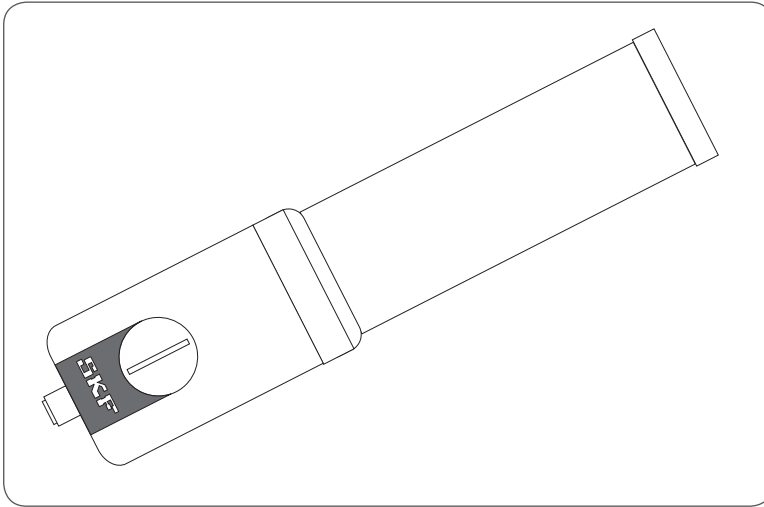


TLMR 101 / 201 Lubricator



Version 03

SKF

Following machinery directive 2006/42/EC, Annex II Part 1 A

The manufacturer

LINCOLN GmbH, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf

hereby declares that the machine

Designation: Electrically driven lubricator to supply lubricants in interval operation mode from special SKF cartridges

Type: TLMR

Part number: TLMR XXX-XX-XX-XX

Year of construction: see type identification plate

complies with all basic requirements of the following directives at the time when first being launched in the market.

Machinery directive 2006/42/EC

EMC 2009/19/EC and 2004/108/EC

RoHS II 2011/65/EC

Applied standards DIN EN ISO 12100:2011; DIN EN 809-1: 2011
DIN EN 61000-6-4:2007; DIN EN 61000-6-2:2005

In the case of modifications or alterations of the above mentioned machine not authorized by the manufacturer validity of this EC declaration of conformity will cease. The person empowered to assemble the technical documentation on behalf of the manufacturer is the head of standardization; see manufacturer's address.

Walldorf, 30.08.2013



Dr.-Ing. Zdravko Paluncic

Director Research & Development

SKF Lubrication Business Unit

Legal Disclosure

The original operating instructions following machinery directive 2006/42/EC is part of the described products and must be kept at an accessible location for further use.

Further language versions

For further language versions of these instructions go to:
www.skf.com/lubrication

Warranty

The instructions do not contain any information on the warranty. This can be found in the general terms and conditions.

Copyright/ Integration of instructions

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Explanation of symbols and signs

You will find these symbols, which warn of specific dangers to persons, material assets, or the environment, next to all safety instructions

in these operating instructions. Please heed these instructions and proceed with special care in such cases. Please forward all safety instructions to other users.

Warning level		Consequences	Probability
	DANGER	Death/ serious injury	Immediate
	WARNING	Serious injury	Possible
	CAUTION	Minor injury	Possible
	ATTENTION	Property damage	Possible

Symbols	
Symbol	Meaning
●	Prompts an action
○	Used for itemizing
	Refers to other facts, causes, or consequences
→	Provides additional information within procedures

Symbols used	
Symbol	Meaning
	General warning
	Electrical component hazard Electrical shock hazard
	Slipping hazard
	Hazard from hot surfaces
	Crushing hazard
	Pressure injection hazard
	Wear personal protective equipment (goggles)
	Note
	Environmentally sound disposal
	Dispose of batteries in an environmentally sound manner
	Dispose of cartridges in an environmentally sound manner

Abbreviations and conversion factors

Abbreviations

re.	regarding
approx.	approximately
°C	degrees Celsius
cu.in	cubic inch
dB (A)	sound pressure level
i.e.	that is
etc.	et cetera
poss.	possibly
°F	degrees Fahrenheit
fl.ou	fluid ounce
fpsec	feet per second
gal.	gallon
hp	horse power
in.	inch
incl.	including
K	Kelvin
kg	kilogram
kp	kilopond
kW	kilowatt
l	litre
lb.	pound
max.	maximum
min.	minimum
min	minute
ml	millilitre
ml/d	millilitre per day
mm	millimeter
N	Newton
Nm	Newtonmeter

oz.	Ounce
psi	pounds per square inch
rh	relative humidity
s	second
sq.in.	square inch
e.g.	for example
>	greater than
<	less than
±	plus or minus
Ø	diameter
mph	miles per hour
assy.	assembly

Conversion factors

Length	1 mm = 0.03937 in.
Area	1 cm ² = 0.155 sq.in
Volume	1 ml = 0.0352 fl.oz.
	1 l = 2.11416 pints (US)
Mass	1 kg = 2.205 lbs
	1 g = 0.03527 oz.
Density	1 kg/cm ³ = 8.3454 lb./gal(US)
	1 kg/cm ³ = 0.03613 lb./cu.in.
Force	1 N = 0.10197 kp
Speed	1 m/s = 3.28084 fpsec.
	1 m/s = 2.23694 mph
Acceleration	1 m/s ² = 3.28084 ft./s ²
Pressure	1 bar = 14.5 psi
Temperature	°C = (°F-32) x 5/9
Power	1 kW = 1.34109 hp

1. Safety instructions

1.1 General safety instructions

The operator must ensure that the lifecycle manual is read and understood by all persons tasked with working on the product or who supervise or instruct such persons.

The operator must also ensure that the staff fully understands the content of the lifecycle manual.

The described product was manufactured according to the state of the art. Risks may, however, arise from its usage and may result in harm to persons or damage to material assets.

Any malfunctions which may affect safety must be remedied immediately. In addition to the lifecycle manual, general statutory regulations and other regulations for accident prevention and environmental protection must be observed and applied.

1.2 General behaviour when handling the product

- o The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- o Technical personnel must familiarize themselves with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- o Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- o Unauthorized persons must be kept away from the product.
- o All safety regulations and in-house instructions relevant to the particular task must be observed.
- o Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.

