WSA RS485 Modbus

Outdoor sensor for relative humidity and temperature

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
Issue date: 13.06.2016

Application

Protected temperature and humidity sensor for outside applications. The Radiation shield protects the outside sensors from rain and radiated heat. With the curved shape and color of the plates air flow is able to move across the sensors to keep radiated temperatures from rooftops and surrounding surfaces from affecting humidity readings.

Types Available

Weather protection - outdoor sensor temperature + humidity – active RS485 Modbus

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Security Advice – Caution

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with
- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Notes on Disposal

As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

Build-up of Self-Heating by Electrical Dissipative Power

Temperature sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power has to be considered when measuring temperature. In case of a fixed operating voltage (±0,2 V) this is normally done by adding or reducing a constant offset value. As Thermokon transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers 0..10 V / 4..20 mA have a standard setting at an operating voltage of 24 V =. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

Remark: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

Application Notice for Humidity Sensors

Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.

For standard environmental conditions re-calibration is recommended once a year to maintain the specified accuracy.

When exposed to high ambient temperature and/or high levels of humidity or presence of aggressive gases (i.e. chlorine, ozone, ammonia) the sensor element may be affected and re-calibration may be required sooner than specified. Re-calibration and deterioration of the humidity sensor due to environmental conditions are not subject of the general warranty.

Technical Data

Measuring values	temperature, humidity
Network technology	RS485 Modbus, RTU or ASCII, half-duplex, baud rate 9.600, 19.200, 38.400 or 57.600, parity: non (2 stopbits), even or odd (1 stopbit)
Power supply	15..24 V = (±10%) or 24 V ~ (±10%)
Power consumption	max. 0,7 W (24 V =) | 1,8 VA (24 V ~)
Measuring range temp.	-20..+80 °C
Measuring range humidity	0..100% rH non-condensing
Accuracy temperature	±0,5 °C (typ. at 25 °C)
Accuracy humidity	±2% between 10..90% rH (typ. at 70 °F)
Enclosure	PA6, pure white
Protection	IP65 according to EN 60529
Cable entry	M20 for cable max. Ø=8 mm
Connection electrical	terminal block, max. 1,5 mm²
Pipe	PA6, black, 19,5 mm, Length=140 | 270 | 400 mm (optional)
Filter	stainless steel wire mesh
Ambient condition	-20..+70 °C, max. 85% short term condensation
Mounting	wall mounting or on a mast tube

Terminal connection
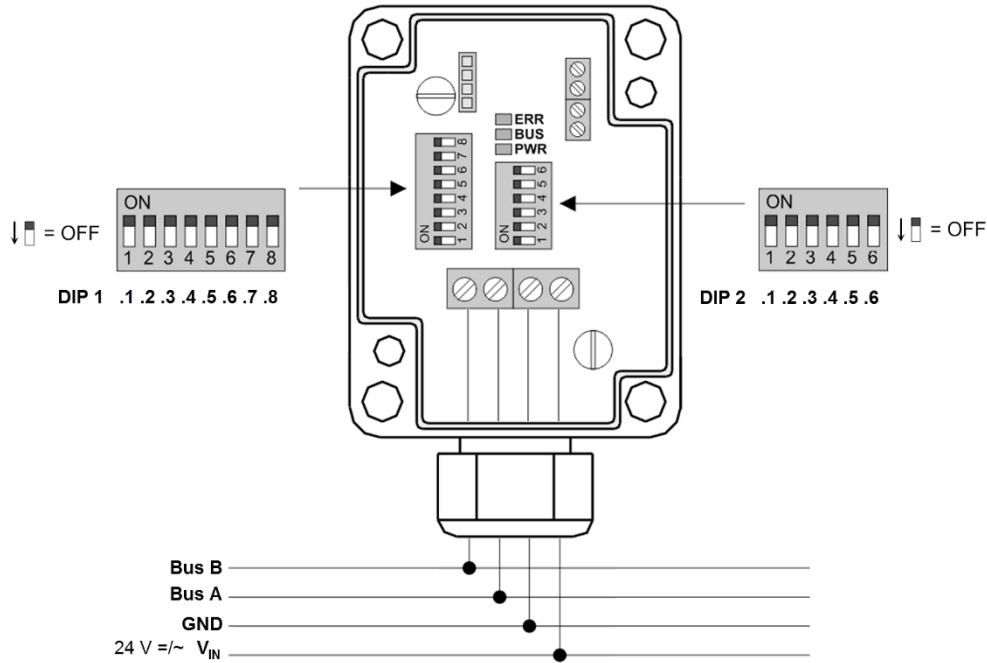
LED	Description
ERR	Indicator for error notification
BUS	Indicator for RS485 traffic
PWR	Power supply

