

DLS

SCHMIERSYSTEME

DIRECT LUBRICATION SYSTEMS

User Guide FlexxPump 400B

135-140-000 135-140-001 135-140-010 135-140-011
135-240-000 135-240-001 135-240-010 135-240-011

(Battery Version)



- Power supply with 3 VDC – battery pack
- operating time up to 36 months
- Lubricant up to NLGI 3
- integrated back pressure monitoring

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Welcome to DLS Schmiersysteme!

Whether you plan to use your FlexxPump for oil or grease, you have made an excellent choice. To learn all about your FlexxPump device take a look through your user guide – it will acquaint you with key features and functions of your device and address any questions that you may have.

Learn how to use your FlexxPump safely and keep it working at its best.

Preface and General Information

FlexxPump is an extraordinary compact lubrication pump for oil and grease up to NLGI 3, also suitable for greases containing solid lubricants. The pump is equipped with a battery pack for self-sufficient power supply and does not need external electricity. The lubricant reservoir (400 cm³) is in the bellow cartridge / pouch. Supply pressure is up to 70 bar.

Depending on the configuration, the FlexxPump is available with 1 (part no. 135-140-000/ 135-140-001/ 135-140-010/ 135-140-011) or 2 outlets (part no. 135-240-000/ 135-240-001/ 135-240-010/ 135-240-011) and is therefore the best solution for applications with limited lubrication points.

Typical applications are electrical motors, ventilators, and compressors. Due to the compact dimensions, the FlexxPump can be used for retrofitting. Many other applications are possible.

Warning

Use the FlexxPump to lubricate machinery only.
Use only FlexxPump bellow cartridges and battery packs.
Replacement non genuine batteries could destroy electronics

Scope of supply

Standard delivery includes:

- FlexxPump, compact lubrication pump
- Tube connector, attached to the outlet, suitable for flexible tube 6 x 4 (Ø 6mm outside and Ø 4mm inside diameter), maximum pressure up to 70 bar
- User guide

Other equipment according to customers' specifications on request:

Upon delivery make sure to check if the delivered goods correspond to your order. DLS Schmiersysteme GmbH will not accept liability for subsequent claims of any shortcomings. Please immediately forward any claims:

- of noticeable transport damage: directly to your forwarder
- of noticeable faults, shortcomings or defects: directly to us.

