NEO Monitors AS
DATA SHEET BOOKLET

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Rev12/22

/ NEO Monitors AS

At NEO Monitors we are committed to helping our customers achieve optimum performance for their individual applications while never compromising on system reliability.

For decades, we have dedicated our business to the sole purpose of improving how our customers monitor and control gas and dust - you could even call it a devotion.
Both on the field and in the lab, we are constantly discovering new ways to deliver gas and dust analysis beyond what is believed to be possible.

Today, we are a leading manufacturer and supplier of TDLAS-based gas and dust analyzers for process optimization, emission monitoring and safety applications. Our analyzers can measure over 40 gases and combinations and are used in a wide range of applications in all kinds of industries.
We have more than 40 distributors spread across all continents, a subsidiary in the US and a Sales office in China. It is the fastest growing European company in this niche, with over 20.000 analyzers installed.

Our dedication enables us to understand our customers' application needs and in turn, design high-performance products and solutions that meet the ever-changing demands facing industrial manufacturers around the world today - and tomorrow.

We don't believe in throwing around industry buzz words, or making claims we can't back up.
Ultimately, our intention is simple: to deliver the most accurate gas and dust measurement possible, while never compromising on system safety and reliability.

We are, in other words: ***PERFORMANCE YOU CAN TRUST***

/ Guide gas measurement

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	LaserGas™ iQ² **	LaserGas™ Q	LaserGas™ III SP	LaserGas™ III OP	LaserGas™ III Portable	LaserGas™ II SP	LaserGas™ II Compact	LaserGas™ II MP	LaserGas™ II OP	LaserDust™
CH4				•		•	•	•	•	
CO %						•	•			
CO2 %						•	•			
CO % + CO2 %						•	•			
CO ppm	•		•	•		•	•	•	•	
CO ppm + CH4	•		•	•		•	•	•		
CO ppm + H2O %	•		•			•	•			
CO2 ppm			•			•	•	•		
H2O %						•	•			
H2O ppm							•			
H2S						•	•	•	•	
H2S + CO2						•	•	•	•	
HCl						•	•	•	•	
HCl + H2O %*						•	•			
HCl + CH4						•	•	•	•	
HCl in VCM						•	•	•		
HCN						•	•	•		
HCN + NH3						•	•	•		
HF*				•	•	•	•		•	
HF + H2O					•	•	•			
N2O %						•	•			
N2O ppm						•	•	•		
NH3			•	•		•	•	•	•	
NH3 + H2O %*			•			•	•			
NO		•				•	•	•		
NO2		•				•	•	•		
O2	•		•			•	•	•		
O2 + Temperature	•		•			•	•			
Particles										•
SO2		•								
C2H2 (Acetylene)						•	•	•		
C2H4 (Ethylene)						•	•			
C2H3Cl (VCM)						•				
C2H4O (Ethylenoxide)						•				
C3H6 (Propylene)						•				
CF4 (Tetrafluoromethane)		•								
CH2O (Formaldehyde)		•				•	***	***		
CH3I (Methyl Iodid)						•	***	***		
COS (Carbonyl sulfide)						•	***	***		
C3H3N (Acrylonitrile)						•	***	***		
CH2Cl2 (DCM)						•	***	***		
H2			•			•		•		

List of gases and gas combinations NEO Monitors can measure with the LaserGas™ and LaserDust™ product lineup. New gases and combinations are constantly being investigated and added to this list.

* LaserGas™ II SP with TÜV/MCERTS certification | ** LaserGas™ iQ² : H2O in combination with CO (T > 500 °C) | *** Contact NEO Monitors

/ LaserInspect™ CIMO4

NEO Monitors' LaserInspect™ CIMO4 gives the operator the opportunity to remotely operate up to 4 LaserGas™ analyzers from the same display*. The operator have full status overview in an instance of all instruments and is able to perform maintenance tasks directly from the panel. This HMI is designed for the NEO Monitors LaserGas™ family and can easily be integrated into a cabinet.

Features

- Sleek full-color touchscreen
- 15" with narrow tablet-style bezels

Certification & Compliance

RoHS Compliant

ATEX Approved
II 3 G Ex ic nA IIC T4 Gc
II 3 D Ex tc IIIC T135°C Dc
DEMKO 14 ATEX 1387X
EN 60079-0, -11, -15, -31

IECEx Approved
Ex ic nA IIC T4 Gc
Ex tc IIIC T135°C Dc
IECEx UL 15.0035X
IEC 60079-0, -11, -15, -31

CE Approved
EN 61326-1 Immunity to industrial locations emission
CISPR 11 Class A IEC/EN 61010-1

UL Approved
cULus listed for ordinary location:
File #E302106 UL 61010-1, -2-201

cULus listed for hazardous location:
File #E317425

Class I, Division 2, Groups A, B, C and D
Class II, Division 2, Groups F and G
Class III, Division 2

ANSI/ISA 12.12.01, C22.2 No. 213-M1987, 157-92

Type 4X IP66 enclosure rating (face only)
ABS type approval for shipboard applications

**Separate Ethernet switch is required to operate multiple analyzers*

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Technical data

Power Input

- Input voltage: 10 to 30 VDC
- Typical power HMI only: 18 W
- Maximum power HMI only: 24 W
- Maximum power HMI with modules: 58 W
- Must use a Class 2 circuit according to National Electrical Code (NEC), NFPA-70 or Canadian Electrical Code (CEC), Part I, C22.1 or a Limited Power Supply (LPS) according to IEC 60950-1 or Limited-energy circuit according to IEC 61010-1.
- Power connection via removable three position terminal block.

Power Connection

- High compression cage-clamp terminal block
- Wire Strip Length: 0.3" (7.5 mm)
- Wire Gauge Capacity: One 14 AWG (1.63 mm) solid, two 18 AWG (1.02 mm) or four 20 AWG (0.81 mm)

Network Media

- 10BaseT: ≥ Cat3 cable
- 100BaseTX: ≥ Cat5 cable

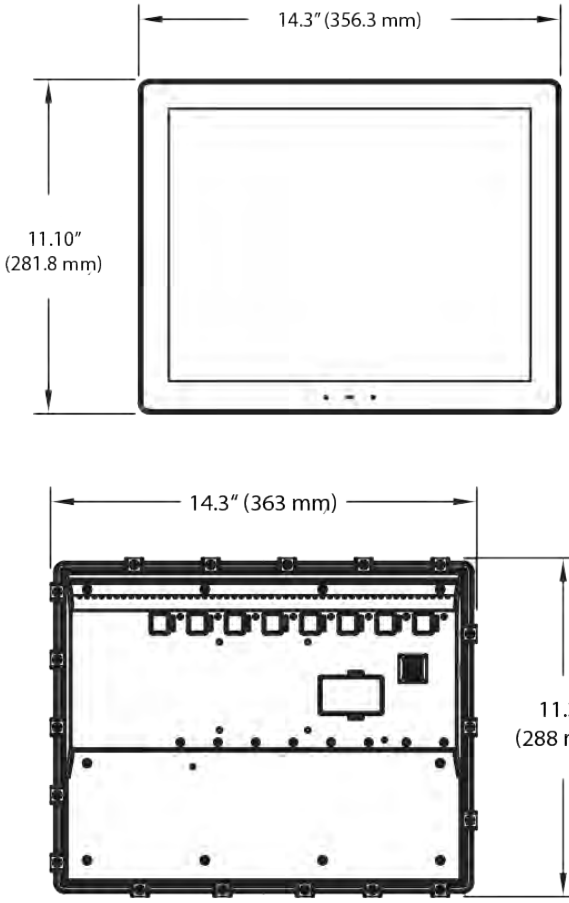
Environmental

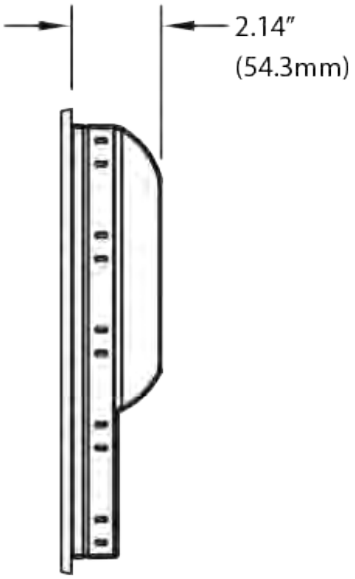
- Operating Temperature: -20°C to 60°C
- Storage Temperature: -20°C to 70°C
- Operating Humidity: 0 to 85% (non condensing)
- Operating Altitude: Up to 2000 meters
- Shock: 40 g per IEC 68-2-27
- Vibration: 4 g @ 5-500 Hz per IEC 68-2-6

LCD Display

- Touchscreen: Resistive analog
- Size 15"
- Pixels: 1024x768
- Brightness: 400 cd/m2
- Backlight 70,000 HR TYP

Outlines and measurements





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/ LaserGas™ iQ2

NEO Monitors LaserGas™ iQ² analyzer is the first to measure up to four gases (O_2, CO, CH_4, H_2O)** and temperature depending on configuration, which eliminates the need for multiple units for combustion analysis. The cutting-edge design and ground-breaking functionality, ensures that the instrument delivers unmatched reliability and durability. By providing an optional single flange solution, installation cost can be significantly reduced. Customers may replace existing analyzers where explosion risks or high maintenance issues are a huge concern.

Features

- No interference from background gases
- Factory calibrated
- No zero drift
- Transceiver configuration
- Multiple configurations
- Designed for 3 configurations – cross stack, one-flange with probe and open path
- Automatic gain
- In-situ measurement
- Integrated span check option (Application dependent)

Applications

- Combustion analysis
- FCC units
- Package boilers
- Process heaters
- Electrostatic precipitators
- VCM waste gas recovery
- Reformer gas
- Incineration

Customer benefits

- Up to 5 measuring components O_2, CO, CH_4, H_2O and temperature
- Can handle a typical combustion process up to 2372 °F/1300°C
- Reduced installation cost
- Low maintenance cost
- Easy to install transceiver, one unit ensures easy alignment
- Double path length increases absorption signal for low concentration
- Transceiver can be mounted on coldest side of stack in extreme hot environments
- Well proven technology
- The design has flexibility to measure new/ other gases and combinations of them

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Technical data

Specifications

Max. process gas temprature:	1300 °C
Max. process gas pressure:	1.5 barA
Optical path length:	max 20m
Response time:	≤ 5 seconds

Environmental conditions

Operating temperatures:	-40 °C - +55 °C
Storage temperature:	-40 ˚C to +70 ˚C
Protection classification:	IP66

Input/output

Analog output:	4 - 20 mA current loop
Digital output:	Ethernet (TCP/IP)
Relay output (4):	High gas, warning and fault (normally closed)
Analog input (2):	4 - 20 mA Process temperature and pressure reading

Ratings

Power supply:	24 VDC (18 - 30 VDC)
Power consumptions:	max 30W
4 - 20 mA:	500 Ohm max isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1M according to IEC 60825-1, eye safe
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 1:	II 2 G Ex pxb IIC T5 Gb II 2 D Ex pxb IIIC T100 °C Db
CSA:	Class I, Div. 2, Groups A, B, C and D; Temp. Code T5
ATEX rating connection box:	II 2 GD Ex e IIC T5 Gb -40°C ≤Ta≤65°C NEMA 4x

Installation and operation

Flange dimension:	DN 80/PN 10-40 (Center Ø 3”) or ANSI 3” #150 (#300) (Center Ø 3”) ANSI 4” #300
Instrument purge:	Application dependent Nitrogen
Probe purge (Optional):	Nitrogen

Maintenance

Calibration:	Check recommended every 12 months
Validation:	In-situ span check with optional internal cell (application depenent)

Dimensions / weight

Transceiver:	461 mm x 399 mm x 174 mm 15 kg

LaserGas™ iQ² X-stack O_2 + CO ppm Standard (below 500 °C)

	Min	Max	LDL/precision
CO Range	0-100ppm	0-10000ppm*m	1 ppm
O_2 (N2 purge)	0-2%	0-25%	0.02%
Process path length	0.5m	20m	
Process temperature	-40 °C	500 °C	
Process pressure	0.7 BarA	1.5 BarA	
CH_4 add-on	0-1%*meter	0-5%*meter	0.01%
Temperature add-on (N_2 purge)	-40 °C	500 °C	15 °C

LaserGas™ iQ² X-stack O_2 + CO ppm High temperature (above 500 °C)

	Min	Max	LDL/precision
CO Range	0-200ppm	0-20000ppm*m	3 ppm
O_2 (N2 purge)	0-5%	0-25%	0.05%
O_2 (Air purge)	-	0-25%	0.2%
Process path length	0.5m	20m	
Process temperature	500 °C	1300 °C	
Process pressure	0.7 BarA	1.5 BarA	
CH_4 add-on	0-5%*meter	0-10%*meter	0.05%
H_2O add-on	-	0-40%	2%
Temperature add-on	500 °C	1300 °C	30 °C
Temperature add-on (N_2 purge)	-40 °C	1300 °C	20 °C

** NEO Monitors reserve the right to change specifications without prior notice*

** Some configurations may not be available in certain countries.

Contact NEO Monitors AS for more information.

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/ LaserGas™ iQ2 Vulcan

NEO Monitors' LaserGas™ iQ² Vulcan is the first in-situ single-flange solution to measure up to four gases (O_2, CO, CH_4, H_2O) as well as the process temperature in a single unit. Based on the well-proven and trusted tunable diode laser absorption spectroscopy (TDLAS) technology, the solution combines cutting-edge design and ground-breaking functionality. It is a complete combustion solution eliminating the need for multiple units. Advanced TDLAS technology enables unmatched reliability and durability. Installation costs of this all-in-one solution are significantly reduced since only one flange is needed. In addition, operational and maintenance costs are kept at a minimum.

Features

- No interference from background gases
- Factory calibrated
- No zero drift
- Transceiver configuration
- Automatic gain
- In-situ measurement
- Span check/validation option for O_2, CO, and CH_4

Applications

- Combustion analysis
- Package boilers
- Process heaters
- Electrostatic precipitators
- VCM waste gas recovery
- Reformer gas

Customer benefits

- Up to 5 measuring components; O_2, CO, CH_4, H_2O and temperature
- Can handle a typical combustion process up to 1562 °F/850°C
- Reduced installation cost
- Low maintenance costs
- Easy to install transceiver, one unit ensures easy alignment
- Double path length increases absorption signal for low concentration
- Well-proven technology

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Technical data

Specifications

Max. process gas temperature:	850 ˚C
Max. process gas pressure:	1.5 BarA
Optical path length:	1 m
Response time:	5 sec

Environmental conditions

Operating temperatures:	-40 ˚C to +55 ˚C
Storage temperature:	-40 ˚C to +70 ˚C
Protection classification:	IP66

Input/output

Analog output(6):	4 - 20 mA current loop
Digital output:	Ethernet (TCP/IP)
Relay output (6):	High gas, warning and fault (normally closed)
Analog input (2):	4 - 20 mA Process temperature and pressure reading

Ratings

Power supply:	24 VDC (18 - 30 VDC)
Power consumptions:	max 30W
4 - 20 mA:	500 Ohm max isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1M according to IEC 60825-1, eye safe
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 1:	II 2 G Ex pxb IIC T5 Gb II 2 D Ex pxb IIIC T100 °C Db
CSA:	Class I, Div. 2, Groups A, B, C and D; Temp. Code T5
Connection box:	
ATEX:	II 2 GD Ex e IIC T5 Gb -40 °C ≤ Ta ≤ 65 °C Nema 4x

Installation and operation

Flange dimension:	DN80/PN 10-40 DN100/PN 10-40 ANSI 3” #150/#300 ANSI 4” #150/#300
Instrument purge:	Nitrogen
Probe purge:	Nitrogen
Calibration check:	Every 12 months
Dimensions / weight iQ²:	461 mm x 399 mm x 174 mm 15 kg
Probe:	1495,8 mm x Ø 63,5 mm 32 kg

Component	Max	LDL
CO	10000 ppm	3 ppm
O_2	25 %	0.05 %
CH_4 add-on	5 %	0.01 %
Process temperature	850 ºC	
Process pressure	1.5 BarA	

NOTE:
Detection limits are specified as the 95 % confidence interval for 1 m optical path and gas temperature / pressure = 25 °C / 1 BarA. Measured in N_2.

NEO Monitors reserves the right to change specifications without prior notice.

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/ LaserGas™ III SP Gas Analyzer

NEO Monitors LaserGas™ III SP gas analyzer is a optical based Tunable Diode Laser Absorption Spectrometer (TDLAS), specifically designed for operation in certified hazardous areas and has been independently assessed as compatible for use in SIL2 installations. The analyzer consists of a transmitter and receiver unit that mount diametrically across the stack, duct, pipe or reactor vessel, eliminating the need for high maintenance sample conditioning systems. The analyzer provides near instantaneous on-line analysis with no cross interference to background gases.

Features

- Zone 1 Exd certified for operation in hazardous areas
- Suitable for use in SIL 2 systems
- Compact footprint
- Automatic continuous system health check
- Low power requirements <15 watts
- Factory calibrated with no zero drift
- No interference from other background gases
- Low maintenance TDLAS measurement technique

Applications

- Process Safety
- Inertization control
- FCC units
- Coke oven gas
- Combustion control
- Selective catalytic reduction (SCR)
- Selective non-catalytic reduction (SNCR)
- DeNOx
- Emission monitoring

Customer benefits

- Reliable and proven non-contact optical laser measurement technique
- NEO Monitors measurement algorithm ensures no cross-interference
- High measurement reliability
- Low ongoing cost of ownership and high return on investment (ROI)
- Very low maintenance

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Technical data

Specifications

Response time:	1 second or longer
Precision (Repeatability):	+/- ½ LDL or 1% of reading, which ever is greater
Linearity:	1% rel.

Environmental conditions

Operating temperature: ATEX:	-40 ˚C to +65 ˚C
CSA:	-40 ˚C to +60 ˚C
Storage temperature:	-40 ˚C to +70 ˚C
Protection classification:	IP65

Inputs / Outputs

Analog output (3):	4 - 20 mA current loop (concentration and transmission)
Digital output:	10/100 Base T Ethernet (Modbus TCP)
Relay output:	High gas, warning/ fault (normally closed)
Analog input:	4 - 20 mA process temperature and pressure reading

Ratings

Power supply:	18-32 VDC
CSA rating:	Class 2 supply
Power consumption :	Max. 20 W
4 – 20 mA output:	500 Ohm max. load impedance, not isolated
Relay output:	1 A at 30 VDC

Safety

Laser class:	Class 1M according to IEC 60825-1, eye safe
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

ATEX zone 1:	Ex db [op is Ga] IIC T4 Gb Ex tb [op is Da] IIIC T100°C Db
CSA:	Class I Div. 2, Groups B, C and D, T4
ATEX rating connection box:	II 2 GD Ex e IIC T5 II 2 D Ex e tb IIIC T85°C Db
Functional safety:	IEC 61508 certified SIL2 capability

Installation and Operation

Flange dimension:	DN50/PN10 or ANSI 2”/150 lbs (other dimensions on request)
Alignment tolerances:	Flanges parallel within 1.5˚
Purging of windows:	Dry and oil-free pressurised air or nitrogen.
Purge flow:	10-50 l/min (application dependent)

Maintenance

Calibration:	Check recommended every 12 months

Dimension and weight

Transmitter and recevier unit (TU/RU):	215 mm (length, add 50 mm for purge unit) x 125 mm (diameter), 3,5 kg each
Window unit (optional):	Wu 60 (length) Wu 100 (length)
TU/RU connection box:	260 mm x 160 mm x 90 mm, 2,5kg

Gas	Detection limit (LDL)	Min process Temp	Max process Temp	Min process Pressure	Max process pressure	Min Range	Max Range	Default Range
O2	100ppm	-40 °C (-40 °F)	1500 °C (2732 °F)	0.7 BarA	10 BarA	-	0-100%	-
CO (Process temp <500 ˚C)	0.5ppm	-40 °C (-40 °F)	500 °C (932 °F)	0.7 BarA	1.5 BarA	0-50ppm	0-10000 ppm*m	-
CH4 Add-on	0.01%	-40 °C (-40 °F)	500 °C (932 °F)	0.7 BarA	1.5 BarA	0.1% * m	0-10% * m	_
CO (Process temp >500 ˚C	3ppm	-40 °C (-40 °F)	1300 °C (2372 °F)	0.7 BarA	1.5 BarA	0-200ppm	0-20000 ppm*m	_
CH4 Add-on	0.05%	500 °C (932 °F)	1300 °C (2372 °F)	0.7 bara	1.5 BarA	0-5%*m	0-10%*m	_
H2O Add- on	2%	500 °C (932 °F)	1300 °C (2372 °F)	0.7 BarA	1.5 BarA	_	0-40%	0-40%
NH3	0.2ppm	-40 °C (-40 °F)	500 °C (932 °F)	0.7 BarA	1.5 BarA	On request	On request	0-50ppm
Optional H2O	tbc	-40 °C (-40 °F)	500 °C (932 °F)	0.7 BarA	1.5 BarA	_	40%	0-40%
H2	0.1 % vol	-50 C (-58 °F)	250 °C (482 °F)	0.5 BarA	10 BarA	5%	100%	-
CO2	10ppm	-40 °C (-40 °F)	1300 °C (2372 °F)	0.7 BarA	1.5 BarA	0-100ppm	0-10%*m	-

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/ LaserGas™ III Ultra SP CO Combustion

LaserGas™ III Ultra uses the innovative baseline-insensitive TDLAS technique specifically designed for combustion analysis. The Ultra simultaneously meets the requirements of combustion control and safety. That is, high measurement accuracy and high dynamic range with simultaneous real-time measurement capability. Applications with very long path lengths and high gas concentrations are no problem for the Ultra.
Thanks to the baseline insensitivity and the use of the proprietary IROSS signal processing, high measurement accuracy is achieved even with complex gas mixtures.
LaserGas™ III Ultra CO in combination with LaserGas™ III O2 are a perfect combination for proper combustion control and safety.

Features

- In-situ real time measurements
- TDLAS technology
- Baseline-insensitive
- High dynamic range
- Fast response time
- Low detection limit
- No interference from other gases
- Not affected by high dust load
- Lifetime calibration, no zero drift
- Integrated span check
- Compact design
- Low power consumption (< 10W)
- Ethernet connectivity

Applications

- Combustion control
- Boilers
- Heaters

To:

- Refineries
- Powerplants
- Chemical industries
- Petrochemical industries
- Steel industries
- and more

Customer benefits

- Process control & process safety in a single analyzer
- Reliable in-situ CO measurements in real time
- Designed for long OPLs & high ranges
- Reduce fuel consumption
- Minimize pollutants emission
- Simple installation, ease of use
- Low maintenance cost
- No consumables
- No sampling systems
- Compressed air purge (no need for Nitrogen)
- No regular calibrations needed
- Designed for applications with complex gas mixtures

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Technical data

Specifications

Detection limit (CO):	0.5 ppm **
Max process gas temperature:	1300 ˚C
Max process gas pressure:	1.5 barA
Optical path length:	Typically 0.5 - 20m
Repeatability:	+/- 0.5 ppm or +/-1% relative, whicever is greater (application dependent)
Linearity:	< 1 % of range
Response time:	≤ 5 sec

Environmental conditions

Operating temperature:	-40 ˚C to +65 ˚C
Storage temperature:	-40 ˚C to +70 ˚C
Protection classification:	IP65

Inputs / Outputs

Analog output (3):	4 - 20 mA current loop (concentration CO, transmission, concentration CH_4)
Digital output:	10/100 Base T Ethernet (Modbus TCP)
Relay output (2):	High gas, warning and fault (normally closed)
Analog input:	4 - 20 mA process temperature and pressure reading

Ratings

Power supply:	24VDC range 18-32 VDC
Power consumption :	Max. 20 W
4 – 20 mA output:	500 Ohm max. load impedance, not isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1 M according to IEC 60825-1, eye safe
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

ATEX zone 1:	Ex db [op is Ga] IIC T4 Gb Ex tb [op is Da] IIIC T100°C Db
CSA:	Class I Div. 2, Groups B, C and D, T4
ATEX rating connection box:	II 2 GD Ex e IIC T5 II 2 D Ex e tb IIIC T85°C Db
Functional safety:	PENDING

Installation and Operation

Flange dimension:	DN50/PN10 or ANSI 2”/150 lbs (other dimensions 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:	10-50 l/min (application dependent)

Maintenance

Calibration:	Check recommended every 12 months
Validation:	In-situ span check with optional internal cell (application depenent)

Dimension and weight

Transmitter and receiver unit (TU/RU):	215 mm (length, add 50 mm for purge unit) x 125 mm (diameter), 3,5 kg each
TU/RU connection box:	260 mm x 160 mm x 90 mm, 2.5kg

**NOTE: Detection limits are specified as the 95% confidence interval for 1 m optical path and gas temperature / pressure = 25˚C / 1 barA. Measured in N_2.

Special process conditions on request

** NEO Monitors reserve the right to change specifications without prior notice*

Process temperature below 500°C

	Min	Max	LDL/precision
CO	0-50ppm	0-100.000ppm*m	0.5ppm**
CH_4 add-on	0-1%*m	0-60%*m	0.01%
Process path length	0.5	30m	
Process temperature	-40 °C	500 °C	
Process pressure	0.7 BarA	1.5 BarA	

Process temperature above 500°C

	Min	Max	LDL/precision
CO	0-200ppm	0-200.000ppm*m	3ppm
CH_4 add-on	0-5%*m	0-100%*m	0.05%
H_2O add-on	-	0-40%	2%
Temperature add-on	500 °C	1300 °C	30 °C
Process path length	0.5m	30m	
Process temperature	500 °C	1300 °C	
Process pressure	0.7 BarA	1.5 BarA	

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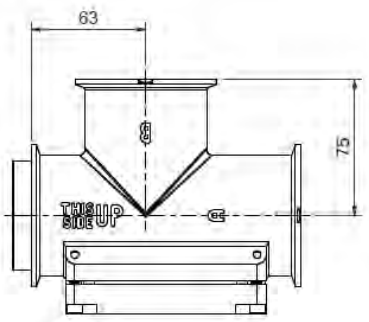
/ LaserGas™ T-Flange solution

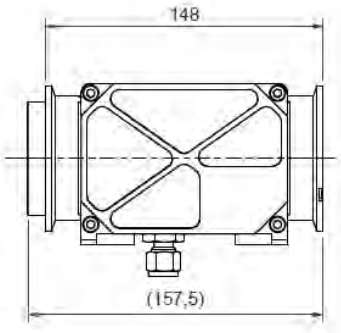
General

The T-flange enables the combination of two LaserGas™ III units on a single measurement port.

The solution consists of two T-shaped flanges, each with a beam splitter, which combines and splits the laser beams of two Laser-Gas III instruments.
The solution enables more gas components to be measured with limited effort and reduced installation costs.

The T-flange is made of Stainless steel (AISI 316L), while the inner optomechanics is made in anodized aluminium.





Customer benefits

- Lower installation cost
- Less space required
- High flexibility
- Hot-swap of a single analyzer possible
- Easily extendable to other applications

Gas combinations *

Channel A	Channel B
CO ppm	O2

** Other gas combinations on request*

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/ LaserGas™ III OP Gas Detector

NEO Monitors LaserGas™ III Open Path Gas Detector is based on our highly successful LaserGas™ III platform and is specifically designed for measurements in critical emission monitoring and fence line applications in hazardous areas. Utilizing separate compact Exd flameproof enclosures, the transmitter and receiver units can be mounted up to 100 meters apart (application dependent), allowing gas concentration measurements along the optical path to be detected in real-time.

Features

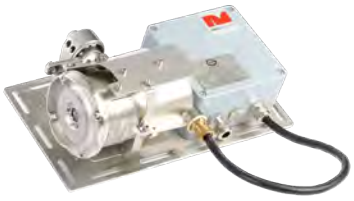
- Zone 1 Exd certified for operation in hazardous areas
- Suitable for use in SIL2 systems
- Compact footprint
- Automatic continuous system health check
- Low power requirements <15 watts
- Factory calibrated with no zero drift
- No interference from other background gases
- Low maintenance TDLAS measurement technique

Applications

- Safety critical open path and fence-line emission monitoring across a wide range of industrial sites, including:
- Oil & Gas
- Petrochemicals
- Chemical plants
- Metals Industry

Customer benefits

- High performance reliable and proven optical laser measurement technique
- NEO Monitors measurement algorithm ensures no cross-interference
- Very low maintenance
- Low cost of ownership
- Flexible installation



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Technical data

Specifications

Type:	Near IR Diode Laser Spectroscopy
Path length:	5-100 m
Self-test:	Continuous
Calibration:	Factory set, no field calibration necessary
Zero:	<+/- 1% of full scale
Repeatability:	<+/- 1% of full scale
Response time:	5 sec (adjustable)

Enviromental conditions

Storage temprature:	-55 °C - 75 °C (-67°F - 167°F)
Operating:	-40 °C - 65 °C (-40°F - 149°F)
Humidity (operational):	100% RH

Input/output

Standard:	4-20 mA source or sink, max load impedance 500 Ohm
Options:	Ethernet
Fault signals:	Fault 1mA Beam Block 2 mA Warning 3 mA

Rating

Power Supply:	24V DC range 18-32V DC
Power consumption:	Max 20W.

Safety

Laser class:	Class 1M according to IEC 60825-1, eye safe
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 1:	II 2 G Ex db [op is Ga] IIC T4 Gb II 2 D Ex tb [op is Da] IIIC T100 °C Db
CSA: Groups and D, T4	Class I, Div. 2, (Canada only) B, C

Protection classification: IP65

IEC 61508 SIL2 capability

Materials

TU and RU:	Stainless steel (ASTM 316)

Optics

Alignment:	+/- 0.15 deg
Obscuration:	> 90%

Dimensions / weight

Footprint/weight:	Ø 125mm x 250 mm/ (4.92" x 9.84") 5.5 Kg (12 lbs.) per TU or RU

Optional junction box (technical data)

Junction box:	GRP / aluminum
Footprint Junction box:	250 mm x 250 mm/ (9.84" x 9.84") 2.0 Kg (4.4 lbs. per Junction Box)
ATEX rating:	II 2 G Ex e I IC T4/T5/T6

Gas	Detection limit (LDL)	Pathlength	Minimum Range
NH3	2 ppm * m	5-100 m	0-40 ppm * m
HF	0.1 ppm * m	5-100 m	0-1 ppm * m
CO	5 ppm * m	5-60 m	0-100 ppm * m
CH4	5 ppm * m	5-100 m	0-100 ppm * m
H2S	20 ppm * m	5-100 m	200 ppm * m

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LaserGas™ II SP

NEO Monitors LaserGas™ is using Tunable Diode Laser Absorption Spectroscopy (TDLAS) i.e a non-contact optical measurement method employing solid-state laser sources. The sensor remains unaffected by contaminants corrosives and does not require regular maintenance. The absence of extractive conditioning systems further improves availability of the measurements and eliminates errors related to sample handling. The monitor is mounted directly onto flanges, which include purge gas connections and a tilting mechanism for easy alignment. Continuous purge flow prevents dust and other contamination from settling on the optical windows. Once power and data lines are connected, measurements are performed in real-time.

Features

- Response time down to 1 second
- No gas sampling: In-situ measurement
- Non contact measurement
- No interference from background gases
- Applicable for many process conditions:
  - high/low temperature
  - high dust
  - corrosive gases
- Line measurement, integral concentration over the full stack diameter
- ATEX and CSA certified
- TÜV, MCERTS, GOST approved technology
- Integrated span check option available
- Suitable for harsh environment
- No zero drift
- Stable calibration
- Long Path lengths

Applications

LaserGas™ II SP is designed for reliable and fast measurement of all kinds of gases in any environment, most typically:

- Chemical industry
- Petrochemical industry
- Metal industry
- Power plants
- Waste incinerators
- Cement industry
- Automotive industry
- Scrubber technology
- Glass industry
- PVC production
- Pulp and paper
- and more

Customer benefits

- In-situ monitoring
- Highly reliable real time analyzer
- Low maintenance cost
- Reduce emission to the environment
- Easy to install and operate
- Reduce daily operation costs
- Optimize process
- Well proven measurement technique

LaserGas™ II SP

Technical Data

Specifications

Optical path length:	Typically 0.5-20m
Response time:	1 – 2 sec
Accuracy:	Application dependent
Repeatability:	1% of range (gas & application specific)

Environmental conditions

Operating temperature:	-20 °C to +55 °C (special version up to +65 °C on request)
Storage temperature:	-20 °C to +55 °C
Protection classification:	IP66

Inputs / Outputs

Analog output (1-3):	4 - 20 mA current loop (concentration, transmission)
Digital output(Optional):	TCP/IP, MODBUS, fibre optic
Relay output (3):	High gas, Maintenance Warning and Fault
Analog input (2):	4 – 20 mA process temperature and pressure reading
Input power supply unit:	100 – 240 VAC, 50/60 Hz, 0.36 – 0.26 A
Output power supply unit:	24 VDC, 900 – 1000 mA

Ratings

Input transmitter unit:	18 – 36 VDC, max. 20W
4 – 20 mA output:	500 Ohm max. isolated
Relay output:	1 A at 30 V DC/AC

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified.
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 1:	II 2 G Ex px IIC T5 Gb II 2 D Ex p IIIC T64°C Db
IECEx/ATEX zone 2:	II 3 G Ex nA nC op is IIC T4 Gb II 3 D Ex td A22 T100°C
CSA:	Class I, Div. 2, Groups A, B, C and D; Temp. Code T4; non-incendive

Installation and Operation

Flange dimension alignment:	DN50/PN10 or ANSI 2"/150lbs (other dimensions on request)
Alignment tolerances:	Flanges parallel within 1.5°
Purge flow:	Dry and oil-free pressurised air or nitrogen 10 - 50 l/min (application dependent)

Maintenance

Calibration:	Check recommended every 12 months
Validation:	In-situ span check with optional internal cell (application depenent)

Dimension and weight

Transmitter unit:	405 mm x 270 mm x 170 mm, 6.2 kg
Transmitter unit: (Ex version)	405 mm x 270 mm x 310 mm, 7.9 kg
Receiver unit:	355 mm x 125 mm x 125 mm, 3.9 kg
Power supply unit:	180 mm x 85 mm x 70 mm, 1.6 kg

Gas	Detection limit (ppm)	Max temp (°C)	Max pressure (BarA)
NH_3	0,15	600	2
HCl	0,05	600	2
HF	0,015	400	2
H_2S	3	300	2
O_2	100	1500	20
% H_2O	50	1500	2*
ppm H_2O	0,1	1000	2
% CO	30	1500	2*
% CO_2	100	1500	2*
ppm CO	0,3	1500	2
ppm CO_2	1	300	2
NO	10	350	2
N_2O	1	200	2
ppm CH_4	0,2	300	3
% CH_4	100	1000	3
NO_2	5	200	1,5
HCN	0,3	300	2

NOTE: Detection limits are specified as the 95% confidence interval for 1m optical path and gas temperature / pressure = 25 °C / 1 BarA. Measured in N_2.

Other gases available on request.

Dual Gas: NH_3+H_2O, HCl+H_2O, CO+CO_2, CO+H_2O, CO+CH_4, O_2+temp, CO+temp.

*Higher pressure available on request for certain gases.

Please contact us for details.

TÜV and MCERTS, GOST approval available for some gases.

Your local distributor:

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/ LaserGas™ II SP H2

NEO Monitors LaserGas™ is using Tunable Diode Laser Absorption Spectroscopy (TDLAS) i.e a non-contact optical measurement method employing solid-state laser sources. The sensor remains unaffected by contaminants corrosives and does not require regular maintenance. The absence of extractive conditioning systems further improves availability of the measurements and eliminates errors related to sample handling. The monitor is mounted directly onto flanges, which include purge gas connections and a tilting mechanism for easy alignment. Continuous purge flow prevents dust and other contamination from settling on the optical windows. Once power and data lines are connected, measurements are performed in real-time.

Features

- Fast response time
- No gas sampling: In-situ measurement
- No interference from background gases
- Applicable for many process conditions
- Line measurement, integral concentration over the full stack diameter
- Integrated span check option
- Suitable for harsh environment
- No zero drift
- Stable calibration
- Continuous internal health check

Applications

LaserGas™ II SP is designed for reliable and fast measurement of all kinds of gases in any environment, most typically:

- Chemical industry
- Petrochemical industry
- Metal industry
- NG processing
- Chlorine production
- Safety applications
- PVC production
- Process control
- Glass production

Customer benefits

- In-situ monitoring
- Highly reliable real time analyzer
- Low maintenance cost
- Reduce emission to the environment
- Easy to install and operate
- Reduce daily operation costs
- Optimize process
- Well proven measurement technique

Technical data

Specifications

Optical path length:	Typically 0.7- 4m
Accuracy:	Application dependet
Repeatability:	2% of range (gas & application dependent)

Environmental conditions

* Certified operating temperature:	-20 °C to +55 °C
Storage temperature:	-20 °C to +55 °C
Protection classification:	IP66

Inputs / Outputs

Analog output (3):	4 - 20 mA current loop (concentration, transmission)
Digital output:	TCP/IP, MODBUS, Optional fibre optic
Relay output (3):	High gas, Maintenance Warning and Fault
Analog input (2):	4 – 20 mA process temperature and pressure reading

Ratings

Input transmitter unit:	18 – 32 VDC, max. 20W
4 – 20 mA output:	500 Ohm max. isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified.
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 1:	II 2 G Ex pxb [op is Ga] IIC T4 Gb II 2 D Ex pxb [op is Da] IIIC T100°C Db
IECEx/ATEX zone 2:	II 3 G Ex nA nC [op is Ga] IIC T4 Gc II 3 D Ex tc [op is Da] IIIC T100°C Dc
CSA:	Class I, Div. 2, Groups A, B, C and D; Temperature Code T4

Installation and Operation

Flange dimension alignment:	DN50/PN10 or ANSI 2"/150lbs (other dimensions on request)
Alignment tolerances:	Flanges parallel within 1.5°
Purge flow:	Dry and oil-free pressurised air or nitrogen 10 - 50 l/min (application dependent)
Purge air quality:	ISO 8573-1:2010, class 3 or better

Maintenance

Visual inspection:	Recommended every 6 – 12 months
Calibration:	Check recommended every 12 months
Validation:	Build-in cell for span check with H2 gas (non ATEX/IECEx/CSA) or integrated span check (all versions).

Dimension and weight

Transmitter unit:	405 mm (plus 65 for purge unit) x 270 mm x 170 mm, 6.2 kg
Transmitter unit: (Ex version)	405 mm (plus 65 for purge unit) x 270 mm x 310 mm, 7.9 kg
Receiver unit:	355 mm (plus 65 for purge unit) x 125 mm x 125 mm, 3.9 kg

** Certified ambient temperature range -20 °C to +55 °C*
Extended ambient temperature ranges; -30 °C to +55 °C or -20 °C to +65 °C (non-certified) availiable upon request, subject to application.

Gas	Detection limit (%Vol)	Min range (%Vol)	Max range (%Vol)	Response time (sec)	Max temp (°C)	Max pressure (BarA)
H_2	0.1	0 -5	0 - 100	2	150	4

NOTE: Detection limits are specified as the 95% confidence interval for 1m optical path and gas temperature / pressure = 25 °C / 1 BarA. Measured in N_2.

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LaserGas™ II Compact

NEO Monitors LaserGas™ is using Tuneable Diode Laser Absorption Spectroscopy (TDLAS) i.e a non-contact optical measurement method employing solid-state laser sources. The sensor remains unaffected by contaminants and corrosives and does not require regular maintenance. The absence of extractive conditioning systems further improves availability of the measurements and eliminates errors related to sample handling. The monitor is mounted directly onto flanges, which include purge gas connections and a tilting mechanism for easy alignment. Continuous purge flow prevents dust and other contamination from settling on the optical windows. Once power and data lines are connected, measurements are performed in real-time.

Features

- Response time down to 1 second
- No gas sampling: In-situ measurement
- No interference from background gases
- No moving parts, no consumables
- ATEX and CSA certified
- Can measure through very thin nozzles <10 mm diameter
- Optimised for very short distance measurements across pipes and along short cells
- Compact design
- No zero drift
- Stable calibration

Applications

LaserGas™ II SP is designed for reliable and fast measurement of all kinds of gases in any environment, most typically:

- Chemical industry
- Petrochemical industry
- Metal industry
- Power plants
- Waste incinerators
- Cement industry
- Automotive industry
- Scrubber technology
- Glass industry
- PVC production
- Pulp and paper
- and more

Customer benefits

- In-situ monitoring
- Highly reliable real time analyzer
- Limited need for maintenance
- Low maintenance cost
- Reduce emission to the environment
- Easy to install and operate
- Reduce daily operation costs
- Optimize process
- Well proven measurement technique
- Requires low purge flow

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LaserGas™ II Compact

Technical Data

Specifications

Optical path length:	Typically 0.1-1m
Response time:	1 – 2 sec
Accuracy:	Application dependent
Repeatability:	1% of range (gas and application specific)

Environmental conditions

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

Inputs / Outputs

Analog output (3):	4 – 20 mA current loop (concentration, transmission)
Digital output:	TCP/IP, MODBUS, Optional fibre optic
Relay output (3):	High gas-, Maintenance, Warning- and Fault relays (normally closed-circuit relays)
Input:	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

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 2:	II 3 G Ex nA nC op is IIC T4 Gb II 3 D Ex tD A22 T100°C
CSA:	Class I, Div. 2, Groups A,B, C and D; Temp. Code T4; non-incendive

Installation and Operation

Flange dimension alignment:	DN50/PN10 or ANSI 2”/150lbs (other dimensions on request)
Alignment tolerances:	Flanges parallel within 1.5˚
Purge flow:	Dry and oil-free pressurised air or gas or by fan 10-50 l/min per flange (application depenent)
	2-4 l/min per flange when set up with thin nozzles (optional)

Maintenance

Calibration:	Recommended every 12 months
Validation:	With optional flow through cell

Dimension and weight

Transmitter unit:	195 mm (plus 65 for purge unit) x 270 mm x 170 mm, 4.8 kg
Transmitter unit:	195 mm (plus 65 for purge unit)
(EX ver.)	x 270x310 mm, 6.5 kg
Receiver unit:	208 mm (plus 65 for purge unit) x 125 mm x 125 mm, 2.6 kg
Power supply unit:	180 mm x 85 mm x 70 mm, 1.6 kg

Gas	Detection limit (ppm)	Max temp (˚C)	Max pressure (BarA)
NH_3	0,15	600	2
HCl	0,05	600	2
HF	0,015	400	2
H_2S	3	300	2
O_2	100	600	2
% H_2O	50	600	2
ppm H_2O	0,1	400	2
% CO	30	600	2
% CO_2	30	600	2
ppm CO	0,3	600	2
ppm CO_2	1	300	2
NO	10	300	2
N_2O	1	200	2
CH_4	0,2	300	2

NOTE: Detection limits are specified as the 95% confidence interval for 1m optical path and gas temperature / pressure = 25 ˚C / 1 barA. Measured in N_2.

Other gases might be available on request.

Dual Gas: NH_3+H_2O, HCl+H_2O, CO+CO_2, CO+H_2O, CO+CH_4, O_2+temp, CO+temp and others.

Higher pressure may be available on request for certain gases.

Please contact us for details.

Your local distributor:

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LaserGas™ II MP

NEO Monitors' LaserGas™ series of gas monitors utilizes Tunable Diode Laser Absorption Spectroscopy (TDLAS); a contactless optical measurement technique employing a narrow band semiconductor laser source. The monitor is unaffected by background gases or drift and therefore requires little regular maintenance or calibration. The LaserGas™ II MP (Multipass) laser beam is coupled into a Herriott cell, where it is reflected multiple times between two spherical mirrors to create a long optical path that greatly enhances measurement sensitivity.
The LaserGas™ II MP monitor is a self-contained unit, simply requiring connection of power, sample gas inlet/outlet and purge gas (application dependent). The monitor is designed to work in conjunction with a suitable sample conditioning system to ensure that a clean and dry sample is delivered to the MP cell.

Features

- Fast response time
- Very low detection limits (ppb for many gases)
- No interference from background gases
- Long term calibration stability
- No zero drift
- No moving parts, no consumables, turn-key instrument
- ATEX and CSA certified

Applications

- Chemical industry
- Petrochemical industry contaminants monitoring
- Natural gas treatment (sweetening plants; H2S in NG)
- Industrial gas (impurities in pure gases)
- Semiconductor industry trace impurity measurements
- Power plants (stack testing of corrosive emission gases)
- H_2S emission monitoring (pulp & paper, refineries, biogas production)
- Hydrogen impurity
- and many more

Customer benefits

- High performance compact design
- Reliable trace level gas measurement
- Precise optimisation of your process
- Reduce your emissions to the environment
- Easy to install and operate, reducing your daily operation costs
- Low maintenance & calibration costs provides excellent ROI
- Up to 12 months between calibration checks
- Superior contactless optical technique ensures you can have full confidence in the measurement

LaserGas™ II MP

Technical Data

Specifications

Optical path length:	2.7 or 11.4 m
Response time:	< 20 sec (depending on sample gas flow)
Accuracy:	Application dependent
Repeatability:	1% of range (gas and application specific)

Environmental conditions

Operating temperature:	0 ˚C to +55 ˚C (32 ˚F to 131 ˚F)
Storage temperature:	-20 ˚C to +55 ˚C (-4 ˚F to 131 ˚F)
Protection classification:	IP64

Inputs / Outputs

Analog output(s) ^ (1-3):	4 – 20 mA current loop

^ Single gas measurements have as standard 1 analog output, dual gas has 2 analog outputs. Optional 2nd and 3rd analog outputs available for second scaled range and/or transmission output

Digital output (Optional):	TCP/IP, MODBUS, Optional fibre optic
Relay output (3):	High gas-, Maintenance, Warning - and Fault relays
Analog input:	4 – 20 mA process temperature and pressure reading

Ratings

Input power:	100 – 240 VAC, 50/60 Hz, 0.36 – 0.26 A or 18 - 36 VDC, max 20W
4 – 20 mA output:	500 Ohm max. isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 2:	II 3 G Ex nA nC op is IIC T4 Gb
CSA:	Class I, Div 2 Groups A, B, C and D; Temp. Code T4; non-incendive

Installation and Operation

Gas inlet / outlet:	6 mm or 1/4 " / 8 mm (5/16") Swagelok (other dimensions on request)
Sample gas flow:	Recommended 2 – 10 l/min (2.1 - 8.4 ft^3/hr)
Sample inlet pressure:	1 – 4.0 BarA (14.5 – 58.0 psia)
Cell temperature:	0 ˚C to +55 ˚C (32 ˚F to 131 ˚F)
Purging of laser chamber (optional):	Dry and oil free pressurised air and gas, Nitrogen for O_2 and CO_2 applications
Purge flow:	Maximum 0.5 l/min (1.06ft^3/hr)

Maintenance

Calibration:	Check recommended every 12 months

Dimension and weight

Cabinet:	500 mm (19.68") x 510mm (20.08") x 215mm (8.46")
	18.4 kg (40.56 lbs)

Gas	Detection limit
O_2	10 ppm
H_2S	0.5 ppm
CH_4	20 ppb
CO	20 ppb
CO_2	0.2 ppm
HCN	50 ppb
NH_3	30 ppb
HCl	10 ppb
H_2	200 ppm

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NOTE: Detection limits are specified as the 95% confidence interval for the standard 11.4 m cell and gas temperature / pressure = 25 ˚C / 1 BarA measured in N_2.

Also available are NO_2, CH_2CHCl (VCM), C_2H_4O (EtO), CH_2Cl_2 (DCM).

Other gases are available, please contact us with your request.

Dual Gas: $CO+CO_2$, $CO+CH_4$

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LaserGas™ Q (ICL edition)

NEO Monitors LaserGas™ Q is using Tunable Laser Absorption Spectroscopy (TDLAS) i.e. a non-contact optical measurement method employing Intraband Cascade Laser (ICL). The sensor has low maintenance cost and does not require regular maintenance. The absence of extractive conditioning systems further improves availability of the measurements and eliminates errors related to sample handling. The monitor is mounted directly onto flanges, which include purge gas connections and a tilting mechanism for easy alignment. Continuous purge flow prevents dust and other contamination from settling on the optical windows. Once power and data lines are connected, measurements are performed in real-time.

Features

- Response time down to 1 second
- No gas sampling: In-situ measurement
- No interference from background gases
- Line measurement, integral concentration over the full stack diameter
- Integrated span check option available
- Suitable for harsh environment
- No zero drift
- Stable calibration
- Very high sensitivity

Applications

LaserGas™ Q is designed for reliable and fast measurement of nitric oxide and nitrogen dioxide in combustion process control, DeNOx, safety and emission monitoring applications and measurement of sulfur dioxide in all kinds of emission control applications.

- Chemical industry
- Petrochemical industry
- Metal industry
- Power plants
- Waste incinerators
- Cement industry
- Automotive industry
- Scrubber technology

Customer benefits

- In-situ monitoring
- Highly reliable real time analyzer
- Low maintenance cost
- Reduce emission to the environment
- Easy to install and operate
- Reduce daily operation costs
- Optimize process
- Well-proven measurement technique

LaserGas™ Q (ICL edition)

Technical Data

Specifications

Optical path length:	Typically 0.5 - 6 m
Response time:	1 – 2 s
Accuracy:	Application dependent
Repeatability:	1% of range. (gas & application specific)

Environmental conditions

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

Inputs / Outputs

Analog output (3):	4 - 20 mA current loop. (i.e. concentration, transmission)
Digital output:	TCP/IP, MODBUS.
Relay output (3):	High gas, Maintenance Warning and Fault.
Analog input (2):	4 – 20 mA process temperature and pressure reading

Ratings

Input transmitter unit:	18 – 30 VDC, max. 20 W
4 – 20 mA output:	500 Ohm max. isolated
Relay output:	1 A at 30 V DC

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Approvals

IECEx/ATEX zone 2:	II 3 G Ex nA nC IIC T5 Gc
	II 3 D Ex tc IIIC T85°C Dc
CSA:	PENDING

Installation and Operation

Flange dimension:	DN50/PN10 or ANSI 2”/150lbs (other dimensions on request)
Alignment tolerances:	Flanges parallel within 1.5°.
Purge flow:	Dry and oil-free pressurised air or nitrogen. 10 - 50 l / min (application dependent).
Purging of windows:	Dry and oil-free pressurized air, nitrogen or by fan.
Purge air quality:	ISO 8573-1:2010, class 3 or better.

Maintenance

Validation:	In-situ span check with optional internal cell (application dependent)

Dimension and weight

Transmitter unit:	420 mm x 270 mm x 170 mm, 6.6 kg
Receiver unit:	265 mm x 270 mm x 170 mm, 5.7 kg

Gas	NO	NO_2	SO_2	HBr
Min. range	0 - 50 ppm	0 - 50 ppm	0 - 300 ppm (*)	0 - 10 ppm
Max. range	0 - 1000 ppm*m	0 - 1000 ppm*m	0 - 20000 ppm*m	0 - 500 ppm*m
Detection limit	1 ppm	1 ppm	5 ppm	0.1 ppm
Temperature	Ambient to 1000 °C	Ambient to 500 °C	Ambient to 400 °C	Ambient to 450 °C
Pressure	0.7 - 1.5 BarA	0.7 - 1.5 BarA	0.7 - 1.3 BarA	0.5 - 1.5 BarA
Windows material	CaF_2	Sapphire	Sapphire	Sapphire

* Other ranges on request.

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LaserGas™ III Portable HF Analyzer

NEO Monitors LaserGas™ is using Tunable Diode Laser Absorption Spectroscopy (TDLAS) i.e. a non-contact optical measurement method employing solid-state laser sources. The portable analyzer is compact, lightweight, and battery powered for HF measurement on the spot. With onboard pump and connections for Teflon tubing the target gas is continuously transferred into the internal measurement cell. The instrument´s low power design gives long operating time on each battery cycle.

Features

- Most advanced LaserGas™ technology available (3rd generation)
- Portable (low weight)
- Low power usage <10 Watt
- Sub ppm HF detection
- No interference from other gases
- Stable calibration
- No zero drift

Applications

The LaserGas™ III Portable HF Analyzer is the solution for reliable detection of short-term HF concentrations, wherever diffuse emissions occur representing a risk to the work force.
Focused applications are:

- Aluminium smelters: Worker protectioduring active work
- Aluminium smelters: Mapping plant emissions
- Refinery alkylation plants: Worker safety

Customer benefits

- Flexible unit designed for measurement on the spot
- Allows fast and reliable operation to measure sub ppm and several hundred ppm HF concentrations
- Regular maintenance not required
- No cross interference from other gases
- Short-term HF peaks are uncovered with the LaserGas™ III portable
- Easy to carry
- Battery operated for several hours
- Internal storage of data

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LaserGas™ III Portable HF Analyzer

Technical Data

Specifications

Detection limit (HF)*:	50 ppb **
Repeatability:	1% of range (gas & application spesific)
Range:	0 - 500 ppm
Storage	3MB

Environmental conditions

Operating temperature:	-20 ˚C to +55 ˚C
Storage temperature:	-20 ˚C to +55 ˚C
Protection classification:	IP65

Outputs

Analog output (3):	4 – 20 mA current loop (concentration and transmission)
Digital output:	10/100 Base T Ethernet (Modus TCP), RS-485

Ratings

Power consumption:	Max. 10 W
4 – 20 mA output:	500 Ohm max. load impedance, not isolated
Battery:	Lithium Ion Battery (14.4 V, 5 A, approx. 10 hours usage time per charge)

Safety

Laser class:	Class 1 according to IEC 60825-1, eye safe

Installation and Operation

Gas inlet / outlet:	6 mm SMC one touch fittings (series KQG)
Sample gas flow:	3 l/min
Sample inlet pressure:	+/- 50 mbar G / 0.8 PSIG (higher pressures possible with different pump)
Sample inlet temperature:	Max 85 ˚C
Calibration:	Check recommended every 12 moths
Maintenance	Instrument check by Ethernet
Filter change	Recommended every 3 months

Physical

Dimensions:	110 mm x 120 mm x 250 mm (4.3" x 4.7"x 9.8"
Weight (incl. battery):	2.3 kg (5 lbs)
Display:	2.7" colour LCD panel
Sample Cell:	Teflon coated Aluminium

** NOTE: Detection limits are specified as the 95% confidence interval for 1 m optical path and gas temperature / pressure = 25 ˚C/ 1 BarA, measured in N_2.

** NEO Monitors reserve the right to change specifications without prior notice*

Your local distributor:

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LaserGas™ II OP

NEO Monitors LaserGas™ II OP is a compact, high performance gas monitor for ambient long distance monitoring. The LaserGas™ II OP consists of a transceiver and retro-reflector unit. The retro-reflector unit consists of one or several cube corners in a weather proof enclosure. LaserGas™ II OP is known as "single line spectroscopy". 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.

Features

- Easy to install, limited need for maintenance
- Response time down to 1 second
- No cross interference from other gases
- Very low detection limits (ppb and low ppm)
- Unaffected by fog or rain down to <1% transmission
- Optional Ethernet connection and auto-alignment unit
- Wide range of detectable gases
- Mounted on our proprietary x/y alignment platform (goniometer). Adapters for fixed installation on platforms or for tripod use are available.
- Equipped also for hazardous areas

Applications

Open Path monitors are critical in emission monitoring across a wide range of industrial applications:

- Oil and gas industry
- Petrochemical refineries
- Landfill sites
- Chemical plants
- Metal industry
- Fireprotection
- Traffic exhaust
- and more

Customer benefits

- Compact high performance gas monitor for ambient long distance monitoring
- No cross interference from other gases
- Easy to install
- Limited need for maintenance
- Low cost of ownership
- Proven and reliable

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LaserGas™ II OP

Technical Data

Specifications

Path length:	Typically 10 - 500 m
Response time:	1-2 sec

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

Analog output (3):	4 – 20 mA current loop (concentration, transmission)
Digital output:	TCP/IP, MODBUS, Optional fibre optic
Relay output (3):	High gas-, MaintenanceWarning - and Fault (normally closed)

Ratings

Input power supply:	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 1A

Safety

Laser class:	Class 1 according to IEC 60825-1
CE:	Certified
EMC:	Conformant with directive 2014/30/ EU

Approvals

ATEX zone 1:	II 2 G Ex px II T5 II 2 D Ex pD 21 IP66 T64 °C
IECEx/ATEX zone 2:	II3 G Ex nA nC [op is] IIC T4 Gb II 3 D Ex tD A22 T100 °C
CSA:	Class I, Div. 2, Groups A,B, C and D; Temp. Code T4; non-incendive

Installation and Operation

Installation:	Special X/Y alignment platform, tripod or auto alignment unit.
Purging of windows:	By fan or blower (only recommended for certain applications)
Maintenance Interval:	Recommended every 6 - 12 months
Calibration:	Check recommended every 12 months
	directive 2014/30/ EU

Dimension and weight

Transceiver unit:	500 mm x 70 mm x180 mm 6.5 kg
Transceiver unit (Eex P):	500 mm x 270 mm x 320 mm 8.2kg
Retro reflector unit:	Size depends on number of reflectors (1 - 25 reflectors)
Power supply unit:	180 mm x 85 mm x 70 mm 1.6 kg
Battery supply (optional):	Size depends on version (10 h / 24 h) max. 280 mm x 190 mm x 180 mm 13.8 kg

Gas	Range	LDL/resolution
NH_3	0-50 ppm	0.01 ppm
HF	0-1 ppm / 0-10 ppm	0.001 ppm
CO	0-50 ppm / 0-2%	0.015 ppm / 0.005%
CH_4	0-50 ppm / 0-5%	0.01 ppm / 0.01%
CO_2	0-2%	0.005%
H_2S	0-2000 ppm	0.5 ppm

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Detection limits are specified as the 95% confidence interval for 100 m path (Optical path length 200m) and gas temperature/pressure = 25 ˚C/1 BarA.

NOTE: HF measurement with continuous verification on atmospheric oxygen or water is an option.

Other gases available on request. Please contact us for details.

Your local distributor:

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LaserDust™ MP, LP and XLP Monitors

NEO Monitors LaserDust™ Medium Path (MP), Long Path (LP), and Extra Long Path (XLP) Monitors are compact, optical dust monitors for true continuous in-situ measurement of dust concentration or opacity. The monitors are designed for measurement across pipes, stacks, and ducts with typical path lengths of 0.5 – 10 m LaserDust™ Monitors use a transmitter/ receiver configuration to measure the dust concentration along the optical line of sight. Our true non-contact approach is superior to point type dust meters.

Features

- Response time down to one second
- Suitable for high temperatures
- Cross stack measurement up to 10 m
- High dynamic range (mg or g with one instrument)
- Scattered light detection for high sensitivity
- Non-contact measurement
- No moving parts

Applications

LaserDust™ the ideal choice for obtaining the best measurement data. Monitors are most typically used in:

- Aluminum smelters and steel works
- Waste incinerators, power plants or cement kilns
- Scrubber and filter optimization
- Bag house filter surveillance
- Dust explosion prevention

Customer benefits

- In-situ monitoring
- Highly reliable real time analyzer
- Low maintenance cost
- Reduce emission to the environment
- Easy to install and operate
- Reduce daily operation costs
- Optimize process
- Well proven measurement techniques

LaserDust™ MP, LP and XLP Monitors

Technical Data

Specifications

Process temperature:	Above dew point up to 700 ˚C
Process pressure:	0.1 – 1.5 BarA (optional windows for up to 5 bar)
Detection limit:	< 0.5 mg/Nm3 (in scattered mode)
Measurement range:	min. 0 – 15 mg/Nm3 (scattered mode), particle size >1micron max. 0 – 10.000 mg/Nm3 (transmission mode), particle size >1micron
Resolution:	0.05 mg/Nm3
Optical path length**:	MP: 0.5 – 3 m LP: 3 – 6 m XLP: 6 – 10 m
Response time:	1 – 2 sec Pulse mode: 50 ms

Environmental conditions

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

Inputs / Outputs

Analog output:	4 – 20 mA current loop (concentration, transmission)
Digital output:	TCP/IP, MODBUS, Optional fibre optic
Relay output:	High dust-, Warning - and Fault relays (normally closed-circuit relays)
Analog input:	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

Safety

Laser class:	Class IIIb according to IEC 60825-1
CE:	Certified
EMC:	Conformant with directive 2014/30/EU

Installation and Operation

Flange dimension:	MP: DN50/PN10 LP: DN80/PN10 XLP: DN150/PN10 Optional ANSI or other sizes 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

Visual inspection:	Recommended every 6 – 12 months (no consumables needed) Remote instrument check by Ethernet connection or external modem possible
Calibration:	Recommended every 12 months (against gravimetric analysis)
Validation:	Integrated zero and span check

Approvals

IECEx/ATEX zone 2:	II 3 GD T100 °C Ex nA nC II T5

Dimension and weight

Transmitter unit:	(MP, LP, XLP) 200 mm (plus 100 mm for purge unit) x 270 mm x 170 mm, 6.2 kg
Transmitter unit:	(Ex version) 200 mm (plus 100 mm for purge unit) x 270 mm x 310 mm, 7.9 kg
Receiver unit (MP):	300 mm (plus 100 mm for purge unit) x 120 mm x 120 mm, 3.9 kg
Receiver unit (LP):	380 mm (plus 100 mm for purge unit) x 120 mm x 120 mm, 5 kg
Receiver unit (XLP):	410mm (plus 100 mm for purge unit) x 270 mm x 170 mm, 8 kg
Power supply unit:	180 mm x 85mm x 70 mm 1.6 kg

** Other OPLs on request

* NEO Monitors reserve the right to change specifications without prior notice

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