

# AquiTron

## AT-G-ALERT Refrigerant Sensor



**QUICKSTART  
GUIDE**



**aquilar**  
leak detection solutions

# AT-G-ALERT

## Refrigerant Gas Sensor For Occupied Spaces

### OVERVIEW

The AquiTron AT-G-ALERT detects refrigerant leaks in occupied spaces.

The detector is for indoor applications. It is housed in an ABS enclosure that fits into most 47mm depth 2-gang UK electrical back boxes (not included). Thinner metal mounting tabs are provided for flush mounting in UK back boxes with higher mounting tabs.



Figure 1. AT-G-ALERT with examples of available fascia plates.

**i** The AT-G-Alert is designed for use in 2- gang UK back boxes with a minimum depth of 47 mm (1.9").

Gas alarms and status messages are indicated visually by a 3-coloured LED and audibly by a buzzer. In case of an alarm and/or fault, relays switch (for example, shut-off valves or alarm devices).

The refrigerant detector can be calibrated and maintained non-intrusively using a magnetic wand.

### INSTALLATION SPECIFICATION

#### AT-G-ALERT

100 to 240 VAC, 50/60 Hz

#### POWER CONSUMPTION

4 watt

#### WIRING POWER

3-core cable, 14 to 20 AWG (0.5 to 2.0 mm<sup>2</sup>)

#### RELAYS

**Number:** Two

**Type:** SPDT

**Rating:** 1 A at 125 and 250Vac, resistive load.

#### WIRING RELAYS

3-core cable, 18 to 20 AWG (0.5 to 1.0 mm<sup>2</sup>)

#### MODBUS

**Connection:** RS-485 terminal block

**Baud rate:** 9600 or 19200 (selectable)

**Default baud:** 9600

**Start Bits:** 1; **Data Bits:** 8

**Parity:** None (default), odd, even (selectable)

**Stop Bits:** 1 (default) or 2 (selectable)

**Retry Time:** 500 ms (min) between retries

**End of Msg:** Silent 3.5 characters

#### WIRING MODBUS

2-core twisted, shielded pair 18 to 24 AWG 7 (0.2 to 1 mm<sup>2</sup>) with 120  $\Omega$  characteristic impedance; Use Belden 8761 or similar; Maximum diameter of cable + heat shrink 8 must be  $\leq 5$  mm (0.2 in)

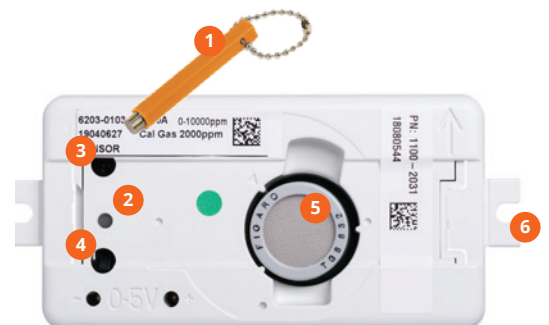


Figure 2. AT-G-ALERT components overview.

1. Magnetic wand
2. 3-colour status LED
3. Magnetic Switch 1 (● on top)
4. Magnetic Switch 2 (●● on bottom)
5. Sensor Module
6. Plastic Mounting Tabs

### MOUNTING CONSIDERATIONS

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

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

**APPLICATION CONSIDERATIONS:** The specifics of the application (for example, possible leaks, air movement/draft, etc.) must be observed.

**ACCESSIBILITY CONSIDERATIONS:** The degree of accessibility required for maintenance purposes must be granted.

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



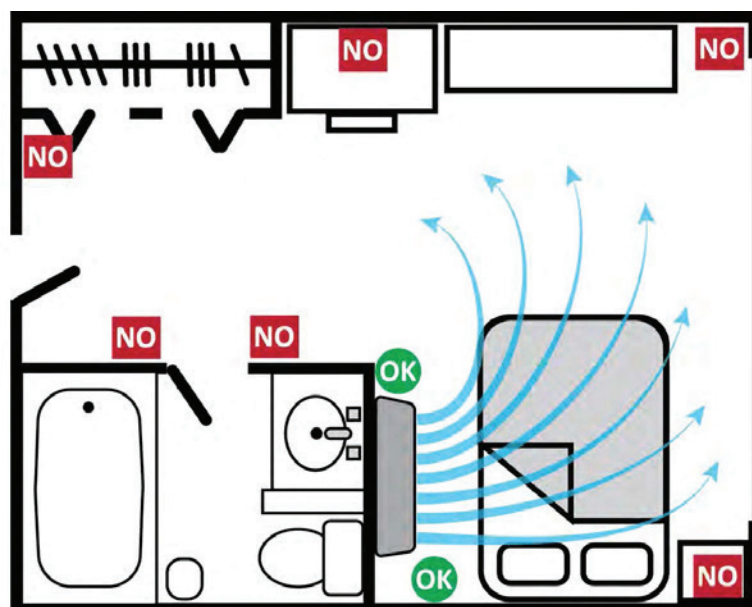


Figure 3. AT-G-ALERT Proper vs. Improper Placement.

Mount the AT-G-ALERT according to the above considerations, product dimensions, and maximum wiring lengths.

## SAFETY INSTRUCTIONS

**CODE COMPLIANCE:** Comply with all local and national laws, rules, wiring codes, and regulations associated with this equipment.

**TECHNICIAN USE ONLY:** This unit must be installed by a suitably qualified technician who will install this unit in accordance with these instructions and the standards in his particular industry/country. Operators of the unit should be aware of the regulations and standards in their industry/country for the operation of this unit. These notes are only intended as a guide and the manufacturer bears no responsibility for the installation or operation of this unit.

Failure to install and operate the unit in accordance with these instructions and with industry guidelines may cause serious injury including death and the manufacturer will not be held responsible in this regard.

**SAFE MOUNTING:** This detector must be connected by a marked, suitably located and easily reached switch or circuit-breaker as means of disconnection.

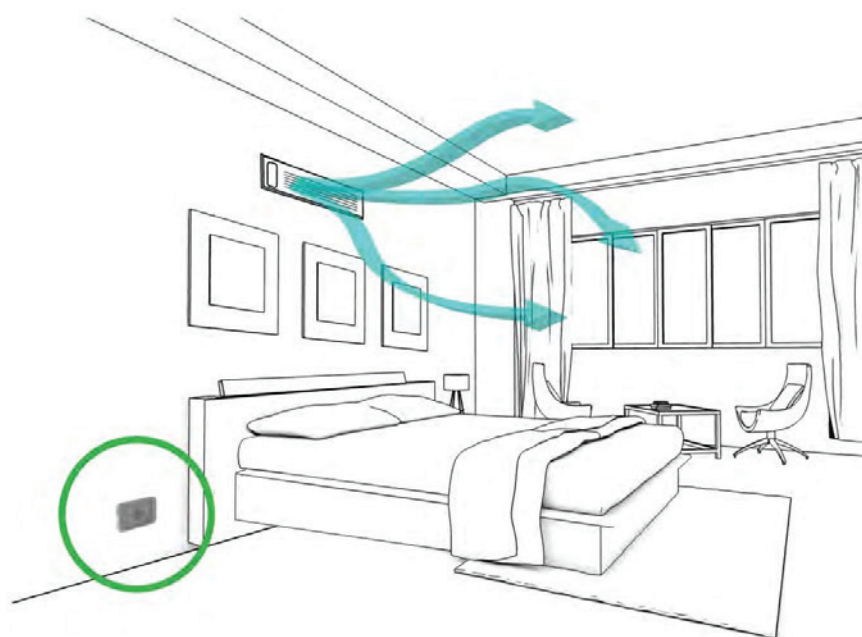


Figure 4. Typical AT-G-ALERT Installation in an Occupied Space Application

**CAUTION:** DO NOT MOUNT the AT-G-ALERT in an area that may contain flammable liquids or vapours. Operation of electrical equipment in such an area constitutes a safety hazard.

**CAUTION:** Mounting in ceiling voids in a hotel room would not strictly comply with EN378.

**CAUTION:** RS-485 signal cable must be insulated to the highest voltage level in the system. Protect the RS-485 signal cable by using the supplied installation kit.

**IMPORTANT** Mount at a height between 100 and 150 mm (4 and 6 inches) off the floor. Avoid drafts and heat sources (like radiators), and avoid sources of steam.

## CONFIGURATION

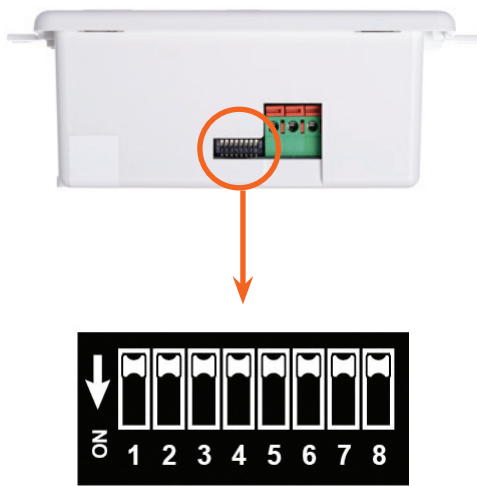


Figure 5. Switches for Configuring the AT-G-Alert

### PIN 1 - RESTART

**Off:** Normal Operation (Default)  
**On:** Restart AT-G-ALERT

### PIN 2,3 - ALARM ON DELAY

**Off,Off:** No Delay (Default)  
**Off,On:** 5 minute Delay  
**On,Off:** 10 minute Delay  
**On,On:** 15 minute Delay

### PIN 4 - FAILSAFE

**Off:** Normal relay Operation (Default)  
**On:** Failsafe relay operation

### PIN 5 - RELAY 2 FAULT INDICATION

**Off:** High alarm or fault (Default)  
**On:** High alarm only

### PIN 6 - ALARM LATCHING

**Off:** Alarms automatically reset (Default)  
**On:** Alarms latch and require manual reset

### PIN 7 - BUZZER DISABLE

**Off:** Buzzer enabled (Default)  
**On:** Buzzer Disabled

### PIN 8 - ENABLE RESET TO FACTORY DEFAULTS

**Off:** Normal Operation (Default)  
**On:** Reset enabled (see manual for details)

## INSTALLATION



Figure 6. Wiring Power & Modbus

**Note:** Before installing the AT-G-ALERT, refer to the calibration gas concentration label and record the value for use in step 16 of the calibration procedure.

When inserting the wire into the terminal, release the spring clamp by pushing back the release latch.

**Caution:** Ensure all wiring connections are made before applying power.

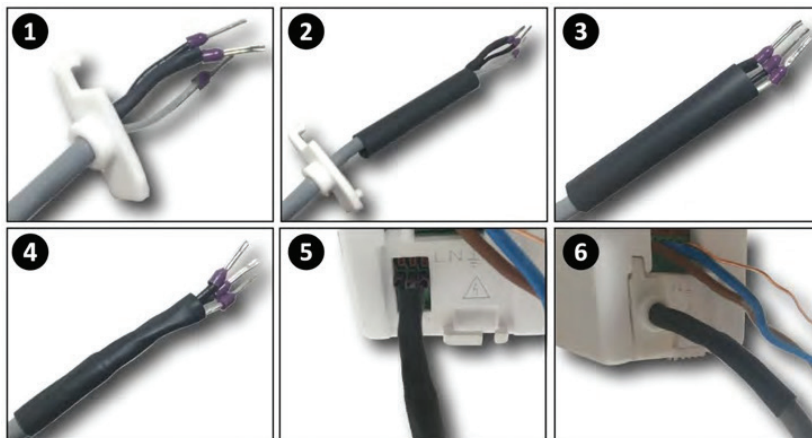


Figure 7. Details for Connecting Modbus Communications Wiring



Figure 8. Wiring Relay 1 (Low Gas Alarm) and Relay 2 (High Gas Alarm or Fault)

**SHIELD WIRE WARNING:** Connect the shield of Modbus wires to the earth ground of the central control system (e.g., chassis, ground bus bar, etc.).

**GROUND:** If a metal plate is used please make sure that this plate is grounded to earth.



Figure 9. AT-G-ALERT Components



1. Example of a custom faceplate
2. Example of a UK back box
3. Mounting tabs
4. Direction arrows (x2) for proper mounting.
5. Sensor type / calibration and ID/ serial number labels
6. Test point access holes (x2)
7. Replaceable sensor module
8. Sensor alignment ribs (x3)

**Note:** For UK back boxes with “higher” mounting tabs, remove the thick plastic mounting tabs from the detector (using wire snips or nippers) and screw on the thinner metal mounting tabs (included) to ensure flush wall mounting of the faceplate. Be sure to dry fit the plastic tabs before cutting them from the detector to verify that they are too thick for proper flush mounting of the faceplate to the wall.

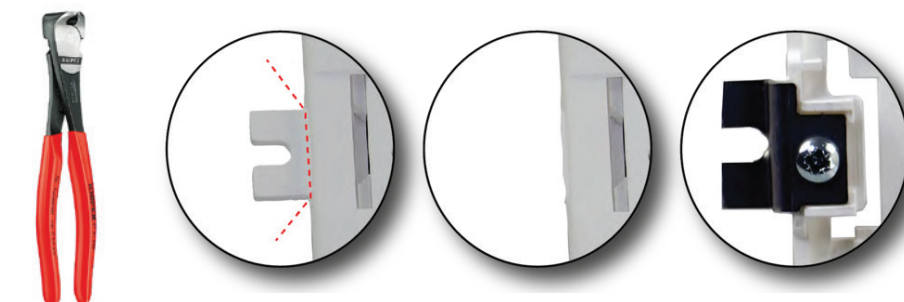
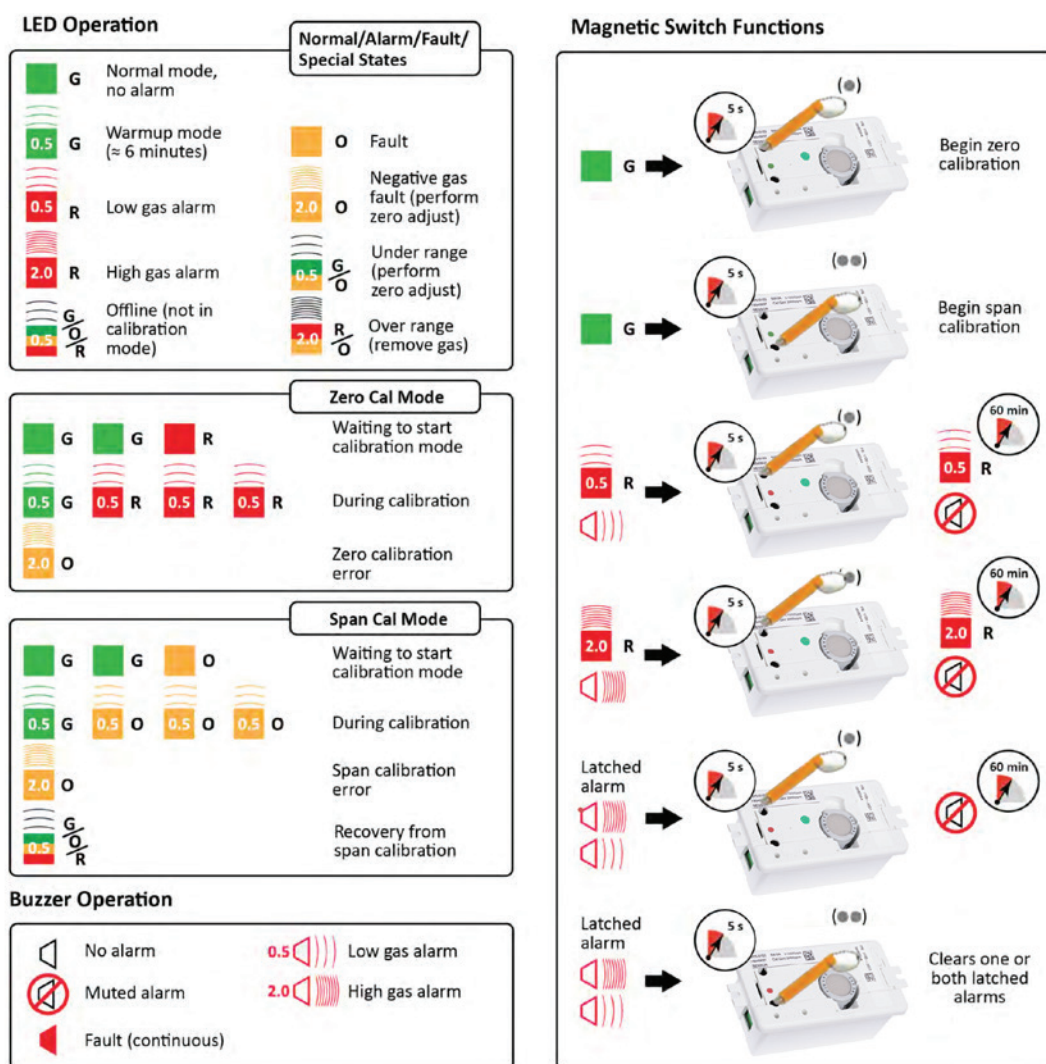


Figure 10. AT-G-ALERT Retrofit of Thinner Metal Mounting Tabs

## OPERATION OVERVIEW



2.0 0.5 2.0 = 2.0 Hz  
FAST flash & chirp

0.5 0.5 0.5 = 0.5 Hz  
SLOW flash & chirp

G Green  
O Orange  
R Red

LED Color



## GENERAL CALIBRATION PROCEDURE

1. Verify that the detector is NOT in alarm and does not have a fault condition (i.e., it must not have a continuous orange LED).
2. Verify that the calibration gas is in a balance of air, not Nitrogen (N<sub>2</sub>).
3. Fit testing hood to the fascia plate (7) or base plate (6) (see below).
4. Ensure switch 8 is OFF. The buzzer will be OFF and the LED will be OFF.
5. Connect the tubing to the barbed fittings of the pressure regulator and testing hood.
6. Verify that gas flow is approximately 0.3 to 1.0 L/min.
7. If operation is intended to be at higher altitudes, the factory calibration will result in a reading lower than the reading at sea level (reduced partial pressure). A new span adjustment is recommended if the altitude or the ambient pressure is changed. The factory calibration is set to sea level.
8. Always perform a zero adjustment before a span adjustment.

**Warning:** Ambient air can be used to zero the sensor instead of synthetic air only if the area is known to be free of the target gas or any gas to which the sensor may be cross-sensitive. In this case, no cylinder or testing hood is needed for the zero adjustment.



Figure 11. Details for Connecting Modbus Communications Wiring

### Zero Adjustment ( ... continued for General Procedure)

9. Tap and hold (•) for more than 5 seconds. The LED will blink green-green-red to indicate the detector is ready. Verify that the calibration gas is in a balance of air, not Nitrogen (N<sub>2</sub>).
10. Apply synthetic air (or use ambient air per the warning above). Set switch 8 to OFF. The buzzer will be OFF and the LED will be OFF.
11. Tap (•) within 30 seconds to confirm start of calibration. Otherwise the detector will time-out and return to normal operation.
12. As the process progresses, the LED will blink green-red, green-red-red, green-red-red-red, etc.
  - To abort calibration, tap and hold (•) for >5 seconds, turn off gas flow and remove the testing hood. The detector will return to normal operation.
  - If calibration is successful (green LED), skip to step 15.
  - If calibration is unsuccessful (orange LED blinks @ 2 Hz), then tap (•) to discard the
13. Turn off gas flow from synthetic air
14. Replace synthetic air tank with calibration gas tank in preparation for span adjustment.

### Span Adjustment

15. Tap and hold (••) for >5 seconds. The LED will blink green-green-orange when the detector is ready.
16. Apply span gas in the concentration listed on the cal gas concentration label (beneath the detector's cover plate). This may require the temporary removal of the bezel and cover plate to see the label.
17. Tap (••) within 30 seconds to confirm initiation of the calibration. Otherwise the detector will time-out and return to normal operation. Turn off gas flow from synthetic air
18. As the calibration process progresses, the LED will blink green-orange, green-orange-orange, green-orange-orange-orange, etc.
  - To abort calibration, tap and hold (••) for >5 seconds, turn off gas flow and remove the testing hood. The detector will return to normal operation.
  - If calibration is successful, the LED will blink green-orange-red indicating 'offline'. Turn off gas flow and remove the testing hood. After 6 minutes the detector will return to normal operation.
  - If calibration is unsuccessful (orange LED blinks @ 2 Hz), then tap (••) to discard the calibration attempt, and see Section 5.3 on page 21 on the user manual for troubleshooting. Turn off gas flow and remove the testing hood. After 6 minutes the detector will return to normal operation.

### Bump Test

1. Inform building personnel of test so that certain alarms may be inhibited (e.g. shutdown valves, notification of authorities, etc.).
2. Connect adapter and target gas according to instructions in General calibration procedure
3. Apply a sufficiently high concentration of target gas to trigger alarms, but not pure refrigerant or hydrocarbons (e.g., do not use a butane lighter), as this might damage the sensor.
4. Once the alarm thresholds are exceeded, all designated gas alarm relays will be activated and the digital outputs will transmit the corresponding gas concentrations.
5. Turn off gas flow and remove testing hood.



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