Data Sheet

# AV/D
# Duct Air Velocity Sensor

## AV/D Duct Air Velocity Sensor

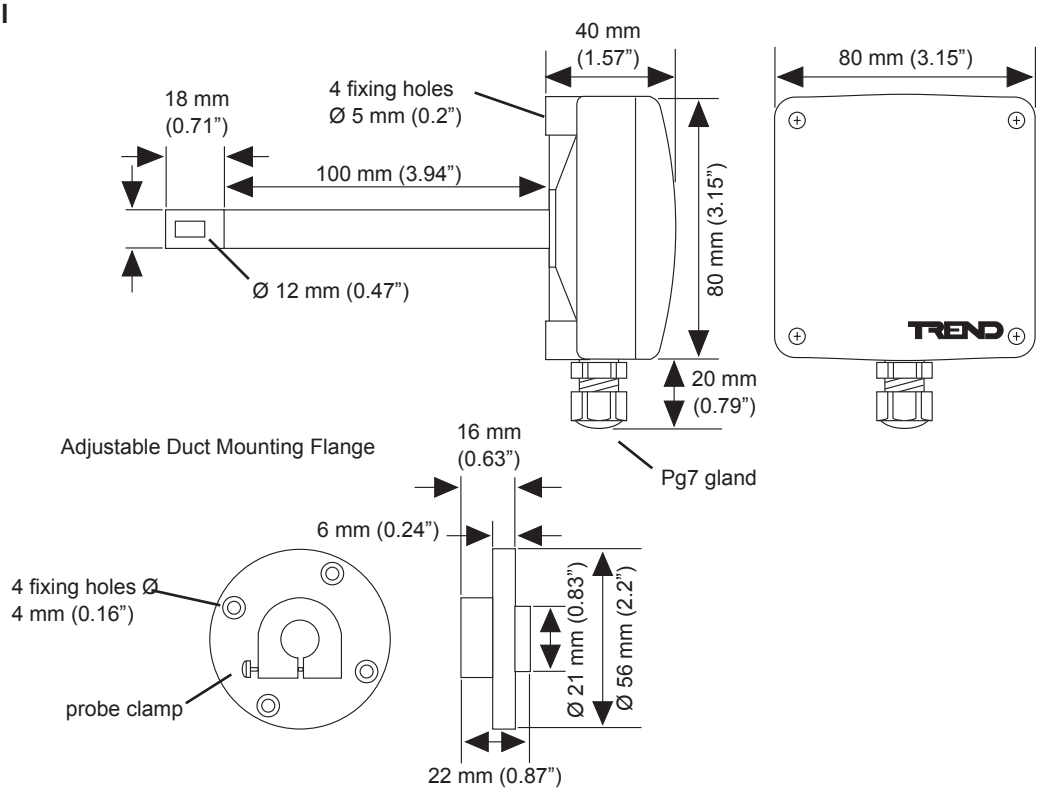

## Description

The AV/D velocity sensor is designed for use in the HVAC industry to give accurate single point measurement of duct air velocity. The measuring method is based on the hot film anemometer principle using special thin film sensor elements. The special construction of the sensor provides easy mounting by producing a very small directional dependency over the range -20 to +20 degrees of rotation. The output (current or voltage), velocity measuring range, and response time can be selected by internal links. Compatible with IQL17/VAV.

## Features

- Continuously adjustable probe depth
- IP65 housing
- Output signal 0 to 10 V or 4 to 20 mA selectable by link
- Response time 0.7 s or 4 s selectable by link
- Good accuracy at low velocity
- Low angular dependance
- Relatively insensitive to dust

## Physical

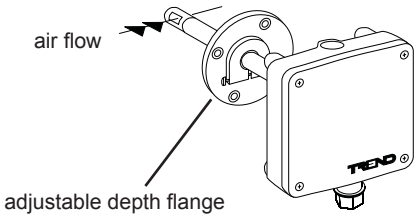


## FUNCTIONALITY

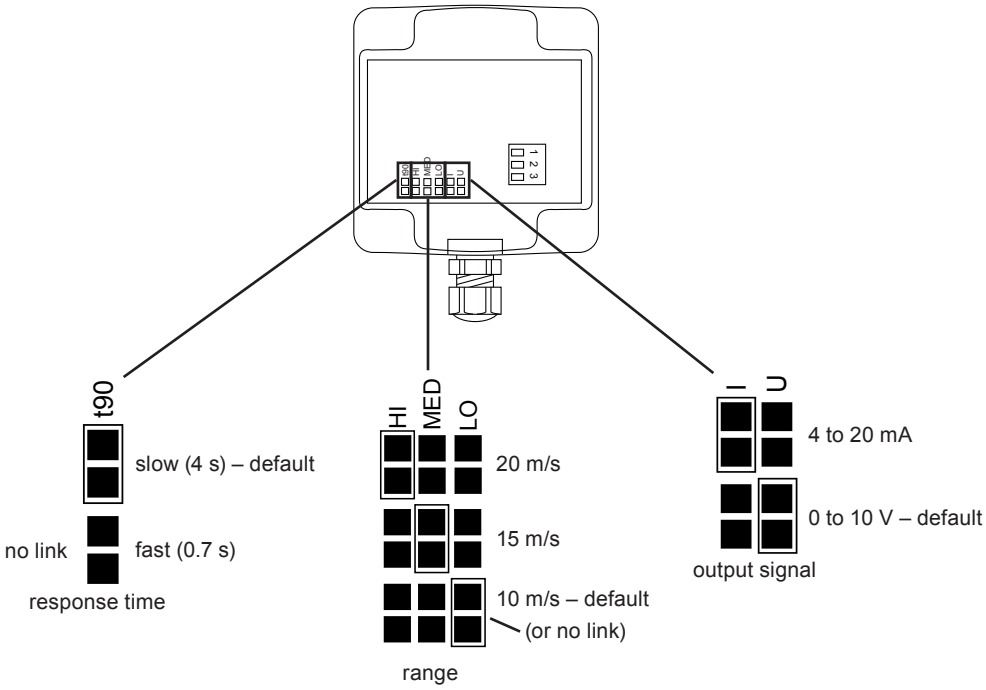
The AV/D air velocity sensor uses a hot film anemometer principle which gives exact measurement of air velocity (mass flow) and very good accuracy at low velocity. This form of sensor is much less sensitive to dust, which means higher reliability and lower maintenance costs.

The sensor is provided with an adjustable duct mounting flange which allows the probe depth to be adjusted over its full length (alternatively the probe may be mounted directly on the duct).

The special construction of the probe provides very small directional dependency within the range -20 to +20 degrees, thus allowing easy mounting.



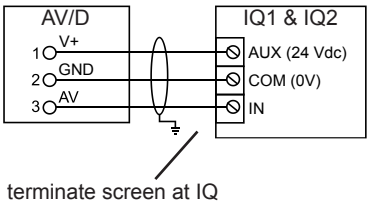

The sensor has on board links to select response time (fast 0.7s or slow 4s), range (0 to 10 m/s (32.8ft/s), 0 to 15 m/s (49.2 ft/s), 0 to 20 m/s (65.6 fts/s)), and output signal (0 to 10 V or 4 to 20 mA).

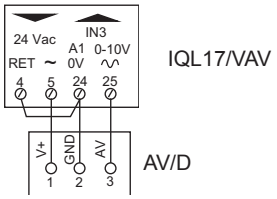


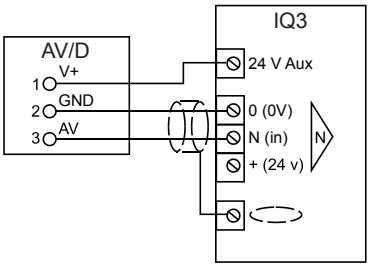
## INSTALLATION

The sensor should be mounted with the sensing element orifice aligned with the direction of air flow and at a point in the duct which is representative of the general air flow. Areas of turbulance should be avoided. (e.g. bends, dampers).
The installation procedure involves:

Drill probe hole in duct
Remove protective cover from probe
Mount probe on duct either directly or via adjustable duct mounting flange (provided) so sensor slot aligns with air flow. Both probe and flange are fixed to duct by 4 screws (provided) via foam gaskets (provided).
If using flange, mount probe on flange and adjust depth so that sensor measures general air flow.
Unscrew lid.
Set links for output signal, range, and response time.
Screw cable gland (Pg7, provided) into sensor.
Thread cable through gland and connect to terminals.
Tighten gland, replace lid and tighten screws.
Connect to IQ controller analogue input channel (configured either for voltage, V, or current, $I_x$ (externally powered), according to output signal set on sensor link). Connect to IQL17/VAV IN3 (24, 25).
Configure IQ controller input sensor type scaling; see specification section (not necessary for IQL17/VAV if linked for 10 m/s, 32.8 ft/s)
Test system




*Note that 24 V supply to sensor should be from 24 V auxiliary output power supply or external supply.*

Full installation details are given in the AV/D installation instructions TG200504.

## ORDER CODE

| | |
|---|---|
| **AV/D/10** | Air velocity sensor, 0 to 10 m/s (32.8 ft/s - default), including adjustable duct mounting flange, mounting screws, foam gaskets and cable gland. |

## MAINTENANCE

If the response time lengthens, clean sensor element by blowing off dust, or clean with isopropyl alcohol.

## DISPOSAL

**WEEE Directive:**

At the end of their useful life the packaging, product, and battery (if fitted) should be disposed of by a suitable recycling centre.
Do not dispose of with normal household waste.
Do not burn.

# SPECIFICATION

## Electrical

Range :0 to 10 m/s (32.8 ft/s) (default). Selectable by link for 0 to 15 m/s (49.2 ft/s), or 0 to 20 m/s (65.6 ft/s).
Output :0 to 10 Vdc (default), $I_L$ <1 mA. Selectable by link for 4 to 20 mA, $R_L$< 500 Ω
Accuracy :At 20 °C (87 °F), 45 %RH and 101.3 kPA.
0 to 10/15 m/s (33/49 ft/s) :±(0.3 m/s (±0.99 ft/s) + 3% of value)
0 to 20 m/s (65 ft/s) :±(0.3 m/s (±0.99 ifts) + 4% of value)
Angular dependance :<3% of measurement at Da <10°
Power Supply :24 Vac ±20% or 24 Vdc +20%, -10%
Power consumption :150 mA (maximum, ac supply)
90 mA (maximum, dc supply)
Response Time
Slow :4 s (default)
Fast :0.7 s

## Mechanical

Dimensions
probe :100 mm (3.94”) x 12 mm (0.47”) diameter
housing :80 mm (3.15”) x 80 mm (3.15”) x 35 mm (1.38”)
Cable gland :Pg7
Weight :114 gm, 4 ozs
Connections :Single part 3 way terminals, for 1.5 $mm^2$ cross section area (16 AWG) cable.
Material :polycarbonate housing
Protection :IP65

## Environmental

Temperature
working :-10 °C to 50 °C, +14 °F to +122 °F
storage :-20 °C to 60 °C, -4 °F to +140 °F
Humidity :0 to 96 %RH
EMC
Emissions :EN50081-1
Immunity :EN50082-1, EN50082-2

## IQ Scaling

The input channel should be linked for voltage, V, (if the sensor is linked for 0 to 10V, V) or for current, Ix (if the sensor is linked for 4 to 20 mA, I).
The sensor type module must be set up with the correct scaling. The recommended method of setting the sensor type scaling is to use SET. For all IQ2 series controllers with firmware version 2.1 or greater, or IQ3 series controllers, the SET Unique Sensor Reference given below should be used:

**Velocity I 10 ms** (4 to 20 mA, 0 to 10 m/s)
**Velocity I 15 ms** (4 to 20 mA, 0 to 15 m/s)
**Velocity V 10 ms** (default setting)(0 to 10 V, 0 to 10 m/s)
**Velocity V 15 ms** (0 to 10V, 0 to 15 m/s)
**Velocity V 20 ms** (0 to 10V, 0 to 20 m/s)

For all scalings (including ft/s) or by choice enter scaling manually as defined in the table below with sensor type scaling mode set to 5 (characterise). *Note that for IQ3 the scaling mode and exponent (E) do not need to be set up.*

| Link | Ix | | | | | | V | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Range | 10 m/s | | 15 m/s | | 20 m/s | | 10 m/s | | 15 m/s | | 20 m/s | |
| Y | 2 (current) | | | | | | 0 (volts) | | | | | |
| E | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| U | m/s 10 | ft/s 32.8 | m/s 15 | ft/s 49.2 | m/s 20 | ft/s 65.6 | m/s 10 | ft/s 32.8 | m/s 15 | ft/s 49.2 | m/s 20 | ft/s 65.6 |
| L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| I1 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| I2 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 | 10 | 10 | 10 |
| O1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O2 | 10 | 32.8 | 15 | 49.2 | 20 | 65.6 | 10 | 32.8 | 15 | 49.2 | 20 | 65.6 |

System Accuracy (including controller)
: ±0.6 m/s (0 to 10 m/s) ±2 ft/s (0 to 32.8 ft/s)

For all other IQ controllers see the sensor Scaling Reference Card TB100521A.

Please send any comments about this or any other Trend technical publication to techpubs@trendcontrols.com



**Trend Control Systems Limited**
Albery House, Springfield Road, Horsham, West Sussex, RH12 2PQ, UK. Tel:+44 (0)1403 211888 Fax:+44 (0)1403 241608 www.trendcontrols.com
**Trend Control System USA**
6670 185th Avenue NE, Redmond, Washington 98052, USA. Tel:(425) 869-3900 Fax:(425) 869-8445 www.trendcontrols.com