

€Select M 1 CD COOL



 **ETATRON D.S.**

UK OPERATING INSTRUCTIONS AND MAINTENANCE



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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 ESELCT M1 CD COOL



General features

eSelect M1 CD COOL is a multi-purpose instrument for a single parameter suitable for measurements of cooling towers, specifically designed for cooling water treatment, abatement operations of air purifiers and humidifiers or any industrial conditioning system. The controller is able to interact with other process equipment such as: a range of conductivity sensors (based on the measurement range); flow meters; drain solenoid valves.

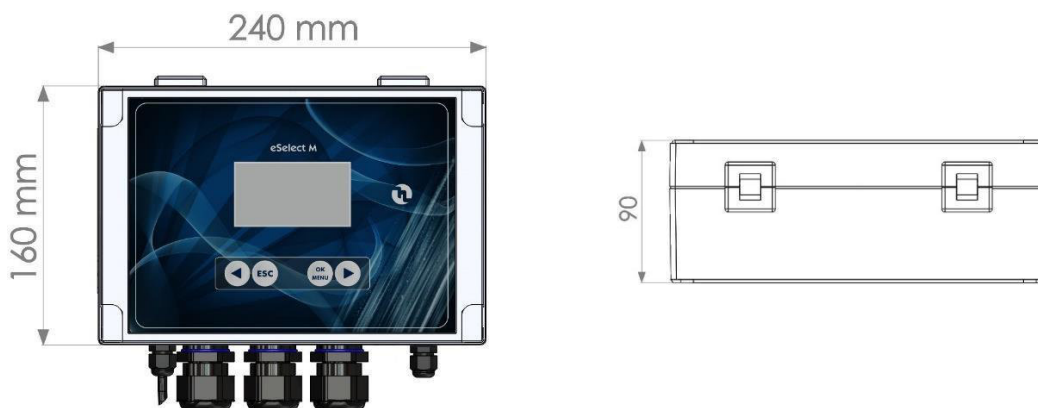
eSelect M1 CD COOL offers high quality performance in terms of measurements and functionality which make it extremely versatile and easy to use such as:

- The instrument is able to work with constant K1 probes at 20.00 mS and even at 100.00 mS (the latter with graphite sensors); the constant K5 ranges up to 2,000 μ S, including other ranges from K0.8 to K10.
- Monitoring 2 modes for purge operations; 4 inhibitor metering modes; 2 Controls of biocidal product metering pumps.

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	SV (solenoid valve) PURGE ON-OFF / voltage-free, relay 5A max – 230Vac
		2	INHIBITOR ON-OFF metering pump/voltage-free, relay 5A max – 230Vac
		3	BIOCIDE 1 ON-OFF metering pump/voltage-free, relay 5A max – 230Vac
		5	BIOCIDE 2 ON-OFF metering pump/voltage-free, relay 5A max – 230Vac
	AUX Output Relay	ALARM voltage-free contact, relay 5A max – 230Vac	
4-20 mA1-2	Outputs 0/4...20 mA1 EC	Adjustable (500 ohm maximum input impedance), with galvanic separation. Connected to Conductivity measurement settings	
	Outputs 0/4...20 mA2 EC	Adjustable (500 ohm maximum input impedance), with galvanic separation. Connected to Conductivity measurement settings	
Delay on Setpoint		Relay activation delay, programmable for each setpoint (999 sec.)	
FLOW Sensor		Blocks outlet operations if there is no flow in the probe socket	
Level		Remote relay control to monitor the chemical additive level (level probe not included)	
CE conductivity measurement range and K factor (cell constant)		K1 Range up to 20.00 mS Hysteresis/PWM start-up point = 500 μS Resolution 10 μS	K5 Range up to 2,000 μS Hysteresis/PWM start-up point = 50 μS Resolution 1 μS
Temperature Settings		K5 Range up to 200 μS Hysteresis/PWM start-up point = 0.50 μS Resolution 0.1 μS	
Temperature probe range		Manual or automatic offset (auto with temperature probe PT100) ▪ Resolution 0.1% °C ▪ Precision: ± 0.5% °C	
Relay insulation voltage		– 20 ... 100°C	
Internal electrical protection		>3000 Vac	
Load		The power supply unit assures electrical protection (instead of the fuse)	
Power supply / Consumption		Resistive load 5A at 230VAC / Inductive load 0.5A at 230VAC	
Consumption / Rated Current		Universal power supply 100÷250VAC / 5W at 240VAC	
Display		230Vca 5W = 25mA ▪ 24Vca-cc=5W = 230mA ▪ 12Vcc 5W = 460mA	
Contact relay duration		Backlit 126x64 display; Visible display area 70x37 mm	
Noise level		≥5x10 ⁴ operations (5A at 230VAC)	
Environmental conditions		Irrelevant	
Transport / storage conditions		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 dry environment	

TECHNICAL SPECIFICATIONS OF THE INSTRUMENT

CE conductivity measurement range and K factor (cell constant)	<ul style="list-style-type: none"> ▪ K1 Range up to 20.00 mS Hysteresis / PWM start-up point = 500 μS Resolution 10 μS ▪ K5 Range up to 2.,000 μS / Hysteresis / PWM start-up point = 50 μS Resolution 1 μS ▪ K5 Range up to 200 μS / Hysteresis / PWM start-up point = 0.50 μS Resolution 0.1 μS
Temperature settings:	Manual or automatic offset (auto with temperature probe PT100) <ul style="list-style-type: none"> ▪ Resolution 0.1% °C ▪ Precision: \pm 0.5% °C
Temperature probe range:	- 20.... 100°C
Power supply / Consumption:	Universal power supply 100÷250VAC / 5W at 240VAC
Microprocessor technology:	SMD components with a 6-key digital control keypad
Linearity, Stability, Reproducibility:	\pm 0.5% in standard conditions
Display:	Backlit 126x64 display; Visible display area 70x37 mm
Delay on Setpoint:	Relay activation delay, programmable for each setpoint (999 sec.)
Delay on start-up:	Delay in relay when the unit is switched on, programmable
Consumption / Rated Current:	230Vca 5W = 25mA ▪ 24Vca-cc=5W = 230mA ▪ 12Vcc 5W = 460mA
Internal electrical protection:	Power supply unit assures electrical protection (instead of fuse)
Level / Relay remote control:	Chemical additive level (level probe not included) output voltage +5VDC
RELAY 1 output:	SV (solenoid valve) PURGE ON-OFF / voltage-free, relay 5Amax 230VAC
RELAY 2 output:	INHIBITOR ON-OFF metering pump/ voltage-free, relay 5Amax 230VAC
RELAY 3 output:	BIOCIDE1 ON-OFF metering pump/ voltage-free, relay 5Amax 230VAC
RELAY 5 output:	BIOCIDE2 ON-OFF metering pump/ voltage-free, relay 5Amax 230VAC
AUX Output:	ALARM voltage-free contact, relay 5A max 230Vac
FLOW sensor:	Blocks outlet operations if there is no flow in the probe socket.
Outputs: Output 0/4...20 mA1 EC:	Adjustable (500 Ω maximum input impedance), with galvanic separation. Connected to Conductivity measurement settings.
Output 0/4...20 mA2 EC:	Adjustable (500 Ω maximum input impedance), with galvanic separation. Connected to Conductivity measurement settings.
Load:	Resistive load 5A at 230VAC / Inductive load 0.5A at 230VAC
Relay insulation voltage:	> 3000VAC
Contact relay duration:	\geq 5x10 ⁴ operations (5A at 230VAC)
Noise level:	Irrelevant
Operating temperature:	ideal temperature 5°C-40°C, resistance up to 0°C-45°C
Environmental conditions:	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.
Transport / storage conditions:	- 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). **If the power cord does not have a plug, 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.**

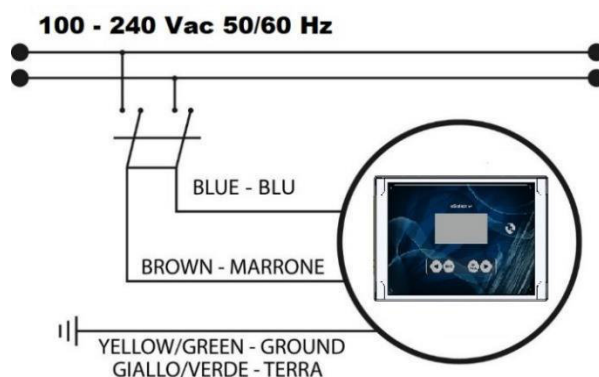


Fig. 1 – Electrical connection

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.

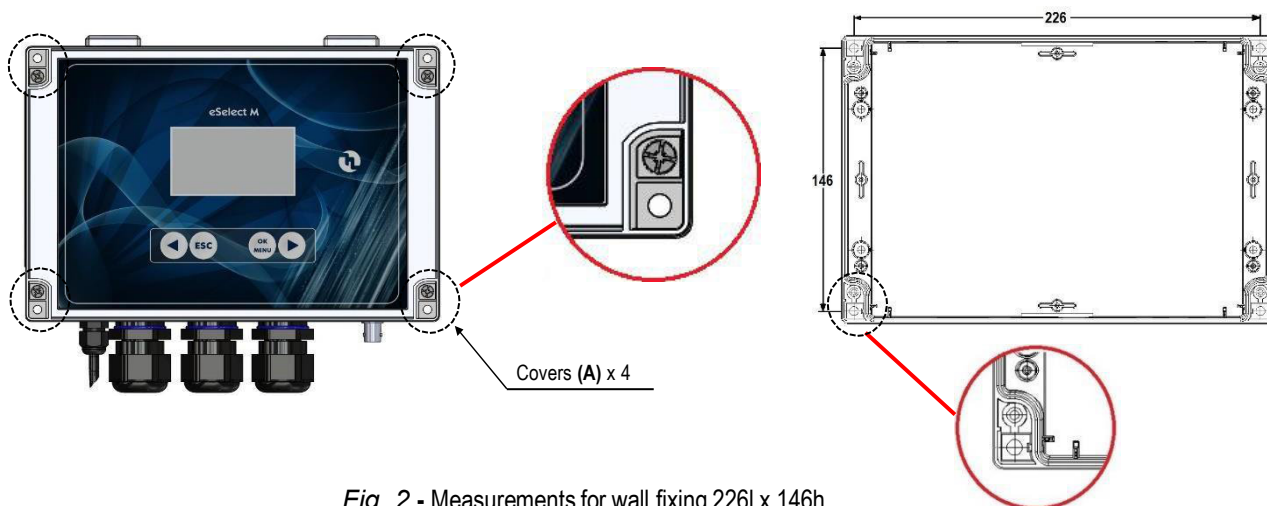


Fig. 2 - Measurements for wall fixing 226l x 146h

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.

