WindSensor

P2546D-OPR Cup Anemometer

The WindSensor P2546D-OPR Cup Anemometer combines unrivaled performance with the only IEC 61400-12-1 compliant classification on the market.

WindSensor P2546D-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 P2546D-OPR is the best choice on the market for wind resource assessment and power performance studies both offshore and onshore.

P2546D-OPR Cup Anemometer Specifications

DESCRIPTION

Sensor type	3-cup anemometer
Applications	Wind resource assessment
	Wind turbine power performance measurement
	Meteorological and environmental monitoring

RESPONSE CHARACTERISTICS

Calibration	Each anemometer individually calibrated compliant with IEC 61400-12-1
Transfer function	$U = 0.620 \times f + 0.21$ [m/s]
Dispersion of transfer function[1]	$\sigma = 0.0015 \times U$ [m/s] @ U = 4...16 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

Signal type	NPN open collector, frequency proportional to wind speed
Duty cycle	45...55 %
Max switching voltage	30 V
Max switching current	10 mA
Output resistance	60 Ω
Pull-up resistor	100 kΩ max @ switching voltage = 5 V
	10 kΩ max @ switching voltage > 5 V

ACCURACY[2]

Calibration standard uncertainty, u_{V1}	0.012...0.038 m/s @ 4...16 m/s	
Classification standard uncertainty, u_{V2}	Class number, k	Operational standard uncertainty, u_{V2} @ 10 m/s
	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]...3.76S	0.002...0.217 m/s

POWER SUPPLY

P2546D-OPR	Self-excited, pull-up resistor of 10...100 kΩ required

ENVIRONMENTAL

Operating temperature range	-40...60 °C
Operating humidity range	0...100% RH
Compliance	CE: EMC & ROHS, REACH, WEEE, FCC

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	0.36 kg
Shipping weight	1.15 kg
Shipping dimensions	Cardboard box 360 x 230 x 210 mm

INSTALLATION

Mounting	Onto a 25.0 ± 0.1 mm (0.984 inch) diameter mast with two set screws
Tools required	4mm Allen wrench (enclosed)

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Notes

(1) The specified transfer function is the population mean of the total number of >> 10.000 calibrations, corresponding to all P2546-OPR Cup Anemometers manufactured.

(2) 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.

(3) Due to minor imperfections in the application of the classification model the lowest attainable S class number is 0.03S, in contrast to the minimum theoretical S class number of 0.00S.

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

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.

R=94
220
282
28
ø20.0
ø25.5
ø46.0

Anemometer

ø25 ± 0.3 mm
L
25
M10
ø35

Mounting tube for power
performance measurement

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