Labeling

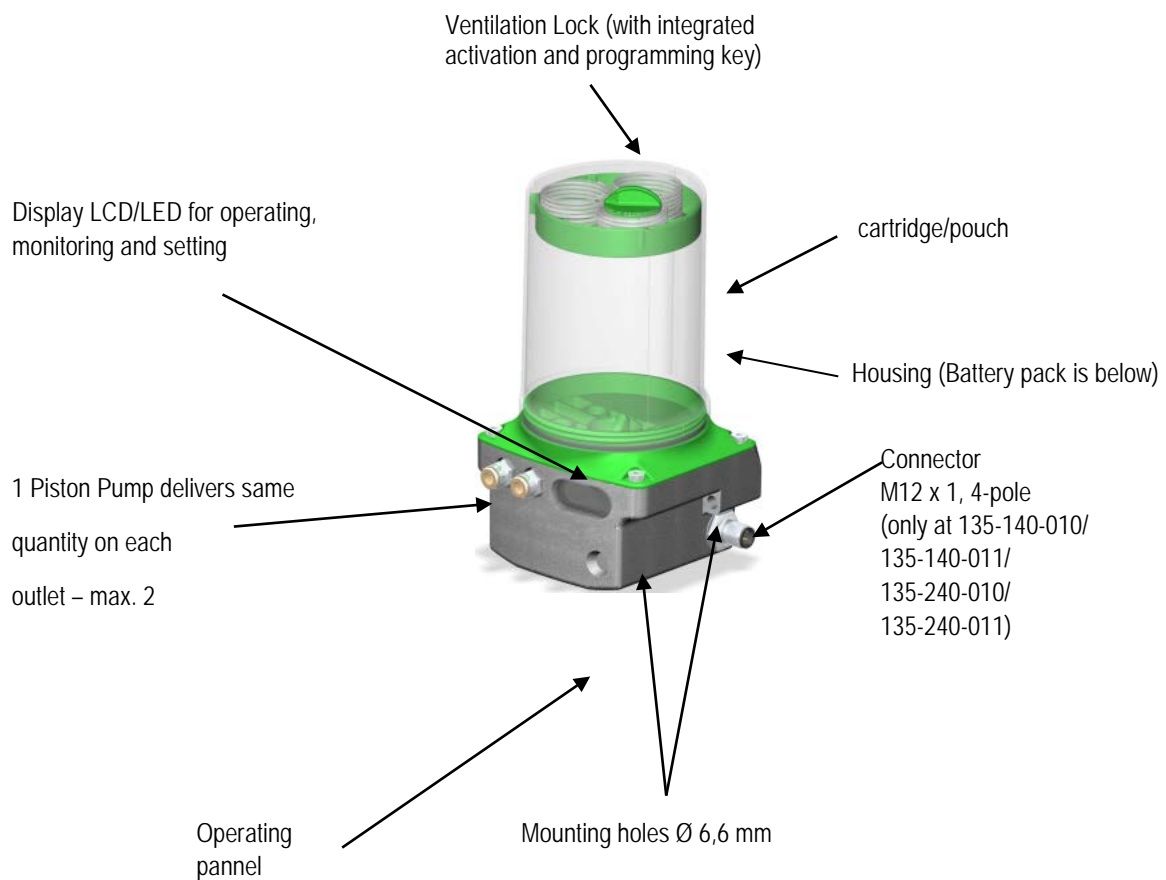
The lubrication pump is clearly marked with a label which includes a short description of the lubrication pump and the used lubricant; furthermore it shows the DLS Schmiersysteme Part numbers.



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Overview

Below a quick overview of the FlexxPump



Note: Never close one outlet because the Piston pump could be damaged!

General safety details

Everybody who is involved with the installation, start-up, maintenance and operation of the FlexxPump must read these instructions carefully!

Use in accordance with guide

The FlexxPump is **only** allowed for **industrial use**. The FlexxPump may only be put into service, if it is integrated or attached to another machine and will be operated together with that machine. The FlexxPump may only be used according to the technical data (see chapter "Technical Data").

Unauthorized **structural changes** of the FlexxPump are **not permitted**. We do not assume liability for damages of persons or machines which result from that.

Additional directives for use in accordance with the regulations:

- Pay attention to all notes in the operator's manual / user guide.
- Carry out all maintenance work.
- **Follow** all appropriate regulations for the **work safety** and **accident prevention** during life of the FlexxPump.
- Only qualified and authorized personnel can carry out the required work on the FlexxPump

Attention! Other uses or uses beyond those described above cannot be considered to be in accordance with the Regulation.

Extent of warranty

Warranties concerning operating safety, reliability and capacity, are only granted under the following conditions: Assembly, installation, maintenance and repair are only carried out through trained specialist. Hazardous hot or cold machine parts must be shielded to prevent touching.

- The FlexxPump must be used according to the instructions in the technical operating manual.
- The rated technical data must not be exceeded in any case.
- Retrofitting and repair work on the FlexxPump may only be done by DLS Schmiersysteme GmbH.

General safety information

Basic information, which must be followed during service, operation and maintenance, are listed as follows.

It is absolutely essential to read the operator's manual / user guide by respective technical staff / technical operator before installation and start up.

In addition to this, it must be permanently available at the site

IMPORTANT

Please pay attention, not only to the safety instructions under this main point, but also to those special security cautions that are mentioned on the other pages.



This symbol warns of electrical voltage



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

Attention!

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

Remark

Points out special information.

Notes attached directly at the machine, must be followed strictly and preserved in completely readable condition!

