

RIF990



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



Technical documentation EN Rev. B

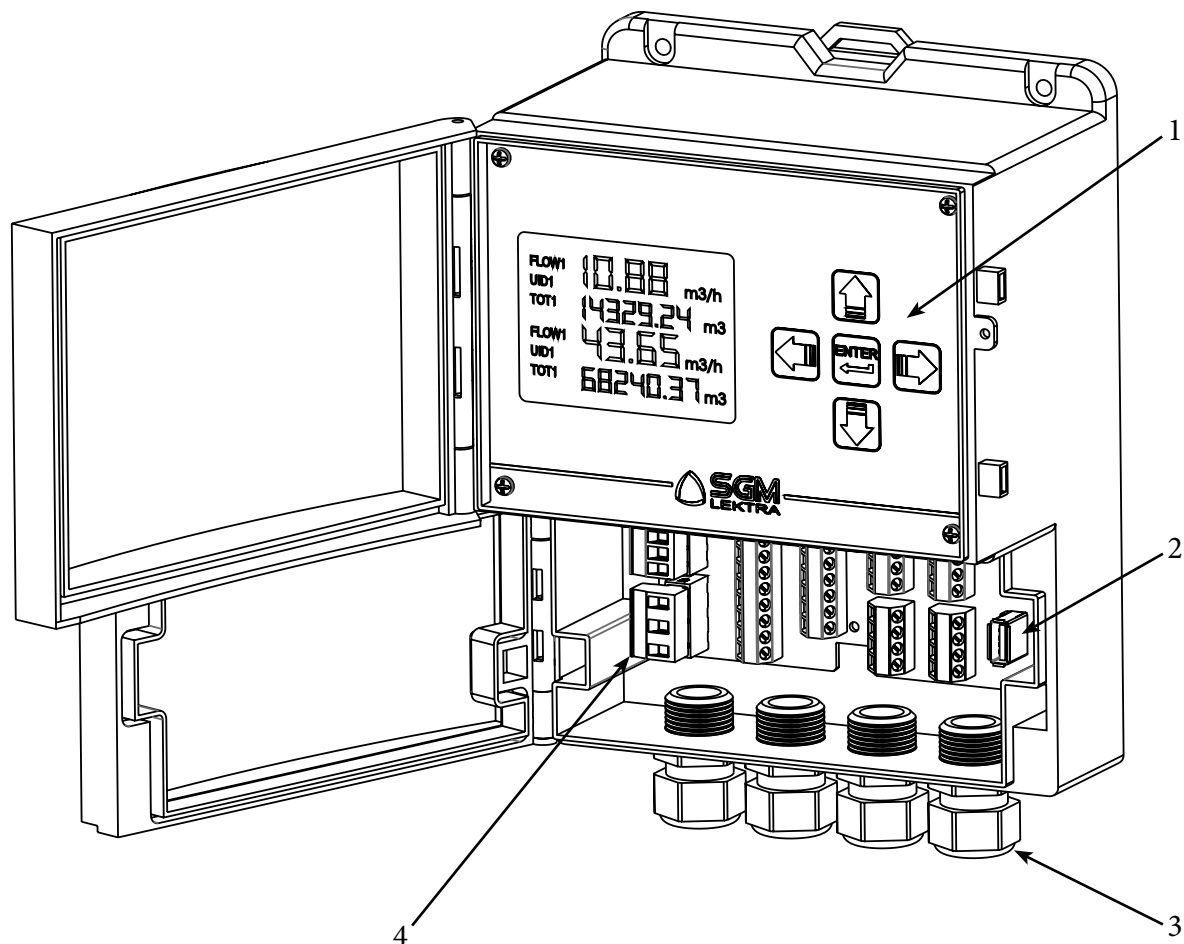
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The warranty will be null if the Client modifies, repair or uses the Products for other purposes than the normal conditions foreseen by instructions or Contract.

In no circumstances shall SGM LEKTRA be liable for direct, indirect or consequential or other loss or damage whether caused by negligence on the part of the company or its employees or otherwise howsoever arising out of defective goods.

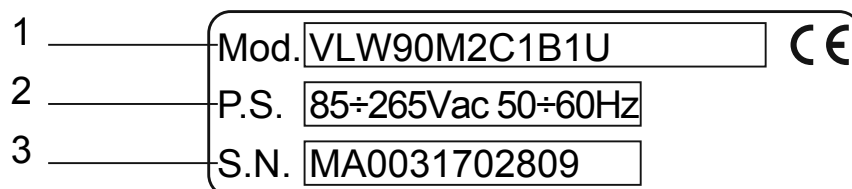
2- PRODUCT



- 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

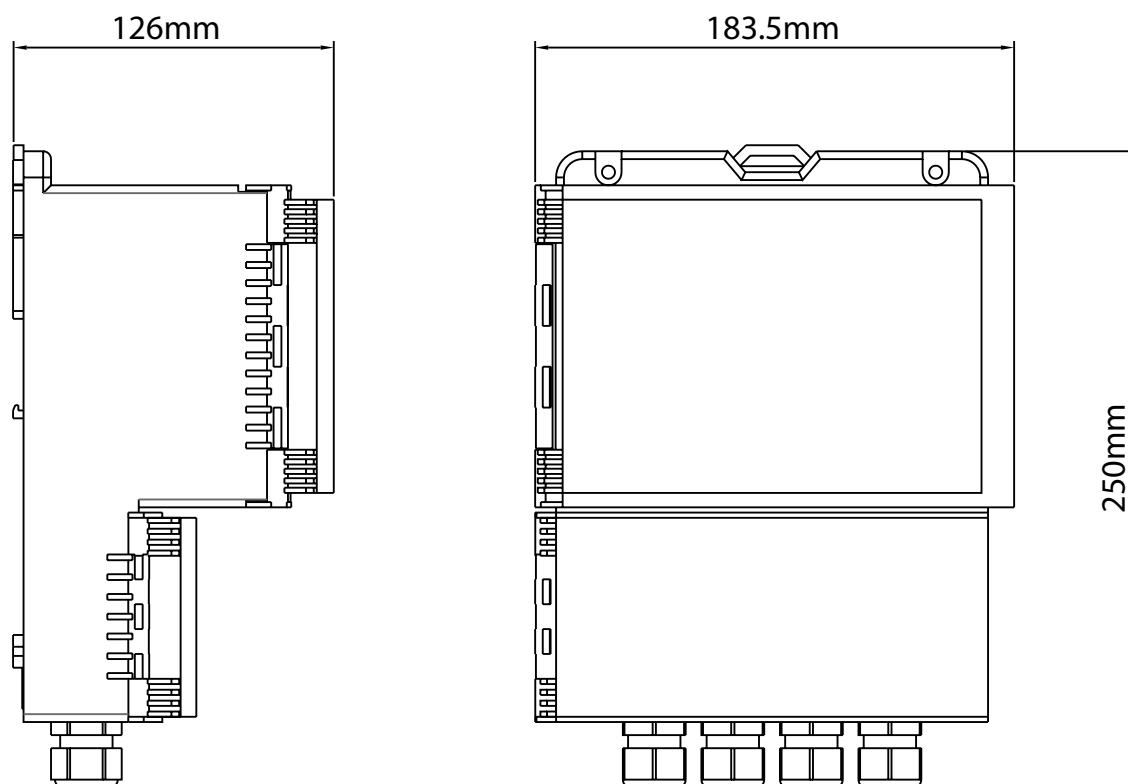
on Pen Drive USB; max.32GB (FAT32)

Power supply for analog transmitters

24Vdc; 200mA max

4-DIMENSIONS

4.1 MECHANICAL DIMENSIONS

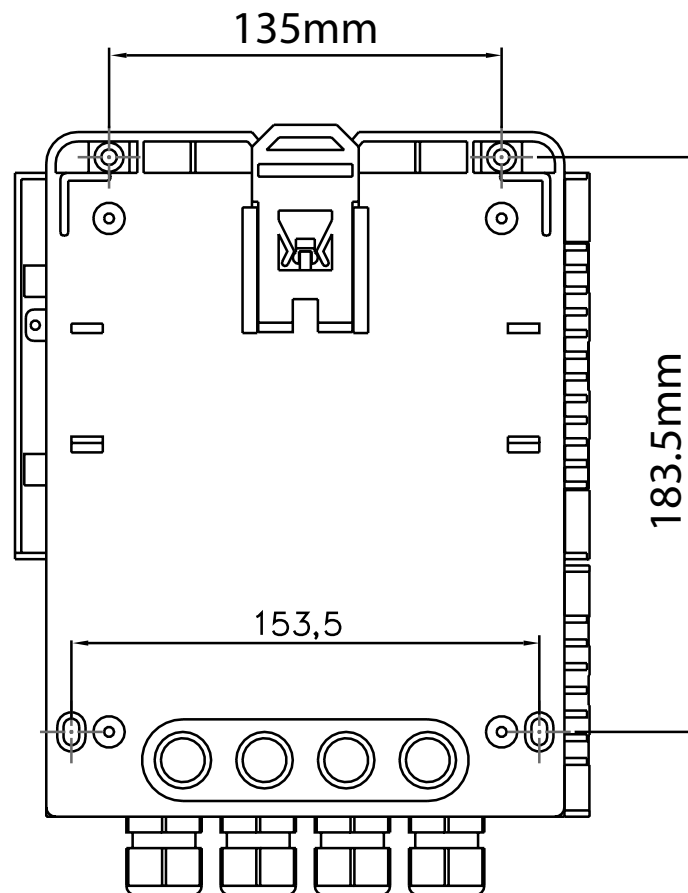


5-INSTALLATION

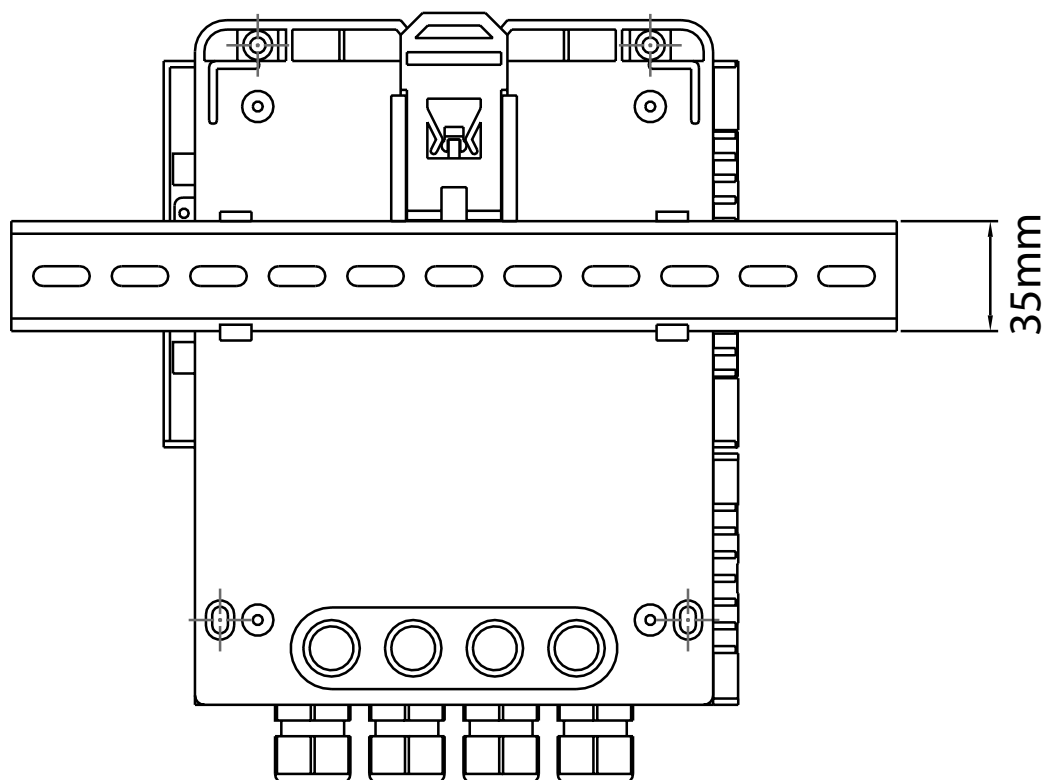
5.1 INSTALLATION PRECAUTION

- 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.

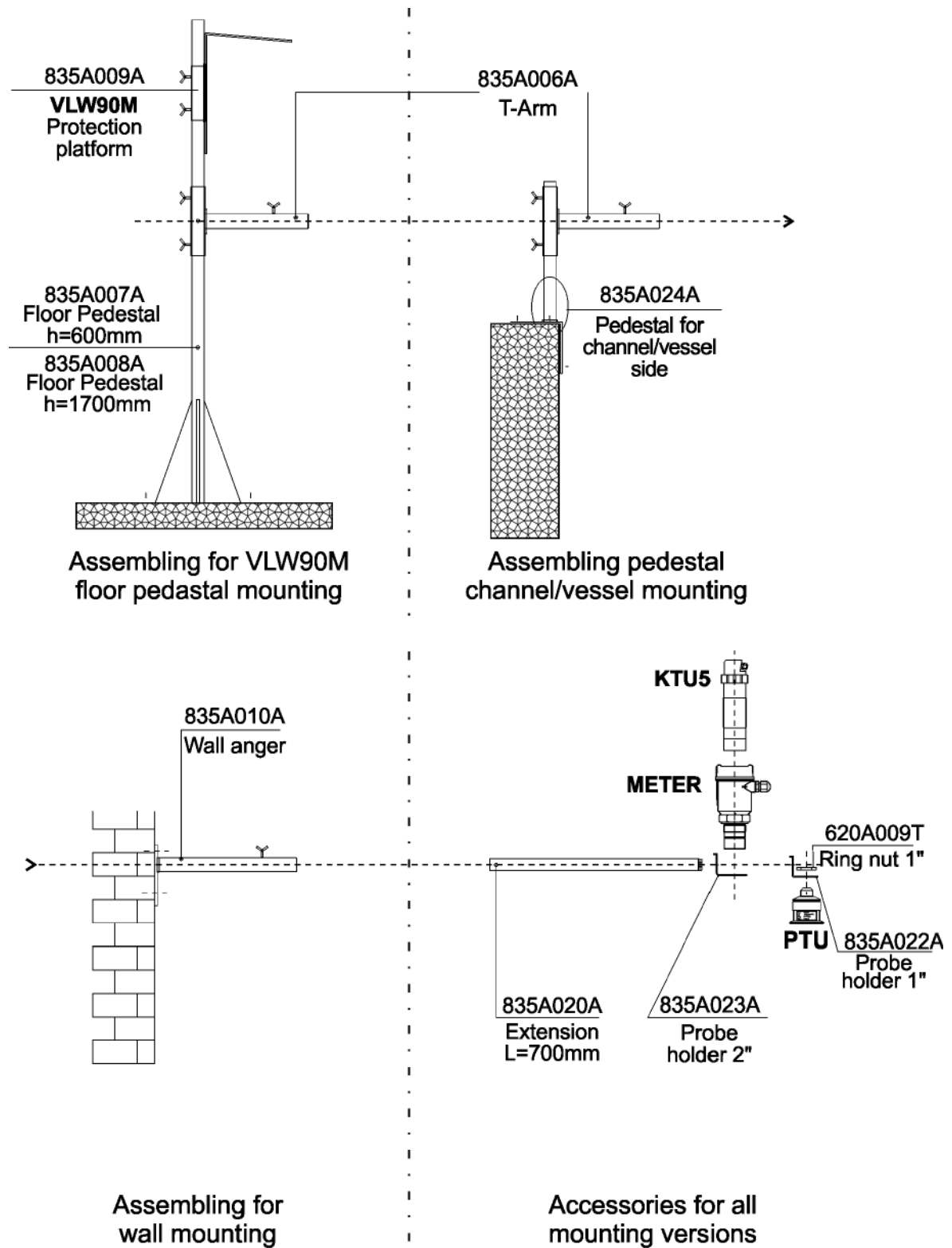
5.1.1 Drilling template for wall mounting



5.1.2 DIN rail mounting



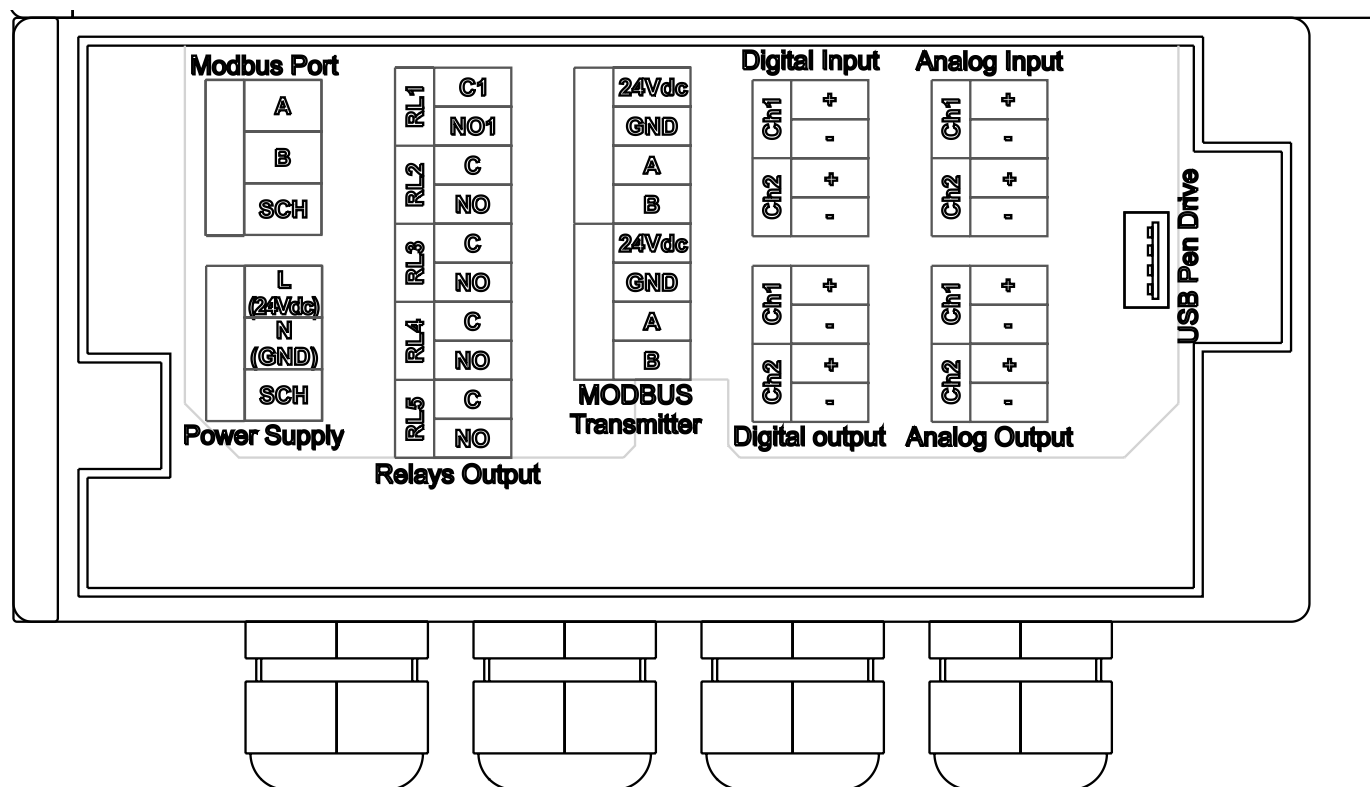
5.1.3 Mechanical installation accessories



