EcoLeak | Eco-6+

Six Zone Panel

INSTALLATION OPERATION & MAINTENANCE INSTRUCTIONS

aquilar
leak detection solutions

Eco-6+

Six Zone Panel

Please read instructions carefully and keep them in a safe place. Wiring should be carried out by a suitably qualified technician in accordance with the applicable regulations and standards in the relevant industry. This manual is intended as a guide, and Aquilar Ltd bears no responsibility for damage or injury arising from incorrect installation of this and any supplementary equipment.

A. GENERAL INFORMATION

The Eco-6+ panel is an updated and improved version of the original Eco-6 panel, providing greater versatility and function with increased sensing capability, while keeping a compact form factor and simple to use, reliable layout. The Eco-6+ is capable of monitoring 6x individual zones of upto 160 metres of sensing cable or 10x Detection probes. The Eco-Network connector allows multiple EcoLeak panels to be connected in a network and report back to one master EcoLeak panel for even more connectivity. Battery back-up is available for up to 24 hours using a 3.2Ah battery or 6 hours using a 1.2Ah batery option.

B. PRODUCT INFORMATION

ECO-6+
100 to 240 Vac, 50-60 Hz, 5W

RELAYS
1x Leak relay per zone (6x total)
1x Common Leak relay
1x Common Break/Fault relay
1x Sounder relay
Type: SPDT
Rating: 5A at 250Vac/24 Vdc

SENSING CABLE COMPATIBILITY
All EcoLeak and TraceTek sensing cable
(TT1000, 1100, 3000, 5000, series)

MAXIMUM LENGTH OF SENSING CABLE
30m per zone (EcoLeak Cable) or up to 60 metres when using ECO-BCB
160m per zone (TraceTek Cable)

MAXIMUM LENGTH OF LEADER/JUMPER CABLE
300 metres (per zone)

PROBE COMPATABILITY
All EcoLeak, AquiTron Probes, for water and fuels

DETECTION PROBES
1x EL-MPS-R or 10x AT-PROBE per zone

NUMBER OF ZONE
6x Individually activated sensing zones

SENSING CIRCUIT
2 wire sensing - EcoLeak
4 wire sensing - TraceTek

CABLE ENTRY AND MOUNTING
4x fixing holes for mounting
15x 20mm, 1x25mm

DIMENSIONS AND WEIGHT
247 x 245 x 85, WxHxD.
Panel-2.4kg (battery excluded)
Panel and 1.2Ah battery-3kg
Panel and 3.2Ah battery-3.6kg

WORKING TEMPERATURE RANGE
5°C to 40°C

ENCLOSURE
Powder coated steel RAL 9006 matt
IP43 - Indoor use only

STATUS LED
Power: Mains-Green
Battery-Yellow
Alarm: Leak-Red (steady
Muted Alarm-Red (flashing)
Cable Break-Yellow

AUDIBLE ALARM
90dB at 10cm

ACCESSORIES
12Vdc Aux Output (Max 500mA) for use with: AT-OPSEN sensors (max 6), AT-SRG refrigerant sensors (max12), Sounders/Beacons and AT-RAP

BATTERY BACK-UP
12Vdc battery back-up (optional)
3.2Ah Large Battery - Up to 24hrs
1.2Ah Small Battery - Up to 6hrs

