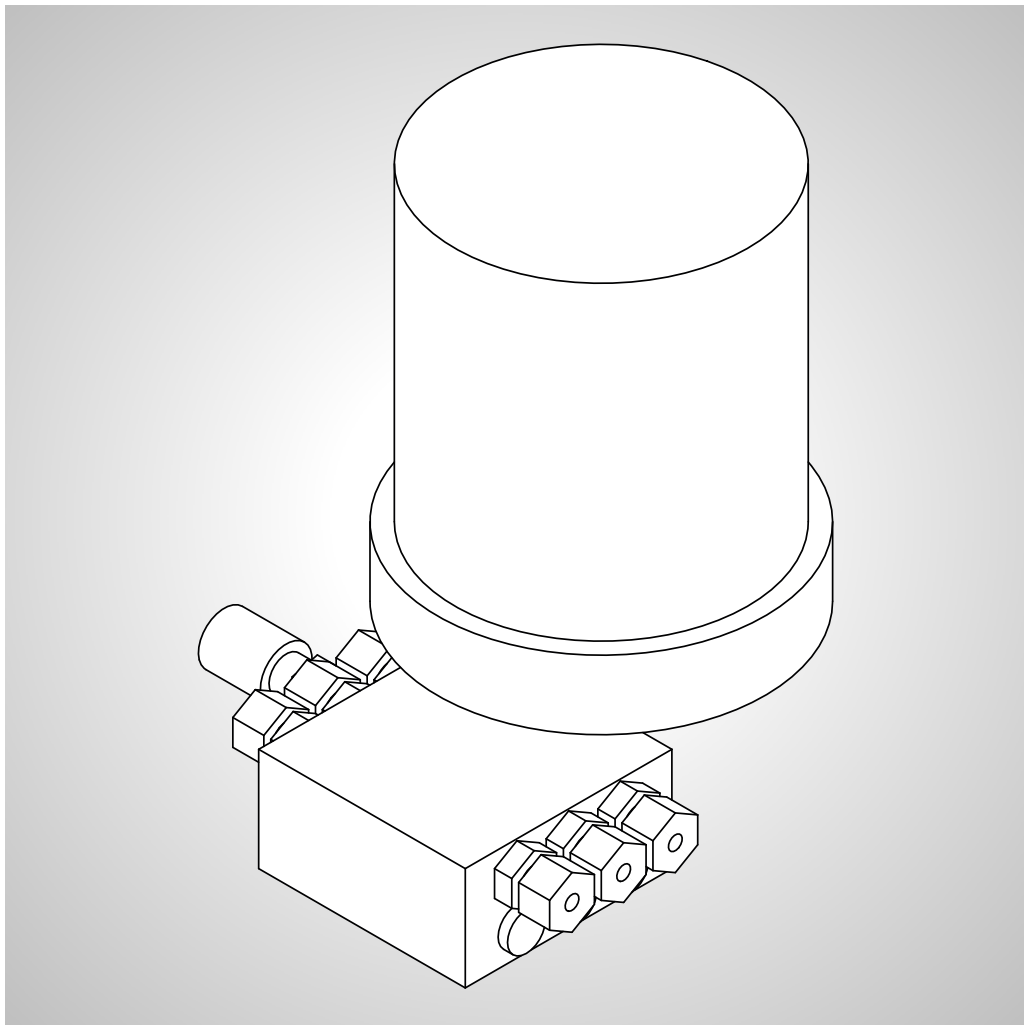


## SERVICE MANUAL

### Automatic lubrication system Memolub PLCD (24 V DC)



Project / Order:	BIX.XXXXXXXXXX
Bill of materials:	101XXXXXX
Serial number:	
Year of manufacture:	2016

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Translation of the original instructions

This manual contains standard illustrations that may deviate from the original. In the case of special models, options, or technical changes, the scope of delivery may differ from the descriptions here. Reprinting the instructions, in whole or in part, requires our permission. Subject to change due to technical improvements.

## Revision history

Version	Date	Description
1.0	May 25, 2016	Basic version

Table -1      *Revision history*



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# I Safety

## I.1 General

Read the entire manual before working with the product. The manual contains important information for your personal safety. The manual must be read and understood by all persons who work on the product in any of the product life phases.



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Read the Safety chapter of the superordinate manual before working with the product. It contains important information for your personal safety. The chapter must be read and understood by all persons who work on the product in any of the product's phases. You are obligated to implement the information and warnings it contains, wherever they pertain to the product.

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## 2 Design, function

### 2.1 Design

The automatic lubrication system of the drive module consists of a small lubricant dispenser with progressive distributor with several outputs. The automatic lubrication system lubricates the guideway and rack of the equipped axes automatically. The lubricating pinion unit lubricates the rack. The wiper and lubrication unit lubricates the guideway.

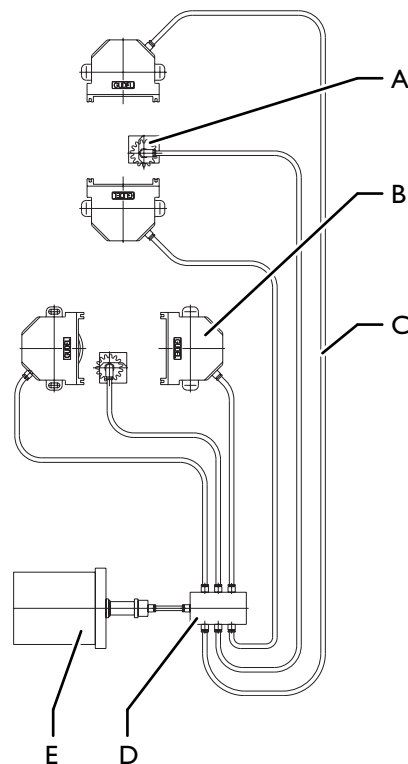


Fig. 2-1

Design of the MEMOLUB automatic lubrication system

- |   |                            |   |                         |
|---|----------------------------|---|-------------------------|
| A | Lubricating pinion unit    | D | Progressive distributor |
| B | Wiper and lubrication unit | E | Lubricant dispenser     |
| C | Lubrication line           |   |                         |

## 2.2 Position of the encoder

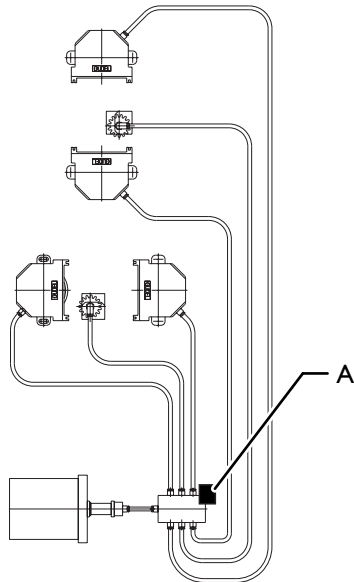


Fig. 2-2 Position of the encoder

A Encoder

## 2.3 Function

The lubrication is an important part of the maintenance.

The following are the most important elements for achieving effective lubrication to optimize productivity:

- Lubricant dispenser
- Lubrication point
- Lubrication quantity
- Lubrication cycle

MEMOLUB is a powerful (25 bar) and precise electro-mechanical lubricant dispenser. The lubrication is centralized and automated. The lubricant is contained in a cartridge. With the progressive distributor, several points can be lubricated simultaneously.

### 2.3.1 Control

For regular lubricant dispensing, the lubricant dispenser needs to be controlled by a PLC. To this end, a pulse rhythm needs to be sent for every lubrication cycle, by means of a control signal. Güdel recommends the following program sequence ➔ Chapter 3.2.2, 15

## 2.3.2 Functional description of progressive distributor



The progressive distributor evenly distributes the incoming lubricant to all outputs that are in use. If an output is closed, the output on the opposite side from it will discharge double the quantity of lubricant.

