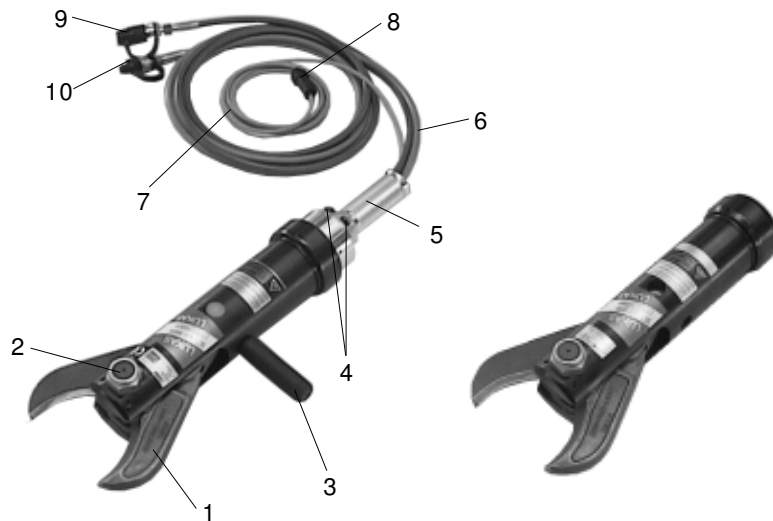


## Operating Instructions Recycling System



### Cutter LSI 600 / 400

84150/1390-85 GB  
Issue 08.2006  
replaces 8.2002



- 1 Blade
- 2 Central bolt with self-locking nut
- 3 Side handle
- 4 Electric push buttons
- 5 Rear handle
- 6 Hydraulic hose pair 0,5 m (USA: 3 m)
- 7 Electric cable 0,5 m (USA: 3 m)
- 8 Electric coupling
- 9 Quick-connect socket
- 10 Quick-connect plug

<b>Content</b>	<b>Page</b>
1 Correct use of the device	3
2 Organisational measures	3
3 General safety instructions	4
4 Maintenance and servicing instructions	5
5 Safety instructions for hose lines	6
6 Indented use	8
7 Description	8
8 Connection of the devices	9
9 Operation	10
10 Dismantling of the device / Stop after operation	12
11 Maintenance	12
12 Repairs	13
13 Troubleshooting	17
14 Technical data	18

## 1 Correct use of the device

**1.1.** The device has been constructed according to the latest technology and the recognised safety regulations. However, danger to life or limb can arise for the operator or third parties occur during use or the device and other items can be damaged.

**1.2.** Only use the device in perfect condition and according to the instructions, safely and safety conscious! Immediately repair (or arrange repair of) malfunctions which can affect safety!

**1.3** The cutter is mainly used in recycling and demolition works. The cutting tool is intended for long-term industrial use. It is designed for cutting steel, sufficiently hard non-ferrous metals, steel sheets and cables. Depending on the type of use, devices are available with different blade shapes.

Typical cutting performance is listed under „Technical Data“.

**1.4** The following must not be cut:

- **energised** cables
- Pipes with pressurised gas or fluids
- **Pre-tensioned** and **hardened** parts such as springs, struts, steering columns and millings
- Mixed materials, e.g. steel/concrete

**1.5** The device (without electrical controls) is suitable for **underwater use up to 40 m**.

**1.6** Devices with cylinder bottom are intended for externally controlled processes. They are mainly used on robots, cranes or other manipulators.

**1.7** The manufacturer / supplier is not liable for damage resulting from incorrect use. The user alone bears the risk. Correct use also includes observing the operating instructions and the inspection and maintenance conditions.

## 2 Organisational measures

**2.1** **Always** store the **operating instructions** to hand at the location where the device is used.

**2.2** In addition to the operating instructions, generally applicable statutory and other binding regulations regarding accident prevention and environmental protection must be observed and applied.

This also includes the wearing of work or protective clothing, helmet with visor or protective goggles, gloves and, if necessary, ear protectors.

**2.3** The device must only be used by a properly trained person, familiar with safety regulations, as otherwise there is a danger of injury.

**2.4** Comply with all safety and risk notices on the device! Keep all safety and risk notices legible.

**2.5** Do not change the device, add or change anything on the device without the manufacturer's consent. This is also the case for fitting and adjusting safety equipment and valves.

- 2.6** The operating pressure marked on the device must not be exceeded.
- 2.7** Only original LUKAS parts and original LUKAS accessories and system components should be used for repairs.
- 2.8** Prescribed and named deadlines for tests/inspections as stated in the operating instructions must be observed.
- 2.9** Properly dispose of all packaging materials and removed parts.

### **3 General safety instructions**

- 3.1** In the event of a malfunction, immediately shut off and secure the device. Repair (arrange repair) immediately.
- 3.2** Before start-up / running and during operation, ensure that nobody can be endangered by the running device. This also means checking the device for loose connections.
- 3.3** Do never grip between the blades and take care that body parts (e. g. hair, fingers) or clothing are never insert between openly visible movable parts.
- 3.4** Only touch the cutting parts with protective gloves as cutting edges are very sharp.
- 3.5** Please note that cut material can fall or catapult away as a result of its sudden removal and suitable protective measures should be taken.
- 3.6** When working, you must ensure there is sufficient illumination.
- 3.7** After each use of the device, check for external damage and deficiencies. Immediately report changes detected (including changes to its operation) to the appropriate office. If necessary, immediately shut off and secure the device. Check all hydraulic and electrical lines, hoses and threaded connections for leakage and check for external damage and immediately repair. Leaking oil can lead to injuries and fires. Damaged electrical lines can lead to short circuits and electric shocks which can result in death.
- 3.8** All types of work which affect the safety and stability of the device are prohibited. Damage can also occur as a result of the device falling over and/or persons can be injured by the falling device. Take care if you use a balancer that in case of a malfunction there is also the possibility that the device could fall down.
- 3.9** You must check that all safety equipment is complete and in perfect condition:
- Labels and notices (safety notices)
  - Safety covers (e.g. hand guard, etc.) are on and in perfect condition.
- 3.10** When working near energised components and lines, suitable measures should be taken to avoid current transfers or high voltage transfers to the device.
- 3.11** The device is filled with hydraulic fluid. These hydraulic fluids can affect your health if drunk or if their fumes are inhaled. Direct skin contact should be avoided for this reason. When working with hydraulic fluids, please be aware that they can have a negative impact on biological systems.

**3.12** The generation of an electrostatic charge producing sparks as a possible consequence should be avoided when working with the device.

**3.13** When working with or storing the device, ensure that the function and safety of the device are not affected by large external temperature effects and that it is not damaged. Please note that the device can heat up as a result of prolonged use.

**3.14** Safety equipment **must never** be disconnected.

**3.15** Never work when overtired or inebriated.

**3.16** Before transporting the device, always check that the accessories are secure.

**3.17** Make sure that you do not get caught by hose lines and cables and trip when using or transporting the device.

## **4 Maintenance and servicing instructions**

**4.1** In order to carry out maintenance and service work, equipment suitable for the work is required. Only staff with specific knowledge and experience in hydraulics may work on the device!

**4.2** Clean oil and all dirt from device and, in particular, connections and screw joints before starting working. Do not use aggressive detergents. Use a fibre-free cloth and ensure thorough cleanliness, especially when rebuilding.

**4.3** When dismantling the device, ensure that all escaping hydraulic fluid is collected, that it does not enter the soil and that it is disposed of in accordance with existing provisions.

**4.4** Always tighten loosened screws and threaded connections when assembling and observe the prescribed torque.

**4.5** Work on electrical devices may only be undertaken by a specialist electrician or by trained persons under the supervision of a specialist electrician corresponding to the electrical technical regulations.

**4.6** Aggressive media (acids, soaps, solvents, steam) can **damage** the device. If the device has to be operated in such an environment **in exceptional cases**, or if it comes into contact with such items, the entire device must be thoroughly cleaned. Moreover, a check according to No. 3.7 above must be undertaken.

**4.7** LSI tools must be inspected at regular intervals for dirt in the hand guard, notably when working overhead. This dirt must immediately be removed (see also „Maintenance“).

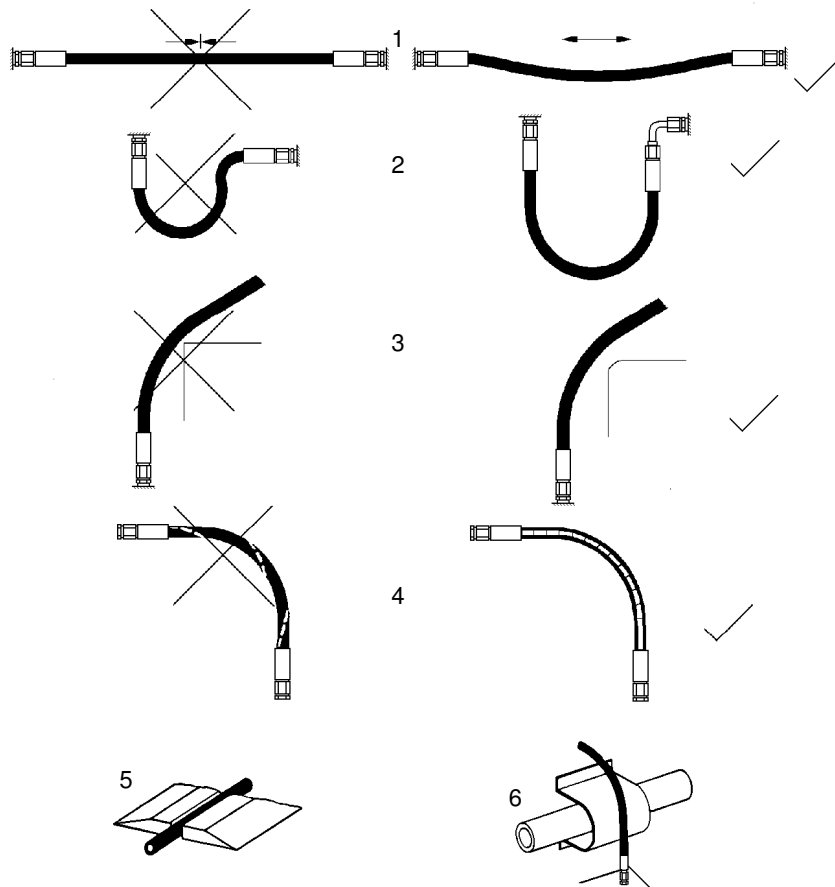
**4.8** The electrical equipment of the device must regularly be inspected/checked. Deficiencies, such as loose connections and braised cables, must immediately be remedied.

## 5 Safety instructions for hose lines

# ● ATTENTION !

- The hoses must **never** come into contact **with brake fluid**.
- After coming to contact with the following fluids, the hoses must immediately be cleaned:
  - acids, soaps, solutions / diluted
  - alcohol and fuels
  - battery acids and ATF
  - phosphate esters

It is also **essential** that the hose lines are **checked for damage** after cleaning. The hose lines must be replaced if necessary.



picture 2

## 5.1 Handling instructions for hose lines

- The defined operating pressure must not be exceeded.
- The hoses must not be subjected to tension and torsion (see picture 2, fig. 1).
- The hose line must not be bent (see picture 2, fig. 2).
- Do not pull or lay hoses across edges (see picture 2, fig. 3).
- Do not connect twisted hoses (see picture 2, fig. 4).
- Never drive a vehicle over the hoses. Loose hose lines laid on roads and paths must be protected against damage, e.g. with hose bridges (see picture 2, fig. 5).
- In the event of high temperatures occurring externally, the hose lines must either be fitted a sufficient distance from the heat-emitting components or protected by suitable measures (shields) (see picture 2, fig. 6).
- Weights must not be suspended on the hose lines.
- Objects must not be allowed to fall onto the hose lines.

## 5.2 Securing the environment in the event of a hose failing

Hose lines must be laid or secured such that risk of the hose failing is avoided.

Danger can occur as a result of:

- the hose moving back and forth after tearing, e.g. through external influence,
- the pressure medium escaping under pressure,
- escaping pressure medium igniting close to a igniting source.

The danger can be avoided, for example, with protective coverings or shields.

### 5.2.1 Beware of hairline tears

- Escaping high-pressure oil can cause **serious injuries** when impinge to the skin.
- In the event of an injury, **immediately consult a doctor!**
- Oil must immediately be cleaned from the wound.
- Do not search for leaks using a finger.
- Depressurise the hydraulic system before loosening connections.



## 5.3 Storing hose lines

- Hose lines are subject to natural aging even when stores correctly and with permissible loads. As a result, their storage time and period of use are limited.

When storing hose lines, the following should be observed:

- Store cool, dry and dust-free (ideally, wrapped in plastic); avoid direct sunlight or UV radiation; shield from nearby sources of heat.
- Do not use ozone-forming lights (e.g. fluorescent lights, mercury vapour lamps) or electrical devices in the immediate surroundings
- Hose lines must be stored de-energised and in a lying position. If storing in rings, the smallest bend radius as recommended by the manufacturer, must not be exceeded.

## 5.4 Labelling the hose lines

- The hose is labelled with manufacturer and operating pressure.
- The maximum permissible operating pressure and month./year of manufacture are labelled at the pressurised neck.

## 5.5 Periods for checking and replacing hose lines

- **Check the hose lines for external damage, tears, bends and inflating after every use.**
- The operator must ensure that hose lines are replaced at reasonable intervals, even if no safety deficiencies can be detected on the hose.
- **The hose line must be replaced 10 years after manufacture at the latest (see label)!**
- Hose lines must be **checked before first start-up** of the technical equipment and then **at least once a year** to ensure a safe **working condition by a properly trained person**. For examples of possible deficiencies, see 5.6 below.

## 5.6 Examples of possible deficiencies to hose lines

- Damage to the external layer to the insert (e.g. chafing, cuts or tears).
- External layer becoming brittle (tears to the hose material).
- Deformations not corresponding to the natural shape of the hose when under pressure or depressurised, or when bent, e.g. separation of layers, bubbles, squashed areas, bends.
- Leaks.
- Installation requirements not observed.
- Hose leaves the fittings.
- Damage or deformation to the fittings which alleviates the function and stability of the fittings or the hose – fittings connection.
- Corroded fittings or metal inserts, which alleviates the stability.
- Storage times and period of use exceeded.

## 6 Indented use

LSI 600E and 400E cutters are exclusively to be connected to a LUKAS power package of series PO... / LSI being equipped with a suitable electromagnetic valve assembly. Model LSI 600 comes without any control valve. It is meant for stationary use and is to be operated by a taylor-made LUKAS power unit.

All cutters serve for cutting steel, sufficiently hard ferrous metals or cables.

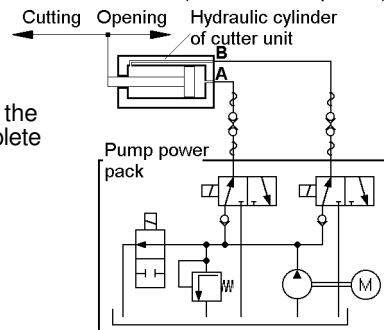
## 7 Description

### 7.1 Cutters

The devices are designed in such a way that a hydraulically actuated piston via mechanical joints symmetrically closes two identical cutter blades positioned opposite each other to cut the object in question. The blade geometry is adapted to the application so as to avoid as far as possible sliding of the material to be cut between the blades. Opening of the blades is also effected by hydraulic-mechanical means (with reduced power).

### 7.2 Connection diagram

To help the operator understand the function of the device, the connection diagram shows the complete unit (cutter unit and pump power pack).





### 7.3 Hydraulic power package

A LUKAS motor pump of PO6... LSI series is to be used for operating the devices. If the power pack comes from a manufacturer other than LUKAS, it must be ensured that it fulfills the LUKAS specifications (see connection diagram), as otherwise dangers may occur for which LUKAS cannot be held liable. Especially it has to be made sure that the permissible working pressure of 50 MPa (500 bar) is without consultation with LUKAS not exceeded.

### 7.4 Hoses

The connection between pump power pack and cutter unit is normally effected with LUKAS hoses. If pipes are to be used, please contact LUKAS.

### 7.5 Control of movements in operation

#### 7.5.1 LSI 600 (device without valve for externally controlled operation)

For hydraulic connection two extra hoses are required (hoses to be ordered separately). The hoses are to be mounted to the pressure ports in the cylinder bottom and to be tightened with a torque of 45 Nm. When fitting the cutter unit to a manipulator, certain principles must be absolutely observed to avoid any risk for persons and the device:

- The device must be fitted swivelling around its longitudinal axis (made possible by means of an axis of rotation on the robot or an adequate rotor sleeve / LUKAS special accessories) so that before the cutting operation it can adjust itself at a right angle to the object to be cut.
- Safety covers and/or measures for safety shut-off must be ensured.

#### **Important!**

Before putting the device into operation, mounting must be agreed with LUKAS from the engineering and safety points of view in all cases.

#### 7.5.2 LSI 600 E and 400 E

(Device with switch actuation for manual operation and manual control)

These devices are operated electrically. The electric connection cable has the same length as the two hoses.

## 8 Connection of the devices

### 8.1 Hydraulic (LSI 600)

In the cylinder bottom can be screwed in 2 LUKAS hydraulic hoses in any desired length.

### 8.2 Hydraulic (LSI 600E and LSI 400E)

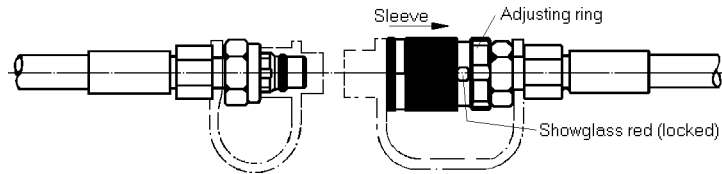
Two hoses (each 0.5 m long) are fitted to the device; they are connected with the pump power pack via a hose pair (5 m / 10 m / 20 m, as is necessary). All hoses are colour marked and have rapid action couplings so that they can be connected without the risk of mix-up:

HP = High pressure —> red,

R = reflux —> blue.

## 8.2 Connection of the plug-in coupling counterparts for HP and R hoses

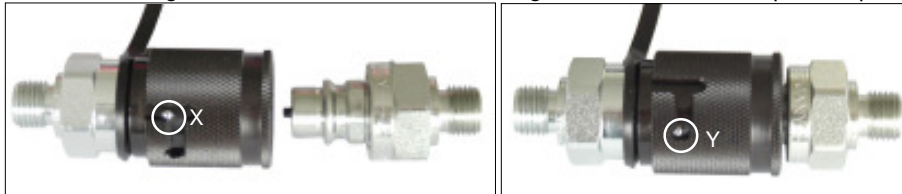
The device is connected to the hydraulic pump with the plug-in coupling counterparts (plug and socket), there being no risk of mix-up.



Before coupling, remove the dust protection covers and unlock the connect socket with adjusting ring by turning it. Withdraw the sleeve and connect plug and socket while holding the sleeve in this position. Release the sleeve and set the showglass to „red“ with the adjusting ring. Now the parts are connected and locked. Decoupling is done in the reverse order.

### **Note regarding the modified release mechanism as of June 2004**

When connecting the hoses, be aware of the following basic functions of the quick couplers:



Before coupling unlock the connect socket by turning the sleeve into position X. Retract sleeve and connect plug and socket. Release sleeve and turn it into position Y.

Now the connection has been made and locked. Uncoupling is done in the reverse order.

Connection of the hoses is possible only, when they are **depressurized**.

In order to prevent contamination of the tool lines protect the couplings with delivered dust caps.

### **Attention!**

Quick couplers partly have special functions. Therefore it is **not allowed screwing them off** from the hoses or **to exchange them**.

## 8.4 Electric (only LSI 600 E and LSI 400 E)

The 0,5 m long electric connection cable (USA: 3m) on the device is fitted with a plug which has to be connected with the coupling of the electric feeder cable running parallel to the hose pair from the power pack. Make the connection by inserting the plug in the socket and lock it by turning the knurled locking ring.

# 9 Operation

## 9.1 Preparatory measures

### 9.1.1 Initial start-up

Before initial start-up and after repairs, the device must be vented:

- Connect the device to the hydraulic pump.
- Fully open and close the device at least twice without load.

### 9.1.2 Inspection of operating state of the pump power pack

—> See separate Operating Instructions of the power pack in question.

**Note:**

Before working on the pump power pack or for coupling/decoupling the hoses, make sure that the pump power pack is switched off (electric connection) or disconnected from the mains and that the lines are unpressurized.

**9.1.3 Warnings**

Before any operation of the cutter unit (concerns manually as well as remotely controlled devices) make sure that the movement of the blades does not constitute a risk to persons (involved or uninvolved) or that the blades or cut-off parts jerking away cannot damage property.

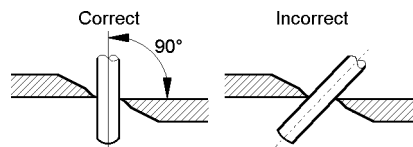
***It is strictly forbidden to grip between the blades!***

**Do not cut**

- live wires,
- pressurized gas or fluid lines,
- prestressed and hardened parts (such as springs, spring steels, steering columns, rolls) as well as composite materials (steel/concrete) without applying special approved safety measures for persons or sufficiently dimensioned machine covers.

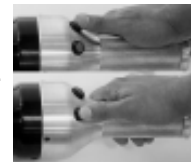
**9.2 Principles on cutting**

**The blades must be applied at a right angle to the object to be cut. To enhance cutting performance, cut as close as possible to the blade fulcrum. On cutting, the gap between the blade tips must not be larger than 3 mm. (Risk of blade fracture!)**



**9.3 Cutters LSI 600 E / 400 E**

By pushing the buttons 4 (see cover page) the tool is opened (push the green button) respectively closed (push the red button). By operation of both buttons at the same time there is no function (blades/arms don't move).



**9.4 Cutter unit LSI 600**

The device is controlled in a semiautomatic or fully automatic way via a remote control. Intervention on the device as such is not possible.

Function of pressure connections: Connection „A“: cut (close blades)  
Connection „B“: open blades

The connections on the device are marked.

Free swivelling movement around the longitudinal axis must be ensured: see Section 7.5.1. Only thus can the cutter unit during the cutting operation adjust itself at a right angle to the object to be cut. Otherwise the blades will be bent up on cutting, which results in dramatically reduced service life.

If on setting-up persons work in the immediate vicinity of the cutter unit, the necessary measures for fitting safety devices, automatic safety shut-off (e.g. „photoelectric barriers“) or manual „emergency stop buttons“ must be taken.

## **10 Dismantling of the device / Stop after operation**

### **10.1 Cutter unit**

After operation, close the blades to a tip distance of a few mm. This relaxes the unit hydraulically and mechanically.

### **10.2 Hydraulic power pack**

Stop the hydraulic power pack after operation.

### **10.3 Hoses**

Uncouple the red hose first and the blue hose second as described under 8.3. Put dust caps over the couplings.

### **10.4 Electric lines**

During longer breaks, the electric lines should be disconnected.

## **11 Maintenance**

### **11.1 Cutter unit**

After each operation and after the end of the shift respectively, a sight check must be carried out, at least once a year. A function test must be accomplished every 500 operating hours or if there are doubts about the safety or reliability (clean first if dirty).

#### ***Visual inspection***

##### *Cutter blades*

- Cutting edges free from spalling and deformation.
- Distance of blades < 3 mm.
- Cutting surfaces slide past each other without contact.
- Blades free from cracks.

##### *Cutter unit*

- Distance between blade tips > 125 mm.
- No leakages.
- Handle existing and fast.

##### *Hoses*

- Check according safety instructions for hoses (see item 5).
- Check for oil leakage.

#### ***Function testing***

- Perfect opening and closing with external / internal switch actuation
- Check of central bolt tightening torque  
MA = 130 <sup>+10</sup> NM (see also drawing to Section 12.3.1).

### **11.2 Covers**

- Inspection of safety devices at / around cutter unit.

### 11.3 Fixture in manipulator

- Perfect condition of chucking and fixture of the device.
- Easy operation of rotating sleeve.

### 11.4 Electric elements

- Check of electric connections / couplings.
- Perfect function of actuating switch.

## 12 Repairs

### 12.1 General

Servicing should only be carried out by the manufacturer or by staff trained by the manufacturer and by authorised LUKAS dealers.

Only components, which are available as original LUKAS spare parts, may be exchanged, because possibly there must be observed necessary special tools, assembly instructions, safety aspects or tests. Therefore use only original LUKAS spare parts.

#### Overpressure safety of the cutters (when not connected)

Undesired pressure could be charged in the device as a result of incorrect connections and temperature increases. Therefore the blue return hose has a safety coupling (quick connect plug, coloured yellow). Undesired overpressure (approx. 1.5 MPa) is automatically released via this plug: oil escapes as well, this is not a malfunction. If foreign couplings are used, which do not have this function, an overpressure safety element (opens at 30 MPa) in the cutter valve will take care for pressure equalization. Oil escapes in the area of the star grip. After the pressure has decreased, the valve is leak-proof again.

If the valve is permanently leaking, the device must be checked by LUKAS.

### 12.2 Preventative service

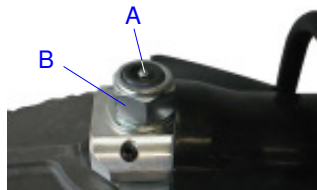
#### 12.2.1 Routine checks

The torque of the central bolt must be checked regularly.

For torques, see the chapter „Technical data“.

Damaged blades can be maintained by sharpening to a total of **0.5 mm**. Please ensure that the internal cutting edges are coplanar.

The central bolt must be lubricated once a day with LUKAS special grease.



The lubrication nipple (A) is directly in the central bolt on the side of the self-locking nut (B).

Lubricate the cutter with a grease gun with LUKAS special grease as shown in the picture right.



Excess grease on the lubrication nipple (see left) after lubrication should be removed and disposed of professional.

**Attention!**

When working with upturned blades, in particular, please ensure that no coarse fragments reaches the mechanical parts under the hand guard of the device. Moveable parts of the device could be blocked as a result and even be destroyed. The device must be checked for dirt and impurities in the mechanical part after each of such applications, and cleaned if necessary.



picture 1

Unscrew handle and pull back the hand guard according to picture 1.



picture 2

Clean dirt and shards from mechanical parts as shown in picture 2 and blow out with compressed air carefully. The hand guard has to be replaced, if it is considerably worn or torn.

### 2.2.2 Main checks

The mechanical transfer elements on the device are subject to very high mechanical stresses and therefore they must be checked after 500 operating hours at latest. Thereby, appearances of attrition can be detected early so that breakages can be avoided by timely replacement of these worn parts. Perfect parts can be reassembled after careful lubrication with LUKAS special grease.

Parts with limited wear (fretting marks) can be refurbished by polishing and reassembled after careful lubrication with the corresponding grease.

If there are heavier traces of wear, the damaged parts must be replaced (in pairs). At these intervals, it is essential to check the blades for crack. A special crack test kit is available.

