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# DMWD 1 to 4 Zone Water Detection Alarm with Distance to Leak Measurement

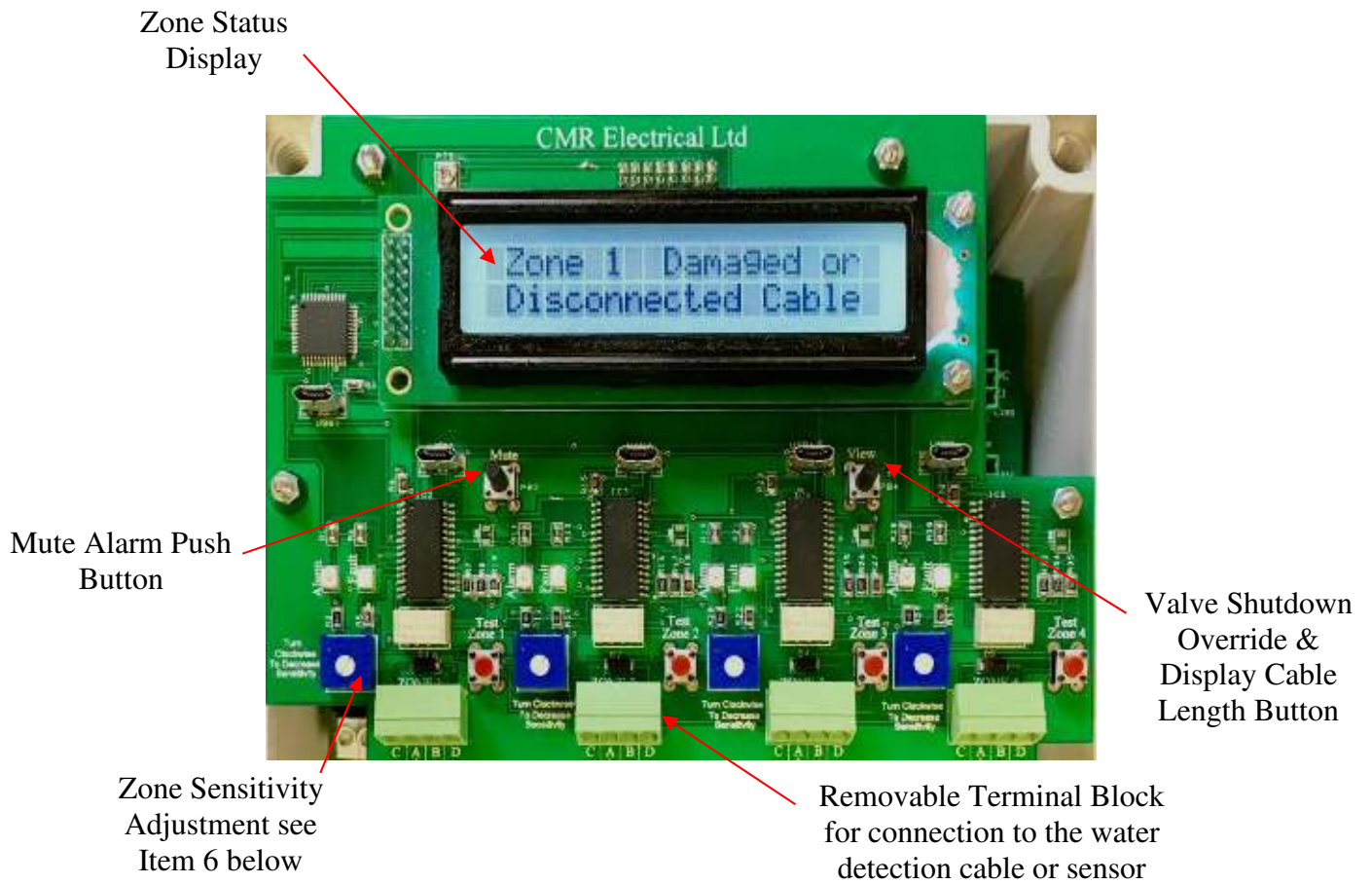
## Installation and Operation Manual



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## 1) Display and Control



### Display Screens



a) All detection cables are connected correctly and a water leak has not detected



b) The detection cable has been disconnected, unplugged, damaged or cut



- c) When the display is rotating between the above two windows, water has been detected and the unit is calculating the distance to the leak



- d) After (c) above, the display will change to show the distance to the leak from the start of the water detection cable.



- e) A leak has been detected but the zone is either not set for a distance reading, was unable to calculate the cable length on power up due to water or contaminants in the cable, or encountered a problem in determining the distance to the leak.

## 2) Operation

In normal operation with no alarms or faults, the audible warning device will be OFF and the display will be showing “The System has no Alarms or Faults”. If one or more of the zones has a disconnected or damaged cable, the audible warning device will sound and the display will show “Zone (1-2-3-4) Damaged or Disconnected Cable”. If the detection cable detects water, the audible warning device will sound and the display will alternate between “WATER LEAK DETECTED ZONE (1-2-3-4) Please Wait” and “WATER LEAK DETECTED Distance Coming Soon” until the final display window showing the distance to the leak “WATER LEAK DETECTED ZONE (1-2-3-4) At 8 Metres”. The display window “WATER LEAK DETECTED AT ZONE (1-2-3-4)” will be displayed on powering up if the system can’t determine the total detection cable length due to water or contaminants touching the cable. This window will also be displayed if the system can’t determine the distance to the leak or the zone is not set for distance measurement. If water shutoff valves are fitted, if a zone detects water, the appropriate valve will close and the associated internal “Closed” lamp will illuminate. The system will automatically open the valve allowing water to flow once the zone stops detecting water. This shutdown can be overridden, See Item 11 below.

