

## TunnelTech 205 - NO<sup>2</sup> Air Quality Monitor

The TunnelTech 205 NO<sup>2</sup> 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.



- ✓ Continuous measurement of NO<sub>2</sub> 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 & maintenance
- ✓ Auto zero & span check by audit gas

ISO 9001:2015  
Quality Certification

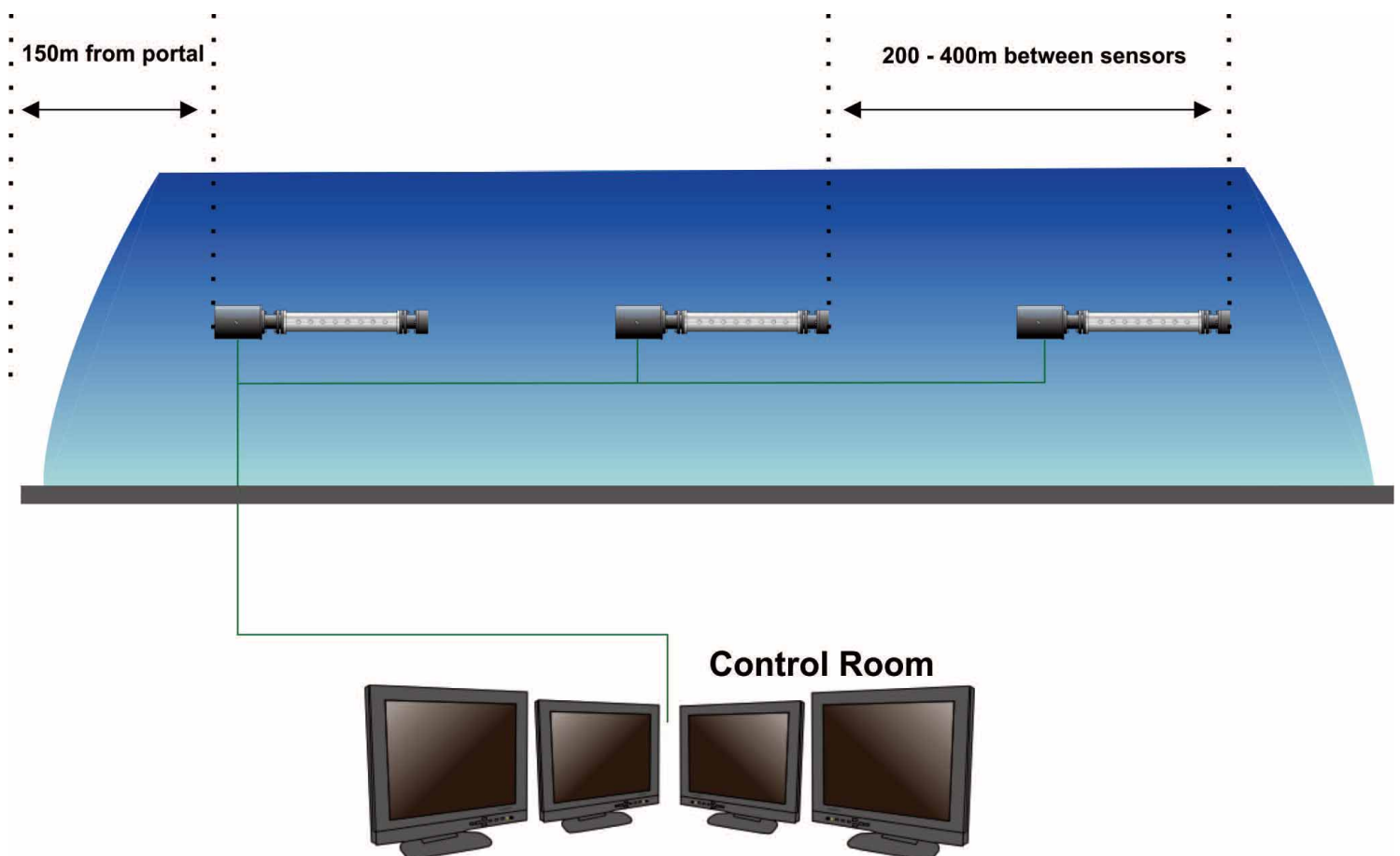
ISO 14001:2015  
Environmental Certification

NO<sub>2</sub> is produced naturally by the combustion processes within the internal combustion engine and is emitted from the exhausts of all types of vehicles. NO<sub>2</sub> 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 NO<sub>2</sub> within road tunnels to reduce the exposure of tunnel users to this toxic gas.

The TunnelTech 205 NO<sub>2</sub> Air Quality Monitor utilises a very accurate measurement technique as UV and blue light are highly absorbed by NO<sub>2</sub>. The TunnelTech 205 is a precision transmissometer which measures the attenuation of UV and blue light by NO<sub>2</sub> 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 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 NO<sub>2</sub> and tunnel airflow.



Designed exclusively for road and rail tunnel applications building on years of experience and proven technology.

Fully configurable analogue and alarm outputs exportable to the tunnel data acquisition system provide real-time CO and NO data.

## Class leading Accuracy, Repeatability and Resolution

### The TunnelTech 205



- Easy installation and set-up
- Will operate on any Winows 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

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Fully configurable analogue and alarm outputs are exportable to the tunnel data acquisition system to provide real-time visibility data.

This data may also be exported via the optional RS485 serial port which delivers MODBUS RTU encoded data to a SCADA system located in the tunnel control centre and/or a local display module.

In addition, IP65 rated enclosures are constructed to resist attack from aggressive gases, road salt and the effects of heat. In areas where extremely low temperatures may be experienced, optional transmitter and receiver insulation jackets are available to reduce the effect.

# Technical Specification

## Sensor Unit

Measurement	NO <sub>2</sub> - Nitrogen Dioxide
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 0m - 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°
Power Supply	48V DC, 50VA from Station Control Unit (SCU)
Construction	Measurement Chamber - 316L Stainless Steel, Sensor - Epoxy coated aluminium

## Compliances

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

Flow Through Check Cell	NO <sub>2</sub> span check using bottled audit gases
Tunnel Display Unit	Tunnel Display Unit
Serial Data	RS485 Modbus Protocol

CODEL International LTD  
Unit 4  
Station Road  
Bakewell  
Derbyshire, DE45 1GE

Tel : +44 (0)1629 814351  
Fax : +44 (0)1629 566307  
Web : [www.codel.co.uk](http://www.codel.co.uk)  
email : [Sales@codel.co.uk](mailto:Sales@codel.co.uk)



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