

BAMOPHOX 322 E - M

Resistivity monitor and controller



INSTRUCTION MANUAL

BAMO MESURES

22, Rue de la Voie des Bans - Z.I. de la Gare - 95100 ARGENTEUIL

Tél : (+33) 01 30 25 83 20 - Web : www.bamo.fr

Fax : (+33) 01 34 10 16 05 - E-mail : info@bamo.fr

Resistivity
monitor and controller

BAMOPHOX 322

27-06-2008

322 M1 04 I

MES

322-04/1

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	Page 3
2. DIMENSIONS	3
3. WIRING	4
4. FRONT PANEL	6
PRESENTATION AND SCROLLING MENU	7
ABOUT BAMOPHOX	8
CONSULTATION / MODIFICATION	8
MEASUREMENT PARAMETERS	8
TESTS	9
ADJUST ALARM 1	9
ADJUST ALARM 2	10
ADJUST ALARM 3	10
OUTPUT mA	11
OUTPUT mA TEMP	11
TEMPERATURE	12
FORCED RELAYS	12
LANGUAGE	12

1. TECHNICAL FEATURES

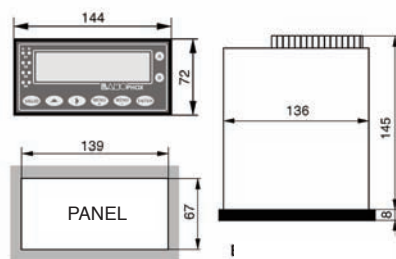
Displayed parameters:	Measurement values - Configuration Menu - Temperature value
Display:	Back lighted - 2 lines of 16 alphanumeric characters; 9,2 mm high
Indication:	LED alarms status
Configuration:	8 push buttons keyboard on front face - Keyword protected
Scales:	From 200 Ohm .cm to 200 MOhm .cm ; please see details on page 8
Accuracy:	$\pm 0,3\%$, $\pm 0,3^{\circ}\text{C}$
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 m Ω 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 x10 ⁶ operations (180 commutation/min) Electrical life time (minimum) 2 x10 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)

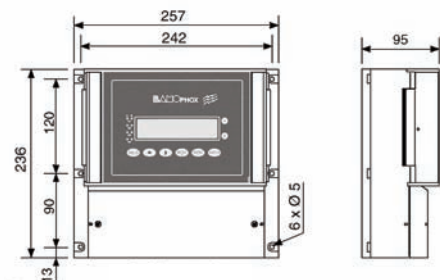
Communication:	RS422 output, J-BUS link, binary slave mode, 2400 to 9600 bauds
Data Logger:	Cycle average measurement record, with a programmable period, 150000 records maxi on MMC (multi media card) / External driver for reading
CE label:	Label CE in conformity with 73/23/CEE low power and electromagnetic compatibility 89/336/CEE

2. DIMENSIONS

Extension terminal:
identical to the
panel
or wall mounting



Panel mounting instrument

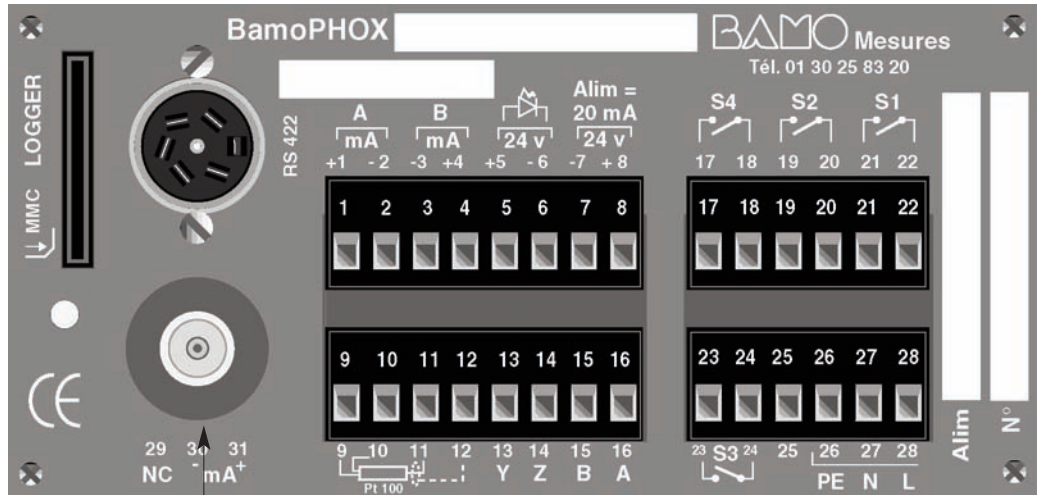


Wall mounting instrument

3. WIRING

PANEL MOUNTING MODEL

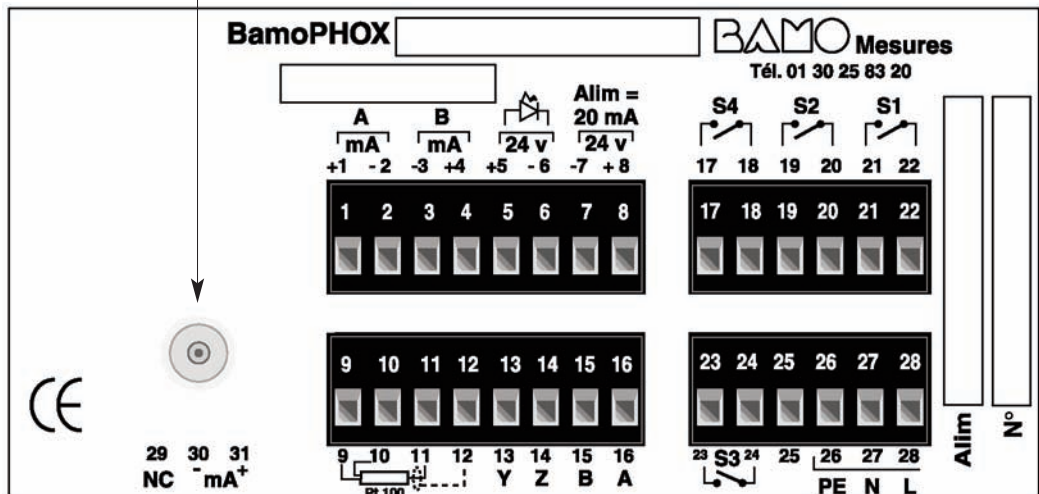
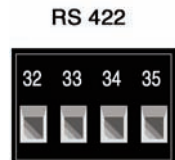
OPTION:
LOGGER
&
RS 422



BNC plug
Input measurement

WALL MOUNTING MODEL

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



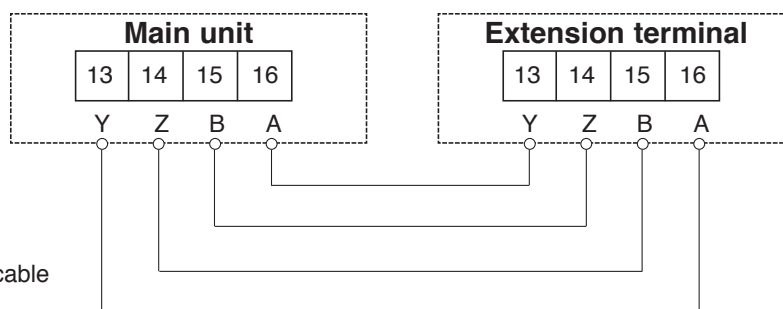
BamoPHOX terminal

1	+ mA measure output	
2	- mA measure output	
3	- mA temperature output	
4	+ mA temperature output	
5	+ 24 V	
6	- 24 V	
7	- 24 V	
8	+ 24 V	
9	Pt 100 Ω	
10		
11		
12		
13	Y	
14	Z	
15	B	
16	A	
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

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

- Maximum length cable
500 m

- Wire specifications:
Mains cable or 4 wires shielded cable
 $\geq 0,25 \text{ mm}^2$ 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 programming
will be overwritten).

