

Laser Ceilometer

Model 8200



Overview

The Model 8200 Ceilometer is a compact instrument designed for fixed and tactical installations where accurate and reliable cloud height information is required. The measurement is based on the LIDAR principle. The light-emitting component is a low-power diode laser with the output power limited to an eye-safe level while advanced optics and signal processing techniques extend the range from near ground level to over 26000 ft.

Features

- Highly reliable operation
- Easy installation and maintenance
- Very long laser life
- 8000 m (26 000 ft) measuring range
- Low weight and low power consumption
- Fixed or portable placement
- RS-232 or RS-422 interface

Measurement Technique

The 8200 uses a biaxial single main lens design providing very low interference and enhanced near field performance. The well-defined laser pulse shape and real-time digitizing techniques use the latest high-speed, high dynamic range scan converter. This, combined with interlaced scan techniques, gives excellent resolution and accuracy. The 8200 has a powerful 32-bit microprocessor and field programmable gate array (FPGA) performing advanced signal processing algorithms to detect multiple cloud bases and sky conditions.

Environmental Performance

The 8200 performs in all environmental conditions from desert to the wet equatorial tropics. The heated windows and the double-skinned design with internal heating and cooling maintain the internal systems at a stable temperature and eliminate internal condensation under all conditions. A NEMA 4X enclosure with a Gore vapor port eliminates the need for dessicant packages. The internal optical components are protected from direct solar radiation by an optical solar filter. There are no internal moving parts. All electrical connections to the unit are surge protected. The vertical visibility is reported during rain and snow or in the absence of a detectable cloud base.

Data Messages

The data port provides 40 message types using standard data formats via RS-232, RS-422, and Ethernet protocols. The message types include CT25K, CL31, MTech BLS, MTech BLE, 8339, and CBME80.

Data Presentation

The data port provides standard data formats via RS-232 and RS-422 standards. Cloud layer detection algorithms are built in to the instrument firmware and the 8200 can be connected to Graphical Cloud analysis software for a workstation.

Where required, the signal return profile can be obtained for each scan. The internal RS-232C and RS-422 interfaces support local and remote control, test and data acquisition. Ethernet, wireless radio, microwave, conventional or DSL modem options can also be used.

Long Life

Sensing circuits and optimization algorithms control the pulse frequency, output power, and temperature of the laser itself in order to extend its life dramatically. The Ceilometer has Built-In Tests that check memory, voltages, temperatures, and key settings at start-up. The laser function and other parameters are checked continuously while the Ceilometer is operating, and these checks can signal alarms or shut down the Ceilometer.

Ordering Information

Part Number	Description
8200-120	120 VAC Ceilometer
8200-240	240 VAC Ceilometer

Spare Parts

Part Number	Description
M403607-00	120 V AC Heater/Blower Assembly
M403607-01	240 V AC Heater/Blower Assembly
M442117-00	Backup Battery

Laser Ceilometer

Specifications

Parameter	Specification
Measurement Range	0 – 26,650 ft (0 – 8200 m)
Resolution	3 m (10 ft)
Accuracy	±1% or ± 2 m (± 5 ft) whichever is greater
Cloud Layers	Up to 4, base and depth
Scan Time	1 – 300 s (user-configurable)
Scan Rate	10,000 scans per second (55 µs) (user-configurable)
Operating Temperature	-40°C to +60°C
Storage Temperature	-50°C to +70°C
Relative Humidity	0–100%, condensing
Wind Load	80 m/s
Laser	
LIDAR	InGaAs, pulsed diode
Wavelength	905 nm
Detector	SiAPD (silicon avalanche photo diode)
Optics	Side-by-side optical channels
Laser Safety	Class 1m AS2211/ Z136.1/ IEC-60825-1
Communications	
Data (Data Port 1)	RS-232, RS-422, RS-485, TCP/IP
Maintenance (Data Port 2)	RS-232, RS-485, TCP/IP
Report Rate	1 – 3600 s (user-configurable)
Output Mode	Automatic or Polled (user-configurable)
Power Requirements	
Power Supply	120/240 VAC, 45–65 Hz, 50 W or 12 VDC, 50 W
Power Consumption with Heater/Blower	200 W
Battery Backup	Ceilometer electronics only
Mechanical	
Enclosure	NEMA 4X (IP66, IEC60529)
Stand	Adjustable – vertical & tilts in both directions (±12°)
Output	
Output Data	Cloud Bases (1 – 4) Cloud Thickness Cloud Amount — (0 – 8 oktas at up to 4 layers) Vertical Visibility Sensor Status Sky Condition
Data Formats	21 standard messages 19 optional data output formats

Dimensions & Weights

Dimensions (Ceilometer)	25 cm × 30 cm × 102 cm (10" L × 12" W × 40" H)
Ceilometer Weight	22 kg (49 lb)
Heater/Blower Weight	8 kg (18 lb)
Shipping Weight	45 kg (99 lb)