MICROPROCESSOR CONTROLLER RE20 TYPE

CE

APPLICATION

The RE20 microprocessor controller is destined to control temperature and other physical quantities, e.g. pressure, humidity, level, flow.

FEATURES

Basic:
- two 4-digit displays - red and green,
- signalling - output state, logic input state, manual working mode,
- three keys for controller configuration.

Inputs:
- measuring input for resistance thermometers, thermocouples and standard signals (see table 1),
- logic input (without voltage).

Outputs:
- two outputs (maximum),
- the main output is the control output,
- the auxiliary output can be control, alarm or retransmission output.

Set value:
- constant, taking soft-start into consideration,
- switched between 2 values through the logic input.

Control:
- two settings of PID parameters,
- control algorithm of ON-OFF or PID type,
- control of heating, cooling or heating-cooling type,

RS-485 serial interface - MODBUS ASCII or RTU

Additional functions:
- manual control,
- self-adaptation,
- retransmission of set value, measured value or control deviation,
- alarm with storage of occurrences,
- programmable network filter,
- safeguard against parameter changes,
- return to standard settings,
- additional menu configured by the user.

TECHNICAL DATA

Input signals — according to the table 1

Table 1

Sensor type/input	Notation	Range
Pt100 acc. EN60751 + A2:1997	Pt100	-199...850°C
Pt1000 acc. EN60751 + A2:1997	Pt1000	-199...850°C
Fe-CuNi	J	-100...1200°C
Cu-CuNi	T	-100...400°C
NiCr-NiAl	K	-100...1372°C
PtRh10-Pt	S	0...1767°C
PtRh13-Pt	R	0...1767°C
PtRh30-PtRh6	B	300...1820°C
NiCr-CuNi	E	-100...1000°C
NiCrSi-NiSi	N	-100...1300°C
Linear current	I	0...20 mA
Linear current	I	4...20 mA
Linear voltage	U	0...5 V
Linear voltage	U	10...5 V

Basic measurement accuracy of the measured value (in % of the measuring range) for:
- resistance thermometers Pt100, Pt1000 — 0.1%
- thermocouples J, K,E or N — 0.1%
- thermocouples B,R, S or T — 0.2%
- linear inputs — 0.1%

Time of measurement — 0.167 s

Input resistance:
- voltage input — 227 kΩ
- current input — 6.2 Ω

Error detection in the measuring circuit:
- thermocouples, Pt100, Pt1000 — measuring range exceeding
- 0...10 V — above 11 V
- 0...5 V — above 5.5 V
- 0...20 mA — above 22 mA
- 4...20 mA — under 1 mA and above 22 mA

Logic input — non-voltage

Kinds of outputs:
- relay, without voltage — make contact, load 2 A/230 V
- transistor voltage — 0/15 V, serial resistance 250 Ω
- voltage continuous — 0...5 V, 0...10 V at $R_{load} \geq 1$ kΩ
- current continuous — 0...20 mA, 4...20 mA at $R_{load} \leq 500$ Ω

Action of outputs:
- reverse — for heating
- direct — for cooling

Accuracy of analog outputs — 0.2% of the range

Digital interface: — RS-485
- protocol — MODBUS
- baud rate — 2400, 4800, 9600, 19200 bit/s
- mode — ASCII - 8N1, 7E1, 7O1
  RTU - 8N2, 8E1, 8O1, 8N1
- address — 1...247
- maximal response time — 500 ms

Signalling of:
- active output 1
- active output 2
- manual working mode
- shorting of logic input

Rated service conditions:

- supply voltage 85...253 V a.c./d.c.
  20...40 V a.c./d.c.

- supply voltage frequency 40...440 Hz
- ambient temperature 0...23...50ºC
- relative humidity < 85% (no condensing)
- external magnetic field < 400 A/m
- preliminary heating time 30 min
- work position any

Power consumption < 9 VA

Weight < 0.3 kg

Panel cut-off dimensions 45$^{+0.6}$ x 45$^{+0.6}$ mm

IP protection ensured through the housing acc. to EN 60529:

- from the frontal side IP40
- from terminals IP20

Additional errors in rated working conditions caused by:

- compensation of the
  thermocouple cold junction ≤ 2K
- ambient temperature change ≤ 100% of the basic error/10K
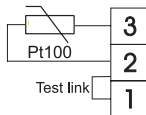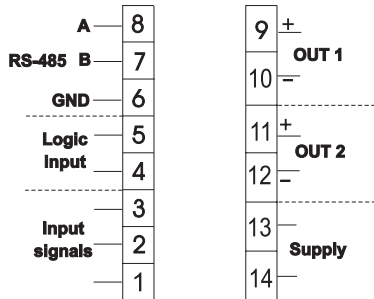
Security requirements acc. to EN 61010-1:

- installation category III
- pollution degree 2
- maximal working voltage
  in relation to ground:
  - supply circuit 300 V a.c.
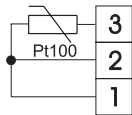 - other circuits 50 V a.c.

Electromagnetic compatibility
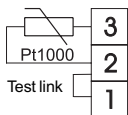
- immunity EN 61000-6-2
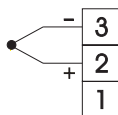- emission EN 61000-6-4

CONNECTION DIAGRAM
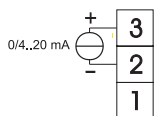

Pt100 resistance thermometer in 2-wire line
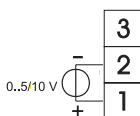

Pt100 resistance thermometer in 3-wire line
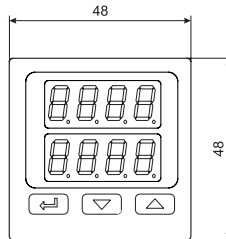

Pt1000 resistance thermometer

Thermocouple

Current input 0/4...20 mA

Voltage input 0...5/10 V

ORDERING CODES

Table 2

RE20 CONTROLLER	X	X	X	X	X	XX	X

Input:
resistance thermometers **1**
thermocouples **2**
linear current signal 0/4...20 mA
or linear voltage signal 0...5/10V **3**
as ordered .... **X**

Main output:
relay **1**
logic, voltage 0/15 V **2**
continuous, current 0/4...20 mA **3**
continuous, voltage 0...5 V **4**
continuous, voltage 0...10 V **5**

Auxiliary output:
without output **0**
relay **1**
logic, voltage 0/15 V **2**
continuous, current 0/4...20 mA **3**
continuous, voltage 0...5 V **4**
continuous, voltage 0...10 V **5**

Interface:
without interface **0**
RS-485 with MODBUS protocol **1**

Supply voltage:
85...253 V a.c./d.c. **1**
20...40 V a.c./d.c. **2**

Kind of option:
catalogue **00**
custom-made* ....**XX**

Acceptance tests
without an extra quality inspection certificate **0**
with an extra quality inspection certificate **1**
acc. to user's agreement** .... **X**

* The code will be established by the manufacturer
** After agreeing with manufacturer

EXAMPLE OF ORDER

The **RE20 - 2- 1 - 0 - 1 - 2 - 00 - 1** code means:
2 - input for thermocouples
1 - main output: relay
0 - without auxiliary output
1 - RS-485 interface with MODBUS protocol
2 - supply voltage: 20....40 V a.c./d.c.
00 - catalogue option
1 - with an extra quality inspection certificate

EXTERNAL AND FITTING DIMENSIONS