

HV/LV distribution transformers

Trihal cast resin transformers

T thermal protection module with PT 100 sensors



T digital thermometer

An optional thermal protection module is available on request for Trihal cast resin transformers. This will monitor the temperature of the windings and prevent overheating.

the standard, T thermal protection module comprises:

■ PT 100 sensors

The main feature of the PT 100 is that it gives the temperature in real time progressively from 0°C to 200°C

-see the graph opposite (accuracy +/-0,5%, i.e. on the measurement scale +/-1 deg.).

The temperature is monitored and displayed by a digital thermometer. The 3 sensors, each comprising one white and two red wires, are located in tubes between the magnetic core and the LV winding, on each phase. So they can be withdrawn and replaced as and when necessary.

■ 1 T digital thermometer, featuring three independent circuits.

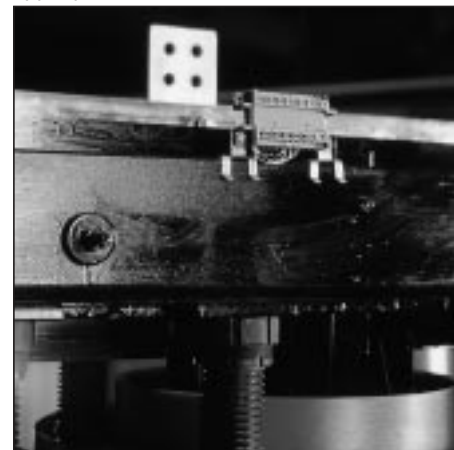
Two of the circuits monitor the temperature read by the PT 100 sensors, one for alarm 1 and one for alarm 2.

When the temperature reaches 140°C (or 150°C) alarm 1 (or alarm 2) information is processed by two independent output relays fitted with change-over switches. The status of these relays is displayed by two diodes (LED).

The third circuit monitors for sensor faults or breaks in power supply. The corresponding relay (FAULT), which is independent and fitted with change-over switches, is instantly switched on when power is connected to the device. Its status is also displayed by a diode.

The T digital thermometer is delivered with full instructions for installation and use.

■ **1 terminal block** to connect the PT 100 sensors to the T digital thermometer. The block is equipped with a plug-in connector. The PT 100 sensors are delivered pre-connected to the terminal block attached to the upper part of the transformer.



terminal block connecting the T digital thermometer to the PT 100 sensors

options

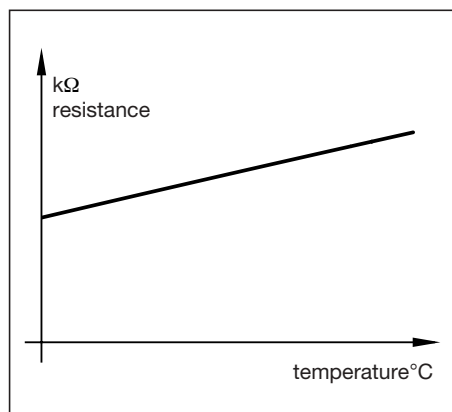
The following extras can be fitted to the T thermal protection module:

■ a FAN output to control the start up of tangential fans in the case of forced ventilation of the transformer (AF): this option includes the supply of 2 sets of tangential fans, pre-cabled and connected to 1 single power connector per set.

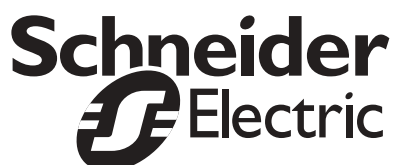
■ an additional input (CH4) connected to a sensor outside of the transformer (not supplied), intended to measure ambient temperature in the MV/LV substation.

■ an RS 232 or RS 485 series output for connection to a plc or computer.

■ a FAN 2 output to control the start up of an additional fan.



characteristic temperature curve given by a PT 100 sensor



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T digital thermometer - technical data conformity with standards IMQ - VDE - UL - CEE

monitoring circuits	supply voltage ⁽¹⁾	24V to 220V AC/DC
	frequency	50-60Hz AC/DC
	power consumption	10VA AC/DC (40VA pick up)
output contacts: alarm 1 and alarm 2	maximum switching voltage	250V AC
	maximum switching current	5A (resistive circuit)
	rated continuous/service current	2A at 220V AC/DC
	recommended upstream fuse rating	3A
	contact life	mechanical 2000000 operations electrical 50000h/85°C
T digital thermometer	operating conditions	
	admissible ambient temperature range	- 20°C to + 60°C
	max. ambient humidity	90% RH (non condensable)
	dimensions (HxLxP)	96x96x130mm
	weight	520g
	casing protection index	IP 54 self extinguishing
	maximum capacity on a terminal connection	2.5mm ²
	fixing	locating recess 92x92mm, suppliance of two pressure clips on the rear side.