6-ELECTRICAL CONNECTIONS

6.1 CONNECTIONS

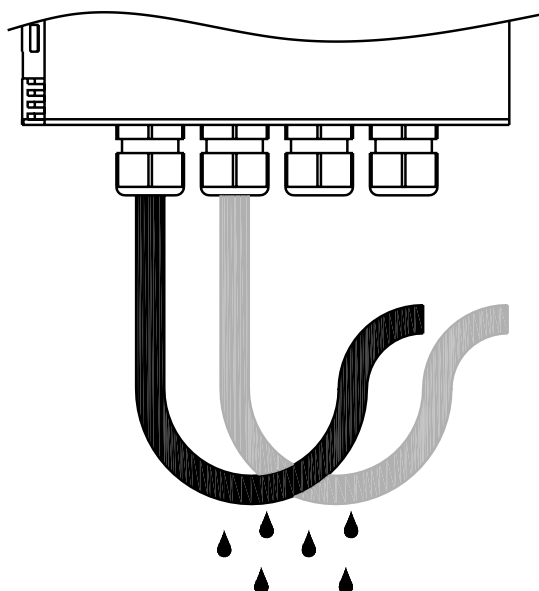
- 1) Separate the engine control cables or power cables from the VLW90M connection cables.
- 2) Remove the caps from the cable glands and open the cover by unscrewing the screws.
- 3) Lead the cables into the transmitter through the cable glands.
- 4) Close the cap and tighten the cable glands



6.2 RECOMMENDATIONS FOR EXTERNAL MOUNTING

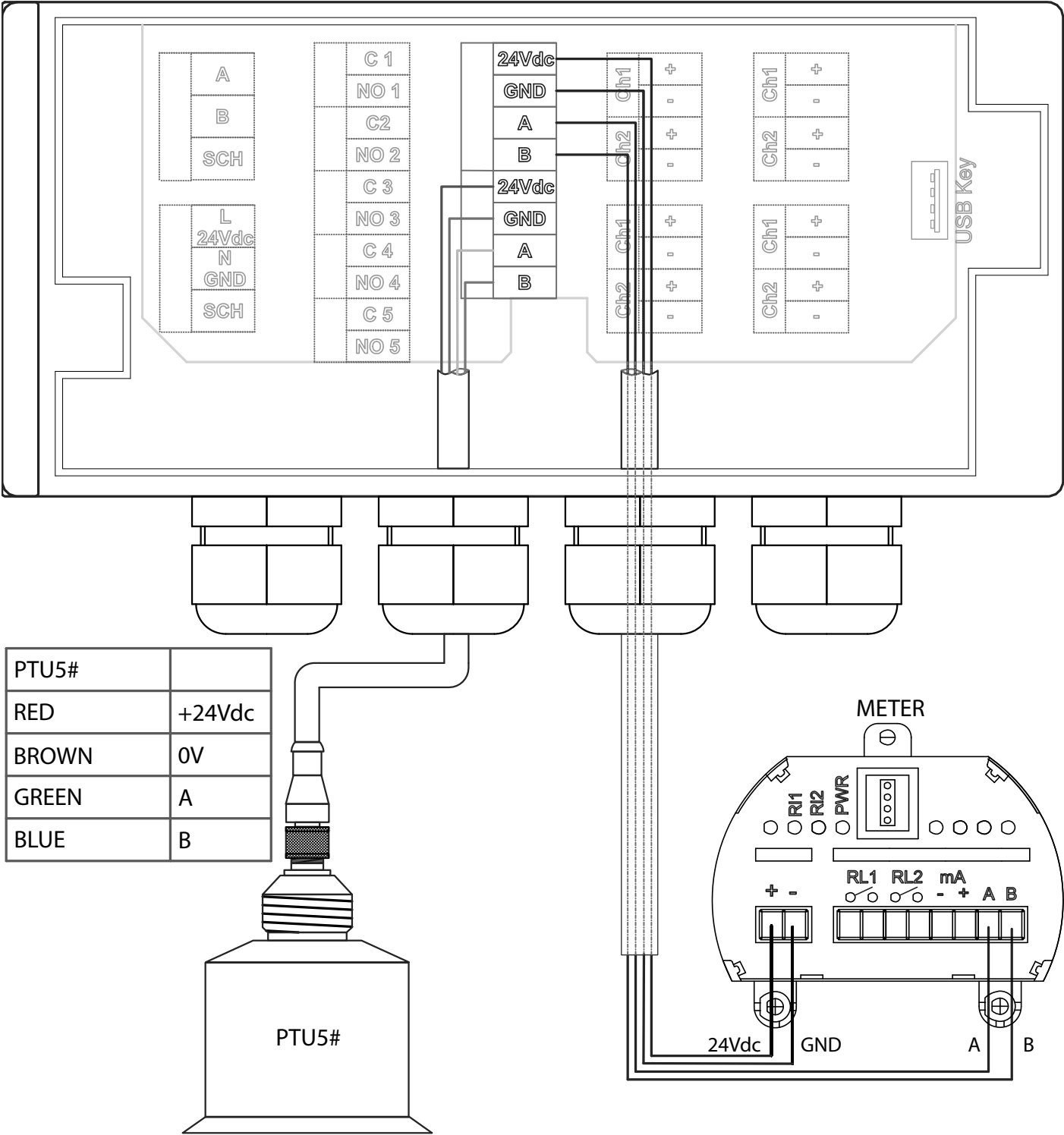
To avoid the humidity infiltration inside the housing is recommended:

- 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.

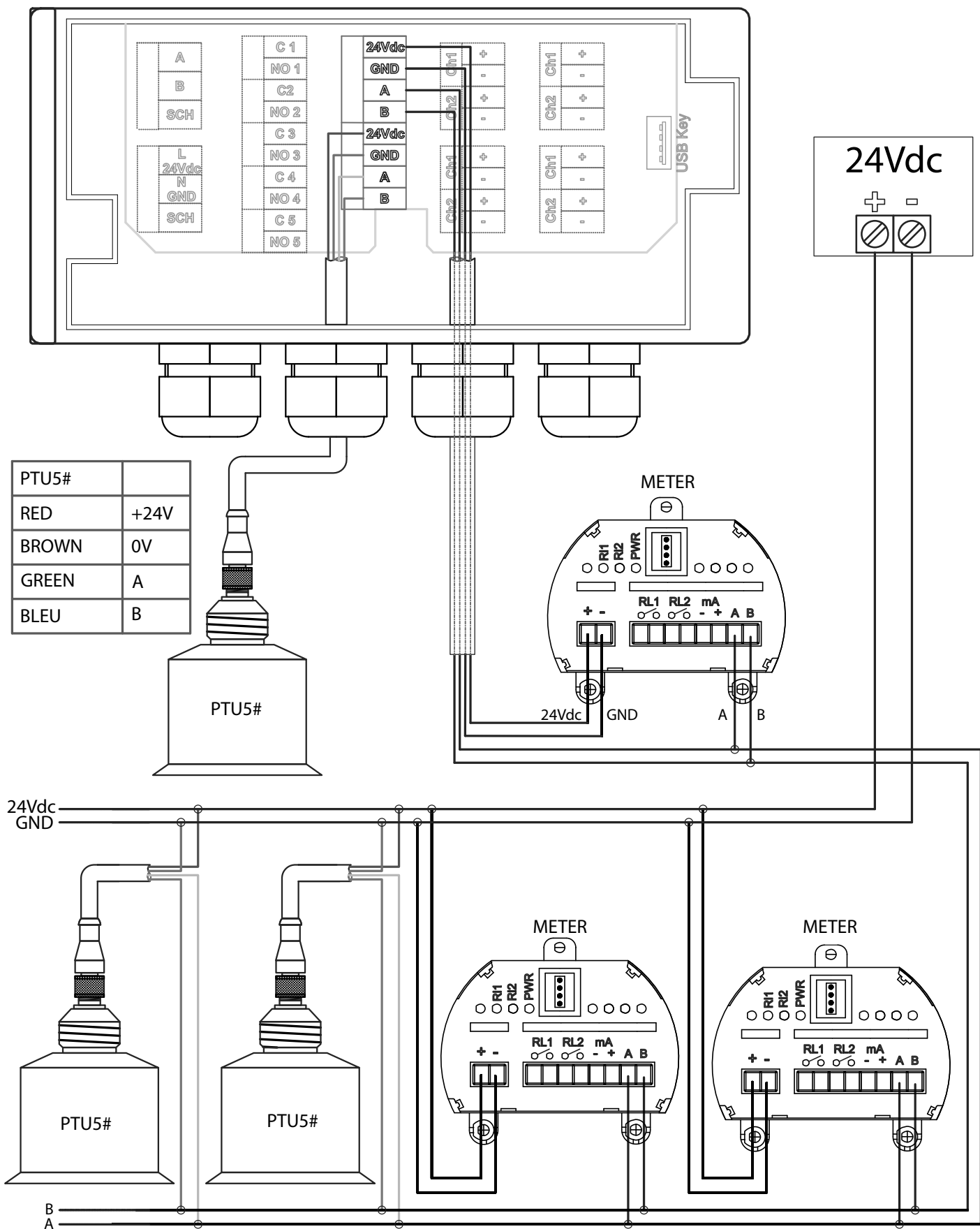


6.3 Riels Instr. ULTRASONIC MODBUS LEVEL TRANSMITTERS CONNECTION

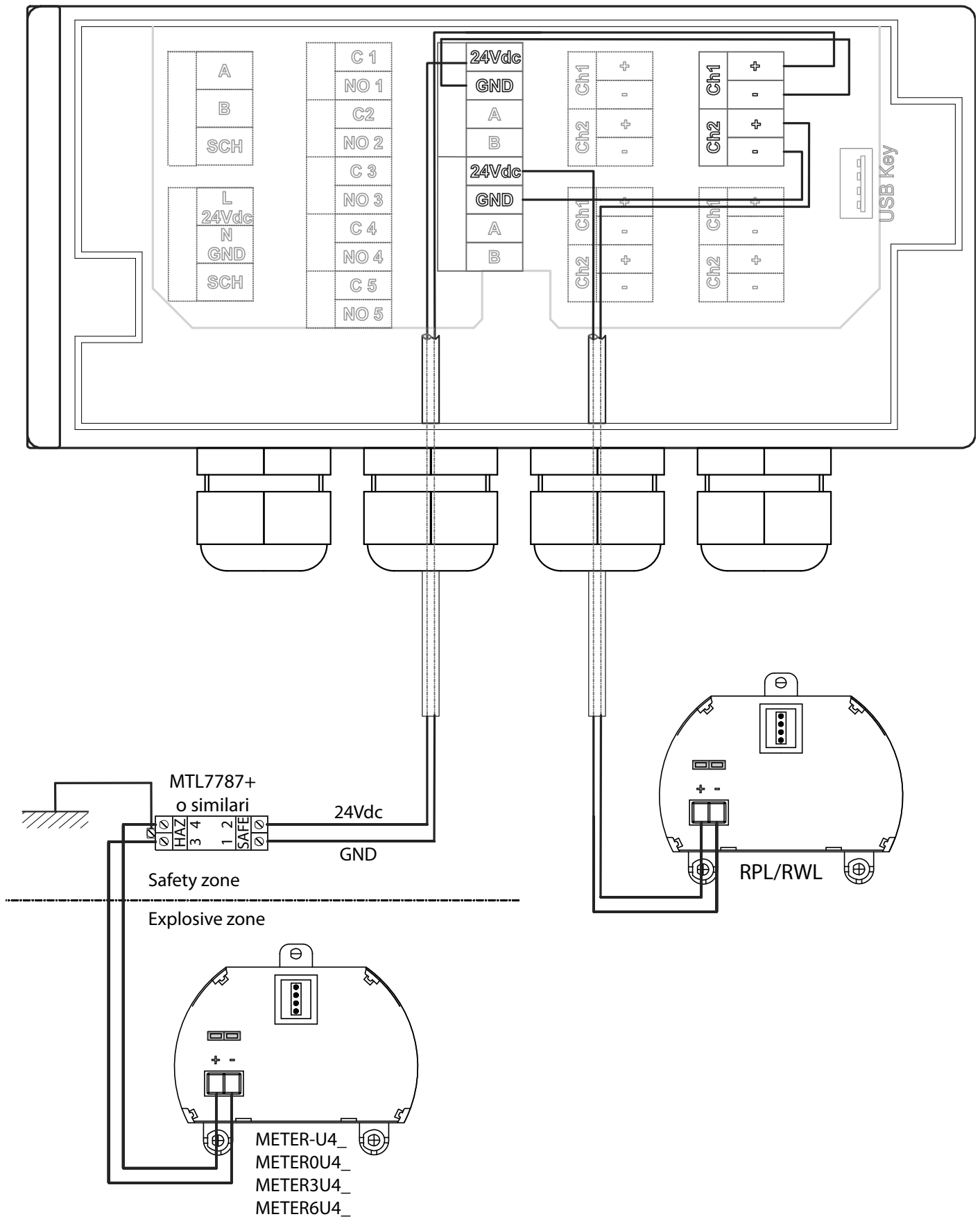
6.3.1 Up to 2 Riels Instr. ultrasonic level transmitters can be directly powered by the VLW90M



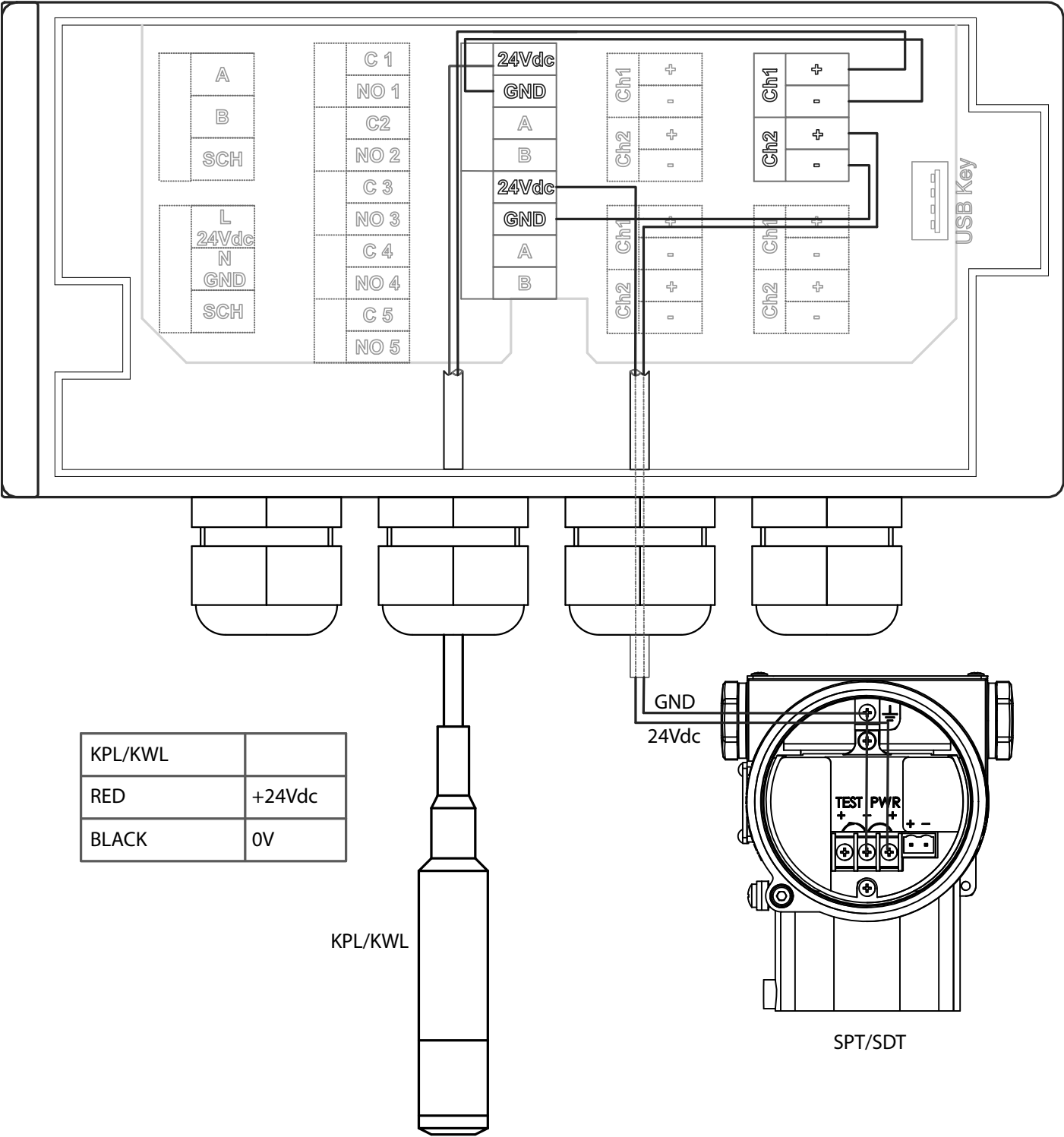
6.3.2 With more than two ultrasonic sensors Riels Instr., 24Vdc additional power supply is needed



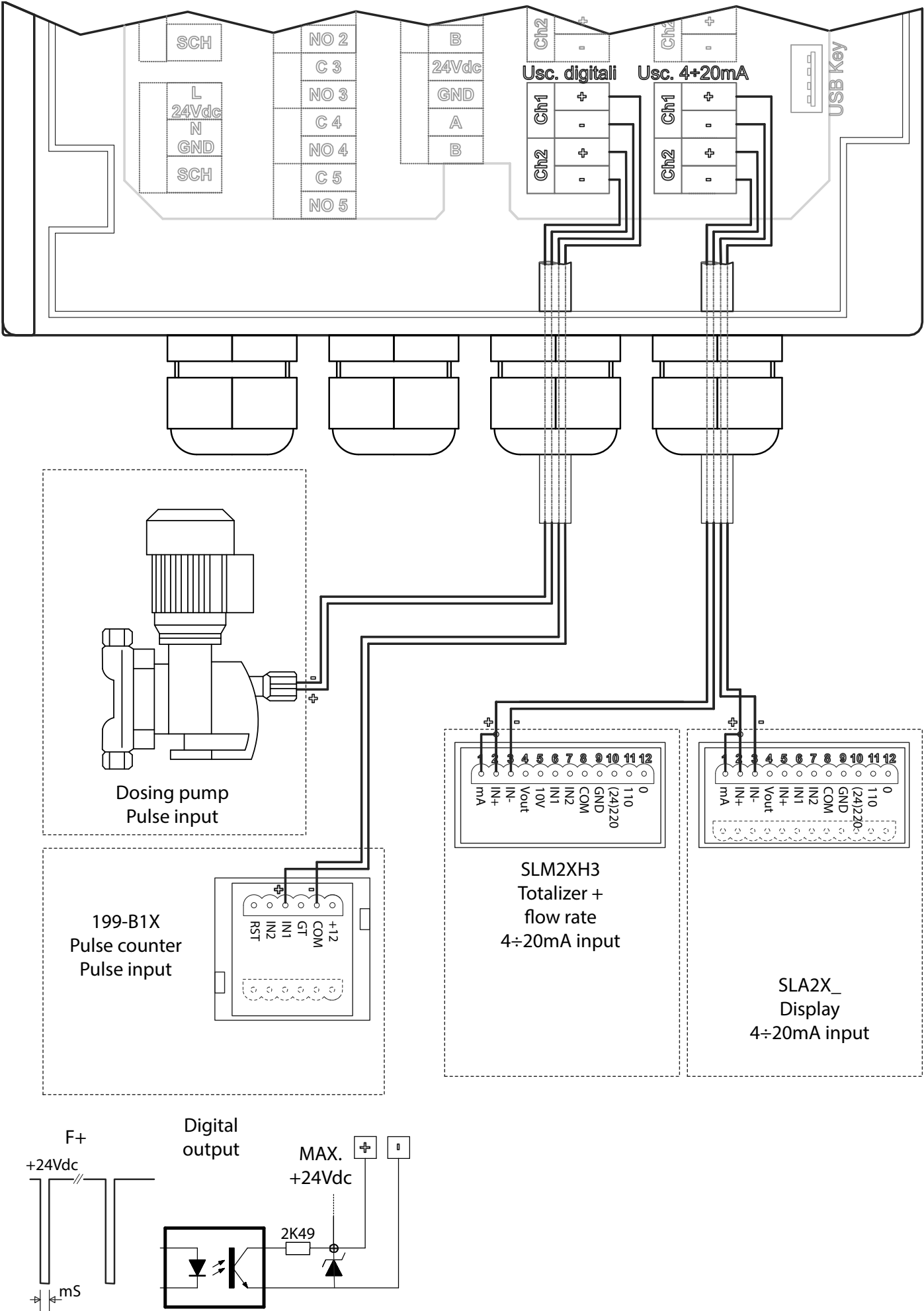
6.3.4 ATEX certified METER or radar RPL / RWL level transmitters connection