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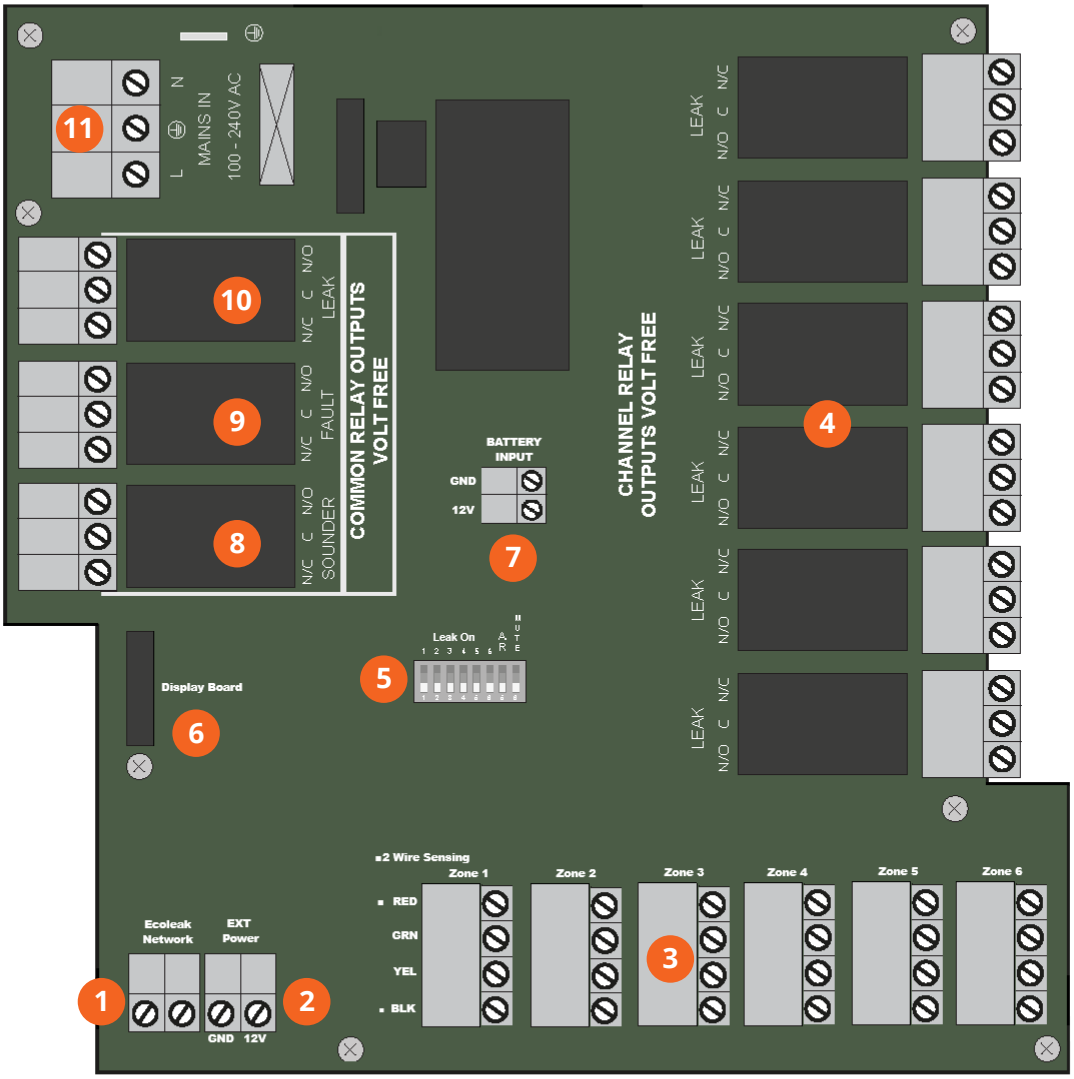
ALARM PANEL INTERNAL LAYOUT



1. Eco-Network Connector
2. Accessory 12v Power
3. 6 Zones sensor connections
4. 6x Leak relays (1 per zone)
5. Zone enabled dipswitch
6. Display Board connector
7. Battery Back-up connector
8. Common Sounder Relay
9. Common Fault Relay
10. Common Leak Relay
11. Mains In 100-240Vac

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ALARM PANEL MOUNTING

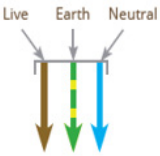
The ECO-6+ leak alarm panel should be mounted on an internal flat surface away from direct contact with water. 4 x fixing holes are provided along with several 20/25mm diameter knockouts for conduit/cable entry. To access the fixing holes it is recommended the circuit board is removed prior to mounting and any holes knocked out/drilled for conduit being fitted.

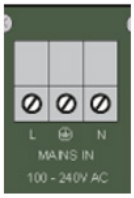
MAINS POWER AND BATTERY CONNECTION

It is recommended this alarm panel should be connected to 230Vac mains power via an un-switched 3A fused spur. The panel has the capability to be connected to 110 – 240Vac.

This alarm panel **MUST** be earthed.

Mains power must be isolated prior to any connection being made or altered.





Warning Shock Hazard. Exposed Circuitry within! It is strongly recommended the power is isolated before opening the control panel door and carrying out any work within this unit.

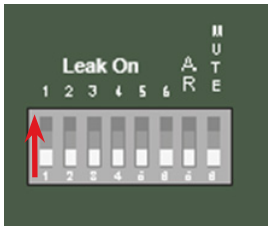
If required ensure the optional battery pack is plugged in. Allow 24 hours for full charge. (two battery versions are available, see section E. for further details)

The panel manages battery condition and automatic switching between mains and battery power. While the panel is in use the battery should be left connected at all times.

A. IMPORTANT SENSOR INFORMATION

ENABLING ZONES

All zones used for sensing must be enabled using the dipswitches 1-6. Zones that are not enabled will not be monitored by the panel. Any enabled zones that do not have a sensor connected will show a fault alarm.



