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LD64

Water Leak Detection Manual



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1) System Overview

The unit is designed to interrogate individual 1 to 4 zone outstations and report back to the main controller if water is found on any of the sensors. On powering up the system the unit will display “CMR ELECTRICAL PLEASE WAIT” until all remote outstations have been interrogated for their current status. Providing there are not alarms or faults on the system, the unit will display “ALL AREAS HEALTHY NO ALARMS OF FAULTS”. If an outstations detects water, the display will change to “WATER LEAK DETECTED” with the location i.e. “1st FLOOR TEA POINT”, the audible warning device will sound, and both the “New Alarm” and the “Common Alarm” relays will energise. On “Muting the alarm, the warning device will stop and the “New Alarm” relay will de-energise leaving the common alarm relay still energised. If the system has more than one alarm or fault, after muting the current alarm, the display will change to display the total number of faults and alarms on the system. With multiple alarms, each can be viewed one at a time by pressing the “Report” button and following the instructions.

The controller also monitors all water detection cables and sensors for disconnection. If a fault with one of the detection cables or sensors is found, the system will display “SENSOR FAULTY AT” and the location i.e. “1st FLOOR TEA POINT”, the audible warning device will sound, and “Common Fault relay will energise. On “Muting” the alarm, the warning device will stop. Again after muting if more than one alarm is present the display will change to show the number of alarms and faults. If the data line between the controller and all the outstations becomes disconnected, the unit keep flashing SYSTEM OFF LINE NOT DETECTING WATER” in the display window, with the audible warning continually pulsing. In this condition the audible warning cant be muted.

If an outstation becomes faulty or the controller is unable to communicate to an outstation, the control unit will display the Node (Outstation) number and the zone (sector) number as well as starting the warning device and energizing the common fault relay.

For darkened areas, the display has a back light that will automatically turn on and off after 10 minutes when a fault or alarm is detected. Using the “REPORT” button will also automatically turn on and off the back light. If the display back light is off, pressing the “DISPLAY LIGHT” button will turn it on for a further 10 minutes.

2) Water detection sensor cable

Areas requiring monitoring for water leaks are commonly fitted with various lengths of water leak detection cable. This cable will detect water anywhere along its length giving a better coverage over conventional spot probes.



The WDC4 cable consists of two separate stainless steel sensor wires and four separate spacer cables bonded together to form one cable, with an overall diameter of 5mm. The signal cables are included to add bulk allowing the cable to lay flat to the ground,.

Cable Specification

Overall diameter	5mm
Spacer Cables	16/0.2mm (0.5mm) 3amp 110vac to IEC 189-3
Sensor wires	Annelid 0.4mm diameter Stainless Steel
Sensor resistance	7 Ω per metre per sensor wire (14 Ω per cable metre)
Sensor spacing	9mm
Maximum length per zone	50 metres

3) Water Solenoid Valves

If required, appropriate sized water solenoid valves can be provided in specified areas. Each valve can be controlled from any zone or all zones on an outstation type OS4V, i.e. outstation 2 has a four zone outstation looking for leaks in four separate areas each area fitted with its own water shut off valve. Within this type of outstation an override switch and light are provided to allow the water to be turned back on even though water is still being detected by the cable sensor.

Specification

Manufacture	Banico
Type	Servo-Assisted
Coil Voltage	230VAC
Buren	25VA-14W
Operation	Powered Open, Slam Shut
Controlled fluid temperature	-10 to 90°C

Maximum pressure

1/2"	3/4"	1"	1 1/2"	2"	
20 bar	20 bar	20 bar	10 bar	10 bar	

Please Note;

The water valves MUST be installed with the arrow on the valve pointing in the direction of the flow.

4) Relay outputs

Five sets of volt free contacts have been provided for the following and can be found within the unit on the main PCB.

- 2 x Common Alarm (Any sector detecting water will energise this relay)
- 2 x New Alarm (Only a new alarm will energise this relay which turns off when muted)
- 1 x Common Fault (Any sensor becoming disconnected will energise this relay)

5)“MUTE” push button

The mute button is provided to silence the audible warning device. It is also used to exit when in the “REPORT” mode.

