Double thermostat

Control Thermostats / Safety Limit Thermostats

RAZ-ST....

Combination of electromechanical TR and STB according to DIN 3440

- **2-position control thermostat and safety limit thermostat with single-pole changeover microswitches**
- **Switching capacity of microswitches**
  - **TR: contact connection 1-2 10 (2.5) A, AC 250 V**
  - **contact connection 1-3 6 (2.5) A, AC 250 V**
  - **STB: contact connection 11-12 10 (2.5) A, AC 250 V**
  - **Terminal for alarm contact connection 11-13 0.5 A, AC 250 V**
- **Time constant conforming to DIN 3440**
- **2 mounting choices: pocket or wall mounting**
- **External setting knob for setpoint adjustment**
- **Internal adjustment of switch-off temperature of safety limit thermostat (STB); switch-off temperature can be checked through the viewing window in the housing**
- **Ambient temperature compensation for switching mechanism and capillary tube (on STB)**
- **Fail-safe design, rupture of the capillary tube causes contact connection 11-12 to open**
- **Internal reset facility covered by removable threaded nipple**

Use

Typical applications:

- Heat generation plant
- For general use in heating, ventilation and air conditioning plant

Function

When the adjustable setpoint of the control thermostat (TR) is reached on rising temperature, contact connection 1-2 changes over to contact connection 1-3. When the temperature of the medium falls by the value of the switching differential, the thermostat reverts to contact connection 1-2.
When the switch-off temperature of the safety limit thermostat (STB) 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 by the value of the switching differential, the thermostat must be manually reset after removal of the threaded nipple.
Should the expansion liquid escape through a leak in the sensing system of the safety limit thermostat (STB), the pressure in the diaphragm drops, causing the contact connection to mechanically 11-12 off.

Type summary

Standard-set	Control and switch-off temperature range	Capillary tube length	Scope of delivery
RAZ-ST.010FP	(TR) 15...95 °C (STB) 95 °C	700 mm	Double pocket for 2 sensing elements, 100mm length (ALT-DB100, brass nickel-plated, PN10), cable gland M16x1.5 mm Mounting instructions
RAZ-ST.011FP	(TR) 15...82 °C (STB) 95 °C		
RAZ-ST.020FP	(TR) 15...95 °C (STB) 100 °C		
RAZ-ST.030FP	(TR) 15...95 °C (STB) 110 °C		
RAZ-ST.1510P [1)]	(TR) 15...95 °C (STB) 90...110 °C		
RAZ-ST.1500P [1)]	(TR) 40...120 °C (STB) 120...130 °C		

1) According to DIN 3440

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 reference given in Data Sheets N1193 and N1194.

Mechanical design

Housing

The base of the thermostat is made of PA (reinforced) and is designed for protection pocket and wall mounting; the electromechanical control thermostat (TR) and the safety limit thermostat (STB) use 2 separate capillary type sensing elements.

The cover is made of ABS + PC and accommodates the setpoint setting knob, the viewing window and the removable threaded nipple for resetting the safety limit thermostat.

The cable entry gland is M16x1.5 mm.

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 setpoint and the switch-off temperature and for removing and replacing the thermostat, if required.

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 elements in the pocket, secure them with a clamp (mounting accessories).
⚠ Temperature setting	The switch-off temperature (e.g. 120..130°C) 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. In case of rupture of the capillary tube, contact 11-12 will open (fail-safe function). In this state, contact 11-13 will remain open and, for this reason may not be used as part of the safety chain.
⚠ Max. AC 250 V	Caution: prior to opening the housing, disconnect the thermostat from the mains supply.
⚠ ⏚	Earth connections must be made in compliance with the regulations.
Disposal	The device is a waste electronic equipment in terms of the European Directive 2002/96/EC (WEEE) and should not be disposed as part of unsorted municipal waste. The relevant national legal rules are to be paid attention. Use for disposal the systems set up to collect electronic waste. Observe all local and applicable laws.

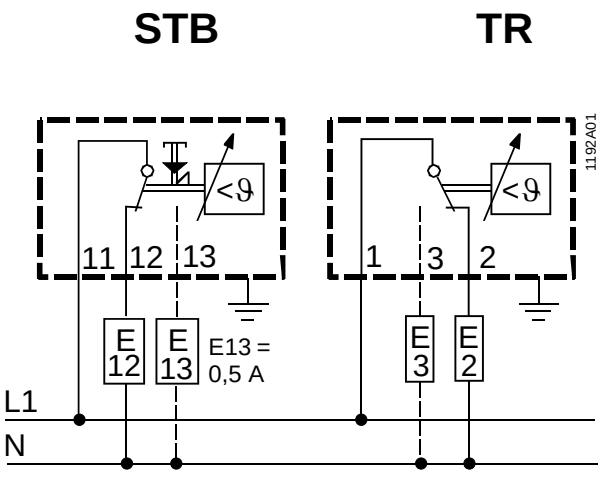
Technical data

Switching mechanism of TR and STB	Switching capacity TR		
	Nominal voltage		AC 24…250 V
	Nominal current I (I_M)	contact connection 1-2	0.1...10 (2.5) A
		contact connection 1-3	0.1… 6 (2.5) A
	Switching capacity STB		
	Nominal voltage range		AC 24…250 V
	Nominal current range I (I_M)		
	contact connection 11-12		0.1…10 (2.5) A
	Terminal for alarm contact connection 11-13		max. 0.5 A
	External fuse		10 A
	Life expectancy at nominal rating	TR Contact 1-2	min. 250 000 switching cycles
		TR Contact 1-3	min. 100 000 switching cycles
		STB	min. 300 switching cycles
	Safety class		I to EN 60 730
	Degree of protection		IP 43 to EN 60 529
Functional data	Externally adjustable temperature TR		
	RAZ-ST.010F/020F/030F/1510		15...95 °C
	RAZ-ST.011F		15...82 °C
	RAZ-ST.010F/ 020F/ 1510 limitation		max. 80 °C ex works (adjustable)
	RAZ-ST.030F no limitation ex works		
	RAZ-ST.1500		40...120 °C
	RAZ-ST.1500 limitation		max. 100 °C ex works (adjustable)
	Safety limit thermostat STB		
	RAZ-ST.010F		95 °C (fixed)
	RAZ-ST.011F		95 °C (fixed)
	RAZ-ST.020F		100 °C (fixed)
	RAZ-ST.030F		110 °C (fixed)
	Internally adjustable safety switch-off temperature for		
	RAZ-ST.1510		90…110 °C (with tool)
	RAZ-ST.1500		120...130 °C (with tool)

	Thermal switching differential TR	6 K (range dependent)
	STB (fixed)	max. temperature 15 ± 5 K
	STB adjustable	max. temperature 20 ± 5 K
Norms and standards	CE conformity	
	Electromagnetic compatibility directive	89/336/EEC
	Low voltage directive	73/23/EEC
	Pressure equipment directive	97/23/EC (CE 0497)
	ENEC (European Norms Electrical Certification)	
	DIN3440 (for pocket mounting) RAZ-ST.1500P /. 1510P	TR/STB 116604
	C-tick	N474
	Product standards	
	Automatic electrical controls for household and similar use	EN 60 730-1
	Special requirements placed on temperature-dependent controls	EN 60 730-2-9
	Type 1 action (TR)	BL (EN 60 730-1/2-9)
	Type 2 action (STB)	BDFHKL (EN 60 730-1/2-9)
	Radio interference protection	click rate N ≤5 to EN 55 014
Environmental conditions	Operation	class 3K5 to IEC 60 721-3-3
	Max. temperature on bulb	
	RAZ-ST.010F/ 011F/ 020F	max. switch-off temperature + 25 K
	RAZ-ST.030F	120 °C
	RAK-ST.1500/ 1510	135 °C
	Ambient temperature at the housing	max. 50 °C (T50)
	Humidity	< 95 % r.h.
	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	135 °C
	Degree of pollution	normal to EN 60 730
	Controlled medium	Water, oil
	Influence of the ambient temperature on TR	-0.18 °C/°C
	Ambient temperature compensation for switching mechanism and capillary tube (on STB)	
Calibration	Calibration temperature TR	max. switch-off temperature
	STB	max. switch-off temperature
	Manufacturing deviation TR	±3 °C
	STB	+0 / -6 °C
	Drift after life expectancy TR and STB	< ±5 %
	Calibrated for ambient temperature at the switching mechanism and capillary tube	20 °C to DIN 3440
	Time constant in: water	<45 s to DIN 3440
	oil	<60 s to DIN 3440
	air	<120 s to DIN 3440
Connections	Electrical connections	screw terminals for wires 2 x 0.75...1.5 mm²
	Earth connection	screw terminals for wires 2 x 0.75...1.5 mm²
	Cable entry gland	M16 x 1.5 mm (for max. 4-core cable)
	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) cover RAL 7035 (light-grey)
	Dim. of sensing elements TR and STB fixed	6.5 mm dia. x 87 mm

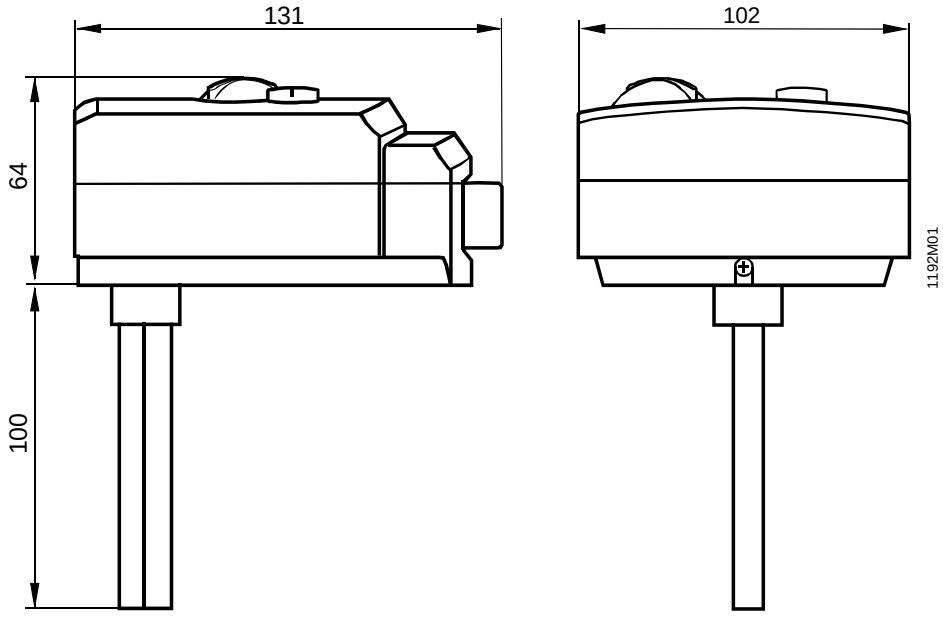
STB adjustable	6.5 mm dia. x 75 mm
Capillary length	700 mm
Min. bending radius of capillary	R min. = 5 mm
Construction	
Carrier of switching mechanism	plastic
Capillary tubes and sensing elements	copper
Diaphragms	stainless steel
Contacts	Ag.1000/1000 (silver)
Weight of standard set	0.53 kg

Connection diagram



E13: Alarm

Dimensions



Subject to alteration