



## EFFICIENT · The Efficient Solution

You are cost conscious but still demanding when it comes to your wind measurement data? If so, the EFFICIENT sensors are your ideal solution.

With this sensor concept, valuable materials meet functional design. EFFICIENT sensors also impress with their high accuracy, effortlessly simple assembly principles and corrosion-resistant materials. With EFFICIENT you save time and money, but not on the quality of your measurement data.

- Proven sensor technology
- Very good starting values
- Simple mast mounting

### Content

1. Initial operation
2. Principles of installation
3. Setting up the North Direction for the wind vane
4. Electrical connection
5. Heating
6. Maintenance
7. Wiring diagram
8. Dimensioned drawings
9. Technical data



## 1. 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.

## 2. Principles of installation



### Attention!

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

### I. Traverse with bore (e.g. Id-No. 32.14627.010000)

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

2. The sensor is led without cable into the bore and fastened by the opposite side with the loose nut.
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. 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.

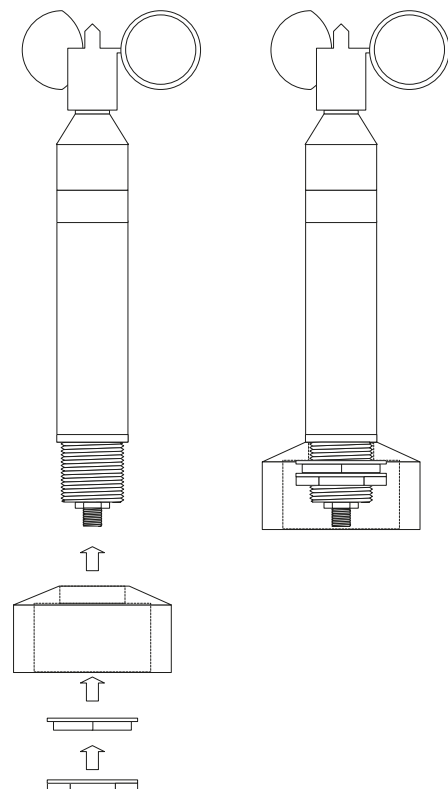


**Ladders or other lifting helps must be absolutely in order and must be guarantee a secure support! Follow the rules for prevention of accidents.**

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. At sensor type with assembled cable to take off the nut over completely cable length.
2. The sensor with cable-plug connection is led without cable into the bore and fastened by the opposite side with a loose nut.
3. The sensors with assembled cable you have to pull through the cable beginning with the open cable end completely, until the sensor is on the edge of bore.
4. The loose nut to be touched now with the flat side first over the cable, in order to fasten the sensor.

And finally we recommend to lock the second nut with its plane side ahead against the first nut (see drawing).





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.

### 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.

### 4. Electrical connection

Sensors EFFICIENT are connected to a data measuring system via the open cable end. The sensors have a cable-plug connection to the cable.

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 an EMC fair Pg-socket*

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

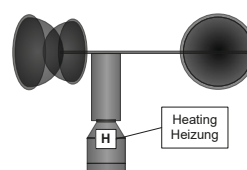


**To reduce the risk of inductive interference the sensor must be properly grounded (screening on both sides).**

### 5. Heating

The sensor disposes of an electronically controlled 18 W-heating within the sensor head.

The heating is supplied together with the sensor electronics. (On request a separate supply of the sensor electronics and the heating by a fixed cable is possible.)



Under most climatological conditions the heating prevents blocking of the moving sensor parts (see illustration). The cup rotor or the wind vane are not heated. In case of icing or formation of ice at the moving sensor element the function is restricted for the period of icing.

