

Single-circuit electronic controller with dual display



The nVent 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 nVent RAYCHEM TCONTROL-05/CONFIG software can be used for computer aided configuration.

nVent RAYCHEM 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)

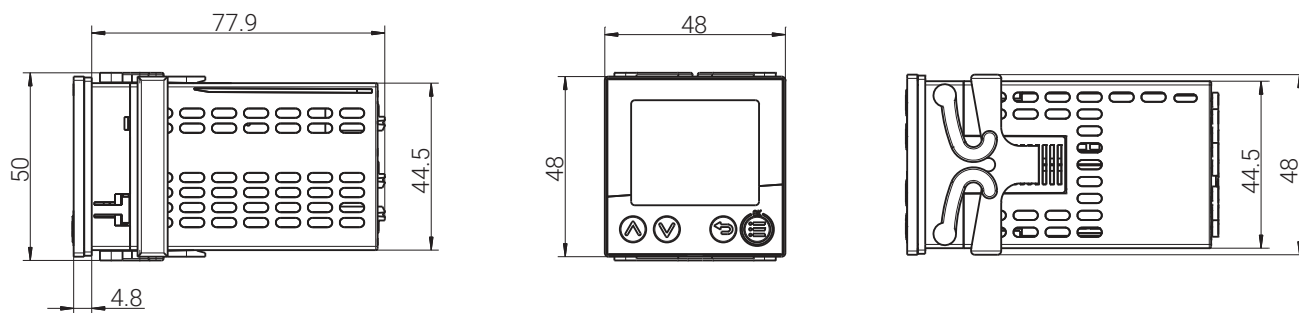
SPECIFIC FEATURES:

- 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.

GENERAL

Application	nVent RAYCHEM TCONTROL-05 units are panel mount controllers and are typically used for providing tight temperature control of individual heat-tracing circuits.	
Area of use	Non hazardous area indoors (panel mount – through the panel)	
Approvals/Certification	Electrical Safety to DIN EN 61010-1 over voltage category II, pollution degree 2 EMC DIN EN 61326 -1, Class A to industrial requirements.	
	Made in GE	
Memory data backup	EEPROM based non-volatile memory. 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 $\leq 0.1\%$

DIMENSIONS (IN MM)



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

ELECTRICAL PROPERTIES

Supply Voltage & own power consumption	110 Vac to 240 Vac $-15/+10\%$, 48 to 63 Hz & ~ 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 ² solid core or 1 mm ² stranded with cable shoe. Terminal strips are pluggable.
Supported output types (depending on model)	TCONTROL-05: 3 relay outputs (SPST) + 1 logic output TCONTROL-05/MA: 2 relay outputs (SPST) + analog output TCONTROL-05/COM: 3 relay outputs (SPST) + 1 logic output + RS485 TCONTROL-05/COMA: 2 relay outputs (SPST) + analog output + RS485

INPUT OPTIONS (ALL TYPES)

Temperature sensor inputs	Pt 100, Pt 1000 RTD's in 2- and 3 wire connection, KTY11-6 sensors 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 to $+2400^{\circ}\text{C}$ depending on the type of temperature sensor used

OUTPUT OPTIONS AND OUTPUT RATINGS (DEPENDING ON TYPE)

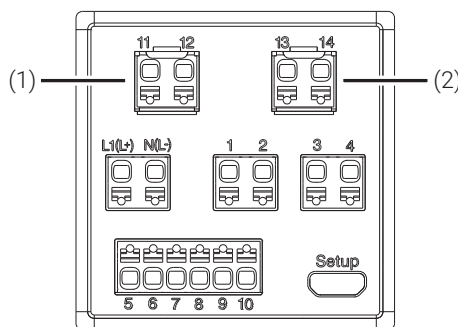
TCONTROL-05	Control and alarm relay contacts (SPST) are rated 3 A at 230 VAC.
TCONTROL-05/COM	Expected lifetime: 350k operations at rated current or $\sim 900\text{K}$ operations at 1 A Logic output 0 .. 12 V. Maximum current 20 mA
TCONTROL-05/MA	Control output, analog: 0/4 .. 20 mA $R_{load} \geq 500$ Ohm
TCONTROL-05/COMA	Logic output 0 .. 12 V, maximum current 20 mA Alarm relay contacts (SPST) are rated 3 A at 230 VAC. Expected lifetime: 350k operations at rated current. 900k 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. On top of the input sensor driven alarms up to 8 different temperature triggered alarm functions can be defined. (see installation instructions for details)

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 to +55°C
Max. storage temperature	–30 to +70°C
Relative humidity	90% maximum, no condensation
Installation position	All positions allowed.

(*) supported on TCONTROL-CONT-03/COMx units only

CONNECTION DIAGRAM



Terminals	Connection	Terminals	Connection	Terminals	Connection
1, 2	Output 1 (relay)	8, 10	Input 2 (for potential-free contact)	13, 14	(2) = option 2: output 5 (relay, logic or analog output)
3, 4	Output 2 (relay)	9, 10	Input 1 (for potential-free contact) or output 3 (logic output)	L1(L+), N(L-)	Voltage supply
5-8	Analog input	11, 12	(1) = option 1: output 4 (relay, logic output) or RS485 interface	Setup (USB)	PC (setup program)

WIRING EXAMPLE

Ordering details	Part description	Product Number	Weight
Control units	TCONTROL-05	1244-022496	~ 0.125 kg
	TCONTROL-05/MA	1244-022497	
	TCONTROL-05/COM	1244-022498	
	TCONTROL-05/COMA	1244-022499	

ACCESSORY SELECTION TABLE

Configuration and setup interface + software	TCONTROL-05/CONFIG	1244-022500	~ 0.120 kg
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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 mm² cable). The sensor cable should be shielded if it is laid in cable ducts or in the vicinity of high-voltage carrying cables. The shield of the extension cable should be grounded at the controller end only.

Note 2: 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 3: Installed in ordinary area.

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