

Dissolved oxygen monitor **BAMOWIZ OX 452**



Code : 452 001

USER MANUAL

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1. PRECAUTIONS

- Installation, commissioning and maintenance operations must only be performed by qualified personnel.
- Connect the device to a suitable supply voltage as indicated in the technical features.
- Turn off the main supply before any installation and maintenance works.
- Operate the device only in accordance with the conditions described in this manual.

2. APPLICATIONS

The BAMOWIZ OX 452 system is a reliable and accurate solution for an optical measurement of dissolved oxygen in the fields of water treatments:

- Water treatment plant (e.g.: Aeration basin)
- Rivers, lakes
- Fish farming and aquaculture

3. DESCRIPTION

In use with a BAMOX 453 probe (data-sheet 453-01), the BAMOWIZ OX 452 allows the continuous measurement of dissolved oxygen concentration in the water. With this set, the atmospheric pressure, water temperature and conductivity are considered, in order to provide a reliable display and accurate measurement (compensated).

BAMOWIZ OX 452 has a colour touch-sensitive screen to navigate through an intuitive and multilingual menu; It procures a large display for easy readings of measurements and operating status. To facilitate commissioning, a menu acting on the analog output and the thresholds is used to simulate the operating process.

The BAMOWIZ OX 452 has two more inputs, 2-wire, 4-20 mA signal (12 V DC power supplied to transmitters). One of the 3 measurements can be transmitted to a remote PLC through the 4-20mA output.

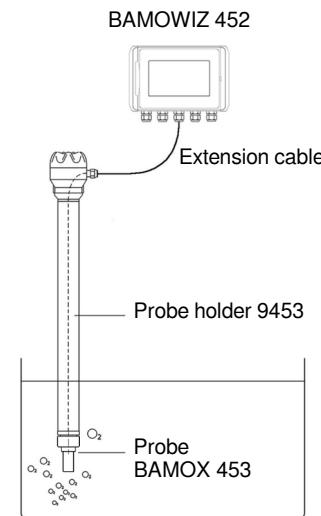
A complete system includes:

- A dissolved oxygen monitor BAMOWIZ OX 452
- A dissolved oxygen optical probe BAMOX 453 (data-sheet 453-01)
- A probe holder 9453 (data-sheet 453-01)
- An extension cable between holder 9453 and monitor BAMOWIZ

In summary, BAMOWIZ allows you to:

- Perform a dissolved oxygen measurement (pressure and / or salinity compensated).
- Choose the setting language
- Set the scale range for the display
- Choose the unit to display
- Set 8 thresholds
- Assign the thresholds to the relay outputs

And more: When inputs Nr 1 or Nr 2 are used for level monitoring, BAMOWIZ also calculates and displays the volume for square or cylindrical tanks or specific tanks (Linearization with 20 points)



The graphic display provides:

- For each input: Identification (TAG) - Value - Unit
- Synoptic of measurements (Bar Graph)
- Identification and status of each relay
- Display of minima and maxima values

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Dissolved oxygen monitor
BAMOWIZ OX 452

09-11-2021

M-452.01-EN-AA

OXY

452-01 /3

4. TECHNICAL FEATURES

Interface

Screen	Graphic color touch-sensitive; size 4/3 - 480 x 272 pixels
Languages	English; French; German; Polish; Portuguese; Spanish
Keyboard	Alphanumeric, dedicated for each language
Scale units	To choose through the list or to set through keyboard

Inputs:

Digital signal	1 input for probe BAMOX 453
Analogue signals	2 inputs, 4-20 mA transmitters, 2-wire, 12 V DC / 0...20 mA (load 50 Ω)

Parameters of measurement compensation:

Temperature	Automatic: Built-in NTC sensor in probe BAMOX 453
Atmospheric pressure	Manual or automatic: Between 500 and 1100 hPa
Salinity	Manual or automatic: Between 0 to 60 g/kg

Outputs:

Analogue	1 output 4-20 mA (with or without linearization)
Relays	3 N.O. contacts, potential free
Adjustable thresholds	1 to 8 trigger points, to be assigned to 2 or 3 relays
Switching power	3 A / 250 V AC
Adjustable hysteresis	From 0 to 100 %
Adjustable timer	From 0 to 9999 seconds

Other operations:

- Linearization (20 points) on 1 input signal 4-20 mA
- Bargraph display of each measurement signal
- Display of minima and maxima values

Electrical features:

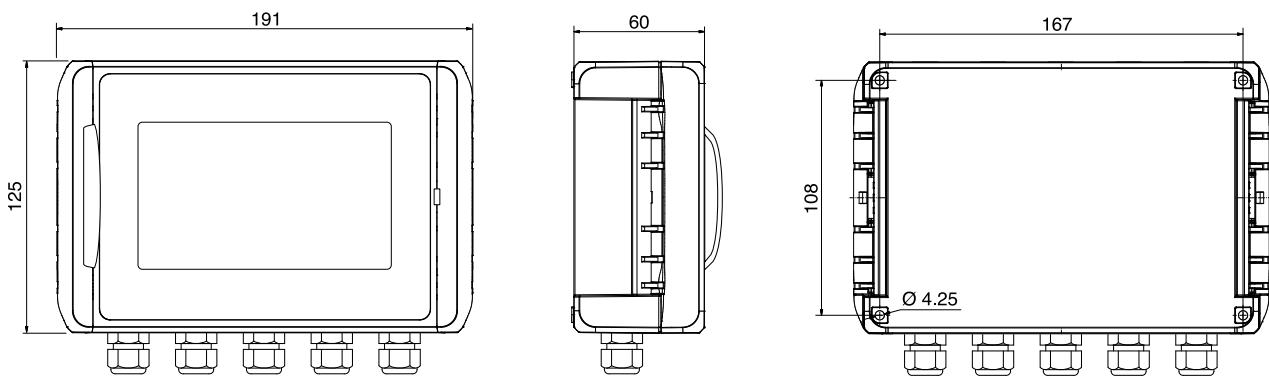
Main power	100 ... 240 V AC 50/60 Hz
Consumption	Max. 5 VA
Cable connections	Screw terminal blocks
Cable glands	5 Cable glands, PG 9

Environnement

Mounting	Wall mount cabinet, in ABS; IP 65
Ambient temperature	-10 ... +50 °C

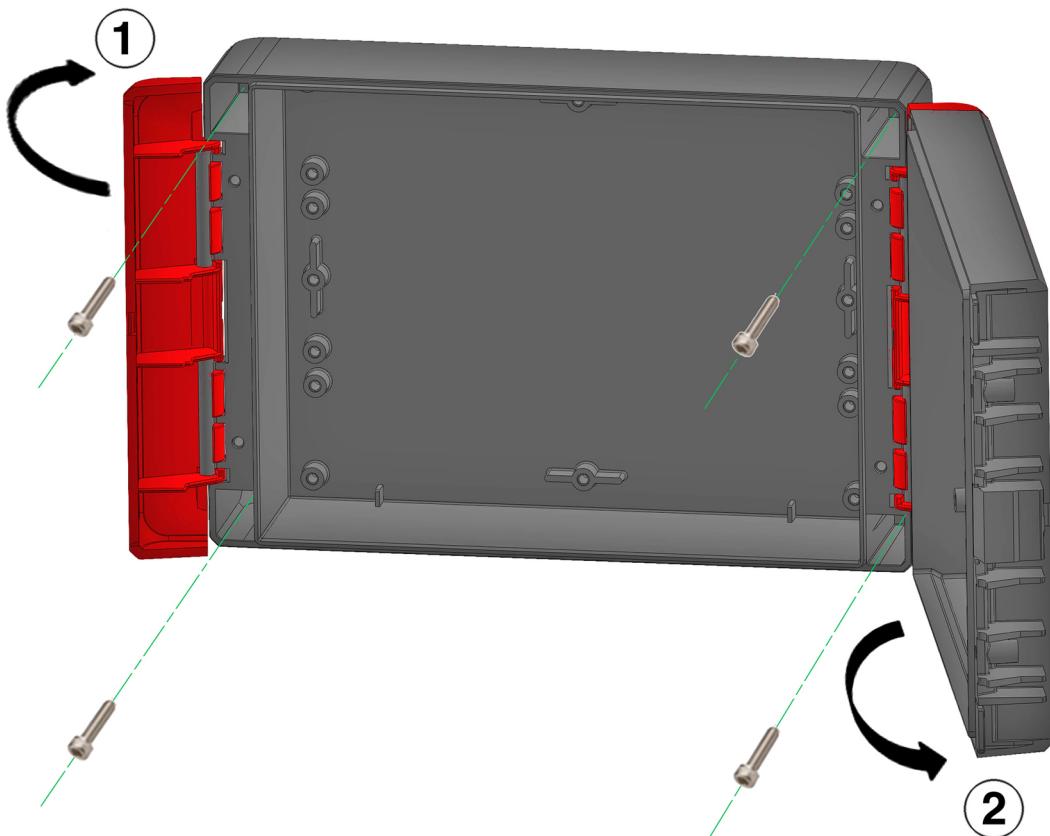
EC Conformity: The instrument meets the legal requirements of the current European Directives.

5. DIMENSIONS



6. INSTALLATION

BAMOWIZ is fixed directly to the wall using 4x4 mm screws.
Caution: Do not drill the housing



