



<https://prom-nasos.pro>
<https://bts.net.ua>
<https://prom-nasos.com.ua>
+38 095 656-37-57,
+38 067 360-71-01,
+38 063 362-12-31,
info@prom-nasos.pro

Dosing systems for swimming pools

TECHNOPOOL

TECHNOPOOL PH-RX



TECHNOPOOL 3



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1.0 INTRODUCTION

Technopool3 is an integrated system able to control up to three peristaltic pumps and a solenoid valve control relay, for the automatic management of water treatment in the swimming pool.

Refer to appendix 2 for Technopool range.

Peristaltic pumps are controlled in the following ways:

- **pH Pump:** for dosing the pH corrector.
The setpoint of the pH value is set to be maintained in the swimming pool.
- **Pump Rx:** for dosing the disinfectant.
The setpoint of the redox value is set to be maintained in the swimming pool.
- **P1 Pump:** for a cyclic dosing of an anti-algae product. (only Technopool3)
A timer is set to program the dosing schedule of the required product and the quantity of product in ml; the programmed quantity can be modified proportionally to the water temperature reached during the latest dosing.
- **Pump Cl:** for dosing the disinfectant. (only Technopool3)
The setpoint of the chlorine value is set to be maintained in the swimming pool.
- **Pump HP:** for dosing the disinfectant. (only Technopool3)
The setpoint of the hydrogen peroxide value is set to be maintained in the swimming pool.
- **P2 Pump:** for a cyclic dosing of a product. (only Technopool3)
A timer is set to program the dosing schedule of the required product and the quantity of product in ml; the programmed quantity can be modified proportionally to the water temperature reached during the latest dosing.

On the other hand, the solenoid valve of the control relay, used for dosing the chlorine tablets, can be programmed in two ways:

- **cyclic**
Opening (ON) and closing (OFF) schedule of the relay are fixed or proportional to the temperature of the water reached during the latest dosing.
- **ON/OFF**
Opening (ON) and closing (OFF) schedule is controlled by the redox/chlorine or hydrogen peroxide; therefore, it depends on the setpoint setting with a fixed hysteresis of 10 mV (redox), 0.05 ppm (chlorine) and 5 ppm (hydrogen peroxide).

1.1 WARNINGS

This manual has the purpose to provide all information required for a correct installation and maintenance of the system, to ensure best results during its operation.

For this reason, the instructions described below must be carefully read, as they supply all information required for the installation, use and maintenance safety.

- Store this manual with care so it can be consulted when necessary.
- Ensure the integrity of the system at the delivery; in case anomalies are detected, contact specialised personnel, before carrying out any intervention.
- Before proceeding with the installation, ensure the data on the plate correspond to the specifications of the electric system.
- Do not operate with bare feet and/or hands.
- Prevent the system from the exposure to atmospheric agents.
- Only specialised personnel is allowed to perform any operation on the system.
- In case of anomalous operation, immediately switch off the system and contact the After-Sales Service for the required repair actions.
- For a correct operation, use original accessories and spare parts.
- The manufacturer declines any responsibility with regard to damage caused by improper use or use of non-original accessories or spare parts.
- The electrical system must be in compliance with the regulations in force of the country where the system is located.
- The room temperature where the system is installed must never exceed 45°C.

1.2 CONFORMITY


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”

To achieve the best and ensure the longest durability of the system, read and follow the rest of the manual especially the part relative to maintenance.

 **The manufacturer declines any responsibility for damages on the system caused by non-qualified personnel.**

1.3 TECHNICAL FEATURES

- Back-lit LCD display 2x16.
- Red LED (pH) pH alarm signal.
- Red LED (Rx-ppm) redox alarm signal (only for Time/pH/Rx Technopool3 systems and pH/Rx).
- Red LED (Rx-ppm) chlorine alarm signal (only for pH/CIJ Technopool3 systems).
- Red LED (Rx-ppm) hydrogen peroxide alarm signal (only for pH/HP Technopool3 systems).
- Main ON/OFF switch.
- Dose enable switch for each pump.
- Solenoid valve output (dry contact, no voltage).
- Flow sensor input.
- 2 inputs for level probes (+1 for Technopool3).
- An input for temperature probe PT 100.
- A BNC input for pH electrode.
- A BNC input for redox electrode (only for Time/pH/Rx Technopool3 systems and pH/Rx).
- A HIRSCHMANN input for chlorine electrode (only for pH/CIJ Technopool3 systems).
- A HIRSCHMANN input for hydrogen peroxide electrode (only for Technopool3 pH/HP systems).
- Alarm repetition output 24-30V.

Hereunder are the maximum pump capacities:

- 4 L/h @ 1 bar, Santoprene® tube.
- 1 L/h @ 3 bar, Silicone tub

1.4 ELECTRICAL FEATURES

- Power supply: 100÷240 VAC 50/60 Hz and consumption (max): 14 W.
- pH Range: 0.00...14.00.
- Redox Range: 0...1000 mV (only for Time/pH/Rx Technopool3 systems and pH/Rx).
- Chlorine range: 0.00...20.00 ppm (only for Technopool3 pH/CIJ systems).
- Hydrogen peroxide range: 0.0...500.0 ppm (only for Technopool3 pH/HP systems).
- Temperatura range (PT100): 0...100° C.

1.5 PACKAGING CONTENT

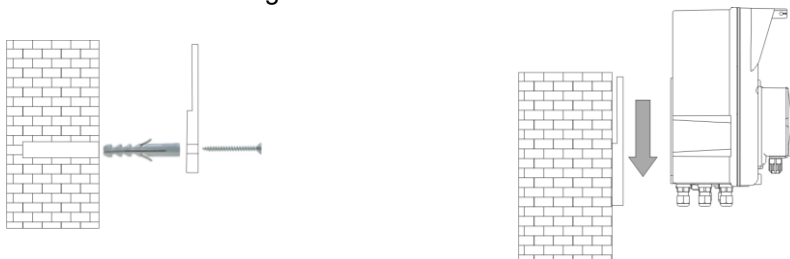
- Technopool System.
- Instruction manual.
- Wall mounting bracket.
- Screws and wall plugs for wall fixing.
- pH 4 buffer solution.
- pH 7 buffer solution.
- 475mV buffer solution (only for Time/pH/Rx Technopool3 systems and pH/Rx).
- pH electrode with 5 m cable.
- Redox electrode with 5 m cable (only for Time/pH/Rx Technopool3 systems and pH/Rx).
- Chlorine electrode with 5 m cable (only for pH/CIJ Technopool3 systems).
- Hydrogen peroxide electrode with 5 m cable (only for pH/HP Technopool3 systems).
- 3-wire temperature probe PT100 with 5 m cable.
- DN50 collars (4pcs).
- Suction filter (2 or 3 pcs).
- Injection valve (2 or 3 pcs).
- Probe holder (1 or 2 pcs).
- Suction and delivery tubes.

2.0 INSTALLATION

- In vertical position with an uncertainty not higher than +/-15°.
- Away from heat sources and in a dry place, with room temperature ranging between 0°C and 45°C.
- In a ventilated place and easily accessible to an operator for ordinary maintenance.
- At maximum 1.5 m high from the liquid to be dosed.
- Do not install the system above the chemical tank if it emits smoke, unless the container is not hermetically closed.

2.1 WALL MOUNTING

Place the system on a wall close to the dosing section and follow the instructions described below.



2.2 ELECTRICAL CONNECTIONS

Before proceeding with the installation, ensure the presence of a suitable earthing connection and of an appropriate sensitive differential switch. Observe electrical values indicated on the system label.

ATTENTION: Before carrying out maintenance on the system, always disconnect the power supply. Always check all electrical connections, by using a multimeter.

An incorrect voltage may damage the system not covered by the guarantee. The following manual must always be kept as reference for any electrical connection. All electrical connections must be carried out in compliance with local laws regarding electrical systems.

CAUTION !!!!!



Verify that the earth system is perfectly functional and complies with the applicable regulations. Ensure the unit is connected to a circuit protected by a highly sensitive (0.03A) RCCB circuit breaker. If unsure please consult a competent electrician. Verify that the rated values of the pump are compatible with those of the mains. Never install the pump directly in parallel with inductive loads (e.g. motors/solenoid valves) if necessary, use an isolating relay.

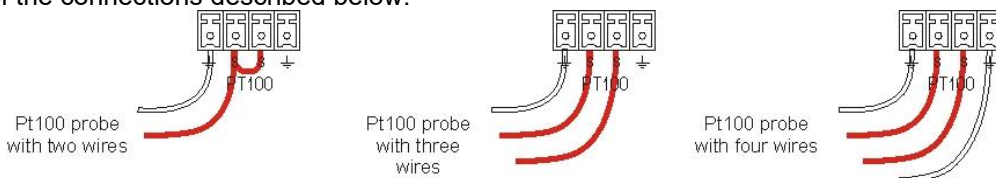
There are 2 protection devices inside the pump: a varistor and a fuse.

2.2.1 Main power supply

Connect a voltage between 100 and 240VCA - 50/60Hz on clamp F N

2.2.2 Temperature probe

Connection of the temperature probe PT100 to the corresponding clamp; depending on the probe model available, carry out one of the connections described below:



2.2.3 Flow signal

Connect the flow sensor signal on input **PROX**.

2.2.4 Dosing enabling signal (V1)

Connect the enablement signal to the dosing (20-230VAC) on input **CHARGE**.

2.2.5 P1 pump product level probe (only for technopool3)

Connect the level probe (on/off contact, without voltage) to input **LEVEL DET**.

2.2.6 pH pump product level probe

Connect the level probe (on/off contact, without voltage) to input **LEVEL RIN**.

2.2.7 P2/Rx/CI/HP pump product level probe

Connect the level probe (on/off contact, without voltage) to input **LEVEL SAN**.

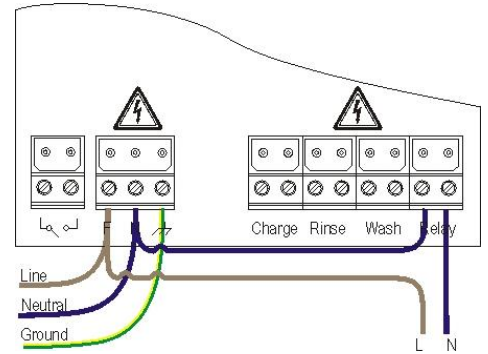
2.2.8 Alarm output – 24V OUT Clamp

It is an alarm repetition output that provides a voltage at **30VCC with a maximum absorption of 500mA**.

2.2.9 Solenoid valve output – RELAY Clamp

RELAY clamp provides a dry contact (not live) and it is used to control the solenoid valve.

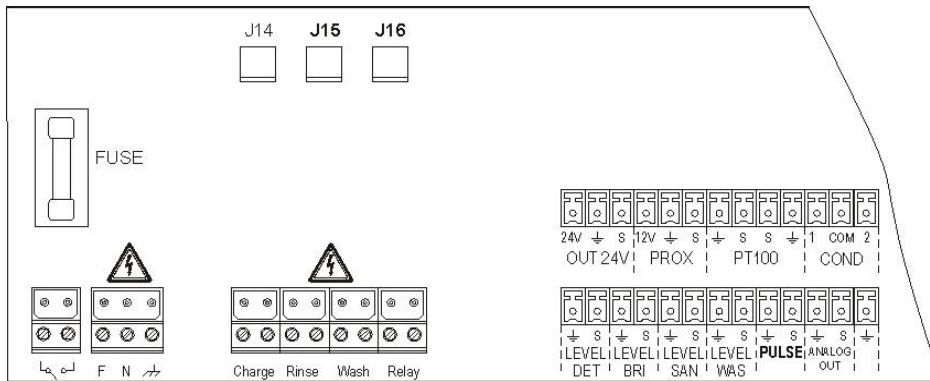
To have a voltage on the **RELAY** clamp equal to the power voltage, i.e. 230VAC, follow the diagram indicated on the side.



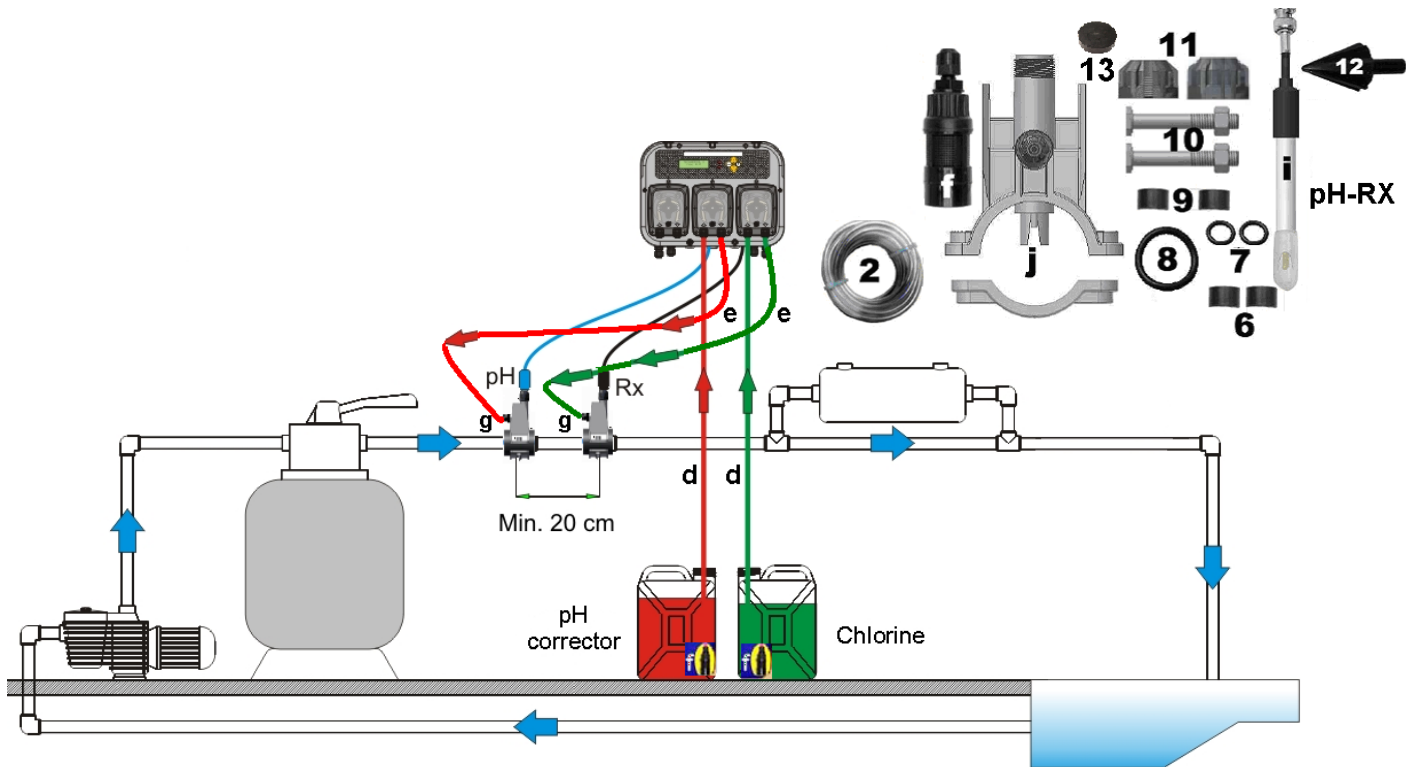
2.2.10 Pump switches

The system can be set with dose enable switches for each pump, which block the dosing of the associated pump. Switches are connected to the circuit in the following way:

- P1 Pump on input **pulse**
- pH Pump on connector **J16**
- P2/Rx/CI/HP Pump on connector **J15**



2.3 HYDRAULIC CONNECTIONS



2.3.1 Assembly of the accessories

Probe holder assembly

- The injection probe holder (j) can be installed on a DN50 or DN60 PVC tube, after a 24mm hole has been drilled
- Ensure the injection tube is inserted so that it points in the direction of flow marked by the arrow
- The injection probe holder must be installed within ± 45° of the vertical.

