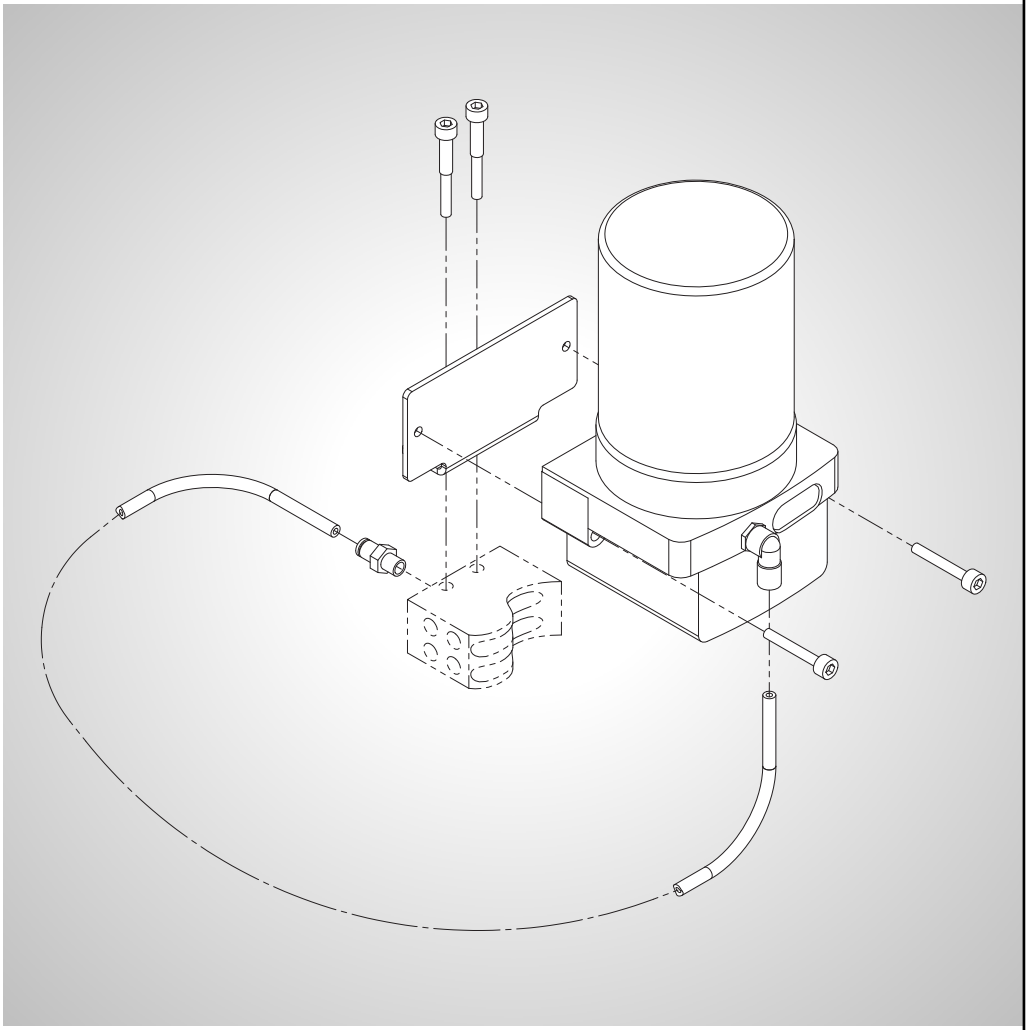
GÜDEL

ASSEMBLY INSTRUCTIONS

Conversion kit FlexxPump 401mod / 401B



Project / Order:

Bill of materials:	10xxxxxxx
Serial number:	911xxxxxx
Year of manufacture:	2019

GÜDEL

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.

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Revision history

Version	Date	Description
1.0	08.03.2019	Basic version

Table -1 *Revision history*

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1 EC declaration of conformity

The manufacturer: GÜDEL AG
Industrie Nord
CH-4900 Langenthal

hereby declares that the machine:

Product, type	Conversion kit FlexxPump 401mod / 401B
Serial number	911xxxxxx
Parts list	10xxxxxxx
Year of manufacture	2019

corresponds to the applicable requirements of the Machinery Directive (2006/42/EC).

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2 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.

2.1 Further applicable documentation

All documents delivered with this manual are further applicable documentation. They must be observed in addition to this operating manual for the safe handling of the product.

2.2 Purpose of the document

These assembly instructions describe the conversion of the product.

The instructions contain the information required for converting the product as intended.

2.3 Explanation of symbols/abbreviations

The following symbols and abbreviations are used in this manual:

Symbol/Abbreviation	Use	Explanation
➲	For cross-reference	See
🗎	Possibly for cross-reference	Page
Fig.	Designation of graphics	Figure
Table	Designation of tables	Table
	In the tip	Information or tip

Table 2-1 Explanation of symbols/abbreviations

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3 Safety

3.1 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.

3.1.1 Product safety

Residual danger

The product is built using state-of-the-art technology. It was designed and constructed in accordance with the accepted safety regulations. However, some residual danger remains during its operation.

There is danger to the personal safety of the operator as well as for the product and other property.

Operation

When operating the product, always observe this manual and ensure that the system is always in perfect working order.

3.1.2 Personnel qualifications

⚠ WARNING

Lack of safety training

Incorrect behavior of untrained or insufficiently trained technicians can result in severe or fatal injuries!

Before technicians work on safety-related aspects of the product:

- Ensure that the technicians are trained with regard to safety
- Train and instruct the technicians specifically for their area of responsibility

Only appropriately trained and authorized technicians are allowed to work on the product.

Persons are authorized if:

- they are familiar with the relevant safety regulations for their area of responsibility
- they have read and understood this manual
- they meet the requirements for an area of responsibility
- they were assigned an area of responsibility by the operator

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The technician is responsible to third parties in his area of responsibility.

During a training session or instruction, the technician may only work on the product under the supervision of an experienced manufacturer's technician.

3.1.2.1 Operating companies

The operating company is responsible for ensuring that:

- the product is used as intended
- the product is sufficiently lubricated at all times
- all safety aspects are complied with
- the product is put out of operation if the functioning of the safety equipment is not fully guaranteed
- the technician working on the product is appropriately trained
- the technician is provided with personal protective equipment
- the operating manual is available to the technician at the operation site of the product at all times
- the technicians are kept up-to-date regarding best practice
- the technicians are informed about technical progress, modifications, and the like.
- the contracted cleaning staff only work under the supervision of a maintenance technician

3.1.2.2 Transport specialists

The transport specialist:

- is able to transport loads safely
- is able to use slings safely and properly
- is able to secure the load properly
- has experience in transportation

3.1.2.3 Fitters

The fitter:

- has very good mechanical and/or electrical knowledge
- is flexible
- has assembly experience

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3.1.2.4 Commissioning technicians

The commissioning technician:

- has good programming knowledge
- has mechanical and/or electrical knowledge
- is flexible

The commissioning technician is responsible for the following tasks:

- commissioning the product
- testing the functions of the product

3.1.2.5 Operators

The operator:

- was trained and instructed by the operating company or the manufacturer
- has very good knowledge of the user interface and the operating elements
- has process knowledge which is specifically geared to the product

The operator is responsible for the following tasks:

- switching the control system of the product on and off
- creating production readiness
- monitoring the production process
- localizing minor malfunctions

3.1.2.6 Manufacturer's technicians

The manufacturer's technician:

- is employed on site at the premises of the manufacturer or representative
- has very good mechanical and/or electrical knowledge
- has good software knowledge
- has maintenance, service and repair experience
- has experience with Güdel products

The manufacturer's technician is responsible for the following tasks:

- performing mechanical and electrical maintenance work in accordance with the manual
- performing mechanical and electrical service work in accordance with the manual
- cleaning the product
- replacing spare parts
- localizing and fixing malfunctions

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3.1.2.7 Maintenance technicians

The maintenance technician:

- was trained by the operating company or the manufacturer
- has very good mechanical and/or electrical knowledge
- has software knowledge
- has maintenance experience
- bears responsibility for the safety of the cleaning staff

The maintenance technician is responsible for the following tasks:

- performing mechanical and electrical maintenance work in accordance with the manual
- cleaning the product
- replacing spare parts
- monitoring and instructing the cleaning staff in the safety zone during the cleaning process

3.1.2.8 Service technicians

The service technician:

- was trained by the operating company or the manufacturer
- has very good mechanical and/or electrical knowledge
- has software knowledge
- has service and repair experience
- is flexible

The service technician is responsible for the following tasks:

- performing mechanical and electrical service work in accordance with the manual
- replacing spare parts

3.1.2.9 Disposal specialists

The disposal specialist:

- is able to separate waste
- is familiar with the country-specific disposal regulations
- has experience in environmentally-friendly disposal
- works carefully and safely

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3.1.3 Disregarding safety regulations

⚠ DANGER

Disregarding safety regulations

Disregarding safety regulations can result in damage to property, severe or fatal injuries.

- Always comply with the safety regulations

Liability

Güdel shall not be held liable under any of the following circumstances:

- The installation regulations were disregarded
- Included protective equipment was not installed
- Included protective equipment was modified
- Included monitoring equipment was not installed
- Included monitoring equipment was modified
- The product was not used as intended
- The maintenance work was not performed in the specified intervals, or was carried out incorrectly.

3.1.4 Installation instructions

Protective measures

The operating company is responsible for ensuring safe conditions in the vicinity of the product. In particular, he must ensure compliance with the general safety regulations, guidelines and standards. Before commissioning the system the operating company must check whether all the protective measures have been implemented. These must cover all hazards. This is the only way to ensure that application of the product conforms to CE regulations.

As stipulated by the Machinery Directive, the protective measures must:

- Correspond to best practices
- Comply with the required safety category

Modifications

The product must never be modified or used in a manner contrary to its intended use. ➲ 🗎 25

General rules for occupational safety

The generally accepted occupational safety rules must be observed and implemented.

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3.2 Hazard symbols in the manual

3.2.1 Hazard warnings

The hazard warnings are defined for the following four types of danger levels:

⚠ DANGER

DANGER

DANGER refers to hazards with a high risk of severe physical injury or immediate fatality.

⚠ WARNING

WARNING

WARNING refers to hazards with a moderate risk of severe physical injury or potential fatality.

⚠ CAUTION

CAUTION

CAUTION refers to hazards with a slight risk of moderate physical injury.

NOTE

NOTE

NOTE refers to hazards that can lead to property damage.

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3.2.2 Explanation of warning symbol

Hazard warnings for personal injuries contain the symbol of the corresponding hazard.

Symbol	Explanation of symbols
	Hazards due to general causes
	Hazards resulting from automatic startup
	Hazards due to falling axles
	Hazards due to heavy components
	Hazards due to environmental pollution
	Hazards from leaking batteries

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3.3 Fundamentals of safety

3.3.1 Separating protective equipment, monitoring equipment

⚠ WARNING

Missing separating protective equipment and monitoring equipment

Missing or modified separating protective equipment and monitoring equipment may result in damage to property or serious injuries!

- Do not remove or modify separating protective equipment and monitoring equipment
- After commissioning the system, correctly attach all the separating protective equipment and monitoring equipment

For more information on separating safety and monitoring equipment, refer to the documentation on the complete system.

3.3.2 Product-specific hazards

⚠ CAUTION

Leaking batteries

Battery fluids and their fumes are hazardous to the environment, corrosive and poisonous! They cause injury to persons and damage to property!

Observe the following points:

- Make sure there is good ventilation in closed rooms before repairing leaks
- Wear safety goggles and gloves
- Prevent battery fluids from getting into the drinking water supply
- Use only dry cleaning cloths without detergents
- Dispose of batteries in an environmentally friendly manner

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⚠ CAUTION

Oil, greases

Oils and greases are harmful to the environment!

- The oils and greases must not get into the drinking water supply. Take appropriate measures
- Observe the country-specific safety data sheets
- Oils and greases must be disposed of as hazardous waste, even if the total quantity is small

3.3.3 Material safety data sheets (MSDS)

Safety data sheets contain safety information about the materials. They are country-specific. Safety data sheets are issued, for example, for materials such as oils, greases, cleaning agents, etc. The operating company is responsible for obtaining safety data sheets for all materials used.

Safety data sheets can be obtained as follows:

- Suppliers of chemicals usually supply their substances together with safety data sheets
- Safety data sheets are available on the Internet.
  (Enter "msds" and the name of the material in a search engine. Safety information about the material will be displayed.)

Read the safety data sheets carefully. Follow all the instructions. We recommend that you store the safety data sheets for future reference.

The safety data sheet for Güdel H1 can be found in the download area of our company Web site http://www.gudel.com

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4 Product description

4.1 Use

4.1.1 Intended use

The automatic lubrication system FlexxPump 401 mod / 401B is designed exclusively for lubricating Güdel guideways and Güdel gear teeth. It may only be used as a replacement for the Memolub automatic lubrication system.

Any other or additional use is not considered to be intended use. The manufacturer assumes no liability for any resulting damage. All risks are borne solely by the user.

4.1.2 Non-intended use

The product is not intended for:

- Lubrication of runners, bearing or other elements
- Operation in potentially explosive areas
- Lubrication of elements in or on automobiles
- Operation outside of the performance specifications provided by Güdel
- Operation outside of permissible temperature range
- Using lubricants with properties other than the ones specified

Any use other than the specified intended use will be considered improper use and is forbidden!

Do not make any modifications to the product.

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4.2 Product designation

The product has a type plate.

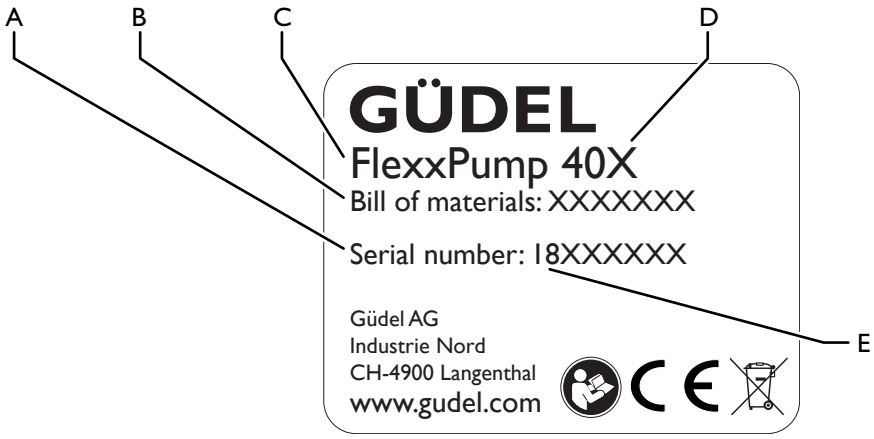

Fig. 4-1 *Type plate*

A	*Serial number*	*D*	*Pump type*
B	*Item number*	*E*	*Build year (the first two digits of the serial number)*
C	*Product name*		

The type plate is attached to the right side of the casing. The hydraulic outputs are indicated by engraved numbers.

