

AG SELECT B2 / B3



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UK OPERATING INSTRUCTIONS AND MAINTENANCE

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Package contents



AG-SELECT controller



Instructions manual



service connectors kit

1. General informations

Electronic instruments controlling electrochemical parameters such as pH, Redox or Chlorine are widely used in swimming pools, waterworks and water treatment plants.

The B Series Controllers stand out for the following features:

- Capability of performing the most possible measurements with just one type of electronic board: pH, Redox (mV), Cl (ppm).
- Simple and easy to learn programming procedure providing two types of menu: an EXPERT menu allowing the user to control indispensable functions, and a SIMPLE menu giving the user the full capability of setting all functions.
- Galvanically isolated electronics providing a high level of immunity to disturbances.

2. Technical data

Parameter	Value	
Tensione di Alimentazione	90 - 240 Vac 50/60Hz	
Power consumption	8 W (1A peak current)	
Operating temperature range	0 – 40 ° C	
SETPOINT relay output terminals	16 Ampere with resistive load. 3 Ampere with inductive load.	N° 2 Setpoint
Auxiliary relay output terminals	5 Ampere with resistive load. 0,7 Ampere with inductive load.	N° 1 auxiliary outputs
Alarm relay output terminals	5 Ampere with resistive load. 0,7 Ampere con carico induttivo.	N° 1 Alarm output
Current output	4 - 20 mA (dynamic 0..500Ω)	N° 2 current outputs
TTL output	0 – 999 pulse/min	N° 2 TTL outputs
PH measure	0 ... 14	0,01 Resolution
RX (mV) measure	- 1000+1400	± 1 mV Resolution
Chlorine measure	0...20 ppm	0,01 ppm Resolution
Temperature measure	0 – 100 °C	0,1 °C
Level control – PT100 connection – Relay output 6A (resistite load) 1A (inductive load).		

3. B2 connection diagram

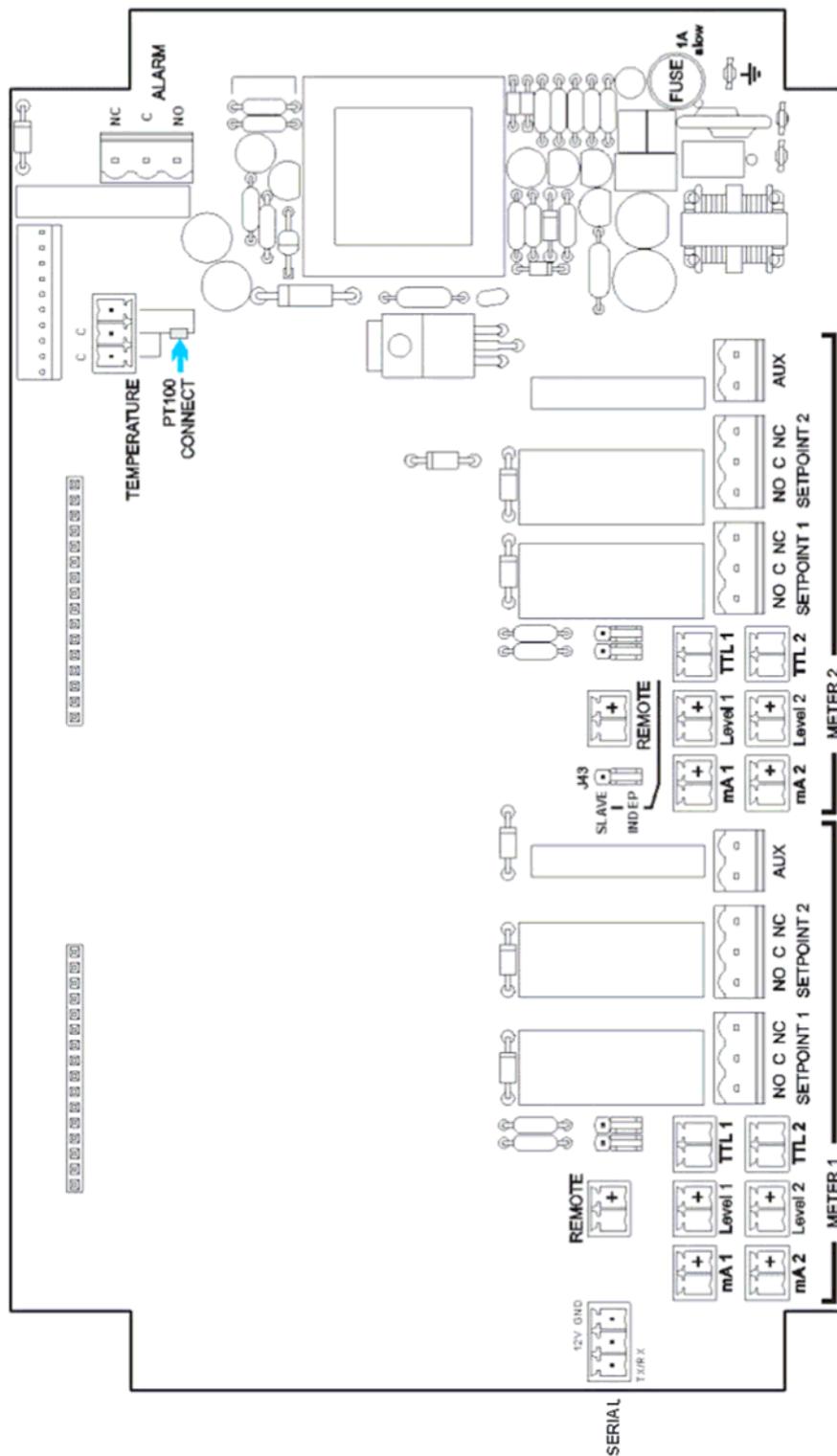


Fig 1

3.1. TTL connection diagram for B2 instrument

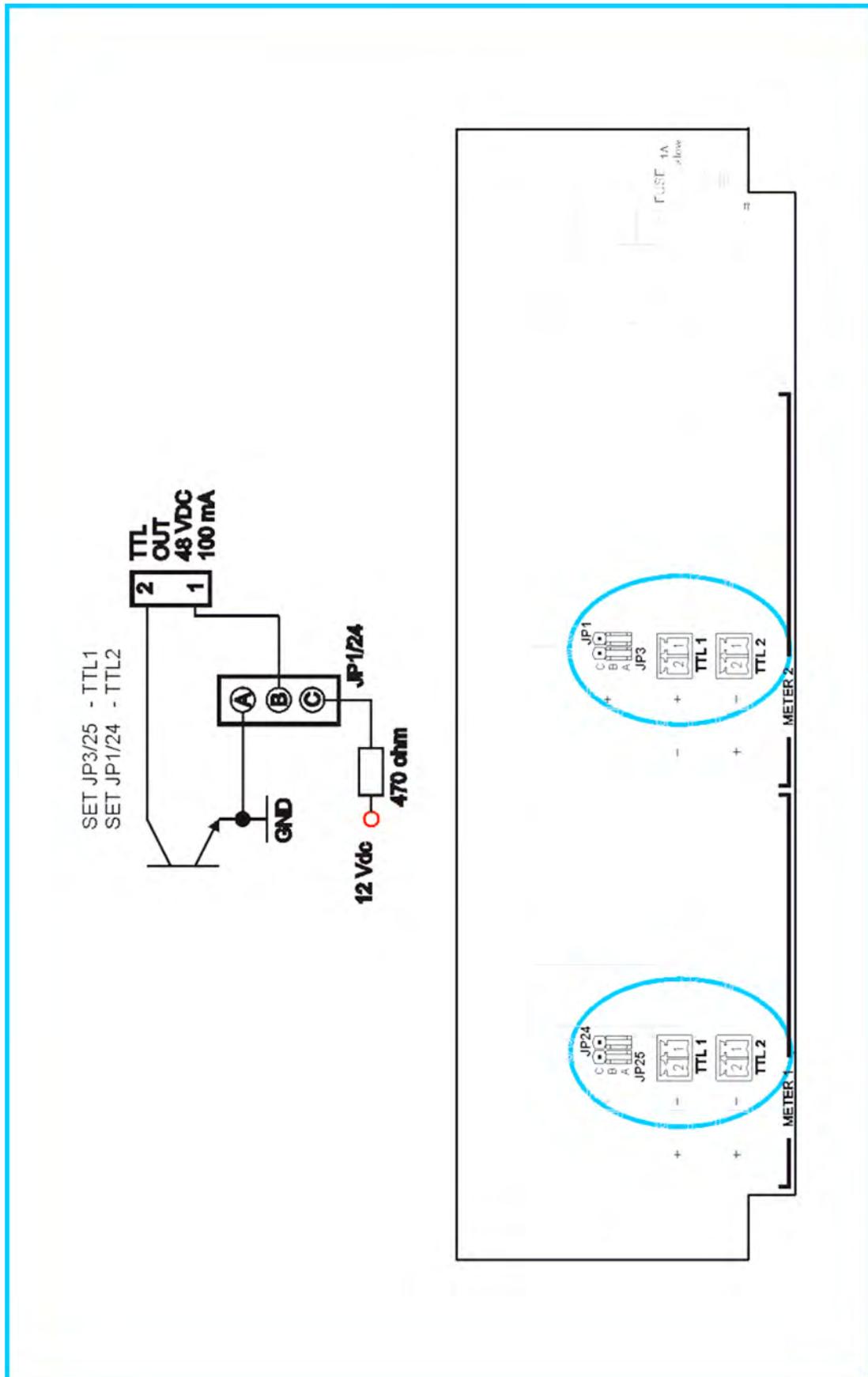
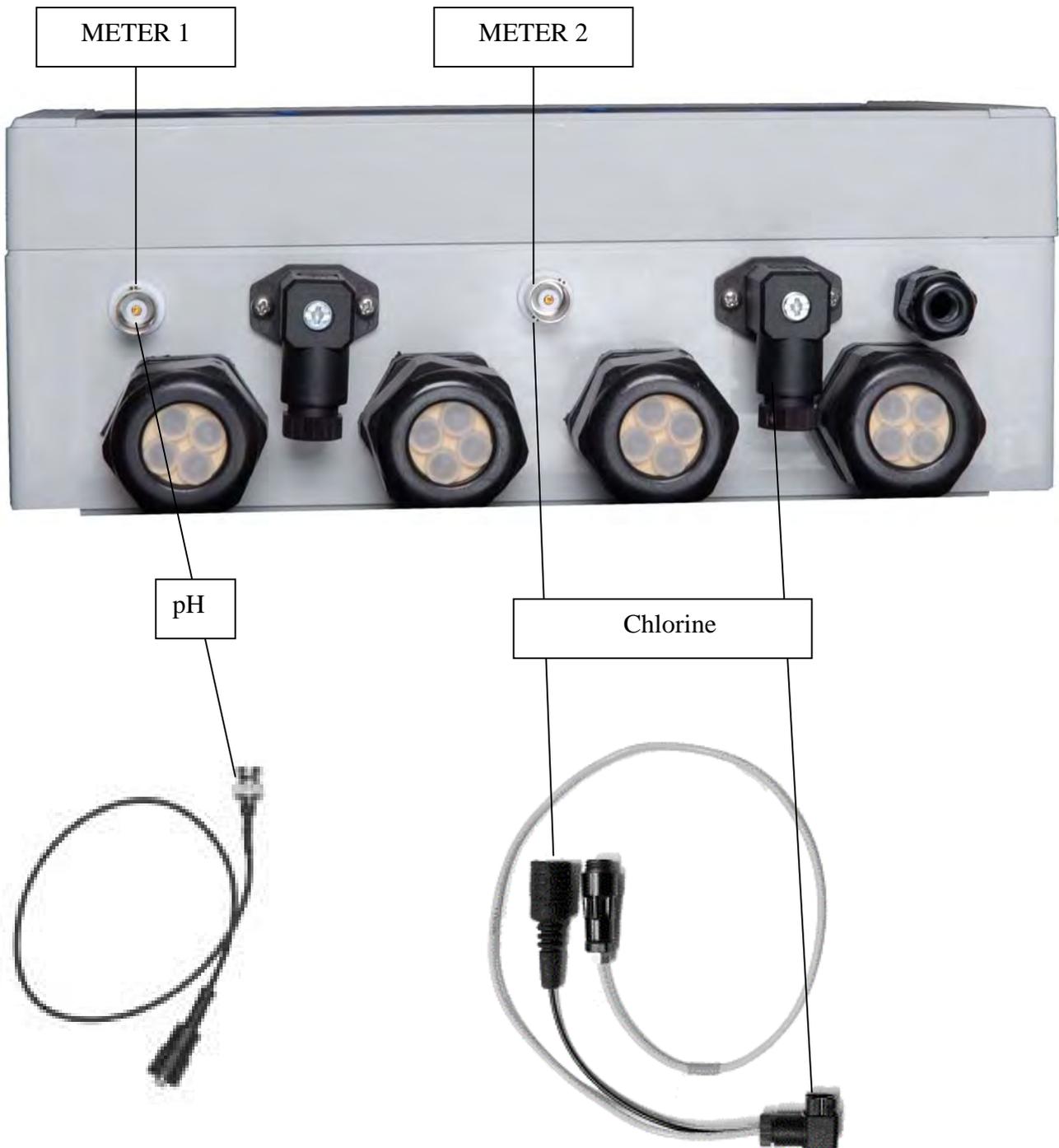