How to make D24mm hole

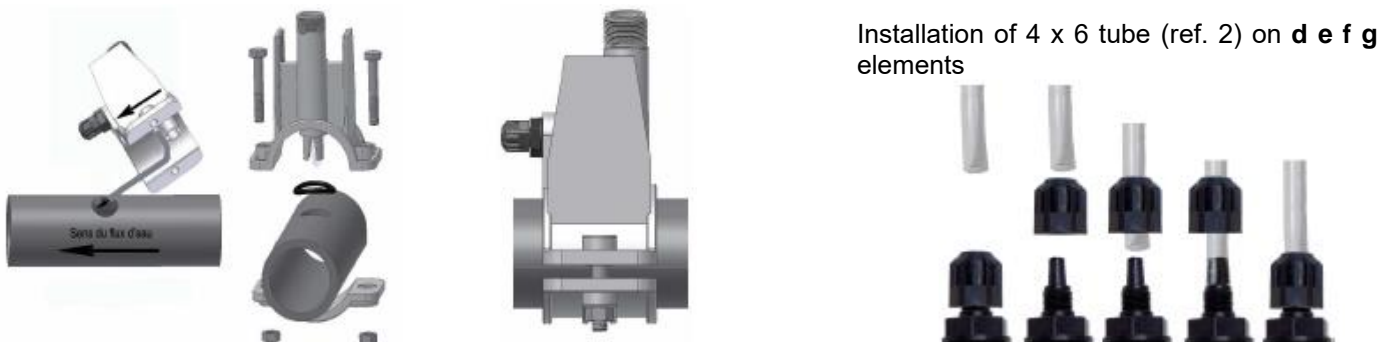
- Drill a 5 mm pilot hole in the top of the PVC tube
- Enlarge the hole with the special tool D24mm supplied in the kit
- Remove any burrs from the hole

2 in 1 Probe holder installation(ref. j) :

- Put the o-ring (ref. 8) on the injection tube
- Insert the injection tube inside the PVC tube, ensuring that the injection is in the same direction as the pool circulation (indicated by the arrow on the sticker)
- Put the big o-ring in its seat keeping it in its position, place the upper part of the probe holder (ref. j) on the PVC tube
- Use the screws to join the 2 parts of the probe holder (if the PVC pipe is DN63 use the 2 spacer (ref. 9))



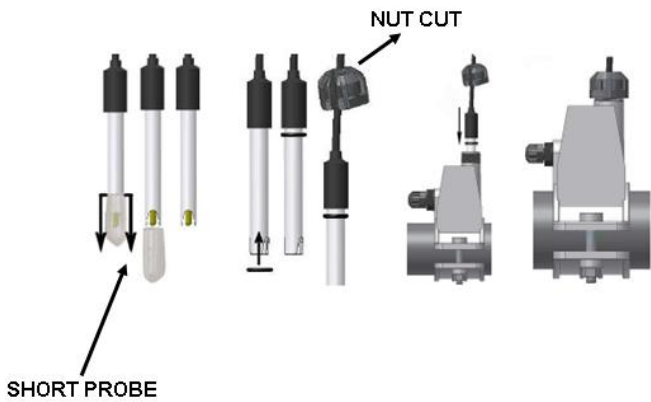
Warning Do not fully tighten one nut before the other.



Short probe Installation (ref. i)

- 1) Remove the cap from the electrode (**do not throw away the cap as it is required for maintenance and winter storage**) Whilst the electrode is out of the system fill the cap ¾ full with water before capping the probe.
- 2) Put 1 o-ring (ref. 7) on the electrode body

- 3) Let the electrode cable pass through the cut on the nut (ref. 11)
- 4) Proceed with electrode calibration, (see chapter 4.10-4.11)
- 5) Carefully insert the electrode in the probe holder, until the o-ring reach its seat between the cap and the probe holder. Then screw the nut with care (ref. 11).

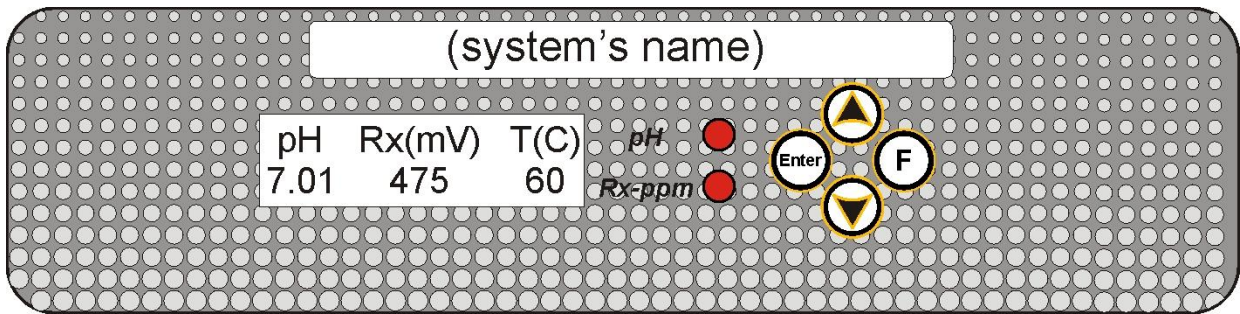


Long probe Installation (120 mm)

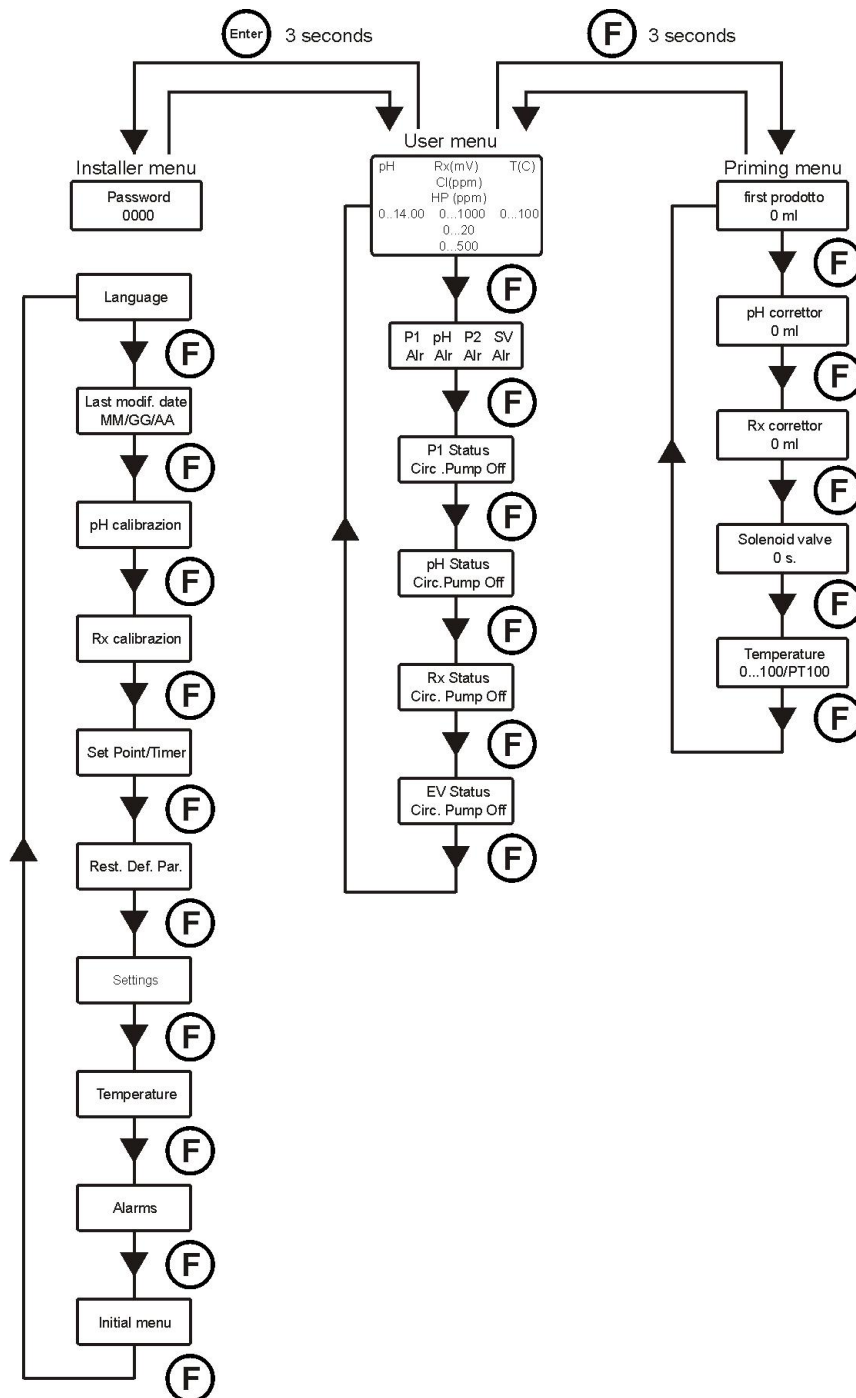
- A standard electrode (12x120 mm) can be used, in that case you must use all the accessories inside the kit
- Put the nut (ref. 11) on the probe body and than, alternatively, one spacer (ref. 6) and one o-ring (ref. 7), like shown in the picture on the side
- Insert with care the electrode in the probe holder, having care that all the components reach their seats. Then screw the nut with care (ref. 11).

Warning Do not bend the electrode otherwise it will be damaged. Electrode inner part is very fragile.

3.0 TECHNOPOOL MENU

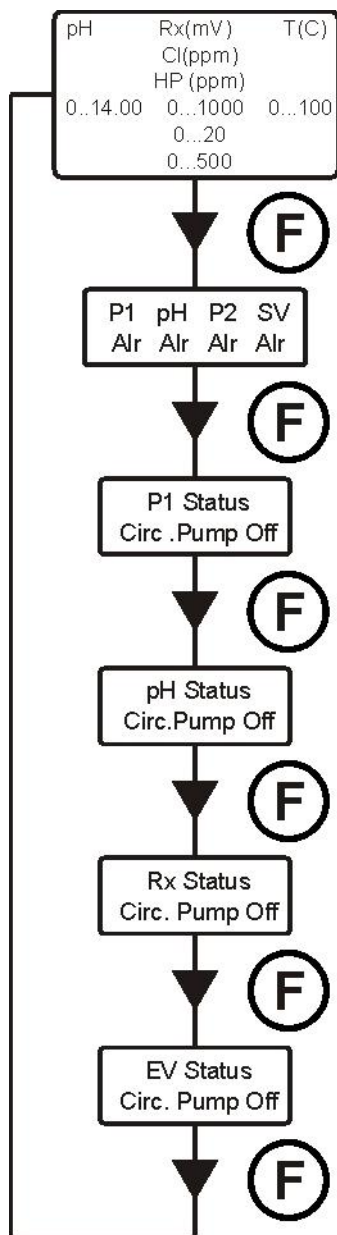


Tecnpool programming system is divided in 2 menus: **User** and **Installer**.



3.1 USER MENU

The User Menu is used to verify the status of pumps and solenoid valve and also allows to prime the pumps.



Default screen shows the reading of the pH and Rx or Cl or HP and the temperature.
(redox in mV is displayed on Time/pH/Rx and pH/Rx Technopool3).
(the chlorine in ppm is only displayed on the Technopool3 pH/Cl).
(the hydrogen peroxide in ppm is only displayed on the Technopool3 pH/HP).

Shows the status and the alarm of the pumps and solenoid valve.
(P2 and EV are not displayed on Time/pH Technopool3).
(P1 is not displayed on pH/Rx or pH/Cl or pH/HP Technopool3).

Displays the status of P1 pump (it is not displayed on pH/Rx, pH/Cl and pH/HP Technopool3).

Status	Description
Active	The pump is active
Inactive	The pump is inactive
Flow alarm	Flow alarm active
Circ. Pump Off	The recirculation pump is not operating
Switch Off	The pump switch is set on OFF
Level alarm	The product tank is empty

Displays the status of pH pump.

Status	Description
Active	The pump is active
Inactive	The pump is inactive
Flow alarm	Flow alarm active
Circ. Pump Off	The recirculation pump is not operating
Switch Off	The pump switch is set on OFF
Level alarm	The product tank is empty
Range alarm	Reading of pH out of the allowed range
OFA alarm	Dosing alarm
Stabilisation	Stabilisation of the probe reading

Displays the status of P2/Rx/Cl/HP pump (it is not displayed on Time/pH Technopool3).

Status	Description
Active	The pump is active
Inactive	The pump is inactive
Flow alarm	Flow alarm active
Circ. Pump Off	The recirculation pump is not operating
Switch Off	The pump switch is set on OFF
Level alarm	The product tank is empty
OFA alarm	Dosing alarm
Stabilisation	Stabilisation of the probe reading

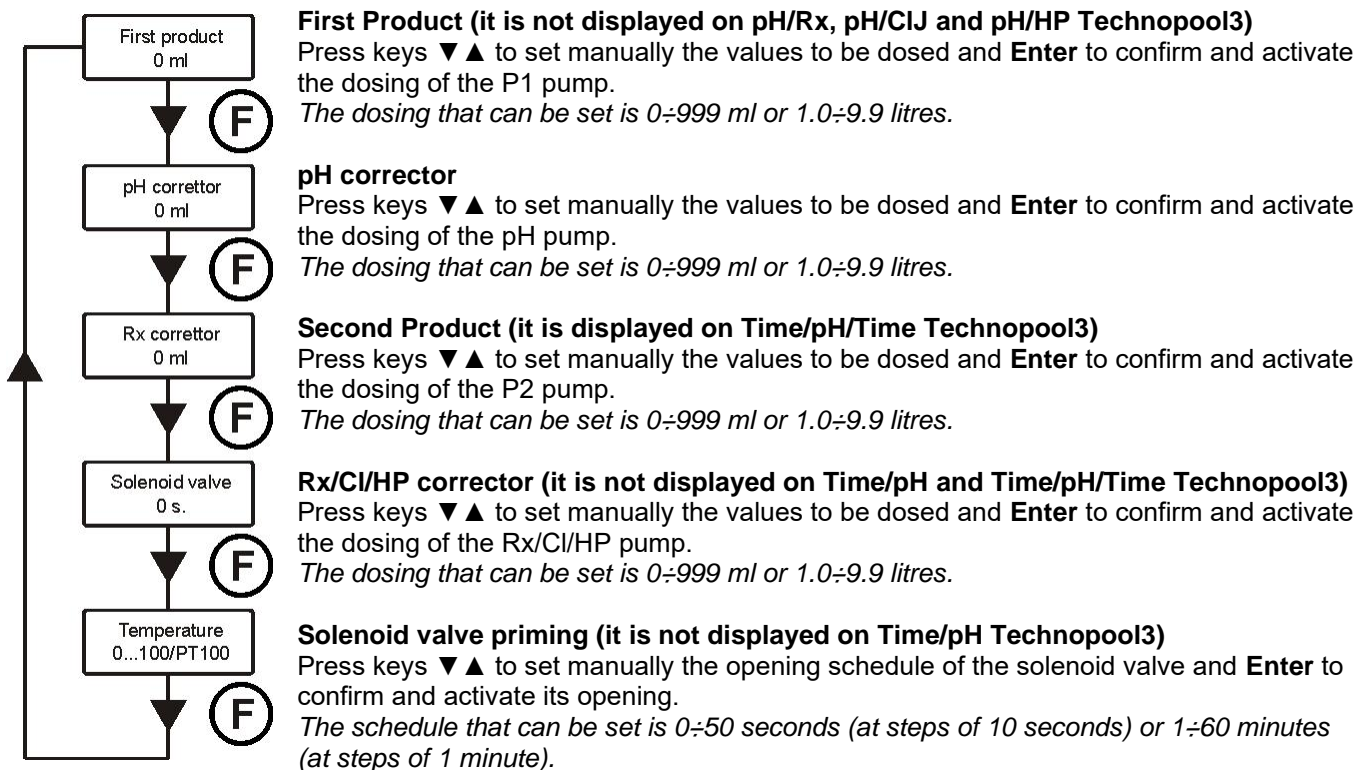
Displays the status of the solenoid valve (it is not displayed on Time/pH Technopool3).

Status	Description
Active	The solenoid valve is active
Inactive	The solenoid valve is inactive
Flow alarm	Flow alarm active
Circ. Pump Off	The recirculation pump is not operating
Stabilisation	Stabilisation of the probe reading

3.1.1 Manual activation of pumps and solenoid valve

The priming sub-menu can be accessed from the user menu, which allows the manual operation of pumps and solenoid valve.

To access this menu, press key **F** for 3 seconds; the following options will be displayed:



Temperature (is displayed only if the temperature is not set on OFF)

Press keys ▼▲ to set the required temperature, only if the temperature has been set manually.

The temperature can be set at 0÷100° C.

Press key **F** for 3 seconds to exit the priming menu, or exit automatically after a minute without pressing any key.

3.2 INSTALLER MENU

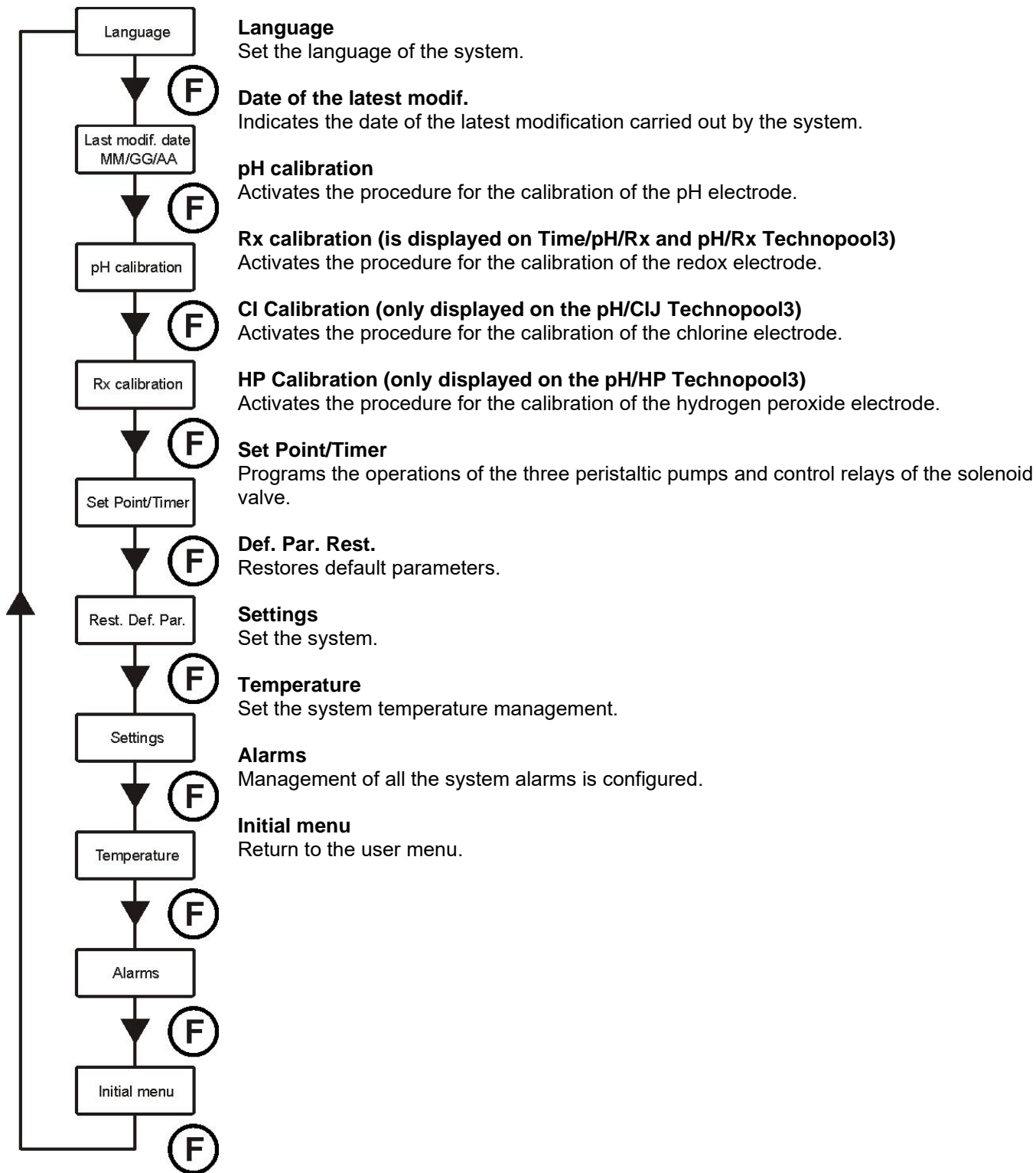
The installer menu is used to program Technopool system.

To access this menu, press key **Enter** for 3 seconds; password request will be displayed:

3.2.1 Password insertion

Password 0000	Press keys ▼▲ to set the value; to pass to the next digit press key Enter ; to confirm press Enter for 3 seconds. <i>The default password is 0000.</i>
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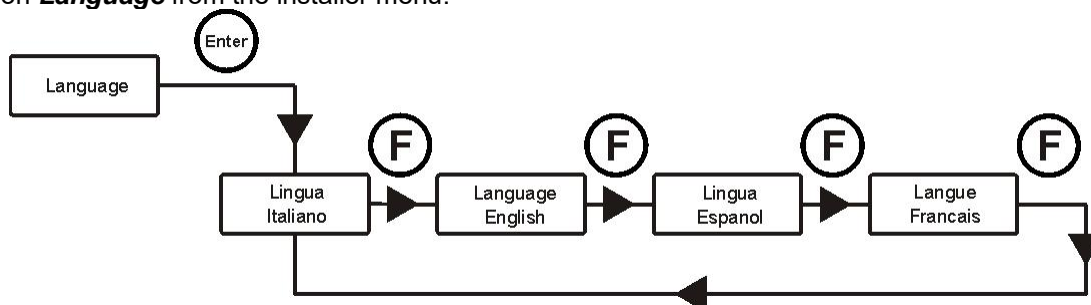
Once the password is confirmed, the installer menu will be displayed.



4.0 QUICK PROGRAMMING

4.1 SELECTION OF THE LANGUAGE OF THE SYSTEM

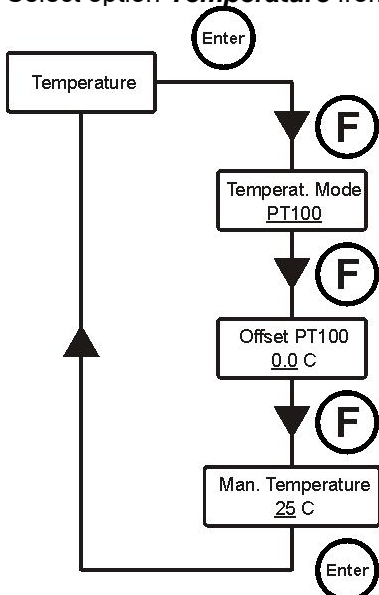
Select option **Language** from the installer menu.



To confirm and exit, press key **Enter** for 3 seconds.

4.2 SETTING THE TEMPERATURE

Select option **Temperature** from the installer menu.



Temperat. Mode

Indicates how the temperature is managed: manually, automatically (with probe PT100) or OFF (deactivated).

Press keys **▼▲** to select the mode and **Enter** to confirm.

PT100 offset (only if the Temperat. Mode is PT100)

This parameter allows to adjust the temperature display. In fact, the offset value can be added to or removed from the measured temperature, so to display the desired value. This parameter is not considered for the calculation of the dosing but only for the display.

Press keys **▼▲** to set the desired value and **Enter** to confirm.

Values that can be set are $-5.0 \div 10.0$.

Man. Temperatur. (only if the Temperat. Mode is Manual)

It represents the coefficient for calculating the compensation of conductivity; it is recommended to leave the default value.

Press keys **▼▲** to set the desired value and **Enter** to confirm.

Values that can be set are $0 \div 100^\circ \text{C}$.

To confirm and exit, press key **Enter** for 3 seconds.

4.3 SETTING OF THE CYCLIC DOSING (PUMP P1) – IT IS NOT DISPLAYED ON PH/RX, PH/CLJ AND PH/HP TECHNOPOOL3

Depending on whether the temperature has been programmed, the following parameters must be set for the pump operation for the cyclic dosing:

Temperature OFF (disabled):

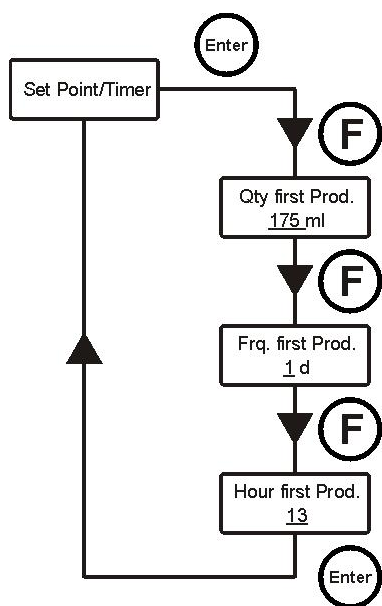
Qty first Prod. – Frq. first Prod. – Hour first. Prod.

Manual temperature or with PT100:

Qty first Prod. – Qty first P. TMax – Frq. first Prod. – Hour first. Prod.

Enter the installer menu, select option **Set Point/Timer** and press key **Enter**.

Temperature OFF (disabled):



Qty first Prod.

Indicates the quantity to be dosed in ml or litres. Press keys ▼ ▲ to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

Frq. first Prod.

Indicates the activation frequency of the pump dosing, which can be set in hours or days. Values that can be set are 1÷23 hours or 1÷7 days (d).

Hour first Prod. (only if the frequency has been programmed in days)

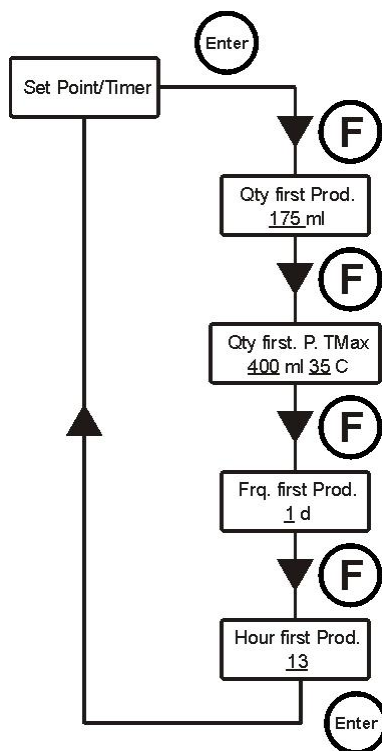
Indicates the activation hour. If it is left in **Auto**, the activation occurs immediately after the programming. Values that can be set are 0÷23 hours or **Auto**.

Example:

- First Prod. Qty = 400 ml
- First Prod. Freq. = 2 d
- First Prod. Hour = 13

The system activates P1 pump to dose 400 ml of product every two days at h13.00.

Manual temperature or with PT100:



Qty first Prod.

