection hose is defective	Replace connection hose
		Hydraulic unit defective	Have repaired by authorised service facility, authorised dealer or directly by LUKAS

Fault	Check	Cause	Solution
Fluid coming out from hydraulic fluid tank	Connected unit not in base position yet and fluid coming out of filler cap?	Return of the hydraulic fluid from the rescue device exceeds the reservoir's maximum quantity when filled.	Reduce fluid level in the hydraulic tank to "Minimum" mark, move the unit to the base position and then fill back up with hydraulic fluid to the "Maximum" level
	Fluid leaks from a different location?	Leak from tank, lines or seals	Replace defective components or repair by authorised dealer or LUKAS directly
Hydraulic fluid milky and cloudy		Water or condensation water in the system	Replace hydraulic fluid immediately
Hose lines cannot be coupled		Coupling defective.	Coupling must be replaced immediately.
It is frequently not possible to couple hose assemblies		Coupling defective.	Coupling must be replaced immediately.
Leak in the couplings	Is the coupling damaged?	Coupling defective.	Coupling must be replaced immediately.
The useful operating time between the individual charging cycles is less than 15 minutes, despite charging the batteries according to the instructions.		Battery defective	Replace battery

If you cannot rectify the malfunctions, inform an authorised LUKAS dealer or the LUKAS customer service department immediately!

The address of the LUKAS Customer Service Department is:

LUKAS Hydraulik GmbH

Weinstraße 39, Erlangen, 91058 Germany

Phone: 0049 (0) 9131 / 698 - 348

Fax.: 0049 (0) 9131 / 698 - 353

12. Technical data

Since all values are subject to tolerances, minor differences may occur between the data on your equipment and the data in the following tables.

The values may also differ because of reading inaccuracies and/or tolerances in the measuring equipment used.



NOTE:

The following tables contain only the technical data necessary for operation and storage.

Further information about your device is available directly from LUKAS.

12.1 P600OE

Type		P 600 OE
Item number		81-53-10 (175825000)
Dimensions (excluding battery) L x W x H	[mm] <i>[in.]</i>	460 x 182 x 257 <i>18.11 x 7.17 x 10.12</i>
Motor power rating	[kW] <i>[HP]</i>	1.0 <i>1.34</i>
Max. operating pressure (HP) ¹⁾	[MPa] ³⁾ <i>[psi.]</i>	70 <i>10000</i>
Flow rate (HP) ¹⁾	[l/min] <i>[gal.-US/min]</i>	0.45 <i>0.12</i>
Max. operating pressure (LP) ²⁾	[MPa] ³⁾ <i>[psi.]</i>	14 <i>2000</i>
Flow rate (LP) ²⁾	[l/min] <i>[gal.-US/min]</i>	2.4 <i>0.64</i>
Max. fill volume <i>Hydraulic fluid</i>	[l] <i>[gal.-US]</i>	1.5 <i>0.40</i>
Max. usable volume <i>Hydraulic fluid</i>	[l] <i>[gal.-US]</i>	1.2 <i>0.32</i>
Weight (without battery with <i>hydraulic fluid</i>)	[kg] <i>[lbs.]</i>	8.3 <i>18.3</i>
Weight (with battery and hydraulic fluid)	[kg] <i>[lbs.]</i>	9.2 <i>20.3</i>
Weight (with mains unit and <i>hydraulic fluid</i>)	[kg] <i>[lbs.]</i>	10.0 <i>22.1</i>
Nominal electrical voltage (with power supply)	[V]	25
Nominal electrical voltage (with lithium/ion battery)	[V]	25.2

¹⁾ HP = High-pressure

²⁾ LP = Low pressure

³⁾ 1MPa = 10 bar

12.1 P600OE

Power consumption at full load	[A]	40
Max. power consumption 230 VAC (with eDraulic Power Supply 230 VAC)	[A]	7
Starting current 230 VAC (with eDraulic Power Supply 230 VAC)	[A]	16
Max. power consumption 110 VAC (with eDraulic Power Supply 110 VAC)	[A]	10
Starting current 110 VAC (with eDraulic Power Supply 110 VAC)	[A]	22
Protection category		IP54
Max. permissible hose length	[m] <i>[ft.]</i>	10 <i>32.81</i>

