

# Part Install Instructions

## GE HEWH & Bradford White HPWH Control Assembly

### WS35X20581, WS35X20582, WS35X20583 & WS35X20584

February 2015

### Overlay

Service replacement controls must have a new overlay included with control (also available separately). Overlays have a one time adhesive and damage will occur if attempts are made to remove and re-use the old one.

Model Number	Control Number
GEH50DEEDSR* GEH50DFEJSR* GEH80DFEJSR*	WS35X20581 (red)
GEH50DEEJSC* GEH80DEEJSC*	WS35X20582 (gray)
GEH50DEEDSC*	WS35X20584 (gray)
BEH50DCEHSB*/ RE2H50R10-1NCWW BEH50DCEJSB*/ RE2H50R10B-1NCWT BEH80DCEJSB*/ RE2H80R10B-1NCWT	WS35X20583 (black)

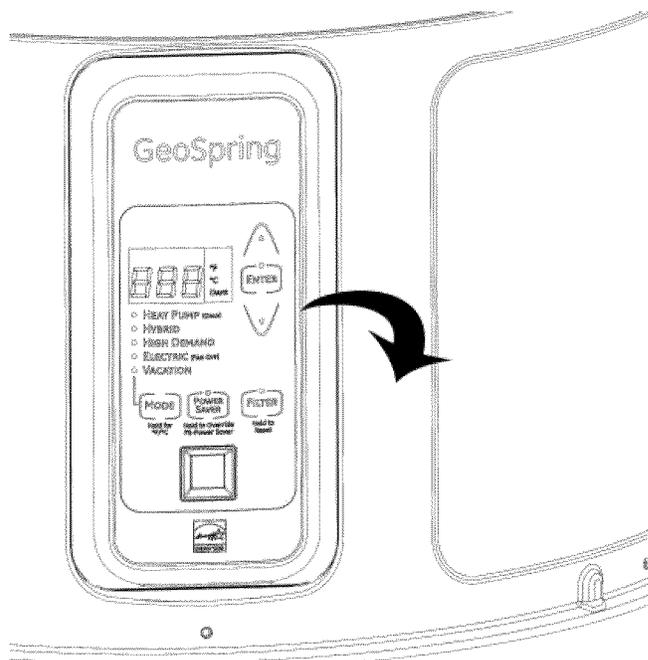
\* Denotes Engineering Digit

Control Trim has changed design on some models (GEH50DEEDSR\*, GEH50DEEDSC\* and BEH50DCEHSB\*/RE2H50R10-1NCWW). New control, overlay and trim must be used.

### Step 1 – Remove Bezel (some models)

Some models (GEH50DEEDSR\*, GEH50DEEDSC\* and BEH50DCEHSB\*/RE2H50R10-1NCWW) have a visible screw at the bottom of the control which allows removal of control housing. All other models have a bezel which must be removed to access the screw securing the control housing to the water heater.

- To remove the bezel pull the right side to the right and outwards to release the mounting tabs.

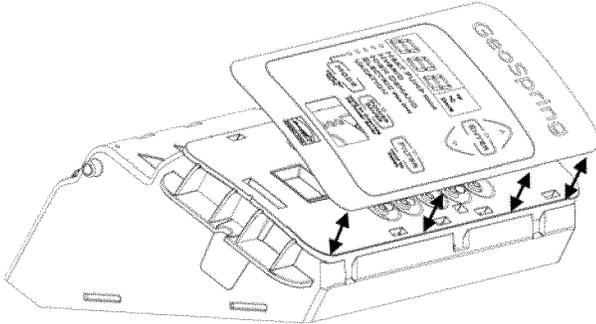


- The bottom mounting screw can now be removed to access rear cover and wiring connections.



## Step 2 – Install Overlay

- Place the control console on a firm, flat surface
- Peel the protective paper backing from the back of the overlay. Use care not to touch the LED window to prevent finger prints and sticking to the adhesive.

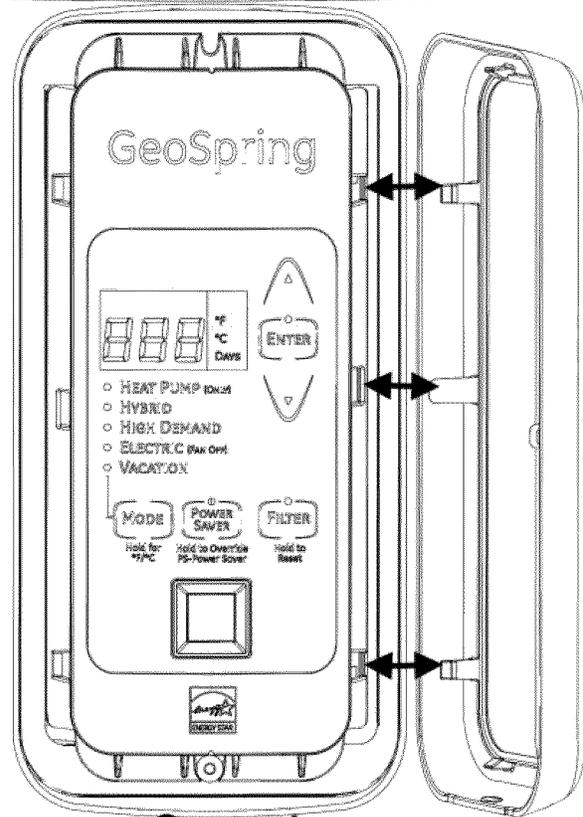


- Place the overlay against the right side lip of the control housing
- Use the RJ45 and top / bottom lips to finish proper orientation of the overlay.
- Firmly press the overlay working from center out to the edges.

## Step 3 – Install the New Control

- Install the control board assembly.
- Connect all wiring.
- Re-mount the control assembly to the water heater.
- Re-install mounting screw at bottom of the control.
- Remove the protective film from the outside of the overlay.

- Install the new control bezel. The control trim is held in place with 10 tabs. (3 each side, 2 on top and bottom). The trim does have a top and bottom. When reinstalling the trim, if reversed, the tabs will not align. It is helpful to squeeze the sides of the trim slightly to guide the side tabs in place.

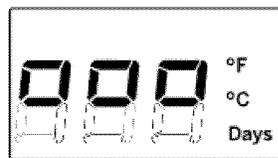


**Correct**

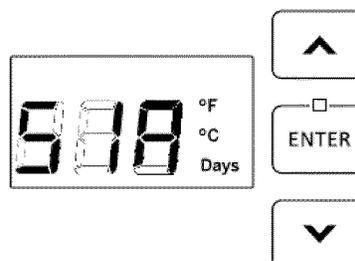
- Turn the power ON.

## Step 4 – Set Personality ID

- The new control will blink “000” at the top of the display and beep 3 times.



- Use the arrow keys on the user interface to scroll to the selected personality ID.



Use the below table to select the proper personality ID. The personality must be set correctly for the new service control to operate properly.

**Note: If the Model has a ducting kit installed use the smaller number in the chart below for initial setting. The ducted personality number will not display and cannot be programmed in this step. The Ducting Accessory adjustment is completed in Step 7 (page 4).**

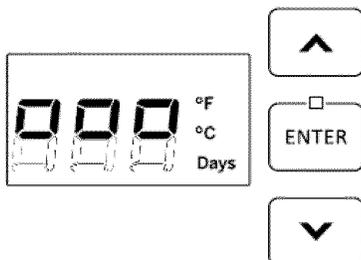
GEH50DEEDSR*	50C
GEH50DEEDSC*	50D
GEH50DFEJSR* (CCE Active)	51A 54A
GEH50DEEJSC* (CCE Active)	52A 55A
GEH80DFEJSR* (CCE Active)	81A 84A
GEH80DEEJSC* (CCE Active)	82A 85A
BEH50DCEHSB*/RE2H50R10-1NCWW	50E
BEH50DCEJSB*/RE2H50R10B-1NCWT (CCE Active)	53A 56A
BEH80DCEJSB*/RE2H80R10B-1NCWT (CCE Active)	83A 86A

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Example: Model GEH50DEEJSC\* personality will have 52A as an initial setting. the ducted setting will update at the end of step 7.

## Step 5 – Finish Setting Personality ID

- Press and HOLD the **ENTER** button until a tone is heard.
- Note: If a valid personality ID is not received the water heater will not function and the display will show a circle in the upper half of each of the three digits.**



## If Incorrect Personality is Set

- Enter **Service Mode**
- Press the **MODE** button 3 times (until the previously selected personality displays on the screen)
- Repeat steps 3 through 6 listed above
- Exit **Service Mode**

**Note: Service mode entry instructions may be found in the mini-manual, inside the front shroud to the right of the control module.**

## Step 6 – Set Anode Clock (GEH50DEEJSC\* and GEH80DEEJSC\* only)

Models GEH50DEEJSC\* and GEH80DEEJSC\* with Anode detection, must have the clock set with install date, anode replacement date or last inspection date, whichever is the most recent date, the consumer must provide this information. The current date must also be entered for proper operation of the anode depletion circuit.

**Set the Install Date**, anode replacement date if it has been replaced or last inspection date.

- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the correct install month (1–12), then Press Enter
- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the correct install day of the month (1–31), then Press Enter
- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the correct install year (14–20), then Press Enter

**Set the current date**

- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the current month (1–12), then Press Enter
- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the current day of the month (1–31), then Press Enter
- With 00 displayed, use  $\wedge$  or  $\vee$  pad to select the current year (14–20), then Press Enter
- The control will “reboot or reset” and restart. 120 initial set point will be displayed.

## Step 7 – Duct Accessory Model Personality Adjustment

Only activate the CCE setting if it was active before the control was serviced. The CCE setting does not need to be active on units with a ducting kit unless it qualifies for Northern Climate Tier 3 rebates or if the consumer wishes the setting to be active.

- Press "DOWN Arrow (v)" and "FILTER" button for 5 seconds.
- The screen will display "dUC or CCE".
- Personality will be adjusted to the larger ducted number as shown in Step 3.
- To exit out of duct setting press "DOWN Arrow (v)" and "FILTER" button for 5 seconds, the screen will display "Std".

## Step 8 – Verify Operation

- Verify that the user interface is displaying an initial set-point of 120° F and turns on.

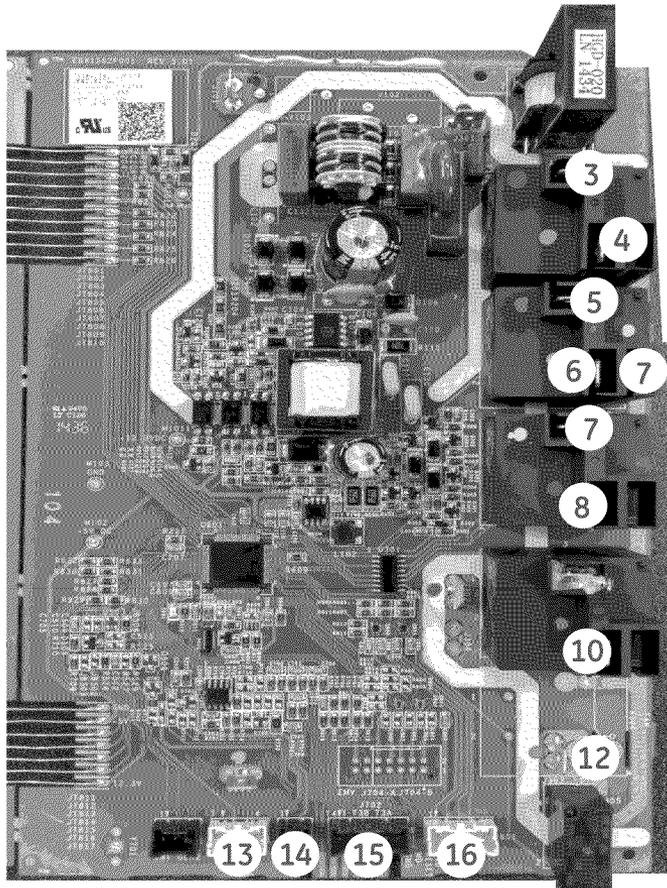
## Step 9 – GE ConnectPlus (if installed)

If the serviced water heater has a ConnectPlus Wi-fi module the customer will need to follow the below direction to connect the GeoSpring to the smartphone app.

- For models **GEH50DFEJSRA**, **GEH50DEEJSCA**, **GEH80DFEJSRA** and **GEH80DEEJSCA** follow the activation instructions on the consumers smartphone GeoSpring app.
- For models listed in the left column in the below table, enter the model number in the right column into the smartphone GeoSpring app.

Model Number on Rating Plate	Enter Model in Smartphone GeoSpring app
GEH50DEEDSRA	GEH50DEEDSRX
GEH50DEEDSRB	GEH50DEEDSRX
GEH50DEEDSCA	GEH50DEEDSCX
GEH50DEEDSCB	GEH50DEEDSCX
RE2H50R10-1NCWW	BEH50DCEHSBA
RE2H50R10B-1NCWT	BEH50DCEJSBA
RE2H80R10B-1NCWT	BEH80DCEJSBA

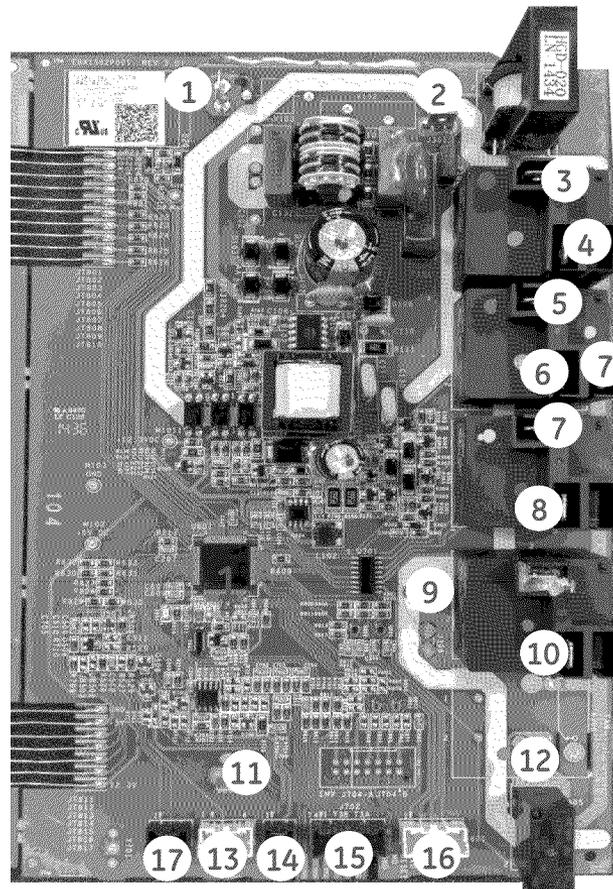
# Control wiring connections



For Models:  
 GEH50DEEDSR\*  
 GEH50DEEDSC\*  
 BEH50DCEHSB\*/  
 RE2H50R10-1NCWW

Notice: some models have a blue jumper wire, it is no longer used.

\* Engineering Digit



For Models  
 GEH50DFEJSR\*  
 GEH50DEEJSC\*  
 GEH80DFEJSR\*  
 GEH80DEEJSC\*  
 RE2H50R10B-1NCWT /  
 BEH50DCEJSB\* Bradford White  
 RE2H80R10B-1NCWT /  
 BEH80DCEJSB\* Bradford White

## Wire color key

- 1 Purple (anode) (not all models)
- 2 Brown (fan) (not all models)
- 3 Red (L2 Route through CT201)
- 4 Pink (L2)
- 5 Purple (L1)
- 6 Orange (upper element)
- 7 Yellow Jumper
- 8 Brown (lower element)
- 9 Pink (compressor capacitor) (not all models)
- 10 Blue (compressor)
- 11 Green (ground) (not all models)
- 12 Grey (fan)
- 13 Yellow (T5 sensor)
- 14 White (T2 sensor)  
Red (T3a sensor)  
White (T3b sensor)
- 15 Blue (T4 sensor)
- 16 White, Orange, Yellow, Blue and Red (EEV)
- 17 Orange (Condensate Sensor)

## Addendum: Fault Code and Counts List – Place this page with the Mini-Manual

The control has been replaced, the new control has enhanced fault codes.

Fault Code Displayed	Fault Counts Before Code Displayed	Condition	Check
FC	10	Control checks to ensure evaporator is free of frost. Continuously verifies that T3a sensor (evaporator inlet temperature) is greater than 20F after 30 minutes of run time.	Check T3a sensor mounting, wiring and resistance. Check Electronic Expansion Valve (EEV) operation. Check sealed system for refrigerant leak.
Fd	10	Control checks to ensure evaporator superheat* is OK (controlled by EEV). Continuously verifies the temperature difference between T3a sensor (evap inlet temp) and T3b sensor (evap outlet temp) is greater than 5F after 30 mins of run time. Control also verifies that T3a is greater than 10F less than T5 ambient sensor.	Check that filter is clean. Check T3a, T3b and T5 sensor mounting, wiring and resistance. Check Electronic Expansion Valve (EEV) operation. Check sealed system for refrigerant leak.
FE	10	Control checks to ensure the compressor discharge temperature never exceeds 240F. Continuously verifies that T4 sensor (compressor outlet temperature) is less than 240F every minute of run time.	Check T4 sensor mounting, wiring and resistance. Check Electronic Expansion Valve (EEV) operation. Check sealed system for refrigerant leak.
FF	10	Control checks to ensure the EEV is operating properly and valve rotation is within range.	Check Electronic Expansion Valve (EEV) operation. Check T3a and T3b sensors mounting, wiring and resistance. Check sealed system for refrigerant leak.
FG	10	Control checks to ensure Ambient temperature is within an acceptable range before starting heat pump. Heat pump operating range is 35°F < (T5 ambient) < 120°F. If ambient temperature (as viewed by T5 sensor) is outside of this range, the unit will switch to Electric/Standard Mode for that heating cycle only. NO fault code is shown on the display.	No failure is assumed, but this information is provided for completeness.
FI*	10	Control checks to ensure evaporator superheat is <20°F AND the EEV position is <450 after 30 minutes of run time. If outside these limits, this provides an early indication of a refrigerant leak. (Note: Target superheat is generally 10°F, and EEV generally operates at a position much lower than 450.)	Check sealed system for refrigerant leak. Check T3a, T3b, T5 sensor mounting, wiring and resistance. Check Electronic Expansion Valve (EEV) operation.
FJ	10	Control checks to ensure that the AC current draw is <= 20.5A while the compressor and lower heating element are both enabled. If current draw is >20.5A, the compressor will be disabled.	Check lower heating element rated wattage. Element wattage is stamped on the heating element terminal block. Correct wattage can be found on the water heater's rating plate.
FL	10	Control checks to ensure that T3a and T3b evaporator inlet and outlet temperatures are within 2.5°F of the T5 ambient temperature 20 minutes after defrost begins.	Check T3a, T3b, T5 sensor mounting, wiring and resistance. Check Electronic Expansion Valve (EEV) operation.
F2	1	T2 tank temperature sensor failure. Just before compressor starts, control checks T2 sensor is within 30F - 170F temperature range.	Check T2 sensor mounting, wiring and resistance. Use service mode to monitor T2 sensor temperature. Control assembly may have failed.
F3	10	Compressor failure. Control energizes compressor, but current sensor detects no current flow.	Check compressor run capacitor. Check compressor, overloads, relay and wiring. Use service mode to manually cycle compressor on/off.
F4	10	Fan Failure	Check fan and wiring.
F5	10	T3a sensor (evap inlet temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.	Check T3a sensor mounting, wiring and resistance. Use service mode to monitor T3a sensor temperature. Control assembly may have failed.
F6	10	T3b sensor (evap outlet temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.	Check T3b sensor mounting, wiring and resistance. Use service mode to monitor T3b sensor temperature. Control assembly may have failed.
F7	10	T4 sensor (compressor outlet) failure. The control detects the thermistor output is at or nearly shorted or open circuit.	Check T4 sensor mounting, wiring and resistance. Use service mode to monitor T4 sensor temperature. Control assembly may have failed.
F8	10	T5 sensor (ambient temperature) failure. The control detects the thermistor output is at or nearly shorted or open circuit.	Check T5 sensor mounting, wiring and resistance. Use service mode to monitor T5 sensor temperature. Control assembly may have failed.
F9	10	Lower heating element failure. Control energizes lower element, but current sensor detects no current flow.	Check lower heating element and wiring. Use service mode to cycle element and check current draw. Control assembly may have failed.
F10	10	Upper heating element failure. Control energizes Upper element, but current sensor detects no current flow.	Check Upper heating element and wiring. Use service mode to cycle element and check current draw. Control assembly may have failed.
F11	1	Dry Tank fault. This test is run within the first 22 minutes after the unit has powered on. (The compressor is engaged for 20 minutes after a 2 minute wait for the system to allow the high and low side pressures to equalize.) The tank temperature, T2, is read and verified it has not risen more than 5 deg F. If it has, this indicates there is not enough water in the tank for water heater operation. After 1 failed Dry Tank test, "F11" is displayed. After 5 failed tests, an audible alarm will sound.	Check to ensure the tank is full of water. Check T2 sensor mounting, wiring and resistance. Use service mode to monitor T2 sensor temperature. Control assembly may have failed.
bAd linE (F12)	1	The voltage is too low at power-up. The control monitors the input line voltage 1 minute after power-up, and if the voltage is below 155V, the fault code will be displayed.	Check electrical supply line connections. Voltage should measure either 208 VAC or 240 VAC, depending upon power supply. Badline counts stored in "F12" and can be monitored via the Control when placed in diagnostics mode.
F13	1	Stuck Key fault. This indicates there is a button on the front panel that is stuck down. This button is inoperable. Other buttons work normally. If the button becomes free, the fault code will clear by itself.	Check to see if all buttons are operable. Control assembly has failed
DirtyFilter (F14)	5	Filter LED is on, and audible alarm is sounding. Filter is too dirty to enable proper function of unit. Number of "Dirty Filter" counts are stored in the "F14" code and can be monitored via the Control when it is placed in Diagnostics Mode. The evaporator is operating at a colder temperature than the ambient temperature as measured by T5.	Check to ensure Filter is clean. Filter cleaning instructions are found in the owner's manual. Repeated dirty filter alarms that do not resolve by cleaning the filter may be an indication of a fan failure.
F15	10	DataFlash fault. The microcontroller has detected a problem in the DataFlash (permanent memory storage).	Control assembly may have failed.
F16*	1	Anode Depleted. Anode LED is on, and the audible alarm is sounding. The control has calculated that the anode rod has been mostly consumed, or the time in operation has exceeded the replacement timeline threshold.	Replace anode rod with GE approved Anode Depletion anode rod.
F17*	1	Anode Depletion miswire condition or shorted to ground. The control has detected that the anode circuit has a corrosion current signal <= 0.25mA.	Check to ensure the tank is full of water. Check anode and (tank) anode wire connections on the board and at the anode rod. Check if either of the T2 wire connections is shorted to earth ground. Check if anode is shorted to tank.
F18	10	Current transformer miswired. F3, F9, and F10 fault codes have all occurred during the same heating cycle.	Check that red L2 wire is through the CT201 current transformer on the board. If it is, board needs to be replaced
F19	10	Low Line Voltage.	Check incoming line voltage.
F20	10	Condensate drain pan port blocked. Water heater will only operate in standard/electric mode until the drain port is cleared and the sensor is no longer in contact with water.	Check main drain on condensate drain pan. Unblock if necessary. Check that the sensor is in the correct position in the drain pan, on the screw post near the main drain port.
F21	1	Application Update Failure. A problem occurred while updating the control application.	Cycle power and try to complete the update again. If problems persist, replace the control board.
F22	1	Parametric Data Update Failure. A problem occurred while updating parametric data.	Cycle power and try to complete the update again. If problems persist, replace the control board.
F23	10	Micro A/D Failure. The control has detected a microcontroller input port has failed.	The control needs to be replaced.

\* on some models