DIN-S-CF www.thermomart.com

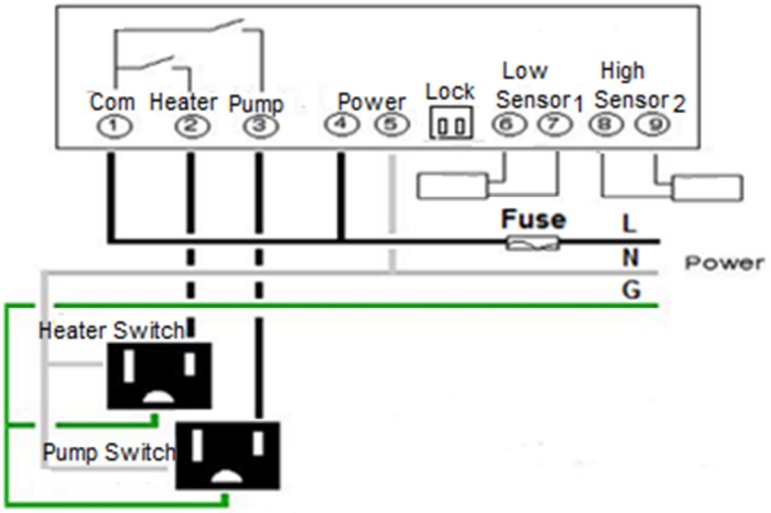
Please check your controller label. Depends on your order the power supply (operating voltage) could be either 110V, 220V or 12V (12v controller does not need ground wire)

① Specification and size:

Product size: 75L x 34.5W x 85D (mm)
Mounting size: 71L x 29W (mm)

② wiring diagram:

Terminals 1 & 2: Output relay contact switch (normally open) for Heater
Terminals 1 & 3: Output relay contact switch (normally open) for Pump (differential switch)
Terminals 4 & 5: Power supply connection
Lock switch : Locking the controller parameter setting
Terminals 6 & 7: Low Temperature sensor1 connection
Terminals 8 & 9: High Temperature sensor2 connection



③ Technical Parameters:

- Temperature measurement range: -50℃~110℃ (-58 ℉ ~ 230 ℉)
- Temperature measurement error: ± 0.5 ℃
- Control accuracy: 0.1 ℃
- Maximum power consumption: 2W
- Resolution: 0.1 ℃
- Sensor Type: 2 sensors NTC (10K/3435)
- Relay contact current: Max10A (for 110V type controller), 10A (for 12V type controller) and 5A (for 220V controller)
- Operating temperature: 0 ℃ ~ 50 ℃

④Primary Parameter Setting

For Changing primary parameter setting, press and hold the SET key and ▲ key for more than 3 seconds at the same time and the controller will go to the " primary parameter setting menu". When press Rst will exit from primary settting.

Symbol	Details	Setting range	Factory settings
CF	Fahrenheit/Celsius	F / C	C
ST	Controlling Temperature to 1 or 0.1	10 / 01	10

⑤ Operating Instructions:

1. RST: To turn the controller ON and OFF press and hold the RST key for 3 seconds.
2. SET:

A: To set the temperature for Heater (the set point for Low sensor1) press the SET 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 SET key again.

B: To set the controller parameters, press and hold the SET key for more than 3 seconds and the controller will go to the "parameter setting menu". By pressing ▲ or▼ keys you can select the required parameter setting from the menu. When the required parameter is found, press the SET key 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 RST key (or wait for about 5 seconds and the controller automatically exit this mode).

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

LED Status (lights display):

- When the working red light on the temperature display is ON, it shows that the heater is working.
- When the Set red light on the temperature display is ON, it shows that the controller is on setting mode.

◆Parameters setting and definition:

Symbol	Details	Setting range	Factory settings
d	Hysteresis Set Value(temperature band for Low sensor 1)	0.1 to 25	1.0
Ld	Lower differential temperature setting (T2-T1)	0 ~ Hd	5 ℃
Hd	Higher differential temperature setting (T2-T1)	Ld ~ 110	10℃
CA1	Temperature Calibration for sensor1	-9.0 To +9.0	0
CA2	Temperature Calibration for sensor2	-9.0 To +9.0	0
pd	Display Mode show 0,1,2	0:sensor1 1:sensor2	2:sensors1,2

◆**Hysteresis (Temperature Band) function ("d" parameter):**

To prevent the frequent ON/OFF action of the output a temperature band (called hysteresis) 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 to 25 degrees. For example when the hysteresis is set on 5 and the set point on 50℃, the Heater output switch ON/OFF action would be when the temperature goes lower than 45℃ (ON) and higher than 55℃ (Off). Press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "d" parameter by pressing "▲" or " ▼" keys. Press the "SET" key when you find "d" and then by pressing "▲" or " ▼" adjust it to any number from 1 to 30.

◆**Temperature calibration: setting ("CA1 and CA2" parameter):**

You can calibrate the temperature readings (for sensor1 or sensor2) with this function. Correction value can be positive, negative or 0. .

Press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu".Find the "CA1" or "CA2" parameter by pressing "▲" or " ▼" keys for calibration of Low sensor1 or High sensor2. Press the "SET" key and then by pressing "▲" or "▼" adjust this parameter.

◆ **Display Mode setting ("Pd" parameter):**

The display of the controller can be set to show either temperature sensor1, sensor2 or sensor1,2. Press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "PD" parameter by pressing "▲" or "▼" keys. Press the "SET" key when you find "PD" and then by pressing "▲" or "▼" adjust this parameter. "PD" can be set on 0,1,2 to display the sensor1, sensor2 or sensor1,2 alternately.

◆**Higher and lower differential temperature functions ("Hd" and "Ld" parameters):**

Sensor1 is Low temperature sensor (T1) and sensor2 is High temperature sensor (T2) and (T2-T1) is differential between 2 temperature zones that is called "d". Hd and Ld are called higher and lower differential temperature numbers that we can change these numbers in parameter setting. So by adjusting Hd (higher range of d=T2-T1) and Ld (lower range of d= T2-T1) parameters you will define the acting range of your pump.

Press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "Hd" or "Ld" parameters by pressing "▲" or "▼" keys. Press the "SET" key when you find "Hd" or "Ld" and then by pressing "▲" or "▼" adjust this parameter.

For example when Hd is set on 10 and Ld is set on 5, the pump output switch will be ON when T2-T1 is higher than 10 degrees and will be Off when T2-T1 drops to 5 degrees and it will be On again when the differential temperature (T2-T1) exceeds 10 degrees.

⑥**Error messages and troubleshooting:**

1) When the controller displays --- it shows that the sensor is disconnected. The controller will make beeping sound and the heating output relay will be closed (so the heater is off) .
2) When the controller displays LLL it shows that the measured temperature by sensor is lower than 0 ℃.
3) When the controller displays HHH it shows that the measured temperature by sensor is higher than 300 ℃.

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.