6) “REPORT” push button

With more than one alarm or fault on the system the controller will display the total number of alarms and faults. To recall the current events first press the “Report” button and follow the on screen instructions

7) “DISPLAY LIGHT” push button

In darkened areas, if the display back light is off, pressing the “DISPLAY LIGHT” will turn it on for 10 minutes.

8) Positioning the Outstations

All outstations are wall mounted using the fixing points located in each corner behind the removable front cover. Outstations should be mounted in a position to allow accessibility to the internal components and cables.

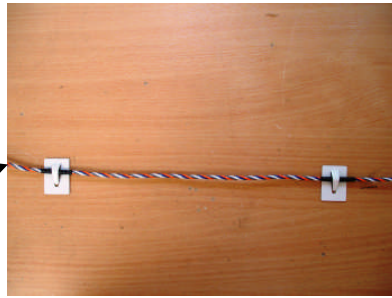
9) Positioning the water detection cable

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).

10) Fitting Cable Clips

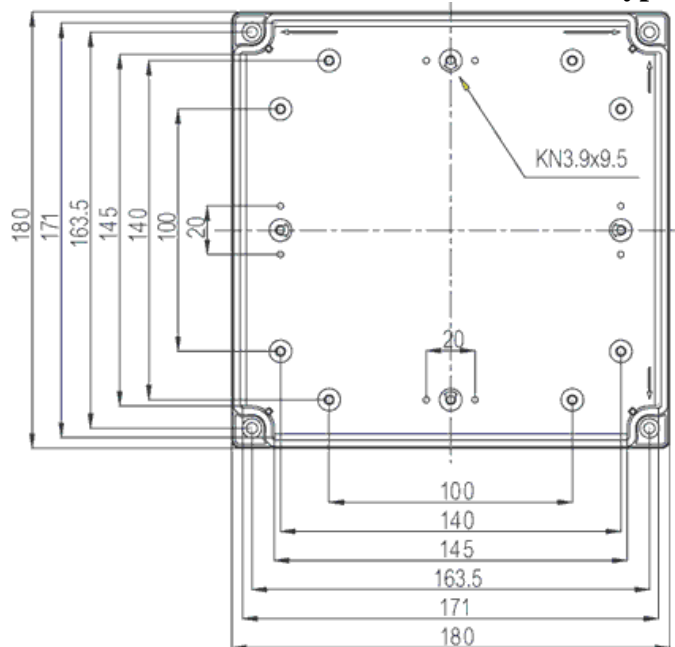
If Cable Clips are required, to protect the small sensor wires and to stop false water detected alarms from occurring insulating tape should be first applied around the detection cable before the clip tongue is closed. Clips should be fitted approximately every 1 to 1.5 metres apart. When using clips 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.

