



Programming instructions



Parts of the general documentation

- Part 1 : Installation and starting instructions
- Part 2 : Programming instructions

General details:

SYCLOPE Electronique 2016® Notice of the 24/08/2016 Rev 3

Controller for semi publics swimming pools.

Range INDIG'O®

Part 2 : Programming instructions

Editor:



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Subject to modification

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I. Use of the document

Please read this entire document before starting to install, adjusting or commissioning your controller device, in order to ensure the safety of users, the processes and the 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

1) Symbols and signs



Identification of a continue voltage or current



Identification of an alternative voltage or 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.

2) Storage and transport



It is important to store and transport your **SYCLOPE INDIG'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

3) 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.

Content of the packaging:

- ✓ One analyser/controller **SYCLOPE INDIG'O®**
- ✓ Installation and starting instruction notice
- ✓ Programming notice

4) 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 procedures

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 INDIG'O®** system has been designed to measure and control Chlorine, Bromine, pH, Redox potential, Ozone, etc... 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 INDIG'O®** 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 INDIG'O®** 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 on the controller 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 INDIG'O®** 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.

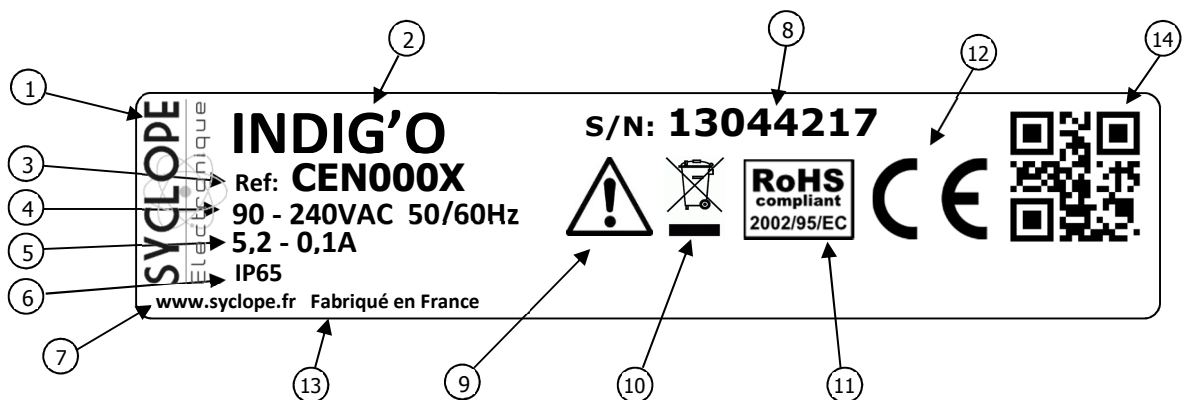


Make sure that the chemical sensors used with this device correspond well to the chemicals used. Refer to the individual technical note of each sensor. Chemistry of water is very complex, in case of doubt, contact immediately our engineering service or your approved installer/reseller.



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 label



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 certified
⑤ Values of the maximum current	⑬ Country of origin
⑥ Classify protection	⑭ Manufacturer square code
⑦ Identification of the manufacturer	
⑧ Serial number	

Identification label



5) Disposal and conformity

The recyclable packaging of the **SYCLOPE INDIG'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.



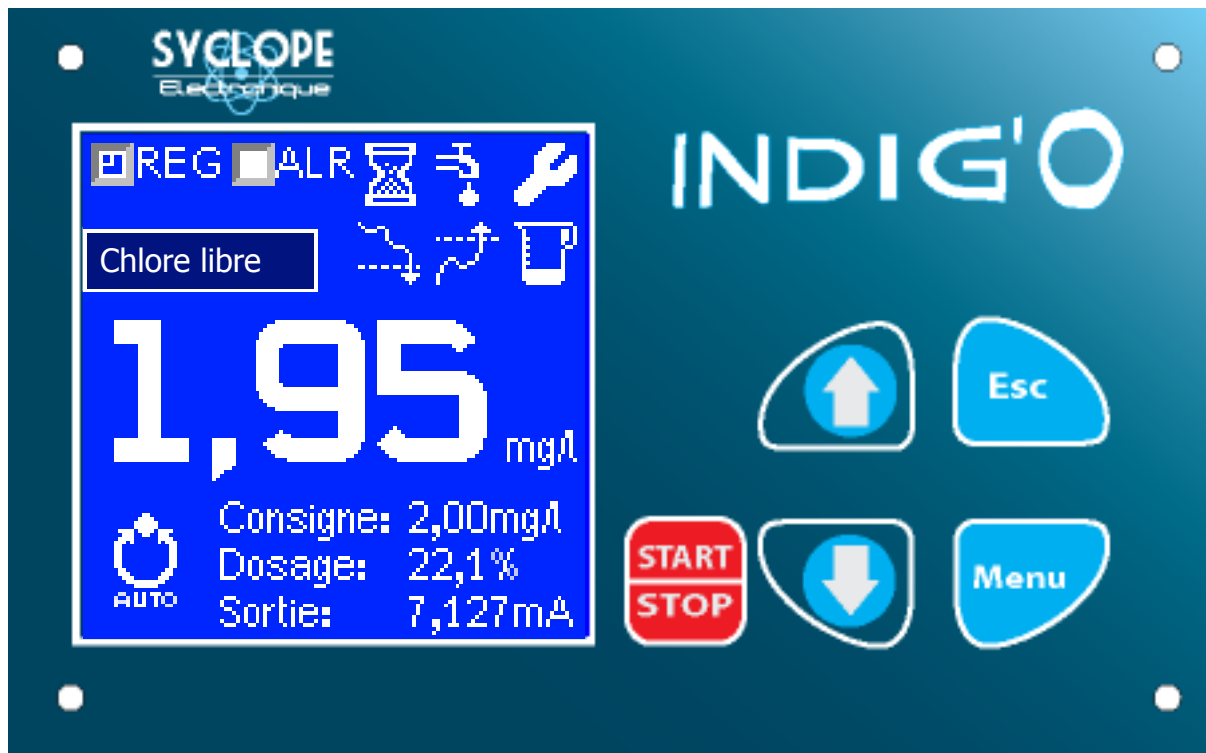
According to European directive 2002/95/EC, this symbol means that the **SYCLOPE INDIG'O®** controller is designed in compliance with the restrictions on hazardous substances



