MLP-Mobile lube pump

ELECTRIC GREASE PUMP FOR MOBILE APPLICATIONS

LUBE Control

Lube Control Pty Ltd
Providing lubrication solutions!

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Automatic Lubrication Systems

MLP-Mobile lube pump

USA
GB

MLP-Mobile lube pump

ELECTRIC GREASE PUMP FOR MOBILE APPLICATIONS.

The MLP Electric Grease Lubrication Pump is particularly suited to Mobile lubrication applications where outdoor installation is necessary.
It can be fitted with up to 3 pump outlets and used with progressive divider systems to construct a fully automatic mobile lubrication system.
The unit has a choice of three sizes of reservoir and can incorporate a Cycle-Dwell/Cycle or Dwell-Sensor Timer ! (Dwell-sensor will stop the pump after reading a cycle from a progressive distributor valve)

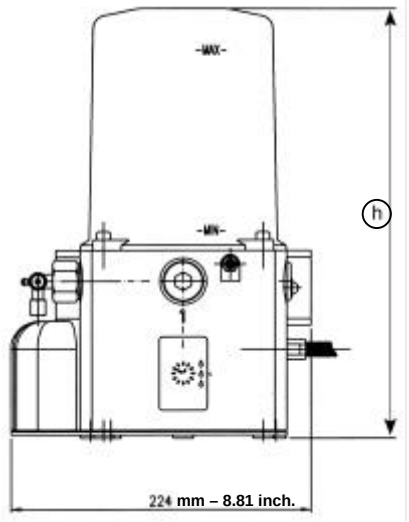
GENERAL FEATURES	
Operatine Temperature	From - 15°C to + 80°C (- 59°F to + 176°F)
Number of Outlets	1 standard, 3 max
Grease	NLGI 2 max
Operating Voltage	12V DC - 24V DC 110V - 230V AC
Power Consumption	80 VA

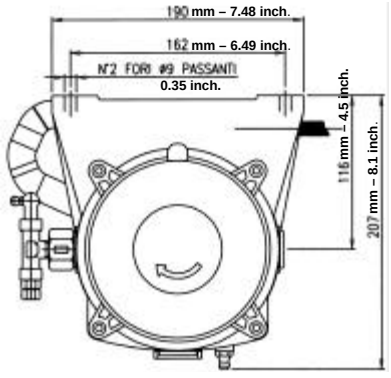
PUMPING ELEMENT	
Delivery per min at 20°C	c. 2.8 cm³ (cu.inch 0.17)
Outlet Port	1/4" BSP
Incorporated Pressure by-pass	250 bar standard (3675 psi)
Non return valve	Included on outlet.

OPTIONAL TIMER MODULE	
Work Time (ON Time)	Min. 20 sec. - max 8 min.
Pause Timer (OFF Time)	Min. 5 min. - max 12 hr.
Short-circuit protection	Included

ORDERING INFORMATION

Voltage	STANDARD (NO TIMER)			DWELL-ON TIMER			DWELL-SENSOR TIMER		
	Reservoir 2 lt 0.44 gals	Reservoir 4 lt 0.88 gals	Reservoir 8 lt 1.76 gals	Reservoir 2 lt 0.44 gals	Reservoir 4 lt 0.88 gals	Reservoir 8 lt 1.76 gals	Reservoir 2 lt 0.44 gals	Reservoir 4 lt 0.88 gals	Reservoir 8 lt 1.76 gals
12V	888300	888301	888302	888312	888313	888314	888324	888325	888326
24V	888303	888304	888305	888315	888316	888317	888327	888328	888329
110V	888306	888307	888308	888318	888319	888320	888330	888331	888332
230V	888309	888310	888311	888321	888322	888323	888333	888334	888335





Dimensions				
		2 lt	**4 lt**	**8 lt**
h	mm.	320	340	515
	inch.	12.59	13.38	20.27

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MLP – Mobile Lube Pump

Electropump for oil and grease

User and Maintenance Manual

Warranty information

TABLE OF CONTENTS

Manufacturer	**DropsA SpA**
Product	**MLP- Mobile Lube Pump Electropump for oil and grease**
Year	**2003**
Certification	CE

1. INTRODUCTION

This manual refers to MLP pump (Mobile Lube Pump).

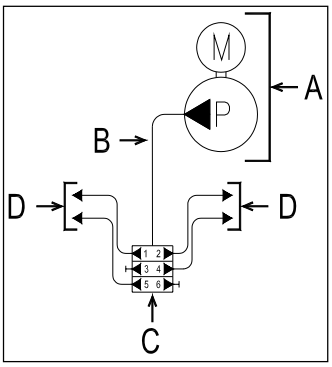
You can find newer revisions of this document from our Sales Offices, or from our website **http://www.dropsa.com** .

The use of the pump referred to in this manual must be entrusted to qualified personnel with a knowledge of hydraulics and electrical systems.

This user and maintenance manual contains important information on health and safety issues for the personnel. It is recommended to attentively read this manual and carefully keep it in good condition so that it is always available to personnel requiring to consult it.

2. GENERAL DESCRIPTION

Centralized lubrication systems significantly reduce the maintenance costs of the equipment on which they are installed, lowering downtime for maintenance operations and increasing the life of lubricated components.
These systems also enable to reach all the points that require lubrication, including those that are not accessible to operators.



The aside diagram represents the centralized lubrication system in its basic configuration.
The system comprises the following units:
A – Electropump with reservoir
B – Main pipe
C – Multiple way distributor
D – Secondary pipes

Once the electropump is commissioned, it supplies a distributor through the main piping coming from the pumping element. The distributor divides and meters the amount of lubricant among the friction points.
The secondary piping distributes the lubricant to the fittings in the different fixed friction points.

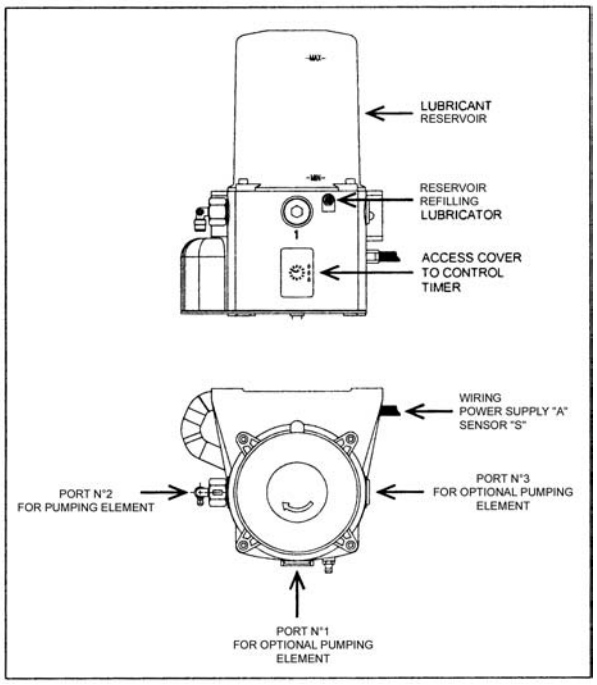
- The serial number of the system must always be quoted when requesting technical information or ordering spare parts.

MLP is a piston pump driven by an eccentric cam which has been designed to operate with a maximum of three pumping elements.

The housing is a compact monobloc plastic element shaped to offer a full resistance to mechanical stresses.

A roller-shaped system and a grease-scraper enable to eliminate air bubbles from grease, thus ensuring an easy operation, also at low temperatures.

The worm-geared ratiomotor with helical wheel and DC low voltage, is directly started by the user or through the control timer setting.



3. PRODUCT – MACHINE IDENTIFICATION

Pump identification label is located on the frontal side of the pump reservoir and contains product serial number, pressure/input voltage and details of the operating parameters.

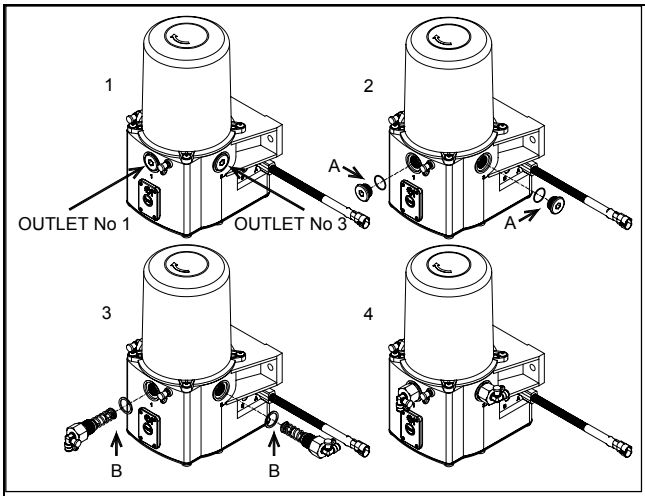
4. TECHNICAL CHARACTERISTICS

Operating temperature	– 30 °C ÷ + 80 °C (– 22 °F ÷ + 176 °F)
Number of ports	1 - 2 or 3
Pumping system	Ø 6 mm (Ø 0.2 in.) piston driven by eccentric cam
Main piping connection	Quick fitting for Ø 6 mm (Ø 0.2 in.) piping
Reservoir capacity	2 – 4 - 8 litres (0.44 – 0.88 – 1.76 gallons) with maximum and minimum level indicators
Mineral lubricant	Grease thickness class: up to **NLGI 2**
Reservoir refilling	Through A / M10x1 UNI7663 lubricator
System for air-bubbles removal	Rotating cylinder and grease-scraper
Maximum pressure	250 ± 50 bar (3675 ± 735 psi) pumping unit built-in safety valve
Flowrate * per single outlet	~ 2.8 cm^3/min (~ 0.17 cu.in.)
Ratiomotor	Worm-geared, with helical wheel and shielded DC low voltage
Vacuum weight speed	22 rpm
Power supply	12 V DC , 24 V DC , 110/220 V AC - 50 Hz
Nominal voltage: 12 V DC	1 A
24 V DC	0.5 A
110 V AC	0.1 A
220 V AC	0.2 A
Mechanical protection	IP65
Control system	**None** / **Timer** / **Timer and Sensor**

* N.B. The flowrate indicated refers to the following test conditions: grease class NGLI 2, standard ambient conditions (Temperature +20 °C (+68 °F)), pressure 1 atm, counterpressure 100 bar (1470 psi) and nominal voltage 12 V / 24 V.
CAUTION: Operate the pump only with the voltage indicated on the product label.

5. PUMP COMPONENTS

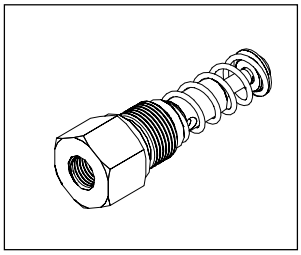
5.1 PUMPING ELEMENT



The system is usually supplied with a single pumping element installed on port n° 2.
The figure shows the sequence of operations to be performed to install a pumping element on port 1 and/or 3.

- Unscrew and remove the seal plug "**A**" from the outlet where the pumping unit has to be installed.
- Insert and tighten the pumping element in the selected configuration "**B**".
- Tighten the pumping element with 20 Nm-torque

CAUTION: the position of the driving cam may hinder pumping element screwing. In this case, it is necessary to install or insert the pumping element on one of the other ports, paying attention to the correct thread screwing.

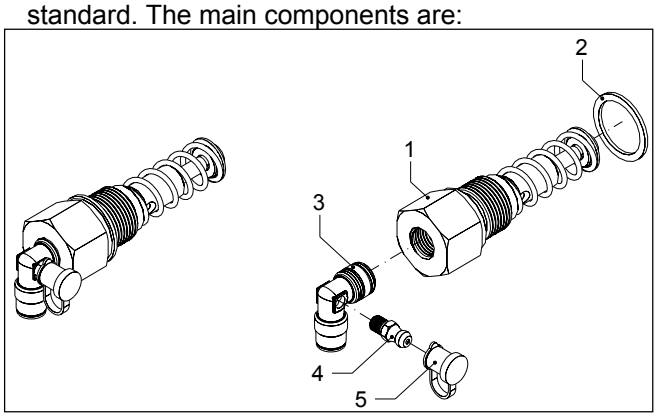


The pumping element is the pump operating-member. It is screwed directly into the pump housing and driven by means of an eccentric cam. The suction system consists of a dual free line, while the discharge is provided with an adjustable delivery valve. The piston contains a safety valve discharging directly into the reservoir, which immediately discharges the fluid inside the pumping element to avoid excessive pressure which could potentially damage the system in the event of distributor blocking.
Pumping element parts are made of high-quality alloy steel, specially treated to improve wear-resistance characteristics. Furthermore, a special external coating guarantees excellent resistance to corrosion, tested through salt fog tests.

Technical characteristics:

Boring ……	Ø 6 mm (Ø 0.23 in.)
Useful stroke ……	5 mm (0.214 in.)
Flowrate ……	0.14 cm³ (0.08 cu.in.)
Weight ……	0.200 Kg (0.44 lb)
Safety valve ……	P_{max} = 250 ± 50 bar (3675 ± 375 psi)
Connection ……	Standard with G1/4" thread

The figure below shows a pumping element with the fitting for the main pipe connection, which is supplied as standard. The main components are:



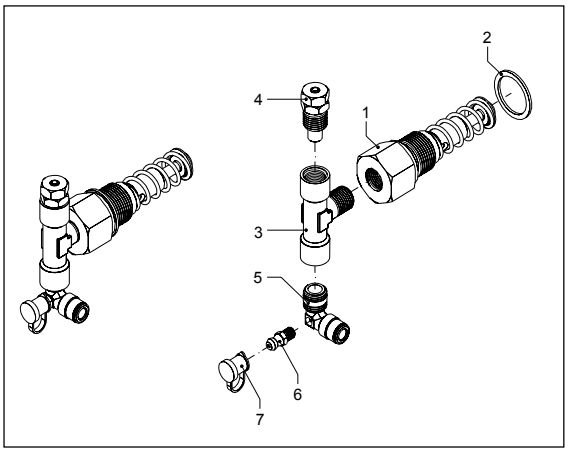
Pos	Part number	Description
1	888336	Pumping element with Ø 6 mm (Ø 0.23 in.) piston
2	888337	Ø22.5x28x1.5 (Ø 0.88 x 1.1 x 0.05 in.) Washer
3	888340	90° fitting G1/4"
4	888341	A M6 UNI7663 Lubricator
5	888342	Plug

Every pumping element is adjusted and tested by the manufacturer.
It is therefore advisable to:

- Avoid to change the set points of the pumping element safety and delivery valves.
- Dropsa Spa shall not be responsible for damages originating from tampering with the safety valve.
- In the event of problems, immediately contact the **Customer Service**.