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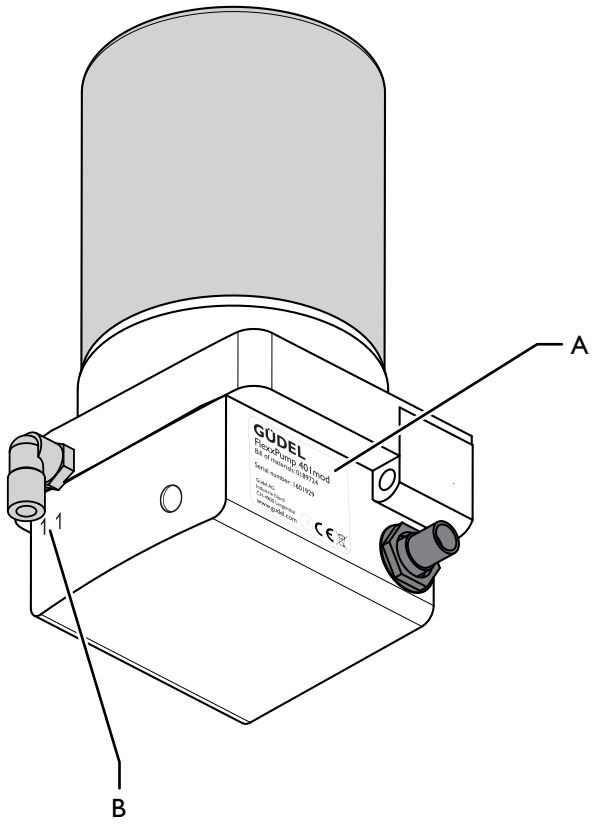

Fig. 4-2 *Product designations*

A *Type plate*

B *Numbers of the hydraulic outputs*

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4.3 Technical data

For the following data, refer to the layout(s) in the appendix.

- Dimensions
- Weight
- Strokes of the individual axes
- Gearbox type
- Gearbox ratios
- Motors

Emission sound pressure level

The emission sound pressure level depends on the machine properties and the operating conditions. Generally the emissions sound pressure level L_{pA} is ≤ 80dB(A), measured at a distance of 1 m from the safety fence and 1.6 m above ground level. The measurement is performed according to the ISO 11202 standard. The measured value is time-averaged over a machine specific cycle and offset with correction factors for room and environment noise correction. The measured value contains measuring uncertainty of +/- 4dB(A) (accuracy grade 3) and applies for a single machine, measured separately.

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4.3.1 Dimensions and connections 401 mod

The FlexxPump 401 mod weighs approx. 1500 g and has the following dimensions:

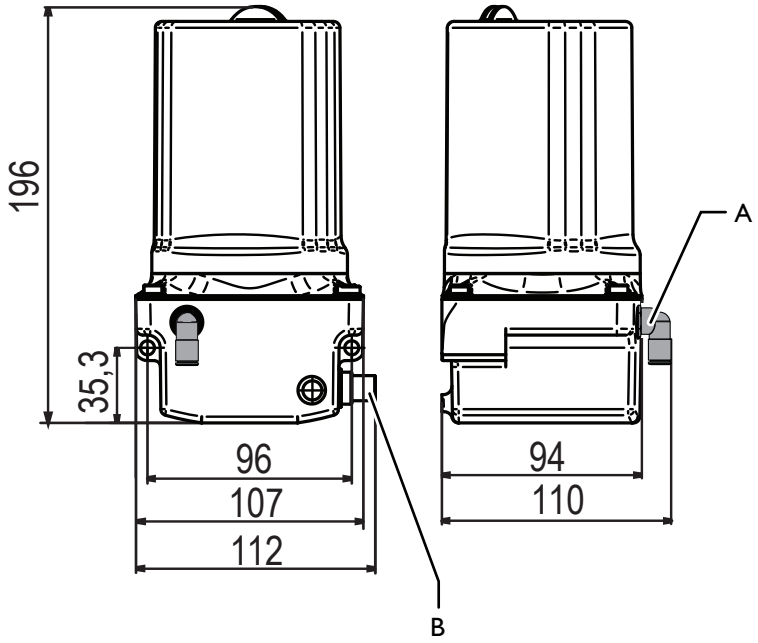

Fig. 4-3 *Dimensions and connections 401 mod*

A *Hydraulic output*

B *Connection plug M12x1*

Connections

Hydraulic:

- One connection for hydraulic hoses with a diameter of 6/3 mm

Electrical: The four-pole connection size M12x1 transmits the following signals:

- Control signals
- Operating voltage

Interfaces

The FlexxPump 401 mod features an integrated microprocessor. It is controlled via a programmable logic controller (PLC).

Operating voltage

Operating voltage	Operating power	Peak power I_{max}	Standby current	Peak output power
24 VDC +/- 5%	200 mA	350 mA	<20 mA	300 mA

Table 4-1 *Operating voltage*

4.3.2 Dimensions and connections 401B

The FlexxPump 401B weighs approx. 1500 g and has the following dimensions:

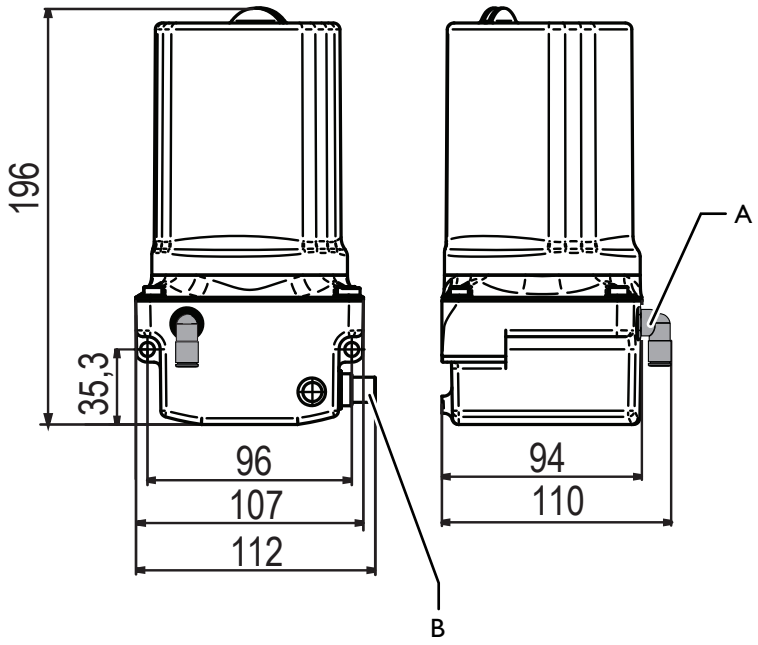

Fig. 4-4 *Dimensions and connections 401B*

A *Hydraulic output*

B *Connection plug M12x1*

Connections

Hydraulic:

- One connection for hydraulic hoses with a diameter of 6/3 mm

Electrical: The four-pole connection size M12x1 transmits the following signals:

- Error signals

Interfaces

Error signal can be displayed optically, if an LED cable is attached.

Operating voltage

The operating voltage is 3 VDC.

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4.3.3 Temperature ranges

The following temperature ranges and humidity apply:

Product life phase	Temperature range	Air humidity
Transport	-10 to +60 °C	
Operation	-20 to +70 °C	Up to and at 85 %, condensation formation is not permissible
Storage	-10 to +40 °C	Up to 75 %

Table 4-2 *Temperature ranges: FlexxPump*

4.3.4 IP protection class

The product conforms to the protection class IP65.

4.3.5 Operating pressure

The operating pressure is 70 bar and is monitored electronically by counter-pressure measurement.

4.3.6 Lubricant amount

The cartridge contains 400 cm^3 of lubricant. The empty level is monitored by an integrated reed contact.

4.3.7 Shelf life of Güdel H1 lubricant

The date of filling of the lubricant is shown on the lubricant cartridge. The Güdel H1 lubricant has a shelf life of two years from date of filling. This applies to sealed original containers stored under the required storage conditions.

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5 Design, function

5.1 Design

5.1.1 Structure of the 401 mod

The product consists of the following assemblies:

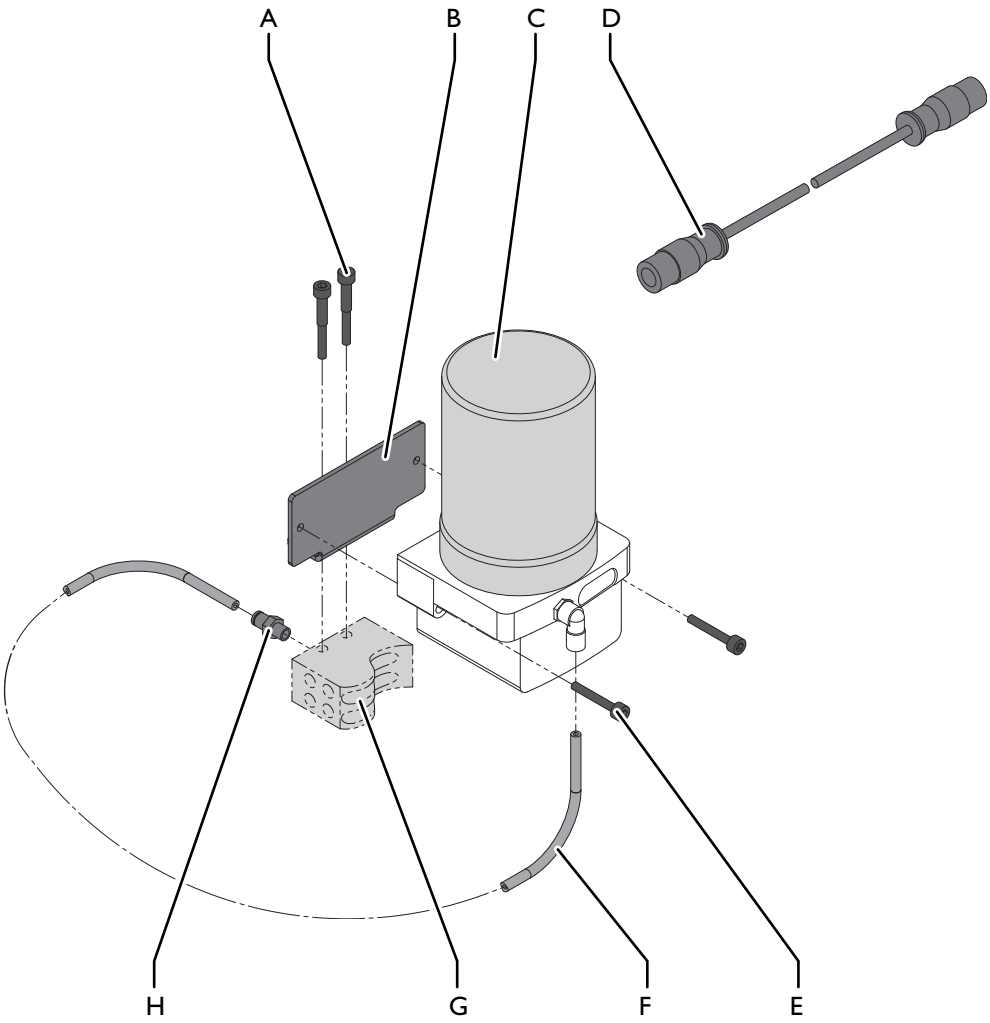

Fig. 5-1 *Structure of the 401 mod*

A	*Fastening screws*	*E*	*Screw*
B	*Bracket*	*F*	*Hydraulic hose*
C	*FlexxPump 401 mod*	*G*	*Progressive distributor*
D	*Adapter cable*	*H*	*Plug-thread connector*

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5.1.2 Detailed design of FlexxPump 401 mod

The FlexxPump 401 mod consists of the following components:

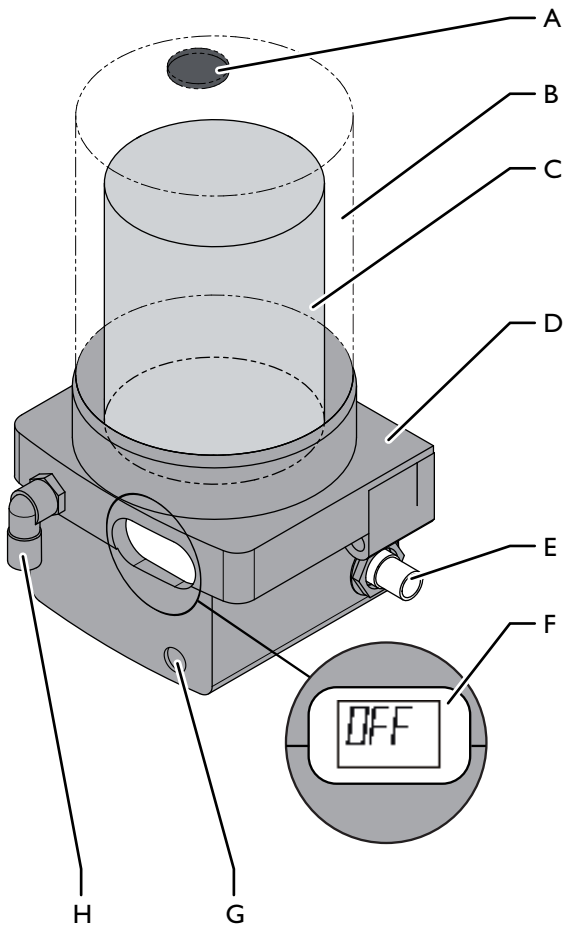

Fig. 5-2 *Detailed design of FlexxPump 401 mod*

A	*Vent locking mechanism*	*E*	*Connection plug for supply and communication with control system*
B	*Covering*	*F*	*LCD display*
C	*Cartridge*	*G*	*Active surface*
D	*Casing*	*H*	*Hydraulic output*

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5.1.3 Structure of the 401B

The product consists of the following assemblies:

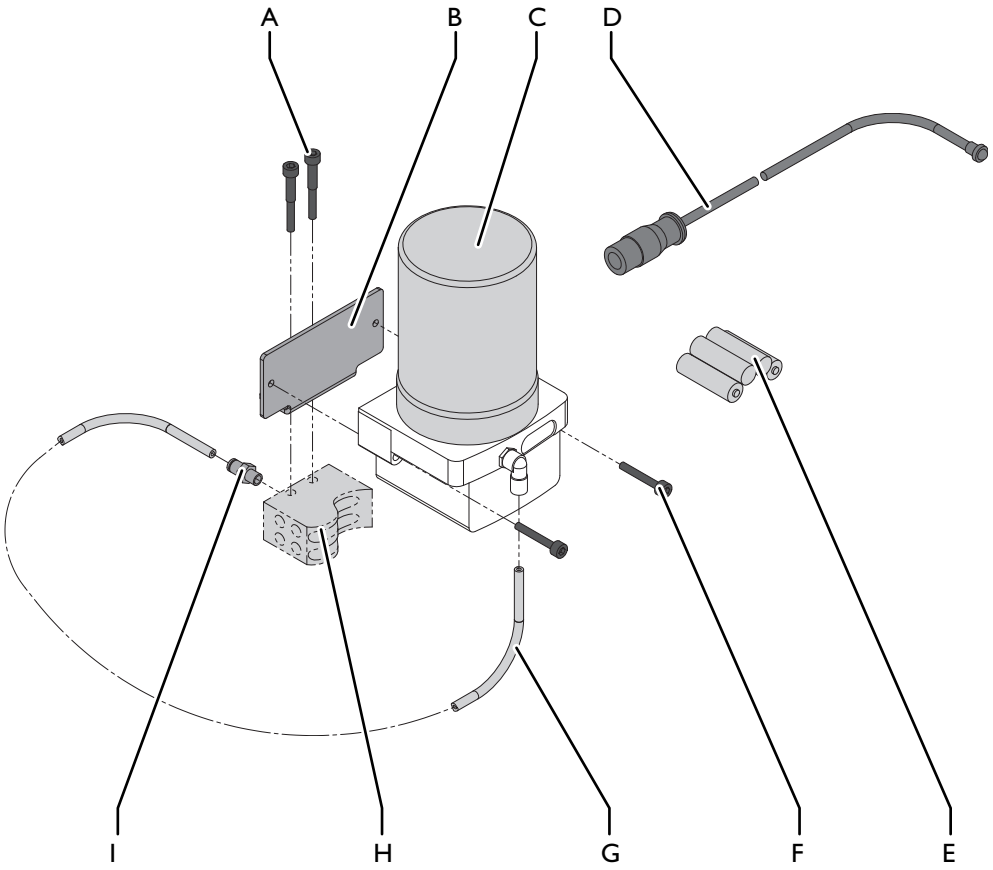

Fig. 5-3 *Structure of the 401B*

A	*Fastening screws*	*F*	*Screw*
B	*Bracket*	*G*	*Hydraulic hose*
C	*FlexxPump 401B*	*H*	*Progressive distributor*
D	*LED cable*	*I*	*Plug-thread connector*
E	*Battery*		

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5.1.4 Detailed design of FlexxPump 401B

The FlexxPump 401B consists of the following components:

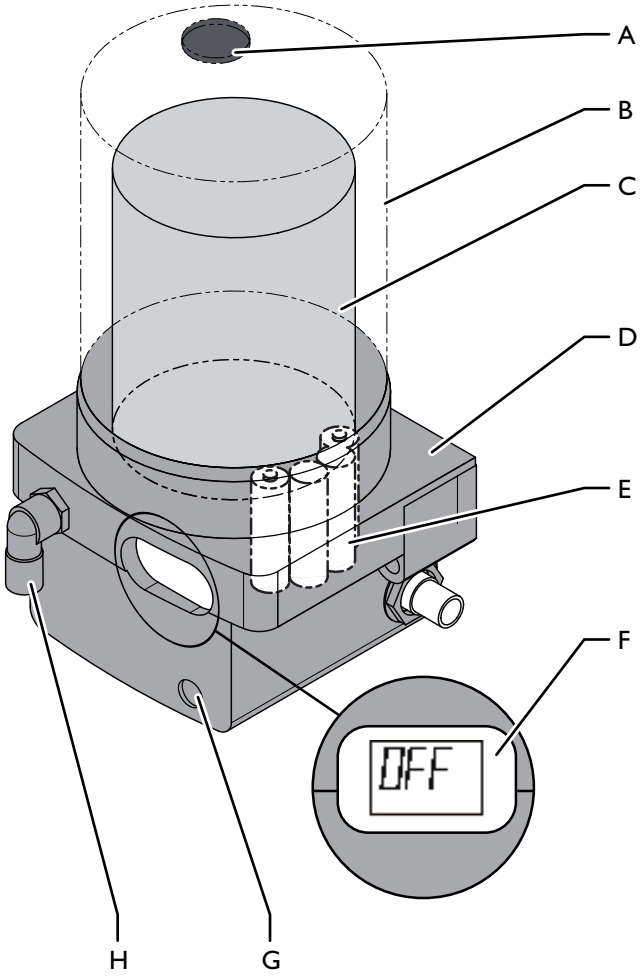

Fig. 5-4 *Detailed design of FlexxPump 401B*

A	*Vent locking mechanism, including magnetic peg*	*E*	*Battery*
B	*Covering*	*F*	*LCD display*
C	*Cartridge*	*G*	*Active surface*
D	*Casing*	*H*	*Hydraulic output*

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5.2 Function

5.2.1 Functional description

The automatic lubrication system is a lubrication system for Güdel components. The FlexxPump feeds the lubricant from the cartridge into the lines. Depending on the design, the lubricant is distributed through splitters, combined through Y-segments, or distributed directly to the lubrication area. Rack and pinions are lubricated by lubricating pinions; guideways are lubricated by lubricating elements.

The FlexxPump outputs a signal in case of overpressure, if the cartridge is empty and for each piston stroke. This makes it possible to process such information further.

5.2.2 401 mod

A PLC feeds and controls the FlexxPump. If the sensor on the progressive distributor reports an error, the type of error is evaluated by the PLC and shown on the HMI during the lubrication procedure. The PLC and the HMI are not included in the scope of delivery.

5.2.3 401B

A battery feeds the FlexxPump. The magnetic peg controls the supply of lubricant. If an LED cable (accessories) is connected to the FlexxPump, it emits an optical signal in case of malfunction. However, the type of error is shown on the display.

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5.2.4 Display elements

The LCD displays indicates malfunctions and operating states of the pump types 401 mod/401B. On the pump type 401 mod, the display is only active during the lubrication procedure. It does not show anything during standstill.

The flashing interval of the green LEDs lets you distinguish between the pump types 401 mod / 401B during operation:

- 5 seconds, 401 mod
- 60 seconds, 401B

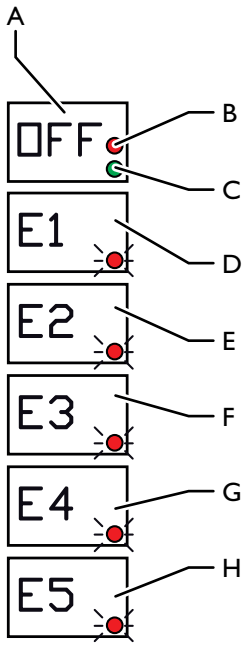

Fig. 5-5 *Display element and malfunctions*

A	*Digit display*	*E*	*Fault message for overcurrent*
B	*LED red*	*F*	*Fault message for operating voltage too low*
C	*LED green*	*G*	*Fault message; internal electrical error*
D	*Fault message for "Empty"*	*H*	*Fault message; internal mechanical error*

Digit display

The digit display serves for communication.

LED

The LED indicates the function:

- The green LED lights up during the lubrication cycle
- The green and red LEDs glow for 5 seconds after activation to check their own status
  Only pump type 401B
- The green LED flashes if there is no error
  Only pump type 401B
- The red LED flashes every 5 seconds if there is an error
  Only pump type 401B

Malfunction message

The malfunction message indicates the type of error. More detailed information ➲ 95

5.2.5 401B

5.2.5.1 Control elements

The magnetic peg is magnetic and integrated into the vent locking mechanism. Remove the vent locking mechanism to use the magnetic peg. Touch the active surface with it to perform the following actions:

- Switch the FlexxPump on and off
- Set lubrication cycle
- Perform functional check

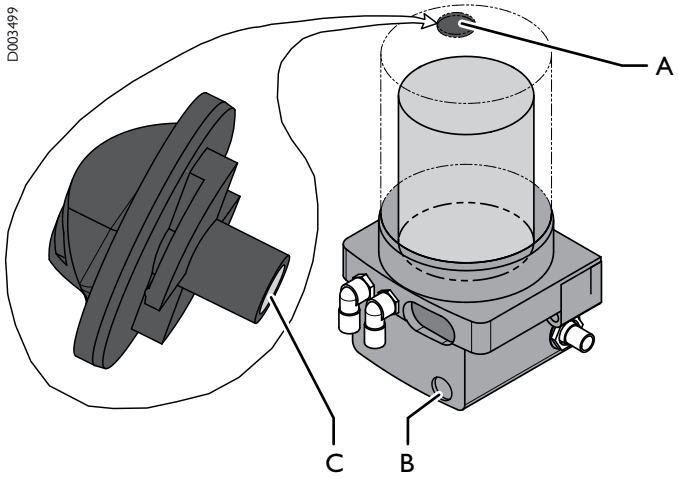

Fig. 5-6 *Magnetic peg*

A *Vent locking mechanism*

B *Active surface*

C *Magnetic peg*

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6 Commissioning

6.1 Introduction

6.1.1 Safety

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 15
It concerns your personal safety!

⚠ 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 system)
- Before switching on the system again, make sure that no one is in the danger area

6.1.2 Personnel qualifications

Only appropriately trained and authorized technicians are allowed to commission the product.

6.2 Transport

Avoid strong impacts and shocks while transporting the automatic lubrication system.

6.3 Packaging symbols

A lithium battery is also included with the product. The packaging unit is marked by one of the following or similar transport information labels. Observe these at all times.

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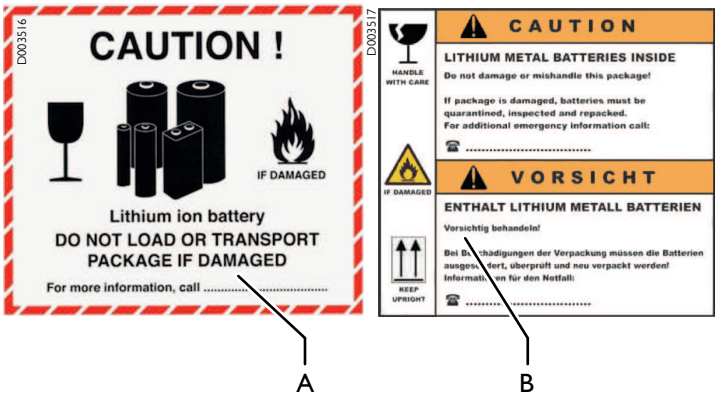

Fig. 6-1 *Transport information*

A *Transport information for lithium battery for airplane transport*

B *Transport information for lithium battery for truck transport*

Both transport information labels warn against fire hazard due to damaged lithium batteries. Packaging units marked with one of these transport information labels:

- Must be handled with care
- May only be transported when not damaged
- Must be repaired appropriately if damaged ➲ Chapter 6.4, 🗎 42

6.4 Repairing damaged packaging

Repair damaged packaging units as follows:

1 Remove packaging unit

2 Check batteries

3 In case of damaged batteries:

- **3.1** Contact manufacturer by phone number on the transport information
- **3.2** Follow manufacturer instructions

4 If batteries are undamaged:

- **4.1** Repackage batteries
- **4.2** Attach transport information for lithium battery to packaging unit

The packaging unit is repaired.

6.5 Intermediate storage

Observe the storage conditions if the product needs to be stored for a certain amount of time before assembly. ➲ 🗎 102

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6.6 Conversion

6.6.1 Prerequisites

Dispose of the packaging in accordance with the local waste regulations.
➲ 107

Checking the delivery

Check the scope of delivery based on the shipping papers. Check the product for damage. Report transport damage promptly.

Interfaces

Check whether the required interfaces are available and ready for use. Order information on the connecting cable.
The following interfaces are needed:

Interface	401 mod	401B
Lubricating pinion for gear teeth and Lubricating element for guideway rail	X	X
Connecting cable M12x1, 4-pole with the corresponding length	X	
PLC	X	

Table 6-1 Interfaces

Assembly site

The following prerequisites apply to the assembly site:

- The original Memolub lubrication system must be completely available
- Sufficiently rigid
- In order to minimize condensation, the device must not be subjected to direct sunlight and/or radiation heat

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6.6.2 Special tools, testing and measuring instruments

Ensure that you have the following special tools, testing and measuring instruments at hand:

Tool	Use	Item number
Allen key size 4+5	Installing the conversion kit	-
Wrench size 14+17	Installing the conversion kit	-

Table 6-2 *Special tools, testing and measuring instruments*

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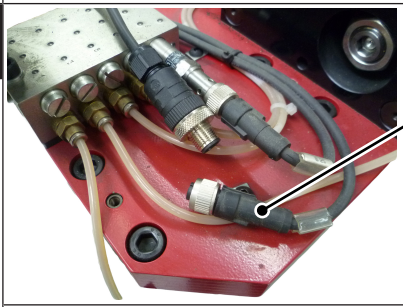
6.6.3 Disassembling the Memolub

Disassemble the Memolub as follows:

1

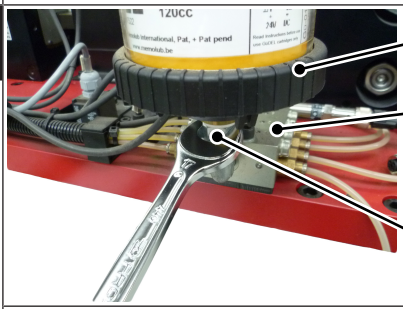
1 Switch off the system and secure it with a padlock against being switched on again

2



2 Disconnect the control cable from the Memolub (only pump type 401 mod)

3



3 Remove the Memolub from the progressive distributor

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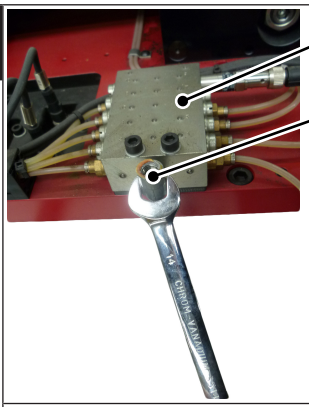
4



4 Remove the elbow pipe

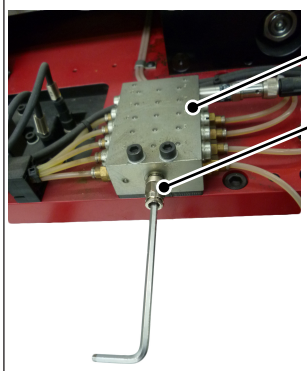
The Memolub has been disassembled.