1.3 Qualified technical personnel

- o Protective and safety mechanisms cannot be removed, modified, or disabled during operation and must be checked for proper function and completeness at regular intervals.
If protective and safety mechanisms must be removed, they must be installed immediately following conclusion of work and then checked for proper function.
- o Any malfunctions that occur must be resolved according to responsibility. The operator of the system/ machine must be notified in case of malfunctions outside the scope of responsibility.
- o Wear personal protective equipment.
- o Observe the particular safety data sheets when handling lubricants.

Only qualified technical personnel may install, operate, maintain, and repair the products described in this document.

Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product into which the described product is incorporated.

Such persons are familiar with the relevant standards, rules, accident prevention regulations, and assembly conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid any potential hazards. The definition of qualified personnel and the prohibition against employing non-qualified personnel are laid down in DIN VDE 0105 and IEC 364.



Relevant country-specific definitions of qualified technical personnel apply for countries outside the scope of DIN VDE 0105 or IEC 364. The core principles of these country-specific qualification requirements for

technical personnel cannot be below those of the two standards mentioned above.

The operator of the final product is responsible for assigning tasks and areas of responsibility and for the responsibility and monitoring of the personnel. These areas must be precisely specified by the operator. The personnel must be trained and instructed if they do not possess the requisite knowledge.



Product training can also be performed by SKF in exchange for costs incurred.

1.4 Electric shock hazard

		WARNING
	Electric shock Performing work on products that have not been de-energized may result in serious injury or death. Assembly, maintenance, and repair work may only be performed on products that have been de-energized by qualified technical personnel.	

Electrical connections for the described product may only be established by qualified and trained personnel authorized to do so by the operator, and in observance of the local conditions for connections and local regulations (e.g., DIN, VDE). Serious injury or death and property damage may result from improperly connected products.

1.5 System pressure hazard

		WARNING
	System pressure The product is pressurized during operation. Centralized lubrication systems must therefore be de-pressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.	

1.6 Operation

The following must be observed during commissioning and operation.

- o All information within this manual and the information within the referenced documents.
- o All laws/ regulations that the operator must observe.

1.7 Assembly, maintenance, malfunctions, shutdown, disposal

- o All relevant persons (e.g., operating personnel, supervisors) must be informed of the activity prior to the start of work. Precautionary operational measures/ work instructions must be observed.
- o Ensure through suitable measures that moving/ detached parts are immobilized during the work and that no body parts can be pinched by unintended movements.
- o Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat or cold.
- o Prior to performing work, the product and the machine/ system in which the product is or will be integrated must be depressurized and secured against unauthorized activation.
- o All work on electrical components may be performed only with voltage-insulated tools.
- o Fuses must not be bridged. Always replace fuses with fuses of the same type
- o Ensure proper grounding of the product.
- o Drill required holes only on non-critical, non-load bearing parts.
- o Other units of the machine/the vehicle must not be damaged or impaired in their function by the installation of the centralized lubrication system.
- o No parts of the centralized lubrication device may be subjected to torsion, shear, or bending.
- o Use suitable lifting gear when working with heavy parts.
- o Avoid mixing up/ incorrectly assembling disassembled parts. Label parts.

1.8 Intended use

The electrically driven lubricators of the TLMR series are designed for the intermittent supply of lubricants from special non-refillable SKF cartridges. There may be used only those lubricants approved for the respective product.

1.9 Foreseeable misuse

- o Any usage of the product differing from the aforementioned conditions and stated purpose is strictly prohibited. Particularly prohibited are:
- o Use in an explosive atmosphere
- o Refilling of the lubricant cartridges
- o Use to feed/ forward/ store Group 1 dangerous fluids according to Directive 67/548/EEC
- o Use to feed/ forward/ store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible operating temperature

1.10 Disclaimer of liability

The manufacturer shall not be held responsible for damages:

- o Caused by contaminated or unsuitable lubricants
- o Caused by the installation of non-original SKF components or SKF spare parts
- o Caused by inappropriate usage
- o Resulting from improper assembly, configuration, or filling
- o Resulting from improper response to malfunctions
- o Caused by independent modification of system components

1.11 Referenced documents

In addition to these instructions, the following documents must be observed by the respective target group:

- o Operational instructions and approval rules
- o Instructions from suppliers of purchased parts
- o Safety data sheet (MSDS) of the lubricant used
- o Safety data sheet of the batteries used
- o Project planning documents and other relevant documents, if provided.

The operator must supplement these documents with applicable national regulations for the country of use. This documentation must be included if the product/ machine is sold or transferred.

1. Safety instructions

1

1.12 Residual risks

Residual risk	Remedy
Life cycle assembly, malfunction, troubleshooting, repair, maintenance	
Electric shock due to defective connection cable	<ul style="list-style-type: none"> • Check connection cable for damages
People slipping due to floor contamination with spilled/ leaked lubricant	<ul style="list-style-type: none"> • Exercise caution when connecting the product's hydraulic connections • Promptly apply suitable binding agents and remove the leaked/ spilled lubricant. • Follow operational instructions for handling lubricants and contaminated parts
Tearing/ damage to lines when installed on moving machine components	<ul style="list-style-type: none"> • If possible, do not install on moving parts; if this cannot be avoided, use flexible hose lines.
Life cycle start-up, operation	
Electric shock due to defective connection cable	<ul style="list-style-type: none"> • Check connection cable for damages
Lubricating oil spraying out due to faulty component fitting/line connection	<ul style="list-style-type: none"> • Tighten all components securely or using the specified torques. Use hydraulic connections and lines suitable for the indicated pressures. These must be checked for proper connection and for damage prior to commissioning.
Life cycle adjustment, shutdown, disposal	
People slipping due to floor contamination with spilled/ leaked lubricant	<ul style="list-style-type: none"> • Exercise caution when disconnecting the product's hydraulic connections • Promptly apply suitable binding agents and remove the leaked/ spilled lubricant • Follow operational instructions for handling lubricants and contaminated parts

2. Lubricants

2.1 General information

ATTENTION

All products may be used only for their intended purpose and in accordance with the life cycle instructions.

Intended use is the use of the products for the purpose of providing centralized lubrication/ lubrication of bearings and friction points with lubricants within the physical usage limits which can be found in the documentation for the device, e.g., operating instructions and the product descriptions, e.g. technical drawings and catalogs. Particular attention is called to the fact that hazardous materials of any kind, especially those materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Para. 2, may only be filled into SKF centralized lubrication systems and components and delivered and/ or distributed with such systems and components after consulting with and obtaining written approval from SKF Lubrication Systems.

No products manufactured by SKF Lubrication Systems are approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.

Other media which are neither lubricant nor hazardous substance may only be fed after consultation with and written approval from SKF Lubrication Systems.

