

## **SYCLOPE TERE'O® controller for swimming pools (Part 1)**



### **Installation, commissioning and operating instructions**

**SYCLOPE**  
Electronique

Parts of the general documentation

- ▶ Part 1 : Manual of installation, commissioning and operating instructions
- Part 2 : Manual of communication instructions

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**General informations :**

**SYCLOPE Electronique 2013**<sup>®</sup> Notice of 11/02/2017 Rev 6.1

Analysers/controller for private and public swimming pools.

**Gamme TERE'O**<sup>®</sup>

Installation, commissioning and operating instructions

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Subject to modifications

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## I. General

### 1) Field application

The analyser/controller of the **SYCLOPE TERE'O®** range you have just purchased is an electronic swimming-pool water management device. It has been carefully developed and manufactured to ensure your greatest pleasure and peace of mind.

Its remarkable capacity for adapting to different conditions and sizes of private or public swimming pools means it can be installed in the most difficult of environments where control of water treatment and swimming-pool water regulation processes are decisive.

The **SYCLOPE TERE'O®** range are equipped with one temperature entry and two specific electronic card adaptors for pH, ORP or chlorine/bromine for measurements using specific sensors for treating swimming-pool water and also include regulations processes with cyclic commands transmitted by means of two relays to control pH and chlorine levels.

The simplicity of operation of the **SYCLOPE TERE'O®**, the user friendliness and the remarkable technical aspects of these devices, will ensure you benefit from their many options, guaranteeing you full control and supervision of the quality of the water in your swimming pool.

The following instructions contain all the information required for the installation, use and maintenance of your new equipment.

- Packaging
- Installation
- Technical specifications
- Commissioning instructions
- Safety tips

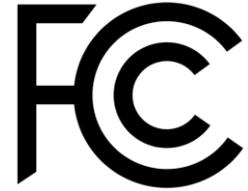
If you would like to receive further information or if you encounter any difficulties not described in this manual, please contact your usual retailer or else directly contact the sales department of SYCLOPE Electronique in France, either at the agency or at the office for your region or country, or the technical/quality departments of our establishments. We will do everything in our power to help you and ensure you benefit from our advice and know-how in the field of measurement and treatment of swimming-pool water.

Contact : [Service-technique@syclope.fr](mailto:Service-technique@syclope.fr)

## 2) FCC conformity

The **SYCLOPE TERE'O**<sup>®</sup> controller complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference (2) this device must accept any interference received, including interference that may cause undesired operation FCC Regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect this equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

**Remark :** To ensure compliance with the FCC regulations on electromagnetic interference for a class B device, use cables properly shielded and connected to the ground as recommended in this manual. The use of a cable that is not properly shielded or earthed for risk of violating the FCC rules.

### 3) Utilisation du document

Please read this entire document before starting to install, adjust or commission your device, in order to ensure the safety of swimmers, users and equipment.

The information provided in this document must be strictly observed. **SYCLOPE Electronique S.A.S.** declines all responsibility in cases where failure to comply with the instructions of this documents is observed.

The following symbols and pictograms will be used to facilitate reading and understanding of these instructions.

- Information
- ▶ Action to be taken
- Item of a list or catalogue

### 4) Signs and safety symbols



Identify a continuous voltage or a continuous current



Identify an alternative voltage or an alternative current



Protective ground



Functional ground



Risk of injury or accident. Identify a warning concerning a potentially dangerous risk. Documentation must be consulted by the user with each time the symbol is notified. If the instructions are not respected, that presents a risk of death, physical injuries or property damages.



Electric hazard. Identify a warning statement relative to a mortal electric danger. If the instructions are not strictly respected, that implies an inevitable risk of physical injuries or death.



Risk of incorrect operation or damage for the device.



Comment or particular information.



Recyclable element

### 5) Storage and transport



It is important to store and transport your **SYCLOPE TERE'O®** in its original packaging in order to minimize risk of damage. Furthermore, the package must be stored in an environment that is protected against humidity and exposure to chemical products.

Environmental conditions for transport and storage:

Temperature : -10 °C to 70 °C  
Air humidity: Maximum of 90% with no condensation

### 6) Packaging



The controller is delivered without electrical power cable.

The pre-holes of the box are drilled and equipped with according electrical glands in compliance with IP65 level protection. Cables must be adapted to the electrical glands to respect the level of protection.

Grounded cables for connecting pH and ORP (Redox) sensors are not provided.

Content of the packaging :

- ✓ One analyzer/controller **SYCLOPE TERE'O®**
- ✓ Installation and starting instruction notice
- ✓ Programming notice
- ✓ Communication notice (Option)

### 7) Warranty

The warranty is provided according to the terms of our general conditions of sale and delivery as long as the following conditions are met:

- Use of the equipment according to the instructions of this notice
- No modifications of the equipment which may modify its behavior and no incorrect manipulation
- Respect for the electrical safety conditions



Consumable material is no longer covered by the warranty when in use.

## II. Environment and safety instructions

Please :

- Read this manual carefully before unpacking, installing or commissioning this equipment
- Take into account all the hazards and recommended precautionary measures

Failure to respect these procedures can result in serious injury to users or damage the device.

### 1) Use of the equipment

The **SYCLOPE TERE'O**<sup>®</sup> system has been designed to measure and regulate pH, Redox (ORP), chlorine (or bromine) by means of sensors and controls of suitable actuators in the context of the possible uses described in this manual.



All other uses are considered to be non-conforming and must therefore be forbidden. SYCLOPE Electronique S.A.S. will not be responsible in any case for any damages that result from such uses.



Any use of sensors or interfaces not-in conformity to the features defined in this handbook must also be proscribed.

### 2) User obligations

The user undertakes not to allow its employees to work with the **SYCLOPE TERE'O**<sup>®</sup> equipment described in this manual unless they:

- Are aware of the fundamental instructions relating to work safety and prevention of accidents
- Are trained in the use of the device and its environment
- Have read and understood these instructions, warnings and manipulation rules

### 3) Risk prevention



The installation and connection of the **SYCLOPE TERE'O**<sup>®</sup> equipment should only be performed by personnel specialized and qualified for this task.  
The installation must comply with current safety standards and instructions!



Before switching the controller on or manipulating the relay outputs, remember always to cut off the primary power supply!  
Never open the controller when it is powered on!  
Maintenance operations and repairs should only be performed by trained, specialized personnel!



Take care when choosing the location for installing the equipment according to the environment!

The **SYCLOPE TERE'O**<sup>®</sup> electronic box should not be installed in a hazardous environment and should be protected against splashing with water or chemical products. It should be installed in a dry, well-ventilated location, isolated from corrosive vapours.

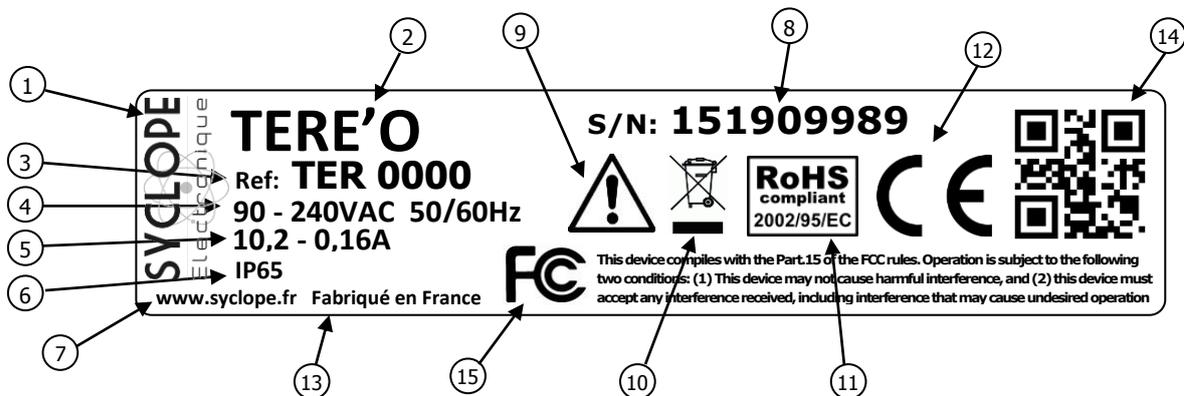


Make sure that the chemical sensors used with this device correspond well to the chemicals used. Refer to the individual technical note of each sensor. Chemistry of water is very complex, in case of doubt, contact immediately our engineering service or your approved installer/reseller.



Chemical sensors are sensitive elements using consumable parts. They must be supervised, maintained and calibrated regularly using specific calibrator systems not-provided with this equipment. In the event of defect, a surplus possible hazard of chemical injections can be noted. In the doubt, a service contract must be taken near your reseller/installer or failing this near our engineering services. Contact your approved installer/reseller or our business service for more information.

4) Identification and localization of the identification plate



① Label of the manufacturer	⑨ Particular risks. Read the notice
② Model of the product	⑩ Product which can be recycled
③ Reference of the product	⑪ Limitation of dangerous substances
④ Range of power supply	⑫ EC compliance
⑤ Values of the maximum current	⑬ Country of the manufacturer
⑥ Class of protection	⑭ Manufacturer square code
⑦ Identification of the manufacturer	⑮ Conformity with the FCC part 15 Class B
⑧ Serial number	

Identification plate



### 5) Disposal and conformity

The recyclable packaging of the **SYCLOPE TERE'O®** equipment must be disposed of according to current regulations.



Elements such as paper, cardboard, plastic or any other recyclable elements must be taken to a suitable sorting center.



According to European directive 2002/96/EC, this symbol means that as of 12 August 2005 electrical appliances cannot be thrown out together with household or industrial waste. According to current regulations, consumers within the European Union are required, as of this date, to return their used devices to the manufacturer, who will take care of disposing them at no extra expense.



According to European directive 2002/95/EC, this symbol means that the **SYCLOPE TERE'O®** controller is designed in compliance with the restrictions on hazardous substances



According to low-voltage directive (2006/95/EC) and the electromagnetic compatibility directive (2004/108/EC), this symbol means that the device has been designed in compliance with the previously cited directives.



In accordance with part 15 of the FCC regulation (Federal communications commission), this symbol indicates that the device was tested and approved under the respect and the conditions of the limits for a Class B digital device.

### III. Technical characteristics and functions

#### 1) Technical characteristics

<b>General characteristics</b>		
Type	Specification(s)	Marker(s)
Consumption	0,3 to 0,16A maximum (without external loads)	-
Power supply required	Between 90V and 240V 50/60Hz	-
Electric protection	Electronic fuse 160mA. Auto-rearmed when power off	F4
Operating temperature (°C)	-5 °C to 45 °C (23 °F to 113 °F)	-
Storage temperature (°C)	-10 °C to 70 °C (10 °F to 158 °F)	-
Humidity	Max. 90% without condensation	-
Case material	ABS or Polycarbonate (US and Canada)	-
Case dimensions	Length : 213 mm (8.4 inches) Width : 185 mm (7.3 inches) Height : 118 mm (4.6 inches)	-
Weight of the case	1,1 kg	-
Protection rating	IP 65	-
Display	Screen LCD 128x128 with back light (White/blue)	-
<b>Entries</b>		
Measurement inputs	4x 0/4...20mA auto-powered entries (12V) without isolation... within : 2x programmable modules internally soldered. <ul style="list-style-type: none"> <li>• 4...20mA isolated module powered by 24VDC max</li> <li>• pH isolated module Range : -400mV to +400mV</li> <li>• Redox isolated module. Range : 0 to 1000mV</li> </ul>	E1 to E4
<b>Powered outputs</b>		
Powered relays	2x Powered relay outputs <ul style="list-style-type: none"> <li>- Max. 5A / 250VAC</li> <li>- Inrush current Max. 15A &lt;1ms</li> </ul>	P1 and P2
REF	12VDC power output for supplying converters or external flow switch sensors.	REF
<b>Communication port</b>		
RS485	1 RS485 communication port with compatible ModBus <sup>®</sup> RTU protocol.	
<b>Protection of powered outputs</b>		
Internal fuses	Glass fuse 5x20mm 5A 250V fast	FUSE1
	Glass fuse 5x20mm 5A 250V fast	FUSE2

2) Main functions

<b>Main functions</b>		
Function	Specification(s)	Marker(s)
Mode of control	Proportional	Control from 0 to 100% Cycle time : 240s
Actuator type	Powered relays 90...240VAC 5A	PWM command
Direction	Up or Down	
Alarms	Low and high alarms	Expressed in real measurement values. Threshold controls up and down.
Closed-loop control	Flow switch control.	Closed-loop control of injections with an external contact (filtering, for example) or with control of water circulation.
Configuration	Std configuration	Automatic selection of parameters
Maintenance	Maintenance program	Internal test program procedures

3) Parameter and scale of measurements

<b>Measures and controls</b>		
<b>Parameters</b>	<b>Scale of measurement</b>	<b>Precision</b>
T°C	-5 to 45°C	± 0,5 %
pH	0 to 14 pH	± 0,5 %
Redox (ORP)	0 to 1000 mV	± 0,5 %
Free chlorine	0 to 2 ppm	± 0,5 %
	0 to 10 ppm	± 0,5 %
Bromine	0 to 2 ppm	± 0,5 %
	0 to 10 ppm	± 0,5 %

#### IV. Installation and wiring

##### 1) Installation conditions



To guarantee user safety and ensure correct operation of your **SYCLOPE TERE'O®**, please observe the following installation instructions:

- Install the controller in a dry location
- The controller must be protected against rain, frost and direct sunlight
- The room temperature must range between 0°C and 50°C, with no condensation.
- Choose an installation location free from vibration, on a suitable support and with no deformation



If these instructions are not observed:

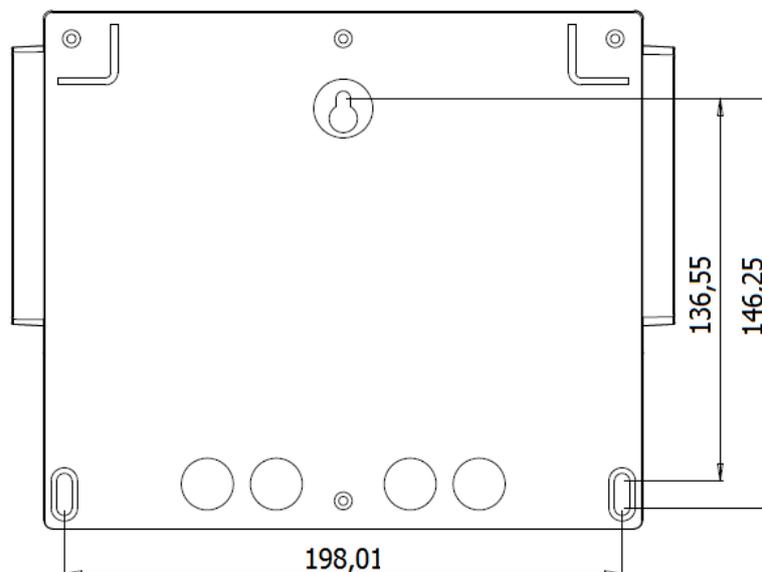
- The controller is at risk of being damaged
- The measurements can be disrupted
- The warranty is not applicable!

##### 2) Installation of the wall-mounted controllers



Before performing the installation and electrical connections, remember to turn off the power! The rating of IP65 is only guaranteed when the closing cover and the glass of the electric box are closed and when the cable glands match the diameters of your cables and are correctly sealed

- ▶ Drilling three holes ( $\varnothing$  5-mm) according to the following drilling plan:



- ▶ Insert the 5-mm plugs using a hammer
- ▶ Insert the upper screw (top screw) first without completely tightening it
- ▶ Insert the lower screws and tighten them
- ▶ Tighten the upper screw
- ▶ Use a spirit level to check for correct and accurate fixing to the wall.

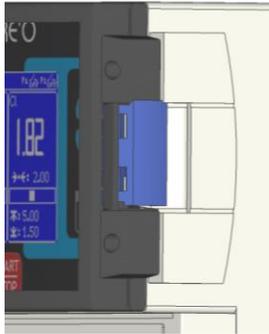
### 3) Opening/Closing the transparent door



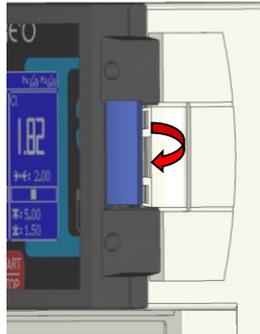
To ensure IP65 protection class, the transparent door must be closed after usage and being sure of the O-ring quality each time.

The controller box is equipped with an automatic lock system which must be understood to manipulate it.

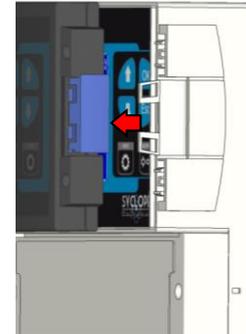
For opening the transparent door:



Locked ...

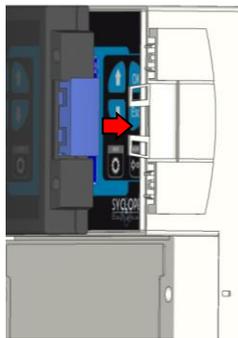


Raise the lock and pull forward it.

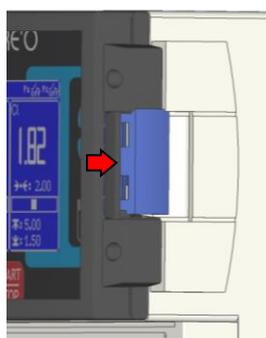


Opened!

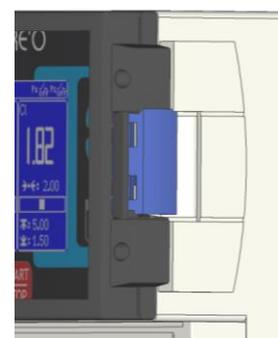
For opening and locking transparent door:



Pass the fingers behind the lock and bring the door with the inch ...



With the palm of the hand, press on the transparent door and tighten with the hand to lock.



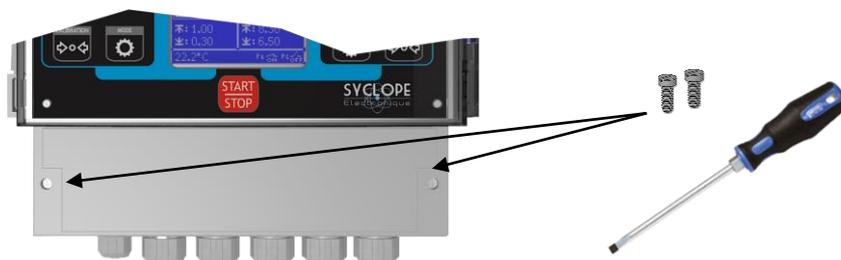
Locked!

### 4) Opening/Closing connection cover



To ensure IP65 protection class, the connection cover must be closed after usage and the O-ring must be checked each time.

Use a specific screwdriver to remove the two screws for opening the cover.



### 5) Electrical connections



The electrical installation must be performed in accordance with current standards by authorized personnel!

A 30mA differential circuit breaker must be installed!

A breaker circuit of maximum 10A must be installed near the controller and easily accessible to stop the main power. It must be identified as a circuit-breaker for the controller!

**Before performing the connections, remember to turn off the power!**



Use multicore cables if possible!

If not possible, always use a special wiring tip to be sure that wires do not make a contact together!

Protect the wirings by using electrical clamps.



The **SYCLOPE TERE'O**<sup>®</sup> controller must be connected to the main circulation pump system by means of "E4" entry and with the flow-switch of the measuring chamber.

#### ***Internal protection :***



The controller is protected by an internal resettable fuse of 160mA and by a varistor of 275VAC for surge protection.



The self-powered relays **P1** and **P2** are protected each by a glass 5x20 fuse of 5A 250V.

Reference	Name
FUS5X20R5000	Fast glass fuse 5x20mm 5A 250V



In case of fuse destroyed, check that the card is not burnt out. If this is the case, the complete card must be changed!

In case of varistor burned, please return the controller to our technical after-sales department for repairing!

### 6) Changing internal fuses of P1 and P2 outputs

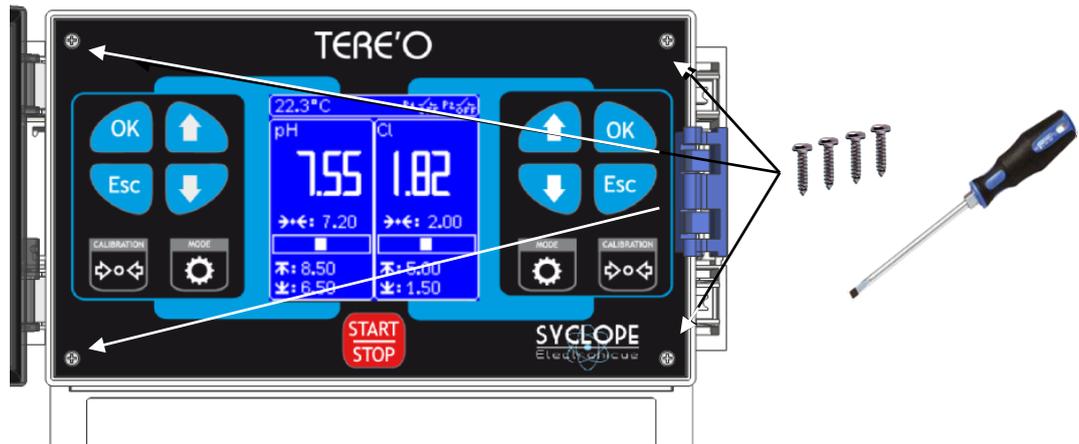


Before changing any fuse, disconnect the power supply.

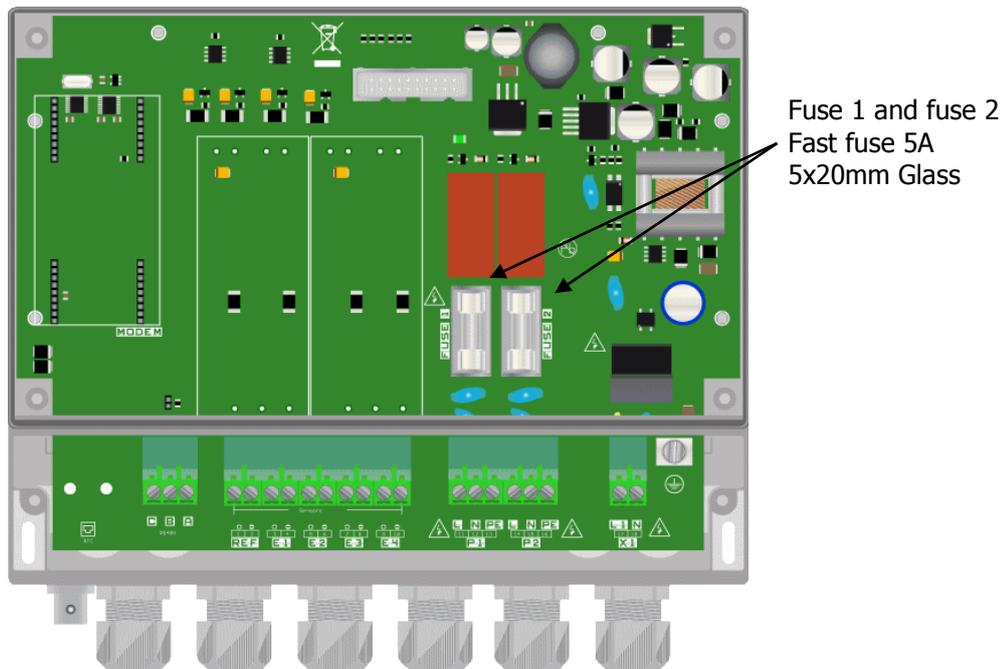


Use only an original fuse. Don't replace it by another one with a higher current !

Open the translucent door and remove the 4 screws with an adequate screwdriver.  
Disconnect the flat cable between the electronic cards carefully.



Localise the fuse to be changed on the bottom card ...  
 Remove the protection cover on the support of fuse ...  
 Change the fuse and reinstall the protection cover.



Reconnect the flat cable between the electronic cards and put the 4 screws to fix the front face.  
 Don't screw them hardy because the electronic box is made in plastic material.

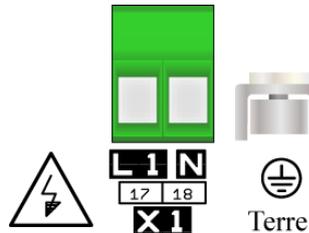
#### 7) Connecting primary power supply



The **SYCLOPE TERE'O**<sup>®</sup> controller is equipped with a switching power supply. It is therefore able to be supplied by AC voltage comprised between 90V to 240V - 50/60Hz.



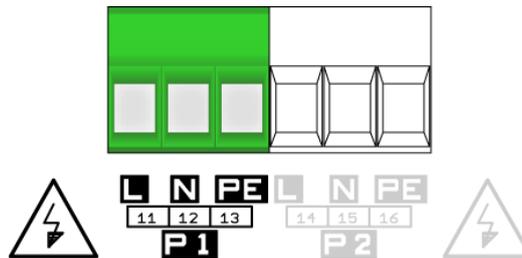
- ▶ Use a 3-point 1.5 mm<sup>2</sup> cable to wire the power supply
  - ▶ Strip the 3 wires for 7mm
  - ▶ Pass the 3-point cable through a cable gland
  - ▶ Wire the live cable to **L1** and the neutral to **N** located "X1"
  - ▶ Wire the ground to the ground plot with an insulated round terminal
- Câbler la terre sur le plot PL1 à l'aide d'une cosse à œillet M4
- ▶ Tighten the cable gland to ensure tightness when done.



The **SYCLOPE TERE'O**<sup>®</sup> controller does not have its own independent power switch. It is directly powered when connected to the main power supply.

#### 8) Connecting the self-powered relay P1

- Connecting the self-powered relay P1

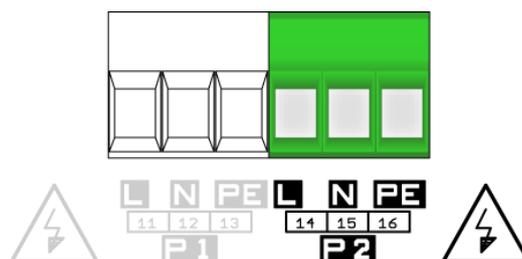


The self-powered relay output P1 (Primary voltage = Available voltage on P1) is used to control the measurement parameter connected on E1.



- ▶ Strip the 2 wires of dosing equipment for 7mm
- ▶ Pass the 3-point cable through a cable gland
- ▶ Wire the two wires to (11) and (12) located on **P1**
- ▶ Wire the ground cable on PE (13) located on **P1**
- ▶ Tighten the cable gland to ensure tightness when done.

- Connecting the powered relay P2



The self-powered relay output P2 (Primary voltage = Available voltage on P2) is used to control the measurement parameter connected on E2.



- ▶ Strip the 2 wires of dosing equipment for 7mm
- ▶ Pass the 3-point cable through a cable gland
- ▶ Wire the two wires to (14) and (15) located on **P2**
- ▶ Wire the ground cable on PE (16) located on **P2**
- ▶ Tighten the cable gland to ensure tightness when done.

#### 9) Connecting the measurement inputs

The **TERE'O**® controller has three measurement inputs with different version either:

- 4...20mA analogical inputs used to measure multi-parameters using isolated current loop from a sensor or from a specific housing chamber with integrated converters.
- Special integrated modules soldered into the controller for direct measurement sensors.

##### a) 4...20mA analogical inputs without internal module version

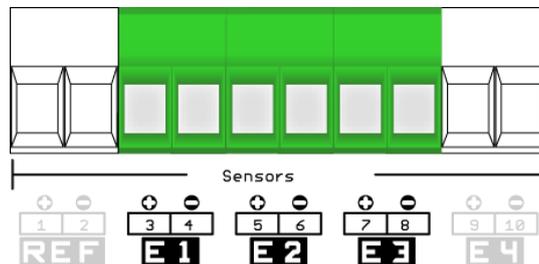


All entries are self-powered by internal 12VDC power supply and must be used without external supplies!!



Analogical entries of the controller are not isolated!

The use of SYCLOPE Electronique technology measuring cells is mandatory. They use a special internal isolation warranting the good working of the sensors!  
No claim will be accepted if these conditions were not respected!



- E1 : Parameter 1 entry (Displayed on the left part of the screen)
- E2 : Parameter 2 entry (Displayed on the right part of the screen)
- E3 : Temperature entry (Displayed on the superior band of the screen)

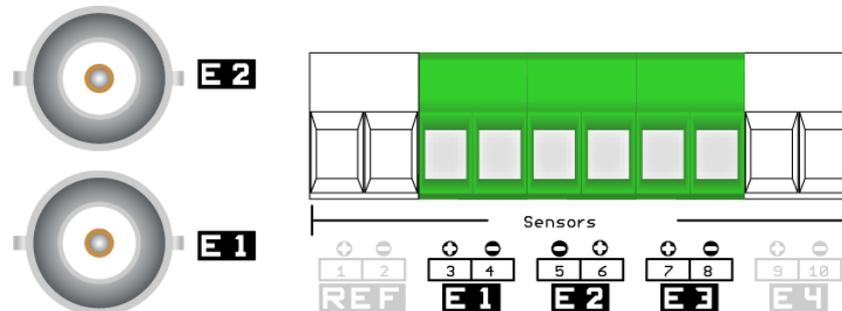
Type	Wiring of SYCLOPE measuring chamber	
	+	-
<b>pH</b>	Green	Blue
<b>Chlorine</b>	White	Black
<b>Bromine</b>	White	Black
<b>Redox</b>	Yellow	Orange
<b>Temperature</b>	White / Blue	White / Yellow
<b>Flow switch</b>	Violet	Grey

## b) Direct entries with internal modules version



Only "E3" is a not isolated self-powered (12V) entry and must be used without external power supply!

This entry is dedicated to the temperature measurement using a 4...20mA SYCLOPE Electronique sensor.



According the controller version, 1 or 2 BNC connectors could be implanted near the electrical glands. These connectors are wired directly to the internal entries E1 or/and E2.

In this configuration, E1, E2 and E3 entries are affected by the factory and must not be changed.

- E1 : pH entry (BNC) (Displayed on the left part of the screen)
- E2 : Chlorine or Bromine or Redox (BNC) entry (Displayed on the right part of the screen)
- E3 : Temperature entry (Displayed on the superior band of the screen)

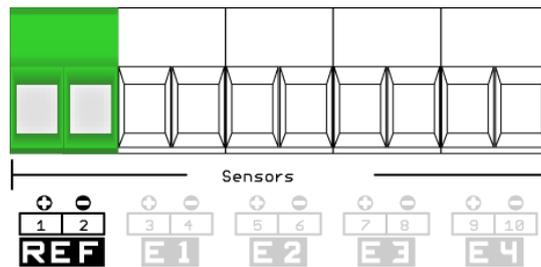
Version \ Parameter	T°C	pH	Chlorine or Bromine	Redox
T°C, pH, Chlorine	Terminal E3	BNC E1	Terminal E2	-
T°C, pH, Bromine	Terminal E3	BNC E1	Terminal E2	
T°C, pH, Redox	Terminal E3	BNC E1	-	BNC E2



Wiring of the pH and Redox (ORP) entries must be respected! Risks of uncontrolled injection of chemical products!



Don't touch internal pin of the BNC connectors! Risks of destroying internal electronic components.

10) Connecting the voltage reference REF

The voltage reference allow you to power the external electronic converters. It is programmable to deliver a 12V power supply.

**Do not invert polarity !**

- **Red wire on "+"**
- **Brown wire on "- "**

11) Wiring the external control entry (E4)

The **TERE'O**® controller has a remote control input (E4) which stops the controls of dosing equipments. This input is a 4...20mA analogical input.

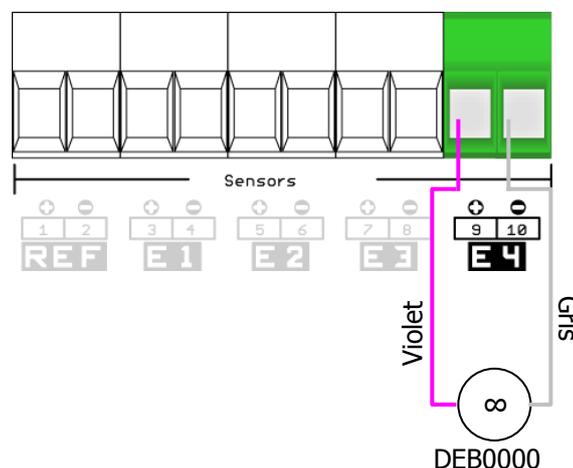
An external resistor is normally connected on this entry for authorizing dosing processes if not external command is requested. If you decide to control dosing processes by an external signal, you must realize the function as follow.



For safety reason, it is strongly recommended to use this function with an external switch which comes from the filtration system to prevent overdosing of chemical products!

## a) Version with 4...20mA sensor used by SYCLOPE :

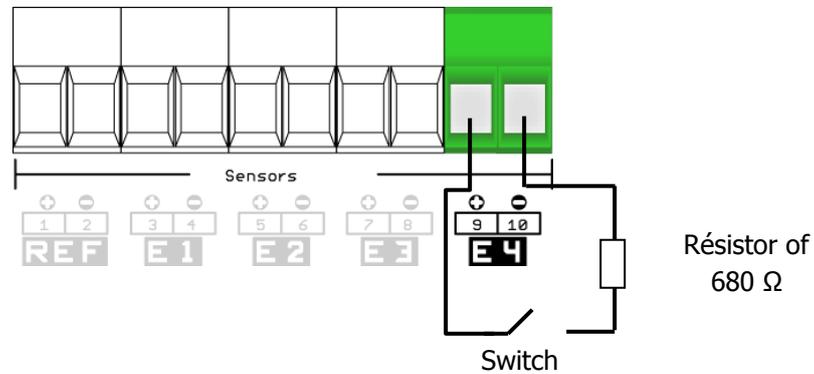
When using SYCLOPE measuring cells, it is optional to have an analogical flow switch detector under reference DEB0000. In this case, the external resistor must be removed and the analogical flow switch must be connected as follow:



In this first case, E4 entry must be programmed as a NC switch (Normally Closed)

b) Version with external free of potential switch :

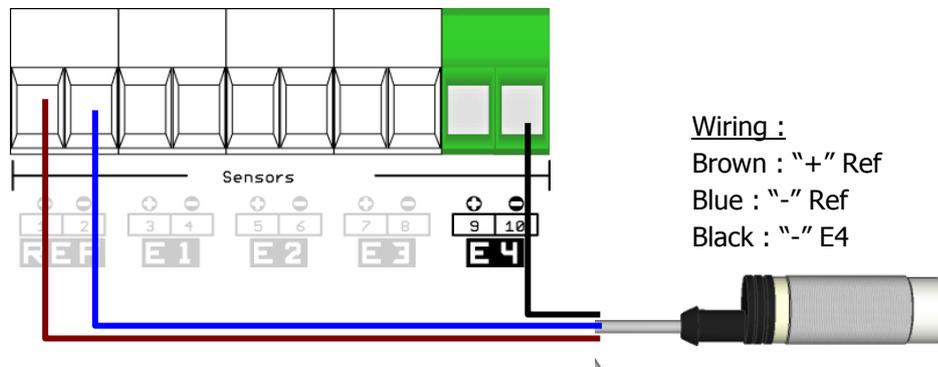
When using an external switch (from filtration system or flow-switch control), the electric wiring must be realized as follow:



In this case, E4 entry must be programmed as NC switch (Normally Connected) or NO switch (Normally Open). The controller is provided with NC configuration.

c) Version with PNP inductive switch :

When using an inductive electronic detector, wire as follow:

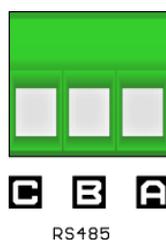


Wiring :  
 Brown : "+" Ref  
 Blue : "-" Ref  
 Black : "-" E4

Inductive detector provided by SYCLOPE is PNP type with 3 wires.  
 In this last case, E4 entry must be programmed as a NC switch (Normally Closed)

12) Connecting the RS485 communication port

The **TERE'O**® controller has a RS485 communication port for connecting to a PLC or a laptop. **TerCom**® maintenance software allows you to program the entire controller and to realize the maintenance easily.





Respect polarities and connections of the bus.

- A terminal to signal AA' (n°3) of USB/RS485 converter
- B terminal to signal BB' (n°4) of USB/RS485 converter
- C terminal to GND (n°5) of USB/RS485 converter

To connect **TERE'O**® controller to a PLC or a laptop, we recommend to use a specific USB/RS485 converter. Please refer to the "communication Manuel" for wiring and programming.

Reference	Name
INF1021	Interface converter USB ⇔ 485



Refer to the "Communication Manuel" for more informations about all possibilities of connection.

## V. General use

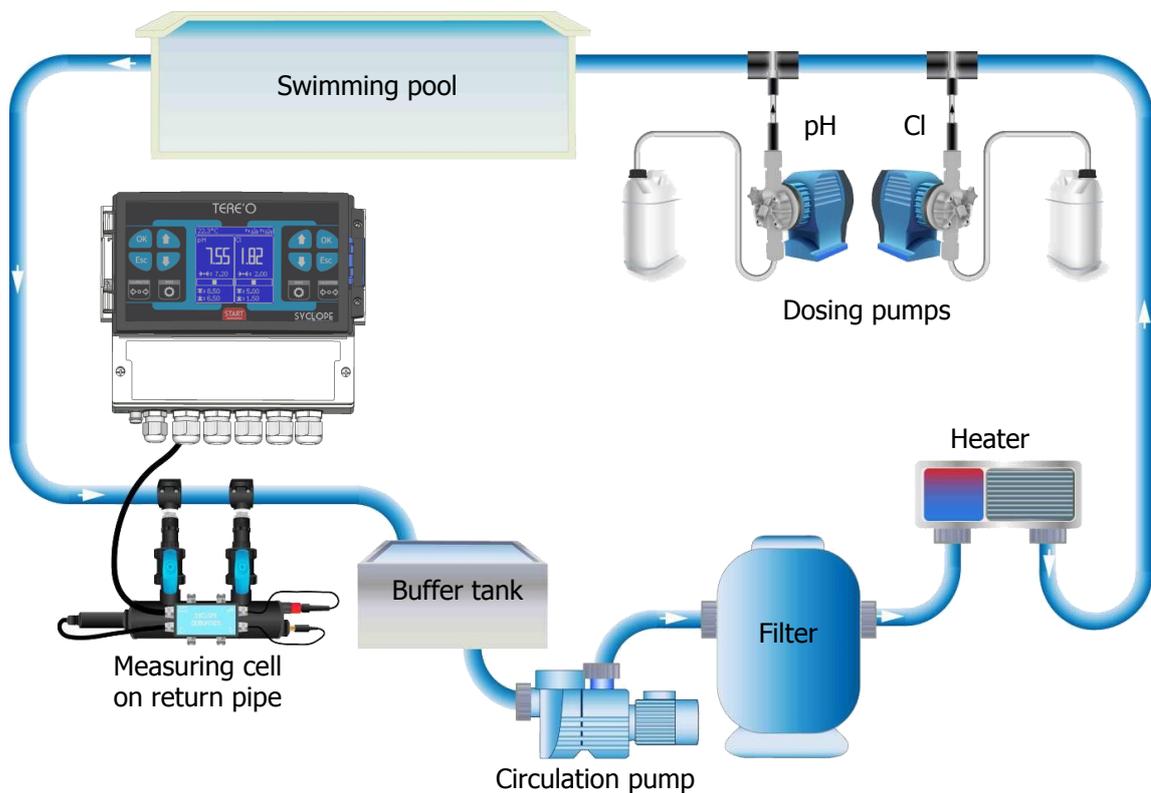
**SYCLOPE TERE'O®** controller is intended to measurement and to control parameters for water treatment of swimming pools. This equipment can be use under two different fundamental principles described below:

- Measurement of parameters come from the gravitating return line
- Measurement of parameters come from the recirculating filtration circuit.

### 1) Measurements come from gravity return line



This type of installation is recommended when more swimming pools are connected only to one buffer tank and one block of filters.



- Water is sampled in the gravitating return line.
- The sensors, installed into the measuring cell, receive water to be analysed and send the values to the controller.
- According to the setting points fixed by the user, the controller sends proportional orders to the pumps installed into the main intake line of the swimming pool.



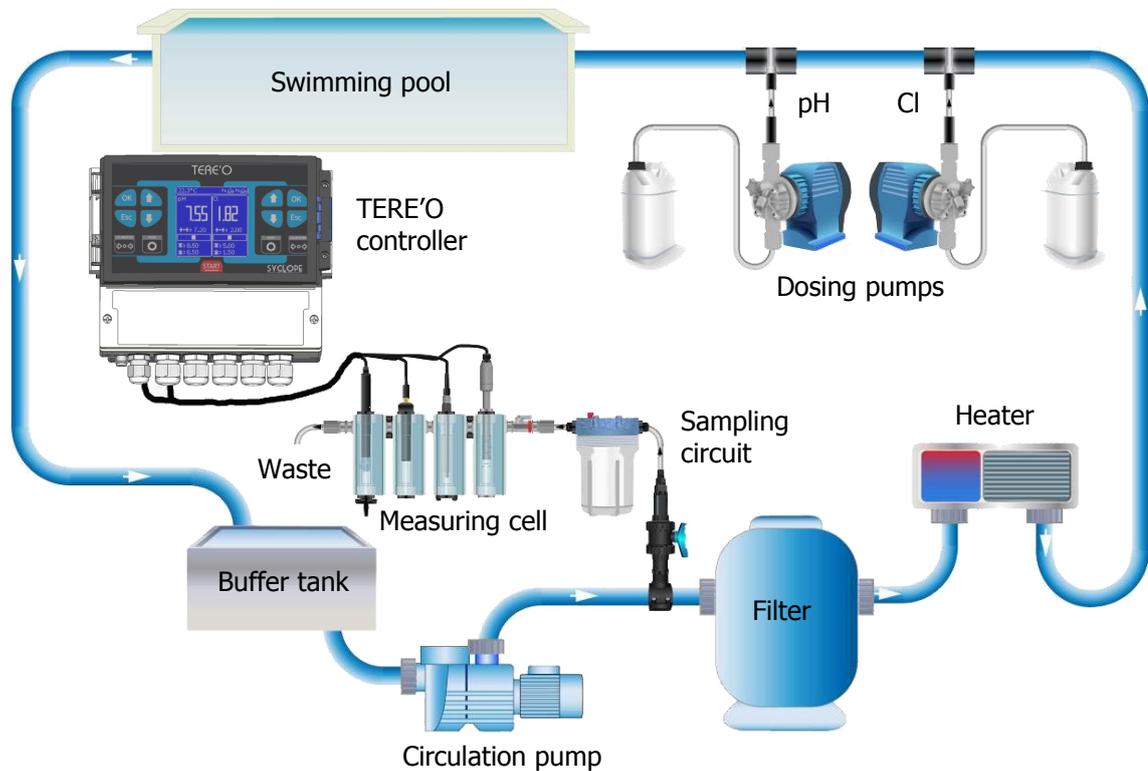
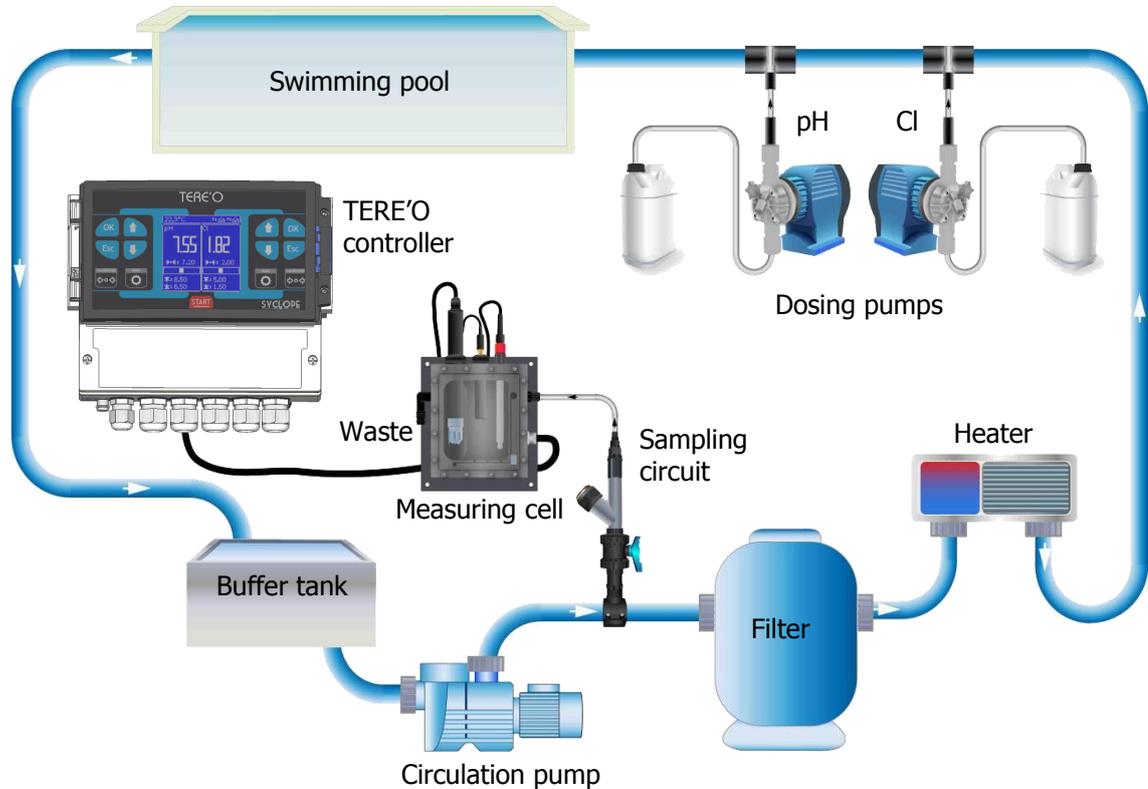
Be careful to the distance between the injection points of chemistry products into the swimming pool and the return line. The water must be homogeneous before coming in the return line.

### 2) Measurements come from recirculating line



This type of installation is recommended in the event of single swimming pool where filtration circuit is independent.

- Water is sampled after the recirculating pumps and before the filter entry. (If using, before flocculent injection circuit)
- The sensors installed into the measuring chamber receive water to be analysed and send the values to the controller.
- According to the setting points fixed by the user, the controller sends proportional orders to the pumps installed into the main intake line of the swimming pool.



## VI. Commissioning

You have just carried out electrical connections, you have installed sensors and you have connected dosing equipments, you are thus ready to carry out the startup of your **SYCLOPE TERE'O®** controller.



Apply the power supply on the controller

Check if no visual problem appear, if the controller is well lit and if the other equipments of the installation are not disturbed.



**SYCLOPE TERE'O®** controller does not launch automatically the chemistry treatments. The user is the main master for launching the controller after checking the good programation according the needs.

**SYCLOPE TERE'O®** is full programmable. During the power up, the preset parameters are fixed and all regulation processes are inactive.



**SYCLOPE TERE'O®** controller is delivered with standard programming. It is advisable for the user to modify this programming if it does not correspond to the needs. To modify the programming of the controller, please refer to the following chapter.

## VII. Programming the controller

The **TERE'O®** controllers are equipped with a keyboard and a LCD display to establish the dialog between the user and the machine.



Ensure the good programming of the **TERE'O®** controller before starting regulations!

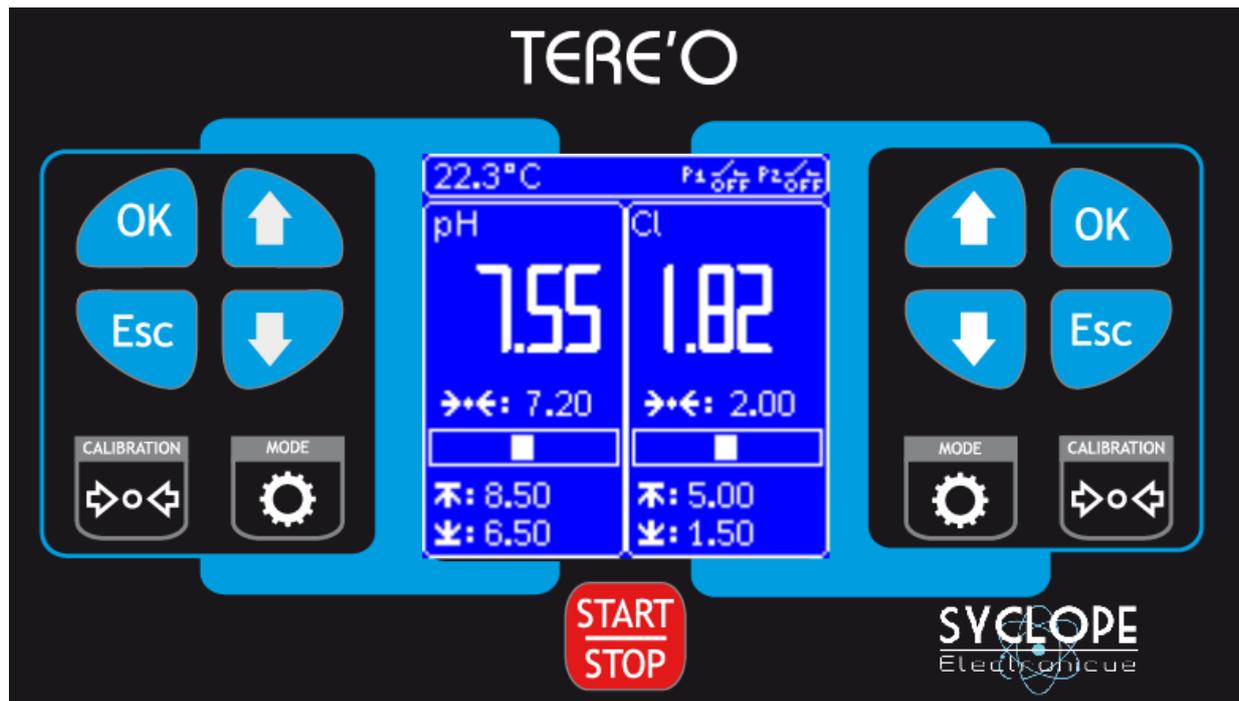
An excess of chemical products can cause harmful actions on the human health and the environment.

### 1) Keypad and LCD display

The LCD display is a 128x128 dots matrix with blue back-light and white writing. By internal software, the screen is separated as follow:

- The higher part indicates the temperature measurement (entry E3), the state of switch control (E4) and the states of P1 and P2 relays.
- The left part indicates the measurement values, controls and alarms of the parameter connected on E1 entry.
- The right part indicates the measurement values, controls and alarms of the parameter connected on E2 entry.

The keypad is symmetrical. The left part of the keyboard gives access to the adjustments of the parameter selected on the left part of the LCD display. The right part of the keyboard gives access to the adjustments of the parameter selected on the right part of the LCD display.



OK key: a short push allows the validation of the operation.



ESC key: a short push allows erase or return to the preceding operation.  
A long push gives you access to the general menu of the controller.



↑ Key: a short push makes it possible to move into the menus or to increment a value.  
A long push allows a fast increment of a value.



↓ Key: a short push makes it possible to move into the menus or to decrement a value.  
A long push allows a fast decrement of a value.



Calibration Key: a short push allows the calibration of the corresponding sensor.  
A long push allows the inhibition of the polarization time for the corresponding sensor.



Mode Key: a short push makes it possible to select the operating process of the controller (Manual or AUTO) when the regulation is launched (START Key).  
A long push gives access the adjustments of the sensor parameters.



Start/Stop Key: allows to activate/deactivate the processes.



The sensor connected to E1 entry is displayed on the left part of the screen.  
The sensor connected to E2 entry is displayed on the right part of the screen.

## 2) « Factory » setting values

Whatever the type of operation chosen, the following configurations are carried out by the factory:

- Language: French
- Contrast: 50 %
- Parameter 1: Chlorine range :10ppm - Set point: 2ppm  
High threshold: 5ppm – Low threshold: 1,5ppm
- Parameter 2: pH – Set point: 7,2pH  
High threshold: 8,5pH – Low threshold: 6,5pH
- Flow control entry : NC (Normally closed)
- Controls : Inactives
- Proportional band Bp : 10%
- Cycle time of PWM: 120 s.

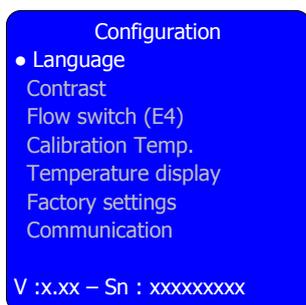
## 3) Principle of programming

The display of the **SYCLOPE TERE'O**® controller is separated in 3 parts:

- A main programming screen
- A label for each parameter adjustment
- A screen of measurement values and dosing in progress.

### a) Main programming menu

A long push on one of the two **ESC** keys gives access to the main programming menu... once in the this menu, a short push on **ESC** key makes it possible to get out immediately.

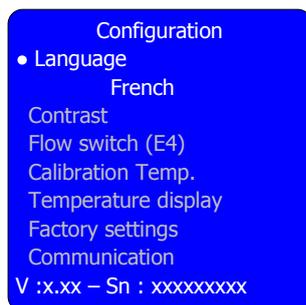


The keys  and  allow to navigate in the menu.

The  key allows you to confirm your choice

The  key allows you to leave the configuration menu

#### ➤ Language

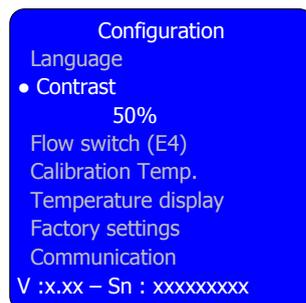


By pushing on **OK** key whereas the line "**Language**" is in intensified brightness allows to have access to language selection.

The  and  keys allow to show the available languages. The validation is done by pushing **OK** key.

In any case, it is possible to return to the previous state without validation by a short pushing the **ESC** key.

#### ➤ Contrast



By pushing on **OK** key whereas the line "**Contrast**" is in intensified brightness allows to have access to adjust contrast value.

The  and  keys allow to increase/decrease the contrast value in real-time. Once desired contrast is reached, the validation is done by pushing **OK** key.

In any case, it is possible to return to the previous state without validation by a short pushing the **ESC** key.

➤ Flow switch (E4)



By pushing on **OK** key whereas the line **"Flow switch"** is in intensified brightness allows to have access to select the polarity of the circulation flow switch.

The **↑** and **↓** keys allow to select the state of the recirculation flow switch **"NO"** (normally open) or **"NC"** (normally closed). Once the good value is selected, the validation is done by pushing **OK** key.

In any case, it is possible to return to the previous state without validation by a short pushing the **ESC** key.

➤ Calibration temperature



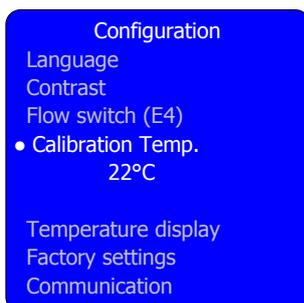
Calibrations are determining operations for good working of the controller and best treatment of the swimming pool!



A bad calibration could be dangerous for your health and your swimming pool. It can cause corrosions and destruction of the swimming pool parts. In any doubt about the procedure, contact our after sale service!



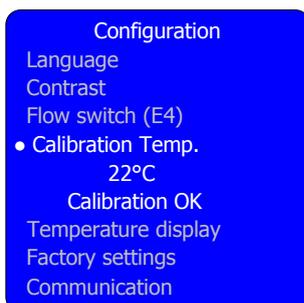
A bad setting point could cause excessive consumptions of calories and harm the environment!



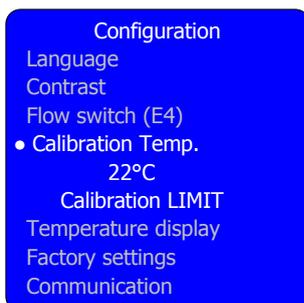
By pressing on **OK** key whereas the line **"Calibration Temp."** is in intensified brightness allows to have access to the temperature sensor calibration. This calibration procedure use only one point.

The **↑** and **↓** keys allow to adjust the measured value to the real value of the temperature.

The validation is done by pushing **OK** key.



If the calibration procedure is correctly proceeded, the **"Calibration OK"** message is displayed.



If the system detects that the last calibration point is a little bit away from the theoretic value, the temperature sensor calibration is done but a **"Calibration LIMIT"** message is displayed.

That means that the temperature sensor is still in operating condition but must be replaced soonest.

```

Configuration
Language
Contrast
Flow switch (E4)
• Calibration Temp.
  22°C
  Calibration ERROR
Temperature display
Factory settings
Communication

```

If the system detects that the last calibration point is too far away from the theoretic value, the temperature sensor calibration is cancelled and "**Calibration ERROR**" message is displayed.

That means the temperature sensor is working bad or is broken. Please, replace it immediately.

➤ Displaying temperature or not

```

Configuration
Language
Contrast
Flow switch (E4)
Calibration Temp.
• Temperature display
  ON
Factory settings
Communication
V :x.xx – Sn : xxxxxxxx

```

By pressing on **OK** key whereas the line "**Temperature display**" is in intensified brightness allows to have access to the choice of activation or deactivation of the temperature displaying in the main screen.

The **↑** and **↓** keys allow to select ON or OFF state. The validation is done by pushing **OK** key.

➤ Factory settings

```

Configuration
Language
Contrast
Flow switch (E4)
Calibration Temp.
Temperature display
• Factory settings
  OK/Esc
Communication
V :x.xx – Sn : xxxxxxxx

```

By pressing on **OK** key whereas the line "**Factory settings**" is in intensified brightness allows to reload the memory by default settings like statement in the paragraph:

The sensor connected to E1 entry is displayed on the left part of the screen.

The sensor connected to E2 entry is displayed on the right part of the screen.

To validate press **OK** key!

To cancel press **ESC** key



Be careful! This operation is irreversible. Once validated by OK key, all your personal configuration parameters will be lost.

➤ Communication

```

Configuration
Language
Contrast
Flow switch (E4)
Calibration Temp.
Temperature display
Factory settings
• Communication
V :x.xx – Sn : xxxxxxxx

```

By pressing on **OK** key whereas the line "**Communication**" is in intensified brightness allows to have access to communication RS485 ModBus configuration.

This window also allows to verify the connection statute of the socket modem when activated.

```

• Speed : 9600
Parity : Even
Adress : 1
Protocol : RTU

```

By using **↑** and **↓** keys allow to select the parameter to be modified, when the desired parameter is in intensified brightness. Press on **OK** key to enter in modification mode.

In modification mode (line blinking) the **↑** and **↓** keys allow to modify the value.

```

Modem : No Modem

```

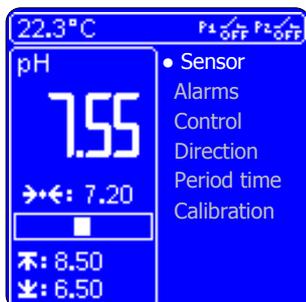
To validate, press **OK** key!

To cancel and to return to the previous menu, press **ESC** key!



For more information, refer to the communication manual of the controller. (Manual 2)

### b) Setting parameter values



By pressing long time on **Mode** key of the left part gives access the menu of the measured parameter from **E1** entry.

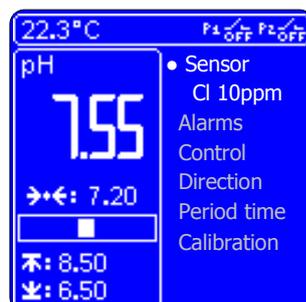
In this menu, navigation is performed by using **↑**, **↓**, **OK** and **ESC** keys on the left part of the display affected to parameter 1.

As the left part, the right part uses the **Mode** key to access the menu of measured parameter from **E2** entry. In this case, navigation is performed using **↑**, **↓**, **OK** and **ESC** key of the right part of the display affected to parameter 2.

#### ➤ Choice of the sensor



The modification of the sensor is only possible if you press **START/STOP** key when starting the controller. Once the sensor is chosen and the controls started, the choice of sensor is deactivated again.



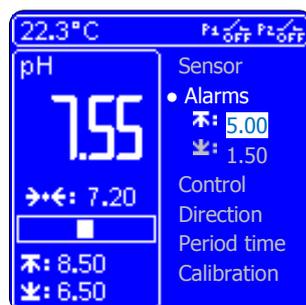
The access to the choice of sensor is performed by pressing **OK** when "**Sensor**" line is selected in intensified brightness.

The **↑**, **↓** keys allow to select the registered sensors.

Once the sensor chosen, use **OK** key to validate the choice.

In any time, it is possible to leave this menu without validating the choice by pressing on **ESC** key.

#### ➤ Alarm thresholds



The access to alarm thresholds sub-menu is performed by pressing **OK** when "**Alarms**" line is selected in intensified brightness.

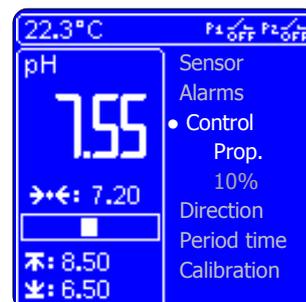
The following sub-menu appears:

Previously, by pressing on **↑** and **↓** keys allow to set the highest alarm threshold corresponding to the parameter. Then done, press on **OK** key to validate the high value.

Once the high threshold validated, use **↑** and **↓** keys to set the lowest alarm threshold and press **OK** to validate the low value.

In any time, it is possible to leave this menu without validating the alarm thresholds by pressing on **ESC** key.

#### ➤ Choice of control mode



The access to the choice of control mode sub-menu is performed by pressing **OK** when "Control" line is selected in intensified brightness.

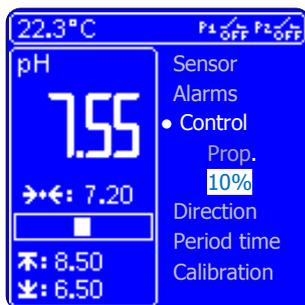
The following sub-menu appears:

The **↑** and **↓** keys allow to select **PROP** mode for proportional control or **HYST** mode for a control by hysteresis.

Once the control mode is chosen, use **OK** key to validate.

In any time, it is possible to leave this menu without validating the alarm thresholds by pressing on **ESC** key.

➤ Setting of proportional/hysteresis band



The access to the proportional/hysteresis band setting sub-menu is performed by pressing **OK** when "**Control**" line is selected in intensified brightness.

The following sub-menus appears:

By pressing on **↑** and **↓** keys allow to set the proportional band corresponding to the parameter.

In any time, it is possible to leave this menu without validating the proportional band by pressing on **ESC** key.



Proportional band (Bp) is understood as "% of full scale (Fs)". That means for a pH full scale of 0 to 14pH and a proportional band of 10%, the dosage value will be 100% when the gap with the setting point will be  $\geq$  to:

$$Fs \cdot (Bp) \% = 14 \times 10 \times (1/100) \text{ either } 1,4\text{pH}$$

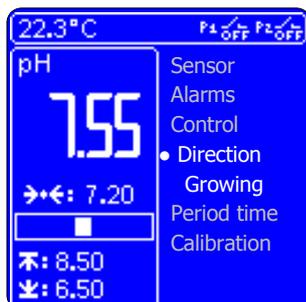


Hysteresis (Hy) is understood as « % of full scale (Fs) centred on the set point. That means for a full scale of 0 to 10ppm for chlorine parameter and a hysteresis value of 10%, the differential value will be:

$$Fs \cdot (Hy) \% = 10 \times 10 \times (1/100) \text{ either } 1\text{ppm.}$$

If the set point is 2ppm, the dosage will be activated between 1,5 and 2,5ppm.

➤ Direction of control



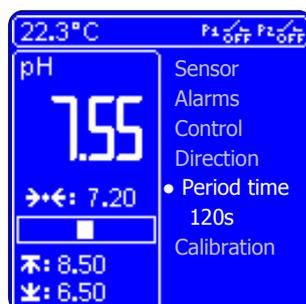
The access to the direction of control is performed by pressing **OK** when "**Direction**" line is selected in intensified brightness.

The following sub-menu appears:

By pressing on **↑** and **↓** keys allow to select "**Growing**" or "**Decreasing**" direction corresponding to the control of parameter.

In any time, it is possible to leave this menu without validating the proportional band by pressing on **ESC** key.

➤ Period time setting



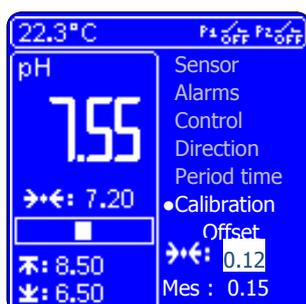
The access to the period time of control is performed by pressing **OK** when "**Period time**" line is selected in intensified brightness.

The following sub-menu appears:

Setting of the period time is allowed by using **↑** and **↓** keys to adjust it between 10 to 240 s. When done, press **OK** to validate the value.

In any time, it is possible to leave this menu without validating the cycle time by pressing on **ESC** key.

➤ Calibration of the offset/pH7 of the sensor

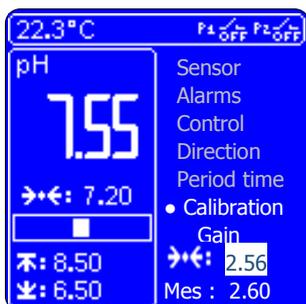


The access to the offset/pH7 calibration sub-menu is performed by pressing **OK** when the "**Calibration**" line is selected in intensified brightness and **OK** again when the "**offset**" lines appear with a value to be adjusted for calibrating zero of amperometric sensor and of pH=7 for pH sensor.