Indicates the quantity to be dosed in ml or litres. Press keys ▼ ▲ to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

Qty first P. TMax

Indicates the quantity to be dosed (0÷999 ml or 1.0÷9.9 litres) to the programmed maximum temperature (23÷36°C) Press keys ▼ ▲ to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

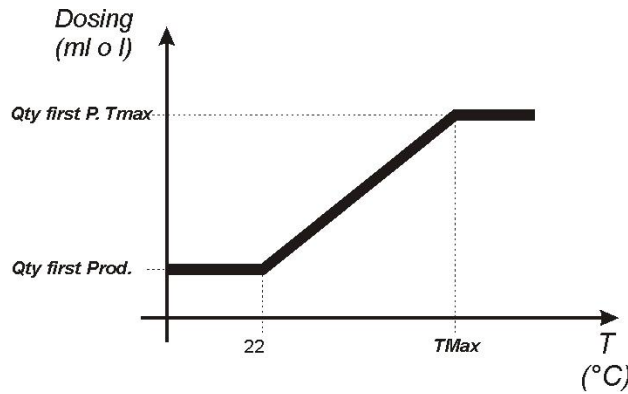
Frq. first Prod.

Indicates the activation frequency of the pump dosing, which can be set in hours or days. Values that can be set are 1÷23 hours or 1÷7 days (d).

Hour first Prod. (only if the frequency has been programmed in days)

Indicates the activation hour. If it is left in **Auto**, the activation occurs immediately after the programming. Values that can be set are 0÷23 hours or **Auto**.

The quantity of product to be dosed is proportional to the temperature reached during the latest dosing, according to the diagram below:



To calculate exactly the dosing, the following formula can be applied:

$$\text{Dosing (ml)} = \frac{(\text{Qty first P. Tmax} - \text{Qty first Prod.}) \times (\text{Temp. max. last dosing} - 22)}{(\text{TMax first Prod.} - 22)} + \text{Qty first Prod.}$$

Example:

- First Prod. Qty = 174 ml
- TMax. first P. Qty = 400 ml @ 35°C
- First Prod. Freq. = 5 h
- First Prod. Hour = N.A.

The system activates P1 pump every 5 hours. If the temperature reached during the latest dosing is 28°C, then the pump will dose:

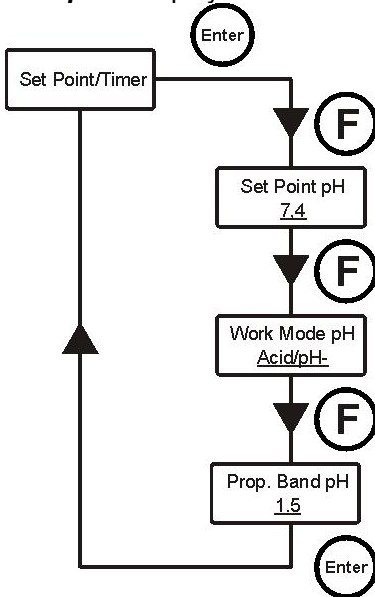
$$\text{Dosing (ml)} = \frac{(400 - 174) \times (28 - 22)}{(35 - 22)} + 174 = \frac{(226) \times (6)}{(13)} + 174 = \frac{(1356)}{(13)} + 174 = 104 + 174 = 278$$

4.4 SETTING THE pH (PUMP pH)

The following parameters must be programmed for pH pump operation:

Set Point pH – Work Mode pH – Prop. Band pH

Enter the installer menu, select option **Set Point/Timer**, press key **Enter** and then key **F** more than once, until **Set Point pH** is displayed:



Set Point pH

The setpoint indicates the value of pH that is intended to keep. Press keys **▼▲** to set the desired setpoint and **Enter** to confirm. *Setpoint values that can be set are 5.0÷9.0 pH.*

Work mode pH

The operation mode sets the type of solution it is being dosed: Acid (the pump starts dosing when the value read by the probe is higher than the Setpoint) or Alkaline (the pump starts dosing when the value read by the probe is lower than the Setpoint). Press keys **▼▲** to select the two options and **Enter** to confirm. *pH Work mode that can be set is Acid/pH- or Alkaline/pH+.*

Proportional band pH

Represents the value of the band for the proportional dosing in time. The pump can be active for maximum 300 seconds. If it is activated for less time, it must be inactive for a time equal to the difference between the set pH cycle period (refer to par. 5.1) and the activation time. Press keys **▼▲** to set the desired value and **Enter** to confirm.

The proportional band can be selected among the following values: 0.5 – 1 – 1.5 – 3 pH.

Time T_{ON} of pump activation is calculated with the following formula:

$$T_{ON} = \frac{300}{\text{Prop. Band pH} : |(\text{Read value pH} - \text{Set Point pH})|}$$

Read value - Set point difference is considered an absolute value.

On the other hand, T_{OFF} is the difference between the set pH cycle period – T_{ON}.

Example:

Set Point pH = 7 pH

Work Mode pH = Acid/pH

Prop. band pH = 1.5 pH

Read value pH = 7.5 pH

$$T_{ON} = \frac{300}{1.5 : |(7,5 - 7)|} = \frac{300}{1.5 : |(0,5)|} = \frac{300}{1.5 : (0,5)} = \frac{300}{3} = 100 \text{ s.}$$

If during the dosing the pump reaches the setpoint, then it stops for the time obtained by the difference between the set pH cycle period (refer to par. 5.1) and the time the pump was active.

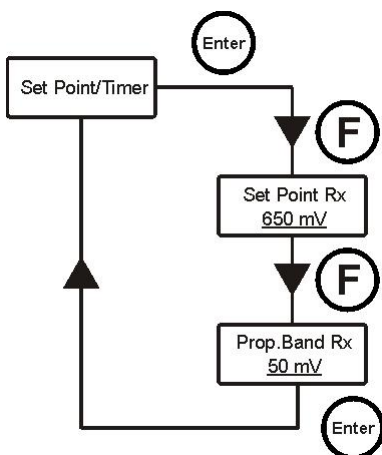
4.5 SETTING THE REDOX (P2 PUMP) (it is displayed for Time/pH/Rx and pH/Rx technopool3)

P2 Pump doses proportionally to the setpoint reading.

The following parameters must be programmed for redox pump operation:

Set Point Rx – Prop. band Rx

Enter the installer menu, select option **Set Point/Timer**, press key **Enter** and then key **F** more than once, until **Set Point Rx** is displayed:



Set Point Rx

The setpoint indicates the value of Rx that is intended to keep. Press keys ▼▲ to set the desired setpoint and **Enter** to confirm.

Setpoint values that can be set are 0÷1000 mV.

Proportional band Rx

Represents the value of the band for the proportional dosing in time.

The pump can be active for maximum 300 seconds. If it is activated for less time, it must be inactive for a time equal to the difference between 300 and the activation time.

Press keys ▼▲ to set the desired value and **Enter** to confirm.

The proportional band can be selected among the following values:
20 – 50 – 100 – 200 mV.

Time T_{ON} of pump activation is calculated with the following formula:

$$T_{ON} = \frac{300}{\text{Prop. Band Rx} : |(\text{Read value Rx} - \text{Set Point Rx})|}$$

Read value - Set point difference is considered an absolute value.

On the other hand, T_{OFF} is the difference between 300 – T_{ON}.

Example:

Set Point Rx= 700 mV

Prop. band Rx = 50 mV

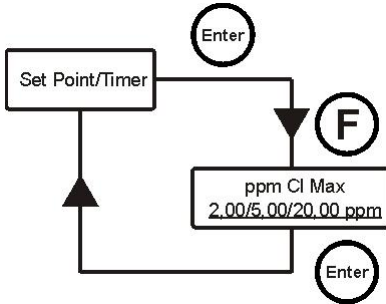
Read value Rx = 675 mV

$$T_{ON} = \frac{300}{50 : |(675 - 700)|} = \frac{300}{50 : |(-25)|} = \frac{300}{50 : (25)} = \frac{300}{2} = 150 \text{ s.}$$

If during the dosing the pump reaches the setpoint, then it stops for the time obtained by the difference between 300 seconds and the time the pump was active.

**4.6 SETTING THE CHLORINE PROBE (PUMP P2)
(it is displayed for technopool3 pH/CIJ)**

The full reading scale of the chlorine probe is set in the **ppm Cl Max** menu.
Enter the **Set Point/Timer** menu to set this parameter:



ppm Cl Max

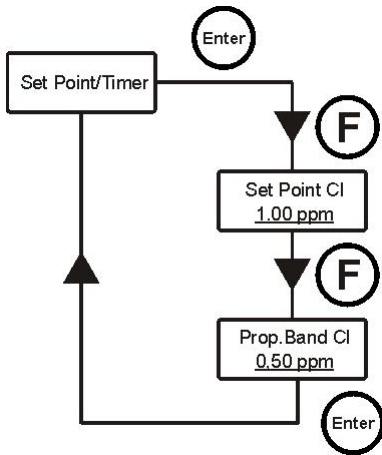
This represents the full reading scale of the chlorine probe.
Use the ▼▲ keys to select the desired value and then confirm with the **Enter** key.
*The full scale value can be selected among the following values:
2.00 – 5.00 – 20.00 ppm.*

**4.6.1 Setting the chlorine (pump P2)
(it is displayed for technopool3 pH/CIJ)**

Pump P2 doses proportionally to the setpoint reading.
The following two parameters must be programmed for the chlorine pump to work:

Set Point Cl – Prop. Band Cl

Enter the installer menu, select **Set Point/Timer**, press **Enter** and then press the **F** key repeatedly until **Set Point Cl** appears on the display:



Set Point Cl

The setpoint indicates the desired chlorine value.
Use the ▼▲ keys to set the desired setpoint and then confirm with the **Enter** key.
The setpoint that can be set ranges between 0.00 and the set full scale (ppm Cl Max).

Prop. Band Cl

Represents the value of the band for the proportional dosing in time.
The pump can be active for maximum 300 seconds. If it is activated for less time, it must be inactive for a time equal to the difference between 300 and the activation time.
Use the ▼▲ keys to set the desired value and then confirm with the **Enter** key.
*The proportional band can be selected among the following values:
0.04 – 0.10 – 0.20 – 0.50 – 1.00 – 1.50 – 2.00 – 4.00 ppm*

Pump activation time T_{ON} is calculated with the following formula:

$$T_{ON} = \frac{300}{\text{Prop. Band Cl} : |(\text{Read value Cl} - \text{Set Point Cl})|}$$

*The **Read value - Set Point** difference is considered an absolute value.*
Whereas, T_{OFF} is the difference between 300 - T_{ON}.

Example:

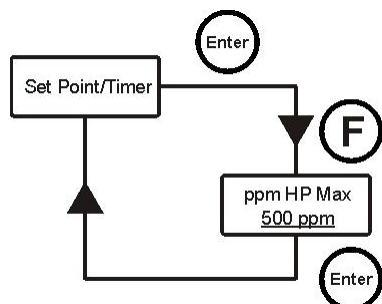
Set Point Cl = 1.00 ppm
Prop. Band Cl = 2.00 ppm
Read value Cl = 0.50 ppm

$$T_{ON} = \frac{300}{2 : |(0,5 - 1)|} = \frac{300}{2 : |(-0,5)|} = \frac{300}{2 : (0,5)} = \frac{300}{4} = 75 \text{ s.}$$

If during the dosing the pump reaches the setpoint, it stops for the time obtained by the difference between 300 seconds and the time the pump was active.

**4.7 SETTING THE HYDROGEN PEROXIDE PROBE (PUMP P2)
(it is displayed for technopool3 pH/HP)**

The full reading scale of the hydrogen peroxide probe is set in the **ppm HP Max** menu.
Enter the **Set Point/Timer** menu to set this parameter:



ppm HP Max

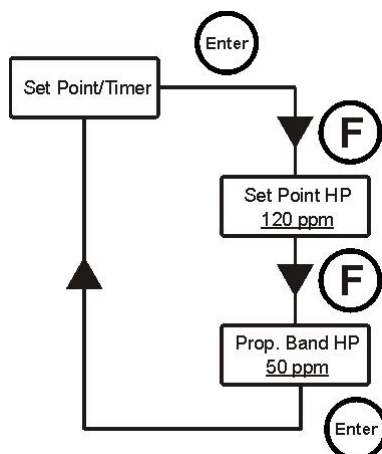
This represents the full reading scale of the hydrogen peroxide probe. Use the ▼▲ keys to select the desired value and then confirm with the **Enter** key.
The full scale value that can be selected is 500 ppm.

**4.7.1 Setting the hydrogen peroxide (pump P2)
(it is displayed for technopool3 pH/HP)**

Pump P2 doses proportionally to the setpoint reading.
The following two parameters must be programmed for the chlorine pump to work:

Set Point HP – Prop. Band HP

Enter the installer menu, select **Set Point/Timer**, press **Enter** and then press the **F** key repeatedly until **Set Point HP** appears on the display:



Set Point HP

The setpoint indicates the desired hydrogen peroxide value. Use the ▼▲ keys to set the desired setpoint and then confirm with the **Enter** key.
The setpoint that can be set ranges between 0.00 and the set full scale (ppm HP Max).

Prop. Band HP

Represents the value of the band for the proportional dosing in time. The pump can be active for maximum 300 seconds. If it is activated for less time, it must be inactive for a time equal to the difference between 300 and the activation time.
Use the ▼▲ keys to set the desired value and then confirm with the **Enter** key.
*The proportional band can be selected among the following values:
50 – 100 – 200 – 300 – 400 ppm.*

Pump activation time T_{ON} is calculated with the following formula:

$$T_{ON} = \frac{300}{\text{Prop. Band HP} : |(\text{Read value HP} - \text{Set Point HP})|}$$

The Read value - Set Point difference is considered an absolute value.
Whereas, T_{OFF} is the difference between 300 - T_{ON}.

Example:

Set Point HP = 120 ppm
Prop. band HP = 60 ppm
Read value HP = 150 ppm

$$T_{ON} = \frac{300}{60 : |(150 - 120)|} = \frac{300}{60 : |(30)|} = \frac{300}{2} = 150 \text{ s.}$$

If during the dosing the pump reaches the setpoint, it stops for the time obtained by the difference between 300 seconds and the time the pump was active.

**4.8 SETTING THE CYCLIC DOSING (PUMP)
(it is displayed for Time/pH/Time technopool3)**

Depending on whether the temperature has been programmed, the following parameters must be set for the pump operation for the cyclic dosing:

Temperature OFF (disabled):

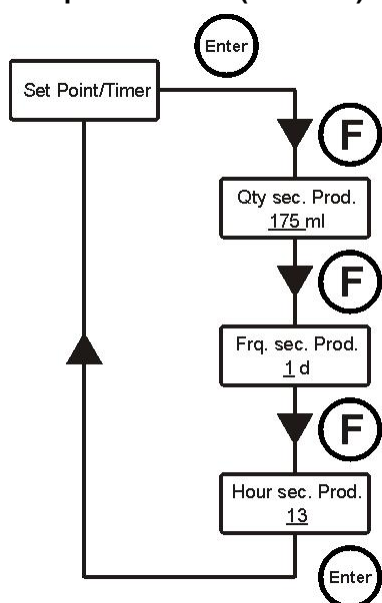
Qty Sec. Prod.– Frq. sec. Prod.– Hour sec. Prod

Manual temperature or with PT100:

Qty sec. Prod. – Qty sec. P. TMax – Frq. sec. Prod. – Hour sec. Prod.

