

ИЗМЕРИТЕЛИ ГРАНИЦЫ ОБЛАКОВ

CL 31, 51

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

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CL31 Ceilometer for Cloud Height Detection

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

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

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 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

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 users to identify the failed module. The CL31 features practical modularity and its easy-access door ensures fast servicing and high data availability.

Easy installation and maintenance

The 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.



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

Features/Benefits

- Measurement range from 0 to 7.6 km (from 0 to 25,000 feet).
- Second-generation, 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
- Extensive self-diagnostics with fault analysis
- Modular design for easy installation and maintenance
- Fast measurement enables detection of thin cloud layers below a solid cloud base
- Latest technology from the world-leading manufacturer - based on the experience from more than 5000 installed Vaisala ceilometers worldwide

Technical Data

Performance

| | |
|---|-----------------------------------|
| Measurement range | 0 ... 25,000 ft. (7.6 km) |
| Reporting cycle | programmable, 2 ... 120 s |
| Reporting resolution | 5 m/10 ft., units selectable |
| Distance measurement accuracy against hard target | greater of ± 1 % or ± 5 m |
| Laser | InGaAs diode, 910 nm |
| Eye safety | Class 1M IEC/EN60825-1 |

Electrical

| | |
|------------------|--|
| Power (* | 100/115/230 VAC $\pm 10\%$, 50 ... 60 Hz max. 310 W including heating |
| Interfaces | |
| data | RS232 / RS485 / Modem / LAN |
| maintenance | RS232 |
| baud rate | |
| RS232 / RS485 | 300 ... 57,600 |
| modem V.21, V.22 | 300 ... 1200 |
| 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
 Sky Condition (optional)

Mechanical

| | |
|--|------------------------|
| Dimensions | |
| total | 1190 x 335 x 324 mm |
| measurement unit | 620 x 235 x 200 mm |
| Weight | |
| total | 32 kg |
| measurement unit | 13 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) (Optional -55 ... +60 °C (-67 ... +140 °F) |
| Humidity | 0 ... 100 % RH |
| Wind | 55 m/s |
| Housing classification | IP66 |
| Vibration | Lloyds Register / IEC60068-2-6 5 ... 13.2 Hz ± 1.0 mm 13.2 ... 100 Hz ± 0.79 mm |
| EMC | IEC/EN 61326 |
| Electrical Safety | IEC/EN 60950 |

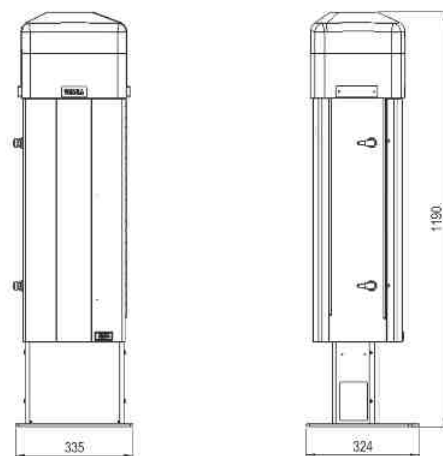
Accessories / Options (*

Cable termination box Termbox-1200 with extra transient protection
 PC maintenance cable QMZ101
 Shock absorbing mounting pad CT35022 for ship installations
 Modem 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 device CL31BIRDKIT
 Air Quality Plug and Play Package for Ceilometer CLAQPACKAGE with laptop and pre-installed functionality of CL- and BL-VIEW

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

Dimensions

Dimensions in mm



CL51 Ceilometer for High-Range Cloud Height

The Vaisala Ceilometer CL51 is designed to measure high-range cirrus cloud heights without surpassing the low and middle layer clouds, or vertical visibility in harsh conditions.

The CL51 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 from the ground level

The enhanced single lens technology applied in the CL51 ensures excellent performance starting at a height of virtually zero. The signal is strong and stable over the whole measurement range.

The CL51 is able to detect three cloud layers simultaneously. If the cloud base is obscured due to precipitation or ground-based fog, the CL51 reports Vertical Visibility. The CL51 is able to provide the backscatter profile over the full measurement range. This information provides a possibility for an advanced boundary layer and atmospheric analysis.