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

III. Human/Machine interface

1) Keyboard



Display 128x128



Key "Menu" : Allow to go in the different menu or to valid a setting



Key "START/STOP" : Allow to start or stop the control. Allow also to acquit the alarms



Key "Esc" : Allow to return at the permanent display



Key "+" : Allow to increment a value or change a setting

Key "-" : Allow to decrement a value or change a setting

2) Permanent display, pictograms and messages

On this display, you can see all the working of your controller:

- The measuring value
- The set point
- The dosing value
- The parameter and his unit
- The status of the relay
- Pictograms and messages for alarms



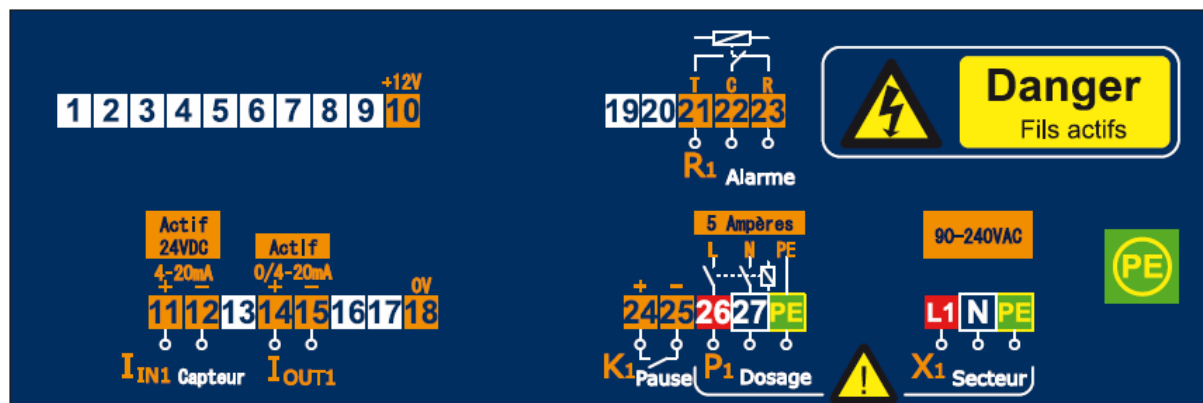
Visualisation	Signification
Value	Measuring value and unity
Parameter	Showing the measured parameter
Status of relay	Showing status of the relay. Checkmark means that relay is activated
Alarms	Showing the actives alarms
M/A Indicator	Showing status of the control. Auto  or STOP 
Set point	Value to reach
Dosage	Percent of control on the metering unit
Output	Value sent to the PLC

