DUAL LOOP CONTROLLER/PROGRAMMER RE19 TYPE

APPLICATION

The RE19 dual loop controller/programmer is destined to control the temperature or other physical quantities, e.g. pressure, humidity, level, flow, converted into an electric signal.
It can independently control two objects or two physical quantities in one object, e.g. temperature and humidity.

This controller is available in three versions:

RE19S - for standard fixed set point control, with the possibility to switch the set point by the logic input,

RE19P - for program-following control, in which the set point changes in time according to the selected program. 15 programs, with 15 segments in each program,

RE19V - for motorised valve control - at choice, two algorythms of stepper control with or without feedback.

BASIC CONTROLLER CHARACTERISTICS

• 3 measuring inputs:
- 2 universal: RTD, TC, linear signals,
- additional linear inputs (optionally):current, voltage, potentiometric,
- arithmetical operations on input signals: addition, subtraction, multiplication.

• 2 logic inputs with functions:
- control of the controller work - stoppage and restart of automatic control,
- erasing of stored alarms,
- locking of parameter changes from the keyboard,
- switching of set points and/or PID parameters,
- control of the program-following control -stoppage or start of the program, jump to the next segment (RE19P).

• 4 outputs: relay, logic 0/15 V, OC, linear current and voltage with programmable functions:
- control: acc. to PID algorythm or ON-OFF,
- alarm: from the measured value or from the control deviation,
- retransmission: for the retransmission of the measured value, set points or control deviations,
- signalling: to signal sensor damages or the logic input state in the program-following control (event output).

• 2 LED (2 x 5) displays, on which the controlled value and the set point for the given loop are displayed,

• LCD (2 x16) character display.

• 10 annunciators for information about the output state and working mode.

• Kinds of set point:
- fixed set point,
- programmed set point: 15 programs, with 15 segments in each (RE19P),
- from the auxiliary input.

• Kinds of control:
- reverse (heating)
- direct (cooling)
- with two circuits, heating + cooling.
- three-stage valve control (in RE19V - e.g. closing and opening the valve,

• 2 algorithms for the PID parameter choice (autotuning).

• RS-485 interface with MODBUS protocol (for controllers with interface, the RE19 prg is added for a quick controller configuration and the process visualisation).

TECHNICAL DATA

Input signals and measuring ranges — Table 1

Input	Signal source	Symbol	Accuracy	Measuring range
Input No1 and No2	Pt100 acc. EN 60751+A2	Pt100	0.1	-200...850°C
	Pt500 acc. EN 60751+A2	Pt500	0.1	-200...850°C
	Pt1000 wg EN 60751+A2	Pt1000	0.1	-200...850°C
	Ni100/1.617	Ni100	0.2	-60...180°C
	Cu100/1.426	Cu100	0.2	-50...180°C
	Thermocouple FeCu-Ni	J	0.2	-200...1200°C
	Thermocouple Cu-CuNi	T	0.2	-100...400°C
	Thermocouple NiCr-NiAl	K	0.1	-200...1370°C
	Thermocouple PtRh10-Pt	S	0.2	-50...1760°C
	Thermocouple PtRh13-Pt	R	0.2	-50...1760°C
	Thermocouple PtRh30-PtRh16	B	0.3[1]	300...1820°C
	Thermocouple NiCr-CuNi	E	0.1	-200...1000°C
	Thermocouple NiCrSi-NiSi	N	0.1	-150...1300°C
	Linear current 0...20 mA	0...20 mA	0.05	0...20 mA
	Linear current 4...20 mA	4...20 mA	0.05	4...20 mA
	Linear voltage 0...10 V[2]	0...10 V	0.05	0...10 V
	Linear voltage 0...5 V[2]	0...5 V	0.05	0...5 V
	Linear voltage 1...5 V[2]	1...5 V	0.05	1...5 V
	Linear voltage 0...1 V[3]	0...1 V	0.05	0...1 V
Auxiliary current input	Linear current 0...20 mA	0...20 mA	0.05	0...20 mA
	Linear current 4...20 mA	4...20 mA	0.05	4...20 mA
Auxiliary voltage or potentio- metric input	Linear voltage 0...10V	0...10 V	0.05	0...10 V
	Linear voltage 0...5V	0...5 V	0.05	0...5 V
	Linear voltage 1...5V	1...5 V	0.05	1...5 V
	Linear voltage 0...1V	0...1 V	0.05	0...1 V
	Potentiometric transmitter 0...100 Ω	0...100 Ω	0.05	0...100 Ω
	Potentiometric transmitter 0...1000 Ω	0...1000 Ω	0.05	0...1000 Ω

[1] error in the range: 500...1820°C
[2] source resistance < 10 kΩ
[2] source resistance < 1 kΩ

Sampling period — Table 2

Type of signal on main inputs	Auxiliary input	Sampling period [sec]
Resistance thermometer in 3-wire line	without auxiliary input	0.66
	with auxiliary input	1.0
Resistance thermometer in 2-wire line, linear inputs, therocouples	without auxiliary input	0.33
	with auxiliary input	0.5

Kind of outputs:

- relay — electromagnetic relays, contact load 230 V, 5 A
- transistor — OC type, U_{max} = 24 V, I_{max} = 10 mA
- transistor voltage — 0/15 V, I_{max} = 20 mA
- voltage continuous — 0...5 V, 0...10 V at $R_{load} \geq 500\ \Omega$
- current continuous — 0...20 mA, 4...20 mA at $R_{load} \leq 500\ \Omega$

Error of analog outputs — 0.2% of the range; (0.3% for 0...5 V)

Serial interface — RS-485
- transmission protocol — MODBUS:
  ASCII: 8N1, 7E1,701;
  RTU: 8N2, 8E1, 8O1, 8N1
- baud rate — 19200, 9600, 4800, 2400 bit/s

Reference and rated working conditions:
- supply voltage — 85...253 V a.c./d.c or 20...40 V a.c./d.c
- supply voltage frequency — 40...440 Hz
- ambient temperature — 5...23...40ºC
- relative humidity — ≤ 85 % (without compensation)
- external magnetic field — < 400 A/m
- working position — any
- resistance of conductors connecting the resistance thermometer with the controller — < 10 Ω/wire

Maximal consumption — < 9 VA

Weight — 400 g

Protection degree ensured through the case acc. to EN 60529
- from the frontal side — IP40
- from terminals — IP20

Additional errors in rated operating conditions caused by:
- < 0.1% of the measuring range — compensation of wire resistance changes in a 3-wire line
- < 2ºC — compensation of thermocouple reference junction temperature changes
- < 0.1% of measuring range/10 K — change of ambient temperature

Security requirements acc. EN61010-1:
- installation category: III,
- pollution degree: 2
- maximal phase-to-earth working voltage:
  - for supplying circuits and relay outputs: 300 V
  - for input circuits, continuous outputs, transistor outputs and the interface 50 V
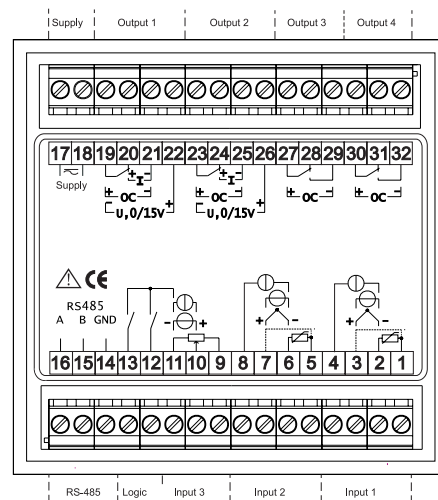
Electromagnetic compatibility:
- immunity — EN61000-6-2
- emission — EN61000-6-4

OVERALL DIMENSIONS and FIXING WAY
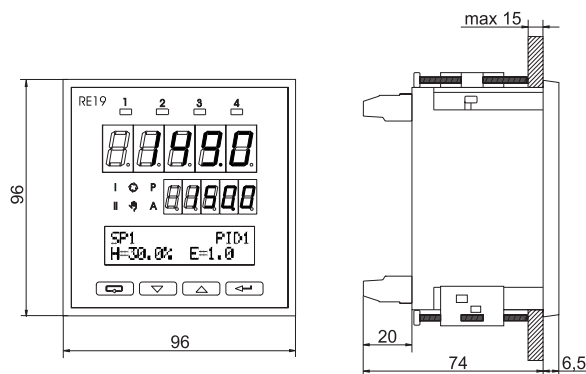
Panel cut-out: 92-0.5 x 92-0.5

ELECTRICAL CONNECTION DIAGRAM

ORDERING CODES   Table 3

DUAL LOOP CONTROLLER RE19	X	X	X	X	X	X

Version:
for standard fixed set point control .... S
for valve control V
with program-following control .... P
on order X

Auxiliary input:
without input 0
current: 0/4...20 mA 1
voltage: 0...10 V, 0...5 V, 0...1 V, 1...5 V ....
potentiometric transmitter: 100 Ω
potentiometric transmitter: 1000 Ω 2
on order X

Outputs:
4 relays 1
4 OC transistors 2
1 transistor 0/15 V + 3 relays 3
2 transistors 0/15 V + 2 relays 4
1 linear analog output + 3 relays 5
1 linear analog output + 3 OC transistors 6
2 linear analog outputs + 2 relays 7
2 linear analog outputs + 2 OC transistors 8
on order X

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

Supply voltage:
85...230...253 V a.c./d.c. 1
20...24...40 V a.c./d.c. 2

Additional testing requirements:
without extra requirements 0
with an extra quality inspection certificate 1
according to customer's requirements* X

* after agreement with the manufacturer

Ordering example:

The **RE19 - S - 1 - 5 - 1 - 1 - 0** code means:

- **S** - version for standard control
- **1** - auxiliary input: 0/4 ...20 mA
- **5** - with 1 linear analogue output and three relays
- **1** - with RS-485 interface
- **1** - supply voltage: 85...253 V a.c./d.c.
- **0** - without extra testing requirements

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