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# ***Combined Wind Transmitter***

***- with analogue output***

**4.3324.32.xxx**



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# 1 Models

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| Order-No.     | Meas. range<br>Wind velocity | Meas. range<br>Wind direction | Electrical<br>Output | Operating<br>voltage       | Model  |
|---------------|------------------------------|-------------------------------|----------------------|----------------------------|--|
| 4.3324.32.040 | 0,3...50 m/s                 | 0...360°                      | 0...20 mA            | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.041 | 0,3...50 m/s                 | 0...360°                      | 4...20 mA            | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.061 | 0,3...50 m/s                 | 0...360°                      | 0...10 V             | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.073 | 0,3...50 m/s                 | 0...360°                      | 0...5 V              | 8...28 V DC<br>or 24 V AC  | Standard   |
| 4.3324.32.640 | 0,3...60 m/s                 | 0...360°                      | 0...20 mA            | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.641 | 0,3...60 m/s                 | 0...360°                      | 4...20 mA            | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.661 | 0,3...60 m/s                 | 0...360°                      | 0...10 V             | 15...28 V DC<br>or 24 V AC | Standard   |
| 4.3324.32.673 | 0,3...60 m/s                 | 0...360°                      | 0...5 V              | 8...28 V DC<br>or 24 V AC  | Standard   |
| 4.3324.32.941 | 0,3...60 m/s                 | 0...360°                      | 4...20 mA            | 15...28 V DC<br>or 24 V AC | "Ship version" *<br>- short wind vane<br>- reinforced cup star<br>- special ball bearing |

\* Comb. Wind transmitters for heavy mechanical load, for ex. on ships, wind power plants or the like.

The combined wind transmitters are shipped in semi-mounted state, in order to avoid transport damages and to keep the package small.

The following parts are included in delivery:

- 1 x Combined wind transmitter, pre-mounted
- 1 x Cup star
- 1 x Wind vane
- 1 x Connecting plug
- 1 x Instruction manual

## 2 Range of application

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The combined wind transmitter serves for the acquisition of the horizontal components of the wind speed and the wind direction. All measuring values are available at the outputs analogue signals. They can be transmitted to display, recording instruments, dataloggers as well as process control systems.

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.

### 3 Construction and Mode of Operation

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The housing, cup star and wind vane are made of aluminum, die the surfaces are anodized. The bow consists of stainless steel. Labyrinth seals and o-rings protect the sensitive internal parts from precipitation. The instrument is designed for mounting to a mast tube; the electrical plug connection is situated in the transmitter shaft.

A low-inertia light-metal cup star (in ball bearings) is set into rotation by the wind. The opto-electronic revolution-scanning produces a pulse frequency which is transformed into the analogue signal by means of an integrated measuring transducer.

The wind direction is acquired by means of an inertia-free 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 GMR- Sensor (Giant Magnetoresistive Effect Sensor) through the position of the magnet field. As signal this sensor outputs two cosine- and sinus-depending voltages. The connected micro-controller calculates from this voltages the wind direction and provides the respective result as **analogue output signal**.

### 4 Recommendation Site Selection / Standard Installation

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In general, wind measurement instruments should be able to detect wind conditions over a broad range. In order to obtain comparative values of the surface wind, measurements should be taken at a height of 10m above a flat, open terrain. Open terrain means that the distance between the wind transmitter and an obstacle is at least 10 times greater than the height of the obstacle itself. If this requirement cannot be fulfilled, then set the wind transmitter up at a height where the influence of local obstacles on the measured values is minimal (about 6-10 m above the level of the obstacle). If the wind transmitter is set up on a flat roof, then place it in the center of the roof and not at the edge in order to avoid privileged directions.

### 5 Installation

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**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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**Remark:**

A **Lightning Rod** Order-No. **4.3100.99.000** is recommended if the instrument is to be used in areas with considerable lightning activity.