Qualification and training of the personnel



The operation, maintenance, service and installation personnel must have appropriate qualifications for this work. Responsibility and supervision of the personnel must be clearly defined by the end user / operator. If the personnel do not have the necessary knowledge, they must be trained and instructed. The operator must ensure that the personnel have completely understood the contents of the user information.

Non-observance of the safety information can be dangerous



Not observing the safety information can lead to danger for people, environment and machines.

Not observing the safety information can mean the loss of any or all damage claims. In special cases, non-observance can, for example, lead to the following dangers:

- Failure of important plant functions.
- Failure of prescribed methods of maintenance and preventive maintenance.
- Endangering people due to electrical, mechanical and chemical effects.
- Endangering the environment due to leakages of dangerous materials.

Safety information for operators/operating staff



- Hot or cold machine parts are hazardous and must be protected from touching. The protection on "moving or rotating parts" must not be removed.
- In case of leakages of dangerous media proper disposal not endangering environment and people must be ensured.
- Legal Regulation must be observed and complied.
- Eliminate any danger due to electrical power.

Safety information for maintenance, inspection and assembly work



All maintenance, inspection and installation work may only be carried out by trained specialists who have been informed appropriately by studying the user information closely. All work must only be carried out when machine is shut down and while wearing appropriate protective clothing. Always comply with the procedures for shutting the machine down that are described in the operating manual. All the safety and protective equipment must be replaced immediately after completing work. Environmentally hazardous substances that endanger the environment must be disposed in accordance with local regulations. Secure the system during maintenance and repair work, against intentional or unintentional operation. Dispose of used lubricants in accordance with the safety data sheets of the lubricant manufacturer.

Alterations and manufacture of spare parts without authority



Rebuilding and altering the FlexxPump is only allowed after consultation with the manufacturer. **Original spare parts** and accessories authorized by the manufacturer are for **safety** purposes. Using other parts results in loss of liability for claims resulting out of this. For components, retrofitted by the operator, DLS Schmiersysteme GmbH does not assume guarantee nor claims for damages.

Prohibited methods of operation

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

General risk reference



All components of the system are designed in accordance with the prevailing regulations of the construction of technical machines, in regards to operational safety and accident prevention. Operation outside of these constraints can lead to dangers for the user respectively third persons or other technical facilities. The FlexxPump therefore may fulfil only **in technically fault-free condition** its intended use. This may only be carried out under compliance of the safety regulations and the attention of the operator's manual. Therefore please **regularly inspect** the pump and its attachments for possible **damage or leaks**

Transport and storage

Use suitable lifting gear for transport.

Do not throw or expose the FlexxPump to strong shock loads.

Store the FlexxPump in a cool and dry place to avoid corrosion of the system's individual parts.



Pay attention to the current safety- and accident prevention instructions during the transport. Wear suitable protection equipment if necessary!

Installation instruction



The following conditions have to be satisfied during the installation of this FlexxPump, thus it can be assembled, with other parts, to a complete machine without affecting the safety and health of humans:



Electrical connection

- Have the electric power supply connected only by a trained electrician!
- Connection and wiring of the electric components should be done by an expert trained in this field.
- Check the voltage details with the existing power supply voltage!

Maintenance / Repair



Disconnect the voltage feed, before starting with **maintenance or repair**.

Maintenance and repair work may only be done with the system shut down.

Check the surface temperature of the FlexxPump, due to **danger of burning** by radiant heat.

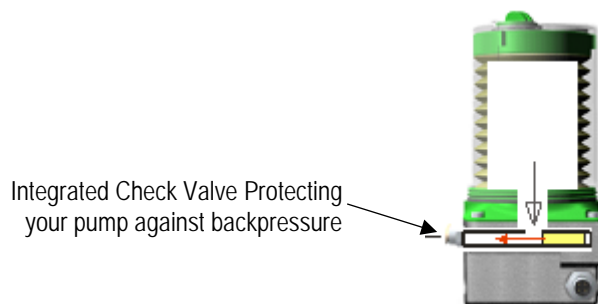
Always wear heat-resistant gloves! Protect the system from activation during maintenance and repair work!

Function/Principle

Putting your FlexxPump into operation, the piston pump starts to work and pump the lubricant in small quantities to the outlets. The integrated microprocessor controls the delivery rates and the operating times, which can be individually set.

How it works:

- Connecting and installing the FlexxPump
- Start up
- Basic settings:
 - Set individual operating time (running time of the cartridge) (P1)
 - Set individual delivery rate (number of strokes) (P2)
- Ready to go



P1: Operating time (running time) of the cartridge? Max. 36 month

P2: Delivery rate of one period (number of strokes)?

Special:

Quick testing back pressure in your lube line and lube points: To check your system, the piston pump supplies small quantities of lubricant into your lubrication lines. The microprocessor measures the backpressure between the lubrication point and the pump. The displayed value is the grease pressure in your tube in {bar}.

Settings

Basic settings (P1: operating time / cartridge = 12 months and P2: delivery rate of one period = 1 stroke of the piston pump) can be easily changed in the individual settings.

Chart: Operating time and delivery rate vs. different settings

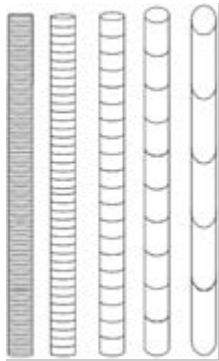
135-140-0x (1 outlet)		P1 setting = Operating time per cartridge (400cm ³) in months						
Operating time (months)		1	3	6	12	18	24	36
Result: Needed amount of lubricant (cm ³)		400	133	67	33	22	17	11
		P2 setting = Delivery rate of one period						
Number of strokes		1	5	10	20	30		
Delivery rate of one period (cm ³)		0,15	0,75	1,5	3,0	4,5		
Result: number of delivery rates per cartridge		2700	540	270	135	90		
135-240-0x (2 outlets)		P1 setting = Operating time per cartridge (400cm ³) in months						
Operating time (months)		1	3	6	12	18	24	36
Result: Needed amount of lubricant for one outlet (cm ³)		200	67	33	17	11	8	6
		P2 setting = Delivery rate of one period						
Number of strokes		1	5	10	20	30		
Delivery rate of one period (cm ³)		0,15	0,75	1,5	3,0	4,5		
Result: number of delivery rates for one outlet per cartridge		1350	270	135	68	45		

Example 135-240-000: Depending on the selected operating time, the lubrication point will be supplied with lubricant more often with small quantity or less frequently with larger quantities in longer time periods. The total amount of lubricant delivered for the same operating time doesn't vary. For P2 = 1, the lubrication point is served 1350 times with 0,15 cm³, if P2 = 5, 270 times with 0,75cm³, if P2 = 10, 135 times with 1,5 cm³, if P2 = 20, 68 times with 3,0 cm³, if P2 = 30, 45 times with 4,5 cm³. Steps between are allowed.

Using the chart

1. Operating time / cartridge : - green range -
Required amount of lubricant each months (for one outlet)
Please note individual setting: **(P1)**
2. Delivery rate of one period / number of strokes: - blue range -
Required amount of lubricant of one period (for one outlet)
Please note individual setting: **(P2)**

Picture: Total amount of the lubricant through the whole service life is not depending on the delivery rate for one period.

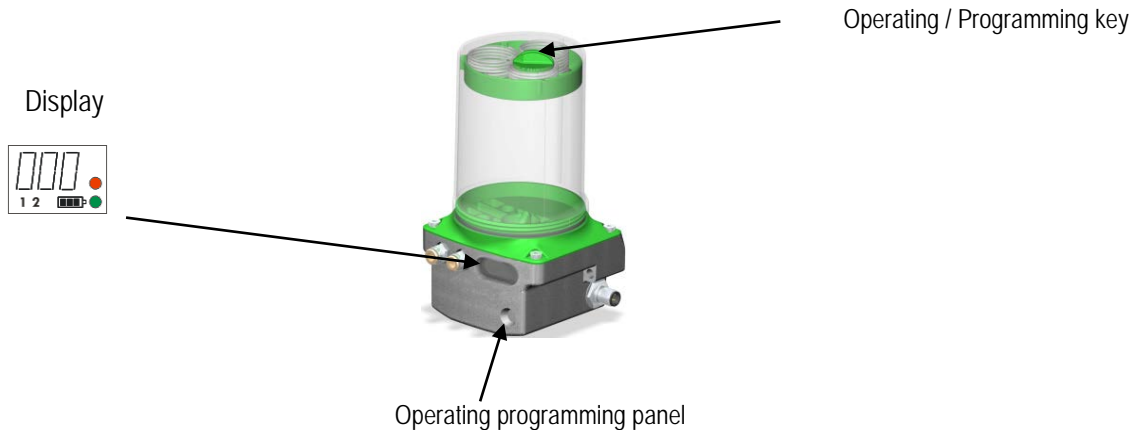


P_2 small: small amounts of lubricant, but therefore smaller period time between 2 lubricant tasks.

P_2 great: bigger amounts of lubricant; but therefore longer period time between 2 lubrication tasks.

The total amount of the lubricant depends only on the emptying time P_1 .

Settings (switch on / switch off / individual settings)



1. Open the ventilation lock (turn CLOSE to OPEN) and remove the cover. The nose of the cover is your **operating / programming key**.
2. To **switch** the FlexxPump **on**, touch the operating pad with the operating / programming key. Hold the operating / programming key on the operating / programming pad until the red LED on the display lights 3 times, and then remove the operating / programming key.
3. Display changes from „OFF“ to „On“: basic settings and power supply are shown at the display:
 - a) first P1 operating time / cartridge (basic setting 12 months)
 - b) second P2 delivery rate (= number of strokes, each 0,15 cm³, basic setting 1)
4. Display „On“ for 3 sec., if there are no desired changes of the settings please set your operating / programming key back at its place and close the ventilation lock (turn OPEN to CLOSE).



5. **Change to individual settings: While the display is flashing „On“, touch the operating button until the red LED flashes two times (at the display), then remove the operating button:**
 - a) P₁ operating time setting: Touching the pad with the button will change the display (1 to 36 is possible); holding the button on the pad causes the display to „run“, short touches will cause the display to increase by 1. Enter the desired setting; when the pad is not touched for more than 2 sec. the display moves on with the next step P₂.
 - b) P₂ delivery rate setting: Touching the pad with the button changes the display (1 to 30 is possible); holding the button on the pad causes the display to „run“, short touches will cause the display to increase by 1. Enter the desired setting; when the pad is not touched for more than 2 sec., setting is finished and data will be saved.
 - c) Please return your operating button back at its place and close the ventilation lock OPEN => CLOSE.



6. Display changes to „On“, first delivery of lubricant:
 - a) In the first 2 seconds only 1 or 2 and the power supply symbol are displayed. 1 or 2 represents the actual served pump exit. Green LED lights up during motor operation.
 - b) Then a number is displayed that represents the actual pressure up to the lubrication point. After completion of pumping the maximum measured pressure is displayed. The indication is in “bar”...0.15 is therefore 15 bar. The pump can only detect values with an accuracy of + / - 15 %. This is sufficient to estimate the situation of the lubrication point.
 - c) LED lights green every 60 sec if the pump works correctly according to the saved settings.

7. **Special: Quick check back pressure testing and quick delivering of extra lubricant**
 Touch the operating / programming key to the operating / programming pad until the red LED flashes twice (at the display), after that remove the key and the display will cycle through the screens shown in step 6.

8. **Filling function** : Ventilate the pump
 Touch the action surface with the action pen.
 duration: Wait 7 x red flashing signal (LED in the display) , then remove action pin after that each pump element is driven and carried out additional discharges per output .
 Pump body is ventilating
 outlet 1.1: 30 x 0,15cm³=4,5cm³
 outlet 1.1: 15 x 0,15cm³=2,25cm³
 outlet 1.2: 15 x 0,15cm³=2,25cm³

9. **Switch OFF**: Touch the operating / programming key to the pad until the red LED flashes 3 times (at the display), after that remove the operating key. Display changes from „On“ to „OFF“: All settings are saved. (Touching the pad for a longer time will not switch unit “On” or “OFF”).

401/501
402/502



Functional problems (error shown on LCD / LED)

Function control is simple:

- LED, green: flashing all 60 sec. during operation, indicates everything is OK
- LED, red: indicates empty cartridge, low power supply level (power supply has to be checked), max. backpressure = system must be checked up to the lubrication point), fault, or control for settings

Error Reports:

E1: empty, LED, red, is flashing every 5 sec.

Reason: cartridge is empty or missing

The pumping will be stopped!

Correction measures: change or reinstall cartridge.

Pump will work again according to settings.

E2: Backpressure more than 70 bar, LED, red, is flashing every 5 sec

Error report only after 3 successive back pressure measurements that are too high.

Correction measures: Check your system up to the lubrication point –

Possible causes are a blockage at the lubrication point, too long tubing or too stiff grease.

The pumping will be stopped!

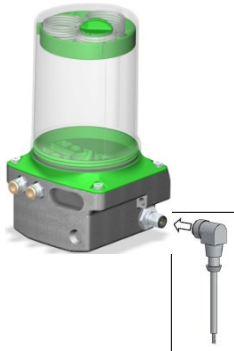
Eliminate the cause of high backpressure (>70bar). Switch off your FlexxPump and switch it on again (the integrated error controller will be reset). The pump is running again.

E3: Power supply level is too low, LED, red, is flashing every 5 sec,

The piston pump is stopped.

Correction measures: power supply has to be checked.

Connector PIN assignment M12x1



Only the follow FlexxPump 400B has a M12x1-Connector:

FlexxPump 401 B

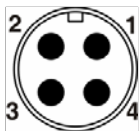
135-140-010

135-140-011

FlexxPump 402 B

135-240-010

135-240-011



Connector PIN assignment M 12 x 1

PIN 1: no assignment

PIN 2: no assignment

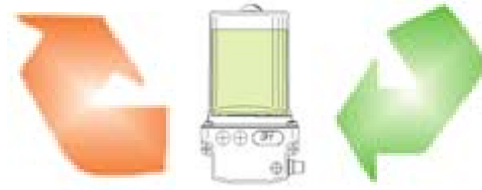
PIN 3: Ground (GND), color: blue

PIN 4: Output signal, color: black

PIN 4: High = operating mode (=OK)

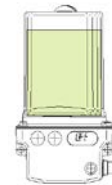
Low = Error (Type of Error shown in display)

Service: replacement of cartridge and battery



Any further service is not necessary.

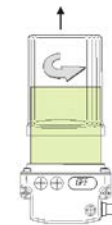
1. Switch off the pump: Display – report „OFF“



2. Take out Ventilation lock (turn CLOSE to OPEN)



3. Press the housing, turn right and remove it



4. Take off the empty cartridge



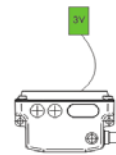
5. Carefully remove the battery pack

- Carefully disconnect the battery pack



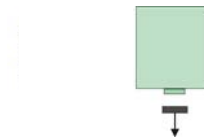
- Connect the new battery pack
= snap into reverse-polarity protection plug

- Install the new battery pack:
Place battery in battery compartment include cable and connector completely!

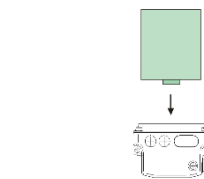


- Remove protection from the new cartridge

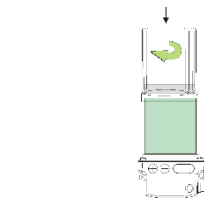
- Lubricate O-Ring of the new cartridge slightly



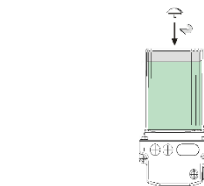
- Place the cartridge on the inlet



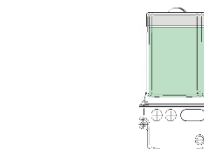
- Place the pump upright on flat surface



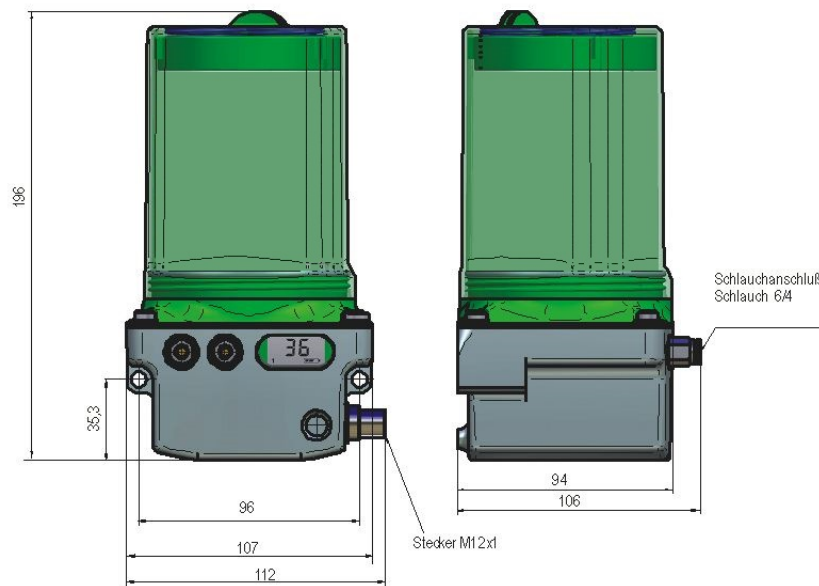
- Install the ventilation lock and close it
(turn OPEN to CLOSE)



- The pump is ready to be switched on
Use operation / programming key to switch ON-OFF



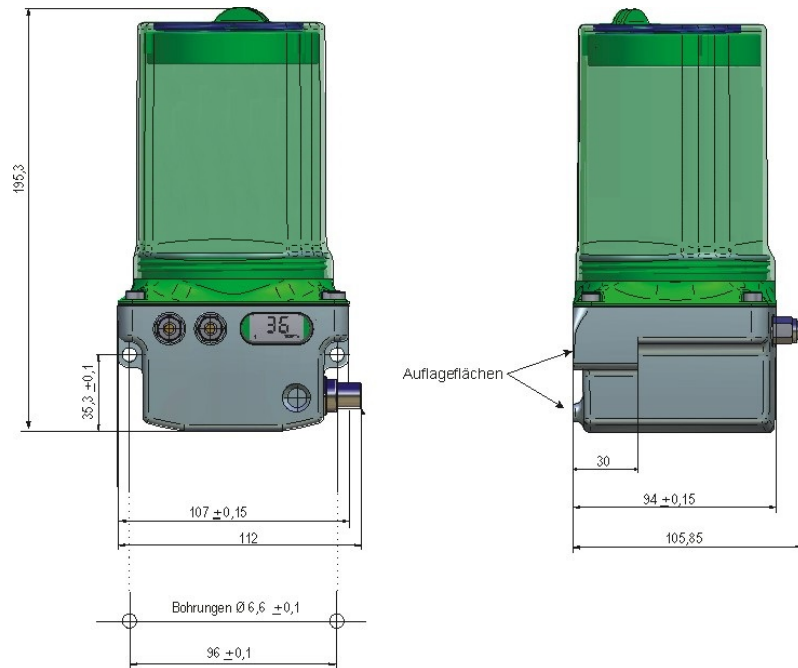
Technical Data



Storage/volume	cartridge 400cm ³
Lubricant	oil or grease up to NLGI 3 also containing solid lubricants
Function / principle	piston pump
Delivery rate per interval	0,15 cm ³
Delivery rate per period	0,15 to 4,5 cm ³
Number of strokes/cartridge	134-140-0xx: 2700 135-240-0xx: 1350 each outlet
Number of outlets	134-140-0xx: 1 outlet 134-240-0xx: 2 outlets
Connection	high pressure tube 6 x 4 (flexible tube with outer diameter Ø 6mm and Ø 4mm inside diameter) maximum pressure up to 150 bar
Operating time/cartridge	1...36 months
Operating pressure	Max. 70 bar
Operating temperature	-20 to +70°C
Dimensions, max.	
Width x height x depth	112 x 196 x 94 mm
Weight, without lubricant	1120g
Integrated Control	microprocessor controlled
Pressure monitoring (monitoring backpressure)	integrated, electronic
Level monitoring	integrated, reed contact
Battery monitoring	integrated, LCD
Connector	M12 x 1, 4-pole
Operating voltage	3 VDC (battery) Only at 135-140-010/135-140-011/135-240-010/135-240-011
Protection class	IP 65 (= suitable for under water operation up to 1 m)
Combination with progressive systems	possible
Accessory	integrated backpressure information, additional lubricant, system control testing

Mounting FlexxPump

2 screws \varnothing 6mm, for example M6x40 are required for a safe installation of your FlexxPump. The optimum clamping force of the screw is 5 Nm. 3 points at the back assure a safe hold



Recommended tube length

Keep in mind:

- For low temperature
- For stiff grease, more than NLGI 2
- For difficult applications with high backpressure

- ➔ Shorten your tube as much as possible
- ➔ Minimum inner diameter is 4mm \varnothing
- ➔ Avoid reductions of the inner tube

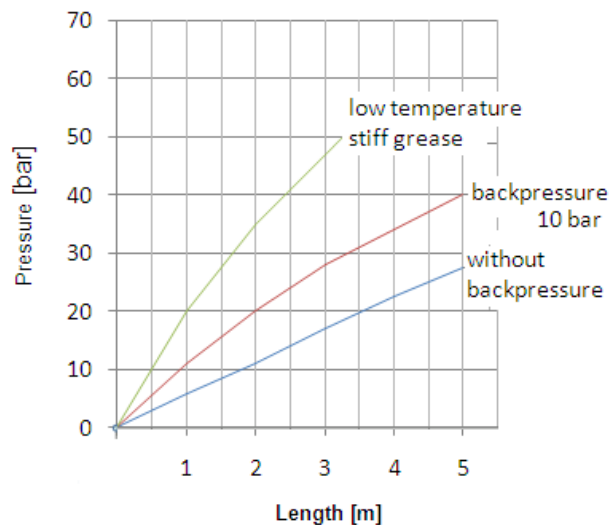
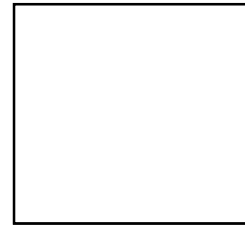


Chart: Required pressure vs. tube length (tested with tubes 6 x 4 mm)

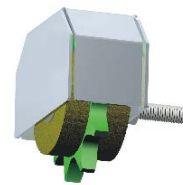
Accessories



A wide range of equipment and many more interesting products you'll find at



Lubrication Pinions material: PU



Lubrication Sprockets

Tube/Hose 6mm outer diameter, 4mm inner diameter, Material PA12 hard, pressure resistance 70bar, black, minimal bending radius 30mm

Tube/hose connectors, quick connector for tube/hose OD 6mm, different thread sizes

Adapter for lubrication points

4-pol cable with M12x1 plug

Tube can be delivered pre filled with grease! This ensures lubricant supply from the very beginning and a save and easy installation of the tube/hose

Disposal

Remark !

When disposing lubricant the waste disposal instructions of the lubricant manufacturer must be observed!

Disposal of the FlexxPump: observe the regional valid laws and regulations.

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