

Operating Manual

ChronoLube System



This operating manual applies to the lubricator
ChronoLube System with a capacity of 120 cm³

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We have put together all information in this documentation with the utmost care. Nevertheless, we cannot exclude deviations and reserve the right to make technical changes to the product without prior notice.

We shall assume no legal responsibility or liability for any damage which may result from such deviations and changes. Necessary changes will be integrated in the next edition.

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1 Preface and General Information

1.1 About this operating manual

- ◆ This operating manual is used for working on and with the OKS ChronoLube System automatic lubricator in a safe manner. It contains safety precautions that must be observed.
- ◆ The operating manual must be available to all persons, who work on and with the lubricator while performing their work, and they must observe all information and references relevant for them.
- ◆ The operating manual must always be complete and in proper legible condition.

1.1.1 Terms used

◆ Lubricator

The brand name OKS ChronoLube System or the term lubricator will be used for the "lubricator" in the following text.

◆ Lubricant cartridge

The term ChronoLube cartridge will be used for the "lubricant cartridge" in the following text. The ChronoLube cartridge is filled with the OKS oil or grease desired by the machine owner and is available in the size 120cm³.

1.1.2 Structure of safety precautions

All safety precautions in this operating manual have a uniform structure.

1.1.3 Danger symbols



Warning! Danger!
This symbol warns you of health dangers up to life-threatening injuries or death!

1.1.4 Information symbols



This symbol points out tips on use that will help you to carry out activities quickly and safely.

1.2 Delivery scope

- ◆ The oils and greases used in the ChronoLube System have an individual composition according to the customer's requirements.
- ◆ Please check immediately following receipt of the delivery, whether it matches your order. OKS Spezialschmierstoffe GmbH will assume no warranty for defects reported at a later time.
- ◆ Report:
 - Recognisable transport damage immediately to the deliverer.
 - Recognisable defects or incomplete deliveries immediately to OKS.

1.2.1 Delivery sizes

| Delivery Designation (Type) | Volume in cm ³ |
|-----------------------------|---------------------------|
| ChronoLube cartridge | 120 |

1.3 OKS ChronoLube System lubricator

1.3.1 Marking

- ◆ The ChronoLube System lubricator is clearly marked with an adhesive label on the CL Drive and an adhesive label on the CL cartridge.
- ◆ **CE marking** on CL drive and CL cartridge
- ◆ Manufacturer:

OKS Spezialschmierstoffe GmbH
Triebstr. 9
80993 München
Germany

Tel.: +49 (0) 89 14 98 92 0 Internet: www.oks-germany.com
Fax: +49 (0) 89 14 19 219 e-mail: info@oks-germany.com

1.3.2 Proper use

- ◆ The ChronoLube System lubricator
 - immediately supplies all lubricating points with oil and grease up to a maximum pressure build-up of 5 bar - constantly, precisely and in the specified temperature range regardless of the ambient temperature.
 - can be used at lubricating points of rolling and friction bearings, drive and transport chains, guides, open gear units and seals.
 - is intended for use in machines and systems.
 - is only to be used for the purposes ordered and confirmed by OKS.
 - is only to be operated under the operating conditions specified in this operating manual.
 - is only to be operated with the settings and variations specified in this operating manual.



Any other use, setting and variation shall be considered improper!

1.4 Legal regulations

1.4.1 Liability

- ◆ The information, data and references in the operating manual were up to date at the time of printing. No claims may be made on lubricators already delivered based on information, illustrations and descriptions.
- ◆ OKS Spezialschmierstoffe GmbH shall assume no liability for injuries, damage and malfunctions resulting from:
 - improper use;
 - unauthorised modifications to the drive system or the ChronoLube cartridge;
 - improper work performed on and with the lubricator;
 - operating and setting errors of the lubricator;
 - incorrect settings and variation sizes of the lubricator;
 - failure to observe the operating manual.

1.4.2 Warranty

- ◆ Warranty conditions: see Terms of Sale and Delivery of OKS Spezialschmierstoffe GmbH.
- ◆ Report warranty claims immediately to OKS after discovering the defect or fault.
- ◆ The warranty is voided in all cases in which no liability claims can be asserted.



