DATASHEET

CL31

Vaisala · Authorized Partner

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VAISALA

Ceilometer CL31

for cloud height detection



Vaisala Ceilometer CL31 is a compact and lightweight instrument for cloud base height and vertical visibility measurements. It detects 3 cloud layers simultaneously. CL31 uses a pulsed diode laser LIDAR (light detection and ranging) technology. CL31 is ideal for aviation and meteorological applications.

Measurement starts from ground level

The enhanced single-lens technology applied in CL31 ensures excellent performance starting at a height of virtually zero. This is due to the strong and stable signal over the whole measurement range. The single-lens technology provides unsurpassed reliability during precipitation, low clouds and ground based obscurations, which are the most critical phenomena in aviation safety.

Fast measurement

Fast measurement helps to detect thin cloud patches below a solid cloud base. CL31 provides a full backscatter profile for data visualization and research purpose.

The CL31 beam can be directed either vertically or tilted. The tilting option together with the novel optics design provides enhanced performance during precipitation by improving the protection given by the shield. In the measurement unit, a tilt angle sensor automatically corrects the measured cloud distance reading to vertical cloud base height.

Extensive self-diagnostics

CL31 is fully automatic. In addition to cloud height data, the messages contain instrument status information based on comprehensive self-diagnostic routines.

In case of malfunction, the diagnostics help users to identify the failed module. CL31 features practical modularity and its easy-access door ensures fast servicing and high data availability.

Easy installation and maintenance

CL31 is easy to install. It has a radiation shield that protects the unit during precipitation and against excessive heat or cooling in extreme temperatures. The automatic window blower with heater improves performance by keeping the window clean and dry. In cold conditions heating prevents frost generation on the window.

Features

- Measurement range from 0 to 7.6 km (from 0 to 25 000 feet)
- Modular design for easy installation and maintenance
- Second-generation, advanced single-lens optics provides excellent performance also at low altitudes
- Fast measurement enables detection of thin cloud layers below a solid cloud base
- Reliable operation in all weather; unsurpassed performance in vertical visibility and cloud detection during precipitation
- Latest technology from the world-leading manufacturer - based on the experience from more than 5000 installed Vaisala ceilometers worldwide
- Extensive self-diagnostics with fault analysis

Data messages

- Cloud hits (up to 3 layers) and status information
- Cloud hits, status, and backscatter profile
- Emulation of CT12K, CT25K, LD-25/40
- Sky condition (optional)

Technical data

Operating environment

Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	–50 … +60 °C (–58 … +140 °F)
Operating humidity	0–100 %RH
Wind tolerance	Up to 55 m/s (123 mph)
Vibration	Lloyds Register / IEC 60068-2-6 5–13.2 Hz, ±1.0 mm 13.2–100 Hz, ±0.79 g 9.1–150 Hz, ±0.5 g
Pollution degree for inside electronics	2
Maximum operating altitude	3000 m (approx. 9800 ft)
IP rating	IP65 (measurement unit) IPX6 (with radiation shield)
UL 50E rating	Type 4

Inputs and outputs

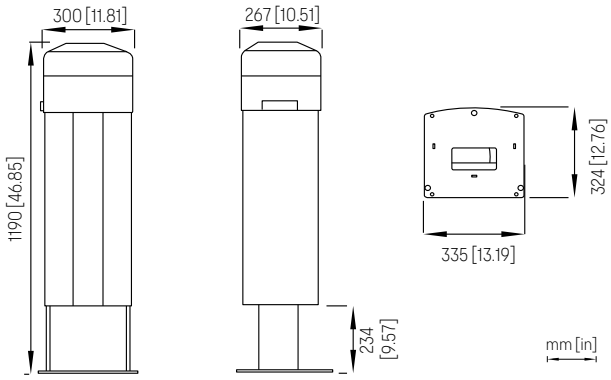
Operating voltage	115/230 V AC ±10 %
Current consumption	
Current consumption (maximum)	2.7/1.4 A
Measurement unit	0.1/0.1 A
Internal heater	0.9/0.4 A
Window conditioner heater	1.5/0.8 A
Window blower	0.2/0.1 A
Frequency (min./max.)	50/60 Hz
Battery backup	12 V internal, VRLA (valve regulated lead acid), 2.4 Ah
Overvoltage protection	Low-pass filter, VDR
Overvoltage category	II
Interfaces	
Data	• RS-232 • RS-485, multidrop, 2-wire • DXL421 modem module • LAN (Ethernet) interface option
Maintenance	RS-232
Baud rate	
RS-232/RS--485	300–57 600 bps
Modem V.21, V.22	300–1200 bps

Mechanical specifications

Tilt positions	Vertical or 12° tilted
Dimensions	
Measurement unit	620 × 235 × 200 mm (24.41 × 9.25 × 7.87 in)
Height with radiation shield	1190 mm (47 in)
Total	1190 × 335 × 324 mm (46.85 × 13.19 × 12.76 in)
Weight	
Measurement unit	12 kg (26.46 lb)
Radiation shield and blower	19 kg (41.89 lb)
Total	31 kg (68.34 lb)
Plywood transport container	
Container size	1400 × 490 × 450 mm (55.12 × 19.30 × 17.72 in)
Container weight	47 kg (103.62 lb)

Measurement performance

Measurement range	0–7.6 km (0–25 000 ft)
Reporting resolution (units selectable)	With 5-m resolution: 5 m or 10 ft With 10-m resolution: 10 m or 30 ft
Reporting interval	Programmable 2–120 s, or polling
Measurement interval	2 s default
Distance measurement accuracy against a hard target	±5 m (16 ft)

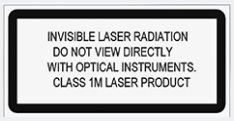


Spare parts and accessories

Cable termination box with extra transient protection	Termbox-1200
PC maintenance cable	QMZ101
Shock absorbing mounting pad for ship installations	CT35022
Modem	DXL421
Attachment mechanics for radio modem antenna	CLRADIOKIT
Graphical User Interface for Ceilometers	CL-VIEW
Boundary Layer View Software for Ceilometers	BL-VIEW
Bird deterrent	CL31BIRDKIT
Air Quality Plug and Play Package for Ceilometer with laptop and pre-installed BL-View	CLAQPACKAGE

Compliance

EU directives and regulations	LVD, EMC, RoHS
EMC immunity	EN 61326-1:2013, industrial environment
EMC emissions	EN 55032:2015 + A11:2020 EN 61000-3-2 EN 61000-3-3
Electrical safety	EN 61010-1:2010 + A1:2019
Environmental	EN IEC 63000:2018
Eye safety	EN 60825-1:2014+A11:2021 Complies with 21 CFR 1040.10 and 1040.11 except for the deviations pursuant to the *Laser Notice No. 56*, date May 8, 2019.
Compliance marks	CE, RCM, China RoHS



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