6.3.5 Riels Instr. hydrostatic head level transmitters connection



6.3.6 Analog and digital outputs connection











7-PROGRAMMING

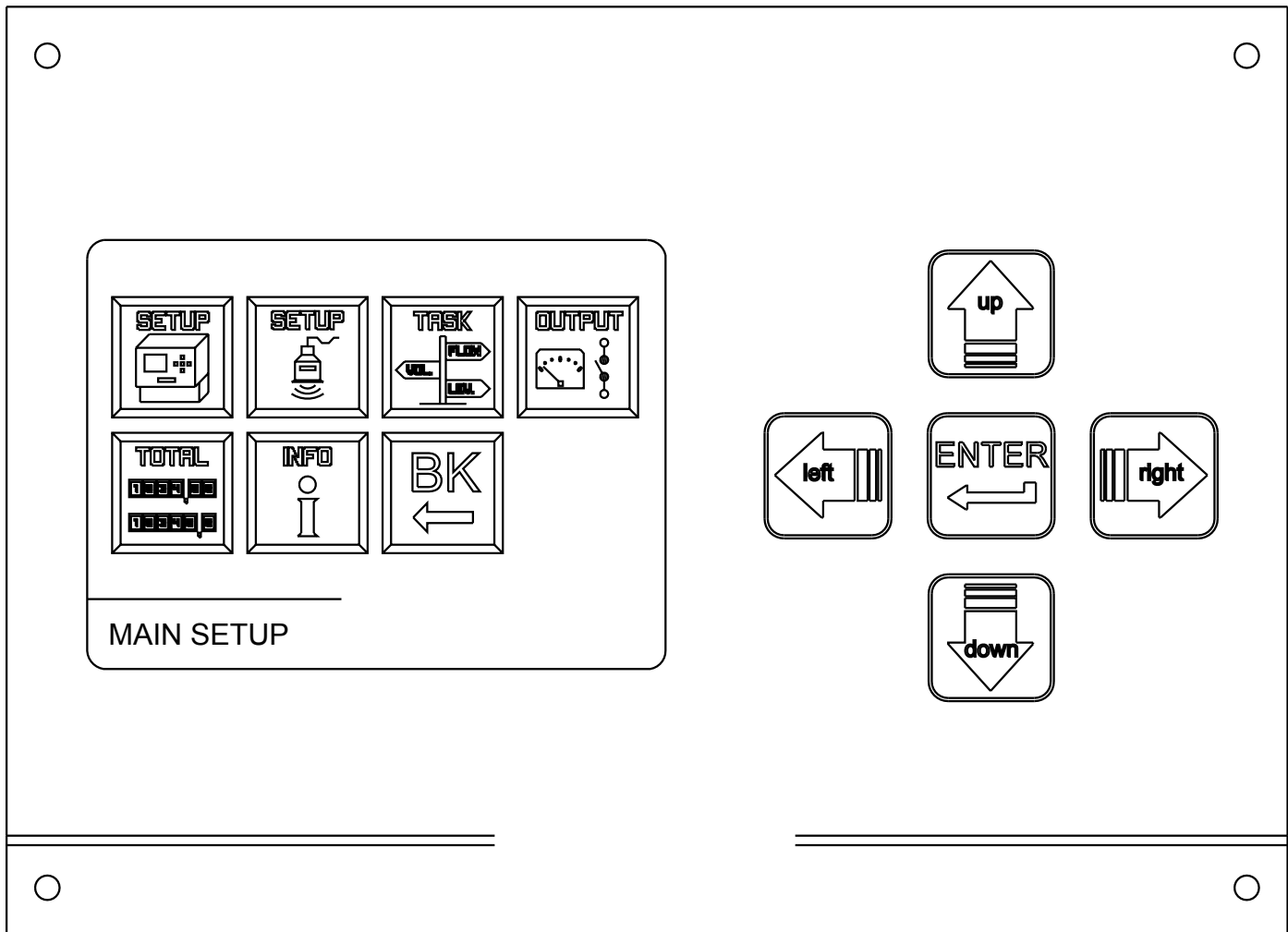
7.1 KEYBOARD

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.

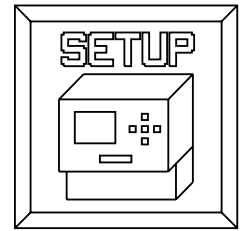
The VLW90M menu structure is simple and easy to intuition.

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 .

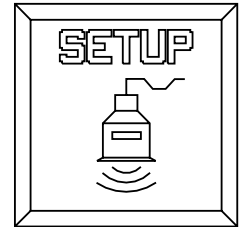


7.2 CONFIGURATION MENU

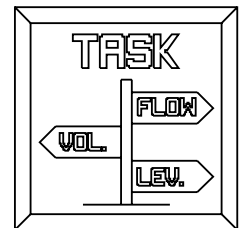
MAIN SETUP - Menu for the VLW90M general configuration.



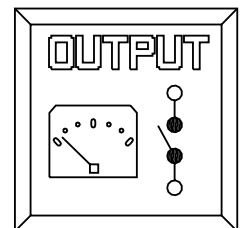
SENSOR SETUP - Menu for Riels Instr. ultrasonic sensors via MODBUS configuration..



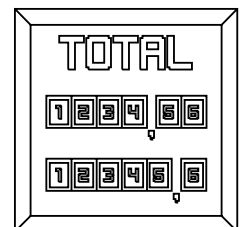
TASK - Menu to configure the VLW90M measurement functions (flow, level, etc.).



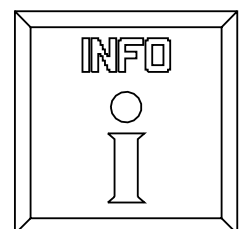
OUTPUT - Menu to configure the analog/digital outputs and the 5 threshold relay.



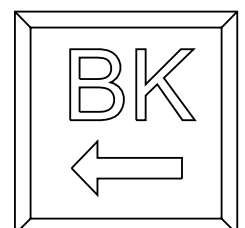
TOTALIZER - Menu for the flow totalizers management



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.

Initializing 

- 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.

* USB CONNECTED

* PROBES FOUND: 4

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

- 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.

* 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

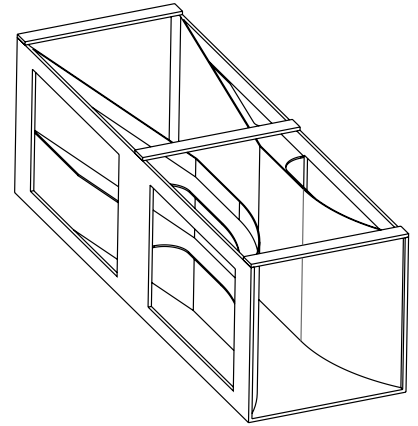
The SGM-LEKTRA developed in collaboration with the Pavia University Hydraulics Institute a “SGM VENTURI STD” called venturi channels family.


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.

SETUP	SETUP	TASK	OUTPUT
TOTAL	INFO	BK	

TASK

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

↑ ↓ to move
→ to select

FLOW1

SENSOR MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA START TOTALIZER
--

↑ ↓ to move
→ to select

FLOW1

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

Error Condition

ACTUAL VALUE LAST VALID VALUE OVER RANGE VALUE ZERO VALUE

↑ ↓ to move
→ to select

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. 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

3.1.6.5

● 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). 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.

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

SET Q MAX	3.1.3
00000m3/h	
↑ ↓ to move E to confirm	

SET ACTUAL HEAD	3.1.3.1
00000mm	
SET Q=0 DISTANCE	
00000mm	
↑ → to modify ↓ to select	

FIG.1

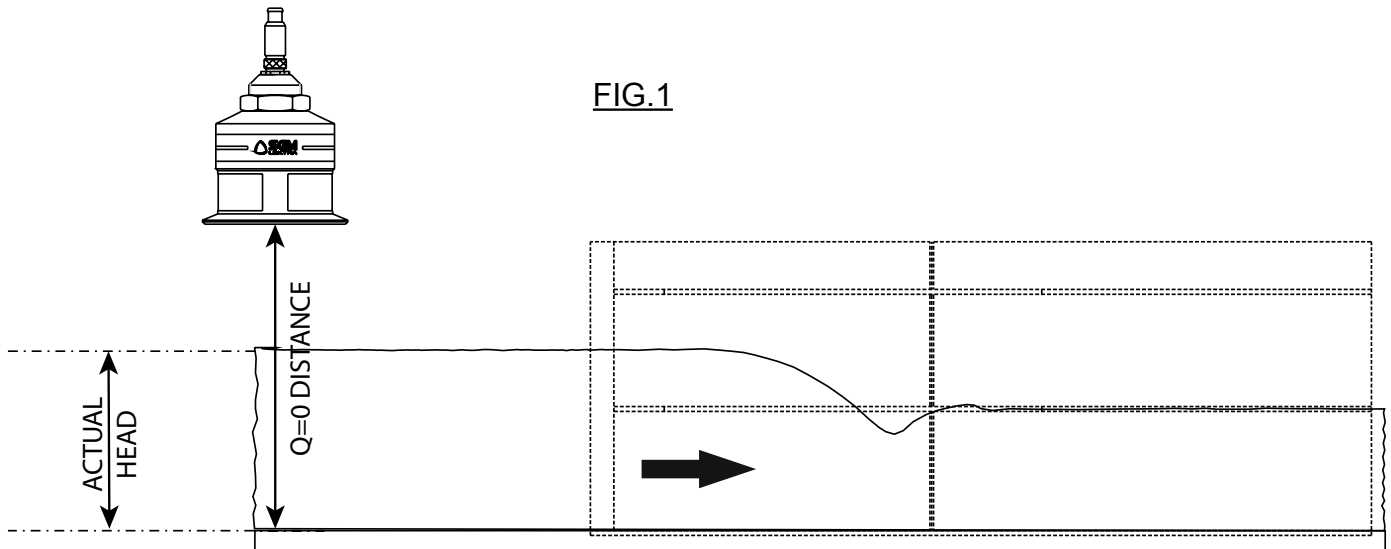
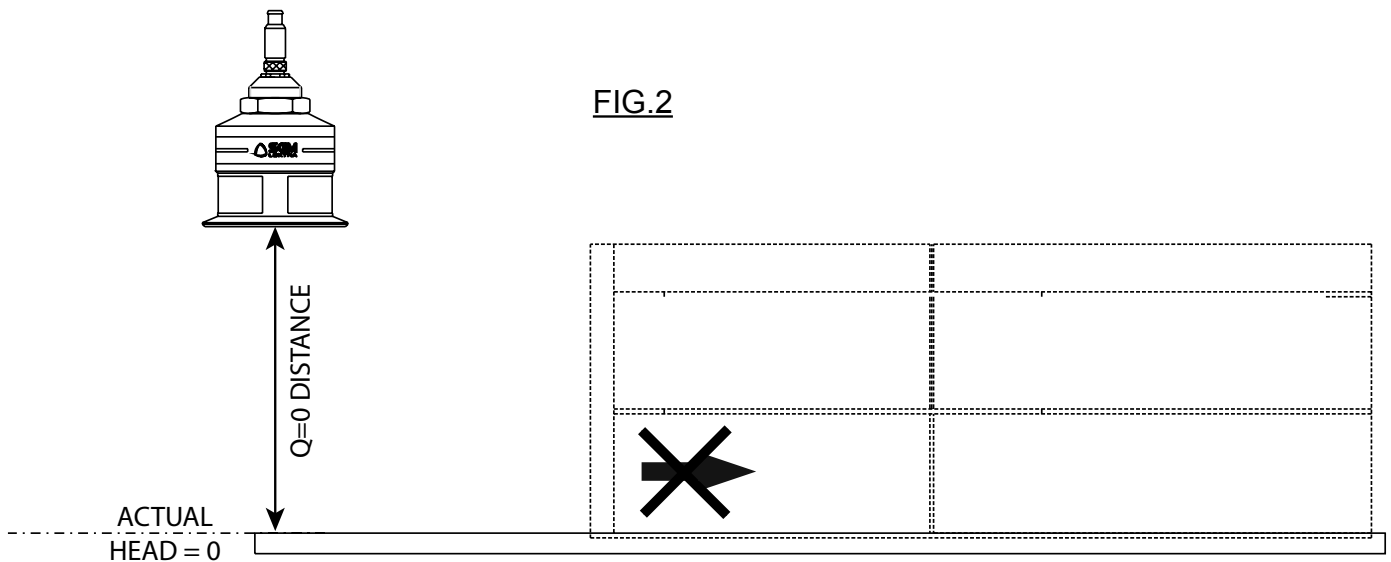



FIG.2



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.

FLOW1

3.1

SENSOR

MEASURE UNIT

CALIBRATION

CUTOFF

MAX FLOW STOP

PRIMARY DEVICE

TABLE

FORMULA

● START TOTALIZER

↑ ↓ to move

→ to select

ARE YOU SURE?

3.1.9


● NO

YES


↑ ↓ to move

→ to select


SETUP




SETUP




TASK




OUTPUT




TOTAL



INFO



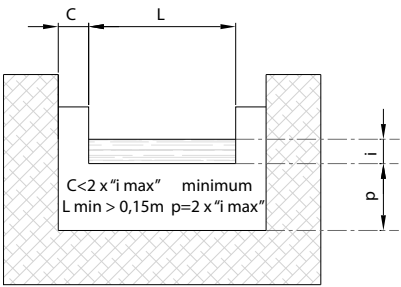
BK




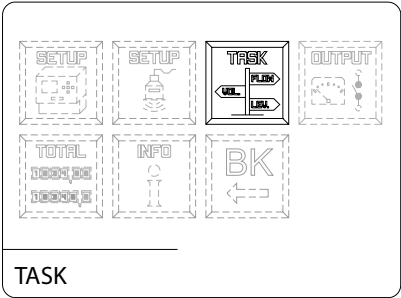
DISPLAY MEASURE

8.2 - Constriction rectangular weir (Francis) configuration

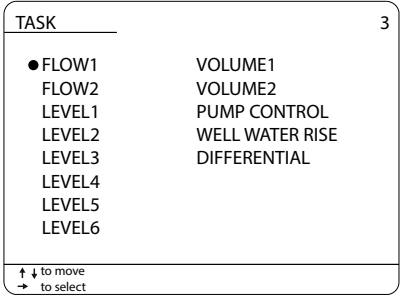
To configure the flow measurement with rectangular weir (Francis) follow the procedure below:



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..

FLOW1

3.1

●

SENSOR
MEASURE UNIT
CALIBRATION
CUTOFF
MAX FLOW STOP
PRIMARY DEVICE
TABLE
FORMULA
START TOTALIZER

↑ ↓

to move

→

to select

FLOW1

3.1.1

●

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

Error Condition

3.1.1.1

●

ACTUAL VALUE
LAST VALID VALUE
OVER RANGE VALUE
ZERO VALUE

↑ ↓

to move

→

to select

FLOW1

3.1

●

SENSOR
MEASURE UNIT
CALIBRATION
CUTOFF
MAX FLOW STOP
PRIMARY DEVICE
TABLE
FORMULA
START TOTALIZER

↑ ↓

to move

→

to select

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

RECT. CONTRACTED

3.1.6.1

0500mm

↑ ↓

to move

E

to confirm

8.2.3 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	

8.2.4 CALIBRATION

Press “DOWN” to select “CALIBRATION” 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	

“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

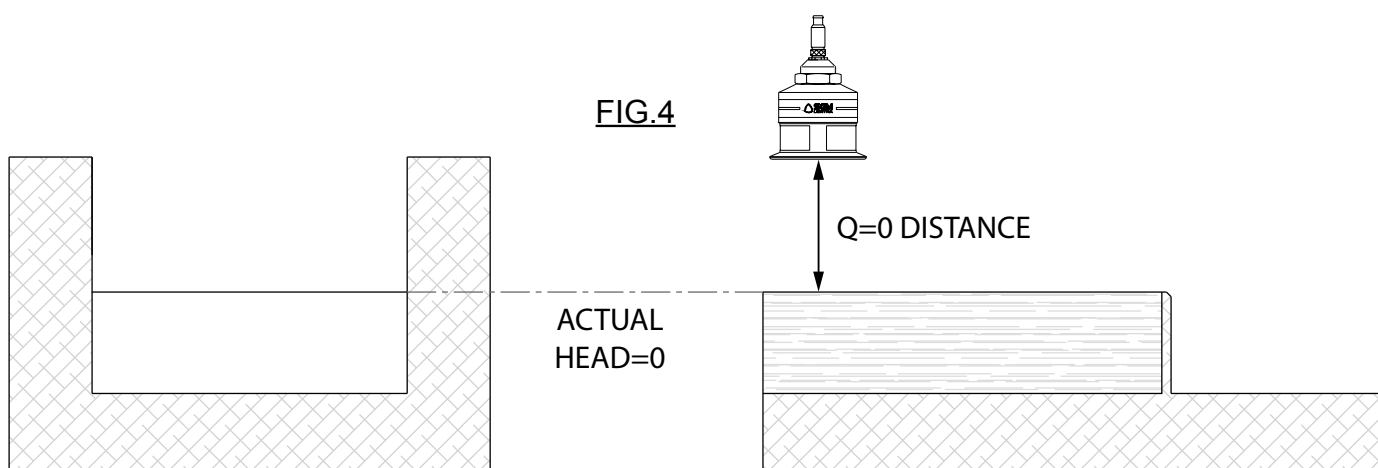
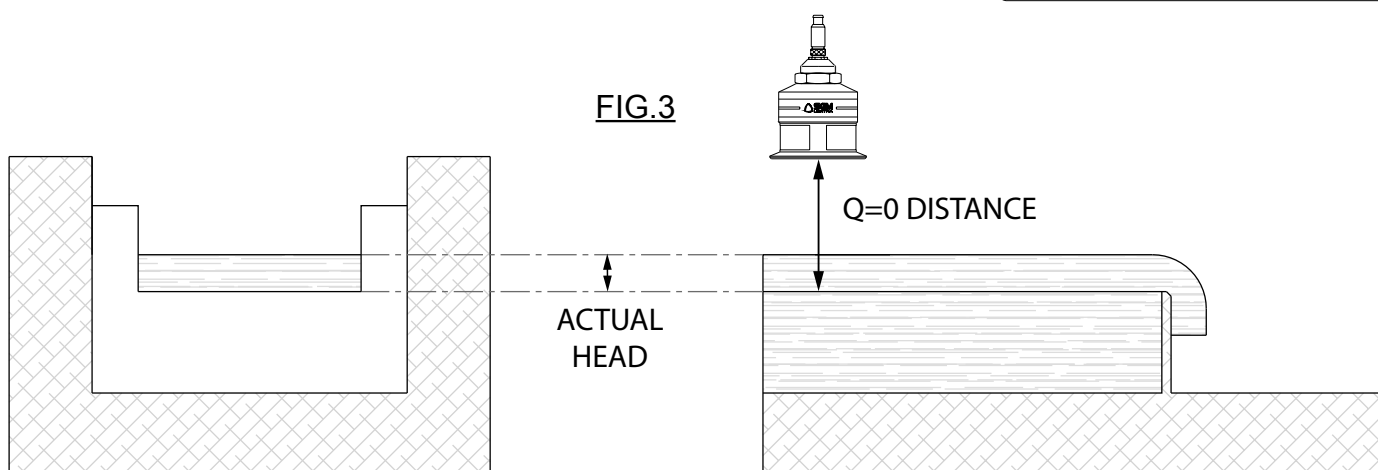
SET Q MAX	3.1.3
00000m3/h	
↑ ↓ to move E to confirm	

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.

SET ACTUAL HEAD	3.1.3.1
00000mm	
SET Q=0 DISTANCE	
00000mm	
↑ → to modify E to confirm ↓ to select	




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.

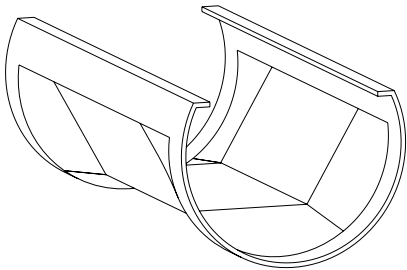
FLOW1	3.1
SENSOR MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA ● START TOTALIZER	
↑ ↓ to move → to select	


ARE YOU SURE?	3.1.9
● NO YES	
↑ ↓ to move → to select	

 TOTAL 000000 000000	 INFO 000000 000000	 BK 000000 000000	
DISPLAY MEASURE			

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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

FUNZIONE

TASK

3

● FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTROL

WELL WATER RISE

DIFFERENTIAL

↑ ↓ to move

→ to select

FLOW1

3.1

● SENSOR

MEASURE UNIT

CALIBRATION

CUTOFF

MAX FLOW STOP

PRIMARY DEVICE

TABLE

FORMULA

TART

☒T

↑ ↓ to move

→ to select

FLOW1

3.1.1

● SENSOR_1

SENSOR_2

SENSOR_3

SENSOR_4

SENSOR_5

SENSOR_6

SENSOR_7

SENSOR_8

ANALOG_1

ANAL

NONE

↑ ↓ to move

→ to select

Error Condition

3.1.1.1

ACTUAL VALUE

● LAST VALID VALUE

OVER RANGE VALUE

ZERO VALUE

↑ ↓ to move

→ to select

8.3.2 PRIMARY DEVICE

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

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

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

8.3.3 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.

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

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	

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	

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

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

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.

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

“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

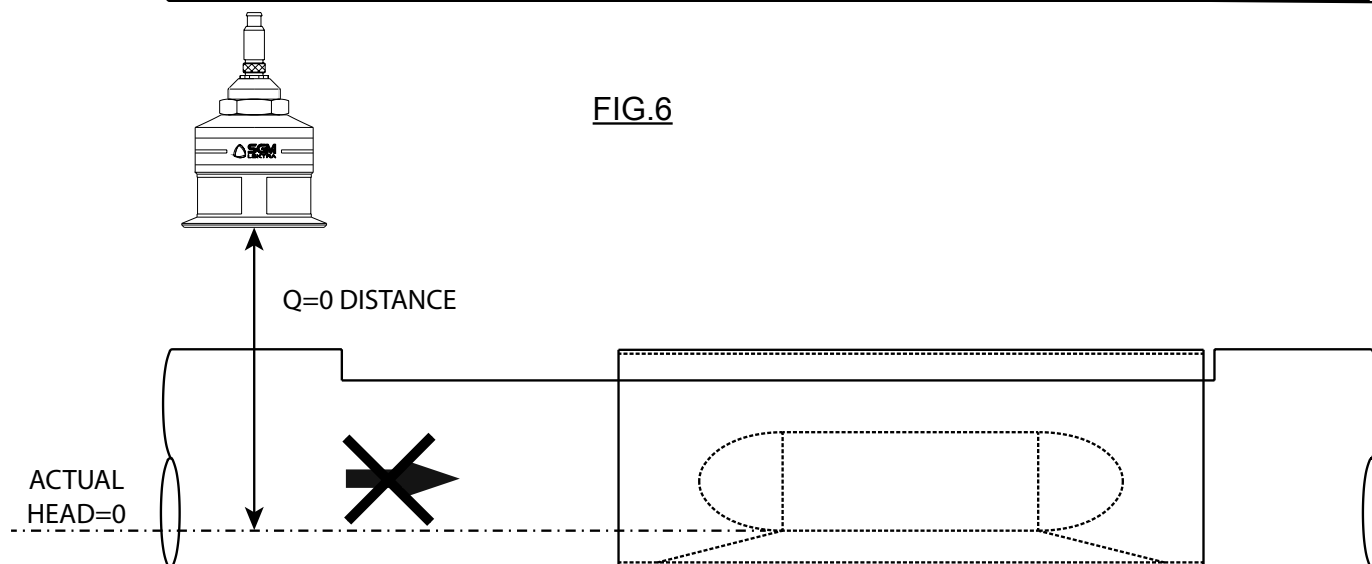
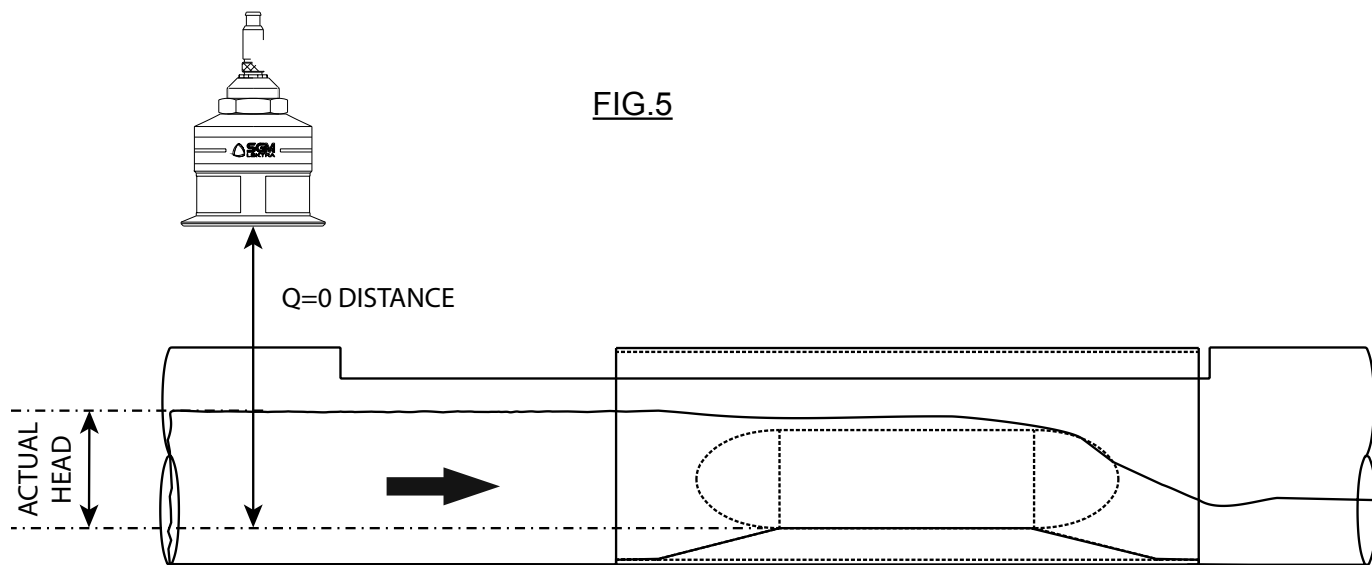
SET Q MAX	3.1.3
00000m3/h	
↑ ↓ to move E to confirm	

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.

SET ACTUAL HEAD	3.1.3.1
00000mm	
SET Q=0 DISTANCE	
00000mm	
↑ → to modify ↓ to select	




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.


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

ARE YOU SURE?	3.1.9
● NO YES	
↑ ↓ to move → to select	

 TOTAL 000000 000000	 INFO 000000 000000	 BK 000000 000000	
DISPLAY MEASURE			

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”.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

OUTPUTS

OUTPUTS

4

RELAY1
RELAY2
RELAY3
RELAY4
RELAY5
● DIGITAL1
DIGITAL2
ANALOG1
ANALOG2

↑ ↓ to move
→ to select

DIGITAL 1

4.6

● TOTALIZER
DIAGNOSTIC
NONE

↑ ↓ to move
→ to select

TOTALIZER

4.6.1

● SELECT TOTALIZER
VOL/PULSE
PULSE LENGTH

↑ ↓ to move
→ to select

SELECT TOTALIZER

4.6.1.1

● TOTALIZER1
TOTALIZER2
USER TOTALIZER
NONE

↑ ↓ to move
→ to select

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”.

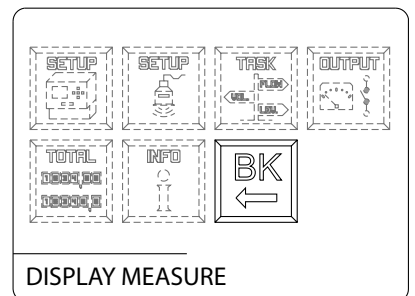
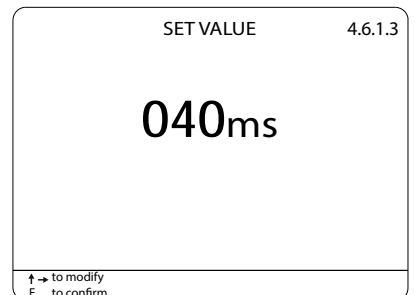
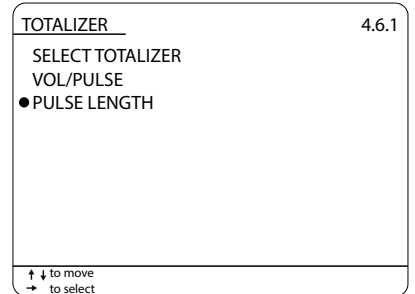
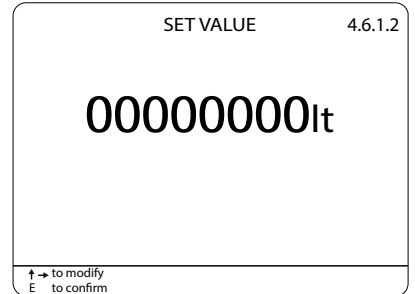
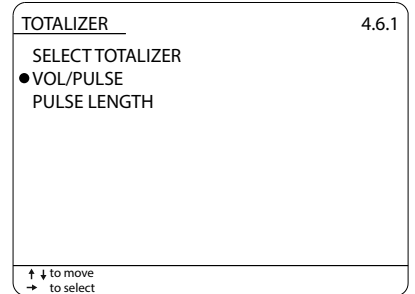
8.4.3 PULSE LENGTH

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”.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

OUTPUTS

OUTPUTS

4

RELAY1
RELAY2
RELAY3
RELAY4
RELAY5
DIGITAL1
DIGITAL2
●ANALOG1
ANALOG2

↑ ↓ to move
→ to select

ANALOG 1

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

00000.00 m3/h

↑ → to modify
E to confirm

ANALOG 1

4.8.1.2

SET 4mA VALUE
●SET 20mA VALUE

↑ ↓ to move
→ to select


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".








SET 20mA VALUE 4.8.1.2

00000.00 m3/h

↑ → to modify
E to confirm

DISPLAY MEASURE

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

8.6.1 TASK

Press “RIGHT” to select “TASK”.

RELAY14.1.1

● TASK

MODE

THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

Select “FLOW1” or “FLOW2”. Press “RIGHT” to confirm.

RELAY14.1.1.1

● FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

NONE

↑ ↓ to move

→ to select

8.6.2 MODE

Press “RIGHT” to select “MODE”.

RELAY14.1.1

TASK

● MODE

THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

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

RELAY14.1.1.2

● min

MAX

↑ ↓ to move

→ to select

8.6.3 THRESHOLD VALUE

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

RELAY14.1.1

TASK

MODE

● THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

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

SET VALUE4.1.1.3

00000.00 m3/h

↑ → to modify

E to confirm

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

RELAY1	4.1.1
TASK	
MODE	
THRESHOLD VALUE	
THRESHOLD HYSTERES	
● SAFETY	
DELAY	

↑ ↓ to move
→ to select

SAFETY	4.1.1.5
● NO	
YES	

↑ ↓ to move
→ to select


			
			

DISPLAY MEASURE

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


SETUP



SETUP


TASK


OUTPUT


TOTAL


INFO


BK


1

MAIN SETUP

LANGUAGE

● DISPLAY SETUP

DATE ADJUST

SENSOR SEARCH

DATALOGGER

SERVICE

CHANGE PASSWORD

UPDATE CONNECTION

↑ ↓ to move
→ to select

DISPLAY SETUP

1.2

LCD COLOR

BACKLIGHT

● DISPLAY MEASURES

SCROLL TIME

TREND DISPLAY

↑ ↓ to move
→ to select

DISPLAY MEASURES

1.2.3

● *FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTR

WATER RISE

DIFFER


TOTALIZER


ERRORS


TREND


↑ ↓ to modify
E to confirm


→ save & exit


SETUP



SETUP


TASK


OUTPUT


TOTAL


INFO


BK


1


DISPLAY MEASURE

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

↑ ↓ to move
→ to select

LEVEL1	3.3
● SENSOR CALIBRATION	

↑ ↓ to move
→ to select

LEVEL1	3.3.1
● SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6	SENSOR_7 SENSOR_8 ANALOG_1 ANALOG_2 NONE

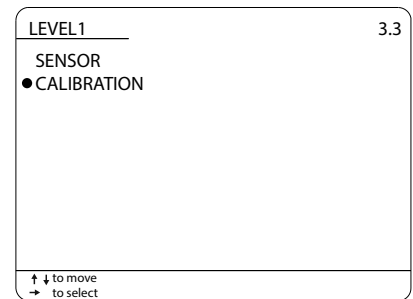
↑ ↓ to move
→ to select

Error Condition	3.3.1.1
ACTUAL VALUE ● LAST VALID VALUE OVER RANGE VALUE ZERO VALUE	

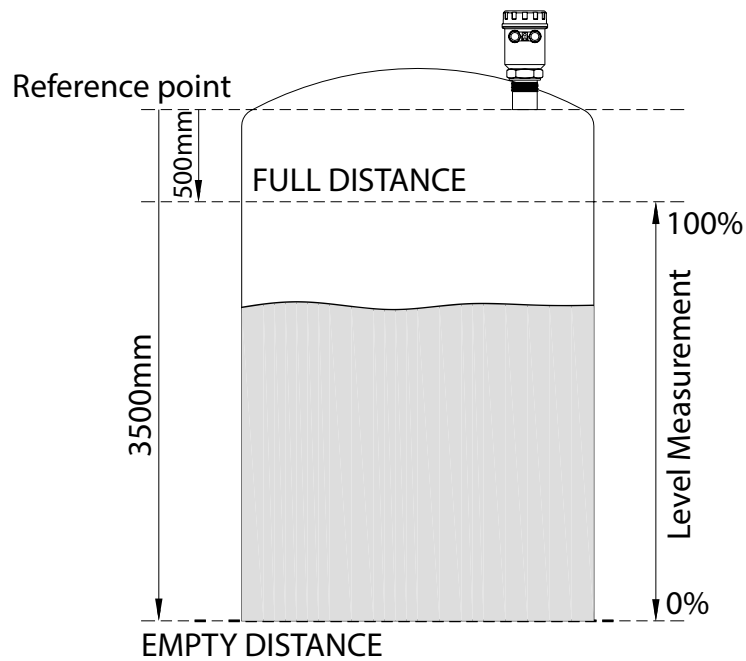
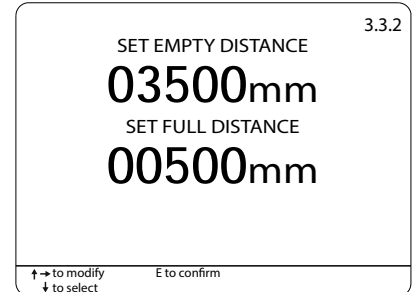
↑ ↓ to move
→ to select

9.1.2 CALIBRATION

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

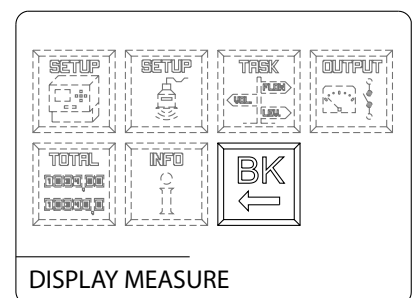


Enter the empty and full distance in mm.
Press “DOWN” to select the distance to be set,
Move the cursor with “RIGHT” and press “UP” to change the digit.
Confirm with “ENTER”.



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.

SETUP	SETUP	TASK	OUTPUT
TOTAL	INFO	BK	

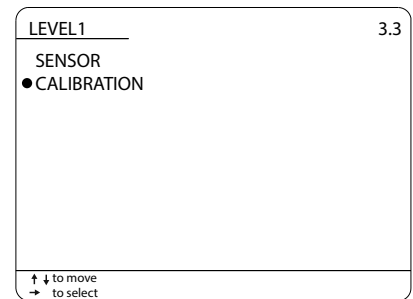
TASK		3
FLOW1 FLOW2 ● LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL	
↑ ↓ to move → to select		

LEVEL1		3.3
● SENSOR CALIBRATION		
↑ ↓ to move → to select		

LEVEL1		3.3.1
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		

9.2.2 CALIBRATION

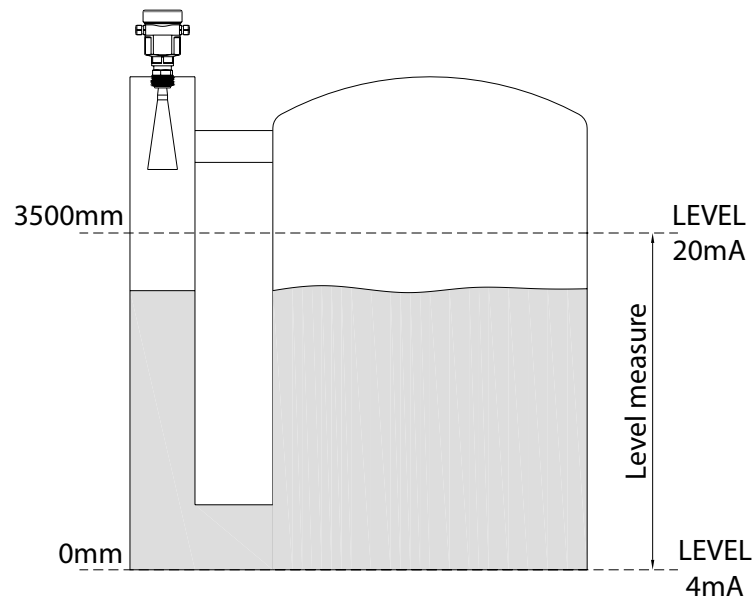
Press “DOWN” to select “CALIBRATION” and press “RIGHT” to confirm.



Enter the level value at 4mA and 20mA.

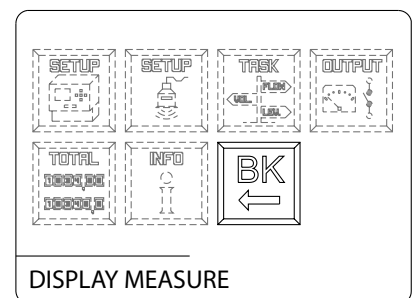
Press “DOWN” to select the distance to be set, Move the cursor with “RIGHT” and press “UP” to change the digit.

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.

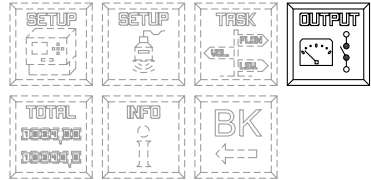
With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”.

Press “UP” or “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 beginning of scale, press “RIGHT” to select “SET 4mA VALUE”.



OUTPUTS

OUTPUTS 4

- RELAY1
- RELAY2
- RELAY3
- RELAY4
- RELAY5
- 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”.

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”.