The length of the water detection cable can be checked providing the system has no alarms or faults as shown in screen (a) on page 3. To check the cable lengths, press the “Override / View” push button. Each cable length will be displayed one at a time.

If the system has multiple alarms, the screen will automatically scroll between each alarm one after the other providing the current alarm has been muted. This scrolling can be stopped at any time by continually pressing the “Mute” push button. If multiple alarms occur at the same time, each alarm will need acknowledging by the press of the “Mute” button. i.e., zones 1 & 2 go into water detected alarm at

the same time, the audible warning will be going with “Zone 1 water detected” on display. Pressing “Mute” will stop the audible warning but it will immediately start again only this time the display will be showing “Zone 2 water detected”. This second alarm will also need the “mute” button operated to silence the audible warning. For ease of installation and fault diagnoses both individual zone “Alarm” and “Fault” lamps have been provided internally on the top PCB.

### 3) *Water leak detected Alarm Test*

To test that the unit is functioning correctly, pressing the red “Test Zone” button to put the system into a Water detected alarm. Using the test facility will operate the alarm relays generating a BMS alarm, and if fitted activate of the remote beacon/sounder and close the water shutoff valve. The resulting screen can be either (d) or (e) as shown on page 3. The displayed distance if any will be fictional.

### 4) *Water Detected Alarm*

When the detection cable comes into contact with water anywhere along its length, the audible warning device will start, the common alarm and if fitted, the zone alarm relay will close and the display will show the zone number and distance to the leak from the start of the detection cable. To stop the audible warning press the “Mute Alarm” button. The system will remain in this state until the water has been removed from the cable when the alarm relay will automatically turn OFF.

### 5) *Sensor Fault*

Because of the exposure of the detection cable on the floor, the system monitors for any breaks in the detection cable including the interconnection cable between the control unit and the detection cable. If a break within the cable is found, the audible warning device will start, the fault relay will operate and the display will show the zone number. To stop the audible warning press the “Mute Alarm” push button. The system will remain in this state until the sensor fault is repaired when the display and common fault relay will revert back to normal. If the controller detects a break in the cable, the system will continue to detect water up to the point of the break.

### 6) *Water Detection Sensitivity Adjustment*

To increase the sensitivity of the cable, turn the potentiometer ANTICLOCKWISE, to decrease the sensitivity turn CLOCKWISE.



Increase Sensitivity



Decrease Sensitivity

The sensitivity adjustment is provided to allow the point at which the system goes into alarm to be adjusted. Once the system is in alarm the cable will need to be dry before any reset. It is recommended that the sensitivity be set so that the arrow on the white plastic circle as shown above is pointing at the 3:00 clock position

## 7) Installation

**THIS EQUIPMENT SHOULD ONLY BE CONNECTED AND WORKED ON BY A QUALIFIED ELECTRICIAN.**

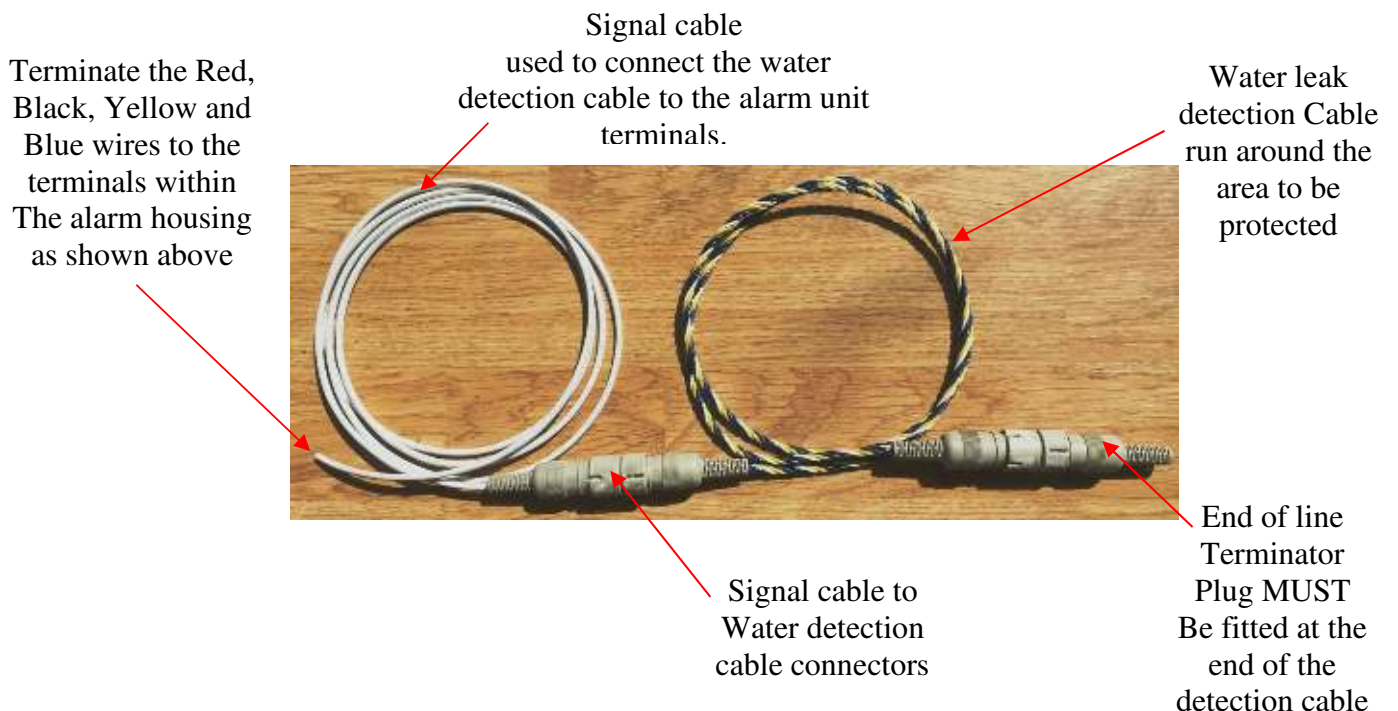
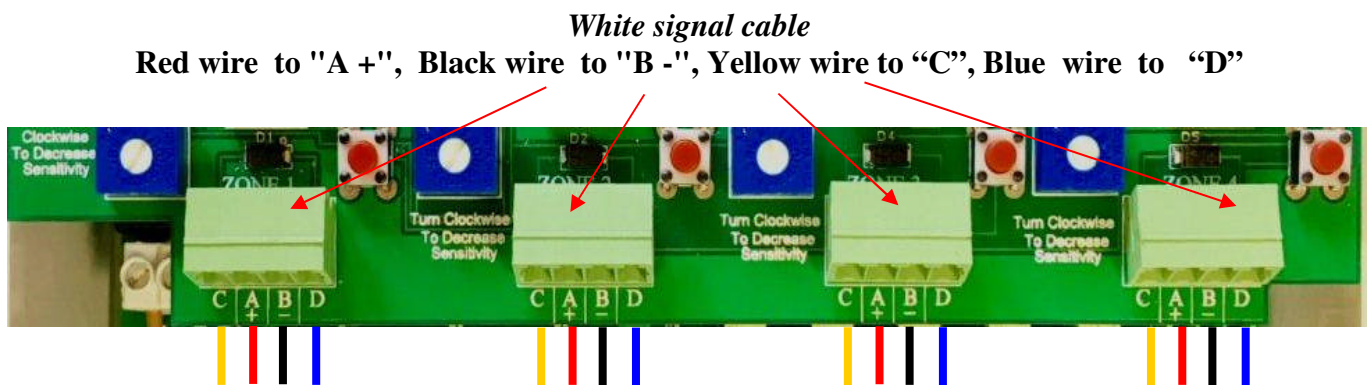
To mount the unit to a wall, first remove the front cover to expose the internal equipment. In each corner of the housing positioned below/above the front cover fixings will be found the mounting holes.

Plastic glands have been provided for incoming power and outgoing signal cables. The large gland requiring a 20mm hole within the housing is for the power cable and the smaller gland requiring a 13mm hole within the housing is for the signal cable. Care should be taken when drilling the holes to ensure no damage occurs to the electronic equipment.

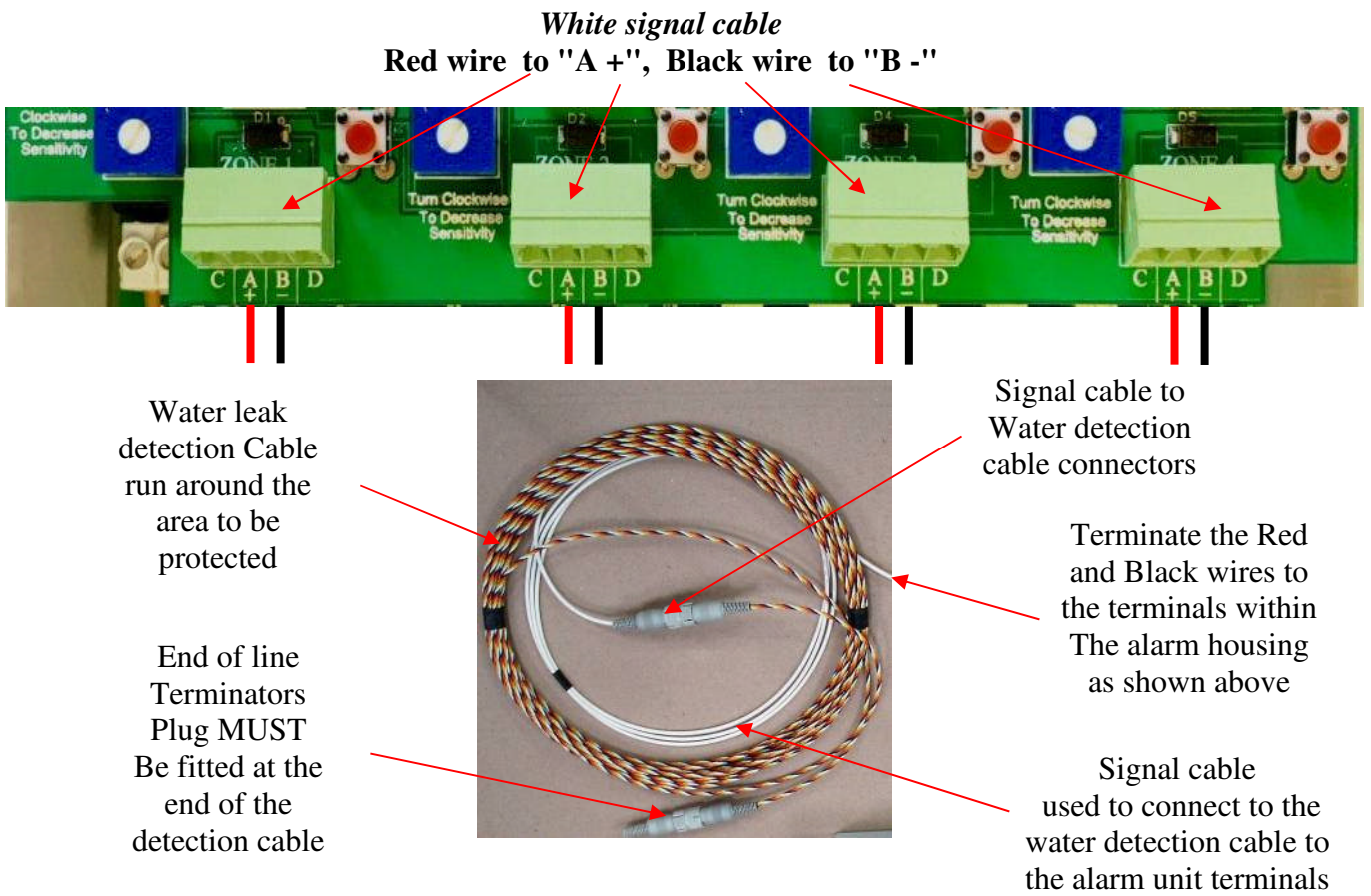
A suitably rated 230VAC power cable supply should be run from a fused spur to the unit and terminated to the internal terminal block marked "L", "E" & "N". The fuse within the fused spur should be rated at 5 Amps.

### Distance Measuring Signal Cable Connections

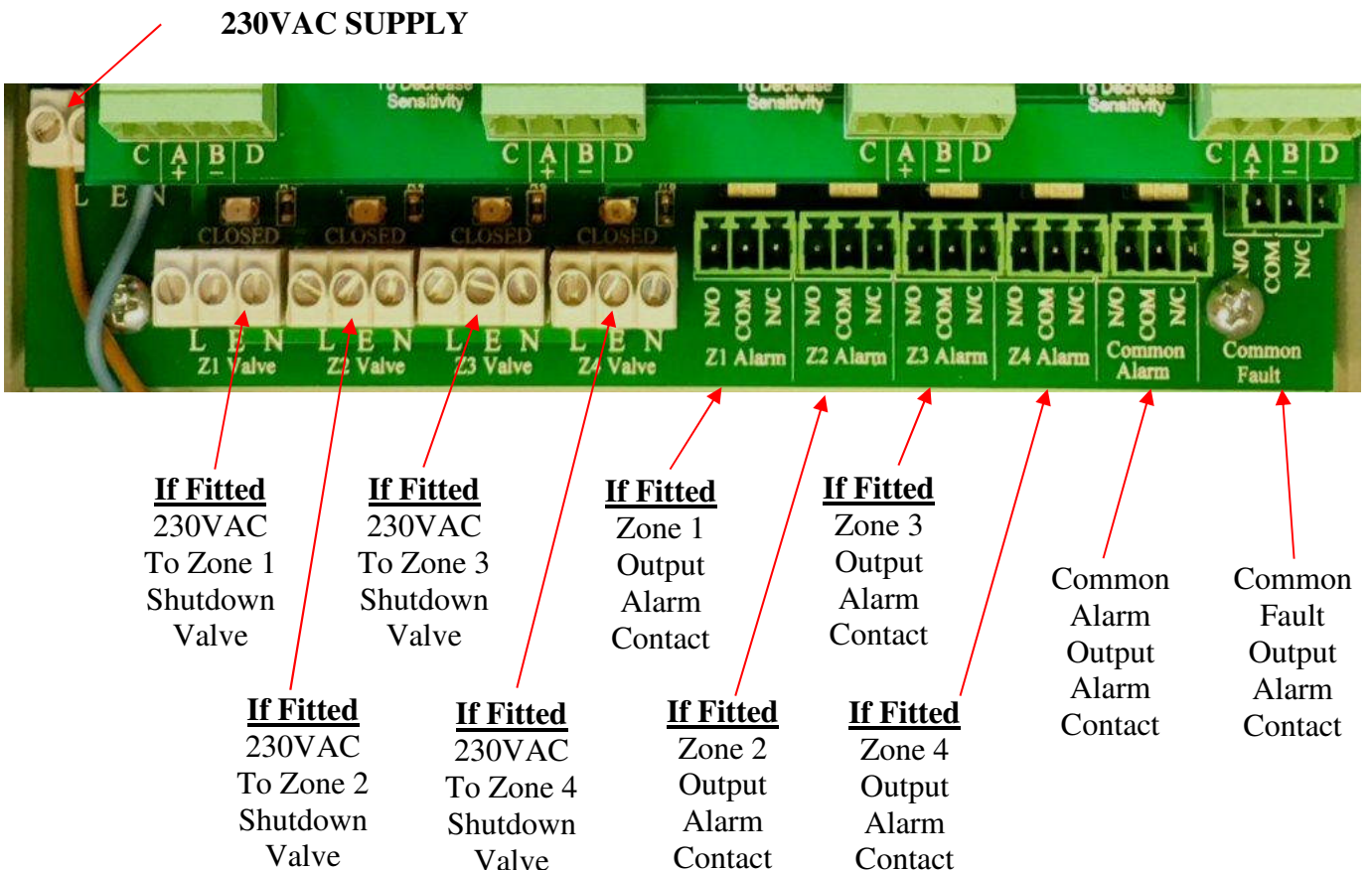
**NOTE; The maximum length of signal cable per zone is 50 metres. For signal cable lengths over 5 metres the cable MUST be a 4 core 0.75mm or above.**