6.6.4 Mounting attachments

Mount the attachments as follows:

1

Plug-thread connector

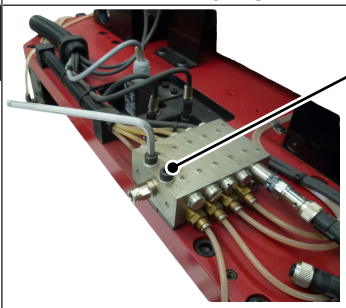


Progressive distributor

Plug-thread connector

1 Mount the plug-thread connector

2



Fastening screws

2 Remove the fastening screws

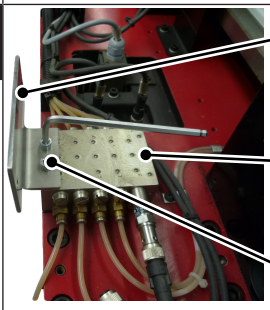
3

Fastening screws

Bracket

3 Unpack the new fastening screws and angle

4



Bracket

Progressive distributor

Fastening screws

4 Install the bracket

The attachments have been installed.

6.6.5 401 mod

6.6.5.1 Preparing material

Prepare the following material:

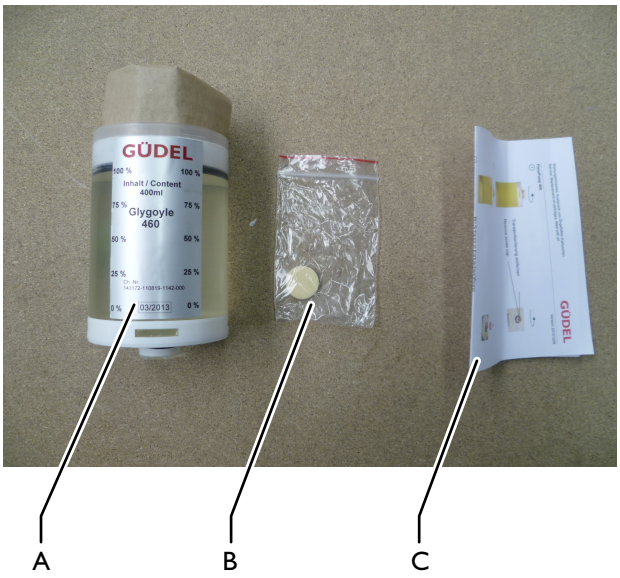


Fig. 6-2 *Prepare material*

- *A* *Cartridge*
- *B* *PU foam*
- *C* *Manual*

6.6.5.2 Installing the FlexxPump

⚠ CAUTION

Danger from spring tension

The covering contains a spring with tension. The covering jumps up when opened. This can lead to minor injuries!

Make sure that no extremities are in the danger area. Carefully remove the covering.

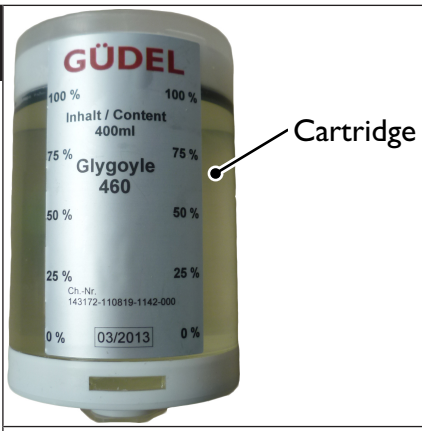
Prepare the FlexxPump

Prepare the FlexxPump as follows:

Prerequisite: The material is prepared

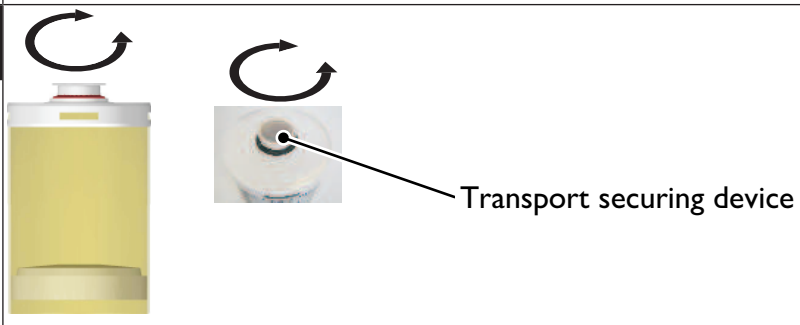
Prerequisite: The battery is inserted in the FlexxPump 401B

1



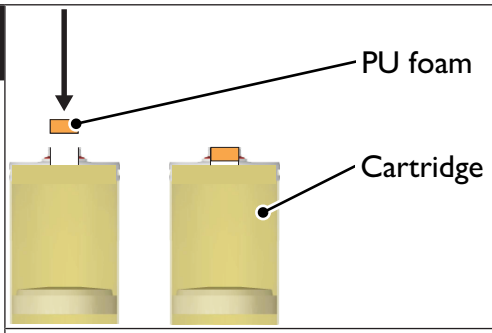
1 Prepare the cartridge according to the following steps
Observe the included instructions for the cartridge

2



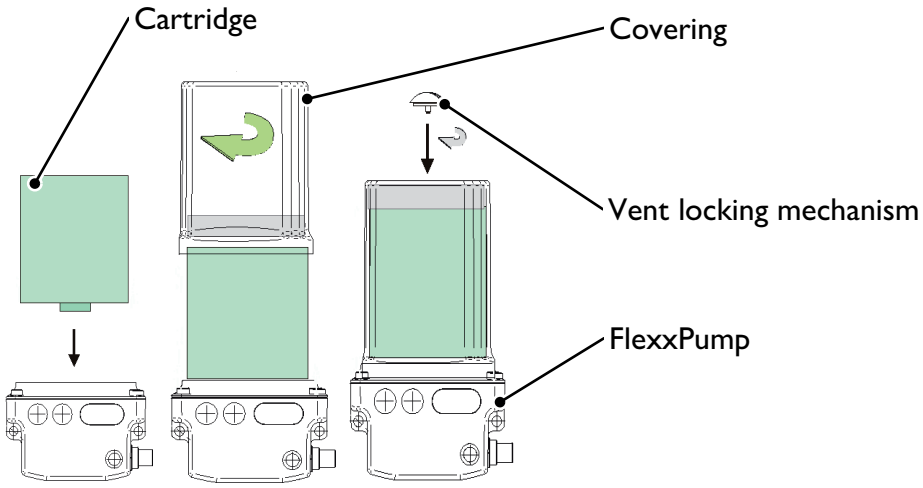
2 Remove the transport securing device

3



3 Install the PU foam in the cartridge

4



4 Insert cartridge
PU foam remains in the cartridge

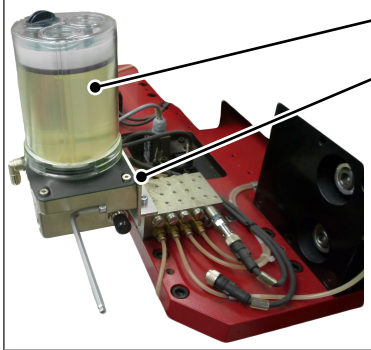
The FlexxPump is prepared.

Install the FlexxPump

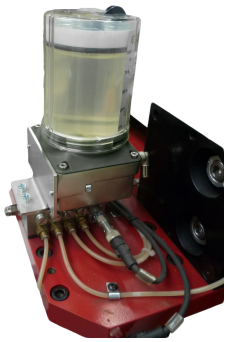
Install the FlexxPump as follows:

1

Assembly version 1:



Assembly version 2:



1 Mount the FlexxPump to the bracket with screws (ansure accessibility to the active surface of the pump type 401B and LCD display)

2

2 Unpack the hose

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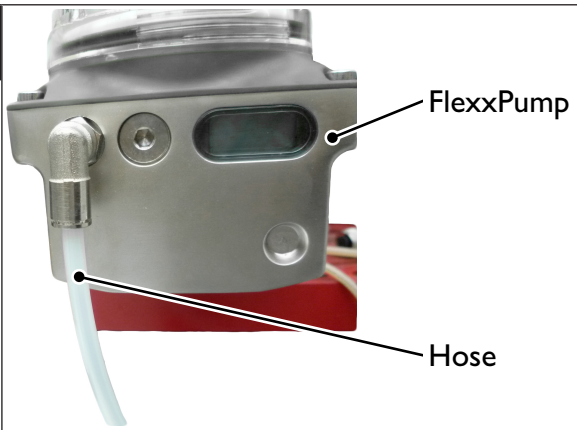
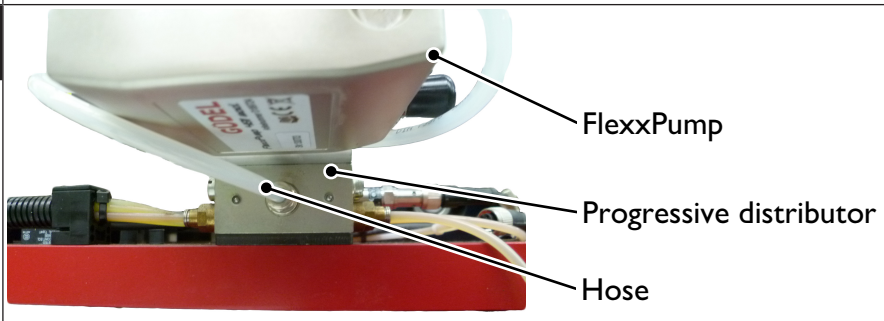
3



3 Connect the hose to the FlexxPump

4



4 Connect the hose to the progressive distributor

The FlexxPump is assembled.

6.6.5.3 Connecting electrical equipment

The conversion kit can be used with two different versions of connecting cables. Choose the procedure for connecting the electrical equipment based on the connecting cable.

- Normal cable
- Y-cable

Normal cable

Güdel recommends using a 1 A delay-action fuse for protecting the supply and control cable.

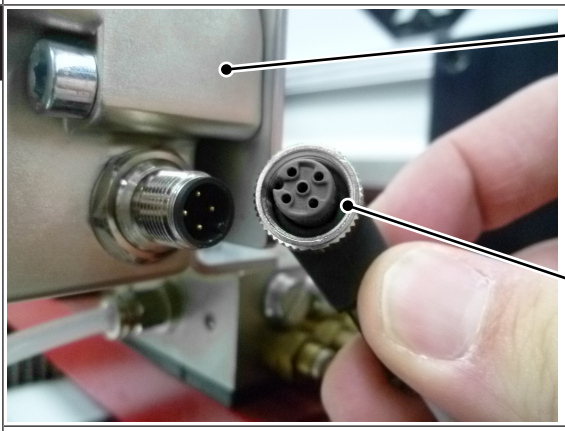
To connect the pump type 401 mod, only use the supplied adapter cable.

Connect the electrical equipment as follows:

1

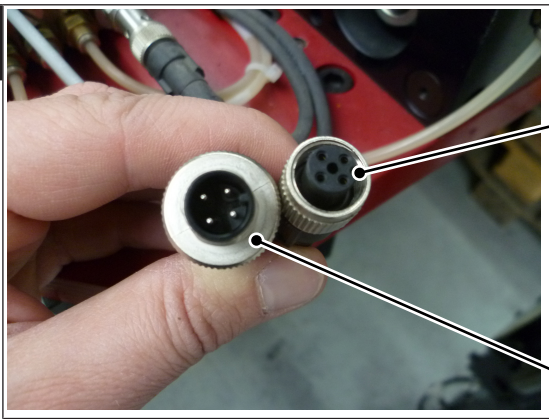
1 Prepare the adapter cable

2



2 Connect the adapter cable to the FlexxPump

3



3 Connect the adapter cable with the original control cable

The electrical equipment has been connected.

Y-cable

To connect the pump type 401 mod, only use the supplied adapter cable.

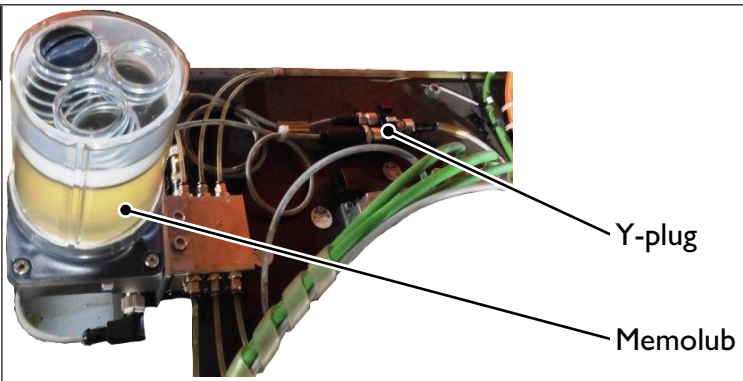
Güdel recommends using a 1 A delay-action fuse for protecting the supply and control cable.

Connect the electrical equipment as follows:

1

1 Prepare the adapter cable

2



2 Disconnect the Y-plug from the Memolub

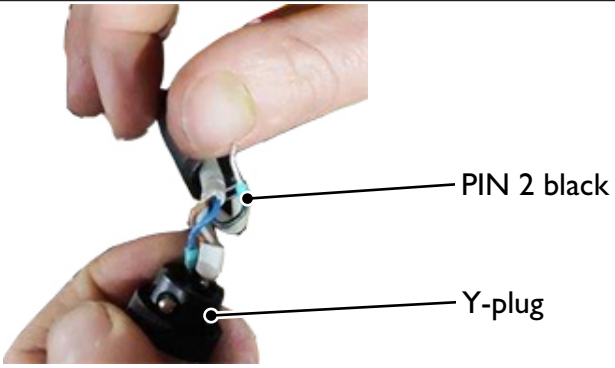
3

3 Replace the Memolub with the FlexxPump ➲ 🗎 50

4

4 Open Y-plug on the machine side

5

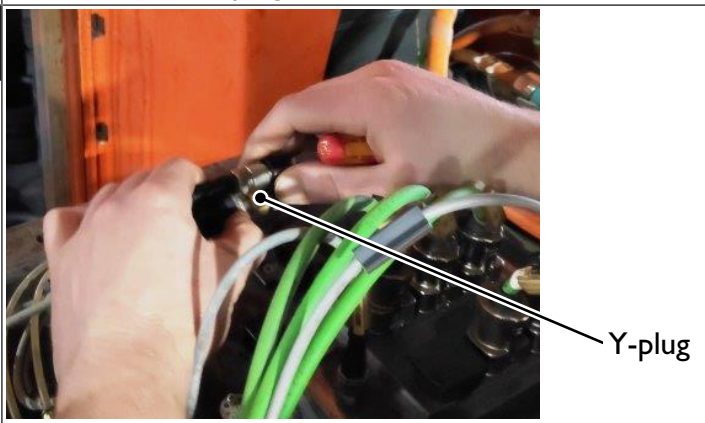


5 Loosen PIN 2 black from the Y-plug, tie to the side and insulate

6

6 Install the Y-plug

7



7 Connect Y-plug and FlexxPump cable

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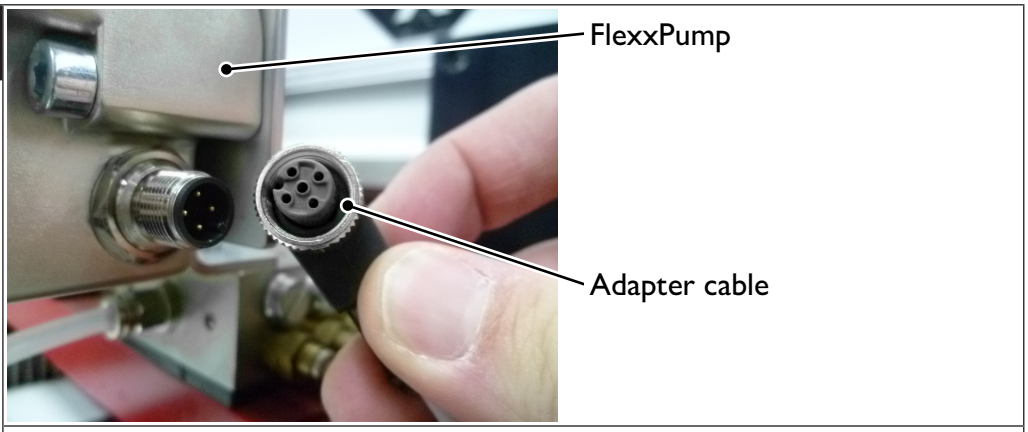

8 Connect the adapter cable to the FlexxPump

The electrical equipment has been connected.

6.6.5.4 Adapting PLC

When installing the 401 mod pump type, the following adaptations need to be made in the PLC program.

NOTE

Not adapted software

Not adapted PLC system can lead to damage or failures on the lubrication system 401 mod!

- Adapt the software of the PLC before the commissioning.

Exactly 0.15 cm^3 lubricant per hydraulic output is emitted during each pump actuation process. With these specifications the PLC can calculate the remaining volume and display it accordingly. A programed message "Cartridge nearly empty" is recommended by Güdel as of a remaining lubricant volume of less than 20 cm^3.

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Procedure

Once 24 VDC operating voltage is applied to PIN 1 and 2 of the connection socket of the FlexxPump 401 mod, the FlexxPump 401 mod carries out a feed stroke. It is necessary for that that the pump is supplied with voltage for the duration of at least 20 seconds.

To initiate another feed stroke, the voltage supply has to be switched off and switched back on after at least 5 seconds.

The PLC programing needs to be adapted and checked during the conversion from a Memolub lubrication system to a FlexxPump 401 mod lubrication system. Please contact a Güdel service department..

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6.6.6 401B

6.6.6.1 Preparing material

Prepare the following material:

Fig. 6-3 *Battery*

6.6.6.2 Preparing material

Prepare the following material:

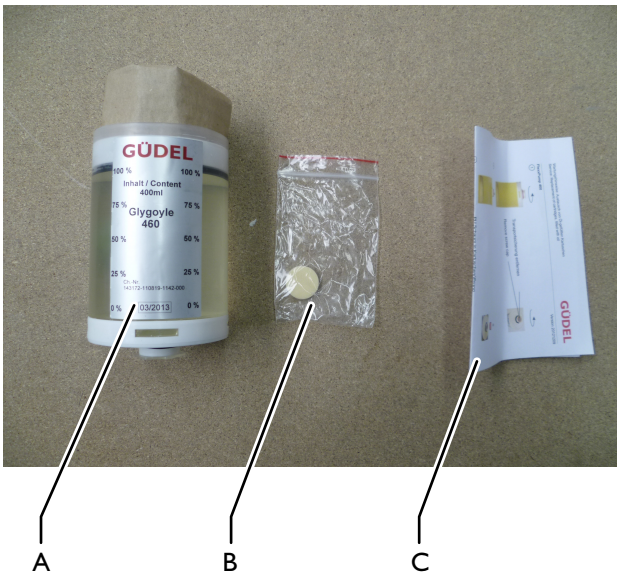

Fig. 6-4 *Prepare material*

A *Cartridge*

B *PU foam*

C *Manual*

6.6.6.3 Installing the FlexxPump

⚠ CAUTION

Danger from spring tension

The covering contains a spring with tension. The covering jumps up when opened. This can lead to minor injuries!

Make sure that no extremities are in the danger area. Carefully remove the covering.

Insert battery

⚠ CAUTION

Leaking lubricants

A plug or battery that protrudes the battery compartment can lead to leakage of the cartridge. Lubricant is hazardous to the environment.

- Make sure that the plug and the battery are completely stowed.

Insert the battery as follows:

I

I Attach plug to new battery

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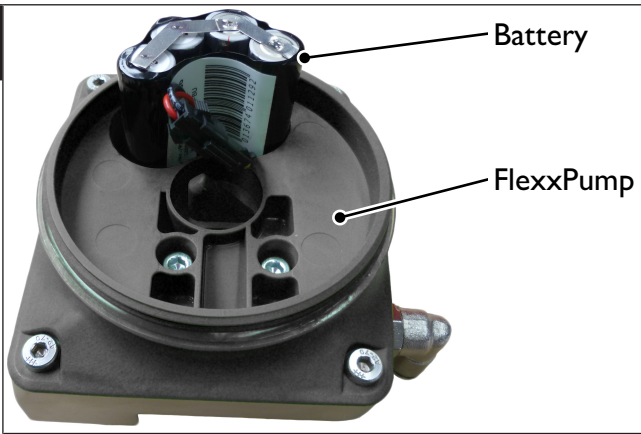
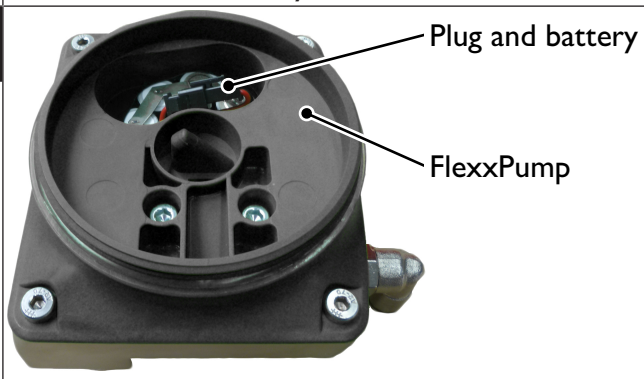
2



2 Insert new battery

3



3 Stow the plug and battery in the battery compartment

The battery is inserted.

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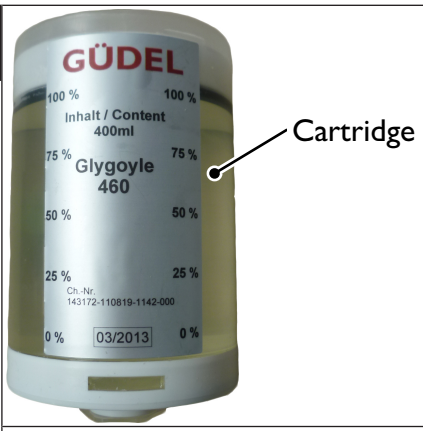
Prepare the FlexxPump

Prepare the FlexxPump as follows:

Prerequisite: The material is prepared

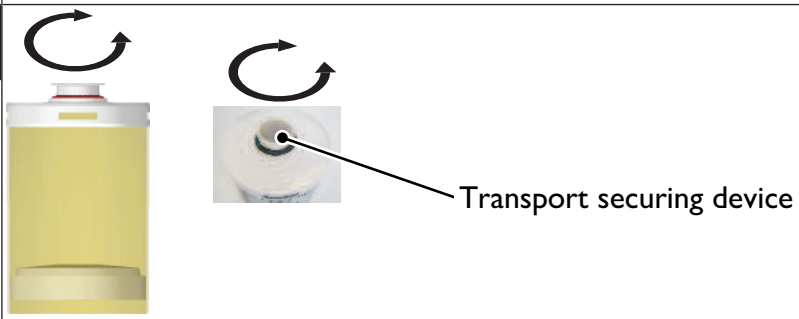
Prerequisite: The battery is inserted in the FlexxPump 401B

1



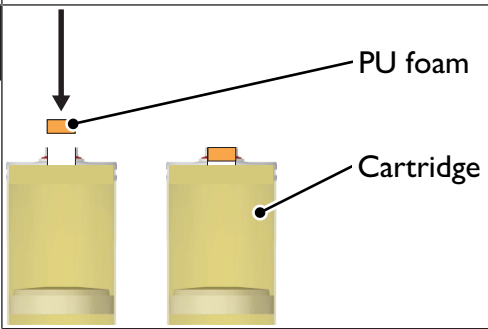
1 Prepare the cartridge according to the following steps
Observe the included instructions for the cartridge

2



2 Remove the transport securing device

3



3 Install the PU foam in the cartridge

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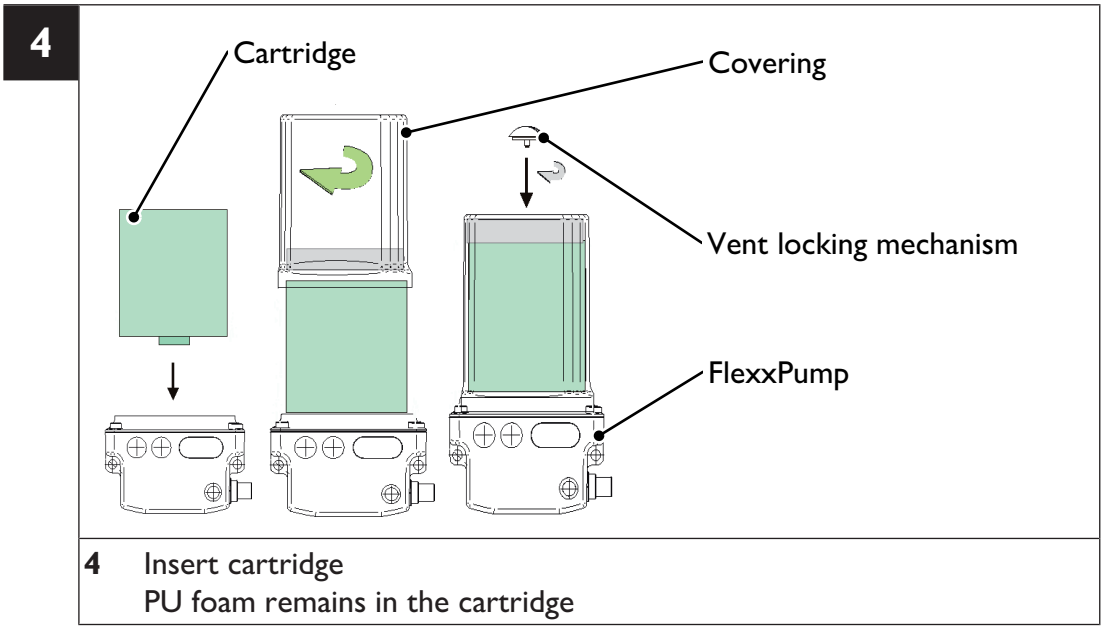


4 Insert cartridge
PU foam remains in the cartridge

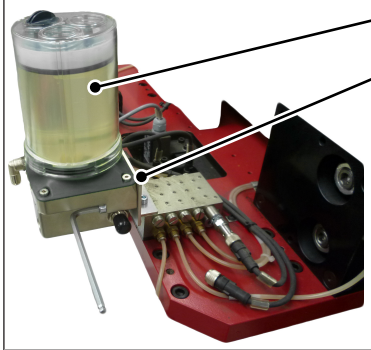
The FlexxPump is prepared.

Install the FlexxPump

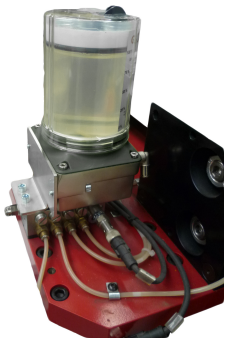
Install the FlexxPump as follows:

1

Assembly version 1:



Assembly version 2:



1 Mount the FlexxPump to the bracket with screws (ansure accessibility to the active surface of the pump type 401B and LCD display)

2

2 Unpack the hose

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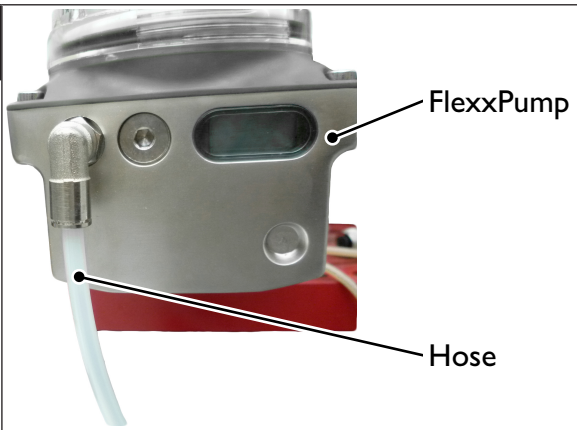
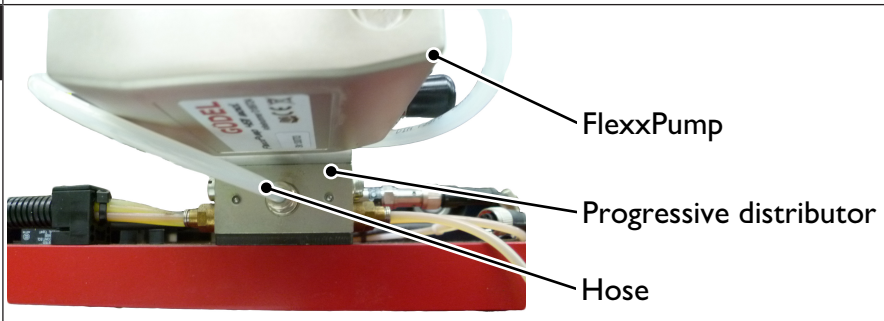
3



3 Connect the hose to the FlexxPump

4



4 Connect the hose to the progressive distributor

The FlexxPump is assembled.

6.6.6.4 Connecting electrical equipment

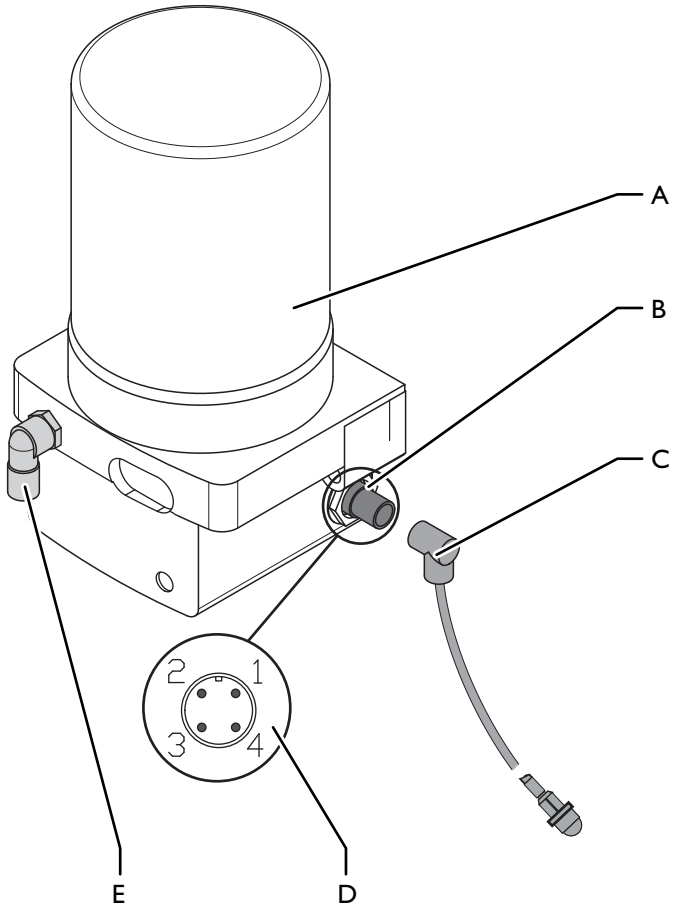


Fig. 6-5 *Connecting electrical equipment*

A	*FlexxPump 401B*	*D*	*Connector pin assignment*
B	*Connection plug for LED cable*	*E*	*Hydraulic output*
C	*Socket of LED cable*		

Connect the electrical equipment as follows:

1 Connect the LED cable:

- **1.1** PIN 1: without assignment
- **1.2** PIN 2: without assignment
- **1.3** PIN 3: Mass (GND), 0 V, color blue
- **1.4** PIN 4: Output signal, color black

2 Route the LED cable securely
(The red LED must be visible for the operator while working)

The electrical equipment has been connected.

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6.6.7 Disposing of the Memolub

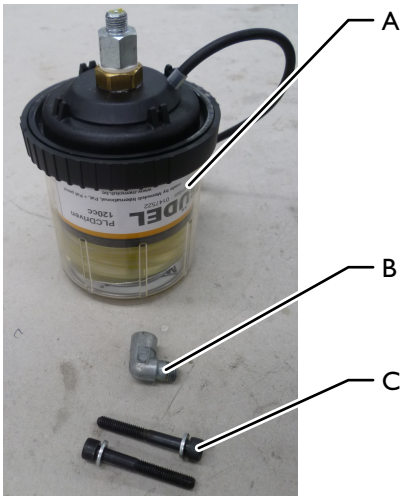

Fig. 6-6 *Disposing of the Memolub*

A *Memolub*

B *Elbow pipe*

C *Old screw*

Dispose of the components as follows:

1 Please dispose of the component according to the Disposal chapter:
➲ 107

The components have been disposed of.

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6.7 Lubrication recommendation

6.7.1 General information

NOTE

Lubricating film missing

A missing lubricating film on guideways and racks leads to damage to the product. This results in operational failure.

- Ensure that there is always a lubricating film on guideways and racks during operation
- Perform the described tasks at the specified times
- Perform lubrication work at the latest when the first signs of tribocorrosion (reddish discoloration of the track) are visible
- Adjust lubrication interval if necessary

The running surfaces of guideways, racks as well as the drive pinions need to be lubricated. A precise recommendation on the lubrication quantity needed cannot be made, because that depends on various factors. The calculations listed here are based on empirical values and lead to reference values. The lubrication quantity needs to be checked regularly and needs to be adapted if necessary.

The following non-conclusive factors determine the lubrication quantity:

- Kilometers traveled by the axle
- Degree of contamination of the axle
- Power-on time of the entire system
- Ambient temperature
- Number of lubrication points
- Elements used in the lubrication system

Güdel recommends to program the HMI user interface so that the operator of the entire system can adjust the lubrication quantity to the operating conditions. The operator is always responsible for adequate and properly functioning lubrication.

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6.7.2 Basics

Average lubricant requirement at a lubrication point (U)

The following lubricant quantities should be dispensed at least per lubrication point. These are empirical values from Güdel. These values can be met only approximatively due to the number of outputs of the pumps and the installed splitters.

Size	Average lubricant requirement per lubrication point (U)
1-5	0.30 cm^3 / 100 km
6-7	0.40 cm^3 / 100 km

Table 6-3 Average lubricant requirement per lubrication point (U)

Recommended lubrication quantity (P_t)

The recommended lubrication quantity P_t can be found in the following table.

System	Size 1-5	Sizes 6-7
3 lubrication points (e.g. EP, TMF, TMO)	0.9 cm^3 / 100 km	1.2 cm^3 / 100 km
6 lubrication points (e.g. ZP)	1.8 cm^3 / 100 km	2.4 cm^3 / 100 km
4 lubrication points (e.g. X-axis FP)	1.2 cm^3 / 100 km	1.6 cm^3 / 100 km

Table 6-4 Recommended lubrication quantity (P_t)

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6.7.3 Calculation formulas

The emptying time of cartridge P1 needs to be determined. With multiple axles per FlexxPump, the axle most traveled needs to be taken into consideration for the calculation (on linear gantries, this is typically the Y-axis).

The following specifications of your application are needed:

- Average velocity of the axle (vm) in m/s
- Operation time (t) of the system per day in hours
- Power-on time (POT) in %

The following values need to be calculated for P1:

Value	Formula	Unit
Running performance of the axle per day (V)	vm x t x POT x 0.036	km/day
Recommended lubrication quantity per day (P)	(V x P_t)/ 100	cm^3/day
Emptying time of cartridge (P1)	Cartridge volume / (P x 30)	months

Table 6-5 Calculation formulas: Emptying time of the cartridge (P1)

6.8 Initial commissioning

Check the connections of the hydraulic system before starting up the product.

6.8.1 401 mod

6.8.1.1 Switching on the FlexxPump 401 mod

Switch on the FlexxPump 401 mod as follows:

1 Switch on and operate the FlexxPump 401 mod via PLC

2 In case of malfunctions:

- **2.1** Rectify malfunctions according to Malfunctions / Troubleshooting ➲ 95
- **2.2** Adjust control if necessary
- **2.3** Repeat process from step 1

The FlexxPump 401 mod is switched on.

In some cases the LCD will display "PAU" if the FlexxPump 401 mod is switched on. This display is not relevant.

Saved information is not lost when switched off.

Lubrication recommendation for pump type 401 mod

Güdel recommends the following lubrication cycles:

Type	Lubrication recommendation
3 times (e.g. EP or TM)	1 lubrication cycle after 144 h or 100 km [1)]
6 times (e.g. linear gantry)	1 lubrication cycle after 72 h or 100 km [1)]
10 times (e.g. AG)	1 lubrication cycle after 72 h or 100 km [1)]

Table 6-6 Recommended lubrication cycles

[1)] = whichever occurs first, however, at the latest, if first traces of tribocorrosion (reddish discoloration of the guideway or gear teeth) appear.

6.8.2 401B

6.8.2.1 Switching on the FlexxPump 401B

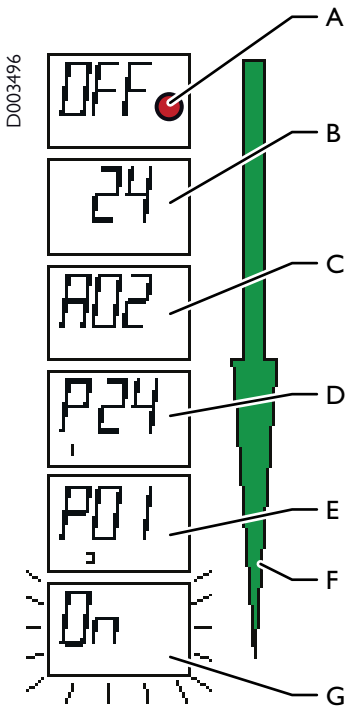

Fig. 6-7 *Display sequence of display LCD*

A	*LED red*	*E*	*Lubrication quantity P2*
B	*Operating voltage in volt (3 VDC)*	*F*	*Sequence of display*
C	*Number of hydraulic outputs*	*G*	*FlexxPump switched on*
D	*Emptying time P1 of cartridge in months*		

Switch on the FlexxPump 401B as follows:

1. Touch the active surface with the magnetic peg
2. Wait for LED to flash 3x
3. Remove magnetic peg

The FlexxPump is switched on.

The FlexxPump starts the lubrication cycle immediately after being switched on.

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Lubrication cycle

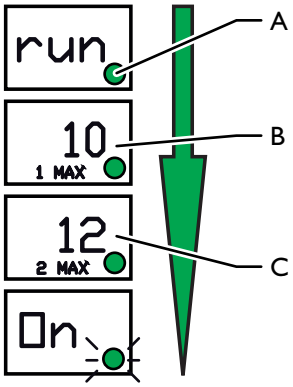

Fig. 6-8 *Lubrication cycle*

A *LED green*

B *Pressure of Hydraulic Output 1.1 in bar*

C *Pressure of Hydraulic Output 1.2 in bar*

The green LED glows during the lubrication cycle. The displayed pressure corresponds to the pressure from the hydraulic output to the lubrication point. The next lubrication cycle starts according to the setting of the lubrication cycle.

Special dispensing

The special dispensing serves to feed smaller amounts of lubricant for testing and experimentation purposes.

Carry out the special dispensing as follows:

Prerequisite: The FlexxPump is switched on

1 Touch the active surface with the magnetic peg

2 Wait for LED to flash 2x

3 Remove magnetic peg

Special dispensing is carried out.

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7 Operation

7.1 General

Only operate the product after observing the installation instructions.

For information on operating the product, refer to the appropriate chapter of the documentation for the complete system.

7.2 Personnel

⚠ WARNING

Training of operating personnel

Incorrect behavior of untrained, or insufficiently trained, operating personnel can lead to severe injury or damage to property!

Before the operating personnel begin working with the product:

- Train and instruct the operating personnel
- Point out dangers in the work area to the operating personnel
- Check the qualifications of operating personnel before approving them
- Keep the operating personnel up-to-date in regard to best practices. Also inform them about technical progress, modifications, etc.

⇨ If these measures are not complied with, you alone as the operating company are liable for damages that may result!

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8 Maintenance

8.1 Introduction

Maintenance tasks

The listed tasks have to be carried out at the prescribed time intervals. If they are not carried out at the specified intervals or improperly, all warranty is voided. Observing these obligations is a significant condition so that the product performing without malfunction as well as its long service life.

Work sequences

Perform the work sequences in the order described. Perform the described tasks at the specified times. This ensures a long service life for your product.

Original spare parts

Only use original spare parts. ➲ 🗎 111

8.1.1 Safety

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 🗎 15
It concerns your personal safety!

⚠ 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 system)
- Before switching on the system again, make sure that no one is in the danger area

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⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

⚠ WARNING

Heavy components

Components can be very heavy. Improper handling can cause severe or fatal injuries!

- Use appropriate lifting units
- Use suitable means to secure the components against tipping over
- Only remove the safety devices after the product has been completely assembled

8.1.2 Personnel qualifications

Only appropriately trained and authorized technicians are allowed to work on the product.

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8.2 Consumables and auxiliary agents

8.2.1 Cleaning agents

Use a soft rag or cloth for cleaning tasks. Only use permissible cleaning agents.

8.2.1.1 Table of cleaning agents

Cleaning agents	Location of application
mild universal cleaner free from aromatic compounds (e.g. Motorex OPAL 5000)	Automatic lubrication system: Pump, lines, other components

This table does not purport to be exhaustive.

Table 8-1 Table of cleaning agents

8.2.2 Lubricants

NOTE

Unsuitable lubricants

Using unsuitable lubricants can cause damage to the machine!

- Only use the lubricants listed
- If uncertain, please contact our service departments

For more information on the lubricants, refer to the tables below. For further information, refer to the chapter "Maintenance tasks" and the respective third party documentation.

Special Güdel lubricants

If special lubricants have been delivered ex-works at the request of the customer, you can find the relevant specifications in the spare parts list.

Alternative manufacturers

The following tables show the specifications of the lubricants. Please inform your manufacturer accordingly. They will then suggest an alternative from their product range.

Low temperatures / food grade

Observe the application range limits of lubricants according to the safety data sheet.

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8.2.2.1 Lubrication

Lubrication cycle

Güdel recommends a lubrication cycle of 150 h or 100 km, whichever occurs first. With automatic lubrication it may not be possible to set this lubrication cycle exactly. I In this case, select the nearest lubrication cycle. Perform lubrication work at soon as the first signs of tribocorrosion (reddish discoloration of the track) are visible.

Automatic lubrication system

The following lubrication systems and lubricants are provided for the automatic lubrication of the product:

Fig. 8-1 *Automatic lubrication system FlexxPump*

Lubrication ex works	Specification	Lubrication quantity	Location of application	Category
Mobil Glygoyle 460 NSF no.136467	CLP PG 460 in accordance with DIN 51502		Automatic lubrication system FlexxPump	oil

Table 8-2 *Lubricants: Automatic lubrication system FlexxPump*

8.2.2.2 Lubricant table

Lubrication ex works	Specification	Lubrication quantity	Location of application	Category
Mobil Glygoyle 460 NSF no.136467	CLP PG 460 in accordance with DIN 51502		Automatic lubrication system FlexxPump	oil

This table does not purport to be exhaustive.

Table 8-3 *Lubricant table*

8.3 Maintenance tasks

8.3.1 Checking automatic lubrication system

Fig. 8-2 *Inspect automatic lubrication system*

Cleaning agents
mild universal cleaner free from aromatic compounds (e.g. Motorex OPAL 5000)

Table 8-4 *Cleaning agents: Automatic lubrication system: Pump, lines, other components*

Check the automatic lubrication system in accordance with the following table.

Inspection point	Description	Measures
Contamination	Check the components for contamination: • Pump • Lines • other components	Immediately clean away any contamination
Loss of lubricant	Check system and its surroundings for traces: • Puddles of oil and oil spills on the floor or in the drip sheets • Leaks, torn or pinched lines	• Remove puddles of oil and oil spills on the floor or in the drip sheets • Replace defective and pinched lines
Function	Check function	Replace defective components immediately

Table 8-5 *Inspection table*

NOTE

Lubricating film missing

A missing lubricating film on guideways and racks leads to damage to the product. This results in operational failure.

- Ensure that there is always a lubricating film on guideways and racks during operation
- Perform the described tasks at the specified times
- Perform lubrication work at the latest when the first signs of tribocorrosion (reddish discoloration of the track) are visible
- Adjust lubrication interval if necessary

8.3.2 Replacing the cartridge

Replace the cartridge if the malfunction message "Empty" appears.

For pump type 401B, replace the battery at the same time.

⚠ CAUTION

Danger from spring tension

The covering contains a spring with tension. The covering jumps up when opened. This can lead to minor injuries!

Make sure that no extremities are in the danger area. Carefully remove the covering.

⚠ CAUTION

Residual amounts in empty cartridges

Empty cartridges contain lubricant residues. Oils and greases are harmful to the environment!

- Dispose of the cartridge in an environmentally friendly manner ➲ 🗎 107

Use only original Güdel cartridges. Never refill the cartridges.

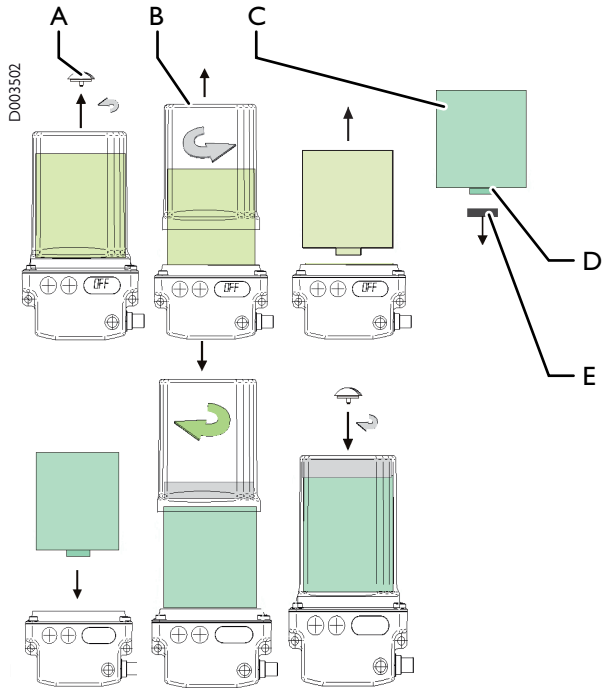

Fig. 8-3 *Replacing cartridge*

A	*Vent locking mechanism*	*D*	*O-ring*
B	*Covering*	*E*	*Retaining cover*
C	*Cartridge*		

Lubrication ex works	Specification	Lubrication quantity
➲ Chapter 8.2.2.1, 80	➲ Chapter 8.2.2.1, 80	400 cm³

Table 8-6 *Lubricants: Automatic lubrication system FlexxPump*

Replace the cartridge as follows:

1 Remove the vent locking mechanism in the direction of the arrow
2 Switch off FlexxPump
3 Remove the covering by turning in the direction of the arrow
4 Remove empty cartridge
5 Only pump type 401B:
Replacing the battery ➲ Chapter 8.3.3, 🗎 84
6 Remove the retaining cover from the new cartridge
7 Lubricate the O-ring slightly
8 Insert new cartridge (make sure the cartridge fits in properly)
9 Put on the covering and turn hand-tight in the direction of the arrow
10 Switching on the FlexxPump ➲ Chapter 6.8, 🗎 71
11 Insert vent locking mechanism and secure

The cartridge is replaced.

8.3.3 Replacing the battery 401B

⚠ CAUTION

Leaking batteries

Battery fluids and their fumes are hazardous to the environment, corrosive and poisonous! They cause injury to persons and damage to property!

Observe the following points:

- Make sure there is good ventilation in closed rooms before repairing leaks
- Wear safety goggles and gloves
- Prevent battery fluids from getting into the drinking water supply
- Use only dry cleaning cloths without detergents
- Dispose of batteries in an environmentally friendly manner

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NOTE

Empty battery

A battery charge lasts for one cartridge only and for a maximum of 3 years (P1 ≤ 36 months). An empty battery causes material damage to the entire plant due to inadequate lubrication.

- Replace the battery simultaneously with the cartridge
- Use only Güdel batteries. Only then can a sufficient battery charge be guaranteed.
- Immediately replace the battery when error message E3 appears

The FlexxPump contains a capacitor. The capacitor stores the supply voltage for 30 seconds. Strictly wait for 30 seconds before attaching the plug to the new battery. Only then will the capacitor be fully discharged and the error message E3 is reset correctly.

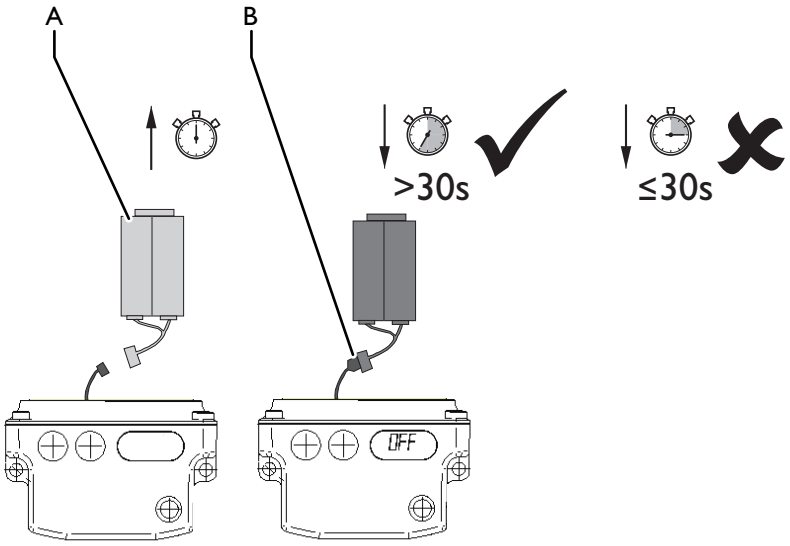

Fig. 8-4 *Replacing the battery 401B*

A *Battery*

B *Plug*

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Replace the battery as follows:

Prerequisite: The cartridge is removed ➲ Chapter 8.3.2, 🗎 82

1 Remove battery
2 Loosen plug
3 Wait for 30 seconds
4 Attach plug to new battery
5 Insert new battery
6 Install cartridge
7 Switching on the FlexxPump ➲ Chapter 6.8, 🗎 71
8 Carry out a special dispensing ➲ 🗎 73

The battery is replaced.

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8.4 Maintenance table

Maintenance work	Maintenance cycle [h]	Duration [min]	Target readership	Lubricants Cleaning agents	Further information
Replacing the cartridge	2,250	10	The manufacturer's technicians Maintenance technicians	Mobil Glygoyle 460 NSF no.136467	➲ Chapter 8.3.2, 🗎 82
Replacing the battery 401B			Maintenance technicians The manufacturer's technicians		➲ Chapter 8.3.3, 🗎 84
Checking automatic lubrication system	11,250		The manufacturer's technicians Maintenance technicians	mild universal cleaner free from aromatic compounds (e.g. Motorex OPAL 5000)	➲ Chapter 8.3.1, 🗎 81

This table does not purport to be exhaustive.

Table 8-7 Maintenance table

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8.5 Intervention report: Maintenance

ASSEMBLY INSTRUCTIONS Conversion kit FlexxPump 401mod / 401B
9007200304623627_V1.1_EN-US

Project / Order:
Bill of materials: 10xxxxxxx
Serial number: 911xxxxxx
Year of manufacture: 2019

Company :
Address :
Location :
Country :

Send

Complete the intervention report after every intervention. You can overwrite the data each time you complete the report. Send the intervention report to Güdel electronically. Use the "Send" button. Sending only works if you have completed the operator details in the intervention report as specified in the Maintenance chapter. Save the generated XML file as a backup. Copy the empty intervention report and scan it in after completing it if you are not working electronically. Send it to service@ch.gudel.com after every intervention.

Maintenance work	Maintenance cycle [h]	Effective operating hours[1]	Name[2]	Comments[3]	Date
Replacing the cartridge	2,250				
Replacing the battery 401B					

Effective operating hours[1] : Service hours [h] of the entire system according to service hour counter in the control panel / Service hours [h] or kilometers [km] of the corresponding axis
Name[2] : First and last name of the service or maintenance technician
Comments[3] : Amount of contamination, anomalies, defects, replaced components

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Intervention report: Maintenance

ASSEMBLY INSTRUCTIONS Conversion kit FlexxPump 401mod / 401B
9007200304623627_V1.1_EN-US

Project / Order:
Bill of materials: 10xxxxxxx
Serial number: 911xxxxxx
Year of manufacture: 2019

Complete the intervention report after every intervention. You can overwrite the data each time you complete the report. Send the intervention report to Güdel electronically. Use the "Send" button. Sending only works if you have completed the operator details in the intervention report as specified in the Maintenance chapter. Save the generated XML file as a backup. Copy the empty intervention report and scan it in after completing it if you are not working electronically. Send it to service@ch.gudel.com after every intervention.

Maintenance work	Maintenance cycle [h]	Effective operating hours[1]	Name[2]	Comments[3]	Date
Checking automatic lubrication system	11,250				

This table does not purport to be exhaustive.

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Effective operating hours[1] : Service hours [h] of the entire system according to service hour counter in the control panel / Service hours [h] or kilometers [km] of the corresponding axis
Name[2] : First and last name of the service or maintenance technician
Comments[3] : Amount of contamination, anomalies, defects, replaced components

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8.6 Feedback on the instructions

Your feedback helps us to keep improving these instructions. Thank you!

mailto: docufeedback@ch.gudel.com

Please provide the following information with your feedback:

- Identification number of the instructions
- Product, type
- Project number, order number
- Material number / serial number
- Year of manufacture
- Location of the product (country, ambient conditions, etc.)
- Photos, comments, feedback with clear reference to the section in the instructions
- Your contact data for clarifications if necessary

You can find most of the information on the type plate or the title page of the instructions. The identification number of the instructions is given on each page, as shown here:

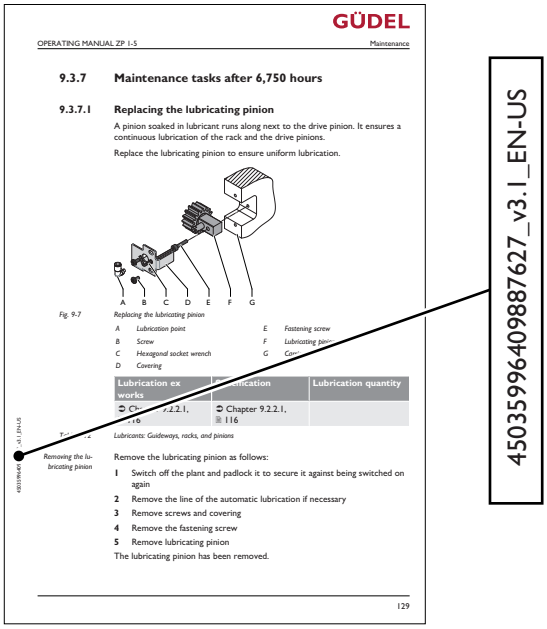

Fig. 8-5 *Identification number of the instructions*

9 Repairs

9.1 Introduction

Work sequences

Perform the work sequences in the order described. Perform the described tasks at the specified times. This ensures a long service life for your product.

Original spare parts

Only use original spare parts. ➲ 🗎 111

9.1.1 Safety

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 🗎 15
It concerns your personal safety!

⚠ 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 system)
- Before switching on the system again, make sure that no one is in the danger area

9.2 Repairs

Always replace the complete FlexxPump, splitter, Y-segments, or hoses with new ones in case of defects. Send the defective FlexxPump back to Güdel for repairs.

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9.3 Malfunctions / Troubleshooting

Malfunction	Cause	Measure
Lubrication system does not lubricate	Cartridge missing/ empty or air in FlexxPump; pump function stopped	Insert new cartridge or vent FlexxPump; the pump continues running without change
Lubrication system does not lubricate	The measured counterpressure was too high three times in a row. Hydraulic connections or hoses may be blocked, hoses too long, and/ or lubricant too stiff/ hard. Pump function has been stopped.	Remove cause of the counterpressure, switch off the power supply to the FlexxPump and switch it on again. The fault is set to zero. The FlexxPump starts up again.
Lubrication system does not lubricate	Various causes	• Switch off the power supply to the FlexxPump and switch it on again. This does not delete the data memory. • Contact the service department if the problem reoccurs

Table 9-1 Malfunctions / Troubleshooting

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9.3.1 401B

9.3.1.1 Empty E1

The red LED flashes every 5 seconds. The FlexxPump stops operating.

Malfunction	Cause	Measure
Empty E1	• Cartridge is missing or empty • Air in FlexxPump	• Insert or replace cartridge, perform functional check if necessary • Carry out a special dispensing ➲ 73

Table 9-2 Empty E1

9.3.1.2 Overcurrent E2

The red LED flashes every 5 seconds. Pressure too high (>70 bar). The FlexxPump stops operating.

Malfunction	Cause	Measure
Overcurrent E2	Line or lubrication point is blocked: • Lubricant too stiff • Lubrication point blocked • Hoses too long	Remove blockage

Table 9-3 Overcurrent E2

Remove the blockage as follows:

1. Switch off FlexxPump
2. Analyze blockage
3. Remove blockage
4. Switching on the FlexxPump ➲ Chapter 6.8, 71
5. Evaluate success
6. If there are deviations: Repeat process from step 1

The blockage is removed.

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9.3.1.3 Operating voltage too low E3

The red LED flashes every 5 seconds. Operating voltage too low. FlexxPump stops operating.

Malfunction	Cause	Measure
Operating voltage too low E3	• No voltage or voltage too low (401 mod) • Battery weak or empty (401B) • Corrosion on motor and sheet • Defective gearbox or motor	• Correct the operating voltage (401 mod) • Replace the battery (401B) If unsuccessful: Send FlexxPump to Güdel

Table 9-4 *Overcurrent E3*

If the error message E3 continues to be displayed despite correct voltage, switching on and off and special dispensing, return the FlexxPump to Güdel. No meaningful analysis of the problem can be carried out for the FlexxPump 401B without the battery. Always include the battery when returning the pump! Add the following additional information, providing as much detail as possible:

- Ambient conditions (temperature, degree of soiling, etc)
- Operating date (from... until...)
- Lubricant

9.3.1.4 System malfunction

In case of system malfunctions, switch the device off and on again. This does not delete the data memory.

Fix system malfunctions as follows:

1 Switch off FlexxPump
  1.1 Touch the active surface with the magnetic peg
  1.2 Wait for LED to flash 3x
  1.3 Remove magnetic peg
  (Display switches to "OFF")
2 Switching on the FlexxPump ➲ Chapter 6.8, 🗎 71

The system malfunctions are fixed.

9.3.1.5 Functional check

The switched on FlexxPump 401B can release lubricant for test purposes.

Perform the functional check as follows:

1 Touch the active surface with the magnetic peg
2 Wait for LED to flash 2x
3 Remove magnetic peg
4 Evaluate success ➲ 73

The functional check is complete.

9.3.2 401 mod

9.3.2.1 System malfunction

In case of system malfunctions, switch the device off and on again. This does not delete the data memory.

Fix system malfunctions as follows:

1 Switch off FlexxPump via PLC
2 Switch on FlexxPump via PLC

The system malfunctions are fixed.

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9.4 Intervention report: Repairs

ASSEMBLY INSTRUCTIONS Conversion kit FlexxPump 401mod / 401B
9007200304623627_V1.1_EN-US

Project / Order:
Bill of materials: 10xxxxxxx
Serial number: 911xxxxxx
Year of manufacture: 2019

Complete the intervention report after every intervention. You can overwrite the data each time you complete the report. Send the intervention report to Güdel electronically. Use the "Send" button. Sending only works if you have completed the operator details in the intervention report as specified in the Maintenance chapter. Save the generated XML file as a backup. Copy the empty intervention report and scan it in after completing it if you are not working electronically. Send it to service@ch.gudel.com after every intervention.

Work[1]	Component[2]	Effective operating hours[3]	Name[4]	Comments[5]	Date

Work[1] : Work carried out during the unplanned maintenance
Component[2] : Affected component/assembly
Effective operating hours[3] : Service hours [h] of the entire system according to service hour counter in the control panel / Service hours [h] or kilometers [km] of the corresponding axis
Name[4] : First and last name of the service or maintenance technician
Comments[5] : Amount of contamination, anomalies, defects, replaced components

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9.5 Service departments

If you have questions, please contact the service departments. ➲ 113

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10 Decommissioning, storage

10.1 Introduction

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 15
It concerns your personal safety!

10.1.1 Personnel qualifications

Only appropriately trained and authorized technicians are allowed to work on the product.

10.2 Storage conditions

⚠ CAUTION

Leaking batteries

Battery fluids and their fumes are hazardous to the environment, corrosive and poisonous! They cause injury to persons and damage to property!

Observe the following points:

- Make sure there is good ventilation in closed rooms before repairing leaks
- Wear safety goggles and gloves
- Prevent battery fluids from getting into the drinking water supply
- Use only dry cleaning cloths without detergents
- Dispose of batteries in an environmentally friendly manner

⚠ CAUTION

Leaking fluids

During storage, substances that are hazardous to the environment can leak!

- Hazardous substances must be prevented from entering the drinking water supply. Take appropriate measures
- Observe the country-specific safety data sheets
- Oils and greases must be disposed of as hazardous waste, even if the total quantity is small

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Room Store the product in a dry location. For information on the required space and the floor capacity, refer to the layout. Use a covering to protect the product against dust and dirt.

Temperature The ambient temperature must remain between -10 and +40 °C. Make sure that the product is not subjected to great temperature fluctuations.

Air humidity The air humidity must be below 75%.

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10.3 Decommissioning

10.3.1 Shutdown

⚠ WARNING

Falling axes, workpieces

Falling axes or workpieces can cause physical damage, serious or fatal injuries!

- Set down any workpieces before working in the danger area
- Never enter the area below suspended axes and workpieces
- Secure suspended axes using the stipulated equipment
- Check the belts of the telescope axes for signs of breakage and tears

Do not empty the lubrication lines and the gearbox when shutting down the product.

To shut down the product, proceed as follows:

1 Switch off FlexxPump

2 Remove cartridge

3 Cut the power supply (plug of the battery for pump type 401B)

The product has been shut down.

10.3.2 Cleaning, rust-proofing

Clean away any dirt and dust from the product. Clean the product thoroughly. Dispose of any cloths soaked in oil or grease in an environmentally friendly manner. ➲ 🗎 107
Apply corrosion protection to all bright parts.

10.3.3 Transport securing devices

On unbraked motors, mount the transport securing devices.

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10.3.4 Identification

Label the product with the following data:

- Date of decommissioning
- Internal machine number/name
- Additional data as per internal guidelines

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11 Disposal

11.1 Introduction

Observe the following during disposal:

- Adhere to the country-specific regulations
- Separate the material groups
- Dispose of the materials in an environmentally friendly way
- Recycle waste if possible

11.1.1 Safety

Only perform the tasks described in this chapter after you have read and understood the chapter "Safety". ➲ 15
It concerns your personal safety!

⚠ 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 system)
- Before switching on the system again, make sure that no one is in the danger area

11.1.2 Personnel qualifications

Only appropriately trained and authorized technicians are allowed to work on the product.

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11.2 Disposal

Your product consists of the following units:

- Packaging
  - Contaminated materials / auxiliary agents (oil paper)
  - Wood
  - Plastic (film)
- Consumables
  - Lubricants (oils/greases)
  - Batteries
- Base unit
  - Metals (steel/aluminum)
  - Plastics (thermoplasts/duroplasts)
  - Contaminated materials / auxiliary agents (felt / cleaning cloths)
  - Electrical material (cables)

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11.3 Waste management compliant assemblies

11.3.1 Disassembly

⚠ CAUTION

Oil, greases

Oils and greases are harmful to the environment!

- The oils and greases must not get into the drinking water supply. Take appropriate measures
- Observe the country-specific safety data sheets
- Oils and greases must be disposed of as hazardous waste, even if the total quantity is small

⚠ CAUTION

Leaking batteries

Battery fluids and their fumes are hazardous to the environment, corrosive and poisonous! They cause injury to persons and damage to property!

Observe the following points:

- Make sure there is good ventilation in closed rooms before repairing leaks
- Wear safety goggles and gloves
- Prevent battery fluids from getting into the drinking water supply
- Use only dry cleaning cloths without detergents
- Dispose of batteries in an environmentally friendly manner

Disassemble the product as follows:

Prerequisite:Prior to disassembly, shut down the product

1 Remove the connecting elements (cables / energy chains)

2 Disassemble assemblies

3 Disassembly the assemblies and separate the different materials

The product has now been disassembled.

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11.3.2 Material groups

Dispose of the material groups in accordance with the following table:

Material	Disposal method
Contaminated materials / auxiliary agents	Hazardous waste
Wood	Municipal waste
Plastic	Collecting point or municipal waste
Lubricants	Collecting point disposal in accordance with the safety data sheets ➲ 23
Batteries	Battery collection
Metals	Scrap metal collection
Electrical material	Electrical waste

Table 11-1 Disposal: material groups

11.4 Disposal facilities, authorities

The disposal facilities and authorities differ from country to country. Observe the local laws and regulations concerning disposal.

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12 Spare parts supply

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12.1 Service departments

Have the following information available for service inquiries:

- Product, type (as per type plate)
- Project number, order number (as per type plate)
- Serial number (as per type plate)
- Material number (as per type plate)
- Location of the system
- Contact person at the operating company
- Description of the issue
- Drawing number (if applicable)

Regular inquiries

If you have questions relating to service, please use the service form at www.gudel.com or contact the responsible service department:

For all other countries not included in the following list, please contact the service department in Switzerland.

Customer with special agreements should contact the service department specified in the contract.

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Americas

Country	Relevant service department	Phone	E-mail
Brazil	Güdel Lineartec Comércio de Automção Ltda. Rua Américo Brasiliense n° 2170, cj. 506 Chácara Santo Antonio CEP 04715-005 São Paulo Brazil	+55 11 99590 8223	info@br.gudel.com
Argentina Mexico	Güdel TSC S.A. de C.V. Gustavo M. Garcia 308 Col. Buenos Aires N.L. 64800 Monterrey Mexico	+52 81 8374 2500 107	service@mx.gudel.com
Canada United States	Güdel Inc. 4881 Runway Blvd. Ann Arbor, Michigan 48108 United States	+1 734 214 0000	service@us.gudel.com

Table 12-1 *Service departments Americas*

Asia

Country	Relevant service department	Phone	E-mail
China	Güdel International Trading Co. Ltd. Block A, 8 Floor, C2 BLDG, No. 1599 New Jin Qiao Road Pudong 201206 Shanghai China	+86 21 5055 0012	info@cn.gudel.com
China press automation	Güdel Jier Automation Ltd. A Zone 16th Floor JIER Building 21th Xinxi Road 250022 Jinan China	+86 531 81 61 6465	service@gudeljier.com
India	Güdel India Pvt. Ltd. Gat No. 458/459 Mauje Kasar Amboli Pirangut, Tal. Mulshi 412 111 Pune India	+91 20 679 10200	service@in.gudel.com

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Country	Relevant service department	Phone	E-mail
Korea	Güdel Lineartec Inc. 11-22 Songdo-dong Yeonsu-Ku Post no. 406-840 Incheon City South Korea	+82 32 858 05 41	gkr.service@gudel.co.kr
Taiwan	Güdel Lineartec Co. Ltd. No. 99, An-Chai 8th St. Hsin-Chu Industrial Park TW-Hu-Ko 30373 Hsin-Chu Taiwan	+88 635 97 8808	info@tw.gudel.com
Thailand	Güdel Lineartec Co. Ltd. 19/28 Private Ville Hua Mak Road Hua Mak Bang Kapi 10240 Bangkok Thailand	+66 2 374 0709	service@th.gudel.com

Table 12-2 Service departments in Asia

Europe

Country	Relevant service department	Phone	E-mail
Denmark	Güdel AG Gaswerkstrasse 26 Industrie Nord 4900 Langenthal Switzerland	+41 62 916 91 70	service@ch.gudel.com
Finland			
Greece			
Norway			
Sweden			
Switzerland			
Turkey			

Country	Relevant service department	Phone	E-mail
Bosnia and Herzegovina	Güdel GmbH Schöneringer Strasse 48 4073 Wilhering Austria	+43 7226 20690 0	service@at.gudel.com
Croatia			
Austria			
Romania			
Serbia			
Slovenia			
Hungary			
Slovakia	Güdel a.s. Holandská 4 63900 Brno Czech Republic	+420 602 309 593	info@cz.gudel.com
Czech Republic			
Portugal	Güdel Spain C/Industria 60 Local 7 08025 Barcelona Spain	+34 93 476 03 80	info@es.gudel.com
Spain			
France	Güdel SAS Tour de l'Europe 213 3 Bd de l'Europe 68100 Mulhouse France	+33 1 6989 80 16	info@fr.gudel.com
Germany	Güdel Germany GmbH Industriepark 107 74706 Osterburken Germany	+49 6291 6446 792	service@de.gudel.com
Germany intralogistics	Güdel Intralogistics GmbH Gewerbegebiet Salzhub 11 83737 Irschenberg Germany	+49 8062 7075 0	service-intralogistics@de.gudel.com

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Country	Relevant service department	Phone	E-mail
Italy	Güdel S.r.l. Via per Cernusco, 7 20060 Bussero (Mi) Italy	+39 02 92 17 021	info@it.gudel.com
Belgium Luxembourg The Netherlands	Güdel Benelux Eertmansweg 30 7595 PA Weerselo The Netherlands	+31 541 66 22 50	info@nl.gudel.com
Estonia Latvia Lithuania Poland Ukraine	Gudel Sp. z o.o. ul. Legionów 26/28 43-300 Bielsko-Biała Poland	+48 33 819 01 25	serwis@pl.gudel.com
Russia Belarus	Gudel Russia Yubileynaya 40 Office 1902 445057 Togliatti Russia	+7 848 273 5544	info@ru.gudel.com
Ireland United Kingdom	Güdel Lineartec (U.K.) Ltd. Unit 5 Wickmans Drive, Banner Lane Coventry CV4 9XA West Midlands United Kingdom	+44 24 7669 5444	service@uk.gudel.com

Table 12-3 *Service departments in Europe*

All other countries

Country	Relevant service department	Phone	E-mail
All other countries	Güdel AG Gaswerkstrasse 26 Industrie Nord 4900 Langenthal Switzerland	+41 62 916 91 70	service@ch.gudel.com

Table 12-4 *Service departments for all other countries*

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Inquiries outside of business hours

If you have service inquiries outside of business hours, please contact the following service departments:

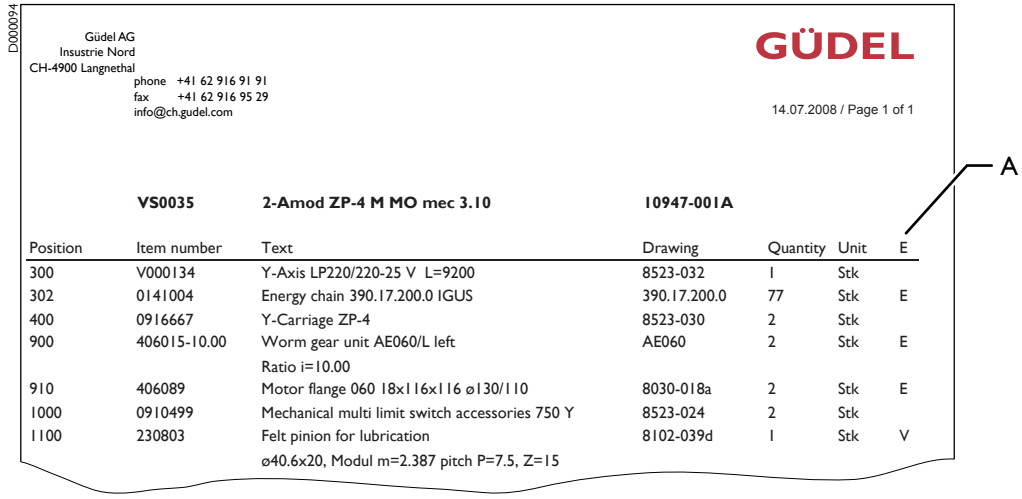
Europe	Güdel AG Gaswerkstrasse 26 Industrie Nord 4900 Langenthal Switzerland	+41 62 916 91 70	service@ch.gudel.com
Americas	Güdel Inc. 4881 Runway Blvd. Ann Arbor, Michigan 48108 United States	+1 734 214 0000	service@us.gudel.com

Table 12-5 *Service departments outside of business hours*

12.2 Explanations regarding the spare parts list

12.2.1 Parts list

The parts list contains all parts of your product. The spare parts and wear items are indicated as described in the explanation of symbols.



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A

VS0035 **2-Amod ZP-4 M MO mec 3.10** **10947-001A**

Position	Item number	Text	Drawing	Quantity	Unit	E
300	V000134	Y-Axis LP220/220-25 V L=9200	8523-032	1	Stk	
302	0141004	Energy chain 390.17.200.0 IGUS	390.17.200.0	77	Stk	E
400	0916667	Y-Carriage ZP-4	8523-030	2	Stk	
900	406015-10.00	Worm gear unit AE060/L left Ratio i=10.00	AE060	2	Stk	E
910	406089	Motor flange 060 18x116x116 ø130/110	8030-018a	2	Stk	E
1000	0910499	Mechanical multi limit switch accessories 750 Y	8523-024	2	Stk	
1100	230803	Felt pinion for lubrication ø40.6x20, Modul m=2.387 pitch P=7.5, Z=15	8102-039d	1	Stk	V

Fig. 12-1 *Explanation of symbols*

A *Spare part status*

Spare part status (column E): E = Spare part
V = Wear item

12.2.2 Position drawings

The positions of the spare parts can be seen on the drawings. These are standard drawings. Individual positions or images might differ from your product.

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Appendix

The appendix of these assembly instructions contains the following documents:

- Layout
- Spare parts lists

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Layout

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Spare parts lists

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Version	1.1
Author	romkal
Date	08.03.2019

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