

RIF990



Tank Inventory, Differential Level, Open Channel Flow,
Pumps Control

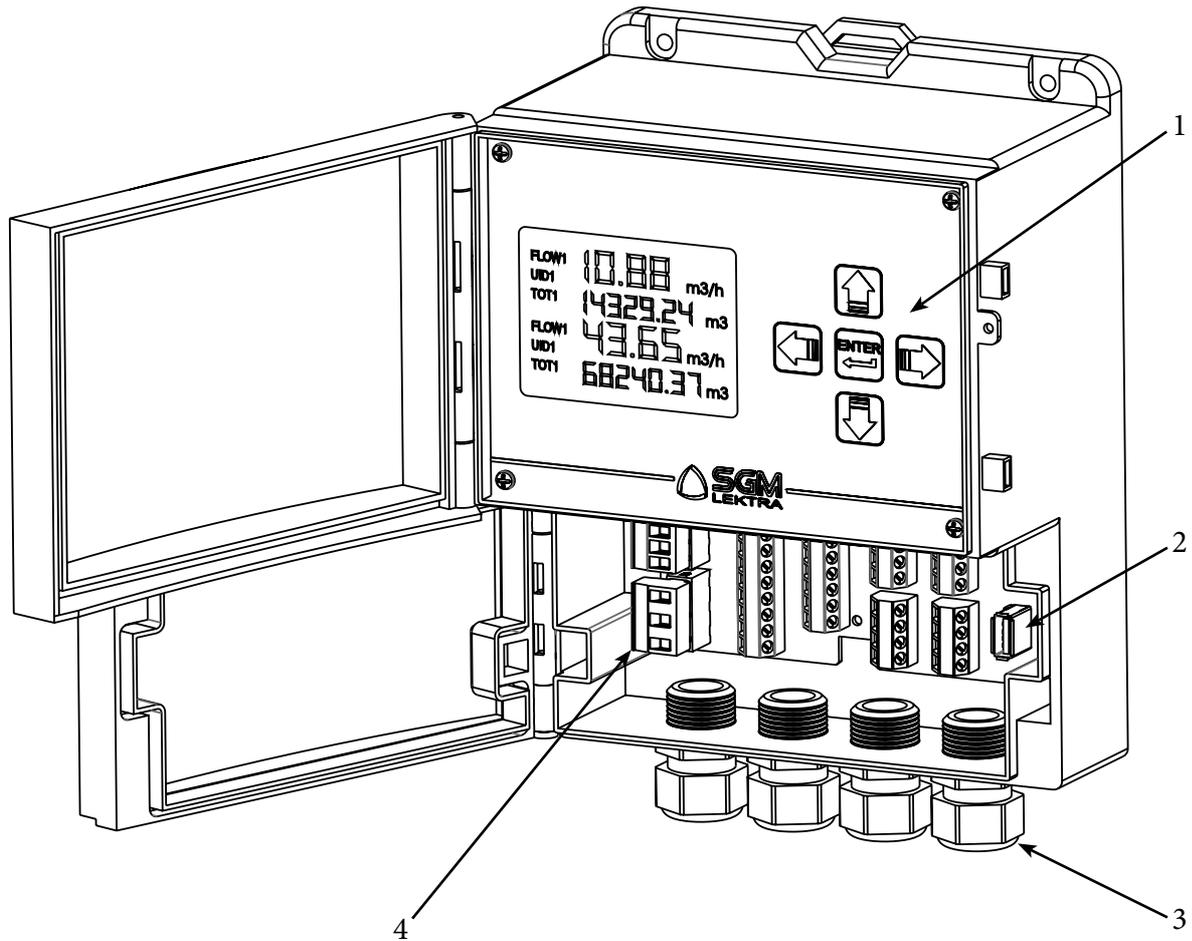


Technical documentation EN Rev. B

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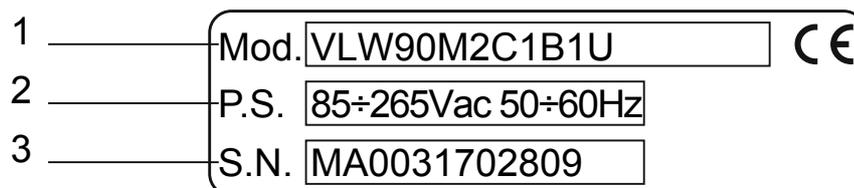
2- PRODUCT



1. Keyboard
2. Pen Drive USB for DATALOGGER
3. N°4 Skintop M20x1,5
4. Morsettiere

2.1 IDENTIFICATION

Each meter has an adhesive identification plate on which are the meter main data. The following picture describes the information and data on the identification plate.



1. Product code

2. Power supply

3. Serial number

3-FEATURES

Housing material

ABS

Mechanical installation

Wall, pipe or DIN rail mountin

Protection degree

IP66

Keyboard

5 push buttons

Display

320x240 matrix color LCD with backlight

Electrical connection

Internal connectors

Working temperature

-20 ÷ +60°C

Power supply

85÷230Vac; 24Vdc

Power consumption

Max. 10W

Analog output

n.2 configurable isolated 4÷20mA

Relays output

n.5 fully configurable relay (5A 250Vac)

Digital output

n.2 open collector (max. 24Vdc 50mA)

Analog input

n.2 4÷20mA

Digital input

n.2 (max. 24Vdc 10mA)

Digital communication

MODBUS RTU

Datalogger

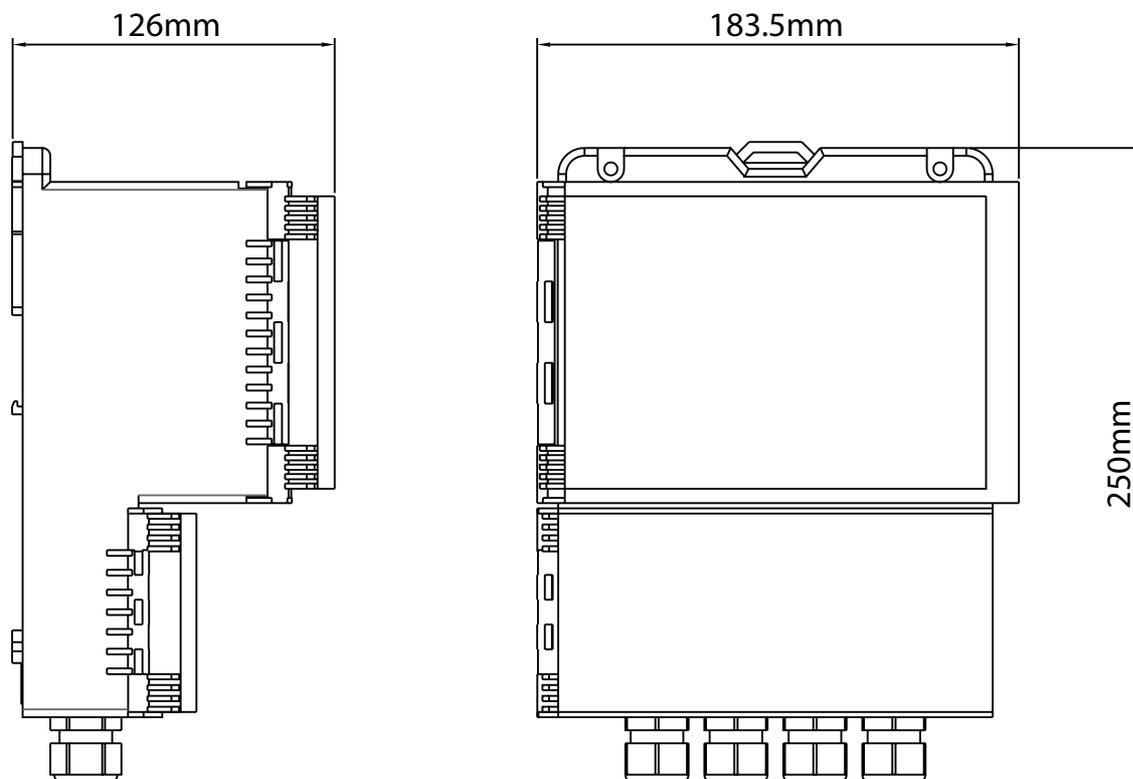
on Pen Drive USB; max.32GB (FAT32)

Power supply for analog transmitters

24Vdc; 200mA max

4-DIMENSIONS

4.1 MECHANICAL DIMENSIONS

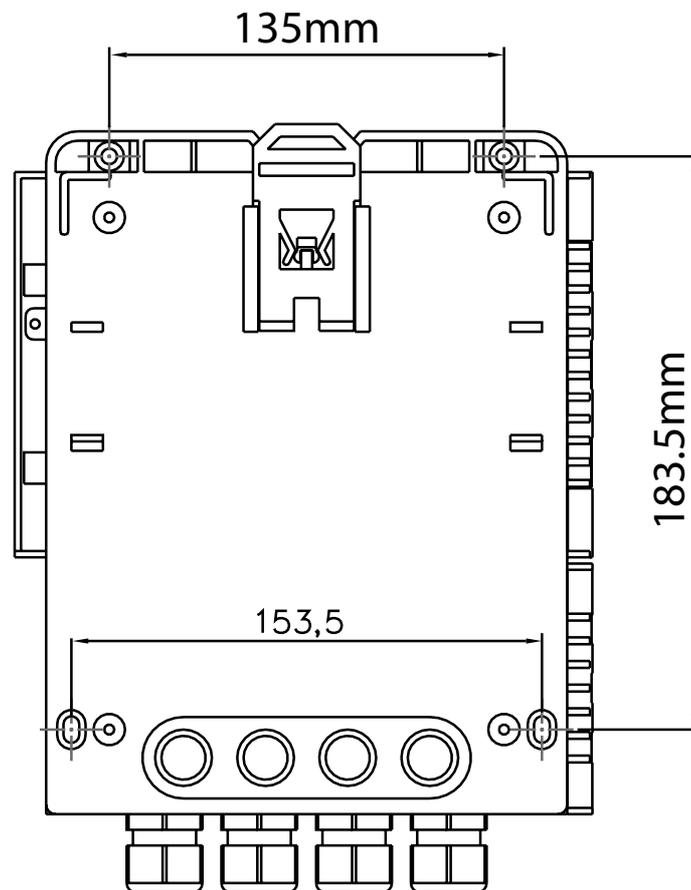


5-INSTALLATION

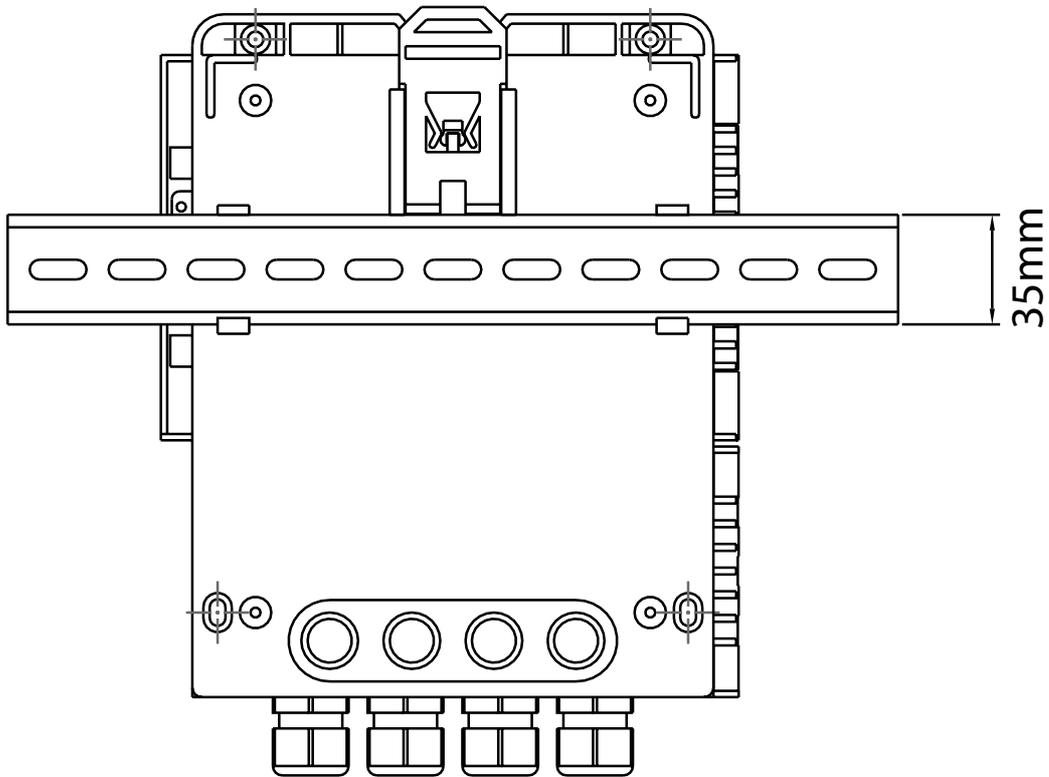
5.1 INSTALLATION PRECAUTION

- Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
- Make sure that the working temperature is between -20 and +60°C
- Install the instrument in an environment compatible with housing material.
For external rain and sun with a protection cover.
- Improper transmitter use would cause serious damage to people, to the product and connected equipment.

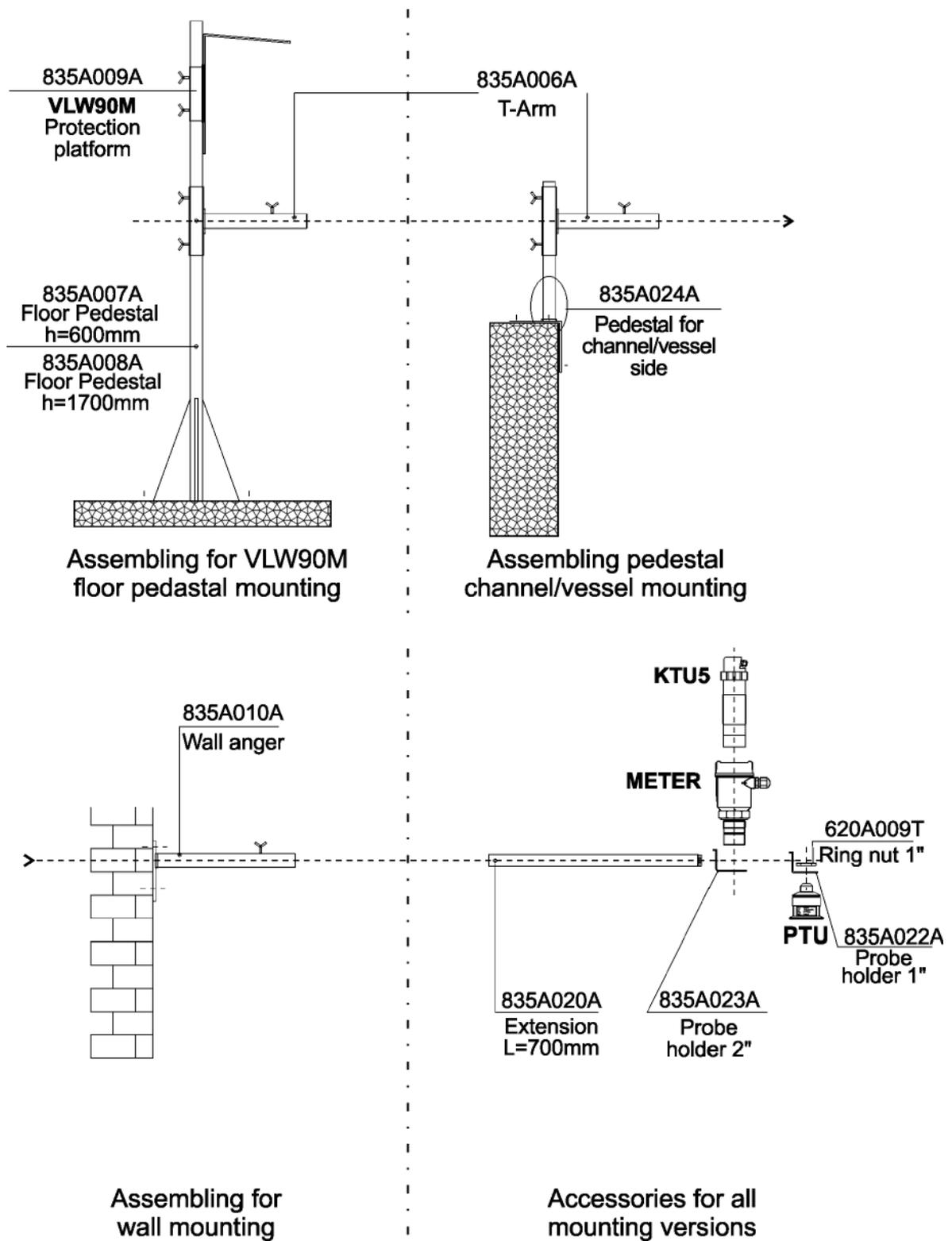
5.1.1 Drilling template for wall mounting



5.1.2 DIN rail mounting



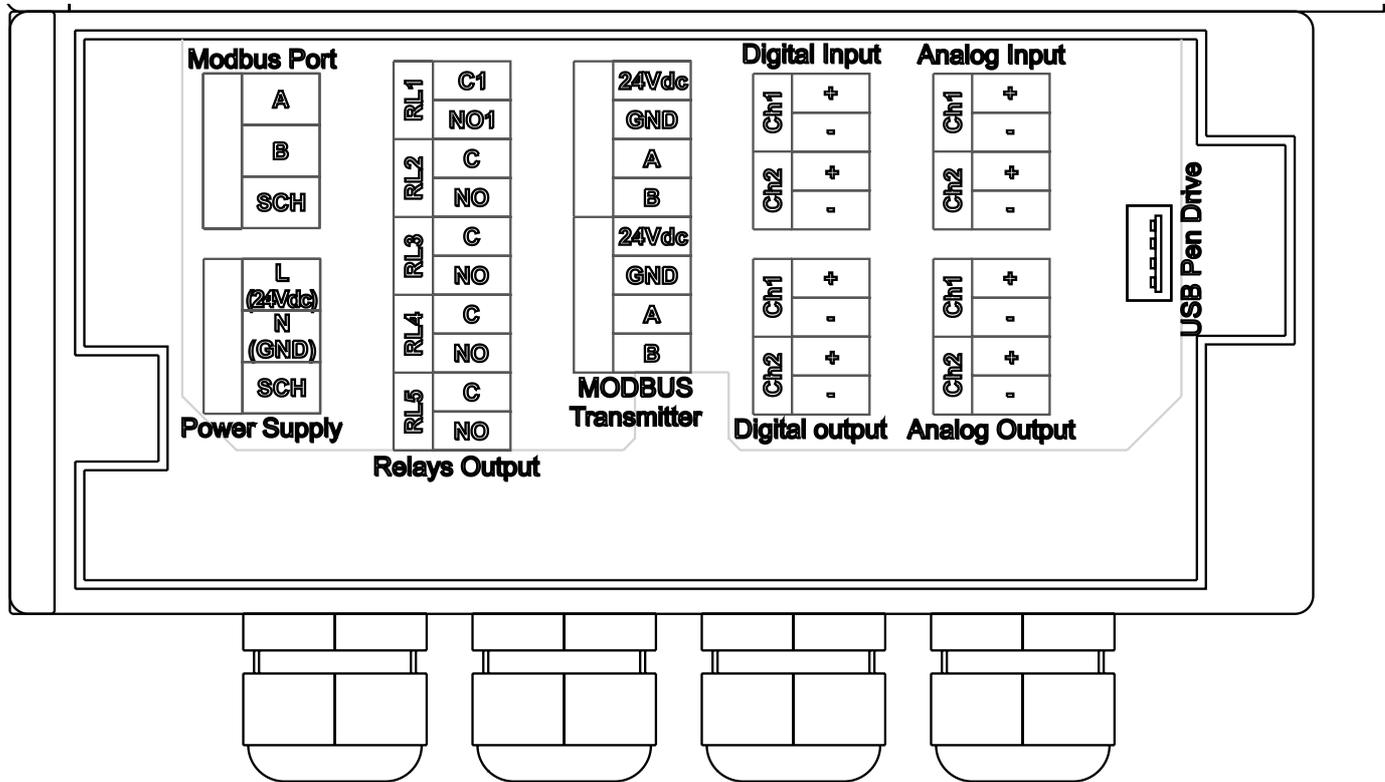
5.1.3 Mechanical installation accessories



6-ELECTRICAL CONNECTIONS

6.1 CONNECTIONS

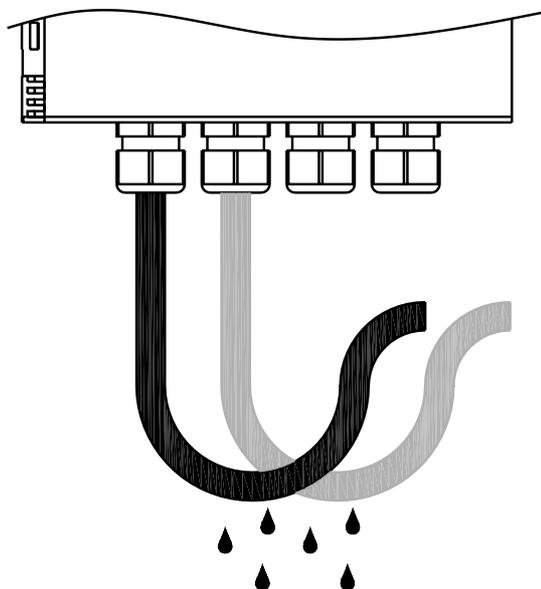
- 1) Separate the engine control cables or power cables from the VLW90M connection cables.
- 2) Remove the caps from the cable glands and open the cover by unscrewing the screws.
- 3) Lead the cables into the transmitter through the cable glands.
- 4) Close the cap and tighten the cable glands



6.2 RECOMMENDATIONS FOR EXTERNAL MOUNTING

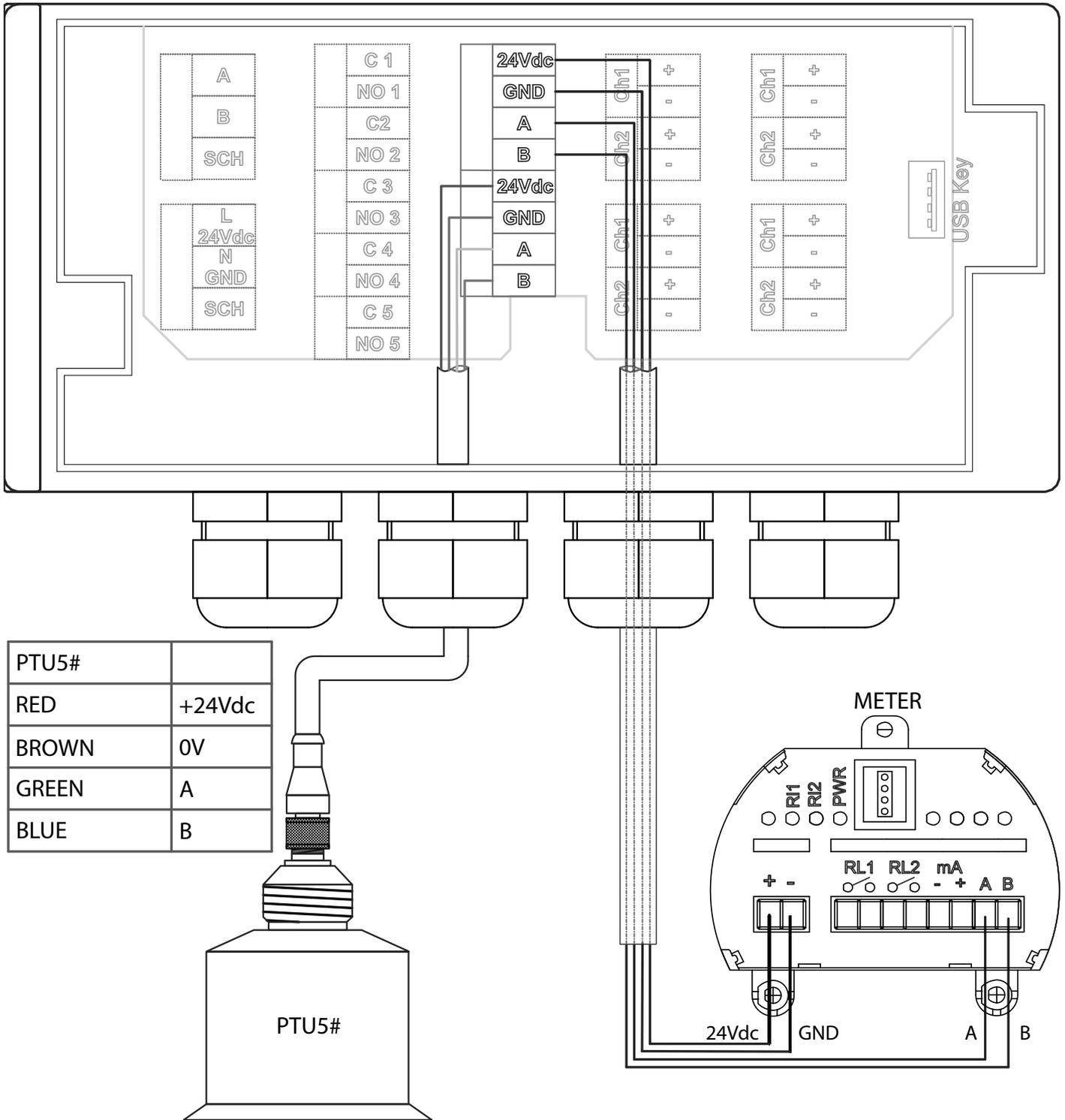
To avoid the humidity infiltration inside the housing is recommended:

- for electrical connections, use a cable with a 6÷12mm outer diameter and fully tighten the M20x1.5 cable gland.
- fully tighten the cap.
- position the cable so that it forms a downward curve at the M20 output; in this way the condensation and/or rain water will tend to drop from the curve bottom.
- The two central cable glands are arranged for the PTU sensor connection cables.

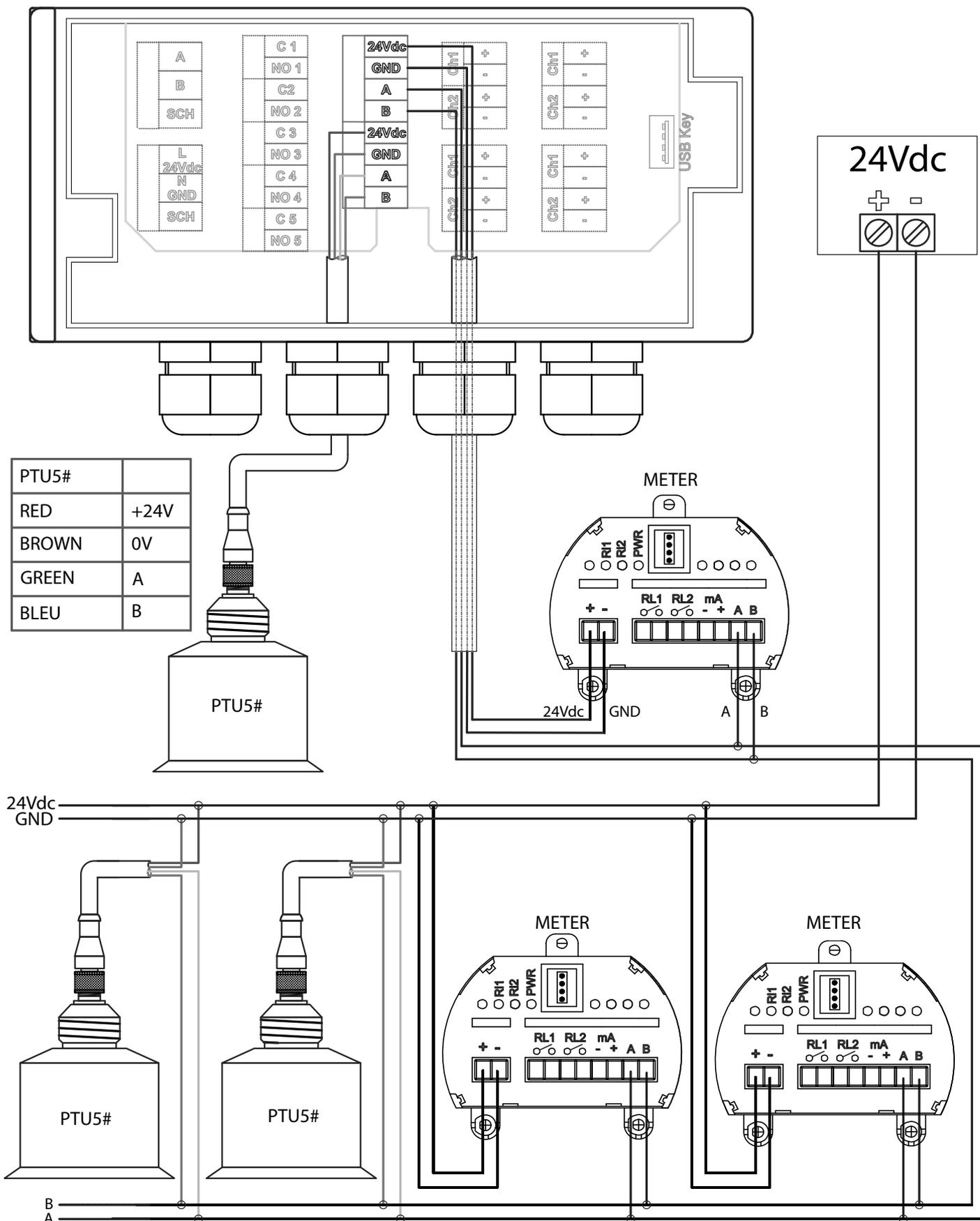


6.3 Riels Instr. ULTRASONIC MODBUS LEVEL TRANSMITTERS CONNECTION

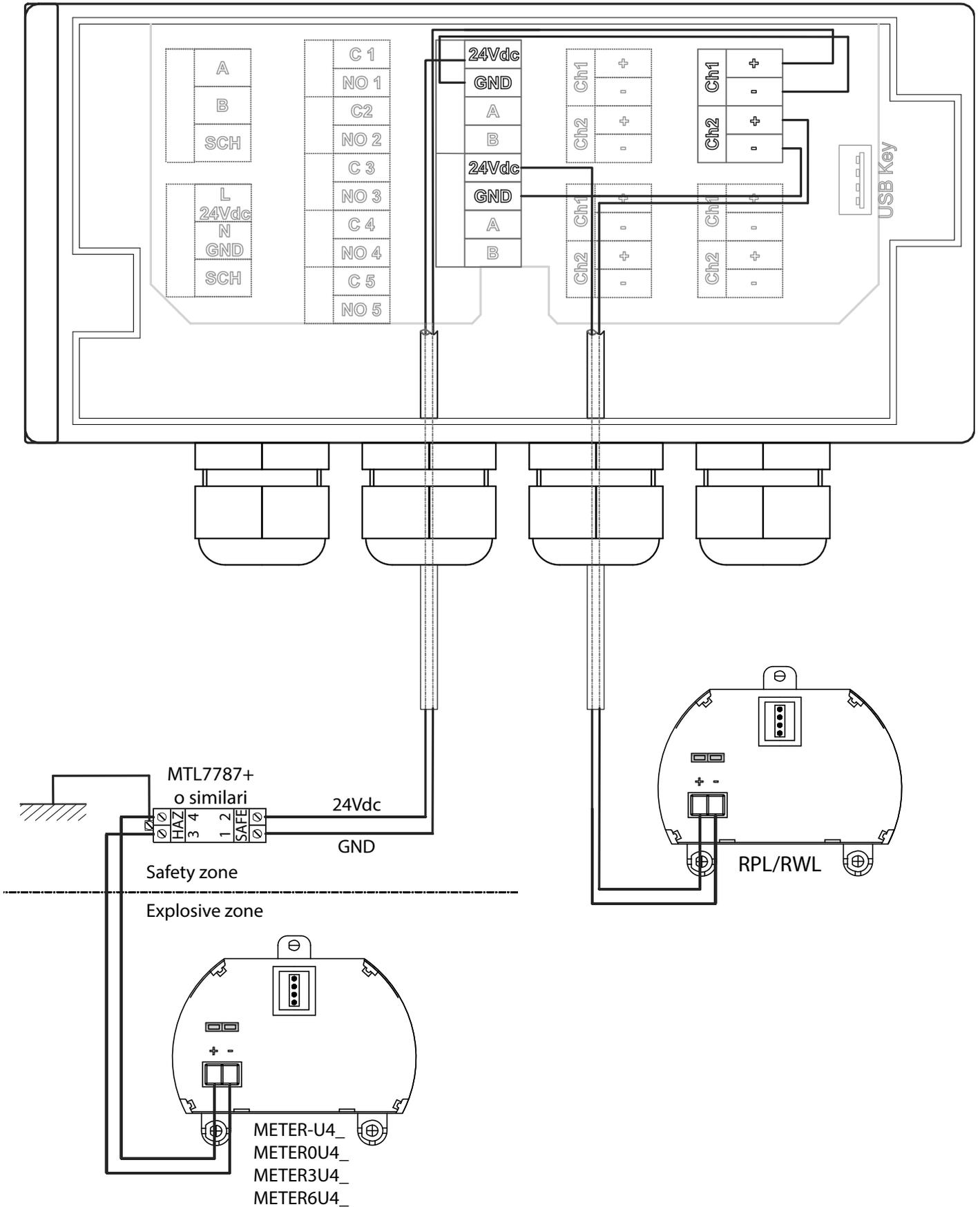
6.3.1 Up to 2 Riels Instr. ultrasonic level transmitters can be directly powered by the VLW90M



