

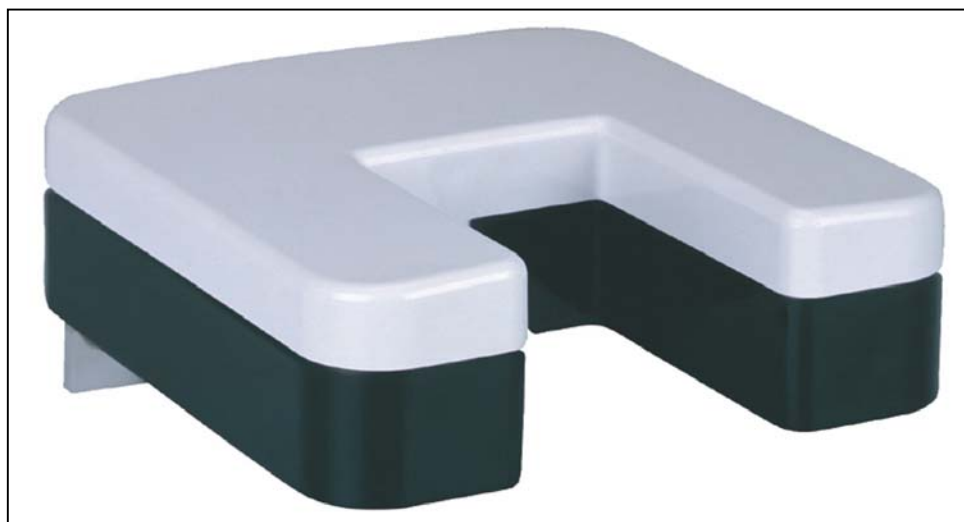
Instruction for use

021335/11/09

Precipitation Sensor

with analogue Intensity Output

5.4103.20.041, 5.4103.20.741



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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 Model

Order - No.	Measuring value	Electrical Output	Operating Voltage	Connection
5.4103.20.041	Precipitation intensity	4...20mA	24 V AC/DC	Cable gland
5.4103.10.741	Precipitation intensity	4...20mA	24 V AC/DC	7- pole plug connection

2 Range of Application

The precipitation sensor serves as measuring instrument for the determination of the instantaneous precipitation intensities (mm precipitation / min.). By integration of the precipitation intensities, the precipitation quantity can be calculated, as well. Control- and warning signals can be derived from the precipitation intensity.

The measuring signal is output as intensity-dependent analogue output value. The dimension of the measurement value output is divided into 4 linear characteristic segments, which show a tenth of the slope of the more sensitive segment.

Thus, it is possible to represent an intensity range from approx. 0,001mm/min. (light drizzle) up to 10 mm/min. (extremely heavy rain) with reasonable resolution (quasi-logarithmic output).

3 Mode of Operation

Precipitation in the form of drizzle, rain, snow, or hail falls through a light band, induced by light diodes, and lead to shadowing effects on the receiving side. The sent light is pulse-modulated so that outside light effects cannot falsify the measurement results. From the extent of shading along with the duration of falling through a factor is calculated that gives the information if there is a precipitation incident or not.

The instrument is equipped with a heating system for extreme weather condition. This avoids ice and snow forming on the housing surface. In addition, the surface retains a temperature of $>0^{\circ}$ by means of a regulated heating.

4 Installation

Please Note:

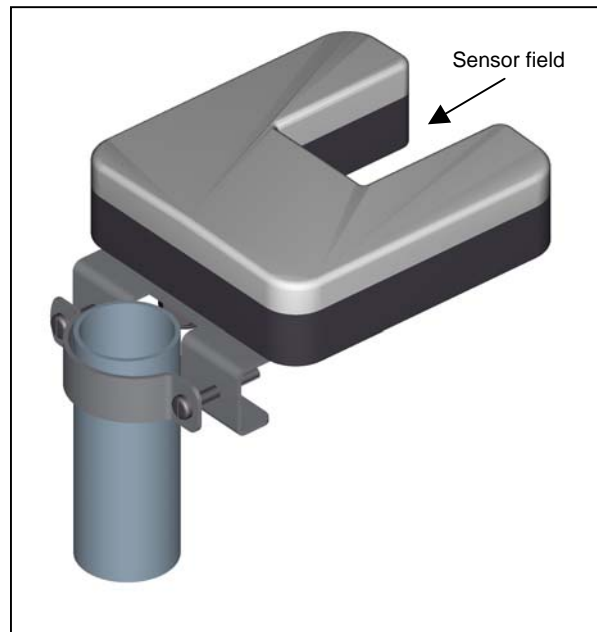
***The electrical connection is to be carried out by experts only.
Please open the instrument only with dry ambient conditions.
Do not damage the exposed electronics!***

Remark:

In order to achieve an optimal electro-magnetic immunity (> 20 V/m) please use shielded cable.

4.1 Mechanical Mounting

The mounting system of the instrument is designed for attachment to a mast. When mounting make sure, that the precipitation can easily reach of the sensor field, and that the instrument is not exposed to strong vibrations or shocks.



4.2 Electrical Mounting for Precipitation Sensor with Cable Gland

To connect the instrument electrically, remove the cover with its 5 screws. The connecting terminals and the DIP-switches for selecting the number of incidences and switch-off delays are then accessible. The electrical connection is carried out according to the Circuit diagram. Insert the cable from below through the screwed cable gland on the bottom of the case and connect it to the connecting terminals and the shield connection. After the wiring – and mounting work is done, the nuts of the screwed cable gland, and die screws of the cover are to be screwed evenly tight with the case so that water cannot penetrate it. The fixing screws for the cover must be screwed down with a torsional of 1 Nm to 2 Nm.

4.3 Electrical Mounting for Precipitation Sensor with Plug Connection

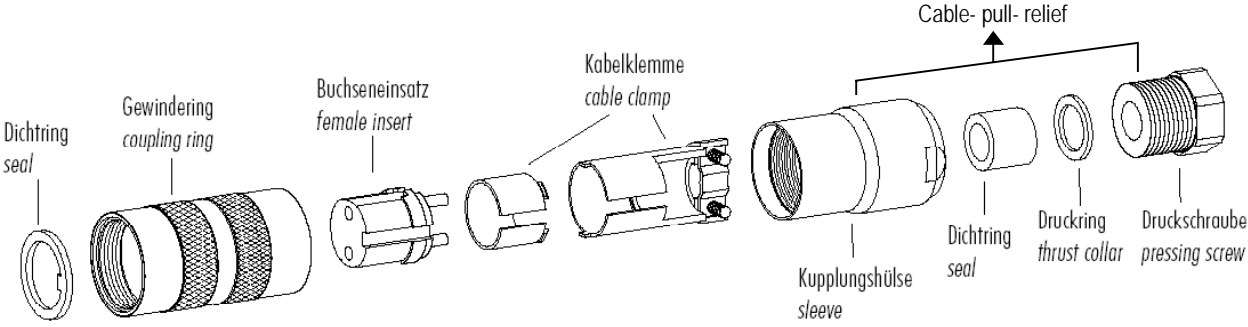
The electrical connection is carried out by plug in accordance with the connecting diagram.

4.3.1 Plug Mounting

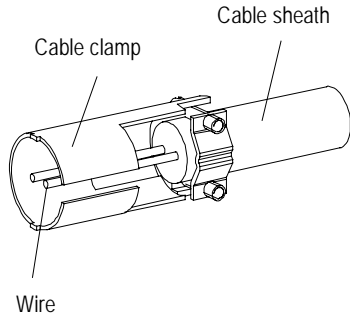
Applies only to instruments with connection „plug“.

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).



Cable clamp
Cable sheath
Wire

5 Taking into Operation

After the electrical connection has been established, and the case has been screwed, the operating voltage can be switched on. The dimension of the measurement value output is reset when the supply voltage is switched on.

6 Maintenance

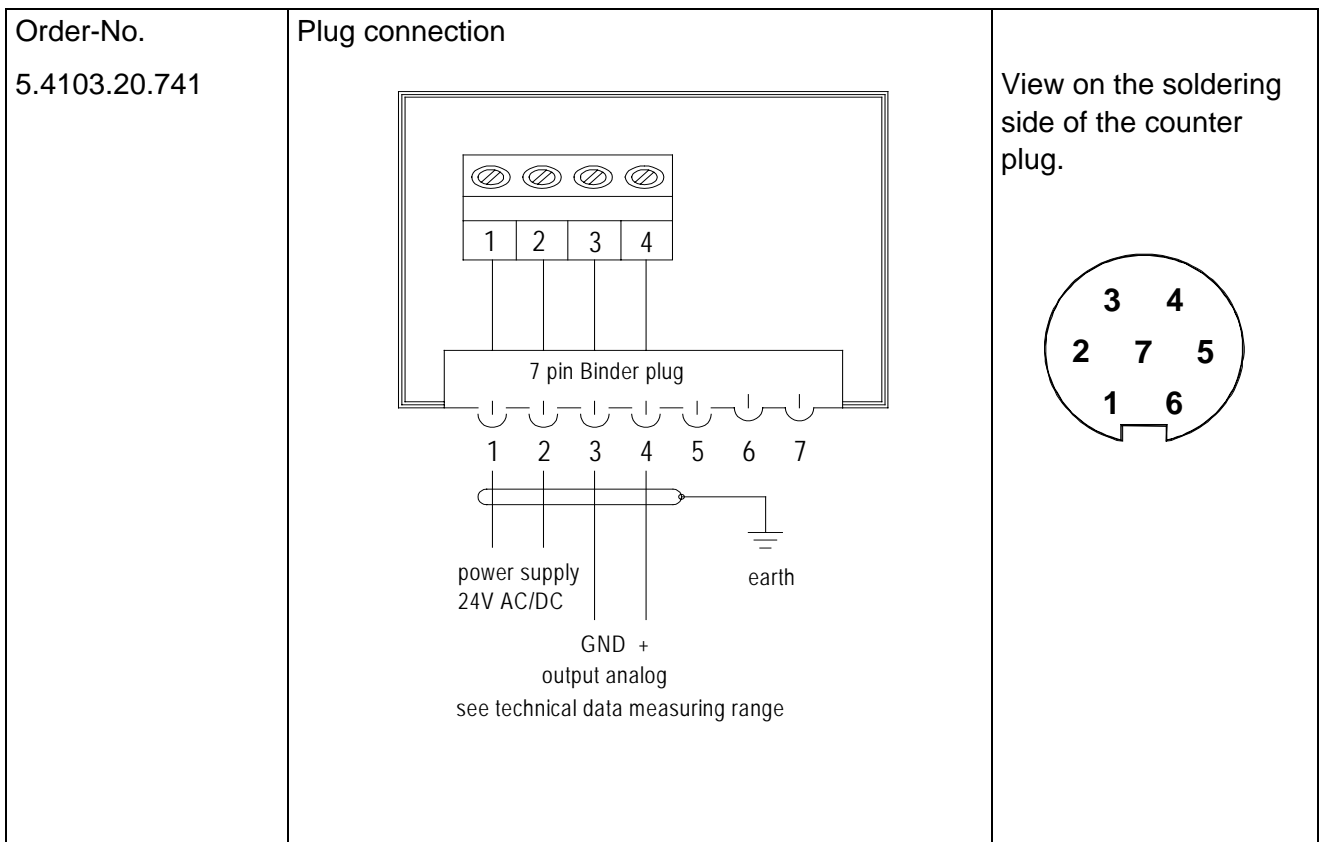
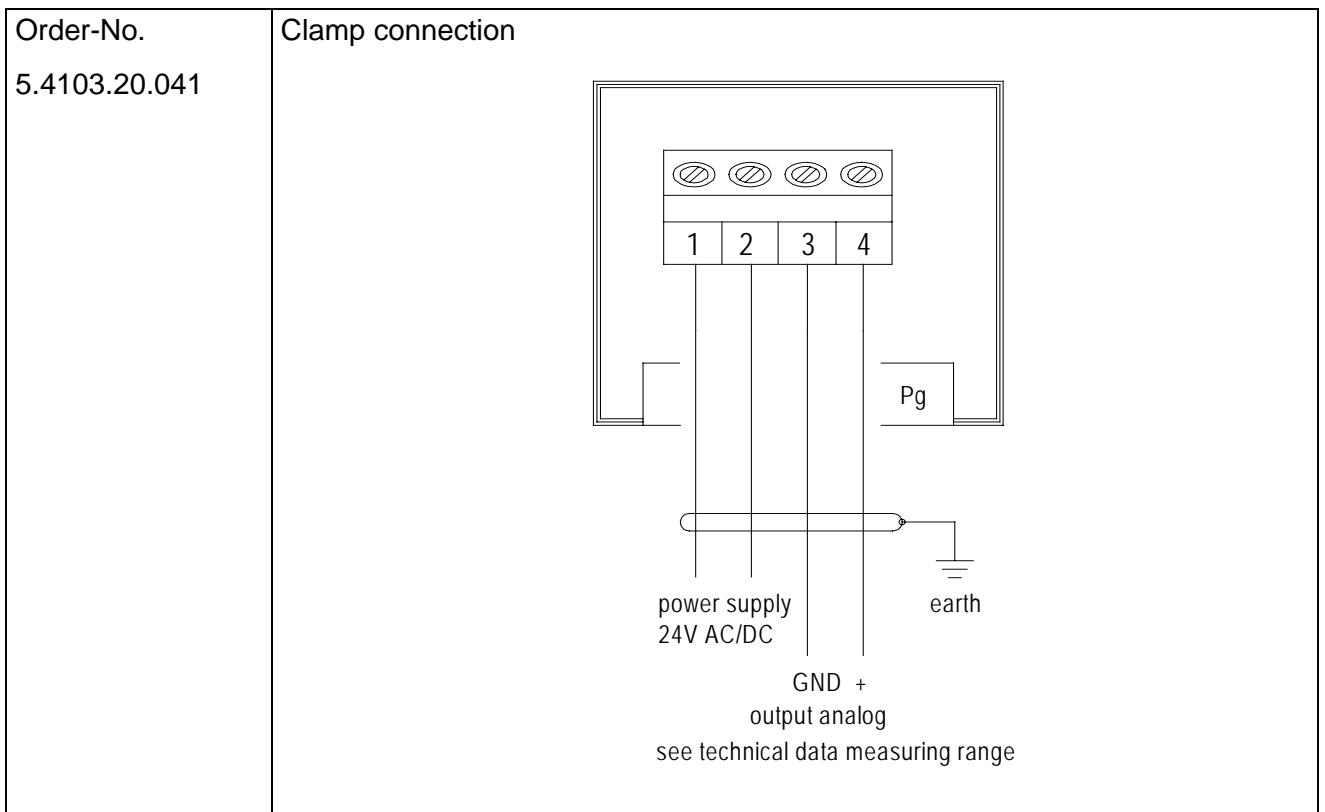
The device is maintenance free.

Cleaning:

The pollution and the pollution level is dependent on the location. Therefore, we recommend the unit be checked at appropriate intervals and cleaned if necessary.

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

7 Connecting Diagram / Connecting Table



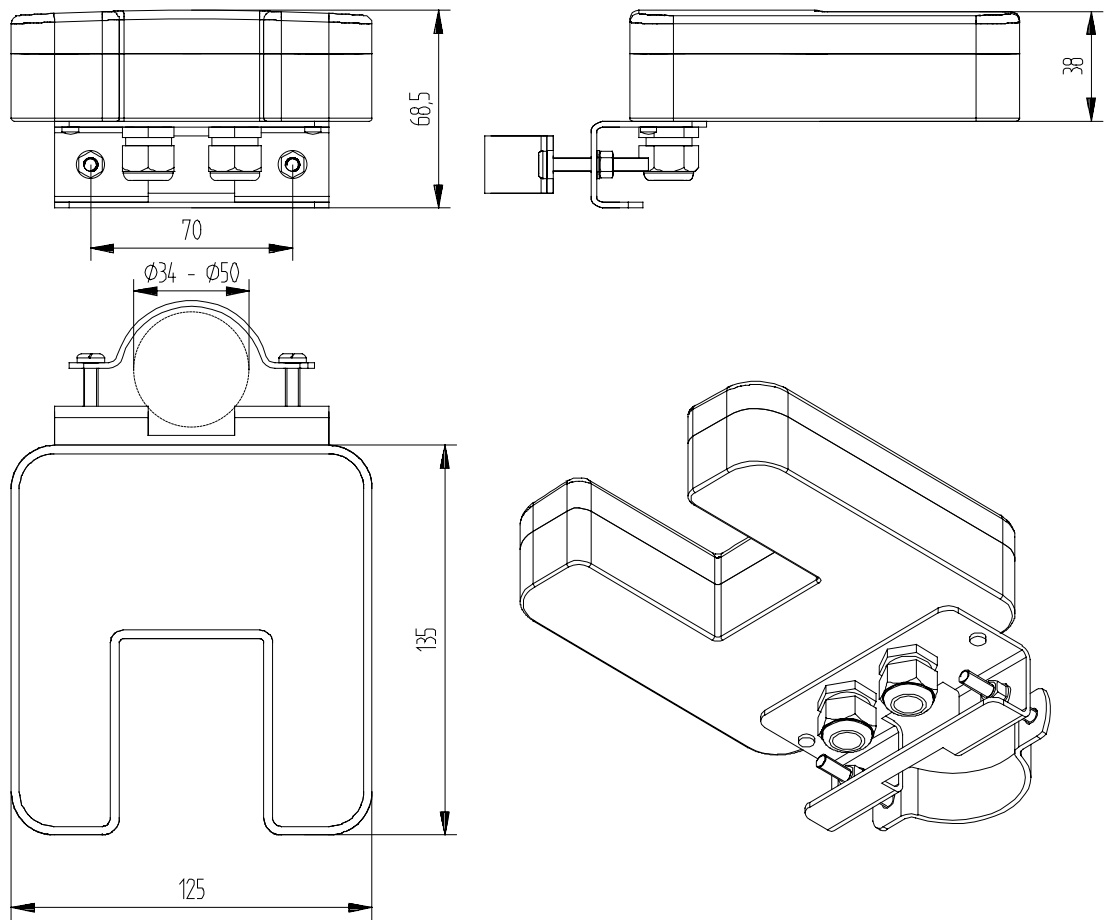
8 Technical Data

Measuring Value	Precipitation intensity (mm / min)		
Output	Constant current, depending on measuring value, between 4,0mA and 20,0mA		
Measuring range, Output, Transfer function	Measuring range	Output	Function ¹⁾
Segment 1	0.....0,01 mm / min	= 4,0.....8,0 mA	$0,0025 *x -0,01$
Segment 2	0,01 0,1 mm / min	= 8,0...12,0 mA	$0,0225 *x -0,17$
Segment 3	0,1....1,0 mm / min	= 12,0...16,0 mA	$0,225 *x -2,6$
Segment 4	1,0...10,0 mm / min	= 16,0...20,0	$2,25 *x -35$
max. load	400 Ohm		
Active sensor surface	25 cm ²		
Minimum drop size	0,2 mm		
Operating voltage	24 V AC/DC ± 15 %		
Operating current	approx. 300 mA @20°C ambient temperature max. approx. 1 A		
Ambient temperature	-30 ... +60°C		
Protection	IP 65 acc. to DIN 40050		
Weight	0,4 kg		
Connection	See model		

¹⁾Function for calculation:

Depending on the segment, where the measured current fits in, the respective function must be applied, wherein for “x” the measured value in mA is entered.

9 Dimensional diagram



10 Accessories (Optional)

<p>Power Supply Unit</p>	<p>9.3388.00.002</p>	<p>The power supply unit provides for the current supply of the Precipitation Sensor. It supplies the necessary operation voltage for the electronics and the heating.</p> <p>Primary : 230 V / 50 Hz Secondary : 24 V AC / 25VA Housing : synthetic Protection : IP 65 acc. to DIN 40050 Dimensions : 107 x 125 x 100 mm Weight : 1,2 kg</p>
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11 EC-Declaration of Conformity

Document-No.: **000902**

Month: 06 Year: 08

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

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Description of Product: **Precipitation Transmitter**

Article No.	5.4103.10.000	5.4103.10.012	5.4103.10.700	5.4103.20.041
	5.4103.20.741	5.4103.30.000	5.4103.30.700	

specified technical data in the document: **021324/10/04; 021196/12/04; 021334/04/05; 021469/08/05**

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: 27.06.2008

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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