

## Single-circuit electronic controller with dual display

### PRODUCT OVERVIEW



The Raychem TCONTROL-05 family of electronic controllers provide accurate temperature control and centralized monitoring for individual heat-tracing circuits.

The compact panel mount TCONTROL-05 has two displays for indicating the process value and the set point. During programming these displays provide user guidance and visual aid to simplify commissioning.

Alternatively, the optional and easy to use TCONTROL-05/CONFIG software can be used for computer aided configuration.

TCONTROL-05 units are factory configured for ON/OFF control and are suitable for most heat-tracing applications. Other types of control algorithms can be configured by the user.

Different hardware configurations are available: Units with a relay output for controlling electro-mechanical relays or solid state relays and TCONTROL-05/MA units with an analog output for driving other types of actuators like thyristors.

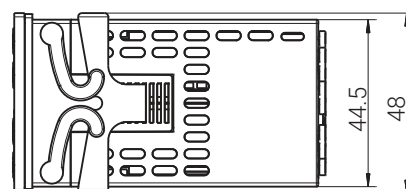
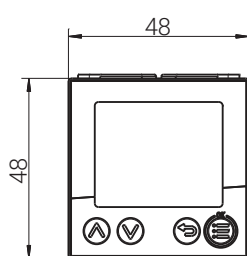
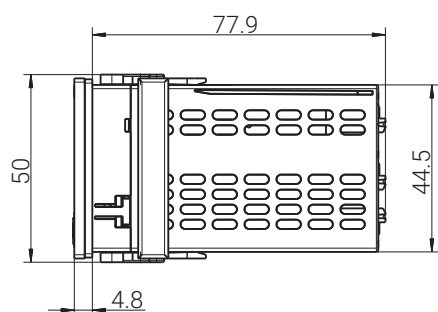
The health of the temperature input sensor is permanently monitored for failures. An alarm will appear in the event of sensor break or short circuit. In the event of a sensor failure the control output switches to a user defined state (ON or OFF)

#### Specific features:

- Time delayed controller activation after initial power up (this can be used to avoid peak demands during start-up)
- Service counter included in order to count and eventually alarm on the number of relay operations.

### PRODUCT SPECIFICATIONS

#### Dimensions (mm)



| Minimum spacing in between panel cut-outs | Horizontal spacing | Vertical spacing |
|-------------------------------------------|--------------------|------------------|
| TCONTROL-05 (all types)                   | > 15 mm            | > 30 mm          |

## Technical details

|                         |                                                                                                                                                           |                      |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Application             | Raychem TCONTROL-05 units are panel mount controllers and are typically used for providing tight temperature control of individual heat-tracing circuits. |                      |
| Memory data backup      | EEPROM based non-volatile memory.<br>No loss of configuration data after power outage or long term shut down.                                             |                      |
| Display                 | 2 piece 18 segment LCD displays                                                                                                                           |                      |
| Supported control modes | ON/OFF, P, PI, PD or PID with auto-tuning are user selectable                                                                                             |                      |
| Measuring accuracy      | Pt100 3-wire                                                                                                                                              | error $\leq 0.1\%$ , |
|                         | Pt100 2-wire                                                                                                                                              | error $\leq 0.1\%$   |
|                         | Thermocouples (incl. cold junction)                                                                                                                       | error $\leq 0.25\%$  |
|                         | Voltage and current inputs                                                                                                                                | error $\leq 0.1\%$   |

## Electrical Properties

|                                             |                                                                                                                                                                                                                                                        |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply voltage & own power consumption      | 110 Vac to 240 Vac $-15/+10\%$ , 48 to 63 Hz & $\sim 4.1$ VA                                                                                                                                                                                           |
| Electrical connections                      | Via screw terminals on the back of the unit. Terminals are suitable for wires ranging from 1 to maximum 1.3 mm <sup>2</sup> solid core or 1 mm <sup>2</sup> stranded with cable shoe. Terminal strips are pluggable.                                   |
| Supported output types (depending on model) | TCONTROL-05: 3 relay outputs (SPST) + 1 logic output<br>TCONTROL-05/MA: 2 relay outputs (SPST) + analog output<br>TCONTROL-05/COM: 3 relay outputs (SPST) + 1 logic output + RS485<br>TCONTROL-05/COMA: 2 relay outputs (SPST) + analog output + RS485 |

## Input options (all types)

|                           |                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------|
| Temperature sensor inputs | Pt100, Pt1000 RTD's in 2- and 3 wire connection, KTY11-6 sensors<br>Thermocouple types: L, J, U, T, K, E, N, S |
| Electrical input signals  | 0/4 .. 20 mA or 0/2 .. 10 V ( $R_i = 100$ Kohm)                                                                |
| Temperature control range | From $-200^{\circ}\text{C}$ to $+2400^{\circ}\text{C}$ depending on the type of temperature sensor used        |

## Output options and output ratings (depending on type)

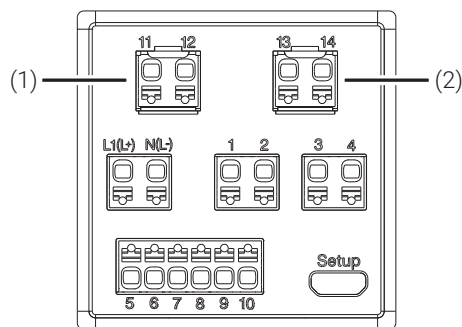
|                                    |                                                                                                                                                                                                                                                                                                               |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TCONTROL-05<br>TCONTROL-05/COM     | Control and alarm relay contacts (SPST) are rated 3 A at 230 VAC.<br>Expected lifetime: 350 k operations at rated current or $\sim 900$ K operations at 1 A<br>Logic output 0 .. 12 V. Maximum current 20 mA                                                                                                  |
| TCONTROL-05/MA<br>TCONTROL-05/COMA | Control output, analog: 0/4 .. 20 mA $R_{load} \geq 500$ Ohm<br>Logic output 0 .. 12 V, maximum current 20 mA<br>Alarm relay contacts (SPST) are rated 3 A at 230 VAC.<br>Expected lifetime: 350 k operations at rated current. 900 k operations at 1 A                                                       |
| Communication options (*)          | RS-485, Modbus at 9600, 19200 or 38400 BPS. Maximum up to 32 devices per network. (*)                                                                                                                                                                                                                         |
| Alarm options                      | 2 independently configurable alarm relay outputs are provided. TCONTROL-05 units automatically alarm in case of sensor break or sensor short.<br>On top of the input sensor driven alarms up to 8 different temperature triggered alarm functions can be defined. (see installation instructions for details) |

(\*) supported on TCONTROL-05/COMx units only

## Enclosure

|                            |                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------------------------------|
| Housing type               | Plastic enclosure approved to IEC 61554 (ABS) Suitable for installation in electrical distribution panels |
| Environmental protection   | Front IP65, rear IP20 to DIN EN60529                                                                      |
| Max. operating temperature | $-10^{\circ}\text{C}$ to $+55^{\circ}\text{C}$                                                            |
| Max. storage temperature   | $-30^{\circ}\text{C}$ to $+70^{\circ}\text{C}$                                                            |
| Relative humidity          | 90% maximum, no condensation                                                                              |
| Installation position      | All positions allowed                                                                                     |

## Connection diagram



| Terminals | Connection       |
|-----------|------------------|
| 1, 2      | Output 1 (relay) |
| 3, 4      | Output 2 (relay) |
| 5-8       | Analog input     |

| Terminals | Connection                                                        |
|-----------|-------------------------------------------------------------------|
| 8, 10     | Input 2 (for potential-free contact)                              |
| 9, 10     | Input 1 (for potential-free contact) or output 3 (logic output)   |
| 11, 12    | (1) = option 1: output 4 (relay, logic output) or RS485 interface |

| Terminals     | Connection                                               |
|---------------|----------------------------------------------------------|
| 13, 14        | (2) = option 2: output 5 (relay, logic or analog output) |
| L1(L+), N(L-) | Voltage supply                                           |
| Setup (USB)   | PC (setup program)                                       |

## APPROVALS

For use in ordinary area (indoors, panel mount - through the panel)

Electrical Safety to DIN EN 61010-1 over voltage category II, pollution degree 2 EMC DIN EN 61326 -1, Class A to industrial requirements.

### Product certification



More details about product certification, approvals and conditions of safe use are available in the installation manual at [www.chemelex.com](http://www.chemelex.com).

## ORDERING INFORMATION

### Wiring example

|               | Part Description | PN          | Weight     |
|---------------|------------------|-------------|------------|
| Control units | TCONTROL-05      | 1244-022496 | ~ 0.125 kg |
|               | TCONTROL-05/MA   | 1244-022497 |            |
|               | TCONTROL-05/COM  | 1244-022499 |            |
|               | TCONTROL-05/COMA | 1244-022498 |            |

### Accessory selection table

|                                         |                         |            |  |
|-----------------------------------------|-------------------------|------------|--|
| Sensors for hazardous area              | MONI-PT100-EXE (1), (2) | 967094-000 |  |
|                                         | MONI-PT100-4/20MA       | 704058-000 |  |
| Sensor for non-hazardous area           | MONI-PT100-NH           | 140910-000 |  |
| Support bracket for temperature sensors | JB-SB-26                | 338265-000 |  |

Note 1: Sensor can be extended with a 3-wire shielded cable of max 30 Ohms per conductor (max. 150 m with a 1.5 mm<sup>2</sup> cable). The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables.

Note 2: The shield of the extension cable should be grounded at the controller end only.

Note 3: MONI-PT100-EXE temperature sensors can be directly connected to the TCONTROL-05 input terminals. There is no need to use current limiting devices such as zener barriers or isolators.

Note 4: Installed in ordinary area.

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**Raychem Tracer Pyrotenax Nuheat**