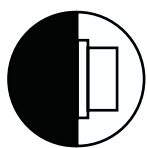
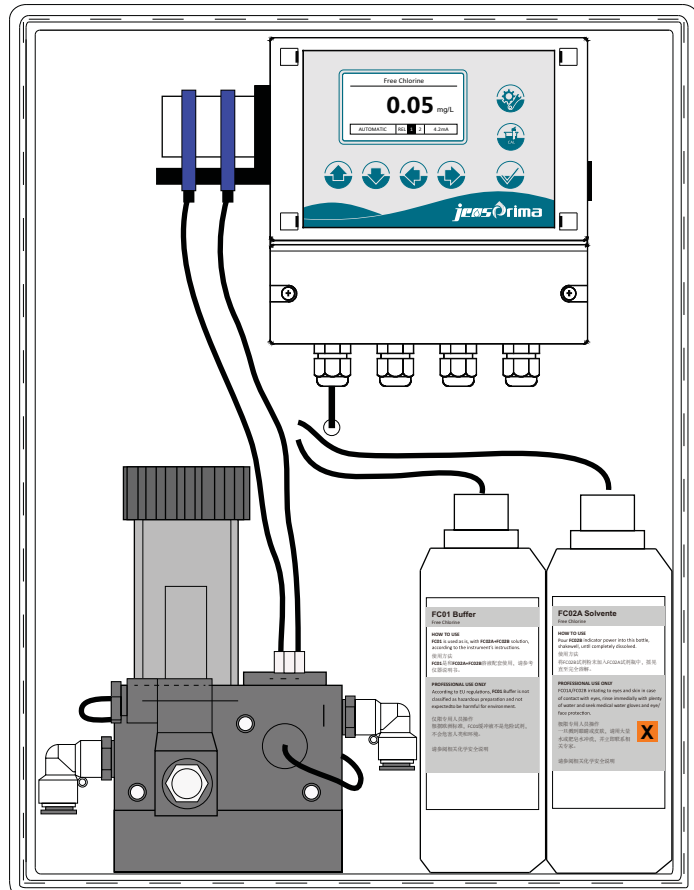


PACON 2500

Online Residual Chlorine Analyzer

OWNER'S MANUAL



WALL MOUNTING

INDEX

1. GENERAL	1
2. GENERAL DESCRIPTION	5
2.1 PHOTOMETRIC CHLORINE MEASURE	5
2.2 MAIN TECHNICAL FEATURES	6
2.3 TECHNICAL FEATURES	6
2.4 HYDRAULIC SYSTEM	7
3. INSTALLATION	8
3.1 COMPOSITION OF THE SUPPLY	8
3.2 INSTALLATION OF THE GEAR CASE	8
3.3 CONNECTIONS AND STARTING	9
3.4 Connection to the Power Supply	12
4. METHODS OF USE	13
4.1 Display	13
4.2 SETTINGS MENU	14
4.3 Calibration Setting	15
5. USER MAINTENANCE	16
5.1 PERIODIC CALIBRATION	16
5.2 REAGENTS REPLACEMENT	17
5.3 DEVICE CLEANING	18
5.4 PHOTOMETRIC CELL CLEANING	18
5.5 LONG INACTIVITY PERIOD	19
6. WARRANTY	20

1 GENERAL

1.1 INFORMATION ON THE MANUAL

This document contains reserved information. It may be subject to modifications and updates without any prior notice.

Printing chronology:

First edition: **PACON 2500 – Rev. 2.0**

This manual is an integral part of the instrument. Upon initial installation of the equipment, the operator must carry out a careful control of the contents of the manual in order to check its integrity and completeness.

If for any reason it is ruined, incomplete or inadequate please contact JENSPRIMA in order to reintegrate or replace the non-compliant manual immediately.

The official versions of the manual, for which JENSPRIMA is directly responsible, are the ones in Chinese and in English.

For countries of different languages from the ones indicated above, the official manual will remain the one in English. JENSPRIMA will not be held responsible for any possible translations in different languages made by distributors or users themselves.

Compliance with the operative procedures and the precautions described in this manual is an essential requirement for the correct operation of the instrument and to guarantee total operator safety.

The manual must be ready in all parts, in front of the instrument, before use so that all methods of operation are clear as well as the controls, connections to the electronic device and precautions for a correct and safe use.

The user manual must be stored, integral and legible in all parts, in a safe place and at the same time it must be immediately accessible to the operator during installation, use and/or installation revision operations.

1.1.1 CONVENTIONS

The present user manual uses the following conventions :

NOTE



The notes contain important information to be highlighted compared with the rest of the text. They generally contain information that is useful to the operator to carry out and optimise operative procedures of the equipment in a correct manner.

CAUTION



Caution messages appear in the manual before procedures or operations that must be observed in order to avoid any possible losses of data or damages to the equipment.

CAUTION



Caution messages appear in the manual in correspondence to the description of procedures or operations that, if carried out incorrectly, may cause damages to the operator or users.

1.2 DECLARATION OF RESPONSIBILITY BY THE MANUFACTURER

JENSPRIMA will be held responsible for the safety, reliability and performance of the equipment only if used in compliance with the following conditions: Calibration, modifications or repairs must be carried out by qualified personnel, specifically authorised by JENSPRIMA.

Opening of the equipment and access to its internal parts may only be carried out by qualified technicians for maintenance and specifically authorised by JENSPRIMA.

The environment in which the equipment is used must comply with safety regulations.

The electrical connections of the environment must be carried out according to regulations and must be perfectly efficient.

Replacements that can be carried out on parts of the equipment and accessories must be done so with others of the same kind and of the same characteristics.

The use and maintenance of the equipment and of relative accessories must be carried out in compliance with the instructions indicated in this manual.

This manual must always be kept integral and legible in all parts.

1.3 LIMITS OF USE AND PRECAUTIONS FOR SAFETY

In order to guarantee safety of the operator together with the correct functioning of the equipment, it is important to work within the limits permitted and to adopt all of the precautions listed below:

CAUTION



Check before use to make sure that all safety requirements are fully satisfied. The equipment must not be powered or connected to other equipment until safety conditions are satisfied.

1.3.1 ELECTRICAL SAFETY

CAUTION



All of the connections on the gear case are isolated from the environment ground (mass is not isolated). DO NOT connect any of these connections to earth.

In order to guarantee conditions of utmost safety for the operator, we recommend that all of the indications listed in this manual are respected.

Power the equipment exclusively using network tension according to specifications (90÷260VAC 50/60Hz)

Replace damaged parts immediately. Cables, connectors, accessories or other parts of the equipment that may be damaged or not working correctly must be replaced immediately. In this case contact your nearest authorised technical assistance centre.

Only use accessories and peripherals specified by JENSPRIMA. In order to guarantee all of the safety requirements, it is important to make exclusive use of the accessories specified in this manual which have been tested in combination with the equipment. The use of accessories and consumption materials of other manufacturers or not specifically recommended by JENSPRIMA will not guarantee the safety and correct operation of the equipment. Only use peripherals that comply with the regulations of their specific categories.

1.3.2 SAFETY OF THE OPERATIVE ENVIRONMENT

The panel of the PACON 2500 gear case is protected against the introduction of liquids. Avoid subject the equipment to the risk of dripping water, sprays of water or immersion in water and the use in environments in which such risks may be present. Equipment in which liquids may have accidentally penetrated must be immediately switched off, cleaned and controlled by authorised and qualified personnel.

Once programming has been carried out, we recommend that the transparent panel is closed.

Protection.

- with a closed transparent panel IP65 EN60529
- with an open transparent panel IP65
- EMI /RFI CEI EN55011 - 05/99

Use the equipment within the environmental limits of temperature, humidity and pressure specified. The instrument has been developed to operate in the following environmental conditions:

- Temperature of the working environment 0°C ÷ +50°C
- Temperature of storage and transportation -25°C ÷ +65°C
- Relative humidity 10% ÷ 95%RH – not condensing

CAUTION



The water treatment plant in which the instrument is introduced must be developed in accordance with the functional requirements imposed by current legislation.

The apparatus must be inserted perfectly into the plant.

The plant must be kept operative in full compliance with the safety regulations provided.

The parameters indicated on the control gear case of the analyser must comply with current regulations.

Any signals of faults to the device must be positioned in an environment that is constantly controlled by operative personnel or plant assistants.

Non compliance with even just one of these conditions may lead the “logics” of the device to operate in a potentially dangerous manner for users of the service.

Therefore, we recommend that service personnel and/or maintenance personnel operate with the utmost care, pointing out any changes to the safety parameters immediately, in order to avoid the creation of any potentially dangerous situations.

As the considerations indicated above cannot be controlled by the product in question, the manufacturer will not be held responsible for any damages that these malfunctions may cause to people or things.

1.4 CAUTION SYMBOL

The symbol illustrated below represents the **CAUTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions for the correct and safe use of the equipment.



In particular, when it is positioned close to connection points to cables and peripheries, the symbol in question refers to careful reading of the user manual for instructions related to the nature of such cables and peripheries and the methods for correct and safe connections. For the position of the CAUTION symbols on the equipment, refer to Chapter 2 “Commands and Indicators, Connections” and Chapter 3 “Installation” of this user manual. The reproductions of equipment panels, with relative commands, connections, symbols and labels are provided in this chapter. Each caution symbol is accompanied by a detailed explanation of its meaning.

1.5 INFORMATION ON RECYCLING AND USE OF MATERIALS

JENSPRIMA, in accordance with specific European regulations, aims at constant improvement of development and of production procedures of its equipment with the objective of drastically reducing the negative impact on the environment caused by parts, components, consumption materials, packaging and the equipment itself at the end of its life cycle.

Packaging is conceived and produced to allow for its re-use or recovery, including recycling of the majority of the materials and to reduce the amount of waste or residues to be disposed of, to a very minimum. In order to assure a correct environmental impact the equipment has been designed with the smallest circuit possible, with the lowest differentiation possible of materials and components, with a selection of substances that guarantee utmost recycling and maximum reuse of the parts and waste disposal free from ecological risks.

The equipment is made in such a way as to guarantee the easy separation or dismantling of the materials containing contaminants compared with others, in particular during maintenance operations and the replacement of parts.

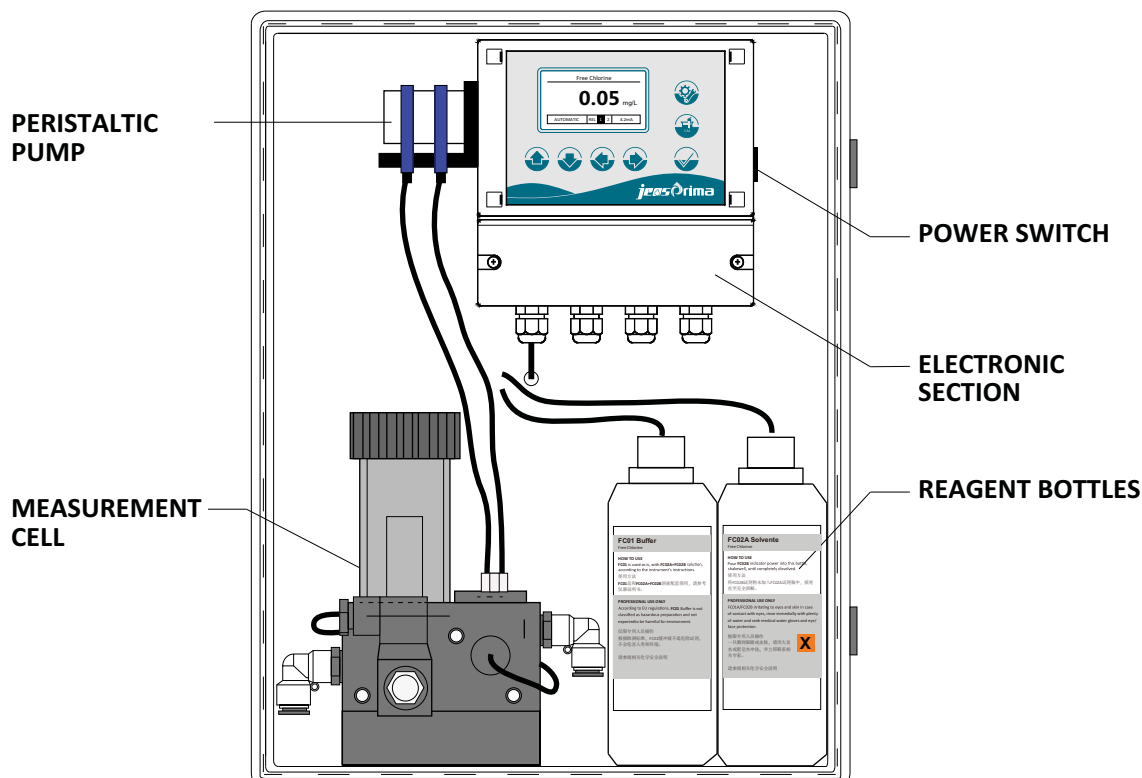
CAUTION



The disposal/recycling of packaging, of consumption materials and of the equipment itself at the end of its life cycle must be carried out in accordance with the norms and regulations that are currently valid in the country in which the equipment is used.

2 GENERAL DESCRIPTION

The analyser of this manual, showed in picture 1, is made up of an electronic gear case, a peristaltic pump, a measurement cell, chemical reagents plus a technical manual. It is powered by the network (90÷260Vac-50/60Hz) by a Switching feeder. This equipment has been designed to analyze ON-LINE water in different applications



Picture 1 – Residual Chlorine analyzer

2.1 PHOTOMETRIC CHLORINE MEASURE

Colorimetric reaction with D.P.D. (Diethyl-Paraphenilendiamina), it's the most selective and reliable method for chlorine measurement (see American Standard Methods) normally used in all the laboratories and by the public authority of environmental control.

The DPD method has few (and all well known) chemicals interference substances, Flow variation in the water supply as soon as pH of the water have no influence in the measurement – as the sample to be measured is buffered by the first reagent (buffer solution)

It comes from the photometric process of measurement. Every measurement is done by two step: the “zero” with the sample water and the measurement with the same sample coloured by the reagents. At the end of the process the measuring cell is emptied and washed. This process avoid interference caused from colour or turbidity in the sample (Well! When the turbidity goes over a certain set point there is an optical check that stops the instrument and shows an alarm.)

The cleaning and substitution of the spares, like peristaltic hose and reagent bottles, can be done very easily also by people not really involved in the chemical instrumentations.

- A) The instrument performs a continuous automatic rinsing of the cell, by opening the sample inlet solenoid.
- B) Expired the electronically programmed time, the solenoid allows the inlet of a pre-set sample quantity in the cell, on which the photometric zero is performed.
- C) Reagents are released through the peristaltic pump.
- D) After the necessary time for colorimetric reaction has lapsed, the instrument measures free residual or total chlorine as a comparison between the measured zero value and the colorimetric value.
- E) The cell is briefly rinsed.
- F) The above cycle is repeated

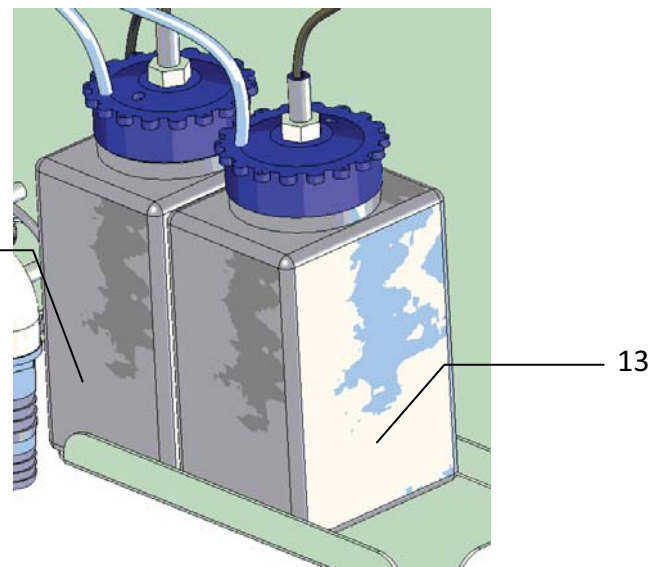
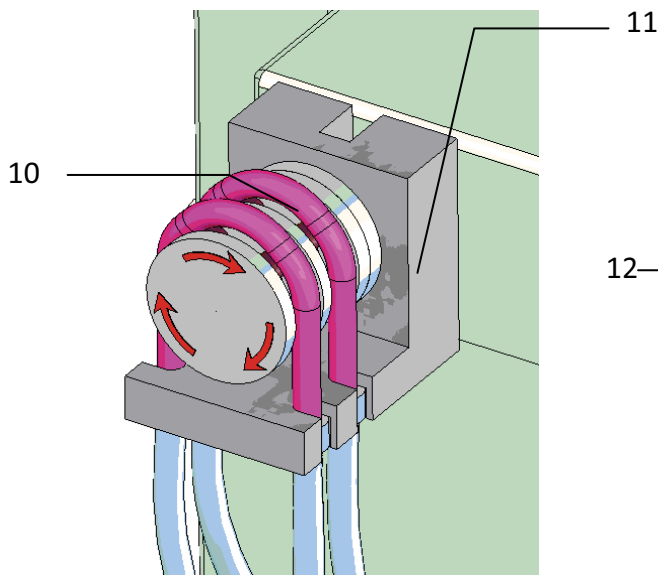
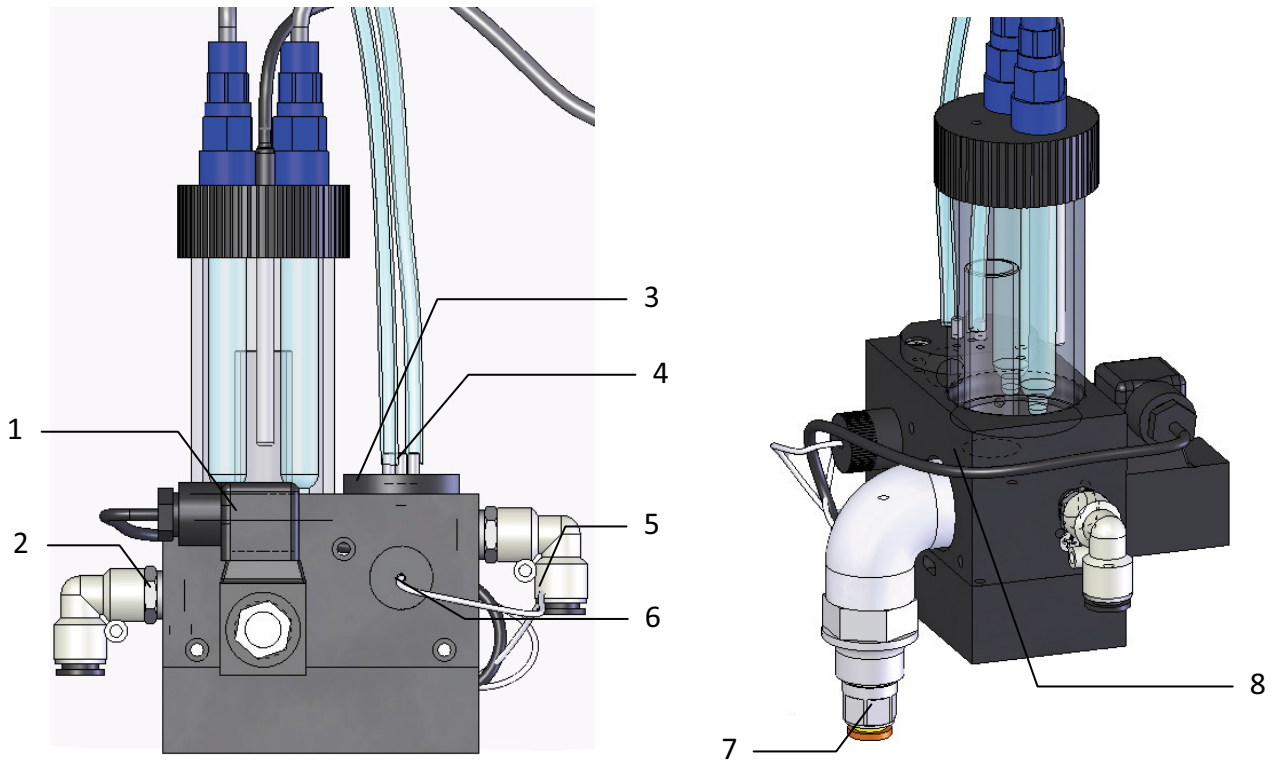
2.2 MAIN TECHNICAL FEATURES

- Measurement of: Free Chlorine
- Programming: through keyboard with 7 keys
- LCD STN 240x128 backlighted
- Recording interval: 00:00 ÷ 99:99 min
- RS485 Serial Output: MODBUS RTU protocol with programmable velocity 9600 Baud Rate.
- Analogue outputs : 4.00 ÷ 20.00 mA galvanically isolated
- Max load: 600 Ohm
- 2 Relay Outputs of Set point for Chlorine measurement

2.3 TECHNICAL FEATURES

Measurement Range:	0 – 5.00 mg/L (PPM)
Accuracy:	±1% of f.s.
Resolution:	0.01 mg/L (PPM)
Cycle Time:	Adjustable; 0 seconds to 3600 seconds Note: the system defaults to 5 minutes
Display:	Multi-Line Liquid Crystal Backlit Display
Alarms:	Two Programmable, 250VAC 5A Form C Relay
Analog Output:	Powered 4-20 mA, 600 Ω drive, isolated
Communications Port:	RS-485 with Modbus
Water Pressure:	Integral pressure regulator 1 bar
Flow Rate:	40 – 80 L/s
Operating Temperature:	0°C – 50°C
Wetted Materials:	PVC, Borosilicate Glass, Reslyn (FFKM)
Sample Temperature Range:	0°C – 40°C (32°F – 104°F)
Power Supply:	90 – 260 VAC, 50/60 Hz
Environmental Conditions:	Not recommended for outdoor use. Altitude up to 2000 meters Up to 95 % RH (non-condensing)
Enclosure Rating:	Designed to meet IP 65
Weight:	5 kg Reagents Shipped Separately
Dimensions:	450 mm X 350 mm X 200 mm
Warranty:	1 Year from date of shipment

2.4 HYDRAULIC SYSTEM



- 1. solenoid valve for washing cell
- 2. input sample
- 3. cell cap
- 4. pipe fitting for reagents injection
- 5. Drainage Continuous gravity drop dirty water
- 6. Photosensor Photometric Cell
- 7. Drainage Continuous gravity drop clean water
- 8. spotlight with led Photometric Cell

- 10. Peristaltic Pump
- 11. Peristaltic base
- 12. Reagent Free Chlorine Buffer (DPD 1) holder
- 13. Reagent Free Chlorine DPD (DPD 2) holder

3 INSTALLATION

Before installing the PACON 2500 carefully read the instructions provided below.

3.1 COMPOSITION OF THE SUPPLY

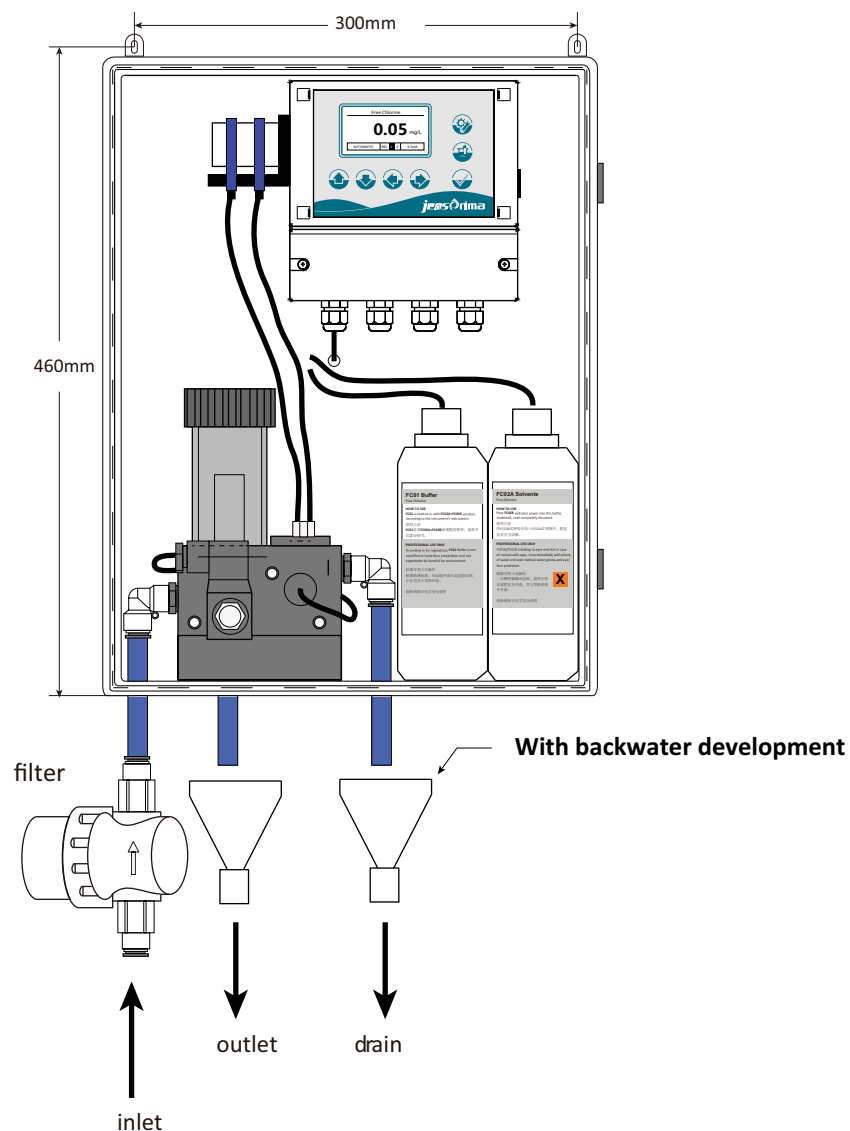
The supply consists of just one package which contains the following parts:

1. 1 PACON 2500 analyzer
2. 1 Technical Manual
3. 2 Bottles reagents for analysis: 1 white (DPD1) 1 black (DPD2)
4. 1 Filter

3.2 INSTALLATION OF THE GEAR CASE

The wall must be completely smooth in order to allow the perfect adhesion of the gear case. It is necessary to make two holes horizontally aligned. The distance from one to the other must be of about 490mm and the case has to be put at about 180cm from the floor to guarantee a good display vision.

The installation could be easier by using a carpenter's level.



On the bottom side there are two outputs for the drainage of the analysed water, on the left side there is the input of the water sampler and on the right side there are the core hitches for the connection to the other uses.

For an easy installing keep away the peripheric from probable prominences; out-distance from other apparatus (at least 40 cm) to simplify the electric and hydraulic connection.

Keep away from water drips and/or sprays of water from adjacent areas in order to safeguard the instrument during programming or calibration stages.

CAUTION

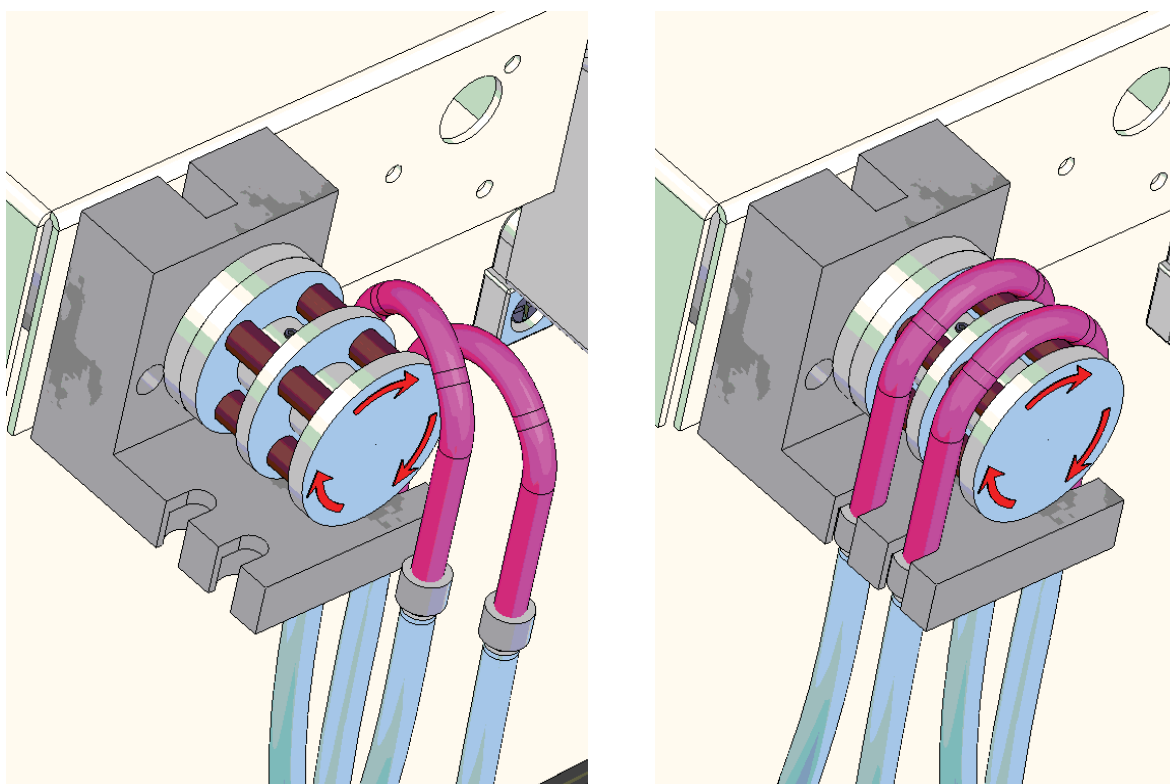


The electric line must be fitted with a suitable life-saving device and magneto-thermal, in compliance with correct installation norms

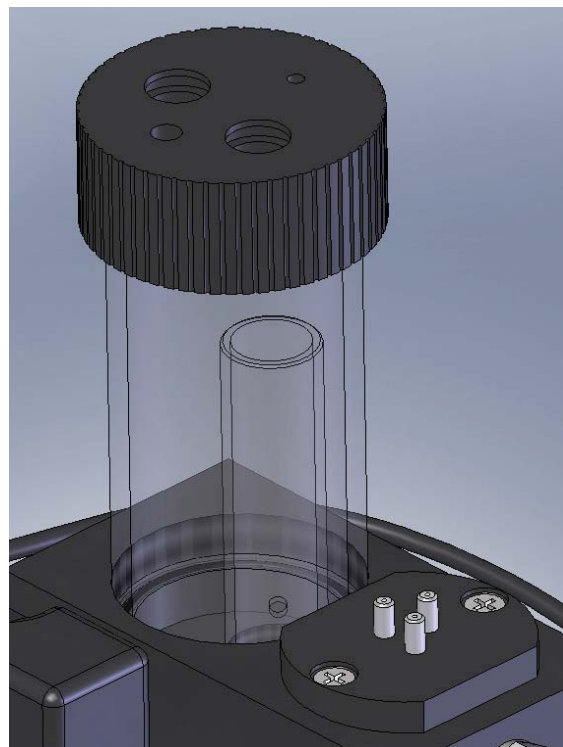
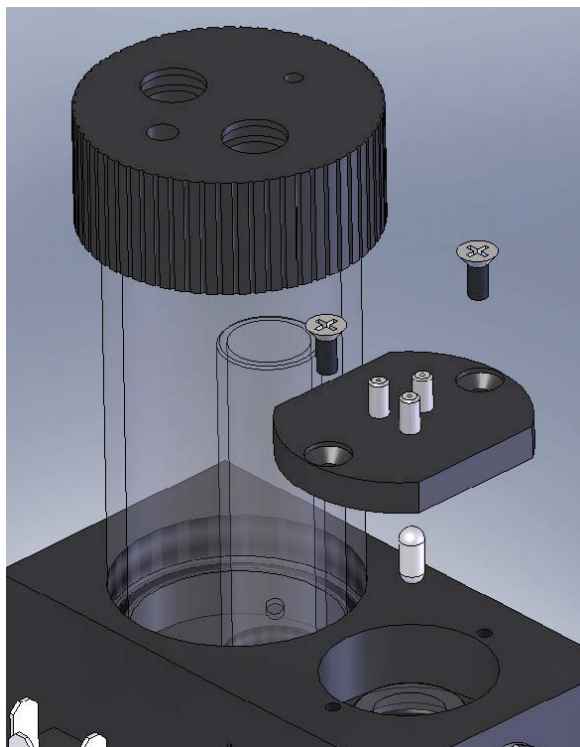
3.3 CONNECTIONS AND STARTING

