



TE221 PROGRAMMABLE DIGITAL TEMPERATURE CONTROLLER WITH P+I HEATING OR COOLING, MODULATING OR ON/OFF CONTROL

DESCRIPTION

The TE221 controller is specially designed to control On/Off or modulating device at the same time or in sequence for heating or cooling applications. They are fully configurable, standalone, 7-Day programmable digital thermostats with optional energy saving input interface.

The thermostat measures the temperature of a room with an integral sensor or a distant space with optional 10K external sensor, and then output On/Off or 0/2-10Vdc signal

by proportional integral algorithm to control heating or cooling devices to maintain the room space at a desired set point temperature.

The thermostat features battery-backed real time clock providing separate programming with 4 schedules for each day of the week. The TE221 controller has a large backlit LCD screen showing room temperature or set point, time, day, and related status.

The thermostat also has optional digital inputs for detection devices such as room occupied/unoccupied detector to enhance energy savings. The many different parameters are set in engineering mode.



FEATURES

- Backlit display for clear readability
- Pre-set 7 day program with 4 daily schedules
- Can be used for modulating and/or On/Off control
- 0/2 to 10 Vdc control signal output on AO1
- On/Off 24Vac control signal output on DO1
- Early fine tune function to ensure programmed temperature is reached by scheduled time
- 12- or 24- hour format with battery backed day and time
- The On/Off button will turn the output off
- Room temperature or setpoint temperature selectable for display
- Full configurable parameters such as switching differential, cycle time, etc are set in 'Engineer Mode'
- Proportional plus integral (P+I) algorithm applied to modulating control
- Optional Remote sensor (RS) input interface for connecting to 10K NTC3 remote temperature sensor
- Optional Energy Saving input (ESI) interface for connecting to hotel card key, occupied/unoccupied sensor, lighting interlock signal or window/door open detection to save energy
- Adjustable unoccupied setpoints for heating mode control
- Non-volatile memory (EEPROM) retains user settings during power loss with backup battery for 5 years
- Stage sequence can be set in engineering mode
- Agency approval: CE directive 2004/108/EC
- Low voltage Class 2 as per UL/CSA standards
- Two year warranty

SPECIFICATIONS

- **Supply Voltage:** 24Vac (+/-10%), 50/60 Hz
- **Display Range:** -30 to 120.0 °C (-22.0 to 248.0 °F) with suitable sensor
- **Display Temperature Unit Resolution:** 0.1 °C/°F
- **Indication Accuracy:** +/-1.0 °C (1.8 °F) at 25 °C
- **Set-point Range:** 0~50 °C / 32~122 °F (default-10~30 °C / 50~86 °F, adjustable), 0.5 °C/°F per setting step
- **Set-point Adjust:** By up and down arrows buttons
- **°C/°F Button:** To toggle between Celsius and Fahrenheit scales
- **Remote Sensor (RS) Input Interface:** For connecting to external NTC Thermistor 10K ohm
- **Energy Savings Input (ESI) Interface:** For saving energy by entering into unoccupied mode when ESI is triggered by Normally Open (N.O.) or Normally Closed (N.C.) dry contact
- **Valve Control:** AO1 0/2-10V modulating output
DO1 On/Off 24Vac output
- **Dimensions:** 94 × 118 × 34 mm (W × H × D)
- **Mounting:** Mounts directly onto wall, panel, standard 65×65 mm junction box (hole pitch 60 mm) or standard 2×4 inch vertical junction box (hole pitch 83.5 mm)
- **Operating Ambient Temperature:**
0 - 50°C, 5~95% RH (non-condensing)

This product must not be used outside of the specified applications. Installation should only be carried out by a licensed and trained installer. All local regulations and codes must be followed, and complied with, during the installation of this product.



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SPECIFICATIONS

Energy Saving Occupied Unoccupied Schedule:

Temperature set point can be programmed for maximum 4 periods for a whole week, 5-2, 5-1-1, or each day.

Schedule	Period	Set Point
1	Wake	Morning temperature
2	Leave	Daytime temperature
3	Return	Evening temperature
4	Sleep	Night temperature

Default Set Point Schedules - can be easily switched between °F or °C scales

COOL	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Sch. 1 🕒	6:00 26.0°C	6:00 26.0°C	6:00 26.0°C	6:00 26.0°C	6:00 26.0°C	6:00 26.0°C	6:00 26.0°C
Sch. 2 🕒	8:00 29.5°C	8:00 29.5°C	8:00 29.5°C	8:00 29.5°C	8:00 29.5°C	8:00 29.5°C	8:00 29.5°C
Sch. 3 🕒	18:00 26.0°C	18:00 26.0°C	18:00 26.0°C	18:00 26.0°C	18:00 26.0°C	18:00 26.0°C	18:00 26.0°C
Sch. 4 🕒	22:00 26.0°C	22:00 26.0°C	22:00 26.0°C	22:00 26.0°C	22:00 26.0°C	22:00 26.0°C	22:00 26.0°C

HEAT	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Sch. 1 🕒	6:00 21.0°C	6:00 21.0°C	6:00 21.0°C	6:00 21.0°C	6:00 21.0°C	6:00 21.0°C	6:00 21.0°C
Sch. 2 🕒	8:00 16.0°C	8:00 16.0°C	8:00 16.0°C	8:00 16.0°C	8:00 16.0°C	8:00 16.0°C	8:00 16.0°C
Sch. 3 🕒	18:00 21.0°C	18:00 21.0°C	18:00 21.0°C	18:00 21.0°C	18:00 21.0°C	18:00 21.0°C	18:00 21.0°C
Sch. 4 🕒	22:00 16.0°C	22:00 16.0°C	22:00 16.0°C	22:00 16.0°C	22:00 16.0°C	22:00 16.0°C	22:00 16.0°C

Note:

Stage sequence can be set in parameter E20.

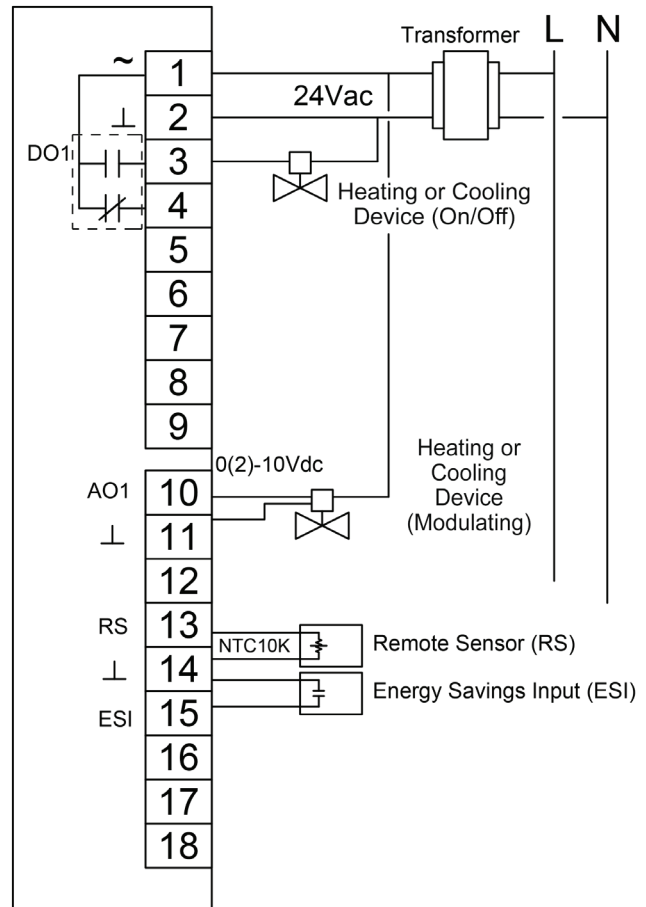
- DO1 and AO1 running at the same time
- DO1 as the first stage, AO1 as the second stage
- AO1 as the first stage, DO1 as the second stage

Parameter E21, can be set to delay stage 2 from 0-10 minutes (example, for use with Thermoelectric actuators).

Parameter E22 to select Heating or cooling mode.

Factory (default) : Heating mode 22 AWG wires or 1.5mm² wires.

WIRING DIAGRAM



Wiring: Up to 18 screw-in terminals, each terminal capable of accepting 14 to 22 AWG wires or 1.5mm² wires.

CONTROL PERFORMANCE

Proportional plus integral (P+I) adaptive control.

ENERGY SAVING INPUT (ESI)

When using optional Energy Saving Input (ESI) interface unoccupied Set Points: Heating: 15.0 are adjustable by engineering mode function

FULLY ADAPTABLE AND CUSTOMIZABLE

TE221 programmable thermostat is fully adaptable and can be customized to your specific needs by setting the parameters in the engineering mode such as proportional and integral band, temperature differential and control mode selection for On/Off or modulating applications