Track-Lube

Rail lubrication system

User and Maintenance Manual

Original text translation

CONTENTS

CE

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Track Lube can be purchased through the authorised distributor BB TECHNICAL SERVICE s.r.l. Go to **www.dropsa.com** or **www.bbtechnicalservice.it**

1. INTRODUCTION

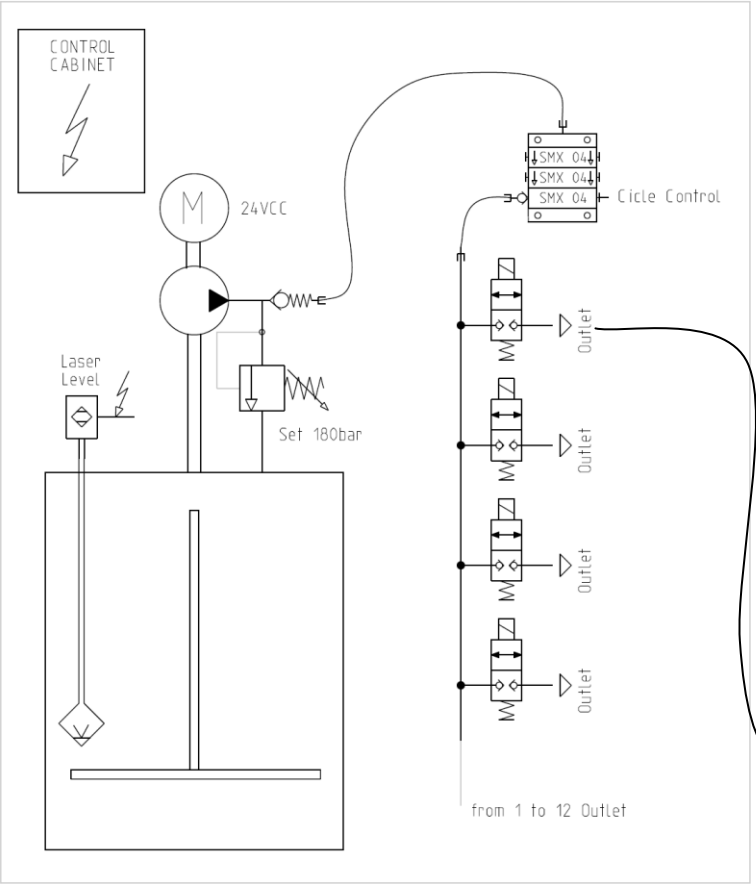
This user and maintenance manual relates to the "**Track-Lube**" rail lubrication system.
The latest version may be obtained from the Technical-Commercial Office, or by consulting our web site http://www.dropsa.com**.**
This user and maintenance manual contains important information about protecting the health and safety of the personnel who intend to use this apparatus. You must read and store it carefully, making sure that it is available at all times for the operators who intend to consult it.

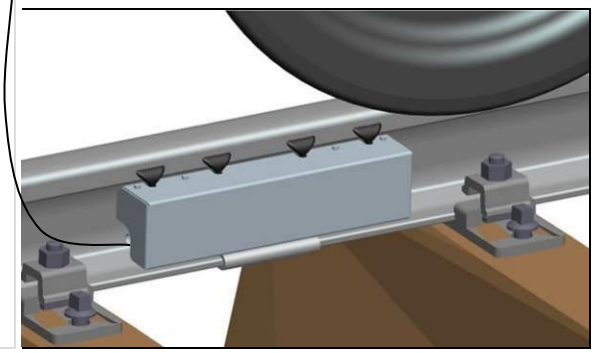
2. GENERAL DESCRIPTION

TRACK-LUBE is the Dropsa lubrication system for grease distribution on the internal side of the track rail.
Track-Lube is a modular system. A standard single bar releases 4 shots of grease on the internal side of rail track head, providing enough lubricant to obtain a smooth distribution of grease for an extension that can reach 6,000 metres where more than 40 trains pass through in the direction of travel. One pumping station (cabinet) can supply up to 12 small bars.
The lubricant (NLGI 2 grease) is applied by extrusion from the bottom of the inner side of the railhead. If properly dosed it does not contaminate the running surface, the ballast or even the soles of the track.

2.1 OPERATING PRINCIPLE

The vibrations created by the passage of the train are detected by the sensor on **SMALL-BAR** that sends the signal to the control panel, marking the start of the lubrication cycle. The pump is activated and the lubricant passes through the SMX distributor with cycle switch, managed by the control panel so the correct amount of grease is sent to the SMALL-BARs or, in succession, to several SMALL-BAR units.
A laser level constantly monitors the remaining amount of grease present in the drum.
A built-in by-pass protects against overpressure, discharging the residual pressure into the drum.





2.2 FUNCTION

The **TRACK-LUBE** system has many functions, briefly listed below:

- LCD panel for diagnosing and monitoring the system status, and for changing the parameters of the entire system.
- Setting the quantity of grease to be supplied to each individual area.
- Lubricant level measurement with laser sensor and level display on the LCD panel; or on web page (OPTIONAL).
- Remote monitoring via e-mail indicating any interruption of operation, including a battery backup in case of power supply failure.
- Ready for online connection via web page.

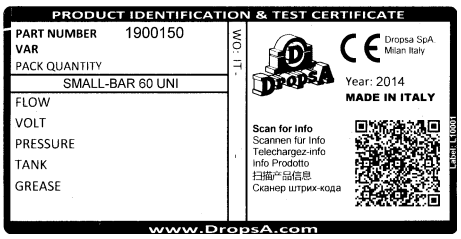
- (OPTIONAL) Monitoring and management via web page of:
  - System status
  - Amount of remaining grease
  - Chart of lubricant level in last 30 days
  - Alarms
  - Warnings
  - System parameters
  - System Start and Stop
  - Alarms or warnings reset
- (OPTIONAL) Send email in case of alarm or o warning
- (OPTIONAL) Send daily report email with:
  - Activation Log of the small-bar of the last 24 hours
  - System status
  - Amount of remaining grease
  - Alarms
  - Warnings
  - Estimated time before drum change
  - Grease consumption and activations number (area) of the last 24 hours
  - Average daily consumption of grease, total grease consumption and number of activations (area) of the last week
  - Average daily consumption of grease, total grease consumption and number of activations (area) of the last month

3. PRODUCT IDENTIFICATION

On the side of the pump there is a label that indicates the product part number, operating voltage and basic characteristics. There is also a label on each individual Small-bar with the part number and the type of rail on which it can be applied.

ELECTRICAL PANEL

CABINET



SMALL-BAR

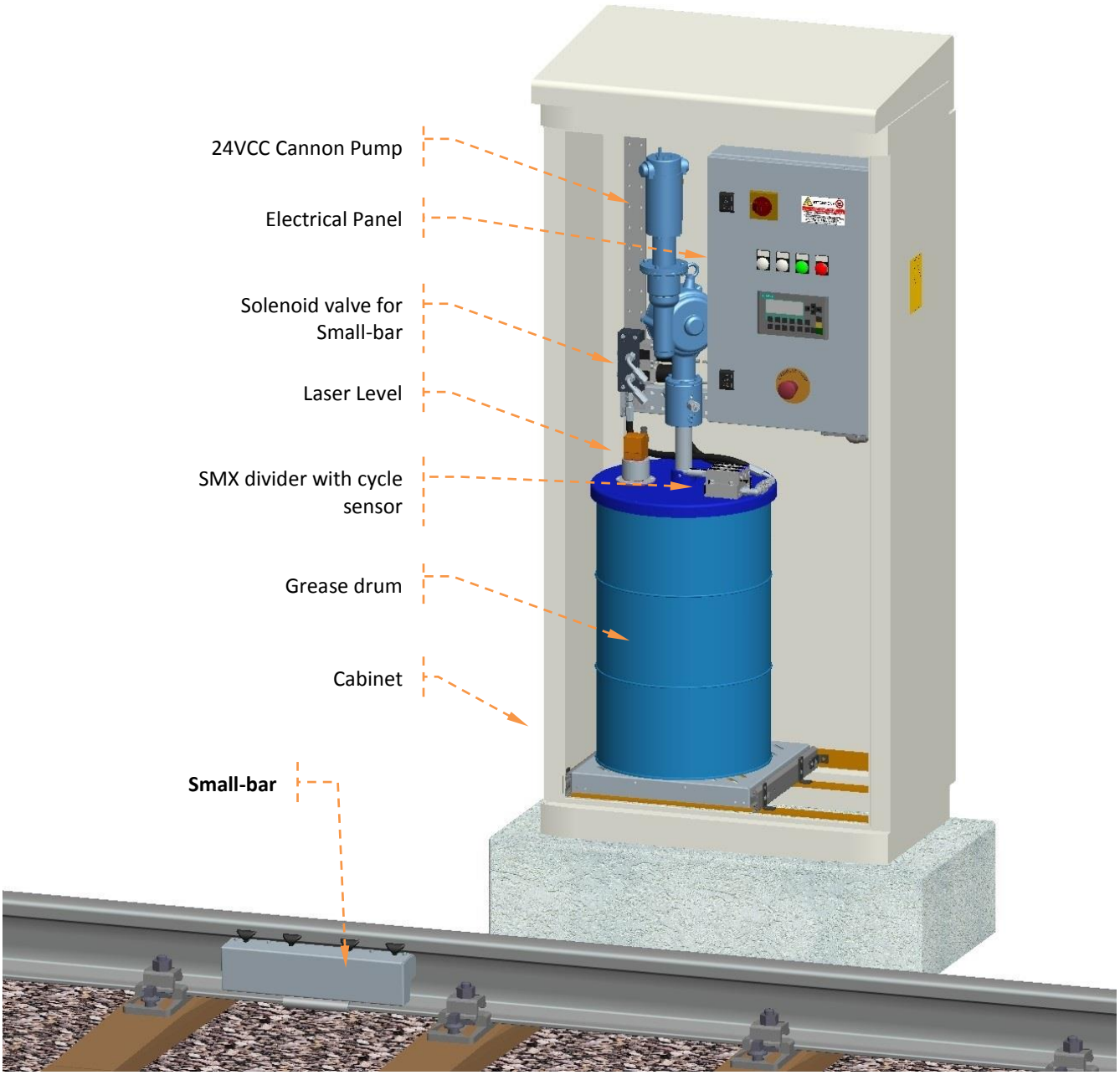
4. TECHNICAL CHARACTERISTICS

TECHNICAL CHARACTERISTICS	
Power Supply	*90 ÷ 260VAC 50 ÷ 60HZ* *1A @ 230V (in Standby) - 3A @ 230V (pump working)*
Pump Power Supply	*24VDC*
Lubricant	*NLGI 2 GREASE*
Drum Capacity	*50 KG*
Weight (cabinet + electrical panel)	*95 KG*
Weight (pump + cover)	*27 KG*
Weight (Small-bar)	*11 KG*
IP Protection (cabinet)	*IP 55 – IK 10*
Operating Temperature	*32°F ÷ 122°F (-25°C ÷ +50°C)*
Storage temperature	*32°F ÷ 185 °F (-25°C ÷ +85°C)*
Sound pressure level	*< 70 db (A)*

