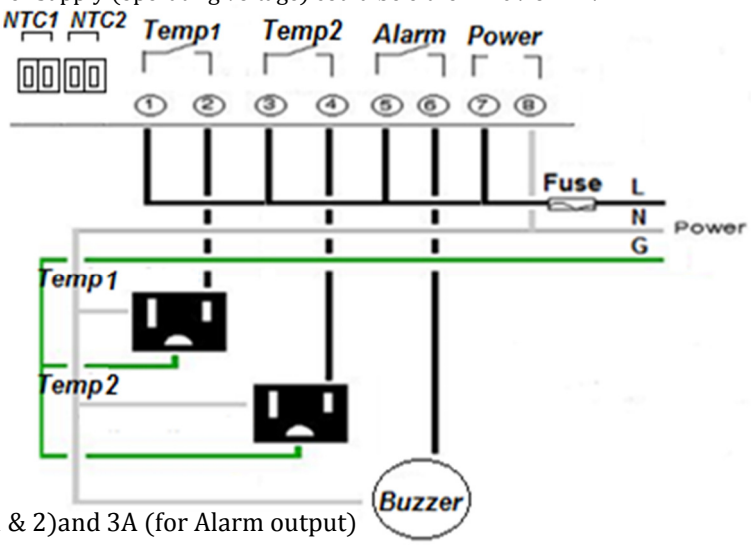
DD2S-F www.thermomart.com

Please check your controller label. Depends on your order the power supply (operating voltage) could be either 110V or 12V (12v controller does not need ground wire)



① Specification and size:

Product size: 180L x 100W x 55D (mm)

Mounting size: 168L x 88W (mm)

② wiring diagram:

Terminals 1 & 2: Temperature Output relay contact switch

Terminals 3 & 4: Humidity Output relay contact switch

Terminals 5 & 6: Alarm Output relay contact switch

Terminals 7 & 8: Power supply connection

NTC1 & NTC2 temperature Sensor: doesn't have polarity

③ Temperature controller Technical Parameters:

- Temperature measurement range: -58 °F ~ 230 °F
- Temperature measurement error: ± 1 °F
- Control accuracy & Resolution: 1 °F
- Maximum power consumption: 2W
- Sensor Type: NTC (10K/3435)
- Relay contact current: Max15A (for temperature output 1 & 2)and 3A (for Alarm output)

④ Button Description:

1. Power: To turn the temperature controllers ON press the Power1 or Power2 keys. To turn the controllers OFF press and hold the Power1 or Power2 keys for 3 seconds.
2. SET: This controller has 2 set points (SET1 and SET2). The following instruction shows how to set the first set point (SET1). The same procedure should be repeated for the second set point (SET2), by just changing SET1 to SET2 in the following instruction.

A: To set the temperature (the set point), press the SET1 key once and the controller will go to the "temperature setting" mode. By pressing ▲ or ▼ keys you can adjust the temperature to your required set point. When the set point is adjusted you can exit the "temperature setting" mode by pressing the SET1 key again.

B: To set the controller parameters, press and hold the SET1 and Up key together more than 3 seconds and the controller will go to the "parameter setting menu". By pressing ▲ or▼ keys you can select the required parameter from the menu. When the required parameter is found, press the SET1 or SET2 keys once and the controller will go to the required parameter setting mode. By pressing ▲ or ▼ keys, you can adjust the parameter that you need. When the parameter is set, you can exit the "parameter setting mode" by pressing the Power1 key (or wait for 5 seconds and the controller automatically exit this mode).

3. ▲: Increasing Up key
4. ▼: Decreasing Down key

⑤ Operating Instructions:

LED Status (light) (light display):

- When the red light beside the "Work1" is ON it shows that the output (heating or cooling) is working.
- If the light beside the "Work1" flashes, it shows that the controller is on delay.
- If the light beside the "Set1" is ON, it shows that the controller is on setting mode.

◆ Cooling / Heating functions:

- Cooling mode: When the current temperature is equal or higher than the set point temperature (+ hysteresis), the relay turns the cooling source ON and when it is less than the set point temperature, the relay turns it OFF.
- Heating mode: When the current temperature is equal or lower than the set point temperature (- hysteresis), the relay turns the heating source ON and when it is higher than the set point temperature, the relay turns it OFF.

◆ Cooling / Heating setting ("HC" parameter):

To set the controller on Heating or Cooling mode, press and hold the "SET1 and Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "HC" parameter by pressing ▲ or▼ keys. Press the "SET1" key when you find the "HC" and then by pressing "▲" or " ▼ " adjust it to "C" for cooling or to "H" for heating mode.

◆ Hysteresis (Temperature Band) function:

To prevent the frequent ON/OFF action of the output a temperature band (called hysteresis or differential set value) is created between the ON and OFF operations. The controller will use a range (a maximum and minimum) for process control action, which is between 1°F to 25°F. For example when the hysteresis is set on 5 and the set point on 50°F, the output ON/OFF action would be when the temperature goes lower than 45°F and higher than 55°F.

◆ Hysteresis setting ("d" parameter):

Press and hold the "SET1 & Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "d" parameter by pressing "▲" or " ▼" keys. Press the "SET1" key when you find "d" and then by pressing "▲" or " ▼" adjust it to any number from 1 to 25.

◆ **Temperature calibration:**

You can calibrate the temperature reading with this function. Correction value can be positive, negative or 0.

◆ **Temperature calibration setting (" CA" parameter):**

Press and hold the "SET1 & Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "CA" parameter by pressing "▲" or " ▼" keys. Press the "SET1" key when you find "CA" and then by pressing "▲"or"▼" adjust this parameter.

◆ **Delay Protection:**

In the cooling mode, you can use this parameter to set the controller on the state of compressor boot delay protection. It prevents breaking the compressor as a result of frequent boot . It also protects the compressor in the state of power cut and then power on. You can define the delay time for starting of your cooling machine.

◆ **Delay setting ("PT" parameter):**

Press and hold the "SET1 & Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "PT" parameter by pressing "▲" or "▼" keys. Press the "SET1" key when you find "PT" and then by pressing "▲" or "▼" adjust this parameter.

◆ **Higher and lower temperature functions:**

By adjusting the higher and lower temperatures you will define the display range of your controller. Narrowing this range will add to the accuracy of the controller.

◆ **Higher and lower temperature setting ("HS" and "LS" parameters):**

Press and hold the "SET1 & Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "HS" or "LS" parameters by pressing "▲" or "▼" keys. Press the "SET1" key when you find "HS" or "LS" and then by pressing "▲" or "▼" adjust this parameter. Please note that your set point has to be always between the HS and LS values.

◆ **High and low temperature alarm functions:**

- If the temperature exceeds the higher alarm temperature "set point temperature + AH" the alarm output relay will be opened, the controller makes beeping sound and the display will alternately flash between "H" and the current temperature. By pressing any key the buzzer alarm will stop and alarm relay output will be closed.
- If the temperature drops to lower than the lower alarm temperature "set point temperature - AL" the alarm output relay will be opened, the controller makes beeping sound and the display will alternately flash between "L" and the current temperature. By pressing any key the buzzer alarm will stop and alarm relay output will be closed.

Setting AL and AH parameters on zero will turn the alarm function off.

◆ **High and low temperature alarm settings ("AH" and "AL" parameters):**

Press and hold the "SET1 & Up" keys for more than 3 seconds to enter the "parameter setting menu". Find the "AL" or "AH" parameters by pressing "▲" or "▼" keys. Press the "SET1" key when you find "AL" or "AH" and then by pressing "▲" or "▼" adjust the temperature. "Set point temperature - AL" is for lower temperature alarm and "Set point temperature + AH" is for higher temperature alarm. Setting AL and AH parameters on zero will turn the alarm function off.

◆ **Parameters setting and definition:**

Symbol	Details	Setting range	Factory settings	Units
HC	Heating / cooling	H / C	C	
d	Hysteresis or Differential Set Value(temperature band)	1 to 25	1	°F
LS	Lower temperature setting	-58 ~ HS	-58	°F
HS	Higher temperature setting	LS ~ 230	230	°F
CA	Temperature Calibration	-9 To +9	0	°F
PT	Delay Protection time	0 ~ 30	1	Minutes
AH	High temperature Alarm Hysteresis	0 ~ 25	1	°F
AL	Low temperature Alarm Hysteresis	0 ~ 25	1	°F

⑥ **Error messages and troubleshooting:**

1) When the controller displays --- it shows that the sensor is disconnected.
2) When the controller displays LLL it shows that the measured temperature by sensor is lower than -58 °F.
3) When the controller displays HHH it shows that the measured temperature by sensor is higher than 230 °F.

⑦ **Caution:**

◆ The maximum current load of the heating or cooling source must not exceed the output relay contact capacity. It will damage the unit and may cause fire.

◆ Check the wiring diagram before wiring the unit. Wrong wiring will damage the controller and may cause fire.

◆ Applying extra force on the screws of controller terminals will break the base. Please tighten the screws gently.

◆ Turn the power supply off when you are wiring relays, sensors, .. Otherwise it will damage the unit and may cause fire.

NTC Sensor

- Measurement range: -58 to 230 °F
- Cable length (L): 10 ft (3m)
- Sensor type: Water proof Negative Temperature Coefficient sensor 10K