VLW90M

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



Technical documentation EN Rev. of 02/02/2023



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Products supplied by SGM LEKTRA are guaranteed for a period of 12 (twelve) months from delivery date according to the conditions specified in our sale conditions document.

SGM LEKTRA can choose to repair or replace the Product.

If the Product is repaired it will maintain the original term of guarantee, whereas if the Product is replaced it will have 12 (twelve) months of guarantee.

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.



- 1. Keyboard
- 2. Pen Drive USB for DATALOGGER (When available)
- 3. N°4 Skintop M20x1,5
- 4. Electrical terminal

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-FEATURES

Housing material ABS **Mechanical installation** Wall, pipe or DIN rail mounting **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÷265Vac; 20÷30Vdc/Vac **Power consumption** Max. 10W **Analog output** n.2 configurable isolated 4÷20mA active, max load 750 Ω **Relays output** n.5 fully configurable relay (5A 250Vac with resistive load) **Digital output** n.2 open collector (max. 24Vdc 50mA), max 1 pulse/second **Analog input** n.2 4÷20mA **Digital input** n.2 (max. 24Vdc 10mA) **Digital communication** MODBUS RTU Datalogger (when available) on Pen Drive USB; max.32GB (FAT32) Power supply for analog transmitters 24Vdc; 200mA max **Compsuntion:** Г Т 24Vdc

	1
only instrument VLW90M	100mA
VLW90M 1 probe in MODBUS	150mA
VLW90M 2 probes in MODBUS	200mA
Relay excited	30mA each

4-DIMENSIONS

4.1 - MECHANICAL DIMENSIONS





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.
- Make sure that the housing material is compatible with environmental condition
- An improper use of the unit can cause serious injuries to operators and damages to the product and to the connected equipments.

5.1.1 - Drilling template for wall mounting







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.
- Fighten 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-SGM LEKTRA ULTRASONIC MODBUS LEVEL TRANSMITTERS CONNECTION

6.3.1 - Up to 2 SGM LEKTRA ultrasonic level transmitters can be directly powered by the VLW90M







6.3.4 - SGM LEKTRA hydrostatic head level transmitters connection



6.3.5 - 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 intuitive.

1. From "RUN" mode: Press to access the main menu



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 SGM LEKTRA 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 menu.

DISPLAY.















7.3 - VLW90M turning on and system initialization

- Firmware loading for the VLW90M unit operating. A green bar is displayed to indicate the initialization procedure progress.
- Searching for SGM LEKTRA ultrasonic sensors connected via MODBUS RTU communication port (RS485). The following information is displayed:
 - a) * Probes Found: 4 ; shows the ultrasonic sensors number connected, with the properly configured UID address.
 - b) UID1.....UID4; showing the measuring sensor model with its UID address. In the example shown, 4 sensors are identified with their model and UID address.
- 3) Searching for data logger Pen Drive connected to the USB port. The following information is displayed:
 - a) * USB CONNECTED; shows that a FAT32 formatted Pen Drive is connected to the USB port and the datalogger function is automatically enabled.
 - b) * USB NOT CONNECTED; shows that no Pen Drive is connected to the USB port, or that the pen drive connected to the USB port is not FAT32 formatted; In this case, connect the Pen Drive to a PC or notebook, and format it by selecting the "FAT32" option in "File System". After is possible to connect the Pen Drive following the procedure described in Chapter 15.



* USB CONNECTED

* PROBES FOUND: 4

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

* USB CONNECTED

* PROBES FOUND: 4

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

* USB NOT CONNECTED

* PROBES FOUND: 4

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

8-OPEN CHANNELS FLOW MEASUREMENT SET UP GUIDES

8.1 - SGM VENTURI STD prefabricated channels configuration

SGM-LEKTRA developed in collaboration with Pavia University Hydraulics Institute a venturi channels family called "SGM VENTURI STD".

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" Emenu icon. Confirm the selection by pressing "ENTER".



8.1.1 - SENSOR

Press "RIGHT" to select "SENSOR".

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

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





8.1.2 - PRIMARY DEVICE	FLOW1 SENSOR	3.1
Press "DOWN" to select "PRIMARY DEVICE" and press "RIGHT" to confirm.	MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP • PRIMARY DEVICE TABLE FORMULA START TOTALIZER	
	<pre>↑↓ to move → to select</pre>	
Press "DOWN" to select "SGM VENTURI STD" and press "RIGHT" to confirm.	FLOW1 RECT. SUPRESSED RECT. CONTRACTED TRAPEZOIDAL VNOTCH • SGM VENTURI STD SGM VENTURI CUSTOM KAFAGI VENTURI PARSHALL INCH PARSHALL FET PALMER BOWLUS ↑ ↓ to move + to select	3.1.6
Use the "UP" or "DOWN" to select the model. Confirm selection with "RIGHT".	FLOW1 • B5150 B5200 B5300 B5400 B5500 B5600 B5800 B51000	3.1.6.5
	↑↓to move	
8.1.3 - MEASURE UNIT Press "DOWN" to select "MEASURE UNIT" and press "RIGHT" to confirm.	FLOW1 SENSOR •MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA START TOTALIZER	3.1
	→ to select)
Press "UP" or "DOWN" to select the flow rate measure unit and press "RIGHT" to confirm.	FLOW MEASURE UNIT It/s It/min It/h	3.1.2 m3/s m3/m m3/h
	↑↓tomove → to select	
Press "UP" or "DOWN" to select the totalizer measure unit and press "RIGHT" to confirm.	TOTAL MEASURE UNIT ●1 m3	3.1.2.1
	↑ ↓ to move	
	→ to select	J

8.1.4 CALIBRATION	FLOW1 3.1 SENSOR
Press "DOWN" to select "CALIBRATION" and press "RIGHT"	MEASURE UNIT • CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA START TOTALIZER • + to move • to select
	SET Q MAX 3.1.3
"MAX Q" is the threshold for Max flow beyond which the to Set the value and confirm with "ENTER"	t. does not increase.
Disabled function with "0" threshold value.	00000m3/h
Enter the actual head or the "O=0"distance in mm .	
Press "DOWN" to select the measure to be set.	
Move the cursor with "RIGHT" and press "UP" to change th	e digit.
CONTIRM WITH "ENTER". Manually measure in mm the "ACTUAL HEAD" and insert th	le data the unit will
automatically calculate the fluid distance to the "Q=0" poir	3.1.3.1 It (zero flow distance). SET ACTUAL HEAD
Alternatively, can directly be entered the "Q=0" empty distant	ance.
In fig.1 the example to correctly detect the "ACTUAL HEAD"	the zero flow condition SET Q=0 DISTANCE
(no flow: see fig.2), because in doing so the "ACTUAL HEAD"	" or "O=0"
manually measurement distance errors are avoided.	0000000
"ACTUAL HEAD" set to "0" is enough to ensure the correct of	calibration.
	to modify E to confirm ↓ to select
FIG.1	



FLOW1

SENSOR

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.

MEASURE UNIT CALIBRATION CUTOFF MAX FLOW STOP PRIMARY DEVICE TABLE FORMULA • START TOTALIZER	
to move to select	
ARE YOU SURE? • NO YES	3.1.9
→ to select	
DISPLAY MEASURE	

3.1

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

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

8.2 - Constriction rectangular weir (Francis) configuration

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





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

With the arrow keys select the "TASK" Emenu 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 "ENTER" to confirm.

