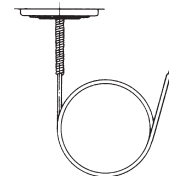
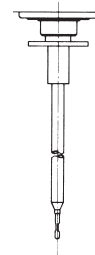
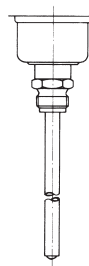
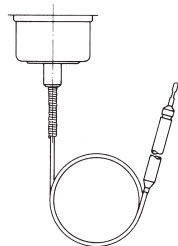
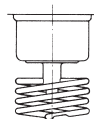
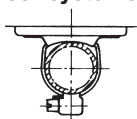


# Mechanical thermostats

## Principal technical data

| Standard version   | Terminal connection  | Ex-version  |
|--|--|---|
| <br>...200    | <br>...300  | <br>...700          |
| <b>Switch housing</b>  | Diecast aluminium GDAISi 12  | Diecast aluminium GDAISi 12   |
| <b>Switching function and connection drawing</b><br>(applies only to version with microswitch) | Floating change-over contact<br>With rising pressure switching single-pole from 3-1 to 3-2   | Floating changeover contact.<br>With rising pressure switching single-pole from 3-1 to 3-2            |
|  |   |                     |
| <b>Switching capacity</b><br>(applies only to version with microswitch)                        | 8 A at 250 VAC<br>5 A at 250 VAC inductive<br>8 A at 24 VDC<br>0.3 A at 250 VDC<br>min. 10 mA, 12 VDC  | 3 A at 250 VAC<br>2 A at 250 VAC inductive<br>3 A at 24 VDC<br>0.03 A at 250 VDC<br>min. 2 mA, 24 VDC |
| <b>Mounting position</b>   | vertical or horizontal<br>preferably vertical  | vertical  |
| <b>Degree of protection</b><br>(in vertical position)  | IP 54 (terminal connection IP 65)  | IP 65   |
| <b>Explosion protection Code</b>   | -  | EEx de IIC T6<br>II 2 G D EEx de IIC T6 IP65 T80° C<br>PTB 02 ATEX 1121                               |
| <b>EC Type Examination Certificate Number</b>  | -  | -   |
| <b>Electrical connection</b>   | Plug connection to DIN 43650/<br>Terminal connection   | Terminal connection   |
| <b>Cable entry</b>   | PG 11 / for terminal connection M 16 x 1.5   | M 16 x 1.5  |
| <b>Ambient temperature</b>   | -15 to +70 °C  | -15 to +60 °C   |
| <b>Switching point</b>   | Adjustable with spindle.   | Adjustable with spindle after the terminal box lid is removed.<br>Not adjustable                      |
| <b>Switching differential</b>  | Adjustable or not adjustable<br>(see Product Summary)  | Not adjustable  |
| <b>Medium temperature</b>  | Max. 70 °C, briefly 85 °C  | Max. 60 °C  |
| <b>Vibration strength</b>  | No significant deviations up to 4 g.<br>At higher accelerations the switching differential is reduced slightly.<br>Use over 25 g is not permitted. |   |
| <b>Isolation values</b>  | Overvoltage category III, contamination class 3, reference surge voltage 4000 V.<br>Conformity to DIN VDE 0110 (01.89) is confirmed.               |   |

### Sensor systems



Strap-on sensor  
TKM

Room sensor  
TRM

Capillary tube sensor  
TAM

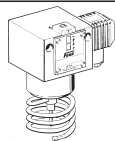
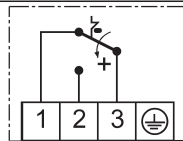
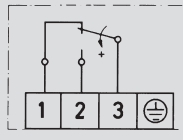
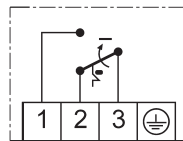
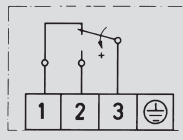
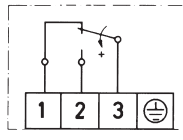
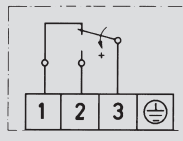
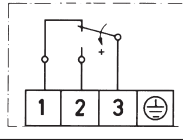
Rod sensor  
TX + R 1

Air duct sensor  
TX + R 6

Frost protection sensor  
FT

# Thermostats

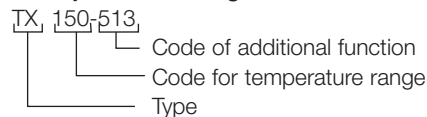
## Additional functions

| Plug connection, 200 series  | Description  | Connection scheme   |
|--|--|---|
|  | <b>Standard version</b><br>Microswitch, single pole switching  |    |
| <b>ZFT 205</b>   | <b>Maximum limiter</b><br>with reclosing lockout.<br>Locking with rising temperature   |    |
| <b>ZFT 206</b>   | <b>Minimum limiter</b><br>with reclosing lockout.<br>Locking with falling temperature  |    |
| <b>ZFT 213</b>   | <b>Gold-plated contacts</b><br>with low contact resistance<br>(e.g. for low voltage)<br>Not available with adjustable switching differential |    |
| <b>ZFT 301</b>   | <b>Terminal connection housing (IP 65)</b>   |   |
| <b>ZFT 351</b>   | <b>Degree of protection IP 65 and switch housing with surface protection</b><br>(terminal connection housing)                                |  |
| <b>ZFT 513</b>   | <b>EExi version</b><br>Housing 300, cable entry and terminals blue<br>Gold-plated contacts, degree of protection IP 65                       |  |

\* The additional prices should be added to the prices of the standard equipment.  
For devices which differ from the standard equipment, the code of the switching device is part of the type designation.

\*\* Switching point adjustment: Please specify switching point and direction of action (rising or falling temperature).

### Example for ordering:



## Service functions

In future, devices with service functions will be produced individually according to the customer's specifications.

The system requires that these product combinations be identified in such a way as to prevent any possibility of confusion. These combinations are characterised by a product code with the suffix "-S" on the packaging label as well as separate labels with barcodes for each service function.

### Service functions

|                 |  |
|-----------------|--|
| <b>ZFT 5970</b> | <b>Setting of switching point according to customer's instructions</b>                   |
| <b>ZFT 5971</b> | <b>Setting of switching point according to customer's instructions with lead sealing</b> |
| <b>ZF 1978</b>  | <b>Labelling of units</b> according to customer's instructions with sticker              |

### Test certificates according to EN 10 204

**WZ 2.2** Factory certificate 2.2 based on non-specific specimen test

**AZ 3.1** Acceptance test certificate 3.1 based on specific test

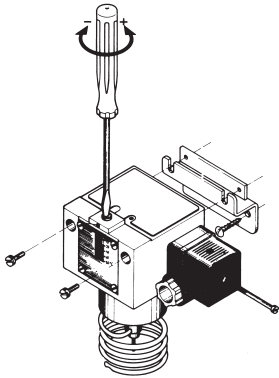
**\*Switching point adjustment:** Please specify **switching point and direction of action** (rising or falling pressure).

Service functions are available for the following type series (including Ex-versions):

Thermostats: TAM, TX, TRM, FT



## General technical information



### Adjustment of thermostats at lower switching point

Setpoint  $x_s$  corresponds to the lower switching point (with falling temperature), the upper switching point  $x_o$  (with rising temperature) is higher by the amount of the switching differential  $x_a$ .

### Setting the switching temperature (setpoint adjustment)

Prior to adjustment, the setscrew above the scale must be loosened by approx. 2 turns and retightened after setting.

The switching temperature is set via the spindle. The set switching temperature is shown by the scale. In view of tolerances and variations in the characteristics of sensors and springs, and due to friction in the switching kinematics, slight discrepancies between the setting value and the switching point are unavoidable. The thermostats are usually calibrated in such a way that the setpoint adjustment and the actual switching temperature correspond as closely as possible in the middle of the range.

Possible deviations spread to both sides equally.

**Clockwise: low switching temperature**

**Anticlockwise: high switching temperature**

### Changing the switching differential (only for switching device TRMV...)

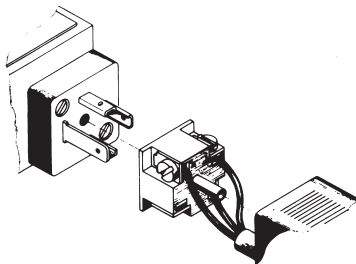
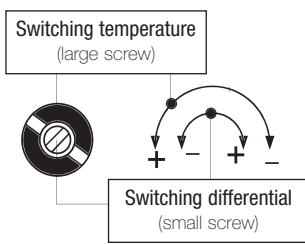
The switching differential is changed by turning the setscrew within the spindle. The lower switching point is not changed by the differential adjustment; only the upper switching point is shifted by the differential. One turn of the differential screw changes the switching differential by about 1/10 of the total differential range.

**When adjusting please note:**

**Switching temperature:** Clockwise for lower switching point.

Anticlockwise for higher switching point.

**Switching differential:** Clockwise for larger differential. Anticlockwise for smaller differential.



### Electrical connection

Plug connection to DIN 43650. Cable entry Pg 11, max. cable diameter 10 mm. Cable outlet possible in 4 directions spaced 90° apart.

### Temperature limiter with reclosing lockout

**Additional function ZFT 205 and ZFT 206:** All thermostats can be equipped with a mechanical interlock. On reaching the value set on the scale, the microswitch trips over and remains in this position. The lock can be released by pressing the unlocking button (identified by a red dot on the scale side of the switching device). The interlock can take effect with rising or falling temperature, depending on the version.

### Mounting position

A vertical mounting position is preferable if at all possible. IP 54 protection according to the requirements of DIN 40050 is guaranteed with a vertical mounting position. A different mounting position may alter the degree of protection, but the operation of the thermostat is not affected.

### Outdoor installation of thermostats

FEMA thermostats can be installed out of doors provided they are mounted vertically and suitably protected against the direct effects of weather. At ambient temperatures below 0°C, ensure that condensation cannot occur in the sensor or in the switching device.



TAM 813

## Capillary tube thermostats Type series TAM

with 1.5 m capillary tube

The sensor cartridge at the end of the capillary tube is the actual active (temperature-sensitive) part of the sensor. Changes in temperature on the capillary tube have no effect on the switching point. Pressure-tight installation of the sensor in pressure vessels of all kinds is possible with the aid of immersion tubes.

### Technical data

(not applicable to Ex versions)

|   |  |
|---|--|
| <b>Body</b>   | Diecast aluminium GD Al Si 12 according to DIN 1725.   |
| <b>Mounting position</b>                            | Any, preferably vertical   |
| <b>Max. ambient temperature at switching device</b> | +70°C<br>+60°C for Ex versions   |
| <b>Capillary tube</b>                               | Cu capillary tube, 1.5 m long<br>Other capillary tube lengths are not possible   |
| <b>Sensor cartridge</b>                             | 8 mm Ø, 100 mm long, material: Cu  |
| <b>Contact arrangement</b>                          | Single pole changeover switch  |
| <b>Switching capacity</b>                           | 8 (5) A 250 VAC  |
| <b>Degree of protection</b>                         | IP 54 according to DIN 40050 (with vertical installation)  |
| <b>Mounting</b>                                     | Temperature sensor with or without immersion tube in containers, air ducts etc.<br>Switching device with 2 screws (Ø 4) directly on a flat wall surface          |
| <b>Calibration</b>                                  | Scale value corresponds to the lower switching point (with falling temperature), the upper switching point is higher by the amount of the switching differential |
| <b>Plug connection</b>                              | Via angled plug to DIN 43650   |
| <b>Switching temperature</b>                        | Adjustable via the setting spindle with a screwdriver  |
| <b>Switching differential</b>                       | Not adjustable   |
| <b>Immersion tubes</b>                              | see page 32.   |

### Product Summary

| Type    | Setting range | Switching differential (mean value) | Max. perm. temperature at sensor |
|---------|---------------|-------------------------------------|----------------------------------|
| TAM 022 | -20 to + 20°C | 1.5 K                               | 110°C                            |
| TAM 150 | +10 to + 50°C | 1.5 K                               | 110°C                            |
| TAM 490 | +40 to + 90°C | 2.0 K                               | 125°C                            |
| TAM 813 | +80 to +130°C | 2.0 K                               | 150°C                            |

**Ex**-version · Degree of protection **Ex** II 2 G/D EEx de IIC T6 IP65 T80°C  
(Technical data see page 18)

|            |               |       |       |
|------------|---------------|-------|-------|
| Ex-TAM 022 | -20 to + 20°C | 1.5 K | 110°C |
| Ex-TAM 150 | +10 to + 50°C | 1.5 K | 110°C |
| Ex-TAM 490 | +40 to + 90°C | 2.0 K | 125°C |
| Ex-TAM 813 | +80 to +130°C | 2.0 K | 150°C |

### Specification

Capillary tube thermostat type TAM ...  
Range of adjustment from ... to ...°C.  
Capillary tube length 1.5 m, diecast aluminium with plug connection to DIN 43650.

### Accessories

Immersion tube type ... R 1, R 2, R3, RN 1, RN 2.

### Dimensions:

