

Additional character on the LCD	
1/2	During a dispensing process LUB-V indicates from which outlet lubricant is being pumped.
MAX	After each cycle the maximum back pressure is displayed in bar.

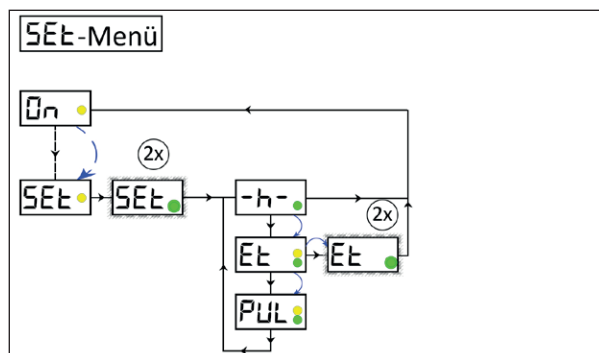
#### 5.4 Actions with the activation and programming key



1. Turn the activation and programming key to the OPEN position and remove it from the housing of LUB-B.
2. Place the key on the action area on the front of LUB-B.
3. Remove the key from the action area as long as the desired menu item is displayed in the LCD.

#### 5.5 SET menu

The SET menu allows you to change the operating mode of LUB-V. You can switch between hour mode -h-, empty time mode Et and impulse mode PUL.



-h- Operating mode: hour mode -h-  
Et Operating mode: empty time mode Et  
PUL Operating mode: impulse mode PUL

If you would like to change the operating mode, move the activation and programming key back to the action area. When your desired operating mode is displayed on the LCD, remove the activation and programming key from the action area.

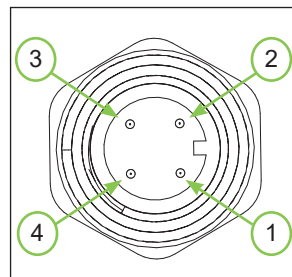
#### 5.6 PRO menu

Being in operating mode hour mode -h-, you can change the pause time h as well as the number of cycles c (number of strokes). Being in PRO menu the first step is to set the pause time h and afterwards the number of cycles c; direct access to the number of cycles c is not possible. Running empty time mode Et, you can change the emptying time Et in months.

#### 5.7 FIL menu

This function enables you to prefill connected accessories (tubes, distributors,...) with the lubricant contained in the lubricant cartridge, especially during the initial start-up of LUB-V. However, the process can also be aborted manually at any time.

#### 5.8 Input and output signals - time control



PIN assignment - time control		
PIN	Assignment	Colour
1	+24 V DC	brown
2	unallocated	white
3	ground	blue
4	output signal	black
Type: M12x1 female connector; 4-pin, A-coded		

LUB-V can be switched off completely by switching off the supply voltage.  
 ⚠ The output signal at PIN 4 can be tapped for further processing (e.g. indicator light or external control). The maximum permissible current output must not exceed  $I_{max} < 20\text{mA}$ . No inductive load (e.g. relay) may be connected!

#### 5.9 Input and output signals - external control (PLC)

To command LUB-V via an external controller (PLC) it is necessary to switch LUB-V to pulse control mode PUL in PRO menu (chapter 6.3.7). In pulse control mode LUB-V operates as a pulse-controlled lubrication system only if unalterable input signals (high level) are transmitted from the PLC to LUB-V via PIN 2 in a defined sequence. LUB-V signals the respective status to the PLC via high/low levels which can be tapped off at PIN 4.

⚠ To operate LUB-V via an external controller (PLC) in pulse control mode a program corresponding to the communication protocol must be created in the PLC.

PIN2: Input signal PLC → LUB-V

LUB-V provides the following unalterably defined control signals (input signals) which must be transmitted from the PLC to LUB-V via PIN 2 of the electrical M12x1 interface as high level (+24 V DC).

The control signals must be generated as high level (+24 V) by the external controller (PLC) over certain times with a tolerance of +/- 0.1 seconds.

Signal length in seconds	Description	Function
2 high	Signal 2 seconds	1 stroke
12 high	Signal 12 seconds	FIL function
14 high	Signal 14 seconds	Error acknowledgement

⚠ LUB-V in pulse control mode PUL only processes the control signals listed in the table up to a maximum length of 14 seconds. If a high level (+24 V DC) exceeds the defined tolerance level, LUB-V does not react. If

a high level (+24 V DC) is applied to PIN 2 of the electrical interface for longer than 15 seconds the LCD will display --- and LUB-V does not react.

#### Control signal 2 seconds

Immediately after the control signal drops the motor run of LUB-V starts and 0.16 cm<sup>3</sup> lubricant is conveyed to the outlet. Simultaneously, LUB-V sends a low level output signal to the external controller (PLC) to confirm the duration of the motor run.

