



DGTEC

Model CD









DECLARATION OF CONFORMITY

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Address:	Via T. Crotti, 1 - 42018 - San Martino in Rio (RE)

Hereby declares that the products named:

• DGTEC

Responds to the principal features of the following European Directives:

- **2014/30/CE of 26/02/2014 - Harmonization of the laws of the Member States relating to electromagnetic compatibility – EMC Directive**
- **2014/35/CE of 26/02/2014 - Harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits – Low Voltage Directive**
- **2011/65/UE of 08/06/2011 with subsequent update 2015/863 of 31/03/2015 – ROHS III Directives**
- **2012/19/UE of 04/07/2012 - WEEE Directives for electrical and electronic waste**

This declaration is issued under the responsibility of Aqua S.p.A.

San Martino in Rio (RE) - 08 settembre 2020

Davide Vezzani
Certification Manager - Aqua S.p.A.



AQUA S.p.A.
 Società a partecipazione di persone a capitali detenuti di Eterna Cooperative S.p.A. - Cap. Soc. € 10.000.000.000 - Sede e Direzione Generale
 S. Martino in Rio - 42018 - Reggio Emilia - Italia - Sede Legale: Via Crotti, 1 - Sede operativa: Via Benito M. 3 - Dist. Piac. e PAV. 011220140200 - Pagine Imprese di RE 0202040200
 Tel. +39.0522.594506 - Fax +39.0522.648100 - www.aqua.it - info@acqua.it



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1.0 INTRODUCTION

The range of “**DGTEC**” programmable digital peristaltic pumps is designed to manage dishwashers and consists of the following models:

- *ST Model: single solenoid valve programmable digital pump*
- *2ST Model: double solenoid valve programmable digital pump*
- *CD Model: adjustable digital pump with conductivity reading*

The CD model is designed to dose liquid or solid detergents according to the conductivity measured in the dishwasher tank, thus enabling simple and precise adjustment.

1.1 WARNINGS



Before starting assembly, carefully read these instructions and follow them during installation.



If the instructions reported in this manual are not followed or carried out correctly, this may result in personal injury or damage the device and/or systems.

We recommend reading the label reported on the pump and following the directions below:

- ✓ ***The pressure of the injection point must be lower or equal to the pump's rated value!***
- ✓ ***When you receive the product, check the integrity of the pump and all of its parts. Should there be any anomalies, promptly notify qualified personnel before performing any operations.***
- ✓ ***Keep this manual carefully for future reference.***
- ✓ ***Before installing the pump make sure that the details provided on the adhesive plate attached to the pump correspond to those of the electrical system.***
- ✓ ***Do not handle the equipment with wet hands or feet!***
- ✓ ***Do not leave the equipment exposed to the elements!***
- ✓ ***Make sure the peristaltic tube is compatible with the liquid to be dosed!***
- ✓ ***The equipment must be handled by qualified personnel!***
- ✓ ***If any irregularities are experienced during pump operation, cut off the power supply and contact one of our customer care centres for any repairs!***
- ✓ ***In order for the pump to operate correctly it is necessary to use original spare parts or accessories. The manufacturer is relieved of any responsibility in the case of any breakdowns due to tampering or use of non-conforming parts and accessories***
- ✓ ***The electrical system must comply with regulations in force in the country where the system is installed.***
- ✓ ***The operating ambient temperature must not exceed 40°C with a relative humidity of 90% at 90°C.***

1.2 NORMATIVE REFERENCES

Our pumps are manufactured according to General Standards in force and in compliance with the following European Directives:

n° 2014/30/CE “ E.M.C.

n° 2014/35/CE “DBT Low Voltage Directive”

n° 2011/65/UE , 2012/19/UE “direttive RoHs e WEEE”

1.3 TECHNICAL FEATURES

1.3.1 ELECTRICAL FEATURES



For the power supply value we recommend reading the label on the pump!

1.3.2 PERFORMANCE

- Maximum height of the suction tube: 1.5 m
- Flow rate and back-pressure: refer to Table 1, read the label on the pump to identify the corresponding model.

Codes	Power supply	Motor Type	Flow rate (l/h)	Backpressure (bar)	Peristaltic Tube	PT100
ADD400601C000000 (not available)	24 VAC/VDC	24 VDC	6	1	Santoprene	X
ADD4006010000000	230 VAC	24 VDC	6	1	Santoprene	X
ADD401000C000000 (not available)	24 VAC/VDC	24 VDC	10	0	Santoprene	X
ADD4010000000000	230 VAC	24 VDC	10	1	Santoprene	X

Tab. 1

The pump codes that may be ordered are found in the table. The manual also proposes pumps with unavailable characteristics in the 4 models in the table (conductivity probe with PT100 sensor to read the temperature and 24 VDC output to activate the solenoid valve to dose solid detergent).

- Operating ambient temperature: 0 ÷ 45°C
- Transport and Packaging Temperature: -10 ÷ 50°C
- Protection rating: IP65

2.0 INSTALLATION

2.1 GENERAL RULES

Pump installation must be carried out as follows:

- In vertical position with an uncertainty not greater than +/-15°.
- Away from sources of heat in dry locations, at a maximum temperature of 40°C and a minimum of 0°C.
- In a ventilated environment and easily accessible to an operator for periodic maintenance.
- Above the level of the liquid that needs to be dosed, at a height of 1.5 metres maximum.
- Do not install the pump above the tank when using liquids that emit fumes, unless it is sealed shut.

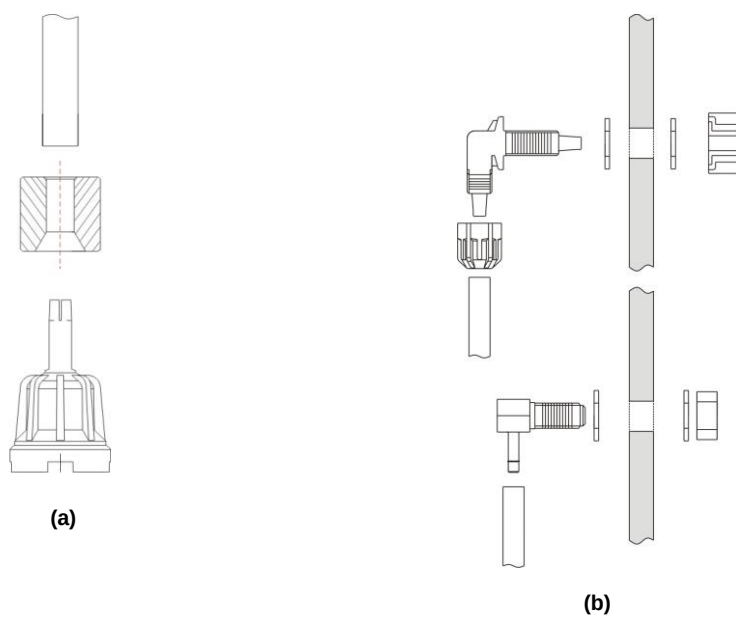
2.2 INSTALLATION KIT

When you purchase the pump, it includes everything required for correct installation, specifically:

- Bracket;
- Dowels and screws;
- Level probe (**optional**);
- Foot strainer (see **Fig. 1- a**);
- PVC suction and delivery tubes (4 m.);
- Conductivity Probe and Electrodes;
- Tank inlet fitting (see **Fig. 1- b**);

Fig. 1

Foot strainer Tank inlet fitting



The full kit supplied is reported in Figure 2.



Fig. 2- Installation kit

2.3 ASSEMBLY



We always recommend wearing protective masks, gloves, goggles and any other PPE during all installation steps and when handling chemical products.

WALL MOUNTING

Proceed as follows to secure the pump to the wall:

- Fix the bracket to the wall using the plugs and screws supplied.
- Place the pump on the bracket.
- Ensure the fixing is stable.



It is also recommended to install the pump in a dry environment, away from heat sources and exhaust vapour.

2.3.1 CONDUCTIVITY PROBE CONNECTION

The provided conductivity probe is a 2-wire conductivity meter type. Upon request, it is possible to receive a 4-wire temperature-compensated probe. The codes set out in Tab. 1 do not consider this option.



Fig. 3 Conductivity Probe

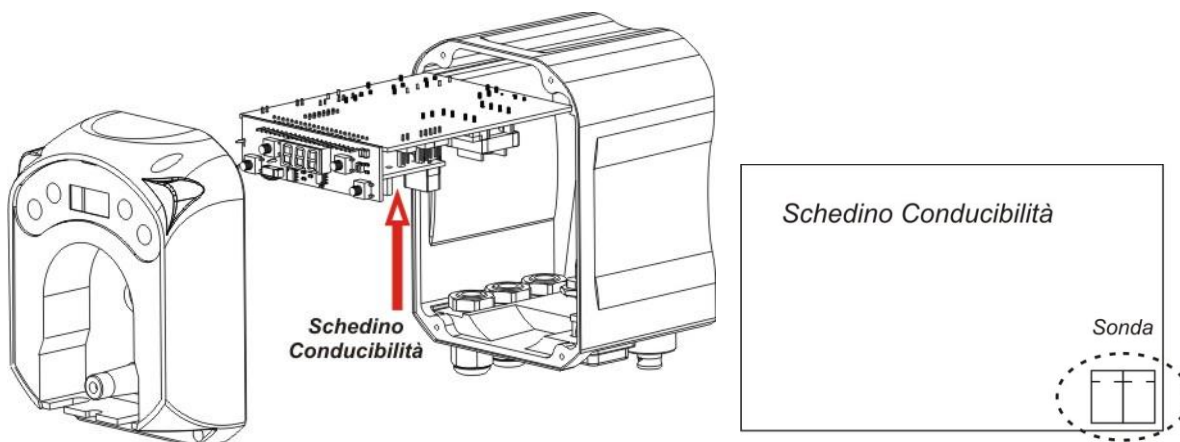


Fig. 4 - Conductivity card

To carry out correct installation of the conductivity probe onto the dishwasher, verify the points detailed hereunder:

- install the probe in the washing tank;
- the probe electrodes must be at least 4 centimetres below the maximum filling level;
- install the probe close to the washing pump filter;
- **Do not install** the probe close to edges, electrical resistance, detergent input and at the bottom of the tank.



Should the dishwasher not be predisposed to assemble the conductivity probe, make a 23 mm hole in the washing tank wall.

Connecting the conductivity meter probe

1. Probe
2. Electrodes
3. Maximum level of water
4. Tank wall
5. Rubber gasket
6. Nut
7. Washing pump filter

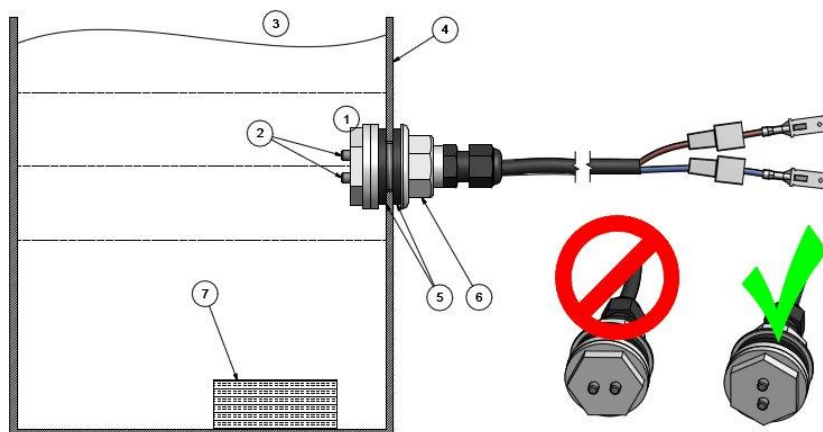


Fig. 5- Conductivity meter probe connection

2.4 ELECTRICAL CONNECTIONS



Before performing any intervention on the pump, disconnect the power supply voltage of the machine!

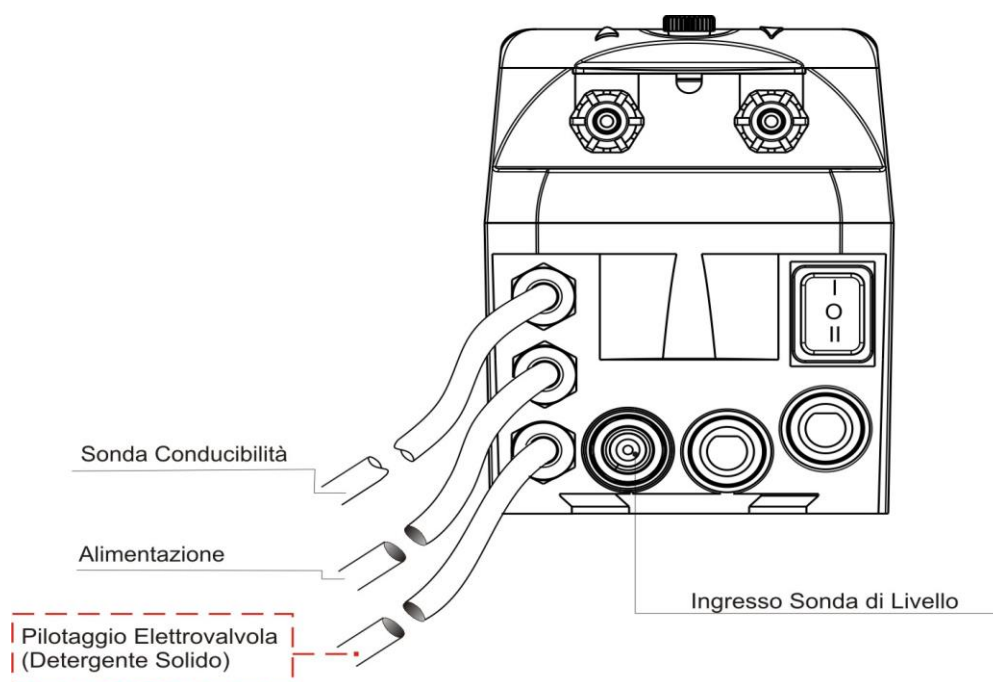


Fig. 6- View from below

Connect the pump cable to a voltage that is compatible with the one on the label.

For the connections refer to Fig. 6.

2.5 HYDRAULIC CONNECTIONS

The CD model enables the dosage of liquid detergent by means of the peristaltic pump, or the dosage of solid detergent by piloting the solenoid valve, which, by regulating the water flow into the dispenser containing the detergent, whether it is granular or in tabs, enables it to dissolve and enter the tank.

2.5.1 INSTALLATION FOR DOSING LIQUID DETERGENT

- Make sure the suction tube is placed in the product container and then connected to the pump intake fitting (marked with the ▲ symbol on the cover) and tightened with the correct ring nut.
- Make sure the delivery tube is inserted in the pump delivery fitting (marked with the ▼ symbol on the cover) and tightened with the correct ring nut. It must then be connected to the infeed fitting of the tank.

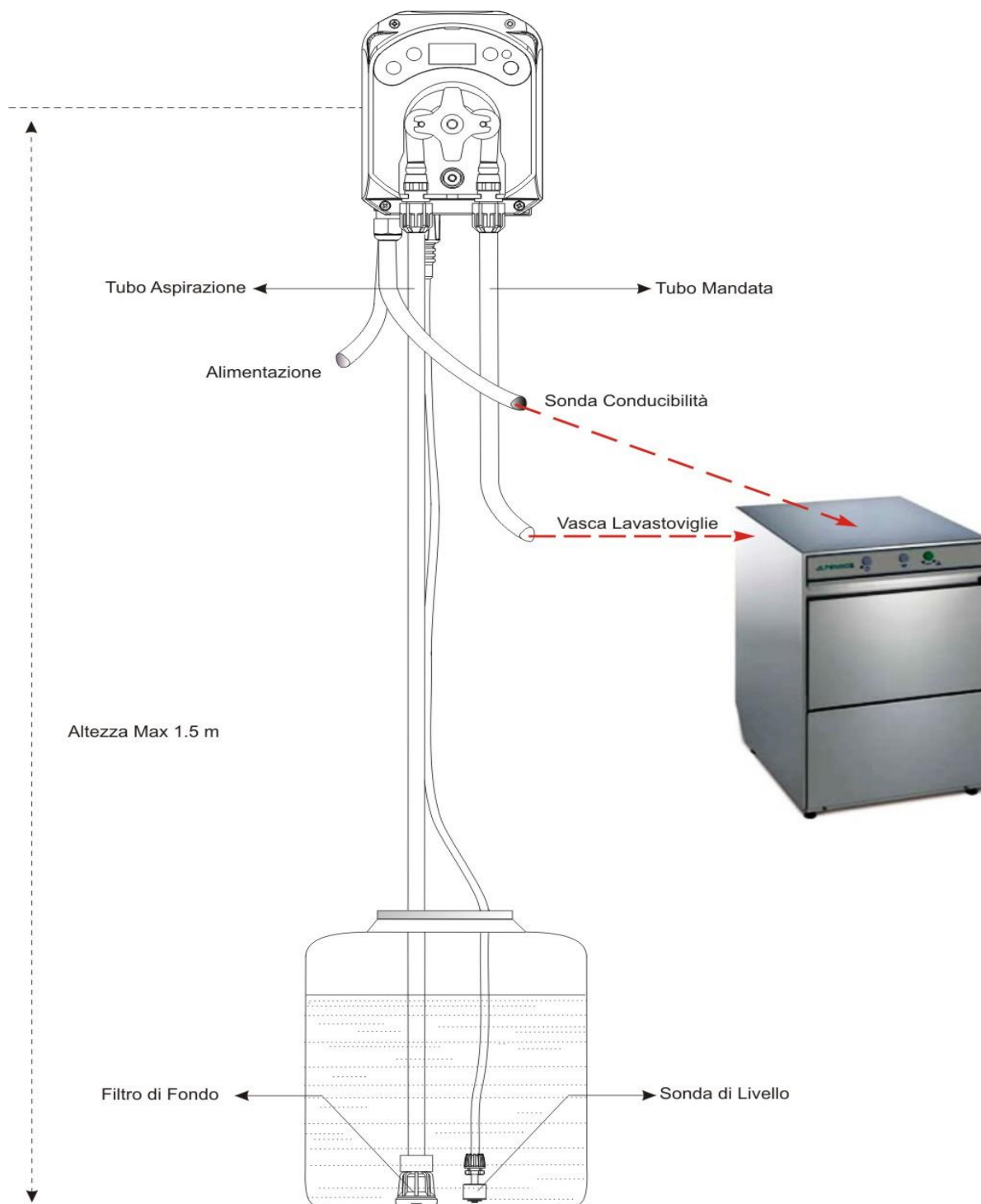


Fig. 7 Installation for dosing liquid detergent

2.5.2 INSTALLATION FOR DOSING SOLID DETERGENT

To dose solid detergent, it will be necessary to connect the solenoid valve to the pump output (see Fig. 6). The device will pilot the opening and closing of the solenoid valve to regulate water flow.

