Visibility Sensor Model 8365 Series

Overview

The 8365 Dual-Technology Visibility Sensor measures the transparency of the atmosphere and calculates its extension coefficient and meteorological optical range (MOR) values. Using both direct attenuation and forward-scatter technologies, the 8365 can perform airborne particle-size measurements once available only from a transmissometer, while having the reliability and cost-effectiveness of a forward-scatter visibility sensor. Its precision makes it ideal for applications such as aviation and meteorological studies requiring high performance and reliability.

Accuracy by Design

The accurate measurement of visibility in all weather conditions, including heavy precipitation, fog, snow, smoke and blowing sand, is limited in other visibility sensors. Two-headed forward-scatter visibility sensors that rely solely on light scattering techniques are blind to certain airborne particle sizes that do not reflect light. By measuring both the light attenuation and light scattering at the same time, the 8365 computes ratiometric values to derive the most accurate answer. This measuring process cancels several variables during

calculation and ensures that the visibility measurement is not affected by contaminants on the lenses, or by temperature effects on the emitters and electronics.

By having two direct-attenuation and two scatter values for every measurement, the 8365 does not have to depend on absolute measurements to be the most accurate sensor available today. This advantage means that measurements are independent of the effects of the environment, thereby maximizing accuracy, reducing recurring calibration, and minimizing maintenance requirements.

Scientifically Valid Chain of Calibration

Every 8365 is calibrated through a scientifically valid chain of reference. The response of the calibration device can be clearly traced to US Air Force Geophysics Laboratory reference transmissometers.

Extensive Self-Diagnostics

If one of the heads should fail, the four-headed configuration allows for continued operation with only three sensor heads. Built-in test (BIT) functions report the failure of the sensor head so that appropriate maintenance can be scheduled. The BIT functions also monitor power supply voltages, heater status, and indications of abnormal operation.

Dual-Technology Visibility Sensor

For more information on “why four heads are better than two heads & even better than a transmissometer,” see the AWI website technical reference section. http://www.allweatherinc.com/reference/toc_techref.html

SENSORS

SPECIFICATIONS

Performance	
Measurement Range (Model 8365-C)	33 ft to 50 miles (10 m to 80 km)
Accuracy	15% RMSE
Measurement Type	MOR or Extinction Coefficient
Averaging Intervals	3, 5, or 10 min
Measurement Units	miles or km
Operating Principle	Dual Technology - direct attenuation and forward-scatter
Light Source	Infrared LED (865 nm ± 35 nm)
Detector	Silicon Photodiode
Principal Scatter Angle	35 degrees
Serial Output	RS-485 or RS-232
Output Interval	Programmable: Interrogate, 10 s, 1 min, or 10 min
Baud Rate	Programmable: 300, 1200, 2400, 4800, or 9600 bps
Analog Output Option	
Output Voltage	0–1 V
Output Impedance	100 Ω
Handheld Terminal Port	
Baud Rate	1200 bps
Serial Port Parameter Setting	8-N-1 (8 data bits, no parity, 1 stop bit)
Power Requirements	
Supply Voltage	115 V AC, 60 Hz 240 V AC, 50–60 Hz with M488174 220 V Kit
Max. Power Consumption	300 W
Environmental	
Operating Temperature	-40 to +136ºF (-40 to +55ºC)
Storage Temperature	-67 to +136ºF (-55 to +55ºC)
Relative Humidity	5–100%, noncondensing
Wind	up to 120 knots (220 km/h)
Hail	up to 0.5” (1.3 cm) dia.
Ice Buildup	up to 0.5”/h (1.3 cm/h)
Elevation	-100 to 10,000 ft ASL (-30 to 3030 m ASL)

ORDERING INFORMATION

Part Number	Description
8365-C	Dual-Technology Visibility Sensor, 115 V AC; includes sensor assembly & control unit
M403326-00	Day/Night Sensor Kit
M488171-01	Ambient Light Sensor Kit
M488173-01	Unistrut Mounting Hardware (control unit)
M488317-00	Galvanized Mounting Pipe Kit
M488150	Grounding Kit
M488174	220 V AC Conversion Kit
11903	Backup Battery Kit
T600503-00	Signal Cable, specify length
M492557	Power Cable, specify length
M104744	Calibration Paddle
M488175	Handheld Terminal

DIMENSIONS & WEIGHTS

Sensor Assembly	61” L × 19” W × 21” H (155 cm × 48 cm × 53 cm)
Controller Assembly	14” W × 16” H × 6” D (30 cm × 36 cm × 15 cm)
Weight	74 lbs (33 kg)
Shipping Weight	135 lbs (61 kg)

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Rev. B 10/2012