VAISALA

Visibility Sensor PWD20W for wind energy industry

Features

- Certified by Deutscher Wetterdienst
- Accurate and traceable measurement of prevailing visibility
- Hood heaters prevent ice accumulation
- Robust and versatile
- Unique algorithm ensures no flicker interference
- Mean time between failures (MTBF) over 20 years
- Easy installation

PWD20W is a visibility sensor with a special algorithm designed for wind turbine installations.

Limit your light emissions

Flashing lights can be disturbing so it is smart to dim them to the optimal level. With PWD20W you can be in conformity with the regulations, such as the German General Administrative Regulation for the Marking and Lightning of Obstacles to Air Navigation. At the same time you can create a comfortable living environment for the surrounding community.

The conditions on top of a wind turbine require a robust device, like PWD20W. Its performance and reliability have proven to be top class. The hood heaters prevent ice accumulation on the device. A special firmware ensures that flashing lights near the visibility sensor are not mixed with light pulses from the sensor.

Tens of thousands of PWD sensors are installed worldwide in demanding applications in all kinds of climates. They are installed on wind turbines both onshore and offshore. With PWD series sensors you get the best-in-class measurement performance and unparalleled reliability. Our failure rate statistics indicate a mean time between failures (MTBF) of clearly over 20 years. You will also benefit from our fast delivery.

The FAA and other leading aviation authorities have placed their confidence in us. Our visibility sensor is also certified by Deutscher Wetterdienst.

Especially for wind turbines

Wind turbines are usually equipped with 2 red obstruction lights each. These obstruction lights flash at set intervals by day and night. Residents in the vicinity of a wind turbine complain of the brightness of the obstruction lights at night. Visibility data is used to control the intensity of these obstruction lights, thereby reducing the disturbance to the neighbors, yet not undermining aviation safety.

PWD20W software has been specially designed for the wind turbine application. The infrared light emitted by obstruction lights may significantly disturb conventional visibility sensors. PWD20W filters out the interference to eliminate the effect of obstruction lights on the visibility measurement. Red LED lights interfere with neither the visibility measurement nor the control of the lights.

Wherever visibility measurement is needed

With a measurement range of 10 to 20 000 meters (32 to 65 600 feet), PWD20W offers long-range visibility measurement for onshore and offshore obstruction lights, offshore obstruction lights for vessels, and met mast equipment. The standard model PWD20 can be used in diverse applications covering harbors, coastal areas, heliports, wind parks – indeed, any locations or areas where visibility measurement is necessary.

Technical data

PWD20W measurement performance

Operating principle	Forward scatter measurement with 45° scattering angle
Measurement interval	15 s
Reporting range of MOR (visibility)	10–20 000 m (32–65 600 ft)
Reporting resolution	1 m (3 ft)
Reporting uncertainty in operational conditions	±10 % at 10–10 000 m (32–32 800 ft)[1)] ±15 % at 10–20 km (2.6–12 mi)
Measurement error (instrument consistency)	±2.5 %

1) Fulfills ICAO Annex 3: ±50 m (164 ft) up to 600 m (1968 ft)

Operating environment

Operating temperature	−40 … +60 °C (−40 … +140 °F)
Storage temperature	−40 … +60 °C (−40 … +140 °F)
Operating humidity	0–100 %RH
Maximum operating wind speed	60 m/s (134 mph)
Sensor orientation	Align receiver to look away from bright lights (sun or flashing beacons)
IP rating	IP66

Inputs and outputs

Power supply	12–50 V DC (electronics) 24 V AC or 24 V DC for heater option
Average power consumption	3 W (peak 10 W) With optional luminance sensor: 5 W With optional hood heaters: 65 W
Outputs	Serial line RS-232 or RS-485 (2-wire) 3 relay controls (open collector) Analog output current: 0–1 mA or 4–20 mA 8-m power/data cable (standard) with connector at PWD end
Auxiliary data in data messages	Low visibility alarms. 3 adjustable alarm limits to set the 3 relay controls. Hardware status (fail/warning). 3rd relay control output can also be driven by hardware status.

Mechanical specifications

Weight	3 kg (6.61 lb)
Material	Aluminum
Dimensions (H × W × L)	146 × 404 × 695 mm (5.75 × 15.91 × 27.36 in)

Compliance

Compliance marks	CE
EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Electromagnetic compatibility (EMC)	IEC 61326-1, industrial environment CISPR 32 / EN 55032, Class B
Corrosion and salt mist	VDA 621-415

Options and accessories

Fiberglass mast, 2.1 m (6 ft 11 in), Ø 60–86 mm (2.36–3.39 in), frangible, white	PWFM210
Aluminum mast, 3 m (9 ft 10 in), Ø 60 mm (2.36 in), white	DKP203W
Aluminum mast, 2 m (6 ft 7 in), Ø 60 mm (2.36 in), white	DKP202W
Interface unit for powering	BOX222W-230 BOX222W-115
Luminance sensor	PWL111
Hood heaters for harsh winter conditions	PWH111
Support arms for mast installations	Various [1)]
Mounting clamps for mast top installations	Various [1)]
Calibration set (2-point calibration)	PWA12
Calibration set (3-point calibration)	PWA13
Maintenance cable (USB) for BOX221 and BOX222	219688

1) For the options, contact Vaisala sales.

Spare parts

Transmitter circuit board	PWT11
Transmitter optics module (includes PWT11 and lens)	DRW214776

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