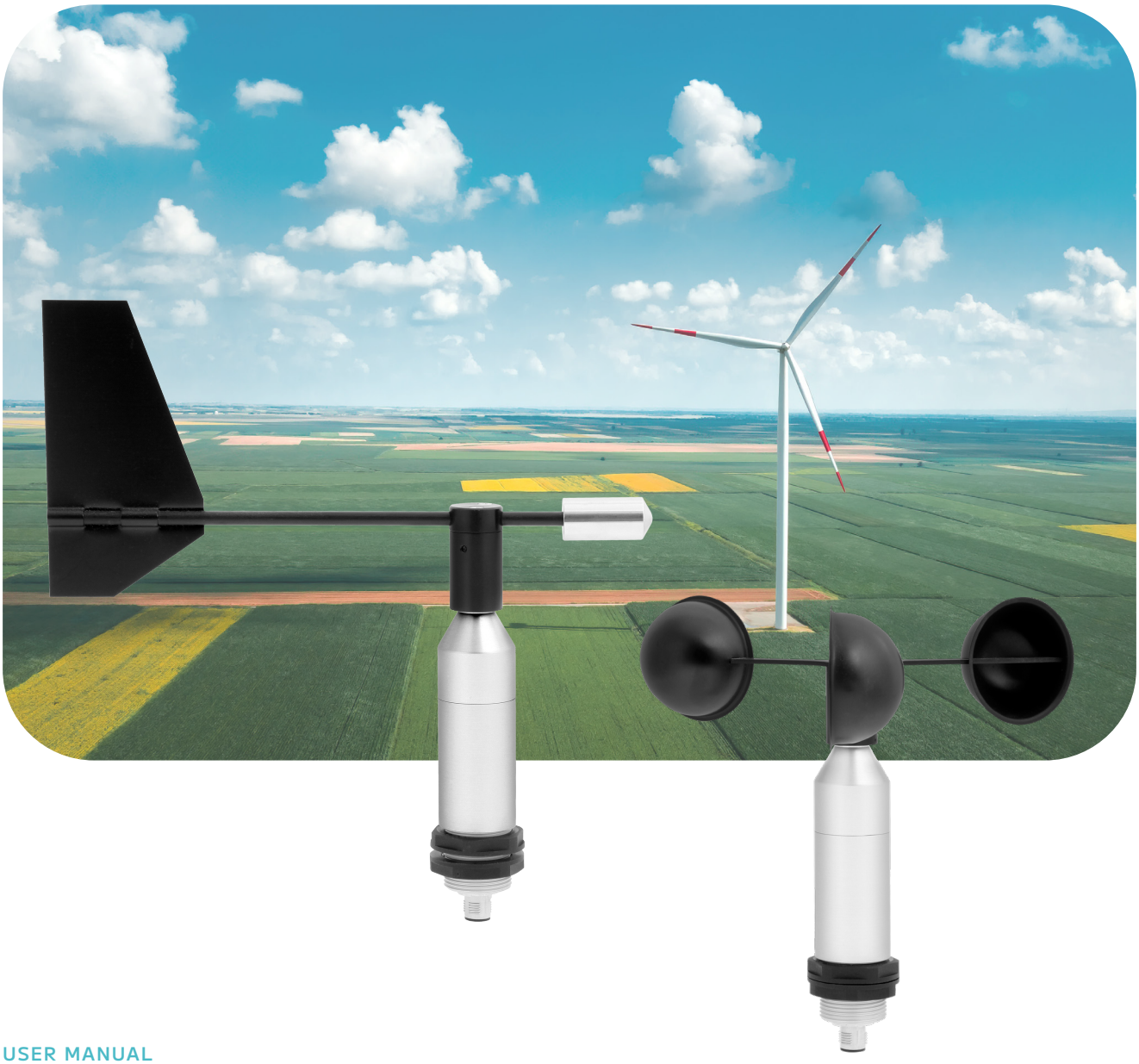

USER MANUAL

ORA

Wind Sensors

aem | LAMBRECHT meteo

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Warranty

Please note the loss of warranty and non-liability by unauthorized 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.

Features of the ORA wind sensors

- ORA wind sensors for determining wind direction and wind speed
- Especially energy-efficient sensors with minimal power requirements
- Highest load capacity due to high-quality measuring elements made of aluminum.
- Precise and reliable measurements due to proven measuring principles and lean, flow-optimized outer geometry
- Simple mounting principles for mast, flange or bore ensure a high degree of flexibility

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

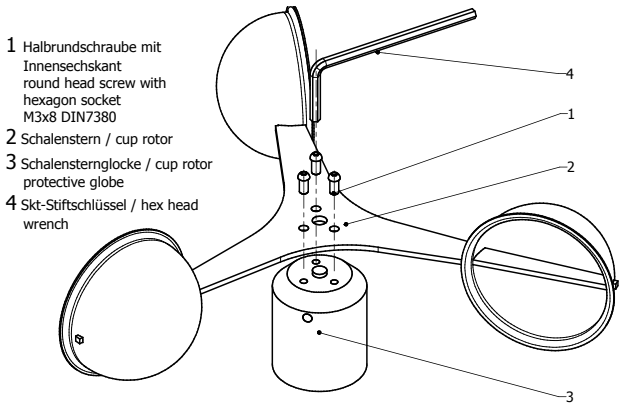
Generally, wind measuring instruments should not measure the specific wind conditions of a limited area, but indicate the typical wind conditions of a wider area. The values measured at different places must be comparable. Thus, when installing the sensor you should make sure the place of installation 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).

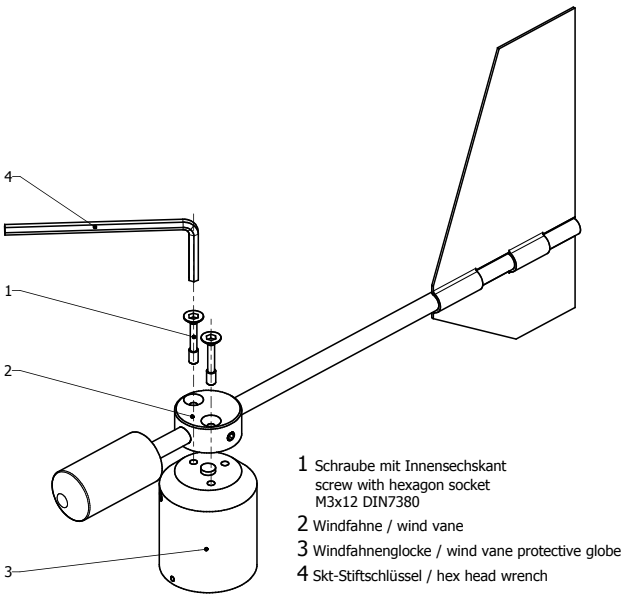
If there is no *undisturbed terrain*, the sensor must be set up at a height that exceeds the height of the obstacle by at least 5 m. If the sensor must be installed on a roof top the place of installation must be in the middle of the roof to avoid predominant wind directions.

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 and the wind vane at the sensor

The bores at the cup rotor and the wind vane are attached in such a way that they can only be installed in a certain clear position. All 3 screws must be used to fasten the cup rotor resp. the wind vane. Thus the correct direction of rotation is guaranteed. The necessary wrench is included in delivery.





Mounting options

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 eventual maintenance works. For access to the sensors use a ladder of appropriate length or a telescope working platform of appropriate height, if applicable.

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

Masts or tubes (grounded) suitable for mounting have an outer diameter of Ø 48-50 mm. A mast adapter (see accessories) is necessary.

MOUNTING THE ADAPTER ON THE WIND SENSOR

1. Remove both thread nuts from the sensor.
2. Insert the sensor into the bore (Ø 30 mm) of the adapter.
3. Fasten the sensor with the flat side of a detached nut from the lower side. Tighten it with a suitable tool (wrench size 36) until a twisting safety of the sensor is given.

MOUNTING THE WIND SENSOR ON THE MAST

1. Install the cable for supply of the sensor electronic and transmission of the sensor signal inside the mast.
2. Put the sensor on the mast (tube). With regard to the wind direction sensor the north mark on the sensor must be aligned to the geographical north direction acc. to 2.6.4. Afterwards fasten the locking screw in the mast adapter to give the sensor a fixed and torsion-free fit.

Proceed analogously when mounting the sensor on a tube traverse.

II. MOUNTING ON TRAVERSE WITH BORE HOLE

At each end of the traverse (Id-No. 32.14627.010000) there are slotted bores with a diameter of 30 mm.

