

# BamoPHOX TOR 322 E - M

## Conductivity meter

Scales: 0-2 mS / 0-20 mS / 0-200 mS / 0-2000 mS



## INSTRUCTION MANUAL

**BAMO MESURES**

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CONDUCTIVITY METER  
BamoPHOX TOR  
**322 E - M**

15-04-2013

322 M1 03 I

**MES**

**322-03/1**

# Conductivity meter BAMOPHOX 322 E & M

## Content

*(Technical information and Manual for LOGGER /RS422 version are on a specific document)*

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## 1. TECHNICAL SPECIFICATIONS

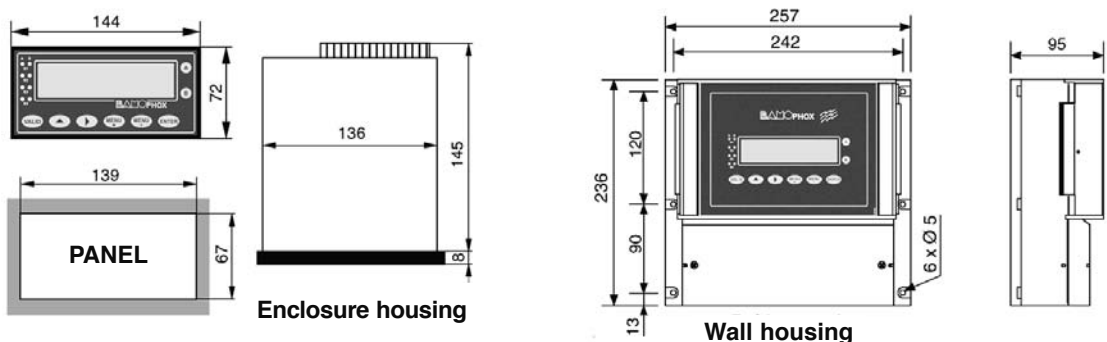
Indication	: Measure – Menu – Temperature
Display	: Back lighted – 2 lines of 16 alphanumeric characters, H = 9,2 mm
Visualization	: Alarms status by LED
Programming	: 8 push button keyboard on front face – Program protection by access code.
Measure scale	: 2 to 2000 mS : Programmable scales 0-20 mS / 0-200 mS / 0-2000 mS
Sensor	: Conductivity TOR probe : Temperature PT 100Ω at 0 °C, 3 wires
Accuracy	: ± 0,3 %, ± 0,3 °C
Probe input	: Dismounting connector
Temperature compensation	: Automatic: By 3 wires PT100 probe, scale 0-100°C : Manual: Depending from process temperature scale 0 – 100°C
Relays output	: 3 closing contacts (Silver alloy), volt free
Threshold programming	: 3 independent thresholds - Adjustable hysteresis for 0 to 100% - Adjustable timer from 0 to 9999 sec
Relays output (S4)	: Jamming alarm function, simultaneous
Contact initial resistance	: 100 mΩ max (voltage drop 6 VDC 1 A)
Breaking capacity	: 831 VAC / 3 A / 277 VAC : 90 W / 3 A / 30 VDC
Switching capacity (min)	: 100 mA, 5 VDC ( variable from switching frequency, environmental conditions, accuracy)
Mechanical life time (min)	: 5 x10 <sup>6</sup> switching (at 180 cpm)
Electrical life time (min)	: 2 x10 <sup>5</sup> (at 20 cpm) for 3 A 125 V AC, 3 A 30 V DC - 10 <sup>5</sup> (at evaluated charge) for 3 A 125 V AC : High and low proportional bands, high and low dead zones
Measure output	: 0/4-20 mA (max 600 Ω) proportional from measure – galvanic insulation included
Temperature output	: 0/4-20 mA (max 600 Ω) All scales from -20 to 160°C – galvanic insulation included
Power supply	: 230 V / 50-60 Hz mono - Others on request - Consumption 10 VA
Models	: Enclosure housing - Front panel IP65 – 72 x 144 Connection on screw terminal IP40 : Wall housing - IP65 – Connection on screw terminal through cable gland

