# Duct air quality / $CO_2$ transmitter

# TQ-D32

| CODE | DESCRIPTION |
|---|---|
| TQ-D32 | Duct air quality transmitter |
| TQ-D32-CO2 | Duct $CO_2$ transmitter |


## APPLICATION AND USE

The TQ-D32 air quality transmitters are designed to control fresh air flow in air conditioning systems. Two different models are available.
TQ-D32 determines the air quality through measurement of Volatile Organic Compounds (VOC's) and other mixed gases.
TQ-D32-CO2 determines the air quality through measurement of $CO_2$ concentration (ppm).

The output signal can be used to control fresh air fans and dampers according to the ventilation load.

It is equipped with a single output which automatically determines whether to run in current or voltage mode, no more jumpers or switches to worry about.

## TECHNICAL CHARACTERISTICS

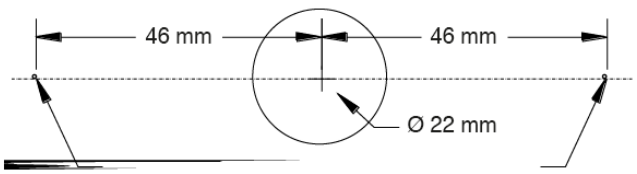
| | |
|---|---|
| Output | 0-10 Vdc or 4-20 mA self-detecting (not loop powered) |
| Power supply | 24 Vac/dc |
| Ambient temperature | -30T70 °C |
| Housing material | ABS (flame retardant) |
| Probe material | PVC, End cap in Delrin |
| Probe Dimensions | 205 x 20 mm Ø |
| Protection | IP54 (for IP65 secure the LID with the two screws provided) |
| Directive | 2014/30/EU |
| IAQ (air quality) | |
| Measurement range | 0 to 100% (0= good air quality - 100%= bad air quality)<br><15% no action needed<br>15 to 60% start to open dampers<br>>60% fully open dampers |
| Type | Tin oxide |
| Warm up period | 15 minutes approx. |
| Conditioning period | 7 days |
| Life expectancy | 5 years |
| $CO_2$ | |
| Measurement range | 0 to 2000 ppm |
| Accuracy * | 400-2000ppm ±25ppm ±5% of scale |
| Type | NDIR |
| Long term stability | <2% of FS over sensor life |
| Temp. dependency | 5ppm per °C or 0,5% of the reading per °, whicheveris greater |
| Response time | 90 seconds (90%) |
| Pressure dependency | 0,13% of reading per mm H |
| Sampling interval | 3 seconds |

* The sensor will reach its operational accuracy after 24 hours of continuous operation.

## INSTALLATION

**Attention:** antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

1. Select a location in the duct where dust & contaminants are at a minimum (i.e. after filters etc.) and which will give a representative sample of the prevailing air condition.
2. Fix the housing to the duct with appropriate screws, or by using the optional duct mounting flange.




3. Release the snap-fit lid by gently squeezing the locking tab.
4. Feed the cable through the waterproof gland and terminate

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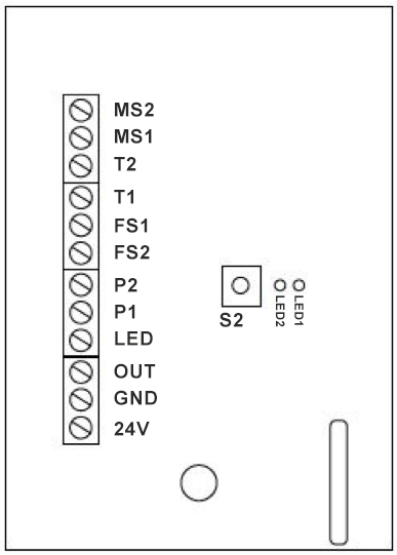
the cores at the terminal block. Leaving some slack inside the unit, tighten the cable gland onto the cable to ensure water tighteness.

5. If the sensor is to be mounted outside, it is recommended that the unit be mounted with the cable entry at the bottom. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
6. Before powering the sensor, ensurethat the supplyvoltage is within the specified tolerances.
7. Allow 3 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise.

To perform an accurate comparison between a transmitter output and a portable reference, it is essential that the two probes are held adjacent for a minimum of 30 minutes in a stable enviroment. Only in this way can speed of response and temperature factors be eliminated.

## CONNECTIONS

| | |
|---|---|
| MS2 | Not used |
| MS1 | Not used |
| T2 | Not used |
| T1 | Not used |
| FS1 | Not used |
| FS2 | Not used |
| P2 | Not used |
| P1 | Not used |
| LED | Occupied / unoccupied text on LCD |
| OUT | Auto-selecting 0-10 Vdc or 4-20 mA (3 wire) output |
| GND | Common 0V |
| 24V | Supply +24 Vac/Vdc |




## LED'S & SELF-TEST

The LEDs are labelled LED1 and LED2. On power up or when the load resistance is in the "forbidden zone" (550R to 3k) the LEDs will flash alternately. Once the system has established which mode to operate in, the appropriate led will be on and not flashing.

| | |
|---|---|
| LED1 | Current output |
| LED2 | Voltage output |

Currently an "Error Halt" will occur if:

1. Temperature is selected and the appropriate sensor not fitted,
2. In $CO_2$ mode a $CO_2$ sensor element is not fitted or is faulty.
3. In IAQ mode a sensor is not fitted.

In all 3 cases above, both LEDs are on and the output is set to zero.

### PCB SELF TEST

Push button is for 50% output. Press and hold, the output in voltage mode it may take several seconds to settle. The screen displays 50% message when active (if display is fitted).

## NOTES

**IAQ option**: Sensor element responds to a broad range of contaminants, such as Ammonia (NH3) and Hydrogen Sulphide (H2S), generated from waste materials in office and home enviroments. it also has high sensitivity to low concentrations of VOCs such as toluene emitted from wood finishing and construction products.

The sensor has a heated element with a nominal resistance in clean air. This resistance decreases in the presence of detectable VOCs. This is a nominal resistance, is different for each sensor element and will change during the life of the sensor. To allow for this, on powering the sensor a period of time is required before the sensor achieves thermal equilibrium (about ten minutes). During this process the system determines the resistance for the sensor element fitted, with this value being used for air air quality calculations. While in operation this reference value is constantly monitored and adjusted as necesary.

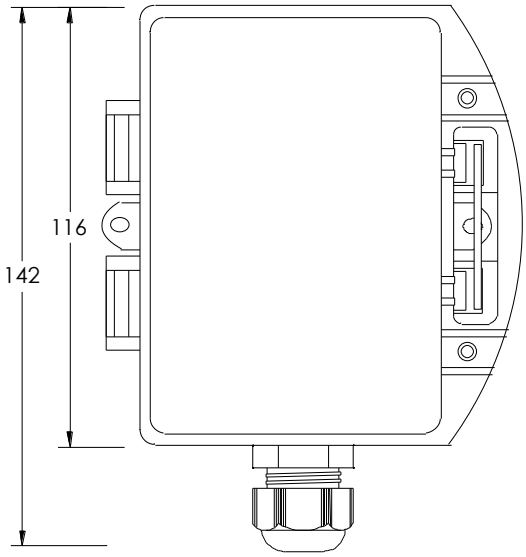
During the ten-minute warm-up after power is applied, the sensor not be exposed to strong VOCs. During this period the output will register zero or GOOD air quality. During warm-up period the unit calibrates itself, it is important that the calibrates itself, it is important that the environment around it is clean uncontaminated air and free from odours cigarette smoke and low occupacy. Ifexposed to VOCs during this time the calibration will be wrong, though it will correct itself after a couple of hours in clean air.

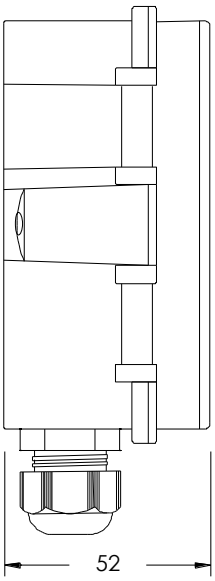
**$CO_2$ option**: Automatic Background Logic (ABC) is designed to be used in HVACapplications where $CO_2$ concentrations will drop to uotside ambient condition (4000 ppm) in a 7-day period. The sensor will reach its operational accuracy after 24 hours of continous operation. $CO_2$ sensor will maintain accuracy with ABC logic enabled, given that it is at leastfour times in 21 days exposed to a reference level of 400 ppm.

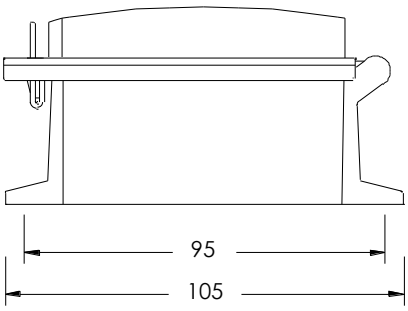
**Radiation shield**: The place profiles are shaped to allow the minimum restriction of airflow while providing the necessary shielding from solar radiation and precipitation.

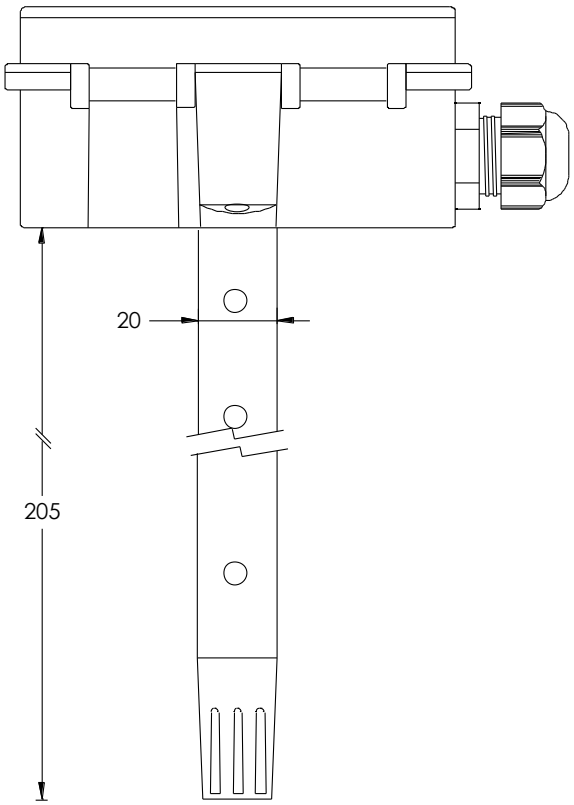
All sensor shields produce an error due to temperature rise during high solar radiant, the error is reduced with higher wind speeds which provide ventilation. The figures given below are based on a radiant intensity of 1000 $W/m^{2;}$ typical errors for the specified wind speeds would be: 0,4 °C @ 3 m/s, 0,65 °C @ 2 m/s, 1,4 °C @1 m/s or slower.

## DIMENSIONS [mm]




The performances stated in this sheet can be modified without any prior notice