		3.1
SENSOR		
MEASURE UNIT		
CALIBRATION		
CUTOFF		
TARI F		
START TOTALIZER		
to move to select		
FLOW/1		211
		5.1.1
SENSOR 2	SENSOR 8	
SENSOR 3	ANALOG 1	
SENSOR 4	ANALOG 2	
SENSOR 5	NONE	
SENSOR 6		
-		
 ↑ ↓ to move → to select 		
Error Condition		3.1.1.1
LAST VALID VALUE		
OVER RANGE VALUE		
ZERO VALUE		
↑ ↓ to move → to select		
FLOWI		3.1
SENSOR		
MEASURE UNIT		
CALIBRATION		
CUTOFF		
MAX FLOW STOP		
PRIMARY DEVICE		
TABLE		
FORMULA		
START TOTALIZER		
START TOTALIZER ↑↓ to move → to select		
START TOTALIZER ↑↓to move → to select FLOW1		3.1.6
START TOTALIZER + + to move + to select FLOW1 RECT. SUPRESSED		3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED		3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED RECT. CONTRACTED TRAPEZOIDAL		3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH		3.1.6
START TOTALIZER + + to move + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD		3.1.6
START TOTALIZER + to move + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO		3.1.6
START TOTALIZER + to move + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI		3.1.6
START TOTALIZER * to move * to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH	 DM	3.1.6
START TOTALIZER * + to move * to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL FEET	 M	3.1.6
FLOWILA START TOTALIZER + to select FLOWI RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL INCH PARSHALL FEET PALMER BOWLUS	9M	3.1.6
TORMULA START TOTALIZER * ↓ to move * to select FLOW1 RECT. SUPRESSED • RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL INCH PARSHALL INCH PARSHALL INCH PARSHALL INCH PALMER BOWLUS * ↓ to select		3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL INCH PARSHALL FEET PALMER BOWLUS + to select RECT. CO	DM NTRACTED	3.1.6
FLOWIGEA \$ + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL FEET PALMER BOWLUS † + to move * to select	M NTRACTED	3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL FEET PALMER BOWLUS + to select RECT. CO	NTRACTED	3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL INCH PARSHALL FEET PALMER BOWLUS + to select RECT. CO	NTRACTED	3.1.6
START TOTALIZER + to select FLOW1 RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL INCH PARSHALL INCH PARSHALL FEET PALMER BOWLUS + to select RECT. CO	NTRACTED	3.1.6
FLOWILA START TOTALIZER + to select FLOWI RECT. SUPRESSED • RECT. CONTRACTED TRAPEZOIDAL VNOTCH SGM VENTURI STD SGM VENTURI CUSTO KAFAGI VENTURI PARSHALL FEET PALMER BOWLUS + to select • to select • COSO	NTRACTED	3.1.6

to move € to confirm

8.2.3 - MEASURE UNIT

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

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

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

		. 0
FLOW1		3.
SENSOR		
MEASURE LINIT		
CUTOFF		
MAX FLOW STOP		
↑ ↓ to move → to select		
FLOW MEASURE UNIT		3.1.
●lt/s	m3/s	
lt/min	m3/m	
lt/h	m3/h	
↑ ↓ to move → to select		
TOTAL MEASURE UNIT		3.1.2.
•		
m3		



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	
CALIBRATION	
PRIMARY DEVICE	
TABLE	
● START TOTALIZER	
ARE YOU SURE?	3.1.9
YES	
↓ to move	
→ to select	
, setup , , setup , , thak , , ,	OUTPUT
	ल्ल है।
TOTAL	
DISPLAY MEASURE	

8.3 - SGM LEKTRA "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 SGM LEKTRA "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.

TASK	
TASK	3
• 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	3.1
+ to select	
FLOW1 • SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6	3.1.1 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	3.1.1.1
+ to select	J





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	
CALIBRATION	
PRIMARY DEVICE	
TABLE	
● START TOTALIZER	
ARE YOU SURE?	3.1.9
YES	
↓ to move	
→ to select	
, setup , , setup , , thak , , ,	OUTPUT
	ल्ल है।
TOTAL	
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".

RELAY1
RELAY2 RELAY3
RELAY4
ELAY5 ● DIGITAL1
DIGITAL2
ANALOG1 ANALOG2
↑↓to move → to select
DIGITAL 1 4.6
↑↓to move → to select
TOTALIZER 4.6.1
SELECT TOTALIZER
PULSE LENGTH
 ↑ ↓ to move → to select
SELECT TOTALIZER 4.6.1.1
• TOTALIZER1 TOTALIZER2 USER TOTALIZER NONE
t ↓ to move

8.4.2 - VOLUME/PULSE	TOTALIZER 4.6.1 SELECT TOTALIZER
Select with "DOWN "VOLUME/PULSE". Press "RIGHT" to confirm.	VOL/PULSE PULSE LENGTH
	↑↓tomove → to select
Set the single pulse value in liters. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	00000000000000000000000000000000000000
8.4.3 - PULSE LENGTH	t → to modify E to confirm TOTALIZER 4.6.1 SELECT TOTALIZER
Select with "DOWN" "PULSE LENGTH". Press "RIGHT" to confirm.	VOL/PULSE ● PULSE LENGTH
Set the pulse length value in ms. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	040 ms
	t → to modify E to confirm
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 of scale, press "DOWN" to select "SET 20mA VALUE". Confirm with "RIGHT".

SETUP I I SET	
	BK
	_
OUTPUTS	
OUTPUTS	4
RELAY1 RELAY2	
RELAY3	
RELAY4 RELAY5	
DIGITAL1	
DIGITAL2 ● ANALOG1	
ANALOG2	
<pre>↑ ↓ to move → to select</pre>	
ANALOG 1	4.8
● FLOW1	VOLUME1
FLOW2	VOLUME2 DIFFERENTIAL
LEVEL2	NONE
LEVEL3	
LEVEL5	
LEVEL6	
↑ ↓ to move	
	4.0.1
eset 4ma VALLIE	4.8.1
SET 20mA VALUE	
↑ ↓ to move	
SET	4mA VALUE 4811
0000	0,00 m3/n
A to modify	
E to confirm	
ANALOG 1	4.8.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	48.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	4.8.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	48.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	48.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	4.8.1.2
ANALOG 1 SET 4mA VALUE • SET 20mA VALUE	4.8.1.2



8.6.1 - TASK	RELAY1 4.1.1 • TASK
Press "RIGHT" to select "TASK".	MODE THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
	† ↓ to move → to select
Select "FLOW1" or "FLOW2". Press "RIGHT" to confirm.	RELAY14.1.1.1• FLOW1VOLUME1FLOW2VOLUME2LEVEL1NONELEVEL2LEVEL3LEVEL3LEVEL4LEVEL5LEVEL6
8.6.2 - MODE	RELAY1 4.1.1 TASK • MODE THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
Press RIGHT to select MODE.	DELAT
Select "min" for minimum flow alarm or "MAX" for maximum flow alarm. Press "RIGHT" to confirm.	RELAY1 4.1.1.2 ● min MAX
8.6.3 - THRESHOLD VALUE Select "THRESHOLD VALUE" to set the relay switching point and press "RIGHT" to confirm.	RELAY1 4.1.1 TASK MODE • THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
	† ↓ to move → to select
	SET VALUE 4.1.1.3
Set the flow threshold value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	00000.00 m3/h
	to modify E to confirm
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8.6.4 - SAFETY	(RELAY1 4.1.1) TASK
To set the relay alarm condition status select "SAFETY" and confirm with "RIGHT".	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.	SAFETY 4.1.1.5 • NO YES
Press 2 times "LEFT" to return to the main menu. Select and press "ENTER" to return to "RUN" mode	+ to nove + to select
	DISPLAY MEASURE

VLW90M - Open channels flow measurement set up guides

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 \star 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.

MAIN SETUP	
MAIN SETUP LANGUAGE • DISPLAY SETUP DATE ADJUST SENSOR SEARCH DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION	1
↑↓ to move → to select	
DISPLAY SETUP LCD COLOR BACKLIGHT • DISPLAY MEASURES SCROLL TIME TREND DISPLAY	1.2
↑ ↓ 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

9-LEVEL MEASUREMENT SET UP GUIDES

9.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

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

To configure the level measurement with SGM LEKTRA ultrasonic transmitters follow the procedure below.

With the arrow keys select the "TASK" E 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.	TASK 3 FLOW1 VOLUME1 FLOW2 VOLUME2 • LEVEL1 PUMP CONTROL LEVEL2 WELL WATER RISE LEVEL3 DIFFERENTIAL LEVEL4 LEVEL5 LEVEL6
9.1.1 - SENSOR Press "RIGHT" to select "SENSOR".	+ to move + to select LEVEL1 3.3 SENSOR CALIBRATION
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.	+ to move + to select LEVEL1 SENSOR_1 SENSOR_7 SENSOR_2 SENSOR_8 SENSOR_3 ANALOG_1 SENSOR_4 ANALOG_2 SENSOR_5 NONE SENSOR_6
Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.	
	† ↓ to move → to select

9.1.2 - CALIBRATION



	BK
DISPLAY MEAS	URE

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 TOTAL SERVE	
TASK	
TASK FLOW1 FLOW2 •LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	3 VOLUME1 VOLUME2 PUMP CONTROL WELL WATER RISE DIFFERENTIAL
 ↑ ↓ to move → to select 	
LEVEL1 • SENSOR CALIBRATION	3.3
↑ ↓ to move → to select	
LEVEL1 SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6	3.3.1 SENSOR_7 SENSOR_8 •ANALOG_1 ANALOG_2 NONE
to move to select	

9.2.2 - CALIBRATION

VLW90M - level measurement set up guides



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

SETUP SETUP TOTAL SEESSE			
DISPLAY MEASURE			

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

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

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

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

9.3.1 - LEVEL

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

To set 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	,
	18
ANALOGI	4.0
FLOW1	VOLUME1
FLOW1 FLOW2	VOLUME1 VOLUME2
FLOW1 FLOW2 • LEVEL1	VOLUME1 VOLUME2 DIFFERENTIAL
FLOW1 FLOW2 •LEVEL1 LEVEL2	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 •LEVEL1 LEVEL2 LEVEL3 LEVEL4	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 •LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 •LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 * + to move	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move • to select	VOLUME1 VOLUME2 DIFFERENTIAL NONE
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move + to select ANALOG 1	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move + to select ANALOG 1 • SET 4mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move + to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 ● LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 ↑ ↓ to move → to select ANALOG 1 ● SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 •LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move • to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 ●LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 ★ + to move ★ to select ANALOG 1 ●SET 4mA VALUE SET 20mA VALUE	VOLUME1 VOLUME2 DIFFERENTIAL NONE 4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move • to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	4.8.1
FLOW1 FLOW2 • LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 • + to move • to select ANALOG 1 • SET 4mA VALUE SET 20mA VALUE	4.8.1

VLW90M - level measurement set up guides

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

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

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

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

SET 4mA VALUE 4	.8.1.1
00000 mm	
t → to modify E to confirm	
ANALOG1 SET 4mA VALUE • SET 20mA VALUE	4.8.1
SET 20mA VALUE 4	.8.1.2
00000 mm	
t → to modify E to confirm	

9.4 - Level threshold relays configuration

The VLW90M has 5 configurable relays for level alarm thresholds.



9.4.2 - MODE

VLW90M - level measurement set up guides

9.4.2 - MODE	THRESHOLD 4.1.1 TASK
Press "RIGHT" to select "MODE".	•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.	(RELAY1 4.1.1.2 ●min MAX
9.4.3 - THRESHOLD VALUE	to move + to select THRESHOLD 4.1.1
Select "THRESHOLD VALUE" to set the relay switching point and press "RIGHT" to confirm.	TASK MODE • THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
	↑↓to move + to select
	SET VALUE 4.1.1.3
Set in mm the level threshold value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	00000 mm
	+ → to modify E to confirm

VLW90M - level measurement set up guides

9.4.4 - SAFETY To set the relay alarm condition status select "SAFETY" and confirm with "RIGHT".	THRESHOLD4.1.1TASK MODETHRESHOLD VALUE THRESHOLD VALUE THRESHOLD HYSTERES• SAFETY
Select: "YES" relay de-energized in alarm condition; "NO" relay energized in alarm condition. Press "RIGHT" to confirm.	Image: state
Press 2 times "LEFT" to return to the main menu. Select and press "ENTER" to return to "RUN" mode.	

DISPLAY MEASURE

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1.2

1.2.3

Courreur SÌ

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".	MAIN SETUP LANGUAGE • DISPLAY SETUP DATE ADJUST SENSOR SEARCH DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION
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.	+ to move + to select DISPLAY MEASURES FLOW1 VOLUME1 FLOW2 VOLUME2 • *LEVEL1 PUMP CONTR LEVEL2 WATER RISE LEVEL3 DIFFER LEVEL3 DIFFER LEVEL4 TOTALIZER LEVEL5 ERRORS LEVEL6 TREND + to modify E to confirm → save & exit
Press 2 times "LEFT" to return to the main menu. Select end press "ENTER" to return to "RUN" mode.	DISPLAY MEASURE

10-DIFFERENTIAL LEVEL MEASUREMENT SET UP GUIDES

10.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

The use of SGM LEKTRA 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 SGM LEKTRA ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK" Emenu icon. Confirm the selection by pressing "ENTER".	SETUP SETUP TOTAL SECSE
Press "RIGHT" to access the submenu "DIFFERENTIAL".	TASK 3 FLOW1 VOLUME1 FLOW2 VOLUME2 LEVEL1 PUMP CONTROL LEVEL2 WELL WATER RISE LEVEL3 • DIFFERENTIAL LEVEL4 LEVEL5 LEVEL6 • 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 -	UPST	REAM	SENSOR
----------	------	------	--------

Press "RIGHT"	to	select	"UPSTREAM	SENSOR".
11000 100111		001000	01 011(E/ (1))	000101

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	סר	
ERROR CONDITION	7	
↓ 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 4	ANALOG_1 ANALOG_2	
SENSOR_5	NONE	
SENSOR_6		

