

Descriptions

- Wind Sensors PRO-METAL for determination of wind direction and wind speed
- Modular wind sensor design for individual customized wind sensors for wind power plants
- Non impact measuring principle "Magnetical Positioning Encoder System" (MPES) for precise data acquisition
- Integrated, regulated heating system, thermotechnically separation of the housing
- Measuring elements with double supported ball bearing of the axis of rotation for lower friction and abrasion and high reliability and longevity
- Stable wind vane and fail-safe 3-armed cup anemometer made of seawater resistant aluminium for highest capacity
- Simple installation principles for mast, flange and bore for high flexibility
- Sensors types with cable-plug connection or assembled cable to afford advantages at commissioning or other services
- Aerodynamical design for precise and safe measurements

Advantages at a glance

- Frictionless data acquisition through non-contact measuring principle
- Most robust, highly precise and long lasting design
- Highest capacity and longevity through precision ball bearings and high quality measuring elements
- Wind speed max. gusts 100 m/s
- High measuring range of 50 m/s
- Low starting values of < 0.4 m/s
- High resolution of measuring values
- Simple installation and maintenance through cable-plug connection and single screw attachment
- Very low needs of maintenance
- Wide range of operating for all-year application in all climatic zones at wind power plants, ships, buoys, harbours, air ports and professional weather stations



Initial operation

The wind can be represented by a vector quantity. For a complete description of the wind it is necessary to specify its speed and direction. The two components are subject to spatial and temporal variations; thus, strictly speaking, they are valid only for the site where the measuring instrument is put up. We therefore recommend to select the place of installation very carefully.

Selecting the place of installation

Generally, wind measuring instruments should not measure the specific wind conditions of a limited area, but indicate the typical wind conditions of a wider area. The values measured at different places must be comparable.

Thus, when installing the sensor you should make sure the place of installation is not under the lee of great obstacles. The distance between the obstacles and the sensor should be 10 times the height of the obstacles (this corresponds to the definition of an undisturbed terrain).

If an undisturbed terrain of this kind does not exist the sensor must be put up at a height of at least 5 m above the obstacle height.

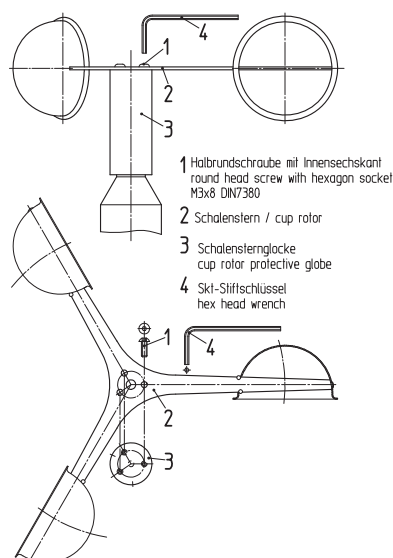
If the sensor must be installed on a roof top the place of installation must be in the middle of the roof to avoid predominant wind directions.

If you want to measure both wind direction and wind speed, install the sensors at the same measuring point, if possible, and make sure to avoid any mutual influence of the sensors.

A wind sensor pair easily meets this requirement since the sensors are set up side by side. Their horizontal distance should be approximately 1.5 m. The two sensors must be staggered vertically so that the lower edge of the upper wind speed sensor is 0.1 to 0.5 m above the upper edge of the lower wind direction sensor.

Mounting of the cup rotor at the wind speed sensor

The bores at the cup rotor are so attached that the cup rotor can only in a certain, clear position to be installed. All 3 screws must be used and the cup rotor with it be fastened. Thus the correct direction of rotation is guaranteed. The necessary wrench is included in delivery.



Principles of installation



Attention!

Because the installation take place in a dangerous height, the assembly personal must follow the rules for prevention of accidents.

I. Mast or pipe mounting



Make sure the device is easily accessible so that you can set up the north direction for the wind direction sensor and perform any maintenance work. To reach the sensors use a ladder of the appropriate length or a telescoping working platform of the appropriate height.



Ladders or other lifting helps must be absolutely in order and must be guarantee a secure support! Follow the rules for prevention of accidents.

Mount the sensors at the top of grounded tube with an outer diameter \varnothing 48-50 mm. The mast adapter (see accessories) is obligatory.

1. Remove both thread nut from the sensor.
2. The sensor with cable-plug connection is led without cable into the bore.
3. Attach the sensor with the flat side of detached nut from the lower side. Tighten with a suitable tool (wrench size 36), until a twisting safety of the sensor aligned to the north is given.