To enable a zone, simply move the dipswitch into the on (up) position

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TWO WIRE SENSING: ECOLEAK SENSING CABLE, ECOLEAK PROBES

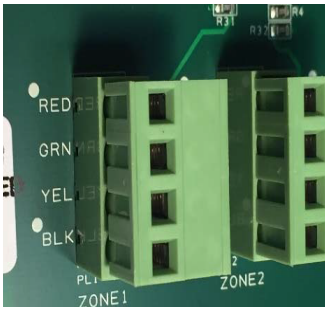
Two wire systems should be connected using the red-black outer terminals only. As indicated by the white dots. Use only EcoLeak sensing cable or EcoLeak/Aquitron probes for two wire sensing. Use of other sensing devices could cause the panel to malfunction.

EcoLeak sensing cable (2-Wire) is not extendable however it can be split into two circuits using the ECO-BCB detailed below

If sensing is required in more than one area on each zone, TT1000 (4-Wire) should be used with AT-MJC/AT-BJC jumper cable between the sensing areas (up to a maximum of 160m total sensing cable per zone).

FOUR WIRE SENSING: TT1000, TT1100, TT5000, AT-PROBE

When using four wire system with Aquilar AT-MLC leader cable or AT-BJC jumper cable the red-green and yellow-black colour coding on the zone sensor input terminals should be observed.



NOTE: Do not connect more than one sensing circuit into each zone. Doing so will cause malfunction in the cable break checking system and may prevent the panel from detecting cable faults and leaks.

Splitting of zones is only possible when using the correct branch connector box for the sensor type. It is important to note that alarms on either branch leg of the connector box will still be reported back to the panel as the same zone.

EcoLeak Sensors- use **ECO-BCB - Ecoleak Branch Connector Box**
Aquitron/TraceTek Sensors- use **AT-BCB - AquiTron Branch Connector Box**

ECO-BCB allows multiple combinations of sensors to be connected to the same zone which is not usually possible with EcoLeak sensing cable.

RELAY CONNECTIONS

A total of nine volt free relays are available for connection to external equipment. All the relays are SPDT and have common, normally open and normally closed contacts.

All relays are volt free contacts. No power is available from them. If using them to control equipment that requires power, an external power source must be supplied and the relay used as a switch. Please see relay connection addendum at the end of this manual for further connection guidance. The relays are rated for a maximum load of 5A 250v. Exceeding this may cause irreparable damage to the alarm panel.

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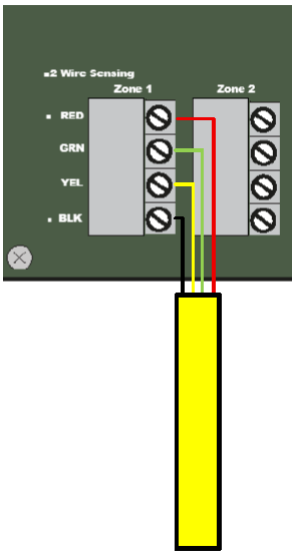
TYPICAL WIRING EXAMPLES

4 Core Leader Cable



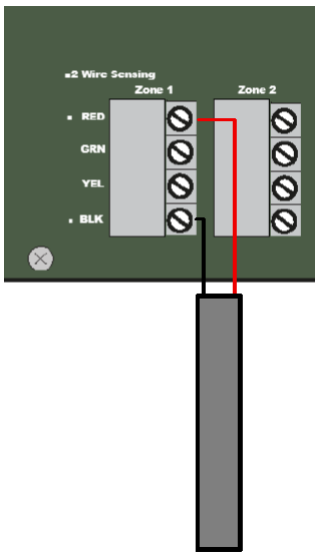
1) TraceTek 4 Core jumper cable is connected as shown. The connectors are colour coded, Red, Green, Yellow, Black.

2) Place the wires in the correct connectors

3) The leader cable will have a female connector on one end which is used to connect modulised 4 core sensing cable. To complete the circuit an end termination will need to be connected to the end of line.

4) Once the wiring has been completed succesfully you can select which zone you would like to operate using the onboard dipswitch function. (See section A)

2 Core Eco-Leak Jumper Cable



1) Eco-Leak 2 Core leader cable is connected as shown. The terminals are colour coded and for two core you will need to utilise black and red.

2) Place the wires in the correct terminals as shown

3) The leader cable will have a female connector on one end which is used to connect to the corresponding length of Eco-Leak sensing cable, with a 82 kΩ resistor built into the sensing cable to complete the circuit.

4) Once the wiring has been completed succesfully you can select which zone you would like to operate using the onboard dipswitch function.

5) If using mini probes the wiring is the same, utilising black and red.

For guidance on volt free relay wiring please see Page 14

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Warning Shock Hazard! Caution 230v mains voltage could be present at these relays that may require isolation elsewhere

Leak relays 1to 6 operate when a leak is detected within their respective zone

There are three 'common' relays: Leak, Break, Sounder

•The common leak relay operates when any of the six zones goes into leak alarm

•The common break relay operates when a cable break is detected on any of the six zones or power is lost* to the panel.