### OPTION (RS 422+Logger)

Communication	: RS422 output J-BUS link – binary slave mode – 2400 to 9600 bauds
Records (Logger)	: measure average automatic record in programmed interval 150000 records max on MMC (Multi Media Card) - External driver necessary

## 2. DIMENSION

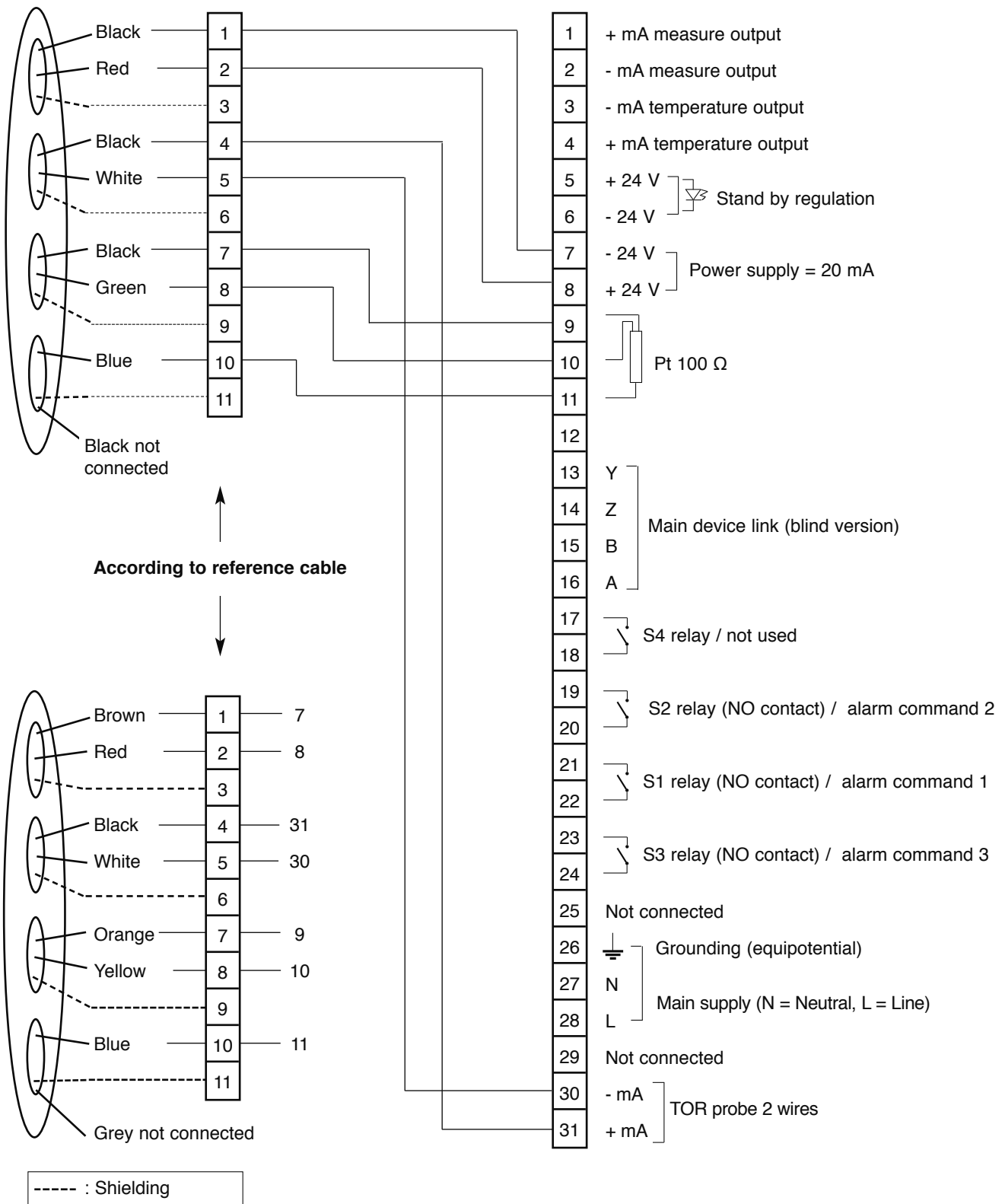
**Blind model:**  
Respectively  
identical  
dimensions,  
by format





