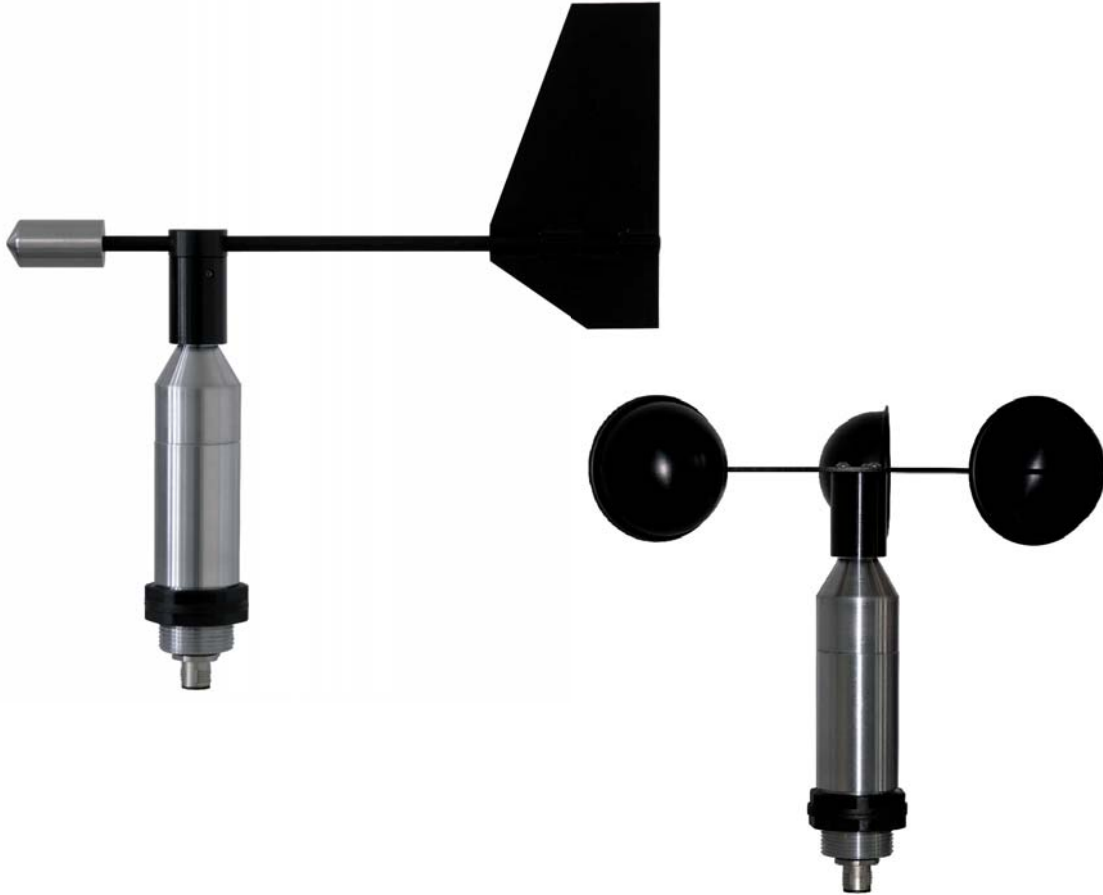




ORA



Wind Sensors ORA

for determination of wind direction and wind speed.

These sensors provide highest capacity and longevity through precision ball bearings and measuring elements with high quality.

Simple installation principles for mast, flange and bore provide for a high degree of flexibility.

Advantages at a glance

- ▶ Long proven measuring principles for precise data acquisition
- ▶ Wind vane and 3-armed aluminium cup rotor made of aluminium for highest capacity
- ▶ Output 0...2.5 Volt
- ▶ Low starting values
- ▶ High resolution of measuring values
- ▶ Minimal electrical power requirement
- ▶ Easy installation through cable plug connection
- ▶ Very low needs of maintenance



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

1 Initial operation

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.

1.1 Selecting the place of installation

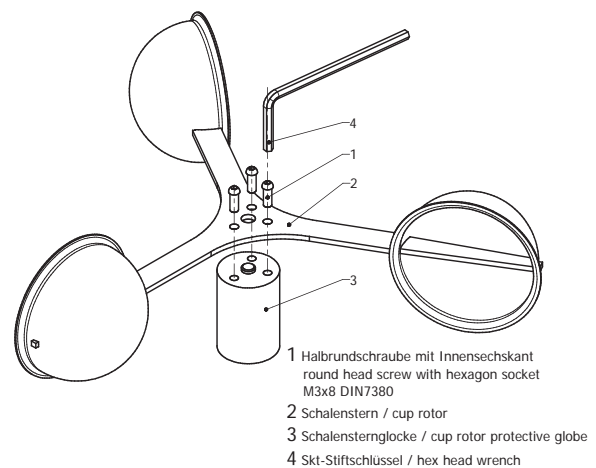
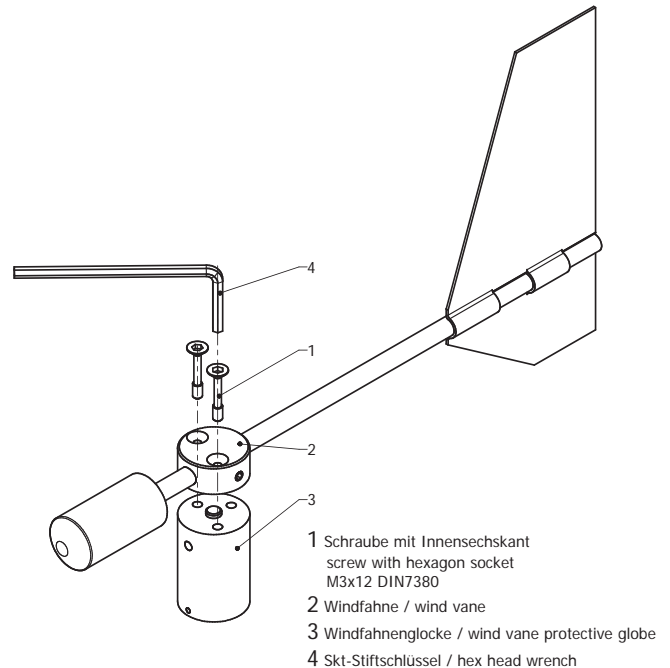
Generally, wind measuring instruments should not measure the specific wind conditions of a limited area, but indicate the typical wind conditions of a wider area. The values measured at different places must be comparable. Thus, when installing the sensor you should make sure the place of installation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



1.2 Installation



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

1.2.1 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 of the adapter at 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 of the wind sensor at 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.

1.2.2 Mounting on traverse with bore hole

At each end of the traverse (Id-No. 32.14627.010 000) 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.

1.2.3 Generally mounting in bores

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.

1.3 North alignment of 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.

1.4 Electrical connection

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. Versions with an assembled cable are possible.

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).



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.

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 representation:
Cable run by a EMC fair Pg-socket*



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

2 Maintenance

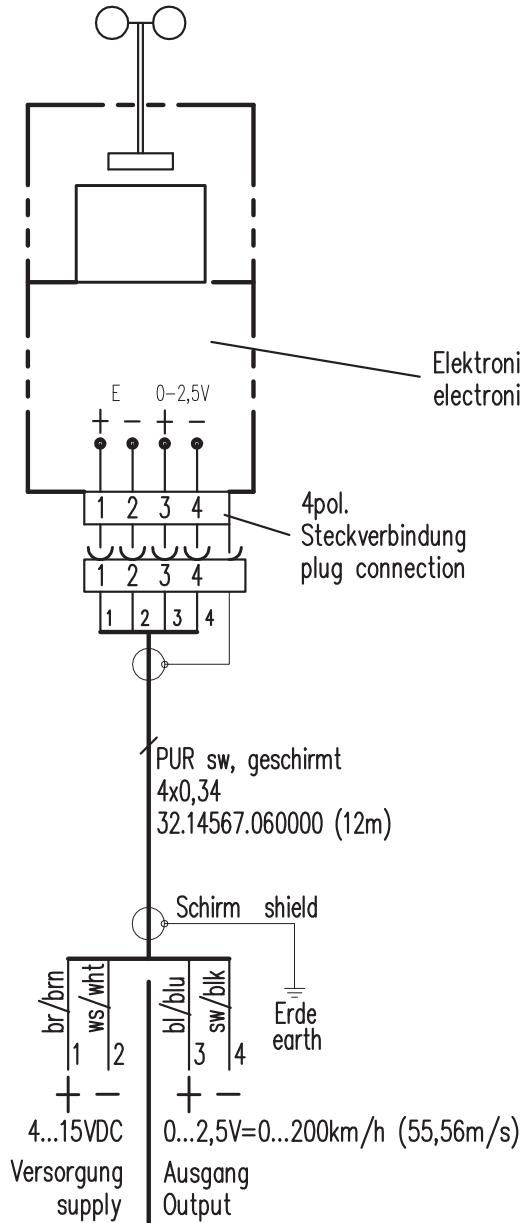
The sensor design permits long periods of maintenance-free operation. We therefore recommend a regular visual verification of the north setup of the wind direction sensor as well as a sensor calibration of both sensor types in intervals of 2 years. In case of problems which cannot be solved by you please do not hesitate to contact our LAMBRECHT meteo service:

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

3 Electrical connection

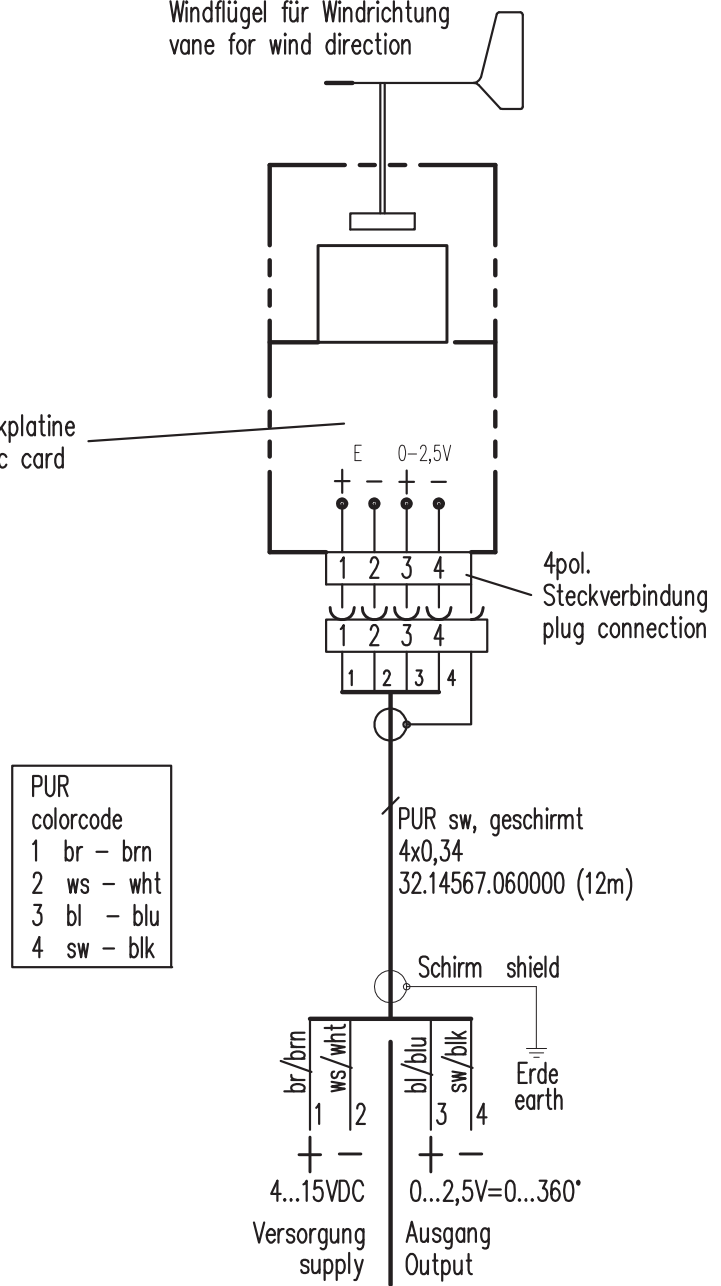
00.14594.210000

Schalenstern für Windgeschwindigkeit
cup rotor for wind speed



00.14594.110000

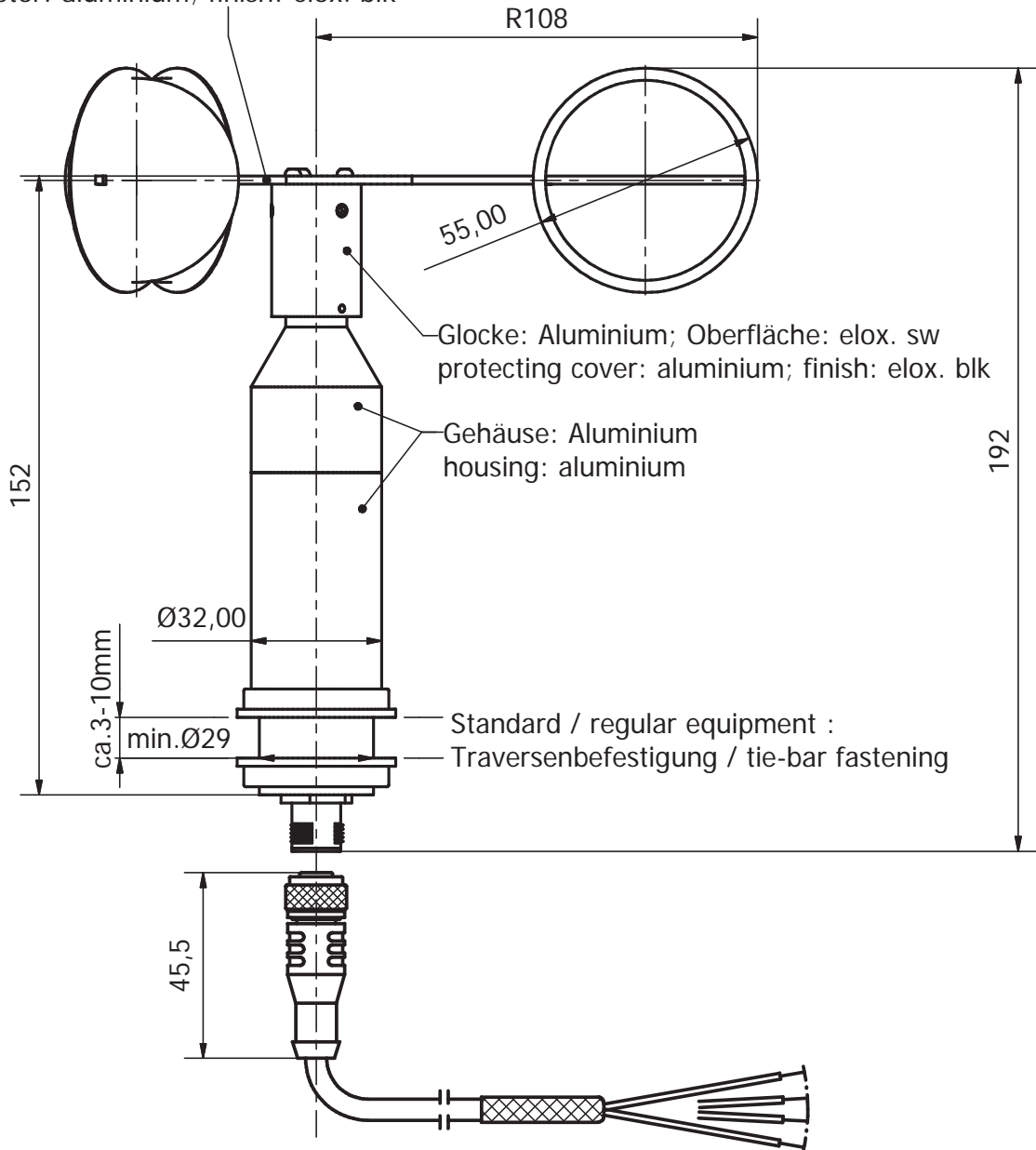
Windflügel für Windrichtung
vane for wind direction



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

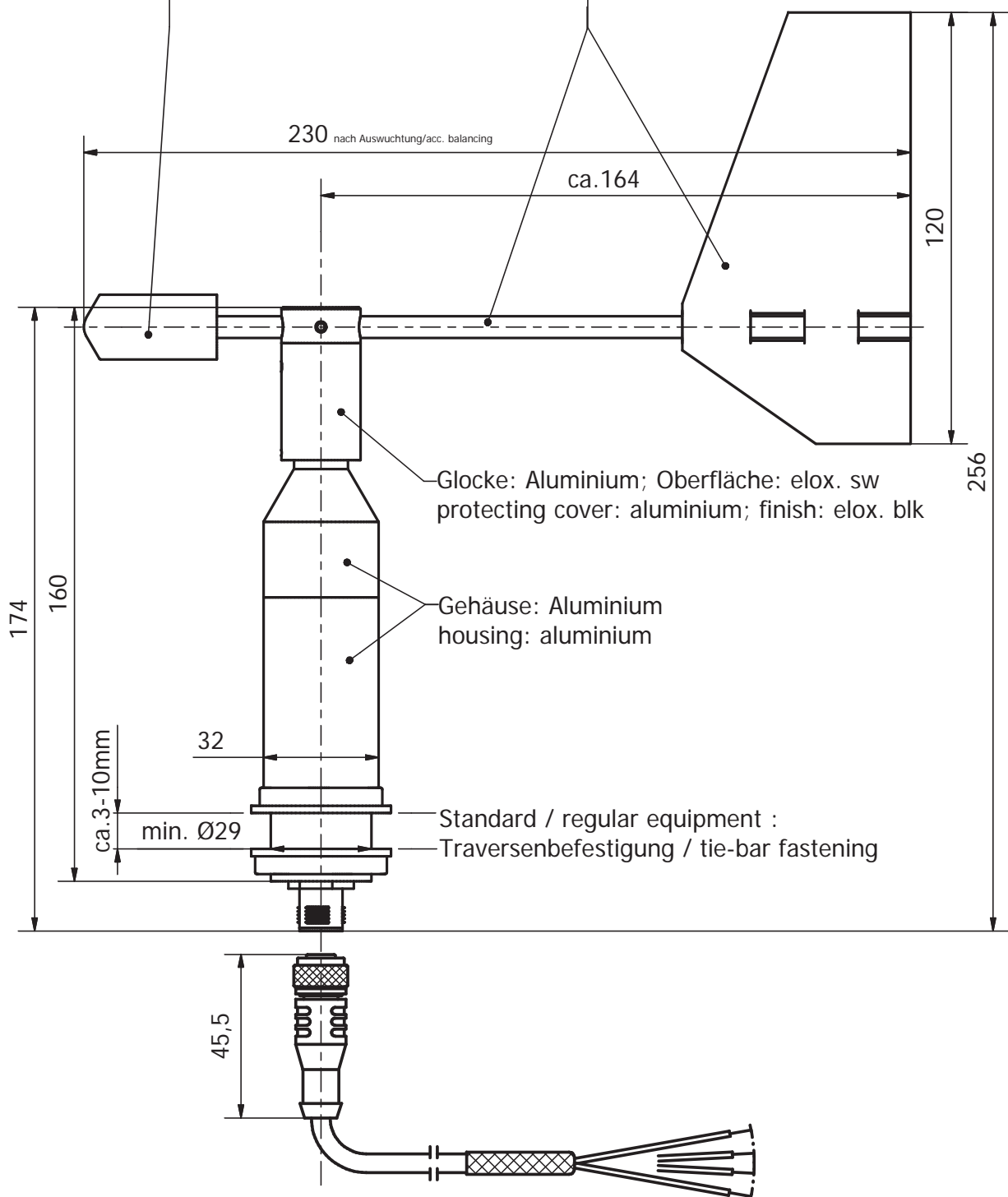
4 Dimensional drawings

Schalenstern: Aluminium; Oberfläche: elox. sw
cup rotor: aluminium; finish: elox. blk





Oberfläche: Gewicht Niro Windflügel: Aluminium; Oberfläche: elox. sw
finish: weight, stainless steel air vane: aluminium; finish: elox. blk





5 Accessories (optional)

Wind traverse (without sensors and without mast)

Id-No. 32.14627.010 000

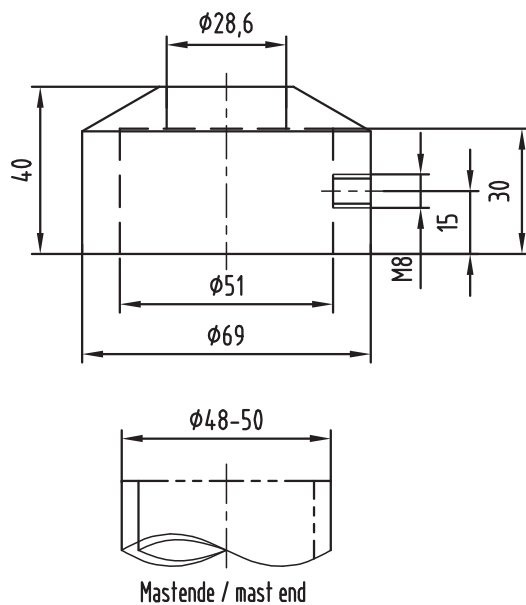


(14567 U6) Mast adapter

Id-No. 32.14567.006 000

Sonderzubehör / extras: No. 32.14567.006000

Adapter für Mastbefestigung / adapter for mast mounting





6 Technical data

(14594) Wind direction sensor

Id-No. **00.14594.110 000**

Meas. principle: Magnetical positioning encoder system (MPES)

Meas. element: wind vane • aluminium

Meas. range: 0...360°

Accuracy: < ± 2°

Resolution: 1°

Starting value: < 0.4 m/s

Output: 0...2.5 V = 0...360°

Supply voltage: 4...15 VDC

Current consumption: < 2 mA (low power)

Strongest wind impact velocity: 80 m/s

Temperature meas. range: -40...+70 °C • under non-icing environmental conditions *

Housing: seawater resistant aluminium • IP 65 • for bores with Ø 30 mm at max. 10 mm material thickness • incl. plug connector

Incl. in delivery: 1 sensor • 12 m cable • with plug connection

Dimensions: see dimensional drawing

Weight: approx. 0.95 kg

Standards: VDI 3786, sheet 2 • WMO No. 8

Connectable to: TROPOS • SYNMET

*) 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.

(14594) Wind speed sensor

Id-No. **00.14594.210 000**

Meas. principle: Magnetical positioning encoder system (MPES)

Meas. element: 3-armed cup rotor • aluminium

Meas. range: 0.4...55 m/s

Accuracy: < ± 0.5 m/s

Resolution: < 0.1 m/s

Starting value: < 0.4 m/s

Output: 0...2.5 V = 0...55.55 m/s

Supply voltage: 4...15 VDC

Current consumption: < 2 mA (low power)

Strongest wind impact velocity: 80 m/s

Temperature meas. range: -40...+70 °C • under non-icing environmental conditions *

Housing: seawater resistant aluminium • IP 65 • for bores with Ø 30 mm at max. 10 mm material thickness • incl. plug connector

Incl. in delivery: 1 sensor • 12 m cable • with plug connection

Dimensions: see dimensional drawing

Weight: approx. 0.9 kg

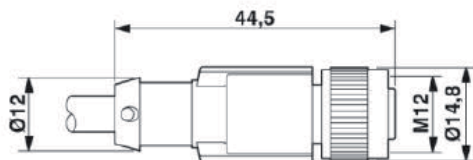
Standards: VDI 3786, sheet 2 • WMO No. 8

Connectable to: TROPOS • SYNMET

Technical data - Cable

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

Dimensioned drawing - Cable



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

Subject to change without notice.

14594_b-de.indd

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