

SERVOTOUGH Laser 3 Plus Combustion

Product overview Hazardous area



Gas	Measures	Application
Oxygen		
Carbon Monoxide	Percent	Process control
Carbon Monoxide + Methane	Trace ppm	Combustion



SENSING TECHNOLOGY

Tunable Diode Laser



Key applications

- Process heaters
- Incinerators
- Power stations
- Furnaces
- Thermal crackers
- Coal mills
- ESP protection
- Thermal oxidizers

Compact combustion analyzer optimized for CO, O₂, or CO + CH₄ measurements

Unrivalled performance

- Process temperatures up to 1300°C (2370°F)*
- Low detection limit
- Negligible zero drift
- Calibration 12 months

Flexible

- Compact design
- Performs in high particulate environments
- Path lengths from 0.5m to 25m (1.6-82ft)*
- Minimal cross interference
- Diverse mounting: ideal for ducts, stacks and reactor installations
- Wide range of applications

Leading analysis

- Dual line oxygen monitoring for continuous oxygen readings from ambient to 1300°C (2370°F)
- Process temperature from 700°C (1292°F) up to 1300°C (2370°F) "hot oxygen analysis"
- Purge with instrument air, not nitrogen, due to the application of advanced spectroscopy techniques "hot oxygen analysis"

* Application and measurement dependent

Easy to use

- Simple to install and operate
- Robust and reliable
- Space saving
- Digital communications Modbus over Ethernet
- User friendly interface and rapid disconnect for easy calibration

Low cost of ownership

- Intuitive alignment for easy installation and maintenance
- Non-depleting TDL technology
- No moving parts, no consumables
- No sample conditioning system - reduced maintenance costs

Benchmark compliance

- ATEX, IECEx and North American hazardous area approvals
- Certified for gases and dust
- Hardware safety integrity certification supports use in SIL 2 safety instrumented systems
- IP66
- CE approved

For more information visit servomex.com/contact

SERVOTOUGH

Laser 3 Plus Combustion

Product overview

Hazardous area

A revolutionary approach to TDL gas analysis

By combining the latest advances in hardware with leading-edge software processing, the SERVOTOUGH Laser 3 Plus is a revolutionary step forward for TDL gas analysis. Servomex has approached TDL analysis afresh, creating an analyzer a fraction of the size without compromising performance. The result is TDL analysis that is easier and faster to install - saving valuable space while enabling much greater installation flexibility.

Low maintenance, low cost-of-ownership

The next-generation ethos of the Laser 3 Plus works hard to reduce costs at all stages. In addition to the immediate advantages of TDL technology - a non-depleting measurement which requires no sample conditioning system - the Laser 3 Plus compact design greatly reduces installation time, with small, light intuitive alignment for easy installation and maintenance. Full ethernet communications for commissioning, diagnostics and trouble shooting.

High performance monitoring

The next generation ethos of the Laser 3 Plus works hard to reduce costs at all stages. In addition to the immediate advantages of TDL technology - a non-depleting measurement which requires no sample conditioning system - the Laser 3 Plus compact design greatly reduces installation time, with small, light intuitive alignment for easy installation and maintenance. Full ethernet communications for commissioning, diagnosis and trouble shooting.

LINE LOCK TECHNOLOGY - SAFE, SECURE, RELIABLE.

These analyzers are not intended for any form of use on humans and are not medical devices as described in the Medical Devices legislation or regulation.

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 Watch our product video

SERVOMEX

Technical data sheet

SERVOTOUGH Laser 3 Plus Combustion



Specifications

Gases measured	O ₂ , CO & CH ₄ , CO				
Technology	Single Line Tunable Diode Laser Spectroscopy				
Performance	Dual O ₂		Dual CO & CH ₄		CO
	O ₂ [†]	Hot O ₂ [§]	CO	CH ₄	
Detection limit (LDL) [‡]	0.05%*	0.1%**	3ppm*	0.05%*	1ppm*
Min. range [‡]	0-5%	0-5%	0-100ppm	0-5%	0-100ppm
Max. range [‡]	0-21%	0-10%	0-10,000ppm	0-5%	0-10,000ppm
Max. temperature [‡]	1300°C (2372°F)		1300°C (2372°F)	500°C (932°F)	1300°C (2372°F)
Optical path length [‡]	0.5-25m (1.6-82ft)				
Max. pressure [‡]	1.2 bar absolute (barA)				
Measurement update rate	5 readings per second				
Response time T ₉₀	<10s [#]				
Drift (zero)	Negligible, <2% Full Scale Range (FSR) between calibrations				
Drift (span)	<4% FSR between calibrations				
Linearity	<1% FSR				
Repeatability	± detection limit or ± 1% of reading, whichever is the greater				
Calibration	Recommended every 12 months (up to 36 months, application dependent, consult Servomex)				
Maintenance	Recommended every 12 months				
Measurement availability	Optimal measurement availability via sealed reference cuvette and Servomex's unique line lock technology principle as standard				

* Detection limits are specified as the 95% confidence interval for 1m (3.3ft) optical path and gas temperature/pressure = to 25°C (77°F) /1 barA.

** Detection limits are specified as the 95% confidence interval for 1m (3.3ft) optical path and gas temperature/pressure = to 1000°C (1832°F) /1 barA.

† Nitrogen purge only.

§ Nitrogen or instrument air purge. Process temperatures >700°C (1292°F) only.

‡ Dependent on temperature path length and dust. Refer to Servomex for application specific performance and limits.

Min. 1 second. Refer to Servomex, LDL and noise affected.

Operating environment	Ensure the effects of any local thermal radiation is considered when assessing the operating environment
Operation	-20°C to +65°C (-4°F to +41°F)
Mounting flange temperature	135°C (275°F)
Storage temperature	-20°C to +65°C (-4°F to +41°F)
Relative humidity	0-80% RH, non-condensing
Altitude (maximum)	4,000m (13,120ft) 2,000m (6,560ft) for hazardous area variants
Warm-up time	Functional within 10 minutes; Servomex recommend allowing 3 hours for the analyzer to stabilize
Ingress protection	IP66, NEMA 4X

The performance specification has been written and verified in accordance with the international standard IEC 61207-1:1994 "Expression of performance of gas analyzers"

Signal outputs/inputs		
Analog output	1 isolated 4-20mA: 500Ω maximum as standard 1 x additional output (specification as above) may be fitted as an option	
Output range	Analog output parameters freely selectable over measurement range	
Alarms & relays	1 x status relay 1A at 30V dc/ac as standard 2 x additional outputs (specification as above) may be fitted as an option	
Analog input (optional)	2 x 4-20mA inputs, maximum current 22mA; input impedance 50Ω	
Digital communications	Modbus TCP/IP Ethernet (10 or 100 base)	
Physical	Transmitter	Receiver
Weight	3kg (6.6lbs)	2kg (4.4lbs)
Dimensions, WxDxH	131 x 164 x 303mm (5 1/8" x 6 1/2" x 12")	110 x 146 x 248mm (4 5/16" x 5 3/4" x 9 3/4")
Mounting	Flange to DN25, DN50, ANSI 1", 2", 3" or 4"	
Utilities		
Supply voltage	24V dc (18-30V dc)	
Rated power	25W maximum	
Purge gas	Dry and oil-free air (ISO 8573.1 Class 2-3) or N ₂ 99.99, gas requirement and flow rate is application dependent	
Zero gas	Typically nitrogen	
Span gas	Application dependent	
Accessories		
	Accessories such as alignment tools, calibration cell kits, purge panels and insertion tubes, isolation flanges and thermal spacers are available for specific applications - contact your local Servomex office	

Sample wetted materials

	Application configurable from
Sample wetted seals	Viton® 70 (standard) or Chemraz® 505 (solvent resist) or equivalent
Flanges	Stainless steel (typically 316) [†]
Insertion tubes	Stainless steel (typically 316) [†]
Process flange gasket	Stainless steel/graphite composite
Process windows	Fused silica (standard) or Sapphire (application dependent)
Process window seal	Loctite® 595

[†] Other options are available, such as titanium CP-2 or Hastelloy® C276

Compliance

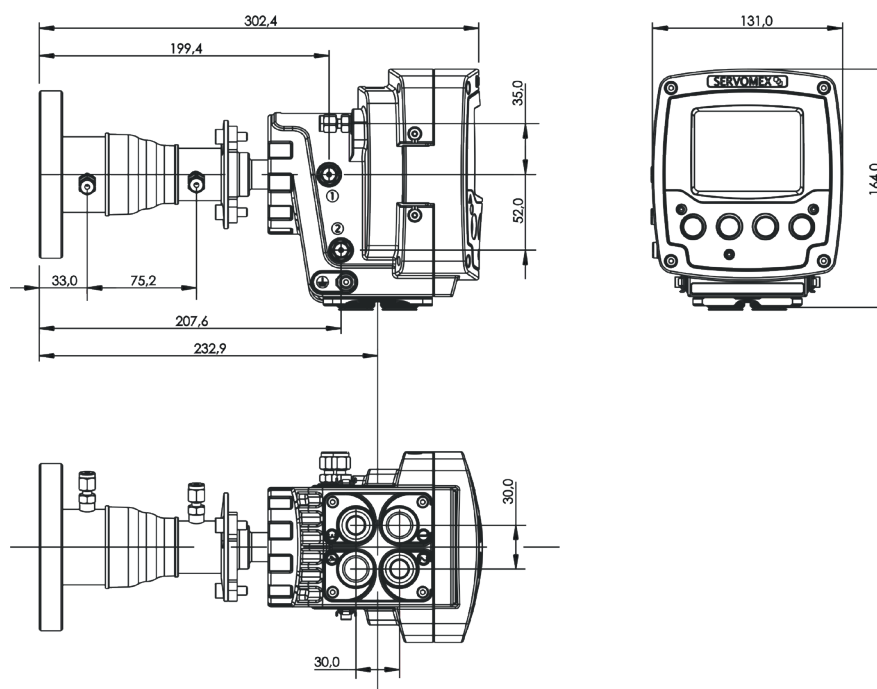
Hazardous area approvals	For process hazardous area zones no greater than Zone 2 or Zone 21
ATEX (Europe)	II 3G Ex ic ec nC op is IIC T4 Gc (-20°C ≤ Ta ≤ +65°C) II 2D Ex tb [Ex op is] IIIB T135°C IP66 Db (-20°C ≤ Ta ≤ +65°C)
IECEx (International)	Ex ic ec nC op is IIC T4 Gc (-20°C ≤ Ta ≤ +65°C) Ex tb [Ex op is] IIIB T135°C IP66 Db (-20°C ≤ Ta ≤ +65°C)
North America	Class I, Division 2, Groups A-D Class II, Division 2, Groups F&G Class III Class I, Zone 2 Group IIC Ambient temperature range -20°C to +65°C, T4 IP66 and type 4X
EC directives	The SERVOTOUGH Laser 3 Plus complies with the EMC Directive, RoHS, and all other applicable directives
Electrical safety	Electrical safety to IEC 61010-1; the SERVOTOUGH Laser 3 Plus has also been certified for use in ordinary locations in USA and Canada

Configuration

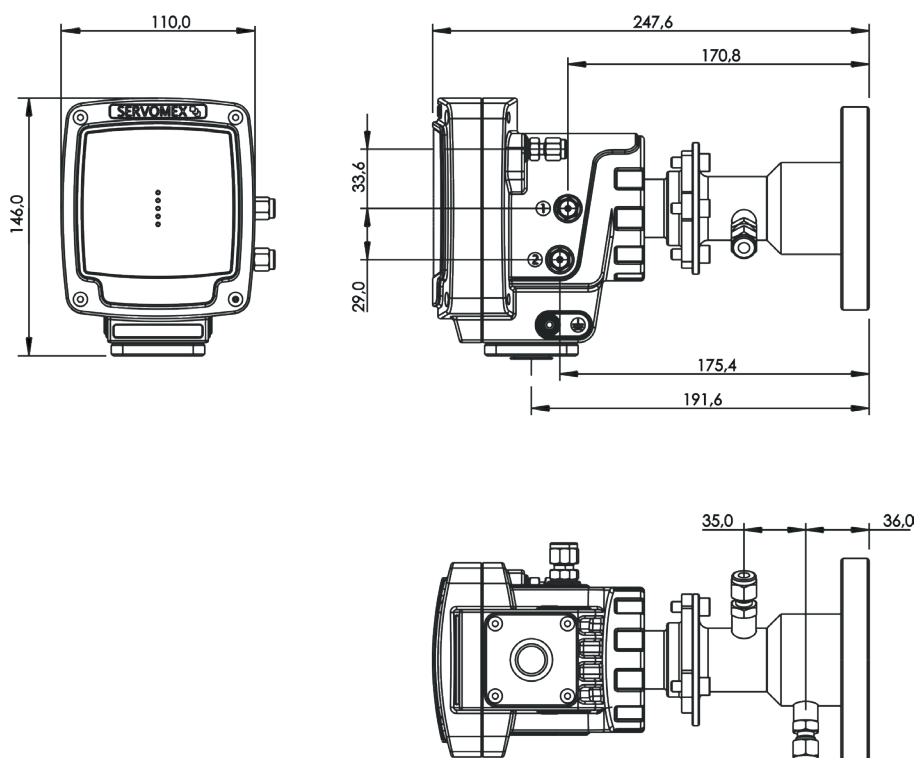
Analyzer features	The SERVOTOUGH Laser 3 Plus measurement arrangement is configured to suit a specific application (see the supplementary configuration sheet), the following features may be configured independently
Outputs and alarm options	Standard: 1 x 4–20mA output and 1 x status relay Additional option card: 1 x 4–20mA output, 2 x status relays, 2 x 4–20mA inputs
Certification (select one)	Safe area/general purpose Gas: ATEX Cat 3 / IEC Ex zone 2 Dust: ATEX Cat 21 / IEC Ex zone 21 North American Class 1 Division 2 (gas and dust)
Functional safety manual	Demonstrates analyzer hardware compliance to SIL 2, IEC 61508

Dimensional drawings

Transmitter



Receiver



Dimensions shown in millimetres

We're ready to help

Whatever your gas
analysis requirements,
wherever you are.

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Analysis that **empowers**

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