



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 three cloud layers simultaneously. CL31 uses a pulsed diode laser LIDAR (light detection and ranging) technology. CL31 is ideal for aviation and meteorological applications.



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

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.

Technical Data

Measurement Performance

Observation range	0 ... 7.6 km (0 ... 25 000 ft)
Reporting resolution	5 m (16 ft 5 in) or 10 m (32 ft 10 in), units selectable
Reporting interval	2 ... 120 s, selectable
Distance measurement accuracy against a hard target	Greater of $\pm 1\%$ or ± 5 m (16 ft)
Laser	InGaAs diode
Wavelength	910 Nm

Operating Environment

Temperature range	-40 ... +60 °C (-40 ... +140 °F) -55 ... +60 °C optional (-67 ... +140 °F optional)
Humidity	0 ... 100 %RH
Wind	To 55 m/s (123 mph)
Vibration	Lloyds Register / IEC60068-2-6 5 - 13.2 Hz, ± 1.0 mm 13.2 - 100 Hz, ± 0.79 g

Inputs and Outputs

Operating voltage	100/115/230 VAC $\pm 10\%$
Frequency (min/max)	45 ... 65 Hz
Power consumption	Max. 310 W including heating
Back-up battery	Internal, 2 Ah

Interfaces

Data	<ul style="list-style-type: none"> 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

Data Messages

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

Compliance

EMC	IEC/EN 61326
Electrical Safety	IEC/EN 60950
Eye safety	Class 1M IEC/EN60825-1

Mechanical Specifications

IP rating	IP66
Tilt positions	Vertical or 12° tilted

Dimensions

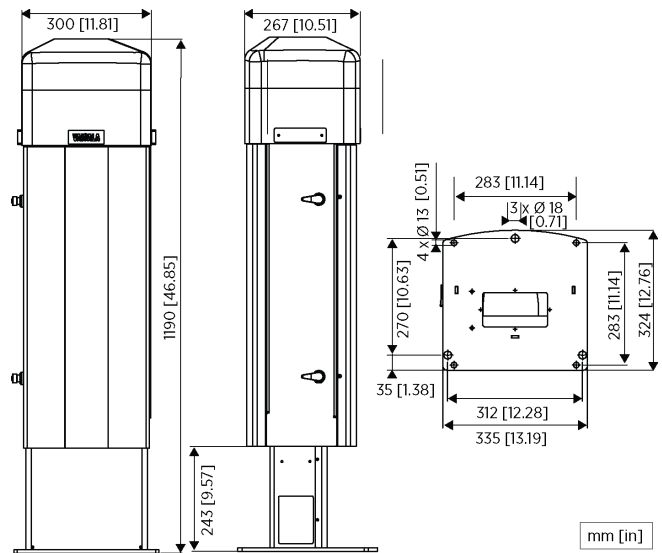
Measurement unit	620 × 235 × 200 mm (24.41 × 9.25 × 7.87 in)
Height with shield	1190 mm (47 in)
Total	1190 × 335 × 324 mm (46.85 × 13.19 × 12.76 in)

Weight

Measurement unit	12 kg (26.5 lb)
Shield and blower	19 kg (41.8 lb)
Total	31 kg (68 lb)

Plywood Transport Container

Container size	1400 × 490 × 450 mm (55 × 19.30 × 17.72 in)
Container weight	47 kg (103.6 lb)



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 functionality of CL-VIEW and BL-View	CLAQPACKAGE



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