

AQ/D Duct Air Quality Sensor

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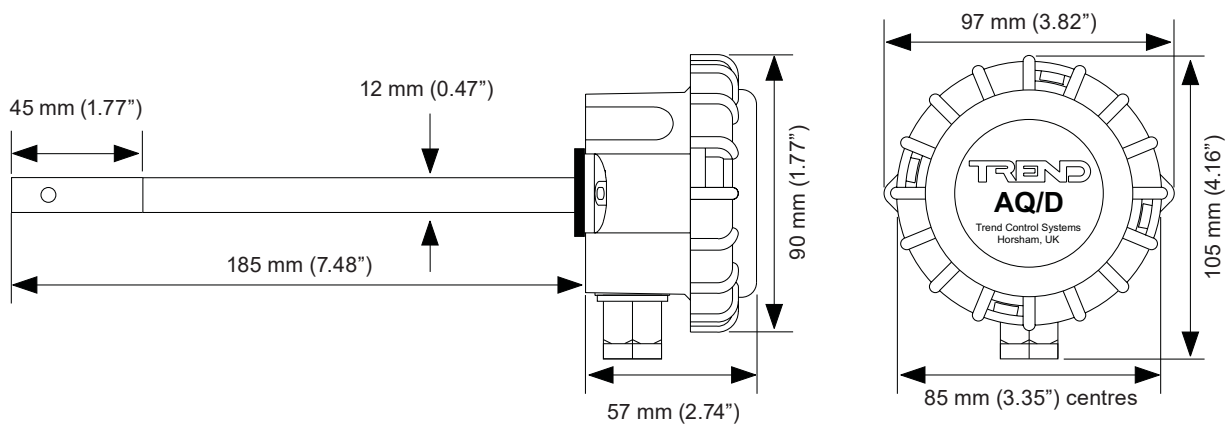
Description

The duct air quality sensor is designed to measure the total air quality. The semiconductor based element has a very high sensitivity to VOCs, solvents, and many other gasses and is ideal for the control of ventilation rates in respect of occupancy and contamination levels. The sensor, when used in the control of ventilation rates, offers energy savings without compromising the air quality.

Features

- Senses mix of gases to monitor air quality
- Pre-calibrated for ease of commissioning
- On site calibration if required with status LED
- Long term reliability
- 0 to 10 V output, 24 Vac/dc
- IP67 housing
- M20 conduit entry

Physical

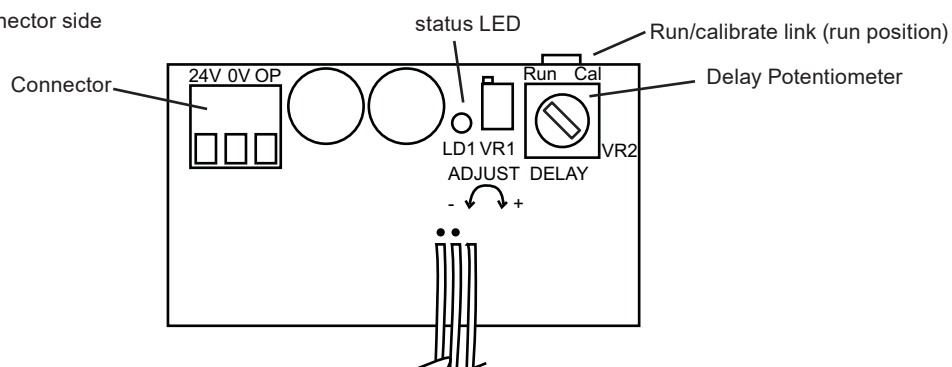


FUNCTIONALITY

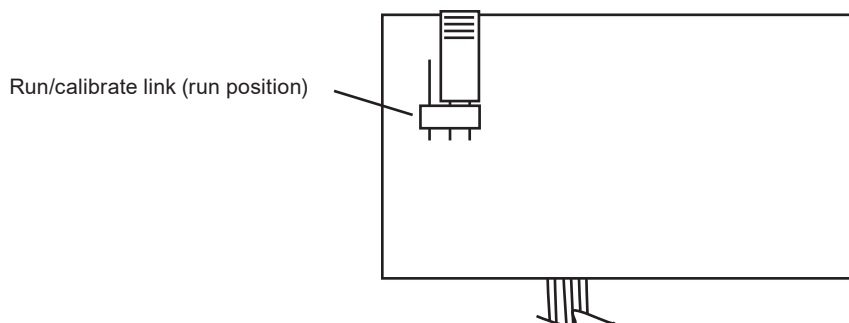
The sensor is highly sensitive to gases given off from Volatile Organic Compounds (VOCs), solvents, and CO. The sensor output is 0 to 10 Vdc and increases with the degree of contamination.

The air quality sensor is factory calibrated to provide 1 V output in clean uncontaminated conditions.

View of AQ/D pcb. from connector side



View of AQ/D pcb. from surface mount side



Status LED

The status LED under 'run' operation provides indication of the average sensor condition over the last 96 hours. This measurement is updated every 24 hours. The following provides indication of the sensor condition.

LED OFF - sensor condition OK
 LED FLASHING - sensor output above 4 V continuous. Atmosphere contaminated or sensor needs re-calibration.
 LED ON - Output above 7 V continuous. Atmosphere severely contaminated or sensor needs re-calibration.

Re-Calibration

If the air quality sensor needs re-calibration this can be achieved by adjusting the calibration potentiometer VR1. If site calibration is necessary then any adjustments should be made in small increments using the following procedure.

1. Ensure that the power supply to the sensor has been on for a minimum of 30 minutes and the environment around it is clean, low occupancy, and free from odours and cigarette smoke.
2. Change red run/calibrate link from Run (*left to centre pin) to Cal mode (calibration, *centre to right pin).
3. The status LED removes the need for a DVM. The LED indicates the following:
 OFF - output below 0.9 V,
 FLASHING - within calibration thresholds,
 ON - output above 1.1 V.
4. If you need to re-calibrate, adjust the TRIM potentiometer VR1 slowly until LED flashes then goes off. The output voltage at this level will be 0.9 to 1.1 Volts. Leave for a minimum of 15 minutes and check the output again.
5. Repeat step 4 if further calibration is required.
6. After the sensor is re-calibrated return the red run/calibrate link to Run position (*left to centre).

*AQ/D pcb viewed from connector side

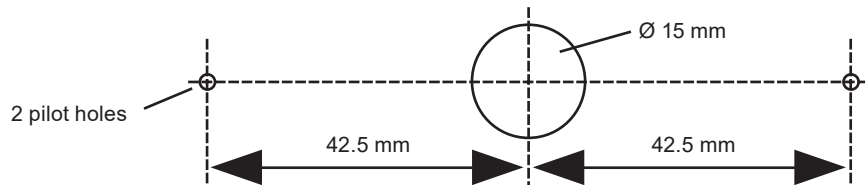
Important do not over adjust during re-calibration as this will cause instability.

INSTALLATION

Due to the sensor's sensitivity to numerous gases, the sensor cannot be rated in ppm across its output range so it is important at the commissioning stage that the setting up is carried out in clean uncontaminated air.

The installation involves:

- choose an accessible location for the sensor where there is good air movement but is not subject to high air velocity
- drill 2 pilot holes at 85 mm centres in duct side to take No.6 20 mm self tapping screws (see template)

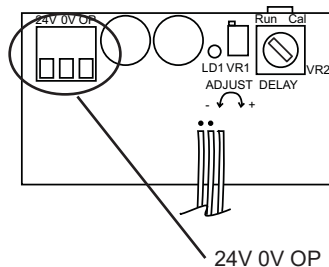


- drill a 15 mm diameter clearance hole centrally between the 2 screw holes
- mount sensor on duct, tighten screws
- remove lid
- remove connector
- insert cable through gland
- check link position is 'Run'
- connect to controller
- turn Delay Potentiometer (VR2) to 'min' (fully anti-clockwise)
- power up and leave for 30 minutes in a clean environment with fan system running, sensor should read between 1 to 3 Vdc, if not recalibrate as above
- turn delay to required level (0-12 mins)
- set up IQ channel for voltage (V)
- configure IQ sensor modules
- test sensor

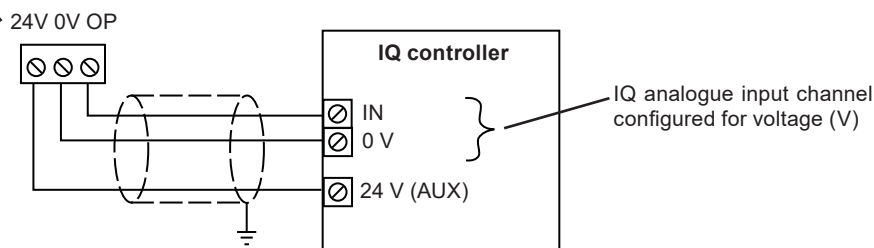
Note: - The sensor is factory calibrated and should not require adjustment under normal conditions. A burn in period of 2 to 3 days is required to ensure a stable and repeatable output.

Full installation details are given in the AQ/D Installation Instructions TG100525.

CONNECTIONS



Note that sensor requires 96 mA from 24 V supply

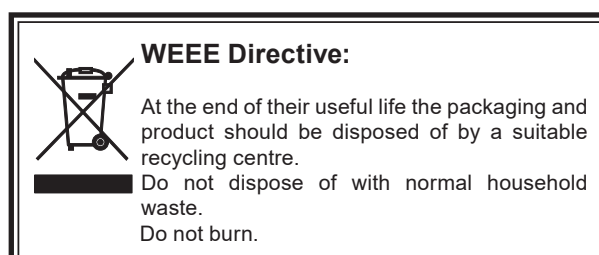


ORDER CODES

AQ/D

Duct air quality sensor.

DISPOSAL



SPECIFICATION

Electrical

Output	:0 to 10 Vdc (0 V = good quality, 10 V = bad quality)
Consumption	:96 mA maximum
Power Supply	:15 to 32 V (ac/dc)
Sensing Element	:Tin dioxide semiconductor element enclosed in flame proof plastic housing.
Accuracy	:International standards to be agreed.
Hysteresis	:Negligible
Sensitivity	:Dependent on gas mix

Mechanical

Dimensions	
Duct tube	:185 mm long x 12 mm diameter
Fixing centres	:85 mm
Head	:57 mm deep x 105 mm diameter (max.)
Cable entry	:M20
Enclosure material	:Flame retardant (V0) ABS.
Probe material	:UL94-0 Flame class rating (3)
Connectors	:Single part for 1.0 mm (20 to 18 AWG)
Weight	:170 gm (6 ozs)
Protection	:IP67

Environmental

Temperature	:Normal range - 10 °C to +50 °C (14 °F to 122 °F), Maximum accuracy/sensitivity + 10 °C to 30 °C (50 °F to 86 °F)
Humidity	:Normal range 0 to 70 %RH Maximum accuracy/sensitivity 60 to 70 %RH.

Input channels and sensor scaling

The IQ controller's input channel must be set up for analog voltage (V), and the sensor type module must be set up with the sensor type scaling. It is recommended to use SET (software tool) for the setting of sensor type module. For all IQ2 series controllers with firmware of version 2.1 or greater, or IQ3 series controllers, the following SET Unique Sensor Reference should be used:

Air Quality V

If not using SET, use the following table for all IQ2 series controllers with firmware of version 2.1 or greater or IQ3; for all other IQ controllers see the Sensor Scaling Reference Card TB100521A.

Use sensor type scaling mode 5, characterise, with the input type set to 0 (volts) and the table below:

Y	Input type	0 (volts)
E	Exponent	3
U	Upper	100
L	Lower	0
P	Points	2
x	lx	Ox
1	0	0
2	10	100

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