

Instruction for Use

021482/05/09

Wind Direction Transmitter - compact

- GMR, serial-synchron output -

4.3129.60.xx0

4.3129.80.000



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Contents

1	Models available	3
2	Application	3
3	Construction and Mode of Operation	4
3.1	Description: Serial-Synchronous Interface	5
4	Recommendation Side Selection / Standard Installation	6
5	Installation.....	6
5.1	Mechanical Mounting	6
5.2	Electrical Mounting	6
6	Plug Mounting	7
7	Maintenance	7
8	Connecting Diagrams	8
9	Technical Data.....	9
10	Dimensional Drawing.....	10
11	Accessories	10
12	EC-Declaration of Conformity	11

Figures

Figure 1:	Thies Code table for 8 bit serial synchronous	4
Figure 2:	Wind Direction Code	5
Figure 3:	Interface Specification „serial synchron“	5
Figure 4:	Plug mounting	7
Figure 5:	Dimensional drawing	10

1 Models available

Order-No.	Meas. range	Electrical output	Heating cap.	Connection
4.3129.60.000	0...360°	8 Bit seriell synchron	20 W	12 m cable LiYCY 6 x 0,25 mm ²
4.3129.60.150	0...360°	8 Bit seriell synchron	20 W	15 m cable LiYCY 6 x 0,25 mm ²
4.3129.60.700	0...360°	8 Bit seriell synchron	20 W	7 pole plug
4.3129.80.000	0...360°	8 Bit seriell synchron	60 W	12 m Kabel LiYCY 6 x 0,25mm ²

2 Application

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.

For winter operation the instruments are equipped with an electronically regulated heating in order to guarantee a smooth running of the ball bearings, and to avoid ice-formation at the slot of the outer rotation parts. The electrical supply of wind transmitter heating is carried out, for ex., by our power supply unit, order-no. 9.3388.00.000.

Thanks to the 60-Watt-heating as well as to the optimized regulating characteristic, model no. 4.3129.**80**.xxx is especially suited for the extremely difficult application in high mountains or at other critical sites, where icing is to be expected.

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 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, which gives two sinus- and cosines-dependent voltages as output signals.

A connected micro-controller calculates from this voltages the wind direction in 144 sectors (2.5° / sector). Related to sector 1 is the wind direction **0° – 2,5°**, sector 144 corresponds to the wind direction **357.5°- 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.

Sector	Gray-Code	Angle degree	Sector	Gray-Code	Angle degree	Sector	Gray-Code	Angle degree	Sector	Gray-Code	Angle degree	Sector	Gray-Code	Angle degree	Sector	Gray-Code	Angle degree
1	0	0,0	25	20	60,0	49	40	120,0	73	228	180,0	97	184	240,0	121	156	300,0
2	1	2,5	26	21	62,5	50	41	122,5	74	229	182,5	98	185	242,5	122	157	302,5
3	3	5,0	27	23	65,0	51	43	125,0	75	231	185,0	99	187	245,0	123	159	305,0
4	2	7,5	28	22	67,5	52	42	127,5	76	230	187,5	100	186	247,5	124	158	307,5
5	6	10,0	29	18	70,0	53	46	130,0	77	226	190,0	101	190	250,0	125	154	310,0
6	7	12,5	30	19	72,5	54	47	132,5	78	227	192,5	102	191	252,5	126	155	312,5
7	5	15,0	31	17	75,0	55	45	135,0	79	225	195,0	103	189	255,0	127	153	315,0
8	4	17,5	32	16	77,5	56	44	137,5	80	224	197,5	104	188	257,5	128	152	317,5
9	12	20,0	33	48	80,0	57	36	140,0	81	160	200,0	105	180	260,0	129	136	320,0
10	13	22,5	34	49	82,5	58	37	142,5	82	161	202,5	106	181	262,5	130	137	322,5
11	15	25,0	35	51	85,0	59	39	145,0	83	163	205,0	107	183	265,0	131	139	325,0
12	14	27,5	36	50	87,5	60	38	147,5	84	162	207,5	108	182	267,5	132	138	327,5
13	10	30,0	37	54	90,0	61	34	150,0	85	166	210,0	109	178	270,0	133	142	330,0
14	11	32,5	38	55	92,5	62	35	152,5	86	167	212,5	110	179	272,5	134	143	332,5
15	9	35,0	39	53	95,0	63	33	155,0	87	165	215,0	111	177	275,0	135	141	335,0
16	8	37,5	40	52	97,5	64	32	157,5	88	164	217,5	112	176	277,5	136	140	337,5
17	24	40,0	41	60	100,0	65	96	160,0	89	172	220,0	113	144	280,0	137	132	340,0
18	25	42,5	42	61	102,5	66	97	162,5	90	173	222,5	114	145	282,5	138	133	342,5
19	27	45,0	43	63	105,0	67	99	165,0	91	175	225,0	115	147	285,0	139	135	345,0
20	26	47,5	44	62	107,5	68	98	167,5	92	174	227,5	116	146	287,5	140	134	347,5
21	30	50,0	45	58	110,0	69	102	170,0	93	170	230,0	117	150	290,0	141	130	350,0
22	31	52,5	46	59	112,5	70	103	172,5	94	171	232,5	118	151	292,5	142	131	352,5
23	29	55,0	47	57	115,0	71	101	175,0	95	169	235,0	119	149	295,0	143	129	355,0
24	28	57,5	48	56	117,5	72	100	177,5	96	168	237,5	120	148	297,5	144	128	357,5

Figure 1: Thies Code table for 8 bit serial synchronous

3.1 Description: Serial-Synchronous Interface

The serial-synchronous interface is a unidirectional 2-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 8-bit measuring value of the wind direction is recorded in a shift register, and the LSB is connected to the data output. In parallel, a new measuring procedure is starting. After 8 clock pulses the wind direction code is output, and the transmission of the inverse wind direction code (see figure 3) is done by further 8 pulses. The inverse wind direction code can be taken as basis for the transmission error control. The simultaneous data output, and the starting of measuring procedure mean that always the last measuring value is output (see figure 2).

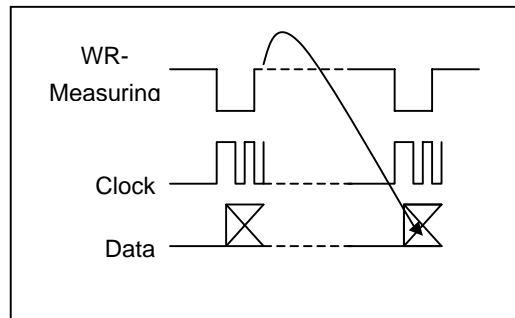


Figure 2: Wind Direction Code

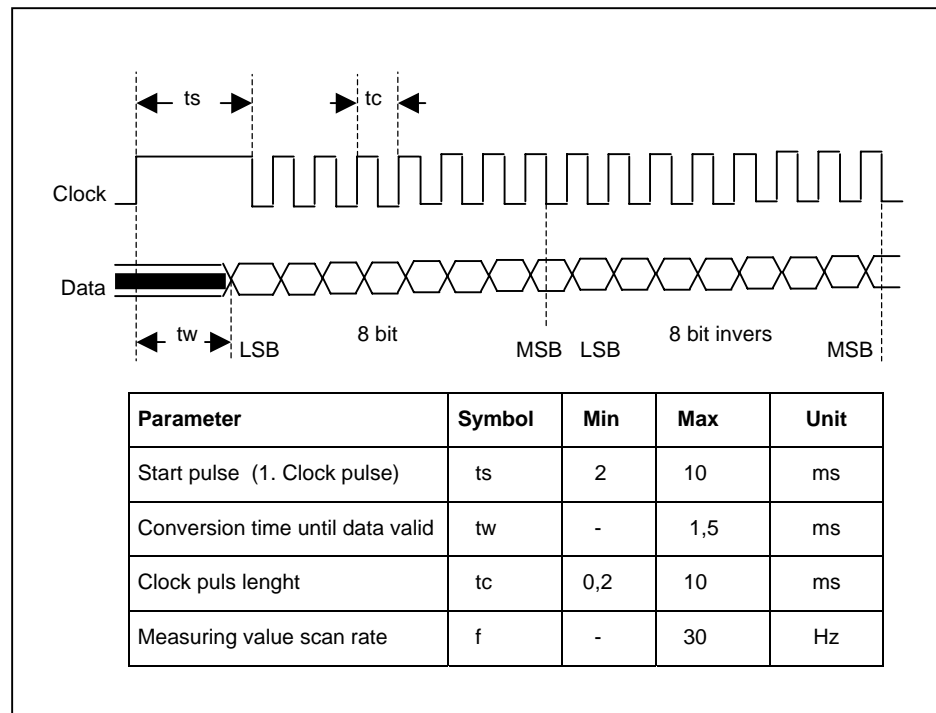


Figure 3: Interface Specification „serial synchron“

Explanation: LSB = Least Significant Bit
MSB = Most Significant Bit

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 \varnothing . (for ex. traverse *compact*, order-no. 4.3171.30.000). The connection cable or connecting plug is passed through the boring, and the wind direction transmitter is fixed with hexagonal nut (SW36) after the north alignment.

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).

5.2 Electrical Mounting

For electrical connection please refer to the connecting diagram.

6 Plug Mounting

Gilt nur für Geräte mit Anschlussart „Stecker“.

Coupling socket, Typ:Binder, Serial 423, EMC with cable clamp
Cable connection: without cable shield

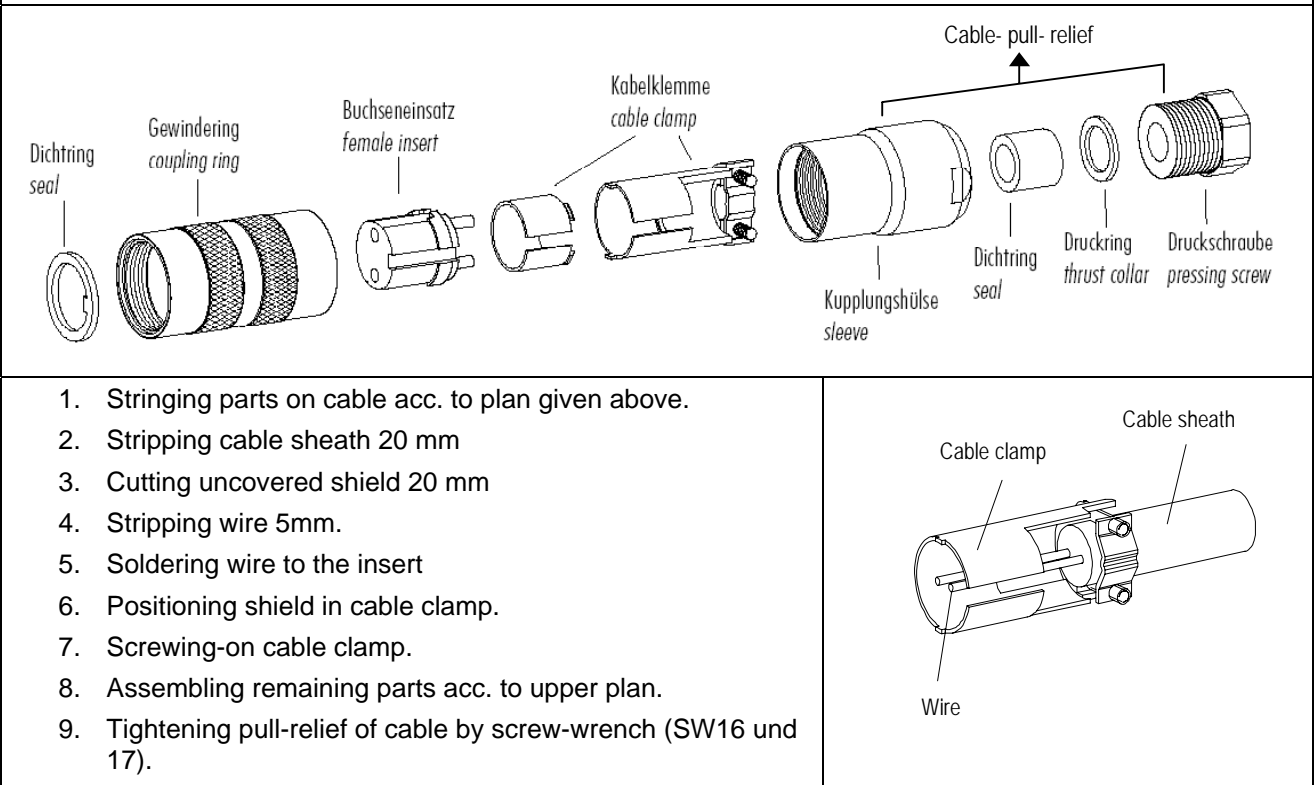
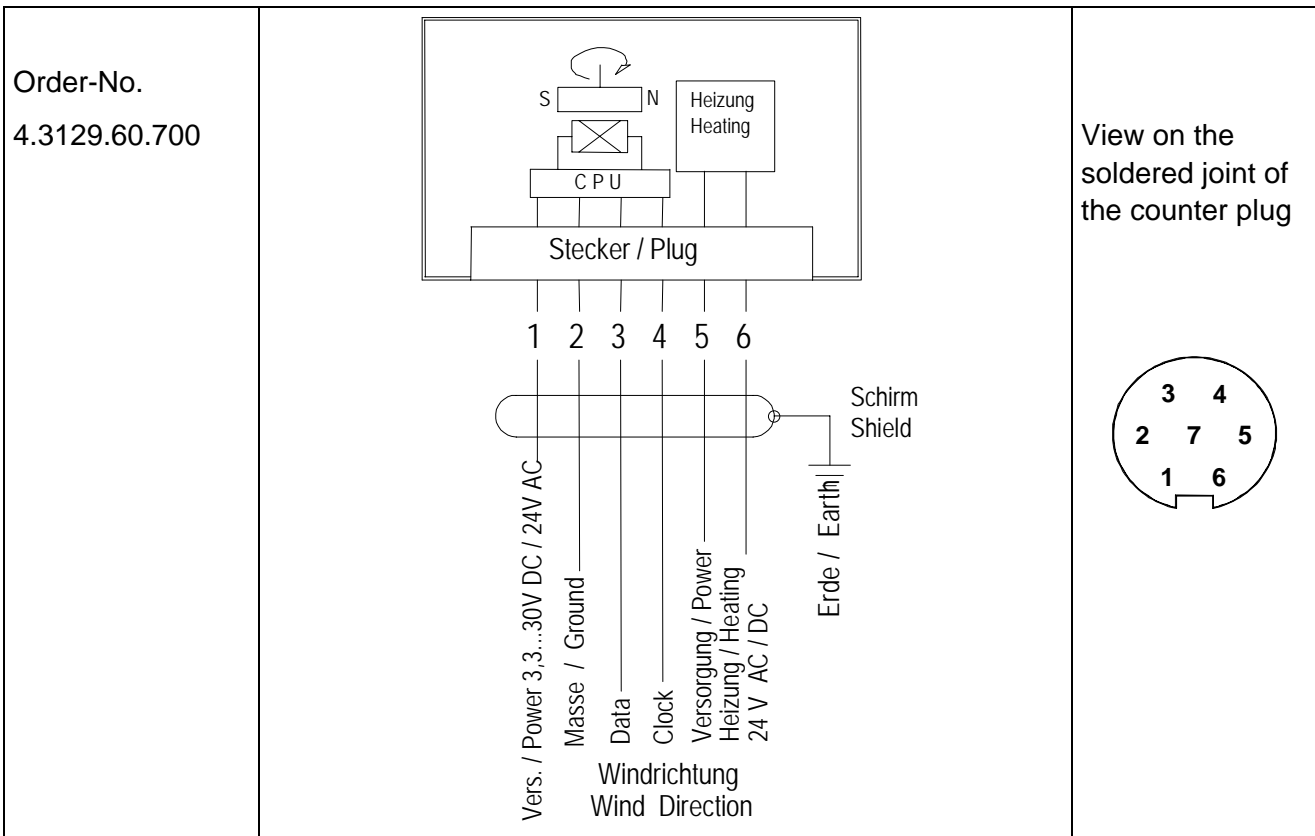
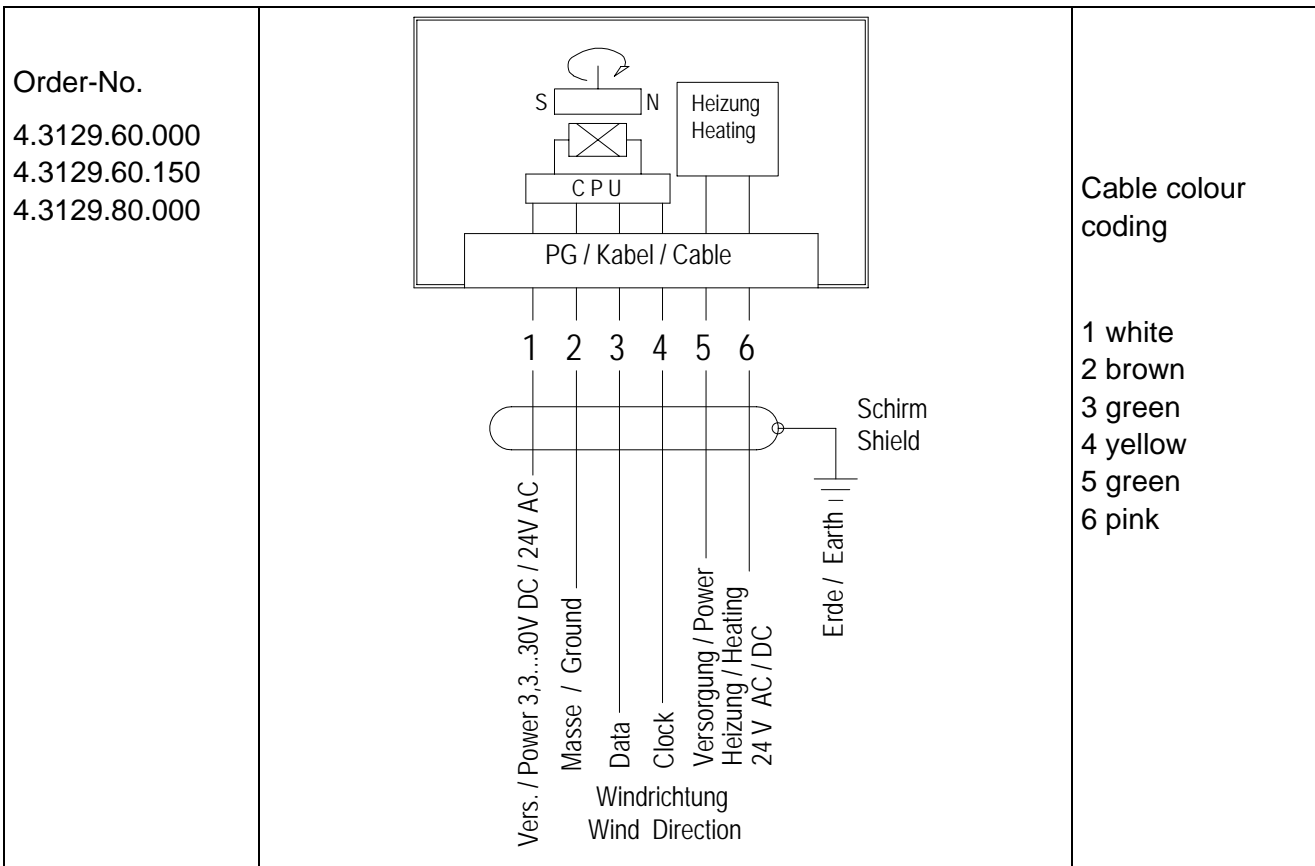


Figure 4: Plug mounting

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.

8 Connecting Diagrams



9 Technical Data

Characteristic	Description /Value
Meas. range	0 – 360°
Resolution	2,5°
Accuracy	± 2°
Meas. principle	magnetic
Output	8 bit serial-synchron
Output data (amplitude)	$U_{pp} = V_{cc}$
Input clock (amplitude)	3,3V – V_{cc} (max)
Electr. Output	
Output signal	$U_{Low} = 0 / U_{Height} \approx U_B$ (unloaded)
loadable (max.)	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.
Serial Interface	see interface specification
Operating voltage (V_{cc})	3,3 ... 30 V DC / 24VAC
Current consumption	<1,0mA (at $U_B = 5$ V)
Operating voltage heating	
4.3129.60.xxx	24 V DC/AC, max. 20 W
4.3129.80.xxx	24 V DC/AC, max. 60 W
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	
w/o cable	ca. 0,3 kg
with cable	ca. 0,3 kg + 0,075 kg / m cable
EMC	EN 61000-6-2 (immunity) EN 61000-6-3 (interfering transmission)

10 Dimensional Drawing

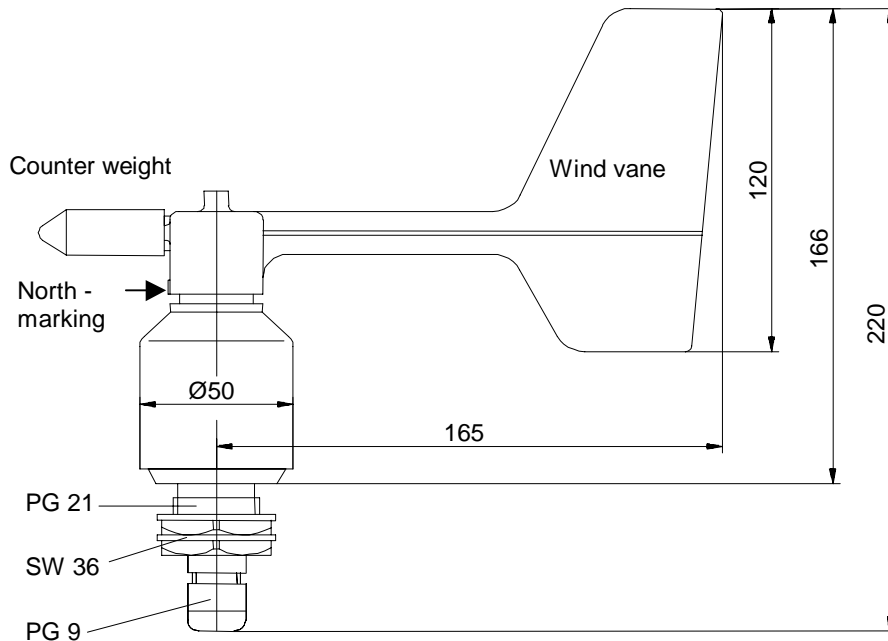


Figure 5: Dimensional drawing

11 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
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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.

12 EC-Declaration of Conformity

Document-No.: 001224

Month: 06 Year: 09

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

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

Article No.	4.3128.00.000	4.3128.00.120	4.3128.01.000	4.3128.03.000
	4.3128.10.000	4.3128.10.110	4.3128.10.120	4.3129.00.000
	4.3129.00.150	4.3129.00.300	4.3129.00.500	4.3129.00.700
	4.3129.03.000	4.3129.10.110	4.3129.60.000	4.3129.60.150
	4.3129.60.700	4.3129.80.000		

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

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: 02.06.2009

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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