

Tunnel Atmosphere Monitoring

TunnelMaster Air Quality Monitor for NO₂

The monitor consists of an optical transceiver unit which incorporates a high-power blue LED as a light source. Light modulated at high frequency is focused by a lens down a sample chamber to a mirror unit, which reflects the beam back along the chamber to the transceiver where it is focused onto a high-sensitivity optical detector. Sintered filters in the measurement chamber allow gases from the tunnel atmosphere to diffuse into the chamber while inhibiting the passage of particulates. The light beam and optical components are thus always operating in a clean gas environment, eliminating the absorbing effects of particulates from the measurement and removing any requirements to clean the optical surfaces. The sintered filters, because of the use of a diffusion mechanism, do not become blocked with particle deposits and do not need cleaning.

During operation, air from the tunnel atmosphere is continuously drawn through the main housing by the exhaust fan. This air diffuses into the measurement chamber where the transmissometer measures the specific absorption of the blue light by NO₂ and computes the concentration of NO₂ in ppb in the tunnel atmosphere. Digital output data from the transmissometer is transmitted serially every second, to the SCU, from where the final outputs are developed.

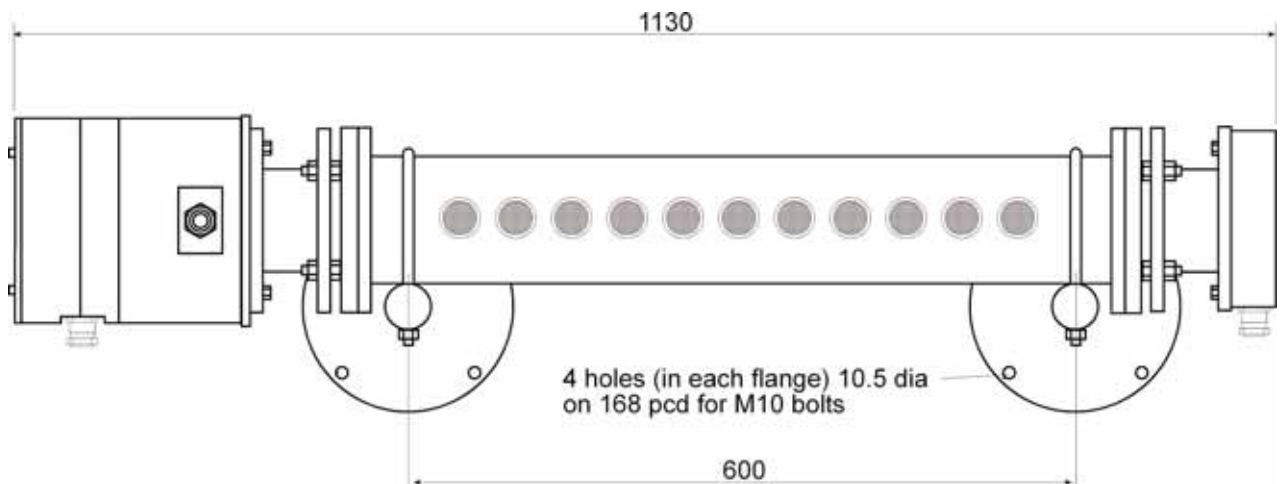
- designed to withstand the harshest of tunnel environments
- precision of +/-40ppb
- range 1000ppb
- routine maintenance limited to annual cleaning of optical surfaces
- modular construction ensures simple installation and cabling
- IP68 ingress protection



Total Solutions - Total Confidence



Overall Unit Dimensions



Specification

AirQuality Monitor

Measurement- specific absorption of blue light
Principle

Measurement- 1m chamber (2m folded beam)
Path

Measurement- 0 - 1000ppb
Range other ranges selectable on set-up

Accuracy - ± 40 ppb

Resolution - 10ppb

Response - 10 minutes
Time

Light Source - blue LED, wavelength 470nm

Power - monitor - 48V DC, 50VA from SCU
- SCU - 76/265V AC, 50/60Hz,
200VA max.

Ambient - -20 to +50°C
Temp. Range

Construction

Measurement- 316L stainless steel
Chamber

Instrument - corrosion resistant epoxy coated
Housings aluminium, sealed to IP68

Communications

Comms. - via CODEL serial digital data bus

Compliances

EMC - 89/336/EEC directive compliant

Low Voltage - 73/23/EEC directive compliant

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