Particulate-Hygro-Thermo-Baro Sensor Compact

Short - Instruction for Use

First Steps – Start up

1.1007.54.78x

At start of software version V3.13

Dok. No. 022034/05/23

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 Typeographical 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

The list of tables and figures can be found in the appendix.

1 Models

Order no.	Serial interface / Data format / Analogue Output	Supply	Model with
1.1007.54.780	RS 485 HD / THIES ASCII / -	2 x 12 … 30V DC	Measuring electronics with plug, weather and radiation protection with permanently connected 5m cable.
1.1007.54.781	RS 485 HD / MODBUS RTU / -	2 x 12 … 30V DC	

The following parts are included in the scope of delivery:

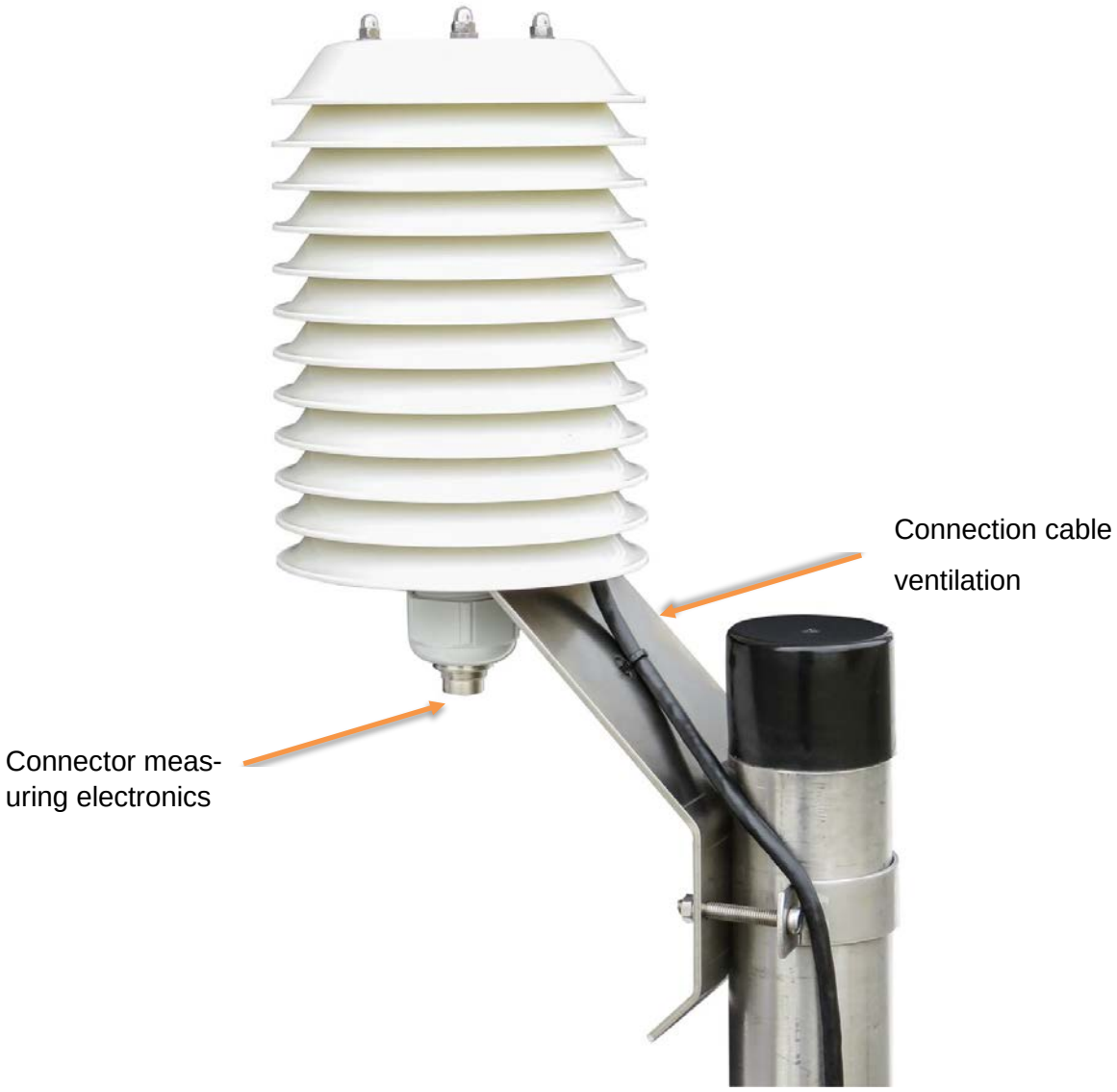
1 x Particulate-hygro-thermo-baro sensor compact
1 x Mating connector for cable assembly
1 x Instructions for use short version (included in the package)
1 x Factory setting (included in the package)

The inductions for use for the particulate-hygro-thermo-baro sensor compact are available for download under the following link:

https://www.thiesclima.com/db/dnl/1.1007.54.78x_Particulate_Hygro_Thermo_Baro_Compact_eng.pdf

2 Electrical Installation

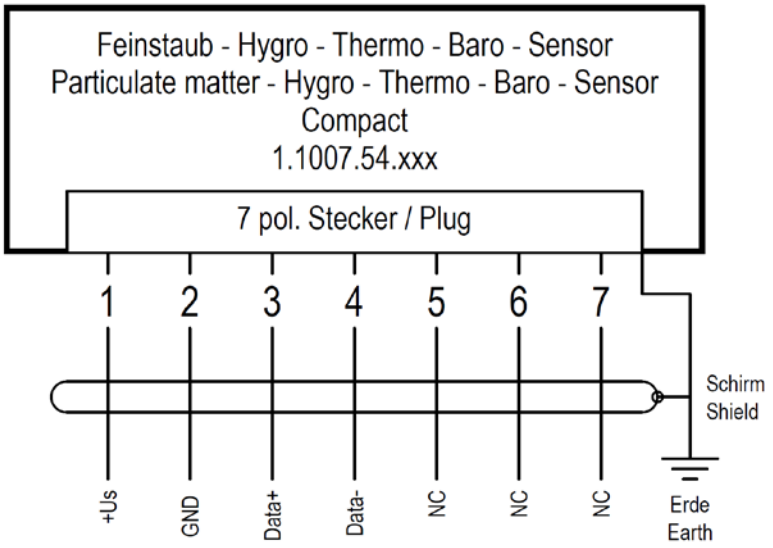
The electrical installation of the particulate-hygro-thermo-baro sensor is divided into two parts. The measuring electronics are connected via a plug connection, which is used both for the power supply and for communication. The ventilation of the weather and radiation protection is connected via a cable that is firmly connected to the device.



2.1 Connection of the measurement electronics

Note:
The RS485 interface is galvanically connected to the supply voltage. The sensor internally contains 2 bias resistors each 47kOhm from RxD to +3.4V and TxD to GND.

2.1.1 Connection Diagram

Order – No.	Connection Diagram
1.1007.54.xxx	

* Outputs 1 to 3 only have a function with analogue output sensors and are configurable

2.1.2 Plug Assignment

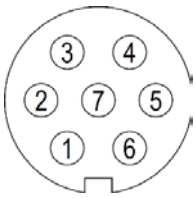
Order – No.	PIN	Name	Function	Core color[1]	Mating connector
1.1007.54.78x	1	+Us	Supply voltage	white	View on the soldered joint of the counter plug 
	2	GND	Ground	brown	
	3	Data+	RS485 Data + (A)	green	
	4	Data-	RS485 Data – (B)	yellow	
	5	NC	Not connected	gray	
	6	NC	Not connected	rose	
	7	NC	Not connected	blue	
	⏚	Shield	-	green – yellow	

Table 1: Plug assignment of the sensor 1.1007.54.78x

2.1.3 Cable for the measurement electronics

The cable to be connected should have the following properties: 4 cores, core cross-section 0.25mm², cable diameter 3 … 5mm, resistant to ultraviolet rays, overall shielding.

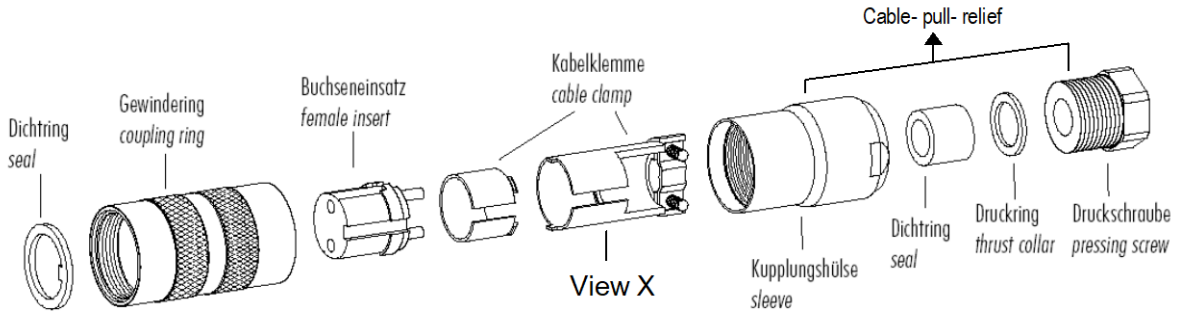
The following procedure is recommended for using the cable shield:

Lay the cable shield between the sensor and the data acquisition system (e.g., datalogger) on both sides. Ground the data acquisition system.

[1] with cable assembly from Thies Clima (accessories). Depending on the variant, the unused cores may not be available

2.1.4 Plug and Cable Mounting

Coupling socket, Type: Binder, Serial 423, EMC with cable clamp



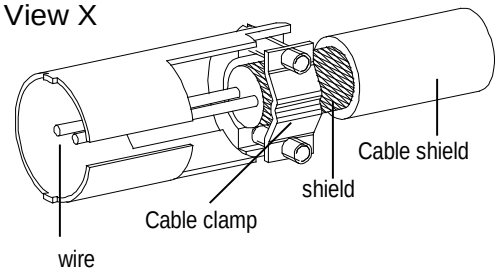
Cable connection: **with** cable shield

1. Stringing parts on cable acc. to plan given above.
2. Stripping cable sheath 20mm
   Cutting uncovered shield 15mm
   Stripping wire 5mm.

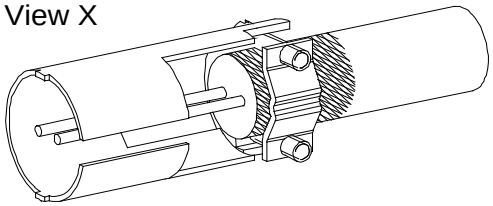
   Cable mounting 1
   Putting shrink hose or insolating tape between wire and shield.

   Cable mounting 2
   If cable diameter permits, put the shield backward on the cable sheath.
3. Soldering wire to the insert, positioning shield in cable clamp.
4. Screwing-on cable clamp.
5. Assembling remaining parts acc. to upper plan.
6. Tightening pull-relief of cable by screw-wrench (SW16 und 17).

Cable mounting 1
View X



Cable mounting 2
View X



2.2 Connection of ventilation

2.2.1 Cable assignment

The permanently connected cable for the ventilation is assigned as follows:

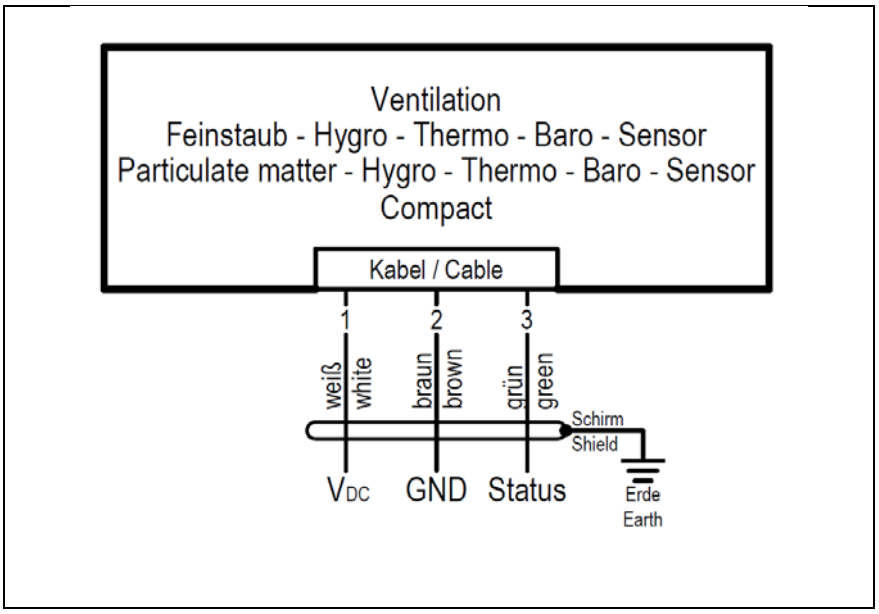


Figure 1: **Ventilation connection diagram**

2.2.2 Fan status

The status output signals the status of the fan. A high signal indicates that the fan is working correctly, if the output is 0V there is a malfunction.

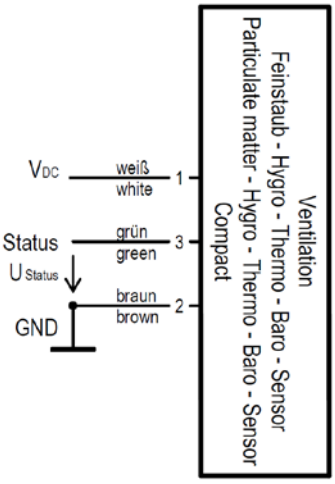


Figure 2: **Connection of the status output**

The voltage U_{Status} takes on following values:

Operating condition	**Voltage U_{Status}**
Normal operation	4,9 … 5,2V
Fan spins too hard / is blocked	0,5 … 0,6V
No supply voltage	0V

Figure 3: Ventilation status output values

3 Technical Data

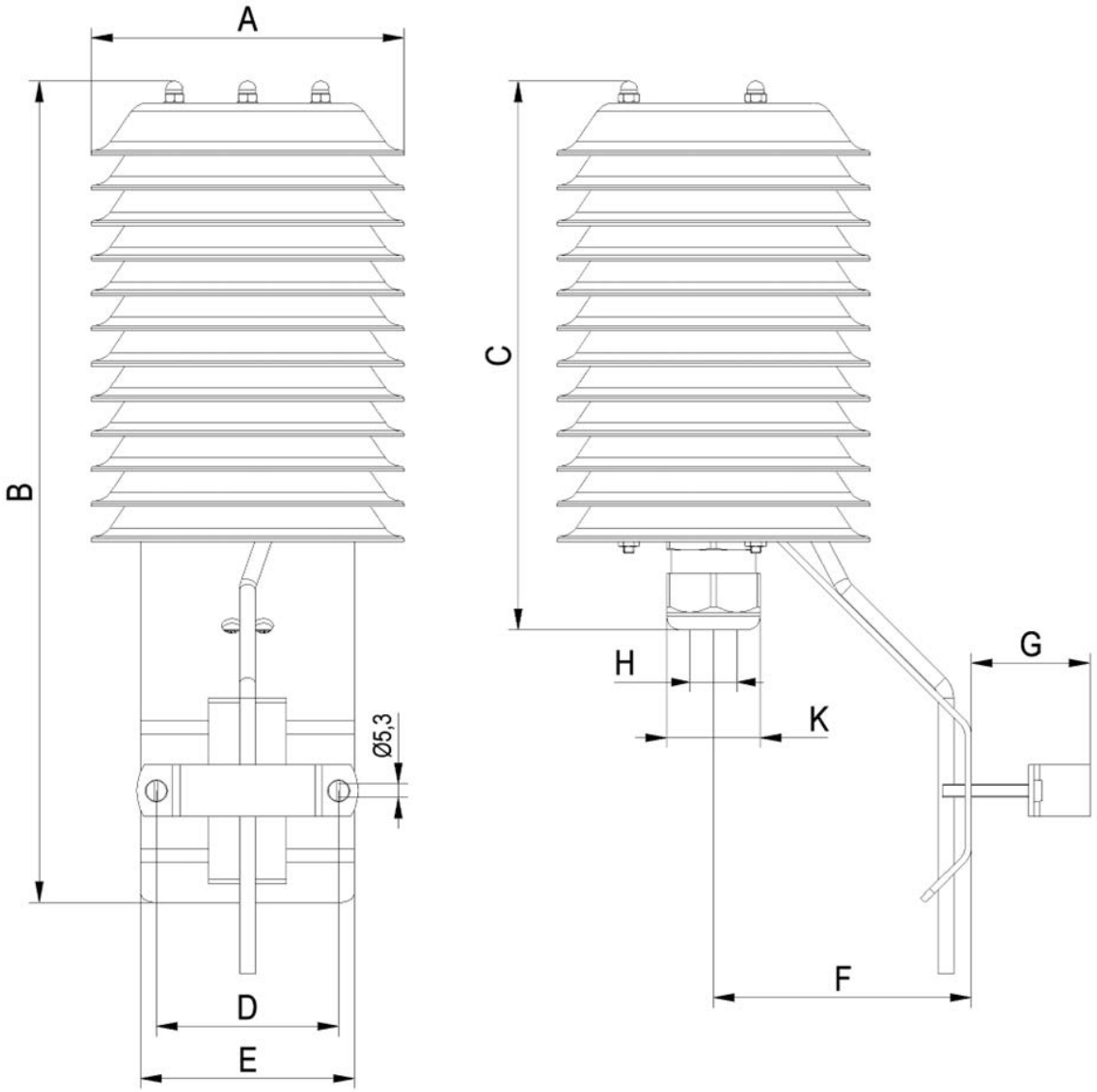
Relative Humidity	
Measuring range	0 … 100% rel. Humidity
Accuracy	Typ. ± 1,5% r. H. @ 25 °C and < 80% r. H. 1,5% r. H. over the complete measuring range
Long-term stability	Typ. < 0,25 rel. humidity / year
Setting time [1]	≤ 35sec
Absolute Humidity	
Accuracy [2]	Better than ± 0,15g/m³ @ -40 … -20 °C Better than 6 % of measuring @ -20 … +60 °C
Air temperature	
Measuring range	-40 … +60 °C
Accuracy	± 0.1 °C @ -40 ... +60 °C @ moved air > 2m/s
Long-term stability	Max. ≤ 0,03 °C / Year
Setting time [1]	≤ 41sec
Dew point temperature	
Accuracy[2]	Better than ±2,0 °C @ 10 … 100% rel. humidity, -40 … +60 °C
Barometric pressure	
Measuring range	300 … 1200hPa
Accuracy	± 0.25hPa @ -20 … +60 °C @ 800 … 1100hPa ± 0.50hPa @ -20 … +60 °C @ 600 … 800hPa
Long-term stability	± 0,3hPa / Year
Setting time [1]	≤ 5s
Particulate matter	
Measuring range	0 … 1000µg/m³
Accuracy (without fog)	**PM2.5** @ -10…+60 °C ± 10µg/m³ @ 0 … 100µg/m³ ± 10% of measuring @ 100 … 1000µg/m³ **PM10** @ -10…+60 °C ± 25µg/m³ @ 0 … 100µg/m³ ± 25% of measuring @ 100 … 1000µg/m³
Long-term stability	Better than ±1,25µg/m³ / Year
Electrical output	
See 1. Models	RS 485 HD
Serial interface	Type: RS485 Operating mode: Half duplex mode Data format: 8N1, 8N2, 8E1, 8E2, 8O1, 8O2, 7E1, 7N1 Baud rate: 2400, 4800, 9600, 19200, 38400, 57600
Resolution (Telegram and interpreter dependent)	Air pressure: 0,01hPa (max.) Humidity: 0,1% rel. humidity Temperature: 0,01 °C (max.) Particulate matter: 0,1µg/m³
Measurement rate	1s
Accuracy	See above
Supply voltage	Voltage: 12 ... 30V DC Measuring electronics via plug socket Ventilation via permanently connected cable
Power consumption	Measurement electronics: typ. 360mW max. 500mW Ventilation: 2W

Further information	
Cable for measurement	LiYCY 4 x 0.25mm² shielded, UV-resistant
Type of connection	Measuring electronics: Connector for data transmission and power supply Ventilation: fixed 5m cable
Admissible environmental conditions	-20 ... +70 °C 0 ... 100 rel. humidity, including condensation
Dimensions	See 4. Dimensional drawing
Weight	Approx. 1,25kg
Type of protection	IP53
Housing material	Stainless steel, polycarbonate

1) $\tau_{63\%}$

2) Derived from the accuracies of humidity and air temperature.

4 Dimensional Drawing



	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H[1] [mm]	K[2] [KS]
1.1007.54.780	Ø120	317	222	70	82	99	Ø35-50	Ø15-21	36

1) H = Sensor diameter; 2) KS = Key size

4.1 Table and Figures Overview

Table overview:

Figures overview:

5 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.

Short instruction for use

https://www.thiesclima.com/db/dnl/1.1007.54.78x_Particulate_Hygro_Thermo_Baro_Compact_FirstSteps_eng

Instruction for use

https://www.thiesclima.com/db/dnl/1.1007.54.78x_Particulate_Hygro_Thermo_Baro_Compact_eng.pdf

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

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