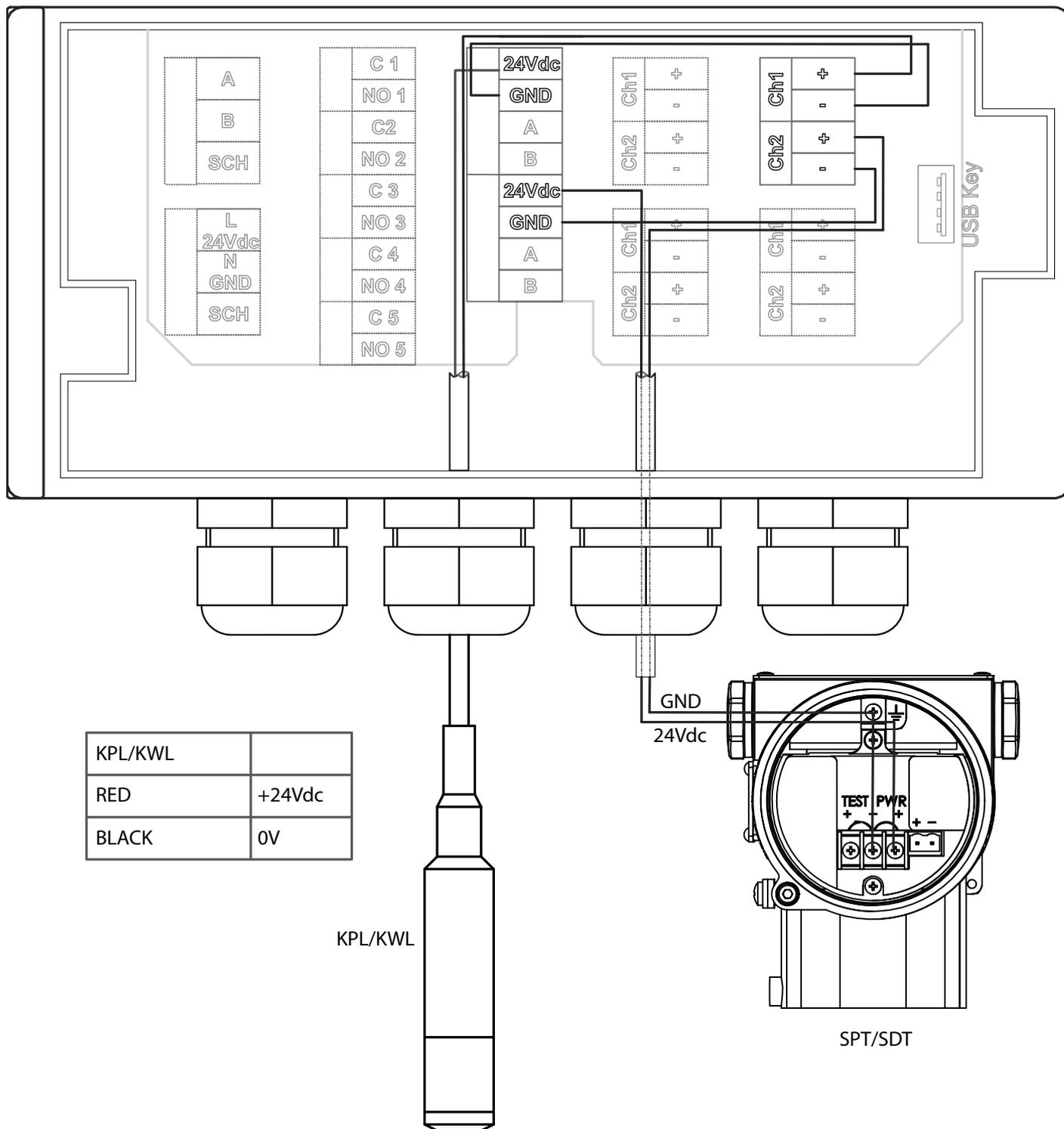
6.3.2 With more than two ultrasonic sensors Riels Instr., 24Vdc additional power supply is needed



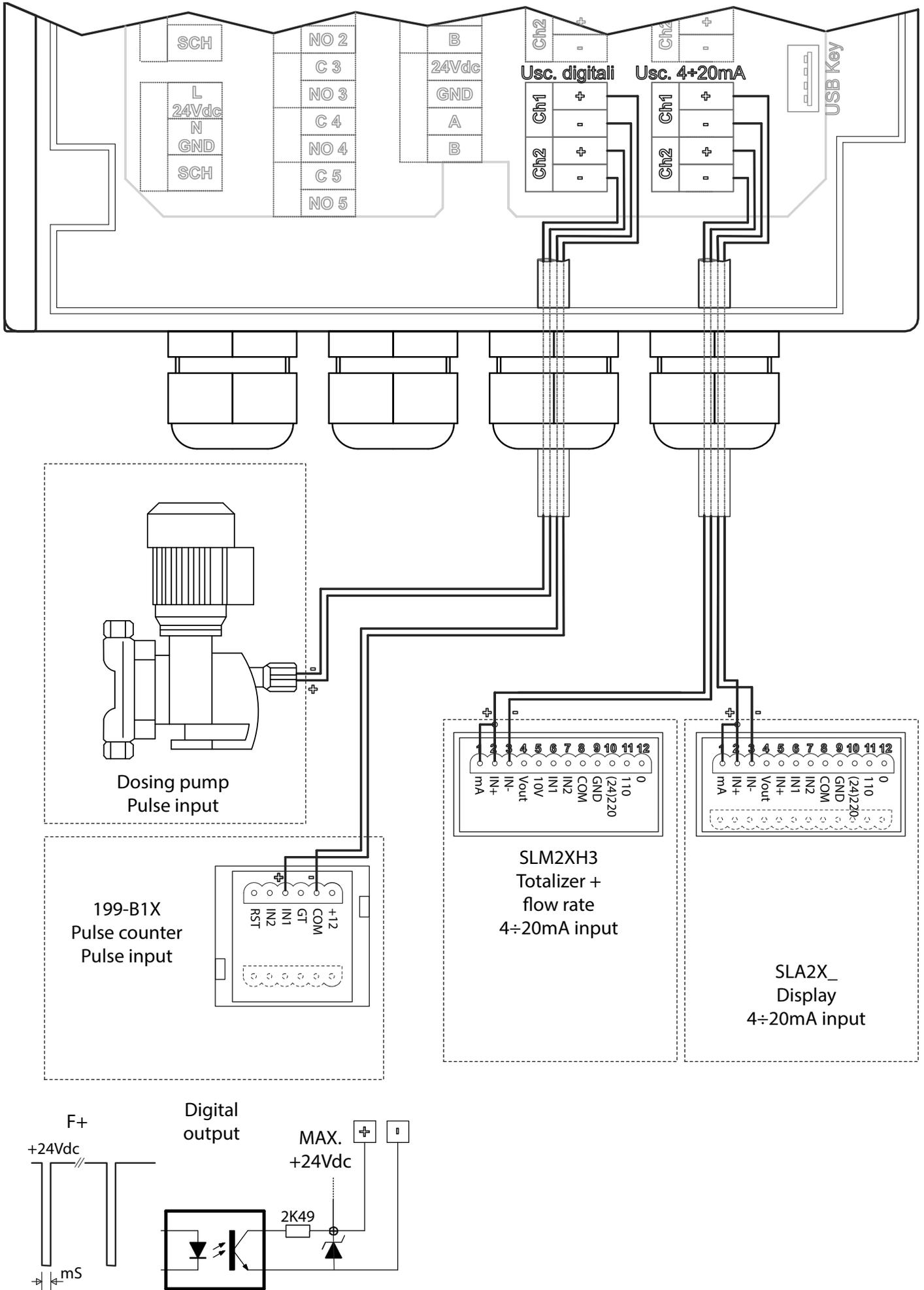
6.3.4 ATEX certified METER or radar RPL / RWL level transmitters connection



6.3.5 Riels Instr. hydrostatic head level transmitters connection



6.3.6 Analog and digital outputs connection



7-PROGRAMMING

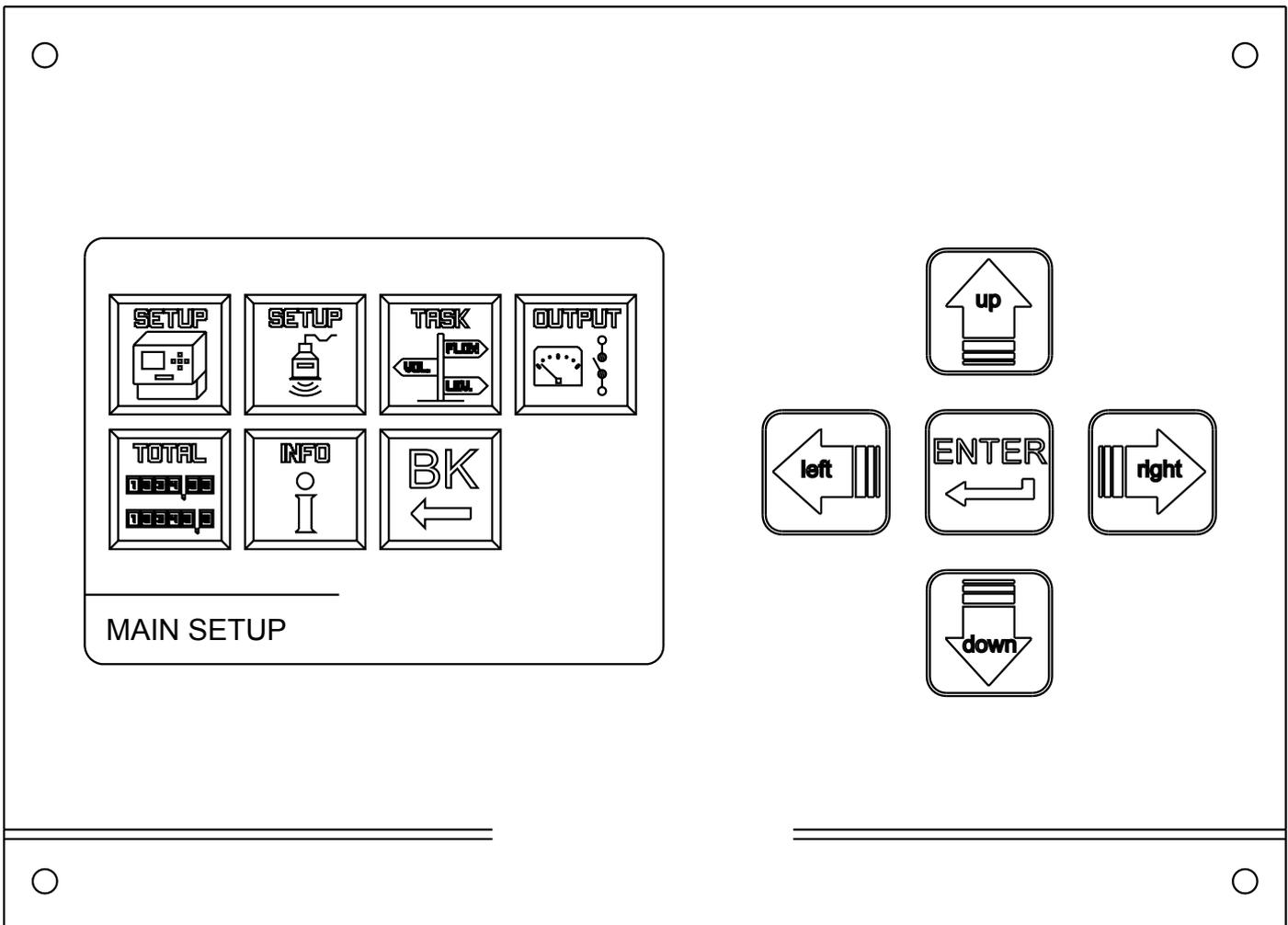
7.1 KEYBOARD

Opening the display cover the 5 buttons for programming are accessible.

The key functions are always described when every single menu and program parameters page are displayed.

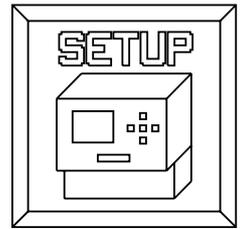
The VLW90M menu structure is simple and easy to intuition.

1. From "RUN" mode: Press  to access the main menu
2. To select a programming menu use the  /  /  /  arrow keys and confirm with .
3. To return to the run mode, in the main menu select the  icon (DISPLAY MEASURE) with arrow keys, and confirm with .



7.2 CONFIGURATION MENU

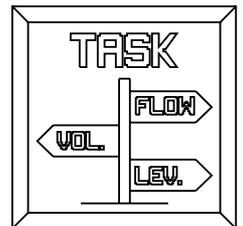
MAIN SETUP - Menu for the VLW90M general configuration.



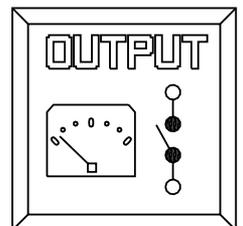
SENSOR SETUP - Menu for Riels Instr. ultrasonic sensors via MODBUS configuration..



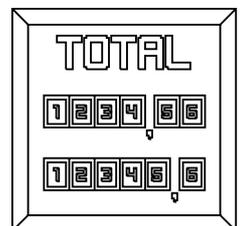
TASK - Menu to configure the VLW90M measurement functions (flow, level, etc.).



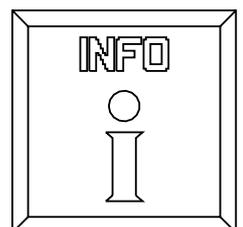
OUTPUT - Menu to configure the analog/digital outputs and the 5 threshold relay.



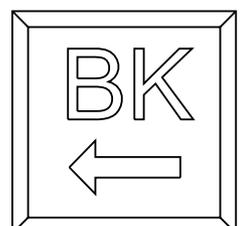
TOTALIZER - Menu for the flow totalizers management



INFO - VLW90M info menù



DISPLAY.



7.3 - VLW90M turning on and system initialization

At power on, VLW90M start automatically the following system procedures:

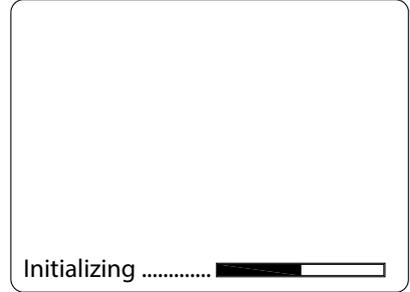
- 1) Firmware loading for the VLW90M unit operating.
A green bar is displayed to indicate the initialization procedure progress.

- 2) Searching for Riels Instr. ultrasonic sensors connected via MODBUS RTU communication port (RS485).
The following information is displayed:
 - a) * Probes Found: 4 ; shows the ultrasonic sensors number connected, with the properly configured UID address

 - b) UID1.....UID4 ; showing the measuring sensor model with its UID address. In the example shown, 4 sensors are identified with their model and UID address.

- 3) Searching for data logger Pen Drive connected to the USB port.
The following information is displayed:
 - a) * USB CONNECTED; shows that a FAT32 formatted Pen Drive is connected to the USB port and the datalogger function is automatically enabled.

 - b) * USB NOT CONNECTED; shows that no Pen Drive is connected to the USB port, or that the pen drive connected to the USB port is not FAT32 formatted; In this case, connect the Pen Drive to a PC or notebook, and format it by selecting the "FAT32" option in "File System".
After is possible to connect the Pen Drive following the procedure described in Chapter 15.



Initializing

```
* USB CONNECTED
* PROBES FOUND: 4

UID1: METER 6m
UID2: PTU_51
UID3: PTU_56
UID4: METER 10m
```

```
* USB CONNECTED
* PROBES FOUND: 4

UID1: METER 6m
UID2: PTU_51
UID3: PTU_56
UID4: METER 10m
```

```
* USB NOT CONNECTED
* PROBES FOUND: 4

UID1: METER 6m
UID2: PTU_51
UID3: PTU_56
UID4: METER 10m
```

8-OPEN CHANNELS FLOW MEASUREMENT SET UP GUIDES

8.1 - SGM VENTURI STD prefabricated channels configuration

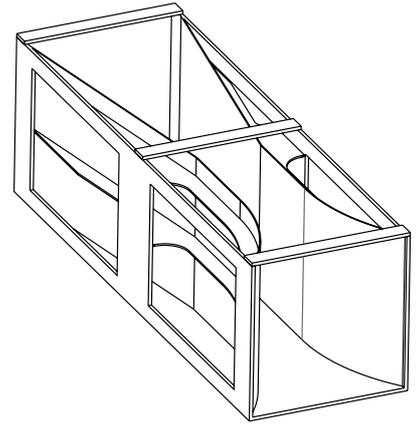
The SGM-LEKTRA developed in collaboration with the Pavia University Hydraulics Institute a “SGM VENTURI STD” called venturi channels family.

These primary device are Venturi channels with a flat bottom and they are suitable to be installed in pre-existing rectangular channels.

The SGM VENTURI STD are suitable for use in irrigation systems, water treatment, industrial wastewater, for sewage sludge and for any murky waters; the flat bottom without protrusions has a self-cleaning effect that makes it difficult to debris deposit.

SGM VENTURI STD can be easily incorporated into existing rectangular channels.

To configure the flow measurement with SGM VENTURI STD channels follow the procedure below:



With the arrow keys select the “TASK”  menu icon.
Confirm the selection by pressing “ENTER”.

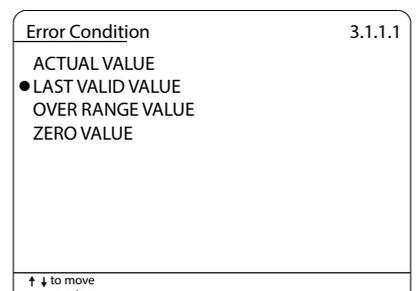
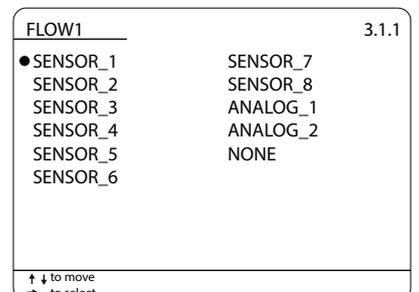
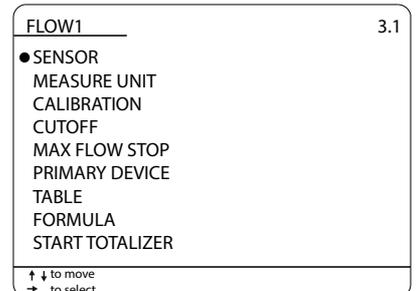
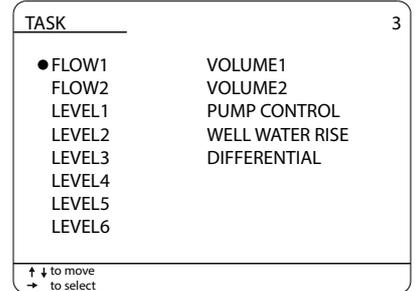
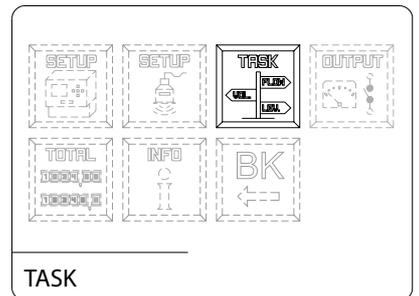
Press “RIGHT” to access the submenu “FLOW1” or “FLOW2”, is possible to configure up to 2 flow measurements

8.1.1 SENSOR

Press “RIGHT” to select “SENSOR”.

Select the SENSOR_x installed on channel with “UP” or “DOWN”.
The sensor UID address identifies the sensor number: ex. sensor with UID 1 address = SENSOR_1, etc..
Press “RIGHT” to confirm.

Press “DOWN” to select the measure condition in error state.
Press to “RIGHT” confirm.



8.1.2 PRIMARY DEVICE

Press "DOWN" to select "PRIMARY DEVICE" and press "RIGHT" to confirm.

FLOW1	3.1
SENSOR MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP ● PRIMARY DEVICE TABLE FORMULA START TOTALIZER	
↑ ↓ to move → to select	

Press "DOWN" to select "SGM VENTURI STD" and press "RIGHT" to confirm.

FLOW1	3.1.6
RECT. SUPPRESSED RECT. CONTRACTED TRAPEZOIDAL VNOTCH ● SGM VENTURI STD SGM VENTURI CUSTOM KAFAGI VENTURI PARSHALL INCH PARSHALL FEET PALMER BOWLUS	
↑ ↓ to move → to select	

Use the "UP" or "DOWN" to select the model. Confirm selection with "RIGHT".

FLOW1	3.1.6.5
● BS150 BS200 BS300 BS400 BS500 BS600 BS800 BS1000	
↑ ↓ to move → to select	

8.1.3 MEASURE UNIT

Press "DOWN" to select "MEASURE UNIT" and press "RIGHT" to confirm.

FLOW1	3.1
SENSOR ● MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA START TOTALIZER	
↑ ↓ to move → to select	

Press "UP" or "DOWN" to select the flow rate measure unit and press "RIGHT" to confirm.

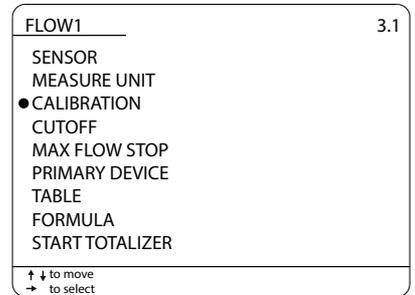
FLOW MEASURE UNIT	3.1.2
● lt/s m3/s lt/min m3/m lt/h m3/h	
↑ ↓ to move → to select	

Press "UP" or "DOWN" to select the totalizer measure unit and press "RIGHT" to confirm.

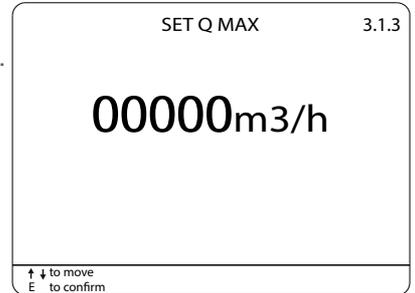
TOTAL MEASURE UNIT	3.1.2.1
● l m3	
↑ ↓ to move → to select	

8.1.4 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT" to confirm.



"MAX Q" is the threshold for Max flow beyond which the tot. does not increase. Set the value and confirm with "ENTER". Disabled function with "0" threshold value



Enter the actual head or the "Q=0" distance in mm . Press "DOWN" to select the measure to be set, Move the cursor with "RIGHT" and press "UP" to change the digit. Confirm with "ENTER".

Manually measure in mm the "ACTUAL HEAD" and insert the data, the unit will automatically calculate the fluid distance to the "Q=0" point (zero flow distance). Alternatively, can directly be entered the "Q=0" empty distance. In fig.1 the example to correctly detect the "ACTUAL HEAD" measure. It is recommended to use the "ACTUAL HEAD" system with the zero flow condition (no flow: see fig.2), because in doing so the "ACTUAL HEAD" or "Q=0" manually measurement distance errors are avoided. "ACTUAL HEAD" set to "0" is enough to ensure the correct calibration.

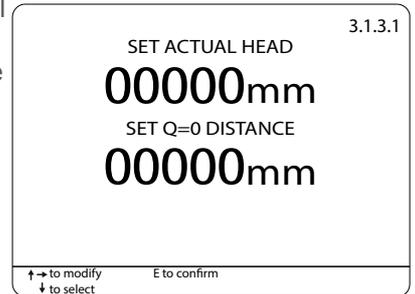


FIG.1

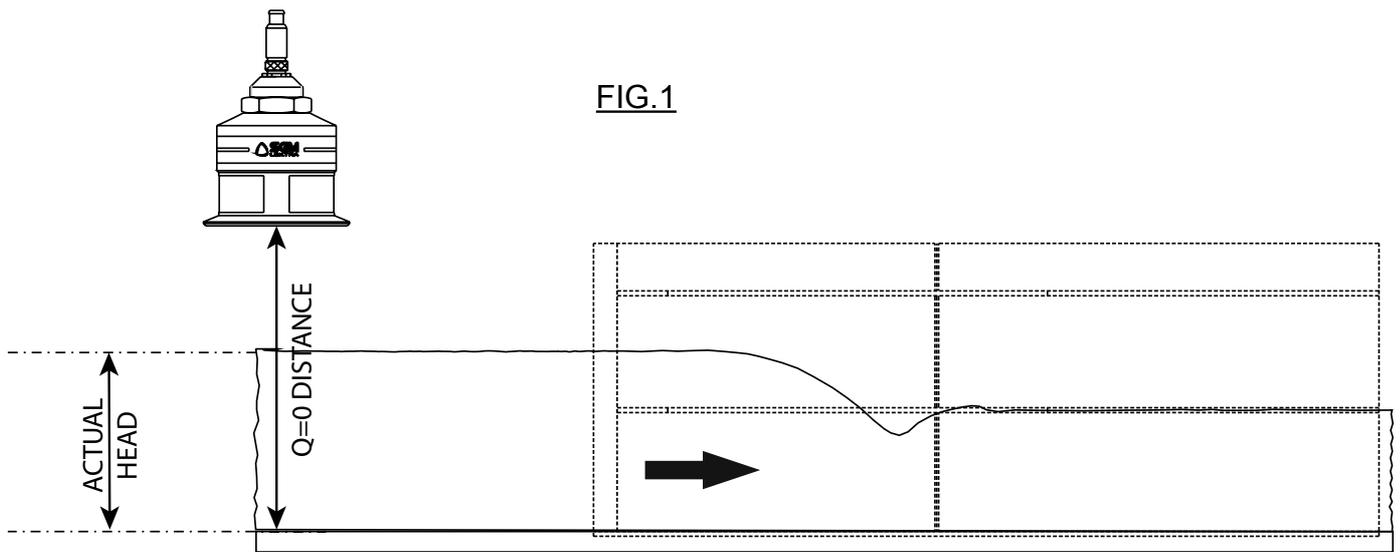
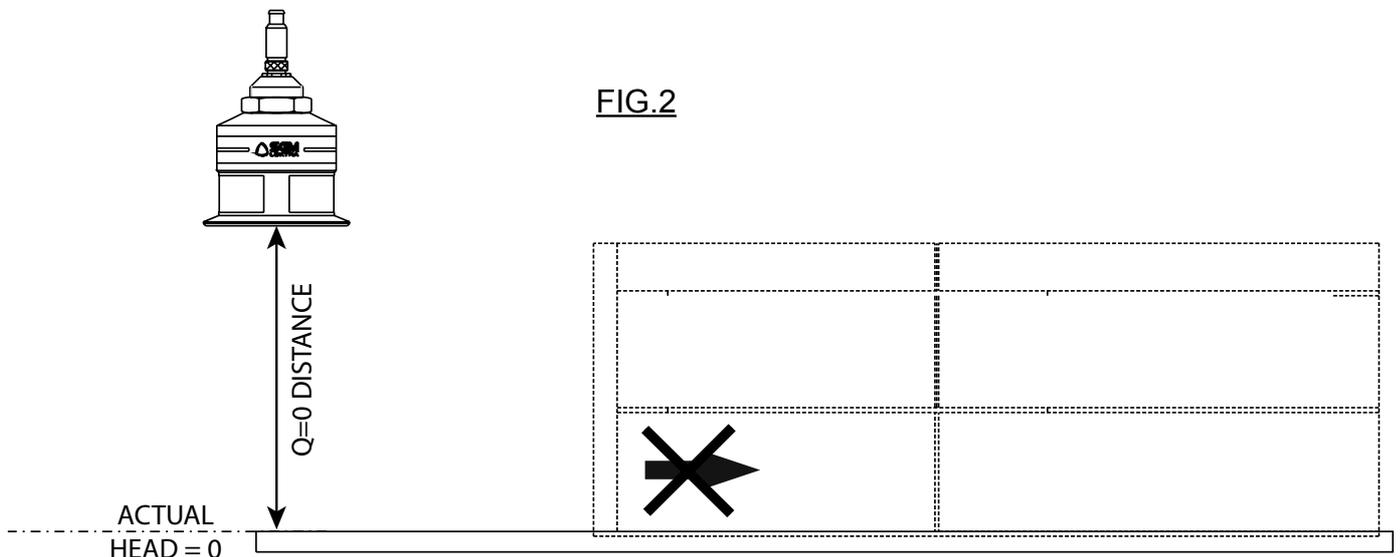


FIG.2



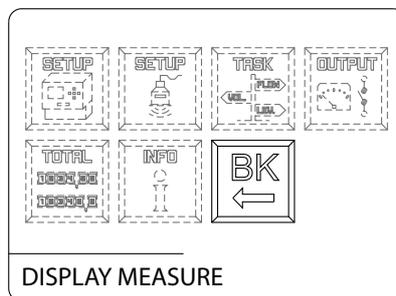
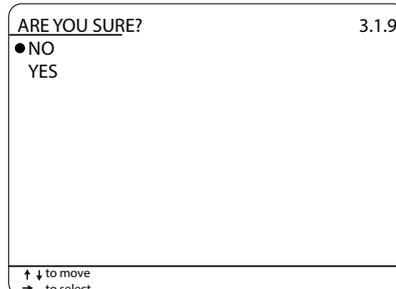
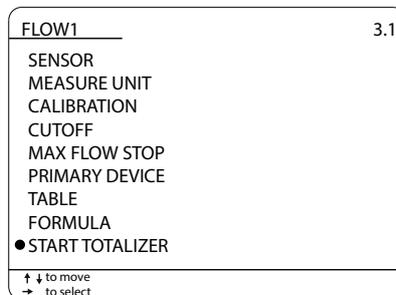
8.1.5 START TOTALIZER

Press "DOWN" to select "START TOTALIZER" and confirm with "RIGHT".
Takes to start the totalizer volume flow.

Start the flow totalizer only after have completed the flow measurement configuration, including head calibration, select "YES" and press "RIGHT" to start the flow totalizer.

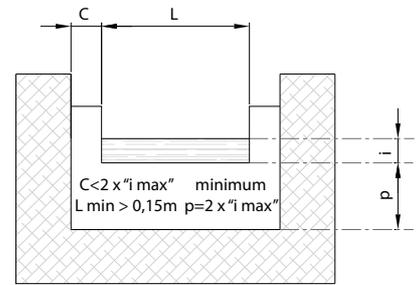
Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode.

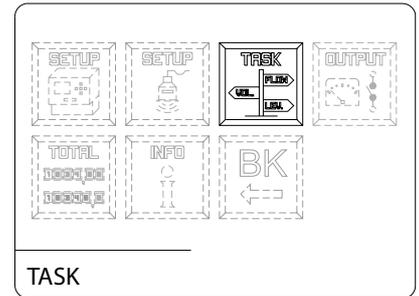


8.2 - Constriction rectangular weir (Francis) configuration

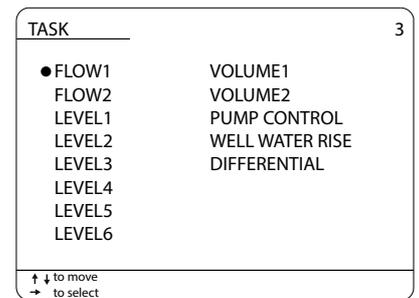
To configure the flow measurement with rectangular weir (Francis) follow the procedure below:



With the arrow keys select the “TASK”  menu icon.
Confirm the selection by pressing “ENTER”.

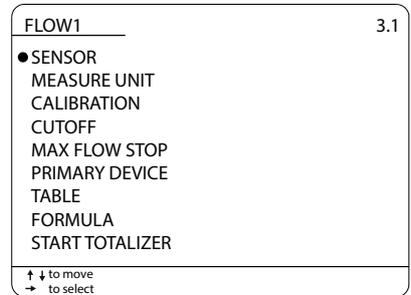


Press “RIGHT” to access the submenu “FLOW1” or “FLOW2”, is possible to configure up to 2 flow measurements.