You can also use masts that can turn around their vertical axis or masts consisting of individual segments or telescoping masts that you can secure after setting up the north direction.

If wind speed and wind direction are measured at the same time, the measurement generally takes place not only at the top of a mast but also at the ends of a cross arm. The arms must stay torsion-free and vibration-proof even at high wind speeds and they must be accessible for you to perform mounting and maintenance work.



When you install the connecting cables make sure not to excessively shorten the cable leading to the connector in the lower part of the sensor casing so that you can later maintain or dismantling the sensor. Put further a cable loop as sensor protection against water under the sensor.



Tip: Install the sensors on ground to the traverse and align you the wind vane parallel to the traverse. You go only then upward, in order to accordingly align the sensors with traverse under assistance of a partner on ground.



II. Traverse with bore

(Id-No. 32.14567.010 000)

At the traverse at each end are bores with a slot and with a \varnothing 30 mm.

1. Remove the lower nut from the sensor.
2. Put a sensor with assembled cable sidewise into the bore.
3. Attach the sensor with the flat side of detached nut from the lower side. Tighten with a suitable tool (wrench size 36), until a twisting safety of the sensor aligned to the north is given.

II. Mounting into bores

Material thickness for installation of the sensor between the nuts may be max. 10 mm.

1. Remove the lower thread nut from the sensor.
2. The sensor with cable-plug connection is led without cable into the bore and fastened by the opposite side with the loose nut as under I.3.
3. The loose nut to be touched now with the flat side first over the cable, in order to fasten the sensor as under I.3.

Setting up the North Direction for the Wind Vane

For wind direction measurements the north mark on the sensor must be aligned with the geographical north direction.

You have to turn the marking exactly over the marking at the sensor shaft. When you have aligned the marks, you may fix the wind vane with e.g. a piece of adhesive tape. When you have fixed the wind vane this way you can locate the reference point by aiming at it over the axis. Now you must turn the sensor casing on the mounting tube until the tip of the wind vane points to the reference point in the north.

To set up the sensor's north orientation select a landmark which is as far as possible up north with regard to the final position of the wind direction sensor.

The reference point can be selected using a topographical map (1:25000). The exact position of the reference point is determined using an amplitude compass that can be adjusted horizontally on a stand.



Please make sure there is no magnetic deviation of the compass.

When the north direction is set up for the wind direction sensor, you can mounting it like under point "Principle of installation". Remove any adhesive tape.

If you cannot select a northern reference point owing to local conditions, you can proceed analogously using a reference point in the south. In this case, however, you have to make sure the north mark on the sensor does not point to the reference point but in the opposite direction.

Electrical Connection

Sensors PRO-METAL are connected to a data measuring system via the open cable end (see next page).

The connecting cable is suitably led along the mast between the data evaluation device (indicating instrument or data acquisition system) and the sensor. The cable must be fastened using appropriate cable ties (their length depends on the mast diameter).



Tip: Lead the cable in a wide curve from the mast to the bottom of the casing so that you can later easily dismount the cable.

Please make sure the cable is protected from humidity on the side of the data processing system. Generally, Pg sockets that use a rubber joint to prevent humidity from penetrating into the terminal box of the data processing system provide sufficient protection.



Example representation:

Cable run by a EMC fair Pg-socket.

Alternatively the lead can be laid also completely in the pipes of a mast, if the mast is accordingly prepared.



To reduce the risk of inductive interference the sensor must be properly grounded (screening on both sides).

Maintenance

The sensor design permits long periods of maintenance-free operation.

We therefore recommend a regular visual verification and functional test the wind sensors as well as a sensor calibration of both sensor types at intervals of 4 years.

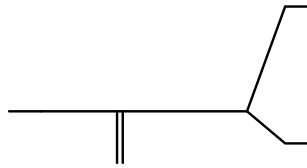
With problems, which you cannot solve, do not hesitate to contact our LAMBRECHT service under:

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Fax: +49-(0)551-4958-327
e-mail: support@lambrecht.net



