



# Lubricators

CONCEPT2

User manual



# Foreword

CONCEPT2 lubricators work with minimal quantity lubrication, which ensures the controlled and efficient supply of lubrication points with selected, very high quality lubricants. The lubricators contain highly efficient, microprocessor-controlled piston pumps. Each piston pump has one outlet, which allows the pause times between two lubricant deliveries to be set individually for each lubricant outlet. The input and output data are visualised by means of the LCD display on the front face of the device housing.

**Supersedes** This user manual supersedes the current BA 39 and BA 40 publications. BA 39 is no longer applicable as the entire content is now included in this user manual. New content has been added on lubricators with oil as a lubricant.

**Current version** A current electronic version (.pdf) of this user manual can be found at <http://medien.schaeffler.com>.  
Use the search term BA 40.

# Lubricators CONCEPT2

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# Lubricators CONCEPT2

**About the user manual** This user manual is part of the product:  
■ Keep for future reference

**Symbols** The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.



In case of non-compliance, death or serious injury may occur. <



In case of non-compliance, minor or moderate injury may occur. <



In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur. <


## Device variants

**A** CONCEPT2-2P

**B** CONCEPT2-2P-24VDC


**C** CONCEPT2-2P-OIL-24VDC

## Control

 Time control

 Pulse control

**Mandatory signs** The mandatory sign is defined in accordance with DIN 4884-2 and DIN EN ISO 7010.

 Use safety goggles

**Availability** A current electronic version (.pdf) of this user manual can be found at <http://medien.schaeffler.com>.  
Use the search term BA 40.

|   |   |
|---|---|
| <b>Legal guidelines</b>                         | The information in this manual corresponded to the most recent status at the close of editing. The illustrations and descriptions cannot be used as grounds for any claims relating to devices that have already been delivered. Schaeffler Technologies AG & Co. KG accepts no liability for any damage or malfunctions if the device or accessories have been modified or used in an inappropriate manner.  |
| <b>Original user manual</b>                     | The original user manual is taken to be a user manual in the German language. A user manual in another language is to be taken as a translation of the original user manual.  |
| <b>General safety guidelines</b>                | Any person working with the lubricator must read this chapter and observe the guidelines.   |
| <b>Usage for the intended purpose</b>           | The intended use of the lubricator is to supply rolling bearings that are installed in machines with grease or oil. A lubricator may only be used in accordance with the technical data, see page 46.   |
| <b>Usage not for the intended purpose</b>       | The device may not be used in or on vehicles.<br>The device may not be used in environments with an explosion risk.<br>The device must not be converted.  |
| <b>Selection and qualification of personnel</b> | The device may only be mounted, commissioned, operated and maintained by qualified personnel. The scope of competence, area of responsibility and monitoring of personnel must be precisely regulated by the site operator.<br>A person defined as qualified personnel: <ul style="list-style-type: none"> <li>■ has all the necessary knowledge</li> <li>■ is aware of all the hazards and safety guidelines</li> <li>■ has read and understood this user manual</li> </ul> If personnel do not possess the necessary knowledge, they must be given the necessary training and instruction. Upon request, Schaeffler can offer appropriate training courses. |

## Lubricators CONCEPT2

- Warning notice** Prevent any interference in or modifications to the device, or the addition or removal of components that are not intended for the device, as this will compromise occupational safety and invalidate any warranty claims.
- Before mounting the device, check for any external damage. If damage or some other defect is found, the device must not be commissioned.
- Ensure that any unused outlets on the device remain open.
- You may only install the device if you are a qualified electrician.
- Ensure that the device is disconnected from the power supply and in a voltage-free state before carrying out any wiring work and opening or closing electrical connections.
- Carry out the installation in accordance with the national and international regulations covering the installation of electro-technical equipment.
- You may only operate the device within the limits described in the technical data. If the device is operated outside these limits, it may be destroyed.
- Always use original replacement parts from Schaeffler Technologies AG & Co. KG for repairs.
- Only dismount the device when it is disconnected from the power supply and in a voltage-free state.
- Wear safety goggles at all times when handling the device.



- Safety specifications** All important safety specifications are described in the following sections.
- Transport** Do not throw the device and avoid exposure to severe shocks.
- Storage** To avoid promoting corrosion, the following ambient conditions must be ensured:
- humidity max. 65%, non-condensing
  - no aggressive chemicals in the environment
  - temperature from +5 °C to +40 °C
- The storage period in an unopened condition is a maximum of two years.
- Mounting** To avoid condensation, the mounting location must be selected so that the device is kept away from direct sunlight or direct radiated heat.
- The device may only be mounted and connected by a qualified professional in compliance with accident prevention regulations.
- Work on electrical devices** When making connections to an electrical device, the following must be observed:
- connection to the power supply only by qualified electricians
  - correct wiring of the electrical components of the device
  - comparison of the voltage data with the available mains voltage

# Lubricators CONCEPT2

**Firefighting** Extinguish burning grease using approved extinguishing agents only, such as powder, foam or carbon dioxide. Attempting to extinguish a grease fire with water will create a life-threatening darting flame.

**Maintenance and repair** The device may only be maintained and repaired by a qualified professional in compliance with accident prevention regulations. Wear safety goggles at all times when handling the device.  
The device must be placed in a voltage-free state before starting repair work. All maintenance and repair work must be carried out when the device is completely shut down.  
During maintenance and repair work, the device must be secured against intentional or unintentional recommissioning.  
If any safety devices must be removed during maintenance or repair, these must be refitted once the work is complete and their function must be checked.

**Troubleshooting and rectification** Troubleshooting and rectification may only be carried out by qualified professionals and in compliance with accident prevention regulations. Wear safety goggles at all times when handling the device.

**Disposal** Lubricators and lubricant-soaked materials must be disposed of by environmentally acceptable methods.

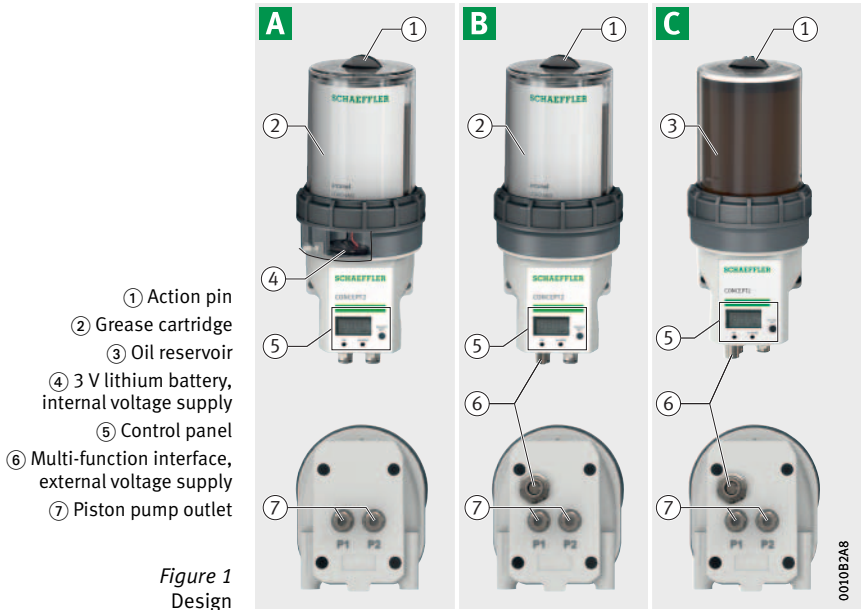
Electronic devices must be disposed of in accordance with the relevant regulations.

**Conversion** The device must not be converted.

In order to comply with directives on electromagnetic compatibility (EMC), the electrical installation (cables, shielding) must not be changed.

**Description** The lubricator is suitable for minimal quantity lubrication with grease or oil.

**Design** The device has a die-cast aluminium housing, which contains the microprocessor-controlled piston pumps and the electronic control unit. There are device variants that differ in terms of the type of control, lubricant and voltage supply.



Minimum quantity lubrication ensures the controlled and efficient supply of a lubrication point with selected, very high quality lubricants.

# Lubricators CONCEPT2

## Features of the device variants

| Feature  | A | B | C |
|--|---|---|---|
| Time control<br>(internal pump control)                                | ● | ● | ● |
| Pulse control<br>(external pump control, via multi-function interface) | – | ● | ● |
| Grease<br>(replaceable cartridge, 250 cm <sup>3</sup> )                | ● | ● | – |
| Oil<br>(built-in oil reservoir, 280 cm <sup>3</sup> )                  | – | – | ● |
| Internal voltage supply,<br>DC 3 V (battery)                           | ● | – | – |
| External voltage supply,<br>DC 24 V (multi-function interface)         | – | ● | ● |

Symbols for device variants, see page 4.

### Control

The piston pumps can be controlled internally (time control). If a lubricator has a multi-function interface on the underside, it can be operated using an external controller (pulse control).

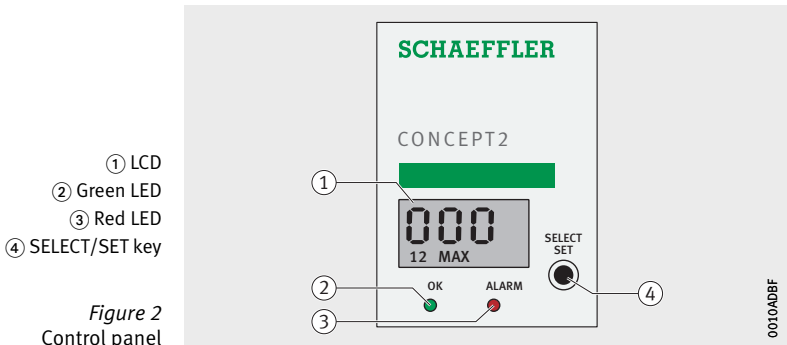
### Voltage shutoff

If the voltage is switched off, the device stops and saves the current settings. At restart, for example due to power up, the device continues to work with the saved settings.

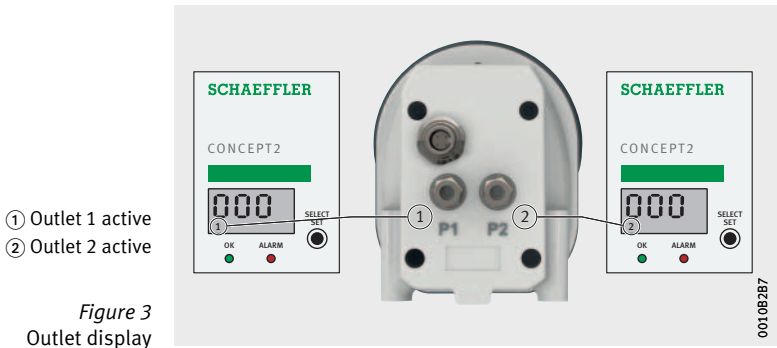
- Lubricant** Two device variants deliver the lubricant from a replaceable grease cartridge. One device variant delivers the lubricant from a built-in oil reservoir.
- Grease cartridge** The grease is supplied in cartridges. A grease cartridge cannot be refilled. Special empty cartridges are the exception to this. The responsibility for using reusable empty cartridges and refilling the cartridges with suitable grease lies with the operator.
- Oil reservoir** The oil reservoir is permanently installed and is filled from above after removing the action pin.
- Action pin** A magnet is fixed by adhesive into the tip of the action pin. This actuates the SELECT/SET key, see page 21.

# Lubricators CONCEPT2

**Control panel** The control panel consists of several elements, *Figure 2*. The liquid crystal display (LCD) shows the system pressure, the active outlet or an error message. The LEDs display the general status. The SELECT/SET key is used to switch between time control and pulse control and the parameters for time control are entered.



**Outlets** The device has two piston pumps. Each piston pump has one outlet, The active outlet is shown on the display.



In order to supply several lubrication points with lubricant via one outlet, splitters can be connected.

Information on suitable accessories can be found in TPI 252, Lubricators for grease and oil lubrication .

**Voltage supply** One device variant is supplied with voltage by a replaceable battery. For two device variants, voltage is supplied via the multi-function interface.

**Battery** A lubricator without a multi-function interface is supplied with voltage by means of a non-rechargeable 3 V lithium battery. This battery must be replaced every time the cartridge is changed.

**Multi-function interface** The 4 pin connector with an external thread M12×1 (communication interface and power supply) is connected to the socket on the lubricator.



*Figure 4*  
Multi-function interface,  
4 pin plug

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# Lubricators CONCEPT2

## Scope of delivery and accessories

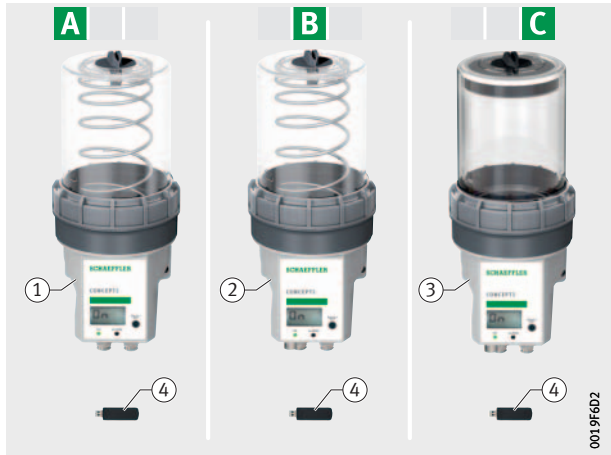
In order to obtain a complete system capable of operation, a lubricant cartridge and accessories must also be ordered in addition to the lubricator.

Information on the available accessories can be found in TPI 252, Lubricators for grease and oil lubrication

<https://www.schaeffler.de/std/1F84>

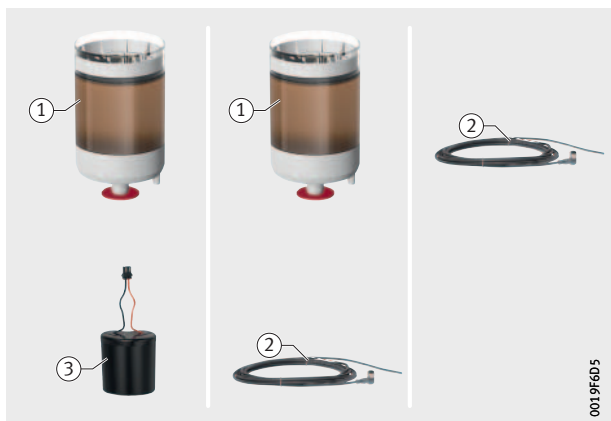
- ① Lubricator CONCEPT2-2P
- ② Lubricator CONCEPT2-2P-24VDC
- ③ Lubricator CONCEPT2-2P-OIL-24VDC
- ④ User manual on USB memory stick

Figure 5  
Scope of delivery



- ① Grease cartridge LC250
- ② Connection cable
- ③ 3 V lithium battery

Figure 6  
Required accessories for a complete system capable of operation





**Transport and storage** The packaging does not protect the product against damage during transportation.

**NOTICE**

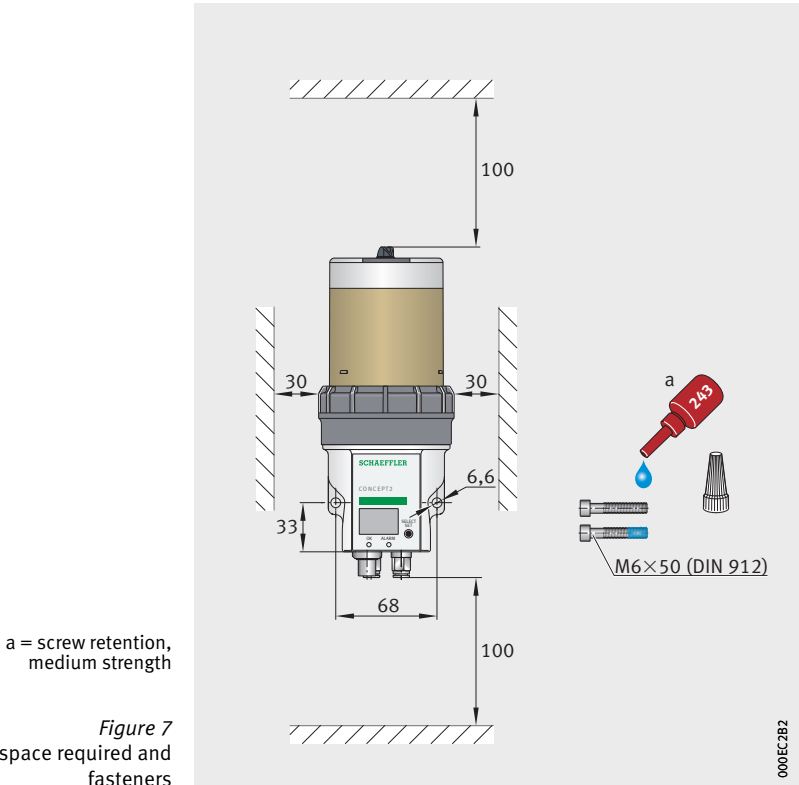
The electronics and plastic parts may be damaged or destroyed by strong vibrations. Avoid dropping the device and exposure to severe shocks. <

To avoid promoting corrosion, the following ambient conditions must be ensured during storage:

- humidity max. 65%, non-condensing
- no aggressive chemicals in the environment
- temperature from +5 °C to +40 °C

# Lubricators CONCEPT2

**Mounting** The illustrated fasteners should be used. The fasteners are not included in the scope of delivery.  
For the dimensions of the device, see page 48.



► Mount the lubricator as close as possible to the lubrication points.

Information on the length of the lubricant lines can be found in TPI 252, Lubricators for grease and oil lubrication .

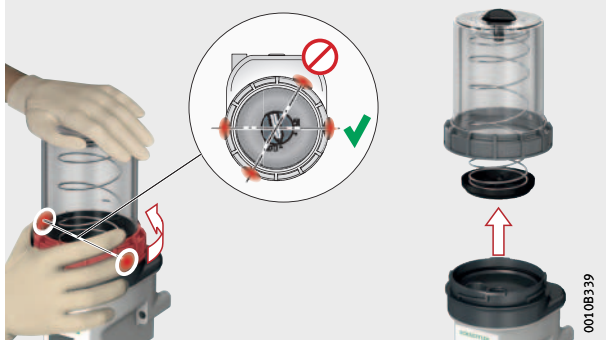
**Commissioning** During commissioning, the lubricator is filled with lubricant and bled. The power supply is also available.

