AquiTron

AT-GU
Commercial Refrigerant Sensor

DATA SHEET

aquilar
leak detection solutions

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AT-GU
Gas Sensing System

CONTENTS

AT-GU

Commercial Refrigerant Sensor

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.

1.1. GENERAL INFORMATION

The AT-GU is a state-of-the-art fixed gas detector which can detect a wide range of different gases. The gas sensors can be used on a stand- alone basis or integrated into Controls or Building Management Systems (BMS).

The AT-GU can be used:

- in new buildings/areas that require continuous monitoring with high tech gas sensor transmitters.
- to add gas detection solutions to an existing system.

Typical detection applications include the detection of:

- refrigerant gases
- combustible gases
- toxic gases and/or volatile organic compounds.

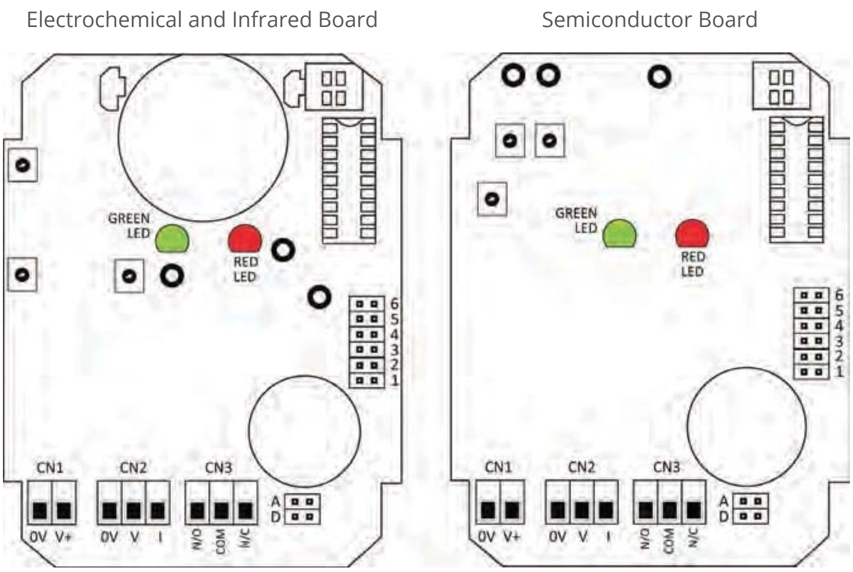

Figure 1. AT-GU Sensor Board (EC, IR, and SC)

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1.2.TECHNICALSPECIFICATIONS

POWER SUPPLY

12-24 VDC, 12-24 VAC 50/60 Hz, 2 W max.

Power consumption (12V): 60mA (EC), 153mA (SC), 136mA (IR)

MONITORING LEDS

Power: Green LED
Akarm: Red LED

AUDIBLE ALARM

Buzzer: enable / disable

ANALOG AUTPUT

4-20 mA; 0-5 V; 0-10 V; 1-5 V; 2-10 V

RELAY OUTPUTS

1 relay rated 1 A @ 24 VAC/VDC; Delay: 0, 1, 5, or 10 minutes

IP RATING

IP41 (standard); IP66 (optional)

HUMIDITY RATING

0-95% non-condensing

APPROVALS

CE; UL/CSA/IEC/EN 61010-1; EN 55011

Temperature Rating	Sensor	IP41 Housing	IP66 Housing
	IRand SC (all)	-4° to 122° F (-20° to 50° C)	-40° to 122° F (-40° to 50° C)
	EC (all but NH3)	-4° to 104° F (-20° to 40° C)	-4° to 104° F (-20° to 40° C)
	EC (NH3)	-4° to 104° F (-20° to 40° C)	-40° to 104° F (-40° to 40° C)

Dimensions/ Weights per Enclosure Type (see Note below)	Housing	Dimensions	Weight
	IP41 (standard)	3.35” x 5.59” x 2.09” 86 x 142 x 53 mm	6.3 oz 180 g
	IP66 (optional	6.89” x 6.5” x 3.29” 175 x 165 x 82 mm	1 lb 6 oz 629 g
	w/ Splash Gua rd	6.89” x 8.9” x 3.29” 175 x 225 x 82 mm	1 lb 9 oz 700 g
	w/ Remote Sensor	6.89” x 6.1” x 3.29” 175 x 155 x 82 mm	1 lb 11 oz 790 g
	w/ Exd Sensor Head	6.89” x 6.1” x 3.29” 175 x 155 x 82 mm	2 lb 10 oz 1185 g
	w/PRV Sensor Head	6.89” x 6.1” x 3.29” 175 x 155 x 82 mm	2 lb 0.3 oz 916 g
	w/ Ai rfl ow/Duct	6.89” x 4.9” x 3.29” 175 x 125 x 82 mm	1 lb 4 oz 578 g
	Exd (ATEX only)	5.51” x 7.09” x 3.54” 140 x 180 x 90 mm	4 lb 15 oz 2234 g

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NOTE: Enclosures listed above are for all models / configurations except IR Halogen, which use the standard IP41 enclosure with a different temperature rating.

NOTE: The hazardous area **EXd Gas Monitor** products are designed with individually certified EXd main housing enclosures and certified EXD remote or attached sensor enclosures. The main housing enclosure and its PCB assembly are also EXd certified, but the final **EXd Gas Monitor** assemblies (main enclosure and/or sensor assembly) are not currently E XD certified, but are pending additional testing.

NOTE: For detection of R449A or R450A, the maximum linear range of 500 ppm equals 50% of the range of the analog output (e.g., 500 ppm = 12 mA, when using 4-20mA output). Data above this range should be discarded as invalid. The alarm set point must not be adjusted higher than 500 ppm.

Units	**Duct Sizes**				
Inches	12 x 12	12 x 24	18 x 18	24 x 24	24 round
Feet	1 x 1	1 x 2	1.5 x 1.5	2 x 2	Pi x 1 x 1
Area (ft^2)	1	2	2.25	4	3.14
CFM	**Ft/min (Based on CFM and Duct Size)**				
2800	2800	n/a	n/a	n/a	n/a
3000	3000	n/a	n/a	n/a	n/a
3400	3400	n/a	n/a	n/a	n/a
3800	3800	n/a	n/a	n/a	n/a
4000	4000	n/a	n/a	n/a	n/a
4400	4400	n/a	n/a	n/a	n/a
4800	4800	n/a	n/a	n/a	n/a
5000	5000	2500	n/a	n/a	n/a
5400	5400	2700	n/a	n/a	n/a
5800	5800	2900	2578	n/a	n/a
6000	6000	3000	2667	n/a	n/a
6400	6400	3200	2844	n/a	n/a
6800	6800	3400	3022	n/a	n/a
7000	7000	3500	3111	n/a	n/a
7400	7400	3700	3289	n/a	n/a
7800	7800	3900	3467	n/a	n/a
8000	8000	4000	3556	n/a	2548
8400	8400	4200	3733	n/a	2675
8800	8800	4400	3911	n/a	2803
9000	9000	4500	4000	n/a	2868

9400	9400	4700	4178	n/a	2994
9800	9800	4900	4356	n/a	3121
10000	10000	5000	4444	2500	3185

SECTION 2. INSTALLATION AND WIRING

WARNING: Explosion hazard do not mount the AT-GU in an area that may contain flammable liquids, vapors, or aerosols. Operation of any electrical equipment in such an environment constitutes a safety hazard.

CAUTION: The AT-GU contains sensitive electronic components that can be easily damaged. Do not touch nor disturb any of these components.

CAUTION: For AC-powered configurations, ensure that the AC neutral supply line is not used as the ground reference for the analog outputs.

NOTE: The mounting location of the monitor should allow it to be easily accessible for visual monitoring and servicing.

NOTE: The monitor must be connected by a marked, suitably located and easily reached switch or circuit-breaker as means of disconnection.

NOTE: Connect monitor power and signaling terminals using wiring that complies with local electrical codes or regulations for the intended application.

NOTE: This instrument can be equipped with a semiconductor sensor for the detection of refrigerant, combustible and VOC gases. Semiconductor sensors are not gas specific and respond to a variety of other gases including propane exhaust, cleaners, and solvents. Changes in temperature and humidity may also affect the sensor's performance.

2.1 GENERAL PLACEMENT GUIDELINES

NOTE: The AT-GU should be installed plumb and level and securely fastened to a rigid mounting surface.

Sensors must be located within the appropriate wire lengths from the central control unit (if used). In all cases the sensor supplied is designed for maximum sensitivity to a particular gas. However, in certain circumstances false al arms m ay be caused by the occasional presence of sufficiently high concentrations of other gaseous impurities. Examples of situations where such abnormalities may arise include the following:

- Plant room maintenance activity involving solvent or paint fumes or refrigerant leaks
- Accidental gas migration in fruit ripening/storage facilities (bananas - ethylene, apples - carbon di oxide).
- Heavy localized exhaust fumes (carbon monoxide, di oxide, propane) from engine-driven forklifts in confined spaces or close to sensors.

Aquilar recommends setting the alarm delay to minimize false alarms.

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2.2 COMPONENTS AND ACCESS OVERVIEW

NOTE: The wiring is the same for the electro-chemical, semi-conductor, and infrared models. The controller wiring is the same for all controllers.

There is a 5-minute power-up delay to allow the sensor to stabilize. Refer to Figure 2 and Figure 3 for internal components and wiring.

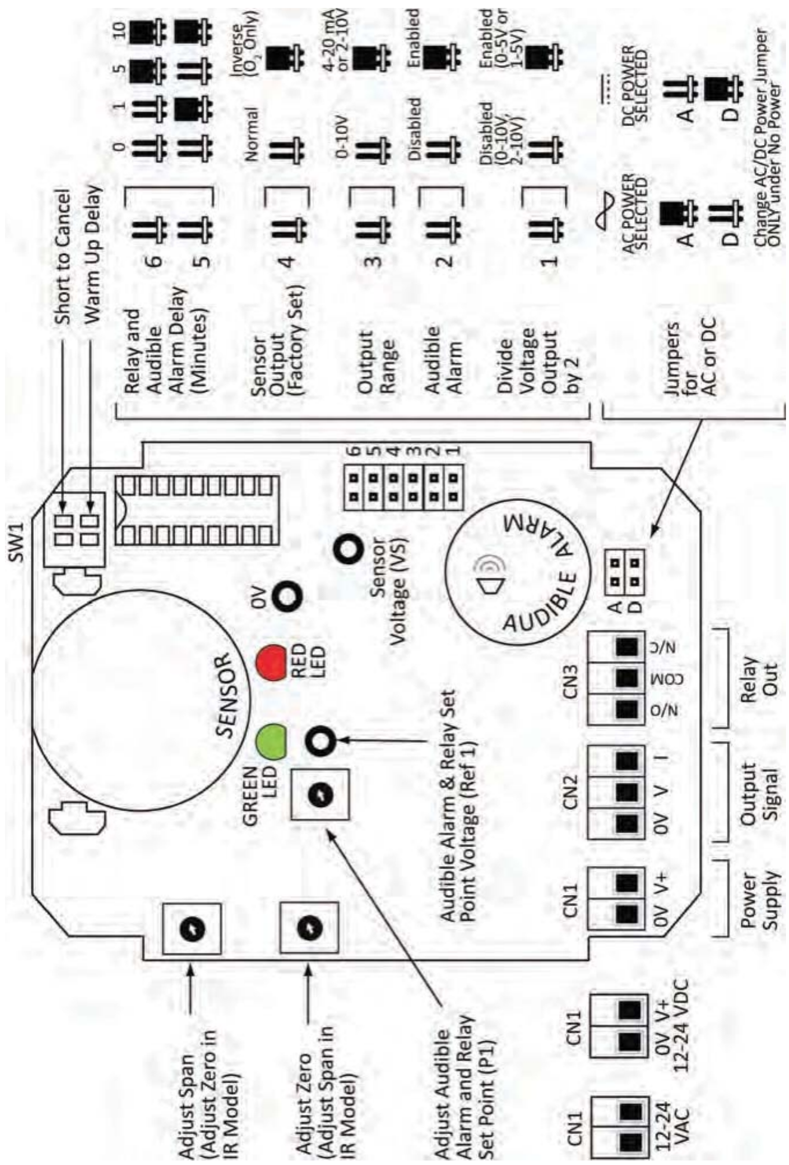

Figure 2. EC or IR Sensor Components and Wiring

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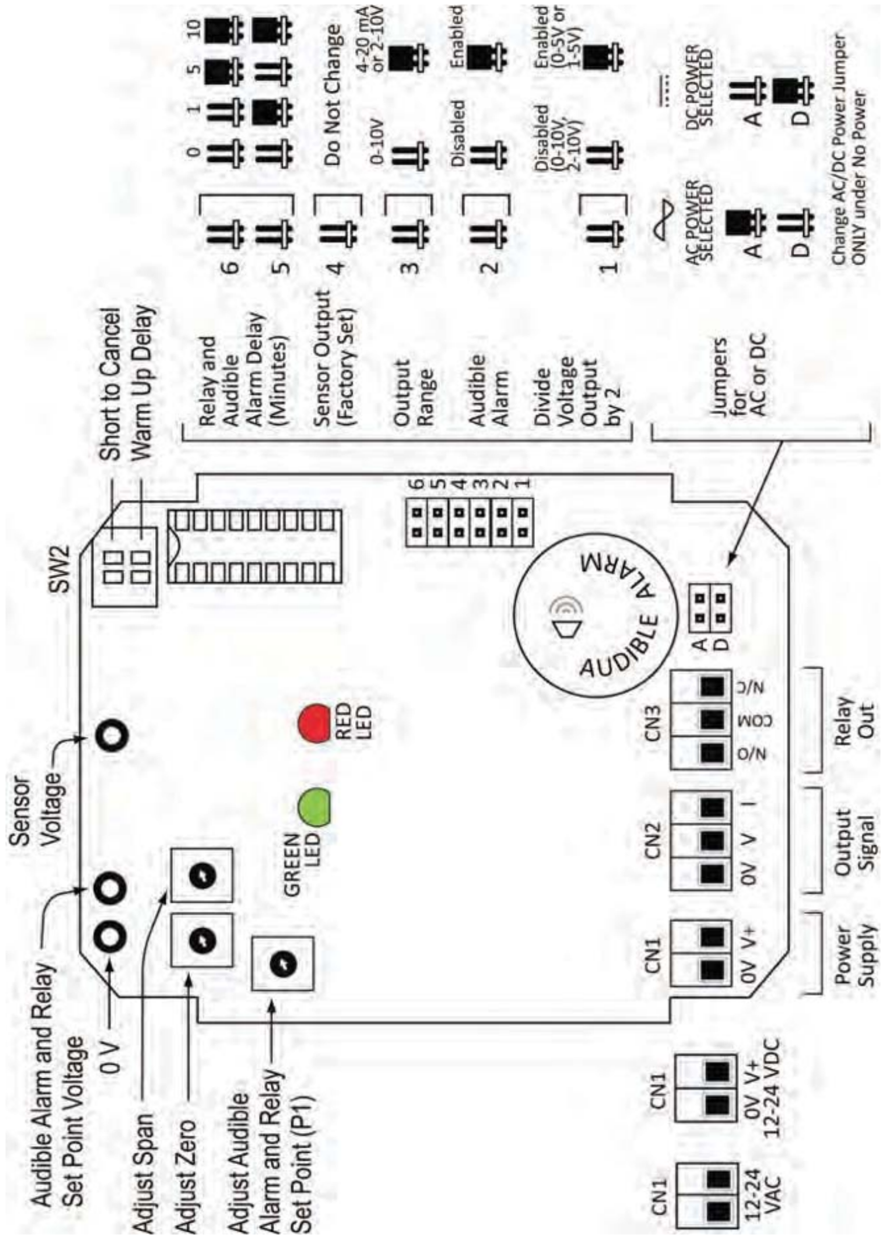

Figure 3. SC Sensor Components and Wiring

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Enclosure Access	To open the standard sensor enclosure, turn the cable clamp 1/2 turn counter-clockwise to loosen the internal gland nut, depress the clip on top of the enclosure and open. Reverse to close. (Note: For the IP66 enclosure, use the four bolts on the front cover.)
Power	12-24V AC/ DC, connect at positions 0V and +V at connector block CN1. • For AC: Jumper A is on, D is off. (See Figure 2 and Figure 3. • For DC: Jumper A is off, D is on. (Default factory setting is DC.) Use 2 wires, typically 18 AWG (minimum).
Output	Connect two wires to terminal block CN2 positions 0V and V or I for voltage or current, respectively. • Connect 4-20mA at CN2 positions 0V and I • Connect volt age output at CN2 positions 0V and V
Relay Set Point	P1 sets the trip point for the relay and audible alarm using the 0- 5V scale (measure at test points 0V and alarm test point TP1). Default factory setting is 50% of the range.
Time Delay	A time delay for the operation of the relay and audible alarm can be selected using jumpers JP5 and JP 6. Default factory setting is zero.
Audible Alarm	The audible alarm can be disabl ed using jumper JP 3. Default factory setting is enabled.

CAUTION: For AC-powered configurations, ensure that the AC neutral supply line is not used as the ground reference for the analog outputs.

2.3 MACHINERY ROOMS

There is no absolute rule in determining the number of sensors and their locations. However, a number of simple guidelines will help to make a decision. Sensors monitor a point as opposed to an area. If the gas leak does not reach the sensor then no alarm will be triggered. Therefore, it is extremely important to carefully select the sensor location. Also consider ease of access for maintenance.

The size and nature of the site will help to decide which method is the most appropriate to use. Locations requiring the most protection in a machinery or plant room would be around compressors, pressurized storage vessels, refrigerant cylinders or storage rooms or pipelines. The most common leak sources are valves, gauges, flanges, joints (brazed or mechanical), filling or draining connections, etc.

- When mechanical or natural ventilation is present, mount a sensor in the airflow.
- In machinery rooms where there is no discernible or strong airflow then options are:

  Point Detection, where sensors are located as near as possible to the most likely sources of leakage, such as the compressor, expansion valves, mechanical joints or cable duct trenches.

