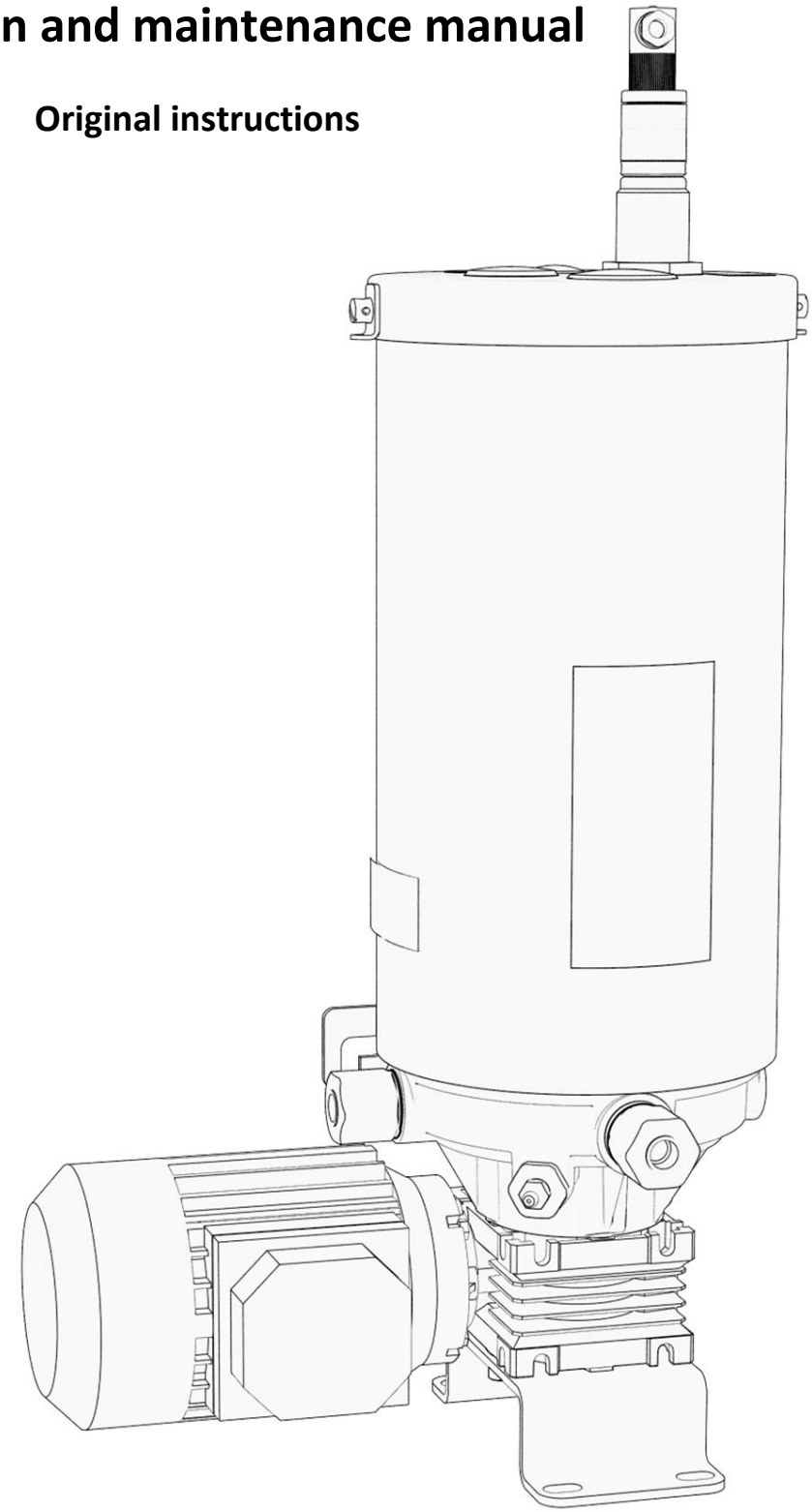
989v2

Multi-outlet electric pump
For 989v2 grease

Operation and maintenance manual

Original instructions



Manual drafted in compliance with directive 2006/42

C2287IE - WK 04/21

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INTRODUCTION

OPERATION AND MAINTENANCE MANUAL

1. GENERAL INFORMATION

1.1. General information

This Operation and Maintenance Manual constitutes an integral part of the 989 V2 (identified in this document with the term MACHINE) made by the company DROPSA S.P.A. (identified in this document with the term MANUFACTURER); for this reason, it must follow the machine itself in the event that it is transferred to a new user or owner.
This manual must be carefully kept and protected from any agent that could deteriorate it for the entire life cycle of the MACHINE.
This manual was drafted for the purpose of providing operators and maintenance personnel of the Machine with information and the instructions essential for correctly and safely operating.
Since it must be easily and immediately consulted, this manual must be placed in a location that is known and accessible to the various users.
This manual contains all the data and information required to carry out preliminary instruction and training of personnel assigned to correctly managing the Machine; for this purpose, it must be used.
Although highlighting all of the notices and warnings for correct use of the MACHINE by the operators or to allow maintenance personnel to operate correctly, this manual presumes that, in the area in which the MACHINE is installed, the prevailing health and safety regulations are observed and that operation and maintenance personnel possess a level of instruction that allows them to correctly interpret the information contained herein.

1.2. Property of the Information

This Operation and Maintenance Manual contains information that is confidential property.
All rights are reserved.
This manual cannot be reproduced or photocopied in all or in part without previous written consent from the MANUFACTURER. The use of this documentation material is permitted only for the customer to whom the manual was provided along with the machine and only for purposes of installation, operation and maintenance on the MACHINE to which the manual refers.
The MANUFACTURER declares that the information contained in this manual is consistent with the technical and safety specifications of the machine to which the manual refers. The drawings, diagrams and technical data are updated to the date of publication of this document and are valid exclusively for the MACHINE to which they are attached.
The MANUFACTURER reserves the right to make changes or improvements to this documentation material without advance notice.
The MANUFACTURER assumes no responsibility for direct or indirect damage to people, objects or pets resulting from the use of this documentation material or the MACHINE in conditions other than those foreseen.

1.3. Contents of the Operation and Maintenance Manual

This Operation and Maintenance Manual is intended for operators and engineers so that they can know and correctly use the MACHINE.
In fact, in addition to a functional description of the Machine and its primary parts, this manual contains the instructions and indications for:
correctly transporting and installing the MACHINE;
correctly using the MACHINE;
carrying out correct cleaning and maintenance on the MACHINE;
placing attention on the most basic safety and accident prevention rules.
The personnel indicated above will thereby be able to know both the potential of the MACHINE and the problems that can arise while managing it.
The most recent version of this document can be obtained by requesting it from the Sales Technical Office or online at www.dropsa.com.

1.4. Warranty

1.4.1. General Conditions

THE MANUFACTURER, DROPSA S.P.A. guarantees the 989 V2 and the equipment manufactured by the same MANUFACTURER free of material and processing defects for a period that is agreed upon at the stipulation of the MACHINE sale contract.
During the warranty period, the Manufacturer undertakes to remove within the necessary time the clear material or processing defects in the event of malfunction or breakdown. This is contingent on the condition that the MACHINE has been assembled with the assistance of the Manufacturer's engineers and that it has been used correctly in compliance with the best rules of operation and maintenance indicated in this manual. Any defective parts under warranty are repaired or replaced free of charge by the MANUFACTURER if it is demonstrated that they are defects

from the origin. The transport or shipping expenses, unless otherwise specified in the sale contract, as well as the transfer expenses related to any intervention by the MANUFACTURER's engineers at the User's site are governed in the sale contract.
The MANUFACTURER, for the construction of the MACHINE, uses materials, organs and mechanisms of the type, state and quality deemed, at their unquestionable discretion, suitable for the functions that the MACHINE must carry out. The MANUFACTURER, in pursuing a policy of constant development and upgrading of the product, reserves the right to modify both the functional and aesthetic characteristics, to make changes to the design of any functional organ or accessory, or to suspend production and supply, without giving any notice and without incurring any obligation whatsoever. Furthermore, the company reserves the right to make any structural or functional change, in addition to modifying the supply of spare parts and accessories without the obligation of notifying anyone and for any reason whatsoever.

1.4.2. Parts not covered under Warranty

The parts subject to wear and any the consumable utensils and materials provided by the MANUFACTURER along with the MACHINE are not covered under warranty.

1.4.3. The responsibility of the user

All the following points are the responsibility of the user.

- **Electrical power supply**, with the suitable characteristics based on the type of motor installed (on this subject, see paragraph 2.1 and in particular, the electrical characteristics indicated specifically on the CE Tag of the individual pump unit).
- **Specific electrical disconnect switch** on the power supply line, dedicated only to the MACHINE or also relative to the machinery / system for which the MACHINE carries out lubrication, with the following characteristics:
  - isolates the electrical equipment from the power supply having only one open and closed position;
  - is lockable with suitable devices (for example a padlock) in open position 0 – OFF or fitted with a wall plug;
  - the disconnect device interrupts all the live wires on its power supply circuit.
- **Control system** for management of the motor (start / stop pump) and the signals coming from the level sensors located in the grease reservoir, fitted with a **simple arrest dedicated control**, which, once launched, determines a stop in Category 0 or in Category 1, in order to have the actuators of the MACHINE completely disconnected from the power supply in a reasonable time in any case.
- **MACHINE** grease reservoir filling system, whether gun, pump or automatic.
- **Grease distribution system** downstream of the MACHINE (the selection and installation of which is the responsibility of the customer), including the piping and the connections, **suitable for managing the pressures** that develop in it due to the pumping of grease in it by the MACHINE, including the **detection / reading system of the relative pressure point**.
- In the event of installation of **emergency stop control**, the logic chain that also includes the MACHINE must reach a reliability such to guarantee a minimum Performance Level equal to PL = c, in accordance with UNI EN ISO 13849-1: 2016
- Utensils and consumable materials.

1.4.4. Operations that void the warranty

Any attempt to disassemble, modify or tamper with a component of the MACHINE by the user or by unauthorised personnel voids the warranty and releases the MANUFACTURER from any liability on any damage whether to people or things stemming from said tampering.

THE MANUFACTURER is also released from any responsibility and the warranty on the MACHINE will be void in the following cases:

- unforeseen use of the machine (on the subject, see the chapter *Improper use of the* MACHINE);
- **opening of the upper cover of the reservoir** of the MACHINE (SPECIFICALLY LEAD SEALED) and/or filling of the reservoir without the use of the included filling nozzle and relative filter.
- use contrary to the requirements of the prevailing standards in the country of use;
- INSTALLATION OF THE MACHINE in conditions other than those specified in the *Transport and Installation chapter*;
- hook-up that does not comply with the specifications found in the *Transport and Installation chapter*;
- use of work equipment other than what is specified in the *Use of the* MACHINE and the *Maintenance and Demolition chapters*;
- total or partial failure to follow the instructions in this manual;
- lack of or incorrect maintenance;
- use of non-original replacement parts or parts not specified by the MANUFACTURER.

The machine is a **grease pump**, designed and constructed to feed an automatic lubrication system for systems or machinery in accordance with its technical specifications.
The machine uses an electric motor which, by means of a ratio motor, allows an eccentric system to be driven which allows the pumping of GREASE from the included pumping element. Also by means of the same motor, a stirring paddle is driven which acts inside the reservoir for the purpose of removing the grease from the walls of the same and push it downward, in other words, toward the action of the pumping elements. Filling of the included reservoir must be carried out only by gun, pump or automatic system, through the included filling nozzle.
All the moving parts are protected inside fixed guards made of metallic material.
The machine is supplied only with an electric motor and relative connection terminal strip. The connection and management (timed, manual or based on a level reading) of the electric activation is delegated to the customer.

2. DESCRIPTION AND TECHNICAL CHARACTERISTICS

The machine is available in **different configurations**, inferred by part numbers, identical to one another as a system of operation, system of protection for the machine operators, residual risks and operator interface, which differ in the following elements:

- type of electric motor and relative specifications of the electrical power supply;
- type of ratio motor;
- number of pumping elements;

- dimension of the grease reservoir;
- type of minimum and maximum level detection sensor (if present), namely induction or laser.

2.1 General description

The 989 v2 range of lubrication pumps are particularly suited for plants with progressive systems and can adapt to many needs without mechanical modifications, even after installation. In fact, be choosing a set of components that are perfectly compatible with one another and easy to assemble, you can vary the pressure, the quantity of grease distributed, the type of grease or the type of distribution.

This construction technique is based essentially on the following modules:

- Electric motor;
- Pump body;
- Pumping element;
- Reservoir.

The bearing structure is the same for any version. The pumping element constitutes the essential module.

Two types of reservoirs with different volume (from 5 or 10 kg÷11 or 22 lbs) can be arranged on the pump body with stirring paddle and electric level indicator.

The 989 v2 OEM is fully protected against the external environment and can operate without difficulty even in the most severe environmental conditions.

2.2. Standard pump components

In the following

Figure 1 e *Table 1* the main components

Figure 1

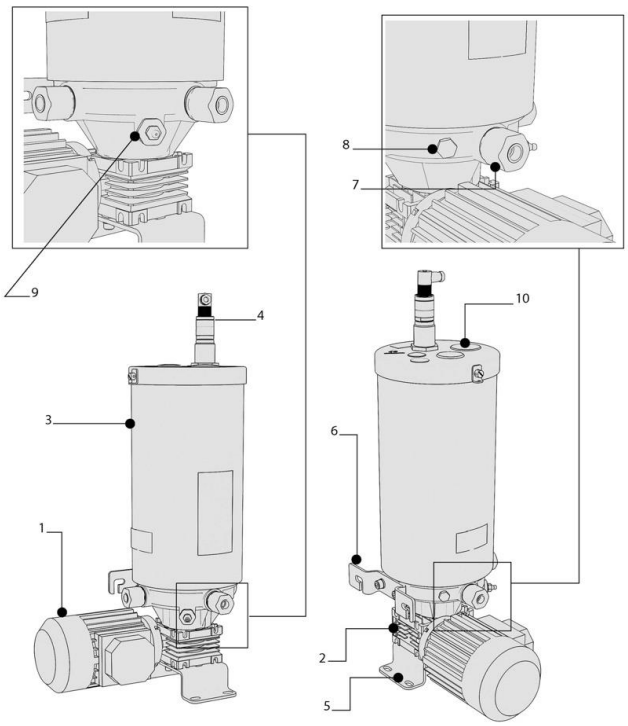


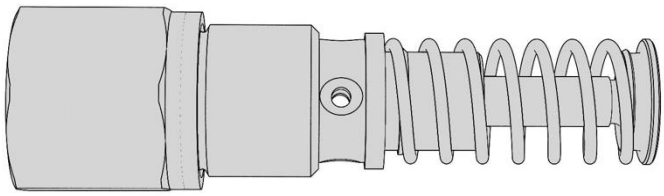
Table 1

STANDARD PUMP COMPONENTS			
1	Motor	6	Wall mounted support bracket
2	Reducer	7	Pumping element
3	Reservoir	8	Reservoir bleed
4	Capacitive minimum level	9	Grease loading
5	Floor mounted support bracket	10	Optional levels housing

2.2.1 Pumping elements

The pump can be supplied both with fixed flow rate pump element (17 cm^3 / min for each pumping element) and with adjustable flow rate pump element (2.5÷17 cm^3 / min for each pumping element).
The seal between piston and pumping body is a dry type since it has no gasket in between.
The pumping element check valve is the tapered seal type. This solution allows an outstanding seal of the system to be guaranteed at high operating pressures (max pressure of 300 bar – 4351 psi).
The line piping is connected directly to the pumping element outlet.
For the adjustment of adjustable pumping elements, see Paragraph 5.3.

Figure 2



2.2.2. Auxiliary pumping elements (optional)

The pump is installation-ready for another one or two pumping elements. This allows more than one line to be fed or the outlets of two or three pumping elements (fixed and adjustable) to be combined, mounted to double or triple the flow rate.

2.2.3 Laser for grease minimum level (optional)

The minimum level is achieved by a laser probe. The probe is normally closed when there is grease. When the minimum level is reached, the probe signals the lack of lubricant.

For connections and settings, see paragraphs 4.2.3 and 5.4. respectively.

2.2.4 Grease stirring paddle (standard pump)

Two reservoirs have been provided with capacity of 5 and 10 kg. (11 – 22 lbs).

As standard, the reservoirs have the stirring paddle that do not need to be disassembled in the event of disassembly and replacement of the same.

2.3. Technical specifications of the pump

In *Table 2* the technical specifications common to all the 989 v2 Pumps are listed.

Table 2

GENERAL SPECIFICATIONS	
Empty weight (5 kg reservoir)	15 kg ~ 33 *lbs*
Empty weight (10 kg reservoir)	18 kg ~ 40 *lbs*
ELECTRICAL SPECIFICATIONS	
Motor power supply	230-400V - ±5% 50Hz 280-480V - ±5% 60Hz Insulation class F
Motor power rating	0.09 kW
Motor grade of protection	IP 54
Grease minimum level	Laser 24V cc Out NO and NC 1 threshold – Capacitive (optional greases NLGI00-NLGI000)
Oil minimum level	Float
Maximum level	Laser 24V cc Out NO and NC 1 threshold (optional)
HYDRAULIC SPECIFICATIONS	
Pumping system	Piston
Flow rate (1 pumping element)	17 cc/min (fixed) – 3~17 cc/min (adjustable)
No. of pumping elements	Max 3
Maximum operating pressures	300 bar (4351 psi)
Outlet connection	1/4" BSP
Reservoir capacity	5-10 kg (11-22 lbs)
Filling filter	Filtering grade 220 µ
Operating temperature	- 10 ÷ + 50 °C *(+14~122F)*
Operating humidity	90% R.H.
Permitted lubricants (1)	grease NLGI000~NLGI2 – Oil min 32 cst
Storage temperature	-40 ÷ +65 °C *(-40~149F)*
Continuous sound pressure level	< 70 dB(A)

(1) If a different product is used, you must ask DROPSA S.p.A. if it is suitable for use.

The following characteristics refers to an operating temperature of +20°C [+68°F] The indicated flow rate value refers to the following test conditions: grease with NLGI 2 consistency class, standard environmental conditions (Temperature 20°C [68°F], pressure 1bar [14.5psi]).

2.3.1. Lubricants

A table is shown that compares the NLGI (National Lubricating Grease Institute) and ASTM (American Society for Testing and Materials) categories for greases, limitedly to the values that involve the 989 v2 pump.

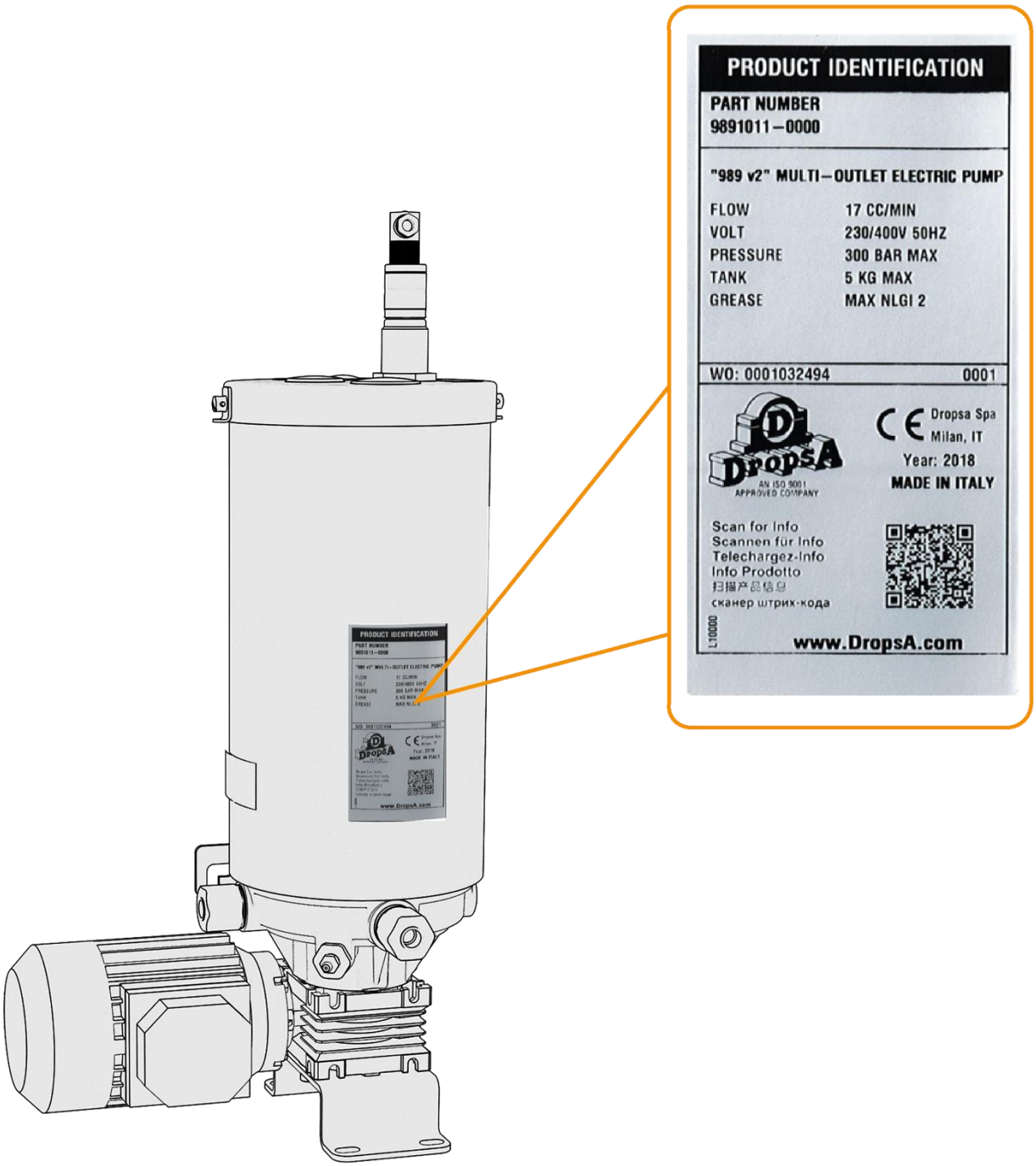
NLGI	ASTM
000	445 - 475
00	400 – 430
0	355 – 385
1	310 – 340
2	265 – 295

For further information on the technical characteristics and the safety measures to adopt, see the Product Safety Data Sheet (MSDS – Material Safety Data Sheet) related to the type of grease selected and supplied by the manufacturer. See paragraph 3.6 on prohibited fluids.

***ATTENTION**:* *the pump is designed to work with maximum NLGI 2 grade lubricants. Use NBR gasket compatible lubricants. Any residual grease inside that was used for assembly and testing is NLGI 2 grade.*

2.4. Identification of the product

A label is located on the pump tank that indicates the product code, the power supply voltages and the basic characteristics.



3. Safety

3.1. Materials present on the MACHINE

None of the materials used for the constructions of the **MACHINE components** are dangerous for the personnel in charge of its operation (during all life phases of the MACHINE itself). Specifically, the materials used for the construction of the MACHINE are primarily:

- iron derivatives;
- plastic derivatives;
- copper derivatives;

During operation, the MACHINE uses specific products for the production purpose, namely lubricants contained in its reservoir to carry out its operations. The lubricants permitted by the manufacturer DropsA S.p.A. can in and of themselves bear phrases of risk on their MSDS (material safety data sheet) even related to flammability, irritability, harmfulness to the health and toxicity of the grease. In this respect, DropsA S.p.A. requires the use of **suitable PPE**, namely gloves, eye protection and shoes, while carrying out the various possible operations on the MACHINE itself. In any case, **this PPE must be integrated or diversified** depending on the explicit requirements of the MSDS relative to the grease being used. On the other hand, lubricants with the characteristics indicated in the following table shown in the paragraph on intended use **are prohibited**.

The MACHINE does not produce gases, residues or powders, fogs, fumes or vapours during operation.

3.2. Devices and Solutions for Protection

The construction devices and solutions described below have been adopted for the MACHINE.

- **Fixed guards in metallic and plastic material that act as a shield for the motion drive parts.**

3.3. Warning of residual risks

In order to prevent any dangerous condition for personnel or damage to the MACHINE caused by residual risks, in other words, those risks that remain despite all the devices adopted, or from less evident potential risks, the MANUFACTURER urges operators, maintenance personnel and all personnel in charge of the MACHINE to strictly adhere to the warnings indicated on the following pages.

3.3.1. Lifting and Transport

3.3.1.1 Residual risks present in the Lifting and Transport Phases

In the lifting and transport phases, risks are present connected to:

- operations on the 989 v2 by unqualified, untrained, uninformed or incorrectly equipped personnel;
- incorrect selection of incorrect use of the means of transport and handling of the components of the 989 v2;
- crushing / impact of the operators in charge of handling;
- loss of load stability during lifting and transport operations;
- impact of parts or components of the 989 v2 with people or objects due to improper behaviour by personnel tasked with the operation;
- impact or falling of the 989 v2, damaging the 989 v2 itself;
- unhealthy positions or excessive strain for the operators tasked with transport and handling the components of the 989 v2.

3.3.1.2. Required Personal Protection Equipment

3.3.1.3. Warnings to be heeded in the Lifting and Transport Phases

In the lifting and transport phases, the warnings in this paragraph must be heeded.

- For these operations, assign only **specialised personnel trained** on handling and transport procedures, capable of safely using the lifting and transport equipment and choosing the most suitable paths for the circumstances.
- Ensure ahead of time that **moving parts** of the 989 v2 have been secured or removed.
- Ensure ahead of time that the **electrical power supply** of the 989 v2 is **disconnected**.
- Only use a **suitable system to grip, lift / lower and transport** the 989 v2 to the installation point. The MACHINE has **limited dimensions** and a **weight** of **15 kg** or **18 kg**, depending on whether it is fitted respectively with a 5 kg or 10 kg grease reservoir.
- Always handle the MACHINE with the reservoir completely empty.

3.3.2. Installation and operation

3.3.2.1. Residual risks present in the Installation and Operation Phases

In the operation and setup phases, risks are present connected to:

- use of the 989 V2 by unqualified, untrained, uninformed or incorrectly equipped personnel;
- **contact with chemical agents**, namely, the grease being used by the MACHINE;
- crushing / impact to the hands or feet due to **falling during transport / positioning / securing** of the MACHINE in its installation point, or **during operation** due to incorrect securing;
- projection of grease from the reservoir bleed valve in the event of **excessive filling**;
- projection of non-pressurised grease in the event of **lack of / incorrect connection of the pumping elements** with the grease distribution system downstream of the machine (the selection and installation of which is the customer's responsibility);
- projection of grease under pressure due to **incorrect connection with the grease distribution system** downstream of the MACHINE (the selection and installation of which is the customer's responsibility) or due to the **breakage of connections or piping of the grease distribution system itself**;
- possible breakage and projection of components or parts of them or materials / foreign objects present in the **GREASE LOADED IN THE MACHINE'S RESERVOIR**, in the event in which it is **loaded in a manner other than that required**, in other words, **without using the filling nozzle** specifically provided on the machine and the relative **grease filter** fitted on the nozzle;
- **serious breakage /** fault with the **MACHINE** or its components, with projection of the same or parts of them or parts being processed.
- possible impact / crushing with the pumping elements handling system in the event of use of the MACHINE **with pumping element or elements removed**;
- projection of fluid under pressure if the **connections and/or the piping of the grease distribution system** downstream of the machine are removed with the system still under pressure, even with the machine already stopped.
- **ignition of flammable materials due to incorrect use of the MACHINE**, namely near open flames;
- contact with live electrical parts.

3.3.2.2. Required Personal Protection Equipment

3.3.2.3 Warnings to be heeded in the Installation and Operation Phases

In the operation and setup phases, the warnings in this paragraph must be heeded.

- Carry out **transport / positioning / securing** of the machine using suitable means. The machine has **limited dimensions** and a **weight** of **15 kg** or **18 kg**, depending on whether it is fitted respectively with a 5 kg or 10 kg grease reservoir. Always handle the MACHINE with the reservoir completely empty.
- Always ensure the correct and solid **connection of the pumping elements** with the grease distribution system downstream of the machine (the selection and installation of which is the customer's responsibility) before starting it.
- Always load the grease using the **filling nozzle** SPECIFICALLY PROVIDED ON THE MACHINE, and the relative **grease filter** fitted on the nozzle.
- **Do not use the machine with pumping element or elements removed**. Remove them only with the machine disconnected from the electrical power supply.
- Do not remove the **connections and/or the piping of the grease distribution system** downstream of the machine are removed with the system still under pressure. Even with the machine already stopped, it can stay under pressure. On the grease distribution system downstream of the MACHINE, always install a **detection / reading system of the relative pressure point. Always ensure the absence of pressure before** removing the connections and/or piping of the grease distribution system downstream of the MACHINE.
- Always install a **grease distribution system** downstream of the MACHINE (the selection and installation of which is the responsibility of the customer), including the piping and the connections, **suitable for managing the maximum pressures** that develop in it due to the pumping of grease in it by the MACHINE.
- **Never operate with open flames near the machine**.
- **Never open the upper cover of the MACHINE**, which is fitted with a lead seal, at the penalty of voiding the warranty.
- For these operations, assign only **specialised personnel trained** on the installation and operation procedures.
- Start the 989 v2 only if **all the safety protection devices are in proper working order**.
- **Do not remove**, for any reason whatsoever, the installed safety devices and guards.
- Adhere to all the **safety and danger signs** AFFIXED ON THE MACHINE.
- Ensure that all the **safety and danger signs** AFFIXED ON THE MACHINE are always legible.
- Wear all the **required PPE**. **Integrate or diversify this PPE** depending on the explicit requirements of the MSDS relative to the **grease being used**.
- Always ensure that **no foreign objects are present** on the MACHINE.
- Carry out **regular maintenance** in accordance with what is established in the specific chapter.
- **Do not operate** in correspondence to the 989 v2 without having entirely and carefully read this manual.
- Activate any movement of the 989 v2 **only after having ensured the absence of other personnel in the dangerous area**.

- Use auxiliary equipment only after understanding the indications contained in the related Operation and Maintenance Manuals or after having followed specific and formalised training.
- Immediately report abnormal operating situations.
- Do not attempt to make the 989 v2 carry out prohibited operations (refer to the indications contained in this manual).
- Do not use the 989 v2 when under the influence of drugs or beverages that can reduce quick reflexes.
- Do not rest equipment / piping / conduit on the 989 v2 or on top of the components that make it up.

3.3.3. Maintenance and Demolition

3.3.3.1. Residual risks present in the Maintenance and Demolition Phases

In the maintenance and demolition phases, risks are present connected to:

- **all the operations and risks already included in the previous paragraphs**.
- operations on the MACHINE by unqualified, untrained, uninformed or incorrectly equipped personnel;
- contact with live parts of the electrical system;
- forgetting objects on the MACHINE at the end of maintenance or adjustment operations;
- contact with hot elements of the MACHINE.

3.3.3.2 Required Personal Protection Equipment

3.3.3.3 Warnings to be heeded in the Maintenance and Demolition Phases

In the maintenance and demolition phases, the warnings in this paragraph must be heeded.

- Execution of maintenance and demolition operations must be carried out by qualified and specifically trained personnel.
- Always ensure to have removed the **electrical power supply** by disconnecting the power supply wall plug before carrying out any operation.
- Use auxiliary equipment and any other tool only after understanding the indications contained in the related Operation and Maintenance Manuals or after having followed specific and formalised training.
- Do not, for any reason whatsoever, use petrol, solvents or flammable liquids to clean the same.
- Do not make any modifications transformations or applications to the 989 v2.
- Do not strike the structure, the components or the panel of the 989 v2 with tools or anything else.
- Do not tamper with the components of the 989 v2.

3.4. Safety Signs

On the MACHINE the warning labels indicated in *Table 3* can be found.

Table 3 – Description of the warning labels on the

	LABEL	DESCRIPTION
A		Warns of the danger of laser-emitted optical radiation.
B		Warns of the danger of electrocution.
C		Warns of the danger due to parts in motion.
D		Indicates that it is prohibited to remove fixed guards with parts in motion.

3.5. Noise and Vibration Indications

3.5.1. Noise

The 989 v2 was designed and built in such a way so as to reduce the noise level emitted during normal operation to a minimum. The noise value detected in the area where the operator is during the work cycle is lower than 70 dB (A).

3.5.2. Vibrations

In operating conditions in compliance with the indications provided by the Manufacturer in this manual, the 989 v2 does not emit vibrations.

3.6. Proper and improper use of the Machine

3.6.1. Proper use

The MACHINE is a **grease pump**, designed and constructed to feed an automatic lubrication system for systems or machinery in accordance with its technical specifications.

The use of the 989 v2 in a way other than what is indicated above is considered **improper use**. The 989 v2 was designed and built to operate in environments where **there is no potentially explosive atmosphere** and, in and of itself, cannot generate a potentially explosive atmosphere if used correctly.

3.6.2. Improper use

Use of the 989 v2 for operations other than those indicated above could cause damage to personnel or to the 989 v2 itself and they are therefore considered **improper uses** for which the MANUFACTURER will not be held liable. Any use of the 989 v2 with methods other than those indicated in *3.8.1 Proper use* is therefore to be considered improper and for this reason, the MANUFACTURER will not be held liable.

The user is responsible for any damage stemming from failure to observe the operating conditions agreed upon when establishing the technical specifications and during the order confirmation phase.

The 989 v2 must not be used in an **improper way**. Specifically:

- use of material other than those indicated in *Intended uses*;
- use of the machine for operations other than those indicated in *Intended uses;*
- washing the MACHINE with water;
- installing and using the machine outdoors or exposed to adverse weather conditions;
- installing and using the machine in an aggressive environment;
- installing and using the MACHINE in a potentially explosive atmosphere;
- loading the MACHINE without using the included loading nozzle and the relative filter;
- using the MACHINE with the fluids indicated in the following *Table 5*.

