

## CHLORINATOR INFORMATION

PLEASE NOTE IN THE FOLLOWING CARD THE REGISTRATION DATA OF THE EQUIPMENT YOU HAVE PURCHASED, WHICH ARE FOUND ON THE SIDE LABEL.

THESE DATA WILL BE OF USE IF YOU WISH TO MAKE ANY ENQUIRY TO YOUR SUPPLIER OR TO BSV ELECTRONIC S.L.

MODEL.....  
REF. ....  
VOLTAGE.....  
SERIAL NUMBER.....



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**ATTENTION**

Before installing the salt water chlorinator, please read this manual carefully. If you need to clarify any point or have any doubts, please contact your dealer or BSV ELECTRONIC S.L. directly. We will be delighted to assist you.

**1- GENERAL DESCRIPTION****1.1- BSV PRO salt water chlorination equipment**

Thank you for purchasing our BSPOOL salt water chlorinator, which will enable you to enjoy your swimming pool in perfect conditions, without the need to add any chemical disinfectants.

The salt water chlorination system produces chlorine directly in the filtering installations by means of electrolysis of slightly salted water. "Free chlorine" (hypochlorous acid,  $\text{HClO}$ ) is produced which is a strong bactericide. Results are similar to the chemical products that are normally added.

Saline electrolysis is a reversible process, meaning that once active elements react with organisms present in the water, it reverts to common salt and water.

The equipment includes an electronic monitoring and regulation control and an electrolysis cell through which the pool water circulates and which is installed in the filtering circuit return

If the salt water chlorinator equipment is left to work permanently, it will not be necessary to change the swimming pool water for several years (8 to 15 depending on its use). You will therefore be collaborating with environment preservation policies and water management and saving.





## 1.2- Technical specifications

### 1.2.1- Equipment

Models	PRO200	PRO250	PRO500	PRO750	PRO1000
Supply voltage	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz
Chlorine production g/hour	200	250	500	750	1000
Max. power	1350W	1750W	3500W	5250W	7000W
Cell current	36A	45A	45A	45A	45A
Dimensions					
Weight	15Kg	20Kg	30Kg	40Kg	50Kg
Protection	IP57	IP57	IP57	IP57	IP57

### 1.2.2 – Common characteristics on the PRO units

- Adjustment of chlorine production by switched mode power supply
- Power supply performance >90%
- Automatic switch-off owing to lack of water flow
- Automatic voltage adjustment depending on the concentration of salt and the temperature, keeping continuous chlorine production.
- Automatic cleaning cycle of electrodes.
- Automatic restart in the event of supply failure.

## 1.3- Recommendations and safety precautions

- The equipment should always be installed by qualified staff.
- Disconnect the equipment from the mains before performing any assembly or maintenance operation.
- **Make sure that the electrical installation has all compulsory protection elements (circuit breaker and differential switch) in perfect condition.**



- It is important to ensure that the supply cables of the electrolysis cell are tightly connected, otherwise the equipment could overheat and break down.
- Ensure that the heatsink wings are not blocked and that air can easily circulate through them.
- BSV PRO equipment incorporate protection systems against short circuits in the cell, absence of water detector and other safety systems that give an acoustic and visual alarm in the event of any anomaly. However, for optimum results, you should ensure the correct hydraulic operation of your swimming pool.
- Corrosive environments may reduce the lifespan of the equipment. Do not leave open containers with acids near the equipment.

## 2- PREPARING THE SWIMMING POOL

### 2.1- Adding salt to the water

Para que el clorador funcione correctamente deberá incorporarse una pequeña cantidad de sal y asegurarse de que el nivel de pH del agua sea el adecuado.

Los niveles de **sal y pH** recomendados son los siguientes:

<b>pH del agua de la piscina-----</b>	<b>7,1 a 7,4</b>
<b>Proporción de SAL en kg/m3-----</b>	<b>4 a 6</b>

To ensure that the chlorinator works correctly, a small amount of salt should be added and the pH level should be suitable.

The recommended **salt and pH** levels are the following:

<b>pH of the swimming pool water-----</b>	<b>7.1 to 7.4</b>
<b>Proportion of SALT in kg/m3-----</b>	<b>4 to 6</b>

Although the equipment will start to operate with lower amounts of salt, the optimum production of salt will be reached with concentrations of over 4kg/m<sup>3</sup>. We recommend a concentration of 5Kg/m<sup>3</sup> to offset small losses of salt occurring when cleaning the filter, the effect of rainfall, etc.

To calculate the salt to be added, multiply the total m<sup>3</sup> of your swimming pool x 5.

**Example :** A swimming pool measuring 9m in length x 4.5m in width x 1.6m in depth.

$9 \times 4.5 \times 1.6 = 64.8$  cubic metres.  $64.8 \times 5 = 324$  Kg of salt to be added.



We recommend using salt that is especially prepared for use in salt water chlorination installations, as it is especially prepared for rapid dissolution and to achieve optimum results. You can find it at retailers specializing in swimming pool products.

**ATTENTION**

When adding salt to the swimming pool, first disconnect the chlorinator (position **OFF**), and start-up the filter for 3 or 4 hours, in order for the salt to dissolve and not to overload the equipment. Once dissolved, start-up the chlorinator.

It is advisable to add salt to the swimming pool gradually, in 2 or 3 times so as not to exceed the recommended amount. Excess salt can overload the chlorinator, in which case it will automatically stop working and water will have to be added to reduce the concentration.

We also recommend not to add salt near the drain, to avoid undissolved salt from circulating in the water circuit.

## 2.2 Chemical balance of the water

The effectiveness of chlorination and the quality of water for healthy bathing, depends largely on the pH of the water. Therefore, it should be checked regularly and adjusted as necessary.

There are other parameters which should be considered for the correct operation of the salt water chlorinator. We recommend an in-depth analysis of the water when installing a salt water chlorinator.

Parameter	Minimum Value	Maximum Value
PH	7.0	7.8
FREE CHLORINE (mg/l)	0.5	2.5
COMBINED CHLORINE (mg/l)	--	0.6
TOTAL BROMIDE (mg/l)	3.0	6.0
BIGUANIDE (mg/l)	25	50
ISOCYANURIC ACID (mg/l)	--	<75
OZONE (GLASS) (mg/l)	--	0
OZONE (before)	0.4	--
TURBIDITY (NTU)	--	<1
OXIDES (mg/l)	--	<3
NITRATES (mg/l)	--	<20

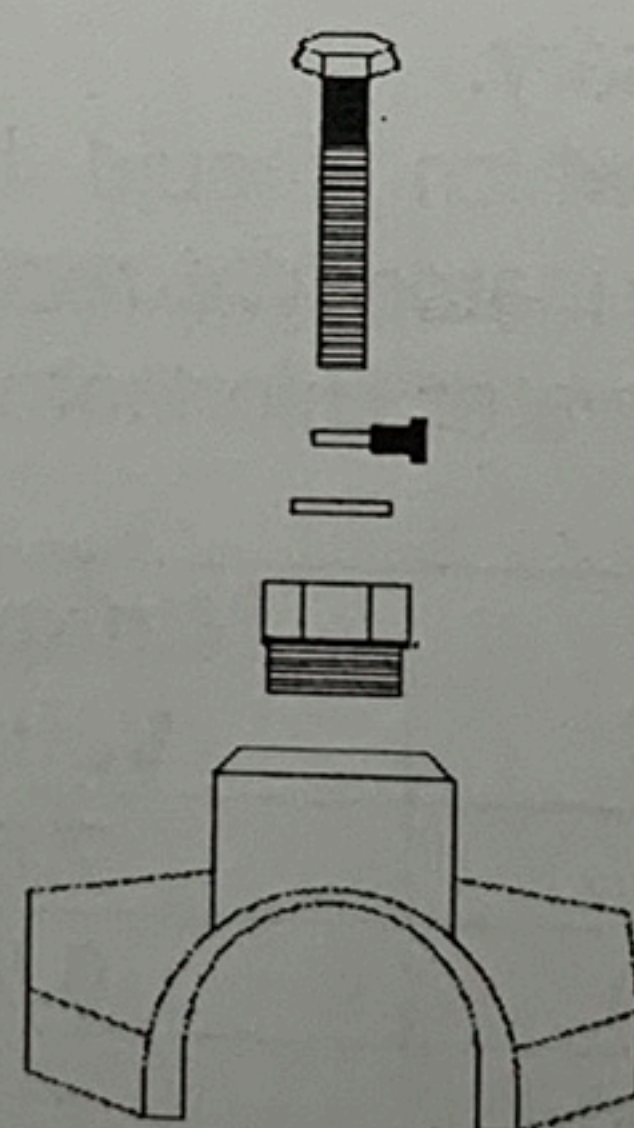


AMMONIA (mg/l)	--	<0.3
IRON (mg/l)	--	<0.3
COPPER (mg/l)	--	<1.5
ALKALINITY (mg/l)	100	160
CONDUCTIVITY (us/cm)	--	<1700
TDS (mg/l)	--	<1000
HARDNESS (mg/l)	150	250

## 3- INSTALLATION OF THE EQUIPMENT

### 3.1- General considerations:

- Place the chlorination cell in the highest position possible of the purification circuit and always after the filter.
- If possible, it is recommended to install the cell with a by-pass system with its corresponding shut-off valves. This is to facilitate maintenance of the cell.
- A **good earth connection is essential**. Use a differential relay with max. 30mA of sensitivity.
- **If a good quality earth connection is not available, place an earth connection kit between the electrolysis cell and the redox probe. OPTIONAL KIT**

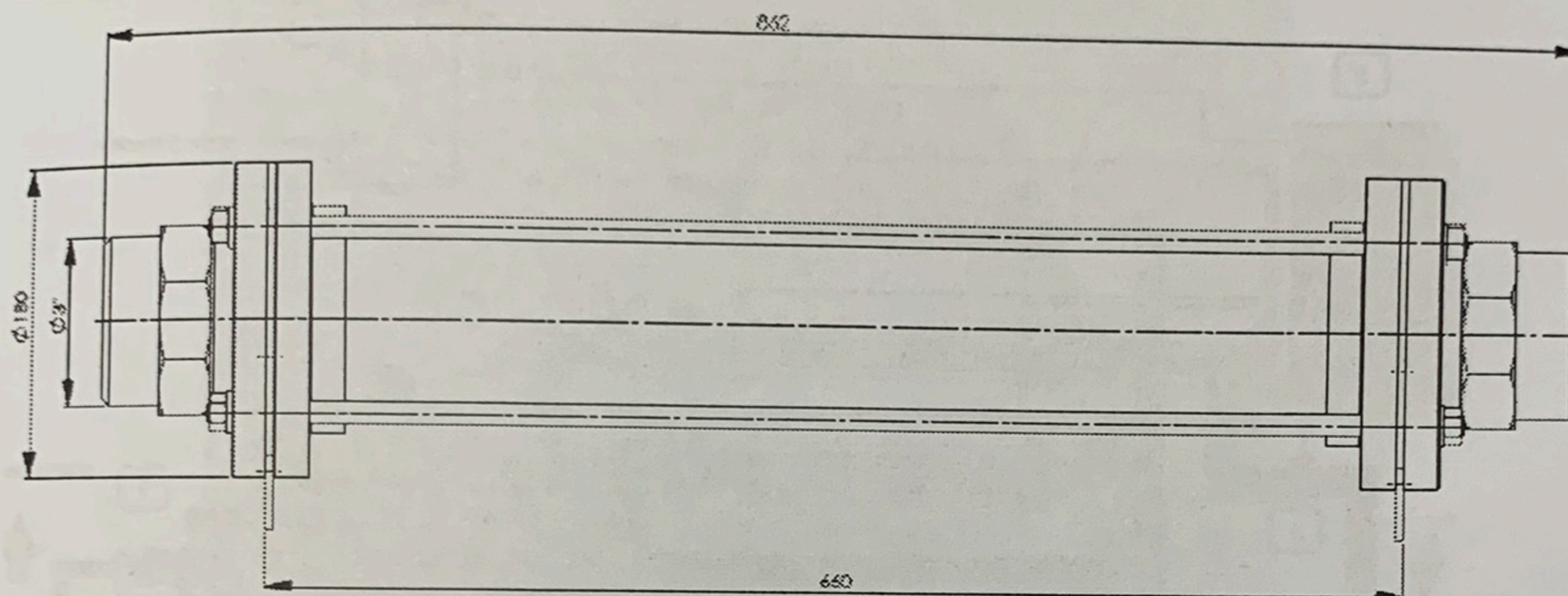




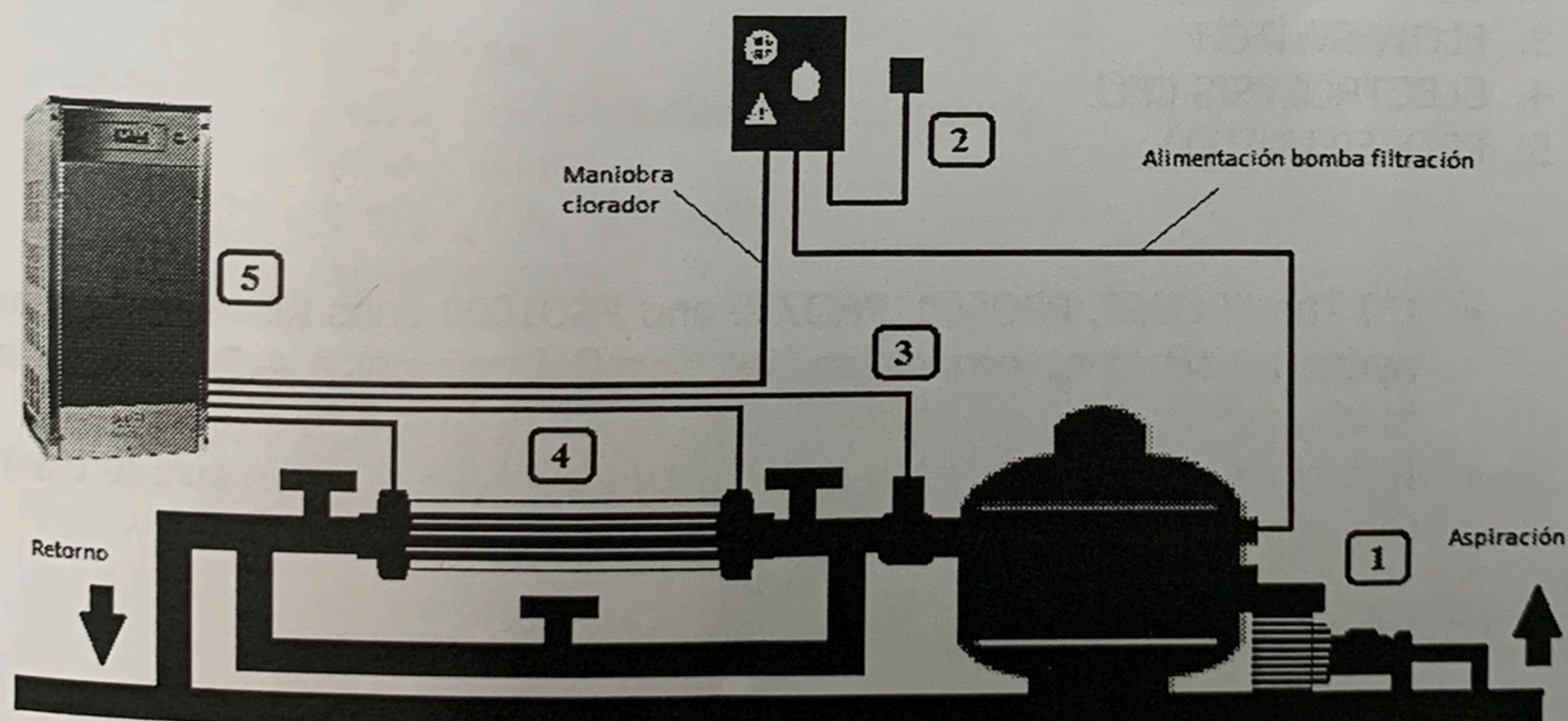
## 3.2- Hydraulic connection diagram

### 3.2.1- Diagram

#### Electrolysis cell



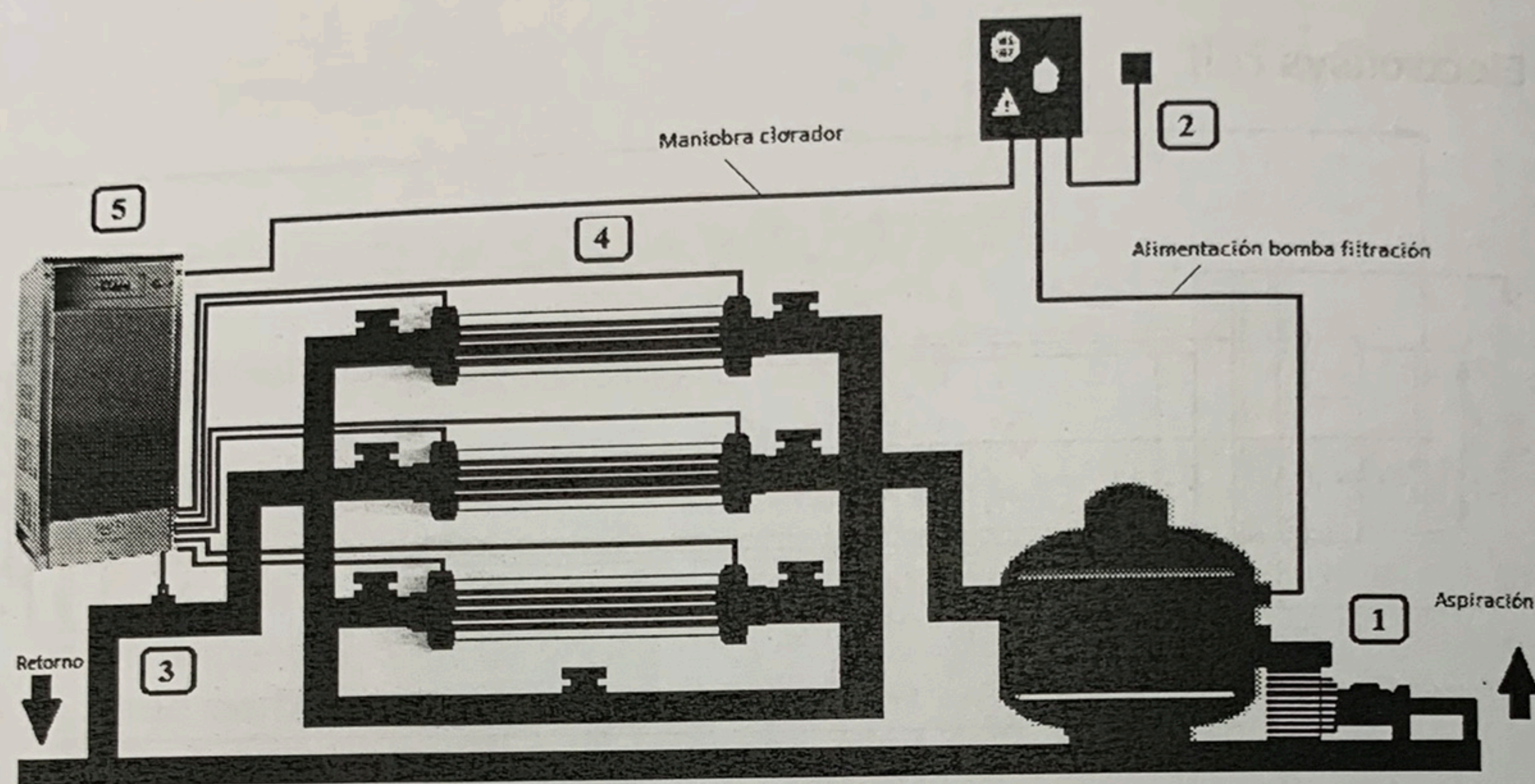
#### Recommended installation (PRO250)



1. FILTRATION
2. CONTROL PANEL
3. FLOW SWITCH
4. ELECTROLYSIS CELL
5. PRO250 UNIT(\*)



## Recommended installation (PRO750)



1. FILTRATION
2. CONTROL PANEL
3. FLOW SWITCH
4. ELECTROLYSIS CELL
5. PRO750 UNIT(\*)

- (\*) The PRO250, PRO500, PRO750 and PRO1000 units follows the same hydraulic scheme, connecting **in parallel** as many cells as power modules.
- It is highly recommended to install a by-pass system, to be able to block the water flow in each cell for maintenance purposes.

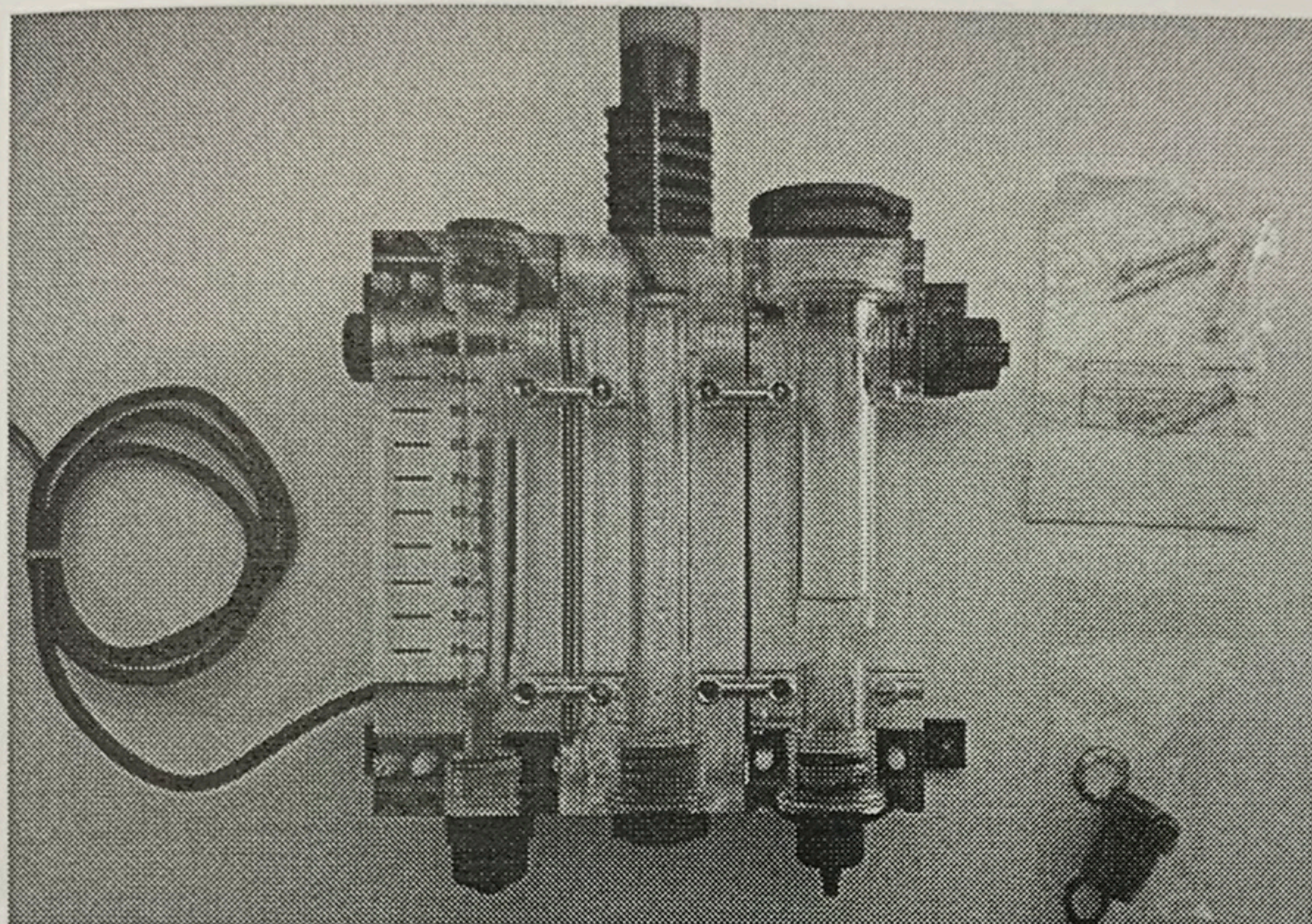
### 3.2.2- PRO/2 kit (free chlorine) Optional in EVO equipment

The amperometric measurement kit, allows to obtain a ppm free chlorine Reading from your swimming pool. This sensor is swimming a 3-electrode header, which is separated from the water through a membrane. This ppm measure has a low dependency of pH and isocyanuric acid, and it can be also installed in sea water swimming pools (this option to be asked to BSV Electronic). Please follow carefully the installation, calibration and maintenance instructions to ensure a perfect setup of the kit.



