

Eligere 02 pH(Rx)-CD



 **ETATRON**

IT NORME DI INSTALLAZIONE, USO E MANUTENZIONE

UK OPERATING INSTRUCTIONS AND MAINTENANCE



(IT) DIRETTIVA "RAEE" SUI RIFIUTI DI APPARECCHIATURE ELETTRICHE ED ELETTRONICHE, AGGIORNATA A L'ULTIMA EDIZIONE

Il simbolo sotto riportato indica che il prodotto non può essere smaltito come normale rifiuto urbano. Le Apparecchiature Elettriche ed Elettroniche (AEE) possono contenere materiali nocivi per l'ambiente e la salute e pertanto devono essere oggetto di raccolta differenziata: smaltite quindi presso apposite discariche o riconsegnate al distributore a fronte dell'acquisto di una nuova, di tipo equivalente o facente le stesse funzioni. La normativa sopracitata, alla quale rimandiamo per ulteriori particolari e approfondimenti, prevede sanzioni per lo smaltimento abusivo di detti rifiuti.

(UK) WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT DIRECTIVE (WEEE, RAEE in Italy) UP TO LAST EDITION

The marking shown below indicates that the product cannot be disposed of as part of normal household waste. Electrical and Electronic Equipment (EEE) can contain materials harmful to health and the environment, and therefore is subject to separate waste collection: it must be disposed of at appropriate waste collection points or returned to the distributor against purchase of new equipment of similar type or having the same functions. The directive mentioned above, to which make reference for further details, provides for punitive actions in case of illegal disposal of such waste.

(FR) DIRECTIVE "RAEE" MISE À JOUR DE LA DERNIÈRE ÉDITION CONCERNANT LES REBUTS D'APPAREILLAGES ÉLECTRIQUES ET ÉLECTRONIQUES

Le symbole ci-dessous indique que le produit ne pas être éliminé comme un normal déchet urbain. Les Appareillages Électriques et Électroniques (AEE) peuvent contenir des matériaux nocifs pour l'environnement et la santé et doivent donc faire l'objet de collecte différenciée: éliminés donc auprès de décharges prévues à cet effet ou rendus au distributeur pour l'achat d'un nouveau, de type équivalent ou ayant les mêmes fonctions. La réglementation susmentionnée, à laquelle nous vous renvoyons pour les détails et les approfondissements ultérieurs, prévoit des sanctions pour la mise en décharge abusive desdits rebus.

(ES) DIRECTIVA "RAEE" ACTUALIZADO A LA ÚLTIMA EDICIÓN SOBRE RESIDUOS DE APARATOS ELÉCTRICOS Y ELECTRÓNICOS

El símbolo que se muestra abajo indica que el producto no puede eliminarse como un residuo urbano normal. Los Aparatos Eléctricos y Electrónicos (AEE) pueden contener materiales nocivos para el medio ambiente y la salud y por tanto tienen que ser objeto de recogida selectiva: por consiguiente tienen que eliminarse en vertederos apropiados o entregarse al distribuidor cuando se adquiera uno nuevo, del mismo tipo o con las mismas funciones. La normativa mencionada arriba, a la que remitimos para más detalles y profundizaciones, prevé sanciones por la eliminación clandestina de dichos residuos.

(PR) DIRETRIZ "RAEE" ATUALIZADO À ÚLTIMA EDIÇÃO SOBRE RESÍDUOS DE EQUIPAMENTOS ELÉTRICOS E ELETRÔNICOS

O símbolo referido abaixo indica que o produto não pode ser eliminado como resíduo urbano normal. Os Aparelhos Elétricos e Eletrônicos (AEE) podem conter materiais nocivos ao ambiente e à saúde e, portanto, devem ser objeto de coleta seletiva: eliminados, portanto, através de depósitos apropriados ou pelo reenvio ao distribuidor para a aquisição de um novo, de tipo equivalente ou que realize as mesmas funções. A normativa referida acima, à qual nos referimos para detalhes complementares e esclarecimentos, prevê sanções no caso de eliminação inadequada de tais resíduos.

(DE) RICHTLINIE "WEEE" AKTUALISIERT AUF DIE LETZTE EDITION ÜBER ELEKTRO- UND ELEKTRONIK-ALTGERÄTE

El símbolo que se muestra abajo indica que el producto no puede eliminarse como un residuo urbano normal. Los Aparatos Eléctricos y Electrónicos (AEE) pueden contener materiales nocivos para el medio ambiente y la salud y por tanto tienen que ser objeto de recogida selectiva: por consiguiente tienen que eliminarse en vertederos apropiados o entregarse al distribuidor cuando se adquiera uno nuevo, del mismo tipo o con las mismas funciones. La normativa mencionada arriba, a la que remitimos para más detalles y profundizaciones, prevé sanciones por la eliminación clandestina de dichos residuos.





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Warnings

Read the warnings below carefully. They provide important information regarding safe installation, use and maintenance. Store this manual with the utmost care for future reference.

The device is built to a professional standard. Its durability and electrical and mechanical reliability will be more efficient if it is used properly and maintenance is carried out on a regular basis.

ATTENTION: Any work or repairs inside the device must be carried out by qualified and authorised personnel. We assume no liability due to failure to comply with this rule.

WARRANTY: 1 year (excluding parts subject to normal wear where applicable, namely: valves, fittings, pipe clamps, tubes, filter and injection valve). Improper use of the device will void this warranty. The warranty is understood as ex-works or authorised distributors.

Symbols used in the manual

		
FORBIDDEN <i>Precedes information regarding safety. Indicates a forbidden operation.</i>	ATTENTION <i>Precedes very important text to protect the health of exposed persons or the machine itself.</i>	INFORMATION NOTE <i>Precedes information concerning use of the device.</i>

Transport and handling

The device must be transported as indicated on the box. Shipping by any means, even if free of carriage of the purchaser or recipient, is carried out at the purchaser's risk. Complaints for missing materials must be submitted within 10 days of arrival of the goods and within 30 days of receipt for defective material. If the device is to be replaced, this must be agreed upon with authorised personnel or the authorised distributor.

Intended use of the device



The device must be solely employed for the use it has been expressly built for, i.e. to check the pH/Rx measurement. Any other use is considered improper and therefore dangerous. The device is not intended to be used for any applications not foreseen at the design stage. For further explanations, the customer must contact our offices for information on the type of instrument in their possession and its correct use. The manufacturer shall not be held liable for any damage resulting from improper, erroneous or unreasonable use.

Risks

After removing the packaging, check the integrity of the device. If in doubt, do not use it and contact a qualified technician. The packing materials (such as plastic bags, polystyrene, etc.) must not be left within the reach of children since they are potentially dangerous.

Before connecting the device, make sure that the rating corresponds to that of the mains. The rating is displayed on the adhesive label on the device itself

The execution of the electrical system must comply with the standards that define professional workmanship in the country where the system is made.

Use of any electrical device implies observance of some fundamental rules. In particular:

- do not touch the device with wet or damp hands or feet (e.g. swimming pools);
- do not leave the device exposed to atmospheric agents (rain, sun, etc.);
- do not allow the device to be used by children or persons incapable of using it without surveillance.

- In case of failure and/or malfunctioning of the device, switch it off and do not tamper with it. For any repairs, please contact our service centres and request the use of original spare parts. Failure to comply with the above can jeopardise the safety of the pump.
- If you decide to no longer use a device, it is recommended to make it inoperable by unplugging it from the mains.
- Make sure it is switched off electrically (both polarities), disconnecting the conductors from the contact points of the mains by opening the omnipolar switch with at least 3 mm between the contacts.

Assembly of the instrument

All instruments produced are normally supplied already assembled. For wall installation see paragraph “**Wall assembly**”.

Disassembly of the instrument

Always pay the utmost attention when disassembling the instrument or before performing maintenance on it. Always disable electrical connections beforehand.

INSTRUMENT ELIGERE 02 PH(RX) - CD



General features

Eligere 02 PH(RX)–CD is a multi-purpose instrument suitable for measuring the pH or RX parameter (REDOX) and CONDUCTIVITY.

Eligere 02 PH(RX) – CD offers high quality performance in terms of measurements and functionality which make it extremely versatile and easy to use, such as:

- The PH measurement parameter may be changed into RX by simple programming and by using the RX electrode;
- The conductivity measurements are in micro Siemens and milli Siemens;
- The instrument's operating range is with a K1 constant up to 20.00 mS and even 100.00 ms (the latter with a graphite electrode) with a K5 constant up to 2,000 μ S and there are also other values from K0.8 a K10;
- Timed AUX outputs programming; Adjustable real-time timer; switch-on time programming.
- Ethernet (LAN) external module connection, Modbus TCP (not included)

Two types of programming menus:

- **Basic:** simplifies programming for household applications such as small swimming pools or water treatment systems
- **Expert:** in the case of professional applications, makes it possible to fine-tune the measurements and safety functions.

Main features

- Device manufactured according to **CE** standards
- Case made of: ABS plastic
- Backlit display 126x64
- Can be fitted with level probe (to check chemicals) (not included)
- Output relay for setpoint values
- AUX external unit remote control output
- RS485 / Ethernet external module connection
- PT100 temperature sensor
- 100/240 VAC power supply 50/60 Hz single-phase (maximum $\pm 10\%$ fluctuations are permitted); on demand 12/24 V

Dimensions of the instrument



Function		Description
Setpoint	Relay outputs 1 - 2 - 3	3 setpoint ON-OFF <i>Independent settings to start up metering pumps or peristaltic dispensers in constant mode or equipment with ON-OFF mode</i>
		Setpoint <i>Adjusts the setpoint value (ON-OFF mode)</i>
		Hysteresis <i>Selects a measurement range around the setpoint value, locking the output relays (ON-OFF)</i>
		Acid – Alkaline pH Direct - Reverse RX and EC <i>Selects the metering direction of the output relay.</i>
		Proportional modular pulse PWM mode <i>Proportional Time/Pause pulse outputs activate metering pumps or peristaltic dispensers with constant mode or ON-OFF equipment.</i>
		Delay on setpoint value <i>Selects a delay time (max 999 sec adjustable) before activating the output relay.</i>
	AUX Outputs Relay	<i>The real-time clock controls remote appliances or devices connected to the AUX1 and 2 outputs in a very accurate manner for programming minutes/hours/days/weeks.</i>
	Alarm 4 Relay	Min Alarm / Max Alarm <i>Alarm function that, on exceeding a minimum or maximum value, switches the alarm relay on or off.</i>
4-20 mA1-2	mA devices outputs	<i>Controls the data logger, PLC, recorder or devices suited to processing the mA signal</i>
	Setpoint metering	<i>Controls mA metering pumps or devices suited to processing an mA signal</i>
Calibration	<i>Calibration menu for pH or RX electrode (Redox) and Conductivity sensor</i>	
System settings	Flow sensor	<i>Switches on or off the flow sensor input (proximity sensor)</i>
	Manual temperature	<i>Select the manual temperature offset. 0-100°C</i>
	Automatic temperature offset	<i>Offsets the temperature with the conductivity probe, therefore measuring the exact value against the current temperature.</i>
	RS485/Ethernet	<i>Remote control via external RS485 / ETHERNET module, Modbus protocol with ETACLOUD Software. The operator connects the unit via a PC, a smartphone or a tablet. (NOT included)</i>

TECHNICAL SPECIFICATIONS OF THE INSTRUMENT

PH measurement range:	▪ 0 pH 14 pH (0.....100°C)
	▪ Resolution ± 0.01 pH ▪ Precision 0.5% of the electrode input signal
	▪ Input resistance $> 10^{12}$ Ohm
	▪ Zero calibration: $\pm 10\%$ adjustment range from the calibration point
	▪ "Gain" calibration: $\pm 10\%$
RX (Redox) measurement range:	▪ Hysteresis: 0.05 pH (programmable)
	▪ Timed PWM impulses: activation point: 1.50 pH (programmable)
	▪ – 1000 mV.....+1000 mV
	▪ Input resistance $> 10^{12}$ Ohm
	▪ Resolution ± 1 mV ▪ Precision 0.5% of the electrode input signal
Temperature settings:	▪ Hysteresis: 10 mV (programmable)
	▪ Timed PWM impulses: activation point: 150 mV (programmable)
Temperature probe range:	Manual or automatic offset (auto with temperature probe PT100)
	▪ Resolution 0.1% °C ▪ Precision: $\pm 0.5\%$ °C
Power supply / Consumption:	– 20.... 100°C
Microprocessor technology:	Universal power supply 100÷250VAC / 5W at 240VAC
Linearity, Stability, Reproducibility:	SMD components with a 6-key digital control keypad
Display:	$\pm 0.5\%$ in standard conditions
Delay on Setpoint:	Backlit 128x64 display; Visible display area 120x60 mm
Delay on start-up:	Relay activation delay, programmable for each setpoint (999 sec.)
Consumption / Rated Current:	Delay in relay when the unit is switched on, programmable
Internal electrical protection:	230Vca 5W = 25mA ▪ 24Vca-cc=5W = 230mA ▪ 12Vcc 5W = 460mA
Level / Relay remote control:	Power supply unit assures electrical protection (instead of fuse)
Outputs	Chemical additive level (level probe not included) output voltage +5VDC
	RELAY A output (setpoint 1): PH (or RX) ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac
	RELAY B output (setpoint 2): PH (or RX) ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac
	RELAY C output (setpoint 3): EC CONDUCTIVITY ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac
	RELAY D Output (ALARM): ALARM voltage-free contact, relay 5A max 230Vac
	RELAY E-F AUX outputs: AUX outputs ON-OFF external equipment voltage-free, relay 5Amax 230Vac
	FLOW sensor: Blocks outlet operations if there is no flow in the probe socket.
	Output 0/4...20 mA1: Adjustable (500 Ω maximum input impedance), with galvanic separation.
	Output 0/4...20 mA2: Connected to PH (or RX) measurement settings.
	Load: Adjustable (500 Ω maximum input impedance), with galvanic separation.
Relay insulation voltage:	Connected to EC CONDUCTIVITY measurement settings.
Contact relay duration:	Resistive load 5A at 230VAC / Inductive load 0.5A at 230VAC
Operating temperature:	> 3000 VAC
Noise level:	$\geq 5 \times 10^4$ operations (at 5A at 230Vca)
Environmental conditions:	ideal temperature 5°C-40°C, resistance up to 0°C-45°C
Transport / storage conditions:	irrelevant
	Possibly dry environment, altitude up to 2000m, Relative humidity 80% for temperature up to 31°C linearly decreasing to 50% of relative humidity at 40°C. Pollution degree 2.
	– 5÷60°C in a dry environment

INSTALLATION



Install the instrument in a dry place, away from heat sources at a maximum room temperature of 40°C.

Comply with standards in force in the different countries regarding electrical installation (Fig. 2). The instrument is supplied with no power cord. **The device must be connected to the mains by means of an omnipolar disconnecting switch with at least 3 mm between the contacts. All the power supply circuits must be interrupted before accessing the connection devices.**

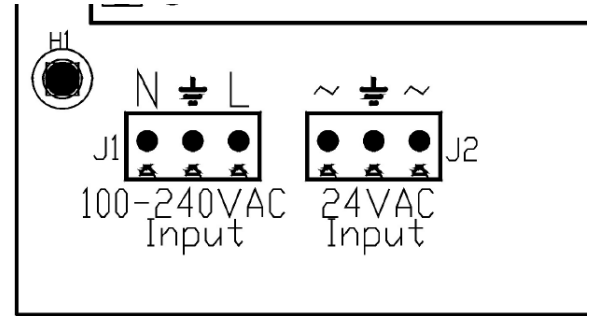


Fig. 1 – Electrical connection

Wall installation

The wall-mounting plugs are supplied with the device. **Always use a plug suitable to the available support.** The layout of the holes to be drilled on the support is displayed in Figure 2.

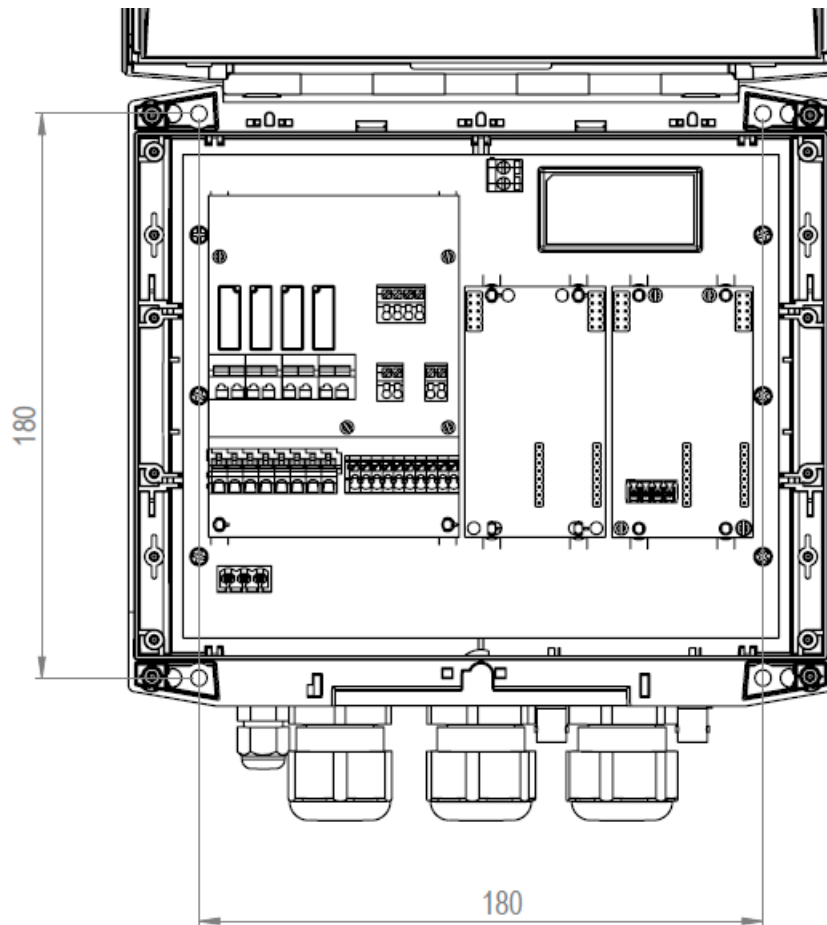


Fig. 2 - Measurements for wall fixing 229I x 204h

To access the 4 installation holes, remove the covers on the installation points **(A)** found on each corner of the instrument, use a Phillips screwdriver to loosen the four screws underneath the covers, then open the front panel (see Fig.2).

The casing has 4 captive screws to quickly open/close the cover, thereby allowing for easy access for commissioning and servicing, as well as assuring excellent seal for long-lasting operation

- Install the unit in a dry place away from heat sources. Max room temperature 40°C.
- Strictly comply with the regulations in force in the various countries regarding electrical systems.
- Fit the instrument on the wall using the screws supplied

Diagram of electrical connections



To connect the accessories and peripheral devices to the instrument, remove the front cover screws, using a Phillips screwdriver to reach the connecting terminal boards.

The terminal boards consist of spring terminals for quick coupling of the wires. Press the square “slotted” pin with a small flat headed screwdriver and insert the stripped wire in the corresponding terminal. **ATTENTION: exert slight pressure on the spring pin to avoid irreparably damaging the terminal board.**

Do not connect more than one device to each pin

Run the wires to be connected through the cable glands on the case wall.

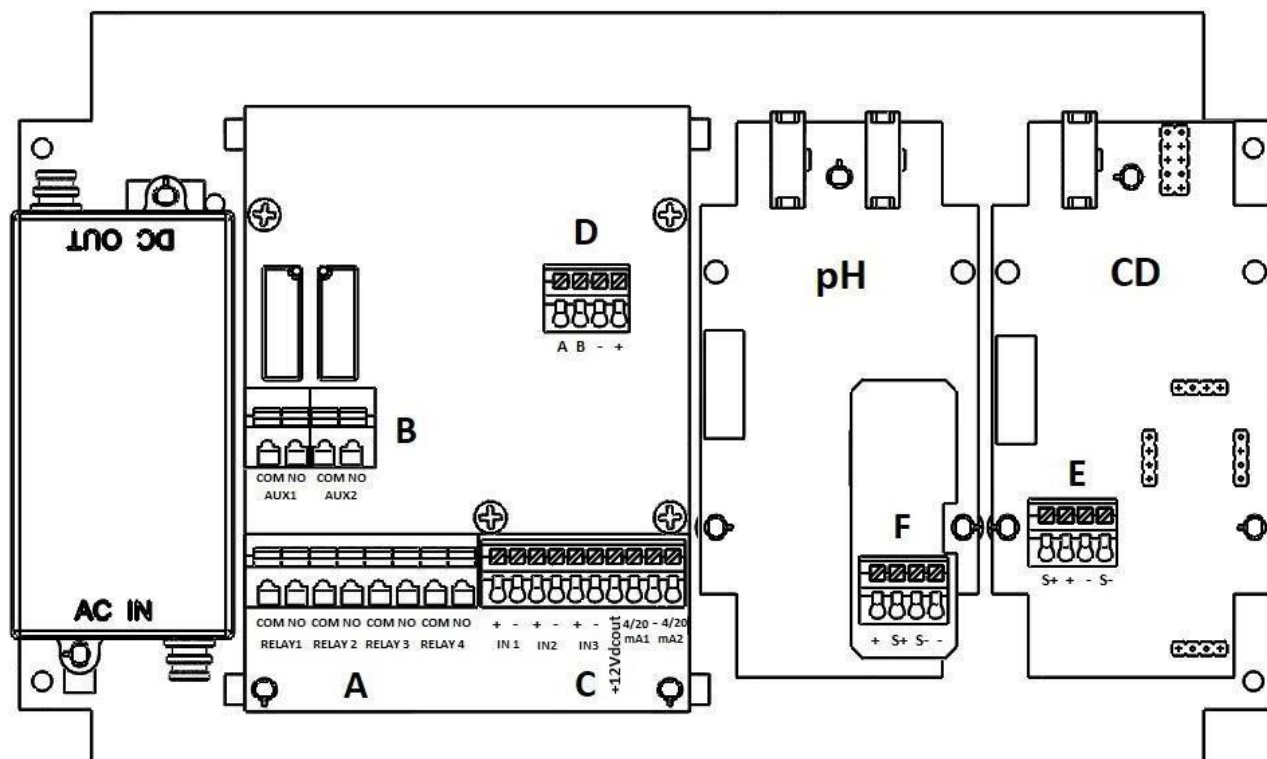


Fig. 3 – Connection diagram

TERMINAL BOARD "A"		
Relay 1	COM NO	Setpoint 1 pH (o RX) ON-OFF / PWM output relay timed pulses
Relay 2	COM NO	Setpoint 2 pH (o RX) ON-OFF / PWM output relay timed pulses
Relay 3	COM NO	Setpoint 3 EC Conductivity ON-OFF / PWM output relay timed pulses
Relay 4	COM NO	ON-OFF ALARM relay output for external signalling device
TERMINAL BOARD "B"		
AUX 1	COM NO	Auxiliary ON-OFF AUX output for remote equipment with Timer programming
AUX 2	COM NO	Auxiliary ON-OFF AUX output for remote equipment with Timer programming
TERMINAL BOARD "C"		
IN 1	+ -	Digital input level probe 1 for the chemical tank
IN 2	+ -	Digital input level probe 2 for the chemical tank
IN 3	+ -	Proximity Sensor input BLACK wires Proximity Sensor input BLUE wires
+12VDC	+	12 VDC output of the Proximity Sensor BROWN wire
4-20 mA1	+	(+)Proportional output pH (or RX) 4-20mA1 for metering pump mA, PLC, data collection
-	-	(-)Proportional output 4-20mA1/mA2 for metering pump mA, PLC, data collection
4-20 mA2	+	(+)Proportional output Conductivity 4-20mA2 for metering pump mA, PLC, data collection
TERMINAL BOARD "D"		
A	ORANGE wire	Connection for RS485 / ETHERNET external module. For connection to the ETACLOUD , the external KIT CONNECT module must be connected (NOT included with the instrument) <i>code KST0000101 KIT CONNECT X INSTRUMENTS SERIES M</i>
B	YELLOW wire	
-	BLACK wire	
+	Not Connected	

TERMINAL BOARD "E"	
S +	Conductivity Probe (WHITE wire)
+	Conductivity Probe (WHITE/BROWN wire)
-	Conductivity Probe (BLACK/BROWN wire)
S -	Conductivity Probe (BLACK wire)
TERMINAL BOARD "F"	
+	PT100 temperature probe (RED wire)
S +	PT100 temperature probe (BLUE wire)
S -	PT100 temperature probe (GREEN wire)
-	PT100 temperature probe (YELLOW wire)



REMEMBER: unit with universal voltage 100-250 VAC ($\pm 10\%$) or 9-24VDC. If the real voltage is constantly at the limit (minimum or maximum), or when the peaks are far above the mentioned range, the unit input is electrically protected against voltage fluctuations; outside the range mentioned above, the instrument does not work and the printed circuit must be replaced. **It is recommended** to use voltage protections, check the earthing system and, when other equipment is connected in parallel, use a transducer. Furthermore, ETATRON **recommends** installing a UPS (genset) to assure continuity thus ensuring no data are lost. A system that is set up without following the proper electrical design rules, without an earthing system, with frequent ON/OFF operations, might directly undermine the printed circuit.

Connect the CONDUCTIVITY SENSOR

NOTE FOR CONDUCTIVITY SENSORS

The instrument works with a simple conductivity sensor with open 2-electrode system, one graphite electrode or AISI 316, both with PTFE body. Also available in AISI 316 with PVC body.



FOR 4/6 WIRE CONDUCTIVITY SENSORS (with built-in temperature sensor) by virtue of the various models on the market, should the operator wish to use these sensors, they are kindly requested to contact the ETATRON service or the local dealer to receive the correct set-up for connecting to the terminal board.

Eligere PH(RX)-CD is NOT suitable for inductive sensors!

Disconnect the instrument from the mains, install the conductivity sensor in the system or in a suitable probe socket.

It is recommended to use a new probe or at least one in good conditions. Connect the conductivity sensor to the terminal board.

NOTE: the instrument is adjusted based on cell constant "K" of the probe in use. This constant must be set up upon first commissioning, or it may also be edited subsequently, as illustrated in the following menus.

IMPORTANT: it is essential for the user to know the cell constant of the probe, provided by its manufacturer.

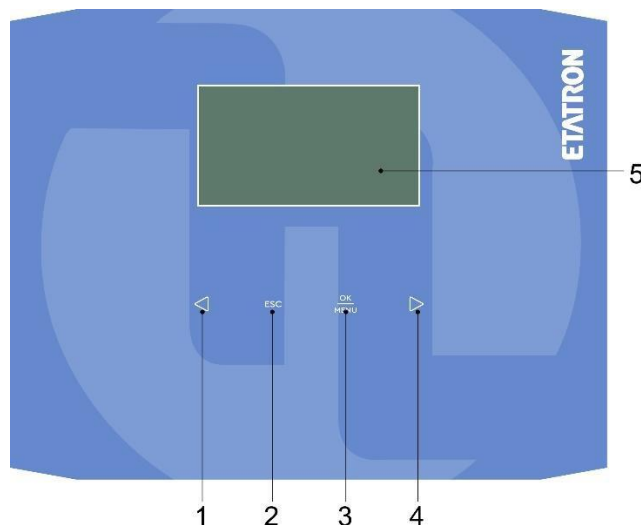
STANDARD OPERATIONAL CONDUCTIVITY RANGES

- **K1** 2000 $\mu\text{S} \div 20.00 \text{ mS}$ (20,000 μS): it can measure up to 1000 μS but the display will be less accurate.
 - **K5** up to 2,000 μS
- ON REQUEST** other measurement ranges are possible only after approval by ETATRON:
 > **K0.8** up to 100 mS (100,000 μS): via ETATRON probe with graphite electrodes or other brands with equivalent models.

ELIGERE 02 PH(RX) - CD

Control Panel

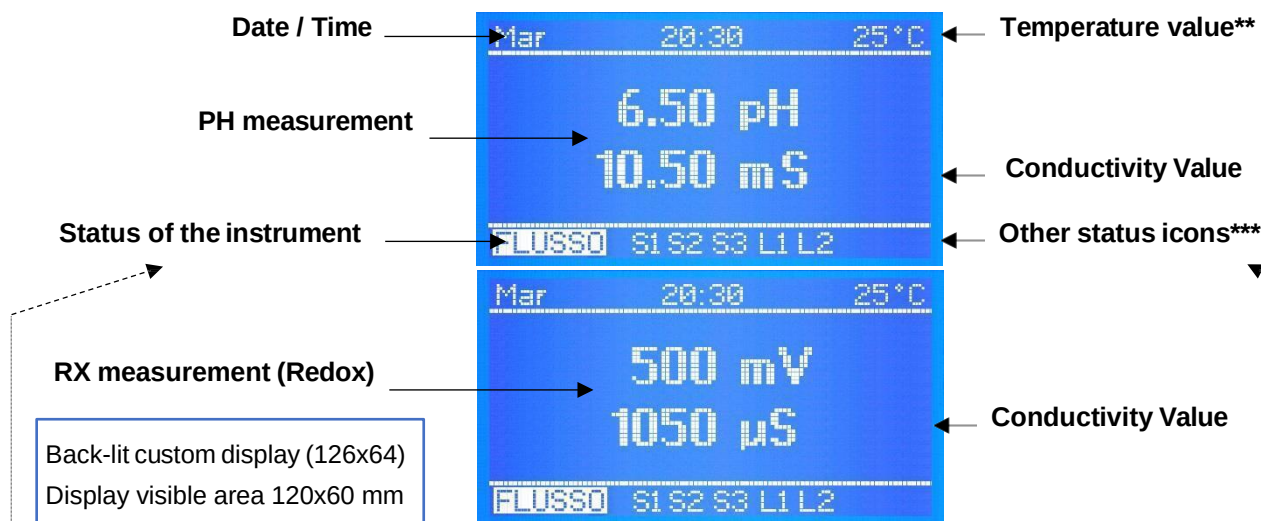
The following figure shows the control panel with the description of the functions of the different keys.



1		Button to scroll the menu to the left and decrease values
2		Button to quit the menu
3		Button to enter the menu and confirm selections
4		Button to scroll the menu to the right and increase values
5	Display	

Fig. 4 – Keypad

DESCRIPTION OF THE DISPLAY



* Instrument status messages shown as follows:

MAX ALARM-SETPOINT 1-3	OVERDOSE-SETPOINT 1	OVERDOSE-SETPOINT 3
MIN ALARM-SETPOINT 1-3	OVERDOSE-SETPOINT 2	AUX / DATE / TIME
FLOW	OVERDOSE-4-20mA1	TEMPERATURE
NO MEASUREMENT CONN.	OVERDOSE-4-20mA2	L1 L2 LEVEL MONITORING

If more than one function is active, the messages are displayed in continuous cycle, each is displayed for 3 seconds. The ALARM message disappears once the measurements are again consistent with the programmed settings, whereas the Overdose icon remains; to remove the active icons from the display, press and hold **ESC**.

When the messages are displayed, the temperature value is not displayed.

NO MEASUREMENT CONNECTION LINK: communication between instrument or display down.



The software of the power and control boards of the Eligere 02 series are connected via the 485 protocol: when instead of the temperature the display shows **NO MEASUREMENT CONN.**, this means there is a problem between the two boards, in that case check the flat electric cable and immediately contact the ETATRON service.

Other status icons shown at the end of the row ***

Other status messages are as follows:

S1 S2 S3 L1 L2 ALARM AUX DATE/TIME OVERDOSE FLOW *BASIC MENU* *EXPERT MENU*

***BASIC MENU* *EXPERT MENU *** these messages are displayed during the programming steps as reminders.

S1 S2 S3 indicate the corresponding active Setpoint. When selecting the "Proportional" mode (Pulse Width Modulation) during the setpoint step, messages S1...S2 blink.

**** FLOW **** shows the absence of water flow in the probe socket: this is only valid when the FLOW SENSOR has been activated (in EXPERT mode).

L1 L2 indicates level control of an external tank and is only shown once the level probe is connected to the pins of terminal IN1 and IN2: when the level in the tank is lower than the float of the level probe, it triggers the Status message.

When the instrument is **first** switched on, a list of all key programming functions is displayed.

If more than one function is active, the messages are displayed in continuous cycle, each is displayed for 3 seconds. The ALARM or OVERDOSE message disappears once the measurements are again consistent with the programmed settings. When the messages are displayed, the temperature value is NOT displayed.

Temperature value: if the temperature has been set up in manual mode, the temperature value matches the one selected. If the automatic mode has been selected and a PT100 temperature sensor has been connected, the temperature value shown matches the real value in the system and allows for automatic offsetting.

OPERATING FUNCTIONS

ON-OFF mode

The unit has an ON-OFF mode which switches on (or off if the reverse mode is ON) the output relays to control Constant / ON-OFF metering pumps, peristaltic pumps or other ON-OFF equipment.

DIRECT / REVERSE direction

The setpoint relays are factory set as follows:

Setpoint 1 PH: ACID mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

Setpoint 2 PH: ALKALINE mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an alkaline product.

Setpoint 1 RX: DIRECT mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an Oxidising product.

Setpoint 2 RX: REVERSE, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out a reducing product.

Setpoint 3 EC: DIRECT mode, the output is active when the measured value is lower than the selected setpoint. REVERSE mode, the output is active when the measured value is higher than the selected setpoint.

ALARM MIN / MAX function

The **Alarm** function makes it possible to select the minimum and maximum values outside which the instrument goes into alarm mode.

HYSTERESIS

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relays when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device. By increasing hysteresis it is possible to move away from the setpoint in accordance with the required value.

Example PH: if the selected set point is 7.00 pH and hysteresis is set at 0.05, the two active points are 6.95 pH and 7.05 pH: within this range, the set point is OFF and the outputs are blocked, outside this range the set point is ON (always in accordance with Acid or alkaline mode). The **RX** parameter (mV) works in the same way indicating values in mV. The conductivity measurement **EC**, works according to the values for the selected conductivity range showing values in mS or μS .

DELAY output response delay on setpoint

The **Delay time** blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the sensor measurements are stable, thus assuring the best results in terms of chemical balance.

PROPORTIONAL PWM mode: Timed "Pulse Width Modulation"

PWM "pulse width modulation" support a proportional mode on each ON-OFF setpoint activating at the pulse, with a change of the Start/Stop cycle time according to the measured value with respect to the setpoint.

Pulse width: pulses are timed ON and OFF based on the distance from the selected setpoint, programmable, example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, if the selected value of the **PWM** mode is 1.50 pH, the proportional function starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.

Cycle Time: selected value of the **PWM** mode 1.50 pH with a 60 second cycle (programmable), example: setpoint is 7.00 pH, at measured value 8.50 pH = active time 60 sec - pause time = 0 sec; 7.75 pH active time = 30 sec - pause time = 30 sec... decreasing the active time as a consequence while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint needs to react, chemical concentration, etc.

MIN Active Time: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < than that chosen with MIN Active Time, the latter prevails on the former, example: measured value 8.50 pH; setpoint 7.00 pH / Period Width 1.50 * Cycle time 60 sec = active time 4 sec. If the user has selected **Active time min** 5 sec, this will be the minimum PWM time and not 4 sec.

The **RX** parameters (mV) work in the same way indicating values in mV.

The conductivity measurement EC, works according to the corresponding values for the selected conductivity range with Factor K showing values in mS or μ S.

ADVANTAGES: the proportional function is more accurate than the ON-OFF mode.

DISADVANTAGES: the user needs to be a professional in order to select the most accurate settings to assure the best results.

ANALOGUE OUTPUTS IN CURRENT 4 -20 mA 1 / 4 -20 mA 2

The instrument features 2 outputs with signal in current in mA. The 4-20 mA signal follows the pH or RX mV and EC (μ S or mS) settings previously selected. The mA output provides two operating modes to be selected according to the system requirements:

- **mA DEVICE:** this is a programmable function combined with the unit of measure of the pH or RX and EC measurement in real time which makes it therefore possible to remotely monitor devices such as data loggers, PLCs, recorders or other devices suited to processing remote signals in mA.
Value 4 mA corresponds to the minimum programmed pH or RX mV or EC value (μ S or mS) **20 mA** corresponds to the maximum measurable pH or mV and EC value, the connected equipment will operate accordingly.
- **METERING ON SETPOINT:** mA outputs control metering pumps suited to processing an input mA signal.
4 mA corresponds to the minimum pH or RX mV and EC value (μ S or mS), hence the connected metering pumps will work at their minimum capacity. **20 mA** corresponds to the maximum measured pH or RX mV or EC value hence the connected metering pump will work at its maximum programmed capacity (according to the settings of the device and of the metering pump).

ADVANTAGES: best possible results because the pulses are extremely accurate in relation to measured levels.

DISADVANTAGES: the user requires a specific metering pump or other device suited to processing a remote signal in mA.

OVERDOSE TIME

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

ADVANTAGES: preventing excessive doses of chemicals.

MAXIMUM METERING TIME

The **maximum metering time** is an extra function that ensures that metering operations are completed within a certain time limit selected by the operator. The relays connected to the metering pumps activate accordingly. This function makes it possible to eliminate time limits, to meter continuously based on the selected setpoints or, if the operator wishes to change the settings, to choose a given period (up to 999 minutes) within the selected hours.

ADVANTAGES: preventing excessive addition of chemical product not only according to the setpoint, but also cancelling any form of programming of the instrument's setpoint.

TIMER IN REAL TIME / START-STOP TIME

The **Timer in real time** makes it possible to control through a timer the AUX outputs for each remote device for the period selected in the program. The operator may also program the days of activity and the exact time of the unit's operations through the Start/Stop programming.

AUX OUTPUTS

The two AUX auxiliary outputs control various functions connected to any type of remote On-Off device controlled by a timer in real time. Each output may control a device or appliance thanks to very accurate programming of minutes/hours/days/weeks.

ADVANTAGES: this function makes this instrument a very versatile control unit not only to measure chemical physical parameters but also for other functions connected to the system where it is installed.

START-UP DELAY

The **start-up delay** blocks the output relays when the unit is switched on, thus allowing the sensor to polarise assuring correct measurements (programmable).

FLOW SENSOR function "Proximity Sensor"

Flow Sensor (not included): if there is no water flow in the probe socket (and possibly in the system), the flow sensor (proximity sensor) disables all outputs ensuring no chemical substance is added.

TEMPERATURE

Manual / Automatic Temperature offset (the latter with a temperature sensor) 0-100°C, the temperature / conductivity measurements will be offset, always obtaining the exact value against the current temperature.

ETHERNET / RS 485 external communication module

The Eligere series is suitable for remote control thanks to an RS485 expansion board with Modbus protocol using the ETACLOUD software. The ETHERNET connection allows the operator to connect to the unit via a PC, a smartphone or a tablet and change the programming and settings using the ETACLOUD software. The unit sends a message once the alarm level, overdose settings are reached, or when the maximum metering time of the metering pump has elapsed.

INITIAL DISPLAY

NOTE FOR THE PROGRAMMER: Read the manual before starting programming or always have it at hand to be sure you are making the correct selections.

IMPORTANT: if no keys are pressed for 60 seconds, the instrument will show the current measurement.

To go forward quickly, **press and hold** one of the ◀▶ buttons

ETATRON
Model Eligere 02

Rev. X. X

The software version is shown when the instrument is on the lower part of the display.
The software is subject to revisions without notice.

The instrument is prepared for measuring and is then ready to operate.

 At this stage, certain status messages might be displayed, which might be active because of current measurements, just go on programming.

The **INITIAL DISPLAY** shows the measurements according to the selected **Measurement Type** (SELECT MEASUREMENT TYPE PH OR RX and SELECT THE "K" FACTOR OF THE CONDUCTIVITY PROBE). If the instrument has already been programmed, the display shows the programs selected previously.

NOTE: if the RX **Measurement Type** is selected, all values are automatically changed to **mV**.

For conductivity measurements, the display will show values in μS up to 1999 (microSiemens) then will change automatically to **mS** (milliSiemens) above this value.

The **CONTINUOUS MEASUREMENT DISPLAY** shows the measurements of the parameter, the status of the functions and the alarm indications.

When the instrument is **switched on for the first time**, a list of functions of all keys is displayed. This screen is no longer displayed during subsequent start-up operations.

READ THE MESSAGE CAREFULLY, THEN PRESS  **OK** TO START.

USE OF THE KEYS

OK: access to the menu, start/stop, selection and editing

 **±** selects the step of the menu or increases / decreases the value

ESC: goes back to the previous menu or does not save the change

* Press OK to start*

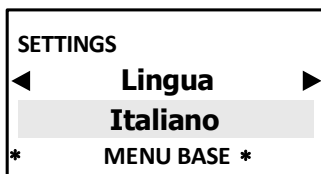
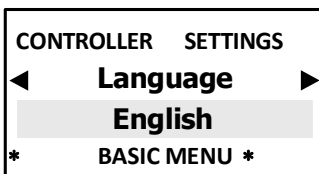
To go forward quickly, **press and hold** one of the ◀▶ buttons



Key	usage
OK	: access menu or start / stop edit
+	: select menu item or inc / dec value
ESC	: to previous menu or discard edit
* Press OK to start *	

IN ENGLISH

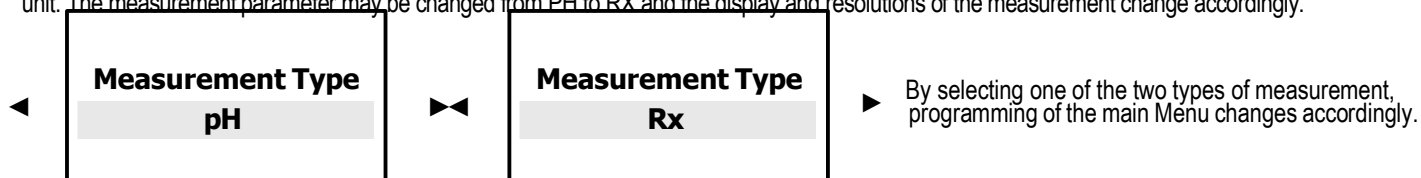
Select the language of the PROGRAMMING MENU



To select the language of the programming menu.
After selecting the Language (ITALIAN, ENGLISH), the programming menu adapts accordingly.

Select MEASUREMENT TYPE PH or RX

The instrument of the Eligere 02 series makes it possible to select the type of measurement to be used, i.e. PH or RX (Redox) in the same unit. The measurement parameter may be changed from PH to RX and the display and resolutions of the measurement change accordingly.



IMPORTANT: after selecting **Measurement Type** PH or RX, **ENSURE** you connect the appropriate electrode. In case the operator should want **Measurement Type** also during operations, proceed as follows:

- **BASIC** menu > **SETTINGS** > **MENUEXPERT** > **MENUSELECTION** > **SETPOINT1** > **Measurement Type**
- from **EXPERT** menu go into > **MENUSELECTION** > **SETPOINT1** > **Measurement Type**
- Press **ESC** to go back to **MENUSELECTION** or press **ESC** **ESC** to go back to **MEASUREMENT DISPLAY A**

Select the CONSTANT CELL "K" FACTOR of the CONDUCTIVITY PROBE

The instrument is adjusted based on cell constant "K" of the probe in use.

IMPORTANT: it is essential for the user to know the cell constant of the probe, provided by its manufacturer.

STANDARD OPERATIONAL CONDUCTIVITY RANGES

- **K1** up to 20.00 mS (20,000 µS)
- **K5** up to 2,000 µS

ON REQUEST other measurement ranges are possible only after approval by ETATRON:

> **K0.8** up to 100 mS (100,000 µS): the latter by means of probe with graphite electrode.

> **K10** up to 200 µS with probe suitable to measure this range.

IMPORTANT: the K1 probe with range 20,000 µS, also makes it possible to measure low conductivity levels, example up to 200 µS, but in these cases the values are indicative because resolution will be less accurate.

However, the same concept does not apply to the other range, example: K5 probe may never measure values above its maximum range, i.e. 2.000 µS.

Setting Meas. CE

Const.K EC probe

1 , 000

The cell constant K default set at 1,000, press ◀▶ to edit the K value.

K1 select 1,000

K5 select 5,000

The display shows the value in µS but if the selected value exceeds 1999 µS, it will show 2.00 mS

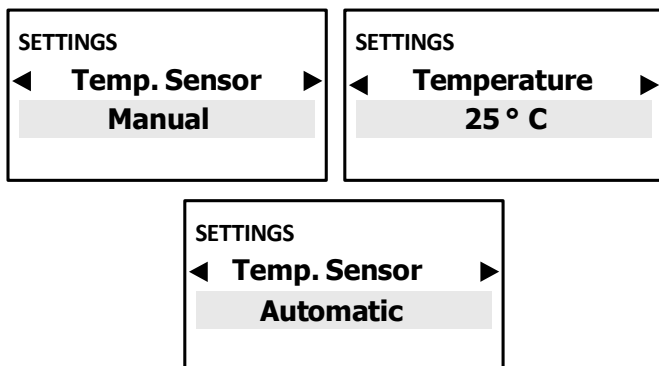
IMPORTANT: ensure the selected K value matches that of the conductivity sensor in use.

The instrument adapts the measurements and display resolution based on the type of selected probe.

In case the user should wish to change the cell Constant Factor EC K, even during operations, proceed as follows:

- **BASIC** menu > **SETTINGS** > **EXPERTMENU** > **MENUSELECTION** > **SETPOINT1** > **Const.K ECC**
- from **EXPERT** menu go into > **MENUSELECTION** > **SETPOINT1** > **CConst.K probe ECC**
- Press **ESC** to go back to **MENUSELECTION** or press **ESC** **ESC** to go back to **MEASUREMENT DISPLAY A**

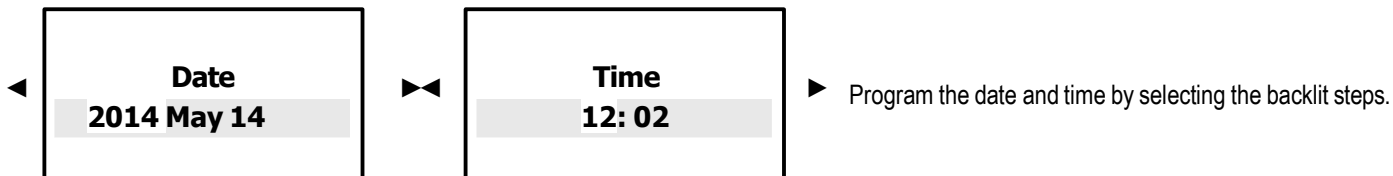
TEMPERATURE settings



Manual temperature offset 0-100°C.

➤ Press ◀▶ to change the ambient temperature.

➤ Select **AUTOMATIC** offsetting for measurements and temperature offsetting with PT100 sensor.



PROGRAMMING MENU

The instrument lets you choose between two programming modes:

- **BASIC** programming: simplified mode for non-professional operators.
- **EXPERT** programming: complete programming that includes functions for more accurate control and results.

After selecting the type of programming, the Menus and sub-menus change accordingly.

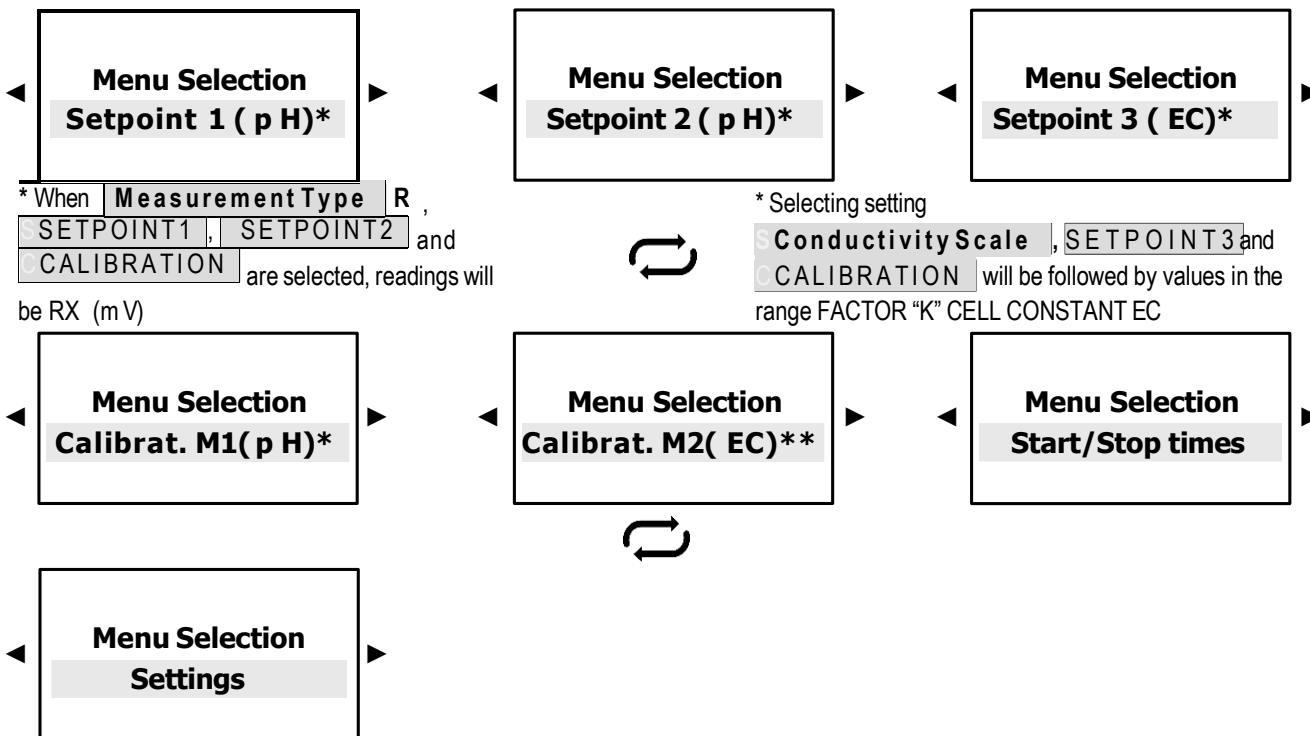
To help the operator choose the correct menu, the main differences between the two menus are set out below:

Menu Mode BASIC	Setpoint 1-2-3 < Setpoint value - Metering - ON/ OFF or Proportional mode - Alarm MIN/MAX (only on Setpoint 1-3) > Calibration > Settings >
Menu Mode EXPERT	Setpoint 1-2-3 < Setpoint value - Metering - ON/ OFF or Proportional mode - Hysteresis - Setpoint delay - Temp. correction - MIN/ MAX Alarm (only on Setpoint 1-3) - Overdose - Max Dosage – Start-up delay > 4-20m A 1 > 4-20m A 2 > Calibration > Start/ Stop > Aux Output > Settings >

☛ Press **OK/MENU** the display shows **BASIC** menu (default)

MAIN MENU > BASIC PROGRAMMING MENU

These are all the steps included in the **Main menu** configuration with the **BASIC** programming menu:



☛ Press **OK/MENU** to confirm the selection and to go to the next sub-menu.

☛ Press **ESC** to go back to the **MEASUREMENT DISPLAY A**

SETPOINT 1 PH AND SETPOINT 1 RX > BASIC MENU

SETPOINT1 PH

Menu Selection Setpoint 1 (p H)

MENU SETPOINT 1 (pH)

Setpoint Value

7 . 00 p H

* MENU BASE *

MENU SETPOINT 1 (pH)

Metering

Acid

* MENU BASE *

MENU SETPOINT 1 (pH)

Metering

Alkaline

* MENU BASE *

MENU SETPOINT 1 (pH)

Mode

ON/OFF

* MENU BASE *



The two programming stages are set out below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

The setpoints activate the output relays for the metering pumps or other devices until the setpoint is reached.

Setpoint 1 is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the

product.

Setpoint 1 is set for operations in **DIRECT** mode: if the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

SETPOINT1 RX

Menu Selection Setpoint 1 (RX)

MENU SETPOINT 1 (RX)

Setpoint Value

200 m V

* MENU BASE *

MENU SETPOINT 1 (RX)

Metering

Direct

* MENU BASE *

MENU SETPOINT 1 (RX)

Metering

Reverse

* MENU BASE *

MENU SETPOINT 1 (RX)

ON/OFF

↩ BY SELECTING "ON-OFF" THE NEXT STEP IS → "MIN ALARM" (ONLY SET POINT1)

MENU SETPOINT 1 (pH)

Mode

Proportional

* MENU BASE *

*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each setpoint, activating the corresponding pulses on the relays based on the measured value.

Default activation point 1.50 pH

Default activation point 150 mV

MENU SETPOINT 1 (RX)

Mode

Proportional

* MENU BASE *

For more accurate settings of the "Modular pulses" PWM, select the "Expert" menu in the initial settings.

↩ *GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM "ON-OFF" MODE OR FROM "PROPORTIONAL" MODE

MENU SETPOINT 1 (pH)

MIN Alarm

0 . 00 p H

* MENU BASE *

The MIN Alarm function selects a **MINIMUM** alarm level, after which the alarm relay is triggered.

MENU SETPOINT 1 (pH)

MAX Alarm

14 . 00 p H

* MENU BASE *

The MAX Alarm function selects a **MAXIMUM** alarm level, after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)

MIN Alarm

- 1500 m V

* MENU BASE *

MENU SETPOINT 1 (RX)

MAX Alarm

1500 m V

* MENU BASE *

MENU SETPOINT 1 pH / RX

Priming

OFF

* MENU BASE *

MENU SETPOINT 1 pH / RX

Priming

ON

* MENU BASE *

The priming function blocks the setpoint value to allow the metering pump to remain primed.

SETPOINT 2 PH AND SETPOINT 2 RX > BASIC MENU

SETPOINT2 PH



Menu Selection Setpoint 2 (pH)

The two programming stages are below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

MENU SETPOINT 2 (pH)

◀ **Setpoint Value** ▶
7 . 00 p H
* MENU BASE *

The setpoints activate the output relays for the metering pumps or other devices until the setpoint is reached.

MENU SETPOINT 2 (pH)

◀ **Metering** ▶
Alkaline
* MENU BASE *

Setpoint 2 is set for operations in **ALKALINE** mode, the output is active when the measured value is lower than the selected setpoint, the alkaline product.

Setpoint 2 is set for operations in **REVERSE** mode: if the measured value is higher than the selected setpoint, the connected pump meters out a reducing agent.

MENU SETPOINT 2 (pH)

◀ **Metering** ▶
Acid
* MENU BASE *

MENU SETPOINT 2 (pH)

◀ **Mode** ▶
ON/OFF
* MENU BASE *

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

SETPOINT2 RX

Menu Selection Setpoint 2 (RX)

MENU SETPOINT 2 (RX)

◀ **Setpoint Value** ▶
200 m V
* MENU BASE *

MENU SETPOINT 2 (RX)

◀ **Metering** ▶
Reverse
* MENU BASE *

MENU SETPOINT 2 (RX)

◀ **Metering** ▶
Direct
* MENU BASE *

MENU SETPOINT 2 (RX)

◀ **Mode** ▶
ON/OFF
* MENU BASE

↩ BY SELECTING “ON-OFF” THE NEXT STEP IS → “MIN ALARM” (ONLY SET POINT1)

MENU SETPOINT 2 (pH)

◀ **Mode** ▶
Proportional
* MENU BASE *

*Modular pulses, also known as PWM “pulse width modulation”, support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the relays based on the measured value (see pg.11-12).

Default activation point 1.50 pH

Default activation point 150 mV

MENU SETPOINT 2 (RX)

◀ **Mode** ▶
Proportional
* MENU BASE *

For more accurate settings of the “Modular pulses” PWM, select the “Expert” menu in the initial settings.

↩ * GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE “ON-OFF” MODE OR “PROPORTIONAL” MODE

MENU SETPOINT 2 pH / RX

◀ **Priming** ▶
OFF
* MENU BASE *

MENU SETPOINT 2 pH / RX

◀ **Priming** ▶
ON
* MENU BASE *

The priming function blocks the setpoint value to allow the metering pump to remain primed.

SETPOINT 3 EC CONDUCTIVITY > BASIC MENU

Menu Selection Setpoint 3 (EC)

Please note that the displayed value is automatically adjusted according to the conductivity range of cell constant "K" previously selected.

MENU SETPOINT 3 (EC)
◀ **Setpoint Value** ▶
1000 µS
* EXPERT MENU *

The setpoints activate the output relays for the solenoid valves or metering pumps or other devices once the setpoint level is reached. The display shows the value in µS but if the value exceeds 1999 µS, it shows 2.00 mS (if the value decreases the reading goes back in µS).

MENU SETPOINT 3 (EC)
◀ **Metering** ▶
Direct
* MENU BASE *

MENU SETPOINT 3 (EC)
◀ **Metering** ▶
Reverse
* MENU BASE *

Direct mode: the output is active when the measured value is **lower** than the one selected in the setpoint.

Reverse mode: the output is active even if the measured value is **higher** than the one selected in the setpoint.

MENU SETPOINT 3 (EC)
◀ **Mode** ▶
ON/OFF
* MENU BASE *

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

↩ BY SELECTING "ON-OFF" THE NEXT STEP IS → "MIN ALARM" (ONLY SET POINT1)

MENU SETPOINT 3 (EC)
◀ **Mode** ▶
Proportional
* MENU BASE *

*Modular pulses of the PROPORTIONAL MODE, also known as PWM "pulse width modulation", support a proportional mode on each setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previously selected K value. The default activation point is **1000 µS** (range 0-20.000 µS DEFAULT); **100 µS** (range 0-2000 µS); **0,10 µS** (range 0-200 µS); **10000 µS** (range 0-200.000 µS).

For more accurate settings of the "Modular pulses" PWM, select the "Expert" menu of the initial settings.

↩ * GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE "ON-OFF" MODE OR "PROPORTIONAL" MODE

FUNCTION ONLY AVAILABLE WITH SETPOINT 1

The MIN and MAX Alarm function selects the alarm levels beyond which the alarm relay is triggered on.

MENU SETPOINT 3 (EC)
◀ **MIN Alarm** ▶
0 µS*
* MENU BASE *

MENU SETPOINT 3 (EC)
◀ **MAX Alarm** ▶
20.00 mS*
* MENU BASE *

The MIN Alarm function selects a MINIMUM alarm level, after which the alarm relay is triggered.

The MAX Alarm function selects a MAXIMUM alarm level, after which the alarm relay is triggered.

* The Max Alarm shows the Maximum value of the selected range according to the selected EC probe K Range.

Example: by selecting range K1 the value 20.00 mS is the Max alarm value, by selecting K5 however it shows 2000 µS

MENU SETPOINT 3 (EC)
◀ **Priming** ▶
OFF
* MENU BASE *

MENU SETPOINT 3 (EC)
◀ **Priming** ▶
ON
* MENU BASE *

ONLY WHEN USING METERING PUMPS

The priming function blocks the setpoint value to allow the metering pump to remain primed.

⏮ Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY A**

SENSOR CALIBRATION > BASIC/EXPERT MENU



Press **OK/MENU** to confirm the selection and go to the next sub-menu.

PH ELECTRODE CALIBRATION > BASIC MENU

Calibration operations follow the type of parameter previously selected in the **Measurement Type** menu

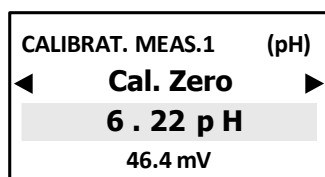
Press **OK/MENU** to confirm the selection and go to the next sub-menu.

According to the selected **Measurement Type**, the Calibration menu shows the electrode to be calibrated.

We suggest using new or however uncontaminated buffer solutions.

As for the length of the pH electrode we advise max 9 m: contact ETATRON for longer distances.

The mV value at the bottom of the screen shows the electrode's efficiency (according to the manufacturer's specifications)

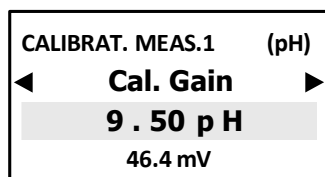


* When Calibration starts, the display shows random values.

Dip the pH electrode in the buffer solution at pH 7.00 for ZERO calibration, wait 2/3 minutes.

Press **◀▶** and ensure the display shows 7.00 pH.

Rinse the electrode with water (possibly demineralised) and dry with a clean cloth or paper tissues.



Dip the pH electrode in the buffer solution at pH 4 or pH 9 for "Gain" calibration, wait 2/3 min.

Press **◀▶** until the display shows **4.00 pH** or **9.00 pH**.

Press **OK/MENU** to confirm the selection

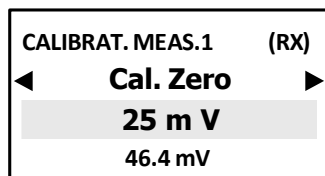
Press **ESC** to go back to the **MENU SELECTION**

Press **ESC ESC** to go back to the **MEASUREMENT DISPLAY**



As the pH measurement is essential for the entire chemical-physical balance, it is recommended to periodically calibrate the pH electrode

RX (REDOX) ELECTRODE CALIBRATION > BASIC MENU



* When the Calibration starts, the display shows random values

Short-circuit the BNC by using a copper wire (for calibration only) to put in contact the internal PIN with the external part of the connector.

Press **◀▶** and ensure the display shows **0 mV**

Connect the BNC of the electrode to the instrument.

Dip the RX electrode in the REDOX buffer solution for "Gain" calibration, wait 2/3 minutes.

Press **◀▶** and ensure the display shows the mV value corresponding to the buffer solution used.

Press **OK/MENU** to confirm the selection

Press **ESC** to go back to the **MENU SELECTION**

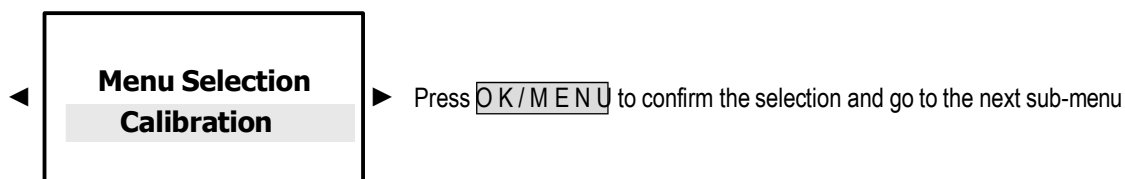
Press **ESC ESC** to go back to the **MEASUREMENT DISPLAY**



The mV value at the bottom shows the electrode signal and consequently its efficiency (according to the manufacturer's specifications). Refer to the electrode's instructions and ensure the mV value displayed matches that of the buffer solution with a tolerance of ± 20 mV.

 READ THE MESSAGE CAREFULLY, THEN PRESS  TO START
To go forward quickly, **press** and hold one of the   buttons

La soluzione nota per la calibrazione deve essere uguale o quasi al valore desiderato (ovvero: il set point). Attendere 5/10 minuti come stabilizzazione e
* Premi OK per avvio *



STANDARD OPERATIONAL CONDUCTIVITY RANGES

- K1 2000 μS ÷20.00 mS (20,000 μS): it can measure up to 1000 μS but the display will be less accurate.
- K5 up to 2,000 μS

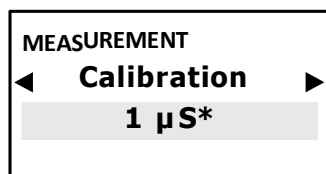
ON REQUEST other measurement ranges are available:

- K0.8 up to 100 mS (100,000 μS): via ETATRON probe with graphite electrodes or other brands with equivalent models.
- K10 up to 200 μS with probe suitable to measure this range.

IMPORTANT NOTES:

- if **NOT** using a temperature sensor, edit in **Expert menu settings > Temperature > Manual** and change the required temperature value;
- when calibrating the sensor, ensure the probe electrodes do not touch any surface except the solution.
- ensure the sensor is securely positioned in the solution's container;
- wait the time required for the calibration measurement to be stable. During calibration, the measurement values always tend to have a small fluctuation but this does not affect calibration.

 *It is recommended to make a simple solution that is consistent with the CE value required in the system (normally the setpoint); use a portable EC instrument or sample solutions having known values to ensure the conductivity level matches the requirements. Use a conductivity sensor with maximum cable length 3/4 m.*



* When calibration starts, the display shows random values

Immerse the EC probe in the known buffer solution, wait for the value to stabilise. To change the value, press , press   until reaching the value of the known solution, press  to confirm.

 Press  to confirm the selection

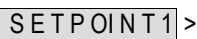
 Press  to go back to the **MENU SELECTION**

 Press   to go back to the **MEASUREMENT DISPLAY**

After calibration wait 10 minutes for the measurement to stabilise.

The instrument adapts the measurements and display resolution based on the type of probe in use.

In case the user should wish to change the cell Constant Factor EC K, even during operations, proceed as follows:

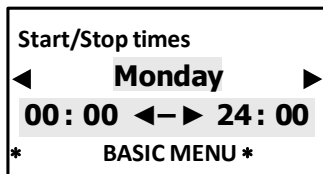
 **BASIC** menu >  >  >  >  > **Const. K EC**

 from **EXPERT** menu go into >  >  > **C Const. K probe ECC**

START/STOP TIMES > BASIC MENU



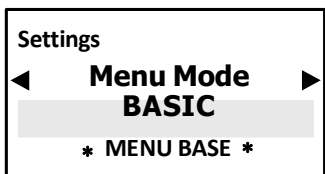
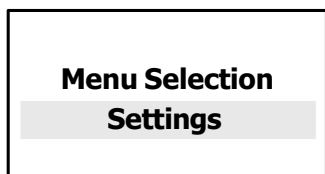
Timer in real time programs the days and exact time of instrument operations.



Program the date and time by selecting the backlit steps.

Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY**

SETTINGS > BASIC MENU



BASIC programming: simplified mode for non-professional operators

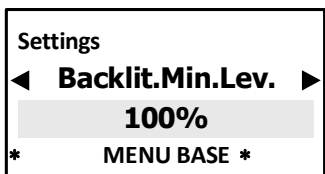
EXPERT Programming: complete programming that includes functions for more accurate control and results.



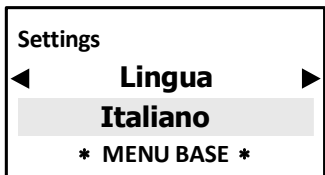
After selecting, e.g. **EXPERT**, the display first shows **BASIC** but changes to **EXPERT** as soon as you start programming, and vice versa.



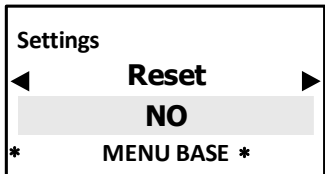
Program the date and time by selecting the backlit steps.



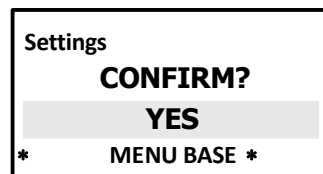
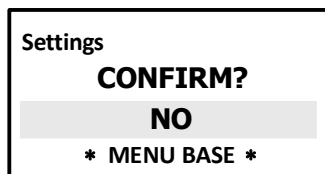
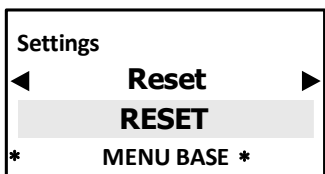
Adjusts display backlighting obtaining energy savings;



To select the language of the programming menu (ITALIAN/ENGLISH). After selecting the Language, the programming menu adapts accordingly.



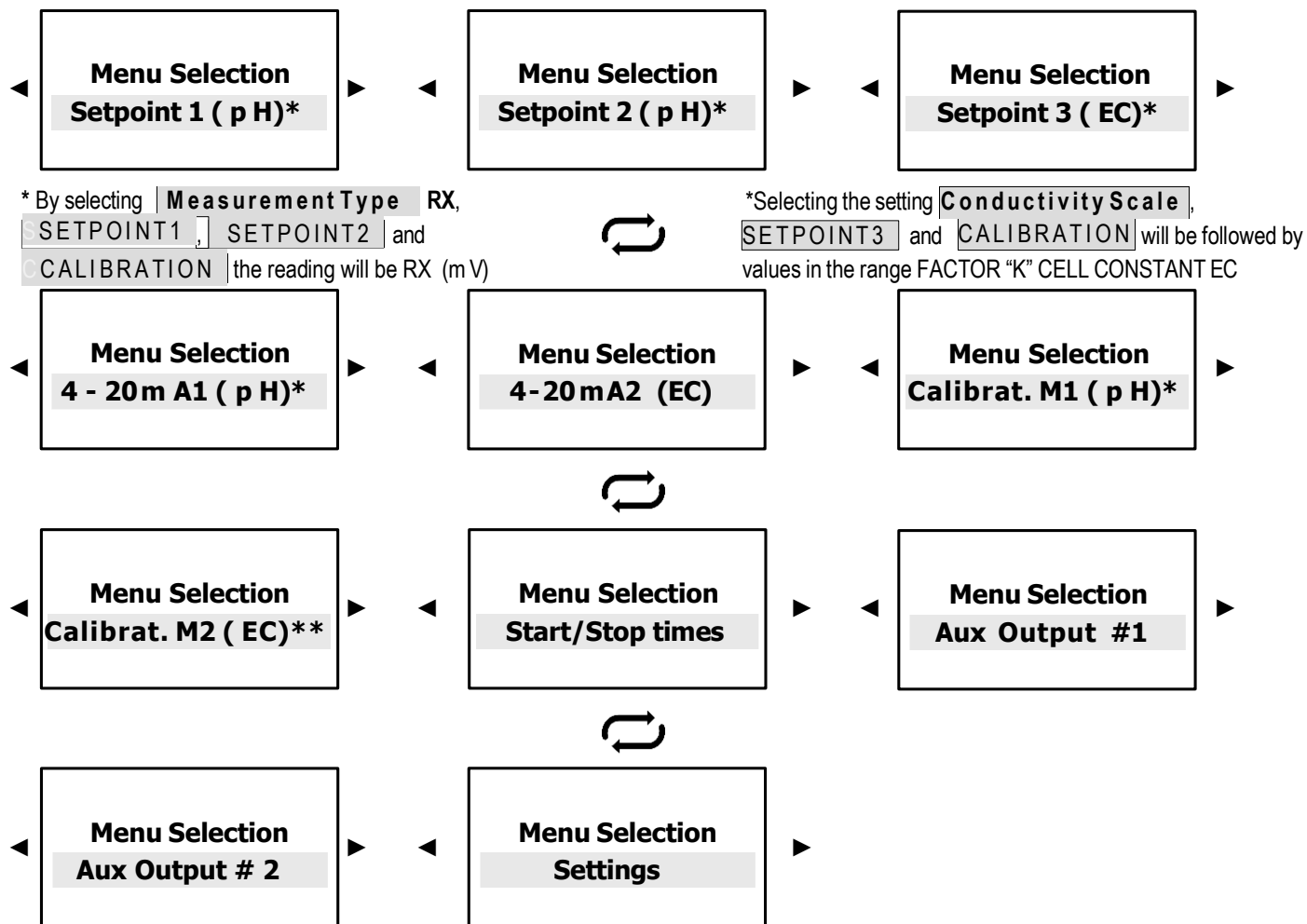
DATA RESET: resets default factory settings. **ONLY** to be used when the parameters do not match or there are programming issues or when the operator wishes to restart from scratch. **NOT** to be overused as many resets may undermine the instrument's efficiency.



By confirming **YES**, the display goes out for about 1 second, then goes back to the **MEASUREMENT DISPLAY**

MAIN MENU > EXPERT PROGRAMMING MENU

These are all the steps included in the **Main menu** configuration with the **EXPERT** programming menu:

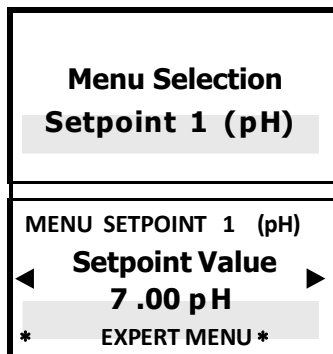


Press **OK/MENU** to confirm the selection and to go on to the next sub-menu.

Press **ESC** to go back to the **MEASUREMENT DISPLAY**

SETPOINT 1 PH AND SETPOINT 1 RX > EXPERT MENU

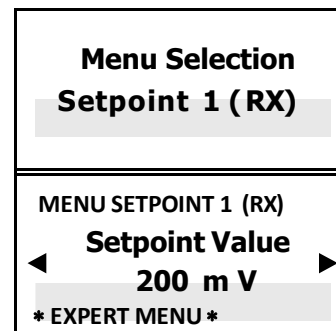
SETPOINT1 PH

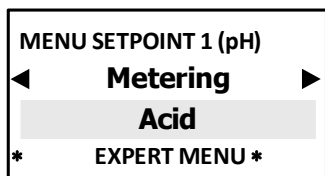


The two programming stages are below: when **Measurement Type** **pH** is selected, refer to the left column; when selecting **RX** refer to the right column.

The setpoint activates the output relays for the metering pumps or other devices until the setpoint value is reached.

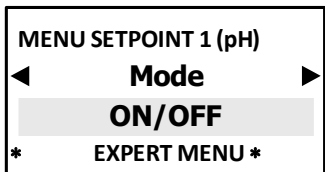
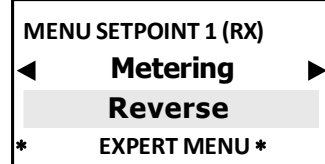
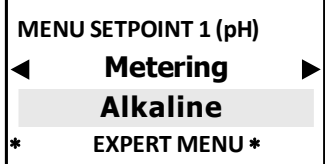
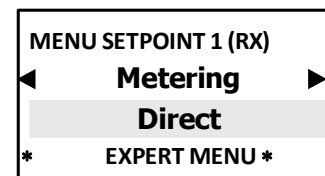
SETPOINT1 RX



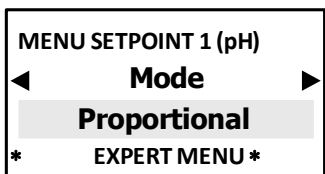
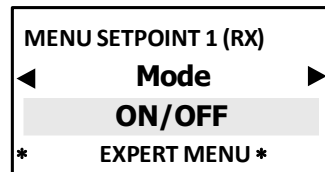


Setpoint 1 is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

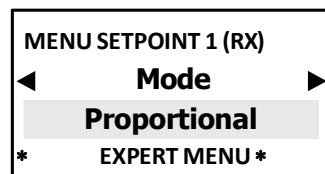
Setpoint 1 is set for operations in **DIRECT** mode: the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.



The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.



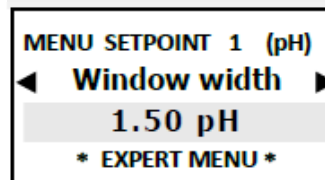
Modular pulses, also known as PWM “pulse width modulation”, support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the output relays based on the measured value. When the Expert Menu is used, other parameters need to be programmed.



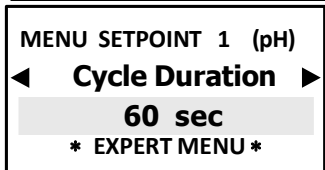
↩ SELECTING “ON-OFF” THE NEXT PROGRAMMING STEP IS → “HYSTERESIS”

↩ SELECTING “PROPORTIONAL” REQUIRES PROGRAMMING THE NEXT STEPS

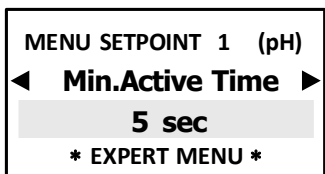
PWM PROPORTIONAL MODE FOR PH WITH TIMED PULSES



Window width: pulses are timed ON and OFF based on the distance from the selected setpoint, programmable, example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, the **PWM** mode starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.



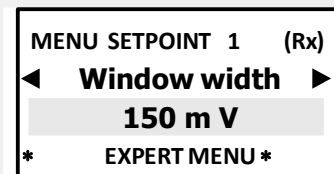
Cycle Duration: the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, measured value 850 pH = active time 60 sec - pause time = 0 sec; at 7.75 pH active time = 30 sec - pause time = 30 sec... as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.



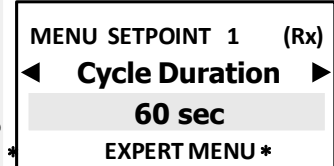
MIN Active Time: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.

PWM PROPORTIONAL MODE FOR RX WITH TIMED PULSES

Windowwidth: pulses are timed ON and OFF based on the distance from the selected setpoint, programmable. Example: if the selected setpoint is 750 mV and the measured value is 500 mV, the **PWM** mode starts after reaching 550 mV with Time/Pause pulses and decreasing the active time while reaching the setpoint (see pg.11-13).



Cycle Duration: the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, at measured value 550 mV = active time 60 sec - pause time = 0 sec; at 625 mV activetime = 30 sec - pause time = 30 sec... as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.



MINActiveTime: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < 0, that selected with MINActiveTime, the latter prevails on the former.

↪ BY SELECTING "ON-OFF" THE NEXT PROGRAMMING STEPS AS FOLLOWS

MENU SETPOINT 1 (pH)

◀ **Hysteresis** ▶

0 . 05 p H

* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable and disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device.

MENU SETPOINT 1 (Rx)

◀ **Min.Active Time** ▶

5 sec

* EXPERT MENU *

MENU SETPOINT 1 pH / RX

◀ **Set point del.** ▶

5 sec

* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

The **Delay time** blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the measurements are stable, thus assuring the best results in terms of chemical balance.

MENU SETPOINT 1 (RX)

◀ **Hysteresis** ▶

10 m V

* EXPERT MENU *

↪ * GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE "ON-OFF" MODE OR "PROPORTIONAL" MODE

MENU SETPOINT 1 (pH)

◀ **Measurement Type** ▶

pH

* EXPERT MENU *

The PH measurement parameter may be changed into RX by simple programming and by using the RX electrode

MENU SETPOINT 1 (Rx)

◀ **Measurement Type** ▶

Rx

* EXPERT MENU *

MENU SETPOINT 1 (pH)

◀ **MIN Alarm** ▶

0 . 00 p H

* EXPERT MENU *

The MIN Alarm function selects a **MINIMUM** alarm level after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)

◀ **MIN Alarm** ▶

- 1500 m V

* EXPERT MENU *

MENU SETPOINT 1 (pH)

◀ **MAX Alarm** ▶

14.00 p H

* EXPERT MENU *

The MAX Alarm function selects a **MAXIMUM** alarm level after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)

◀ **MAX Alarm** ▶

1500 m V

* EXPERT MENU *

MENU SETPOINT 1 pH / RX

◀ **Overdose** ▶

00 . 00 h: m

* EXPERT MENU *

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

MENU SETPOINT 1 pH / RX

◀ **Max. Metering** ▶

000 (no limit)

* EXPERT MENU *

MENU SETPOINT 1 pH / RX

◀ **Max. Metering** ▶

000 m / 00 h

* EXPERT MENU *

Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

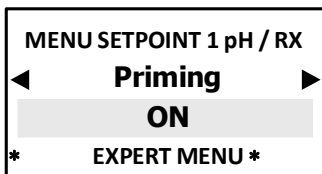
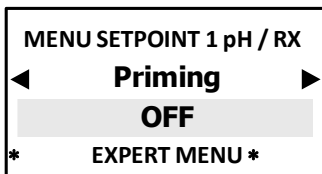
MENU SETPOINT 1 pH / RX

◀ **Start-up Delay** ▶

00 . 00 h: m

* EXPERT MENU *

The **start-up delay** stops the output relays when the unit is switched on, thus allowing the sensor to polarise assuring reliable measurements (programmable).



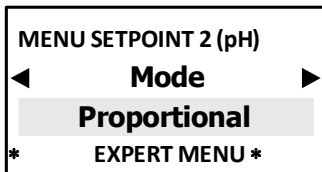
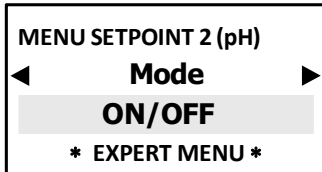
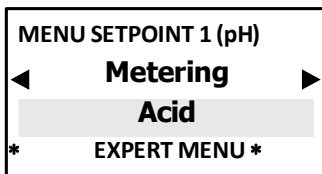
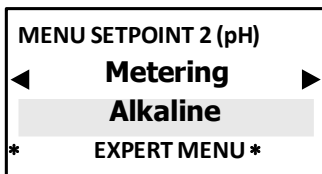
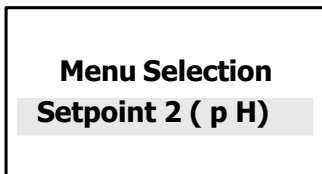
ONLY WHEN USING METERING PUMPS

The priming function blocks the setpoint value to allow the metering pump to remain primed.

Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY**

SETPOINT 2 PH AND SETPOINT 2 RX > EXPERT MENU

SETPOINT2 PH



The two programming stages are below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

The setpoint activates the output relays for the metering pumps or other devices until the setpoint value is reached.

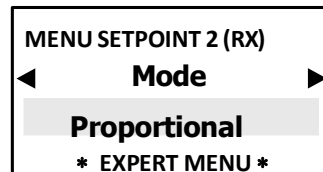
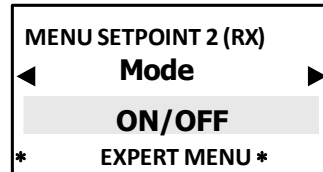
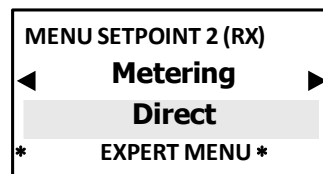
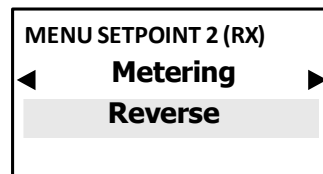
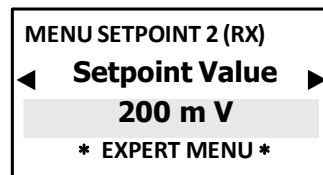
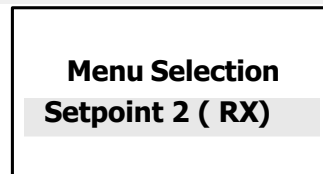
Setpoint 2 is set for operations in **ALKALINE** mode, the output is active when the measured value is lower than the selected setpoint, the alkaline product.

Set point 2 is set for operations in **REVERSE** mode: the output is active when the measured value is higher than the selected setpoint, the connected pump meters out a chlorine reducing agent.

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

*Modular pulses, also known as PWM “pulse width modulation”, support a proportional mode on each setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previous settings of the selected hysteresis. When the Expert Menu is used, other parameters need to be programmed.

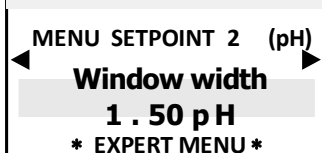
SETPOINT2 RX



SELECTING “ON-OFF” THE NEXT PROGRAMMING STEP IS → “HYSTERESIS”

SELECTING “PROPORTIONAL” REQUIRES PROGRAMMING THE NEXT STEPS

PWM PROPORTIONAL MODE FOR PH WITH TIMED PULSES



Window width: pulses are timed ON and OFF based on the distance from the selected setpoint (programmable). Example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, the **PWM** mode starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.

MENU SETPOINT 2 (pH)
 ◀ **Cycle Duration** ▶
 60 sec
 * EXPERT MENU *

Cycle Duration: the PWM mode has a 60 second cycle (programmable), example: setpoint is 7.00 pH, measured value 8.50 pH = active time 60 sec - pause time = 0 sec; at 7.75 pH active time = 30 sec - pause time = 30 sec... as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated; how fast or slowly the setpoint needs to react, chemical concentration, etc.

MENU SETPOINT 2 (pH)
 ◀ **Min.Active Time** ▶
 5 sec
 * EXPERT MENU *

MIN Active Time: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.

PWM PROPORTIONAL MODE FOR RX WITH TIMED PULSES

Window width: pulses are timed ON and OFF based on the distance from the selected setpoint (programmable). Example: if the selected setpoint is 750 mV and the measured value is 500 mV, the PWM mode starts after reaching 550 mV with Time/Pause pulses and decreasing the active time while reaching the setpoint.

MENU SETPOINT 2 (RX)
 ◀ **Window width** ▶
 150 m V
 * EXPERT MENU *

Cycle Duration: the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, the measured value is 550 mV = active time 60 sec - pause time = 0 sec; at 625 mV active time = 30 sec - pause time = 30 sec... as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated; how fast or slowly the setpoint needs to react, chemical concentration, etc.

MENU SETPOINT 2 (RX)
 ◀ **Cycle Duration** ▶
 60 sec
 * EXPERT MENU *

MIN Active Time: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.

MENU SETPOINT 2 (pH)
 ◀ **Min.Active Time** ▶
 5 sec
 * EXPERT MENU *

↩ BY SELECTING "ON-OFF" THE NEXT PROGRAMMING STEPS ARE AS FOLLOWS

MENU SETPOINT 2 (pH)
 ◀ **Hysteresis** ▶
 0 . 05 p H
 * EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device.

MENU SETPOINT 2 (RX)
 ◀ **Hysteresis** ▶
 10 m V
 * EXPERT MENU *

MENU SETPOINT 2 pH / RX
 ◀ **Set point del.** ▶
 5 sec
 * EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

The **Delay time** blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when measurements are stable, thus assuring the best results in terms of chemical balance.

↩ * GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE "ON-OFF" MODE OR "PROPORTIONAL" MODE

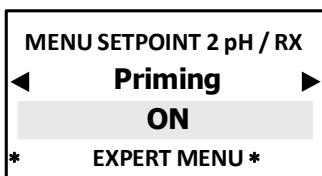
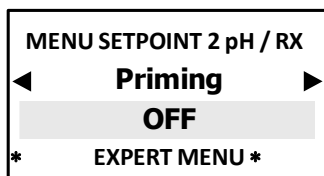
MENU SETPOINT 2 pH / RX
 ◀ **Overdose** ▶
 00 . 00 h : m
 * EXPERT MENU *

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

MENU SETPOINT 2 pH / RX
 ◀ **Max. Metering** ▶
 000 (no limit)
 * EXPERT MENU *

MENU SETPOINT 2 pH / RX
 ◀ **Max. Metering** ▶
 000 m / 00 h
 * EXPERT MENU *

Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

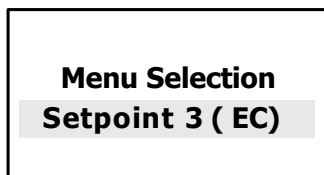


ONLY WHEN USING METERING PUMPS

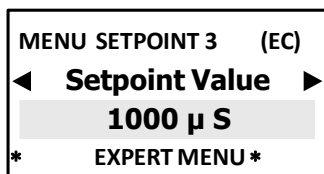
The priming function blocks the setpoint value to allow the metering pump to remain primed.

Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY**

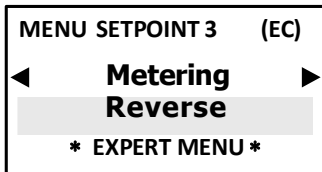
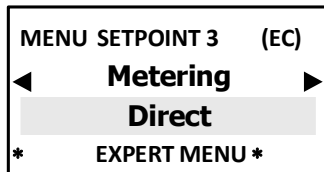
SETPOINT 3 EC CONDUCTIVITY > EXPERT MENU



Please note that the displayed value is automatically adjusted according to the conductivity range of cell constant "K" previously selected.

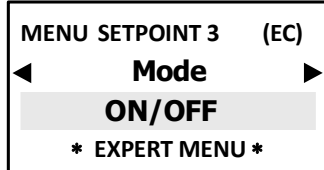


The setpoints activate the output relays for the metering pumps or other devices once the setpoint level is selected. The display shows the value in μS , but if the value exceeds 1999 μS , it shows 2.00 mS (if the value decreases the reading goes back in μS).



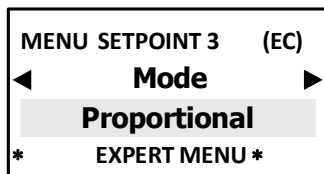
Direct mode: the output is active when the measured value is **lower** than the one selected in the setpoint.

Reverse mode: the output is active even if the measured value is **higher** than the one selected in the setpoint.



The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

BY SELECTING "ON-OFF" THE NEXT STEP IS → "MIN ALARM" (ONLY SET POINT1)

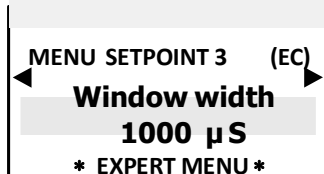


*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previously selected K value. The default activation point is **1000 μS** (range 0-20.000 μS DEFAULT); **100 μS** (range 0-2000 μS); **0,10 μS** (range 0-200 μS); **10000 μS** (range 0-200.000 μS).

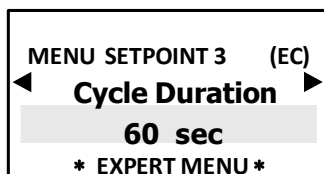
SELECTING "ON-OFF" THE NEXT PROGRAMMING STEP IS → "HYSTERESIS"

SELECTING "PROPORTIONAL" REQUIRES PROGRAMMING THE NEXT STEPS

PWM PROPORTIONAL MODE WITH TIMED PULSES



Window width: pulses are timed ON and OFF based on the distance from the selected setpoint (programmable). Example: if the selected setpoint is 700 μS EC and the measured value is 600 μS , the **PWM** mode starts after reaching 650 μS with Time/Pause pulses and decreasing the active time while reaching the setpoint.



Cycle Duration: the PWM mode has a 60 second cycle (programmable). Example: setpoint is 700 μS . active time 60 sec - pause time = 0 sec; 775 μS active time = 30 sec - pause time = 30 sec... as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.

MENU SETPOINT 3 (EC)
 ◀ **Min.Active Time** ▶
 5 sec
 * EXPERT MENU *

MIN Active Time: programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < 0, the selected MIN Active Time prevails over the former.

↪ BY SELECTING "ON-OFF" THE NEXT PROGRAMMING STEPS ARE AS FOLLOWS

MENU SETPOINT 3 (EC)
 ◀ **Hysteresis** ▶
 200 µ S*
 * EXPERT MENU *

FUNCTION NOT AVAILABLE SIMULTANEOUSLY WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device. By increasing hysteresis it is possible to move away from the setpoint in accordance with the required value.*Value shown based on the selected cell constant "K".

MENU SETPOINT 3 (EC)
 ◀ **Set point del.** ▶
 5 sec
 * EXPERT MENU *

FUNCTION NOT AVAILABLE SIMULTANEOUSLY WITH PROPORTIONAL MODE

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the measurements are stable, thus assuring the best results in terms of chemical balance.

MENU SETPOINT 3 (EC)
 ◀ **Const.K CE probe** ▶
 1 , 000
 * EXPERT MENU *

FUNCTION ONLY AVAILABLE ON SETPOINT 1 PROGRAMMING

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the measurements are stable, thus assuring the best results in terms of chemical balance.

↪ * GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE "ON-OFF" MODE OR "PROPORTIONAL" MODE

MENU SETPOINT 3 (EC)
 ◀ **Temp. Correction** ▶
 0 . 0 %/° C
 * EXPERT MENU *

The **Alpha EC factor** is the correction factor for conductivity measurements according to temperature: **each conductivity sensor depends on the temperature**. Conductivity changes linearly with the temperature of the solution. This coefficient normalises the conductivity measurements at the reference temperature of 25°C. For aqueous solutions, this coefficient varies 1.9%-2% per °C. Select 0 if you do not wish to normalise reading. The Alpha factor assures the best measurement results and the best accuracy.

MENU SETPOINT 3 (EC)
 ◀ **MIN Alarm** ▶
 0 µ S*
 * EXPERT MENU *

MENU SETPOINT 3 (EC)
 ◀ **MAX Alarm** ▶
 20. 00 mS*
 * EXPERT MENU *

FUNCTION ONLY AVAILABLE WITH SETPOINT 1

The MIN Alarm function selects a MINIMUM alarm level, after which the alarm relay is triggered.
 The MAX Alarm function selects a MAXIMUM alarm level, after which the alarm relay is triggered.

MENU SETPOINT 3 (EC)
 ◀ **Overdose** ▶
 00. 00 h: m
 * EXPERT MENU *

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

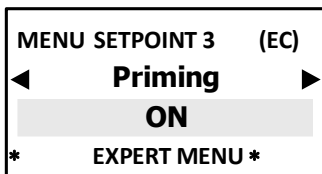
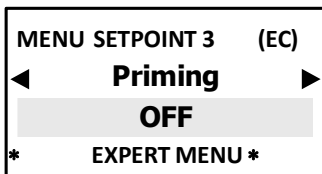
MENU SETPOINT 3 (EC)
 ◀ **Max. Metering** ▶
 000 (no limit)
 * EXPERT MENU *

MENU SETPOINT 3 (EC)
 ◀ **Max. Metering** ▶
 000 m / 00 h
 * EXPERT MENU *

Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

MENU SETPOINT 3 (EC)
 ◀ **Start-up Delay** ▶
 00. 00 h: m
 * EXPERT MENU *

The **start-up delay** stops the output relays when the unit is switched on, thus allowing the sensor to polarise assuring correct measurements (programmable).

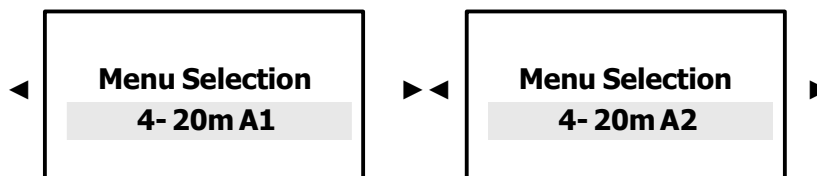


ONLY WHEN USING METERING PUMPS

The priming function blocks the setpoint value to allow the metering pump to remain primed.

Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY**

ANALOGUE 4-20mA OUTPUTS FUNCTION SELECTION > EXPERT MENU



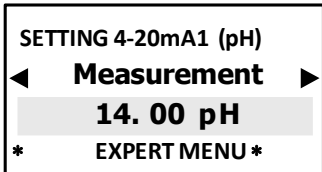
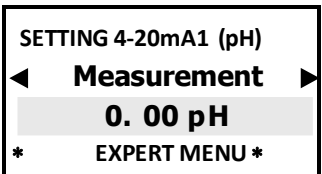
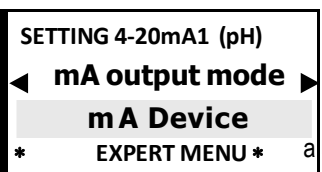
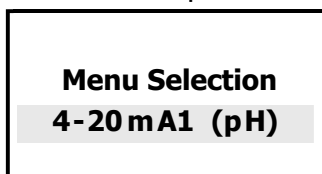
Press **OK/MENU** to go into mA mode. In mA mode the instrument lets you choose two operative functions:

- **EXTERNAL DEVICES** suited to operating with mA signal such as data loggers or data recorders or other mA equipment
- **SETPOINT** through the control of metering pumps suited to controlling an mA external digital signal.

4 -20 m A 1 OUTPUT PH OR RX > Remote Devices Function

The 4-20mA1 analogue output of the instrument follows the options previously selected in **Measurement Type** i.e. pH or RX.

mA1 pH

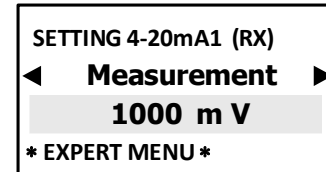
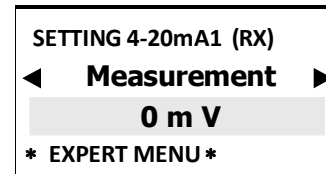
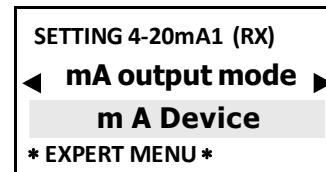
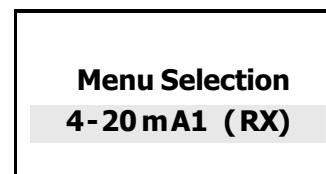


Please note that the value displayed is automatically adjusted according to the **Measurement Type** selected in paragraph 8.2

The 4-20mA proportional analogue outputs are related to the CE measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.

Select the value corresponding to 4 and 20 mA based on Setpoint 1.

mA1 RX



Press **ESC** to go back to MAIN MENU or press **ESC ESC** to go back to the CONTINUOUS MEASUREMENT display

4 -20 m A 1 OUTPUT PH OR RX > METERING FUNCTION ON SETPOINT

The 4-20mA1 analogue output of the instrument follows the options previously selected in **Measurement Type** i.e. pH or RX

mA1 pH

mA1 RX



Menu Selection
4- 20mA1 (pH)

SETTING 4-20mA1 (pH)
◀ **mA output mode** ▶
Setpoint
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Setpoint Value** ▶
7 .00 pH
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Acid
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Alkaline
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Window width** ▶
1 .50 pH
* EXPERT MENU *

SETTING 4-20mA1 pH/RX
◀ **Overdose** ▶
00. 00 h:m
* EXPERT MENU *

SETTING 4-20mA1 pH/RX
◀ **Max. Metering** ▶
000 (no limit)
* EXPERT MENU *

Please note that the value displayed is automatically adjusted according to the **Measurement Type** selected.

Select the Set point value to control the metering pump or other equipment suited to processing the mA signal.

Setpoint mA is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

Setpoint mA is set for operations in **DIRECT** mode: if the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.

The window width sets the distance from the setting point where the 4-20mA mode starts: 4mA = 0 metering pump pulse, 20mA = max impulsive frequency of the metering pump. The window width depends on many variables: distance injection point, reaction time, chemical solution %...

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

Maximum Metering is a safety function that ensures metering is completed in the selected time. The relays of the metering pumps open accordingly. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

Menu Selection
4- 20 m A1 (RX)

SETTING 4-20mA1 (pH)
◀ **mA output mode** ▶
Setpoint
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Setpoint Value** ▶
200 m V
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Direct
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Reverse
* EXPERT MENU *

SETTING 4-20mA1 (pH)
◀ **Window width** ▶
150 m V
* EXPERT MENU *

SETTING 4-20mA1 pH/RX
◀ **Max. Metering** ▶
000 m / 00 h
* EXPERT MENU *

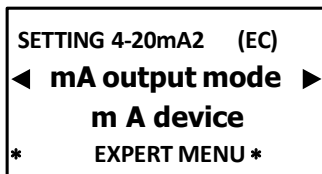
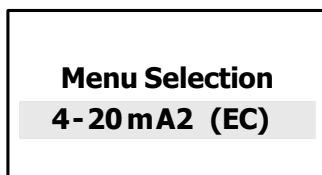
⏮ Press **ESC** to go back to MAIN MENU or press **ESC ESC** to go back to the CONTINUOUS MEASUREMENT display

4 -20 m A 2 OUTPUT EC CONDUCTIVITY > Remote Devices Function

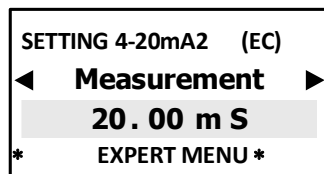
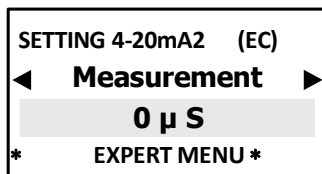
The analogue 4-20mA2 output of the instrument follows the settings selected in **K Constant of the EC probe**



Please note that the displayed value is automatically adjusted according to the conductivity range of the previously selected cell constant "K".



The 4-20mA proportional analogue outputs are related to the CE measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.



Select the value corresponding to 4 and 20 mA based on Setpoint 3.

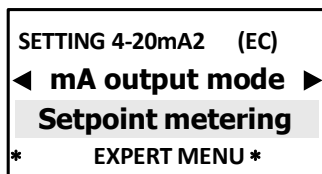
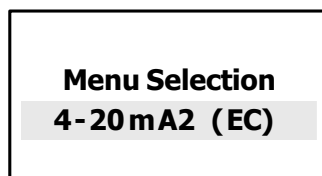
Press **ESC** to go back to **MENU SELECTION** or press **ESC** **ESC** to go back to **MEASUREMENT DISPLAY**

4 -20 m A 2 OUTPUT EC CONDUCTIVITY > METERING FUNCTION ON SETPOINT

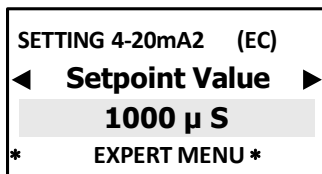
The analogue 4-20mA2 output of the instrument follows the settings selected in the **K Constant of the EC probe**



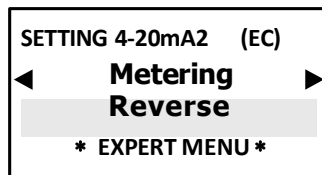
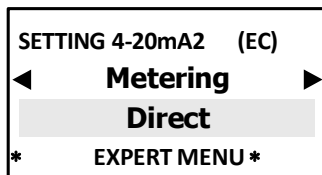
Please note that the displayed value is automatically adjusted according to the conductivity range of cell constant "K" previously selected.



The proportional analogue 4-20mA outputs are related to the CE measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.

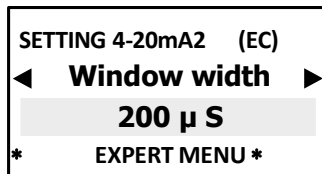


Select the Set point value to control the metering pump or other equipment suited to processing an mA signal.



Direct mode: the output is active when the measured value is lower than the one selected in the setpoint.

Reverse mode: the output is active even if the measured value is higher than the one selected in the setpoint.



The **window width** sets the distance from the setting point where the 4-20mA mode starts: 4mA = 0 metering pump pulses, 20mA = max impulsive frequency of the metering pump. The window width depends on many variables: distance injection point, reaction time, chemical solution %...

SETTING 4-20mA2 (EC)

◀ **Overdose** ▶

00. 00 h : m

* EXPERT MENU *

With the **overdose time** alarm one can select a period of time during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

SETTING 4-20mA2 (EC)

◀ **Max. Metering** ▶

000 (no limit)

* EXPERT MENU *

SETTING 4-20mA2 (EC)

◀ **Max. Metering** ▶

000 m / 00 h

* EXPERT MENU *

Maximum Metering is a safety function that ensures metering is completed in the selected time. The relays of the metering pumps open accordingly. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

☞ Press **ESC** to go back to **MENU SELECTION** or press **ESC** **ESC** to go back to **MEASUREMENT DISPLAY A**

START/STOP TIMES > EXPERT MENU

Menu Selection

Start/Stop times

Timer in real time programs the days and exact time of instrument operations.

Start/Stop times

◀ **Monday** ▶

00 : 00 ↔ 24 : 00

* EXPERT MENU *

Start/Stop times

◀ **Tuesday** ▶

00:00 ↔ 24 : 00

* EXPERT MENU *

Program the date and time by selecting the backlit steps.

☞ Press **ESC** to go back to **MENU SELECTION** or press **ESC** **ESC** to go back to **MEASUREMENT DISPLAY**

AUX OUTPUTS > EXPERT MENU

The **auxiliary outputs** control various functions connected to any type of remote On-Off device controlled by a timer in real time. The AUX output may control a device or appliance thanks to very accurate programming of minutes/hours/days/weeks. ADVANTAGES: this function makes this instrument a very versatile control unit not only to measure chemical physical parameters but also for other functions connected to the system where it is installed.

◀ **Menu Selection**

Aux Output # 1 ▶

◀ **Select Menu**

Aux Output # 2 ▶

☞ Press **OK/MENU** to confirm the selection and to go on to the next sub-menu.

☞ Press **ESC** to go back to MAIN MENU or press **ESC** **ESC** to go back to the CONTINUOUS MEASUREMENT display

AUX 1 Program **01**

Active time (m:s) **01 : 00**

Start time (h:s) **10 : 30**

Enabl. days Mo: **N**

Tue: **N** Wed: **N** Thurs : **N**

Fri : **N** Sat : **N** Sun: **N**

Wk. 1: **Y** 2: **Y** 3: **Y** 4: **N**

The settings of the program entail many steps, which may be selected to have absolute operating precision (up to 99 programs for each AUX output).

AUX 2 Program **01**

Active time (m:s) **01 : 00**

Start time (h:s) **10 : 30**

Enabl. days Mo: **N**

Tue: **N** Wed: **N** Thurs : **N**

Fri : **N** Sat : **N** Sun: **N**

Wk. 1: **Y** 2: **Y** 3: **Y** 4: **N**

AUX 1 or AUX 2 Program 01

Press ◀ ▶ select program number (up to 99)

Confirm by pressing **OK**, automatically goes to the next step

Active time (m:s) 01:00

Selects the active time of the connected On/Off device

		Press ◀▶ to select the minutes, confirm OK to move to the next digits Press ◀▶ to select the seconds, confirm OK to move to the next step
Start time	(h:m) 10:30	Selects the start time of the connected On/Off device Press ◀▶ to select the hours, confirm OK to move to the next digits Press ◀▶ to select the minutes, confirm OK to move to the next step
Enabl. days	Mon: N ... Y	Selects the days during which the connected equipment is operational Press ◀▶ to select the days of activity ◀▶ N no or Y yes Confirm by pressing OK , automatically goes to the next step
Weeks	1:S 2:N 3:N 4:N	Selects the weeks of the month during which the connected equipment is operational Press ◀▶ to select the weeks of activity ◀▶ N no or Y yes Confirm by pressing OK , automatically goes to the next step

Press **ESC** to go back to **MENU SELECTION** or press **ESC ESC** to go back to **MEASUREMENT DISPLAY**

SETTINGS > EXPERT MENU

Menu Selection Settings



SETTINGS

◀ **Menu Mode** ▶
BASIC
* EXPERT MENU *

SETTINGS

◀ **Menu Mode** ▶
EXPERT
* EXPERT MENU *

BASIC programming: simplified mode for non-professional operators

EXPERT programming: complete programming that includes functions for more accurate control and results.

After selecting, e.g. **EXPERT**, the display first shows **BASIC** but changes to **EXPERT** as soon as you start programming, and vice versa.

SETTINGS

◀ **Date** ▶
2017 May 14
* EXPERT MENU *

SETTINGS

◀ **Time** ▶
12:02
* EXPERT MENU *

Program the date and time by selecting the backlit steps.

SETTINGS

◀ **Flow Sensor** ▶
Disabled
* EXPERT MENU *

SETTINGS

◀ **Flow Sensor** ▶
Enabled
* EXPERT MENU *

Flow Sensor: if there is no water flow in the probe socket (and possibly in the system), the **ENABLED** flow sensor (proximity sensor) disables all outputs ensuring no chemical substance is added.

SETTINGS

◀ **pH priority** ▶
OFF
* EXPERT MENU *

SETTINGS

◀ **pH priority** ▶
ON
* EXPERT MENU *

By enabling the pH priority function, the instrument is able to first reach the pH setpoint, then switch to product metering operations (oxidising or reducing agent), thus assuring measurement stability

SETTINGS

◀ **Temp. Sensor** ▶
Manual
* EXPERT MENU *

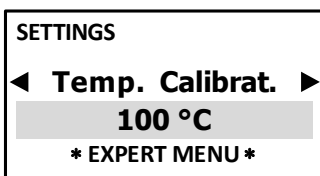
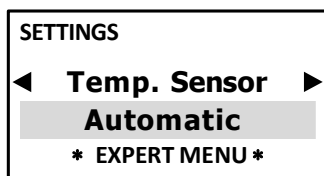
SETTINGS

◀ **Temperature** ▶
25 °C
* EXPERT MENU *

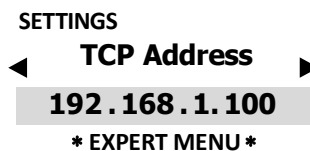
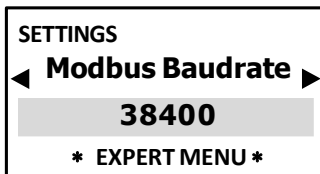
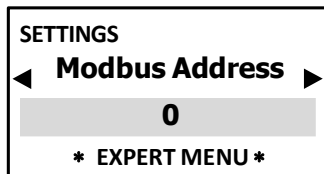
Manual temperature offset 0-100°C.

Press ◀▶ to show the desired temperature.

Select **AUTOMATIC** offsetting for temperature offset measurements via PT100 probe

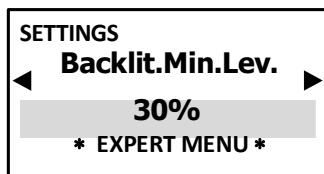


To calibrate the temperature sensor, press ◀▶ to edit the desired temperature.



Modbus Address: from 0 to 254
Modbus Baudrate: transmission speed
TCP Address: IP address

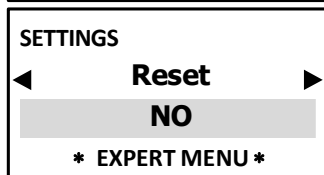
The above menus are **ONLY** displayed if the instrument of the Eligere series is connected to the external RS485 / ETHERNET module (for the settings, refer to the **CONNECTION** manual).



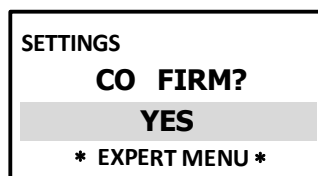
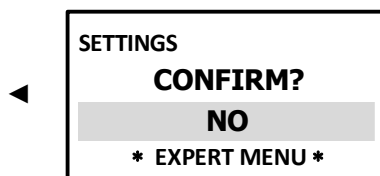
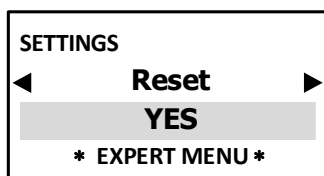
Adjusts display backlighting obtaining energy savings;



To select the language of the programming menu.
After selecting the Language (ITALIAN/ENGLISH), the programming menu adapts accordingly.



DATA RESET: resets default factory settings. **ONLY** to be used when the parameters do not match or there are programming issues or when the operator wishes to restart from scratch. **NOT** to be overused as many resets may undermine the instrument's efficiency.



By confirming **YES**, the display goes out for about 1 second, then goes back to the **MEASUREMENT DISPLAY A**

SENSOR CLEANING AND MAINTENANCE

Notes on ELECTRODES / Cleaning and Maintenance

The formation of deposits on the electrode produces reading errors. The required cleaning operation depends on the type of deposit in question. In case of thin deposits, shake the electrode or spray it with distilled water. Organic residues or especially stubborn deposits must be removed by means of chemicals. Mechanical cleaning of the bulb should only be performed in extreme cases, but take into account that abrasion may cause irreparable damage. If cleaning does not completely restore effectiveness of the electrode, the electrode might have got old. Ageing will show in a measurement error or in a slow response. Check the mV value displayed at the bottom of the screen during **Calibration** operations: this is a way to check electrode effectiveness, if the value deviates from the values indicated in the electrode specifications (contained in its instructions), change the electrode or contact ETATRON or the authorised dealer

RECONDITIONING VALID FOR PH and RX ELECTRODES

The following chemical treatments may be performed to recondition the electrode until bulb cleaning.

- 1) Immerse the electrode tip in hydrochloric acid 0.1N (HCl) for 15 seconds, then rinse with water and dip the electrode again in a 0.1 N sodium hydroxide solution (NaOH) for 15 seconds, followed by a second rinse. Repeat this sequence three times, then perform another test measurement. If the reading is still incorrect, go to point 2.

- 2) Immerse the electrode tip in a 20% ammonium bifluoride solution (NH₂F-HF) for two or three minutes, then rinse with water and perform another measurement test. If the reading is still incorrect, proceed to point 3.
- 3) Immerse the tip of the electrode in 5% hydrofluoric acid (HF) for 10 seconds, then rinse thoroughly in water and very quickly in 5N hydrochloric acid (HCl), followed by a second rinse in water. If the test measurement still gives incorrect results, the only thing to do is change the electrode.

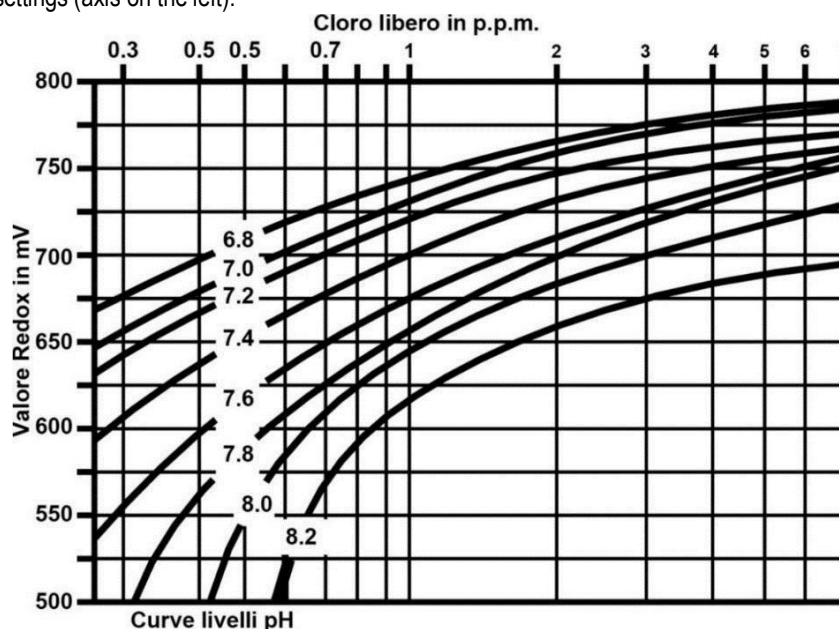


*We suggest using new buffer solutions or still in good conditions (not old) or a reliable test kit.
As for the length of the pH electrode cable we advise a max 9m: contact ETATRON for longer distances.*

CURVE of the OXIDE/REDOX REDUCTION POTENTIAL (ORP)

Redox measurements depend on the stability of the pH level.

To obtain the mV value for programming, the operator must find the exact point that intersects the axis of the required ppm value, the curve of the measured pH = the mV settings (axis on the left):



Notes on CONDUCTIVITY PROBES

NOTE FOR CONDUCTIVITY SENSORS

The instrument works with a simple conductivity sensor with open 2-electrode system, one graphite electrode or AISI 316, both with PTFE body. Also available in AISI 316 with PVC body.



FOR 4/6 WIRE CONDUCTIVITY SENSORS (with built-in temperature sensor) by virtue of the various models on the market, should the operator wish to use these sensors, they are kindly requested to contact the ETATRON service or the local dealer to receive the correct set-up for connecting to the terminal board.

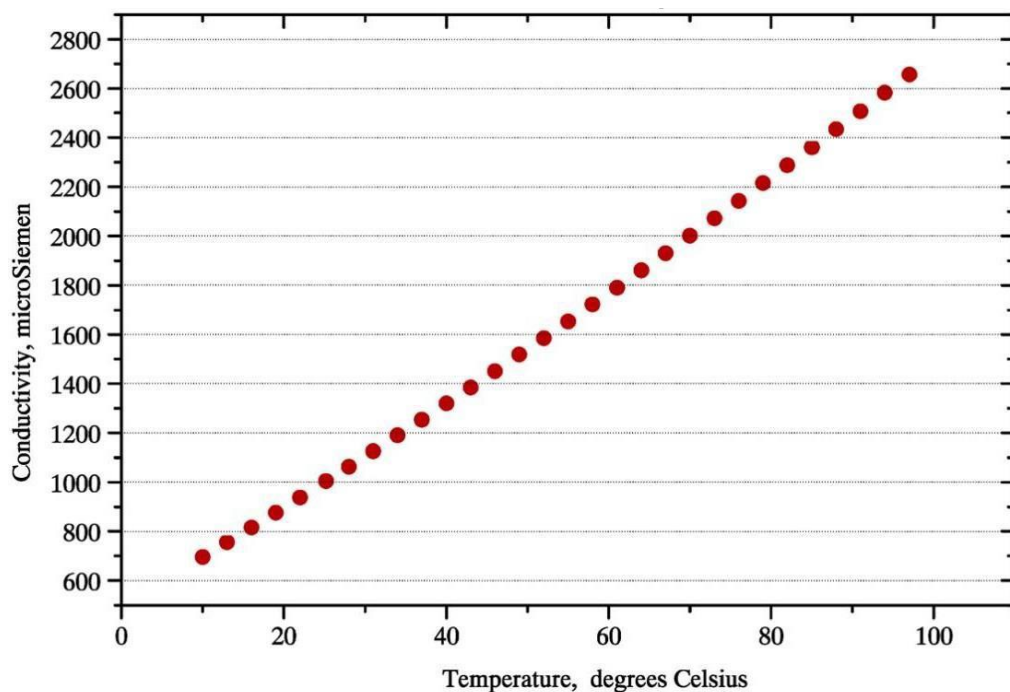
Eligere 02 PH(RX)-CD is NOT suitable for inductive sensors!

The instrument is automatically adjusted for various conductivity ranges and adapts to the various features of cell constants "K". However, at the start of programming and in Expert Menu - Setpoint 1" the user may adjust the desired K factor.

IMPORTANT: the conductivity ranges described above are only indicative; considering that, for example, a K1 probe (range 20 mS) is able to perform fair measurements below 2000 µS, only resolution will be less accurate. However, the same concept does not apply to higher ranges

ALPHA FACTOR / TEMPERATURE / CONDUCTIVITY

The **CE alpha factor** is a corrective factor for the conductivity measurements to take into account the temperature: EACH CONDUCTIVITY SENSOR DEPENDS ON THE TEMPERATURE. Conductivity changes linearly with the temperature of the solution. This coefficient normalises the conductivity measurements at the reference temperature of 25°C. The **alpha** factor assures the best measurement result and the best accuracy. 2% for every °C, is on average the typical value found for many water samples with dissolved solids. Over a wide temperature range (e.g. 0-100 °C) the temperature offset factor might not remain constant.



Maintenance of CONDUCTIVITY SENSORS

SENSOR STORAGE

Short term: rinse the sensor electrodes in demineralised water; allow them to dry and reuse.

Long term: as above, plus cover the electrodes, store in a dry place.

Monthly Maintenance

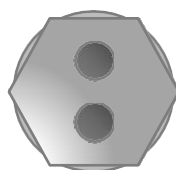
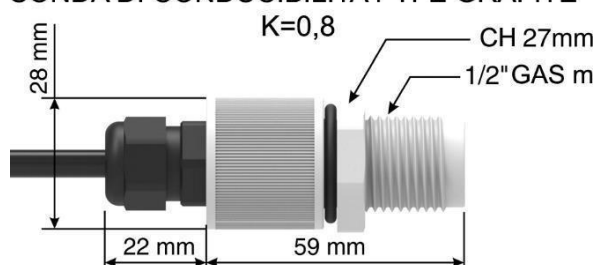
It is recommended to perform calibration on a monthly basis. Follow the procedure set out under calibration. Keep track of the cell constant at each monthly calibration.

When to clean the sensor

Various factors may influence the physical limits on the liquid and apparent cell constant; scaling, biological cultures, oil, wax, rubber etc. all reduce the actual liquid flow area. Periodic cleaning of the conductivity sensors in use removes these deposits and restores conduction surfaces, cell volume hence cell constant.

CONDUCTIVITY SENSORS: Configuration and Measurement Range

SONDA DI CONDUCIBILITA PTFE GRAFITE

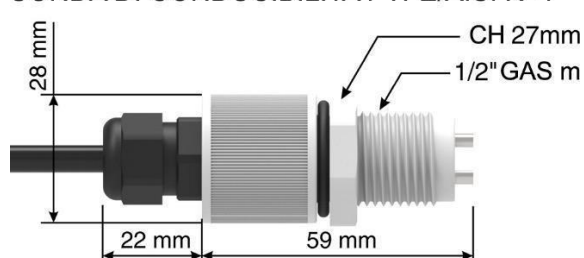


Model: **STGEC**
 Code: 99210014
 Electrodes: GRAPHITE
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 135 gr.

Cell constant K:

Range K0.8: standard 20 mS (20,000 μ S)
 Able to measure up to 100 mS (100,000 μ S)

SONDA DI CONDUCIBILITA PTFE/AISI K=1

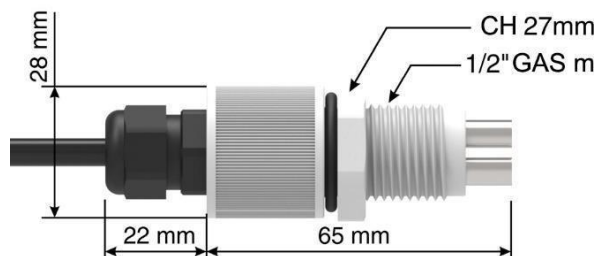


Model: **STEC K1**
 Code: 99210008
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 135 gr.

Cell constant K:

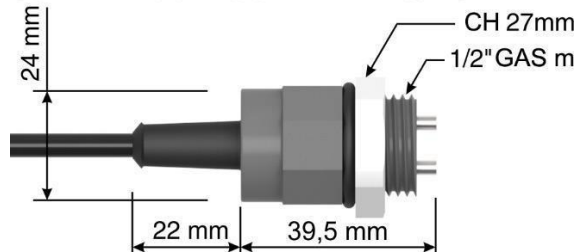
Range K1: standard 20 mS (20,000 μ S)

SONDA DI CONDUCIBILITA PTFE/AISI K=5



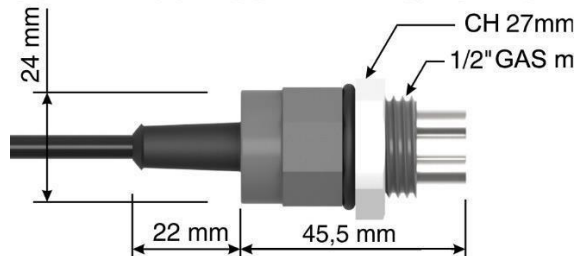
Model: **STEC K5**
 Code: 99210009
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 137 gr. 135 gr.
Cell constant K:
 Range K5: standard 20 mS (20,000 μ S)

SONDA DI CONDUCIBILITA PVC/AISI K=1



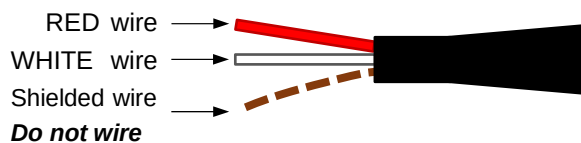
Model: **SEC K1**
 Code: 99210018
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PVC
 Cable length: 3 m
 Weight: 135 gr.
Cell constant K:
 Range K1: standard 20 mS (20,000 μ S)

SONDA DI CONDUCIBILITA PVC/AISI K=5



Model: **SEC K1**
 Code: 99210019
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PVC
 Cable length: 3 m
 Weight: 135 gr.
Cell constant K:
 Range K1: standard 2 mS (2,000 μ S)

Configuration of CONDUCTIVITY PROBE WIRES



INSTRUMENT TROUBLESHOOTING



WARNING: ignoring the safety information may endanger your life or cause severe injuries!



ATTENTION: in the presence of gas or in premises saturated with gas, ensure you disconnect the device's power supply for metering the Chlorine gas; also ensure the power supply of other equipment making up the system is secured.



Before working on the unit, disconnect it from the mains

MALFUNCTION	POSSIBLE CAUSE	SOLUTION
1. Display is OFF	No power supply	a. Check the electrical connections b. Check whether the mains match the power supply printed on the label.
	Burnt smell	Check the board and replace it following authorisation by ETATRON
2. The measurement display remains fixed (there are no changes)	pH or RX levels are NOT stable	Check again using a portable instrument.
	Conductivity levels are NOT stable	Check again using a portable instrument or portable conductivity kit
	The signal from the sensor does not change	Repeat sensor calibration and if the problem persists, change the sensor.
3. The measurement display changes all the time (measurement surges)	Electrical disruption from the local mains	Check the local mains. Check the earthing system connections
	Micro-electrical disturbances in the measured fluid	Check instrument calibration, if the instrument measures correctly eliminate the electrical disturbances and refer to point A
4. The sensor calibration procedure cannot be completed	Old or contaminated buffer solution kit	Change buffer solution and use a portable kit
	Faulty sensor	Adhere to the recommendations below
IMPORTANT TESTS: in cases 2, 3, 4 above always test operation of the unit with the following steps: A. Take down the unit from the system and install it in another room or laboratory without connections to other devices, but directly to the local mains. B. Recreate in a container with fresh water the chemical-physical conditions of the system and relevant conductivity value. C. Program the unit and calibrate the sensor. a. If the results show correct unit operation, this means the issues lie within the system. b. If the problem persists, replace the sensor with a new one; if the problem continues, the unit is faulty, contact the Manufacturer or authorised Dealer.		
5. The setpoint relay does not close the contact	Incorrect setpoint	Correct the setpoint
	Incorrect setpoint mode	Change the setpoint operating mode, direct or reverse, on the functions menu



REMEMBER: unit with universal voltage 100-250 VAC ($\pm 10\%$) or 9-24VDC. If the real voltage is constantly at the limit (minimum or maximum), or when the peaks are far above the mentioned range, the unit input is electrically protected against voltage fluctuations; outside the range mentioned above, the instrument does not work and the printed circuit must be replaced. **It is recommended** to use voltage protections, check the earthing system and, when other equipment is connected in parallel, use a contactor. Furthermore, ETATRON **recommends** installing a UPS (genset) to assure continuity thus ensuring no data are lost. A system that is set up without following the proper electrical design rules, without an earthing system, with frequent ON/OFF operations, might directly undermine the printed circuit.





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