Budderfly Thermostat – BTS-U2

User Manual

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Contents

Introduction

Budderfly thermostat is a device that regulates temperature in a heating or cooling system. It operates by measuring the current temperature and comparing it to a set temperature, called the setpoint. The thermostat has an internal temperature and humidity sensors and can also have an external temperature sensor connected to it.

When the current temperature deviates from the setpoint, the thermostat sends a signal to turn on or off the heating or cooling system to bring the temperature back to the setpoint.

The thermostat is powered by 24 VAC, can control 2 cooling and 3 heating stages, is smart, with the capability to connect to the internet via Wi-Fi, and can be locked with a pin, set either locally or through Budderfly apps. This allows for remote temperature control and monitoring through a Budderfly apps. The thermostat can be programmed with different setpoints for different times of the day and for 7 days, allowing for energy efficiency and comfort control. It also has manual override options for immediate temperature adjustments. The thermostat BTS-U2 from Budderfly displays, in addition, the indoor air quality index and can behave accordingly.

Systems Compatibility

The Budderfly Thermostat BTS-U2 is designed to operate with low-voltage heating and cooling systems. Do not use with line-voltage and cooling systems.

- The Budderfly Thermostat BTS-U2 supports multiple system types:
- Gas heating (up to three stages)
- Oil heating (up to three stages)
- Electric heating (up to three stages)
- Traditional AC (up to three stages)
- Heat pump with auxiliary heat (up to three stages)
- Dual fuel systems
- Boilers
- Floor Heating systems
- Fan Coil Units

Specifications

- **Dimensions**: H 96 mm x W 86 mm x D 31 mm
- **Display Resolution:** 480 x 320
- **Display Size:** 73.4 mm Height 489 mm Width
- **WI-FI:** 802.11 b/g/n (2.4G) TOUCH Capacitive
- **Input Voltage:** 24VAC, 50/60 Hz
- **Relay Rating:** 24VAC@ 1Amp maximum per relay
- **Operating Temperature:** 32 F to 150 F
- **Operating:** RH 0% -90% (non-condensing)
- **Storage Temperature:** 32 F to 150 F
- **Temperature Sensors**: Thermistor 10K NTC type 2
- **Control Range**: 41 °F to 122 °F

Terminal Description

| Designator	Description
R	24 VAC Heat/Cool Supply
C	24 VAC Common
Y/Y1	First stage of cooling or first stage heat pump
Y2	Second stage of cooling or second stage heat pump
W/O.B	W: First stage of conventional heating or first stage auxiliary heat. O.B: Heat pump reversing valve (supports both O type and B type
W2/Aux	W2: Second stage of conventional heating or second stage of auxiliary heat for heat pump systems. Aux: Auxiliary humidifier, dehumidifier, or ventilator
G	Fan
T	Outside air sensor
Gnd	Ground
Ocp	Occupy input
NC	No-Connect

Wiring Diagrams

As the BTS-U2 is compatible with multiple systems, the following represents the wiring diagrams for different system types configurations.

NOTE: Wire colors are for reference only. Not every installation will have wires of the same color. If you are unsure of how to properly install the unit, please contact a licensed electrician or a professional HVAC installer before attempting the installation.

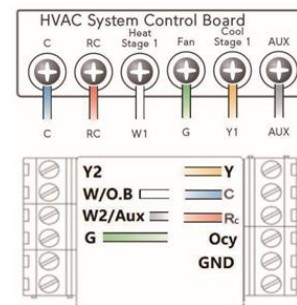The following table shows the maximum wire length allowed:

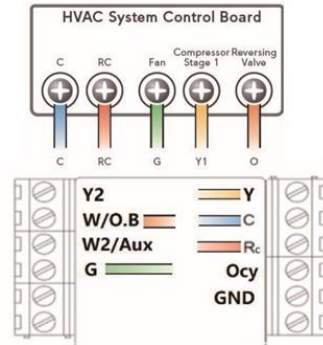| Wire Gauge	Acceptable Maximum Length
18 #AWG	128ft or 38m
20 #AWG	80ft or 24m
22 #AWG	50 ft or 15m
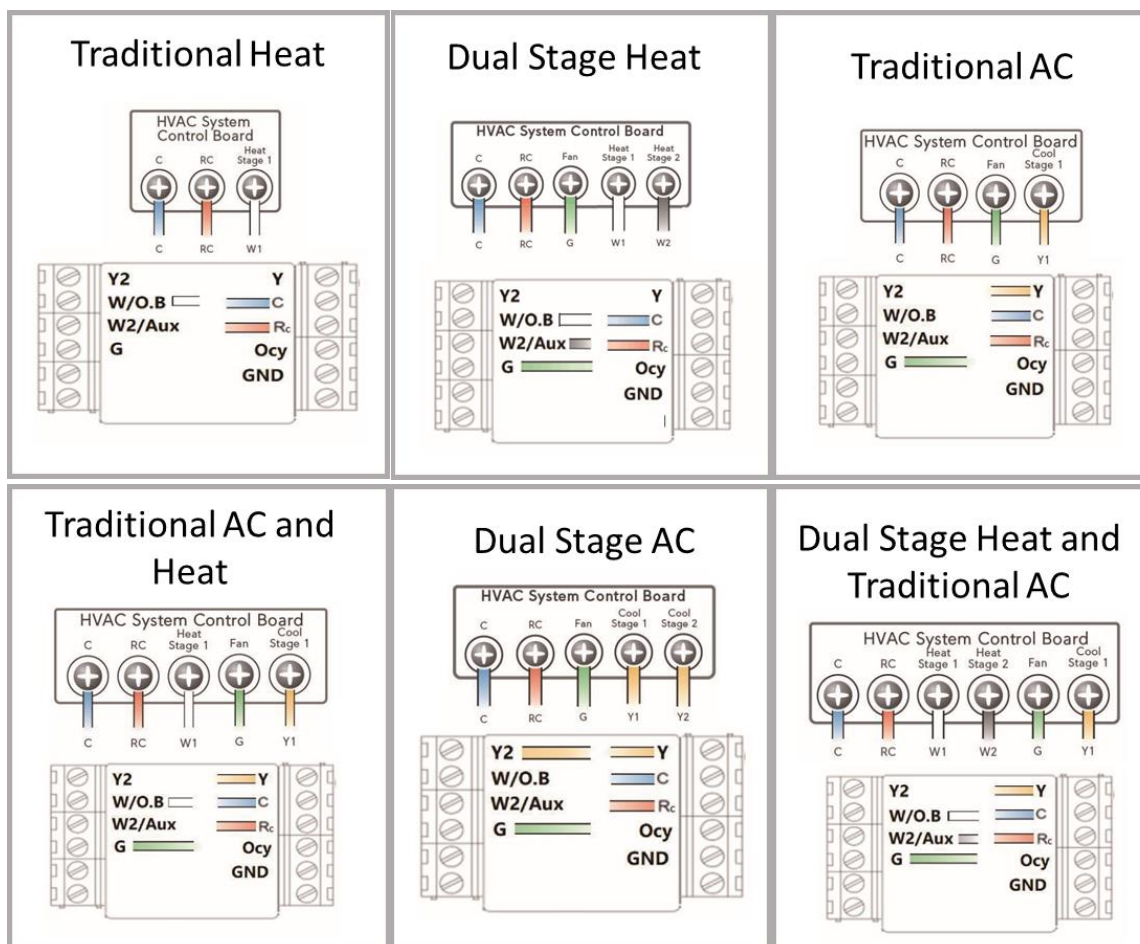
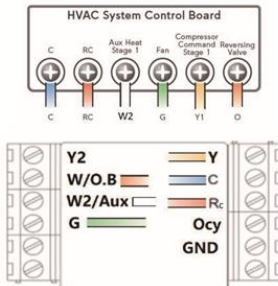## Dual Stage Heat and Dual Stage AC
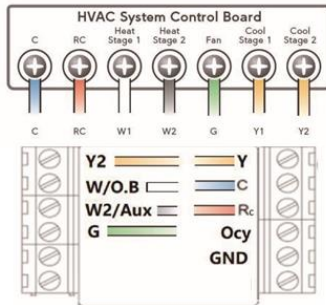
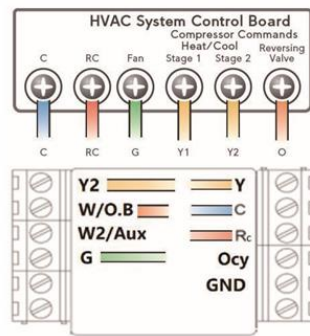## Furnace-Powered Auxiliary Device
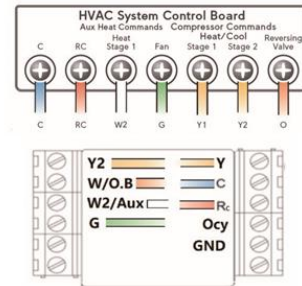

Heat Pump

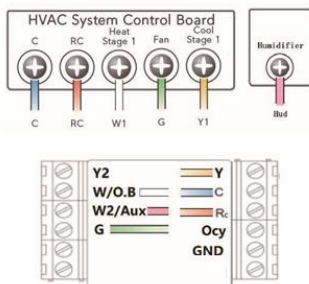

One Stage Heat Pump with One Stage Auxiliary Heat

Dual-Stage Heat Pump

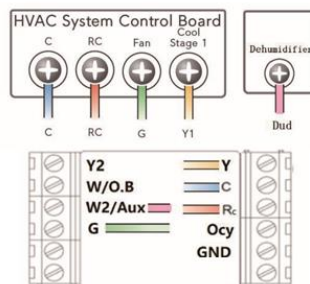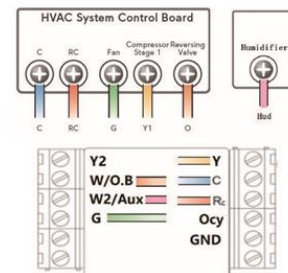## Dual-Stage Heat Pump with Auxiliary Heat

Traditional AC and Heat with Humidifier

Traditional AC with Dehumidifier

Heat Pump with Humidifier

Getting Started

Existing Thermostat Replacement

Step 1. Power Off HVAC Equipment

Before disconnecting the existing thermostat, or installing the BTS-U2, disconnect the power to the heating and air conditioning equipment.

Step 2. Remove Existing Thermostat

Disconnect the wires to the existing thermostat and remove it from the wall (if you are installing the BTS-U2 in the same location).

Step 3. Install the BTS-U2

The ideal location for the thermostat is approximately 5 ft (1.5 m) above floor level in the main living area.

Warning: Do not install the thermostat: Close to sources of heat such as incandescent lights Near supply heating/cooling sources, in direct sunlight, non-insulated or poorly insulated walls In the kitchen or other areas of potentially high heat and/or humidity In an area that could restrict air flow

To install the thermostat:

1. Gently separate the backplate from the thermostat.

2. Place the thermostat backplate on the wall. Make sure that any existing wires can be inserted through the opening for the wiring.

3. Using the backplate as a template, mark the location of the mounting holes on the wall as shown below.

4. Move the backplate out of the way and make holes where indicated in step 3. The mounting holes can accommodate a #6 pan-head screw. It is recommended to use the included fasteners to ensure proper fitting of the front housing.

5. Use the included drywall plugs (or other suitable anchors) to ensure the thermostat can be mounted securely to the wall. 6. Fasten the backplate to the wall using the screws provided (or other suitable screws).

Step 4. Connect the Wiring

You need to use low-voltage cable to connect the thermostat to the HVAC equipment. Check the wiring diagrams on pages 10 to 19 for the number of wires required.

To connect the thermostat to the equipment:

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1. Connect the wires as shown in the wiring diagrams.

2. Attach the BTS-U2 to the backplate. Ensure that the pins on the thermostat align with the terminal block on the backplate.

Step 5. Power On HVAC Equipment

After you've completed the wiring, you can apply power to the heating and air conditioning equipment. The EMS Si receives power from the equipment and will automatically power on.

Step 6. Setup system installation

Entering the Installer setup Menu

01 Press the icon on the main screen.
02 On the Feature Setting page select icon to next page
03 select 'Installation Settings'
04 On Installation Settings page press the "Re-Install" icon
05 Input the password 1234, Press the "Continue" icon
06 Select which system and settings this thermostat will work with press the "Next" key on the bottom of screen to finish all settings.

LCD Display Functions
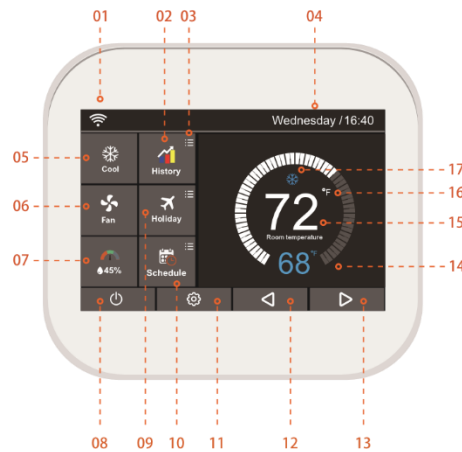
01- Wi-Fi indicator- Displayed when connected to a WiFi Network

02- History: History data, temperature and humidity trace line

03- Adjusting the optional settings.

04- Day Indicator & Clock.

05- System Mode: Heat, Cool Auto, Off.

06- Fan mode Auto, On.

07- Humidity:

(1) If humidity value less than 30%, the pointer will be in the Red area.

(2) If humidity value is between 30% and 60%, the pointer will be in the Green area.

(3) If humidity value is more than 60%, the pointer will be in the Gray area.

08- Power ON/OFF.

09- Holiday: Displayed when thermostat is in holiday mode.

10- Schedule: Programmable Operation.

11- Setup Button.

12- Adjusting the Setting Temperature or Turn Page.

13- Adjusting the Setting Temperature or Turn Page.

14- Setting Temperature display.

15- Room Temperature display.

16- C or 'F Display.

17- Displayed "Heating/Cooling/Vent" symbol.

Main Screen Operations

I.   Hold Feature

The Temperature Hold function allows you to manually override the current operating program and set a different temperature for a desired period. Click the "Hold" and entry in setting interface.

Click the First column of "Hold Temp", use the arrows to set the desired hold temperature. (Temperature Range 5℃-35℃).

Click the Second/Third columns of Hour/Minute, use the arrows to set the desired "Hold Time"

Click the back icon to save and return to main display, or select "Cancel" to delete the setting. You will see the "HOLD Left: **:** "indication is displayed on screen. The time will countdown the set duration and then revert to the normal program.

II.   Holiday

The MC6 will maintain this temperature for the duration of the holiday and will then automatically return to the program mode on your return.

Click the column of Years/Month/Day,Use the arrows to set the Year/Month/Day values under Holiday Start.

Click the column of Years/Month/Day,Use the arrows icons to set the Year/Month/Day values under Holiday End.

Click the back icon to save and return to main display. Displayed" Holiday until **/** **:**"or select" Cancel" to delete the setting

III.   Fan Mode

Click the "Fan" on the Main Display, and change the Fan mode to Auto or High.

IV.   Schedule

Select the "Schedule" on the Main Display, and enter the "Edit" interface.

On the Edit Page, from Monday to Sunday can be selected to edit.

Click "Monday" and enter Monday's setting interface.

There are Four Time Period can be selected: Morning/Day/Evening/ Night (each time period has options).

In the program of Monday:Morning   .

Click the First Column of "Time" ,use the   icons to set desired "Hour"Click the Second Column of "Time" ,use the   icons to set desired Minute. For Example:The Setting Time is 04:00am.

Click the Third Column of "Temperature", use the   icons to set desired Temperature.

For Example: The Setting Temperature is 80.6°F Day   .

The same as Program Morning procedures.

For Example: The Setting Time is 10:40 am.

For Example: The Setting Temperature is 72.5°F Evening   .

The same as Program Morning procedures.

For Example: The Setting Time is 8:30 pm.

For Example: The Setting Temperature is 78.8°F Night   .

The same as Program Morning procedures.

For Example: The Setting Time is 12:00 pm.

For Example: The Setting Temperature is 82.4°F.

Four Time Periods:

04:00 am-10:40 am : During this time period ,the temperature will   remain at 80.6°F.

10:40 am-8:30 pm : During this time period ,the temperature will   remain at 75.2°F.

8:30 pm-12:00 pm : During this time period ,the temperature will   remain at 78.8℉.

Operation of Feature Settings

1.   Clock Settings

To set the clock ,follow these steps.

1. Select the "gear" icon and enter Feature Settings.
2. Select The "Clock Setting" to enter Setting Interface.

3. Select the column of Year/Month/Day, use the arrow icons to set the Year/Month/Day values.
4. Select the column of "Time", use the arrow icons to set Hours/ Minute.
5. Select the back icon to save and return to main display.

2. Backlight Settings

Click the gear icon to enter Feature Settings.
Click "Backlight" selection and enter Backlight Setting.
Choose the dimming preference between automatic and manual and use the slider to adjust to the desired brightness.
Click the back icon to save and return to main display.

3. Standby Screen

Click the gear icon and enter Feature Settings.
Select "Standby Screen" and enter Setting interface.
There are Four Selection (3Min, 10Min, Just Night, Never) to controls the Standby Screen Time.
Click the icon back icon to save and return to main display.

4. Screen Lock

Click the gear icon and enter Feature Settings.
Select "Screen Lock" and enter setting interface.
You can enable or disable using the slider.

5. Temperature Format

Click the gear icon and enter Feature Settings.
Select the "Temp Format" option to enter setting interface.
There are two options:
Select the desired temperature format between °C and °F.   .
Click the back icon twice to save and return to main screen.

6. Temperature Limit

Click the gear icon and enter Feature Settings.
Select the "Temp Limit " option to enter setting interface.
Click the First Column, use the arrows key icon to adjust.
Minimum Temperature to 41°F-93.2°F.
Click the Second Column ,use the arrows key icon to adjust.

Maximum Temperature to 42.8°F-95°F.

Click the back icon twice to save and return to main screen.

7. Switch Diff

This function allows you to increase the switching differential of the thermostat. The system defaults to 32.9°F, meaning that when the temperature is set to 68°F, the thermostat will start heating at 67.1°F and stop at 68°F. If the default value is 33.8°F, start heating at 66.2°F, stop at 68°F.

8. Output Delay

To prevent rapid switching, an output delay can be entered and can be set from 0-15 minutes. (The default is 00, means no delay)

9. Daylight Saving Time

Click the gear icon and enter Feature Settings.
Select "DST" then "Auto DST" to enter setting interface.
There are three options:
European Union / US & Canada/Australia & New Zealand
Select the back icon to save and return to main screen.

10. System Information

Click the gear icon to enter feature settings.
Select "System Information" to enter interface,
It will show shows Version Number : Pro-3.43s.
Select the back icon to Exit.

11. Reset Factory Settings

Click gear icon then "Reset Factory Settings" and enter setting interface.
Warning: Reset will make you lose the current Settings and return to the factory Settings.

Regulatory

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This device has been tested and found to comply with the limits for a Class B digital device, according to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used following the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

i.   Reorient or relocate the receiving antenna.
ii.   Increase the separation between the equipment and receiver.
iii. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
iv.   Consult the dealer or an experienced radio/TV technician for help.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment.

Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled rolled environment. This device should be installed and operated with a minimum distance of 20cm between the radiator and your body.