After the fixing of the photometer to the wall, is necessary to follow these steps:

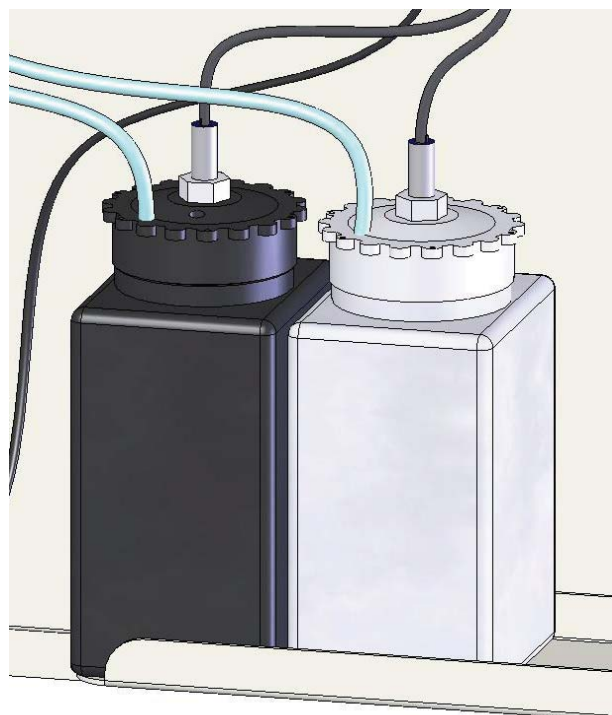
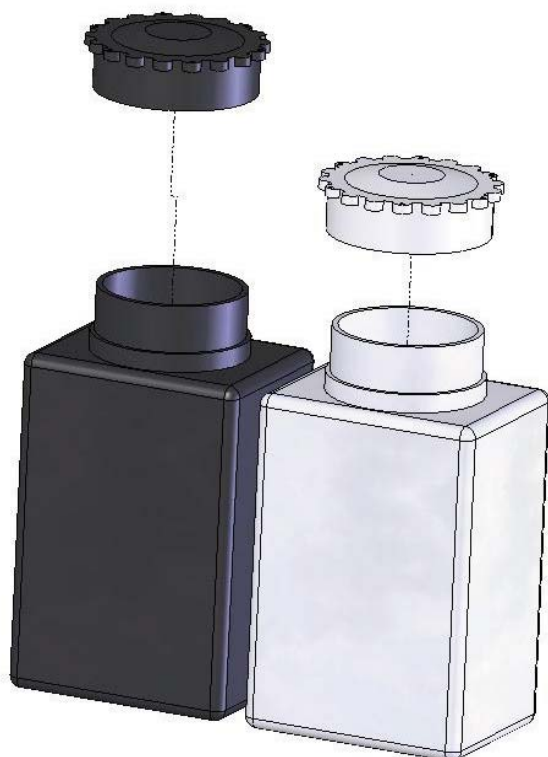
1. position red pipes of the peristaltic pump as showed below



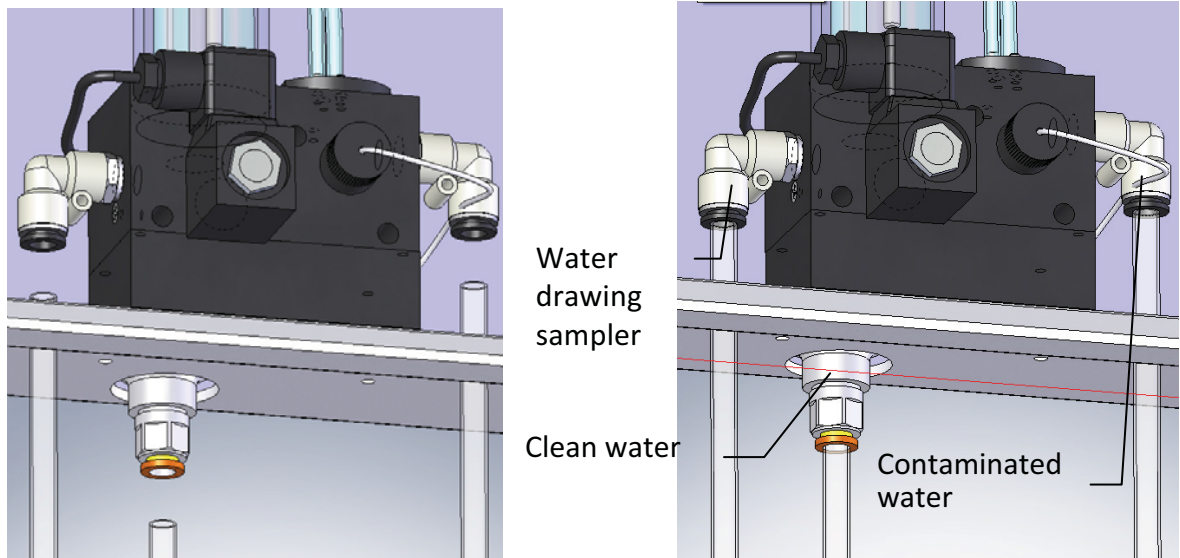
2. unscrew the screws M3 from the reactives' cap, introduce the magnetic anchor inside the slide and screw the cap as shown in the picture.



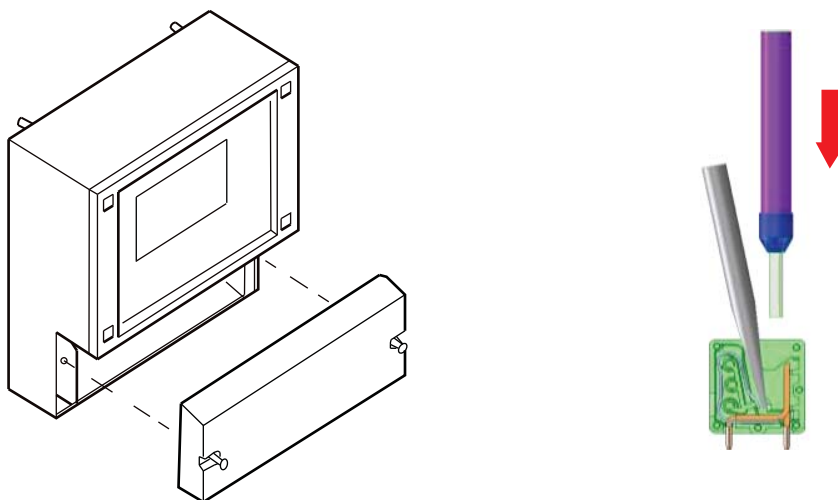
3. Prepare reagents by pouring the DPD sulfate powder in the dye reagent (DPD2).
4. take off not perforated caps from the reagents bottles and screw on them the caps with the float complying with the colours (white DPD1, black DPD2); position them on the support base.



4. connect the sample pipe to the input of the cell (pipe fitting with clutch for pipes with diameter of 10mm). Water alimentation pressure must be stable. Regulate the inflow to make the water flowing from the clear pipe inside the cell.
Connect two pipes to the 3/4" dump clutches for the dirty reagents and clean water discharge.



5. connect the electric alimentation respecting the indication on the terminal board.



CAUTION

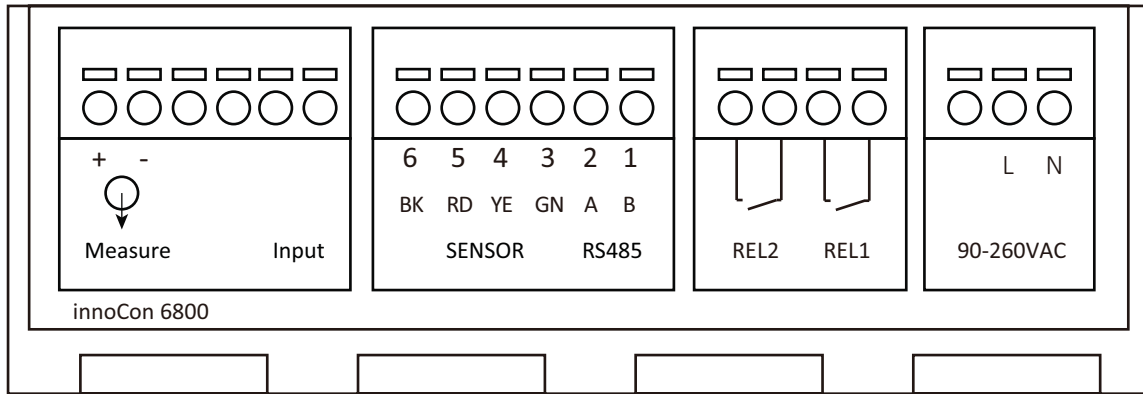


To access the 4 screws necessary to remove control panel, remove the plastic parts on the sides of the electronic box.

CAUTION



The electric line must be fitted with a suitable life-saving device and magneto-thermal, in compliance with correct installation norms.



Terminial Description

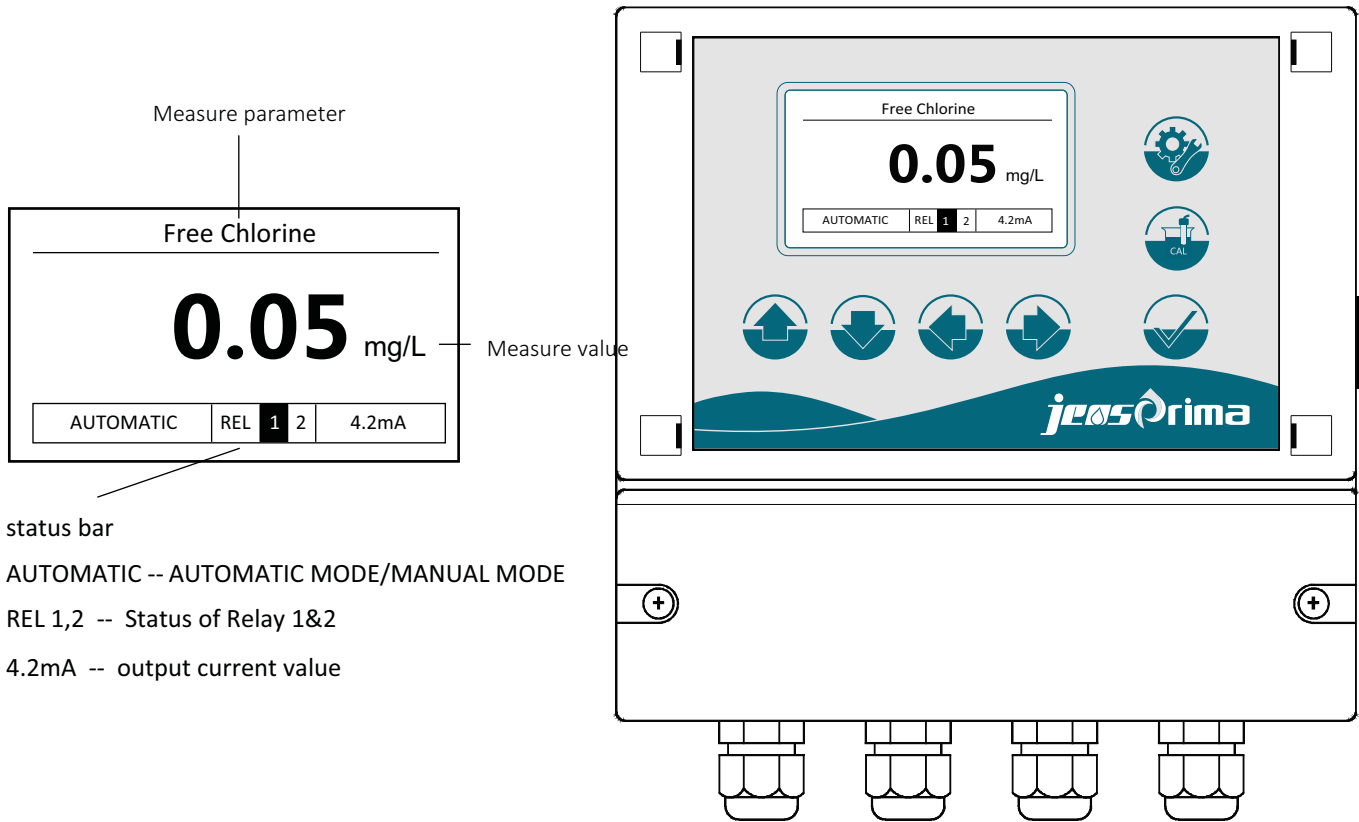
- L : Power supply (Phase) ,90-260VAC,50/60Hz
- N : Power supply (Neutral), 90-260VAC,50/60Hz
- REL1 : Relay1 for remote alarm
- REL2 : Relay2 for remote alarm
- RS485 A : Interface RS485 (A)
- RS485 B- Interface RS485 (B)
- Measure + : mA Cl2 positive cable
- Measure- : mA Cl2 negative cable

3.4 Connection to the Power Supply

Once you have made sure that the tension complies with the one indicated in the previous paragraphs, connect the electrical power line to the clamps marked by connecting the clamp with the relative symbol to earth.

4 METHODS OF USE

4.1 Display



status bar

AUTOMATIC -- AUTOMATIC MODE/MANUAL MODE

REL 1,2 -- Status of Relay 1&2

4.2mA -- output current value


Function discription:

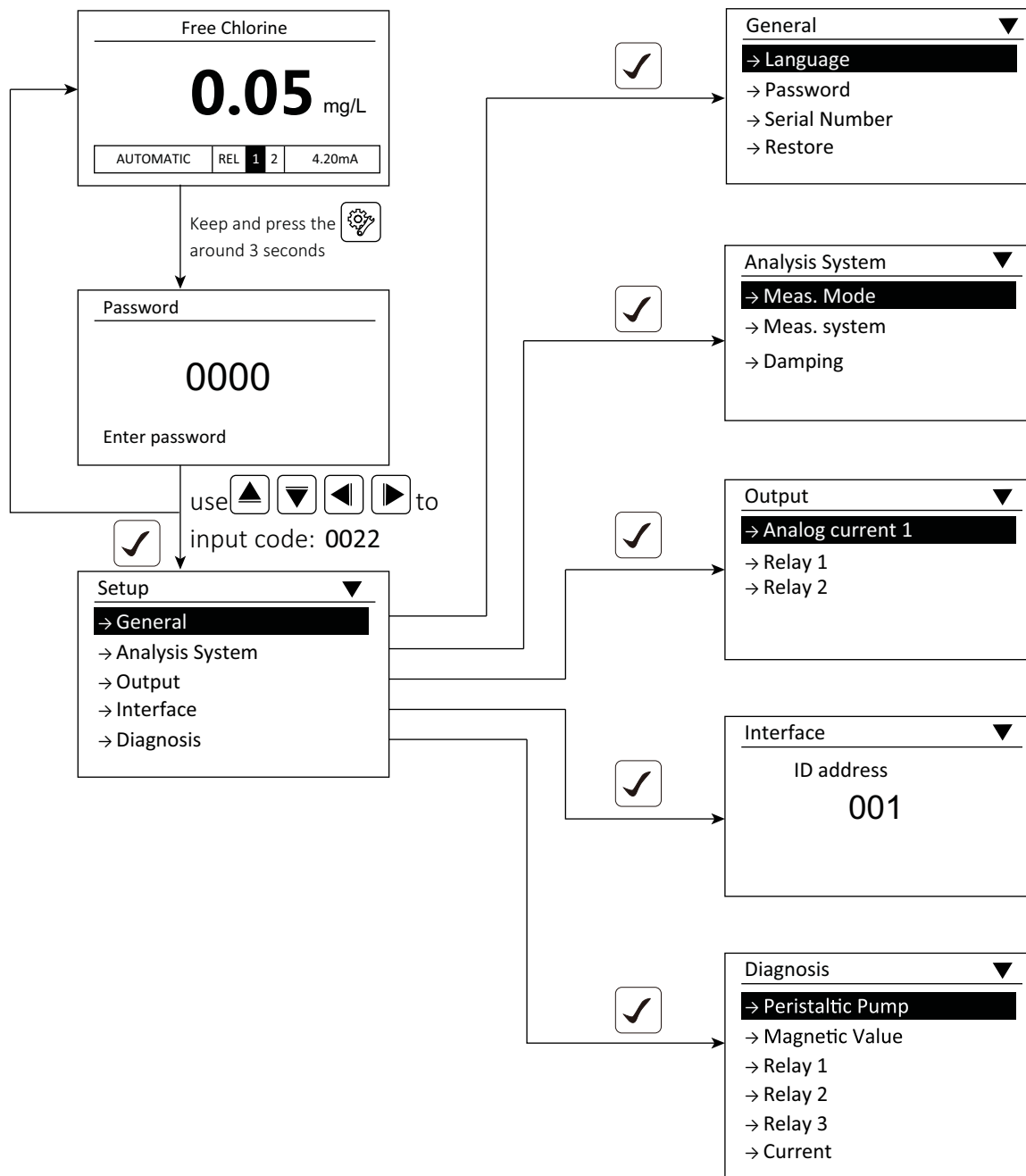
	MENU ESC	Keep and press the SETUP key around 3 seconds
	CAL	Keep and press the CAL key around 3 seconds
	ENTER	Save and go to next
	FUNCTION	Start a measurement
	FUNCTION	Filling reagent




When entering setting mode, there are passwords(0022). Passwords are set by factory and users cannot modify them by themselves. Anytime press SETUP to quit calibration mode and return to upper function. Press twice to quit setup mode at anytime.

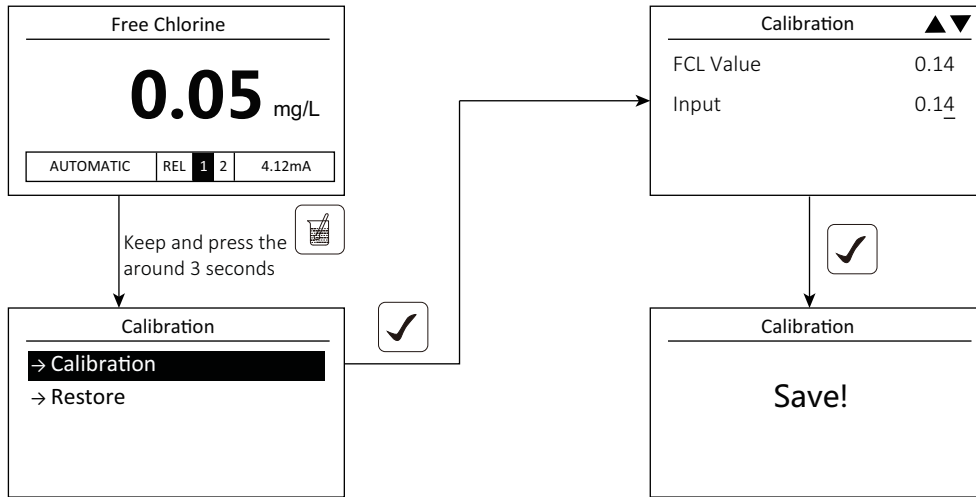
4.2 SETTINGS MENU

Enter setting mode: Keep and press the  around 3 seconds then LCD will enter the CODE SET. The back light turns on.



4.3 Calibration Setting

Enter Calibration mode: Keep and press the  around 3 seconds.



This step of the programme is dedicated to the calibration of the instrument by using a solution with known Chlorine concentration (or another reference measurement system).

1) Automatic

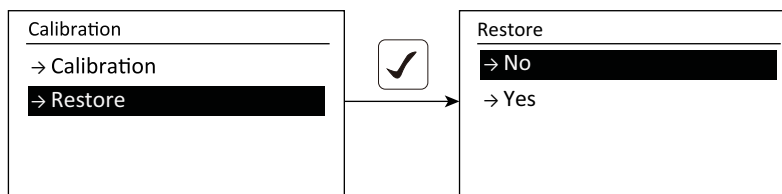
By selecting this function and pressing the button the system activate a complete measurement cycle. When the cycle is over the device shows an apparent value based on a previous calibration values.

Now, by using the buttons and is possible to introduce another value and confirm this pressing .

In this way the system calculates a new “gain” that can be applicated on all measurement scale.

2) Reset Default

By selecting this function and pressing the push button the system resets the Default calibration values.



5 USER MAINTENANCE

In order to respect a correct use of the device is important to take care about all the components of the system, particularly to those which can degrade themselves in the long period. For example:

- peristaltic pump
- peristaltic pump' s red pipes
- clear pipes of reagents
- photometric cell

If one of them show anomalies or breakings, it must be replaced by the same spare part.

Expecially for the photometric cell there might be coating or some organic substances deposits.

Deposits must be removed by mechanical or chemical solutions. Mechanical removal can be done by a damp cloth to avoid eventually damages to the cell. For calcareous coatings is recommended to use a solution of water and 10% chloridric acid

CAUTION



Take care of the indications written on the reagents' safety card . Is also recommended the use of IPD (Individual Protection Devices)

5.1 PERIODIC CALIBRATION

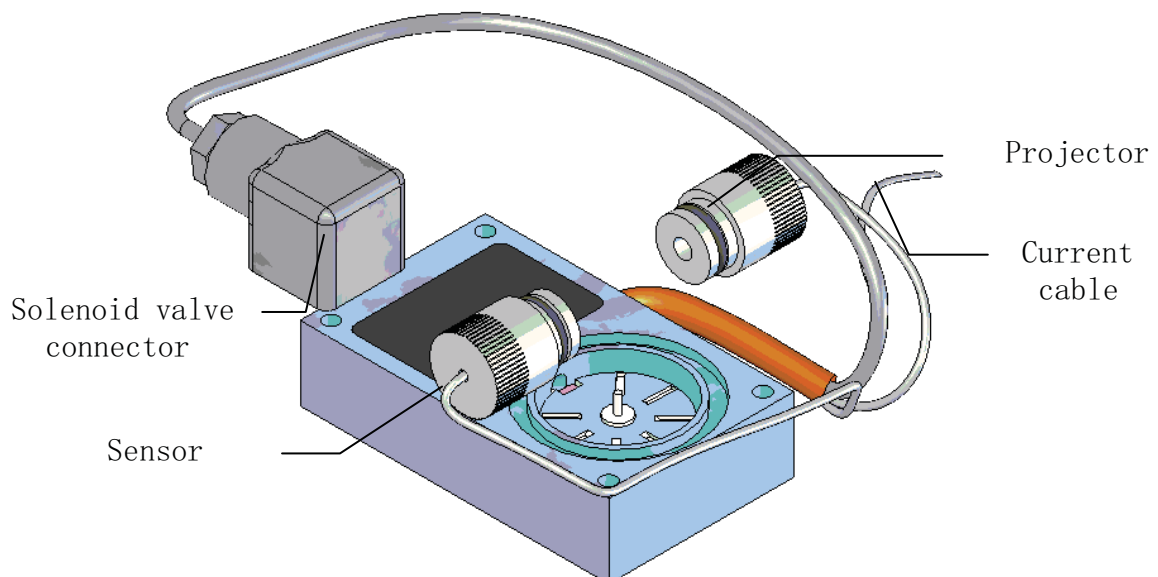
The system is able to run without a continuously maintenance

Calibration frequency can be decided from the technician according to each application.

Is recommended a periodic test on the measure quality by verifying probe's alignment.

Chlorine measurements can be verified by using another reference photometer in the same time of the water sampling.

If the devices don' t give the same value, the system must be calibrated another time as explained in the charter "Calibration". Reagents and measurement group showed below replacements always require a new calibration.

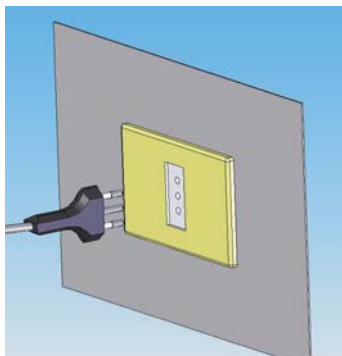


If the comparison with the buffer solutions shows different values the device must be calibrated as described in Calibration menu.

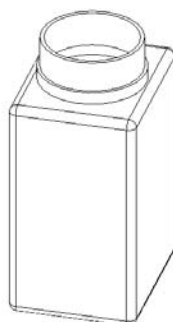
5.2 REAGENTS REPLACEMENT

Reagents replacement happens with the following steps:

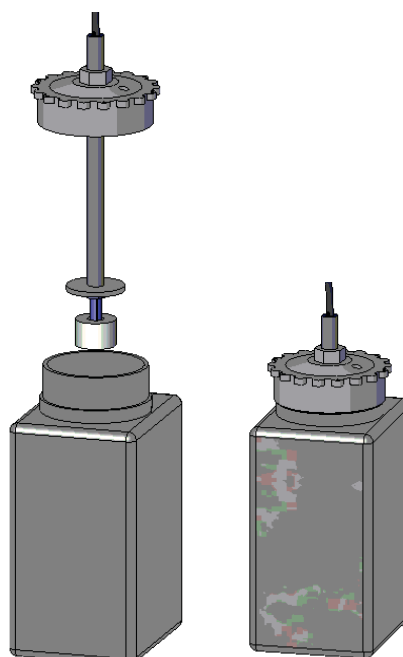
- Switch off the device by turning off the voltage feed.



- Take the new reactive bottle taking off the cap.



- Screw the cap from the bottle of the exhaust and replace it with the new one.
- Crew the cap on the new reactive bottle until it is tight enough.



- This operation must be done for each reagent
- Replaced each reagent, the device can be turn on. Refill immediately reagents' pipes, by the rotation of the peristaltic pump until air bubbles disappear, then turn off and on the device another time.
- Reagents replacement now is over. In the next phase is necessary to check chlorine measures values as showed in the "PERIODIC CALIBRATION" paragraph.

CAUTION



Take care of the indications written on the reagents' safety card . Is also recommended the use of IPD (Individual Protection Devices)

JENSPRIMA ordering code for a new reagent set for this analyzer is:

50-2500-00	Reagent Set for Free Chlorine
------------	-------------------------------

5.3 DEVICE CLEANING

The device cleaning is only suitable for the following devices. For a good maintenance of all the parts of the photometer, all kind of coating has to be removed anyway.

Clean everything always by using a damped cloth.

5.4 PHOTOMETRIC CELL CLEANING

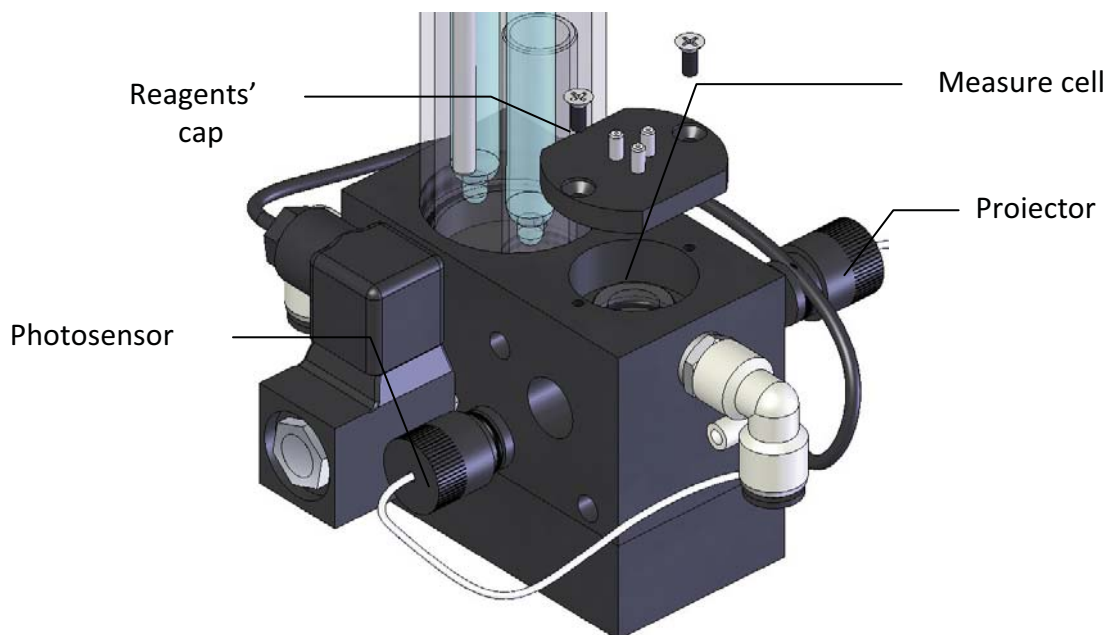
This operation in the normal maintenance procedure to apply when the display shows "Dirty Cell"

Take off the reagents cap to enter in the cell.

Clean the cell by using smooth materials like cotton-fioc, soft cloth and if it is necessary 10% chloridric acid (to remove limestone claddings)

Claddings in general must be removed from the cell by mechanical actions as indicated above.

Switch on the device to use the light from the projector to clean the cell easily. (as showed in the picture below)



CAUTION



During these operations turn off all dosing and alarm devices to avoid dangerous situations. Do not clean the cell with abrasive or metal objects. This could irreversibly damage the cell along, thus causing its malfunction .

5.5 LONG INACTIVITY PERIOD

If long inactivity is expected:

1. Remove the reagent bottles and replace them with distilled water
2. Wash reagents' pipes by activating peristaltic pump by pressing the key for a few seconds. When the pipes are clean and filled with the water it is possible to stop the cleaning procedure.
3. For the following ten minutes leave the instrument turned on to let it do the necessary procedures for the rinsing of the cell. Lift the cover of the cell to verify the cleaning of it. If it is necessary, use, as mentioned above, chloridric acid or other products with a wet cloth, to clean claddings.
4. When the cell is clean, turn off the device, unhook the tubes and apply light pressure on the deformed part.
5. To turn on the instrument another time after the period of inactivity repeat indicated.

CAUTION



The dosing systems and the alarm devices must be turned off during these operations to avoid dangerous situations

6 WARRANTY

JENSPRIMA will replace or repair at its own sole option, those parts that may eventually manifest defects in manufacturing or operating, despite of a diligent and proper use by the customer. The defective product, or considered such, must be sent free of charge to the PRIMA Factory, and will be returned, after the reparation, at purchaser's expense. In order to activate the warranty, a detailed written request should be sent to

JENSPRIMA, specifying failures or disruptions complained within 12 (twelve) months from the date of installation with a maximum of 12 months from date of shipment.

Are excluded from the warranty, then at purchaser's charge, the costs of performance of our staff for operations offsite, except the hours of work. The travel's time and expenses, meals, etc. will be charged according to ANIE rates.

Components subject of natural wear and glass-parts are excluded from the warranty. The warranty lapses only if the equipment were manipulated by someone not belonging to our company or without our explicit authorization.

MODEL _____

SERIAL NUMBER _____

TESTING DATE _____

NOTE: _____

JENSPRIMA INSTRUMENTS



JENSPRIMA INSTRUMENTS LIMITED

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