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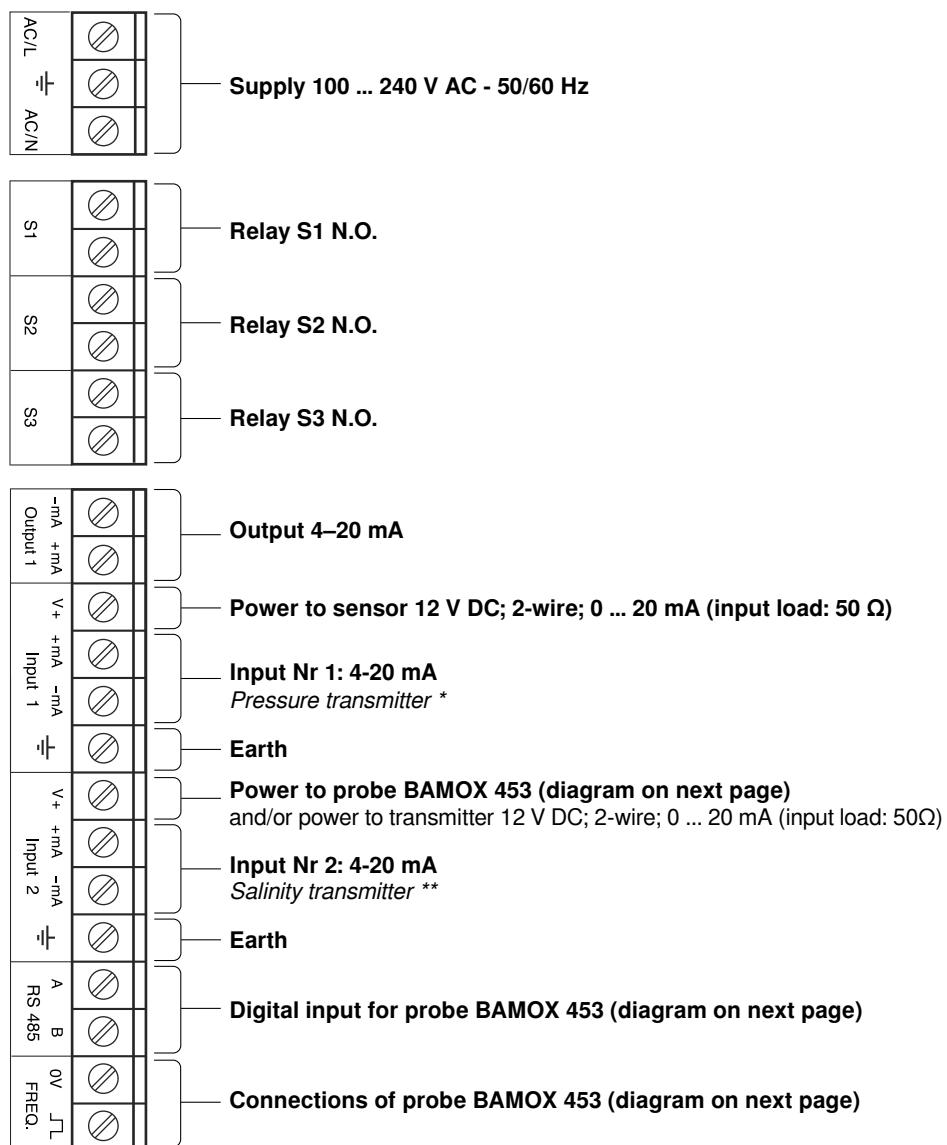
OXY

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7. ELECTRICAL CONNECTIONS

BAMOWIZ terminal blocks

2 inputs 4-20 mA + 1 input oxygen probe + 1 output 4-20 mA + 3 relay outputs

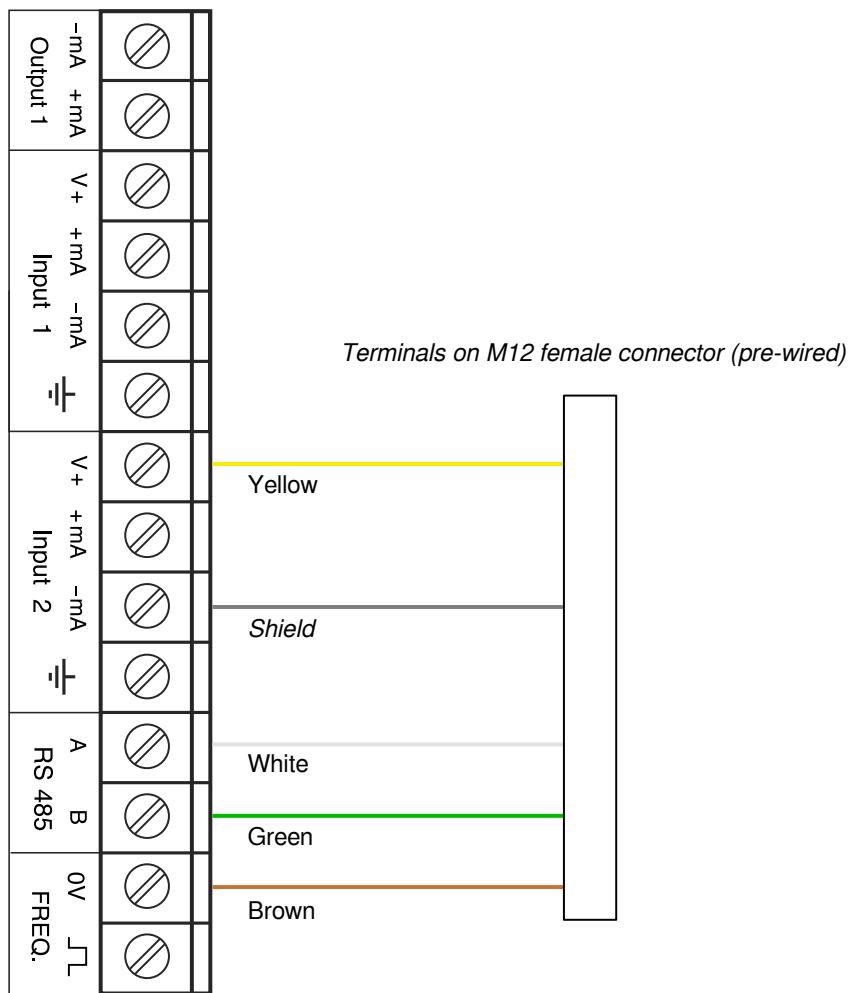


Important : Pressure and/or salinity compensation

* For automatic pressure compensation, the pressure transmitter must be connected to input n ° 1