***WARNING*: Do not operate the unit outside the specified voltage ranges.**

5. COMPONENTS

TRACK-LUBE



6. UNPACKING AND INSTALLING

6.1 UNPACKING

Once a suitable installation position has been identified, unpack the pump and prepare for installation. It is important to inspect the pump to ensure that there has been no damage during transportation. The packaging material used does not require any special disposal procedures. You should refer to your regional requirements.

6.2 INSTALLING CABINET

The system must be installed by skilled personnel qualified to work on rails.

To reach the installation site, the following methods can be used:

- Using a two wheeled dolly.

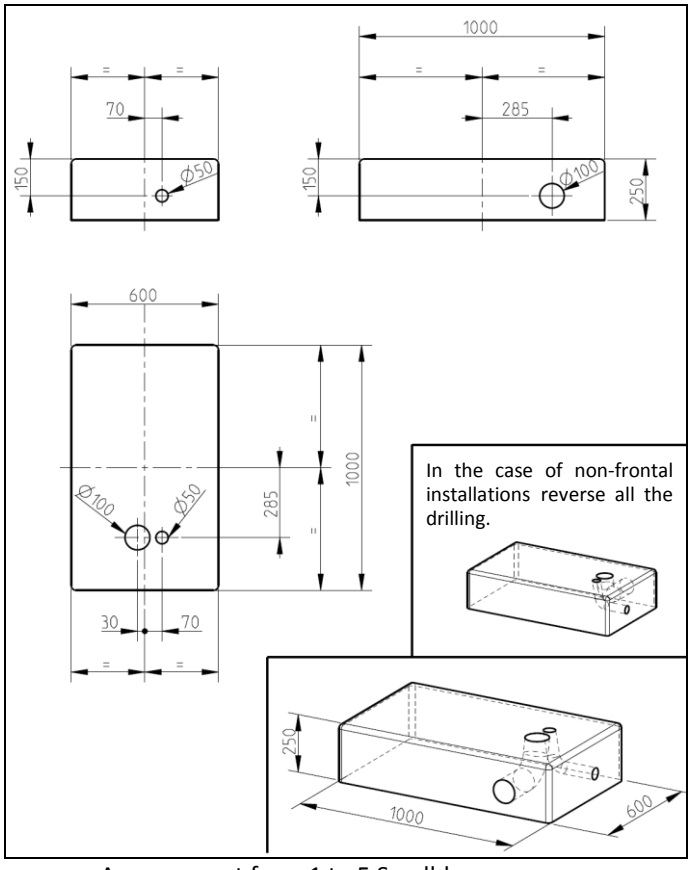
- Positioned and secured on pallets for transport with fork.
  On redundancy programme with through manual strap

- Harnessed with ropes or straps for lifting with cranes or
  a railway loader.

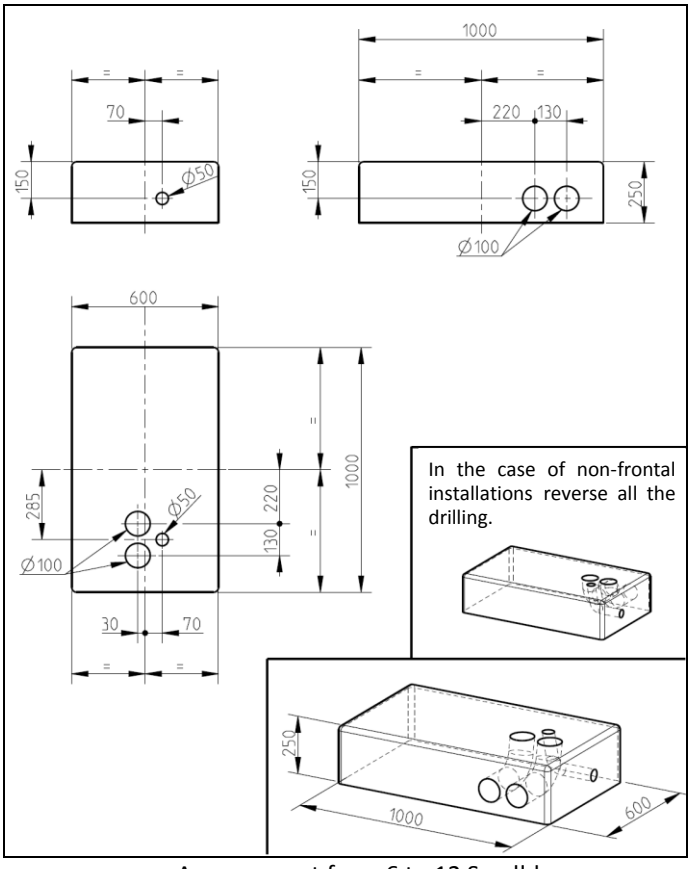
- Small loads can be handled manually with the right number of people.

1) A cement base must be prepared. It should be made in advance to avoid corrosion caused by wet cement.

   Base Dimensions:



Arrangement from 1 to 5 Small-bar

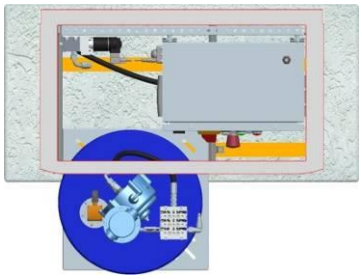


Arrangement from 6 to 12 Small-bar

2) Position the cabinet on the base and bore the holes for the insertion of fixing bolts.
3) Secure the cabinet to the base material using the wall anchor bolts and the suitable washers included in the assembly kit.
4) Pass the power cable, the wires for the vibration sensors and pipes for the lubricant through the base.
5) Measure the exact length of the pipes and cables to sensors.
6) Mount the fittings on the tubes beside the solenoid valves inside the cabinet and connect them to the solenoid valve assembly output.
7) Complete the installation by applying polyurethane foam or similar material to seal and insulate the open bottom.

6.3 INSTALLING THE DRUM AND PUMP

1) Remove the shelf by grasping the front edge of it.
2) Place the drum on the shelf as far left as possible, taking special care not dent the drum, as this would stop the follower plate as it moves down.
3) Insert the plunger into the drum until it comes into contact with the grease. Avoid contaminating the pump stem with soil or sand which could cause blockage.
4) Insert the "Cannon" pump complete with drum cover and lid, making sure of the correct orientation.
5) Hand tighten the radial screws of the cover without excessive force.

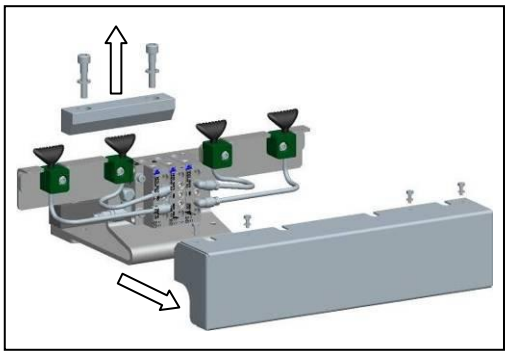


Move the drum to the left edge

6) Push the shelf all the way back into the cabinet
7) Connect the delivery pipe with the quick coupling, the motor plug, the laser probe connector, and the SMX cycle sensor.

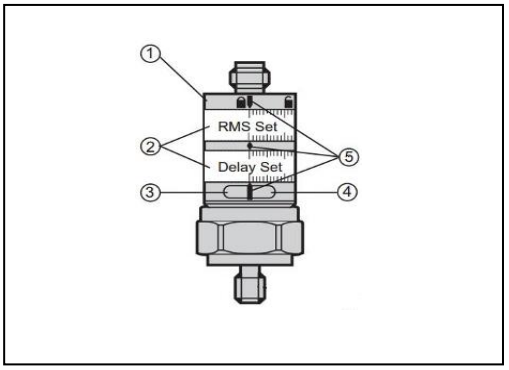
6.4 SMALL-BAR INSTALLATION

1) Prepare the location in advance by removing rubble for easy installation.



2) Remove the front cover and remove the clamping block.

