

Wind Transmitter

>>First Class Advanced X<<

Short - Instruction for Use

4.3352.00.400 / 401

4.3352.10.400 / 401

- Classified according to IEC 61400-12-1 EDITION 2.0 (2017-03)

At start of software version V4.0



Dok. No. 021962/10/23

THE WORLD OF WEATHER DATA

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 instructions have 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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Patent

This device is protected by patents.

Patent no.: EP 1 398 637

Patent no.: DE 103 27 632

Patent no.: EP 1 489 427

Shipment

1 x Wind Transmitter First Class Advanced X

1 x Connection plug

1 x Short Instructions for use (the complete instructions for use is available for download)

The instructions for use are available for download under the following link:

https://www.thiesclima.com/db/dnl/4.3352.x0.400-401_Wind_Transmitter_FirstClass-Advanced-X_eng.pdf

1 Models

Order no.	Measuring range	Serial interface / Data format	Supply	Heater
4.3352.00.400	0,3 ... 75m/s	RS 485 / ASCII	3,7 ... 42V DC	24V AC/DC, 25W
4.3352.10.400	0,3 ... 75m/s	RS 485 / ASCII	3,7 ... 42V DC	without
4.3352.00.401	0,3 ... 75m/s	RS 485 / MODBUS	3,7 ... 42V DC	24V AC/DC, 25W
4.3352.10.401	0,3 ... 75m/s	RS 485 / MODBUS	3,7 ... 42V DC	without

2 Installation

Attention:

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

Note:

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

Attention:

The device may only be supplied with a power supply of the "Class 2, limited power".

2.1 Mechanical Mounting

Note:

The wiring must be prepared so far, that plug and cable have been pushed through instrument carrier, mast, traverse etc., and can be connected to the wind transmitter at the moment of the „Mechanical Mounting”, described in the following (please refer also to chapter 7.2).

The wind transmitter must be mounted on an instrument carrier, which is suited for the measurement. For dimensions of wind transmitter please refer to 15. dimension diagram.

Suitable instrument carriers are masts, tubes, traverses, arms, adapters, adapters of POM for isolated mounting, which correspond to the mounting dimensions of the wind transmitter, and to the static requirements.

The inner diameter of the instrument carrier should be $\geq 20\text{mm}$ based on plug- and cable feed-through.

If the north alignment is carried out by compass, please consider the local declination (= deviation of direction of the magnetic needle from the true north), and local magnetic interferences (e.g. hardware, electric cable).

For alignment aid and for easy changing / replacement without readjustment:

North-ring (accessory 509619):

The optional north ring part. no. 509619 can be used to mount the wind transmitter. The north ring serves as an alignment aid and for easy changing / replacement without having to re-adjustment of the north direction of wind indicators. The north ring uses the north borehole of the mast holder for this. See 15. dimension diagram.

When aligning the wind transmitter on a moving object (e.g. vehicle, wind wheel, ship etc.) please consider that the “north point” to be determined, might possibly be located on the object.

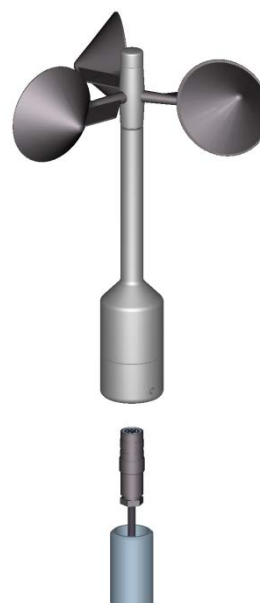
The wind transmitter must be mounted on an instrument carrier, which is suited for the measurement. For dimensions of wind transmitter please refer to chapter 15.

Tools:

Hexagon socket wrench SW3
(Allen key).

Procedure:

1. Lead a prepared cable with assembled plug through the bore hole of mast, tube, arm etc., and connect it to the wind transmitter.
2. Put wind transmitter on mast, tube, arm etc.
3. Align wind transmitter to "north".
(procedure see chapter 7.1.1)
4. Safeguard the wind transmitter by two M6-Allen head screws.



2.1.1 North Alignment

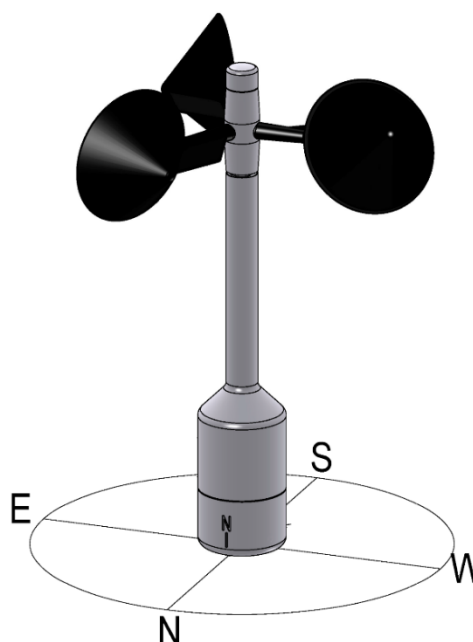
For the precise determination of the **Inclination angle** the Wind Transmitter must be aligned **northwards** (geographical north).

Tools:

Hexagon socket wrench size 3
(Allen key).

Procedure:

1. Detect a prominent object in the surrounding area (tree, building etc.) in north direction by means of a compass.
2. Via the north marking (N) and an imaginary north-south axis the Wind Transmitter is to be located on the prominent object.
3. Align Wind Transmitter.
The north marking must indicate to the geographic north.
4. In case of match the wind transmitter is to be secured by an M6- hexagon socket screw.



2.2 Electrical Mounting

2.2.1 Cable

Solder a shielded cable with diameter 7-8mm and a core cross-section of 0.5...0.75mm² to the enclosed coupling socket.

- The number of necessary wires is given in the connection diagram (chapter 7.3).

2.2.1.1 Cable Recommendation

No. of wires/ diameter / type / cable diameter
CABLE 8x0.5mm ² LIYCY BLACK, UV- resistant, Ø 7.6mm

2.2.2 Cable Shield

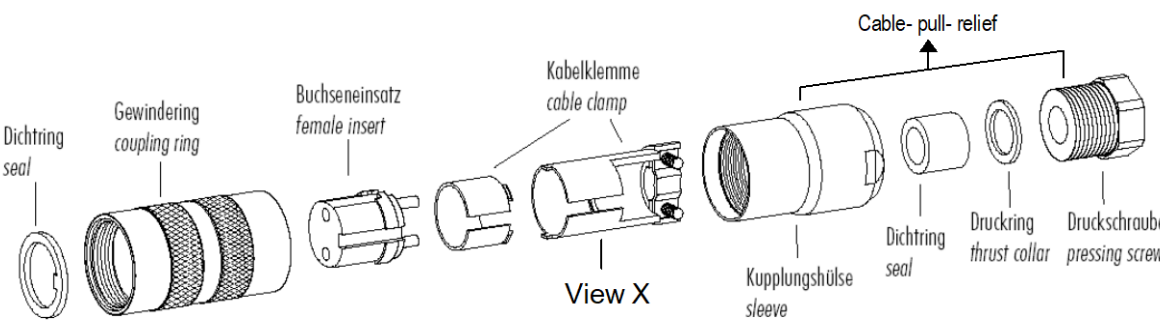
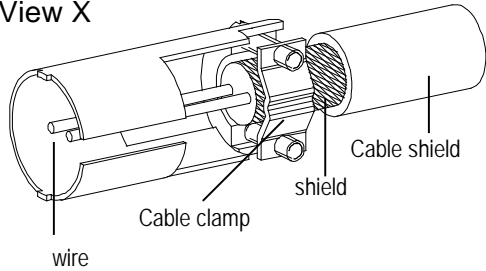
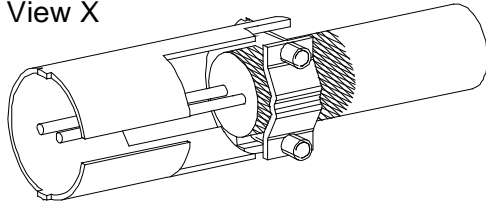
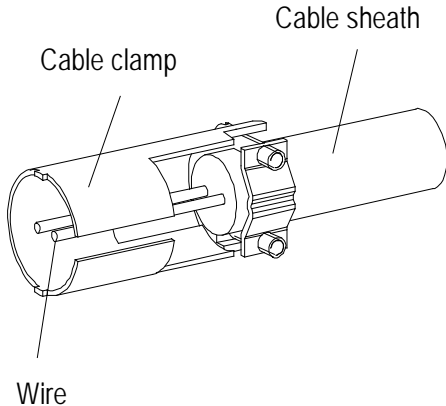
The connection of the cable shield between sensor and data acquisition device should be selected in way, that in case of over-voltages no equalizing currents will flow that might destroy the electronic components.

The connection of the cable shield should depend on the selected isolated, or respectively, non-isolated mounting of the sensors.

2.2.2.1 Connection recommendation for the cable shield

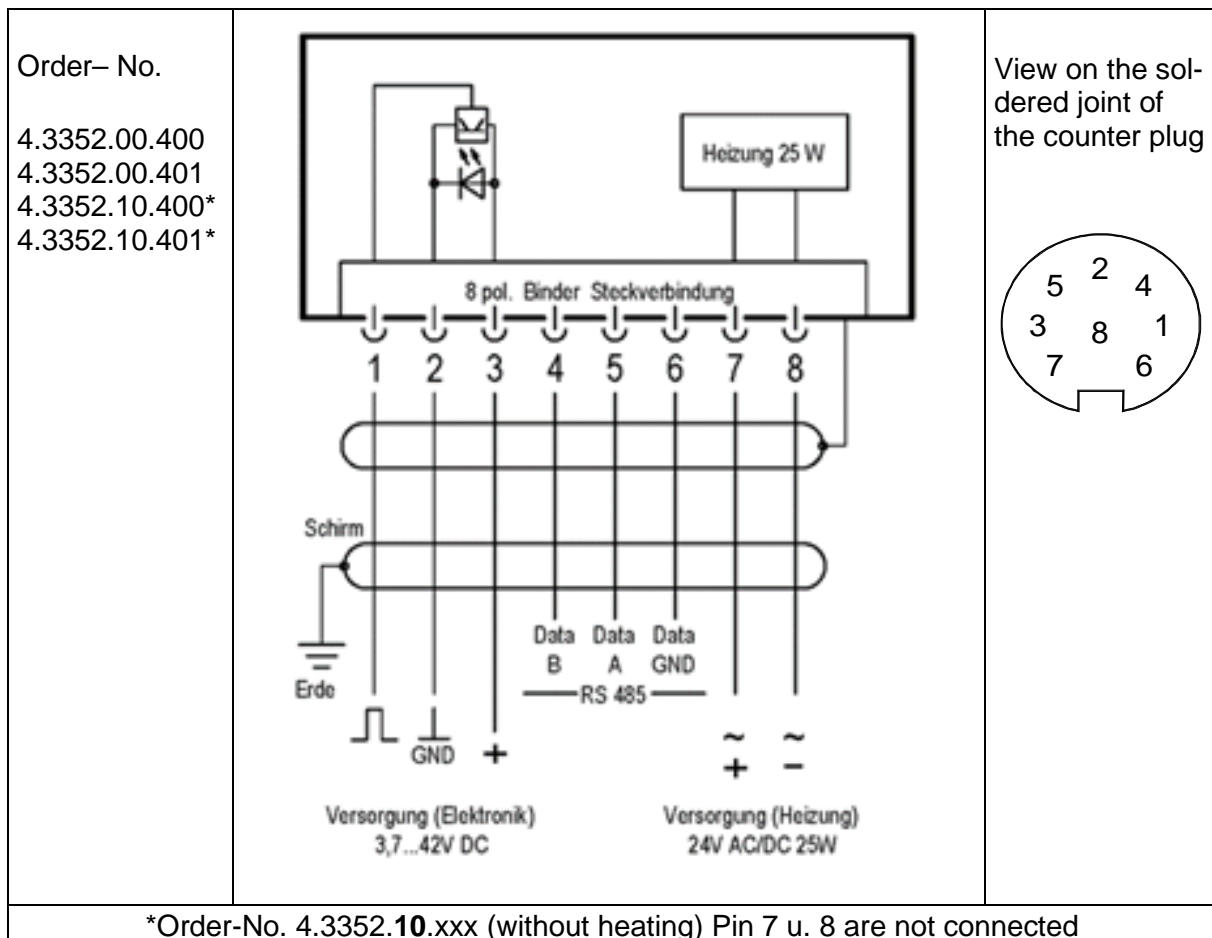
	Sensor Carrier	Sensor	Shielding / Ground	Lightning Protection
1.	Metallic measurement mast, grounded	Isolated mounting at the measuring mast (e.g. by non-metallic brackets, holder etc. or by metallic brackets, holder etc. with isolated plastic adaptors).	Apply the cable shield between sensor and data acquisition device (e.g. datalogger) both-sided. Ground data acquisition device.	Mount metallic lightning protection rod on the mast. Alternatively: Install separate lightning protection rod beside the measurement mast.
2.	Metallic measurement mast, grounded	Non-isolated mounting at the measurement mast (e.g. by metallic brackets, holders etc.).	Apply cable shield between sensor and data acquisition device (e.g. datalogger) only one-sided at the acquisition device. Ground data acquisition device.	Mount metallic lightning protection rod on the mast in isolated condition , and ground lightning protection rod. Alternatively: Install separate lightning protection rod beside the measurement mast.
3.	Metallic measurement mast, not grounded (mounted in isolated condition, e.g. on the attic)	Non-isolated mounting at the measurement mast (e.g. by metallic brackets, holders etc.).	Apply the cable shield between sensor and data acquisition device (e.g. datalogger) both-sided. Ground data acquisition device.	Mount metallic lightning protection rod on the mast in isolated condition , and ground lightning protection rod. Alternatively: Install separate lightning protection rod beside the measurement mast.
4.	Non-metallic measuring mast (=isolated)	Mounting at the measurement mast (e.g. by metallic brackets, holders etc.).	Apply the cable shield between sensor and data acquisition device (e.g. datalogger) both-sided. Ground data acquisition device.	Mount metallic lightning protection rod on the mast, and ground lightning protection rod. Alternatively: Install separate lightning protection rod beside the measurement mast.

2.2.3 Plug and Cable Mounting

Coupling socket, Type: Binder, Serial 423, EMC with cable clamp	
	
Cable connection: with cable shield	
<ol style="list-style-type: none"> Stringing parts on cable acc. to plan given above. Stripping cable sheath 20mm. Cutting uncovered shield 15mm. Stripping wire 5mm. <p><i>Cable mounting 1</i> Putting shrink hose or insulating tape between wire and shield.</p> <p><i>Cable mounting 2</i> If cable diameter permits, put the shield backward on the cable sheath.</p> <ol style="list-style-type: none"> Soldering wire to the insert, positioning shield in cable clamp. Screwing-on cable clamp. Assembling remaining parts acc. to upper plan. Tightening pull-relief of cable by screw-wrench (SW16 und 17). 	<p><i>Cable mounting 1</i> View X</p>  <p><i>Cable mounting 2</i> View X</p> 
Cable connection: without cable shield	
<ol style="list-style-type: none"> Stringing parts on cable acc. to plan given above. Stripping cable sheath 20mm. Cutting uncovered shield 20mm. Stripping wire 5mm. Soldering wire to the insert. Positioning shield in cable clamp. Screwing-on cable clamp. Assembling remaining parts acc. to upper plan. Tightening pull-relief of cable by screw-wrench (SW16 und 17). 	

2.3 Connecting Diagram

Connection diagram acc. to chapter 7.2.2.1 no.1, 3 and 4:



Contact	Name	Function
1	SIG	Signal (rectangle)
2	GND	Ground
3	+Us	Supply 3.7 ... 42V DC
4	Data-	RS485 Data -
5	Data+	RS485 Data +
6	Data GND	RS485 GND
7	HZG	Heating supply: voltage: 24V AC/DC power: 25W
8	HZG	

Note:

The signal "Data GND" (pin 6) is internally connected via a 47ohm resistor to the supply ground (pin 2)!

3 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.

Cleaning

For the cleaning of the device should use a damp cloth without chemical cleaning agents are used.

Certain symptoms of wear and tear can appear on the ball bearings after years of use. These symptoms are expressed in a lowered sensitivity of response, standstill or run-noises of the ball bearings. In case that such disturbances might occur, we recommend to return the instrument - in original package - to the factory for maintenance work.

Note:

Please use original packing during transport of instrument.

We recommend the threads of the plugs with a suitable corrosion inhibitor to protect against corrosion.

4 Technical Data

Characteristics	Description
Measurement range	0.3 ... 75m/s
Measurement uncertainty	±1% from the measured value or < ±0,2m/s @ 0,3 ... 50m/s
Survival velocity	80m/s (min. 30 minutes)
Admissible environmental conditions	-40 ... +80°C 0 ... 100% relative humidity, including condensation
Housing inside temperature measurement	Measurement range: -40 ... +80°C Precision: ±1°C
Air pressure measurement	Measurement range: 300 ... 1100hPa Precision: ±1.0hPa @ 20°C
Inclination measurement (X, Y, Z)	Measurement range: -89.9 ... +89.9° Precision: +/-1°
Vibration (X, Y, Z)	Measurement range: 0 ... 50Hz Precision: ±0.4Hz
Acceleration	Measurement range: ±8g (1g=9,81m/s ²) Precision: ±30mg @ -3g ... +3g
Temperature control for air pressure sensor, acceleration sensor.	Precision: ±0.5K Setting range: 0 ... +60°C The target temperature is set with a command with a resolution of 0.1K
Frequency output	Type: open-drain or push-pull Form: rectangle Frequency: 1082Hz @ 50m/s without using calibration data Amplitude: corresponds to supply voltage, max. 15V

Characteristics	Description
	Load Ra > 1kΩ (Push-pull output with 200Ω in series) Approx. <200nF (corresponds to a cable length ~ 1km)
Serial interface	Type RS485 Operating mode Half duplex mode Data format 8N1 Baud rate 2400, 4800, 9600, 19200, 38400, 57600 Response time max. 10ms (parameter „RD“ equal 0)
Linearity	Correlation factor r between frequency and wind velocity $y = 0,0462 * f + 0,21$ typical with standard curve $r > 0.99999$ (4 ... 20m/s)
Start-up velocity	<0.3m/s
Resolution	0.05m wind run
Distance constant	<3m (according to ASTM D 5096 – 96), 3m according to ISO 17713-1
Turbulent flow into cups	Deviation Δv turbulent compared to stationary horizontal flow $-0.5\% < \Delta v < +2\%$ Frequency < 2Hz
Classification	According to IEC 61400-12-1 edition 2.0 Wind Turbine Power Performance Testing 2017-03
Wind load	Approx. 100 N @ 75m/s
Heater	Surface temperature of the housing neck >0°C at 20m/s to -10°C air temperature, at 1 0m/s to -20°C Use of the Thies icing standard 012002 on the housing neck Heater controlled with temperature sensor.
Electric supply for electronic	Voltage: 3.7 ... 42V DC (galvanically separated from the housing) Current: 8mA typ. 100mA max. (with heating pressure sensor on) approx. 0.9mA in power saving mode SM1, HT0 approx. 1.5mA in power saving mode SM2, HT0, HP65535
Electric supply for Housing heater	Current: 24V AC/DC +- 20%, 45...65 Hz (galvanic isolation from housing) Idling voltage: max. 32V AC and max. 48V DC Power: 25W Proportional control, control temperature: 5°C, Heater can be enabled disabled via interface, galvanically separated to the housing and the measured value logging
Type of connection	8-pin connector for shielded conductor in shaft (see connection diagram)
Mounting	Mounting on mast Outer diameter ≤ 34mm Inner diameter ≥ 22mm Note: mounting on mast is possible with separate adapter (option).
Dimensions	see dimensional drawing
Weight	approx. 0.5kg

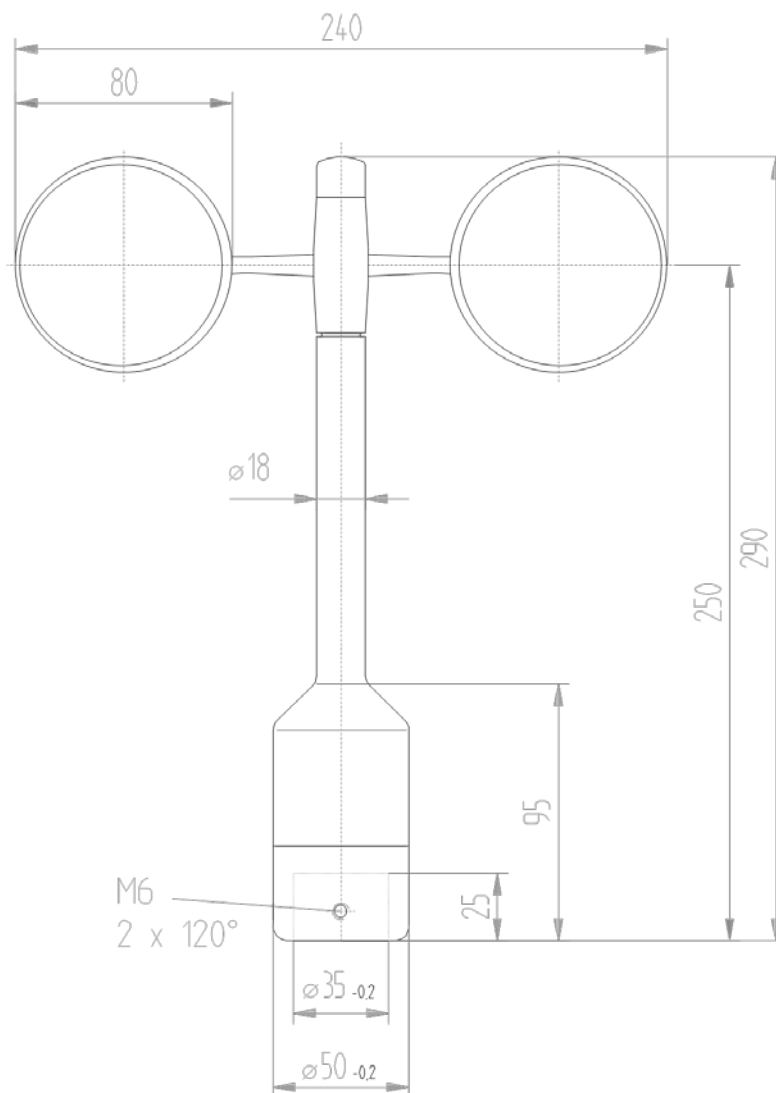
Characteristics	Description
Type of protection	IP 55 (DIN 40050)
Material	Aluminum (AlMgSi1)
Housing	Aluminum (AlMgSi1)
Mast-adaptor	Stainless steel V4A (1.4571)

5 FAQ - Frequently Asked Questions

For this product we have provided a FAQ - Frequently Asked Questions collection for our customers on the homepage.

Link: https://www.thiesclima.com/db/dnl/4.3352.x0.40x_FAQ_en.pdf

6 Dimensional Drawing



7 More Information / Documents as download

Further information can be found in the short instructions for use. These document and also the instruction for use are available for download under the following links.

Instruction for use

https://www.thiesclima.com/db/dnl/4.3352.x0.400-401_Wind_Transmitter_FirstClass-Advanced-X_eng.pdf

**Please contact us for your system requirements.
We advise you gladly.**

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