If you are not sure of any modification,
do not press the VALID key,

To change parameters of data capture:

Numeric 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
+

LANGUAGE

MENU
+

With **LOGGER** option

See documentation

LOGGER + RS 422

ABOUT Bamophox

ABOUT Bamophox

ENTER

VERSION 1.00

ENTER

SERIAL N°

ENTER

20879 05

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,
message appear during 3 second.

CONSULTATION mode
resets automatically after 30 min.

MEASUREMENT PARAMETERS

MEASUREMENT TYPE

ENTER

RESISTIVITY

ENTER

K : _ _ _ _

ENTER

(Cell constant)

ENTER

KR : _ _ _ _

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 for 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

see page 10

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.



ENTER

HIGH/LOW



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.



ENTER

HIGH/LOW



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

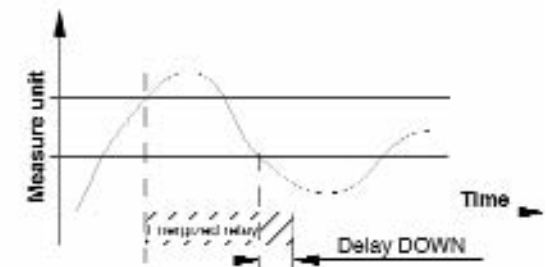
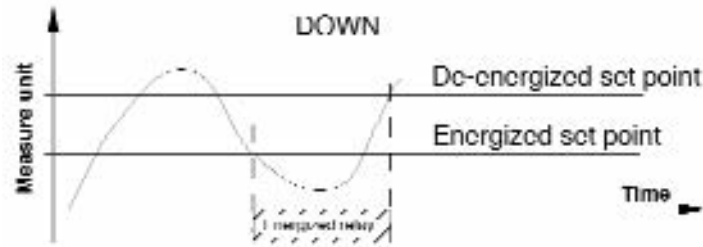
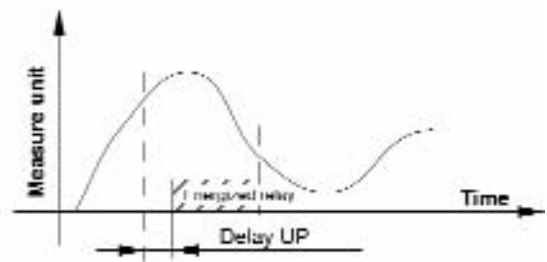
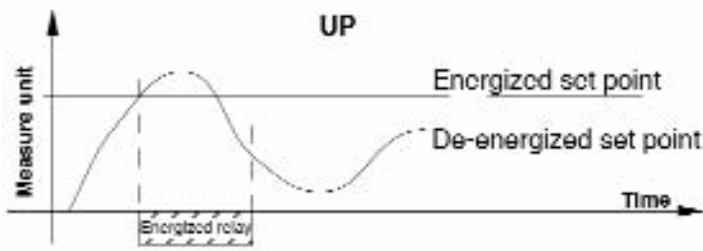
ENTER

SAVING ?

VALID

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



OUTPUT mA

MENU + → **OUTPUT mA TEMP**

ENTER

HIGHER 200 MΩ



Valeur correspondant to 20,00 mA output

ENTER

LOWER 200 Ω



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** → see page 12

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

ENTER

MEASURE: **AUTO / MANUAL**

AUTO : Measure with Pt 100 Ω sensor

ENTER

FLUID T° + **025,0** °C

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

ENTER

AUTO TC : **YES / NO**

Fluide temperature manual setting

ENTER

(Reference temperature 20°C)

VALID

SAVING ?

FORCED RELAY

MENU +

LANGUAGE

ENTER

ALARM 1 OFF/ON

ENTER

ALARM 2 OFF/ON

ENTER

ALARM 3 OFF/ON

Alarm manual test mode

VALID

LANGUAGE

MENU +

Go back to display

ENTER

FRENCH / ENGLISH / ITALIAN / GERMAN

ENTER

SAVING ?

VALID