



# R251

## programmable controller

R251 is an in-built programmable controller intended for temperature regulation of electric ovens and warming systems using contractors and solid state relays (SSR). According to its settings, the controller allows programming of arbitrary temperature cycle consisting of one to eight segments and one final segment. Each segment is defined by time of growth or decline to goal value, and by the goal value itself. The type of final segment can be infinity hold, controlled decay, or uncontrolled decay.

The controller offers a wide range of options for high-quality regulation, delayed start, etc. Parameter settings are achieved by five-keys foil keypad in dialog mode. Temperature and time are displayed on 5-character LED display, the cycle progress is portrayed on LED bracket, consisting of four LEDs. Another four LEDs are used to indicate current state of controller outputs.

The controller allows saving up to four records of passed temperature cycles to its internal memory.

Temperature can be measured by resistive sensors (Pt100, Pt1000, Ni1000) or by thermocouples (B, C, E, J, K, N, R, S, T, voltage 0–39 mV and 0–78 mV). The input sensor can use current output 0–20 mA or 4–40mA as well. It is necessary to state the requested sensor type (voltage, resistive, current) in your order, the type of thermocouple or range of input current can be adjusted from controller keypad, after entering a service

password.

The output part of the controller consists of three relays (two of them with N.O./N.C. contacts 230V / 2A, one with N.O. contacts 230V / 2A) and one 12V / 10mA output for the solid state relay (SSR) actuation. The function of each relay can be selected from controller keypad, after entering a service password. It is also possible to add a voltage or current output for proportional elements actuation.

Operating the controller, adjusting of parameters and diagnostic functions are presented by system of well-arranged menu views, showing textual acronyms on red 7-segment LED display, guiding the user through all options and settings of the controller.

Access to controller settings is divided into five levels, according to impact on regulated system. To avoid unauthorized intervention, access to the lowest three levels can be secured by passwords. Passwords for upper two levels are compulsory and can not be changed.

In case when the controller is equipped with communication module, entire settings can be performed through PC.

During a power supply failure (blackout) all parameters remain preserved and after power recovery the controller continues in the process.

### Inputs

- voltage: thermocouple B, C, E, J, K, N, R, S, T, voltage 0–39 mV or 0–78 mV
- resistive 0 to 300 W - Pt100 or resistance measuring 0 to 300 W
- resistive 0 to 3000 W - Pt1000, Ni1000 or resistance 0 to 3000 W
- current: 0–20 mA or 4–20 mA

### Outputs

- 1× relay N.O. contact 230 V / 2 A
- 2× relay with N.O. / N.C. contact 230 V / 2 A
- voltage output 12 V / 10 mA for solid state relay (SSR) actuation
- all connections (power supply, outputs, sensor) are presented by removable terminals, function of all outputs is selectable from controller keypad, after entering a service password.

### Outputs per request

- current output 0–20 mA (includes range 4–20 mA), or voltage output 0–10 V
- serial communication channel RS485

### Accuracy

- for thermocouples 0,2 %, error of measuring cold end temperature thermocouple  $\pm 2$  °C
- for resistive sensors 0,5 %, resolution 0,1 °C
- for current input 0,2 %, resolution 0,01 mA

### Features

- up to 100 programs, every with 1 to 8 segments and one final segment, can be stored in controller memory
- operations with programs and/or controller settings can be performed during program runtime
- selectable acoustic signalization of program segment transition
- periodic program launching
- selectable type of input sensor using controllers keypad
- selectable function of controller's outputs
- delayed program start (up to one week)
- real time clock settings

### Protections

- all data preservation during power supply failure
- operation break in case of malfunction or limit values of regulated magnitude overrun
- access to important parameters is secured by system of passwords

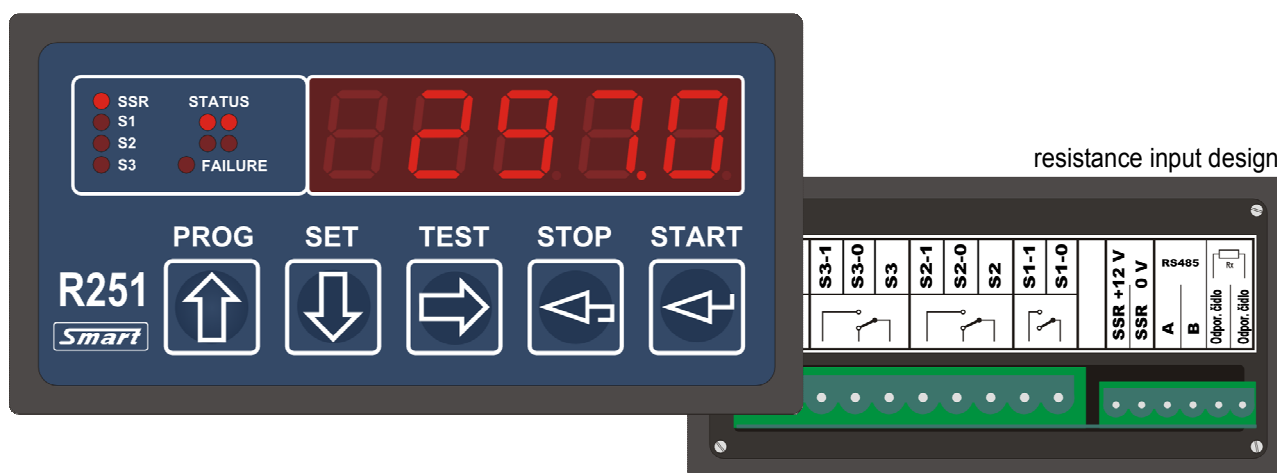
### Signalization

- termination or disconnection of input sensor
- limit values of regulated magnitude overrun
- allowed alarm deviation overrun
- allowed time of power failure overrun

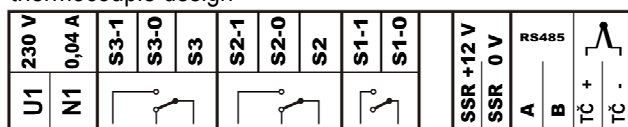
### Other

- power supply 230 V/50 Hz, 0,04 A
- size 96×48×130 mm
- mounting aperture size: 92×43 mm
- coverage IP50, IP54 if requested
- weight 450 g

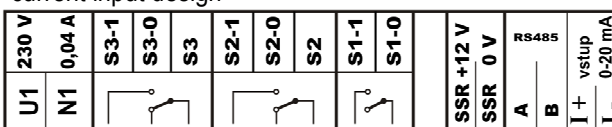
### Front panel and terminals connection



#### thermocouple design



#### current input design



Development and production  
 SMART, spol. s r. o.  
 Purkyňova 45  
 612 00 Brno, Czech republic  
 E-mail: smart@smartbrno.cz  
 www.smartbrno.cz

authorized sales representative