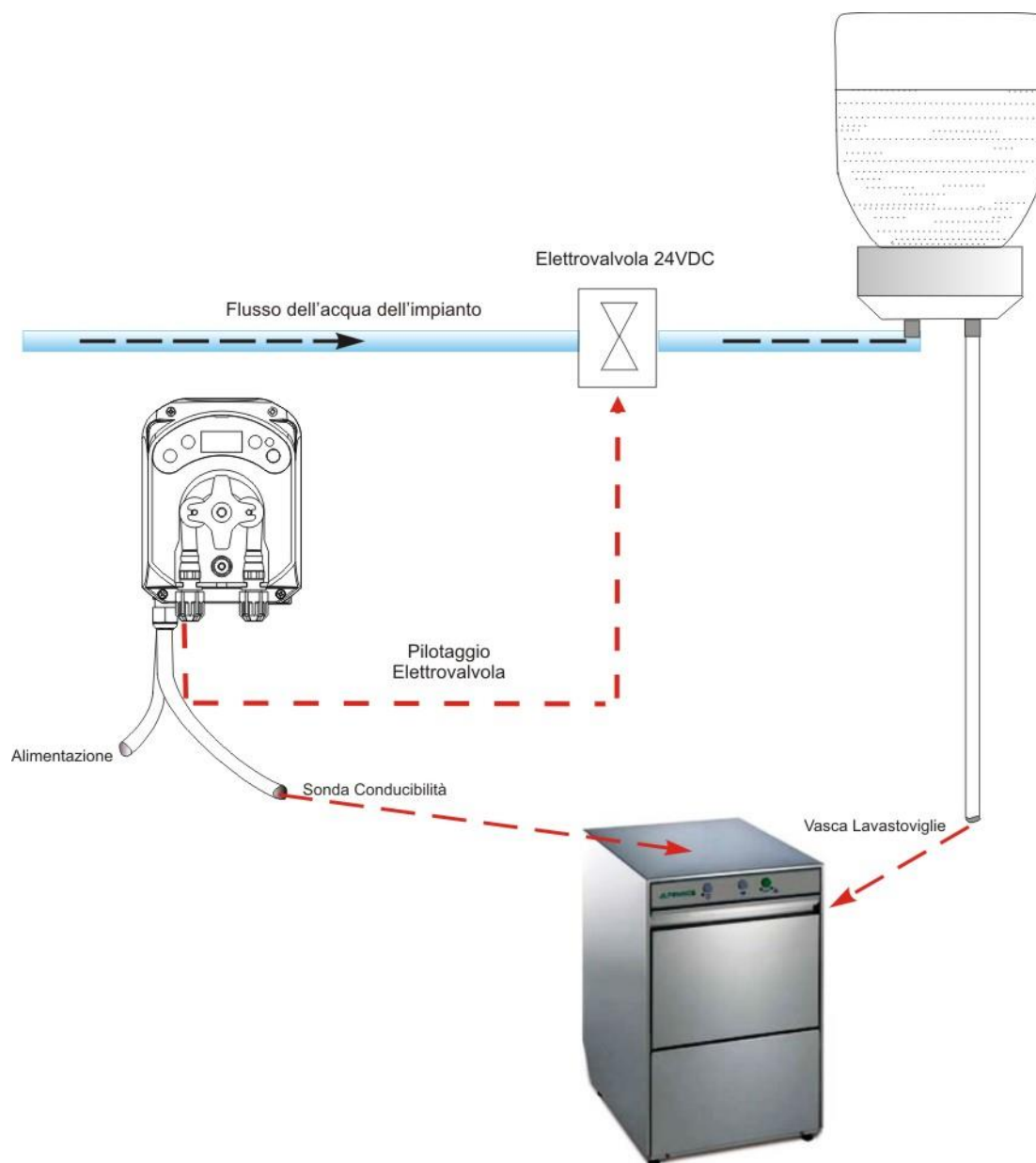


Fig. 8 *Installation for dosing solid detergent*

3.0 PROGRAMMING

3.1 MAIN FEATURES

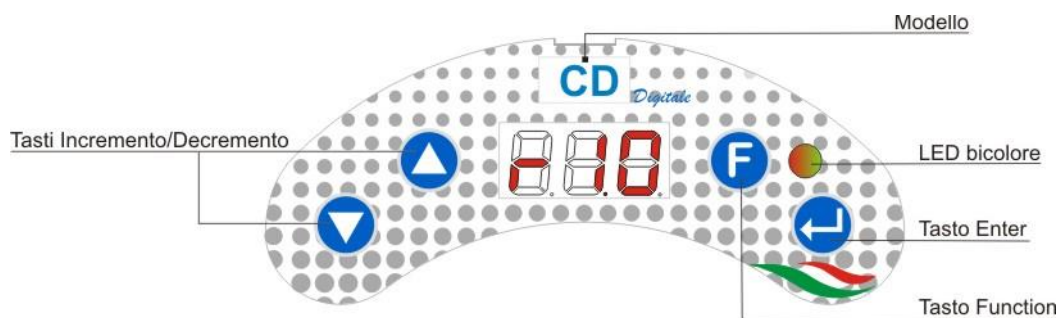


FIG. 9 - USER INTERFACE



The Increase/Decrease keys allow to change the numerical values and scroll through the lists of options for all the available menu entries.



The Enter key allows to access and exit from the various entries of the submenus. Pressing the key for 3 seconds allows, from the Initial Menu, to access the Programming Menu and to go back to the Menu one level up from the main entries on a Menu;



The Function key allows to browse through the Menu's entries. By pressing the key for 3 seconds from the initial page, you can access the User Menu;

TWO-COLOURED LED

The two-coloured LED displays the following conditions:

- **Steady green:** the pump is active;
- **Flashing green:** the pump is dosing;
- **Steady red:** the pump is off;
- **Flashing red:** there is an alarm;
- **Steady orange:** if you are browsing the Programming Menu;
- **Flashing orange:** Pump priming in progress;



The switch has three positions:

— : the pump is active (ON)

O : the pump is off (OFF)

≡ : the pump is priming (MOM)

The MOM position is monostable, therefore after setting the switch to MOM, when it is released the switch automatically goes back to OFF.

The pump doses for 60 seconds at the maximum speed; if the MOM key is pressed again before the 60 seconds elapse, the priming is interrupted.

OPERATION

The CD model pump doses detergent according to the value of conductivity measured and the set-point value set. Conductivity reading is carried out through the supplied electrode probe.

The flow rate of the pump depends on the difference between the programmed set-point and conductivity read.

The read conductivity value and set-point are expressed in conductivity units 0-100 (0 unit corresponds to the air probe).

The set-point is the conductivity value that is obtained by pouring the g/l of detergent into the dishwasher tank that is necessary for optimal washing (See 3.3.2 Set-point Set-up).

DOSING LIQUID DETERGENT (PERISTALTIC)

The speed with which the pump doses is the function of the difference between the measured conductivity and the set-point value set, therefore, they will have the following flow rate values:

- The Nominal Flow Rate is the flow rate indicated on the pump label, while the Effective Flow Rate value is obtained by means of pump calibration, which enables the correction of variations on the nominal flow rate due to multiple factors (wear of the peristaltic tube, etc).

 ***If, from calculations on the Flow Rate Percentage value, a value greater than 100% of the pump Flow Rate is obtained, you must consider that maximum value as equivalent to 100% of the effective flow rate (or nominal, if pump calibration has never been executed).***

If the peristaltic pump is not used and the 24V solenoid valve is piloted to pass water into the solid detergent dispenser, dosing regulation will occur at the time of opening and closing of the solenoid valve: timing is calculated according to the conductivity distance measure by the set-point value set and the values set for the ON time (**Ton**) and the OFF time (**Toff**).

- Read conductivity: 1%-65% of Set-point → **E.v. ON** = Ton; **E.v. OFF** = Toff;
- Read conductivity: 65%-90% of Set-point → **E.v. ON** = 80% Ton; **E.v. OFF** = Ton + Toff - 80% Ton;
- Read conductivity: 90%-110% (hysteresis) of Set-point → **E.v. ON** = 80% t.on, **E.v. OFF** = Ton + Toff - 80% Ton, if the conductivity value is nearing the Set-point range indicated; **E.v. ON** = 0 seconds (non-active dosing) if the conductivity value is decreasing in the indicated range;


$$\% \text{ Portata} = \frac{80 * 4 \text{ l/h}}{4.2 \text{ l/h}} = 76\%$$
$$\text{E.v. OFF} = (20 + 10) - 80\% * 20 = 14 \text{ sec}$$

As in the previous example, the solenoid valve will remain open, thus enabling the passage of water flow until reaching a value of 10 units (~ 110%), and will start dosing again only when the value of measured conductivity goes below 8 units (hysteresis around the Set-point value).

The measured conductivity value of a solution is influenced by the temperature as well, and to compensate for this influence you need to know its value. You can choose to compensate the value of conductivity automatically with the temperature obtained from the probe PT100* integrated into the conductivity probe, or by setting the value manually by calculating the temperature in the tank.

Conductivity variation is linked to the temperature by means of a proportional coefficient called *Temperature Coefficient*; the said coefficient, which is programmed between 0.0% and 5.0%, indicates the percentage variation of conductivity /°C. The temperature coefficient depends on the product used: should you not know the value, it is advised to leave the default value, equivalent to 2.0%.

The dGdoser CD model pump measures conductivity to calculate the g/l of detergent dissolved in water. Since conductivity depends on temperature, it is necessary to compensate the calculated value. The units of conductivity shown are therefore compensated for in temperature.

MENU

When the pump is turned on, regardless of the status of the switch, the display shows the firmware version for a second in the following way "**r1.0**". It then displays the first entry of the Initial Menu. You can browse the whole Menu both when the switch is ON and when it is OFF.

The Menu consists of the following submenus:

- **Initial Menu**, which allows to display the status of the pump;
- **User Menu**, which allows to change the main operating parameters;
- **Programming Menu**, which allows to set all the operating parameters and to display statistics: this menu can only be accessed by entering a password;

To browse through the Menus refer to Annex G - *Menu Layouts*.

Initial Menu

The first entry of the Initial menu displays one of the following pages, depending on the status of the switch:



H2O (no water): displayed in the event the absence of water is detected in the dishwasher tank, or a nil conductivity value is read;

HI.C (high Conductivity Value): displayed in the event the measured conductivity value is above or within the set-point value set (a decreasing value but which still remains in the set-point hysteresis window), therefore no dosing of detergent in the tank is required;

Lo.C (low Conductivity Value): displayed in the event the measured conductivity value is below or within the set-point value set (an increasing value but is still in the set-point hysteresis window), therefore dosing of detergent in the tank is required;

(*) CD Model that has temperature reading through PT100

From the home page, with the **F** key, it is possible to scroll through the other entries of the Menu and display:

- the **SEt** set-point value selected for conductivity;
- the temperature value (°C) set manually or read by the PT100 temperature probe from 0.0 to 99.9°C: if the automatic temperature has been set and the temperature probe is not connected, the display will show "**t -**".

From the temperature value, always using the **F** key, you go back to the first entry, which will be preceded by the label "**St.d**" (dosing status) if the switch is ON.

From any entry of the Initial Menu you can go to the:

- **Programming Menu** by pressing **Enter** for 3 seconds;
- **User Menu** by pressing the **F** key for 3 seconds;

User Menu

The User Menu allows you to set fundamental parameters for pump dosing and set-point conductivity.

You can browse through the User Menu with the **F** key and display:

- **AdE**: allows to prime the pump without using the switch. You can start or stop the priming with the **Enter** key. The display shows a flashing "**AdE**" and the pump starts running at top speed.
- **SEt**: allows you to set the set-point value from 0 to 100 units;

The Set-point parameter can be changeable only if it has been enabled from the Settings Menu, or if:

- **OnL** (on-line change) enabled;

From the User Menu you can go back to the Initial Menu by pressing the **F** key for 3 seconds.



Should there be one or several active alarms, every page of the Initial Menu and User Menu will be alternated to the entry that reports the signal with top priority. (see Alarm section).

Programming Menu

The Programming Menu allows to set all of the pump's operating parameters and can be accessed only by entering the password.

You can enter the Programming Menu only from the Initial Menu: after pressing **Enter** for 3 seconds, the display shows "**PAS**", the LED turns orange and is steady. Then press **Enter** again and on the password selection menu the first digit of "000" starts flashing. With the **▲** and **▼** keys you can increase/decrease the value displayed, with **Enter** you can scroll and select the desired digit. After setting the correct password, press **Enter** again for 3 seconds.

