

# SERVOTOUGH Laser 3 Plus - Combustion Oxygen

NEXT-GENERATION TUNABLE DIODE LASER (TDL) COMBUSTION OXYGEN MONITOR COMBINES UNIQUE FEATURES, LEADING PERFORMANCE AND REDUCED COST-OF OWNERSHIP IN A REVOLUTIONARY COMPACT DESIGN.

INTRODUCING LINE LOCK CUVETTE TECHNOLOGY - NEVER LOSE TRACK OF YOUR MEASUREMENT



## SERVOTOUGH Laser 3 Plus - Combustion Oxygen

The SERVOTOUGH Laser 3 Plus is a revolution in TDL Absorption Spectroscopy analysis: a highly compact gas monitor for in-situ cross stack applications, which delivers exceptional performance benefits in a revolutionary compact design.

Servomex's pioneering approach to design has produced an analyzer that occupies a footprint up to 1/10th the size of competitor products. This provides instant benefits in terms of installation ease and flexibility.

The SERVOTOUGH Laser 3 Plus delivers exceptional TDL performance, with a fast response to measuring O<sub>2</sub> in a wide range of applications. Utilizing the latest Wavelength Modulated Spectroscopy (WMS) measurement techniques with unique Servomex signal processing, the Laser 3 Plus provides the most stable, repeatable results with minimal installation and maintenance costs.

### FLEXIBLE

- Compact design
- Performs in high particulate environments
- Path lengths from 0.1m to 25m
- Minimal cross interference
- Diverse mounting: ideal for ducts, stacks and reactor installations

### EASY TO USE

- Simple to install and operate
- Robust and reliable
- 0-1% up to 0-25% range available.
- Space saving
- Digital communications Modbus, Ethernet
- User friendly interface rapid disconnect for easy calibration

### LOW COST OF OWNERSHIP

- Small, light intuitive alignment for easy installation and maintenance
- Non-depleting TDL technology requires no replacement
- No moving parts, no consumables
- No sampling system reduces maintenance costs
- Purge with instrument air not nitrogen due to the application of advance spectroscopy techniques

### UNRIVALLED PERFORMANCE

- Process temperatures from 700°C up to 1500°C "Hot Oxygen" analysis
- Low detection limit
- Dual line oxygen monitoring for continuous oxygen readings from ambient to 1500°C
- Negligible zero drift

### BENCHMARK COMPLIANCE

- ATEX, IECEx hazardous area approvals
- North American hazardous area approvals pending
- CE approved
- Wide process ambient temperature range
- IP66
- SIL 2

Learn more about the SERVOTOUGH Laser 3 Plus - Combustion Oxygen  
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# PRODUCT OVERVIEW: Laser 3 Plus - Combustion Oxygen

## 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 fresh, creating an analyzer a fraction of the size without compromising performance. The result is TDL analysis that is easy and fast to install, both 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 sampling systems or sensor replacement - the Laser 3 Plus compact design greatly reduces installation time, with small, light intuitive alignment for easy installation and maintenance. In addition, the Laser 3 Plus requires a fraction of the window purge gas flow required by competitor analyzers. Full ethernet communications for commissioning, diagnostics and trouble shooting.

## HIGH PERFORMANCE MONITORING

The hardware advances of the Laser 3 Plus are matched by an advanced WMS processing laser measurement, augmented by unique signal processing software which eliminates drift over extended operational periods by automatically tracking on a sealed reference cuvette absorption line - Line Lock Technology. This robust tracking mechanism ensures a highly reliable and accurate operation over long periods, with calibration frequencies extended beyond twelve months for many applications.

The result is a sturdy, general purpose and hazardous area optimized design which ensures Laser 3 Plus can handle the most challenging of locations; including particulate-rich environments.

LINE LOCK TECHNOLOGY - SAFE, SECURE, RELIABLE.

## KEY APPLICATIONS - COMBUSTION CONTROL

- Process Heaters
- Incinerators
- Thermal Crackers
- Thermal Oxidisers
- Power Stations
- Coal Mills
- Furnaces

## ALTERNATIVE PRODUCTS

The SERVOTOUGH product range features a number of options designed to meet your application needs.

### FluegasExact 2700



Designed to measure O<sub>2</sub> and CO<sub>e</sub> in flue gases for improved combustion efficiency and reduced emissions, the FluegasExact gas analyzer is designed to suit the most demanding needs of combustion efficiency applications in the Power

### Oxy 1900



When you need high performance O<sub>2</sub> monitoring of flammable gases for applications like blanket inerting and flare stack analysis, choose the award winning Oxy; now augmented by innovative options including Flowcube flow measurement technology.

### OxyExact 2200



The SERVOTOUGH OxyExact high specification oxygen analyzer offers an unrivalled combination of precision, flexibility and performance for optimum process and safety control. The OxyExact can be configured with a safe or hazardous area control unit with up to six transmitters.



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SPECIFICATIONS	DETECTION LIMIT	MAX. MEASURING RANGE	MAX. PRESSURE MEASUREMENT	MAX. SAMPLE TEMPERATURE/°C
O <sub>2</sub>	0.1% 0.05%	0 - 10% >700°C * 0 - 21%	1.2 bar abs.	1500
<b>NOTES</b>	Detection limits are specified as the 95% confidence interval for 1m optical path and gas temperature/pressure = to 1000°C/1 bar abs. Pressures quoted are spectroscopic limits for the Laser 3 Plus ATEX and IEC certified products will be limited to 1.1bar abs maximum process pressures for flammable samples. Specification is application dependent			

\* Application dependent, on temperature, pathlength and dust. Refer to Servomex for further details.

MONITORING PERFORMANCE	
Technology	Single Line Tunable Diode Laser Spectroscopy
Optical path length	0.1* - 25m
In - situ response time	<10 seconds (T <sub>10</sub> -T <sub>90</sub> at full specification)
Zero Drift	Negligible
Repeatability	± detection limit or ± 2% of reading whichever is greater
Linearity	<1% FSR
Calibration	Check recommended every 6-12 months with flow through cell, or using optional external calibration cell.
Maintenance	Recommended every 12 months.
Measurement availability	Optimal measurement availability and safety via sealed reference cuvette as standard. Removes the need for regular line validation maintenance

\* For applications <1m and >500°C, refer to Servomex for further details.

OPTIONS	DESCRIPTION	SPECIFICATION
Pathlength Specific Optics	0.1m to 2m >2m to 12m >12m to 25m)	Optics are specified to ensure optimal transmission intensity
Outputs and Alarms	Standard: 1 x 4-20 mA output, 1 x Status Relay Additional option Card: 1 x 4-20mA output 2 x Status Relays, 2 x 4-20mA inputs	4-20 mA output: Isolated current loops, 500 Ω maximum 4-20 mA input: Maximum current 22mA input impedance 50 Ω Status Relays: 1A at 30V Vdc/ac
Digital Communications	TCP/IP Ethernet	10 or 100 base Ethernet and Modbus TCP
Flange Sizes	DN25, DN50, ANSI 1", 2", 3" and 4 "	Available as standard
Sample wetted seals	Standard and solvent resistant versions	Viton 70 or Chemraz 505 (or equivalent)
Power Supply	The analyzer is powered by 24V dc.	An external mains rated power supply (85-264 VAC, 50/60 Hz) is available for US and ATEX/IECEx (Gas) hazardous areas
In-Line Span cell	Available to allow analyzer performance to be checked with live reference gas	Validation of reading

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 BUSINESS CENTER



# PRODUCT DATA: Laser 3 Plus - Combustion Oxygen

## DEVICE SPECIFICATION

### Size:

- TRANSMITTER:  
131mm width (5<sup>1</sup>/<sub>8</sub>"")  
164mm high (6<sup>1</sup>/<sub>2</sub>"")  
302.4mm deep (11<sup>9</sup>/<sub>10</sub>"")
- RECEIVER:  
110mm width (4<sup>5</sup>/<sub>16</sub>"")  
146mm high (5<sup>3</sup>/<sub>4</sub>"")  
247.6mm deep (9<sup>3</sup>/<sub>4</sub>"")

### Weight:

- TRANSMITTER: <3.0 kg (6.6 lbs)
- RECEIVER: <2.0 kg (4.4 lbs)

### Operating temperature:

- -20°C to +65°C (standard)

### Certifications:

- ATEX Cat 3 (Gases)
- IECEx Zone 2 and Zone 21
- North American Class 1 Division 2 and Zone 2 (Gas and Dust) pending
- ATEX Cat 21 (Dust)
- Safe Area / General Purpose
- CE marked in compliance with ATEX, EMC, LVD and all other applicable directives

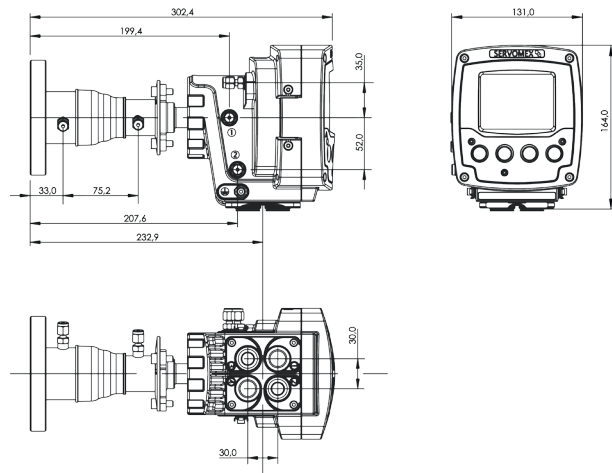
### Protection Class:

- IP66
- NEMA 4X

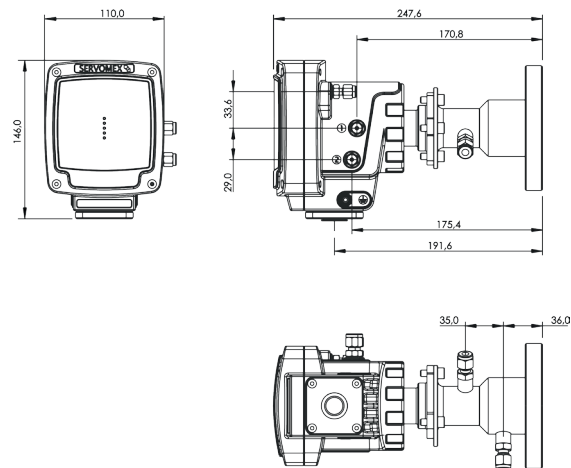
*These analyzers are not intended for any form of use on humans and are not medical devices as described in the Medical Devices Directive 93/42/EEC.*

## DEVICE SCHEMATIC

### Transmitter



### Receiver



**Please note:** While every effort has been made to ensure accuracy, no responsibility can be accepted for errors or omissions. Data may change, as well as legislation, and you are strongly advised to obtain copies of the most recently issued regulations, standards and guidelines. This document is not intended to form the basis of a contract.

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