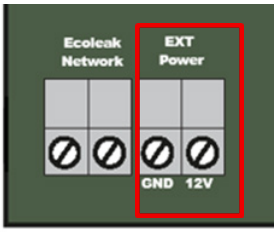
***Note**: For loss of mains power, if the optional battery pack is plugged in and charged, the fault relay can be reset and the system will continue to monitor for leaks and cable break on battery power until the backup battery discharges or mains is restored

•The common sounder relay is primarily for the connection of external sounders. It will operate with both leak and break alarms. Pressing the mute or reset button on the panel will reset this relay

Leak and fault relays will only reset when the leak/fault has been rectified and the reset is operated either by pressing the button, or automatically by the panel. The Mute button has no effect on leak or break relay output

IMPORTANT! Relay output terminals refer to the panel in its 'off' state. The Break/Fault relay is energised when the panel is mains powered. Once power is applied to the panel the normally open and closed terminals are reversed

C. ACCESSORY POWER

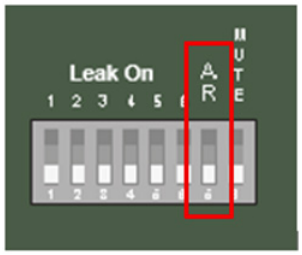


The Eco-6+ has a 12Vdc output for the powering of accessories such as AT-OPSENS (max 6), AT-SRG Refrigerant Sensor (max 12), the AT-RAP remote alarm, or other remote sounder beacon devices. The maximum load available from this is 500mA. Exceeding this may cause damage to the panel.

Note: Accessory load will reduce battery back up performance.

D. AUTO RESET

By default all alarms must be manually reset. THe Eco-6+ can be set to auto reset. This is set on dipswitch 7. Enabling this will mean all alarms will automatically reset once the leak or fault has been cleared without any input from the user.



Important!: Alarm history is not retrievable from the Eco-6+, auto reset should only be enabled if the panel is connected to a BMS or master panel that can record alarm events.

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E. BUZZER DISABLE

The internal buzzer can be disabled by using dipswitch 8. Enabling this dipswitch will only mute the internal buzzer. All relays and LED's (including the sounder relay) will operate as normal.

F. BATTERY BACK-UP

The Eco-6+ can also support battery back-up for up to 24 hours or 6 hours when using 3.2Ah or 1.2Ah option, please see below for optional codes:

Code: 6135 Large Capacity battery – up to 24 hours
Code: 6136 Small Capacity battery – up to 6 hours

The battery should be connected into the correct terminal using the leads supplied, taking care to connect the red + terminal of the battery to 12v and the black – terminal to GND
The panel will automatically charge the battery, monitor for mains failure, switch to battery power and back to mains power as required. While the panel is in use the battery should be left connected at all times.

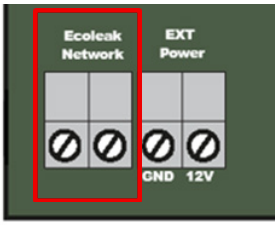
The built in battery monitoring system will automatically cut off or will not engage battery power LED if the battery has drained below safe use limits.

Important!: Incorrect connection or third-party batteries/leads may cause irreparable damage to the panel.

G. ECONET NETWORK CONNECTION

The Eco-6+ can be easily networked with other EcoLeak panels in master/slave configuration with only a 2 core cable using the EcoNet connection.

To use this feature the master and slave(s) should be connected by a two core cable (such as our 6118 EL-BJC-2C 100m two core bulk jumper cable). Each slave panels EcoNet output will use a zone on the Master panel and should be connected into the EcoLeak sensor connector utilising the Red and Black (terminals) on the required zone input. (See section I)



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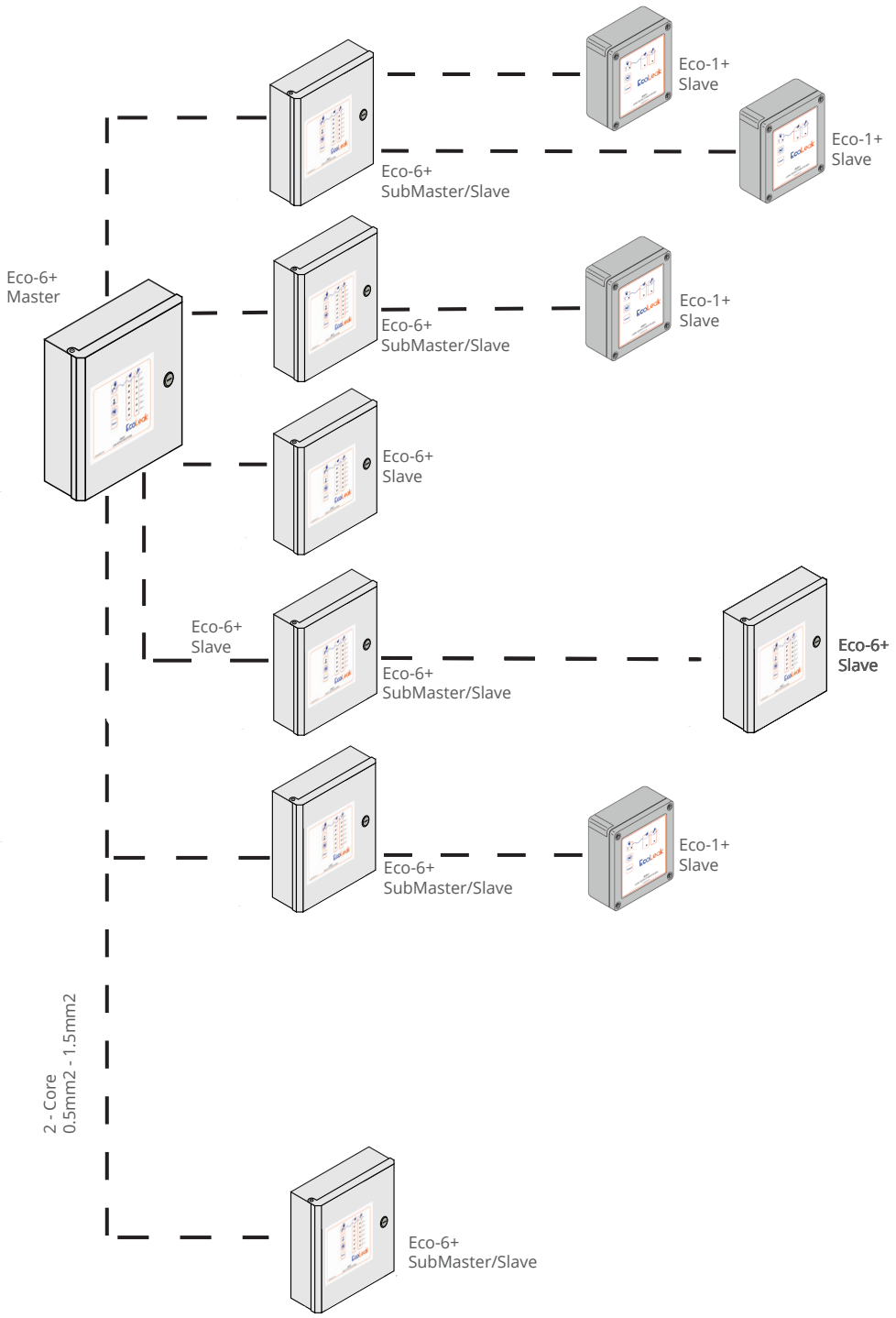
H. ECONET NETWORK CONFIGURATION



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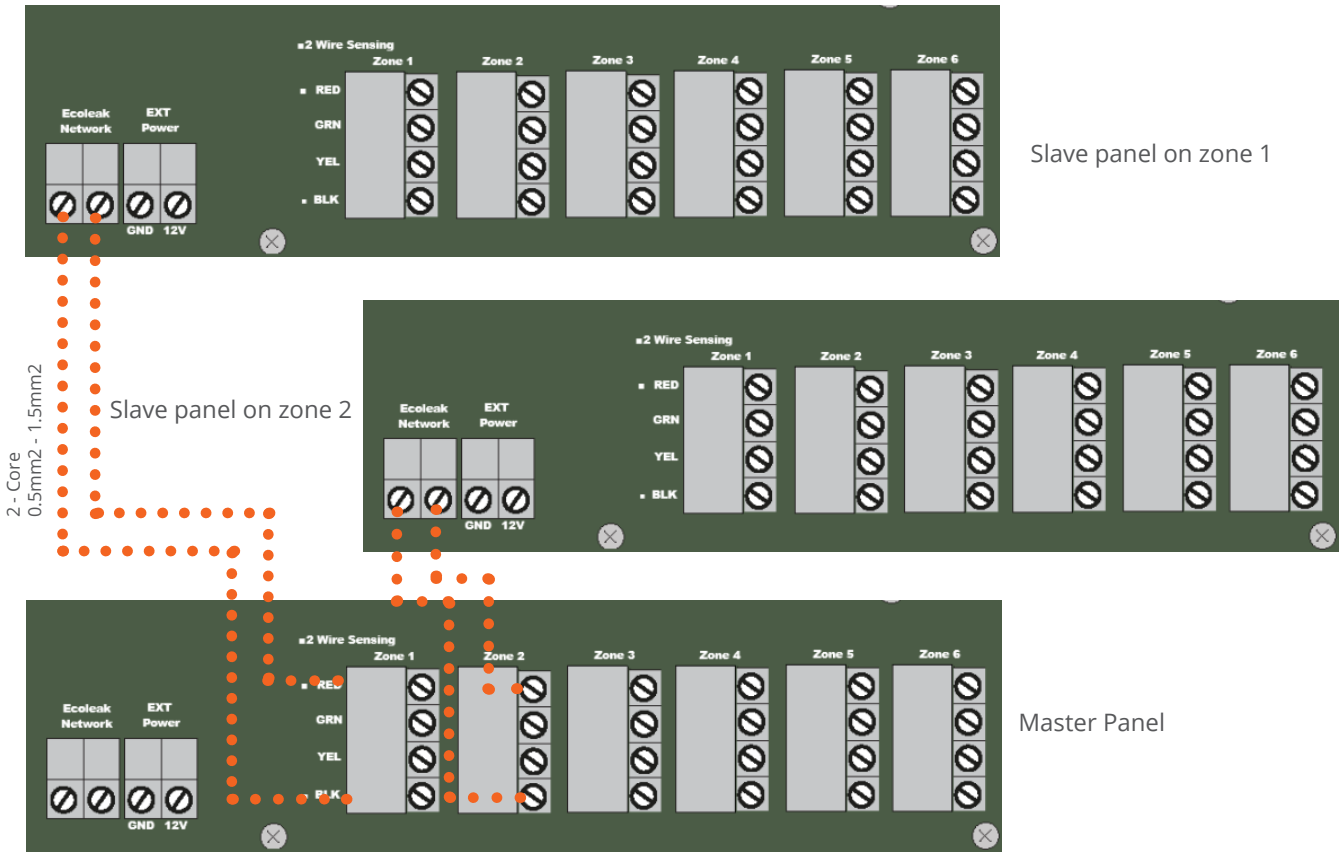
I. ECONET WIRING CONNECTION



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J. NORMAL OPERATION

After connections are complete, supply power to the unit. If the sensing circuit is complete and free of leaks or other problems, the panel will run a function test and then the green mains power LED only will remain illuminated.

Testing the alarm panel after supplying power and Routine maintenance procedure:

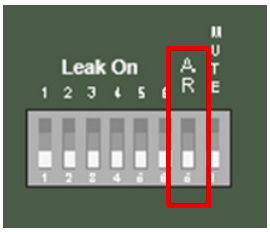
- When power is supplied, the GREEN LED illuminates for mains power.
- Place water or a mapping tool on the probe or sensing cable and the ECO-6+ panel should report a leak alarm condition in the corresponding zone. For the TraceTek TT5000 systems, simulate a leak condition by tightly bending and holding the sensor cable. Please refer to the relevant sensing cable/probe installation instructions for further information.
- Verify that the RED alarm LED is illuminated and the zone is correct.
- Confirm both zone leak and common leak relays operate for all enabled zones.
- The buzzer will sound and will only be silenced when the mute button is pressed or system is reset. Reset is only possible once the probe or sensing cables are dried.
- To test the fault alarm operation disconnect the probe or sensing cable from the leader/jumper cable. The ECO-6+ panel will report a fault alarm in the corresponding zone.
- Verify the Amber alarm LED is illuminated and the zone is correct.
- Confirm fault relay operates on all zones.
- Buzzer mute and reset in same method as for a leak alarm. Reset is only possible once the fault has been repaired.
- Turn off mains power (after allowing sufficient time for battery charge). Green power light will switch to amber to indicate panel is running on battery power. If battery LED is flashing or does not illuminate battery power is too low for proper operation and will require further charging.
- While on battery power ensure leak and fault functions operate correctly.

If the ECO-6+ panel does not appear to operate properly contact your supplier for assistance

K. RESETTING THE UNIT

When the probe or sensing cables are dried or repaired press the reset button. The unit is designed so an alarm can be muted, but the panel **cannot** be reset until the leak or fault has been rectified.

If auto reset is enabled the system will still not reset until the leak/fault has been rectified.



Important!: Any master panels connected via the EcoNet connection will also need to be separately reset. The master panel cannot be reset while connected to a slave panel that is still in alarm.

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L. CLEANING THE MODULE

If it is necessary to clean the outside surface, use a dry cloth or sponge. Do not use solvents or abrasive cleaners. Do not open the enclosure if it is wet (risk of electrical shock).

M. FUSE REPLACEMENT

The panels mains input is protected by a 1A, 250-V fuse. Use no other type of fuse or the Eco-6+ panel could be damaged or could fail to perform properly.

Warning Shock Hazard. Exposed Circuitry within! It is strongly recommended the power is isolated before carrying out any work within the unit.

