BAMOPHOX 322 E - M

Resistivity monitor and controller

INSTRUCTION MANUAL

Resistivity monitor and controller
BAMOPHOX 322 E & M

Content

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

1. TECHNICAL FEATURES

|	
Displayed parameters:	Measurement values - Configuration Menu - Temperature value
Display:	Back lighted - 2 lines of 16 alphanumerical characters; 9,2 mm high
Indication:	LED alarms status
Configuration:	8 push buttons keyboard on front face - Keyword protected
Scales:	From 200 Ohm to 200 MOhm; please see details on page 8
Accuracy:	± 0,3%, ± 0,3°C
Probe input:	BNC plug
Temperature compensation:	Automatic with an input for a 3 wires Pt 100 Ohm/0°C, range 0…100°C
	Manually from 0…100°C
Relay outputs:	3 closing contacts (Silver alloy), voltage free
Thresholds:	3 programmable independent thresholds - with adjustable hysteresis 0…100%
	and adjustable timer from 0 to 9999 sec
1 Output relay *(S4)*:	Alarm contact for PT 100 malfunction
Contact:	Initial resistance 100 mΩ as a maximum (voltage drop 6 V DC 1 A)
	Rated at 831 V AC / 3 A / 277 V AC; 90 W / 3 A / 30 V DC
	Switching capacity (minimum) 100 mA, 5 V DC (depending of switching frequency, ambient conditions, accuracy)
	Mechanical life time (minimum) 5×10^6 operations (180 commutation/min)
	Electrical life time (minimum) 2×10^5 (20 comm./min) [3 A, 125 V AC], [3 A, 30 V DC] and 10^5 (evaluated charge) for 3 A, 125 V AC
Measurement/PID:	0/4-20 mA (maxi 600 Ω) proportional to measurement, galvanic insulated
Temperature output:	0/4-20 mA (max 600 Ω), scaling 0…100°C, galvanic insulated
Program Testing:	Simulation through the menu on measurement, temperature, and relay outputs
Main power supply:	230 V AC / 50-60 Hz [other on request] - Consumption 10 VA
Models:	Panel mounting, IP65, 72 x 144 mm, connections on screw terminal IP40
	Wall mounting, IP 65, connections on screw terminal

OPTION (RS 422 + Logger)

Communication:	RS422 output, J-BUS link, binary slave mode, 2400 to 9600 bauds
Data Logger:	Cycle average measurement record, with a programmable period, 150000 records maxi on MMC (multi media card) / External driver for reading

CE label: Label CE in conformity with 73/23/CEE low power and electromagnetic compatibility 89/336/CEE

