AquiTron

AT-SRG
Sensor for
Refrigerant Gas

INSTALLATION & OPERATION INSTRUCTIONS

aquilar
leak detection solutions

AT-SRG

Sensor for Refrigerant Gas - Occupied Spaces

Please read these instructions carefully and keep them in a safe place (preferably close to the module) for future reference. These instructions must be followed carefully to ensure proper operation.

A. GENERAL INFORMATION

The AquiTron Sensor for Refrigerant Gas (AT-SRG) detects refrigerant leaks in occupied spaces.

The sensor is for indoor applications only. It is housed in an ABS enclosure that fits into most standard single gang UK electrical back boxes (not included).

Refrigerant gas leak alarms and sensor status are indicated visually by a 2-colored LED and audibly by a buzzer. In case of an alarm and/or fault, a volt free relay is available for remote output (for example, shut-off valves, remote alarm devices or central monitoring/BMS).

1. The AT-SRG refrigerant sensor requires no calibration during its life cycle.
2. Proper installation and Annual bump testing for correct function is strongly recommended as required for BS EN378 compliance.

B. PRODUCT INFORMATION

AT-SRG POWER

AT-SRG-12/24V 12/24Vac/dc*

AT-SRG-230V 100 to 240 Vac, 50-60 Hz

*±10% maximum

POWER CONSUMPTION

Maximum wattage : 0.7 Watts

RELAYS

Number: One LEAK and FAULT relay

Type: SPDT
Rating: 3 A at 250Vac/30Vdc

PANEL OUTPUT

Dedicated output compatible with all Eco-Leak panels.

SIZE

To fit within a UK single back socket box, 35 or 44mm deep.

AUDIBLE ALARM

67dB @ 1 Meter

DETECTABLE GASES

R410A, R32, R290 (dependant on interchangeable sensor head installed - refer to sensor head label)
Note: Each sensor is suitable for one gas.

SENSOR LIFE

Expected 15 years, depending on sensor's environmental conditions

ALARM DELAY

0 or 5 minutes, Dip Switch Selectable

APPROVALS

BS EN IEC 61000-6-3:2021
BS EN IEC 61000-6-1:2019

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AT-SRG Sensor for Refrigerant Gas

B. APPLICATION

ENVIRONMENTAL CONSIDERATIONS: Carefully consider the full range of environmental conditions which the sensor will be exposed to.

TARGET GAS CONSIDERATIONS: The physical data of the gas to be detected must be observed.

APPLICATION CONSIDERATIONS: The appropriate location should be carefully selected. For example, possible leak location, air movement/drafts, etc. should be considered.

ACCESSIBILITY CONSIDERATIONS: Accessibility is required for maintenance purposes.

ELECTRONIC CONSIDERATIONS: The system contains sensitive electronic components that can be damaged. Do not touch or disturb any of these components.

COMPLIANCE: Ensure the sensor is positioned to meet the required regulations and standards to suit project requirements.

The AT-SRG should be mounted in a position considering the above criteria. The location should be appropriate for the gas being detected and the protection required.

This would generally be in open air, away from heat sources and drafts (radiators, windows/doors etc.) at **low level (approx. 100-300mm above FFL)** within the occupied space being protected (e.g. not ceiling voids or wardrobes). See diagram for example of suitable location.

Places to avoid installing the AT-SRG Sensor

Places to consider when installing the AT-SRG Sensor

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C. INSTALLATION

⚠ This sensor and associated equipment must be installed in accordance with all local and national laws, rules, wiring codes, and regulations.

⚠ Failure to install and operate the unit in accordance with these instructions and with industry guidelines may cause serious injury including death. This unit must be installed by a suitably qualified technician who will install this unit in accordance with these instructions and the relevant standards. Operators of the unit should be aware of the regulations and standards in their country for the operation of this unit. These notes are only intended as a guide and Aquilar bears no responsibility for the installation or operation of this unit.