ANALOG1 4.8.1

SET 4mA VALUE
 ● SET 20mA VALUE

↑ ↓ to move
 → to select


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

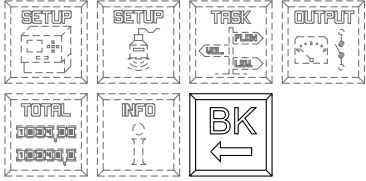
SET 20mA VALUE 4.8.1.2

00000 mm

↑ → to modify
 E to confirm

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


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



DISPLAY MEASURE

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

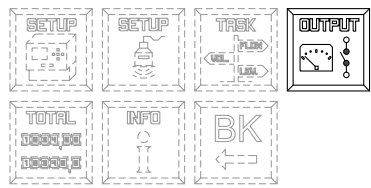
Press “RIGHT” to select “THRESHOLD”.

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”.

THRESHOLD

4.1.1

TASK

●MODE

THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

RELAY1

4.1.1.2

●min

MAX

↑ ↓ to move

→ to select

THRESHOLD

4.1.1

TASK

MODE

●THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

SET VALUE

4.1.1.3

00000 mm

↑ → to modify

↵ to confirm

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.

THRESHOLD	4.1.1
TASK	
MODE	
THRESHOLD VALUE	
THRESHOLD HYSTERES	
● SAFETY	
DELAY	

↑ ↓ to move
→ to select

SAFETY	4.1.1.5
● NO	
YES	


↑ ↓ to move
→ to select

DISPLAY MEASURE

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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

MAIN SETUP

MAIN SETUP1

LANGUAGE

● DISPLAY SETUP

DATE ADJUST

SENSOR SEARCH

DATALOGGER

SERVICE

CHANGE PASSWORD

UPDATE CONNECTION

↑ ↓ to move
→ to select

DISPLAY SETUP1.2

LCD COLOR

BACKLIGHT

● DISPLAY MEASURES

SCROLL TIME

TREND DISPLAY

↑ ↓ to move
→ to select

DISPLAY MEASURES1.2.3

FLOW1

FLOW2

● *LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTR

WATER RISE

DIFFER

TOTALIZER

ERRORS

TREND

↑ ↓ to modify
E to confirm
→ save & exit

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK


DISPLAY MEASURE

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”.

SETUP	SETUP	TASK	OUTPUT
TOTAL	INFO	BK	

TASK		3
FLOW1	VOLUME1	
FLOW2	VOLUME2	
LEVEL1	PUMP CONTROL	
LEVEL2	WELL WATER RISE	
LEVEL3	● DIFFERENTIAL	
LEVEL4		
LEVEL5		
LEVEL6		

↑ ↓ to move
→ to select

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”

DIFFERENTIAL		3.13
● UPSTREAM SENSOR		
DOWNSTREAM SENSOR		
ERROR CONDITION		

↑ ↓ to move
→ to select

UPSTREAM SENSOR		3.13.1
● SENSOR		
CALIBRATION		

↑ ↓ to move
→ to select

UPSTREAM SENSOR		3.13.1.1
● 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

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

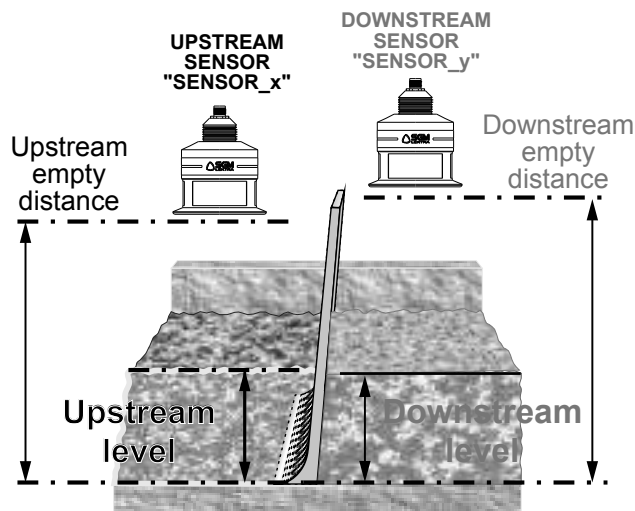
Error Condition	3.13.1.1.1
ACTUAL VALUE ● LAST VALID VALUE OVER RANGE VALUE ZERO VALUE	
↑ ↓ to move → to select	

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 → to select	E to confirm



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.

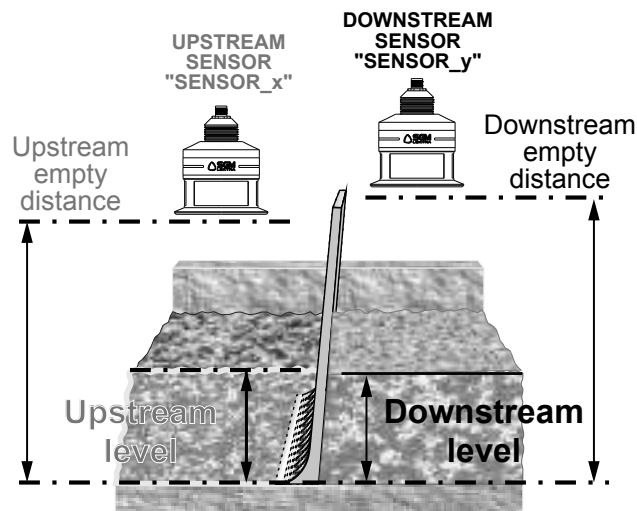
Press "DOWN" to select the measure to be set. Move the cursor with "RIGHT".

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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

TASK

TASK

3

FLOW1
FLOW2
LEVEL1
LEVEL2
LEVEL3
LEVEL4
LEVEL5
LEVEL6

VOLUME1
VOLUME2
PUMP CONTROL
WELL WATER RISE
● DIFFERENTIAL

↑ ↓ to move
→ to select

DIFFERENTIAL

3.13

● UPSTREAM SENSOR
DOWNSTREAM SENSOR
ERROR CONDITION

↑ ↓ to move
→ to select

UPSTREAM SENSOR

3.13.1

● SENSOR
CALIBRATION

↑ ↓ to move
→ to select

UPSTREAM SENSOR

3.13.1.1

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

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”.

UPSTREAM SENSOR3.13.1

SENSOR

●CALIBRATION

↑ ↓ to move

→ to select

SET LEVEL 4mA3.13.1.2

00000mm

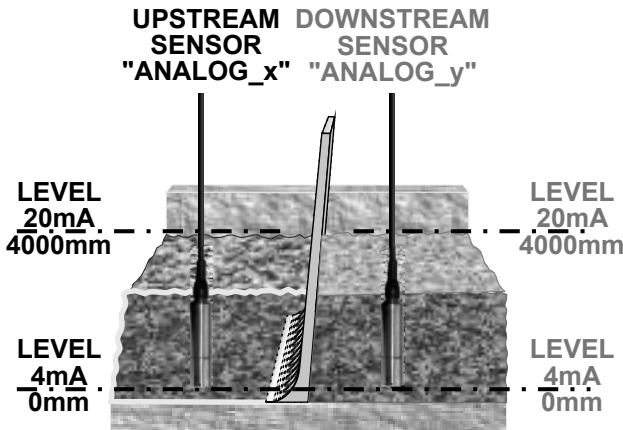
SET LEVEL 20mA

04000mm

↑ → to modify

↓ to select

E to confirm



10.2.2 DOWNSTREAM SENSOR

Press “RIGHT” to select “DOWNSTREAM SENSOR”.

DIFFERENTIAL3.13

UPSTREAM SENSOR

●DOWNSTREAM SENSOR

ERROR CONDITION

↑ ↓ to move

→ to select

Press “RIGHT” to select “SENSOR”.

DOWNSTREAM SENSOR3.13.2

●SENSOR

CALIBRATION

↑ ↓ to move

→ to select

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.

DOWNSTREAM SENSOR3.13.2.1

SENSOR_1

SENSOR_2

SENSOR_3

SENSOR_4

SENSOR_5

SENSOR_6

SENSOR_7

SENSOR_8

ANALOG_1

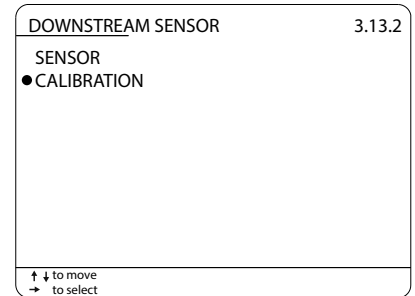
●ANALOG_2

NONE

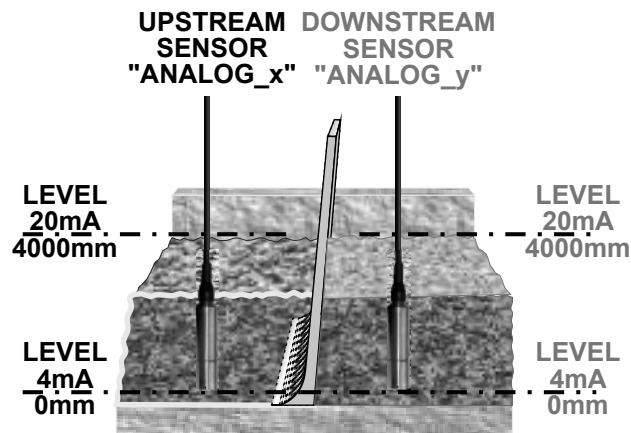
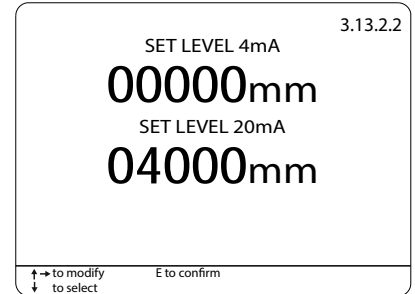
↑ ↓ to move

→ to select


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

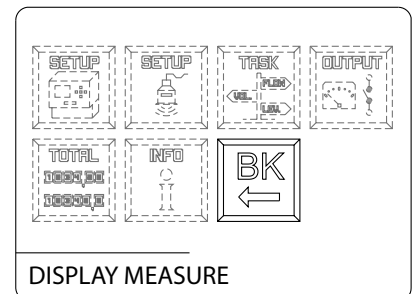


Enter the upstream sensor level value at 4mA and 20mA.
Press "DOWN" to select the measure to be set,
Move the cursor with "RIGHT" and press "UP" to change the digit.
Confirm with "ENTER".




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”

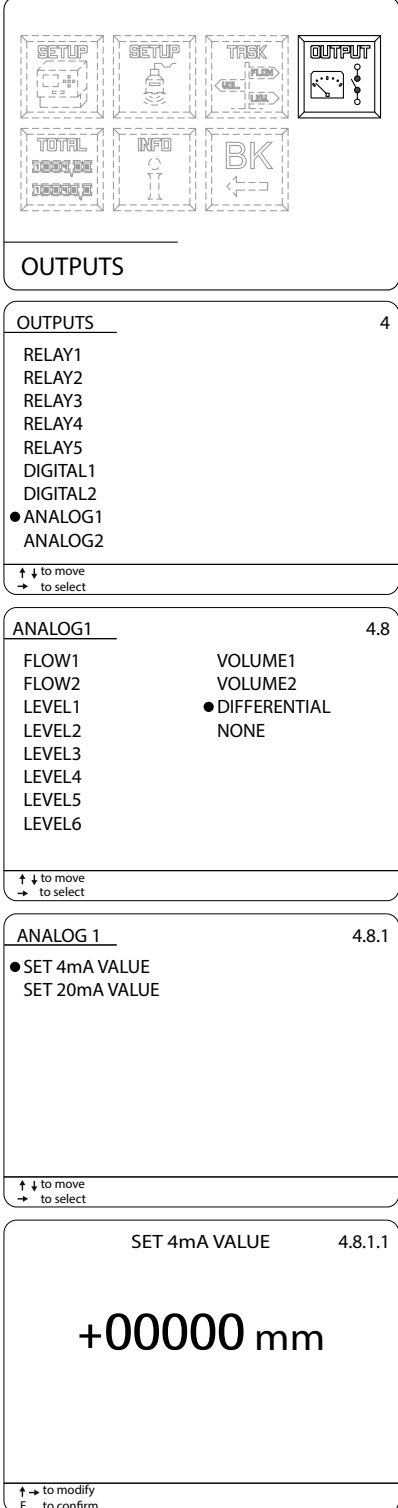
Press “UP” o “DOWN” to select “ANALOG1” or “ANALOG2”.
Press “RIGHT” to confirm.

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”.



The screenshot shows the menu navigation process. It starts with a main menu containing icons for SETUP, TASK, OUTPUT, TOTAL, INFO, and BK. The 'OUTPUT' icon is selected. The next screen, titled 'OUTPUTS', lists various output types: RELAY1, RELAY2, RELAY3, RELAY4, RELAY5, DIGITAL1, DIGITAL2, ANALOG1 (selected with a dot), and ANALOG2. Below this list are navigation instructions: '↑ ↓ to move' and '→ to select'. The next screen, titled 'ANALOG1', shows two columns of options. The left column lists FLOW1, FLOW2, LEVEL1, LEVEL2, LEVEL3, LEVEL4, LEVEL5, and LEVEL6. The right column lists VOLUME1, VOLUME2, DIFFERENTIAL (selected with a dot), and NONE. Navigation instructions are at the bottom. The next screen, titled 'ANALOG 1', shows two options: SET 4mA VALUE (selected with a dot) and SET 20mA VALUE. Navigation instructions are at the bottom. The final screen, titled 'SET 4mA VALUE', shows the value '+00000 mm' in a large font. Navigation instructions at the bottom indicate '↑ → to modify' and 'E to confirm'.

OUTPUTS

RELAY1
RELAY2
RELAY3
RELAY4
RELAY5
DIGITAL1
DIGITAL2
● ANALOG1
ANALOG2

↑ ↓ to move
→ to select

ANALOG1

FLOW1
FLOW2
LEVEL1
LEVEL2
LEVEL3
LEVEL4
LEVEL5
LEVEL6

VOLUME1
VOLUME2
● DIFFERENTIAL
NONE

↑ ↓ to move
→ to select

ANALOG 1

● SET 4mA VALUE
SET 20mA VALUE

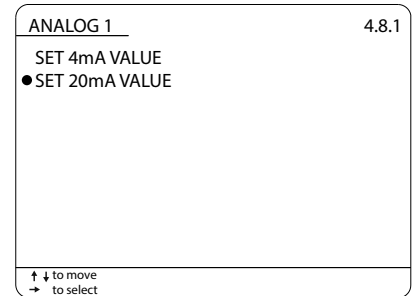
↑ ↓ to move
→ to select

SET 4mA VALUE

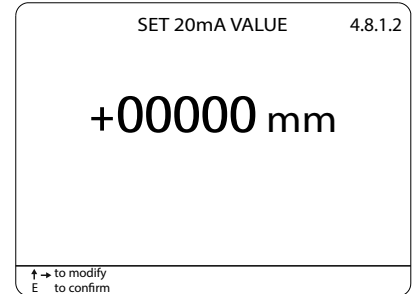
+00000 mm

↑ → to modify
E to confirm


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

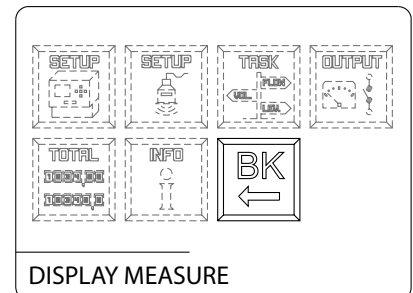


Set in mm the differential level value corresponding to the 20mA output.
Confirm with “ENTER”.




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.

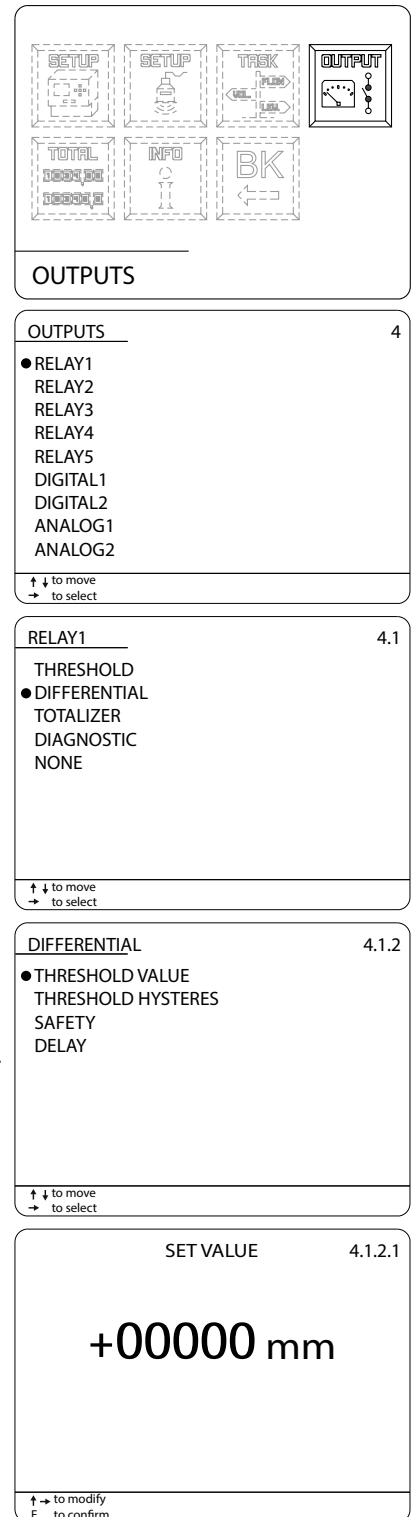
With the arrow keys select the “OUTPUTS”  menu icon.
Confirm the selection by pressing “ENTER”.

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 image shows a sequence of four menu screens from the VLW90M device. The first screen is the main menu with icons for SETUP, TASK, OUTPUT, TOTAL, INFO, and BK. The second screen is the 'OUTPUTS' menu, listing RELAY1 through ANALOG2. The third screen is the 'RELAY1' configuration menu, showing options like THRESHOLD, DIFFERENTIAL, TOTALIZER, DIAGNOSTIC, and NONE. The fourth screen is the 'DIFFERENTIAL' configuration menu, showing options like THRESHOLD VALUE, THRESHOLD HYSTERES, SAFETY, and DELAY. The final screen shows the 'SET VALUE' for the threshold, currently set to +00000 mm.

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

DIFFERENTIAL 4.1.2

- THRESHOLD VALUE
- THRESHOLD HYSTERES
- SAFETY
- DELAY

↑ ↓ to move
→ to select

SET VALUE 4.1.2.1

+00000 mm

↑ → to modify
E to confirm

Press “DOWN” to select “THRESHOLD HYSTERESIS” to set the relay hysteresis and press “RIGHT” to confirm.

DIFFERENTIAL	4.1.2
THRESHOLD VALUE	
● THRESHOLD HYSTERESIS	
SAFETY	
DELAY	
↑ ↓ to move → to select	

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

SET VALUE	4.1.2.2
+00000 mm	
↑ → to modify E to confirm	


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








DIFFERENTIAL	4.1.2.3
THRESHOLD VALUE	
THRESHOLD HYSTERESIS	
● SAFETY	
DELAY	
↑ ↓ to move → to select	

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

SAFETY	4.1.2.3
● NO	
YES	
↑ ↓ to move → to select	

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


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

			
			
DISPLAY MEASURE			

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

MAIN SETUP

MAIN SETUP 1

- LANGUAGE
- DISPLAY SETUP
- DATE ADJUST
- SENSOR SEARCH
- DATALOGGER
- SERVICE
- CHANGE PASSWORD
- UPDATE CONNECTION

↑ ↓ to move
→ to select

DISPLAY SETUP 1.2





- LCD COLOR
- BACKLIGHT
- DISPLAY MEASURES
- SCROLL TIME
- TREND DISPLAY




↑ ↓ to move
→ to select

DISPLAY MEASURES 1.2.3

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

↑ ↓ to modify
E to confirm → save & exit






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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

TASK

TASK1

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

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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”.