2. DIMENSIONS

Extension terminal: identical to the panel or wall mounting
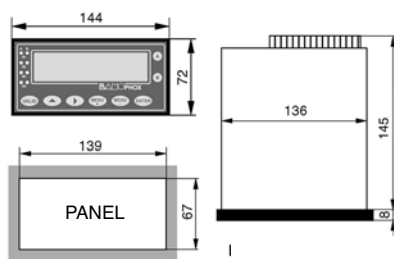
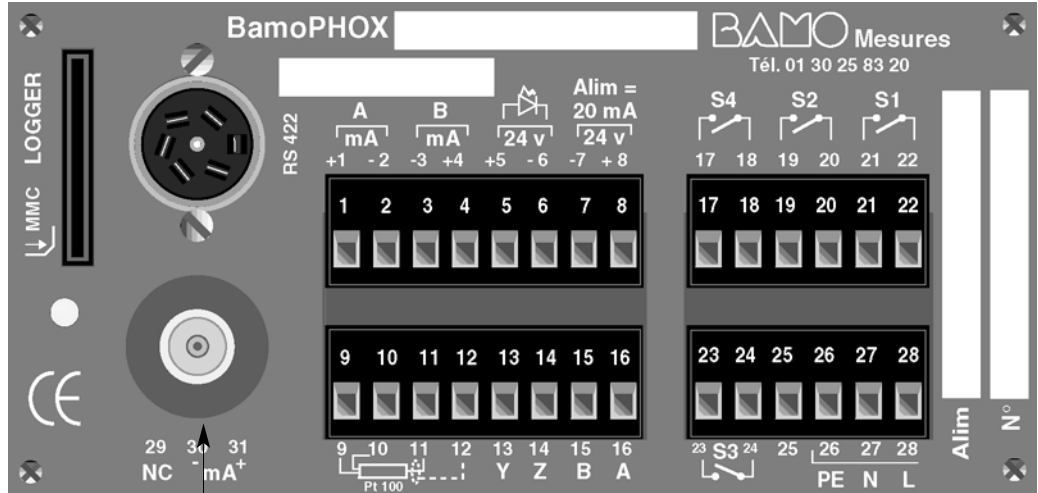Panel mounting instrument
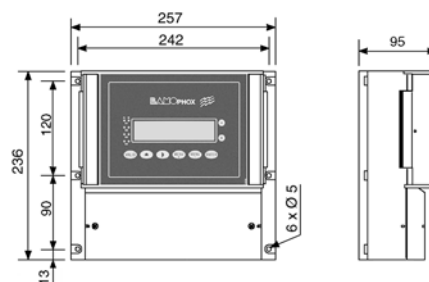
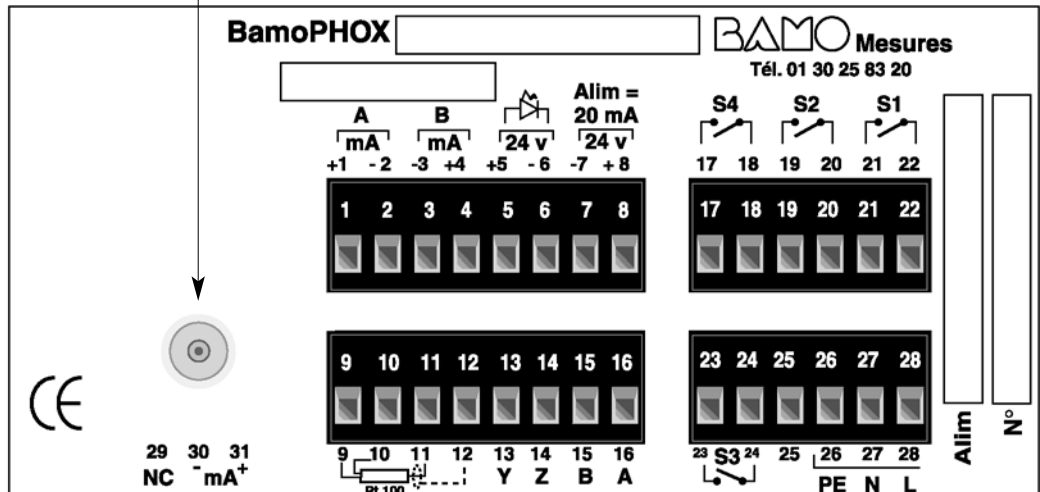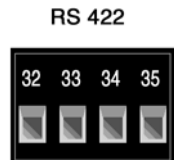Wall mounting instrument

3. WIRING

PANEL MOUNTING MODEL

OPTION:
LOGGER
&
RS 422

BNC plug
Input measurement

WALL MOUNTING MODEL

OPTION:
LOGGER
&
RS 422
(accessible by removal the higher cap)

RS 422

BamoPHOX terminal

Terminal	Description
1	+ mA measure output
2	- mA measure output
3	- mA temperature output
4	+ mA temperature output
5	+ 24 V ⎤ Stand by regulation
6	- 24 V ⎦
7	- 24 V ⎤ Power supply = 20 mA
8	+ 24 V ⎦
9	
10	Pt 100 Ω
11	
12	
13	Y ⎤
14	Z
15	B
16	A ⎦ Main device link (blind version)
17	S4 relay / PT 100 malfunction
18	
19	S2 relay (NO contact) / alarme commande 2
20	
21	S1 relay (NO contact) / alarme commande 1
22	
23	S3 relay (NO contact) / alarme commande 3
24	
25	Not connected
26	Grounding (equipotential)
27	N
28	L	Main supply (N = Neutral, L = Line)

Wiring from wall or panel mounting BAMOPHOX to an Extension terminal BAMOPHOX

Main unit					Extension terminal			
13	14	15	16		13	14	15	16
Y	Z	B	A		Y	Z	B	A

- <u>Maximum length cable</u>
  500 m

- <u>Wire specifications:</u>
  Mains cable or 4 wires shielded cable
  ≥ 0,25 mm^2 cross section
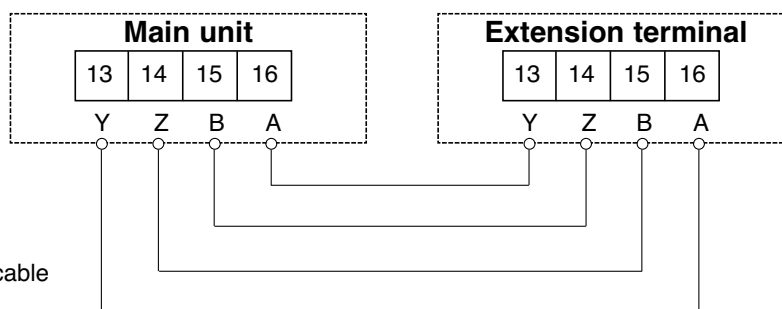
4. FRONT PANEL

S1, S2, and **S3**
indicate relays status:

LED lighting = contact ON
LED OFF = contact OFF
LED flashing = Timer in use

2 lines /16 alphanumeric characters
9.22 mm high - Back lighted

Key **"A"**
To display the parameters of upper line.
(main BAMOPHOX)

Key **"B"**
To display the parameters of lower line.
(Extension blind BAMOPHOX)
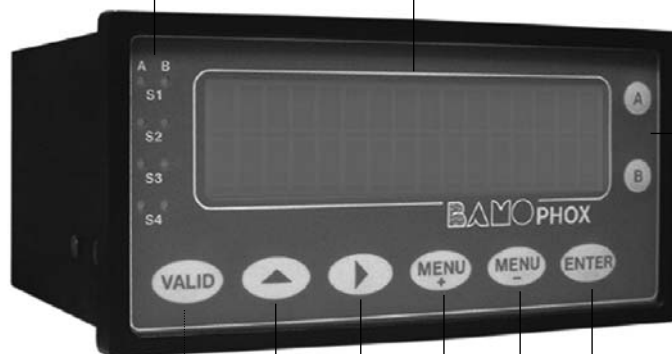
"VALID" key
To save the parameters on EPROM
when it asks:

VALIDATION ?

Caution, when you press this key,
all parameters are saved.
(previous data programmation
will be overwrited).
If you are not sure of any modification,
do not press the VALID key,

To change parameters of data capture:

Numéric input increase the
flashing digit (loop 0 after 9).

Reverse the choice Yes / No,
Up/Down, 0-20 mA / 4-20 mA etc.

To change of blinking digit

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

"MENU - " key
To move the cursor during configuration.
At the last digit, comes back on the first one.

"MENU +" key
To go back to the previous display

Pushing simultaneously both keys
"MENU +" and **"ENTER"**
allows a fast return to measurement display.

