

TunnelTech 205

Road Tunnel Atmosphere Monitoring Systems

NO₂ Air Quality Monitor

- Continuous measurement of NO₂ in road tunnels
- High accuracy down to low ppb levels
- Rugged, corrosion resistant construction
- Minimal maintenance requirements, low cost of ownership
- PC based software for commissioning and maintenance
- Optional RS485 (MODBUS) Output
- Auto zero and span check by audit gas



TunnelTech 205 - NO₂ Air Quality Monitor

The CODEL TunnelTech 205 NO₂ Air Quality Monitor is a highly efficient transmissometer configured for the continuous measurement of Nitrogen Dioxide in road tunnel atmospheres. This extremely stable and reliable monitor incorporates a high-power blue LED to utilise the capacity of nitrogen dioxide to absorb UV and blue light to provide accurate readings in parts per billion.

NO₂ is produced naturally by the combustion processes within the internal combustion engine and is emitted from the exhausts of all types of vehicles. NO₂ is also particularly toxic and prolonged exposure to levels as low as a few hundred parts per billion will have a detrimental effect on human health. There is a growing international requirement to measure and limit the levels of NO₂ within road tunnels to reduce the exposure of tunnel users to this toxic gas.

The TunnelTech 205 NO₂ Air Quality Monitor utilises a very accurate measurement technique as UV and blue light are highly absorbed by NO₂. The TunnelTech 205 is a precision transmissometer which measures the attenuation of UV and blue light by NO₂ in the tunnel atmosphere. The light source is a near infrared LED where the interfering effects of particulate in the atmosphere are eliminated by making the measurement within a metre long diffusion cell into which the atmospheric gases, but not the particulate, can freely diffuse.

The result is a very accurate and stable sensor having no moving components and requiring no maintenance throughout its lifetime. Even the optic surfaces remain clean because they are contained within the diffusion cell which prevents the deposition of dirt on them. The filters through which the gas diffuses do not become blocked because the diffusion process exerts no forces on particulate to force them into the filter pores.

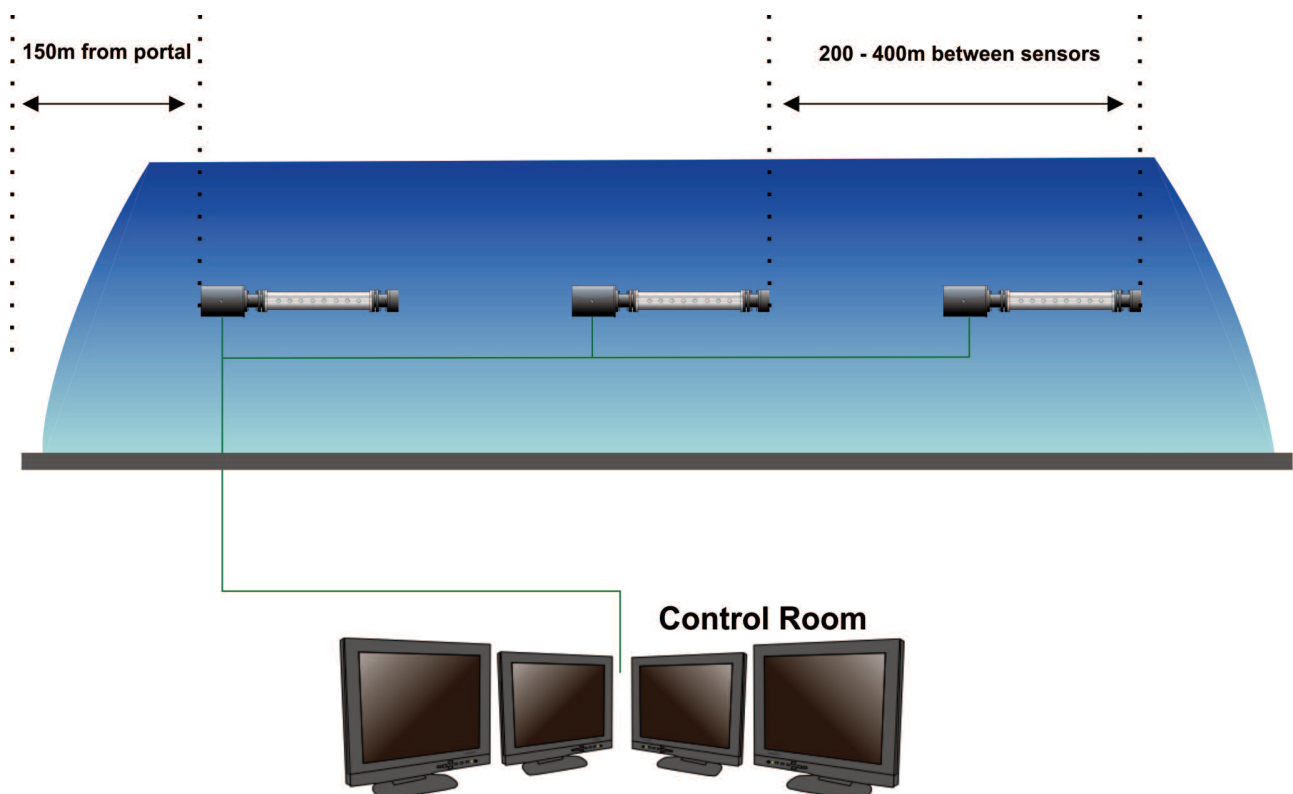
Fully configurable analogue and alarm outputs are generated inside the Station Control Unit (SCU) which are fully configurable via the supplied CODEL TunnelTech Software. In addition there is a choice of either RS232 or RS485 outputs which can be utilised to deliver MODBUS protocol to a SCADA system located in the tunnel control centre.

CODEL's tunnel sensor range is further extended by additional sensors for the measurement of NO₂ and tunnel airflow.

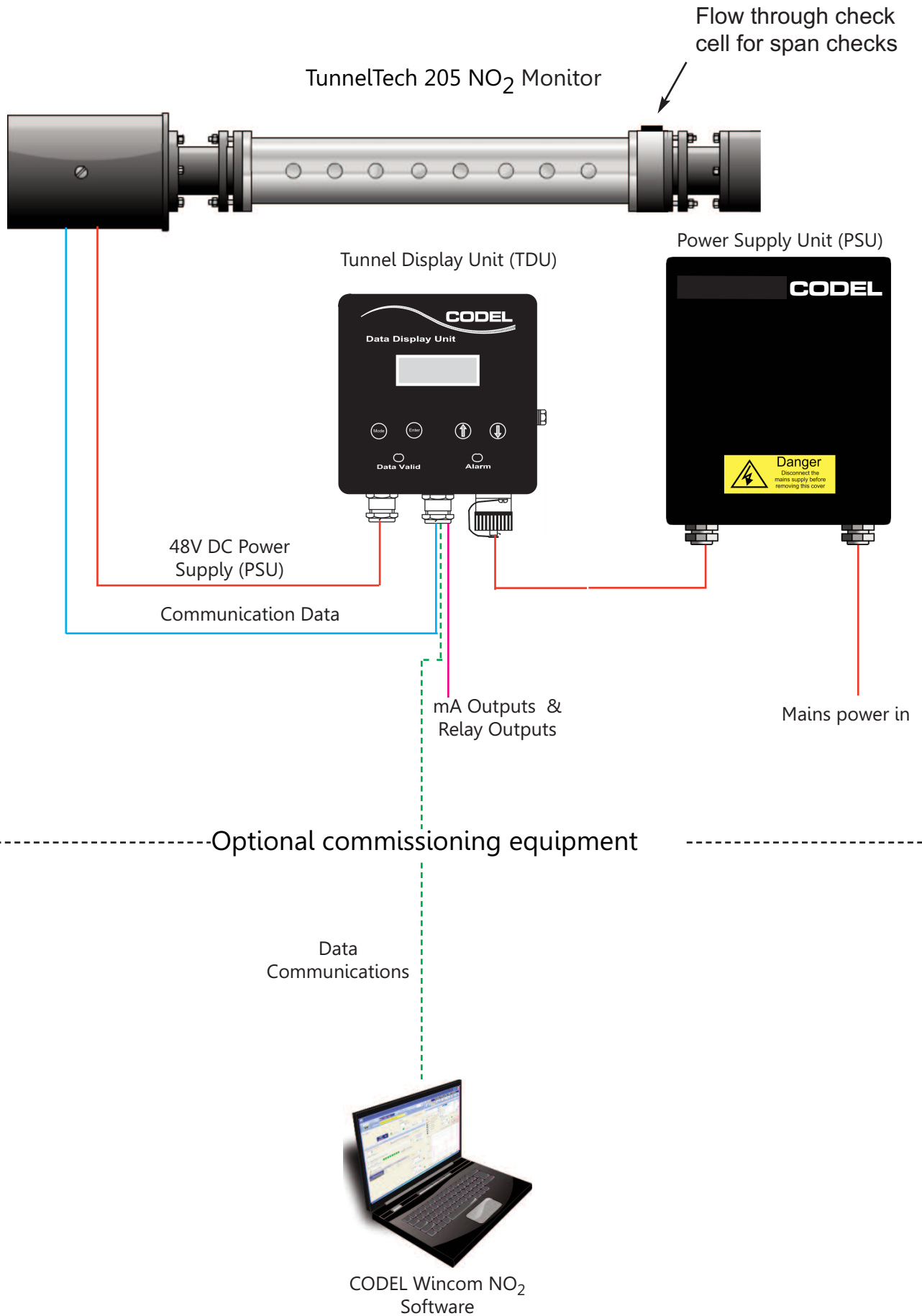
Please see these additional product data sheets:-

TunnelTech 301/2 Air Flow Monitors - For the measurement of wind speed and direction

TunnelTech 201 Air Quality Monitor - For the measurement of Carbon Monoxide, Nitric Oxide & Visibility



TunnelTech 205 - NO₂ Monitor - System Arrangement



TunnelTech Software

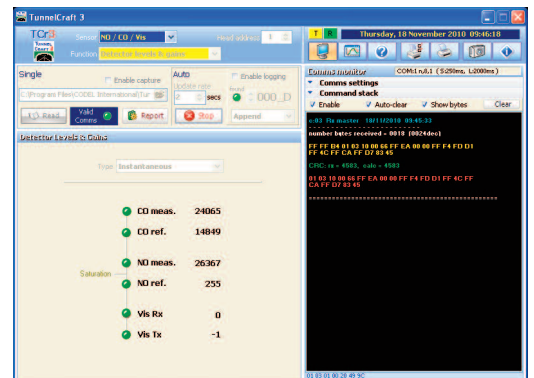
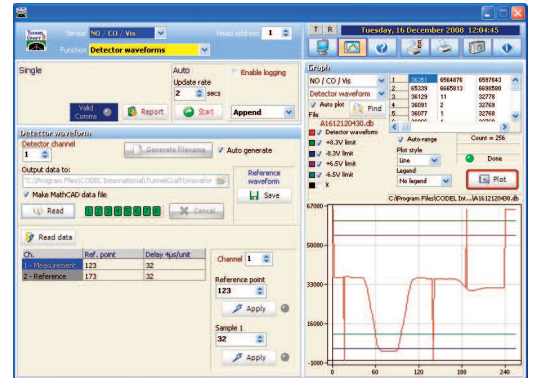
- Easy installation and set-up
- Will operate on any Windows based operating system
- User friendly Alignment Mode to aid initial set-up and optical alignment
- Allows sensor configuration settings to be adjusted
- Fault diagnostic logging for sensor troubleshooting

TunnelTech Software is supplied with all CODEL Tunnel Sensor's as standard for the purpose of commissioning and maintenance of the sensors. With simple installation and set-up routine to any Windows based laptop PC, the program takes only minutes to load and configure and comes with a comprehensive on-board help feature.

The software enables the sensor's complete data and control functions to be accessed via a laptop from the Station Control unit (SCU) using an RS485 cable supplied with the sensor.

Zero calibrations and span checking (using a CODEL sealed Check Cell or Flow Through Check Cell) can be initiated via the software after commissioning or a maintenance period. Should it be necessary to alter the initial factory-set current and relay output configuration then this can also be carried out with ease.

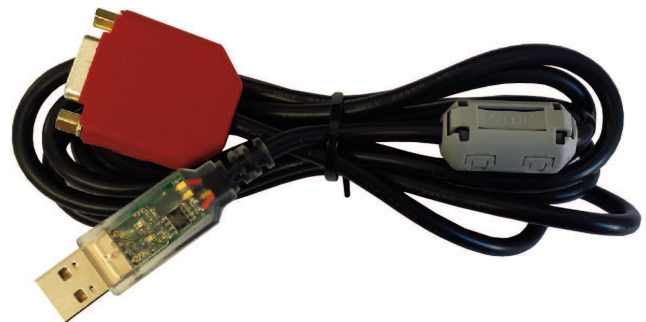
For maintenance, the software includes short-term logging and trending of diagnostic data for fault analysis.



Communication Interfaces

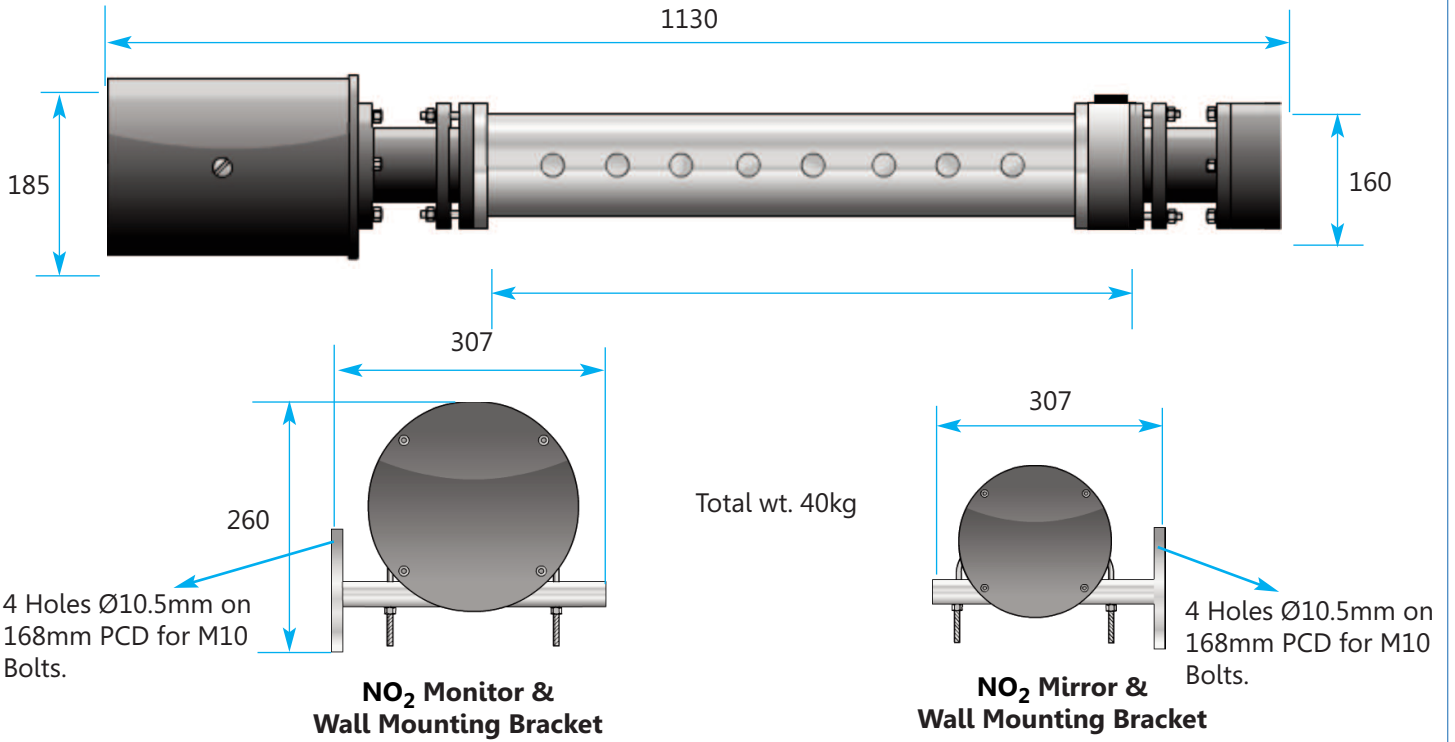


RS232 Unit

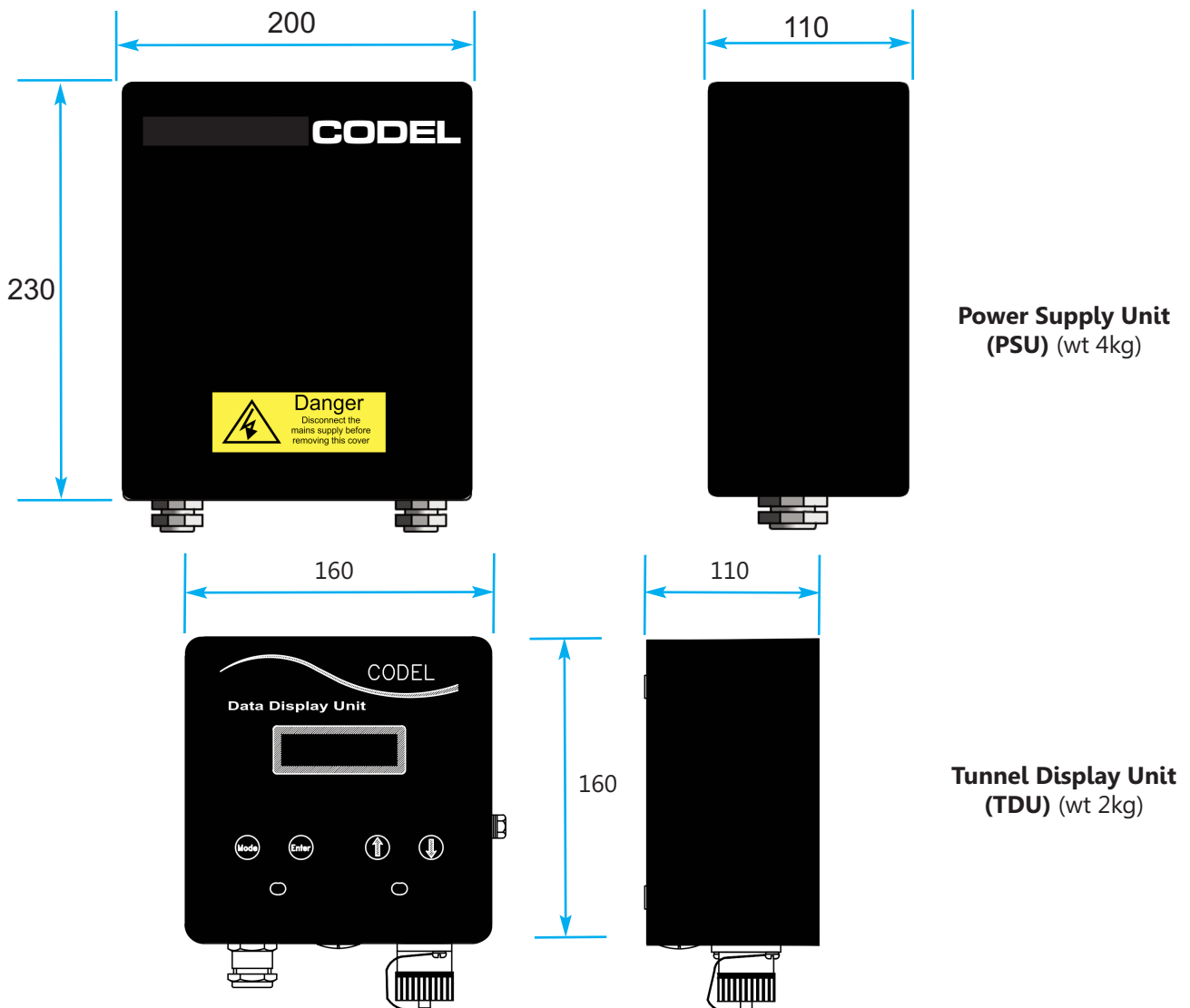


RS485 Unit

TunnelTech 205 - Overall Dimensions - NO₂ Monitor



Overall Dimensions - Power Supply Unit & Tunnel Display Unit (Optional)



Note: All dimensions are in mm

TunnelTech 205 NO₂ - Technical Specification

Sensor Unit

Measurement	NO ₂ - Nitrogen Dioxide
Measuring units	ppb (Parts Per Billion)
Measurement Principle	Specific absorption of blue light
Light Source	Blue LED
Measurement Path	1m Chamber (2m folded beam)
Measurement Range	0 - 1ppm standard, configurable up to 0 - 5ppm
Accuracy	+/- 0.04ppm
Detection Limit	+/- 0.01ppm
Linearity	Fully linear
Drift	No drift as there is a zero calibration every 24 hours
Response Time	Less than 200 seconds
Data Refresh	1 second
Ambient Temperature	-20 to +50°C
Power Supply	48V DC, 50VA from Station Control Unit (SCU)
Construction	Measurement Chamber - 316L stainless steel, Sensor - Epoxy coated aluminium
IP Rating	IP67
EMC	89/336/EEC directive compliant
Low Voltage	73/23/EEC directive compliant

Communications & Outputs

Analogue outputs	2 x 4-20mA, 200V common mode isolation, maximum load 500Ω
Logic	2 x volt-free contacts SPCO, 0.25A @ 125V AC, 1A @30V DC, 0.25A @ 100V DC
Communications Port	Via CODEL serial digital data bus

Services

Power	Mains 110/230 VAC single phase 50/60 hz
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Optional Items

Flow Through Check Cell	NO ₂ span check using bottled audit gases
Tunnel Display Unit	For local display of sensors outputs
Serial Data	RS485 Modbus Protocol

Distributor

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CODEL International Ltd
Station Building
Station Road
Bakewell
Derbyshire
DE451GE
United Kingdom

Tel : +44 (0)1629 814351
Fax : +44 (0)8700 566307
Web : www.codel.co.uk
Email : sales@codel.co.uk