

RAK: Universal thermostat

How energy efficiency is improved

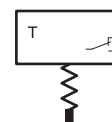
Control, monitoring and limiting according to needs and with no auxiliary energy.

Features

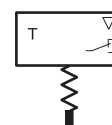
- Regulates and monitors the temperature of liquids in baths, containers, pipes and ducts
- Variants as temperature controllers (TR), temperature monitors (TW), temperature limiters (TB) or safety temperature limiters (STB)
- Thermostat with remote sensor
- Clamp-on thermostat
- Capillary tube thermostat with or without protective tube
- Double thermostat, e.g. as TW and STB
- Sealable
- As per PED 97/23/EC, classified as cat. IV (RAK 13.5050S)



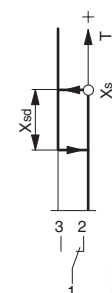
RAK



TR, TW



TB, STB



Technical data

Power supply		
Max. load ¹⁾	Terminal 1-2 TW, TB	10(2.6) A, 250 V~
	Terminal 11-12 STB	10(6) A, 250 V~
	Terminal 1-4 TW	4(0.6) A, 250 V~
	Min. load	500 mA, 40 V
Parameters		
	Calibration point	23 °C ±2 °C (Tu 23), 37 °C ±2 °C (Tu 37) (RAK13.5050S)
	Serviceable life	> 100,000 switchings
	Serviceable life of limiter	> 15,000 switchings
	Interference class	Click rate < 5 (EN 55014)
Time characteristic in water	Time constant with protective tube (inner diameter 7)	< 45 s
	Time constant without protective tube (inner diameter 7)	< 15 s
	Effect of temperature at instrument head ²⁾	0.20...0.60 K/K
Setting accuracy	Setting accuracy	±6 K at 50 °C
	Setting accuracy for limiter	+0/-9 K at 50 °C
	Setting accuracy for clamp-on temperature sensor	+4 K (system. error)
Ambient conditions		
	Storage and transport temperature	-25...75 °C
	Admissible ambient temperature	0...70 °C (T70) (housing)
	Admissible ambient temperature when used as a clamp-on sensor	Max. 130 °C (water temperature)
Construction		
	Weight	0.22 kg
	Sensor cartridge	68 mm
	Housing	Two sections, lower section black, upper section yellow, including inspection window
	Housing material	Plastic
Standards and directives		
	Type of protection	IP 54 (EN 60529) with protective tube IP 40 (EN 60529)
	Protection class	I (IEC 60730)
	Test marks ³⁾	ID: 0000006982 (RAK13.5050S)

¹⁾ Take the RC circuitry into account for inductive loads

²⁾ Depending on type

³⁾ Certificate can be downloaded from www.certipedia.com



CE conformity according to	Low-voltage directive 2006/95/EC	EN 60730-1;2-9
	EMC directive 2004/108/EC ⁴⁾	EN 55014: 4,2
	PED 97/23/EC, cat. IV ⁵⁾	EN 14597

Overview of types

Type	Setting range	Switching difference	Capillary tube	Max. temp., sensor
RAK13.5050S	130/120/110/100/95 °C	20 K	800 mm	170 °C
RAK582.4/3726	50...130 °C	4 K	800 mm	200 °C
RAK582.4/3728	15...95 °C	4 K	800 mm	200 °C
RAK582.4/3729	80...160 °C	4 K	1600 mm	200 °C
RAK582.4/3753	150...230 °C	4 K	1000 mm	280 °C
RAK582.4/3754	40...120 °C	4 K	1600 mm	200 °C
RAK582.4/3770	-10...50 °C	4 K	1600 mm	180 °C
RAK582.4/3773	5...30 °C	4 K	800 mm	200 °C
RAK584.4/3782	20...60 °C	10 K	800 mm	200 °C
RAK584.4/3783	50...130 °C	10 K	800 mm	220 °C

⚡ *RAK13.5050S: STB, classified in PED 97/23/EC as per cat. IV, with protective tube, inner diameter 7, brass, 100 mm, as per DIN/EN 14597, intrinsically safe with locking mechanism; irreversible setting notches*

