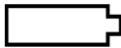
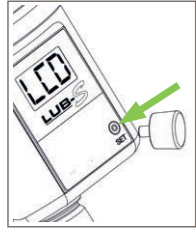


Clr	If the process is aborted during FIL command Clr appears at first.
Additional character on the LCD	
	Displayed when the cartridge is empty and needs to be replaced.
MAX	After each cycle the maximum back pressure is displayed in bar.

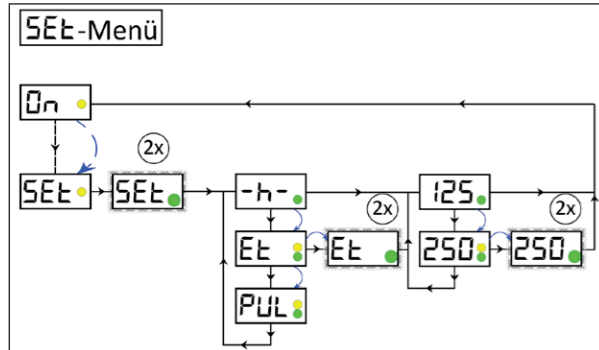
5.4 Actions with the activation and programming key



1. Remove the activation and programming key from the underside of LUB-S-V.
2. Place the activation and programming key on the action area on the front of LUB-S-V.
3. Remove the activation and programming key from the action area (SET) 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 and the cartridge size of LUB-S-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
125/250 Changeable value of cartridge size

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).

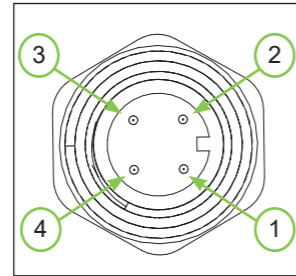
Being in PRO menu the first step is to set the pause time h and afterwards the number of cycles c; direct access to the number of cycles c is not possible.

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

To operate LUB-S-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-S-V

LUB-S-V provides the following unalterably defined control signals (input signals) which must be transmitted from the PLC to LUB-S-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-S-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-S-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-S-V does not react.

Control signal 2 seconds

Immediately after the control signal drops the motor run of LUB-S-V starts and 0.16 cm³ lubricant is conveyed to the outlet. Simultaneously, LUB-S-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...50	dispensing process	low, 10...18 seconds
E1	cartridge empty	0,5Hz square wave signal, permanent
E1	cartridge error	low, permanent
E2	overload	low, permanent
E3	undervoltage	low, permanent
E4	fatal error	low, permanent

LUB-S-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

A used lubricant cartridge must not be replaced on LUB-S-V as the integrated stroke counter of LUB-S-V is automatically reset by the cartridge sensor after a cartridge has been removed. Only use full lubricant cartridges.

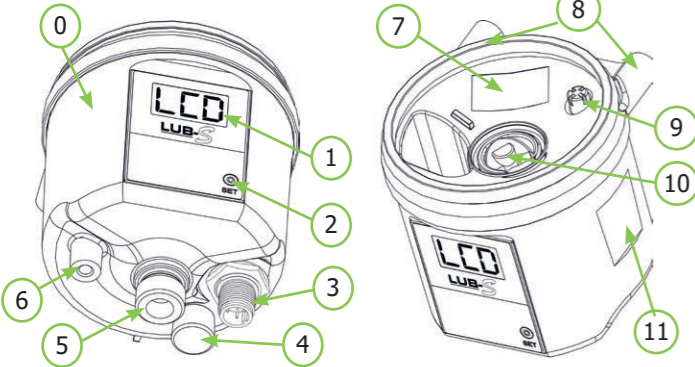
LUB-S

Quick start guide LUB-S-V (24 VDC)



This brief instruction of mounting LUB-S-V addresses to experienced users. Please visit www.G-LUBE.com to download the complete user manual including all safety instructions.

1. Overview LUB-S-V



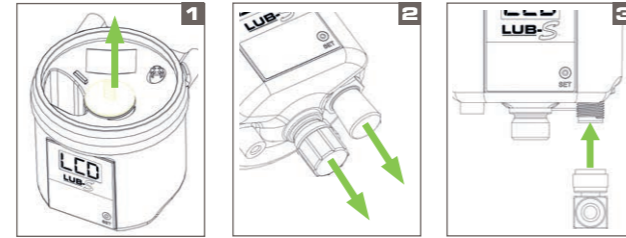
No.	Description
0	LUB-S-V
1	LCD
2	Operation pad (for actions with the activation and programming key)
3	Electric interface M12x1
4	Activation and programming key
5	Lubricant outlet / M16 male thread for bottom mounting
6	M5 female thread for bottom mounting
7	Serial number of LUB-S-V
8	M5 female thread for rear mounting
9	Cartridge sensor
10	Lubricant inlet with thread for cartridge
11	Nameplate with designation and CE mark

2. Technical data

Housing		
mounting options	backside: female thread M5 (2x) bottom: f. thread M5 (1x), m. thread M16x1.5 (1x)	
max. torque mounting	3	Nm
mounting position	any, upright (preferred)	
operating temperature	-15 to +60*	°C
Lubricant and hydraulic		
number of lubrication points	up to 4 by using splitters* up to 10 by using progressive distributors*	
max. pressure	50 (-10%/+15%)	bar
grease delivery	per stroke	0,16 (-5%)
		cm ³
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



- Remove the yellow protective cap from the top of the lubricant inlet of LUB-S-V.
- Unscrew the yellow protective cap counterclockwise from the lubricant outlet on the bottom of LUB-S-V. Remove the black protective cap from the electrical interface on the bottom of LUB-S-V.
- To connect LUB-S-V with an external power supply system add a proper connecting cable to the electrical interface on the bottom of LUB-S-V.



- Turn the cap on the lubricant cartridge counterclockwise and pull it off.
- Place the full lubricant cartridge on LUB-S-V. Turn the lubricant cartridge clockwise onto LUB-S-V.

4. Commissioning

1. Mechanical fastening

Fix LUB-S-V mechanically through the M5 female threads or through the M16x1.5 male thread of the lubricant outlet. Pay particular attention to the maximum tightening torques permissible for the M5 female threads!

2. Electrical connection

3. Power on

4. Execute FIL function

5. Hydraulic connection

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

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

☺ Ideally, use tubes prefilled with the appropriate lubricant.

6. Check the settings on LUB-S-V

Check the required values for the lubrication point at the factory settings of LUB-S-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...10 can be set.

The **empty time mode Et** allows the emptying time of the cartridge to be set in months. Emptying times between 1...24 month(s) can be set. Additionally, LUB-S-V can be embedded into a programmable logic controller (PLC) which sends orders and controls LUB-S-V in **impulse mode PUL**.

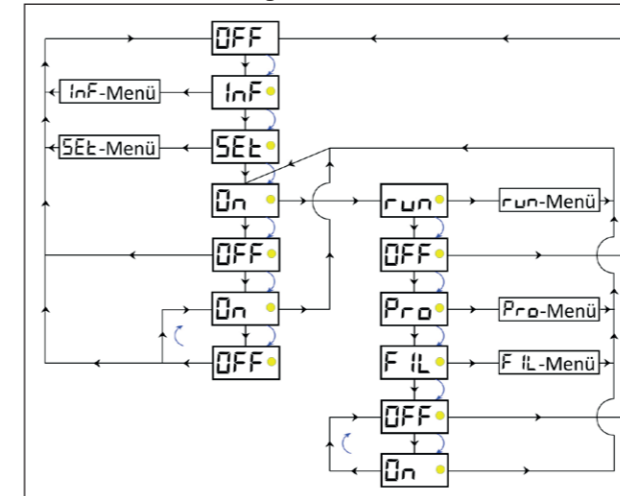
5.1 Default settings, operating mode: hour mode -h-

Pause time h = 6 The pause time is 6 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-S-V in an external control (PLC) to command and control the device. The number of strokes (one stroke=0.16 cm³) 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-S-V menu navigation as well as the options for branching to submenus.

☺ LUB-S-V can be switched on and off at several points in the menu navigation.

☺ The INF menu provides you with an informative overview of the current LUB-S-V settings.

☺ The SET menu allows you to make change the operating mode and to adjust the size of the cartridge.

☺ The RUN menu allows you to manually trigger a single dispense at LUB-S-V.

☺ The PRO menu allows you to make changes to the LUB-S-V settings - and thus to its dispensing behavior.

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

Display in LCD	Meaning
PUL	LUB-S-V is ready for operation in impulse mode PUL and waits for control signals from the PLC
PUL (flashing)	LUB-S-V is receiving a control signal from the PLC
---	Received control signal longer than 15 seconds
Errors	
E1	Error E1 (empty cartridge / cartridge error)
E2	Error E2 (overload / overpressure)
E3	Error E3 (undervoltage)
E4	Error E4 (fatal error)
Submenus	
INF	INF menu
n01	Firmware version of LUB-S-V
h06	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
125	Currently set value of cartridge size
SET	SET menu
-h-	Operating mode: hour mode
Et	Operating mode: empty time mode
PUL	Operating mode: impulse mode
125/250	Changeable value of cartridge size
RUN	RUN menu
01...50	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...10	Adjustable setting of number of strokes c
01...24	Adjustable setting of emptying time Et
PUL	Currently set operating mode: impulse mode No changeable value
FIL	FIL menu
01...50	During the manually triggered, active FIL command, the LCD displays the approximate back pressure in bar. In addition, the green LED lights up.