1) HP = High-pressure 2) LP = Low pressure 3) 1MPa = 10 bar

12.2 Noise emissions (based on the EN ISO 3744 standard)

Used power source	Lithium-ion battery	Power supply
Idling (measured at a distance of 1 m) [dB(A)]	54	54
Full load (measured at a distance of 1 m) [dB(A)]	71	71
Idling (measured at a distance of 4 m) [dB(A)]	53	53
Full load (measured at a distance of 4 m) [dB(A)]	67	67

12.3 Hydraulic fluid recommendation

Mineral oil DIN ISO 6743-4 for LUKAS hydraulic equipment and others

	Oil temperature range	Oil code	Viscosity rating	Remarks
A	-20 +55°C	HM 10	VG 10	

	Oil temperature range	Oil code	Viscosity rating	Remarks
A	-4.0 +131°F	HM 10	VG 10	

recommended viscosity range: 10...200 mm²/s **(10...200 cSt.)**

Supplied with HM 10 DIN ISO 6743-4.



CAUTION!

Before you use hydraulic fluids from a different manufacturer, you must contact LUKAS or an authorised dealer.

12.4 Operating and storage temperature ranges

Operating temperature [°C] / [°F]	-20 ... +55	-4 ... +131
Ambient temperature (device in operation) [°C] / [°F]	-25 ... +45	-13 ... +113
Storage temperature (device not in operation) [°C] / [°F]	-30 ... +60	-22 ... +140

12.5 Oscillation / vibration

The total oscillation value / vibration value to which the upper limbs are exposed, is below 2.5 m/s².

13. EC Declarations of conformity



LUKAS Hydraulik GmbH
Weinstrasse 39,
91058 Erlangen
Deutschland



Dinglee, LUKAS, Hurst, Vetter

IDEX Europe GmbH
Weinstrasse 39
91 058 Erlangen
Germany

EG-Konformitätserklärung / EC Declaration of Conformity

Im Sinne der EG-Maschinenrichtlinie 2006/42/EG, Anhang II A
In accordance with the EC Machinery Directive 2006/42/EC, Appendix II A

Hiermit erklären wir, dass das nachfolgend bezeichnete Hydraulikaggregat
We hereby declare that the following hydraulic power unit

Artikelnr. / Item no.	Modell und Typ / Model and type
81-53-10	P 600 OE

in Verbindung mit Netzteil
in combination with power supply

Artikelnr. / Item no.	Modell und Typ / Model and type
81-53-15	Power supply 230V/50Hz

- in der von uns gelieferten Ausführung den Bestimmungen der Maschinenrichtlinie 2006/42/EG und den sie umsetzenden nationalen Rechtsvorschriften entsprechen.
Berücksichtigt wurden insbesondere die Normen:
 - DIN EN ISO 12100:2010, Ausgabe: 2011-03 - Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung.
 - DIN EN 13204, Ausgabe: 2016-12 – Doppelt wirkende hydraulischen Rettungsgeräte für die Feuerwehr und Rettungsdienste – Sicherheits- und Leistungsanforderungen.
- *in the versions supplied by us conform to the EC Machinery Directive 2006/42/EC and the national statutory provisions that implement them.*
The following standards have particularly been taken into consideration:
 - *DIN EN ISO 12100:2010, publication date: 2011-03 – Safety of machinery - General principles for design - Risk assessment and risk reduction.*
 - *DIN EN 13204, publication date: 2016-12 – Double acting hydraulic rescue tools for fire and rescue service use – Safety and performance requirements.*

Bei einer nicht mit uns abgestimmten Änderung oder Verwendung der Maschine/Ausrüstung verliert diese Erklärung ihre Gültigkeit.
This declaration loses its validity in the case of alterations or usage of the machinery/equipment not approved by LUKAS.

Erlangen, 08.12.2016

i. V.