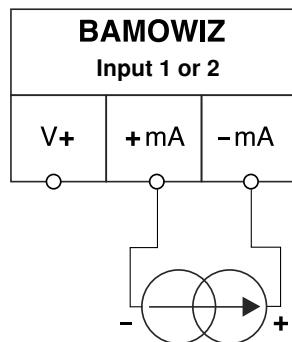
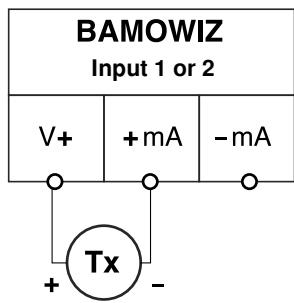
** For automatic salinity compensation, the salinity transmitter must be connected to input n ° 2

7.0.1 Connection of the probe BAMOX 453 via the extension cable



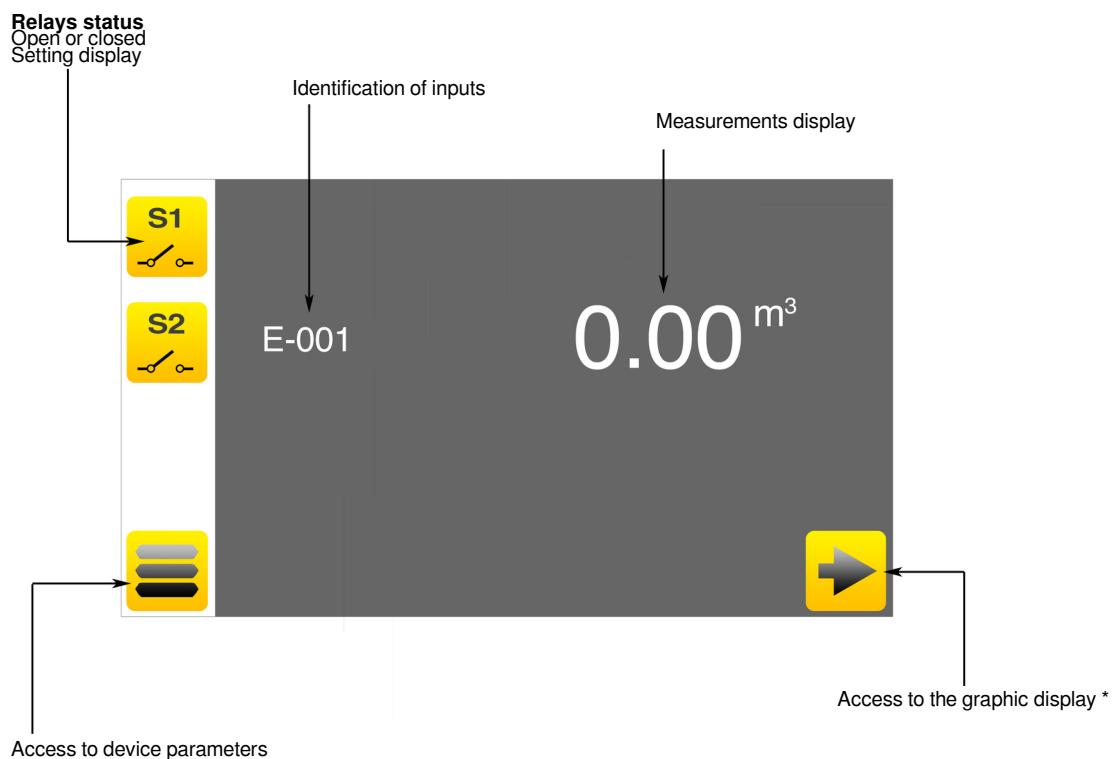
7.0.2 BAMOWIZ - Power to transmitters 12V DC (input load 50 Ω)

Caution: Maximum 1 Watt for both inputs.