From time to time the cutter must be cleaned and lubricated with oil to protect it against external corrosion.

### 12.2.3 Function and load test

If there are doubts about the safety and reliability, an additional function and load test must be carried out. For that purpose LUKAS offers a test equipment.

### 12.2.4 Changing the hydraulic oil

- Change the hydraulic oil after approx. 500 operating hours, but after 2 years at latest;
- Whenever the oil of the appropriated pump (motor / hand pump) is changed. Mixing the cutters used oil with fresh oil must be avoided because of impurity.

#### **Procedure**

The cutter is in closed (retracted) position • Change oil of the pump. Unscrew return hose on the pump:

- **for hose connection:** unscrew the connector from the blue return line;
- **for quick couplings:** Fully release the union nut on the plug-in coupling of the blue return line.

Slowly extend the device with the pump. Collect the old oil from the annulus side in a separate container and dispose it like the old oil from the pump • Actuate the pump no longer.

Reconnect the return hose to the pump:

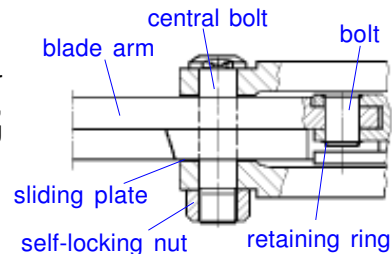
- Tighten the union nut on the plug-in coupling according to 12.3.6,
- Tighten hose nipple in the valve block with  $M_A = 45 \text{ Nm}$ ,
- Ventilate device according to 9.1

## 12.3 Repairs

### 12.3.1 Blades / blade arm and levers

Blades / blade arm and levers must be replaced if there are breakages and cracks or if the blades are no longer in order as a result of multiple regrinding of the cutting edges (12.2.1).

- Unscrew the nut from the central bolt (wrench size of the jaw wrench see chapter "Technical data") and remove the central bolt,
- Remove the retaining ring with retaining ring nipper,
- Replace the blades and sliding plates,
- Insert bolts with retaining rings,
- Tighten the nut on the central bolt with torque according to chapter „Technical data“.



**Note:** The bolts are accessible, when the blades are closed.

**Attention:**

Thoroughly clean all sliding surfaces before assembly and grease with LUKAS special grease.

**Note:** Defective parts (blades, bolts, sliding plates) should always be replaced as pairs. If you detect, when changing blades, that the levers are damaged (see 12.3.1), their fit holes are deformed, fretting marks exist or they are otherwise damaged, these must be replaced too.

This repair must be carried out by an authorised LUKAS dealer or by the LUKAS service department.

**12.3.2 Loss of oil at the hand hold**

Hose connection of the pressure and return line leaky; tighten the hose connections on the control valve:

*Procedure:*

Loosen the 2 screws with insulation cases in the hand hold (hexagon socket SW5)

- Remove hand hold and tighten threaded connections, if necessary replace seals.
- Fix hand hold with screws and insulation cases.

**12.3.3 Replacing the hand guard** (only with switch actuation for manual operation)

The hand guard protects the operator against injuries resulting caused by the moving parts. In case of damage, the hand guard must be replaced.

*Procedure:*

Unscrew handle • remove blades / blade arms (see 12.3.1) • Remove hand guard • move the new hand guard over the cylinder body until the holes of the hand guard and the screw holes for the handle matches • mount handle.

**12.3.4 Handle**

Defective handles must be removed immediately.

*Procedure:*

Unscrew defective handle and remove it over the cylinder body • fix the new handle, if necessary replace screws and washers.

**12.3.5 Labels**

All damaged labels must be replaced (safety instructions, type labels, etc).

*Procedure:*

Remove damaged labels • clean the surfaces with acetone and glue on the new labels.

**12.3.6 Quick couplers**

Quick couplers on the hoses must be changed, if:

- external damages are visible • interlock does not work • oil constantly leaks when connected.

**Note:** Couplers must not be repaired, they must be replaced by original LUKAS parts.

When assembling tighten the union nut on the hose line with  $M_A = 45 \text{ Nm}$ .



### 13 Troubleshooting

Trouble	Check	Cause	Remedy
Hoses cannot be coupled		Pressurized	Relieve pump pressure
Blades move slowly or by jerks when actuated	Hoses correctly connected, power pack operating	Air in the hydraulic system	Thoroughly vent pump unit
No pressure build-up		Insufficient oil in the tank or motor pump. Pump not ventilated after oil change	Refill oil and ventilate the system
Oil leakage out of hoses or hose fittings		Untightness, possible damages	Replace hoses
Surface of the hydraulic hoses is dissolved		Contact with aggressive media	Replace hoses
Blades spread up at tips to a gap of more than 3 mm		Torque of the central bolt nut is insufficient	Retighten, see chapter 12.2.1
Leakages: leaks at the piston rod		Defective piston rod seal	Changing the seals by an authorized dealer or directly by LUKAS

If the defects cannot be repaired, contact an authorised LUKAS dealer or the LUKAS service department.

The address of the LUKAS service department is:

**LUKAS Hydraulik GmbH**, Weinstraße 39, D-91058 Erlangen; PF 2560, D-91013 Erlangen Kundendienst Tel 09131/698 348; Fax 09131/698 353.

## 14 Technical data

Type	LSI 600	LSI 600E	LSI 400E
Dimensions l x w x h (mm)	481x210x126	684x252x126	684x252x126
Weight (incl. oil filling) (kg)	20	22	14,3
Control voltage with integral switch (V)	-	24	
Protective system switch / cable / plug	-	IP 54	
max. operating pressure (MPa)*	50		
usable oil quantity l <sup>1</sup>	0,20		

\* 1MPa = 10 bar;

\*\* Necessary oil quantity in the hydraulic power pack for operating the tool  
(Difference in quantity piston / rod side)

Opening distances and forces		
Measuring point	Material dia. mm	Cutting forces kN
At tip	max. 125	40
50 mm from tips	20	78
87,5 mm from tips	25	260
max. Cutting force	25	270

### 14.1 Maximal cutting performance for LSI 600 / LSI 600 E / LSI 400 / LSI 400 E

Max. Dimensions of Material						
Type of material	Form of material	Strength R <sub>m</sub> N/mm <sup>2</sup>	LSI 600/600E	LSI 600/600E	LSI 400	LSI 400E
			max. cutting performance m m	Continous cutting performance m m	max. cutting performance m m	Continous cutting performance m m
	○	750	dia. 23	dia. 18	dia. 23	dia. 18
	○	500	dia. 25	dia. 20	dia. 25	dia. 20
	□	500	40 x 4	30 x 4	40 x 4	30 x 4
Steel	⊙	500	dia. 65 x 3	dia. 60 x 3	dia. 65 x 3	dia. 60 x 3
	└	500	50 x 50 x 5	50 x 50 x 4	50 x 50 x 5	50 x 50 x 4
	—	500	80 x 8	80 x 6	60 x 8	60 x 6
	└	500	60 x 30 x 6	40 x 40 x 4	60 x 30 x 6	40 x 40 x 4
Alu	○	400	dia. 28	dia. 24	dia. 28	dia. 24
Copper	○	200	dia. 35	dia. 28	dia. 35	dia. 28

For daily use it is to be distinguished between max cutting performance and cutting performance under continuous duty.