VLW90M - differential level measurement set up guides

Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.	Error Condition ACTUAL VALUE • LAST VALID VALUE OVER RANGE VALUE ZERO VALUE	3.13.1.1.1
	↑↓to move → to select	
Select "CALIBRATION" with "DOWN" and press "RIGHT".	UPSTREAM SENSOR SENSOR • CALIBRATION	3.13.1
	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 00000 mm SET EMPTY DISTANCE 00000 mm	3.13.1.2
	↑→ to modify E to confirm	
Upstream empty distance Upstream Level	am >	
10.1.2 - DOWNSTREAM SENSOR	DIFFERENTIAL UPSTREAM SENSOR • DOWNSTREAM SENSOR ERROR CONDITION	3.13
Press "RIGHT" to select "DOWNSTREAM SENSOR".		
	↑↓to move → to select	
Press "RIGHT" to select "SENSOR".	DOWNSTREAM SENSOR ● SENSOR CALIBRATION	3.13.2
	↑ ↓ to move → to select	



Press 2 times LEFT to return to the main menu.



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:

Press "RIGHT" to access the submenu "DIFFERENTIAL".	K 3 DW1 VOLUME1 DW2 VOLUME2 /EL1 PUMP CONTROL /EL2 WELL WATER RISE /EL3 • DIFFERENTIAL /EL4 /EL4
	/EL6
10.2.1 - UPSTREAM SENSOR	o move o select FERENTIAI 3 13
• UPS DO ERF Press "RIGHT" to select "UPSTREAM SENSOR".	STREAM SENSOR WNSTREAM SENSOR ROR CONDITION
+ to + to Press "RIGHT" to select "SENSOR".	TREAM SENSOR 3.13.1 VSOR LIBRATION
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.	TREAM SENSOR 3.13.1.1 VSOR_1 SENSOR_7 VSOR_2 SENSOR_8 VSOR_3 ANALOG_1 VSOR_4 ANALOG_2 VSOR_5 NONE VSOR_6

	UPSTREAM SENSOR	3.13.1
	● CALIBRATION	
Select "CALIBRATION" with "DOWN" and press "RIGHT".		
·		
	↑↓to move	
	3.1	13.1.2
	SET LEVEL 4mA	
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.	04000mm	
Confirm with "ENTER".		
	to the second life in the second second	
	to select	
UPSTREAM DOWNSTREAM SENSOR SENSOR		
"ANALOG_x" "ANALOG_y"		
A		
LEVEL		
<u>20mA</u> 4000mm · · · · · · · · · · · · · · · · ·		
4mA		
10.2.2 - DOWNSTREAM SENSOR	DIFFERENTIAL	3.13
	UPSTREAM SENSOR • DOWNSTREAM SENSOR	
Pross "PIGHT" to select "DOW/NSTPEAM SENSOD"	ERROR CONDITION	
FIESS RIGHT TO SELECT DOWNSTREAM SENSOR.		
	↑ ↓ to move	
	→ to select	3 13 2
	• SENSOR	5.15.2
Press "RIGHT" to select "SENSOR"	CALIBRATION	
	→ to select	
	DOWNSTREAM SENSOR 3.1 SENSOR_1 SENSOR 7	13.2.1
Select the ANALOG_x input with "UP" or "DOWN". ANALOG 2 is associated with the sensor connection to Analog Input Ch2 terminals	SENSOR_2 SENSOR_8 SENSOR_3 ANALOG 1	
(see par.6.3.4/6.3.5.).	SENSOR_4 •ANALOG_2 SENSOR_5 NONE	
Press "RIGHT" to confirm.	SENSOR_6	
	↑ ↓ to move → to select	

VLW90M - differential level measurement set up guides

	DOWNSTREAM SENSOR 3.13.2 SENSOR • CALIBRATION
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".	3.13.2.2 SET LEVEL 4mA OOOOOOmm SET LEVEL 20mA OHOOOOmm
UPSTREAM DOWNSTREAM SENSOR SENSOR	+→ to modify E to confirm ↓ to select
LEVEL 20mA 4000mm	
LEVEL 4mA 0mm	
Press 2 times "LEFT" to return to the main menu. Select 🖼 and press "ENTER" to return to "RUN" mode.	

DISPLAY	MEASORE

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.



	ANALOG 1 4.8.1 SET 4mA VALUE • SET 20mA VALUE
To set end of scale, press "DOWN" to select "SET 20mA VALUE". Confirm with "RIGHT".	
	↑↓tomove → to select
	SET 20mA VALUE 4.8.1.2
Set in mm the differential level value corresponding to the 20mA output. Confirm with "ENTER".	∻00000 mm
	t → 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

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" Even menu icon. Confirm the selection by pressing "ENTER".	OUTPUTS
Press "UP" o "DOWN" to select "RELAY1", or "RELAY2", or "RELAY3", or "RELAY4" or "RELAY5". Press "RIGHT" to confirm.	OUTPUTS 4 • RELAY1 RELAY2 RELAY3 RELAY4 RELAY5 DIGITAL1 DIGITAL2 ANALOG1 ANALOG2 • LIO MOVE
Press "DOWN" to select "DIFFERENTIAL" and confirm with "RIGHT".	RELAY1 4.1 THRESHOLD •DIFFERENTIAL TOTALIZER DIAGNOSTIC NONE •ONE
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".	+ to move → to select SET VALUE 4.1.2.1 +000000 mm + to modify E to confirm

Press "DOWN" to select "THRESHOLD HYSTERES" to set the relay hysteresis and press "RIGHT" to confirm.	DIFFERENTIAL 4.1.2 THRESHOLD VALUE • • THRESHOLD HYSTERES SAFETY DELAY
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 ←000000 mm
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 HYSTERES • SAFETY DELAY
Select: "YES" relay de-energized in alarm condition; "NO" relay energized in alarm condition. Press "RIGHT" to confirm.	↑ + to move ★ to select 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.

SETUP SETUR TRSK OUTPUT With the arrow keys select the "MAIN SETUP" Emenu icon. FUR Confirm the selection by pressing "ENTER". INFO 1917,92 DEEEE MAIN SETUP MAIN SETUP 1 LANGUAGE DISPLAY SETUP DATE ADJUST Press "UP" or "DOWN" to select "DISPLAY SETUP". SENSOR SEARCH Confirm with "RIGHT". DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION ↑ ↓ to move → to select DISPLAY SETUP 1.2 **10.5.1 - DISPLAY MEASURES** LCD COLOR BACKLIGHT Press "DOWN" to select "DISPLAY MEASURES" and confirm with "RIGHT". DISPLAY MEASURES SCROLL TIME TREND DISPLAY ↑ ↓ to move → to select DISPLAY MEASURES 1.2.3 FLOW1 VOLUME1 With the pointer to "DIFFER", press "ENTER", the * symbol will highlight the FLOW2 VOLUME2 PUMP CONTR LEVEL1 selection. WATER RISE LEVEL2 Press "RIGHT" to save and exit. •*DIFFER LEVEL3 "LEVEL2/3/4/5/6" are available only when active TOTALIZER LEVEL4 ERRORS LEVEL5 LEVEL6 TREND to modify
 E to confirm → save & exit SETUP SETUP TRSK OUTPUT 合 Press 2 times "LEFT" to return to the main menu. URI. LEN. Select and press "ENTER" to return to "RUN" mode. TOTAL NFO BK indi de la cont ¢ IBBBEE DISPLAY MEASURE

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11-VOLUME MEASUREMENT SET UP GUIDES

11.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

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

To configure the volume measurement with SGM LEKTRA ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK" Emmenu 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.	TASK 1 FLOW1 •VOLUME1 FLOW2 VOLUME2 LEVEL1 PUMP CONTROL LEVEL2 WELL WATER RISE LEVEL3 DIFFERENTIAL LEVEL5 LEVEL6
11.1.1 - SENSOR	+ to move + to select
Press "RIGHT" to select "SENSOR".	↑ ↓ to move → to select
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.	VOLUME13.9.1• SENSOR_1SENSOR_7SENSOR_2SENSOR_8SENSOR_3ANALOG_1SENSOR_4ANALOG_2SENSOR_5NONESENSOR_6
Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.	
	† ↓ to move → to select

11.1.2 - MEASURE UNIT

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

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

11.1.3 - CALIBRATION

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

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





11.1.4 - TANK SHAPE

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

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

11.1.4.1 - VERTICAL CYLINDER

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

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

VOLUME1	3.9
SENSOR	
MEASURE UNIT	
CALIBRATION	
● TANK SHAPE	
↑ ↓ to move → to select	
TANK SHAPE	394
	5.9.4
RECTANGULAR	
↑ ↓ to move → to select	
	204
	3.9.4
VERTICAL CYLINDER	
RECTANGULAR	
↑ ↓ to move → to select	
	30/1
DIAMETER	5.2.4.1
00000	
UCUUUMM	
OFFSET VOL	
00000	
UUUDUlt	
t to modific Eto combumo	



11.1.4.2 - HORIZONT CYLINDER	TANK SHAPE VERTICAL CYLINDER • HORIZONT CYLINDER RECTANGULAR	3.9.4
For tank with horizontal cylindrical section, select "HORIZONT CYLINDER" and press "RIGHT".		
Enter the diameter and the length in mm.	DIAMETER DIAMETER DISOOmm LENGTH DIAMETER DIAMETER DIAMETER DIAMETER DIAMETER	3.9.4.2
B1500m.	+→to modify E to confirm + to select	

3000mmLENGTH

LENGTH

01500mm offset vol 000501t

F to confirm

TANK SHAPE VERTICAL CYLINDER HORIZONT CYLINDER • RECTANGULAR

↑ ↓ to move → to select

↑→to modify ↓ to select 3.9.4

3.9.4.3

11.1.4.3 - RECTANGULAR.

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

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



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



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.

Press "RIGHT" to access the submenu "VOLUME1" or "VOLUME2", is possible to configure up to 2 volume measurements. ITAK I1.2.1 - SENSOR PRESS "RIGHT" to select "SENSOR". I1.2.1 - SENSOR Image: select the ANALOG_x input with "UP" or "DOWN". ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals; ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals; ANALOG_1 is associated with the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5). Press "RIGHT" to select "MEASURE UNIT" and the sensor connection to Analog Input Ch2 terminals (see par.6.3.4/6.3.5). Press "DOWN" to select "MEASURE UNIT" Press "UP" or "DOWN" to select the measure unit. Confirm with "RIGHT". Image: select the measure unit. Confirm with "RIGHT".	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. * VOLUME1 11.2.1 - SENSOR VOLUME1 WULVMTF RSE 11.2.1 - SENSOR VOLUME1 30 * Select the ANALOG_x input with "UP" or "DOWN". 30 ANALOG_1 is associated with the sensor connection to Analog Input Ch1 terminals; * MULDG_2 is associated with the sensor connection to Analog Input Ch1 terminals; ANALOG_2 is associated with the sensor connection to Analog Input Ch1 terminals; * MULDG_2 is Sensor, 2 11.2.2 - MEASURE UNIT Select "MEASURE UNIT" and press "RIGHT". Press "UP" or "DOWN" to select "MEASURE UNIT" and press "RIGHT". ** Sensor, 1 ************************************		TASK
11.2.1 - SENSOR Image: Ima	Press "RIGHT" to access the submenu "VOLUME1" or "VOLUME2", is possible to configure up to 2 volume measurements.	TASK 3 FLOW1 • VOLUME1 FLOW2 VOLUME2 LEVEL1 PUMP CONTROL LEVEL2 WELL WATER RISE LEVEL3 DIFFERENTIAL LEVEL4 LEVEL5 LEVEL6 LEVEL6
11.2.1 - SENSOR VOLUMEI 3.9 Press "RIGHT" to select "SENSOR". MASURE UNT CAUBRATION TANK SHAPE		to move to select
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. 11.2.2 - MEASURE UNIT Press "DOWN" to select "MEASURE UNIT" and press "RIGHT". VOLUMEI 1.3.1 Sensor MEASURE UNIT OWN " to select the measure unit. Confirm with "RIGHT".	11.2.1 - SENSOR Press "RIGHT" to select "SENSOR".	VOLUME1 3.9 • SENSOR MEASURE UNIT CALIBRATION TANK SHAPE
11.2.2 - MEASURE UNIT 1 + to move + to select YOLUME1 3.9 SENSOR • MEASURE UNIT CALIBRATION TANK SHAPE Press "DOWN" to select "MEASURE UNIT" and press "RIGHT". 1 + to move + to select Press "UP" or "DOWN" to select the measure unit. Confirm with "RIGHT". 3.9.2 Image: the select the measure unit. 1 + to move + to select Image: the select the measure unit. 3.9.2 Image: the select the measure unit. 1 + to move + to select	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.	↑ + to move ★ to select VOLUME1 3.9.1 SENSOR_1 SENSOR_7 SENSOR_2 SENSOR_8 SENSOR_3 ● ANALOG_1 SENSOR_4 ANALOG_2 SENSOR_5 NONE SENSOR_6
11.2.2 - MEASURE UNIT 3.9 SENSOR • MEASURE UNIT CALIBRATION TANK SHAPE Press "DOWN" to select "MEASURE UNIT" and press "RIGHT". 1 to move to select * to select * to select		↑ ↓ to move
Press "DOWN" to select "MEASURE UNIT" and press "RIGHT".	11.2.2 - MEASURE UNIT	VOLUME1 3.9 SENSOR • MEASURE UNIT CALIBRATION TANK SHAPE
[†] ↓ to move [†] to select [†] ↓ to move [†] to select [¶] → to move [†] → to move	Press "DOWN" to select "MEASURE UNIT" and press "RIGHT".	
↑ ↓ to move → to select	Press "UP" or "DOWN" to select the measure unit. Confirm with "RIGHT".	t → to move + to select MEASURE UNIT 3.9.2 I m3
→ to select		A Lto move
		T ♦ to move → to select

VLW90M - volume measurement set up guides

11.2.3 - CALIBRATION

I.2.3 - CALIBRATION Press "DOWN" to select "CALIBRATION" and press "RIGHT".	VOLUME1 3.9 SENSOR MEASURE UNIT • CALIBRATION TANK SHAPE
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".	t + to move ★ to select 3.9.3 SET LEVEL 4mA OOOOOOmm SET LEVEL 20mA OBSOOmm + to modify + to modify + to select
3500mm	LEVEL 20mA

Level measure

LEVEL

4mA

VOLUME1

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.