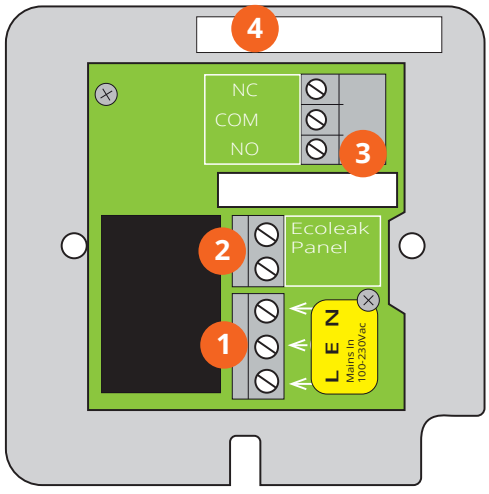
⚠ Ensure all wiring connections are complete prior to applying power to this unit.

This unit should be installed within a standard UK single gang back box (not supplied) Minimum depth 35mm . This can be flush or surface mount. (**Recommended 44mm back box**)

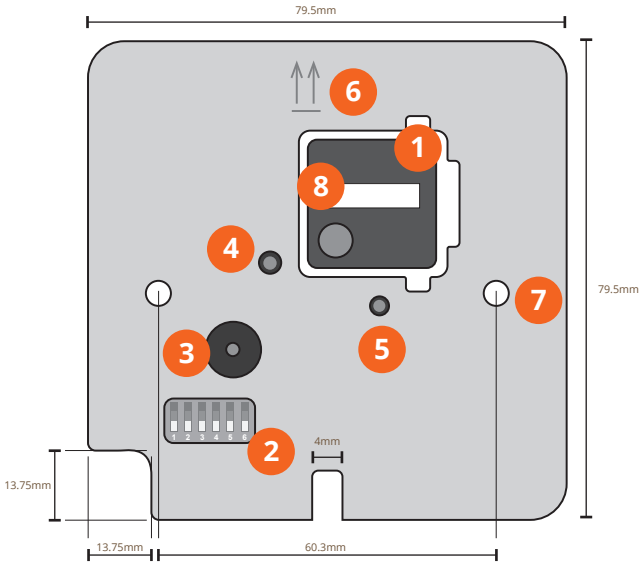
If fitting the AT-SRG into an existing double gang socket box the double gang adapor plate should be used to ensure correct operation of the sensor.

Proper earthing must be observed. If using metal socket boxes or metal faceplate proper earth bonding must be observed according to local electrical regulations.

D. COMPONENTS OVERVIEW



1. Power In 100 - 230Vac or 12/24Vac/dc (dependent on model)
2. Ecoleak Panel Connection
3. Relay Connection (Volt Free)
4. Serial Number



1. Replacement Sensor Head
2. Dipswitch (for configuring the AT-SRG-XX)
3. Buzzer
4. Bi-Colour LED
5. Reset / Mute Button
6. Direction (Top) arrows x2 for proper mounting
7. Mounting screw holes.
8. Gas Type / Low and High Level set points

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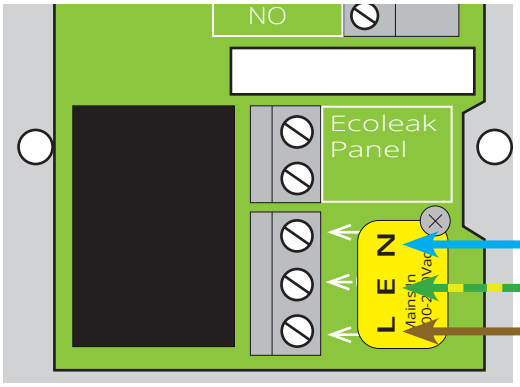
D. POWER CONNECTION

Important. This unit must be earthed. If the protective earth conductor terminal is also used for other bonding purposes, the protective conductor shall be applied first and secured independently of other connections. The protective conductor shall be connected in such a way that it is unlikely to be removed during servicing that does not require disconnection of the protective conductor.

Important. All electrical connections must be made by a suitably qualified technician in accordance with current electrical regulations.

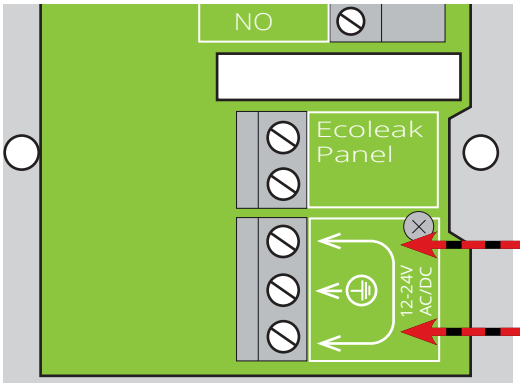
Important. All connections should be made before applying power.

AT-SRG-230



Important. Fuse protection not to exceed 3 Amp, cable not to exceed 1.5mm^2

AT-SRG-12/24



Important. Polarity free connection. **Very Important:** If the volt free relay is controlling 230Vac, the earth terminal shown here must be connected to the incoming earth for correctn earth protection. Metallic Back box and metallic faceplates must also be earthed.

Power should be supplied from a local source that will allow the sensor to be easily isolated if required.

Fuse protection should not exceed 3Amp.

When using a metal faceplate with the AT-SRG, dual ferrules can be used to earth the faceplate in accordance with the IET regulations.

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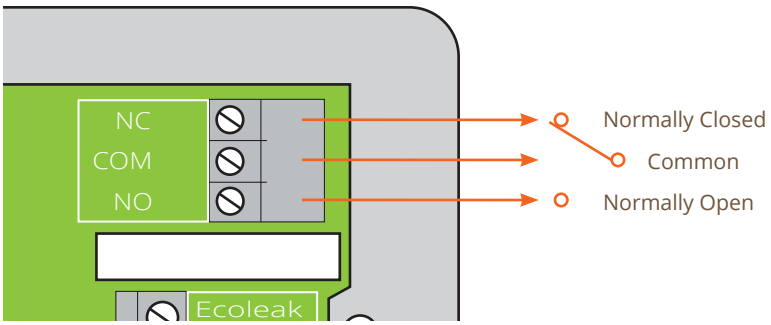
E. RELAY CONNECTION

The AT-SRG has an on-board volt free relay to allow it to be used to control local equipment such as pump down system valves or remote beacons etc.

The relay is SPDT so can be used in normally open or normally closed configurations.

Important. All electrical connections must be made by a suitably qualified technician in accordance with current electrical regulations.



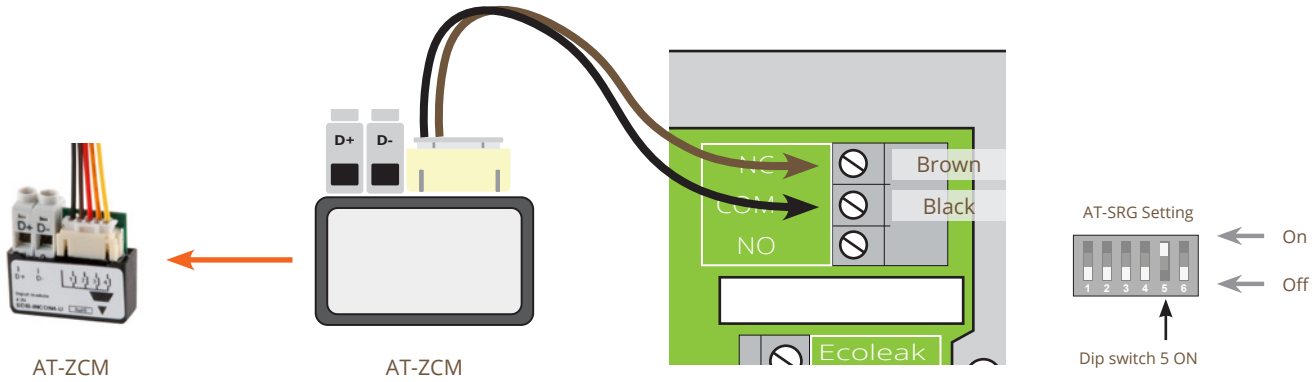
Note: The relay operation can be setup in failsafe by configuring the dipswitch no 5 (see section F).

Important. The relay on the AT-SRG is volt free. No power output is available from it.

Relay rated at Max 3 A at 250Vac/30Vdc

F. CONNECTIVITY

AQUINET FIELD BUS MONITORING SYSTEM CONNECTION



The AN-ZCM brown and black wires should be connected to the C and N/C AT-SRG relay outputs.

Dipswitch 5 should be enabled on the AT-SRG.

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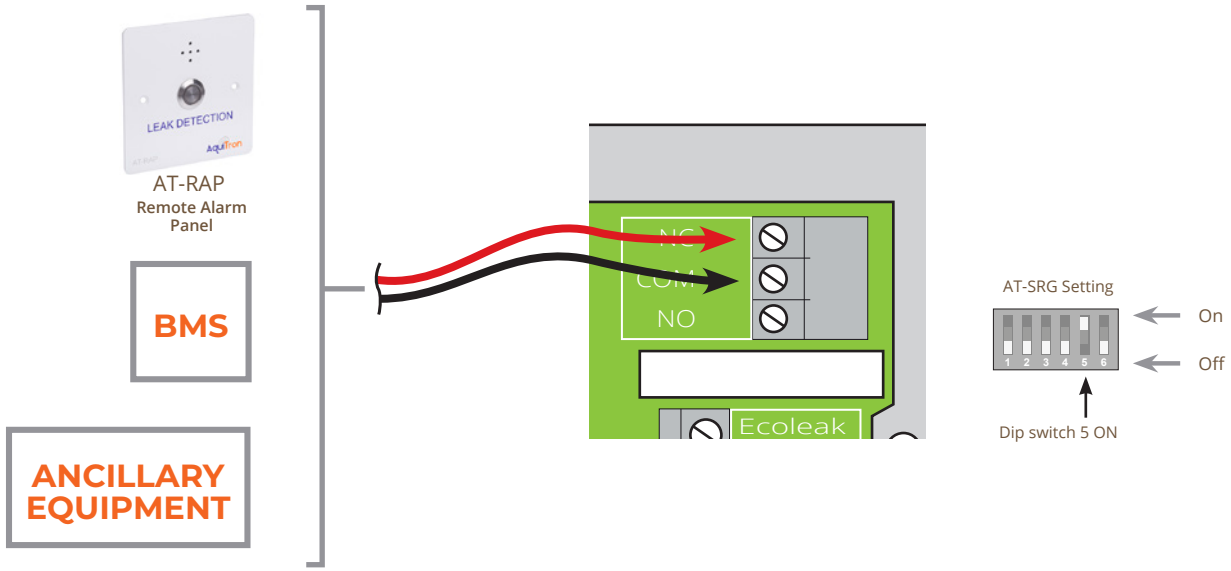
BMS / REMOTE PANEL / ANCILLARY EQUIPMENT CONNECTION

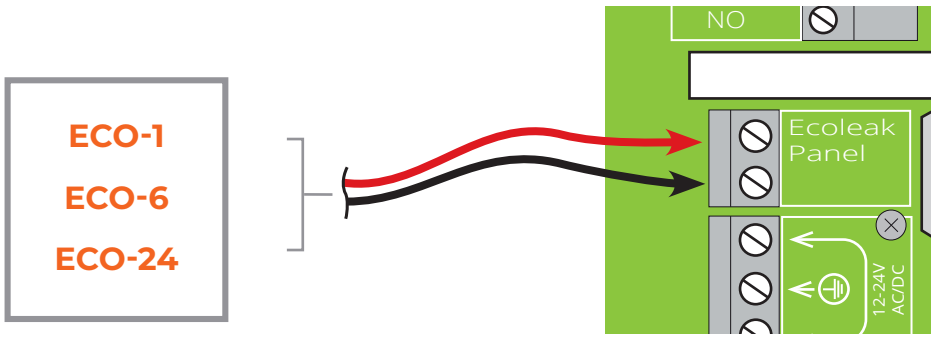


The AT-RAP should be connected across the C and N/C AT-SRG relay outputs.