SCROLLING MENU

MEASUREMENT DISPLAY

MENU +

ABOUT BAMOPHOX

MENU +

CONSULTATION / MODIFICATION

MENU +

MEASUREMENT PARAMETERS

MENU +

ADJUST ALARM 1

MENU +

ADJUST ALARM 2

MENU +

ADJUST ALARM 3

MENU +

OUTPUT mA RESISTIVITY

MENU +

OUTPUT mA TEMPERATURE

MENU +

TEMPERATURE

MENU +

FORCED RELAY

MENU +

CLOCK

MENU +

RECORDING PERIOD

MENU +

LIAISON SERIE

MENU +

With LOGGER option

See documentation

LOGGER + RS 422

LANGUAGE

MENU +

ABOUT Bamophox

ENTER → ABOUT Bamophox

ENTER VERSION 1.00

ENTER SERIAL N°

ENTER 208 79 05

CONSULTATION / MODIFICATION

▲ CONSULTATION

ENTER MODIFICATION

ENTER CODE ? **0000**

ENTER CODE ? 7905   ▲ ▶

ENTER TIME: 30 mn

MENU +

Using 4 last digits of serial N°

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

__CONSULTATION mode
resets automatically after 30 min.__

MEASUREMENT PARAMETERS

MEASUREMENT TYPE

ENTER RESISTIVITY

ENTER K : _ _ _ _ _   ▲ ▶
(Cell constant)

ENTER KR : _ _ _ _ _   ▲ ▶
(Correction factor)

ENTER SCALE: **kΩ / MΩ**

LENGTH OF CABLES
According to the following table.

Cell constant	0,01	0,1	1	10
Scale				
200 MOhm	10 m			
20 MOhm	50 m	10 m		
2 MOhm	100 m	50 m	10 m	
200 KOhm		100 m	50 m	10 m
20 KOhm		100 m	100 m	50 m
2 KOhm			100 m	100 m
200 Ohm				100 m

With automatic temperature compensation							
Factor	**0,01**		**0,1**		**1**		**10**
Scale 1	20,00 MOhm		2,000 MOhm		200,0 KOhm		20,00 KOhm
Scale 2	2,000 MOhm		200,0 KOhm		20,00 KOhm		2,000 KOhm
Without automatic temperature compensation							
Factor	**0,01**		**0,1**		**1**		**10**
Scale 1	200,0 MOhm		20,00 MOhm		2,000 MOhm		200,0 KOhm
Scale 2	20,00 MOhm		2,000 MOhm		200,0 KOhm		20,00 KOhm
Scale 3	2,00 MOhm		200,0 KOhm		20,00 KOhm		2,000 KOhm
Scale 4	200,0 KOhm		20,00 KOhm		2,000 KOhm		200,0 Ohm

From the mode MODIFICATION it is easy to return back to measurement fot testing the relay outputs and regulation mode.
Once in modification mode, **reach measurement display and press ENTER**

ENTER

FORCED MEASURE

ENTER

0,000 MΩ / °C ▲ ▶ (one digit is flashing) Modify the value. Immediately the instrument acts within the configuration (thresholds, regulation, analog outputs ...).

ENTER

Press ENTER to cancel the test mode and to go back to the measurement mode.

ADJUST ALARM 1 ⟶ **MENU +** ⟶ ADJUST ALARM 2

ENTER

ALARM 1 **ON/OFF** ▲

ENTER

ALARM 1 **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** MΩ / °C ▲ ▶ Value to which S1 relay will be energized

ENTER

OFF **0000** MΩ / °C ▲ ▶ Value to which S1 relay will be down

ENTER

DELAY UP **ON/OFF** ▲ With or without delay for S1 energizing

ENTER

TIME**0000** SEC ▲ ▶ Duration of the delay for S1 energizing

ENTER

DELAY DOWN **ON/OFF** ▲ With or without delay S1 will be down

ENTER

TIME **0000** SEC ▲ ▶ Duration of the delay for S1 will be down

ENTER

SAVING ?

VALID

ADJUST ALARM 2 ⟶ (MENU +) ⟶ ADJUST ALARM 3

ENTER

ALARM 2 **ON/OFF** ▲

ENTER

ALARM 2 **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** MΩ / °C ▲ ▶   Value to which S2 relay will be energized

ENTER

OFF **0000** MΩ / °C ▲ ▶   Value to which S2 relay will be down

ENTER

DELAY UP **ON/OFF** ▲   With or without delay for S2 energizing

ENTER

TIME**0000** SEC ▲ ▶   Duration of the delay for S2 energizing

ENTER

DELAY DOWN **ON/OFF** ▲   With or without delay S2 will be down

ENTER

TIME **0000** SEC ▲ ▶   Duration of the delay for S2 will be down

ENTER

SAVING ?