In the interest of a long tool life and acceptable service intervals, we recommend not to exceed permanently the figures given for continuous duty. Applications in the range of the max. cutting performance require a perfect condition of the blades and shortened service intervals.

## 14.2 Central bolt / Torque

Type	LSI 600/600E / LSI 400/400E
Central bolt	M 27 x 1,5 (SW 41)
Torque (Nm)	130 + 10

## 14.3 Oil recommendations

For LUKAS hydraulic devices, use mineral oil in accordance with DIN 51 524 and others

	Range of oil temperature	Viscosity rating	Remarks
A	-24 .... +30°C	HL 5	
B	-18 .... +50°C	HLP 10	
C	-8 .... +75°C	HLP 22	
D	+5 .... +80°C	HLP 32	
E	-8 .... +70°C	HF - E15	biodegradable

Recommended viscosity range: 10 ... 200 mm<sup>2</sup>/s,  
delivered with HLP 22 to DIN 51 524.

## 14.3 Permissible temperature range

The permissible working temperature for LSI tools is from -20°C bis + 55°C.

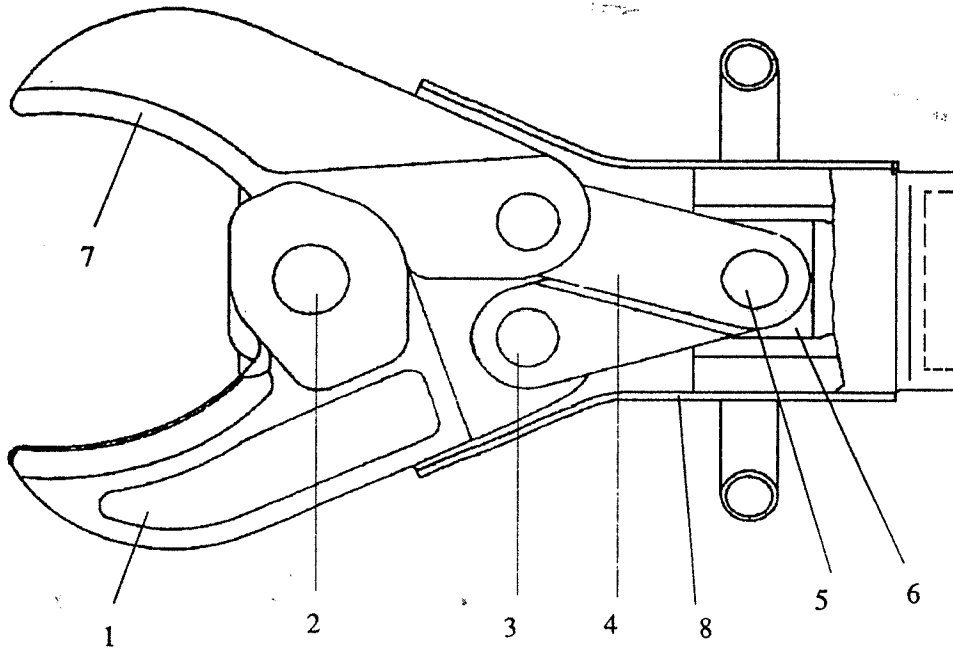
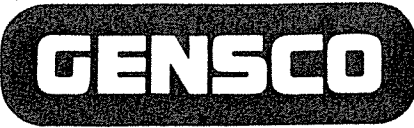
---

### LUKAS Hydraulik GmbH

A Unit of IDEX Corporation  
Weinstraße 39, 91058 Erlangen • Germany  
Postfach 2560, 91013 Erlangen • Germany  
Telefon +49(0)9131/698-0 • Telefax +49(0)9131/698-394  
e-mail: info@lukas.de



subject to revision



### Change of Cutting Blades

Unscrew the nut of the central bolt and drive out the central bolt (fixed spanner 36)

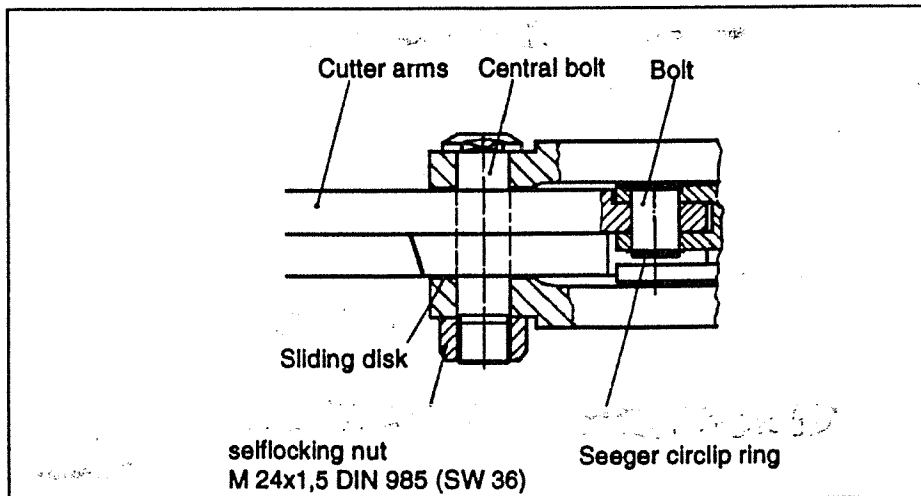
- Remove the Seeger circlip rings
- Grease the new cutting blades properly before mounting
- Tighten nut of central bolt with 120 + 10 Nm

- 1 Cutter blades
- 2 Center bolt with selfsecuring nut
- 3 Bearing bolt for lever
- 4 Lever
- 5 Bearing bolt in the piston attachment
- 6 Piston attachment
- 7 Cutting edge
- 8 Protective hose

The distance between the blade tips can be max. 12 mm during the cutting process (risk of breakage!)

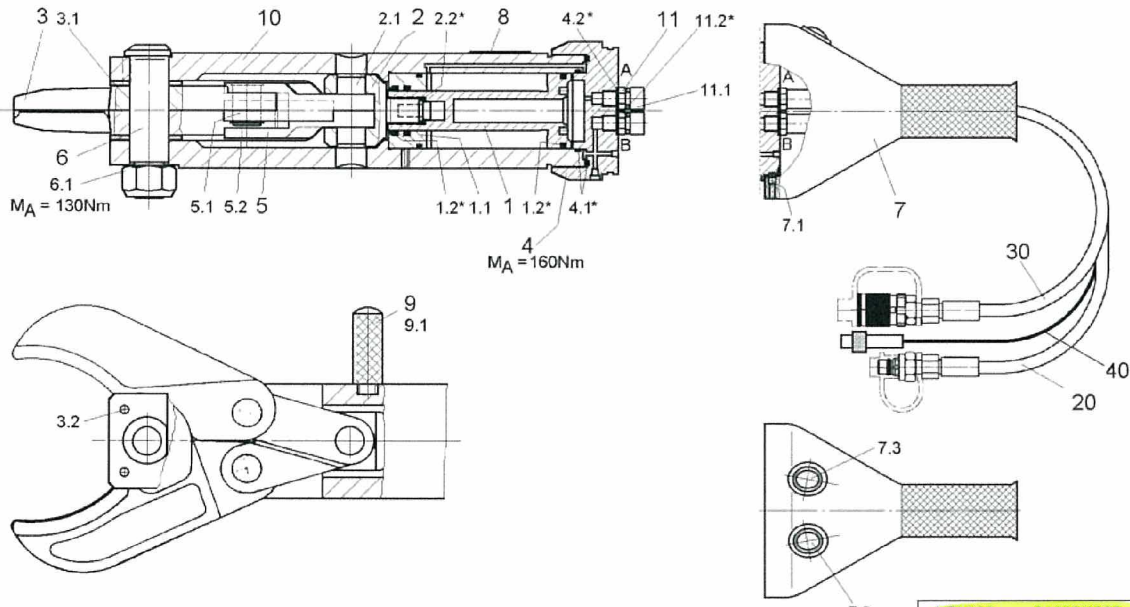
### After Operation

After operation, close the cutter arms until the tips are only a few millimeters apart. This hydraulically relaxes the device.



### Remark:

The bolts are freely accessible when the cutter arms are closed.



gültig für:  
valid for:

LSI 600	84150/1390
LSI 600 E	84150/1396
LSI 400 E	84150/1398
Menge/Quant.	

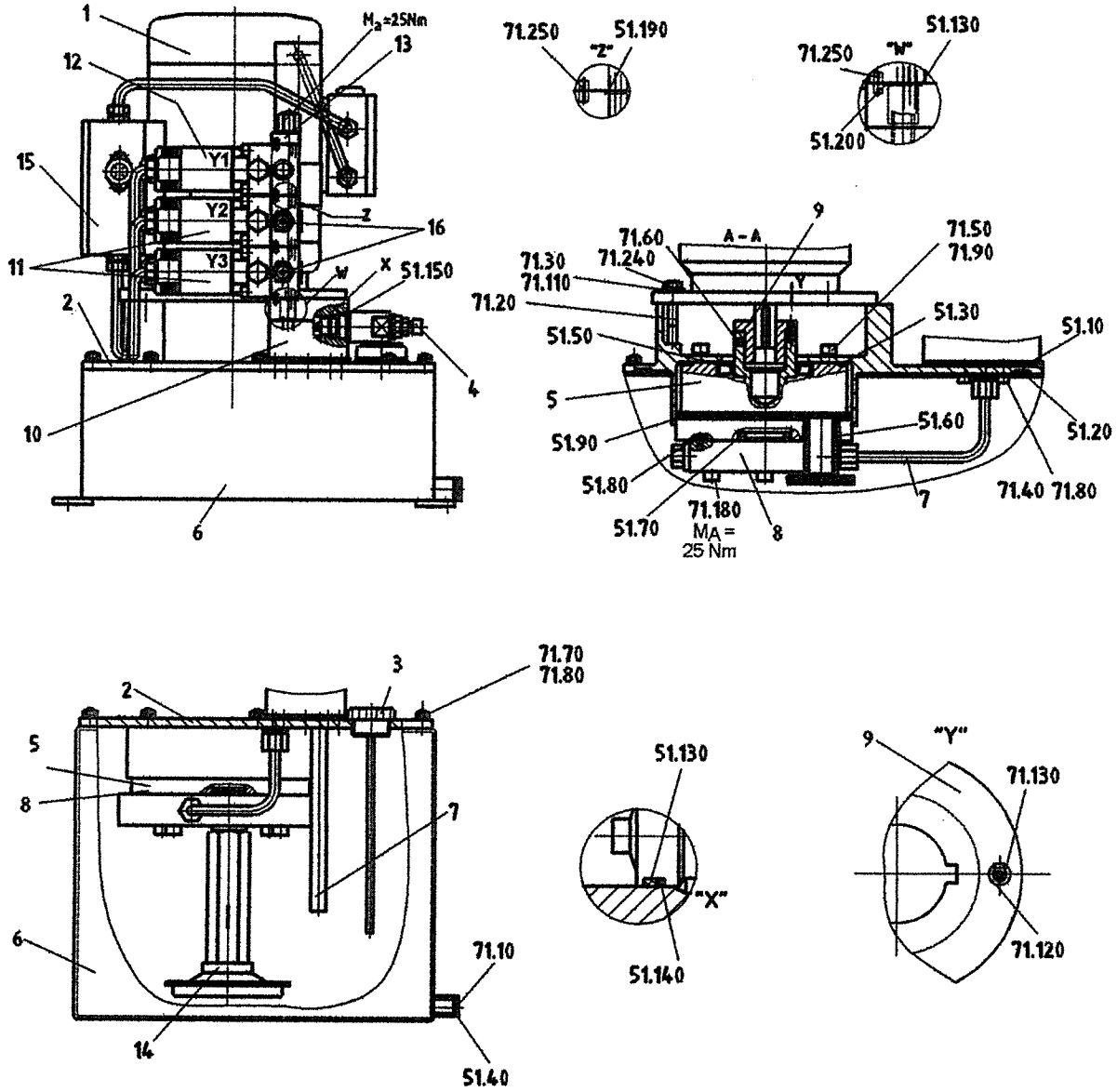
Pos. Item	Bestellbezeichnung	Description	Bestellnummer Ref. no.	Menge/Quant.			lieferbar available
1	Kolben, inklusive:	piston, including:	V84150/1290-02	1	1	1	XX
1.1	Führungsbuchse	guiding bushing		1	1	1	-
1.2*	Dichtungen	sealings		4	4	4	-
2	Druckstück, inklusive:	pressure piece, including:	V84150/1290-03	1	1	1	XX
2.1	Zylinderstift	cylinder pin		1	1	1	-
2.2*	Dichtung	sealing		1	1	1	-
3	Schermesser, inklusive:	cutting blades, including:	V84150/1290-05	1	1	1	XX
3.1	Gleitblech	sliding plate		1	1	1	-
3.2	Spannhülse	tightening sleeve		2	2	2	-
4	Anschlußboden, inklusive:	supporting part, including:	V84150/1390-16	1	1	1	XX
4.1*	Dichtungen	sealings		2	2	2	-
4.2*	Dichtring	sealing ring		2	2	2	-
5	Hebelglied, inklusive:	lever member, including:	V84150/1290-08	2	2	2	XX
2.1	Zylinderstift	cylinder pin		1	1	1	-
5.1	Bolzen	bolt		2	2	2	-
5.2	Sicherungsring	securing ring		2	2	2	-
6	Lagerbolzen / Mutter, inklusive:	bearing bolt / nut, including:	V84150/1290-07	1	1	1	XX
6.1	Mutter	nut		1	1	1	-
7	E-Ventil, inklusive:	E-valve, including:	V84150/6218	1	1	1	XX
7.1	Gewindestift M6x10	threaded pin M6x10		3	3	3	-
7.2	Mini-Taster, rot	push button, red	HR 1603 17101	1	1	1	XX
7.3	Mini-Taster, grün	push button, green	HR 1603 17104	1	1	1	XX
8	Schildersatz-Stanzbogen	set of identification labels	V84150/1390-90	1			XX
	Schildersatz-Stanzbogen	set of identification labels	V84150/1396-90		1		XX
	Schildersatz-Stanzbogen	set of identification labels	V84150/1398-90			1	XX
9	Griff, inkl.	handle, incl.	V84182/1101-08	1	1	1	XX
9.1	Griff 824 - TPE	handle 824 - TPE		1	1	1	-
10	Zylinderkörper, inklusive:	cylinder body, including:	V84150/1290-01	1	1	1	XX
	Zylinderkörper, inklusive:	cylinder body, including:	V84150/1290-11			1	XX
4.1*	Dichtung	sealing		2	2	2	-
11	Anschlußnippel M14x1,5/M12x1,5, inklusive:	connection plug M14x1,5/M12x1,5, including:	V84126/5102-35	2			XX
4.2*	Dichtring	sealing ring		2			-
11.1	Schraubkappe	screw cap		2			-
11.2	O-Ring	o-ring		2			-
20	Schlauch DN 6PN630-3000, BL-NI-M12 x 1,5	hose DN 6PN630-3000, BL-NI-M12 x 1,5	V84150/7075		1	1	XX
30	Schlauch DN 6PN630-3000, RT-MU-M12 x 1,5	hose DN 6PN630-3000, RT-MU-M12 x 1,5	V84150/7076		1	1	XX
40	Kabel f. E-Ventil, inkl.	cable f. E-valve, incl.	V84150/6238		1	1	XX
50	Dichtungssatz	sealing set	84150/1290-99	1	1	1	XX
51	Sicherungsring (Pos. 5.2)	securing ring (pos. 5.2)	84150/1290-98	10	10	10	XX

