THE WORLD OF WEATHER DATA - THE WORLD OF WEATHER DATA - THE WORLD OF WEATHER DATA

Thies CLIMA

Instruction for Use

021436/01/07

Wind Transmitter „First Class“

4.3350.00.140 / 141 / 161
4.3350.10.140 / 141 / 161

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Contents

1 Models available

Order- No.	Output Frequency Source	Output Frequency Sink	Output Analogue U / I	Meas. range	Supply	Heating
4.3350.00.140	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	0...20 mA = 0,3...75 m/s	0,3...75 m/s	15…24V DC	24V AC/DC, 24 W
4.3350.00.141	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	4...20 mA = 0,3...75 m/s	0,3...75 m/s	15…24V DC	24V AC/DC, 24 W
4.3350.00.161	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	0...10 V = 0,3...75 m/s	0,3...75 m/s	15…24V DC	24V AC/DC, 24 W
4.3350.10.140	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	0...20 mA = 0,3...75 m/s	0,3...75 m/s	15…24V DC	without 1
4.3350.10.141	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	4...20 mA = 0,3...75 m/s	0,3...75 m/s	15…24V DC	without
4.3350.10.161	1000 Hz @ 50 m/s	1000 Hz @ 50 m/s	0...10 V = 0,3...75 m/s	0,3...75 m/s	15…24V DC	without

The following parts are included in delivery:
1 Instrument
1 Terminal plug
1 Instruction for Use

2 Application

The wind transmitter is designed for the acquisition of the horizontal component of the wind speed in the field of meteorology and environmental measuring technology, evaluation of location, and measurement of capacity characteristics of wind power systems.

- The measuring value is available at the outputs, at the same time, in digital form as frequency as well as also in analogue form as current or voltage.

The measuring data available are ideally adapted to the supply in display instruments, recording instruments, datalogger, as well as process control systems.

For winter operation the instrument is optionally equipped with an electronically regulated heating, which guarantees a smooth running of the ball bearings, and prevents the shaft and slot from icing-up.

Remark

When using fastening adapters (angle, traverses, etc) please take a possible effect to the measuring values by shading into consideration.

3 Mode of Operation

A low-inertia cup star (in ball bearings) with 3 cups, made of carbon-fibre-reinforced plastic, is set into rotation by the wind. The rotation is scanned opto-electronically, and is converted into a square wave signal. The frequency of this signal is proportional to the number or rotations. A down-stream frequency/voltage-converter of high precision generates an output voltage which is strictly linear-dependent from the frequency. This analogue measuring data can be output alternatively as voltage- or current measuring value. At the same time, the wind transmitter delivers also the rectangular digital signal as output data. The supply of the electronics can be effected by dc-voltages from 15 v to 24 v. The supply of the optional heating is provided separately by an ac/dc. The heating prevents the Wind Transmitter First Class from blocking up even under extreme meteorological icing conditions.

The outer parts of the instrument are made of corrosion-resistant anodised aluminium. Highly effective labyrinth gaskets and O-rings protect the sensitive parts inside the instrument against humidity and dust. The instrument is mounted onto a mast tube; the electrical plug-connection is located in the transmitter shaft.

4 Recommendation Side Selection / Standard Installation

In general, wind measuring instruments are supposed to record wind conditions over a large area. According to international regulations, the surface wind should be measured at a height of 10 m above even open terrain, in order to achieve comparable values. An open terrain is defined as terrain where the distance between the wind-measuring instrument and the next obstacle is at least ten times the height of this obstacle (Guide to Meteorological Instruments and Methods of Observation, Sixth Edition, WMO-No. 8). If this regulation cannot be fulfilled, the measuring instrument should be installed at a height at where the measurement values are not influenced by any local obstacles. In any case, the measuring instruments should be installed at a height of 6 to 10 m above the mean height of the buildings or trees in the vicinity. If it is necessary to install the instrument on a roof, it should be installed in the centre of the roof in order to avoid any preferential directions.

5 Installation

5.1 Electrical Mounting

Solder a shielded cable with diameter 7-8 mm and a core cross-section of 0,5...0,75 mm² to the enclosed coupling socket.

- The number of necessary wires is given in the connection diagram (chapter 8).

Cable recommendation	
Type/ No. of cores /Diameter	Cable diameter
LIYCY 4 x 0,75 mm²	ca. 7 mm
LIYCY 5 x 0,50 mm²	ca. 7 mm
LIYCY 6 x 0,75 mm²	ca. 7,7 mm
LIYCY 7 x 0,50 mm²	ca. 7,5 mm
LIYCY 8 x 0,50 mm²	ca. 8 mm

5.2 Mechanical Mounting

Mount the transmitter onto a pipe socket of R 1“ (Ø 33,5 mm) and a length of 25 mm. The pipe socket must have an internal diameter of at least 25 mm as the wind transmitter must be connected electrically with a plug from below.

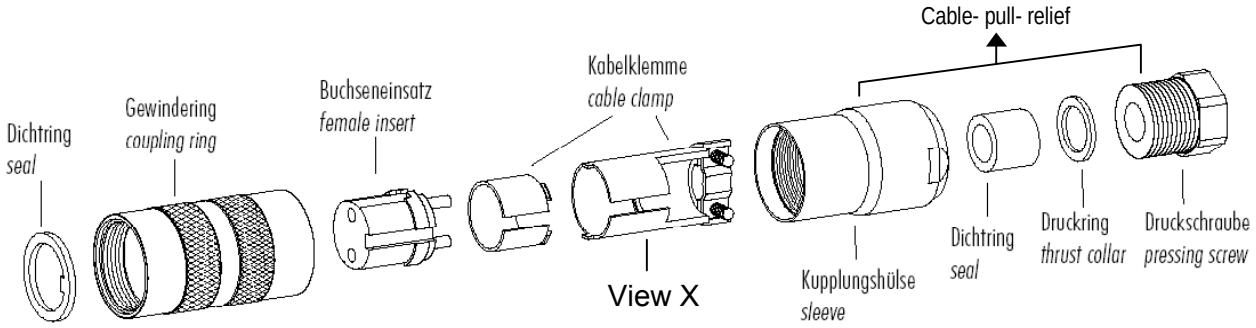
After electrical connection the wind transmitter is put onto the pipe socket, and is fixed by means of 2 threaded pins (female hexagon 3 mm) at the base of the transmitter.

Attention

Storing, mounting, and operation under weather conditions is permissible only in vertical position, as otherwise water can get into the instrument.

6 Plug Mounting

Coupling socket 507550 (Binder, Serial 423), EMC with cable clamp

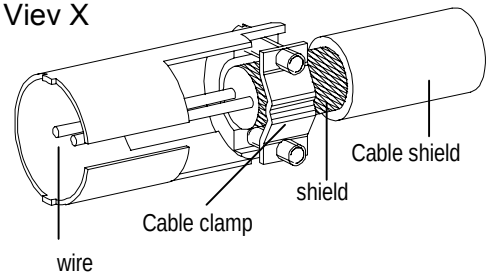


1. Stringing parts on cable acc. to plan given above.
2. Stripping cable sheath 20 mm
   Cutting uncovered shield 15 mm
   Stripping wire 5mm.

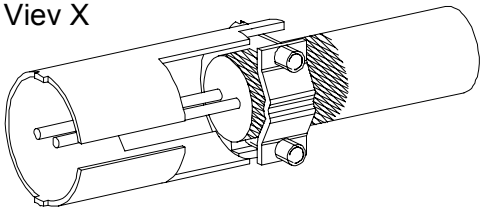
   Cable mounting 1
   Putting shrink hose or insolating tape between wire and shield.

   Cable mounting 2
   If cable diameter permits, put the shield backward on the cable sheath.
3. Soldering wire to the insert, positioning shield in cable clamp.
4. Screwing-on cable clamp.
5. Assembling remaining parts acc. to upper plan.
6. Tightening pull-relief of cable by screw-wrench (SW16 und 17).

Cable mounting 1
Viev X



Cable mounting 2
Viev X



7 Maintenance

If properly installed, the instrument requires no maintenance. Heavy pollution can lead to blockage of the slot between the rotating and the stable parts of the transmitter. Thus it is advisable to remove the accumulated dirt from the instrument .

