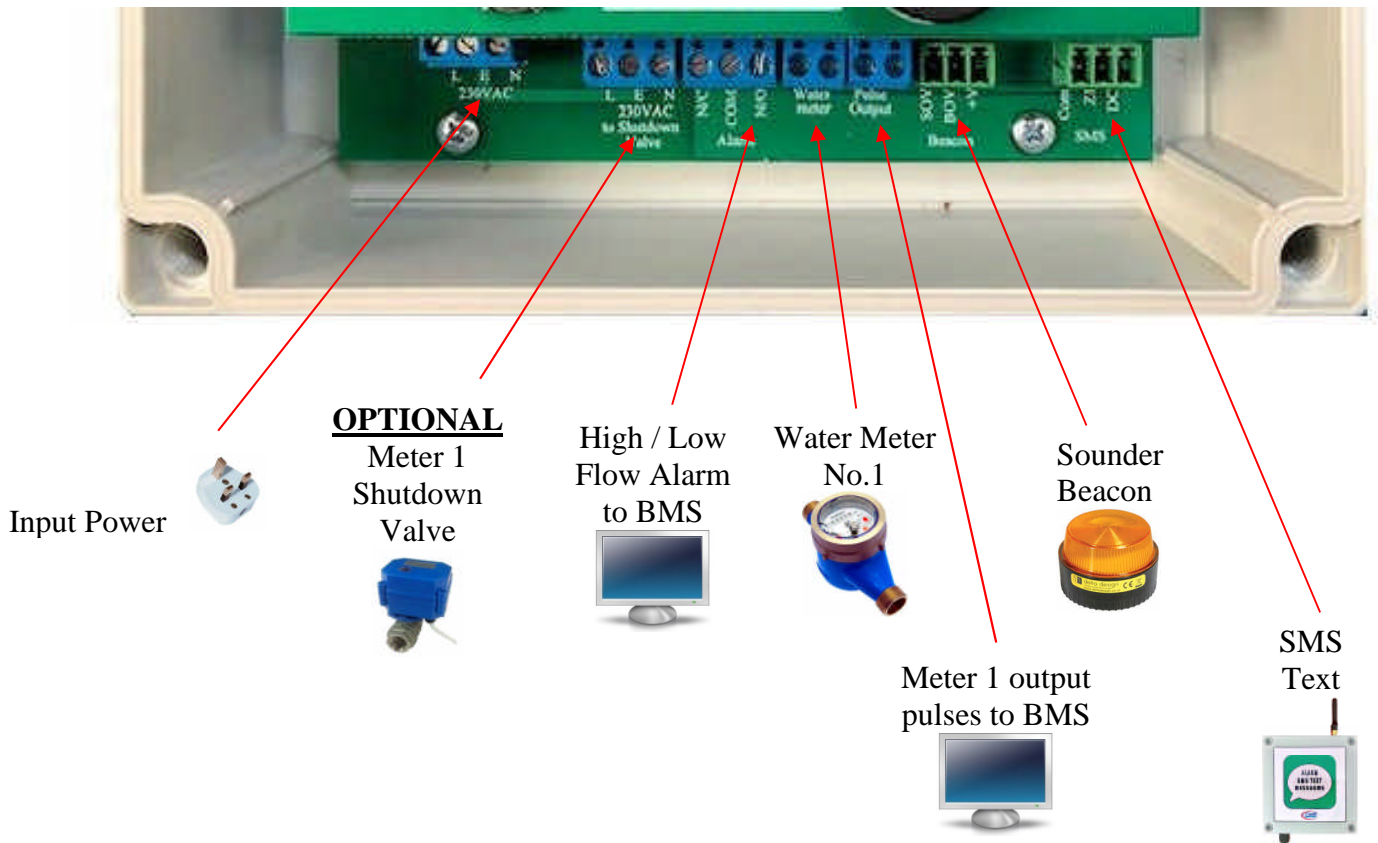# BLDA1-2
Water Leak Detection Manual

Contents

1) *System Overview*

Being fully programmable to suite users' requirements, the unit is connected to a water meter installed to the main incoming water supply and optional shut off valve. This meter can be existing but must be fitted with a devise that will give a volt free pulse output proportional to the flow rate, that can be either 1, 10 or 100 litres per pulse. Designed to monitor the flow of water entering the building or area, the unit raises an alarm and if required, shut of the water supply when the flow of water exceeds a preset maximum amount of allowable water for a present period of time, or by detecting a continuous flow of water. By setting realistic flows and time periods any increase above the user defined settings will be detected and dealt with by maintenance staff thereby saving water and limiting damage caused by a major leak.
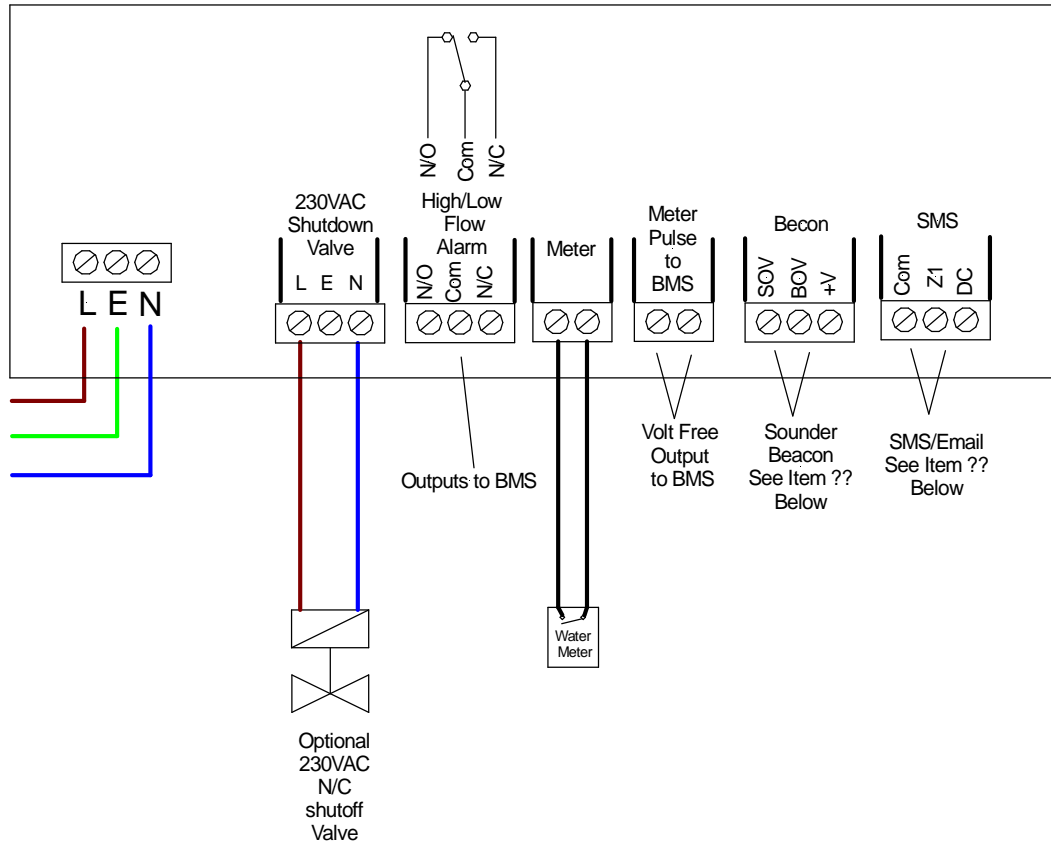
2) *Installation*
THIS EQUIPMENT SHOULD ONLY BE CONNECTED AND WORKED ON BY A QUALIFIED ELECTRICIAN.

To mount the unit to a wall, first open the front door to expose the internal equipment. In the bottom and top corners of the housing is a fixing point. 3.5mm pozi-drive screws or any screw with a head no bigger than 7mm diameter can be used to fix the housing in place. Cable access into the box should be via cable glands which can be positioned anywhere around the enclosure or on the inside for back entry. Care should be taken not to damage the internal equipment when drilling the enclosure. A 230VAC power supply should be run from a fused spur to the unit's internal terminal block marked "L", "E" & "N". The fuse within the fused spur should be rated at 5 Amps. The BLDA1-2 unit should be linked to the pulsed water meters by a 0.8mm² conductor 2 core screened cable up to a maximum 400 meters away. Pulsed water meters usually have BSP thread connections up to 50mm, above 50mm PN16 flanged connections are used. If shutoff valves are required, they should be installed just after the water meter(s) and cabled in a flexible 3 core 230VAC cable rated at 3amps.

Input Power

OPTIONAL
Meter 1 Shutdown Valve

High / Low Flow Alarm to BMS

Water Meter No.1

Sounder Beacon

Meter 1 output pulses to BMS

SMS Text

3) Wiring Detail

4) Water Solenoid Valves

If the system is supplied with water shutoff valves, once a water leak has been detected the unit will remove the 230V supply holding open the valve thereby closing it and stopping the flow of water

Connection of Water Shutdown Ball Valve

The 230VAC supply to the valves is generated from within the alarm unit. 15 to 25mm valves are supplied with a red and black cable whilst larger valves are red and green. For good practice connect live to the red wire and neutral to the black or green wire.

The Valve is supplied with a short length of cable that will need extending back to the valve terminals within the alarm unit.

WARNING, in order to shut properly, this type of valve need powering for at least 3 minutes.

Connection of Water Shutdown Solenoid Valve

The 230VAC supply to the valves is generated from within the alarm unit.

Having removed and opened the 3-pin socket, connect live to terminal "1", neutral to terminal "2" and Earth to the earth terminal

PLEASE NOTE;
We don't recommend that this type of valve and will NOT be supplied by CMR electrical. However, if this type of valve MUST be fitted, ensure that the arrow on its body facing the direction of flow, if not, the valve will not stop the flow of water.

5) Relay outputs
Volt free contacts have been provided for the following and can be found within the unit on the main PCB.
   a)   High/Low Flow alarm, contacts rated at 30VDC 1A
   d)   Meter output proportional pulses for onward indication

6) Sounder Beacon and SMS Text messaging
If a beacon or beacon sounder is supplied connect to the three terminals identified as "Beacon" as follows.

6-1) Non-Mutable Beacon or beacon sounder
If the beacon or the beacon sounder is to be active (On all the time) until the water leak alarm has been cleared, connect as follows.

Terminal reference		Connect Beacon / beacon sounder terminals to the following terminals
+V		Beacon +V or Strobe /Tone + terminal
BOV		Beacon -V or Strobe /Tone - terminal
SOV		NO connection to this terminal

6-2) Mutable Beacon or beacon sounder
If the beacon or the beacon sounder is to turn off when the "Mute" push button is pressed connect as follows.

| Terminal reference		Connect Beacon / beacon sounder terminals to the following terminals
+V		Beacon +V or Strobe /Tone + terminal
BOV		NO connection to this terminal
SOV		Beacon -V or Strobe /Tone - terminal

6-3) *Mutable sounder Beacon on all the time*

If the beacon is to remain alight all the time an alarm is current but the sounder is to be turned off when the "Mute" push button is pressed connect as follows.

Terminal reference		Connect Beacon / beacon sounder terminals to the following terminals
+V		Strobe and Tone + terminal
BOV		Strobe - terminal
SOV		Tone - terminal

Warning; if the above option "6-3" is required, **remove** the electrical link connected between the second (Strobe -) & third terminals (Tone -) terminals within the sounder.

6a) *Fitting an SCA repeat alarm or SMS / Email messaging system*
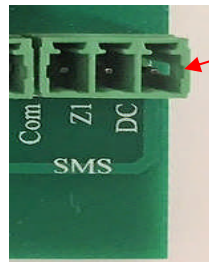
Use the "SMS" terminal block

SCA Terminal No.	SMS Terminal No.		Cable wire colours fitted to the messaging system
+V	DC		**RED**
Sig	Z1		**BLUE**
0V	COM		**BLACK**

7) *Push Button Description*

External Buttons

"Next Window" Used to display information outlined in item 8 below
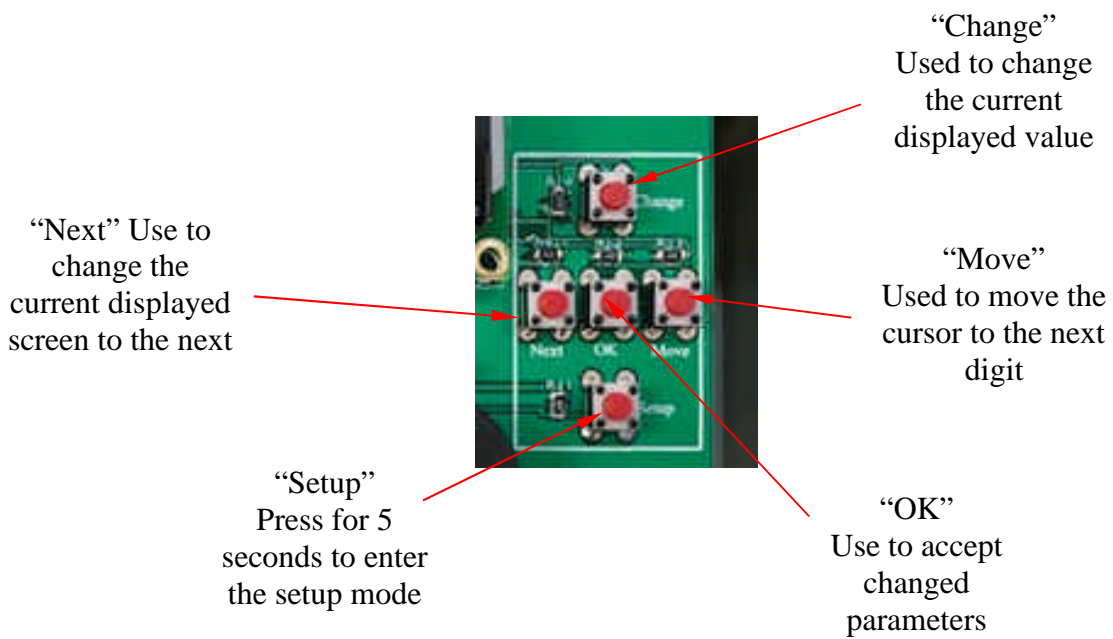
"Mute" Use to silence the audible warning

"Water On" Used to reset the system after an alarm has been Muted and turn ON the water shutdown valve if fitted.

This button can also be used to place the unit into 4 hour "No Alarm Generated" period to allow tanks etc. to fill


6

Internal Setup Buttons

"Change"
Used to change the current displayed value

"Next" Use to change the current displayed screen to the next

"Move"
Used to move the cursor to the next digit

"Setup"
Press for 5 seconds to enter the setup mode

"OK"
Use to accept changed parameters

8) Display Screens

The unit will revert back to the first screen after two and a half minutes. Each press of the "Next Window" button will first show what the next window will be before displaying it. This is provided to allow quick motoring through the screens to the desired information.

Normal screen, if "next Window" button isn't pressed, the unit will revert back to this screen after two and a half minutes.
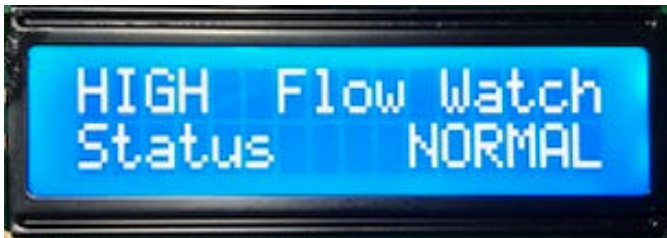
Current Flow Watch Type Low or High

Alarm status "Normal" or "Alarm"

Press the "Next Window". Button once, the following window will appear after 2 seconds.
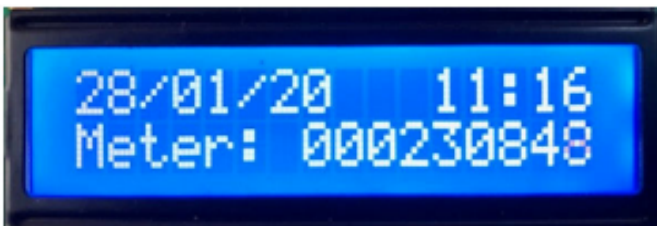
Day Date and Time

Total Meter Reading

Press the "Next Window". Button once, the following window will appear after 2 seconds.
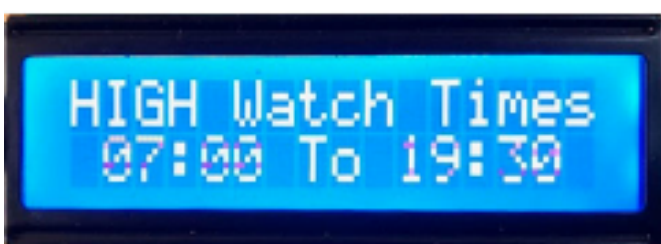
High Flow (occupied) time period

7

Press the "Next Window". Button once, the following window will appear after 2 seconds.

Maximum and Minimum HIGH Flow
Recorded readings

Press the "Next Window". Button once, the following window will appear after 2 seconds.

Maximum and Minimum LOW Flow
Recorded readings

Press the "Next Window". Button once, the following window will appear after 2 seconds.


The system is set for a meter with a
1 pulse per Litre output

Press the "Next Window". Button once, the following window will appear after 2 seconds.

High Flow ALARM limits, the total
Number of Litres over what period of time.
i.e., 350/L 00:10Hrs, if the unit sees 350 litres
within 9 minutes the unit will go into alarm

Press the "Next Window". Button once, the following window will appear after 2 seconds.
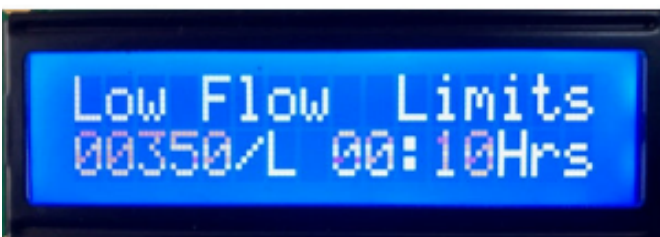
Low Flow ALARM limits, the total
Number of Litres over what period of time.
i.e., 350/L 00:10Hrs, if the unit sees 350 litres
within 9 minutes the unit will go into alarm

9) Overview for setting up the system

IMPORTANT

The Leak Detection System will not work correctly until it has been setup and commissioned as detailed below. You will need to nominate a person responsible for the operation and understanding of the system. This must include how to setup the system, keeping records and being aware what the alarms mean and their implications. Water consumption is unique for each installation; therefore, it is important to establish Low and High flow periods i.e. when the building is occupied or unoccupied. An initial investigation will be required to establish the weekly / daily patterns of water consumption. Further investigation should be undertaken at regular intervals to understand the overall usage including fluctuations such as filling water tanks.

Setting up the system will require;

1) Set or confirm the Pulse per Litre ratio for the fitted Meter

2) Set or confirm the approximate high and low water usage and timeout period

3) Confirm or set the Time and Date and day

4) Set or confirm the constant flow alarm timers

5) Set the High Flow times between Monday to Sunday this is the occupied (day time) period

Setup procedure 1

If the setup parameters as detailed above are known, enter them using the following procedures. Once the system has been initially setup, let the system run for at least a week ignoring any generated alarms. At the end of this period, re-enter setups and adjust the maximum High & Low flow water volume and time periods based on the readings from the maximum Litres displayed on screen two and three.

Setup procedure 2

If setup parameters are not known, enter setups and set both the high and low flow timers (see 11 below) to 00:00. This will stop the unit from alarming i.e. permanent sleep mode. Run for at least a week, at the end of this period, re-enter setups and adjust the maximum High & Low flow water volume and time periods based on the readings from the maximum Litres displayed on the screen (see 8 above).

REMEMBER, YOU MUST ADD A TIME IN THE PERIOD TIMER TO TAKE THE SYSTEM OUT OF PERMINANT SLEEP MODE.

How to enter the Setup Routine

Press the "setup" push button, the internal sounder will rapidly pulse. This is to help stop persons from inadvertently altering the setup parameters. You MUST keep the "Setup" button pressed ignoring the pulsing horn until the display changes to the meter pulse rate screen at which time the pulsing horn will stop.

Please note;
YOU WILL ONLY HAVE 5 MINUITES TO CHANGE THE SETINGS BEFORE THE SYSTEM EXITS SETUPS WITHOUT SAVING ANY CHANGES.

Internal Setup Push Button	*Function*
Next	Each press of this button will move to the next parameter setup screen without any changes to the current screen. To exit Setups Keep pressing this button until one of the screens in section 8 appears.
Change	With the curser flashing over a parameter or digit, press this button to change the parameter or digit to the next value. If you make a mistake, keep pressing the button until the correct value is displayed.
Move	Use this button to move the curser to the next digit in a parameter. If you keep pressing this button it will rotate the flashing cursor through all the digits back to the most significant digit.
OK	You MUST press this button to save any parameter changes. The curser will then move to the next parameter or screen.

10) Setting up the Meter Pulses per Litre

Note;   If the "OK" button is not pressed the new setting will NOT be saved.
The system can be set to 1, 10 or 100 litres per pulse

Set to 1, 10 or 100 Litres per pulse

Actions required;
a) To move on to the High & Low flow screen below, without making any changes to the pulse rate press the "Next" button.
b) Press the "OK" button to accept Meter's litre per pulse or;
c) Press the "Change" button, each press will change the litres per pulse to 001, or 010 or 100 then back to 001 on the next press. When the correct Meter pulse rate is displayed press the "OK" button to accept, this will save the change and move to the next screen.

11) Setting up High and Low maximum allowable litres and time period

Note; If the "OK" button is not pressed the new setting will NOT be saved.
The maximum litres can be set to between 00000 and 99999 litres, the time setting can be set between 00:00 to 24:00 hours

Set High and Low flow Alarm settings

Actions required;
a) To move on to the Clock setup below, without making any changes to the High or Low Flow maximum litres or alarm timer press the "Next" button.
b) Press the "OK" button to accept High Flow litres and move onto the High Flow alarm timer or;
c) Press the "Change" button, each press will increment the most the significant digits between 0 and 9, press again to return back to 0. When the correct number is displayed press the "Move" to move to the next digit or the "OK" button to save the new setting and move on to the High Flow timeout period timer. By repeated presses of the "Move" button, the cursor will rotate through the number back to the most significant digit of the number.
d) With the cursor flashing on the most significant hours digit, repeat steps a, b and c above until the required time is displayed and press "OK" to save and move on to the Low Flow maximum litres.
e) With the cursor flashing on the most significant Low Flow maximum litres digit, repeat steps a, b, c and d above.
f) When finished press the "OK" button to accept the changes and move to the next screen.

12) Setup the Clock

NOTE; The time format only allows for a maximum 23.59 hours and NOT 24:00
If the "OK" button is not pressed the new setting will NOT be saved.

Day, Month, Year and 24-hour time

Day of the week

You will only be allowed to enter a valid day, date and times. If you try to exceed the normal clock format the display will automatically display the minimum for that parameter i.e. if the display shows the time as 23:00 with the cursor flashing over the "2", one more press on the "Change" button will result in the display showing 20:00. The clock has automatic leap year and UK summer time compensation.

SYSTEM OPERATION IS DEPENDANT UPON THE CLOCKS DAY, DATE, TIME AND DAY OF THE WEEK BEING SET CORRECTLY.

Actions required;
a) To move on to the high flow time screen below, without making any changes to the clock press the "Next" button.
b) Press the "OK" button to accept the displayed Day, Month, Year, Time and move to the day of the week setting.
c) Press the "Change" button, each press will change the digits between 0 and its maximum and back to 0 again. When the correct number is displayed press the "Move" to move to the next digit or the "OK" button to save the new setting and move on to the Day of the week setting. By repeated presses of the "Move" button, the cursor will rotate through all of the day, month, year and time digits until its back to the most significant day digit. If a mistake is made, keep pressing the "Move" button until over the required digit. Press "OK" to save.
d) With the cursor flashing on the day of the week, press the "Change" button until the correct day is displayed. Once correct, press the "OK" button to move to the next setup screen.

13) Set the continuous flow alarm time periods

Note; If the "OK" button is not pressed the new setting will NOT be saved. Both timers can be set to a maximum of 59
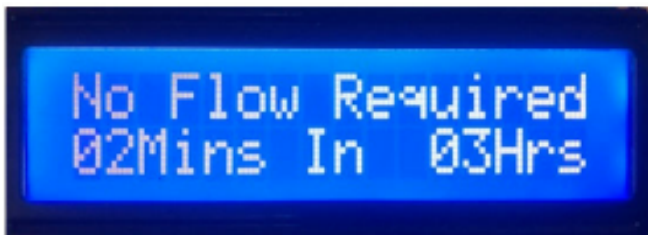
No flow time for a period of time in hours

The system looks for a period measured in minuets, of NO water flow, over a period measured in hours. If no water flow is detected for the first period (minuets) of time, the second period (hours) is reset and no alarm is generated. However, if there is a no, no flow period (minuets) i.e. continuous flow, within the second time period (hours), an alarm will be raised. The screen above shows that there MUST be a break in water flow for at least 2 minuets within a 3-hour period.

Actions required;
a) To move on to the High Flow screen, without making any changes press the "Next" button.
b) Press the "OK" button to accept and save the displayed Mins time and move to the Hrs time or;
c) Press the "Change" button, each press will change the digits between 0 and its maximum and back to 0 again. When the correct number is displayed press the "Move" to move to the next digit or the "OK" button to save the new minutes time and move on to the hours' time. By repeated presses of the "Move" button, the cursor will rotate through the digits until its back to the most significant digit. If a mistake is made, keep pressing the "Move" button until over the required digit again.
d) Repeat steps a and c above to adjust the hours' time.
e) Press the "OK" button to save and move onto Monday's high flow times.

14) Set the High Flow time periods for the day of the week

Note; If the "OK" button is not pressed the new setting will NOT be saved. The time setting can be set between 00:00 to 24:00 hours
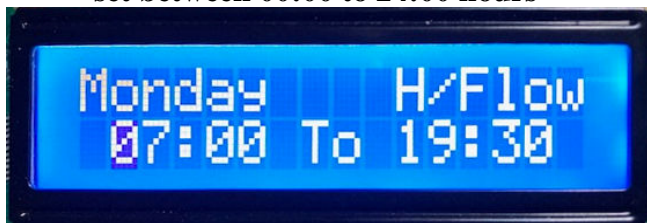
High Flow period

You will need to set the high flow period for each day of the week starting at Monday. This time period would normally be when the building is occupied i.e. an office block could be 07:00 to 18:30. Monday to Friday, 07:00 to 12:00 Saturday and unoccupied on Sunday.

Actions required;
a) To move on to the next High Flow screen, without making any changes press the "Next" button.
b) Press the "OK" button to accept and save the displayed start time and move to the end time or;
c) Press the "Change" button, each press will change the digits between 0 and its maximum and back to 0 again. When the correct number is displayed press the "Move" to move to the next digit or the "OK" button to save the new start time and move on to the end time. By repeated presses of the "Move" button, the cursor will rotate through both hour digits until its back to the most significant digit. If a mistake is made, keep pressing the "Move" button until over the required digit again.
d) Repeat steps a and c above to adjust the stop time.
e) Press the "OK" button to save and move onto Tuesday's high flow times.

With the next High Low Times screen on display, repeat steps a) through e) for all the days of the week. You MUST press "OK" or "Next" after setting up Sundays High Flow period to finish setting up the system and displaying the main screen.

15) *How to reset the unit after an alarm*

Once the unit detects an unusual flow of water it will setup an alarm by flashing the display, sounding the internal sounder, start the external sounder beacon if fitted, operate the BMS alarm contact, operate the Text messaging unit if fitted and turn off the water if a shutdown valve is fitted. When this happens, press the "Mute" button to stop all sounders and investigate the cause of the excessive water flow. Once you are happy that no leak exists, press the "Water On" button to reset the unit back to normal running.

16) *Place the unit into a 4-hour SLEEP mode*

If a large volume of water is required say to fill a water tank, the system can be placed into a 4-hour sleep period where it will ignore all water flow. This feature will only work if there are no current alarms, with the display status showing as NORMAL. To place the unit into Sleep Mode, press and keep pressing the "Water On" push button until the beeping stops and the display changes to.

The unit will remain in this mode with the minutes ticking down until the time period is up when it will revert back to normal mode. This feature can be cancelled at anytime by pressing the "Mute" push button.

17) *Water meters*

Dimensions

*L= the total length with connection nuts for rigid pattern without compression.

Additional length options available.

Technical Data

18) Water meter Installation

Before installing the water meter, make sure that the meter has been chosen correctly. Check that the nominal diameter, flow rate, working temperature and pressure are compatible with actual installation conditions.

1. It is recommended that a straight length of pipe the same diameter as the meter and equivalent in length to 10 times the meter diameter is fitted immediately prior to the meter inlet and 5 times the meter diameter after the meter.

2. Before installing the meter make sure that the two sections of cut pipe are positioned correctly and supported where necessary, clean them carefully (especially if the pipes are empty) and allow water to flow for some time using a section of pipe instead of the meter, to remove any scale/debris leftover from the disturbance to the pipe.

3. Install the meter in a place protected from frost if possible (insulate with lagging materials during the winter months) and locate in the lowest part of the pipe work in order to avoid accumulation of air within the measuring chamber.

4. Install the meter in a position where it can be easily read, but is not accessible for tampering. Locate the meter where it will be safe from disturbance and damage from passing objects.

5. Install the meter so that the water is flowing in the same direction as the arrow shown on the body and in the position recommended by the manufacturer, following any indications on the dial. For guaranteed performance according to ISO 4064, meters should be installed in a perfectly horizontal plain. Accuracy may be reduced if installed in a vertical orientation.

6. It is advisable to install isolation valves upstream and down stream of the meter, in order to make the maintenance or verification of the meter possible. The installation of an internal or external non-return valve is also recommended.

7. There should be no restriction of the pipe at the meter inlet, and flange joints where used, should not obstruct the flow of water into the meter body. Any regulation of the flow should be carried out on the outlet side of the meter.

IMPORTANT:
Before putting in to operation, it is necessary to purge the pipe and meter of air (for this operation it may be necessary to rotate the meter) Valves must be opened slowly so as not to allow any air present within the pipe work to damage the meter by over running it's internal measuring mechanism.