SKF Lubrication Systems considers lubricants to be an element of system design and must always be factored into the selection of components and the design of centralized lubrication systems. The lubricating properties of the lubricants are critically important in making these selections.

2.2 Selection of lubricants

ATTENTION

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used. The amount of lubricant required at the lube point is specified by the bearing or machine manufacturer. It must be ensured that the required lubricant volume is provided to the lubrication point. The lubrication point may otherwise not receive adequate lubrication, which can lead to damage and failure of the bearing.

Selection of a lubricant suitable for the lubrication task is made by the machine/ system manufacturer and/or the operator of the machine/ system in cooperation with the lubricant supplier.

When selecting a lubricant, the type of bearings/ friction points, the expected load during operation, and the anticipated ambient conditions must be taken into account. All economic and environmental aspects must also be considered.

2.3 Approved lubricants

ATTENTION

If required SKF can help customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system

Please contact SKF Lubrication Systems if you have further questions regarding lubricants. It is possible for lubricants to be tested in the company's laboratory for their suitability for pumping in centralized lubrication systems (e.g. „bleeding“). You can request an overview of the lubricant tests offered by SKF Lubrication Systems from the company's Service department.

ATTENTION

Only lubricants approved for the product may be used. Unsuitable lubricants can lead to failure of the product and to property damage.

ATTENTION

Different lubricants must not be mixed. Doing so can cause damage and require costly and complicated cleaning of the product/ lubrication system. It is recommended that an indication of the lubricant in use be attached to the lubricant reservoir in order to prevent accidental mixing of lubricants.

The product described here can be operated using lubricants that meet the specifications in the technical data. Depending on the product design, these lubricants may be oils, fluid greases, or greases.

Mineral, synthetic, and/ or and rapidly biodegradable oils and base oils can be used. Consistency agents and additives may be added depending on the operating conditions.

Note that in rare cases there may be lubricants whose properties are within permissible limit values but whose other characteristics render them unsuitable for use in centralized lubrication systems. For example, synthetic lubricants may be incompatible with elastomers.

2.4 Lubricants and the environment



ATTENTION

Lubricants may pollute ground and waters. Lubricants have to be handled and disposed of properly. Relevant applicable regulations and laws regarding the disposal of lubricants must be observed.

It is important to note that lubricants are environmentally hazardous, flammable substances which require special precautionary measures during transport, storage, and processing. Consult the safety data sheet from the lubricant manufacturer for information regarding transport, storage, processing, and environmental hazards of the lubricant that will be used.

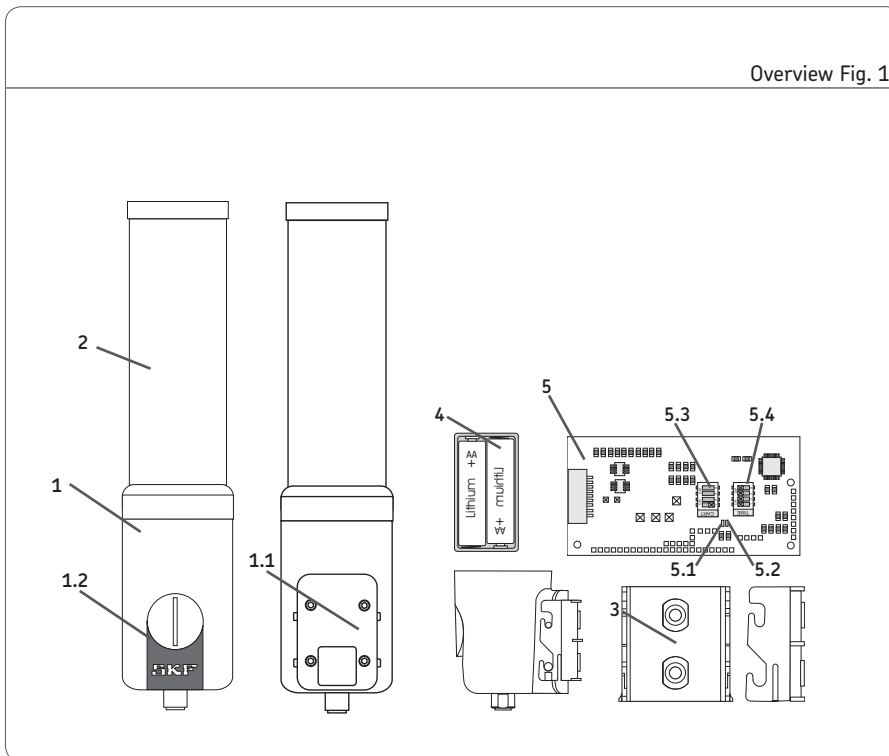
The safety data sheet for a lubricant can be requested from the lubricant manufacturer.

2.5 Lubricant hazards

	<div data-bbox="662 271 1002 346">WARNING</div> <div data-bbox="662 346 1002 705">Risk of slipping and injury Leaking lubricant is hazardous due to the risk of slipping and injury. Beware of any lubricant leaking out during assembly, operation, maintenance, or repair of centralized lubrication systems. Leaks must be sealed off without delay.</div>
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3. Overview/ functional description

Item	Description
1	Drive unit assy.
1.1	Lid of the battery compartment
1.2	Bayonet plug
2	Cartridge
3	Bracket to fix the drive unit
4	Battery holder
5	Control printed circuit board with green (5.1) and red (5.2) LED to display operating and error states and the two DIP switch blocks Cart (5.3) and TIME (5.4). The control printed circuit board is positioned in the drive unit and can be accessed by removing the bayonet plug.



3.1 Lubricator

The TLMR is a compact, powerful, electrically driven lubricator to supply lubricant intermittently from special, non-refillable SKF lubricant cartridges.

To do so the supply piston carries out a complete supply cycle (full downward and upward movement).

There is available a 12/24 VDC as well as a battery version independent of the power grid. We recommend to use the 12/24 VDC version in areas where mainly low temperatures are to be expected.

The lubricant volume required at the lube point can easily be adapted to the requirements by selecting the suitable cartridge size and adjusting the dispensing time (consumption time of the cartridge).

The dispensing time of the cartridges can be set from 1 to 24 months.

3.2 Operation with PLC control unit

For special applications the TLMR can be driven also with an external control unit (PLC).