Fig 2

3.1.1 Electrodes connections for B2 instrument



4. B3 connection diagram

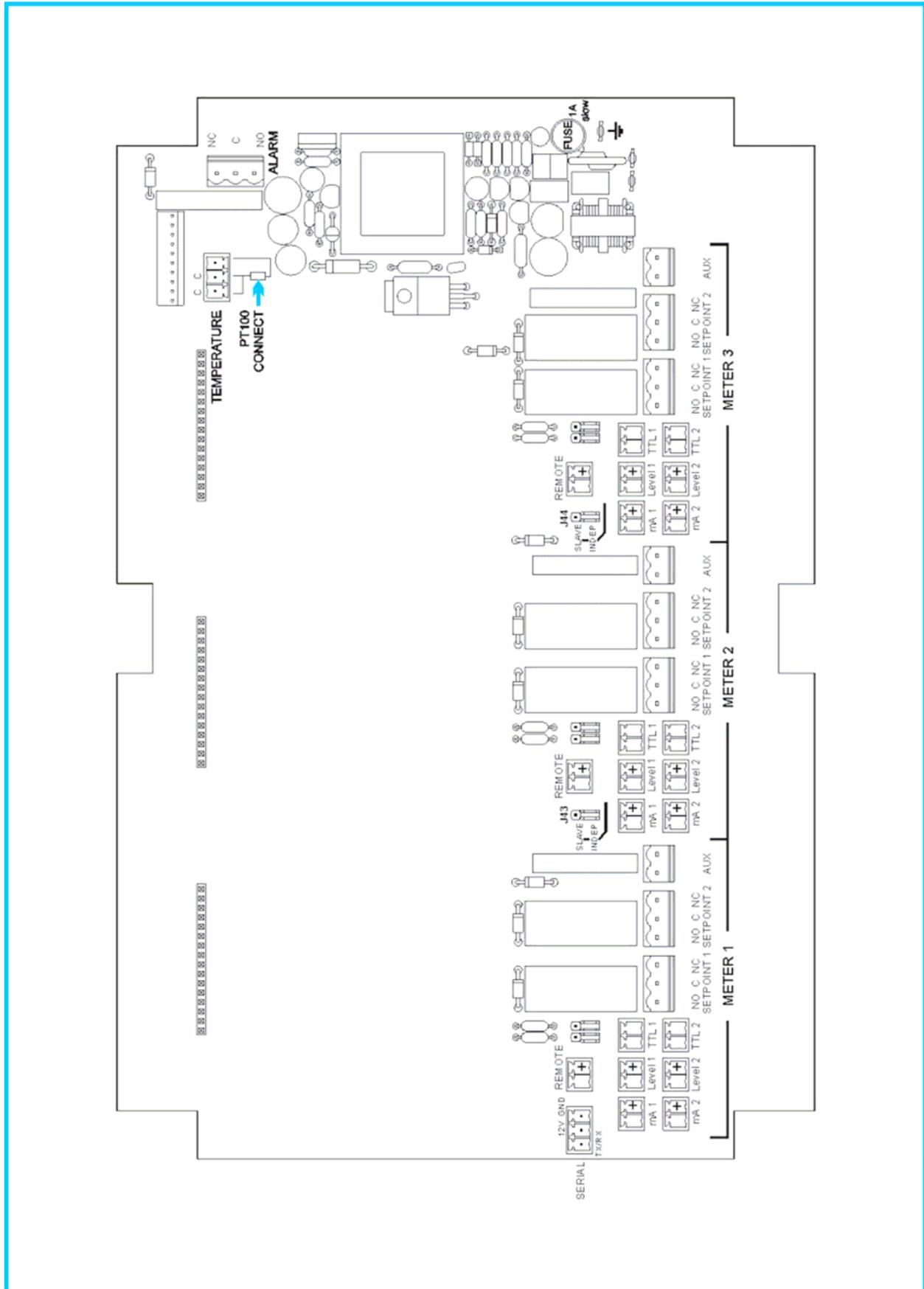


Fig 3

4.1. TTL connection diagram for B3 instrument

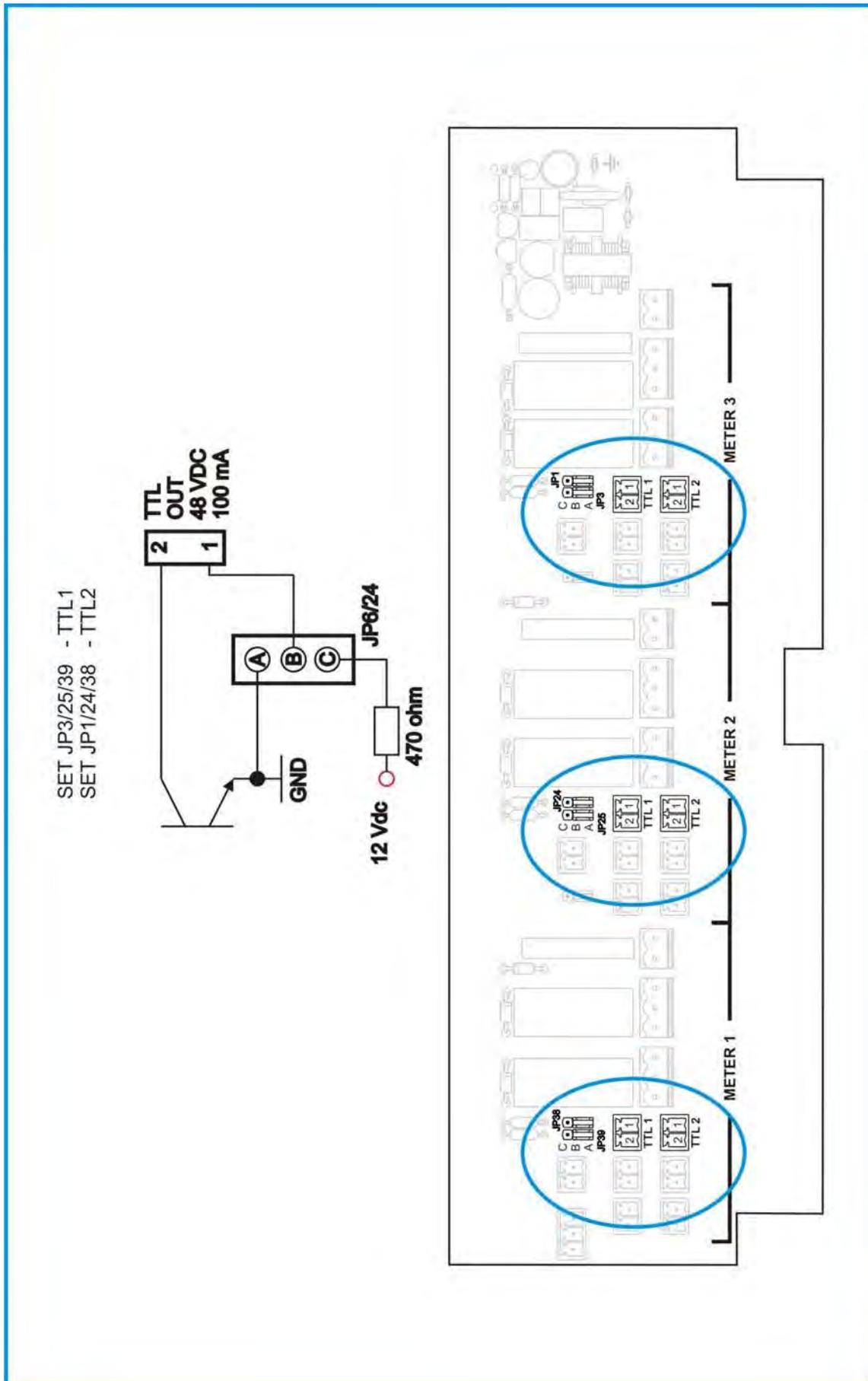
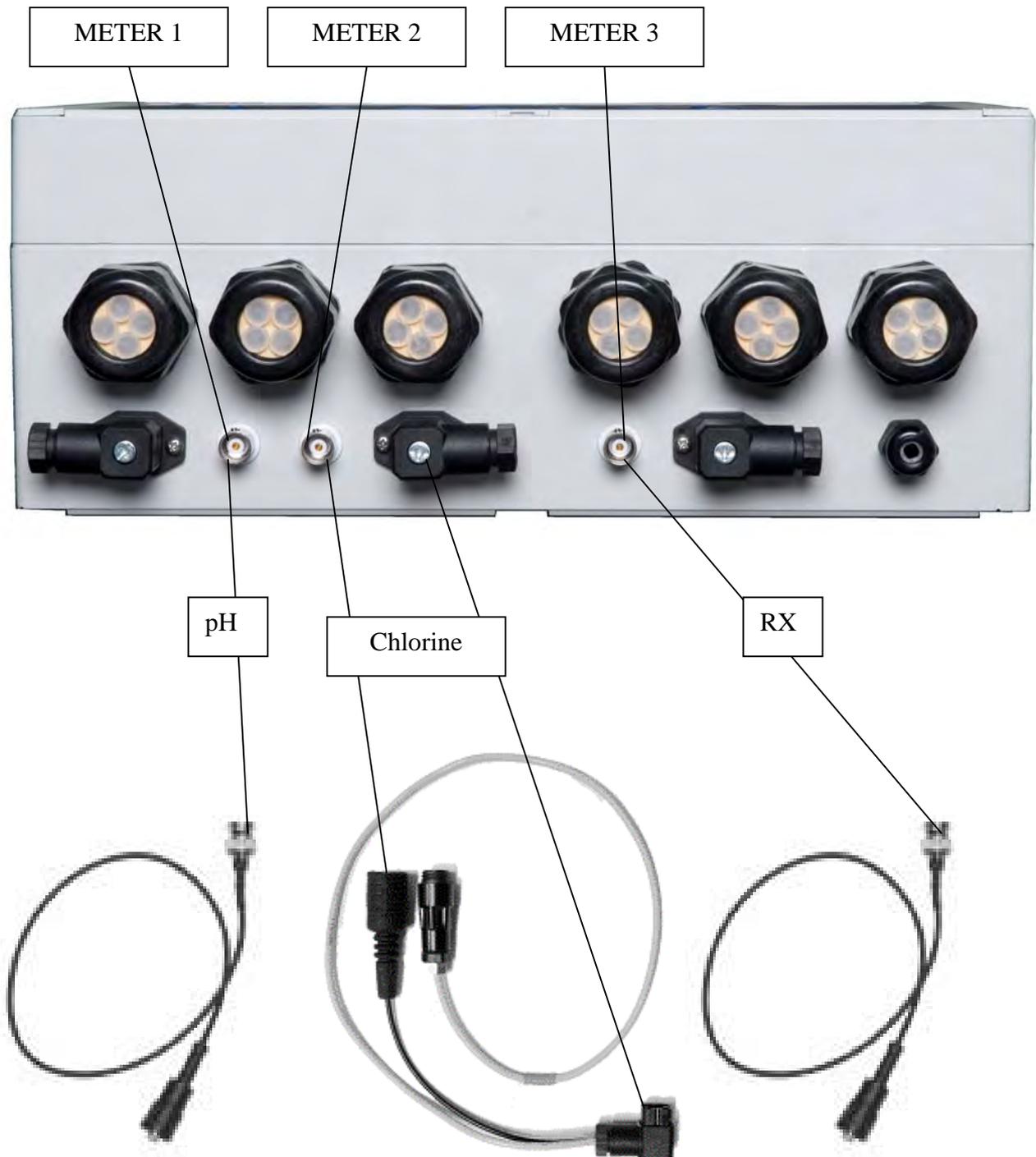


Fig 4

4.1.1 Electrodes connections for B3 instrument



5. Display description

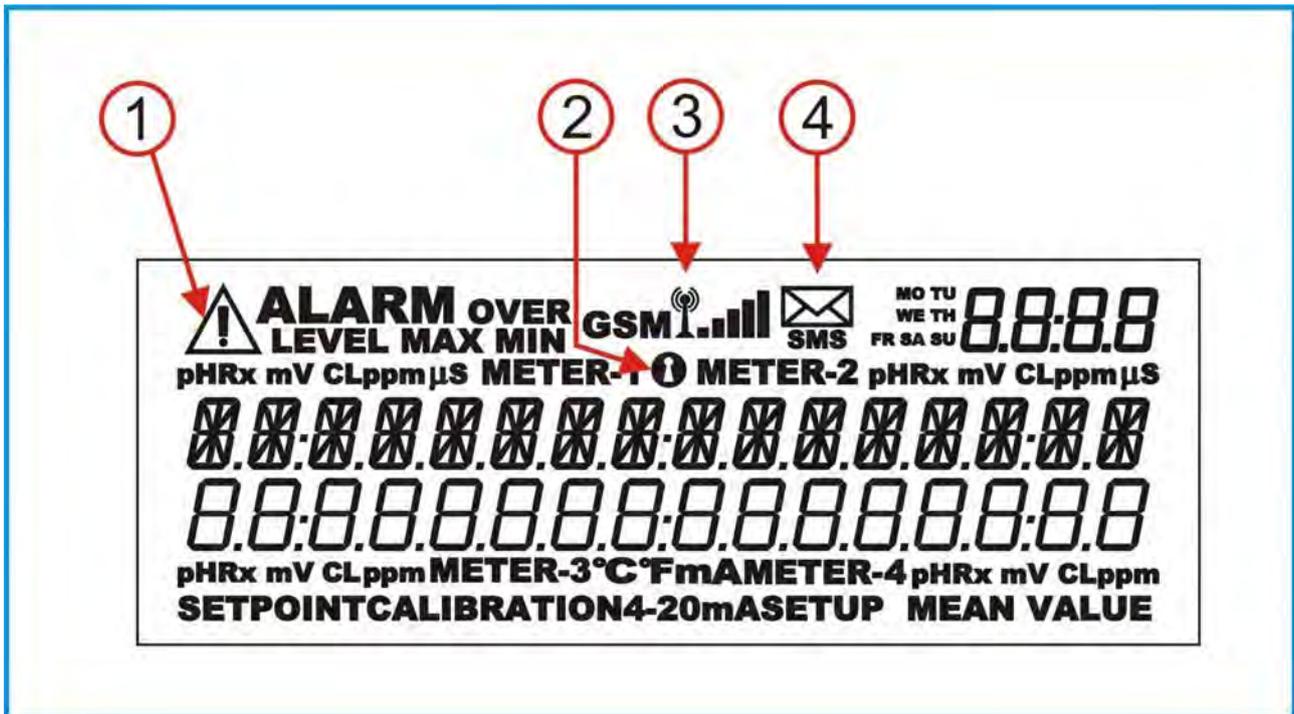


Fig 6

Icona n° 1 – Alarm status

Icona n° 2 – Password

Icona n° 3 – GSM device connected and operating

Icona n° 4 – GSM forwarding or receiving

6. B2-B3 Control panel description



Fig 7



Fig 8

6.1. Light signs

	<p>SET 1 Attivo</p>
	<p>SET 2 Attivo</p>

6.2. Keyboard

	<p>ESC – Comes one step back in the programming procedure.</p>
	<p>Minus symbol – Decreases numbers and defines functions within specific programming menus. E.g.: when selecting the type of measurement allows the user to shift between pH, Rx and Chlorine.</p>
	<p>Plus symbol – Increases numbers and defines functions within specific programming menus. E.g.: when selecting the type of measurement allows the user to shift between pH, Rx and Chlorine.</p>
	<p>Shift right – Used to select the digit to modify when setting passwords or times.</p>
	<p>Meter – Used to select the type of measurement “METER 1, 2 o 3”</p>
	<p>OK - Allows the user to proceed by confirming the selections.</p>

7. Overall dimensions

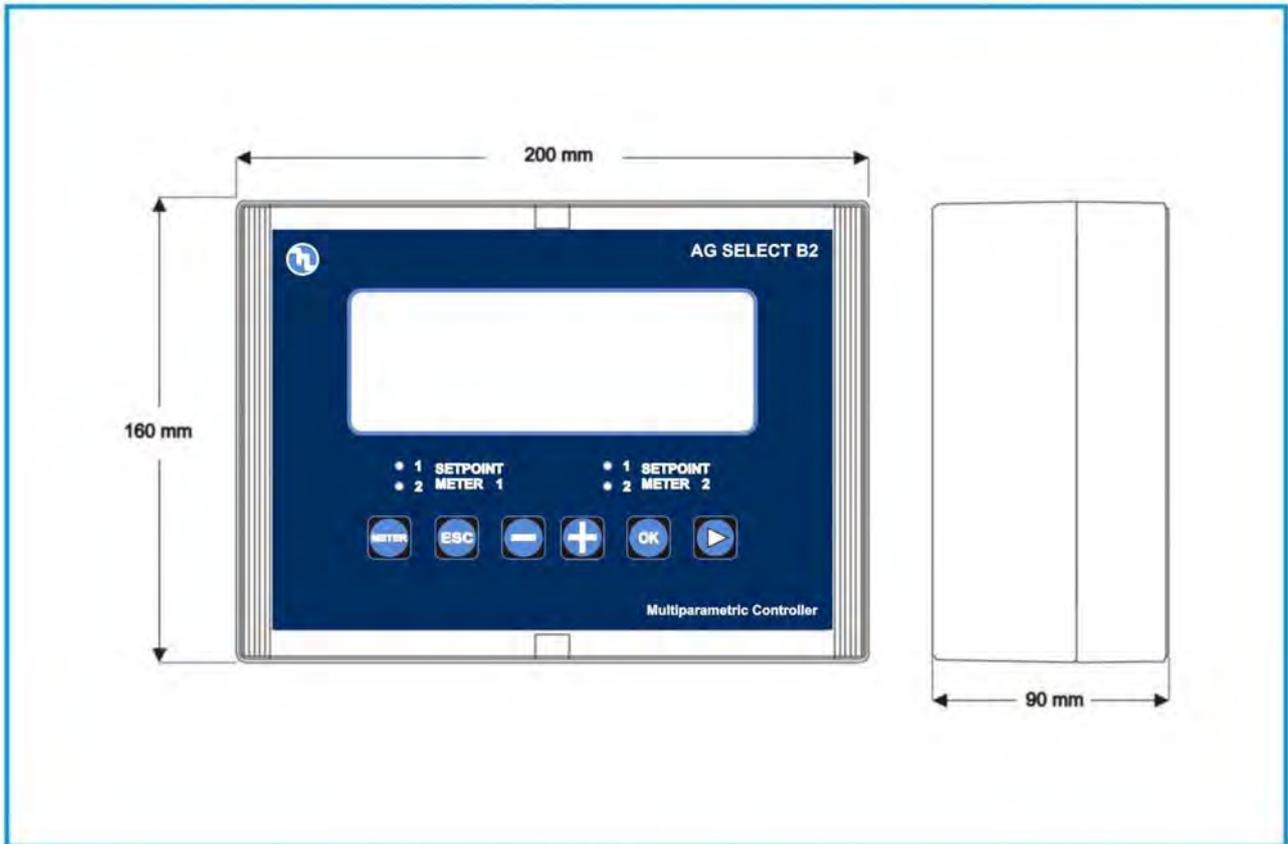


Fig 9

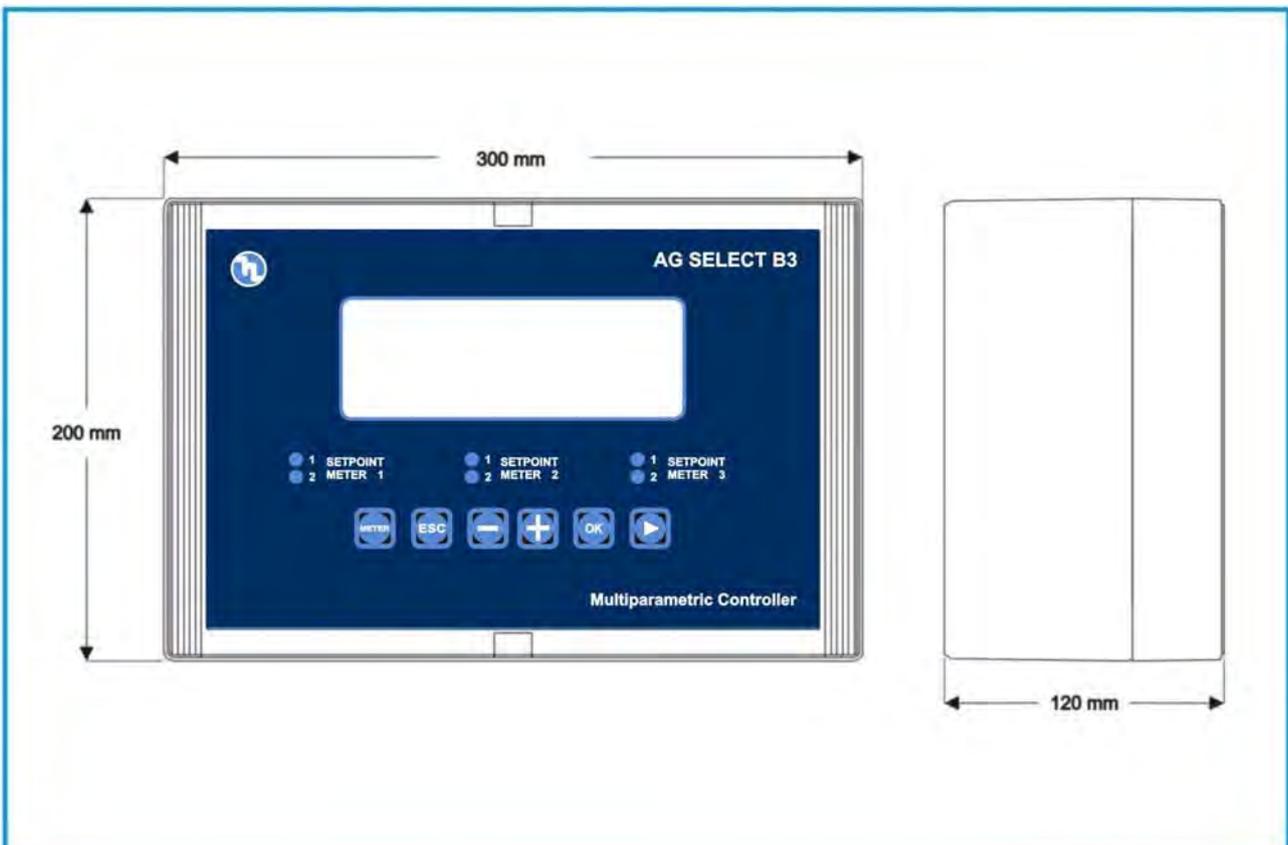


Fig 10

8. Defaults parameter

N°	Function	Default Ph	Default RX – Mv	Default Cl – ppm
1	Setpoint 1-2	7,2	600	1
2	Type of action	Acid	Oxidising	Direct
3	Hysteresis	0,05	10	0,05
4	SETPOINT 1 and 2 actuation delay	00:03 m:s	00:03 m:s	00:03 m:s
5	TTL 1 and 2 outputs max frequency	120	120	120
6	Measurement at TTL 1 and 2 max frequency	14,00	1400	14
7	mA output 1 and 2, measurement at 4 mA	0,00	0	0
8	mA output 1 and 2, measurement at 20 mA	14,00	1400	10
9	Alarm - high threshold	14,00	1400	10
10	Alarm - low threshold	0,00	0	0
11	Alarm - overdosage (OVER)	99:59 h:m	99:59 h:m	99:59 h:m
12	Menu mode	BASIC	BASIC	BASIC
13	Password	OFF	OFF	OFF
14	Temperature unit	°C	°C	°C
15	Temperature compensation mode	Manual 25°C	Manual 25°C	Manual 25°C
16	Calibration menu delay	5'	5'	5'
17	Actuation delay when switching on	5"	5"	5"

9. Programming the controller

All programming parameters and modes of operation of the instrument can be set by using its keyboard and dedicated display.

9.1. Starting controller operation

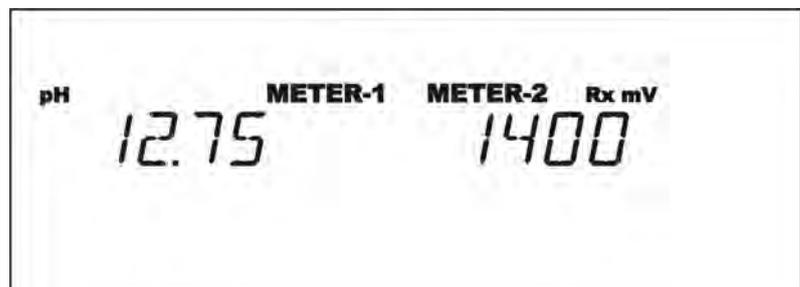
Three types of probes can be connected to the instrument for each channel; the device is factory programmed as follows:

- METER 1 - Ph
- METER 2 - Chlorine
- METER 3 - Redox

To modify that selection, the initial configuration must be changed by setting the EXPERT mode during SETUP; there is nothing to prevent the user from having the system work simultaneously with three pH measurements or, for example, two pH and one Chlorine measurements.

To change the initial configuration, see Section 9.2.3.

LCD AG SELECT B2
operation mode



LCD AG SELECT B3
operation mode



9.2. Programming procedure

9.2.1. Selecting the measurement channel

When installing the controller for the first time, the user must configure it depending on the intended type of measurement or control.

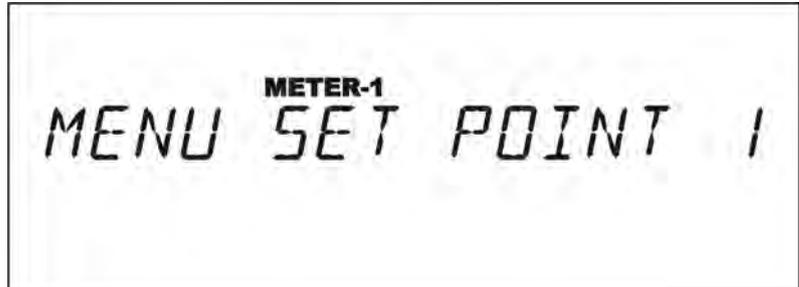
The first action for the user to carry out is setting the operation modes for every measurement outlet: METER 1 and 2 for B2 controller, and METER 1, 2 and 3 for B3 controller. Selection is made by pressing



METER button



Press the  key to select the measurement channel to configure and enter the relating programming menu.



When setting the instrument, it is advisable to follow the programming procedure outlined below. Conversely, if only a single parameter must be changed, it is advisable to go directly to the menu comprising the concerned function, and perform the necessary changes or settings.

The MAIN menu is comprised of 6 submenus, by using which all controller's functions can be set:

SETPOINT 1 – SETPOINT 2 – 4 20 Ma – CALIBRATION – ALARM – SETUP.

The 4 20 mA and ALARM menus show up only in the “EXPERT” mode

9.2.2. Main menu

After selecting the measurement channel, the main menu is available to set the various functions of the controller.

To navigate within the main menu, press the



keys and select the function that needs programming. When the function that needs programming shows up on the display



press the key to confirm the selection made and enter the corresponding menu.



9.2.3. Setting up the controller

When the display shows “MENU -



SETUP” press the key; Two types of programming are available: the advanced mode (EXPERT) allows the experienced user to set all parameters affecting pH control; the simplified mode (SIMPLE) allows control of only a few parameters essential for controlling the measured value.

To shift between the EXPERT and SIMPLE selections use the followings



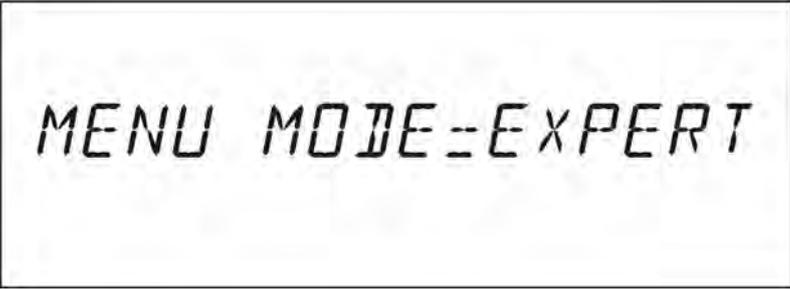
keys



press key to confirm the selection.

A rectangular box representing a digital display showing the text "MENU SETUP" in a monospaced, uppercase font.

MENU SETUP

A rectangular box representing a digital display showing the text "MENU MODE=EXPERT" in a monospaced, uppercase font.

MENU MODE=EXPERT

A rectangular box representing a digital display showing the text "MENU MODE=SIMPLE" in a monospaced, uppercase font.

MENU MODE=SIMPLE

BEWARE!

The instrument can carry out three distinct types of measurement: pH, Redox or Chlorine; that means that, depending on the requirements of the system and type of probe connected, the user can decide what type of measurement to control. To outline the programming procedure, the example shows the pH control setting, however the procedure is the same for controlling the Redox potential or Chlorine.

As soon as the type of programming is defined, the type of measurement that the instrument is to control can be set: pH, Redox or Cl-ppm.

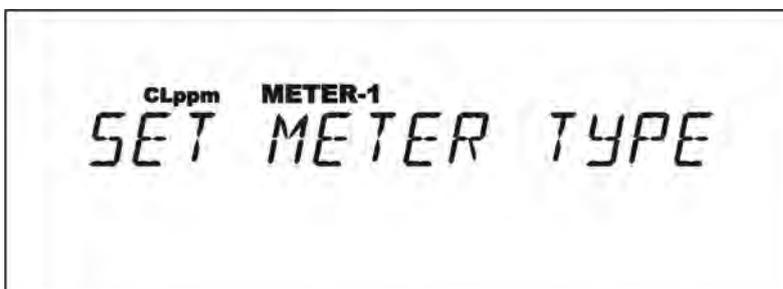
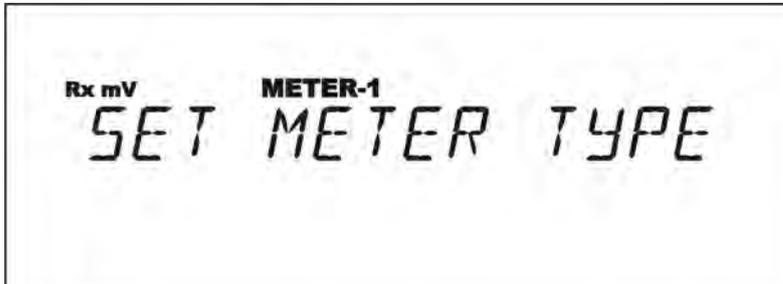
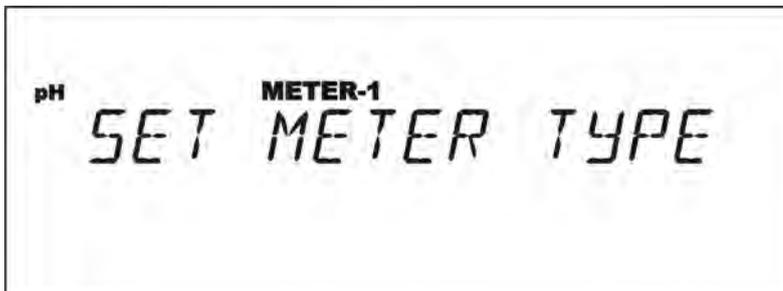
Use below keys to select the type of



measurement



press the key to confirm the selection.



The selection of the type of measurement needs to be changed only when the type of probe is changed.

As soon as the measurement is selected, proceeding within the SETUP menu, the user can decide to activate the password security and the relating 6 digits code.

The password can be any number between 000000 and 999999:

Press the key



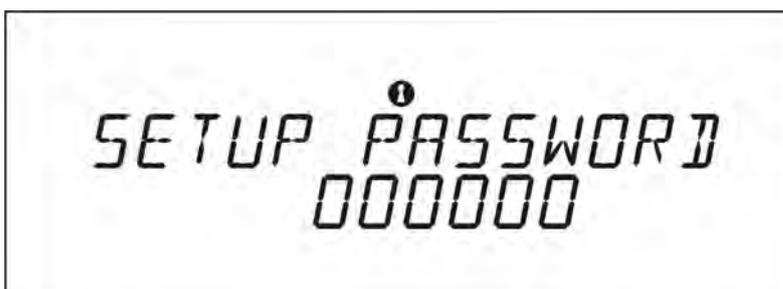
to select the digit to set and press



keys to set the selected digit; press the key



to confirm. Repeat the procedure for every digit to be set.



As soon as the password is set, the unit of measure for temperature can be selected (°C or °F). Press



keys & to confirm the selection.

TEMPERATURE UNIT

°C

TEMPERATURE UNIT

°F

As soon as the unit of measure is set, the instrument allows two distinct modes of temperature compensation to be defined: through a PT100 probe, or setting the temperature manually.

TEMP.SENSOR=NONE

In case the TEMP.SENSOR=NONE function is selected, the reference value will be requested, while if the TEMPERATURE=PT100 function is selected, the instrument will read directly the temperature value from the probe connected to the terminal board.

TEMP.SENSOR=PT 100



Press

keys to select the function and



key to confirm.

If the manual function is selected, the instrument's display shows the default temperature (25°C); by



pressing the keys the temperature value can be set in the range between 0 and 99.9°C.



Press the key to confirm settings.



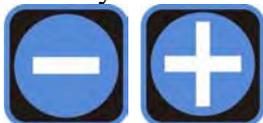
Proceeding with the SETUP menu, two time values can be set:

CAL MENU TIMEOUT, representing the exit delay time from the programming menu in case no keys are pressed during the probe calibration stage;

DELAY AT STARTUP, defining the delay time of measurement actuation from switching on the instrument.



To carry out the setting on both menus, press



intended delay time (m:s) and



key to shift from minutes to seconds and back, lastly press



to confirm settings.

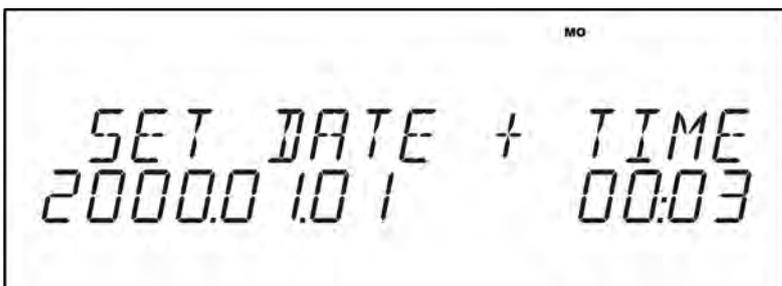


The controller has a calendar and an internal clock for the management of the exits with timer and the storage of the data recorded by the controller; in order to set up the clock the following settings must be carried out.

Select the programme on which the settings need to be carried out by pressing the



key and change the chosen



value by using the keys  



Once the date and time are set, by pressing the  key, the SETUP menu (main) can follow; thanks to the clock with date setting, two functions have been integrated: **Flocculant** and **Cleaning** which activate in timer and schedule mode, some auxiliary relays (one for each measure channel).

By using the Flocculant function it is possible to activate the flocculant dosing system, up to a maximum of 4 interventions (timer and scheduled mode) during the day.

By using the Cleaning function it is possible to activate a dosing pump for the cleaning of the electrode, up to a maximum of 4 interventions (timer and scheduled mode) during the day; the difference from the flocculant mode, is that the Cleaning mode interrupts the tool's operations (disabling the set-point). At the end of such intervention the tool awaits the start up time (see Start-up delay).

Using   buttons select the function that needs to be activated

Activate, by pressing  when "off" appears on the display, the Setup menu is disabled and none of the two functions is activated; otherwise press the button

 when the function that needs to be activated appears on the display: Flocculant or Cleaning.



Once one of the two functions is activated (flocculant or cleaning) it is necessary to set the auxiliary outputs that need to be activated.





By pressing the buttons   select the days in which the auxiliary output needs to be activated; scroll down all the possible options until the day or the combination of days that need to be activated appears:

- Off.
- Whole week.
- 5 day week.
- 6 day week.
- Saturday and Sunday.
- Days odd numbered.
- Days even numbered.
- Monday.
- Tuesday.
- Wednesday.
- Thursday.
- Friday.
- Saturday.
- Sunday.



After having selected the days or the day in which the intervention needs to be carried out, the



activation time needs to be set. Press the buttons to set the hours or the minutes



and use the button to select the field (hours/minutes) on which to carry out the settings.



Carry on with the programming to define the activation times by pressing the key

After having established the day or days of the intervention, the duration of it needs to be set. Regarding the **Cleaning** function, it is possible to set the seconds of the auxiliary output activation, where the message on the display is as follow:



Use the keys to set the seconds of activation.



In the case of the **Flocculant** function it is possible to set hours and minutes of activation of the auxiliary output; the message appearing on the display is as follow:



Use buttons to set the hours or the minutes of activation.



Use the button to select the field (hours/minutes) on which to carry out the setting of the activation time.

9.2.4. Calibration menu

The CALIBRATION menu allows the user to calibrate the probe by using reference solutions.

Dipping the probe in the pH 7 buffer solution is the calibration procedure's first step.

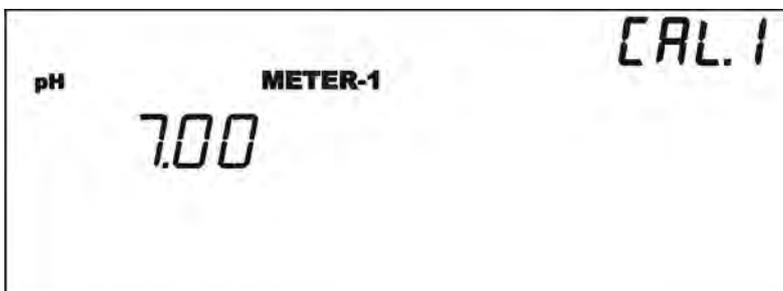


Select the CAL function from the main menu by pressing the  key.

Once in the calibration function, the display shows the message CAL.1; at this point press the

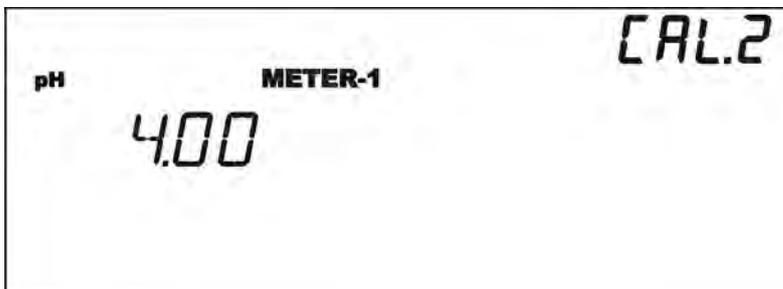


until the value



7.00 shows up, then press  key to confirm the operation; the display shows the message CAL.2.

Dip the probe in a pH 4 or pH 9 buffer solution.

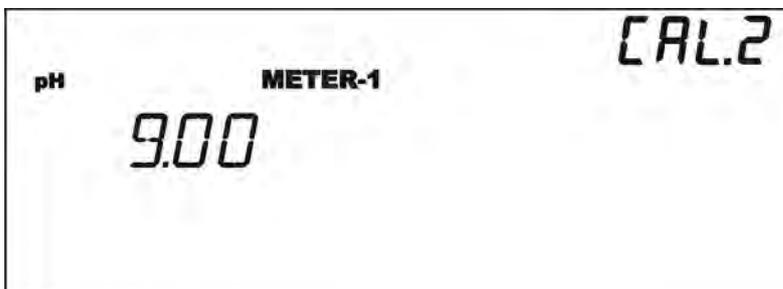


Press



until the value

4.00 or 9.00 shows up,

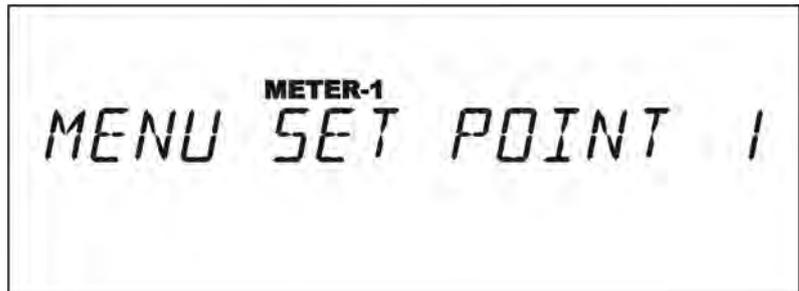


then press the  key to confirm the operation.

The instrument is so calibrated.

9.2.5. Setpoint settings

After setting up and calibrating the instrument, the SETPOINT values must be set: the instrument features two independent SETPOINT for each measurement, actuating two corresponding relay outputs. The reference values to be adopted as target values for the system can be set by programming the SETPOINT 1 or 2 menu.



Choosing the SETPOINT to set (1 or 2) by pressing the  key is the first operation to carry out.

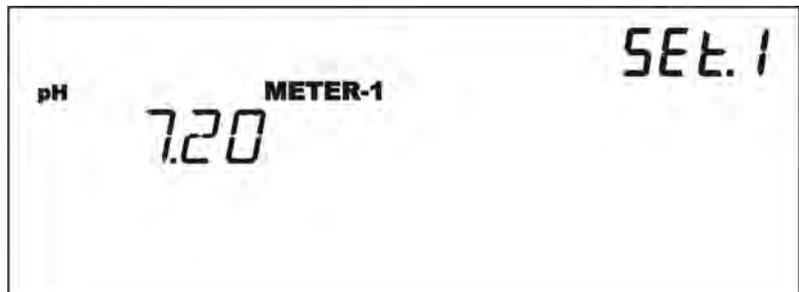
At this point in the programming procedure the intended value must be set by pressing the



or



keys.



Confirm the operation by pressing the

 key.

Defining the type of actuation is the next step: in the case of pH measurement the choice is between an acid or alkaline actuation, for the Rx measurement the choice is between REDOX and OXIDANT, for the Chlorine measurement the choice is between INVERSE and DIRECT.



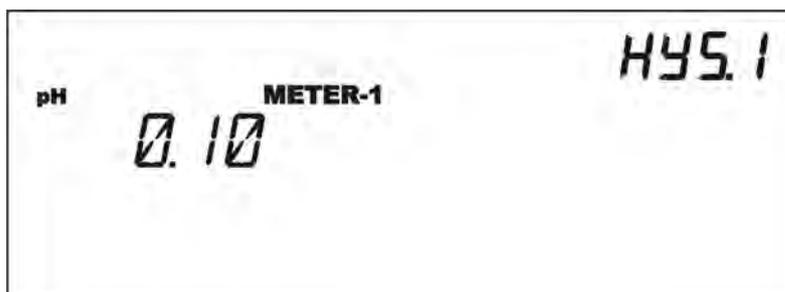
Press   keys to define the type of actuation and



press the  key to confirm the choice.



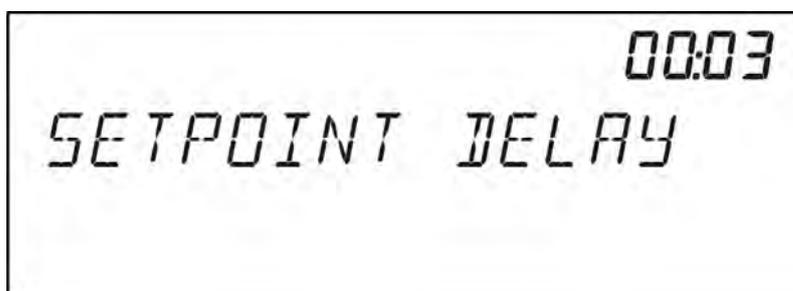
After defining the type of actuation, setting the hysteresis value is the next step.



Press   keys to set

the value, press the  key to confirm choice.

The Controller allows the user to define a delay time relating to SETPOINT actuation. Set the following value to activate that function.



Press   keys to set the minutes or seconds, press the

 to select the field to change

(minutes or seconds) and confirm the choice by pressing the  key.

The instrument features one TTL output for each SETPOINT, that can operate in the proportional or ON-OFF mode.



Press the   keys to choose the operation mode of the TTL output selected:

PROPORTIONAL or ON-OFF.

In the proportional mode the frequency of pulses decreases approaching the SETPOINT until the minimum set value is reached, whilst in the ON-OFF mode the TTL output is actuated when the corresponding SETPOINT relay changes its position.



Press the  key to confirm the choice.

When choosing the proportional mode, three parameters must be set to allow the TTL output to operate correctly, as follows:

1. Measurement value at maximum frequency
2. Maximum frequency value (between 0 and 999 pulse/min)
3. Frequency value corresponding to the SETPOINT.
4. Pulse amplitude setting.

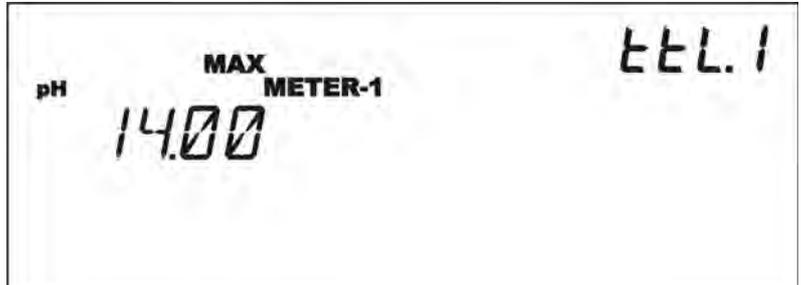
To set the measurement value at maximum frequency press the



keys.



Then press the  key to confirm the choice.



At this point the instrument asks the maximum frequency value; press the



keys and then



press the  key to confirm the choice.



As soon as the maximum frequency value is set, the minimum frequency value, corresponding to SETPOINT actuation must be set.

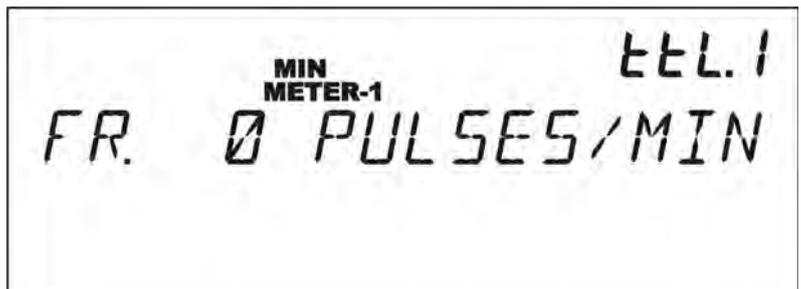
To set that value, press the



keys and then



press the  key to confirm the choice.



9.2.6. Alarms configuration

The Controller features various alarms that can be configured by the user; three types of alarm can be set:

MAX – The controller raises an alarm above a given measurement value.

LOW – The controller raises an alarm below a given measurement value.

OVER – The controller raises an alarm when a given time interval has elapsed and the measurement has not come back to the intended setpoint values.

In the main menu press  key when the message “MENU ALARM” shows up.



At this point the MAX alarm can be

set; press   keys to set the pH value above which the controller must raise an alarm, press

 the  key to confirm the choice.



Proceeding with the ALARM menu, the MIN alarm can be set; press the

  keys to set the pH value below which the controller must raise an alarm and then press

 the  key to confirm the choice.