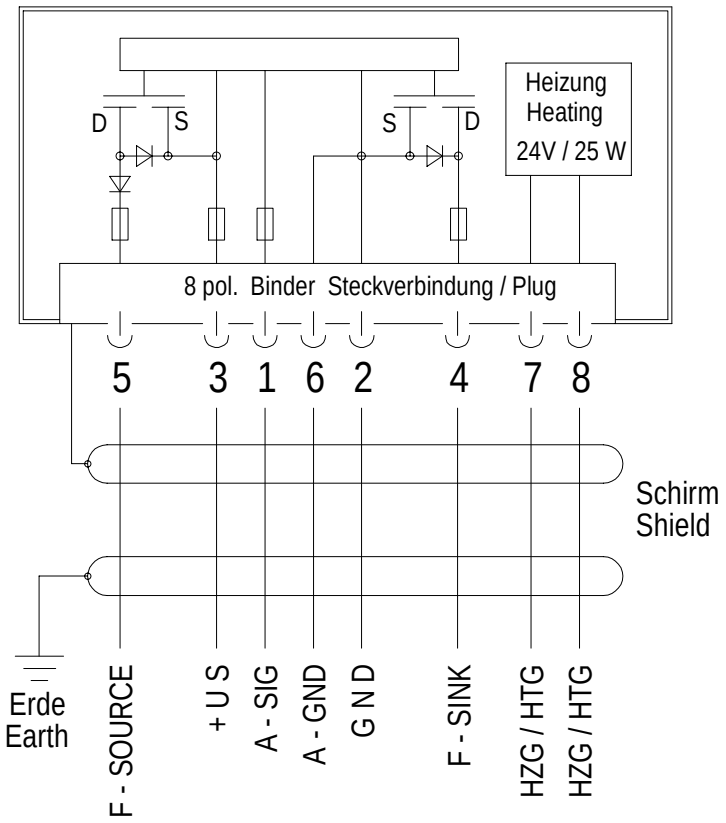
Remark

For transport of instrument please use original packing.

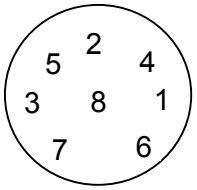
8 Connecting Diagram

Order – No.

4.3350.00.140
4.3350.00.141
4.3350.00.161
4.3350.10.140
4.3350.10.141*
4.3350.10.161*



View on the soldered joint of the counter plug

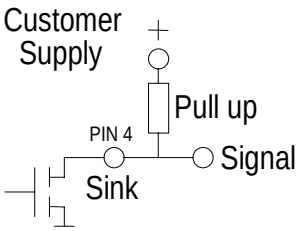


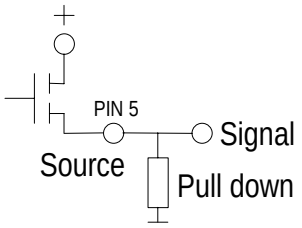
*Order-No.. 4.3350.**10**.1xx (without heating) PIN 7 u. 8 are not connected

Pin	Name	Function
1	A - SIG	Analogue output
6	A - GND	Analogue ground
2	GND	Ground supply
3	+Us	Supply 15 V...24 V DC
4	F - SINK	Frequency output (rectangle), open Drain
5	F - SOURCE	Frequency output (rectangle), source (open Drain)
7	HTG	Heating supply: voltage: 24 V AC/DC Power : 25 W
8	HTG	
*Order-No.. 4.3350.**10**.1xx (without heating) PIN 7 u. 8 are not connected		

9 Technical Data

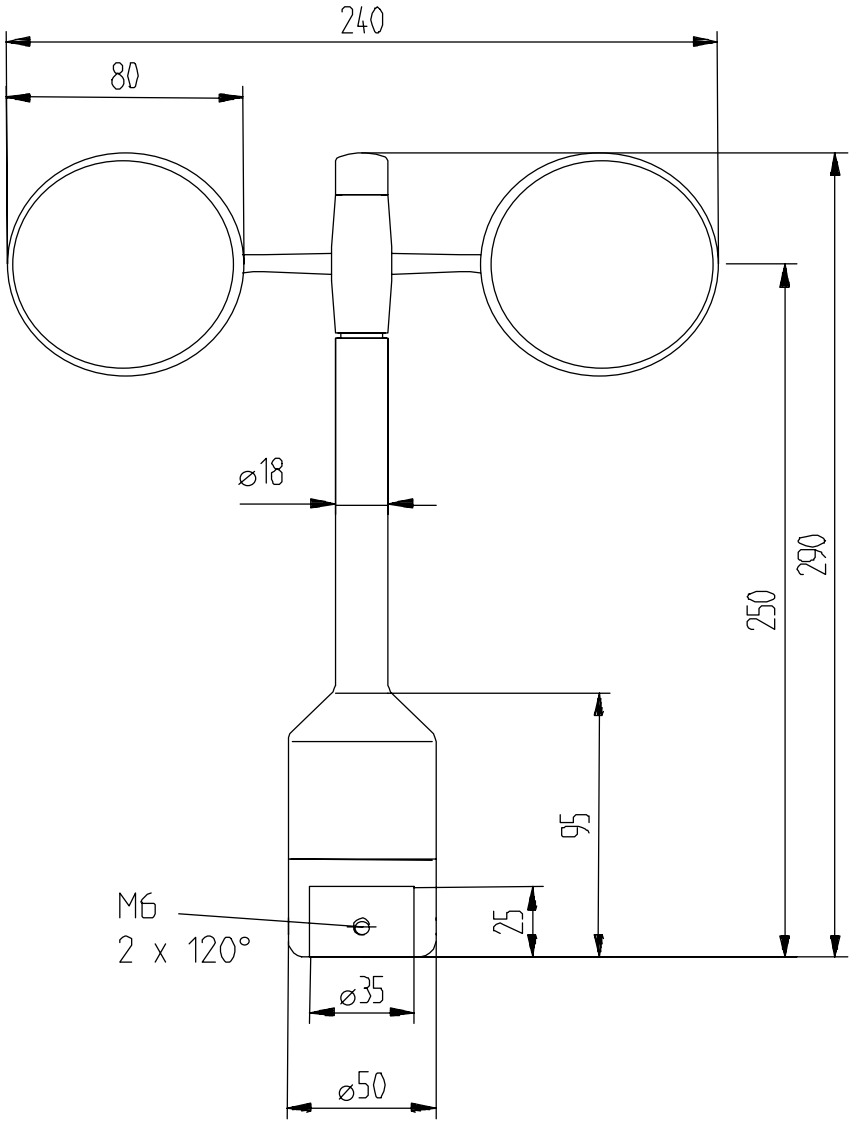
Characteristic	Description
Measuring range	0,3 ... 75 m/s
Measuring instability (without calibration)	0,3...50 m/s < 2% of measuring value or < 0,2 m/s
Survival speed	85 m/s (max. 30 min.)
Permissible Ambient conditions	- 50...+ 80°C, all occurring situations of relative humidity (including dew moistening)
Output signals digital	
Form	Rectangle
Frequency	1000 Hz @ 50 m/s
Sink-output	Pull down on ground (Open Drain)
Permissible drain-current	max. 250mA
Ext. Pull up resistance	R > 100 Ω @ maximum voltage of +24 V
Source-output	Pull up on supply (Open Drain)
Permissible Source-current	maximal 100mA
Ext. Pull down resistance	R > 270 Ω @ maximum voltage of +24 V
Permissible Parallel-capacity	C < 200 nF corresponds to typical cable length of 1km
Output signal analogue	
4.3350.x0.140	Current 0 ... 20,0 mA = 0 ... 75 m/s @ 500Ω
4.3350.x0.141	Current 4,0 ... 20,0 mA = 0 ... 75 m/s @ 500Ω
4.3350.x0.161	Voltage 0 ... 10,0 V = 0 ... 75 m/s @ 5 kΩ
Linearity F/U-converter	Correlation factor r between output voltage and frequency r > 0.999 999 (0,2 … 50 m/s)
Linearity Complete instrument	correlation r between output data and wind speed r > 0.999 95 (4 … 20 m/s)
Starting velocity	< 0,3 m/s
resolution	0,05 m wind run
Distance constant	< 3 m (acc. to ASTM D 5096 – 96)





Inclined flow	Measuring value deviation Δv compared with stationary horizontal flow: Δv < 1 % conditions:	
	Wind speed Horizontal Turbulence intensity Turbulence structure (rough country) Average deviation from the horizontal flow with standard spread of the inclined flow angle	v = 8 m/s t ≤ 20% r ≤ 0.8 σ ≤ 2
Turbulent flow	Deviation Δv turbulent compared with stationary horizontal flow -0,5% < Δv < +2% Frequency < 2 Hz	
Heating	Surface temperature of housing neck > 0 °C at 20 m/s up to –10 °C air temperature, at 10 m/s to –20 °C using the Thies icing standard 012002 on the housing neck heating regulated by temperature sensor on constantly +7°C .	
Electrical supply for electronics	Voltage: 15...24 V DC (galvanic isolation from housing) current: 15 mA typisch @ voltage output and without external load current: 15 mA + output current typical @ current output Ripple immunity: max. 25% rms ≈ 20 V_{pp} @ 24 V	
Electrical supply for heating	current: 24 V AC/DC (galvanic isolation from housing) Idling voltage: max. 30 V AC, max. 42 V DC Power: 25 W	
Connection	8-pole plug-connection for shielded cable in the shaft (see connecting diagram below)	
Mounting	Mounting on mast R 1“, for ex. DIN 2441 1½ “ with separate adaptor (option)	
Wind load at 75 m/s	ca. 100 N	
Dimensions	See dimension diagram	
Weight	ca. 0,5 kg	
Protection	IP 55 (DIN 40050)	
EMC	EN 61000-6-2:2002 (immunity) EN 61000-6-3:2002 (interfering transmission)	

10 Dimensional Drawing



11 Accessories

The following accessories are available for the wind direction transmitter:

Traverse 0,6 m For mounting the wind speed and wind direction transmitter jointly onto a mast	4.3174.00.000	Horizontal sensor distance: 0,6 m Vertical sensor distance: 0,2 m Mast receptacle: 48 - 50 mm Material: Aluminum, anodised Dimensions: tube Ø 34x4mm, 668 mm long, 756 mm high

Hanger –FIRST CLASS- 1m For the lateral mounting of a wind speed and wind direction transmitter onto a mast tube..	4.3184.01.000	Sensor distance to mast: 1 m Mast clamp: 40 – 80 mm Tube diameter: 34 mm Material: Aluminum

Lightning rod For mounting the a/m traverse or hanger.	4.3100.98.000	Dimension: Ø 12 mm, 500 mm long, 1050 mm high Material: Aluminum

Please contact us for other accessories such as cables, power supply units, masts, as well as for additional mast- or system-constructions.

Example: Wind transmitter with traverse and lightning rod.

12 EC-Declaration of Conformity

Document-No.: **001574** Month: 06 Year: 08

Manufacturer: **A D O L F T H I E S G m b H & C o. K G**

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Description of Product: **Windsensor FIRST CLASS**

Article No.

4.3350.00.000	**4.3350.10.000**	
4.3350.00.140	**4.3350.00.141**	**4.3350.00.161**
4.3350.10.140	**4.3350.10.141**	**4.3350.10.161**

specified technical data in the document: **021309/07/06; 021435/01/07**

The indicated products correspond to the essential requirement of the following European Directives and Regulations:

2004/108/EC DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

2006/95/EC DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

552/2004/EC Regulation (EC) No 552/2004 of the European Parliament and the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation)

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

Reference number	Specification
IEC 61000-6-2: 2005	Electromagnetic compatibility Immunity for industrial environment
IEC 61000-6-3: 2006	Electromagnetic compatibility Emission standard for residential, commercial and light industrial environments
IEC 61010-1: 2001	Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements

Place: Göttingen Date: 25.06.2008

Legally binding signature: issuer:

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Wolfgang Behrens, General Manager

.....
Joachim Beinhorn, Development Manager

This declaration certificates the compliance with the mentioned directives, however does not include any warranty of characteristics.
Please pay attention to the security advises of the provided instructions for use.

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