  Perimeter Detection, where sensors completely surround the area or equipment.
- For **heavier-than-air** gases such as halocarbon and hydrocarbon refrigerants such as R404A, propane, and butane sensors should be located near ground level.
- For **lighter-than-air** gas (e.g., ammonia), the sensor needs to be located above the equipment to be monitored on

a bracket or high on a wall within 12 in (300 mm) of (or on) the ceiling – provided there is no possibility of a thermal layer trapped under the ceiling preventing gas from reaching the sensor. **NOTE:** At very low temperatures (e.g., refrigerated cold store), ammonia gas becomes heavier than air.

- With similar density or miscible gases, such as CO or CO2, sensors should be mounted about head high (about 5 feet [1.5 m]).
- Sensors should be positioned just far enough back from any high-pressure parts to allow gas clouds to form and be detected. Otherwise, a gas leak might pass by in a high-speed jet and not be detected by the sensor.
- Make sure that pits, stairwells and trenches are monitored since they may fill with stagnant pockets of gas.
- If a pressure relief vent (PRV) pipe is fitted to the system, it may be a requirement to mount a sensor to monitor this vent pipe. It could be positioned about 6.5 ft (2 m) above the PRV to allow gas clouds to form.
- For racks or chillers pre-fitted with refrigerant sensors, these should be mounted so as to monitor the compressors. If extract ducts are fitted the airflow in the duct may be monitored.

2.4 REFRIGERATED SPACES

In refrigerated spaces sensors should be located in the return airflow to the evaporators on a sidewall, below head height preferred, or on the ceiling, not directly in front of an evaporator. In large rooms with multiple evaporators, sensors should be mounted on the central line between 2 adjacent evaporators, as turbulence will result in airflows mixing.

2.5 CHILLERS

In the case of small water or air-cooled enclosed chiller units mount the sensor so as to monitor airflow to the extract fans. With larger models also place a sensor inside the enclosure under or adjacent to the compressors.

In the case of outdoor units:

- Such as enclosed air-cooled chillers or the outdoor unit for VRV/VRF systems mount the sensors so as to monitor airflow to the extract fan. With large units also place a sensor inside the enclosure under or adjacent to the compressors.

In the case of non-enclosed outdoor units:

- If there is an enclosed machinery section then locate a sensor there.
- In the case of the units with enclosed compressors, mount sensors in the enclosures.
- Where you have protective or acoustic panels mount the sensors low down under the compressors where it is protected by the panels.
- With air-cooled chillers or air-cooled condensers with non-enclosed condenser sections it is difficult to effectively monitor leaks in the coil sections. With some designs it will be possible using an airflow sensor to monitor airflow to the start-up fansin the front or rear sections.
- If there is a possibility of refrigerant leaks into a duct or air-handling unit, install a sensor to monitor the airflow.

Weatherproof sensors should be used for unprotected outdoor applications.

2.6 AIR CONDITIONING – DIRECT SYSTEMS VRV/VRF

EN378 states that detectors to ensure safety have their sensors located in such positions that they monitor the concentration at heights of the occupants of a human occupied space taking into account the characteristics of the refrigerant used e.g. at less than bed height with heavier than air gases in a hotel room. It also states that ceiling voids are regarded as part of the human occupied space.

Monitoring ceiling voids in a hotel room would not strictly comply with EN378.

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DOs

- Mount the in-room sensor at less than the normal heights of the occupants e.g. in a hotel room this is less than bed height – between 200-500mm off the floor.
- Keep away from draughts and heat sources like radiators etc.
- Avoid sources of steam.

DON'Ts

- Do not mount sensors under mirrors, at vanity units or in or near bathrooms.

IMPORTANT: Carefully consider ramifications of using too few sensors. A few extra sensors could make a significant difference if a gas leak occurs.

SECTION 3. HOUSING DIMENSIONS

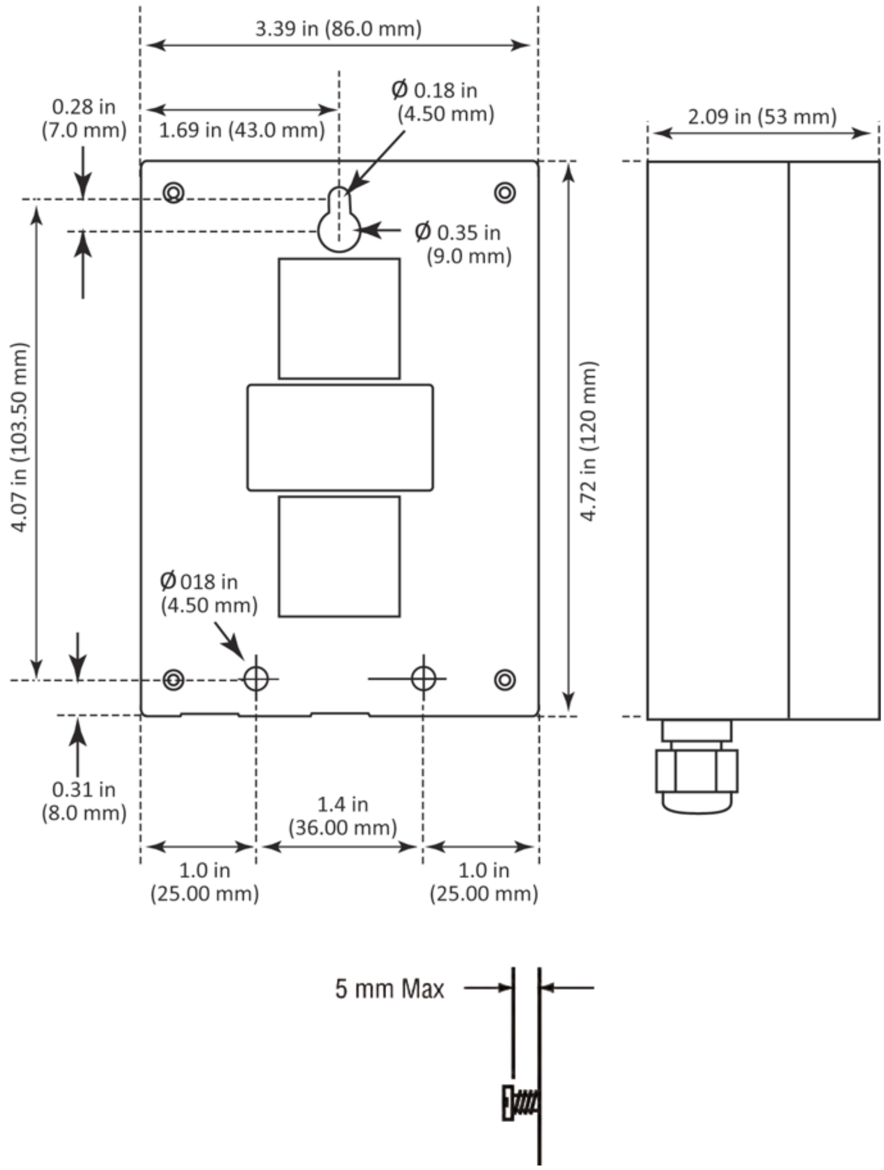

Figure 4. AT-GU Standard Housing

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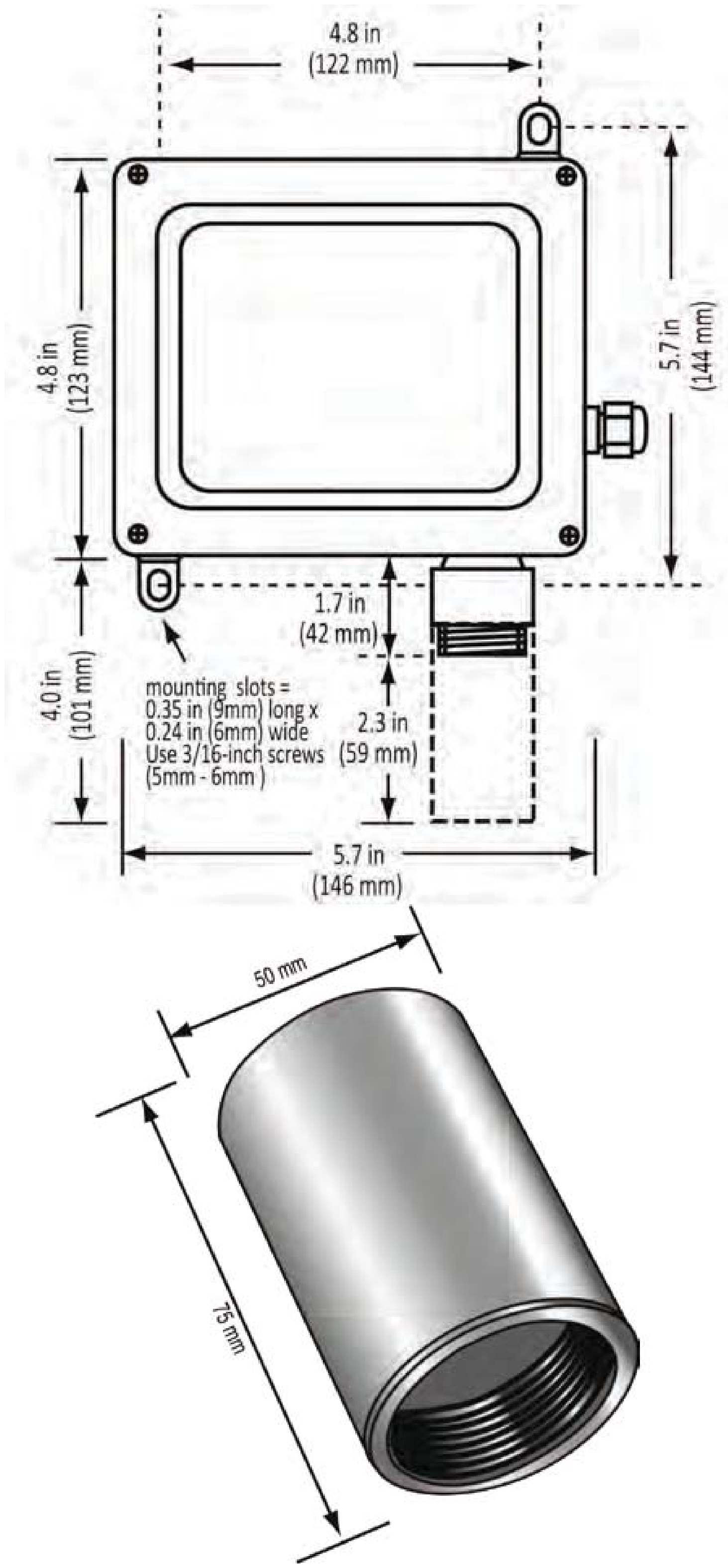

Figure 5. IP66 Housing with Splashguard

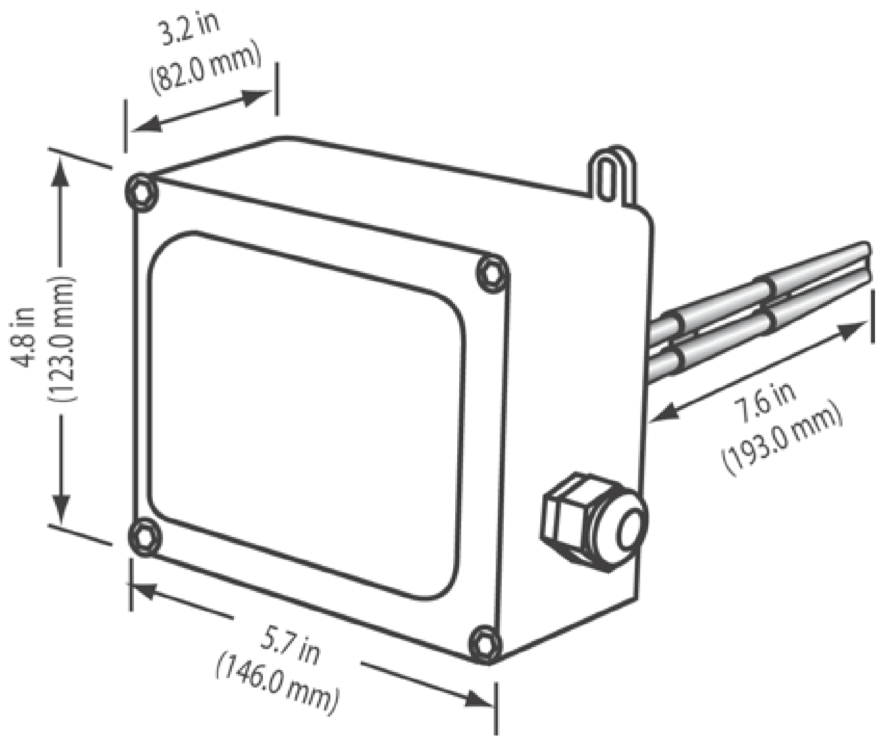

Figure 6. IP66 Airflow Duct Mount Housing

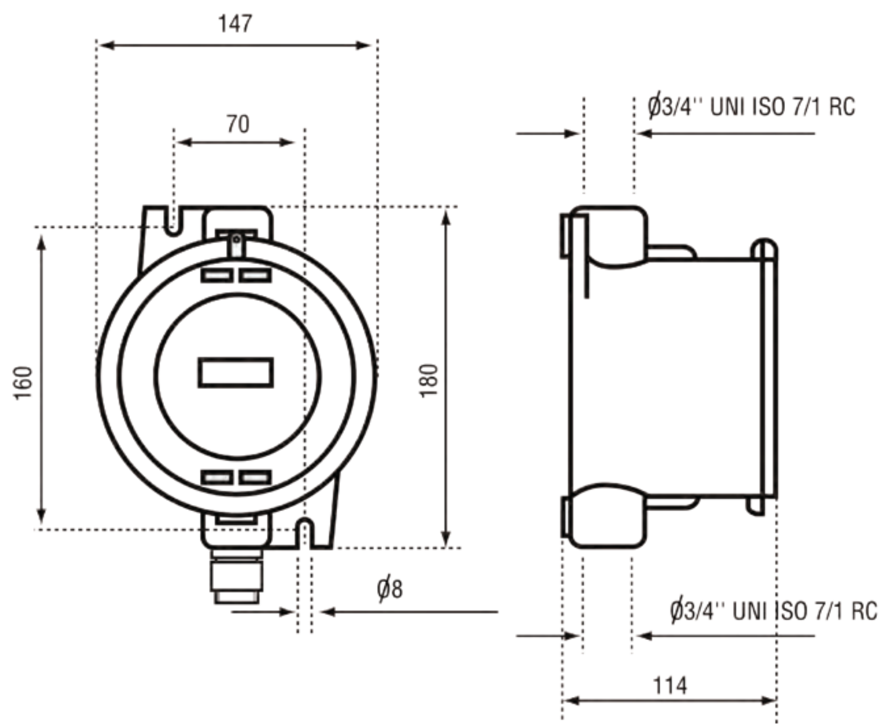

Figure 7. Exd Housing

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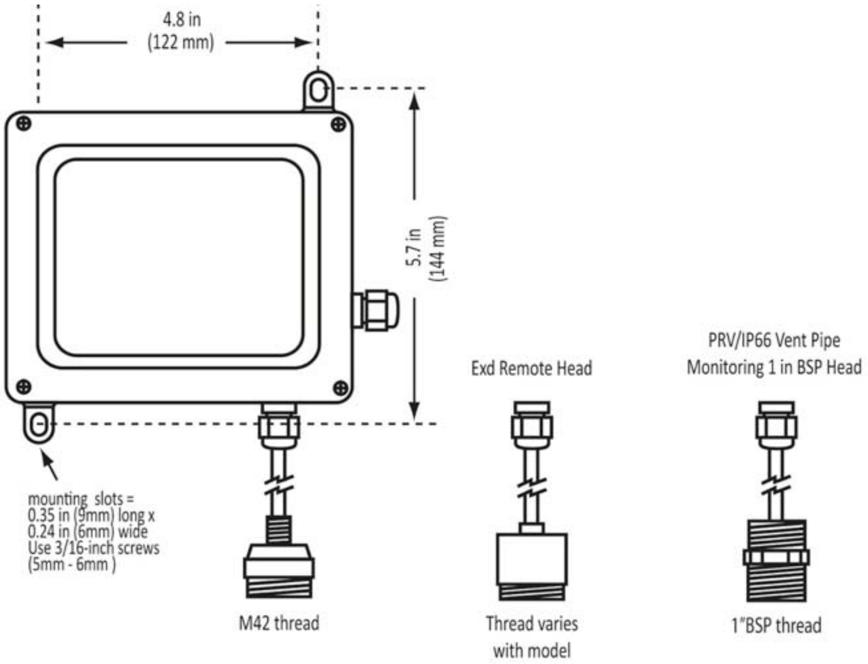

Figure 8. IP66 Housing with Remote Sensor Head

NOTE: For the Exd Remote Sensor Head and 16.4 ft (5 m) cable, the thread varies based on the model.

SECTION 4. OPERATION AND STABILISATION

On powering up, the AT-GU will sense for the presence of gas after an initial warm-up delay of 5 minutes. The green LED will flash at 1 second intervals during the warm-up.

In an alarm condition:
- green LED stays on and the red LED is on
- audible alarm operates (if not disabled and after delay, if set).
- relay out put activates (after a delay, if set)
- V and I output changes proportionally with gas concent ration.

In a fault condition:
- green LE D will be off and the red LE D will be on
- voltage/current fault output will activate:
  - 2mA on the 4-20mA output
  - 0.5V on the 1-5V output
  - 1.0V on the 2-10V output.

The typical time for various sensor types to stabilize is shown below.

Sensort Type	Stabilization Time
Electrochemical (E C)	20-30 seconds
Semiconductor (S C)	1-3 minutes
Infrared (IR)	2 minutes

On power up, the electrochemical sensor outputs a signal voltage norm ally below the set alarm level. Semiconductors output over the + max scale, i.e., > 5V. Both move towards zero as they stabilize.

If sensors have been in long-term storage or the detectors have been turned off for a long period, stabilization is much slower. However, within 1-2 hours sensors should have dropped below the alarm level and be operational. You can monitor progress exactly by monitoring the 0-10V output. When the output settles around zero the sensor is stabilized. In exceptional circumstances the process can take up to 24 hours or more.

SECTION 5. CONFIGURATIONS

5.1 OVERVIEW

Function	Description
Time Delay	Available on the audible alarm and relay to avoid false alarms. This is set with jumpers. The default delay is 0 minutes. You may wish to set to 15 minutes during start up. See Figure 2 and Figure 3 for setting the jumpers.
Audible Alarm	The units have an internal audible al arm. You can disable this by jumper, but the **default setting is "enabled"** in compliance with EN378. See Figure 2 and Figure 3 for setting the jumpers.
Output	Decide which output is required: 4-20mA, 1-5V, 0-10V, relay outputs, etc. See Figure 2 and Figure 3 for setting the jumpers.

5.2 ADJUSTING THE ALARM SET POINT

This process is the same for all versions using pot P1 and t est points 0V and REF1.

Step	Adjusting the Alarm Relay
1	Locate Pot P1 and use it to adjust the set point at which the relay activates.
2	Monitor the output between test points 0V (negative) and REF1 (positive) until the correct setting is reached. See example below.

Example: For a sensor range of 0-1000 ppm, calculate the voltage to set the relay at 100 ppm.

$$\text{Alarm Point Voltage} = \text{Alarm Value} \times \frac{5V}{\text{Max Range}}$$

$$\text{Alarm Point Voltage} = 100ppm \times \frac{5V}{1000ppm} = 0.5V$$

So the alarm volt age setting is 0.5 Volts.

SECTION 2. INSTALLATION AND WIRING

6.1 OVERVIEW

To comply with the requirements of EN378 and the European F-GAS regulation, sensors must be tested annually. However, local regulations may specify the nature and frequency of this test.

CAUTION: Check local regulations on calibration or testing requirements.

CAUTION: The AT-GU contains sensitive electronic components that can be easily damaged. Do not touch or disturb any of these components

NOTE: The AT-GU is calibrated at the factory. After installation, a zero adjustment maybe required due to differenc es in environmental conditions.

IMPORTANT: If the AT-GU is exposed to a large leak it should be tested to ensure correct functionality by electrically resetting the zero setting and carrying out a bump test. See procedures bel ow.

IMPORTANT: Aquilar recommends annual checks and gas calibration. Aquilar also recommends sensor replacement every 3 years or as required. Calibration frequency may be extended based on application, but should never exceed 2 years.

IMPORTANT: In applications where life safety is critical, calibration should be done quarterly (every 3 months) or on a more frequent basis. Aquilar is not responsible for setting safety practices and policies. Safe work procedures including calibration policies are best determined by company policy, industry standards, and local codes.

IMPORTANT: Failure to test or calibrate the unit in accordance with applicable instructions and with industry guidelines may result in serious injury or death. The manufacturer is not liable for any loss, injury, or damage arising from improper testing, incorrect calibration, or inappropriate use of the unit.

IMPORTANT: Before testing the sensors on-site, the AT-GU must have been powered up and allowed to stabilize.

IMPORTANT: The testing and/or calibration of the unit must be carried out by a suitably qualified technician, and must be done:

- in accordance with this manual
- in compliance with locally applicable guidelines and regulations.

Suitably qualified operators of the unit should be aware of the regulations and standards set down by the industry/country for the testing or calibration of this unit. This manual is only intended as a guide and, insofar as permitted by law, the manufacturer accepts no responsibility for the calibration, testing, or operation of this unit. The frequency and nature of testing or calibration may be determined by local regulation or standards.

EN378 and the F-GAS Regulation require an annual check in accordance with the manufacturer's recomm endation.

NOTE: For improved accuracy and response, the instrument should be zeroed and calibrated in the environment in which it is being installed.

There are two concepts that need to be differentiated:

- bump test
- calibration

BUMP TEST

Exposing the sensor to a gas and observing its response to the gas. The objective is to establish if the sensor is reacting to the gas and all the sensor outputs are working correctly. There are two types of bump test.

Quantified: A known concentration of gas is used.
Non-Quantified: A gas of unknown concentration is used.

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CALIBRATION

Exposing the sensor to a calibration gas, setting the “zero” or standby voltage to the span/range, and checking/adj usting all the outputs, to ensure that they are activated at the specified gas concentration.

CAUTION: Before you carry out the test or calibration:

- Advise occupants, plant operators, and supervisors.
- Check if the AT-GU is connected to external systems such as sprinkler systems, plant shut down, external sirens and beacons, ventilation, etc. and disconnect as instructed by the customer.
- Deactivate alarm delays if selected at JP5, JP 6 as per Figure 2 and Figure 3.
- For bum p test or calibration the AT-GU should be powered up for 24 hours. The instrument should be fully stabilised per Section 4.

6.2 BUMP TESTING

After installation, the units should be bump tested. Expose the sensors to appropriate test gas (NH_3, CO_2, etc.). The system will alarm when the test gas ppm value is above the alarm level. The gas should put the system into alarm and light the red LED. The delay prevents the audible alarm from sounding and the rel ay from switching (if delay is set).

With a bump test you can see the functions of the sensor - the red LED will light, the relay and audible al arm will function, and the output (0-10V, for exampl e) will show the gas level.
Ideally bump tests are conducted on site in a clean air atmosphere.

NOTE: Prior to carrying out a bump test, check and adjust the zero setting as described in the Calibration section.

NOTE: Procedures for bump test and calibration vary depending on the sensor technology used and the gas in question. The AT-GU is available in three sensor versions: Semiconductor (SC), Electrochemical (EC) and Infrared (IR).

NOTE: Do not pressurize the sensor.

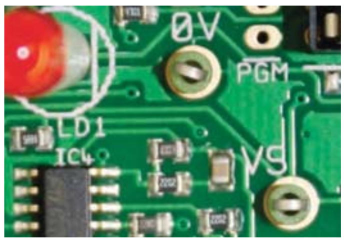
NOTE: For semiconductor sensors, you MUST use calibration gas in a balance of air (not N_2).

IMPORTANT: After a semiconductor or electrochemical sensor is exposed to a substantial gas leak, the sensor should be checked and replaced if necessary.

NOTE: To test the audible alarm and/or relay function, check the delay is set at zero and expose to gas. You can mute the audible alarm by removing jumper 3.

BUMP TESTING USING CALIBRATION GAS CYLINDERS

1. Remove the enclosure lid of the gas detector (not in an exhaust area).
2. Connect a voltmeter to monitor sensor response (in Volts DC). Monitor the response bet ween pins 0V and VS.
3. Expose the sensor to gas from the cylinder. You can place the entire AT-GU into a plastic bag or use a plastic hose/hood to direct gas to the sensor head. A response of above 80% is acceptable.



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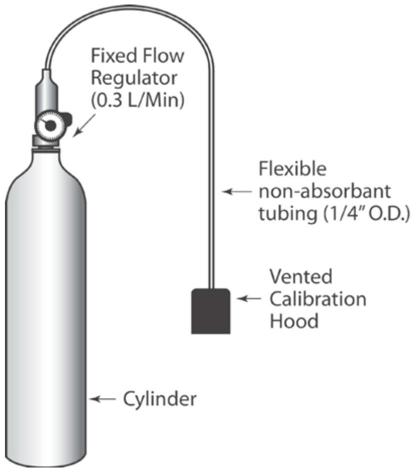

Figure 9. Gas Cylinder and Test Hardware

6.3 CALIBRATION OVERVIEW

There are two adjustments required: zero and s pan. They are monitored at 0V and VS using a 0-5V scale. If the sensor range is 0-1000 ppm, then 5V=1000 ppm.

Aquilar offers a calibration kit that consists of a calibration gas cylinder, a flow regulation valve with flexible non-absorbent tubing and vented calibration hood. Tools required:

- Gas cylinder with the appropriate gas and concentration
- A voltmeter (crocodile clips recomm ended)
- Screwdriver (depending on housing).

The AT-GU has three sensor PCB versions: semiconductor (SC), electrochemical (EC), and infrared (IR).

6.4 CALCULATING CALIBRATION VOLTAGE

Sensor out puts are linear. As long as you have a gas cylinder of known concentration you can calibrate to any desired range.

Example: For a sensor range of 0-1000 ppm and a cylinder of the target gas at 800 ppm:

$$\text{Voltage} = \text{Alarm Value} \times \frac{5V}{\text{Sensor Range}}$$

$$\text{Voltage} = 800\text{ppm} \times \frac{5V}{1000\text{ppm}} = 4V$$

So the output voltage signal should be adjusted to 4V.

6.5 CALIBRATING SEMICONDUCTOR (SC) SENSORS

1. Locate Pot P2 which is used to adjust the zero poi nt.
2. Monitor the output between 0V (negative) and VS (positive).
3. Adjust Pot P2 to 0 V or slightly positive (0.01 V is acceptable).
4. Locate Pot P3 which is used to calibrate the range (span) of the sensor.
5. Monitor the output between 0V (negative) and VS (positive).
6. Expose the sensor to calibration gas and allow to stabilize (approximately 6 minutes).
7. Adjust pot P3 to the voltage calculated in section 6.4 (page 29).

NOTE: PFor semiconductor sensors, you MUST use calibration gas in a balance of air (not N2)

6.6 CALIBRATING SEMICONDUCTOR (SC) SENSORS

There are two adjustments required: zero and s pan. They are monitored at 0V and VS using a 0-5V scale. If the sensor range is 0-1000 ppm, then 5V=1000 ppm.

1. Locate Pot VR201 which is used to adjust the zero point.
2. Monitor the output between 0V (negative) and VS (positive).
3. Adjust Pot VR201 to 0V or slightly positive (0.01 V is acceptable).
4. Locate Pot VR202 which is used to calibrate the range (span) of the sensor.

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5. Monitor the output between 0V (negative) and VS (positive).
6. Expose the sensor to calibration gas and allow to stabilize (approximately 6 minutes).
7. Adjust pot VR202 to the voltage calculated in section 6.4 (page 29).

6.7 CALIBRATING INFRARED (IR) SENSORS

1. Locate Pot VR203 which is used to adjust the zero point.
2. Monitor the output between 0V (negative) and VS (positive).
3. Expose the sensor to pure 99% nitrogen until output is stable (approximately 3 minutes).
4. Adjust Pot VR203 to 0 V or slightly positive (0. 01 V is acceptable).
5. Locate Pot VR202 which is used to calibrate the range (span) of the sensor.
6. Monitor the output between 0V (negative) and VS (positive).
7. Expose the sensor to calibration gas and allow to stabilize (approximately 3 minutes).
8. Adjust pot VR202 to the voltage calculated in section 6.4 (page 29).

SECTION 7. TROUBLESHOOTING

ALARM PANEL

Symptom:
Green and Red light off
Cause:
1. Check power supply. Check wiring.
2. AT-GU was possibly damaged in transit. Check by installing another AT-GU to confirm the fault.

Symptom:
Red light on, green led off (indicates a fault)
Possible Cause:
1. Sensor m ay be disconnected from printed circuit board. Check to see sensor is properly inserted into board.
2. The sensor has been damaged or has reached the end of life and needs to be exchanged. Contact Aquilar for instructions and support.

Symptom:
Alarms in the absence of a leak
Possible Cause:
1. Try setting an alarm delay.
2. Perform a bump test to ensure proper operation.

AquiTron

AT-GU
Gas Sensing System

BACHARACH

EU Declaration of Conformity

Product(s):	Gas Detector
Model(s):	MGS-150, MGS-250 and derivatives
The manufacturer of the products covered by this declaration:	Bacharach, Inc. 621 Hunt Valley Circle New Kensington, PA 15068 U.S.A.
Year(s) conformity is declared:	2012
Directive(s)	2014/30/EU Electromagnetic Compatibility (EMC)

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of the declaration

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation.

Harmonised Standard(s)

EN 50270:2006	Electromagnetic compatibility - electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 55011:2009/A1:2010, Group 1, Class A	Industrial, scientific and medical equipment - radio-frequency disturbance characteristics - Limits and methods of measurement
FCC Part 15, Subpart B	Electromagnetic Emissions: Unintentional radiation from electronic devices

Signed for and on behalf of Bacharach, Inc.

New Kensington, PA, U.S.A., 07 March 2016

Aaron E. Kennison, Engineering Manager

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