2 Safety Precautions

2.1 Persons responsible for safety

◆ Operator

- The owner is any natural or legal person, who uses the lubricator or on order of whom the lubricator is used.
- The operator or its safety representative must ensure
 - that all relevant regulations, information and laws are complied with;
 - that only qualified personnel work on and with the lubricator;
 - that the operating manual is available to the personnel during all corresponding work, and that the personnel complies with it;
 - that unqualified personnel is prohibited from working on and with the lubricator;
 - that the necessary accident prevention regulations and safety regulations are complied with during assembly of or while performing maintenance on the lubricator.

◆ Qualified personnel

Qualified personnel are persons who, due to their training, experience, instruction and knowledge of applicable standards and regulations, accident prevention regulations and operating conditions, have been authorised by the person responsible for the system's safety to carry out the respectively required activities, and can recognise and avoid possible dangers in the process.

2.2 General safety precautions

- ◆ No claim to completeness is made with these safety precautions. In case of questions and problems, please speak with the Technical Service of OKS.
- ◆ The lubricator complies with state-of-the-art technology and is basically considered safe to operate at the time of delivery.
- ◆ The lubricator presents dangers to persons, the lubricator itself and other property of the operator if:
 - unqualified personnel works on and with the lubricator;
 - the lubricator is used improperly and for other than the specified purpose;
 - the lubricator is incorrectly adjusted or varied.
- ◆ The lubricator must be filled with the correct oil or grease and must be set so that it fulfils its function with proper setting, attachment and during proper use in fault-free operation, and presents no danger to persons.
This also applies to its interaction with the entire system and the points to be lubricated.
- ◆ Make sure with suitable measures that no damage occurs if the lubricator should fail.
- ◆ Only operate the lubricator in proper condition.
- ◆ Retrofitting, changes or modifications to the lubricator are always prohibited. They always require consultation with OKS.
- ◆ Do not open the ChronoLube cartridge with force.

2.3 Safety precautions for the OKS ChronoLube System

2.3.1 Safety precautions during installation and maintenance



- ◆ Make sure that all workplaces and traffic routes are clean and safely accessible!
- ◆ During assembly and maintenance work at workplaces with a danger of falling, the corresponding regulations and guidelines must be complied with.
- ◆ During assembly and maintenance work on machines and systems, the safety precautions and the corresponding operating instructions must be complied with, e.g. shut down the machine.

2.3.2 Safety precautions when handling the ChronoLube cartridge



- ◆ Avoid all contact of the eyes, skin and clothing with oil and grease!
- ◆ Avoid swallowing oil and grease!
- ◆ Do not allow oil and grease to get into the soil or sewerage system!
- ◆ Observe safety data sheets of oil and grease!
- ◆ Oil and grease on traffic routes leads to an increased danger of slipping. Therefore, immediately clean the floor with appropriate means!
- ◆ Only use genuine ChronoLube cartridges from OKS!

2.3.3 Safety precautions when handling batteries



- ◆ Avoid all contact of the eyes, skin and clothing with battery substances!
- ◆ Avoid swallowing leaking battery substances!
- ◆ Observe safety data sheets for batteries!
- ◆ Do not expose batteries to extreme heat or throw into open flame!
- ◆ Never recharge batteries!
- ◆ Observe regulations for disposing of batteries!
- ◆ Only use genuine battery sets from OKS!



3 Technical Data

3.1 Product properties

3.1.1 Design

- ◆ On customer request, lubricators are delivered with the filling with oil and grease specified by the operator.
These consist of (see Figure 1):
 - (a) Sealing plug
 - (b) ChronoLube cartridge available with the OKS lubricant specified by the customer (R ¼" internal thread).
ChronoLube cartridge may not be refilled!
 - (c) Drive system, consisting of a rugged geared motor and an electronics unit for control, **reusable**.
 - (d) Battery set consisting of three size AA batteries with 1.5 V each. The batteries are not intended for recharging.
Never use batteries a second time!
 - (e) Sealing cap for the drive system, **reusable**.

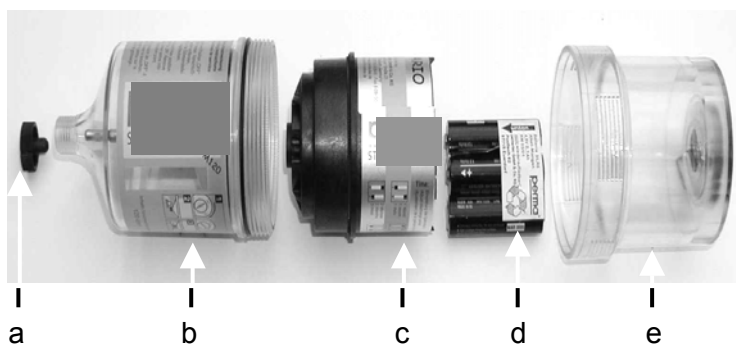


Figure 1

3.1.2 Mode of operation

The piston movement ensures the precise output of oil or grease to the lubricating point. The lubricant is fed out of the ChronoLube cartridge by a driven spindle in the piston. This moves the piston and builds up a pressure of **5 bar** in the CL cartridge. The automatic pressure limitation switches off the system above 5 bar following repeated start-up.

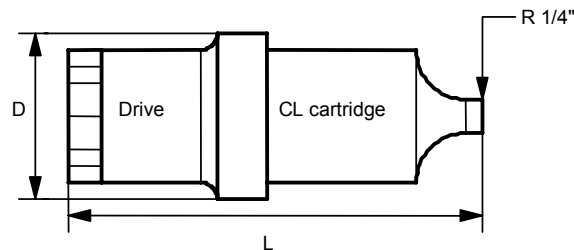
The size of the CL cartridge must be set on the electronics unit with a coding switch marked "VOL". The running time of the dispensing process must be set with a second coding switch marked "TIME".

3.1.3 Table for dispensing quantity per dispensing cycle

| Dispensing time | Break time | Dispensing quantity per dispensing cycle |
|-----------------|------------|--|
| | | M 120 cm ³ |
| [Months] | [h:min] | [cm ³] |
| 1 | 1:30 | 0.26 |
| 3 | 4:37 | |
| 6 | 9:17 | |
| 12 | 18:36 | |

3.2 Weights and dimensions

| Type | Volume in cm ³ | Diameter in mm D | Total length in mm L | Weight in kg empty | Weight in kg filled |
|--------------|---------------------------|---------------------|-------------------------|-----------------------|------------------------|
| CL cartridge | 120 | 71 | 165 | 0.386 | approx. 0.500 |



3.3 Operating conditions

3.3.1 Temperatures

- ◆ Operating range: – 10° C to + 50° C
- ◆ In this temperature range a uniform dispensing behaviour and a pressure build-up up to a maximum of 5 bar is ensured.
- ◆ At temperatures above + 50° C and below – 10° C the mode of operation cannot be ensured.

3.3.2 Ambient conditions

- ◆ The lubricators are protected against dust and splash water when the individual components are correctly assembled.
- ◆ Media in the environment, in particular chemically aggressive substances, can attack sealing rings and plastics.

4 Storage

4.1 General information on storage

If the lubricator is not installed immediately, provide suitable storage conditions in dry, dust-free indoor rooms protected from sunlight.

4.1.1 Suitable storage conditions

- ◆ Dry
- ◆ Dust-free
- ◆ Temperature + 20° C ± 5° C

4.1.2 Suitable storage periods

- ◆ Up to one year
 - ChronoLube cartridge
 - Battery set
- ◆ Over one year
 - ChronoLube drive
 - Cover for CL drive

5 Commissioning and Operation

5.1 Preparations



Before the lubricator is installed, the lubricating points and the supply lines must be sufficiently pre-lubricated with the same lubricant that the ChronoLube cartridge contains. For this purpose, OKS can supply you with a 400 g lubricant cartridge for grease guns with the corresponding OKS lubricant (see Chap 11.1).

- ◆ When installing the OKS ChronoLube System, a support bracket (thread G ¼ inside and outside) from OKS should be used.
- ◆ For horizontal installation, the OKS retaining clip should be used to fix the lubricator in place.

5.2 Prior to commissioning

- ◆ Check the entire lubricator for external damage.
- ◆ Is the ChronoLube cartridge filled with the desired oil or grease?
- ◆ Has a new battery set been installed?
- ◆ Is the "VOL" coding switch in the drive system set to the correct size of the ChronoLube cartridge?
- ◆ Is the "TIME" coding switch in the drive system set to the desired dispensing time of the operator?
- ◆ Has an oil throttle been mounted for an oil-filled ChronoLube cartridge?
- ◆ Are all components properly assembled and tightened hand-tight?

5.3 Initial start-up

- ◆ The OKS ChronoLube System is delivered from the factory with the pre-set dispensing time of 6 months (basic setting).
- ◆ On order the dispensing time requested by the operator can already be set at the factory.



The operator must be sure to check the settings before commissioning and set them itself if necessary! (see Chapter 7)

- ◆ Pre-lubricate the lubricating points with the same lubricant as is contained in the ChronoLube cartridge (see Chap. 5.1).
- ◆ Check whether the thread of the ChronoLube System matches the thread of the screw-in point (R ¼).
- ◆ Remove the sealing plug from the ChronoLube cartridge and screw the ChronoLube System into the lubricating point hand-tight.
- ◆ When using lubricators filled with oil, also seal off the connection thread with a suitable, commonly available sealing compound and ensure a vertical installation position of the lubricator (outlet at the bottom).
- ◆ Start the dispensing process of the ChronoLube System by switching the rotary switch on the cover of the drive system from the "OFF" position to the "ON" position.

You recognise that the dispensing process with exiting of the lubricant has started from the drive motor starting up and the red LED lighting up.



5.4 During operation

- ◆ Conduct regular checks during operation. When doing so, pay particular attention to leaks and the condition of the lubricator.
- ◆ Check the fill level in the transparent ChronoLube cartridge regularly!
- ◆ If faults occur, go through the fault table in Chapter 9. If the faults cannot be eliminated, please contact the Technical Service of OKS.



Never change settings of the coding switches during operation or following start-up!

6 Changing ChronoLube Cartridge

6.1 To be generally observed

The need for changing the empty ChronoLube cartridge is indicated by the simultaneous flashing of the red and green LED.



When changing the ChronoLube cartridge, the battery set must always also be replaced. Otherwise proper operation of the lubricator cannot be guaranteed!

When changing the ChronoLube cartridge, the size and the dispensing time of the ChronoLube cartridge can be reset with the coding switches in the drive system.

As the drive system and the control PCB must be protected from moisture, the change may only be carried out in a dry environment!

6.2 Procedure when changing CL cartridge

- (a) Move rotary switch from "ON" to "OFF" position
- (b) Unscrew lubricator completely from lubricating point
- (c) Screw off drive system cover
- (d) Remove drive system from CL cartridge
- (e) Remove battery set (old) from drive system
- (f) Insert battery set (new) in drive system in direction of arrow
- (g) Reset coding switches if dispensing time or size of ChronoLube cartridge changes
- (h) Place drive system on new ChronoLube cartridge until toothings of two intermesh
- (i) Screw drive system cover to CL cartridge hand-tight
- (j) Remove sealing plug on ChronoLube cartridge
- (k) Screw lubricator into lubricating point hand-tight
- (l) For lubricators filled with oil, also seal off screw-in thread with commercially-available sealing compound and ensure a vertical installation position of lubricator (outlet at bottom).
- (m) Move rotary switch from "OFF" to "ON" position

Dispensing process begins!



7 Drive System Settings

7.1 Function display

The LEDs are located on the control PCB and can be observed through the transparent cover (see Figure 2, Chap. 7.2).

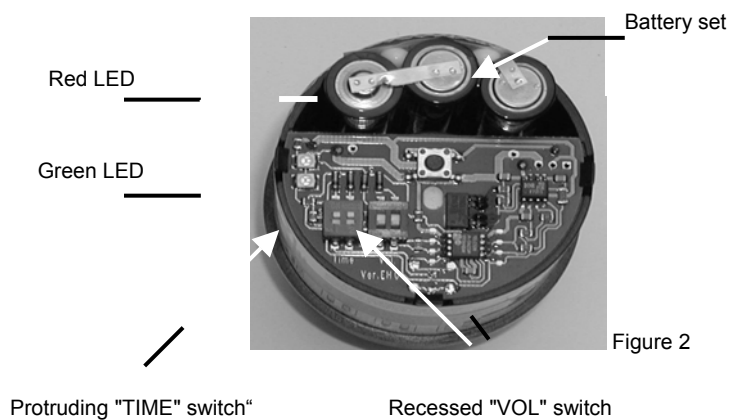
The OKS ChronoLube System is equipped with a red and a green LED. These LEDs indicate the following operating states or faults to the operator.

| LED | Signal | Signal Duration | Explanation |
|---------------|------------|------------------|----------------------|
| green | flashing | every 15 seconds | Operation (OK) |
| red | flashing | every 8 seconds | Fault |
| green and red | flashing | every 3 seconds | CL cartridge empty |
| red | continuous | continuous | CL System dispensing |

7.2 Setting options on control PCB

Two coding switches are located on the control PCB.

The **protruding** switches marked "TIME" are for setting the dispensing time, and the **recessed** switches marked "VOL" are for setting the size of the LC unit.



7.3 Dispensing time settings

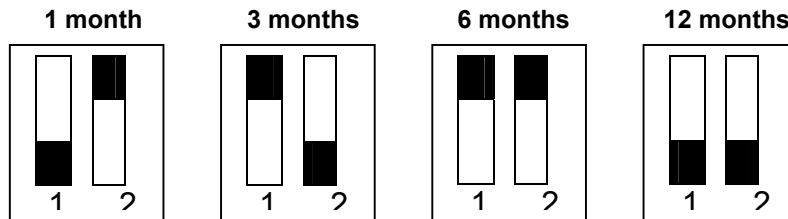
The dispensing time of the ChronoLube cartridge must be set with the **protruding** coding switches marked "TIME" on the control PCB of the drive system.

You can adjust or set the protruding switches using a small screwdriver or your fingers.



The set dispensing time can be marked on the drive system with the adhesive spots provided. The adhesive spots differ in their colour and the printed number of the dispensing time.

7.3.1 Setting overhanging "TIME" coding switches for four different dispensing times



You should also note the set dispensing time of the lubricator in your lubricating and maintenance schedule (see Chapter 11.1).

7.4 Setting volume of LC unit

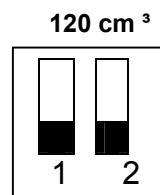
The size of the ChronoLube cartridge can be set with the **recessed** coding switches marked "VOL" on the control PCB of the drive system.

You can adjust or set the recessed switches using a small screwdriver.



If the position of the "VOL" coding switch does not match the size of the ChronoLube cartridge, faults will occur due to incorrect signals of the control unit (see Chap. 9).

7.4.1 Setting recessed "VOL" coding switches



7.5 Start of dispensing settings

Set the rotary switch on the drive system cover (Figure 3) with a screwdriver from the "OFF" to the "ON" position to start the dispensing process, or from the "ON" to the "OFF" position to stop or end the dispensing process.

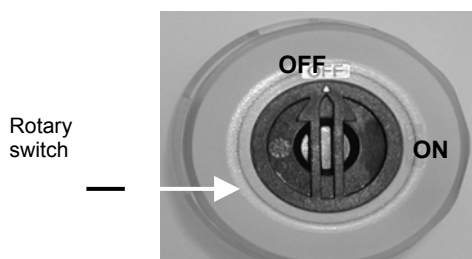


Figure 3

7.6 Changing settings

The dispensing time and the size of the ChronoLube cartridge can only be set when a new ChronoLube cartridge is fitted. Should the settings be changed during ongoing operation or following start-up, then a new, completely filled ChronoLube cartridge and a new battery set must be used.

Should the settings be changed during operation, then a fault will occur in the controller and the monitoring electronics. As a result, OKS can assume no guarantee for precise lubrication.



**Use a new, completely filled ChronoLube cartridge and a new battery set each time the settings are changed.
Never use a partially emptied ChronoLube cartridge!**

7.7 Dispensing and running times

- ◆ Depending on the operator's setting, the ChronoLube System permanently and precisely dispenses the lubricant constantly, precisely and regardless of the temperature every one (1), three (3), six (6) or twelve (12) months to the intended lubricating points.
- ◆ The dispensing time is automatically set to six (6) months at the factory.
- ◆ **The dispensing time must always be checked by the operator before commissioning!**

8 Dispensing Quantities in Dependency on Running Time

Dispensing volume per day in cm^3

| Size of LC unit | 120 cm^3 |
|-----------------|-------------------|
| Dispensing time | |
| 1 month | 4.00 |
| 3 months | 1.33 |
| 6 months | 0.67 |
| 12 months | 0.33 |

9 Troubleshooting

If faults occur during lubricator operation, please check possible fault causes using the following table. Should a fault occur which is not listed in the table, please contact our Technical Service.

| Fault | Possible Cause | Remedy |
|---|---|---|
| ChronoLube System does not operate | Switch on cover is set to "OFF" No batteries in ChronoLube drive Old batteries reused Batteries are leaky Components are not correctly screwed together | Set switch to "ON" Insert battery set Insert new batteries New ChronoLube drive Assembly components properly and screw together more firmly |
| ChronoLube System indicates with red and green flashing LED: "End of dispensing" reached, but ChronoLube is not yet empty | Settings were changed during ongoing operation | Fit full ChronoLube cartridge and new battery set and restart |
| ChronoLube System indicates with green flashing LED: "System operating", but ChronoLube cartridge is empty | <u>Settings were changed during ongoing operation</u> | Fit full ChronoLube cartridge and new battery set and restart |
| ChronoLube System indicates with red flashing LED: "System fault" | <u>Lines or connection parts are clogged</u> The counter-pressure is too great | Clean lines and connection parts, switch unit off and on Reduce counter-pressure |
| ChronoLube System does not dispense | Old batteries used Unit operated for longer time below - 10° C Settings were changed during ongoing operation | Insert new batteries Only operate unit in specified temperature range Fit full ChronoLube cartridge and new battery set and restart |

10 Disposal



Contribute to environmental protection by recycling valuable raw materials and protecting resources. In addition, we refer to the disposal guidelines of the respective countries.

| What must be disposed of? | Material | How is it to be disposed of? |
|---------------------------|----------------------|-----------------------------------|
| Transport materials | Pallets | Return to manufacturer or carrier |
| Packaging | Paper and cardboard | Paper recycling |
| | Plastics | Plastic recycling |
| | Excelsior | Reuse |
| Lubricants | Oil and grease | Oil and greasy waste |
| Components | ChronoLube drive | Dispose of as electronics scrap |
| | Cover for CL drive | Plastics recycling |
| | ChronoLube cartridge | Oil and greasy waste |
| | Batteries | Special waste for batteries |

11 Accessories for OKS ChronoLube System



Accessories and spare parts must meet the technical requirements! This is always ensured with genuine spare parts from OKS.

11.1 Accessories

- ◆ Support bracket (G ¼ thread, female and male)
- ◆ Retaining clip
- ◆ Bracket with insert or oil throttle
- ◆ 400 g grease cartridge or oil in container
- ◆ Additional accessories on request

11.2 Spare parts

- ◆ ChronoLube cartridge (R ¼ thread), content 120 cm³
- ◆ Battery set
- ◆ ChronoLube drive
- ◆ Cover for ChronoLube drive

12 Service

The operator can return the emptied ChronoLube System to OKS so that we can:

- ◆ dispose of the used parts in an environmentally friendly manner.

or:

- ◆ replace the battery set.
- ◆ change the ChronoLube cartridge.
- ◆ set the desired dispensing time.

For a fee, we then return a ready-to-use ChronoLube System to you.

EC Declaration of Conformance

according to Machine Directive 98/37/EC and according to the EMC Directive 89/336/EEC.

The manufacturer

OKS Spezialschmierstoffe GmbH
Triebstr. 9

80993 München
Germany

herewith declares that the designated product in the delivered versions complies with the regulations of the above directives, including their applicable changes at the time of the declaration.

| | |
|----------------------|-----------------------|
| Product designation: | Automatic lubricator |
| Product name: | OKS ChronoLube System |
| Content: | 120 cm ³ |

The following harmonised standards were applied:

| | |
|------------------|--|
| EN 292 – 1: 1991 | Safety of machinery – Basic concepts, general principles of design– Part 1: Basic terminology, methodology |
| EN 292 – 2:1991 | Safety of machinery – Basic concepts, general principles of design– Part 2: Technical principles and specifications |
| EN 60204 -1:1998 | Electrical equipment of machines |

Munich, 16 November 2004

OKS Spezialschmierstoffe GmbH

This declaration certifies the agreement with the specified directives, however is no guarantee of properties.
The safety precautions of the operating manual must be observed.