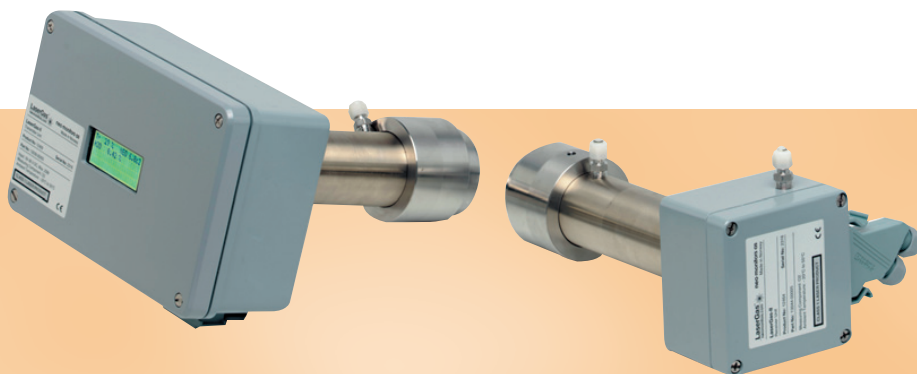


LaserDust™ Medium, Long and Extra Long Path Monitors - *Data sheet*



The LaserDust Medium (MP), Long Path (LP), and Extra Long Path (XLP) Monitors from NEO Monitors AS are compact, high performance dust monitors for true continuous in-situ measurement of dust concentration or opacity. Based on well-proven diode laser technology the instruments have a number of unique features.

- **Response time down to one second**
- **Dust pulse detection with 50 ms resolution**
- **Very low detection limit (0.5 mg/Nm³)**
- **High dynamic range**
- **Scattered light detection for low dust levels**
- **Low cost of ownership**
- **Ethernet connection (optional)**

The monitors' very compact design comprises a transmitter and receiver unit, only. Both are protection classified to IP66 for outdoor use. Measurement readings are provided through standard 4-20mA current loops, a fibre-optic output or the optional Ethernet connection. The latter enables communication via a local area network or the Internet. The instrument is supplied directly with 24 VDC or standard AC line voltage, when the dedicated power supply unit is used.

Measuring principle

The LaserDust's optical measuring principle is based on the property of particles to absorb and scatter incident light. Red laser light is transmitted through the process gas and two separate detectors located opposite the laser detect the amount of direct light transmitted and the amount of forward scattered light. Both signals depend on the number of dust particles present. At low dust levels (< 200 mg/Nm³) concentration is calculated from the scattered light sig-

nal, which provides a precise measurement down to 0.5 mg/Nm³ and is unaffected by dust depositing on the windows. At high dust levels concentration calculation is based on the direct light signal, which provides virtually unlimited dynamic range (at least 10 g/Nm³). Alternatively, this signal can be used for measurement of opacity. The two measurement modes are selected in the software.

Installation and Operation

The LaserDust monitors are easy to install and designed to operate in very rough industrial environments. The transmitter and receiver units are mounted directly onto the duct or stack flanges. 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. Purging with instrument air prevents dust from fouling the optical windows. Upon installation in-situ calibration against an extractive reference method is important to ensure that different types of dust with different optical properties are measured correctly.

Main applications

The LaserDust MP, LP, and XLP monitors' most important applications are within continuous emission monitoring in different industrial sectors. The following are some of the typical applications:

- **Emission monitoring in Aluminium smelters**
- **Emission monitoring in waste incinerators and power plants**
- **Scrubber and filter optimisation**
- **Broken bag detection in bag house filters**

Technical Data LaserDust™ Medium, Long and Extra Long Path Monitor

Instrument data

Specifications

Process temperature	< 800 °C
Process pressure	0.1 – 1.5 bar (optional windows for up to 5 bar)
Window transmission	Max. 40 % reduction in window transmission allowed
Detection limit	0.5 mg/Nm ³ or better (application dependent)
Measurement range	min. 0 – 25 mg/Nm ³ max. 0 – 10.000 mg/Nm ³
Accuracy	+/- 0.5 mg/Nm ³ or +/- 5% (whichever is higher)
Optical Path length (OPL)	Medium Path: 0.6 - 3 m (shorter OPL on request) Long Path: 3 - 6 m Extra Long Path: 6 - 10 m
Response time	1 – 2 sec Pulse mode: 50 ms
Averaging time	5 – 600 sec (default = 10 sec)
Zero drift	< 0.5 mg/Nm ³ between maintenance intervals

Environmental conditions

Operating temperature	-20 °C to +55 °C
Storage temperature	-20 °C to +55 °C
Protection classification	IP66

Inputs / Outputs

Analogue output	4 – 20 mA current loop
Digital output	RS – 232 format Optional 10 or 10/100 Base T Ethernet Optional fibre optic (ASCII – format)
Relay output (3)	High dust -, Warning - and Fault relays (normally closed-circuit relays)
Analogue input	Optional 4 – 20 mA process temperature and pressure reading

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

Installation and Operation

Flange dimension	Medium Path: DN50/PN10 Long Path: DN80/PN10 Extra Long Path: DN150/PN10 Optional ANSI or other on request
Alignment tolerances	Flanges parallel within 1.5 °
Purging of windows	Dry and oil-free pressurised air or gas, or by fan
Purge flow	50 – 100 l/min (application dependent)

Maintenance

Interval	Recommended every 6 – 12 months (no consumables needed) Remote instrument check by Ethernet connection or external modem possible
Calibration	Recommended every year, in-situ against extractive reference method

Security

Laser class	Class IIIb 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

Transmitter unit	200 (plus 100 for purge unit) x 270 x 170 mm, 6.2 kg
Transmitter unit (EEx p version)	200 (plus 100 for purge unit) x 270 x 310 mm, 7.9 kg
Receiver unit	300 (450 for LP) (plus 100 for purge unit) x 120 x 120 mm, 3.9 kg (5 kg for LP)
	XLP: 410 (plus 100 for purge unit) x 270 x 170 mm, 8 kg
Power supply unit	180 x 85 x 70 mm, 1.6 kg

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