

# CL31 Ceilometer for Cloud Height Detection



*Vaisala Ceilometer CL31 measures cloud base height and vertical visibility in all weather – good or bad.*

The Vaisala Ceilometer CL31 is a compact and lightweight instrument for cloud base height and vertical visibility measurements. It is able to detect three cloud layers simultaneously. The CL31 is ideal for aviation as well as meteorological applications where reliable detection of clouds is essential.

The CL31 employs a pulsed diode laser LIDAR (light detection and ranging) technology, where short, powerful laser pulses are sent out in a vertical or near-vertical direction. The reflection of light (backscatter) caused by clouds, precipitation or other obscuration is analyzed and used to determine the cloud base height.

## Measurement starts from ground level

The enhanced single lens technology applied in the 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

The CL31 measurement cycle can be adjusted between 2 and 120 seconds, which gives flexibility for different applications. In addition, fast measurement helps to detect thin cloud patches below a solid cloud base. The CL31 provides a full backscatter profile for data visualization and research purposes.

## Extensive self-diagnostics

The 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 a malfunction the diagnostics help the user to identify the failed module. The CL31 features practical modularity and its easy-access

## Features/Benefits

- Measurement range from 0 to 7.5 km (from 0 to 25,000 feet)
- Second generation of advanced single lens optics provides excellent performance also at low altitudes
- Reliable operation in all weather: unsurpassed performance in vertical visibility and cloud detection during precipitation
- Fast measurement enables detection of thin cloud layers below a solid cloud base
- Modular design for easy installation and maintenance
- Extensive self diagnostics with fault analysis
- Latest technology from the world-leading manufacturer – based on the experience from more than 5,000 installed Vaisala ceilometers worldwide

door ensures fast servicing and high data availability.

## Easy installation and maintenance

The radiation shield provides better window protection during precipitation. In extreme temperatures it protects against excessive heat or cooling.

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.

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

## Performance

Measurement range	0...25,000 ft (7.5 km)
Measurement cycle	programmable, 2...120 s
Reporting resolution	5m / 10 ft, units selectable
Distance measurement accuracy	
against a hard target	greater of $\pm 1\%$ or $\pm 5$ m
Laser	InGaAs diode, 910 nm
Eye safety	Class 1M IEC/EN 60825-1

## Electrical

Power (*)	100 / 115 / 230VAC $\pm 10\%$ , 50...60 Hz max. 310 W including heating
Interfaces	
Data	RS232 / RS485 / Modem
Maintenance	RS232
Bits per second	
RS232 / RS485	300...57,600
Modem V.21, V.22, V.22bis	300...2400
Back-up battery	Internal, 2 Ah

## 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

## Mechanical

Dimensions	
Total	1190 x 335 x 325 mm
Measurement unit	620 x 235 x 200 mm
Weight	
Total	31 kg
Measurement unit	12 kg
Tilt positions	Vertical or 12° tilted
Automatic window blower / heater	
Radiation shield and pedestal	
Service access through a door	
Optical filters for protection against direct sunlight	

## Environmental

Temperature range	-40...+60 °C (-40...+140 °F)
Humidity	0...100 % RH
Wind	55 m/s
Housing classification	IP65 (NEMA 4)
Vibration	Lloyds Register / IEC60068-2-6 5...13.2 Hz $\pm 1.0$ mm 13.2...100 Hz $\pm 0.79$ mm
EMC	IEC/EN 61326
Electrical Safety	IEC/EN 60950

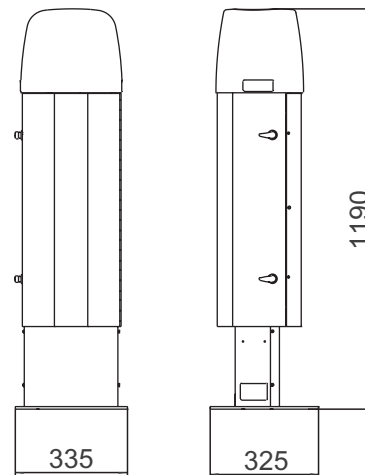
## Accessories / options (\*)

Cable termination box Termbox-1200 with extra transient protection  
 PC maintenance cable QMZ101  
 Shock absorbing mounting pad CT35022 for ship installations  
 Modem module DMX501  
 Attachment mechanics for radio modem antenna CLRADIOKIT

(\* Please specify power and optional accessories when ordering.)

## Dimensions

Dimensions in mm.



Specifications subject to change without prior notice.  
 © Vaisala Oyj