Designed for harsh weather

The CL51 has a shield with a blower and heater, which allows steady operation in precipitation and under extreme temperatures. Reliable solar protection is ensured by optical filters. A tiltable shield further protects the instrument

from precipitation and specular reflection from ice crystals. The tilt angle measurement and correction is automatic.

Self-diagnostics

In addition to cloud height data, the fully automatic CL51 outputs messages with information on the instrument status. The information is based on comprehensive self-diagnostic routines. In case of a malfunction the diagnostics help the user to identify the failed module.

Maintenance

Periodic maintenance of the CL51 is normally limited to window cleaning. There is no need for adjustments in the field. 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. Any malfunction is automatically reported in the data and status messages.



CL51

Features/Benefits

- Cloud reporting range up to 13 km (43,000 feet)
- Second-generation, advanced single-lens optics with excellent performance also at low altitudes
- Modular design for easy installation and maintenance
- Reliable operation in all weather: unsurpassed performance in precipitation
- Detection of Cirrus clouds
- Backscatter profiling over full range up to 15 km
- Field-proven, fully automatic 24/7 operation in all weather conditions
- Extensive self-diagnostics with fault analysis
- Based on robust and affordable laser diode technology
- Latest technology from the world leading manufacturer - installed base over 5,000 Ceilometers worldwide

Technical Data

Performance

| | |
|--|---|
| Cloud reporting range | 0 ... 13 km (0 ... 43,000 ft.) |
| Backscatter profiling range | 0 ... 15 km (0 ... 49,200 ft.) |
| Reporting cycle | programmable 6 ... 120 s, or polling |
| Reporting resolution | 10 m /33ft, units selectable |
| Distance measurement accuracy against a hard target | greater of $\pm 1\%$ or ± 5 m |
| Laser | InGaAs diode, 910 nm |
| Eye safety | Class 1M IEC/EN 60825-1 |

Electrical

| | |
|-------------------|--|
| Power (*) | 100/115/230 VAC $\pm 10\%$, 50 ... 60 Hz max. 310 W incl. heating |
| Interfaces | |
| Data | RS232/RS485/Modem /LAN |
| Maintenance | RS232 |
| Bits per second | |
| RS232/RS485 | 300 ... 115,200 |
| Modem V.21, V.22, | 300 ... 1200 |
| Backup battery | Internal, 2Ah |

Data Messages

Cloud hits (up to 3 layers) and status information
 Cloud hits, status and backscatter profile
 Emulation of CL31 and LD-40
 Sky Condition (optional)

Mechanical

| | |
|--|------------------------|
| Dimensions | |
| Total | 1531 x 364 x 354 mm |
| Measurement unit | 834 x 266 x 264 mm |
| Weight | |
| Total | 46 kg |
| Measurement unit | 18.6 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 | |

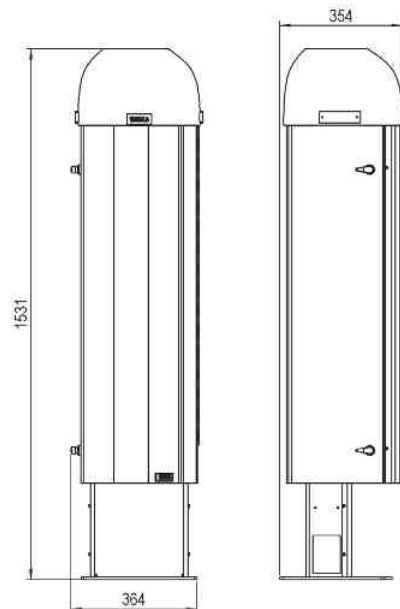
Environmental

| | |
|------------------------|----------------------------------|
| Temperature range | -55 ... +60 °C (-67 ... +140 °F) |
| Humidity | 0 ... 100 %RH |
| Wind | 55 m/s |
| Housing classification | IP65 |
| Vibration | Lloyds Register/IEC 60068-2-6 |
| EMC | IEC/EN 61326 |
| Electrical safety | IEC/EN 60950 |

Accessories and Options (*)

Cable termination box Termbox-1200 with extra transient protection
 PC maintenance cable QMZ101
 Shock absorbing mounting pad CT35022 for ship installations
 Modem DXL421
 Attachment mechanics for radio modem antenna CL51RADIOKIT
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