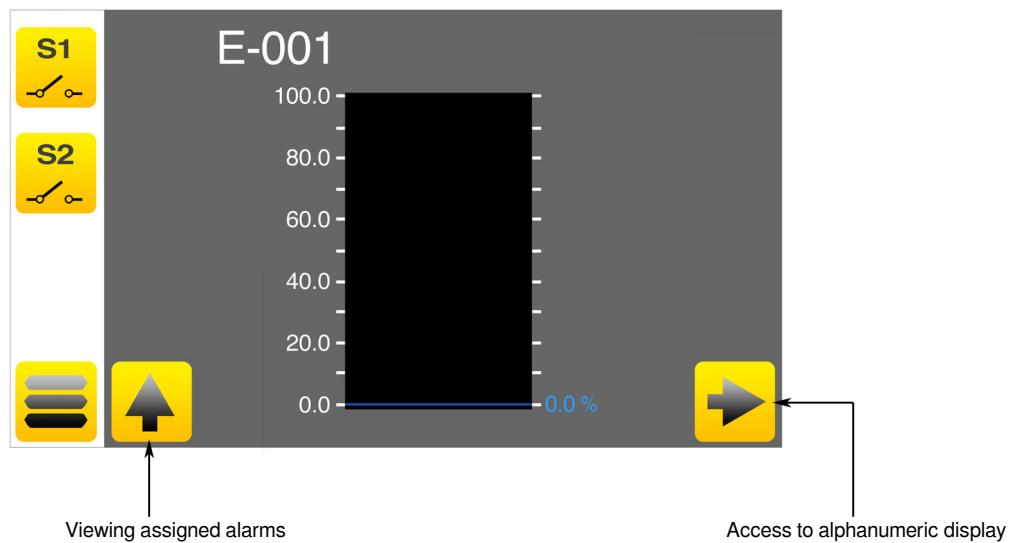


8. MAIN DISPLAYS

8.1 ALPHANUMERIC DISPLAY



8.2 GRAPHIC DISPLAY



* A graphic is available for each connected transmitter; Press the right arrow to access the different graphics.

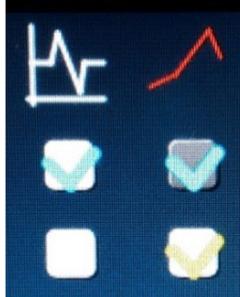
8.3 CHARTS DISPLAY



1) Features:

Backup capacity	96 hours
RESET OF MEMORY	When main power switches off
Recording frequency	Each 5 min of the measurement average value
Number of charts displayed	2 Charts simultaneously (see pic. A)
Number of data on charts	Max. 300 points
Period scales	6 h / 12 h / 24 h
Time shift	Hour per hour
4-channel recording:	Input I1 - Display n° 1 Input I1 - Display n° 2 Input I2 - Display n° 1 Input I2 - Display n° 2

2) Choose the charts to display:



Press the key "CHARTS" (right top of screen) to display the selection.

Pic. B.: The first column is for choosing the main chart, the second column for choosing the secondary chart.

Note that the scaling will be that of the main chart.

Pic. C: The selected charts are displayed on the screen.



3) Setting the period scale:

Pic. D : Use the keys '-' and '+' to decrease or to increase the period (6 h ; 12 h ; 24 h).



4) Time shift:

Pic. E (example): Use the blue arrow keys to shift the display area hour per hour.
Note that a long press (> 2 sec) increases the shift speed.

Visualization of values on the charts:
 It is possible to view the data of each point of the chart by pressing on it.
Use of a touch screen pen is highly recommended.



9. DESCRIPTION OF ICONS

The touch screen allows you to navigate within the menus and set up parameters according your applications.



HOME
Return to alfanumeric main display



SETTINGS
Access to serial number and version of your BAMOWIZ
Access to screen saver (set up available only in MODIFICATION MODE)



LANGUAGES
Language selection



MENU
Access to parameter settings of the monitor



PADLOCK
Open: MODIFICATION mode
Closed: CONSULTATION (review) mode



RETURN
Back to previous screen, as well as ENTER function



ARROWS
Cursors to navigate within the menus



OFF / ON
To disable (OFF) or enable (ON) setting(s)



SAVE
To save the settings



ESCAPE
To cancel modification(s)



RELAY STATUS S1, S2, S3
Display relays status and settings resume



CURSOR
To navigate within the menus
Alternative display to Arrows in some menus



SELECTION
Scroll of choices



CHARTS
To choose the charts to display



BLUE ARROWS
To shift the display area hour per hour.

10. SCREEN SETTINGS

10.1 LANGUAGE SELECTION

Direct access to the language of your choice:

- From the main screen, go to MENU.
- Press "SETTINGS" to view the icon LANGUAGES
- Select your language, pressing the corresponding flag.

10.2 CONSULTATION mode or MODIFICATION mode

CONSULTATION mode allows the end-user to review all settings.
This mode corresponds to a closed padlock icon.

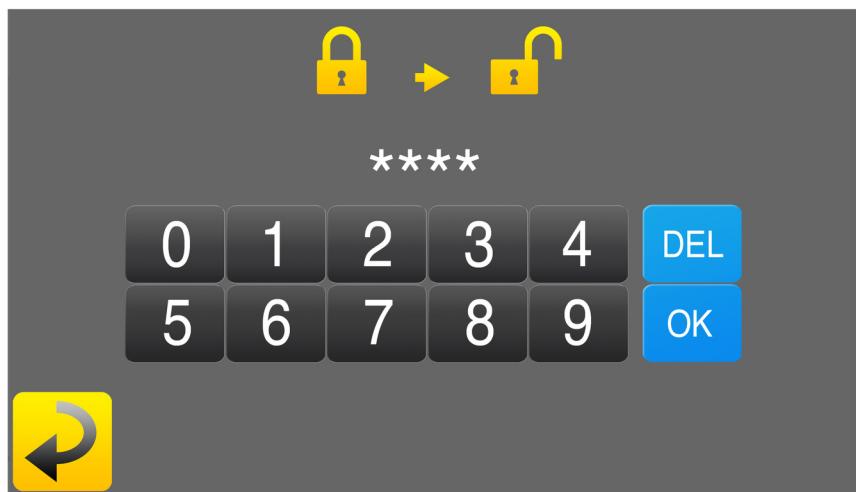
To change settings, you have to use the MODIFICATION mode.
This mode is protected by a password: the last 4 numbers of the serial number.