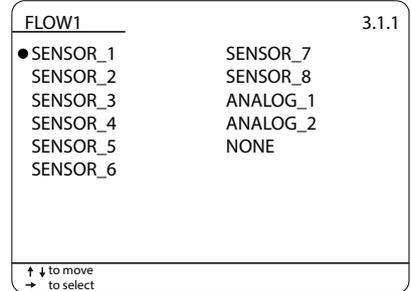


8.2.1 SENSOR

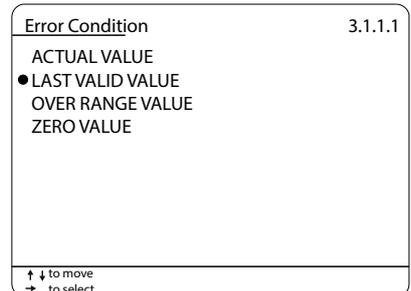
Press "RIGHT" to select "SENSOR".



Select the SENSOR_x installed on channel with "UP" or "DOWN".
The sensor UID address identifies the sensor number: ex. sensor with UID 1 address = SENSOR_1, etc..
Press "RIGHT" to confirm.

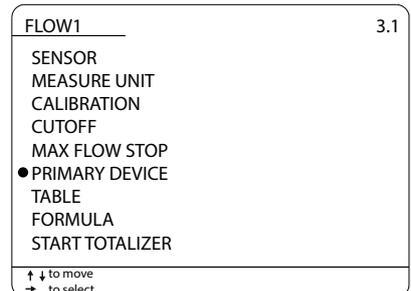


Press "DOWN" to select the measure condition in error state.
Press to "RIGHT" confirm.

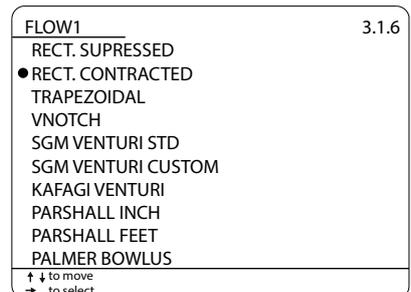


8.2.2 PRIMARY DEVICE

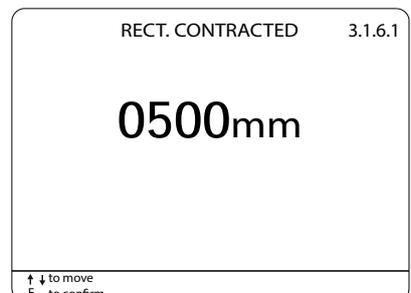
Press "DOWN" to select "PRIMARY DEVICE" and press "RIGHT" to confirm.



Press "DOWN" to select "RECT. CONTRACTED" and press "RIGHT" to confirm.

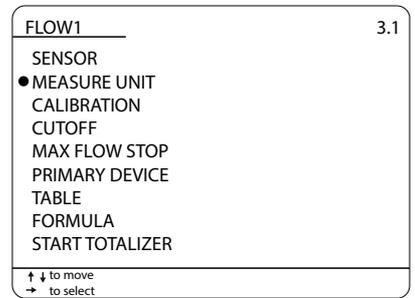


Enter the "L" dimension in mm. Move the cursor with "RIGHT",
and press "UP" to change the digit.
Press "RIGHT" to confirm..

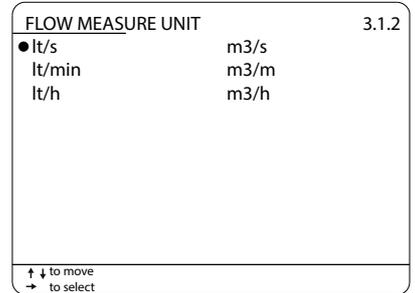


8.2.3 MEASURE UNIT

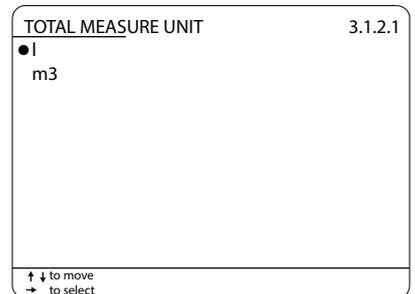
Press "DOWN" to select "MEASURE UNIT" and press "RIGHT" to confirm.



Press "UP" or "DOWN" to select the flow rate measure unit and press "RIGHT" to confirm.

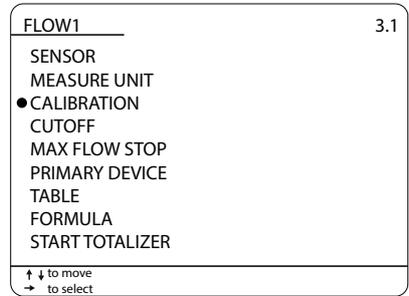


Press "UP" or "DOWN" to select the totalizer measure unit and press "RIGHT" to confirm.

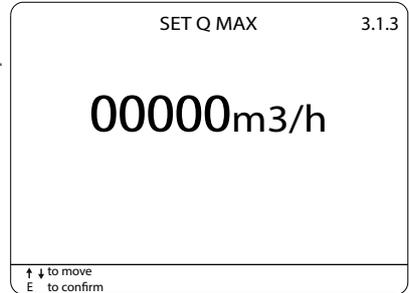


8.2.4 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT" to confirm.

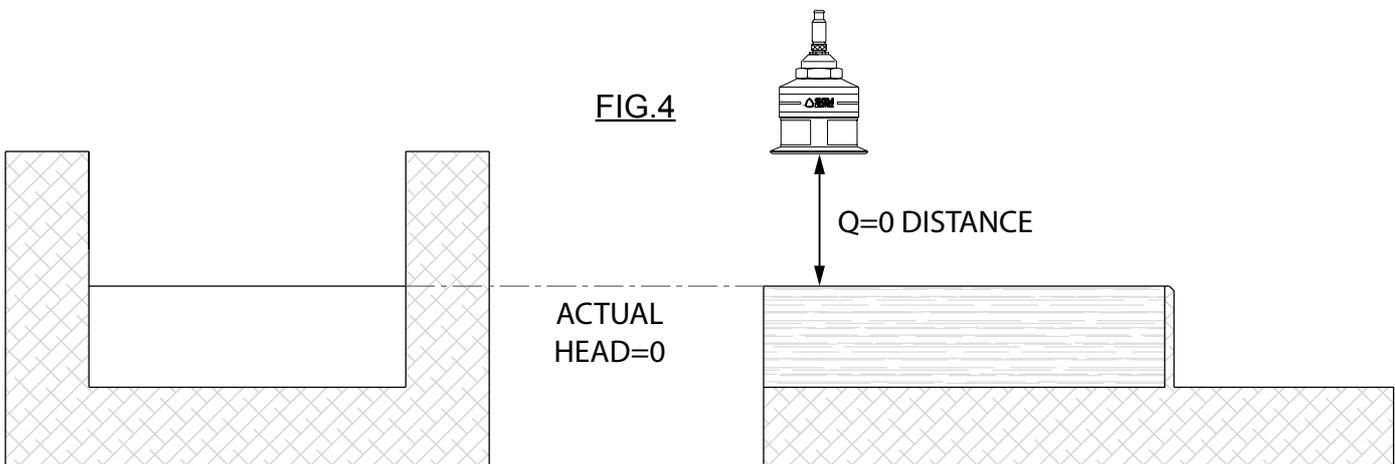
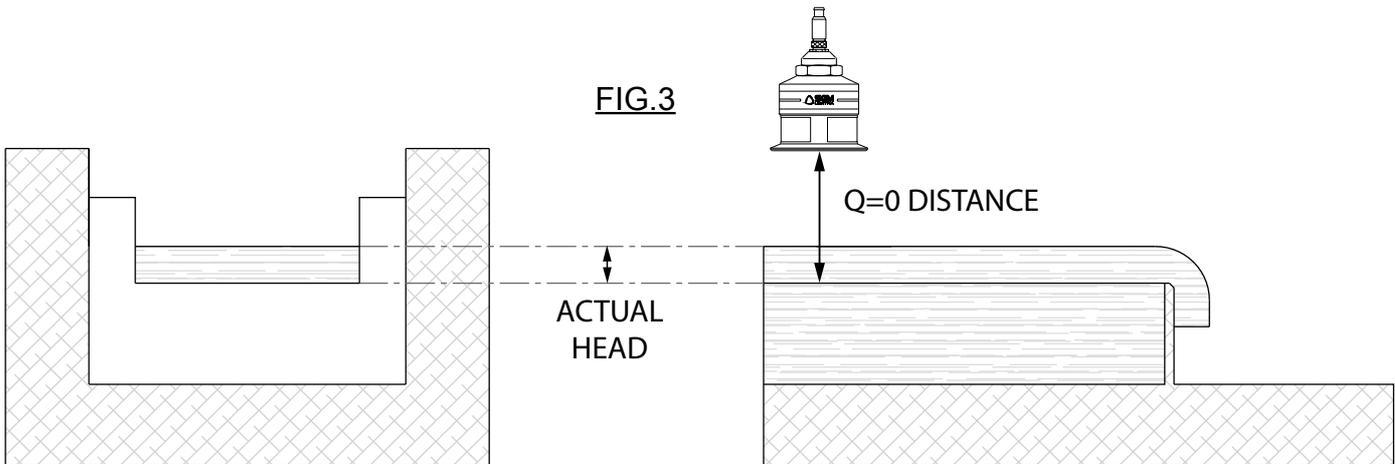
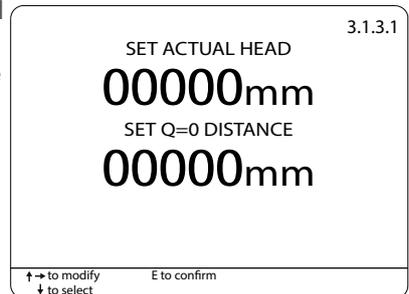


"MAX Q" is the threshold for Max flow beyond which the tot. does not increase. Set the value and confirm with "ENTER". Disabled function with "0" threshold value



Enter the actual head or the "Q=0" distance in mm . Press "DOWN" to select the measure to be set, Move the cursor with "RIGHT" and press "UP" to change the digit. Confirm with "ENTER".

Manually measure in mm the "ACTUAL HEAD" and insert the data, the unit will automatically calculate the fluid distance to the "Q=0" point (zero flow distance). Alternatively, can directly be entered the "Q=0" empty distance. In fig.3 the example to correctly detect the "ACTUAL HEAD" measure. It is recommended to use the "ACTUAL HEAD" system with the zero flow condition (no flow: see fig.4), because in doing so the "ACTUAL HEAD" or "Q=0" manually measurement distance errors are avoided. "ACTUAL HEAD" set to "0" is enough to ensure the correct calibration.



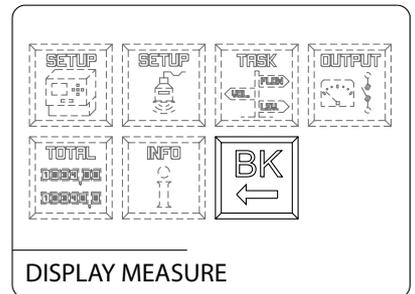
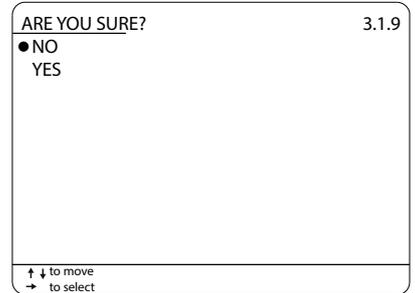
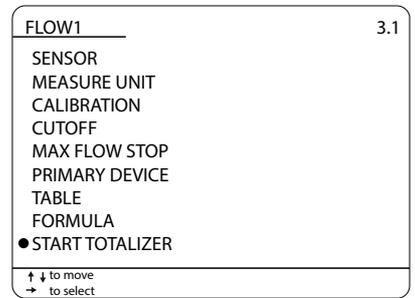
8.2.5 START TOTALIZER

Press “DOWN” to select “START TOTALIZER” and confirm with “RIGHT”.
Takes to start the totalizer volume flow.

Start the flow totalizer only after have completed the flow measurement configuration, including head calibration, select “YES” and press “RIGHT” to start the flow totalizer.

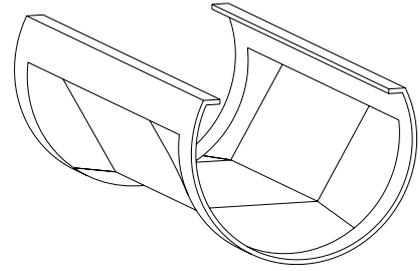
Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode.

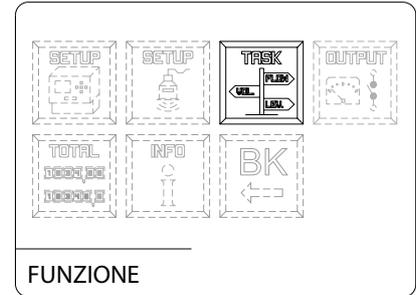


8.3 - Riels Instr. "PALMER BOWLUS" prefabricated channels configuration

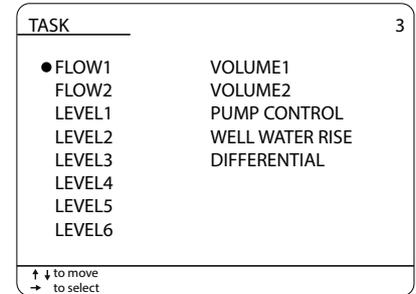
The Palmer Bowlus flume is usually used in underground pipes with manholes for inspection, even if its size made it interesting for flow monitoring in many kinds of channels. To configure the flow measurement with Riels Instr. "PALMER BOWLUS" prefabricated channels follow the procedure below:



With the arrow keys select the "TASK"  menu icon. Confirm the selection by pressing "ENTER".

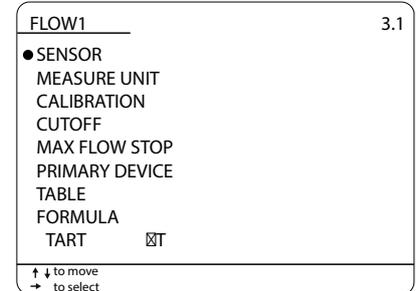


Press "RIGHT" to access the submenu "FLOW1" or "FLOW2", is possible to configure up to 2 flow measurements

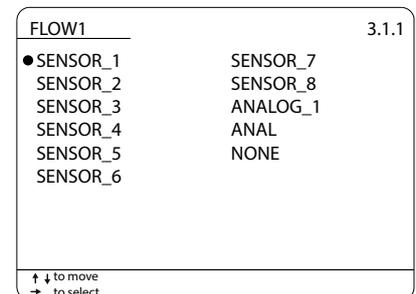


8.3.1 SENSOR

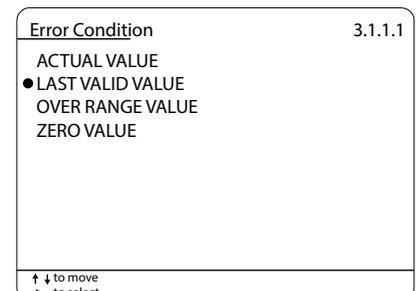
Press "RIGHT" to select "SENSOR".



Select the SENSOR_x installed on channel with "UP" or "DOWN". The sensor UID address identifies the sensor number: ex. sensor with UID 1 address = SENSOR_1, etc.. Press "RIGHT" to confirm.



Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.



8.3.2 PRIMARY DEVICE

Press “DOWN” to select “PRIMARY DEVICE” and press “RIGHT” to confirm.

FLOW1	3.1
SENSOR MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP ● PRIMARY DEVICE TABLE FORMULA START TOTALIZER	
↑ ↓ to move → to select	

Press “DOWN” to select “PALMER BOWLUS” and press “RIGHT” to confirm.

FLOW1	3.1.6
RECT. SUPRESSED RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTOM KAFAGI VENTURI PARSHALL INCH PARSHALL FEET ● PALMER BOWLUS	
↑ ↓ to move → to select	

Use the “UP” or “DOWN” to select the model. Confirm selection with “RIGHT”.

FLOW1	3.1.6.10
● 4 inch (DN100) 24 inch (DN600) 6 inch (DN150) 28 inch (DN700) 8 inch (DN200) 32 inch (DN800) 10 inch (DN250) 36 inch 12 inch (DN300) 42 inch 16 inch (DN400) 48 inch 20 inch (DN500) 60 inch 21 inch 72 inch	
↑ ↓ to move → to select	

8.3.3 MEASURE UNIT

Press “DOWN” to select “MEASURE UNIT” and press “RIGHT” to confirm.

FLOW1	3.1
SENSOR ● MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA START TOTALIZER	
↑ ↓ to move → to select	

Press “UP” or “DOWN” to select the flow rate measure unit and press “RIGHT” to confirm.

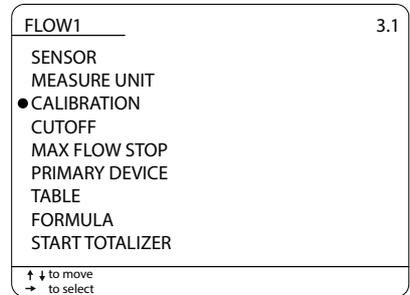
FLOW MEASURE UNIT	3.1.2
● l/s m3/s l/min m3/m l/h m3/h	
↑ ↓ to move → to select	

Press “UP” or “DOWN” to select the totalizer measure unit and press “RIGHT” to confirm.

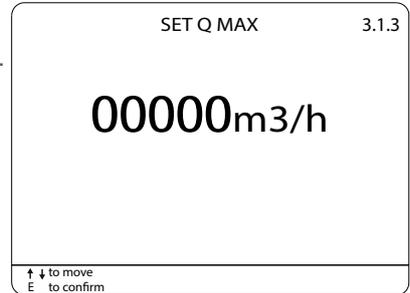
TOTAL MEASURE UNIT	3.1.2.1
● l m3	
↑ ↓ to move → to select	

8.3.4 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT" to confirm.



"MAX Q" is the threshold for Max flow beyond which the tot. does not increase. Set the value and confirm with "ENTER". Disabled function with "0" threshold value



Enter the actual head or the "Q=0" distance in mm. Press "DOWN" to select the measure to be set, Move the cursor with "RIGHT" and press "UP" to change the digit. Confirm with "ENTER".

Manually measure in mm the "ACTUAL HEAD" and insert the data, the unit will automatically calculate the fluid distance to the "Q=0" point (zero flow distance). Alternatively, can directly be entered the "Q=0" empty distance. In fig.5 the example to correctly detect the "ACTUAL HEAD" measure. It is recommended to use the "ACTUAL HEAD" system with the zero flow condition (no flow: see fig.6), because in doing so the "ACTUAL HEAD" or "Q=0" manually measurement distance errors are avoided. "ACTUAL HEAD" set to "0" is enough to ensure the correct calibration.

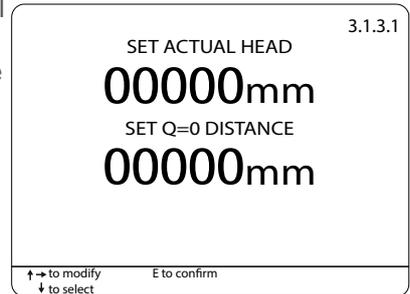


FIG.5

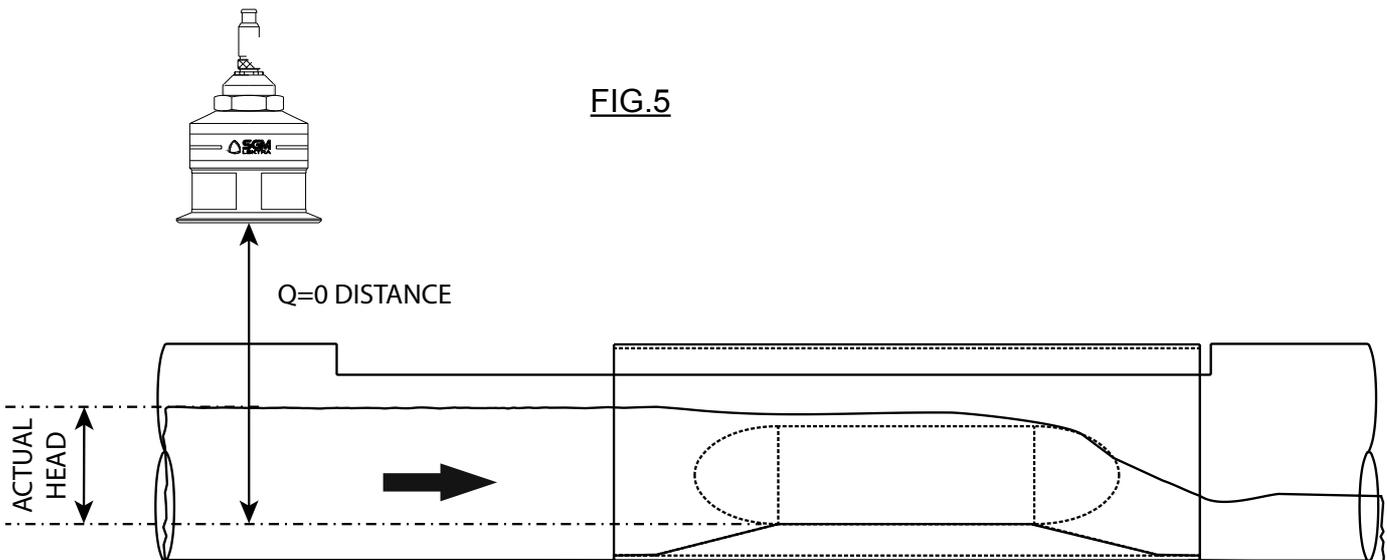
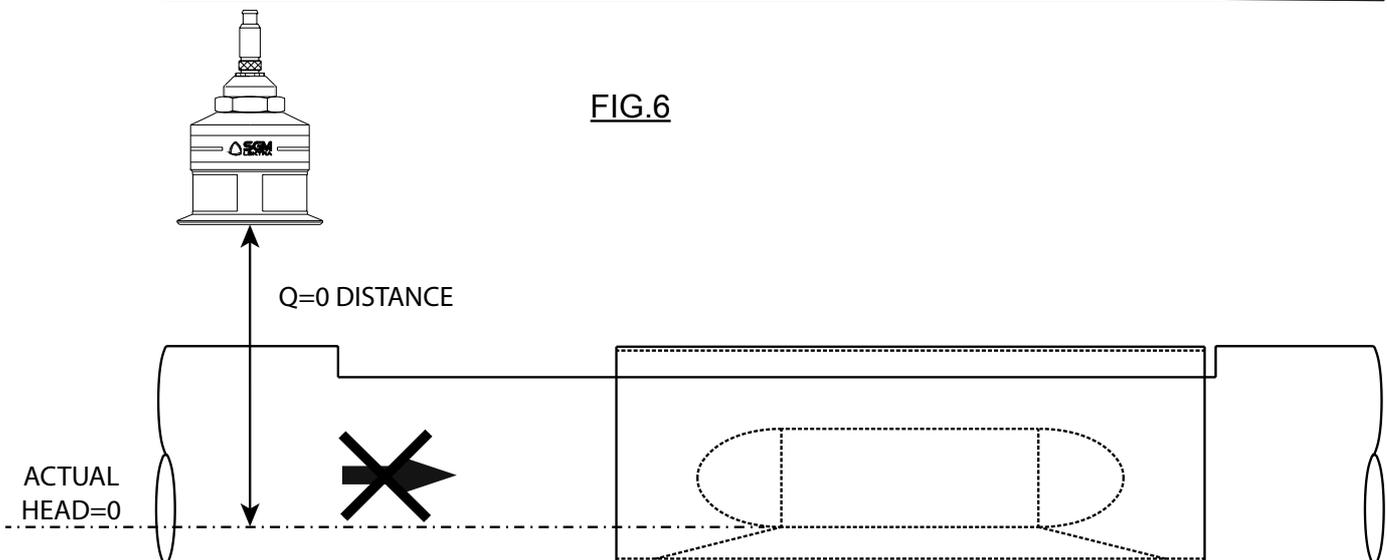


FIG.6



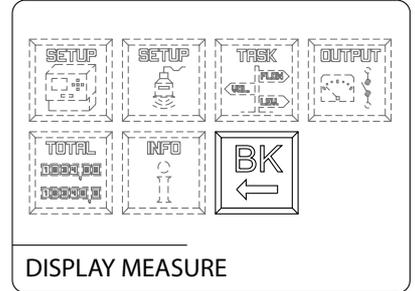
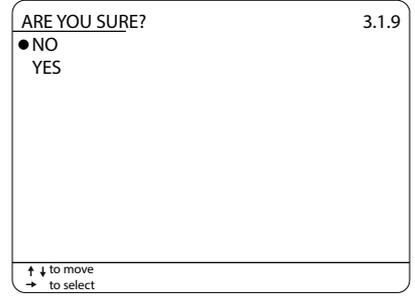
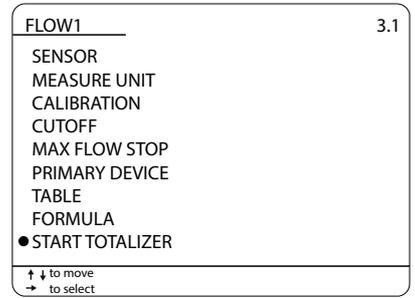
8.3.5 START TOTALIZER

Press “DOWN” to select “START TOTALIZER” and confirm with “RIGHT”.
Takes to start the totalizer volume flow.

Start the flow totalizer only after have completed the flow measurement configuration, including head calibration, select “YES” and press “RIGHT” to start the flow totalizer.

Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode.



8.4 - Volume pulse repetition configuration for remote totalizer

The VLW90M has 2 configurable digital open collector outputs for flow totalizer pulse repetition.

With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”

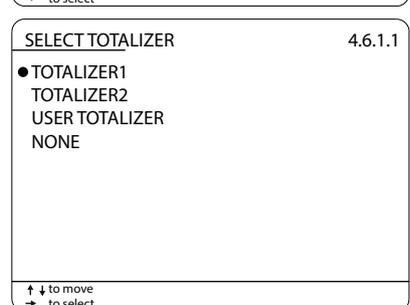
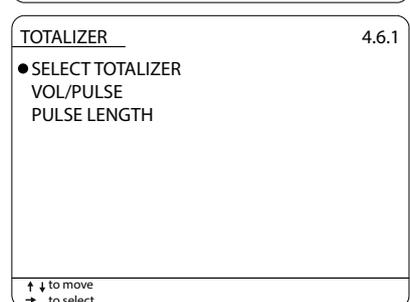
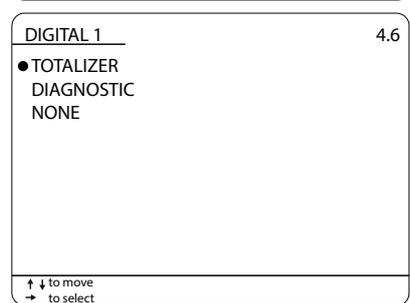
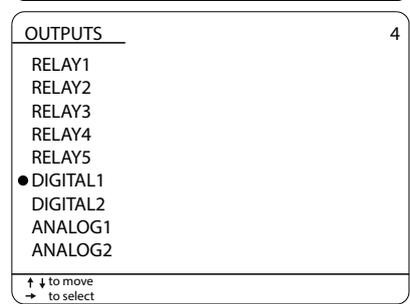
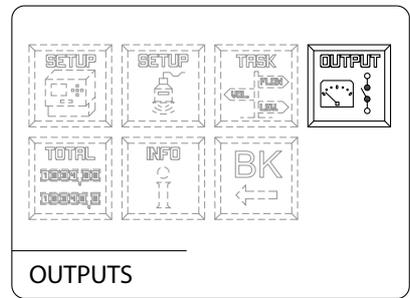
Press “UP” o “DOWN” to select “DIGITAL1” or “DIGITAL1”.
Press “RIGHT” to confirm.

8.4.1 TOTALIZER

Press “RIGHT” to select “TOTALIZER”

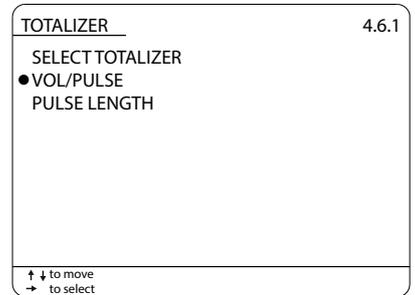
Press “RIGHT” to select “SELECT TOTALIZER”

Select the totalizer to be associated with the digital output and confirm the selection with “RIGHT”.

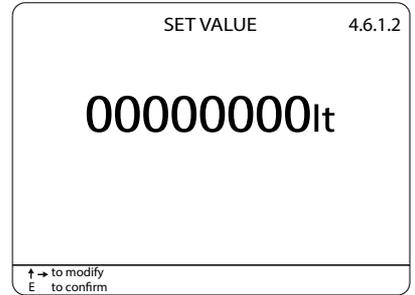


8.4.2 VOLUME/PULSE

Select with "DOWN" "VOLUME/PULSE".
Press "RIGHT" to confirm.

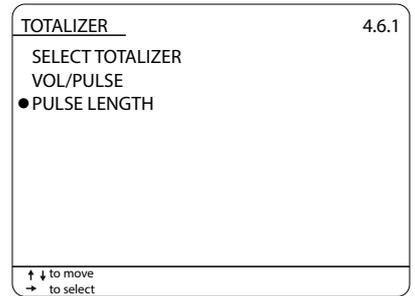


Set the single pulse value in liters. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".

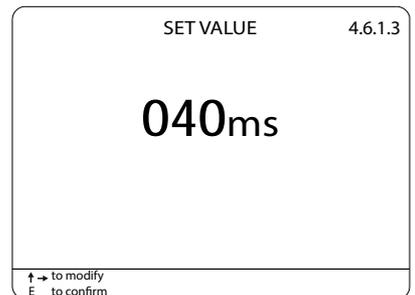


8.4.3 PULSE LENGTH

Select with "DOWN" "PULSE LENGTH". Press "RIGHT" to confirm.

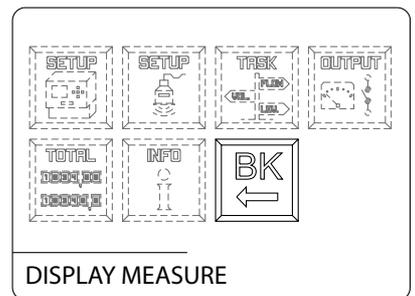


Set the pulse length value in ms.
Move the cursor with "RIGHT" and "UP" to change the digit.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



8.5 - 4÷20mA output configuration for flow rate transmission

The VLW90M has 2 configurable analog outputs 20mA for the flow measurement remote transmission..

With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”

Press “UP” o “DOWN” to select “ANALOG1” or “ANALOG2”.
Press “RIGHT” to confirm.

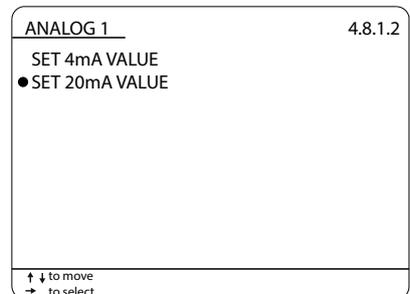
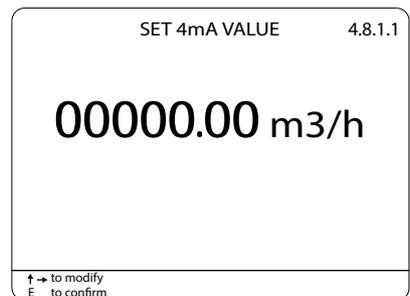
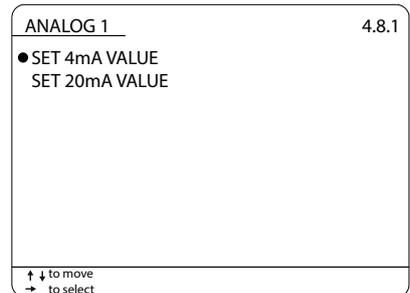
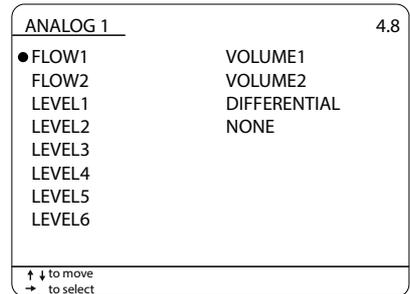
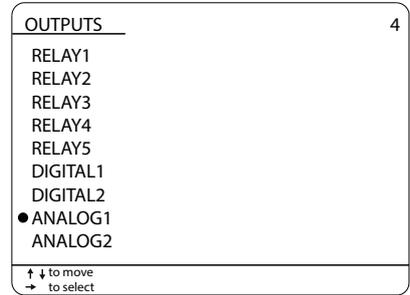
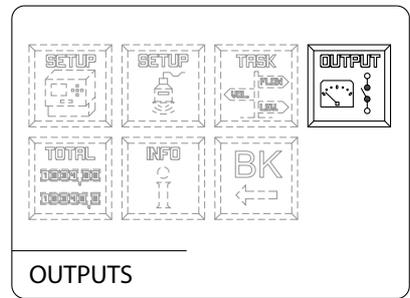
8.5.1 FLOW

Press “UP” or “DOWN” to select “FLOW1” or “FLOW2”. Confirm with “RIGHT”.

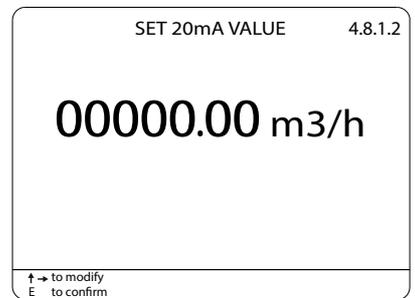
To set beginning of scale, press “RIGHT” to select “SET 4mA VALUE”.

Set the flow rate value corresponding to the 4mA output.
Confirm with “ENTER”. Measure unit is displayed according to the setting in par. 8.1.3, 8.2.3 o 8.3.3

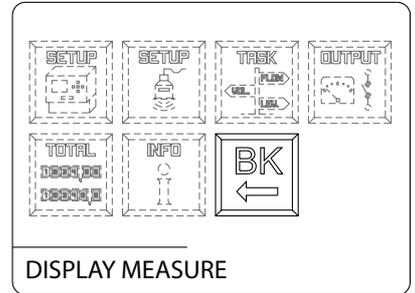
To set end ofscale, press “DOWN” to select “SET 20mA VALUE”.
Confirm with “RIGHT”.



Set the flow rate value corresponding to the 20mA output.
 Confirm with "ENTER". Measure unit is displayed according to the setting in par. 8.1.3, 8.2.3 o 8.3.3



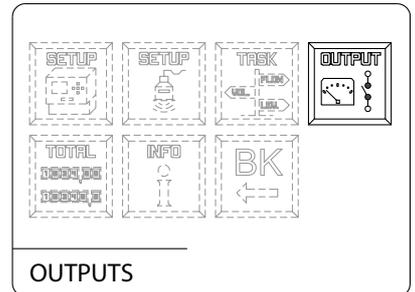
Press 2 times "LEFT" to return to the main menu.
 Select  and press "ENTER" to return to "RUN" mode



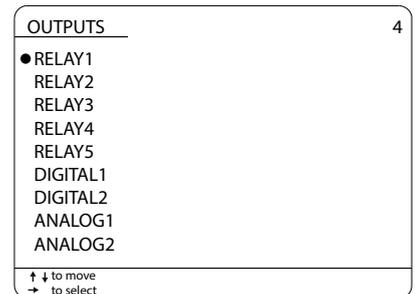
8.6 - Flow rate threshold relays configuration

The VLW90M has 5 configurable relays for flow rate alarm thresholds.

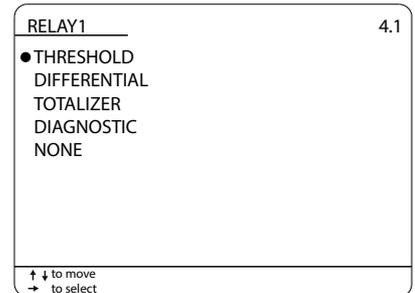
With the arrow keys select the "OUTPUT"  menu icon.
 Confirm the selection by pressing "ENTER"



Press "UP" o "DOWN" to select "RELAY1", or "RELAY2", or "RELAY3", or "RELAY4" or "RELAY5".
 Press "RIGHT" to confirm. .

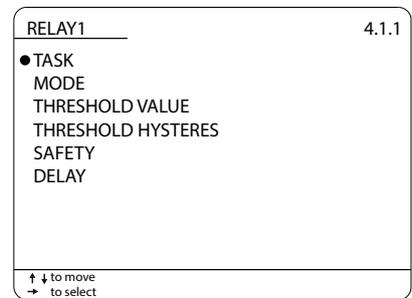


Press "RIGHT" to select "THRESHOLD".

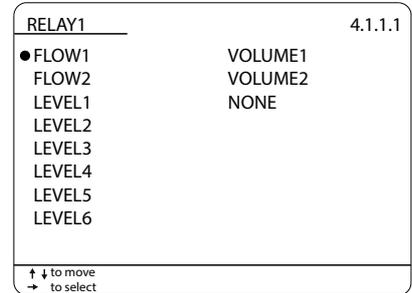


8.6.1 TASK

Press "RIGHT" to select "TASK".

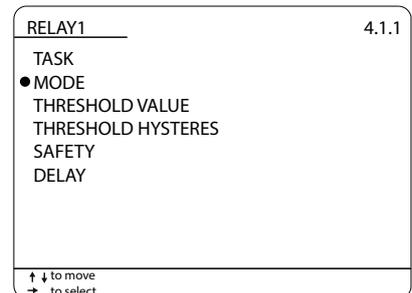


Select "FLOW1" or "FLOW2". Press "RIGHT" to confirm.

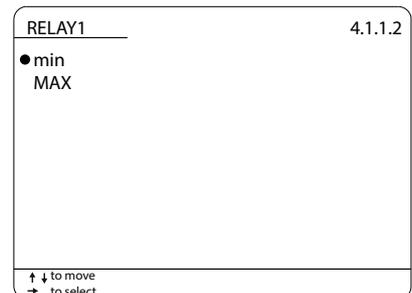


8.6.2 MODE

Press "RIGHT" to select "MODE".

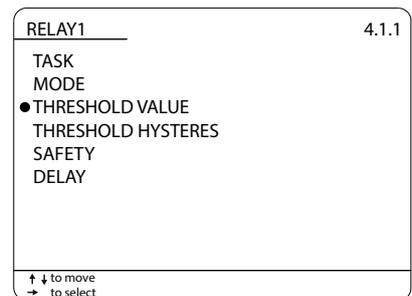


Select "min" for minimum flow alarm or "MAX" for maximum flow alarm. Press "RIGHT" to confirm.

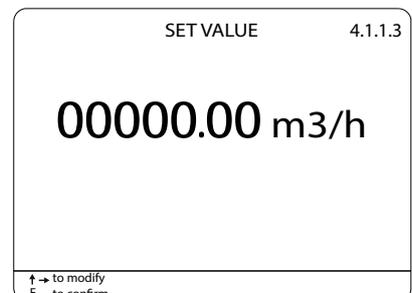


8.6.3 THRESHOLD VALUE

Select "THRESHOLD VALUE" to set the relay switching point and press "RIGHT" to confirm.



Set the flow threshold value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".

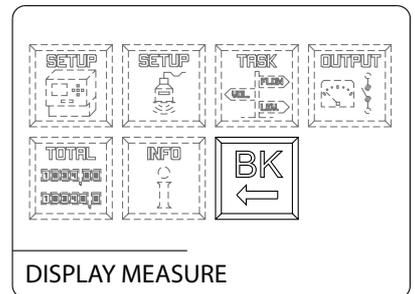
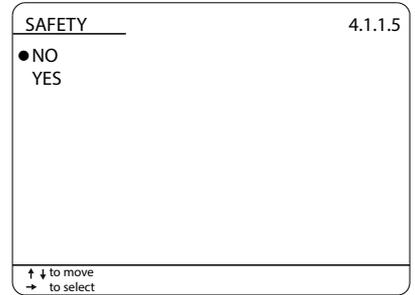
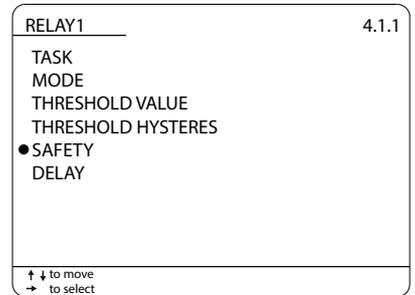


8.6.4 SAFETY

To set the relay alarm condition status select "SAFETY" and confirm with "RIGHT".

Select:
 "YES" relay de-energized in alarm condition;
 "NO" relay energized in alarm condition.
 Press "RIGHT" to confirm.

Press 2 times "LEFT" to return to the main menu.
 Select  and press "ENTER" to return to "RUN" mode



8.7 - Configuration of displayed measures

When the flow measurement function is activated the VLW90M automatically enables the display of the instantaneous flow rate, totalizer value, distance and head.

The flow values display deactivation or reactivation is possible in the “MAIN SETUP” menu.

With the arrow keys select the “MAIN SETUP”  menu icon. Confirm the selection by pressing “ENTER” .

Press “UP” or “DOWN” to select “DISPLAY SETUP”. Confirm with “RIGHT”.

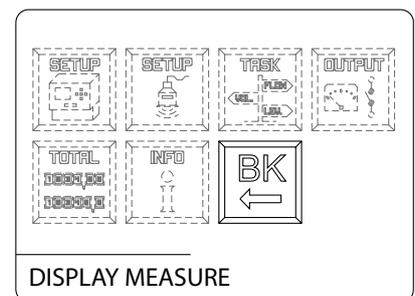
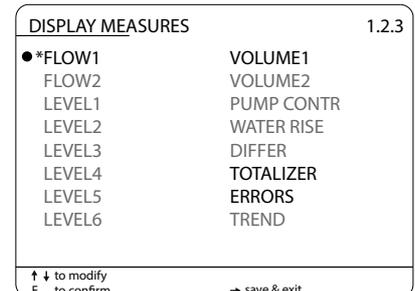
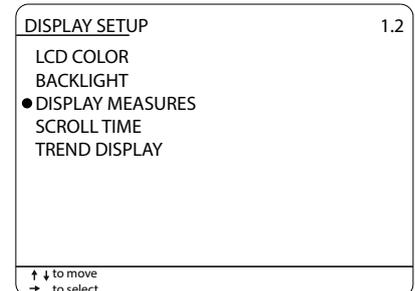
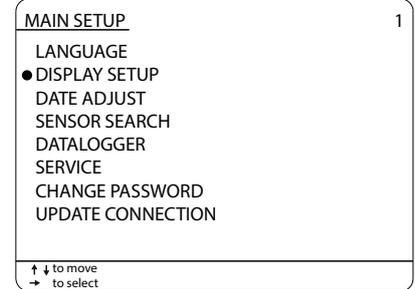
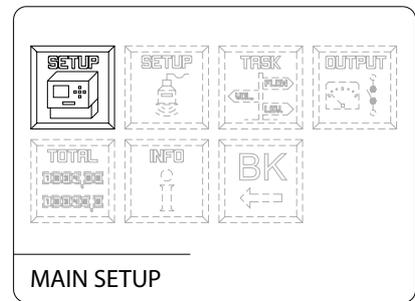
8.7.1 DISPLAY MEASURES

Press “DOWN” to select “DISPLAY MEASURES” and confirm with “RIGHT”.

With the pointer to “FLOW1”, press “ENTER”, the * symbol will highlight the selection. Press “RIGHT” to save and exit. “FLOW2” is available only when active

Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



9-LEVEL MEASUREMENT SET UP GUIDES

9.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the level measurement total control with the VLW90M unit.

To configure the level measurement with Riels Instr. ultrasonic transmitters follow the procedure below.

With the arrow keys select the "TASK"  menu icon.
Confirm the selection by pressing "ENTER"

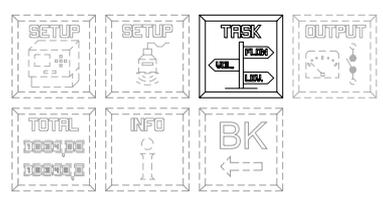
Press "RIGHT" to access the submenu "LEVEL1", or "LEVEL2", or "LEVEL3", or "LEVEL4", or "LEVEL5" or "LEVEL6", is possible to configure up to 6 level measurements

9.1.1 SENSOR

Press "RIGHT" to select "SENSOR".

Select the SENSOR_x with "UP" or "DOWN".
The sensor UID address identifies the sensor number: ex. sensor with UID 1 address = SENSOR_1, etc.. Press "RIGHT" to confirm.

Press "DOWN" to select the measure condition in error state .
Press to "RIGHT" confirm.



TASK

TASK	3
<ul style="list-style-type: none"> FLOW1 FLOW2 ● LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 	<ul style="list-style-type: none"> VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL
↑ ↓ to move → to select	

LEVEL1

LEVEL1	3.3
<ul style="list-style-type: none"> ● SENSOR CALIBRATION 	
↑ ↓ to move → to select	

LEVEL1

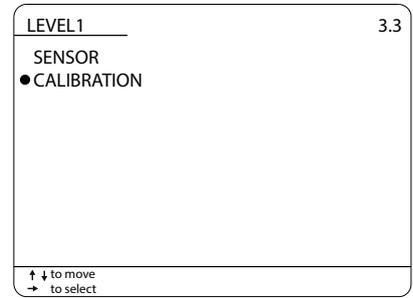
LEVEL1	3.3.1
<ul style="list-style-type: none"> ● SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6 	<ul style="list-style-type: none"> SENSOR_7 SENSOR_8 ANALOG_1 ANALOG_2 NONE
↑ ↓ to move → to select	

Error Condition

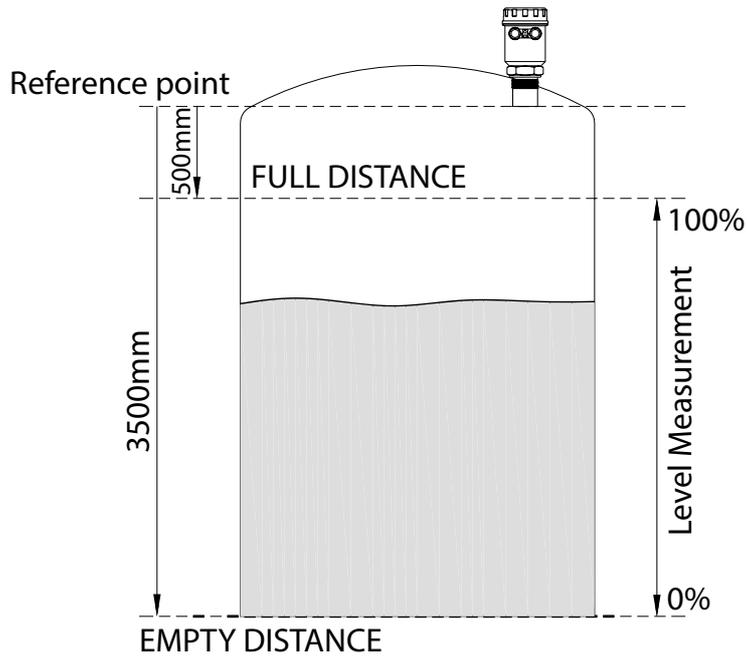
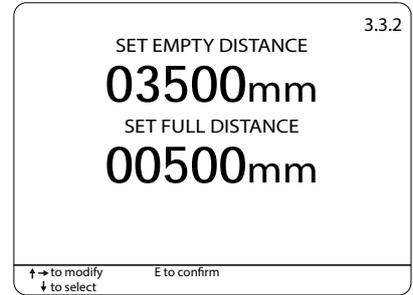
Error Condition	3.3.1.1
<ul style="list-style-type: none"> ACTUAL VALUE ● LAST VALID VALUE OVER RANGE VALUE ZERO VALUE 	
↑ ↓ to move → to select	

9.1.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT" to confirm.

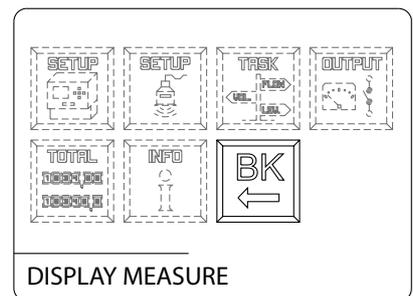


Enter the empty and full distance in mm.
Press "DOWN" to select the distance to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



9.2 - 4÷20mA analog transmitter configuration

With the 2 VLW90M analog inputs is possible to control the measurement with any level sensor that transmits an 4÷20mA analog signal.

To configure the level measurement with 4÷20mA analog level transmitters follow the procedure below:

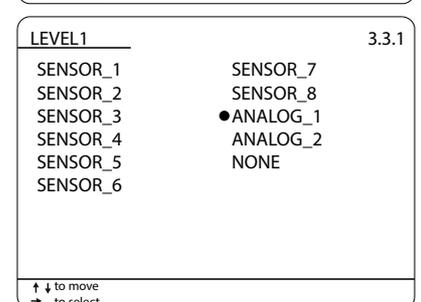
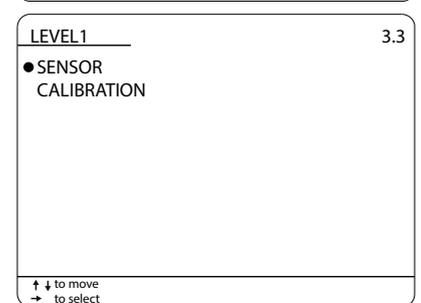
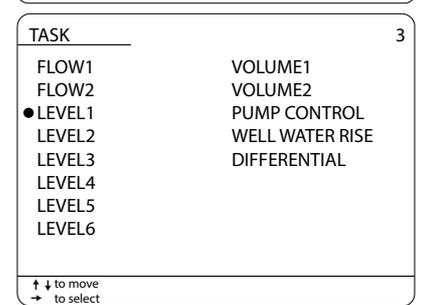
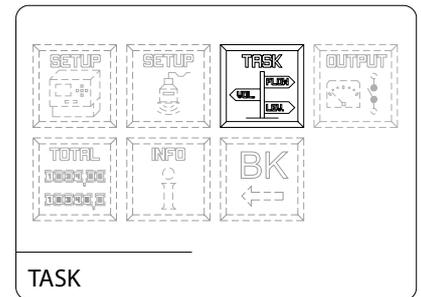
With the arrow keys select the “TASK”  menu icon.
Confirm the selection by pressing “ENTER”

Press “RIGHT” to access the submenu “LEVEL1”, or “LEVEL2”, or “LEVEL3”, or “LEVEL4”, or “LEVEL5” or “LEVEL6”, is possible to configure up to 6 level measurements

9.2.1 SENSOR

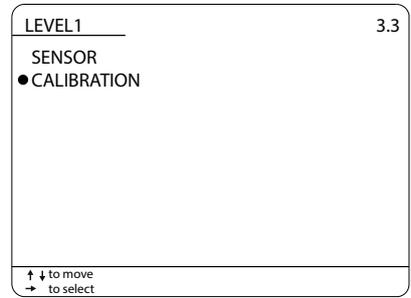
Press “RIGHT” to select “SENSOR”.

Select the ANALOG_x input with “UP” or “DOWN”.
ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals; ANALOG_2 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5).
Press “RIGHT” to confirm.

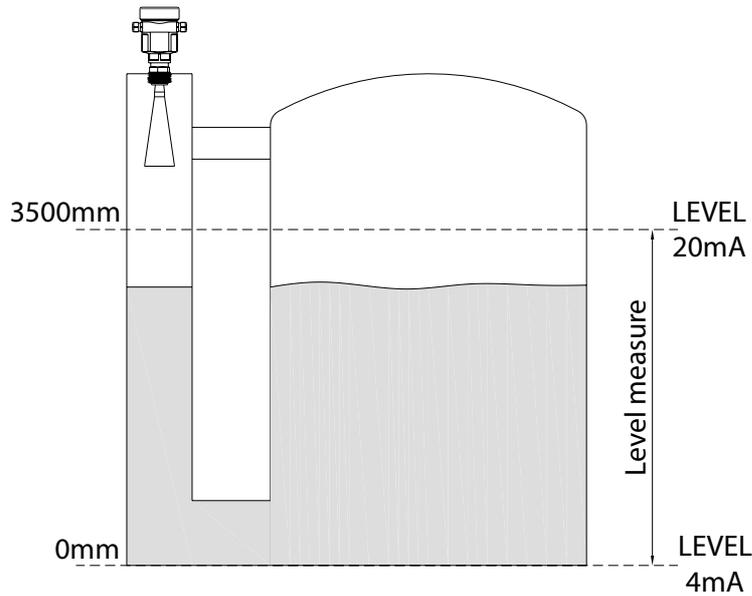


9.2.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT" to confirm.

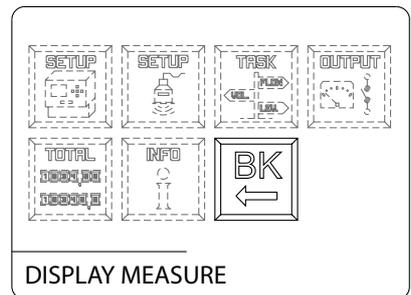


Enter the level value at 4mA and 20mA.
Press "DOWN" to select the distance to be set, Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode.



9.3 - 4÷20mA output config. for level measurement transmission to remote displays

The VLW90M has 2 configurable 4÷20mA analog outputs for the level measurement remote transmission.

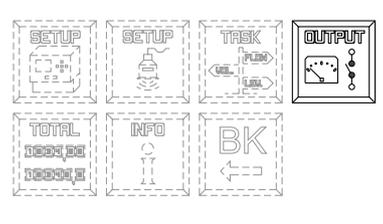
With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER” .

Press “UP” o “DOWN” to select “ANALOG1” or “ANALOG2” .
Press “RIGHT” to confirm.

9.3.1 LEVEL

Press “UP” or “DOWN” to select “LEVEL1”, or “LEVEL2”, or “LEVEL3”, or “LEVEL4”, or “LEVEL5” or “LEVEL6” .
Confirm with “RIGHT” .

To set begining of scale, press “RIGHT” to select “SET 4mA VALUE” .



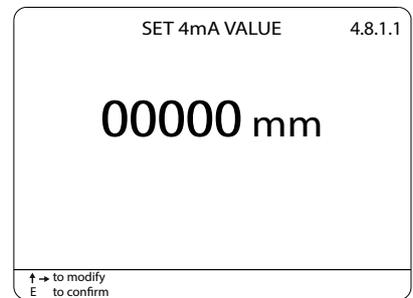
OUTPUTS

OUTPUTS		4
RELAY1		
RELAY2		
RELAY3		
RELAY4		
RELAYS		
DIGITAL1		
DIGITAL2		
● ANALOG1		
ANALOG2		
↑ ↓ to move → to select		

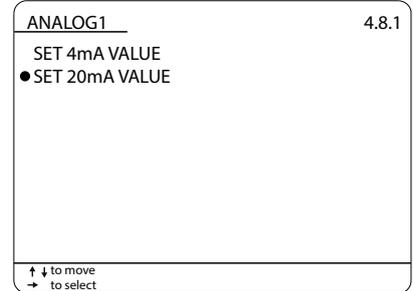
ANALOG 1		4.8
FLOW1	VOLUME1	
FLOW2	VOLUME2	
● LEVEL1	DIFFERENTIAL	
LEVEL2	NONE	
LEVEL3		
LEVEL4		
LEVEL5		
LEVEL6		
↑ ↓ to move → to select		

ANALOG 1		4.8.1
● SET 4mA VALUE		
SET 20mA VALUE		
↑ ↓ to move → to select		

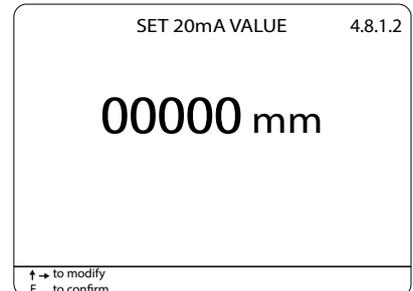
Set in mm the level value corresponding to the 4mA output.
Confirm with "ENTER".



To set end of scale, press "DOWN" to select "SET 20mA VALUE".
Confirm with "RIGHT".

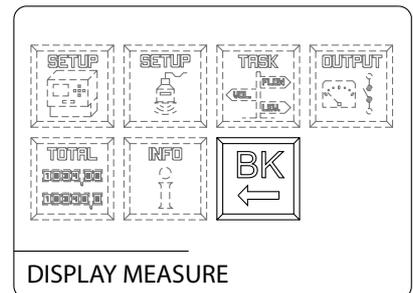


Set in mm the level value corresponding to the 20mA output.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode.



9.4 - Level threshold relays configuration

The VLW90M has 5 configurable relays for level alarm thresholds.

With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”

Press “UP” o “DOWN” to select “RELAY1”, or “RELAY2”, or “RELAY3”, or “RELAY4” or “RELAY5”.
Press “RIGHT” to confirm.

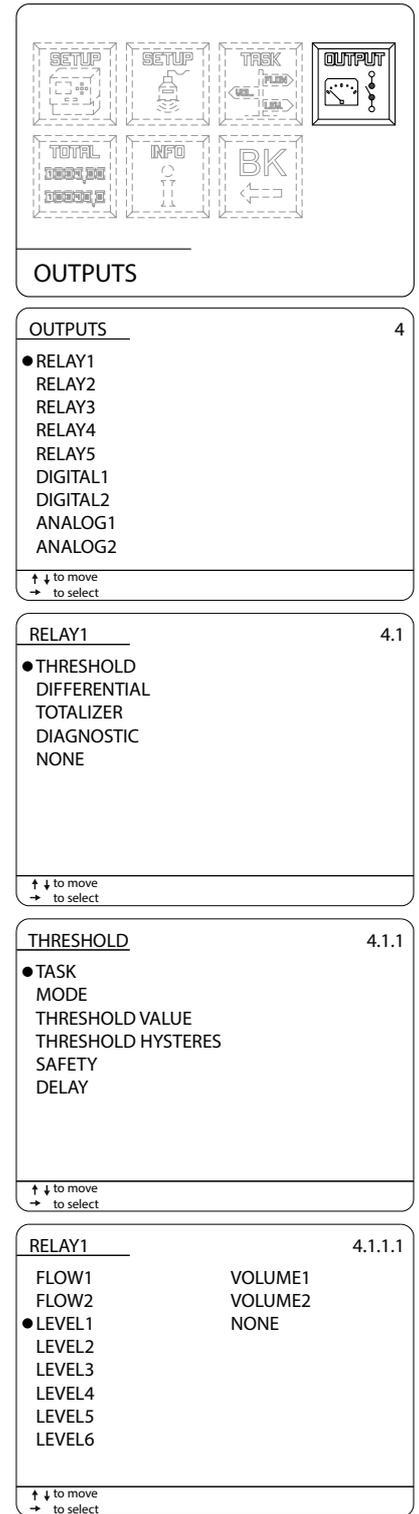
Press “RIGHT” to select “THRESHOLD”.

9.4.1 TASK

Press “RIGHT” to select “TASK”.

Select “LEVEL1”, or “LEVEL2”, or “LEVEL3”, or “LEVEL4”, or “LEVEL5” or “LEVEL6”.

Press “RIGHT” to confirm.



OUTPUTS

OUTPUTS 4

- RELAY1
- RELAY2
- RELAY3
- RELAY4
- RELAY5
- DIGITAL1
- DIGITAL2
- ANALOG1
- ANALOG2

↑ ↓ to move
→ to select

RELAY1 4.1

- THRESHOLD
- DIFFERENTIAL
- TOTALIZER
- DIAGNOSTIC
- NONE

↑ ↓ to move
→ to select

THRESHOLD 4.1.1

- TASK
- MODE
- THRESHOLD VALUE
- THRESHOLD HYSTERES
- SAFETY
- DELAY

↑ ↓ to move
→ to select

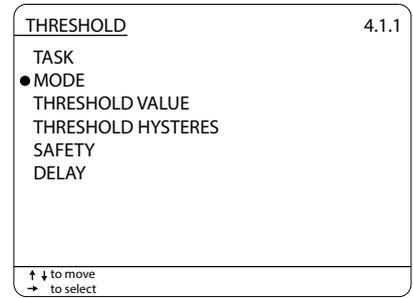
RELAY1 4.1.1.1

FLOW1	VOLUME1
FLOW2	VOLUME2
● LEVEL1	NONE
LEVEL2	
LEVEL3	
LEVEL4	
LEVEL5	
LEVEL6	

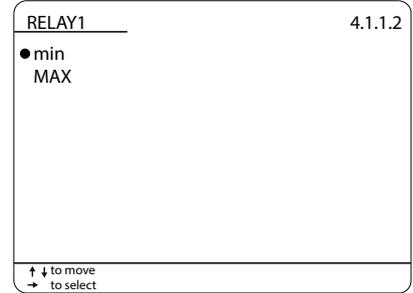
↑ ↓ to move
→ to select

9.4.2 MODE

Press "RIGHT" to select "MODE".

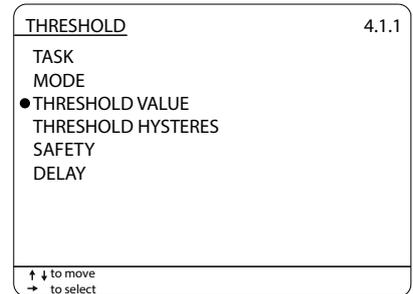


Select "min" for minimum level alarm or "MAX" for maximum level alarm. Press "RIGHT" to confirm.

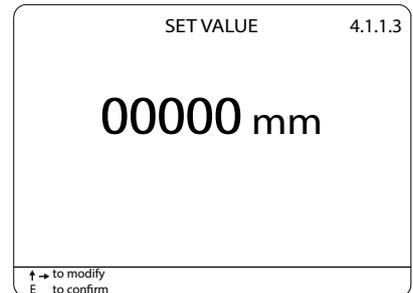


9.4.3 THRESHOLD VALUE

Select "THRESHOLD VALUE" to set the relay switching point and press "RIGHT" to confirm.



Set in mm the level threshold value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".

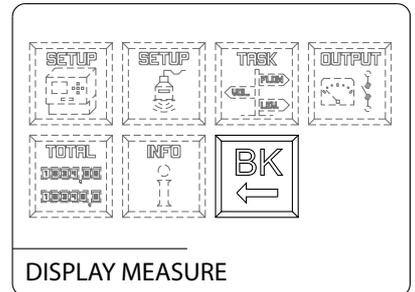
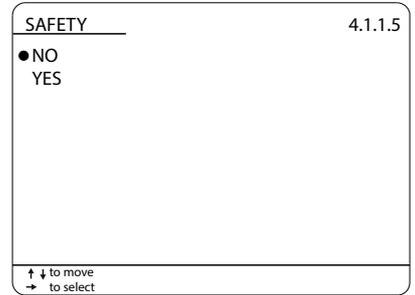
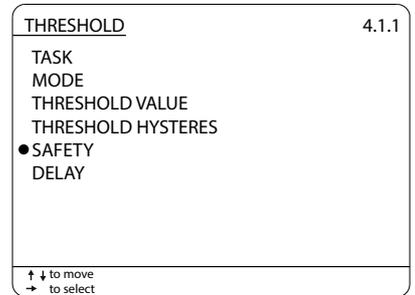


9.4.4 SAFETY

To set the relay alarm condition status select “SAFETY” and confirm with “RIGHT”.

Select:
 “YES” relay de-energized in alarm condition;
 “NO” relay energized in alarm condition.
 Press “RIGHT” to confirm.

Press 2 times “LEFT” to return to the main menu.
 Select  and press “ENTER” to return to “RUN” mode.



9.5 - Configuration of displayed measures

When the level measurement function is activated the VLW90M automatically enables the display of the measured level value.

The level values display deactivation or reactivation is possible in the “MAIN SETUP” menu.

With the arrow keys select the “MAIN SETUP”  menu icon.
Confirm the selection by pressing “ENTER” .

Press “UP” or “DOWN” to select “DISPLAY SETUP” .
Confirm with “RIGHT” .

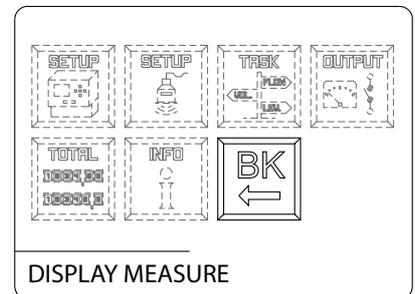
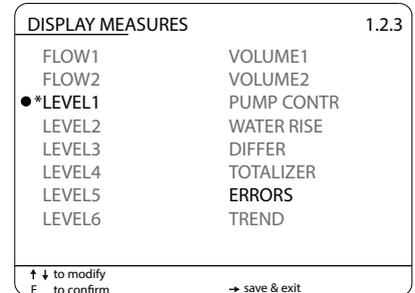
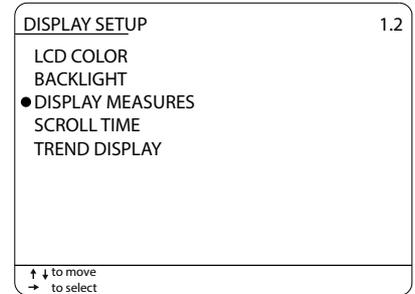
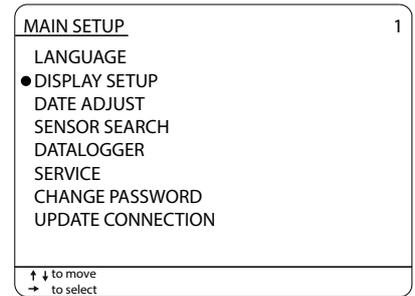
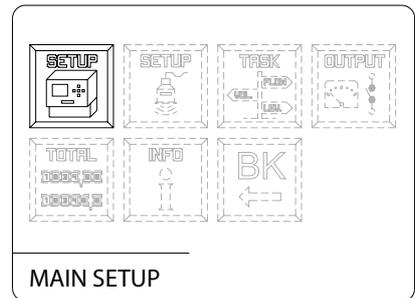
9.5.1 DISPLAY MEASURES

Press “DOWN” to select “DISPLAY MEASURES” and confirm with “RIGHT” .

