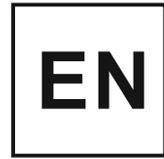


# SALT ELECTROLYSIS SYSTEM



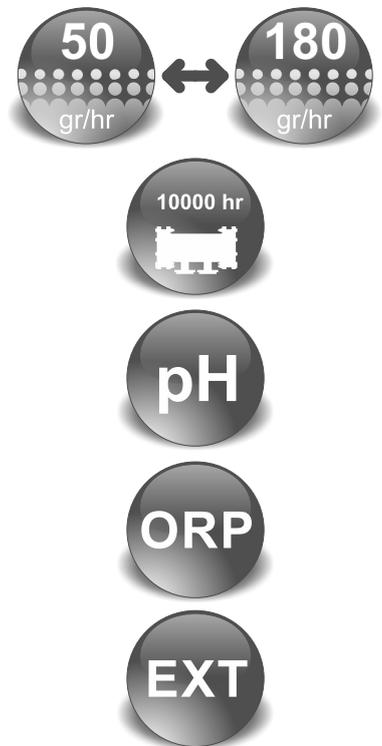
## PUBLIC SERIES



Model. 50  
Model. 70  
Model. 90  
Model. 180

Model. 50 (EXT-1)  
Model. 70 (EXT-1)  
Model. 90 (EXT-1)  
Model. 180 (EXT-1)

Model. 50 (EXT-1D)  
Model. 70 (EXT-1D)  
Model. 90 (EXT-1D)  
Model. 180 (EXT-1D)



# INSTALLATION AND MAINTENANCE MANUAL





**IMPORTANT:** The instruction manual you are holding includes essential information on the safety measures to be implemented for installation and start-up. Therefore, the installer as well as the user must read the instructions before beginning installation and start-up. Keep this manual for future reference.



**Disposal of waste electrical and electronic domestic systems in the European Union**

All the products marked with this symbol indicate that the product shall not be mixed or disposed with your household waste at their end of use. It is responsibility of the user to eliminate this kind of wastes depositing them in a recycling point adapted for the selective disposal of electrical and electronic wastes. The suitable recycling and treatment of these wastes contributes in essential way to the preservation of the Environment and the health of the users. For further information regarding the points of collection of this type of wastes, please contact to the dealer where you acquired the product or to your municipal authority.

The instructions given in this manual describe the operation and maintenance of Electrolysis systems SERIES 50,70,90 and 180, seawater also, and their corresponding versions with PH/ORP control extensions (EXT-1). For optimum performance of Electrolysis systems SERIES 50,70,90 and 180, we recommend you to follow the instructions given below:

**1.CHECK THE CONTENTS OF THE PACK:** \_\_\_\_\_

You should find the following elements inside the box:

- Power supply.
- Electrolysis cell.
- pH sensor (only in models with pre-installed **EXT-1** control extension).
- EX-ORP sensor (only in models with pre-installed **EXT-1** control extension).
- Calibration solutions pH 7.0 (green) / pH 4.0 (red) / ORP 470 mV (only in models with pre-installed **EXT-1** control extension).
- CEE22 (M) connector for dosage pump (only in models with pre-installed **EXT-1** control extension).
- Operation Manual.

**2.GENERAL FEATURES:** \_\_\_\_\_

When Salt Electrolysis Systems is installed, a quantity of salt must be dissolved into the swimming pool water. This salty water then passes through the electrolysis cell that is located in the plant room. The Salt Electrolysis Systems consists of two elements: an electrolysis cell and a power supply. The electrolysis cell contains a quantity of titanium plates (electrodes) and when a weak electrical current is passed through the plates inside the electrolysis cell, there is chlorine production.

Maintaining a level of chlorine in swimming pool water keeps the water sanitised and healthy to swim in. Salt Electrolysis Systems will manufacture chlorine whenever the pool circulation system (pump and filter) is operational.

The power supply is provided with various safety devices, which are activated in case of irregular operation of the system, as well as a microprocessor driven control system.

The Salt Electrolysis Systems have an automatic cleaning system that prevents the scaling of the electrodes. In addition, Salt Electrolysis Systems allow the integration of a PH/ORP control extension (**EXT-1**).

**2.2 SAFETY WARNINGS AND RECOMMENDATIONS:** \_\_\_\_\_

- The equipment should be assembled and handled by truly qualified people.
- Current electrical and accident prevention regulations should be followed.
- Under no circumstances will the manufacturer be held responsible for the assembly, installation or start-up, nor any handling or fitting of components unless they are carried out on its premises.
- The Salt Electrolysis Systems operate at 230VAC, 50/60 Hz. Do not attempt to alter the system to operate at a different voltage.
- Check that all the electrical connectors are well tightened to avoid false contacts and their consequent overheating.
- Before installing or replacing any component, disconnect the equipment from the mains, and use exclusively spare parts supplied originals.
- Taking into account the fact that the equipment produces heat, it must be installed in places with sufficient ventilation. Fan openings should be kept free of any element that could obstruct them. The equipment should not be installed near flammable materials.
- The Salt Electrolysis Systems have an IP24 protection degree. They should never be installed in places susceptible to flooding.

### 3.DATASHEET:

Salt Electrolysis systems are equipped with a touch control panel located on its front (Fig. 15).

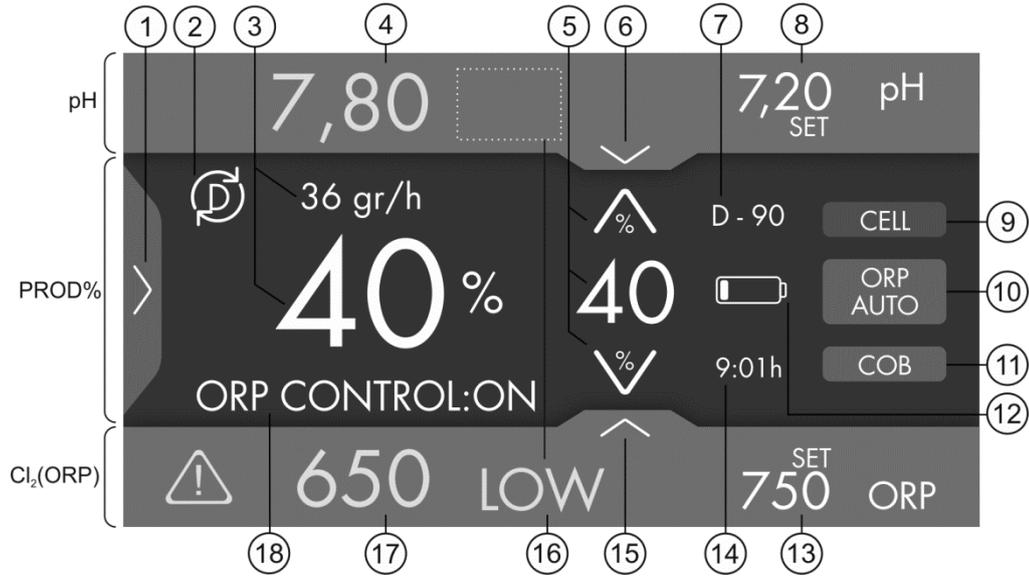
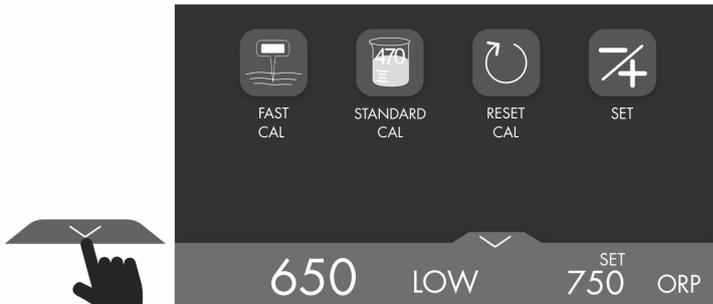
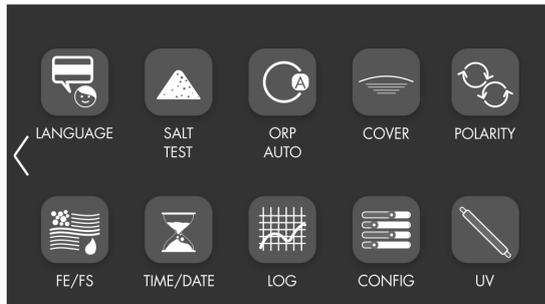
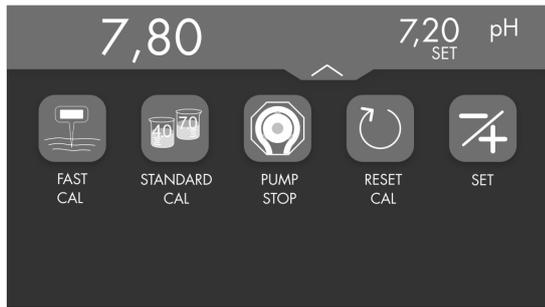


Fig. 15



1. PROD configuration menu (%)
2. Self-cleaning indicator (direct / reverse)
3. Production value (% & gr.Cl2 / hr)
4. pH value
5. Production setpoint (%)
6. Menu pH settings
7. Equipment model
8. Setpoint Ph
9. Alarm cell passivated
10. ORP AUTO
11. Cover
12. Battery alarm
13. Setpoint Cl2 (ORP)
14. Time
15. Configuration menu Cl2 (ORP)
16. Alarms / Info pH and Cl2 (ORP)
17. Cl2 Value (ORP)
18. Alarms / Production info (%)



## Fuente de Alimentación / Power Supply

Modelo / Model

Descripción/Description	50	70	90	180
Tensión de servicio / Input voltage	230 V 50/60 Hz.			
Consumo / Consumption (A ac)	1.5 A	1.8 A	2.1 A	4.2 A
Fusible / Fuse (6x32mm)	5AT	6AT	7AT	12,5AT
Salida / Output (A dc)	6 x 9 A	5 x 15 A	6 x 15 A	6 x 30 A
Producción / Production (gr Cl <sub>2</sub> /hr)	45 - 50	60 - 70	80 - 90	150 -180
m <sup>3</sup> Piscina / Pool	Consultar guía selección / Consult selection guide			
Salinidad / Salinity	3 - 12 gr./l. (4 - 6 gr./l. recomendado / recommended)			
Temperatura ambiente / Room temperature	max. 40°C			
Envolvente / Enclosure	ABS	Metal		
Inversión polaridad / Polarity reversal	2 h., 3 h. y TEST (menu config.) / 2 h., 3 h. and TEST (config menu)			
Control producción / Production control	0-100%			
Detector de flujo (gas) / Flow Sensor (gas)	Sí / Yes			
Detector flujostato/inductivo /Flow-switch/inductive sensor	Opcional / Optional			
Control Producción por cobertor / Production Control by cover	Sí / Yes			
Control Producción Externo / External Production Control	Sí / Yes			
Diagnos. Electrodo / Check cell function	Sí / Yes			
Paro seguridad pH / Pump Stop	Si, config. soft. 1 ... 99 min. / Yes, soft. config. 1 ... 99 min.			
Test salinidad (cualitativo) / Salinity test (qualitative)	Sí / Yes			
Indicador Alarma sal / Salt alarm indicators	Sí / Yes			
Menú Conf. Sistema / Setup menu	Pantalla táctil LCD / LCD touch screen			
Control RS485 / Control RS485 (Modbus)	Opcional / Optional			
Poolstation® compatible	Sí / Yes			
Históricos / Logs	Sí / Yes			



## Célula de Electrolisis / Electrolysis Cell

Modelo / Model

Descripción/Description	50	70	90	180
Electrodos (titanio activado autolimpiante) Electrodes (self-cleaning titanium activated)	Premium + : 10.000 - 12.000 hr			
Caudal mín.(m <sup>3</sup> /h) / Flow min. (m <sup>3</sup> /h)	8	12	15	30
Número de electrodos / Number of electrodes	13	6	7	13
Material	Polipropileno / Polypropylene			
Bridas conexión / Connection flanges	1'1/2''	D63		D90
Presión máxima / Maximum pressure	3 Kg/cm <sup>2</sup>			
Temperatura trabajo / Working temperature	15 - 40°C máx.			

## Extensiones / Extensions

Opcional / Optional : EXT-1, EXT-1D

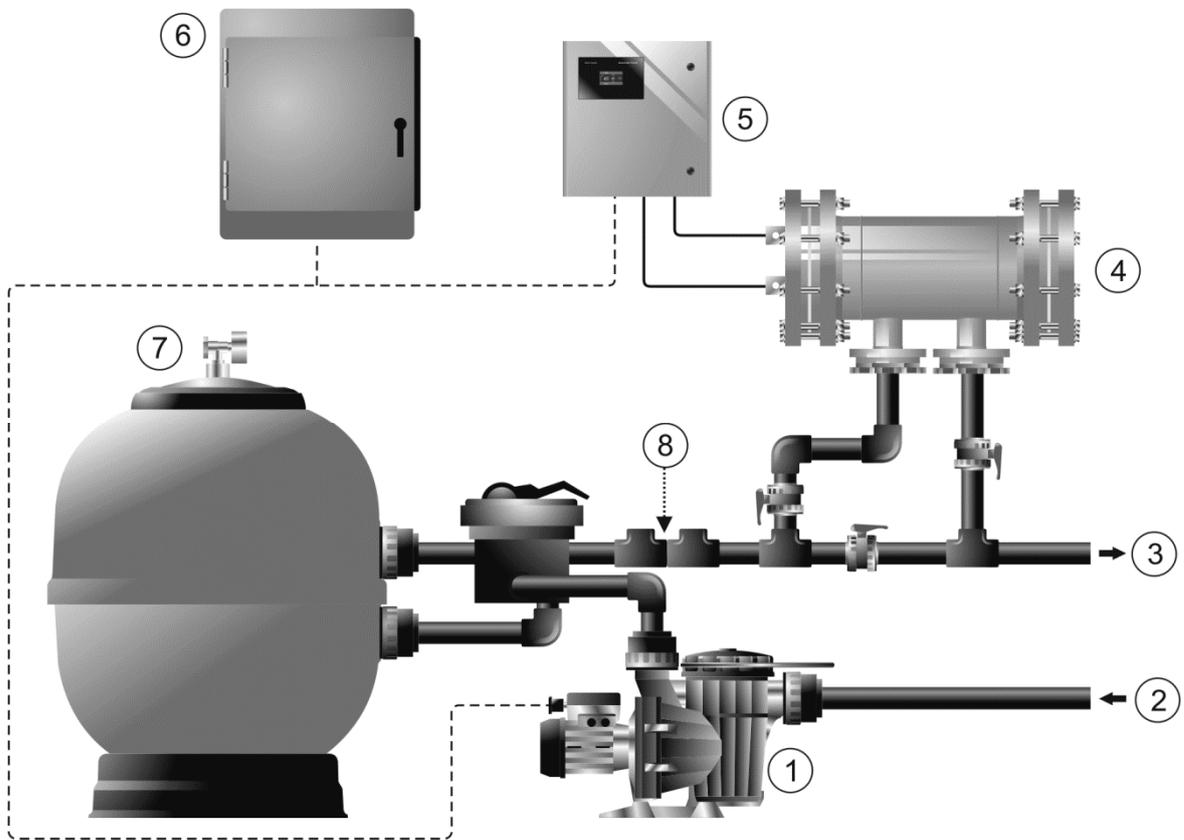
EXT-1	Extensión control pH-ORP integrado / Integrated pH-ORP control extension
EXT-1D	Ext. control pH-ORP int. + kit portasondas / Int. pH-ORP control ext. + sensor holder kit



## Sensores de pH/ORP / pH/ORP Sensors

Descripción / Description	EXT-1, EXT-1E
Rango de medida / Measure range	0.00 - 9.99 (pH) / 0 - 999 mV (ORP)
Rango de control / Control Range	7.00 - 7.80 (pH) / 600 - 850 mV (ORP)
Precisión / Precision	± 0.1 pH / ± 1 mV (ORP)
Calibración Calibration	Automática (patrones pH-orp) Automatic (buffers pH-ORP)
Salidas control (pH) Control outputs (pH)	Una salida 230 V / 500 mA (conexión bomba dosific.) An output 230 V / 500 mA (dosing pump connection.)
Sensores pH/ORP / pH/ORP sensors	Cuerpo epoxy, unión sencilla. / Epoxy body, single bond.

		Referencia-Reference	Producción-Production
<p>70-90      180      50</p>	<b>Opción controladores</b> <b>Controllers option</b>		<b>Electrolisis salina</b> <b>Salt electrolysis</b>
	50	<p><b>EXT-1</b></p>	<b>50 gr Cl<sub>2</sub>/hr</b>
	70		<b>70 gr Cl<sub>2</sub>/hr</b>
	90	<p><b>EXT-1D</b></p>	<b>90 gr Cl<sub>2</sub>/hr</b>
180		<b>180 gr Cl<sub>2</sub>/hr</b>	



- 1.- Pump.
- 2.- Aspiration.
- 3.- Return.
- 4.- Electrolysis cell.
- 5.- Power supply.
- 6.- Pool control panel.
- 7.- Filter
- 8.-Other equipment.  
(heat exchanger, UV, etc.)

Fig.1 Recommended installation diagram.

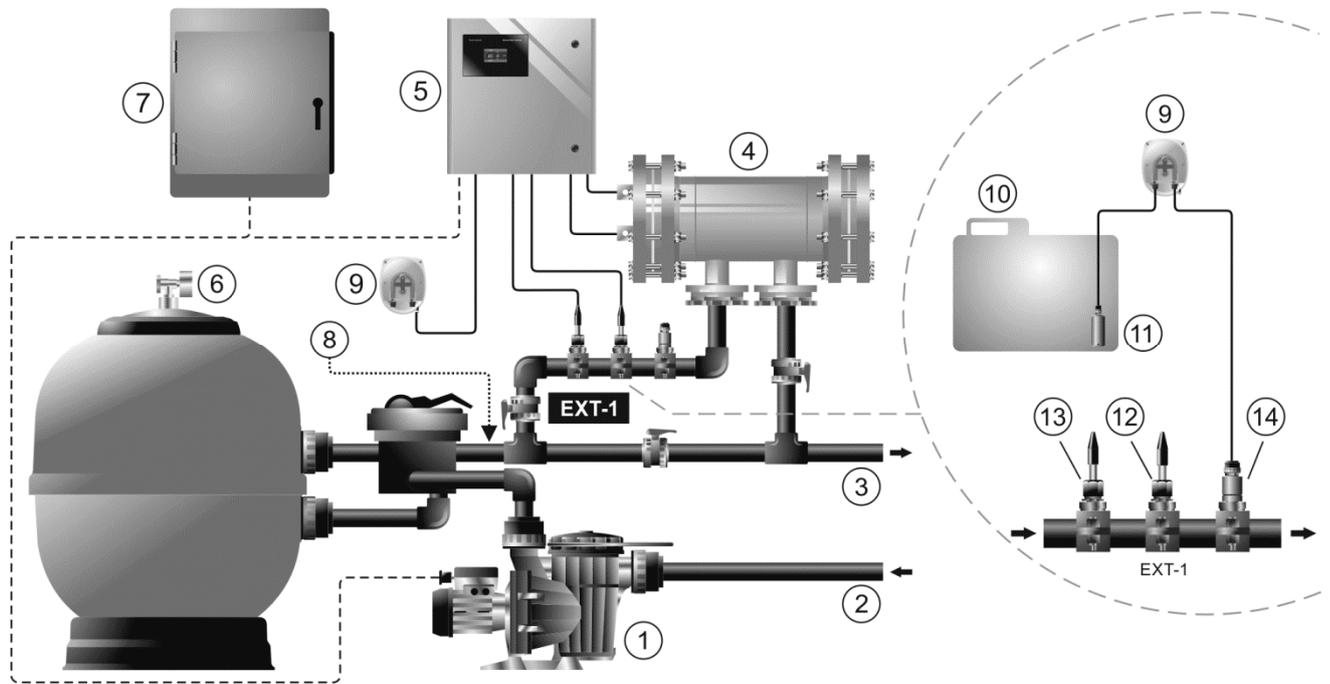


Fig.2 Recommended installation diagram (and its corresponding version with integrated **EXT-1** control extension).

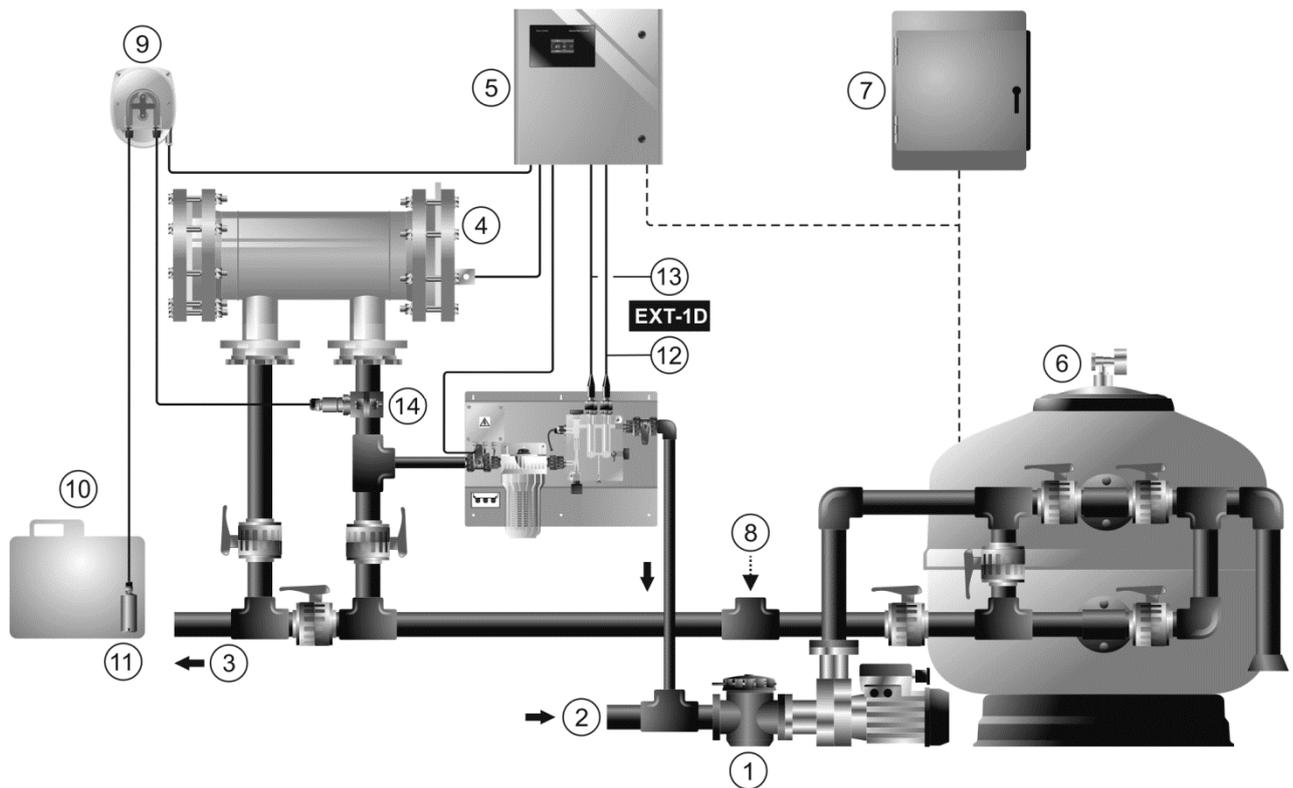
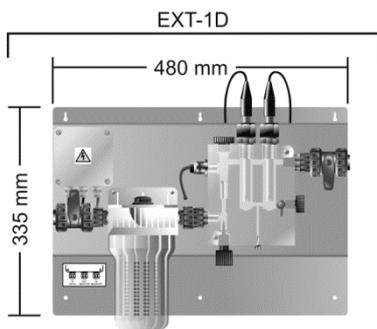
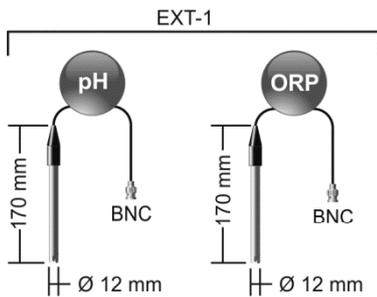
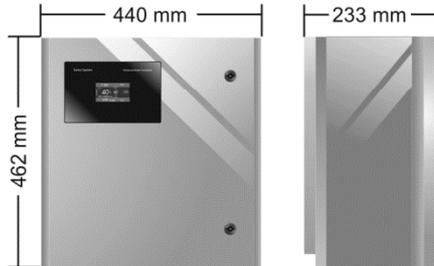
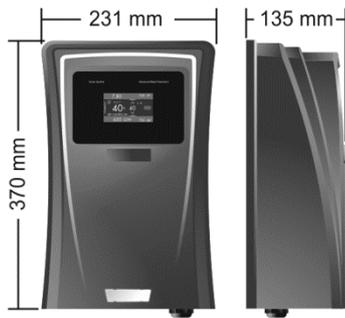


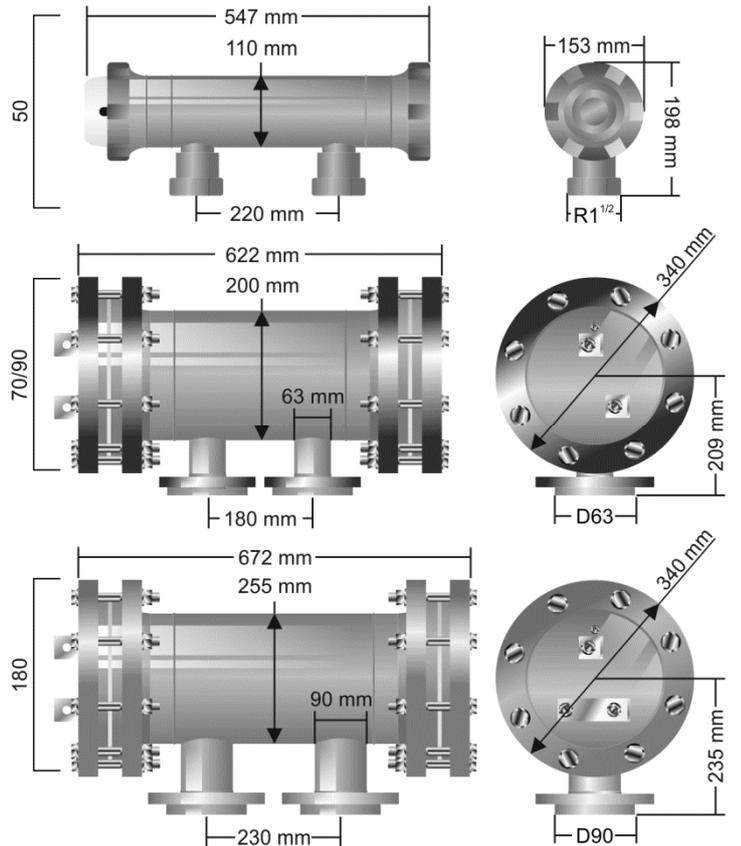
Fig.2.1 Recommended installation diagram (and its corresponding version with integrated **EXT-1D** control extension).

- |   |                        |
|---|------------------------|
| 1.- Pump.   | 9.- Dosage pump        |
| 2.- Aspiration.                                   | 10.- pH-minus tank     |
| 3.- Return.                                       | 11.- Aspiration filter |
| 4.- Electrolysis cell.                            | 12.- ORP sensor        |
| 5.- Power supply                                  | 13.- pH sensor         |
| 6.- Pool control panel.                           | 14.- Injection valve   |
| 7.- Filter  |                        |
| 8.- Other equipment<br>(heat exchanger, UV, etc.) |                        |

**DIMENSIONS:**



EXT-1, EXT-1D  
(opcional, optional)



## 4.INSTALLATION: \_\_\_\_\_

### 4.1.Installation of the power supply

Always install the POWER SUPPLY of the Salt Electrolysis Systems VERTICALLY on a solid and rigid surface (wall) as shown in the recommended installation diagram (Figs. 1,2). In order to guarantee a good state of conservation, the POWER SUPPLY should be installed in a well-ventilated dry place. Due to IP degree of the POWER SUPPLY the , Salt Electrolysis Systems should not be installed outdoors. The POWER SUPPLY should be installed a bit distant from the electrolysis cell so that it cannot accidentally suffer water splashes.

**Beware of corrosive atmosphere formation due to pH decreasing solutions (specially, those ones based on hydrochloric acid "HCl"). Do not install the Salt Electrolysis Systems near to any stores of these chemicals. We strongly recommend the use of chemicals based on sodium bisulphate or diluted sulphuric acid. Power supply must be connected to the electrical control box of the pool, so that the pump and the Salt Electrolysis Systems are turned on (and off) simultaneously.**

**IMPORTANT: Circuit breaker curve specification should be "D" or "K".**

### 4.2.Installation of the electrolysis cell

The electrolysis cell is made of polypropylene in whose interior the electrodes are placed. The electrolysis cell must be always installed indoors and **after the pool filter**, and after any other equipment that may be present (heat pumps, control systems, etc.).

The installation of the cell should allow easy access to the installed electrodes by the user. It is highly recommended to install the electrolysis cell **HORIZONTALLY** in a place of the pipe that can be easily isolated from the rest of the installation by two valves, so that the tasks of maintenance can be carried out with no need of partial or total draining of the swimming pool.

Where the cell is installed on a by-pass (recommended option), a valve to regulate the flow must be introduced. Prior to installation, please consider the following commentaries might be considered:

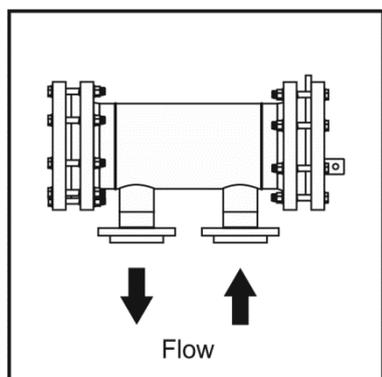


Fig. 3

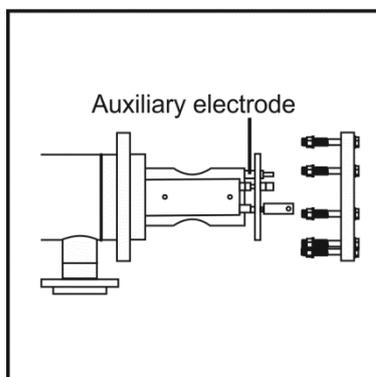


Fig. 4

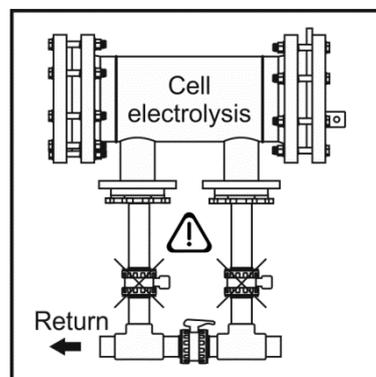


Fig. 5

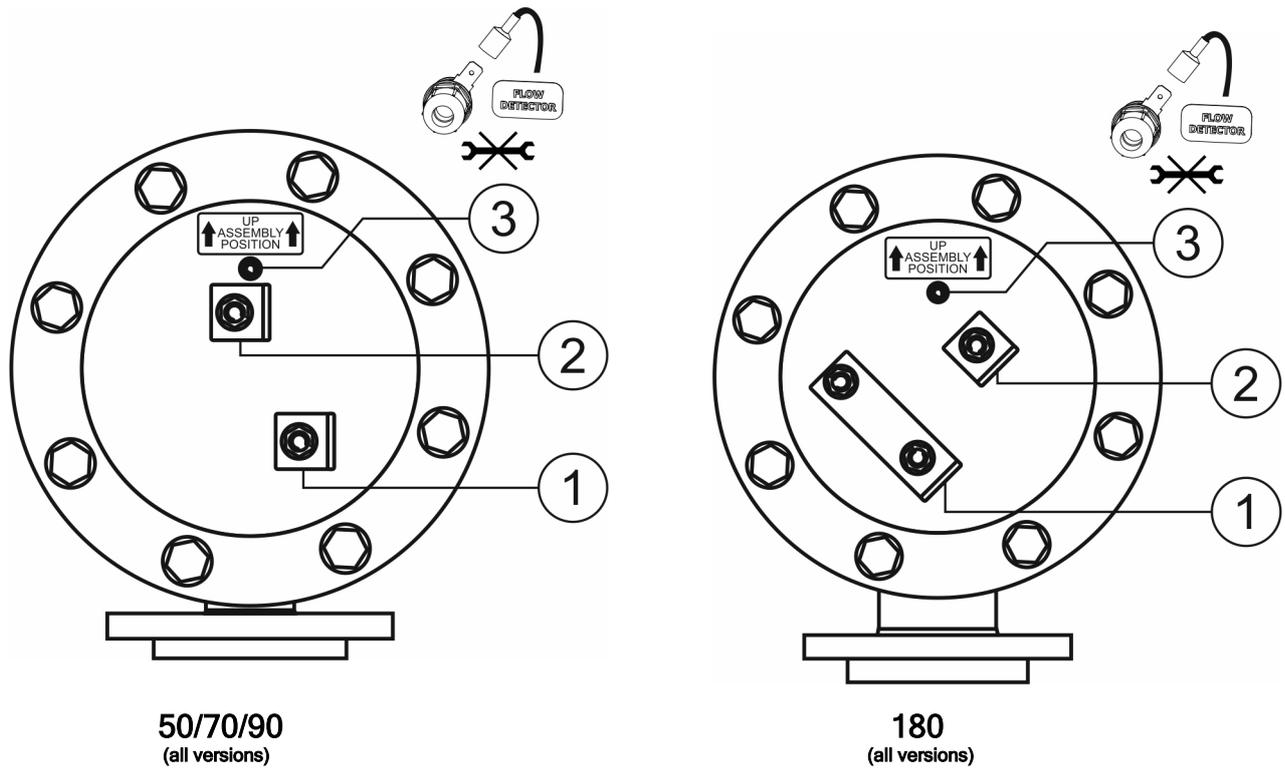
1. Flow direction marked in the cell must be respected. Recirculation system must guarantee the minimum flow stated in the Table of Technical Specifications for each model (see Section 9).

2. The system flow detector activates if there is not recirculation (flow) of water through the cell or if flow is very low, **always that the inlet and outlet valves are open**. If the detector is closed, the detector will not function. (See Fig 5). If electrolysis gases are not properly removed through the electrolysis cell, the generated gas bubble electrically isolates the auxiliary electrode (electronic detection). Therefore, when locating the electrodes in the cell, the level sensor (auxiliary electrode) will have to be located in the higher area of the cell. The safest orientation is shown in the recommended installation diagram.

3. **WARNING:** if the in-out valves of the electrolysis cell are closed simultaneously, the flow detector (gas detector) will not work correctly, with the consequent risk of cell breakdown. Although this situation is extremely unusual, **it can be easily avoided once the equipment has been installed, by locking at opened position the return valve to the swimming pool**, so it cannot accidentally be manipulated.

### 4.3. Electrical connection of the electrolysis cell

Make the interconnection between the electrolysis cell and the power supply according to the following scheme (Fig. 6). Due to relatively high current intensity circulating do not modify or cut either the length or section of the supplied cables without making a previous consultation to an authorized distributor. The cable connecting the electrolysis cell and the power supply should never exceed the maximum length recommended in the section 9 of this Manual:



1. Contact 1
  2. Contact 2
  3. Flow Detector (Gas)
- Fig. 6

EXT-1

### 4.4. Installation of the pH / ORP sensors

1. Install the pH and ORP electrode holders in the circuit through ½" saddles (not included with the equipment) (Fig. 7).
2. Insert the electrodes into their corresponding holders. Next, tighten the holder until the electrode is properly fixed.
3. The electrodes must be installed in the holder so that it is guaranteed that the sensor located in their ends are always submerged in the water circulating through the pipe.
4. **Install always the electrodes vertically or with a maximum inclination of 40°.** (Fig. 8).
5. Connect the pH / ORP sensor provided with the unit to the corresponding BNC connectors located in the unit's side.

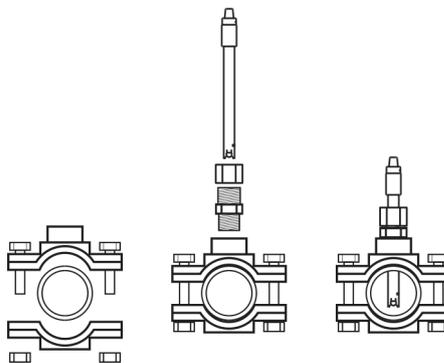


Fig. 7

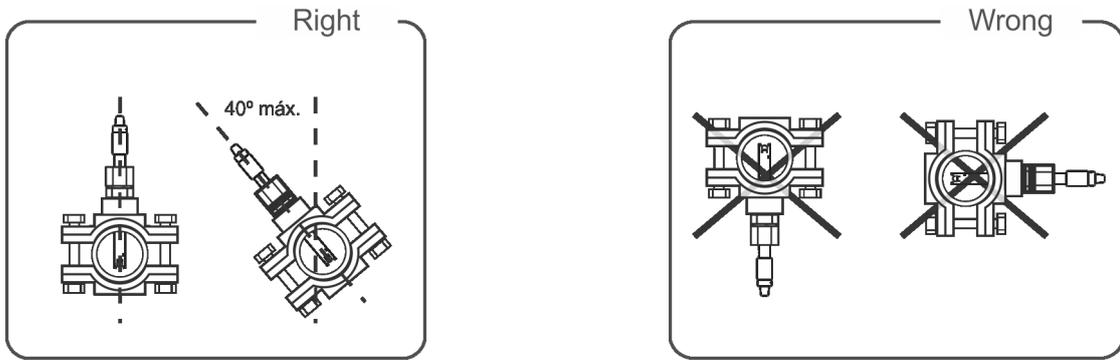


Fig. 8

**4.5. Installation of the external flow detector (optional, not supplied with the unit).**

1. Install the saddle supplied in a section of the pipe at the entrance to the electrolysis cell. It should always be installed in a horizontal position relative to the ground (see Fig. 9-1).
2. Install the flow detector (flow switch) vertically in the saddle (Fig. 9-2).
3. There is an arrow on the head of the flow detector. Make sure that this arrow is parallel to the pipe shaft and pointing in the direction that the water flows (Fig. 9-3).
4. Do not install the flow detector near magnetic objects. They could affect the operation of the magnetic device it contains and reduce its reliability.

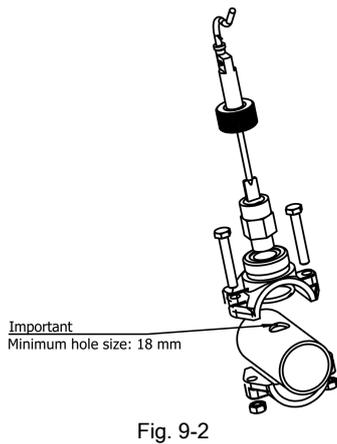


Fig. 9-2

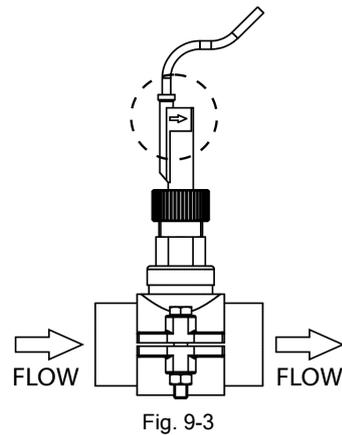


Fig. 9-3

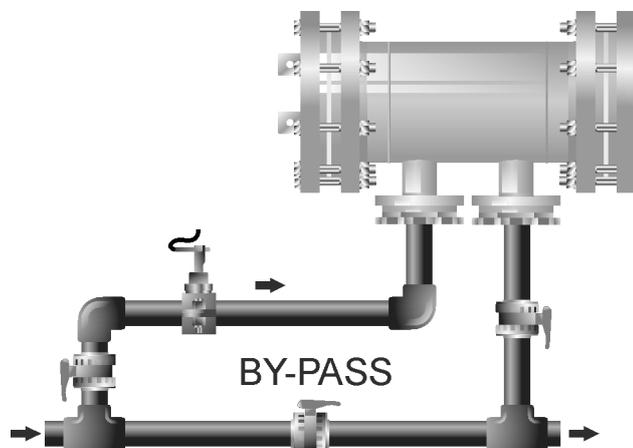
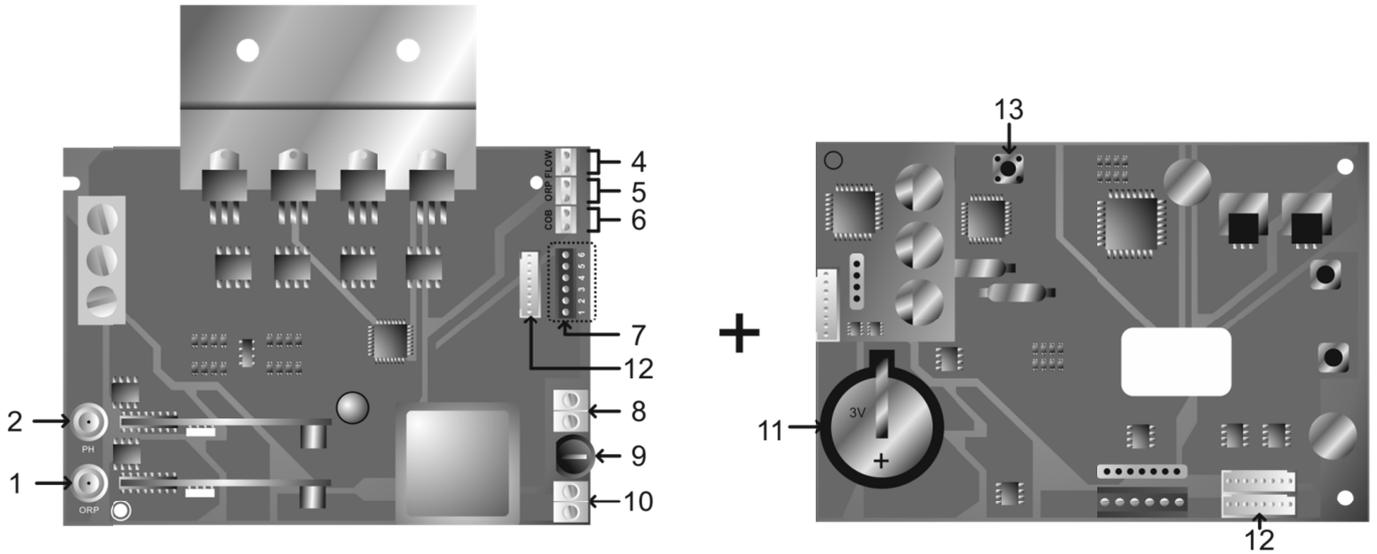


Fig. 9-1

#### 4.6. Terminals

Besides basic operations, the electrolysis system have a series of input-output signals, enabling the connection of additional external controls. They are located on connector of the power card, inside of the power supply (Fig. 14).

### MOD. 50-70-90



### MOD. 180

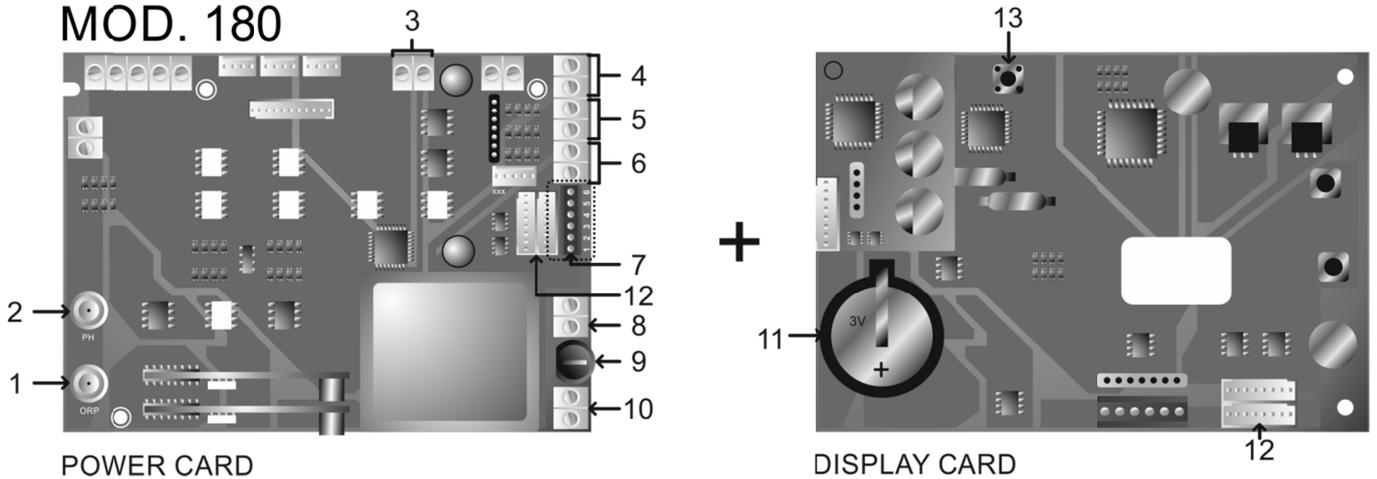


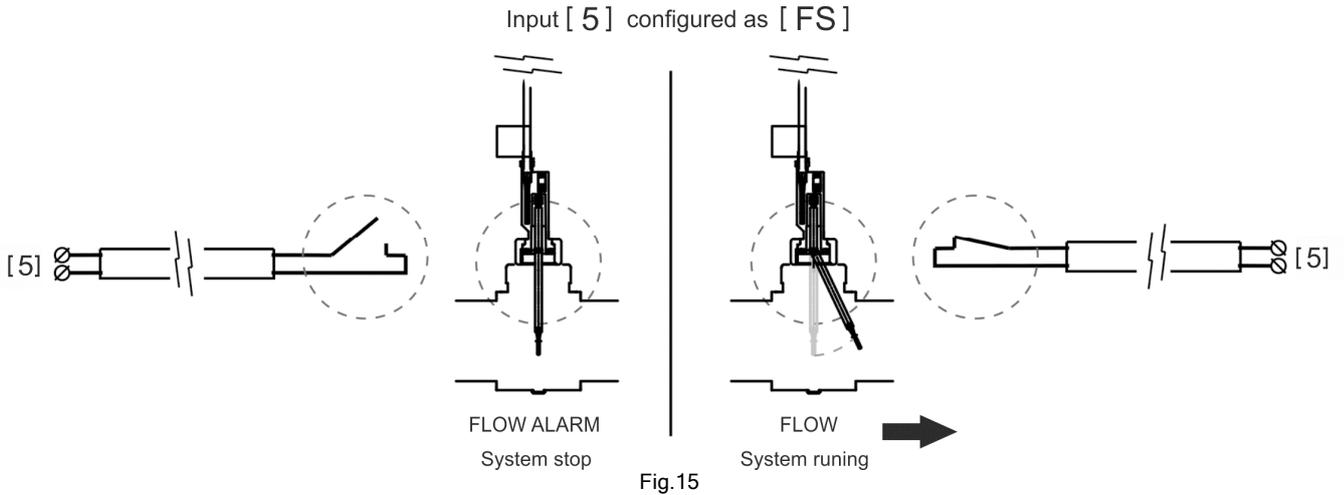
Fig. 14

#### DESCRIPTION OF TERMINALS:

1. ELECTRODE ORP
2. ELECTRODE PH
3. INDUCTIVE FLOW DETECTOR (Polarity -, +)
4. CONNECTION OF FLUJOSTATO (OPTIONAL potential free contact).
5. EXTERNAL CONTROL ORP (potential free contact)
6. COVER SIGNAL (Contact free potential)
7. POOLSTATION CONNECTION
8. pH PUMP CONNECTION (ON / OFF 0.5A/220V)
9. FUSE PUMP pH (0.5A / 220V)
10. INPUT 230Vac
11. BATTERY
12. CONNECTION VIEWER
13. DISPLAY RESET

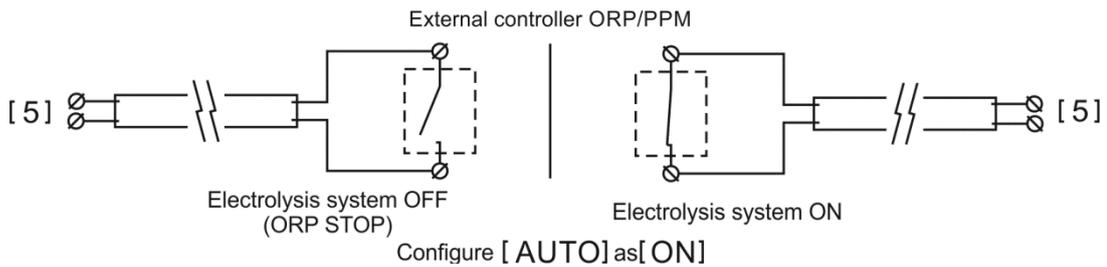
**[4] EXTERNAL FLOW DETECTOR control (OPTIONAL, not supplied with equipment):** input for voltage free contact. When the contact connected to this input is opened (external flow detector at rest), and input [4] has been set to **[ON]** during the system configuration, the electrolysis system is switched off (flow alarm). Connect the cables of the external flow detector to the corresponding input **[4]**.

(4) Configuration: FS = ON, Enabled // FS = OFF, Not enabled. Ver5.1 / 6



**[5] ORP Control (not enabled in equipment / EXT-1 or EXT-1D):** input for voltage free contact. This input can be used to make the electrolysis system interact with an external controller (ORP, RESIDUAL CHLORINE, PHOTOMETER, etc.). For this, it is sufficient to connect two wires from the voltage-free contact located on the external controller to the corresponding input **[5]** located on the power card of the unit.

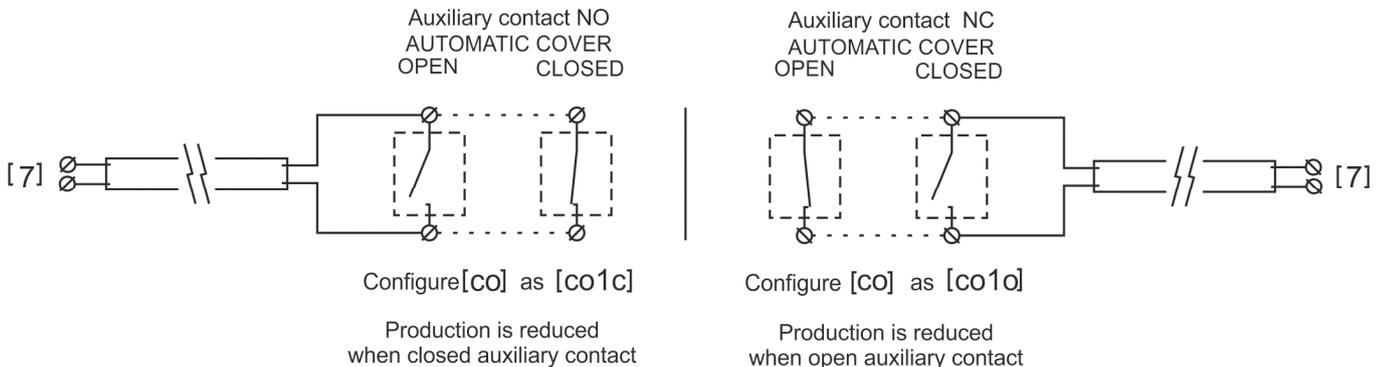
(5) Configuration Auto: Auto = ON, external control enabled // Auto = OFF, external control not enabled. See 5.1 / 3



Note: On equipment with pH & ORP integrated (Ext1, Ext1D) AUTO program control ORP in automatic mode (AUTO = ON) or manual mode (AUTO = OFF), leaving the input (5) disabled for a control external.

**[6] AUTOMATIC COVER CONTROL:** input for potential-free contact. Depending on status of the contact connected to it on the automatic cover's electric panel, this input enables you to programme a reduction of the equipment's output current to a percentage of its nominal value.

(6) Config. Cover: CO = CO\_1C, enabled NO // CO = CO\_10, enabled NC // CO = CO\_0, Not enabled. See 5.1 / 4



#### **4.7. Start-up**

1. Check that the filter is 100% clean, and ensure that the swimming pool and the installation do not contain copper, iron or algae. Ensure that any heating equipment on the pool is suitable for use in salt water.
2. Ensure that the swimming pool water is balanced, because like that the chlorine produced is used more efficiently and effectively, and ensures that the life of the electrodes is prolonged. Water should be maintained within the parameters shown below.
  - a) pH must be in the range 7.2-7.6
  - b) Total alkalinity must be in the range 60-120 ppm
3. Although the Salt Electrolysis System can operate within a salinity range of 5 - 6 g/l, the minimum recommended level of salt, 5 g/l, should be maintained by adding 5 kg per m<sup>3</sup> of water if the water did not previously contain salt. Always use common salt (sodium chloride), without additives like iodides, that is "apt for human consumption". Never add the salt through the electrolysis cell. Add it directly to the swimming pool or into the balance tank.
4. When adding the salt, and in case the swimming pool is going to be used immediately, carry out a treatment with chlorine. An initial dose of 2 g/m<sup>3</sup> of trichloroisocyanuric acid may be added.
5. Prior to starting up the salt chlorinator, disconnect the power supply to the salt chlorinator and run the pump for 24 hours to ensure that the salt is completely dissolved.
6. Next, reconnect the power supply and turn on the salt chlorinator, locating the production level so that free chlorine concentration stays within the recommended range (0.5 - 1.5 ppm).

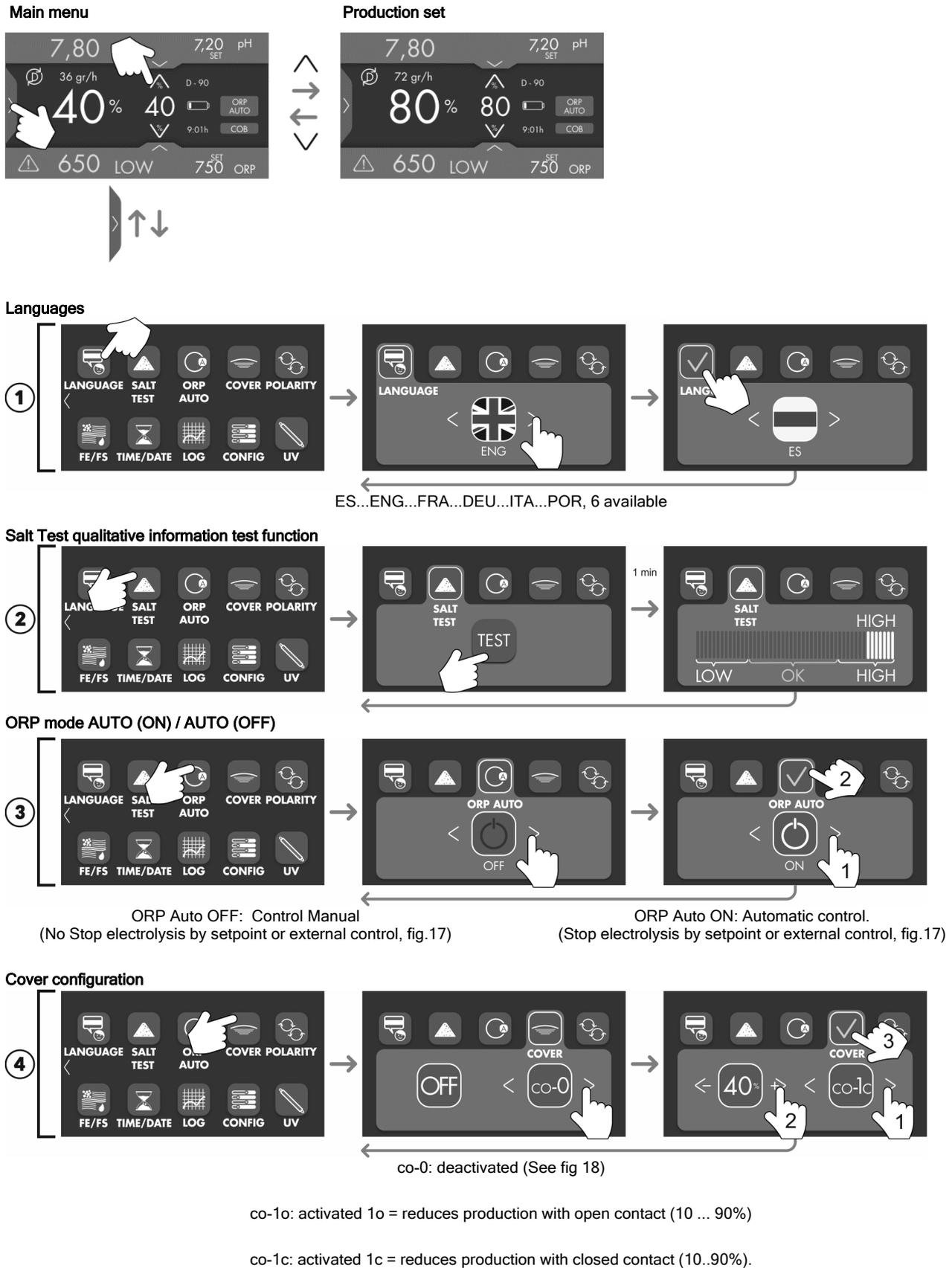
**NOTE:** in order to establish the free chlorine level you will need to use a test kit.

In outdoor swimming pools it is advisable to maintain a level of 25-30 g/m<sup>3</sup> of chlorine stabiliser (cyanuric acid) in the pool. A level of 75 ppm should be never exceeded. This will help to stop the chlorine that is in the water from being destroyed by the sun.

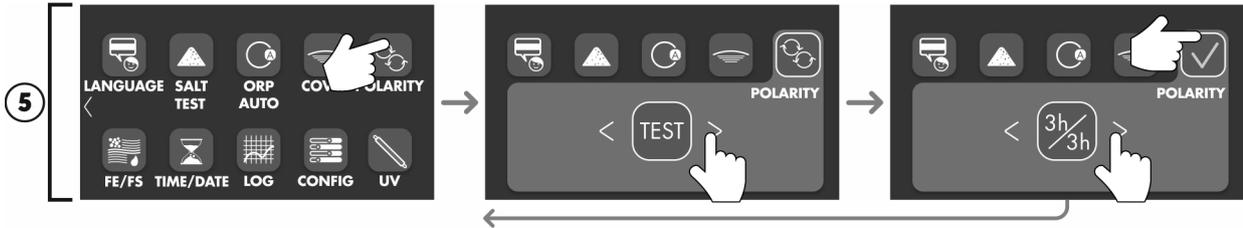
## 5. OPERATION:

### 5.1. System configuration menu

To modify the operating parameters of the system, you must enter the PROGRAMMING mode according to the following flow diagram.



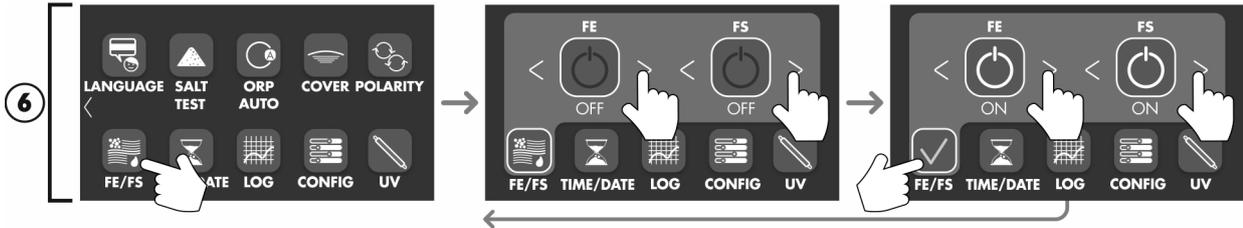
**Polarity change**



3h / 3h: change every 3 hours 2h / 2h: change every 2 hours (factory value).

Test: change every 2 minutes (only for verification for a short period of time, as it could damage the electrodes).

**Flow detectors (FE gas and FS flow switch)**



**Gas detector :**

OFF: Deactivated

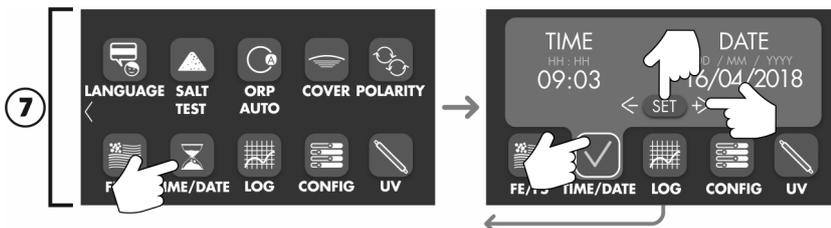
ON: Activated. Activated gas detector (fig.4) Factory value

**Flow Detector:**

OFF: Deactivated

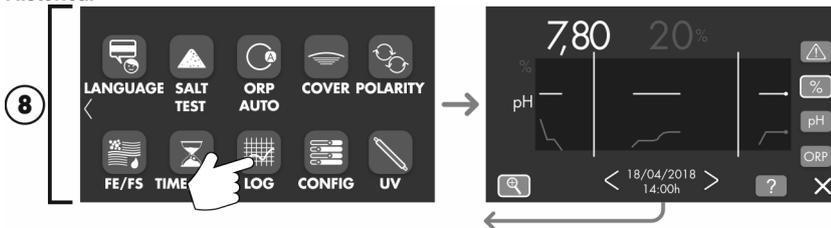
ON: Activated (fig.15)

**Clock: Time / Day / Month / Year**



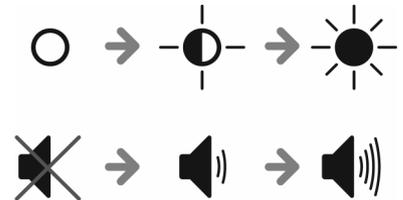
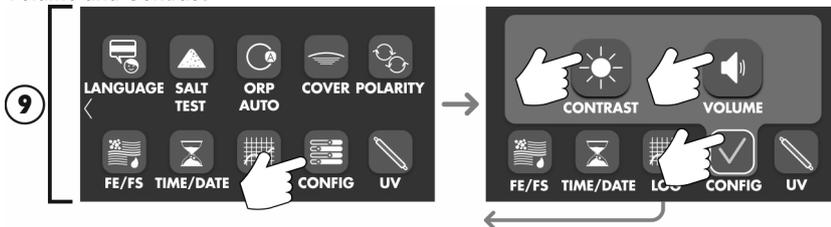
"TIME: MINUTES" & "DAY: MONTH: YEAR"

**Historical**



Information 28 days / 28 hours  
 ⚠ Alarms  
 % Alarms  
 pH % Production and Setpoint electrolysis  
 ORP  
 PH value and Setpoint  
 Value ORP and Setpoint

**Volume and Contrast**



**5.2. Integrated pH / ORP controller**

The integrated pH / ORP controller is supplied with a default factory calibration and programmed with the following parameters:

SETPOINT pH="7.2" / ORP="750 mV"

**IMPORTANT:** In order to have a correct regulation of the pH value, the Total Alkalinity of the pool water must be maintained in the range 60-120 ppm CaCO<sub>3</sub>. Use a pool water test kit to check the Total Alkalinity and adjust manually if necessary.

**5.2.1. CONNECTION OF THE PH / ORP SENSORS**

Connect the pH / ORP sensor provided with the unit to the corresponding BNC connectors located in the unit's base (Fig. 23).

**5.2.2. CONNECTION OF THE DOSAGE PUMP**

The Salt Electrolysis System (EXT-1 models) have a connector on their base for connecting a dosage pump to control the pH of the water in the pool. The dosage pump can be connected through the CEE22 connector supplied for that purpose with the equipment (Fig. 23).

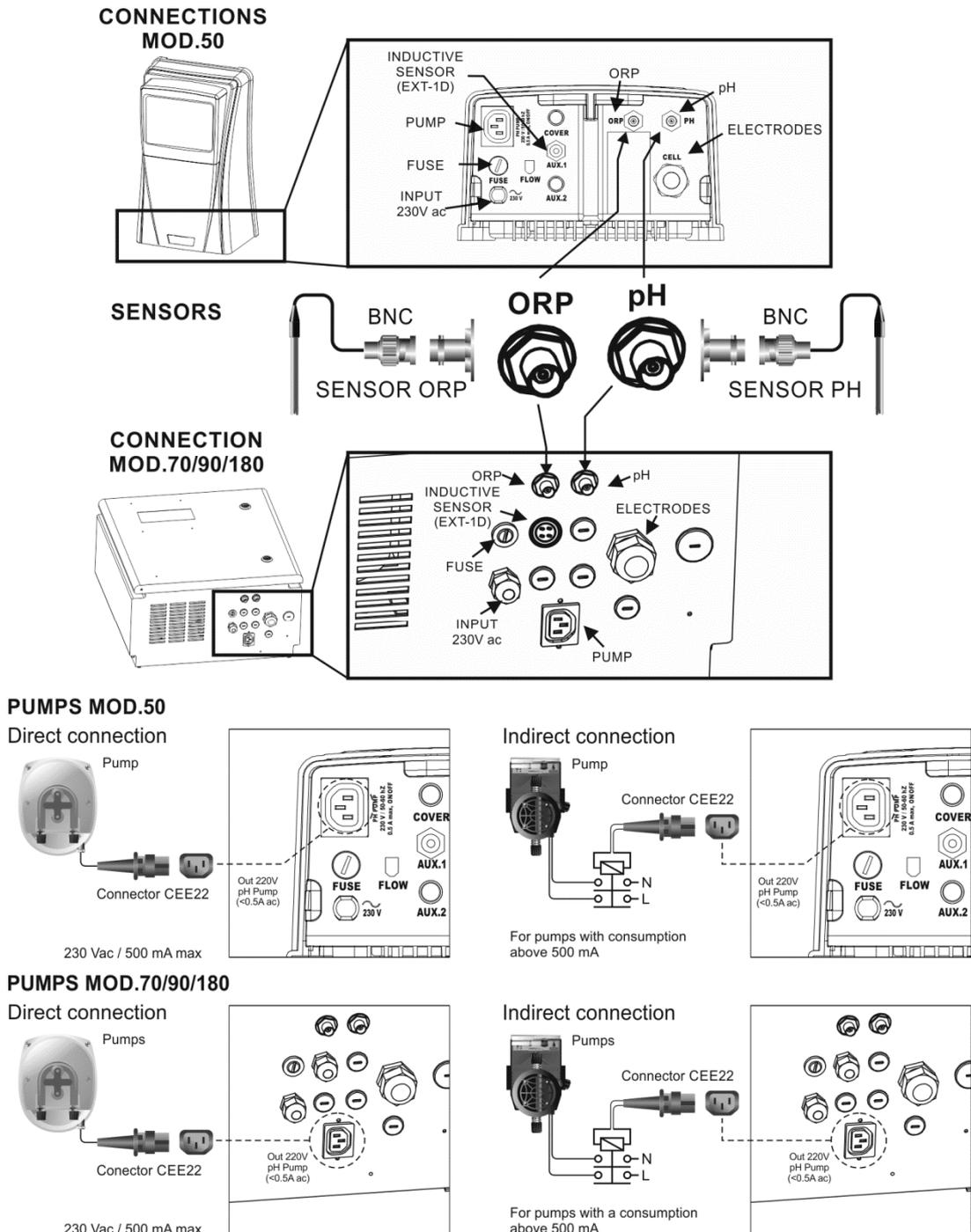


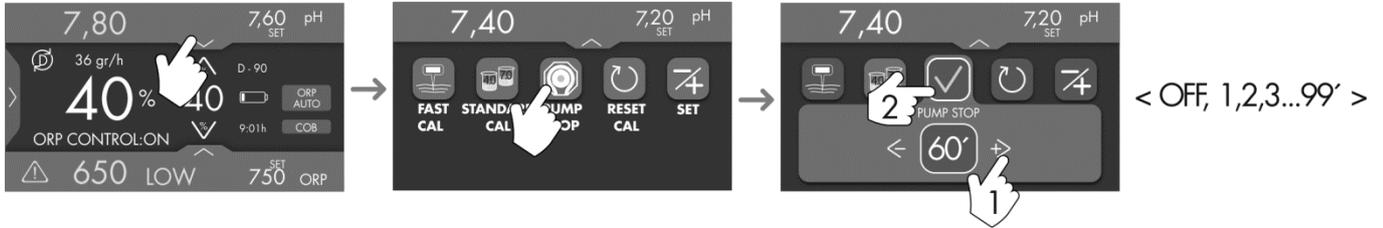
Fig. 23

### 5.2.3. SAFETY STOP CONFIGURATION OF THE DOSAGE PUMP (PUMP STOP AND RESET FUNCTION)

The integrated pH controller has a security system (PUMP-STOP FUNCTION) acting on the dosage pump which allows to avoid the following situations:

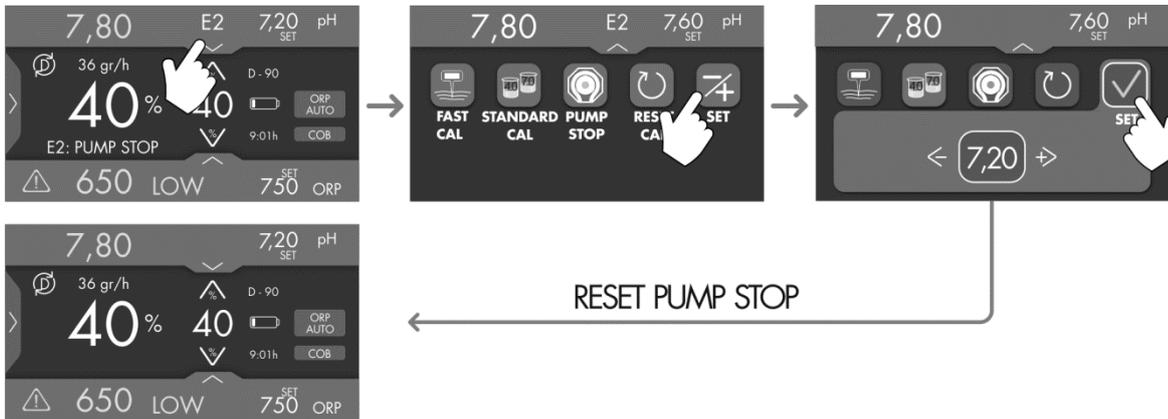
- Damages caused by the dry operation of pump (depleted pH-minus product).
- Over-dosage of pH-minus product (damaged or aged sensor).
- PH regulation problems due to high alkalinity in the water (newly filled pool, high carbonate levels).

The PUMP-STOP FUNCTION is set at the factory to 60 MINUTES of safety time (PUMP STOP: 60). To modify this value, perform the following procedure:

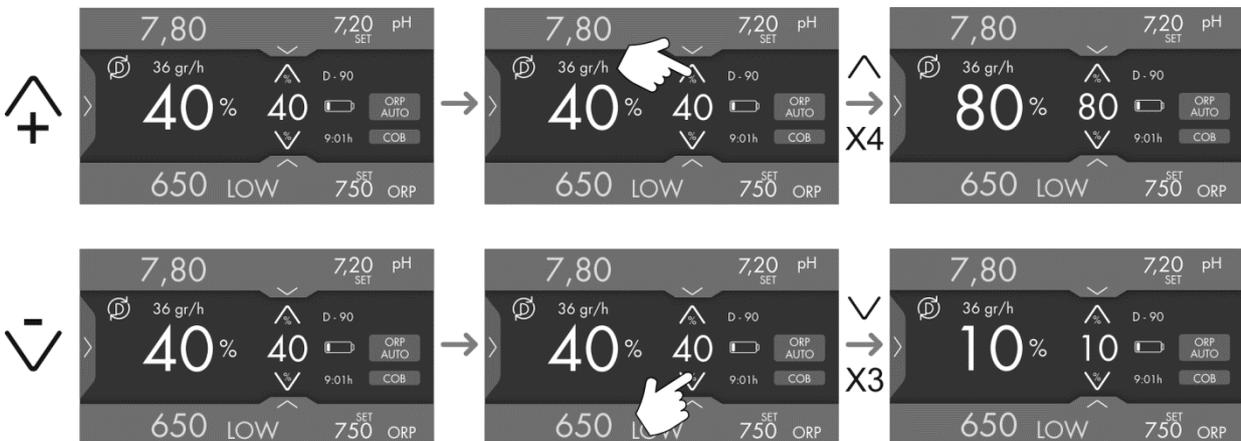


When the PUMP-STOP FUNCTION is activated (PUMP STOP other than OFF), the system will stop the dosing pump after the programmed time (PUMP STOP between 1 ... 99min) without reaching the pH setpoint value.

The pump is reactivated by entering the "pH Programming" menu and pressing (SET):



### 5.3. Programming of production setpoint value (gr/h).



### 5.4. Programming the pH menu

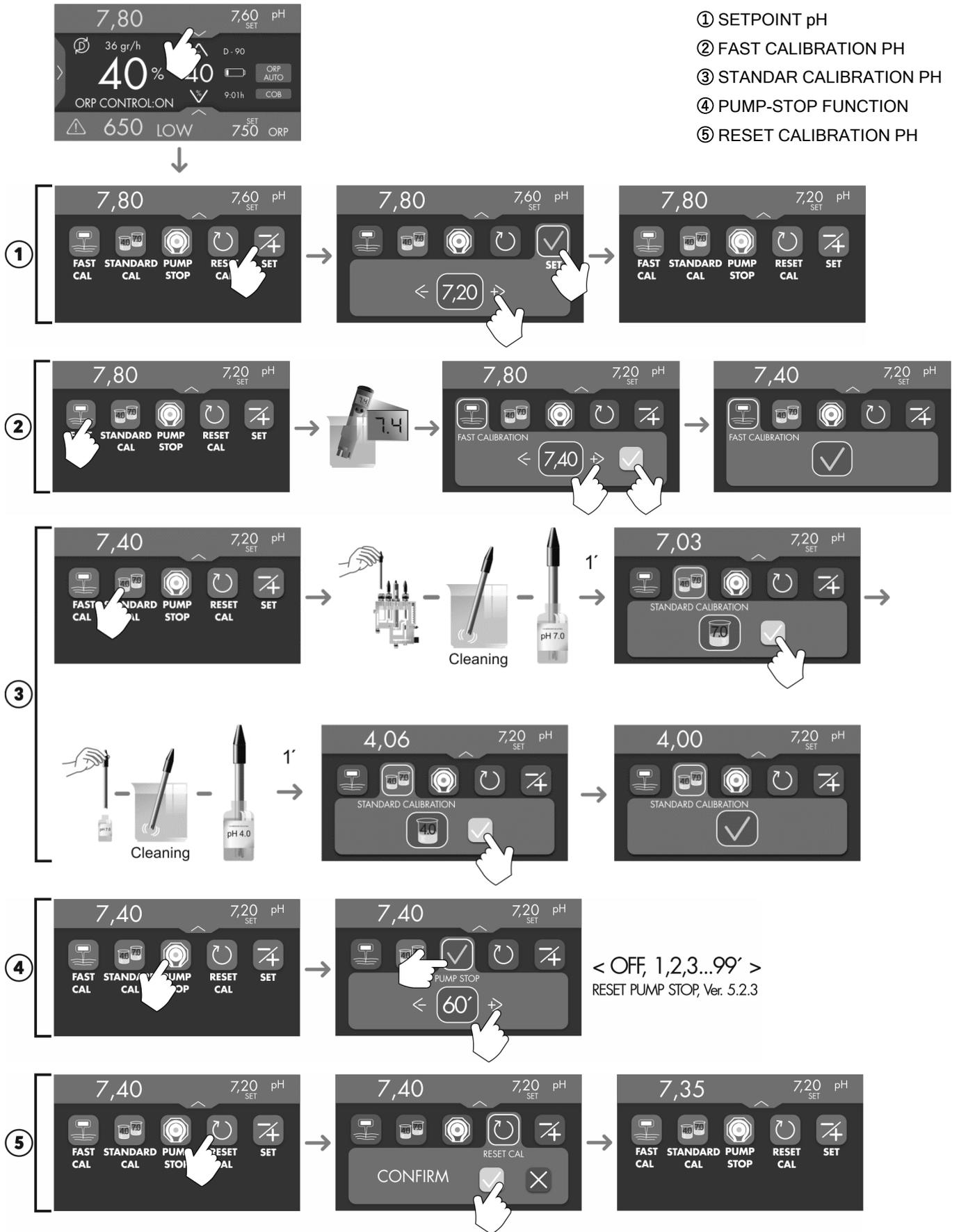
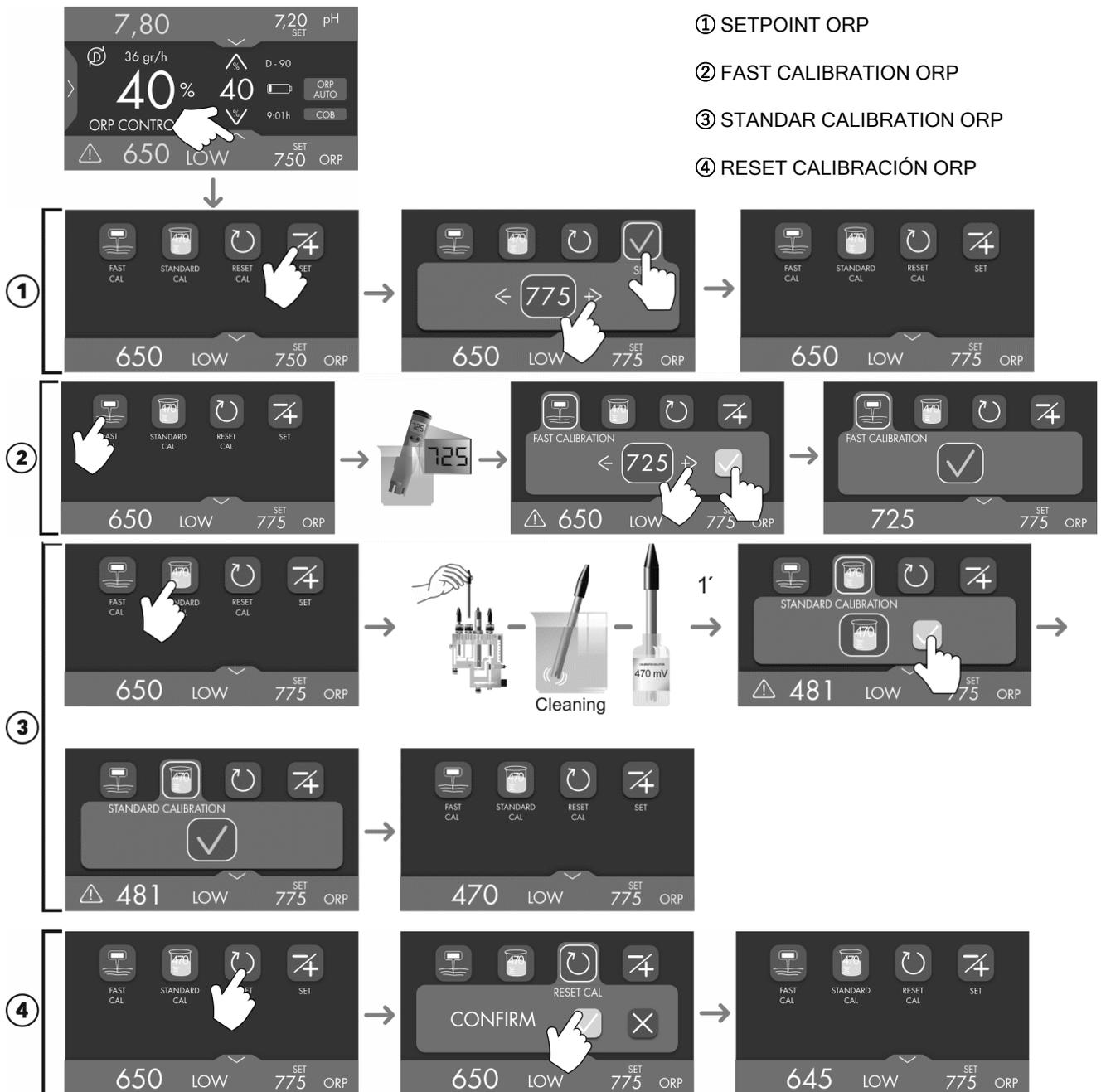


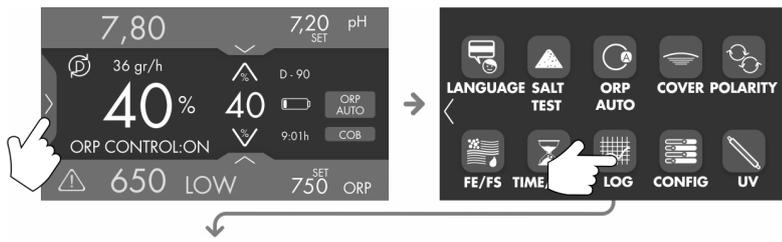
Fig. 24

## 5.5. Programming the ORP menu



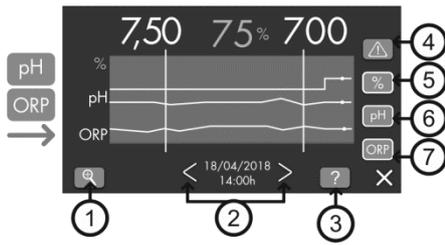
## 5.6. HISTORICAL:

We can access the database of the machine and know the values that have been obtained in a certain date, or the alarms that have appeared.

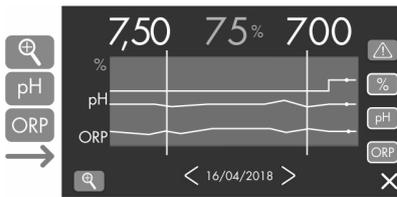


- 1) View 48 hours / 28 days
- 2) Backspace <=> Advance hours / day
- 3) Graphic scale (1 technique)
- 4) Info Alarms
- 5) Production
- 6) pH value
- 7) ORP value
- 8) Setpoint
- 9) Alarm corrected
- 10) Active alarm
- 11) Partial hours
- 12) Total hours
- 13) Reset partial hours
- 14) Exit

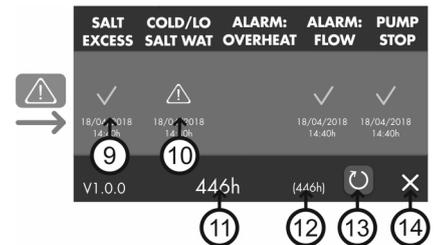
Screen 48 hours and 3 Parameters



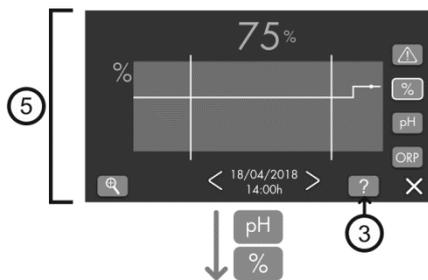
Screen 28 Days and 3 Parameters



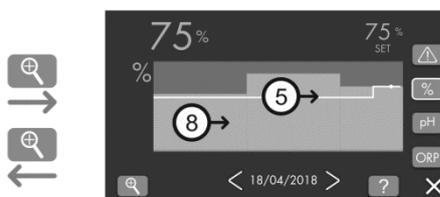
Alarm screen



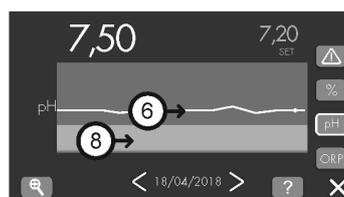
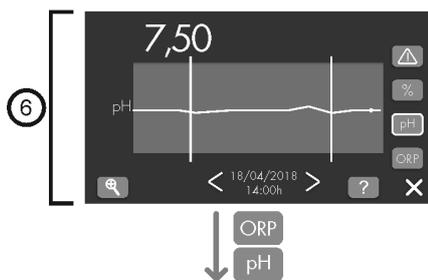
Screen 48 hours & 1 Parameter



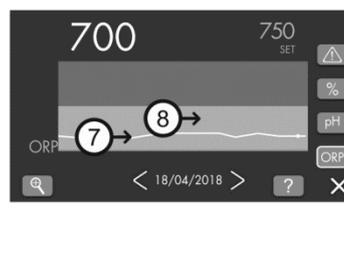
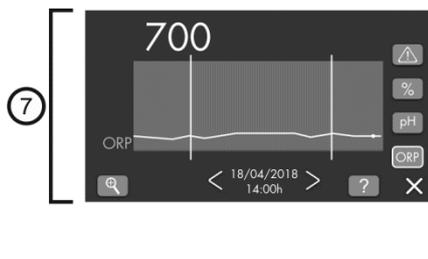
Screen 28 Days & 1 Parameter



Production



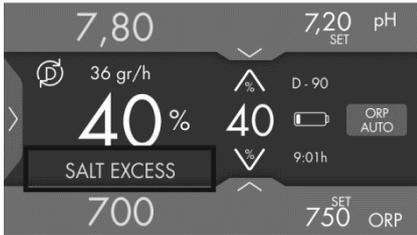
pH



ORP

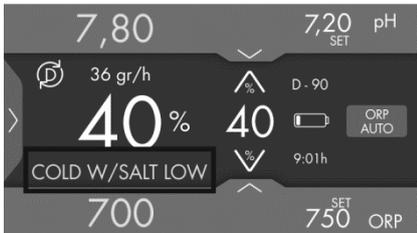
## 5.7. Alarms

### HIGH SALT LEVEL



High conductivity or an excess of salt has been added. The message **"EXCESS SALT"** appears in the message bar of the display.

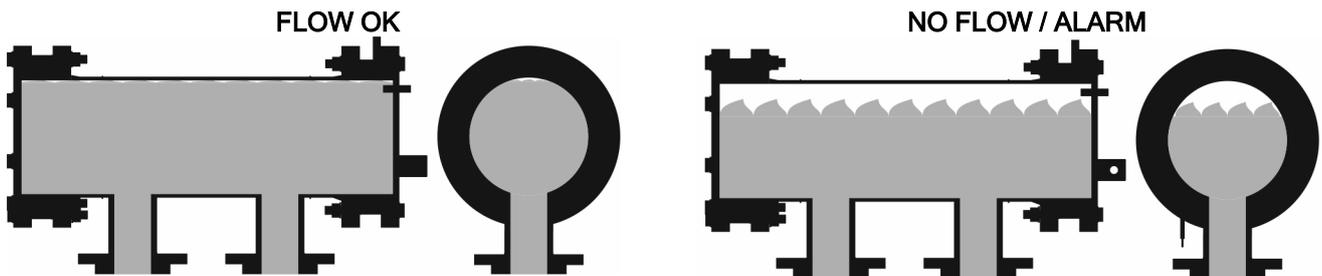
### LOW SALT LEVEL



Low conductivity or cold water or low salt. The message **"COLD W / SALT LOW"** appears in the message bar of the display.

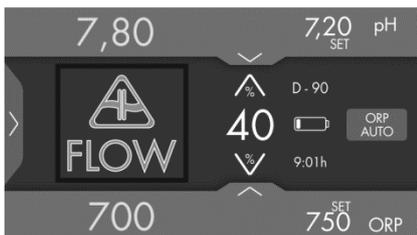
### WATER LEVEL IN CELL/FLOW DETECTOR (GAS)

If an air or gas bubble forms at any time at the top of the electrolysis cell and the FLOW DETECTOR is not submerged, the system will automatically switch off production, originating the alarm **"FLOW"**. The system automatically resets when water flows through the cell again or the bubble disappears.



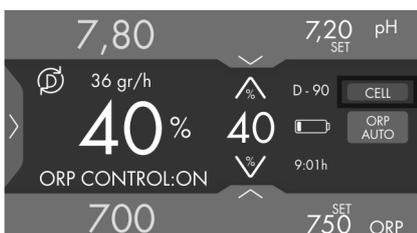
### OPTIONAL EXTERNAL FLOW DETECTOR / FLOW SWITCH (not included with the equipment)

During the system configuration process, the input for the external flow switch is activated (factory-programmed default value), the system will automatically switch off production, the **"FLOW"** alarm appears. The system automatically resets whenever water starts to flow through the flow switch again. (Fig. 15)



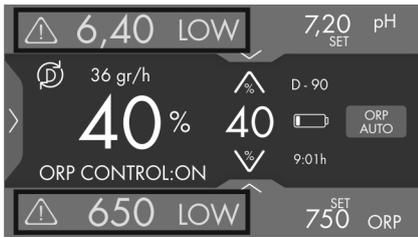
### CELL ALARM

The system has a malfunction indication alarm on the electrodes of the electrolysis cell. This usually occurs at the end of the electrodes' useful life, when they lose their power. However, although this is a self-cleaning system, this malfunction could also be due to excessive scaling on the electrodes when the system operates with hard water with a high pH value.



The electrodes are disabled and need to be replaced, appears **"CELL"**.

### LOW ALARM PH / ORP



The integrated pH / ORP (mV) controller has an ALARM signal that is activated when an anomalous value outside the range is detected, lower than pH 6.5 / ORP 650.

### HIGH ALARM PH / ORP



The integrated pH / ORP (mV) controller has an ALARM signal that is activated when an abnormal value outside the range is detected, greater than pH 8.5 / ORP 850. For safety reasons at pH > 8.5 (HIGH) the pH dosage is stopped.

### COVER



The cover control is activated.

## 6. MAINTENANCE:

### 6.1. Maintenance of the electrolysis cell

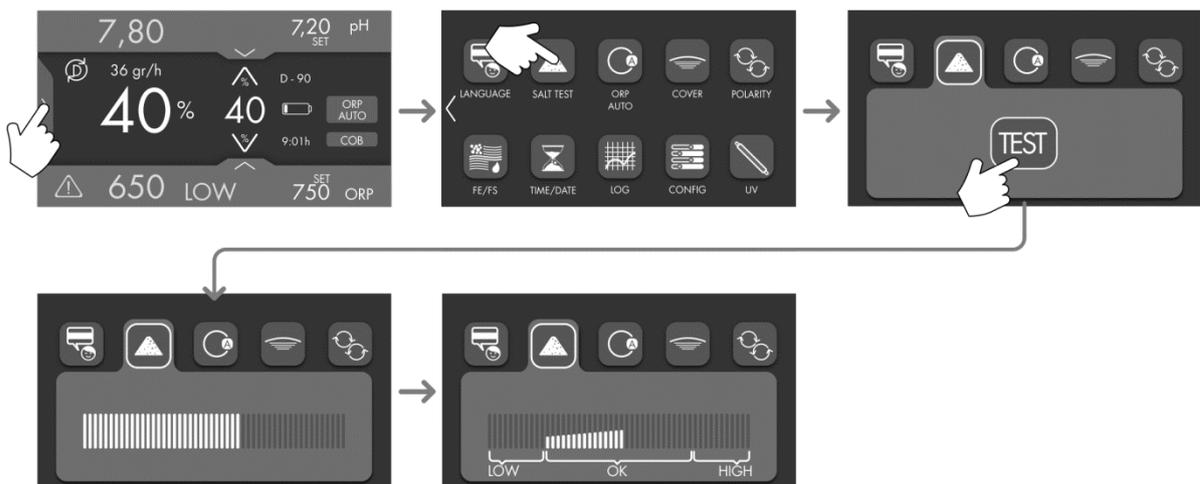
The electrolysis cell must be kept in suitable conditions to ensure a long lifetime. This salt chlorination unit has an automatic electrode cleaning system that helps to prevent scale build-up on the electrode surface. If the salt chlorination system is operated in accordance with these instructions, and in particular if the pool water balance is kept within the recommended parameters, it should not be necessary to manually clean the electrodes. However, if the pool water and the salt chlorination system are not maintained in line with these instructions then it may be necessary to manually clean the electrodes following the procedure outlined below:

1. Cut off the 230 Vac unit's supply.
2. Unscrew the closing nut located at the end where the electrodes are located, and remove the electrode package.
3. Use diluted hydrochloric acid (a part of commercial acid in 10 parts of water), submerging the electrode package in the prepared solution for no more than 10 minutes.
4. NEVER SCRAPE OR SWEEP THE CELL OR THE ELECTRODES.

The electrodes of a salt chlorination system comprise of a titanium sheet coated with a layer of noble metal oxides. The electrolysis processes that take place on their surface produce a progressive wearing down - the electrodes do have a finite life. In order to optimise electrode lifetime, please consider the following aspects:

1. Although all Salt Electrolysis System units are SELF-CLEANING, a prolonged operation of the system at pH values over 7.6 in waters of high hardness can produce scale formation on the surface of the electrodes. Scaling on the electrodes surface will progressively deteriorate the coating, causing a decrease of lifetime.
2. Manually cleaning/washing the electrodes (as described above) will shorten their life.
3. Prolonged operation of the system at salinities lower than 3 g/l (3000 ppm) will cause a premature deterioration of the electrodes.
4. Frequent use of copper based algacides will promote the formation of copper deposits on the electrodes, progressively damaging the coating. Remember that chlorine is the best algicide.

### 6.2. Salt Test (Not compatible with seawater system. Salt Test will not be operative if FLOW ALARM is active or system is STOPPED in AUTO mode)



### 6.3. Salt additions

The recommended salt concentration is 5-6 gr/l of sodium chlorine (NaCl). If "COLD WATER - LOW SALT" alarm appears in the message bar of the screen, salt addition to the pool may be needed.

If the electrodes are in good condition please proceed as follows:

1. If the water temperature is between 24°C and 30°C, add salt gradually until the disappearance of the alarm.
2. At temperatures below 24°C (cold water), this alarm may appear even if the salinity level is right because a diminution in the water conductivity is interpreted by the system as loss of salinity. In this situation, if the pool is in use, add the necessary salt until the disappearance of the alarm. If the pool is in a non-use period it is advisable to reduce the chlorine production to 50% and also reduce the filtration time. With these actions the alarm will disappear and the electrode lifetime will be maximized.  
To allow proper monitoring of the salinity of the water, we recommend using a portable conductivity/temperature meter, or other similar device. The type of salt recommended for use in swimming pools with electrolysis system should not contain any additives (iodide, anti-caking, etc.), and should be suitable for human consumption.



**IMPORTANT:** a sudden failure in the sensors can result in over-dosing of chlorine or pH regulation product. You should take appropriate security measures to foresee this possibility. Keep in mind that high concentrations of free chlorine using DPD colorimetric test will not show any colour, as the DPD reagent degrades when chlorine levels are too high.

#### ERROR MESSAGES:

E1

If the calibration process is interrupted for whatever reason, the controller will automatically leave the calibration mode if the intervention of the user is not detected in a few seconds. In this case, "E1" indication in display will appear.

E2

If the ORP value detected during the calibration process is very different from the expected one (e.g., defective electrode, etc.), display will indicate "E2", not allowing calibration.

E3

If the ORP measure is unstable during the calibration process, code "E3" will appear in the display. In addition, the ORP-electrode calibration will not be allowed.

EXT-1(D)

#### 6.4. pH/ORP sensor maintenance

1. Ensure that the sensor membrane remains moist all the time
2. If the sensor is not going to be used for a long period, keep it submerged in a pH=4.0 conservation solution
3. To clean the sensor, avoid the use of abrasive materials that can scratch the sensor surface.
4. **The pH / ORP sensor is a consumable part and will need to be replaced over a period of time.**

## 7.TROUBLESHOOTING: \_\_\_\_\_

Any action required to solve possible problems in the equipment should always be performed with the equipment disconnected from the mains. Any problem not indicated in the following list should be solved by technician.

PROBLEM	SOLUTION
<b>Production indicator always indicates "0" at all production levels</b>	<p>Check electrodes.</p> <p>Verify connections between power supply and the electrolysis cell.</p> <p>Check salt concentration.</p>
<b>The power supply is not turned on.</b>	<p>Check the system is properly connected to 230 V/50-60 Hz in the command box of the pump.</p> <p>Check the state of the fuse located at the bottom of the power supply.</p>
<b>Free chlorine levels in the water are very low.</b>	<p>Check that the system produces chlorine in pool jets.</p> <p>Verify that the water Chemicals parameters (pH, combined chlorine, isocyanuric acid, etc.) are correct.</p> <p>Increase filtering time.</p> <p>Add chlorine stabilizer (cyanuric acid) until a concentration of 25 - 30 g/m<sup>3</sup> is achieved.</p>
<b>pH/ORP controller always show extreme values, or readings are unstable.</b>	<p>The cable of the pH/ORP sensor is damaged. Clean the contacts or replace the cable.</p> <p>The pH/ORP sensor has an air bubble in the membrane area. Hold the sensor in vertical position. Shake it lightly until the bubble moves up.</p> <p>Sensor fault. The connection cable is too long or it is too near to sources of electrical interference (motors, etc.). Replace the sensor. Locate the unit nearer to the sensor.</p>
<b>Impossible calibration of the pH/ORP sensor</b>	<p>Polluted or expired calibration solution.</p> <p>Blocked sensor membrane. Check the membrane is not damaged. Clean the sensor with diluted acid in water, shaking it lightly.</p> <p>Sensor fault. Replace the sensor.</p>
<b>Slow response of the pH/ORP sensor</b>	<p>Sensor electrostatically charged. During the calibration phase, the sensors should not be dried with paper or cloth. Clean it exclusively with water and shake it lightly.</p> <p>Insufficient renovation of the analyzed water (no flow through the sample point). Ensure that the tip of the sensor is submerged in the water at the sample point, and that no air bubbles are present.</p>

## 8. TECHNICAL CHARACTERISTICS:

### TECHNICAL SPECIFICATIONS:

#### Standard working voltage

230V AC - 50 Hz.	
XX-50, cable: 3 x 1.5 mm <sup>2</sup> , long. 2 m.	1.5 A
XX-70, cable: 3 x 1.5 mm <sup>2</sup> , long. 2 m.	2.8 A
XX-90, cable: 3 x 1.5 mm <sup>2</sup> , long. 2 m.	3.4 A
XX-180, cable: 3 x 2.5 mm <sup>2</sup> , long. 2 m.	6.7 A

#### Fuse

XX-50	5 A (T)*
XX-70	6 A (T)*
XX-90	7 A (T)*
XX-180	12,5 A (T)*

(\*) Use always curve D or K circuit breakers

#### Output voltage

24VDC	
XX-50, cable: 3 x 4 mm <sup>2</sup> , long. 2,5 m.	9 A
XX-70, cable: 3 x 4 mm <sup>2</sup> , long. 2,5 m.	15 A
XX-90, cable: 3 x 4 mm <sup>2</sup> , long. 2,5 m.	15 A
XX-180, cable: 2 x 10 mm <sup>2</sup> , long. 2,5 m.	30 A

#### Production

XX-50	45 ... 50 g/h
XX-70	60 ... 70 g/h
XX-90	80 ... 90 g/h
XX-180	150 ... 180 g/h

#### Minimum recirculation flow

XX-50	8 m <sup>3</sup> /h
XX-70	12 m <sup>3</sup> /h
XX-90	15 m <sup>3</sup> /h
XX-180	30 m <sup>3</sup> /h

#### Electrode number

XX-50	13
XX-70	6
XX-90	7
XX-180	13

#### Net weight (packaging included)

XX-50	30Kg
XX-70	60Kg
XX-90	60Kg
XX-180	60Kg

### GENERAL FEATURES:

#### Control system

- Microprocessor.
- Membrane keypad with control keys and operation indication leds.
- Control I/O: 3 inputs (potential-free contact type) for monitoring the external flow switch, the state of the automatic cover and ORP/residual chlorine controller.
- Cell output: production control (11 discrete levels).  
Integrated pH/ORP controller (only in versions with **EXT-1** control extension installed).

#### Self-cleaning

Automatic polarity switch

#### Working temperature

From 0 C to +40°C  
Cooling: natural convection

#### Material

Power supply / wall terminal: Metal  
Electrolysis cell and sensor-holder: Polypropylene

**EXT-1(D)**

#### pH sensor

Body: plastic (blue)  
Range 0 -12 pH  
Solid electrolyte

#### ORP sensor

Body: plastic (red)  
Range 0 - 1± 2000 mV  
Solid electrolyte

## 9.WARRANTY CONDITIONS: \_\_\_\_\_

### 9.1.GENERAL ASPECTS

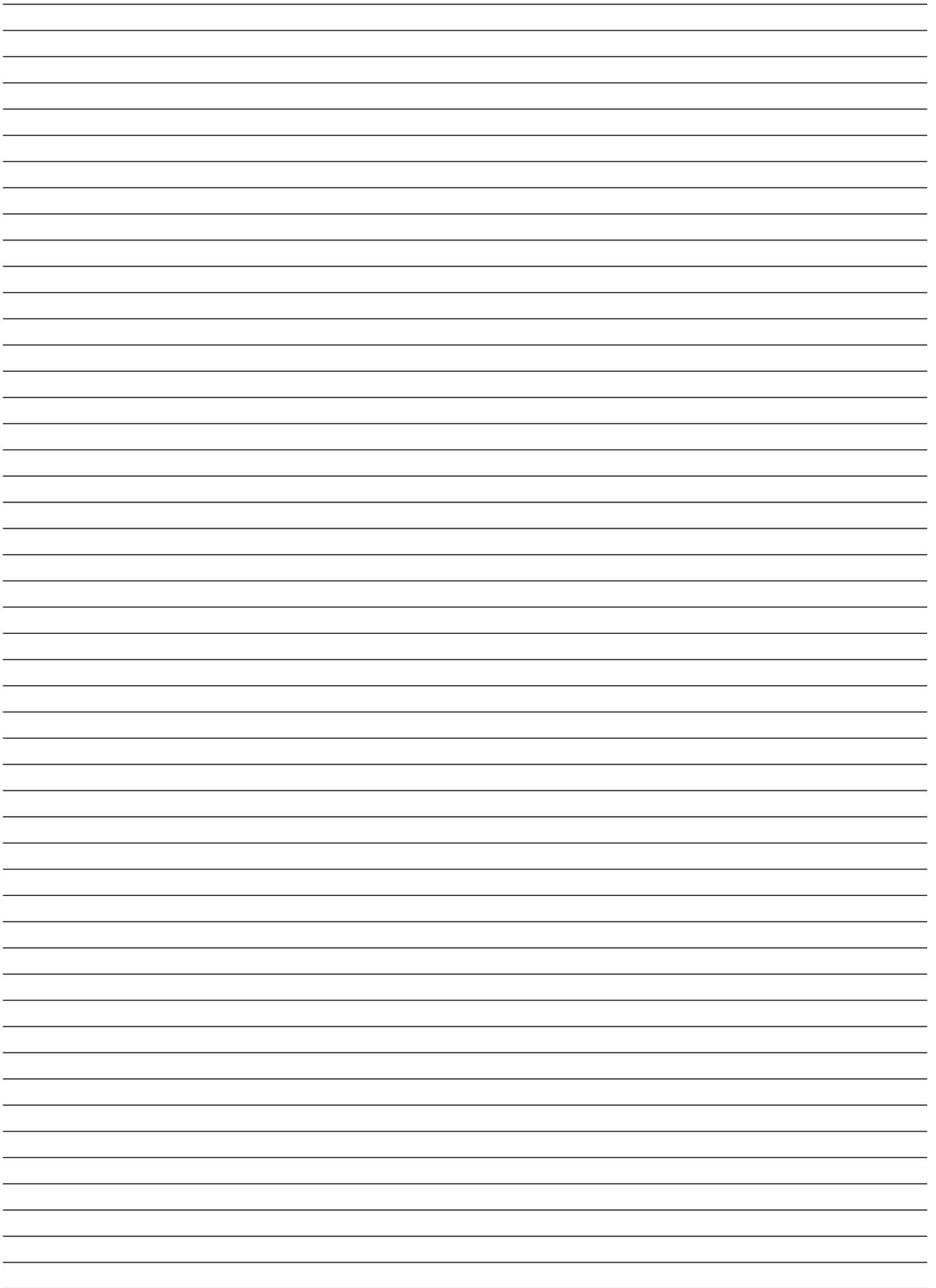
- 9.1.1. According to these provisions, the seller guarantees that the guaranteed product is in perfect condition upon delivery.
- 9.1.2. The Total Warranty period is 2 YEARS.
- 9.1.3. The Warranty period will be calculated as of delivery to the purchaser. The electrode is covered by a 2-YEAR WARRANTY (or 7.000 hours), which is not extendable. The pH /ORP sensors are covered by a 6-MONTH non-renewable warranty.
- 9.1.4. Should the Product be faulty and the seller is notified during the Guarantee Period, he shall repair or replace the Product at his own cost wherever he sees fit, unless this is either impossible or out of proportion.
- 9.1.5. When the Product cannot be repaired or replaced, the buyer may request a proportional price reduction or, if the fault is important enough, rescission of the sales contract.
- 9.1.6. Parts replaced or repaired pursuant to this warranty shall not extend the warranty period of the original Product, although they shall have their own warranty.
- 9.1.7. For this warranty to be effective, the buyer shall accredit the date of acquisition and delivery of the Product.
- 9.1.8. When the buyer alleges a fault in the product over six months after its delivery, he shall accredit the original and existence of the alleged fault.
- 9.1.9. This Warranty Certificate does not limit or prejudice consumer rights pursuant to national legislation.

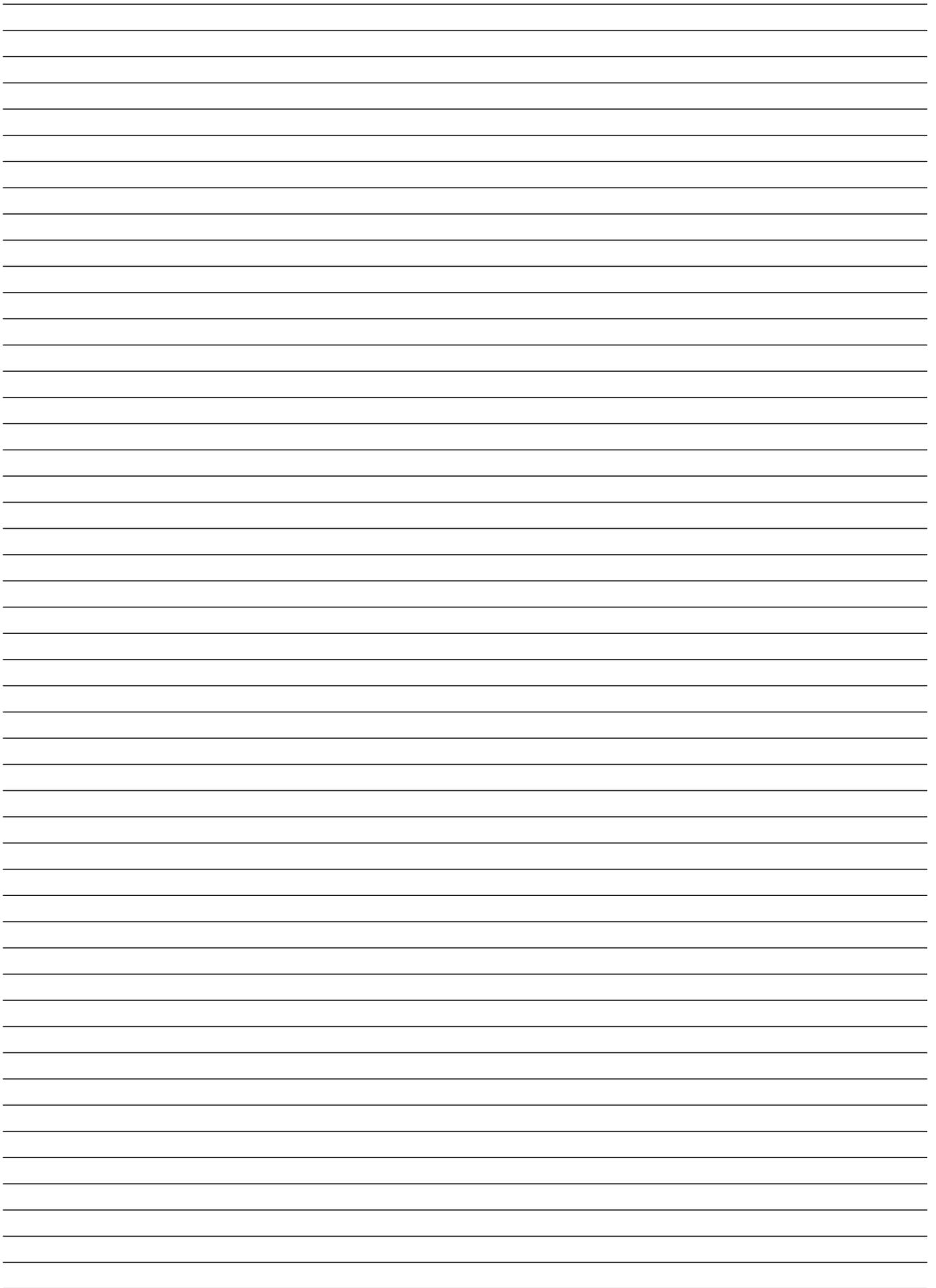
### 9.2.SPECIFIC CONDITIONS

- 9.2.1. For this warranty to be effective, the buyer must closely follow the manufacturer's instructions included in the documentation supplied with the product, as applicable to each product range and model.
- 9.2.2. Whenever a schedule is defined for the replacement, maintenance or cleaning of certain product parts or components, the warranty shall only be valid when said schedule has been correctly followed.

### 9.3.LIMITATIONS

- 9.3.1 This warranty shall only be applicable to sales to consumers, with consumer being defined as a person who purchases the product for other than professional purposes.
- 9.3.2 No warranty is applicable to normal wear or the product, parts, components and/or fungible or consumable materials (except the electrode).
- 9.3.3 The warranty does not cover cases in which the product: (i) has been incorrectly treated; (ii) has been inspected, repaired, maintained or handled by an unauthorised person; (iii) has been repaired or maintained with non-original parts, or (iv) has been incorrectly installed or started up.
- 9.3.4 When a faulty product results from incorrect installation or start-up, this warranty shall only be applicable when the installation or start-up forms part of the product contract of sale and had been performed by the seller or under the seller's responsibility.
- 9.3.5. Damage or faults due to any of the following causes:
  - Bad programming of the system and/or user inadequate calibration of the pH/ORP sensors.
  - Operation at salinity values of less than 3 g of sodium chloride per litre and/or temperatures lower than 15°C or higher than 40°C.
  - Operation at a pH of more than 7.6.
  - Use of explicitly unauthorised chemicals.
  - Exposure to corrosive environments and/or temperatures of less than 0°C or more than 50°C.





EN	PRODUCTS	<b>SALT ELECTROLYSIS SYSTEM</b>	Model. 50	Model. 50 (EXT-1)	Model. 50 (EXT-1D)
FR	PRODUITS	<b>SYSTÈME D'ÉLECTROLYSE SALINE</b>	Model. 70	Model. 70 (EXT-1)	Model. 70 (EXT-1D)
ES	PRODUCTOS	<b>SISTEMA DE ELECTROLISIS DE SAL</b>	Model. 90	Model. 90 (EXT-1)	Model. 90 (EXT-1D)
IT	PRODOTTI	<b>SISTEMA D'ELETTROLISI SALINA</b>	Model. 180	Model. 180 (EXT-1)	Model. 180 (EXT-1D)
DE	PRODUKTE	<b>SALZ-ELEKTROLYSE-SYSTEM</b>			
PT	PRODUTOS	<b>SISTEMA DE ELECTRÓLISE SALINA</b>			

**DECLARATION EC OF CONFORMITY**

The products listed above are in compliance with:

Low Voltage Directive (LVD) 2006/95/EC.  
Electromagnetic Compatibility Directive (CEM)  
2004/108/EC.  
ROHS Directive 2011/65/EC.

**DÉCLARATION CE DE CONFORMITÉ**

Les produits énumérés ci-dessus sont conformes à:

La Directive des Appareils à Basse Tension (LVD)  
2006/95/EC.  
La Directive de Compatibilité Électromagnétique (CEM)  
2004/108/EC.  
La Directive ROHS 2011/65/EC.

**DECLARACION CE DE CONFORMIDAD**

Los productos arriba enumerados se hallan conformes con:

Directiva de Equipos de Baja Tensión (LVD) 2006/95/EC.  
Directiva de Compatibilidad Electromagnética (CEM)  
2004/108/EC.  
Directiva ROHS 2011/65/EC.

**DICHIARAZIONE CE DI CONFORMITÀ**

I prodotti di cui sopra adempiono alle seguenti direttive:

Direttiva per gli Apparecchi a Bassa Tensione (LVD)  
2006/95/EC.  
Direttiva di Compatibilità elettromagnetica (CEM)  
2004/108/EC.  
Direttiva ROHS 2011/65/EC.

**KONFORMITÄTSESKLÄRUNG CE**

Die oben aufgeführten Produkte sind konform mit:

Richtlinie für Niederspannungsanlagen (LVD)  
2006/95/EC.  
Richtlinie zur elektromagnetischen Kompatibilität (CEM)  
2004/108/EC.  
Richtlinie ROHS 2011/65/EC.

**DECLARAÇÃO CE DE CONFORMIDADE**

Os produtos relacionados acima estão conformes as:

Directiva de Equipamentos de Baixa Tensão (LVD)  
2006/95/EC.  
Directiva de Compatibilidade Electromagnética (CEM)  
2004/108/EC.  
Directiva ROHS 2011/65/EC.

**EG-VERKLARING VAN OVEREENSTEMMING**

De onderstaande producten zijn conform met:

de Laagspanningsrichtlijn 2006/95/EEG  
de Richtlijn inzake elektromagnetische compatibiliteit  
2004/108/EEG  
de Richtlijn ROHS 2011/65/EC.

Signature / Qualification:

Signature / Qualification:

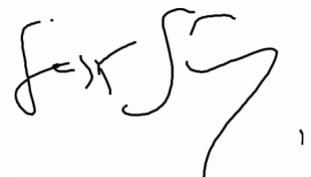
Firma / Cargo:

Firma / Qualifica:

Unterschrift / Qualifizierung:

Assinatura / Título:

Handtekening / Kwalificatie:



Gaspar Sánchez Cano  
Gerente

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