Example : S/N : 20000-01

Password is: 0001

Note: Serial number of your BAMOWIZ is on the sticker on side of the unit. You can find it as well through the menu SETTINGS.

- From the main screen, go to MENU
- Press the padlock icon and type the last four numbers of S/N
- Pressing "OK" the BAMOWIZ is set in MODIFICATION mode (Open padlock)



In case of mistyping, the display shows "ERROR".

After 30 minutes, the BAMOWIZ reset automatically in CONSULTATION mode.

10.3 SCREEN SAVER

Access from the menu SETTINGS (in MODIFICATION mode): allows to set the brightness of screen saver mode (it runs after 30 min of non activity).

11. OXYGEN MONITORING SETTINGS

Identification	Name of channel: Type it, using the keyboard
Averaging	BAMOWIZ performs a measurement every 10 seconds (other frequency on request) You can set an average of measurements during a period between 1 to 50 seconds Set a value between 1 to 50 s
Pressure compensation	Manual pressure compensation: Select ON Default value: OFF (manual pressure compensation is not operating)
Pressure Auto (INPUT 1)	With ON setting, type the atmospheric pressure value (Default: 1013 hPa) With an external pressure transmitter connected to input 1: Select ON to allow the measurement <i>Note: Activating this function automatically disable the manual pressure compensation.</i>
Salinity compensation	Manual salinity compensation: Select ON Default value: OFF (manual salinity compensation is not operating)
Salinity Auto (INPUT 2)	With ON setting, type the salinity value (Default: 0 g/kg) With an external salinity transmitter connected to input 2: Select ON to allow the measurement <i>Note: Activating this function automatically disable the manual salinity compensation.</i>
Main display	Select the measurement unit for the main display: %, mg/l, ppm

Important:

The activation of the AUTO compensation(s) involves the use and the connection of pressure and/or salinity transmitters respectively on the INPUTS 1 & 2. If automatic compensation is activated without a connected transmitter, the BAMOWIZ will show an alert by a flashing red error message on the corresponding channel.

Note: If the dissolved oxygen probe BAMOX 453 is disconnected, BAMOWIZ will show an alert by a flashing red error message.

12. OXYGEN CALIBRATION

The BAMOX 453 probe is calibrated at the factory, however the user can calibrate it at any time.

The two-point calibration method (0 and 100%) is recommended for measurements of low oxygen concentrations.

IMPORTANT: Refer to the manual of the probe BAMOX 453.

Concentration 0%	In order to determine the 0 %: Immerse the probe in a solution of sulfite in water (concentration < 2 %) Press RETURN When the measurement stabilizes, press VALID <i>Note: If the offset is greater than 20%, the calibration point cannot be validated; In such a case, report to the manual of the probe, chapters "Caution", "Maintenance" and "Replacement".</i>
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Then rinse the probe with clear water, and, dry it.

Concentration 100 %	The slope of the measuring scale is determined with the probe in an environment saturated of oxygen. Position the probe end in air saturated with water vapour (for instance in a damp cloth). Press RETURN When the measurement stabilizes, press VALID <i>Note: If the gap is lower than 80 %, or greater than 120 %, the calibration point cannot be validated; In such a case, report to the manual of the probe, chapters "Caution", "Maintenance" and "Replacement".</i>
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To confirm the calibration: Press SAVE.

RAZ Val Factory If necessary, to return to the factory calibration settings, press RETURN and then SAVE to record all settings.



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13. SETTINGS OF INPUTS 1 & 2

For inputs 1 & 2, choose between 3 types of measurement:

- Level
- Volume
- Specific: Such as Pressure, Turbidity, Temperature, etc.

13.1 SETTING A LEVEL MEASUREMENT

Below, set up of a channel for LEVEL:

Press icon MENU, choose the "Settings input I1" (or I2)

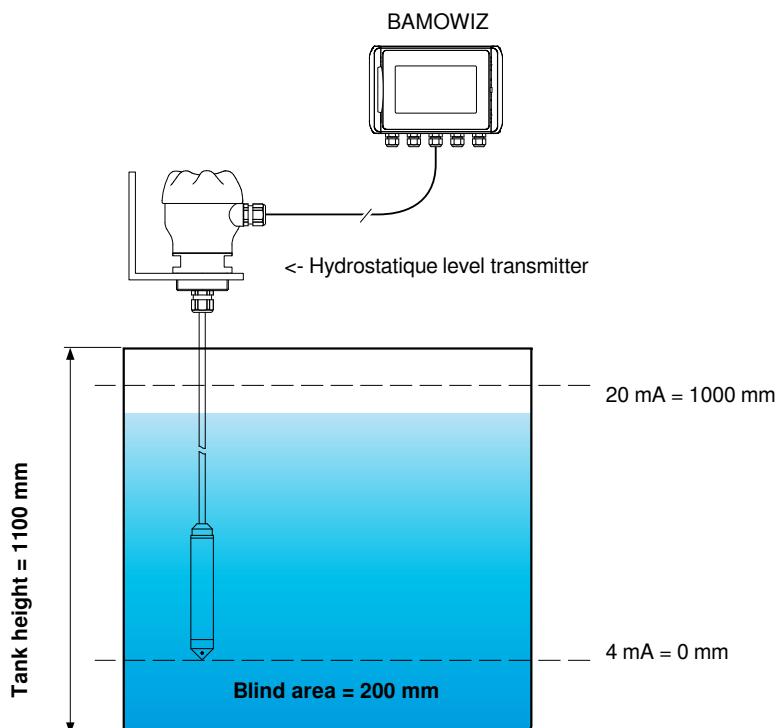
Start-up input?	ON
Identification	Type the channel name with the keyboard
Measurement type	Level
Unit for display	Select the unit: mbar, mm or mmH2O (water column)
4 mA	Type the value in previous unit at 4 mA
20 mA	Type the value in previous unit at 20 mA
Blind area	Type the value in previous unit for the blind area
Tank height	Type the whole height for Bar Graph display (including the blind area)
Screen N° 1	Select the unit for the numeric display: m, cm, mm or %
Screen N° 2	Select the unit for Bar Graphical display: m, cm, mm or , %

Press RETURN , then SAVE to record all settings.

Example :

Use of an hydrostatique level transmitter with 4-20mA output signal corresponding to 0 ... 1000 mm WC (water column). The sensor is in immersion in 1100 mm tank high and at 200 mm above the bottom. The digital display will be in mm and graphic display in cm

To show the height of liquid on BAR GRAPH, the height of tank is necessary (1100 mm) and display N°2 is in cm (bar graph).



13.2 SETTING A CHANNEL FOR VOLUME

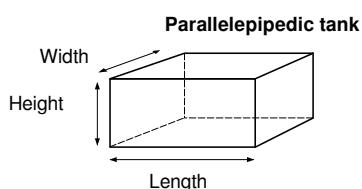
Below, set up of a channel for VOLUME monitoring (sensor measures the liquid height):

Press icon MENU, choose the "Settings input I2" (or I1):

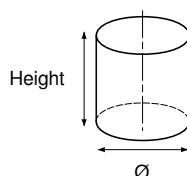
Start-up input?	ON
Identification	Type the channel name with the keyboard
Measurement type	Volume
Unit for display	Select the unit of height measurement: mbar, mm or mmH2O
4 mA	Type the value in previous unit at 4 mA
20 mA	Type the value in previous unit at 20 mA
Blind area	Type the value in previous unit of blind area height
Tank type	Select the type: Parallelepipedic, cylindric & horizontal, cylindric & vertical or specific <i>Dimensions are requested according the type of tank, for volume calculation (See below standard tank shapes).</i> <i>Specific tanks: it opens a new menu for linearization curve with up to 20 steps.</i>
Screen N° 1	Select the unit for the numeric display: m ³ (cubic metre) or l (litre)
Screen N° 2	Select the unit for graphical display: m ³ (cubic metre) or l (litre)

Press RETURN , then SAVE to record all settings.

Standard tank shapes:

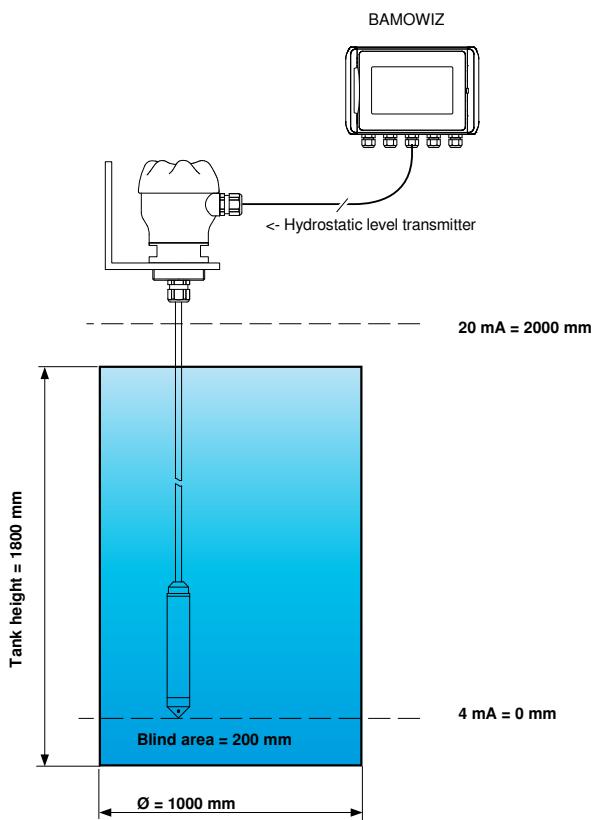


Cylindric & vertical tank with flat bottom



Example:

Use of an hydrostatique level transmitter with 4-20mA output signal corresponding to 0 ... 2000 mm WC (water column). The sensor is in immersion at 200 mm above the tank bottom; Tank is cylindric & vertical, 1800 mm high and diam. 1000 mm. The digital display will be in litre and graphic display in %.



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13.3 SETTING A CHANNEL IN SPECIFIC MODE

Below, set up of a channel for a specific input:

Press icon MENU, choose the "Settings input I1 or I2"

IMPORTANT: To activate automatic pressure and / or salinity compensation, the transmitters must be connected to input Nr.1 for pressure and to input Nr.2 for salinity. Then go to the I1 SETTINGS menu to configure the pressure transmitter, to I2 SETTINGS menu for the salinity transmitter.

