

# INSTALLATION INSTRUCTIONS

## Twinning Kit NAHA003WK.01

For Use With Furnace Models Using  
Honeywell ST9120 and ST 9160 Electronic Fan Controls

Please read these instructions completely before attempting installation.

### **⚠ WARNING**

**Electrical shock hazard/Fire and/or explosion hazard.**

**Turn off electric power supply at disconnect switch or service panel before starting installation.**

**Turn off gas supply at field installed manual gas valve before starting installation.**

**Failure to follow this warning can result in property damage, personal injury and/or death.**

### **⚠ WARNING**

**Installation or repairs made by unqualified persons can result in hazards to you and others. Installation MUST conform with local building codes or, in the absence of local codes, with the National Fuel Gas Code NFPA 54/ANSI A223.1, 1990 or latest edition. In Canada, National Standard CAN/CGA B149-1.**

**The information contained in this manual is intended for use by a qualified service technician familiar with proper safety procedures and equipped with the proper tools and test instruments.**

**Failure to carefully read and follow all instructions in this manual can result in furnace malfunction, property damage, personal injury and/or death.**

This twinning kit is intended to permit two identical gas furnaces to be installed connected to the same duct work. Air conditioning can be added by using one air conditioning evaporator coil sized for the total air flow capabilities of the two furnaces.

### Single and Two Stage Heating

Single or two stage heating is obtainable using twinning kit NAHA003WK01. Follow the instructions located in the Twinning Kit Installation section for proper hookup of desired thermostat staging.

### Furnace Installation

Refer to the Installation Instructions packed with the furnaces for information about clearances, start-up and maintenance, gas piping and vent installation.

#### CAUTION

**Furnaces installed MUST be identical. They may be installed on a raised platform or wood floor which MUST be level. When side return is required, separate return air drops MUST be made to both furnaces. Do not use rear of furnace for the return air duct connection.**

#### CAUTION

**Make sure blower motors are wired to operate on the same speed tap.**

#### CAUTION

**Two furnaces must be plumbed with a single supply gas shut off valve.**

**NOTE:** When twinning kit has been installed, locate the adhesive backed wiring diagram included in the kit and apply next to the existing wiring diagrams in the furnaces.

### TWINNING KIT INSTALLATION

The twinning kit contains (2) 36" wires of two different colors to interconnect the electronic fan controls of the two furnaces. **For proper operation, and to avoid damage to the controls, be sure to match Z1 to Z1 and Z2 to Z2 or C to C and H to H on each fan control (see Figure 1 and Figure 2).** The wires are color coded to assist with this connection. Each wire is factory terminated with a special crimped edge connector which will push into mating connection positions on the edge of the circuit board on each fan control. The length of these wires can be extended by cutting and splicing sufficient additional wire to each lead.

An isolation relay is provided to protect the system's thermostat from possible overloading due to the combined valve and control load of the two appliances.

## Installation Procedures

1. Remove line power from both appliances before starting installation of the twinning kit.
2. Locate the Z1 and Z2 or C to C and H to H connections along one edge of each control (see **Figure 1** and **Figure 2**). The designations are printed on top of the circuit board, and a black bar shows the correct orientation of the metal body which will be pushed in to make connection.
3. Remove furnace casing hole plugs and route the twinning leads through bushings provided as required, and lengthen if necessary by splicing. Be sure to observe the polarity required so as to match Z1 to Z1 and Z2 to Z2 or C to C and H to H (see **Figure 3**).
4. Push the terminal into the slot on the circuit board edge. Be sure to align the body with the black bar to line up the solder finger below the circuit board (see **Figure 1**). The terminal will "bite into" the solder and make the necessary connection. Repeat for each end of both wires.
5. Locate and mount the isolation relay in the circulating blower compartment on the same panel as the electronic fan control in furnace #1 (see **Figure 1** and **Figure 2**).
6. Refer to single stage or two stage thermostat wiring as noted below.

### Single Stage Thermostat Operation Reference Figure 6 and Figure 7

1. Interconnect the thermostat wiring in parallel from the thermostat to the terminal blocks on each fan control, for the "G" and "Y" connections only. Interconnect the wiring from the "C" connections at the terminal blocks on each fan control. Note: The "Y" connection is not required if air conditioning is not available.
2. Connect wire from "W" connection at the thermostat to the "W" connection of the electronic fan control of furnace #1.
3. Connect wire from "R" connection at the thermostat to the "R" connection of the electronic fan control of furnace #1.
4. Connect wire from the "W" connection of the electronic fan control of furnace #1 to one side of the 24Vac coil of the isolation relay (terminal #3). (Wire terminals for connection to the isolation relay are provided in the kit)
5. Connect wire from the "C" connection of the electronic fan control of furnace #1 to the other side of the 24Vac coil of the isolation relay (terminal #1).
6. Connect one wire to each of the normally open terminals of the isolation relay (terminals #2 and #4) and connect to the "R" and "W" connections at the electronic fan control of furnace #2.
7. Set the heat delay off timings on each control to the same setting.
8. Set thermostat anticipator setting at 0.90.
9. Recheck wiring connections, splices, and insulation. Re-apply line power to both appliances.

### Two Stage Thermostat Operation Reference Figure 6 and Figure 7

1. Interconnect the thermostat wiring in parallel from the thermostat to the terminal blocks on each fan control, for the

"G" and "Y" connections only. Interconnect the wiring from the "C" connections at the terminal blocks on each fan control. Note: The "Y" connection is not required if air conditioning is not available.

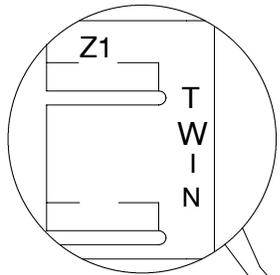
2. Connect wire from "W1" of the thermostat to the "W" connection of the electronic fan control of furnace #1.
3. Connect wire from "W2" of the thermostat to one side of the 24Vac coil of the isolation relay (terminal #3). (Wire terminals for connection to the isolation relay are provided in the kit)
4. Connect wire from "R" connection at the thermostat to the "R" connection of the electronic fan control of furnace #1.
5. Connect wire from the "C" connection of the electronic fan control of furnace #1 to the other side of the 24Vac coil of the isolation relay (terminal #1).
6. Connect one wire to each of the normally open terminals of the isolation relay (terminal #2 and #4) and connect to the "R" and "W" connections at the electronic fan control of furnace #2.
7. Set the heat delay off timings on each control to the same setting.
8. Set thermostat anticipator setting at 0.75 for the 1st stage and 0.15 for the 2nd stage.
9. Recheck wiring connections, splices, and insulation. Re-apply line power to both appliances.

### Twinning Kit Operation

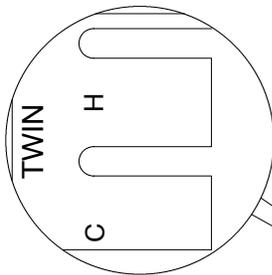
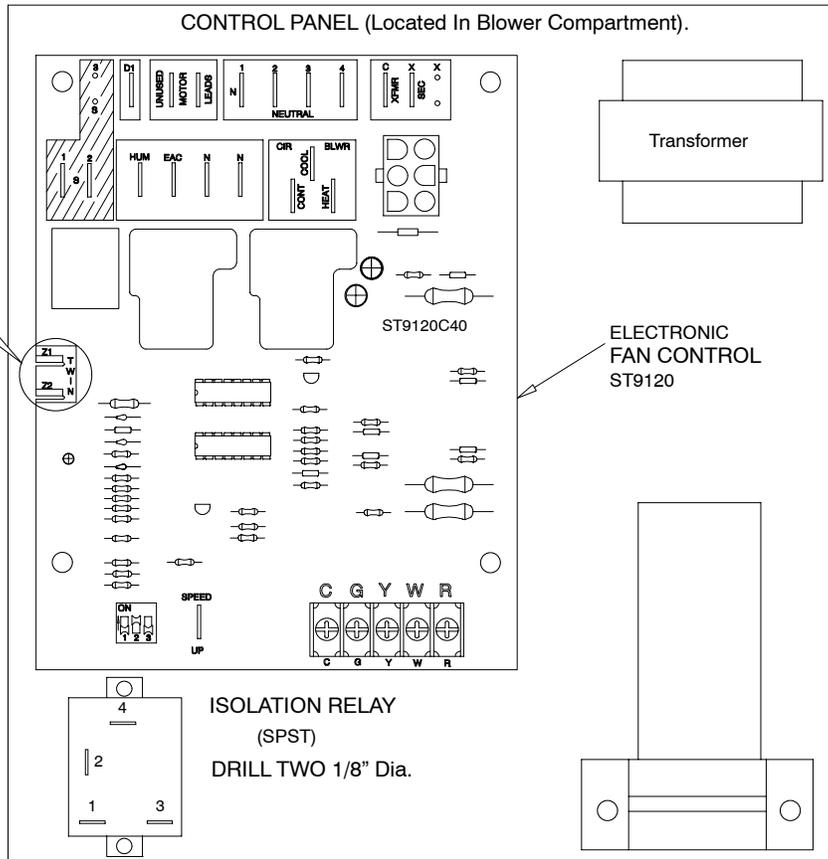
1. Turn the heat/cool switching at the thermostat to "OFF", or set so neither a call for heating nor cooling is being made.
2. Turn the fan switch to "ON" from "AUTO", or jumper from "R" to "G" at "furnace 1". Within several seconds, the circulation blowers of each furnace will start at the same speed connected to their respective "heat" speed taps.
3. Turn the fan switch to "OFF" from "AUTO" or remove the jumper from "R" to "G". Both circulation blowers will stop after several seconds.
4. Disconnect one wire from the high limit connection on "furnace 1". Within several seconds, the circulation blowers of each furnace will start at the same speed connected to their respective "heat" speed taps.
5. Re-connect the wire removed from the high limit connection on "furnace 1". After the completion of the heating "blower off" delay, both blowers will stop.
6. Repeat steps (4) and (5) with the limit connection in "furnace 2" versus "furnace 1". The same operation should result.
7. Operate the system through a normal call for heat, burner on operation, and burner off operation. Each furnace should fire and cycle both blowers, including blower on and off delays, as in a normal single system.
8. Operate the system through a normal call for cooling. The compressor operation should function normally, with each furnace circulation blower operating at the speeds connected to their respective "cool" speed taps after cooling "blower on" delay. When the call for cooling ends, the circulation blowers will stop upon the completion of the "cooling off" delay.

Figure 1

Connection of Twinning Leads and Locating Isolation Relay On Furnace #1 Control Panel



Twinning Leads



Twinning Leads

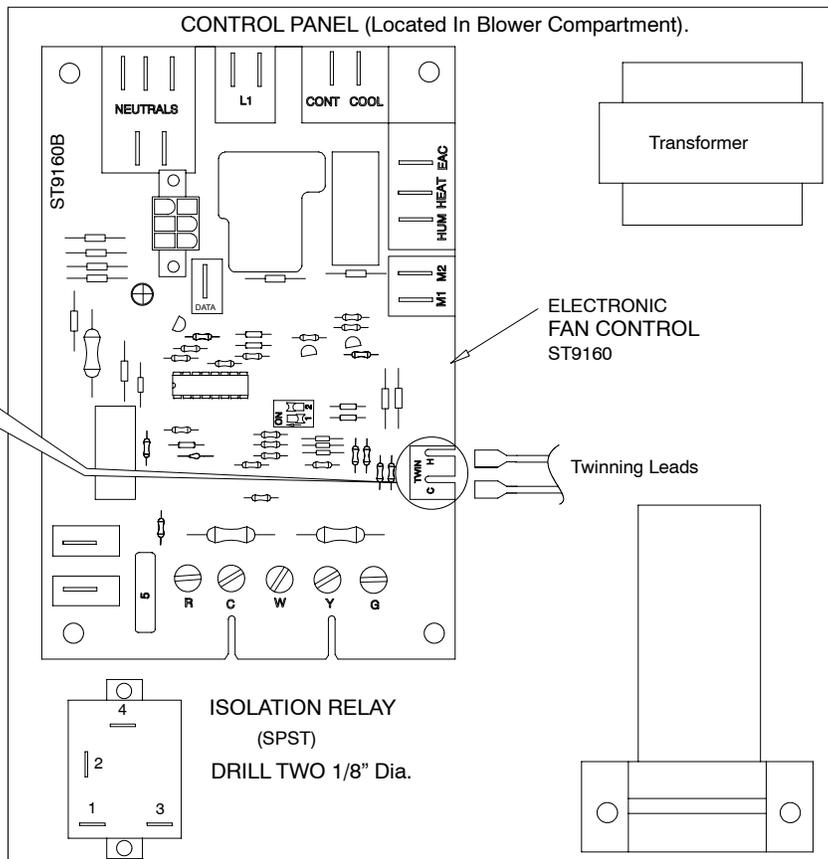
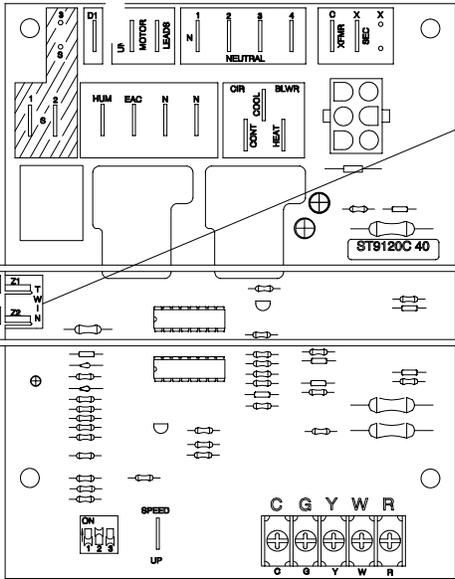


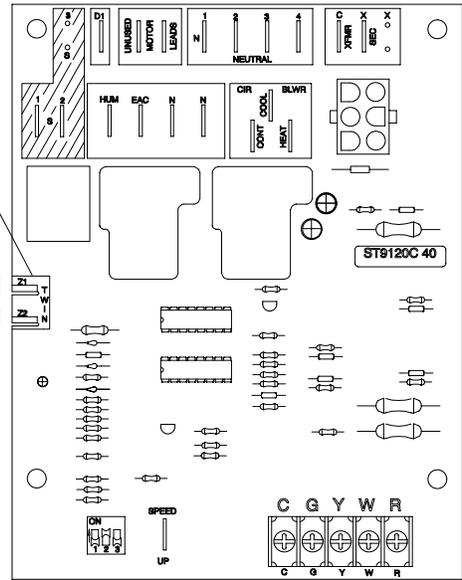
Figure 2

CONTROLS FOR ST 9210 & ST9160

ELECTRONIC FAN CONTROL  
(ST9120)

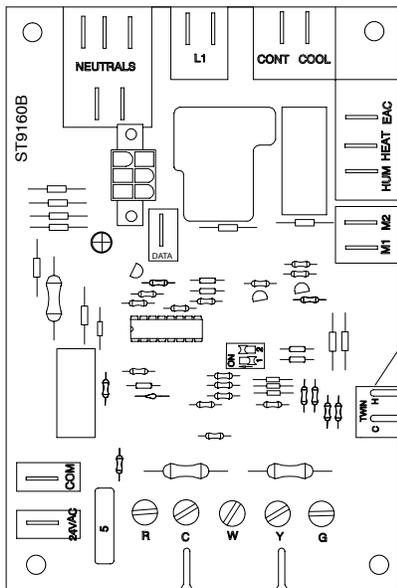


ELECTRONIC FAN CONTROL  
(ST9120)

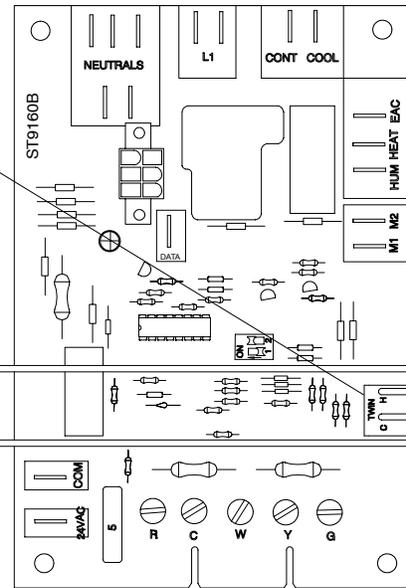


Twinning Leads  
Connect Z1 To Z1  
And Z2 To Z2.

ELECTRONIC FAN CONTROL  
(ST9160)



ELECTRONIC FAN CONTROL  
(ST9160)

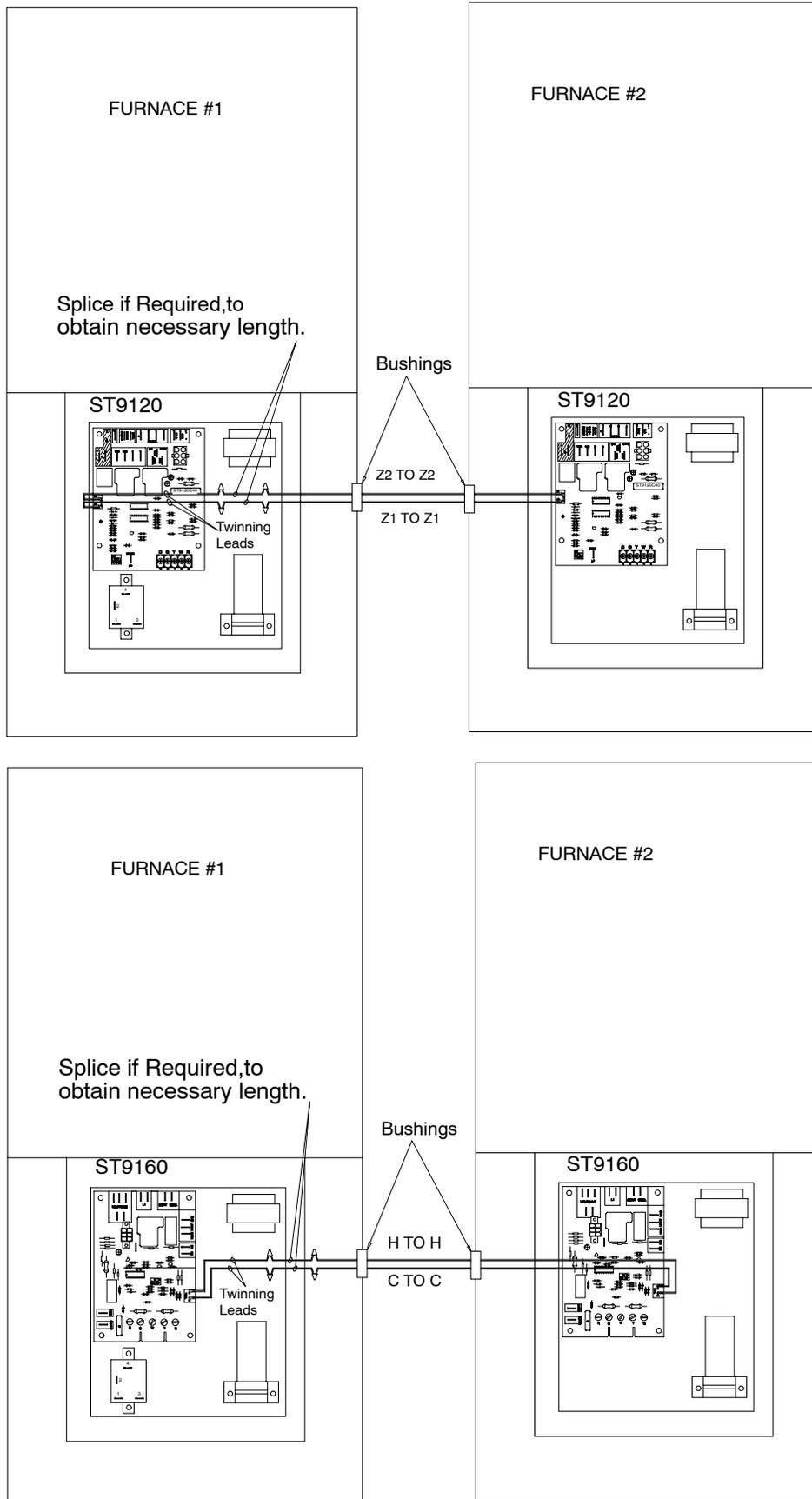


Twinning Leads  
Connect H To H  
And C To C.

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Figure 3

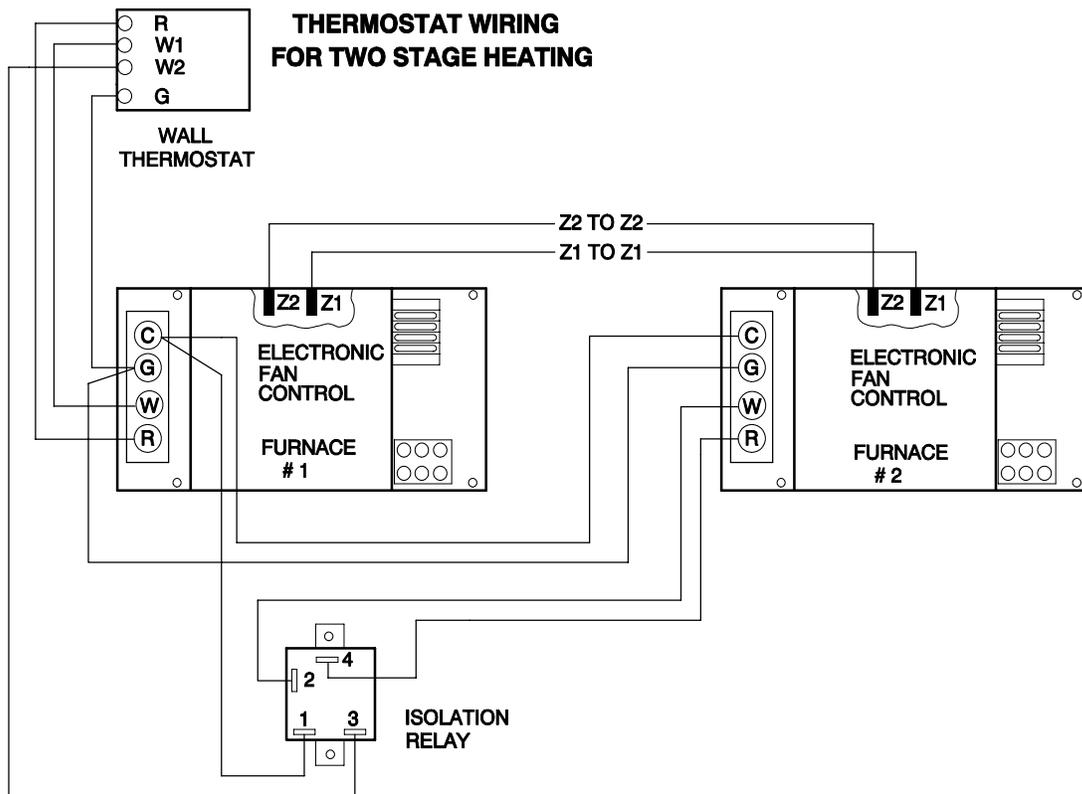
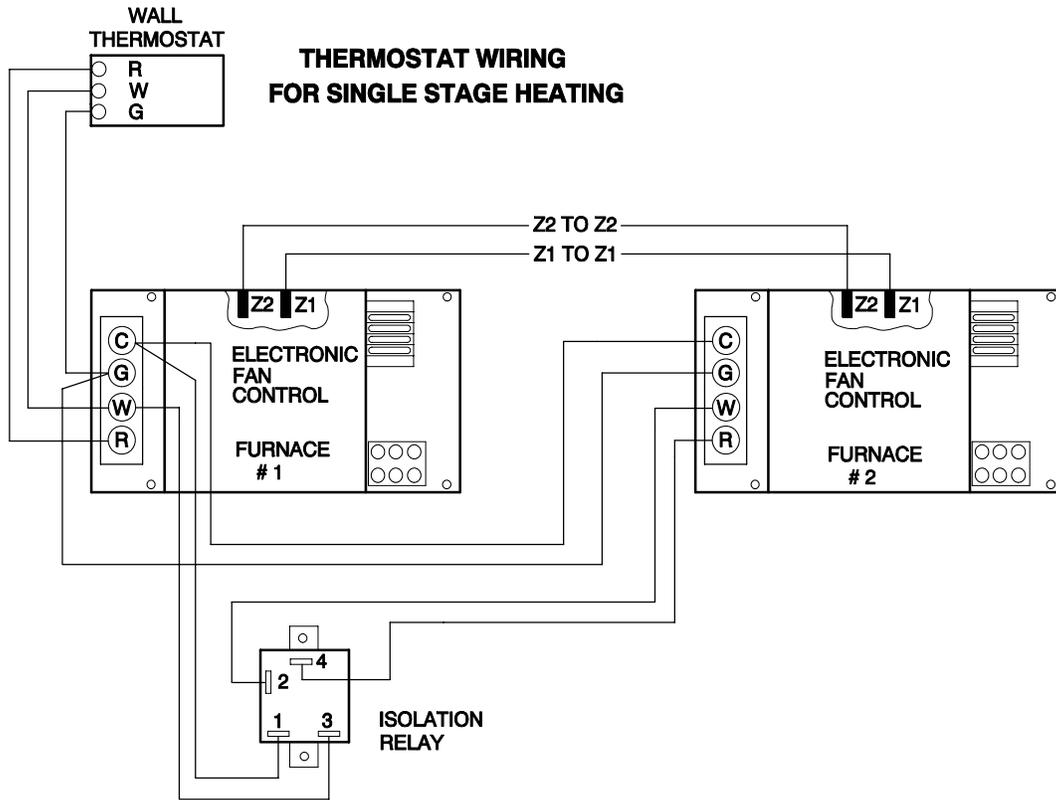
Proper Connection of Twinning Leads for ST 9120 & ST 9160



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Figure 4

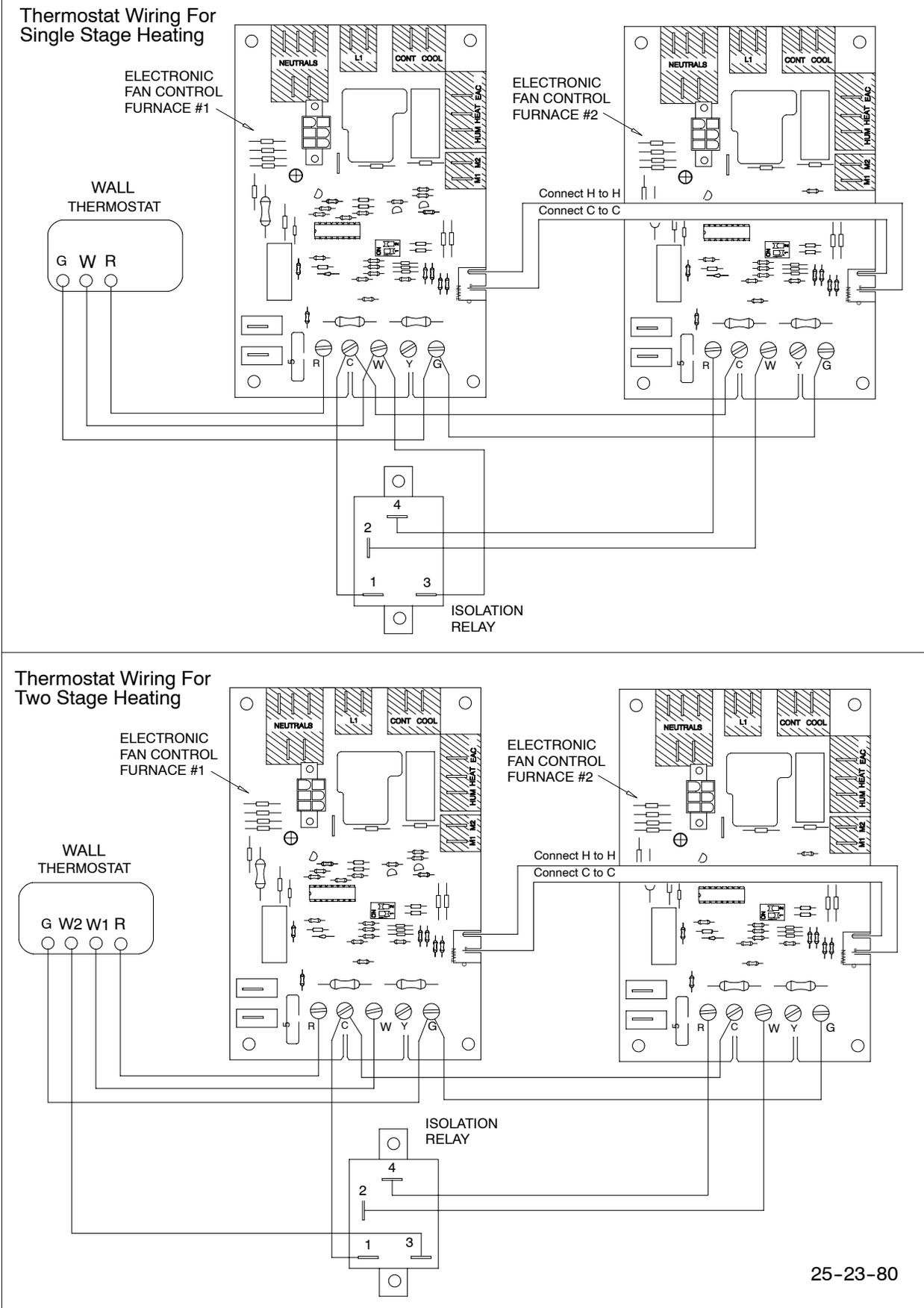
Proper Connection of Twinning Leads for ST 9120



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Figure 5

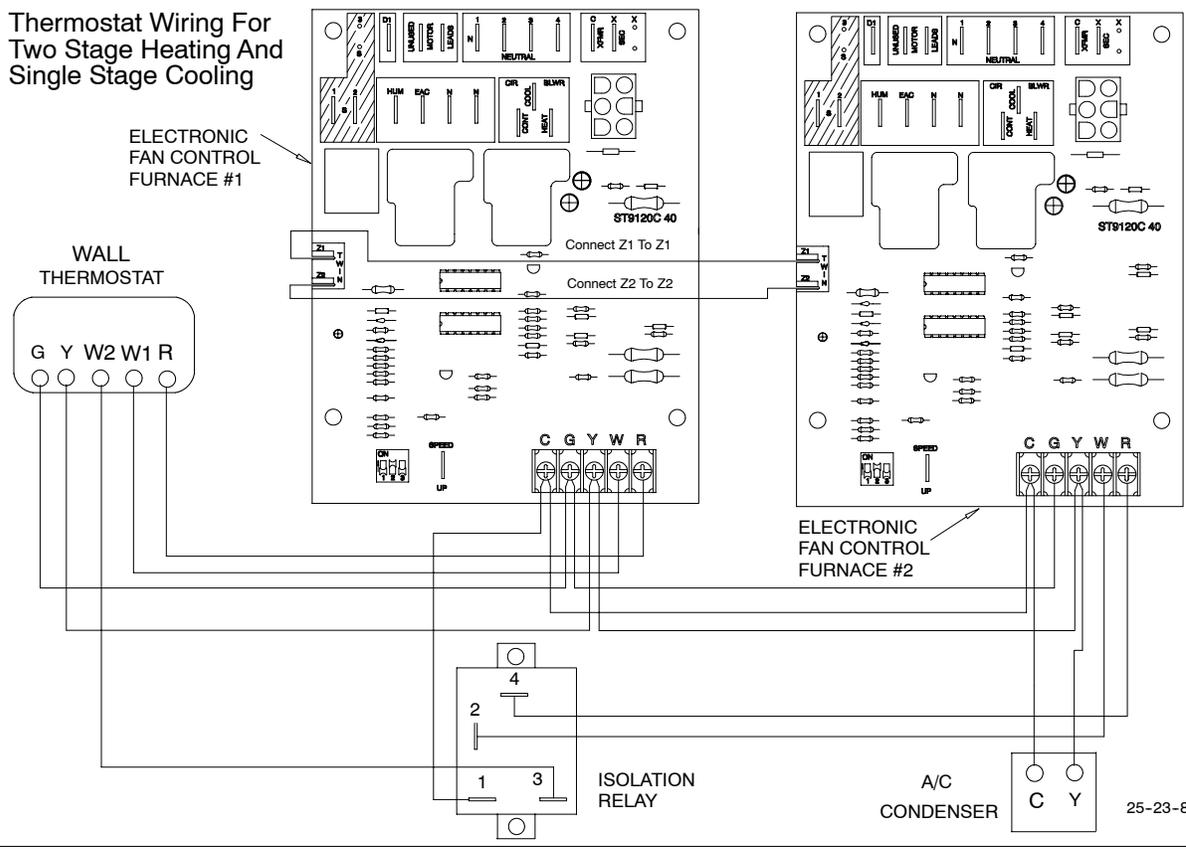
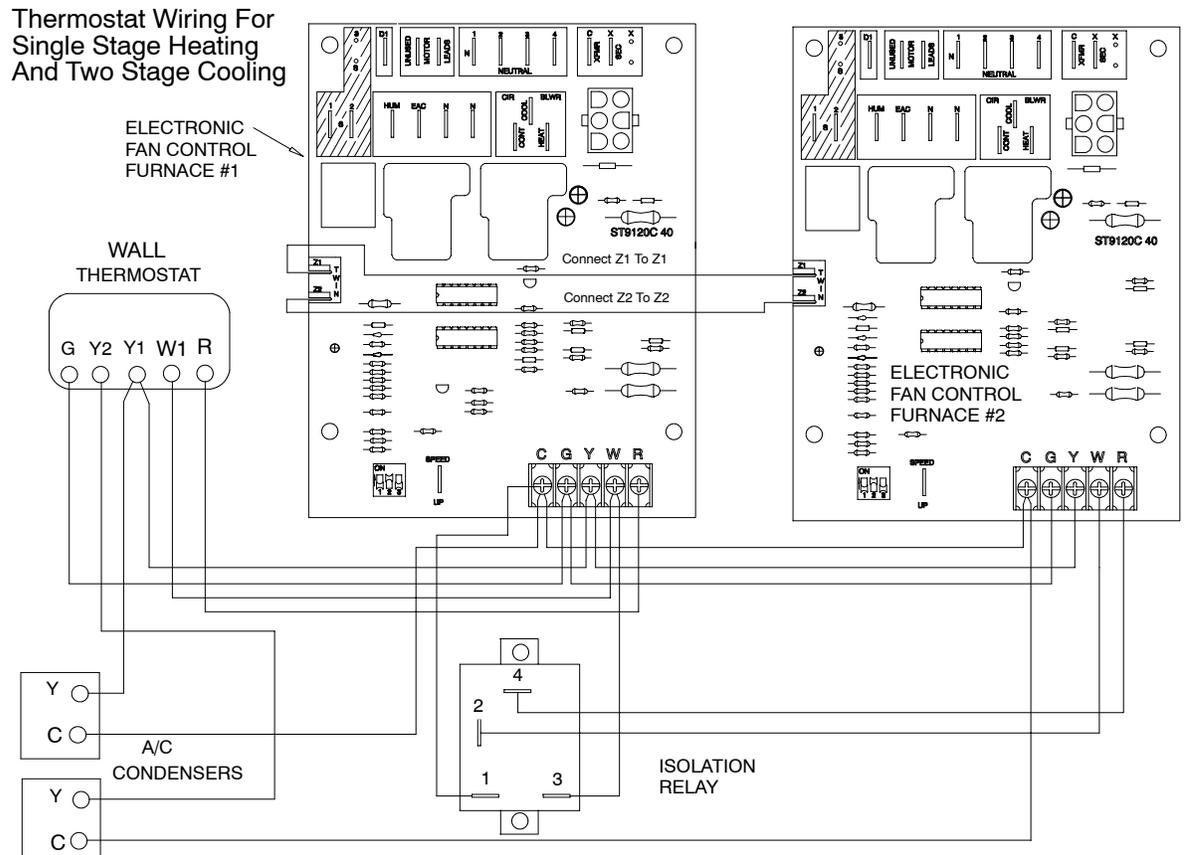
Proper Connection of Twinning Leads for ST 9160



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Figure 6

ST 9120

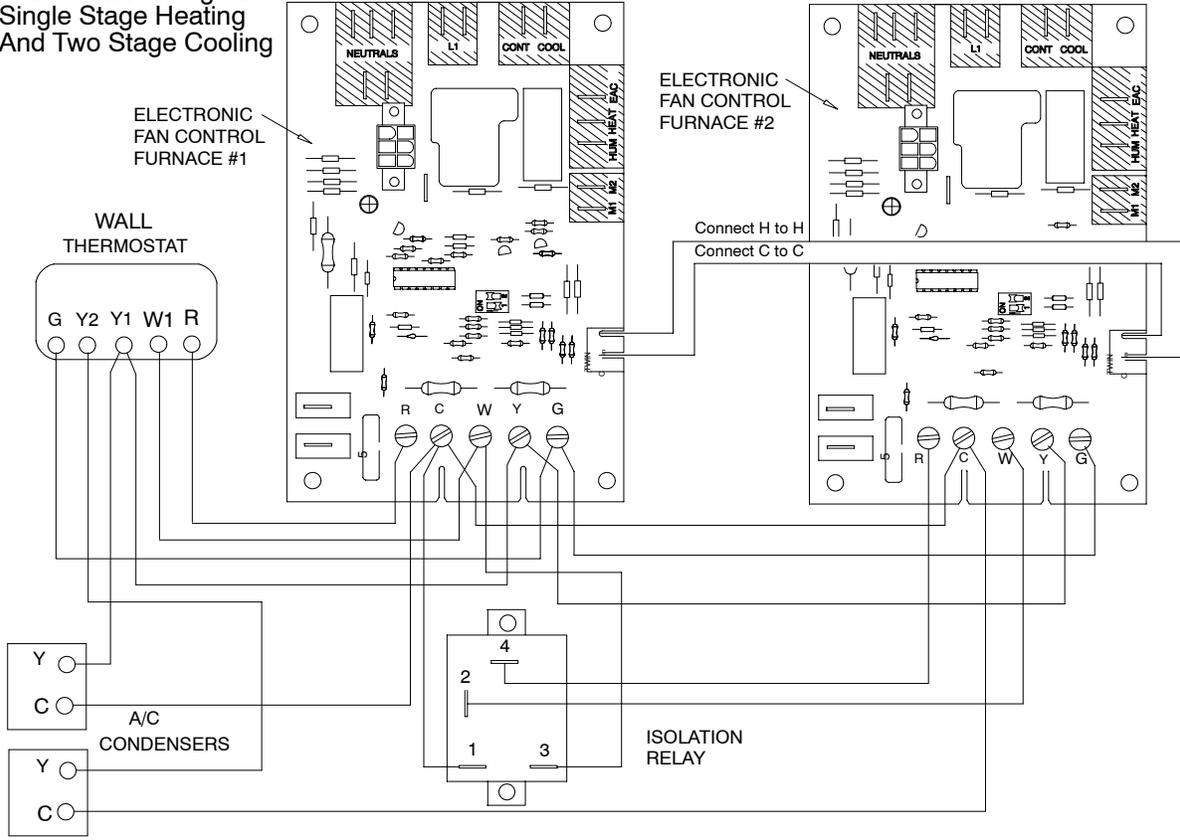


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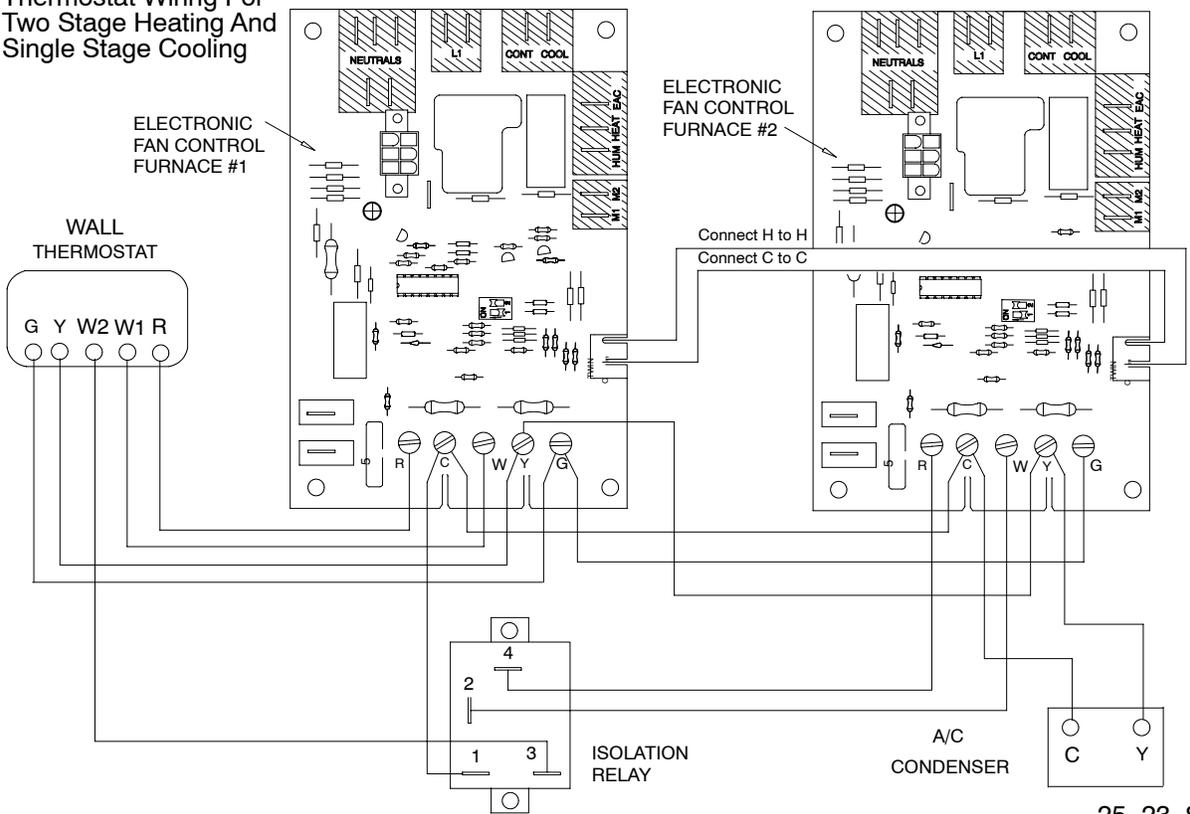
Figure 7

ST 9160

Thermostat Wiring For Single Stage Heating And Two Stage Cooling



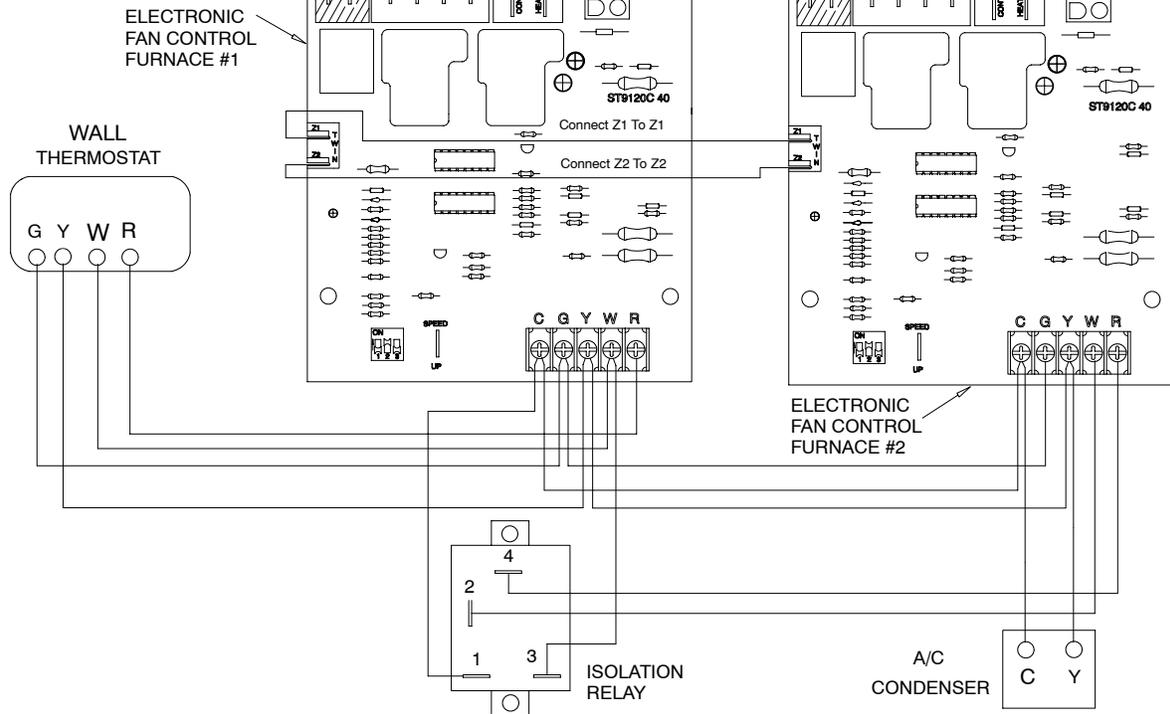
Thermostat Wiring For Two Stage Heating And Single Stage Cooling



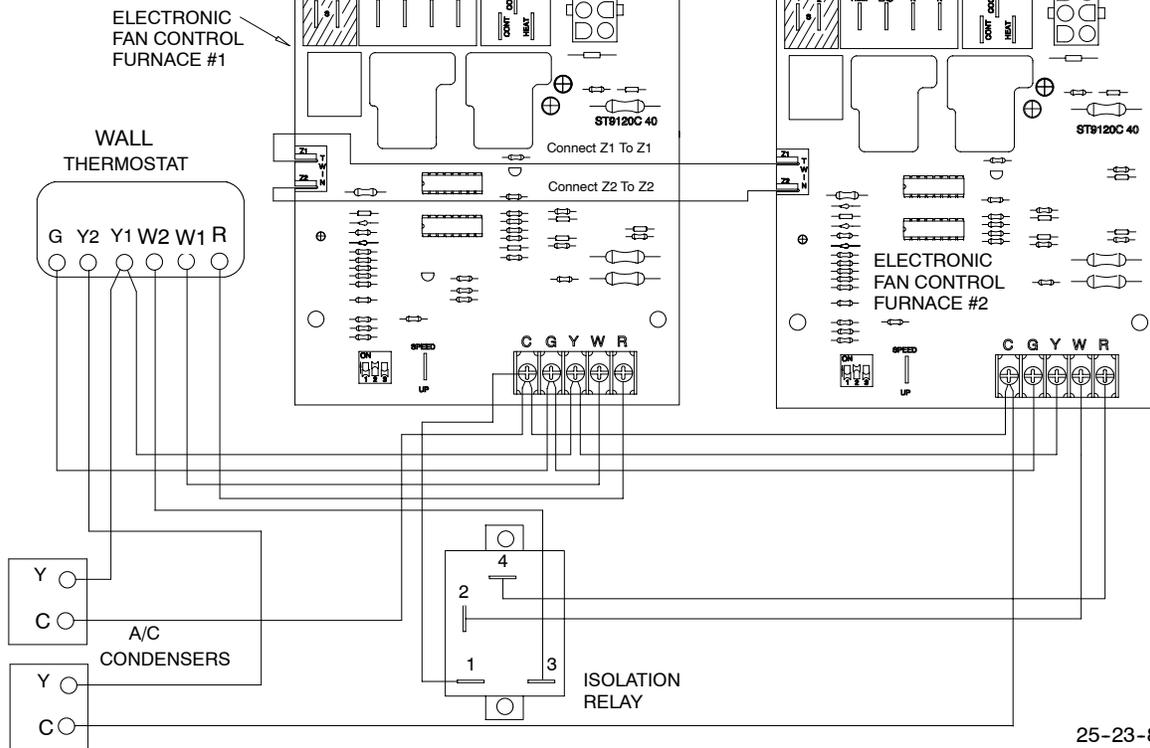
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**Figure 8**

**Thermostat Wiring For Single Stage Heating And Cooling.**



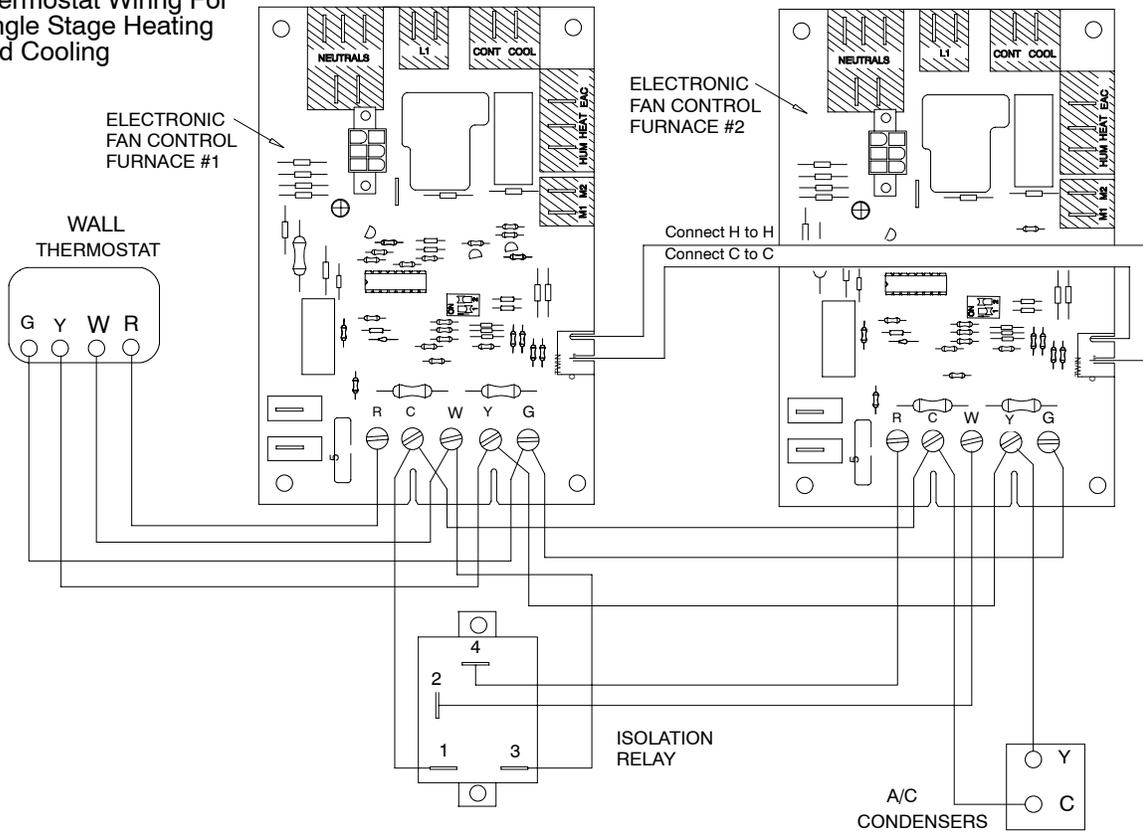
**Thermostat Wiring For Two Stage Heating & Cooling**



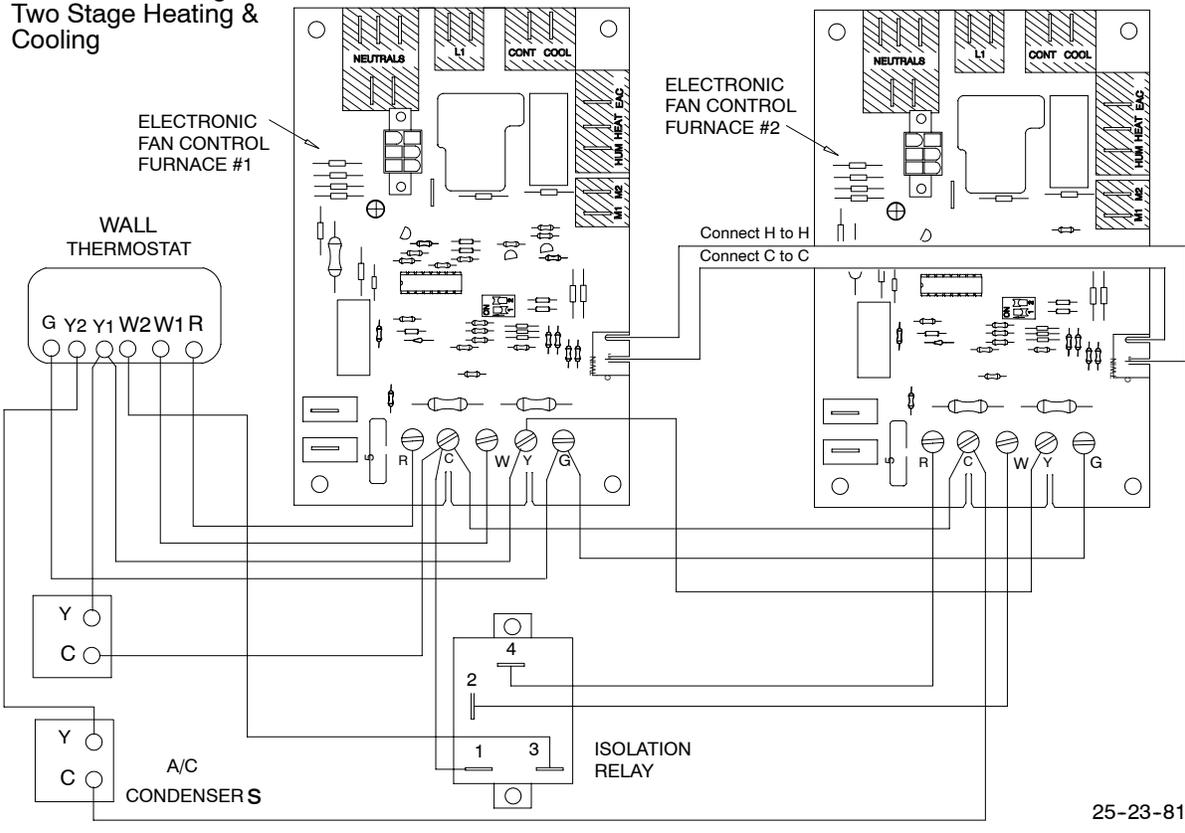
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**Figure 9**

**Thermostat Wiring For Single Stage Heating And Cooling**



**Thermostat Wiring For Two Stage Heating & Cooling**



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