**Probe terminals**

**BamoPHOX terminal / Wiring for 230 V AC**

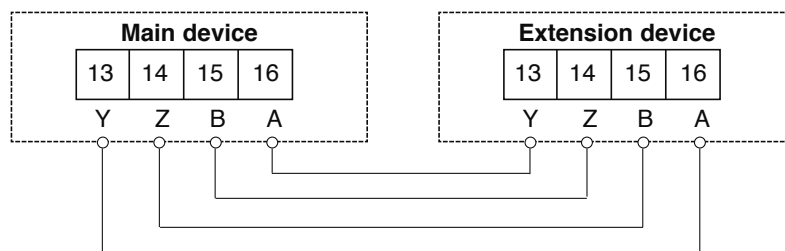


According to reference cable

**Link:**  
max lenght = 500 meter

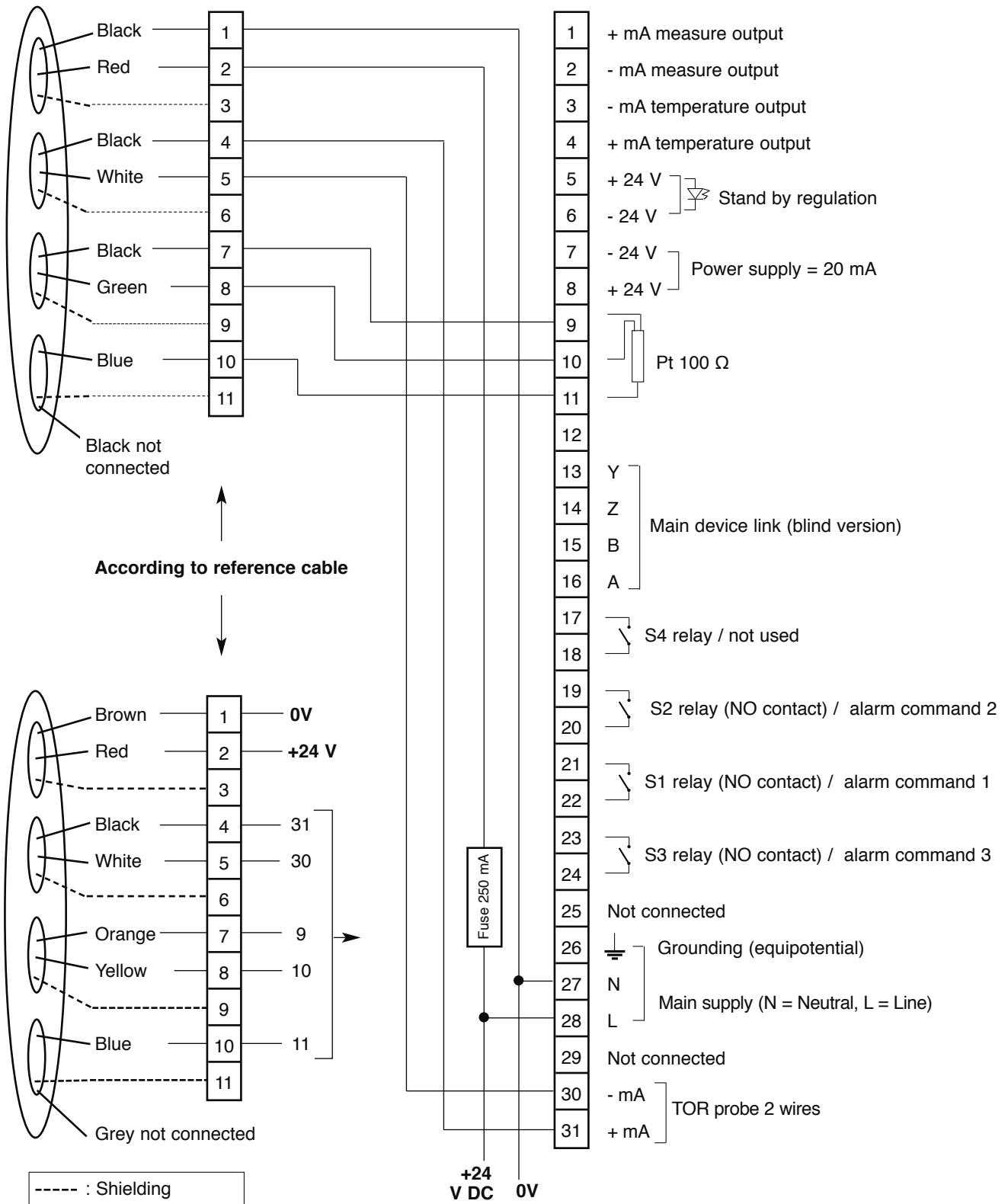
**Cable:**  
Cables network  
or shielded cable /4 wire  
cross-section  $\geq 0,25 \text{ mm}^2$