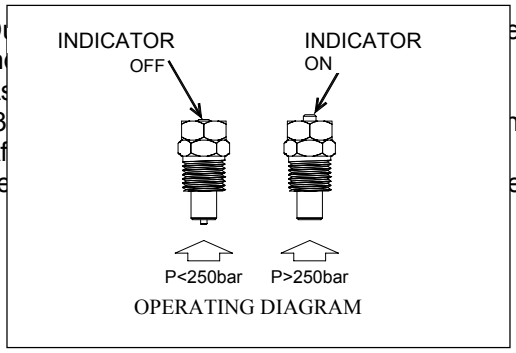
5.2 OVER-PRESSURE INDICATOR

The figure below shows a version of the pumping element, which can be supplied as optional and includes an external signalling system that controls safety valve acting.
The following table lists valve components:



Pos	Part number	Description
1	888336	Pumping element with Ø 6 mm (Ø 0.23 in.) piston
2	888337	Ø22.5x28x1.5 (Ø 0.88 x 1.1x 0.05 in.) Washer
3	888338	G1/4" 3-way shunt
4	888339	Over-pressure indicator 250 bar (3675 psi)
5	888340	90° fitting G1/4"
6	888341	A M6 UNI7663 Lubricator
7	888342	Plug

D ernal over-pressure
in
As reaches 250 bar
(3 ng position (**ON**).
Af it is necessary to
ve e **OFF** position.



6. UNPACKING AND INSTALLING THE PUMP

6.1 UNPACKING
Once a suitable location has been found to install the unit remove the pump from the packaging. Check the pump has not been damaged during transportation or storage. No particular disposal procedures are necessary, however packing should be disposed of in accordance with regulations that may be in force in your area or state.

6.2 INSTALLING THE PUMP
Allow sufficient space for the installation, leaving minimum 100 mm (3.93 in.) around the pump. Place the pump at shoulder height to avoid an unnatural posture or possibility of sustaining impacts.
Do not install the pump in aggressive or explosive/inflammable environments or on components subject to vibration.

- Ensure the fittings and piping are protected from impacts and suitably secured.

6.3 ELECTRICAL WIRING
Operate the pump only with the voltage indicated on the product label.

6.4 HYDRAULIC CONNECTION

Connect pump to system by the hydraulic connecting point, located on pump member.

6.5 SETTING OPERATIONS

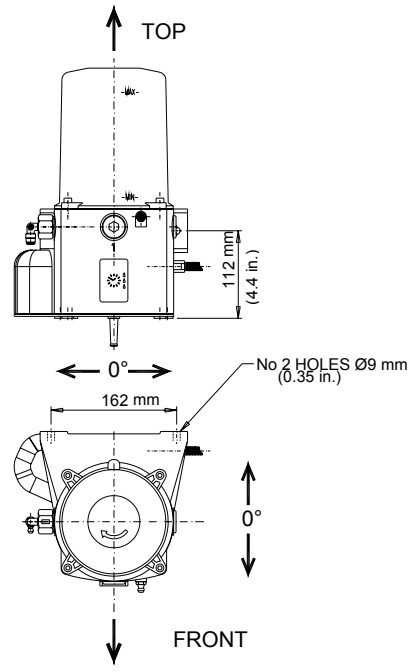
Pumps without timers do not require any adjustment (time-pressure-flowrate); pumps with timers allow only pause and working time adjustments.

7. PUMP OPERATION

Centralized lubrication systems are designed for automatic lubrication of the friction points.

- Users are not allowed to make unauthorized changes to an existing system. Modifications must be carried out or authorized by the manufacturer only or in compliance with him.
- The system should always be used within the operating parameters specified in paragraph **4 (TECHNICAL CHARACTERISTICS**).
- The system must be used only with compatible fluids; see paragraph **15 (PRECAUTIONS)**.
- For further information, contact Technical Department of **Dropsa Spa**.

The manufacturer shall not be responsible for damages originating from an improper use or the unauthorized modification of the system or its components.
Furthermore, the manufacturer shall not be responsible for damages originating from the use of non original spare parts or parts not certified by the manufacturer, or for damages originating from the use of lubricants different from those listed.

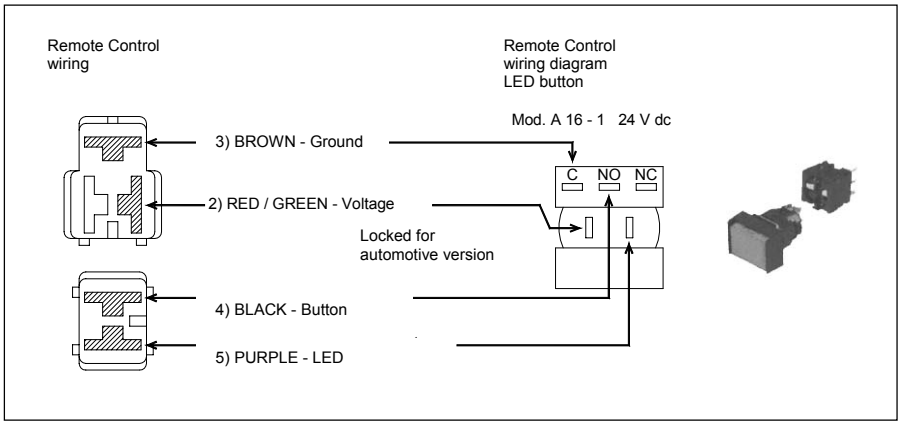


Recommendations:

- Do not install pump plunged into liquids or on supports with high vibrations.
- Do not install the pump in locations with explosive or inflammable mixtures.
- Place the MLP electropump in the position shown in the figure.
- Allow 100 mm (3.93 in.) minimum distance from the other equipments or obstacles which might prevent access to the pump.
- Install the pump ensuring that the refilling lubricator and the control timer are easily accessible.
- Fix the pump to its support using the Ø 9 mm (Ø 0.35 in.) holes and the 2 M8 UNI5931 – 8.8 screws.

7.1 ELECTRIC WIRING

For electropumps with pause-sensor control Timer, install the **Remote Control device** LED button on the control board of the machine or vehicle. It is possible to use both the 12/24 V DC and 110/220 V AC remote control devices.

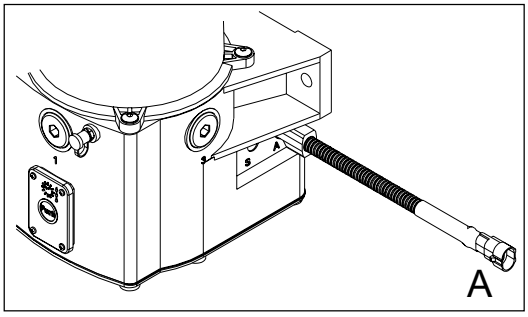


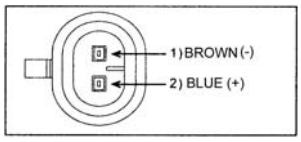
The aside figure shows the wiring electric diagram provided with LED button. For information on wiring connections, see the diagram and choose the version required.

