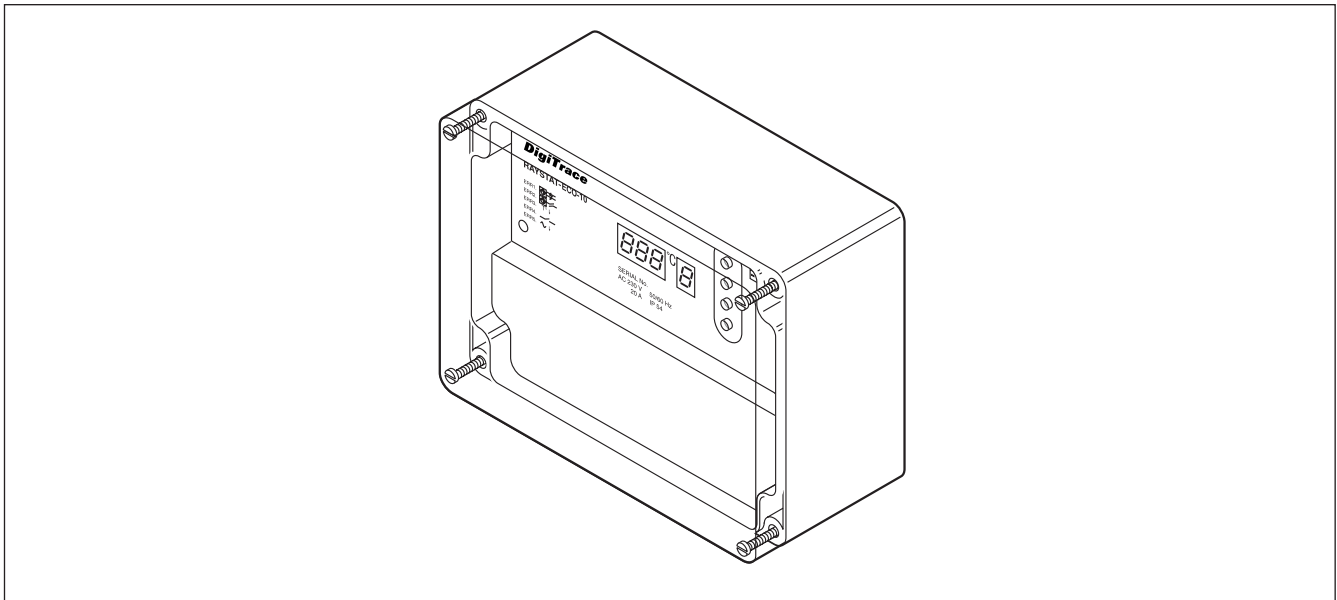


Ambient sensing Energy saving frost protection controller

The RAYSTAT-ECO-10 temperature controller is designed to control heating cables used for frost protection applications. It continuously adjusts the trace-heating output based on the ambient temperature. Using a proprietary algorithm, the RAYSTAT-ECO-10 controller measures ambient temperature and determines the appropriate cycle time during which the heating cables will be energised.

Since ambient temperatures in winter are often below freezing point, but well above the minimum designed ambient temperature, significant energy savings are realised. Parameters are displayed and can be set easily. The controller includes a 25A relay which allows direct switching of the heating circuit. The enclosure can easily be installed outdoors. The unit includes a Pt 100 sensor for determining ambient temperature in ordinary area.

The RAYSTAT-ECO-10 controller is designed to provide trouble-free, long term operation. In addition to the display, the controller includes an alarm relay that switches either upon low supply voltage, upon output fault or upon RTD failure thus allowing remote indication of system status.



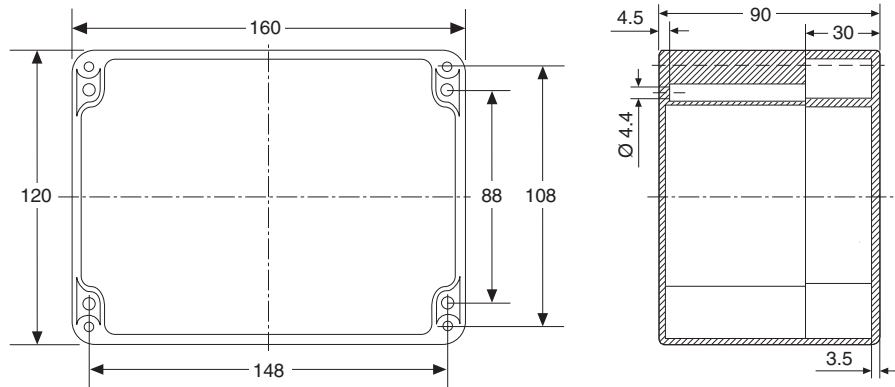
General

Area of use	Ordinary area, outdoors
Ambient operating temperature range	-40°C to +40°C
Supply voltage (nominal)	230 V +10% -10%, 50/60 Hz
Internal power consumption	≤ 14 VA

Enclosure

Protection	IP65
Base and lid	Grey polycarbonate base Transparent lid
Lid fixing	4 captive screws
Entries	2 x M25, 1 x M20, 1 x M16 Direct entry of heating cable into unit with M25 connection kit
Gland plug	1 x M20

Dimensions (in mm)



Temperature sensor

Type	3-wire Pt 100 according to IEC Class B
Area of use	Ordinary area
Sensor can be extended with a 3-wire shielded cable of max. 20 Ω per conductor (max. 150 m with a 3 x 1.5 mm ² cable). The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables. The shield of the extension cable should be grounded at the controller end only.	

Output relays

Control relay	Single pole single throw relay, rating: 25 A at 250 VAC
Alarm relay	Single pole double throw relay, rating: 2 A at 250 VAC, voltfree

Parameter settings

Maintain temperature set point	0°C to + 30°C (heating 0% powered)
Minimum ambient temperature	-30°C to 0°C (heating 100% powered)
Heater Operation if Sensor Error	ON (100%) or OFF, user defined ON or OFF
Voltage Free Operation	YES or NO
Parameters can be programmed without power supply (internal battery) and parameters are stored in non-volatile memory.	

Energy saving with Proportional Ambient Sensing Control (PASC)

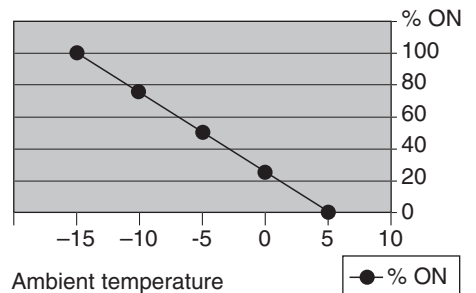
Duty cycle (power to heater ON) depends on the ambient temperature.

For example:

If minimum temperature= -15°C and if maintain temperature (set point)= +5°C

ambient t°	% ON
-15	100
-10	75
-5	50
0	25
5	0

Min. Ambient
Set point

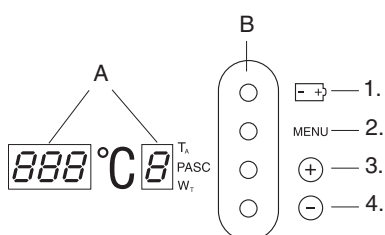


Result: At ambient temperature of -5°C, 50% energy is saved

Diagnosed alarms

Sensor errors	Sensor short / Sensor open circuit
Low temperature	Min. expected ambient temperature reached
Voltage errors	Low supply voltage / Output voltage fault

Display layout

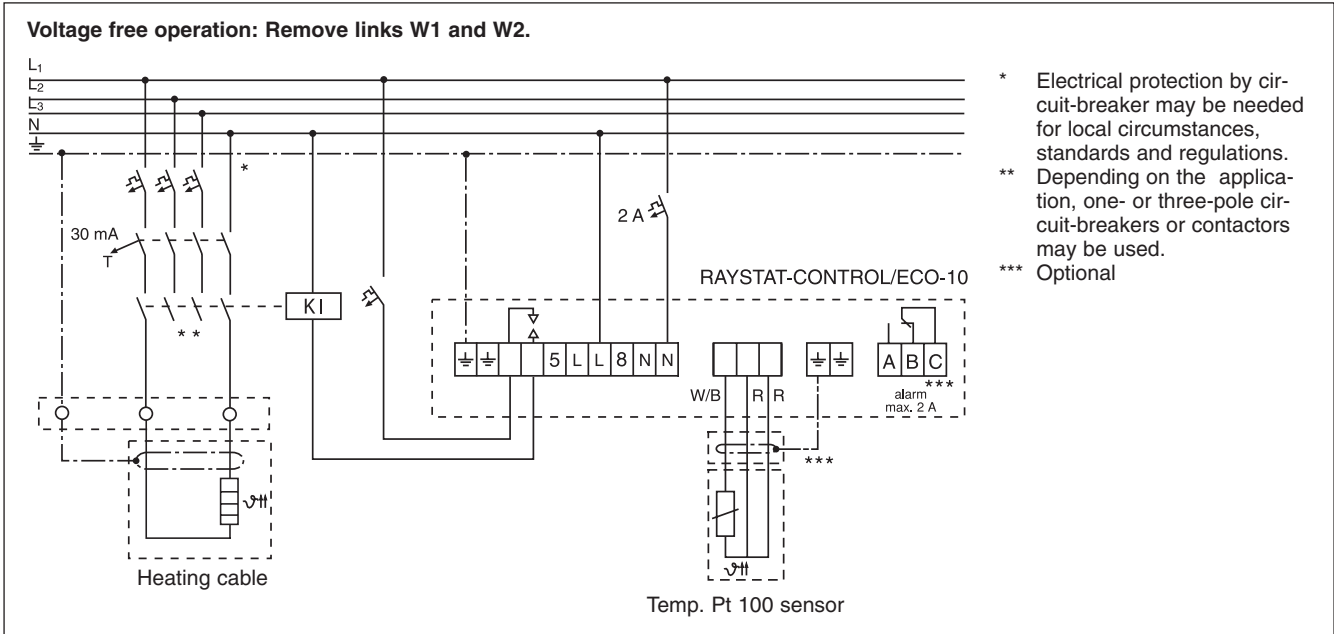
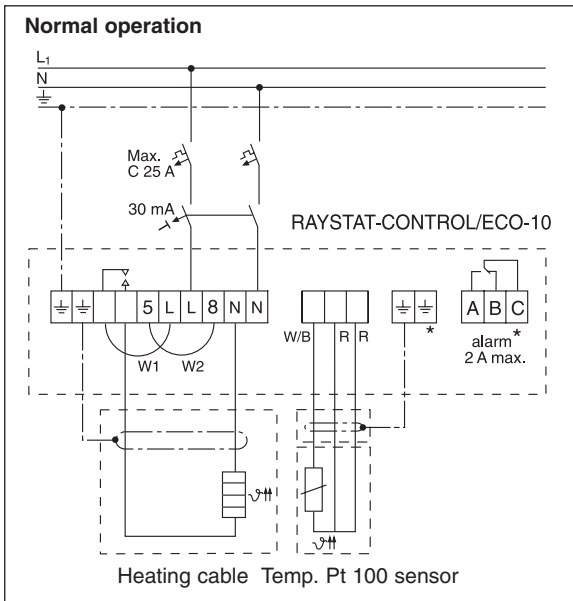


A. LED Display (parameter and error indications)

B. Push buttons

1. Battery activation
2. Parameter selection
3. Increase value
4. Decrease value

Connection details



- * Electrical protection by circuit-breaker may be needed for local circumstances, standards and regulations.
- ** Depending on the application, one- or three-pole circuit-breakers or contactors may be used.
- *** Optional

Connection terminals

Supply	3 terminals for 0.75 mm ² to 4 mm ²
Pt 100 connection	4 terminals for 0.75 mm ² to 2.5 mm ²
Control relay connection	3 terminals for 0.75 mm ² to 4 mm ²
Alarm relay connection	3 terminals for 0.75 mm ² to 2.5 mm ²

Mounting method

Support bracket	Surface mounting with 4 fixing holes on 148 x 108 mm centres, M4 clearance SB-100, SB-101 (SB-110 or SB-111)
-----------------	---

Ordering details

Part description	RAYSTAT-ECO-10
PN (Weight)	145232-000 (800 g)

Accessories

PA Reducer	Reducer M25 (M) / M20 (F)
PN	184856-000