

OPERATING MANUAL

Pump Model FKGGM-EP Original Instructions



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1 General Safety Instructions

1.1 Importance of safety instructions

DANGER



Importance of safety instructions

This operating manual contains important information on handling and safety.

Read the operating manual carefully before you start any work with the product.

Always have the operating manual available on site.

Residual risk

Despite the comprehensive safety measures considered for design and operation of our product, the product is not absolutely safe. There remain residual risks, which cannot be eliminated.

To mitigate the residual risks:

- Take all appropriate precautions as stated in the safety instructions and safety messages.
- Observe the operating instructions.
- Keep to regular check intervals and maintenance.
- Wear personal protective equipment where required.




Non-observance of the safety instructions

Failure to follow the safety instructions can result in:






- damage to persons, serious injuries or death.
- material damage.
- failure of the product.
- Danger to the environment.

1.2 Signal words and symbols used

You will find the following signal words and symbols throughout the whole operating manual:

Level	Meaning
 DANGER	Warns of dangers for persons with a high potential risk. Non-observance of this warning is highly likely to result in serious injury or even death.
 WARNING	Warns of dangers to persons with a medium potential risk. Non-observance of this warning could result in serious injury.
 CAUTION	Warns of dangers for persons with a low potential risk. Non-observance of this warning could result in minor injuries.
NOTICE	Indicates information considered important but not hazard related. Non-observance could lead to damage to property and the environment.

Symbols used

	This symbol warns of electrical voltage.
	This symbol warns of danger to persons if not observed.
	This symbol warns of hot surfaces.
	This symbol warns of suspended loads.
	This symbol warns of possible material damage due to electrostatic discharge if not avoided.

Information labels

	Notice
	Wear ear protection.
	Wear eye protection.
	Wear protective clothing.
	Wash your hands.
	Recycle properly.

1.3 Personnel qualification and training

This operating manual is intended for:

Any person entrusted with tasks involving the product throughout its life cycle.

Qualified personnel

Only qualified personnel may handle the product. Qualified personnel can recognize and minimize possible hazards due to their skills and knowledge. They are qualified by training, certifications, the relevant degree and/or are instructed accordingly.

Authorized persons

Operators	Operators work with the product. They are involved in operation, monitoring and basic maintenance.
Qualified electricians	Electricians install and maintain electrical components, wire the product, diagnose and repair electrical issues.
Service technician	Service technicians are involved with installation, maintenance and repair on site of operation.
Handling personnel	Handling personnel are involved in transport, storage and control of the product.

1.4 Safety instructions for assembly, inspection, maintenance

- Only carry out any installation, inspection or maintenance work at standstill of the product.
- Wear appropriate protective equipment.
- Depressurize and disconnect the product from power supply.
- Secure the product against intentional and unintentional restart during your work. Reinstall all safety and protective equipment after completion of the work.
- Clean soiled or contaminated surfaces before installation, inspection or maintenance.

CAUTION



Hot surfaces

Hot surfaces of the product can lead to burns.

- a) Wear heat-resistant gloves.
- b) Check the surface temperature of the product.

- Naked light or fire are strictly forbidden.

1.5 Unauthorized modification / Production of spare parts

Modification and repair of the product are only permitted after consultation with the manufacturer.

Use only original spare parts and accessories.

Do not modify the product until you receive the written specific instructions by the manufacturer.

1.6 Intended use and improper use

The product is used to convey lubricants within an automatic lubrication system.

Intended use

The product is intended for commercial use only.

The product is a machine according to Machinery Directive 2006/42/EC.

- Use the product only within the values as stated in the technical data.
- Mind the lubricant specifications of the manufacturer.
- Observe all relevant regulations for occupational safety and accident prevention during the whole life cycle of the product.

Improper use

Any other use beyond the stated intended use is improper.

Improper use can be in particular, but not limited to:

- operating the product with improper lubricants.
- changing the product without authorization by the manufacturer.
- carrying out work at or with the product without having the necessary professional training and authorization.
- disregarding required maintenance and inspection intervals.
- exceeding or undergoing the limit values as stated in the technical data.

1.7 Electrostatic discharge

NOTICE



Avoid Electrostatic discharge (ESD).

Electrostatic discharge on contact could destroy integrated electronic components.

- a) Keep to the safety precautions against Electrostatic discharge (according to EN 61340-5-1/-3).
- b) Ensure well grounding of the environment (people, workplace and packaging) when handling the products.

2 Scope of Warranty

Warranty is only granted by the manufacturer for the use as intended and under the following conditions:

- Authorized qualified personnel carries out installation, connection and maintenance.
- The product is used in accordance with the information in the operating manual.
- The limit values as stated in the technical data are not exceeded or gone below.
- Only Groeneveld-BEKA may carry out modification and repair of the product.

NOTICE



Damage caused by lubricants

Damage caused by operation with an unsuitable lubricant will invalidate guarantee and warranty.

Groeneveld-BEKA will generally not assume liability for damage caused by lubricants, even if Groeneveld-BEKA has tested and approved the lubricants. Damage caused by lubricants (e.g. due to improper storage) cannot be retraced.

3 Manufacturer

Company name and address of the manufacturer of the machine:

Groeneveld-BEKA GmbH

Beethovenstraße 14

91257 Pegnitz, Bayern, Germany

Tel.: +49 9241729-0

Fax: +49 9241729-50

4 General Product Information

4.1 Product Description

The FKGGM-EP is an electrically actuated pump with up to three lubrication outlets. The FKGGM-EP is able to deliver commercial lubricants up to NLGI-2 at a maximum operating pressure of 350 bar. Therefore this system is the ultimate solution for various industrial applications.



1	Level monitoring The FKGGM-EP can be equipped with an electronic level monitoring.
2	Filling cap If your product is equipped with a filling cap, you can fill the pump via the filling cap in the reservoir cover.
3	Reservoir The FKGGM-EP reservoir is made of transparent plastic. FKGGM-EP is available with different reservoir capacities.
4	Pump element One pump element is required for each outlet. Different types of pump elements are available: <ul style="list-style-type: none"> • Different pump elements with fixed flow rates • Pump element with adjustable flow
5	Pressure limiting valve
6	Zerk You can fill the pump with a standard filling press. You can replace the zerk with a fillier coupling.
7	Control unit The FKGGM-EP series differ in control type. You can control the FKGGM-EP externally or with an integrated control unit that, depending on the control unit, that includes: <ul style="list-style-type: none"> • Three control functions: time, clock-pulse, or revolutions • Electronic level monitoring, pump and distributor function, line rupture, lubricant supply • Selection of operating conditions: easy, medium, or heavy duty • Integrated data logger with diagnosis module DiSys

4.2 Applicable documents

Dimensioned drawing
Connection diagram
Spare parts drawing
Certificates

4.3 Shutdown and Disposal

WARNING



Product under pressure and connected to power

You can get injured by:

- a) liquids which escape due to high pressure.
- b) electrical power due to high voltage.

Mind all relevant national and international laws and regulations for disposal.

1. Depressurize the product.
2. Switch off electrical power supply.
3. Have electrical components disconnected from the electrical power supply by a trained electrician.
4. Remove all pipes and hoses from the product and detach fittings.
5. When you change the lubricant, observe the disposal instructions of the lubricant manufacturer.
6. Collect lubricants or contaminated cloths in marked containers and dispose of them properly.

5 Transport and storage

Transport

WARNING



Suspended loads

You might get injured if suspended loads fall down.

- a) Keep distance to suspended loads.
- b) Wear appropriate protective clothing.

-
- Make sure that the means for transportation or the lifting device has sufficient carrying capacity.
 - Observe the applicable regulations on safety and accident prevention for transportation.
 - Do not throw the product or expose it to shocks.
 - Secure the product against slipping or falling over during transport.
 - Make sure the product is empty before moving it.

Storage

- Store the product cool and dry to avoid corrosion.
- If the product contains lubricants, observe the storage conditions of the lubricants.
- If the lubricant is overstored, check if oil and soap are separated. In this case, replace the lubricant.
- Store the product in upright position.

6 Technical Data

General

Delivery volume per stroke and outlet	depending on pump element
Number of outlets	max. 3
Outlet connection thread	Ø6 mm, Ø8 mm, Ø10 or G1/4"
Lubricant	grease: up to NLGI - 2 (greases with solid contents on request) oil: Mineral from 40mm ² /s (cSt)
Operating pressure	max. 350 bar
Pressure limiting valve	set to 290 bar (standard)
Operating temperature	-35° C to +70° C
Reservoir material	plastic
Reservoir size	1.9 L / 2.5 L / 4.0 L / 8.0 L / 16.0 L
Installation position	vertical (paddle) / rotating (follower plate)
Direction of rotation	in arrow direction
Degree of protection	IP 65
Sound pressure level	<70 dB (A)

Motor

Drive	gear motor
Current type of motor	direct current
Operational voltage	12 / 24 V DC / 115 V AC / 230 V AC
Frequency	- / - / 50-60 Hz / 50-60 Hz
Current consumption	2.2 A (12 V) / 1.1 A (24 V)
Speed	15 rpm
Fuse protection (not included in the product)	5 A (12 V) / 3 A (24 V)

Control Unit

Supply voltage	10 to 60 V DC (for EP-T2: 10 to 32 V DC)
Current consumption	6.0 A
Output for signal lamp	0.4 A
Fuse protection (not included in the product)	6.3 A

Level Monitoring

Operational voltage	10 to 60 V DC (standard) / 90 to 250 V AC (only rectangular plug connector)
Switching current	max. 200 mA (10 to 60 V DC) / max. 250 mA (90 to 250 V AC)
Switching type	normally open and normally closed PNP (M12x1 plug) / normally open or normally closed PNP (rectangular plug connector)
Connection	plug M12x1 (DIN EN 61076-2-101-A) / rectangular plug connector (EN 175301-803-A)

7 Installation Instructions

- 1) Check the product for transport damage and completeness before installation.
- 2) Remove transport protection.
- 3) Select the place of installation so that the product is protected against environmental and mechanical impacts.
- 4) Ensure unhindered access.
- 5) Observe the information on fastenings from the dimensional drawing.

7.1 Pump elements compatible

The product supports the following pump element types:

- PE-120 V
- PE-60
- PE-120
- PE-170

Each element is available with different pipe connections. Depending on the type, the pump element is optionally available with a pressure limiting valve.

7.2 Level monitoring

Optical:

If your pump is equipped with a transparent reservoir and level sticker, you can check the level optically.

Electrical:

If your product is equipped with electrical level monitoring, the level is monitored by one sensor for minimum or maximum level, or by two sensors for both.

The electrical level monitoring is available with two different electrical connections:

- Plug-type connection M12x1
- Line socket according to EN175301-803A

The configuration depends on the product version and intended application of your product.

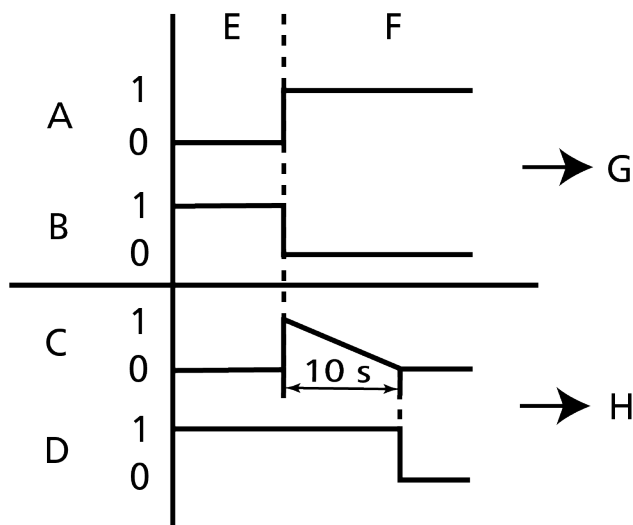
You can connect the level monitoring to an external control, such as an on-board computer or PLC.

If you have the product version for minimum level, plug-type connection M12x1, and voltage range 10 – 60 V DC, you can evaluate the level monitoring by the control units BEKA-troniX1 and EP-tronic.

Minimum level

See [7.3.4: Level monitoring connection diagrams](#) [► 24].

You can use the level monitoring contact as NO or NC contact. Preferably select NO contact if you want to ensure wire rupture monitoring.



A	NC contact
B	NO contact
C	Time 10 s
D	Product
E	Level OK
F	Reservoir empty
G	Signals of the level monitoring
H	Evaluation by integrated control units BEKA-troniX1 or EP-tronic or external control unit

NO contact

- 1) Connect to the black wire for use as NO contact.
- 2) Insulate the other wire accordingly.

The level monitoring will emit a signal as long as there is sufficient lubricant in the reservoir. The signal stops if the level falls below minimum level (MIN).

Evaluation:

- with external control: switch product off when there is no signal for more than 10 seconds.
- with integrated control: the integrated control unit will switch the product off when there is no signal for more than 10 seconds. Operation starts automatically again after refilling.

NC contact

- 1) Connect to the white wire for the use as NC contact.
- 2) Insulate the other wire accordingly.

The level monitoring will emit a signal if the level falls below minimum level (MIN).

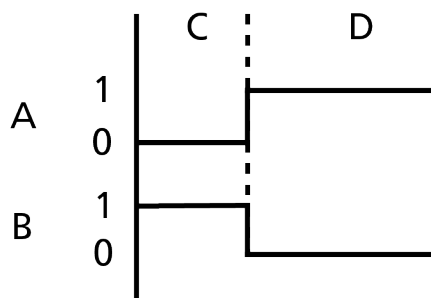
Evaluation:

- with external control: switch product off when the signal is constantly present for more than 10 seconds.
- with integrated control: the integrated control will switch the product off when the signal is constantly present for more than 10 seconds. Operation starts automatically again after refilling.

Maximum level

See [7.3.4: Level monitoring connection diagrams](#) [► 24].

You can use the level monitoring contact as NO or NC contact. Preferably select NC contact if you want to ensure overfill protection.



A	NC contact
B	NO contact
C	Level full
D	Level not full

NO contact

- 1) Connect to the black wire for the use as NO contact.
- 2) Insulate the other wire accordingly.

The level monitoring will emit a signal when the level increases to maximum level (MAX).

NC contact

- 1) Connect to the white wire for the use as NC contact.
- 2) Insulate the other wire accordingly.

The level monitoring emits a signal as long as the lubricant level is below maximum level (MAX). The signal stops if the level increases to maximum level (MAX).

7.3 Electrical connection

WARNING



Risk of electric shock

- a) Have the electrical power supply installed by a qualified electrician.

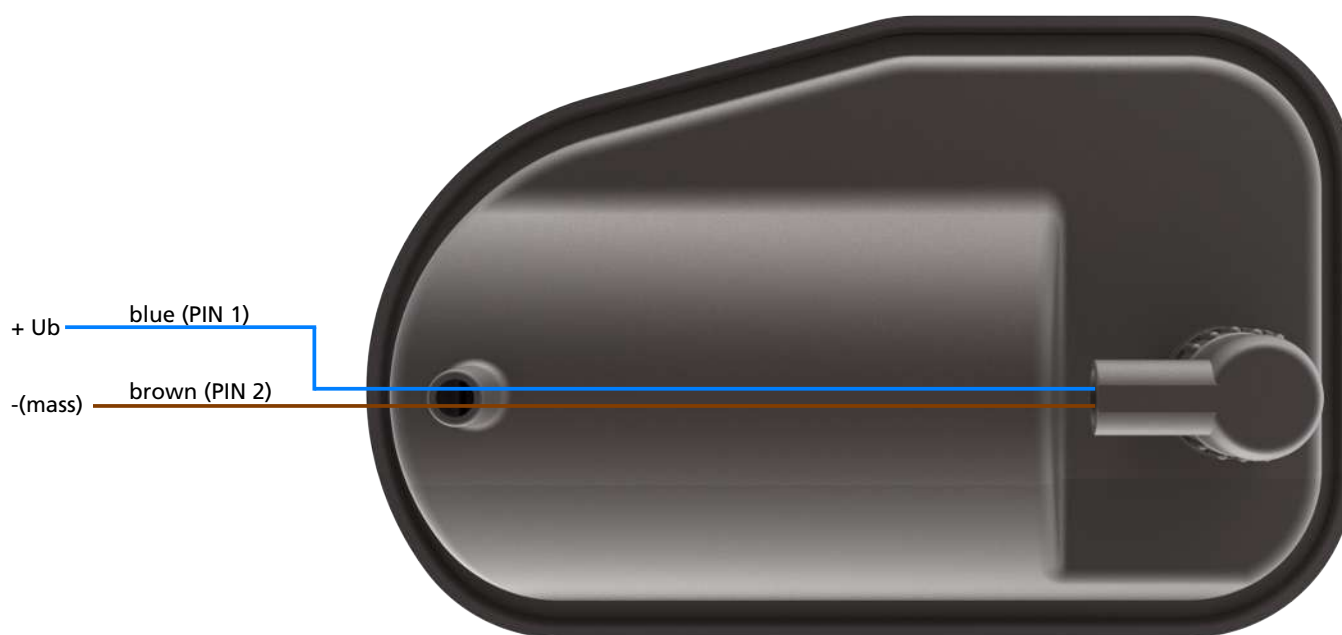
- Mind all specifications of the electrical connection diagram.
- Compare the voltage specifications with the existing mains voltage.

7.3.1 No control connection diagrams

Without plug connection



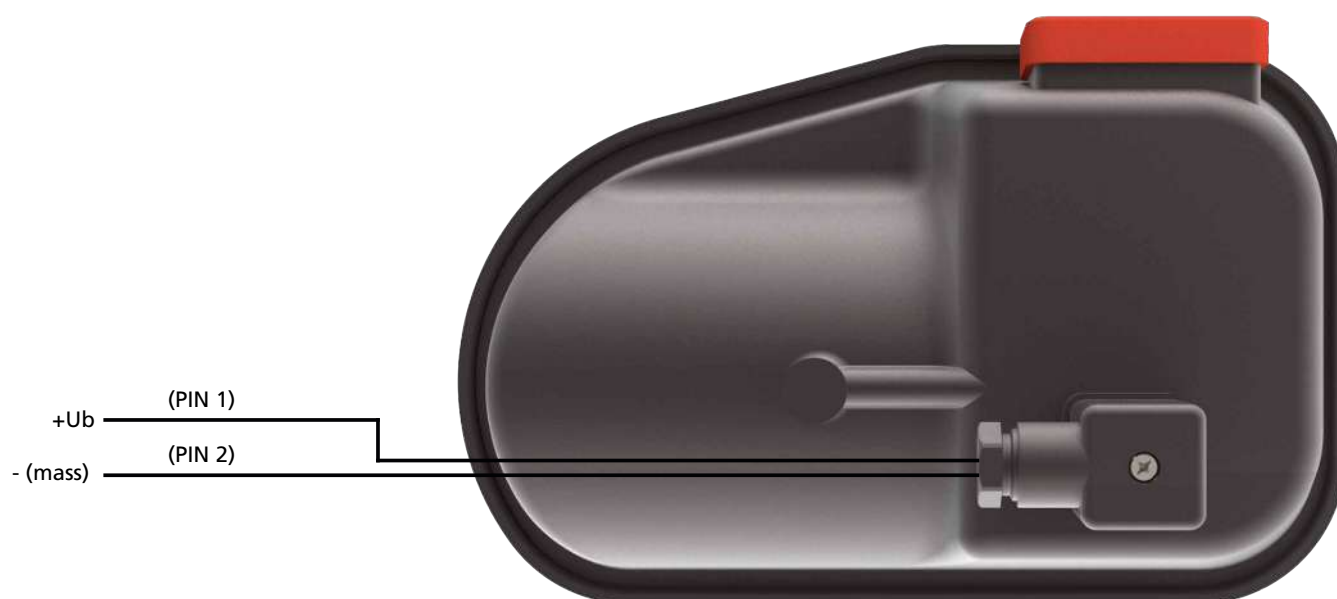
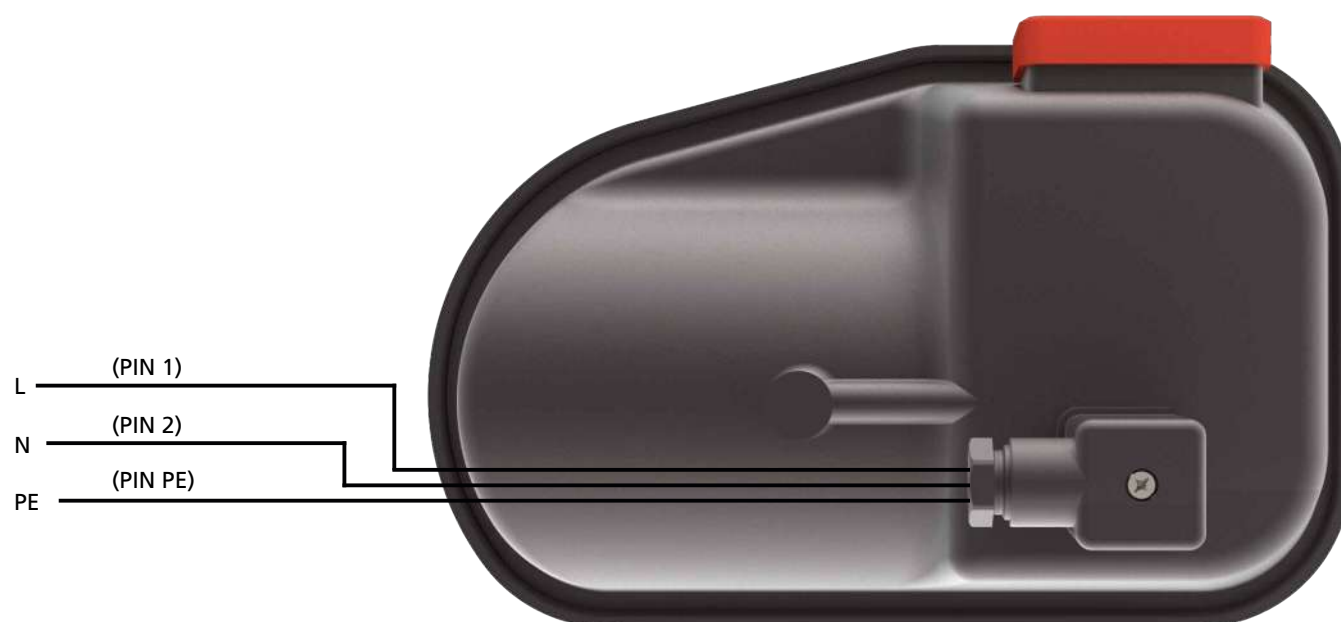
Product with DC supply with bayonet connection

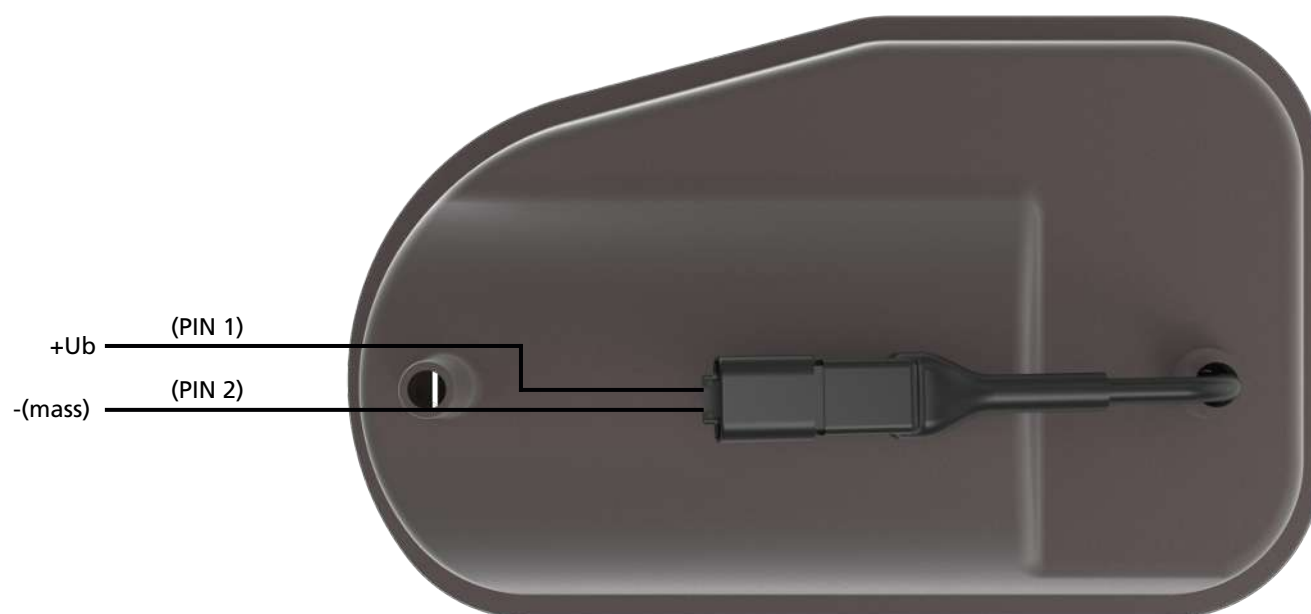


NOTICE



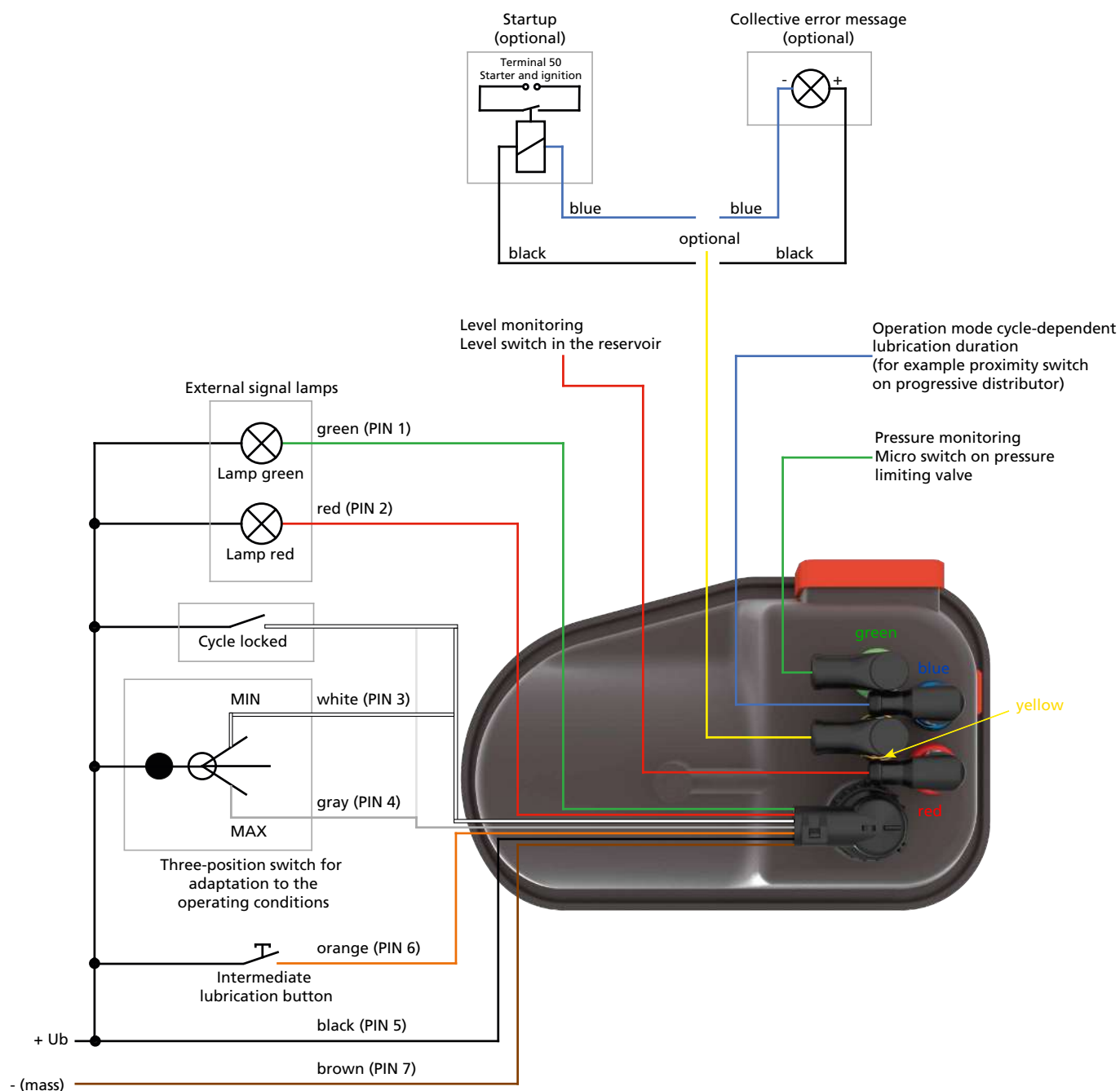
The bayonet connector and a 10m connection cable are included for products with DC supply without control and with bayonet connection.

Product with DC supply with cubic plug**Product with AC supply with cubic plug**

With Deutsch connector, 4-pins**With Deutsch connector, 2-pins**

7.3.2 EP-tronic connection diagram

With bayonet connection



NOTICE

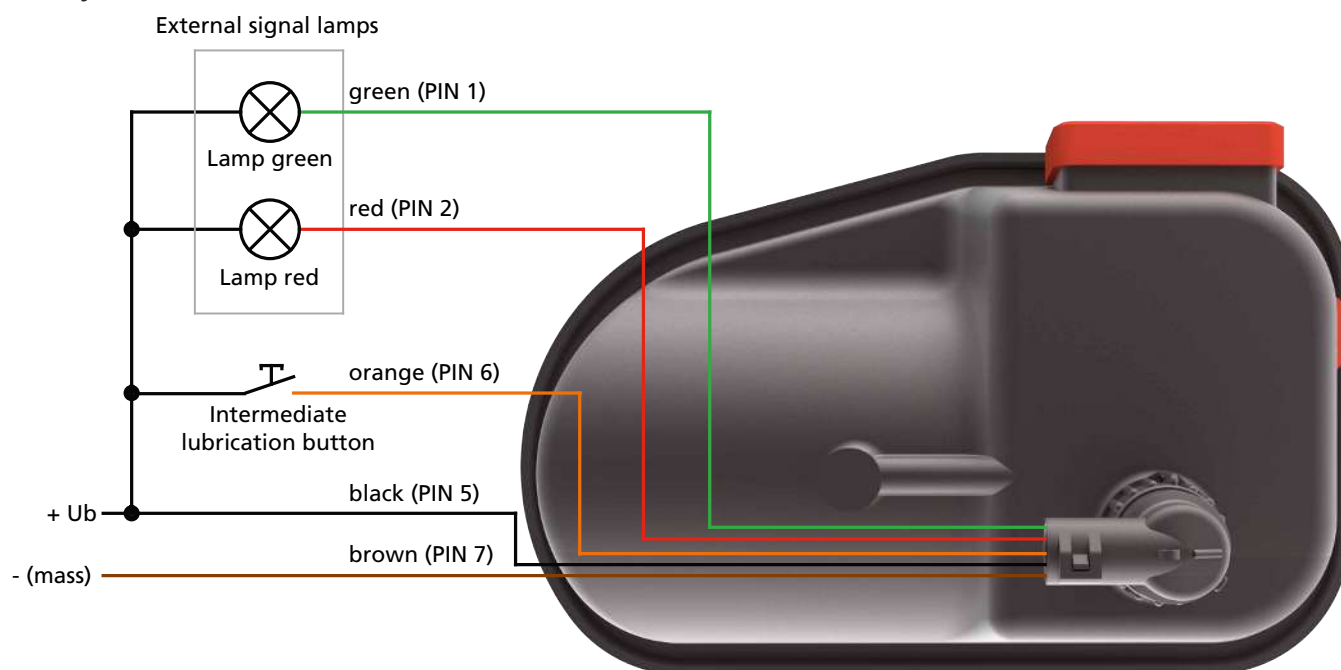


The bayonet connector and a 10m connection cable are included for products with EP-tronic control with bayonet connection.

If your product is equipped with a level monitoring, a M12x1 connector and a 0,6m connection cable are also included in delivery.

7.3.3 BEKA-troniX1 connection diagrams

With bayonet connection

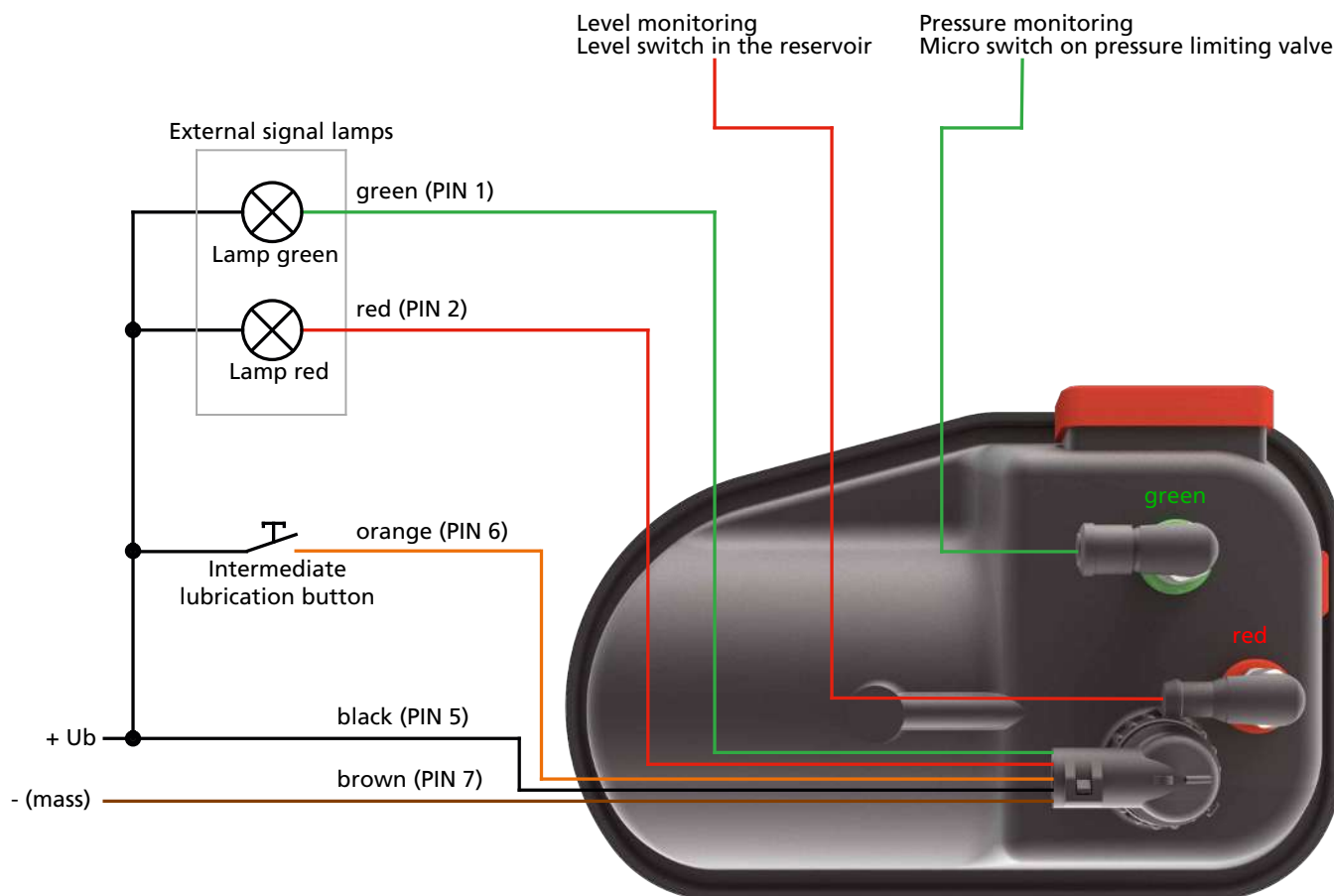


NOTICE



The bayonet connector and a 10m connection cable are included for products with BEKA-troniX1 control.

With bayonet connection and plug-type connections M12x1



NOTICE

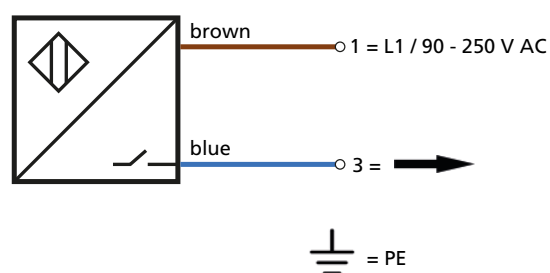
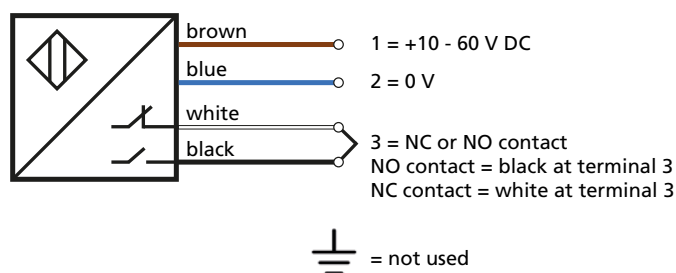


The bayonet connector and 10m connection cable are included for products with BEKA-troniX1 control.

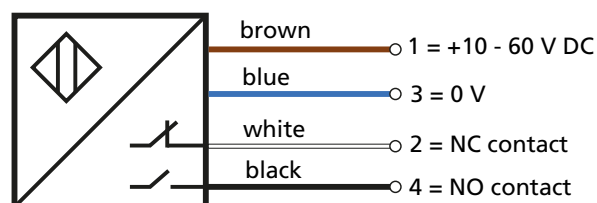
If your product is equipped with a level monitoring, a M12x1 connector and a 5m connection cable are also included.

7.3.4 Level monitoring connection diagrams

With cable socket EN175301-803A



With plug connection M12x1



7.4 Lubricants

Lubricant	grease: up to NLGI - 2 (greases with solid contents on request) oil: Mineral from 40mm ² /s (cSt)
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- Use lubricants with high-pressure additives.
- Use only lubricants of the same saponification type.
- Comply with the lubricant specifications of the machine manufacturer.
- Comply with the safety data sheet of the lubricant manufacturer. Keep the safety data sheet of the used lubricant on hand.

NOTICE



The lubricant flow changes with the operating temperature.

- Lubricants with solids content on request

7.5 Lubricant filling

There are different possibilities to fill the reservoir. Refer to following paragraphs:

- [Filling at zerk with filling press \(7.5.1: Filling at zerk with filling press\) \[► 25\]](#)
- [Filling at filling connection with filling press \(7.5.2: Filling at filling connection with filling press\) \[► 26\]](#)
- [Filling at filling connection with filling coupling \(7.5.3: Filling at filling connection with filling coupling\) \[► 27\]](#)

Filling process

NOTICE



Contamination of the reservoir

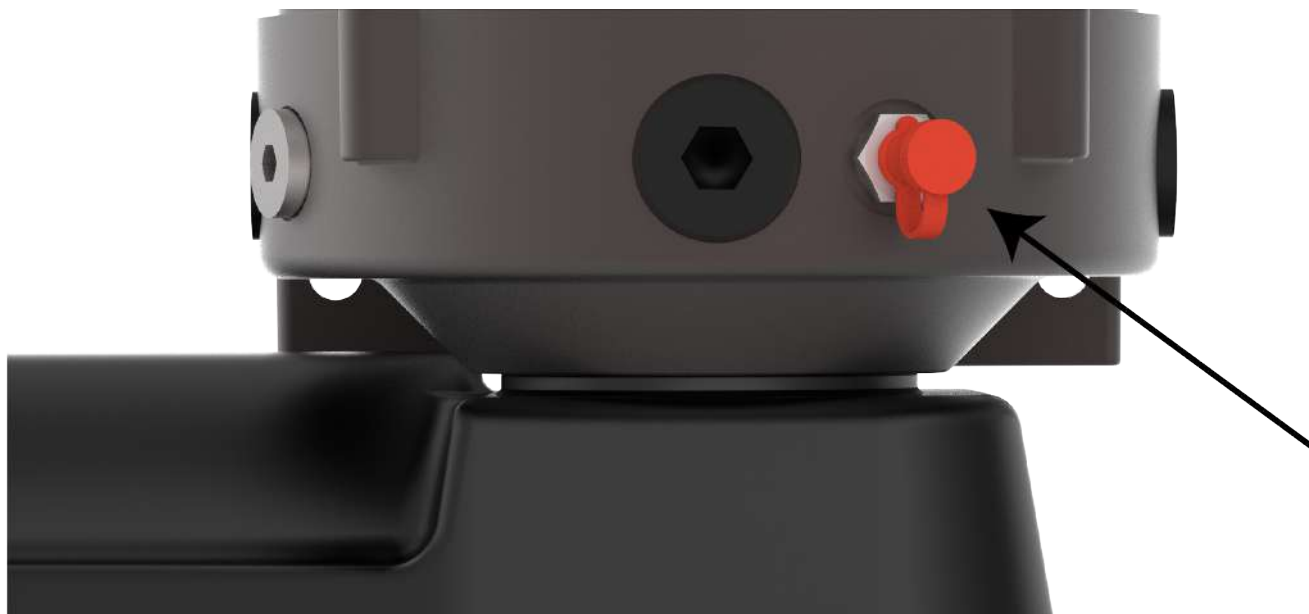
Dirt particles that get into the reservoir can cause seizure of the pistons in the pump elements or clog lines and connected distributors.

- Ensure a clean environment for the filling process.
- Only fill with clean lubricant.

- Operate the product during the filling process to avoid air inclusions in the lubricant.
- Do not overfill the reservoir.
- Collect leakages and dispose of them properly.
- Check the level regularly at equal intervals during the first hours of operation. Refill clean lubricant if necessary.

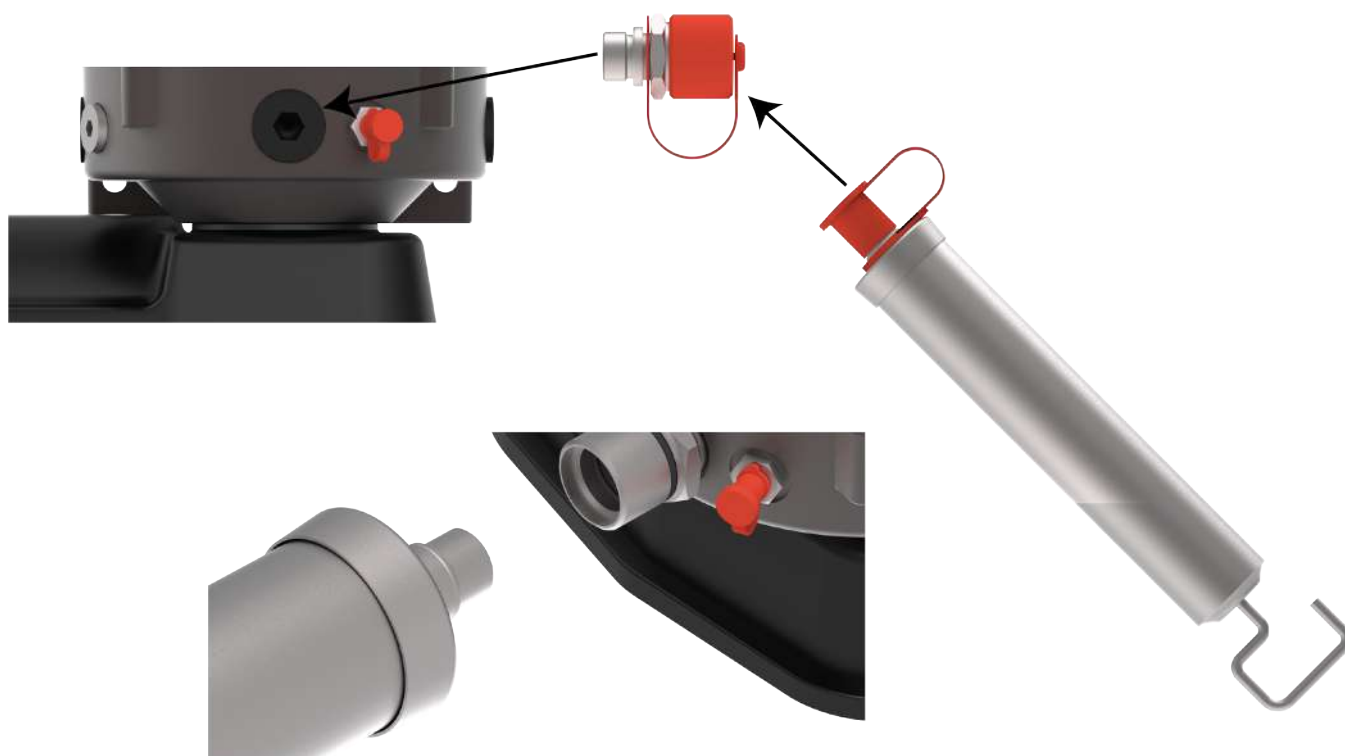
7.5.1 Filling at zerk with filling press

- 1) Remove the protective cap from the zerk.
- 2) Connect a suitable filling press (manually operated or pneumatic) at the zerk.
- 3) Fill up to maximum level.
- 4) Put the protective cap on the zerk again after filling.



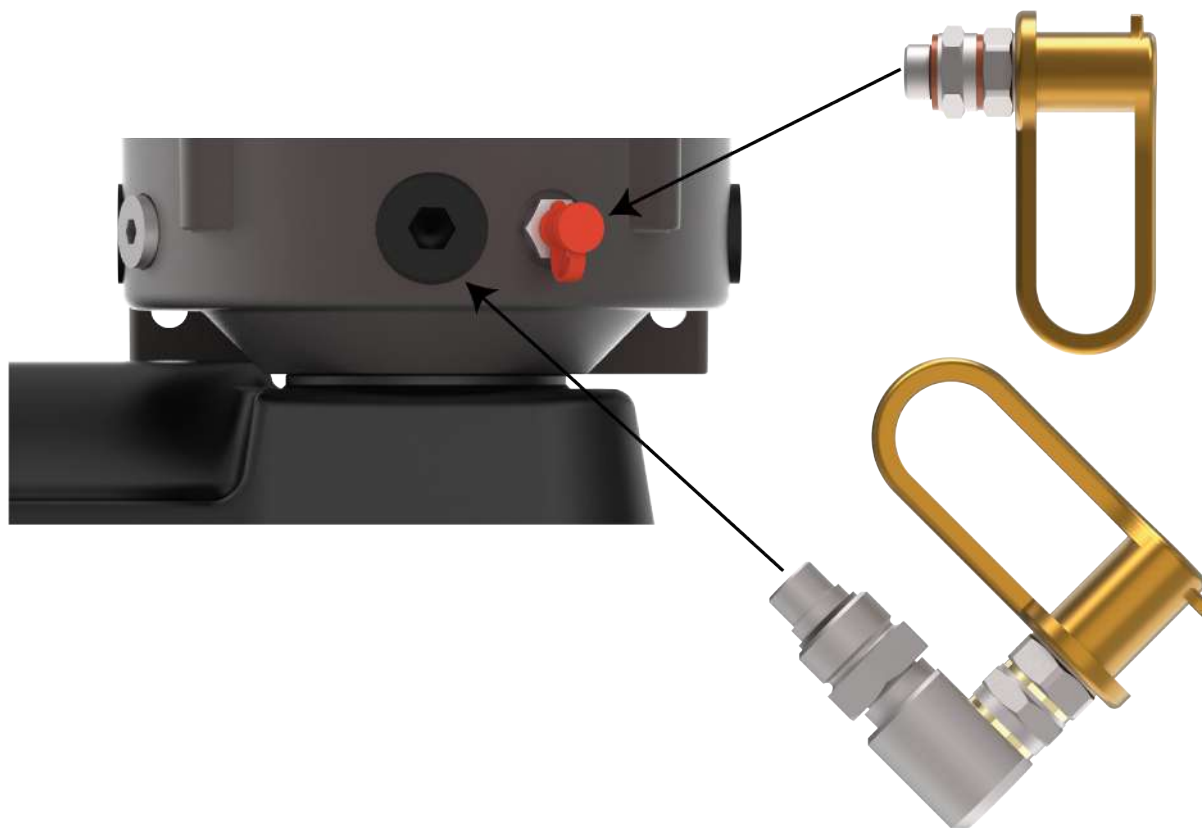
7.5.2 Filling at filling connection with filling press

- 1) Remove the screw plug.
- 2) Screw a filling connection M20x1,5 into the outlet.
- 3) Operate the filling press until the lubricant visibly emerges (approx. 10mm), then connect the filling press to the filling connection.
- 4) Fill up to maximum level.
- 5) Disconnect the filling press from the filling connection.
- 6) Remove the filling connection from the outlet.
- 7) Screw the screw plug back into the outlet.



7.5.3 Filling at filling connection with filling coupling

- 1) Remove the screw plug or the zerk.
- 2) Connect a filling coupling M20x1,5 or G1/4.
- 3) Connect a suitable filling pump to the filling coupling.
- 4) Fill up to maximum level.
- 5) Disconnect the filling pump from the filling coupling.
- 6) Remove the filling coupling from the outlet.
- 7) Screw the screw plug back into the outlet.



7.6 Vent the lubrication system

- Vent the lubrication system with initial start-up and after each lubricant change.
- Only vent the lubrication system when depressurized and with open outlets.
- Operate the product until the lubricant comes out from the pressure connection free of air bubbles.

7.7 Line assembly

Please comply with the following for line assembly:

- Lay out the lines professionally.
- Ensure that fittings are tight against pressure.
- All components must be approved for the maximum operating pressure as stated in the technical data.

8 Control unit and Settings

8.1 General settings

You can control the progressive lubrication system with an integrated control unit. The following integrated control units are available for the product:

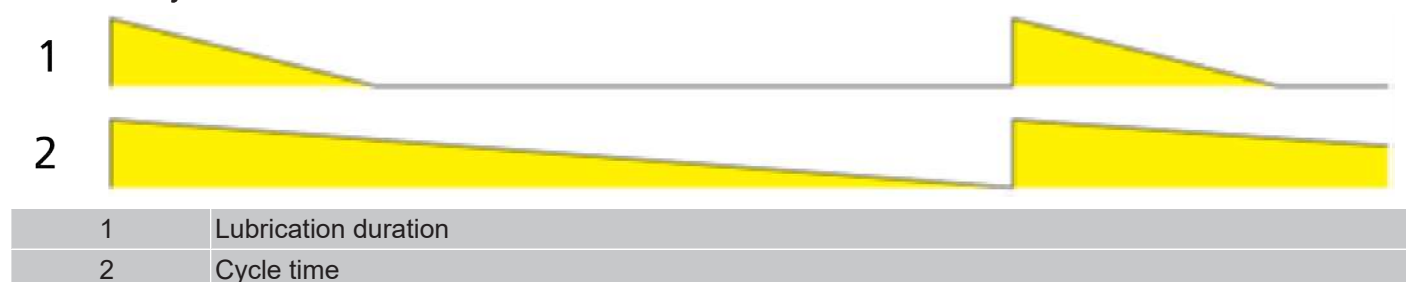
- BEKA-troniX1
- EP-tronic

You can also retrofit an integrated control unit.

All the integrated control units work with lubrication cycles.

Lubrication cycle = cycle time + lubrication duration

Lubrication cycle:



NOTICE



Diagnosis software

For some functions you need the diagnosis software BEKA-DiSys, like e.g. for changing the setting ranges or deactivation of a function. Find the current version under www.groeneveld-beka.com

8.2 BEKA-troniX1

The BEKA-troniX1 is an integrated control unit.

You can set the cycle time to be time-dependent.

You can set the lubrication duration to be either time-dependent or revolution-dependent.

With the BEKA-troniX1 you can evaluate:

- Level monitoring
- System pressure monitoring

NOTICE



You need the control unit version with plug-type connections M12x1 for evaluation.

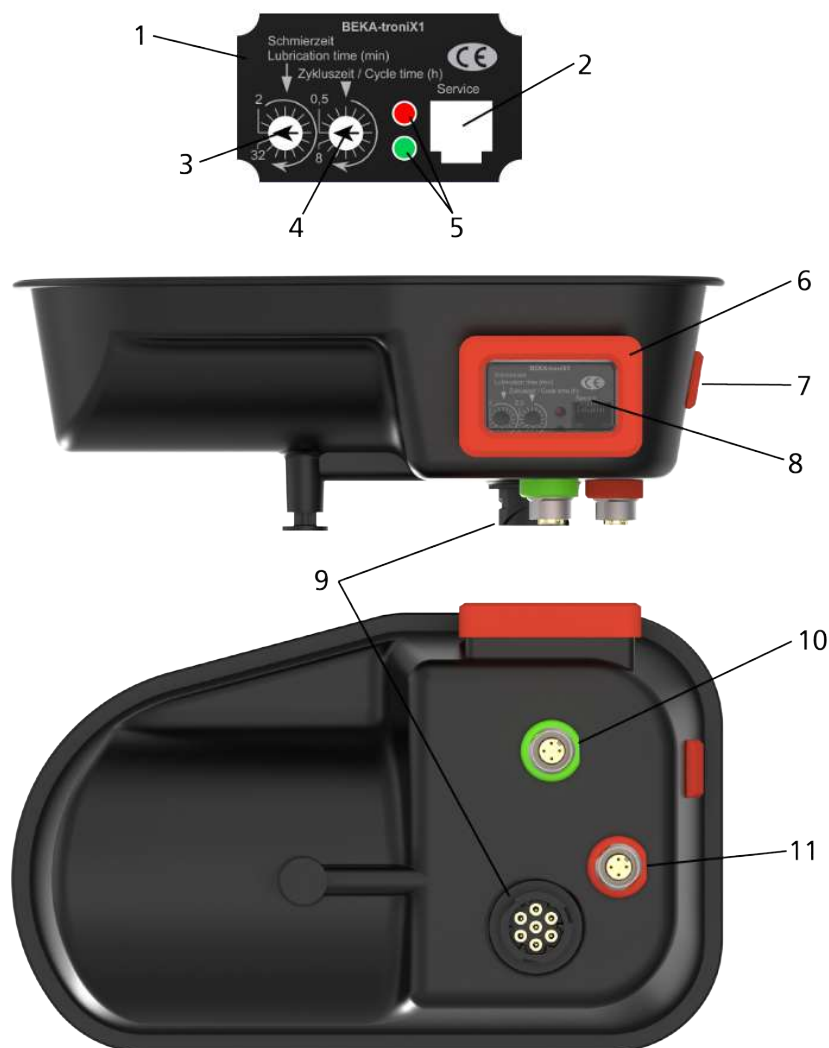
The BEKA-troniX1 emits signals via a red and a green LED in the inspection window of the housing. Refer to [Signal indicators BEKA-troniX1 \(12.2: Signal indicators\) \[► 45\]](#) for the different signals.

Operational database

The BEKA-troniX1 features an operational database in which the following values are stored:

- Data on the control unit, such as type, version, serial number and production date
- Real-Time-Clock (RTC), date and time, adjustable time zones
- Current settings, such as cycle time, operational mode for lubrication duration, lubrication duration and monitoring times
- Statistical values, including operation hours, number of intermediate lubrications, number of different errors and diagnoses
- Date and time of the last diagnosis

Functional description



1	Sticker (example) in inspection window
2	Connection for diagnosis software BEKA-DiSys
3	Switch with detents to set the lubrication duration
4	Switch with detents to set the cycle time
5	Functional status LEDs
6	Frame of inspection window
7	Intermediate lubrication button
8	Inspection window
9	Voltage connection, bayonet 7-pins
10	Plug-type connection M12x1 (green) for pressure monitoring
11	Plug-type connection M12x1 (red) for level monitoring

When voltage is switched on (ignition on), the red and the green LED in the inspection window will glow for 1,5 seconds and signal function standby of the control unit.

If the voltage is interrupted (ignition off) during a cycle or the lubrication duration, the data will be stored in the operational database of the control unit. When voltage is applied again, the cycle will continue from that point where it has been interrupted.

You can actuate an intermediate lubrication at any time by pushing the button for intermediate lubrication when voltage is applied. The data from the current lubrication cycle will be deleted and a new cycle will start.

Some errors require a reset after troubleshooting. Push the button for intermediate lubrication. The product will start a new lubrication cycle.

Setting the parameters

With the diagnosis software BEKA-DiSys you can change the lubrication duration and the operational mode for the lubrication duration.

NOTICE



Order and exchange the sticker in the inspection window of the protective housing when you have changed the parameters.

You can change the lubrication duration and cycle time within a setting range at the indexing switches in the inspection window.

- 1) Detach the frame of the inspection window with a flat screwdriver.
- 2) Detach the four recessed head screws and remove the transparent inspection window.

NOTICE



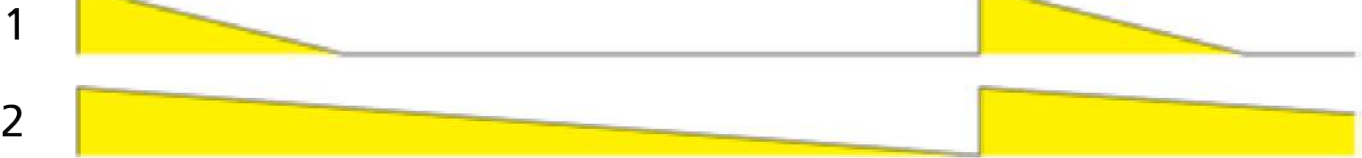
Water in the control unit

If you do not reinstall inspection window and the frame properly after setting the parameters, water can get into the control unit and destroy it.

Operational modes

Cycle time time-dependent

With this operational mode you can set the cycle time in minutes or hours, depending on the selected setting range.



1	Lubrication duration
2	Time-dependent cycle time

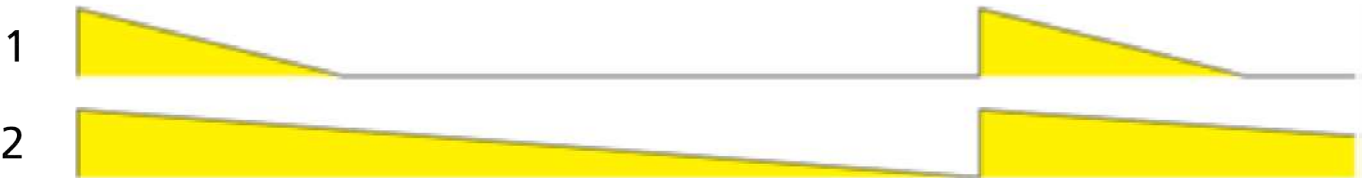
Possible setting ranges for time-dependent cycle time:

- 0,5 to 8 h (16 notches, in increments of 0,5 h)
- 2 to 32 min (16 notches, in increments of 2 min)
- 2 to 32 h (16 notches, in increments of 2 h)

Set the cycle time within the selected range with the right indexing switch.

Lubrication duration time-dependent

With this operational mode you can set the lubrication duration in minutes or seconds, depending on the selected setting range.



1	Time-dependent lubrication duration
2	Cycle time

Possible setting ranges for time-dependent lubrication duration:

- 1 to 16 min (16 notches, in increments of 1 min)
- 2 to 32 min (16 notches, in increments of 2 min)
- 2 to 32 s (16 notches, in increments of 2 s)

Set the lubrication duration within the selected setting range with the left indexing switch.

Lubrication duration revolution-dependent

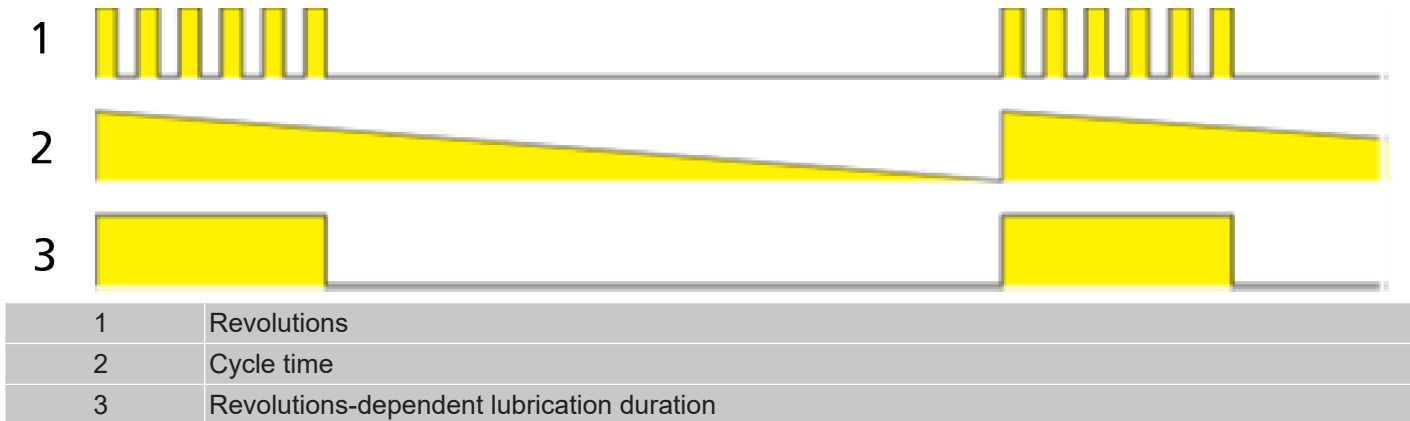
In this operational mode you can set the lubrication duration by the number of counted pump revolutions. A sensor in the product emits a signal to the control unit with each pump revolution. The control unit signals an error if it does not receive a signal within a monitoring time (default setting 30 s). Refer to [Signal indicators BEKA-troniX1 \(12.2: Signal indicators\)](#) [► 45] for more information.

NOTICE



BEKA-DiSys diagnosis software

You can change setting ranges or the revolution monitoring time (where applicable) with the BEKA-DiSys diagnosis software.



Possible setting ranges for revolution-dependent lubrication duration:

- 1 to 16 revolutions (16 notches, in increments of 1 revolution)
- 10 to 160 revolutions (16 notches, in increments of 10 revolutions)
- 170 to 320 revolutions (16 notches, in increments of 10 revolutions)

Set the lubrication duration within the selected setting range with the left indexing switch.

Level monitoring

This function requires a plug-type connection for additional equipment and the version MIN-level, plug-type connection M12x1 and voltage range 10 – 60 V DC.

Refer to [BEKA-troniX1 connection diagrams \(7.3.3: BEKA-troniX1 connection diagrams\)](#) [► 22] and [Level monitoring for connection and further information](#).

NOTICE



Level monitoring is not used

Deactivate the level monitoring function with the diagnosis software BEKA-DiSys if you do not want to use it. Close the provided connection with a protective cap.

Pressure monitoring

With a micro switch attached to the pressure limiting valve you can monitor the operating pressure in the lubrication system. The micro switch is connected at the green marked connection with plug M12x1. Refer to [BEKA-troniX1 connection diagrams \(7.3.3: BEKA-troniX1 connection diagrams\)](#) [► 22].

If the pressure in the system exceeds a set value, the pressure limiting valve will open. The micro switch is actuated and signals to the control unit. The control unit will switch off the product and signal an error. Refer to [Signal indicators BEKA-troniX1 \(12.2: Signal indicators\)](#) [► 45].

This error requires a reset after troubleshooting. Push the button for intermediate lubrication.

8.3 EP-tronic

The EP-tronic is an integrated control unit.

You can set the cycle time to be time-dependent. You can set the lubrication duration to be either time-dependent, clock pulse-dependent, or revolution-dependent.

With the EP-tronic you can evaluate:

- Level monitoring
- System pressure monitoring

Special features:

With this control unit you can also use the following function:

- Adaption to the operating conditions
- Lock cycle
- External status signal for errors or OK-signal

The EP-tronic emits signals via a red and a green LED in the inspection window of the housing. Refer to [Signal indicators EP-tronic \(12.2: Signal indicators\) \[► 46\]](#) for the different signals.

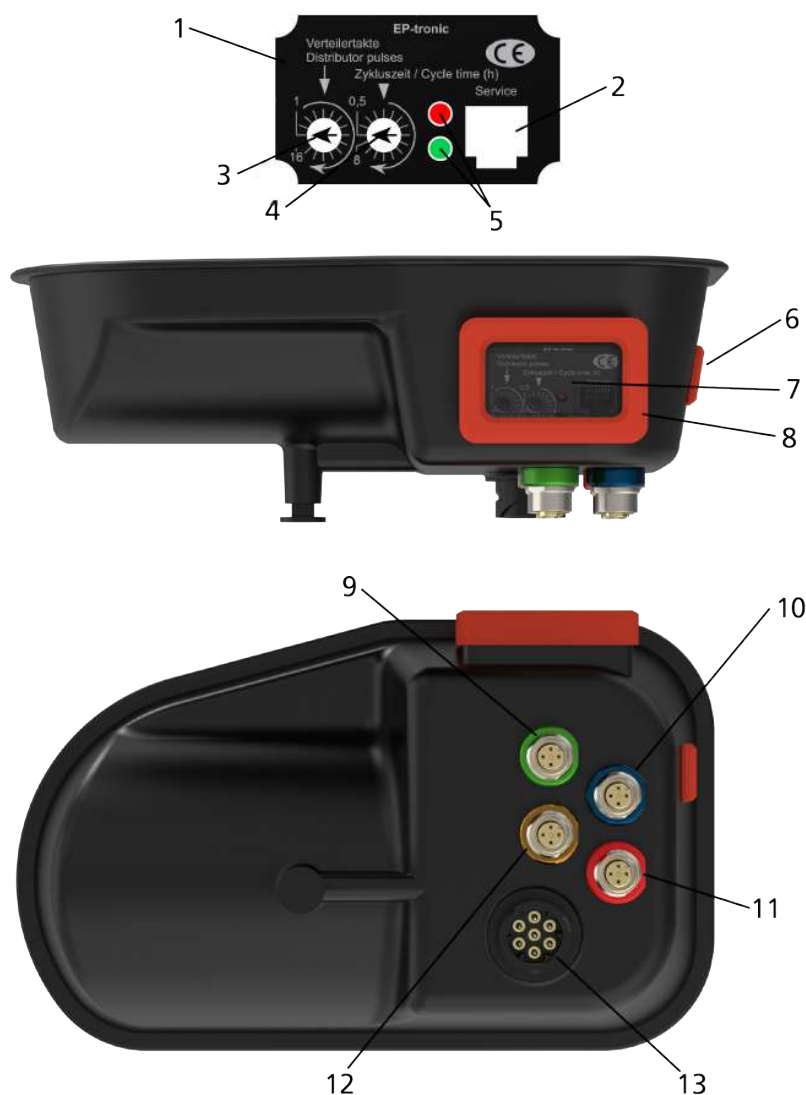
Operational database

The EP-tronic features an operational database in which the following values are stored:

- Data on the control unit, such as type, version, serial number and production date
- Real-Time-Clock (RTC), date and time, adjustable time zones
- Current settings, such as cycle time, operational mode for lubrication duration, lubrication duration and monitoring times
- Statistical values, including operation hours, number of intermediate lubrications, number of different errors and diagnoses
- Date and time of the last diagnosis
- Error log of the last 100 errors with information on type of the error, time and date
- Event log of the last 100 settings with time and date

You can change the operational mode for lubrication duration, cycle time and lubrication duration, and the monitoring time with the diagnosis software BEKA-DiSys.

Functional description



1	Sticker (example) in inspection window
2	Connection for diagnosis software BEKA-DiSys
3	Switch with detents to set the lubrication duration
4	Switch with detents to set the cycle time
5	Functional status LEDs
6	Frame of inspection window
7	Intermediate lubrication button
8	Inspection window
9	Plug-type connection M12x1 (green) for system pressure monitoring
10	Plug-type connection M12x1 (blue) for clock pulse signals of the distributor
11	Plug-type connection M12x1 (red) for level monitoring
12	Plug-type connection M12x1 (yellow) for external status signal
13	Voltage connection, bayonet 7-pins

When the voltage is switched on (ignition on), the red and the green LED in the inspection window will glow for 1,5 seconds and signal function standby of the control unit.

If the voltage is interrupted (ignition off) during a cycle or the lubrication duration, the data will be stored in the operational database of the control unit. When voltage is applied again, the cycle will continue from that point where it has been interrupted.

You can actuate an intermediate lubrication at any time by pushing the button for intermediate lubrication when voltage is applied. The data from the current lubrication cycle will be deleted and a new cycle will start. Some errors require a reset after troubleshooting. Push the button for intermediate lubrication. The product will start a new lubrication cycle.

Setting the parameters

With the diagnosis software BEKA-DiSys you can change the setting ranges for lubrication or cycle time as well as the operational mode for the lubrication duration.

NOTICE



Order and exchange the sticker in the inspection window of the protective housing when you have changed the parameters.

You can change the lubrication duration and cycle time within a setting range at the indexing switches in the inspection window.

- 1) Detach the frame of the inspection window with a flat screwdriver.
- 2) Detach the four recessed head screws and remove the transparent inspection window.

NOTICE



Water in the control unit

If you do not reinstall inspection window and the frame properly after setting the parameters, water can get into the control unit and destroy it.

Operational modes

Cycle time time-dependent

With this operational mode you can set the cycle time in minutes or hours, depending on the selected setting range.

1



2



1	Lubrication duration
2	Time-dependent cycle time

Possible setting ranges for time-dependent cycle time:

- 0,5 to 8 h (16 notches, in increments of 0,5 h)
- 2 to 32 min (16 notches, in increments of 2 min)
- 2 to 32 h (16 notches, in increments of 2 h)

Set the cycle time within the selected setting range with the right indexing switch.

Lubrication duration time-dependent

With this operational mode you can set the lubrication duration in minutes or seconds, depending on the selected setting range.

1



2



1	Time-dependent lubrication duration
2	Cycle time

Possible setting ranges for time-dependent lubrication duration

- 1 to 16 min (16 notches, in increments of 1 min)
- 2 to 32 min (16 notches, in increments of 2 min)
- 2 to 32 s (16 notches, in increments of 2 s)

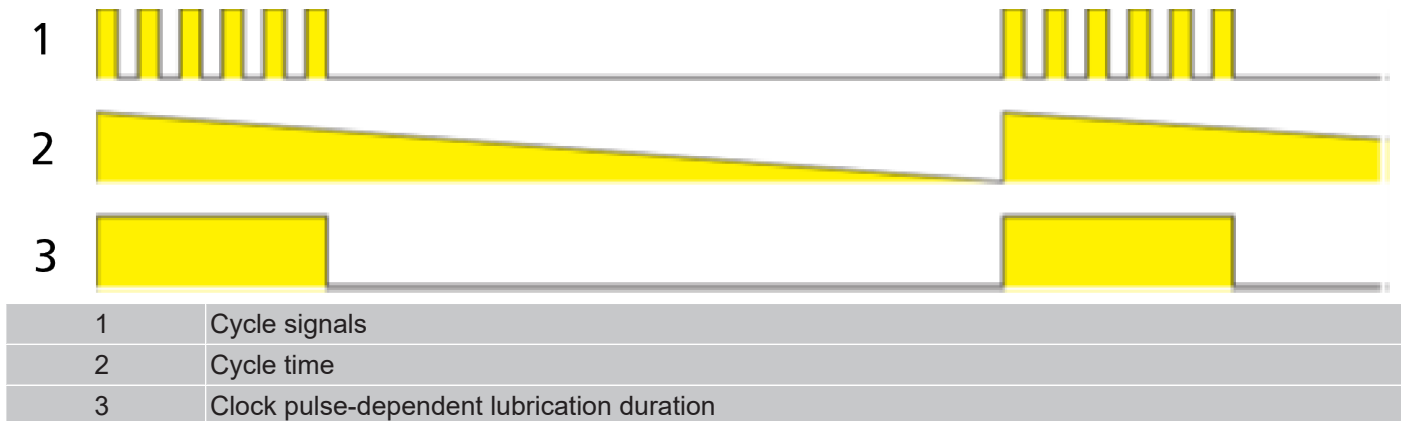
Set the lubrication duration within the selected setting range with the left indexing switch.

Lubrication duration clock pulse-dependent

In this operational mode you can determine the lubrication duration by the number of incoming clock pulses from a signaling device. The signaling device can be a proximity switch at a progressive distributor for example. The control unit signals error if it does not receive a clock pulse signal within an adjustable monitoring time (default setting 12 min). Refer to [Signal indicators EP-tronic \(12.2: Signal indicators\) \[► 46\]](#) for more information.

Push the button for intermediate lubrication to reset the error after troubleshooting.

The signaling device can be connected at the blue marked plug-type connection M12x1. You can change setting range and clock pulse monitoring time with the BEKA-DiSys diagnosis software.



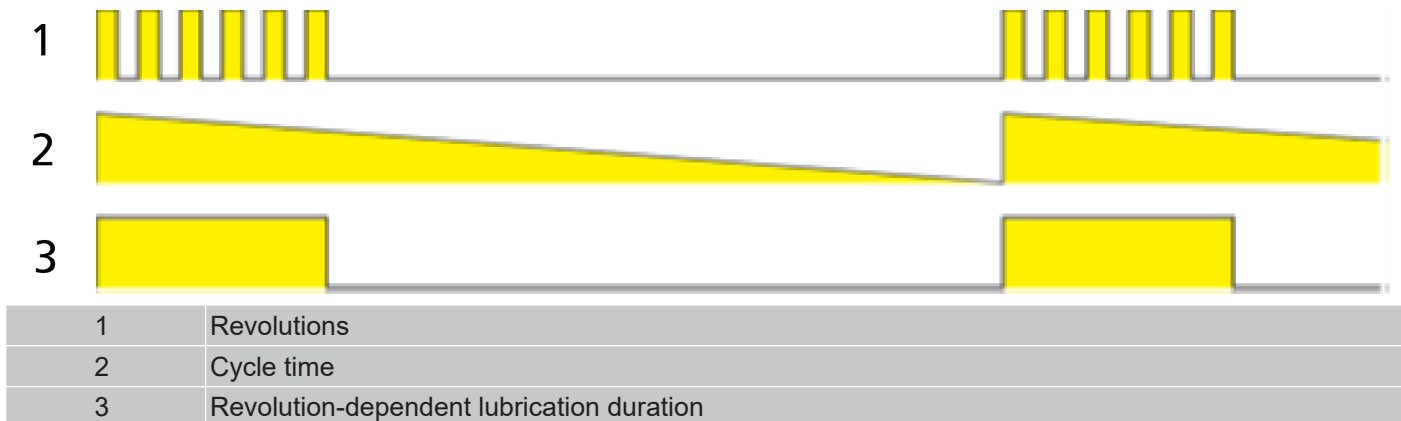
Possible setting ranges for clock pulse-dependent lubrication duration:

- 1 to 16 clock pulses (16 notches, in increments of 1 clock pulse)
- 17 to 32 clock pulses (16 notches, in increments of 1 clock pulse)
- 33 to 48 clock pulses (16 notches, in increments of 1 clock pulse)

Set the lubrication duration within the selected setting range with the left indexing switch.

Lubrication duration revolution-dependent

In this operational mode you can set the lubrication duration by the number of counted pump revolutions. A sensor in the product emits a signal to the control unit with each pump revolution. The control signals error if it does not receive a signal within an adjustable monitoring time (default setting 30 s). Refer to [Signal indicators EP-tronic \(12.2: Signal indicators\) \[► 46\]](#) for more information.



Possible setting ranges for revolution-dependent lubrication duration:

- 1 to 16 revolutions (16 notches, in increments of 1 revolution)
- 10 to 160 revolutions (16 notches, in increments of 10 revolutions)
- 170 to 320 revolutions (16 notches, in increments of 10 revolutions)

Set the lubrication duration within the selected setting range with the left indexing switch.

NOTICE



BEKA-DiSys diagnosis software

You can change setting ranges or the revolution monitoring time (where applicable) with the BEKA-DiSys diagnosis software.

Level monitoring

This function requires a plug-type connection for additional equipment and the version MIN-level, plug-type connection M12x1 and voltage range 10 – 60 V DC.

Refer to the connection diagrams and Level monitoring for connection and further information.

NOTICE



Level monitoring is not used

Deactivate the level monitoring function with the diagnosis software BEKA-DiSys if you do not want to use it. Close the provided connection with a protective cap.

Pressure monitoring

With a micro switch attached to the pressure limiting valve you can monitor the operating pressure in the lubrication system. The micro switch is connected to the green marked connection with plug M12x1. Refer to [7.3.2: EP-tronic connection diagram](#) [► 21].

If the pressure in the system exceeds a set value, the pressure limiting valve will open. The micro switch is actuated and signals to the control unit. The control unit will switch off the product and signal an error. Refer to [Signal indicators EP-tronic. \(12.2: Signal indicators\)](#) [► 46]

This error requires a reset after troubleshooting. Push the button for intermediate lubrication.

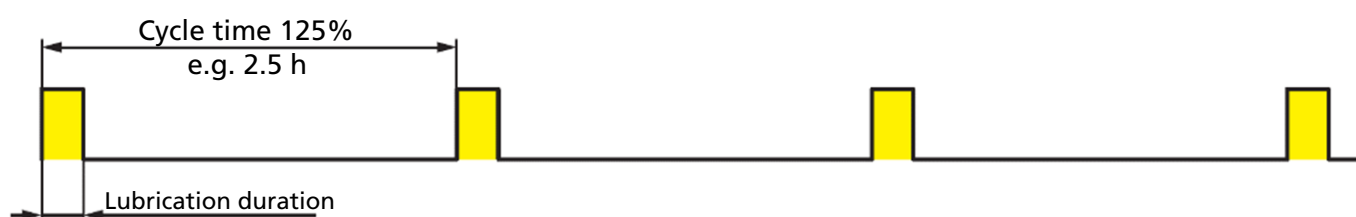
Special functions

Adaption to the operating conditions

Within 30 s after applying the voltage, you can customize the lubrication intervals with a 3-position rocker switch. You can order this switch separately.

Operating conditions:

Light – Positioned on light load, the lubrication points receive the lubricant in longer intervals.



Medium – Positioned on medium load, the lubrication points receive the lubricant in the set interval.



Heavy duty – Positioned on heavy duty, the lubrication points receive the lubricant in shorter intervals.



Turn the voltage (ignition) off and on after you have selected your appropriate switch position or actuate an intermediate lubrication.

Cycle locked

This function is suitable for applications where machine parts or attachments only need lubrication when they are under operation, e.g. the press of a garbage truck.

NOTICE



If you wish to use this function you cannot connect the rocker switch for adaption to the operating conditions at the same time.

You can use this function when the white and the gray wires of the control unit are connected to the ignition. This connection can be made by a circuit in the on-board computer of the vehicle or by an external control. Refer to [7.3.2: EP-tronic connection diagram](#) [► 21].

When the circuit is closed by the on-board computer or the external control, the cycle is locked. Alternatively, the current lubrication duration is completed, and the next one is locked. The green LED in the inspection window starts flashing. Refer to [Signal indicators EP-tronic.](#) ([12.2: Signal indicators](#)) [► 46]

NOTICE



This signal is not indicated by externally connected signal lamps.

External status signal

The status signal can be output either as

- Error signal: permanent signal when an error is detected

or as

- OK signal: permanent signal that is interrupted when an error is detected

The following messages can be evaluated by a relay or a lamp:

- Clock pulse error during the lubrication duration
- Revolution error during the lubrication duration
- Reservoir empty
- System pressure too high

Connect the relay or lamp at the yellow marked plug-type connection M12x1. These parts and also the cable are not included in the delivery.

The EP-tronic is by default set to error signal. You can change the setting to OK-signal with the diagnosis software BEKA-DiSys.

9 Start-up and Operation

Please check the following before you start up the product:

- Clean environment
- Reservoir filled with suitable lubricant, refer to [Lubricants \(7.4: Lubricants\)](#) [► 24]
- Lubrication system vented, refer to [7.6: Vent the lubrication system](#) [► 27]
- Direction of rotation check as follows:

Direction of rotation check

Compare the direction of rotation of the paddle with the directional arrow on the level sticker. If the direction of rotation is wrong, check the electrical connections and change them if necessary.

NOTICE



Wrong direction of rotation

Operation with the wrong direction of rotation will result in damage of motor and the product.

10 Maintenance

WARNING



Risk of burns due to hot surfaces

- a) Check the surface temperature of the product.
- b) Wear heat-resistant gloves.

Before any maintenance work or repair, do the following:

- 1) Disconnect the product from voltage.
- 2) Depressurize the product.
- 3) Put the product at standstill.
- 4) Make sure the product cannot be restarted during maintenance.
- 5) Clean soiled or contaminated surfaces. Wear protective equipment if necessary.

10.1 General Maintenance

Preventive maintenance

Regular inspections and maintenance are essential to ensure optimal performance and longevity of the product.

- Keep to the inspection intervals. Groeneveld-BEKA recommends to replace wear parts as listed in the table.

NOTICE



Maintenance intervals

Independent from the listed intervals for inspection and maintenance, define the specific intervals according to the operating conditions.

- a) Review the specified intervals regularly.
- b) Ensure that safety and function of the product are not affected if you adjust intervals.

- Read also the log files of errors and warnings as part of the maintenance work.

Operation	Interval					
	1 month	3 months	1 year	2 years	5 years	8-10 years
Check lubricant quantity and refill if necessary		X				
Check lubricant and compressed air lines		X				
Check visually the fastening of all parts of the lubrication system		X				
Function test		X				
Clean the lubricant lines with oil			X			
Proximity switch					X	
Pump element					X	
Replace the pump base body and seals						X
Replace seals of reservoir cover						X
Replace hoses						X

Extraordinary Maintenance

Do not carry out any extraordinary maintenance task. Only qualified personnel of Groeneveld-BEKA is authorized to carry out extraordinary maintenance.

10.2 Lubricant change

NOTICE



Pay attention to utmost cleanliness when filling lubricant.

- Carry out the lubricant change according to the specifications of the lubricant manufacturer.
- Ambient influences like temperature or pollution might effect the recommended intervals.
- Only use lubricants which are suitable for the product, the machine and the operational conditions.
- Ensure that the lubricant quality is the same as of the previously used lubricant.
- Drain and clean the reservoir even with good compatibility of the lubricants.

11 Cleaning

Basics

Clean the product regularly to ensure proper function.

Only use cleaning detergents that do not damage the product.

Interior cleaning

You need to clean the inside of the product only if incorrect or contaminated lubricants accidentally enters the product. Please contact Groeneveld-BEKA for assistance.

Exterior cleaning

WARNING



Risk of electric shock

- a) Switch off electrical power supply.

Make sure no cleaning fluid enters the interior of the product during cleaning.

Mind the IP rating of the product when cleaning.

12 Troubleshooting

12.1 General Troubleshooting

Error	Possible cause	Possible troubleshooting
Product does not operate	Fuse defective	Replace fuse
	Electrical line interrupted	Replace electrical line
	Product defective	Replace product
Product operates, but does not deliver	Air bubbles in the delivery piston	Vent the product
	Air bubbles in the reservoir	Vent the product
	Reservoir empty	Fill reservoir
	Pump element defective	Replace pump element
No lubricant collar at all lubrication points	Product does not operate	See error "Product does not operate"
	Lubrication system blocked	See error "Lubricant leakage at the pressure limiting valve"
No lubricant collar at some lubrication points	Supply lines to secondary distributors burst or leaky	Replace lines
	Screw connections leaky	Retighten or replace screw connections
Speed of product reduced	High system pressure	Check lubrication system / lubrication points (no damage)
	Supply voltage too low	Check supply voltage
Lubricant leakage at the pressure limiting valve	System pressure too high	Check lubrication system
	Progressive distributor blocked	Replace progressive distributor
	Lubrication system blocked	Repair blocked / fixed lubrication point
	Valve spring broken	Replace pressure limiting valve
Level monitoring signals although the reservoir is full	Level monitoring defective	Replace level monitoring
	Level monitoring not correctly connected	Check connection of level monitoring, change if necessary

Error	Possible cause	Possible troubleshooting
Product does not operate	Fuse defective	Replace fuse
	Electrical line interrupted	Replace electrical line
	Product defective	Replace product
	Integrated control unit defective	Replace integrated control unit
Product operates, but does not deliver	Air bubbles in the delivery piston	Vent the product
	Air bubbles in the reservoir	Vent the product
	Reservoir empty	Fill reservoir
	Pump element defective	Replace pump element
	Integrated control unit defective	Replace integrated control unit
No lubricant collar at all lubrication points	Product does not operate	See error "Product does not operate"
	Lubrication system blocked	See error "Lubricant leakage at the pressure limiting valve"
	Lubrication duration (product operation time) too short	Extend lubrication duration
	Cycle time too long	Reduce cycle time
No lubricant collar at some lubrication points	Supply lines to secondary distributors burst or leaky	Replace lines
	Screw connections leaky	Retighten or renew screw connections

Speed of the product reduced	High system pressure	Check lubrication system / lubrication points (no damage)
	Supply voltage too low	Check supply voltage
Lubricant leakage at the pressure limiting valve	System pressure too high	Check lubrication system
	Progressive distributor blocked	Replace progressive distributor
	Lubrication system blocked	Repair blocked / fixed lubrication point
	Valve spring broken	Replace pressure limiting valve
Level monitoring sends a signal although the reservoir is full	Level monitoring defective	Replace level monitoring
	Level monitoring incorrectly connected	Check connection of level monitoring, change if necessary
Error "level too low" is displayed, although no level monitoring is installed	Level monitoring is activated in the integrated control unit	Deactivate level monitoring in the control with the help of the diagnostic software BEKA-DiSys
LEDs in the inspection window of the integrated control unit flash (see Signal indicators)	Product operates	No error
	Cycle error in operating mode time – dependent lubrication duration	Check external signal transmitter and connected cable, replace if necessary Reset error with intermediate lubrication
	Error "level too low"	Fill reservoir
	Error "system pressure too high"	Check lubrication system, repair if necessary Reset error with intermediate lubrication
	Revolution error in operating mode revolution – dependent lubrication duration	Check lubrication system or product, repair if necessary Reset error with intermediate lubrication
Product functions (operating mode, cycle time or lubrication duration) do not match with the values set at the control unit	Operating mode or setting range of the integrated control unit have been changed, but the sticker in the inspection window of the protective housing not	Use diagnostic software BEKA-DiSys and adjust the settings accordingly or exchange the sticker in the inspection window

12.2 Signal indicators

Signal indicators BEKA-troniX1:

Signal indicators		Function
LED red	ON	Signals standby when voltage is switched on for the first time
	OFF	
LED green	ON	One lubrication cycle
	OFF	
LED red	ON	Error "level too low"
	OFF	
LED green	ON	Error "system pressure too high"
	OFF	
LED red	ON	Revolution error in operating mode revolution-dependent lubrication duration
	OFF	
LED green	ON	Error "CPU / memory"
	OFF	
LED red	ON	Test lubrication (continuous lubrication)
	OFF	
LED green	ON	For mode time-dependent lubrication duration: Set the lubrication duration higher than the cycle time to trigger continuous lubrication
	OFF	

Signal indicators EP-tronic:

Signal indicators			Function
LED red	ON	<div>Ready for operation 1,5 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>During the entire lubrication</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>Until lubricant is refilled</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>0,5 s 0,5 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
			Test lubrication (continuous lubrication)
LED red	ON	<div>1 s 1 s</div>	
	OFF		
LED green	ON		
	OFF		
			For mode time-dependent lubrication duration: Set the lubrication duration higher than the cycle time to trigger continuous lubrication

13 Annex

13.1 Pump element PE-120

13.1.1 Product description

PE-120 without pressure limiting valve

This pump element is used in piston pumps with mechanically controlled piston (desmodromic). The intake and pressure stroke of this pump element is therefore also mechanically controlled. The pump unit drives the pump element via an eccentric ring. It is intended for the conveyance of clean mineral oil and greases up to NLGI-2 without solids content. This pump element supplies the lubrication points either directly or delivers the metered lubricant to distributors.

The PE-120 flow rate is set to 0,12 cm³/stroke and cannot be adjusted.

DANGER



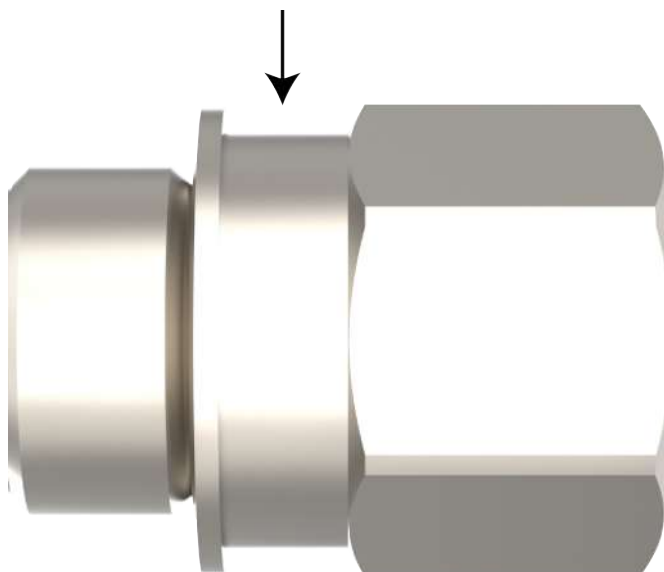
Unsecured lubrication circuit

System parts under high pressure

For the PE-120 without pressure limiting valve you must secure the connected lubrication circuit by an external pressure limiting valve with an opening pressure of max. 290 bar.



The PE-120 is part of a series of pump elements PE-60, PE-120 and PE-170. As a marking, the PE-120 is without an additional groove.



PE-120 with pressure limiting valve

This pump element provides an integrated pressure limiting valve.

Maximum pressure is set to 290 bar.

The PE-120 with pressure limiting valve flow rate is set to 0,12 cm³/stroke and cannot be adjusted.



This pump element is further available with micro switch attached to the pressure limiting valve. With this micro switch you can monitor the maximum operating pressure in the lubrication system.

13.1.2 Technical Data

Metering volume	0,12 cm ³ / stroke
Pressure max.	350 bar
Pressure limiting valve	with or without
Pressure limiting valve adjusted to	290 bar
Lubricant	Grease: up to NLGI - 2 Oil: Mineral from 40mm ² /s (cSt)
Pressure outlets	pipe outlet Ø6, Ø8, Ø10, G 1/4
Surface	ZnNi – DIN EN ISO 9227 >700h

13.1.3 Pump element installation

Installation

If your pump element is without an integrated pressure limiting valve, please proceed as follows

⚠ CAUTION



Installation and removal only at complete standstill.

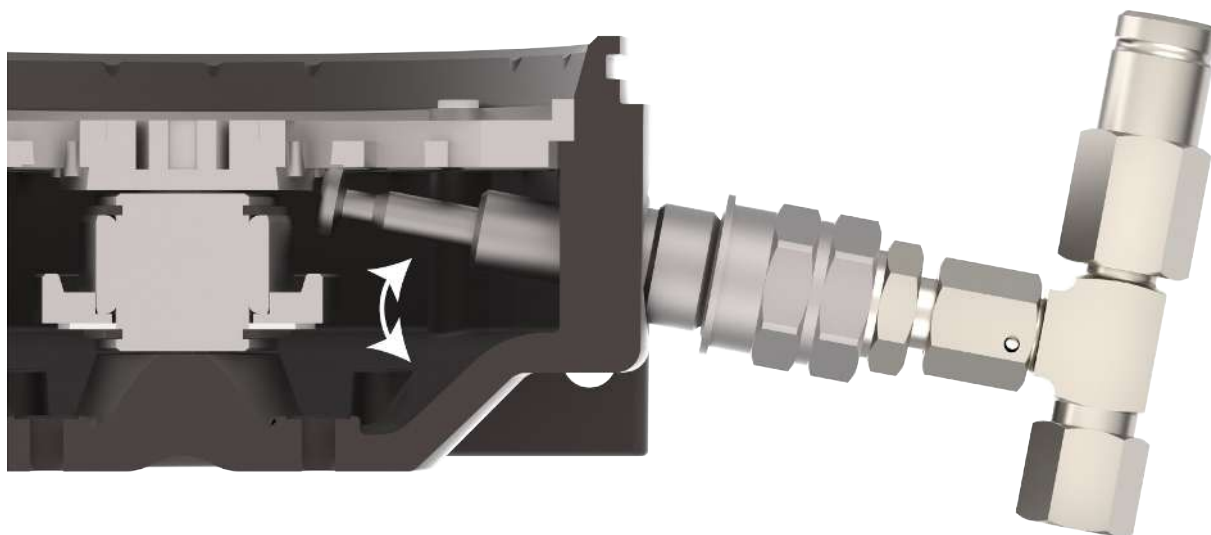
- 1) Ensure that the paddle is opposite to the position where you intend to install the pump element.

NOTICE

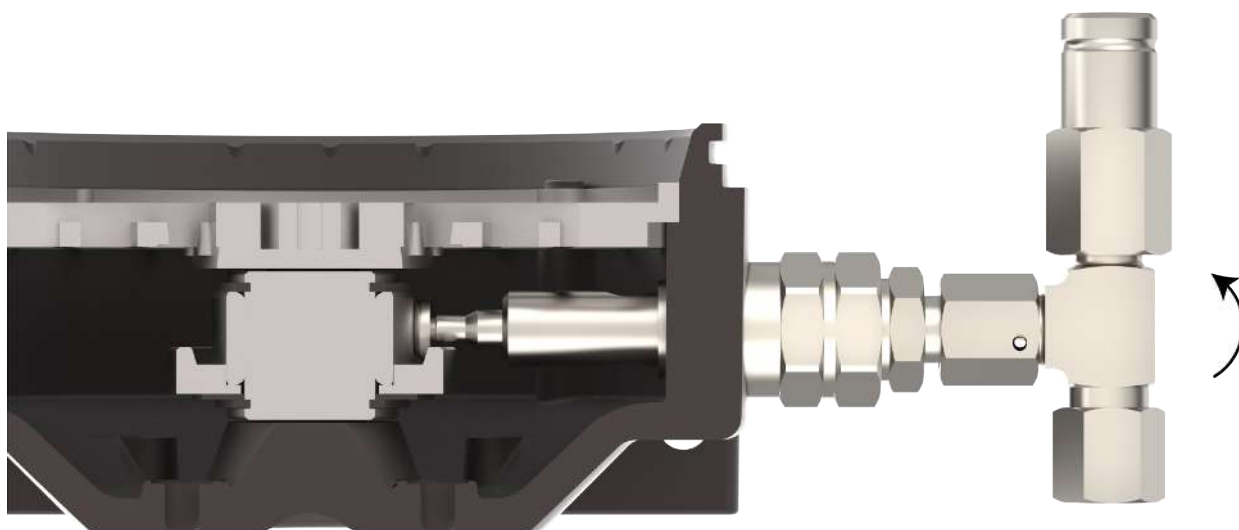


Please pay attention that you install the pump element with the attached sealing ring.

- 2) Pull out the piston partially.
- 3) Insert the pump element into the outlet of the pump housing, holding it at an upward angle.
- 4) Hang the pump element piston in the eccentric ring.



- 5) When the head of the piston rests in the eccentric ring, you can move the pump element to a horizontal position.



- 6) Tighten the pump element manually with $48 \text{ Nm} \pm 10\%$ up to stop position.
- 7) Connect the product to power again and then operate it with open outlets until lubricant comes out free of air bubbles.

Removal

For removal of the pump element proceed as follows:

- 1) Disconnect the product from power supply and secure it against recommissioning.
- 2) Disconnect the line from the relevant pump element.
- 3) Unscrew the pump element a little, holding it tilted downwards during that.

NOTICE



Make sure that the pump element piston does not remain in the pump housing.
Make sure that the sealing ring is removed also. Do not reuse this sealing ring.

Installation and removal of a PE-120 with pressure limiting valve

Your PE-120 is with an integrated pressure limiting valve:

If necessary, remove the pressure limiting valve before installation of the pump element. Then follow the steps as described and attach it to the pump element after installation again with a torque of $30\text{Nm} \pm 10\%$.

The same goes for the removal of a pump element with pressure limiting valve. Unscrew the pressure limiting valve and then follow the steps for removal.

13.1.4 Pressure limiting valve

- By default, the pressure limiting valve is set to a pressure of 290 bar.
- If you need to attach the pressure limiting valve to the pump element, use AF 17 and tighten it with a torque of $30\text{ Nm} \pm 10\%$.
- By default connection for the line is $\varnothing 6$.

Other pressures or connection variants are possible on request.



13.1.5 Micro switch

Monitoring with the micro switch is the electrical solution. It is only possible for the operation with grease.

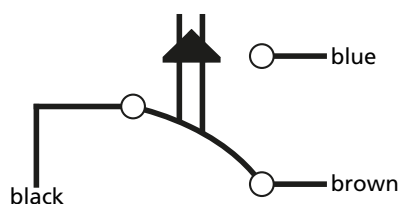
Operate the micro switch as NC or NO contact according to the connection diagram.

The pressure limiting valve will open at a pressure of 290 bar. The switch is actuated in the case of overpressure. This can happen due to a blocked lubrication point, for instance. You can evaluate the signal with e.g. an already available machine control. You have to evaluate the signal in a way that recommissioning is only possible after malfunction remedy.



You can connect the pressure limiting valve with micro switch wither with a loose cable on one side or with a cable and angle connector M12x1.

Connection diagram for loose cable



Connection diagram for angled plug M12x1



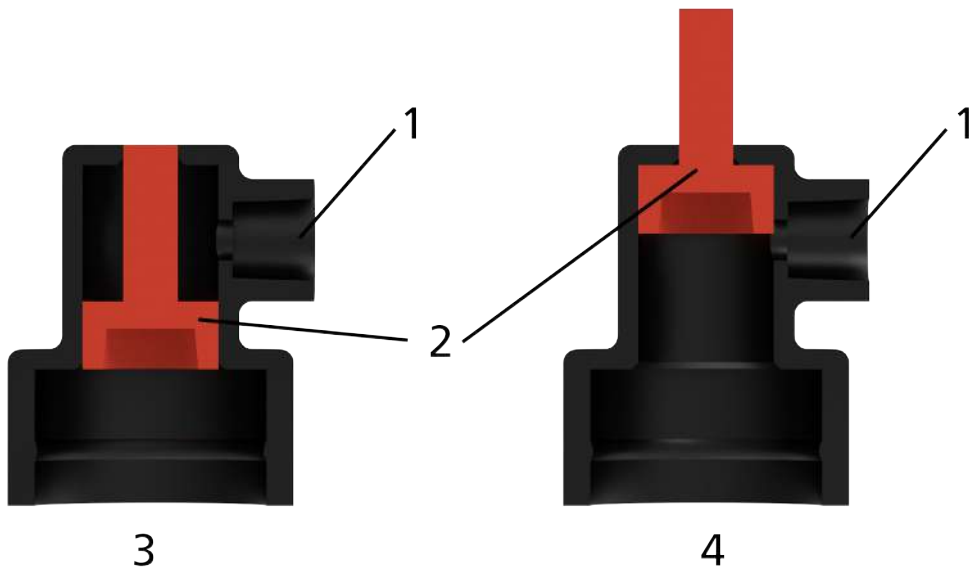
13.1.6 Indicator pin

Monitoring with the indicator pin is the mechanical solution. It is only possible for the operation with grease.

The pressure limiting valve will open at a pressure of 290 bar and the indicator pin in the cap will be extracted by the escaping grease. You have to push back the pin manually after troubleshooting.

You have received the indicator pin either already attached to the pump element or you can easily put it on the pressure limiting valve.

Simply install a return connection to the pump reservoir in order to return the grease flowing out.



1	Return connection
2	Indicator pin
3	Function OK
4	Error

13.1.7 Lubricants

Lubricant	Grease: up to NLGI - 2 Oil: Mineral from 40mm ² /s (cSt)
-----------	--

- Use lubricants with high-pressure additives.
- Use only lubricants of the same saponification type.
- Comply with the lubricant specifications of the machine manufacturer.
- Comply with the safety data sheet of the lubricant manufacturer. Keep the safety data sheet of the used lubricant on hand.

NOTICE



The lubricant flow changes with the operating temperature.

13.1.8 Start-up and operation

Before starting up the product, please make sure of the following:

- the environment is clean
- pump elements are fitted correctly
- pump elements are vented

WARNING



High-pressure

If your pump element is equipped with a pressure limiting valve, lubricant might flow out at the pressure limiting valve under high pressure.

- a) Wear safety goggles.
- b) Relief the system from pressure before any work.
- c) Do not stay in the area of the pressure limiting valve if there is an error signalled.

13.1.9 General Maintenance

The product lifespan depends on the lubricant used and the environment.

If the pump loses pressure and the piston is worn out, you need to replace the pump element.



WEBSITE



CONTACT



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