Dipswitch 5 should be enabled on the AT-SRG.

⚠ **Important note:** The AT-RAP and possible Ancillary equipment used requires a local power supply.

ECOLEAK CENTRAL/REMOTE MONITORING PANEL CONNECTION



The AT-SRG sensor can be directly connected to a zone input on an Eco-Leak alarm panel for central/remote monitoring.

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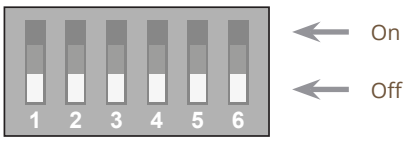
F. OPERATION

DIPSWITCH CONFIGURATION

Important: Configuration should be carried out prior to applying power to the sensor.

If a dipswitch setting is altered the sensor should be reset (see page 9) to ensure the new setting is correctly identified and applied by the sensor.

AT-SRG Dipswitch

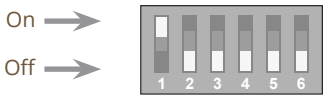


All 6 switches are shown in the OFF position above

Dipswitch switch controls:

1. Sounder Mute
2. Relay Activiation
3. Alarm Delay
4. Alarm Latch
5. Relay Failsafe
6. Extend Mute

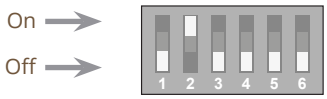
1 - Sounder Mute



Off - Sounder enabled (Default)

On - Sounder Mute active (Sounder disabled)

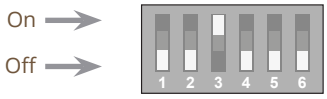
2 - Relay Activiation



Off - Relay operates for both high- and low-level alarms (Default)

On - Relay only operates on high level alarm

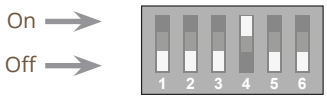
3 - Alarm Delay



Off - Alarm functions are active immediately (Default)

On - Alarm functions (LED, Sounder and relay outputs) are delayed for 5 minutes.

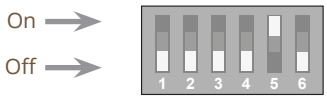
4 - Alarm Latch



Off - Alarm functions reset if gas is no longer detected (Default)

On - Alarm functions stay active until manually reset (Sensor reset button operated)

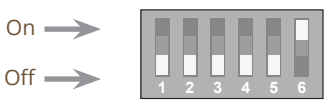
5 - Relay Fail-safe



Off - Relay operates when sensor in alarm outputs are standard as indicated on sensor board.

On - Relay is 'energised' when AT-SRG is powered. It will still operate when sensor in alarm. However outputs are reversed while power is applied and will de-energise to indicate power loss to sensor

6 - Extend Mute



Off - A muted alarm will re-alarm after 30 minutes if gas is still present in the room (Default)

On - A muted alarm re-alarms after 60 minutes if gas is still present in the room.

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LED OPERATION

The sensor has a bi-colour LED to indicate status.

Sensor Operation	LED Indicator	
Startup Mode		Slow flashing green LED - 1Hz
Standby		Solid green LED
Leak Alarm - Low Threshold Level		Red (Slow Flashing) - 0.5 Hz
Leak Alarm - High Threshold Level		Red (Fast Flashing) - 2Hz
Fault Alarm		Red / Green (Fast Flashing) - 1 Hz
No Power to Sensor		LED Off

SOUNDER OPERATION

Sensor Operation	Sounder Operation	
Startup Mode		Single Beep
Leak Alarm - Low Threshold Level		Twin tone, rising, repeated at 1Hz
Leak Alarm - High Threshold Level		Alternating high / low tone 1Hz
Fault Alarm		Single tone repeated 0.5Hz

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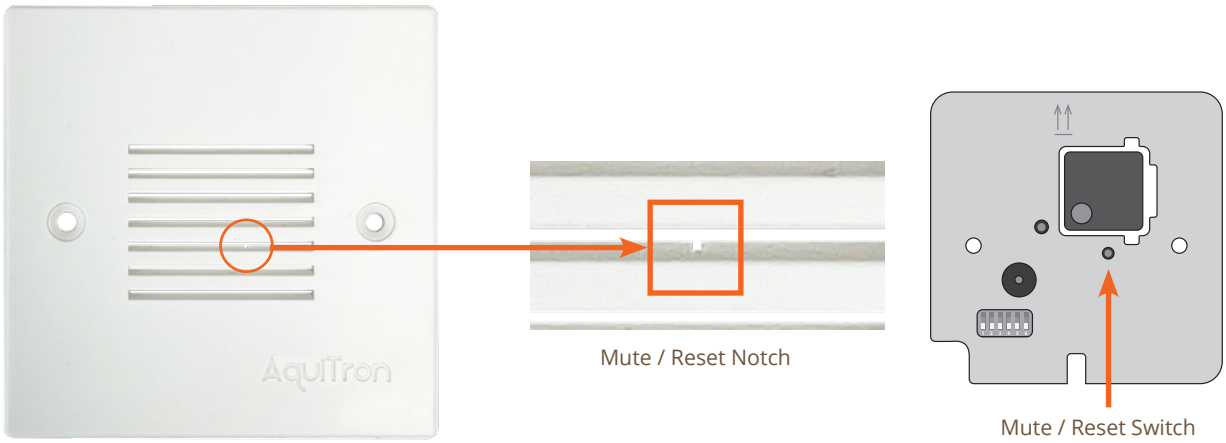
Mute / Reset Sensor



The sensor can be muted or reset by pressing the mute / reset switch. The notch showing on the faceplate align to the Mute / Reset swtch at the back of the faceplate. Use an item like a paper clip to mute or reset the AT-SRG.

The AT-SRG sensor can be reset by holding down the mute button for 10 seconds. This will force the sensor to go back through its start up procedure.

SETUP

Once all connections and configurations are complete the unit can be physically installed in its back box ensuring no cables are trapped or damaged. Power can now be applied.

Each time power is applied the AT-SRG will enter 'start up mode'. During this time the sensor will perform automatic zeroing and calibration functions.

Important. For correct operation it is vital the AT-SRG unit is powered and commissioned in the environment it will be operating within.

Start up mode will complete after 1-2 minutes.

When the LED turns solid green the sensor is ready for use and monitoring for refrigerant gas.

Contact your sensor supplier or Aquilar if the unit goes into fault alarm at this point.

The AT-SRG sensor can be reset by holding down the mute button for 10 seconds. This will force the sensor to go back through its start up procedure.

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G. COMMISSIONING

BUMP TEST

It is important to perform a 'bump test' to ensure correct operation of the alarm system.

Important. Do not use 100% refrigerant or any other 100% gas to attempt to test the sensor. Doing so will invalidate any warranty. Only bump test gas in the target configuration must be used and delivered using the 0.3L/min test gas regulator (available from Aquilar). Bump test gas percentages and PPM/LEL percetnages levels differ for each target gas.

To prevent unwanted escape of sample refrigerant gas the AT-SRG-TA test adaptor hood and hose kit should be used to perform bump tests.

Once sufficient gas has been introduced to the sensor it will go into alarm.

LED and sounder operation should be confirmed.

Relay operation and Eco panel output (if used) should be confirmed.

In default mode the AT-SRG will self-reset as the test gas dissipates unless alarm latching (dipswitch 4) is enabled. If alarm latching function is enabled, then the reset button must be pushed to mute and reset the sensor.

Important. The test gas flow regulator should be shut off between bump tests.

MAINTENANCE

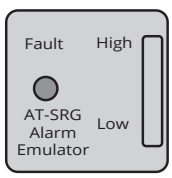
The above bump tests should be carried out as part of planned maintenance. We would recommend annually as a minimum.

Periodic system testing can be performed without test gas by using the AT-SRG-AE alarm emulator kit.

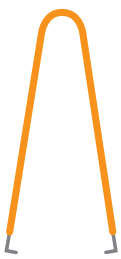
Important. Emulator testing should not replace annual bump testing as does not test the sensor head.

THE AT-SRG-AE ALARM EMULATOR

The AT-SRG-AE consists of two elements, the alarm emulator and the sensor head extractor tool, shown below:



Alarm Emulator



Sensor head extractor tool

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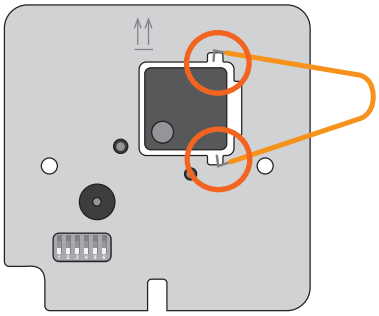
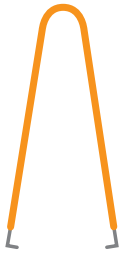
USING THE AT-SRG-AE ALARM EMULATOR

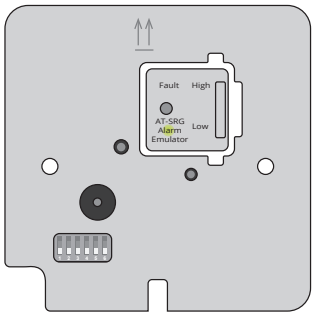
The sensor should be first turned off. Faceplate must then be removed.

Then the AT-SRG sensor head should be removed from the sensor body using the provided using the removal tool in the AT-SRG-AE kit.

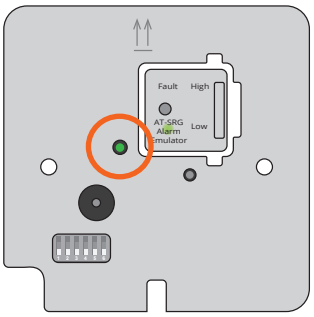


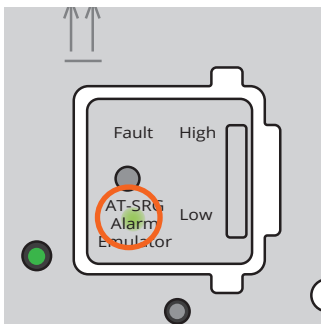


The emulator can then be fitted.



Once power is returned to the sensor , the Emulator's Led will indicate the emulator is ready for use. The main sensor LED should also be solid green before starting using the emulator tool.





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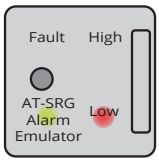
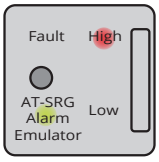
USING THE AT-SRG-AE ALARM EMULATOR CONT.

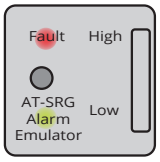
Push the button to scroll through the alarm emulation options available.



Emulator will produce a low level alarm on the sensor.

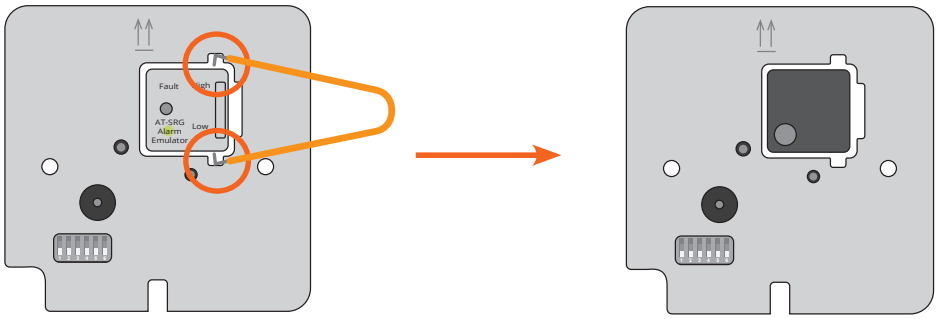


Emulator will produce a high level alarm on the sensor.



Emulator will produce a fault alarm on the sensor.

Once the tests have been carried out the unit should be powered down so the emulator can be removed using the sensor head extractor tool, and the sensor head re-fitted.



Once power is restored the sensor will go through the start up process. Refer to section H for LED Operationd durting startup procedure.

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H. TROUBLE SHOOTING

Problem:
Sensor does not go into alarm when test gas applied

1. **Possible Cause:**
   AT-SRG has no power.
   Action:
   - Check power connections are correctly made.
   - Check power is present at the sensor with a multi-meter.
   - Check supply voltage matches AT-SRG model used.

2. **Possible Cause:**
   Unit is still in start up mode.
   Action:
   Reset unit, wait until the LED goes solid green then retest

3. **Possible Cause:**
   Incorrect sample gas being used.
   Action:
   Check correct refrigerant gas type is being used.

4. **Possible Cause:**
   Alarm delay has been enabled
   Action:
   Turn off dipswitch 3 and reset unit

5. **Possible Cause:**
   Has the unit been setup in the environment it is being used in?
   Action:
   Reset unit to go back into start up mode.

6. **Possible Cause:**
   Test gas is not in date?
   Action:
   Check date on the gas cylinder that statyes whther the gas is still in date.

7. **Possible Cause:**
   Test gas cylinder empty?
   Action:
   Check regulator guage for gas level.

8. **Possible Cause:**
   Test gas not applied to the required duration.
   Action:
   When bump testing leave gas at least up to a minute (until unit alarms).

Problem:
Alarm LED flashes but there is no audible warning

1. **Possible Cause:**
   Mute is enabled
   Action:
   Check dipswitch 1 is not enabled

Problem:
Sensor does not begin start procedure when power is applied

1. **Possible Cause:**
   Not powered correctly
   Action:
   - Check power connections are correctly made.
   - Check power is present at the sensor with a multi-meter.
   - Check supply voltage matches AT-SRG model used.

2. **Possible Cause:**
   Sensor is faulty
   Action:
   Obtain RMA number and return to Aquilar for repair/replacement.

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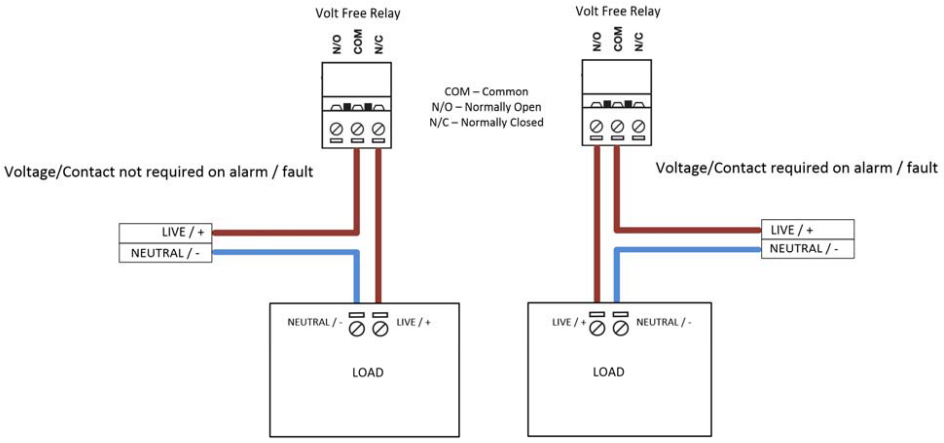
AT-SRG
Sensor for Refrigerant Gas

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.

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