

Installer Manual Smart Wi-Fi Thermostats

ST920WF Up to 3 Heat / 2 Cool Heat Pump
Up to 2 Heat / 2 Cool Conventional

ST921WF Up to 2 Heat / 1 Cool Heat Pump
2 Heat / 1 Cool Conventional
1 Heat / 2 Cool Conventional

Model number is located on back of thermostat.

1 Specifications

2 Installation

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6 System Testing

 **Warning** For installation by experienced service technicians only.

 **Caution** Possible electric shock or damage to equipment can occur.
Disconnect power before beginning installation.

This thermostat requires 24 Volt AC Power.

For use only as described in this manual. Any other use will void warranty.

This manual is for Installer use only.

1 SPECIFICATIONS

This thermostat is compatible with:

- Single stage conventional and heat pump systems
- Single stage heat pumps with auxiliary heat
- Heat pump systems with 2 compressors and auxiliary heat (ST920WF)
- Conventional systems up to 2 stages of heat and 2 stages of cool (ST920WF)
- Heating only systems
- Cooling only systems

Electrical and Control Specifications

- Electrical Rating: 24 Volt AC
- 1 amp maximum load per terminal
- AC Power: 18 – 30 Volts AC
- Control Range: 50° to 90° F (10° to 32° C)
- Temperature Accuracy: +/- 1.5° F (+/- 1.0° C)

Terminations

- ST920WF: Rc, Rh, W1/OB, W2/AX, Y1, Y2, G, L, C
ST921WF: Rc, Rh, W1/OB, Y1, *, G, L, C

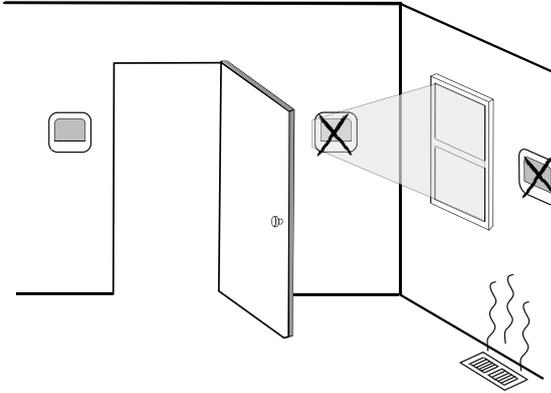
2 INSTALLATION

Warning *Disconnect power before beginning installation.*

Thermostat Location

Install the thermostat approximately 5 feet (1.5m) above the floor in an area that has a good amount of air circulation and maintains an average room temperature.

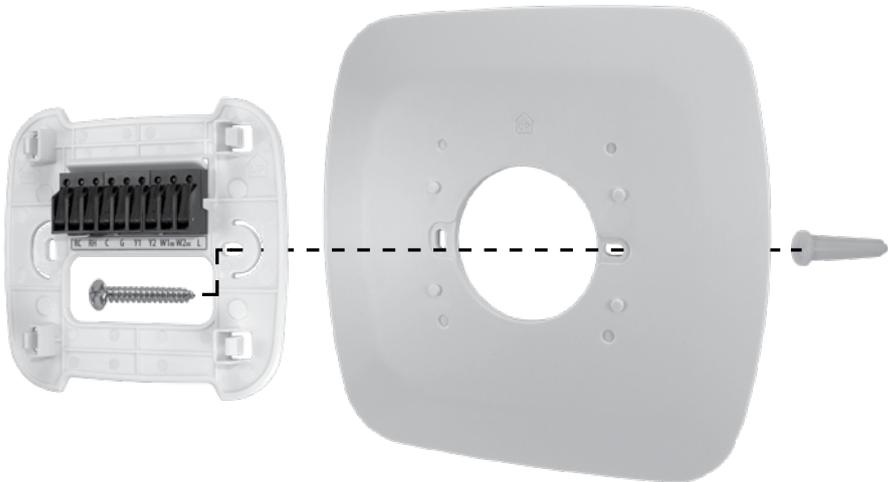
Avoid installation in locations where the thermostat can be affected by drafts, dead air spots, hot or cold air ducts, sunlight, appliances, concealed pipes, chimneys and outside walls.



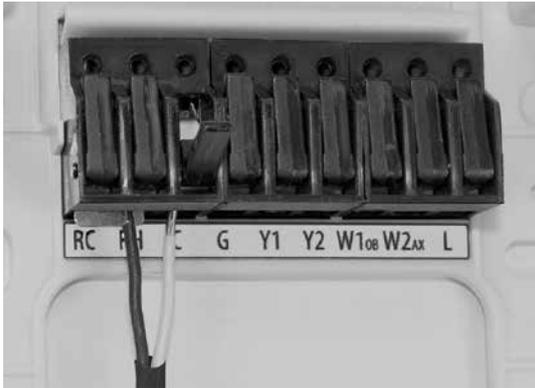
Install the Sub-Base:

- Remove the sub-base from the body of the thermostat.
- Mount the sub-base as shown below:

**Drill 3/16" pilot holes in your desired location.
Use supplied anchors for drywall or plaster.**



2 INSTALLATION



Attach Wiring - To insert a wire into a terminal, flip up the locking tab and slide the wire into the terminal directly above the corresponding label. Insert each wire as required for the desired application. Once each wire is inserted, flip the tab down to lock it in position. Then pull gently on each wire to be sure the wire is secure.

Conventional Systems - Typical Wiring Configurations for HVAC: CONV

MODEL	ST920WF or ST921WF			ST921WF		ST920WF
	1 Heat 0 Cool	0 Heat 1 Cool	1 Heat 1 Cool	2 Heat 1 Cool	1 Heat 2 Cool	2 Heat 2 Cool
Terminal Description	System Type: HEAT	System Type: COOL	System Type: HEAT/COOL	System Type: HEAT/COOL	System Type: HEAT/COOL	System Type: HEAT/COOL
24 VAC Cooling Transformer	Rc	Rc	Rc ¹	Rc ¹	Rc ¹	Rc ¹
24 VAC Heating Transformer	-	-	Rh ^{1,2}	Rh ^{1,2}	Rh ^{1,2}	Rh ^{1,2}
24 VAC Transformer Common	C	C	C ³	C ³	C ³	C ³
Fan Relay	G ⁴	G	G	G	G	G
1st Stage Cooling	-	Y1	-	-	Y1	Y1
2nd Stage Cooling	-	-	-	-	* ⁵	Y2
1st Stage Conventional Heat	W1	-	W1	W1	W1	W1
2nd Stage Conventional Heat	-	-	-	* ⁵	-	W2
Unused	-	-	-	-	-	-

*"HVAC" and "System Type" are configured in the Settings - See section 5

NOTES - Conventional Systems

- 1 Remove factory installed jumper for dual transformer systems
- 2 Only required for dual transformer systems
- 3 For dual transformer systems, common must come from cooling transformer
- 4 Only connect if needed for system
- 5 The * (Asterisk) terminal functions as either Y2 or W2 depending on configuration

Provide disconnect and overload protection as required.

2 INSTALLATION

Heat Pump Systems - Typical Wiring Configurations for HVAC: HT PUMP or D FUEL

MODEL	Both	ST921WF		ST920WF		
	1 Heat Pump 0 Auxiliary	1 Heat Pump 0 Auxiliary	1 Heat Pump 1 Auxiliary	1 Heat Pump 1 Auxiliary	2 Heat Pump 0 Auxiliary	2 Heat Pump 1 Auxiliary
Terminal Description	System Type: HEAT/COOL					
24 VAC Cooling Transformer	Rc	Rc	Rc	Rc	Rc	Rc
24 VAC Heating Transformer	-	-	-	-	-	-
24 VAC Transformer Common	C	C	C	C	C	C
Fan Relay	G	G	G	G	G	G
1st Compressor Stage	Y1	Y1	Y1	Y1	Y1	Y1
2nd Compressor Stage	-	-	-	-	Y2	Y2
Reversing Valve	OB ¹					
Auxiliary Heating Stage	-	-	* ²	-	AX	AX
System Malfunction Indicator	L	L	L	L	L	L

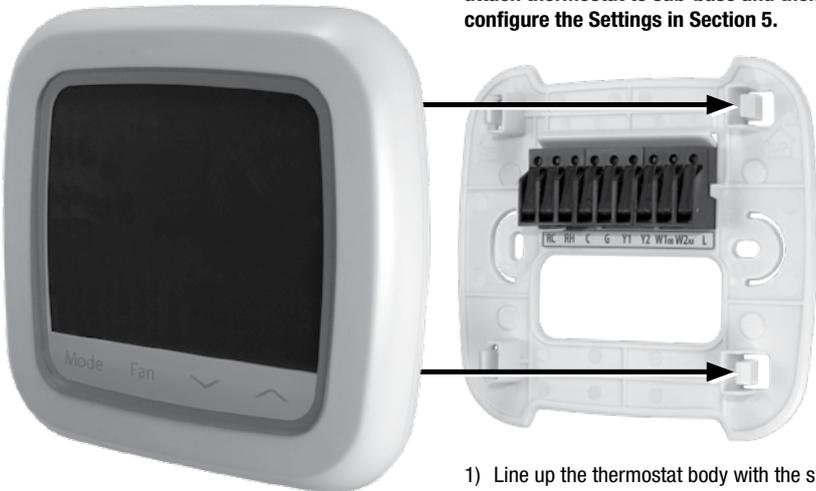
"HVAC" and "System Type" are configured in the Settings - See section 5

NOTES - Heat Pump Systems

- 1 O (cool active) or B (heat active) is selected in the Installer Settings menu
- 2 The * (Asterisk) terminal functions as either Y2 or W2 depending on configuration

Provide disconnect and overload protection as required.

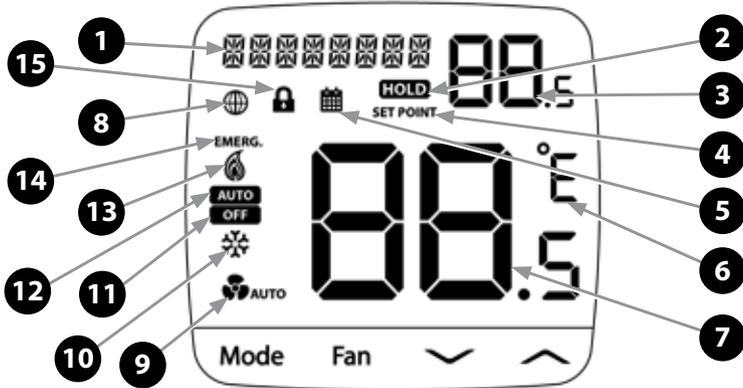
Attach to Thermostat Sub-Base



Once you complete the wiring in Section 2, attach thermostat to sub-base and then configure the Settings in Section 5.

- 1) Line up the thermostat body with the sub-base.
- 2) Carefully push the thermostat body against the sub-base until it snaps in place.

3 QUICK REFERENCE



Display Characters

1	Alphanumeric text display		
2	Schedule Override Indicator Temporary: & HOLD Permanent: HOLD	9	Fan indicator: Auto - On -
3	Setpoint or parameter value	10	Cooling Mode
4	SET POINT Setpoint indicator	11	OFF Off Mode
5	Schedule running indicator	12	AUTO Auto Cooling/ Heating mode
6	Fahrenheit or Celsius units	13	Heating Mode
7	Room Temperature	14	EMERG. Emergency Heat mode
8	Wi-Fi indicator	15	Key lock indicator

Buttons

Mode - Mode Selection	Fan - Fan Speed Selection	Mode + Fan - Toggle °F or °C
Increase Value Decrease Value	+	Hold for 3 seconds to lock/unlock thermostat

The thermostat must be properly configured to operate correctly. Upon powerup or after a factory reset, you are presented with the option for MOBILE or MANUAL SETUP. Use the **▲ ▼** button to move from MOBILE to MANUAL SETUP, if desired.

Description	Available Settings	Description of Available Settings
MOBILE SETUP	-	Use for Mobile Setup
	This is the default option. To use mobile setup, simply keep choose this option and open the BlueLink SOLO application to connect and configure your thermostat.	
MANUAL SETUP	NO	Returns to MOBILE SETUP
	YES	Starts MANUAL SETUP
	RESET	Factory Resets the device
	Select YES for this option if you wish to configure the thermostat manually. If you wish to return to MOBILE setup, you can select NO. Selecting RESET will factory reset the device.	

4 MOBILE SETUP

When MOBILE SETUP begins scrolling across the screen, the thermostat is ready to connect with the application.

Download the BLUELINK SOLO application on your iOS or Android device. After downloading the application, follow the steps in the BLUELINK SOLO Mobile Application to complete setup and installation.



5 MANUAL SETUP

If an internet connection is not available or you prefer to configure the thermostat manually, you can choose MANUAL SETUP to do so. This will bring you into a device configuration menu.

See pages 7-10 for instructions on how to navigate this menu.

This menu can also be accessed at any time after the initial configuration by pressing MODE and FAN at the same time for 5 seconds.

If  is displayed, you must unlock the thermostat to proceed.

To unlock the thermostat, press **▲** and **▼** at the same time for 3 seconds until the  icon disappears.



Manual Setup Menu

To Access the Menu after Initial Setup:

- 1) Press MODE and FAN at the same time for 5 seconds.
- 2) While in the menu, use the **▲** and **▼** arrows to change the selected option.
- 3) Use FAN to confirm the option, and MODE to back out of current option or submenu.



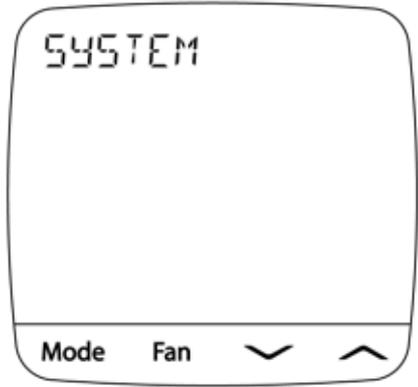
No.	Description	Default	Available Settings	Description of Available Settings
1	SYSTEM	-	-	-
	Select this option to enter the SYSTEM submenu. (See page 8).			
2	TIME ZONE	-	Pacific Eastern, Central, Mountain, Pacific, Alaska, Hawaii	
	Select the time zone for your thermostat.			
3	TIME DATE	-	-	-
	Select this option to enter the TIME DATE submenu. (See page 9).			
4	FORMAT	12	12	Select for a 12 hour clock
			24	Select for a 24 hour clock
	Select the format for the clock, either 12 hours with AM/PM or 24 hours.			
5	NETWORK	-	-	-
	Select this option to enter the Wi-Fi NETWORK submenu. (See page 10).			
6	FROST	NO	NO	Select to disable Frost Protection
			YES	Select to enable Frost Protection
	Frost Protection will run the heat regardless of system state whenever the room temperature falls below the frost setpoint. The default frost setpoint is 41°F (5°C), and this can be adjusted from the application.			
7	TEMP CAL	0	-6 to 6°	Select an offset to the display temperature of -6 to 6°F (-3 to 3°C)
	Select a temperature calibration or offset to apply to the reading.			
8	SPAN	0.5	0.5, 1.0, 2.0	Select a 1st stage Span to control cycling.
	Select the range of temperature to control the degree of separation between the setpoint temperature and the first stage of heating or cooling.			
9	D2	2	1 to 20	Select a second stage differential of 1-20°F. (0.5 - 10°C)
	Selects a differential which controls the degree of separation between the 1st and 2nd stage of heating or cooling.			
10	DEADBAND	2	2, 3, 4	Select a deadband for autochangeover of 2, 3, or 4°F (1, 1.5, or 2°C).
	When using auto changeover mode, the dead band determines the separation between heating and cooling.			
11	FACTORY	NO	NO	Selecting NO will not reset the thermostat.
			YES	Select to factory reset the thermostat.
	Selecting YES will return the thermostat to all factory default settings.			

System Submenu

To Access this Submenu:

- 1) Press FAN when viewing the option #1 SYSTEM in the main menu (see page 7).
- 2) While in the menu, use the **▲** and **▼** arrows to change the selected option.
- 3) Use FAN to confirm the option, and MODE to back out of current option or submenu.

NOTE: This menu is adaptive and available options will vary based on your previous selections.

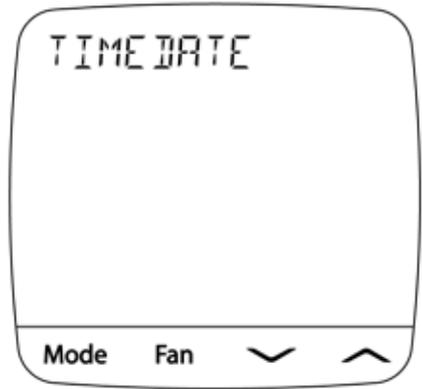


No.	Description	Default	Available Settings	Description of Available Settings
1a	HVAC	CONV	CONV	Select for Conventional Systems
			HT PUMP	Select for Heat Pump Systems
			D FUEL	Select for Heat Pumps with fossil fuel auxiliary
Select the type of heating and cooling equipment controlled.				
1b	SYS TYPE	HEAT	HEAT	Select for Heat Only Systems
			COOL	Select for Cool Only Systems
			HEATCOOL	Select for Heating and Cooling Systems
Select the heating and/or cooling function of your equipment.				
1c	FAN TYPE	GAS	GAS	Select for Gas heating systems
			ELECTRIC	Select for Electric heating systems
This option controls whether or not the fan is called alongside the heat. To activate the fan alongside the heating, select ELECTRIC. If GAS is selected, the fan will not be called alongside the heat.				
1d	HP TYPE	o	o	Select for O (Cool Active) reversing valve
			b	Select for B (Heat Active) reversing valve
Select the switching operation for the changeover or reversing valve.				
1e	COOL STA	1	1	Select for one stage of cooling
			2	Select for two stages of cooling
Select the number of cooling stages.				
1f	HEAT STA	1	1	Select for one stage of heating
			2	Select for two stages of heating
Select the number of heating stages.				
1g	HP STA	1	1	Select for one stage of heat pump
			2	Select for two stages of heat pump
Select the number of heat pump stages for heating and cooling.				
1h	AUX HEAT	1	0	Select for no auxiliary heat
			1	Select for one stage of auxiliary heat
Select the number of heat pump stages for heating and cooling.				

Time/Date Submenu

To Access this Submenu:

- 1) Press FAN when viewing the option #3 TIME DATE in the main menu (see page 7).
- 2) Change settings as required using the **▲** and **▼** arrows.
- 3) Use FAN to confirm a selection, or use MODE to back out of the current option or sub-menu.



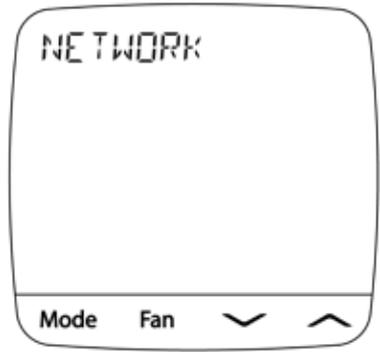
NOTE: This menu is not available while the thermostat is connected to the cloud, as the clock will update automatically based on your time zone.

No.	Description	Default	Available Settings	Description of Available Settings
3a	YEAR	20	20 - 99	Select the current year
	Select the current year by selecting the last two digits. The first two digits are always assumed to be 20--.			
3b	MONTH	01	01 - 12	Select the current month
	Select the current month from January to December by selecting the number of the month from 01 to 12.			
3c	DAY	01	01 - 31	Select the current day
	Select the current day from the 1st to the 31st.			
3d	HOUR	12AM	12AM TO 11PM	Select the current hour
	Select the current hour from 12AM to 11PM.			
3e	MINUTE	00	00 to 59	Select the current minutes
	Select the current minutes from --:00 to --:59			

Network Submenu

To access this submenu:

- 1) Press FAN when viewing the option #5 NETWORK in the main menu (see page 7).
- 2) While in the menu, use the **▲** and **▼** arrows to change the selected option.
- 3) Use FAN to confirm the option, and MODE to back out of current option or submenu.



NOTE: Many of the options in this menu are read-only, and can only be viewed when the thermostat has a Wi-Fi connection.

No.	Description	Default	Available Settings	Description of Available Settings
5a	STATUS	0	0	No Connection
			1	Connected
			2	Lost Connection
Press FAN to display the current status of the Wi-Fi network and cloud connection.				
5b	SSID	-	-	Shows the current SSID
	Press FAN to display the SSID (network name) of the Wi-Fi network saved to the thermostat.			
5c	IP ADDR	-	-	Shows the current IP Address
	Press FAN to display the current IP Address assigned to the thermostat.			
5d	MAC ADDR	-	-	Displays the MAC Address
	Press FAN to display the MAC Address of the thermostat.			
5e	RSSI	-	-30 to -100	Displays the Wi-Fi RSSI
	Displays the current RSSI (signal strength) of the thermostat's Wi-Fi connection. Typically -50 is excellent while -90 is poor.			
5f	RESET	NO	NO	Selecting NO will not reset the network settings
			YES	Select to reset the thermostat's network connection.
	Selecting YES will remove the network connection from the thermostat. This reset will take place upon exit of the menu.			

6 SYSTEM TESTING



Warning *Read Before Testing*

- Do not short (or jumper) across terminals on the gas valve or at the heating or cooling system control board to test the thermostat installation. This could damage the thermostat and void the warranty.
- Do not select the COOL mode of operation if the outside temperature is below 50° F (10° C). This could possibly damage the controlled cooling system and may cause personal injury.
- This thermostat includes an automatic compressor protection feature to avoid potential damage to the compressor from short cycling. When testing the system, make sure to take this delay into account.

To Test Thermostat:

- 1 Press the **MODE** button until the thermostat is in HEAT mode.
- 2 Press the **▲** button to raise the set temperature a minimum of 3 degrees above the current room temperature. The system should start within a few seconds. With a gas heating system, the fan may not start right away.
- 3 Press the **MODE** button until the thermostat is in the OFF mode. Allow the heating system to fully shut down.
- 4 Press the **MODE** button until the thermostat is in the COOL mode.
- 5 Press the **▼** button to lower the set temperature a minimum of 3 degrees below the current room temperature. The system should start within a few seconds (unless compressor short cycle protection is active – See note above).
- 6 Press the **MODE** button until the thermostat is in the OFF mode. Allow the cooling system to fully shut down.
- 7 Press the **FAN** button until the thermostat is in FAN ON mode. The system fan should start within a few seconds.
- 8 Press the **FAN** button until the thermostat is in FAN AUTO mode. Allow the system fan to turn off.

Limited Warranty

When installed by a professional contractor, this product is backed by a 5 year limited warranty. Limitations apply. For limitations, terms and conditions, you may obtain a full copy of this warranty:

- Visit us online: www.braeburnonline.com/warranty
- Call us: 866.268.5599
- Write us: Braeburn Systems LLC
2215 Cornell Avenue
Montgomery, IL 60538



Installer - store this manual for future reference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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.

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux CNR exempts de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes :

- (1) Ce dispositif ne peut causer des interférences ; et
- (2) Ce dispositif doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

Please Note: This thermostat may have been updated over the internet since this manual was printed. Always refer to the support web site for the latest information.

Braeburn®

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