

## Instruction for Use

021668/09/12

### ***Wind Direction Transmitter - compact***

- TMR, 10 bit serial-synchronous output -

**4.3129.60.001 / 701**

**4.3129.70.001 / 701**



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## Safety Instructions

- Before operating with or at the device/product, read through the operating instructions. This manual contains instructions which should be followed on mounting, start-up, and operation. A non-observance might cause:
  - failure of important functions
  - Endangering of persons by electrical or mechanic effect
  - Damages at objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or **Adolf Thies GmbH & Co. KG**. Only components and spare parts supplied and/or recommended by **Adolf Thies GmbH & Co. KG** should be used for repairs.
- Electrical devices/products must be mounted and wired only in voltage-free state.
- **Adolf Thies GmbH & Co KG** guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
- All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
- The device / product is designed for a specific application as described in these operating instructions.
- The device / product should be operated with the accessories and consumables supplied and/or recommended by **Adolf Thies GmbH & Co KG** .
- Recommendation: As it is possible that each measuring system / device / product under certain conditions, and in rare cases, may also output erroneous measuring values, it is recommended to use redundant systems with plausibility checks with **security-relevant applications**.

## Environment

- As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "*ElektroG*" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.
- Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, arrange for recycling as the packaging materials are designed to be recycled.



## Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although this operating instruction has been drawn up with due care, **Adolf Thies GmbH & Co KG** can accept no liability whatsoever for any technical and typographical errors or omissions in this document that might remain.
- We can accept no liability whatsoever for any losses arising from the information contained in this document.
- Subject to modification in terms of content.
- The device / product should not be passed on without the/these operating instructions.

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# 1 Models available

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Order-No.	Meas. range	Elektrischer Ausgang	Heating	Connection
4.3129.60.001	0...360°	10 Bit serial synchronous	20W / 24V	12 m Cable LiYCY 6 x 0,25mm <sup>2</sup> , UV- resistant
4.3129.60.701	0...360°	10 Bit serial synchronous	20W / 24V	7 pole plug
4.3129.70.001	0...360°	10 Bit serial synchronous	without	12 m Cable LiYCY 6 x 0,25mm <sup>2</sup> , UV- resistant
4.3129.70.701	0...360°	10 Bit serial synchronous	without	7 pole plug

Included in delivery:

Wind Direction Transmitter

Mating plug for model 4.3129.xx.701

## 2 Application

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The wind direction transmitter is designed for the acquisition of the horizontal wind direction. The measuring values are output as electrical digital signals, for ex. for processing or storing.

An electronically-regulated heating system has been installed optionally for wintertime use, in order to prevent a blocking of the gap between the external rotation parts by ice aggregation.

## 3 Construction and Mode of Operation

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The outer parts of the instrument are made of corrosion-resistant material (aluminum, stainless steel, plastic). The aluminum parts are additionally protected by means of an anodic coat. Labyrinth sealing protects sensitive parts inside the instrument against humidity.

The wind direction is detected by a low-inertia wind vane. The axis of the wind vane is running in ball bearings and carries a diametrically magnetized magnet at the inner end. The angle position of the axis is scanned contact-free by a magnetic angle sensor, (TMR-Sensor = Tunnel Magneto Resistance) which gives two sinus- and cosines-dependent voltages as output signals.

A connected micro-controller calculates from this voltages the wind direction in 1024 sectors (0.35° / sector). Related to sector 1 is the wind direction **0°–0.35°**, sector 1024 corresponds to the wind direction **359.65°–360°**.

The measurement output is done on request via a serial-synchronous interface. Appropriate interfaces are integrated in THIES systems such as wind display LED, wind interface and dataloggers.











### 3.1 Description: Serial-Synchronous Interface

The serial-synchronous interface is a unidirectional 3-wire-interface. When no data query is effected the wind transmitter is in the state of stand-by. On receiving the first clock signal the 10-bit measuring value of the wind direction plus status bit is recorded in a shift register, and the LSB is connected to the data output. In parallel, a new measuring procedure is starting. The simultaneous data output, and the starting of measuring procedure mean that always the last measuring value is output (see figure 2). After 16 clock pulses the wind direction code plus status bit is output (see table 2). The identification as 10 bit data word is done by the identifying bit, and the control of transmission errors is carried out by means of the parity bit. The parity bit is generated by the following bits:

bit: 0 -7, bit 8 -13 and bit 15. Parity bit = 1, when the sum of the bits 0 -7, bit 8 -13 and bit 15 is not even.

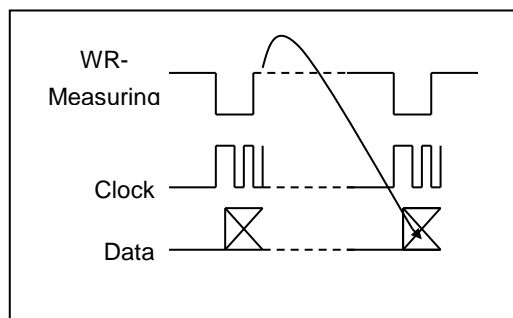


Figure 1: Wind Direction Transmission

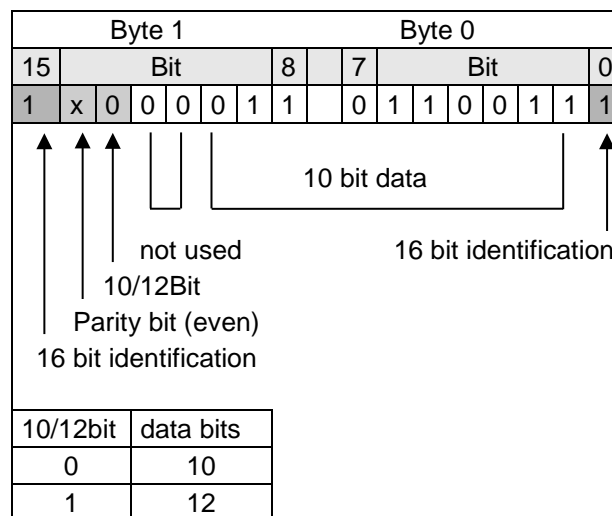
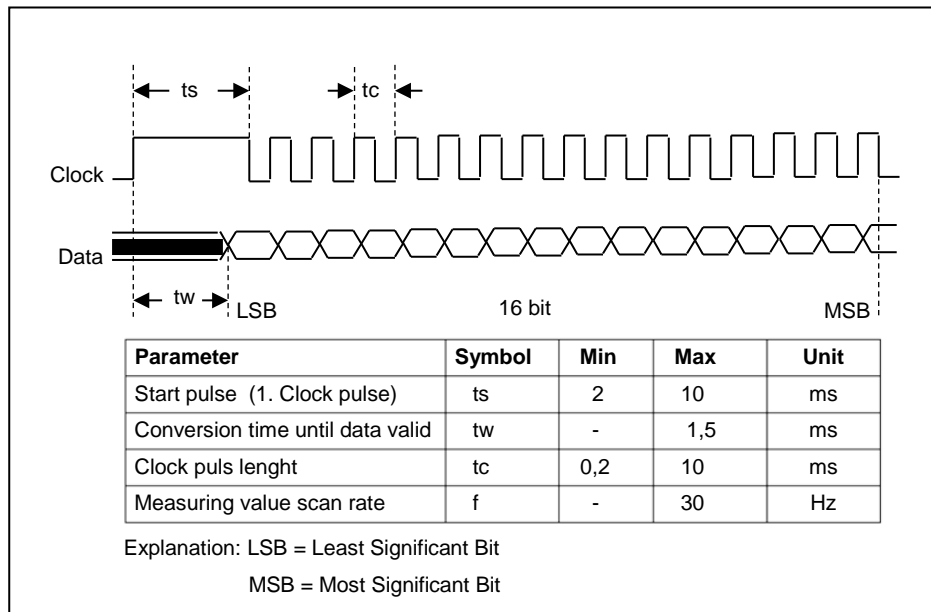


Figure 2: Protocol



**Table 2: Interface Specification „serial synchronous“**

## 4 Recommendation Side Selection/Standard Installation

In general wind measurement instruments should be able to detect the wind conditions of a large area. In order to obtain comparable values when determining the surface wind, measurements should be taken at a height of 10 meters over an even unobstructed area. An unobstructed area means that the distance between the wind transmitter and an obstacle should be at least 10 times the height of the obstacle (s. VDI 3786). If it is not possible to fulfil this condition, then the wind transmitter should be set up a height where local obstacles do not influence the measured values to any significant extent (approx. 6-10 m above the obstacle).

The wind transmitter should be set up in the centre of flat roofs and not on the roof side in order to avoid bias in the direction (privileged directions).

## 5 Installation

### **Attention:**

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

### **Remark:**

*When using fastening adapters (angle, traverses, hangers etc.) please take a possible effect by turbulences into consideration.*

## 5.1 Mechanical Mounting

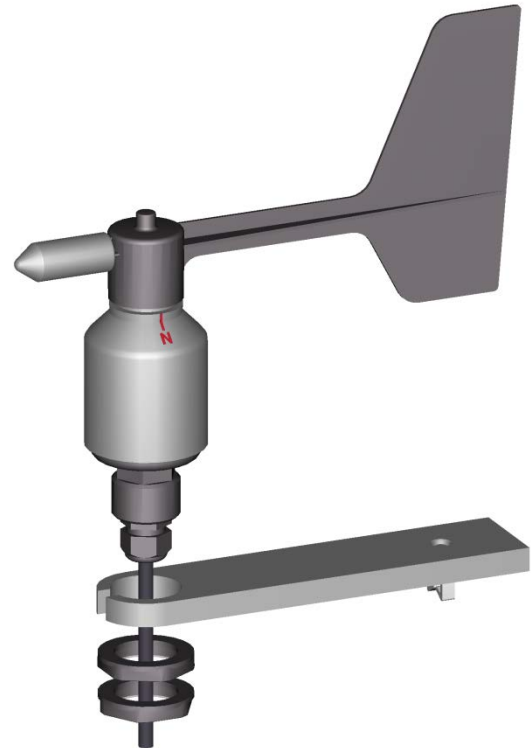
The mounting of the transmitter could be done for example at a traverse with a boring of PG 21 or on hangers with a boring of 29 mm Ø.

The cable or plug is passed through the boring, and the wind direction transmitter is fixed with hexagonal nut (SW36) after the north alignment.

The cable or the plug is passed through the boring, and the wind direction transmitter is fixed with hexagonal nut (SW36) after the north alignment (see chapter 5.2).

**Caution: The Hexagon nuts must be tightened to 6 Nm.**

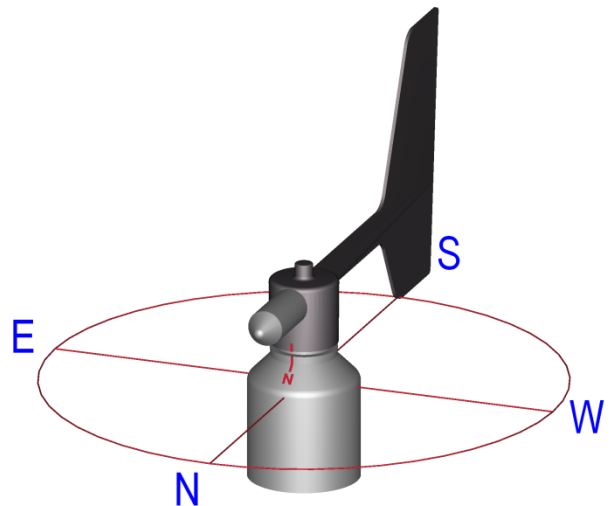
Remark:  
The traverse is not included in delivery.



## 5.2 North Alignment

Rotate the case markings (north marking) on the shaft and on the protective cap until they are aligned. Then select an obvious point in a northerly direction in the surroundings (a tree, a building etc.) with the aid of a compass. Take a bearing on this point over the wind vane and the counter weight of the wind direction transmitter, and when these coincide screw the wind transmitter into place. (the north marking must indicate to the geographic north).

**Caution: The Hexagon nuts must be tightened to 6 Nm.**



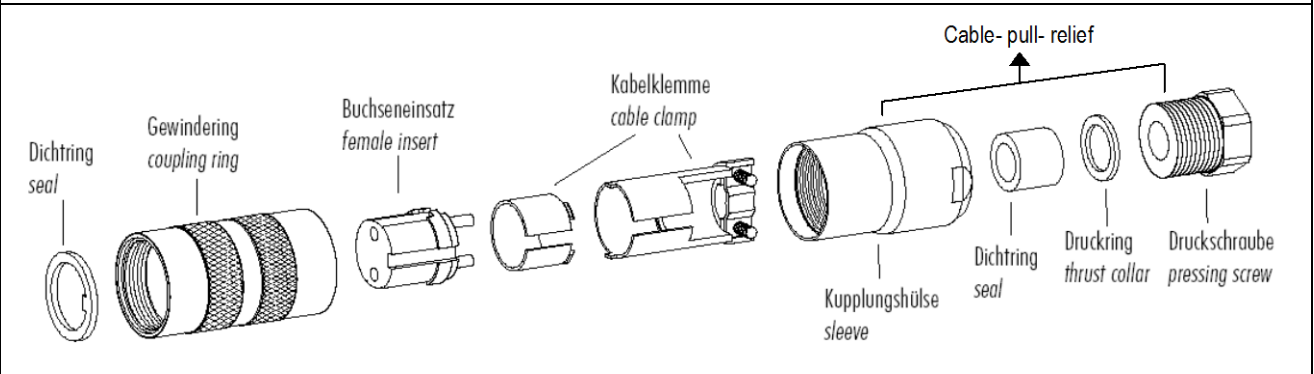
### 5.3 Electrical Mounting

For electrical connection please refer to the connecting diagram.

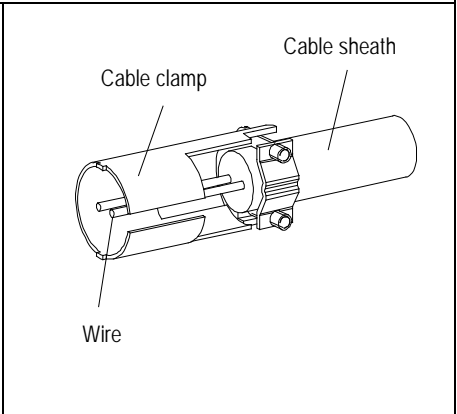
### 5.4 Plug Mounting

Applies only for instruments with connection „plug“.

Coupling socket, type: Binder, serial 423, EMC with cable clamp  
 Cable connection: without cable shield



1. Stringing parts on cable acc. to plan given above.
2. Stripping cable sheath 20 mm
3. Cutting uncovered shield 20 mm
4. Stripping wire 5mm.
5. Soldering wire to the insert
6. Positioning shield in cable clamp.
7. Screwing-on cable clamp.
8. Assembling remaining parts acc. to upper plan.
9. Tightening pull-relief of cable by screw-wrench (SW16 und 17).



## 6 Connecting Diagrams

<p>Order-No. 4.3129.60.001</p>	<p>PG / Kabel / Cable</p> <p>1 2 3 4 5 6</p> <p>Vers. / Power 3.3...30V DC / 24V AC Masse / Ground Data Clock Versorgung / Power Heizung / Heating 24 V AC / DC</p> <p>Windrichtung Wind Direction</p> <p>Schirm Shield Erde / Earth</p>	<p>Cable colour coding</p> <p>1 white 2 brown 3 green 4 yellow 5 grey 6 pink</p>
<p>4.3129.70.001</p>	<p>-Without Heating, PIN 5 and 6 are not used.</p>	
<p>Order-No. 4.3129.60.701</p>	<p>Stecker / Plug</p> <p>1 2 3 4 5 6</p> <p>Vers. / Power 3.3...30V DC / 24V AC Masse / Ground Data Clock Versorgung / Power Heizung / Heating 24 V AC / DC</p> <p>Windrichtung Wind Direction</p> <p>Schirm Shield Erde / Earth</p>	<p>View on the soldered joint of the counter plug</p>
<p>4.3129.70.701</p>	<p>-Without Heating, PIN 5 and 6 are not used.</p>	

## 7 Maintenance

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After proper mounting the instrument works maintenance free. Heavy pollution can clog up the slit between the rotating and the stationary parts of the wind transmitter. This slit must be kept clean.

### **Cleaning**

For cleaning the instrument please use a damp cloth without chemical cleaning agents.

## 8 Technical Data

Characteristic	Description /Value
Meas. range	0...360°
Resolution	0.35°
Accuracy	± 1,5°
Starting Threshold	< 0,4 m/s acc. to VDI- Directive 3786 Part 2 < 1,0 m/s acc. to ASTM- Standards D 5366-96
Delay Distance	< 2,5 m acc. to ASTM- Standards D 5366-96
Damping ratio	> 0,3 acc. to ASTM- Standards D 5366-96
Meas. principle	magnetic
Output	10 bit serial-synchronous
Output data (amplitude)	$U_{pp} = V_{cc}$
Input clock (amplitude)	3.3V...Vcc (max)
Electr. Output	
Output signal loadable (max.)	$U_{Low} = 0 / U_{Height} \approx U_B$ (unloaded) 10 mA
Serial Interface	see Interface specification
Starting delay:	The serial data output is transmitted on request at the earliest 5 s after the operating voltage has been connected.
Operating voltage (Vcc)	3.3...30V DC/24VAC
Current consumption	<1.0mA (at $U_B = 5$ V)
Operating voltage heating	
4.3129.60.x01	24V DC/AC, max. 20W
4.3129.70.x01	-----
Ambient temperature	- 40 °C...+ 70 °C
Survival speed	maximally 80 m/s, 30 minutes
Connection	See model (chapter 1)
dimensions	See dimensional drawing
Mounting	For ex. onto mast tube receptacle thread PG 21 or boring $\varnothing$ 29 mm
Protection	IP 55, in position of application
Weight	
4.3129.x0.701	0.4 kg
4.3129.x0.001	1.1 kg
Material	
Housing	Aluminium (AlMgSi1)
Vane	Synthetic with fibre glass (PC-GF10)
Bottom	Synthetic (POM H2320)

## 9 Dimensional Drawing

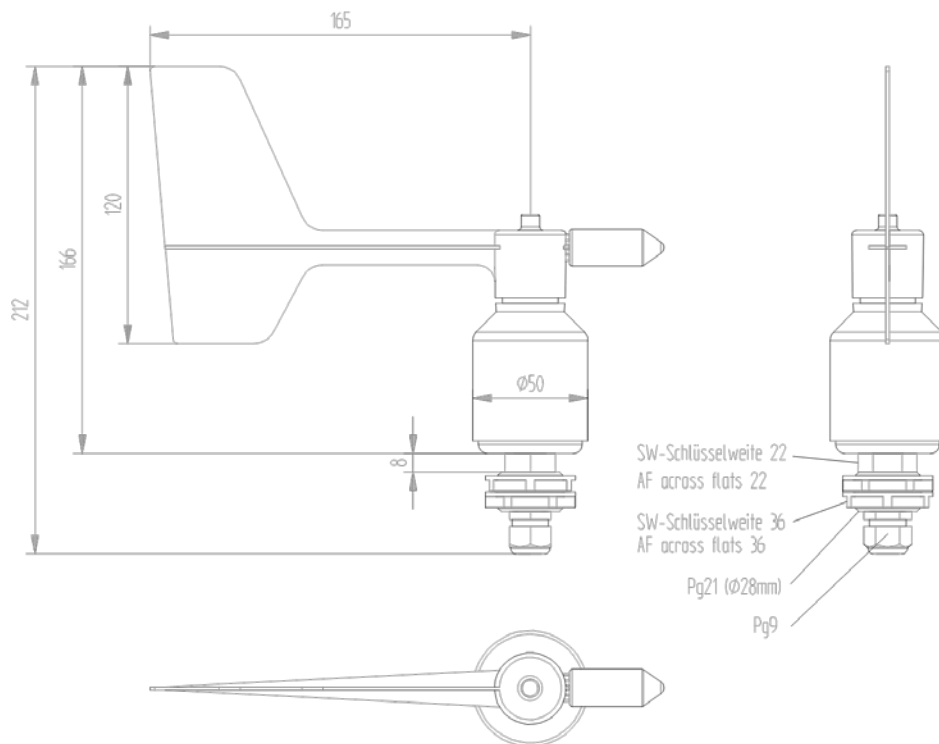


Figure 3: Drawing for design with cable glant

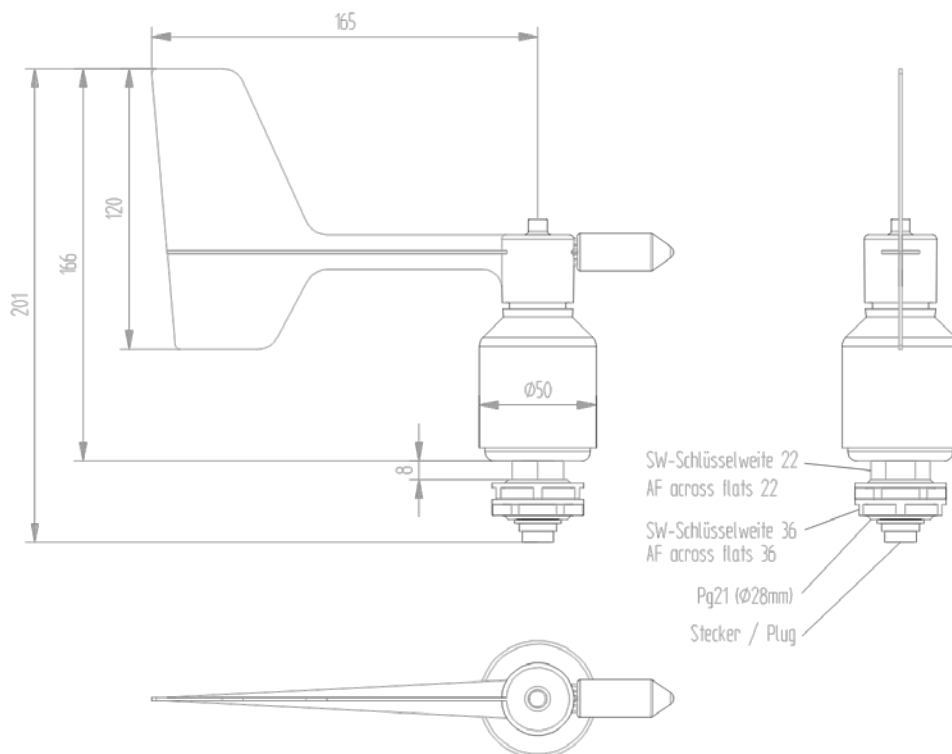


Figure 4: Drawing for design with plug



## 10 Accessories

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The following accessories are available for the wind direction transmitter:

Traverse For mounting the wind speed transmitter and wind direction transmitter <i>compact</i> jointly onto a mast.	4.3171.30.000 4.3171.31.000	Clamping range: Ø 48 ... 102 mm Clamping range: Ø 116 ... 200 mm Sensor distance: 0,8 m Material: Aluminum
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Traverse, short For mounting the wind direction transmitter <i>compact</i> onto a mast.	4.3171.40.000 4.3171.41.000	Clamping range: Ø 48 ... 102 mm Clamping range: Ø 116 ... 200 mm Length: 0,4 m Material: Aluminum
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Lightning rod For mounting the a.m. traverses	506351	Length: 0,56 m Material: stainless steel
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Please contact us for other accessories such as cables, power supply units, masts, as well as for additional mast- or system-constructions.

# 11 EC-Declaration of Conformity

Document-No.: 001224

Month: 02 Year: 17

Manufacturer: **ADOLF THIES GmbH & Co. KG**

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This declaration of conformity is issued under the sole responsibility of the manufacturer

Description of Product: **Wind Direction Transmitter – compact digital**

Article No.	<b>4.3128.00.000</b>	<b>4.3128.00.120</b>	<b>4.3128.01.000</b>	<b>4.3128.03.000</b>
<b>4.3128.10.000</b>	<b>4.3128.10.110</b>	<b>4.3128.10.120</b>	<b>4.3129.00.000</b>	<b>4.3129.00.150</b>
<b>4.3129.00.300</b>	<b>4.3129.00.500</b>	<b>4.3129.00.700</b>	<b>4.3129.03.000</b>	<b>4.3129.10.110</b>
<b>4.3129.60.000</b>	<b>4.3129.60.001</b>	<b>4.3129.60.150</b>	<b>4.3129.60.700</b>	<b>4.3129.70.001</b>
<b>4.3129.60.701</b>	<b>4.3129.70.701</b>	<b>4.3129.80.000</b>		

specified technical data in the document: **021092/02/07; 021191/02/07; 021226/11/05; 021481/05/09; 021504/07/06; 021667/09/12**

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

- 2014/30/EU DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
- 2014/35/EU DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of 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)
- 2011/65/EU DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- 2012/19/EU DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)

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

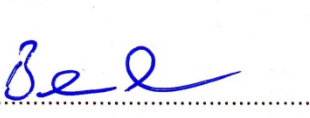
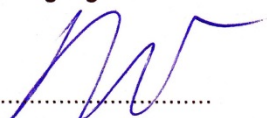
- EN 61000-6-2 Electromagnetic compatibility  
Immunity for industrial environment
- EN 61000-6-3 Electromagnetic compatibility  
Emission standard for residential, commercial and light industrial environments
- EN 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use.  
Part 1: General requirements
- EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Place: Göttingen  
Signed for and on behalf of:

Date: 13.02.2017

Legally binding signature:

issuer:



Thomas Stadie, General Manager

Joachim Beinhorn, Development Manager

This declaration certifies 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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