NB: For 110/220 V AC remote control devices, it is recommended the use of a lamp with a voltage over 24 V.

Connect the electropump to the electric system of the vehicle or of the machine on which the lubrication system is installed.

Electropump **12/24 V DC**, **without Timer** and with **Pause/Operation timer**.
Power supply is the only connection available.
The above figure shows the **power supply/sensor WIRING** used for the connection.



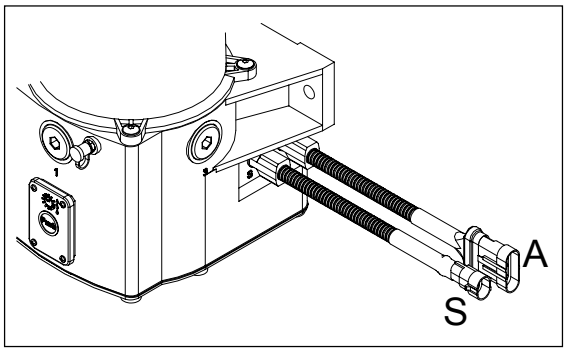


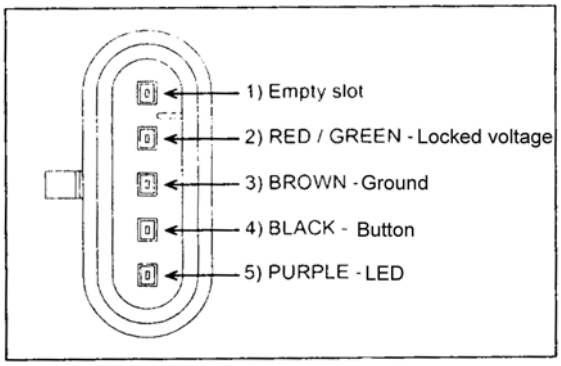
The wiring is the same used for the connection of the electropump to the sensor in the Timer/Sensor versions. Wiring comes from the pump assembly marked as **A**.

Electropump **110/220 V AC**, **without Timer** and **Pause/Operation Timer**.
The above figure shows the wiring connection diagram.

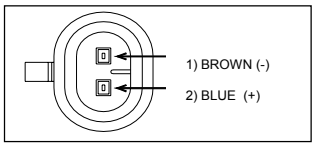
Even in this case, the wiring comes from the pump assembly and is supplied with a 600 mm (23.6 in.) protective cover.

Electropump **12/24 V DC** with **Pause - Sensor Timer**.





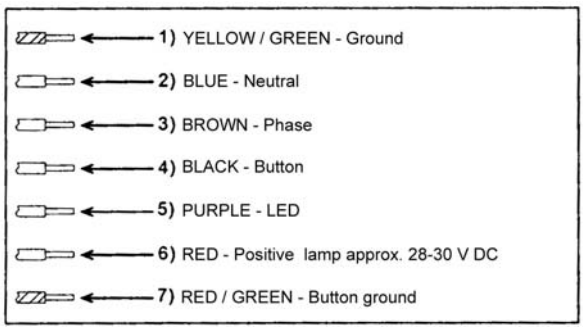
Connector A



Connector S

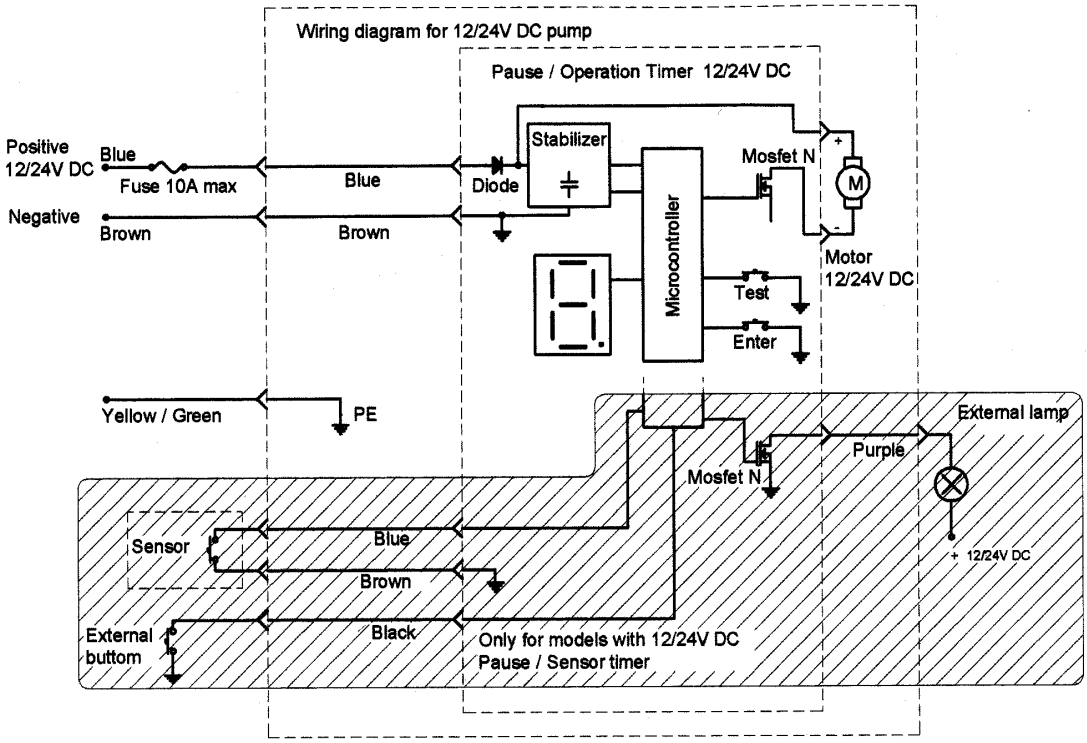
The figure shows the wiring diagram.
Power supply/sensor WIRING, coming from pump assembly output **S**, must be connected to sensor **B** connector. Connector coming from pump assembly output **A** must be connected to the power supply and to the **Remote Control Device** LED button.

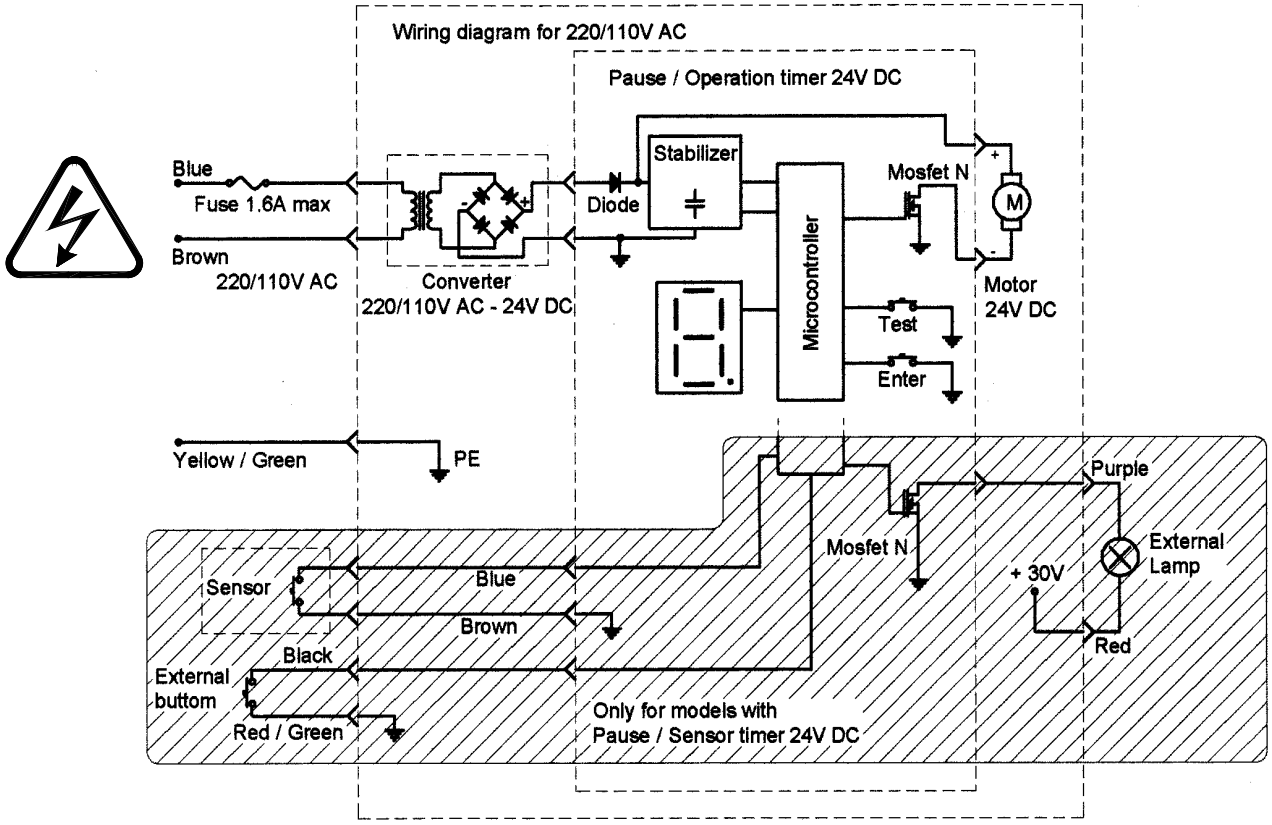
Electropump **110/220 V AC** with **Pause - Sensor Timer**.



The diagram shows the electric wiring coming from the pump assembly outlet **A**. The electropump must be connected to power supply system and to the **Remote Control device** LED button. The wiring is supplied with approximately 600 mm (23.6 in.) protecting cover. **Power supply/sensor WIRING**, coming from the pump body **S** output, must be connected to the sensor, as in the **12/24 V DC** version.

ELECTRIC WIRING DIAGRAM

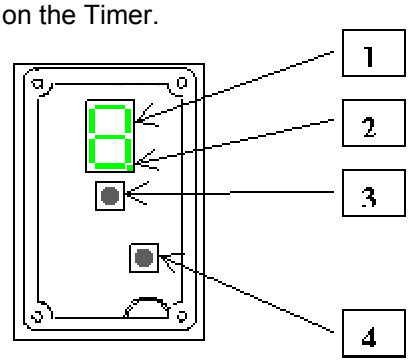




7.2 CONTROLS

The following table describes the command and control devices of centralized lubrication systems with Pause/Operating timer and Pause/Sensor timer.

The figure shows the devices installed on the Timer.



Pumps without timer are electrically powered by a system which starts the unit. You can find system commissioning and monitoring instructions among the operation and control instructions of the machine where the system is installed.

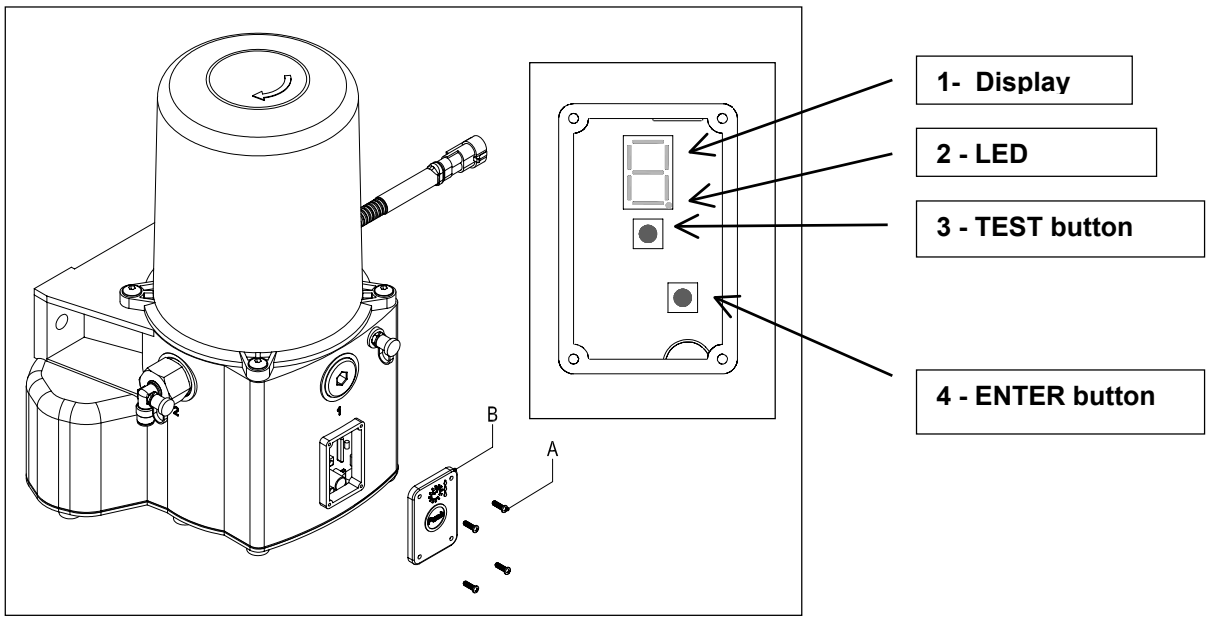
Pos.	Type	Description
1	Display	• It displays the parameters set during the time setting procedure. • LEDs turn on in sequence during ordinary operation.
2	Led	This LED turns on when the lubrication system is electrically powered.
3	TEST button	It can be actuated by slightly pressing PUSH on the timer access cover. Pushed during ordinary operation, it starts the set working cycle. At the end of the working cycle, the timer returns to the Automatic mode. Pushed during timer setting, it enables options browsing.
4	ENTER button	• Pushed for 3 seconds, starts the digital setting procedure. • Pushed shortly during the setting mode, enables to change the P (pause) and L (working) values.
A remote control device is available as optional for systems with Pause - Sensor timer. It must be installed near to the control panel of the vehicle or the machine where the system is installed.		

-----	LED	• It turns on when the centralized lubrication system is powered. It remains on for a few seconds until the timer has completed the initial check and then turns off. • It flashes when the pump is started up. • It turns on when the reservoir is empty or a problem occurs on the system. • Pushed during ordinary operation, starts a work cycle. At the end of the working cycle, the timer returns to the Automatic mode.

7.3 TIMER SETTING

The following sections summarize the operations needed to be performed for control timer digital setting.

It is useful to remember that in case of power cut, the timer saves the internal data in a long lasting digital memory. As soon as power is restored, timer reloads the saved data and starts counting the time from the point and the status its operation had been interrupted.