Electrical connection

Windflügel für Windrichtung
vane for wind direction

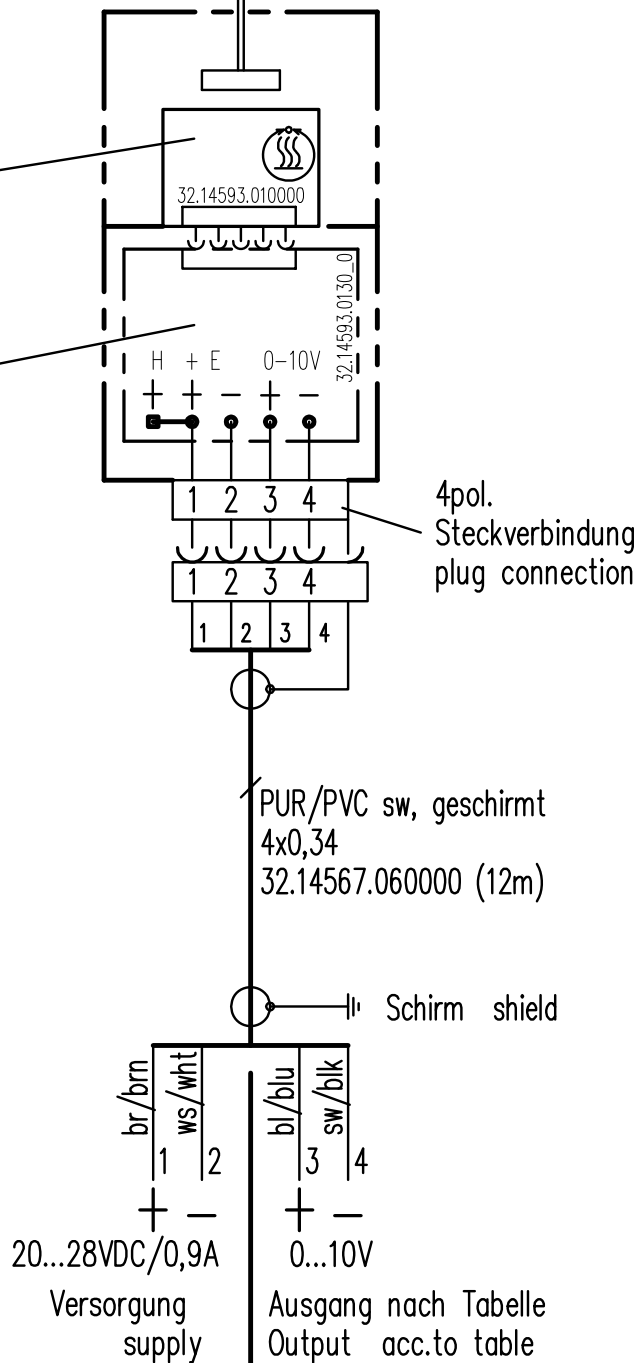


Schalenstern für Windgeschwindigkeit
cup rotor for wind speed



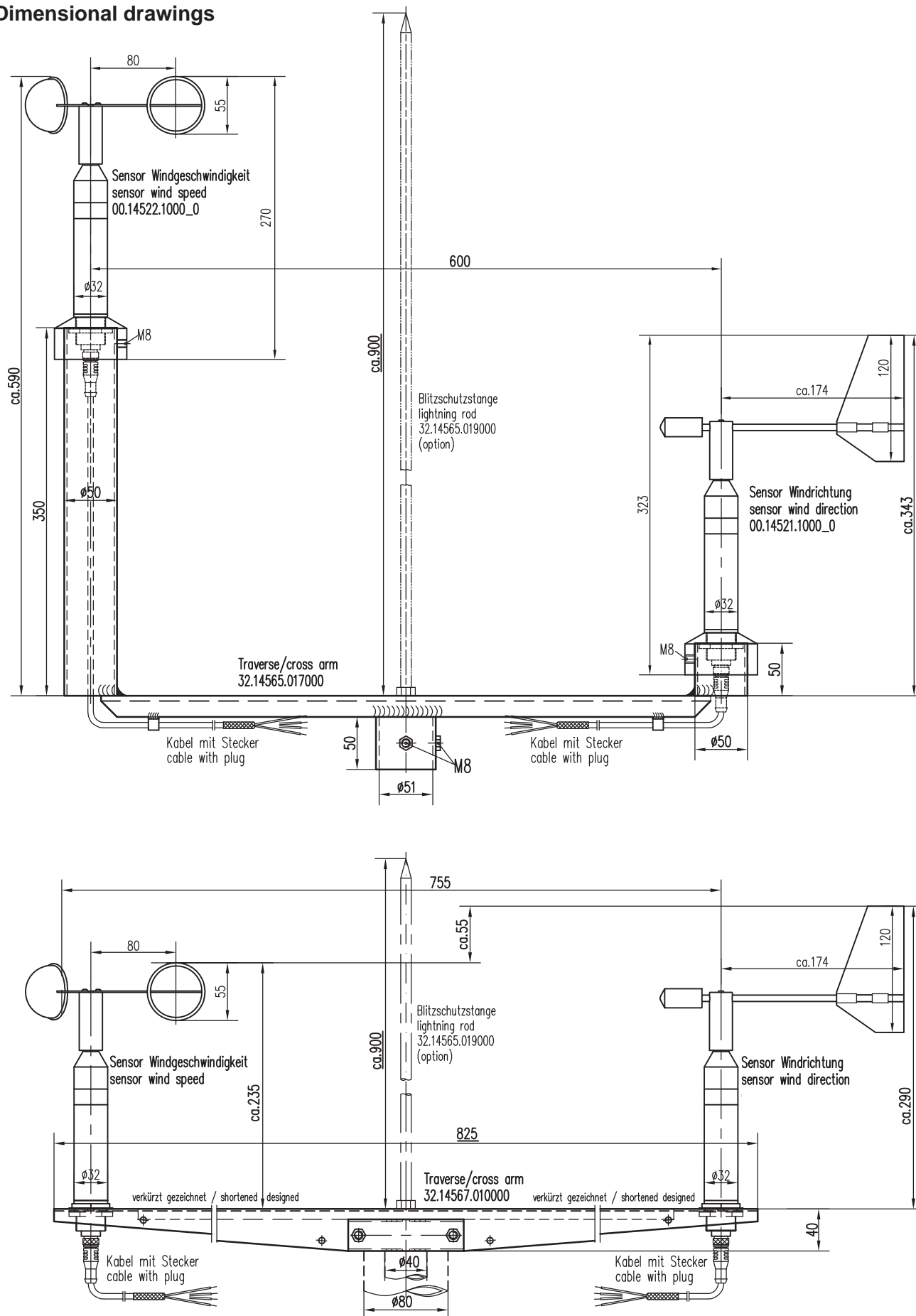
Heizung,
elektronisch geregelt
heating,
electronically controlled

Elektronikplatine
electronic card



PUR/PVC colorcode	
1	br - brn
2	ws - wht
3	bl - blu
4	sw - blk

Dimensional drawings





Technical Data

Wind Sensors PRO-METAL with analogue 0...10 V output signal

Measuring principle:	Magnetical positioning encoder system (MPES)
Range of applications:	Temperatures -40...+70 °C heated* • rel. humidity 0...100 % • wind speed max. gusts 100 m/s
Output:	0...10 V • 4 Hz update rate
Supply voltage:	24 V _{DC} (20...28 V _{DC}) • max. 800 mA • heating • electr. controlled
Housing:	Seawater-resistant aluminium • special surface • silver • IP65 in upright position

Parameters	Wind direction	Wind speed
Id-No.	00.14521.900 012	00.14522.900 012
Measuring elements:	Wind vane • stably Alu • special surface	3-armed cup anemometer • Alu • special surface
Measuring ranges:	0...360°	0...50 m/s
