EXPLORE THE CLIMATE

CE370

Long Range Automatic Aerosol LiDAR

The CE370 LiDAR provides continuous and real-time operation with high performance measurements of aerosols and clouds including the vertical distribution with an extended range (up to 25 km).

It features a large aperture (200 mm diameter) for enhanced measurement up to high altitudes while ensuring full compliance with eye safety rules.

A second telescope can be added to extend the measuring range towards very low altitudes (from 50 m).

The CE370 can be operated in fixed mode (indoor or outdoor with enclosure) within an observation network, or during ponctual campaigns (fixed or even on a mobile vehicle).

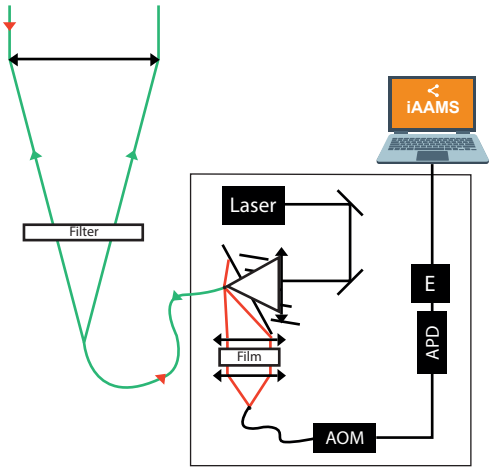
Features

- Aerosol measurements up to 25 km
- Very short blind zone (< 50 m) with an overlap from 5 km
- Real time «quicklook» visualization
- Automatic extinction and backscattering profiles (with AOD or LR)
- High stability and low maintenance
- Eye safety compliance with EN-60825/ANSI Z136
- Easy transportation ➡ Outdoor / indoor / mobile operation

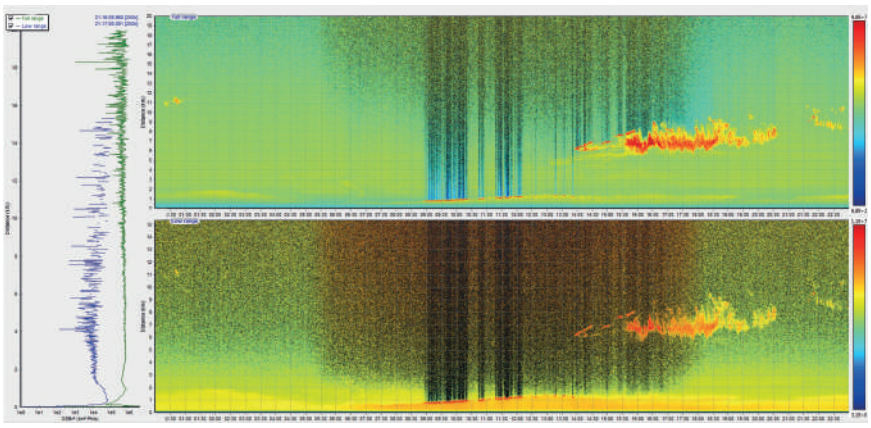
Applications

- Air quality monitoring
- Climate change
- Airport / Aviation
- Atmospheric sciences
- Aerosol and cloud modeling
- Numerical Weather Prediction (NWP)

Technology



Measurement principle of the CE370 LiDAR: E = Electronic card ; AOM = Acousto Optic Modulator ; APD = Avalanche Photo Diode.



Vertical profile of Ln(PR2) data with indication of Signal to Noise Ratio (dots). Quicklook of range corrected data and time graph of background noise

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Technical specifications

Source

Laser type	Green laser: frequency doubled Nd:YAG
Wavelengths	532 nm
Pulse energy	10 µJ (option 20 µJ)
Repetition rate	4.7 kHz
Pulse width	< 15 ns

Optics

External fiber optics length	10 m (30 m in option)
Main optical head type	Galilean
Main optical head aperture diameter	200 mm
Main optical head effective focal length	900 mm
Total beam divergence	Emission: 55 µrad Reception: 55/ µrad (900 µrad for low range)
Beam configuration	Mono-axis, Bi-axis for low range
Eye-safety	Yes
Detector type	APD QE 55%
Filter bandwidths (3)	0.2 - OD 12

Data

Data aquisition mode	Photon counting
Continuous acquisition	Yes, automatic
Data counting rate	25 Mc/s
Electronic range resolution	15 m gates
Electronic range	From 50 m up to 30 km (2048 gates)
Data transfer to PC	USB
Measurement range*	Molecular detection range in typical conditions (AOD 0.2) with 10 min averaging: By night time = 25 km By day time = 15 km
Retrieved products	• PR^2 / $Ln(PR^2)$ data (after instrumental corrections) • Stratification analysis (aerosols, boundary layers, clouds) • Extinction & backscatter coefficients (with additional data: AOD or LiDAR Ratio) • Raw data and other connections.

***Measurement range**
The detection range of a high altitude layer of particles (aerosols or cloud) strongly depends on its concentration.The less concentrated the layer, the farther its detection.
Therefore, to define the performance of a LiDAR in terms of measurement range, it is usual to rather refer to the Molecular Detection Range : the distance (in the absence of clouds) up to which the LiDAR is able to measure the small "molecular" signal of an aerosol free atmosphere (with a Signal to Noise Ratio superior to 1). This Molecular Detection Range only depends on measurement conditions (total aerosol loading, averaging time, night/day).
For any given measurement condition, the LiDAR will detect particle layers above the corresponding Molecular Detection Range, the maximal height depending on layer's concentration.

Environmental conditions

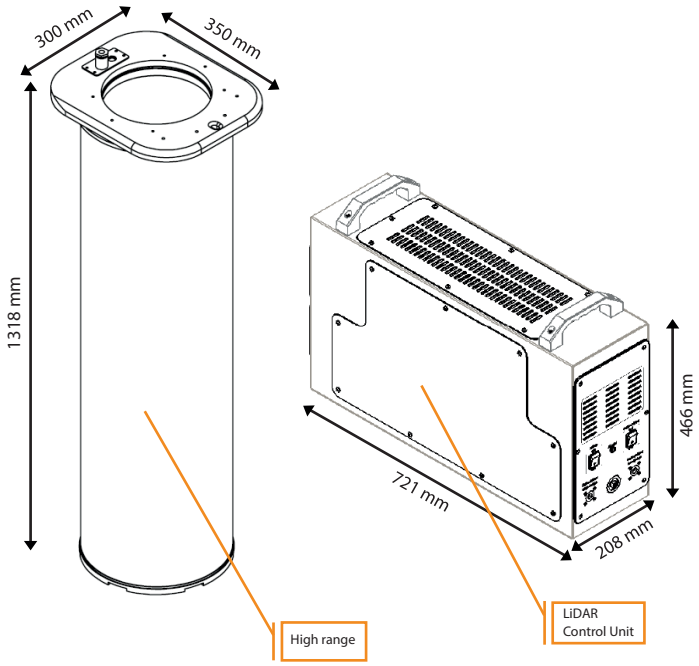
Temperature range	Without thermal enclosure: • Control unit = +20°C to +30°C • Optical head system = +15°C to +35°C
Humidity range	Without thermal enclosure: • Control unit = 0 to 90% RH • Optical head system = 0 to 100% RH and rain

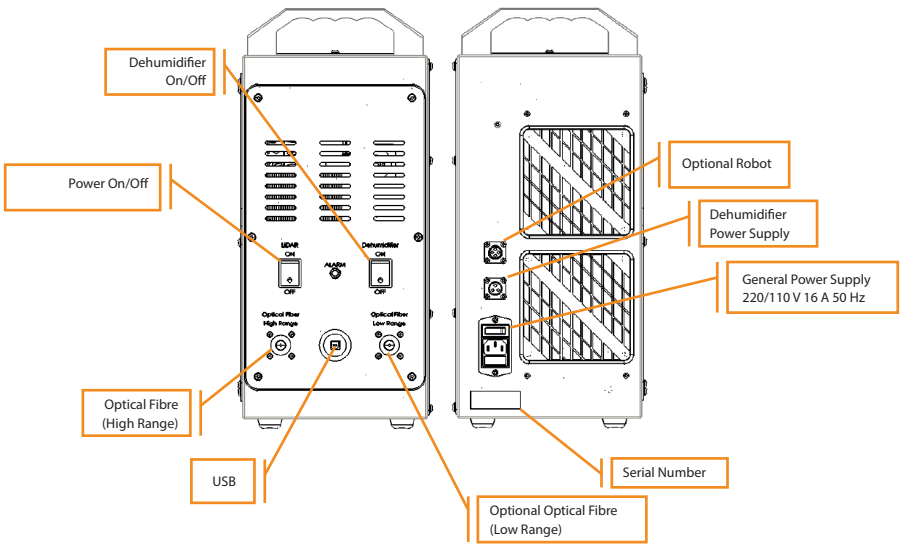
Power

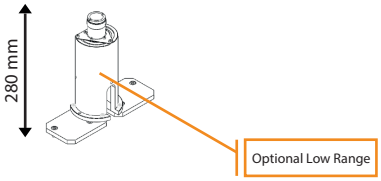
Power supply	100/115/230 V AC and 28 V DC, <100 W

Mechanical Specifications

Transportability	Yes
Dimensions	• Optical head = Ø 200 x 1300 mm • Control unit = L 700 x W 200 x H 400 mm
Weight	90 kg







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