Start-up input?	ON
Identification	Type the channel name with the keyboard
Measurement type	Specific
Unit for display	Type measuring unit with the keyboard
4 mA	Type the value in previous unit at 4 mA
20 mA	Type the value in previous unit at 20 mA
Blind area	Type the value in previous unit for the blind area

Press RETURN , then SAVE to record all settings.

Note: Measuring unit and scale range are directly set on both displays, numeric and Bar Graph.

14. THRESHOLDS SETTING (Maximum 8)

Below: an example to set up a threshold

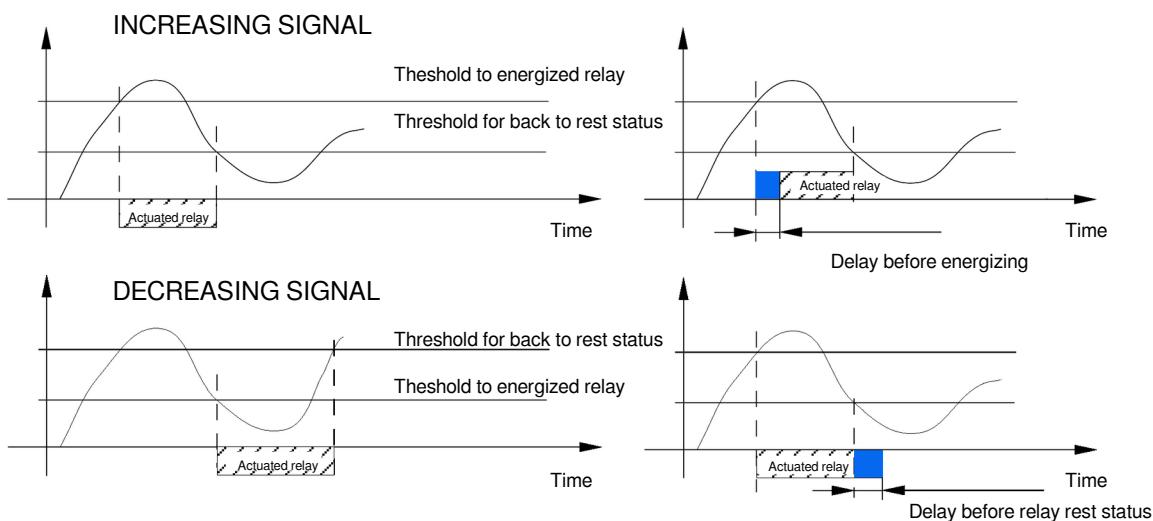
Go to the menu "THRESHOLDS"

To add one threshold, press " + ", then press on the threshold to be set up.

Identification	Type the threshold name with the keyboard
Input selection	Select the input channel to assign to this threshold
Unit selection	Select the measuring unit: mm, % or m ³
Direction	<i>The selection is not available when the "specific mode" is in use on the assigned channel.</i> Increasing = Actuated when measurement value is higher than threshold. Note: The REST setpoint will be lower than the EXCITED setpoint (See graph below) Decreasing = Relay actuates when measurement value is lower than threshold. Note: The REST setpoint will be greater than the EXCITED setpoint (See graph below)
Energized relay	Type the value for which the relay will be energized
Rest status	Type the value for which the relay will be back to "rest status"
Delay before actuation	ON / OFF: with or without delay to energize the relay
Timer (ON)	When a delay is desired, type the duration of delay before relay is energized.
Delay before "rest status"	ON / OFF: with or without delay to set back relay in rest status
REST Timer	Type the duration of delay before relay get back to rest position.
Threshold operation	To assign threshold, or to a relay, or to one relay plus display, or display threshold on screen without actuating any relay.

When thresholds are set, press RETURN , then SAVE to record all settings

NOTE: On Bar Graph, set thresholds are displayed on request.



15. TEST OF RELAYS

In MODIFICATION mode, this menu allows you to test manually the relays. When entering into this menu, relays are OFF mode (rest status). Press the icon on the key "selection" to test the relay: It switches to ON status.

16. SETTINGS OF ANALOGUE OUTPUT mA

Below are the details of settings for output 4-20 mA:

Go to the menu "Output mA".

Start-up input	ON
Choose the input	Assign the output 4-20 mA to the desired input (or oxygen, or i1, or i2).
Choose the unit	Select the measurement unit
4 mA	Type the corresponding value for the 4 mA.
20 mA	Type the corresponding value for the 20 mA.

17. HISTORICAL OF MIN. & MAX. VALUES

BAMOWIZ keeps in memory the Min. and Max. values of each input.

Push on "Reset" to erase the Max. & Min. values for each necessary input.

NOTE: On graphical display, Max. & Min. values may be displayed or hidden on request.

18. CHOOSE THE COLOURS

This setting is accessible from the COLOUR menu in MODIFICATION mode. This menu allows you to individually change the colours of the displayed values.

- 1) From the main display, go to "MENU"
- 2) Go to the menu "COLOUR"
- 3) Select the input and the type of display desired to choose the colour.
 - Confirm your choice by pressing the "SAVE" key
 - Do the same for the other inputs if necessary, then press the "RETURN" key to exit the menu "COLOUR"
 - Press the SAVE key to save your settings.