Accuracy:	± 1 %	± 0.3 m/s ≤ 10 m/s; ± 1 % FS ...50 m/s
Resolution:	< 1°	< 0.1 m/s
Starting value:	< 0.4 m/s	< 0.4 m/s
Weight:	400 g	350 g

Cables: **Id-No. 32.14567.060 000** 12 m cable with plug-in connector on one side and open end on the other
(order separately) **Id-No. 32.14567.060 010** 15 m cable with plug-in connector on one side and open end on the other

*) Remark: In case of possible icing and formation of ice at the movable sensor measuring element the function is restricted for the duration of icing.

Standards

- EMC acc. to EN 50082/81
- Low voltage standard 73/23/EWG and VDE 0100
- WMO No. 8
- VDI 3786 part 2

Accessory (please order separately)

(14565 U17) Crossbeam Id-No. 32.14565.017 000
(14567 U10) Crossbeam Id-No. 32.14567.010 000
(14567 U6...) Mast adapter Ø 50 mm
Id-No. 32.14567.006 xxx
(14565 U19...) Lightning rod
Id-No. 32.14565.019 000

Different masts can be specified by project.

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.



Quality System certified by DQS according to
DIN EN ISO 9001:2008 Reg.No. 003748 QM08

Subject to change without notice.

PRO-METAL_b-e.indd

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