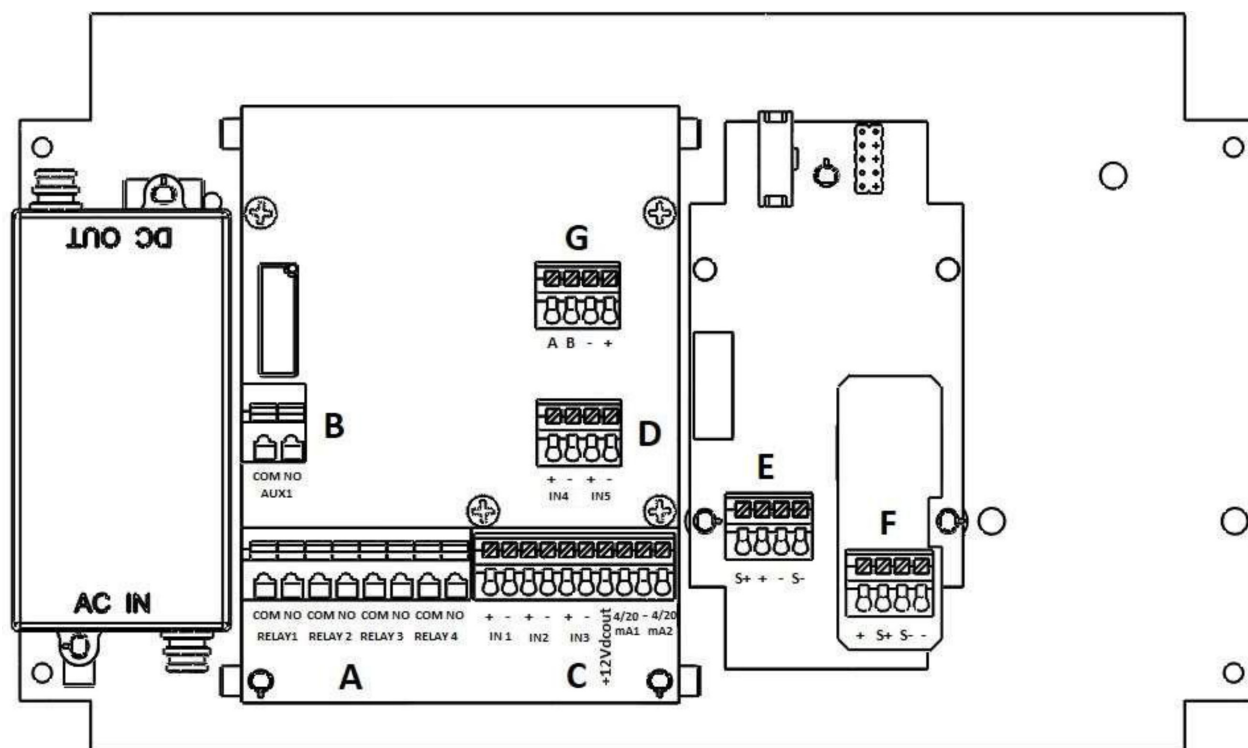


Fig. 3 – Connection diagram

TERMINAL BOARD “A”		
Relay 1	COM	SV PURGE Solenoid Valve
	NO	
Relay 2	COM	INHIBITOR METERING PUMP
	NO	
Relay 3	COM	BIOCIDE 1 METERING PUMP
	NO	
Relay 4	COM	BIOCIDE 2 METERING PUMP
	NO	
TERMINAL BOARD “B”		
AUX 1	COM NO	ON-OFF ALARM relay output for external signalling device
TERMINAL BOARD “C”		
IN 1	+	Digital input INHIBITOR level probe for the chemical tank
	-	
IN 2	+	Pulse Emitting Meter
	-	
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 Conductivity 4-20mA1 for metering pump mA, PLC, data collection
-	-	(-) Proportional output Conductivity 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”		
IN4	Digital input BIOCIDE 1 level probe for the chemical tank (+) (-)	
IN5	Digital input BIOCIDE 2 level probe for the chemical tank (+) (-)	
TERMINAL BOARD “E”		
S +	Conductivity Probe (WHITE wire)	

+	White/Brown wire	
-	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)	
TERMINAL BOARD "G"		
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</i> KIT CONNECT X INSTRUMENTS SERIES M
B	YELLOW wire	
-	BLACK wire	
+	Not Connected	

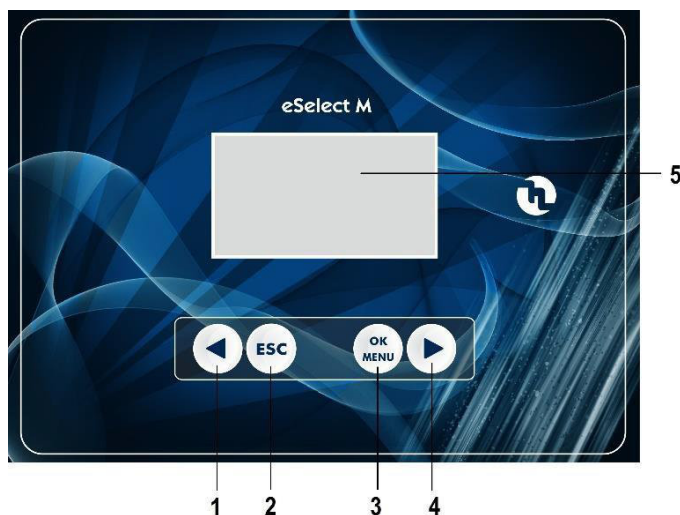


REMEMBER: unit with universal voltage 100-250 VAC ($\pm 10\%$) or 9-24VDC. If the real voltage is constantly at the limit (minimum or maximum), or when the peaks are far above the mentioned range, the unit input is electrically protected against voltage fluctuations; outside the range mentioned above, 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.

ESELECT M1 CD COOL

Control Panel

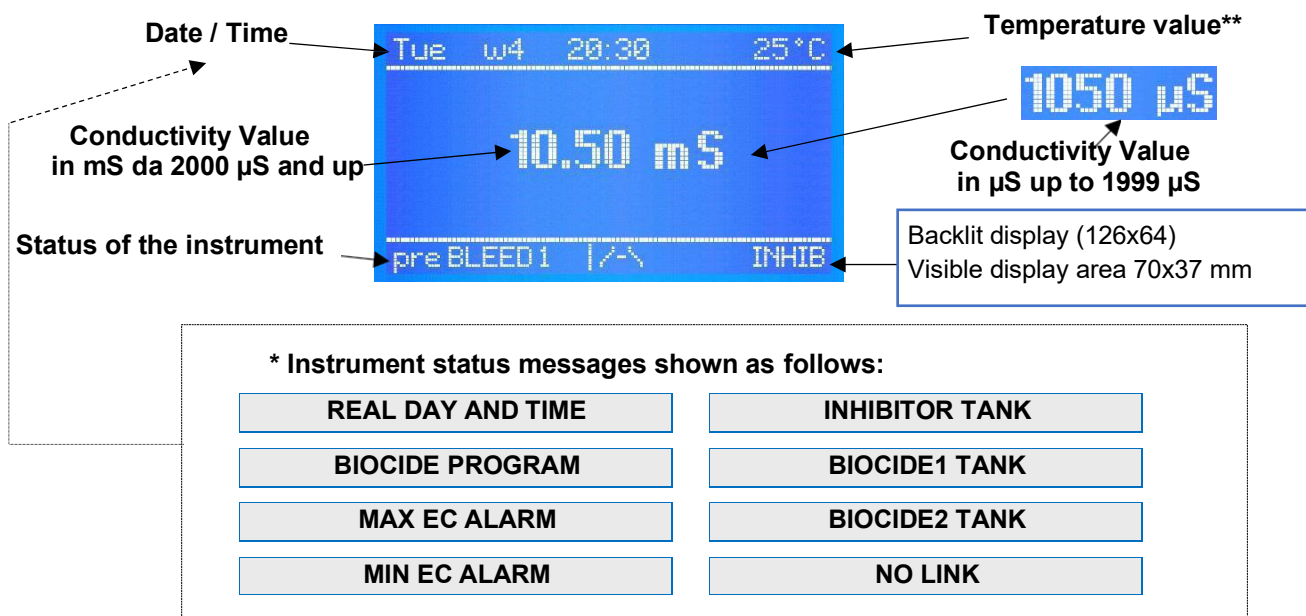
The following picture shows the control panel with a description of the functions of the various keys.



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



If more than one function is active, the messages are displayed in continuous cycle, each is displayed for 3 seconds.

The ALARM or FLOW message disappears once the measurements are again consistent with the programmed settings. 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 and display down.



The software of the power and control boards of the eSelect M 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 ***

EC - MAX ALARM	: Max EC conductivity value programmed in the "PURGE" menu mode = conductivity
EC - MIN ALARM	: Min EC conductivity value programmed in the "PURGE" menu mode = conductivity
INHIBITOR TANK	: when the Inhibitor tank reaches a low level (closed contact)
BIOCIDE1 TANK	: when the Biocide1 tank reaches a low level (closed contact)
BIOCIDE2 TANK	: when the Biocide2 tank reaches a low level (closed contact)

The **day** and **time** are set automatically by the instrument based on the real time selected in "SETTINGS".

The Icon **w** .. is the week selected based on one of the two menus of the BIOCIDES programs, also based on the real time and date selected in the "SETTINGS" menu

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

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

Other status messages are as follows:

WAIT please ... : for 5 seconds after the instrument has started up

pre Purge 1/pre Purge 2: blocks the Biocide 1 or 2 metering operation because the conductivity level is higher than the value selected in the "Pre Purge" programming step of the "BIOCIDE" menu.

BIO1 or BIO2 block: removes all operations for Purge and Inhibitor metering immediately after dispensing Biocide 1 or Biocide 2 when the dispensing process is completed.

Purge in standby: all the conditions for activating the solenoid valve for the purge are in place but the SV is not open due to other active operations, e.g. BIO block.

BIO1 or BIO2 in standby: the BIO metering process is in standby due to other active operations, for example pre-Purge or active Inhibitor dispensing or Purge operation in progress.

"|/-\" This is an animated sequenced icon that moves each time the pulses are received by the unit via the pulse emitting meter.

NO FLOW shows the absence of waterflow in the probe socket of the sensor: this is only valid when using a proximity sensor and the "Flow sensor" function is enabled.

Other status icons:

PURGE: the SV solenoid valve is activated for purge operations

BIO1: BIOCID1 dispensing operations

BIO2: BIOCID2 dispensing operations

OPERATING FUNCTIONS

The acronyms and terms mentioned below are used in this booklet:

SV = Solenoid Valve; **EC** = Conductivity or Electro conductivity (also referred to as CD);

BIOCID = Biocide metering pump; **INHIBITOR** = Inhibitor metering pump; **FLOW SENSOR** = Proximity

ON-OFF mode

The unit features an ON-OFF mode that enables (or disables if the reverse mode is ON) the output relays of the metering pumps, peristaltic pumps or other equipment.

ADVANTAGES: it works with the great majority of ON-OFF devices, which are also cost-effective.

DIRECT / REVERSE direction

The setpoint relays are factory set as follows:

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.

MIN / MAX ALARM function

The **Alarm** function (AUX1 relay) makes it possible to select the minimum and maximum values outside which the instrument triggers an alarm.

ADVANTAGES: increasing safety measures assuring an alert if the parameters are out of control.

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 is 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 value in accordance with the required value.

Example with CL chlorine with range 2 Cl ppm: if the selected setpoint is 1 Cl ppm and hysteresis is set at 0.050 Cl ppm, the two activation values are 0.95 and 1.05 Cl ppm; within this range, the setpoint is OFF and outputs are blocked, outside this range the setpoint is ON (always according to Direct or Reverse mode).

ADVANTAGES: assuring proper system control without straining the connected device.

DISADVANTAGES: the user must remember that the programmed hysteresis is slightly different from the required setpoint.

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.

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

The instrument features an output with signal in current in mA. The 4-20mA signal follows the settings of the Factor K cell constant selected previously. The mA output provides two operating modes to be selected according to the system's operational requirements:

- **mA DEVICE:** this is a programmable function combined with the EC conductivity 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. **4 mA** corresponds to the minimum EC value (0 μ S), **20 mA** corresponds to the maximum measurable value (according to the selected **K** Factor) which may be 200 μ S, 2000 μ S, 20 mS, 100 mS, the connected device is activated accordingly.

- **METERING ON SETPOINT:** the mA output controls metering pumps suited to processing an input mA signal. **4 mA** corresponds to the minimum EC value (0 μ S), therefore the connected mA unit operates at the minimum programmed capacity. **20 mA** corresponds to the maximum measured value (according to the selected **K** factor range) which may be 200 μ S, 2000 μ S, 20 mS, 100 mS, therefore the connected mA unit operates at the maximum programmed capacity.

- **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 an input signal in mA.

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 unit operations through Start/Stop programming.

START-UP DELAY

The **start-up delay** stops 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: 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 (DISABLED by default).

TEMPERATURE

Manual / Automatic Temperature offset (the latter with a PT100 temperature sensor) 0-100°C, the conductivity measurements will be offset in temperature, always obtaining the exact value.

ETHERNET / RS 485 communication control unit with external module

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

PROGRAMMING FUNCTIONS

Purge SV Solenoid Valve control

The instrument eSelect M – CD COOL offers **two modes** for purge operations (water drain) of the SV.

TIMER mode: for easy programming or in case of conductivity probe fault, the operator may enable the Timer mode; the SV is driven by the internal timer regardless of the conductivity reading in the cooling tower.

Purge: TIMER mode	Mode Selection	Selects the operational mode to drive the purge SV: the two modes are via Timer built into the instrument or via the Conductivity measurement.
	Cycle time	Selects the intermediate time between two purge operations.
	Cycle duration	Selects the opening cycle of the purge SV.
	Flow Sensor	Enables or disables the Flow sensor function (proximity probe).
	Max Manual Time	Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.
	Manual ON / OFF start-up	Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/ OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

CONDUCTIVITY mode: processes the conductivity level to control purge operations; the displays show the measured EC values and drives the relay output connected to the SV solenoid valve. Electroconductivity is monitored by a setpoint: once this is reached, the instrument commands solenoid valve opening and drains the desalinated and conditioned water. NOTE: for EC conductivity measurements, the display shows μS values up to 1999 (micro Siemens), then they change automatically into mS (milli Siemens) above the value of the latter.

CONDUCTIVITY MODE	Mode Selection	Selects the operational mode to drive the purge SV: the two modes are via Timer built into the instrument or via the Conductivity measurement.
	High Setpoint	Sets the setpoint at the highest value, after reaching which the relay closes (opens the SV)
	Low Setpoint	Sets the setpoint at the lowest value, after reaching which the relay opens (closes the SV)
	Max opening time	Maximum opening time of the purge valve: it is a safety mode that replaces the conductivity measurement in the event of EC probe fault or other defects.
	Max Alarm	If the EC measurement exceeds the selected Max value, the relay is closed and the alarm message is displayed. The alarm is independent of the chosen direction (direct/reverse), via relay 4, it controls an external signalling device.
	Min alarm	If the EC measurement is below the selected min value, the relay is closed and the alarm message is displayed. The alarm is independent of the chosen direction (direct/reverse), via relay 4, it controls an external signalling device.
	Direction	Direct , the output is active when the measured value is lower than the selected setpoint. Reverse , the output is active when the measured value is higher than the selected setpoint
	Flow Sensor	Enables or disables the Flow sensor function (proximity probe).
	Max Manual Time	Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.
	Manual ON / OFF start-up	Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/ OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

ON-OFF mode: The unit features an ON-OFF mode which activates (or deactivates in the event of reverse mode ON) the output relays connected to the ON-OFF equipment such as SV (solenoid valve).

RELAY 4 ON-OFF RELAY OUTPUT: The relay 4 output may be connected to the alarm device (buzzer or light) or to other equipment. ADVANTAGES: increases safety measures providing an alert if the parameters are out of control.

MIN / MAX ALARM: The **Alarm** function makes it possible to select the minimum and maximum values outside which the instrument goes into alarm mode. To restore the alarm function, wait for the measurement to go back to the setpoint
ADVANTAGES: increases the safety measures assuring an alert if the parameters are out of control.

INHIBITOR control

The instrument eSelect M – CD COOL offers **four modes** for inhibitor metering operations.

DIRECT PURGE: starts dispensing the inhibitor when the purge SV is open (works parallel to the SV)

DIRECT PURGE	Mode Selection	DIRECT PURGE: the inhibitor is dispensed during SV purge operations.
	Max Metering time	Selects the maximum inhibitor dispensing time.
	Flow Sensor	Enables or disables the Flow sensor function (proximity probe).
	Max Manual Time	Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.
	Manual ON / OFF start-up	Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/ OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

% PURGE: The inhibitor is dispensed after the SV closes for a time based on the SV opening percentage equal to the duration of the last purge operation.

PURGE %	Mode Selection	PURGE %: the inhibitor is dispensed on the percentage basis of the last SV opening.
	Max Metering time	Selects the maximum inhibitor dispensing time.
	Purge % supply	Sets the SV time percentage for draining; this is the time corresponding to inhibitor dispensing operations.
	Flow Sensor	Enables or disables the Flow sensor function (proximity probe).
	Max Manual Time	Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.
	Manual ON / OFF start-up	Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/ OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

TIMER: controls inhibitor dispensing operations via the internal timer: at the start of each period, a metering pump injects a selected volume of inhibitor for a preset time. During SV drain operations, inhibitor dispensing stops.

TIMER	Mode Selection	TIMER: controls inhibitor dispensing operations via the internal timer.
	Pause Period	During this period the inhibitor metering pump is stopped.
	Metering time	Selects the inhibitor dispensing time.
	Flow Sensor	Enables or disables the Flow sensor function (proximity probe).
	Max Manual Time	Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.
	Manual ON / OFF start-up	Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/ OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

METER: The function is active during topping up of mains water and is driven by the instrument which controls the meter pulses in line, dispensing the inhibitor in a manner proportional to the inlet water flow.



NOTE: the meter function requires using a proportional metering pump suited to processing input digital contacts generated by a pulse emitter water meter.

METER	Mode Selection	METER is a function connected to the meter pulses, dispensing the inhibitor in a manner proportional to the inlet water flow.
	Pulse Start	Selects the pulse from the meter to start injecting by the inhibitor metering pump.
	Metering time	Selects the inhibitor dispensing time.

	Flow Sensor	<i>Enables or disables the Flow sensor function (proximity probe).</i>
	Max Manual Time	<i>Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.</i>
	Manual ON / OFF start-up	<i>Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON/OFF start-up" only works if the previous function "Max Manual Time" has been programmed.</i>

BIOCIDES control

The instrument eSelect M – CD COOL offers **two modes** for two Biocide metering operations.

Most cooling tower systems include two biocide programs to assure efficient disinfection quality.



NOTE: the Biocide function requires using an On-Off metering pump suited to processing the input contacts generated by the internal timer.

BIOCIDES 1 / BIOCIDES 2	Edit programs	<i>Enables or disables the Biocide metering program via the real-time timer.</i>
	Program	<i>The program in biocide mode offers many programming steps that assure more accurate metering operations and with absolute precision (up to 99 programs for each biocide).</i>
	Setting Pre-Purge	<i>Pre-Purge is a safety function: if the conductivity level is lower than the selected EC setpoint (High Setpoint) it allows the drain operation before dispensing the biocide and after disabling the purge SV. It prevents wasting chemical biocides uselessly in the event the SV should open at the same time, during or just before the start of the biocide activation time.</i>
	Time lock	<i>Output time lock mode: SV purge, inhibitor dispensing and Biocide2 dispensing operations are blocked for the duration of the Biocide1 dispensing operations, thus preventing a waste of the chemical product while allowing its disinfection cycle to be completed at the same time.</i>
	Flow Sensor	<i>Enables or disables the Flow sensor function (proximity probe).</i>
	Max Manual Time	<i>Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.</i>
	Manual ON / OFF start-up	<i>Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.</i>

Other functions

Calibration	<i>Calibration menu of the Conductivity sensor and PT100 temperature sensor. Manual or automatic temperature offset is useful for conductivity measurement.</i>
4-20 mA outputs	<i>Controls the data logger, PLC, recorder or devices suited to processing the mA signal.</i>
Real-time clock	<i>Sets the date and exact time driving the internal timer according to the real-time clock</i>
Flow Control	<i>Selects the flow sensor (proximity probe): the ETATRON flow sensor is normally open (NO). This status must be enabled while commissioning from the SETTINGS menu.</i>
Level Control	<i>The eSelect M – CD COOL offers 3 level controls that allow the user to connect 3 float level probes that control the metering tank level of the inhibitor and biocide metering pumps 1 and 2. When the low level indicated by the float is reached, the connected metering pumps are stopped, the alarm relay is opened and a message is displayed.</i>

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 eSeleC M1

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 K range. If the instrument has already been programmed, the display shows the programs selected previously.

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

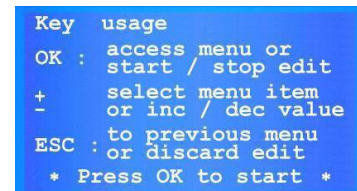
 **OK:** access to the menu, start/stop, selection and editing

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

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

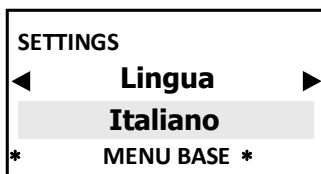
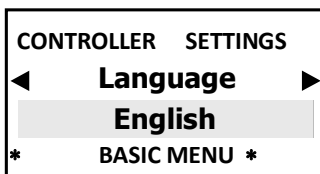
* Press OK to start*

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



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 the **CONSTANT 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 D.S.:

- > 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.

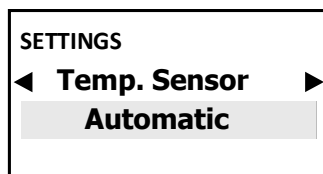
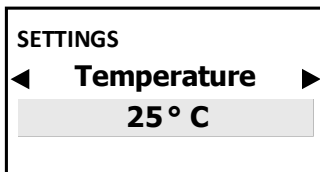
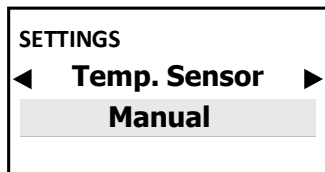
In case the user should wish to change the cell Constant Factor K, even during operations, act as follows:

☛ **BASIC** menu > **SETTINGS** > **EXPERTMENU** > **MENU SELECTION** > **SETPOINT1** > **Const.K EC**

☛ from **EXPERT** menu go into > **MENU SELECTION** > **SETPOINT1** > **Const.K EC probe**

☛ Press **ESC** to go back to **MENU SELECTION** or press **ESC** | **ESC** to go back to **MEASUREMENTDISPLAY**

TEMPERATURE settings



One of the following functional modes can be selected:

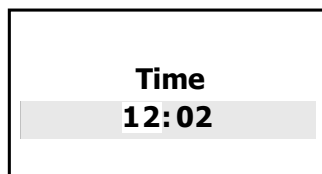
Manual:

The value is set by the user (0-100°C) in the configuration menu, it is the reference parameter for offsetting the pH value

Automatic:

The value measured by the PT100 probe is the reference parameter for offsetting the chlorine value

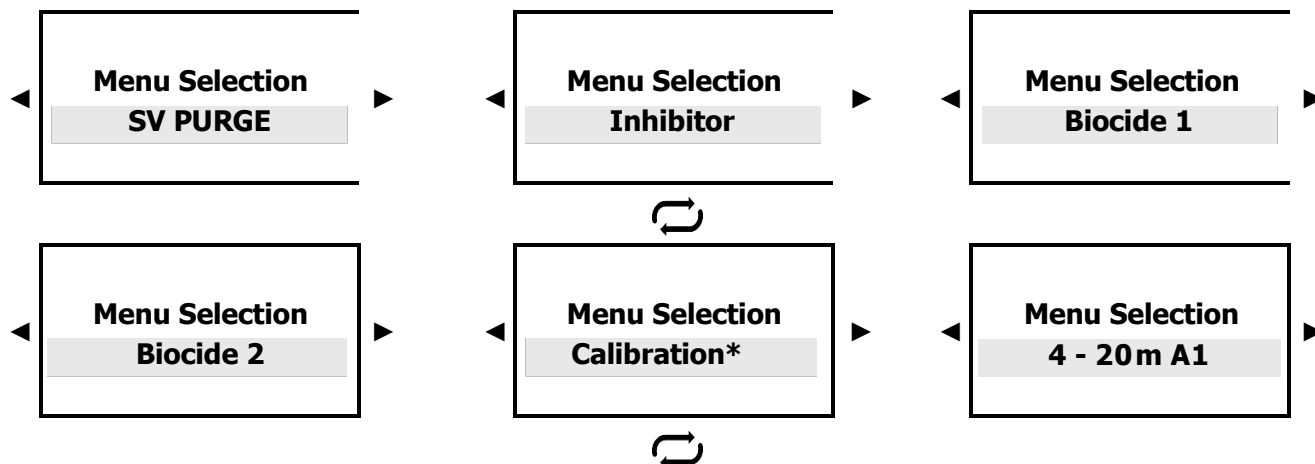
DATE AND TIME – Timer in real time

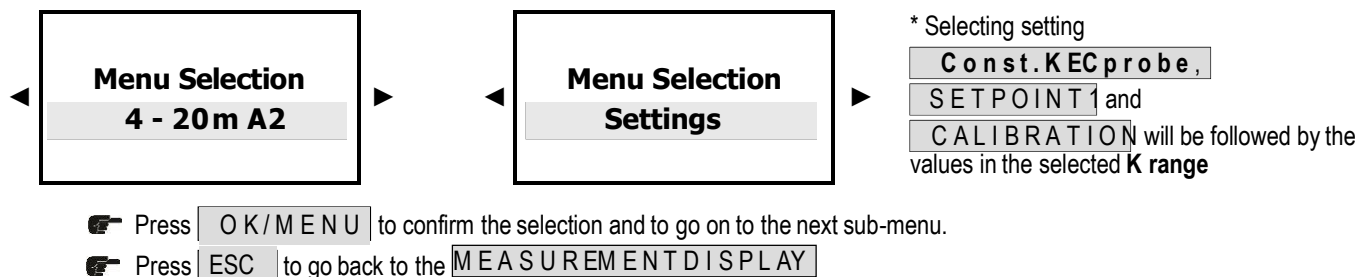


Some applications might require programming activation or deactivation of the device. This is why the electronic device is equipped with a clock and calendar.

MENU SELECTION

The **MENU SELECTION** configuration includes all the following steps:



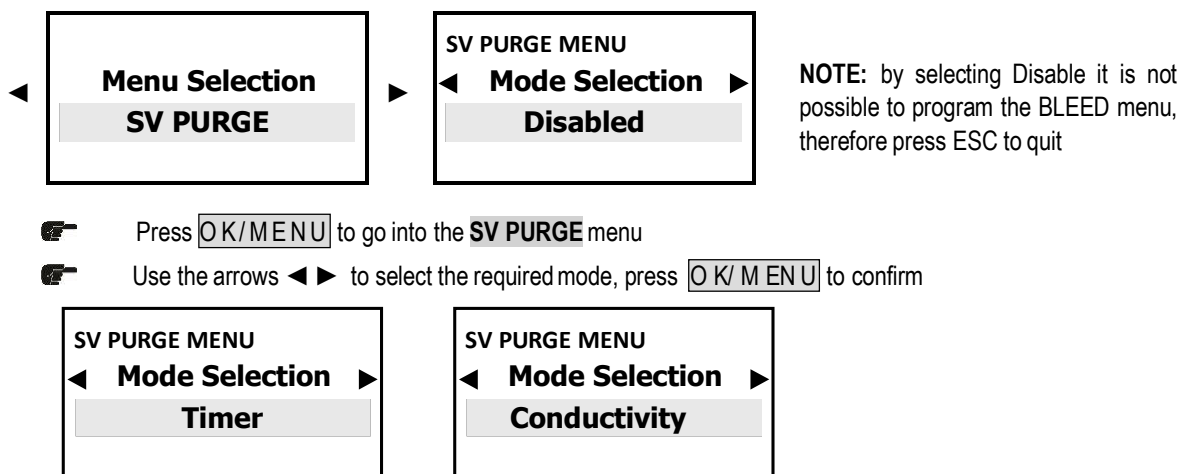


PURGE MENU

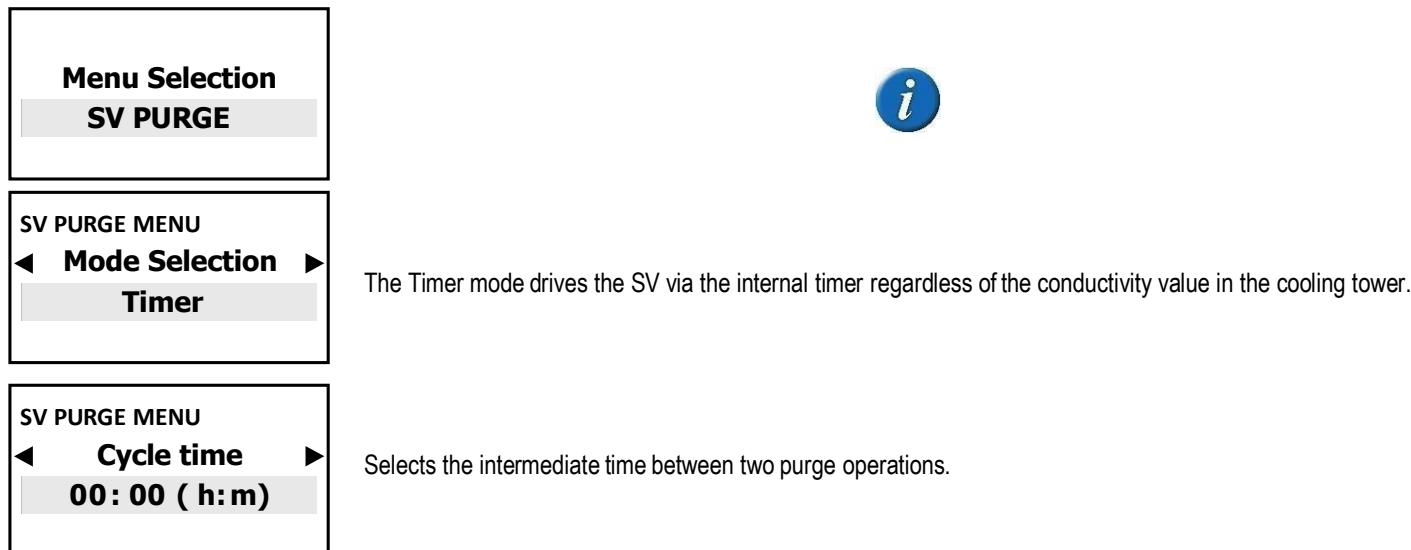
The instrument offers **two modes** for purge operations (water drain) of the SV.

- **TIMER mode:** for easy programming or in case of conductivity probe fault, the operator may enable the Timer mode; the SV is driven by the internal timer regardless of the conductivity reading in the operating Cooling tower.
- **CONDUCTIVITY mode:** processes the conductivity level to control purge operations; the displays show the measured EC values and drive the relay output connected to the SV solenoid valve. Electroconductivity is monitored by a setpoint: once this is reached, the instrument commands solenoid valve opening and drains the desalinated and conditioned water.

The first step requires enabling the drain SV (solenoid valve):



PURGE operations by means of internal TIMER programming



SV PURGE MENU

◀ **Cycle duration** ▶

000:00 (m:s)

Selects the opening cycle of the purge SV.

SV PURGE MENU

◀ **Flow Sensor** ▶

Disabled

SV PURGE MENU

◀ **Flow Sensor** ▶

Enabled

Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added

SV PURGE MENU

◀ **Max Manual Time** ▶

000.00 (m:s)

Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.

SV PURGE MENU

◀ **Manual Start-up** ▶

OFF

SV PURGE MENU

◀ **Manual Start-up** ▶

ON

Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON / OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

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

PURGE operations by means of CONDUCTIVITY measurement

Menu Selection

SV PURGE



SV PURGE MENU

◀ **Mode Selection** ▶

Conductivity

Processes the conductivity level to control purge operations; the displays show the measured EC values and drive the relay output connected to the SV solenoid valve.

SV PURGE MENU

◀ **High Setpoint** ▶

0 μ S

SV PURGE MENU

◀ **Low Setpoint** ▶

0 μ S

The setpoints activate the output relay for the solenoid valve or other devices once the setpoint level is selected. The display shows the value in μ S but if the value exceeds 1999 μ S, it shows 2.00 mS (if the value decreases the reading goes back in μ S).

SV PURGE MENU

◀ **Max SV time** ▶

000:00 (m:s)

Selects the maximum opening time of the purge SV.

SV PURGE MENU

◀ **MAX Alarm** ▶

0 μ S*

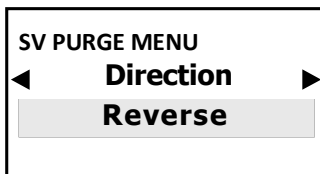
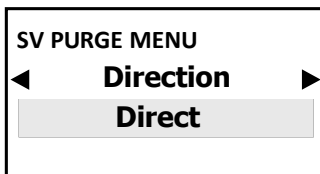
SV PURGE MENU

◀ **MIN Alarm** ▶

0 μ S*

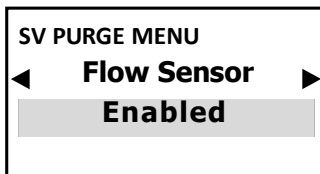
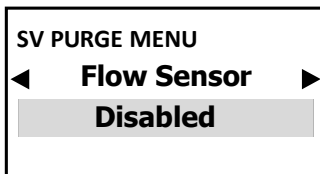
The MIN Alarm function selects a MINIMUM alarm level after which the alarm relay is triggered on.

The MAX Alarm function selects a MAXIMUM alarm level beyond which the alarm relay is triggered on.

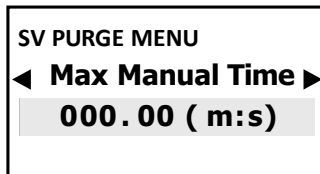


Direct mode: the output is active when the measured value is lower than the one selected in the setpoint.

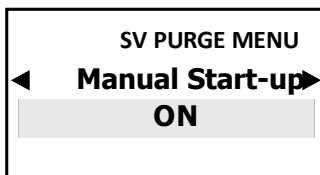
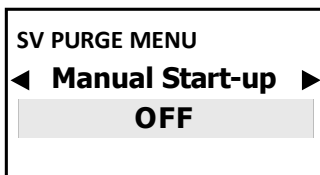
Reverse mode: the output is active even if the measured value is higher than the one selected in the setpoint.



Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added.



Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.

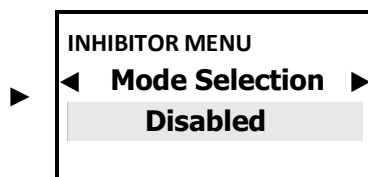
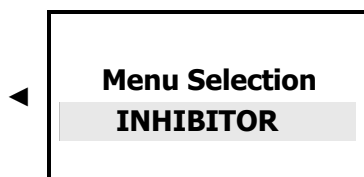


Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

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

INHIBITOR MENU

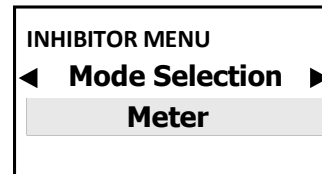
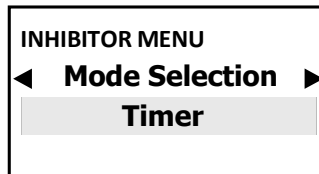
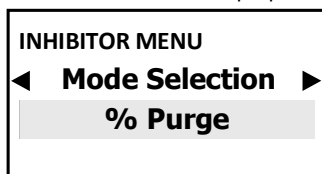
The first step requires enabling the INHIBITOR function connected to a metering pump:



NOTE: by selecting Disable it is not possible to program the INHIBITOR.

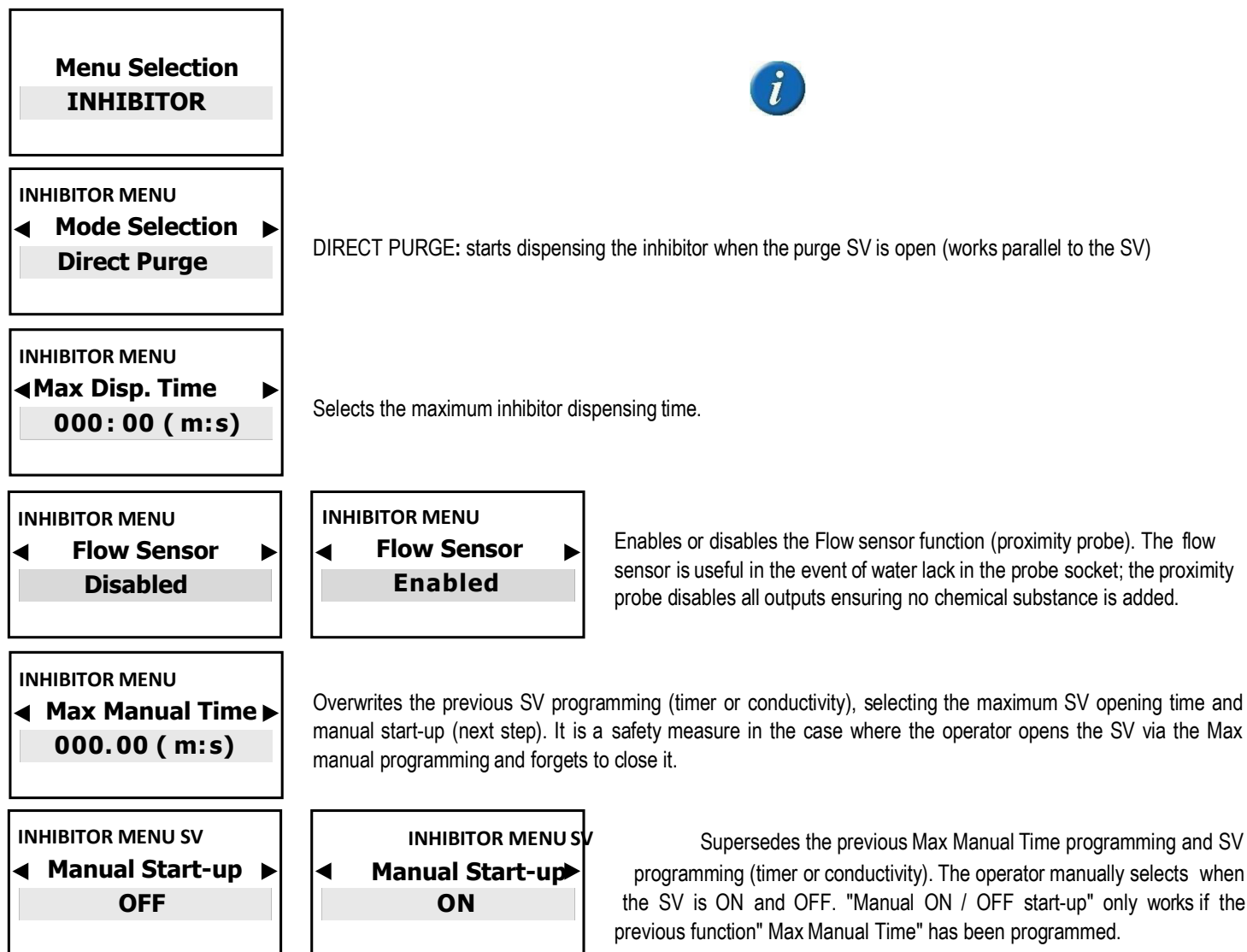
The instrument eSelect M – CD COOL offers **four modes** for inhibitor metering operations.

- DIRECT PURGE:** starts dispensing the inhibitor when the purge SV is open (works parallel to the SV)
- % PURGE:** The inhibitor operates after the SV closes for a time based on the SV opening percentage equal to the duration of the last purge operation.
- TIMER:** controls inhibitor dispensing operations via the internal timer: at the start of each period, a dispensing pump injects a selected volume of inhibitor for a preset time. During SV drain operations, inhibitor dispensing stops.
- METER:** The function is active during topping up \ of mains water and is driven by the instrument which controls the meter pulses in line, dispensing the inhibitor in a manner proportional to the inlet water flow.



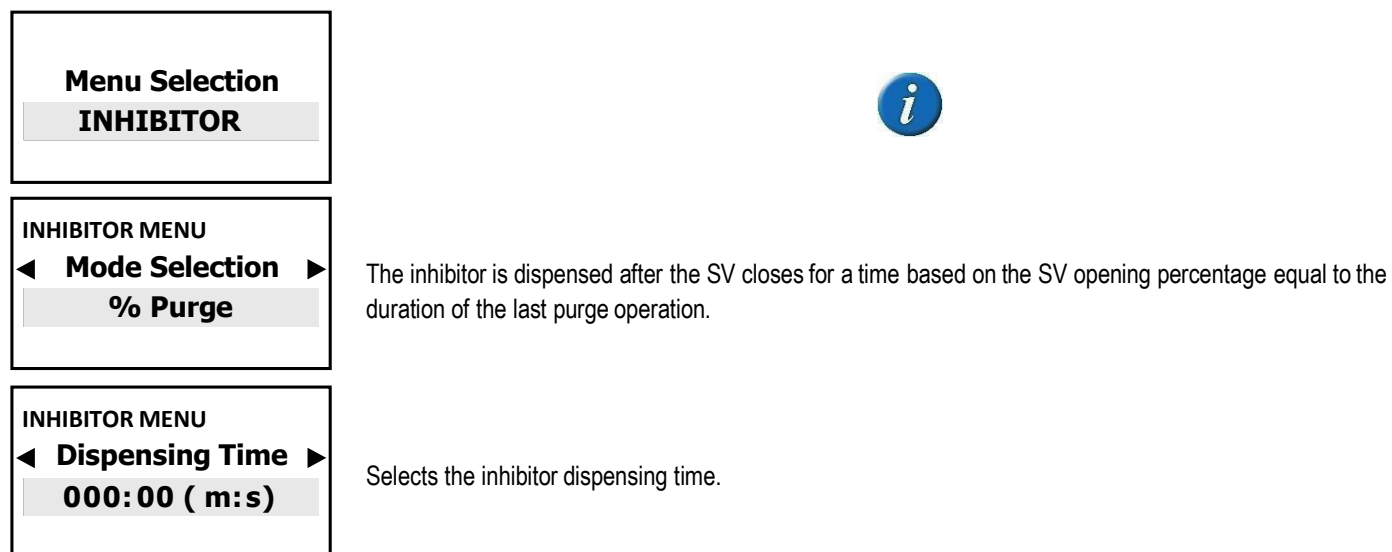
Press **OK/MENU** to enter the **INHIBITOR** menu

Use the arrows **◀ ▶** to select the required mode, press **OK/MENU** to confirm



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

INHIBITOR METERING operations via Purge % function



INHIBITOR MENU
◀ **Dispense Purge %** ▶
0%

Sets the SV time percentage for draining; this is the time corresponding to inhibitor dispensing operations.

INHIBITOR MENU
◀ **Flow Sensor** ▶
Disabled

INHIBITOR MENU
◀ **Flow Sensor** ▶
Enabled

Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added.

INHIBITOR MENU
◀ **Max Manual Time** ▶
000.00 (m:s)

Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.

INHIBITOR MENU
◀ **Manual Start-up** ▶
OFF

INHIBITOR MENU
◀ **Manual Start-up** ▶
ON

Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

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

INHIBITOR METERING operations via **TIMER** programming function

Menu Selection
INHIBITOR



INHIBITOR MENU
◀ **Mode Selection** ▶
Timer

The Timer controls inhibitor dispensing operations via the internal timer: at the start of each period, a metering pump injects a selected volume of inhibitor for a preset time. During SV drain operations, inhibitor dispensing stops.

INHIBITOR MENU
◀ **Pause Period** ▶
000:00 (h:m)

During this period the inhibitor metering pump is stopped.

INHIBITOR MENU
◀ **Dispensing Time** ▶
000:00 (m:s)

Selects the inhibitor dispensing time.

INHIBITOR MENU
◀ **Flow Sensor** ▶
Disabled

INHIBITOR MENU
◀ **Flow Sensor** ▶
Enabled

Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added.

INHIBITOR MENU
 ◀ **Max Manual Time** ▶
 000.00 (m:s)

Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.

INHIBITOR MENU
 ◀ **Manual Start-up** ▶
 OFF

INHIBITOR MENU
 ◀ **Manual Start-up** ▶
 ON

Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

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

INHIBITOR METERING operations via PULSE EMITTING METER

Menu Selection
 INHIBITOR



INHIBITOR MENU
 ◀ **Mode Selection** ▶
 Meter

The function is active during topping up of mains water and is driven by the instrument which controls the meter pulses in line, dispensing the inhibitor in a manner proportional to the inlet water flow.

INHIBITOR MENU
 ◀ **Pulse Start** ▶
 0

Selects the pulse (digital reed contact) from the pulse emitter water meter to start injections of the inhibitor metering pump, for example: by selecting 10, after 10 pulses received by the water dispenser, the metering pump performs 1 injection. NOTE: this function requires using a proportional metering pump able to process the input digital contact.

INHIBITOR MENU
 ◀ **Dispensing Time** ▶
 000:00 (m:s)

Selects the inhibitor dispensing time.

INHIBITOR MENU
 ◀ **Flow Sensor** ▶
 Disabled

INHIBITOR MENU
 ◀ **Flow Sensor** ▶
 Enabled

Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added.

INHIBITOR MENU
 ◀ **Max Manual Time** ▶
 000.00 (m:s)

Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.

INHIBITOR MENU
 ◀ **Manual Start-up** ▶
 OFF


INHIBITOR MENU
 ◀ **Manual Start-up** ▶
 ON

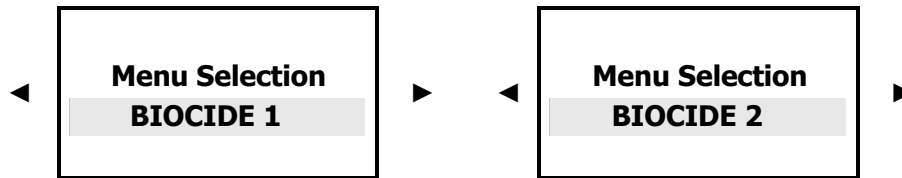
Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON and OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.

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

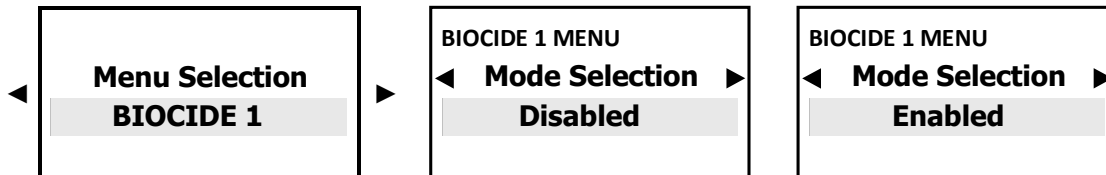
BIOCIDE MENU

The instrument eSelect M – CD COOL offers **TWO modes** for Biocide metering operations. Most cooling tower systems include two biocide programs to assure efficient disinfection quality.

 **NOTE:** the Biocide function requires using an On-Off metering pump suited to processing the input contacts generated by the internal timer.




The first step requires enabling the BIOCIDE function connected to a metering pump:




 Press **OK/MENU** to enter the **BIOCIDE** menu

 Use the arrows **◀ ▶** to select the required mode, press **OK/MENU** to confirm

BIOCIDE 1 / BIOCIDE 2 via TIMER for programming DISPENSING CYCLES

BIOCIDE 1		BIOCIDE 2
Menu Selection BIOCIDE 1		Menu Selection BIOCIDE 2
BIOCIDE 1 MENU Edit program.		BIOCIDE 2 MENU Edit program.
Biocide 1 Program 01 DispensingTime(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	<p>The program in biocide mode entails many steps that may be programmed to assure more accurate metering operation with absolute precision (up to 99 programs for each biocide)</p>	Biocide 2 Program 01 DispensingTime(m:s) 01 : 00 Start time 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

Enter in the highlighted steps  select the desired parameters, confirm selection **00KK** go to the next step, below the programming steps to be selected:


Biocide 1	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
 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

Weeks 1:S 2:N 3:N 4:N


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

BIOCIDE MENU > PRE-PURGE > TIME LOCK

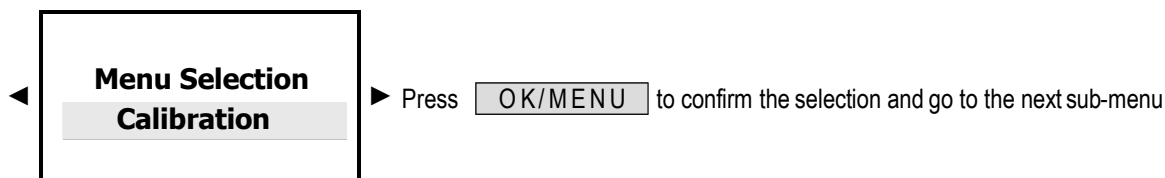
BIOCIDE 1		BIOCIDE 2	
Menu Selection BIOCIDE 1		Menu Selection BIOCIDE 2	
BIOCIDE 1 MENU ◀ Pre Purge ▶ 0 μS	<i>Pre-Purge is a safety function: if the conductivity level is lower than the selected EC setpoint it allows the drain operation before dispensing the biocide and after disabling the purge SV. It prevents wasting chemical biocides uselessly in the event the SV should open at the same time, during or just before the start of the biocide activation time.</i>	BIOCIDE 2 MENU ◀ Pre Purge ▶ 0 μS	
BIOCIDE 1 MENU ◀ Time lock ▶ 000:00 (m:s)	<i>Output time lock mode: SV purge, inhibitor dispensing and Biocide2 dispensing operations are blocked for the duration of Biocide1 dispensing operations, thus preventing a waste of the chemical product while allowing its disinfection cycle to be completed at the same time.</i>	BIOCIDE 2 MENU ◀ Time lock ▶ 0 μS	
BIOCIDE MENU ◀ Flow Sensor Disabled ▶	BIOCIDE MENU ◀ Flow Sensor Enabled ▶	Enables or disables the Flow sensor function (proximity probe). The flow sensor is useful in the event of water lack in the probe socket; the proximity probe disables all outputs ensuring no chemical substance is added.	
BIOCIDE MENU ◀ Max Manual Time ▶ 000.00 (m:s)	<i>Overwrites the previous SV programming (timer or conductivity), selecting the maximum SV opening time and manual start-up (next step). It is a safety measure in the case where the operator opens the SV via the Max manual programming and forgets to close it.</i>		
BIOCIDE MENU ◀ Manual Start-up ▶ OFF	BIOCIDE MENU ◀ Manual Start-up ▶ ON	<i>Supersedes the previous Max Manual Time programming and SV programming (timer or conductivity). The operator manually selects when the SV is ON / OFF. "Manual ON / OFF start-up" only works if the previous function "Max Manual Time" has been programmed.</i>	

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

CONDUCTIVITY SENSOR CALIBRATION > EXPERT MENU

 **READ THE MESSAGE CAREFULLY, THEN PRESS **OK** 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
 * Premi OK per avvio *



STANDARD OPERATIONAL CONDUCTIVITY RANGES

- **K1** 2000 $\mu\text{S} \pm 20.00 \text{ mS}$ (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 D.S.

- > **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.

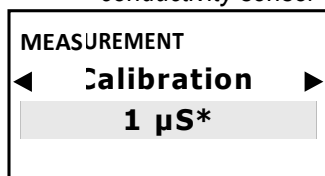
IMPORTANT NOTES:

- if **NOT** using a temperature sensor, go to **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.

A message is displayed before 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 prepared solution, wait for the value to stabilise. To change the value, press

OK/MENU, press **◀▶** until reaching the value of the **prepared buffer solution**, press **OK/MENU** to confirm.

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

Press **ESC** **ESC** 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.

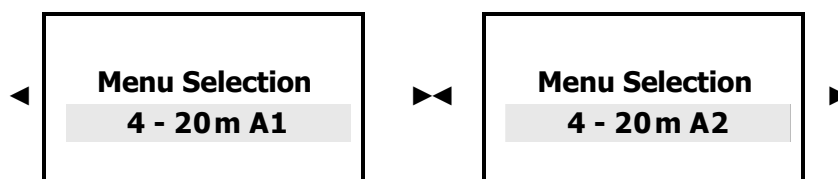
In case the user should wish to change the cell Constant Factor EC K, even during operations:

Press **BASIC** menu > **SETTINGS** > **EXPERT MENU** > **MENU SELECTION** > **SETPOINT 1** > **Const. K EC**

Press from **EXPERT** menu go into > **MENU SELECTION** > **SETPOINT 1** > **Const. K EC probe**

ANALOGUE 4-20MA OUTPUTS

The instrument features two outputs with signal in current in mA. The 4-20mA signal follows the settings of the **K** Factor cell constant selected previously. The mA output provides two operating modes to be selected according to the system's operational requirements:



The 4-20mA1 / 4-20mA2 outputs follow the settings selected in the menu **K Constant of EC probe and Setpoint**.

Press **OK/MENU** to go into mA mode.

mA1

mA2



Menu Selection

4 - 20 m A1

Menu Selection

4 - 20 m A2

*Programming according to selected **EC probe K factor** Valid for: 4-20mA1 / 4-20mA2

SETTING 4-20mA

◀ **mA Output Mode** ▶

m A Device

The 4-20mA proportional analogue outputs are related to the 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

SETTING 4-20mA

◀ **mA Output Mode** ▶

m A Device

SETTING 4-20mA

◀ **Measurement** ▶

0 μ S

SETTING 4-20mA

◀ **Measurement** ▶

0 μ S

SETTING 4-20mA

◀ **Measurement** ▶

20.00 m S

Select the value corresponding to 4 and 20 mA based on conductivity **EC Setpoint** settings in the Purge menu.

SETTING 4-20mA

◀ **Measurement** ▶

20.00 m S

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

SETTINGS

Menu Selection

Settings



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

◀ **Temp. Sensor** ▶

Manual

* EXPERT MENU *

SETTINGS

◀ **Temperature** ▶

25° C

* EXPERT MENU *

Manual temperature offset 0-100°C.

Press ◀▶ to show the ambient temperature.

When selecting AUTO offset for temperature/electrode measurements, always give the exact value against the current temperature.

SETTINGS
◀ **Temp. Sensor** ▶
Automatic

SETTINGS
◀ **Temp. Calibrat.** ▶
100 ° C

Press ◀▶ to show the ambient temperature and calibrate the sensor.

SETTINGS
◀ **Temp. Correction** ▶
0 . 0 % / ° C

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.

SETTINGS
◀ **Modbus Address** ▶
0
* EXPERT MENU *

SETTINGS
◀ **Modbus Baudrate** ▶
38400
* EXPERT MENU *

SETTINGS
◀ **TCP Address** ▶
192.168.1.100
* EXPERT MENU *

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 eSelect M series is connected to the external RS485 / ETHERNET module (for the settings, refer to the CONNECTION manual).

SETTINGS
◀ **Backlit.Min.Lev.** ▶
30%
* EXPERT MENU *

Adjusts display backlighting obtaining energy savings;

SETTINGS
◀ **Lingua** ▶
Italiano
* EXPERT MENU *

To select the language of the programming menu (*Italian/English*).

SETTINGS
◀ **Reset** ▶
NO

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.

SETTINGS
◀ **Reset** ▶
YES

SETTINGS
CONFIRM?
NO

SETTINGS
CON

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

Notes on CONDUCTIVITY PROBES

NOTE FOR CONDUCTIVITY SENSORS

The eSelect M - CD COOL 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.

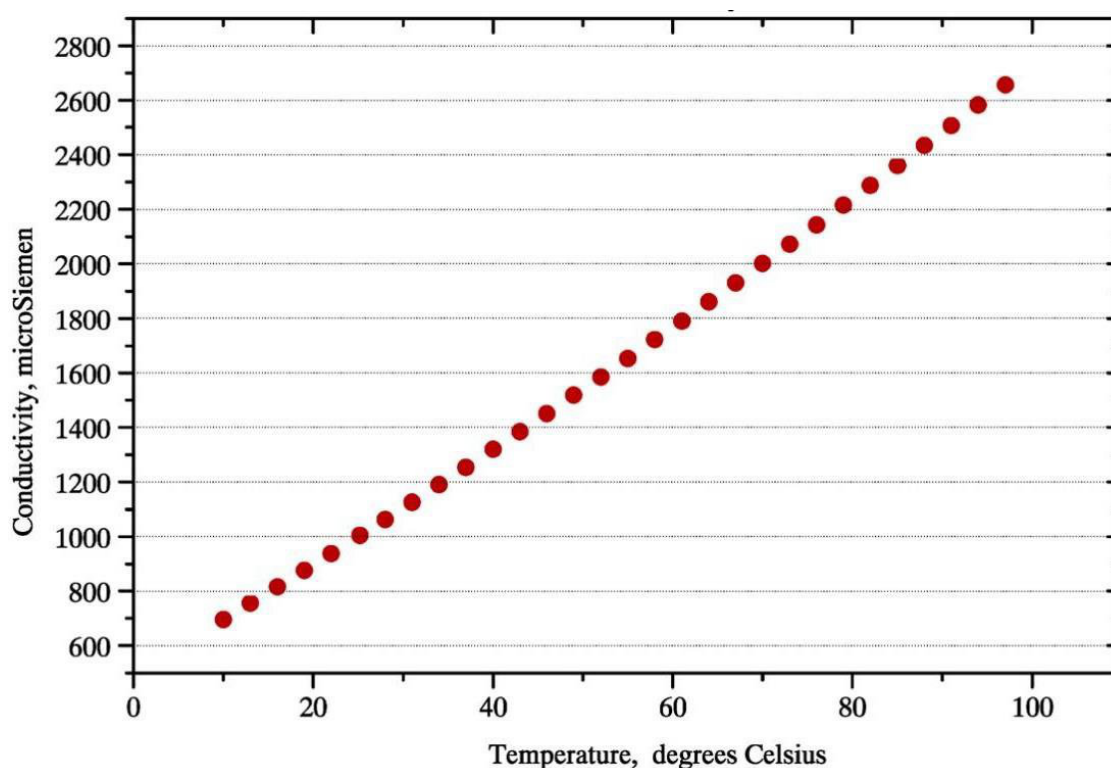
The instrument is NOT suitable for inductive sensors!

The eSelect M - CD COOL 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.

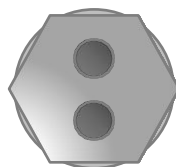
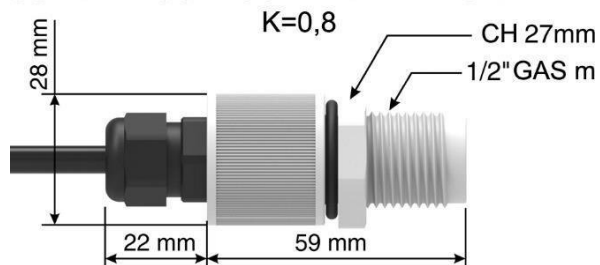
IMPORTANT: the conductivity ranges described above are only indicative; considering that, for example, a K1 probe (range 20 mS) is able to perform fair measurements below 2000 μ S, only resolution will be less accurate. However, the same concept does not apply to higher ranges

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.

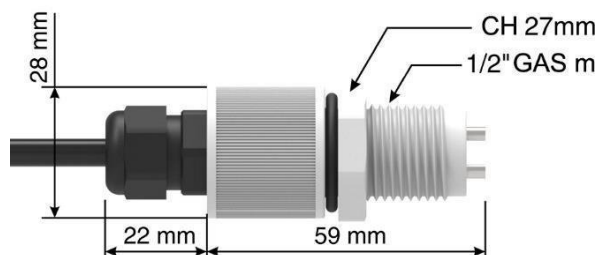


SONDA DI CONDUCTIBILITA PTFE GRAFITE



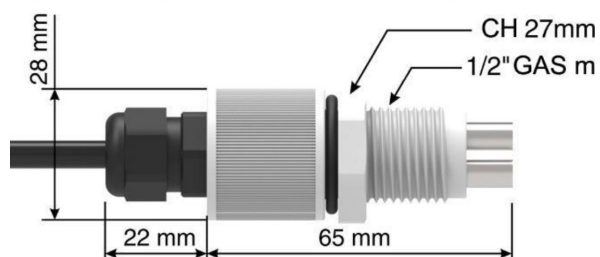
Model: **STGEC**
 Code: 99210014
 Electrodes: GRAPHITE
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 135 gr.
Cell constant K:
 Range K0.8: standard 20 mS (20,000 μ S)
 Able to measure up to 100 mS (100,000 μ S)

SONDA DI CONDUCTIBILITA PTFE/AISI K=1



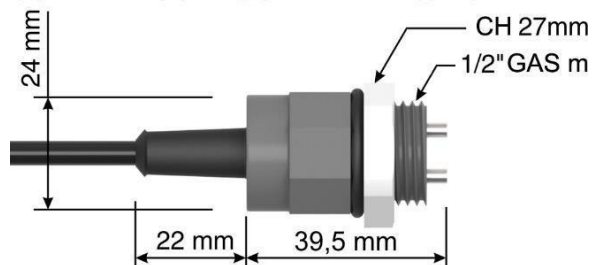
Model: **STEC K1**
 Code: 99210008
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 135 gr.
Cell constant K:
 Range K1: standard 20 mS (20,000 μ S)

SONDA DI CONDUCTIBILITA PTFE/AISI K=5



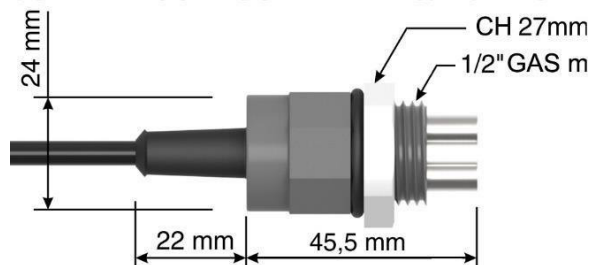
Model: **STEC K5**
 Code: 99210009
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PTFE
 Cable length: 3 m
 Weight: 137 gr. 135 gr.
Cell constant K:
 Range K5: standard 20 mS (20,000 μ S)

SONDA DI CONDUCTIBILITA PVC/AISI K=1

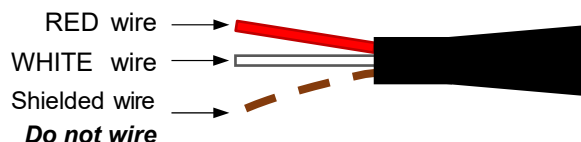


Model: **SEC K1**
 Code: 99210018
 Electrodes: AISI 316
 Pressure: 8 bar Max
 Body: PVC
 Cable length: 3 m
 Weight: 135 gr.
Cell constant K:
 Range K1: standard 20 mS (20,000 μ S)

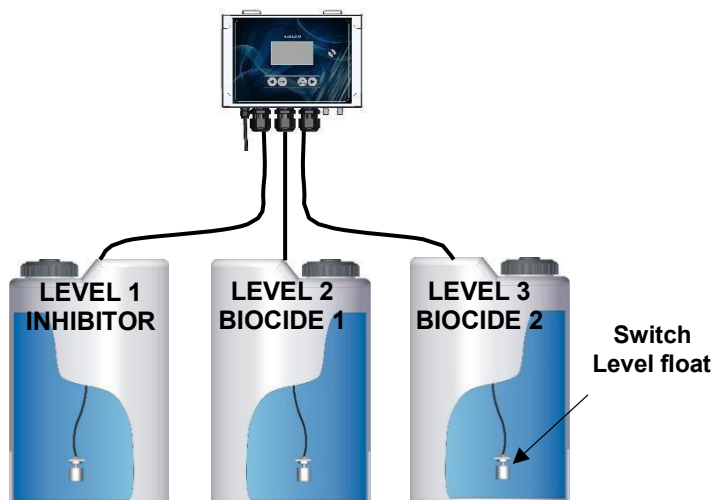
SONDA DI CONDUCTIBILITA PVC/AISI K=5



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)



Installation of LEVEL PROBES and TANKS for chemical products



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)	Conductivity levels are NOT stable	Check again using a portable instrument, especially the temperature
	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.
- If the results show correct unit operation, this means the issues lie within the system.
 - 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.

Suggestions for troubleshooting CONDUCTIVITY SENSORS

- **Slow Response:** typically due to excessive length of the collection system and slow flow, which therefore results in long delays in sample conveyance. Solve by adding a fast flow circuit with the sensor on the short current side or by shortening the line. A slow response may also be caused by a dirt buildup in the collecting line. In this case the problem may be mitigated by changing the collection point and installing a knock-out pot.
- **Constantly low readings/low peaks:** typical of bubbles in the collection line that remain between the probe electrodes.
- **Gradually decreasing readings:** the instrument cannot be adequately calibrated. This problem is typical of scaling or deposits of fouling/sludge on the sensor. The sensor must be cleaned.
- **Maximum readings** in any condition: first of all ensure the instrument is showing the conductivity by using a portable conductivity meter.

