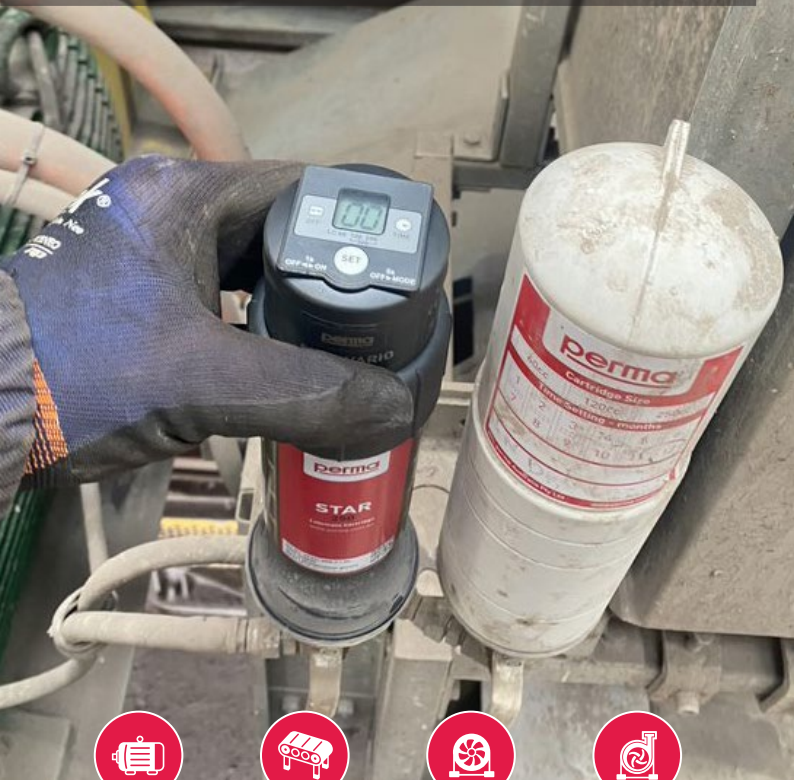


perma STAR VARIO

Pocket Guide



Battery insertion and initial assembly

The perma STAR VARIO is set and controlled via a simple to navigate menu using a single SET button. The menu is intuitive and requires minimal manipulation after the initial setting.

Features which support simple operation and error minimisation include:

Initial set screen

A new lubricator displays  on the LCD. This forces users to set the time and LC (lubricant canister) size before the lubricator can be turned on.

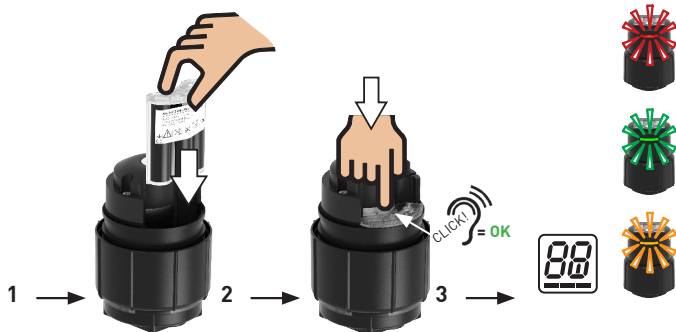
Automatic restart

When the LC and battery set is changed the lubricator automatically restarts meaning that there is no need to use the SET button when servicing lubricators.

A

Insert battery set into the underside of the DRIVE. It will click into place.

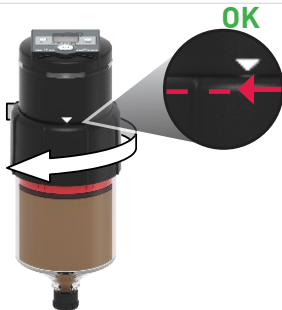
The DRIVE will perform a self-test, during which the LED system will change from red to green to orange and the drive motor will run continuously.

**B**

Sit the DRIVE on top of the LC so that the socket of the DRIVE engages correctly with the hexagonal head of the LC spindle.

Secure it by rotating the collar until it comes to its stop point.


When correctly assembled the white triangle markings around the DRIVE will be visible as shown.



Setting for the first time

The LC SIZE, TIME interval type (months or weeks) and TIME setting must be assigned for each new DRIVE before first use.

A

Insert a new battery set. The lubricator will perform a self-test and display .

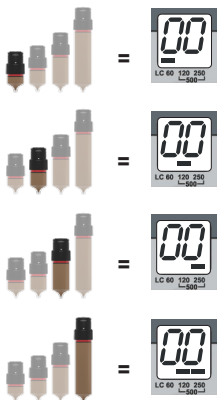


= New DRIVE which has not been set

B

The lines at the bottom of the display indicate the SIZE options of 60, 120, 250 and 500cm³. Press the SET button for 5 seconds and the lines will begin to flash.

Release and press the button to scroll through the SIZE options. Stop at the desired size.



C

After the SIZE has been assigned, wait for 'm' (months) to be displayed. Press the button to toggle between 'm' (months) and 'w' (weeks). Stop at the desired TIME interval type.

**D**

Press and release the button to scroll through the TIME options. Stop at the desired setting.




months



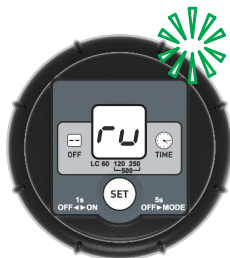
weeks

E

Wait for the screen to go to the off status .

Press the SET button for 1 second to turn the lubricator ON.

The setting will now be displayed and after 8 seconds the lubricator will perform its initialisation run cycle.



At the end of the run cycle the display will return to the allocated setting.



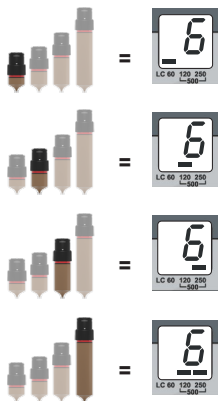
Example - 120cm³ set to 3 months.

Changing the setting after initial programming

After initial programming, the assigned settings can be changed at anytime from either the ON or OFF status.

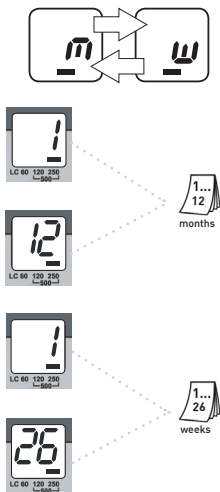
A

Press the SET button for 5 seconds.
Press and release the SET button to scroll to the new SIZE setting



B

Wait for the TIME interval type to start flashing.
Select the new TIME interval type.
Wait for the TIME setting to start flashing.
Select the new TIME setting.



Turning OFF and ON

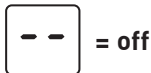
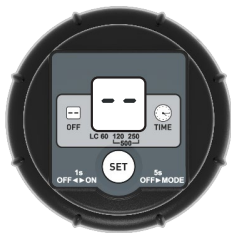
The lubricator can be turned OFF at anytime except during a run cycle.

If a lubricator is turned OFF for a period of time it will retain memory of its operational status and recommence the lubricant delivery program from that point when turned back ON.

It is important to note that turning the lubricator OFF and ON does not reset the memory of the grease volume remaining. The only way to reset the memory is to remove and re-insert the battery set.

A

Press the SET button for 1 second to turn the DRIVE OFF. The off screen will be displayed.



B

Press the SET button for 1 second to restart the lubricator. The programmed setting will be shown.



Dispensing rates

Weekly settings

The dispensing rate data tabled below applies to the perma STAR VARIO and STAR VARIO BLUETOOTH®. Details on the dwell time between lubricant delivery cycles are available upon request.

Time setting, weeks	Daily dispensing rate, cm ³ per day			
	60cm ³	120cm ³	250cm ³	500cm ³
1	8.57	17.14	35.71	71.43
2	4.29	8.57	17.86	35.71
3	2.86	5.71	11.90	23.81
4	2.14	4.29	8.93	17.86
5	1.71	3.43	7.14	14.29
6	1.43	2.86	5.95	11.90
7	1.22	2.45	5.10	10.20
8	1.07	2.14	4.46	8.93
9	0.95	1.90	3.97	7.94
10	0.86	1.71	3.57	7.14
11	0.78	1.56	3.25	6.49
12	0.71	1.43	2.98	5.95
13	0.66	1.32	2.75	5.49



Time setting, weeks	Daily dispensing rate, cm ³ per day			
	60cm ³	120cm ³	250cm ³	500cm ³
14	0.61	1.22	2.55	5.10
15	0.57	1.14	2.38	4.76
16	0.54	1.07	2.23	4.46
17	0.50	1.01	2.10	4.20
18	0.48	0.95	1.98	3.97
19	0.45	0.90	1.88	3.76
20	0.43	0.86	1.79	3.57
21	0.41	0.82	1.70	3.40
22	0.39	0.78	1.62	3.25
23	0.37	0.75	1.55	3.11
24	0.36	0.71	1.49	2.98
25	0.34	0.69	1.43	2.86
26	0.33	0.66	1.37	2.75

Dispensing rates

Monthly settings

The dispensing rate data tabled below applies to the perma STAR VARIO and STAR VARIO BLUETOOTH®. Details on the dwell time between lubricant delivery cycles are available upon request.