The following rules apply for an operation of the TLMR with a PLC control unit:

- o The TLMR must be switched "ON" via the DIP switch.
- o The power supply is switched on and off via the PLC control unit.
- o All DIP switch settings can be used except from "Venting" and "Reset".
- o The TLMR can be switched on maximum twice per minute.
- o During standard operation there must not be switched more than 2 supply cycles per hour by the PLC control unit.
- o To vent the lubricator, e.g. after a change of cartridge, a higher number of supply cycles is possible (e.g. 10 supply cycles).

4. Technical data

4.1 General technical data

Technical data

Admissible operating temperature	min. -25 °C	max. 70 °C
Operating pressure	max. 30 bar	
Lubricant outlet	G1/4	
Installation position	any	
Protection class	IP 6K9K	
Output per supply cycle	approx. 0.12 ml	
Total output	≥ 12 lubricant cartridges (380 ml)	
Pumpable lubrication greases	NLGI 1 and 2	
Weight of drive unit (incl. batteries)	0.8 kg	

Electric connection

TLMR 201

Power supply	12/24 VDC
Max. power input	< 1A
Protection class	SELV (1)

TLMR 101 (battery version)

Supply voltage	4 x 1.5 V (AA)
Corresponding batteries are supplied with each cartridge.	
Batteries have to be exchanged each time the cartridge is changed. Afterwards carry out a reset.	

Factory settings

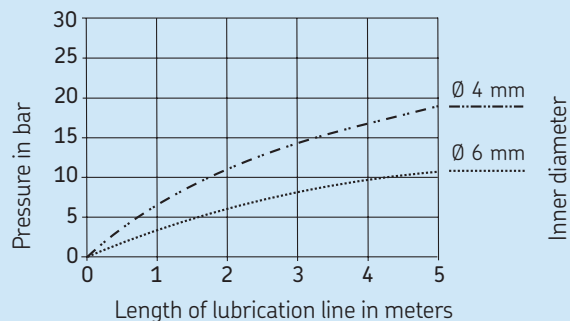
TLMR	without cartridge	with 120 ml cartridge
Dispensing time	6 months	3 months
Size of cartridge	380 ml	120 ml
Reset	OFF	OFF
Activated	OFF	OFF

Nominal output

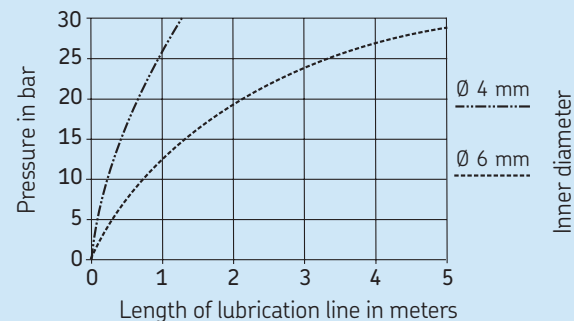
	Cartridge 120 ml		Cartridge 380 ml	
Dispensing time				
01 month	4.00	ml/d	-----	
02 months	2.00	ml/d	6,30	ml/d
03 months	1.30	ml/d	4.20	ml/d
06 months	0.60	ml/d	2.10	ml/d
09 months	0.40	ml/d	1.40	ml/d
12 months	0.30	ml/d	1.00	ml/d
18 months	0.20	ml/d	0.70	ml/d
24 months	0.15	ml/d	0.50	ml/d

4.2 Output pressure in dependency of the line length and temperature

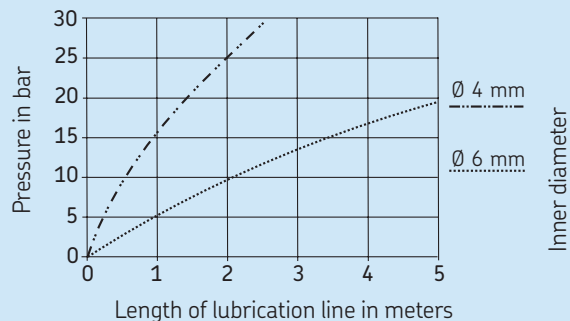
Pressure diagram + 20 °C



Pressure diagram - 10 °C



Pressure diagram ± 0 °C



ATTENTION

The pressure values stated in the diagrams are average values out of measurements with SKF lubrication greases of NLGI 2. These values are to be understood as reference values. In addition to the shown context between temperature/ line length/ nominal diameter and the pressure resulting thereof, there exists the possibility that in case of low temperatures the output may be reduced due to a deteriorated suction behaviour of the lubricant. This should be considered when laying out the system. The maximum supply pressure of the TLMR of 30 bar must not be exceeded.

5. Delivery, returns, and storage

5.1 Delivery

The products are packaged in accordance with standard commercial practice according to the regulations of the recipient's country. During transport, safe handling must be ensured and the product must be protected from mechanical effects such as impacts. The transport packaging must be marked „Do not drop!“

There are no restrictions for land or sea transport. For transport of Lithium batteries there apply the legal IATA (International Air Transport Association) regulations regarding packaging, marking, volume limitation and declaration of the shipment.

After receipt of the shipment, the product(s) must be inspected for damage and for completeness according to the shipping documents. The packaging material must be preserved until any discrepancies are resolved.

5.2 Storage

SKF products are subject to the following storage conditions:

5.3 Electrical devices

- o Ambient conditions: dry and dust-free surroundings, storage in well ventilated dry area.
- o Storage time: max. 24 months
- o Permissible humidity: < 65% (rh)

Storage temperature:

min. + 10 °C / max. + 40 °C

- o Avoid direct sun or UV exposure
- o Shield nearby sources of heat and coldness.

5.4 General notes related to storage

- o The product(s) can be wrapped in plastic film to provide low-dust storage.
- o Protection against ground moisture by storing on a shelf or wooden pallet.

6. Assembly

6.1 General information

Only qualified technical personnel may install, operate, maintain, and repair the progressive feeders described in the lifecycle manual. Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product into which the progressive feeders are incorporated.

Such persons are familiar with the relevant standards, rules, accident prevention regulations, and operating conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid potential hazards.

Before assembling/ setting up the product, the packaging material and any shipping braces (e.g. plugs) must be removed.

The packaging material must be preserved until any discrepancies are resolved.

ATTENTION

Observe technical data (chapter 4).

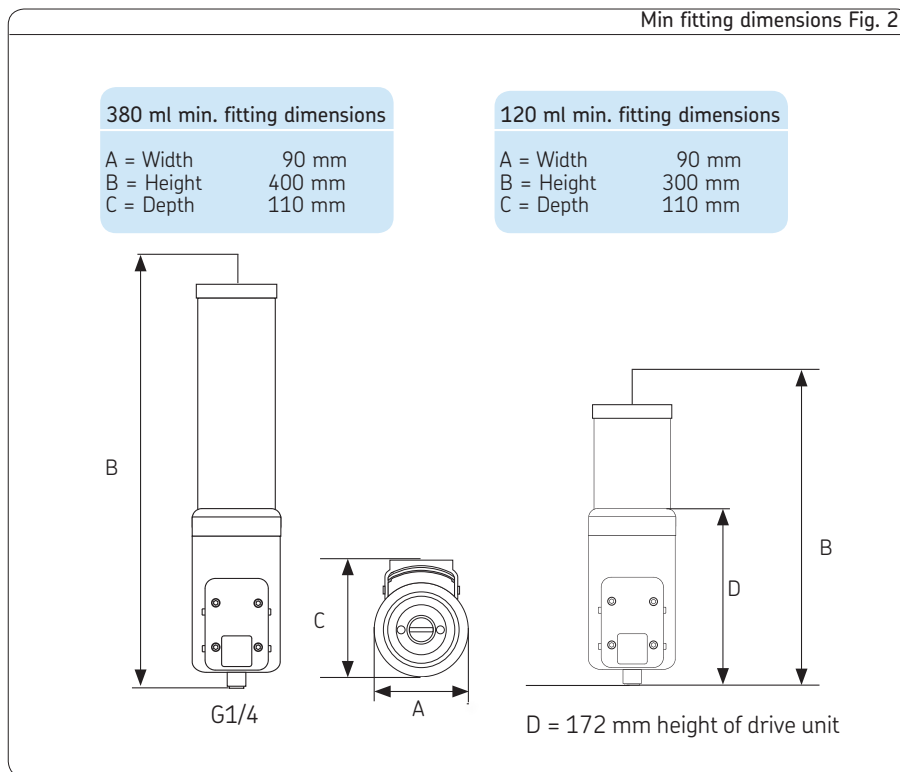
6.2 Set-up and attachment

The product should be protected against humidity and vibration and should be installed in an easily accessible position to ensure all other installations can be carried out without any problem. For indications on the maximum admissible ambient temperature see the technical data. During assembly and during any drilling work, always pay attention to the following:


- o Other units must not be damaged by assembly work.
- o The product must not be installed within the range of moving parts.
- o The product must be installed at an adequate distance from sources of heat and coldness.
- o Maintain safety clearances and comply with local regulations for assembly and accident prevention.

6.3 Minimum assembly dimensions

To ensure enough space for maintenance works (e. g. change of cartridge) and for any disassembly of the product, adhere to the minimum assembly dimensions.



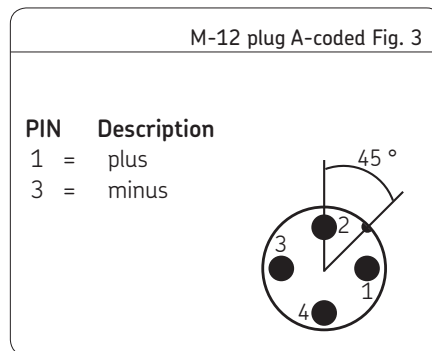
6.4 Electrical connection 12/24 VDC

	WARNING
	<p>Electric shock</p> <p>Electrical connections may only be performed by qualified technical personnel. Local connection conditions and legal prescriptions (e.g. DIN, VDE) must be adhered to.</p>

Electrical connections must be realized in such way that there are not transmitted any forces to the product (stressless connection).

For details on the electrical characteristics see chapter 4, technical data.

6.5 Pin assignment M-12 plug



6.6 Lubrication line connection

The lubrication line must be connected in such way that there are not transmitted any forces to the product (stressless connection).

6.7 Notes related to the type identification plate

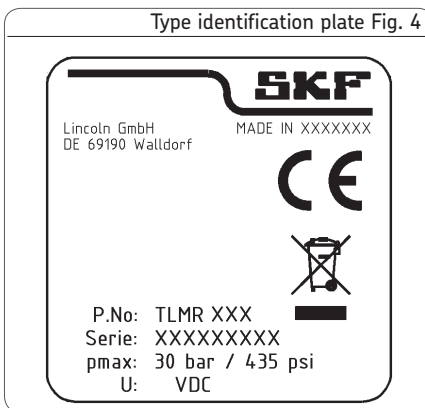
The type identification plate states important characteristics such as type designation, order number, etc.

To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions Manual.

P. No.: _____

Series: _____

Voltage: _____VDC



6.8 Adjustment options

In the following you see the adjustment options of the TLMR lubricator.

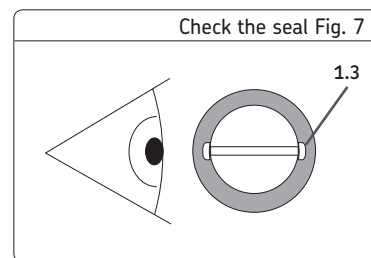
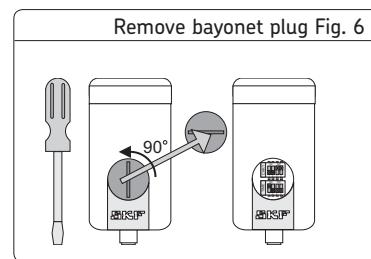
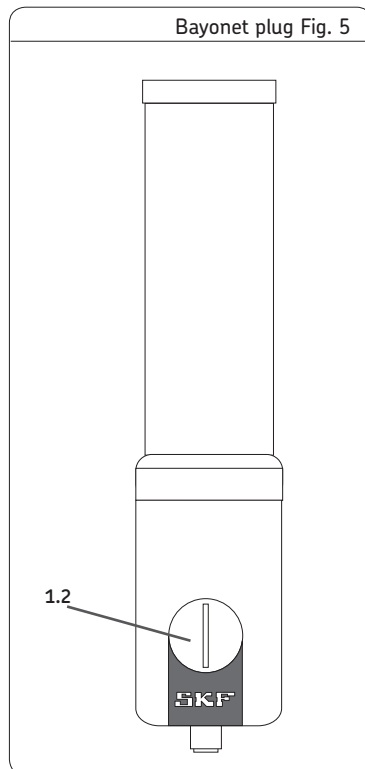
6.9 Access to the printed circuit board

To carry out the described configuration on the DIP switches of the printed circuit board it is necessary to remove the bayonet plug (1.2) and to remount it after completion of the works.

- Turn the bayonet plug (1.2) anticlockwise by 90°.
- Remove bayonet plug (1.2) with seal (1.3).

After completion of the works:

- Remount bayonet plug (1.2) with seal (1.3). Ensure that seal (1.3) is not damaged.

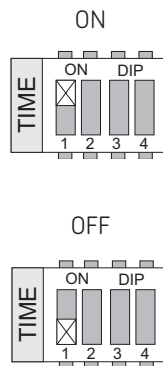


6.10 Adjustment options DIP switch block TIME

To set the options position the DIP switches as shown in figures 8 and 9 (white). If not all DIP switches are required for an option, these are not shown (grey).

6.11 Activate/ deactivate the TLMR

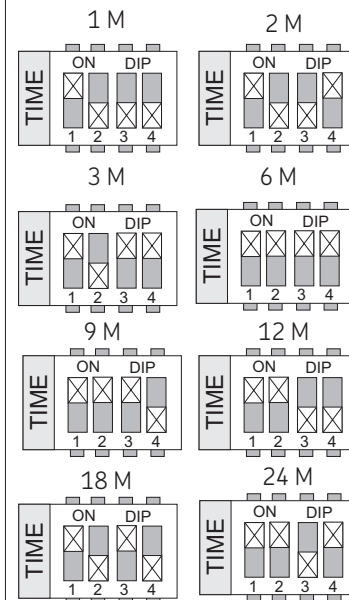
Activate/ deactive Fig. 8



6.12 Set the consumption time

M = Consumption time in months

Set the consumption time Fig. 9

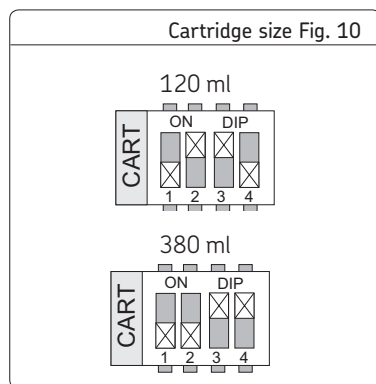


6.13 Adjustment options

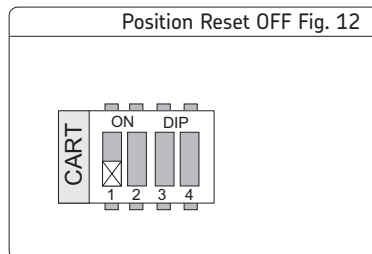
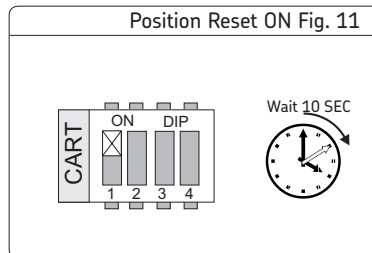
DIP switch block CART

To set the options position the DIP switches as shown in figures 10 till 13 (white). If not all DIP switches are required for an option, these are not shown (grey).

6.14 Adjust size of cartridge



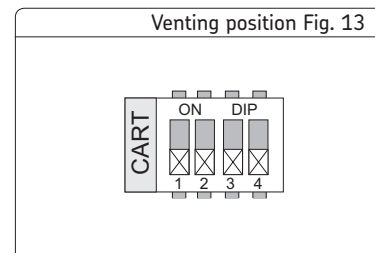
6.15 Carry out reset



ATTENTION

The DIP switch has to remain in this position up to 10 s. A successful reset is indicated by a simultaneous lighting of the red and the green LEDs. After the reset make sure to adjust the correct cartridge size again.

6.16 Venting/ functional control



Serves to vent and to check the function after changing the cartridge.

ATTENTION

Use the venting position only for a short time. Permanent operation in this position will result in premature reaching of the nominal durability of the drive unit.

6.17 Mount the cartridge

Mount the cartridge

- Remove protective screw (6) from lubricator and keep it for later use.
- Remove closure screw (7) of the cartridge.
- Eliminate contaminations in the area around the cartridge and the grease inlet of the driving unit.
- Turn cartridge (2) into the TLMR by hand until it stops.

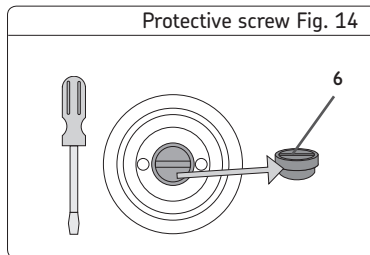
Remove the cartridge

- Turn used cartridge (2) clockwise out of the TLMR.
- Check sealing ring (1.5), replace defective sealing ring.
- Turn in new cartridge as described and carry out the reset, if necessary, change the size of the cartridge.

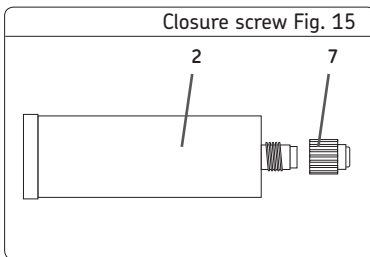
or

- Turn protective screw (6) into the lubricator.
- Switch off the TLMR.

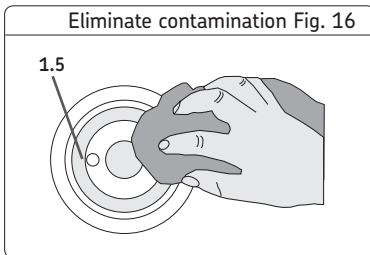
Protective screw Fig. 14



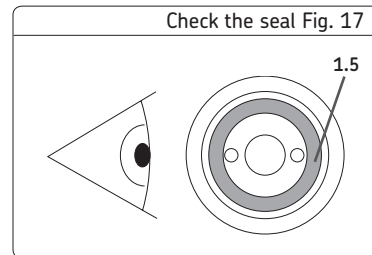
Closure screw Fig. 15



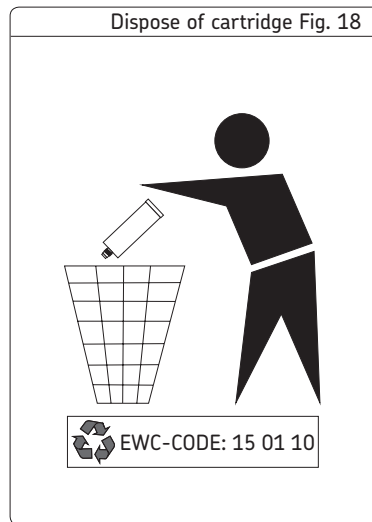
Eliminate contamination Fig. 16



Check the seal Fig. 17



Dispose of cartridge Fig. 18



6.18 Mount the bracket

The stainless steel fastening material, which is part of the scope of delivery, is used to mount the bracket.

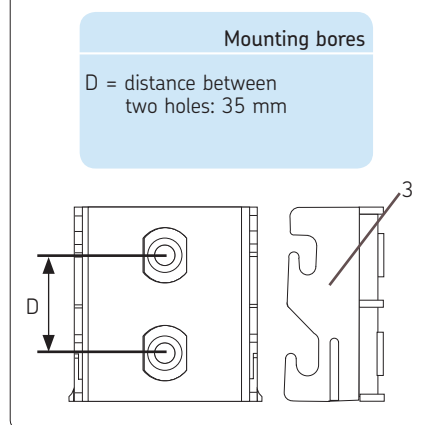
ATTENTION

In the area of the mounting bores the bracket must not rest clear of the surface. Otherwise bracket will be deformed and damaged. Mount bracket to even surface only. When mounting the bracket to hollow profiles, line the bracket accordingly.

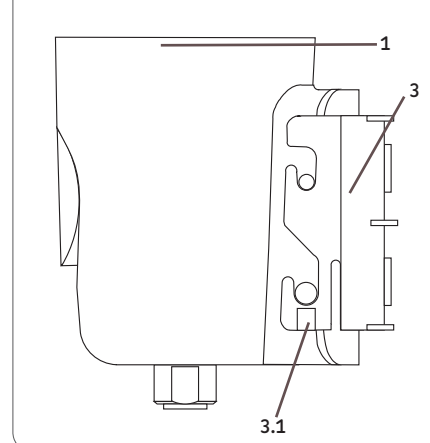
- o 2 x countersink screw M 6 x 20
DIN ISO 10642
- o 2 x washer
DIN 125 A 6,4
- o 2 x nut M 6 A2
- Attach the bracket to the mounting surface following the hole pattern and in accordance with the attachment conditions.

Tightening torque 4 +0.5 Nm

Mounting bores Fig. 19



Drive unit in bracket Fig. 20



6.19 Insert/ remove drive unit

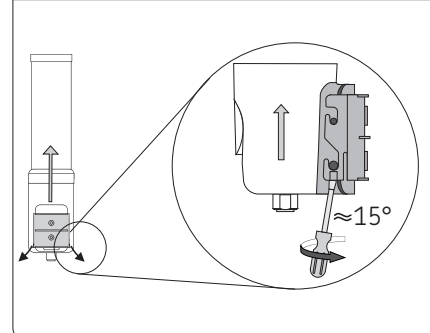
Insert

- Push drive unit (1) into the bracket (3) from the top and press it down until the drive unit locks in place (snap fit with locking function).

Remove

- Carefully bend the lashes (3.1) of the bracket (3) outwards with a screwdriver.
- Press the drive unit (1) upwards out of the bracket.

Drive unit Fig. 21



6.20 Changing of battery

- Loosen and remove the four screws (1.6) on the lid (1.1) of the battery compartment.
- Remove battery holder (4).
- Change batteries.
- Insert battery holder (4) again.
- Make sure that during assembly the cables of the battery holder are not jammed between the lid of the holder and the holder.
- Check the seal (1.4) and replace it in case of damages.

- Mount lid (1.1) of battery compartment back again.

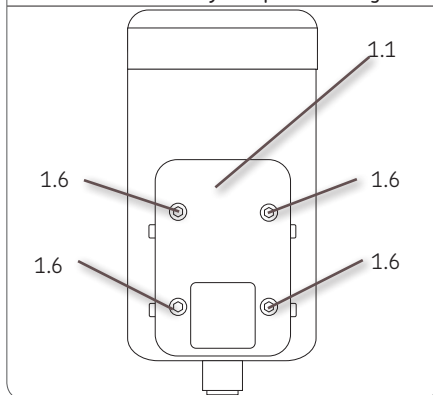
Tightening torque = 1.9 + 0.1 Nm

Tool: : Hexagon socket wrench Size 4

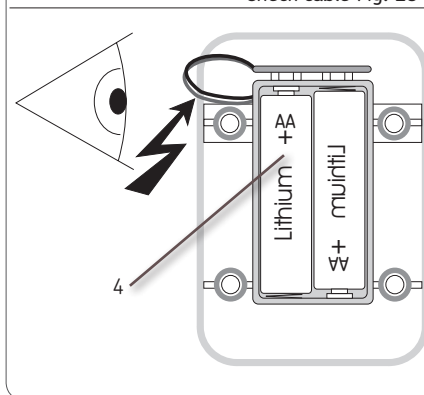
ATTENTION

The screws (1.6) of the battery compartment are undetachable. Do not turn them out by force or by means of an electrical tool. When changing the battery ensure correct orientation of the batteries in the battery holder (pressure spring = negative pole).

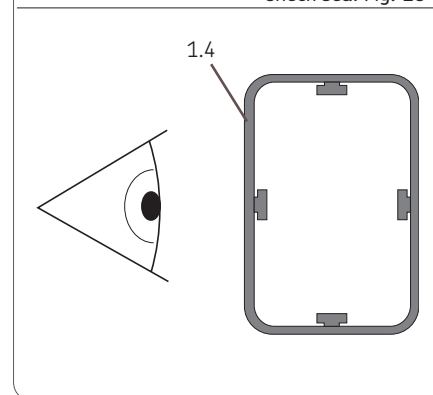
Lid of the battery compartment Fig. 22



Check cable Fig. 23



Check seal Fig. 25



Disposal of batteries Fig. 24



Li-ion Batteries

 EWC-CODE: 16 06 05

7. Start-up

7.1 General information

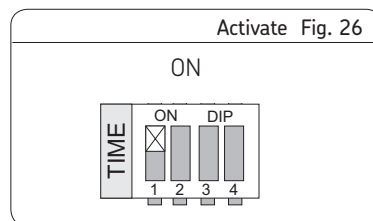
Before the system start-up, both the lubricant cartridge and the DIP switch positions have to be verified with the intended use. In addition, the electric and hydraulic connections are to be checked.

Prior to commissioning, ensure that:

- o the grease in the lubricant cartridge is suitable for the intended purpose.
- o the correct cartridge size is set.
- o the correct dispensing time is set.
- o the system has been ventilated.
- o a reset procedure has been carried out.
- o all electrical and hydraulic connections are correctly connected.
- o bayonet plug and if applicable the battery compartment are correctly mounted.