3.2 QUICK START-UP

This section features the steps to carry out to use the pump straight away. For further details on operation, refer to section 3.3 "Advanced Programming".

The fundamental parameter to set for pump operation is:

Conductivity Set Point

From the User Menu you can proceed quickly with the steps below:

- Prime the pump;
- Select the Setpoint;

Here below are the pump default parameters:

- Disabled temperature correction;
- On-line Change of Set-point from enabled User Menu;

USER MENU

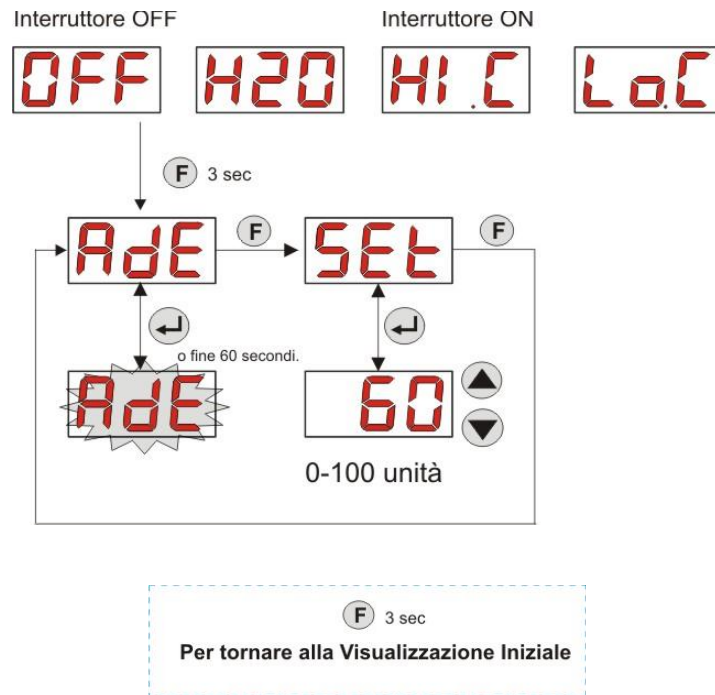


Fig. 11 - Standard programming from User Menu

3.3 ADVANCED PROGRAMMING

Here below are the various features of the **Programming Menu** in greater detail.

Every parameter that is changed in the pump's programming is saved when you go back to the initial display. If the pump's power supply is disconnected before going to the stand-by display, programmed data is lost.

3.3.1 SETTING THE LANGUAGE

From the **LIn** entry you can choose between Italian **It** and English **En** via the ▲ ▼ keys. Use **Enter** to enter and exit. (Fig. 12)

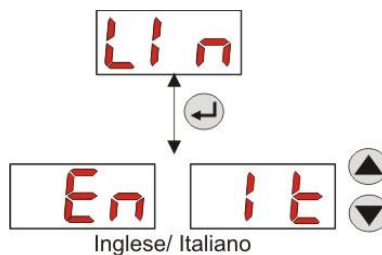


Fig. 12 - Programming the Language

3.3.2 SETTING THE SETPOINT

Set-point is the conductivity value obtained from the tank once the g/l of optimal detergent has been dissolved to execute the wash.

From the **Con** entry, it is possible to access the following sub-menu: (Fig. 13):

- **LEt:** displays the conductivity value read by the probe, in units from 0 to 100; **by pressing the F key for 3 seconds, you may set the read value as a Set-point value;**
- **SEt:** allows you to display and if necessary change, via the ▲ and ▼ keys, the conductivity Set-point value from 0 to 100 units;

To go back to the main **Con** entry of the Programming Menu, press **Enter** for 3 seconds.
The applied pressure for 3 seconds to set the Set-point, from the reading entry, assumes that the g/l of optimal detergent has been dissolved in the tank to carry out the wash.

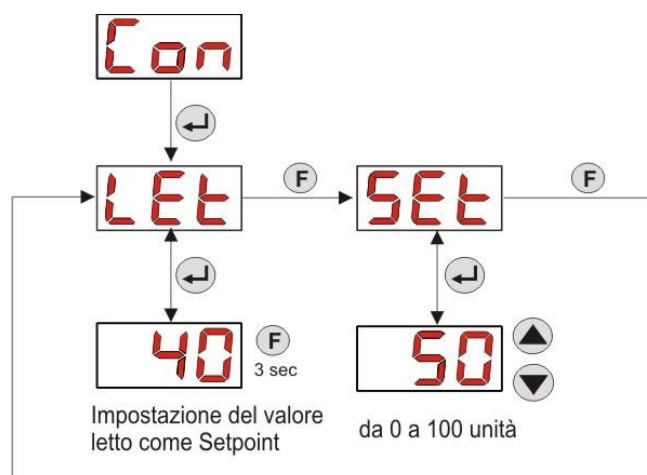


Fig. 13 - Set-point and measured reading value setting from the Programming Menu

3.3.3 DISPLAYING AND RESETTING STATISTICS

From the **StA** entry on the Programming Menu you can access the Pump statistics submenu. Here below are the parameters saved during the pump's operation:

- The pump's overall operating time **t.F.P**, from 0 to 999 hours, with the following format:
 - **h.mm** up to 9 h and 59 m
 - **hh.m** up to 99 h and 59 m (minutes expressed in tens)
 - **hhh** up to 999 h
- Number of times the OFA 1 over-dosage alarm has been activated, indicated by **OF1** (from 0 to 999);
- Number of times the OFA 2 over-dosage alarm has been activated, indicated by **OF2** (from 0 to 999);

To reset each of the above-mentioned fields, just access from the numerical value to the **rSt** reset entry with the **F** key and from there select **YES**, confirming with **Enter**: the corresponding reset value is displayed.

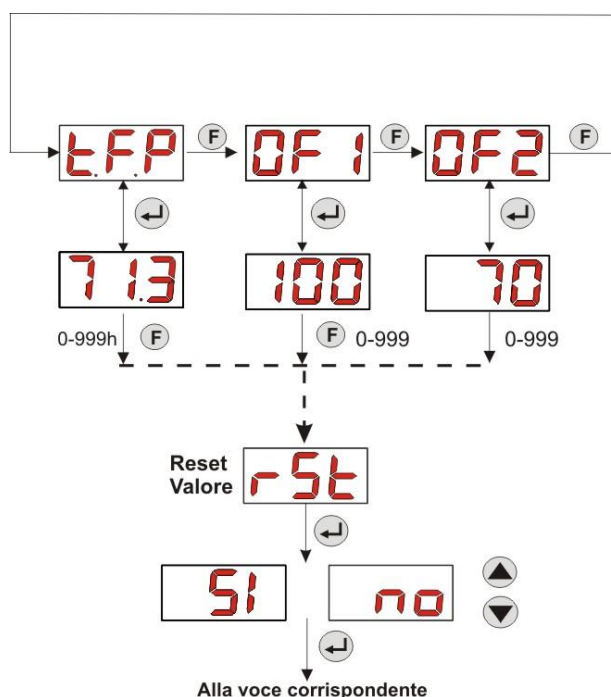


Fig. 14- Statistics Menu

To go back to the Programming Menu press **Enter** for 3 seconds.

3.3.4 SETTING THE TEMPERATURE

The temperature setting allows you to correct the conductivity value read.

From the Programming Menu, after the entry **InP**, by accessing the entry **°C**, it is possible to choose between manual setting "**noA**" and automatic temperature reading "**Aut**" from the PT100 probe.

If you want to correct the measured value in relation to the thermal variation, in manual mode, just set a temperature equal to 25°C.

The default setting is equivalent to "**noA**", with temperature equal to 25°C.

From the entry "**°C**", by pressing **Enter**, it is possible to display:

- Temperature value measured from 0.0 to 99.9°C if the mode is **Aut**: if the probe is not connected, the display will show "t - -";
- Set temperature value, from 0 to 99.9 °C if the mode is **noA**;

To go back to the Programming Menu, press **Enter** again.

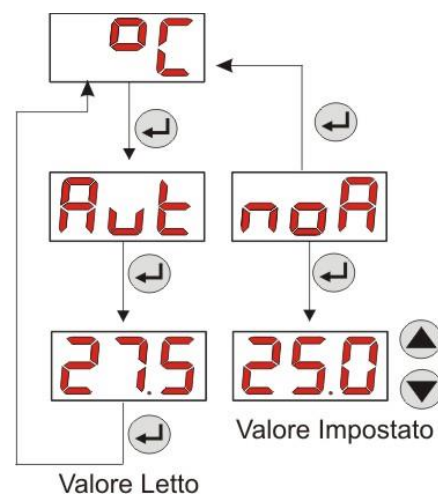


FIG. 15- TEMPERATURE

3.3.5 CALIBRATING THE PUMP

Pump calibration allows you to achieve more accurate dosing, as it allows you to correct the dosing speed calculation in relation to the actual flow rate of the pump. If calibration has never been carried out, the dosing speed percentage is calculated based on the pump rated flow rate value (read the value on the label).

From the **tAr** entry, you will be able to calibrate the pump for a fixed time of 60 seconds, thereby measuring the amount of liquid dosed via a graduated container used as a reference: from the start label "**StA**", launch the count by pressing **Enter** and the pump will start dosing at top speed. Finally, just set the amount in ml (from 0 to 300).

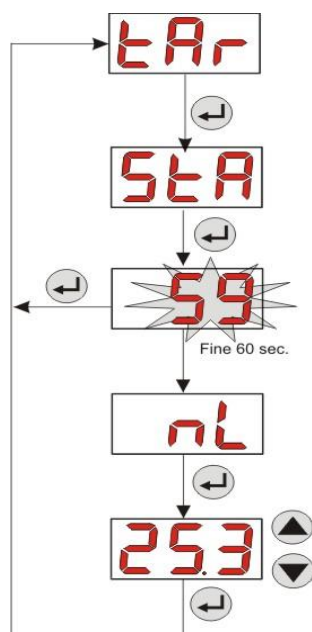


Fig. 16- Pump Calibration Menu

3.3.6 RESETTING DEFAULT PARAMETERS

From the **r.P.d** entry you will be able to reset the equipment default parameters (refer to the **Default Parameters Table** in Attachment F). If you choose to reset the initial values, you will go back to the initial display. See Fig. 17. Once you confirm with **YES**, you cannot go back.