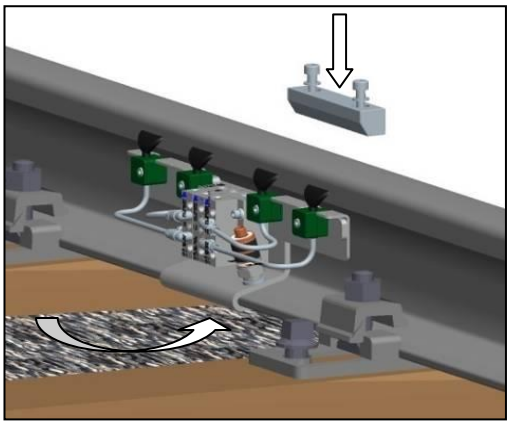
3) The vibration sensor is adjusted and locked with the correct settings before being sent to the customer.
Check that the vibration sensor is set at minimum, both for the intervention threshold (RMS Set) and the intervention delay (Delay Set), and that the locking ring ① is in the "closed padlock" position. If not, or if the sensor needs to be adjusted, turn the lock ring ① to the "open padlock" position, adjust both rings ②, positioning the first indicator mark in correspondence with the indicators ⑤ and turn the lock ring ① to the "closed padlock" position. ③ The green LED indicates that the supply voltage is present and the yellow LED ④ indicates activation of the signal.



4) Position the small-bar by passing it under the rail and insert the fixing clamp. Tighten the screws to a torque of 25Nm using a number 8 Allen key.

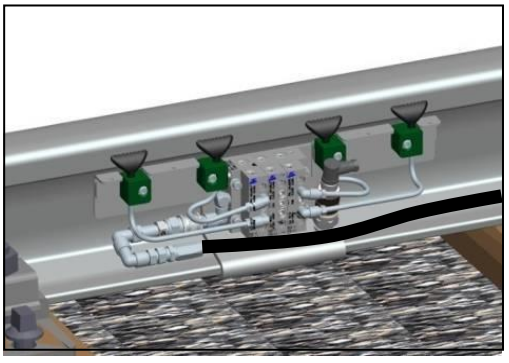
5) Check the exact length of the pipe and mount the fitting on the hose.

6) Connect the pipe to the Small-bar input using the quick coupling and connect the vibration sensor (if present) turning the connector so it faces to the right.



7) Use the "180 connector kit" only if the supply pipe is in the direction opposite the SMALL-BAR input.

8) Use the retaining clips to lock the tube and the cable along the path on the surface of the rail.



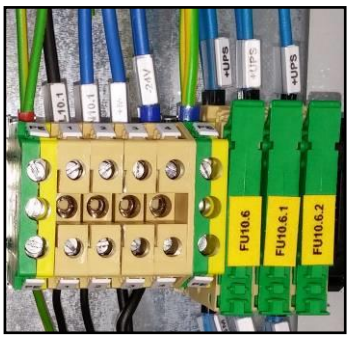
9) Replace the front cover by tightening the screws to a torque of 6Nm using a number 8 hex wrench.

6.5 ELECTRICAL CONNECTION

6.5.1 CONNECTING POWER SUPPLY LINE

Inside the panel, at the bottom right you will find a terminal labelled X1. This must be connected to the power supply (terminals X1-1 and X1-2) and its ground on terminal PE located alongside the terminals.
We recommend using at least 2.5 mm2 gauge cables for connection to the power supply and for connections to ground.

Position		Function	
Bloc	**Numbering of the terminal**		
X1	1	L	LINE
	2	N	
	3	+	PUMP
	4	-	



WARNING: **The panel is designed to be powered with 230VAC but can also be connected to the voltages indicated in paragraph 4**
Failure to comply could cause permanent damage to the control panel.

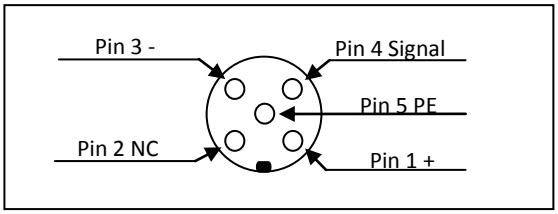
NOTE: Always make connections when the power supply is isolated and switched off.
All connections should be performed by qualified and authorized personnel, in compliance with the regulations.
Make sure the wires:

- are suitably long;
- have appropriate isolation grade that is intact until they enter the terminal;
- are properly clamped.

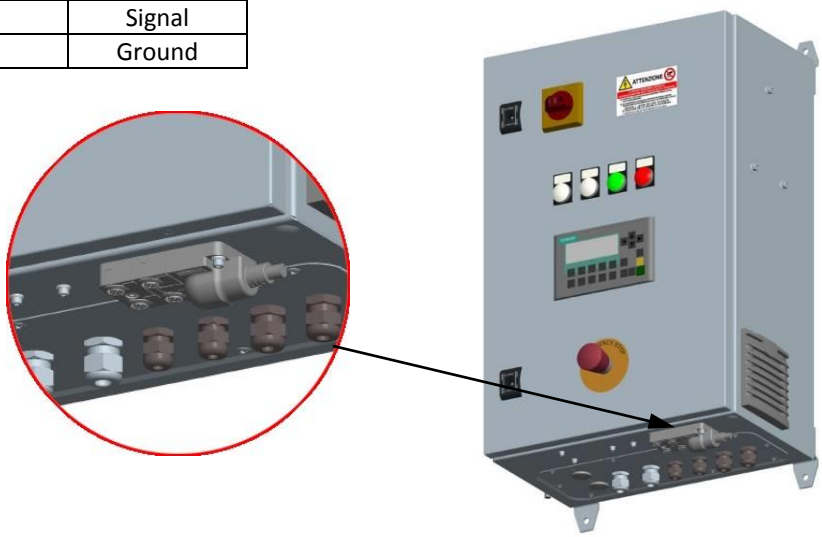
6.5.2 CONNECTION OF VIBRATION SENSORS

To connect the vibration sensor cables on both the sensor side (90° connector) and on the panel side (straight connector) use the corrugated conduit and fittings supplied, with the correct pin position described below.

Connector sensor side	Numbering cable wires	Connector panel side	Description
M12 90° type		**M12 Straight type**	
Pin Sensor		**Pin multiple socket**	
1	1	1	+ 24V DC
2	2	2	Not used
3	3	3	-
4	4	4	Signal
---	---	5	Ground



Complete the connection by plugging the vibration sensor connectors into the power strip located under the panel.



WARNING: **make sure that the vibration sensors are properly connected to the power strip located under the panel (see figure above) not to be confused with the power strip on the left side.**

6.5.3 SOLENOID CONNECTION

To connect the solenoid, take the cable with the two pre-wired connectors, connect one end of the cable to the solenoid valve and the other to the power strip located on the panel side.

6.6 ADDING A NEW SMALL-BAR (OPTIONAL)

The system is designed to be expanded with up to 12 small bars.
If it becomes necessary to change the existing system by adding SMALL-BARS, only qualified personnel should do so:

1) Disconnect the power supply to the system by pressing “Stop” and “Emergency Stop”
2) Unhook the hose with the quick release coupling from the pump.
3) Remove the 4 holding screws of the solenoid valve assembly from the bracket.
4) Remove the screw on the initial body.
5) On the new "EV Kit for Small-bar" remove the threaded bushing
6) Approach the new kit to the EV group, aligning the reference pin with the corresponding hole.
7) Tighten the screw on the new kit.
8) Refit the threaded bush in the kit.
9) Reassemble the initial body with the related screw.
10) Reassemble the whole EV group on the bracket inside the cabinet.
11) Connect the solenoid valve to the power strip on the side of the panel.
12) Pass the cable for the vibration sensor and the tube for the lubricant through the base.
13) Determine the exact length of the tube and cable to sensor.
14) Install the fitting on the pipe on the side of the solenoid valve in the cabinet and connect the solenoid valve group output.
15) Connect the vibration sensor to the related power strip located under the control panel.
16) Install the new Small-bar as shown in the "INSTALLATION OF SMALL BAR" section.
17) Switch on the power and start the lubrication cycle (once set).

6.7 REPLACING THE DRUM

To begin removing the drum, you must do the following:

1) Disconnect the power supply to the system by turning off the main switch.
2) Unhook the hose with the rapid coupling from the pump.
3) Disconnect the SMX cycle sensor and the laser sensor.
4) Remove the shelf by grasping the front edge of it.
5) Remove the cover radial screws.
6) Remove the "Cannon" pump, complete with drum lid from the drum, taking care not to contaminate the stem with sand or soil.
7) Remove the drum from the shelf.
8) Remove the additional weight on the follower plate.
9) Remove the compactor located on the bottom inside of the drum, taking care not to contaminate it with sand or soil.
10) Insert new drum of grease as shown in "INSTALLING THE DRUM AND PUMP" section.

7. OPERATING INSTRUCTIONS

7.1 BEFORE OPERATION

- The unit can be operated only by qualified personnel.
- Use gloves and safety glasses as required by the lubricant Safety Data Sheet.
- Do not ignore health hazards and observe the rules of hygiene.
- Always use appropriate piping for the operating pressures.
- Verify the integrity of the system.
- Make sure the pump operates at operating temperature and the pipes are free of air bubbles.

Check the correct connection of the electrical devices.

7.2 USE

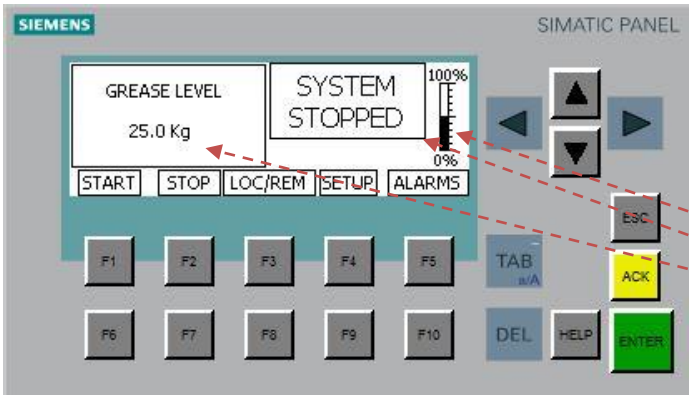
Start the lubrication cycle (once set) using the START button (F1). Fig. 1
Verify that the vibration sensor is activated by the passage of the train to start the lubrication cycle. Fig. 4.
Check the correct lubricant delivery from the small-bar.

7.3 INITIAL SETUP

Close the main switch and wait for the loading to complete. The screen shown in Fig. 1 will appear.
From this screen, pressing the F4 key (SETUP) accesses the Global Settings page (Fig. 6) where there are parameters related to the dosage sensor and the level of the drum. Use the arrow icons to select the value to be changed, and press the ENTER key to can change the value. Confirm the new value with the ENTER button.
The minimum level is used to signal the need to replace the grease drum via the control panel (or OPTIONAL via mail and web).
The level alarm stops the entire lubrication system and requires an immediate replacement of the drum.
The overtime cycle is used to protect the system in case of lubricant leaks, pump failure, faulty cycle sensor etc...
For optimal use of the system, we recommend setting the alarm level to 4 Kg and overtime to 4 minutes.
The minimum level can be set to any value higher than the alarm level.
Once this is complete you can press the F1 key and switch to programming the vibration sensor impulses Fig. 8.
On this screen we have all 12 vibration sensors managed by the system and to the right of it the number of how many activations (passes of the train) to make it start the relative cycle.
Use the arrows to select the value to be changed, and use the ENTER button to access and save the value.
At this point you can return to the page shown in Fig. 6. Press F2 to switch to programming the does impulses Fig. 7.
On this screen, all 12 areas managed by the system are displayed and on the right of it the number of dose impulses set. One impulse corresponds to 0.24 CC.
Use the arrows to select the value to be changed, and use the ENTER button to access and save the value. This value depends on how you want to lubricate the rail, the frequency of trains, the position of the SMALL BAR etc...
At this point you can return to the screen shown in Fig. 6 and press the F3 key to switch to the area and sensor matching Fig.11.
This screen is used to match a vibration sensor to one or more areas depending on the installation needs.
On this screen, F1 and F2 are used to scroll through the areas. Use ENTER to set edit mode and use the up and down arrows to change the number of the sensor matched to the area.
If the area is not used, the value "-" must be assigned to the sensor.

***ATTENTION*: If matching a sensor in use to a small bar that is not present, the system goes into alarm condition at the first activation of the vibration sensor.**

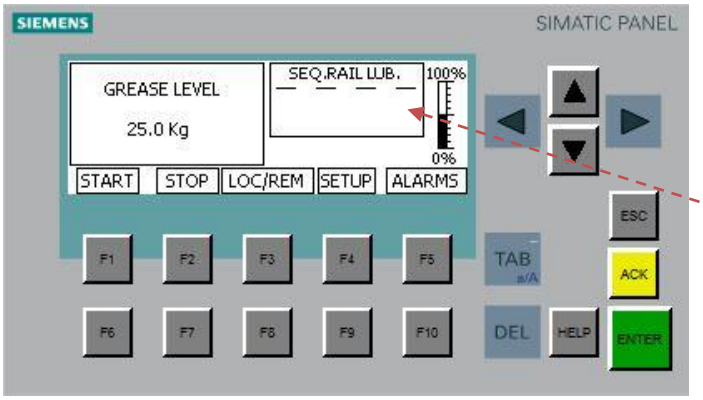
7.4 LCD PANEL SCREENS ON THE INTERNAL FRAMEWORK



F1: STARTS THE SYSTEM
F2: STOPS THE SYSTEM
F3: Go to **LOCAL-REMOTE PAGE** Fig. 10
F4: Go to **SETUP PAGE** Fig. 6
F5: Go to **ALARMS PAGE** Fig. 5

Drum grease level percentage
System stopped warning
Amount of grease in the drum

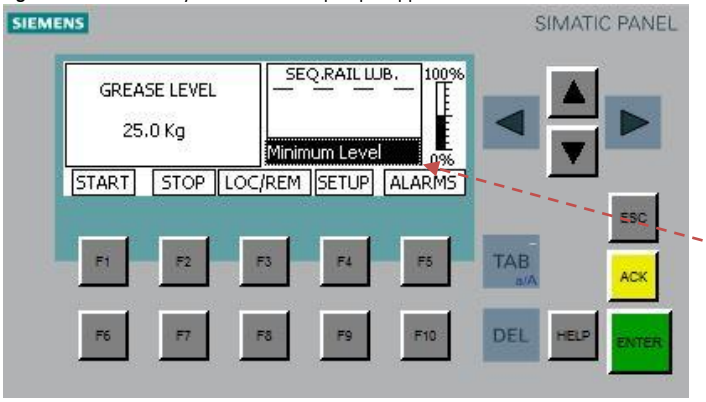
Fig.1 Screen with system stopped, 25 kg of grease in the drum (50% of the drum).



F1: ----------
F2: STOPS THE SYSTEM
F3: Go to **LOCAL-REMOTE PAGE** Fig. 10
F4: Go to **SETUP PAGE** Fig. 6
F5: Go to **ALARMS PAGE** Fig. 5

Order lubrication Areas

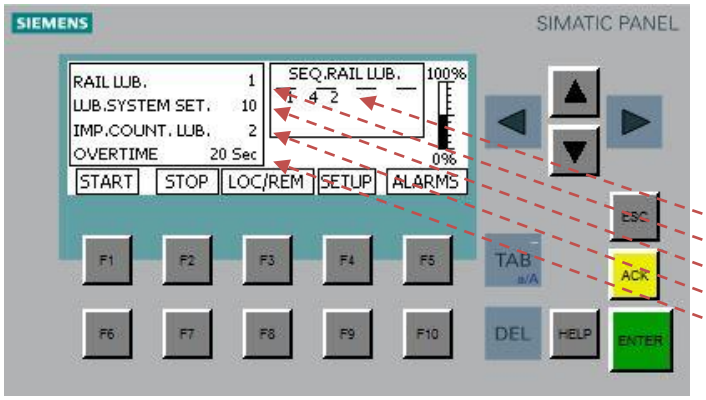
Fig.2 Screen with the system armed and pump stopped



F1: STARTS THE SYSTEM
F2: STOPS THE SYSTEM
F3: Go to **LOCAL-REMOTE PAGE** Fig. 10
F4: Go to **SETUP PAGE** Fig. 6
F5: Go to **ALARMS PAGE** Fig. 5

Alarm or warning description

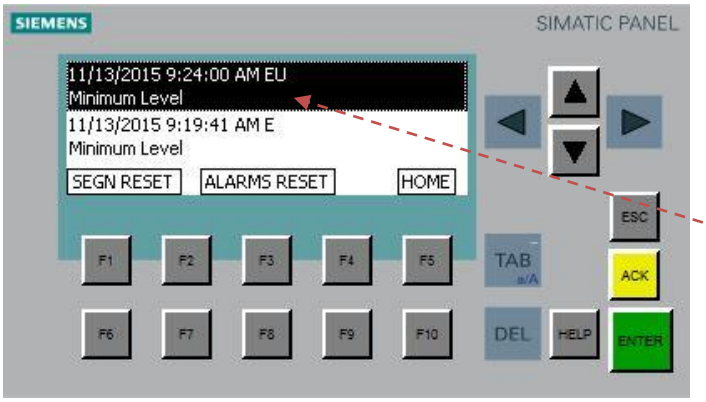
Fig.3 Screen with system stopped and minimum level alarm active.



F1: ----------
F2: STOPS THE SYSTEM
F3: Go to **LOCAL-REMOTE PAGE** Fig. 10
F4: Go to **SETUP PAGE** Fig. 6
F5: Go to **ALARMS PAGE** Fig. 5

Lubrication sequence
Area in lubrication phase
Number of dose impulses set for the area in lubrication phase
Number of dose impulses counted for the area in lubrication phase
Remaining seconds before the system goes into Overtime

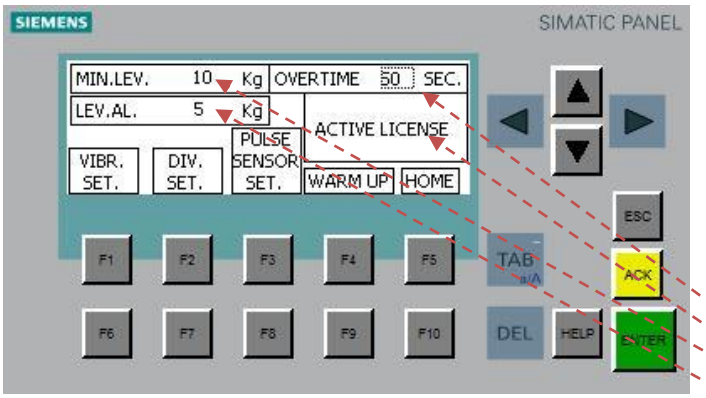
Fig.4 Screen with system armed, lubrication area 1 in progress and next lubrications in sequence, first area 4 and then 2.



F1: RESET SIGNALS (WRITTEN)
F2: ----------
F3: RESET ALARMS
F4: ----------
F5: Go to **MAIN PAGE** Fig. 1

Log all alerts occurring since the last reset of alert

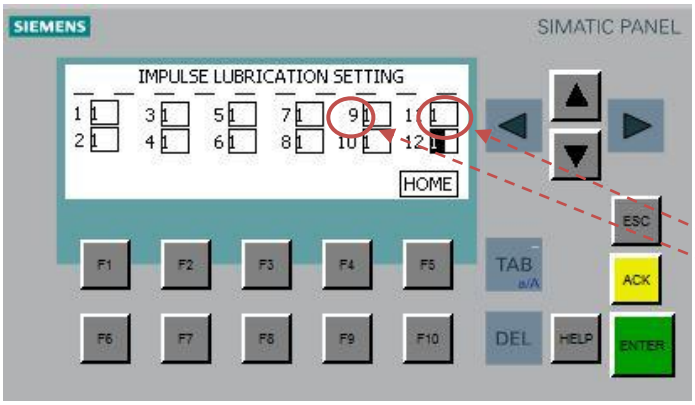
Fig.5 Screen with occurring alarm.



F1: Go to **VIBRATION SET PAGE** Fig. 8
F2: Go to **DOSE SET PAGE** Fig. 7
F3: Go to **SENSOR AREA MATCHING SET PAGE** Fig. 11
F4: Go to **MANUAL START PAGE** Fig. 9
F5: Go to **MAIN PAGE** Par. 1

Maximum time between dose impulses
License status
Amount of grease below which the system goes into warning
Amount of grease below which the system is in alarm and stops

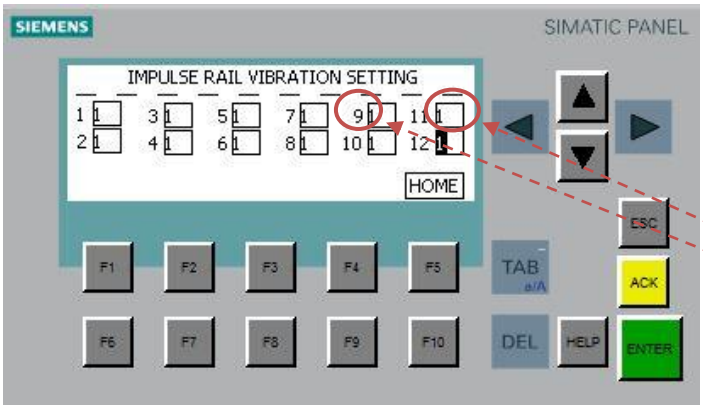
Fig.6 Global settings screen



F1: ----------
F2: ----------
F3: ----------
F4: ----------
F5: Go to **MAIN PAGE** Par. 1

Number of impulses of dose sensor
Vibration sensor number

Fig.7 Grease set quantity screen



F1: ----------
F2: ----------
F3: ----------
F4: ----------
F5: Go to **MAIN PAGE** Par. 1

Number of vibration impulses (area) before the lubrication cycle.
Rail number area

Fig.8 Area activation impulses screen.

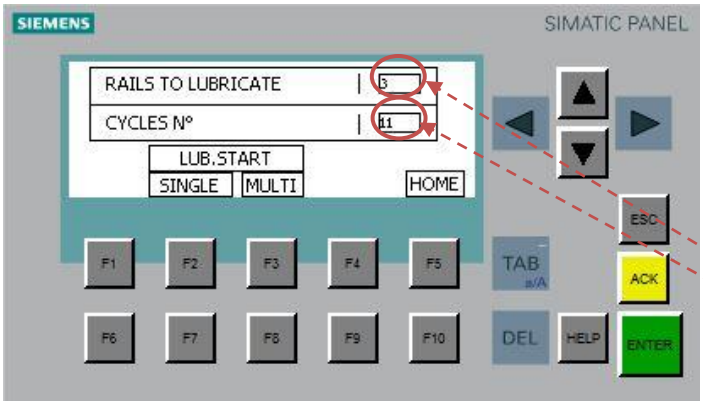


Fig.9 Start manual screen

F1: ----------
F2: START LUBRICATION FOR SINGLE AREA
F3: START LUBRICATION FROM AREA 1 UNTIL SET AREA
F4: ----------
F5: Go to **MAIN PAGE** Par. 1

Area/areas number/numbers to lubricate
Number of impulses of dose sensor to be lubricated

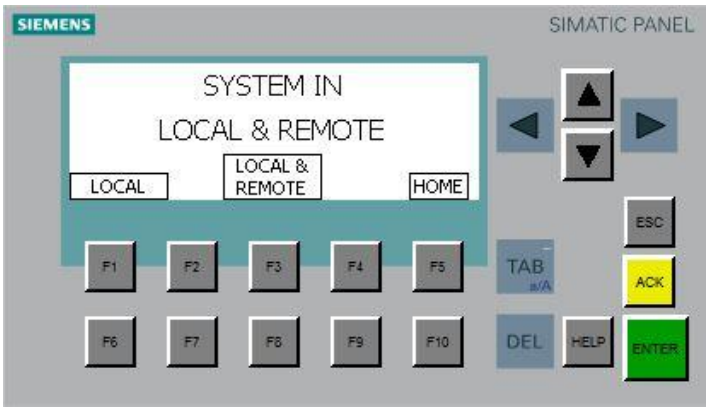


Fig.10 Setting enabling remote commands screen

F1: SET SYSTEM IN LOCAL
F2: ----------
F3: SET SYSTEM IN REMOTE TOO
F4: ----------
F5: Go to **MAIN PAGE** Par. 1

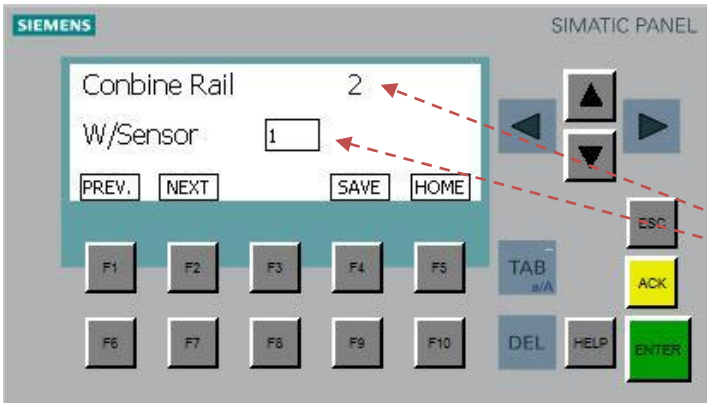


Fig.11 Setting matched area sensor screen, area 2 has been matched with vibration sensor 1.

F1: GO TO PREVIOUS AREA
F2: GO TO NEXT AREA
F3: ----------
F4: SAVE THE DISPLAYED MATCH
F5: Go to **MAIN PAGE** Par. 1

Number of the area to match
Number of matched sensor

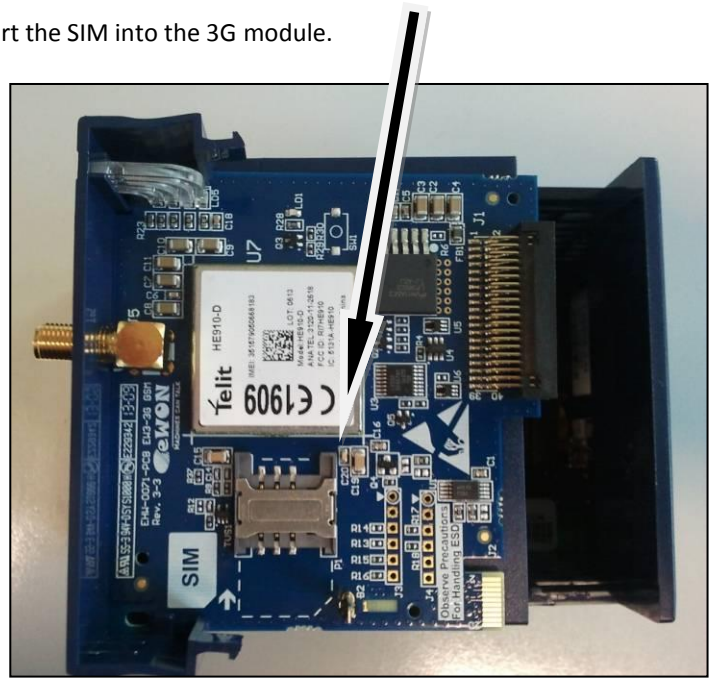
7.5 REMOTE SERVICE (OPTIONAL)

To take advantage of remote support it is essential to have a SIM card with data service enabled.
Ensure that the SIM is not PIN protected.
Remove the card from the 3G module (see following figure).

1. The clips are offset to the right. Press the clips and pull up.
2. Safety element as prevention of incorrect installation of the card.

> ***ATTENTION*: to prevent possible damage to the base unit and the expansion card, wait for 30 seconds after turning off the equipment before inserting (or removing) the expansion card.**

At this point you can insert the SIM into the 3G module.



> ***ATTENTION*: Do not use remote maintenance module if the 3G card is not in its slot, this may cause the loss of the configuration of the Internet connection, making remote assistance impossible.**

Carefully insert the expansion card and slide it down until the hooks make a "click" sound.

Note: Do not insert the card if you feel some resistance when trying to insert.

After inserting your 3G SIM card, you must configure the module for remote assistance by sending an SMS to the number of the newly inserted SIM with the APN credentials of the SIM.

The APN configuration SMS must have the following format:
APN=[provider APN]***,USER=***[if required by the provider, otherwise enter the word USER]***,PWD=***[if required by the provider, otherwise enter the letters PWD]

For example: for Vodafone operator: *APN=mobile.vodafone.it,USER=USER,PWD=PWD*

Note: The configuration SMS must not contain spaces

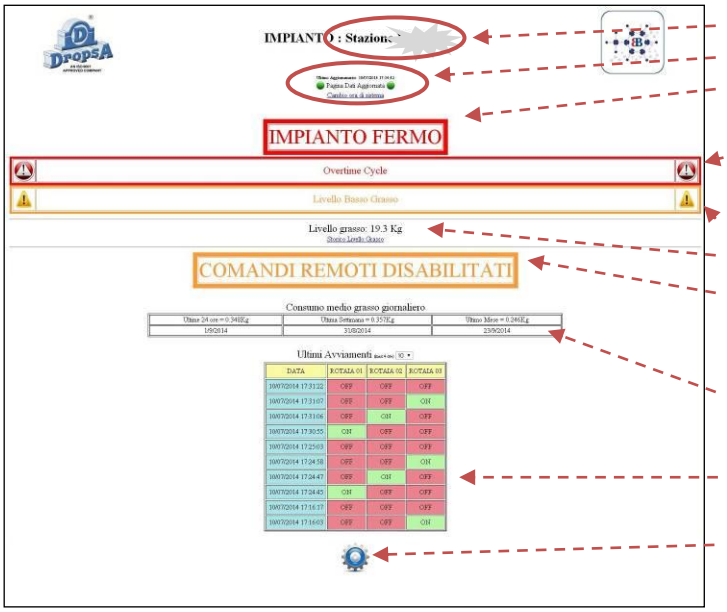
At this point you must connect the batteries (1) and close the general switch (2).

Once these steps are completed and after waiting a few minutes, you will receive a confirmation SMS of successful APN configuration.
After sending the SMS the remote service module will restart and connect to the remote service Server.
At this point you will see the LED on the 3G card 3G come on depending on the level of the signal.

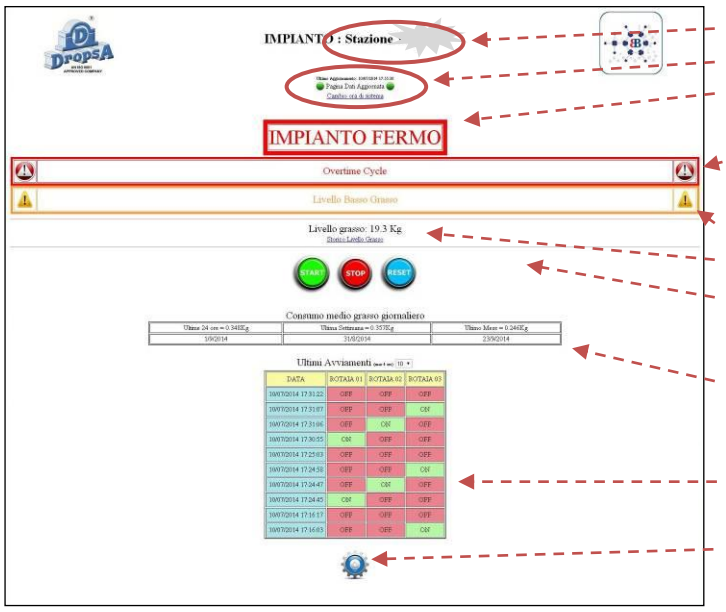
NR.	SIGN	DESCRIPTION
1	GSM	Green ON = The modem is ONLINE
2	▮	Green ON = Signal level > 1 Weak signal
3	▮	Green ON = Signal level > 10 Good Signal
4	▮	Green ON = Signal level > 16 Excellent signal

Note: If all signal level LEDs are off, there is no signal.

7.6 WEB CONTROL INTERFACE (OPTIONAL)

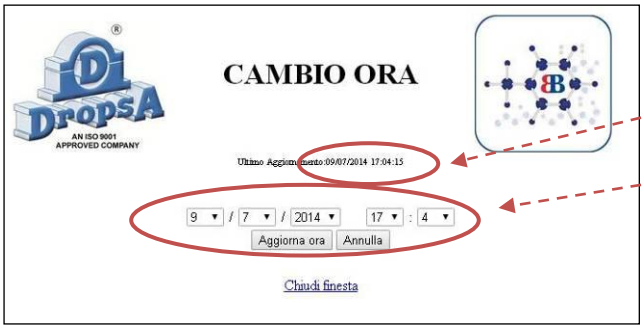


System description
Last updated page and change time
System status
Active alarm
Active warning
Drum level
Commands (in this case the commands are enabled only in local mode)
Daily average consumption of grease and foreseen drum change
Last areas start up (max 4 hours)
Go to system settings page



System description
Last update page and change time
System status
Active alarm
Active warning
Drum level
Commands (the reset button is present only if there is an active alarm or warning)
Daily average consumption of grease and foreseen drum change
Last areas start up (max 4 hours)
Go to system settings page

Website screen - HOME PAGE - remote controls enabled, active alarm, active warning and the system is stopped.



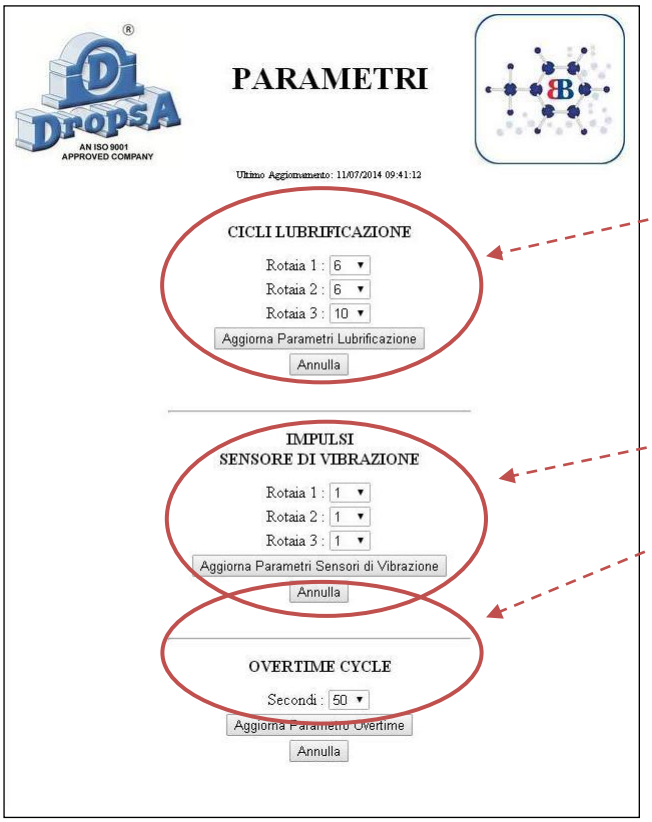
Remote service module's date

Computer's current date

Website screen – CHANGE TIME –

Grease consumption chart for last 30 days

Website screen – GREASE LEVEL –



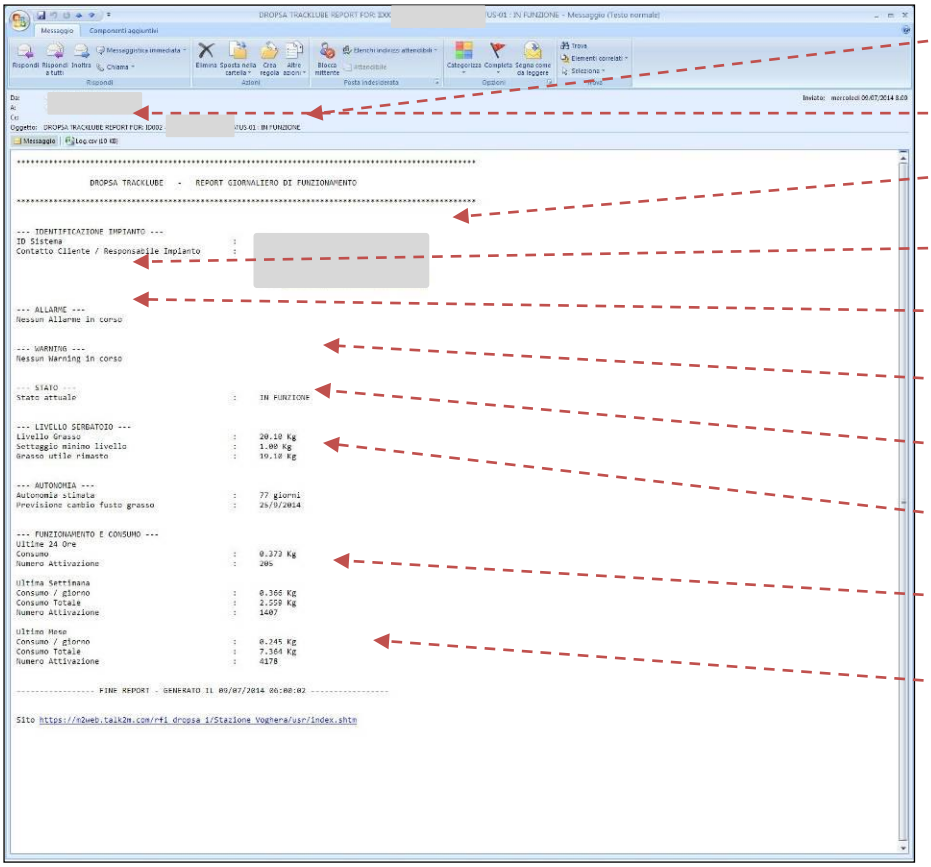
Lubrication cycles only for enabled areas

Number of vibration impulses (areas) before lubrication

Maximum time between dose impulses

Website screen - PARAMETERS –

NOTE Parameter modification is enabled only for authorized and enabled personnel.



Dropsa ID – System description – System Status *

CSV file, activation log for the last 24 hours

Customer Contact / System manager

Any active alarms with description and alarm start or end date

Any active warning

Current system status

Grease level status

Estimated grease autonomy

Grease consumption and the number of activations for the last 24 hours, last week and last month

Link to the website to check the current system status

Email screen – DAILY REPORT -

* STATUS: 01 WORKING
02 ALARM
03 WARNING
04 STOPPED

	A	B	C	D	E	F
1	TimeInt	TimeStr	rotaia_01	rotaia_02	rotaia_03	
2	1404885620	09/07/2014 6.00.20	0	0	0	
3	1404889012	09/07/2014 6.56.52	1	0	0	
4	1404889016	09/07/2014 6.56.56	0	1	0	
5	1404889026	09/07/2014 6.57.06	0	0	1	
6	1404889040	09/07/2014 6.57.20	0	0	0	
7	1404889438	09/07/2014 7.03.58	1	0	0	
8	1404889440	09/07/2014 7.04.00	0	1	0	
9	1404889450	09/07/2014 7.04.10	0	0	1	
10	1404889456	09/07/2014 7.04.16	0	0	0	
11	1404890211	09/07/2014 7.16.51	1	0	0	
12	1404890221	09/07/2014 7.17.01	0	1	0	
13	1404890223	09/07/2014 7.17.03	0	0	1	
14	1404890239	09/07/2014 7.17.19	0	0	0	
15	1404891583	09/07/2014 7.39.43	1	0	0	
16	1404891595	09/07/2014 7.39.55	0	1	0	
17	1404891597	09/07/2014 7.39.57	0	0	1	
18	1404891611	09/07/2014 7.40.11	0	0	0	
19	1404892804	09/07/2014 8.00.04	1	0	0	
20	1404892806	09/07/2014 8.00.06	0	1	0	
21	1404892818	09/07/2014 8.00.18	0	0	1	
22	1404892832	09/07/2014 8.00.32	0	0	0	
23	1404893138	09/07/2014 8.05.38	1	0	0	
24	1404893140	09/07/2014 8.05.40	0	1	0	

Log (6)

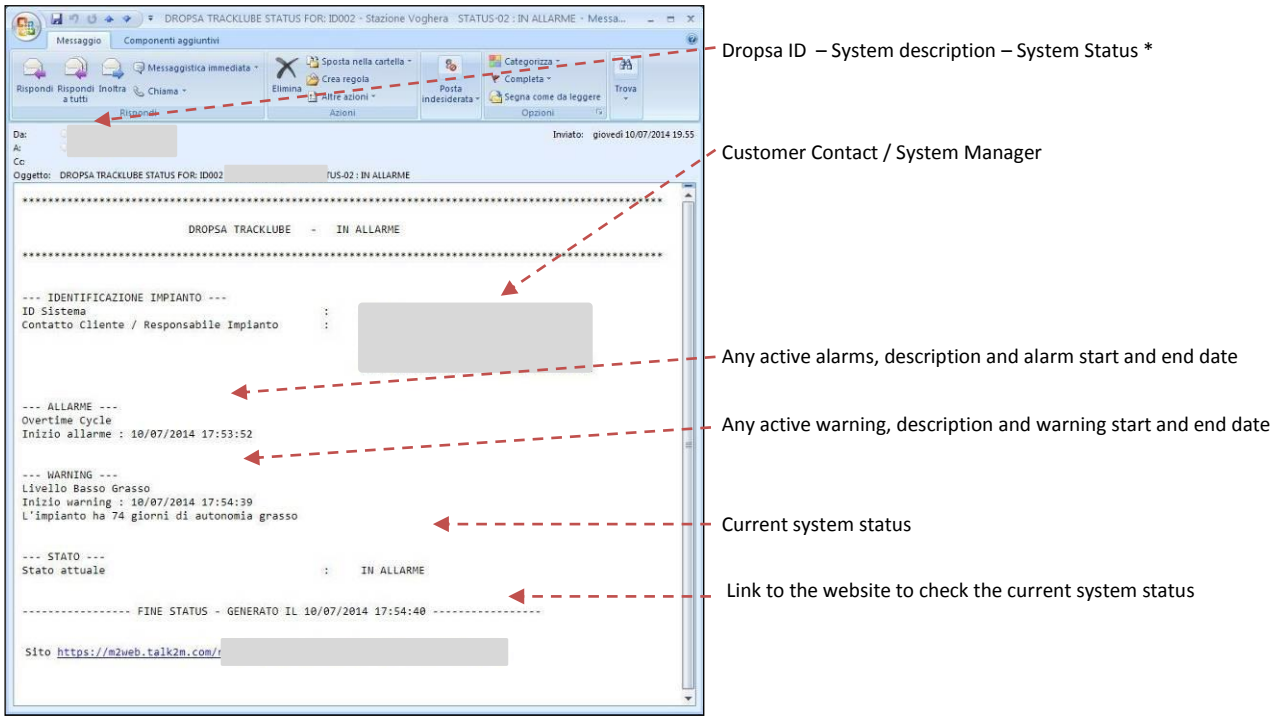
Start of lubrication of area 1 at 7:03 and 58 seconds and the other areas stopped

End of lubrication of area 2 at 7:04 and 0 seconds and at the same time lubrication of area 2 started

End of lubrication of area 2 at 7:04 and 10 seconds and at the same time area 3 started

End of lubrication of area 3 at 7:04 and 16 seconds

View of CSV file attached to email report.



ALARM and WARNING email screen

8. TROUBLESHOOTING

***ATTENTION*: The system can be opened and repaired only by authorized personnel.**

Below is a trouble shooting table to show possible problems and solutions.
If you are in any doubt about the correct solution to fix a problem, do not dismantle parts of the TRACK- LUBE but contact an Authorized Dropsa Sales and Service Point for technical assistance.

TROUBLESHOOTING TABLE		
PROBLEM	**POSSIBLE CAUSE**	**CORRECTIVE ACTION**
System block, lubrication suspended.	*Warning*. The system is battery powered due to a power failure.	If the problem persists check the input voltage, the main switch and fuses.
	Alarm. The emergency button has been pressed.	Manually reset the emergency button on the control panel.
	Alarm. No impulse was detected in the cycle time set in overtime.	Check that the dose sensor works, that the pump does not suck in air and that at least one EV output is active while the pump is in operation.
	Alarm. The grease level is below the safety level.	Replace the drum.
The pump works but lubricant does not reach the lubrication points.	Disconnected piping.	Check the condition of the pipes and their connections to the fittings. Replace worn pipes.
The pump does not deliver lubricant.	Air bubbles in the lubricant.	Disconnect the pipe from the fitting attachment to the pumping unit. Operate the pump until lubricant comes out of the fitting completely free of air bubbles.
	Drum dented and the follower plate cannot descend.	Replace the drum.

9. MAINTENANCE PROCEDURES

ATTENTION: Before carrying out any maintenance operation, ensure that the hydraulic and electrical power is disconnected.

The system does not require any special tools for operation and maintenance. When working with the pump, it is nonetheless recommended that personal health and safety equipment is used as is normal for any operation in an industrial or similar workplace.
The system has been designed and built to require minimal maintenance and operate in different and demanding operating environments. It is recommended that the unit is inspected and kept clean to ensure long life and trouble free operation. It is important to check all tubing on the system to ensure that it is always tight and leak free.

10. DISPOSAL

During maintenance or disposal of the machine, care should be taken to properly dispose of environmentally sensitive items such as oils or other lubricants. Refer to prevailing local regulations in your area. When disposing of this unit, it is important to ensure that the identification label and all the other relative documents are also destroyed.

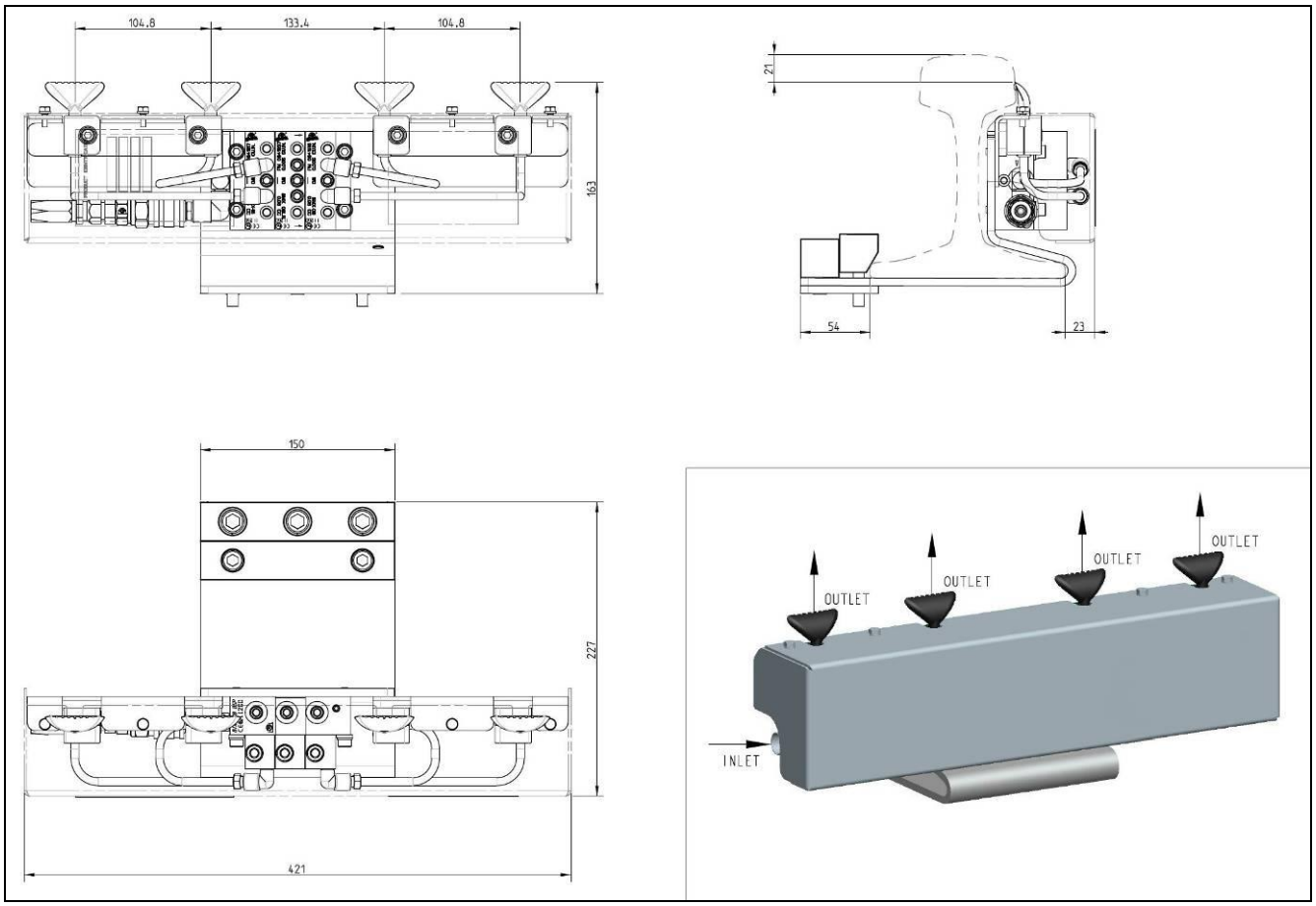
11. ORDERING INFORMATION

To create a complete system, you must define the quantity of all the parts mentioned below.

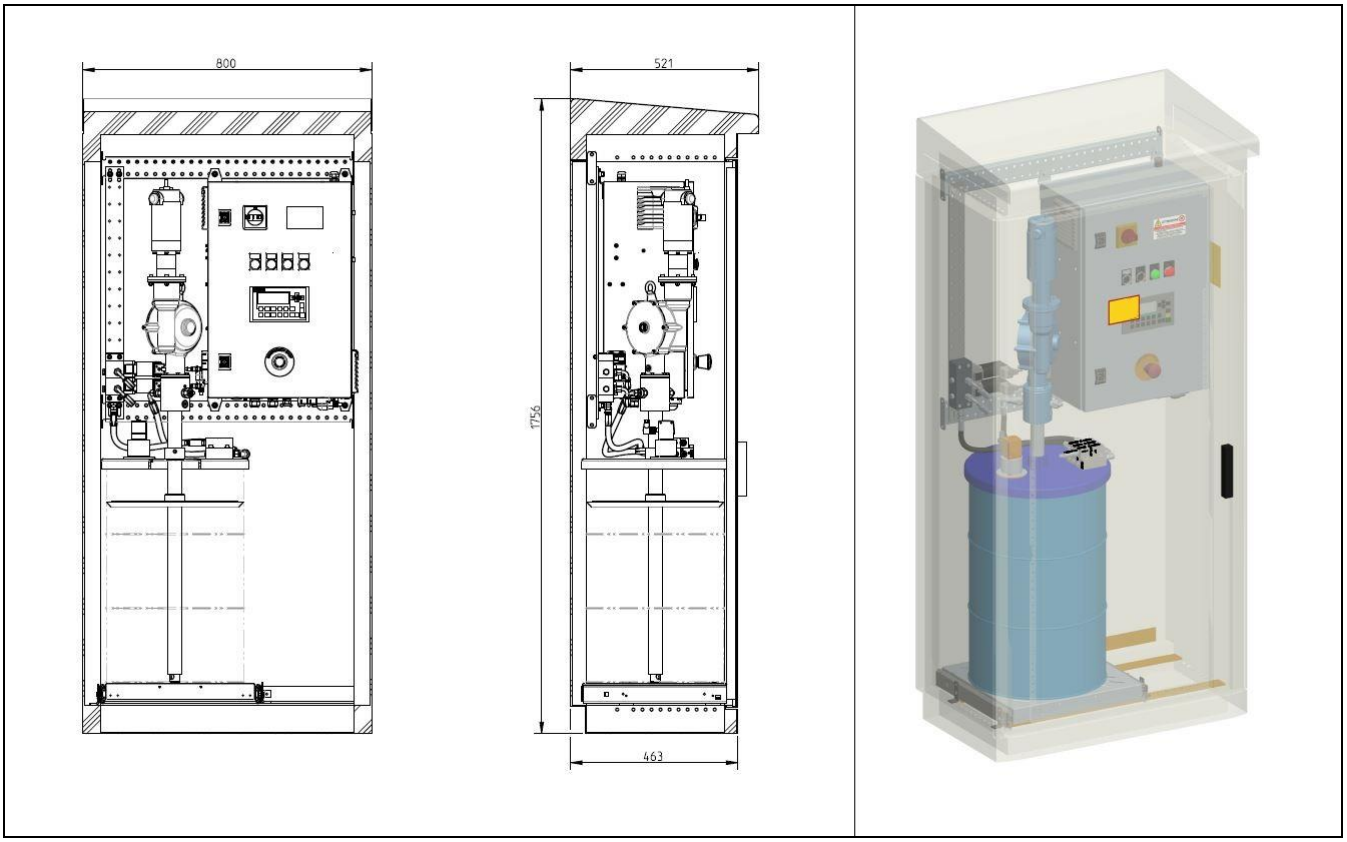
CODE	DESCRIPTION	NOTE
1900290	RAIL LUBRICATION GROUP	Cabinet with preassembled structures including shelf, pump, control panel, etc.
3133825	SMALL-BAR + EV KIT	Number of Small-bars equivalent to the solenoid valves to be mounted in the cabinet.
3133829	SMALL-BAR 50 UNI + EV KIT	As an alternative to the previous (3133825) only for rails 50 UNI.
3133837	SMALL-BAR SWITCH POINT + EV KIT	Number of Small-bars equivalent to the solenoid valves to be mounted in the cabinet.
3133826	SMALL-BAR VIBRATION MONITOR KIT	With 10m of cable and sheath. Indicate any length longer than the cable sheath 0039045 + 1523535. (providing the measurement of the duct or the corrugated prepared)
3133838	SMALL-BAR 50 UNI VIBRATION MONITOR KIT	With 10m of cable and sheath. Indicate any length longer than the cable sheath 0039045 + 1523535. (providing the measurement of the duct or the corrugated prepared)
0101818	FLEX SAE 100 FILLED GREASE "TS 18 G"	Indicate total metres for all small-bars. (providing the measurement of the duct or the corrugated prepared)
0101814	D.8 FLEX TUBE GREASE PRELOADED	To be used as an alternative to 0101818 for distances greater than 25 metres between cabinet and small-bar. Specify total meters for all small-bar, (providing the measurement of the duct or the corrugated prepared) and add one fitting P. No 0102525 to each small-bar.
1525796	CLIP MOUNTING CABLES AND PIPES FOR RAILS	Preferably one every 2 metres of pipe that runs on rails.
3225008	GREASE-TS 18 G MOD-50KG	Must always be ordered
TRACKWEB	REMOTE CONTROL MODULE	Activation system for monitoring and control via web page.
3133898	EXPANSION KIT 4 TO 8	Only for installations from 5 to 8 small-bars.
3133899	EXPANSION KIT 4 TO 12	Only for installations from 5 to 12 small-bars.
1641433	KIT ANTI ICE	Kit with electric panel, temperature sensor.
3178052	12 MT HEATING CABLE	12m Heating cable and insulated pipe
3178055	18 MT HEATING CABLE	18m Heating cable and insulated pipe. To be ordered as an alternative to the 3178052 cable.
3133828	SMALL-BAR 180 FITTING KIT	Useful for not excessively bending the tube that goes into the small-bar input at 180 ° or 90 °.

12. DIMENSIONS

SMALL-BAR



CABINET



13. HANDLING AND TRANSPORT

Prior to shipping, the equipment is carefully packed in cardboard packaging. During transport and storage, always keep the pump right side up as indicated on the box. On receipt, check that package has not been damaged. Then, store the machine in a dry location.

When moving equipment pay attention to the direction indicated on the cardboard box.
The components of the system can withstand temperatures during storage from -25 ° C to + 85 ° C; In order to prevent damage, it is necessary to ensure the system has reached a temperature of +5 ° C before start-up.

14. PRECAUTIONS

<u>WARNING:</u> It is necessary to carefully read the instructions and the risks involved in the use of lubrication equipment. The operator must be familiar with the equipment and function by reading the User and Maintenance Manual.

Power supply
No type of maintenance must be carried out before unplugging the machine from the power supply. Make sure that no one can start it up again during maintenance. All the installed electric and electronic equipment, reservoirs and basic components must be grounded.
Flammability
The lubricant generally used in lubrication systems is not flammable. However, it is advisable to avoid contact with extremely hot substances or open flames.
Pressure
Prior to any operation, ensure the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.
Noise
The equipment does not emit noise above 70 dB (A).

14.1 LUBRICANTS

The pump has been designed to operate with grease max NLGI 2. Always use lubricants compatible with NBR (Buna) Rubber seals. Any residual lubricant found on new units is residual NLGI 2 test grease used during the assembly of the pump.

The following is a comparison table between NLGI (National Lubricating Grease Institute) and ASTM (American Society for Testing and Materials) between greases, showing the permissible values for the pump.
For further technical information and on safety information consult the lubricant MSDS Safety data sheet or equivalent document supplied by the lubricant manufacture.

GREASE	
NLGI	**ASTM**
00	400 – 430
0	355 – 385
1	310 – 340
2	265 – 295

15. OPERATING HAZARDS

The verification of conformity with the essential safety requirements and regulations of the Machine Directive is conducted by compiling a check list which has been pre-prepared and is contained in the technical file.
Three types of lists are used:

- List of dangers (appendix A, EN 1050).
- Application of essential safety requirements.
- Electrical safety requirements (EN 60204).

The following is a list of dangers which have not been fully eliminated but which are considered acceptable:

- During installation there may be small low pressure oil seepage from the pump. Always use appropriate protective clothing, gloves and take all necessary safety precautions.
- Contact with lubricant during maintenance or filling of the reservoir. →As per previous point, correct precautions must be taken to protect from contact with lubricant.
- Electrical shock. → All electrical connections must be carried out by a qualified electrician who has studied the connection to ensure no electrical danger.
- Abnormal operation posture. →The pump should be installed in a suitable position with ample clearance as indicated in this manual to avoid abnormal posture for the operator.
- Unsuitable Lubricant. →Lubricant characteristics are indicated on the pump and in this user manual. In any case contact a Dropsa Sales and Support engineer (*if in any doubts, contact the Technical Department Dropsa SpA*).

FLUIDS EXPLICITLY NOT ALLOWED	
Fluids	**Dangers**
Lubricants with abrasive additives	Wear of the components inside the pump
Lubricants with silicone based additives	Pump seizure
Petrol – solvents – flammable liquids	Fire – explosion – damage to the gaskets
Corrosive products	Pump corrosion - damage to people
Water	Pump oxidation
Food substances	They would be contaminated

Distributore autorizzato ed esclusivo e responsabile customer service.