⚠ In order to ensure a reliable and unambiguous recognition of the control signal a pause must be observed. The control signal 2 seconds requires a pause time of at least 22 seconds between two identical or different control signals.

#### Control signal 12 seconds

The control signal 12 seconds triggers the FIL function by the external control.

#### Control signal 14 seconds

The control signal 14 seconds is used to acknowledge error messages of errors E2 and E3.

LCD	Description	Output signal (PIN 4)
OFF	switched off	low, permanent
PUL	ready for operation	high, permanent
PUL flashing	received control signal	high, permanent
01...70	dispensing process	low, 7...17 seconds
E1	cartridge empty	0,5Hz square wave signal, permanent
E2	overload	low, permanent
E3	undervoltage	low, permanent
E4	fatal error	low, permanent

⚠ LUB-V does not process any control signals until all errors have been eliminated.

⚠ Error E2 (overload) must be acknowledged with the control signal 14 seconds after elimination of the cause(s).

⚠ Error E3 (undervoltage) must be acknowledged with the control signal 14 seconds after elimination of the cause(s).

## 6. Maintenance

### NOTICE

It is not possible to refill empty or opened lubricant cartridges.

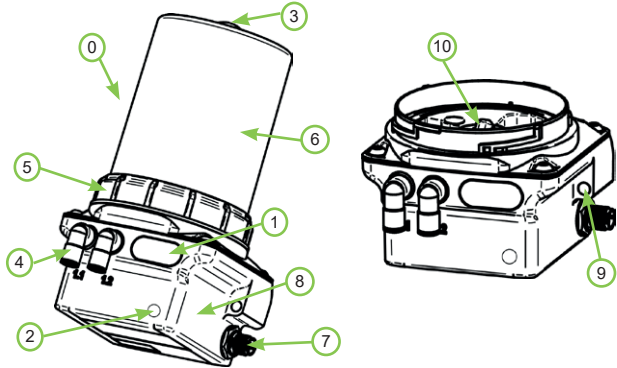
# LUBRICUS

## Quick start guide LUB-V



This brief instruction of mounting LUB-V addresses to experienced users. Please visit [www.G-LUBE.com](http://www.G-LUBE.com) to download the complete user manual including all safety instructions.

## 1. Overview LUB-V



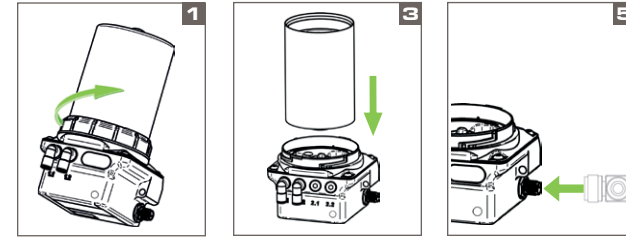
No.	Description
0	Lubricus V (LUB-V)
1	LCD
2	Action area (for actions with the activation and programming key)
3	Activation and programming key
4	Lubricant outlet(s) (different versions available)
5	Retaining ring
6	Housing
7	M12x1 electrical interface
8	Nameplate with designation, CE mark and serial number
9	Clearance hole for assembly
10	Lubricant inlet with thread for cartridge

## 2. Technical data

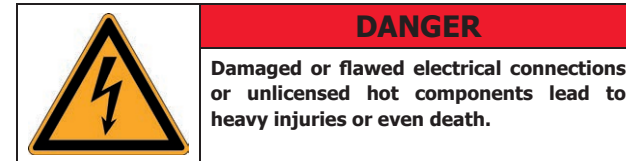
Housing		
mounting options	holes for screw M6	
mounting position	upright	
operating temperature	-15 to +60*	°C
Lubricant and hydraulic		
lubricant outlets	1 / 2	
max. pressure	70 bar / 1015 psi (-10%/+15%)	
steady state pressure	50 bar / 725 psi	
grease delivery	per stroke	0,16 (-5%) cm <sup>3</sup>
Electrics		
operating voltage	24 (+/- 5%)	V
protection	0,75 (slow blow)	A
protection class	IP 54	

\* The stated value is down to the individual application and may extensively differ in some cases (depending on the lubricant and further conditions).

## 3. Mounting



- Separate the housing from the power unit by turning the retaining ring counterclockwise.
- Turn the cap on the lubricant cartridge counterclockwise and pull it off.
- Place the full lubricant cartridge on LUB-V (label facing front). Turn the lubricant cartridge clockwise onto LUB-V.
- Place the dismantled housing on LUB-V. Fasten the housing to the power unit by turning the retaining ring clockwise.
- To connect LUB-V with an external power supply system add a proper connecting cable to the electrical interface on the side of LUB-V.



### DANGER

Damaged or flawed electrical connections or unlicensed hot components lead to heavy injuries or even death.

## 4. Commissioning

### 1. Mechanical fastening

Fix LUB-V mechanically. Pay particular attention to the maximum tightening torques permissible!

### 2. Electrical connection

### 3. Power on

### 4. Execute FIL function

### 5. Hydraulic connection

Connect the consumer hydraulically to LUB-V. If you connect tubes to LUB-V make sure that tubes and connectors are installed tightly, cleanly and correctly.

The tube length shall not exceed 5 meters, the inner tube diameter shall not be lower than 4 mm.

① Ideally, use tubes prefilled with the appropriate lubricant.

### 6. Check settings on LUB-V

Check the required values for the lubrication point at the factory settings of LUB-V and adjust them if necessary.

Factory settings: operating mode=hour mode.

## 5. Operation and settings

Three operating modes can be selected.

The **hour mode -h-** allows setting the number of cycles (c) within a pause time (h) in hours. The cycles are evenly distributed over the pause time. Pause times between 1...240 hour(s) and cycles between 1...30 can be set.

The **empty time mode Et** allows the emptying time of the cartridge to be set in months. Emptying times between 1...36 month(s) can be set. Additionally, LUB-V can be embedded into a programmable logic controller (PLC) which sends orders and controls LUB-V in **impulse mode PUL**.

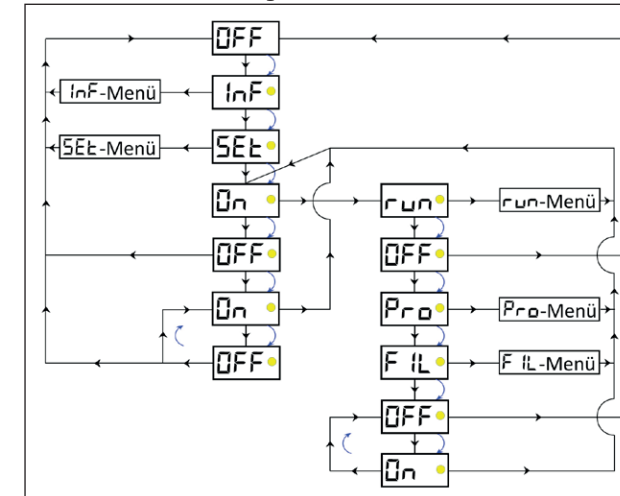
### 5.1 Default settings, operating mode: hour mode -h-

Pause time h = 3 The pause time is 3 hours.  
Number of cycles c = 1 The number of cycles is one (1) stroke during pause time.

### 5.2 Default settings, operating mode: impulse mode PUL

Impulse mode PUL enables embedding LUB-V in an external control (PLC) to command and control the device. The number of strokes (one stroke=0.16 cm<sup>3</sup>) dispensed now depend on the PLC's signals.

### 5.3 Menu and LCD messages



The graphic above illustrates the unchangeable basic flowchart of the LUB-V menu navigation as well as the options for branching to submenus.

- ① LUB-V can be switched on and off at several points in the menu navigation.
- ① The INF menu provides you with an informative overview of the current LUB-V settings.
- ① The SET menu allows you to make change the operating mode and to adjust the size of the cartridge.
- ① The RUN menu allows you to manually trigger a single dispense at LUB-V.
- ① The PRO menu allows you to make changes to the LUB-V settings -

and thus to its dispensing behavior.

① The FIL menu allows you to manually trigger a fixed number of dispenses at LUB-V.

Display in LCD	Meaning
PUL	LUB-V is ready for operation in impulse mode PUL and waits for control signals from the PLC
PUL (flashing)	LUB-V is receiving a control signal from the PLC
---	Received control signal longer than 15 seconds
Errors	
E1	Error E1 (empty cartridge)
E2	Error E2 (overload / overpressure)
E3	Error E3 (undervoltage)
E4	Error E4 (fatal error)
Submenus	
INF	INF menu
n01	Firmware version of LUB-V
h03	Currently set value of pause time h
c01	Currently set value of number of strokes c
6	Currently set value of emptying time Et
PUL	Currently set operating mode: impulse mode
SET	SET menu
-h-	Operating mode: hour mode
Et	Operating mode: empty time mode
PUL	Operating mode: impulse mode
RUN	RUN menu
01...70	During the manually triggered active RUN command („quick check“/extra dispense), the LCD displays the approximate back pressure in bar. In addition, the green LED lights up.
PRO	PRO menu
h1...240	Adjustable setting of pause time h
c1...30	Adjustable setting of number of strokes c
01...36	Adjustable setting of emptying time Et
PUL	Currently set operating mode: impulse mode No changeable value
FIL	FIL menu
01...70	During the manually triggered, active FIL command, the LCD displays the approximate back pressure in bar. In addition, the green LED lights up.
Clr	If the process is aborted during FIL command Clr appears at first.