N°	Operation	Effect
01	Unscrew fixing screws "**A**" and remove the cover "**B**" to access the timer	This operation gives access to control timer digital setting.
02	Press **ENTER** for 3 seconds	The display turns on and **P** (Pause) appears.
03	Press **ENTER** shortly	The display shows the value set for **P** parameter.
04	Press **TEST** to change **P** value	Every time the button is pushed, the display sequentially shows the digits and the letters reported on the pause time setting table.
05	Press **ENTER** shortly to confirm the setting	The displayed value is stored as current value for **P** and the display shows letter **P** again.
• **NB.** For versions with Pause-Sensor control timer, skip directly to operation 10, because the only parameter that can be set is the P (pause time).		
06	Press **TEST** to alternate **P** and **L** displays	The display shows letter **L** (working time). • **NB**: Remember that **TEST** enables to alternate **P** or **L** displays.
07	Press **ENTER** shortly	The display shows the value set for L.
08	Press **TEST** to change **L** value	Every time the button is pressed, the displays sequentially shows the digits and the letters reported on the working time settings table.
09	Briefly press **ENTER** to confirm the selected setting	The displayed value is stored as current value for **L** and the display shows letter **L** again.
10	Press **ENTER** for 3 seconds	The display turns off and is ready to run with the new set parameters.
11	Remount timer access cover "**B**" and retighten screws "**A**"	The pump is ready to operate.

Time setting tables

• **PAUSE: P** Pause time settings	
Display	Time
0	5 min
1	10 min
2	15 min
3	30 min
4	1 h
5	2 h
6	3 h
7	4 h
8	5 h
9	6 h
A	7 h
B	8 h
C	9 h
D	10 h
E	11 h
F	12 h

• **OPERATION: L** Working time settings	
Display	Time
0	20 sec
1	40 sec
2	1 min
3	1.5 min
4	2 min
5	2.5 min
6	3 min
7	3.5 min
8	4 min
9	4.5 min
A	5 min
B	5.5 min
C	6 min
D	6.5 min
E	7 min
F	8 min

NB: working time **L** can be set only through the "pause-working" electronic card.

With pause-sensor electronic card, The cycle control time is fixed at 10 minutes

CAUTION – Electropump with timer is delivered with the following default settings:

- Pause time = 5h (Display 8)
- Operation time =1 min (Display 2)

7.3.1 TIMER

Located inside the pump casing, in a waterproof housing, it automatically controls the centralized lubrication system.

Technical specifications for models with Pause/Operation timer, 24 V DC

Operating voltage	20 ÷ 30 V DC
Maximum current load	5 A
Short circuit limitation	7 A
Stand-by current consumption	30 mA
Cycle current consumption	50 mA (motor current excluded)
Working temperature	-25 °C ÷ +70 °C (-13 °F ÷ +158 °F)
Storage temperature	-30 °C ÷ +80 °C (-22 °F ÷ +176 °F)
Hardware protection	• Overload limitation • Polarity inversion • Overheating • Over voltage (max 45 V DC)
Type of time memory	EEPROM
Memory life	Lifetime of product
Pause time setting	From 5 min to 12 hours via digital setting
Working time setting	From 20 sec to 8 min via digital setting

Warning:

- To supply the timer, follow the instructions provided in diagram **ELECTRIC WIRING**
- Do not supply the timer with voltages over 35 V to prevent operating problems.

WORKING - PAUSE/OPERATING CYCLE
The cycle is entirely controlled through the digital timer setting. The system runs a lubrication cycle for the preset working-time soon after the pause-time interval.
Working time must be set so that the duration of the lubrication cycle is enough to lubricate all the bearing points connected to it.
To determine the time required to complete a lubrication cycle, disconnect the secondary pipe from any of the distributor outlets and measure the time interval between two subsequent lubricant deliveries.
For assistance in determining the working time, contact the **Customer Service**.

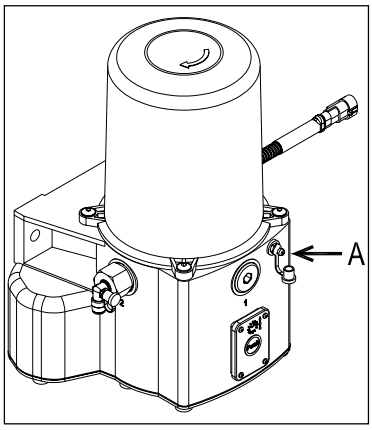
SENSOR - PAUSE/OPERATING CYCLE -
The only section of the working cycle controlled by the timer is the pause time setting. After the pre-set time interval, the system starts lubrication. The proximity sensor, with switch or inductor installed on the progressive distributor, reads the starting and the end cycle positions and stops the pump automatically.

SENSOR
The sensor, generally fitted on the system, has the same functions of an ordinary button with an outlet acting as internal contact. This sensor is used with the Pause/Operating Timer.
The working cycle starts by acting the contact of the closed sensor. The pump starts working (lubricating) after the pre-set pause interval. By operating the distributor, the sensor contact is activated and reads the initial position of the lubrication cycle. When the distributor operating re-starts, the sensor contact is activated, reads an end of cycle and stops the pump.

Technical characteristics of the standard sensor :

- Protection grade …… IP68
- Contact ..…….. ON / OFF
- Operating temperature ..……. – 30 °C ÷ + 80 °C (- 22 °F ÷ + 176 °F)

7.4 RESERVOIR REFILLING



The reservoir is refilled through the lubricator "**A**". Remove the lubricator plug and refill the reservoir up to the maximum level (**MAX**), by means of a special equipment for pressure lubrication. For information on lubricant characteristics, see the following paragraph. During the refilling, verify that the air is discharged through the air- hole. Ensure that the air-hole, placed on the reservoir rear side, is not obstructed.

7.4.1 LUBRICANTS

- It is useful to remember that systems manufactured by **Dropsa SpA** are designed to be used with lubrications with a maximum grade of **NLGI 2**
- Use only compatible lubricants with **NBR** seals
- **Dropsa SpA** supplies the system components that are already lubricated with **NLGI 2** lubricant.

Family description	NLGI grade	ASTM penetration at +25°C(+77 °F) in 1/10 of mm
Fluid greases	000	445 – 475
Semi-fluid greases	00	400 – 430
Semi-fluid greases	0	355 – 385
Mild greases	1	310 – 340
Medium greases	2	265 - 295

The table provides comparative data between NLGI (National Lubricating Grease Institute) and ASTM (American Society for Testing and Materials) data only for the values concerning the systems manufactured by **Dropsa SpA.**
For further information on technical data and safety measures, see the **Product Safety Sheet** (Directive **93/112/EEC**) related to the type of lubricant selected or supplied by the manufacturer.

8. TROUBLESHOOTING

The following diagnostic table highlights the main anomalies which may be encountered, the probable causes and possible solutions.
If doubt exists or you cannot solve the problem, do not attempt to search for the trouble by disassembling machine parts but contact the Engineering Department of DROPSA S.p.A.

