



SERVOTOUGH Laser

The SERVOTOUGH Laser is a high performance single path cross-stack (in-situ), or extractive gas monitor, designed for use in a diverse range of emissions monitoring and process control applications for both safe and certified hazardous areas, in refineries, natural gas plants, petrochemical, IG, power and downstream chemical plants.

The monitor is certified to the latest standards, fully meeting the requirements of the new flammable sample regulations, allowing safe operation in situations where the process stream itself is flammable.

FEATURES

- Continuous in-situ monitoring
- Low detection limits
- Fast response times, typically less than 2 seconds
- Highly stable 2nd harmonic gas detection technology offers extended (6-12 month) calibration intervals
- Minimal cross interference to other gases
- Utilises the proven tuneable diode laser (TDLAS) measurement technique
- High temperature and high pressure operation possible
- Suitable for high dust applications
- Ethernet connectivity option
- Low cost of ownership

HAZARDOUS AREA FEATURES

- Certified for -20°C to 65°C ambient operation *
- Fully compliant with new flammable sample regulations
- Certified for use on hazardous processes
- Suitable for use in Zone 21 dust hazardous atmospheres without requirement for instrument purge
- T5 rated units available
- 110-240V ac or 24V options

APPLICATIONS

- Combustion
- Thermal Oxidisers
- Emissions
- Waste Incinerators
- Ammonia Slip (DeNOx)
- FCCU Process Control
- Flare Gas
- Plus many others

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KEY FEATURES

The SERVOTOUGH Laser is a highly reliable gas monitor, designed for continuous in-situ measurement.

The monitor is designed for direct installation across stacks, ducts, and reactors typically employing path lengths of 0.5 -15m. By-pass and extractive configurations are also possible.

The monitor utilises a transmitter/receiver configuration to measure the average gas concentration along the optical line-of-sight, in both safe area and flammable gas streams.

HAZARDOUS AREA	ATEX	ATEX & IECEx	HAZARDOUS PROCESS
Gas	Ex II 3(2) G	Ex nA nC op is IIC T5 Gc [Ex op is IIC T6 Gb]	Gas
Gas	Ex II 3G (1D)	Ex nA nC op is IIC T5 Gc [IIIB T70°C Da]	Dust
Dust	Ex II 2D(2G)	Ex tb IIIB IP66 T75°C Db [Ex op is IIC T6 Gb]	Gas
Dust	Ex II 2(1) D	Ex tb IIIB IP66 T75°C Db [IIIB T70°C Da]	Dust

Notes

1. T5 rating for process flange temperature up to 100°C; T4 rating for process flange temperature up to 135°C
 2. T75°C rating for process flange temperature up to 75°C; T100°C rating for process flange temperature up to 100°C; T135°C rating for process flange temperature up to 135°C.
- * For operation at ambient temperatures between 55°C and 65°C (131°F - 149°F) please consult Servomex.

COMPLIANCE

SERVOTOUGH Single Path:
Laser Class 1M according to IEC 60825-1
EC Low Voltage Directive
EC EMC Directive
IECEx and EC ATEX Directive

SERVICE & SUPPORT

For new installations and replacement of older Servomex and competitor products, we will work with you to develop a bespoke service and support package, ensuring full measurement availability and plant operation within your timescales and budget.

SERVOSPARES

To ensure the integrity and optimum performance of your Servomex product, we recommend fitting only factory authorised spare parts. This is particularly important for all hazardous area certified products.

SERVOSURE

Ensure your Servomex analyser is properly commissioned and delivers optimum performance with a maintenance contract, service programme and extended warranty.

SERVOTECH

Make the most of your Servomex gas analyser by attending a training course at one of our training centres in Europe, USA or Asia or on your own site.

SERVOHELP

Whether you have a simple question or complex process challenge, our local offices and global support network are here to help you.

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SPECIFICATIONS

GAS MEASURED:

	Detection Limit	Min. Measuring range	Max. Sample Pressure	Max. Sample Temperature/°C
NH ₃	0.11mg/m ³ (0.15ppm)	0 - 15ppm	2 bar abs.	600
HCl	0.08mg/m ³ (0.05ppm)	0 - 5ppm	2 bar abs.	600
HF	0.013mg/m ³ (0.015ppm)	0 - 1.5ppm	2 bar abs.	400
H ₂ S	4.5mg/m ³ (3ppm)	0 - 300ppm	2 bar abs.	300
O ₂	0.01%	0 - 1%	20 bar abs.	1500
H ₂ O (ppm)	0.08mg/m ³ (0.1ppm)	0 - 10ppm	2 bar abs.	400
H ₂ O (%)	40mg/m ³ (50ppm)	0 - 5000ppm	2 bar abs.	1500
CO (%)	38mg/m ³ (30ppm)	0 - 3000ppm	2 bar abs.	1500
CO ₂ (%)	59mg/m ³ (30ppm)	0 - 3000ppm	2 bar abs.	1200
CO (ppm)	0.4mg/m ³ (0.3ppm)	0 - 30ppm	2 bar abs.	1500
CO ₂ (ppm)	0.4mg/m ³ (0.2ppm)	0 - 20ppm	2 bar abs.	300
NO	14mg/m ³ (10ppm)	0 - 1000ppm	2 bar abs.	300
N ₂ O	2mg/m ³ (1ppm)	0 - 100ppm	2 bar abs.	200
HCN	0.36mg/m ³ (0.3ppm)	0 - 30ppm	2 bar abs.	300
CH ₄	0.14mg/m ³ (0.2ppm)	0 - 20ppm	3 bar abs.	300
C ₂ H ₂	0.12mg/m ³ (0.1ppm)	0 - 10ppm	2 bar abs.	200
C ₃ H ₆	0.01%	0 - 1%	3 bar abs.	200
CH ₃ I	9mg/m ³ (3ppm)	0-300ppm	2 bar abs.	200
NH ₃ + H ₂ O	0.15mg/m ³ (0.2ppm NH ₃) / 0.05% H ₂ O*	0 - 20ppm / 0 - 5%	1.5 bar abs.	500
HCl + H ₂ O	0.16mg/m ³ (0.1ppm HCl) / 0.1% H ₂ O*	0 - 10ppm / 0 - 5%	1.5 bar abs.	400
HF + H ₂ O	0.018mg/m ³ (0.02ppm HF) / 0.01% H ₂ O*	0- 2ppm / 0 - 1%	1.5 bar abs.	400
CO + CO ₂	0.01% (both)	0 - 1% /0-1%	1.5 bar abs.	300
O ₂ + Temp	0.05%/10°C	0-5%	1.5 bar abs.	1500

Detection limits are specified for 1m optical pathlength and gas temperature/pressure = 25°C / 1 bar abs (* H₂O specified at 180°C). The recommended minimum range is the detection limit multiplied by 100. Other gases such as NO₂, C₂H₄, C₂H₆, HBr, and HI are available on request.

PERFORMANCE:

Technology:	Single Line Laser Diode Spectroscopy
Optical path:	0.5 - 20 meters
Response time:	<2 Seconds
Drift:	Application dependent
Repeatability:	+/- Detection Limit or +/- 1% of Reading, whichever is greater
Linearity:	<1% FSR
Averaging time:	Rolling average from 2 seconds to 24 hours (exponential decay)
Calibration:	Check recommended every 6 - 12 months In-situ with integral flow through cell (application dependent), or ex-situ using optional calibration cell
Maintenance:	Recommended every 6 - 12 months. Remote instrument check possible via optional Ethernet or modem connection
SIGNAL INPUTS/ OUTPUTS:	
Analogue output:	Isolated 4-20mA current loop (500 ohms maximum) Second 4-20mA current loop (500 ohms maximum) for transmission reading (optional)
Serial output:	RS232 format (for PC connection during installation/maintenance)
Digital communications:	Optional 10 or 10/100 Base T Ethernet and MODBUS (read only)
Optical fibre output:	ASCII format (optional)
Relay output:	High gas relay (normally closed contact), 1A at 30V DC/AC Warning relay (normally closed contact), 1A at 30V DC/AC Fault relay (normally closed contact), 1A at 30V DC/AC
Analogue input:	4-20mA process temperature and pressure sensors (optional)

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POWER SUPPLY:

Input:

Mains: 100-240V AC, 50/60 Hz, 0.36 - 0.26 A
24V DC: 24V DC, 900mA - 1000mA (hazardous area units only)

Standard mounting:

DN50/PN10 (optional DN80 or ANSI)

Alignment tolerances:

Flanges parallel within 1.5°

Window purging:

Dry and oil free air or N₂ (application dependent)

Purge flow:

20-50 litres/min (application dependent)

OPERATING ENVIRONMENT:

Operating & storage temperatures:

-20°C to +55°C (Standard)
-20°C to +65°C (High Temp)*

Protection classification:

IP66

HAZARDOUS AREA:

Gases & Dusts:

ATEX Cat 3 (Gases) and Cat 2 (Dusts) Certificate Baseefa10ATEX0100X
IECEx Zone 2 and Zone 21 Certificate IECEx BAS 10.0038X

Dimensions (HxWxD) & weights

Transmitter unit	284 x 263 x 198mm	13.15kg
Receiver unit	255 x 127 x 90mm	4.9kg

*does not apply for all gases and ranges

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