LUBMANN
Centralized Lubrication System

# Operating- and assembly manual
# Grease lubrication pump
## ALP81

LUBMANN
Centralized Lubrication System

## Inhaltsverzeichnis



All information subject to technical changes.

| Rev. | Change | Date / Author: | Date / Released: |
|---|---|---|---|
| 02 | Update | 24.04.2025 / HB | 24.04.2025 / JR |
| | | | |
| | | | |
| | | | |

# 1 Declaration of incorporation

LUBMANN
Centralized Lubrication System

## Declaration of incorporation for incomplete machinery (acc. to EC-directive 2006/42/EG)

The manufacturer: Lubmann GmbH
Kleiner Johannes 21
91257 Pegnitz, Germany

declares hereby, that the following partly completed machinery:

Grease lubrication pump
Type: ALP81
Part No.: 20xxxxxxxx / 99xxxxx / 15xxxxxx

is complying with all essential requirements of the above-mentioned machinery directives (2006/42/EG): Annex I, article 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4, and 1.5.1.

The following coordinated standards have been used:
DIN EN 809
DIN EN ISO 12100

The following other specifications and standards have been used:
VDE 0530

The protection targets of the directive for have been electric equipment 2014/35/EU observed according to the annex I, no. 1.5.1 of the machine directive.

The incomplete machine may only be put into service as soon as there has been stated that the machine, into which the incomplete machine shall be installed, responds to the determinations of the machine directive (2006/42/EG).

The special documentation that responds to the machine, has been prepared according to annex VII part B.

The manufacturer, documentation department, phone +49 9241 80 89 87 00, email: info@lubmanngmbh.de; obliges itself to pass on electronically the special documentation for partly completed machinery to individual national authorities upon request.

Pegnitz, 01.09.2022

ppa. Markus Kurzdörfer
General Manager
Lubmann GmbH

www.Lubmann-GmbH.de

Amtsgericht Bayreuth HRB-Nr. 7823 Steuernummer: DE316746274 Adresse: Kleiner Johannes 21, D-91257 Pegnitz Email: Info@lubmann.de

## 2 CE Certificate



TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group

TÜVRheinland®
Precisely Right.

Lubmann GmbH
Markus Kürzdörfer

Dr.-Alfred-Herrhausen-Allee 16
47228 Duisburg
Germany

Date : 11.06.2021
Our ref. : WYH 01
Your ref.: M.K.

**Ref : AM Certificate of Conformity (Module A)**

Type of Equipment : Centralized Lubrication System
Model Designation : See Certificate
Certificate No. : AM 50507162 0001
Report No. : 17705122 003

Dear Markus Kürzdörfer,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body

Huajian Dong

Enclosure

证书的详细资料请登陆www.certipedia.com查阅，或拨打我司客服热线800 999 3668 / 400 883 1300咨询

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Internet: http://www.chn.tuv.com

# CERTIFICATE

TÜVRheinland®

of Conformity
EC Council Directive 2006/42/EC
Machinery

Registration No.: AM 50507162 0001

Report No.: 17705122 003

**Holder:**
Lubmann GmbH
Dr.-Alfred-Herrhausen-Allee 16
47228 Duisburg
Germany

**Product:**
Grease Pump
(Centralized Lubrication System)

**Identification:**
Type Designation : ALP8xy (x=1, 2, 3. y=2)
ALP10xy (x=1, 2, 3. y=2, 4, 6, 8)
(LUBMANN)
Serial No. : Engineering sample

Remark: Refer to test report 17705122 003 for details.
See more module type designations in attachment 1.1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Certification Body

Date 11.06.2021

Huajian Dong

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

TÜVRheinland®

1.1

**TÜV Rheinland**
**LGA Products GmbH**
**Tillystraße 2, 90431 Nürnberg**

**Attachment to**
**Registration No.:** AM 50507162 0001
**Report No.:** 17705122 003

**Manufacturer:**
Lubmann GmbH
Dr.-Alfred-Herrhausen-Allee 16
47228 Duisburg
Germany

**Scope:**

Type Designation:
ALPA8xy (x=1. y=1, 2)
ALPA10xy (x=1, 2. y=2, 4, 6)
ALPA12xy (x=1, 2. y=4, 8, 10, 15, 20, 30)
ALPB10xy (x=1, 2. y=2, 4, 6)
ALPB12xy (x=1, 2. y=4, 8, 10, 15, 20, 30)
ALPB13xy (x=1, 2. y=15, 20, 30)
(LUBMANN)
Serial No.: Engineering sample

Remark: Refer to test report 17705122 003 for details.

Certification Body

TÜVRheinland LGA Products GmbH Zertifizierungsstelle

Huajian Dong

**Date:** 2021-06-11

# 3 Imprint

**Manufacturer**
Lubmann GmbH
Add: Kleiner Johannes 21, 91257 Pegnitz, Germany
E-Mail: info@lubmann-gmbh.de
Website: www.lubmann-gmbh.de

**Training courses**
In order to provide a maximum of safety and economic viability, Lubmann GmbH carries out detailed training courses. It is recommended that the training courses are attended. For more information, please contact Lubmann GmbH.



**Disclaimer**
The manufacturer shall not be held responsible for damages caused by:

- Non appropriate use faulty assembly, operating, setting, maintenance, repair or accidents
- Use of inappropriate lubricants
- Improper or late response to malfunctions
- Unauthorized modifications of the product
- Intent or negligence
- Use of non-original Lubmann spare parts
- Faulty planning or layout of the centralized lubrication system

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

## 4 Explanation of symbols


Safety instructions which, if not complied with, may endanger persons, are marked specifically with the general hazard symbol!


This heading is used if inaccurate compliance or non-compliance with the Operating Instructions or specified work procedures etc. may result in damage.

General commandment!
Points out Special Information!

## 5 Warranty and extent of warranty

Inappropriate intervention will rule out your warranty claim!

Warranty regarding operational safety, reliability and performance of the progressive divider is only accepted by the manufacturer under the following conditions:

- Assembly, connection, setting, maintenance and repair are carried out by authorized and specialized staff.
- The limits stipulated in the technical data must never be exceeded
- Only original components or components approved by the manufacturer may be used for repair and maintenance work.

All guarantees and warranties expire for damages to the grease lubrication pump that are caused by operation with improper lubricants (e.g., piston wear, piston jamming, plugins, embrittled sealings).
Lubmann does not assume liability on damages caused by lubricants, even if these lubricants have been tested and released by laboratory tests, as damages caused by lubricants (e.g., by expired or improper stored lubricants, batch variations etc.) can not be retraced to their root cause in retrospect.

**Contact:** Lubmann GmbH, Kleiner Johannes 21, 91257 Pegnitz, Germany

## 6 Safety instructions

**General information**
Any safety-related faults must be eliminated without delay.

Below please find fundamental instructions to be complied with, regarding assembly, operation and maintenance. The mechanical and the competent specialists / staff of the operating company must read the Operating Instructions on all accounts prior to starting assembly, commissioning and maintenance. Moreover, the Operating Instructions must permanently be available on site.

Not only the safety instructions included under this item, but also the specific safety instructions appearing in other parts of this manual must be complied with.

**General risk reference**
All system components have been designed in view of operational safety and accident prevention according to the applicable provisions for the design of technical equipment.

Nevertheless, utilization thereof may result in risks for the user or third parties and/or technical equipment. Thus, the system may only be used in proper technical working within its intended fields of application and in compliance with the safety provisions and the Operating Instructions.

**Personal**
The staff in charge of operation, maintenance, inspection and assembly must be qualified accordingly for this work. The operating company must stipulate competences, responsibilities and the supervision of staff precisely. If the staff does not dispose of the appropriate knowledge, they must be trained and instructed. The operating company must ensure that the staff have understood the contents of the Operating Instructions.

**Gefahr bei Nichtbeachtung der Sicherheitshinweise**


Non-compliance with the safety information may put persons at risk and endanger the environment and/or the machine.
Non compliance with the safety instructions may rule out any claims for damages..

Non-compliance may lead, e. g. to the following dangers:

- Failure of important system functions,
- Failure of the specified maintenance and servicing methods,
- Endangering people due to electrical, mechanical and chemical effects,
- Endangering the environment due to leakages of dangerous materials.

**Intended purpose**
The pumps of the series ALP81 serve only for the supply of central lubrication systems at vehicles, systems and machines. Any use beyond this scope is regarded as being not in conformity with the intended purpose.

**Assembly and maintenance**

Observe for all assembly works at vehicles, systems and machines the valid local accident prevention regulations and safety instructions as well as the specifications for operation and maintenance.

All maintenance, inspection and assembly work may only be carried out by trained specialists. All work must only be carried out when the plant is at a standstill and while wearing appropriate protective clothing.
All the safety and protective equipment must be replaced immediately after completing work.


Media that endangers the environment must be disposed in accordance with pertinent official specifications.

Secure the system during maintenance and repair works, against intentional and unintentional reoperation.

Dispose of process materials in accordance with the safety data sheets of the lubricant manufacturer.

**Safety information for operators/operating staff**

If hot or cold machine parts led to hazards, the customer must secure them from being touched.

The guards on moving or rotating parts must not be removed.


Drain leakages of dangerous materials in a way, that people or the environment are not endangered.

Comply with legal regulations.

Exclude any hazards by electric energy.

**Unauthorized modification and spare part production**


Modifications and alterations on the grease lubrication pump require the manufacturer's prior approval.
The use of non-original parts excludes liability for the resulting consequences.

**Danger caused by the electrics**


The units may be connected to the power supply exclusively by appropriately trained qualified personal in conformity with the local connection conditions and regulation (e. g. DIN, VDE)!

Improperly connected equipment may lead to serious personal injury and damage to property!

**Danger caused by system pressure**


The units might be under pressure. Make them pressure less before you start with repairs, changes or extensions.

**Use of hydraulic hose lines**

Installing hydraulic hose lines at the lubrication pump, the operator must observe respectively ensure the following items.


Checks for proper assembly and function must be carried out according to the regional valid guidelines.

Checks for a safe provisioning and use must be carried out according to the regional valid guidelines.

The check deadline must not be exceeded.

Exchange defect hydraulic hose lines immediately and professional.

Hydraulic hose lines subject to a wear process and must be exchanged regularly and according to the manufacturer`s details.

**Cleaning**


The grease lubrication pump has an IP65 (according to DIN EN 60529) protection class!

It is not allowed to clean the Lubmann grease lubrication pumps of serie ALP81 with a high-pressure cleaner.

The high-pressure jets can allow water to penetrate the seals into the grease lubrication pump.

We do not provide a warranty when high-pressure cleaner are used!

**Lubricant**

The system has been designed for commercially available multi-purpose greases of NLGI class 2 for operation in summer and winter.

Use greases with high-pressure additives (EP greases).

Only use greases of the same saponification type.

Lubricants containing solid contents must not be used (lubricants like graphite or MoS2 on request).


Observe the vehicle manufacturer’s specifications, when you select the lubricant.

After the system has been shut down, check the lubricant for physical and chemical signs of aging to see whether it is still suitable for use.
After the system has been shut down: Check the lubricant for physical and chemical aging phenomena to see whether it is still suitable for use.

Observe the safety data sheet for the lubricant used.

**Hazards to environment cause by lubricants**

The lubricants which are recommended by the manufacturer of your vehicle, system or machine correspond in their composition to the common safety regulations. Mineral oils and greases are generally hazardous to ground water and their storage, processing and transport requires special precautions.

**Inadmissible methods of operation**


Operational security of the plant is only guaranteed if it is operated in accordance with the operating instructions. The limit values stated in the technical data must not be exceeded under any circumstances.

# 7 Delivery, Returns and Storage

**Transport**
The grease lubrcation pumps of the series ALP81 are packed commercially, according to the regulations of the recipient country and to the wish of the customer.

There are no limitations with respect to land, air or sea transport.

Store in a dry place at a temperature of -5° C to +35°C.

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent. Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

**Returns**
Clean all parts and pack them properly (i.e., following the regulations of the recipient country) before returning them.

Protect the product against mechanical influences such as impacts.

There are no restrictions for land, sea or air transport.

**Storage**
Lubmann products are subject to the following storage conditions:

- dry, dust- and vibration-free in closed premises
- no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
- protect from environmental influences such as UV rays
- protected against pests and animals (insects, rodents, etc.)
- possibly in the original product packaging
- shielded from nearby sources of heat and coldness
- in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water

**Storage conditions for parts filled with lubricant**
The conditions mentioned in the following will have to be adhered to when storing products filled with lubricant.

<u>Storage period of up to 6 months</u>
The filled products can be used without having to take further measures.

<u>Storage periao from 6 to 18 months</u>

1. Connect the pump electrically
2. Switch the grease lubrcation pump on and let it run, e.g., by triggering an additional lubrication, until about 4 cm³ of lubricant will leak from each pump elemet
3. Switch the pump off and disconnect it from the electrical grid
4. Remove and dispose of leaked lubricant

<u>Storage period exceeding 18 mounth</u>

To avoid dysfunctions, consult the manufacturer before commissioning.
The general procedure to remove the old grease filling corresponds to that of a storage period from 6 to 18 months.

# 8 Shutdown and disposal

**Temporary shutdown**

Temporarily shut the system down by:

- Switching off the superior machine.
- Disconnecting the product from the power supply.

**Final shutdown and disassembly**

The final shutdown and disassembly of the product must be planned and carried out by the operator in a professional manner and in compliance with all regulations to be observed.

**Disposal**

- for Countries within the European Union

Disposal should be avoided or minimized wherever possible. Disposal of products contaminated with lubricant must be affected via licensed waste disposal contractor in accordance with environmental requirements and waste disposal regulations as well as local authority requirements.

The specific classification of the waste is in the waste producer's responsibility, as the European Waste Catalogue provides different waste disposal codes for the same type of waste but of different origin.

Electrical components have to be disposed of or recycled following WEEE directive 2012/19/EU.

Plastic or metal parts can be disposed of with the commercial waste.

- for Countries outside the European Union

The disposal must be done according to the valid national regulations and laws of the country where the product is used.

# 9 Accompanying documents

In addition to this manual, the following documents must be considered by the respective target audience:

- Operational instructions and release regulations for the pump used
- Safety data sheet for the lubricant used
- Project documentation
- Operating instructions for components installed during assembly of the central lubrication system
- Release regulations and regulations in the company

## 10 Technical Data

**Motor:**

| | | |
|---|---|---|
| Operating voltage: | 12V DC ±10% | 24V DC ±10% |
| Revolutions [rpm]: | 20 ± 2 | 23 ± 2 |
| Relative duty cycle: | 30% ED S3 30 minutes | |
| Current consumption at +20°C: | | |
| Idling: | 1 A | 0.6 A |
| Full load: | 5 A | 3 A |
| Fuse: | 10 A | 6 A |

ATTENTION

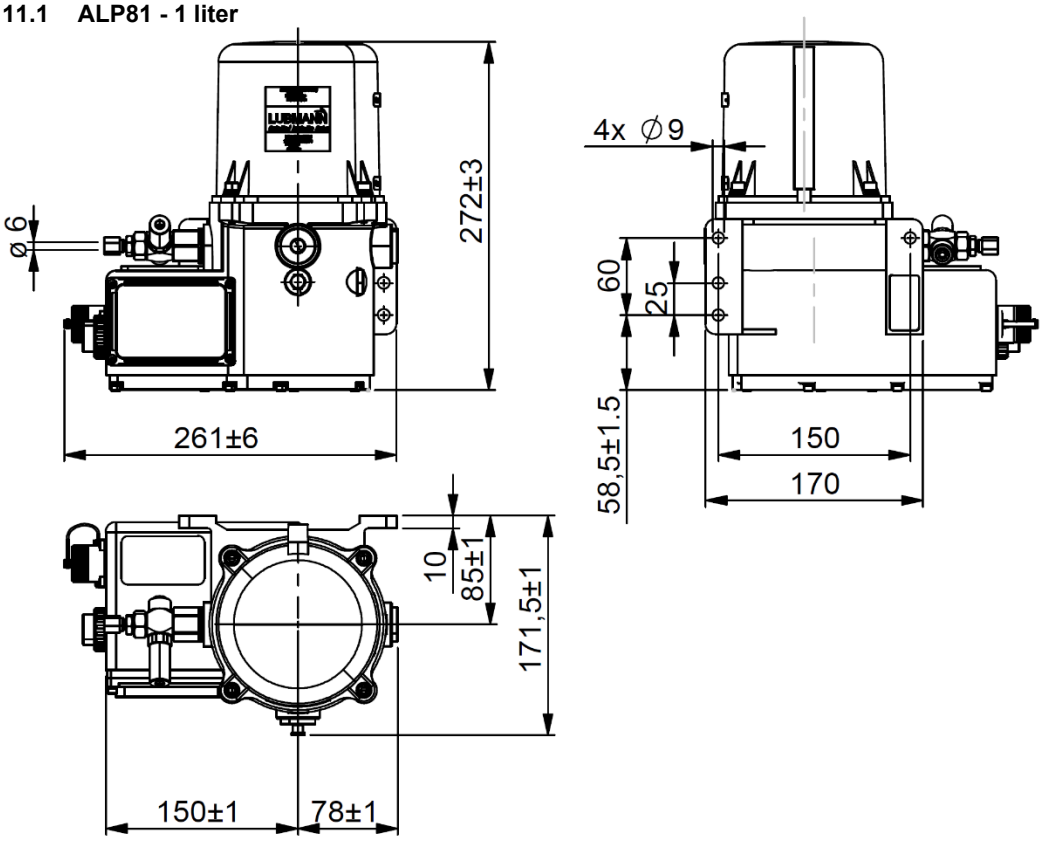
The pump must be protected by a back-up fuse in front of the pump to avoid overvoltage damage!

**Grease lubrication pump:**

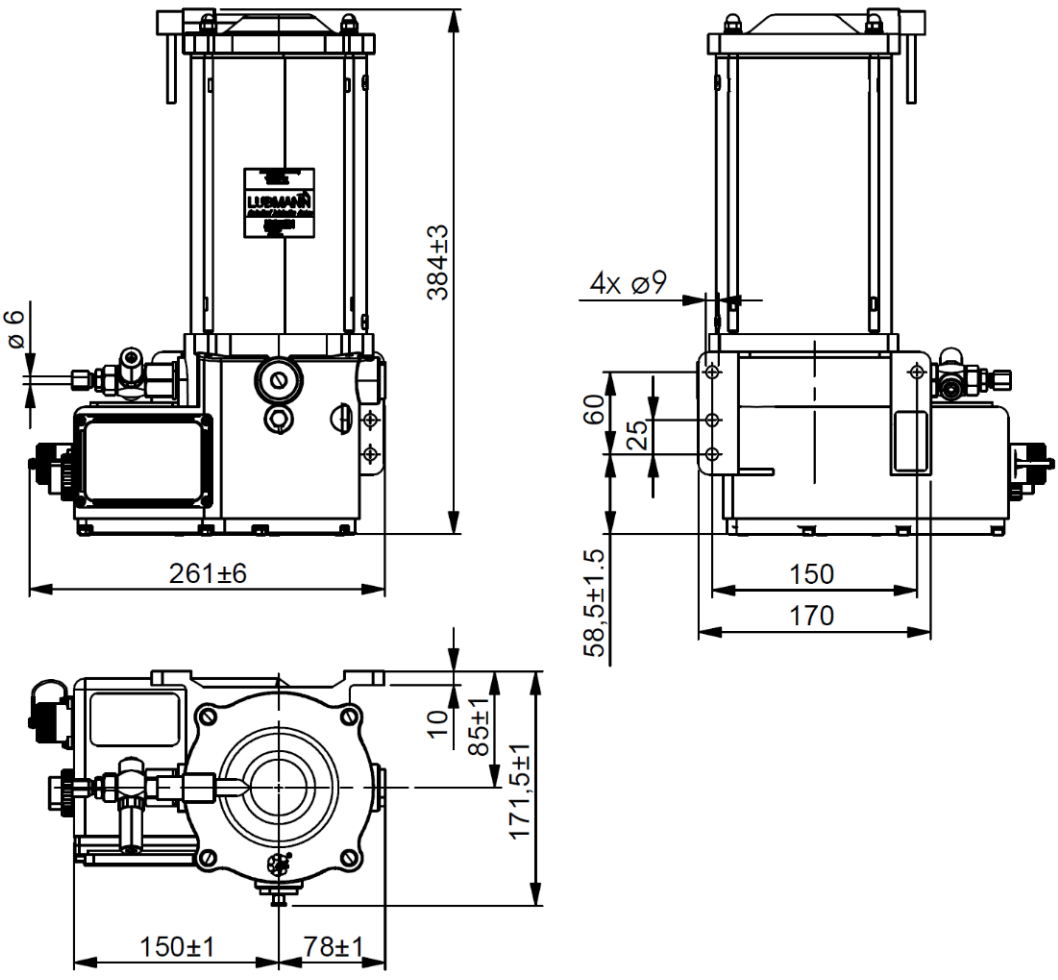
| | |
|---|---|
| Max. number of pump elements PE: | 3 |
| Max. operating pressure: | 350 bar |
| Adjusting of pressure relief valve: | 300 bar |
| Permissible operating temperature: | -35°C bis +70°C |
| Sound pressure level: | <70 dB |
| Reservoir size: | 1 and 2 liter |
| Installation position: | Behälter Vertikal |
| Protection type: | IP65 |
| Lubricant: | Grease up to NLGI-Cl.2<br>(no grease with solids)<br>no oil |

# 11 Installation dimensions

## 11.1 ALP81 - 1 liter




## 11.2 ALP81 – 2 liter

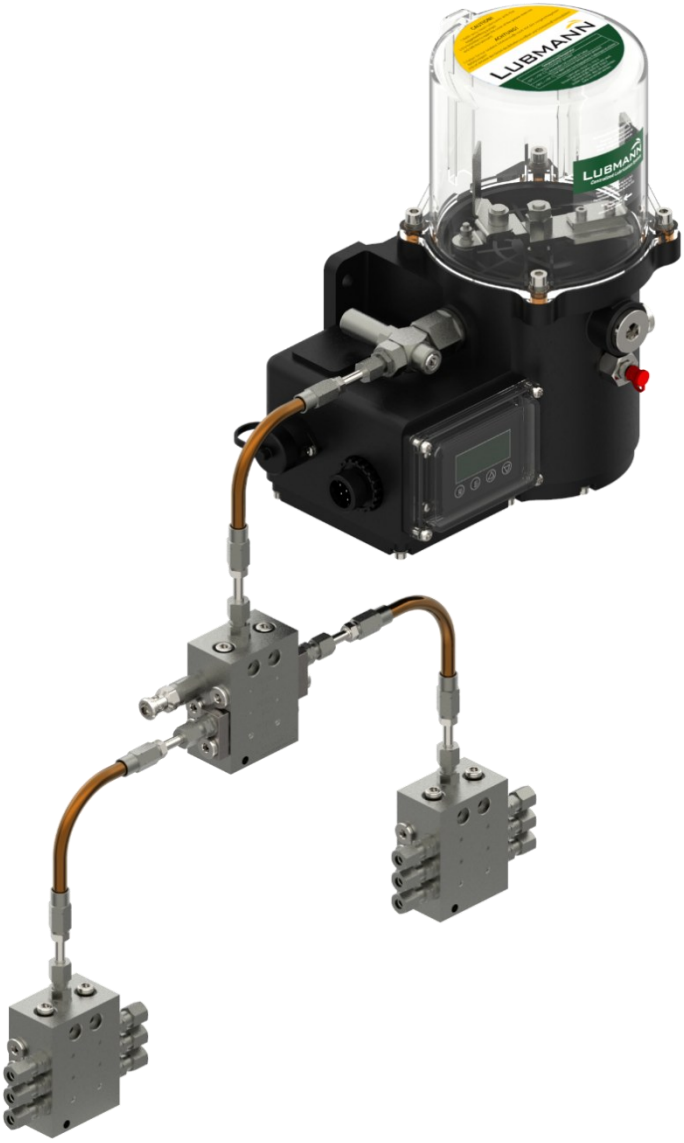


# 12 Overview and function

## 12.1 General

Lubmann grease lubrication pump type - ALP81 has been widely used in industries like wind power, mining, metallurgy, machine tools, textiles, food, ports, commercial vehicles, construction machinery, and heavy mechanical equipment, etc.

Our Lubmann automatic lubrication system lubricates all lube points as required through progressive lubrication system. It can reduce the friction resistance, reduce contact wear and decrease the friction surface temperature. Meanwhile, it plays a supporting role of anti-rust, shock absorption and sealing of bearings and bolts.

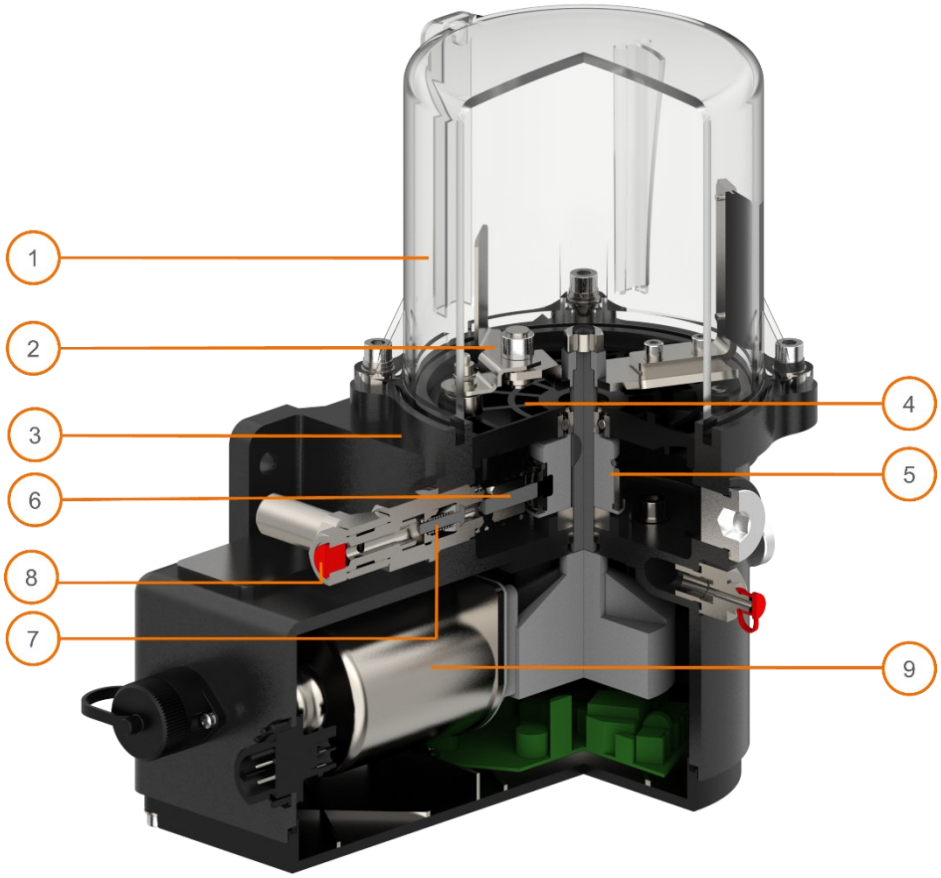


## 12.2 Functional description

The Lubmann grease lubrication pump ALP81 is electrically operated and has up to a max. 3 independently operating lubricant outlets, which can be engaged by bypasses. A separate pump element PE is required for each outlet. Three different delivery rates are available. This allows the grease quantity to be metered precisely for the requirements of the individual progressive distributor layouts.

These pumps enable the delivery of lubricants up to NLGI-Class 2 at a operating pressure of maximum 300 bar (adjusting of safety valve SV).

The ALP81 series pumps differ in reservoir size and control type. It can be controlled by the serial controller with and LED display, or externally by PLC, board computer or external controller from Lubmann.




1 Grease reservoir
2 Agitator blade (with stirring paddle, magnet and guide plate)
3 Pump body housing
4 Perforated base plate
5 Eccentric pressure disc
6 Delivery pistonrü
7 Non return valve
8 Safty valve
9 Motor

A DC motor (9) continually operates eccentric pressure disc (5). This eccentricity effects the suction and pressure strokes of the delivery piston (6), whereby the integrated non-return valve (7) prevents the delivery media from being sucked back out of the main line.

The agitator blade (2) pushes the lubricant out of the grease reservoir (1) through a perforated base plate (4), which reduces any air bubbles, to the suction area in the pump body (3). A scarper on the agitator blade (2) enables a visual check of the lubricant volume still present in the transparent supply container (1).

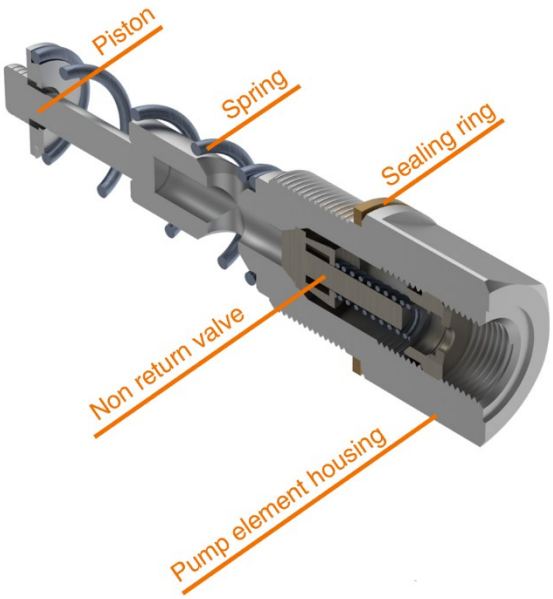
The safety valve (8) is pre-set to 300 bar.

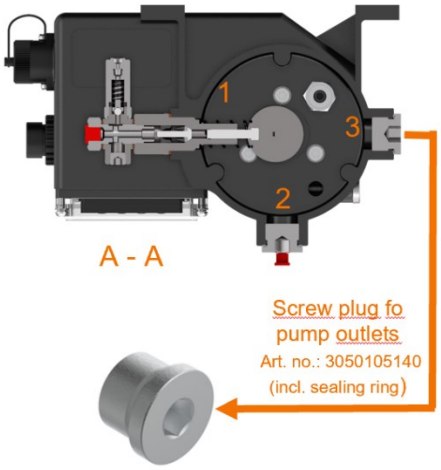
### 12.3 Pump element

ALP81 series grease lubrication pumps can be installed -max. 3 pump elements with saftey valve type SV-C on the pump outlet position 1/2/3

or
max. 2 pump elements with type SV-A safety valve with bypass on the pump outlet position 1 and 3.

Pump elements can deliver the lubricant single with the flow rate range between 0,075 - 0,225 cm³/stroke or bridged with each other to achieve a higher flow rate till 0,675 cm³/stroke with SV-A safety valve
or
till 0,9 cm³/stroke with SV-C safety valve.


**Technical data pump element PE (without DBV):**

| | **Delivery rate** (cm³ / stroke) | **Article number*** | **Screw-in thread** | **Connection thread** |
|---|---|---|---|---|
| PE 1.5 | 0,075 | 2070011689* | M22x1.5 | G 1/4 |
| PE 2.5 | 0,125 | 2070011690* | M22x1.5 | G 1/4 |
| PE 4.5 | 0,225 | 2070011691* | M22x1.5 | G 1/4 |

* Article number inluces sealing ring, wihtout safty valve

**Functional description**

On the vertical shaft of the geared DC motor an eccentric pressure disc with eccentric hole in the centre is mounted.

When the pump starts running the eccentric pressure disc will make a back-and-forth movement (X1, X2, X3). The piston of the pump element, which is mounted in the pump body, runs against the eccentric pressure disc.

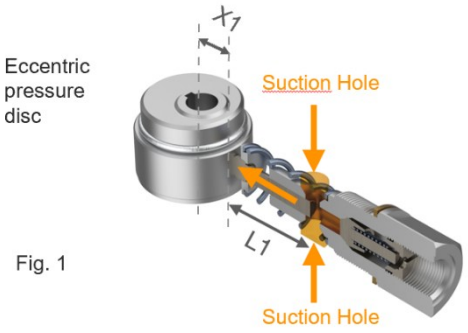



Fig. 1

When the EDP is moving away from the piston (Fig. 1) the spring on the pump element will push the piston against the EPD. In this suction stroke grease is sucked into the pump element through the 2 suction holes.
See the 2 arrows in (Fig. 1). The vertical shaft will continue rotating and the EPD will push the piston into the other direction (Fig. 2).

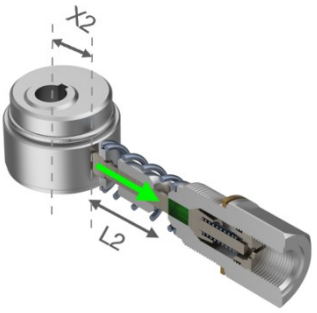



Fig. 2

In this pump stroke the piston will close the 2 suction holes and pushes the suctioned grease to the non-return valve (Fig. 3).

The pressure created by the piston and grease will open the non-return valve (Dia. 15.1-3) and the grease flows to the outlet of the pump element further into the lubrication system (Fig. 3).

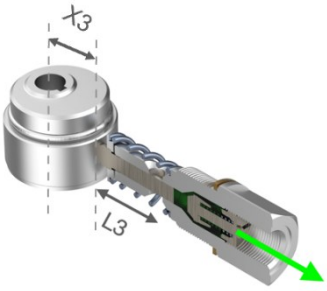



Fig. 3

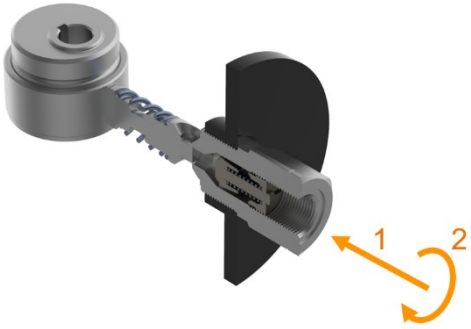
**Pump element installation and removal**


Only install or remove the pump element when pump power OFF!!!

1. Insert the pump element vertically into the pump outlet housing drilling.
2. Tighten the pump element clockwise.

Montieren Sie das Pumpenelement mit einem Anzugsdrehmoment von 43 ± 2 Nm.

3. To remove, reserve order description above.

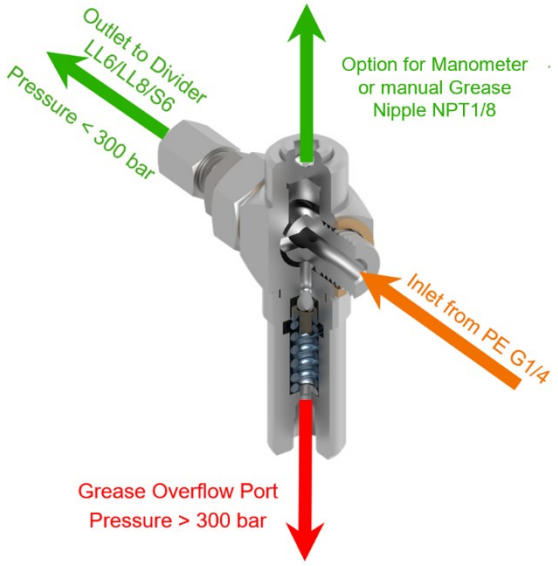


## 12.4 Safety valves

### 12.4.1 Safety valve SV-C

The safety valve SV-C is pre-set to 300 bar.

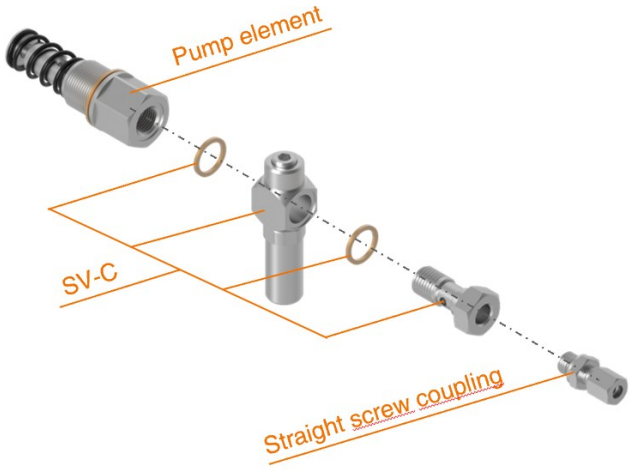
When the system pressure is higher than the pre-set valve (300 bar), the safety valve opens, lubricant flows from the safety valve overflow port out.
Please observe the applicable environmental regulations.



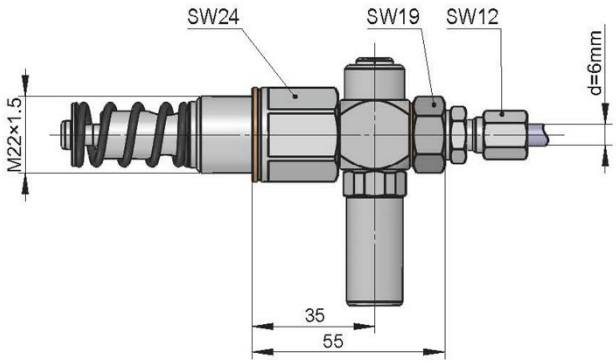

| | Version | Article number |
|---|---|---|
| Safety valve SV-C-<br>pre-set to 300 bar-<br>G1/4-M10x1<br>(incl. flat washer) | / | 2070011684 |
| Straight<br>screw coupling<br>GE | D6LL | 3050100890 |
| | D8LL | 3050104830 |
| | D6S | 9901900 |

You can find further screw connections in our accessories catalogue.

Install the safety valve with a tightening torque of 36 ± 2 Nm.




**Exploded view**
Pump element with SV-C safety valve
and straight screw coupling



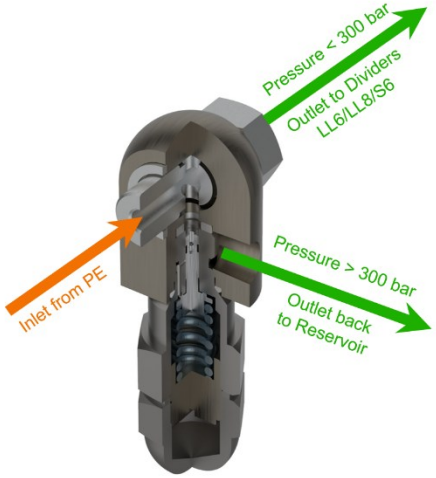

**Dimensions**
Safety valve with pump element

### 12.4.2 Safety valve SV-A – for bypass

The safety valve SV-A is pre-set to 300 bar.

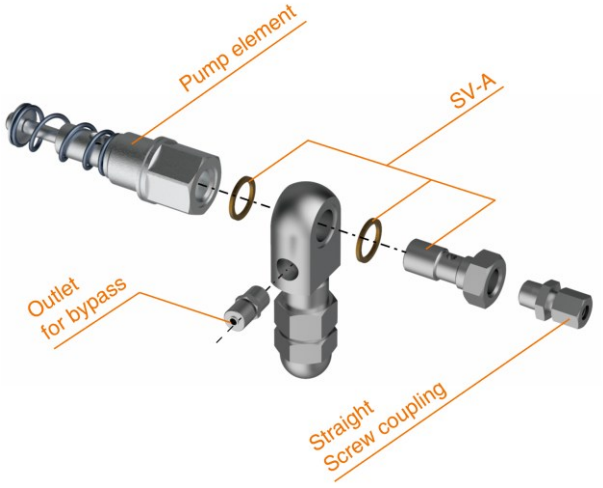
When the system pressure is higher than the pre-set valve (300 bar), the safety valve opens, lubricant flows from the bypass of the safety valve and back to pump reservoir.

| | Version | Article number |
|---|---|---|
| Safety valve SV-A-for bypass-pre-set to 300 bar-G1/4-M10x1 (incl. flat washer) | / | 2011221370 |
| Bypass | Single bypass | 2011026280 |
| | Dual bypass | 2011026510 |
| Straight screw coupling GE | D6LL | 3050100890 |
| | D8LL | 3050104830 |
| | D6S | 9901900 |

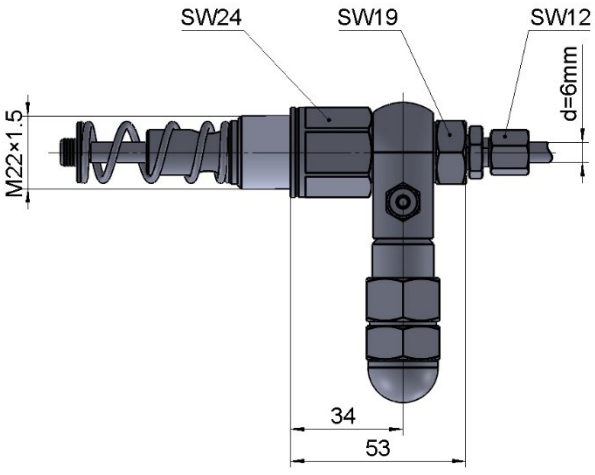



You can find further screw connections in our accessories catalogue.

Install the safety valve with a tightening torque of 36 ± 2 Nm




**Exploded view**
Pump element with safety valve SV-A
and straight screw coupling



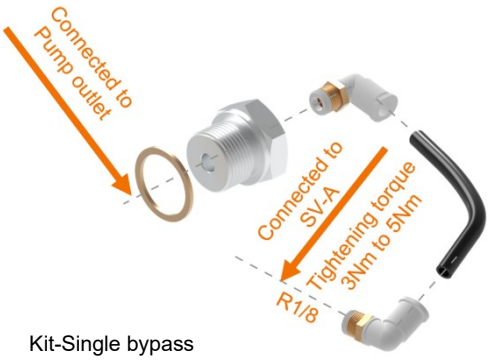

**Dimensions**
Safety valve with pump element

### 12.4.3 Bypass for safety valve SV-A

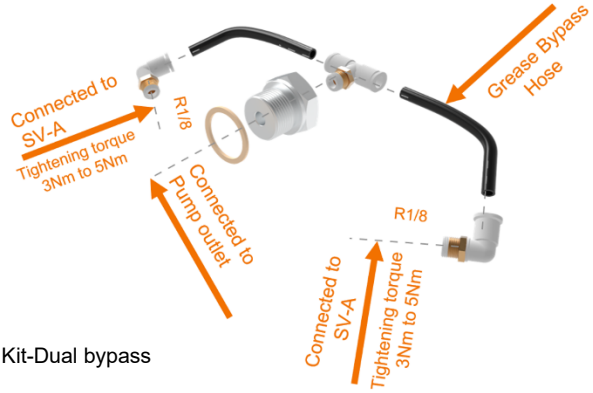
When the system pressure is higher than the pre-set 300 bar of the safety valve, the lubricant from the pump element can be returned to the grease reservoir via a bypass.

Two versions are available as complete kit sets.

| | Article number | Remark |
|---|---|---|
| Kit-Single bypass for safety valve SV-A-M22x1,5 | 2011026280 | Lubricant from a pump element is returned to the grease reservoir in case of overpressure. |
| Kit-Dual bypass for safety valve SV-A-M22x1,5 | 2011026510 | Lubricant from two pump elements is returned to the grease reservoir in case of overpressure. |

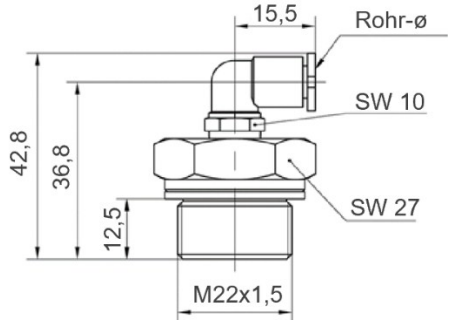



Kit-Single bypass

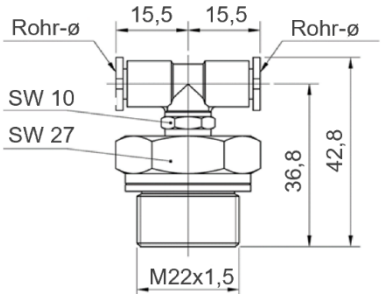



Kit-Dual bypass

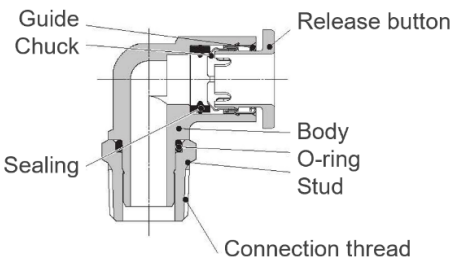
**Dimensions of the connection fittings:**




Connection fitting
from kit – single bypass




Connection fitting
from kit – dual bypass




Structure Elbow screw coupling-push in


**Installation example:**
Grease lubrication pump with SV-A installed and single bypass

## 12.5 Level monitoring min.

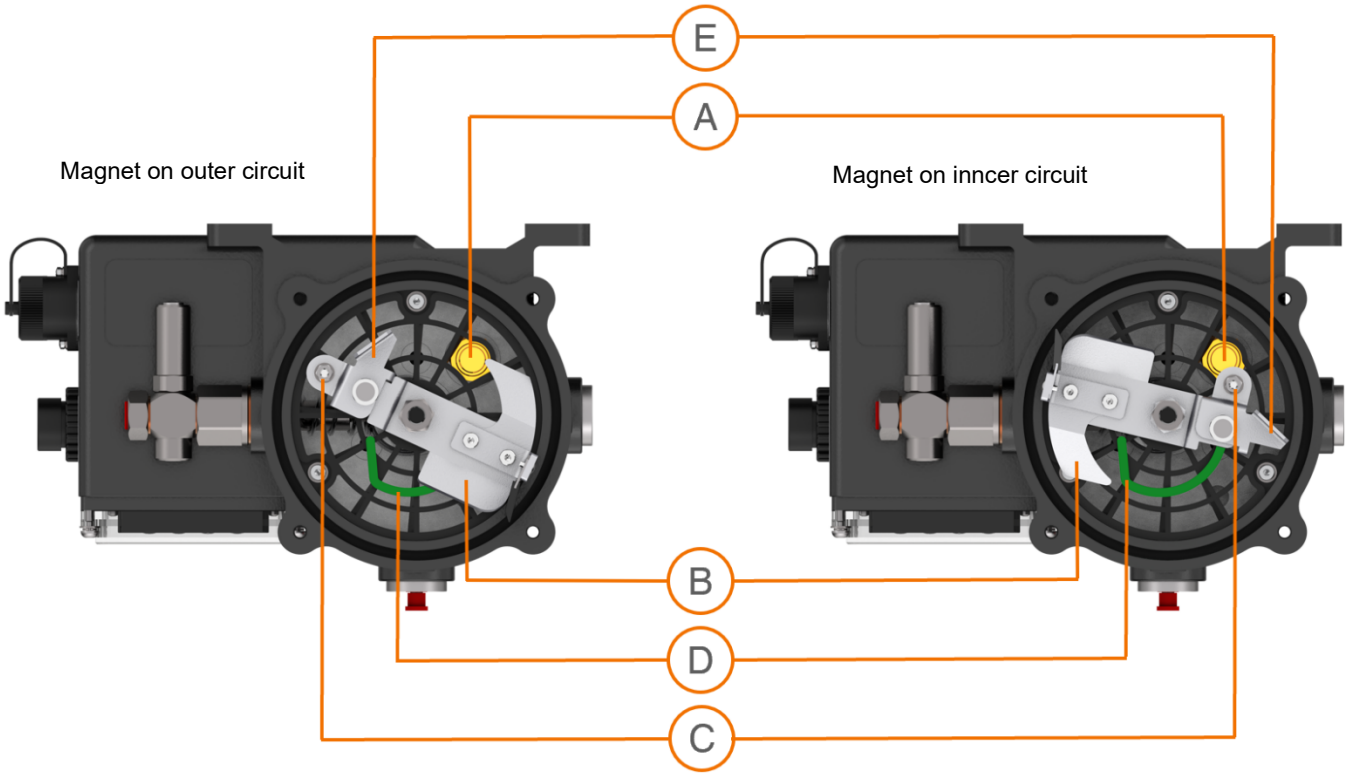
**Functional principle of the intermittent low level signal**

The intermittent empty signal operates contactlessly.

If the reservoir is filled with a lubrication grease suitable for the intermittent low-level indication and the pump is operating, then the stirring paddle (E) is deflected by the resistance of the lubrication grease. Therefore, the magnet (C) connected to the stirring paddle (E) is moved on its inner circuit and trigger a pulse at the magnetic switch (A) with its magnetic field. A guide plate (D) positively guides the magnet (C) together with the pivoted stirring paddle (E) towards the outside during each revolution. As soon as the stirring paddle (E) leaves the guide plate (D), the lubricant's resistance pushes the guide plate together with the magnet (C) to the inside again.

As soon as the lubricant inside the reservoir has fallen to that level that the lubricant's resistance is no more sufficient to further deflect the stirring paddle (E), the magnet (C) remains on the outer circuit and dont trigger a pulse at the magnetic switch (A) with its magnetic field.

The magnetic switch (A) will send out a pulse signal every time it is triggered. If the magnet C slides across the magnetic switch A more than 5 times (including 5 times) continuously in an operating cycle, the integrated controller of the pump will consider that the amount of grease in the pump is sufficient.
If the magnet does not rotate at least five revolutions directly above the magnetic switch due to minimum fill level, an empty signal is output directly at the signal connection of the grease lubrication pump.




**A** Magnet switch (yellow marked)
**B** Agitator blade
**C** Magnet
**D** Guide plate (green marked)
**E** Stirring paddle

# 13 Assembly

**General information**
Only qualified technical personnel may install the products described in these Instructions. During assembly pay attention to the following:


- Other units must not be damaged by the assembly
- The product must not be installed within the range of moving parts
- The product must be installed at an adequate distance from sources of heat and coldness
- Observe the product's IP degree of protection
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents
- Possible existing visual monitoring devices, e.g. pressure gauges, MIN/MAX markings or piston detectors, must be clearly visible
- Observe prescriptions in chapter Technical data regarding the installation position

**Place of installation**
Protect the product against humidity, dust and vibrations and install it in an easily accessible position to facilitate other installation and maintenance works.

**Minimum assembly dimensions**

Ensure sufficient space for maintenance work or for attachment of further components to build a centralized lubrication system to the pump by leaving a free space of at least 100 mm into each direction in addition to the stated dimensions.
**All the installation dimensions can be found in chaper "installations dimensions"*

**Installation bores**


Drill the mounting bores on non-loadbearing parts of the superior machine only.
Fastening must not be done on two parts moving against one another.
Please speak to the manufacturer and obtain approval for drilling.

**Welding work**


There is a risk of damage to the main machine and the grease lubrication pump.
Please contact the manufacturer and obtain approval for any welding work you wish to perform.

**Mount pump element and safety valve**

Generally, a standard pump has a set of pump element and safety valve (SV-C) on the left side of the pump outlet.

To mounting an extra set of pump element and safety valve, please make sure the pump has been disconnected from the power supply.

Tightening torque for pump element = 43 Nm ± 2 Nm

Tightening torque for safety valvel = 36 Nm ± 2 Nm

## 14 Filling the grease reservoir

1. Use only EP-2 greases which are approved for the various operating temperatures.
2. The grease lubrication pump must be vertical while filling with lubricant.
3. When refilling, do not exceed the maximum fill level mark. Check the filling process and stop it before the maximum fill level is reached.
4. It is strictly forbidden to remove the top cover of the pump for filling lubricants.
5. Only fill in clean lubricants!
   The service life of the pump elements highly depends on the quality of the used lubricants.

Serie

Grease nippel-M14x1,5-straight-(ED)
Art. no.: 2031001509

The grease nipple
is standard equipment
on all Lubmann grease pumps.

Filling connector-straight-M22x1,5-
with dust cap
Art. no.: 2010821140

Filling connector-90-M22x1,5-
with extension-with dust cap
Art. no.: 2010821150

Filling connector-45-M22x1,5-
with dust cap
Art. no.: 2010821160

Option

Lubmann-Hand-filling press for
400g Pull-Off cartrige or 500g
loose grease
Art. no.: 9900053

Option

Filling connector-swivel-
male-ISO 7241_1B-M14x1,5
-with dust cap
Art. no.: 2011022120

Filling connector-straight-
male-ISO 7241_1B-G1/4-ST-
ZnNi
Art. no.: 3050101270

Filling connector
Straight-male-
ISO 7241_1B-M14x1,5
-with dust cap
Art. no.: 2011220670

Pneumatic filling pumps
*Please contact us; we have a wide selection of mechanical, electric, and pneumatic filling pumps.*

## 15 Electrical connection and control unit


Danger of electric shock!

Make sure to disconnect the product from the power supply before carrying out any works on electrical components.

Carry out the electrical connection according to the connection type of the pump.

Use the power cable according to the respective connection diagram as described in this manual. A back-up fuse must be used. See description on page 12.
If you don't require divider monitoring, screw the protective cap 3030502160 into the socket. This is the only way to maintain the protection class (IP class).

Work on electrical components may be performed only by qualified electricians. At a minimum, the following safety measures must be taken before any work on electrical components is done:


1. Disconnect
2. Secure against reconnection
3. Verify absence of voltage
4. Ground and short-circuit
5. Cover or barricade adjacent live parts

The electrical connection must be implemented in accordance with the specifications of the standards of the DIN VDE 0100 series or of the standards of the IEC 60364 series, respectively.

Connect the electrical cables or wirings without mechanical forces are transferred to the products. Connect plugs with the corresponding bushes and secure them against becoming loose.

The central lubrication pump must be secured with a suitable external fuse.

The electrical connection is established in accordance with the type of connection of the specific central lubrication pump.

## 15.1 Wiring diagram – without controller

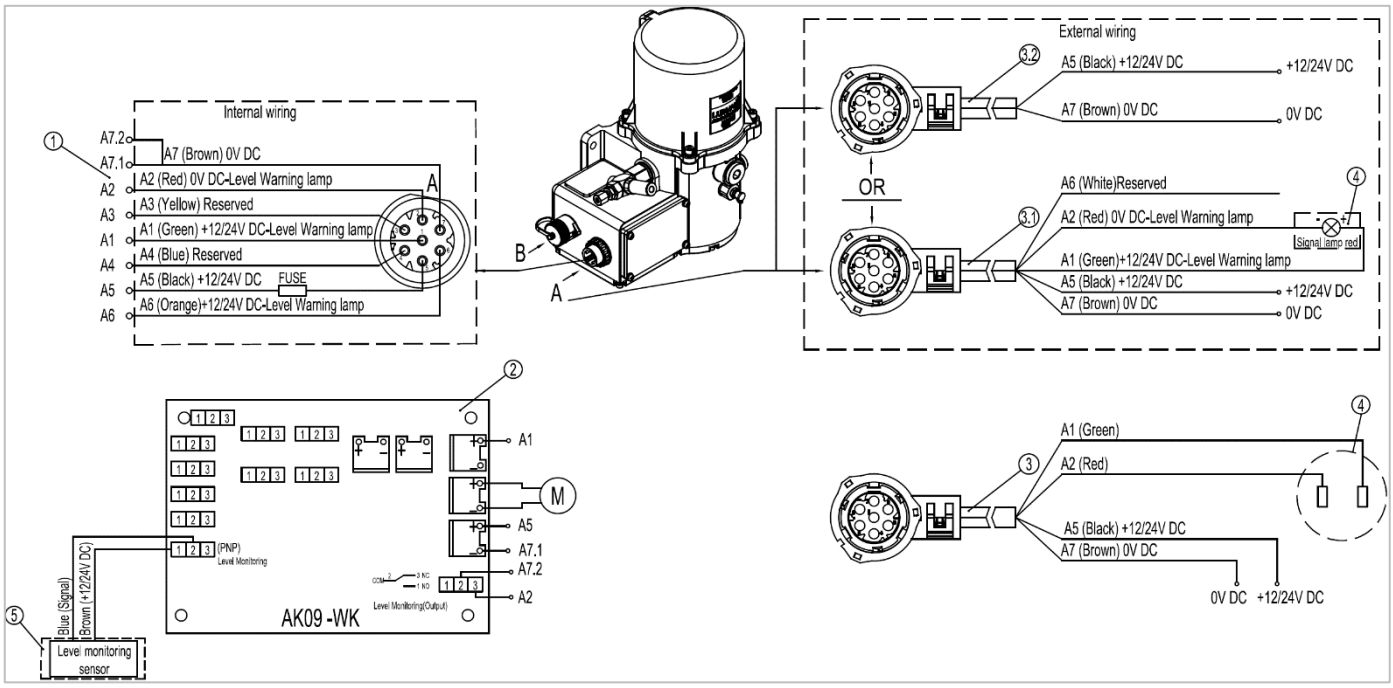
**Grease lubrication pump-ALP81 with 7-pin BYN connector – Level monitoring via an external indication light**

The grease lubrication pump is supplied with 12/24V DC via the 7-pin BYN connector at position A.
Lubrication time and break time are not programmable.
The grease level indication light turns on “red” when the pump gets an error signal for the grease level.

For the non-controller version ALP81 greas lubrication pump, it is not possible to monitor the divider status!

For more information about other solutions please contact us.

**Wiring diagram LE10001011**




| Pos. | Qty. | Description | Article number |
|---|---|---|---|
| 1A | 1 | Wire Kit-power supply-ALPB-ALP81_BYN-12VDC-Int.-0,3m-BYN_M_7P-5xP_ JSTxH_F-2xP_ JSTvH_F-7x0,5 | 2040120780 |
| 1B | 1 | Wire Kit-power supply-ALPB-ALP81_BYN-24VDC-Int.-0,3m-BYN_M_7P-5xP_ JSTxH_F-2xP_ JSTvH_F-7x0,5 | 2040120760 |
| 2A | 1 | Controller-AK09-WK-V2.0-12VDC-not programmable | 15010743 |
| 2B | 1 | Controller-AK09-WK-V2.0-24VDC-not programmable | 15010742 |
| 3.1A | 1 | Cable kit-power supply-12/24VDC-Ext.-7,5m-BYN_F_90_7P-5x1,0 | 2110012451 |
| 3.1B | 1 | Cable kit-power supply-12/24VDC-Ext.-5,0m-BYN_F_90_7P-5x1,0 | 2110012452 |
| 3.2A | 1 | Cable kit-power supply-12/24VDC-Ext.-7,5m-BYN_F_90_7P-2x1,0 | 2110012722 |
| 3.2B | 1 | Cable kit-power supply-12/24VDC-Ext.-5,0m-BYN_F_90_7P-2x1,0 | 2110012723 |
| 4A | 1 | Indication light-12VDC-red-M16 | 3030102940 |
| 4B | 1 | Indication light-24VDC-red-M16 | 3030102930 |
| 5 | 1 | Sensor-min. level-ALP81-12/24VDC-M14x1,5-L63-2_wire-AL | 2010821200 |

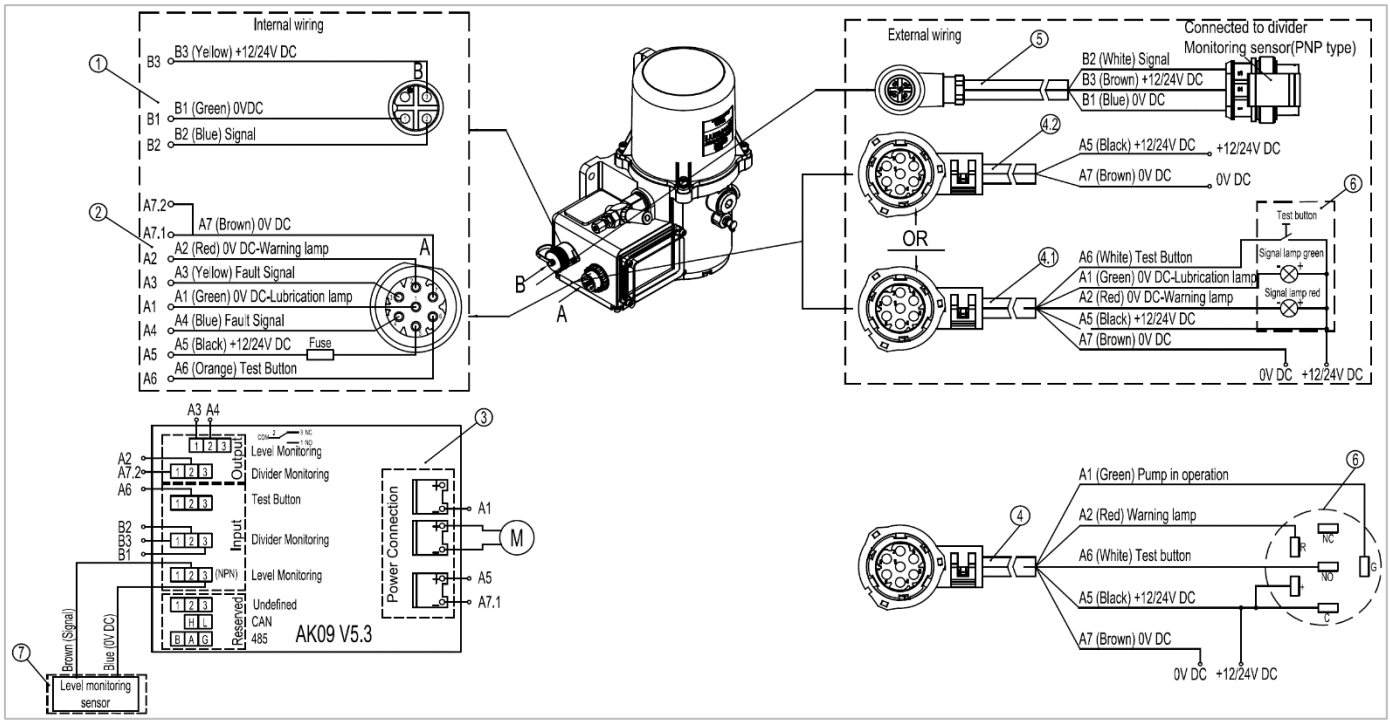
## 15.2 Wiring diagram – with controller

**Grease lubrication pump-ALP81 with 7-pin BYN connector – System monitoring via an external illuminated push button**

The grease lubrication pump is supplied with 12/24V DC via the 7-pin BYN connector at position A.
This connection ist standard.
An intermediate lubrication reset function is triggered by pressing an illuminated pushbutton, which is installed, for example, in the cabin.
During the lubrication time (grease lubrication pump in operation) – 3P, the optional illuminated pushbutton lights up green.
If the button lights up “red”, this indicates an error message EE.
The button lights up “yellow” if an error message is being reset but is still pending.
Via Pos. B the distributor monitoring 2P (proximity switch) is connected to the grease lubriction pump.

For more information about other solutions please contact us.

**Wiring diagram LE10001012**




| Pos. | Qty. | Description | Article number |
|---|---|---|---|
| 1 | 1 | Wire Kit-divider monitoring-12/24VDC-Int.-0,3m-BD_F-4P-3xP_ JSTxH_F-3x0,5 | 2010821300 |
| 2A | 1 | Wire Kit-power supply-ALPB-ALP81_BYN-12VDC-Int.-0,3m-BYN_M_7P-5xP_ JSTxH_F-2xP_ JSTvH_F-7x0,5 | 2040120780 |
| 2B | 1 | Wire Kit-power supply-ALPB-ALP81_BYN-24VDC-Int.-0,3m-BYN_M_7P-5xP_ JSTxH_F-2xP_ JSTvH_F-7x0,5 | 2040120760 |
| 3 | 1 | Controller-ALP81-AK09-V5.3-12/24VDC-programmable (print board)-program code d-61 | 2040120350 |
| 4.1 A | 1 | Cable kit-power supply-12/24VDC-Ext.-7,5m-BYN_F_90_7P-5x1,0 | 2110012451 |
| 4.1 B | 1 | Cable kit-power supply-12/24VDC-Ext.-5,0m-BYN_F_90_7P-5x1,0 | 2110012452 |
| 4.2 A | 1 | Cable kit-power supply-12/24VDC-Ext.-7,5m-BYN_F_90_7P-2x1,0 | 2110012722 |
| 4.2 B | 1 | Cable kit-power supply-12/24VDC-Ext.-5,0m-BYN_F_90_7P-2x1,0 | 2110012723 |
| 5A | 1 | Cable kit-divider monitoring-12/24VDC-Ext.-7,5m-BD_M_90_4P-AMP_F_3P-3x0,5 | 2110012409 |
| 5B | 1 | Cable kit-divider monitoring-12/24VDC-Ext.-5,0m-BD_M_90_4P-AMP_F_3P-3x0,5 | 2110012410 |
| 6A | 1 | Illuminated push button-24VDC-red_green_yellow-M16 | 3030600350 |
| 6B | 1 | Illuminated push button-12VDC-red_green_yellow-M16 | 3030600340 |
| 7 | 1 | Sensor-min. level-ALP81-12/24VDC-M14x1,5-L63-2_wire-AL | 2010821200 |

### 15.3 Controller AK09 with LED Display AK06

The controller AK09 V5.3 is the integrated setting adjustable controller for grease lubrication pump ALP81 BYN series.

The AK06 LED – Monitor / Display Universal works only in combination with the AK09 Setting adjustable controller which can be programmed with different program codes depending on the version (d-61).

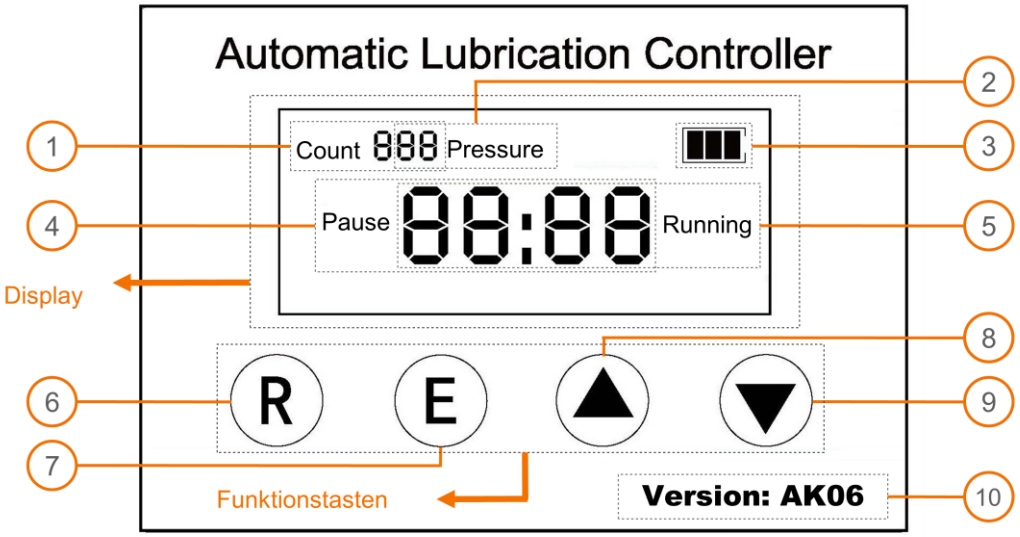
**Main display** shows system status like the number of finished lubrication cycles ①, (one complete lubrication cycle = 1 full pause time + 1 full lubrication time), divider monitoring status ②, grease level status ③, counting down pause time ④ and counting upwards lube time ⑤. If a failure is detected by the controller, the display shows the Error Code instead of pause time or lube time in main display area.

| Error-Code: | Definition |
|---|---|
| **EE-1** | Low grease level or no grease in pump reservoir, pump is under risk of empty running. |
| **EE-2** | Divider monitoring - "failure," e.g., blocked lubrication point, overpressure between pump and main divider. Pressure relief valve opens at a pressure above 300 bar! |

ATTENTION

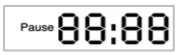
The AK09 has Fault Tolerance Program; the error code only starts during the second cycle after the controller gets a failure signal.
After the failure has been fixed, the controller needs 2 cycles as well to reset the failure signal automatically!

#### 15.3.1 Display and Function keys - Overview




#### 15.3.2 Display und Function keys - Description

| Pos. | Symbol | Description |
|---|---|---|
| 1 | Count 888 | **Cycles Counting:** During the pause time 1P, POS. 1 shows the number of finished lubrication cycles. The value of Count adds 1 after a full lube time.<br>E.g., **Count 168** means the system finished 168 lubrication cycles. |
| 2 | 88 Pressure | **Divider Monitoring:** During the running time 3P, 2 shows the impulse of the divider monitoring.<br>**OFF Pressure** means controller is counting the detected impulse cycles from the divider monitoring. The Sign turns into **ON Pressure** after the preset value of impulse cycles from the divider has been detected. Main display turns into **EE-2**, and you can hear an alarm for 30 seconds, if the controller has not detected the preset value of impulse cycles during the lube time. |
| | Grease level | Grease level – OK. There is sufficient lubricant in the grease reservoir. |
| | | Grease level - warning. Pump works under the risk of low grease level.<br>An immediate grease refilling is recommended here. |

| | | |
|---|---|---|
| |  |  Grease level – low. Pump detected low grease level status.<br>During the automatic cycle, the pump stops immediately no matter it reaches the preset running time or not. Error EE-1 will appear on the monitor until the pump is refilled.<br>Push Ⓔ to clear the warning alarm. |
| | | **Special conditions:**<br>If after the initial alarm, the pump is manually started by pressing the R button from the display, then the pump will do a complete greasing cycle according to the value set at 3P setting. The alarm for EE-1 will engage after the cycle finishes.<br>If the pump is manually restarted using the test button, the consequence will be followed same as automatic cycle. |
| 4 |  | **Pause Time:**<br>Special conditions: If after the initial alarm, the pump is manually started by pressing the R button from the display, then the pump will do a complete greasing cycle according to |
| 5 |  | **Lube Time / Schmierzeit**:<br>During the system lube time, the main display shows e.g., 01:28 Running for the actual finished lube time – 1 minute and 28 seconds and the time continue counting |
| 6 |  | **Reset button (Test button):** Push Ⓡ during the pause time, main display stops counting down the remained pause time immediately and starts a new cycle with preset lube time.<br>Push Ⓡ during the lube time, main display stops counting lube time immediately and starts a new cycle with preset pause time. |
| 7 |  | **Enter button:**<br>For „Enter“ function, please check the details in parameter setting. Push Ⓔ during the system warning or error alarm ( EE-1 or EE-2) to clear the alarm. |
| 8 |  | **Parameter setting “+”:**<br>In the menu up. Please check the details in parameter setting. |
| 9 |  | **Parameter setting "-":**<br>Please check the details in parameter setting.<br>Click Down Arrow no matter during the pause time or lube time, can enter the status checking interface to check the following data:<br><br>D-XX: Program Code of the pump (for ALP81 Pump regular program, XX=61)<br>EE-X: Error Code in the last cycle X (X= 0, 1, 2)<br>t XX: Environment Temperature is XX°C<br>-XX: Total Cycles is XX |
| 10 | **Version: AK06** | **Version LED- Displays:**<br>AK06 is the current version of our display.<br>**For further information on other Lubmann control units or external control units, please contact us.* |

### 15.3.3 Parameter – Description

| Parameter | Description | Setting areas | Factory setting |
|---|---|---|---|
| 1P | Pause time | 0 to 99 hrs and 0 to 59 mins<br>Min. 1 min / Max. 99 hrs and 59 mins | 2 h |
| 2P | Divider monitoring<br>Impulse cycles | 0 to 99 impulses cycles<br>0 means system does not detect the | 00 |
| 3P | Lube time | 0 to 99 mins and 0 to 59 secs<br>Min. 1 sec / Max. 99 mins and 59 secs | 6 min |
| 4P | Low temperatur setup | from -50 to 0 Celsius Degrees adjustable | -15 |

### 15.3.4 Parameter Setting after first connecting to power

For first time connecting the power on the pump, the display shows the program code “d-61” up like (Fig. 1) or other pump pre-set program code, depends on pump and software type.

Fig. 1 Controller program code

The program code can NOT be changed! The controller has pre-set parameters which can be changed under needs by following the setup steps. Otherwise, the pump runs with the default pre-set parameter.

After program code “d-61” the controller shows 1P Pause Time and is counting down, system cycle is 0 (Fig. 2).

Fig. 2 Pause time display after first power connection

### 15.3.5 Reset parameters using the control buttons

#### 15.3.5.1 Setting Pause time (hours and minutes)

Press the △ and ▽ buttons with two fingers for 4 seconds at the same time. After releasing the △ and ▽ buttons (you will hear a tone), press ❶ to enter parameter setting mode and begin setting 1P (pause time hourly parameter, Fig. 3).

Fig. 3 Setting 1P Pause time in hour

Press △ or ▽ button to adjust the 1P Pause Time value for hour (Fig. 3). Then press ❶ button again to enter -1 (Pause Time minute parameter) setting. Press △ or ▽ button to adjust the -1 value for minutes (Fig. 4).

Fig. 4 Setting 1P Pause time in minute

1P and -1 can not set as 00 in the same time. If 1P is set as 00, -1 starts with 01.

#### 15.3.5.2 Setting divider monitoring:

After completing the P1 setting, press the ❶ button again to switch to the 2P divider monitoring setting until 2P is successfully set. Press the ❶ button to save and exit the setting status (Fig. 5).

Fig. 5 Setting 2P divider monitoring cycles

For system without divider monitoring sensor, set 2P always as 0.

#### 15.3.5.3 Setting lube time:

3P in minutes and -3 in seconds (the same way of setting the parameters we describe for 1P Pause Time and -1 setting) (Fig. 6 and Fig.7).

Fig. 6 Setting 3P Lube time in minute

3P and -3 can not set as 00 at the same time. If 3P is set as 00, -3 starts with 01.

Fig. 7 Setting 3P Lube time in second

### 15.3.5.4 Setting low temperature:

Press ❺ button to switch to 4P Low temperature setting.
With this parameter you can stop the pump working at low temperatures.
Pre-set temperature is – 15° C. Press △ or ▽ button to adjust the
4P low temperature setup.
Press ❺ button to confirm your new low temperature setting (Fig. 1).

Fig. 1 Setting 4P
Low temperature

System has a temperature sensor. In case the real temperature is under the pre-set value, the pump stops automatically to avoid the damage of motor.

Press ❺ to exti the edit mode!

### 15.3.5.5 Display of controller during lubrication cycles

The control unit will automatically start with the 1P pause time!
The display will now show the newly set 1P pause time, e.g., Pause 10:28, i.e., the pause time is 10 hours and 28 minutes. The pause time will count down in hours and minutes until 00:00 (Fig. 2).

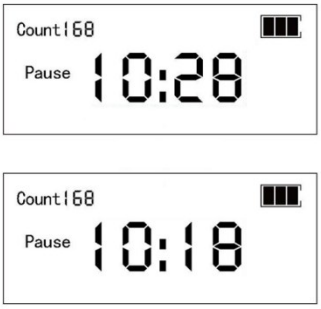


Fig. 2 Display pause time 1P
counting down

After the 1P pause time has ended, the 3P lubrication time begins counting up in minutes and seconds. For example, 01:28 Running indicates that you have set 1 minute and 28 seconds as the lubrication time. It counts up from 0 seconds to 1 minute and 28 seconds (Fig. 3).

Fig. 3 Display Lube time 3P
counting up

### 15.3.5.6 Reset button - Start an intermediate lubrication

Push ⓡ during the pause time, main display stops counting down the remained pause time immediately and starts a new cycle with pre-set lube time (Fig. 1).

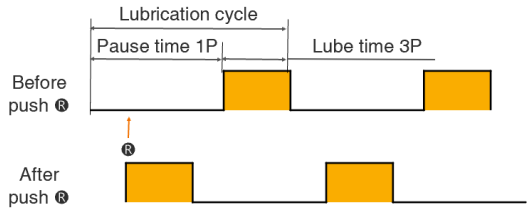



Fig. 1 Cycle changing when push ⓡ during pause time

Push ⓡ during the lube time, main display stops counting lube time immediately and starts a new cycle with pre-set pause time. (Fig. 2)

Push ⓡ always means skipping the current pause/lube time and enter into a new lube/pause time.

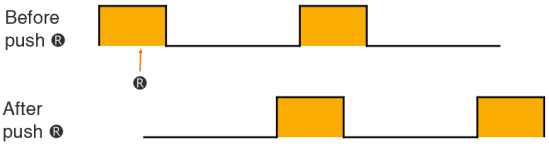



Fig. 2 Cycle changing when push ⓡ during lube time

### 15.3.6 Restart the controller after switching off the machine

In case power/machine is switched off during a lube time P1 or pause time P3 following happens:

Switching machine on during 1P Pause Time, the 1P Pause time is counting down from the rest pause time where the machine was switched off (Fig. 3).

In case power / machine is switched off during a 3P Lubrication Time, the Lubrication time starts the full new Lubrication time which you setup (Fig. 4).

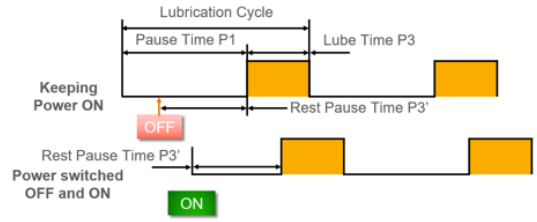



Fig. 3 Cycle changing when power switch ON and OFF during pause time

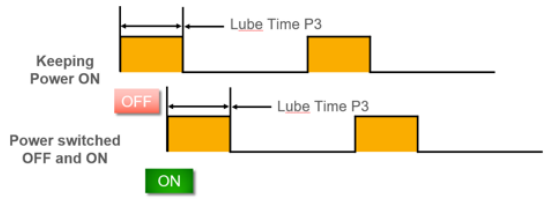



Fig. 4 Cycle changing when power switch ON and OFF during lube time

**Divider monitoring 2P – Impulse cycles and monitoring**

2P divider monitoring, must **NOT** be set as 0.

In case, the Detecting time T1, which is needed to detect the pre-set value of impulse cycles, is shorter than pre-set lube time 3P, Display turns from “OFF Pressure” to “ON Pressure” at the end of T1, Controller continues the rest lube time. After the lube time is finished, count of lubrication cycles +1. (Fig. 5).

In case the theoretical Detecting time T1, which is needed to detect the pre-set value of impulse cycles, is longer than pre-set lube time 3P, Display remains ““OFF Pressure”, and shows EE-2 error massage in the end of 3P and lasts for 30 secs. Lubrication cycles will not be counted. (Fig. 6).

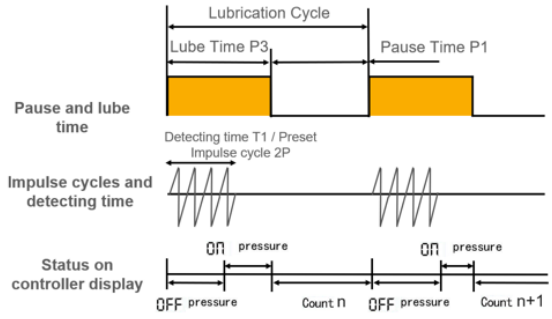



Fig. 5 T1 < 3P

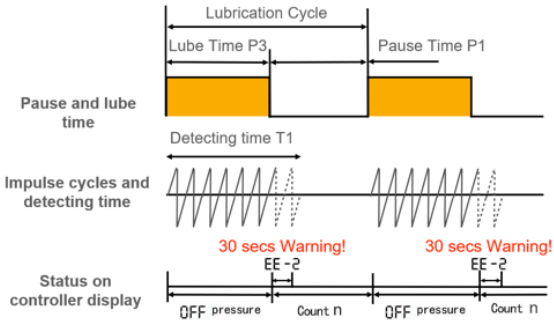



Fig. 6 T1 > 3P

For preset value of 3P - lube time less than 5 mins, the preset value of 2P less than 3 is recommended.

For preset value of 3P - lube time less than 10 mins, the preset value of 2P less than 5 is recommended.

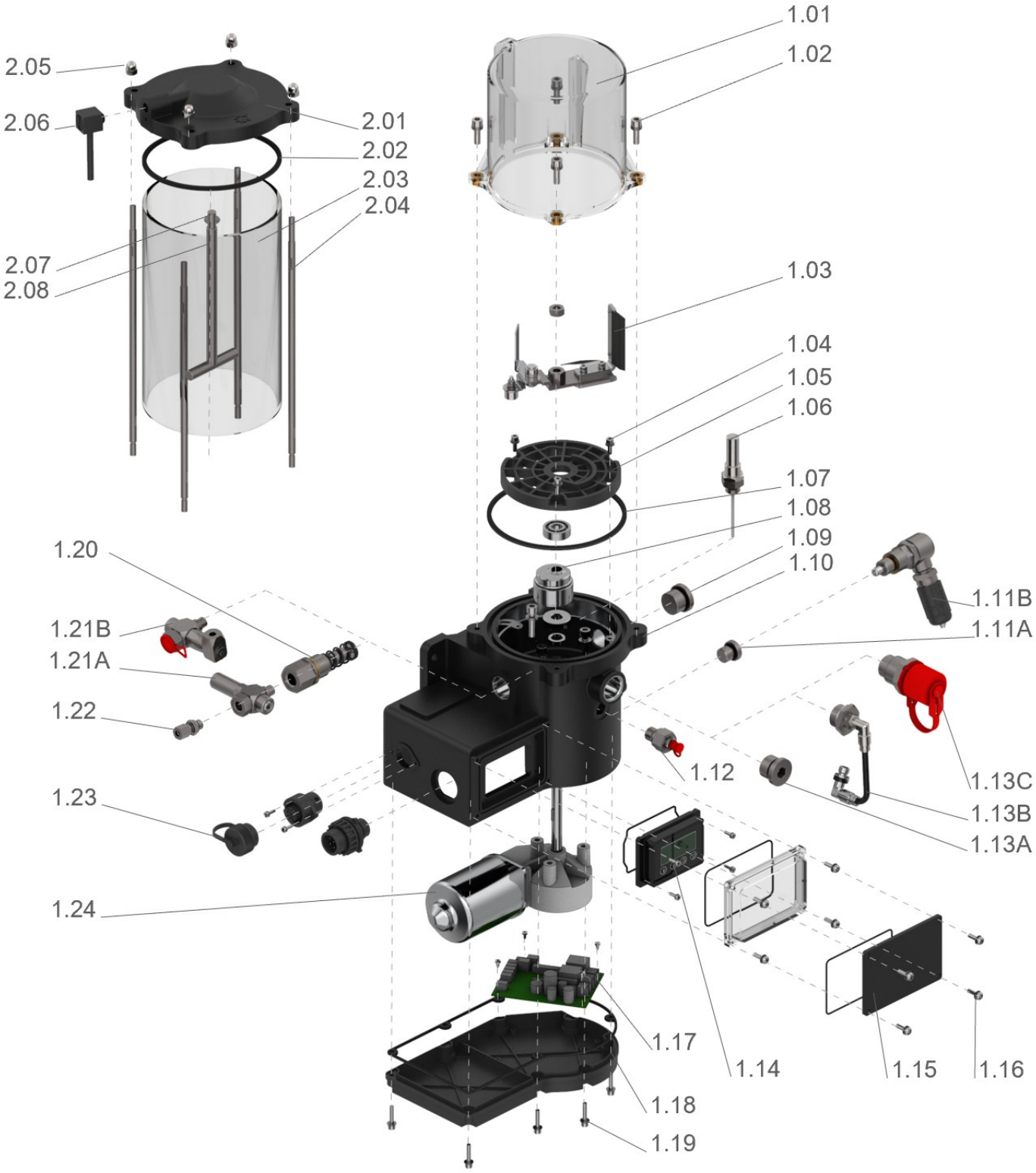
The volume of grease for each greasing point only decided by 3P - lube time, not by 2P - impulse cycles..

## 16 Trouble shooting

| Fault | Possible cause | Solution |
|---|---|---|
| Grease lubrication pump not running / blocked | Spannungsversorgung unterbrochen Fettschmierpumpe unterbrochen | Power supply interrupted. Grease lubrication pump interrupted. |
| | Anschlusskabel unterbrochen / defekt | Connection cable interrupted/defective. |
| | Motor / Fettschmierpumpe defekt | Motor/grease lubrication pump defective. |
| | Sicherung defekt | Fuse defective. |
| | Internes Steuergerät defekt | Internal control unit defective. |
| Grease lubrication pump is running but does not deliver or delivers too little lubricant | Grease lubrication pump is empty | Refill lubricant |
| | Clogged or crushed lubricant line | Replace lubrication line |
| | Leaking screw connection | Tighten or replace screw connection |
| | Pause time setting too high or lubrication time too low | Adjust control parameters |
| | Pump element flow rate too low | Adjust pump element size |
| | Pump element clogged/defective | Replace pump element |
| | Unsuitable lubricant | Use a suitable lubricant for the grease lubrication pump and operating temperature |
| | Check valve defective | Replace check valve in the outlet screw connection |
| | Pressure relief valve defective | Replace pressure relief valve |
| | Air trapped in the lubricant/pump body | Start the grease lubrication pump until lubricant flows out of the pump outlet without bubbles |

# 17 Spare part

## 17.1 Spare parts drawing



## 17.2 Spare parts list

| POS | Anz. | Article number | |
|---|---|---|---|
| 1.01 | 1 | 15010424 | Grease reservoir-transparent-ALP81-D120-H125-1L |
| 1.02 | 4 | 3040103380 | Hexagon socket head cap screw-M6x20-8.8-ST-ZnNi-with flat washer and spring washer |
| 1.03 | 1 | 15010419 | Kit-agitator blade with stirring paddle, magnet and guide plate-ALP81-D120 |
| 1.04 | 1 | 3040102910 | Hexagon socket head cap screw-M4x14-A2-SS-with flat washer and spring washer |
| 1.05 | 1 | 15010422 | Perforated base plate-ALP81-D111,5x12-PA |
| 1.06A | 0-1 | 2010821200 | Sensor-min. level-ALP81-12/24VDC-M14x1,5-L63-2_wire-AL |
| 1.07 | 1 | 3021000187 | Sealing ring-grease reservoir bottom-ALP81-D120-128,5x3-NBR |
| 1.08 | 1 | 2031001570 | Eccentric pressure disc-EDS-D37 |
| 1.09 | 1 | 3050105140 | Screw plug-M22x1,5-(ED)-ST-ZnNi |
| 1.10 | 1 | 15010736 | Pump body housing for grease lubrication pump-ALP81-230x160x135-Al-black painted |
| 1.11A | 0-1 | 3050105820 | Screw plug-M14x1,5-(ED)-ST-ZnNi |
| 1.11B | 0-1 | 2011022120 | Filling connector-swivel-male-ISO 7241_1B-M14x1,5-with dust cap |
| 1.11C | 0-1 | 2011220670 | Filling connector-straight-male-ISO 7241_1B-M14x1,5-with dust cap |
| 1.12 | 1 | 2031001509 | Grease nipple-M14x1,5-straight-(ED) |
| 1.13A | 0-1 | 3050105140 | Screw plug-M22x1,5-(ED)-ST-ZnNi |
| 1.13B | 0-1 | 2011026280 | Kit-Single bypass for safety valve SV-A-M22x1,5 |
| 1.13C-1 | 0-1 | 2010821140 | Filling connector-straight-M22x1,5-with dust cap-for Hand filling press |
| 1.13C-2 | 0-1 | 2010821150 | Filling connector-90-M22x1,5-with extension-with dust cap-for Hand filling press |
| 1.13C-3 | 0-1 | 2010821160 | Filling connector-45-M22x1,5-with dust cap-for Hand filling press |
| 1.14A | 0-1 | 2011223180 | LED-Display-AK06-(only display without controller) |
| 1.14B | 0-1 | 15010721 | LED-Display-AK06-transparent protective cover-100x68x15 |
| 1.15 | 1 | 15010724 | Blind plate-fit for without LED-Display-AK06-100x68x4 |
| 1.14-1<br>1.15-1 | 1 | 15010722 | Sealing ring-AK06-85x57x1,8-NBR |
| 1.14-2<br>1.15-2 | 4 | 15010723 | Cross recessed cheese head screw-M4x14-A2-SS-with flat washer and spring washer |
| 1.16 | 4 | 3040101630 | Cross recessed cheese head screw-M3x6-A2-SS |
| 1.17A | 0-1 | 2040120350 | Controller-ALP81-AK09-V5.3-12/24VDC-programmable (print board)-program code d-61 |
| 1.17B | 0-1 | 15010743 | Controller-AK09-WK-V2.0-12VDC-not programmable |
| 1.17C | 0-1 | 15010742 | Controller-AK09-WK-V2.0-24VDC-not programmable |
| 1.18-1 | 1 | 3020101170 | Pump body cover-ALP81-205x130x20 |
| 1.18-2 | 1 | 3020200470 | Sealing ring-pump body cover bottom-ALP81-202x132x2-NBR |
| 1.19 | 8 | 3040104370 | Hexagon socket head cap screw-M4x20-A2-SS-with flat washer and spring washer |
| 1.20A | 0-1 | 2070011689 | Pump element-PE-1,5-0,075 cm3/stroke-M22x1,5-G1/4 |
| 1.20B | 0-1 | 2070011690 | Pump element-PE-2,5-0,125 cm3/stroke-M22x1,5-G1/4 |
| 1.20C | 0-1 | 2070011691 | Pump element-PE-4,5-0,225 cm3/stroke-M22x1,5-G1/4 |
| 1.21A | 0-1 | 2070011684 | Safety valve SV-C-preset to 300 bar-G1/4-M10x1 |
| 1.21B | 0-1 | 2011221370 | Safety valve SV-A-for bypass-preset to 300 bar-G1/4-M10x1 |
| 1.22 | 1 | 3050100890 | Straight screw coupling-GE-D6LL-M10x1 (SW14-ED)-ST-ZnNi |
| 1.23 | 1 | 3030502160 | Protective cap divider monitoring at pump body-BD-4 pin-IP67-black |
| *1.23 ** | | | *For article numbers for cable kits, see chapter wiring diagrams* |
| 1.24A | 0-1 | 3010404000 | Direct current motor-12V/DC-CNLW |
| 1.24B | 0-1 | 3010404170 | Direct current motor-24V/DC-CNLW |
| 2.00 | 1 | 2031001617 | Kit-grease reservoir attached to pump body-ALP81-D120-H210-2L-(full package) |
| 2.01 | 1 | 2010430190 | Top cover-ALP81-D120-2L-Al-black painted |
| 2.02 | 2 | 3020200200 | Z-sealing ring-grease reservoir top-ALP81-D120-128x3,0-NBR |
| 2.03 | 1 | 2010830100 | Grease reservoir-transparent-ALP81-D120-H206-2L |
| 2.04 | 4 | 3010402391 | Tie-rod for grease reservoir-ALP81-2L-D7-M6-L236-ST-ZnNi |
| 2.05-1 | 4 | 3040101080 | Flat washer-D11,7x2,6x1,5-(M6)-A2-SS |
| 2.05-2 | 4 | 3040101090 | Spring washer-9,5x6,3x1,75-(M6)-A2-SS |
| 2.05-3 | 4 | 3040102200 | Hexagon acorn nut-DIN_1587-M6-6-A2-SS |
| 2.06 | 1 | 2090121660 | Kit-ventilation-grease reservoir-ALPB_ALP81(2L) |
| 2.07 | 1 | 3040102510 | Low hexagon nut-DIN_EN_ISO_4035-M8-A2-SS |
| 2.08 | 1 | 3010106150 | T-rod for grease distribution at reservoir-ALP81-D120-2L-D10-L162-ST-ZnNi |

## 18 Order key

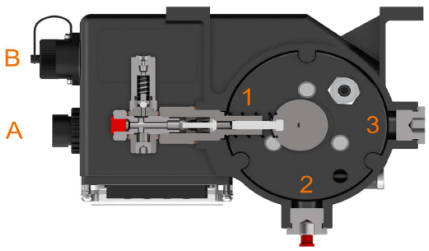
**ALP81** [1] - [2] . PE [2.5C] - [0] - [0] . [2] . [0] . [1] . [0000]

| Size of grease reservoir (liter) | |
|---|---|
| 1L D130 | 1 |
| 2L D130 | 2 |

| Power supply | |
|---|---|
| 12V | 1 |
| 24V | 2 |

Pos. 1 | Pos. 2 | Pos. 3

| Pump outlet M22x1.5 configuration - Pos. 1/2/3 | | | |
|---|---|---|---|
| | Pos. 1 | Pos. 2 | Pos. 3 |
| Screw plug | 0 | 0 | 0 |
| PE 1.5 without bypass | 1.5C | 1.5C | 1.5C |
| PE 1.5 with bypass | 1.5A | 1.5A | 1.5A |
| PE 2.5 without bypass | 2.5C | 2.5C | 2.5C |
| PE 2.5 with bypass | 2.5A | 2.5A | 2.5A |
| PE 4.5 without bypass | 4.5C | 4.5C | 4.5C |
| PE 4.5 with bypass | 4.5A | 4.5A | 4.5A |
| Hand press adapter straight | | HP | HP |
| Hand press adapter 45° | | HP45 | HP45 |
| Hand press adapter 90° | | HP90 | HP90 |
| Bypass inlet * | BP | BP | BP |
| Customised setting | X | X | X |




*Standard: PE at position 1*

** For pump elements with a safety valve with bypass, a bypass inlet must be provided at the nearest outlet.*

| Pos. A - Power connection | |
|---|---|
| without power cable | 0 |
| with cable kit-power supply BYN 5/7 Pin, 7,5 m | 2 |
| Customized version | X |

| Pos. B - Divider monitoring connector (Signal input) | |
|---|---|
| with protective cap divider monitoring | 0 |
| Customized version | X |

| Controller | |
|---|---|
| without controller | 0 |
| with integrated controller AK06 | 1 |
| Customized version | X |

| Special models | |
|---|---|
| Standard version | 0000 |
| Customized version | XXXX |