

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

21-05-2008

322 M1 03 H

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

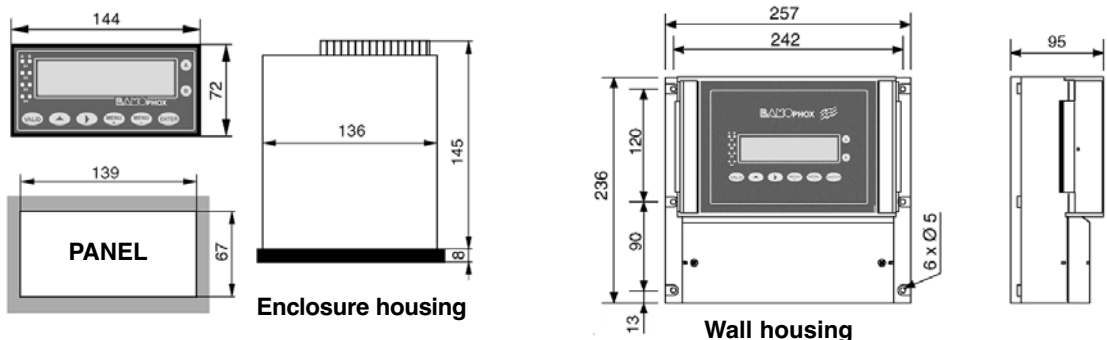
Indication	: Measure – Menu – Temperature
Display	: Back lighted – 2 lines of 16 alphanumeric characters, H = 9,2 mm
Visualization	: Alarms status by LED
Programming	: 8 push button keyboard on front face – Program protection by access code.
Measure scale	: 2 to 2000 mS : Programmable scales 0-20 mS / 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 ⁶ switching (at 180 cpm)
Electrical life time (min)	: 2 x10 ⁵ (at 20 cpm) for 3 A 125 V AC, 3 A 30 V DC - 10 ⁵ (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

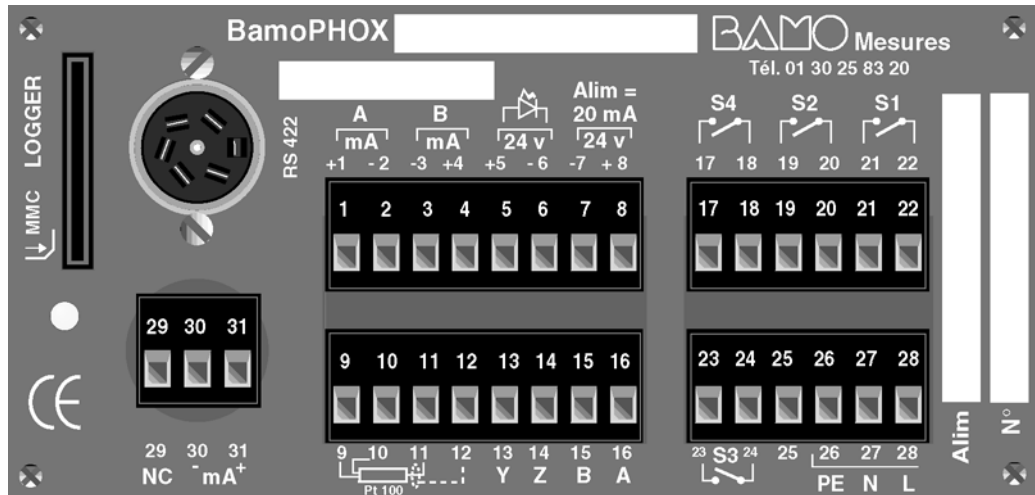
Blind model:
Respectively
identical
dimensions,
by format



3. WIRING

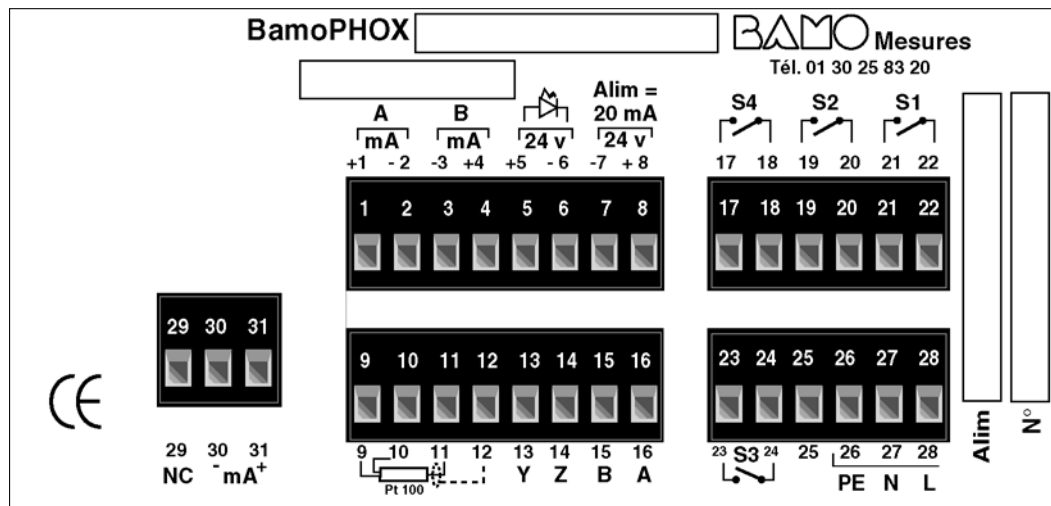
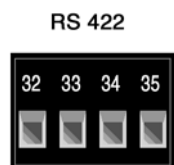
ENCLOSURE BOX

**OPTION:
LOGGER
&
RS 422**



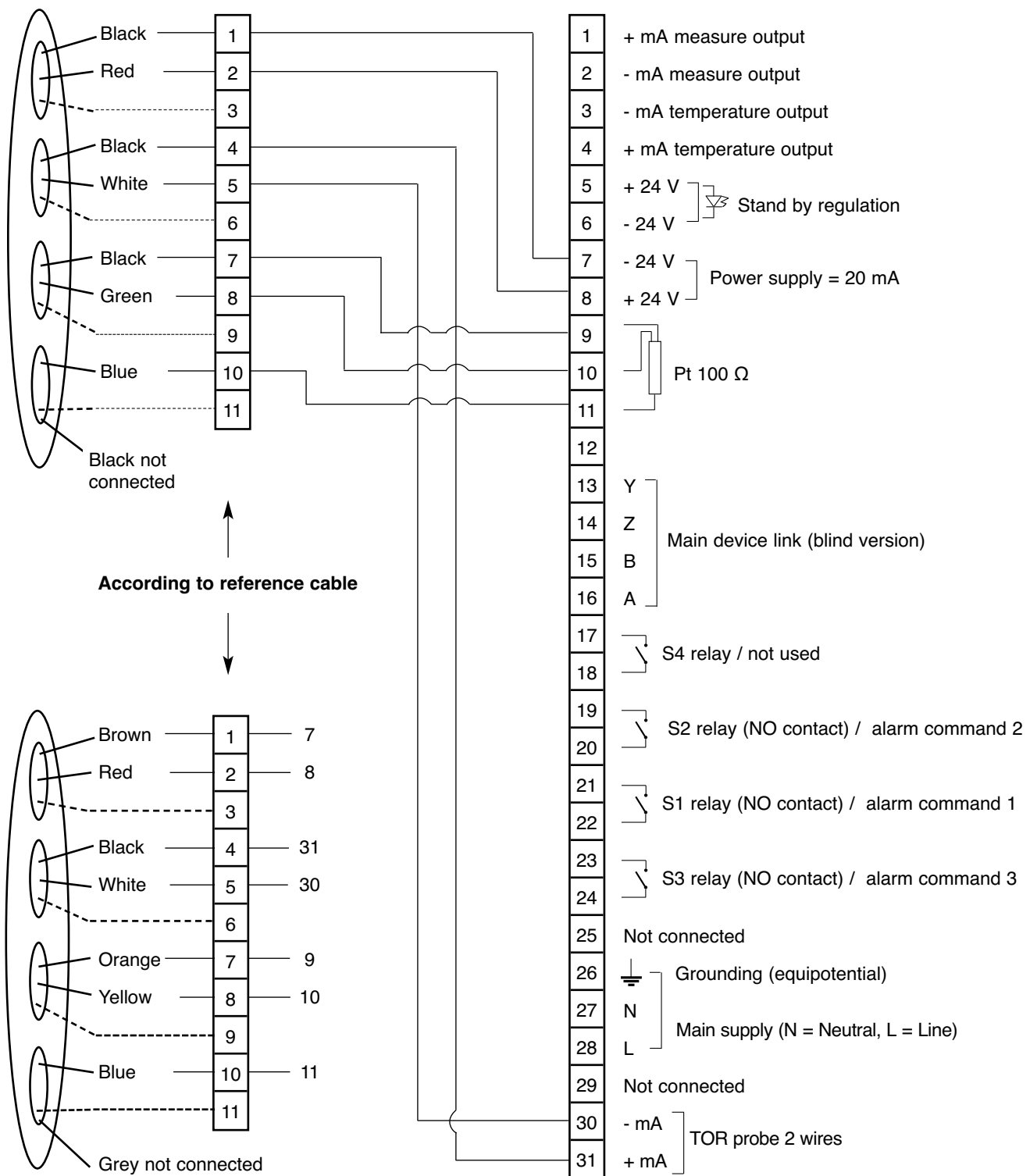
WALL HOUSING

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



Probe terminals

BamoPHOX terminal



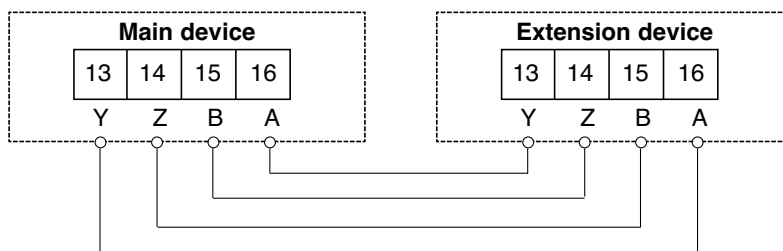
According to reference cable

----- : Shielding

Link:
max lenght = 500 meter

Cable:
Cables network
or shielded cable /4 wire
cross-section ≥ 0,25 mm²

Wirering to the blind device "Extension"



4. FRONT PANEL

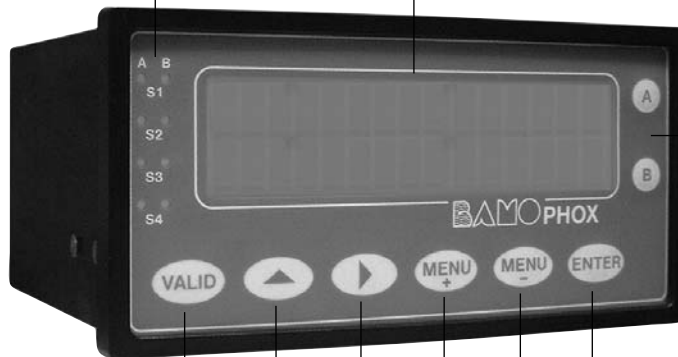
S1, S2, and S3

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

% +20,0 °C

MENU
+

ABOUT BAMOPHOX

MENU
+

CONSULTATION / MODIFICATION

MENU
+

MEASURE DATA

MENU
+

ADJUST ALARM 1

MENU
+

ADJUST ALARM 2

MENU
+

ADJUST ALARM 3

MENU
+

OUTPUT mA Cond

MENU
+

OUTPUT mA TEMP

MENU
+

TEMPERATURE

MENU
+

FORCED RELAY

MENU
+

CLOCK

MENU
+

RECORDING PERIOD

MENU
+

LIAISON SERIE

MENU
+

LANGUAGE

MENU
+

If **LOGGER** option:

See documentation

LOGGER + RS 422

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.



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 S1 relay will be energized

ENTER

OFF 0000 mS / °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 → see page 10

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 mS / °C



Value to which S2 relay will be energized

ENTER

OFF 0000 mS / °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 S3 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 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 S3 relay will be energized

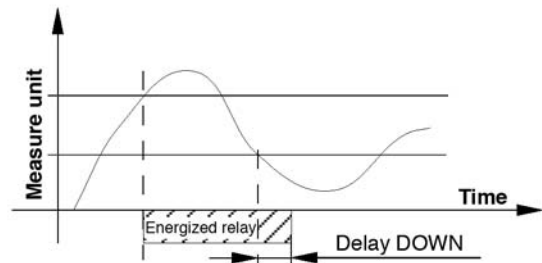
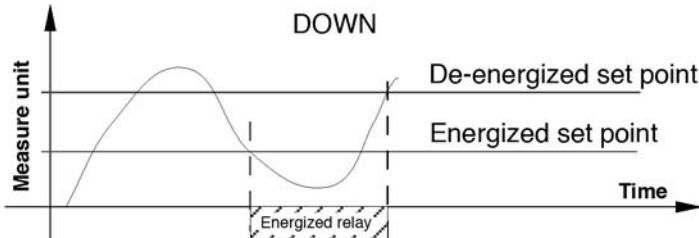
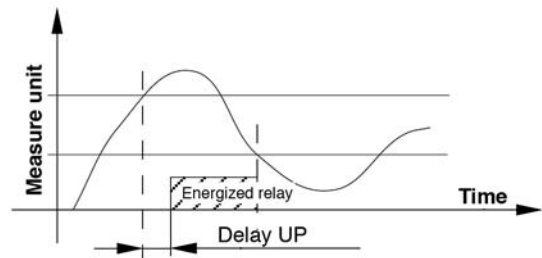
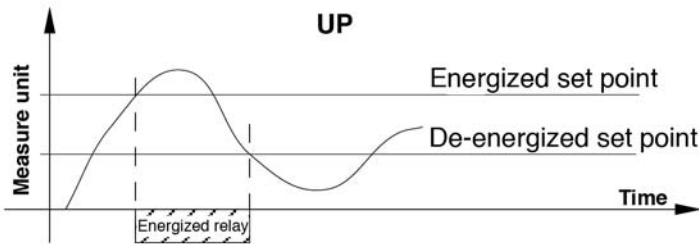
Value to which S3 relay will be down

With or without delay for S3 energizing

Duration of the delay for S3 energizing

With or without delay S3 will be down

Duration of the delay for S3 will be down



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