Insulating Tape
Under the fixing
clip tongue

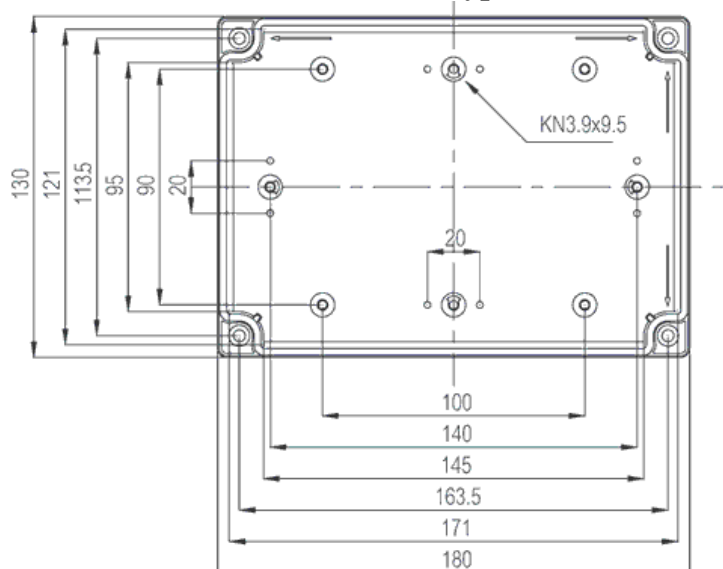


11) Housing Sizes

Main control unit and Outstation type OS4V



Outstation type OS4



12) Installation

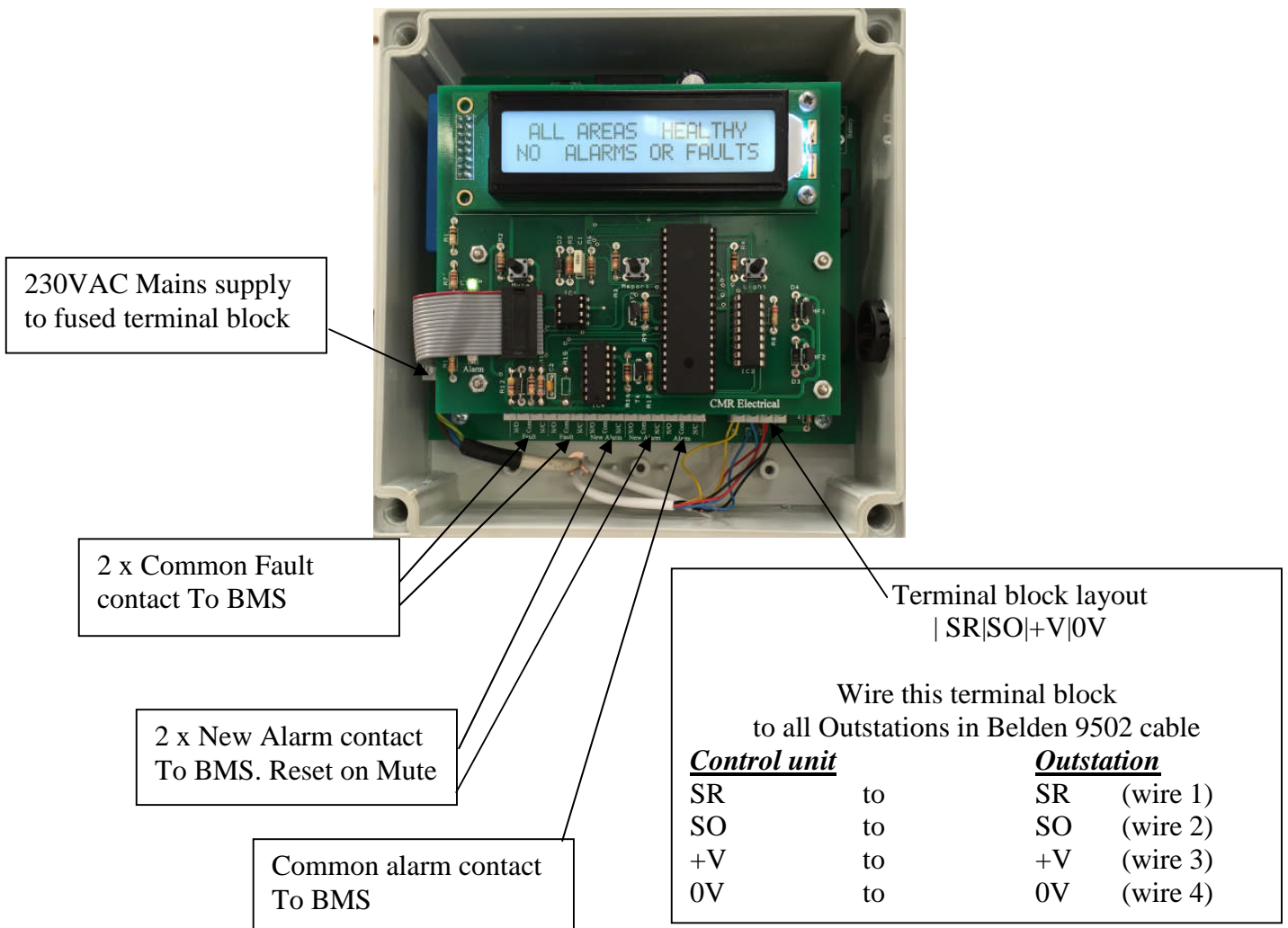
THIS EQUIPMENT SHOULD ONLY BE CONNECTED AND WORKED ON BY A QUALIFIED ELECTRICIAN.

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. 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 units internal terminal block marked “L”, “E” & “N”. The fuse within the fused spur should be rated at 5 Amps. If a factory made signal cable has not been provided use the following connections. If the system has been supplied on a plug in bases please refer to the installation drawing supplied.