⚡ *RAK582*: TW with protective tube, inner diameter 7, brass, 100 mm, not classified in PED*

⚡ *RAK584*: TB, open contacts, with protective tube, inner diameter 7, brass, 100 mm*

⚡ *RAK582.4/3729, RAK582.4/3753: Stainless-steel protective tube provided; stainless-steel protective tubes are preferable from approx. 130 °C; including 100 mm distance piece for temperatures > 130 °C*

Accessories

Type	Description
0364435001	Assembly kit for clamp-on and double thermostat with 2 plugs for upholding protection rating IP 54 and retaining strap for fitting to pipe ½"...3" (for RAK as clamp-on thermostat T < 120 °C)

As stem-type thermostat

Type	Description
0364439***	Pocket, int. dia. 7; R½; brass (see product data sheet)
0364440***	Pocket, int. dia. 15; R½; brass; for 2-3 sensor cartridges (see product data sheet)
0210240010	Distance piece, 100 mm

As thermostat with remote sensor

Type	Description
0296724000	Sensor holder for wall mounting
0303212000	Rubber grommet for holding the capillary tube when passing through into ventilation ducts; T < 50 °C
0364140000	Tension-relief piece for use when fitted in protective tubes
0364432001	Fixing kit for duct or wall mounting
0364434001	Sensor support spiral for direct fitting in air ducts

Description of operation

Definitions and functions

Depending on the temperature, the single-pole change-over switch is activated (at temp. limit of normally-closed contacts).

Setpoint (X_s)

The setpoint (X_s), which can be adjusted, corresponds to the upper change-over point.

Switching difference (X_{sd})

The switching difference (X_{sd}) corresponds to the difference between the switching-on temperature (X_s) and the switching-off temperature. It is set to a fixed value for all RAK models (see type description).

Temperature controller, monitor (TW)

⁴⁾ Only for the RAK 13.5050S

⁵⁾ Only for the RAK 13.5050S

With its setting knob, the TW enables easy, convenient adjustment of the temperature setpoint. The set temperature is switched on and off automatically.

Temperature limiter (TB)

The adjustment of the temperature setpoint for the temperature limiter is restricted and only possible with the aid of a tool. It is reset by pressing the "RESET" button using the tool.

Safety temperature limiter (STB)

The STB has the same functionalities as the TB, although the adjustment of the setpoint is irreversible. The adjustment of the setpoint is only possible for a low temperature. For safety reasons, resetting is not possible and is mechanically blocked. Only after the temperature decreases can the device be unlocked by pressing the internal "RESET" button. As it is classified as PED 97/23/EC cat. IV, the STB is suitable for safety applications.

Two universal housings can be connected to each other by plugging them together. In this way, it is easy to create a double thermostat controller-monitor or monitor-limiter. It is not permitted to plug the device together with the STB of type RAK13.5050S.



Material damage

► RAK 582.4 and 584.4 must not be used to ensure the safety of installations that are within the operating range of pressure equipment Directive 97/23/EC.

Effect of temperature of instrument head

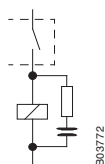
Type RAK	Calibration tolerance K	Correction factor ⁶⁾ K/K
3773	± 6	0.15
3770	± 6	0.29
3728	± 6	0.18
3754	± 6	0.31
3726	± 7	0.19
3729	± 7	0.34
3753	± 8	0.25
5050	+0/-9	0.30
3782	± 6	0.32
3783	± 7	0.38

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

Technical appendix



RC circuitry for inductive load

For the optimum RC circuitry, see the information from manufacturers of gates, relays, etc. If this is not available, the inductive load can be reduced by applying the following rule of thumb:

- Capacity of the RC circuitry (μF) equal to or greater than the operating current (A)
- Resistance of the RC circuitry (Ω) approx. the same as the resistance of the coil (Ω)

⁶⁾ Relating to the ambient temperature

Materials

Material	
Housing base	Reinforced PA, up to 120 °C
Housing cover	PC, durable up to 120 °C
Inspection window	PC, durable up to 120 °C

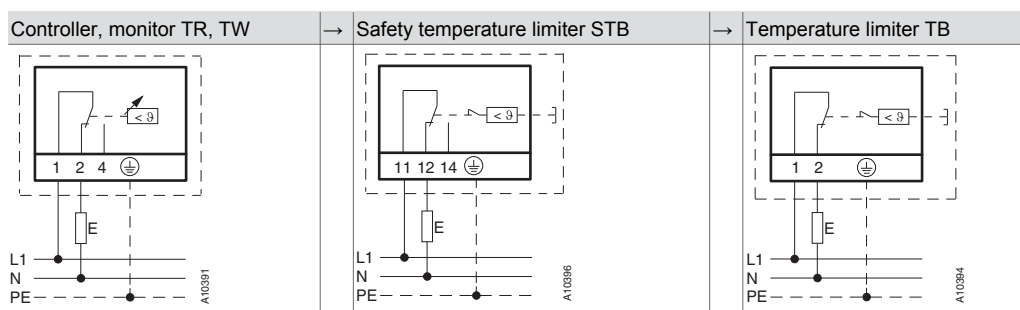
Sensor medium	
Up to 160 °C	Polymethylsiloxane
Up to 230 °C	Trimethylsiloxo
	CAS No.: 63148-62-9

Based on the available information, when used as intended, the product is not dangerous as per Directive 67/548/EEC.

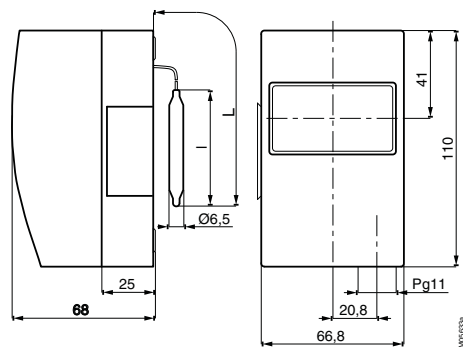
Disposal

When disposing of the product, observe the currently applicable local laws. More information on materials can be found in the Declaration on materials and the environment for this product.

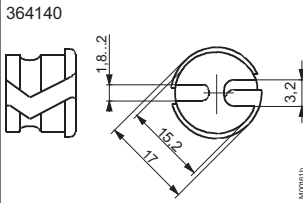
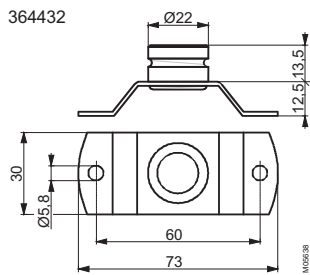
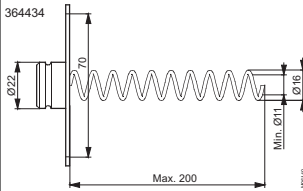
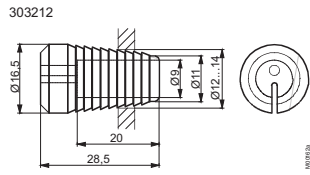
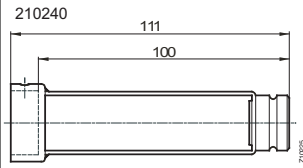
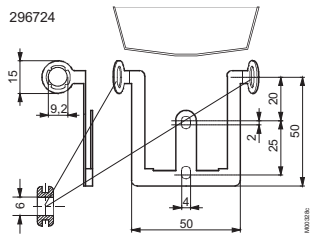
Connection diagram



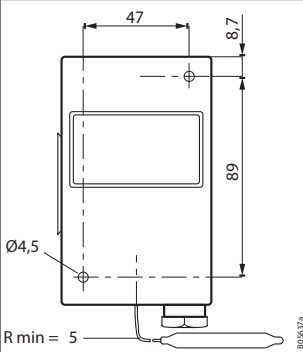
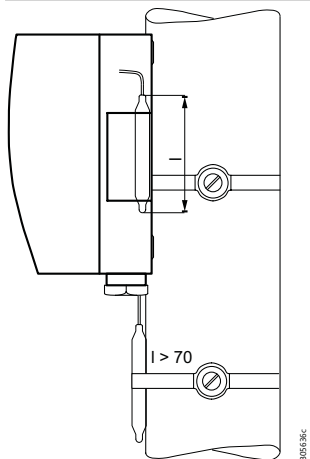
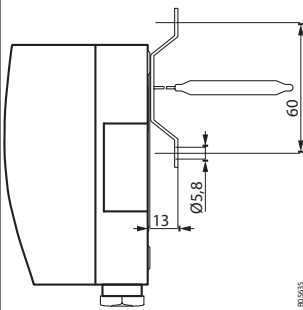
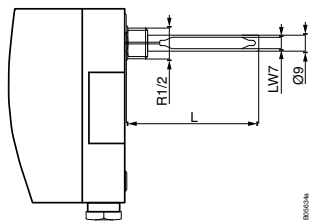
Dimension drawing

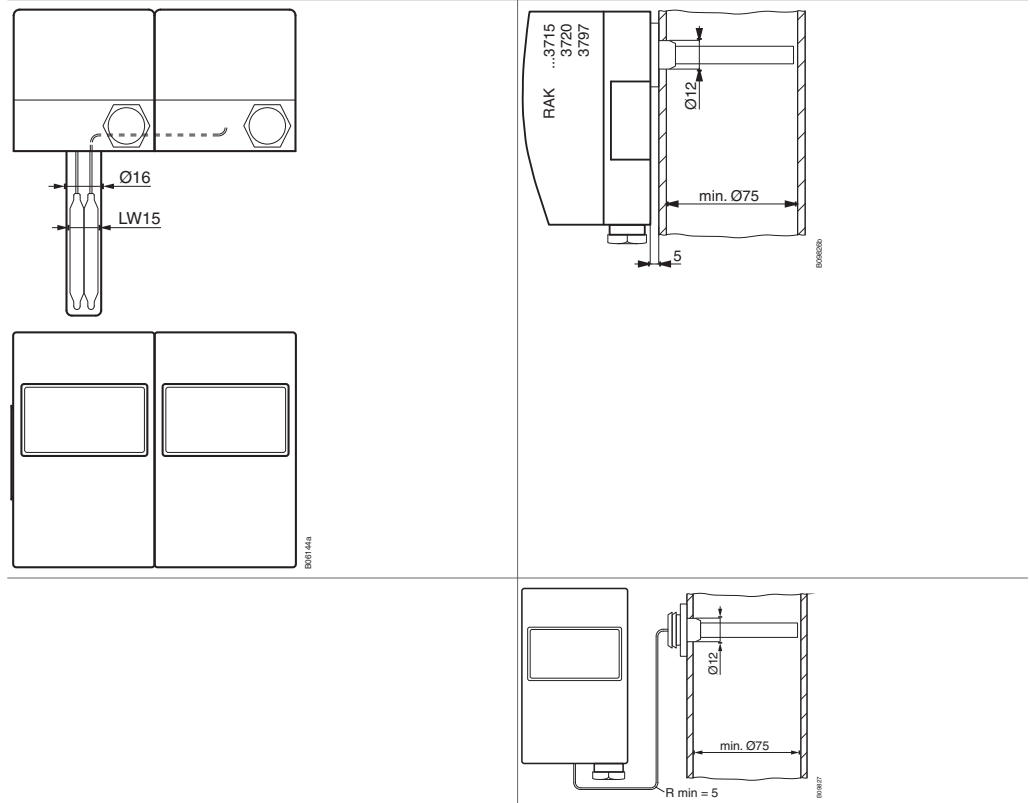


Accessories



Fitting methods





When used as STB according to PED cat. IV, when fitting consider information under www.certipedia.com.
 ID: 0000006982.