7.2 Switching on

Set the DIP switch to the ON position.



8. Operation, shutdown, and disposal

8.1 General information

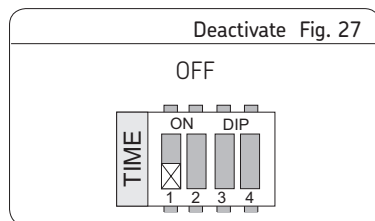
The TLMR lubricator works automatically. Still the function should be checked at regular intervals.

8.2 Temporary shutdown

Set the corresponding DIP switch to the OFF position to shut the system down temporarily.

In case of longer shutdown observe the notes stated in chapter "Transport, delivery, and storage".

To start the system up again observe the notes stated in chapter "Assembly".



8.3 Shutdown and disposal

If the product will be permanently shut down, the local regulations and laws regarding the disposal of contaminated equipment must be observed. The product can also be returned to the manufacturer for disposal, in which case the customer is responsible for reimbursing the costs incurred. The parts are recyclable.

8.4 Disposal of the batteries

- Collect used batteries separately in a plastic bag that closes airtight.
- Dispose of used batteries in accordance with the prevailing legal prescriptions in an environmentally sound manner (collecting points).

WARNING

Never recharge, short-circuit, expose to heat over 85 °C, or throw batteries into water. Do not drop, puncture or deform batteries. In case of damage electrolyte may leak from the battery. Observe the battery manufacturer's safety data sheet.

Disposal of batteries Fig. 28

Li-ion Batteries

EWC-CODE: 16 06 05

9. Maintenance

9.1 General

The manufacturer shall not be held liable for damages resulting from improperly performed assembly, maintenance or repair work on the product.

9.2 Cleaning

- Thoroughly clean all outside surfaces. Do not use aggressive cleaning agents. Interior cleaning normally is not necessary.

9.3 Maintenance

The TLMR requires almost no maintenance.

Still when replacing a cartridge the TLMR should be checked for proper functioning and damages.

9.4 Functional test

- Loosen lubricant feed line from TLMR.
- Switch TLMR off and on again (triggering an additional lubrication cycle). Repeat procedure if required.
- Reinstall lubricant feed line.

9.5 Inspection for damages

- All seals
- Bayonet plug
- Bracket
- Drive unit
- If applicable, battery lid

10. Malfunctions, causes, and remedies

Possible malfunctions	Cause	Elimination, detection of the malfunction
TLMR does not work	DIP switch ON/ OFF in OFF position	Put the DIP switch in the ON position. The test of the storage program starts (10 s)
	There is no connection to the power supply. Batteries are empty (TLMR 101)	Connect the TLMR to the correct power supply Replace the batteries
	Fault - storage test	Switch the TLMR on again. The test of the storage program must lapse automatically, i. e. the LEDs flash during 10 s following the sample "Switch-on process".
	Fault - overcurrent (2 hours pause) Fault - TLMR blocked	The red LED flashes following the sample "Pause after overcurrent" The red LED flashes following the sample "Pause after blockade"
TLMR works, but does not dispense lubricant	Air in the supply line Cartridge is empty	Remove the supply line, put the DIP switch into the "Venting" position. Let the TLMR run until lubricant is supplied free of bubbles Green LEDs flash following the sample "Pre-empty warning" Replace cartridge and batteries, if need be

9

10

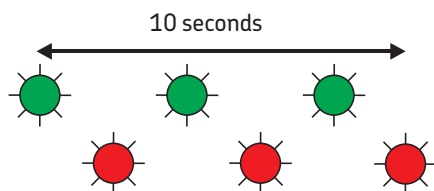
10.1 Operating and error displays - LEDs of the control printed circuit board

Switch-on process

Each time the system is switched on, the storage program is checked with regard to possible errors.

LED display:

Alternate lighting of the green and the red LEDs during 10 seconds.



If an error is detected during the storage test, the test will be interrupted and both LEDs will switch off before the 10 seconds will have lapsed.

Operation

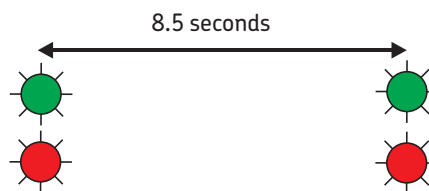
During operation of the TLMR both LEDs are off.

Low-level warning (10% remaining volume)

As soon as the number of metering strokes assigned to the size of the cartridge is reached, a pre-empty warning is displayed.

LED display:

Green and red LEDs light up shortly every 8.5 seconds.

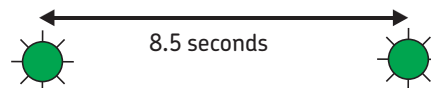


Pause after metering

A pause after a metering process is displayed as follows.

LED display:

Green LED lights up shortly every 8.5 seconds.

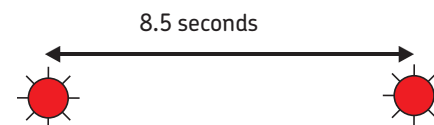


Blockade/ signal error/ overcurrent

A pause (2 hours) after a blockade/ signal error/ overcurrent is displayed as follows:

LED display

Red LED lights up shortly every 8.5 seconds. Blockade/ signal errors light up for 80 ms, overcurrent lights up for 500 ms



11. Spare parts

Battery spare parts kit

Part no.: 541-34901-2

consisting of:

- Battery lid assy.
(incl. seal and screws)

Closure plug spare parts kit

Part no.: 541-34901-4

consisting of:

- Closure plug assy.
(incl. seal)

Battery holder spare part

Part no.: 541-34901-6

consisting of:

- battery holder

Bracket spare parts kit

Part no.: 541-34901-3

consisting of:

- Bracket
- Fixing material (stainless steel)
 - 2 x countersink screw M 6 x 20
DIN ISO 10642
 - 2x washer
DIN 125 A6,4
 - 2x hexagon nut M 6 A2

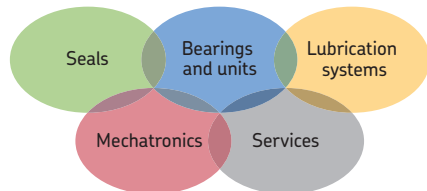
Sealing ring spare parts kit

Part no.: 541-34901-5

consisting of:

- self-adhesive sealing ring

Notices



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry world-wide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

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