0223

Cup Anemometer *classic*

Description

Rugged sensor for the measurement of the horizontal component of the wind speed.

Driven by the flow, the cups are set into rotation. A light barrier scans an optical disc in the interior of the sensor and provides a frequency linearly dependent on the wind speed.

A built-in electronical heating prevents the bearings and the rotation part from being blocked by icing.

Technical Data

Sensor

Sensing element	Cup rotor
Transducer	Optoelectronical transmitter with frequency output
Output	0..50 m/s = 0..1045 Hz
Pulse Level	Rectangular: LO = <0.5 V / HI = >4.5 V
Resolution	0.05 m wind run
Accuracy	0..15 m/s ± 0.3 m/s >15m/s ± 2% of reading

Threshold

Starting speed	0.3 m/s

Rotor

Type	3 hemispherical cups
Material	Aluminium
Outside diameter	ø315 mm
Distance constant	5 m (63% of final value)
Bearings	Stainless steel ball bearings

Power Supply

Supply voltage	4..18 VDC
Current consumption	0.3 mA unloaded
Power-up time	50 ms

Heating

Heating power	Approx. 20 W, electronically controlled
Supply voltage	24 VAC/DC
Current consumption	0.83 A

Casing

Material	Aluminium
Protection	IP 55
Dimensions	ø70 x 226 mm
Weight	1 kg
Mast mount	Mounting on a tube with ø48 mm outside diameter, >ø36 mm inside diameter (e.g. 1 1/2'' DIN tube)

Electrical connection

Connector (at the sensor)	7 pin round connector
Connector (to the logger, optional)	6 pin round connector DIN 45322
Cable	3 x 0.5 mm² (without heating supply), 10 x 0.25 mm² (with heating supply)

Environmental Conditions

Operating temperature	-35..+80˚C
Relative humidity	0..100%
Maximum wind speed	60 m/s
Wind load at 60 m/s	10 N

Measurement Characteristics

The anemometer provides a pulse frequency linearly dependent on the wind speed. The parameters given in this data sheet are standard characteristics. An individual calibration in a wind tunnel will improve the accuracy.

Characteristic Curve

wind speed [m/s] = slope [m] · frequency [Hz] + offset [m/s]

Slope [m]:	**0.0474**
Offset [m/s]:	**0.48**

Wind Speed [m/s]	**Frequency** [Hz]
0	0.0
1	11.0
2	32.1
3	53.2
4	74.3
5	95.4
6	116.5
7	137.6
8	158.6
9	179.7
10	200.8
15	306.3
20	411.8
25	517.3
30	622.8
35	728.3
40	833.8
45	939.2
50	1044.7
55	1150.2
60	1255.7

Frequency [Hz]	**Wind Speed** [m/s]
0	0.0
10	1.0
20	1.4
30	1.9
40	2.4
50	2.9
60	3.3
70	3.8
80	4.3
90	4.7
100	5.2
200	10.0
300	14.7
400	19.4
500	24.2
600	28.9
700	33.7
800	38.4
900	43.1
1000	47.9
1100	52.6

Characteristic Curve for wilog303/306

Please use the following charateristic curve when the sensor is connected to **wilog303** or **wilog306** data loggers. For individually calibrated anemometers use the **slope** and **offset** values indicated in the calibration report.

Example: Sensor Connected to Anemometer Input No. 2

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v2 : mean sigma max = 0.0474 * F2 + 0.48 * ( F2 > 0 )
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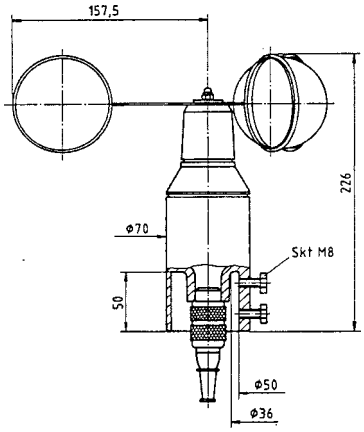
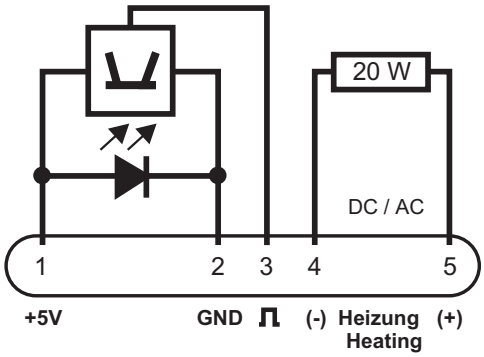
Installation

Dimensions



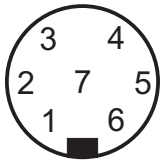
Wiring Diagram



Electrical Connection

Connector (at the sensor): 7 pins

Pin	Function
1	Power Supply +4..18 VDC
2	Ground
3	Signal
4	Heating DC(-) or AC1
5	Heating DC(+) or AC2
6	N.C.
7	Shield



View to the Sensor

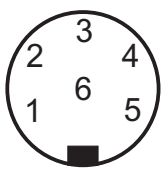
Cable

Wire	Colour	Function
wh	white	Power Supply
br	brown	Ground
gn	green	Signal
ye	yellow	Heating (-) or AC1
gr	grey	Heating (+) or AC2

The sensor is optionally delivered with a multipole round connector for the direct connection to **wilog** data loggers.

Connector (to the logger): 6 pins according to DIN 45322

Pin	Function
1	N.C.
2	Power Supply +5 VDC
3	Signal
4	Heating (-) or AC1
5	Heating (+) or AC2
6	Ground



View to the Logger

Mounting

Mounting the Rotor

The anemometer comes partly mounted. Please proceed as follows in order to mount the cups:

1. Remove the dome nut (8mm tool) and the disk from the top of the anemometer the rubber sealing remaining in the cap.
2. Place the rotor on the top of the cap the dowel pin fitting into the gap.
3. Replace the disk and the nut.
4. When retightening the nut hold the anemometer at the protective cap instead of the cups.

Mounting the Sensor at the Mast

Attach the anemometer at the top or on a mounting boom along the mast. Make sure that the flow to the sensor is not disturbed by the mast or any obstacle at the site.

Place the sensor on a tube and fasten it with the fixing screws.

Tools

The following tools are required during installation of the sensor:

- Open spanner, 8 mm width
- Open spanner, 13 mm width
- Small screw driver for the connection of the cable to the terminal strips (optional)

Maintenance

Dust and air pollution may choke the slit between the body and the rotating part of the anemometer. Please keep this slit clean.

The bearings may be subject to wear and tear after a long period of use. Thus leading to noise as well as to a higher starting torque. In this case please send the sensor to the manufacturer for replacement of the ball bearings.

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