TS-DI Series

Duct/Immersion temperature sensor

Overview

Duct/Immersion sensor for measurement of air temperature and other gaseous mediums for HVAC applications

Applications

- Supply and exhaust ducts in HVAC systems
- Can be used as an immersion temperature sensor when combined with a thermowell pocket

Features & Benefits

- Robust design: UV-resistant case
- Extended operating temperature range
- Ease of installation
- Tool-free and removable connectors

Model Selection

TS-DI <xxx>	Duct/Immersion sensor temperature – passive
TS-DI V <xxx>	Duct/Immersion sensor temperature – active V 0..10 V
TS-DI A <xxx>	Duct/Immersion sensor temperature – active A 4..20 mA

<xxx>: mounting length 50/100/150/200/250/300/450 mm

Product Specifications

Measuring Values — Temperature

Output

- Voltage (TS-DI V) — 1x 0..10 V or 0..5 V, configurable via jumper, min. load 5 kΩ
- Ampere (TS-DI A) — 1x 4..20 mA, max. load 500 Ω
- Passive — NTC10K Type II

Power supply

- TS-DI V — 15..24 V = (±10%) or 24 V ~ (±10%) SELV
- TS-DI A — 15..24 V = (±10%) SELV

Power consumption

- TS-DI V — typ. 0,4 W (24 V =) | 0,8 VA (24 V ~)
- TS-DI A — typ. 0,5 W (24 V =)

Measuring range temp. (passive) — -50..+150 °C

Output signal range temp. (TS-DI V | A)[1] — default setting: 0..+160°C
selectable from 8 temperature ranges -50..+50 | -20..+80 | -15..+35 | 10..+120 | 0..+50 | 0..+100 | 0..+160 | 0..+250 °C, adjustable at the Transducer

Accuracy temperature

- TS-DI V | A — ±0,5 K (typ. at 21 °C within default measuring range)
- Passive — ±0,22 °C / 25 °C

Sensor (passive) — 2-wire (default), 3-wire or 4-wire

Enclosure — PC, pure white, UV resistant

Protection — IP65 according to EN 60529, SI-Protection

Cable entry — Flextherm M20, for wire Ø=4,5..9 mm, removable

Electrical connection — removable plug-in terminal, max. 2,5 mm²

Pocket — stainless steel V4A, Ø=6 mm, mounting length: 50 | 100 | 150 | 200 | 250 | 300 | 450 mm

Ambient conditions — max. 85% rH short term condensation

Mounting — with duct temperature of +90..120 °C mounting flange MF6 flexible, at +120..260 °C mounting flange MF6 (brass) is recommended

1 Max. permissible operating temperature

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 components of a large-scale fixed installation, Distech Controls 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.

Product Testing and Certification

The declaration of conformity of the products can be found on our website **https://www.distech-controls.com**

General Remarks Concerning Sensors

Especially with regards 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 (±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 (±0,2 V) this is normally done by adding or reducing a constant offset value. As Distech Controls 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.

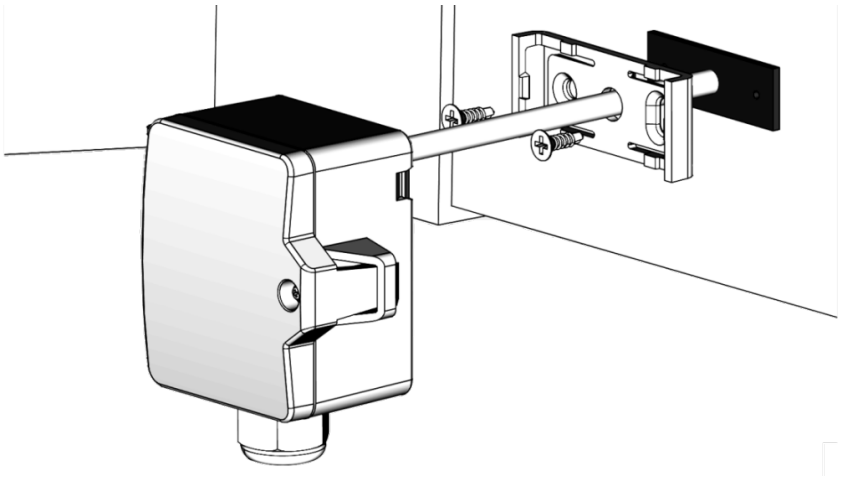
NOTE: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

Enclosure with UV and Weather Resistance

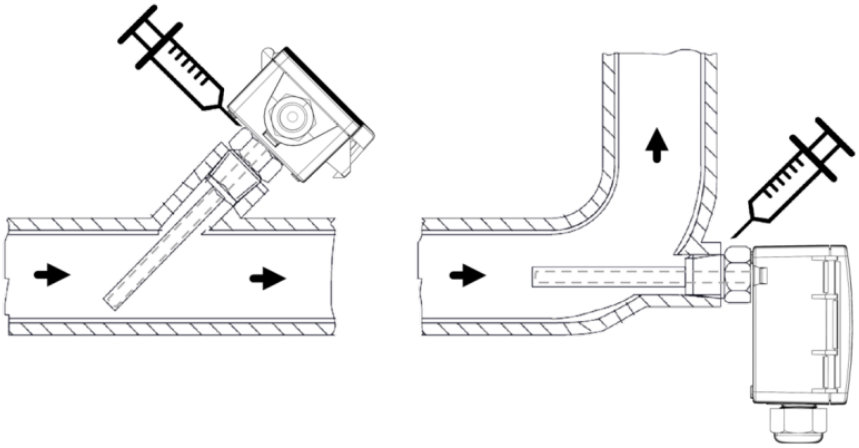
After some time, outdoor mounted plastics can lose their color and quality. Therefore, all housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide used 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.

Mounting Instructions

The sensor can be mounted on the ventilation duct 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 A.

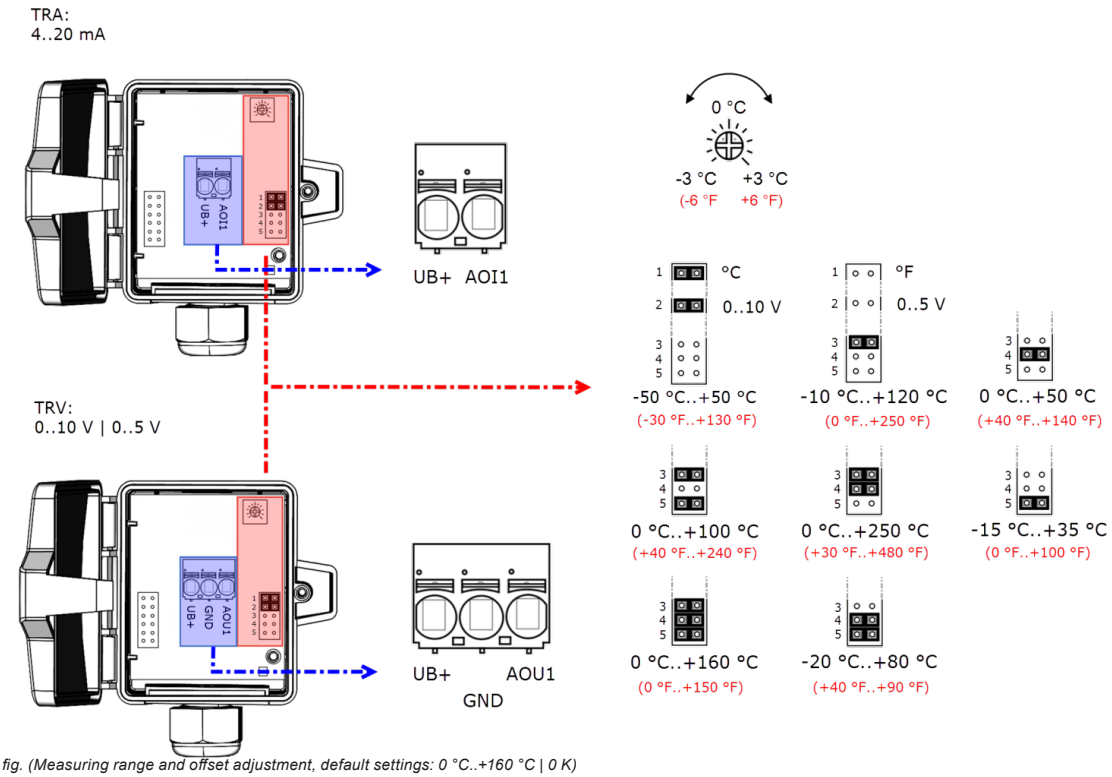


fig. (Measuring range and offset adjustment, default settings: 0 °C..+160 °C | 0 K)

Dimensions (mm)