**Non Distance Measuring Signal Cable Connections**



**Power, Shutdown Valves and BMS Connections**



**Output Volt Free contacts for use by a Building Management System.**

<i>Function Required</i>	<i>Fitted as Standard</i>	<i>Relay Output Terminals</i>
Zone 1 alarm	No	Z1 Alarm
Zone 2 alarm	No	Z2 Alarm
Zone 3 alarm	No	Z3 Alarm
Zone 4 alarm	No	Z4 Alarm
Water detected alarm any zone	Yes	Common Alarm
Cable Disconnected Alarm	Yes	Common Fault
Power Fault	Yes	Common Fault

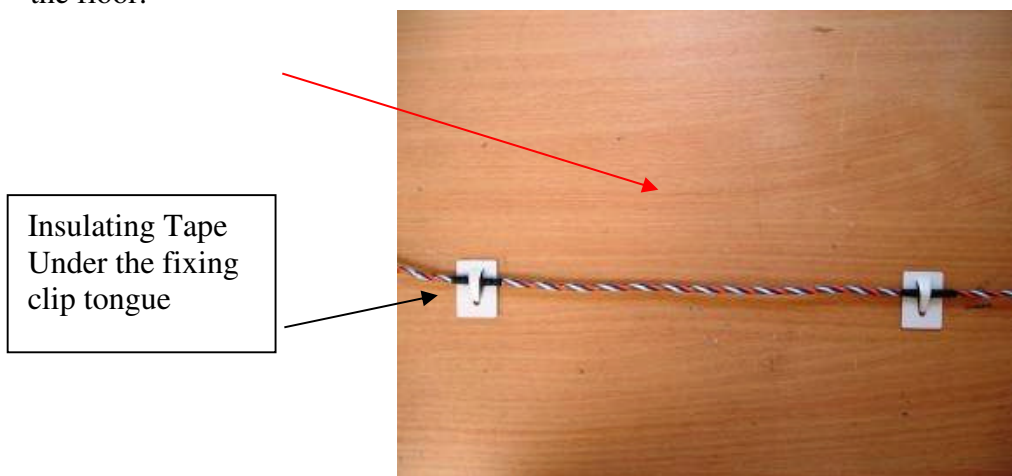
All Zone wiring and volt free alarm / fault relays wiring is to removable screw type terminal blocks.

**8) Positioning the water detection cable**

The detection cable is susceptible to damage and should not be fitted to areas where the cable is likely to be damaged or walked on. If fitting the cable around Air Conditioning Units with humidifiers, ensure that cable is positioned at least one metre from the ACU to stop intermittent alarms being generated from over humidity or water droplets from the AHU. Having positioned the detection cable, ensure that the End of line terminator is plugged into the end of the cable (see drawing above).

**9) Fitting Cable Clips**

If Cable Clips are required, to protect the small sensor wires and to stop false water detected alarms from occurring insulating tape should be first applied around the detection cable before the clip tongue is closed. Clips should be fitted approximately every 1 to 1.5 metres apart. When using clips make sure that the cable touches the floor between the clips, **DO NOT** tighten the cable so that the cable does not touch the floor.

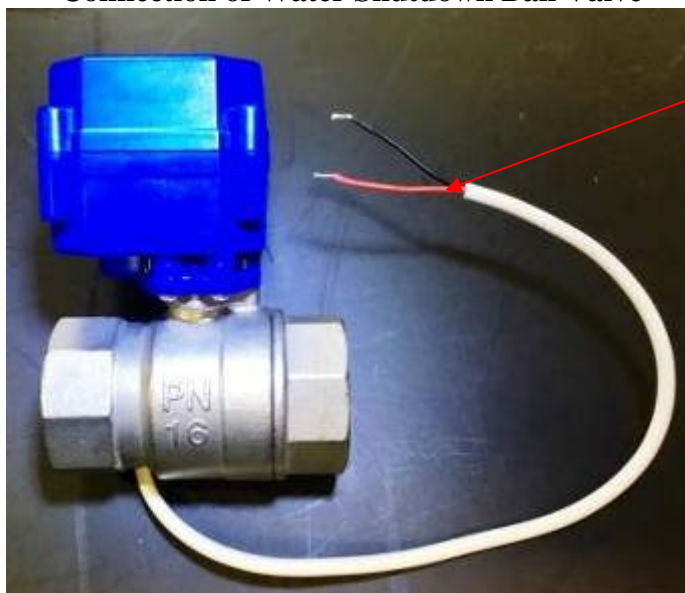


**10) Water Shutdown Valve**

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. Once the leak has been rectified the detection cable may take some hours to dry out. During the dry out period the valve can be opened and closed using the procedure outlined in **Item 11** below.



### 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.

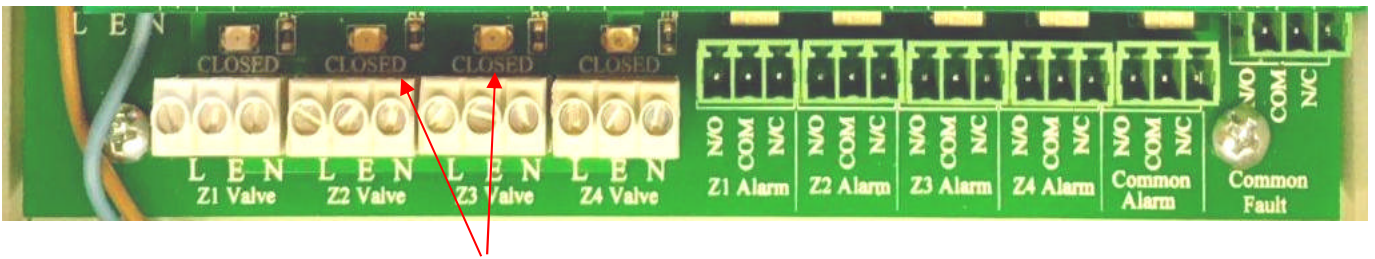
Having removed and opened the 3 pin socket, connect live to terminal “1”, neutral to terminal “2” and Earth to the earth terminal

#### **PLEASE NOTE;**

**The type of valve MUST be fitted with the arrow on its body facing the direction of flow, if not, the valve will not stop the flow of water.**

#### ***11) Water Shutdown Valve Override Procedure***

This feature will only work if there is a current water leak detected alarm, the zone has not already been overridden and the alarm has been Muted. To put the system into shutdown override and re-open the water valve, press and keep pressed the “Shutdown Override” push button. On pressing the button the unit will start beeping. Keeping the finger on the button and wait until the beeping stops. Once this happens stop pressing the Mute button. The system will automatically cancel the override once the zone stops detecting a water leak. If the Override needs cancelling and the valve needs to be closed again, Press the “Shutdown Override” button again and following the same procedure will cancel the override and close the shutdown valve.



Zone 1-2-3 & 4 Shutdown valve closed lamps

**12) Beacon and beacon sounder**

If a beacon or beacon sounder is supplied connect to the three terminals identified as “Sounder Beacon” as follows.



Sounder Beacon terminal block

**12a) 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 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

**12b) 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

**12c) 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 “12c” is required, **remove** the electrical link connected between the second (Strobe -) & third terminals (Tone -) terminals within the sounder.

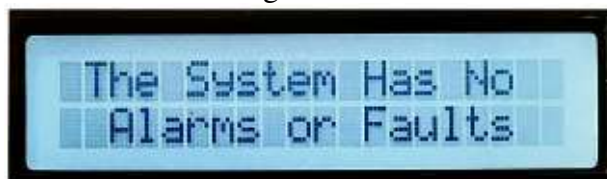
### 13) Fitting the battery backup

The battery should be fitted connected after the system as been commissioned. Place the battery within the housing in the space provided. Connect the small BLACK cable to the “—“ battery terminal and the RED with black dots wire to the batteries “+” terminal. If the battery is misconnected, the battery fuse located on the small PCB will blow.

### 14) Commissioning

**The unit will automatically calculate the total cable length each time it is power up. For this reason, the unit MUST be clear of all alarms and faults. If the total cable length can't be calculated due to contaminants or water in the detection cable, the system will revert back to a standard water detection system with NO measurement to the leak. However, once the cable dries out the system will again automatically calculate the total detection cable length without the need of powering down the unit.**

Having connected the unit as described above, turn on the mains power to the unit. The display should display the following screen. If not, refer to the “Fault Diagnostics” below. If the unit powers up with the audible warning going, press the mute button and wait to see if the alarm clears. If the alarm remains after approximately 20 seconds, refer to the “Fault Diagnostics” below.



*Note; Before the system can be commissioned and tested, the alarm unit must be displaying this screen.*

With the unit powered and displaying the above screen, press the “Override ” push button and check each zones cable length is correct.



Next unplug the End of line terminator positioned at the end of the detection cable. The controller should display “Zone (1-2-3-4) Damaged or Disconnected Cable” and the audible warning device should sound, if not refer to the “Fault Diagnostics” below, press the “Mute” button, the audible warning device should stop. Replace the End of line terminator to return the system to normal.



Using a cup containing approximately 250ml of CLEAN water, immerse a small area (75mm long) of cable into the water. The controller should alternate between the following two screens.

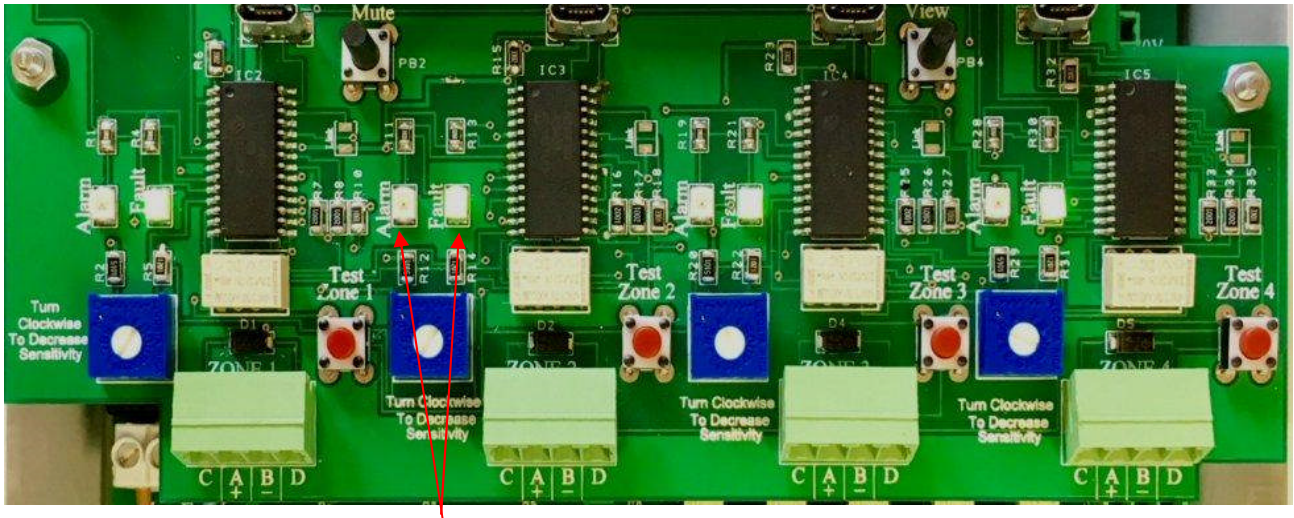


Once the unit calculates the distance to the leak, the display will change to the following and the audible warning device should sound, if not refer to the “Fault Diagnostics” below. Press the “Mute” button the audible warning device should stop.



Remove the water and wipe the cable dry with some tissue paper. Repeat for all other zones.

**15) Fault Diagnoses**



To help with fault diagnoses individual “Alarm” and “Fault” lamps are provided so show the status of each zone.

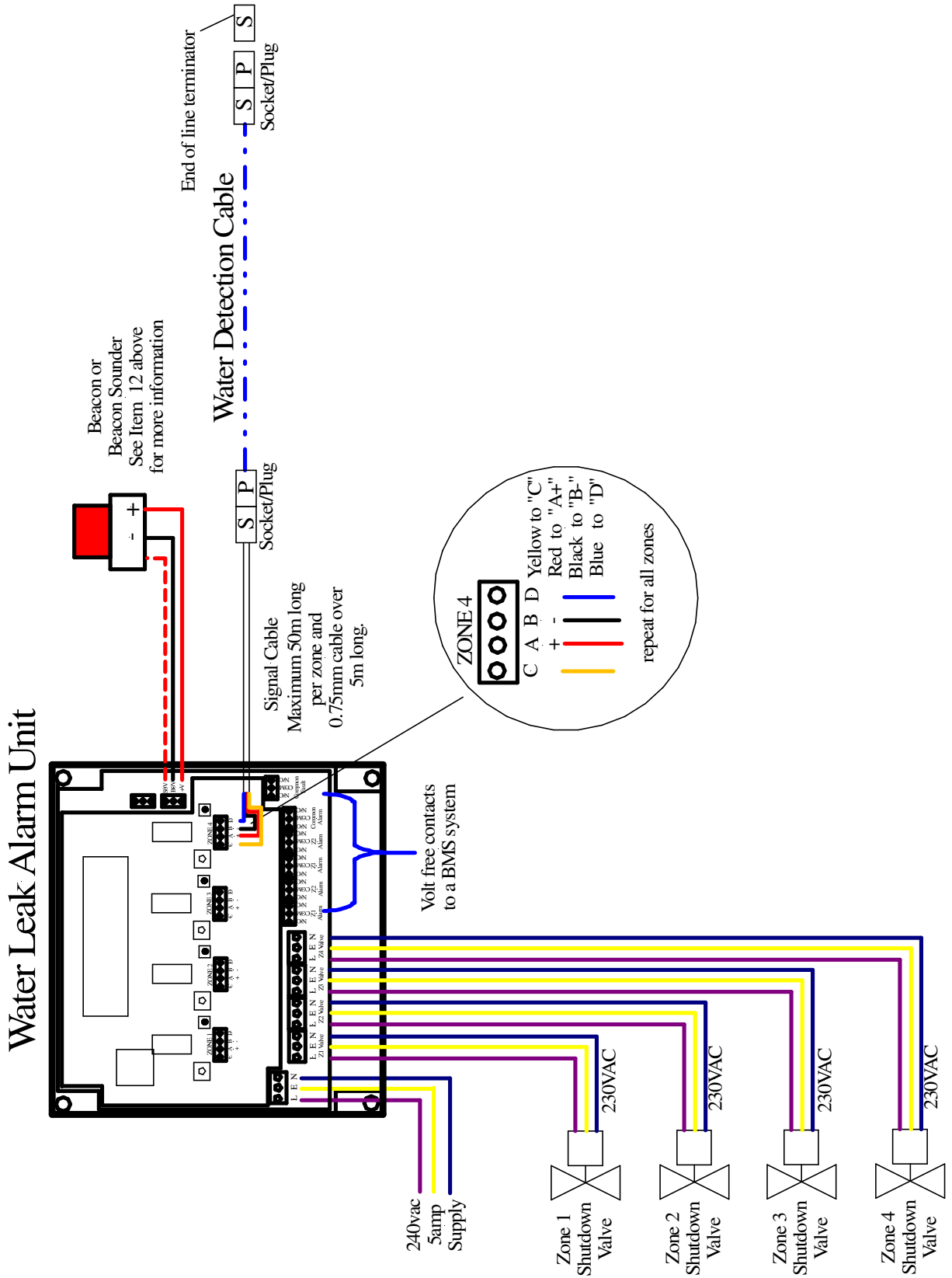
*The following faults will cause the system to display the following alarms*

<b>Alarm Statement</b>	<b>Possible Fault</b>
“Disconnected Cable”	End of line terminator not fitted. Cut or damaged cable. Signal cable not plugged into detection cable. Signal cable “C” cable not connected. Signal cable “A+” cable not connected. Signal cable “B-“ cable not connected. Signal cable “D” cable not connected.
“Water Detected” (no measurement)	Detection cable has short circuit between sensors. On power up, the detection cable has water touching it. Cable “A+” and “A-“ are crossed.
No alarm statement but measurement to leak is totally wrong	Cables “C” and “A+” are crossed or Cables “B-” and “D” crossed

### Additional problem diagnostics

<b><i>Fault</i></b>	<b><i>Possible Reason</i></b>
Display is OFF and the unit appears dead	<ol style="list-style-type: none"> <li>1) No power to the control unit. <i>Test with a meter</i></li> <li>2) The power fuse has blown. <i>Test the fuse with a meter</i></li> </ol>
The Water Detected statement remains in the screen all the time.	<ol style="list-style-type: none"> <li>1) The cable needs drying out after detecting water. <i>Using tissue paper, dry the cable.</i></li> <li>2) The cable has a short between the sensors due to Contaminants. <i>Clean the cable using water and tissue paper dry out afterwards</i></li> <li>3) The cable has been damaged. <i>Visually check the cable for damage.</i></li> <li>4) The sensitivity of the detection system is too sensitive. <i>Remove the lid from the small plastic box connected to the detection cable and turn the potentiometer until the system resets.</i></li> <li>5) System fault. <i>Return to manufacture</i></li> </ol>
The display appears dead and does not show “Water Detected” even though the system has a water detected alarm and the audible warning device is sounding.	<ol style="list-style-type: none"> <li>1) System fault. <i>Return to manufacture</i></li> </ol>
The system will not record a water detected alarm, the Display and audible warning device do not react to water on the cable.	<ol style="list-style-type: none"> <li>1) Sensitivity could be too low or a Possible system fault. <i>Remove the lid from the small plastic box connected to the detection cable and turn the potentiometer until the system goes into alarm.</i></li> <li>2) System fault. <i>Return to manufacture</i></li> </ol>
The display shows faulty or disconnected cable all the time.	<ol style="list-style-type: none"> <li>1) The detection or signal cable is broken or disconnected. <i>Check for cable faults or breaks.</i></li> <li>2) System fault. <i>Return to manufacture</i></li> </ol>
Horn not working	<ol style="list-style-type: none"> <li>1) System fault. <i>Return to manufacture</i></li> </ol>
If fitted, The battery will not power the system	<ol style="list-style-type: none"> <li>1) Battery discharged, disconnect a lead and test with meter.</li> <li>2) Battery fuse blow, see item 10</li> <li>3) Charger fault, disconnect a battery lead &amp; check for 13.5V</li> </ol>

# 16) Installation Drawings



System using Water Detection Cable. Not all the shown devises may be available on your system

**17) Maintenance**

The system should be fully tested using the commissioning procedure at least once a year for correct operation and if fitted, a check made to ensure that the shutoff valve operates correctly. All cables should be inspected at the same time for signs of damage, dirt contamination or mis-placement.

**18) Housing Sizes**

**Main control unit and Outstation type OS4V**

