

# SFK02+ FR

Immersion temperature sensor

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
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### » APPLICATION

Immersion sensor with hinged lid enclosure USE complete and integrated thermowell pocket for temperature measurement of gases and liquids in pipework applications. Sensor is especially designed for fast processes. Ideal for e.g. hot tap water process when a very fast feedback is needed for a pleasant control result.

### » TYPES AVAILABLE

#### Immersion sensor temperature – passive

- SFK02+ FR <sensor> <xxx>.06/04

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

- SFK02+ FR TRV MultiRange <xxx>.06/04
- SFK02+ FR TRA MultiRange <xxx>.06/04

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

<xxx>: mounting length 1.97/3.94/7.87/11.8 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

### » PRODUCT TESTING AND CERTIFICATION



#### Declaration of conformity

The declaration of conformity of the products are available on our website  
<https://www.thermokon.de/direct/en-gb/categories/sfk02plus-fr>

## » NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: [www.thermokon.com](http://www.thermokon.com)

## » 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.

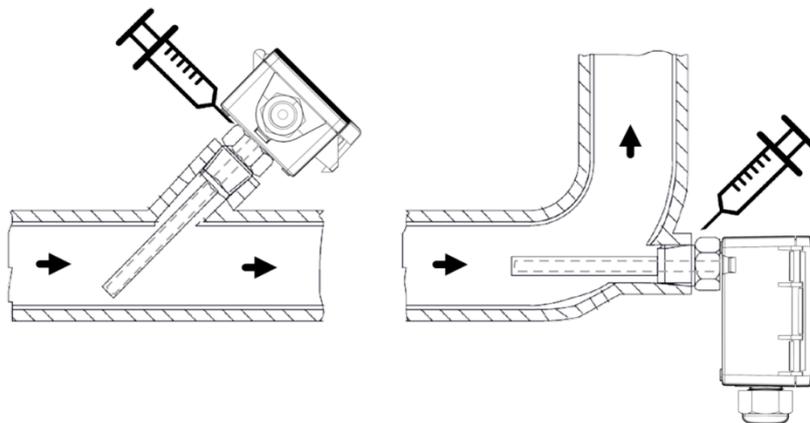
## » BUILD-UP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

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.**

## » MOUNTING ADVICES

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 for usage in liquid media. Use contact fluid for better heat transfer between sensor and measuring medium.



## » USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

After some time, outdoor mounted plastics can lose their color and quality. Therefore, all USE housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide used is specially developed for polycarbonate and offers excellent UV protection through the reflection of the entire light spectrum including the UV component by 340 nm. This effectively counteracts the otherwise occurring photochemical polymer degradation. The colors stay full for a long time without fading. The material is also resistant to cold and frost.

» **TECHNICAL DATA**

<b>Measuring values</b>	temperature		
<b>Medium</b>	gases, fluids		
<b>Output voltage</b> <i>(type-dependent)</i>	<b>TRV</b> 1x 0..10 V or 0..5 V, configurable via jumper, min. load 5 kΩ		
<b>Output ampere</b> <i>(type-dependent)</i>	<b>TRA</b> 1x 4..20 mA, max. load 500 Ω		
<b>Output passive</b> <i>(type-dependent)</i>	<b>passive</b> optional, PT100/PT1000/Ni1000/Ni1000TK5000/LM235Z/NTC.../PTC... other sensors on request		
<b>Power supply</b> <i>(type-dependent)</i>	<b>TRV</b> 15..24 V = (±10%) or 24 V ~ (±10%) SELV	<b>TRA</b> 15..24 V = (±10%) SELV	
<b>Power consumption</b> <i>(type-dependent)</i>	<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> <i>(type-dependent)</i>	<b>passive</b> -60..+300 +320 °F, depending on used sensor		
<b>Output signal range temp.</b> <i>*Scaling analogue output</i> <i>(type-dependent)</i>	<b>TRV   TRA</b> 0..+150 °F (default setting), selectable from 8 temperature ranges -30..+130   0..+250   +40..+140   0..+150   +30..+480   0..+100   +40..+240   +40..+90 °F, optionally adjustable at the transducer		
<b>Operating temperature range</b> <i>* Max. permissible operating temperature</i>	<b>sensor pocket</b> -58..+320 °F	<b>electronic – TRV TRA</b> -31..+158 °F	<b>electronic - passive</b> -31..+194 °F
<b>Accuracy temperature</b> <i>(type-dependent)</i>	<b>TRV   TRA</b> ±0,5 K (typ. at 70 °F within default measuring range) time constant: T <sub>63%</sub> 2,5 s	<b>passive</b> depending on used sensor time constant: T <sub>63%</sub> 2,5 s	
<b>Sensor</b> <i>(type-dependent)</i>	<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 M20, for wire max. Ø=0.18..0.35 in., removable		
<b>Connection electrical</b>	removable plug-in terminal, max. 14AWG		
<b>Pocket</b>	stainless steel V4A, Ø=0.24   0.16 in., mounting length: 1.97   3.94   7.87   11.8 in., thread R 1/2" max. operating pressure 10 bar (145psi)		
<b>Ambient condition</b>	max. 85% rH short term condensation		

» **CONNECTION PLAN AND CONFIGURATION**

**Passive**

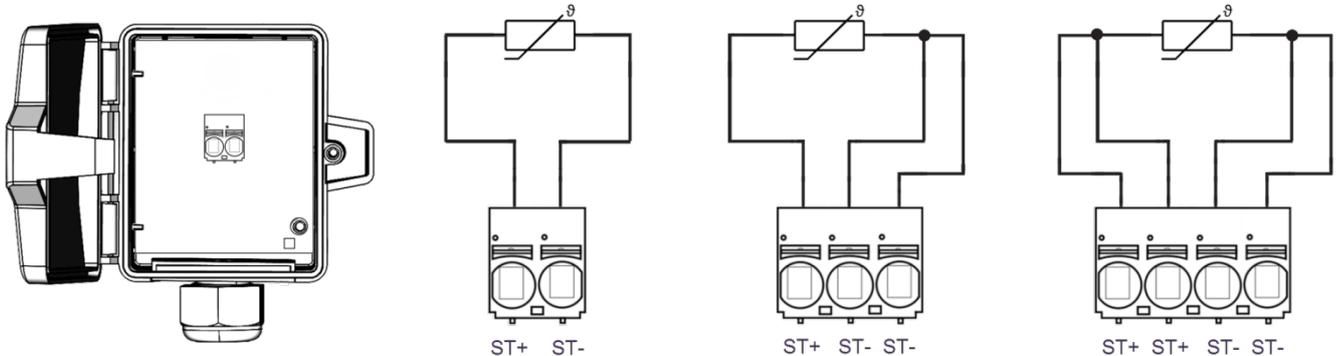


fig. (terminal assignment passive sensor)

**Active**

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.

**TRV**  
0..10V | 0..5V

UB+ AOU1  
GND

**TRA**  
4..20mA

UB+ AO11

**Temperature Offset**

0 K  
-6°F +6°F

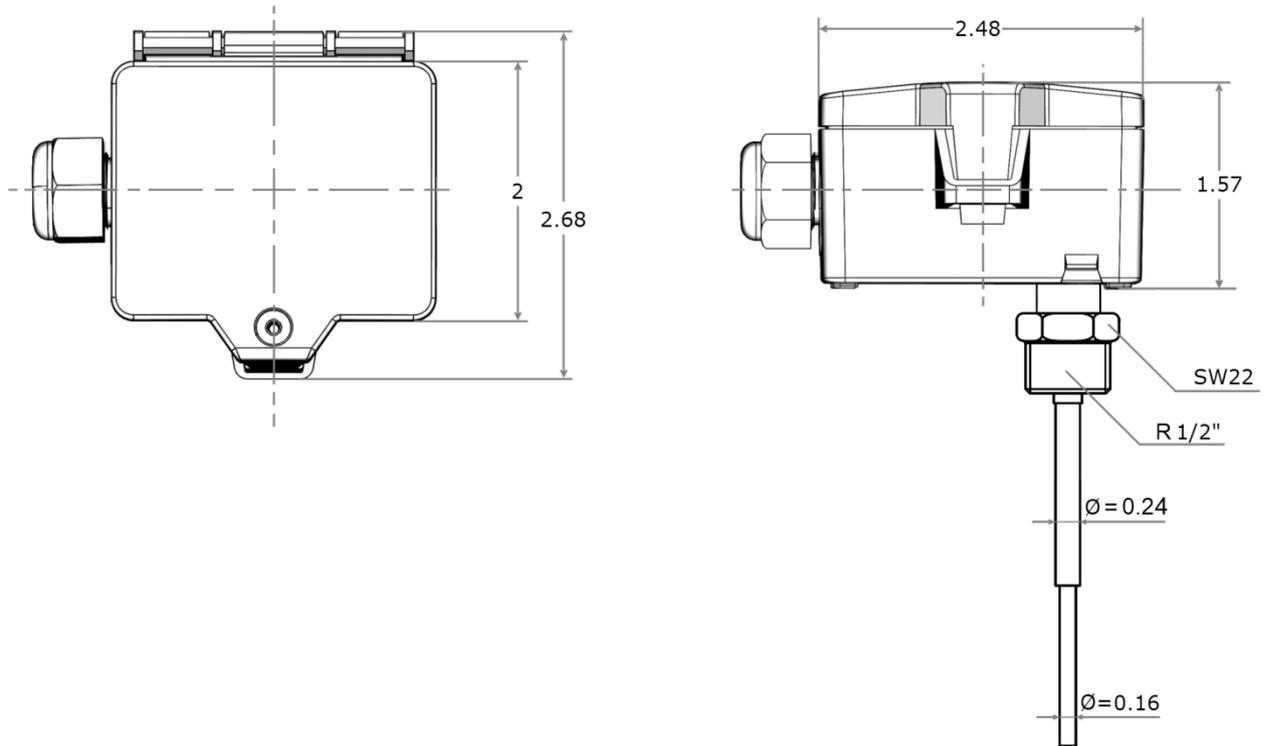
**Jumper 1-5**

1		1		°C		°F (additional. Informationen below)
2		2		0..10V		0..5 V <i>TRV only</i>
3		3		0 0 0		+40°F..+240°F
4		4		0 0 0		+40°F..+90°F
5		5		0 0 0		+30°F..+480°F
3		3		0 0 0		0°F..+100°F
4		4		0 0 0		0°F..+150°F
5		5		0 0 0		0°F..+150°F

EN datasheet with additional Informationen about °C

fig. (Measuring range and offset adjustment, default settings: -30 °F..+130 °F | 0 K)

**» DIMENSIONS (IN.)**



**» ACCESSORIES (INCLUDED IN DELIVERY)**

Mounting kit universal  
 • Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 698511

**» ACCESSORIES (OPTIONAL)**

Sealing insert M20 USE white, 2x Ø=0.28 in. (for 2 wire; PU 10 pieces)

Item No. 641333