**Wiring to the blind device "Extension"**



**Probe terminals**

**BamoPHOX terminal / Wiring for 24 V DC**

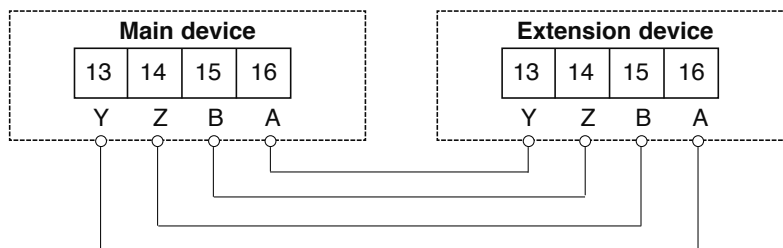


According to reference cable

**Wiring to the blind device "Extension"**

**Link:**  
max length = 500 meter

**Cable:**  
Cables network  
or shielded cable /4 wire  
cross-section ≥ 0,25 mm<sup>2</sup>



## 4. FRONT PANEL

### S1, S2, and S3

Led indicate output relay status corresponding to:  
 LED ON = Relais ON  
 LED OFF = Relais OFF  
 LED Blinking = Timer ON

Back lighted alphanumerical display  
 2 lines /16 alphanumeric characters H = 9.22 mm

"A" key  
 allows to reach to higher line parameters.

"B" key  
 allows to reach to lower line parameters.



"VALID" key  
 To write parameters on EPROM when the display ask you:

### VALID ?

Take care when you press this key, that all parameter are saved.  
 If you are not sure of our manipulation, do not press VALID key, (previews data programmation will be lost).

"ENTER" key  
 To change the step displayed menu.  
 At the last step, return to the first line.

"MENU" key  
 To move the cursor during programmation.  
 At the last digit, return on the first one.