VALID

ADJUST ALARM 3 ⟶ (MENU +) ⟶ OUTPUT mA ⟶ see page 11

ENTER

ALARM 3 **ON/OFF** ▲

ENTER
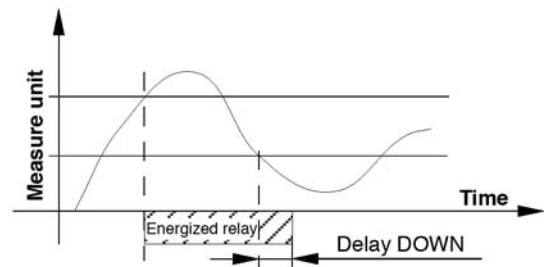
ALARM 3 **MEASURE/TEMP.** ▲   **MEASURE**= Alarm dedicated to the measure.
   TEMPERATURE= Alarm dedicated to the temperature

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** MΩ / °C ▲ ▶   Value to which S3 relay will be energized

ENTER

OFF **0000** MΩ / °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
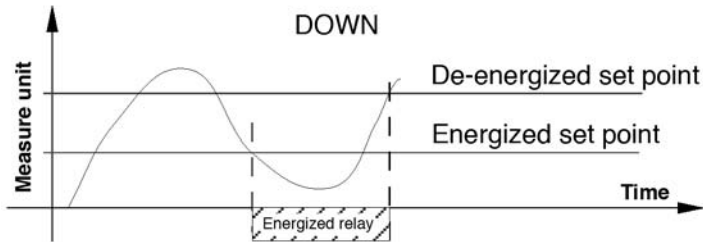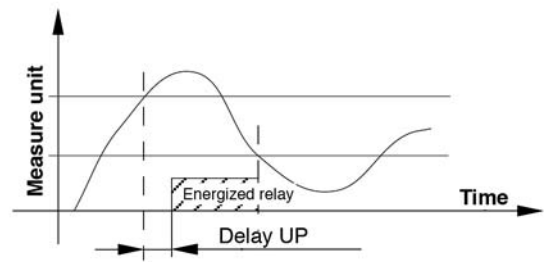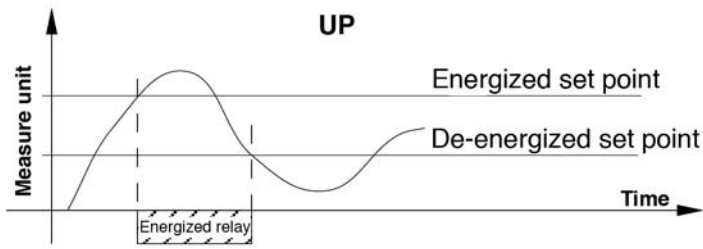
ENTER

SAVING ?

VALID

UP

Energized set point
De-energized set point

Energized relay

Delay UP

DOWN

De-energized set point
Energized set point

Energized relay

Delay DOWN

OUTPUT mA ⟶ MENU + ⟶ OUTPUT mA TEMP

ENTER

HIGHER **200 MΩ**   ▲ ▶ Valeur corresponding to 20,00 mA output

ENTER

LOWER **200 Ω**   ▲ ▶ Valeur corresponding 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 ⟶ see page 12

ENTER

HIGHER **+160,0** °C   ▲ ▶ Valeur corresponding to 20,00 mA output

ENTER

LOWER **+000,0** °C   ▲ ▶ Valeur corresponding 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

(ENTER)

AUTO : Measure with Pt 100 Ω sensor

MEASURE: **AUTO / MANUAL**   ▲

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**

(ENTER)

(Reference temperature 20°C)

(VALID) SAVING ? ◀

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)