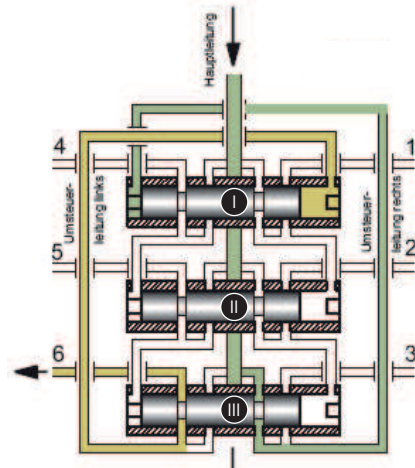


Fig. 2-3 Function of the progressive distributor, Fig. 1

From the main line, the lubricant flows through the right-hand ring groove of piston III. The changeover line moves piston I to its right-hand end position. The lubricant displaced by piston I goes through the left changeover line and exits at output 6.

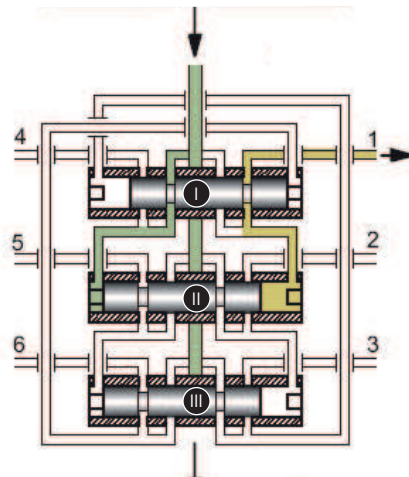


Fig. 2-4 Function of the progressive distributor, Fig. 2

After piston I has moved, lubricant flows to the left side of piston II and pushes the piston to its right-hand end position. The displaced lubricant exits through output 1.

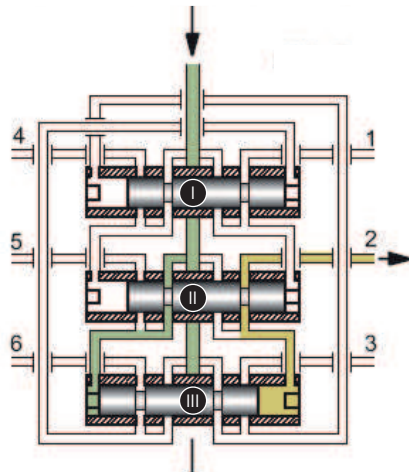


Fig. 2-5 Function of the progressive distributor, Fig. 3

After piston II has moved, lubricant flows to the left side of piston III and pushes the piston to its right-hand end position. The displaced lubricant exits through output 2.

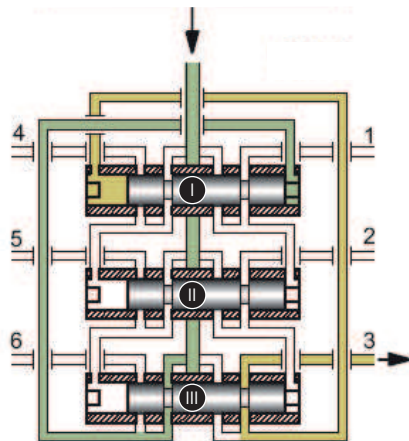


Fig. 2-6 Function of the progressive distributor, Fig. 4

After piston III has moved, lubricant flows to the right side of piston I and pushes the piston to its left-hand end position. The displaced lubricant exits through output 3. The progressive distributor continues to follow the functional sequence as described, until all outputs have been supplied with lubricant.



As long as pressure is generated by the lubricant, the entire procedure keeps repeating in the progressive distributor.

## 3 Commissioning

### 3.1 Connecting PLCD

Connect the automatic lubrication system as follows.



The interface electronics of Memolub reacts very sensitively to low voltage levels. The low voltage levels can be caused by the semiconductor electronics of output boards.

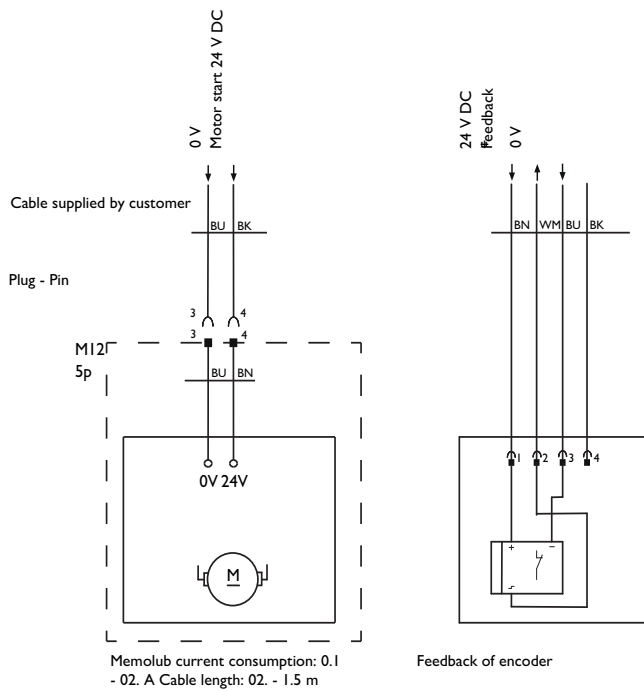


Fig. 3-1 Connecting PLCD

## 3.2 Programming

### 3.2.1 Signal waveform over time

The signal waveform over time for the motor (output) and encoder (feedback) is as follows.



The encoder reports a complete pass through the progressive distributor, with two edge changes. The software therefore has to react to the second changing edge at the feedback input.

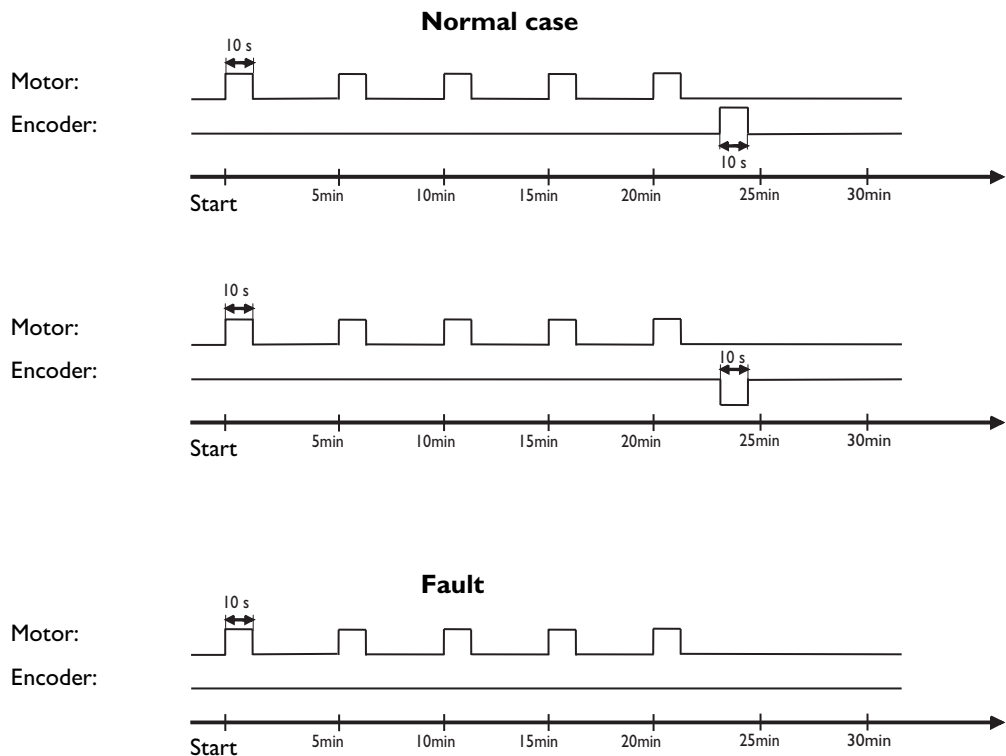


Fig. 3-2 Signal waveform over time

### 3.2.2 Recommended solution, software programming

Software procedure:

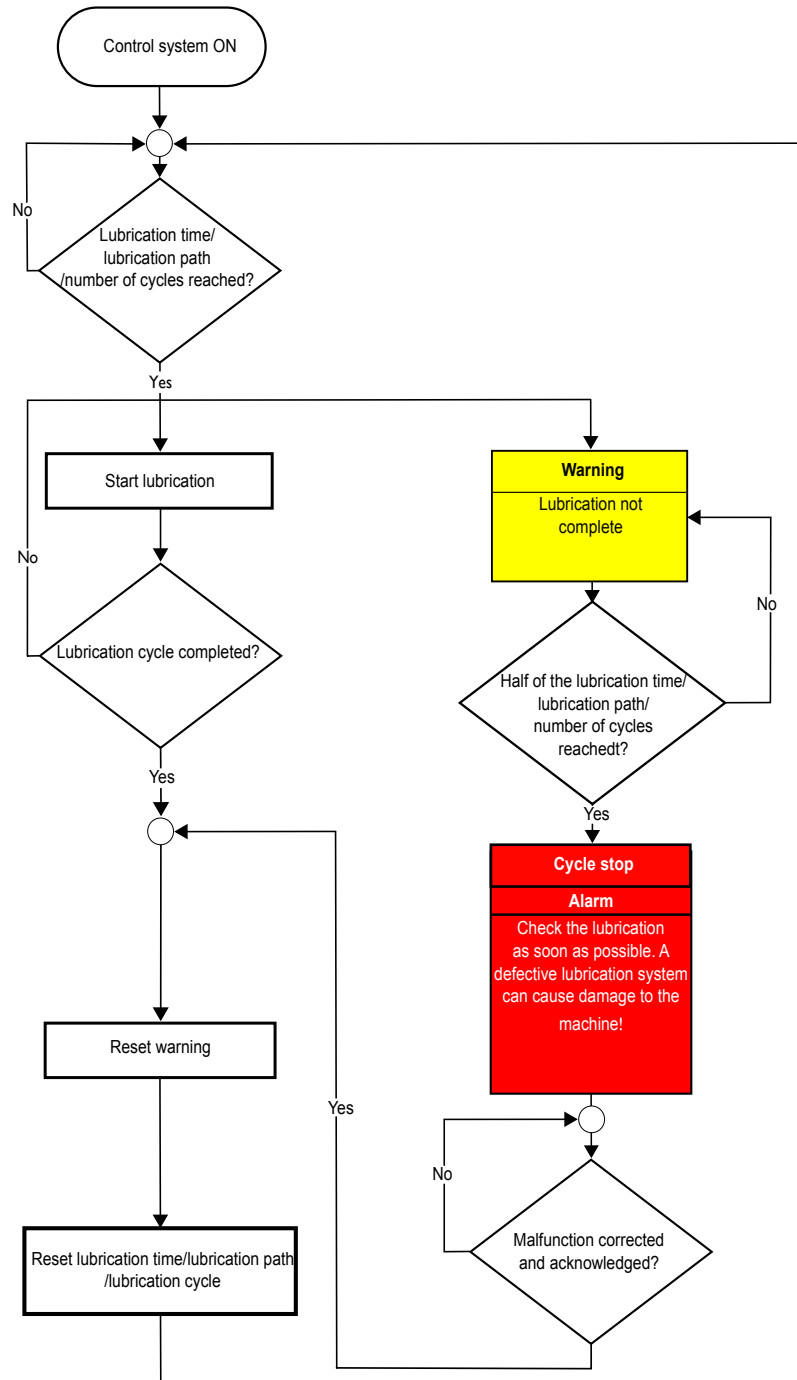


Fig. 3-3 Process for automated lubrication





## 4 Operation

### 4.1 Setting the lubrication cycle / lubrication quantity

The following table shows the lubricant consumption when standard settings are used.

You can find additional settings in the third-party documentation from MEMOLUB.

#### 4.1.1 Lubrication quantity

*Lubrication quantity*

Per pulse, the lubricant dispenser discharges the following lubrication quantity to the progressive distributor:

Lubrication quantity [ml]	Lubrication quantity per output on the progressive distributor [ml]
0.635	0.1015 (on a progressive distributor with six outputs)

Table 4-1

*Lubrication quantity per pulse: at the lubricant dispenser / at an output of the progressive distributor*

The lubrication quantity per output on the progressive distributor is usually equal. However, closing an output affects the lubrication quantity per output.

*Lubrication quantity: Calculation example*

The lubrication quantity is increased by increasing the number of pulses sent to the MEMOLUB lubrication system. The more pulses are sent within the same period, the higher are the lubrication quantity and the lubrication consumption.

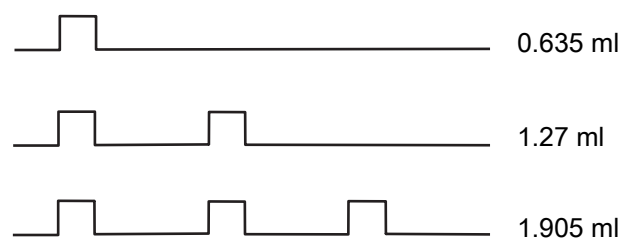


Fig. 4-1

*Calculation example: Lubrication quantity at the lubricant dispenser*



## **5          Replace the cartridge**

Replace the cartridge according to the MEMOLUB third-party documentation.



## 6 Lubricants used

### NOTE

#### Incompatible lubricant!

Mixing different lubricants affects their properties!

- Never mix different types of lubricant
- Before using another type of lubricant, replace the following components:
  - ⇒ Wiper and lubrication unit
  - ⇒ Lubricating elements of the roller support
  - ⇒ Lubricating pinion
- Rinse the lines with fresh lubricant



Fig. 6-1 Automatic lubrication system Memolub

Lubrication ex works	Specification	Lubrication quantity
Mobil Glygoyle 460 NSF no.136467	CLP PG 460 in accordance with DIN 51502	

Table 6-1 Lubricants: Automatic lubrication system Memolub



Fig. 6-2 Automatic lubrication system Memolub

Lubrication ex works	Specification	Lubrication quantity
Castrol Longtime PD	2KP2K-30 in accordance with DIN 51502	

Table 6-2 Lubricants: Automatic lubrication system Memolub



## 7 Malfunions / Troubleshooting

### **DANGER**



#### **Hazardous voltage**

The product contains components that are energized with hazardous voltages. Touching these components will cause an electric shock. Electric shocks can be fatal!

Before working in the danger area:

- Switch off the superordinate main power supply
- Secure the superordinate power supply against being switched on again (main switch of complete plant)
- Ground the equipment.

### **WARNING**



#### **Automatic startup**

During work on the product, there is danger of the machine starting up automatically. This can lead to severe or fatal injuries!

Before working in the danger area:

- Secure vertical axes (if equipped) against falling.
- Switch off the superordinate main power supply. Secure it against being switched on again (main switch for the complete plant)
- Before switching on the plant again, make sure that no one is in the danger area

Malfunction	Cause	Measures
Lubrication system does not lubricate	Cannot be determined	<ul style="list-style-type: none"> <li>• Check all possible malfunctions</li> <li>• Fix malfunctions as in Measures</li> </ul>

Malfunction	Cause	Measures
Lubrication system does not lubricate	MEMOLUB feed has failed	<ul style="list-style-type: none"> <li>• Check the connecting cables for breaks</li> <li>• Check the connections of MEMOLUB</li> <li>• Check the power supply</li> </ul>
Lubrication system does not lubricate	<ul style="list-style-type: none"> <li>• Cartridge empty</li> <li>• Lines damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the cartridge as described in the MEMOLUB third-party documentation</li> <li>• Check the lines</li> </ul>
Encoder does not send a signal	<ul style="list-style-type: none"> <li>• Encoder defective</li> <li>• Cable damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the encoder</li> <li>• Check the cables of the encoder</li> <li>• Check the connections of the encoder</li> </ul>
Lines do not contain lubricant	Progressive distributor defective	Replace the progressive distributor

Table 7-1 Malfunctions



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