(1) universal supply irrespective of polarity.

power supply

Monitoring circuits have to be supplied from an auxiliary supply (standard: 24 to 220V AC/DC). If no suitable supply is available they may be supplied from the transformer's secondary side. To avoid the "FAULT" relay tripping, it is fitted with a time delay.

Warning: when the device is supplied directly from the transformer's secondary side, it is necessary to protect it from possible overvoltages that could damage the electronic circuit. We recommend to use our surge-limiter PT 73-120 or PT 73-220 (220V CA).

installation

The T thermometer should never be installed on the transformer or inside its metal enclosure due to its operating temperature limits (see table opposite).

■ it can be installed in the low voltage switchboard (or on a wall) either horizontally or vertically (see table opposite for fixing details).

■ **it is recommended, especially for an installation in an LV switchboard, to retain a minimum clearance to other equipment (take into account the highest voltage) or heat sources and ensure adequate ventilation. Take care also to the highest voltage according to the insulation distances.**

connections:

PT 100 sensors are to be connected to the T digital thermometer between the connecting terminal attached to the transformer and the T digital thermometer's plug-in connector. It is not supplied by France Transfo.

See diagram opposite.

Warning: since the transformer is of thermal class F, the T digital thermometer must be programmed with a maximum temperature of 140°C for alarm 1 and 150°C for alarm 2.

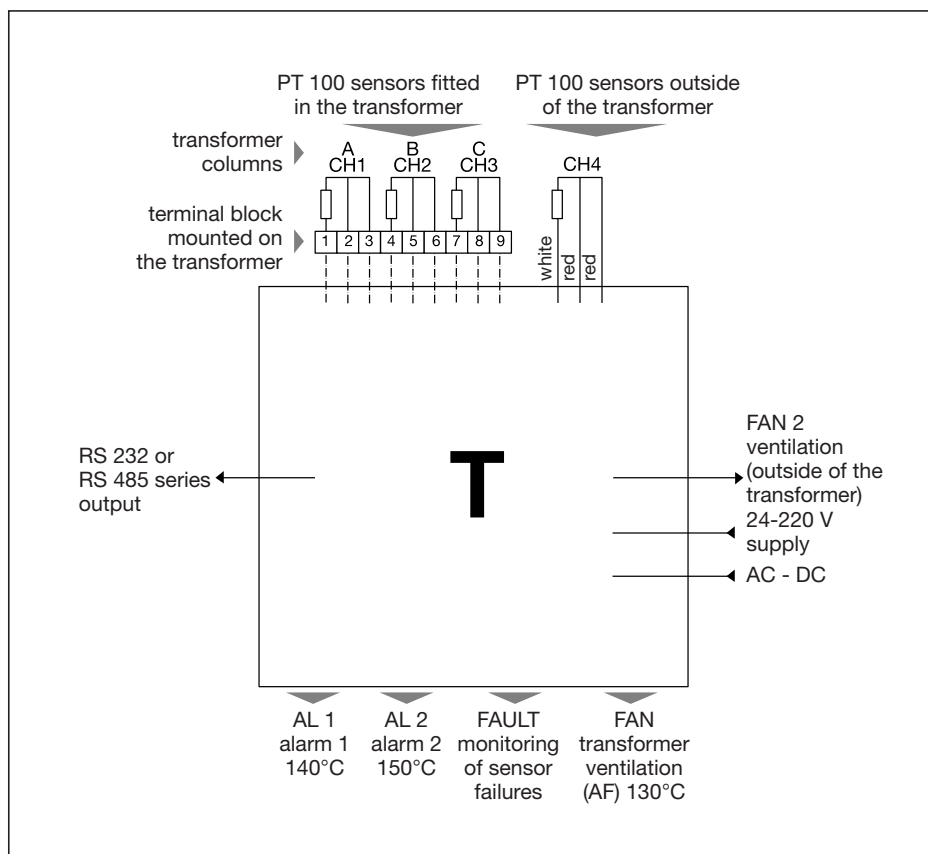
France Transfo is in no way liable for any damage to the transformer should these maximum temperatures not be complied with.

The following conditions must be complied with

- use screened and braided cables (20twists/meter)
- minimum conductor cross-section: 1mm²
- wiring should not pass near power circuits
- maximum length of connection: 300m
- minimum clearances to live parts: see above
- wiring should not be attached to any live part of the transformer
- the LV panel should be earthed.

insulation (kV)	minimum clearance (mm)
7.2	270
12	450
17.5	450
24	450
36	650

advised by France Transfo



connection diagram for the T digital thermometer

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Due to the evolution of standards and materials, the present document will bind us only after confirmation from our technical department.

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