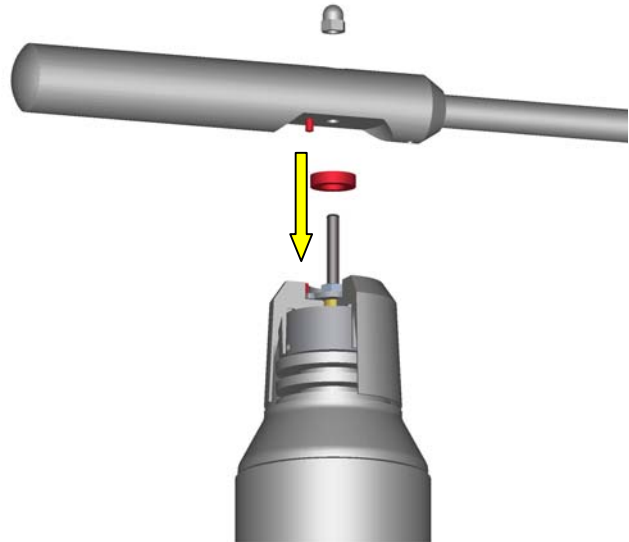
## 5.1 Mounting of wind vane

### Tools

- Screw wrench SW 8

### Mounting of wind vane

1. Remove wind transmitter housing and wind vane from the packing.
2. Screw off cap nut (SW 8) The gasket remains in the protective cap
2. Mounting of wind vane acc. to figure. The dowel at the wind vane must catch the notch of the protective cap. The cap nut is to be screwed tightly.



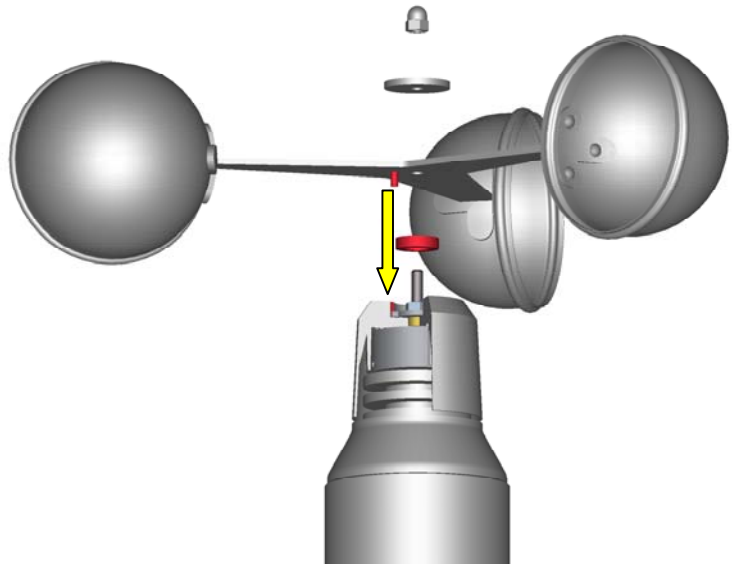
## 5.2 Mounting of Cup Star

### Tools

- Screw wrench SW 8

### Mounting

1. Remove cup star from the packing.
2. Screw-off cap nut (SW 8) and remove disc. . The gasket remains in the protective cap.
1. Mounting of cup star acc. to figure. The dowel at the cup star cross must catch the notch of the protective cap. The cap nut is to be screwed tightly.



### 5.3 Mounting the Wind Transmitter

The transmitter can be mounted onto a tube of R 1 1/2" (  $\approx$  48,3 mm), 50 mm long. The internal diameter of the mounting tube must be at least 40 mm since the transmitter will be plugged into an electrical system from below. Solder a cable onto the enclosed plug (see chapter 5.4). After electrical connection, set the wind transmitter onto the tube. North marking and bow shall indicate to the North.

#### ***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). The instrument is fixed on the shaft by means of the two hexagon head screws.

#### ***Alignment of the comb. Wind Transmitter on a Ship***

- The reference point for the wind transmitter is the roll-axis of the ship, whereat "0°" is related to the **ship bow**.

Rotate the case markings (north marking) on the shaft and on the protective cap until they are aligned. Take a bearing on ship bow 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).

When aligning the comb. wind transmitter on other mobile objects (for ex. vehicles, wind power plants etc.) this procedure can be adopted

## 5.4 Electrical Mounting

A shielded cable with a diameter of 6..8 mm and a core section of 0,5...0,75 mm<sup>2</sup> must be soldered on to the enclosed coupling socket.

The number of required cores, and the PIN assignment is stated in the connection diagram (chapter 7).

- Cable recommendation: Type LIYCY 7 x 0.5 mm<sup>2</sup>, Ø 8 mm

### 5.4.1 Plug Mounting, Cable Mounting

| Coupling socket 211 194, 7-pol., (Binder, Serial 423), EMC with cable clamp  |   |
|--|---|
|  |   |
| <ol style="list-style-type: none"> <li>1. Stringing parts on cable acc. to plan given above.</li> <li>2. Stripping cable sheath 20 mm<br/>Cutting uncovered shield 15 mm<br/>Stripping wire 5mm.</li> </ol> <p><i>Cable mounting 1</i><br/>Putting shrink hose or insulating tape between wire and shield.</p> <p><i>Cable mounting 2</i><br/>If cable diameter permits, put the shield backward on the cable sheath.</p> <ol style="list-style-type: none"> <li>3. Soldering wire to the insert, positioning shield in cable clamp.</li> <li>4. Screwing-on cable clamp.</li> <li>5. Assembling remaining parts acc. to upper plan.</li> <li>6. Tightening pull-relief of cable by screw-wrench (SW16 und 17).</li> </ol> | <p><i>Cable mounting 1</i><br/>View X</p> <p><i>Cable mounting 2</i><br/>View X</p> |

## 6 Maintenance

If the instrument has been properly mounted, no maintenance is required. Heavy pollution can clog the slits between the rotating and stationary parts of the instrument. These slits must always be clean and unclogged.

After years of use, the ball bearings can suffer from wear and tear. This is expressed in a higher starting torque respectively in the fact that the cup anemometer does not start rotating. If such a defect occurs, we recommend that you return the instrument to the factory for repair.





## 8 Technical Data

|  |  |  |
|--|--|--|
|  | <b>4.3324.32.040</b><br><b>4.3324.32.041</b><br><b>4.3324.32.061</b><br><b>4.3324.32.073</b><br><b>4.3324.32.640</b><br><b>4.3324.32.641</b><br><b>4.3324.32.661</b><br><b>4.3324.32.673</b>               | <b>4.3324.32.941</b>   |
| <b>Wind Speed</b>                                    |  |  |
| Meas. range  | 0...50/60 m/s (= mA / V)<br>see models (chapter 1)   | 0...60 m/s (= 4...20 mA)   |
| Start-up   | 0,3 m/s  | >0,3 m/s   |
| Accuracy   | ±0,4 m/s resp. 2,5 % from meas. value  | ±0,5 m/s resp. 2,5 % from meas. value  |
| Distance constant                                    | 5 m  | 5 m  |
| <b>Wind Direction</b>                                |  |  |
| Meas. range  | 0... 60° (= 4...20 mA)   | 0...360° (= 4...20 mA)   |
| Start-up   | <0,6 m/s at 90° vane move  | <1 m/s at 90° vane move  |
| Accuracy   | 1,5°   | 1,5°   |
| Resolution   | 2,5°   | 2,5°   |
| Damping ratio  | 0,2 –0,3   | 0,2 –0,3   |
| <b>General</b>                                       |  |  |
| Electrical outputs                                   | No. see models available<br>0...20 mA @ ≤ 500 Ω, U <sub>B</sub> ≥ 12V<br>4...20 mA @ ≤ 500 Ω, U <sub>B</sub> ≥ 12V<br>0...5 V @ ≥ 1000 Ω, U <sub>B</sub> ≥ 8V<br>0...10 V @ ≥ 1000 Ω, U <sub>B</sub> ≥ 12V | No. see models available<br>4...20 mA @ ≤ 500 Ω, U <sub>B</sub> ≥ 12 V                 |
| Max. wind load                                       | 60 m/s   | 75 m/s (max. 30 min.)  |
| Ambient temperature                                  | -35...+80°C  | -35...+80°C  |
| Operating voltage<br>with Heating<br>without Heating | 24 V DC/AC, ca. 40 W,<br>electronically regulated<br>8 / 15...28 V DC  | 24 V DC/AC, ca. 40 W,<br>electronically regulated<br>15...28 V DC                      |
| Protection   | IP 55  | IP 55  |
| Wind load at 35 m/s                                  | approx. 50 N   | approx. 50 N   |
| Mounting   | onto mast tube 1 ½", for ex. DIN 2441  | onto mast tube 1 ½", for ex. DIN 2441  |
| Connection   | 7-pole plug connection in the shaft  | 7-pole plug connection in the shaft  |
| Weight   | 2,8 kg   | 2,8 kg   |
| Model  | Standard   | "Ship version"<br>- short wind vane<br>- reinforced cup star<br>- special ball bearing |

## 9 Dimensions

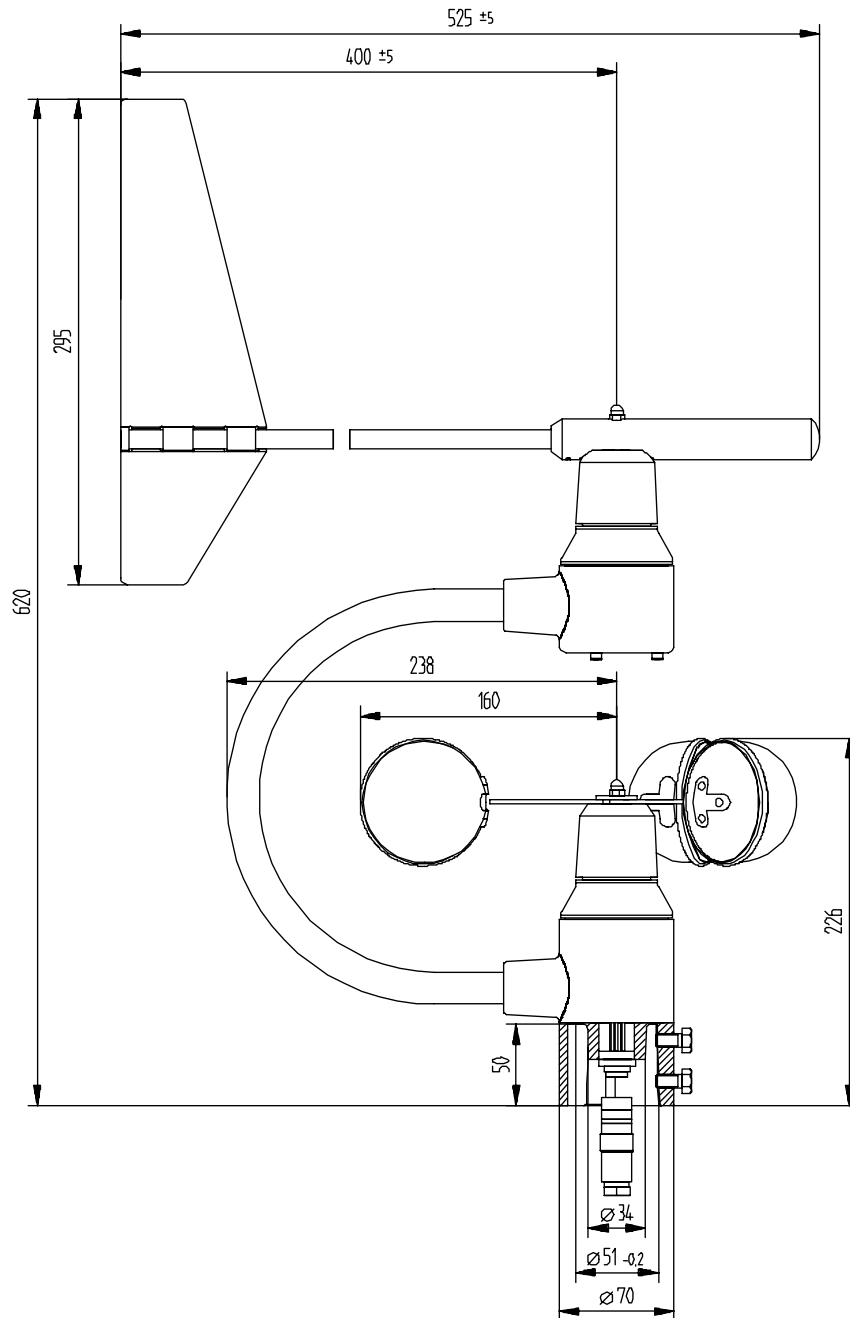
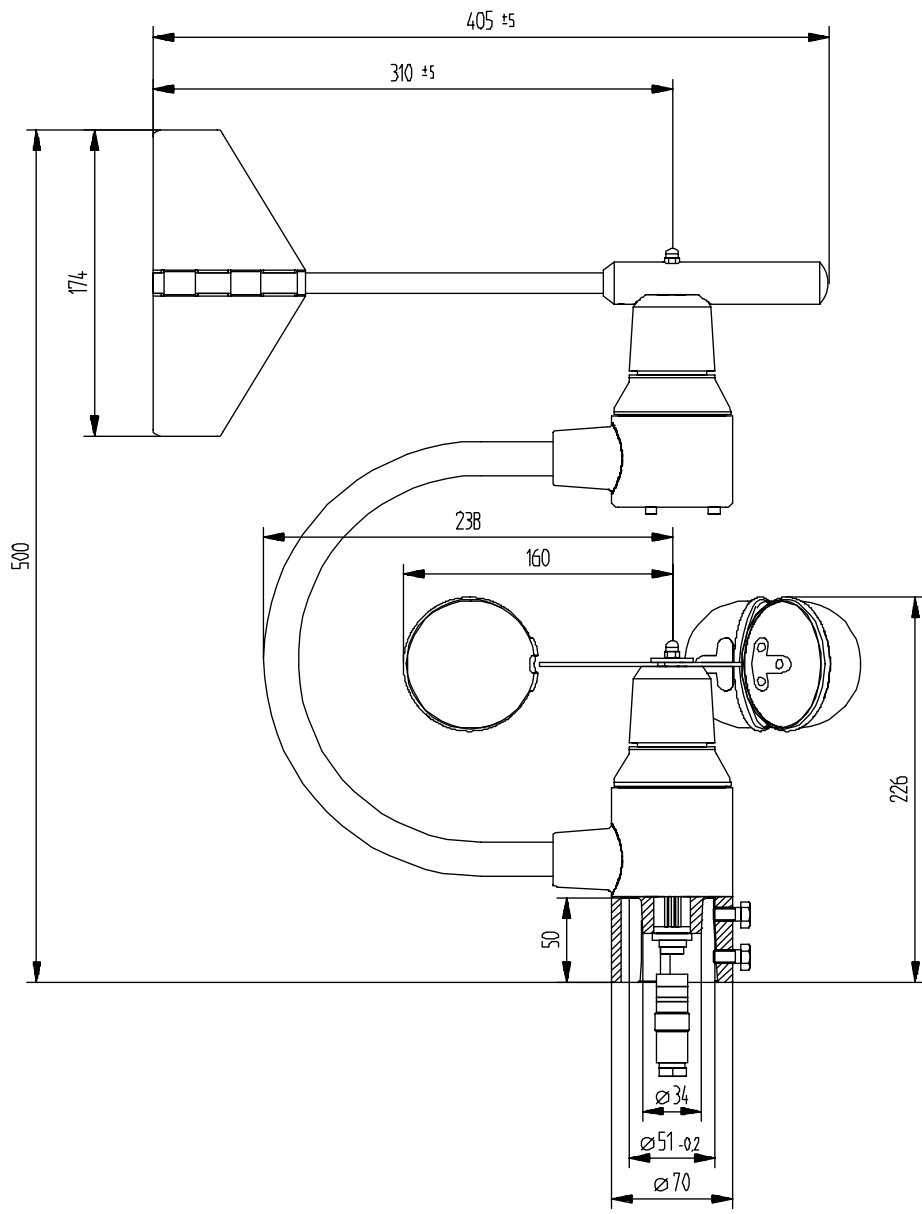


Figure 1: Dimension 4.3324.32.xxx



**Figure 2: Dimension 4.3324.32.941**

# 10 EC-Declaration of Conformity

Document-No.: 000438

Month: 02 Year: 09

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

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Description of Product: **Wind Direction Transmitter, Combined Wind Transmitter**

|             |                      |                      |                      |                      |
|-------------|----------------------|----------------------|----------------------|----------------------|
| Article No. | <b>4.3125.33.040</b> | <b>4.3125.33.041</b> | <b>4.3125.33.060</b> | <b>4.3125.33.061</b> |
|             | <b>4.3125.33.073</b> | <b>4.3125.33.841</b> |                      |                      |
|             | <b>4.3324.32.040</b> | <b>4.3324.32.041</b> | <b>4.3324.32.061</b> | <b>4.3324.32.073</b> |
|             | <b>4.3324.32.640</b> | <b>4.3324.32.641</b> | <b>4.3324.32.661</b> | <b>4.3324.32.673</b> |
|             | <b>4.3324.32.941</b> |                      |                      |                      |

specified technical data in the docume **021588/02/09; 021597/02/09**

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<br>Immunity for industrial environment   |
| IEC 61000-6-3: 2006 | Electromagnetic compatibility<br>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: 12.02.2009

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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