3.9

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

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

0mm

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.

SETTIP TURTUD SETUP Š 3 -With the arrow keys select the "OUTPUTS" 🖼 menu icon. TOTAL INFO Confirm the selection by pressing "ENTER". 1991,92 TETT OUTPUTS OUTPUTS 4 RELAY1 Press "UP" o "DOWN" to select "ANALOG1" or "ANALOG2". RELAY2 RELAY3 Press "RIGHT" to confirm. RELAY4 RELAY5 DIGITAL1 DIGITAL 2 ANALOG1 ANALOG2 ↑ ↓ to move → to select 11.3.1 - VOLUME ANALOG1 4.8.1 FLOW1 ● VOLUME1 FLOW2 VOLUME2 LEVEL1 DIFFERENTIAL Press "UP" or "DOWN" to select "VOLUME1" or "VOLUME2". LEVEL2 NONE Confirm with "RIGHT". LEVEL3 LEVEL4 LEVEL5 LEVEL6 ↑ ↓ to move → to select ANALOG 1 4.8.1 • SET 4mA VALUE SET 20mA VALUE To set beginning of scale, press "RIGHT" to select "SET 4mA VALUE". ↑ ↓ to move → to select SET 4mA VALUE 4.8.1.1 Set in mm the volume value corresponding to the 4mA output. 00000 m3 Confirm with "ENTER". ↑ → to modify E to confirm



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

			CUIPUT C
TOTAL IBBI,BE IBBI,E		BK	
DISPLAY N	MEASU	RE	

11.4 - Volume threshold relays configuration

The VLW90M has 5 configurable relays for volume alarm thresholds.

With the arrow keys select the "OUTPUTS" First menu icon. Confirm the selection by pressing "ENTER".	
	OUTPUTS
Press "UP" o "DOWN" to select "RELAY1", or "RELAY2", or "RELAY3", or "RELAY4" or "RELAY5". Press "RIGHT" to confirm.	OUTPUTS 4 • RELAY1 RELAY1 RELAY2 RELAY3 RELAY3 RELAY4 RELAY5 DIGITAL1 DIGITAL2 ANALOG1 ANALOG2 + to move
	to select
Press "RIGHT" to select "THRESHOLD".	• THRESHOLD 0 DIFFERENTIAL TOTALIZER DIAGNOSTIC NONE
11.4.1 - TASK Press "RIGHT" to select "TASK".	THRESHOLD 4.1.1 •TASK MODE THRESHOLD VALUE THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY Content of the second sec
	to move to select
Select "VOLUME1", or "VOLUME2". Press "RIGHT" to confirm.	RELAY14.1.1.1FLOW1• VOLUME1FLOW2VOLUME2LEVEL1NONELEVEL2LEVEL3LEVEL4LEVEL4LEVEL5LEVEL6
	to move → to select
11.4.2 - MODE Press "RIGHT" to select "MODE".	RELAY1 4.1.1 TASK MODE THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
	↑↓to move → to select

Select "min" for minimum level alarm or "MAX" for maximum level alarm. Press "RIGHT" to confirm.	RELAY1 4.1.1.2 • min MAX
11.4.3 - THRESHOLD VALUE Select "THRESHOLD VALUE" to set the relay switching point and press "RIGHT" to confirm.	to move to select
Set m3 or in I the volume threshold value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	SET VALUE 4.1.1.3
11.4.4 - SAFETY To set the relay alarm condition status select "SAFETY" and confirm with "RIGHT".	t → to modify E to select RELAY1 TASK MODE THRESHOLD VALUE THRESHOLD HYSTERES SAFETY DELAY
Select: "YES" relay de-energized in alarm condition; "NO" relay energized in alarm condition. Press "RIGHT" to confirm.	
Press 2 times "LEFT" to return to the main menu. Select and press "ENTER" to return to "RUN" mode.	

11.5 - Configuration of displayed measures

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

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

SETUP SETUP TRSK OUTPUT With the arrow keys select the "MAIN SETUP" em nu icon. FUR ΰü. LEU. Confirm the selection by pressing "ENTER". INFO 36,2681 DEEDĘE MAIN SETUP MAIN SETUP 1 LANGUAGE DISPLAY SETUP DATE ADJUST Press "UP" or "DOWN" to select "DISPLAY SETUP". SENSOR SEARCH Confirm with "RIGHT". DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION ↑ ↓ to move → to select DISPLAY SETUP 1.2 **11.5.1 - DISPLAY MEASURES** LCD COLOR BACKLIGHT Press "DOWN" to select "DISPLAY MEASURES" and confirm with "RIGHT". DISPLAY MEASURES SCROLL TIME TREND DISPLAY ↑ ↓ to move → to select DISPLAY MEASURES 1.2.3 FLOW1 ●*VOLUME1 With the pointer to "VOLUME1", press "ENTER, the * symbol will highlight FLOW2 VOLUME2 LEVEL1 PUMP CONTR the selection. WATER RISE LEVEL2 Press "RIGHT" to save and exit. LEVEL3 DIFFER "VOLUME2" are available only when active. LEVEL4 TOTALIZER ERRORS LEVEL5 LEVEL6 TREND ↑ ↓ to modify E to confirm → save & exit SETUP TRSK OUTPUT SETUP (MIN) R Press 2 times "LEFT" to return to the main menu. UEL. j**u**r Select 🛱 TOTAL INFO BK and press "ENTER" to return to "RUN" mode. ¢ I DEECI **DISPLAY MEASURE**

12-PUMP CONTROL SET UP GUIDES

12.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

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

To configure the pump control with SGM LEKTRA ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK" menu icon. Confirm the selection by pressing "ENTER".	SETUP (114)(
Select submenu "PUMP CONTROL" and press "RIGHT".	TASK FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	3 VOLUME1 VOLUME2 • PUMP CONTROL WELL WATER RISE DIFFERENTIAL
Select "PUMP 1", or "PUMP 2", or "PUMP 3" or "PUMP 4" or "PUMP 5" with "RIGHT".	+ to nove + to select PUMP CONTROL PUMP 1 (RL1) PUMP 2 (RL2) PUMP 3 (RL3) PUMP 4 (RL4) PUMP 5 (RL5)	3.11
12.1.1 - SENSOR Press "RIGHT" to select "SENSOR".	↑ + to move	3.11.1
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.	+ to move + to select SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6	3.11.1.1 SENSOR_7 SENSOR_8 ANALOG_1 ANALOG_2 NONE
Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.	+ to move to select Error Condition ACTUAL VALUE ACTUAL VALUE ACTUAL VALUE OVER RANGE VALUE ZERO VALUE	3.11.1.1.1
12.1.2 - CALIBRATION



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	

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

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

12.1.5 - UPPER TH LEVEL

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

Set in mm the upper threshold level value (see fig. next page). Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER". VLW90M - pump control set up guides

PUMP 1 (RL1)	3.11.1
,	
SENSOR	
CALIBRATION	
FNARIE	
MODE	
MODE	
UPPER TH LEVEL	
LOWER TH LEVEL	
DELAY	
DEDIT	
★ I to move	
→ to select)
MODE	3.11.1.4
● EMPTYING	
FILLING	
↑ ↓ to move	
→ to select)
(
PUMP 1 (RL1)	3.11.1.5
CENCOR	
SENSOR	
CALIBRATION	
ENABLE	
MODE	
• UPPER IN LEVEL	
LOWER TH LEVEL	
DELAY	
↑ ↓ to move	
↓ → to select)
	<u> </u>
UPPER TH LEVEL	3.11.1.5
	~
l ocooomi	
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
f → to modify F to confirm	J
	/

12.1.6 - LOWER TH LEVEL



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" Emmenu icon. Confirm the selection by pressing "ENTER".		
Select submenu "PUMP CONTROL" and press "RIGHT".	TASK FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6	3 VOLUME1 VOLUME2 • PUMP CONTROL WELL WATER RISE DIFFERENTIAL
Select "PUMP 1", or "PUMP 2", or "PUMP 3" or "PUMP 4" or "PUMP 5" with "RIGHT".	+ to select PUMP CONTROL PUMP 1 (RL1) PUMP 2 (RL2) PUMP 3 (RL3) PUMP 4 (RL4) PUMP 5 (RL5)	3.11
12.2.1 - SENSOR	$ \begin{array}{c} \uparrow \downarrow \text{to move} \\ \Rightarrow \text{ to select} \\ \hline PUMP 1 (RL1) \end{array} $	3.11.1
Press "RIGHT" to select "SENSOR".	SENSOR CALIBRATION ENABLE MODE UPPER TH LEVEL LOWER TH LEVEL DELAY	
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.	+ ↓ to move + ↓ to select SENSOR_1 SENSOR_2 SENSOR_3 SENSOR_4 SENSOR_5 SENSOR_6	3.11.1.1 SENSOR_7 SENSOR_8 •ANALOG_1 ANALOG_2 NONE
	to move to select	

SET LEVEL 4mA

00000mm

SET LEVEL 20mA

E to confirm

3.11.1

3.11.1.2

PUMP 1 (RL1)

SENSOR • CALIBRATION ENABLE MODE

↑ ↓ to move → to select

UPPER TH LEVEL LOWER TH LEVEL DELAY

12.2.2 - CALIBRATION

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

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



12.2.3 - ENABLE

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

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

PUMP 1 (RL1) SENSOR CALIBRATION • ENABLE MODE UPPER TH LEVEL LOWER TH LEVEL DELAY	3.11.1
CALIBRATION • ENABLE MODE UPPER TH LEVEL LOWER TH LEVEL DELAY	
ENABLE MODE UPPER TH LEVEL LOWER TH LEVEL DELAY	
UPPER TH LEVEL LOWER TH LEVEL DELAY	
LOWER TH LEVEL DELAY	
DELAY	
▲ I 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".

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

12.2.5 - UPPER TH LEVEL

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

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

	3.11.1
SENSOR	
CALIBRATION	
ENABLE	
I OWER TH LEVEL	
DELAY	
to select	
MODE	3.11.1.4
● EMPTYING	
FILLING	
to move to select	
	3 11 1
	5.11.1
ENABLE	
MODE	
• UPPER TH LEVEL	
LOWER TH LEVEL	
DELAY	
↑ ↓ to move to select	
UPPER TH LEVEL	3.11.1.5
02000	
UEUUUMM	
↑ → to modify	

12.2.6 - LOWER TH LEVEL



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

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



SETUP

INFO

OUTPUT

4

TREK

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".	
	MAIN SET
Press "UP" or "DOWN" to select "DISPLAY SETUP". Confirm with "RIGHT".	MAIN SETUP LANGUAGE • DISPLAY SE DATE ADJU SENSOR SE DATALOGG SERVICE CHANGE PA UPDATE CO
	↑ ↓ to move → to select
12.3.1 - DISPLAY MEASURES Press "DOWN" to select "DISPLAY MEASURES" and confirm with "RIGHT".	DISPLAY SET LCD COLOR BACKLIGHT • DISPLAY ME SCROLL TIM TREND DISF
With the pointer to "PUMP CONTR", press "ENTER" the * symbol will highlight the selection. Press "RIGHT" to save and exit.	to select to select to select To select DISPLAY ME. FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL3 LEVEL4 LEVEL5 LEVEL6 to confirm
Press 2 times "LEFT" to return to the main menu. Select and press "ENTER" to return to "RUN" mode.	SETUP CC-1 TOTAL 100825E 100825E

ΓUΡ 1 TUP ST ARCH GER ASSWORD ONNECTION 1.2 UP EASURES ΛE PLAY ASURES 1.2.3 VOLUME1 VOLUME2 •*PUMP CONTR WATER RISE DIFFER TOTALIZER ERRORS TREND → save & exit SETUP TRSK ourreur S. Y INFO BK $\langle -$ **DISPLAY MEASURE**

13-WELL WATER RISE SET UP GUIDES

13.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

The use of SGM LEKTRA 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 SGM LEKTRA ultrasonic transmitters follow the procedure below:

With the arrow keys select the "TASK" Emmenu icon. Confirm the selection by pressing "ENTER".	
Select submenu "WELL WATER RISE" and press "RIGHT".	TASK3FLOW1VOLUME1FLOW2VOLUME2LEVEL1PUMP CONTROLLEVEL2• WELL WATER RISELEVEL3DIFFERENTIALLEVEL4LEVEL5LEVEL6LEVEL6
13.1.1 - LEVEL SENSOR	+ to move + to select WELL WATER RISE 3.12
Press "RIGHT" to select "LEVEL SENSOR".	CALIBRATION 1st PUMP (RL1) 2nd PUMP (RL2) 3rd PUMP (RL3) 4th PUMP (RL4) 5th PUMP (RL5) ALARM IMPUT
	to move to select
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.	LEVEL SENSOR3.12.1• SENSOR_1SENSOR_7SENSOR_2SENSOR_8SENSOR_3ANALOG_1SENSOR_4ANALOG_2SENSOR_5NONESENSOR_6
	↑↓to move → to select
Press "DOWN" to select the measure condition in error state. Press to "RIGHT" confirm.	Error Condition 3.12.1.1 ACTUAL LEVEL • LAST VALID VALUE OVER RANGE VALUE ZERO VALUE
	† ↓ to move → to select

13.1.2 - CALIBRATION



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".



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		ON THRESHOLD LEVEL 3.12.3.1
Set in mm the on threshold l Move the cursor with "RIGHT Confirm with "ENTER".	evel value. "" and "UP" to change the digit.	02500mm
Press "DOWN" to select "OFF	THRESHOLD LEVEL" and press "RIGHT".	t → to modify E to confirm 1st PUMP (RL1) ON THRESHOLD LEVEL • OFF THRESHOLD LEVEL ROTATION ENABLE ENABLE
		↑ ↓ to move
		→ to select
		OFF THRESHOLD LEVEL 3.12.3.2
Set in mm the off threshold I Move the cursor with "RIGHT Confirm with "ENTER".	evel value. "" and "UP" to change the digit.	00500mm
		A to modifie
		E to select
100	9%	
-		
	ON THRESHOLD LEVEL	
Level measure	Emerginal OFF THRESHOLD LEVEL PUMP n°1 Image: Comparison of the second seco	PUMP 5
0%	· Lo_1	

VLW90M - well water rise set up guides

Press "DOWN" to select "ROTATION" and press "RIGHT".	1st PUMP (RL1) 3.12.3 ON THRESHOLD LEVEL OFF THRESHOLD LEVEL • ROTATION ENABLE
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.	<pre></pre>
Press "DOWN" to select "ENABLE" and press "RIGHT".	to select <u>1st PUMP (RL1)</u> 3.12.3 ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ROTATION •ENABLE
Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".	
Press 2 times "LEFT" to return to the main menu. Select and press "ENTER" to return to "RUN" mode.	+ + to move + to select

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:



13.2.2 - CALIBRATION



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".



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	ON THRESHOLD LEVEL 3.12.3.1
Set in mm the on threshold level value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	02500mm
Press "DOWN" to select "OFF THRESHOLD LEVEL" and press "RIGHT".	to modify E to confirm 1st PUMP (RL1) ON THRESHOLD LEVEL ● OFF THRESHOLD LEVEL ROTATION ENABLE 8 Conferment of the second s
	↑↓tomove → to select
	OFF THRESHOLD LEVEL 3.12.3.2
Set in mm the off threshold level value. Move the cursor with "RIGHT" and "UP" to change the digit. Confirm with "ENTER".	00500mm
	↑→ to modify E to select
100%	
ON THRESHOLD LEVEL	
PUMP PUMP n°1 0%	PUMP 5

VLW90M - well water rise set up guides

Press "DOWN" to select "ROTATION" and press "RIGHT".	1st PUMP (RL1) 3.12.3 ON THRESHOLD LEVEL OFF THRESHOLD LEVEL • ROTATION ENABLE
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.	+ to move
Press "DOWN" to select "ENABLE" and press "RIGHT".	t to nove → to select <u>1st PUMP (RL1)</u> 3.12.3 ON THRESHOLD LEVEL OFF THRESHOLD LEVEL ROTATION •ENABLE
Press "UP" or "DOWN" to select "YES". Confirm with "RIGHT".	↑ + to move ◆ to select ENABLE NO • YES
Press 2 times "LEFT" to return to the main menu. Select 🖭 and press "ENTER" to return to "RUN" mode.	+ to move + to select

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



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

14.1 - via MODBUS SGM LEKTRA ultrasonic transmitters configuration

The use of SGM LEKTRA 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" Emmenu icon. Confirm the selection by pressing "ENTER".	
Press "UP" or "DOWN" to select "SENSOR SEARCH". Confirm with "RIGHT".	MAIN SETUP 1 LANGUAGE DISPLAY SETUP DATE ADJUST • • SENSOR SEARCH DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION Image: Constant of the select
	SEARCHING
The display will show the UID address of the new connected transmitter. Normally the new transmitters have the UID 1 address.	UID_ 1 FOUND
	Set New Uid (1 to 8)
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.	1
	↑ ↓ to move E to select
DISCONNECT THE TRASMITTER	

IKASMIII

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

VLW90M - PTU5x or METER or KTU5 sensor via MODBUS new connection

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 SE LANGU DISPLA DATE A SENSOI DATALC SERVIC CHANG • UPDATI	<u>TUP</u> AGE Y SETUP DJUST R SEARCH OGGER E E PASSWC E CONNEC	PRD TION		1				
 ↑ ↓ to move → to select 	e t							
PLI	EASE WAIT	·						
	* PROBES FOUND: 4							
	UID1: UID2: UID3: UID4:	PTU51 PTU51 METER PTU56	6m 6m 5m 12m					
→ save & e	exit							

15-DATALOGGER (WHEN AVAILABLE)

15.1 - DATALOGGER on USB Pen Drive activation

With the arrow keys select the "MAIN SETUP" Emmonution. 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.

	BK 4
MAIN SETUP	
MAIN SETUP LANGUAGE DISPLAY SETUP DATE ADJUST SENSOR SEARCH • DATALOGGER SERVICE CHANGE PASSWORD UPDATE CONNECTION	1 N
↑ ↓ to move	
WRITE RATE STORAGE USB CONNECT USB DISCONNECT	1.5
+ + to move → to select WRIT	e rate 1.5.1
to modify E to select DATALOGGER WRITE RATE ● STORAGE USB CONNECT USB DISCONNECT	1.5
+ ↓ to move + ↓ to select STORAGE •*FLOW1 FLOW2 LEVEL1 LEVEL2 LEVEL2 LEVEL3 LEVEL4 LEVEL5	1.5.2 VOLUME1 VOLUME2 DIFFERENTIAL NONE
LEVEL6	

VLW90M - Datalogger

15.1.3 -	USB	CONNECT
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I5.1.3 - 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".	DATALOGGER 1.5 WRITE RATE STORAGE ● USB CONNECT USB DISCONNECT ↑ ↓ to move ★ to select to select
Wait until the system finds the connected pen drive to the VLW90M USB port.	PLEASE WAIT
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.	USB CONNECTED
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".	USB NOT CONNECTED

15.2 - DATALOGGER on USB Pen Drive file reading

15.2.1 - USB DISCONNECT DATALOGGER 1.5 WRITE RATE STORAGE USB CONNECT Before removing the Pen Drive to read the file, select "USB DISCONNECT" with the USB DISCONNECT "DOWN" and confirm with "RIGHT". ↑ ↓ to move → to select Wait until the system disconnects the Pen Drive from the VLW90M USB port. PLEASE WAIT The message "REMOVE USB DEVICE" is displayed. Is now possible to remove the pen drive. REMORE USB DEVICE SETUP OUTPUT SETUP TREK FLOR Press 2 times "LEFT" to return to the main menu. TOTAL NFO Select and press "ENTER" to return to "RUN" mode. BK IIII TERE 2 **DISPLAY MEASURE**

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 mesure)
- **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	тот	unit	LEV(mm)	VOL	unit	DIFF(mm)	PUMP_LEV(mm)
22/05/2013	18:26:16	FLOW1	1	28513,68	l/m	2529,30	m3	0	0,00		0	0
22/05/2013	18:26:36	FLOW1	1	23816,33	l/m	2538,02	m3	0	0,00		0	0
22/05/2013	18:26:56	FLOW1	1	6636,55	l/m	2542,76	m3	0	0,00		0	0
22/05/2013	18:27:16	FLOW1	1	11376,47	l/m	2545,24	m3	0	0,00		0	0

16-FACTORY TEST AND QUALITY CERTIFICATE

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

CE

(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:



This mark on the instrument indicates that the product and its electronic accessories must not be disposed of with other household waste at the end of their useful life.

To avoid possible damage to the environment or human health resulting from uncontrolled waste disposal, please return the equipment directly to a specialized recycling company, in compliance with local regulations.



This instrument is powered by a battery type 2,4V triple-A, 0.6Ah NiMH; at the end of the life of the battery or the instrument, do not disperse it in the environment. The battery must be disposed of in the appropriate collection centers.

NI - MH