The controller can raise an OVER alarm when the measurement value does not come back to the Setpoint value within the established time interval; to activate that function proceed as follows:



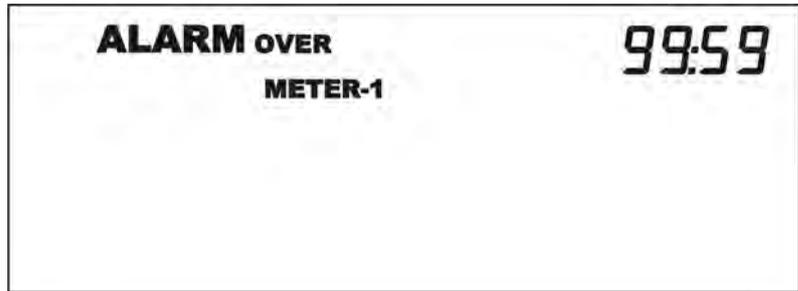
Press the



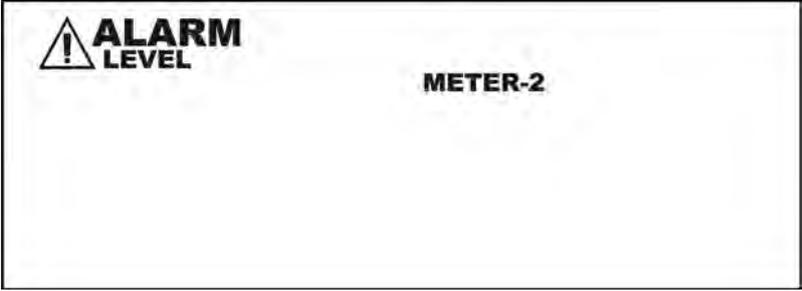
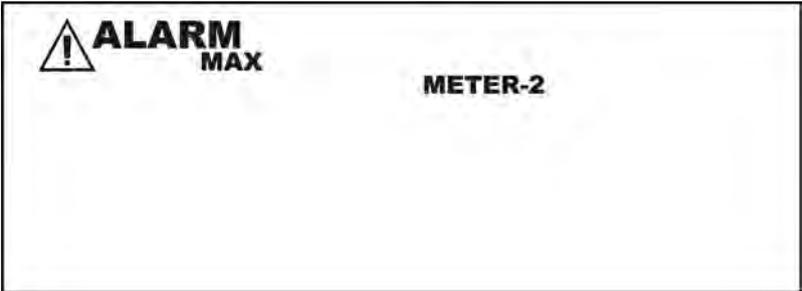
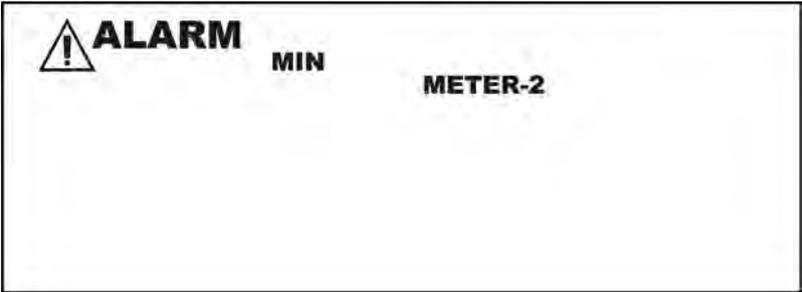
set the hours or minutes, press the key to select the field to change (hours or minutes)



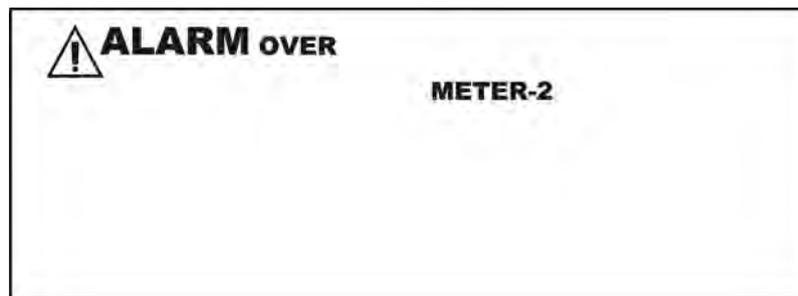
and confirm the choice by pressing key.



When the sign “ALARM” appears during the normal functioning of the tool, the corresponding relay contacts commute, making it possible to signal the state of emergency from a distance; also, at the moment that one of these emergency situations arising, the dosage of the corresponding section METER 1, 2 or 3 (in the case of B3) will block it self and the indications represented in the examples in the following table appear on the display:

<p>Level Alarm On one of the pumps connected to the SETPOINT 1 or 2 of the METER 2 section <i>AUX output goes from normally open to normally closed</i></p>	
<p>Maximum alarm It is activated, when the maximum measure value is exceeded, above which the tool should block. <i>AUX output goes from normally open to normally closed</i></p>	
<p>Minimum alarm It is activated, when the minimum measure value is exceeded, above which the tool should block. <i>AUX output goes from normally open to normally closed</i></p>	

Over alarm It is activated, when the maximum foreseen time is exceeded, within which the measure should reach the SETPOINT value. *AUX output goes from normally open to normally closed*



9.3. Setpoint manual activation

In order to facilitate the priming phase, the SETPOINT outputs can be manually activated, simultaneously to the activation of the selected output (SETPOINT 1 o 2); the corresponding output TTL is taken up to the maximum frequency and the corresponding current output (20 mA) to the maximum value.

In order to carry out such operation the SETPOINT menu that needs to be activated needs to be



accessed, then simultaneously press the buttons and .

As long as the buttons are kept pressed all the above outputs remain activated.

9.4. Proximity sensor

The tools B2 e B3 have 2 entrances (B2) or 3 entrances (B3) denominated REMOTE to which proximity sensors can be connected (see Fig. 1 and Fig. 3) that inserted in the outflow sensor carrier, signal the presence of water in the installation and therefore the need to start the inspection.

It is possible to define the functioning modes of the REMOTE entrances through the configuration of the J43 jumper on the B2 and the J43 and J44 jumpers on the B3 tool: inserting the Clevis in correspondence to the INDEP writing, the REMOTE entrances become independent from each other and each activates or deactivates the outputs of the METER section associated to them, instead, by inserting the clevis in correspondence to the SLAVE writing, only the REMOTE entrance of the METER 1 remains active, which controls all the outputs on the tool.

In order to activate the tool (METER 1, 2 o 3) the proximity sensor should be Normally Closed.

9.5. PT100 connection

As it is possible to see on the connection diagram represented in Fig. 1 and 3 the tool foresees the mounting of the PT100 3 wire sensors.

Regarding the two poles PT100 it is necessary to short circuit the two terminals of the clamps marked "C" with a clevis (fig.1 e 3) and connect the two wires of the PT100 between one of the above poles "C" and the third pole which is still free; instead for the four wire one it is necessary to connect both wires to one of the two pairs of twisted wires at the third pole and the other two wires of the other twisted pair to the two poles marked "C".

9.6. MMC Card configuration

The Controller foresees a recording of the data collected on Memory Card of MMC type, the memorized information is as follows: measured value of time unit, state of SETPOINT, state of alarms.

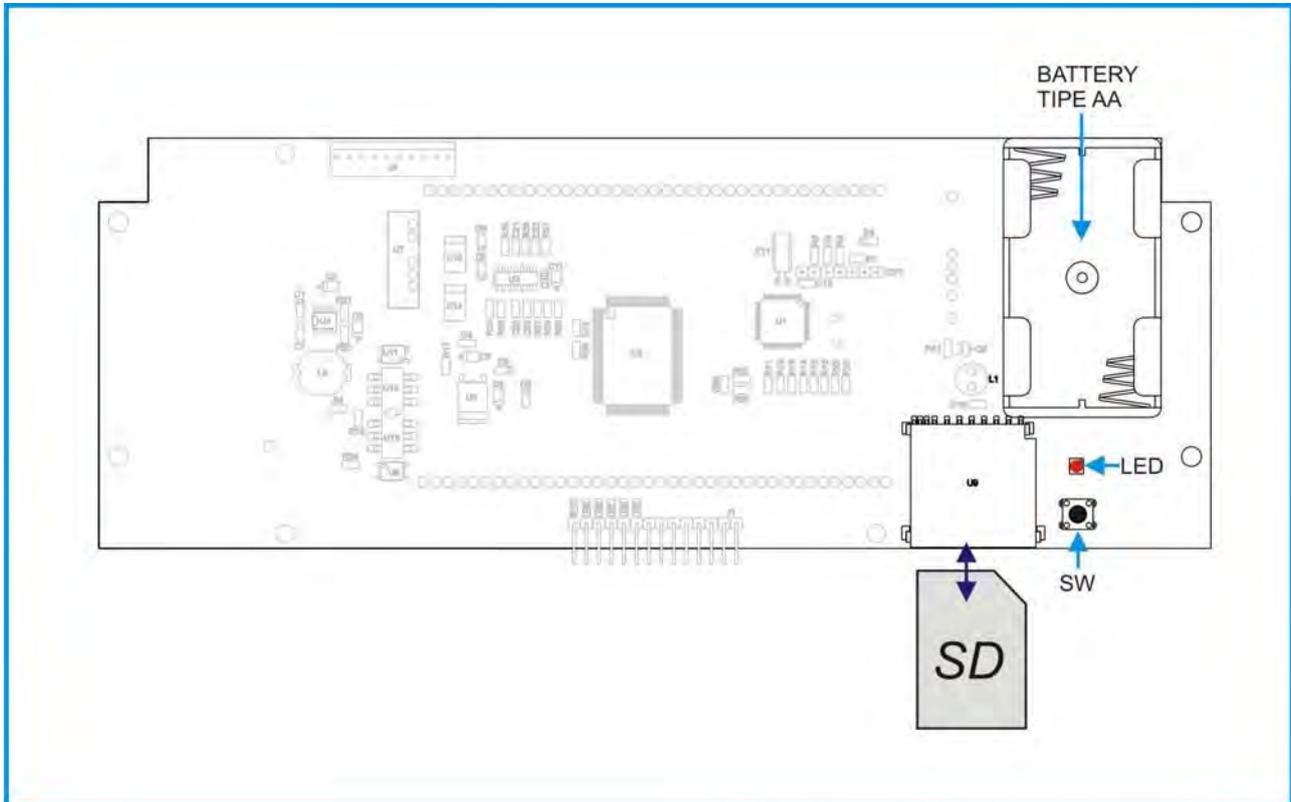


Fig 11

9.6.1. Inserting MMC Card

Insert the MMC Card as indicated in Fig. 11, the LED lights up for about 3 seconds to confirm the correct loading of the memory of the tool.

