# 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 Applications 3-cup anemometer

Wind resource assessment

Power performance measurements

Meteorological and environmental monitoring

#### **RESPONSE CHARACTERISTICS**

Calibration (1)

Calibration, mean value Variation of calibrations <sup>(2)</sup>

Distance constant (63% recovery)

Starting threshold

Resolution

Range

Each anemometer individually calibrated compliant with IEC 61400-12-1

U =  $0.620 \times f + 0.217 \text{ [m/s]}$  $\sigma = 0.015 \text{ m/s} @ 10 \text{ m/s}$ 

 $1.81 \pm 0.04 \text{ m}$ 

< 0.3 m/s

0.001 m/s @ 10-minute average mode

0...75 m/s

#### **OUTPUT SIGNAL P2546A-OPR**

Signal type

Duty cycle

Max switching voltage

Max recommended switching current

Output resistance

Switch closure, frequency proportional to wind speed

40...60 %

30 V

10 mA

330 Ω, 1 W

#### **OUTPUT SIGNAL P2546C-OPR**

Signal type

Output voltage at 0.4 m/s Output voltage at 75 m/s

Output resistance

Low-level AC sine wave, frequency proportional to wind speed

25 mV peak, minimum 14 V peak, typical

 $650 \pm 50 \,\Omega$ 

#### **ACCURACY**

Calibration uncertainty,  $u_{V1}$ , k=1 (3)

Classification uncertainty,  $u_{V2}$ , k=1 (3)

0.28 % @ 4...16 m/s 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

0.03...3.76S 0.002...0.217 m/s

#### **POWER SUPPLY**

P2546A-OPR

P2546C-OPR

Self-excited, pull-up resistor of 10...100 k $\Omega$  required Self-excited, no external power supply required

0.217 m/s

**ENVIRONMENTAL** 

Operating temperature range

Operating humidity range

EMC compliance

-38...60 °C

3.76D

0...100 % RH

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 Tools required Onto a 25.0  $\pm$  0.3 mm (0.984 inch) diameter tube with two set screws

4 mm Allen wrench (enclosed)



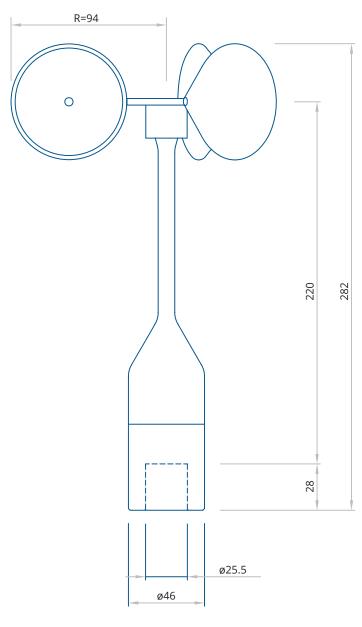
#### Notes

- (1) The current IEC 61400-12-1:2017 standard requires that "The anemometer shall be mounted on a round vertical tube of the same ( $\pm$  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  $\pm$  0.2 mm and a diameter of 25  $\pm$  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.

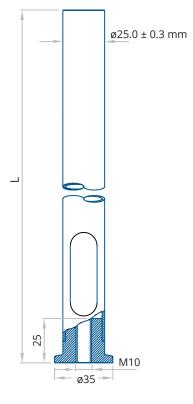
#### References

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



Anemometer



Mounting tube for power performance measurement

