

Instruction for Use

021074/03/14

Wind Direction Transmitter - compact

- with analogue output -

4.3129.xx.xxx



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
 - endangerment of persons by electrical or mechanical effect
 - damage to 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 a 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 may, under certain conditions, and in rare cases, may also output erroneous measuring values, it is recommended using redundant systems with plausibility checks for **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, please arrange for recycling as the packaging materials are designed to be recycled.



Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although these 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

Order - No.	Meas. range	Electr. Output	Heating	Operating Voltage	Connection
4.3129.00.140 4.3129.00.840*	0...360°	0...20 mA	20 W	15...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.00.141	0...360°	4...20 mA	20 W	15...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.00.161	0...360°	0...10 V	20 W	15...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.00.167	0...360°	0...2 V	20 W	8...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.00.173	0...360°	0...5 V	20 W	8...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm
4.3129.00.740	0...360°	0...20 mA	20 W	15...30 V DC or 24 V AC	7 pole plug
4.3129.00.741	0...360°	4...20 mA	20 W	15...30 V DC or 24 V AC	7 pole plug
4.3129.00.761	0...360°	0...10 V	20 W	15...30 V DC or 24 V AC	7 pole plug
4.3129.00.767	0...360°	0...2 V	20 W	8...30 V DC or 24 V AC	7 pole plug
4.3129.00.773	0...360°	0...5 V	20 W	8...30 V DC or 24 V AC	7 pole plug
4.3129.00.940	0...360°	0...20 mA	20 W	15...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.00.941	0...360°	4...20 mA	20 W	15...30 V DC or 24 V AC	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.02.141	0...360°	4...20 mA	10 W	15...30 V DC or 24 V AC	2 m cable 6 x 0,56 mm ²
4.3129.04.767	0...360°	0...2 V	20 W	8...30 V DC or 24 V AC	7 pole plug
4.3129.05.140	0...360°	0...20 mA	20 W	15...30 V DC or 24 V AC	15 m cable LiYCY 6 x 0,25 mm
4.3129.05.141	0...360°	4...20 mA	20 W	15...30 V DC or 24 V AC	15 m cable LiYCY 6 x 0,25 mm ²
4.3129.05.161	0...360°	0...10 V	20 W	15...30 V DC or 24 V AC	15 m cable LiYCY 6 x 0,25 mm ²
4.3129.39.141	0...360°	4...20 mA	20 W	15...30 V DC or 24 V AC	15 m cable LiYCY 6 x 0,25 mm ² with cable lug at the shield

* Counter nut inverse-mounted, see figure 5.

2 Application

The wind direction transmitter is designed for the acquisition of the horizontal wind direction. The measuring values are output as electrical analogue signals. The measuring data available are ideally adapted to the supply in display instruments, recording instruments, datalogger, as well as process control systems.

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

Power for the heating system could be provided for instance by our Power Supply Unit, Order No. 9.3388.00.000.

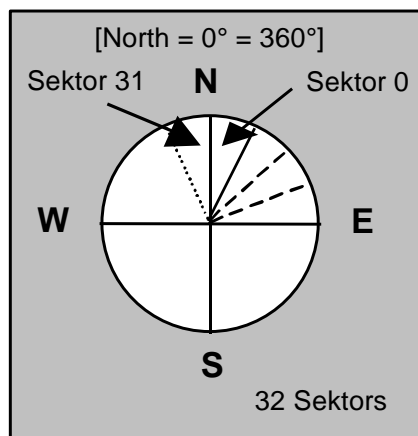
3 Construction and Mode of Operation

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 means of a low-inertia wind vane, the ball bearing axis of which is connected to a code disc. This code disc is coded with a 5-Bit Gray-code which is scanned opto-electronically. The 5-Bit Code is converted to an analog signal via an integrated D/A-converter.

The code disc resolves the wind direction into 32 sectors (11,25°/ sector). The analogue output signal is proportional to the 32 sectors (see chapter 9, table 1).

The sectors start at wind direction N (North) with sector 0, and end with sector n (see drawing).



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.

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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 \varnothing .

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:

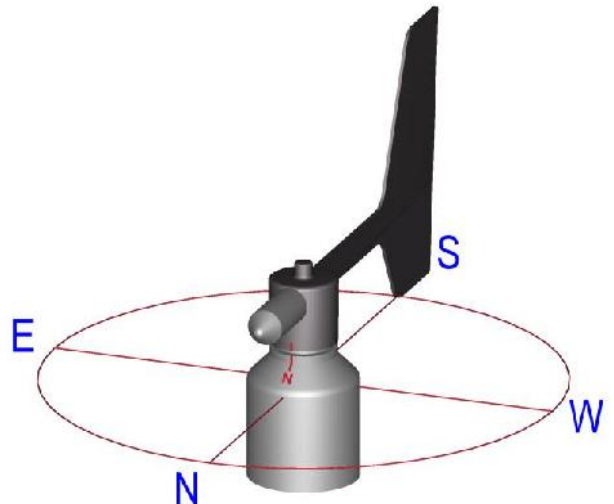
The traverse is not included in delivery.



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.*



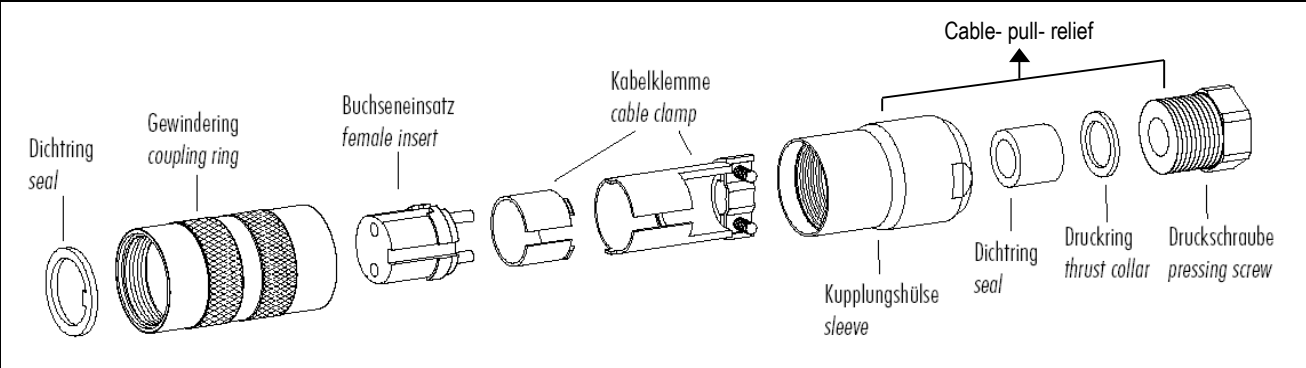
5.3 Electrical Mounting

For electrical connection please refer to the connecting diagram.

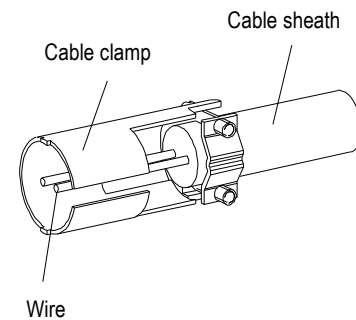
5.4 Plug Mounting

Coupling socket, Typ: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).



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6 Connecting Diagrams

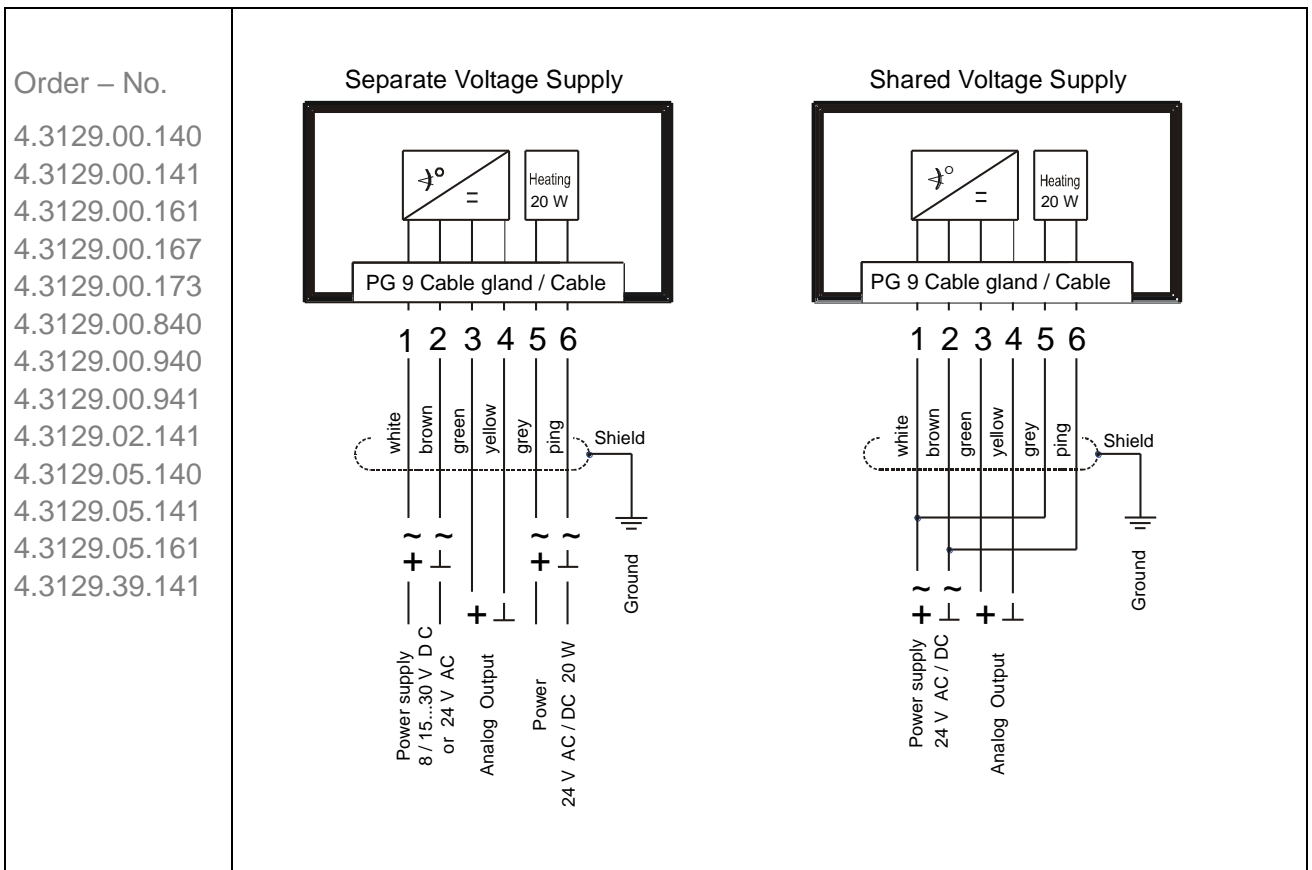


Figure 1: Connecting diagram for models with cable

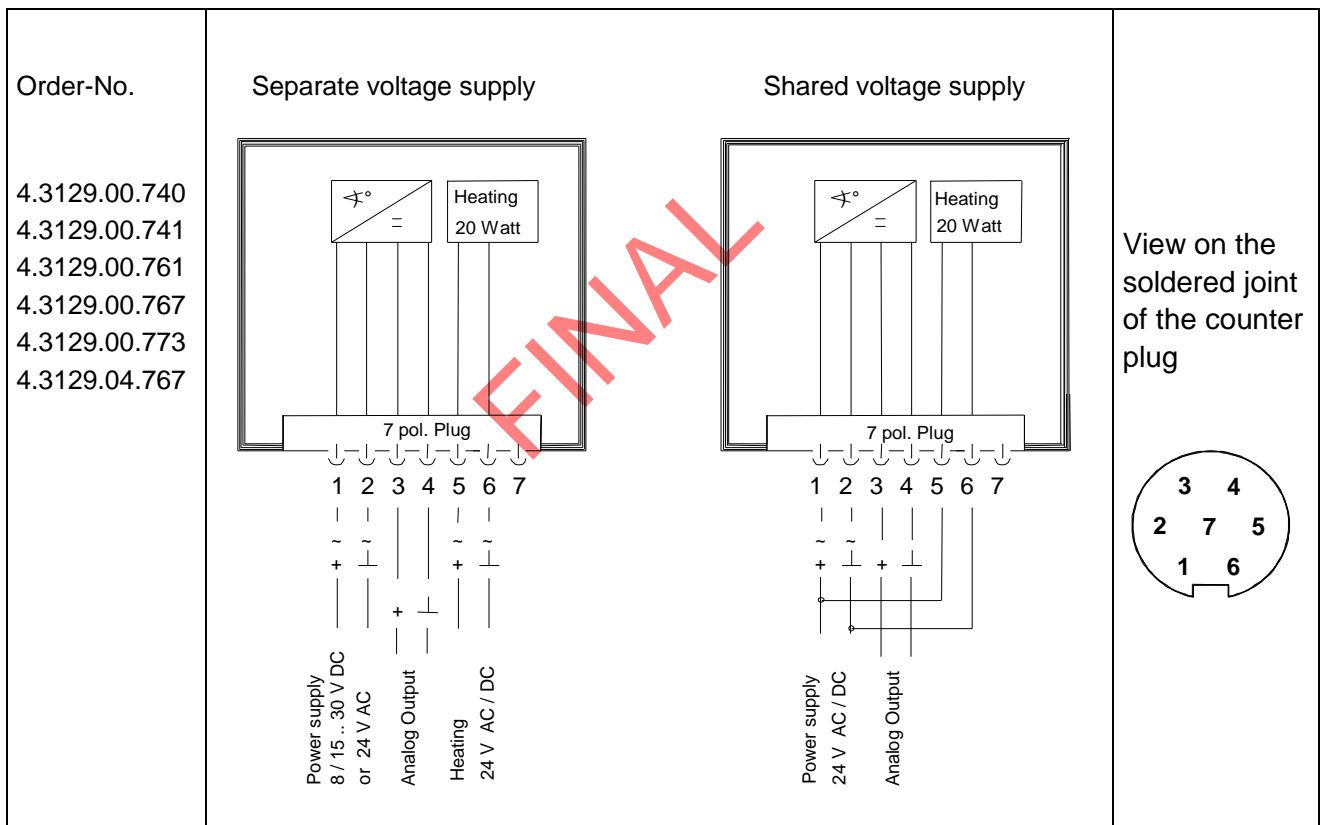


Figure 2: Connecting diagram for models with plug

7 Maintenance

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

Meas. range	0...360°
Resolution	11,25° ; 5 Bit Gray-code (32 sectors)
Accuracy	± 5°
Starting Threshold	≤ 0.4m/s acc. to VDI Directive 3786 Part 2 ≤ 1m/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
Measuring principle	opto-electronic
Electrical output	mA ; V (see table 1)
Load	
Current output (mA)	max. 500 Ohm (for > 15 V DC operating voltage)
Voltage output (V)	min. 1 K Ohm
Operating voltage	see models available, chapter 1
Operating voltage heating	24 V DC/AC, max. 20 W (10 W*)
Ambient temperature	-40°C...70°C
Survival speed	maximally 80 m/s, 30 minutes
Connection	See models available
Dimensions	see dimensional diagram
Montage	For ex. onto a mast tube with receptacle thread PG 21 or boring Ø 29 mm
Protection	IP 55
Weight	ca. 0,60 – 1,20 kg depending on model
Material	
Housing	Aluminium (AlMgSi1)
Vane	Synthetic with fibre glass (PC-GF10)
Bottom	Synthetic (POM H2320)

* The ambient temperature, stated with wind direction transmitters with 10 W heating, is possible only in ice-free condition.

The electrical output is carried out on the basis of the code-disc resolution (5 bit) in 32 increments.

		4.3129.0x.140 940	4.3129.xx.141 741 941	4.3129.0x.167 767	4.3129.0x.173 773	4.3129.0x.161 761
Incr.	[Angle degr.]	0 .. 20 [mA]	4 20 [mA]	0 ..2 [V]	0 .. 5 [V]	0 ..10 [V]
0	00,00 – 11,25	0,000	4,0	0,000	0,00	0,00
1	11,25 – 22,50	0,625	4,5	0,0625	0,156	0,313
2	22,50 – 33,75	1,250	5,0	0,1250	0,312	0,626
3	33,70 – 45,00	1,880	5,5	0,1880	0,468	0,939
4	45,00 - 56,25	2,500	6,0	0,2500	0,624	1,252
5	56,25 - 67,50	3,125	6,5	0,3125	0,780	1,565
6	67,50 - 78,75	3,750	7,0	0,3750	0,936	1,878
7	78,75 – 90,00	4,375	7,5	0,4375	1,092	2,191
8	90,00 - 101,25	5,000	8,0	0,5000	1,248	2,504
9	101,25 - 112,50	5,625	8,5	0,5625	1,404	2,817
10	112,50 - 123,75	6,250	9,0	0,6250	1,560	3,130
11	123,75 – 135,00	6,875	9,5	0,6875	1,716	3,443
12	135,00 - 146,25	7,500	10,0	0,7500	1,872	3,756
13	146,25 - 157,50	8,125	10,5	0,8125	2,028	4,069
14	157,50 - 168,75	8,750	11,0	0,8750	2,184	4,382
15	168,75 – 180,00	9,375	11,5	0,9375	2,340	4,695
16	180,00 - 191,25	10,000	12,0	1,0000	2,496	5,008
17	191,25 - 202,50	10,625	12,5	1,0625	2,652	5,321
18	202,50 - 213,75	11,250	13,0	1,1250	2,808	5,634
19	213,75 - 225,00	11,875	13,5	1,1875	2,964	5,947
20	225,00 - 236,25	12,500	14,0	1,2500	3,120	6,260
21	236,25 - 247,50	13,125	14,5	1,3125	3,276	6,573
22	247,50 - 258,75	13,750	15,0	1,3750	3,432	6,886
23	258,75 – 270,00	14,375	15,5	1,4375	3,588	7,199
24	270,00 - 281,25	15,000	16,0	1,5000	3,744	7,512
25	281,25 - 292,50	15,625	16,5	1,5625	3,900	7,825
26	292,50 - 303,75	16,250	17,0	1,6250	4,056	8,138
27	303,75 – 315,00	16,875	17,5	1,6875	4,212	8,451
28	315,00 - 326,25	17,500	18,0	1,7500	4,368	8,764
29	326,25 - 337,50	18,125	18,5	1,8125	4,524	9,077
30	337,50 - 348,75	18,750	19,0	1,8750	4,680	9,390
31	348,75 – 00,00	19,375	19,5	1,9375	4,836	9,703

Table 1: Electrical Output

9 Dimensional Drawing

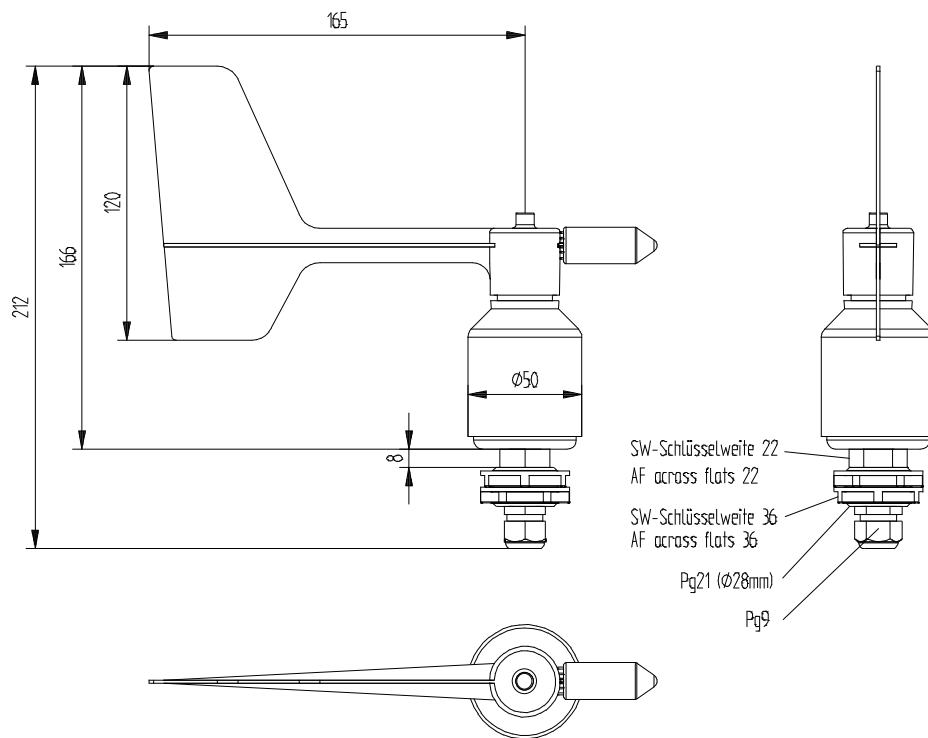


Figure 3: Dimensional drawing with cable

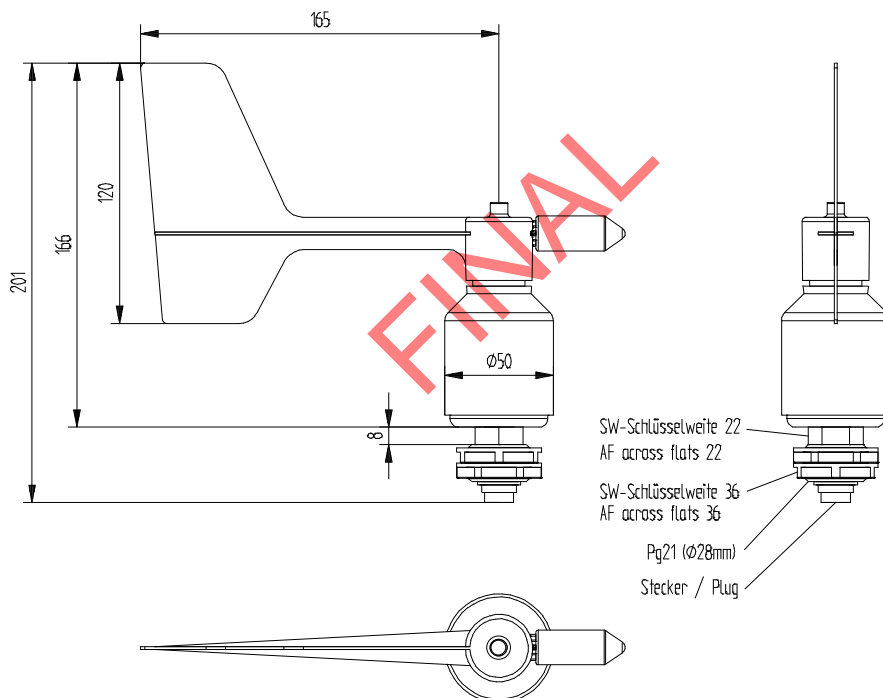


Figure 4: Dimensional drawing with plug

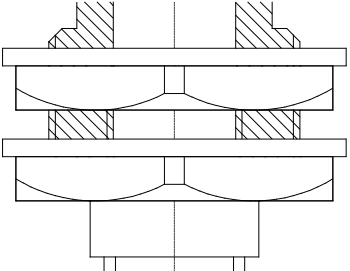
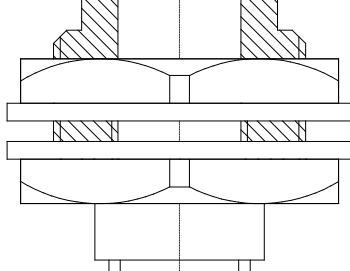
	4.3129.xx.xxx	4.3129.00.840
Assembly condition of the counter nut ex works		

Figure 5: counter nut

10 Accessories

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
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
Lightning rod For mounting the a.m. traverses	506351	Length: 0,56 m Material: stainless steel

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.: 001223

Month: 03 Year: 14

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

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Fax: (0551) 79001-65
email: Info@ThiesClima.com

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

Article No.	4.3129.00.140	4.3129.00.141	4.3129.00.161	4.3129.00.167
4.3129.00.173	4.3129.00.740	4.3129.00.741	4.3129.00.761	4.3129.00.767
4.3129.00.773	4.3129.00.940	4.3129.00.941	4.3129.00.840	4.3129.02.141
4.3129.03.141	4.3129.04.767	4.3129.05.140	4.3129.05.141	4.3129.05.161
4.3129.09.141	4.3129.39.141	4.3129.53.141	4.3129.54.141	4.3129.60.140
4.3129.60.141	4.3129.60.161	4.3129.60.167	4.3129.60.173	4.3129.60.740
4.3129.60.741	4.3129.60.761	4.3129.60.767	4.3129.60.773	4.3129.65.141
4.3129.65.161	4.3129.70.773	4.3129.80.140	4.3129.80.141	4.3129.80.161
4.3129.80.167	4.3129.80.173	4.3129.80.740	4.3129.80.741	4.3129.80.761
4.3129.80.767	4.3129.80.773	4.3129.90.741		

specified technical data in the document: 021071/03/04; 021189/08/10; 021453/06/05;
021487/12/13; 021732/07/13

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: 2010	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements

Place: Göttingen

Date: 14.03.2014

Legally binding signature:

issuer:

.....
Wolfgang Behrens, 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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