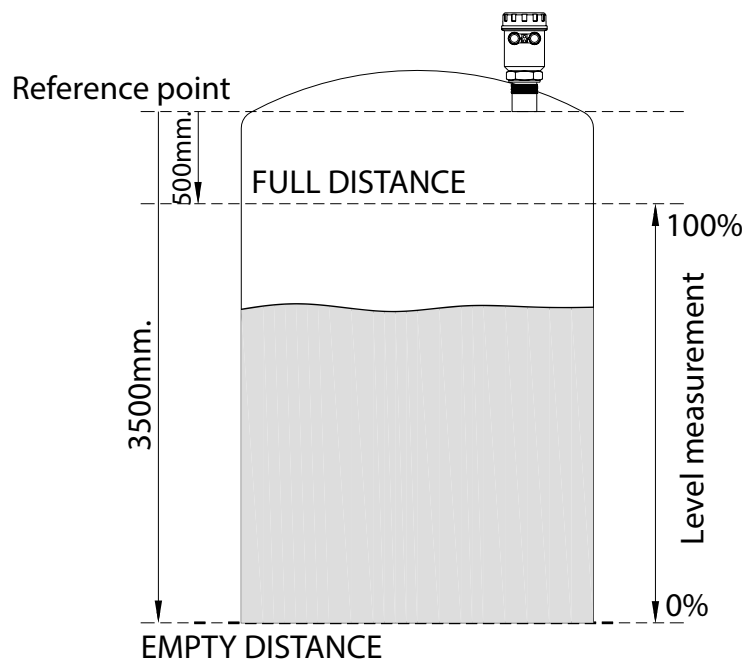
Enter the empty and full distance in mm.
Press “DOWN” to select the measure to be set.
Move the cursor with “RIGHT” and press “UP” to change the digit.
Confirm with “ENTER”.

VOLUME1	3.9
SENSOR ● MEASURE UNIT CALIBRATION TANK SHAPE	
↑ ↓ to move → to select	

MEASURE UNIT	3.9.2
● l m3	
↑ ↓ to move → to select	

VOLUME1	3.9
SENSOR MEASURE UNIT ● CALIBRATION TANK SHAPE	
↑ ↓ to move → to select	

SET EMPTY DISTANCE	3.9.3
03500mm	
SET FULL DISTANCE	
00500mm	
↑ → to modify E to confirm ↓ to select	



11.1.4 TANK SHAPE

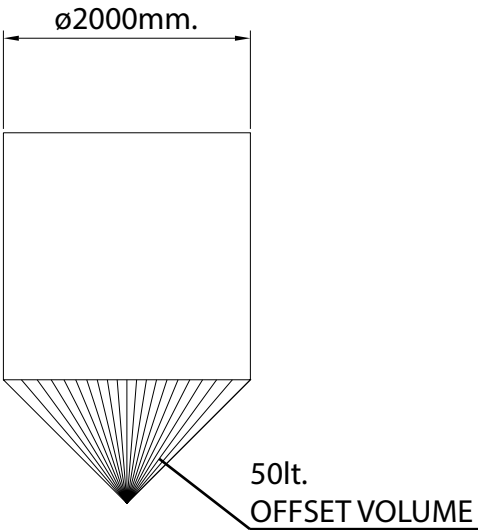
Press “DOWN” to select “TANK SHAPE” and confirm with “RIGHT”.

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),



VOLUME13.9

SENSOR
MEASURE UNIT
CALIBRATION
●TANK SHAPE

↑↓ to move
→ to select

TANK SHAPE3.9.4

●VERTICAL CYLINDER
HORIZONT CYLINDER
RECTANGULAR

↑↓ to move
→ to select

TANK SHAPE3.9.4

●VERTICAL CYLINDER
HORIZONT CYLINDER
RECTANGULAR

↑↓ to move
→ to select

DIAMETER
02000mm
OFFSET VOL
00050lt3.9.4.1

↑→ to modify
↓ to selectE to confirm

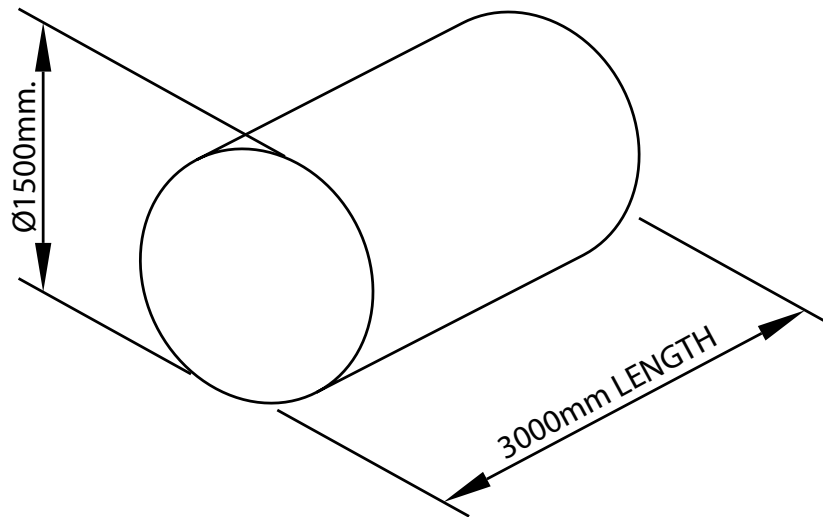
11.1.4.2 - HORIZONT CYLINDER

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 ● HORIZONT CYLINDER RECTANGULAR	
↑ ↓ to move → to select	

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



11.1.4.3 - RECTANGULAR.

For tank or silo with vertical rectangularl section,
select “RECTANGULAR” and press “RIGHT”.

TANK SHAPE3.9.4

VERTICAL CYLINDER
HORIZONT CYLINDER
●RECTANGULAR

↑ ↓ to move
→ to select

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

WIDTH3.9.4.3

02000mm

LENGTH

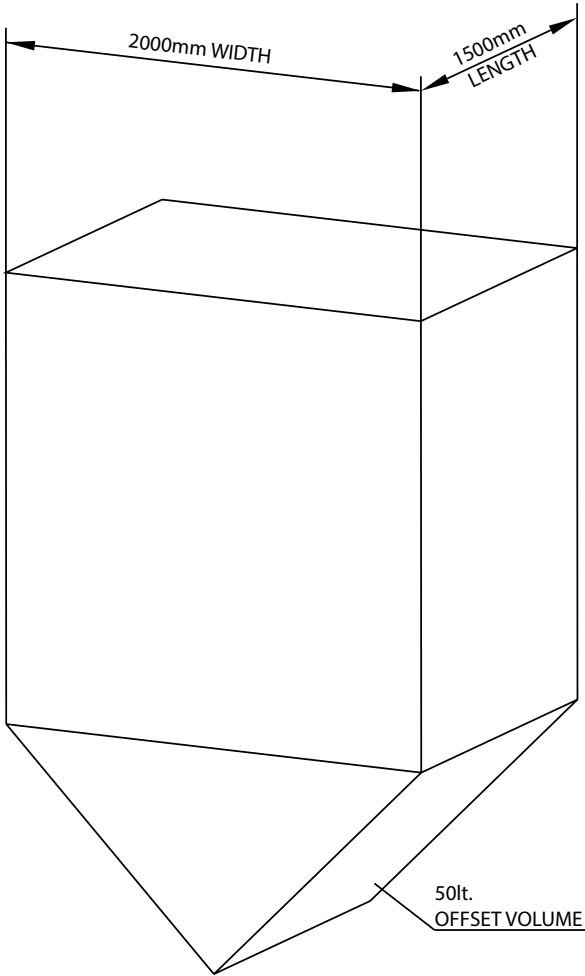
01500mm

OFFSET VOL

00050It

← → 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

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO


BK

DISPLAY MEASURE

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

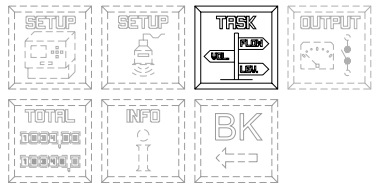
Press “RIGHT” to select “SENSOR”

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”.

						
TASK						
<table border="0"> <tr> <td> TASK </td> <td>3</td> </tr> <tr> <td> FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 </td> <td> ● VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL </td> </tr> <tr> <td> ↑ ↓ to move → to select </td> <td></td> </tr> </table>	TASK	3	FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	● VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL	↑ ↓ to move → to select	
TASK	3					
FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	● VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL					
↑ ↓ to move → to select						
<table border="0"> <tr> <td> VOLUME1 </td> <td>3.9</td> </tr> <tr> <td> ● SENSOR MEASURE UNIT CALIBRATION TANK SHAPE </td> <td></td> </tr> <tr> <td> ↑ ↓ to move → to select </td> <td></td> </tr> </table>	VOLUME1	3.9	● SENSOR MEASURE UNIT CALIBRATION TANK SHAPE		↑ ↓ to move → to select	
VOLUME1	3.9					
● SENSOR MEASURE UNIT CALIBRATION TANK SHAPE						
↑ ↓ to move → to select						
<table border="0"> <tr> <td> VOLUME1 </td> <td>3.9.1</td> </tr> <tr> <td> SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6 </td> <td> SENSOR_7 SENSOR_8 ● ANALOG_1 ANALOG_2 NONE </td> </tr> <tr> <td> ↑ ↓ to move → to select </td> <td></td> </tr> </table>	VOLUME1	3.9.1	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	
VOLUME1	3.9.1					
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						
<table border="0"> <tr> <td> VOLUME1 </td> <td>3.9</td> </tr> <tr> <td> SENSOR ● MEASURE UNIT CALIBRATION TANK SHAPE </td> <td></td> </tr> <tr> <td> ↑ ↓ to move → to select </td> <td></td> </tr> </table>	VOLUME1	3.9	SENSOR ● MEASURE UNIT CALIBRATION TANK SHAPE		↑ ↓ to move → to select	
VOLUME1	3.9					
SENSOR ● MEASURE UNIT CALIBRATION TANK SHAPE						
↑ ↓ to move → to select						
<table border="0"> <tr> <td> MEASURE UNIT </td> <td>3.9.2</td> </tr> <tr> <td> ● l m3 </td> <td></td> </tr> <tr> <td> ↑ ↓ to move → to select </td> <td></td> </tr> </table>	MEASURE UNIT	3.9.2	● l m3		↑ ↓ to move → to select	
MEASURE UNIT	3.9.2					
● l m3						
↑ ↓ to move → to select						

11.2.3 CALIBRATION

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

VOLUME1	3.9
SENSOR MEASURE UNIT ● CALIBRATION TANK SHAPE	
↑ ↓ to move → to select	

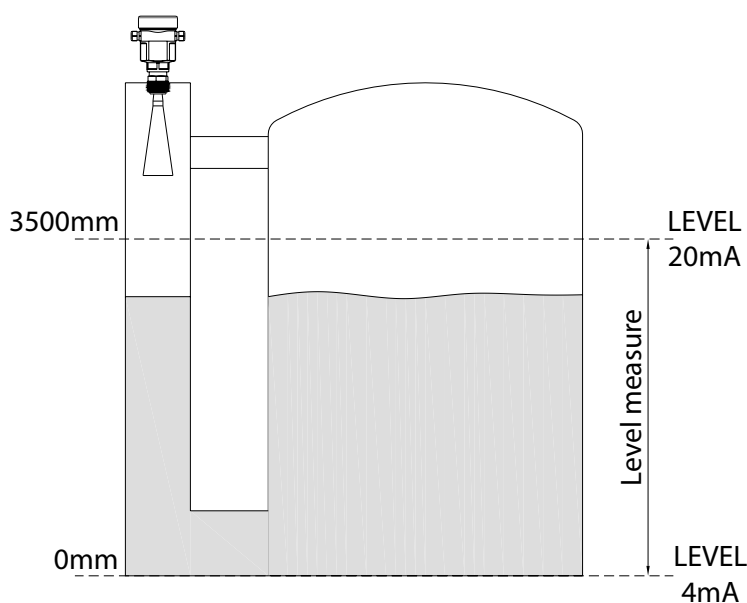
Enter the level value at 4mA and 20mA.

Press “DOWN” to select the measure to be set.

Move the cursor with 2RIGHT” and press “UP” to change the digit.

Confirm with “ENTER”.

SET LEVEL 4mA	3.9.3
00000mm	
SET LEVEL 20mA	
03500mm	
↑ → to modify E to confirm ↓ to select	




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.

VOLUME1	3.9
SENSOR MEASURE UNIT CALIBRATION ● TANK SHAPE	
↑ ↓ to move → to select	


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

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

			
			
DISPLAY MEASURE			

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”

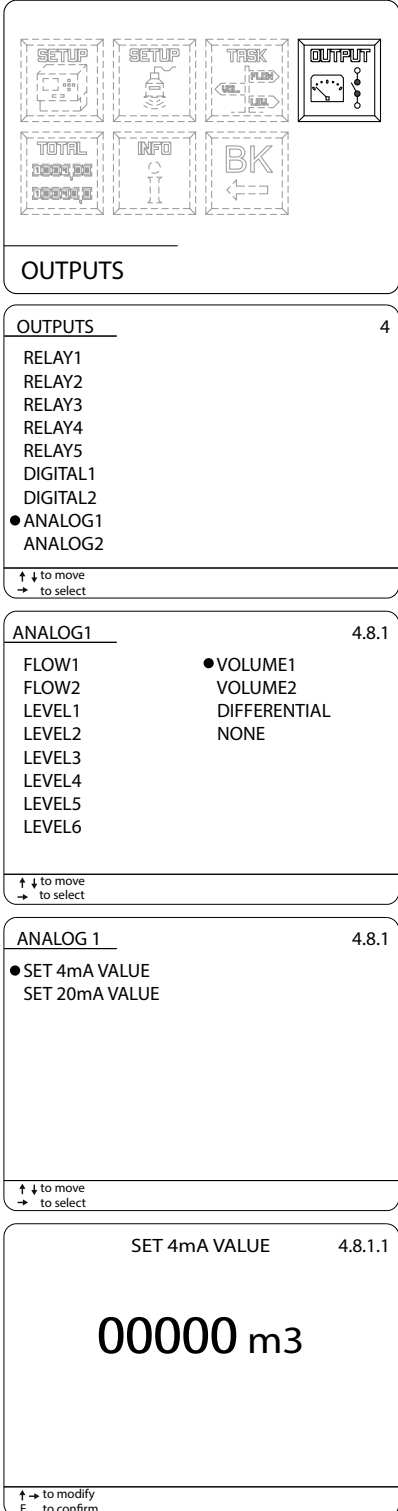
Press “UP” or “DOWN” to select “ANALOG1” or “ANALOG2”.
Press “RIGHT” to confirm.

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 screenshot shows the menu navigation process for configuring the 4÷20mA output. It starts with a main menu with icons for SETUP, TASK, OUTPUT, TOTAL, INFO, and BK. The 'OUTPUTS' menu is selected, showing a list of output types: RELAY1 through RELAY5, DIGITAL1 through DIGITAL2, and ANALOG1 (selected) and ANALOG2. The 'ANALOG1' menu is then shown, with options: FLOW1 through FLOW2, LEVEL1 through LEVEL6, and VOLUME1 (selected), VOLUME2, DIFFERENTIAL, and NONE. The 'ANALOG 1' menu is selected, showing 'SET 4mA VALUE' (selected) and 'SET 20mA VALUE'. Finally, the 'SET 4mA VALUE' screen is shown, displaying '00000 m3'.

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

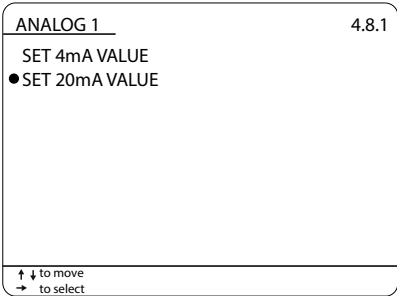
↑ ↓ to move
→ to select

SET 4mA VALUE 4.8.1.1

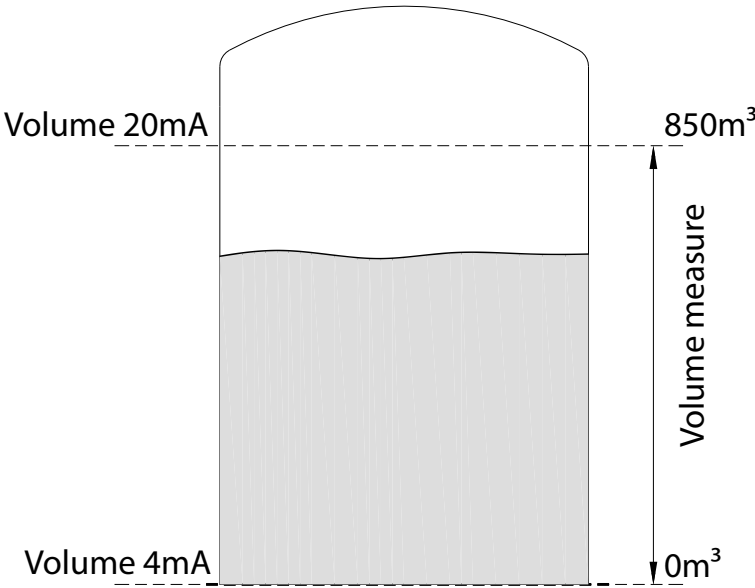
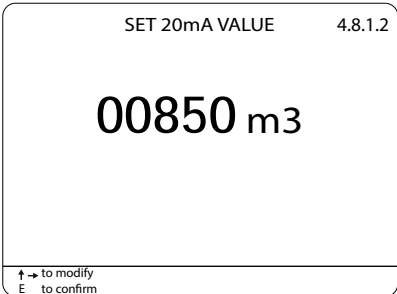
00000 m3

↑ → to modify
E to confirm

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

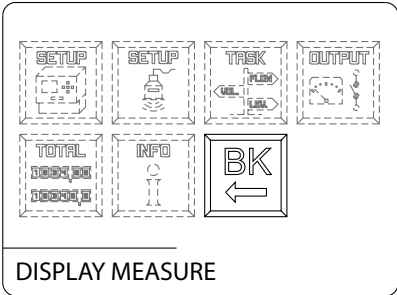


Set in mm the volume value corresponding to the 20mA output.
Confirm with “ENTER”.




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

Press “RIGHT” to select “THRESHOLD”.

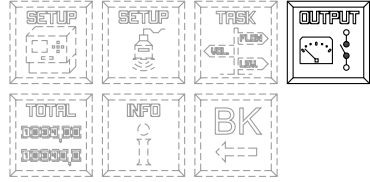
11.4.1 TASK

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	● VOLUME1
FLOW2	VOLUME2
LEVEL1	NONE
LEVEL2	
LEVEL3	
LEVEL4	
LEVEL5	
LEVEL6	

↑ ↓ to move
→ to select

RELAY1 4.1.1.1

- 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.

RELAY14.1.1.2

● min

MAX

↑ ↓ to move

→ to select

11.4.3 THRESHOLD VALUE

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

RELAY14.1.1

TASK

MODE

● THRESHOLD VALUE

THRESHOLD HYSTERES

SAFETY

DELAY

↑ ↓ to move

→ to select

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

SET VALUE4.1.1.3

00000.00m3

↑ → to modify

E to select

11.4.4 SAFETY

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

RELAY14.1.1

TASK

MODE

THRESHOLD VALUE

THRESHOLD HYSTERES

● SAFETY

DELAY

↑ ↓ to move

→ to select

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

SAFETY4.1.1.5

● NO

YES

↑ ↓ to move

→ to select

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

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

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO


BK

DISPLAY MEASURE

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”.

