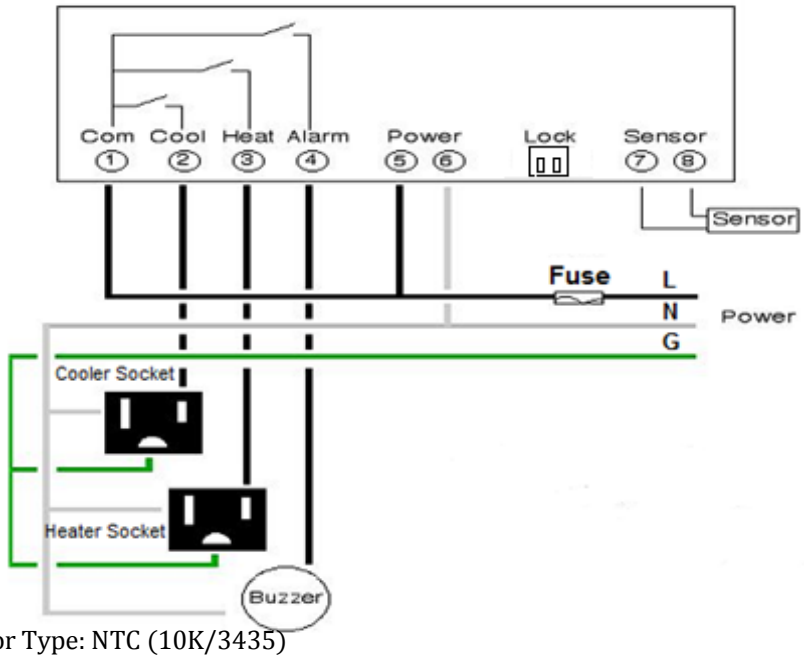
DWH7016H www.thermomart.com

Please check your controller label. Depends on your order the power supply (operating voltage) could be either 110V, 220V or 12V

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: Cooling output - Relay contact switch (normally open).
Terminals 1 & 3: Heating output - Relay contact switch (normally open).
Terminals 1 & 4: Alarm output - Relay contact switch (normally open).
Terminals 5 & 6: Power supply connection
Lock switch : Locking the controller parameter setting
Terminals 7 & 8: Temp sensor connection (NTC Probe)



Com	Switch	Cooling	Heating	Alarm	Power		Lock	Probe	
1		2	3	4	5	6	Switch	7	8

③ Technical Parameters:
- Temperature measurement range: -50 ℃ ~ 110 ℃
- Temperature measurement error: ± 0.5 ℃
- Control accuracy: 1 ℃
- Maximum power consumption: 2W
- Resolution: 0.1 ℃
- Sensor Type: NTC (10K/3435)
- Relay contact current (Output 1,2 – Cooling): Max10A/110V, 5A/220V
- Relay contact current (Output 1,3 – Heating): Max10A/110V, 5A/220V
- Relay contact current (Output 1,4 – Alarm): Max10A/110V, 5A/220V

④ Button (Key) Description:
1. RST: A) To turn the controller On and Off: To turn the controller ON press the RST key. To turn the controller OFF press and hold the RST key for 3 seconds.

B) To set the Heating Temperature (lower set point): Press the RST key once and the controller will go to the "heating temperature setting or lower set point setting" mode. By pressing ▲ or ▼ keys you can adjust the temperature to your required set point. When the lower set point is adjusted you can exit the "heating temperature setting" mode by pressing the RST key again (or wait for about 15 seconds and the controller automatically exit this mode). This lower set point can also be set via LS parameter (learn more about this in parameters setting section).

2. SET: A) To set the Cooling Temperature (higher set point): Press the SET key once and the controller will go to the "cooling temperature setting or higher set point setting" mode. By pressing ▲ or ▼ keys you can adjust the temperature to your required set point. When the higher set point is adjusted you can exit the "cooling temperature setting" mode by pressing the SET key again (or wait for about 15 seconds and the controller automatically exit this mode). This high set point can also be set via HS parameter (learn more about this in the parameters setting section).

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 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 15 seconds and the controller automatically exit this mode).

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

⑤ Operating Instructions:
LED Status (light display):
- When the red light beside the "Work" is ON it shows that the output (heating or cooling) is working.
- If the light beside the "Work" flashes, it shows that the controller is on delay.
- If the light beside the "Set" is ON, it shows that the controller is on setting mode.

◆ Heating and cooling functions:
- If the current temperature is more than the cooling temperature (higher) set point [≥(HS + Cd)], the cooling output relay will be opened and will turn the chiller (the cooling source) ON and when the current temperature drops to lower than the cooling set point [≥ (HS-Cd)] the cooling output relay will be closed and will turn the cooling source OFF.
- If the current temperature is less than the heating temperature (lower) set point [≥(LS – Hd)] , the heating output relay will be opened and will turn the heater (the heating source) ON and when the current temperature passes the heating set point [≥ (LS+Hd)] the heating output relay will be closed and will turn the heating source OFF.

◆ **Heating and cooling temperature (Lower and Higher set points) settings ("LS" and "HS" parameters):**

To set the Heating and Cooling temperatures, press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "LS" or "HS" parameters by pressing ▲ or▼ keys. Press the "SET" key when you find the "LS" or "HS" and then by pressing "▲" or " ▼ " adjust the temperature. "LS" parameter is for heating temperature (lower set point) and "HS" is for cooling temperature (higher set point).

◆**Hysteresis or Differential Set Value (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°C to 15°C. For example when the cooling hysteresis (Cd) is set on 5 and the higher set point (HS) is on 50°C, and when the heating hysteresis (Hd) is set on 3 and t the lower set point (LS) on 20°C, the ON/OFF action of heating output would be when the temperature goes lower than 17°C and the cooling output would be when the temperature goes higher than 55°C.

◆ **Hysteresis (heating and cooling hysteresis) settings ("Hd" and "Cd" parameters):**

Press and hold the "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "Hd" or "Cd" parameters by pressing "▲" or "▼" keys. Press the "SET" key when you find "Hd" or "Cd" and then by pressing "▲" or "▼" adjust them to any number from 1 to 25. "Hd" parameter is for heating hysteresis and "Cd" is for cooling hysteresis.

◆ **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 "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "CA" parameter by pressing "▲" or " ▼" keys. Press the "SET" 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 "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "PT" parameter by pressing "▲" or "▼" keys. Press the "SET" key when you find "PT" and then by pressing "▲" or "▼" adjust this parameter.

◆**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 "SET" key for more than 3 seconds to enter the "parameter setting menu". Find the "AL" or "AH" parameters by pressing "▲" or "▼" keys. Press the "SET" 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 definitions:**

Symbol	Details	Setting range	Factory settings	Units
Hd	Heating Hysteresis or Heating Differential Set Value	1 to 25	5	℃
Cd	Cooling Hysteresis or Cooling Differential Set Value	1 to 25	5	℃
LS	Heating Temperature setting (Lower Set Point)	-50 ~ HS	20	℃
HS	Cooling Temperature setting (Higher Set Point)	LS~ 110	30	℃
CA	Temperature Calibration	-9 to +9	0	℃
PT	Delay Protection time	0 ~ 30	1	Minutes
AH	Higher temperature alarm setting	0~25	1	℃
AL	Lower temperature alarm setting	0~25	1	℃

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 -50 °C.
3) When the controller displays HHH it shows that the measured temperature by sensor is higher than 110 °C.

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.