

WindSensor

P2546-OPR Cup Anemometer



The WindSensor P2546-OPR Cup Anemometer combines unrivaled performance with the only IEC 61400-12-1 compliant classification on the market.

WindSensor P2546-OPR is the highest-performing cup anemometer on the market certified by the first IEC 61400-12-1 compliant classification.

Low class numbers result in the lowest uncertainty attainable in both flat and complex terrain, but can be further reduced by calculating a site specific S-classification.

One-piece molded cup rotor contributes to an outstanding low variability from unit to unit ensuring consistent performance over the full range of influence parameters.

Originally designed for marine environments, the P2546-OPR is the best choice on the market for wind resource assessment and power performance studies both offshore and onshore.

P2546-OPR Cup Anemometer Specifications

DESCRIPTION

Sensor type	3-cup anemometer
Applications	Wind resource assessment Power performance measurements Meteorological and environmental monitoring

RESPONSE CHARACTERISTICS

Calibration ⁽¹⁾	Each anemometer individually calibrated compliant with IEC 61400-12-1
Calibration, mean value	$U = 0.620 \times f + 0.217$ [m/s]
Variation of calibrations ⁽²⁾	$\sigma = 0.015$ m/s @ 10 m/s
Distance constant (63% recovery)	1.81 ± 0.04 m
Starting threshold	< 0.3 m/s
Resolution	0.001 m/s @ 10-minute average mode
Range	0...75 m/s

OUTPUT SIGNAL P2546A-OPR

Signal type	Switch closure, frequency proportional to wind speed
Duty cycle	40...60 %
Max switching voltage	30 V
Max recommended switching current	10 mA
Output resistance	330 Ω , 1 W

OUTPUT SIGNAL P2546C-OPR

Signal type	Low-level AC sine wave, frequency proportional to wind speed
Output voltage at 0.4 m/s	25 mV peak, minimum
Output voltage at 75 m/s	14 V peak, typical
Output resistance	$650 \pm 50 \Omega$

ACCURACY

Calibration uncertainty, u_{V1} , $k=1$ ⁽³⁾	0.28 % @ 4...16 m/s	
Classification uncertainty, u_{V2} , $k=1$ ⁽³⁾	Class number	Operational standard uncertainty, u_{V2} @ 10 m/s, $k=1$
	1.32A	0.076 m/s
	3.71B	0.214 m/s
	1.54C	0.089 m/s
	3.76D	0.217 m/s
	0.03...3.76S	0.002...0.217 m/s

POWER SUPPLY

P2546A-OPR	Self-excited, pull-up resistor of 10...100 k Ω required
P2546C-OPR	Self-excited, no external power supply required

ENVIRONMENTAL

Operating temperature range	-38...60 °C
Operating humidity range	0...100 % RH
EMC compliance	EN61326-1 Class A

PHYSICAL

Exterior materials	Anodized aluminum, stainless steel and GRP
Mating cable connector	Lemo E Series FFA.1E.650.CTAC45 (cable diameter 4.1...4.7 mm)
Overall height	282 mm
Swept diameter of rotor	188 mm
Weight	0.40 kg
Shipping weight / dimensions	1.15 kg / cardboard box 360 x 230 x 210 mm

INSTALLATION

Mounting	Onto a 25.0 ± 0.3 mm (0.984 inch) diameter tube with two set screws
Tools required	4 mm Allen wrench (enclosed)

Notes

- (1) The current IEC 61400-12-1:2017 standard requires that "*The anemometer shall be mounted on a round vertical tube of the same (± 0.1 mm) outer diameter as used during calibration (and classification), but of no larger diameter than the body of the anemometer*". Hence, we specify a mounting tube diameter for calibration (and classification) of 25 ± 0.2 mm and a diameter of 25 ± 0.3 mm for power performance measurement.
- (2) Variation of calibrations is not an uncertainty, but denotes the distribution of anemometer calibrations. The specified standard deviation indicates an extremely low variability.
- (3) Accuracy is a qualitative concept which is quantified in terms of uncertainty. The anemometer-specific uncertainty is the combined uncertainty of the calibration uncertainty, u_{v1} , and the operational uncertainty, u_{v2} , as determined by the class number, k according to IEC 61400-12-1.

References

IEC 61400-12-1:2005- Power performance measurements of electricity producing wind turbines

ISO/IEC 98-3:2008- Guide to the expression of uncertainty of measurement

WMO 2008- Guide to Meteorological Instruments and Methods of Observation

Dimensional drawing