### 6. Maintenance

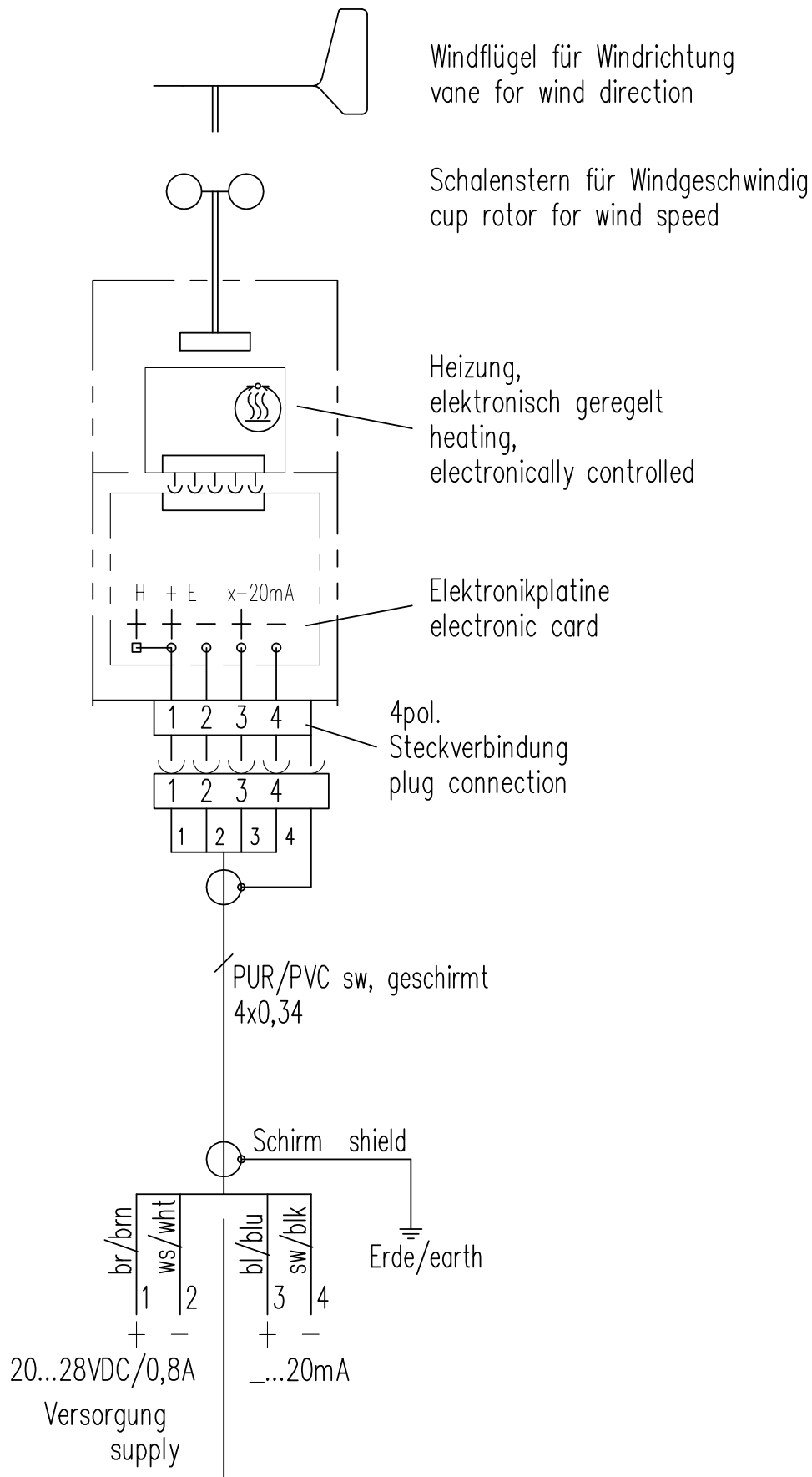
The sensor design permits long periods of maintenance-free operation. We therefore recommend a regular visual verification of the north setup of the wind direction sensor as well as a sensor calibration of both sensor types in the distance of 2 years. With problems, which cannot solve you, do not hesitate to contact our LAMBRECHT meteo service under:

Tel.: +49-(0)551-4958-0

Fax: +49-(0)551-4958-312

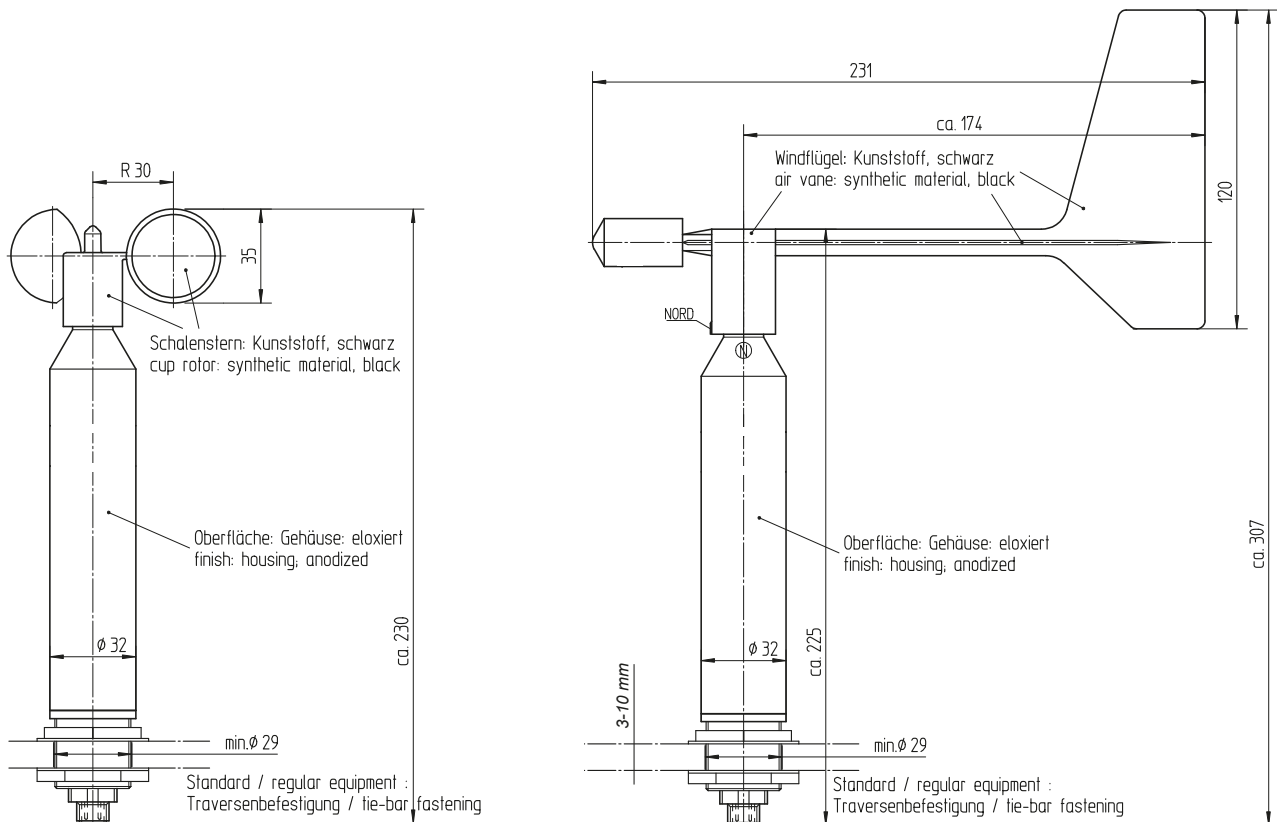
e-mail: support@lambrecht.net

## 7. Wiring diagram





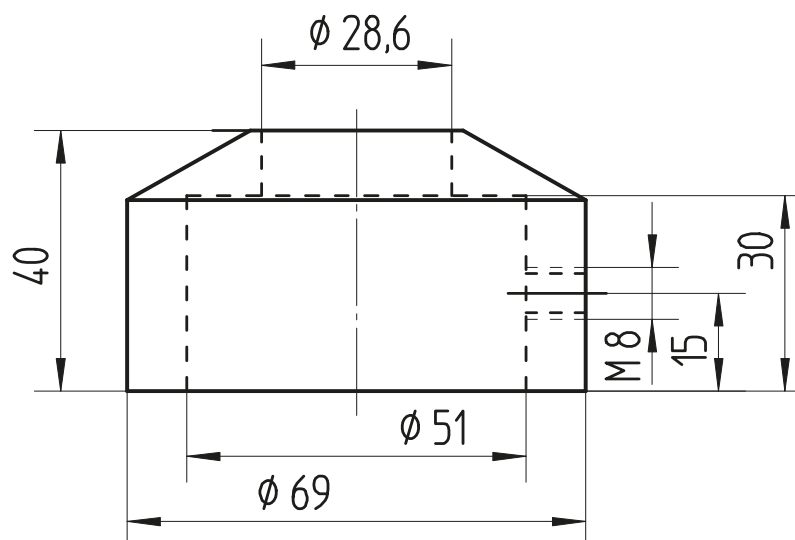
## 8. Dimensioned drawings



### Accessories (optional):

#### (14567 U6) Mast adapter

Id-No. 32.14567.006 000



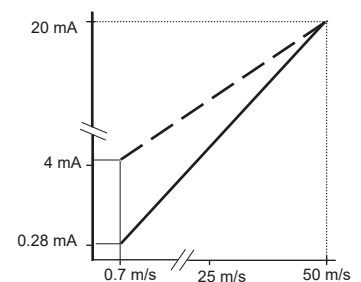


## 9. Technical data

### Wind sensors with analogue mA-output

Measuring principle:	Hall Sensor Array, non-contact
Range of application:	Temperatures -30...+70 °C heated * • wind speed 0...60 m/s
Heating:	18 W heating • electronically controlled • The heating within the sensor head prevents blocking of the moving parts under most climatological conditions.
Supply voltage:	24 VDC (20...28 VDC) • max. 800 mA
Housing:	Seawater-resistant Aluminium • anodized • IP 55 • shaft-Ø 32 mm • for mounting-bore Ø 30 mm at max. 10 mm material thickness
Dimensions:	See dimensioned drawings
Included in delivery:	1 sensor
For connection to:	Data processing system, e. g. TROPOS, Ser[LOG]Plus • power supplies • user specific evaluation systems (not included in delivery)

Parameters	Wind direction Id. 00.14579.100 040	Wind speed Id. 00.14579.200 040
Measuring elements:	wind vane • stably fibre-reinforced plastics	3-armed cup anemometer • fail-safe plastics
Measuring ranges:	0...360°	0.7...50 m/s
Accuracy:	± 2°	< ± 2 % FS
Resolution:	2°	< 0.02 m/s
Starting value:	< 0.7 m/s	< 0.7 m/s
Output:	4...20 mA = 0...360° • max. load 600 Ω	4...20 mA = 0...50 m/s • max. load 600 Ω • compensated
Weight:	0.35 kg	0.25 kg



\*) [Remark: In case of icing and formation of ice at the movable sensor measuring element the function is restricted for the period of icing. For installation sites with high risk of icing LAMBRECHT provides for specially heated sensors.]

### Disposal

LAMBRECHT meteo GmbH is listed and registered at the Stiftung Elektro-Altgeräte Register ear under:

**WEEE-Reg.-No. DE 45445814**

In the category of monitoring and control instruments, device type: "Monitoring and control instruments for exclusively commercial use".

#### Within the EU



The device has to be disposed according to the European Directives 2002/96/EC and 2003/108/EC (Waste Electrical and Electronic Equipment). Do not dispose the old device in the household waste! For an environmentally friendly recycling and disposal of your old device, contact a certified disposal company for electronic waste.

#### Outside the EU

Please follow the regulations in your country regarding the appropriate disposal of waste electronic equipment.

### Technical data - Cable

Flame resistance of the cable: acc. to UL Style 20549

### Warranty

**Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission of the 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.