N	Problem	Code	Possible cause	Solution
01	Motor does not operate	01.01	Power supply failure	Verify power supply system, and check fuse conditions
		01.02	Electronic card does not operate	Replace the electronic card
		01.03	Ratiomotor does not operate	Replace the ratiomotor
02	Pump does not deliver lubricant	02.01	Empty reservoir	Refill the reservoir with impurity-free lubricant
		02.02	Air-bubbles in lubricant	Disconnect the main piping from the pumping connection fitting. Operate the pump in the manual mode until the fitting discharges air-bubble free lubricant
		02.03	Use of incompatible lubricant	Replace the lubricant with a compatible one
		02.04	Obstructed suction pipe-line	Disassemble the pumping unit and clear suction pipe-line
		02.05	Pump unit piston worn	Replace the pumping unit
		02.06	Blocked delivery valve	Replace the pumping unit
03	Pump operates but does not deliver lubricant to the bearing- points	03.01	Disconnected piping	Inspect piping
		03.02	Blocked progressive distributor	Replace or clear the distributor
04	Lubricant reaches bearing-points in incorrect quantities	04.01	The distributor is not correctly connected to the bearing-points	Compare dosages with system diagram
		04.02	Incorrect pause time setting	Re-set pause time
05	LED off	05.01	Incorrect supply voltage	Verify that the supply voltage range is between 20V DC and 30V DC. Then act on the supply circuit
06	By pushing TEST button, motor does not operate	06.01	Motor is not correctly connected to timer	Verify motor connecting wiring to timer. Then restore the correct connection
		06.02	Motor does not correctly operate	Verify the motor neither is short-circuited nor it absorbs a current over 7A. Replace the ratiomotor
07	LEDs alternate but the motor does not run	07.01	Faulty motor	Contact the Customer Service
08	Pump starts lubrication but stops immediately	08.01	Faulty motor or high output consumption	Allow the pump being cooled for a few minutes and try again. If the problem still continues, contact the Customer Service

9. MAINTENANCE PROCEDURE

9.1 MAINTENANCE OPERATION

This paragraph provides essential information to allow maintenance staff to perform ordinary maintenance in safety.

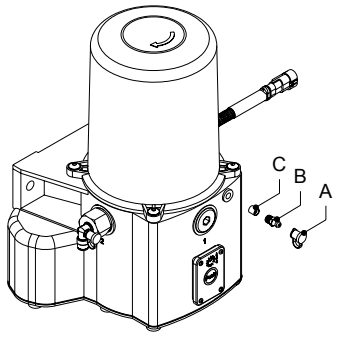
Before performing any maintenance procedure, operators should remember to:

• Verify	that the system is stopped
• Disconnect	the electropump from the power supply
• Open	the selector contact switch placed on the upper side of the electric cabinet
• Adopt	all the protective measures in accordance with the accident prevention, especially those necessary to warn that the system is in maintenance.

9.2 SCHEDULED MAINTENANCE

Due to components simplicity of design, sturdy construction and reliability, **Dropsa SpA** expects a limited number of inspections and scheduled maintenance interventions.
The following table lists the checks that have to be performed periodically, along with the frequency and type of interventions that the serviceman must perform to guarantee the efficiency of the system for a long time.

CHECK	RECURRENCE	INTERVENTION
Components tightening	After the first 500 hours	Check that all components have been correctly tightened
Piping fixing	After the first 500 hours Every 1500 hours	Check snap-on connections Check that machine parts have been fixed properly
Electropump functioning	Every 6 months	Verify electropump functioning by pushing the TEST button
Reservoir level	As required	Refill the reservoir
Refilling filter	Every 2 refills	Check and replace the filter, if necessary (see the following paragraph)



9.3 FILTER REPLACEMENT

For refilling filter maintenance, remove plug“ **A**”, lubricator“ **B**” and filter “**C**”.
Inspect and clean the filter with compressed air, when required.
If the filter is still dirty after being cleaned, replace it.
Remount filter “**C**”, lubricator “**B**” and plug “**A**”.
Tighten lubricator “**B**” with torque 6Nm maximum.

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 local regulations in force 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.

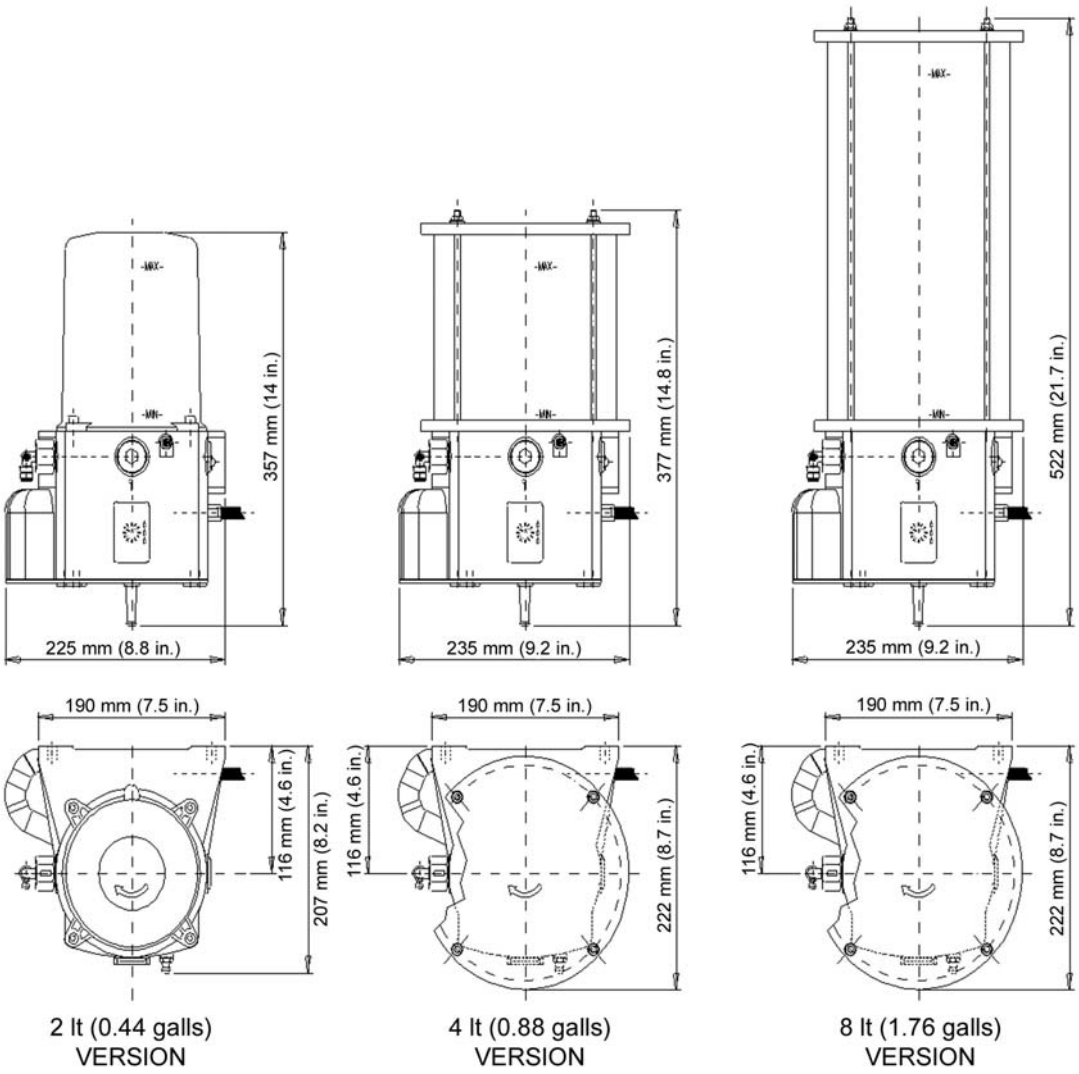
11. ORDERING INFORMATION

	Electropump without timer			Electropump with pause/working timer			Electropump with pause/sensor timer		
Reservoir / Voltage	2 lt 0.44 galls	4 lt 0.88 galls	8 lt 1.76 galls	2 lt 0.44 galls	4 lt 0.88 galls	8 lt 1.76 galls	2 lt 0.44 galls	4 lt 0.88 galls	8 lt 1.76 galls
12 V	888300	888301	888302	888312	888313	888314	888324	888325	888326
24 V	888303	888304	888305	888315	888316	888317	888327	888328	888329
110 V	888306	888307	888308	888318	888319	888320	888330	888331	888332
230 V	888309	888310	888311	888321	888322	888323	888333	888334	888335

12. DIMENSIONS

The following table lists, for each model, the pump vacuum weight in the standard configuration, i.e. with a single pumping element installed.
The following figure shows the maximum overall dimensions expressed in mm (in.):
To facilitate maintenance allow minimum100 mm (3.93 in.) of access on all sides.

Version	Vacuum weight with the pumping element installed
Reservoir capacity 2 litres (0.44 galls)	3.3 kg (7.3 lb)
Reservoir capacity 4 litres (0.88 galls)	4.8 kg (10.6 lb)
Reservoir capacity 8 litres (1.76 galls)	5.5 kg (12.1 lb)



13. HANDLING AND TRANSPORTATION

Prior to shipping, MLP pumps are carefully packed in cardboard boxes. During transportation and storage, always maintain the pump the right way up as indicated on the box.
On receipt check that the packaging has not been damaged and store the pump in a dry place.

14. OPERATING HAZARDS

SAFETY WARNINGS

- An improper use of the centralized lubrication system may cause damages due to an excessive or inadequate lubrication of the points to which it is connected.
- It is always necessary to comply with the accident prevention laws and the environmental regulations in force in the area where the centralized lubrication system is used.

It is necessary to read and understand the possible hazards and risks involved when using a lubrication pump. The operator must fully understand the hazards explained in this manual.

Power supply
Any type of intervention must not be carried out before unplugging of the machine from the power supply. Make sure that no one can start it up again during the intervention.
All the installed electric and electronic equipment, reservoirs and basic components must be grounded.

Flammability
The lubricant generally used in lubrication systems is not normally flammable. However, it is advised to avoid contact with extremely hot substances or naked flames.

Pressure
Prior to any intervention, check the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.

Noise
Pump does not produce excessive noise, less than 70 dB(A) .

15. PRECAUTIONS

Verification of compliance with essential safety requirements and machine Directive dispositions has been carried out filling in checking lists provided and contained in the *technical file*.
Dropsa used three kinds of checking list:

- List of hazards (according to the EN 1050 as it refers to EN 292);
- Enforcement of the essential safety requests (machine Directive – annex 1, part 1);
- Electric safety requirements (EN 60204-1)

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

- ♦ During assembly or maintenance oil squirts at low pressure are possible. (For this reason suitable personal protective clothing must be worn and appropriate protective measures must be taken during these operations).
- ♦ Contact with oil -> see the requirements for the use of suitable individual protective measures
- ♦ use of incompatible lubricant -> fluid characteristics are shown on the pump and in the manual **(in case of doubt contact Dropsa S.p.A. Eng. Dept.)**.
- ♦ Protection against direct and indirect contact must be provided by the user.
- ♦ as the pump must always be functioning, it is necessary to control the electrical connections so that, in the case of power failure, customer's machine is restarted only by means of a reset, while lubrication pump can restart automatically.
- ♦ it is recommended to reseal the retailer any time the reservoir is uncovered for maintenance.
- ♦ Carefully avoid to clear the pump using alcohol.

INCOMPATIBLE FLUIDS	
Fluid	**Danger**
Lubricants containing abrasive components	Premature wear of pump
Lubricants containing silicon	Pump failure
Petrol – solvents – inflammable liquids	Fire – explosion –seal damage
Corrosive products	Pump damage - danger to persons
Water	Pump oxidization
Food Products	Contamination of the product

15. WARRANTY

All products manufactured and marketed by Dropsa are warranted to be free of defects in material or workmanship for a period of at least 12 months from date of delivery.

Extended warranty coverage applies as follows:

Complete system installation by Dropsa: 24 Months

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be maximum of 18 months from ship date.

If a fault develops, notify us giving a complete description:

- ✓ fault
- ✓ product code
- ✓ test record number where available (format xxxxxx-xxxxxx)
- ✓ date of delivery
- ✓ date of installation
- ✓ the operating conditions of the subject product(s).

We will subsequently review this information and, at our option, supply you with technical service or shipping instruction and returned materials authorization number (RMA) which will have instructions on how to prepare the product for return.

Upon prepaid receipt of subject product to an authorized Dropsa Sales & Service location, we will then either repair or replace such product(s), at out option. If the warranty is not run out yet, we will perform such necessary product repairs or replace such product(s) at our expense.

Dropsa reserves the right to charge an administration fee (logistic, checking etc.) if the product(s) returned are found to be not defective.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

Consumables and perishable products are excluded from this or any other warranty.

No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

The use of Dropsa product(s) implies the acceptance of our warranty conditions. Modifications to our standard warranty must be in made in writing and approved by Dropsa.

17. DECLARATION OF COMPLIANCE WITH CE STANDARDS

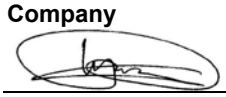
Manufacturer:	*DROPSA SpA*
	Via B. Croce, 1 - 20090 Vimodrone (MI)
	Address
	02 – 250.791
	Telephone

states, by the terms of Directive **89/392/EEC**, Annex **II,** paragraph **B**, that:

The Machine:	**E-PUMP- Mobile lube pump**

- Has been designed to be integrated in a machine that complies with the requirements of Directive **89/392/EEC.**
- Is compliant with the requirements of Directive **89/392/EEC** and subsequent amendments (Directives **91/368/EEC, 93/44/EEC, 93/68/EEC**).
- Is compliant with the requirements of the EMC Directive **89/336/EEC** and with Directive **92/31/EEC** "Electromagnetic compatibility", as indicated in Directive **95/54/EEC** "Measurement of irradiated electromagnetic emissions".

Furthermore, the manufacturer states that the unit can be operated only if the machine on which it is installed has been identified and found compliant with the requirements of Directive **89/392/EEC.**

TECHNICAL DIRECTOR	W. Divisi
	Name
DROPSA SpA	
Company	
	January 2003
Signature	**Date**

It is useful to remember that the Declaration of Conformity is valid only if:

- The indications, safety warnings and instructions given in the operation and maintenance manual are observed.
- The system is used in accordance with the instructions provided by the manufacturer.
- Adjustment operations are carried out by authorized, trained and qualified personnel.
- Maintenance operations are carried out by qualified and authorized technicians.

Failure to comply with the requirements listed in the Certificate of Conformity shall automatically invalidate the warranty.

18. DROPSA LOCATIONS

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Fax: (+1) 586-566-1541
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Z.I. des Doucettes
91140 - Garges Les Gonesse
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Fax: (+33) 01 39 86 26 36
E-mail: sales@dropsa.com

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