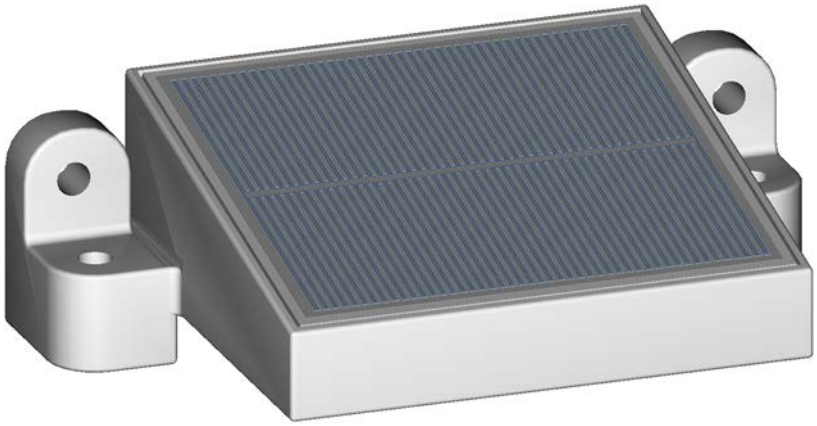
Rain Monitor

Instruction for Use

5.4106.0x.xxx



Dok. No. 021708/09/23

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.

Table of Contents

Table of Figure

1 Device Versions

Article - No.	Measuring value	Output	Operating-Voltage	Configuration
5.4106.00.011	Precipitation detected: Yes = contact open No = contact closed	Semiconductor relay; Type: normally open	11…28V AC or 10…32V DC	- 10m cable, 4 pol., - Cable shielded, - uv-resistant - fixing kit
5.4106.00.100	Precipitation detected: Yes = contact 5 No = contact 3	Semiconductor relay: Type: Changeover	11…28V AC or 10…32V DC	- 3m cable, 5 pol. - fixing kit
5.4106.00.901	Precipitation detected: Yes = contact closed No = contact open	Semiconductor relay; Type: normally open	11…28V AC or 10…32V DC	- 3m cable, 4 pol. - without fixing kit
5.4106.01.011	Precipitation detected: (5Hz, 10 …50Hz)	Semiconductor relay; Type: normally open	11…28V AC or 10…32V DC	- 10m cable, 4 pol. - Cable shielded - uv-resistant - fixing kit

Scope of supply:
- Rain monitor
- Fixing kit (see Model)
- Operating instructions

2 Application

The rain monitor is designed to act as a sensor detecting the start and end of precipitation. It is used as a status indicator or sensor for controlling downstream safety devices (control units) protecting windows, ventilation flaps, sun blinds, awnings, etc. The sensor area takes the form of a capacitor on glass-coated ceramic. Glass passivation ensures that the rain monitor is extremely environment-resistant as well as robust while offering good long-term stability and resistance to aggressive media.

3 Setup and Mode of Operation

Whenever precipitation strikes the rain monitor and wets the sensor surface, this changes the capacitance of the surface, so triggering a switching signal, i.e. wetting of the sensor surface signals the precipitation status "yes" (5.4106.00.xxx).

Special version 5.4106.01.xxx: Frequency output according to degree of wetting of the sensor surface (5Hz: dry, 10 … 50Hz: not much wetting … much wetting)

To protect the sensor surface from bedewing and icing-up, it is heated to an overtemperature of approx. 2K.

When the sensor surface is wetted, it is adjusted to approx. 10K above the ambient temperature, so ensuring fast faster drying. Once it has dried, the device switches to the precipitation status "no".

Definition for precipitation status / output:

5.4106.00.011 / 100

Precipitation “yes”	=	contact 3-4 open
Precipitation “no”	=	contact 3-4 closed
Power failure (sensor “off”)	=	contact 3-4 open

- In case of interrupted or missing operating voltage (sensor “off”) precipitation “yes” is signalized; thus, even in this state the object to be protected is safeguarded.

5.4106.00.901

Precipitation “yes”	=	contact 3-4 closed
Precipitation “no”	=	contact 3-4 open
Power failure (sensor “off”)	=	contact 3-4 open

- In case of interrupted or missing operating voltage (sensor “off”) precipitation “no” is signalized; thus, there is possibly no object protection.

5.4106.01.011

Precipitation “yes”	=	frequency 10 … 50Hz depending on wetting
Precipitation “no”	=	frequency 5Hz
Power failure (sensor “off”)	=	contact 3-4 open

- In case of interrupted or missing operating voltage is the output open, but no frequency is output. Because of that is the object protection available is the case.

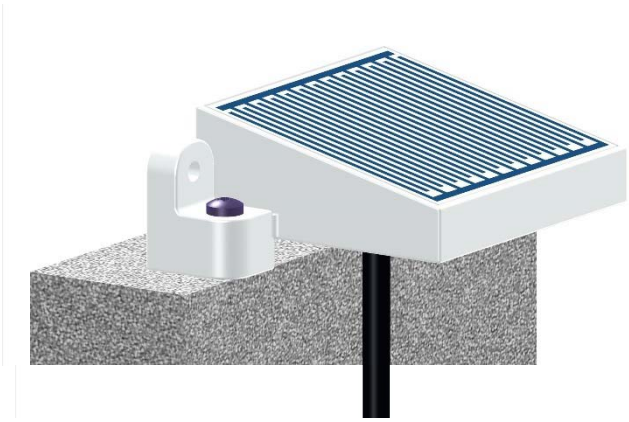
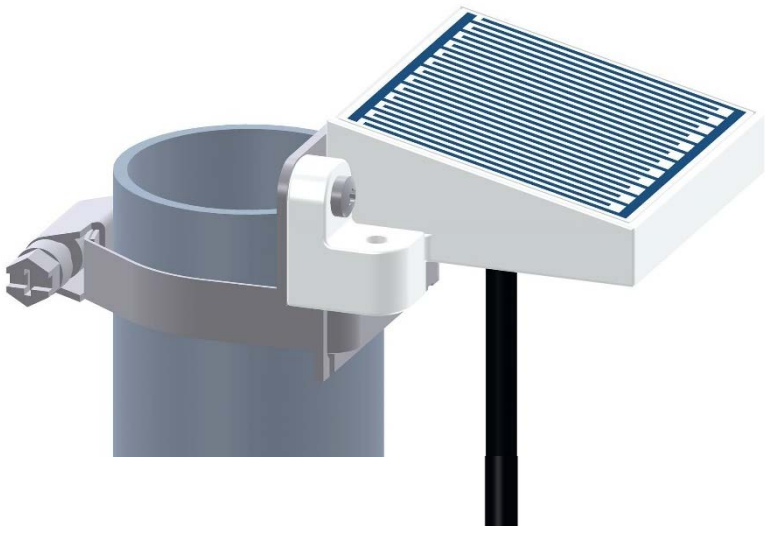
4 Installation

Please Note:

The electrical connection is to be carried out by experts only.

4.1 Mechanical Mounting

The device should be installed at a location, that will result in representative readings and protected from the wind as far as possible. During installation make sure, that precipitation can strike the sensor surface unimpeded. For dimensions, see section 8.

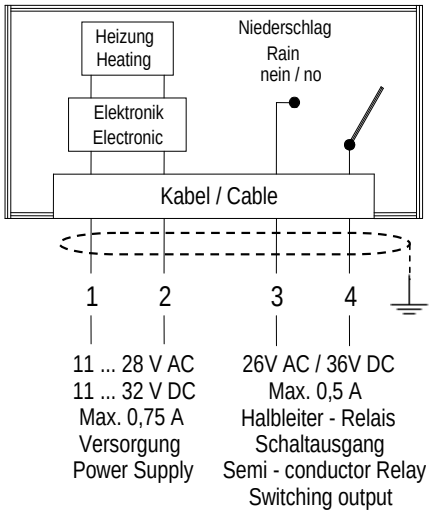
Instrument without fixing kit Mounting must be performed on a flat vertical or horizontal surface so that the bottom edge of the device is level.	
Note: *The cable routing must be done without kinking the cable. Cable kinks can cause a cable break. Cable breakage due to cable kinks does not constitute a warranty or claim.*	
Instrument with fixing kit Mounting can be carried out at the end of a mast tube (Ø 35-50mm).	

4.2 Electrical Mounting

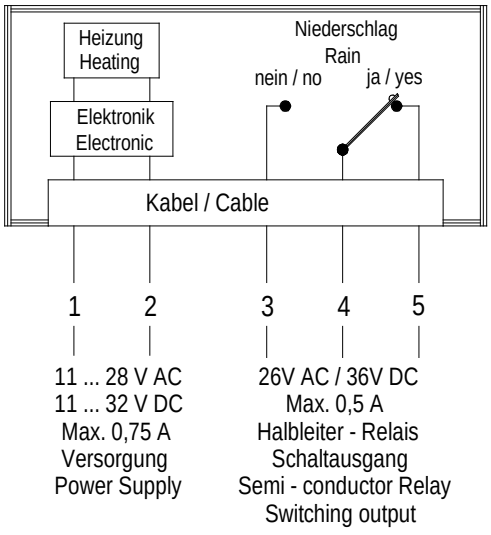
Either AC or DC can be used as the power supply, with protection from polarity reversal. The output is an isolated electronic relay. A non-detachable cable is used for connection: see connecting diagram, **section 4.2.1.**

4.2.1 Pin Assignment and Precipitation Status

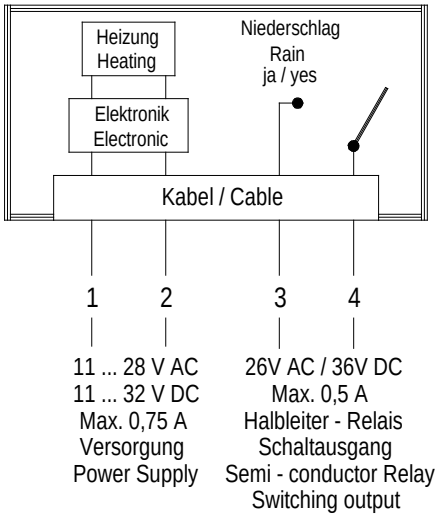
5.4106.00.011			
	Supply	Output	
	1-2	Contact 3-4	
Sensor surface wet	on	open	
Sensor surface dry	on	closed	
Sensor surface wet or dry	off	open	
Figure state: - instrument power-off or - sensor surface wet			



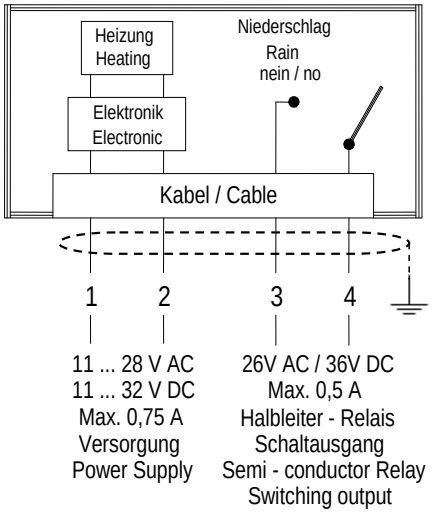
5.4106.00.100			
	Supply	Output	Output
	1-2	Contact 3-4	Contact 4-5
Sensor surface wet	on	open	closed
Sensor surface dry	on	closed	open
Sensor surface wet or dry	off	open	closed
Figure state: - instrument power-off or - sensor surface wet			



5.4106.00.901			
	Supply	Output	
	1-2	Contact 3-4	
Sensor surface wet	on	closed	
Sensor surface dry	on	open	
Sensor surface wet or dry	off	open	
Figure state: - instrument power-off or - sensor surface dry			



5.4106.01.011			
	Supply	Output	
	1-2	Contakt 3-4	
Sensor surface wet	on	Frequence (Wetting)	10 … 50Hz (few a lot)
Sensor surface dry	on	Frequence	5Hz
Sensor surface wet or dry	off	open	
Figure state: - instrument power-off			



5 Taking into Operation

The operating voltage can be switched on once the electrical connection has been made.

6 Maintenance

The device is maintenance free.

Cleaning:
Depending on the installation location and the associated type/degree of soiling occurring there, we recommend checking the sensor surface of the device at suitable intervals and cleaning it as required.
For cleaning a damp cloth without chemical cleaning agents should be used.

7 Specifications

Measuring value	Precipitation (yes / no)
Signal output	Semiconductor relay, Potential-free / electrically isolated / metallically separated
Relay- contact voltage	Max. 26V AC / 36V DC, max. 0.5A (cos φ > 0.9), 0.2A (cos φ = 0.4).
Switch-on delay	< 0.5s Signal- Output 15s Heating
Operating voltage	11...28VAC or 11...32VDC (max. 0,75A) Protected against polarity reversal
Current consumption	Heating off: < 12mA
	Heating on: Max. 0.35A (@ 11...12VAC operating voltage). Max. 0.75A (@ 12...27VAC operating voltage). Max. 0.3A (@ 27...32VAC operating voltage).
Sensor area	18cm^2
Sensitivity	Approx. 0.2mm/h
Ambient temperature	-30...+60°C
Protection	IP 66 acc. to DIN 40050
Dimension	See dimension diagram (section 8).
Weight	160g with fixing kit 100g without fixing kit
Material	Housing: Polycarbonate (PC), UV-stabilised, white (RAL 9010) Sensor: Ceramic (aluminum oxide AL2O3), glass-coated Fixing kit: Stainless steel 1.4301.
Connection 5.4106.0x.011 5.4106.00.100 5.4106.00.901	 Cable, non-detachable, type: Li9YFC11Y 4 x 0.25mm², 10m long Cable, non-detachable, type: LiYY 5 x 0.14mm², 3m long Cable, non-detachable, type: LiYY 4 x 0.25mm², 3m long

8 Dimensional Drawing

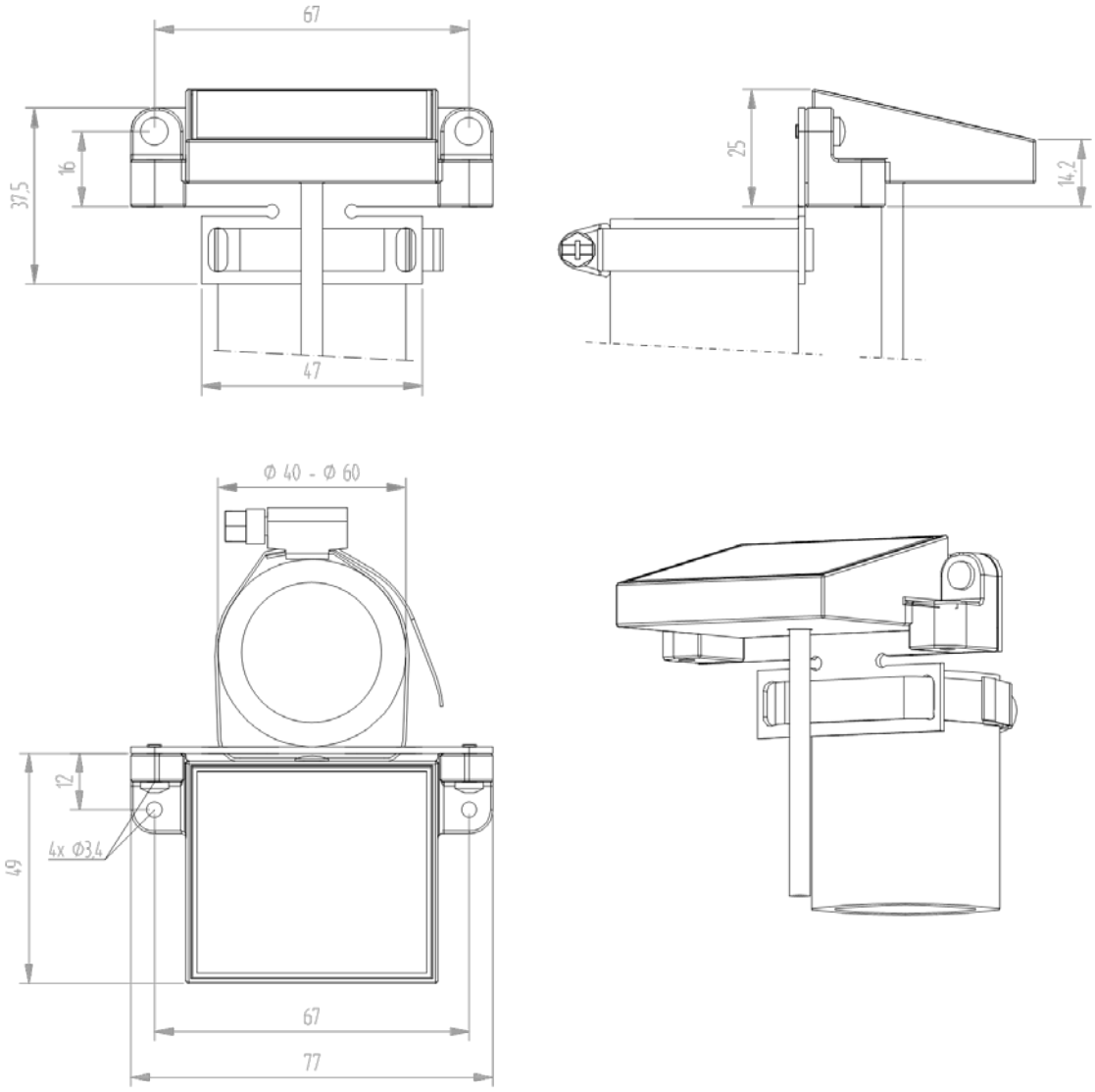


Figure 1: Rain monitor with fixing kit

9 EC-Declaration of Conformity

Manufacturer: Adolf Thies GmbH & Co. KG
Hauptstraße 76
37083 Göttingen, Germany
http://www.thiesclima.com

Product: Precipitation Monitor; (Leitfähigkeit)

Doc. Nr. 903-45167_CE

Article Overview:

5.4106.00.011	5.4106.00.100	5.4106.00.901	5.4106.01.011

The indicated products correspond to the essential requirement of the following European Directives and Regulations:

2014/30/EU	26.02.2014	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
2017/2102/EU	15.11.2017	DIRECTIVE (EU) 2017/2102 of the European Parliament and of the Council of November 15, 2017 amending Directive 2011/65 / EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
2012/19/EU	13.08.2012	DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE).

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

DIN EN IEC 61000-6-2	2019-11	Electromagnetic compatibility Immunity for industrial environment
DIN EN 61000-6-3:2007 + A1:2011	2011-09	Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments
DIN EN 61010-1	2020-03	Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
DIN EN IEC 63000	2019-05	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Göttingen, 29.08.2023

General Manager - Dr. Christoph Peper

Development Manager - ppa. Jörg Petereit

This declaration of conformity is issued under the sole responsibility of the manufacturer.

This declaration certificates 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.

10 UK-CA-Declaration of Conformity

Manufacturer: Adolf Thies GmbH & Co. KG
Hauptstraße 76
37083 Göttingen, Germany
http://www.thiesclima.com

Product: Precipitation Monitor; (Leitfähigkeit)

Doc. Nr. 903-45167_CA

Article Overview:

5.4106.00.011	5.4106.00.100	5.4106.00.901	5.4106.01.011

The indicated products correspond to the essential requirement of the following Directives and Regulations:

1091	08.12.2016	The Electromagnetic Compatibility Regulations 2016
RoHS Regulations 2012	01.01.2021	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
3113	01.01.2021	Regulations: waste electrical and electronic equipment (WEEE)

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

BS EN IEC 61000-6-2	25.02.2019	Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments
BS EN IEC 61000-6-3	30.03.2021	Electromagnetic compatibility (EMC). Generic standards. Emission standard for equipment in residential environments
BS EN 61010-1+A1	31.03.2017	Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
BS EN IEC 63000	10.12.2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Göttingen, 29.08.2023

Legally binding signature:

General Manager - Dr. Christoph Peper

Legally binding signature:

Development Manager - ppa. Jörg Petereit

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We advise you gladly.

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