### 3.2.2.1 – Kit content

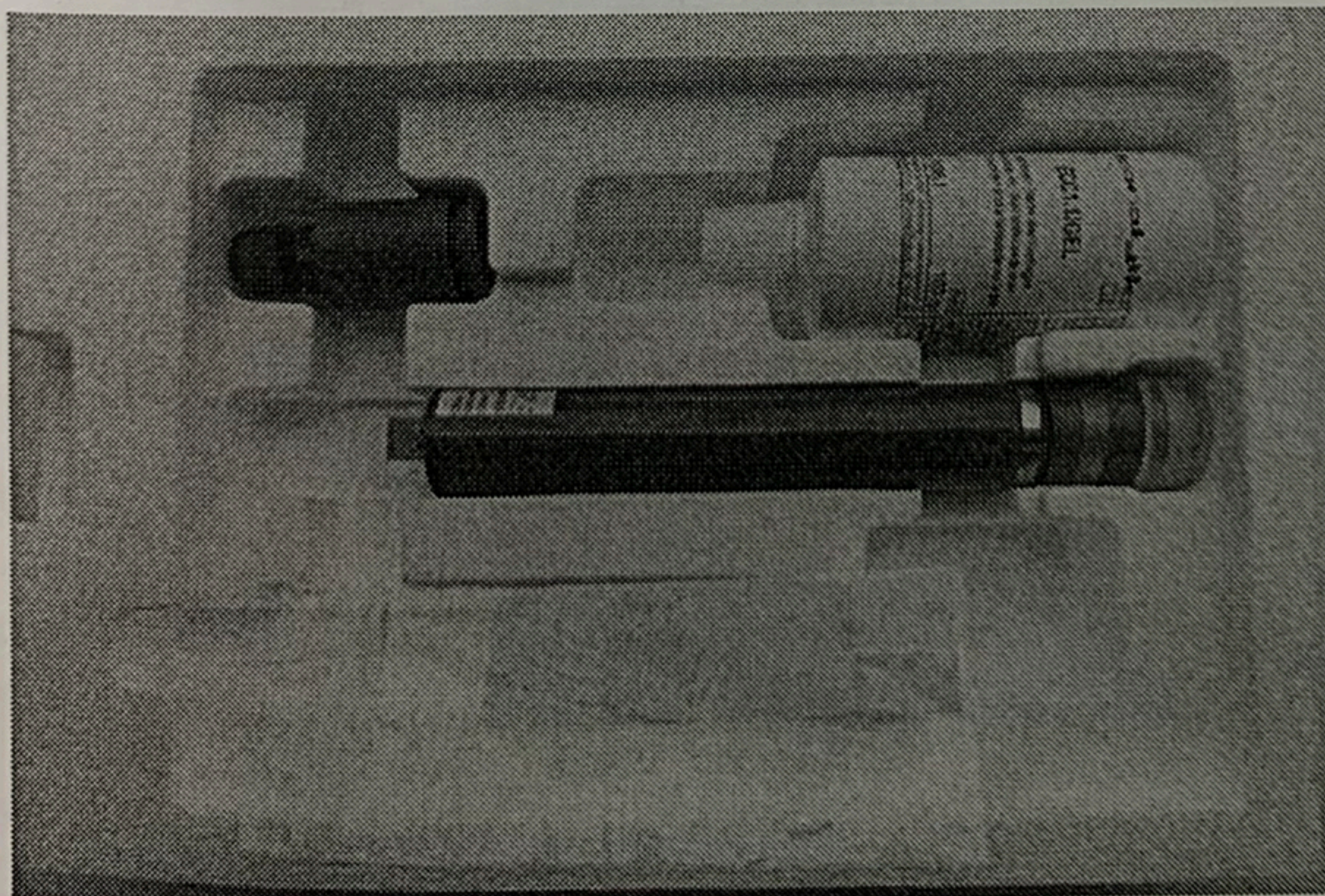
#### 3.2.2.1.1- Probe Holder



#### 3.2.2.1.2- Free Chlorine Probe

##### Includes

- CC1 Probe
- Membrane (Included in the header)
- Protection cap
- ECC1.1/GEL Electrolyte
- Abrasive paper





### 3.2.2.2- Technical specification

TECHNICAL SPECIFICATION	
Measure	Free chlorine, low pH dependency
Technology	Membrane. Potentiostatic 3-electrode header
Electronics	Embedded in the probe. 4-20mA output
Supply	12 to 30 VDC (10mA)
CL measure range	0.01 to 10.0 ppm
Measure deviation	approx. 3% every month
Operation temperature	0 to 45°C
Storage temperature	0 to 55°C
Operation maximum pressure	0.5 bar. Water hammer effect must be avoided.
pH range	4 to 12
Calibration	Directly on BSV control panel
Maximum time without CL on water	24h
Maintenance period	Water test: Minimum once a week
	Header-membrane change: Once a year
	Electrolyte change: Every 3-6 months, depending on the quality of the water

### 3.2.2.3- Installation

Please, carefully follow the recommendations regarding probe installation in order to ensure its proper operation:

#### 3.2.2.3.1- Hydraulic installation

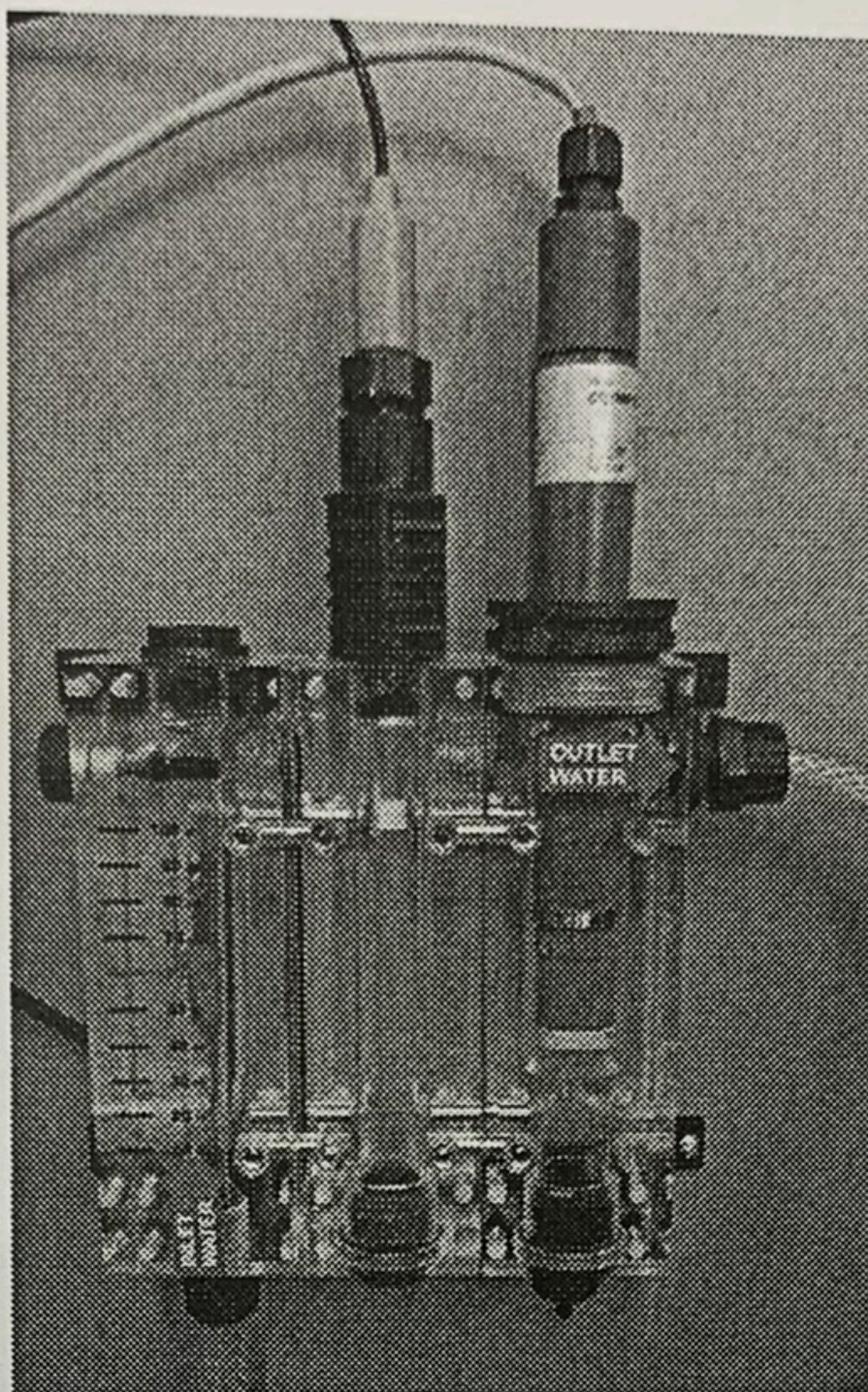
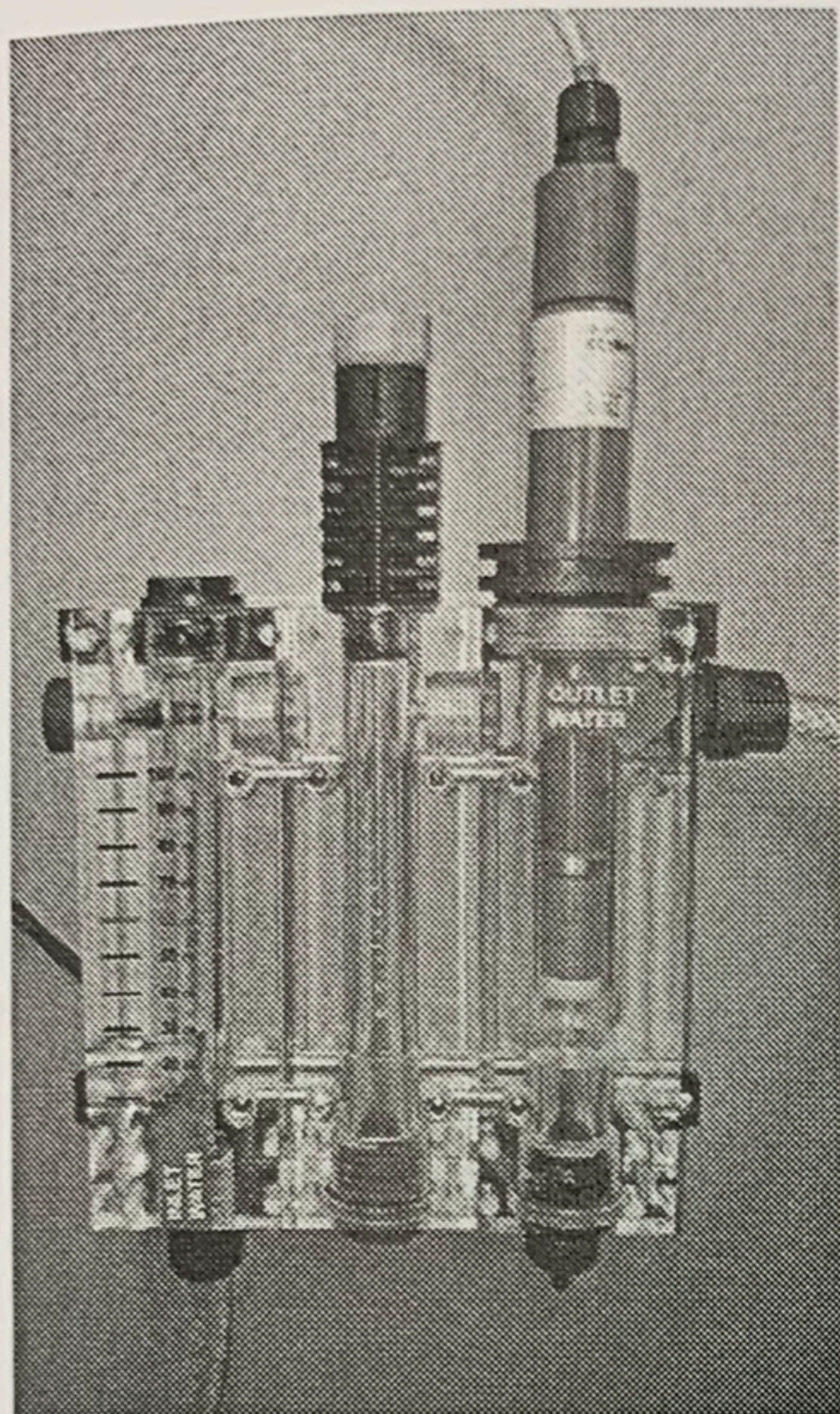
Attach the probe holder to the wall by means the screws and wall plugs included in the box.

Ensure that the probe is correctly leveled.

As shown in the following Picture, the water inlet is in the lower left part of the probe holder, while the water outlet is in the upper right side of the probe holder.

In case a pH probe must be installed, it can be placed in the central part of the probe holder, removing the yellow cap and install the pH probe.





### Additional recommendations:

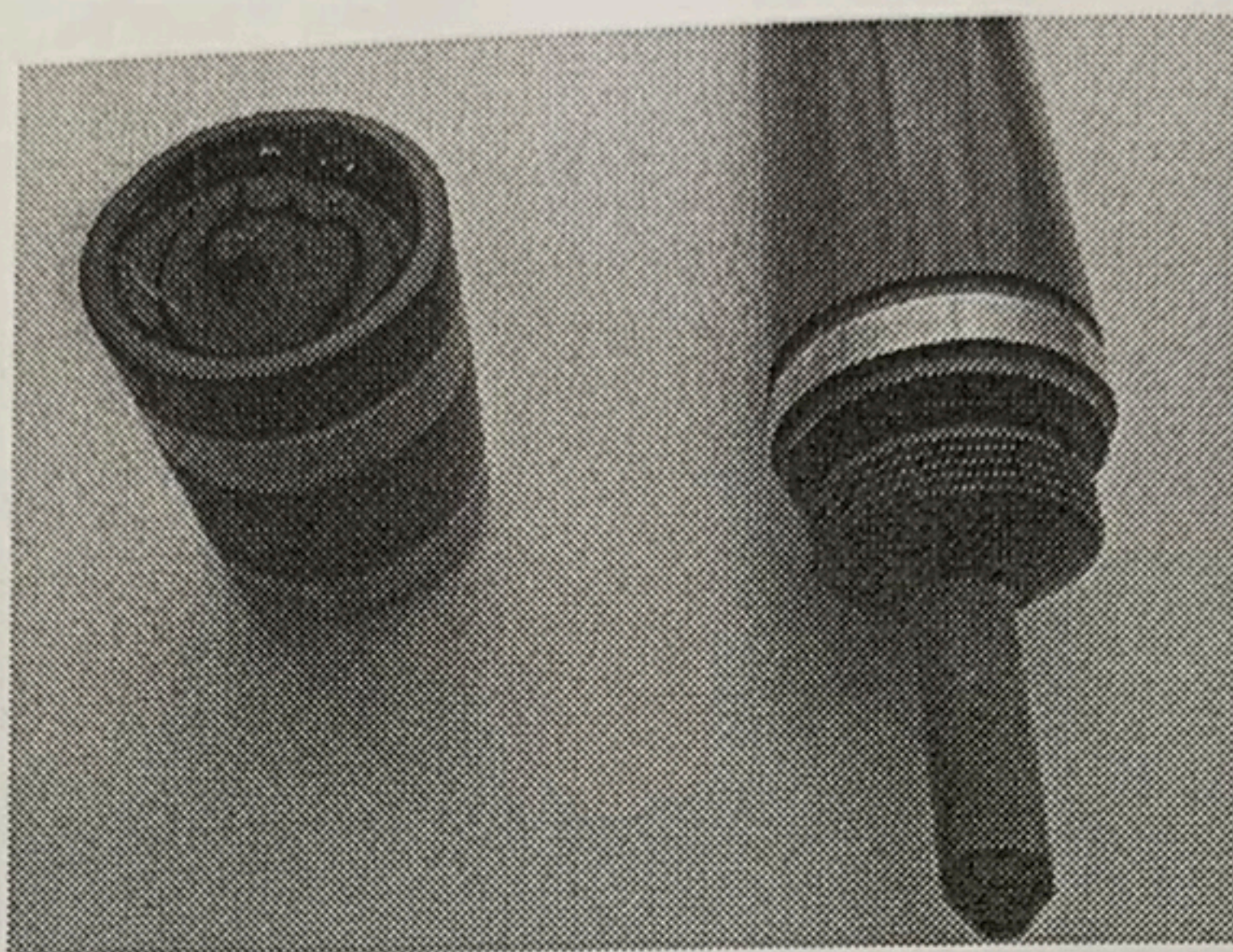
- If possible, install a hose valve at input, and another one at output to ease the cleaning and maintenance tasks.
- The probe holder water inlet can be connected after the filter, but then a good maintenance of the filter cleaning must be ensured, otherwise the measure can be affected by the chlorine consumption inside the filter.
- As an alternative, the inlet can be connected before the filter, but then it is strictly necessary to install a specific cartridge filter to avoid the probe contamination.

### 3.2.2.3.2 Probe set up

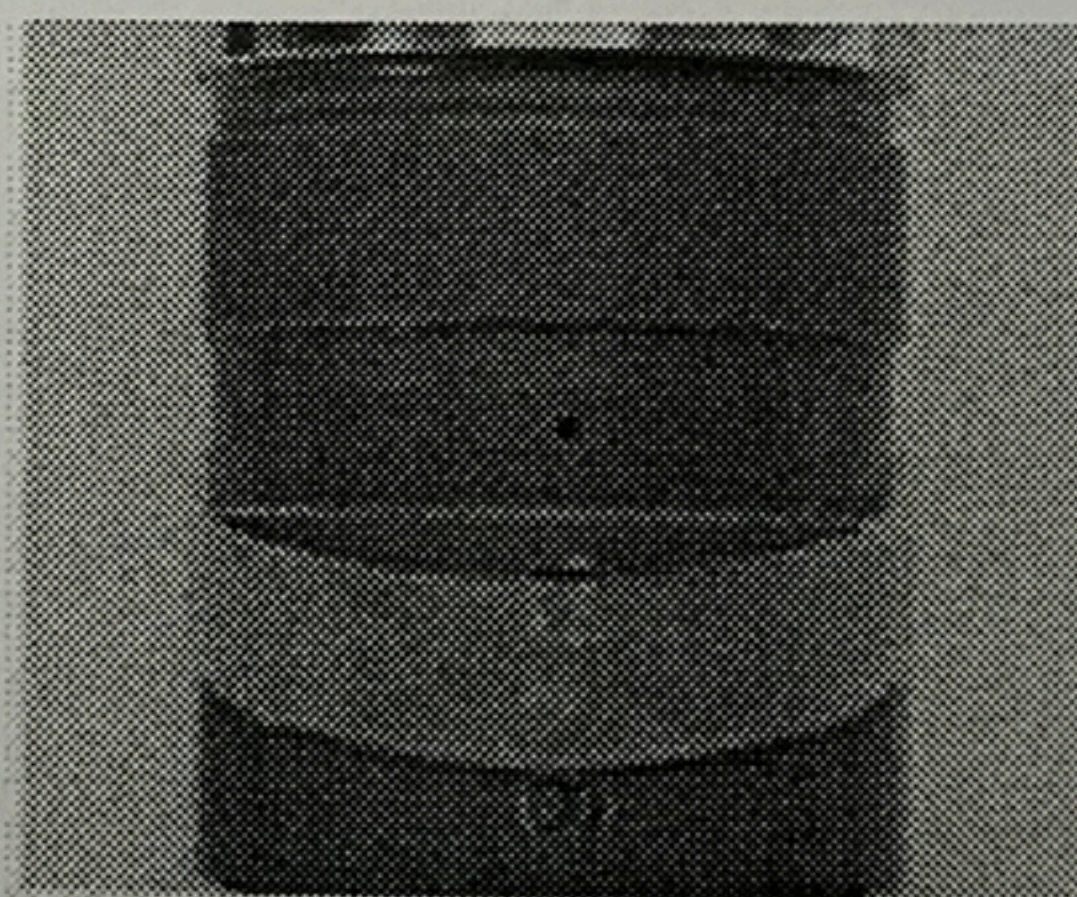
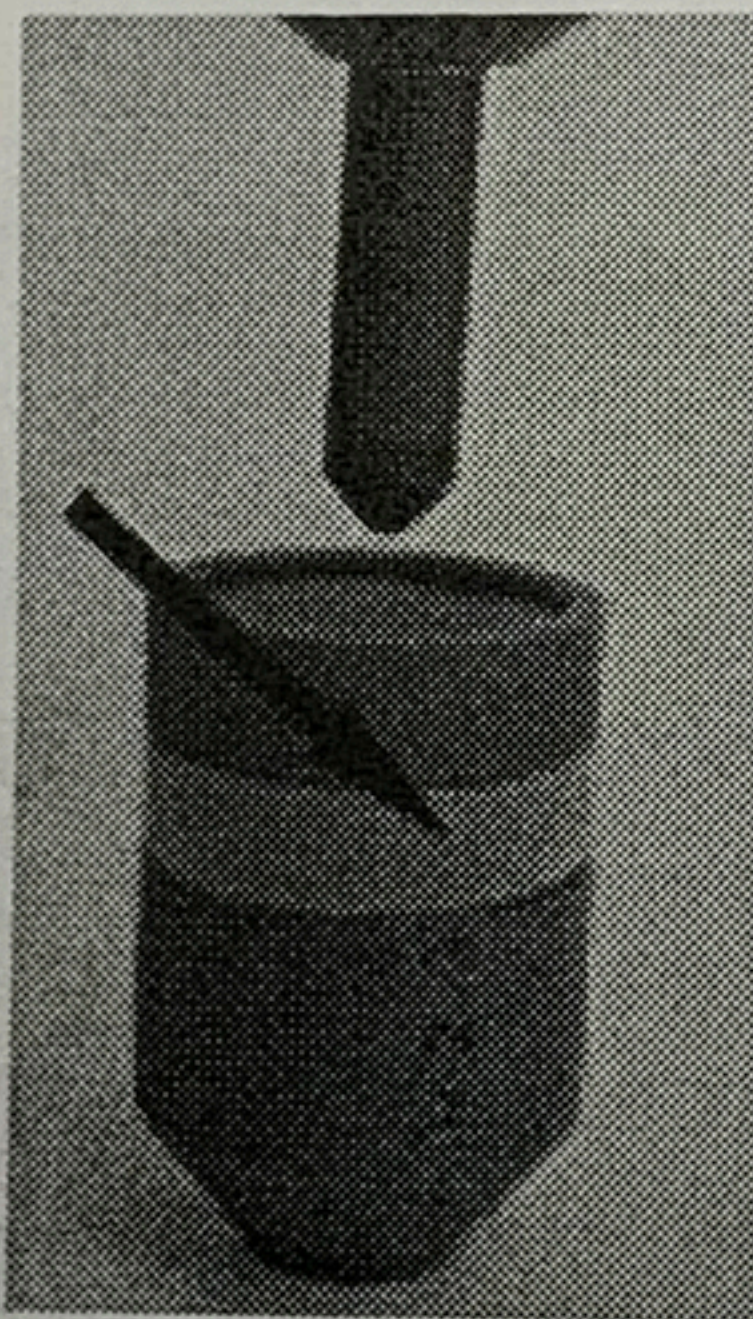
Before installing the probe, it is necessary to fill the cap with electrolyte. Please, follow carefully the following steps:

- 1) Unscrew the header cap from the sensor body and keep both parts in a clean and stable surface.  
**Important:** Don't touch the membrane and the gold electrode, they could be contaminated.
- 2) Fill the header cap with the supplied electrolyte. Fill it gently to avoid creating bubbles.





- 3) **Caution:** Before screwing again the header cap to the sensor body, the silicone ring must be removed, uncovering the small hole shown in the following picture:



**Please, take care that this step is done correctly, otherwise the header membrane could be damaged, and will be out of warranty.**

- 4) Screw the header cap to the body of the probe. The excess of electrolyte will leak out across the small hole and the upper part of the cap. Use a cloth or blotting paper to clean it.

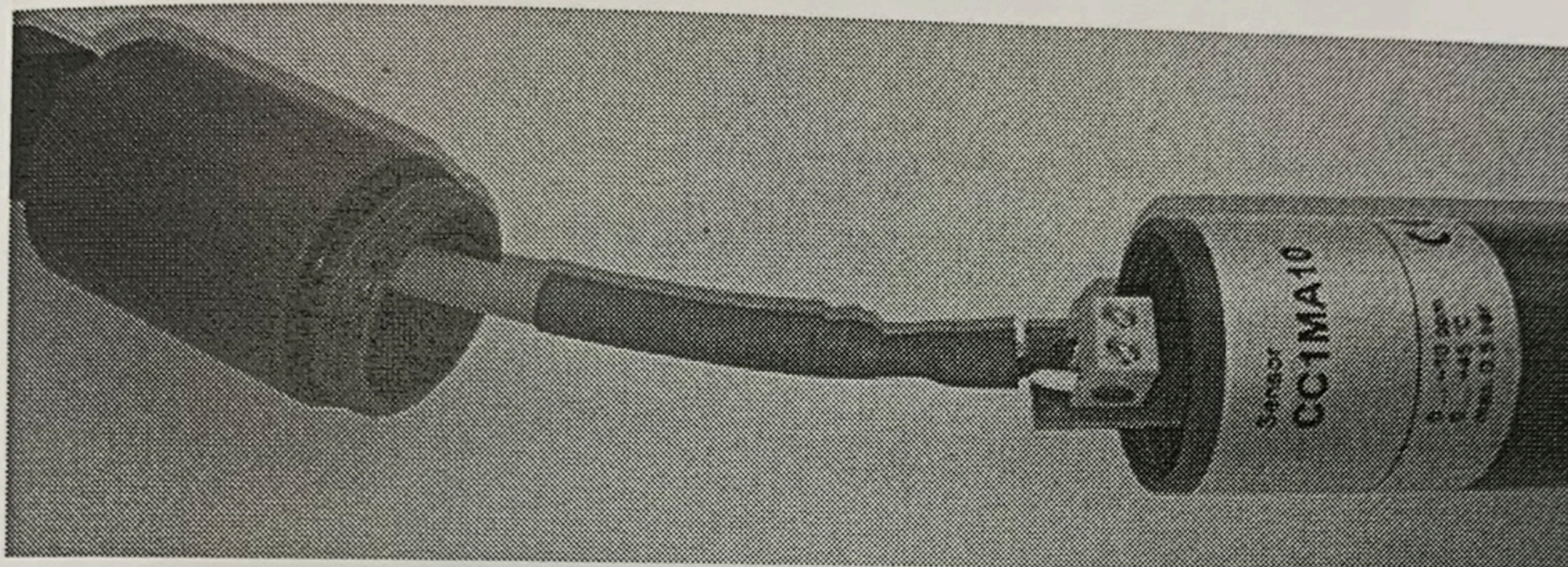
**Important: Ensure to fully screw the header cap.**

- 5) Put the silicone ring to its original position, in this way, the small hole will be covered again with the silicone ring.



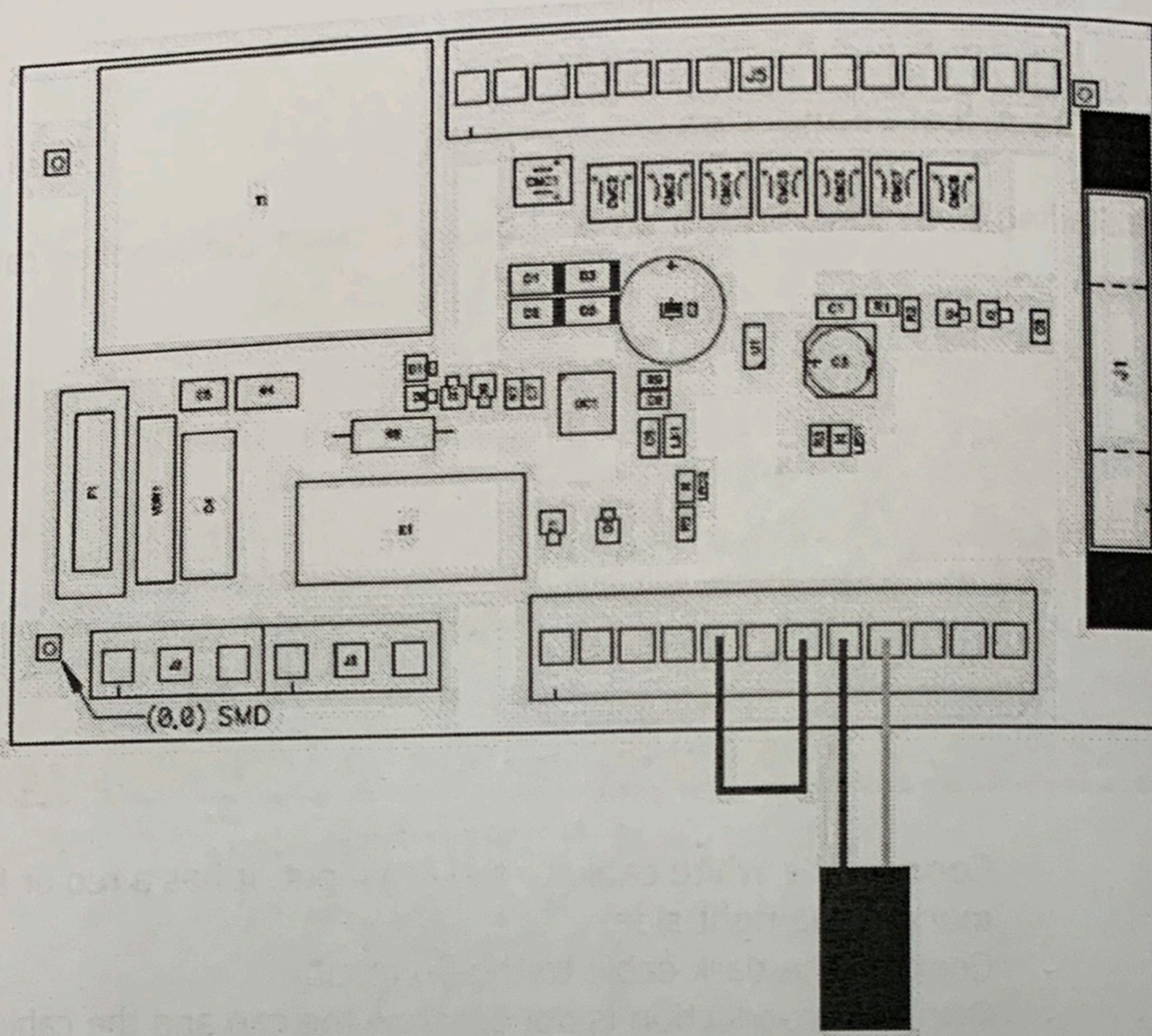
### 3.2.2.3.3 Electrical connection

Before installing the probe on the probe holder, connect the supplied cable as follows:



- Connect the white cable to the (+) input, it has a red or blue mark in the right side.
- Connect the dark cable to the (-) input.
- Once the connection is done, screw the cap and the cable gland.



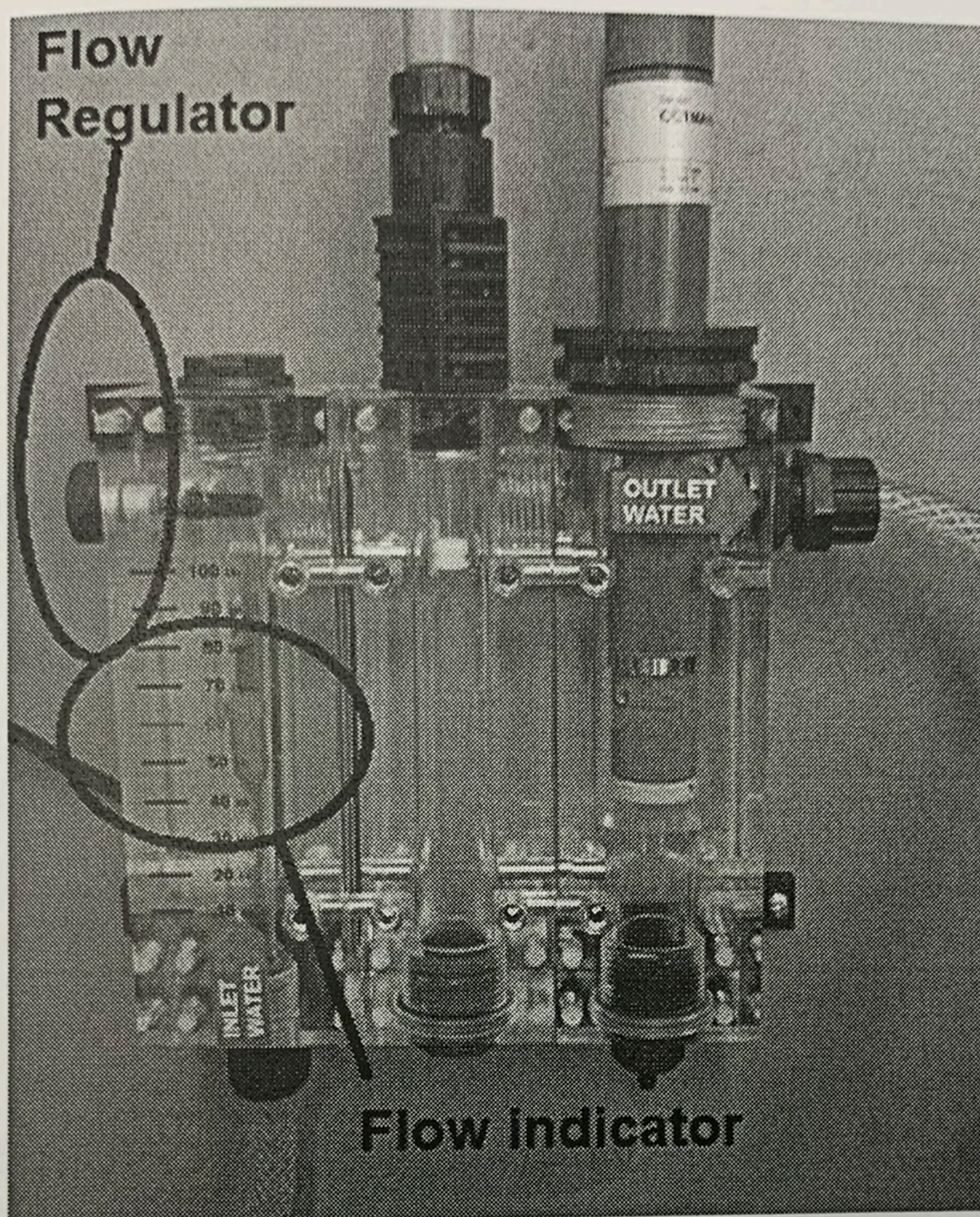


- Connect the cable to the P954D as follows:
  - o White cable: Input 9
  - o Dark cable: Input 8
  - o A cable bridge must be done between inputs 5 and 7.

### 3.2.2.3.4 Calibration

- 1) Install the probe on the probe holder. Use a tool to ensure the sensor is correctly tightened.
- 2) Switch the filtration pump on and adjust the water flow. The red flow indicator must be floating in the mid part of the indicator:





- 3) Switch on the electrolysis / dosing System. The CL reading will slowly increase and will be stable after some minutes.

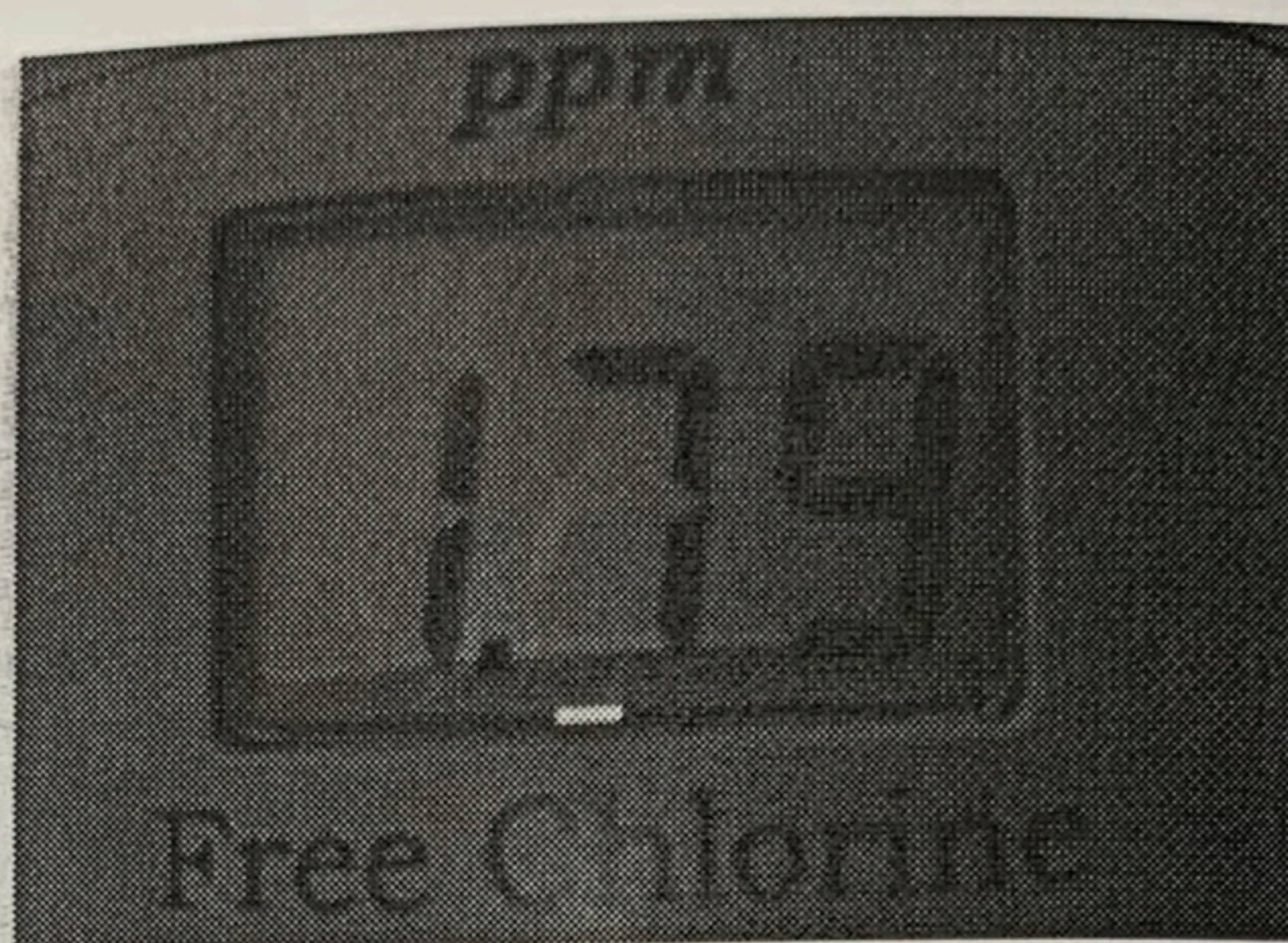
**Note:** When the probe is switched on for the first time, the stabilization time could take longer than usual. In any case, it is recommendable to wait for at least 3 hours before making a first calibration.

#### 4) Calibration

Wait until the CL reading is stable. If a difference between the display reading and the water testing by means of DPD-1 testing is observed, perform a calibration as follows:

- a. DPD-1 test. Take a water sample from the small plastic tap placed at the bottom part of the probe holder.





- b. Chlorine Menu -> Select "calibration" and press OK. Wait until the reading is stable:
- c. Adjust the real value obtained by means of DPD-1 test.
- d. Return to the main screen. The current CL value will match with the value obtained from DPD-1 test.

### 3.2.2.3.5 Probe maintenance

Please, carefully read the following maintenance instructions for your PRO/2 Kit.

The maintenance periods are illustrative, they are depending on factors such as the quality of the water and the installation maintenance, especially with the filtration system.

**Weekly Maintenance:** Analyze the water from your swimming pool and if necessary, calibrate the free chlorine probe as shown on the 3.4 chapter.

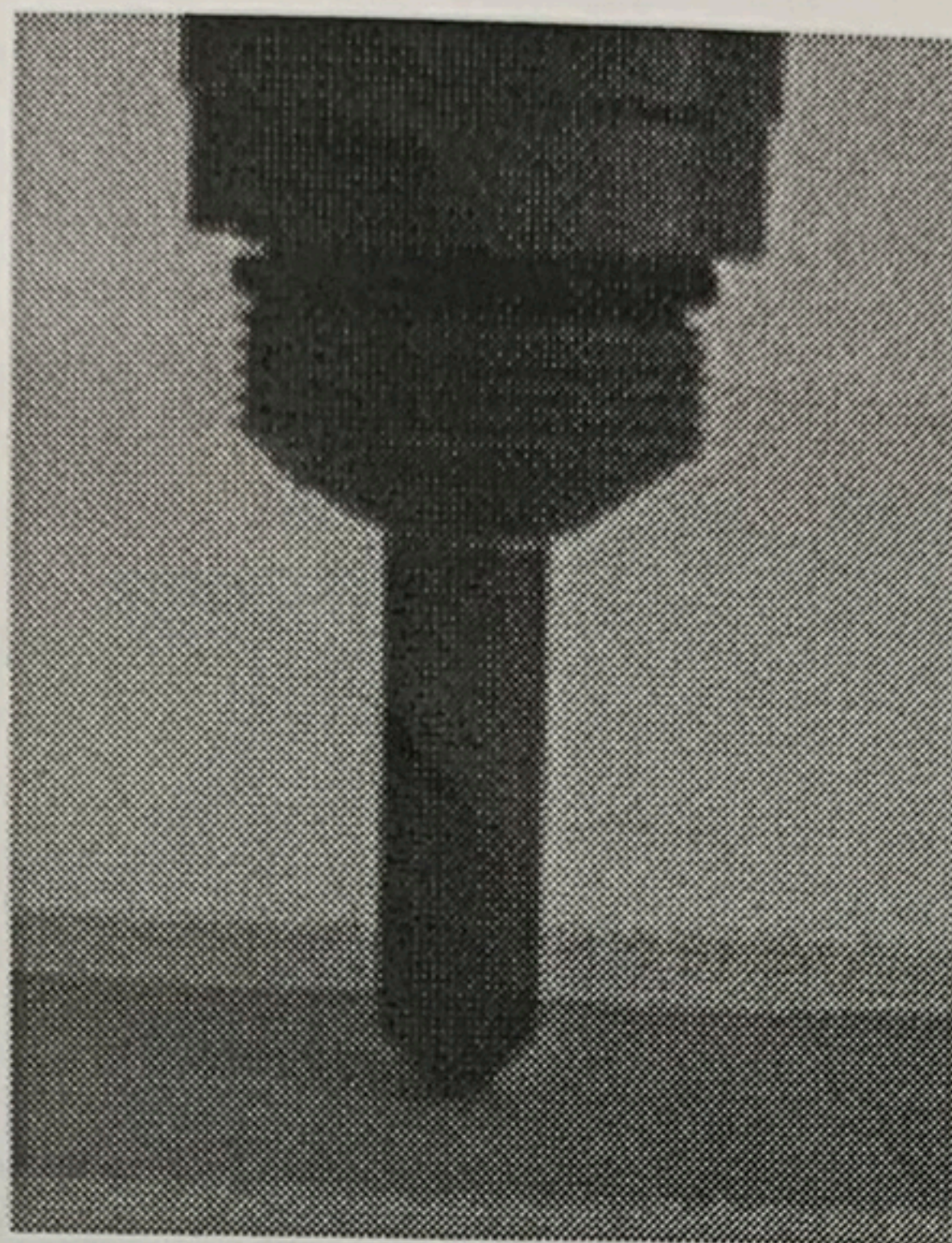
**Twice a year (depending on the installation):** Replace the electrolyte.

**Once a year:** Replace the header (membrane).

How to replace the electrolyte and the header.

- 1) Remove the probe from the probe holder
- 2) Unscrew the header and remove the old electrolyte. Handle it carefully to avoid damaging the membrane.
- 3) Clean the Sharp point of the probe using the supplied abrasive paper.  
Please do it carefully, without an excessive pressure.





- 4) Carefully wash the header with tap water, and fill it again with new electrolyte. In case of the header needs to be replaced, discard the used an install a new one.
- 5) Remove the silicone ring, uncovering the small hole.
- 6) Completely screw the header, cleaning the excess of electrolyte, and place again the silicone ring to its place.
- 7) Install the probe with the probe holder. Calibrate it after 2-3 hours working.

### **3.3- ELECTRICAL CONNECTION DIAGRAM**

#### **3.3.1- PRO250/500/750/1000 units**

- All the PRO series units can be configured to work with single or three-phase supply, depending on the installation needs.
- instalación.

#### Single-phase connection

- Ensure the line supply has all the protections and the correct cable size according with the current consumption (see table on page 32)
- Remove the upper cover of the unit to be able to see the terminal strips.
- Connect the single-phase cables (230V) to the input strips. The neutral must be connected to the blue strip while the phase must be connected to one of the three strips marked as (L1-L2-L3).