Enter the installer menu, select option **Set Point/Timer** and press key **Enter**.

Temperature OFF (disabled):



Qty sec. Prod.

Indicates the quantity to be dosed in ml or litres. Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

Frq. sec. Prod.

Indicates the activation frequency of the pump dosing, which can be set in hours or days. Values that can be set are 1÷23 hours or 1÷7 days (d).

Hour sec. Prod. (only if the frequency has been programmed in days)

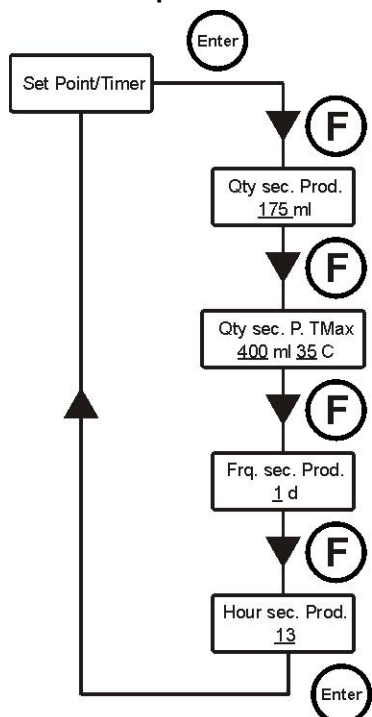
Indicates the activation hour. If it is left in **Auto**, the activation occurs immediately after the programming. Values that can be set are 0÷23 hours or Auto.

Example:

*Sec. Prod. Qty = 400 ml
Sec. Prod. Freq. = 2 d
Sec. Prod. Hour = 13*

The system activates P2 pump to dose 400 ml of product every two days at h13.00.

Manual temperature or with PT100:



Qty sec. Prod.

Indicates the quantity to be dosed in ml or litres. Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

Qty sec. P. TMax

Indicates the quantity to be dosed (0÷999 ml or 1.0÷9.9 litres) to the programmed maximum temperature value (23÷36°C) Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷999 ml or 1.0÷9.9 litres.

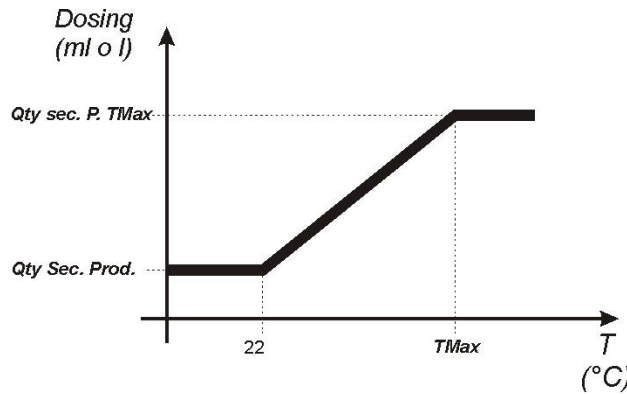
Frq. Sec. Prod.

Indicates the activation frequency of the pump dosing, which can be set in hours or days. Values that can be set are 1÷23 hours or 1÷7 days (d).

Hour sec. Prod. (only if the frequency has been programmed in days)

Indicates the activation hour. If it is left in **Auto**, the activation occurs immediately after the programming. Values that can be set are 0÷23 hours or Auto.

The quantity of product to be dosed is proportional to the temperature reached during the latest dosing, according to the diagram below:



To calculate exactly the dosing, the following formula can be applied:

$$\text{Dosing (ml)} = \frac{(\text{Qty sec. P. TMax} - \text{Qty sec. Prod.}) \times (\text{Temp. max. last dosing} - 22)}{(\text{TMax first Prod.} - 22)} + \text{Qty sec. Prod.}$$

Example:

- Qty sec. Prod. = 174 ml
- Qty sec. P. TMax = 400 ml @ 35°C
- Frq. sec. Prod. = 5 h
- Hour sec. Prod. = N.A.

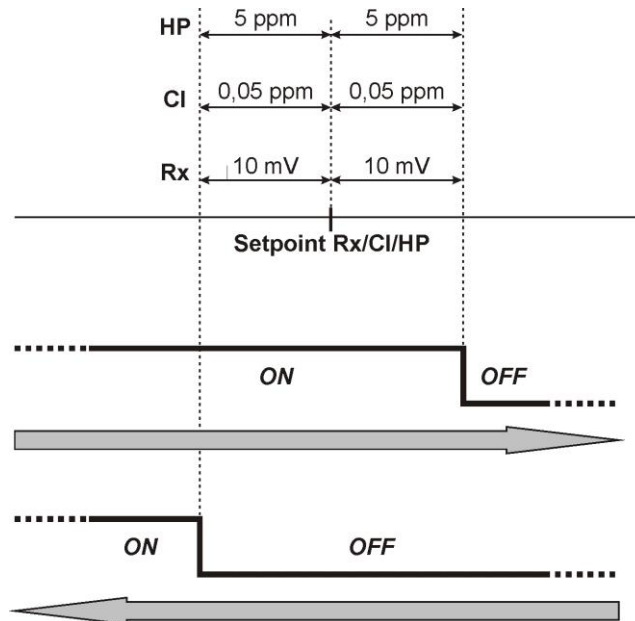
The system activates P2 pump every 5 hours. If the temperature reached during the latest dosing is 28°C, then the pump will dose:

$$\text{Dosing (ml)} = \frac{(400 - 174) \times (28 - 22)}{(35 - 22)} + 174 = \frac{(226) \times (6)}{(13)} + 174 = \frac{(1356)}{(13)} + 174 = 104 + 174 = 278$$

4.9 SETTING THE SOLENOID VALVE

The operation mode of the control relay of the solenoid valve can be ON/OFF or cyclical.

ON/OFF: The relay opening and closing is controlled by the redox/chlorine/hydrogen peroxide reading; if the system reads a value lower than the set Setpoint, then the relay is activated (ON), otherwise it is deactivated (OFF). In this case, a hysteresis of 10 mV (redox, Rx), 0.05 ppm (chlorine, ClJ) or 5 ppm (hydrogen peroxide, HP) must be considered.



Cyclical: The relay opening and closing is continuously controlled by the On and OFF timing, which can be proportional to the temperature (set on automatic or manual) or not (temperature set on OFF).

Manual temperature or with PT100:

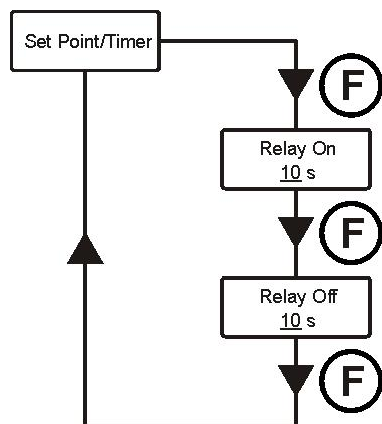
Relay On – Relay On T. Max – Relay Off – Relay Off T. Max

Temperature OFF (disabled):

Relay On – Relay Off

Enter the installer menu, select option **Set Point/Timer**, press key **Enter** and then key **F** more than once, until **Relay On** is displayed:

Temperature OFF (disabled):



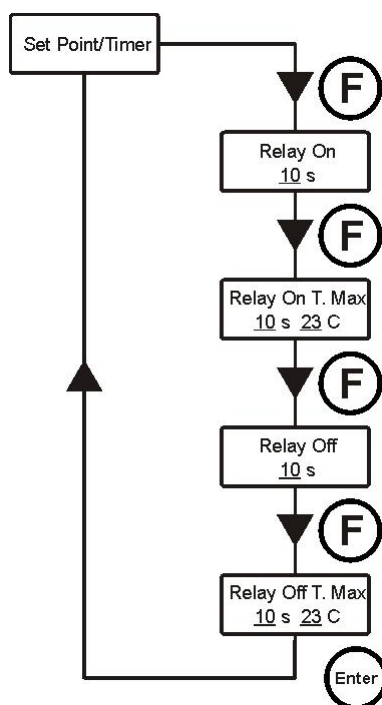
Relay On

It indicates the relay ON schedule (solenoid valve open). Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷59 seconds or 1÷60 minutes.

Relay Off

It indicates the relay OFF schedule (closed solenoid valve). Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷59 seconds or 1÷60 minutes.

Manual temperature or with PT100:



Relay On

It indicates the relay ON schedule (solenoid valve open). Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷59 seconds or 1÷60 minutes.

Relay On T. Max

Indicates the ON timing of the relay (solenoid valve open) to the programmed maximum temperature value. Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set for the timing are 0÷59 seconds or 1÷60 minutes; whereas 23÷36° C for the temperature.

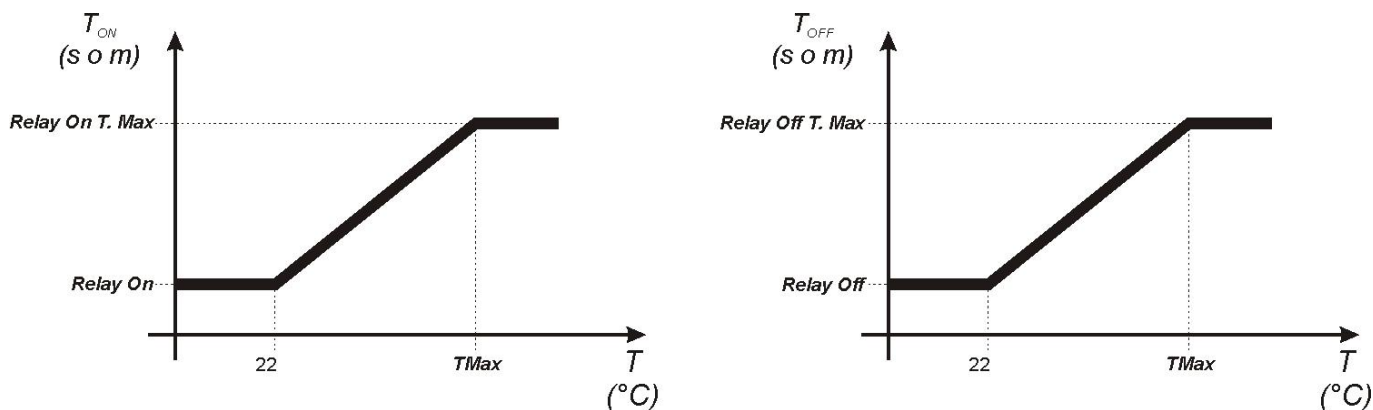
Relay Off

It indicates the relay OFF schedule (closed solenoid valve). Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set are 0÷59 seconds or 1÷60 minutes.

Relay Off T. Max

Indicates the OFF timing of the relay (solenoid valve closed) to the programmed maximum temperature value. Press keys **▼▲** to set the desired value and **Enter** to confirm. Values that can be set for the timing are 0÷59 seconds or 1÷60 minutes; whereas 23÷36° C for the temperature.

The two ON and OFF timings are proportional to the temperature reached during the latest dosing, according to the diagram below:



To calculate exactly the dosing, the following formulas can be applied:

$$T_{ON} = \frac{(\text{Relay On T. Max} - \text{Relay On}) \times (\text{Temp. max. last dosing} - 22)}{(\text{Relay On T. Max} - 22)} + \text{Relay On}$$

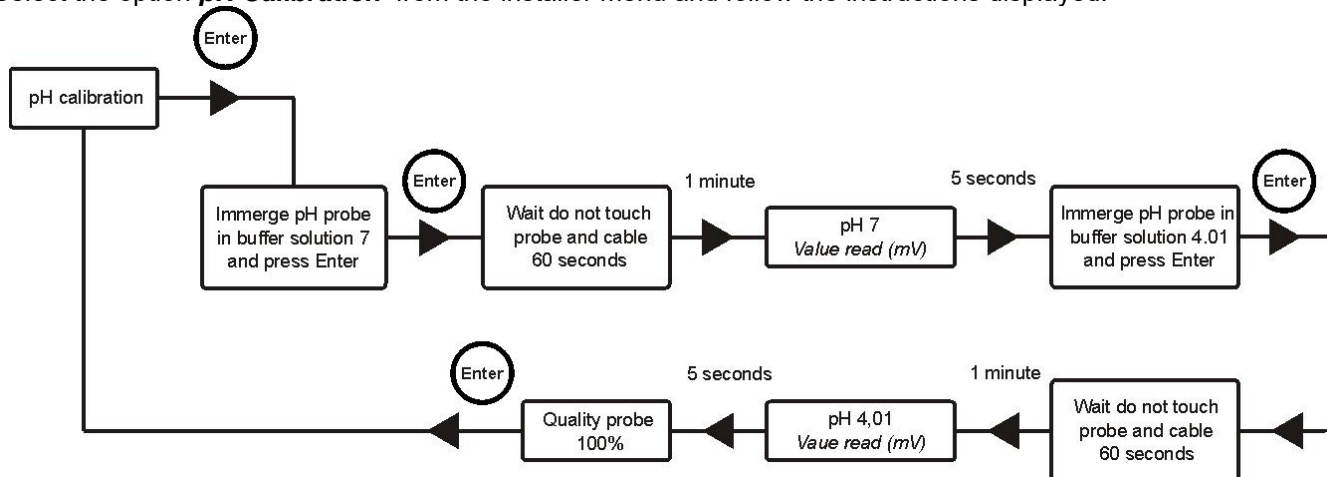
$$T_{OFF} = \frac{(\text{Relay Off T. Max} - \text{Relay Off}) \times (\text{Temp. max. last dosing} - 22)}{(\text{Relay Off T. Max} - 22)} + \text{Relay Off}$$

4.10 CALIBRATION OF PH ELECTRODE

The calibration of the pH electrode is carried out on two points, therefore it is requested to have the following material always available:

- pH 7 buffer solution.
- pH 4,01 buffer solution.
- Container with water for cleaning the electrode (i.e. a glass).

Select the option **pH Calibration** from the installer menu and follow the instructions displayed.



Once carried out the pH 7 calibration, rinse the electrode with water, so to prevent the pH 4 solution from polluting.

Once the procedure is completed, the quality of the calibrated electrode will be displayed; if the quality of the probe results 25% or less, carry out a new calibration.

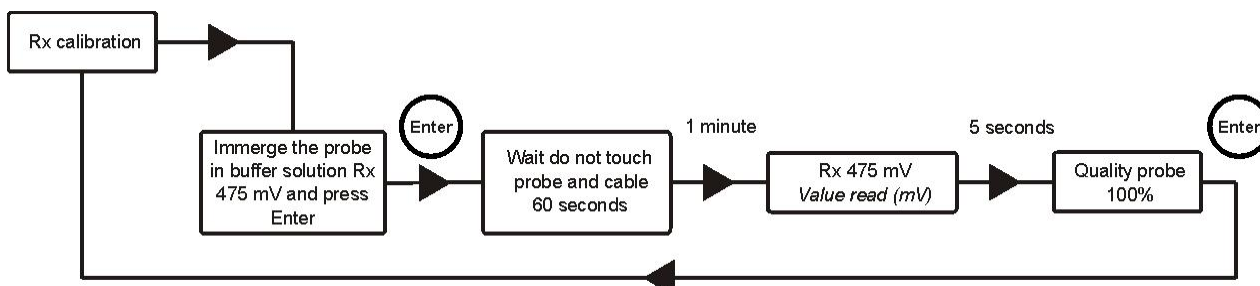
Should the result still be 25% or less, it is recommended to replace the probe.

4.11 CALIBRATING THE REDOX ELECTRODE (it is displayed for Time/pH/Rx and pH/Rx technopool3)

The calibration of the redox electrode is carried out only on one point, therefore it is requested to have the following material always available:

- 475 mV buffer solution.

Select the option **Rx Calibration** from the user menu and follow the instructions displayed.



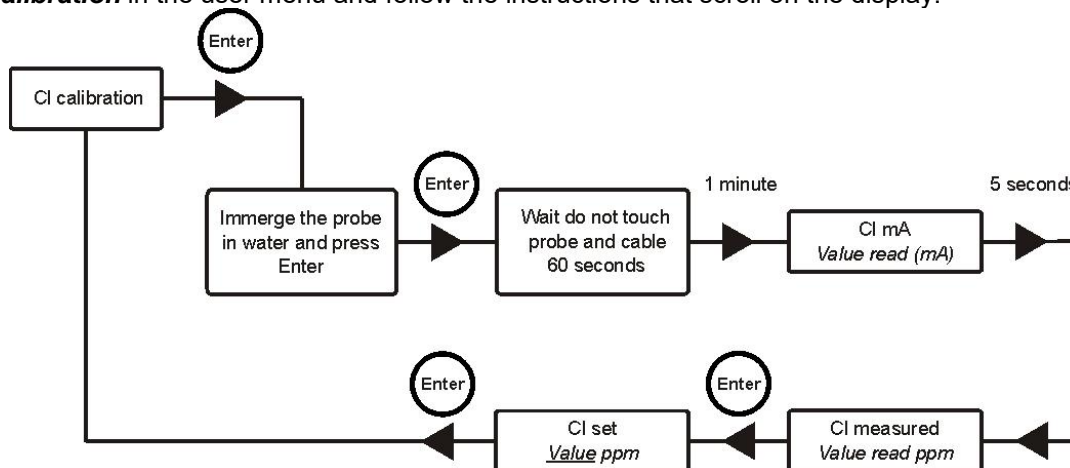
Once the procedure is completed, the quality of the calibrated electrode will be displayed; if the quality of the probe results 25% or less, carry out a new calibration. Should the result still be 25% or less, it is recommended to replace the probe.

4.12 CALIBRATING THE CHLORINE ELECTRODE (it is displayed for technopool3 pH/CIJ)

The calibration of the chlorine electrode is carried out only on one point, therefore the following material must be readily available:

- DPD1 reference instrument.

Select **CI Calibration** in the user menu and follow the instructions that scroll on the display.



When the system acquires the calibration value, two parameters regarding the measure are displayed:

- the current value (0.00÷20.00 mA).
- the measured chlorine value (0.00÷20.00 ppm).

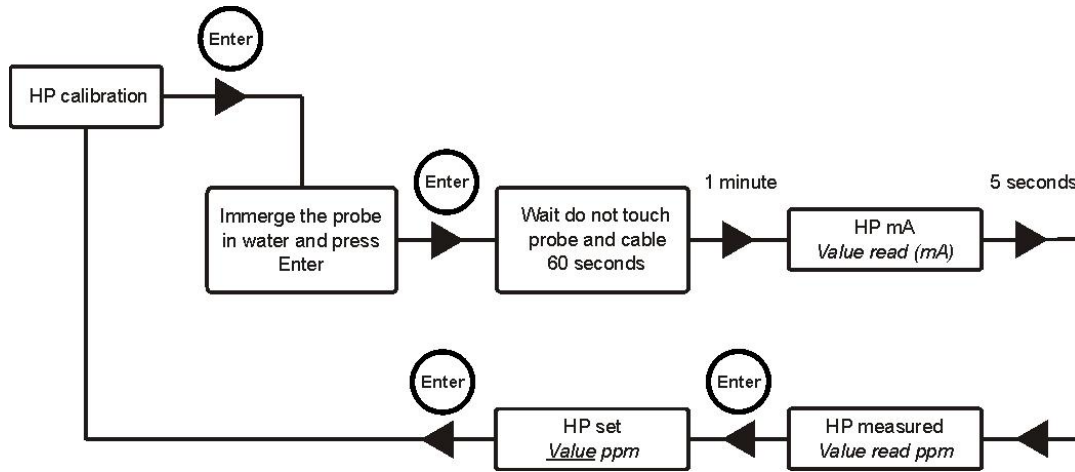
Furthermore, the value detected by the DPD1 reference instrument can be associated with the value measured by the system using the arrow keys in the **CI set** menu. The value that can be set ranges between 0.00 and 20.00 ppm.

4.13 CALIBRATING THE HYDROGEN PEROXIDE ELECTRODE (it is displayed for technopool3 pH/HP)

The calibration of the hydrogen peroxide electrode is carried out only on one point, therefore the following material must be readily available:

- DPD4 reference instrument.

Select **HP Calibration** in the user menu and follow the instructions that scroll on the display.



When the system acquires the calibration value, two parameters regarding the measure are displayed:

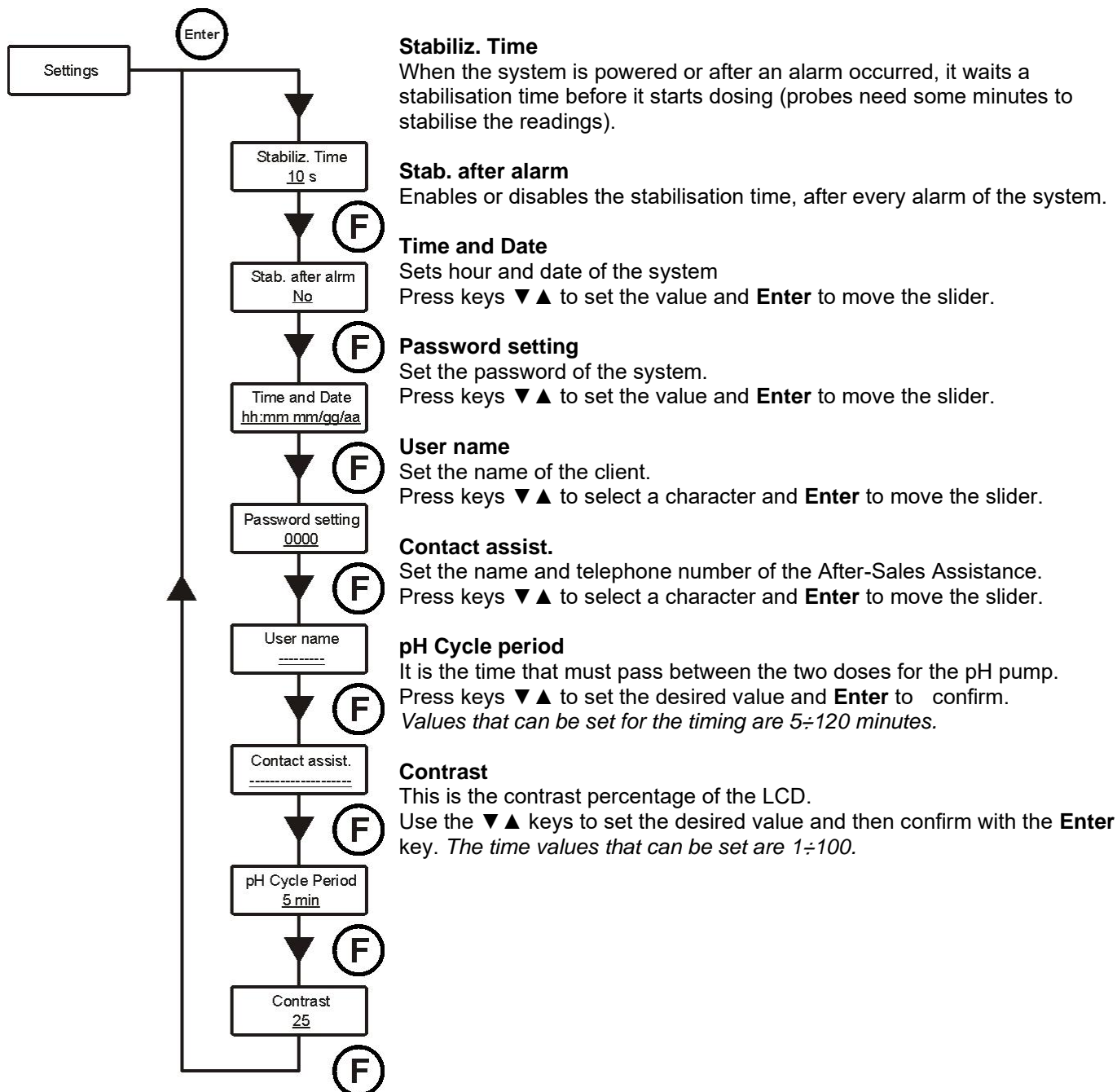
- the current value (0.00÷20.00 mA).
- the measured hydrogen peroxide value (0.0÷500.0 ppm).

Furthermore, the value detected by the DPD4 reference instrument can be associated with the value measured by the system using the arrow keys in the **HP set** menu.

The value that can be set ranges between 0.0 and 500.0 ppm.

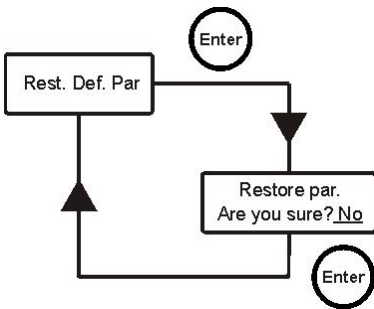
5.0 ADVANCED PROGRAMMING

5.1 CONFIGURATION OF THE SETTINGS



To confirm and exit, press key **Enter** for 3 seconds.

5.2 RESTORE THE DEFAULT PARAMETERS



The restoration of the factory parameters is enabled (refer to appendix 1). The system asks if you are sure to proceed. Press keys ▼▲ to select the two options and **Enter** to confirm.



By activating this function, all programmed data will get lost!

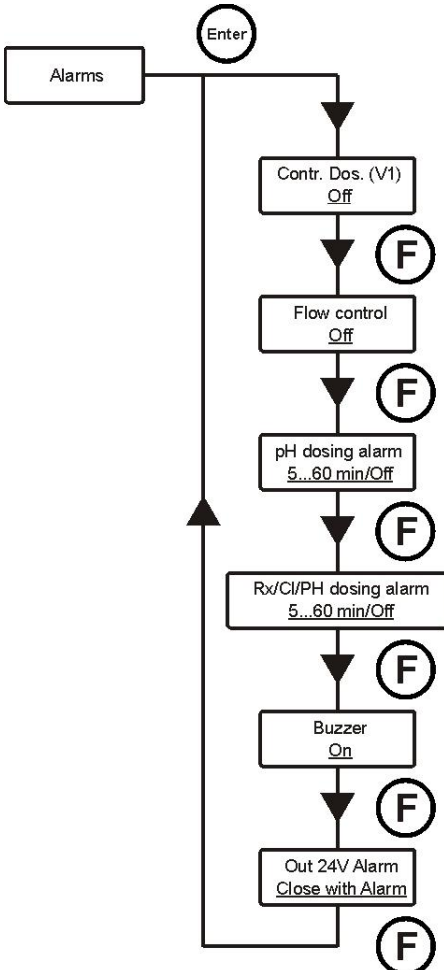
6.0 ALARMS

The system is equipped with the following alarms:

- **Level alarm**, with 3 seconds of hysteresis; this alarm interrupts the operation of the relative pump.
- **Flow alarm**, with 3 seconds of hysteresis; this alarm interrupts the dosing of the system.
- **Dosing enabling alarm**, with 3 seconds of hysteresis; this alarm interrupts the dosing of the system.
- **pH measure alarm**: The system is equipped with a pH reading alarm. If the value of the pH is lower than 5 and higher than 9, the system stops the pumps. If the value of pH is lower than 5 or higher than 9, it is recommended to control the probe and the quality of the water.
- **Dosing Alarm**: product dose with no effect (with no variation in the pH or Rx or Cl or HP reading). The dosing alarms can only be removed by restarting the system (use the ON/OFF switch) or automatically, when the measure nears the setpoint.

6.1 SETTING THE ALARMS

Select **Alarms** in the installer menu.



Contr. Dos. (V1)

Enables or disables the dosing, when signal V1 occurs (signal of the active recirculation pump). Press keys ▼▲ to select the two options and **Enter** to confirm.

Flow control

Enables or disables the dosing, when water flow occurs. Press keys ▼▲ to select the two options and **Enter** to confirm.

pH dosing alarm

This is a dosing alarm and if the pH pump doses the product and there is no variation in pH (0.05 pH) during the set time, the system signals the alarm and stops dosing.

The alarm is automatically disabled when the setpoint is neared (when the difference between the pH measure and the setpoint is less than 0.2 pH). Use the ▼▲ keys to set the desired value or disable the alarm (Off) and then confirm with the **Enter** key.

The time values that can be set are 5÷60 minutes.

Rx dosing alarm (only for technopool3 Time/pH/Rx and pH/Rx)

This is a dosing alarm and if the Rx pump doses the product and there is no variation in Rx (5 mV) during the set time, the system signals the alarm and stops dosing.

The alarm is automatically disabled when the setpoint is neared (when the difference between the pH measure and the setpoint is less than 20 mV).

Use the ▼▲ keys to set the desired value or disable the alarm (Off) and then confirm with the **Enter** key.

The time values that can be set are 5÷60 minutes.

Cl dosing alarm

(only for technopool3 pH/ClJ)

This is a dosing alarm and if the Cl pump doses the product and there is no variation in Cl (2.5% of the value set in **ppm Cl Max**) during the set time, the system signals the alarm and stops dosing.

The alarm is automatically disabled when the setpoint is neared (when the difference between the Cl measure and the setpoint is less than 2.5% of the value set in **ppm Cl Max**).

Use the ▼ ▲ keys to set the desired value or disable the alarm (Off) and then confirm with the **Enter** key.

The time values that can be set are 5-60 minutes.

HP dosing alarm

(only for technopool3 pH/HP)

This is a dosing alarm and if the HP pump doses the product and there is no variation in HP (1% of the value set in **ppm HP Max**) during the set time, the system signals the alarm and stops dosing.

The alarm is automatically disabled when the setpoint is neared (when the difference between the HP measure and the setpoint is less than 10% of the value set in **ppm HP Max**).

Use the ▼ ▲ keys to set the desired value or disable the alarm (Off) and then confirm with the **Enter** key.

The time values that can be set are 5-60 minutes.

Buzzer

Activates or deactivates the alarm acoustic signal.

Press keys ▼ ▲ to select the two options and **Enter** to confirm.

Out 24V Alarm

Sets the operation mode of **Out 24V** output, which can be set either open or closed, when alarms occur.

Press keys ▼ ▲ to select the two options and **Enter** to confirm.

6.2 ALARM SIGNAL

Alarms are always signalled by the LCD display with the wording **Air**.

Moreover, the two LEDs light on to indicate that the pH or redox/Chlorine/Hydrogen peroxide pump has an alarm situation in progress.

7.0 WINTER PAUSE

It is recommended to work the system with tap water to clean the tube and avoid chemical attacks during the pause period. Probes must be removed from the installation, during the winter pause. The protective cap must be filled with 1/3 of water and placed on the probe edge.

Chlorine electrode (see Appendix 3 for references)

Remove the Cl electrode from the probe holder, loosen the cap and remove the electrolyte from the membrane-holder cap (11) and from the cap (15) only for ADELCLJ15, rinsing it under a little running water. Then dry everything, paying attention not to damage the membrane and the surface of the electrode. Once the electrode is dry, place it in its package for the winter break.

Hydrogen peroxide electrode (see Appendix 4 for references)

Remove the HP electrode from the probe holder, loosen the membrane cap and remove the electrolyte, clean both the membrane cap and the electrode with water. Then dry everything, paying attention not to damage the membrane and the surface of the electrode. Close the membrane cap without tightening and place the electrode in its package for the winter break

8.0 OPERATIONS TO CARRY OUT AT THE BEGINNING OF THE SEASON

- It is recommended to install a new probe at the beginning of the season, to prevent the system from malfunctions.
- Once replaced the electrode or when restarting the system, repeat the calibration procedure.
- It is recommended to perform the calibration procedure of the Chlorine probe. If calibration is no longer possible due to the indication being too low, rub the tip of the measure electrode with the supplied sand paper and if necessary, replace the electrolyte.
- It is recommended to perform the calibration procedure of the hydrogen peroxide probe. If calibration is no longer possible due to the indication being too low, rub the tip of the measure electrode with the supplied sand paper and if necessary, replace the electrolyte.

9.0 RETURN TO THE AFTER-SALES SERVICE

The material must be sent back in its packaging with all its original protection devices before the guarantee period is completed.

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

The measure electrode must be placed in its original packaging and protected with the cap full of water.

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

10.0 GUARANTEE CERTIFICATE

The manufacturer guarantees the material for a period from the date of delivery to the first buyer.

During this period of time, after an examination of the manufacturer or an authorised reseller, the manufacturer will provide free of charge any failed component which material or processing is found defective or, at its option, the component will be repaired directly or through authorised workshops.

All components subjected to normal wear are excluded from the guarantee, such as: tubes, valves, gaskets, connections, tube ring-nuts, filters, injection valves, probes, electrodes and glass components.

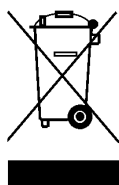
The manufacturer declines any responsibility and obligation regarding other costs, damages and direct or indirect losses arising from the use or inability to use the pump, in whole or in part.

Repair and replacement shall not extend or renew the guarantee period. Assembly and dismantling costs of the system pumps, transportation costs and used materials (filters, valves, etc.) are borne by the buyer.

The right to repair or replace under guarantee becomes void when:

- The pump is not used according to installation, use and maintenance instructions provided by the manufacturer.
- The pump is repaired, dismantled or modified by non-authorised workshops.
- Non-original spare parts or accessories have been used.
- The injection system is damaged after using incompatible products.
- The electric system is damaged for external causes of any type, for example overvoltages.

At the end of the warranty period, the manufacturer will be released from all the above mentioned obligations.



Pursuant to directives 2011/65/UE , 2002/96/EC, 2003/108/EC), it is notified that:

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

Consumers are obliged by law to return electrical and electronic devices at the end of their service lives to the public collecting points set up for the purpose or point of sale, when purchasing a new equivalent device in terms of one-to-one. The crossed out rubbish mean symbol on the product, on the instructions 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 national regulations. By recycling, reusing the material or other forms of utilising old devices, you are making an important contribution to protecting our environment.

11.0 APPENDIX 1 – Default parameters

Parameter	Default value
Language	English
First Product Quantity	175 ml
First Product Quantity at the maximum temperature	400 ml
First Product Maximum Temperature	35 °C
First Product Frequency	1 day
First Product Hour	h 13.00
Second Product Quantity	0 ml
Second Product Quantity at the maximum temperature	0 ml
Second Product maximum temperature	28 °C
Second Product Frequency	1 day
Second Product Hour	Auto
Set Point pH	7,4
pH Work Mode	Acid
Proportional Band pH	1
Set Point Rx	650 mV
Proportional Band Rx	50 mV
Relay Mode	Cyclical
Relay On	0 s
Relay On at the maximum temperature	0 s
Relay Off	0 s
Relay Off at the maximum temperature	0 s
Maximum Temperature for Relay Timing	28 °C
Stabilisation Time	30 s
Stabilisation after Alarm	No
Password	“0000”
User name	“ ”
Contact assist.	“ +390522695805 ”
Out 24V Alarm (alarm repetition)	Closed with Alarm
Temperature Mode	PT100
Manual Temperature	25 °C
Offset PT100	0 °C
Dosing Control (V1)	On
Flow Control	Off
pH dosing Alarm	Off
Rx dosing Alarm	Off
Cl/HP dosing Alarm	Off
Buzzer (alarm repetition)	Off
System kind	Technopool TpH
Pump 1 flow	1.4 l/h
Pump 2 flow	1.4 l/h
Pump 3 flow	1.4 l/h
Pump 1 Max flow	4.0 l/h
Pump 2 Max flow	4.0 l/h
Pump 3 Max flow	4.0 l/h
pH Cycle Period	5 min
Max chlorine ppm	5.00 ppm
Set Point Cl	1.00 ppm
Proportional Band Cl	0.50 ppm
Max HP ppm	500 ppm
Set Point HP	120 ppm
Proportional Band HP	50 ppm
Contrast	25

12.0 APPENDIX 2 – TECHNOPOOL RANGE

The range of technopool3 product family is the following:



Technopool3 Time/pH/Time

It is a system with three peristaltic pumps controlled in the following way:

- **P1: pump controlled by timer 1.**
- **pH: pump controlled by pH reading.**
- **P2: pump controlled by timer 2.**



Technopool3 Time/pH/Redox

It is a system with three peristaltic pumps controlled in the following way:

- **P1: pump controlled by timer 1.**
- **pH: pump controlled by pH reading.**
- **Rx: pump controlled by Redox reading (Rx).**



Technopool3 Time/pH

It is a system with two peristaltic pumps controlled in the following way:

- **P1: pump controlled by timer 1.**
- **pH: pump controlled by pH reading.**

Technopool pH/Redox

It is a system with two peristaltic pumps controlled in the following way:

- **pH: pH pump controlled by pH reading.**
- **P2: pump controlled by Redox reading (Rx).**



Technopool pH/CIJ

It is a system with two peristaltic pumps controlled as follows:

- **pH: pump controlled by pH reading.**
- **P2: pump controlled by chlorine reading (Cl).**

Technopool pH/HP

It is a system with two peristaltic pumps controlled as follows:

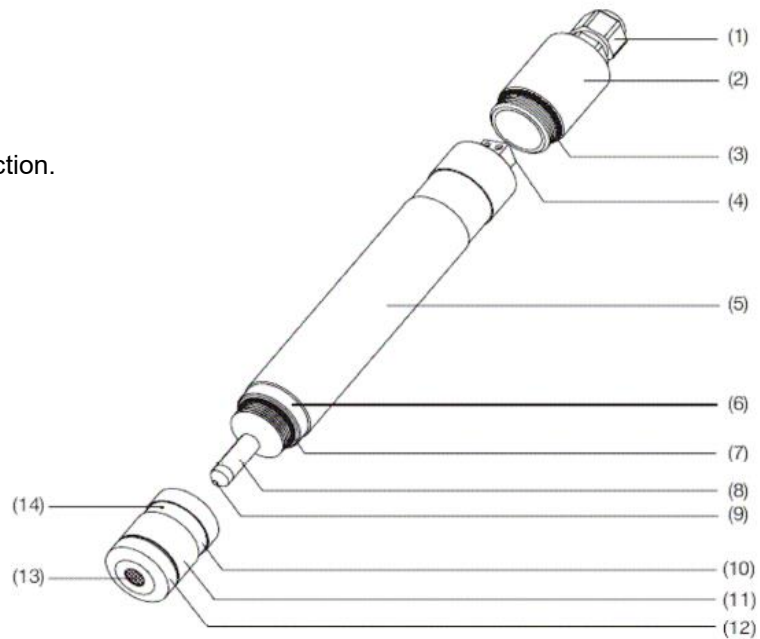
- **pH: pump controlled by pH reading.**
- **P2: pump controlled by hydrogen peroxide reading (HP).**

13.0 APPENDIX 3 – FREE CHLORINE MEASURE CELL (CL)

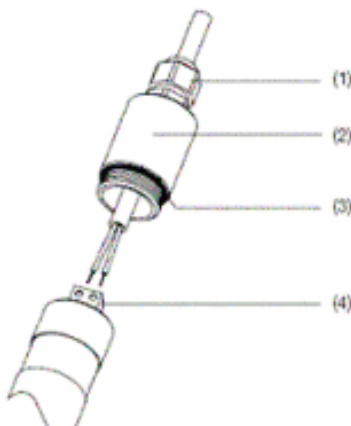
- Operating temperature: 0 to 45° C.
- Water conductivity: > 10 µ S/cm.
- Maximum working pressure: 0.5 bar.
- Output signal: 4÷20 mA current proportional to the ppm reading.
- Power supply: 12 Vdc ± 1 V.
- Electrolyte life: approx. 3 months (or less if the chlorine concentration is high).
- Membrane life: approx. one year (depends greatly on the quality of the water).
- A device must be used for the calibration, in order to determine the content of free chlorine according to the DPD method (it is recommended to use a photometric instrument).
- The reading of the free chlorine measure cell supplied is slightly affected by the variations in pH (range 4÷12 pH).

Description of the chlorine electrode

1. PG7 cable gland.
2. Cover.
3. O-Ring.
4. 2-pole terminal for the electrical connection.
5. Electrode holder.
6. Counter electrode (stainless steel).
7. O-Ring.
8. Reference electrode.
9. Measure electrode.
10. Transparent ring.
11. Membrane cap.
12. Membrane covering.
13. Membrane.
14. Valve.



Installation procedure



Electrical connections

- Connect the wires to the terminal (4). (+ brown / - blue).
- Tighten by hand (2) until the O-Ring (3) isolates the system.
- Close the PG7 cable gland securely (1).

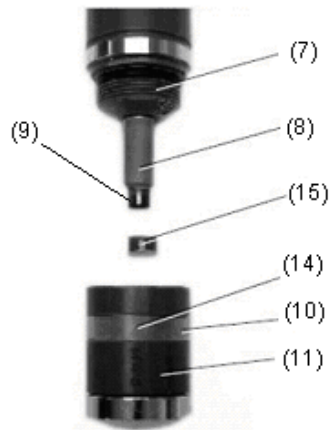


Probe polarization is required on the first installation. After having connected the probe to the Technopool3, immerse it in a container of water at 0 ppm and leave it for an hour.



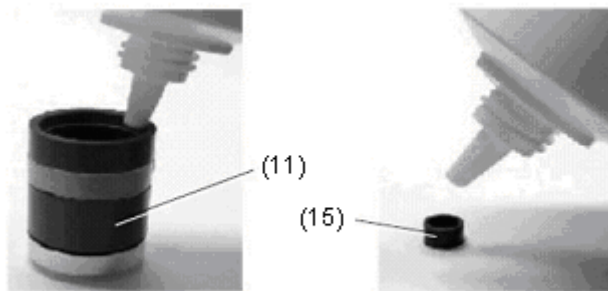
The membrane is extremely sensitive! When removing or tightening the membrane cap, make sure the membrane is not damaged with the high or low pressure.

Procedure to fill the electrolyte

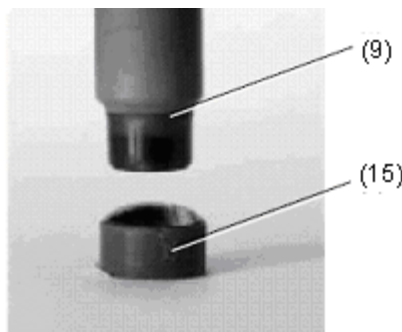


only for ADELCLJ15

- **ATTENTION: If the membrane holder cap (11) is removed when the ventilation hole (14) is not open, the membrane is ruined!!!**
- Move the transparent ring (10) that covers the ventilation hole (14) downward (above the marking) with a small screwdriver in order to open the hole.
- Loosen the membrane cap (11) from the casing (7) of the measure cell
- Move the transparent ring (10) once again into the groove in order to cover the ventilation hole.
- Clean the membrane cover (11) and the cover (15 **only for ADELCLJ15**) under running water and dry them.



- Fill (11) and (15 **only for ADELCLJ15**) with the electrolyte supplied, making sure **not to create air bubbles**.



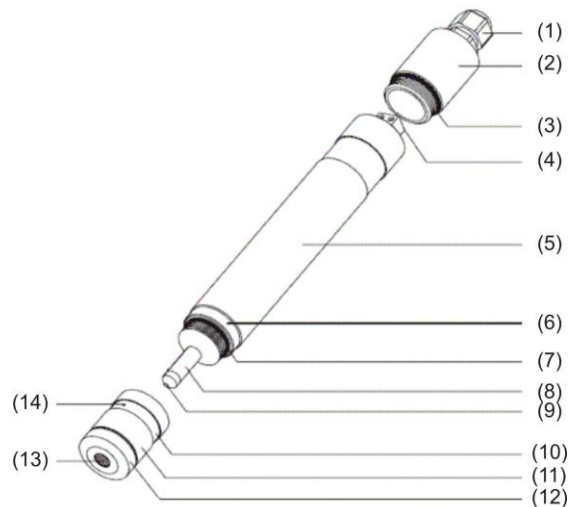
- **Only for the ADELCLJ15 electrode:** place the vertical probe and carefully push the measure electrode into the cover (15).
- Slowly loosen the membrane holder cap (11) from the casing (5) of the measure cell, for the excess electrolyte to flow through the open valve.
- Tighten the membrane cover securely. The O-Ring causes an initial resistance. When the membrane cover is tightened completely, the measure cell must not knock against the membrane. This could damage it and make it unusable.

14.0 APPENDIX 4 – HYDROGEN PEROXIDE MEASURE CELL (HP)

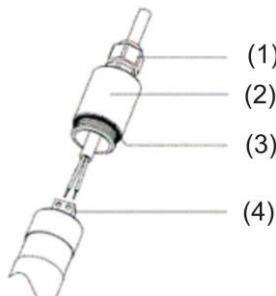
- Operating temperature: from 1 to 45° C.
- Maximum working pressure: 1 bar.
- Output signal: 4÷20 mA current proportional to the ppm reading.
- Power supply: 10...30 Vdc.
- Electrolyte life: from 3 to 6 months.
- Membrane life: approx. one year (depends greatly on the quality of the water).
- A device must be used for the calibration, in order to determine the content of hydrogen peroxide according to the DPD method (it is recommended to use a photometric instrument).
- The reading of the hydrogen peroxide measure cell supplied is slightly affected by the variations in pH. (range 2÷11 pH).
- The recommended flow rate through the flow sensor is 30 L/h. A minimal water flow is required. The measure slightly depends on the water flow rate.
- The measure is compensated in temperature.
- The probe must never work with no water.
- The probe cannot be used in water with no disinfectant for more than a day.
- **Attention: accumulated sediment or biological contamination on the membrane can interfere with the measure.**
- Before storing the probe, remove the membrane cap and rinse it together with the electrode in clean water. Then dry all the parts in a dust-free area. Then close the membrane cap without tightening to protect the electrode.
- **Attention: the membrane must not touch the measure electrode.**
- When the probe is to be used again, clean the tip of the electrode with the special sand paper and use a new membrane cap.
- Used membrane caps that have been used for at least a day, cannot be stored and re-used.
- If calcium forms on the membrane cap, it is recommended to place it in a solution with 1% hydrochloric acid for a few hours. Then wash it thoroughly with clean water and dry it before using it again.

Description of the hydrogen peroxide electrode

1. PG7 cable gland.
2. Cover.
3. O-Ring.
4. 2-pole terminal for the electrical connection.
5. Electrode holder.
6. Counter electrode (stainless steel).
7. O-Ring.
8. Reference electrode.
9. Measure electrode.
10. Transparent cover.
11. Membrane cap.
12. Membrane covering (stainless steel).
13. Membrane.
14. Valve.






Installation procedure



Electrical connections

1. Connect the wires to the terminal (4): **brown (+) / blue (-)**.
2. Tighten by hand (2) until the O-Ring (3) isolates the system.
3. Close the PG7 cable gland securely (1).

-  **Probe polarization is required on the first installation. After having connected the probe to the Technopool3, immerse it in a container of water at 0 ppm and leave it for an hour.**
-  **The membrane is extremely sensitive! When removing or tightening the membrane cover, make sure the membrane is not damaged with the high or low pressure.**
-  **If calibration is not possible due to the values being unstable or too low, the electrolyte must be changed.**

PROCEDURE TO CLEAN AND FILL THE ELECTROLYTE

Step #1: loosen the membrane cap



- **ATTENTION: if the membrane cap is removed when the ventilation hole is not open, the membrane is ruined by the vacuum created in the electrolyte chamber!!!**
- Move the two transparent rings downward above the marking text with a small screwdriver in order to allow air to enter the electrolyte chamber.
- Loosen the membrane cap from the casing of the measure cell.
- Empty and clean the membrane cap under running water and dry it.

Step #2: fill the membrane cap



- Set one of the two transparent rings in place in order to cover the ventilation hole. **Make sure the ring is not deformed!**
- Fill the membrane cap with the electrolyte supplied, making sure **not to create air bubbles!**

Step #3: clean the measure electrode



- The electrode must be washed with clean water and dried with a clean paper towel.
- Use the special sand paper supplied to clean just the tip of the dry electrode. Hold the special sand paper well and rub the tip of the slightly tilted electrode on the sand paper. Then turn the probe slightly and rub it on the paper again.
- Repeat the procedure a number of times

Step #4: set the electrode back on the membrane cap



- Keep the part with the electrode in a vertical position and set it on the filled membrane cap.
- Turn anti-clockwise until the thread engages, then tighten the part with the electrode clockwise by hand on the membrane cap.
- The excess electrolyte comes out through a valve (above the marking text) of the membrane cap. Do not close this vent with your finger!
ATTENTION: The electrolyte can come out of the relief valve!

Step #5: set the second transparent ring in place

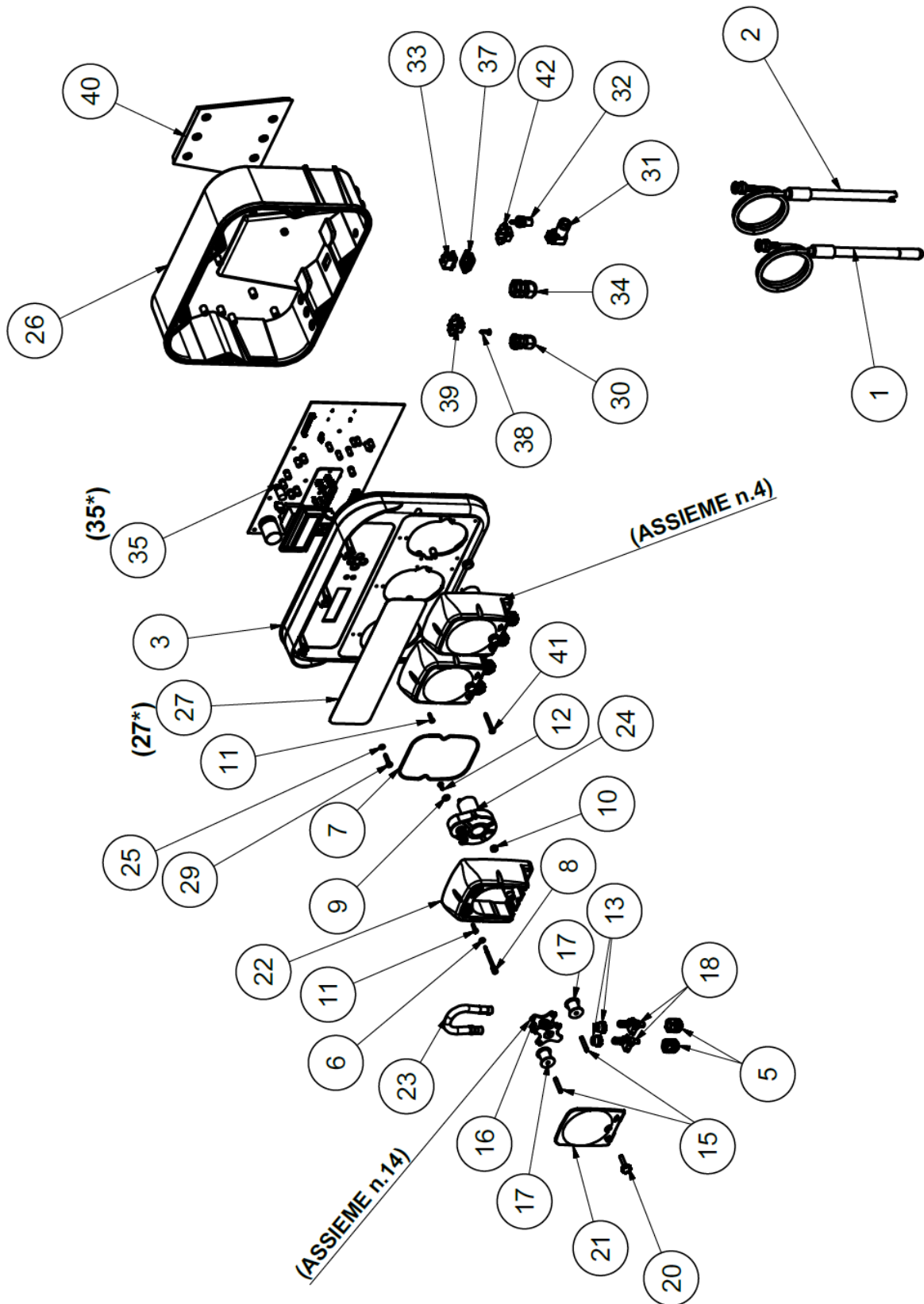


- Make sure the membrane cap is securely fastened to the part of the electrode.
- Then set the second transparent ring in its place.
Make sure the ring is not deformed!



If the indication level is still too low, a new membrane cap must then be used. The commissioning period of a new membrane cap can take up to one day! **Recommendation: the electrolyte must be changed every 3 - 6 months.**

ESPLOSO / EXPLODED VIEW / EXPLOSE / DIBUJO



ELENCO COMPONENTI			
N°	CODICE	DESCRIZIONE	QTÀ
1	ADELTPH05	ELETTRODO PH PLASTICA A-PH5 CAVO 5 METRI	1
2	ADELTRX05	ELETTRODO RX PLASTICA A-RX5 CAVO 5 METRI	1
3	ADSP3500003	COPERCHIO CASSA TRE POMPE ARNITE NERA VERSIONE 3 PERISTALTICHE	1
4	AD0Q00301F001100	ASSIEME PDP TEC-CG 4-1 24VDC SANTOPRENE NERA (RICAMBIO TECHNOPOOL)	3
5	ADSP5004001E	GHIERA FISSATUBO PP NERA 1/8" 4X6 STD	2
6	ADSP5007072	OR "R1" NBR - 2.60X1.90	1
7	ADSP5007074	OR - RIF. 2412 - NBR	1
8	ADSP6000107	TAPPO ROSSO PER FORO REGOLAZIONE PER-R	1
9	ADSP6000469	RONDELLA PIANA FASCIA LARGA D. 3 x 9 - DIN 9021 INOX A2	2
10	ADSP6000502	DADO M 4 UNI 5587 - INOX A2	1
11	ADSP6000714	VITE M 2,9 X 13 UNI 6954 (TCTC) INOX A2	5
12	ADSP6000749	VITE M 2,9 X 9,5 UNI 6954 (AF-TCTC) INOX A2	2
13	ADSP8000006	SERRATUBO GRANDE PP NERO PER-R	2
14	ADSP8000009A	PORTA RULLINI COMPLETO PER-R/TEC 4/6-1	1
15	ADSP8000032	PERNO RULLINO IPCR/PER-R 4X19,3	2
16	ADSP8000059	PORTA RULLINI IPCR/CG/PER-R ARNITE PBT NERO	1
17	ADSP8000089	RULLINO PER-R D.13,6 DELRIN	2
18	ADSP8000014	RACCORDO PER-R PP NERO GRANDE	2
19	ADSP8000028	PERNO GUIDA PORTARULLINO PER-R	1
20	ADSP8000029	MANOPOLA FISSAGGIO COPERCHIO TRASPARENTE TEC	1
21	ADSP8000081	COPERCHIO FRONTALE TRASPARENTE TEC FUME'	1
22	ADSP8000084N	CASSA ANTERIORE TEC PP NERA	1
23	ADSP8000103	TUBO SANTOPRENE D. 5,8 X 9,4 55 NAT (Complete Tube ADSP8000109H)	1
24	ADSP8000254	MOTORE RAP 225 24VDC PER-R	1
25	ADSP5007072	OR "R1" NBR - 2.60X1.90	4
26	ADSP3500000	CASSA INFERIORE POMPA TRIPLA ARNITE NERA (VN)	1
27	ADSP7000480	ETICHETTA POLICARBONATO AQUA POOL SYSTEM NEUTRA (PER CASSA 3 POMPE)	1
27*	ADSP7000544	ETICHETTA POLICARBONATO TECHNOPOOL TIMER pH RER	1
29	ADSP6000767	VITE M 3,5 X 19 UNI 6954 (AF-TCTC) INOX A2	3
30	ADSP6000424	PRESSACAVO PASSO PG7 - 1900.07 - NERO	4
31	ADSP6000454	CONNETTORE FEMMINA 4 VIE G4W1F	1
32	ADSP6000463	CONNETTORE BNC FEMMINA	2
33	ADSP6000516	INTERRUTTORE ON/OFF 3A 250V TIPO A BILICO	1
34	ADSP6000581	PRESSACAVO + DADO PG9 NERO (vn)	1
35	ADSP6000638	SKD TECHNOPOOL3/TIMER PH-RX (EL214+EL201A+EL201BPH+EL201B)	1
35*	ADSP6000637	SKD TECHNOPOOL3/TIMER PH (EL214+EL201A+EL201B-PH)	1
37	ADSP6000686	COVER TRASPARENTE DI PROTEZIONE PER INTERRUTTORE ON/OFF	1
38	ADSP6000714	VITE M 2,9 X 13 UNI 6954 (TCTC) INOX A2	8
39	ADSP6000836	CONNETTORE MASCHIO 4 VIE G4A5M CABLATO LIVELLO PANDUIT 2 VIE	3
40	ADSP6020156	STAFFA FISSAGGIO A PARETE HC300 PP NERO	1
41	MB010300	VITE M 3,5 X 32 UNI 6954 (AF-TCTC) INOX A2	2
42	ADSP6000834	CONNETTORE MASCHIO 3 VIE G4A5M (FILI BLU-NERO-MARRONE) PER HC300 CL-P	1

