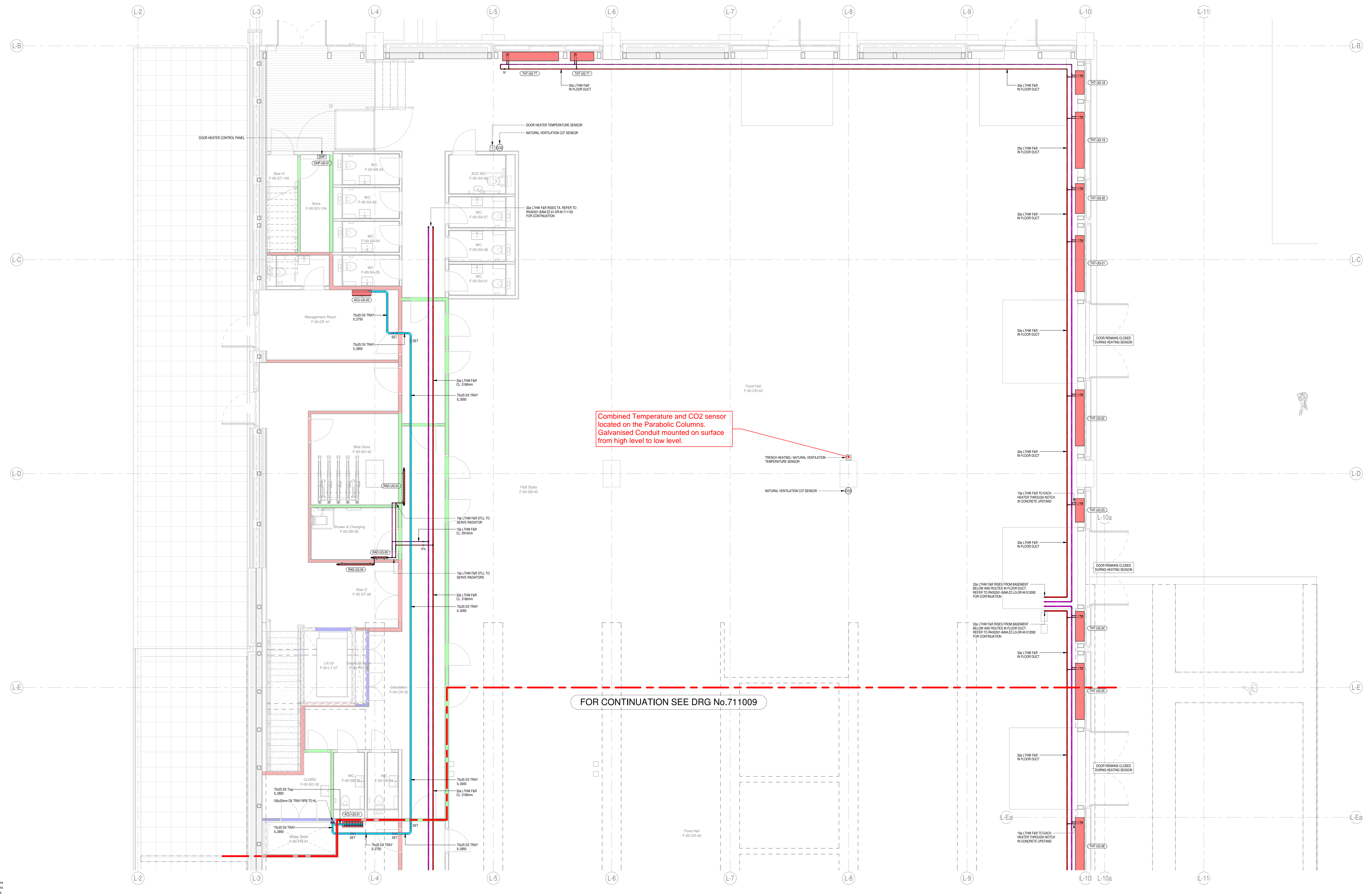


Project Title:	Our Cultural Heart – Phase 1				
Contract No:	HNE.0476				
To:	Kirklees Conservation Officer	Company:	Kirklees Council		
Approval of the followig is required:-					
Equipment:	Building Management System - Temperature and CO2 Sensors				
Location:	Food Hall				
Description:	Detail of Mechanical services fixed to the Paraoblic support columns				
Attached Detail Documents:	Page 1	Page 2	Page 3	Page 4	Front Cover Plan Drawings Section from 3-D Model Manufacturer Data Sheet
Issued by: BAM Construction Ltd.	Guy Cheung	Date	12/02/2025		
Please return comments by:		26/02/2025			

To be completed and returned by Conservation Officer			
Notes:-			
Returned by:		Company:	
Signature:		Date:	



Combined Temperature and CO2 sensor located on the Parabolic Columns. Galvanised Conduit mounted on surface from high level to low level.

FOR CONTINUATION SEE DRG No.711009

Fire Wall Legend

240 Mms
125 Mms
90 Mms
50 Mms
30 Mms

Suitability Code (as defined in BS1192)

WIP - Work In Progress
Shared (Non-Contractual)
S1 - Suitable for Co-ordination
S2 - Suitable for Information
S3 - Suitable for Review & comment
S4 - Suitable for Stage Approval
S5 - Not Used
S6 - Suitable for F&M Authorisation
S7 - Suitable for AIM Authorisation
WP - Published (Non-Contractual)
D1 - Suitable for Costing
D2 - Suitable for Tender
D3 - Suitable for Contractor Design
D4 - Suitable for manufacture/procurement

- NOTES**
1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL AND MECHANICAL DRAWINGS, DETAILS, SPECIFICATIONS AND SCHEDULES.
 2. ALL DIMENSIONS UNLESS OTHERWISE STATED.
 3. DETAILS OF COMMISSIONING, ISOLATION AND CONTROL DEVICES SHOWN ON HEATING AND COOLING SCHEMATIC AND TYPICAL DETAIL DRAWINGS.
 4. ALL COMMISSIONING / AUTOMATIC FLOW REGULATION VALVES TO BE INSTALLED WITH FINE STRAIGHT PIPE DIAMETERS UPSTREAM AND FIVE STRAIGHT PIPE DIAMETERS DOWNSTREAM OF A VALVE.
 5. ALL PIPEWORK TO BE COORDINATED WITH ALL OTHER M&E SERVICES, BUILDING STRUCTURE, FF&E LAYOUTS AND ARCHITECTURAL INTENT THE MECHANICAL CONTRACTOR SHALL ALLOW FOR ALL NECESSARY BENDS, TEES, VALVES, SUPPORTS ETC. TO ALLOW FULL COORDINATED INSTALLATION.
 6. THE MECHANICAL CONTRACTOR SHALL ALLOW FOR ALL NECESSARY BENDS, TEES, VALVES, SUPPORTS ETC. TO ALLOW A FULLY COORDINATED INSTALLATION.
 7. FLEXIBLE CONNECTIONS SHALL BE PROVIDED TO ALL TRAYS OF PLANT AND EQUIPMENT CONTAINING FANS AND PUMPS TO ISOLATE TRANSDUCANCE OF VIBRATIONS TO PIPEWORK.
 8. FIRE STOPPING SHALL BE PROVIDED TO ALL SERVICES PASSING THROUGH FIRE COMPARTMENTS.
 9. ALL HEAT RADIATOR POSITIONS WITHIN CORRIDOR SPACES TO BE REVIEWED AND COORDINATED BY ARCHITECT PRIOR TO INSTALLATION, WHERE POSITIONS VARY SUBSTANTIALLY TO THAT SHOWN AIRUP DESIGN ENGINEER TO BE ADVISED.
 10. ALL HEAT RADIATOR POSITIONS WITHIN CORRIDOR SPACES TO BE REVIEWED AND COORDINATED BY ARCHITECT PRIOR TO INSTALLATION, WHERE POSITIONS VARY SUBSTANTIALLY TO THAT SHOWN AIRUP DESIGN ENGINEER TO BE ADVISED.
 11. PIPEWORK EXPANSION REQUIREMENTS TO BE PROVIDED BY A SPECIALIST TO BE PROVIDED BY THE MECHANICAL CONTRACTOR BASED ON THEIR FINAL COORDINATED LAYOUT/CONDENSED MATERIALS PRIOR TO INSTALLATION.
 12. EXPOSED VERTICAL AND HORIZONTAL PIPEWORK WITH ROOMS SHALL BE FINISHED TO MATCH HEAT RESISTANT PAINT, COLOUR TO ARCHITECT'S SPECIFICATION.
 13. ALL LTHW PIPEWORK SHALL BE FULLY INSULATED AND CLEARLY LABELLED.
 14. ALL RADIATORS TO BE PROVIDED WITH LOCKSHED VALVES AND TAMPERS/PROOF DOUBLE REGULATING (PRE-SETTABLE) TRYS, ALL TRYS TO BE FACTORY PRE-SET TO DESIGN FLOW RATE INDICATED ON HEATING SCHEMATICS.
 15. FINAL LOCATION OF TEMPERATURE SENSORS AND THERMOSTATS TO BE CONFIRMED BY BMS CONTROLS SPECIALIST. TEMPERATURE SENSORS SHALL NOT BE INSTALLED IN POSITIONS WHERE THEY CAN BE INFLUENCED BY DIRECT SUNRADIATION.

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 Services Design
 Project Management
 Facilities Management
 Building Information Modelling
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 25 The West End Exchange Quay 2
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 0161 8776274
 www.bam.co.uk

Kirklees Cultural Heart

Food Hall Heating & Cooling Layout Upper Ground Floor - Sheet 1

Scale: 1:50 @ A0
 Date: 01.11.24
 Project: IR430321-BAM-ZZ-00-DR-M-711008

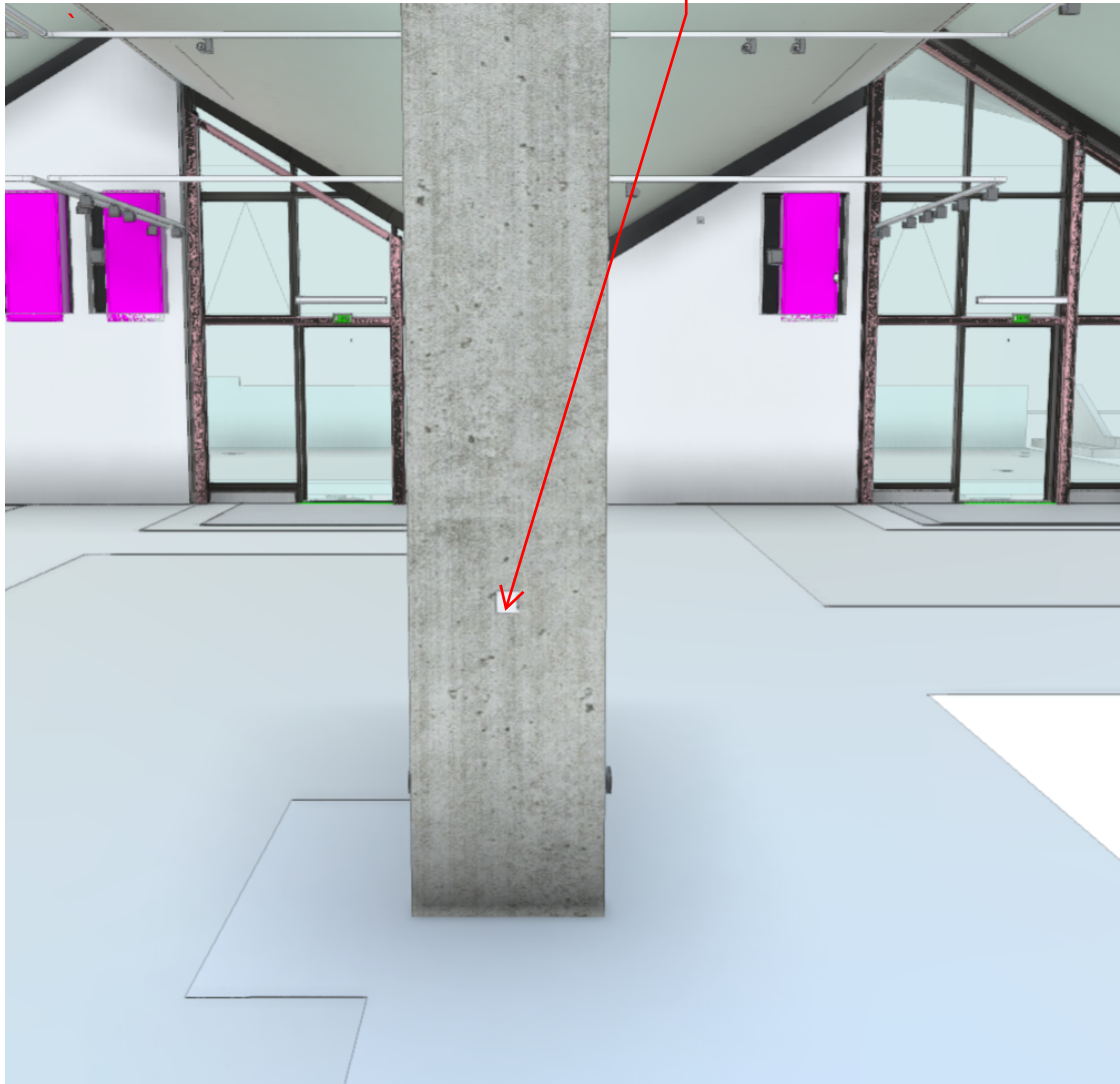
Drawn: BB
 Checked: GC
 Approved: S4

Page 26 of 26
Sheet 5
 of 8888

REV	NO	DATE	DESCRIPTION
01	01	25.11.24	PRELIMINARY ISSUE

Combined Temperature and CO2 sensor mounted on a Parabolic Column

Temp/Co2 Sensor



CO2, Temperature, Humidity Sensors

CO2/T/.. CO2, Temperature, Humidity Sensors



Description

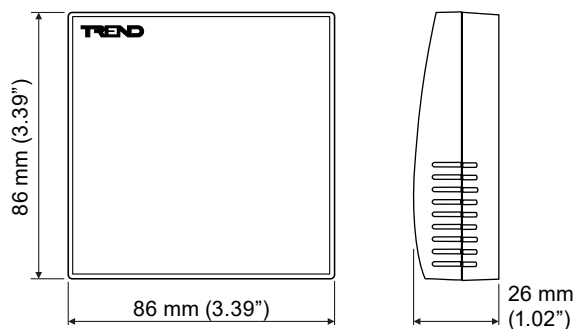
The CO2/T/.. series sensors measure the carbon dioxide concentration and air temperature. The range consists of duct and space sensors.

Space sensors have an option for humidity measurement.

Features

- High quality thermistor temperature sensor
- Humidity measuring option for space sensor
- IP67 housing (duct sensor)
- Two part terminals to facilitate wiring
- 24 Vac/dc supply
- Adjustable depth duct mounting flange option

CO2/T/..IS



FUNCTIONALITY

The CO2/T/.. series carbon dioxide and temperature sensors can be used for a wide range of HVAC applications, operating over a 0 to 2000 ppm concentration CO₂ range. The CO₂ sensor offers an accuracy of ±50 ppm +2% of measured value.

The CO2/T/D duct sensor, as a temperature working range is -20 °C to +60 °C (-4 to +140 °F) utilising a 10 kohm at 25 °C thermistor temperature sensing element. Recommended scaling is given for 0 °C to +40 °C (32 to +104 °F).

The CO2/T/..S space sensor, has temperature measurement range is 0 °C to +40 °C (32 to +104 °F) utilising a 10 kohm at 25 °C (77 °F) thermistor temperature sensing element. The output signal is 0 to 10 V corresponding to 0 to +40 °C (32 to +104 °F) with an accuracy of ±0.3 °C (±0.54 °F).

The humidity sensor option on the CO2/T/H/S has a measurement range of 0 to 95 %RH range with ±3 %RH accuracy over 30 to 70 %RH, and ±5 %RH accuracy over 10 to 90 %RH. The output signal is 0 to 10 V corresponding to 0 to 100 %RH.

INPUT CHANNELS AND SENSOR SCALING

The input channel must be set to the appropriate input type (see controller documentation for details) and the sensor type module must be set up with the correct scaling.

The recommended method of setting the sensor scaling is to use the 'Unique Sensor Reference' provided, see below for details.

The scaling parameters used by SET can be seen when the sensor type is configured. If this is not suitable you can create your own sensor scaling using SET.

Carbon dioxide concentration: The input channel used should be set for voltage (V), and sensor scaling set as below.

Controller	Unique Sensor Reference
IQ3, IQ4, IQeco, IQ2 >v2.1	C02 V
IQ1, IQ2 <v2.0	Refer to the IQ Configuration Manual (90-1533)

Temperature: The input channel used should be set for voltage (V) for CO2/T/./H/S, and Thermistor (T) for CO2/T/D, and sensor the scaling set as below.

CO2/T/./H/S

Controller	Unique Sensor Reference
IQ3, IQ4, IQeco, IQ2 >v2.1	Temp V 0+40 for value in °C Temp V +32+40 F for value in °F
IQ1, IQ2 <v2.0	Refer to the IQ Configuration Manual (90-1533)

CO2/T/D

Controller	Unique Sensor Reference
IQ3, IQ4, IQeco, IQ2 >v2.1	Thermistor HTST DT for value in °C Thermistor HTST DT F for value in °F
IQ1, IQ2 <v2.0	Refer to the IQ Configuration Manual (90-1533)

Humidity: The input channel used should be set for voltage (V), and sensor scaling set as below.

Controller	Unique Sensor Reference
IQ3, IQ4, IQeco, IQ2 >v2.1	Humidity V
IQ1, IQ2 <v2.0	Refer to the IQ Configuration Manual (90-1533)

INSTALLATION

CO2/T/..S

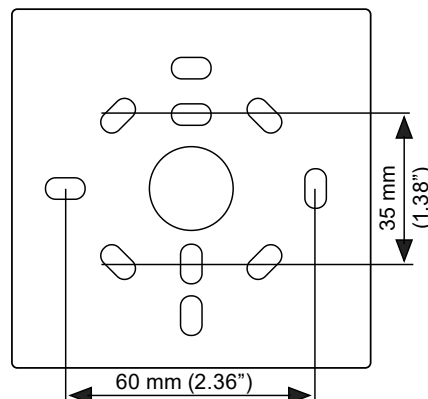
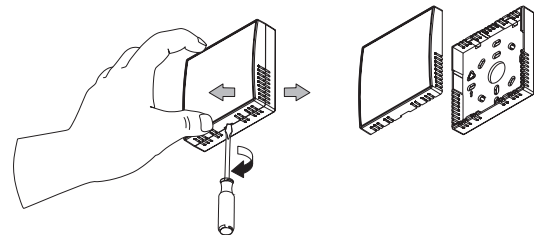
The sensor housing consists of a front panel and a backplate. The backplate can be separated from the front panel by inserting a screwdriver in the bottom slot and twisting.

Choose an accessible location for the sensor where the surrounding air temperature is representative of the room. The backplate is designed so that it can be mounted on a back box or a standard recessed wall box, or surface mounted with mini-trunking by using a knockout in one of the sensor's side walls.

The installation involves:

- Choosing location
- Mounting sensor (via two screws - minimum)
- Connecting terminals
- Assembling sensor unit
- Setting up IQ input channels to voltage (V) for CO2 concentration, temperature, and humidity (if option fitted).
- Configuring IQ sensor modules
- Testing

Full installation details are given in the CO2/T/..S Installation Instructions (TG201171).



CO2/T/D

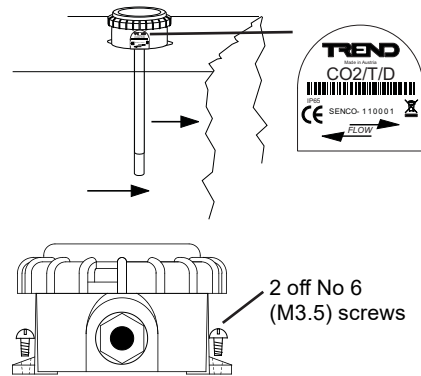
Choose an accessible location where the sensor element will lie in the airstream to be measured. Ensure that there is no stratification in the airstream being measured (i.e. downstream of mixing dampers, heating coils, cooling coils). Mount the probe in the duct by screwing the sensor box directly onto the duct. It should be mounted in the orientation indicated on the label on the side of the unit so that the air flows into and out of the inlet/outlet slots. The probe requires a 15 mm (0.59") hole cut into the duct. The sensor box may be screwed directly to the duct using 2 screws at 85 mm (3.35") centres. The installation involves:

- Choosing location
- Drilling sensor probe hole
- Drilling fixing holes
- Mounting sensor on prepared location
- Removing sensor lid
- Feeding IQ cables through gland
- Wiring cables
- Replacing sensor lid
- Setting up IQ input channels to voltage (V) for CO₂ concentration and to thermistor (T) for temperature.
- Configuring IQ sensor modules
- Testing sensor

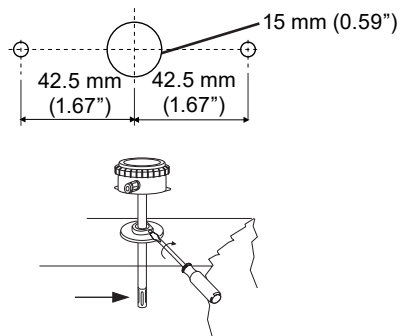
The optional mounting flange enables the probe depth to be adjusted by tightening the flange clamp to secure the position. It is screwed to the duct using 4 off screws at 45 mm (1.77") centres.

Full installation details are given in the CO2/T/D Installation Instructions (TG201170).

Direct Mounting



Flange Mounting



COMPATIBILITY


When connecting to an IQ4 controller the following limits apply if the IQ4 is to provide power. If the sensor is powered from a separate power supply these limits do not apply.

Controller	Max No of CO2 sensors
IQ41x	0
IQ422/24V	1
IQ422/230V	3
IQ4E/230V	6

ORDER CODES

- CO2/T/D** Duct carbon dioxide concentration and temperature sensor
- CO2/T/S** Space carbon dioxide concentration and temperature sensor
- CO2/T/H/S** Space carbon dioxide concentration, temperature, and humidity sensor
- ACC/FLANGE/12MM/5** Adjustable depth, duct mounting flange - pack of 5

DISPOSAL



WEEE Directive:

At the end of their useful life the packaging and product should be disposed of by a suitable recycling centre.

Do not dispose of with normal household waste.
Do not burn.

SPECIFICATIONS

CO₂ MEASUREMENT

Working range	:0 to 2000 ppm CO ₂ concentration
Signal	:0 to 10 V for 0 to 2000 ppm into >10 kohm
Accuracy	:±(50 ppm + 2% of measured value) at 23 °C (73.4 °F) and 1013 mbar
Temperature influence	:2 ppm/°C at 0 ppm typical
Pressure influence	:1 ppm/1 mbar at 1000 ppm approx. (physical effect)
Resolution	:0.2 ppm (internal 15 bit)
Long-term stability	:20 ppm/year typical
Response time	:t ₉₀ <= 250 s

TEMPERATURE MEASUREMENT

Working range	:-20 to +60 °C (-4 to +140 °F)
Sensing element	:Trend standard thermistor 10 kohm at 25 °C (77 °F)
Signal	
CO2/T/D	:thermistor (resistance)
CO2/T/..S	:0 to 10 V for 0 to +40 °C (32 to 104 °F) into >10 kohm
Accuracy	
CO2/T/..S	:±0.3 °C (±0.54 °F) at 23 °C (79 °F) and 1013 mbar with 24 Vdc supply (±0.55 °C, ±1 °F with 20 to 28 Vdc supply)
Resolution	
CO2/T/..S	:0.005 °C, 0.009 °F (internal 15 bit)

HUMIDITY MEASUREMENT (CO2/T/H/..S only)

Working range	:0 to 95 %RH (non condensing)
Signal	:0 to 10 V for 0 to 100 %RH into >10 kohm
Accuracy	:±3 %RH over range 30 to 70 %RH, ±5 %RH over range 10 to 90 %RH, both at 23 °C (79 °F) and 1013 mbar
Resolution	:0.01 %RH (internal 15 bit)

ELECTRICAL

Power input voltage	:24 Vdc (15 to 35 Vdc), 24 Vac (±20%)
Power input current	:13 mA dc typical (while not measuring) 350 mA dc at 23 °C (77 °F) for 350 ms (during measurement)

MECHANICAL

Material CO2/T/D	
Enclosure	:Impact resistant ABS
Probe	:Polycarbonate (flammability HB)
Filter	:PTFE membrane filter
Duct mounting flange	:Polycarbonate (flammability HB)
Material CO2/T/..S	
Enclosure	:Flame retardant (V0) ABS
Dimensions CO2/T/D	
Duct probe	:258 mm, 10.16" (including filter) x 12 mm, 0.75" (diameter)
Head	:105 mm (4.13") x 57 mm (2.24") x 97 mm (3.82")
Fixing centres	:85 mm (3.35")
Dimensions CO2/T/..S	:86 mm (3.39") x 86 mm (3.39") x 26 mm (1.02")
Weight	
CO2/T/D	:200 g approximately
CO2/T/..S	:150 g approximately
Connections	:2 part 6 pole screw terminals for 0.2 mm ² to 1.5 mm ² cross section area (24 to 16 AWG) cable

ENVIRONMENTAL

Protection	
CO2/T/D	:IP65 except filter cap and air inlet/outlet
CO2/T/..S	:IP20
CE compatibility	:EN61326-1, EN61326-2-3
Storage Temperature	:-20 to +60 °C (-4 to +140 °F)
Humidity	:0 to 95 %RH, non condensing

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