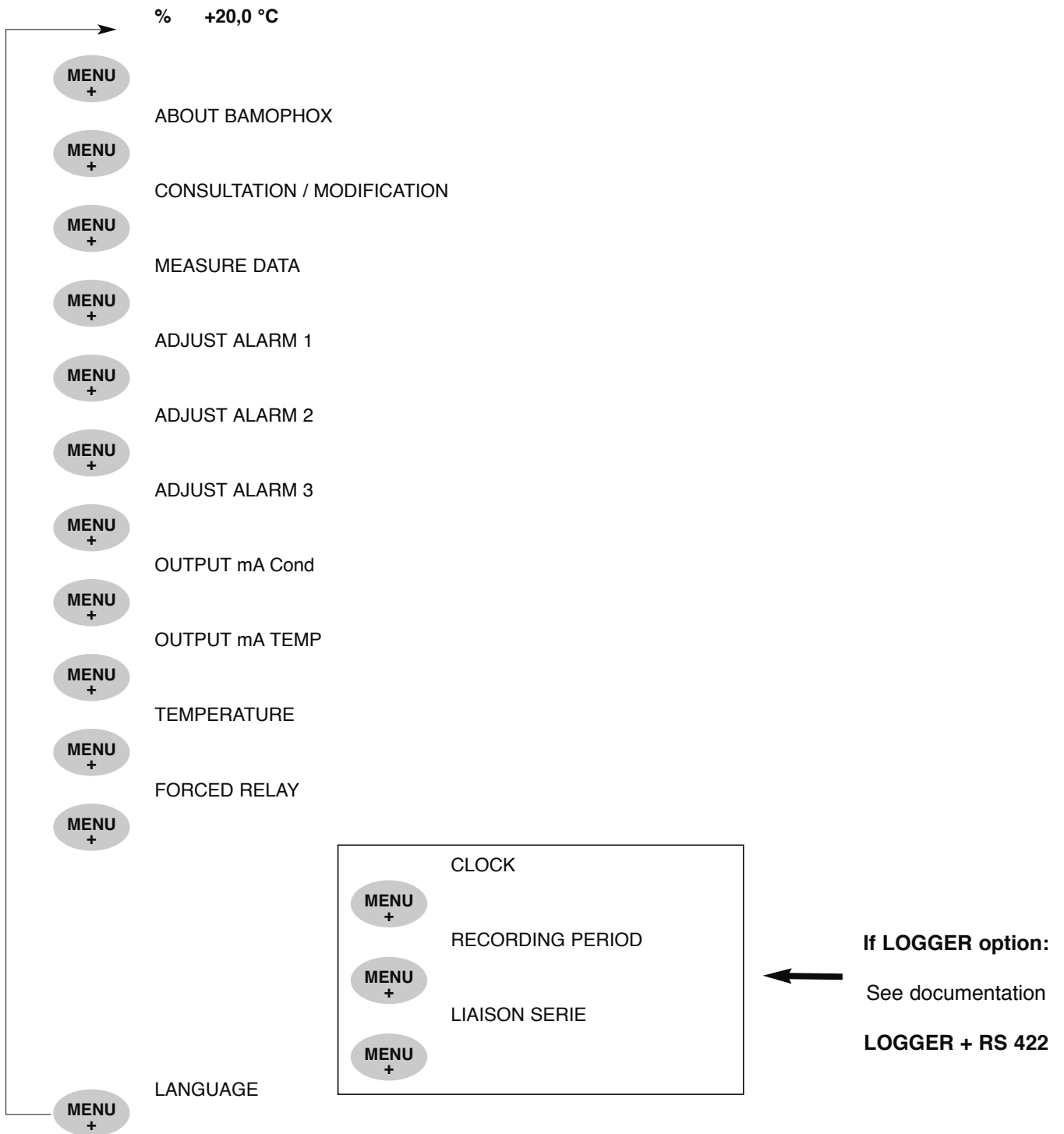
"HIGH" key  
 To change parameters of data capture:  
 Numerical data increase the flashing digit (loop 0 after 9).  
 Reverse the choose Yes / No,  
 Up / Down, 0-20 mA / 4-20 mA etc.

"MENU +" key  
 To go to following menu,  
 (any time)

\*Simultaneous pressure on  
 "MENU +" and "ENTER" key  
 allows a fast return to measurement display.

"RIGHT" key  
 To go to the next display or to change value.

## MENU PRESENTATION AND SCROLLING





## ABOUT Bamophox

ABOUT Bamophox

ENTER

VERSION 1.00

ENTER

SERIAL N°

ENTER

2087905

ENTER

## CONSULTATION / MODIFICATION

CONSULTATION

▲

MODIFICATION

ENTER

CODE ? 0000

ENTER

CODE ? 7905

ENTER

TIME: 30 mn

MENU  
+

Using 4 last digits of serial N°

In case of invalid password, "ERROR" message appear during 3 second.

(CONSULTATION mode is automatically reactivated after 30 minutes)

## PARAMETERS MEASURE

MEASURE TYPE

ENTER

CONDUCTIVITY

ENTER

KR : 1,002

ENTER

SCALES : 2 mS / 20 mS / 200 mS / 2000 mS

ENTER

O.T. : +000,6 °C

ENTER

**FROM MODIFICATION MODE, IT IS POSSIBLE TO FORCE THE MEASURE OR P.I.D.**  
(In MODIFICATION mode, go to measures display and press ENTER)

ENTER

FORCED MEASURE

ENTER

0000 mS / °C



(Pointer is blinking on one measure digits).  
Modify the measure. value is instantly considered by the equipment (relays, régulation, mA outputs...).

ENTER

(Press ENTER to exit from this menu and go to real measure)

## ADJUST ALARM 1

MENU  
+

ADJUST ALARM 2

ENTER

ALARM 1 ON/OFF



ENTER

ALARM 1 MEASURE/TEMP.



ENTER

HIGH/LOW



ENTER

ON 0000 mS / °C



ENTER

OFF 0000 mS / °C



ENTER

DELAY UP ON/OFF



ENTER

TIME 0000 SEC



ENTER

DELAY DOWN ON/OFF



ENTER

TIME 0000 SEC



ENTER

SAVING ?

VALID

**MEASURE**= Alarm dedicated to the measure.  
**TEMPERATURE**= Alarm dedicated to the temperature

**High**= Energized if measure is higher to the set point  
**Low**= Energized if measure is lower to the set point

Value to which S1 relay will be energized

Value to which S1 relay will be down

With or without delay for S1 energizing

Duration of the delay for S1 energizing

With or without delay S1 will be down

Duration of the delay for S1 will be down

## ADJUST ALARM 2

MENU  
+

ADJUST ALARM 3 → see page 10

ENTER

ALARM 2 ON/OFF



ENTER

ALARM 2 MEASURE/TEMP.



ENTER

HIGH/LOW



ENTER

ON 0000 mS / °C



ENTER

OFF 0000 mS / °C



ENTER

DELAY UP ON/OFF



ENTER

TIME 0000 SEC



ENTER

DELAY DOWN ON/OFF



ENTER

TIME 0000 SEC



ENTER

SAVING ?

VALID

**MEASURE**= Alarm dedicated to the measure.  
**TEMPERATURE**= Alarm dedicated to the temperature

**High**= Energized if measure is higher to the set point  
**Low**= Energized if measure is lower to the set point

Value to which S2 relay will be energized

Value to which S2 relay will be down

With or without delay for S2 energizing

Duration of the delay for S2 energizing

With or without delay S2 will be down

Duration of the delay for S3 will be down

# ADJUST ALARM 3

MENU +

OUTPUT mA

see page 11

ENTER

ALARM 3 ON/OFF



ENTER

ALARM 3 MEASURE/TEMP.