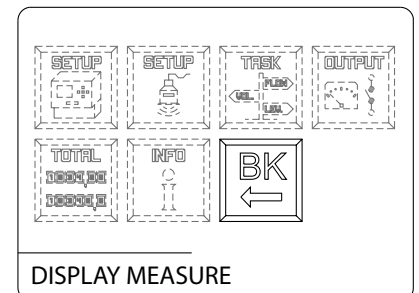
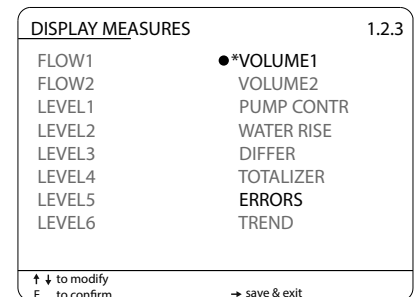
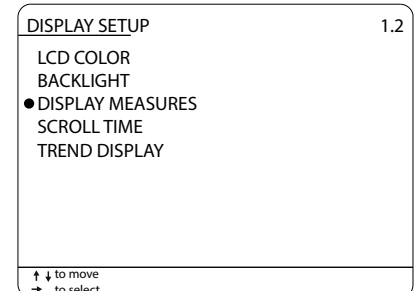
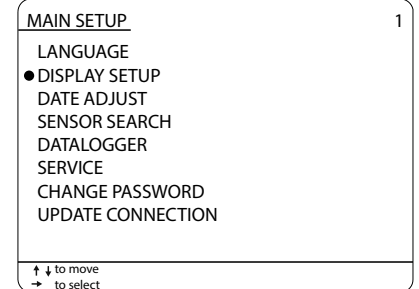
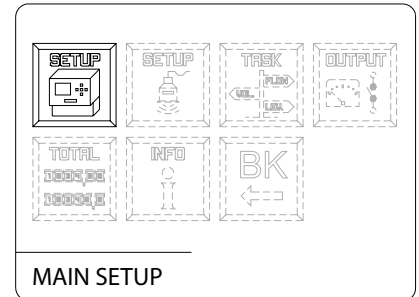
With the pointer to “VOLUME1”, press “ENTER, the * symbol will highlight the selection.

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.

<div> <div>SETUP</div> <div>SETUP</div> <div>TASK</div> <div>OUTPUT</div> </div> <div> <div>TOTAL</div> <div>INFO</div> <div>BK</div> </div>	
TASK	
<div>TASK 3</div> <div> <div> <div>FLOW1</div> <div>FLOW2</div> <div>LEVEL1</div> <div>LEVEL2</div> <div>LEVEL3</div> <div>LEVEL4</div> <div>LEVEL5</div> <div>LEVEL6</div> </div> <div> <div>VOLUME1</div> <div>VOLUME2</div> <div>● PUMP CONTROL</div> <div>WELL WATER RISE</div> <div>DIFFERENTIAL</div> </div> </div> <div> <div>↑ ↓ to move</div> <div>→ to select</div> </div>	
PUMP CONTROL 3.11	
<div> <div>● PUMP 1 (RL1)</div> <div>PUMP 2 (RL2)</div> <div>PUMP 3 (RL3)</div> <div>PUMP 4 (RL4)</div> <div>PUMP 5 (RL5)</div> </div> <div> <div>↑ ↓ to move</div> <div>→ to select</div> </div>	
PUMP 1 (RL1) 3.11.1	
<div> <div>● SENSOR</div> <div>CALIBRATION</div> <div>ENABLE</div> <div>MODE</div> <div>UPPER TH LEVEL</div> <div>LOWER TH LEVEL</div> <div>DELAY</div> </div> <div> <div>↑ ↓ to move</div> <div>→ to select</div> </div>	
SENSOR 3.11.1.1	
<div> <div>● SENSOR_1</div> <div>SENSOR_2</div> <div>SENSOR_3</div> <div>SENSOR_4</div> <div>SENSOR_5</div> <div>SENSOR_6</div> </div> <div> <div>SENSOR_7</div> <div>SENSOR_8</div> <div>ANALOG_1</div> <div>ANALOG_2</div> <div>NONE</div> </div> <div> <div>↑ ↓ to move</div> <div>→ to select</div> </div>	
Error Condition 3.11.1.1.1	
<div> <div>ACTUAL VALUE</div> <div>● LAST VALID VALUE</div> <div>OVER RANGE VALUE</div> <div>ZERO VALUE</div> </div> <div> <div>↑ ↓ to move</div> <div>→ to select</div> </div>	

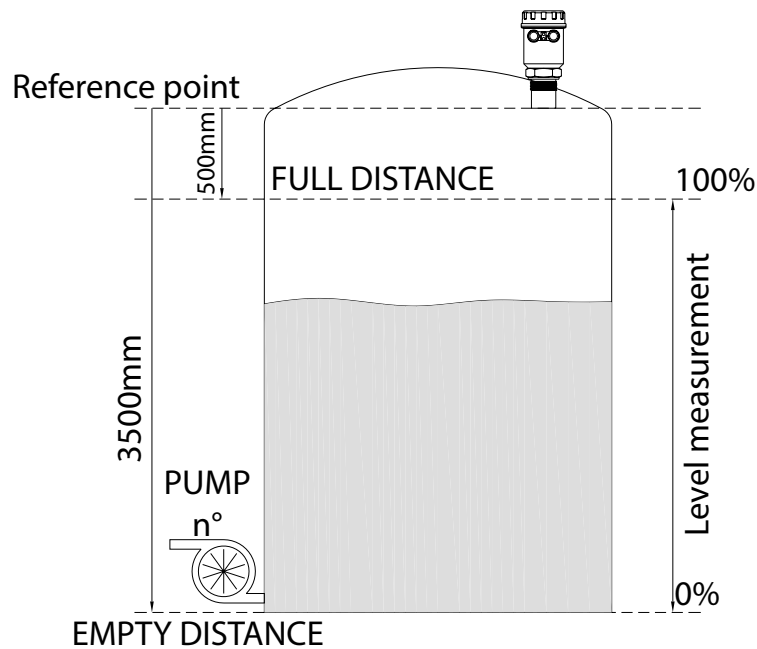
12.1.2 CALIBRATION

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”.

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

SET EMPTY DISTANCE	3.11.1.2
03500mm	
SET FULL DISTANCE	
00500mm	
↑ → to modify E to confirm ↓ to select	



12.1.3 ENABLE

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

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

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

ENABLE	3.11.1.3
NO ● YES	
↑ ↓ to move → to select	

12.1.4 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	

12.1.5 UPPER TH LEVEL

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

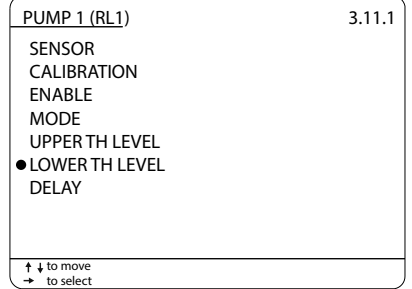
PUMP 1 (RL1)	3.11.1.5
SENSOR CALIBRATION ENABLE MODE ● UPPER TH LEVEL LOWER TH LEVEL DELAY	
↑ ↓ to move → to select	

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".

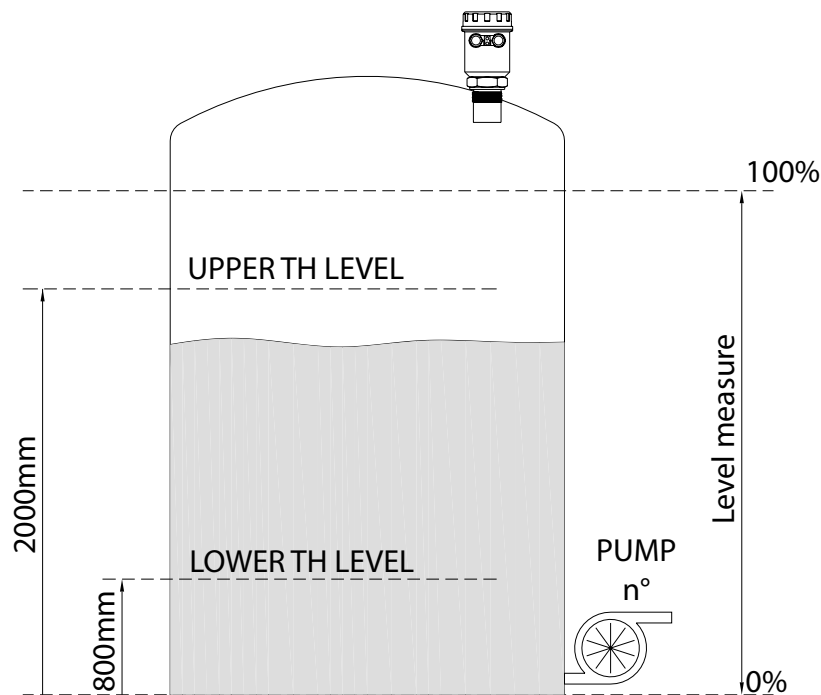
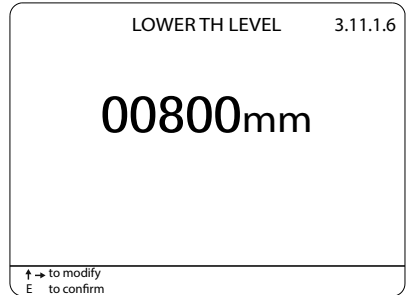
UPPER TH LEVEL	3.11.1.5
02000mm	
↑ → to modify E to confirm	

12.1.6 LOWER TH LEVEL

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

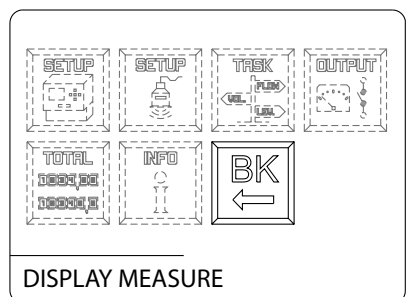


Set in mm the lower threshold level value.
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”.




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”.

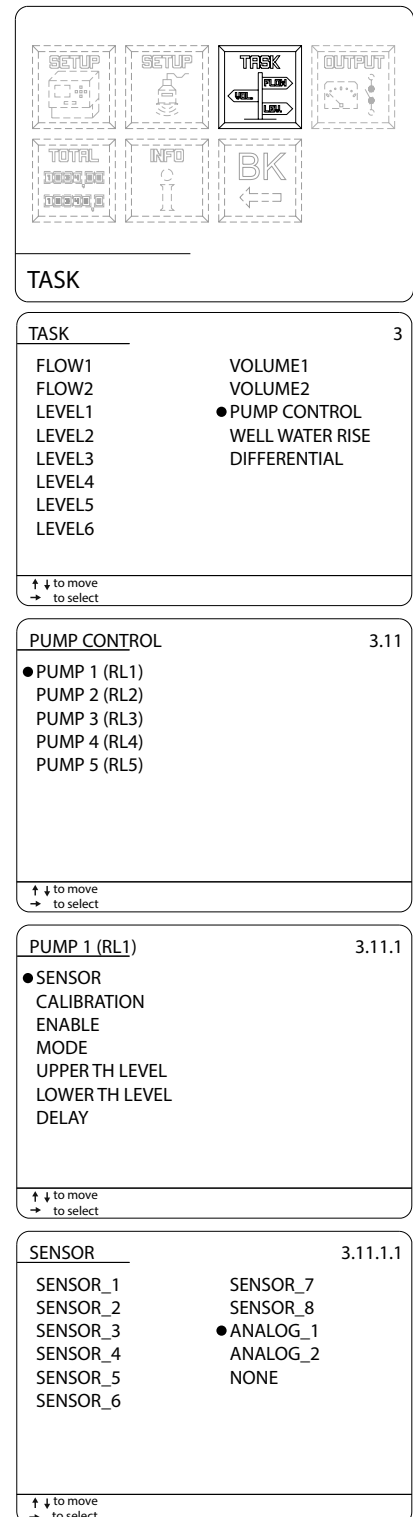
Select submenu “PUMP CONTROL” and press “RIGHT”.

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.



The image shows a sequence of four screenshots from the VLW90M pump control setup menu, illustrating the configuration steps for a 4÷20mA analog transmitter.

First Screenshot: Main Menu
The menu displays several options: SETUP, TASK, OUTPUT, TOTAL, INFO, and BK. The TASK option is highlighted with a red border.

Second Screenshot: TASK Menu
The TASK menu shows a list of options: FLOW1, FLOW2, LEVEL1, LEVEL2, LEVEL3, LEVEL4, LEVEL5, LEVEL6, VOLUME1, VOLUME2, PUMP CONTROL (highlighted with a red dot), WELL WATER RISE, and DIFFERENTIAL. The page number 3 is in the top right corner.

Third Screenshot: PUMP CONTROL Menu
The PUMP CONTROL menu shows a list of options: PUMP 1 (RL1), PUMP 2 (RL2), PUMP 3 (RL3), PUMP 4 (RL4), and PUMP 5 (RL5). The page number 3.11 is in the top right corner.

Fourth Screenshot: PUMP 1 (RL1) Menu
The PUMP 1 (RL1) menu shows a list of options: SENSOR (highlighted with a red dot), CALIBRATION, ENABLE, MODE, UPPER TH LEVEL, LOWER TH LEVEL, and DELAY. The page number 3.11.1 is in the top right corner.

Fifth Screenshot: SENSOR Menu
The SENSOR menu shows a list of options: SENSOR_1, SENSOR_2, SENSOR_3, SENSOR_4, SENSOR_5, SENSOR_6, SENSOR_7, SENSOR_8, ANALOG_1 (highlighted with a red dot), ANALOG_2, and NONE. The page number 3.11.1.1 is in the top right corner.

Navigation instructions at the bottom of each menu: ↑ ↓ to move, → to select.

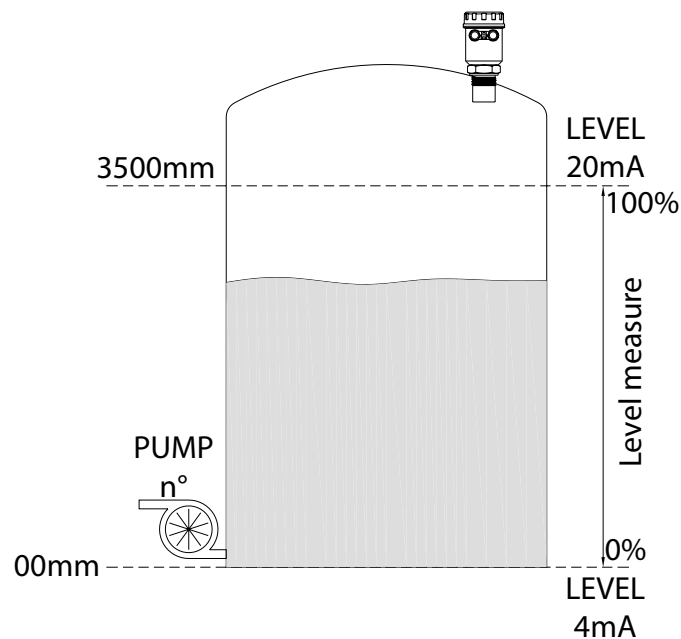
12.2.2 CALIBRATION

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”.

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

SET LEVEL 4mA	3.11.1.2
00000mm	
SET LEVEL 20mA	
03500mm	
↑ → to modify E to confirm ↓ to select	



12.2.3 ENABLE

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

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

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

ENABLE	3.11.1.3
NO ● YES	
↑ ↓ to move → to select	

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”.

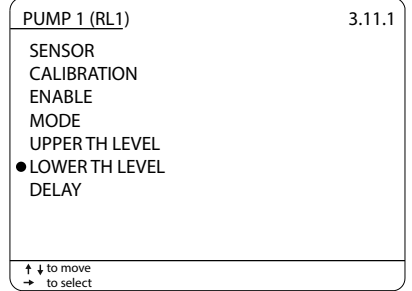
PUMP 1 (RL1)	3.11.1
SENSOR CALIBRATION ENABLE MODE ● UPPER TH LEVEL LOWER TH LEVEL DELAY	
↑ ↓ to move → to select	

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”.

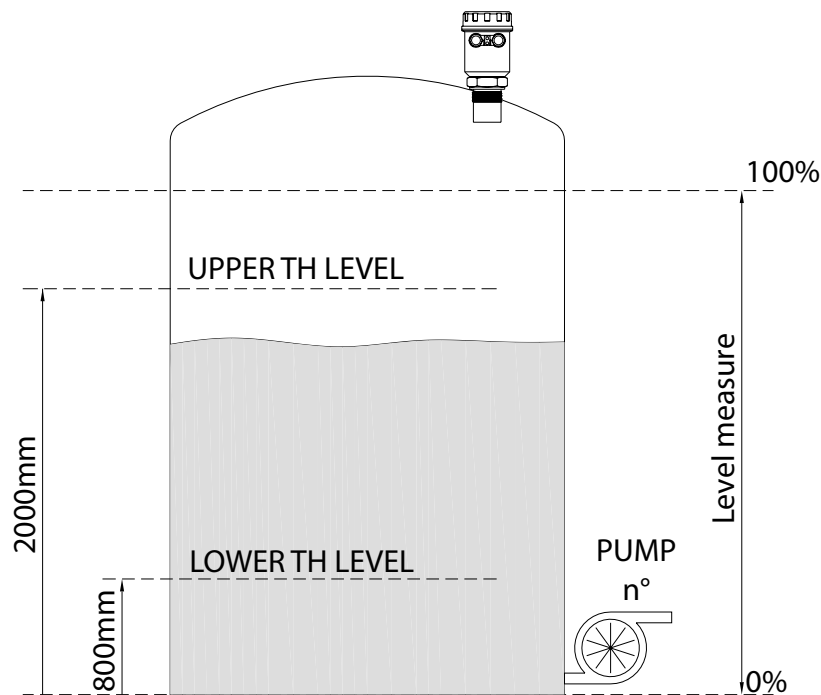
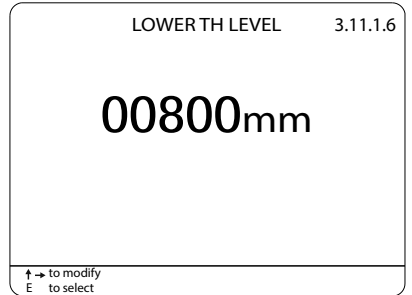
UPPER TH LEVEL	3.11.1.5
02000mm	
↑ → to modify E to confirm	

12.2.5 LOWER TH LEVEL

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

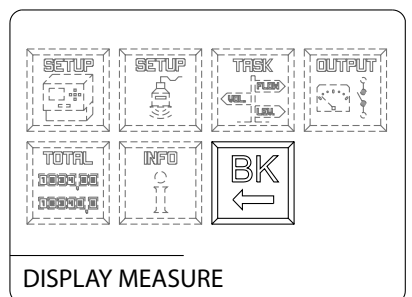


Set in mm the lower threshold level value.
Move the cursor with “RIGHT” and “UP” to change the digit.
Confirm with “ENTER”.



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” .