3) Alarms

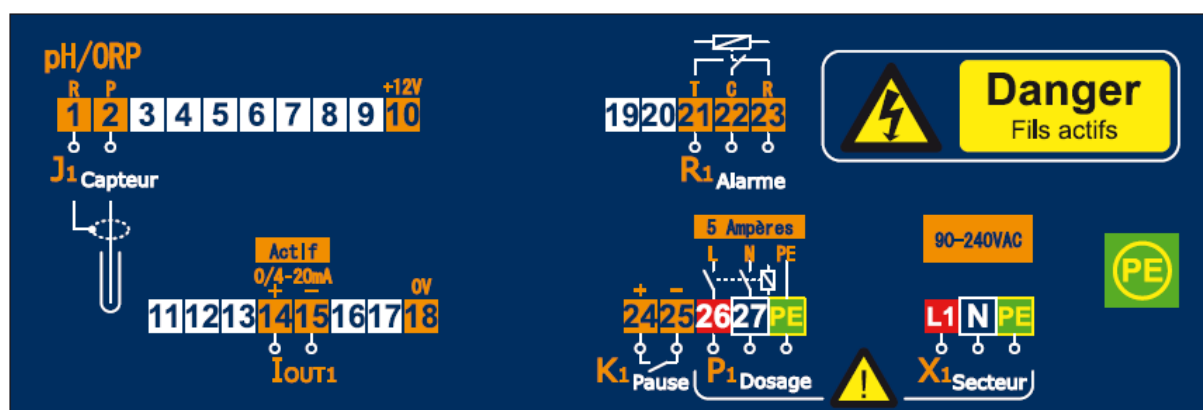
Visualisation	Signification	Menu of modification	Value	Action
	Polarization time	Configuration Menu Sensor Page	Time	Stop dosing
	Incorrect flow	Configuration Menu Flow switch Page	NO or NC	Stop dosing
	Sensor Maintenance	-	-	Calibration Limit
	Low alarm threshold	Settings Menu Alarms Page	Value	Activate R1 relay
	High alarm threshold	Settings Menu Alarms Page	Value	Activate R1 relay
	Overdosing delay	Settings Menu Alarms Page	Time	Stop dosing Activate R1 relay
Polarization in progress or defective sensor I<3,7 mA	Polarization or default of the sensor	-	-	Stop dosing
Sensor out of range or short circuit. I>20 mA	Sensor out of range or short circuit	-	-	Stop dosing
Disconnected or defective sensor	Bad connection or sensor in default	-	-	Stop dosing

4) Internal connections

Reference: CEN0000 with 4-20 mA analog input



References: CEN0001 and CEN0005 with pH or ORP input



IV. Navigation into the menus

1) Accessing to the menus

The programming interface of the **SYCLOPE INDIG'O®** is based on 3 different levels:

- **Setting** Menu: to program the working settings such set point, alarms...
- **Configuration** Menu: to configure the machine such flow switch, analog output...
- **Factory** Menu: to configure the language, the parameter and the range

Each Menu contains several pages allowing to set or configure the unit.

This table describe the composition of each menu and how to reach them.

Menu	Key	Action	Page
Setting		Simple Press	Calibration
			Control
			Alarms
Configuration		Press for 5 sec	Dosage
			Control relay
			Analog output
			Flow switch
			Sensor (Polarization)
			Test
Factory		Press for 5 sec during switching on power	Language Sensor (parameter) Range

2) Navigation into the Menu

Once the Menu is reached:



: Permit to scroll the cursor and to valid a modification

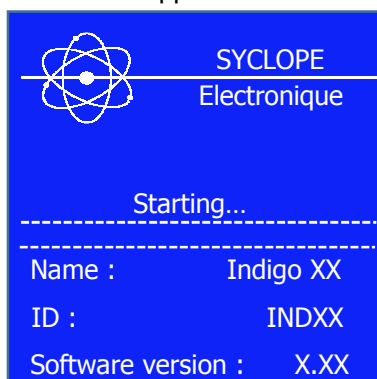


: Permit to scroll the setting or the value selected

V. Starting

1) Starting display

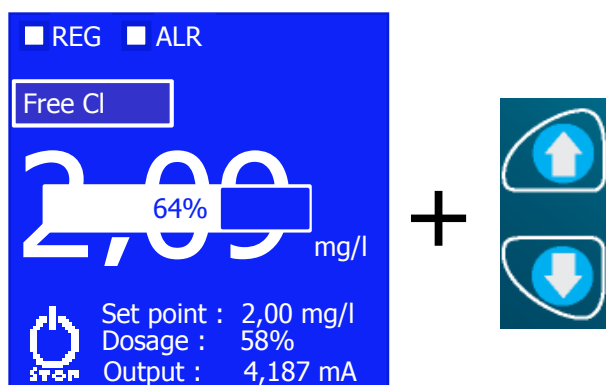
Once the controller is switched on, this screen appears.



Line	Signification	Setting	Default value
Name	Name of the product	Indigo mA or mV	Depend of the reference
ID	Embedded software name	INDMA or INDMV	Depend of the reference
Version	Embedded software version	X.XX	Depend of the reference

2) Adjust the contrast display

To adjust the contrast of the display, press on the arrow **"TOP"** or **"BOTTOM"** from the permanent screen.



3) Starting the control

To start the control, press the key **"START/STOP"**



VI. Setting Menu

The Setting Menu permit to set all the working parameter. Press the key "**MENU**" to reach this menu and press again the key "**MENU**" to go over the 3 different screens of this level.

Menu	Key	Action	Page
Setting		Simple press	Calibration
			Control
			Alarms

1) Calibration of the sensor : Screen "Calibration"

This screen allow to make two operations regarding the calibration of the sensor.

- Buffer : to calibrate the sensor to the standard value measured with your reference device or a buffer solution. Adjust the value with arrow keys "**TOP**" or "**BOTTOM**" then valid this value pressing the "**MENU**" key.
Depending of the value set, the controller automatically adjust the slope or the offset.
- Erasing : to reset the calibration and return to factory properties (Slope and offset). In this screen, press the "**MENU**" key for 5 sec to do this operation.

Version 4-20 mA

Calibration	Control	Alarms
Sensor:	6,506 mA	
Raw value:	2,08 mg/l	
Buffer:	2,09  mg/l	
Slope:	1,19 mA/mg/l	
@Standard :	100 %	

Version pH

Calibration	Control	Alarms
Sensor:	0,5 mV	
Raw value:	6,99 (pH)	
Buffer :	6,99  (pH)	
Offset:	0,0 mV	
Slope:	-59,1 mV/(pH)	

Version ORP

Calibration	Control	Alarms
Sensor:	745 mV	
Raw value:	745 mV	
Buffer:	+745  mV	
Offset:	0,0 mV	

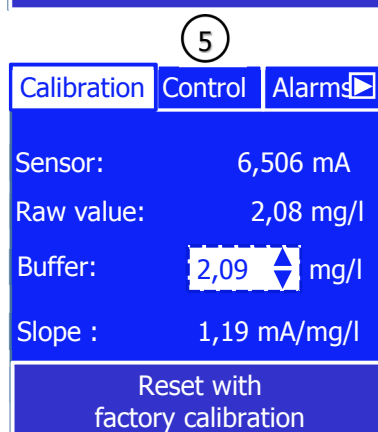
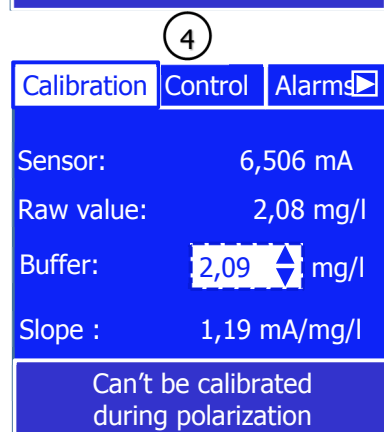
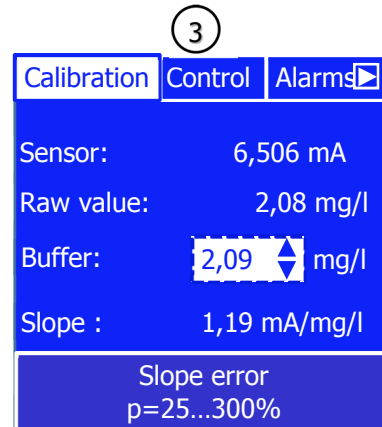
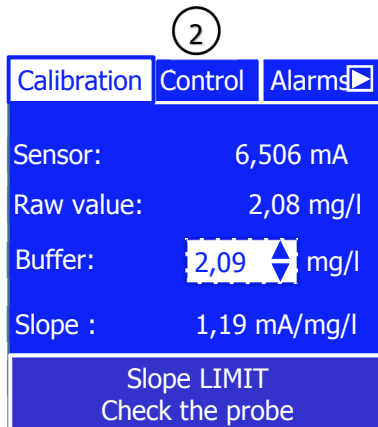
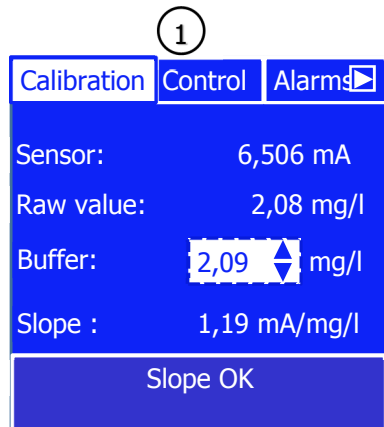
Name	Signification
Sensor	Raw current or mV gives by the sensor without calibration
Raw value	Raw value (in mg/l or mV) following the raw mA or mV signal
Buffer	Value to set with the reference device or buffer solution
Slope	Slope after calibration in mA/mg/l or in mV/pH
@Standard (Version mA)	Correcting factor after calibration %
Offset (Version mV)	Offset after calibration in mV



After calibrating, a message appears to tell you the calibration status.

Messages and signification after calibrating.

Message	Signification	Action	Fig.
Slope OK	Calibration correct. Slope changed	Calibration done	1
Offset OK	Calibration correct. Offset changed	Calibration done	-
Slope LIMIT Check the probe	The calculated slope after calibration is out of normal value. (Calculated slope <> 33.....250% of standard slope)	Calibration done. Display of the pictogram key of maintenance on the permanent screen	2+6
Offset LIMIT Check the probe	The calculated slope after calibration is out of normal value.	Calibration done. Display of the pictogram key of maintenance on the permanent screen	-
Slope error p=25...300% (Version 4-20 mA)	The calculated slope after calibration is out of acceptable values between 25 and 300%	Calibration refused	3
Offset error Delta (max) = ± 90 mV (Version pH)	The calculated offset after calibration is out of acceptable values	Calibration refused	
Calibration error Delta (max) = ± 70 mV (Version ORP)	The calculated offset after calibration is out of acceptable values	Calibration refused	
Can't be calibrated during polarization	Impossible calibration during polarization	Calibration refused	4
Reset with factory calibration	Reset calibration (slope and offset) values	Back to factory value	5



2) Control settings : Page "Control"

This page allow you to set:

- The set point: value to control in your water
- The Xp value: value for the proportional action on the metering unit

Version 4-20 mA	Version pH	Version ORP
Calibration Control Alarms Set point : 2,00 mg/l Xp : 1,00 mg/l	Calibration Control Alarms Set point : 7,20 (pH) Xp : 0,30 (pH)	Calibration Control Alarms Set point : 460 mV Xp : 30 mV

Name	Signification	Setting range	Default value
Set point	Set point value for control	4-20 mA : 10% to 85%* pH : 2 to 12 ORP : 300 à 850	4-20 mA : 20%* pH : 7,2 ORP : 460 mV
Xp	Value of the proportional action	4-20 mA : 10% to 500%* pH : 0,1 to 70 ORP : 1 to 100	4-20 mA : 10%* pH : 7,2 ORP : 460 mV

(*) : In % of the measured full scale set for the sensor

Details :

-Setpoint : Means value to be reached and stabilized along processing time.

-XP value : Difference between the measuring value and the setpoint for which the regulation is at the maximum. (Controlling value* at 100%).

*Controlling value : It represent the proportional action on the dosing unit (For example, a dosing pump) to reach the setpoint. This value is displayed on the main screen and call "**Dosage : xx %**" (See picture)

Example : Setpoint is 2 mg/l and Xp is 1 mg/l

If difference is 1.5 (> to 1) then Controlling value = 100%
 If difference is 1.0 (= to 1) then Controlling value = 100%
 If difference is 0.5 (< to 1) then Controlling value = 50%
 If difference is 0.25 (< to 1) then Controlling value = 25%

3) Alarms configuration : Page "Alarms"

This page allow you to define :

- Upper alarm threshold : value for the upper alarm threshold with activation of the Alarm relay after overpassing the value
- Lower alarm threshold : value for the lower alarm threshold with activation of the Alarm relay after overpassing the value
- Overdosing delay : Maximum delay (in sec) to reach the setpoint. If overpassing of this delay, activation of the Alarm relay + stop control + display of the pictogram on the main screen
- Version 4-20 mA Version pH Version ORP

ation

Control

Alarms

Upper : mg/l

Lower : mg/l

Overdose : s

ation	Control	Alarms
Upper :	7,70	(pH)
Lower :	6,80	(pH)
Overdose :	0	s

◀ation

Control

Alarms

Upper : 850 mV

Lower : 300 mV

Overdose : 0 s

Name	Signification	Setting range	Default value	Action
Upper threshold	Upper threshold value	4-20 mA : 2 to 100%* pH : 0,2 to 14 ORP : -980 to 1000	4-20 mA : 40 %* pH : 7,70 ORP : 850	Alarm activation
Lower threshold	Lower threshold value	4-20 mA : 0% to 98%* pH : 0 to 13,8 ORP : -1000 to 980	4-20 mA : 10 % pH : 6,80 ORP : 300	Alarm activation
Overdose	Maximum dosing delay before stopping control	0.....9999 s	0 s	Alarm activation Stop control

(*) : Expressed in % of the measuring range

Upper Alarm

■ REG ■ ALR

Free Cl

4,10 mg/l

Setpoint : 2,00 mg/l
 Dosage : 0,00%
 Output : 10,57

Lower Alarm

REG ALR

pH

6.50 pH

Setpoint : 7,20 pH
 Dosage : 0,00%
 Output : 11,43

Overdosing

REG ALR

pH

7.50 pH

STOP

Setpoint : 7,20 pH
 Dosage : 0,00%
 Output : 12,57 mA

VII. Configuration Menu

The Configuration Menu allow you to configure the machine. Keep pressing during 5 sec the "**MENU**" key to access to this level. Then, press again the Menu key to drive into the different steps.

Menu	Key	Action	Page
Configuration		Press during 5 sec	Dosage
			Control relay
			Analog output
			Flow switch
			Sensor (Polarization)
			Test

1) Dosing mode : Page "Dosage"

According to the version of the product, this page allow to set :

- Additional load : This value, expressed in %, permit to keep a minimum dosing action even once the setpoint reached.

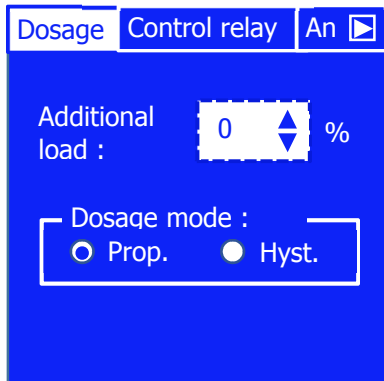
Then, according to the version of the machine :

- In 4-20 mA version, the dosing mode : Proportional mode (Prop.) or On/Off with hysteresis (Hyst.)
- In pH version, the direction : Direction of the dosing (Acid or pH-) or (Alkali or pH+)
- In ORP version, the direction : Oxidant or Reducer

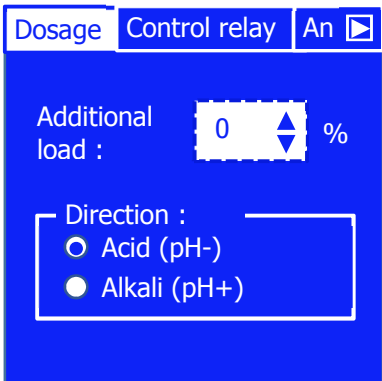


The direction in the 4-20 mA version is always a rising action. The value should be below the setpoint to have an action of the dosing unit.

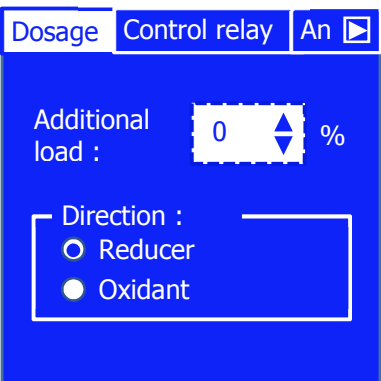
Version 4-20 mA



Version pH



Version ORP

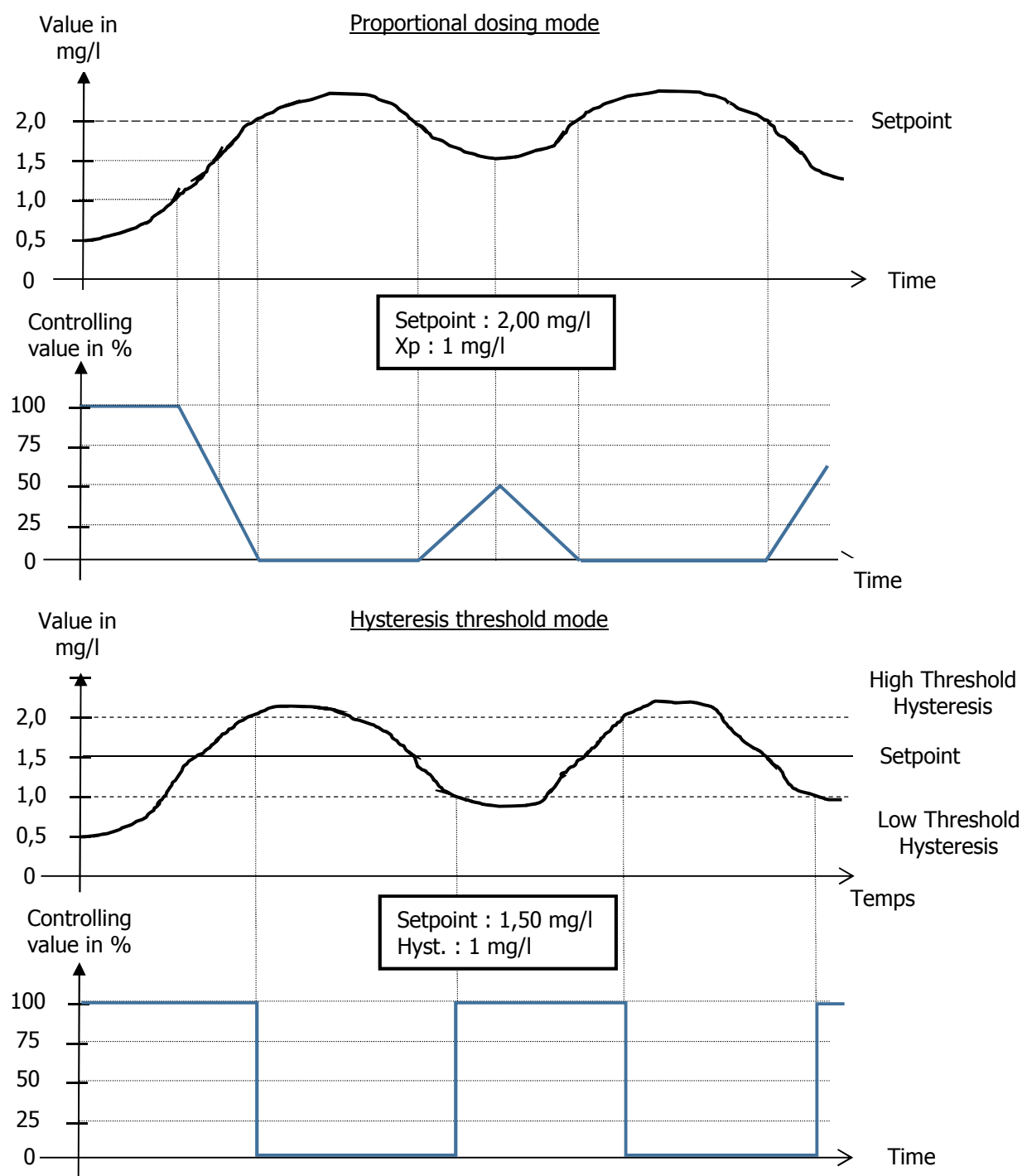




In the 4-20 mA version, if the Hysteresis dosing mode is set, the control range should be set in the "Control" page of the Setting Menu instead of the Xp value in proportional dosing mode. This value is also expressed in the measuring unity (For example, mg/l).

Name	Signification	Setting range	Default value
Additional load	Minimum dosing action	0 to 30 %	0 %
Dosage mode	Proportional control or Hysteresis threshold	Prop. or Hyst.	Prop.
Direction Version pH	Control direction	Acid or Alkali	Acid
Direction Version Redox	Control direction	Reducer or Oxidant	Oxidant

Control chart according to the dosing mode set Proportional or Hysteresis.



2) Control cycle time : Page "Control relay"

This page allow you to define :

- Period : complete duration of a dosing cycle (Only for Proportional mode)
- Min. Time : Minimum time of an action on the relay. If the action to do on the dosing unit is lower than this value, the controller make an addition of the time and apply the action after.

Example :

If : Period = 20 sec, Min. Time = 3 sec, Controlling value = 10 %

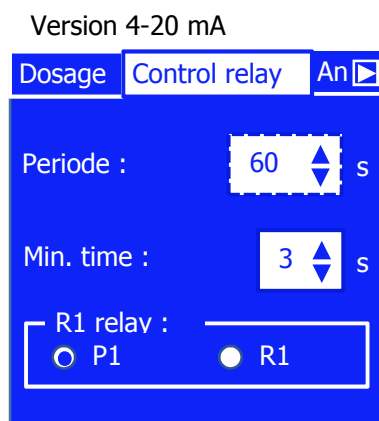
Then : Activation time should be 2 sec. This time is lower than the minimum time set. The controller will make an addition on 2 periods to exceed the minimum time set. So, the controller will make an action of 4 sec (2x2 sec) on 2 periods, so 4 sec on 40 sec period.

If : Period = 20 sec, Min. Time = 5 sec, Controlling value = 10 %

Then : Activation time should be 2 sec. This time is lower than the minimum time set. The controller will make an addition on 3 periods to exceed the minimum time set. So, the controller will make an action of 6 sec (3x2 sec) on 3 periods, so 6 sec on 60 sec period.

You can define also :

- Control Relay : this setting allow to invert the assignment of the two relays. In this case, the powered relay is used for alarm and the dry contact relay, for control.

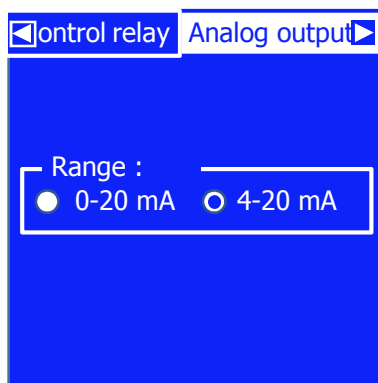


Name	Signification	Setting range	Default value
Periode	Duration of the dosing cycle	10.....1800 s	60 s
Min. time	Minimum time of an action on the dosing unit	0.....5 s	3 s
Dosing relay	P1 set = P1 Dosage is for control R1 set = R1 Alarme is for control	P1 or R1	P1

3) Range for 4-20 mA analog output : Page "Analog output"

This page allow you to set the range of the analog output **I_{out1}** :

- Range : define the range of the analog output. This output allow to transfer the measuring value to a PLC.

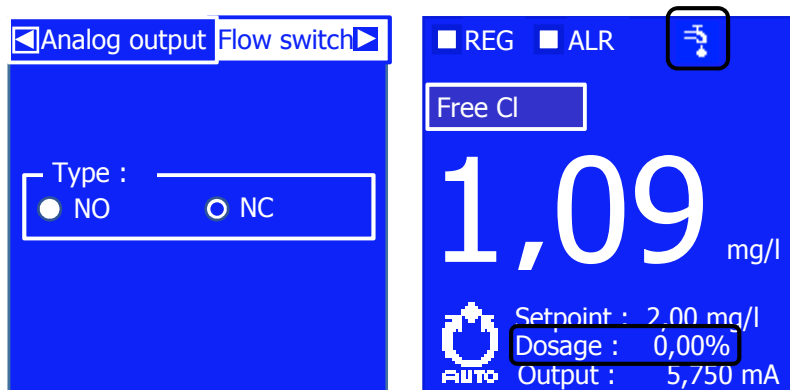


Name	Signification	Setting range	Default value
Range	Working range of the output	0-20 mA or 4-20 mA	4-20 mA

4) Flow switch input : Page "Flow switch"

This page allow you to define the type of the input **K_{1pause}**. When the condition is not checked, the controller put in stand-by the control and display a pictogram on the main screen.