**MEASURE**= Alarm dedicated to the measure.  
**TEMPERATURE**= Alarm dedicated to the temperature

ENTER

HIGH/LOW



**High**= Energized if measure is higher to the set point  
**Low**= Energized if measure is lower to the set point

ENTER

ON 0000 mS / °C



Value to which S3 relay will be energized

ENTER

OFF 0000 mS / °C



Value to which S3 relay will be down

ENTER

DELAY UP ON/OFF



With or without delay for S3 energizing

ENTER

TIME 0000 SEC



Duration of the delay for S3 energizing

ENTER

DELAY DOWN ON/OFF



With or without delay S3 will be down

ENTER

TIME 0000 SEC

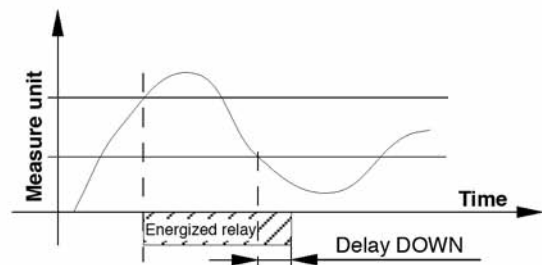
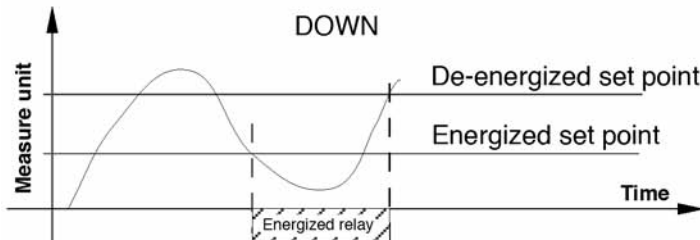
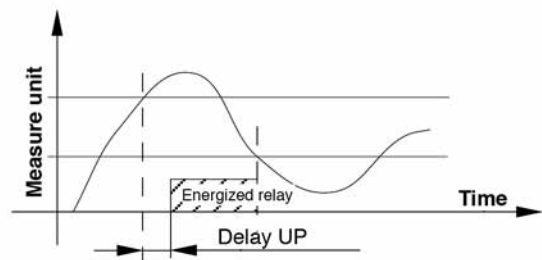
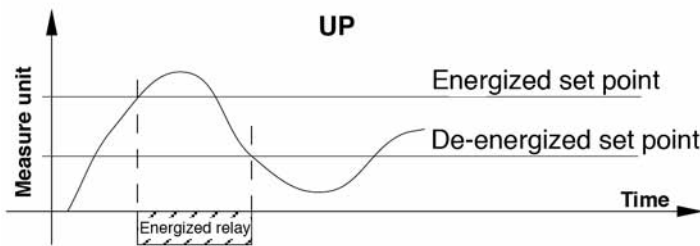


Duration of the delay for S3 will be down

ENTER

SAVING ?

VALID



OUTPUT mA

MENU +

OUTPUT mA TEMP

ENTER

HIGHER 2000 mS



Valeur correspondant to 20,00 mA output

ENTER

LOWER 0 mS



Valeur correspondant to 4,00 mA output (0,00 mA)

ENTER

OUTPUT 4-20 mA/ 0-20mA



Output selection  
0,00 mA or 4,00 mA

ENTER

SAVING ?

VALID

Output mA TEMP

MENU +

TEMPERATURE

ENTER

HIGHER +160,0 °C



Valeur correspondant to 20,00 mA output

ENTER

LOWER +000,0 °C



Valeur correspondant to 4,00 mA output (0,00 mA)

ENTER

OUTPUT 4-20 mA/ 0-20mA



Output selection  
0,00 mA or 4,00 mA

ENTER

SAVING ?

VALID

TEMPERATURE

MENU +

FORCED RELAYS

→ see page 12

ENTER

MEASURE: AUTO / MANUAL



**AUTO** : Measure with Pt 100 Ω sensor

**MANU** : Without Pt 100 Ω sensor, the temperature value is manually set at the next step

ENTER

FLUID T° + 025,0 °C



Fluide temperature manual setting

ENTER

AUTO TC : YES / NO



**YES**: Reference temperature

20°C

or 25°C

ENTER

SAVING ?

VALID

**FORCED RELAY**

MENU  
+

**LANGUAGE**

ENTER

ALARM 1 OFF/ON



ENTER

ALARM 2 OFF/ON



} Alarm manual test mode

ENTER

ALARM 3 OFF/ON



VALID

**LANGUAGE**

MENU  
+

Go back to display

ENTER

FRENCH / ENGLISH / ITALIAN / GERMAN



ENTER

SAVING ?

VALID