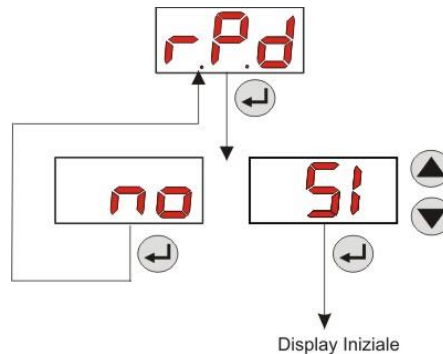


Fig. 17- Default parameters reset

3.3.7 SETTINGS MENU

From the **InP** entry of the Programming Menu, via the **Enter** key, you can access the **Settings Menu**. From the Settings Menu you can carry out the following operations (refer to **Figure 18**):

- Set the password to access the Programming section, **PAS**: with **Enter** you can go to the “000” selection page, with the ▲ and ▼ keys you can increase/decrease the value displayed and with **Enter** you can scroll through the figure you intend to set. After choosing the new password, press **Enter** for 3 seconds to go back to the **PAS** entry;
- Enable the pump stop in the case of a **St.P** level alarm: to access and exit the submenu, use **Enter**, to scroll through “YES/no” use the ▲ and ▼ keys;
- Choose whether to disable the over-dosage alarm OFA **OF.r** only from the switch by placing it in the OFF position, or to disable it from the switch as well as when turning off the equipment, **Aut**: to enter and exit the sub-menu, use the **Enter** key, to scroll “OFF/Aut” use ▲ and ▼;
- Select the time frame to control the OFA alarm, **OFA**, within a range of 1-999 seconds or disable it (**OFF**): to enter and exit the submenu use **Enter**, to scroll through the values use the ▲ and ▼ keys;
- Set the time of the pump maintenance alarm, **O.F.d**, from 0 (disabled) to 999 hours, based on the following format:
 - **h.mm** up to 9 h and 59 m
 - **hh.m** up to 99 h and 59 m (minutes expressed in tens)
 - **hhh** up to 999 hTo enter and exit the submenu use **Enter** and increase/decrease the value with the ▲ and ▼ keys;
- Choose if you want to make the Set-point, **OnL**, a value that can be changed on-line or from the User Menu: to enter and exit the sub-menu use **Enter**, to scroll through “YES/no” use the ▲ and ▼ keys;
- Enable the **A.bu** buzzer when an alarm is activated: to enter and exit the sub-menu use **Enter**, to scroll through “YES/no” use the ▲ and ▼ keys;
- Set the temperature coefficient value **C.d.t** (see *Operation, Section 3.1*) from 0.0 to 5.0 (percentage value from 0.0% to 5.0%): to enter and exit the sub-menu use the **Enter** key, the value is increased/decreased by using the ▲ and ▼ keys;
- Set the opening time of the solenoid valve **t.on**, in the case of dosage without the peristaltic pump (solid detergent), in the range of 0-30 seconds: to enter and exit the sub-menu, use the **Enter** key, the value is increased/decreased by using the ▲ and ▼ keys;
- Set the closing time of the solenoid valve **t.oF**, always in the case of dosage without the peristaltic pump (solid detergent), in the range of 0-30 seconds: to enter and exit the sub-menu, use the **Enter** key, the value is increased/decreased by using the ▲ and ▼ keys;



The **t.on** and **t.oF** entries are visible on the Settings Menu only in the case in which the pump is programmed to pilot the solenoid valve, otherwise by **C.d.t**, by pressing the **F** key, it goes back to the first entry of the Settings Menu.

To go back to the Programming Menu, to the **InP** entry, just press **Enter** for 3 seconds from any entry of the Menu.

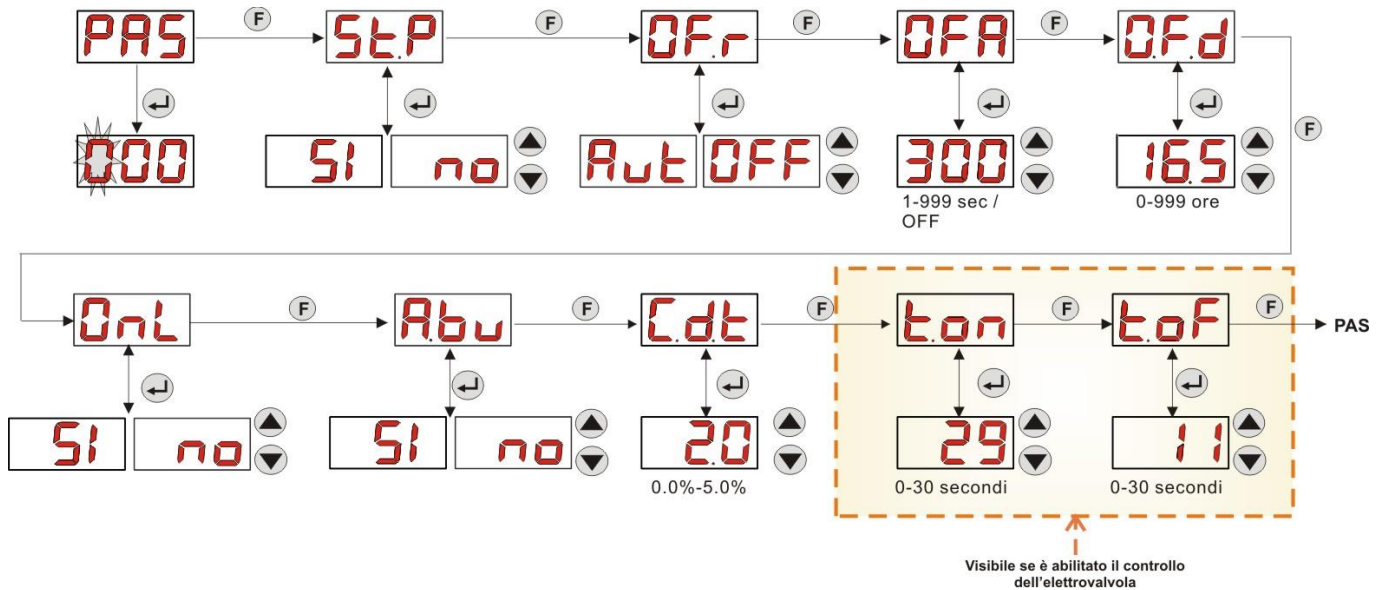


Fig. 19 - Settings Menu

4.0 ALARMS

4.1 MOTOR ALARM

The motor alarm is present in all CD pump models with motors in direct current.

In the event of excessive absorption of the motor due to malfunction, or if the power supply voltage of the pump (30 Volts) drops below 24 Volts, the pump performs three attempts to restart the motor. The three attempts carried out before the alarm signal are respectively after 5 seconds, then 10 seconds and finally after 15 seconds from the previous stop. The alarm is signalled as follows:

- Acoustic signal through the buzzer (if installed on the pump), with a frequency of 1 second on and 1 second off;
- flashing red LED;
- "**not**" flashing on the display;

In this alarm status the motor is stationary. Restoring normal status to the equipment is carried out by turning off/turning on the switch or through the power supply.

4.2 MAINTENANCE ALARM

The maintenance alarm is activated when the pump has been running for longer than the time set in the relative **O.F.d** sub-menu (see *Settings Menu*).

If you set 0.00 (h.mm) as a time value for the maintenance alarm, it will be disabled.

This is reported by the pump as follows:

- Audio signal via the buzzer (if there is one on the pump) if enabled (see **A.bu** on the "Settings Menu") with a frequency of 1 second on and 1 second off;
- flashing red LED;
- "**OFd**" flashing on the display;

In this alarm status the motor is stationary. To disable the alarm, you need to go to the **t.F.P** entry (pump operating time) in the Statistics Menu and reset the value.

4.3 LEVEL ALARM (only for the model with the level probe)

A level probe can be connected to the pump to report the end of the product, which is indicated by the pump in the following way:

- Audio signal via the buzzer (if there is one on the pump) and if enabled (see **A.bu** on the “Settings Menu”) with a frequency of 1 second on and 1 second off;
- flashing red LED;
- “**uLo**” flashing on the display;

The inlet has a 3-second recognition filter to identify false contacts and unwanted level alarm signals.

This alarm may or may not imply the pump will stop, depending on the option chosen in the “**St.P**” submenu (Settings Menu: **St.P=SI**→ the pump is stopped; **St.P=no**→ the pump keeps on dosing).

The alarm is automatically reset when the level of the chemical product to be dosed is restored.



In priming mode, the level alarm is not indicated.

4.4 OFF STATUS ALARM

If the switch is left on the OFF position, after 20 minutes the switch alarm is activated and signalled by the pump in the following way:

- Audio signal via the buzzer (if there is one on the pump) and if enabled (see **A.bu** on the “Settings Menu”) with a frequency of 1 second on and 1 second off;
- flashing red LED;
- “**OFF**” flashing on the display;

Just set the switch to ON to disable it.

4.5 OFA ALARM

The OFA alarm is a dosing alarm and is distinguished in two distinct signalling phases: **OFA 1 Alarm** and **OFA 2 Alarm**.

The OFA 1 alarm is activated when the set conductivity set-point is reached within an established time-frame (**T_{OFA}**).

The observation time may be set from 1 to 999 seconds or may be disabled (OFF) from the entry **OFA** of the Menu Settings: counting of **T_{OFA}** is activated at the beginning of the pump dosing.

The OFA 2 alarm is the second level of signalling of the said alarm, which is activated after a set-point situation is not reached and remains for double the set time, therefore, after [2 x (**T_{OFA}**)] seconds from the beginning of dosing.

The OFA alarm is reported by the pump in the following way:

- Audio signal via the buzzer (if there is one on the pump) and if enabled (see **A.bu** on the “Settings Menu”) with a frequency of 1 second on and 1 second off;
- flashing red LED;
- flashing “**OF1**” or “**OF2**” on the display;
- OFA 1 Alarm: the pump continues to dose;
- OFA 2 Alarm: Stop dosing;

The OFA 1 alarm will be disabled if:

- The conductivity value is brought back to the Set-point value;
- Use the switch or the pump power supply to turn it on or off;

The OFA 2 alarm will be disabled if:

- Turning off and turning on is carried out through the switch or by means of the pump power supply, if the OFA alarm Reset setting, **OF.r**, is equal to **Aut**;
- Turning off and turning on is only carried out by means of the switch, if the OFA alarm Reset setting, **OF.r**, is equal to **OFF**;

4.6 TEMPERATURE ALARM

The Temperature Alarm is activated whenever the temperature mode (°C) in the Programming Menu is set to automatic “Aut”, but the PT100 probe is not connected (temperature value reported as t - -).

The Temperature Alarm is reported in the following way:

- Audio signal via the buzzer (if there is one on the pump) and if enabled (see **A.bu** on the “Settings Menu”) with a frequency of 1 second on and 1 second off;
- flashing red LED;
- “n°C” flashing on the display;

When the alarm is reported, the pump keeps on operating as normal.

You will automatically exit the alarm status as soon as the probe is connected or by changing the temperature mode to manual.

5.0 MAINTENANCE

This section reports the general rules you need to follow to operate the pump correctly and the steps to carry out periodically to ensure optimal conditions are maintained over time.

5.1 GENERAL RULES

Maintenance operations must be conducted systematically and accurately by following the recommendations reported below to the letter.

It is difficult to define the standard times required for maintenance beforehand, as there are a number of factors that determine the wear of the pump and in particular the parts that are in contact with the liquid.

This also applies to the type of product used to clean the materials that are in contact with it (valves, etc.) as it depends on the compatibility of the material with the chemical product being dosed.

Having said this, we can take as an example a product, such as sodium hypochlorite, that develops crystals, which is often used with our pumps, and with which we have a great deal of experience, and trace an identity kit of the type of maintenance required.

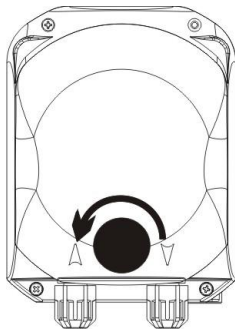
5.2 PERIODIC MAINTENANCE

- Check the foot strainer and clean it periodically from any residuals of crystallised product or dirt deposits.
- Ensure there are no impurities in the suction and delivery tubes, because they may damage the peristaltic tube and, at the same time, cause anomalies in the flow rate;
- **Pump materials in contact with the chemical product such as: foot strainer and injection valve must be checked and cleaned at least every three months.** If the products are particularly aggressive increase the frequency of cleaning;
- Calibrate the pump periodically;

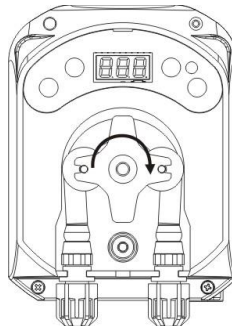
To remove and place back the peristaltic tube refer to the steps described respectively in 20 and 21

Removing the peristaltic tube

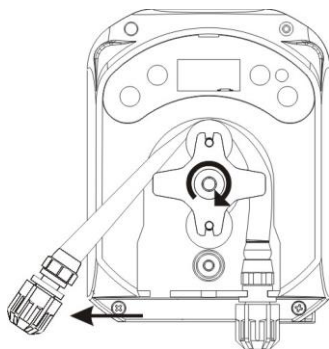
Step 1 - Open the front glass



Step 2 - Turn the roller clockwise and release the (left) intake ring nut



Step 3 - Removing the tube



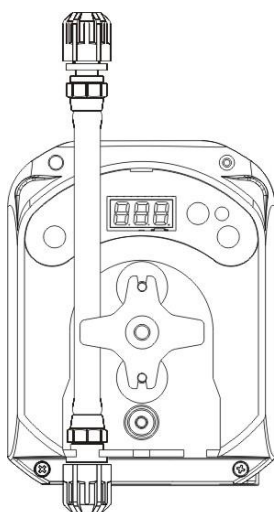
Step 4 - Release the (right) delivery ring nut and remove it completely



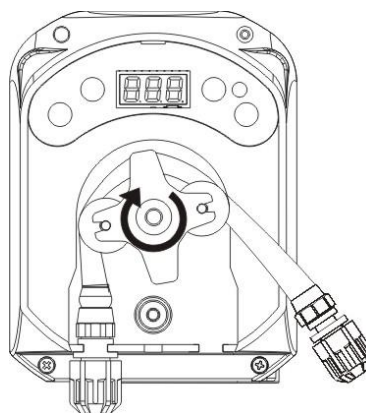
Fig. 20 - Removal of the peristaltic tube

Placing back the peristaltic tube

Step 1 - Position the tube and secure it on the left-hand side



Step 2 - Insert it in the bell by turning the roller



Step 3 - Close the front glass

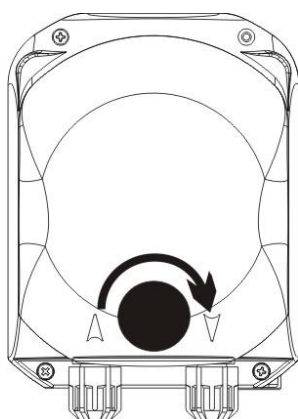


Fig. 21- Placing back the peristaltic tube

5.3 TROUBLESHOOTING

Problem: the pump does not turn on, the LED and display remain off

Solution:

1. Make sure the connection to the electrical network has been set up correctly in accordance with the information provided on the pump's identification plate.
2. The electronic board may be damaged as well: call the Support Service.

Problem: the pump is dosing, but there is no conductivity variation

Solution:

1. Check the product's level.
2. Make sure the probe is not damaged.
3. Make sure the foot strainer is not clogged up.
4. Make sure the delivery tube is inserted into the tank correctly.
5. Check the status of the peristaltic tube. If evident malformations are detected, make sure that the material is compatible with the product being dosed by consulting the chemical compatibility table (see ANNEX D), and then go ahead with the replacement.

Problem: liquid leaking from the peristaltic tube**Solution:**

1. Make sure the delivery and intake tubes are inserted properly and the ring nuts are well tightened.
2. Check the status of the peristaltic tube. If evident malformations are detected, make sure that the material is compatible with the product being dosed by consulting the chemical compatibility table (see ANNEX D), and then go ahead with the replacement.

6.0 RETURNING MATERIAL TO THE AFTER-SALES SERVICE

The material must be sent back in its packaging with all its original protection devices before the end of the warranty period.

The system must be clean and the chemical product removed from the tubes.

The manufacturer declines any responsibility regarding damages caused by transportation, if the aforementioned conditions are not complied with.

7.0 WARRANTY CERTIFICATE

The manufacturer provides warranty covered for pumps made by them for a period of 12 months, starting from the delivery date to the first user ().*

Within the above terms the producer agrees to provide spare parts for any parts that they, or their authorised representative, believe present factory or material defects free of charge; or to carry out the repair directly or through authorised workshops.

The producer is nevertheless excluded from any other responsibility and obligation regarding other expenses, direct or indirect damage and losses deriving from the use or from the impossibility, either total or partial, to use the pumps.

Any repairs or replacing of parts will neither extend nor renew the duration of the warranty period.

Costs to assemble and disassemble the pump from the system, shipping costs and consumables (filters, valves, etc.) are borne by the user.

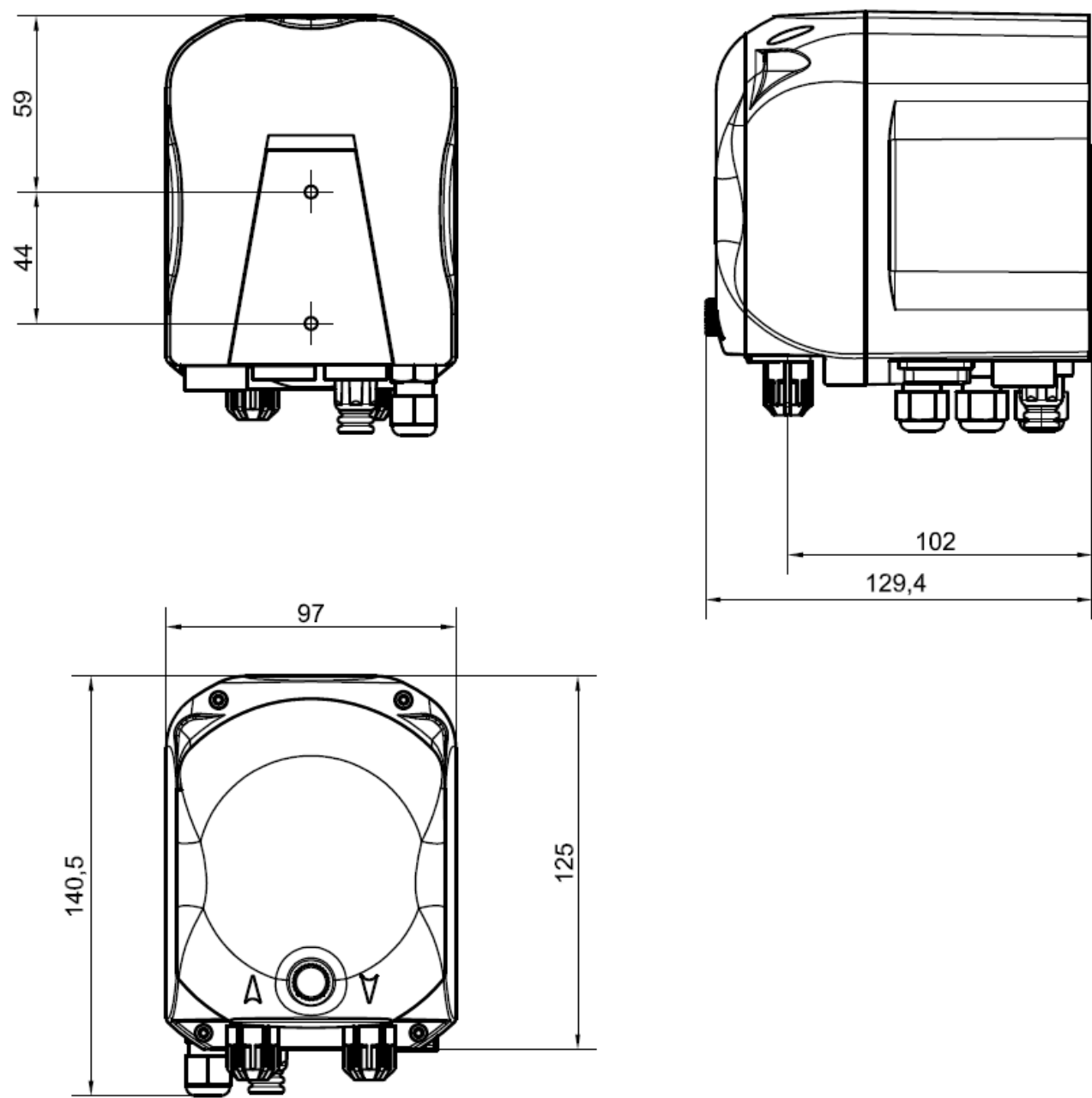
The manufacturer's obligations, envisioned in the previous paragraphs, are not valid if:

- *The pumps are not used in compliance with the instructions provided on the operating and maintenance booklet;*
- *The pumps are repaired, dismantled or modified by workshops that have not been authorised by the manufacturer;*
- *Non-original parts have been used;*
- *The injection systems have been damaged by non-compliant products;*
- *The electrical systems breakdown due to external factors such as surges, any kind of electrical discharges etc.;*

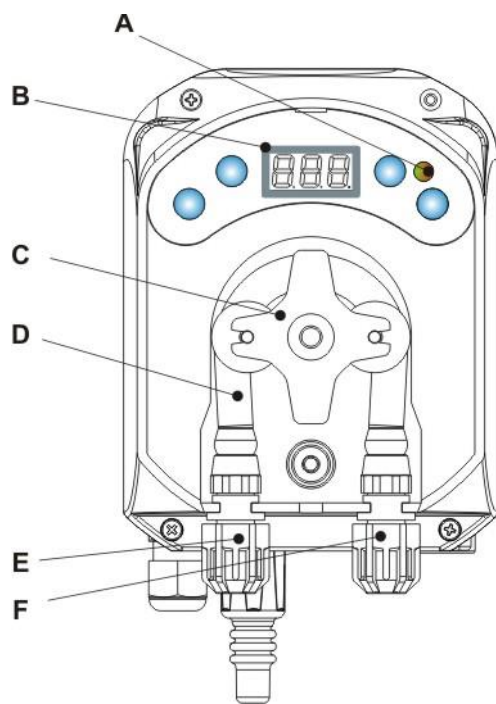
When the warranty period expires 12 months after delivery of the pump, the manufacturer is relieved of any responsibility and obligation described in the above paragraphs

() as attested by the serial code and the invoice's issue date*

ANNEX A - Overall dimensions

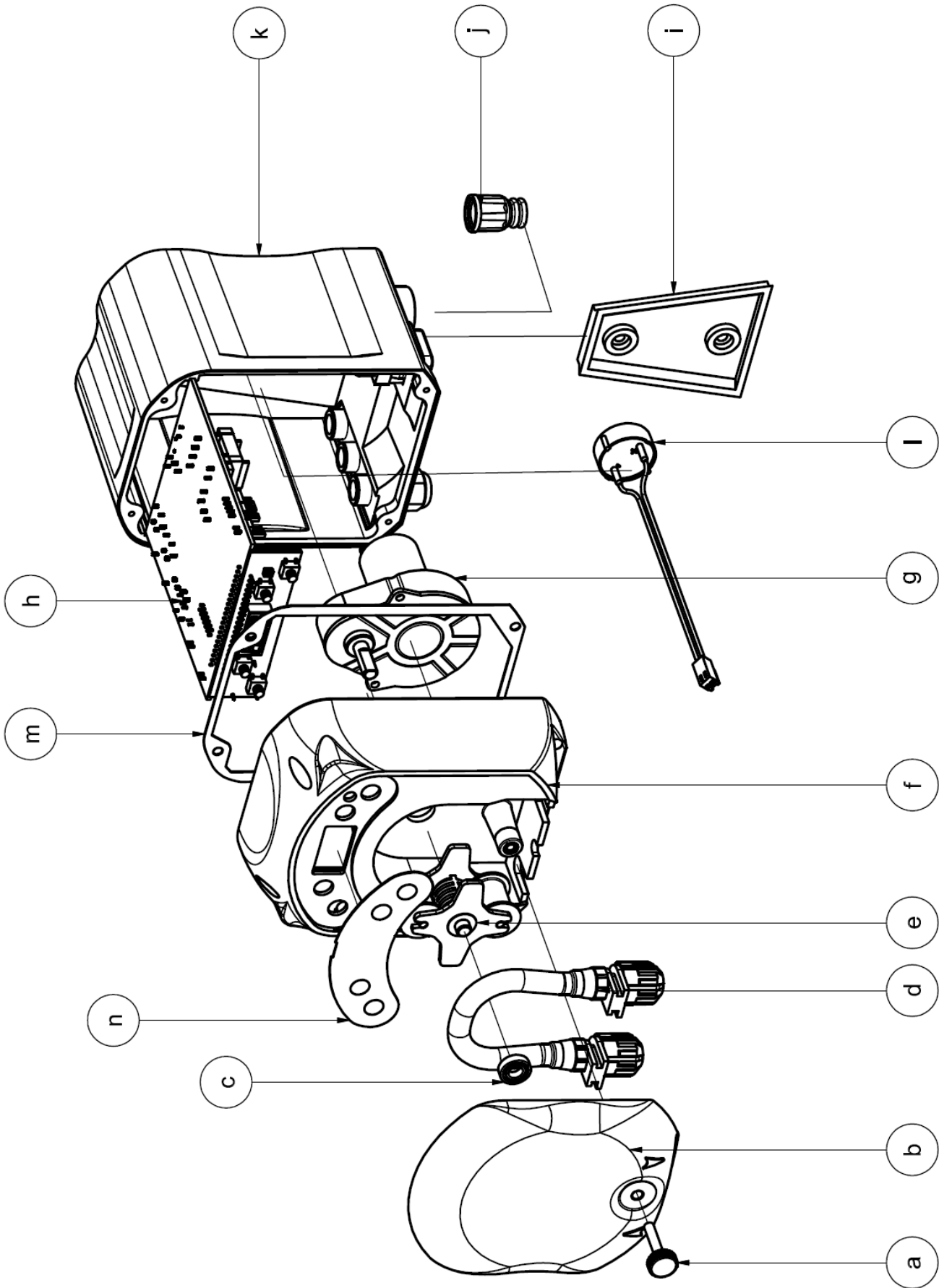


ANNEX B - Reference Figures



Ref.	Description
A	Two-coloured LED
B	3-digit display with 7 segments
C	Roll-holder
D	Peristaltic tube
E	Intake fitting
F	Delivery fitting

ANNEX C - Exploded views



Identification	Code	Description	Quantity
a	ADSP8000029	KNOB TO SECURE CLEAR COVER	1
b	ADSP8000195	NEUTRAL SMOKE-GREY FRONT COVER	1
c	ADSP4100207	BEARING FOR PUMP COVER	1
d	ADSP800I109	SANTOPRENE TUBE	1
e	ADSP8000009A	COMPLETE ROLLER HOLDERS	1
f	ADSP9600005	GREY FRONT DGTEC CASING	1
g	ADSP8000255	RAP 125 24VDC MOTOR	1
	ADSP8000217	24VDC 10 l/h motor	1
h	ADSP6000971	SKD DGTEC CD	1
i	ADSP8000025	FIXING BRACKET	1
j	ADSP6000948	FEMALE BNC PROTECTION FROM BLACK RUBBER PANEL	1
k	ADSP9600006	DGTEC GREY REAR CASING	1

ANNEX D - Chemical Compatibility Table

Key: 1: excellent/good resistance
2: moderate resistance
3: non-resistant

Product	Formula	Ceram.	PVDF	PP	PVC	Hastel.	PTFE	FPM (Viton)	EPDM (Dutral)	NBR	PE
Acetic Acid, Max 75%	CH ₃ COOH	2	1	1	1	1	1	3	1	3	1
Concentrated Hydrochloric Acid	HCl	1	1	1	1	1	1	1	3	3	1
Hydrofluoric Acid, 40%	H ₂ F ₂	3	1	1	2	2	1	1	3	3	1
Phosphoric Acid, 50%	H ₃ PO ₄	1	1	1	1	1	1	1	1	3	1
Nitric Acid, 65%	HNO ₃	1	1	2	3	1	1	1	3	3	2
Sulphuric Acid, 85%	H ₂ SO ₄	1	1	1	1	1	1	1	3	3	1
Sulphuric Acid, 98.5%	H ₂ SO ₄	1	1	3	3	1	1	1	3	3	3
Amines	R-NH ₂	1	2	1	3	1	1	3	2	3	1
Sodium bisulphite	NaHSO ₃	1	1	1	1	1	1	1	1	1	1
Sodium Carbonate (soda)	Na ₂ CO ₃	2	1	1	1	1	1	2	1	1	1
Ferric chloride	FeCl ₃	1	1	1	1	1	1	1	1	1	1
Calcium Hydroxide	Ca(OH) ₂	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide (caustic soda)	NaOH	2	1	1	1	1	1	2	1	2	1
Calcium Hypochlorite	Ca(OCl) ₂	1	1	1	1	1	1	1	1	3	1
Sodium Hypochlorite, 12.5%	NaOCl+NaCl	1	1	2	1	1	1	1	1	2	2
Potassium permanganate, 10%	KMnO ₄	1	1	1	1	1	1	1	1	3	1
Hydrogen Peroxide, 30%	H ₂ O ₂	1	1	1	1	1	1	1	2	3	1
Aluminium Sulphate	Al ₂ (SO ₄) ₃	1	1	1	1	1	1	1	1	1	1
Copper Sulphate	CuSO ₄	1	1	1	1	1	1	1	1	1	1

Key: 1: excellent/good resistance
2: moderate resistance
3: non-resistant

Product	Formula	PharMed	Tygon LFL	Santoprene
Acetic acid 50%- 60%	CH ₃ COOH	1	1	2
Hydrochloric acid 37%	HCl	1	1	2
Hydrofluoric Acid 40-48%	H ₂ F ₂	3	2	3
Phosphoric acid	H ₃ PO ₄	1	1	1
Nitric Acid 68%-71%	HNO ₃	3	3	3
Sulphuric Acid 30%	H ₂ SO ₄	1	1	1
Sulphuric Acid 95%-98%	H ₂ SO ₄	3	3	2
Amines	R-NH ₂	2	3	1
Sodium sulphates	NaHSO ₃	1	1	1
Sodium Carbonate (soda)	Na ₂ CO ₃	1	1	1
Ferric chloride 43%	FeCl ₃	1	1	1
Calcium Hydroxide	Ca(OH) ₂	1	1	1
Sodium Hydroxide (caustic soda) 30-40%	NaOH	1	2	1
Calcium Hypochlorite 20%	Ca(OH) ₂	1	1	1
Sodium Hypochlorite, 12.2%	NaOCl+NaCl	1	1	1
Potassium permanganate, 6%	KMnO ₄	1	1	1
Hydrogen Peroxide, 30%	H ₂ O ₂	1	1	1
Aluminium Sulphate 50%	Al ₂ (SO ₄) ₃	1	1	1
Copper Sulphate 13%	CuSO ₄	1	1	1

ANNEX E - Default Parameters

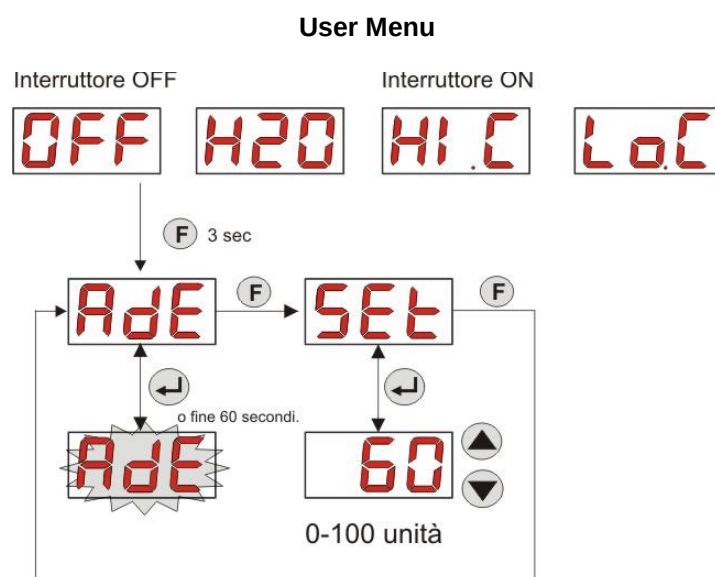
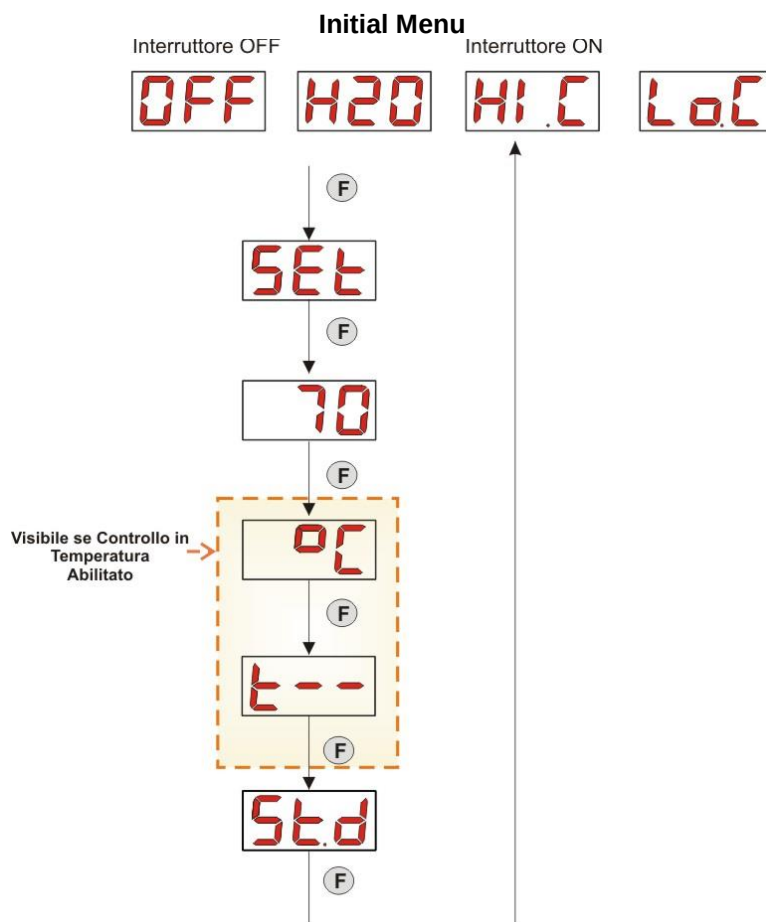
Default Parameters Table

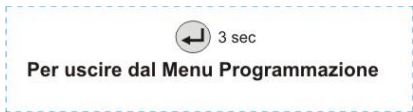
IT parameter	EN parameter	Meaning	Value
A.bu	b.En	Buzzer Enabling	YES
C.d.t		Temperature coefficient	2.0 %
LIn	LAn	Language	En
OFA	OFA	Over-dosage Alarm Time	OFF (disabled)
O.F.d	O.F.d	Maintenance Time	0 sec (disabled)
OF.r	OF.r	OFA 2 Alarm Reset	Aut
OnL	OnL	Online	YES
PAS	PAS	Password	000
SEt	SEt	Set-point conductivity	100
St.P	P.St	Pump Stop (due to Level Alarm)	no (disabled)
t.oF	oF.t	Solenoid Valve Closing Time	10 sec
t.on	ont	Solenoid Valve Opening Time	10 sec
°C	°C	Temperature	OFF

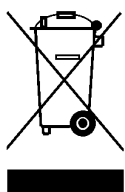
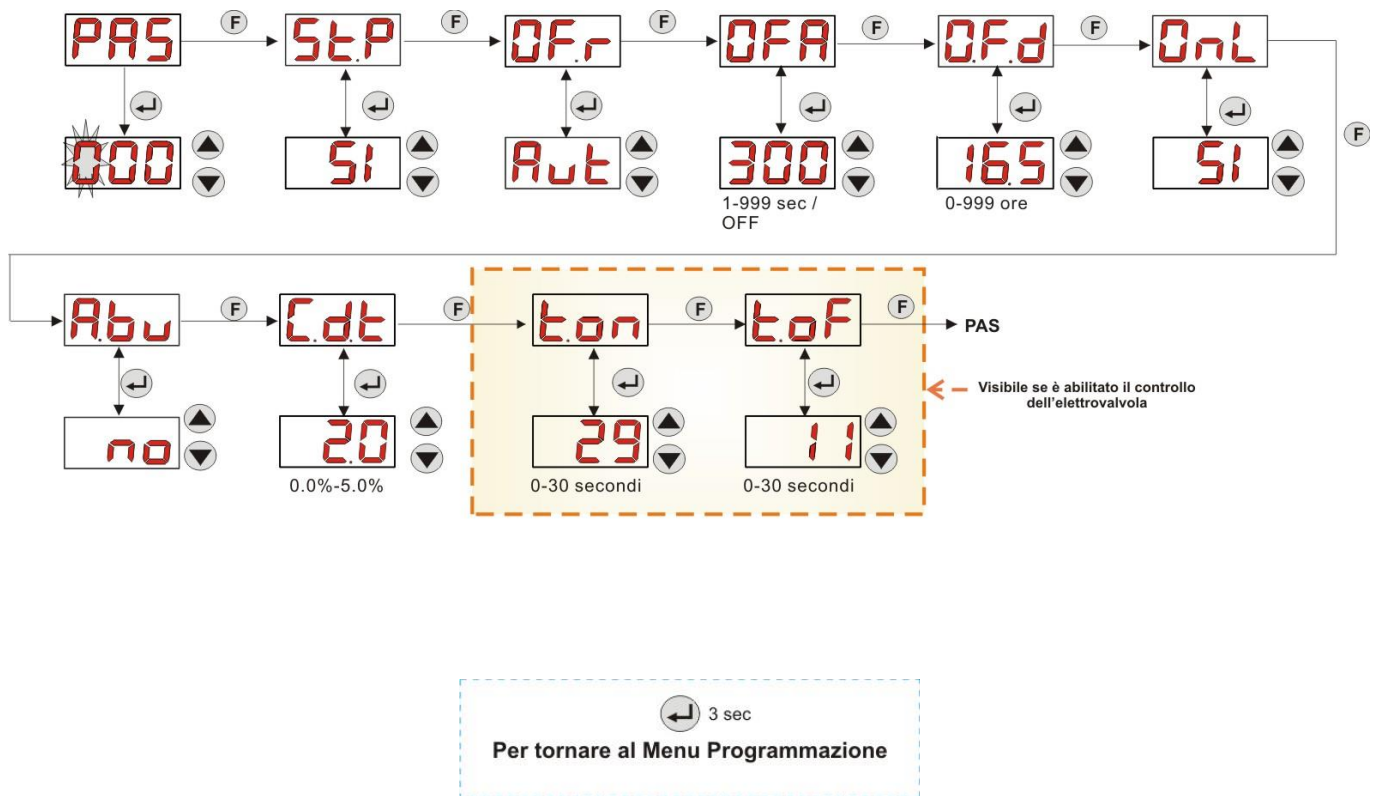
ANNEX F- Acronyms Table

IT acronym	En acronym	Meaning
A.bu	En.b	Buzzer Enabling
AdE	PrI	Priming
Aut/noA	Aut/noA	Automatic/Non-automatic (manual)
C.d.t		Temperature coefficient
Err	Err	Error
H2O	H2O	No Water in the Tank
HI.C	HI.C	High conductivity
InP	Opt	Settings
LEt	rEA	Reading (Conductivity value read)
LIn	LAn	Language
Lo.C	Lo.C	Low conductivity
nL	nL	ml
OFA	OFA	Over-dosage Alarm Time
O.F.d	O.F.d	Maintenance Time
OF.r	OF.r	OFA 2 Alarm Reset
OF1	OF1	OFA 1 Alarm Activation
OF2	OF2	OFA 2 Alarm Activation
OnL	OnL	Online
PAS	PAS	Password
r.P.d	r.d.P	Default Parameters Reset
rSt	rSt	Reset
SEt	SEt	Set-point Conductivity
SI / no	YES / no	SI/ NO
StA	StA	Statistics / Pump Calibration Start
St.d	d.St	Dosing Status
tAr	CAL	Pump Calibration
t.on	ont	Solenoid Valve Opening Time
t.oF	oF.t	Solenoid Valve Closing Time
t.F.P	P.d.t	Pump Operating Time
°C	°C	Temperature in °C

ANNEX G - Menu Layouts







Pursuant to art. 13 of Leg. Decree no. 151 dated 25/07/2005 (implementation of Directives 2002/95/EC, 2002/96/EC, 2003/108/EC) it is notified that:

The electric and electronic devices must not be considered as household waste.

Consumers must, by law, return the electric and electronic devices at the end of their useful life to adequate recycling centres. The crossed-out waste bin symbol on the product, on the instruction manual or on the packaging indicates that the product is subject to the disposal rules envisioned by the Standard. Illegal disposal of the product implies the application of the administrative fines provided for by Leg. Decree no. 151 dated 25/07/2005. By recycling, reusing the material or other forms of employing old devices, you are making an important contribution to protecting the environment.



DGTEC CD

