

Visibility Sensor

Tideland Signal Corporation



- Up to 16 km (10 mile) visibility range
- Proven 42-degree forward scatter angle
- Ice-resistant “look down” geometry
- Flexible output options
- Compact, lightweight package
- Simple installation & maintenance

Measures atmospheric visibility (meteorological optical range) by determining the amount of light scattered by particles (smoke, dust, haze, fog, rain, & snow) in the air that passes through the sample volume. A 42-degree forward scatter angle is used to ensure performance over a wide range of particle sizes. MOR is calculated by the user by converting the received signal strength (extinction coefficient, σ) using Koschmeider’s formula, $MOR (Km) = 3/\sigma$.

Performance in all weather conditions was a design prerequisite for the Visibility Sensor. An integrated, one-piece housing design keeps all cabling internal to the sensor for the ultimate protection against the elements. The sensor housing is made from anodized aluminum and the enclosures are rugged, UV-resistant fiberglass rated to IP66. Based on the proven experience of the NWS and FAA, the sensor uses a “look down” geometry to reduce window contamination and clogging from blowing snow.

The windows use continuous duty anti-dew heaters and thermostatically controlled external hood heaters are optional for protection in extreme environments. All power and signal lines to the Visibility Sensor are protected with surge and EMI filtering to help guarantee uninterrupted service for the life of the sensor.

Installation and maintenance effort is minimal for the Visibility Sensor. A mounting flange located on the bottom of the Main Electronics Box mates with a user supplied 1-1/2 inch IPS pipe. A 1 inch IPS pipe mounting flange is also available. Power and signal connections are made through waterproof cable glands to terminal boards in the Main Electronics Box.

Calibration of the fog detector in the field is as simple as attaching a factory supplied calibration fixture and following a procedure that takes less than 30 minutes. Semiannual calibration is recommended.

Visibility	30m to 16 km standard	AC Version:	100-240 VAC, 24 VA;
Range:	10m to 10 km optional		75 VA w/ Hood Heaters
Extinction	100 – 0.1863 km ⁻¹ standard	DC Version:	10-36 VDC, 6 VA Nominal;
Range:	300 – 0.30 km ⁻¹ optional		18 VA w/ Hood Heaters
Accuracy:	+/-10% RMSE	Size:	889mm W x 292mm H x 305mm D
Time Constant:	60 sec	Weight:	8kg
Scatter Angle:	42 deg nominal	Operating Temperature:	-40° C to 60° C
Source:	880 nm LED	Operating Humidity:	0-100%
Output standard:	0-10V DC	Protection:	IP66 (NEMA 4X)
Output Options:	0-5V DC analog, 4-20mA, Serial RS-232, RS-422 or RS-485, Control Relay	Standards	CE

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EEx Visibility Sensor

Tideland Signal Corporation



- Up to 8 km (5 mile) visibility range
- Forward scatter measurement technique
- ATEX Zone 1 Hazardous area
- Flexible output options
- Compact, lightweight package
- Simple installation & maintenance

Measures atmospheric visibility (meteorological optical range) by determining the amount of light scattered by particles (smoke, dust, haze, fog, rain, & snow) in the air that passes through the sample volume. A 42-degree forward scatter angle is used to ensure performance over a wide range of particle sizes. MOR is calculated by the user by converting the received signal strength (extinction coefficient, σ) using Koschmeider's formula, $MOR (Km) = 3/\sigma$.

Performance in all weather conditions was a design prerequisite for the EEx Visibility Sensor. The sensor uses ATEX rated EEx housings and offshore marine grade sheathed cables to ensure all-weather, Zone 1, IP66 certified performance.

A sturdy aluminum frame painted with durable powder-coat paint is used to mount the housings and provide

mounting to a customer supplied mounting pipe. Power and signal lines to the EEx Visibility Sensor are protected with surge and EMI filtering to help guarantee uninterrupted service for the life of the sensor.

Installation of the EEx Visibility Sensor is easy. A mounting flange located on the bottom of the sensor housing mates with a user-supplied 4 inch IPS pipe. Power and signal connections are made through M25 threaded holes using user supplied, ATEX approved cable glands and wiring. User wiring is made to DIN rail mounted terminal boards in the Signal Processing Box.

Calibration of the EEx Visibility Sensor in the field is as simple as attaching a calibration fixture to the back of the sensor and following a procedure that requires less than 20 minutes. Each sensor is supplied with a calibration fixture. Semiannual calibration is recommended.

Visibility Range:	15m to 8 km	DC Input:	12 or 24 VDC, 10 VA Nominal;
Accuracy:	+/-10% RMSE	Size:	1170mm W x 915mm H x 560mm D
Time Constant:	60 sec.	Weight:	40kg
Scatter Angle:	42 deg nominal	Operating Temperature:	-20° C to 60° C
Source:	880 nm LED	Protection:	IP66 (NEMA 4X)
Output standard:	0-10V DC	Operating Humidity:	0-100%
Output Options:	Various options of analogue, serial and control relays	Mounting:	Nominal 102mm pipe (122mm OD max.)
		Standards	CE, ATEX Ex II 2GD EEx d IIb T5/T6

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