Measurement value of the parameter appears on "**Mes**" line.

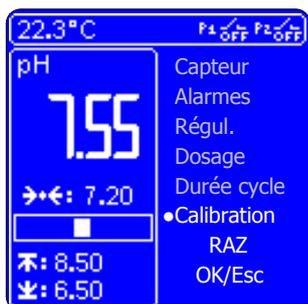
By pressing on **↑** and **↓** keys allow to set the reference value. When the good value is entered, press **OK** key to validate.

➤ Calibration of the gain or pH4 of the sensor



The access to the Gain/ph4 calibration sub-menu is performed by pressing **OK** when the **"Calibration"** line is selected in intensified brightness and **OK** again when the **"Gain"** lines appear with a value to be adjusted when away of 0 value for calibrating gain (or slope) of amperometric sensor and of pH=2 to 6 and pH=8 to 12 for pH sensor. Measurement value of the parameter appears on **"Mes"** line. By pressing on **↑** and **↓** keys allow to set the reference value. When the good value is entered, press **OK** key to validate.

➤ Resetting calibration



The access to the resetting calibration sub-menu is performed by pressing **OK** when the **"Calibration"** line is selected in intensified brightness and **OK** again when the **"RAZ"** line appears. By pressing on **OK** key will reset all calibration of the corresponding parameter. In any time, it is possible to leave this menu without reset by pressing on **ESC** key.



Be careful! This operation is irreversible. Once validated by OK key, all your personal configuration parameters will be lost.

c) Screens of measurements and dosing in progress

This screen is the operational screen of your controller. It is composed of three parts:

- Left part corresponding to the measured parameter on **E1** entry.
- Right part corresponding to the measured parameter on **E2** entry.
- High band part giving various operating information.

➤ Displaying the measurement value

The measured value is displayed according to the range of the selected sensor... This field can take four different statuts:

	}		<p>Measured value.</p> <p>Value higher than the range of the sensor.</p> <p>Value lower than the range of the sensor.</p> <p>Unconnected sensor</p>
--	---	--	-----------------------------------------------------------------------------------------------------------------------------------------------------

➤ Displaying setting point

The symbol represent the setting point value.

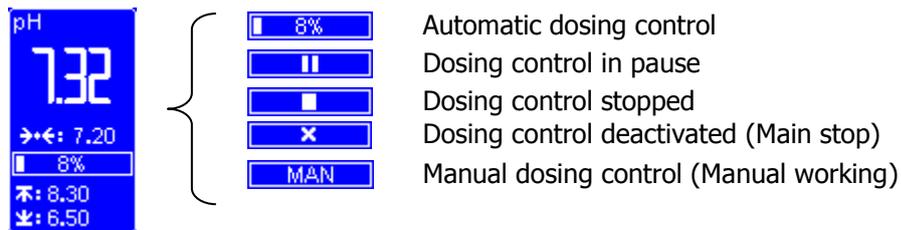
This last one is programmable directly from the main screen by using **↑** and **↓** keys corresponding to the parameter. Validate by pressing **OK** key!



If the modification is not validated before 5s, it will not be registered.

### ➤ Displaying dosing controls

The dosing control symbol can take five different statuses.



When started the controller, dosing control is stopped:

By pressing on **START** key launches the regulation of the two parameters according their setting points.

If the sensor polarization is not finished (the symbol is present), the regulation is in pause mode (symbol

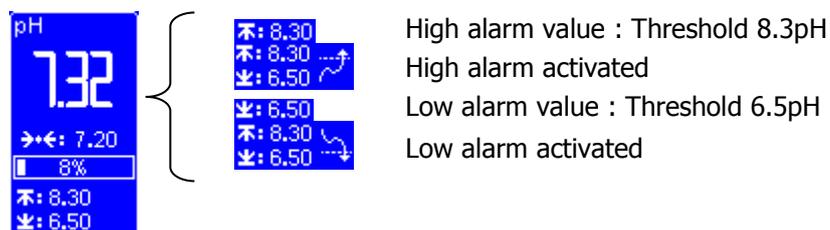
When polarization is finished (the symbol disappears), the automatic dosing controls are activated (

If you wish to select manual dosing control on one of the two parameters, press on the **MODE** key allows to pass in manual dosing control (symbol ), an additional pressing on **MODE** key allows to pass in deactivated mode (symbol ), again, another additional pressing on **MODE** key allows to return in automatic mode.

By pressing on **STOP** key allows to stop the regulation of the two parameters (symbol ). Pressing **MODE** key is without effect when the regulation is stopped.

### ➤ Displaying alarms

Bottom of the display part informs about the thresholds and the states of alarms.



### ➤ Displaying statutes in the higher display band

The higher display part gives informations about **E3** and **E4** entries and **P1** and **P2** relay outputs.

The value **22.3°C** displayed in the left higher corner indicates the temperature.

The symbol informs that the water does not circulate into the measuring chamber.

The symbol informs that the P1 output is activated.

The symbol informs that the P2 output is deactivated.

4) Polarisation of sensor

When starting the controller or when connecting of a new sensor, the symbol  will appear. This symbol indicates that the polarization of the sensor is in progress. During this programmed time fixed at 2 minutes, the regulation, if it is launched, is put in pause mode (symbol ). During this period, it is impossible to reach adjustments or calibrate the sensor.



By pressing on **CALIB** key allows to inhibit the polarization time of the corresponding sensor.

5) Calibration of the sensors

The **CALIBRATION** key allows to carry out a calibration of the sensor with who's connected on **E1** or **E2** entries with only one reference value.



Calibrations are determining operations for good working of the controller and best treatment of the swimming pool!



A bad calibration could be dangerous for your health and your swimming pool. It can cause corrosions and destruction of the swimming pool parts. In any doubt about the procedure, contact our after sale service!



A bad setting point could cause excessive consumptions of calories and harm the environment!



Before carrying out the calibration, pH or Redox or Chlorine or Bromine measurements must be performed with special equipment using chemical reagents.



This operation does not require the stop the recirculating pumps nor the removing sensors from the measuring cell.

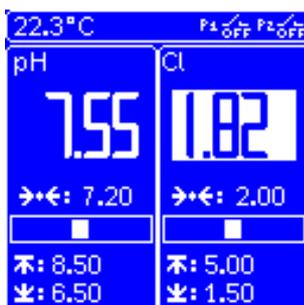


The chemical reagents for pH or Redox (ORP) or Chlorine or Bromine measurements are not provided with the controller.



To proceed an automatic calibration:

- Recirculating circuit must work since several minutes
- Displayed value must be stable
- Dosing pumps must be stopped



By pressing on the **CALIBRATION** key causes measured value zone in intensified brightness. Use  $\uparrow$  and  $\downarrow$  keys to adjust the value according your reference. When done, press OK to validate!

During this operation, press on **ESC** key to cancel the calibration or wait 5 seconds without any action on any key. Controller will recover the previous display before calibration procedure.

If the sensor calibration correctly proceeded the message "**Calibration OK**" is displayed.

If the system detects that the last calibration point is a little bit away from the theoretic value, the sensor calibration is done but a **"Calibration LIMIT"** message is displayed.

That means that the sensor is still in operating condition but must be replaced soonest.

If the system detects that the last calibration point is too far away from the theoretic value, the sensor calibration is cancelled and **"Calibration ERROR"** message is displayed.

That means the sensor is working bad or is broken. Please, replace it immediately.

### **VIII. Maintenance**

The controller is without maintenance.

Repairs must be carried out only by qualified technicians and must be carried out in our factory of SAUVAGNON.

For any problem concerning the controller or councils about water treatment, do not hesitate to contact our after sale service.

## EC Certificate of conformity

**Designation of the products: TERE0**

**Declaration :**

SYCLOPE Electronique SAS, Z.I. Aéroport Pyrénées in SAUVAGNON - France -, hereby certifies by the present that the following models "UNIS'EAU and INDIG'O", controllers for the analysis and controls of physicochemical measurements are in conformity with the standards and safety as defined by the European directives 2006/95/EC (Low voltage directive), 2004/108/EC (Electromagnetic compatibility) and 2002/95/CE (RoHS directive).

The present declaration is valid for all of the specimens manufactured after the date of this certificate and according to the original documents of manufacture.

The following standards were used for the examination:

- 2006/95/EC:** **Harmonized standards EN61010-1 Ed3 : 2010**  
2006/95/EC Low voltage directive,  
Safety requirements for electrical equipment for measurement, control, and laboratory use
- 2004/108/EC:** **Harmonized standards EN55022 : 2010, EN55024 : 2010**  
**EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8,**  
**EN61000-4-11, EN61000-3-2 and EN61000-3-3**  
2004/108/EC Electromagnetic compatibility (EMC Directive)  
**Harmonized standard ETSI EN 301 511 V9.0.2.**  
**Harmonized standards ETSI EN 300 328 V1.7.1.**  
**Harmonized standards EN62311(2008), EN50385(2002) and EN50383(2002)**
- 2002/95/CE:** **RoHS Directive (Limitation of dangerous substances).**

**Date of the first sale: 2013, March.**

The present declaration engages the responsibility of :



**SYCLOPE Electronique S.A.**  
**Z.I. Aéroport Pyrénées**  
**64 230 SAUVAGNON**

Represented by :

Georges BRETON  
President

Sauvagnon : 2013/04/17









**SYCLOPE Electronique S.A.S.**

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