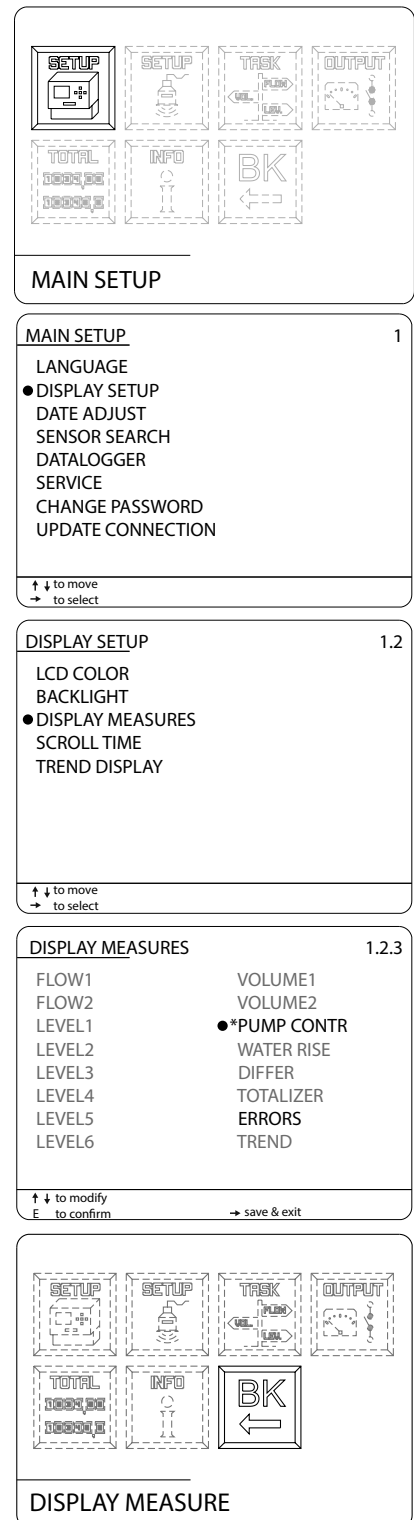
12.3.1 DISPLAY MEASURES

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



MAIN SETUP

MAIN SETUP 1

- LANGUAGE
- DISPLAY SETUP
- DATE ADJUST
- SENSOR SEARCH
- DATALOGGER
- SERVICE
- CHANGE PASSWORD
- UPDATE CONNECTION

↑ ↓ to move
→ to select

DISPLAY SETUP 1.2

- LCD COLOR
- BACKLIGHT
- DISPLAY MEASURES
- SCROLL TIME
- TREND DISPLAY

↑ ↓ to move
→ to select

DISPLAY MEASURES 1.2.3

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


↑ ↓ to modify
E to confirm → save & exit

DISPLAY MEASURE

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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

TASK

TASK

3

FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTROL

● WELL WATER RISE

DIFFERENTIAL

↑ ↓ to move

→ to select

WELL WATER RISE

3.12

● LEVEL SENSOR

CALIBRATION

1st PUMP (RL1)

2nd PUMP (RL2)

3rd PUMP (RL3)

4th PUMP (RL4)

5th PUMP (RL5)

ALARM IMPUT

↑ ↓ to move

→ to select

LEVEL SENSOR

3.12.1

● 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

Error Condition

3.12.1.1

ACTUAL LEVEL

● LAST VALID VALUE

OVER RANGE VALUE

ZERO VALUE

↑ ↓ to move

→ to select

13.1.2 CALIBRATION

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

Enter the empty and full distance in mm.

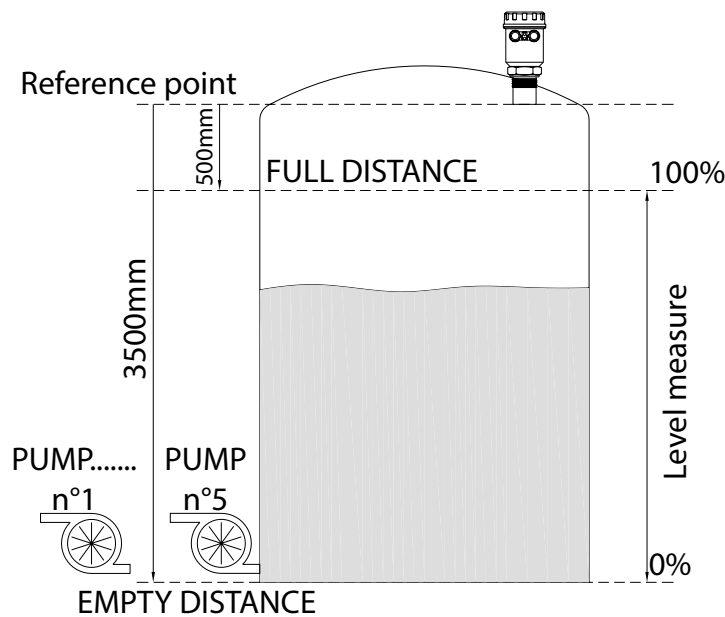
Press "DOWN" to select the measure to be set,

Move the cursor with "RIGHT" and press "UP" to change the digit.

Confirm with "ENTER".

WELL WATER RISE	3.12
LEVEL SENSOR	
● CALIBRATION	
1st PUMP (RL1)	
2nd PUMP (RL2)	
3rd PUMP (RL3)	
4th PUMP (RL4)	
5th PUMP (RL5)	
ALARM IMPUT	
↑ ↓ to move	
→ to select	

SET EMPTY DISTANCE	3.12.2
03500mm	
SET FULL DISTANCE	
00500mm	
← → to modify	E to confirm
↓ to select	



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".

WELL WATER RISE	3.12
LEVEL SENSOR	
CALIBRATION	
● 1st PUMP (RL1)	
2nd PUMP (RL2)	
3rd PUMP (RL3)	
4th PUMP (RL4)	
5th PUMP (RL5)	
ALARM IMPUT	
↑ ↓ to move	
→ to select	

1st PUMP (RL1)	3.12.3
● ON THRESHOLD LEVEL	
OFF THRESHOLD LEVEL	
ROTATION	
ENABLE	
↑ ↓ to move	
→ to select	

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

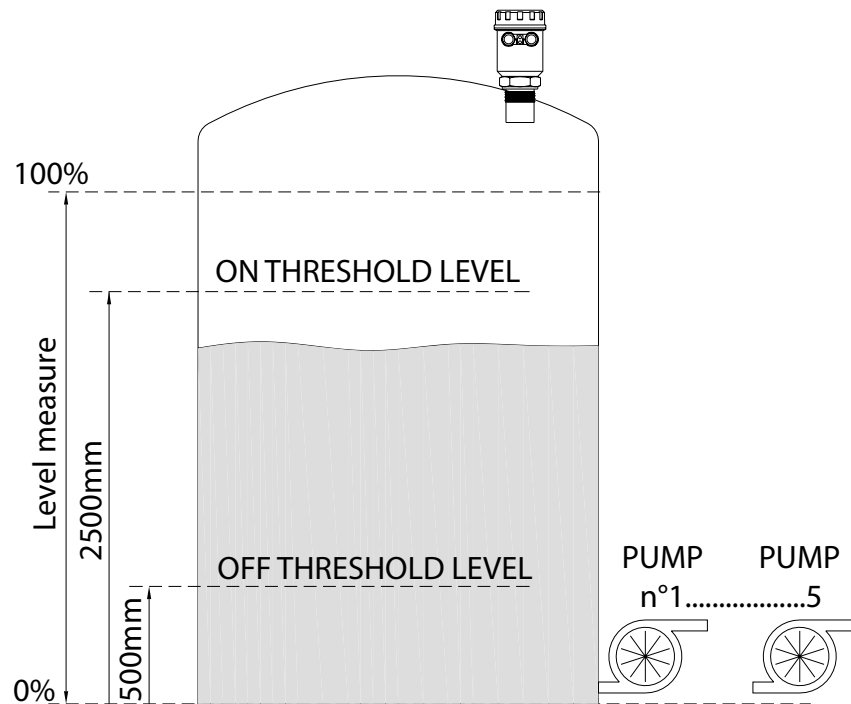
ON THRESHOLD LEVEL	3.12.3.1
02500mm	
↑ → to modify E to confirm	

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

1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL ● OFF THRESHOLD LEVEL ROTATION ENABLE	
↑ ↓ to move → to select	

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

OFF THRESHOLD LEVEL	3.12.3.2
00500mm	
↑ → to modify E to select	



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

1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ● ROTATION ENABLE	
↑ ↓ to move → to select	

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.

ROTATION	3.12.3.3
NO ● YES	
↑ ↓ to move → to select	

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








1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ROTATION ● ENABLE	
↑ ↓ to move → to select	

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

ENABLE	3.12.3.4
NO ● YES	
↑ ↓ to move → to select	


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

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

			
			
DISPLAY MEASURE			

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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

TASK

TASK

3

FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTROL

● WELL WATER RISE

DIFFERENTIAL

↑ ↓ to move

→ to select

WELL WATER RISE

3.12

● LEVEL SENSOR

CALIBRATION

1st PUMP (RL1)

2nd PUMP (RL2)

3rd PUMP (RL3)

4th PUMP (RL4)

5th PUMP (RL5)

ALARM IMPUT

↑ ↓ to move

→ to select

LEVEL SENSOR

3.12.1

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

13.2.2 CALIBRATION

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

Enter the empty and full distance in mm.

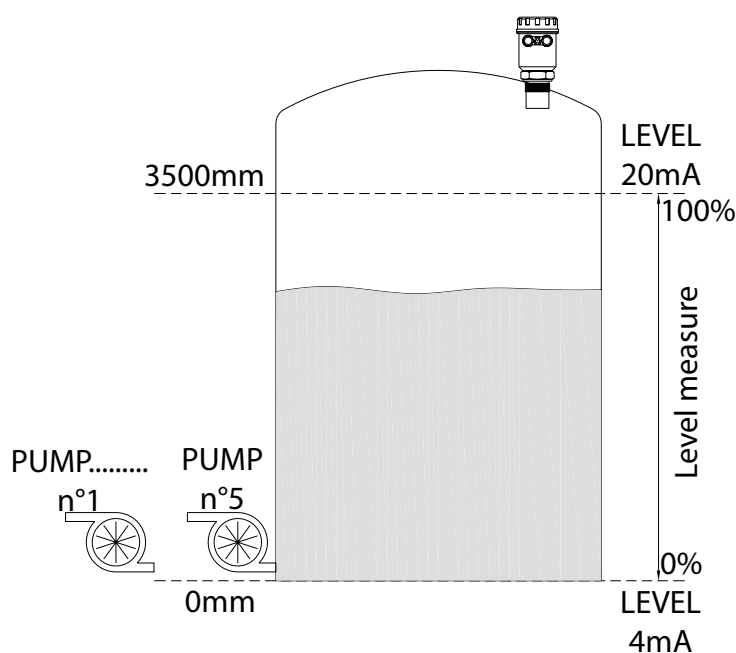
Press "DOWN" to select the measure to be set,

Move the cursor with "RIGHT" and press "UP" to change the digit.

Confirm with "ENTER".

WELL WATER RISE		3.12
LEVEL SENSOR		
● CALIBRATION		
1st PUMP (RL1)		
2nd PUMP (RL2)		
3rd PUMP (RL3)		
4th PUMP (RL4)		
5th PUMP (RL5)		
ALARM INPUT		
↑ ↓ to move		
→ to select		

SET LEVEL 4mA		3.12.2
00000mm		
SET LEVEL 20mA		
03500mm		
↑ ↓ to modify		
→ to select		E to confirm



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".

WELL WATER RISE		3.12
LEVEL SENSOR		
CALIBRATION		
● 1st PUMP (RL1)		
2nd PUMP (RL2)		
3rd PUMP (RL3)		
4th PUMP (RL4)		
5th PUMP (RL5)		
ALARM INPUT		
↑ ↓ to move		
→ to select		

1st PUMP (RL1)		3.12.3
● ON THRESHOLD LEVEL		
OFF THRESHOLD LEVEL		
ROTATION		
ENABLE		
↑ ↓ to move		
→ to select		

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

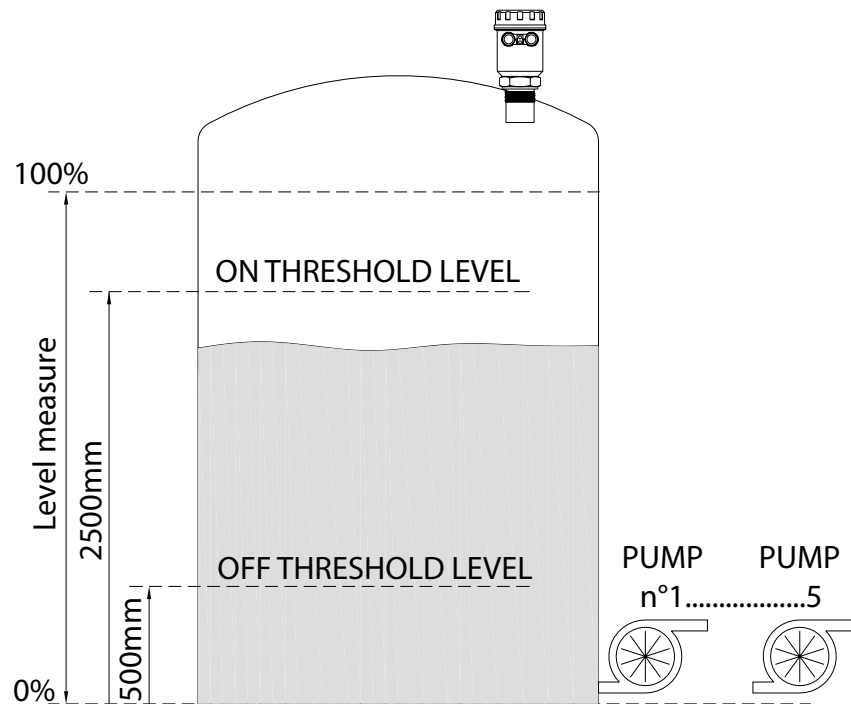
ON THRESHOLD LEVEL	3.12.3.1
02500mm	
↑ → to modify E to confirm	

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

1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL ● OFF THRESHOLD LEVEL ROTATION ENABLE	
↑ ↓ to move → to select	

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

OFF THRESHOLD LEVEL	3.12.3.2
00500mm	
↑ → to modify E to select	



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

1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ● ROTATION ENABLE	
↑ ↓ to move → to select	

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.

ROTATION	3.12.3.3
NO ● YES	
↑ ↓ to move → to select	

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








1st PUMP (RL1)	3.12.3
ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ROTATION ● ENABLE	
↑ ↓ to move → to select	

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

ENABLE	3.12.3.4
NO ● YES	
↑ ↓ to move → to select	


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

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

			
			
DISPLAY MEASURE			

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

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

MAIN SETUP

MAIN SETUP1

LANGUAGE

● DISPLAY SETUP

DATE ADJUST

SENSOR SEARCH

DATALOGGER

SERVICE

CHANGE PASSWORD

UPDATE CONNECTION

↑ ↓ to move
→ to select

DISPLAY SETUP1.2

LCD COLOR

BACKLIGHT

● DISPLAY MEASURES

SCROLL TIME

TREND DISPLAY

↑ ↓ to move
→ to select

DISPLAY MEASURES1.2.3

FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

PUMP CONTR

● *WATER RISE

DIFFER

TOTALIZER

ERRORS

TREND

↑ ↓ to modify
E to confirm

→ save & exit

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK


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".

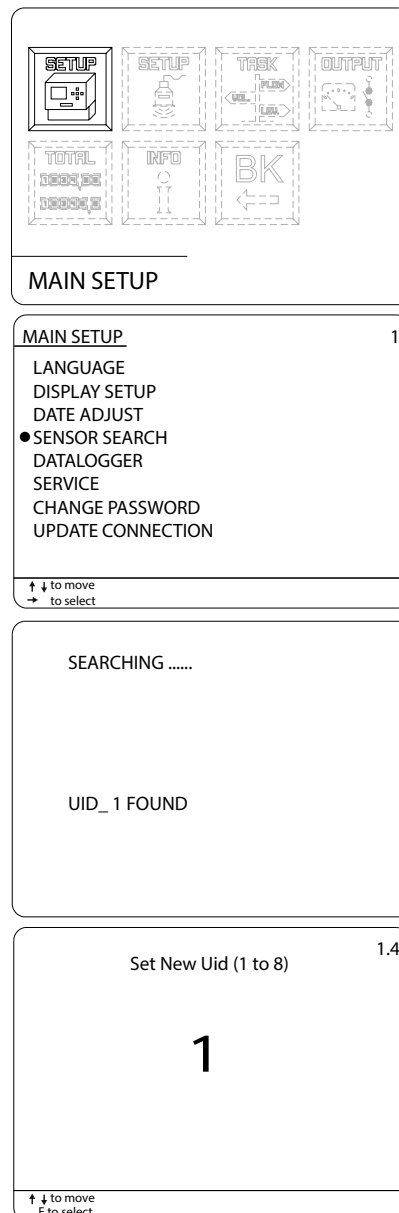
Press "UP" or "DOWN" to select "SENSOR SEARCH".
Confirm with "RIGHT".

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.

MAIN SETUP

1

LANGUAGE
DISPLAY SETUP
DATE ADJUST
SENSOR SEARCH
DATALOGGER
SERVICE
CHANGE PASSWORD
● UPDATE CONNECTION

↑ ↓ to move
→ to select

PLEASE WAIT


* PROBES FOUND: 4

UID1: PTU51 6m
UID2: PTU51 6m
UID3: METER 5m
UID4: PTU56 12m

→ save & 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.

SETUP

SETUP

TASK

OUTPUT

TOTAL

INFO

BK

MAIN SETUP

MAIN SETUP1

LANGUAGE

DISPLAY SETUP

DATE ADJUST

SENSOR SEARCH

●DATALOGGER

SERVICE

CHANGE PASSWORD

UPDATE CONNECTION

↑ ↓ to move
→ to select

DATALOGGER1.5

●WRITE RATE

STORAGE

USB CONNECT

USB DISCONNECT

↑ ↓ to move
→ to select

WRITE RATE1.5.1

0020sec

↑ → to modify
E to select

DATALOGGER1.5

WRITE RATE

●STORAGE

USB CONNECT

USB DISCONNECT

↑ ↓ to move
→ to select

STORAGE1.5.2

●*FLOW1

FLOW2

LEVEL1

LEVEL2

LEVEL3

LEVEL4

LEVEL5

LEVEL6

VOLUME1

VOLUME2

DIFFERENTIAL

NONE

↑ ↓ to move
E to select

→ save & exit

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

DATALOGGER	1.5
WRITE RATE STORAGE ● USB CONNECT USB DISCONNECT	
↑ ↓ to move → to select	

PLEASE WAIT

USB CONNECTED

USB NOT CONNECTED

15.2 - DATALOGGER on USB Pen Drive file reading

15.2.1 USB DISCONNECT

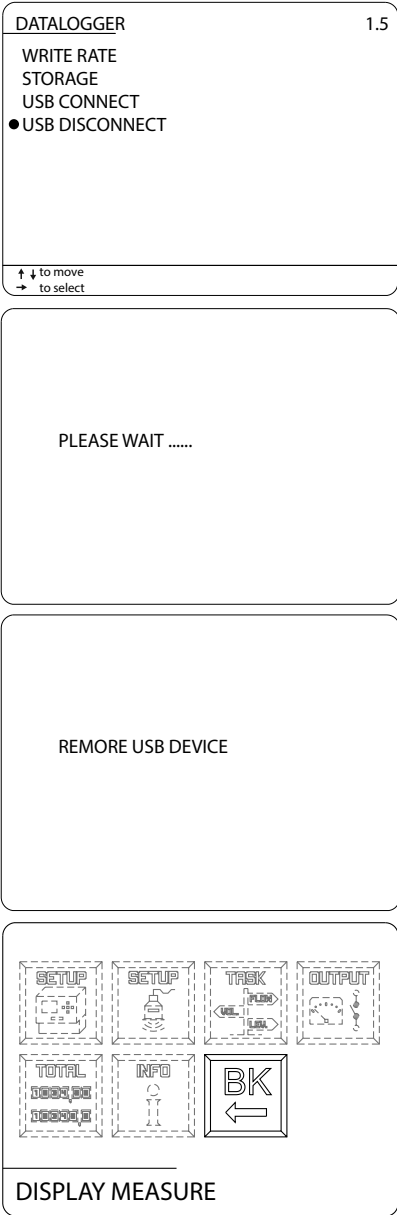
Before removing the Pen Drive to read the file, select “USB DISCONNECT” with the “DOWN” and confirm with “RIGHT”.

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	23616.33	l/m	2536.02	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:

A large, empty rectangular box with rounded corners, intended for the user to describe the equipment being certified.

(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: