

CZAKI THERMO - PRODUCT

05-090 Raszyn - Rybie

ul. 19 Kwietnia 58

tel. (22) 720-23-02

fax (22) 720-23-05

e-mail: handlowy@czaki.pl

R-202 TEMPERATURE CONTROLLER USER'S MANUAL

Application

R-202 is a microprocessor based temperature controller for applications requiring simple on-off control systems. Adjustable hysteresis makes the controller more flexible. The instrument can be mounted into a control panel. R-202 is manufactured in two versions: for thermocouple and for RTD's sensor (3-wire). When R-202 works with thermocouple sensor, the cold junction temperature is compensated automatically. R-202 temperature controller is equipped with relay contacts available at the output terminals.

The user can adjust following parameters:

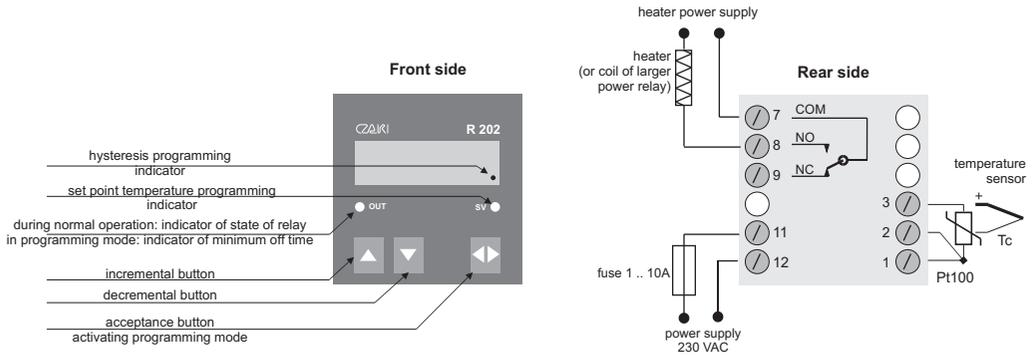
- set point value
- hysteresis
- minimum relay off time

Specifications

Variant	Set point temperature range	Sensor
R-202-Pt100/1	0.0 .. +199.9 °C	Pt100
R-202-Pt100	0 .. +800 °C	Pt100
R-202-J	0 .. +700 °C	Fe-CuNi (J)
R-202-K	0 .. +1200 °C	NiCr-NiAl (K)
R-202-N	0 .. +1300 °C	NiCrSi-NiSi (N)
R-202-B	+400 .. +1800 °C	PtRh30-PtRh6 (B)
R-202-S	+200 .. +1600 °C	PtRh10-Pt (S)
R-202-R	+200 .. +1600 °C	PtRh13-Pt (R)

Accuracy of measurement (for ambient temperature 23 °C ± 5°C)	0.25% of set point temperature range ±1 digit
Hysteresis	0.1 .. 25 °C for R-202Pt100/1 1 .. 250 °C for other cases
Minimum relay off time	1 .. 600 seconds
Output	electromechanical relay, 5A, 250 VAC
Display	LED 10 mm, red
Power supply	230VAC, 50Hz, 2VA
Housing Front side	IP40
Terminals	IP30
Ambient temperature	0 .. +45 °C
Dimensions (height x width x depth)/weight	48 x 48 x 115 mm / ca. 200g
Window for mounting (height x width)	45.5 x 45.5 mm

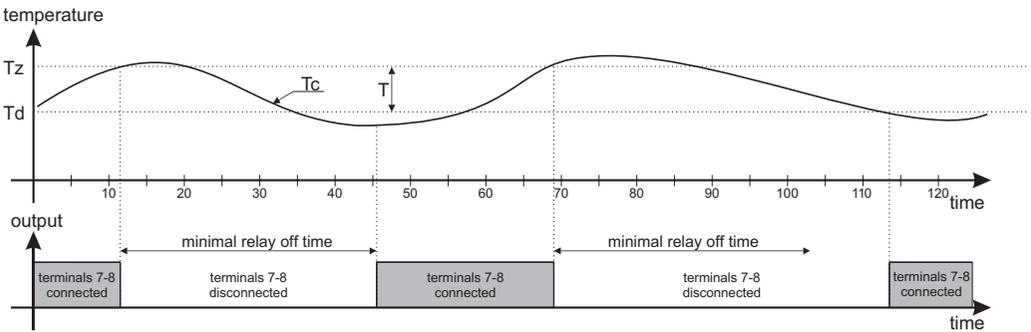
Fig.1 Front panel layout and terminals connections.



Operation

R-202 is an on-off temperature controller with hysteresis. The instrument output is an electromechanical relay. Temperature controlling is carried-out in the way that the relay turns-on (then terminals 7 and 8 are connected) when the sensor temperature T_c falls below T_d (see Fig. 2) and the relay turns-off when the sensor temperature reaches the set point temperature T_z . The parameter minimum relay off time enables additional protection of the relay against too frequent switching.

Fig.2 Example of temperature controlling.



Example

In this example R-202-J will be described. In this case the set point temperature range is 0.. 700 °C.
 Parameters: set point temperature T_z : 350 °C; hysteresis T : 2 °C
 low threshold temperature T_d : 350°C - 2°C=348°C
 minimal relay off time: 34 seconds

Set point temperature T_z programming

Press and hold the button \leftarrow for about 1 second.
 When the LED SV turns-on, the instrument enters into programming mode of set point temperature.
 Now the display shows the value of set point temperature T_z in °C.
 The user can change the set point temperature with buttons \uparrow or \downarrow .
 In order to accept the new value, the button \leftarrow should be pressed down.
 The display shows current temperature of the sensor now.

Hysteresis T programming

Press and hold the button  for about 3 seconds.

When the dot turns-on in the display (see Fig. 1), the controller enters into programming mode of hysteresis. Now the display shows the value of hysteresis in °C.

The user can change the hysteresis with buttons  or .

In order to accept the new value, the button  has to be pressed down.

The display shows current temperature of the sensor now.

Minimum relay off time programming

Press and hold the button  for about 8 seconds.

When the LED OUT turns-on, the instrument enters into programming mode of minimum relay off time. Now the display shows the value of minimum relay off time in seconds.

The user can change the value of the parameter with buttons  or .

Then the button  should be pressed down.

Messages

 this message appears when the power supply is connected; it indicates that microprocessor loads parameters from non-volatile memory; the message disappears in 10 seconds and the controller starts displaying actual temperature of the sensor (Tc).

 this message indicates damage of the sensor or temperature of the sensor is out of range

 this message appears when the ambient temperature is too high; in this case the parameters of the controller cannot be saved in non-volatile memory; when this message appears, the controller should be immediately disconnected from the power supply

Mounting procedure

The controller should be mounted in a panel using an attached mounting bracket.

Fig. 1 shows connection diagram. It is recommended to use shielded cable to connect the input sensor. For thermocouple sensor proper compensating cable (preferable shielded) has to be used. If a shielded cable is used, the shield should be connected at one point only. Don't run input wires together with power cables. The output relay and the power supply should be connected using copper cables.

Contents of package

Temperature controller with mounting bracket.

In the case of controller working with platinum sensor Pt100, a testing resistor.

User's manual.

Notes

Never exceed the current and voltage limits for the output relay (5A, 250 VAC).

The power supply circuit should contain quick-acting fuse 1 .. 10 A (Fig. 1).

Never exceed the ambient temperature of the unit.

Maintenance

The controller doesn't require any maintenance.

In the case of failure please contact Commercial Department of CZAKI THERMO-PRODUCT.

Default settings

Set point temperature: 100 °C, hysteresis: 1°C, minimum relay off time: 10 seconds.

Testing

In the case of controller working with platinum sensor Pt100: instead of the sensor please connect the testing resistor. The controller should display the temperature corresponding to its resistance.

In the case of controller working with thermocouple: please connect sensor input terminals. The controller should display the ambient temperature.