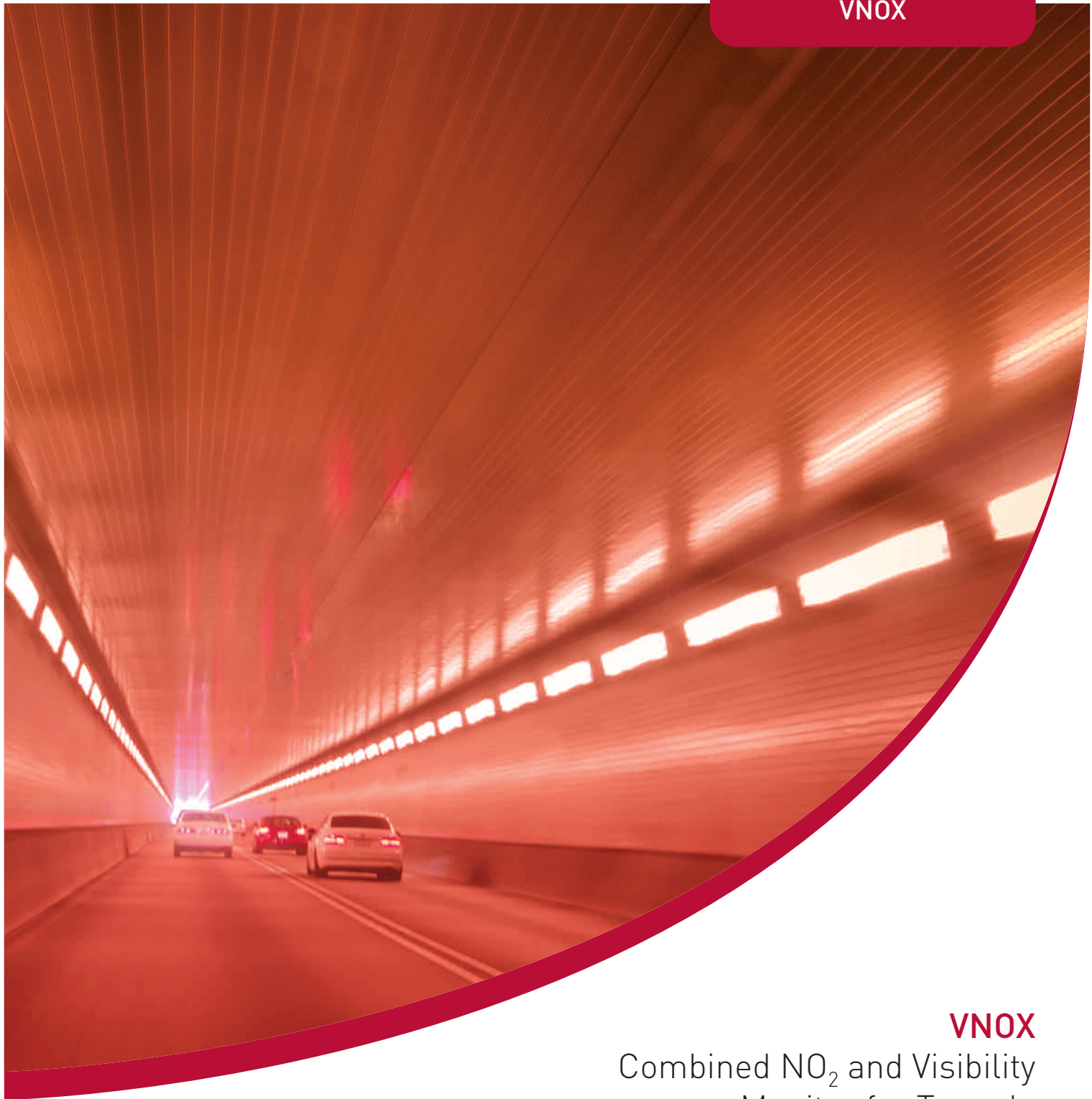


VNOX



VNOX
Combined NO₂ and Visibility
Monitor for Tunnels



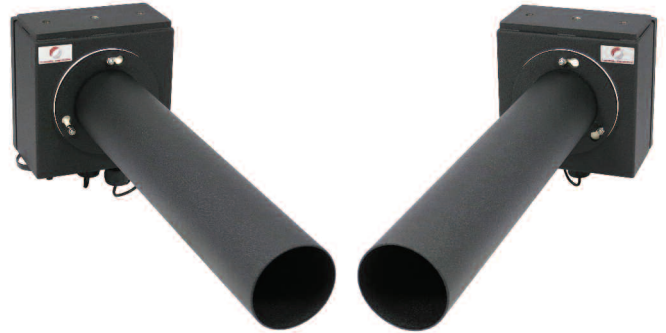
TUNNEL SENSORS

VNOX

Combined NO₂ and Visibility Monitor for Tunnels

FEATURES

- Direct optical measurement of nitrogen dioxide (NO₂) using differential absorption
- Visibility measurement using the widely accepted light transmission opacity technique
- Temperature and humidity compensated measurements, with data output available
- IP65 rated external enclosure supplied with quick release dust protection tubes and wall mounting brackets
- Intelligent analyser with optional TSCU operator interface
- Choice of interface options enabling easy integration into tunnel control system



BENEFITS

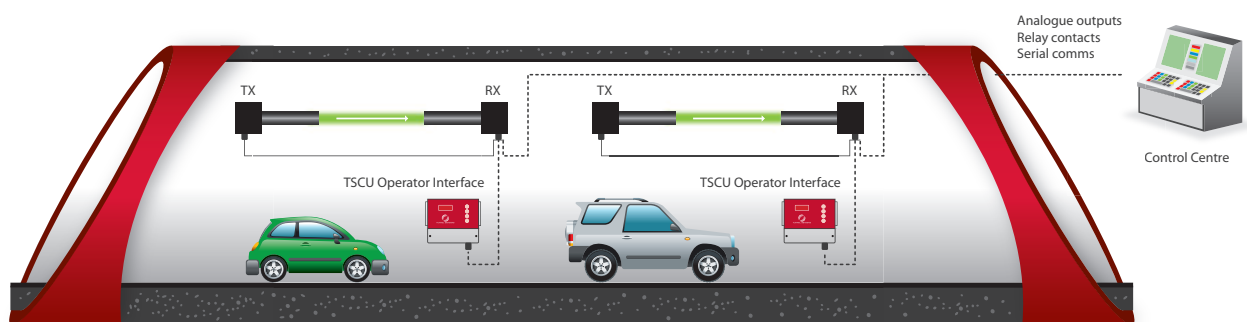
- Designed specifically for in-situ monitoring in tunnels
- Rugged design to withstand corrosive atmosphere and regular tunnel washing
- Plug and socket cable connection enabling simple installation
- No moving parts and low maintenance requirements
- Suitable for right or left hand hanging to enable compliance with regulations governing tunnel light emissions facing on-coming traffic

APPLICATIONS

The VNOX tunnel monitor uses differential optical absorption to measure nitrogen dioxide (NO₂) in tunnel atmospheres and makes a visible opacity measurement to determine the visibility within the tunnel. These measurements can be used as part of an air quality management system for ventilation control and/or secondary smoke detection within a traffic tunnel, rail tunnel or other confined space.

OPERATION

The VNOX sensor consists of a Transmitter (TX) and Receiver (RX) mounted “facing” each other on the wall or ceiling of a tunnel. The TX emits two optical beams; Green and Violet. The NO₂ absorbs the Violet light more strongly than the Green and this differential absorption is used to determine the amount of NO₂ in the optical path. Using this dual wavelength technique makes the VNOX less sensitive to the effects of drift and false readings due to the presence of dust or other particulates in the optical beam. The visibility is measured by the standard light transmission opacity technique using the Green optical beam.



SYSTEM COMPONENTS

- VNOX sensor consisting of Transmitter (TX) and Receiver (RX)
- LSZH cable with connectors for connecting the RX and TX
- Power-Comms cable for the RX, made to suitable length (required accessory)
- Integrated wall mounting brackets
- PC based utility software package for set-up and control of the instrument
- Optional TSCU operator interface with remote or local mounting configurations
- Optional variable input AC power supply
- Optional reference filters for routine calibration check of the instrument

TECHNICAL SPECIFICATION

NO₂ MEASUREMENT PERFORMANCE

Parameter	Comment
Measuring Principle	Differential optical absorption
Measurement Reading	Concentration in ppm or ppb (user selected)
Measuring Range	0 – 10 ppm (user configurable)
Path Length	5 – 11 m (10 m optimum)
Accuracy	+/- 0.05 ppm (at 10 m optimum path length) +/- 5 % (absolute)

VISIBILITY MEASUREMENT PERFORMANCE

Measuring Principle	Light transmission
Measurement Reading	Transmission Extinction Coefficient (k) Meteorological Optical Range (MOR) Opacity
Measuring Range	
Transmission	0 – 1.000
Extinction Coefficient (k)	0 – 0.1000 m ⁻¹
Meteorological Optical Range (MOR)	0 – 15,000 m
Opacity	0 – 100 %
Accuracy	+/- 1% as opacity

POWER REQUIREMENTS

Voltage	+24 Vdc
Nominal Current Consumption	300 mA
Power Up Current Consumption	300 mA

INTERFACE OPTIONS

Serial Comms	ModBus RTU via RS485 External USB
Analogue Outputs	0 / 2 / 4 – 20 mA (isolated and scalable)
Digital Relay Contacts	3A @ 30 Vdc (level alarms and data valid alarm)

PHYSICAL

Ambient Operating Temperature	-20 – +55 °C
Ambient Operating Humidity	0 – 100 %
Ingress Protection	IP65 for external use
Materials	Powder coated stainless steel
Dimensions (incl. dust tube)	499 x 158 x 197 mm (each measuring head)
Weight	
TX Head (excl. dust tube)	2.4 kg
RX Head (excl. dust tube)	2.5 kg

Tunnel Sensors

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TUNNEL SENSORS

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