

### Datasheet

Subject to technical alteration  
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### Application

Duct/Immersion sensor for measurement of air temperature and other gaseous mediums for HVAC applications (e.g. supply and exhaust ducts).

Can be used as an immersion temperature sensor combined with a thermowell pocket.

### Types Available

#### Duct/Immersion sensor temperature – passive

AKF10+ <sensor> <xxx>.0x

#### Duct/Immersion sensor temperature – active TRV 0..10 V | TRA 4..20 mA

AKF10+ TRV MultiRange <xxx>.06

AKF10+ TRA MultiRange <xxx>.06

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

<xxx>: mounting length 1.97/3.94/5.9/7.87/9.84/11.81/17.7 in.

0x: .06 = Pocket Ø 6 mm (0.24 in.) / .04 = Pocket Ø 4 mm (0.16 in.)

MultiRange: Measuring ranges 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 a 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.

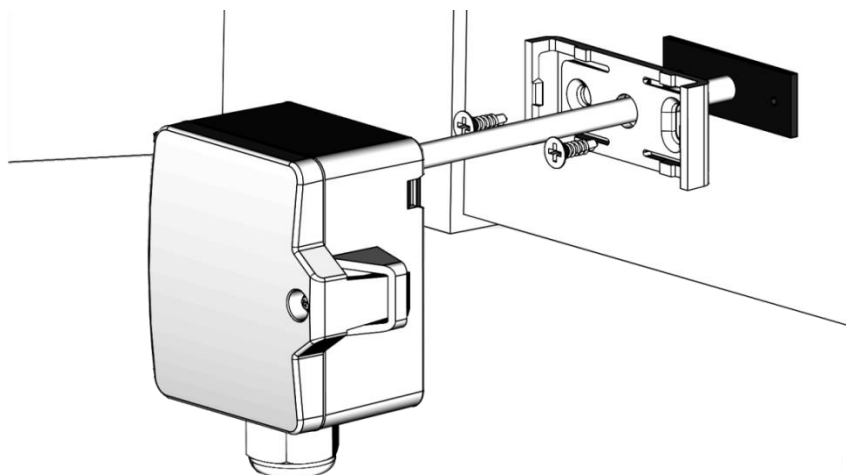
**Remark: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.**

## Technical Data

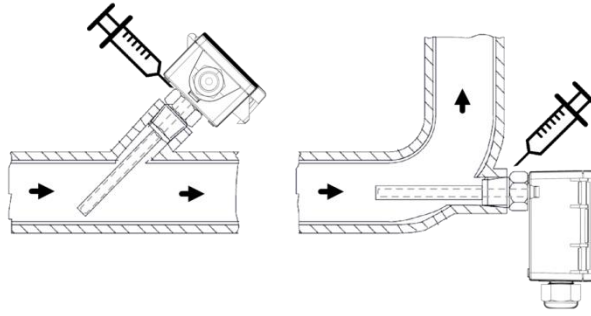
<b>Measuring values</b>	temperature			
<b>Output voltage</b>	<b>TRV</b> 1x 0..10 V or 0..5 V, configurable via jumper, min. load 5 k $\Omega$			
<b>Output ampere</b>	<b>TRA</b> 1x 4..20 mA, max. load 500 $\Omega$			
<b>Output passive</b>	<b>passive</b> optional, PT100/PT1000/Ni1000/Ni1000TK5000/LM235Z/NTC.../PTC... other sensors on request			
<b>Power supply</b>	<b>TRV</b> 15..24 V = ( $\pm$ 10%) or 24 V ~ ( $\pm$ 10%) SELV	<b>TRA</b> 15..24 V = ( $\pm$ 10%) SELV		
<b>Power consumption</b>	<b>TRV</b> typ. 0,4 W (24 V =)   0,8 VA (24 V ~)	<b>TRA</b> typ. 0,5 W (24 V =)		
<b>Measuring range temp.</b>	<b>passive</b> -60..+260 +300 +320 +500 °F, depending on used sensor			
<b>Output signal range temp.</b> *Scaling analogue output	<b>TRV   TRA</b> default setting: 0..+150 °F selectable from 8 temperature ranges -30..+130   0..+250   +40..+140   0..+150   +30..+480   0..+100   +40..+240   +40..+90 °F, adjustable at the transducer			
<b>Operating temperature range</b> * Max. permissible operating temperature	<b>sensor pocket</b> -58..+320 °F optional -112..+500 °F	<b>electronic – TRV TRA</b> -31..+158 °F	<b>electronic – passive</b> -31..+194 °F	<b>mounting clip   base</b> -31..+194 °F
<b>Accuracy temperature</b>	<b>TRV   TRA</b> $\pm$ 0,5 K (typ. at 70 °F within default measuring range)		<b>passive</b> typ. $\pm$ 0,3 K (typ. at 70 °F), depending on used sensor	
<b>Sensor</b>	<b>passive</b> 2-wire (default), 3-wire or 4-wire			
<b>Enclosure</b>	enclosure USE-S, PC, pure white			
<b>Protection</b>	IP65 according to EN 60529, SI-Protection			
<b>Cable entry</b>	Flextherm M16, for wire max. $\varnothing$ =0.12..0.28 in., removable			
<b>Connection electrical</b>	removable plug-in terminal, max. 14AWG			
<b>Pocket</b>	stainless steel V4A, $\varnothing$ =0.24 in., optional $\varnothing$ =0.16 in., mounting length: 1.97   3.94   5.9   7.87   9.84   11.81   17.7 in.			
<b>Ambient condition</b>	max. 85% rH short term condensation			
<b>Mounting</b>	with duct temperature of +194..+250 °F mounting flange MF6 flexible, at +250..+500 °F mounting flange MF6 (brass) is recommended			

## Mounting Advices

The sensor can be mounted on the ventilation duct either by means of the mounting clip. For risk of condensate permeation in the sensor tube respectively in the immersion pocket the bushing must be installed in a position that occurred condensate can run off.



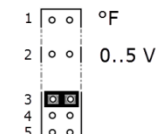
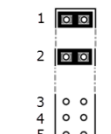
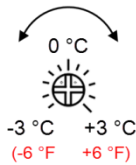
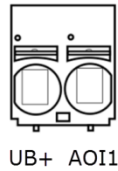
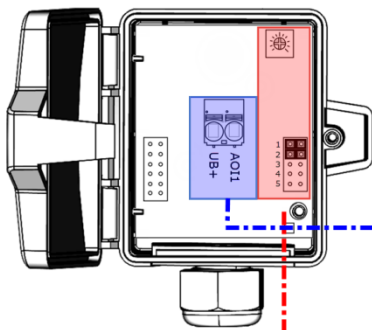
Mounting with immersion pocket or compression fitting for usage in liquid media. Use contact fluid for better heat transfer between sensor and measuring medium.



### Connection Plan and Configuration

The adjustment of the measuring ranges is made by changing the jumpers in a de-energized state. The output value of the new measuring range is available after 2 seconds. Jumper 2 has no function for type TRA.

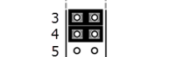
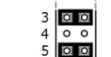
TRA:  
4..20 mA



-50 °C..+50 °C  
(-30 °F..+130 °F)

-10 °C..+120 °C  
(0 °F..+250 °F)

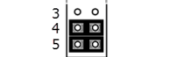
0 °C..+50 °C  
(+40 °F..+140 °F)



0 °C..+100 °C  
(+40 °F..+240 °F)

0 °C..+250 °C  
(+30 °F..+480 °F)

-15 °C..+35 °C  
(0 °F..+100 °F)



0 °C..+160 °C  
(0 °F..+150 °F)

-20 °C..+80 °C  
(+40 °F..+90 °F)

TRV:  
0..10 V | 0..5 V

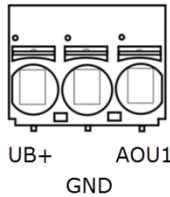
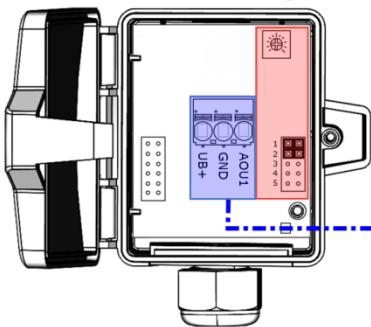
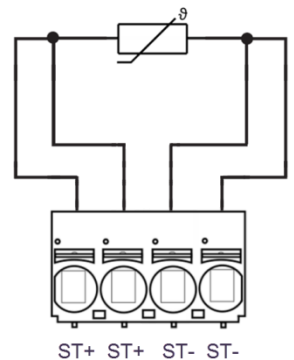
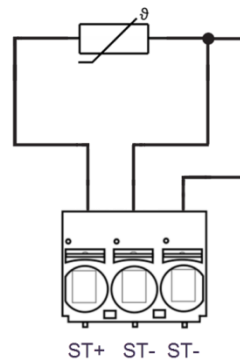
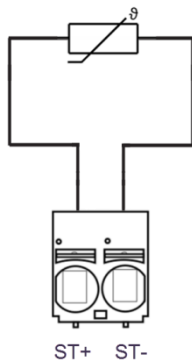
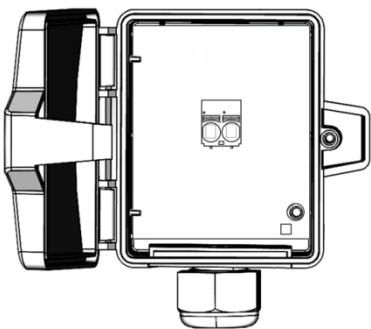
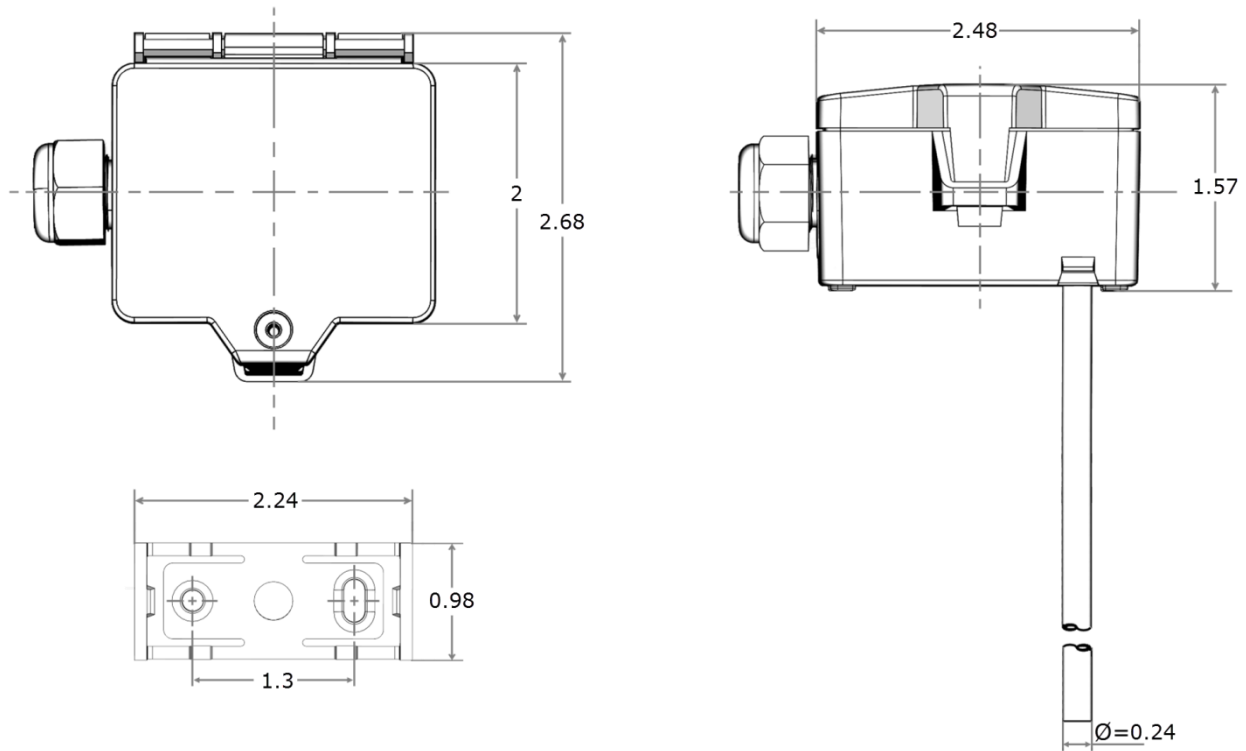


fig. (Measuring range and offset adjustment, default settings: 0 °F..+150 °F | 0 F)

Passive



**Dimensions (in.)**



Pocket Ø=0.16 in. optional

**Accessories (included in delivery)**

Mounting kit AKF10+ Item No. 637978  
 • Cover screw + screw cover • 2 Screws • mounting clip + self-adhesive seal

**Accessories (optional)**

VA-Compression fitting type KL6VA (suitable for 0.24 in.) Item No. 103213  
 VA-Compression fitting type KL4VA (suitable for 0.16 in.) Item No. 103206  
 Mounting base enclosure USE pure white Item No. 667722  
 Mounting flange MF6 flexible (suitable for Ø=0.16 | 0.24 | 0.28 in.) Item No. 399098  
 Mounting flange MF6, brass (suitable for Ø=0.24 in.) Item No. 003407  
 Mounting flange MF4, brass (suitable for Ø=0.16 in.) Item No. 102438  
 Syringe thermal contact fluid Item No. 102308

**M16 Sealing inserts cable entry (packaging unit 10 pcs.)**

for wire with Ø	5/16"
Item No	641340

**Thermowell pockets stainless steel / brass for sensors with pocket Ø=0.24 in.**

length	1.97 in.	3.94 in.	5.9 in.	7.87 in.	9.84 in.	11.81 in.	17.7 in.
THMSDS	610995	611008	611015	611022	611763	611039	611046
THVADS	611152	611817	611824	611848	611862	611879	611893

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>.