\* Bestandteil des Dichtungssatzes

\* component of sealing set

Bei Bestellung Bestellbezeichnung und Bestellnummer angeben. · When ordering please indicate description and ref. no.  
Nur Ersatzteile und Teile mit XX sind einzeln lieferbar. · Only spare parts and parts with XX are available as single parts.

gültig für: PO6-LSI 510 115/60 84112/5303  
 valid for: PO6-LSI 520 230/60 84112/5304



Pos. Item	Bestellbezeichnung	Description	Bestellnummer Ref. no.	Menge Quantity		lieferbar available
				84112/53..		
				PO6-LSI-510 ..03	PO6-LSI-520 ..04	
1	Einph. Motor 1,26 kW 115/60, kpl.	single phase motor 1,26 kW 115/60, cpl.	V84112/5699 1	1		XX
	Einph. Motor 2,2 kW 230/60, kpl.	single phase motor 2,2 kW 230/60, cpl.	V84112/5304 1		1	XX
2	Pumpenträger, kpl.	pump plate, cpl.	V84150/7601-02	1	1	XX
3	Einfülldeckel mit Ölmesstab (10 l)	filling cap with dipstick (10 l)	V84150/7601-04	1		XX
	Einfülldeckel mit Ölmesstab (25 l)	filling cap with dipstick (25 l)	V84150/7801-11		1	XX
4	Druckbegrenzungsventil DVB06DRE/500	pressure relief valve	V84132/7005	1	1	XX
5	RK-Pumpe RK2-10/2,34+2-6,5/0,98, kpl.	radial piston pump, cpl.	V84136/1413	1		XX
	RK-Pumpe RK2-12/3,3+2-8/1,5, kpl.	radial piston pump, cpl.	V84136/1409		1	XX
6	Ölbehälter 10l, kpl.	oil container 10l, cpl.	V84150/7601-01	1		XX
	Ölbehälter 25l, kpl.	oil container 25l, cpl.	V84072/9230-09		1	XX
7	Verrohrung, kpl. LSI 510	pipe, cpl., LSI 510	V84112/5650-01	1		XX
	Verrohrung, kpl. LSI 520	pipe, cpl., LSI 520	V84112/5640-05		1	XX
8	Druckschaltventil, kpl.	pressure valve, cpl.	V84136/0039	1	1	XX
9	Kupplung E, kpl.	coupling, cpl.	V84136/0867-03	1	1	XX
10	Anschlussplatte PO6_LSI, kpl.	connection plate PO6_LSI, cpl.	V84112/0707	1	1	XX
11	Wegesitzventil R-1-WG115 VB11	way seat valve R-1-WG230 VB11	V84112/5699-02	2		XX
	Wegesitzventil R-1-WG230 VB11	way seat valve R-1-WG230 VB11	V84112/5640-02		2	XX
12	Wegesitzventil F-1-WG115 VB11	way seat valve F-1-WG115 VB11	V84112/5699-03	1		XX
	Wegesitzventil F-1-WG230 VB11	way seat valve F-1-WG230 VB11	V84112/5640-03		1	XX
13	Zuganker PO6-LSI, kpl.	pulling anchor PO6-LSI, cpl.	V84112/5640-04	1	1	XX
14	Saugstutzen	suction pipe	V84072/9230-08		1	XX
15	Schaltgerät LSI 115 V, kpl.	switching tool LSI 115 V, cpl.	V84112/5517	1		XX
	Schaltgerät LSI 230 V, kpl.	switching tool LSI 230 V, cpl.	V84112/5675		1	XX
16	Anschlussnippel G1/4 / M 14x1,5	connection nipple G1/4 / M 14x1,5	V84071/3380-01	2	2	XX
51	Ersatzteilbeutel PO6-LSI	spare parts bag PO6-LSI	84112/5640-99	1	1	XX
71	Normteilkpaket PO6-LSI	stand. parts bag PO6-LSI	84112/5640-96	1	1	XX

Bei Bestellung Bestellbezeichnung und Bestellnummer angeben. • When ordering please indicate description and ref. no.  
Nur Ersatzteile und Teile mit XX sind einzeln lieferbar. • Only spare parts and parts with XX are available as single parts.

LUKAS Hydraulik GmbH • Weinstraße 39 • D-91058 Erlangen • Postfach 2560 • D-91013 Erlangen • Telefon 09131 698-0 • Telefax 09131 698-394







# Hydraulic diagram