Using a Belden 0.5mm 4 core industrial cable type YE00906.00100 or similar, connect the cable from the controller to the outstations in the following way.

Main Controller terminal number	Outstation terminal number
SR	SR
SO	SO
+V	+V
0V	0V

Control Box wiring

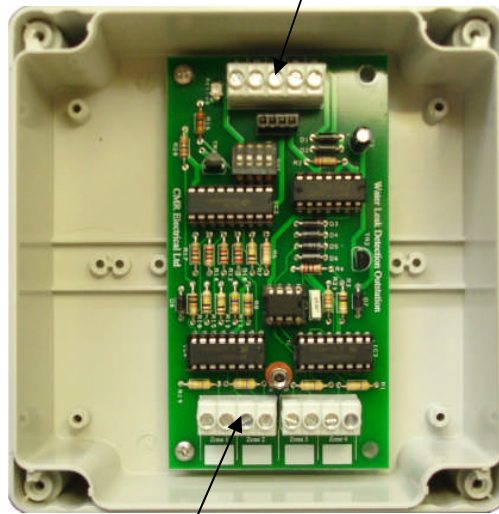


Outstation Wiring

NOTE;

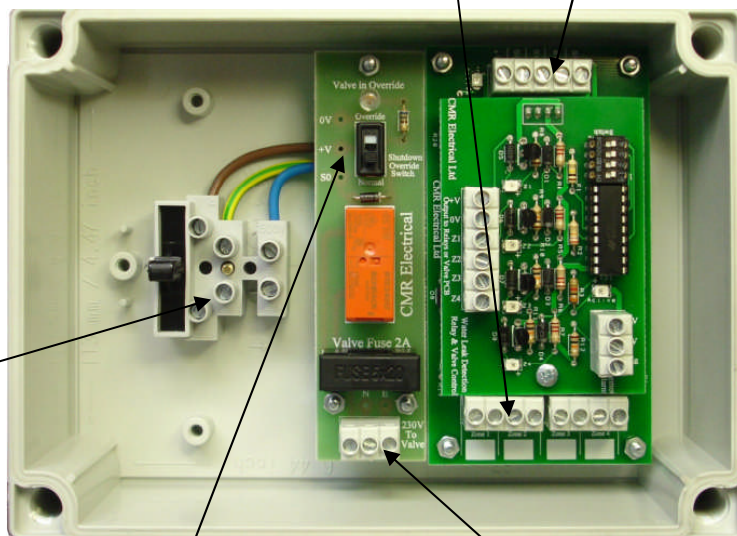
The uniquely addressed Outstation MUST be fitted to the correct location to ensure that the system alarm location matches the actual location.

Wire this terminal block			
Back to the main alarm unit in Belden 9502 cable			
<u>Control unit</u>		<u>Outstation</u>	
SR	to	SR	(wire 1)
SO	to	SO	(wire 2)
+V	to	+V	(wire 3)
0V	to	0V	(wire 4)
Terminal block layout			
+V SC SO 0V SR			



OS4 TYPE OUTSTATION

Water Detection Cable is fitted to Zone 1 to Zone 4 Terminals



Input 230VAC supply

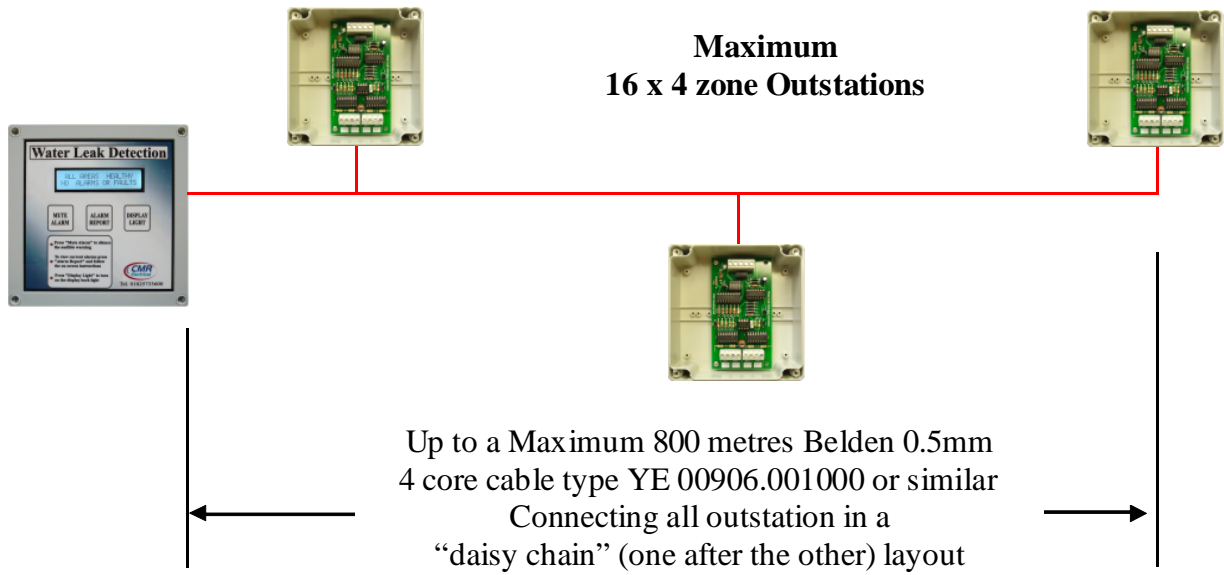
OS4V TYPE OUTSTATION

Valve shutdown Override Switch and light

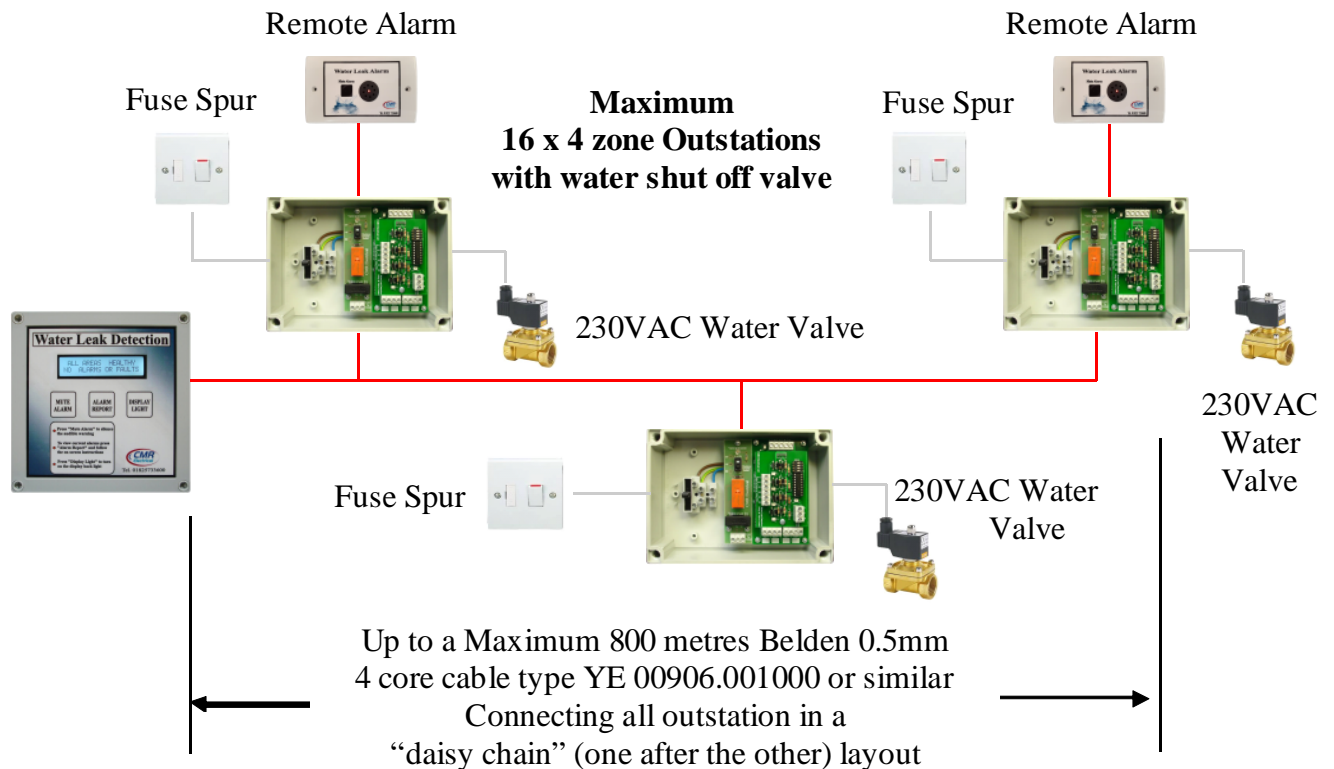
230VAC supply to water valve

Typical Connection Drawing

Installation using Standard Outstations

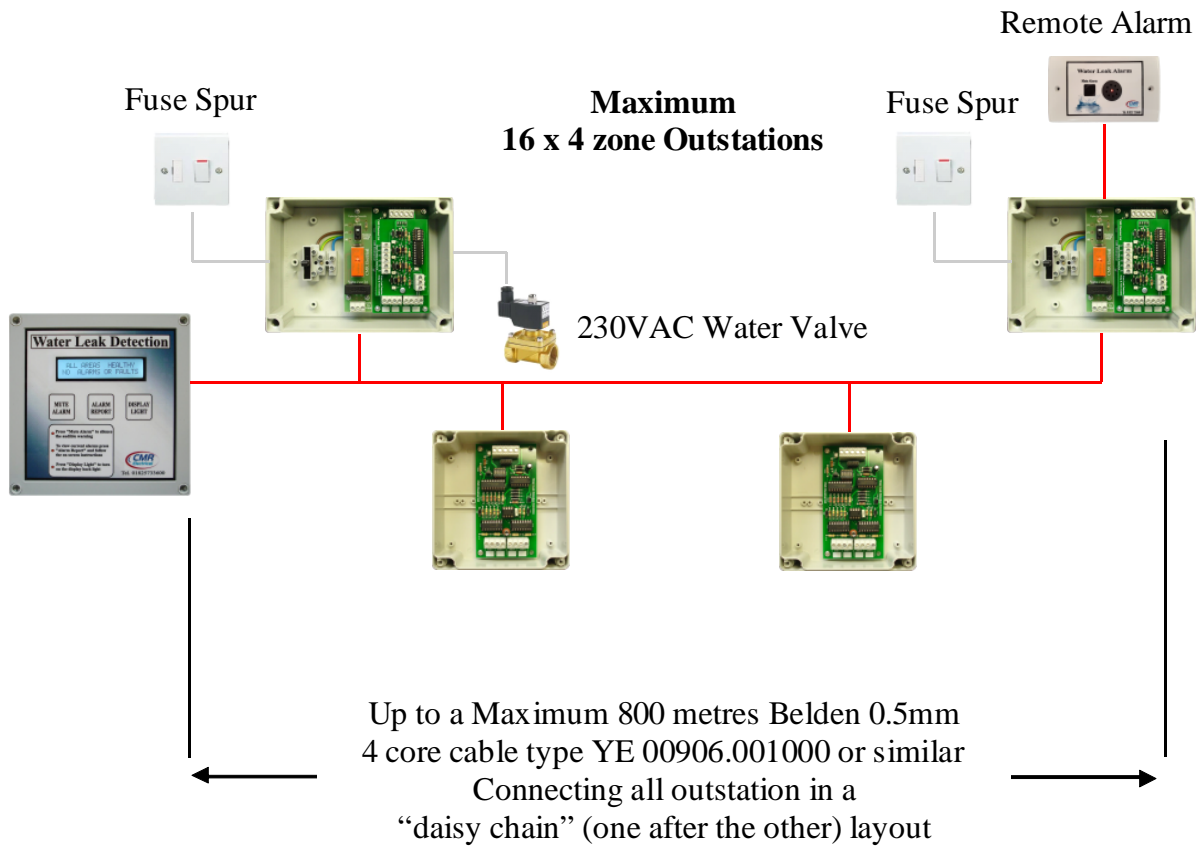


Installation using Outstations with Water Valve Shut off and Remote Alarm



Each Outstation will need its own 230VAC Power Supply

Installation with a mixture of Standard, water valve control Outstations and remote alarm units



Each Water control or Repeat Alarm Outstation will need its own 230VAC Power Supply

13) Commissioning

Having connected the unit as described above, turn of the mains power to the unit. The display should illuminate with the words “CMR ELECTRICAL PLEASE WAIT”. If not, refer to the “Fault Diagnostics” below. If supplied, connect the battery to the flying leads provided.

Having powered up the system the unit will interrogate all the outstations for the first time displaying “Please wait”. After a number of seconds the display will change to either “ALL AREAS HEALTHY” or “WATER LEAK DETECTED” or “SENSOR FAULTY AT” with the location on the second line, please refer to ITEM 1 above for description. Having removed all alarms and faults from the system, using a cup of CLEAN water, immerse a small area of sector 1 detection cable (50mm long) into the water. The controller should display “WATER LEAK DETECTED SECTOR 1” and the warning device should be sounding. Mute the alarm and note the warning device stops. Remove the water placed on sector 1 cable using a dry tissue, the controller should reset back to “ALL AREAS HEALTHY”. Repeat this for all other sectors.

14) Remote Repeat Alarm

If the remote repeat alarm unit is required, the outstation MUST be fitted with the optional relay board. To connect this item to the system, using a low voltage 3 core cable, connect in the following way.



Terminal block layout +V 0V Sig			
Wire this terminal block to all Outstations in Belden 9502 cable			
<u>Outstation</u>		<u>Remote alarm</u>	
+V	to	+V	(wire 1)
0V	to	0V	(wire 2)
Sig	to	Sig	(wire 3)

This item has an audible warning device and “Mute” push button. Once muted, the alarm will self reset once the alarm has been removed. Please note, this unit will NOT activate for system faults.

15) Fault Diagnoses

<i>Fault</i>	<i>Possible Reason</i>
Display appears to be dead	<ol style="list-style-type: none"> 1) No power to the control unit. <i>Test with a meter</i> 2) The power fuse has blown. <i>Test the fuse with a meter</i>
The Water Detected statement remains ON all the time.	<ol style="list-style-type: none"> 1) The cable needs drying out after detecting water. <i>Using tissue paper dry the cable.</i> 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> 3) The cable has been damaged. <i>Visually check the cable for damage..</i> 4) System fault. <i>Return to manufacture</i>
The display keeps flashing and the warning devise cant be muted	<ol style="list-style-type: none"> 1) Data line fault to ALL outstations. <i>Disconnect the system after outstation 1 and keep adding outstations one at a time until the fault repeats itself.</i> 2) System fault. <i>Return to manufacture</i>
The water detected statement remains ON all the time.	<ol style="list-style-type: none"> 1) The detection or signal cable is broken or disconnected. <i>Check for cable faults or breaks.</i> 2) Detection module fault. <i>Dip part of the detection cable into a cup of water and see if it sets up an alarm.</i> 3) System fault. <i>Return to manufacture</i>
Horn not working	<ol style="list-style-type: none"> 1) System fault. <i>Return to manufacture</i>

16) Operational instructions

Water leak detection
alarm status and
location display



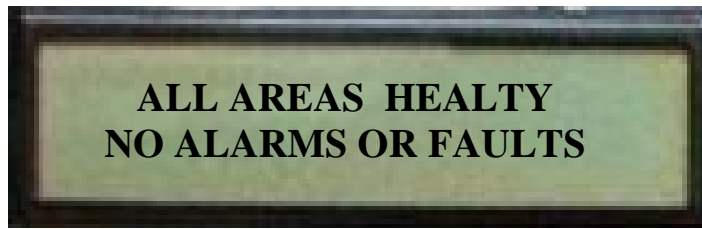
Use this button to
Silence the audible
alarm and put the
system into Auto reset
Mode

Use this button to look
at the location of
multiple current water
leaks and fault alarms

Use this button to turn
on the display back
light for 10 minutes

Display Windows

- (1) This window is the system normal display and indicates that there are no water detected or cable faults on the system.



Action required:
Nothing

- (2) This Flashing window with the audible warning device sounding, indicates a new, **Water Leak Detected Alarm**. If the display is steady and the warning device is off, the display is showing the location of the only alarm on the system and that someone has previously pressed the "MUTE" push button. With the display steady and the audible warning device off, when the water has been removed from the sensor or cable, the system will auto reset and display will show window (1).