1. Remove the lower nut from the sensor.
2. Put a sensor sidewise into the bore.
3. Fasten the sensor with the flat side of the detached nut from the lower side. Tighten it with a suitable tool (wrench size 36) until a twisting safety of the sensor is given.

III. MOUNTING ON NON-MANUFACTURER MOUNTING DEVICES

Material thickness for installation of the sensor between the nuts may be max. 10 mm. Mounting is to be made in the following steps:

1. Remove the lower thread nut from the sensor.
2. The sensor has to be inserted into the bore and fastened by the opposite side with the loose nut (removed as under 1.). With regard to the wind direction sensor the north mark on the sensor must be aligned to the geographical north direction acc. to 1.3 before finally fastening the nut.

North alignment of the wind vane

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

You have to turn the wind vane's 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 you can locate the reference point by aiming it over the axis. Now you turn the sensor casing on the mounting tube until the tip of the wind vane points to the reference point in the north. This assumes that the sensor is easily turnable on the mounting part. The sensor has to be fixed in this position. **Forceful turning of the mounted sensor can damage the instrument!** After alignment the adhesive tape has to be removed.

For precise north alignment compass declination has to be considered.

Note: Follow all safety instructions while setting up the sensor onto a mast.

Electrical connections

Wind sensors ORA are connected to a data measuring system via the open cable end. The sensors have a cable-plug connection to the 12 m cable. The connecting cable is placed 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).

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.

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

Please make sure that 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: Cable run by an EMC-compliant Pg socket

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

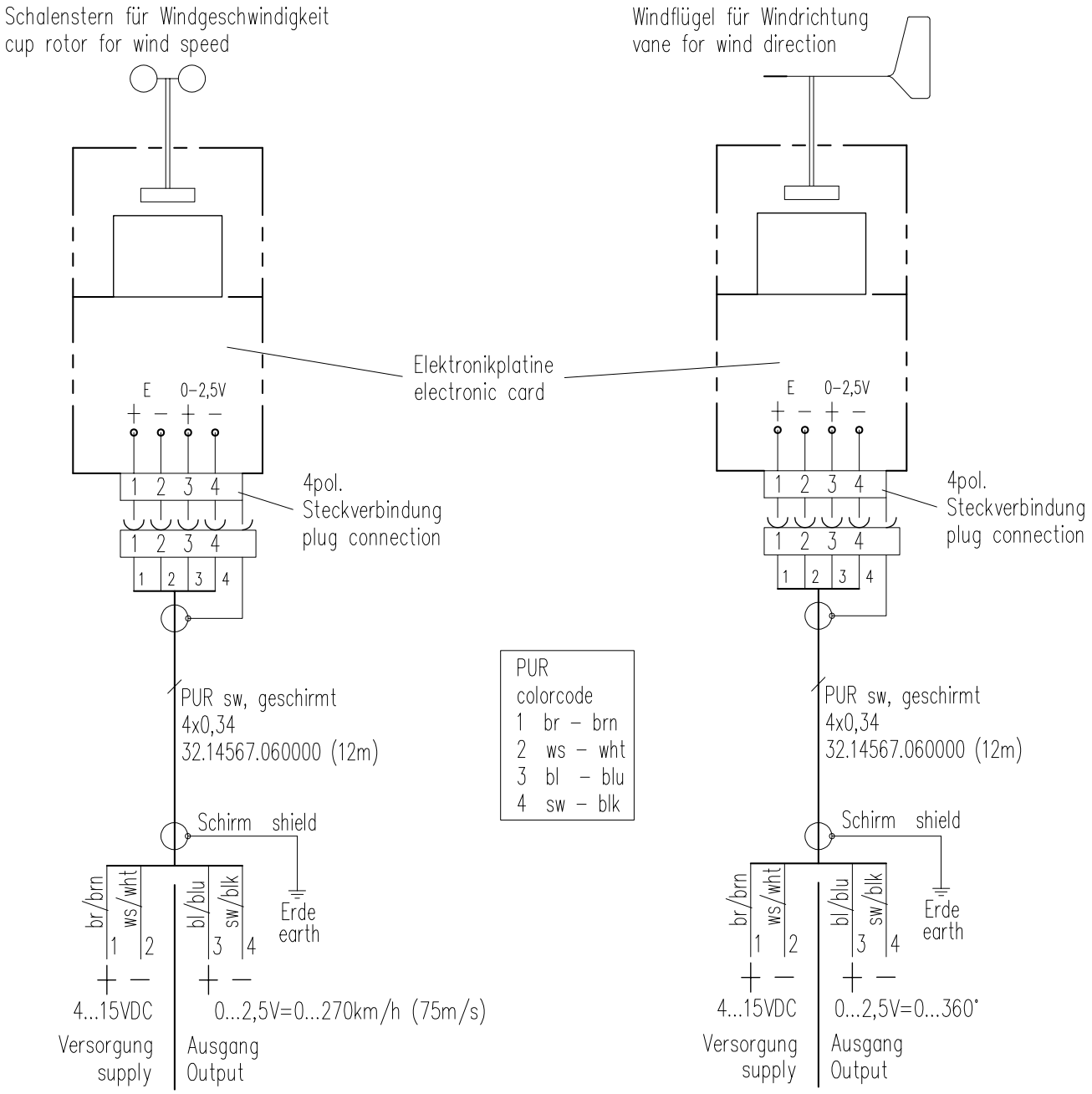
Maintenance

The sensor design permits long periods of maintenance-free operation. We therefore recommend a regular visual verification of the north setup of the wind direction sensor as well as a sensor calibration of both sensor types in intervals of two years. In case of problems which cannot be solved by you please do not hesitate to contact our LAMBRECHT meteo service:

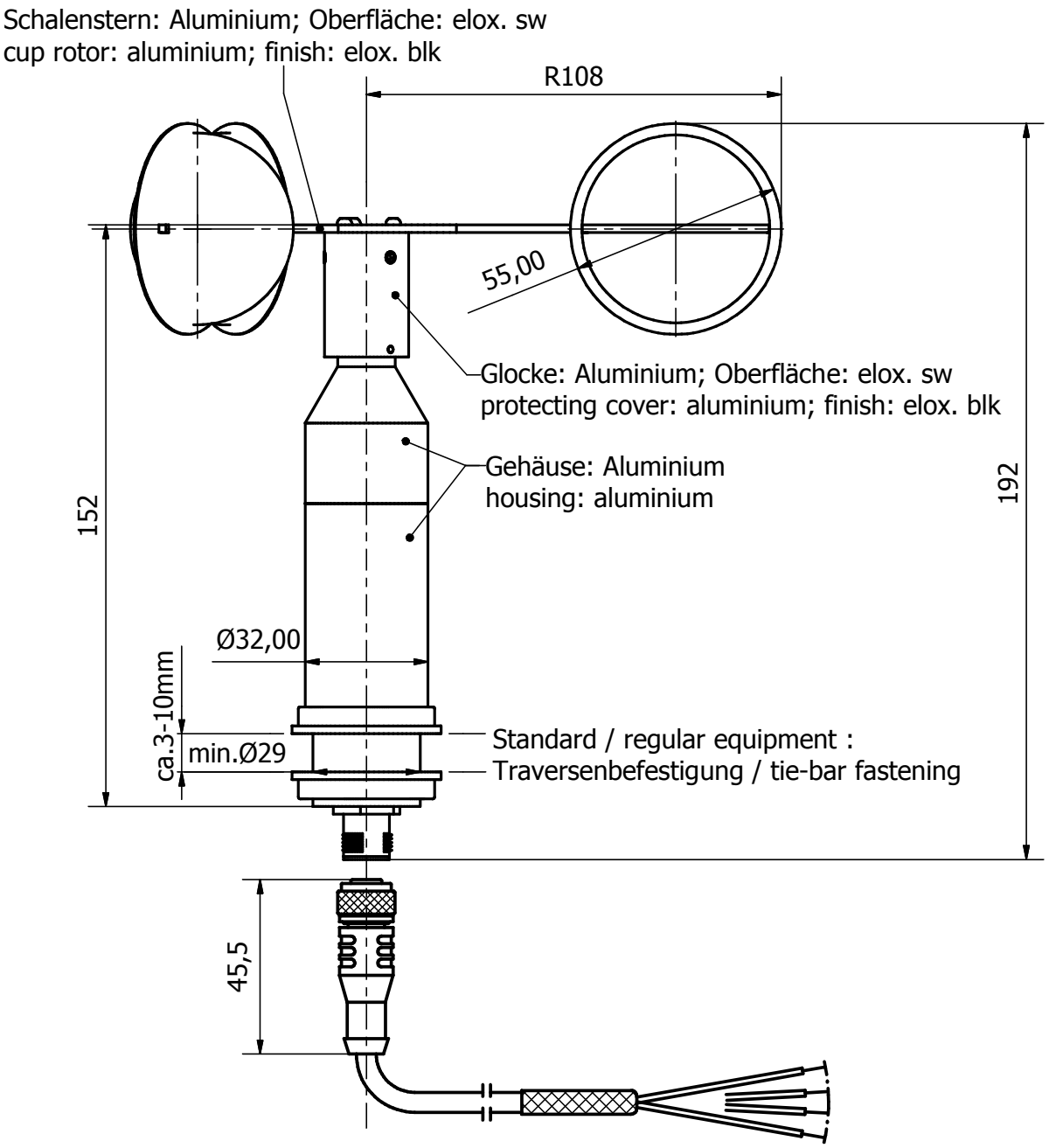
Tel: +49-(0)551-4958-0

E-mail: support@lambrecht.net

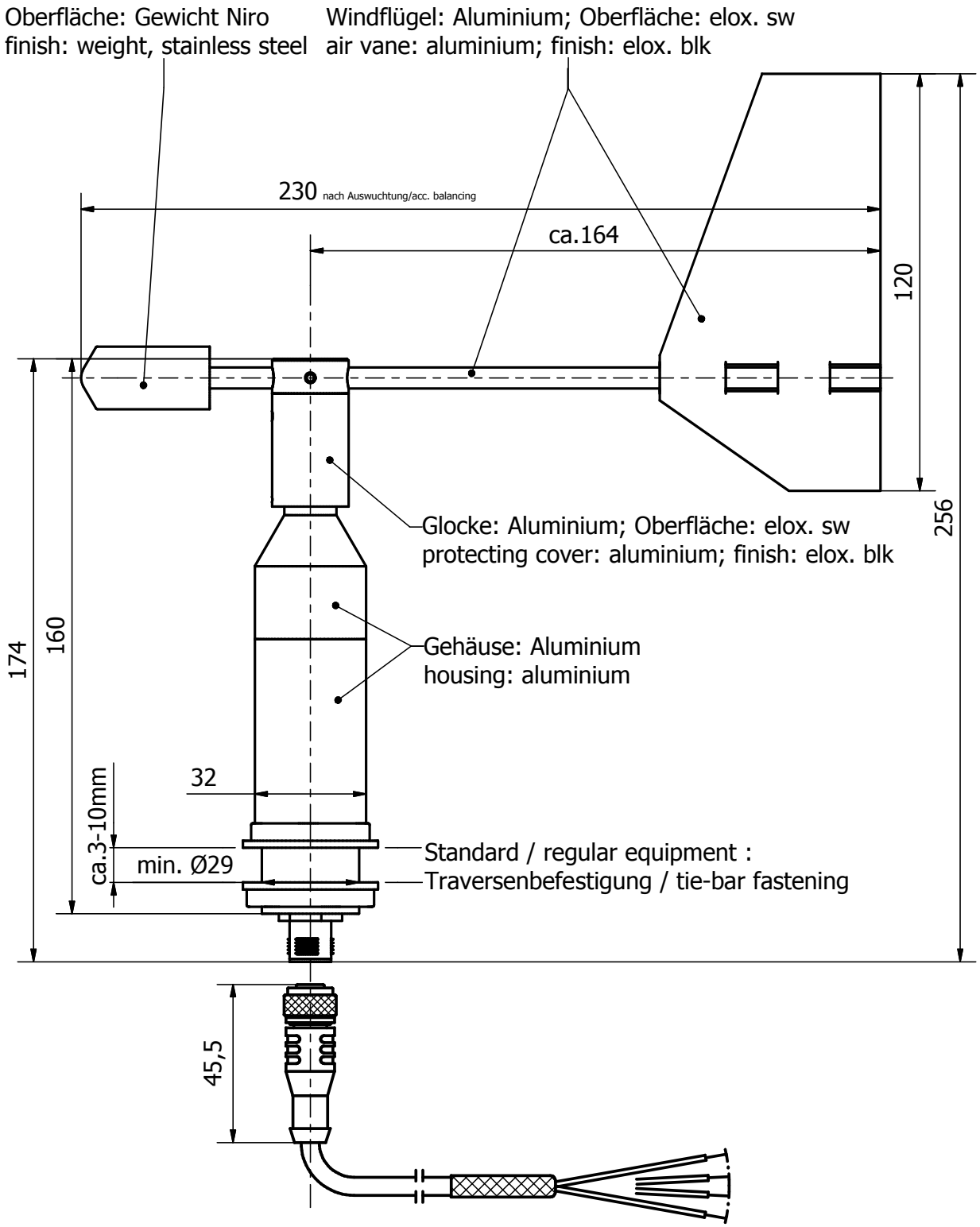
Circuit diagram



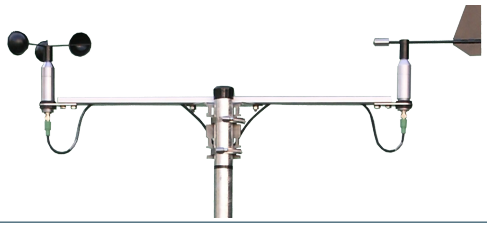
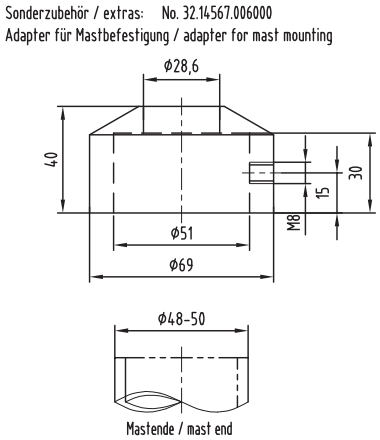
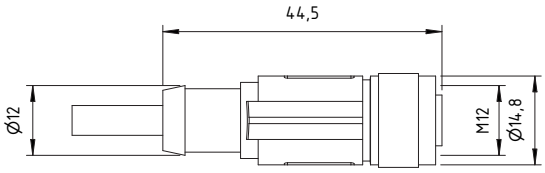
Dimensioned drawing wind speed sensor



Dimensioned drawing wind direction sensor



Accessories (optional)

ID 32.14627.010000 Traverse; sensor distance: 75 cm (Delivery without sensors and without mast)	
ID 32.14567.006000 Mast adapter	
ID 32.14567.060000 Sensor cable with plug connection; length: 12 m Flame resistance of the cable: acc. to UL-Style 20549	

Disposal

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

WEEE-Reg.-Nr. 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 - Sensors

	ORA Wind Direction Sensor	ORA Wind Speed Sensor
ID	**00.14594.120000**	**00.14594.220100**
GENERAL		
Measuring principle	Magnetical positioning encoder system (MPES)	
Range of application	-40...+70 °C; under non-icing environmental conditions*	
Survival wind speed	80 m/s	
Supply voltage	4...15 VDC	
Current consumption	< 2 mA (low power)	
Housing	seawater resistant aluminum; IP 65; for mounting holes Ø 30 mm with max. 10 mm material thickness; incl. plug connector	
Dimensions	see dimensioned drawings	
Scope of delivery	sensor; user manual	
PARAMETER	ORA Wind Direction Sensor	ORA Wind Speed Sensor
Measuring element	blade wind vane; aluminum	three-armed cup rotor; aluminum
Measuring range	0...360°	0.4...75 m/s; ± 0.3 m/s ≤ 10 m/s; ± 1 % FS ...50 m/s
Accuracy	< ± 2°	< ± 0.5 m/s
Resolution	1°	< 0.1 m/s
Starting value	0.4 m/s	0.4 m/s
Output	0...2.5 V = 0...360°	0...2.5 V = 0...75 m/s
Weight	0.95 kg	0.90 kg
Standards	VDI 3786, sheet 2; WMO No. 8	
ACCESSORIES (please order separately)		
ID 32.14627.010000	Traverse; sensor distance: 75 cm	
ID 32.14567.006000	Mast adapter; diameter: 50 mm	
ID 32.14567.060000	Sensor cable with plug connection, length: 12 m	

*) In case of possible icing and ice formation on the movable sensor measuring element, the function is reduced for the time of icing.

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