With the pointer to “LEVEL1”, press “ENTER”, the * symbol will highlight the selection. Press “RIGHT” to save and exit.
“LEVEL2/3/4/5/6” are available only when active.

Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode.



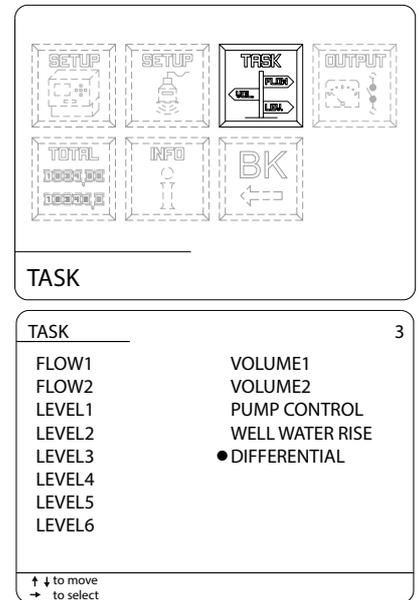
10-DIFFERENTIAL LEVEL MEASUREMENT SET UP GUIDES

10.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the differential level measurement total control with the VLW90M unit.

To configure the differential level measurement with Riels Instr. ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon.
Confirm the selection by pressing "ENTER".

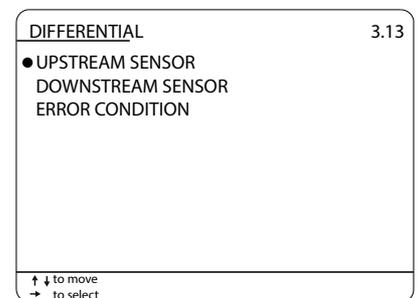


Press "RIGHT" to access the submenu "DIFFERENTIAL".

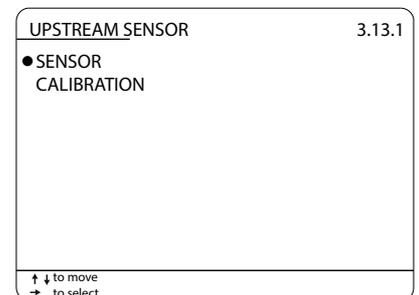
N.B. - Perform the steps described in 10.1.1 and 10.1.2 sections (CALIBRATION) during the "Level difference = 0" real condition, because this condition allows to enter the same "ACTUAL LEVEL" value, automatically obtain the correct 0 setting (UPSTREAM LEVEL - DOWNSTREAM LEVEL = 0)

10.1.1 UPSTREAM SENSOR

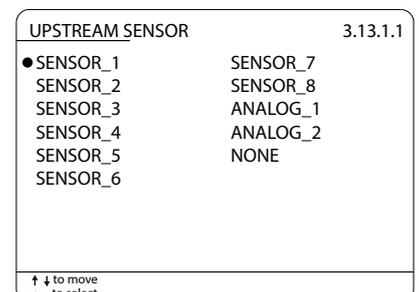
Press "RIGHT" to select "UPSTREAM SENSOR".



Press "RIGHT" to select "SENSOR".



Select the UPSTREAM SENSOR_x with "DOWN".
The sensor UID address identifies the sensor n.: ex. sensor with UID 1 address = SENSOR_1, etc.. Confirm with "RIGHT"



Press "DOWN" to select the measure condition in error state .
 Press to "RIGHT" confirm.

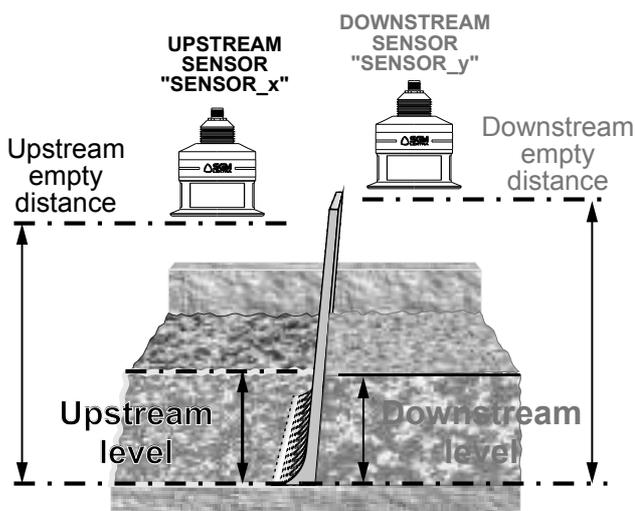
Error Condition	3.13.1.1.1
ACTUAL VALUE ● LAST VALID VALUE OVER RANGE VALUE ZERO VALUE	
↑ ↓ to move → to select	

Select "CALIBRATION" with "DOWN" and press "RIGHT".

UPSTREAM SENSOR	3.13.1
SENSOR ● CALIBRATION	
↑ ↓ to move → to select	

Enter in mm the ACTUAL LEVEL or EMPTY DISTANCE value.
 Press "DOWN" to select the measure to be set. Move the cursor with "RIGHT".
 Press "UP" to change the digit. Confirm with "ENTER" and then press "LEFT".

SET ACTUAL LEVEL	3.13.1.2
00000mm	
SET EMPTY DISTANCE	
00000mm	
↑ → to modify E to confirm ↓ to select	



10.1.2 DOWNSTREAM SENSOR

Press "RIGHT" to select "DOWNSTREAM SENSOR".

DIFFERENTIAL	3.13
UPSTREAM SENSOR ● DOWNSTREAM SENSOR ERROR CONDITION	
↑ ↓ to move → to select	

Press "RIGHT" to select "SENSOR".

DOWNSTREAM SENSOR	3.13.2
● SENSOR CALIBRATION	
↑ ↓ to move → to select	

Select the UPSTREAM SENSOR_x with "DOWN".
 The sensor UID address identifies the sensor n.: ex. sensor with UID 2 address = SENSOR_2, etc.. Confirm with "RIGHT"

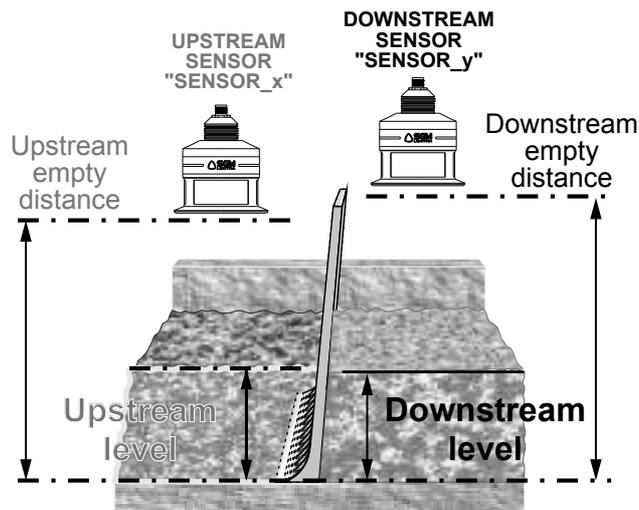
DOWNSTREAM SENSOR		3.13.2.1
SENSOR_1	SENSOR_7	
● SENSOR_2	SENSOR_8	
SENSOR_3	ANALOG_1	
SENSOR_4	ANALOG_2	
SENSOR_5	NONE	
SENSOR_6		
↑ ↓ to move → to select		

Select "CALIBRATION" with "DOWN" and press "RIGHT".

DOWNSTREAM SENSOR		3.13.2
SENSOR		
● CALIBRATION		
↑ ↓ to move → to select		

Enter in mm the ACTUAL LEVEL or EMPTY DISTANCE value.
 Press "DOWN" to select the measure to be set. Move the cursor with "RIGHT".
 Press "UP" to change the digit. Confirm with "ENTER" and then press "LEFT".

SET ACTUAL LEVEL		3.13.1.2
00000mm		
SET EMPTY DISTANCE		
00000mm		
↑ → to modify ↓ to select		
E to confirm		



Press 2 times "LEFT" to return to the main menu.
 Select  and press "ENTER" to return to "RUN" mode.

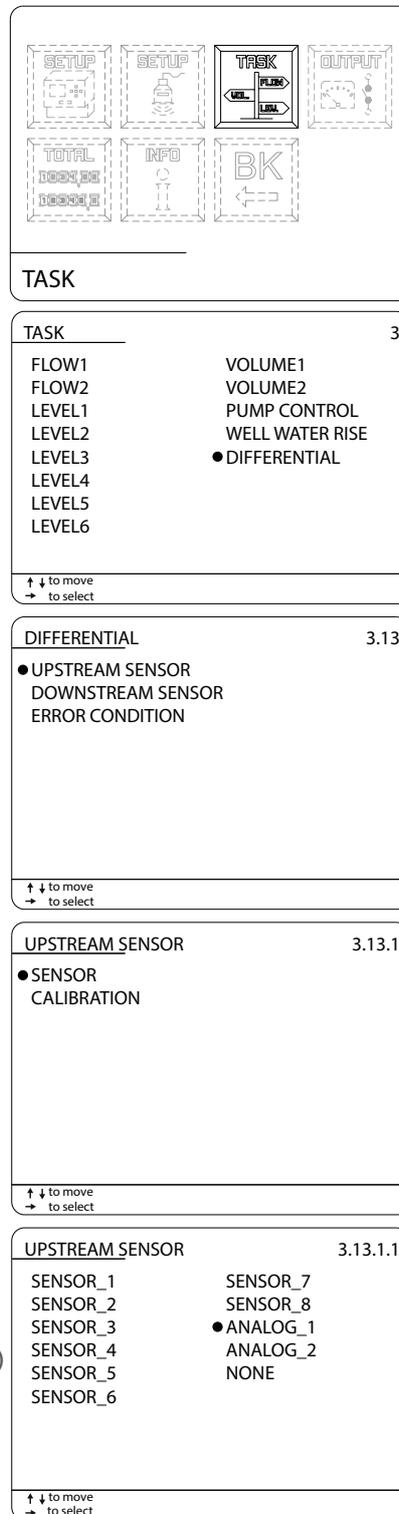
			
			
DISPLAY MEASURE			

10.2 - 4÷20mA analog transmitter configuration

With the 2 VLW90M analog inputs is possible to control the measurement with any level sensor that transmits an 4÷20mA analog signal.

To configure the differential level measurement with 4÷20mA analog level transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon.
Confirm the selection by pressing "ENTER".



Press "RIGHT" to access the submenu "DIFFERENTIAL".

10.2.1 UPSTREAM SENSOR

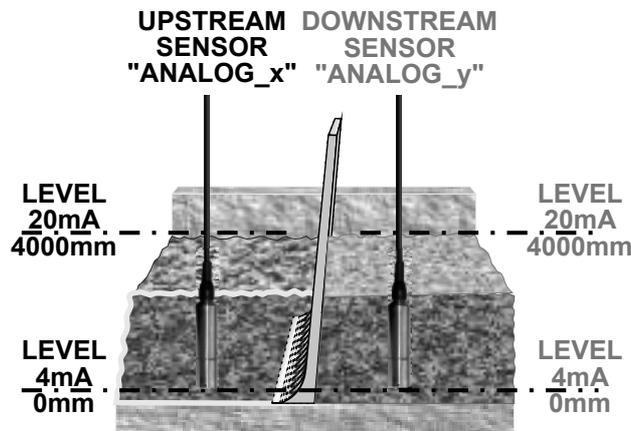
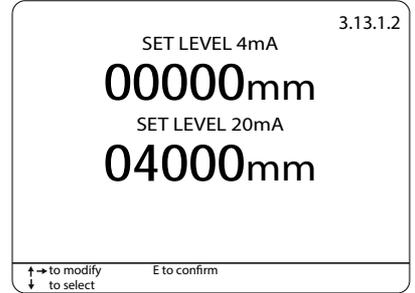
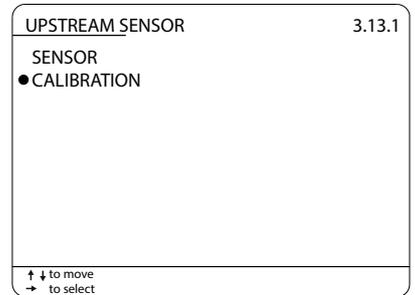
Press "RIGHT" to select "UPSTREAM SENSOR".

Press "RIGHT" to select "SENSOR".

Select the ANALOG_x input with "UP" or "DOWN". ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals (see par.6.3.4/6.3.5.)
Press "RIGHT" to confirm.

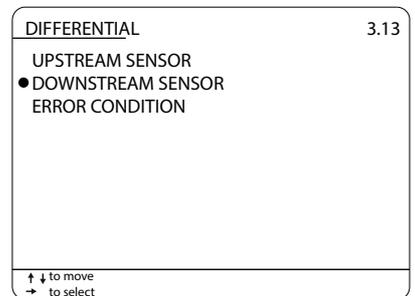
Select "CALIBRATION" with "DOWN" and press "RIGHT".

Enter the upstream sensor level value at 4mA and 20mA.
 Press "DOWN" to select the measure to be set,
 Move the cursor with "RIGHT" and press "UP" to change the digit.
 Confirm with "ENTER".

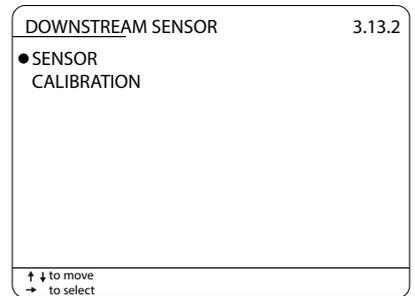


10.2.2 DOWNSTREAM SENSOR

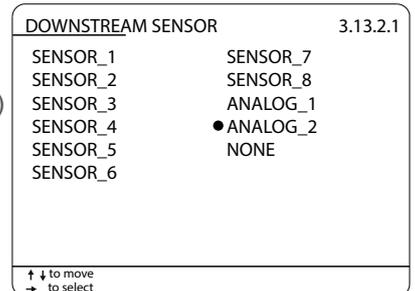
Press "RIGHT" to select "DOWNSTREAM SENSOR".



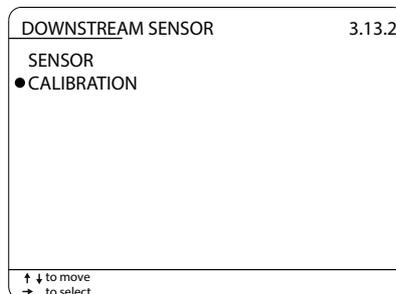
Press "RIGHT" to select "SENSOR".



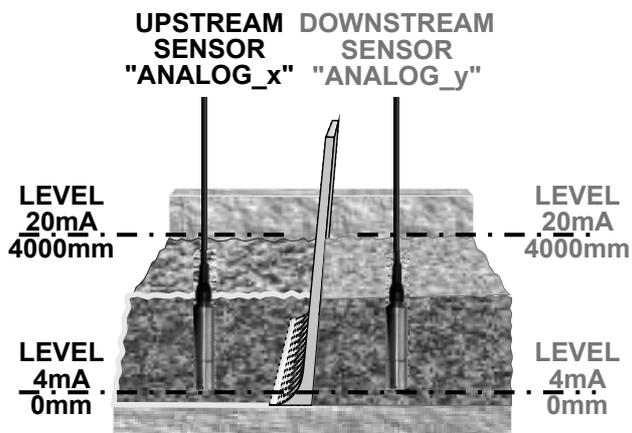
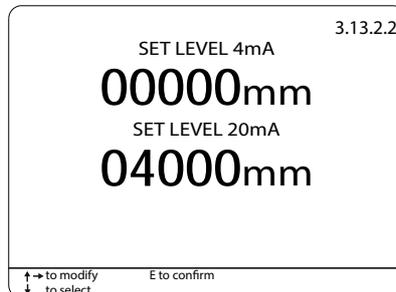
Select the ANALOG_x input with "UP" or "DOWN". ANALOG_2 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5.)
 Press "RIGHT" to confirm.



Select "CALIBRATION" with "DOWN" and press "RIGHT".

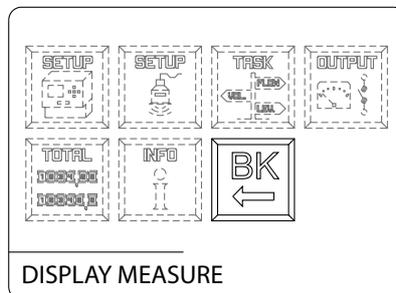


Enter the upstream sensor level value at 4mA and 20mA.
Press "DOWN" to select the measure to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



10.3 - 4÷20mA output config. for differential level transmission to remote displays

The VLW90M has 2 configurable 4÷ 20mA analog outputs for the differential level remote transmission.

With the arrow keys select the “OUTPUT”  menu icon.
Confirm the selection by pressing “ENTER”

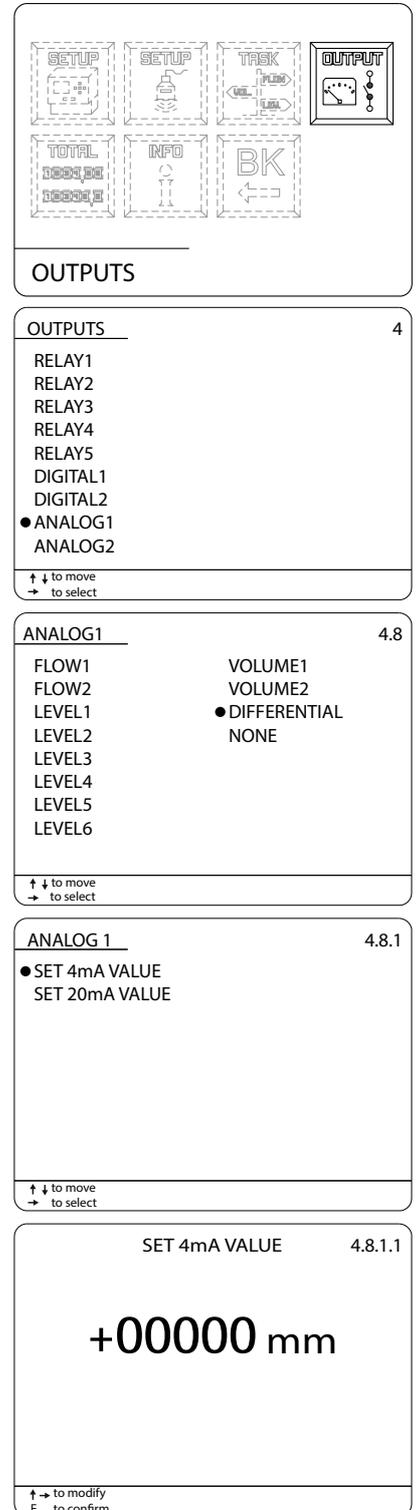
Press “UP” o “DOWN” to select “ANALOG1” or “ANALOG2”.
Press “RIGHT” to confirm.

10.3.1 DIFFERENTIAL

Press “UP” or “DOWN” to select “DIFFERENTIAL”.
Confirm with “RIGHT”

To set begining of scale, press “RIGHT” to select “SET 4mA VALUE”.

Set in mm the differential level value corresponding to the 4mA output.
Confirm with “ENTER”.



OUTPUTS 4

- RELAY1
- RELAY2
- RELAY3
- RELAY4
- RELAY5
- DIGITAL1
- DIGITAL2
- ANALOG1
- ANALOG2

↑ ↓ to move
→ to select

ANALOG1 4.8

- FLOW1
- FLOW2
- LEVEL1
- LEVEL2
- LEVEL3
- LEVEL4
- LEVEL5
- LEVEL6
- VOLUME1
- VOLUME2
- DIFFERENTIAL
- NONE

↑ ↓ to move
→ to select

ANALOG 1 4.8.1

- SET 4mA VALUE
- SET 20mA VALUE

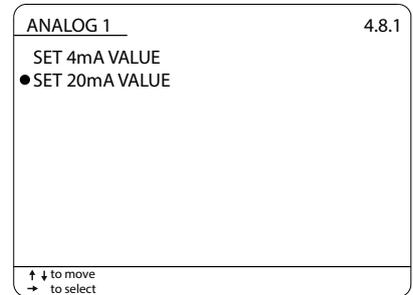
↑ ↓ to move
→ to select

SET 4mA VALUE 4.8.1.1

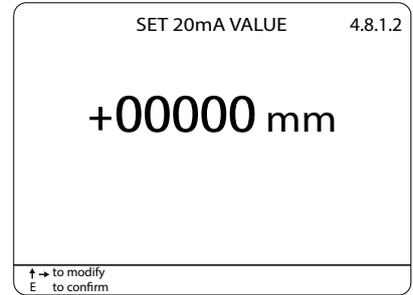
+00000 mm

↑ → to modify
E to confirm

To set end of scale, press "DOWN" to select "SET 20mA VALUE".
Confirm with "RIGHT".

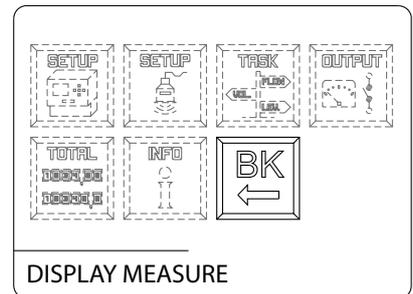


Set in mm the differential level value corresponding to the 20mA output.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



10.4 - Differential level threshold relays configuration

The VLW90M has 5 configurable relays for differential level alarm thresholds.

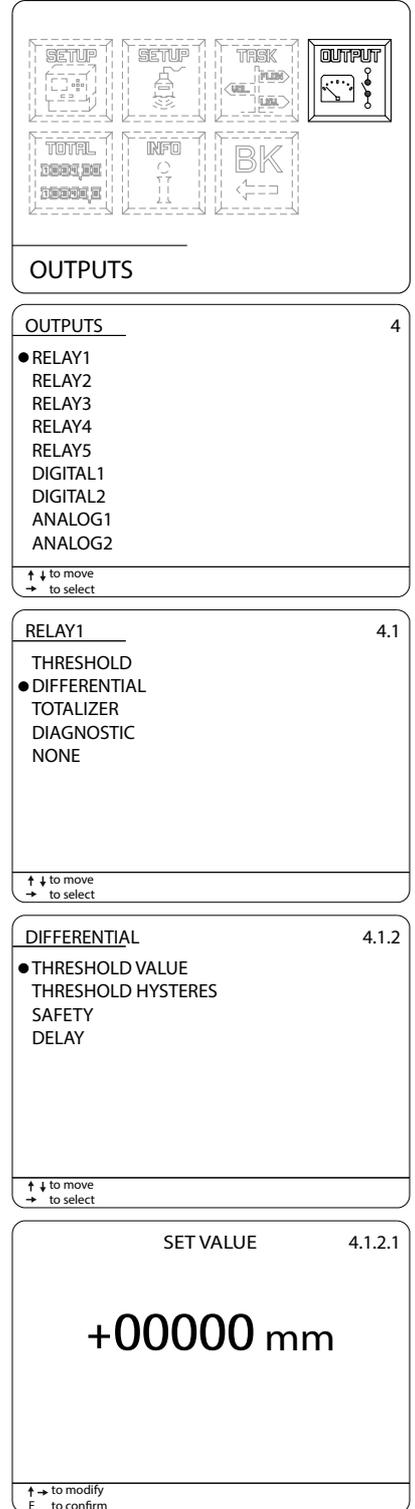
With the arrow keys select the "OUTPUTS"  menu icon.
Confirm the selection by pressing "ENTER".

Press "UP" or "DOWN" to select "RELAY1", or "RELAY2", or "RELAY3", or "RELAY4" or "RELAY5".
Press "RIGHT" to confirm.

Press "DOWN" to select "DIFFERENTIAL" and confirm with "RIGHT".

Press "RIGHT" to select "THRESHOLD VALUE" to set the relay switching point.

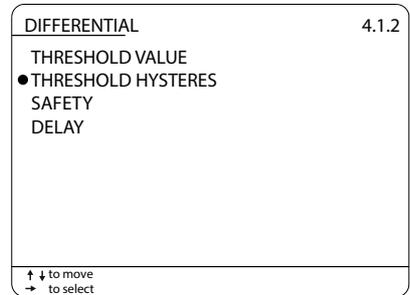
Set in mm the differential level threshold value.
Move the cursor with "RIGHT" and "UP" to change the digit.
Confirm with "ENTER".



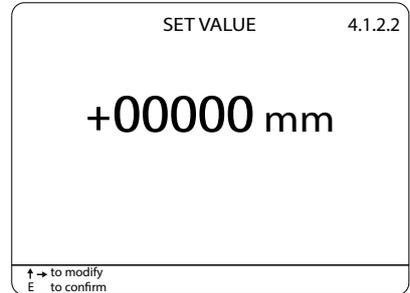
The screenshot shows a sequence of menu screens:

- MAIN MENU:** A grid of icons including SETUP, TASK, OUTPUT, TOTAL, INFO, and BK. The OUTPUT icon is highlighted.
- OUTPUTS:** A list of output types: RELAY1, RELAY2, RELAY3, RELAY4, RELAY5, DIGITAL1, DIGITAL2, ANALOG1, and ANALOG2. RELAY1 is selected.
- RELAY1:** A list of modes: THRESHOLD, DIFFERENTIAL, TOTALIZER, DIAGNOSTIC, and NONE. DIFFERENTIAL is selected.
- DIFFERENTIAL:** A list of settings: THRESHOLD VALUE, THRESHOLD HYSTERES, SAFETY, and DELAY. THRESHOLD VALUE is selected.
- SET VALUE:** A screen showing the value **+00000 mm** being set.

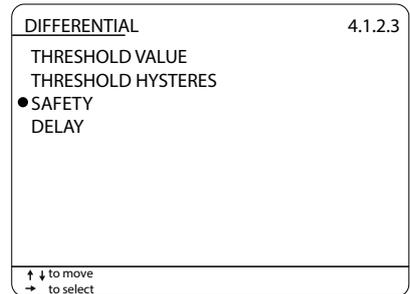
Press "DOWN" to select "THRESHOLD HYSTERES" to set the relay hysteresis and press "RIGHT" to confirm.



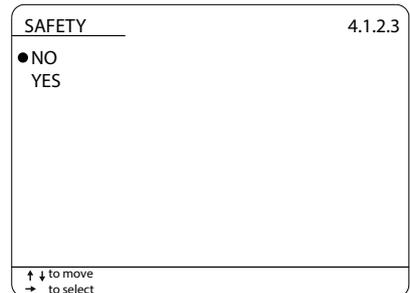
Set in mm the threshold hysteresis value.
Move the cursor with "RIGHT" and "UP" to change the digit.
Confirm with "ENTER".



Press "DOWN" to select "SAFETY" to set the relay alarm condition status and press "RIGHT" to confirm.

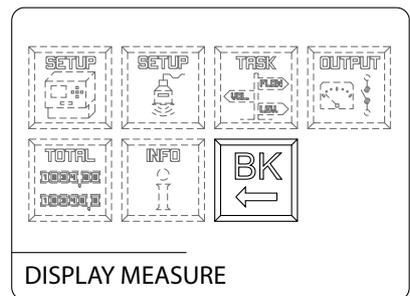


Select:
"YES" relay de-energized in alarm condition;
"NO" relay energized in alarm condition.
Press "RIGHT" to confirm.



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



10.5 - Configuration of displayed measures

When the differential level measurement function is activated the VLW90M automatically enables the display of the level difference value between upstream and downstream.
 The differential level values display deactivation or reactivation is possible in the “MAIN SETUP” menu.

With the arrow keys select the “MAIN SETUP”  menu icon.
 Confirm the selection by pressing “ENTER” .

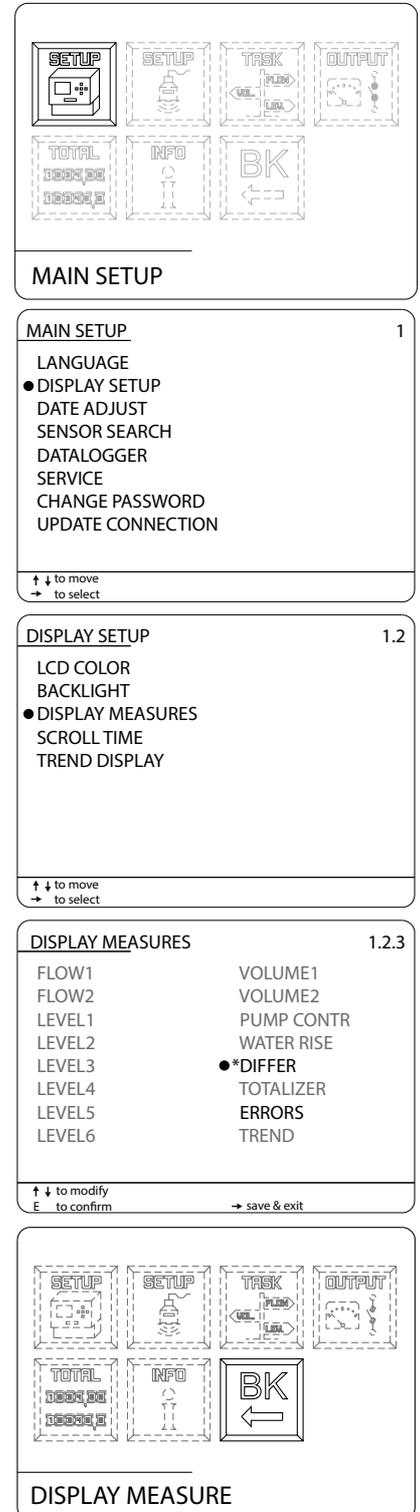
Press “UP” or “DOWN” to select “DISPLAY SETUP”.
 Confirm with “RIGHT”.

10.5.1 DISPLAY MEASURES

Press “DOWN” to select “DISPLAY MEASURES” and confirm with “RIGHT”.

With the pointer to “DIFFER”, press “ENTER”, the * symbol will highlight the selection. Press “RIGHT” to save and exit.
 “LEVEL2/3/4/5/6” are available only when active

Press 2 times “LEFT” to return to the main menu.
 Select  and press “ENTER” to return to “RUN” mode



The screenshot shows the menu navigation process:

- MAIN SETUP** (Page 1)
 - LANGUAGE
 - DISPLAY SETUP
 - DATE ADJUST
 - SENSOR SEARCH
 - DATALOGGER
 - SERVICE
 - CHANGE PASSWORD
 - UPDATE CONNECTION
- DISPLAY SETUP** (Page 1.2)
 - LCD COLOR
 - BACKLIGHT
 - DISPLAY MEASURES
 - SCROLL TIME
 - TREND DISPLAY
- DISPLAY MEASURES** (Page 1.2.3)

FLOW1	VOLUME1
FLOW2	VOLUME2
LEVEL1	PUMP CONTR
LEVEL2	WATER RISE
LEVEL3	● *DIFFER
LEVEL4	TOTALIZER
LEVEL5	ERRORS
LEVEL6	TREND
- DISPLAY MEASURE**

11-VOLUME MEASUREMENT SET UP GUIDES

11.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the level measurement total control with the VLW90M unit.

To configure the volume measurement with Riels Instr. ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon.
Confirm the selection by pressing "ENTER".

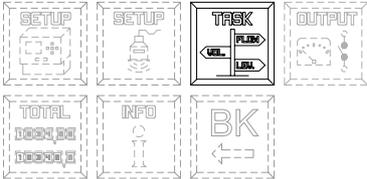
Press "RIGHT" to access the submenu "VOLUME1" or "VOLUME2",
is possible to configure up to 2 volume measurements.

11.1.1 SENSOR

Press "RIGHT" to select "SENSOR"

Select the SENSOR_x with "UP" or "DOWN".
The sensor UID address identifies the sensor number: ex. sensor with UID 1 address = SENSOR_1, etc.. Press "RIGHT" to confirm.

Press "DOWN" to select the measure condition in error state.
Press to "RIGHT" confirm.



TASK

TASK 1

- FLOW1
- FLOW2
- LEVEL1
- LEVEL2
- LEVEL3
- LEVEL4
- LEVEL5
- LEVEL6
- VOLUME1
- VOLUME2
- PUMP CONTROL
- WELL WATER RISE
- DIFFERENTIAL

↑ ↓ to move
→ to select

VOLUME1 3.9

- SENSOR
- MEASURE UNIT
- CALIBRATION
- TANK SHAPE

↑ ↓ to move
→ to select

VOLUME1 3.9.1

- 0
-
- SENSOR_4 ANALOG_1
- SENSOR_5 ANALOG_2
- SENSOR_6 NONE

↑ ↓ to move
→ to select

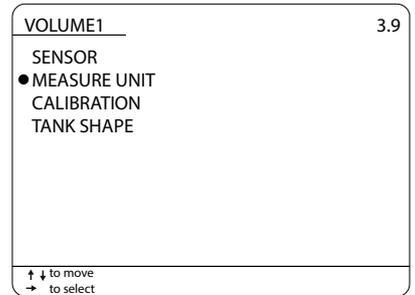
Error Condition 3.9.1.1

- ACTUAL VALUE
- LAST VALID VALUE
- OVER RANGE VALUE
- ZERO VALUE

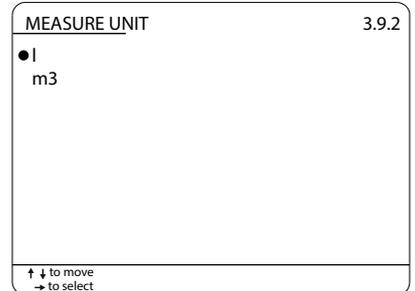
↑ ↓ to move
→ to select

11.1.2 MEASURE UNIT

Press “DOWN” to select “MEASURE UNIT” and press “RIGHT”.

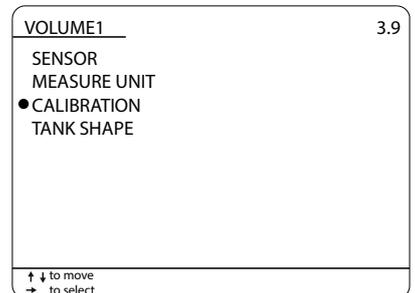


Press “UP” or “DOWN” to select the measure unit.
 Confirm with “RIGHT”.

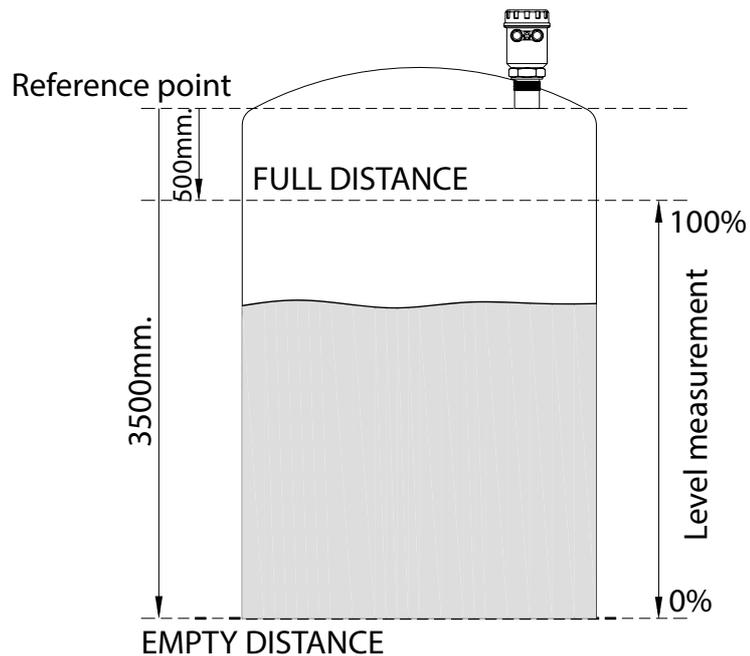
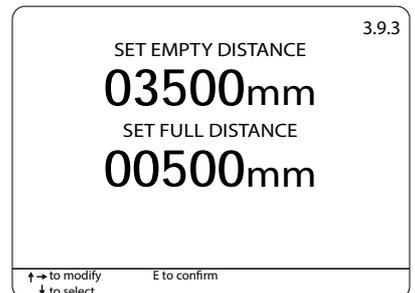


11.1.3 CALIBRATION

Press “DOWN” to select “CALIBRATION” and press “RIGHT”.

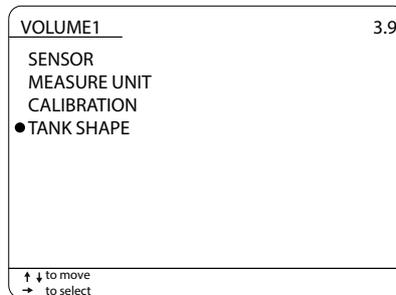


Enter the empty and full distance in mm.
 Press “DOWN” to select the measure to be set.
 Move the cursor with “RIGHT” and press “UP” to change the digit.
 Confirm with “ENTER”.

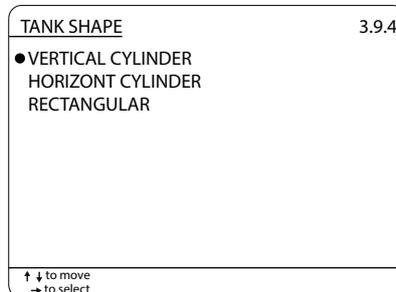


11.1.4 TANK SHAPE

Press "DOWN" to select "TANK SHAPE" and confirm with "RIGHT".

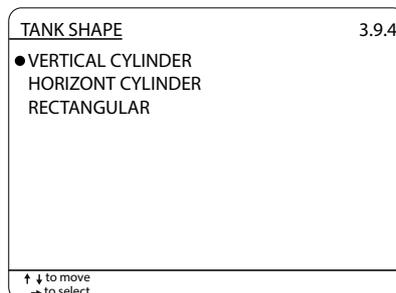


Press "UP" or "DOWN" to select the geometric shape.
To confirm the selection press "RIGHT".

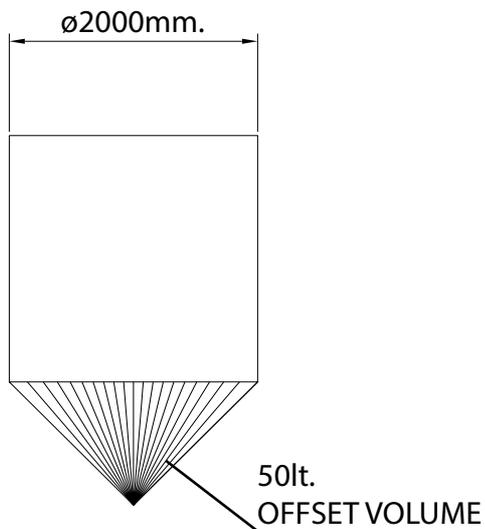
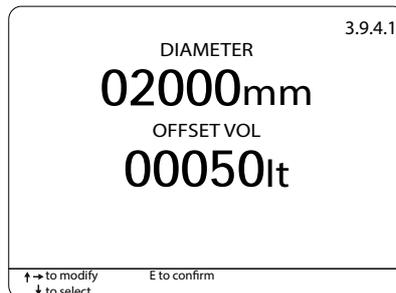


11.1.4.1 - VERTICAL CYLINDER

For tank or silo with vertical cylindrical section,
select "VERTICAL CYLINDER" and press "RIGHT".



Enter the diameter in mm and, if necessary, the tank/silo conical part
volume (OFFSET VOL),



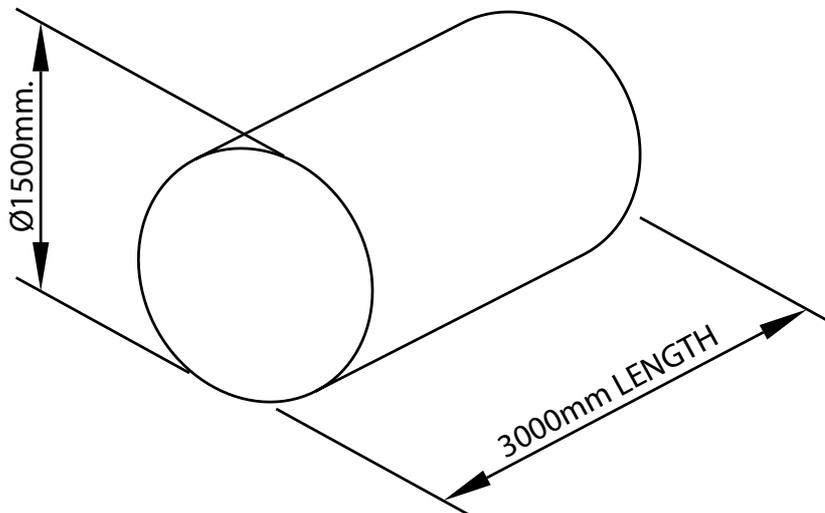
11.1.4.2 - HORIZONT CYLINDER

For tank with horizontal cylindrical section,
select "HORIZONT CYLINDER" and press "RIGHT".

Enter the diameter and the length in mm.

TANK SHAPE	3.9.4
VERTICAL CYLINDER <input checked="" type="radio"/> HORIZONT CYLINDER RECTANGULAR	
↑ ↓ to move → to select	

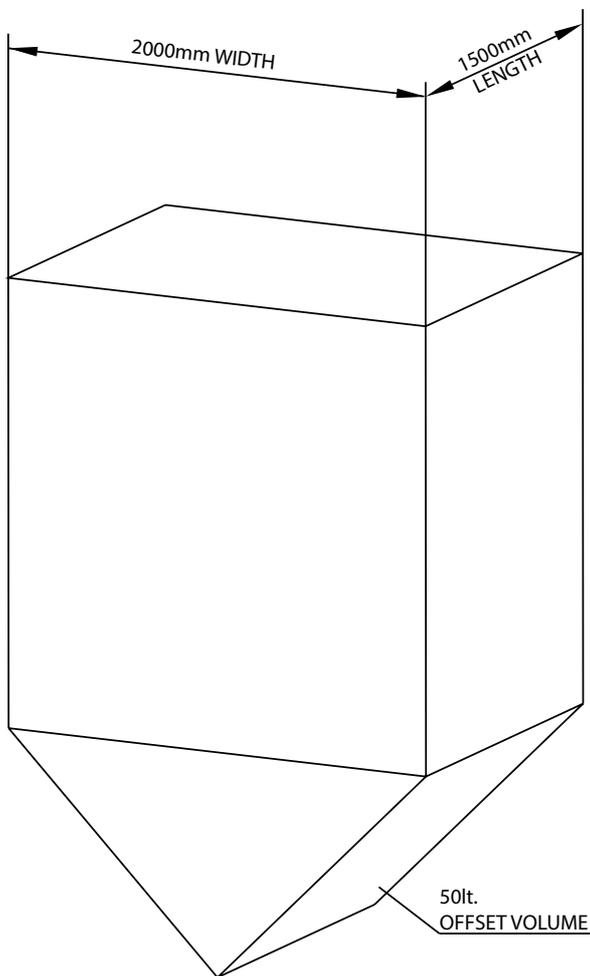
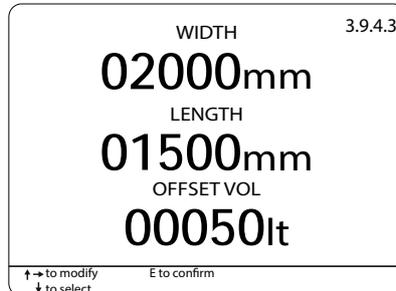
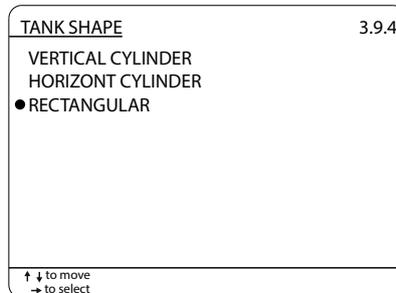
	3.9.4.2
DIAMETER	
01500mm	
LENGTH	
03000mm	
↑ → to modify ↓ to select	E to confirm



11.1.4.3 - RECTANGULAR.

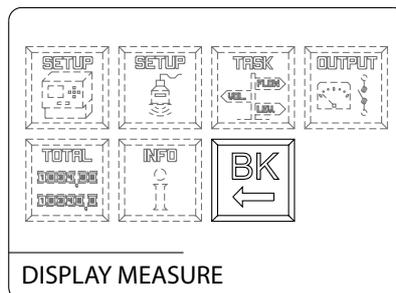
For tank or silo with vertical rectangular section, select "RECTANGULAR" and press "RIGHT".

Enter the width and the length in mm and, if necessary, the tank/silo conical part volume (OFFSET VOL).



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



11.2 - 4÷20mA analog transmitter configuration

With the 2 VLW90M analog inputs is possible to control the measurement with any level sensor that transmits an 4÷20mA analog signal.

To configure the volume measurement with 4÷20mA analog level transmitters follow the procedure below

With the arrow keys select the “TASK”  menu icon.
Confirm the selection by pressing “ENTER”.

Press “RIGHT” to access the submenu “VOLUME1” or “VOLUME2”, is possible to configure up to 2 volume measurements.

11.2.1 SENSOR

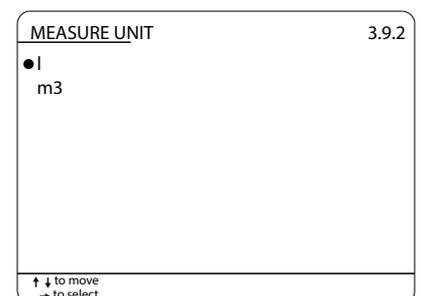
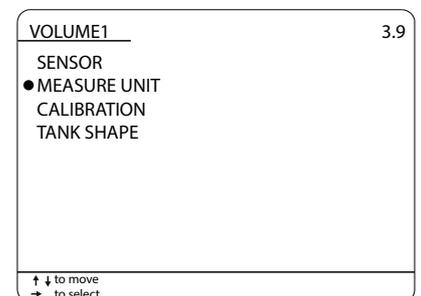
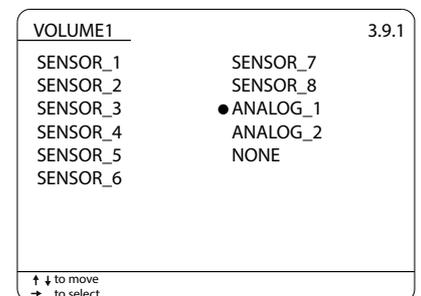
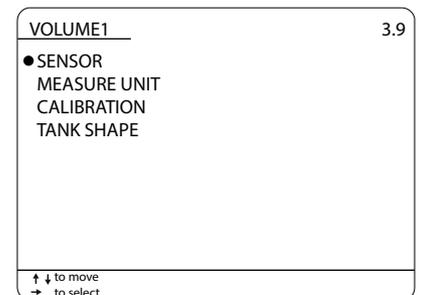
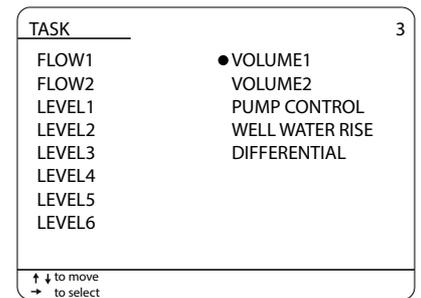
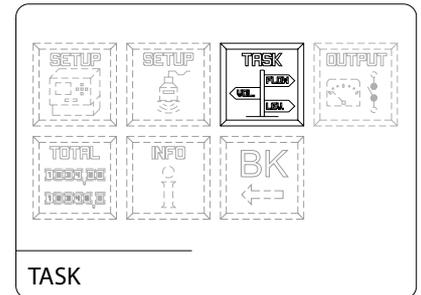
Press “RIGHT” to select “SENSOR”

Select the ANALOG_x input with “UP” or “DOWN”.
ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals;
ANALOG_2 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5).
Press “RIGHT” to confirm.

11.2.3 MEASURE UNIT

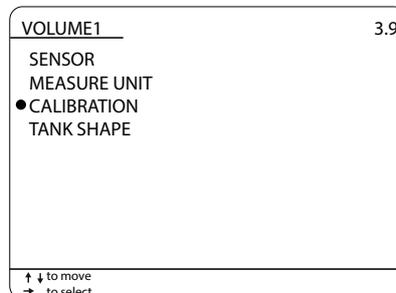
Press “DOWN” to select “MEASURE UNIT” and press “RIGHT”.

Press “UP” or “DOWN” to select the measure unit.
Confirm with “RIGHT”.

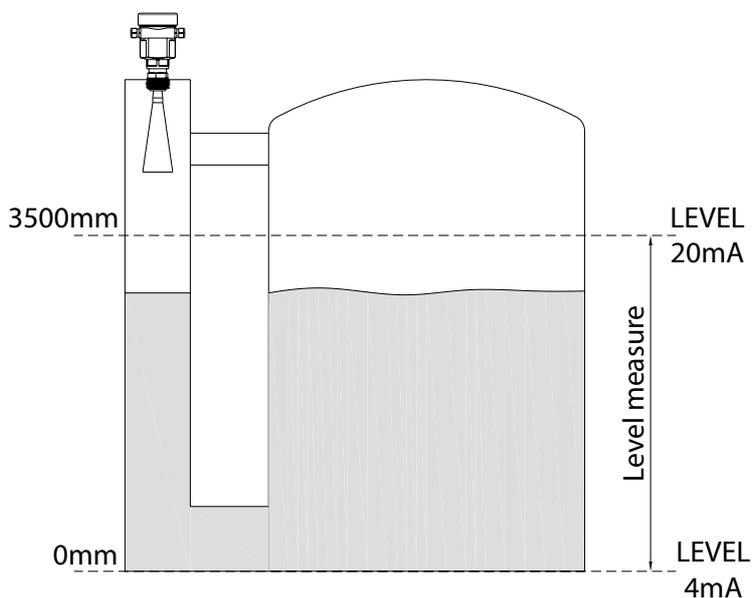
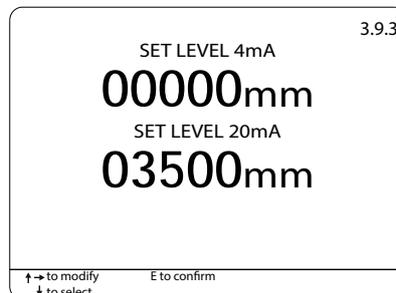


11.2.3 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT".

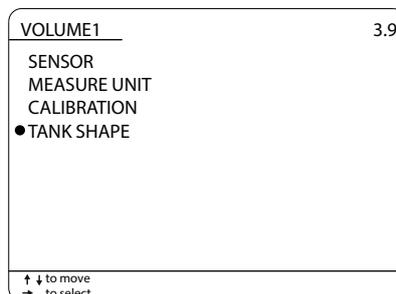


Enter the level value at 4mA and 20mA.
 Press "DOWN" to select the measure to be set.
 Move the cursor with 2RIGHT" and press "UP" to change the digit.
 Confirm with "ENTER".



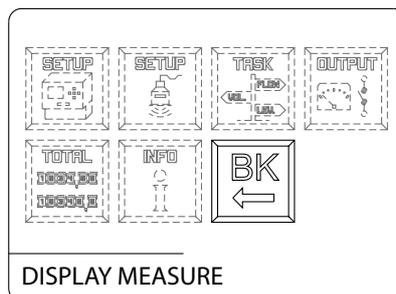
11.2.4 TANK SHAPE

Press "DOWN" to select "TANK SHAPE" and confirm with "RIGHT".
 Follow the procedure described in paragraphs: 11.1.4.1, o 11.1.4.2 o 11.1.4.3.



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



11.3 - 4÷20mA output configuration for volume measurement transmission to remote displays

The VLW90M has 2 configurable analog outputs 20mA for the volume measurement remote transmission.

With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”

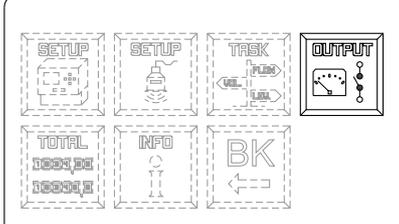
Press “UP” o “DOWN” to select “ANALOG1” or “ANALOG2”.
Press “RIGHT” to confirm.

11.3.1 VOLUME

Press “UP” or “DOWN” to select “VOLUME1” or “VOLUME2”.
Confirm with “RIGHT”.

To set begining of scale, press “RIGHT” to select “SET 4mA VALUE”.

Set in mm the volume value corresponding to the 4mA output.
Confirm with “ENTER”.



The diagram shows a grid of menu options: SETUP (with a gear icon), SETUP (with a tank icon), TASK (with a left arrow icon), OUTPUT (with a right arrow icon), TOTAL (with a bar chart icon), INFO (with a person icon), and BK (with a left arrow icon). The OUTPUT menu is highlighted with a dashed border.

OUTPUTS

OUTPUTS 4

- RELAY1
- RELAY2
- RELAY3
- RELAY4
- RELAY5
- DIGITAL1
- DIGITAL2
- ANALOG1
- ANALOG2

↑ ↓ to move
→ to select

ANALOG1 4.8.1

- FLOW1
- FLOW2
- LEVEL1
- LEVEL2
- LEVEL3
- LEVEL4
- LEVEL5
- LEVEL6
- VOLUME1
- VOLUME2
- DIFFERENTIAL
- NONE

↑ ↓ to move
→ to select

ANALOG 1 4.8.1

- SET 4mA VALUE
- SET 20mA VALUE

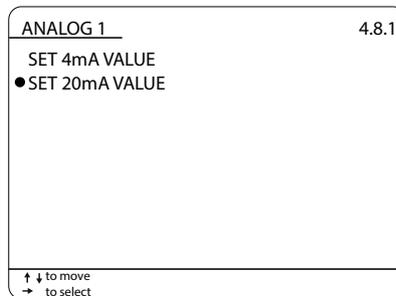
↑ ↓ to move
→ to select

SET 4mA VALUE 4.8.1.1

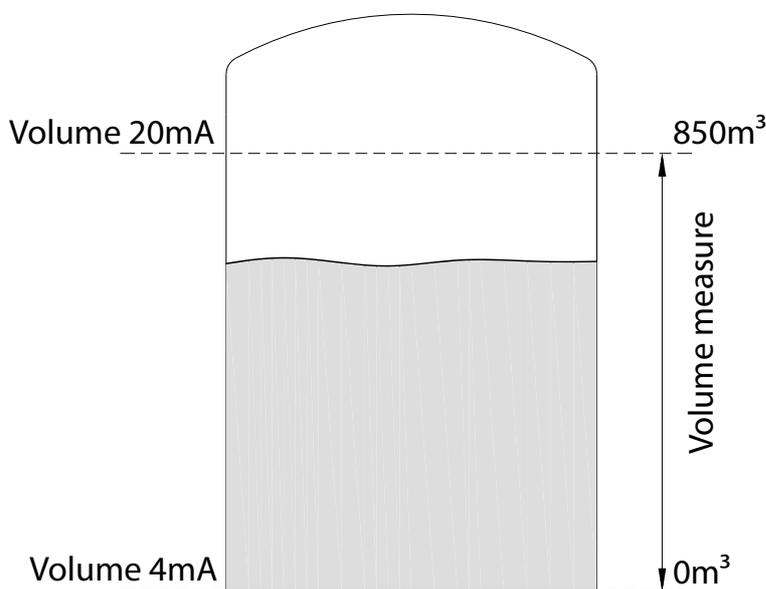
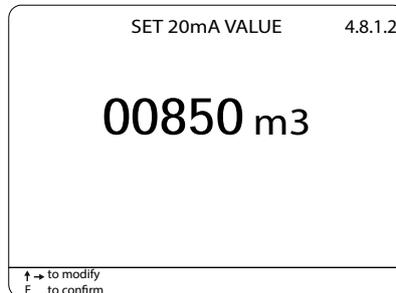
00000 m3

↑ → to modify
E to confirm

To set end of scale, press "DOWN" to select "SET 20mA VALUE".
Confirm with "RIGHT".

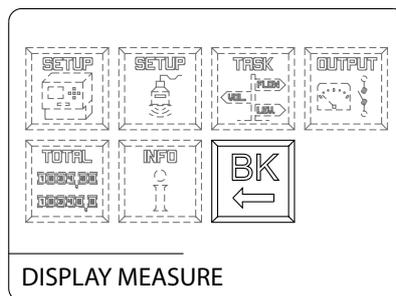


Set in mm the volume value corresponding to the 20mA output.
Confirm with "ENTER".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



11.4 - Volume threshold relays configuration

The VLW90M has 5 configurable relays for volume alarm thresholds.

With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”.

Press “UP” o “DOWN” to select “RELAY1”, or “RELAY2”, or “RELAY3”,
or “RELAY4” or “RELAY5”.
Press “RIGHT” to confirm.

Press “RIGHT” to select “THRESHOLD”.

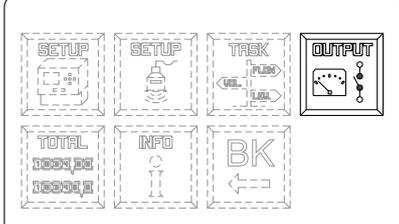
11.4.1 TASK

Press “RIGHT” to select “TASK”.

Select “VOLUME1”, or “VOLUME2”.
Press “RIGHT” to confirm.

11.4.2 MODE

Press “RIGHT” to select “MODE”.



OUTPUTS

OUTPUTS 4

- RELAY1
- RELAY2
- RELAY3
- RELAY4
- RELAY5
- DIGITAL1
- DIGITAL2
- ANALOG1
- ANALOG2

↑ ↓ to move
→ to select

RELAY1 4.1

- THRESHOLD
- DIFFERENTIAL
- TOTALIZER
- DIAGNOSTIC
- NONE

↑ ↓ to move
→ to select

THRESHOLD 4.1.1

- TASK
- MODE
- THRESHOLD VALUE
- THRESHOLD HYSTERES
- SAFETY
- DELAY

↑ ↓ to move
→ to select

RELAY1 4.1.1.1

- FLOW1
- FLOW2
- LEVEL1
- LEVEL2
- LEVEL3
- LEVEL4
- LEVEL5
- LEVEL6
- VOLUME1
- VOLUME2
- NONE

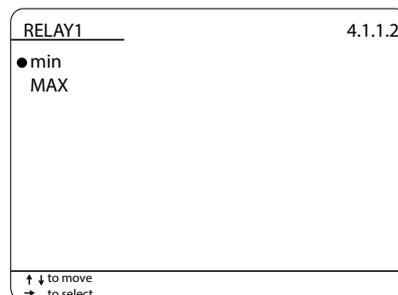
↑ ↓ to move
→ to select

RELAY1 4.1.1

- TASK
- MODE
- THRESHOLD VALUE
- THRESHOLD HYSTERES
- SAFETY
- DELAY

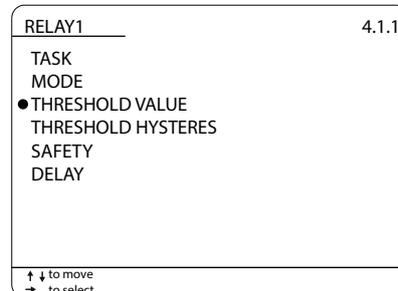
↑ ↓ to move
→ to select

Select “min” for minimum level alarm or “MAX” for maximum level alarm.
Press “RIGHT” to confirm.

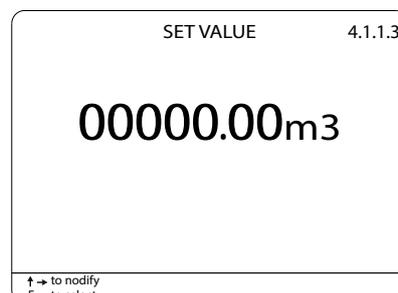


11.4.3 THRESHOLD VALUE

Select “THRESHOLD VALUE” to set the relay switching point and press “RIGHT” to confirm.

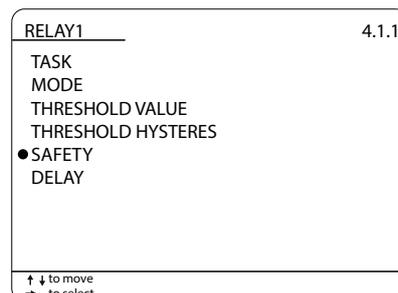


Set m3 or in l the volume threshold value.
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”.

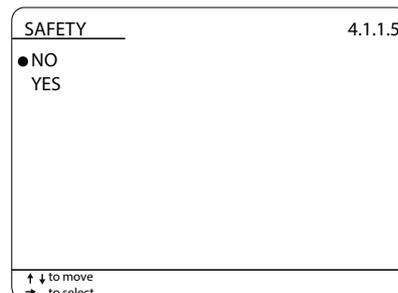


11.4.4 SAFETY

To set the relay alarm condition status select “SAFETY” and confirm with “RIGHT”.

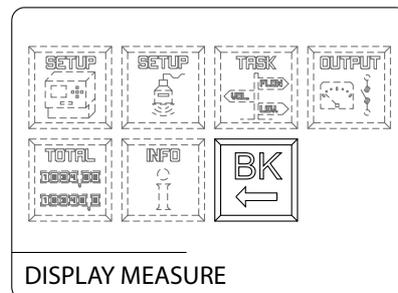


Select:
“YES” relay de-energized in alarm condition;
“NO” relay energized in alarm condition.
Press “RIGHT” to confirm.



Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



11.5 - Configuration of displayed measures

When the volume measurement function is activated the VLW90M automatically enables the display of the calculated volume value.

The volume value display deactivation or reactivation is possible in the “MAIN SETUP” menu.

With the arrow keys select the “MAIN SETUP”  menu icon.
Confirm the selection by pressing “ENTER” .

Press “UP” or “DOWN” to select “DISPLAY SETUP”.
Confirm with “RIGHT” .

11.5.1 DISPLAY MEASURES

Press “DOWN” to select “DISPLAY MEASURES” and confirm with “RIGHT” .

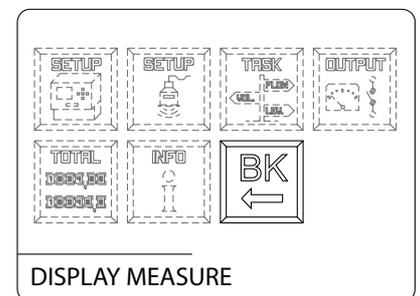
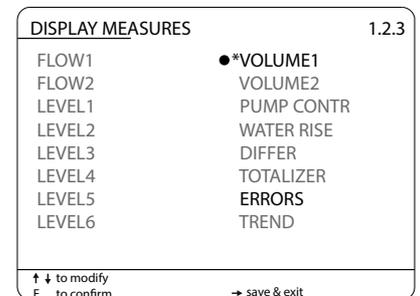
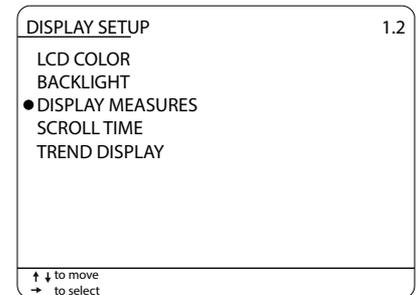
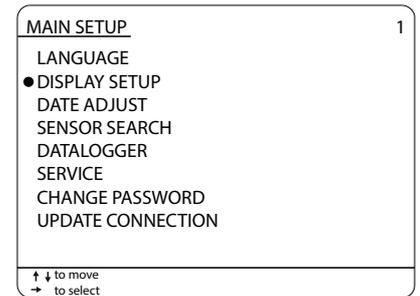
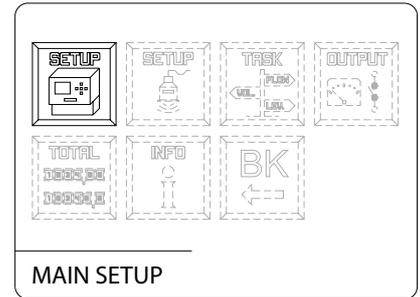
With the pointer to “VOLUME1”, press “ENTER, the * symbol will highlight the selection.

Press “RIGHT” to save and exit.

“VOLUME2” are available only when active

Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



12-PUMP CONTROL SET UP GUIDES

12.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the level measurement total control with the VLW90M unit. To configure the pump control with Riels Instr. ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon. Confirm the selection by pressing "ENTER".

Select submenu "PUMP CONTROL" and press "RIGHT".

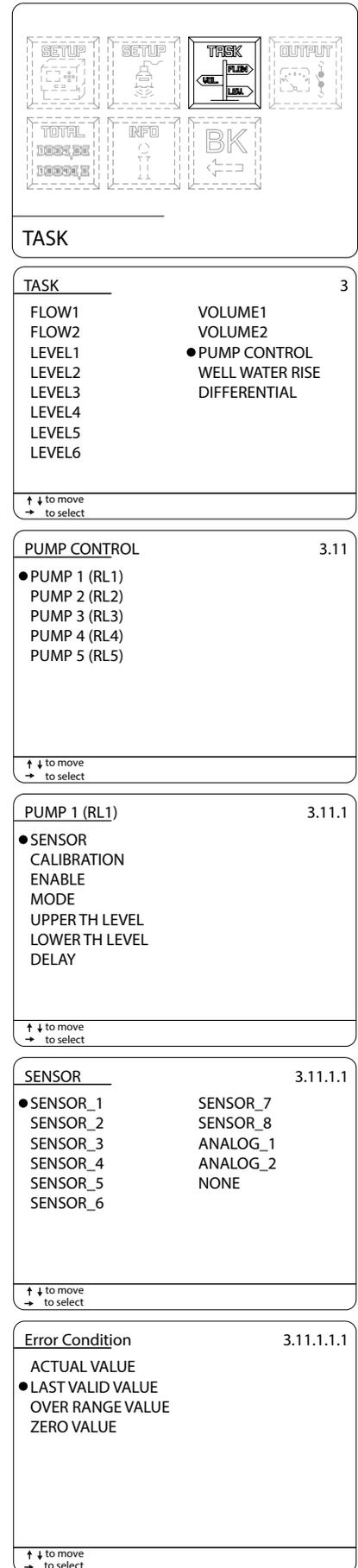
Select "PUMP 1", or "PUMP 2", or "PUMP 3" or "PUMP 4" or "PUMP 5" with "RIGHT".

12.1.1 SENSOR

Press "RIGHT" to select "SENSOR".

Select the SENSOR_x with "UP" or "DOWN".
The sensor UID address identifies the sensor number:
ex. sensor with UID 1 address = SENSOR_1, etc.
Press "RIGHT" to confirm.

Press "DOWN" to select the measure condition in error state.
Press to "RIGHT" confirm.



TASK

TASK 3

FLOW1 VOLUME1
FLOW2 VOLUME2
LEVEL1 ● PUMP CONTROL
LEVEL2 WELL WATER RISE
LEVEL3 DIFFERENTIAL
LEVEL4
LEVEL5
LEVEL6

↑ ↓ to move
→ to select

PUMP CONTROL 3.11

● PUMP 1 (RL1)
PUMP 2 (RL2)
PUMP 3 (RL3)
PUMP 4 (RL4)
PUMP 5 (RL5)

↑ ↓ to move
→ to select

PUMP 1 (RL1) 3.11.1

● SENSOR
CALIBRATION
ENABLE
MODE
UPPER TH LEVEL
LOWER TH LEVEL
DELAY

↑ ↓ to move
→ to select

SENSOR 3.11.1.1

● SENSOR_1 SENSOR_7
SENSOR_2 SENSOR_8
SENSOR_3 ANALOG_1
SENSOR_4 ANALOG_2
SENSOR_5 NONE
SENSOR_6

↑ ↓ to move
→ to select

Error Condition 3.11.1.1.1

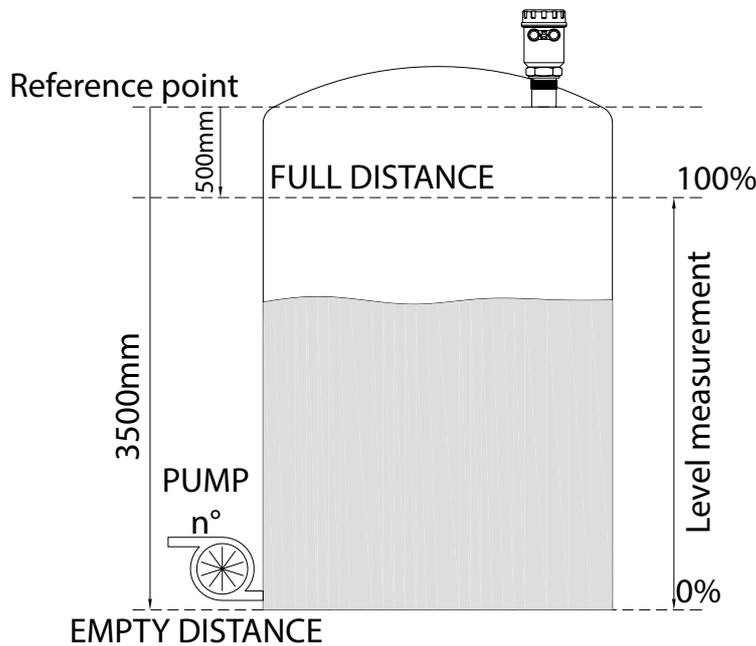
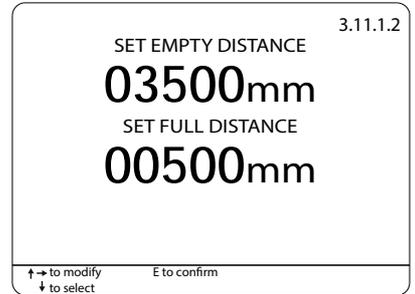
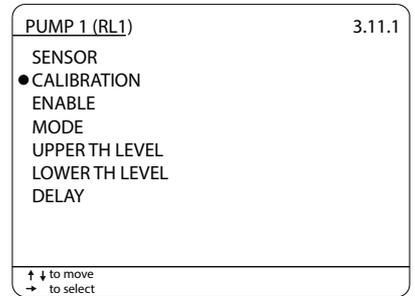
ACTUAL VALUE
● LAST VALID VALUE
OVER RANGE VALUE
ZERO VALUE

↑ ↓ to move
→ to select

12.1.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT".

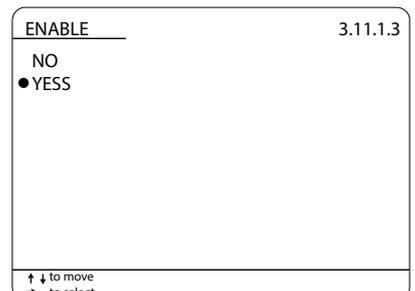
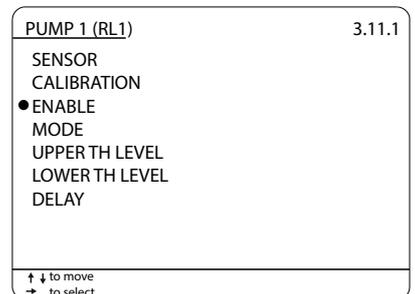
Enter the empty and full distance in mm.
 Press "DOWN" to select the measure to be set.
 Move the cursor with "RIGHT" and press "UP" to change the digit.
 Confirm with "ENTER".



12.1.3 ENABLE

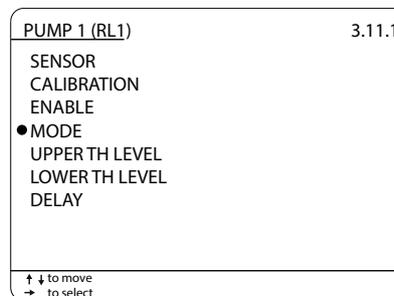
Press "DOWN" to select "ENABLE" and press "RIGHT".

Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".

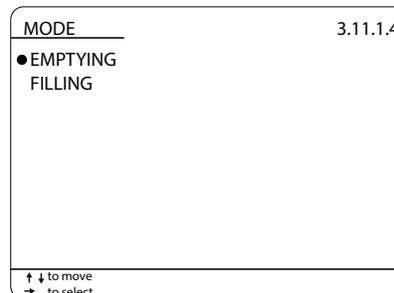


12.1.4 MODE

Press "DOWN" to select "MODE". Confirm with "RIGHT".

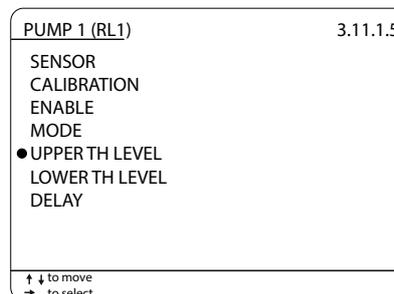


Press "UP" or "DOWN" to select "EMPTYNG" or "FILLING". Confirm with "RIGHT".

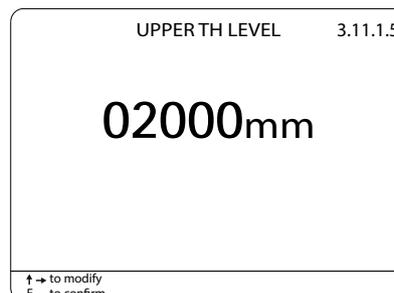


12.1.5 UPPER TH LEVEL

Press "DOWN" to select "UPPER TH LEVEL". Confirm with RIGHT".

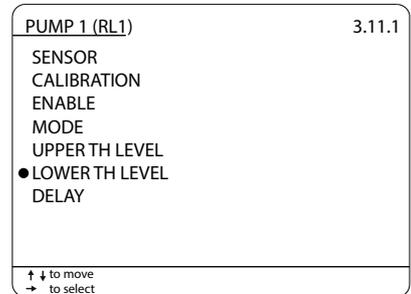


Set in mm the upper threshold level value (see fig. nex page). Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".

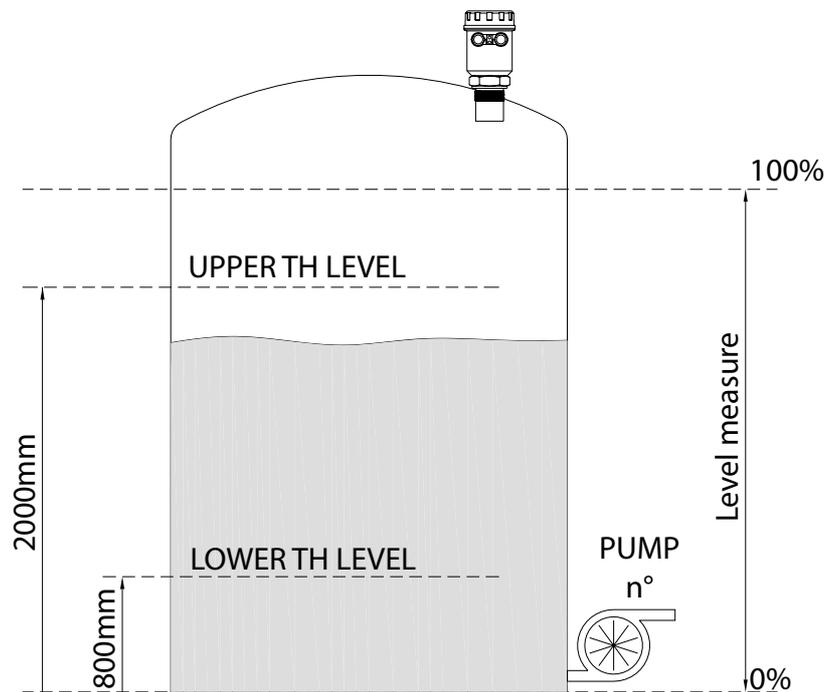
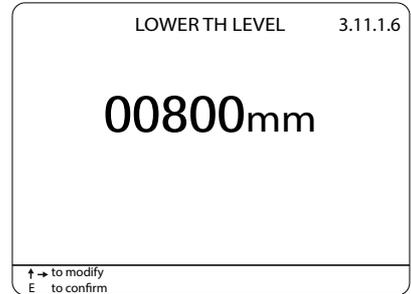


12.1.6 LOWER TH LEVEL

Press “DOWN” to select “LOWER TH LEVEL”. Confirm with “RIGHT”.

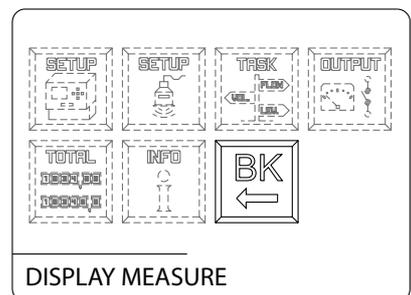


Set in mm the lower threshold level value.
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”.



Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



12.2 - 4÷20mA analog transmitter configuration

With the 2 VLW90M analog inputs is possible to control the measurement with any level sensor that transmits an 4÷20mA analog signal. To configure the pump control with 4÷20mA analog level transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon. Confirm the selection by pressing "ENTER".

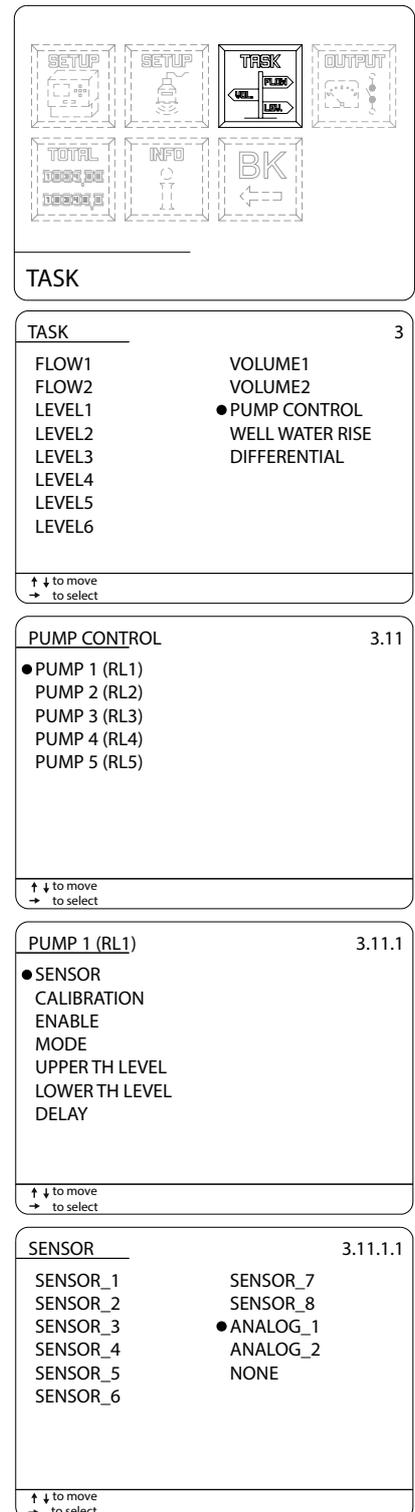
Select submenu "PUMP CONTROL" and press "RIGHT".

Select "PUMP 1", or "PUMP 2", or "PUMP 3" or "PUMP 4" or "PUMP 5" with "RIGHT".

12.1.1 SENSOR

Press "RIGHT" to select "SENSOR".

Select the ANALOG_x input with "UP" or "DOWN".
 ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals;
 ANALOG_2 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5).
 Press "RIGHT" to confirm.



TASK

TASK 3

FLOW1
 FLOW2
 LEVEL1
 LEVEL2
 LEVEL3
 LEVEL4
 LEVEL5
 LEVEL6

VOLUME1
 VOLUME2
 ● PUMP CONTROL
 WELL WATER RISE
 DIFFERENTIAL

↑ ↓ to move
 → to select

PUMP CONTROL 3.11

● PUMP 1 (RL1)
 PUMP 2 (RL2)
 PUMP 3 (RL3)
 PUMP 4 (RL4)
 PUMP 5 (RL5)

↑ ↓ to move
 → to select

PUMP 1 (RL1) 3.11.1

● SENSOR
 CALIBRATION
 ENABLE
 MODE
 UPPER TH LEVEL
 LOWER TH LEVEL
 DELAY

↑ ↓ to move
 → to select

SENSOR 3.11.1.1

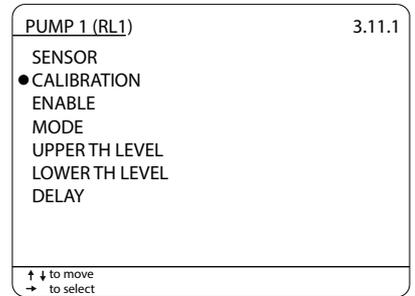
SENSOR_1
 SENSOR_2
 SENSOR_3
 SENSOR_4
 SENSOR_5
 SENSOR_6

SENSOR_7
 SENSOR_8
 ● ANALOG_1
 ANALOG_2
 NONE

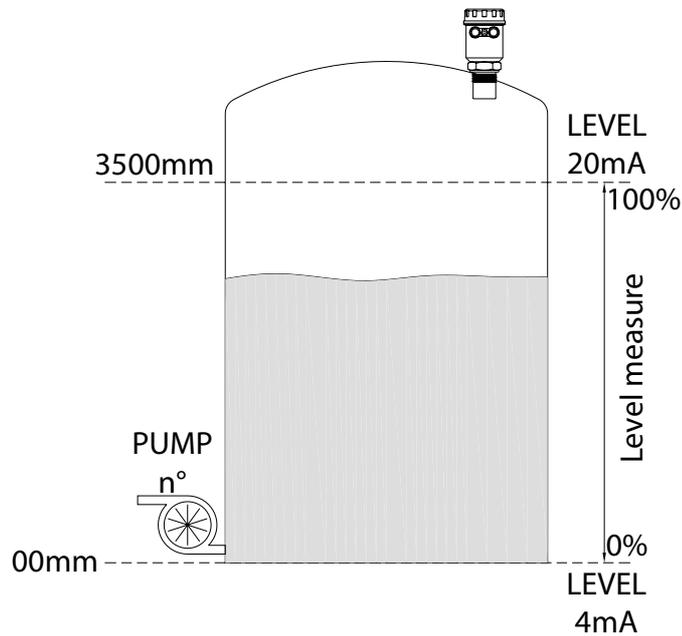
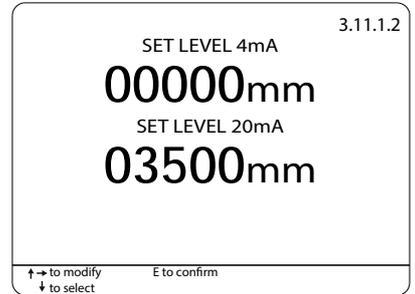
↑ ↓ to move
 → to select

12.2.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT".

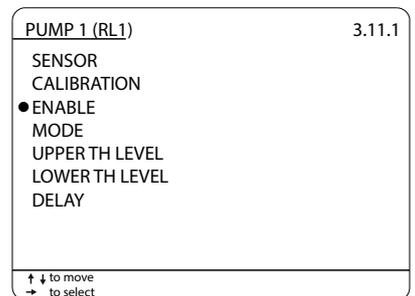


Enter the level value at 4mA and 20mA.
Press "DOWN" to select the measure to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".

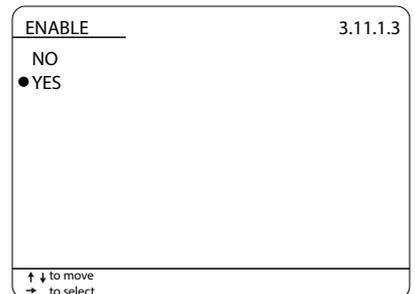


12.2.3 ENABLE

Press "DOWN" to select "ENABLE" and press "RIGHT".



Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".



12.2.4 MODE

Press "DOWN" to select "MODE". Confirm with "RIGHT".

PUMP 1 (RL1)	3.11.1
SENSOR CALIBRATION ENABLE ● MODE UPPER TH LEVEL LOWER TH LEVEL DELAY	
↑ ↓ to move → to select	

Press "UP" or "DOWN" to select "EMPTYNG" or "FILLING".
Confirm with "RIGHT".

MODE	3.11.1.4
● EMPTYING FILLING	
↑ ↓ to move → to select	

12.2.5 UPPER TH LEVEL

Press "DOWN" to select "UPPER TH LEVEL". Confirm with "RIGHT".

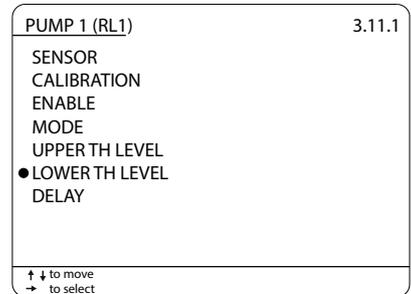
PUMP 1 (RL1)	3.11.1
SENSOR CALIBRATION ENABLE MODE ● UPPER TH LEVEL LOWER TH LEVEL DELAY	
↑ ↓ to move → to select	

Set in mm the upper threshold level value (see fig.nex page).
Move the cursor with "RIGHT" and "UP" to change the digit.
Confirm with "ENTER".

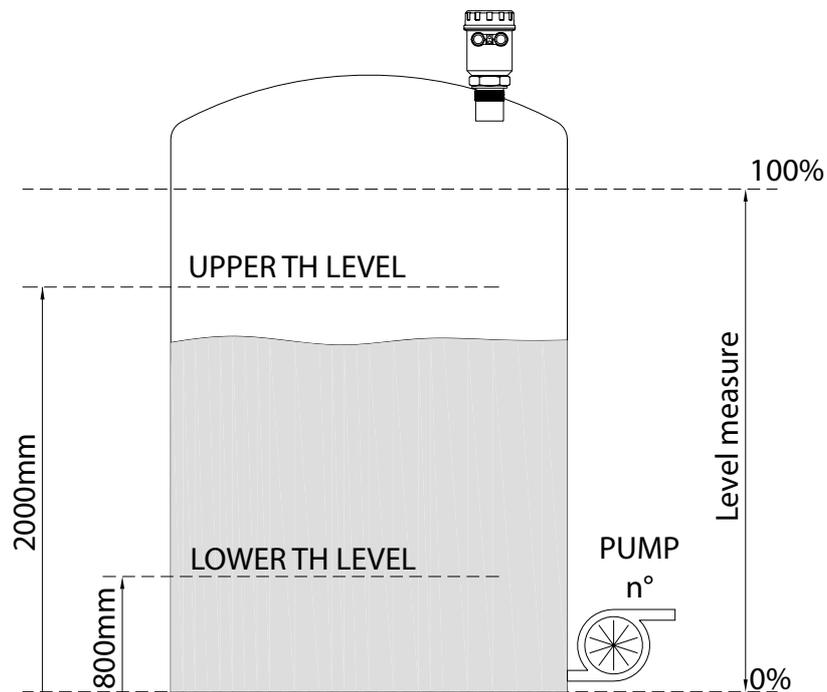
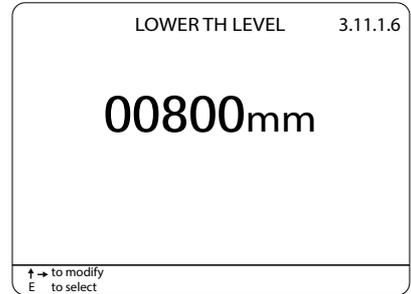
UPPER TH LEVEL	3.11.1.5
<h1>02000mm</h1>	
↑ → to modify E to confirm	

12.2.5 LOWER TH LEVEL

Press “DOWN” to select “LOWER TH LEVEL”. Confirm with “RIGHT”.

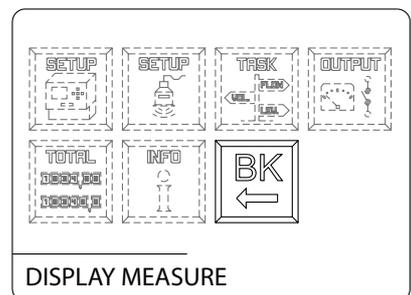


Set in mm the lower threshold level value.
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”.



Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



12.3 - Configuration of displayed measures

When the pump control function is activated the VLW90M automatically enables the display of the pump control state.

The pump control state display deactivation or reactivation is possible in the “MAIN SETUP” menu.

With the arrow keys select the “MAIN SETUP”  menu icon.
Confirm the selection by pressing “ENTER” .

Press “UP” or “DOWN” to select “DISPLAY SETUP”.
Confirm with “RIGHT”.

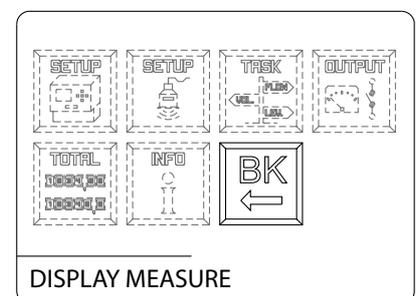
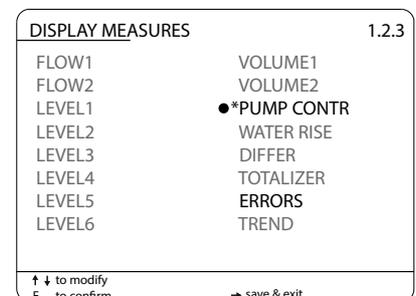
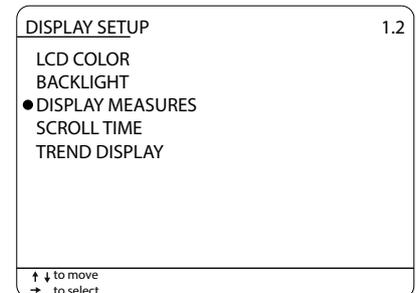
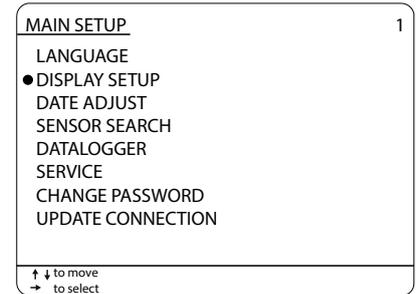
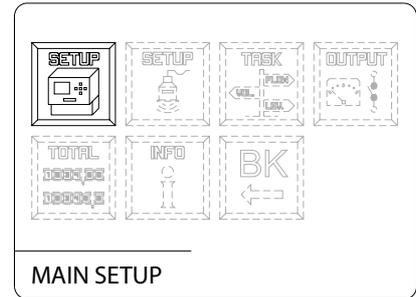
12.3.1 DISPLAY MEASURES

Press “DOWN” to select “DISPLAY MEASURES” and confirm with “RIGHT”.

With the pointer to “PUMP CONTR”, press “ENTER” the * symbol will highlight the selection.
Press “RIGHT” to save and exit.

Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



13-WELL WATER RISE SET UP GUIDES

13.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the level measurement total control with the VLW90M unit.

To configure the well water rise with Riels Instr. ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK"  menu icon.
Confirm the selection by pressing "ENTER".

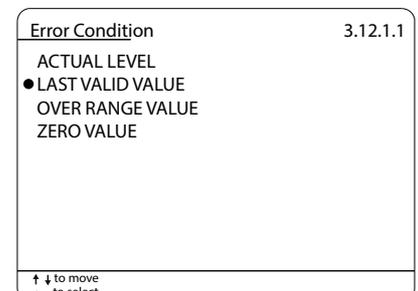
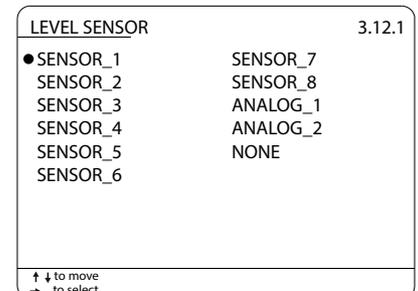
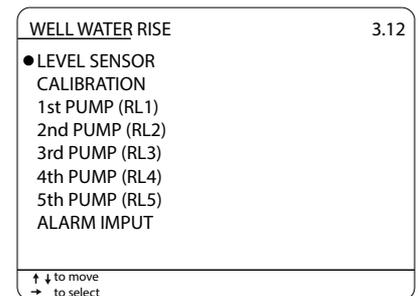
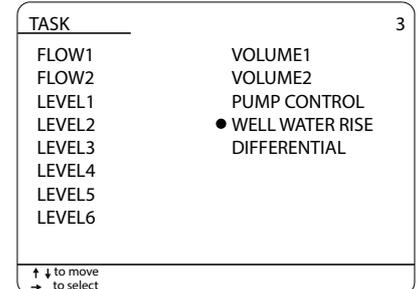
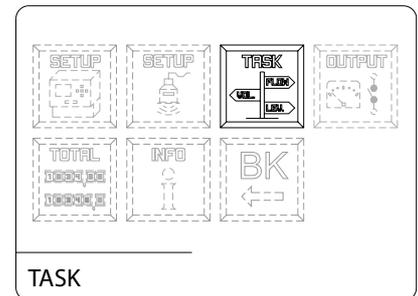
Select submenu "WELL WATER RISE" and press "RIGHT".

13.1.1 LEVEL SENSOR

Press "RIGHT" to select "LEVEL SENSOR".

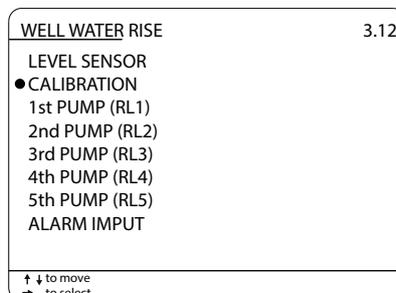
Select the SENSOR_x with "UP" or "DOWN".
The sensor UID address identifies the sensor number:
ex. sensor with UID 1 address = SENSOR_1, etc.
Press "RIGHT" to confirm.

Press "DOWN" to select the measure condition in error state.
Press to "RIGHT" confirm.

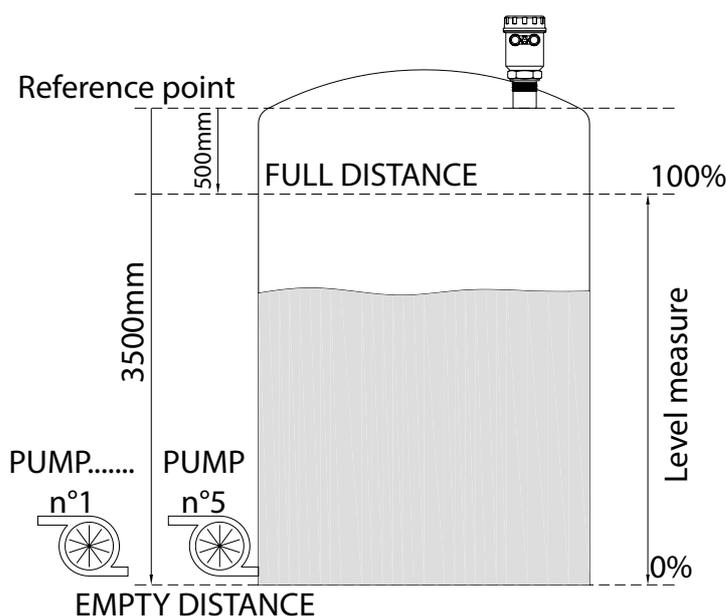
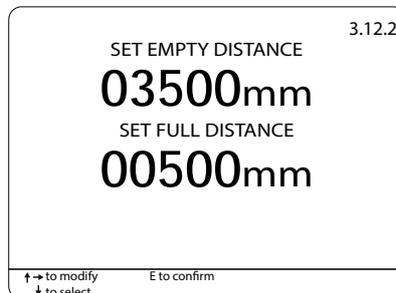


13.1.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT".

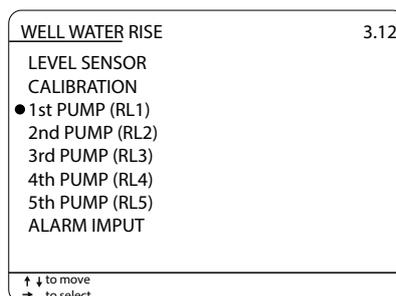


Enter the empty and full distance in mm.
Press "DOWN" to select the measure to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".

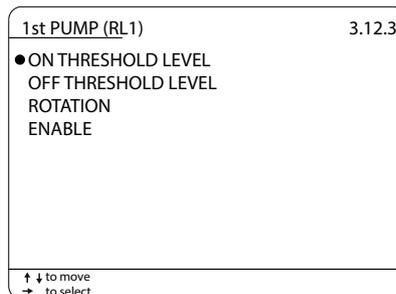


13.1.3 PUMP

Press "DOWN" to select "1st PUMP", or "2nd PUMP", or "3rd PUMP", or "4th PUMP" or "5th PUMP".
Confirm with "RIGHT".



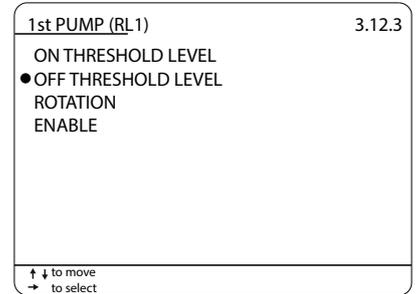
Press "DOWN" to select "ON THRESHOLD LEVEL" and press "RIGHT".