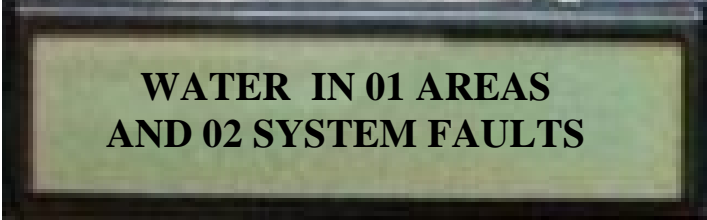
Action required:
Press the "MUTE" push button to silence the audible warning, immediately go to the indicated area, and carefully look for signs of a water leak. If no obvious signs of water are found, it is probably a small leak and it may be necessary to follow the cable route using your hand over the cable to locate it. Once located stop the leak and dry the cable or spot probe using tissue paper or cloth. Once the cable or sensor is dry, the system will self reset and no further action will be required.

- (3) The following Flashing window with the audible warning device sounding, indicates a new, **Detection Sensor is Damaged or disconnected** alarm. If the display is steady and the warning device is off, the display will be showing the location of the only alarm on the system and that someone has previously pressed the "MUTE" push button. With the display steady and the audible warning device off, when the sensor damage, or disconnection has been rectified, the system will auto reset and display will show window (1).



Action required:
Press the "MUTE" push button, inspect the connections and cabling for signs of disconnection or damage from the appropriate outstation to the end of the detect cable or sensor. Also check that the End Of Line plug at the end of the detection cable has not been removed.

- (4) This window will appear when the system has more than one current alarm. The display below shows that there is one current "Water Leak" and one current "Fault" on the system

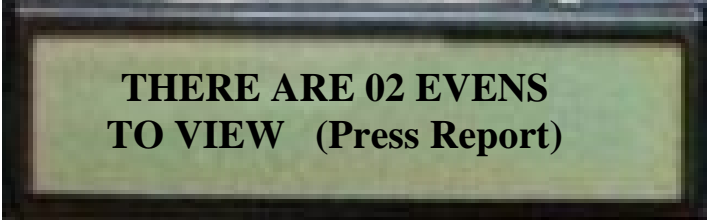


**WATER IN 01 AREAS
AND 02 SYSTEM FAULTS**

Action required:

Press the "REPORT" push button to see each alarm in turn

- (a) After pressing "REPORT" this window will appear



**THERE ARE 02 EVENS
TO VIEW (Press Report)**

Action required:

Press the "REPORT" push button

- (b) Press the "REPORT" push button to view the first current alarm, pressing the "REPORT" button again to display the next alarm. Pressing the "MUTE" button at any time returns the display back to item (4)



**Use Report To View
Event Mute To Exit**

Action required:

Press the "MUTE" button to Exit back to the screen in (4) or Press the "REPORT" button to view the first current alarm. Subsequent pressing of the "REPORT" button will display each current alarm in turn until the following screen is displayed. Pressing the "MUTE" button at any time reverts back to the (4) screen.

- (c) Having displayed all of the current alarms one after the other or pressed the "MUTE" push button, the display will change to the following. After a short time delay, the display will revert back to (4)

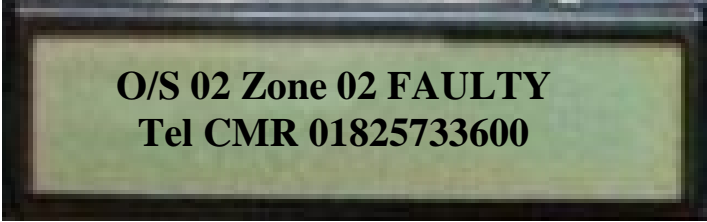


**This is The End
Of The Report**

Action required:

Nothing

- (5) The following window indicates a faulty or disconnected outstation.



O/S 02 Zone 02 FAULTY
Tel CMR 01825733600

Action required:

Check connections at the outstation terminals or call CMR for advise

- (6) If the following window appears with a un-mutable audible warning, the alarm unit had been disconnected from all the remote outstations and NO water leak detection monitoring is taking place.



**SYSTEM IS OFF LINE AND
NOT DETECTING WATER**

Action required:

The system is no longer detecting water in ANY area. All cabling to all outstations must be checked for disconnection or damage.

TOTAL FAILURE OF THE SYSTEM.