Table 4 – Prohibited fluids

PROHIBITED FLUIDS	
FLUIDS	***HAZARDS***
Lubricants with abrasive additives	*High wear of the contaminated parts*
Lubricants with silicon additives	*Seizing of the pump*
Petrol – solvents – flammable liquids	*Fire – explosion – damage to the gaskets*
Corrosive products	*Corrosion of the pump – damage to personnel*
Water	*Oxidation of the pump*
Food substances	*Contamination of the same*

***ATTENTION**: The manufacturer cannot be held liable for any fault caused by unreasonable, improper and/or incorrect use of the Machine.*

4. TRANSPORT AND INSTALLATION

4.1. Preparations at the customer's expense

Unless otherwise agreed upon, the following preparations remain the user's responsibility.

- **Electrical power supply**, with the suitable characteristics based on the type of motor installed (on this subject, see paragraph 2.1 and in particular, the electrical characteristics indicated specifically on the CE Tag of the individual pump unit).
- **Specific electrical disconnect switch** on the power supply line, dedicated only to the MACHINE or also relative to the machinery / system for which the MACHINE carries out lubrication, with the following characteristics:
  - isolates the electrical equipment from the power supply having only one open and closed position;
  - is lockable with suitable devices (for example a padlock) in open position 0 – OFF or fitted with a wall plug;
  - the disconnect device interrupts all the live wires on its power supply circuit.
- **Control system** for management of the motor (start / stop pump) and the signals coming from the level sensors located in the grease reservoir, fitted with a **simple arrest dedicated control**, which, once launched, determines a stop in Category 0 or in Category 1, in order to have the actuators of the MACHINE completely disconnected from the power supply in a reasonable time in any case
- **MACHINE grease reservoir filling system**, whether gun, pump or automatic.
- **Grease distribution system** downstream of the MACHINE (the selection and installation of which is the responsibility of the customer), including the piping and the connections, **suitable for managing the pressures** that develop in it due to the pumping of grease in it by the MACHINE, including the **detection / reading system of the relative pressure point**. **To determine the maximum operating pressure**, it is necessary to know the pressure drop of the pipeline connected to the pumping elements, depending on the length, temperature and type of lubricant.

Depending on these variables to achieve a proper supply to the delivery point, it is always necessary to ensure that the pipeline pressure loss plus the pressure required at the lubrication point does not exceed the maximum pressure supplied for pump delivery

- In the event of installation of **emergency stop control**, the logic chain that also includes the MACHINE must reach a reliability such to guarantee a minimum Performance Level equal to PL = c, in accordance with UNI EN ISO 13849-1: 2016
- Room with the following operational **environmental conditions**, necessary for correct operation of the MACHINE:
  - ambient temperature - 10°C ÷ + 50°C (+ 14°F ÷ + 122°F);
  - relative humidity 90%.
- In the installation room, **there must be no gases or corrosive or harmful acids**, damaging both to the operators and to the MACHINE itself.
- In the installation room, **there must be no potentially explosive areas** generated by bases or powders.
- In the room where the machine is installed, a **brightness** must be guaranteed no lower than 300 lux, taking care for the uniformity of the lighting and the absence of reflections.
- In the work room, **the following must not be present**:
  - strong oxidising agents (acids in general, oxidising mineral acids, amino compounds, magnesium, aluminium and zinc salts);
  - open flames;
  - sparks;
  - heat sources;
  - abrasive powders.

4.2. Transport, handling and installation

DANGER: ***the*** MANUFACTURER ***will not be held liable for any damage to objects and/or personnel stemming from improper operations carried out by unqualified, untrained or unauthorised personnel.***

DANGER: ***the*** MANUFACTURER ***will not be held liable for any damage to objects and/or personnel stemming from improper operations carried out by unqualified, untrained or unauthorised personnel.***

To carry out the task in question, the following Personal Protection Equipment is required:

4.2.1. Installation of the pump

To complete the task in question, carry out the following simple steps.

- Position the pump and secure it to its support (on the wall or floor) by using the appropriate Ø9mm eyelets, (0.354 in) with 4 suitable screws. The pump has limited dimensions and a weight of 15 kg or 18 kg, depending on whether it is fitted respectively with a 5 kg or 10 kg grease reservoir, to which the weight of the grease with a full reservoir must be summed.
- Assemble the pump in such a way that the grease nipple for filling the reservoir is easily accessible.
- Leave at least 100mm (3.94 in) perimeter distance from other equipment or obstacles that prevent access to the pump.
- In the event of wall-mounted installation, mount the pump at “operator height” (about 1200 mm from the floor surface) to avoid abnormal posture or the possibility of impact.
- Ensure that the pipes and wires have been properly fastened and protected from any possible impact.
- Verify that the grease used is fit for operating temperatures, especially at temperatures below 0° C. If in doubt, contact our Technical Office for the correct choice of lubricant.

4.2.2. Hydraulic connections

The plumbing connection point to install the pump to the system is located on the pumping body with G1/4” thread for "Progressive" pumping elements and G1/8" for "Multi-line" pumping elements. The possibility of having the return in pump with G1/8” thread is provided.

***ATTENTION**:* *the pipeline must reach the point of lubrication along the shortest route possible.*

4.2.3. Electrical connection

The electrical connection is the responsibility of the user who must provide unequivocal identification of the power supply connection and output signals.

Connect the machine to the electrical line as indicated in this manual.

The unmounted connectors and the power and signals cables must have suitable thickness with regard to the absorption of the machine and type in accordance with regulations in force. They can be ordered separately (see Paragraph 7.1).

The pump must be installed in an industrial environment in compliance with prevailing law.

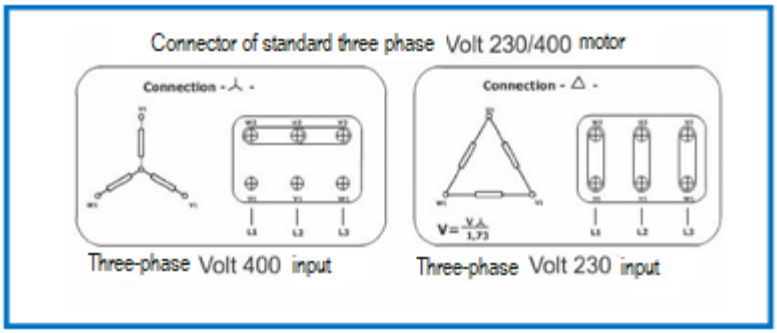
In order to prevent dangers of electrocution due to direct or indirect contact with the live parts, the electrical power supply line must be adequately protected with a specific breaker switch with 0.03 Ampere tripping threshold and max tripping time of 1 second.

DANGER:	***check the correspondence between the electrical power supply of the pump and that of the machine / electrical power supply system (by means of the electrical specifications declared on the CE Tag applied on the side of the pump reservoir).***

DANGER:	***a disconnect switch must be installed on the machine that hosts the pump.***

DANGER:	***the switch's disconnect power must be ≤ 10 kA and the rated current In = 6 A.***

Figure 3 – Connection diagram



DANGER:	***all the electrical components must be connected to the ground. This is valid both for the electrical components and for controller devices. For this purpose, ensure that the ground wire is connected directly. For safety reasons, the ground cable must be about 100 mm longer than the phase wires. In the event of accidental disconnection of the cable, the ground terminal must be the last to disconnect.***

5. START-UP, ADJUSTMENT AND OPERATION

Once the operations described in chapter *4 – Transport and installation* have been carried out, you can proceed with start-up and operation of the 989 V2.

DANGER: ***only correctly trained personnel informed on the risks present may operate near the MACHINE and only after having read this operation and maintenance manual in its entirety. The MANUFACTURER will not be held liable for any damage to objects and/or personnel stemming from improper operations carried out by unqualified, untrained or unauthorised personnel.***

5.1 Checks to carry out during the first start-up of the pump

- Ensure the presence of a specific **electrical disconnect switch** on the power supply line, dedicated only to the MACHINE or also relative to the machinery / system for which the MACHINE carries out lubrication.
- Check to ensure that the **electrical connections** have been carried out correctly and solidly.
- Ensure that the grease distribution system downstream of the MACHINE (the installation of which is the customer's responsibility), and in particular the piping and connections, are **correctly and solidly installed, without any type of leaks**.
- Ensure correct operation of the **simple arrest control**.
- Check the operation of the **pressure detection / reading system** relative to the grease distribution system downstream of the MACHINE.
- Using a gun or manual pump, carry out the **first filling of the reservoir**, in accordance with the description in the following paragraph.
- Check the necessity to **integrate or diversify** the PPE depending on the explicit requirements of the MSDS relative to the grease being used.
- The unit may be put into operation only by **specialised personnel**.
- Using the pump submerged in fluids or in a particularly aggressive or explosive/flammable environment **is prohibited** unless it has been prepared ahead of time by the supplier for this purpose.
- **DO NOT use lubricants that are aggressive** to NBR gaskets. If you are unsure, contact the DropsA S.p.A technical office for a detailed list of recommended lubricants.
- Check the **integrity** of the pump.
- Ensure that the pump operates at **operating temperature** and that the pipelines are free of any **air bubbles**.

5.2 Reservoir filling

***ATTENTION**: in order to prevent any malfunctions and voiding of the warranty, we recommend topping up the grease without impurities exclusively from the dedicated loading system.*

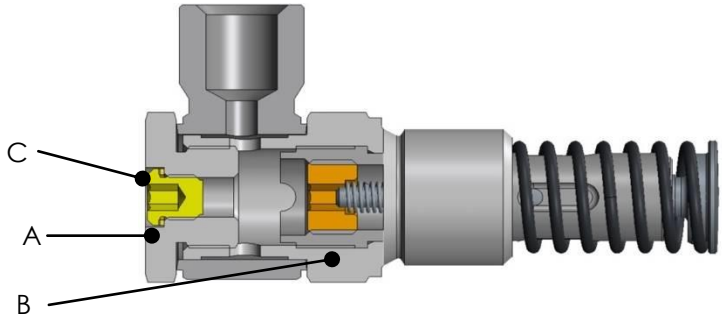
Filling the reservoir is carried out by means of the dedicated device complete with filter.

5.3 Adjustable pumping element setting

In order to set the progressive pumping element with an adjustable flow, proceed as follows.

- Make sure that there is no residual pressure in the delivery pipeline.
- Remove the cap “A” by using a size 4 mm Allen wrench.
- Using a 4 mm Allen wrench inserted into grub screw “B”, rotate the jacket of the pumping element. Each full rotation of the wrench corresponds to approx. 0.05 cc / cycle.
- Check for the presence and compliance (replace if necessary) of the gasket “C”.
- Remove the cap “A” by using a size 4 mm Allen wrench.

Figure 4 – Adjustable pumping element



5.4 Calibration of the laser Level probe 0295131, 24Vdc Out NO and NC (1 threshold)

To calibrate the laser Level probe 0295131, 24Vdc Out NO and NC (1 threshold) proceed as follows.

To obtain a correct setting, take the setting ring nut to the maximum value and then descend to the desired value.

A label is positioned on the pump with the electrical connection diagram and the settable threshold values. The pump is normally supplied with the sensor pre-set at the threshold “L” (minimum level).

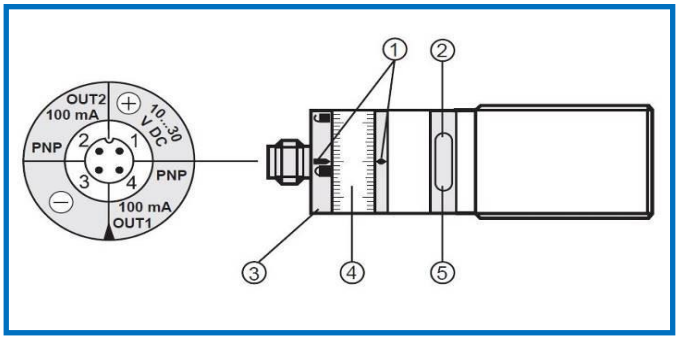
Whereas the other thresholds:

- MM (absolute maximum level);
- M (maximum level);
- LL (absolute minimum level);

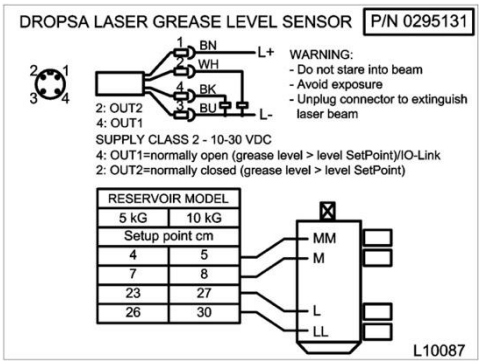
can be set by the user.

***ATTENTION**:* *only one threshold at a time can be set.*

Figure 5 – Adjustable pumping element



1	Reference notch
2	Yellow LED: lights when the set value is reached (outlet=ON)
3	Locking ring nut
4	Setting ring nut (manually adjustable after unlocking)
5	Green LED: indicates the correct power supply (24Vdc)



5.5 Operation of the 989 v2

The MACHINE is supplied only with an electric motor and relative connection terminal strip. The connection and management (timed, manual or based on a level reading) of the electric activation is delegated to the customer.

No adjustments are required. The pump is electrically powered by a system that controls activation and manages the minimum level contact and the revolution counter. There is also an extra cycle button that provides external cycle request enabling.

For the operation of the lubrication system, refer to the machine's management and control instructions where the pump is installed.

To carry out the task in question, the following Personal Protection Equipment is required:

5.5.1 Start-up

To start the 989 v2, you must:

- insert the wall plug or position the electrical **disconnect switch** on the MACHINE's power supply line to **I – ON**;
- Check the setting data indicated on the control panel (if present).
- Press the start button on the machine where the pump is connected.
- Ensure that the pump starts.
- Ensure the adequate lubrication of the machine (if there are doubts on correct operation, you can contact the DropsA S.p.A. Technical Office and ask for the testing procedure).

5.5.2 Arrest

To stop the 989 v2, you must:

- position the electrical **disconnect switch** on the machine's power supply line to **O – OFF** or remove the wall plug.

This way, the 989 v2 is **disconnected from any power supply**.

6. Maintenance and demolition

Before carrying out any maintenance or cleaning operation described below, you must always disconnect THE 989 V2 from the relative power supplies, carrying out all the operations indicated below.

- Position the electrical **disconnect switch** on the machine's power supply line to **O – OFF** or remove the wall plug.
- Place a sign on the machine reading "MACHINE IN MAINTENANCE".
- **Always ensure the absence of pressure** IN THE GREASE DISTRIBUTION SYSTEM DOWNSTREAM OF THE MACHINE.

	***DANGER:***	***the MANUFACTURER will not be held liable for any damage to objects and/or personnel stemming from improper operations carried out by unqualified, untrained, inadequately equipped or unauthorised personnel.***

In any case, to carry out all maintenance or cleaning operations indicated below in correspondence to the 989 v2 , the following Personal Protection Equipment is required:

6.1 Problems and solutions

Below is a troubleshooting table where the main faults, probable causes and possible solutions to be carried out immediately are indicated (contact DropsA).

In the event of doubts and/or irresolvable problems, do not search for the fault disassembling parts of the pump, but rather contact the DropsA Technical Office.

Table 5 – Troubleshooting

PROBLEM	CAUSE	REMEDIAL ACTION TO BE TAKEN
The pump motor does not work.	No current present.	Check the power supply.
	The motor does not work.	Replace the motor. This operation may be carried out only by DropsA S.p.A. engineers.
The pump works but grease does not arrive at the lubrication points.	Lines disconnected.	Check the condition of the lines and the relative connections to the fittings. Replace worn lines.
	Blocked distributor	Clean or replace distributor.
The grease is distributed to the lubrication points in irregular doses.	The distributor is not properly connected to the lubrication points.	Check the dosages with the system diagram.
The pump begins the greasing phase but ends it immediately	Defective motor or high output absorption.	Allow to cool for a few minutes and try again. If the problem persists, replace the motor. This operation may be carried out only by DropsA S.p.A. engineers.
The pump does not dispense grease.	The reservoir is empty.	Fill the reservoir with clean grease.
	Air bubbles in the grease.	Disconnect the piping from the pumping element. Activate the pump according to the manual operating cycle until grease comes out of the pumping element without any air bubbles. For the cartridge versions, you can manually press the cartridge itself in order to favour priming of the pumping element.
	Use of unsuitable grease.	Empty the reservoir and refill it with a suitable grease again.
	The piston of the pumping element is worn out.	Replace the pumping element (see Paragraph 6.3.1).
	The delivery valve of the pumping element is blocked.	Replace the pumping element (see Paragraph 6.3.1).

6.2 Scheduled maintenance

The following table lists the periodic inspections, the frequency and the intervention that the maintenance will have to carry out in order to ensure the efficiency of the system over time.

Table 6 – Scheduled maintenance times

CHECK	FREQUENCY INTERVAL	INTERVENTION
Cleaning	Daily	Carefully remove any residues and powders and any foreign objects.
Check pressure	Daily	Check the operation of the pressure detection / reading system relative to the grease distribution system downstream of the machine.
Check fastening	Monthly	Check the correct fastening of the machine in its place of installation monthly, whether wall or floor mounted.
Check fixed guards	Monthly	Check the integrity of the MACHINE's fixed guards and their fastening monthly, particularly concerning the upper cover of the reservoir.
Attachment of the lines	After the first 500 hours of operation Every 1500 hours of operation	Check the joint fittings. Check the fastening to the parts of the machine.
Reservoir level	As required	Restore the grease level in the reservoir.
Filling filter	As required	Check and possibly replace.

6.3 Special maintenance operations

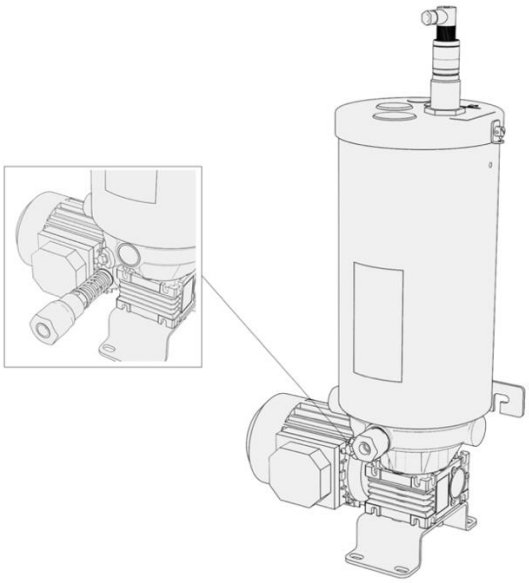
The special maintenance operations assigned to the user are indicated below, to be carried out as necessary.

6.3.1 Replacement of the pumping element

In the event of low pressure in the grease distribution circuit downstream of the machine or a lack of or partial lubrication, the pumping element on the relative lubrication line must be replaced. Therefore, operate as follows.

1. **Empty the reservoir** in order to avoid lubricant spills
2. Position the electrical **disconnect switch** on the machine's power supply line to **O – OFF** or remove the wall plug.
3. **Always ensure the absence of pressure** in the grease distribution system downstream of the MACHINE.
4. **Disconnect the piping** for grease distribution from the pumping element being replaced.
5. **Unscrew and remove** the pumping element being replaced, using an appropriate wrench.
6. Position the **new pumping element**.
7. **Tighten the pumping element** with a suitable torque wrench to a tightening torque of **70 Nm**.
8. **Reconnect the piping** and tighten it correctly and solidly.

Figure 6 – Replacement of the pumping element

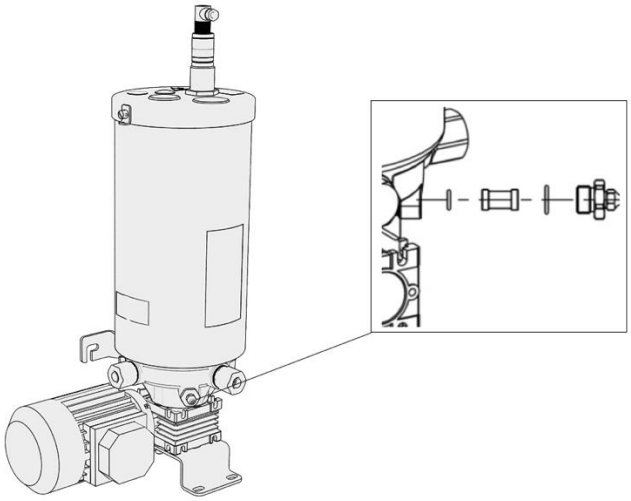


6.3.2 Replacement of the filter

In case of difficulty filling the reservoir, replace the filling nozzle filter. Therefore, operate as follows.

1. Position the electrical **disconnect switch** on the machine's power supply line to **O – OFF** or remove the wall plug.
2. **Always ensure the absence of pressure** in the grease distribution system downstream of the MACHINE.
3. **Unscrew and remove** the filling nozzle.
4. **Remove the clogged filter with pliers**.
5. Position the **new filter**.
6. **Position and tighten** the filling nozzle.

Figure 7



6.4 Demolition

When the 989 v2 has completed its life cycle, before proceeding with the final dismantling, a series of operations must be carried out aimed at minimising the environmental Impact connected with the disposal of the components of the 989 v2 itself, as required by the prevailing regulations on waste disposal. These operations are:

1. Separate and store the parts with environmental Impact, in other words:
   a. separate the various parts that could cause pollution;
   b. carry out a selection of the materials in order to favour recycling, allocating them to sorted disposal (in particular, select the plastic or rubber elements).
   c. Dispose of the carcasses, in other words, once the polluting elements have been removed and stored, use a specialised structure for disposal of the carcasses.

***ATTENTION**:* *upon demolition of the MACHINE, **render useless** the identification tag of the MACHINE itself and the relative technical documentation. The user has the option of returning these elements to the MANUFACTURER's Technical Office which will destroy them. Simply storing the aforementioned elements in an inaccessible location is prohibited. At the end of the operations, **notify** the MANUFACTURER's Technical Office of the completed dismantling of the MACHINE.*

7. ORDER INFORMATION AND DIMENSIONS

7.1 Order information

In *Table 7* the description can be found of how each 989 v2 Pump is encoded through the generation of the complete Part Number, indicated on the CE Tag of each individual unit, to be specified if ordering optional equipment or replacement parts.

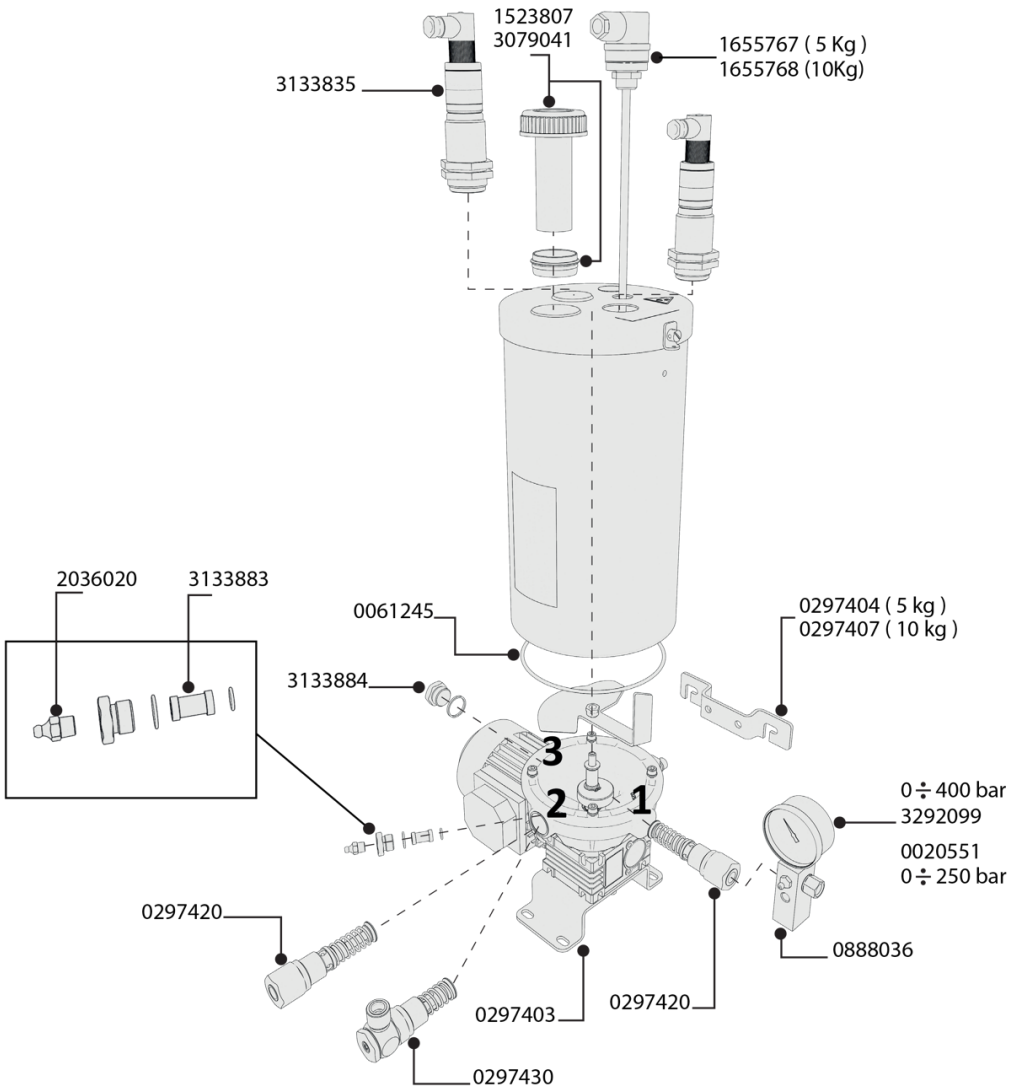
Table 7

			Base data	4°	5°/6°	7°	8°	9°	10°	11°
PUMP 989 v2			**989 v2**	**0**	**00**	**0**	**0**	**0**	**0**	**0**
	Description	**DROPSA Code**	**CODE**							
Reservoir	Without reservoir	-	0							
	5kg	0297402	1							
	10kg	0297408	2							
Three-phase electric motor	Motor not present	-	00							
	STANDARD 3PH-230/400V 50Hz 280/480V 60Hz	3301000	01							
	3PH-440V-60Hz	3301000-440V-60HZ	02							
	3PH-460V-60Hz	3301000-460V-60HZ	03							
	3PH-230/400V 50Hz 280/480V 60Hz UL-CSA	3301730	05							
Pumping elements	Without pumping elements	0297418 (x3)	0							
	One fixed flow rate pumping element	0297420+0297418 (x2)	1							
	Two fixed flow rate pumping elements	0297420 (x2)+0297418	2							
	Three fixed flow rate pumping elements	0297420	3							
	One adjustable flow rate pumping element	0297430+0297418 (x2)	4							
	Two adjustable flow rate pumping elements	0297430 (x2)+0297418	5							
	Three adjustable flow rate pumping elements	0297430	6							
Minimum level	STANDARD GREASE VERSION with laser sensor 0295131, 24Vdc Out NO and NC (1 threshold)	3133885	0							
	Capacitive level (5kg) grease NLGI00/NLGI000	0297409	1							
	Capacitive level (10kg) grease NLGI00/NLGI000	0297425	2							
	Float level (5kg) oil	1655767-3079041 - 1523807	3							
	Float level (10kg) oil	1655768-3079041 - 1523807								
Maximum level	the standard pump is supplied without the max level	-	0							
	Laser 24V cc Out NO and NC (1 threshold)	3133885	1							

The following

Figure 8 contains the codes for ordering optional equipment or replacement parts.

Figure 8 – Spare parts and optional equipment codes



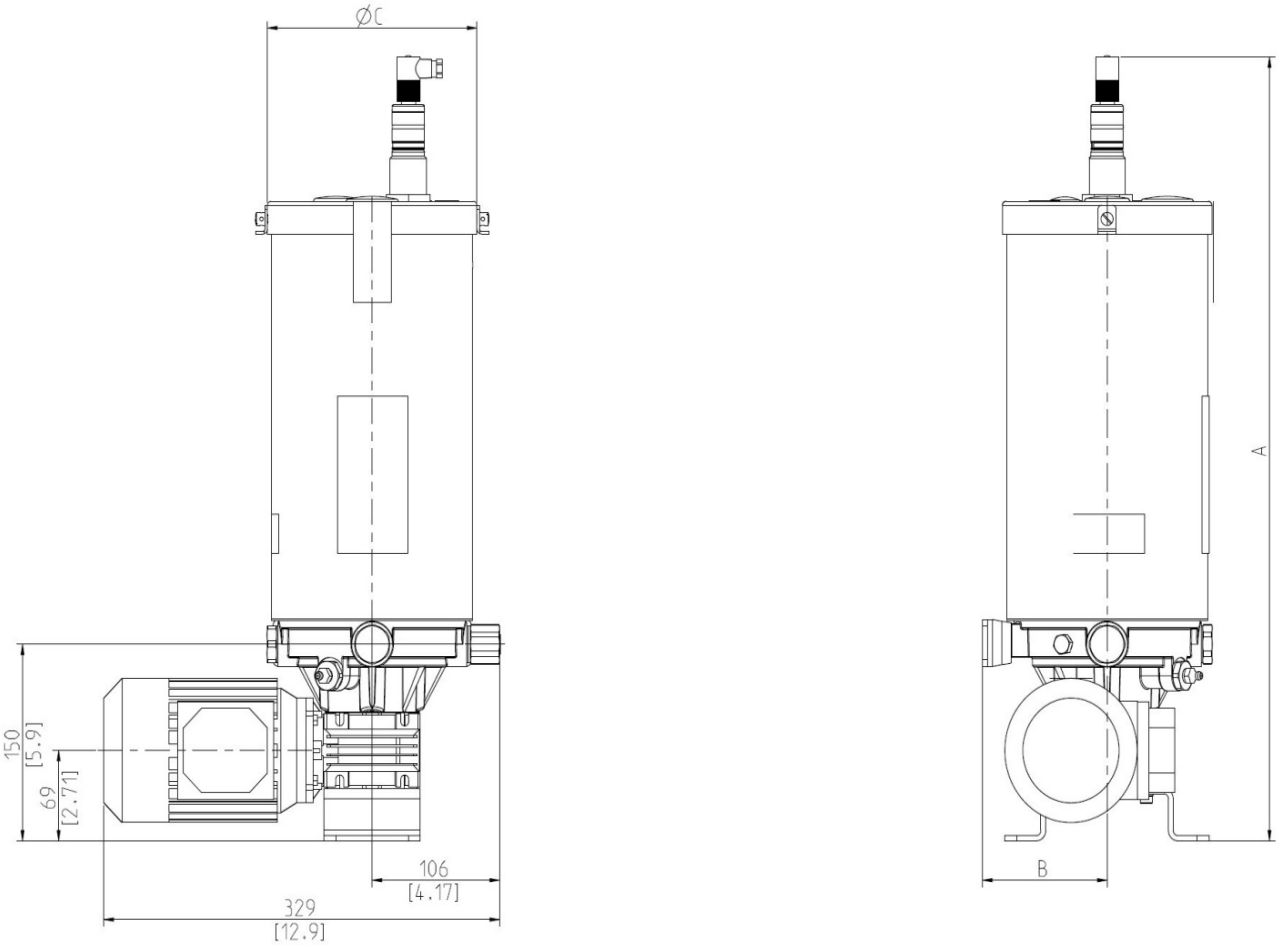
OPTIONAL KITS and ACCESSORIES		SPARE PARTS	
CODE	**DESCRIPTION**	**CODE**	**DESCRIPTION**
0297420C	Fixed flow rate pumping element 17 cc/min	2036020	Grease nipple
0297430C	Adjustable flow rate pumping element 3~17 cc/min	3133883	Filter and gaskets kit
3133885	Laser Kit 24V cc Out NO and NC (1 threshold)	3133884	Gasket cap kit.
3133886	Pallet kit	0061245	Reservoir gasket
*0888036	External By-Pass 0~250 bar	0297403	Bracket
**0299450	External By-Pass 0~250 bar	0297404	Wall-mount bracket 5 kg
0086450	Hydraulic inverter 60~300 bar	0297407	Wall-mount bracket 10 kg
0020551	Pressure gauge 0~250 bar	0297409	Capacitive minimum level kit 5kg
3292099	Pressure gauge 0~400 bar	0297425	Capacitive minimum level kit 10 kg

* Available for outlet 2-3 with fixed pumping elements

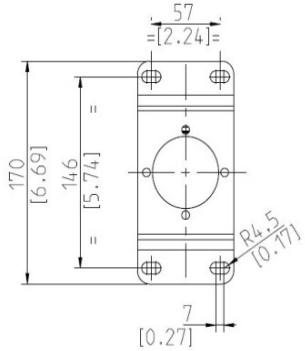
** To be secured on the pallet (3 inlets)

7.2 Dimensions

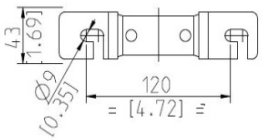
Figure 9 – Dimensions in mm [in]



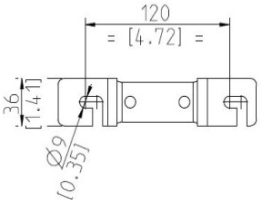
Floor mount base plate



Wall mount base plate 10 kG



Wall mount base plate 5 kG



	5 kg	10 kg
A – mm [in]	596 [23.4]	648 [25.5]
B – mm [in]	103.5 [4]	122.5 [4.8]
C – mm [in]	175 [6.88]	230 [9]

DropsA

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