



## Limit Thermostats

## RAK-TB.1..M

Electromechanical TB according to DIN3440

- Limit thermostat with single-pole changeover microswitch
- Switching capacity    contact connection 11-12 16 (2.5) A, AC 250 V  
Terminal for alarm    contact connection 11-13 0.5 A, AC 250 V
- Time constant conforming to DIN EN 14597
- 3 mounting choices: pipe, pocket or wall mounting
- Switch-off temperature can be checked through the viewing window in the housing
- Internal reset facility covered by removable threaded nipple
- Push-in terminals for fast installation

### Use

Typical applications:

- Heat generation plant
- For general use in heating, ventilation and air conditioning plant
- Underfloor heating systems (RAK-TB.1400-M)

### Function

When the switch-off temperature is reached, contact connection 11-12 changes over to contact connection 11-13 (alarm) and the thermostat remains tripped in this position. When the temperature of the medium falls below the value of the switching differential, the limit thermostat (TB) must be manually reset after removal of the threaded nipple.

If the probe has cooled down to a temperature below approx. -20°C, the control current circuit opens, however, automatically closes again, when the temperature rises.

## Type summary

| Product No.    | Stock number | Degree of protection | Switch-off temperature | Capillary tube length | Scope of delivery   | Pocket length <sup>1)</sup> |
|----------------|--------------|----------------------|------------------------|-----------------------|---|-----------------------------|
| RAK-TB.1400S-M | S55700-P108  | IP43                 | 45...60 °C             | 700 mm                | Pocket (for RAK....B) /<br>Clamping band for max.<br>pipe dia. 100 mm /Cable<br>gland M16x1.5 mm /<br>Mounting instructions | ---                         |
| RAK-TB.1410B-M | S55700-P109  | IP43                 | 50...70 °C             |                       |   | 100 mm                      |
| RAK-TB.1420S-M | S55700-P110  | IP43                 | 65...80 °C             |                       |   | ----                        |

1) Pocket ALT-SB100, brass nickel-plated, PN10

### Accessories

Refer to Data Sheets N1193 and N1194.

### Ordering

When ordering, please give type reference according to "Type summary" (standard set).

If the accessories required are not those included in the standard set, they can be ordered separately according to the type references given in Data Sheets N1193 and N1194.

## Mechanical design

### Housing

- The base of the thermostat is made of PC (reinforced) and is designed for pipe, pocket or wall mounting; the electromechanical thermal reset limit thermostat uses a capillary type sensing element.
- The cover is made of PC and has a viewing window.
- The cable gland is M16x1.5 mm.
- The PC plastic is especially designed to be flame resistant, UV protected and flexible against high temperatures and tough against chemical and biological impacts.

## Notes

### Mounting aid

Installation Instructions are enclosed in the package.

### Mounting location

It must be ensured that there is sufficient clearance above the thermostat for seeing through the viewing window, for adjusting the switch-off temperature and for removing and replacing the thermostat, if required.

### Pipe mounting

The clamping band should be properly tightened to ensure the entire length of the sensing element is in close contact with the pipe's surface.

### Pocket mounting

Mount the pocket and adjust the hexagon as required. Immerse the capillary sensing element in the pocket and secure the base to the pocket by means of the screw.

### Wall mounting with sensing element in the pocket

To prepare for wall mounting, knock out the fixing holes in the housing and pull out the capillary tube until the required length is reached. After immersing the capillary sensing element in the pocket, secure it with a clamp (mounting accessories).

### Temperature setting

The switch-off temperature must be adjusted only by qualified personnel.

### Wiring

The appliance must be wired by the installer only.

The cables used must meet the insulation requirements for mains voltage.

Wire the thermostat according to the connection diagram and in compliance with local regulations.

### Max. AC 250 V

Caution: prior to opening the housing, disconnect the thermostat from the mains supply.

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Earth connections must be made in compliance with the regulations.

## Disposal



The devices are considered electronics devices for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic waste.

- Dispose of the device via the channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

## Technical data

|                          |  |  |
|--------------------------|--|--|
| Switching mechanism      | Switching capacity   |  |
|                          | Nominal voltage  | AC 24...250 V  |
|                          | Nominal current $I (I_M)$  | contact connection 11-12 0.1...16 (2.5) A  |
|                          |  | contact connection 11-13 2 (0.4) A (terminal for alarm)                              |
|                          | External fuse  | 16 A   |
|                          | Life expectancy at nominal rating  | min. 300 switching cycles  |
|                          | Safety class   | I to EN 60 730   |
|                          | Degree of protection:  | IP 43 to EN 60 529   |
|                          | Internally adjustable switch-off temperature   |  |
|                          | RAK-TB.1400S-M   | 45...60 °C   |
| Directives and Standards | RAK-TB.1410B-M   | 50...70 °C   |
|                          | RAK-TB.1420S-M   | 65...80 °C   |
|                          | Thermal switching differential (all types)   | 10 ± 5 K   |
|                          | Product standard   | EN 60730-x   |
|                          |  | DIN EN 14597   |
|                          | EU Conformity (CE)   | CE1T1206xx <sup>1)</sup>   |
|                          | Radio interference protection  | click rate N ≤5 to EN 55 014   |
|                          | Operation  | class 3K5 to IEC 60 721-3-3  |
|                          | Max. temperature on bulb   | max. switch-off temperature + 25 K   |
|                          | Ambient temperature at the housing   | max. 80 °C (T80)   |
| Environmental conditions | Humidity   | < 95 % rH  |
|                          | Mechanism  | class 3M2 to IEC 60 721-3-3  |
|                          | Storage and transport  | class 2K3 to IEC 60 721-3-2  |
|                          | Ambient temperature  | -25...+70 °C   |
|                          | Humidity   | < 95 % r.h.  |
|                          | Max. temperature socket  | 125 °C   |
|                          | Degree of pollution  | 2 to EN 60 730   |
|                          | Controlled medium  | Water, oil, air  |
|                          | Manufacturing deviation  | +0 /-6 °C  |
|                          | Calibrated for ambient temperature at the switching mechanism and capillary tube to DIN EN 14597 | 22 °C  |
| Calibration              | RAK-TB.1400S-M   | 22 °C  |
|                          | RAK-TB.1410B-M   | 22 °C  |
|                          | RAK-TB.1420S-M   | 22 °C  |
|                          | Time constant in: water  | <45 s to DIN EN 14597  |
|                          | oil  | <60 s to DIN EN 14597  |
|                          | air  | <120 s to DIN EN 14597   |
|                          | Electrical connections   | Push In <sup>2)</sup> terminals for wires<br>6 x 0.75...2.5 mm <sup>2</sup>          |
|                          | Earth connection   | Push In <sup>2)</sup> terminals for wires<br>2 x 0.75...2.5 mm <sup>2</sup>          |
|                          | Cable entry gland  | M16 x 1.5 mm   |
|                          | External wiring flexible cord  | Type M attachment (designed to be connected with prepared conductors, e.g. ferrules) |

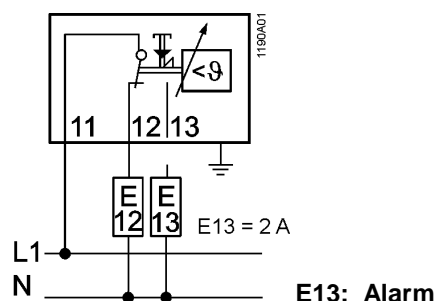
## General data

|                                    |  |
|------------------------------------|--|
| Housing colors                     | base RAL 7001 (dark-grey)<br>cover RAL 7035 (light-grey) |
| Dimensions of sensing element      | 6.5 mm dia. x 73 mm resp. 87mm                           |
| Capillary length (all types)       | 700 mm   |
| Min. bending radius of capillary   | R min. = 5 mm  |
| Construction                       |  |
| Carrier of switching mechanism     | plastic  |
| Capillary tube and sensing element | copper   |
| Diaphragm                          | stainless steel  |
| Contacts                           | Ag.1000/1000 (silver)                                    |
| Weight of standard set: RAK...B    | 0.33 kg  |
| RAK...S                            | 0.27 kg  |

1) The documents can be downloaded from <http://siemens.com/bt/download>.

2) Push In is a patented connection technology designed by Weidmüller, Germany's leading manufacturer of electrical connection technologies.

## Connection diagram



## Dimensions

