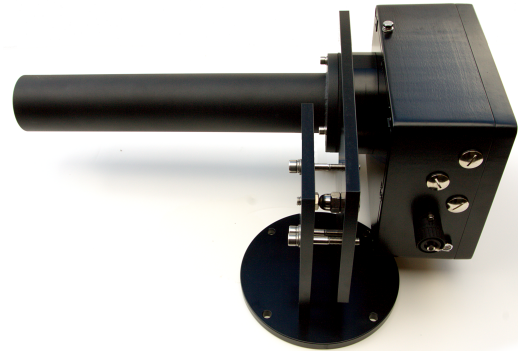# CODEL
A Forbes Marshall Company

TunnelTech 202 - CO and Visibility Monitor

The TunnelTech 202 Air Quality Monitor is an essential part of any road or rail tunnel safety system. It monitors the atmosphere within the tunnel and ensures that the tunnel ventilation systems provides sufficient clean air to protect tunnels users health and for drivers to clearly see the road ahead.

The TunnelTech 202 analyser uses well proven infra-red techniques to determine CO concentration and optical attenuation to monitor visibility levels.

✓ Continuous measurement of CO and Visibility in road and rail tunnels.

✓ Class leading Accuracy, Repeatability and Resolution

✓ Rugged, corrosion resistant construction

✓ Minimal maintenance requirements

✓ PC based software for commissioning & maintenance

✓ Optional RS485 (Modbus) Output

ISO 9001:2015
Quality Certification

ISO 14001:2015
Environmental Certification

Monitoring Solutions

TunnelTech

www.codel.co.uk

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 cold smoke data.

Class leading Accuracy, Repeatability and Resolution

The TunnelTech 202

- 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

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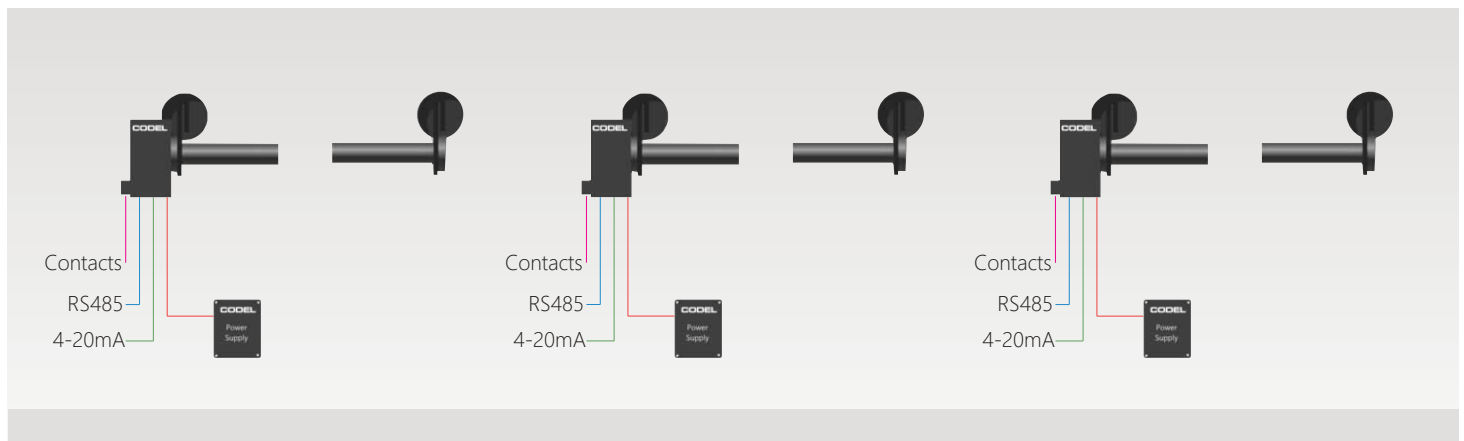
As there is only one moving part, reliability levels are very high and maintenance requirements are extremely low. The sight tubes have been designed to ensure that airborne dust and contaminants do not reach the optical windows and cause drift.

Fully configurable analogue and alarm outputs are exportable to the tunnel data acquisition system to provide real-time CO and Visbility 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.
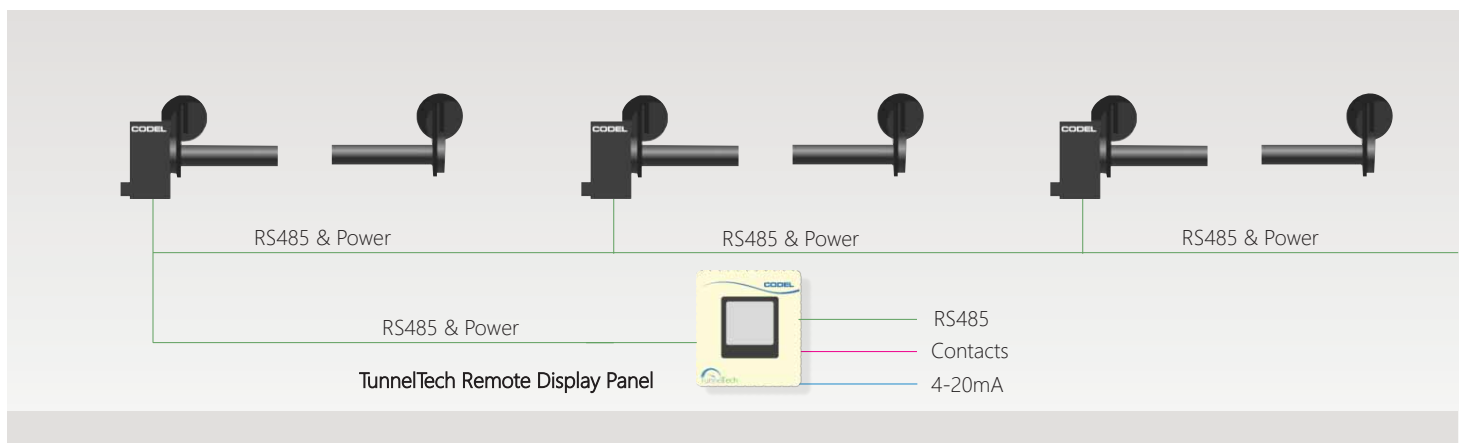
In addition, IP65 rated enclosures are constructed to resist attack from aggressive gases, road salt and the effects of heat.

In areas where extremely low temperatures may be experienced, optional transmitter and receiver insulation jackets are available to reduce the effect.

System Layout Option 1 - Stand-alone systems

Contacts
RS485
4-20mA
Power Supply

Contacts
RS485
4-20mA
Power Supply

Contacts
RS485
4-20mA
Power Supply

System Layout Option 2 - Integrated package

RS485 & Power

RS485 & Power

RS485 & Power

RS485 & Power

TunnelTech Remote Display Panel

RS485
Contacts
4-20mA

Technical Specification

Sensor Unit

Gas Species Options	Single or multi-gas measurements available: CO & Visibility		
Measuring Units	ppm for CO, m^{-1} or m for visibility		
Path Length	3m (6m folded beam)		
Calibration	Automatic zero calibration - manual span check by sealed check cell		
Measurement	Carbon Monoxide (CO)	Visibility	
Measurement Technique	Infrared Gas Cell Correlation	Optical Transmissivity	
Measurment Range (Typical*)	CO 0 -100ppm	0 - 0.015m^{-1}	
Accuracy	CO +/- 1ppm or 2% of span	Vis +/- 0.0002 m^{-1}	
Resolution	CO +/- 1ppm	Vis +/- 0.0001 m^{-1}	
Response Time	CO Seconds Minimum	Vis 10s - 2 min selectable	
Ambient Temperature	-20^{0}C to +50^{0}C		
Power Supply	12V DC, 20 VA from separate power supply. Optional 24V DC available upon request.		
Construction	Corrosion resistant epoxy coated aluminium housing sealed to IP66		

*Other measurement ranges available on request

Compliances

EMC	EN61326-1:2006 & EN50270:2006 directive compliant
Low Voltage	73/23/EEC directive compliant

Communications & Outputs

Analogue Outputs	3 x 4-20mA current outputs as standard, isolated, 500Ω maximum load, fully configurable through TunnelTech software.
Relay Outputs	3 x volt-free SPCO contacts, 50V, 1A maximum load, configurable as alarm contacts.
Communications Port	For local connection to laptop PC using RS232 or optional RS485 interface unit.

Services

Power	12V DC @ 1.5A/24V @ 2.5A

Optional Items

Power Supply	90/264V AC, 47-63Hz, 60W 12V DC @ 5A (or 24V DC @2.5A)
Check Cell Holder	For manual span check using sealed check cell
Sealed Check Cell	CO & Visibility span check optical cell
Tunnel Display Unit	For local display of sensors outputs
Serial Data	RS485 Modbus Protocol

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TunnelTech

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