**NOTICE** Compressed air can damage the seals and introduce contaminants into the lubricator. Use brushes and cloths to clean the parts. <

**Removing the upper housing part**

**A B**

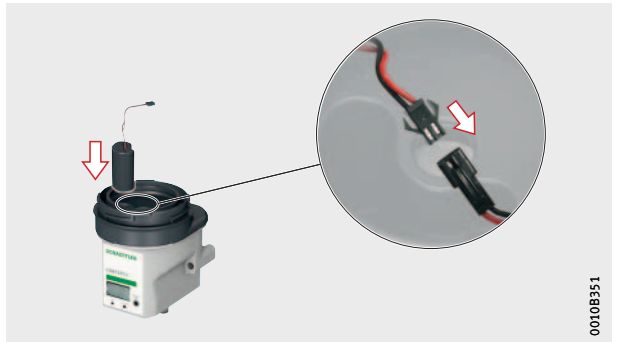
**NOTICE** If contaminants enter the lubricator, the piston pumps will be damaged. Clean the upper housing part prior to detaching, if contaminated. <



*Figure 8*  
Removing the upper housing part

**Fitting and connecting the battery**

**A**



*Figure 9*  
Fitting and connecting the battery

# Lubricators CONCEPT2

## Fitting the grease cartridge

**A** **B**

**NOTICE**

If contaminants enter the lubricator, the piston pumps will be damaged. Clean the grease cartridge prior to insertion, if contaminated. <



Figure 10

Fitting the grease cartridge

## Mounting the upper housing section

**A** **B**

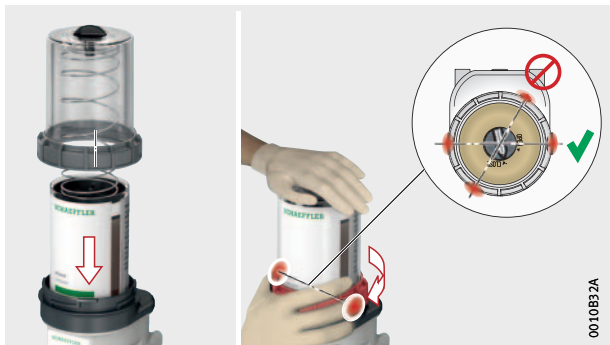
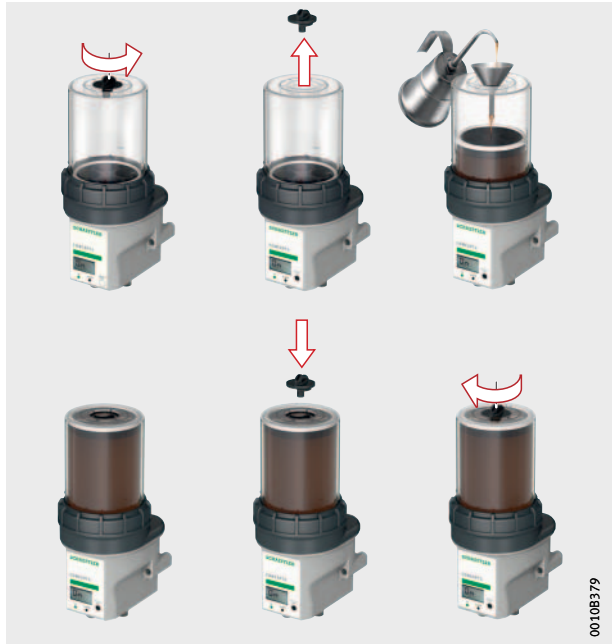


Figure 11

Mounting the upper housing section

## Filling the oil reservoir



*Figure 12*  
Filling the oil reservoir

# Lubricators CONCEPT2

## Connecting the connection cable



The connection cable can transmit the supply voltage and control signals.

**NOTICE**

A defective connection cable can damage the device. Replace a defective connection cable immediately. <

**NOTICE**

Failure to observe the safety regulations may result in damage to the device. Ensure that all electrical connection work is carried out exclusively by qualified personnel who observe the safety regulations. <

**NOTICE**

Exceeding the permissible connection values will cause serious damage to the device. Observe the permissible connection values, see page 46. <

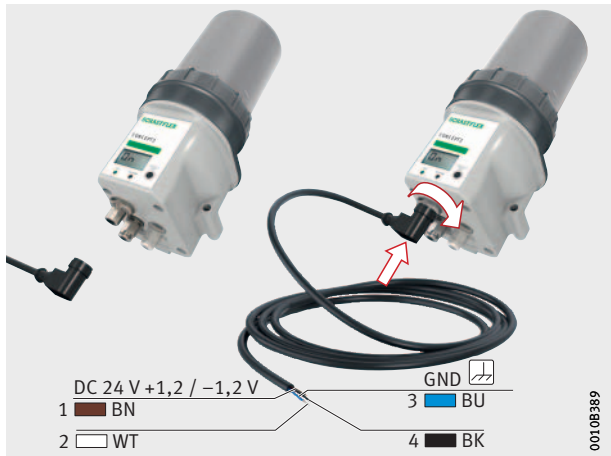


Figure 13  
Connecting the connection cable

### Connector assignment

| PIN | Colour     | Assignment   |
|-----|------------|--|
| 1   | Brown (BN) | Input voltage DC 24 V +1,2/-1,2 V, operating voltage stabilised at DC 24 V |
| 2   | White (WT) | Input signals for controlling the individual pump outputs                  |
| 3   | Blue (BU)  | Output, ground (GND)   |
| 4   | Black (BK) | Output signal  |

Only with original Schaeffler connection cables is the allocation of colour to assignment as specified.

**Operation** Some functions can only be performed with the action pin, even if the lubricator is controlled by PLC. The action pin is located in the upper housing part.

**Action pin** A magnet is fixed by adhesive into the tip of the action pin. This actuates the SELECT/SET key.

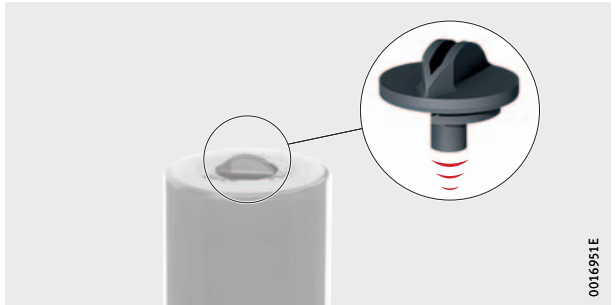


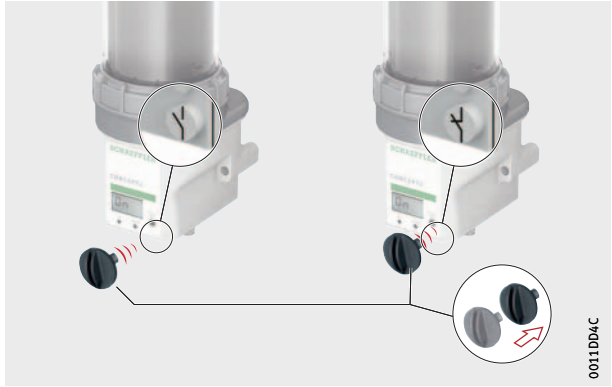
Figure 14  
Action pin



Figure 15  
Removing the action pin

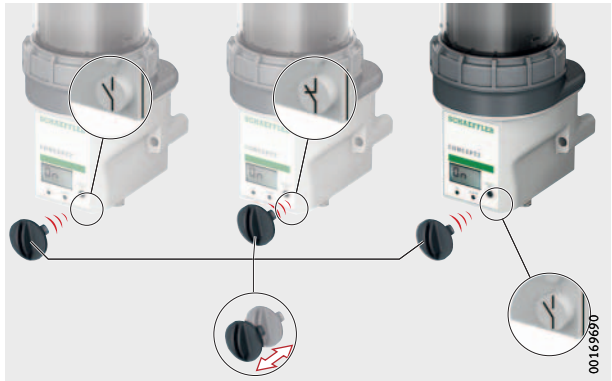
## Lubricators CONCEPT2

If the action pin is held in front of the SELECT/SET marking on the display foil, a magnetically actuated switch is closed.



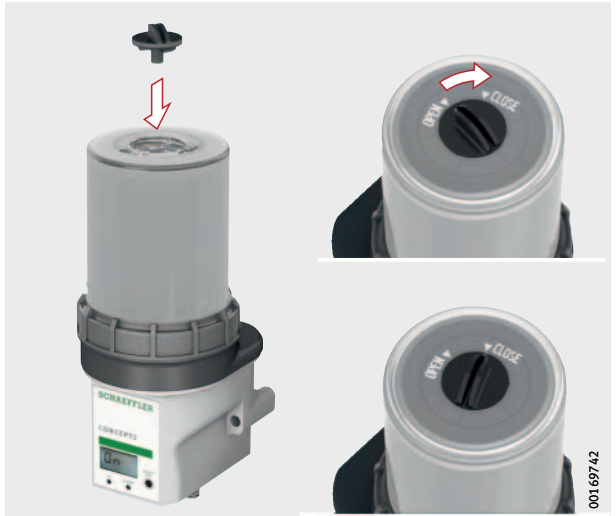
*Figure 16*  
Press continuously

If the action pin is immediately removed again, SELECT/SET can effectively be tapped. This behaviour is helpful when adjusting values.



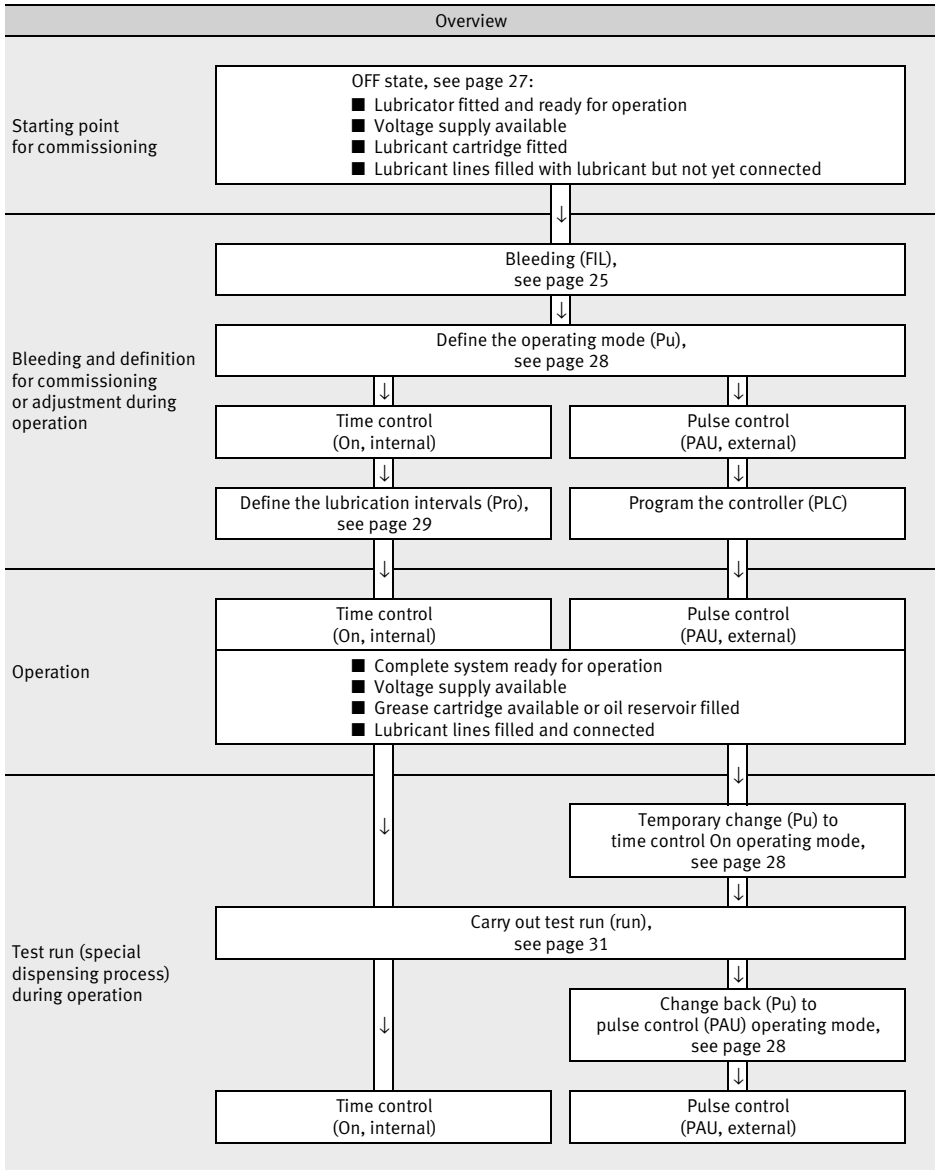
*Figure 17*  
Single tap





*Figure 18*  
Fit the action pin

# Lubricators CONCEPT2



## Bleeding the lubricator



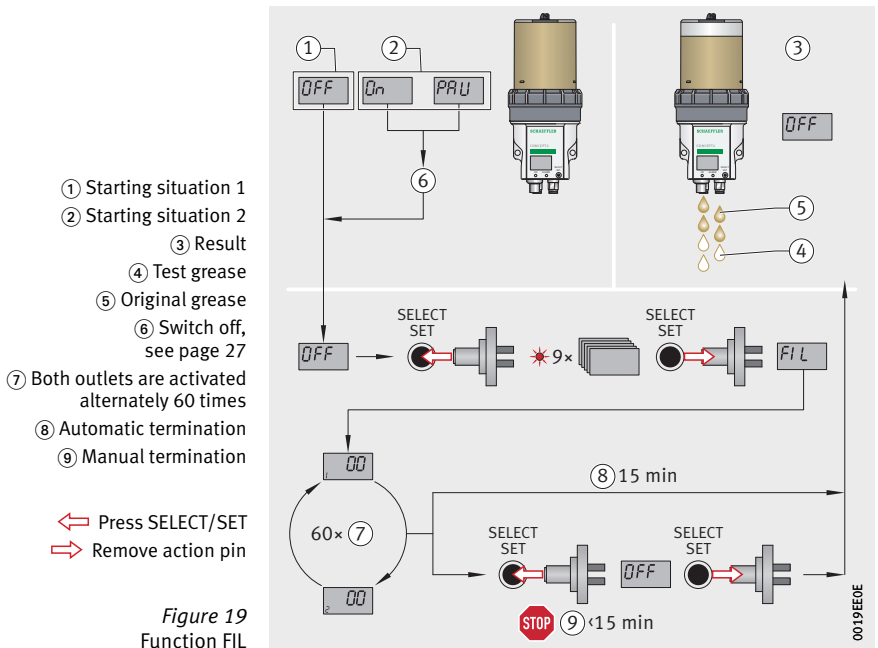
The lubricator must be bled during initial operation. This involves inserting the grease cartridge and then calling up function FIL. Depending on the length of the lubricant line, it may be necessary to call up the function several times.

**Function FIL** During the bleeding process, both outlets are activated alternately 60 times. It is, however, possible to terminate the bleeding process manually prior to this point.

This function is required for:

- initial operation
- bleeding of the pump

For lubricators filled with a test grease, bleeding is complete during initial operation when the original grease emerges.



# Lubricators CONCEPT2

## Switching on the lubricator (On/PAU)

The lubricator can only be switched on if the lubricator is supplied with voltage. After the lubricator has been switched on, the active operating mode (On/PAU) defaults to the mode that was active prior to the lubricator being switched off.

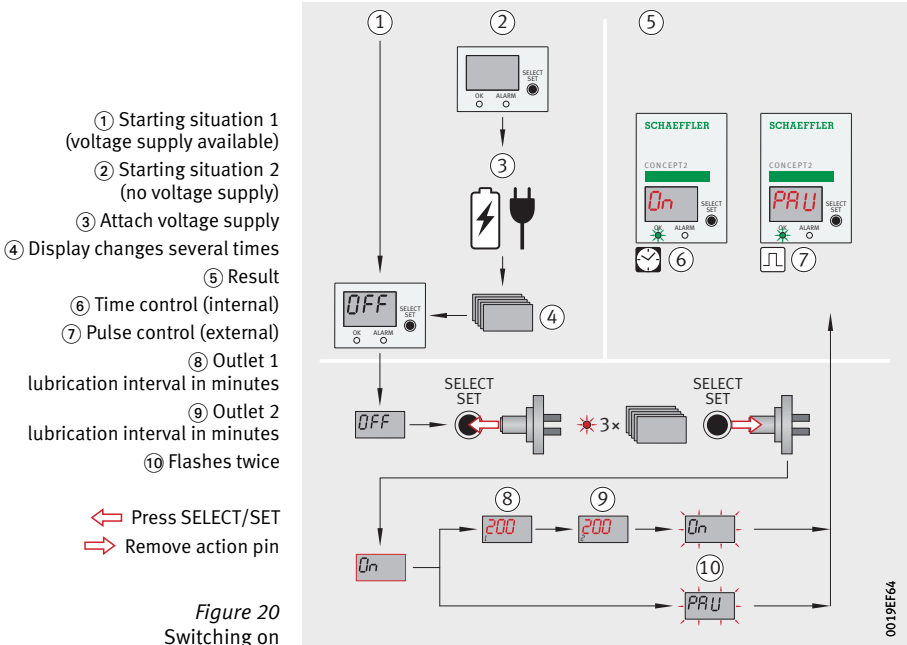


Figure 20  
Switching on

**Switching off the lubricator (OFF)**

The lubricator is switched off (OFF) when no further grease is to be delivered to the lubrication point or when the operating mode is changed.

The operating mode (On or PAU) and the set lubrication intervals are saved.

**Note** In order that the lubrication cycles can be reliably recorded in time control, the voltage must be applied for at least 15 min. For a shorter lubricator runtime, use pulse control.

- ⇐ Press SELECT/SET
- ⇒ Remove action pin

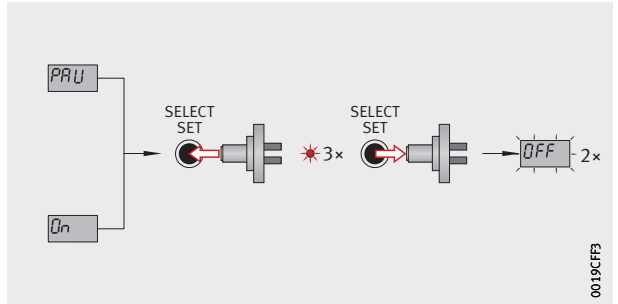


Figure 21  
Switching off from PAU/On

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- ⇐ Press SELECT/SET
- ⇒ Remove action pin

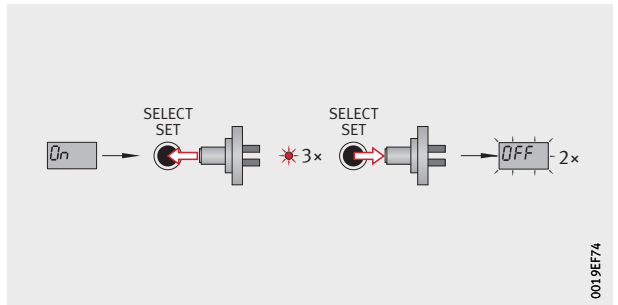


Figure 22  
Switching off from On

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# Lubricators CONCEPT2

## Changing the operating mode



The lubricator can be in one of two operating modes. Depending on the operating mode, the relubrication interval is triggered by an external timer (pulse control) or via an integrated timer (time control).

| Display   | Operating mode | Explanation          |
|-----------|----------------|----------------------|
| On (Pu0)  | Time control   | Internal timer       |
| PAU (Pu1) | Pulse control  | External timer (PLC) |

If the lubricator's voltage supply is linked to the machine's voltage supply, the integrated timer will only be active and relubrication will only take place when the machine is in operation.

**Function Pu** This function is used to change the operating mode.

The operating mode can only be changed when the lubricator is switched off (OFF).

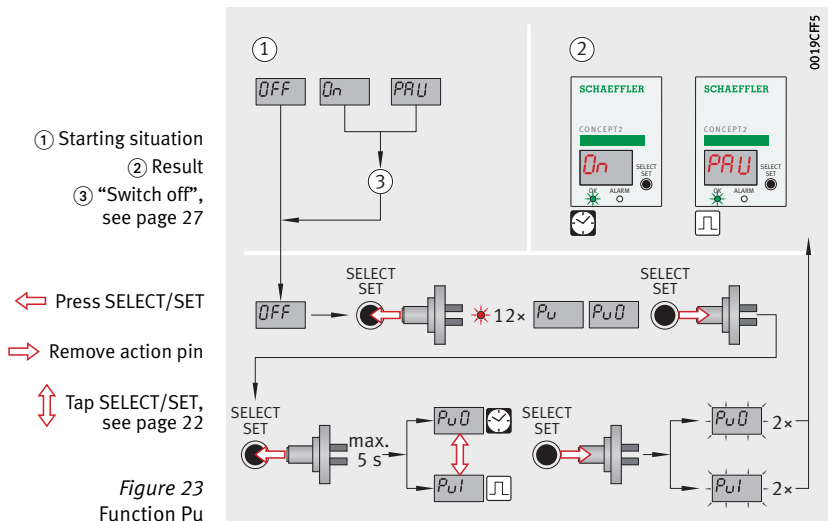


Figure 23  
Function Pu

## Setting the lubrication intervals

Lubrication intervals set directly on the device are only active in the time control (On) operating mode. One lubrication interval can be set for each outlet. Each outlet can be deactivated, in which case “---” is displayed.

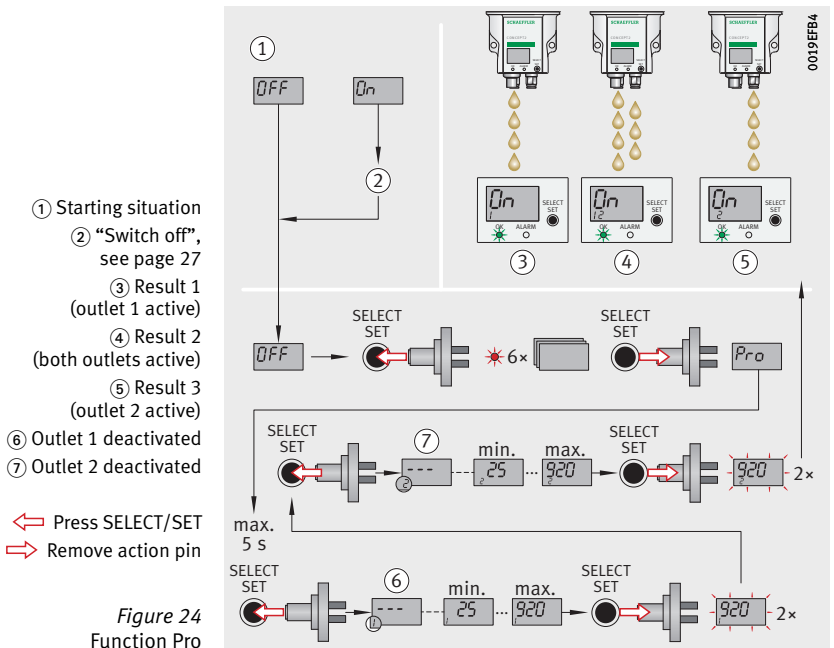
### Default setting

In the delivered condition, the lubricator is set as follows:

- time control operating mode (On)
- both outlets active
- lubrication interval of 300 min for both outlets

### Function Pro

This function is used to set the lubrication interval for each outlet. The step size is 5 min. The range is 25 min to 920 min. Once the set time has elapsed, a lubricant quantity of 0,16 cm<sup>3</sup> is dispensed.



## Lubricators CONCEPT2

**Special dispensing** The special dispensing process permits a test run following a cartridge change or the occurrence of a fault. During special dispensing, the back pressure between the pump and lubrication point is displayed.

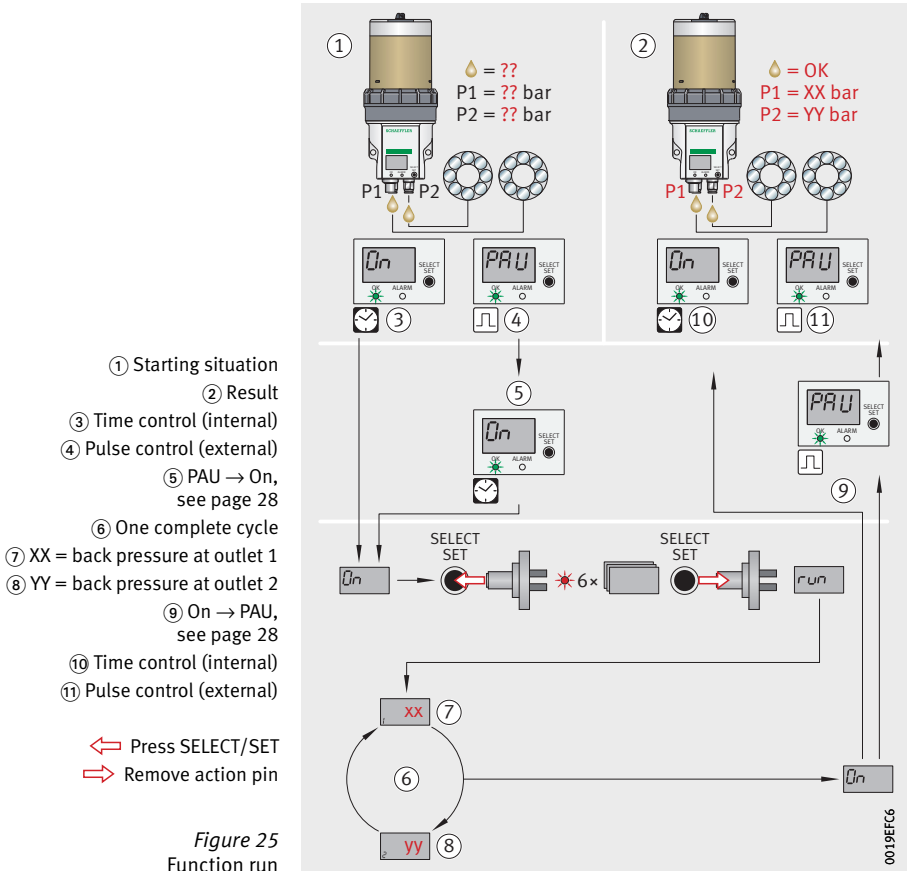
The back pressure is dependent on the type of grease used, the length and cross-section of the line, the ambient temperature and the back pressure at the lubrication point.

**Note** The function run must be executed in the time control (On) operating mode.



**Function run** This function is used to deliver a small quantity of lubricant from both pumps. This allows:

- checking of the pumps
- back pressure checking



## Lubricators CONCEPT2

### External controller (PLC)



The device works with pulse control through the connection of an external controller (PLC). A corresponding program must be created in the PLC to operate the lubricator.

An input and an output must be provided on the control side to integrate the lubricator into an external controller.

Input signals at PIN 2 are transmitted by the controller.

Output signals at PIN 4 can be picked up via HIGH/LOW level for further processing (for example, indicator lights or external controller).

#### NOTICE

Exceeding the output current will cause serious damage to the device. The maximum permissible output current must not exceed  $I_{\max} < 20$  mA. Do not connect an inductive load (for example, relay). <

The lubricator can be switched off completely by shutting off the supply voltage. Once the supply voltage has been reconnected, the device carries out an automatic check and works after receiving an input signal from the PLC.

#### 4 pin plug, connector assignment

Power is supplied via PIN 1 and PIN 3. The PLC must send a control signal to PIN 2. The lubricator transmits signals to the PLC via PIN 4. A signal has one of the following two states:

- HIGH
- LOW



Figure 26  
4 pin plug

#### Connector assignment

| PIN | Colour     | Assignment   |
|-----|------------|--|
| 1   | Brown (BN) | Input voltage DC 24 V +1,2/-1,2 V, operating voltage stabilised at DC 24 V |
| 2   | White (WT) | Input signals for controlling the individual pump outputs                  |
| 3   | Blue (BU)  | Output, ground (GND)   |
| 4   | Black (BK) | Output signal  |

Only with original Schaeffler connection cables is the allocation of colour to assignment as specified.

# Lubricators CONCEPT2

**Input signals at PIN 2** The input signals trigger the lubricant dispensing process. A further input signal can only be sent after a certain pause time. The lubricator only reacts to control signals at PIN 2 in certain operating modes. These operating modes are output via PIN 4 as HIGH/LOW level and must be picked up and processed on the control side.

## Overview of signals

| Input signal     | Description of function |
|------------------|-------------------------|
| 2 seconds signal | Stroke at pump body 1   |
| 4 seconds signal | Stroke at pump body 2   |

**Pulse signal display** While pulse signals are present at input PIN 2, the PAU display will flash.

**Signals for dispensing lubricant** The lubricator only processes defined control signals. The pulse signals for controlling the pump bodies are defined for the following factors:

- are stated in seconds
- accuracy  $\pm 0,1$  s
- pause time between two pulses as a function of the signal

The input signal with a defined signal length (HIGH level) is sent from the external controller to the lubricator. Immediately after the input signal drops, the motor starts running and the defined lubricant quantity is transported to the outlet. At the same time, the device sends a LOW level as an output signal to the external controller while the motor is running.

The lubricator sends a continuous output signal (HIGH level) to PIN 4, which indicates to the external controller that it is ready for operation. The input signal is only registered if the prior output signal was at a constant HIGH level for at least three seconds.

The motor running time is dependent on various conditions, such as the design of the hydraulic system, back pressure and temperature.

For reasons of functional safety, no input signals are detected while the piston pump motors are running if external control by means of a PLC is used.

**Further information** Further information can be found in TPI 252, Lubricators for grease and oil lubrication

**2 seconds signal** The 2 seconds signal triggers a grease dispensing process at the outlet in pump body 1.

- U = voltage
- t = time
- $T_p$  = pause time between two signals
- $T_{fb}$  = optimum query point for successful dispensing of grease
- ML = motor run
- ① Input signal at PIN 2
- ② Output signal at PIN 4

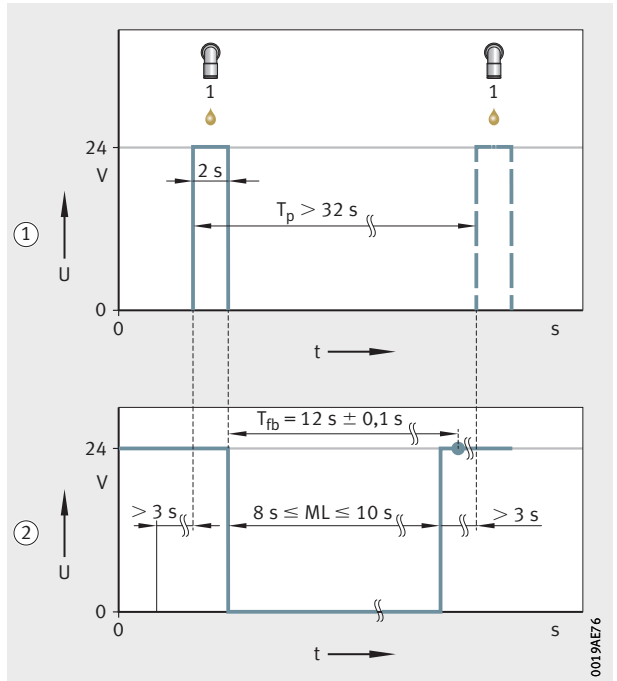
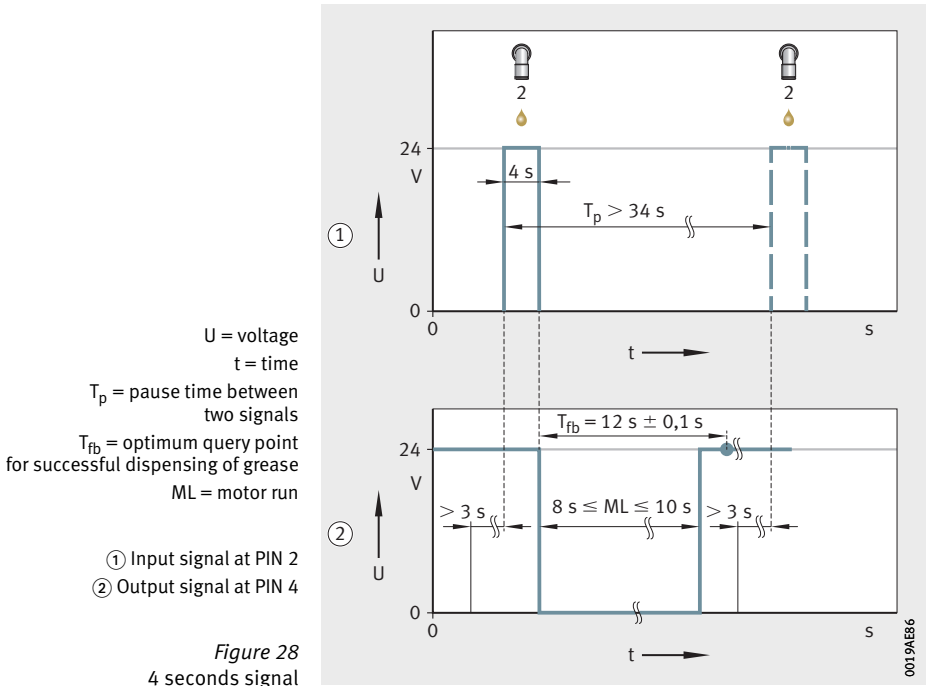


Figure 27  
2 seconds signal

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# Lubricators CONCEPT2

**4 seconds signal** The 4 seconds signal triggers a grease dispensing process at the outlet in pump body 2.

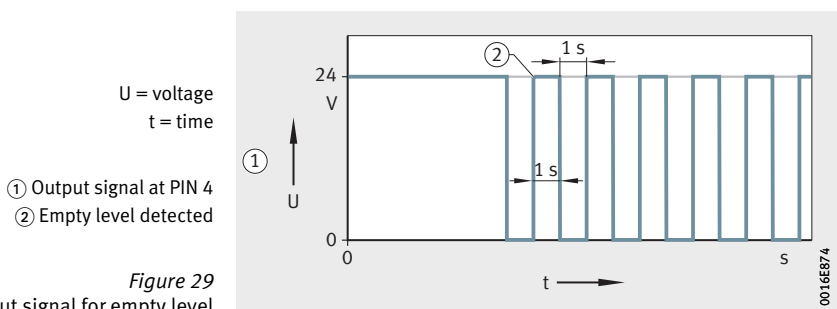


**Output signals at PIN 4** The possible output signals that may be present at PIN 4 are described in, *Figure 29* to *Figure 31*, page 39.  
These signals can be used to diagnose the operating status.

**Overview of signals**

| Output signal   | Status information                   |
|---|--------------------------------------|
| HIGH/LOW level<br>(0,5 Hz square wave signal, continuous) | Empty level                          |
| LOW level<br>(continuous)                                 | Lubricant dispensing<br>unsuccessful |

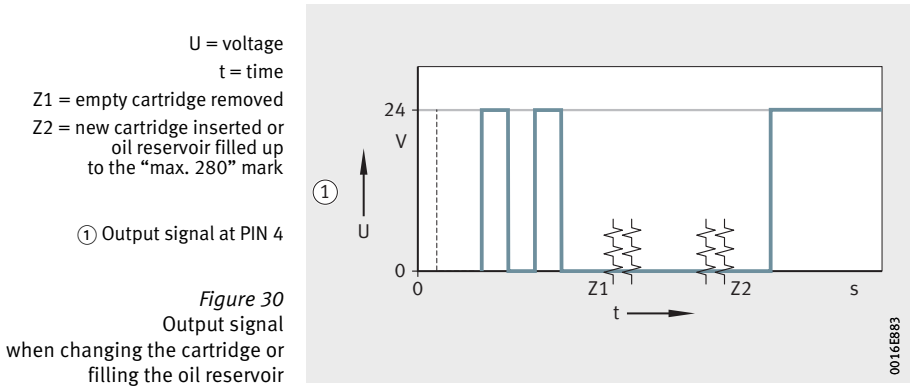
**Empty level** The empty level of the cartridge or oil reservoir is indicated by a 0,5 Hz square wave signal (HIGH/LOW level).  
Once the empty level has been reached, the lubricator will cease to deliver lubricant or process any more control signals. This ensures that no air can enter the lubricator or lubricant lines.



The empty level signal cannot be cleared and continues without interruption until the cartridge is replaced or the oil reservoir is replenished.

## Lubricators CONCEPT2

The transition across the output signals when replacing a cartridge with the lubricator switched on is illustrated as follows, *Figure 30*.

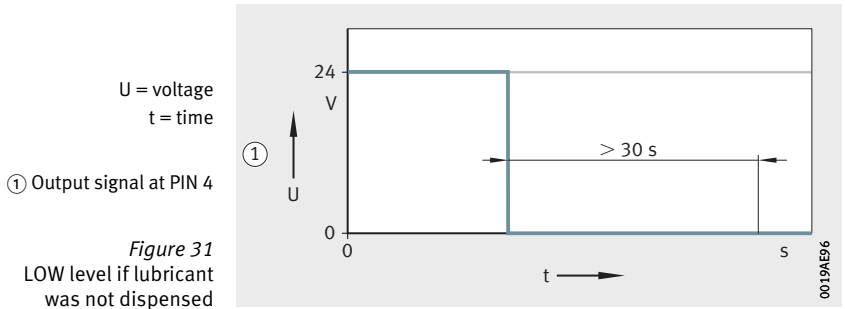


The output signal for the empty level is the 0,5 Hz square wave signal (HIGH/LOW level). At time Z1, when the cartridge is removed, the signal changes to a permanent LOW level. The time Z2 marks the insertion of the new cartridge, from which point a permanent HIGH signal is sent.

For further information on changing cartridges, see page 44.



**Error message** A permanent LOW level indicates that the lubricant was not dispensed successfully.



In the case of a permanent LOW level, the operator must carry out troubleshooting on the device in a defined sequence.

**Feedback function** The motor run control is also referred to as the feedback function. After activation of the outlets, the output signal at PIN 4 is switched for the time of the actual delivery stroke (maximum 15 s per outlet) from HIGH to LOW. The number of confirmed delivery strokes can be used to estimate depletion.

# Lubricators CONCEPT2

## Errors

**Error messages** This chapter describes the error messages and how to rectify them.

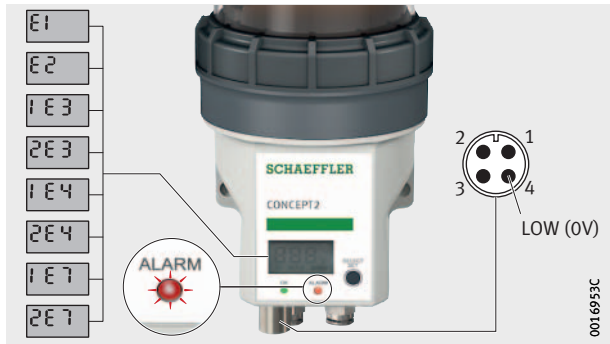


Figure 32  
Error display

**Errors**  
E1, E2, 1E3 and 2E3

| Display  |                       |   |        |
|--|-----------------------|---|--------|
| E1   | E2                    | 1E3   | 2E3    |
| 1)   | 1)                    | 2)  | 2)     |
| Independent of pump  |                       | Pump 1  | Pump 2 |
| Cause  |                       |   |        |
| Empty grease cartridge or oil reservoir                          | No cartridge inserted | Undervoltage  |        |
| Remedy   |                       |   |        |
| Insert a new cartridge or fill the oil reservoir to the maximum. |                       | Insert a new battery or ensure that the voltage supply delivers 300 mA. If the error reoccurs, send the device in for repair. |        |

- 1) Error message is cleared automatically.
- 2) Switch the device off (OFF), then back on (On), to clear the error message.

**Errors**  
1E4, 2E4, 1E7 and 2E7

| Display   |        |   |        |
|---|--------|---|--------|
|   |        |   |        |
| 1)  | 1)     | 1)  | 1)     |
| Pump 1  | Pump 2 | Pump 1  | Pump 2 |
| Cause   |        |   |        |
| Internal electrical defect  |        | Back pressure at the pump was greater than 50 bar three times in succession.                |        |
| Remedy  |        |   |        |
| If the error reoccurs after being cleared, send the device in for repair. |        | Eliminate the blockage at the lubrication point. Reduce the hose length. Use softer grease. |        |

1) Switch the device off (OFF), then back on (On), to clear the error message.

**Troubleshooting and rectification**  
**Continuous LOW level**

The troubleshooting sequence in the event of a permanent LOW level is as follows:

Step ①

Check the voltage supply

Step ②

Dispense lubricant from the device

Step ③

Carry out a manual back pressure measurement of all lubricant lines using a manual grease gun

Step ④

Check lubricant line and lubrication point

① **Power supply**

| Details  | Evaluation  |
|--|---|
| <b>A</b>   | <ul style="list-style-type: none"> <li>■ Voltage values unacceptable? Then restore the supply voltage.</li> <li>■ Voltage values acceptable? Then insert the plug. Clear the error. Perform self-test.</li> <li>■ Successful? Then the error has been eliminated.</li> <li>■ Unsuccessful? Then continue with ②.</li> </ul> |
| ■ Fit new battery.   |   |
| <b>B C</b>   |   |
| <ul style="list-style-type: none"> <li>■ Remove plug.</li> <li>■ Check whether there is a DC 24 V voltage supply.</li> </ul> |   |

# Lubricators CONCEPT2

## Dispensing of grease <sup>②</sup>

| Details  | Evaluation   |
|--|--|
| <ul style="list-style-type: none"> <li>■ Disconnect all lubricant lines from the device.</li> <li>■ Where necessary, switch to the time control (Pu0) operating mode.</li> <li>■ Execute (run) special dispensing process.</li> <li>■ Where necessary, switch back to the pulse control (Pu0) operating mode.</li> </ul> | <ul style="list-style-type: none"> <li>■ Irregular or no discharge of lubricant at the outlets? Then send the device in.</li> <li>■ Regular discharge of grease at the outlets? Then continue with ③.</li> </ul> |

## Manual back pressure measurement <sup>③</sup>

| Details   | Evaluation  |
|---|---|
| <ul style="list-style-type: none"> <li>■ Use manual grease gun with pressure manometer.</li> <li>■ Ensure that the lubricant is identical.</li> <li>■ Slowly feed in the lubricant approx. &gt; 15 s/stroke.</li> </ul> | <b>A</b>  |
|   | <ul style="list-style-type: none"> <li>■ <math>p_{max} &lt; 25 \text{ bar}</math>? Then send the device in.</li> <li>■ <math>p_{max} &gt; 25 \text{ bar}</math>? Then continue with ④.</li> </ul> |
|   | <b>B C</b>  |
|   | <ul style="list-style-type: none"> <li>■ <math>p_{max} &lt; 45 \text{ bar}</math>? Then send the device in.</li> <li>■ <math>p_{max} &gt; 45 \text{ bar}</math>? Then continue with ④.</li> </ul> |

## Lubricant line and lubrication point <sup>④</sup>

| Details   | Evaluation  |
|---|---|
| <ul style="list-style-type: none"> <li>■ Remove any kinks in the lubricant line.</li> <li>■ For grease: Clear any blockages (grease separation = separation of base oil and thickener) due to over-aged grease in the lubricant line and at the lubrication point.</li> </ul> | <ul style="list-style-type: none"> <li>■ Successful? Then the error has been eliminated.</li> </ul> |

**Note** If you are unable to clear the error and eliminate the cause, contact your specialist dealer. For devices with a grease cartridge, the following applies: To avoid compromising warranty claims, only send the lubricator in with the grease cartridge screwed into place.

## Maintenance



In the event of incorrect maintenance and depending on the type of machine or system involved, there is a risk of accidents resulting in severe injury or death. Only perform maintenance work on stationary machines. Do not disable any safety devices unless it is absolutely necessary in order to reach the lubricator. Reconnect all safety devices on completion of the maintenance work. <

### Maintenance plan

| Maintenance  | Commissioning | After 100 hours or 3 months | Annually | As necessary |
|--|---------------|-----------------------------|----------|--------------|
| Cleaning   | ●             | ●                           | ●        | ●            |
| Visual inspection  | ●             | ●                           | ●        | ●            |
| Replacing the cartridge or filling the oil reservoir up to the "max. 280" mark | ●             | –                           | ●        | ●            |

● Maintenance required.

### Cleaning

Clean the device with a brush and cloths.



Compressed air can damage the seals and force contaminants into the lubricator. Do not use compressed air for cleaning. <

### Visual inspection

During the visual inspection, the entire lubrication system is checked for external damage:

- Check the condition of the lubrication points for correct supply of lubricant.
- Replace damaged or defective parts immediately to ensure permanent lubrication.
- Check the fill level of the cartridge or oil reservoir.
- Check the device for error messages and eliminate the cause.

# Lubricators CONCEPT2

## Replacing the cartridge Ensuring the voltage supply

- Ensure that the lubricator is supplied with voltage for reliable detection of the cartridge and (On) time control or PAU (pulse control) is displayed.

## Removing the upper housing part



**NOTICE**

The upper housing part is preloaded. Risk of injury due to parts springing off when opening the upper housing part. Carefully loosen the collar ring and upper housing part. ◀

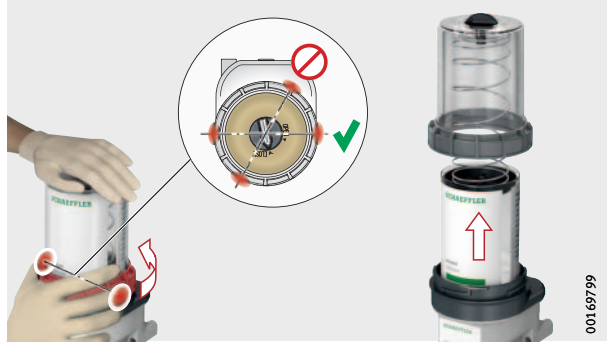


Figure 33  
Removing the upper housing part

## Removing the empty grease cartridge



After replacing the cartridge, the empty grease cartridge must be disposed of in accordance with the manufacturer's disposal instructions.



Figure 34  
Removing the empty grease cartridge

## Removing the battery



- ▶ Remove the 3 V lithium battery and replace it with a new original 3 V lithium battery.
- ▶ Fit the new 3 V lithium battery and connect the connection cables with each other.

## Fitting the grease cartridge



### NOTICE

If an unsuitable grease is used, greasing of the lubrication point will be insufficient or absent and the lubrication point will be damaged. Always use the grease that was in the now empty grease cartridge. <

### NOTICE

The empty level detection system counts the number of lubricant deliveries. If only a partially filled grease cartridge is used, the empty level detection system will fail and the lubrication point may become damaged. Only use a completely filled grease cartridge. <

- ▶ Proceed as shown, see page 18.

## Attaching the upper housing part



- ▶ Proceed as shown, see page 18.
- ▷ The error message shown will be cancelled automatically.

### Test run

- A test run should be carried out following a cartridge change.
- ▶ Ensure that the lubricator is in time control mode.
- ▶ Activate the function run, see page 31.

# Lubricators CONCEPT2

- Decommissioning** In decommissioning, the following must be observed:
- The machine must be shut down.
  - The whole installation must be placed in a voltage-free state.
  - The lubricator must be in a voltage-free state.
  - The lubricant pipes must be in an unpressurised state.

**Disposal** In order to prevent environmental contamination, disposal of the lubricator must be carried out in accordance with the directives of the relevant country of use.

## Technical data

| Characteristic                                      |                  | Value   |
|---|------------------|---|
| Dimensions  |                  | 91 mm×223 mm×112 mm   |
| Mass (without cartridge)                            |                  | ≈ 1 kg  |
| Mounting position                                   |                  | Vertical  |
| Protection class                                    |                  | IP54  |
| Housing material                                    |                  | Polyamide   |
| Lubricant volume                                    | Grease cartridge | 250 cm <sup>3</sup>   |
|   | Oil              | 280 cm <sup>3</sup>   |
| Lubricant   | Grease           | Grease up to NLGI 2 <sup>1)</sup>   |
|   | Oil              | > 68 cSt  |
| Functional principle                                |                  | Piston pump   |
| Operating pressure                                  | DC 24 V          | 50 bar +7,5/-5 bar  |
|   | Battery          | 30 bar +4,5/-3 bar  |
| Metering volume per outlet with one delivery stroke |                  | 0,16 cm <sup>3</sup> 0/-0,008 cm <sup>3</sup>   |
| Number of outlets                                   |                  | 2   |
| Outside diameter of the lubricant line              |                  | 6 mm  |
| Number of lubrication points                        |                  | Depending on hose connector:<br><ul style="list-style-type: none"> <li>■ ≤ 2 (direct)</li> <li>■ ≤ 4 (with splitters)</li> <li>■ &gt; 4 (with progressive distributors)<sup>2)</sup></li> </ul> |

continued ▼

- <sup>1)</sup> Arcanol greases up NLGI 2 (taking into account the maximum lubricant line length).  
 Other greases up to NLGI 2 (with experimental determination of maximum lubricant line length).  
 No solid particles (except PTFE).
- <sup>2)</sup> Technical clarification necessary.



| Characteristic   | Value  |
|--|--|
| Connection   | PA hose  |
| Operating temperature                                    | -20 °C up to +70 °C  |
| Operating voltage  | DC 24 V +1,2/-1,2 V (stabilised) via cable<br>3 V lithium battery  |
| Connection plug for multi-function interface             | M12×1, 4 pin (only for DC 24 V)  |
| Current consumption DC 24 V                              | $I_{\max} \leq 250$ mA   |
| Controlling the lubrication intervals                    | Integrated time control via timer, 25 minutes to 920 minutes<br>External time control via multi-function interface (PLC) |
| Error output via display (error message with error code) | Empty level, grease cartridge missing, pump body motor too slow, internal electrical defect, back pressure too high      |
| Status information via multi-function interface          | Empty level, collective error, signal for successfully completed lubrication cycle                                       |

continued ▲

## Current

| Designation   | Value<br>mA           |       |
|---|-----------------------|-------|
| Peak current $I_{\max}$                               | during pump operation | 250   |
|   | typical               | < 150 |
| Idle current  | ready                 | < 20  |
|   | typical               | 10    |
| Maximum output current (at PIN 4), no inductive loads | 20                    |       |

The peak current is increased by the output current drawn, for example 250 mA + 100 mA = 350 mA.



Recommendation: Protection by delayed-action fuse 1 A.

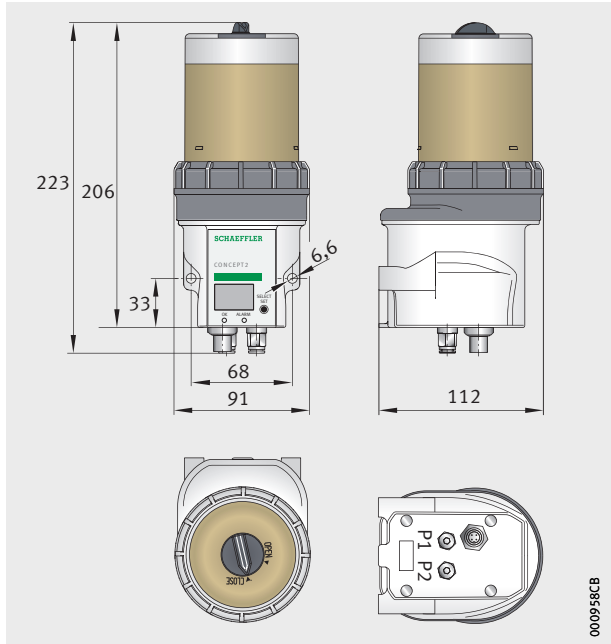


Figure 35  
Dimensions

## EU Declaration of Conformity

**SCHAEFFLER**

en

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### EU Conformity Declaration

within the meaning of EMC Directive 2004/108/EC and Machinery Directive 2006/42/EC

**The manufacturer:** Schaeffler Technologies AG & Co. KG  
Georg-Schäfer-Str. 30  
D-97421 Schweinfurt

hereby declares that, based on its design and type and also on its marketed version, the product specified below complies with the relevant safety and health requirements of the following EU directives: EMC Directive 2004/108/EC and Machinery Directive 2006/42/EC. Any changes made to the product that have not been agreed to by the manufacturer will cause this declaration to lose its validity.

The manufacturer bears sole responsibility for issuing this conformity declaration.

**Product designation:** Lubrication system  
**Product name:** CONCEPT2  
**Type:** C2-1P / C2-2P / C2-1P-24VDC / C2-2P-24VDC / C2-1P-OIL-24VDC / C2-2P-OIL-24VDC

**Applicable harmonized standards:**  
EN 12100:2011: Safety of Machinery  
EN 61000-6-2, EN 61000-6-4: Electromagnetic Compatibility (EMC)

**Name and address of the person authorized to compile the technical documents:**  
Schaeffler Technologies AG & Co. KG  
Georg-Schäfer-Str. 30  
D-97421 Schweinfurt

  
Peter Schuster  
Head of Mechatronics

**Place, date:**  
Schweinfurt, 4/25/2019

This declaration certifies compliance with the directives specified above; however, it does not involve any guarantee of specific features. The safety information in the operating instructions must be followed.

Schaeffler Technologies AG & Co. KG • Georg-Schäfer-Str. 30 • D-97421 Schweinfurt • Tel.: +49 9721 91-0

0019A9EC

*Figure 36*

EU Declaration of Conformity

**Schaeffler Technologies  
AG & Co. KG**

Georg-Schäfer-Straße 30  
97421 Schweinfurt  
Germany  
[www.schaeffler.de/en](http://www.schaeffler.de/en)  
[info.de@schaeffler.com](mailto:info.de@schaeffler.com)

In Germany:

Phone 0180 5003872

From other countries:

Phone +49 9721 91-0

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