



THERMONEAT

Digital Thermostat Model: TN-S211SA0



USER MANUAL

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Please read this manual carefully before using the device.

- Check the power supply voltage before connecting to the device.
- All wiring operation must be performed under the power off status.
- Consider the maximum output current of the solid state relay 8A (0.5hp). Make sure the relay is not overloaded.
- Be careful when connecting wires of sensor, load and supply input. Improper connection will seriously damage the device.
- Do not expose the device to water or moisture. Turn it off and disconnect the fridge power supply before cleaning.
- Ensure that wires of sensor, load and power supply are far enough from each other.
- Don't drop, hit or shake the device.
- Do not install the device in very hot, cold or humid environments.
- Do not attempt to open and service the device yourself.
- This device is designed based on the specifications of its dedicated temperature sensor. using other sensors will reduce the accuracy of temperature measurement.

General Description

TN-S211SA0 digital thermostat is a microcontroller-based devices suitable for cooling or heating control applications. it utilizes a zero-crossing solid state relay to drive a compressor or a heater. It uses an NTC type sensor to measure the temperature value. It is fully configurable through defined parameters in the settings menu which can be set via keypad.

Small case design, easy installation and simple wiring features are made this device a suitable case for using in mass production lines.

Unlike the small size, this temperature controller can deliver up to 8A at its output so it is able to power up compressors with 0.5hp directly.

Main features

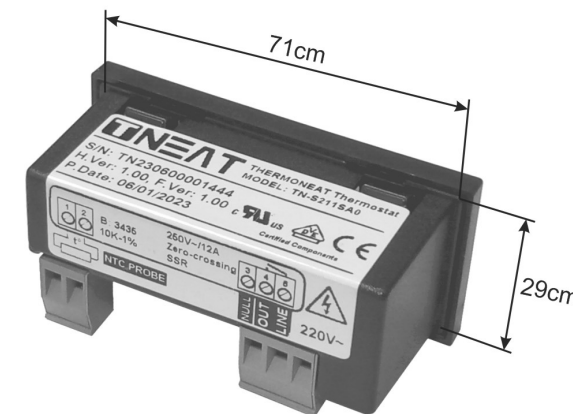
- Accurate temperature measurement
- Can be used as a cooling or heating controller by setting the application mode
- Output delay protection at startup
- Compressor delay protection
- Sensor calibration
- Password protected setting menu
- Temperature setting range limitation for end users
- Displaying status of the output
- Periodic output power on function in sensor failure condition
- Keypad lock function

Technical Specifications

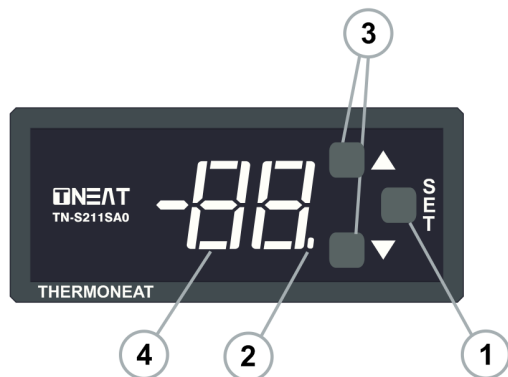
- **Power supply:** 220V AC $\pm 20\%$, 50~60HZ
- **Output relay maximum rating:** 8A / 0.5hp
- **Power consumption:** < 1w
- **Sensor Type:** NTC 10K Ω at 25°C. waterproof probe
- **Temperature measurement and regulation range:** -40 ~ +60 °C
- **Resolution:** 1°C
- **Accuracy:** $\pm 0.5^\circ\text{C}$
- **Index of Protection:** IP20
- **Front panel index of protection:** IP54
- **Operating temperature:** -20 ~ +70 °C
- **Storage temperature:** -40 ~ +85 °C
- **Operating humidity:** 20% ~ 85%
- **Connector:** Plug in screw terminals

Dimensions and Weight

- **Installing hole size:** 71 (L) x 29 (W)
- **Front panel size:** 77 (L) x 35 (W)
- **Product size:** 77 (L) x 35 (W) x 36 (D)
- **Sensor wire length:** 1.5 meters
- **Net Weight (including sensor):** 65g



Front Panel



- SET Key:** Used In order to enter the device parameters settings and confirm the desired values.
- Output Relay Activation Indicator**
- UP and DOWN Keys:** Changing the Set Point and Browsing through Menu Parameters and their values.
- Two digit seven segment LED Display**

View and change set point

- by pressing or keys once, set point will be displayed. The default Value of Set point is 4°C
 - Select the desired value by pressing or keys.
 - Press key to apply and save the selected value as a new temperature set point.
- ◆ To cancel the operation, don't press any key for a few seconds in steps 1 or 2.

View and change Parameters

- Press key for a few seconds until "P5" appears on the screen. After a while the device is ready to get the password by displaying the number 0.
- Use and keys to scroll the numbers to find and select the default password, then press key. Entering the predefined password, number 24, allows the user to view and change parameters

TN-S211SA0 menu parameters

Item	Description	Unit	Min	Max	Def
E0	The temperature difference between the set point and temperature value in which output relay will be switched off ¹	°C	1.0	20.0	5.0
E1	Cabinet temperature sensor calibration ²	°C	-10.0	10.0	0.0
E2	Selecting between cooling or heating application (0: Heating, 1: Cooling)	—	0	1	1
E0	Activation of main relay output delay at startup	minutes	1	10	4
R0	Maximum set point temperature that can be set by end users	°C	R1 + 1	60	40
R1	Minimum set point temperature that can be set by end users	°C	-40	R0 - 1	-40
LL	Locking the keypad ³ (LL= 1, Keypad is locked)	—	0	1	0

1- Application mode (E2), set point and Temperature difference (E0) together, specify the temperature values in which relay will be toggled. the relay contact will be opened at the set point temperature and will be closed at a calculated temperature according to E3, E0 and set point values.

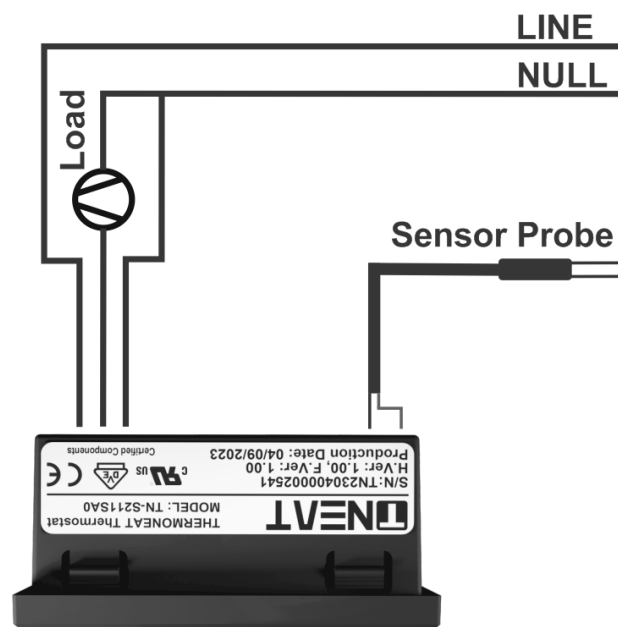
Example1 (heating): E2= 0, E0= 2 and Set Point= 37, The relay will turn on at 35°C and turn off at 37°C.

Example2 (cooling): E2= 1, E0= 2 and Set Point= 5, The relay will turn on at 7°C and turn off at 5°C.

2- It is highly recommended not to change this parameter. Any change will affect the accuracy of measurement unless in the case of calibrating the device with a more accurate instrument by an expert in a laboratory.

3- when LL is set to 1, by pressing any keys, set point will only be displayed and it will no longer possible to change the set point.

Typical Wiring Diagram



Device Errors

E 1: Sensor failure, Interruption or problem in temperature sensor Signal.

Note: When a sensor failure condition occurs, the device will changes the output state every 15 minutes from On state to Off state and vise versa. This periods are constant and user can not change them.

This feature prevents the chamber temperature from rising in the event of sensor failure.

This temperature controller is designed as an economic choice to use in single door refrigerators and other applications that need few options to controlling the temperature. If it does not meet your requirements, you can use other products such as TN-S211AA0 model from Thermoneat.



Read more about this product on website

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