

### Datasheet

Subject to technical alteration  
Issue date: 24.10.2017



### Application

Cable sensor for temperature measurement for HVAC applications. In conjunction with a Thermowell pocket suitable temperature measurement in immersion temperature applications. Designed for control and monitoring applications.

### Types Available

#### Cable temperature sensor – passive

TF25 <sensor> T<x> <xxx>.06 L1000

#### Cable temperature sensor – active TRV 0..10 V | TRA 4..20 mA

TF25 TRV MultiRange T180 <xxx>.06 L1000

TF25 TRA MultiRange T180 <xxx>.06 L1000

<sensor>: PT100/PT1000/Ni1000/Ni1000TK5000/LM235Z/NTC.../PTC...other sensors on request

T<x>: max. temperature 100/125/150/180 °C

<xxx>: pocket length 50/100/150/200/250 mm

L1000: standard cable length 1000 mm, additional probe and cable lengths on request

MultiRange: Measuring range adjustable at the transducer

### 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.

## General remarks concerning sensors

Especially with regard to passive sensors in 2-wire conductor versions, the wire resistance of the supply wire has to be considered. If necessary the wire resistance has to be compensated by the follow-up electronics. Due to self-heating, the wire current affects the measurement accuracy. So it should not exceed 1 mA.

When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Sensing devices with transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage ( $\pm 0,2$  V). When switching the supply voltage on/off, onsite power surges must be avoided.

## 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 ( $\pm 0,2$  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.**

## Technical Data

Measuring values		temperature
Output voltage	TRV	0..10 V, min. load 5 k $\Omega$
Output Amp	TRA	4..20 mA, max. load 500 $\Omega$
Power supply	TRV	15..24 V = ( $\pm 10\%$ ) or 24 V ~ ( $\pm 10\%$ )
	TRA	15..24 V = ( $\pm 10\%$ )
Power consumption	TRV	max. 0,45 W (24 V =)   0,8 VA (24 V ~)
	TRA	max. 0,5 W (24 V =)
Measuring range temp	passive	depending on used sensor
	TRV1/TRA1	-50..+50 °C
	TRV2/TRA2	-10..+120 °C
	TRV3/TRA3	0..+50 °C (standard)
	TRV4/TRA4	0..+160 °C
	TRV8/TRA8	-15..+35 °C
Working range temp	passive	depending on used sensor, 400 °C (optional)
	active	-50..160 °C
Accuracy temperature	passive	depending on used sensor
	active	$\pm 1\%$ of measuring range (typ. at 21 °C), with cable max. 2 m
Sensor	passive	2-wire (standard), 3-wire oder 4-wire sensor cable 1   2   4   6 m
Enclosure	active	PA6.6, white, with quick lock screws
Protection	Enclosure	IP65 according to EN 60529
	Sensor	IP65 according to EN 60529, hexagon pressed   IP67 according to EN 60529, rolling with SI-Protection
Cable entry	active	M20 for cable with max. $\varnothing=8$ mm
Connection electrical		terminal block, max. 1,5 mm <sup>2</sup>
Pocket		stainless steel Mat. 1.4571, $\varnothing=6$ mm, mounting length 50   100   150   200   250 mm
Ambient condition		-35..+70 °C, max. 85% rH short term condensation
Weight	passive	30 g
	TRV   TRA	145 g
Notes	passive	cable ends with conductor sleeves as standard, additional probe and cable lengths on request, sensor cable 2 m, mounting length 50 mm
	TF25 400°C	

## Mounting Advice

Depending on the application, the cable temperature sensor is assembled to the air duct by means of a mounting flange respectively a clamp screw joint.

Operation of the sensor with an immersion pocket: Use contact fluid for better heat transfer between sensor and measuring medium.

When using our sensing elements in moist rooms or for purposes in refrigeration technology, we recommend to use version IP67.

## Connection Plan

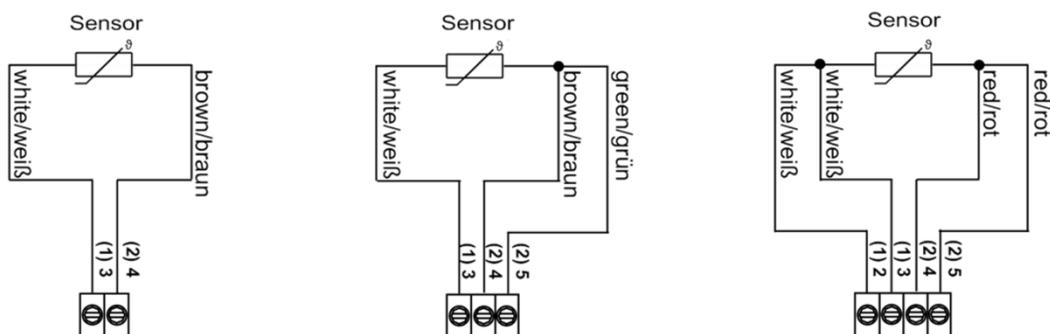


fig. (terminal assignment passive sensor)

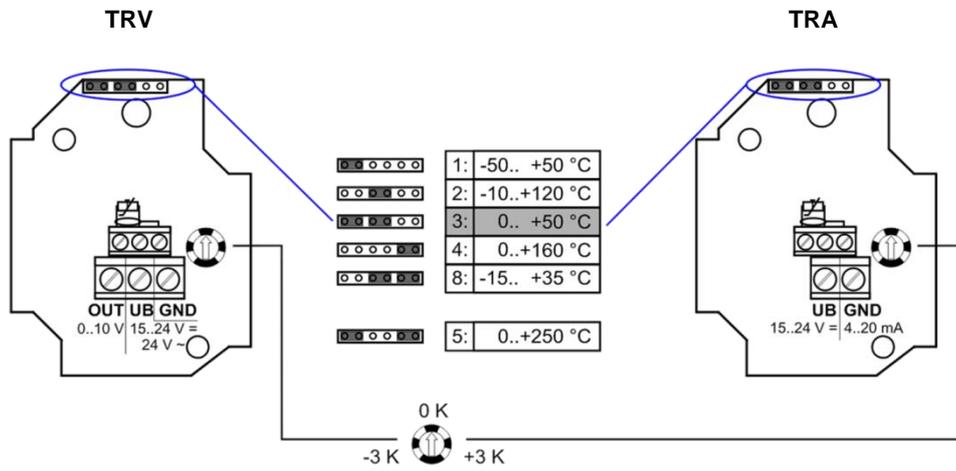
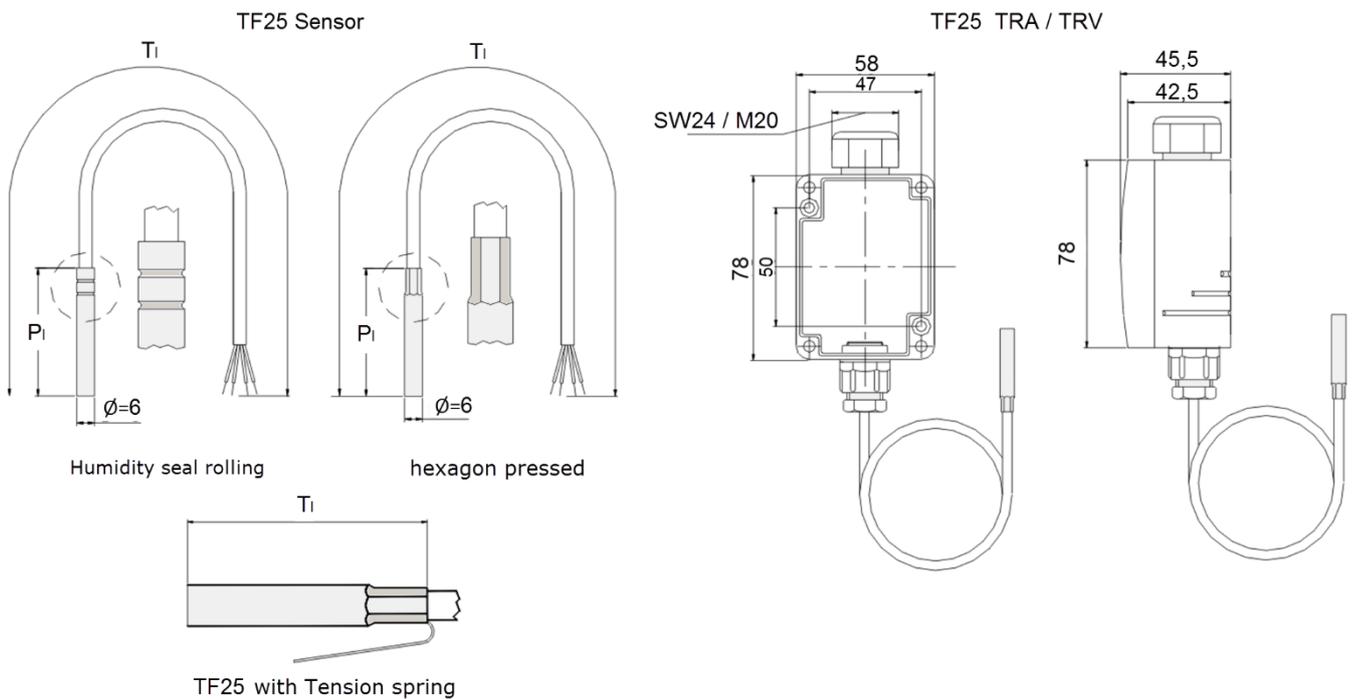


fig. (Measuring range and offset adjustment, default settings: 0 °C..+50 °C | 0 K)

## Dimensions (mm)



- T<sub>1</sub> (Total length) = 1 | 2 | 4 | 6 m
- P<sub>i</sub> (Pocket length) = 50 | 100 | 150 | 200 | 250 mm

## Accessories (optional)

Mounting flange MF6 (brass)

Item No. 003407

Mounting flange MF7 flexible (incl. inserts for Ø=4mm / 6mm)

Item No. 399098

Compression fittings G 1/4" for Ø=6 mm with cutting ring VA, stainless steel

Item No. 103213

### Thermowell pockets stainless steel / brass for sensors with pocket Ø=6 mm

length	50 mm	100 mm	150 mm	200 mm	250 mm
THMSDS	610995	611008	611015	611022	611763
THVADS	611152	611817	611824	611848	611862

MS-thermowell pocket (brass, suitable up to 16 bar) type THMSDS <xx>.

VA-thermowell pocket (stainless steel, suitable up to 40 bar) type THVADS <xx>.