Device Address (binary coded)

DIP 1.1	DIP 1.2	DIP 1.3	DIP 1.4	DIP 1.5	DIP 1.6	DIP 1.7	DIP 1.8	Adresse
2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	*Significance*
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1 (default)
OFF	**ON**	OFF	OFF	OFF	OFF	OFF	OFF	2
ON	**ON**	OFF	OFF	OFF	OFF	OFF	OFF	3
…	…	…	…	…	…	…	…	…
ON	**ON**	**ON**	**ON**	OFF	OFF	OFF	OFF	15
…	…	…	…	…	…	…	…	…
ON	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	247

Options

DIP 2.1	Modus
OFF	RTU
ON	ASCII

DIP 2.2	DIP 2.1	Baud
OFF	OFF	9600
ON	OFF	19.200
OFF	ON	38.400
ON	ON	57.600

DIP 2.4	DIP 2,5	Parity
ON	OFF	even
OFF	ON	Odd
OFF	OFF	No
ON	ON	Not used

| DIP 2.6	not used
OFF	
ON	

When using ASCII mode, parity must be set to EVEN or ODD. „No Parity" (no) is not available in ASCII mode.

RS485 Modbus Register

Data adress (Register)	Function code	Description	Type
585_{dec} $0x249_{hex}$	4	relative humidity[1/10] %	SIGNED 16 Bit
587_{dec} $0x24B_{hex}$	4	temperature [1/100] °C	SIGNED 16 Bit
5_{dec} $0x005_{hex}$	3	temperature offset [1/100] K	SIGNED 16 Bit

Sample: rh   = 01E2hex = 0482dec = 48,2%
   temp   = 0B21hex = 2849dec = 28,49 °C

Mounting Advices
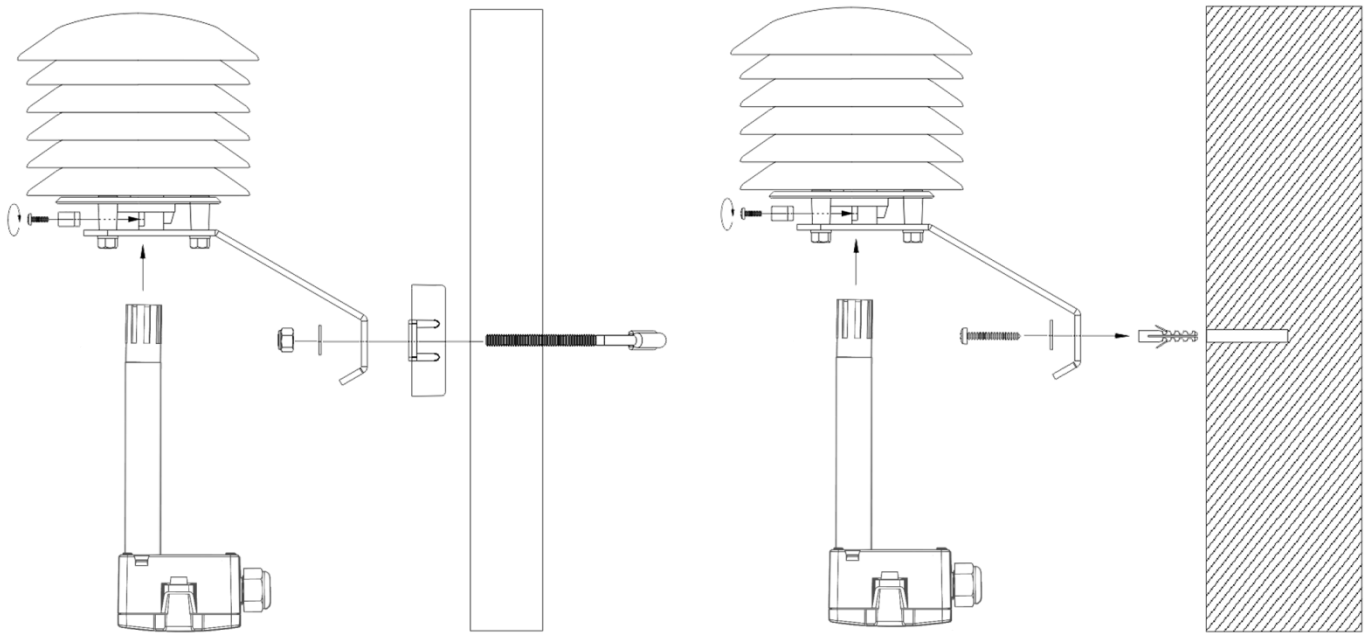
Application Notice

After a certain time, dirt in the air can collect on the filter and then adversely affect the operation of the sensor. Under normal ambient condition an annual maintenance is recommended. Rinse the filter after cleaning with distilled water and dry it using clean oil-free air or nitrogen. Extremely contaminated filters should be replaced. At extreme ambient conditions, e.g. corrosive gases, the humidity sensor may have to be changed.

Dimensions (mm)

78

50

58

47

15

SW24/M20

45,5

42,5

L 1

L 2

78

19,5
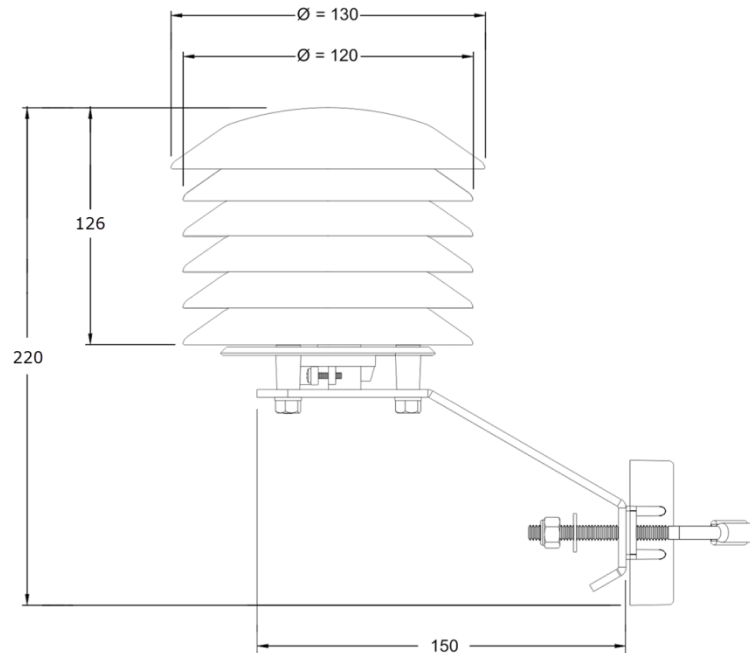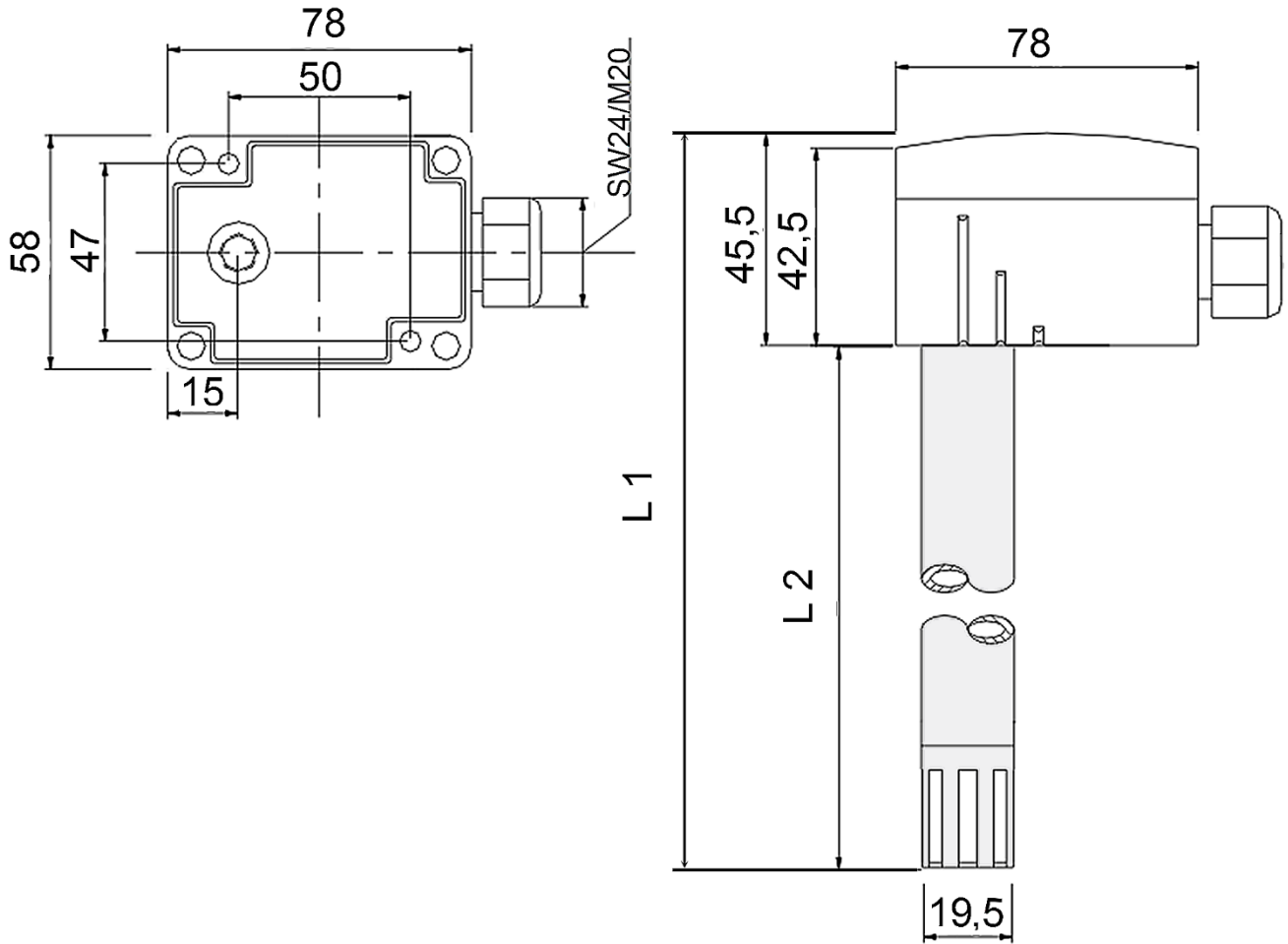
Accessories (optional)

Filter stainless steel, wire mesh (spare part)   Item No. 231169
Weather protection for FTK, FTK+, WSA (replacement)   Item No. 625241