Carsten Sauerbier
Bevollmächtigter / Authorized Representative
Director of Technical Innovation and Development
IDEX Europe GmbH

i. A.


Dietmar Lindner
Konstrukteur / Engineering Designer

14. Accessories

14.1 Batteries

Only LUKAS lithium-ion rechargeable batteries may be used to operate the P600OE. These guarantee optimum performance and maximise the operating time of the units.



NOTE:

To ensure maximum operating time and maximum uptime, you must make sure that the battery is always fully charged before connecting it to a rescue device.



Charging state display

Query button

Technical Data	nom. Voltage	Capacity	Energy	Weight
Unit	V DC	Ah	Wh	kg <i>lbs</i>
Battery type 1	25.2	2.6	65	0.92 <i>2.03</i>
Battery type 2	25.2	5.0	126	0.94 <i>2.07</i>

Battery Type 1: Display code



Capacity = 75...100% - LED 1-4 lights up

Capacity = 50...75% - LED 1-3 lights up

Capacity = 25...50% - LED 1-2 lights up

Capacity = 0... 25% - LED 1 lights up

Battery Type 2: Display code



Capacity = 75...100% - LED 1-4 lights up

Capacity = 62...75% - 4th LED lights up, 1-3 lights up

Capacity = 50...62% - LED 1-3 lights up

Capacity = 37...50% - 3rd LED lights up, 1-2 lights up

Capacity = 25...37% - LED 1-2 lights up

Capacity = 12...25% - 2nd LED lights up, 1 lights up

Capacity = 5... 12% - LED 1 lights up

Capacity = 0...5% - 1st LED lights up

14.2 Battery charger

Only the "eDRAULIC Power Pack Charger" may be used for the lithium/ion batteries.

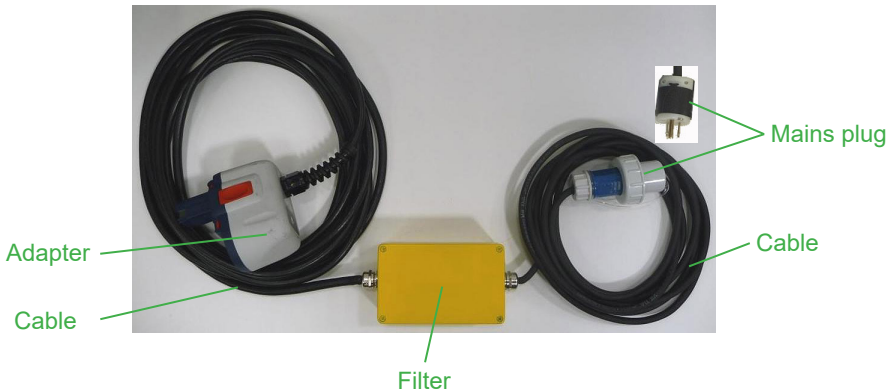


NOTE:

Pay strict attention to the separate operating instructions for the battery charger.

14.3 Power supply

The P600OE has a unique power supply with integrated electronics, allowing the devices to be operated for an almost unlimited time by connecting them to an external power source. The power supply converts the voltage of the external power source in such a way that it may be used instead of a battery.



Structure:

There is an adapter on one side of the power supply which can be simply inserted into the connection slot of the devices and locked. The other side has a mains plug. Both are connected by a cable. The mains plug is a Schuko plug with Protection Classification IP68. The integrated filter is appropriate for the conversion of AC voltage to DC voltage.



NOTE:

Pay strict attention to the separate operating instructions for the power supply.

15. Instructions regarding disposal



Please properly dispose of all packing materials and removed parts.

Electrical equipment, accessories and packaging should always be disposed of in an environmentally compatible way.

Only for EU countries:

Do not dispose of electrical equipment with your household waste!

According to the European Directive 2002/96/EC governing electrical and electronic waste and their application in national legislation, old electrical equipment must be separately collected and recycled in an environmentally compatible manner.

Please also take into account the notes in the separate operating instructions for the batteries.

16. Notes

LUKAS Hydraulik GmbH

A unit of the IDEX Corporation

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