- Type : define the type of the input NO or NC
 NO : Normally open
 NC : Normally Close



Name	Signification	Setting range	Default value
Type	Type of the input K_{1pause}	NO or NC	NC

5) Polarization time : Page "Sensor"

This page allow you to define the polarization time of the sensor. After the power supply or after a default on the sensor, the controller wait during the time set before controlling. During this time, a pictogram is displayed on the main screen:

- Polarization : define the duration before launching the control

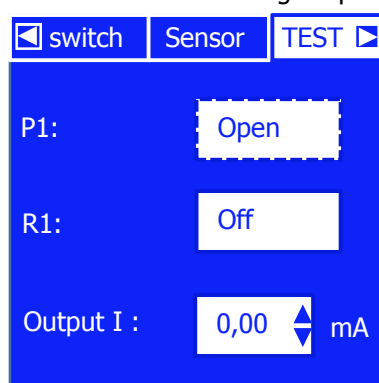


Name	Signification	Setting range	Default value	Action
Polarization	Delay before launching the control	0.....15 min	2...min	Stop control Display picto

6) Output testing : Page "Test"

This page allow you to check manually the working of the output :

- R1 relay : Activation of the powered relay **P₁Dosage**
- R2 relay : Activation of the dry contact relay **R₁Alarme**
- Output I : Sending a defined current on the analog output **I_{OUT1}**

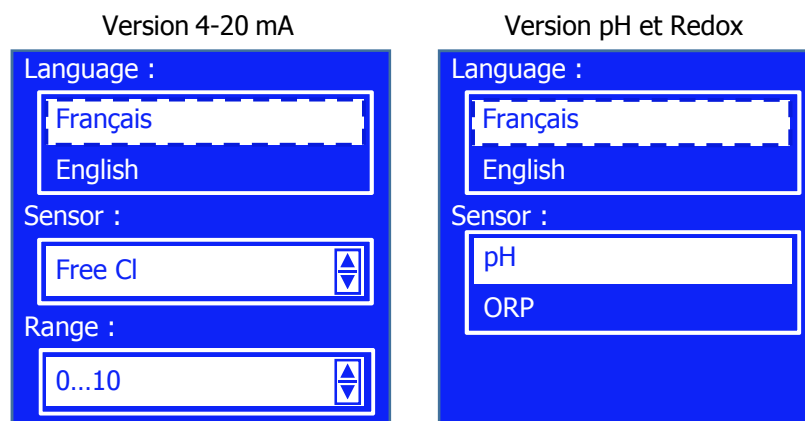


Name	Signification	Setting value	Default value
P1 relay	Working test of P₁Dosage	Open or Close	Open
R1 relay	Working test of R₁Alarme	Off or On	Off
Output I	Working test of I_{OUT1}	0...20 mA	0,00

VIII. Factory Menu

The Factory Menu allow you to configure some general parameters of the controller. While you switch on the power supply, keep pressing the "**START/STOP**" key during 5 sec to access to this menu. Then, press the Menu key to navigate.

Menu	Key	Action	Page
Factory		Keep pressing for 5 sec while switch on power supply	Language Sensor (Parameter) Range



1) Selection of the language

This area allow you to choose de language of the HMI:

Name	Signification	Setting range	Default value
Language	Select your language	Français or English	Français

2) Selection of the sensor

This area allow you to choose the measuring sensor. Refer to the version, to see the possibilities:

Name	Signification	Version	Setting range	Default value
Sensor	Choice of the sensor	Version 4-20 mA	Free Chlorine Active Chlorine Total Chlorine CLO2 BCDMH Bromine DBDMH Bromine Free Bromine Ozone Turbidity	Free Chlorine
		pH	pH ORP	pH
		ORP	pH ORP	ORP

3) Selection of the range

This area allow you to define the range of the sensor. The ranges available change according to the measuring sensor. The range is only changeable for 4-20 mA version :

Name	Signification	Settings	Ranges	Default value
Range	Range of the sensor	Free Chlorine Active Chlorine Total Chlorine CLO2 BCDMH Bromine DBDMH Bromine Free Bromine Ozone Turbidity	0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 à 1 / 2 / 10 / 20 ppm 0 to 1 / 2 ppm 0 to 50/100/200/500/1000 NTU	0-10 ppm

IX. CE Compliance certificate

EC Certificate of conformity

Designation of the product: INDIG'O

Declaration :

SYCLOPE Electronique SAS, Z.I. Aéroport Pyrénées in SAUVAGNON - France -, hereby certifies by the present that the following model "INDIG'O", controller for the measurements and the controls of physicochemical parameters is 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 EN61010-1:2001
2006/95/EC Low voltage directive,
Safety requirements for electrical equipment for measurement, control, and laboratory use
Test report n° 2008-29 of 2008, 26th June.
- 2004/108/EC:** Harmonized standards EN61326-1:2006
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)
Test report n° 2008-24 of 2008, 8th June.
- 2002/95/CE:** RoHS Directive (Limitation of dangerous substances).

Date of the first sale: 2008, July.

The present declaration engages the responsibility of :



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

Represented by :

Georges BRETON
President and General Manager

Sauvagnon : 2008/09/09





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