

# Northern Brewer Dual Stage Temperature Controller

## User Manual

### 1. Overview

- Plug and play design
- Dual stage output, control both heating and cooling equipment at the same time with one device
- Maximum output load: 1200W
- Dual display window displays both measured temperature and set point
- Temperature calibration
- Compressor delay protection for refrigeration control
- Optional high and low temperature alarms
- Over-temperature and sensor fault alarm

### 2. Specification

Temperature Control Range	-58~210 ° F / -50~99 ° C
Temperature Resolution	0.1° F / 0.1 ° C
Temperature Accuracy	±1°F (-50 ~ 160° F)/±1°C (-50 ~ 70°C)
Temperature Control Mode	On/Off Control, Heating and Cooling
Input Power	100 ~240VAC, 50Hz/60Hz
Temperature Control Output	Max. 10A, 100V ~240V AC
Buzzer Alarm	High and Low Temperature Alarm
Sensor Type	NTC sensor (Included)
Sensor Cable Length	2m / 6.56ft
Relay Contact Capacity	Cooling (10A, 100-240VAC)
	Heating (10A, 100-240VAC)
Input Power Cable Length	5ft (1.5m)
Output Power Cable Length	1 ft (30cm)
Dimension	Body: 5.5x2.7x1.3inch (140x68x33mm)
	Socket: 3.3x1.7x1inch (85x42x24mm)
Ambient Temperature	-22~ 167 ° F / -30~ 75 ° C
Storage	Temperature -4~ 140 ° F / -20~ 60 ° C
	Humidity 20~85% (No Condensate )

### 3. Diagram



- ① Current Temperature display:**  
Also displays menu code when in settings mode
- ② Current Set point display:**  
Also displays settings menu when in settings mode
- ③ Cooling/Heating Indicator Lamp:**  
When illuminated the device is on.  
When the cooling light is blinking it is under delay protection.
- ④ Set key:** Hold SET key for 3 seconds to enter menu for function settings.  
Press SET key for 3 seconds to quit and save settings changes.
- ⑤ Decrease key**
- ⑥ Increase key**
- ⑦ Heating/Cooling Sockets**

### 4. Operation instructions

4.1 When the controller is working normally, short press ▲ " key, the heating differential (HD) will be displayed; short press ▼ " key, the cooling differential (CD) will be displayed. The screen will return to normal display mode after 2 seconds.

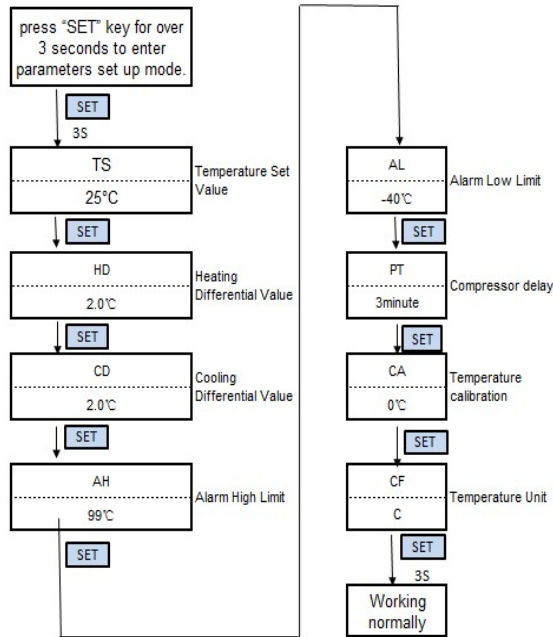
#### 4.2 How to set parameters

When the controller is working normally, hold the "SET" key for 3 seconds to enter the settings mode.

Press "SET" key to go to next the menu . Press

▲ ' key or ▼ "key to set the current parameter value. After done changing settings, hold "SET" key for 3 seconds to save the parameter changes and return to normal temperature display mode. While in settings mode, if there are no operations for 10 seconds, the system will exit settings mode and return to normal temperature display mode without saving parameter changes.

#### 4.3 Setup Flow Chart



### 5. Menu instruction

When the temperature is displayed in Fahrenheit

Menu code	Function	Setting range	Default setting	Remarks
TS	Temperature Set Value	-50~210°F	77°F	5.1
HD	Heating Differential Value	1~30°F	3°F	
CD	Cooling Differential Value	1~30°F	3°F	
AH	Alarm High Limit	-50~210°F	200°F	5.2
AL	Alarm Low Limit	-50~210°F	-40°F	
PT	Compressor Delay	0-10 minutes	3 minutes	5.3
CA	Temperature Calibration	-15°C~15°F	0°F	5.4
CF	Display in Fahrenheit or Centigrade		F	5.5

When the temperature is displayed in Centigrade

Menu code	Function	Setting range	Default setting	Remarks
TS	Temperature Set Value	-50~99.9°C	25°C	5.1
HD	Heating Differential Value	0.3~15°C	2.0°C	
CD	Cooling Differential Value	0.3~15°C	2.0°C	
AH	Alarm High Limit	-50~99.9°C	90°C	5.2
AL	Alarm Low Limit	-50~99.9°C	-40°C	
PT	Compressor Delay	0-10 minutes	3 minutes	5.3
CA	Temperature Calibration	-15°C~15°C	0°C	5.4
CF	Display in Fahrenheit or Centigrade		C	5.5

#### 5.1 Temperature Control Range Setting (TS, HD, CD)

When the controller is working normally, the LED displays current measured temperature, and automatically identifies and switches refrigeration and heating as needed to maintain the temperature setpoint.

When the measured temperature rises **above the cooling differential** the system enters refrigeration mode, the cool indicator lamp will turn on, and refrigeration relay starts to work. When the cool indicator lamp blinks, it means the refrigeration equipment is under compressor delay protection status. When the measured temperature drops back below the cooling setpoint it will turn off the refrigerator

When the measured temperature is **less than** the desired setpoint and the heating differential the system enters heating status, and the heat indicator lamp will turn on, and heating relay starts to work.

When the measured temperature **returns to the setpoint or above**, the heat and the indicator lamp will turn off.

#### 5.2 Alarm High/Low Limit Setting (AH, AL)

When the measured temperature is higher or equal to the high alarm temperature, high temperature alarm buzzer will sound until the temperature drops lower than high temp alarm, or any key is pressed.

When measured temperature is lower than the low temperature alarm a buzzer will sound until the temperature rises above the low limit, or any key is pressed.

#### 5.3 Compressor Delay (PT)

If the measured temperature is higher than the value of temperature set point plus cooling differential, the equipment won't start refrigeration immediately - it will wait for the set delay time and then turn on. When the time interval between two refrigeration operations is larger than preset delay, the equipment will start refrigeration immediately. When the time interval between two refrigeration is less than preset delay, the equipment won't start refrigeration until the set delay time is satisfied.

Delay time is calculated starting right after the moment refrigeration stops.

#### 5.4 Temperature Calibration (CA)

When there is deviation between measured temperature and actual temperature, use temperature calibration function to align the measured temperature and actual temperature. The corrected temperature is equal to temperature before calibration plus corrected value (the corrected value can be a positive value, 0, or a negative value).

#### 5.5 Display in Fahrenheit or Centigrade unit (CF)

Users can select to display Fahrenheit or Centigrade temperature values according to their preference. The default setting is Centigrade.

To display in Fahrenheit, set the "CF" value to F.

**Attention:** When the "CF" value is changed, all the settings values will revert to factory settings.

### 6. Error Description

**Sensor fault alarm:** If the temperature sensor is faulty, the controller will initiate sensor fault mode, and stop all functions. The buzzer will sound and the LED will display "ER". The buzzer can be silenced by pressing any key. After any faults are resolved, the system will return to normal working mode.

**Over-temperature alarm:** When the measured temperature exceeds the measuring range (less than -50°C/-58°F or higher than 99°C/210°F), the controller will initiate over-temperature alarm mode, and stop all functions. The buzzer will sound, and the LED will display "HL". The buzzer can be silenced by pressing any key. When the temperature returns to operating range, the system will return to normal working mode.