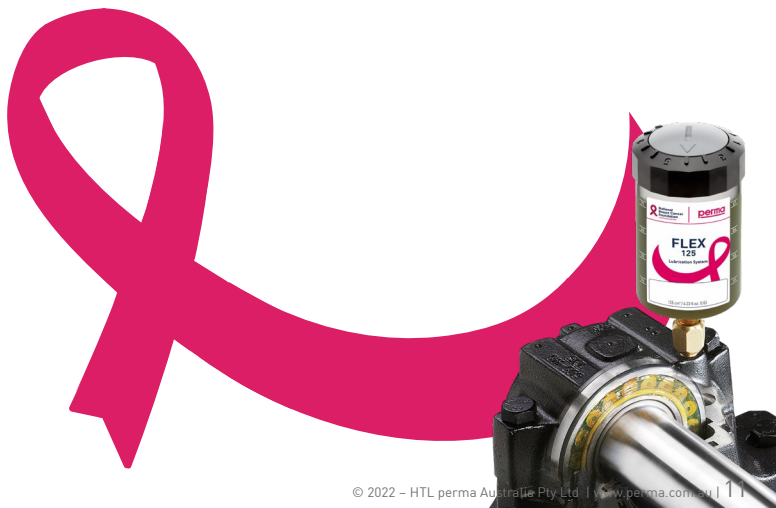
Time setting, months	Daily dispensing rate, cm ³ per day			
	60cm ³	120cm ³	250cm ³	500cm ³
1	2.0	4.0	8.3	16.45
2	1.0	2.0	4.2	8.22
3	0.67	1.3	2.8	5.48
4	0.50	1.0	2.1	4.11
5	0.40	0.80	1.7	3.29
6	0.33	0.67	1.4	2.74
7	0.29	0.57	1.2	-
8	0.25	0.50	1.0	-
9	0.22	0.44	0.93	-
10	0.20	0.40	0.83	-
11	0.18	0.36	0.76	-
12	0.17	0.33	0.69	-

LUBRICATING THE WHEELS OF RESEARCH

perma is committed to making a valuable contribution to the community and are proud to be partnering with the National Breast Cancer Foundation (NBCF).

NBCF perma FLEX is made in Germany and supports our corporate partnership with the National Breast Cancer Foundation.

The NBCF perma FLEX is ideal when a compact, lightweight, automatic lubricator is required for direction mounting to lubrication points.



Days since empty count

It is recommended to always write the installation date on the cartridge of perma STAR VARIO lubricators. This provides valuable information to personnel involved in lubricator inspections. In particular, if a lubricator is found to be empty, the recorded date allows the period for which lubricant has not been delivered to be determined, which in turn allows the equipment maintainer to determine the appropriate maintenance action.

For occasions where an installation date has not been recorded the perma STAR VARIO* provides a count of the number of days for which the cartridge has been empty.

*This feature is only available for perma STAR VARIO drive units with software version 3.4 onwards.

Contact your supplier of perma products for more information.

Information from empty lubricators



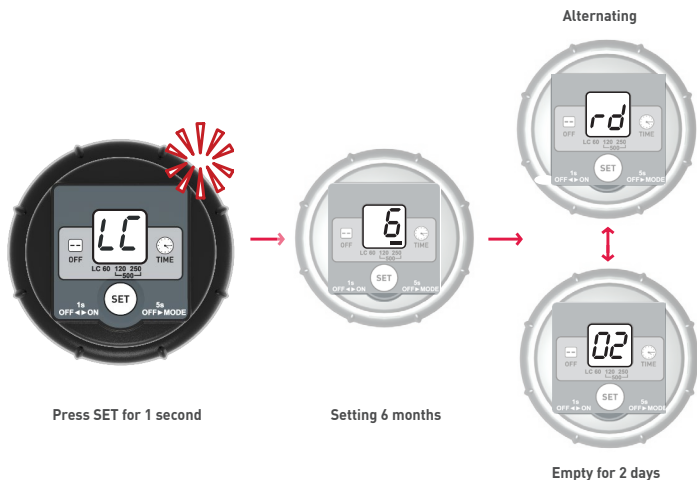
When the lubricant cartridge is empty the lubricator display screen shows LC and the LEDs flash red every 2 seconds.

When LC is displayed the time setting and count of the number of days that the cartridge has been empty can be obtained. This information assists equipment maintainers to make decisions about the most appropriate action when lubricators are found to be empty, especially when lubricant cartridges have not been clearly marked with the installation date.

To confirm the lubricator time setting press and hold the SET button for 1 second, then release the SET button to confirm the number of days since empty. The display will automatically alternate between '**rd**' and the day count, up to a maximum of 99 days. After alternating between '**rd**' and the day count eight times the display will return to 'LC'. **rd** = days count since **red**.

Example - A 250cc lubricator is found to be empty, displaying LC, with no date markings on the lubricant cartridge. By holding the SET button down for 1 second it is confirmed that the time setting is 6 months and that the lubricator has been empty for 2 days. The display sequence is shown below.

This information would indicate to the equipment maintainer that no special action is required other than the normal lubricator servicing procedure.



Lubricator status

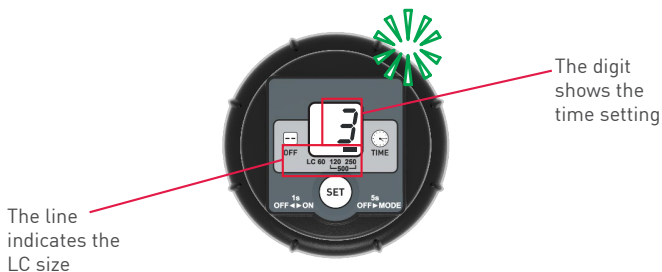
Dwell

What is on the display?

The display shows the time setting and the LC size. For the example shown, the time setting is 3 months and the LC size is 250cm³.

What is the light sequence?

Single **green** flash every 7 seconds.



What is happening?

The lubricator is in between lubricant delivery cycles. The time between cycles depends on the lubricator setting.

Lubricator status

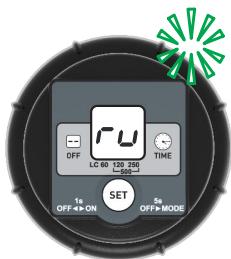
Run

What is on the display?

'ru' stands for 'run' and indicates that lubricant is being dispensed. At the end of the run cycle the lubricator will return to the dwell mode, displaying the time setting and LC size.

What is the light sequence?

Single **green** flash every 1 second.



What is happening?

The DRIVE system is dispensing lubricant.

Lubricator status

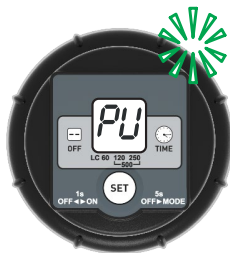
Purge

What is on the display?

'PU' stands for 'purge' and indicates that the purge cycle has been activated and that lubricant is being dispensed.

What is the light sequence?

Single **green** flash every 1 second.



What is happening?

The purge cycle has been initiated by holding down the SET button for 10 seconds.

A full purge cycle delivers around 6cm³ of grease and can be interrupted at anytime by pushing the SET button once.

Lubricator status

Empty

What is on the display?

The display shows LC.

What is the light sequence?

Single **red** flash every 2 seconds.



What is happening?

The LC is empty and needs to be changed. If 'LC' is displayed but the LC is not empty, check the following:

1. Check that the LC size setting correctly matches the actual LC size.
2. Ensure that new batteries are exchanged with every new LC. This is necessary to reset the lubricator for the next service cycle.

Lubricator status

Overload

What is on the display?

'OL' stands for 'overload' and indicates that resistance to lubricant delivery has been too high.

What is the light sequence?

Double **red** flash every 7 seconds.



What is happening?

The resistance to lubricant dispensing has been too high for the DRIVE system to overcome and as a consequence 'overload' has been registered. Lubricant dispensing has stopped.



The grease point should be manually purged to check for blockages or problems. If free delivery of grease cannot be re-established the root cause of the high resistance must be investigated and rectified.

- > A plug of grease caused by excessive oil bleed;
- > Low temperatures which have affected lubricant pumpability;
- > An extended shutdown during which the resistance to grease flow to idle equipment has increased;
- > Poor installation practices such as grease lines which are too narrow.

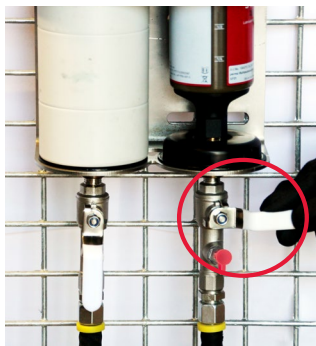
A

Overload is indicated by OL on the display screen and red flashing lights.



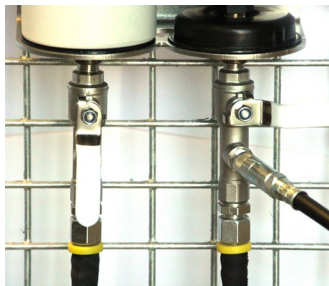
B

If a manual grease kit is in place, close the valve so that the lubricator is not damaged during manual purging.

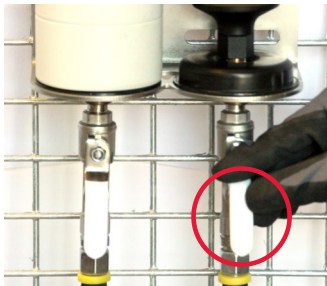


C

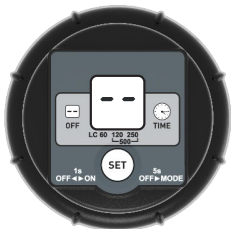
Purge the lubrication point using a manual grease gun and confirm that grease can be freely received.

**D**

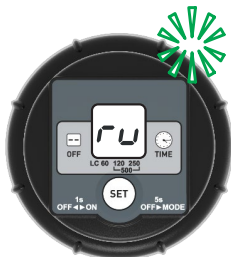
After approx. 1 minute open the ball valve. Reopening too quickly can allow grease pressure within the line to damage the lubricator.

**E**

Press the SET button for 1 second to turn lubricator off. Press for another second to turn back on.

**F**

A short run cycle will begin automatically.



G

If the short run cycle is successful the lubricator will return to normal operation, showing the time setting.

**H**

If the lubricator returns to 'overload' again contact your supplier of perma lubricators to seek further technical support.

HINT

For step C it is always preferable to use a manual grease gun, rather than a battery operated grease gun or an air operated grease pump. Using a manual grease gun will provide the operator with the opportunity to get a direct feel for the resistance against grease flow and how it changes as grease is pumped into the point.

Lubricator status

Low battery

What is on the display?

The display shows 'Lo', meaning 'low'

What is the light sequence?

Double **red** flash every 2 seconds.



What is happening?

The battery which has been installed is either damaged or is depleted. A new battery set must be used. Contact your perma supplier if a new battery set is found to be defective.

Lubricator status

Fault

What is on the display?

The display shows 'Er', meaning 'error'.

What is the light sequence?

Double **red** flash every 2 seconds.



What is happening?

The lubricator DRIVE system has sustained damage and will not work. Contact your perma supplier for further advice.

Inspection guidelines

The periodic inspection of lubricators is important to support the integrity of the overall lubrication program.

The following points are important:

- > Inspection of lubricators should be carried out by a competent person who understands the various display and light sequence combinations.
- > A permanent marker should be carried in order to mark and date the piston positions.

A

Remove lubricator cover. Leave the lubricator in its mounted position to complete the inspection.



B

Confirm status using the display screen / flashing lights. The time setting on the display and a green light indicates normal operation.



C

Check, mark and date the position of the piston. Compare the position to the expected piston position.

**D**

Refit lubricator cover.

**E**

Check the condition of fittings and grease lines. Repair or raise work orders as required.



Service guidelines

The periodic inspection of lubricators is important to support the integrity of the overall lubrication program.

The following points are important:

- > ALWAYS exchange battery set;
- > ALWAYS record service dates on LC;
- > Lubricators can be serviced without removing the clear wet cap;
- > Replacing the battery set automatically resets the lubricator so there is no need to turn lubricators OFF and then ON again when servicing.

A

Confirm lubricator status via display screen and piston level.



B

Do not turn the lubricator off. Remove lubricator, disassemble and remove battery set using eject trigger.



C

Exchange LC and battery set.

**D**

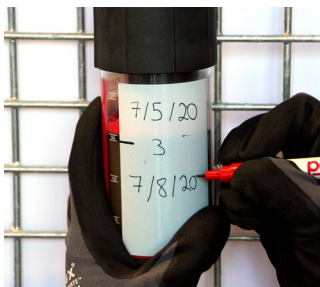
Insert new battery set, attach new LC and reassemble. An automatic self test will occur.

**E**

Lubricator will start automatically. Observe first run cycle and afterwards confirm that the setting is correct

**F**

Record installation and next service dates on LC and remount to lubrication point.





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