In case of error the LED starts to flash rapidly, remove the Memory Card, format it by using a personal computer in FAT16 or FAT32 mode and try to repeat the above inserting procedure.

If the Memory Card still does not work it needs to be changed.

9.6.2. Removing MMC Card

Whilst the tool is switched on press the SW button until the LED begins to flash, at this point it is possible to safely remove the Memory Card.

WARNING

In order to avoid any damages or loss of data collected in the Memory Card it is indispensable to insert two due AA batteries in the battery compartment indicated in Fig. 1

9.6.3. Current outputs menu

The controller is equipped with two current outputs settable by the user; the measurement value corresponding to 4 or 20 mA can be set for every output.

In the Main menu press  key when the message “MENU 4-20 mA” shows up.

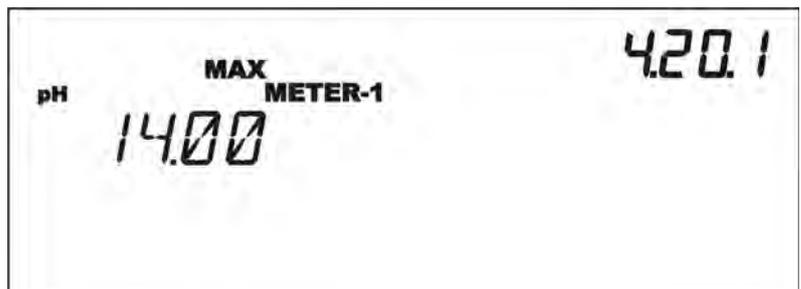


Press   keys to set the pH value for the first current output, corresponding to 4 mA.



Press  key to confirm the choice.

Press   keys to set the pH value for the first current output, corresponding to 20 mA.



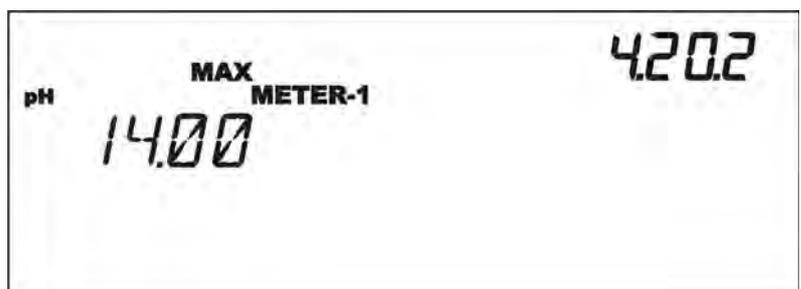
Press  key to confirm the choice.

Press   keys to set the pH value for the second current output, corresponding to 4 mA.



Press  key to confirm the choice.

Press   keys to set the pH value for the second current output, corresponding to 20 mA.





Press  key to confirm the choice.

It is possible to connect the current outputs to some proportional pumps current controlled, in this case it is necessary to coincide the “low” value of the current (4 mA) with the SETPOINT set on the tool and according to the system’s needs, the “high” value of the current (20 mA) to the value of the measure from which the proportional intervention should start.

10. Firmware version

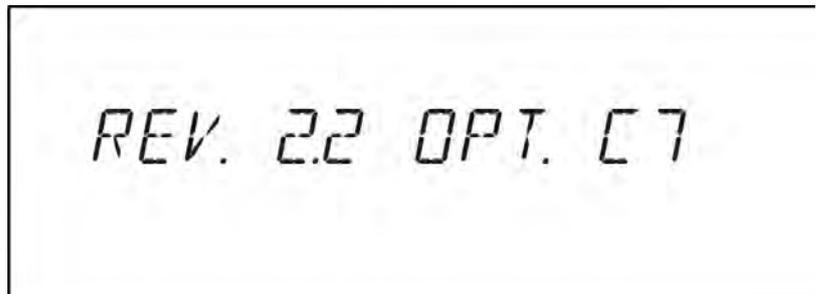
Two different types of firmware are present on B2 and B3 controllers:

- Firmware Controller – user interface control
- Firmware Meter – instrument meter control (METER 1, 2 or 3).

Press simultaneously



 keys,
on display appears the Firmware
controller version.



Press button  to display
METER 1 FIRMWARE VERSION,
press again Meter to display
METER 2 and METER 3 (METER
3 is available for B3 controller
only).

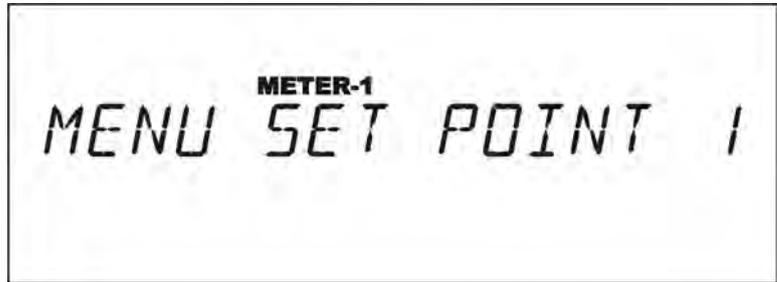


Press  key to return to measuring mode.

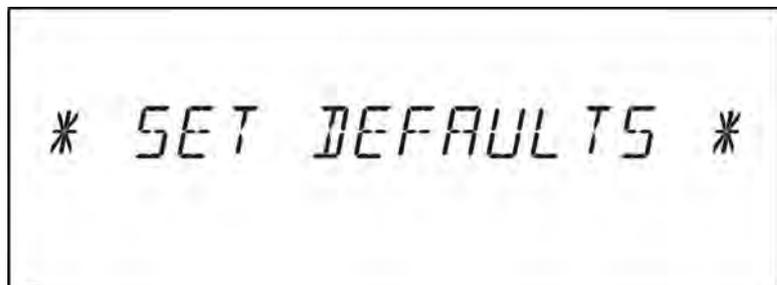
11. RESET procedure



Within 15 seconds from switching on the tool press the  button and enter the main menu the following writing appears on the display:



Simultaneously press the buttons  , the following writing appears on the display:



At this stage it is possible to carry out two different types of RESET:



Press twice consecutively the button , followed by the button . In order to carry out a total RESET (return to factory setting).



Press twice consecutively the button , followed by the button . In order to carry out a partial RESET (return to factory setting keeping the sensor calibration).

12. Password restricted menu

Password may be enabled in order to prevent access to setting menus.

When a password is introduced, the user is still going to be able to adjust one single calibration point. This will allow him, for example, to perform small measure adjustments by means of a photometer.

If a password is present, menu-access-settings change from what beforehand specified in paragraph 9.2.2.



By pressing while the controller is in measuring mode, the user gets into a special menu where he is asked if he intends to perform a single point calibration or instead to enter the required password in order to get access to regular setting menus.



The requested selection can be done through and keys.

In case calibration has been selected, please refer to paragraph 9.2.4.

Notice that, in this case, only one calibration point may be adjusted. In particular:

- pH case ↗ second calibration point (the one with value different from 7.00);
- all other cases ↗ first calibration point (the one with value different from 0.00).

On the other hand, if the user has selected to get access to regular setting menus, the relevant password must be entered, as described in paragraph 9.2.3.

13. Priming of the pumps

To facilitate the priming of the pumps, it is possible to manually activate the output of the SETPOINT.

Such procedure is accessible even in presence of password by pressing simultaneously two keys (as following described) while the visualization of the measure is in progress.

The procedure of priming of the pumps involves:

- Activation of the relay SETPOINT
- 4-20mA output is set to 20mA
- If in ON/OFF mode, TTL relay is activated; if in PROPORTIONAL mode, the TTL output is set to the maximum frequency.

To effect such operation:



Press simultaneously  and  keys or  and  keys to enter in priming setting.

The priming setting will open



Select on which measure it is desired to perform the operation using  key.



Press  key for pump n.1



Press  key for pump n.2

Until the keys stay pressed the whole outputs remain activated.



ETATRON D.S.

HEAD OFFICE - ITALY

Via dei Ranuncoli, 53 - 00134 ROMA - ITALY

Phone +39 06 93 49 891 - Fax +39 06 93 43 924

e-mail: info@etatronds.com - web: www.etatronds.com

ITALY (BRANCH OFFICE)
ETATRON D.S.
Via Ghisalba, 13
20021 Ospiate di Bollate
(MI) ITALY
Phone +39 02 35 04 588
Fax +39 02 35 05 421

ASIA ETATRON D.S.
(Asia-Pacific) PTE Ltd
67 Ubi Crescent, #03-05
Techniques Centre
Singapore 408560
Republic of Singapore
Phone +65 67 43 79 59
Fax +65 67 43 03 97

USA - CANADA - MEXICO
ETATRON AMERICA
1642 McGaw Avenue
Irvine, CA 92614
USA
Phone +1 949 251 8700
Fax +1 949 752 7867

ESPAÑA - ETATRON
DOSIFICACION Y MEDICION S.L.
Avda. Letxumboro 83
Pabellón 6
Irún (20305) ESPAÑA
Phone +34 902 09 93 21
Fax +34 943 09 03 12
www.etatron.es

BRASIL
ETATRON do Brasil
Rua Vidal de Negreiros, 108
Bairro Canindé - CEP 03033-050
SÃO PAULO SP
BRASIL
Phone/Fax +55 11 3228 5774

RUSSIAN FEDERATION
DOSING SYSTEMS
3-rd Mytishenskaya, 16/2
129626 Moscow
RUSSIA
Phone +7 495 787 1459
Fax +7 495 787 1459

UKRAINE
000 ETATRON - UKRAINE
Soborna Street, 446
Rivne, 33024 Rivne Region
UKRAINE
Phone +380 36 26 10 681
Fax +380 36 26 22 033

UNITED KINGDOM
Etatron GB
Lindum Business Park
Station Road North Hykeham
Lincoln, LN6 3QX UK
Phone +44 (0) 1522 85 23 97
Fax +44 (0) 1522 50 03 77

ETATRON FRANCE
1 Mail Gay Lussac
95000 Neuville Sur Oise
Tel: +33 (0)1 34 48 77 15
Fax: +33 (0)1 78 76 73 95

A **B** C D

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