N. STORAGE AND HANDLING OF SENSING CABLE

Despite their rugged construction, EcoLeak and TraceTek sensing cables must be handled in a manner appropriate for a sensing device or they may be damaged and require replacement.Therefore, you should follow some basic rules for storing and handling all sensing cables:

- Store spare cable in its original packaging or container in a clean, dry place until ready for installation.
- Schedule cable and probe/sensor installation after all mechanical, plumbing, and electrical work has been completed
- Clean the area where the cable is to be installed, and remove any obvious debris or other sources of contamination.
- Do not solder or weld near the cable without providing protection from heat, solder flux, or weld splatter.
- Do not drop tools or floor tiles on the cable; sharp and heavy objects may damage the cable.
- Avoid walking or stepping on the cable. Provide shielding (for example, a half shell of plastic pipe or upturned cable tray) where additional protection is necessary.
- Do not use insulation tape or similar to secure sensing cable (some tapes and adhesives absorb moisture) or use solvents that could eventually cause an alarm.
- Do not drag sensing cable through contaminants (such as pipe flux, PVC cement, solvents, oil, water or dirt)

O. NOTE ON CABLE CLEANING

EcoLeak and TraceTek sensing cables use a solid core polymer construction and can usually be easily cleaned with tap water. In extreme cases or when large amounts of cable are contaminated, either cable can be washed in a dishwasher. Try a water only (no detergent) cycle first and avoid the heated dry cycle. When placing the cable in the dishwasher be sure to keep water out of the connectors (TraceTek cable ends can be connected together for convenience).
The TraceTek TT5000 sensing cables cannot be cleaned and must be replaced after exposure to fuel or solvent.

P. FINAL COMMISSIONING CHECK LIST

1. Complete a system inspection in the presence of the owner.
2. Ensure a plan showing the location of the zone and sensor is available.
3. Check that the following information is clearly visible adjacent to the alarm module:
   - “In case of alarm” instruction.
   - Location of the system “as fitted drawing” in case it is not installed adjacent to the alarm module.
   - Name and contact number of the person responsible for operating the system
   - Supplier’s contact name and address. Or details of the installation/maintenance company.
4. Hand over these Installation, Operating and Maintenance Instructions.
5. Make the owner aware that it is strongly recommended to perform a systems check at regular intervals, as a minimum once every 12 months.

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Q. ROUTINE MAINTENANCE AND TESTING

Perform a functional check per the following procedure as a minimum of 12-month intervals. Repair or replace all damaged wiring, probes and sensor cables. Such a check will identify conditions that adversely affect the capability of the system.
More frequent checks may be required if the sensing cable is repeatedly exposed to leaks, or if construction or repair work is done where the sensing cable or probes may be exposed. Apart from fuse replacement there are no field repair procedures for the Eco-6 panel. If the module fails to perform the functional tests it must be returned to your supplier for repair or replacement.

Contact your local EcoLeak representative for further information on service and maintenance support.

R. ROUTINE TEST PROCEDURE:

- Should be carried out as initial setup procedure as set out above.
- **Important Note:** This may cause external equipment to shut down or go into alarm if devices are connected to the leak and fault relay contacts.

S. TROUBLESHOOTING

POWER

Problem: Green mains power LED Does not illuminate
Possible Cause: No power to alarm panel. Mains or internal fuse blown.
Action: Confrim power supply is live and switched on, check 3A fuse within spur, replace if necessary. Verify mains power present at mains terminals of panel. Check internal 1A fuse, replace if necessary. If panel remains inoperative please contact supplier.

RELAY OUTPUTS

Problem: No power from the relay
Possible Cause: Relays are volt free contacts. No power avialable from them.
Action: Rewire to use relay as a switch from an external power source. Please see volt free relay operation

Problem: Solenoid valve opening when expected to be closed (or vice versa), or other connected equipment behaving in the opposite manner to required. Paying particular attention to the break/fault relay as it is energized when the alarm is powered.
Possible Cause: Incorrect wiring of relay normally closed or normally open terminals.
Action: Use other terminal. Please see volt free relay operation

WATER SENSING

Problem: Leak found, but no alarm
Possible Cause: Zone has not been enabled
Action: Enable zone and retest. (See section A)

Problem: Leak Alarm, but no leak is found.
Possible Cause: Sensing cable is dirty or contaminated.
Action: Clean cable using water (no solvents, acetone, white spirit or turps). Dry the cable and check Eco-Leak front panel. Heavily contaminated cable may require replacement. But if dirt is accumulating, cleaning and/or replacement will eventually be required.

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WATER SENSING (CONTINUED)

Problem: Leak Alarm, but no leak is found.
Possible Cause: Sensing cable is exposed to occasional water spraying.
Action: It is best to keep the sensor cable at least 1 meter (3 feet) from the airflow of any air conditioning units, or areas where occasional wetting of the sensor could be expected.

Problem: Leak Alarm, but no leak is found.
Possible Cause: Cable is in contact with sharp metal edges.
Action: Check the sensor cable for possible points of contact with sharp edges such as the edges of drip trays or the pipe threads on adjustable floor supports trunking and ducting. Reposition the cable as necessary or insert a small piece of insulating material to prevent the cable from making contact with the metal edge.

FUEL OIL SENSING

Problem: Leak Alarm, but no leak is found.
Possible Cause: Cable is pinched (TT5000 cable)
Action: Check the sensor cable for possible pinch points. TT5000 can indicate a leak if tightly bent or compressed by a heavy object

Problem: Leak Alarm.
Possible Cause: Probe or sensing cable is contaminated (TT5000 cable)
Action: Locate the spill area, investigate the cause of the spill and take necessary repair actions.
Clean up in the spill area and clean and dry the probe, if necessary. Any TT5000 cable contaminated with hydrocarbons (oil, fuel etc.) will need to be replaced, it cannot be cleaned and re-used. Leak LED will turn off when cable/probe is replaced/ dried and reset button is pressed.

FAULT ALARM

Problem: Fault output to BMS but no fault indicated on zones
Possible Cause: Mains power lost to panel.
Action: Check mains power is connected and turned on. Check fuses. Test and replace as necessary.

Problem: Fault indicated on one or more zones, but no obvious fault found.
Possible Cause: Loose connection on sensing circuit.
Action: Check all connections are sufficiently tightened within the alarm panel, connectors are fully pressed home, and any modular connectors are fully tightened. If using TT1000 sensing cable or AT-PROBE-M ensure the TT-MET-PC end termination is fitted properly on the end of line. If using AT-PROBE-TS ensure the last probe has end of line terminations (cable loops) fitted.

Problem: Fault indicated, but no obvious fault found.
Possible Cause: Sensing cable or probe faulty or damaged.
Action: Check sensors for damage, test and replace as necessary.

Problem: Fault indicated, but no obvious fault found.
Possible Cause: Short to earth on sensing circuit.
Action: Check sensing cables or probes are not earthed. Pins on probes should be positioned not touching metal surfaces. Sensing cable not positioned running over sharp metal surfaces (drip tray edges, false floor support pedestals etc.)

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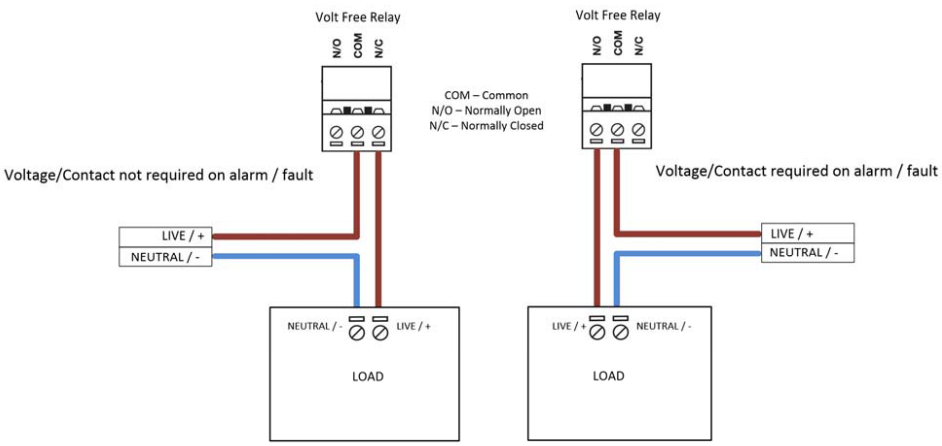
Eco-6+
Six Zone Panel

VOLT FREE RELAY OPERATION

All leak detection alarm panels supplied by Aquilar are provided with, at least one, volt free relay.These are also known as volt free contacts or dry contacts. They are used to operate auxiliary equipment such as – valves, sounders, pumps, beacons etc., sending closed or open contact signals to Building Management Systems (BMS) or other logic level controls. As the name suggests, there is no voltage present at the terminals. So, to operate a valve, for example, you need to have a dedicated power supply which is then fed through the relay (typically the live feed) to switch it on or off accordingly.Typical wiring is as follows:



Please ensure that the load does not exceed the ratings of the volt free relay. This is stated in the relevant product's data sheet / installation instructions.

Wiring of volt free relays should be undertaken by a suitably qualified technician and in accordance with the regulations and standards in their industry/country. These notes are only intended as a guide and Aquilar Ltd bears no responsibility for the installation or operation of the unit.

Important: All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their application. Aquilar Limited makes no warranty as to the accuracy or completeness of the information, and disclaims any liability regarding its use. The only obligations of Aquilar Limited are those in the Aquilar Standard Terms and Conditions of Sale for this product, and in no case will Aquilar Limited be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use or misuse of the product. Specifications are subject to change without notice. In addition, Aquilar Limited reserves the right to make changes – without notification to Buyer – to processing or materials that do not affect compliance with any applicable specification.

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