# Operating Instructions

**PRO 250 / 500**




perma-tec GmbH & Co. KG perma PRO

This operating manual is valid for the lubricator perma PRO with PRO LC-units 250 cc and 500 cc.



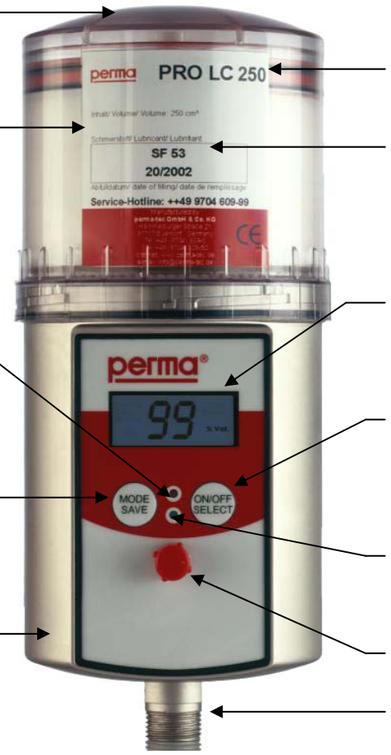


We have taken great care when compiling all the details contained in this documentation. However, we cannot rule out discrepancies and we reserve the right to make technical changes to the product without giving advance notice.
We do not assume any judicial responsibility or liability for damages which may ensue as a result.
We will include any necessary changes in the next edition.

Compiled and printed: 18 / 11 / 2005

Lubrication System perma

# Lubrication System perma PRO




**Protection cover**
With bayonet catch for quick opening/closing.

**PRO LC – Unit**
(Lubrication Canister)
Cartridge, piston, spindle filled with lubricant.

**Red LED**
Additional malfunction indication.

**Push Button: MODE/SAVE**
Leads to the Configuration Menu and saves the selected settings.

**Drive Unit**
Contains electronics, motor, and pump system.

**Type**
Product type and size of PRO LC-unit.

**Content**
Description of the contained lubricant and the filling date.

**Display**
Informs about operating conditions, malfunctions, settings, and the lubricant volume left in the PRO LC-unit..

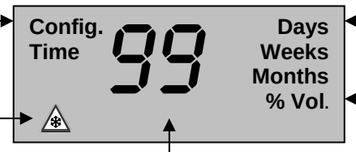
**Push Button: ON/OFF/SELECT**
Used to turn the unit on and off, and also to gradually increase the discharge period.

**Green LED**
Additional indication of the current operating condition.

**Connector for distributor PRO MP 6**

**Connection thread**
G 3/8 outside and G 1/8 inside for application into a lubrication point or for connecting a grease tube.

## Display




**Configuration menu**
For entering the settings.

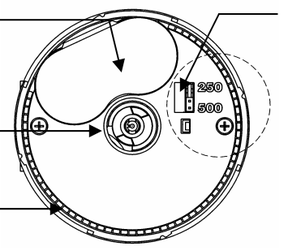
**Ice crystal**
Indicates either that the temperature dropped below 0°C /32°F ( blinking signal), or that the low temperature cut-off has shut the lubrication system off (constant signal) .

**Setting Mode**
Displays the current setting in days, weeks, or months.

**Remaining volume of the PRO LC-unit**
Shows the lubricant remaining in the PRO LC-unit in % volume.

**Number Display**
Shows the value of the remaining volume, the value of the discharge period, or the malfunction.

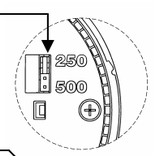
## Drive Unit



**Battery Compartment**
For insertion of battery set

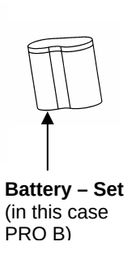
**Catch**
For driving the spindle

**Interlocking teeth**
To position the PRO LC-unit.




**Plug-In**
To plug in the contact pin (Jumper)

**Contact Pin**
(Jumper) To set the size of the PRO LC unit (250 cc / 500 cc)



**Battery – Set**
(in this case PRO B)

# Quick Reference Guide for the Lubrication System perma PRO

On this page you will find some important information for quick and easy operation and setting of the perma PRO. Before the first installation of the perma PRO, and whenever you need detailed instructions, you should read the complete Operating Manual which contains information that must be observed. Make sure to follow the instructions given in the chapter “Safety Notes”.

## 1 Assembly of the perma PRO // Exchange of PRO LC-unit
**(refer to chapters 4 and 7)**

- Insert a new battery set into the battery compartment (follow directions of the arrows).
- On the assembly plate, insert the contact pin in the correct slot for the PRO LC-unit that you intend to use (250 or 500).
- Place the PRO LC-unit inside the cover and remove the plug of the PRO LC-unit.
- Push the PRO LC-unit into the cover until lubricant comes out of the opening.
- If necessary, mount the drive unit onto the mounting device and attach it with the three pre-drilled holes.
- Place the PRO LC-unit with its cover on the drive-unit. Make sure that the catch locks and that the teeth of PRO LC-unit and drive unit interlock.
- Turn the cover clockwise until the bayonet catch locks.

## 2 Starting the perma PRO **(refer to chapter 6.5)**

- Hold down the ON/OFF/SELECT button until the „Remaining Volume“ appears in the display and the green LED starts blinking.

## 3 Determine Discharge Period **(refer to chapter 6.7)**

- Refer to the manufacturer’s guidelines about the lubrication point that you want to lubricate, in order to determine the required lubricant amount in cc per one hundred operating hours.
- Refer to chart 3 (chapter 6.7) and find your required lubrication amount. Based on that, the chart will show you the required PRO LC-unit size, the setting of the discharge period, and the setting mode.
- You may also refer to our perma Select program which can be downloaded from our web page free of charge. It helps you in selecting the correct settings.

## 4 Setting the Discharge Period **(refer to chapter 6.8)**

- Keep the MODE/SAVE button pressed until you have reached the Configuration Menu.
- Push the MODE/SAVE button as many times as it takes to reach the desired setting (Days, Weeks or Months).
- When the display shows the correct setting mode, push the ON/OFF/SELECT button as many times as it takes to reach the desired discharge period.

## 5 Save Settings **(refer to chapter 6.8)**

- Keep the MODE/SAVE button pressed until the display shows the „remaining volume“.

## 6 Stopping the perma PRO **(refer to chapter. 6.6)**

- Keep the ON/OFF/SELECT button pressed until the display shows ("– –") .

**perma-tec**

GmbH & Co. KG

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## Table of Contents

# 1. Various

### About this Operating Manual

- This operating manual is intended for the safe operation of the perma PRO automatic lubricator. It contains safety instructions which must be adhered to.
- Everyone who works on or with the lubricator must have access to this operating manual during their shift. They must also pay attention to all relevant instructions and notices.
- The operating manual must always be kept complete and in easy to read condition.

### Terms Used

- **Lubricator perma PRO**

  In the following text, the “lubricator“ will either be called “lubricator“ or by its name “perma PRO“.

- **Lubrication Canister**

  In the following text, the “Lubrication Canister“ will be called PRO LC-unit. The user can order the PRO LC-unit with different lubricants and in size 250 cc and 500 cc.

### Usage of Safety Instructions

All safety instructions in this operating manual are standardized.

### Danger Signs

This sign warns you of any danger to people’s health or to subjects.

### Tips

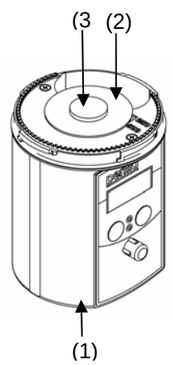
This sign alerts you to application tips which will help you in doing certain tasks quicker and safer.

## 1.1 Delivery / Content

- perma PRO will be delivered according to customer specifications in regards to type of grease and size of PRO LC-unit.
  The user must only assemble it and adjust the desired settings.
- Mounting device and screws included.
- Operating instructions and EC Conformity Declaration included.
  Upon delivery, make sure to check if the delivered goods correspond to your order. perma-tec GmbH & Co. KG will not accept liability for subsequent claims of any shortcomings.
- Please immediately forward any claims:
  - of noticeable transport damage: directly to the forwarder.
  - of noticeable faults, shortcomings or defects: directly to your perma distributor.

## 1.2 Storage

When the lubricators are not immediately installed, you must ensure appropriate storage conditions in dry, dust free places with a temperature of +20°C ±5° C (+68°F ±9°F).
Please make sure that the cover disc (2) with plug (3) on PRO / PRO C drive units (1) is never removed for a longer period since this will cause the internal support battery to empty prematurely.
Remove the cover disc only right before you intend to use the lubricator.
Extended storage periods without cover disc/plug or without an PRO LC unit should be avoided.
Make sure that PRO LC-units and battery sets are not stored longer than one year.




# 12. Conformity Declaration for perma PRO

### EC – Conformity Declaration

According to the Machinery Directive 98/37/EC and according to EMV (Electromagnetic Compatibility) – Directive 89/336/EWG.

The manufacturer

**perma-tec GmbH & Co. KG**
**Hammelburger Straße 21**

**D – 97717 Euerdorf**

hereby declares that the product as described in the given statement conforms to the regulations appertaining to the directives referred to above, including any amendments thereto which are in force at the time of the declaration.

| | |
|---|---|
| Product description: | Automatic lubricator |
| Product name: | Lubricator perma PRO |
| Type: | perma PRO 250 and perma PRO 500 |

The following harmonised standards were applied:

| | |
|---|---|
| EN 292 – 1: 1991 | Safety of machinery – basic concepts, general terms of reference as regards design and construction<br>– Section 1: Basic Terminology, Methodology |
| EN 292 – 2:1991 | Safety of machinery – basic concepts, general terms of reference as regards design and construction<br>– Section 2: Technical terms of reference and specifications |
| EN 60204 – 1:1998 | Machinery’s electrical equipment |

Euerdorf, 09 December 2002

perma-tec GmbH & Co. KG

Peter Mayr, Managing Director

Dr. Michael Weigand, Technical Management

This declaration certifies conformity to the directives referred to but it is not a warranty of qualities. The safety instructions of the operating manual are to be observed.

## 10. Disposal

Help us in protecting the environment and saving resources by recycling valuable raw material.
Please follow your local waste disposal regulations.

## 11. Service

- Please contact your local supplier for availability and cost of the following:
  - Returning of the empty lubricator for environmentally safe recycling or disposal.

  or:

  - exchange of battery set.
  - exchange of PRO LC-unit.
  - setting the desired discharge period.

### 1.3 Markings

- The lubricator perma PRO is clearly marked with a label on the drive system and a label on the PRO LC-unit.
- **CE mark** on the drive unit and the PRO LC-unit.
- Manufacturer:

  perma-tec GmbH & Co. KG
  Hammelburger Straße 21
  D – 97717 Euerdorf

  Internet: www.perma-tec.com
  e–mail: info@perma-tec.com

### 1.4 Intended Usage

The lubricator perma PRO

- Immediately supplies all lubrication points with lubricant, at a pressure build-up of max. 25 bar (360 psi.), permanently, precisely and independent of temperature.
- Can be used for all lubrication points of sliding- and roller bearings, drive- and transport chains, sliding guideways, open gears and seals.
- Should only be connected to/used with original lubrication tubes from perma-tec GmbH & Co. KG.
- Is intended for use on machinery and equipment.
- Is only to be used for the ordered purpose and purposes confirmed by perma-tec.
- Is only to be used for operating conditions recommended in this operating manual.
- Is only to be used with settings and variations recommended in this operating manual.

**Any other usage, setting, addition, and variation is considered to be inappropriate!**

### 1.5 Legal Requirements

**Liability**

- The information, data and tips stated in this operating manual were up-to-data as of the printing date. No claims for already delivered lubricators perma PRO can be made based on the information, pictures and descriptions
- perma-tec GmbH & Co. KG can not be held liable for damages and malfunctions caused by:
  - inappropriate usage;
  - unauthorized alterations to the drive system or the PRO LC-unit;
  - inappropriate operations on or with the lubricator;
  - incorrect operation and settings of the lubricator;
  - incorrect settings of time and size of the lubricator;
  - ignoring the operating manual.

**Warranty**

- Warranty terms and conditions: see terms and conditions of sale and delivery appertaining to perma-tec GmbH & Co. KG.
- Lodge any warranty claims with your local supplier immediately after the defect or error has been identified.
- The warranty expires in all instances where no liability claims can be enforced.

## 2. Safety Instructions

### 2.1 Persons responsible for safety

- The operator or his safety officer must warrant,
  - that all the relevant regulations, instructions and laws are adhered to;
  - that only qualified personnel will work with and on the lubricator;
  - that unauthorized personnel are not allowed to work with and on the lubricator;
  - that the safety regulations are adhered to when mounting the lubricator or during maintenance.

### 2.2 General Safety Instructions

- We are not laying claim to completeness in regards to these safety instructions. Please contact perma-tec Customer Service if you have any questions or problems.
- At the time of delivery the lubricator is in line with state-of-the-art technology and in principle is considered to be safe to operate.
- Dangers emanate from the lubricator for persons, the lubricator itself and for other material assets of the operator if:
  - unqualified personnel operates the lubricator;
  - the lubricator is used inappropriately and for operations that it was not intended to be used for;
  - the lubricator setting / variation is incorrect;
  - the lubricator is opened by force while in operation;
  - the lubricator is not mounted with the perma mounting device;
  - the tube connection to the lubrication point was not carried out and attached correctly;
- Operate the lubricator only when it is in perfect condition.
- Retrofitting, changing, or reconstructing the lubricator is prohibited. perma-tec must be consulted first.
- Only original tube connections and connectors from perma-tec can be used on or with the lubrication system since these will withhold high pressures of up to 25 bar (360psi).
- Ambient media, especially chemically aggressive substances, can attack seals and plastic.

### 2.3 Safety information for perma PRO

**Safety during Installation and Maintenance**

⚠
- Ensure that all workstations and traffic routes are clean and safe!
- Ensure that the relevant regulations and guidelines are adhered to when the installation or maintenance work is carried out in places where danger of falling exists.
- Ensure that the relevant safety and operating instructions are observed when the lubricators are installed or serviced on machines or in factories (i.e. to Stop the machine).

**Safety When Handling the PRO LC-Unit**

⚠
- Avoid contact of lubricant with eyes, skin, and clothing!
- Avoid swallowing of lubricant!
- Prevent lubricant from getting into soil or sewer system!
- Observe safety data sheets of lubricants!
- Lubricant on traffic ways will increase the danger of slipping! Therefore, immediately clean lubricant from floors with special cleaner.
- Only use original PRO LC-units from perma-tec!

**Safety when Handling Batteries!**

⚠
- Avoid contact of battery substances with eyes, skin and clothing!
- Avoid swallowing any leaking battery substances!
- Observe safety data sheets for batteries!
- Do not expose batteries to extreme heat and do not throw into open fire!
- Do not recharge batteries!
- Ensure that regulations for waste disposal of batteries are observed!
- Only use original battery sets from perma-tec!

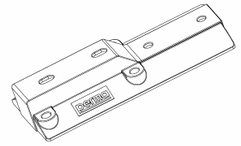
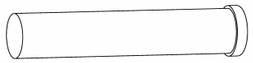
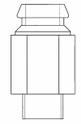
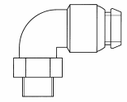
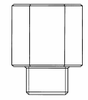
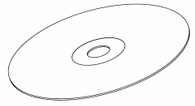
| Spare parts | Part No. | Illustration |
|---|---|---|
| perma PRO mounting device | 27.008.007 |  |
| 400 g grease cartridge for pre-lubrication with grease press filled with SF 04<br><br>400 g grease cartridge for pre-lubrication with grease press filled with other lubricants | on request<br><br>on request |  |
| Straight connecting piece G 1/8 for lubricant tubes | 27.008.010 |  |
| Angle G 1/8 for connecting a lubricant tube | 27.008.011 |  |
| Special lubricant tube with different lengths | 27.008.009 |  |
| Reducer G 3/8 – G 1/4 | on request |  |
| CD ROM with SELECT software (calculation of the lubricant amount), lubrication and maintenance schedule and operating instructions as PDF file | on request |  |

Table 5 b

## 9. Accessories and Spare Parts

Due to the high pressure of up to 25 bar, you should only use **genuine** spare parts and accessories from perma-tec in order to ensure a reliable operation of the lubrication system.
This especially applies to lubricant tubes.

**Spare parts and accessories must meet the technical requirements!**
**This is always guaranteed with genuine spare parts and accessories from perma-tec.**

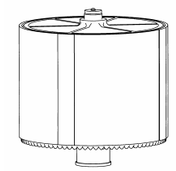
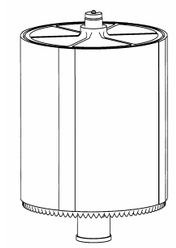
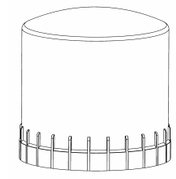
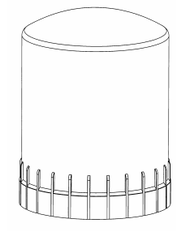
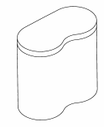
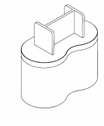
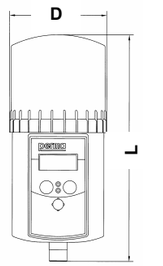
| Spare parts | Art. No. | Illustration |
|---|---|---|
| PRO LC-unit (250 cc) filled with special lubricant SF 04 | 2220004608 |  |
| PRO LC-unit (250 cc) filled with other lubricants | on request | |
| PRO LC-unit (500 cc) filled with special lubricant SF 04 | 2230004609 |  |
| PRO LC-unit (500 cc) filled with other lubricants | on request | |
| Protection cover 250 cc made of transparent plastic | 2299101000 |  |
| Protection cover 250 cc made of aluminium for applications with ester-containing lubricants | 2299102001 | |
| Protection cover 500 cc made of transparent plastic | 2299102000 |  |
| Protection cover 500 cc made of aluminium for applications with ester-containing lubricants | 2299102002 | |
| Battery set B<br>(0° C to +60° C / 32°F to 140°F) | 2299001606 |  |
| Battery set B PLUS<br>(-20° C to +60° C / -4°F to +140°F) | 2299002607 |  |

Table 5 a

## 3. Technical Data



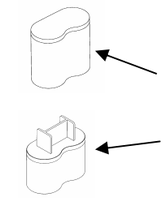



Figure 1

| | PRO 250 | PRO 500 |
|---|---|---|
| **Volume of the PRO LC-unit** | 250 cc | 500 cc |
| **Length (L)** | 210 mm | 260 mm |
| **Diameter (D)** | 92 mm | 92 mm |
| **Weight, empty** | 1.30 kg | 1.37 kg |
| **Weight, filled with SF04** | 1.53 kg | 1.82 kg |
| **Discharge period** | 1 day to 24 months | 1 day to 12 months |
| **Discharged volume per lubrication impulse** | 0.5 cc | |
| **Application temperature** | -20° C to +60 °C / -4°F to +140°F | |
| **Maximum pressure build-up** | 25 bar / 360 psi | **Combination of these Maximum-Values can only be realized by temperatures of ≥20°C/ 68°F. At lower temperatures, the application is limited according to the diagram below.** |
| **Maximum tube length (inner-Ø 5mm)** | 5 m | |
| **Lubricants** | Greases up to rated consistency NLGI 2 | |
| **Power supply (0° C to +60 °C / +32°F to +140 °F)** | Battery set PRO B (3 V alkaline manganese, not rechargeable) | |
| **Power supply, low temperature (-20°C to +60°C / -4°F to +140°F)** | Battery set PRO B PLUS (3 V lithium, not rechargeable) | |
| **Connection thread** | G 3/8 outside – G1/8 inside | |
| **Protection class** | IP 54 | |

Table 1




The dashed standard grease- and dotted low temperature-lines show the maximum values allowed.

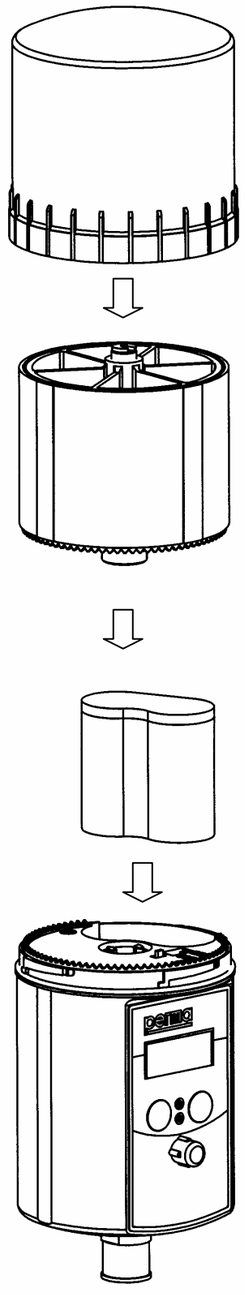
**If your application is out of the specification range shown in this diagram, please contact your local distributor. perma-tec cannot be held liable for these applications.**

Example:

1. *The application temperature is +5°C / +41°F. What is the maximum tube length allowed for standard grease?*
   Correct Answer: 3m max. tube length for standard grease, 5m max. tube length for low temp. grease (arrow 1 meets the dashed line of the standard grease range at 3m)
2. You want to use a *4m tube. Up to which temperature can the system be used?*
   Correct Answer: +10°C/50°F with standard grease -5°C/23°F with low temp. grease (arrow 3 meets the dotted line of low temp. grease at the –5°C mark; and the dashed line of the standard grease at the +10°C mark)

### 3.1 Design of the perma PRO Lubricator

Lubricators are available as 250 cc and 500 cc versions and they can be supplied with the lubricant requested by the customer. They consist of (refer to figure 2):



Protection cover for the drive unit, **re-usable**.

PRO LC-unit (Lubrication Canister), can be supplied as 250 cc and 500 cc versions with the lubricant requested by the customer. **Usage of perma pro PRO LC-units only!**

Battery set, consisting of two batteries. The batteries are not rechargeable and must be changed every time the PRO LC-unit is replaced. **Batteries can only be used once! Usage of perma-tec battery sets only!**

Drive unit, consisting of a gear motor, a pump system and an electronic unit for the control system, **re-usable.**

Figure 2

## 8. Trouble Shooting

### 8.1 Error Messages on the Display

Possible errors of the lubrication system are detected by the electronic control system and are indicated on the display. If an error is displayed, the system is switched off until the cause of the error has been eliminated and the error message has been acknowledged.

**Error messages are acknowledged and reset by pushing the ON/OFF/SELECT button.**

### 8.2 Trouble shooting guide

If there are malfunctions during the operation of the lubrication system, please check for possible causes using the following table (refer to table 4). If you have to deal with a malfunction that is not listed in the table below, please contact your local supplier for technical support.

**Every time that an error message is displayed, the red LED is also blinking.**

| Indication of the display | Error | Possible cause | Remedial measures |
|---|---|---|---|
| E1 | Lubricator has been switched off | Excess motor current of the lubricator motor due to a blocked outlet<br><br>Battery set is empty | Clear the blockage and acknowledge the fault by pushing and holding down the ON/OFF/SELECT button.<br><br>Insert a new battery set and use a full PRO LC-unit. |
| E4 | Lubricator has been switched off | Drive mechanism is defective. | Exchange the drive unit. |
| LC | System does not detect the PRO LC-unit<br><br>Signal of the jumper is not found | No PRO LC-unit installed<br><br>Jumper has not been inserted correctly or is missing | Install an PRO LC-unit.<br><br>Insert the jumper in the correct slot for the PRO LC-unit size that you intend to use. |
| Lo | No power supplied to the system from the battery | No battery inserted or battery set empty | Insert a new battery set and use a full PRO LC-unit. |

Table 4

### 7.2 How to Replace the PRO LC-Unit

a) Turn the protection cover on the drive unit counter-clockwise and remove it.

b) Remove the empty PRO LC-unit. The display indicates "LC" and the red LED is blinking.

c) Remove the used battery set from the drive unit. The display indicates "Lo".

d) Insert the new battery set into the drive unit. Follow the directions of the arrows. The display indicates "LC" again.

e) Remove the plug of the PRO LC-unit.

f) Push the PRO LC-unit into the protection cover until lubricant comes out of the opening. (refer to figure 6, chapter 4).

g) Place the new PRO LC-unit on the drive unit, turn it until the catch locks and the teeth of the PRO LC-unit and the drive unit interlock. The control system automatically recognizes the new PRO LC-unit. The display indicates "-- " if the perma PRO was switched off prior to the replacement of the PRO LC-unit. Or it indicates "99 % Vol." if the perma PRO was switched on before the replacement. You should only use completely full perma-tec PRO LC-units, in order to guarantee a trouble-free operation.

h) The lubrication system continues to operate with the previous setting of the discharge period.

i) If necessary, change the discharge period of the lubricator (refer to chapter 6.8).

**The discharging process automatically starts using the previous settings of the discharge period if the lubricator was switched on prior to the replacement of the PRO LC-unit.**
**If the lubricator was previously switched off, the discharging process must be started by pushing the ON/OFF/SELECT button. (refer to figure 13, chapter 6.5)**

## 4. Mounting and Assembly of the Lubrication System

### 4.1 Mounting the Drive Unit onto a Fixing Device for Wall-Mounting

- Attach the supplied mounting device to the drive unit using the two enclosed hex head bolts (M6 x 16) and the two washers.
- Screw the mounting device with the drive unit onto a support of your system.
  For the position of the bores of the three fixing screws (141.5 x 45) refer to figure 3 below. You have to use at least three hexagon screws M6 x 25.
- Before you connect the outlet of the drive unit to the lubricant tube, you have to make sure that the lubrication points and the complete lubricant tube is pre-lubricated with the same lubricant that is contained in the PRO LC-unit. For that, perma-tec offers a 400 g lubrication cartridge for manually-operated grease presses with the requested lubricant.
- Connect the lubricant tube (connection G 3/8 outside or G 1/8 inside) to the outlet of the drive unit and install the tube correctly between the outlet and the lubrication point. The lubricant tube must not be longer than five meters.

**Make sure that you assemble the connections and lubricant tubes correctly and tightly to avoid possible leakage.**

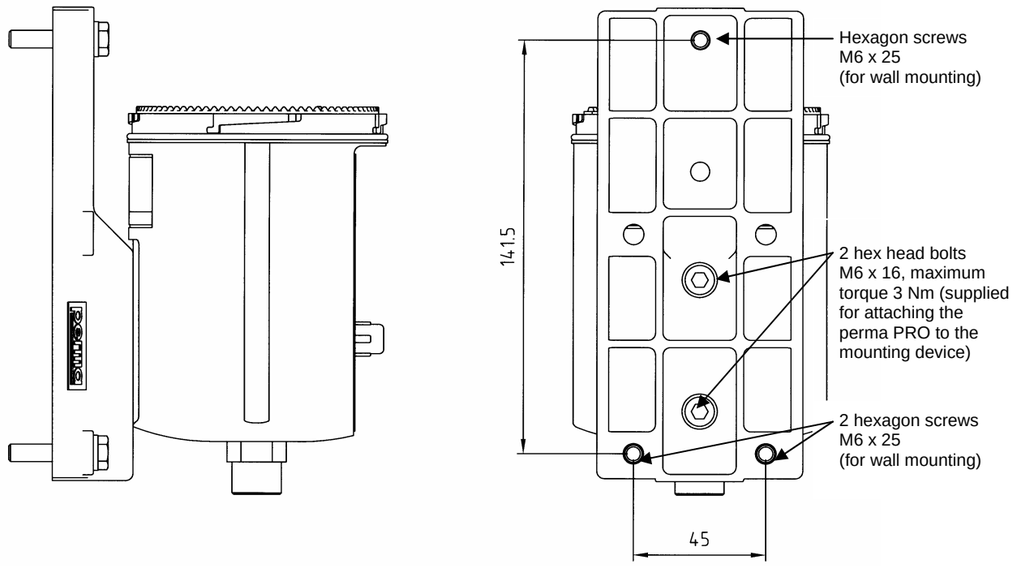



Figure 3

## 4.2 Assembly of the Lubricator

a)

- Insert the battery set into the drive unit (according to the direction of the arrow on the label).
- Check the position of the jumper, which has to correspond to the size of the PRO LC-unit (refer to figure 4 and chapter 7.1).

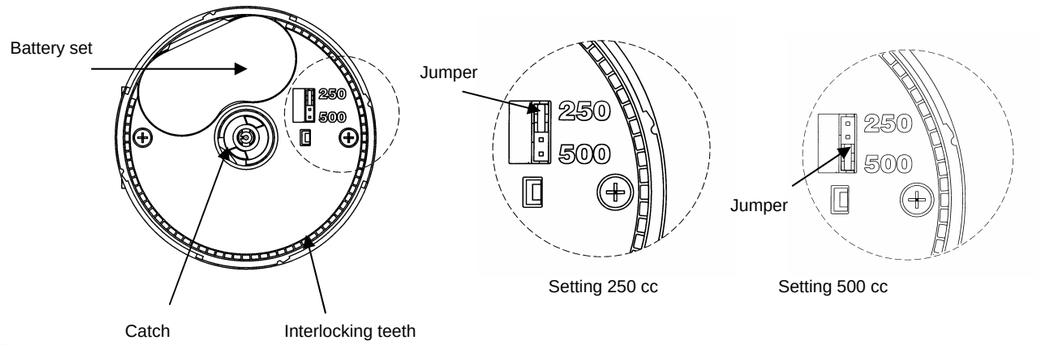



Figure 4

b)

- Place the PRO LC-unit inside the protection cover and remove the plug of the PRO LC-unit (refer to figure 5).

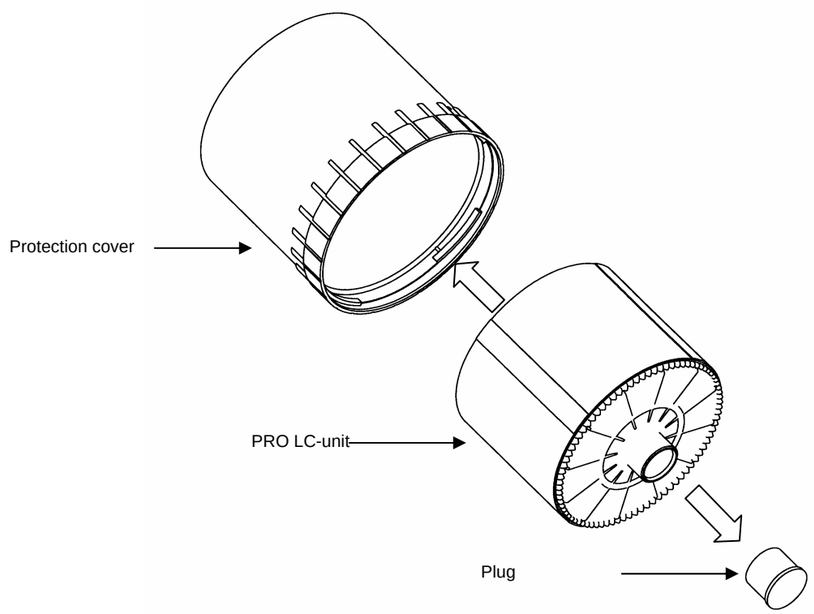



Figure 5

## 7. Replacement of the PRO LC-Unit

**The Following Must Always Be Taken into Account**

If the replacement of an empty PRO LC-unit becomes necessary, it will be indicated by a simultaneous blinking of the red and the green LED. Additionally, the display indicates that the PRO LC-unit is empty (refer to figure 21).


Figure 21

**If you replace the PRO LC-unit, you also have to change the battery set. Otherwise, the correct operation of the lubricator cannot be guaranteed!**
**If you replace the PRO LC-unit by an PRO LC-unit of a different size, a corresponding protection cover (refer to table 5a, chapter 9) must be used.**

After the installation of the new PRO LC-unit, the control system continues to operate using the previously valid setting of the discharge period.

## 7.1 Setting the Volume of the PRO LC-Unit

You have to set the size of the PRO LC-unit by inserting the contact pin (jumper) into the base plate of the battery compartment in the drive unit. (refer to figure 22).
You can use pointed pliers for plugging-in the jumper.

**If the position of the jumper does not correspond to the size of the installed PRO LC-unit, incorrect signals of the control unit will lead to malfunctions. (refer to table 4, chapter 8.2).**

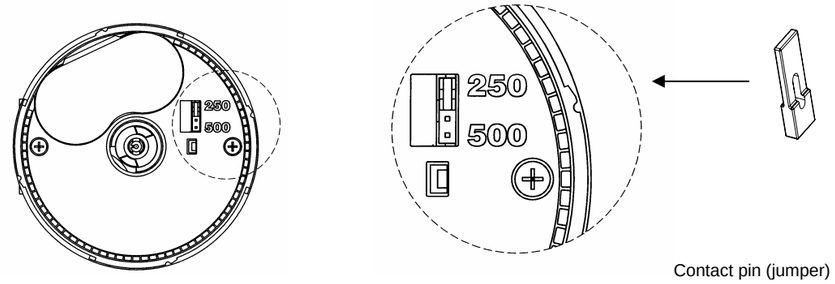



Figure 22

Plugged-in jumper for size 250 cc

Since the drive unit and the control board must be protected against moisture, an exchange may only be carried out in dry conditions!

**Attention!** If an PRO LC-unit has been removed from the lubricator and another PRO LC-unit has been installed, the control system always assumes that this PRO LC-unit is new and full. **Therefore you should never use an PRO LC-unit if it is not completely full!**

**Low-Temperature Cut-Off of the Lubrication System**

The temperature range from 0° C to -19° C ( 32°F to –2.2°F) is indicated by a blinking ice crystal symbol (refer to figure 20).
In this temperature range the lubrication system perma PRO continues to operate without interruption.

**Please note, that in this temperature range an additional discharge is not possible!**


Figure 20 Display with a blinking ice crystal (in this example with 89 % Vol.)

In order to protect the system from damage, the low-temperature cut-off of the lubrication system is automatically carried out by the control system and the built-in temperature sensor.

If the temperature reaches or falls below -20°C (-4°F), the lubricator is switched off by the low-temperature cut-off and the ice crystal symbol is permanently indicated on the display. The remaining volume is still displayed in % Vol.

**From this time onwards, the lubricant is no longer discharged. You have to take this fact into account if your system continues to operate in order to prevent damages!**

As soon as the temperature rises and reaches -19° C (-2.2°F) or higher, the control system switches the lubrication system on again.
The display shows the remaining volume and the blinking ice crystal symbol.
**All discharges (except additional discharges), accumulated during the shut-off, will be caught up when the system continues operation (at a max. of two additional discharges with every regular discharge).**

## 6.9 Calculation of the Remaining Discharge Period

Please note, that in case of one or several additional discharges, the remaining discharge period of the lubrication system must be recalculated. This also applies in case of a cut-off of the lubrication system due to a long machine standstill (e.g. weekends or annual holidays) or in case of a low-temperature cut-off carried out by the system if temperatures reach -20° C (-4°F).
You should also note the result of your calculation of the remaining discharge period in your lubrication and maintenance schedule.

Formula: $$R_{DP} = \frac{SDP * RV}{100}$$

SDP: Set Discharge Period of the lubricator (days, weeks, months)

RV: Remaining Volume (displayed in % Vol.)
$R_{DP}$: Remaining discharge period (days, weeks, months depending on SDP)

**Example of a Calculation of the Remaining Discharge Period**

The perma PRO with a 250 cc PRO LC-unit was originally set to a discharge period (SDP) of eight months, since the lubrication point needs 4.3 cc lubricant /100 h. After two months, the perma PRO indicates a remaining volume (RV) of 75 % Vol. At this point, the lubricator is switched off for six weeks (e.g. machine standstill). When it is switched on again, you would like to determine when the PRO LC-unit will be empty.

$$R_{DP} = \frac{SDP * RV}{100} = \frac{8 * 75}{100} = \frac{600}{100} = 6$$

This results in a remaining discharge period of six months. After these six months, the PRO LC-unit will be empty and must be replaced by a new one.

c)

- Push the PRO LC-unit into the protection cover until lubricant comes out of the opening (refer to figure 6).

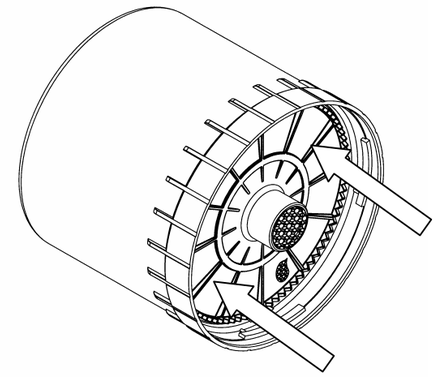


Figure 6

d)

- Place the PRO LC-unit with its protection cover on the drive-unit. Make sure that the catch locks and that the teeth of the PRO LC-unit and the drive unit interlock (refer to figure 4 and figure 7).
- Turn the cover clockwise until the bayonet catch locks.

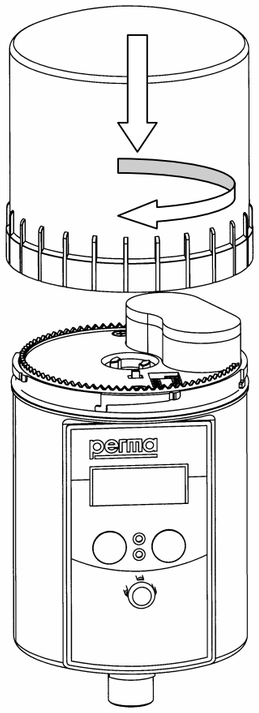



Figure 7

## 5. Display and Control Elements of the Lubrication System

### 5.1 Display Elements

The operating status of the lubricator can be determined via the green or the red LED and via the display at the control unit (refer to figure 8) of the perma PRO.
The perma PRO offers a menu-guided setting. Changes of the settings are shown on the display. Error messages, e.g. in case the pressure in the lubricant tube gets too high, are also indicated on the display.

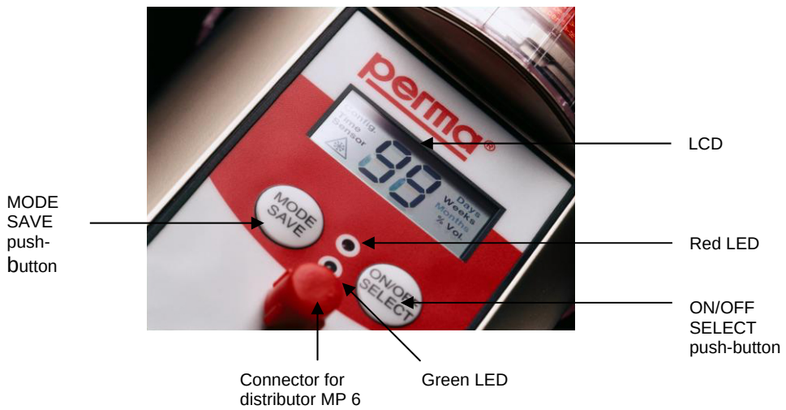



Figure 8

### 5.2 Function Indication on the Display

The display is located on the control unit of the perma PRO (refer to figure 8, chapter 5.1).
The display shows settings, operating conditions and error messages of the lubricator.

In case of an error free operation of the lubrication system, the display shows the remaining volume of the mounted PRO LC-unit in percent volume (% Vol.). Figure 9 shows an example of the displayed information if the PRO LC-unit is new and full.


Figure 9

**The display cannot be switched off by the operator. If the lubrication system is switched off, the display will always show two lines ( see figure 10 below).**

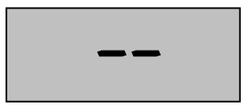



Figure 10

### 5.3 Function Indication via the LED signal lights

| LED | Signal | Signal Length | Explanation |
|---|---|---|---|
| green | flash | every 10 seconds | operation (OK) |
| red | flash | every 3 seconds | error / malfunction |
| green and red | flash | every 3 seconds | PRO LC-unit empty |
| green | light | permanently | Lubricator is discharging |
| green and red | none | none | Lubricator switched off or battery low |

Table 2

- To save the changes, press the MODE/SAVE button until the display switches back to the information displayed before you started to change the settings.


Figure 18

Figures in the display are blinking.

Display shows "--", if perma PRO was previously off.
Display shows ". % Vol.", if perma PRO was previously switched on.

- If you want to check the changes, press the MODE/SAVE button again until the display switches to the configuration mode and shows the current settings.

**If You Do Not Want to Save the Changes**

If you do **not** want to save the changes that you have made in the configuration menu, press the ON/OFF/SELECT button until the display shows the symbol ("--") for OFF or the remaining volume of the PRO LC unit in % VOL.
The settings existing prior to the change remain valid.

**Automatic Termination of the Configuration Mode**

If you do not press a button in the configuration mode for ten seconds, the control system is automatically switching back to the previously set mode (“ON“ or “OFF“) without saving the changes.
The settings existing prior to the change remain valid.

**Additional Discharge**

With an additional discharge, a lubrication point can be supplied with an additional amount of the lubricant.

For an additional discharge, the lubrication system must be switched on (display shows remaining volume) and you have to press both buttons simultaneously and hold them down (refer to figure 19).


Figure 19 For an additional discharge, press both buttons at the same time and hold them down.

An additional discharge is only possible at temperatures above 0° C / 32°F (figure 20, ice crystal is not visible).
Every additional discharge reduces the remaining discharge period since an increased amount of the lubricant has been supplied. This must be taken into account in your lubrication and maintenance schedule. A calculation is possible with the formula from chapter 6.9 and with the remaining volume which is displayed.

The minimum period between two additional discharges is 30 seconds. If you continue to press the buttons during that period, further additional discharges will follow.

## 6.8 Setting the discharge period

The discharge period can be set any time (refer to figures 15 to 18) without having to install a new PRO LC-unit and without having to interrupt the operation. It does not matter if the perma PRO is switched on or off, since the system switches back to its original operating status after the changes have been made.
The only difference is the information shown on the display before and after the settings.
In the following example, the lubricator is switched off.

**You must hold down the buttons until the indication of the display changes!**

- To reach the configuration menu, hold the MODE/SAVE button down until the display changes. Then, the lubricator shows the current settings.

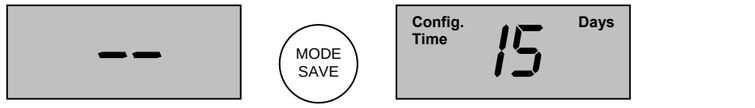



Figure 15

Lubricator is switched off

The figures on the display are blinking and the current setting mode is shown (e.g. . *15* Days).

- You can now switch within the setting mode from days to weeks to months every time that you press the MODE/SAVE button.


Figure 16

The figures on the display are blinking and the setting mode is shown.

- If you have reached the desired setting mode, push the ON/OFF/SELECT button as many times as it takes to set the number of days, weeks or months.

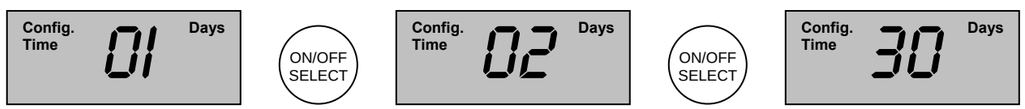



Figure 17

The figures on the display are blinking and gradually increasing with every push of the button. The example shows the setting of days.

- When setting the days, you can select a figure between 1 and 30. After 30, the count starts again with the figure 01.
- When setting the weeks, you can select a figure between 1 and 24. After 24, the count starts again with the figure 01.
- When setting the months, you can select a figure between 1 and 24 depending on the size of the PRO LC-unit (refer to table 1) and on the position of the jumper. After 24, the count starts again with the figure 01.

## 5.4 Control Buttons

There are two push-buttons on the control unit (refer to figure 8) which can be used for a menu-guided change of the settings.
For operating the lubricator, it makes a difference if you push a button quickly or if you hold the button down for a longer period of time. For the control system to recognize that a button has been pushed for a long period of time, you have to hold the button down for at least four seconds. If you hold the button down for less than four seconds, this is recognized as a quick push of the button.

- With the MODE/SAVE button (refer to figure 11), you can reach the configuration menu, change the mode and save the modified settings for further operation.


Figure 11

- With the ON/OFF/SELECT button (refer to figure 12), you can switch the lubricator on and off and you can increase the discharge period gradually. Every time that you push the button, the discharge period is increased by either a day, a week or a month.


Figure 12

# 6. Operation and Control

## 6.1 Preparations

- Prior to the installation of the lubricator, the lubrication point and the complete connection tube must be sufficiently prelubricated with the same lubricant that the PRO LC-unit contains. For this, perma-tec offers a 400 g lubrication cartridge for grease presses with the corresponding lubricant (refer to table 5b, chapter 9).
- When installing the perma PRO, the supplied perma-tec mounting device should be used.
- The lubricant tube must be installed and mounted correctly. The length of the lubricant tube may not exceed a maximum of 5 meters and the tube must be a perma-tec product.
- Please check if the thread of the perma PRO (G 3/8 or G 1/8) corresponds to the connection thread of the lubrication point. If this is not the case, you can order a corresponding reducer or other parts from the perma accessory range.

For the initial setting into operation of a perma PRO, the pump system in the drive unit is pre-filled with SF 04 from perma's standard range of lubricants. An exception is made with regard to lubricants for the food industry. A complete discharge of this pump filling is guaranteed after approx. 10 discharges (carry out additional discharges, if necessary).

## 6.2 Prior to Operation

- Check all parts of the lubricator for obvious damages!
- Is the new PRO LC-unit filled with the required lubricant?
- Did you insert a new battery set?
- Did you set the drive unit to the correct size of the PRO LC-unit by inserting the jumper into the corresponding slot?
- Has the cover disc with plug been removed from drive unit (see Chap. 1.2)?
- Was the drive unit set to the discharge period requested by the operator while taking into account the required discharge volume?
- Did you assemble and mount all of the parts correctly and tightly?

## 6.3 Setting into Operation

- If necessary, mount the drive unit onto a fixing device for wall-mounting. (refer to chapter 4.1).
- Set the volume of the PRO LC-unit via the jumper position (refer to chapter 4.2 a).
- Insert the battery set into the drive unit and the PRO LC-unit into the protection cover and close the complete system (refer to chapters 4.2 b-d).
- Switch-on the lubrication system (refer to chapter 6.5).
- Determine the discharge period (refer to chapter 6.7).
- Set the discharge period via the buttons below the display (refer to chapter 6.8).
- Carry out an additional discharge (refer to chapter 6.8).
  If the drive motor has started and the green LED is lit, the lubricator has started to discharge. The display indicates the remaining volume (% Vol.) of the PRO LC-unit.

**The operator must always check the customer-specific settings and if necessary change them before the lubricator is set into operation!**

## 6.4 During Operation

- Carry out regular inspections during the operation. You should pay special attention with regard to leakage and to the condition of the lubricator!
- Check the condition of the lubricant tube and the connections regularly!
- Check the filling level of the transparent PRO LC-unit regularly!
- After one or several additional discharges, you have to calculate the reduced discharge period and note this on your lubrication and maintenance schedule.
- If a malfunction is indicated on the display, you can determine the cause using the trouble shooting guide (refer to table 4, chapter 8.2). If the fault cannot be fixed, please contact your supplier for technical support.

**Additional discharges and long machine standstills must always be taken into account with regard to the remaining discharge period of the lubricator.**

## 6.5 Switching the Lubrication System On

To switch the lubrication system on (refer to figure 13), keep the ON/OFF/SELECT button pressed until the indication ("– – ") on the display is replaced by an indication of the remaining volume – e.g. *99* % VOL (with a new PRO LC-unit) – and the green LED starts blinking.


Figure 13

## 6.6 Switching the Lubrication System Off

To switch the lubrication system off (refer to figure 14), keep the ON/OFF/SELECT button pressed until the display no longer indicates the remaining volume – % VOL – but indicates ("– – ") instead. When the lubrication system is switched off, all of the settings are saved. This means that if you start the lubricator again, it will take up the operation at the point where it had been switched off.


Figure 14

## 6.7 Determining the Discharge Period

The discharge period is automatically factory-set to six months according to the supplied PRO LC unit. Upon request, a factory-setting of the discharge period required by the customer is also possible. The size of the PRO LC unit is taken into account.

If you want to determine the discharge period, you need to know the required amount of the lubricant in cubic centimeters for 100 operating hours (cc/100 h). This information can be taken from the technical documents of the manufacturer of the lubrication point.
With this information, you can simply determine the discharge period using the following table (table 3).

| | Average discharge volume in cc per 100 operating hours | | | | | |
|---|---|---|---|---|---|---|
| PRO LC – unit | 250 cc | | | 500 cc | | |
| Setting mode / Setting point Discharge period | Days | Weeks | Months | Days | Weeks | Months |
| 1 | 1041,7 | 148,8 | 34,3 | 2083,3 | 297,6 | 68,5 |
| 2 | 520,8 | 74,4 | 17,1 | 1041,7 | 148,8 | 34,3 |
| 3 | 347,2 | 49,6 | 11,4 | 694,4 | 99,2 | 22,8 |
| 4 | 260,4 | 37,2 | 8,6 | 520,8 | 74,4 | 17,1 |
| 5 | 208,3 | 29,8 | 6,9 | 416,7 | 59,5 | 13,7 |
| 6 | 173,6 | 24,8 | 5,7 | 347,2 | 49,6 | 11,4 |
| 7 | 148,8 | 21,3 | 4,9 | 297,6 | 42,5 | 9,8 |
| 8 | 130,2 | 18,6 | 4,3 | 260,4 | 37,2 | 8,6 |
| 9 | 115,7 | 16,5 | 3,8 | 231,5 | 33,1 | 7,6 |
| 10 | 104,2 | 14,9 | 3,4 | 208,3 | 29,8 | 6,9 |
| 11 | 94,7 | 13,5 | 3,1 | 189,4 | 27,1 | 6,2 |
| 12 | 86,8 | 12,4 | 2,9 | 173,6 | 24,8 | 5,7 |
| 13 | 80,1 | 11,4 | 2,6 | 160,3 | 22,9 | -- |
| 14 | 74,4 | 10,6 | 2,4 | 148,8 | 21,3 | -- |
| 15 | 69,4 | 9,9 | 2,3 | 138,9 | 19,8 | -- |
| 16 | 65,1 | 9,3 | 2,1 | 130,2 | 18,6 | -- |
| 17 | 61,3 | 8,8 | 2,0 | 122,5 | 17,5 | -- |
| 18 | 57,9 | 8,3 | 1,9 | 115,7 | 16,5 | -- |
| 19 | 54,8 | 7,8 | 1,8 | 109,6 | 15,7 | -- |
| 20 | 52,1 | 7,4 | 1,7 | 104,2 | 14,9 | -- |
| 21 | 49,6 | 7,1 | 1,6 | 99,2 | 14,2 | -- |
| 22 | 47,3 | 6,8 | 1,6 | 94,7 | 13,5 | -- |
| 23 | 45,3 | 6,5 | 1,5 | 90,6 | 12,9 | -- |
| 24 | 43,4 | 6,2 | 1,4 | 86,8 | 12,4 | -- |
| 25 | 41,7 | -- | -- | 83,3 | -- | -- |
| 26 | 40,1 | -- | -- | 80,1 | -- | -- |
| 27 | 38,6 | -- | -- | 77,2 | -- | -- |
| 28 | 37,2 | -- | -- | 74,4 | -- | -- |
| 29 | 35,9 | -- | -- | 71,8 | -- | -- |
| 30 | 34,7 | -- | -- | 69,4 | -- | -- |

Table 3

Please take into account that in case of one or several additional discharges, the remaining discharge period of the lubrication system must be recalculated. This also applies in case of a cut-off of the lubrication system due to a long machine standstill (e.g. weekends or annual holidays) or in case of a low-temperature cut-off carried out by the system if temperatures reach -20° C/-4°F (refer to figure 20). You should also note the result of your calculation of the remaining discharge period in your lubrication and maintenance schedule.

**The perma SELECT software helps you to determine the discharge period.
Visit our website www.perma-tec.com for a free download of this software.**