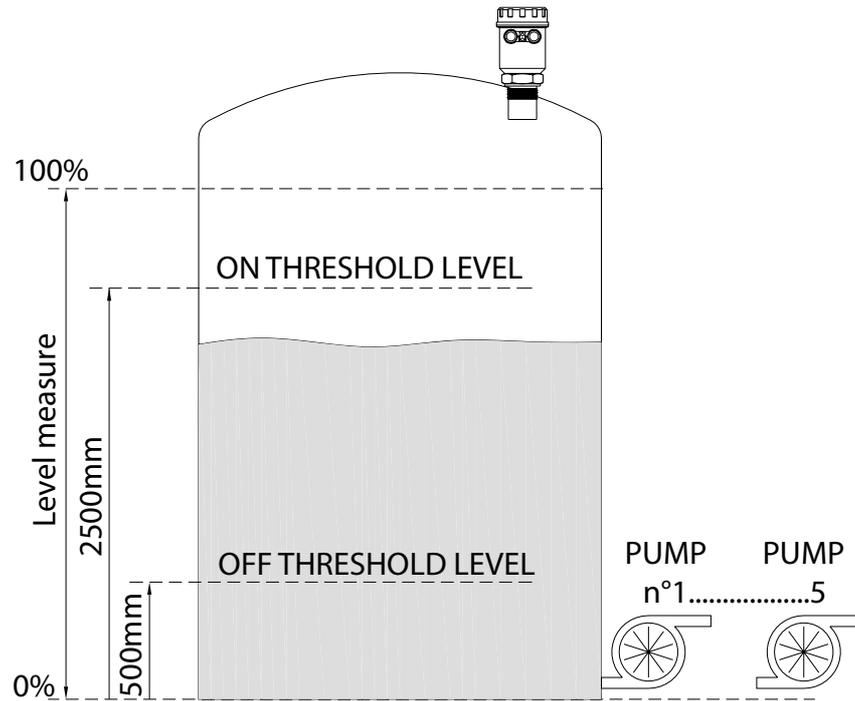
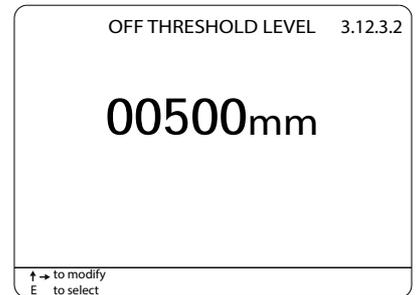
Set in mm the on threshold level value.
 Move the cursor with "RIGHT" and "UP" to change the digit.
 Confirm with "ENTER".



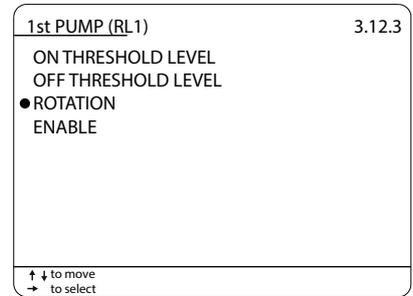
Press "DOWN" to select "OFF THRESHOLD LEVEL" and press "RIGHT".



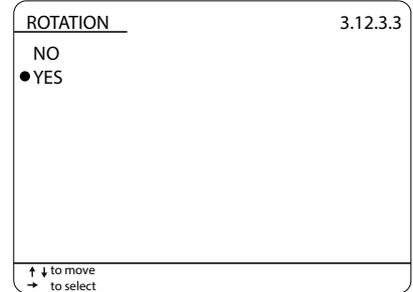
Set in mm the off threshold level value.
 Move the cursor with "RIGHT" and "UP" to change the digit.
 Confirm with "ENTER".



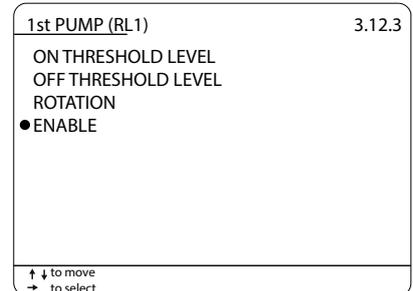
Press "DOWN" to select "ROTATION" and press "RIGHT".



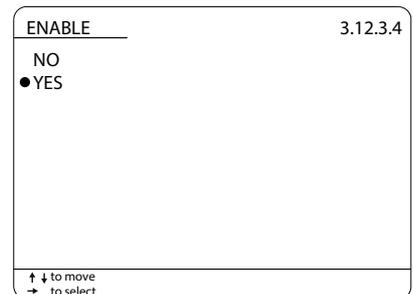
Select "YES" to enter the pump operating cycle in the working times table. The pump that has accumulated the lowest operation time will be turned on for the first. Press "RIGHT" to confirm.



Press "DOWN" to select "ENABLE" and press "RIGHT".

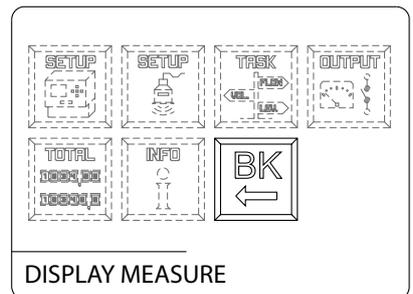


Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".



Press 2 times "LEFT" to return to the main menu.

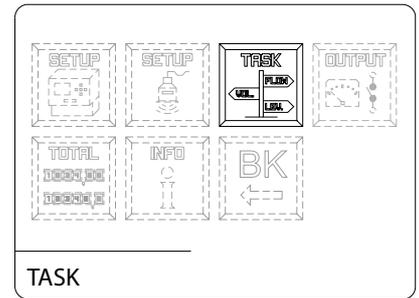
Select  and press "ENTER" to return to "RUN" mode



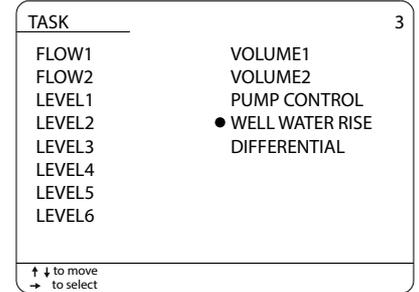
13.2 - 4÷20mA analog transmitter configuration

With the 2 VLW90M analog inputs is possible to control the measurement with any level sensor that transmits an 4÷20mA analog signal. To configure the well water rise with 4÷20mA analog level transmitters follow the procedure below:

With the arrow keys select the “TASK”  menu icon. Confirm the selection by pressing “ENTER”.

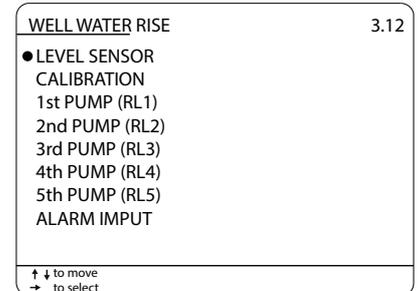


Select submenu “WELL WATER RISE” and press “RIGHT”.

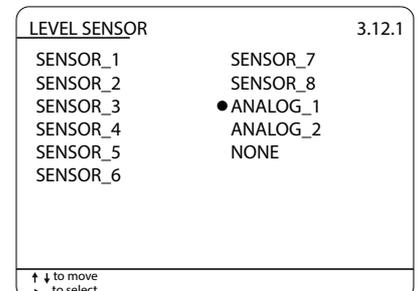


13.2.1 LEVEL SENSOR

Press “RIGHT” to select “LEVEL SENSOR”.

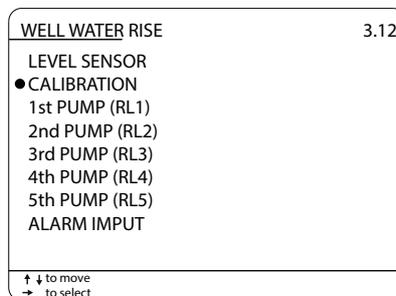


Select the ANALOG_x input with “UP” or “DOWN”.
 ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals;
 ANALOG_2 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5).
 Press “RIGHT” to confirm.

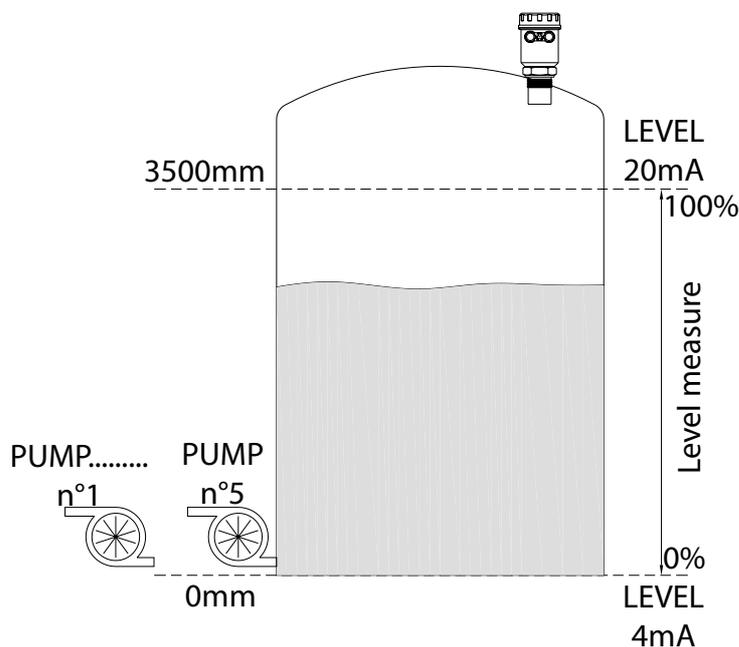
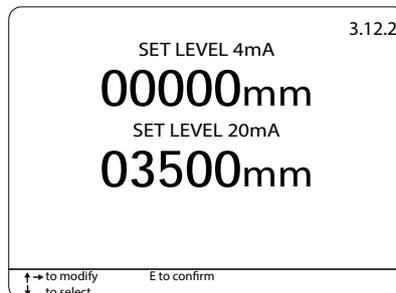


13.2.2 CALIBRATION

Press "DOWN" to select "CALIBRATION" and press "RIGHT".

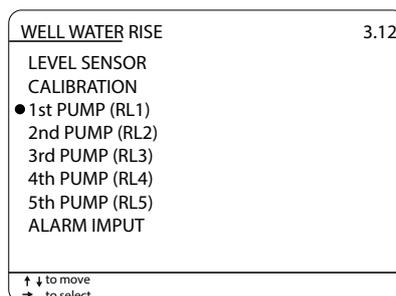


Enter the empty and full distance in mm.
Press "DOWN" to select the measure to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".

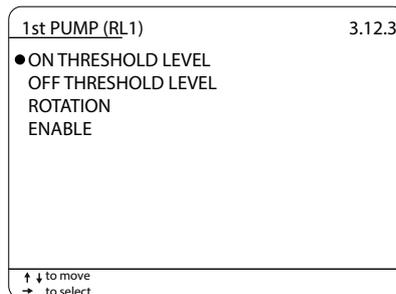


13.2.3 PUMP

Press "DOWN" to select "1st PUMP", or "2nd PUMP", or "3rd PUMP", or "4th PUMP" or "5th PUMP".
Confirm with "RIGHT".



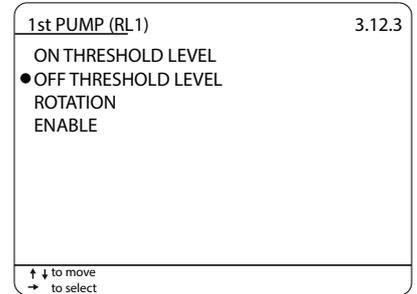
Press "DOWN" to select "ON THRESHOLD LEVEL" and press "RIGHT".



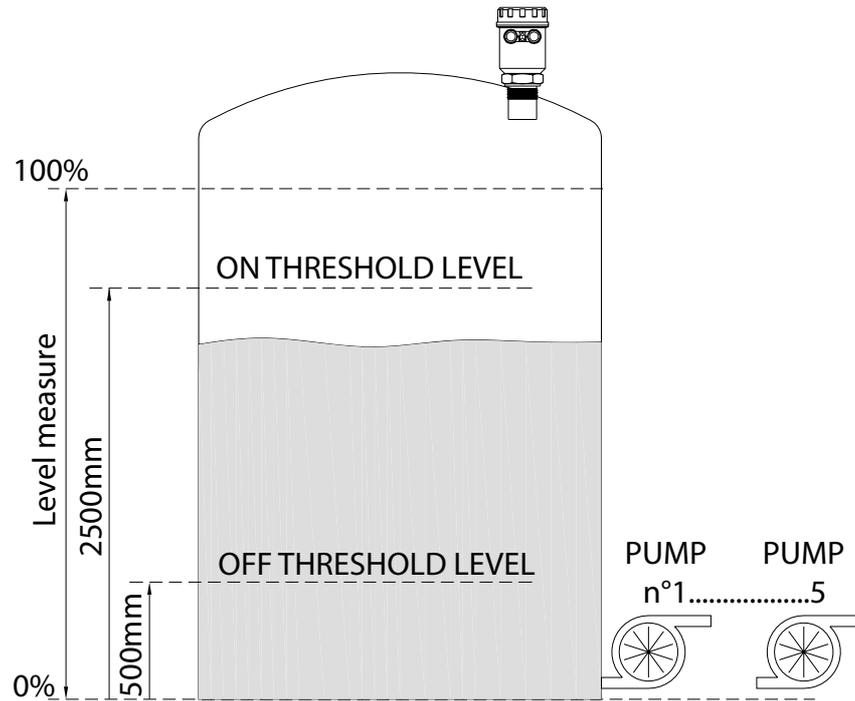
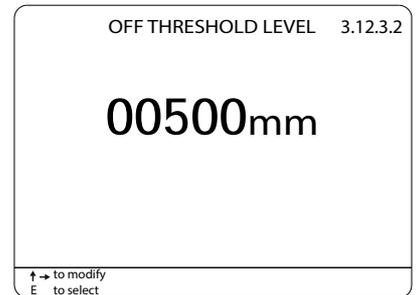
Set in mm the on threshold level value.
 Move the cursor with "RIGHT" and "UP" to change the digit.
 Confirm with "ENTER".



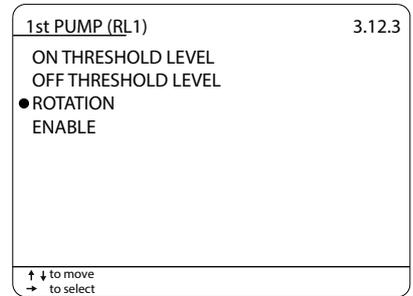
Press "DOWN" to select "OFF THRESHOLD LEVEL" and press "RIGHT".



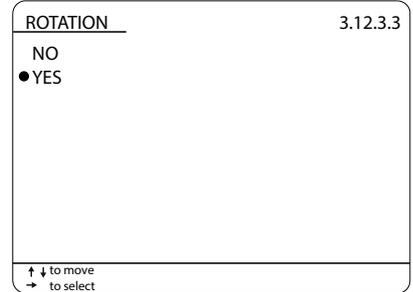
Set in mm the off threshold level value.
 Move the cursor with "RIGHT" and "UP" to change the digit.
 Confirm with "ENTER".



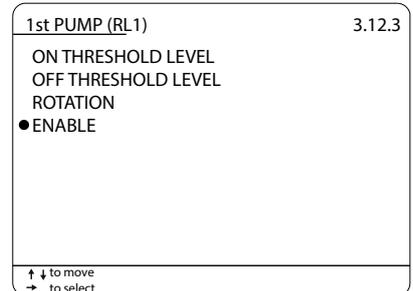
Press "DOWN" to select "ROTATION" and press "RIGHT".



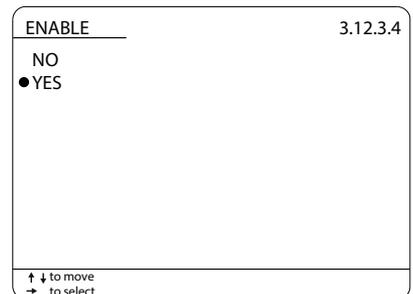
Select "YES" to enter the pump operating cycle in the working times table. The pump that has accumulated the lowest operation time will be turned on for the first. Press "RIGHT" to confirm.



Press "DOWN" to select "ENABLE" and press "RIGHT".

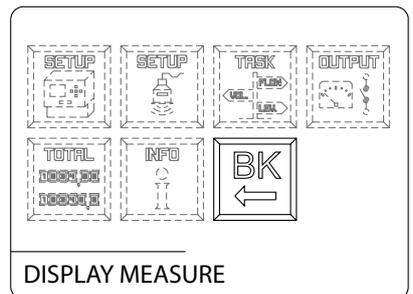


Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".



Press 2 times "LEFT" to return to the main menu.

Select  and press "ENTER" to return to "RUN" mode



13.3 - Configuration of displayed measures

When the well water rise function is activated the VLW90M automatically enables the display of the pumps rotation state. The pumps rotation state display deactivation or reactivation is possible in the "MAIN SETUP" menu

With the arrow keys select the "MAIN SETUP"  menu icon. Confirm the selection by pressing "ENTER".

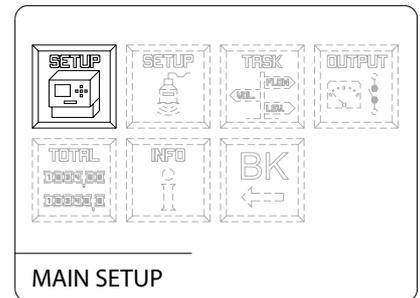
Press "UP" or "DOWN" to select "DISPLAY SETUP". Confirm with "RIGHT".

13.3.1 DISPLAY MEASURES

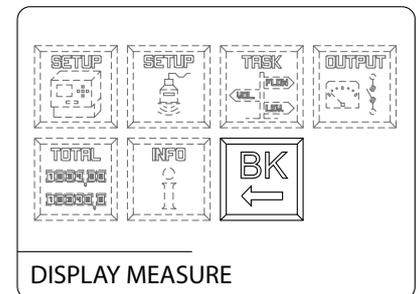
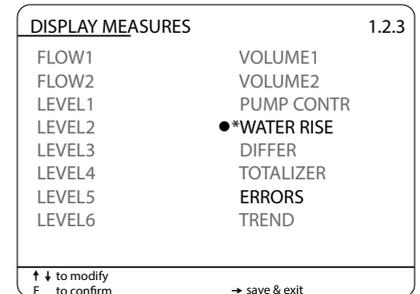
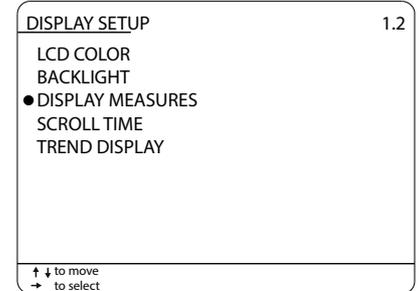
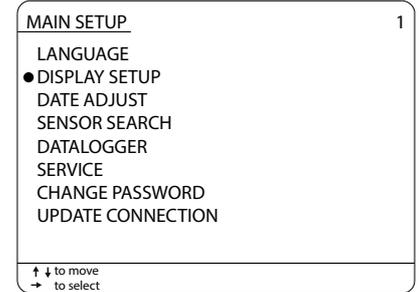
Press "DOWN" to select "DISPLAY MEASURES" and confirm with "RIGHT".

With the pointer to "WATER RISE", press "ENTER" the * symbol will highlight the selection. Press "RIGHT" to save and exit.

Press 2 times "LEFT" to return to the main menu. Select  and press "ENTER" to return to "RUN" mode



MAIN SETUP



DISPLAY MEASURE

14 - PTU5x OR METER OR KTU5 SENSOR Via MODBUS NEW CONNECTION

14.1 - via MODBUS Riels Instr. ultrasonic transmitters configuration

The use of Riels Instr. ultrasonic level transmitters, with MODBUS RTU communication protocol, allows the total sensor control with the VLW90M unit.

WARNING - Disconnect all PTU50/51/56 or METER or KTU5 transmitters and only connect the new PTU50/51/56 or METER or KTU5 transmitter to configure.

With the arrow keys select the "MAIN SETUP"  menu icon. Confirm the selection by pressing "ENTER".

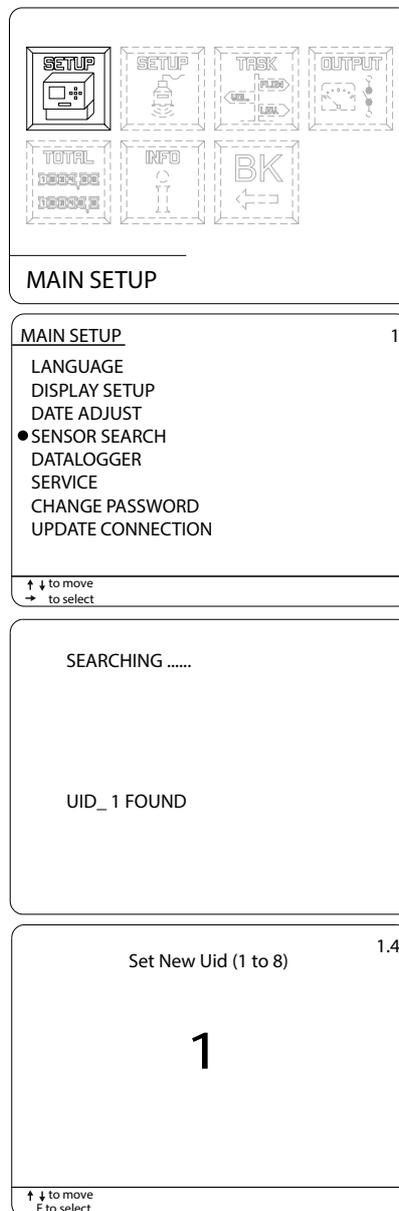
Press "UP" or "DOWN" to select "SENSOR SEARCH". Confirm with "RIGHT".

The display will show the UID address of the new connected transmitter. Normally the new transmitters have the UID 1 address

Set the UID address of the new connected transmitter. NB - The transmitters connected to the same VLW90M must have different UID addresses from each other. Press "ENTER" to confirm.

DISCONNECT THE TRASMITTER

WARNING - Reconnect all PTU50/51/56 or METER or KTU5 transmitter

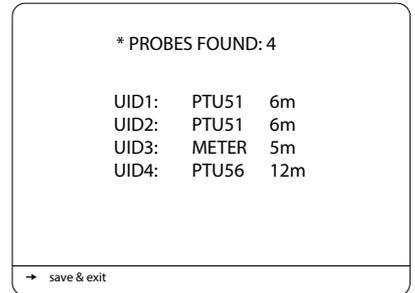
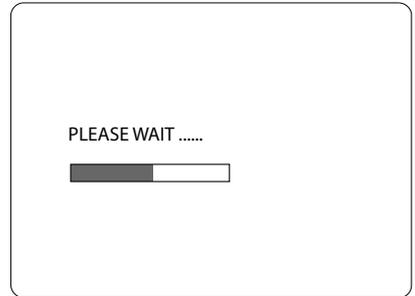
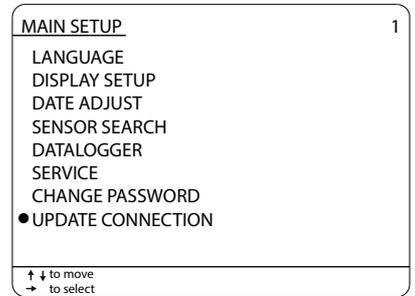


14.1.2 UPDATE CONNECTION

Press “DOWN” to select “UPDATE CONNECTION” and press “RIGHT”.

The display will show the search bar graph progress of the connected transmitters.

The display shows the connected sensors number, the model and the maximum measurement distance.
Press “RIGHT” to save and exit.



15-DATALOGGER

15.1 - DATALOGGER on USB Pen Drive activation

With the arrow keys select the “MAIN SETUP”  menu icon.
Confirm the selection by pressing “ENTER” .

Press “UP” or “DOWN” to select “DATALOGGER”.
Confirm with “RIGHT”.

15.1.1 WRITE RATE

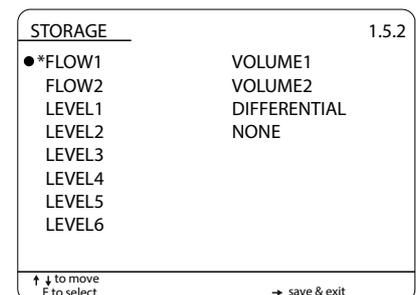
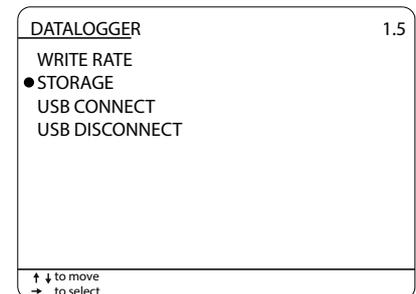
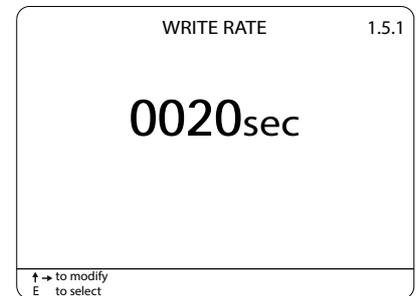
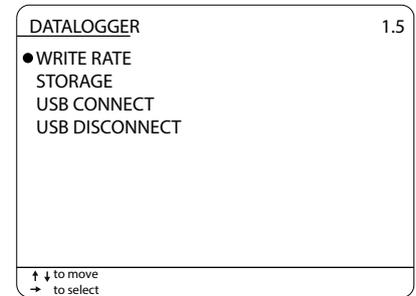
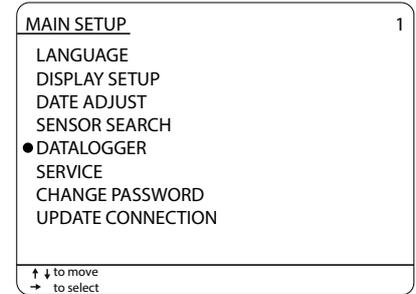
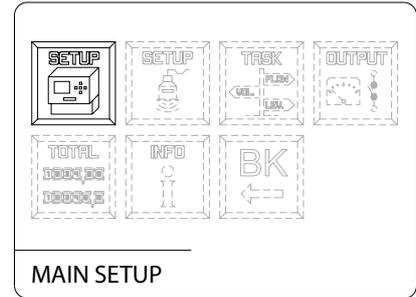
Press “DOWN” to select “WRITE RATE” and press “RIGHT”.

Enter the interval time, in sec., for data storage (min.10 sec., max. 3600 sec.).
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”:

15.1.2 STORAGE

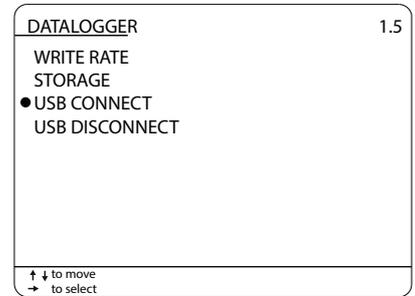
Press “DOWN” to select “STORAGE” and press “RIGHT”.

Position the pointer on the task to be stored.
Pressing “ENTER”, the * symbol will highlight the selection.
Press “RIGHT” to save and exit.
Only the activated functions are selectable.

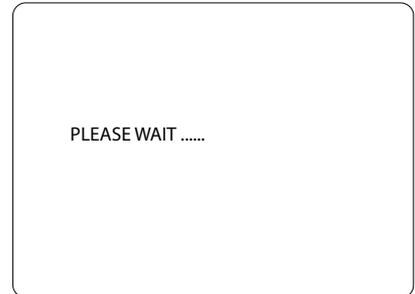


15.1.3 USB CONNECT

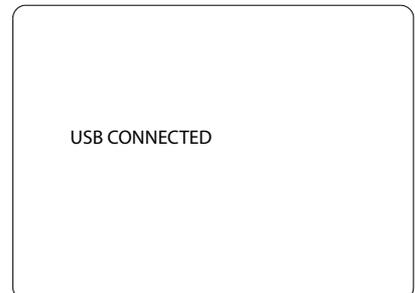
Only if the Pen Drive is inserted into the USB port after turning on the VLW90M, select "USB CONNECT" and confirm with "RIGHT".



Wait until the system finds the connected pen drive to the VLW90M USB port.

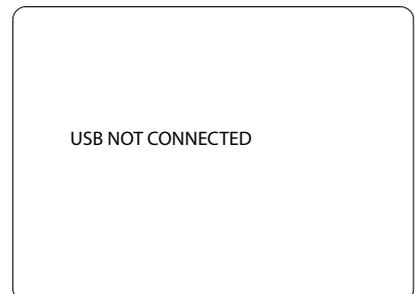


The Pen Drive is connected to the system. The "USB CONNECTED" message is displayed and the data logger is enabled to write data to the "LOG_FILE.TXT" file.



Connection failed. The message "USB NOT CONNECTED" is displayed. Check:

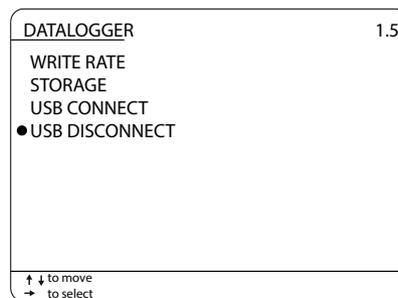
- connection to the USB port
- that the Pen Drive formatting mode (File System) is "FAT32"



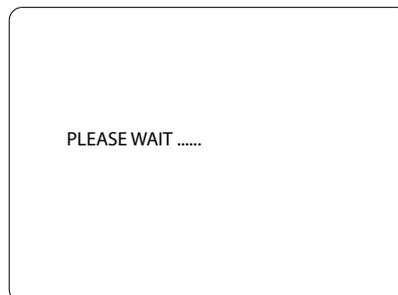
15.2 - DATALOGGER on USB Pen Drive file reading

15.2.1 USB DISCONNECT

Before removing the Pen Drive to read the file, select “USB DISCONNECT” with the “DOWN” and confirm with “RIGHT”.



Wait until the system disconnects the Pen Drive from the VLW90M USB port.

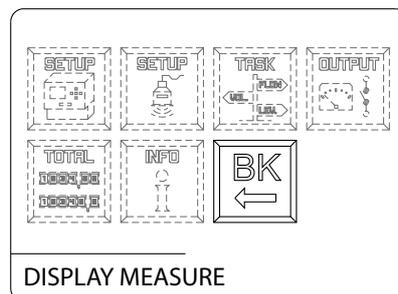


The message “REMOVE USB DEVICE” is displayed. Is now possible to remove the pen drive.



Press 2 times “LEFT” to return to the main menu.

Select  and press “ENTER” to return to “RUN” mode



15.2.2 READ THE STORED DATA

To read the stored data, simply insert the pen drive into a PC or a notebook USB port and open the "LOG_FILE.TXT" datalogger file directly with EXCEL® or CALC by OpenOffice.orgTM.
The following data are available in the table DATA LOGGER (columns):

- **DATE**
- **TIME**
- **TASK**
- **UID** (ultrasonic sensor UID address)
- **FLOW** (flow rate measure)
- **unit** (flow rate measure unit)
- **TOT** (flow totalizer volume)
- **unit** (flow totalizer measure unit)
- **LEV [mm]** (level measure)
- **VOL** (volume measure)
- **unit** (volume measure unit)
- **DIFF[mm]** (differential level measure)
- **PUMP_LEV[mm]** (pump level measure)
- **RL1/2/3/4/5** (relay status; 0 = relay de-energized 1 = relay energized)
- **DIST_ERR** (ultrasonic sensor distance measurement error; 0 = normal condition, 1 = error condition)
- **MAXGAIN_ERR** (ultrasonic sensor max gain alarm; 0 = normal condition, 1 = alarm condition)
- **NOECHO_ERR** (ultrasonic sensor echo signal reception absence; 0 = normal condition, 1 = alarm condition)
- **TEMP_ERR** (ultrasonic sensor temperature measurement error; 0 = normal condition, 1 = alarm condition)

DATE	TIME	TASK	UID	FLOW	unit	TOT	unit	LEV[mm]	VOL	unit	DIFF[mm]	PUMP_LEV[mm]
22/05/2013	18:26:16	FLOW1	1	28513.68	l/m	2529.30	m3	0	0.00	--	0	0
22/05/2013	18:26:36	FLOW1	1	23816.33	l/m	2538.02	m3	0	0.00	--	0	0
22/05/2013	18:26:56	FLOW1	1	6636.55	l/m	2542.76	m3	0	0.00	--	0	0
22/05/2013	18:27:16	FLOW1	1	11376.47	l/m	2545.24	m3	0	0.00	--	0	0

16-FACTORY TEST AND QUALITY CERTIFICATE



In conformity to the company and check procedures I certify that the equipment:

(Multifunction unit)

is conform to the technical requirements on Technical Data and it is made in conformity to the procedure

Quality Control Manager: Production and check date: