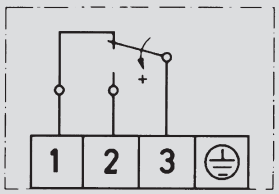
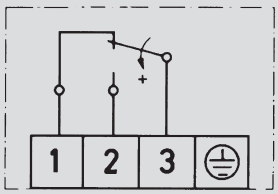
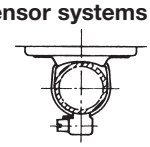
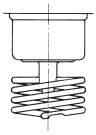
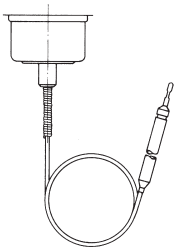
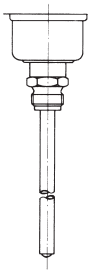
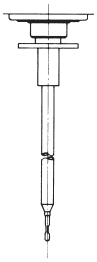
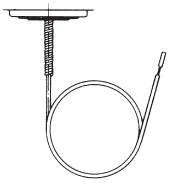
Mechanical thermostats

Principal technical data

Standard version	Terminal connection	Ex-version
 …200	 …300	 …700

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

Sensor systems

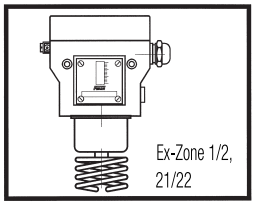







Strap-on sensor TKM	Room sensor TRM	Capillary tube sensor TAM	Rod sensor TX + R 1	Air duct sensor TX + R 6	Frost protection sensor FT

Temperature monitoring
in explosion-endangered areas

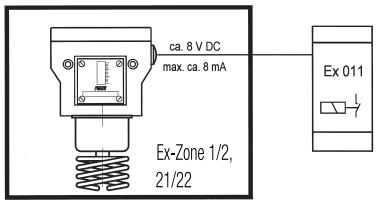
Temperature switches with special equipment can also be used in explosion risk area ≥ Zone 1 (21).

The following alternatives are possible:



1. Thermostats with pressure-proof encapsulated switching device, degree of protection Ex II 2 G/D EEx de IIC T6 IP65 T 80°C

The thermostat in pressure-proof encapsulation can be used directly in explosion risk areas ≥ Zone 1 (21). The maximum switching voltage, switching capacity and ambient temperature must be taken into account and the rules for installation in the explosion risk area must be observed.
All thermostats may be equipped with explosion-proof switching devices. However, special circuits and designs with an adjustable switching differential are not permitted.



2. Thermostats in EExi version

All thermostats in the standard version can be used in explosion risk areas ≥ Zone 1, if they are incorporated into an “intrinsically safe circuit”. Intrinsic safety is based on the principle that the control current circuit in the explosion risk area carries only a small quantity of energy which is not capable of generating an ignitable spark.
Isolating amplifiers, e.g. type Ex 011, must be tested by the Physikalisch-Technische Bundesanstalt (PTB) pursuant to ATEX 100 and approved for use in explosion risk areas. Isolating amplifiers must in any event be installed outside the explosion risk area.
Thermostats which are intended for EEx-ia installations are equipped with blue terminals and cable entries. In view of the low voltages and currents carried via the contacts of the microswitches, gold-plated contacts are used in the EX-i version (additional function ZFT 513).

Temperature monitoring in Zone 1 (21) and 2 (22)

Pressure-proof encapsulated Ex-de ...	**Intrinsically safe D ...-513 +Ex 011**
Explosion protection: Ex II 2 G/D EEx de IIC T6 IP 65 T80° C	Explosion protection: EEx-ia
ATEX approval for the complete switching device	ATEX approval for isolating amplifier Ex 011
Thermostats with silver contact	Thermostats with gold-plated contacts, blue terminals and blue cable entries.
Switching capacity: max. 3 A, 250 VAC min. 2 mA, 24 VDC	Switching capacity: max. 100 mA, 24 VDC min. 2 mA, 5 VDC
	Information for devices with additional function ZF 513, ZF 574, ZF 576 to EN 50020: U_i = 10 VDC I_i = 20 mA L_i = 0 µH C_i = 0 pF
The thermostat can be installed within the Ex-Zone.	The isolating amplifier must be installed outside the Ex-Zone.

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)

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

Ⓔx-version · Degree of protection Ⓔx 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: