



Laser Analyser AtLAS-900

Analyser based on laser technology for extractive applications in safe area and in hazardous area, ATEX classified (Zone 1 / 21).



AtLAS-900

www.adev.it

Extractive Type Process Analyser based on single ray Laser Technology (TDLAS)

AtLAS-900 is a rugged process analyser for in line measurements in harsh applications. TDLAS technology ensures incredibly fast response time, very low drift and no cross sensitivity due to the presence of other gas in the stream.

This instrument can be used in a variety of applications but it has been optimized to solve specific problems, typical of the inerting control in centrifuges and reactors in chemical and pharmaceutical industry, as well as in biogas and landfill gas.

The sample runs through the analysis tube. The transmitter and receiver units are placed at the analysis tube far ends. So, the sample gas only contacts Quartz and Teflon and this makes the analyser parts totally free from the attack of acids and solvents. Again, there are not moving parts and the analyser can even withstand with the direct ingress of liquid and it can be sterilized.

The extremely simplified and resilient design allows to reduce to the minimum the sampling systems components upstream the analyser.

The AtLAS-900 can be provided for safe area or for hazardous area classified Zone 1 / Zone 21 (ATEX certified).

TDLAS Analyser

for Extractive
Applications



Technical Specification

TDLAS Analyser AtLAS-900

Performance Specification

Measuring Principle	TDLAS (Tunable Diode Laser Absorption Spectroscopy)
Light Source	Semiconductor Laser
Accuracy	$\leq \pm 1\%$ FS
Linearity Error	$\leq \pm 1\%$ FS
Repeatability	$\leq \pm 1\%$ FS
Span Drift	$\leq \pm 1\%$ FS / 6 months
Zero Drift	$\leq \pm 1\%$ FS / 6 months
Maintenance Cycle	≤ 2 times / year (clean optical window)
Calibration Cycle	≤ 2 times / year
Enclosure Rating	IP66
Response Time	≤ 1 sec. at T90
Optical Path	Minimum 350 mm for O ₂



Key Applications

- Inerting Control
- Centrifuges
- Reactors
- Chemical and Pharmaceutical Industry
- Biogas & Landfill Gas
- Solvents Recovery
- Fertilizers

Signals

Analog Output	2 x 4-20 mA isolated (max. load 750 Ω)
Analog Input	2 x 4-20 mA isolated (for temperature and pressure compensation, if necessary)
Digital Output	RS485 / RS232
Relay Output	3 x (24V, 1A)



European Compliance

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- ATEX Directive 2014/34/EU



Operative Specification

Sample Flow Rate	2000 ÷ 5000 cc/min.
Pressure	Max. 3 bar abs.
Power Supply	24 Vdc or 100...240 Vac, ≤ 20 W
Ambient Temperature	-20°C...+60°C
Ambient Humidity	$\leq 90\%$ non-condensing
Installation	Extractive
Pneumatic Connections	2 x fittings for tube O.D. 8 mm (In / Out)
Wiring Connections	ATEX version: 1 x armored cable gland for cable 6.5÷10.5 mm. Safe area version: 2 x cable glands for cable 5÷8 mm 3 x threaded hole M20 x 1.5 (with plug) 1 x threaded hole M25 x 1.5 (with plug)



ATEX

ATEX certification for Zone 1 / Zone 21 with protection mode:

II 2 G D Ex db op is IIC T6 Gb Ex
Ex tb op is IIIC T80°C Db
Ta = -20°C to +60°C

ATEX Certificate Number **CML 18 ATEX 1400X**

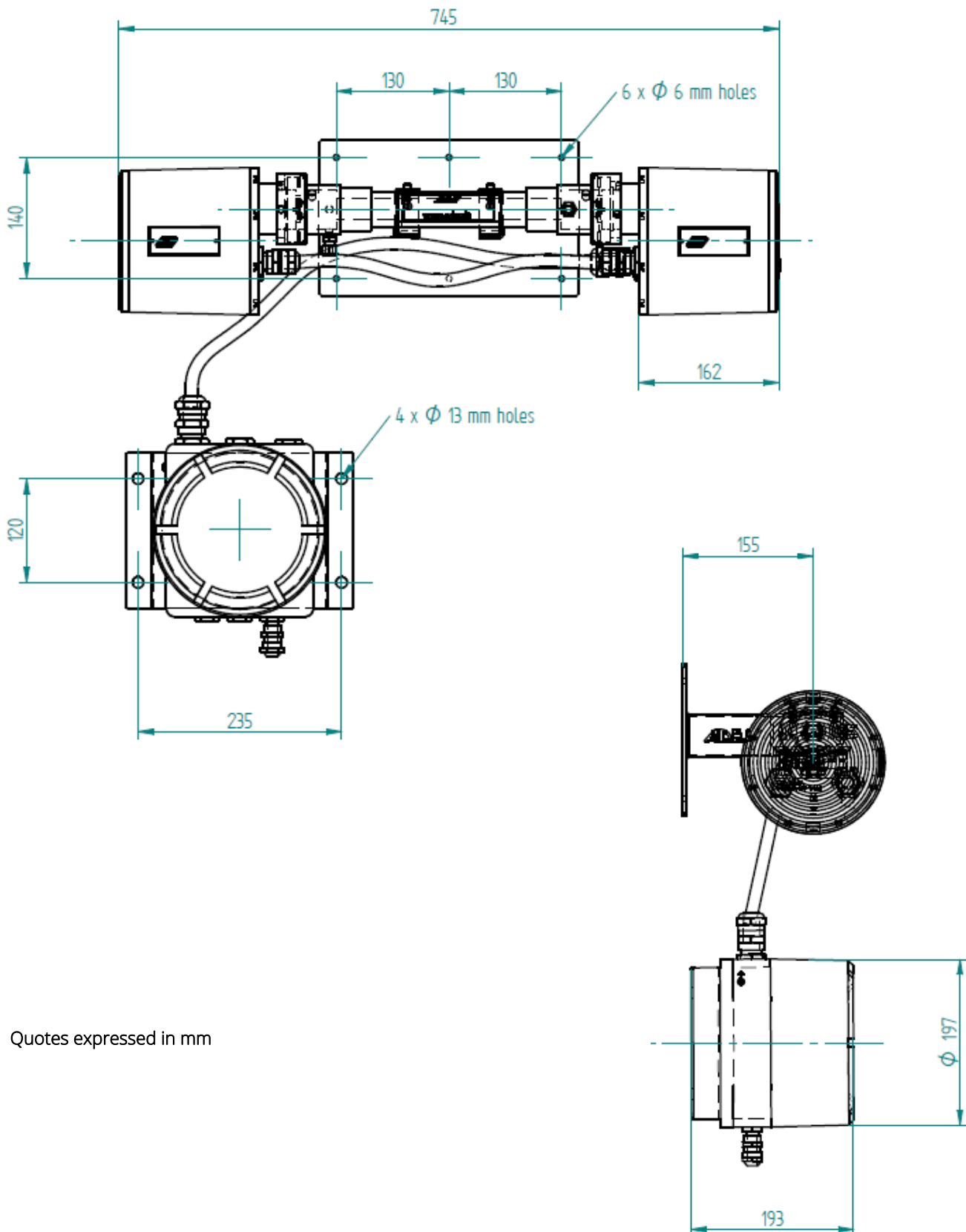


Physical Specification

Dimensions	Refer to dimensional layout
Weight	26 Kg. total
Wet Parts Materials	Analyser: K9/JGS2 Quartz, Teflon Analysis tube: SS 304 or SS304 Teflon-Coated

Dimensional Layout

TDLAS Analyser AtLAS-900



Quotes expressed in mm

Construction Philosophy

A simple system that reduce maintenance to the minimum

AtLAS-900 is essentially made by 4 blocks: transmitter, receiver, analysis tube and junction box, where the power supply and customer terminal boards for signal connections are placed.

All parts contacted by gas are in selected materials in order to resist to corrosion (Quartz, SS or Teflon) and to allow the sterilization of the instrument.

The wide section of the analysis tube makes the liquid very easy to drain.

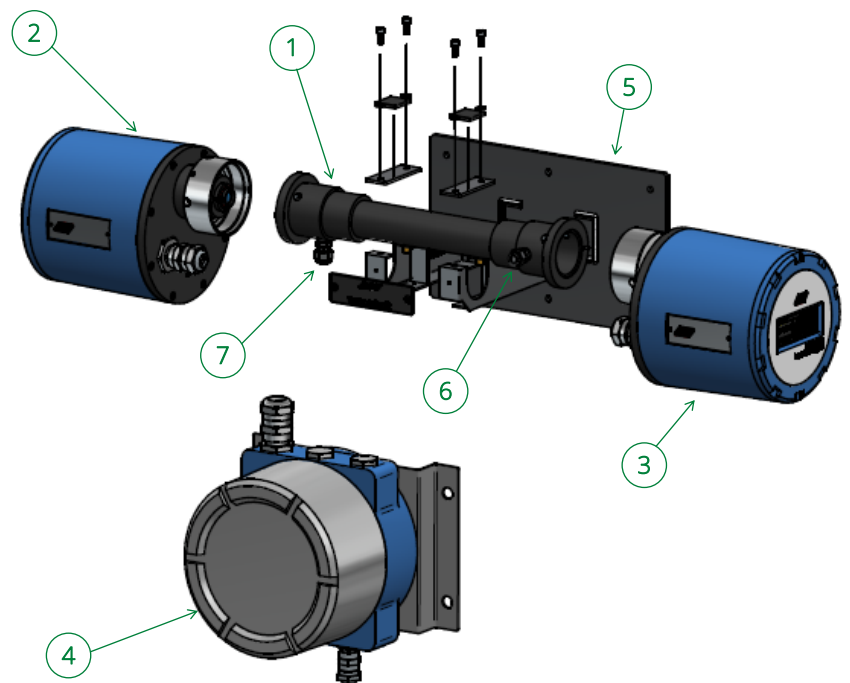
- ✓ Measuring principle not subjected to depletion
- ✓ No problem in case of liquid entrance
- ✓ Not affected by vibrations
- ✓ Sterilizable with hydrogen Peroxide or other solvents
- ✓ Not affected by flow rate
- ✓ Selected materials, solvents and acid resistant

AtLAS-900 warranties extremely reliable Oxygen measurements in safety-demanding applications, typical of **Chemical** and **Pharmaceutical** industry

Also available for other gases measurement (after evaluation)



- 1 Analysis Tube
- 2 Transmitter
- 3 Receiver
- 4 Junction box / power supply unit
- 5 Mounting bracket for plate / wall mounting
- 6 Sample IN
- 7 Sample OUT



TDLAS Technology

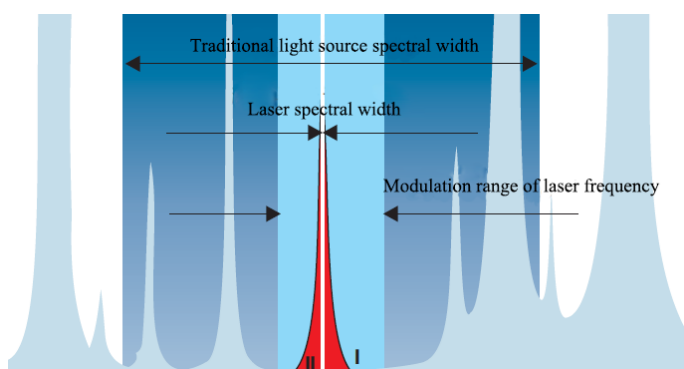
State-of-the-art Performance



Measuring Principle

TDLAS (Tunable Diode Laser Absorption Spectroscopy) mainly uses the character that Tunable laser's narrow band and wavelength change with the current.

So by precisely modulating the current of tunable laser, it can scan a certain absorption peak of detected gas (no absorption of background gas).



And after obtaining the second harmonics absorbed by detected gas, it finally works out the concentration of detected gas by using this second harmonics and line-width.

The TDLAS technology has been developed into a kind of high sensitivity, high resolution, fast response time and high selectivity of gas detection technology, widely used in industrial process monitoring control.

By using a tunable semiconductor laser, AtLAS-900 scans the specific absorption line of the measured gas (no background gas) to get the second harmonic of the gas.

Through processing and analyzing the second harmonic and the broadening information of the gas, the concentration of the gas is obtained.



Features

High Performance

- Adopting wavelength-modulation-spectroscopy allows better signal/noise ratio and anti-interference capability of dust and background gas
- Single line spectrum technology, free from interference of background gas
- No cross sensitivity due to the presence of solvents
- Extremely high stability and repeatability
- Almost instantaneous response time

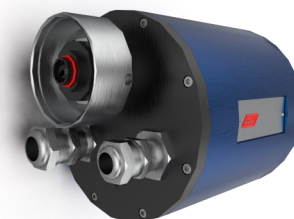
Interface

- I/O interface, self-diagnosis and alarms
- Local OLED display with magnetic keys, operated by magnetic pen without opening the housing



Easy to Use

- Modular design makes field maintenance operations very easy
- Simple to clean in case dirty deposits on the optical parts



Low Costs of Ownership

- It requires a simple sampling system
- No depleting or consumable parts that need to be periodically replaced or refilled

Sampling System

for Analyser AtLAS-900

As though any other extractive analyser, also the AtLAS-900 requires a sample and conditioning system upstream, able to deliver the sample gas to the analyser in the appropriate manner.

What makes the AtLAS-900 unique respect to other solutions is the fact that thanks to its constructive philosophy, this analyser allow to reduce the sampling system to the minimum since it can tolerate the inlet of liquids saturated of solvents and acids in considerable amount

In addition, even in case the measure is compromise by the inlet of too much liquid and dust, the system doesn't suffer permanent damages and the operative condition can be restored simply cleaning the optical parts with a cloth. Optical parts that are easily accessible just disconnecting the transmitter and the receiver units from the two far ends of the analysis tube.

ADEV has a wide experience in the process and can provide the AtLAS-900 analyser combined with a sample and condition system designed for the specific application requirements. Contact ADEV for details.

- 1 Flowmeter or flow switch
- 2 Manual valve for switching from Sample to Zero/Span. In option, proximity sensor on the valve
- 3 Valves on Zero and Span inlets
- 4 AtLAS-900 analyser with analysis tube in AISI or AISI Teflon-coated
- 5 Air (or Nitrogen) Ejector
- 6 Solenoid route-valve for Air (or Nitrogen).
- 7 Pressure reducer for Air (or Nitrogen).
- 8 Flowmeter to adjust Air (or Nitrogen)
- 9 Junction box

Important: The system shown here aside is just an example. Each sampling system must be studied in accordance to the specific application because each plant has its own peculiarities.

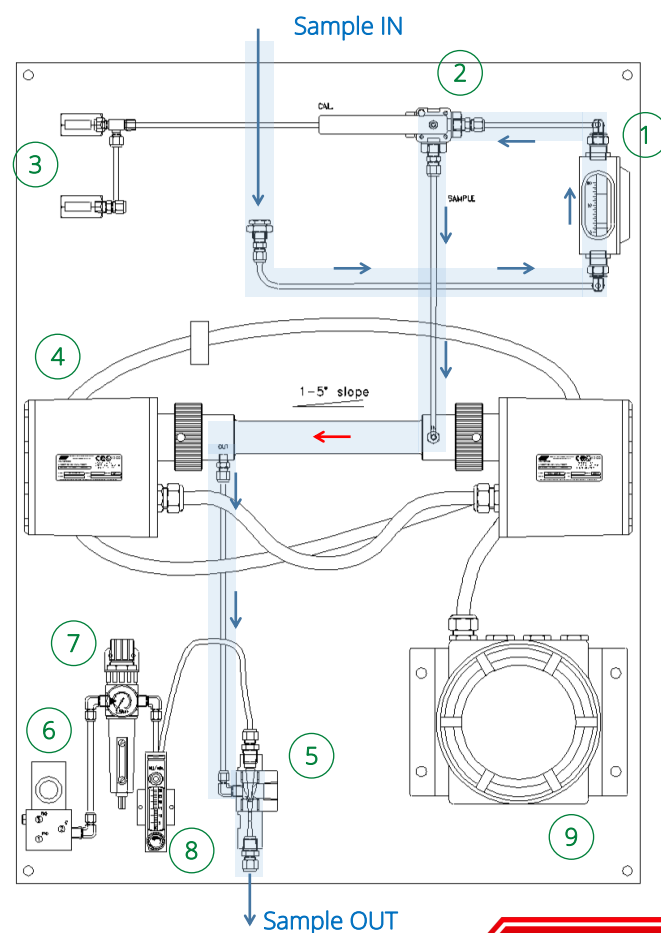
Chemical & Pharma



Inerting control in chemical and pharmaceutical industry is one the typical application of this system. In this applicative fields, the presence of solvents and acid condensates are one of the most relevant problems to be solved. Traditional analysers don't tolerate the direct inlet of the above mentioned substances that may damage the sensor and/or would be subjected to heavy cross sensitivity effects on the measure.

The result of this is the need of complex and expensive sample and condition systems that normally represent the main burden in terms of maintenance.

All these problems are surpassed thanks to the AtLAS-900. Here below an example of typical sampling system for inerting control in centrifuge is shown.



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