LaserGas™
neo monitors as

LaserGas™ Open Path monitor

- Data sheet

The LaserGas II Open Path (OP) monitor from NEO Monitors AS is a compact, high performance gas monitor for ambient long distance monitoring. Based on the well-proven tuneable diode laser (TDLAS) technology the instrument has a number of unique features:

- **Up to 500 m measurement path**
- **Response time down to one second**
- **No cross interference from other gases**
- **Very low detection limits (ppb and low ppm)**
- **Unaffected by fog or rain down to <1% transmission**
- **Low cost of ownership**
- **Ethernet connection**
- **Portable, battery powered version available**

The monitor consists of a transceiver and retro-reflector unit, which are both suitable for outdoor use. Different path lengths between 1 and 500 m are easily measured by entering the selected distance (automatic phase correction included in hardware). As an option a portable, battery powered version of the LaserGas II OP is available containing a control keypad and a flash memory for data logging.

Measuring principle

Unlike conventional UV or IR spectrographic instruments, LaserGas II monitors employ the measurement principle known as 'single line spectroscopy', which eliminates cross interference from other gases. A single gas absorption line with no interference is chosen in the near IR spectral range and scanned by a single-mode diode laser. A retro-reflector located opposite to the laser reflects the light back to the transceiver. A detector collects the returned light for further analysis and calculation of the gas concentration.

Installation and Operation

The LaserGas II OP monitor is easy to install using a special x/y alignment platform or tripod for the transceiver and rigid platform or tripod for the retro-reflector. A visible aiming laser and sighting optics simplify alignment even over long distances. For installation in hazardous areas an ATEX approved EEx P solution is available. The instrument contains no moving parts, thereby limiting preventive maintenance to visual inspection and cleaning of optical windows. A fan is advisable in rough industrial environments to prevent dust from fouling the optical windows. Calibration checks are recommended every 6 – 12 months, only.

Main applications

The LaserGas II OP monitors play an important role in continuous emission monitoring across a wide range of industrial applications. The following are some of the most typical applications:

- **Monitoring of production halls (e.g. Aluminium smelters)**
- **Leak detection**
- **Gas fencing in the proximity of industries**
- **Fire protection**
- **Monitoring of traffic exhaust**

Technical Data LaserGas™ II Open Path Monitor

Table of Gases

Gas	Detection limit	Min meas. range
NH_3	0.008 mg/m³	0 – 1 mg/m³
HCl	0.003 mg/m³	0 – 0.3 mg/m³
HF	0.001 mg/m³	0 – 0.1 mg/m³
H_2S	0.15 mg/m³	0 – 15 mg/m³
H_2O	0.002 mg/m³	0 – 0.2 mg/m³
CO	1.5 mg/m³	0 – 15 mg/m³
NO	0.5 mg/m³	0 – 50 mg/m³
N_2O	0.25 mg/m³	0 – 25 mg/m³
CH_4	0.01 mg/m³	0 – 1 mg/m³
$NH_3 + H_2O$	0.01 mg/m³ / 0.003 %	0 – 1 mg/m³ / 0-0.3%
$HF + H_2O$	0.001 mg/m³ / 0.001 %	0 – 0.1 mg/m³ / 0-0.1 %

Detection limits are specified for 100 m optical pathlength and gas temperature / pressure = 25 °C / 1 bar abs. Other gases are available on request.

Instrument data

Specifications	
Optical path length	maximum 500 m
Response time	down to 1 sec
Averaging time	Rolling average from 2 seconds to 24 hours (exp. decay)
Span drift	< 4% of measuring range between maintenance intervals
Zero drift	Negligible (< 2% of measuring range between maintenance intervals)
Environmental conditions	
Operating temperature	-20 °C to +55 °C
Storage temperature	-20 °C to +55 °C
Protection classification	Transceiver unit IP66, retro-reflector and battery unit IP65
Inputs / Outputs	
Analogue output (3)	4 – 20 mA current loop
Digital output	10 or 10/100 Base T Ethernet, RS – 232 format, Optional fibre optic (ASCII – format)
Relay output (3)	High gas-, Warning - and Fault relays (normally closed-circuit relays)
Analogue input	Optional 4 – 20 mA process temperature and pressure reading
Internal memory (optional)	8 MB flash memory (sufficient for 24 h logging at 60 sec averaging time)
Ratings	
Input power supply unit	100 – 240 VAC, 50/60 Hz, 0.36 – 0.26 A
Output power supply unit	24 VDC, 900 – 1000 mA
Input transmitter unit	18 – 36 VDC, max. 20 W
4 – 20 mA output	500 Ohm max. isolated
Relay output	1 A at 30 V DC/AC
Battery supply unit (optional)	input: 90-264 VAC, 50/60 Hz output: 24 VDC, fused 1 A
Installation and Operation	
Installation	Special X/Y alignment platform or tripod
Alignment tolerances	Typically +/- 1 m RAD deviation (application dependent)
Purging of windows	By fan or blower (only recommended for certain applications)
Maintenance	
Interval	Recommended every 6 – 12 months (no consumables needed) Remote instrument check by Ethernet connection or external modem possible
Calibration	Check recommended every 6 – 12 months With separate calibration cell using certified calibration gas
Security	
Laser class	Class 1 according to IEC 60825-1
CE	Certified
EMC	Conformant with EMC standards EN 61000-6-2(3) and LVD 73/23/EEC
Explosion protection (optional)	
Area classification	Zone 1
Type of protection	EEx P – purged/pressurized
Explosion group	GD – all gases, vapours, and dusts
Temperature class	T5 – max. 100 °C
Dimension and weight	
Transceiver unit	500 x 270 x 180 mm, 6.5 kg
Transceiver unit (EEx P version)	500 x 270 x 320 mm, 8.2 kg
Retro reflector unit	Size depends on number of reflectors, max. 400 x 200 x 400 mm, 13 kg (9 reflectors)
Power supply unit	180 x 85 x 70 mm, 1.6 kg
Battery supply (optional)	Size depends on version (10 h / 24 h) max. 280 x 190 x 180 mm, 13.8 kg

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