
Transformer temperature control device

RTT 16



Katowice 2012r.

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1. Introduction

Electronic device RTT-16 is particularly suitable for the temperature control of dry and resin transformers and motors equipped with PTC or NTC sensors.

2. Use.

Device is able to control maximum three temperature thresholds. The relay with switching contacts is applied as the device's outputs for each temperature threshold. The fourth relay works as the time relay, which switches on with 5 sec. delay after power turning on.

3. Technical data:

Supply voltage:	100-240VAC or 150 -320VDC (standard) 18-36VDC (option RTT16-DC) 12VDC (option RTT16-E)
Max. Power consumption: (continuous load output 12VDC)	36VA
Power consumption:	12VA
Max. current-carrying capacity output 12VDC:	0,4A
Number of inputs:	3 (max. 3 PTC or NTC sensors can be serial connected to each-series connection, total nominal resistance lower than 1 k Ω) and timer
Nominal threshold resistance:	1 k Ω
Delay to turn on track D (t1)	5 sec.
Delay to turn off track D (t2)	min. 0,2 sec.
Number of outputs:	4 switching contacts
Maximum switch voltage:	400V AC
Maximum switch power:	2kVA
Maximum switch current:	250VAC 30VDC/8A (Schrack RY210012)
Ambient temperature (operation):	-25 to 55°C
Ambient temperature (storage):	-25 to 80°C
Protection:	Automatic disconnection of power supply:
Electrical resistance of insulation	>2,5kV, 50Hz, 1 min
Protection housing:	IP30
Width:	70 mm.
Length:	119 mm.
Height:	101 mm.
Weight:	0,4kg.
Accessories WTT8b (optional):	
- input Pt100 sensor	2-wire
- supply voltage	12VDC/100mA
- measuring range	0-250°C
- digit quantity:	3
- digit height:	27 mm.

4. Installation.

Device should be mounting on DIN-rail TS-35. Set the configuration switch on front panel, according to the description below. Connect protective earth, power supply, and the sensors. Connect output's contacts in a needed way. The system does not require adjustment and can operate in any position. Section of the cable that can be connected to terminals cannot be larger than 2.5 mm^2 . It is recommended to use a line of 1 mm^2 or 1.5 mm^2 section. No regulation or conservation is required by the device. System does not require maintenance.

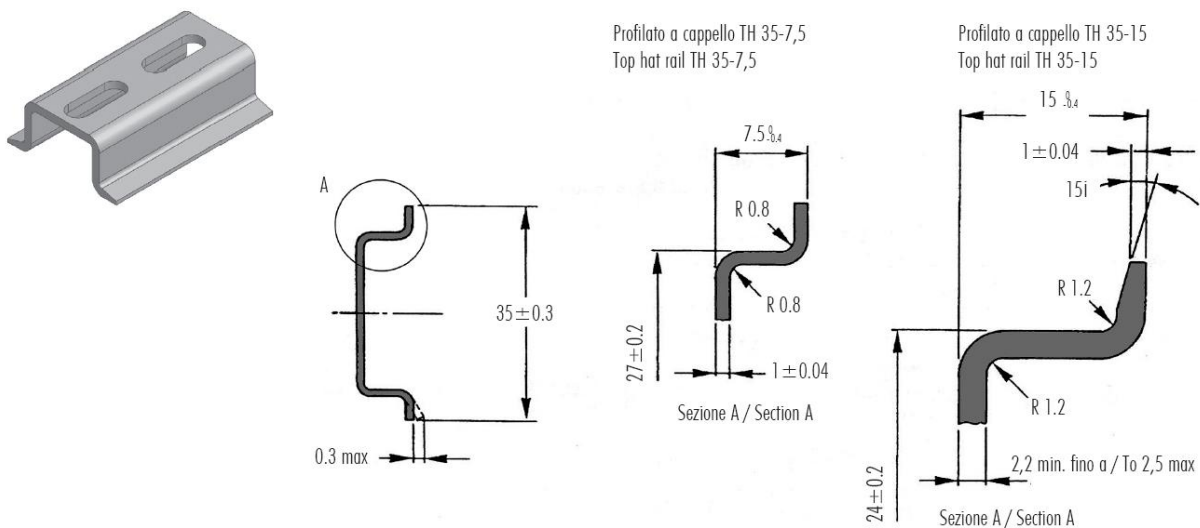


Fig.1 Dimensions DIN-rail



Attention!

Before switching on make sure that the supply voltage U_s of the type device and the mains voltage are the same.

5. Construction.

Maximum three sensors with $1\text{k}\Omega$ nominal resistance can be connected to the device's inputs. Each sensor is tested in a bridge configuration, by its own comparator with hysteresis. Comparator activates or disables the corresponding actuator. Actuators are RY210012 relays. All output relays potentially separated from each other. Channel D is attached after 5 seconds after power-on system.

Used in the device switching mode power supply allows the correct operation of the power

supply voltage in the range 100-240V AC or 150-320V DC without any switching (version standard). In version RTT16-DC is converter DC/DC, which allows the correct operation of the power supply voltage in the range 18-36V DC. For economic version device RTT16-E power supply is 12V DC. This version is without switching power supply.

The solution implemented in the system is reserved.

6. Programming.

To set the type of work of RTT-16 serve switch placed on front side. The following combinations are possible:

For PTC sensors:

Setting the switch the type of work in position PTC (upper position- fig.2). Relays are switched on when temperature is correct. The relays are switched off when temperature is too high. In the absence of power this combination causes the relay pass in the state such as the over-temperature, which protects the transformer in case of power failure. (Recommended)

Setting the switch the type of work in position NTC (lower position). Relays are switched off when temperature is correct. The relays are switched on when temperature is too high. In this position system does not control the temperature in the absence of power supply .

For NTC sensors:

Setting the switch the type of work in position NTC (lower position). Relays are switched on when temperature is correct. The relays are switched off when temperature is too high. In the absence of power this combination causes the relay pass in the state such as the over-temperature, which protects the transformer in case of power failure. (Recommended)

Setting the switch the type of work in position PTC (upper position- fig.2). Relays are switched off when temperature is correct. The relays are switched on when temperature is too high. In this position system does not control the temperature in the absence of power supply .

7. Failures.

The relays do not switch on , although the sensors work correctly:

- Check supply voltage - lamp should be lit on the power supply.
- Make sure that supply voltage is connected correctly and is the same as on the type device.
- Change fuse (see fig.2).
- Check if switch the type of work is properly set-up, if the symptom persists, consult the manufacturer. These symptoms may occur if the system has been destroyed or blocked power supply. This may be an instance of high potentials between the sensors or the appearance of a supply voltage of a series of voltage pulses with an energy that allows the internal blown fuses or protective varistor (eg, lightning).

The system switches by connecting the sensors on the outside and does not work on the transformer:

- Check for proper connection of sensors and their resistance.

In case of problems please contact:

+48 (32) 353 41 31 w.26

hitin@hitin.pl

8. Charts, drawings, diagrams.

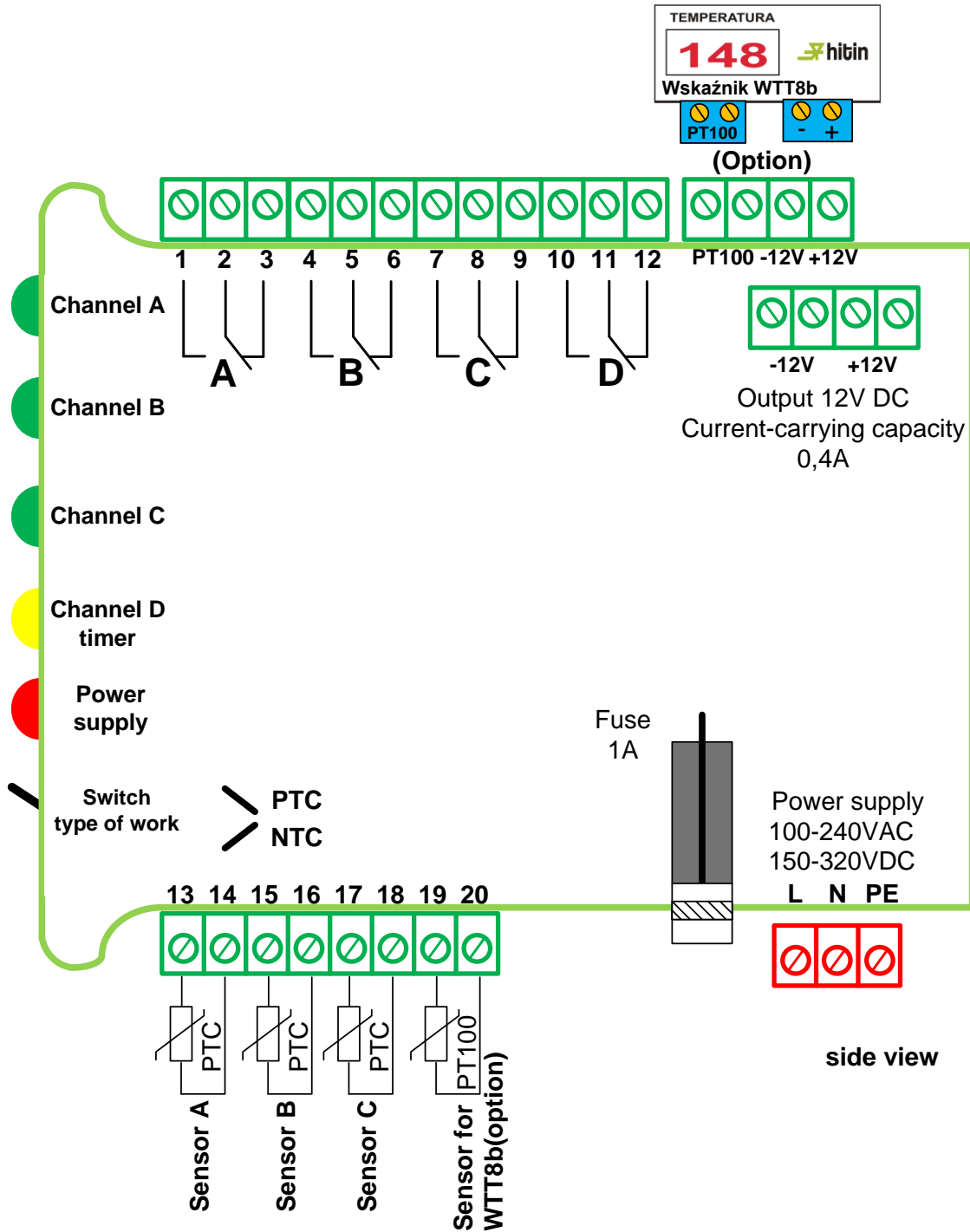


Fig.2 Arrangement of basic elements RTT16 (standard version).

(A,B,C executive relays of temperature control circuits, D- a timer output relay). Sensor connect to contact 13-14 react on relay A, Sensor connect to contact 15-16 react on relay B, Sensor connect to contact 17-18 react on relay C External LED display WTT8b shows temperature of a sensor connected to terminals 19-20.

Red LED is lit when the device powered on.

The fuse used is Schurter 0034.15.16; 5x20mm;1A

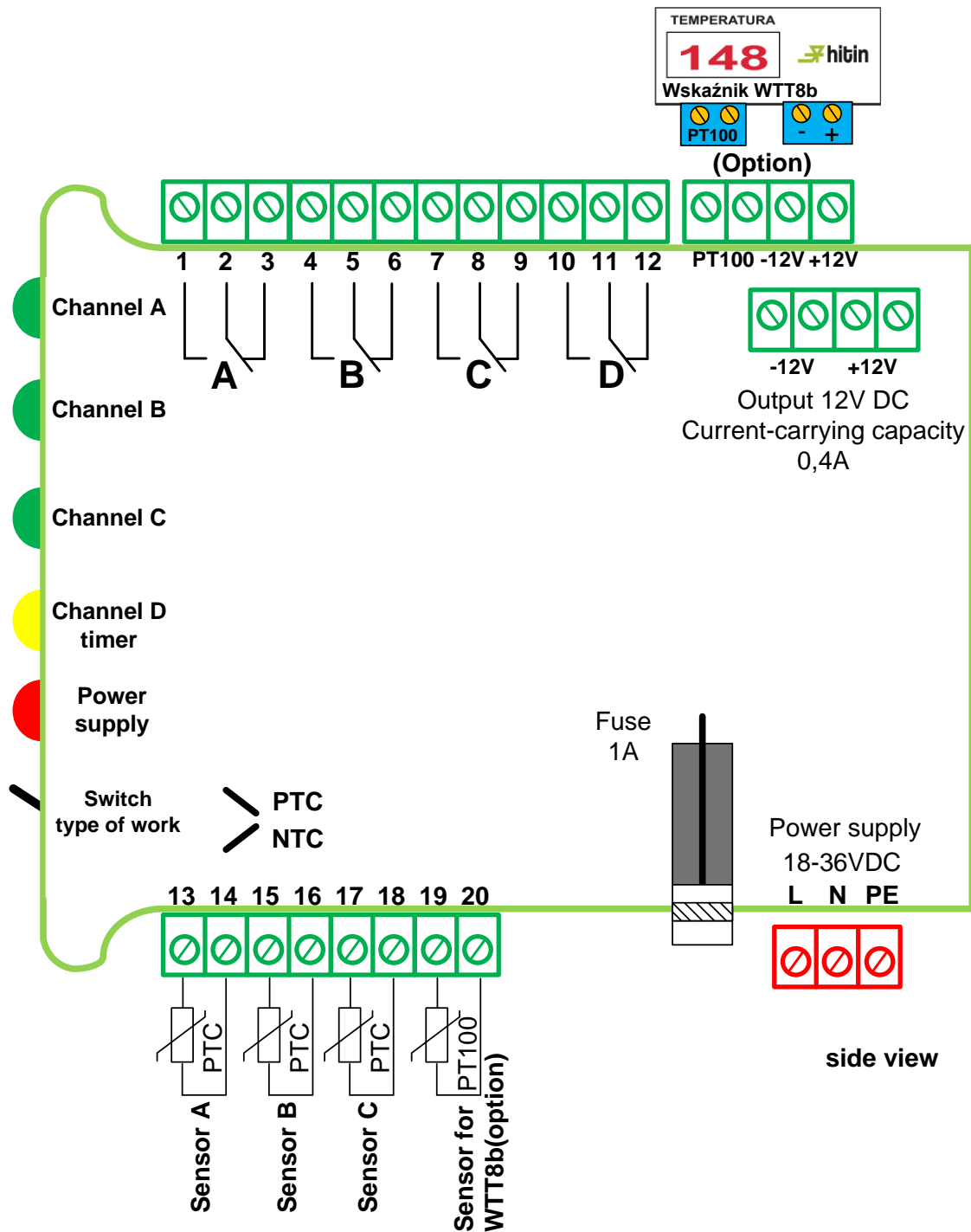


Fig.3 Arrangement of basic elements RTT16-DC.

(A,B,C executive relays of temperature control circuits, D- a timer output relay). Sensor connect to contact 13-14 react on relay A, Sensor connect to contact 15-16 react on relay B, Sensor connect to contact 17-18 react on relay C, External LED display WTT8b shows temperature of a sensor connected to terminals 19-20.

In case loss of power supply red diode lit off.
In fuse base is Schurter 0034.15.16; 5x20mm;1A

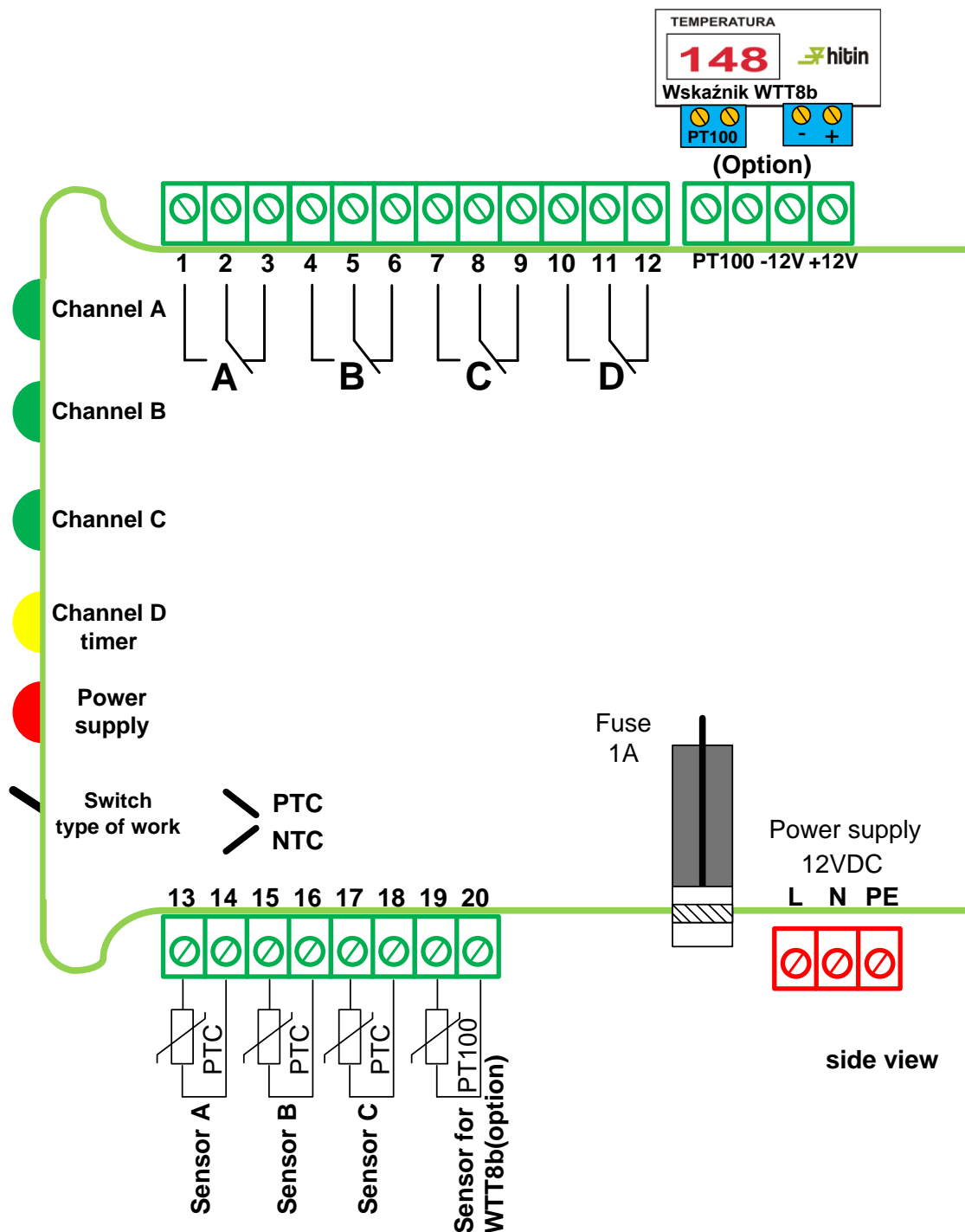
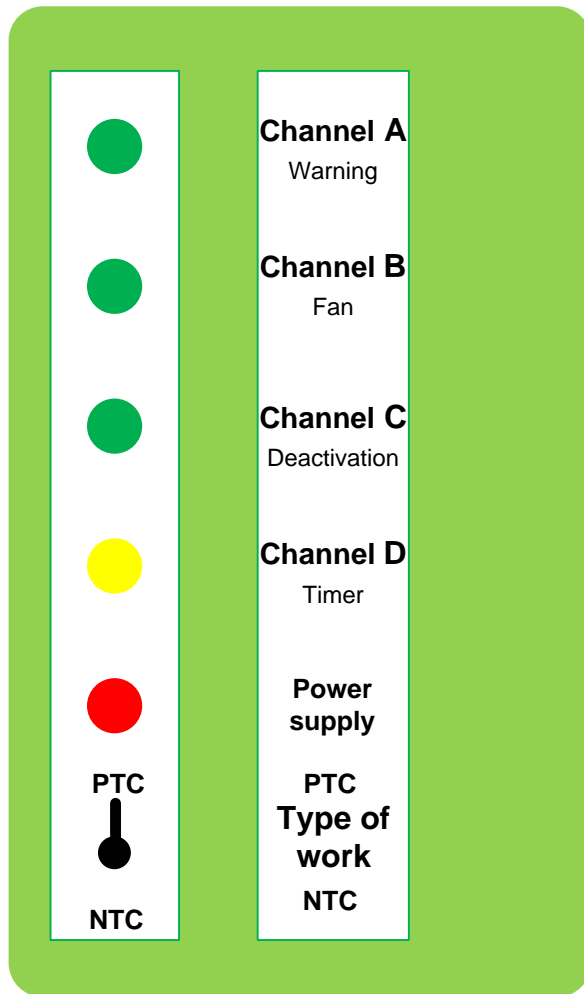


Fig.4 Arrangement of basic elements RTT16-E.

(A,B,C executive relays of temperature control circuits, D- a timer output relay). Sensor connect to contact 13-14 react on relay A, Sensor connect to contact 15-16 react on relay B, Sensor connect to contact 17-18 react on relay C, LED Display WTT8b shows the temperature sensor connected to contact 19-20.

In case loss of power supply red diode lit off.
 In fuse base is Schurter 0034.15.16; 5x20mm;1A



front view

Fig.5 Front view RTT16.

External connection diagrams is shown in figure bellow for version standard. Difference between RTT16 (standard) and RTT16-DC, RTT16-E is power supply. Connecting sensors and elements protect to control device is the same for all version.

EXAMPLE OF THE CONNECTION CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

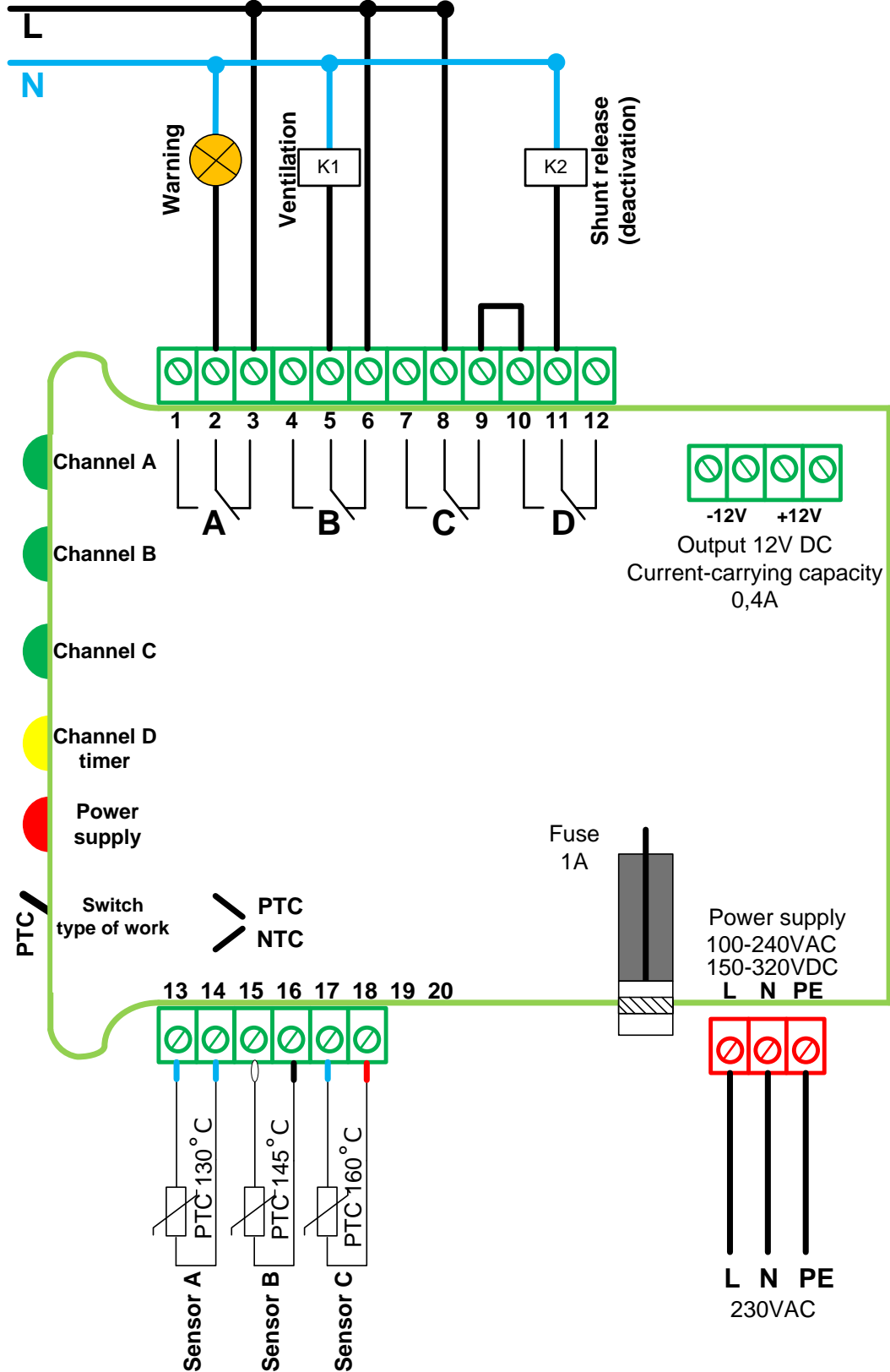


Fig.6 Example of the use of RTT-16 equipped with three PTC temperature sensors - 3 temperature thresholds, the coil voltage (shunt release).

All the contacts shown in de-energized position.

1. The switch must be set to PTC.
2. Signaling and the coil connected as shown.

EXAMPLE OF THE CONNECTION CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

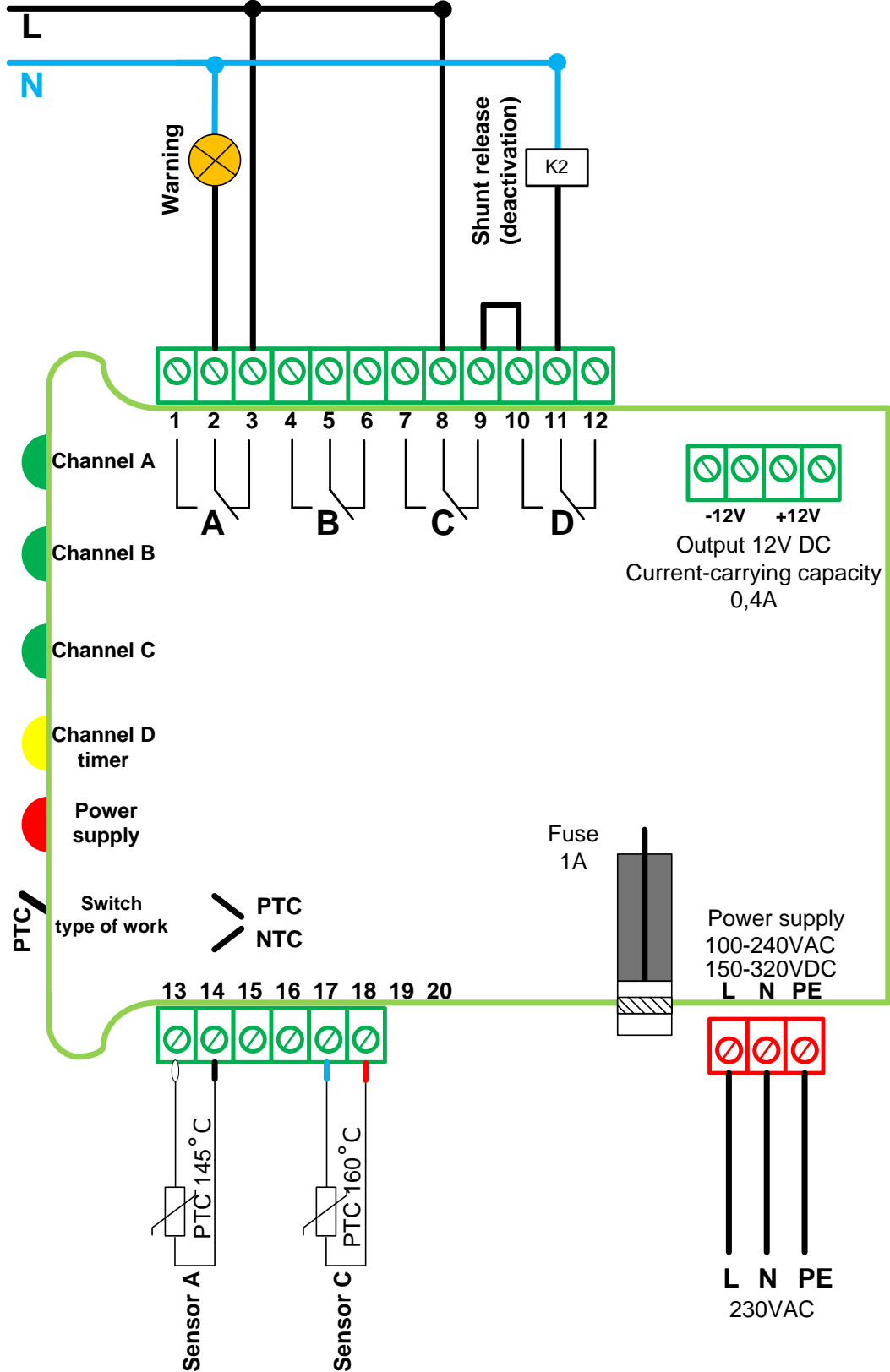


Fig.7 Example of the use of RTT-16 equipped with two PTC temperature sensors - 2 temperature thresholds, the coil voltage (shunt release).

All the contacts shown in de-energized position.

1. The switch must be set to PTC.
2. Signaling and the coil connected as shown.

EXAMPLE OF THE CONNECTION CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

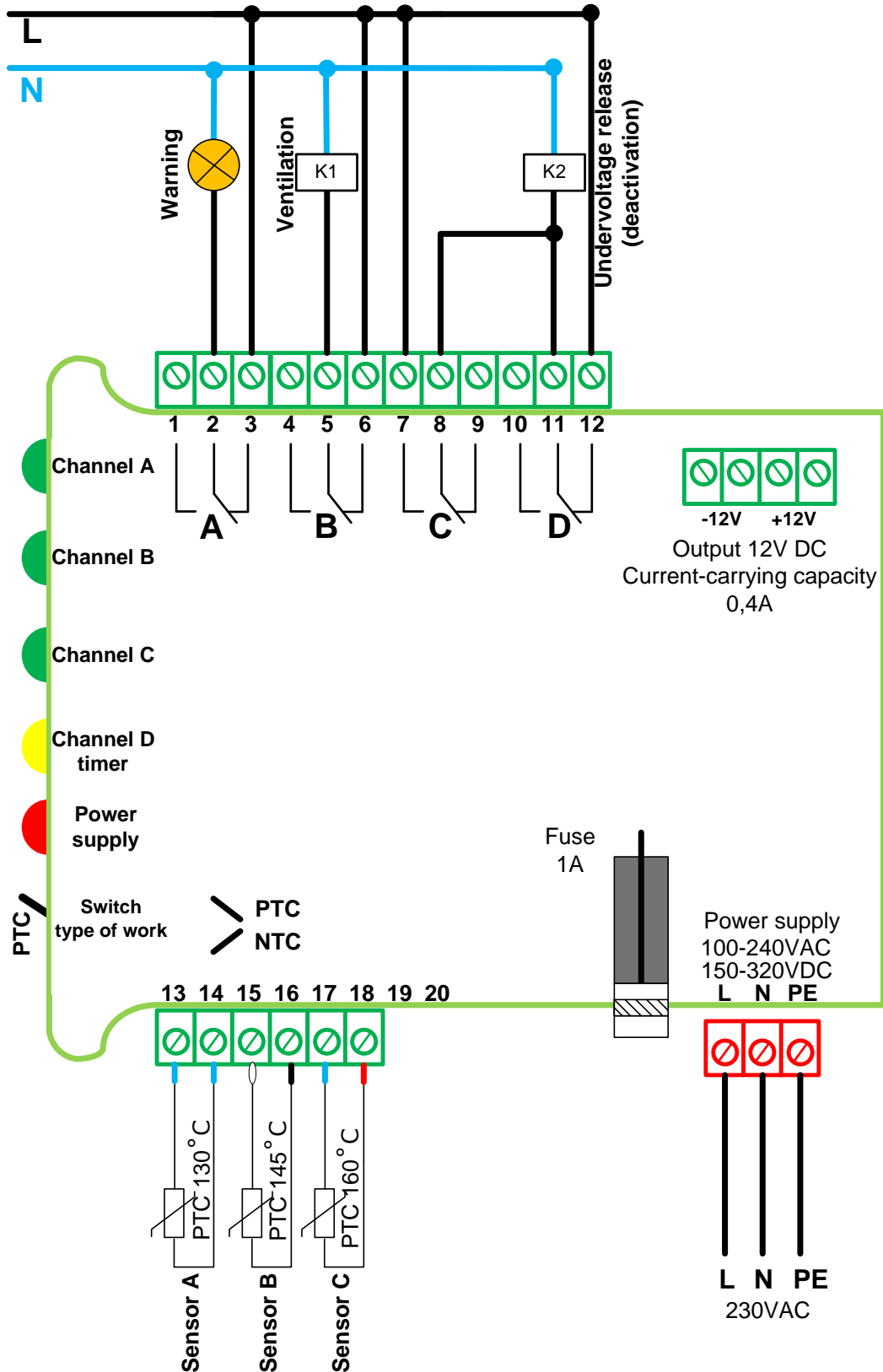


Fig.8 Example of the use of RTT-16 equipped with three PTC temperature sensors – 3 temperature thresholds, the coil voltage (undervoltage release).

All the contacts shown in de-energized position.

1. The switch must be set to PTC.
2. Signaling and the coil connected as shown.

EXAMPLE OF THE CONNECTION CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

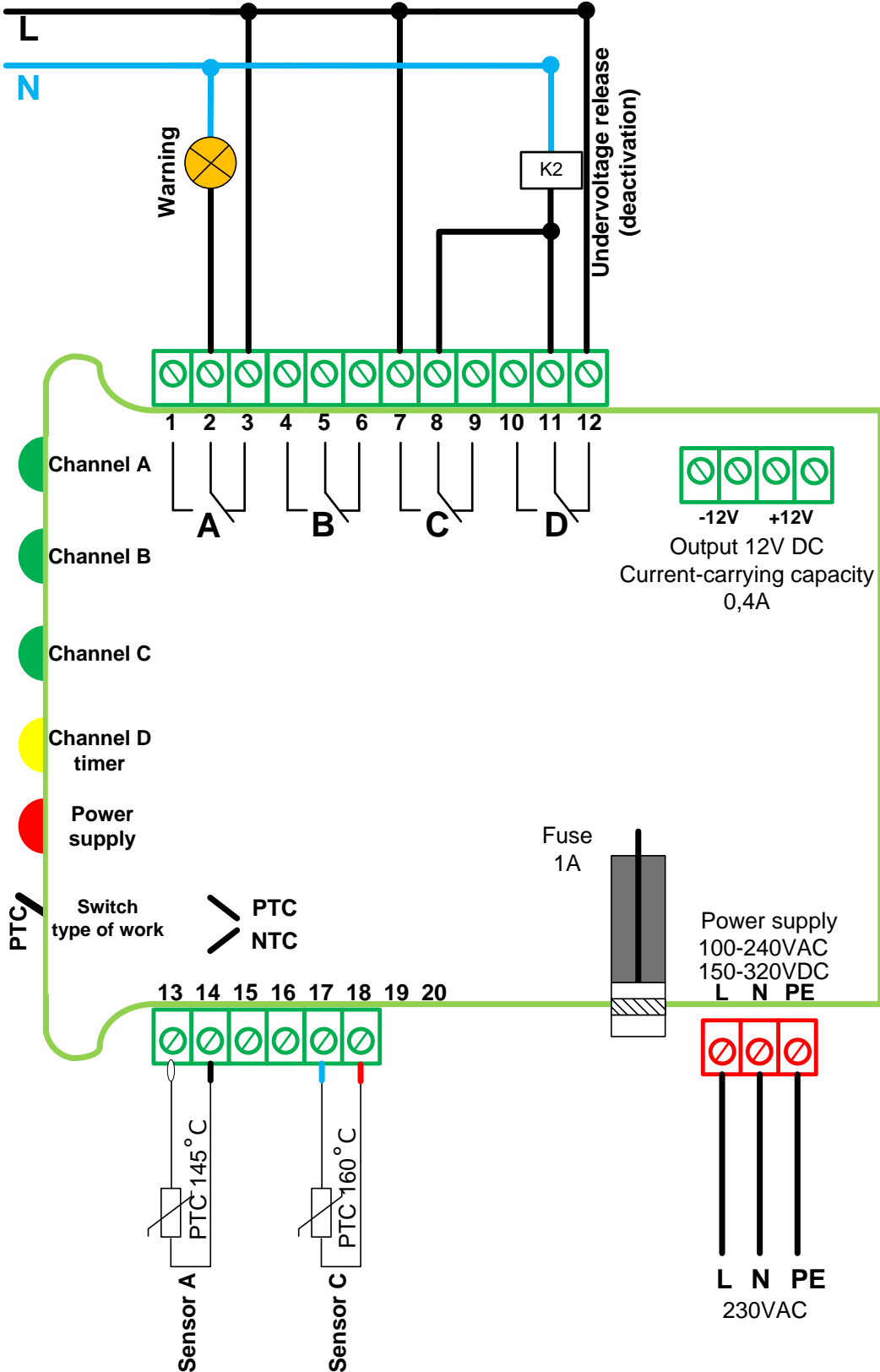


Fig.9 Example of the use of RTT-16 equipped with two PTC temperature sensors – 2 temperature thresholds, the coil voltage (undervoltage release).

All the contacts shown in de-energized position.

1. The switch must be set to PTC.
2. Signaling and the coil connected as shown.

EXAMPLE OF THE CONNECTION DOESN'T CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

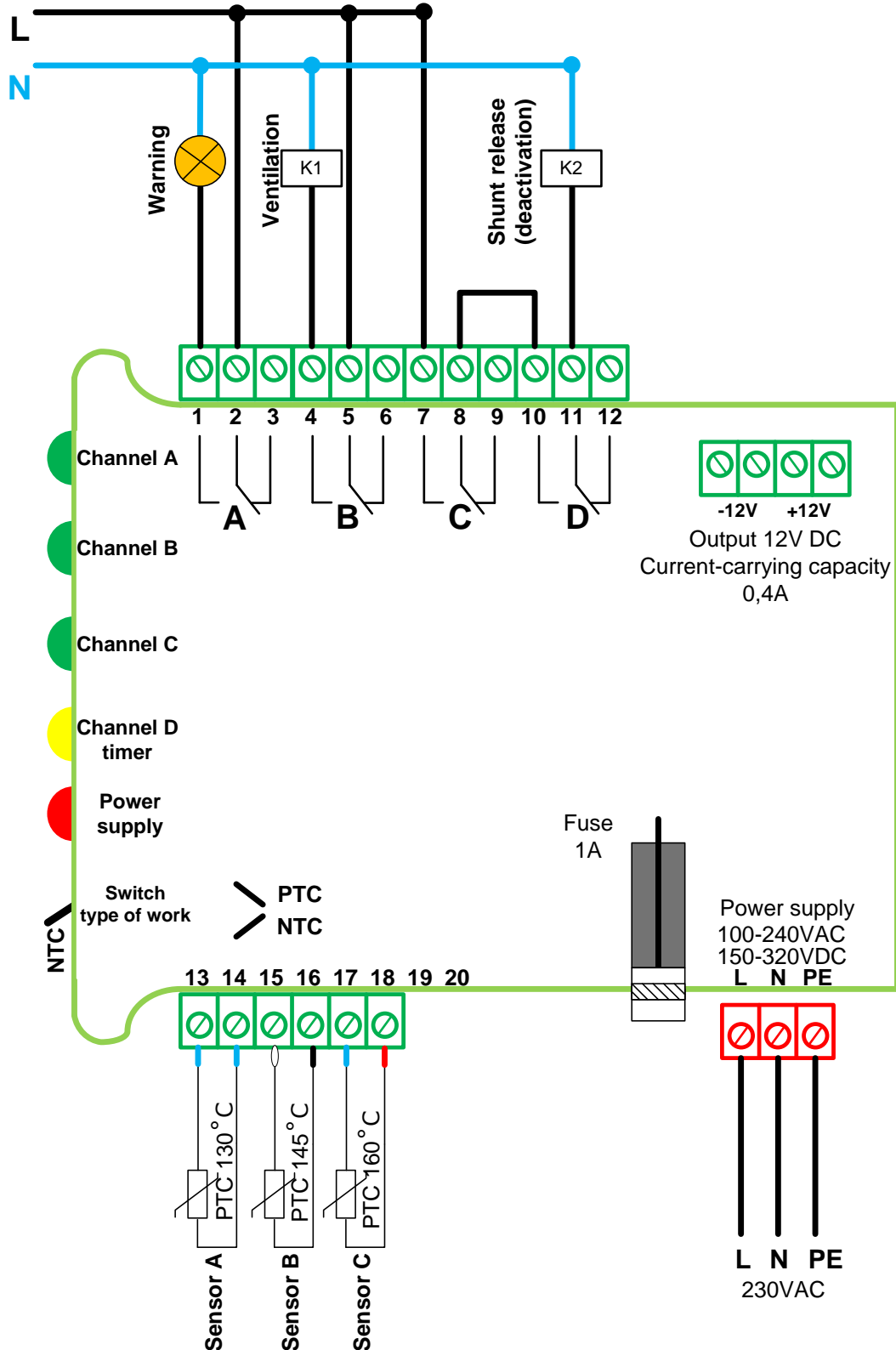


Fig.10 Example of the use of RTT-16 equipped with three PTC temperature sensors - 3 temperature thresholds, the coil voltage (shunt release).

All the contacts shown in de-energized position.

1. The switch must be set to NTC.
2. Signaling and the coil connected as shown.

EXAMPLE OF THE CONNECTION DOESN'T CAUSES TURN OFF TRANSFORMER AFTER POWER LOSS.

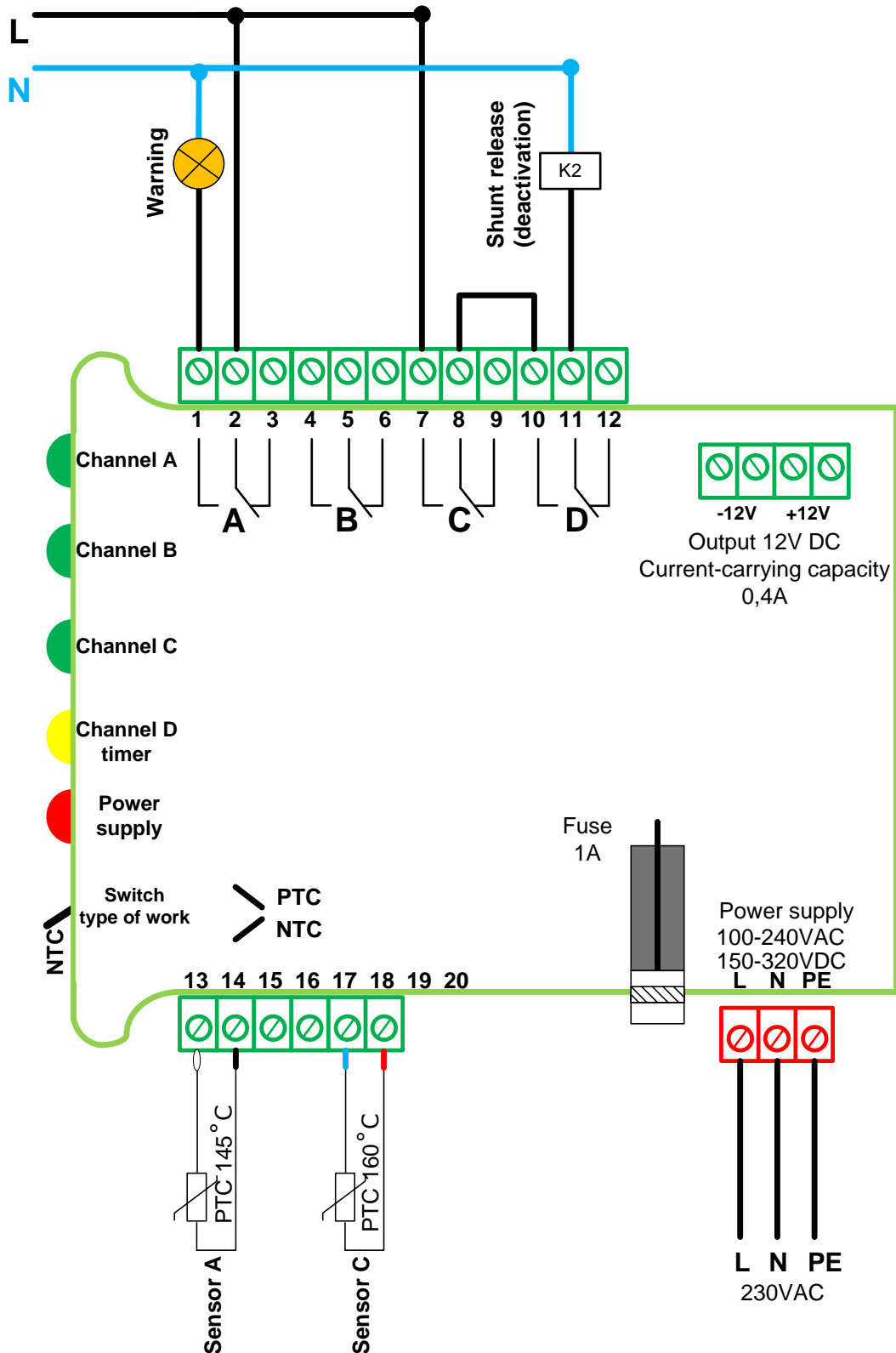


Fig.11 Example of the use of RTT-16 equipped with two PTC temperature sensors - 2 temperature thresholds, the coil voltage (shunt release).

All the contacts shown in de-energized position.

1. The switch must be set to NTC.
2. Signaling and the coil connected as shown.

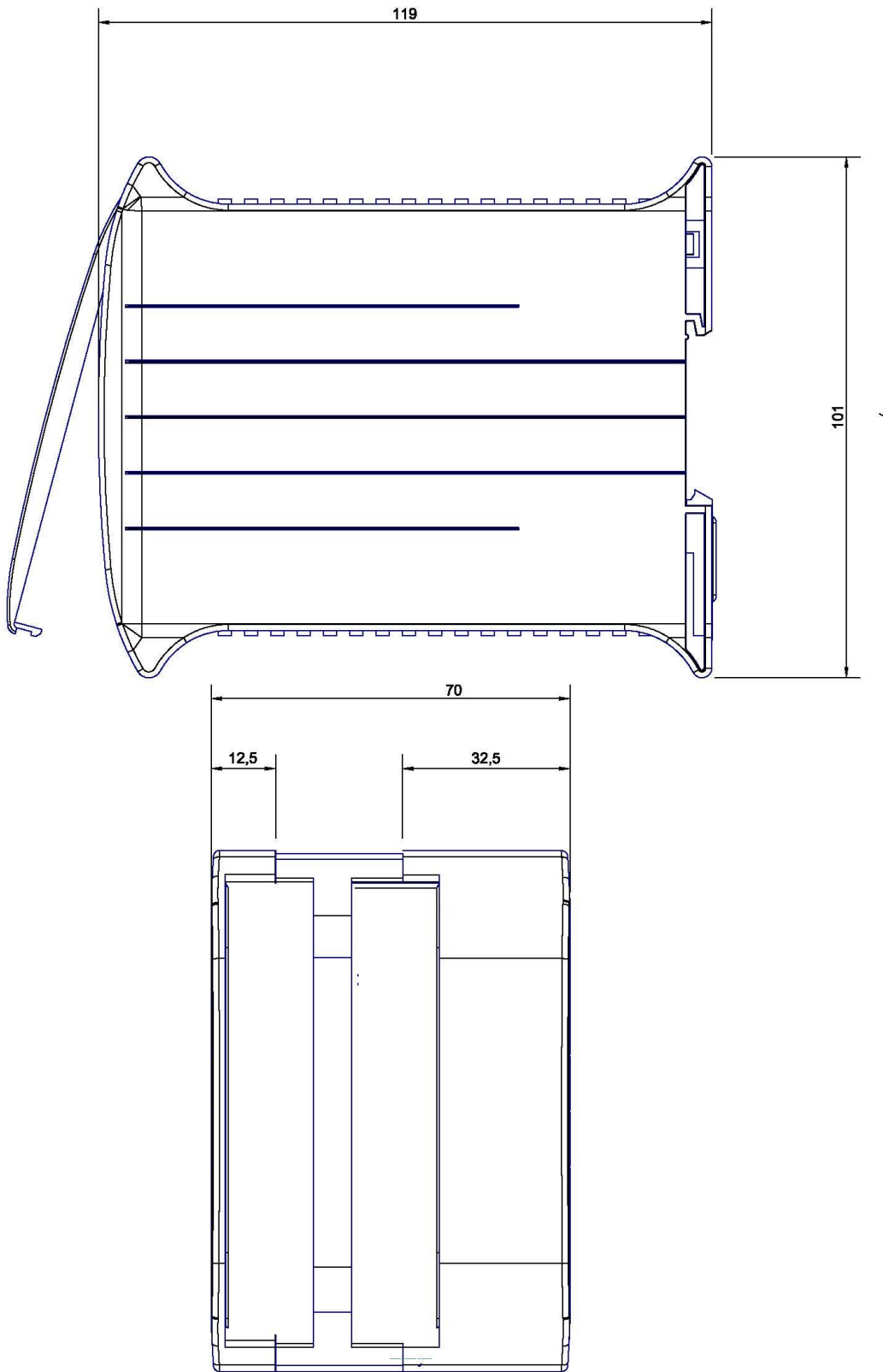


Fig.12 Casing dimensions RTT16

9. Accessories:

RTT16 + WTT8b

RTT16 with additional LED display – WTT8b shows the temperature sensor Pt100 connected to contact 19-20. Auxiliary indicator WTT8b should be connected with the RTT16 via a 4-wire cable with a cross-section of 1 to 1.5 mm². Connect wires as described on fig.13. (terminals +12 V,-12V and Pt100).

Permissible distance 15 m of cable connections.

After installing the system does not require any adjustment.

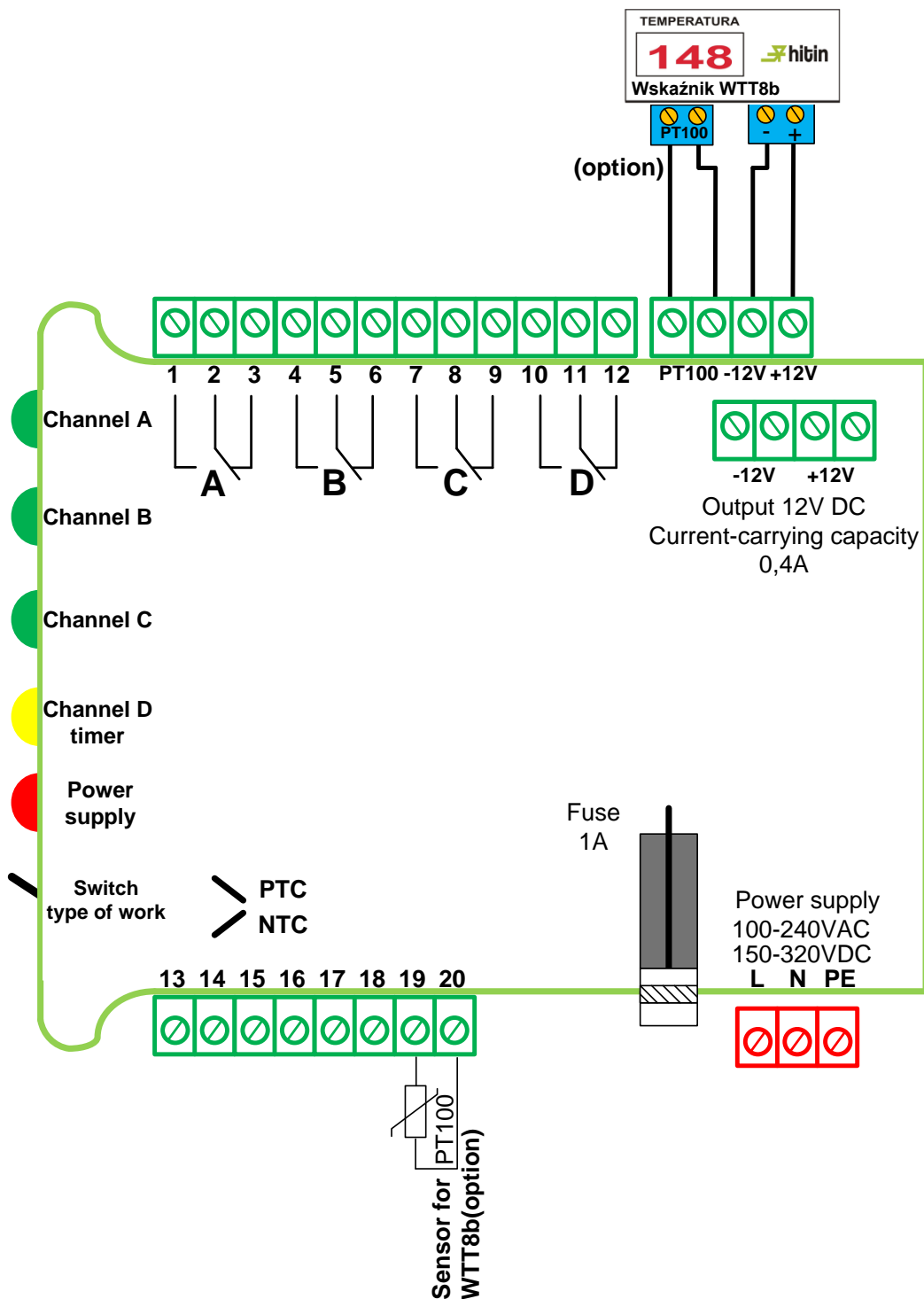


Fig.13 RTT16 with LED – display WTT8b.

10. Order form:

- a) **Version RTT16 (standard)**
Power supply 100-240VAC or 150-320VDC without any switching.
- b) **Version RTT16-DC**
Power supply 18-36VDC.
- c) **Version RTT16-E**
Power supply 12VDC. This version is without feeder.

Additional options:

- **LED display - WTT8b**