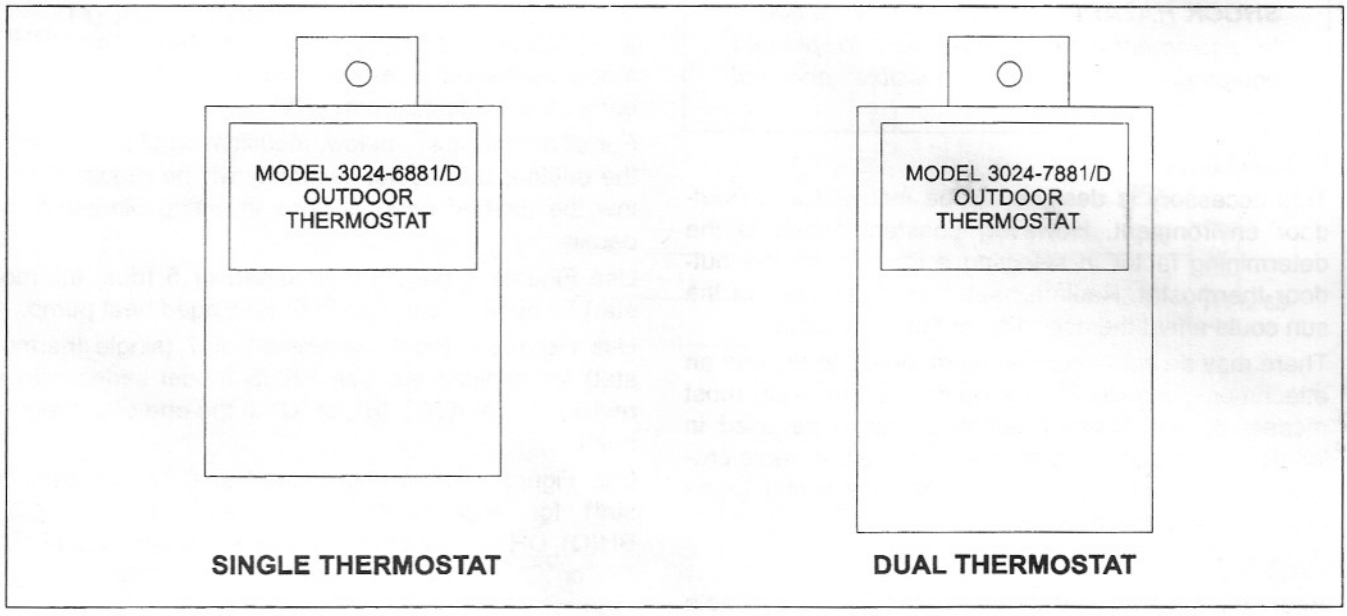
# ACCESSORY KIT INSTALLATION INSTRUCTIONS

## OUTDOOR THERMOSTAT




**SINGLE THERMOSTAT** **DUAL THERMOSTAT**

**IMPORTANT -** These instructions are intended for the use of qualified individuals specially trained and experienced in installation of this type of equipment and related system components..

**⚠WARNING**

*Improper installation may damage equipment, can create a shock hazard, and will void the warranty.*

**NOTE:** The words Shall" or Must" indicate a requirement which is essential to satisfactory and safe product performance.

The words Should" or May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

Installation and service personnel are required by some states to be licensed.

Persons not qualified shall not install this equipment or interpret these instructions.

## APPLICATION

These outdoor thermostat accessories may be used with heat pump series BRH(S,Q), DRH(S,Q), FRHS, BH(Q), DH(Q), FH, PHP. The single thermostat is used with systems having 5 - 10 KW electric heat. The dual thermostat is used with systems having 15KW or more electric heat. The function of the outdoor thermostat accessory is to prevent the use of unneeded auxiliary electric heat when the heat pump capacity is sufficient to meet the home heating requirement, thus saving energy and utility costs. Note that the auxiliary electric heat operates in response to the second stage of the wall thermostat, and that the outdoor thermostat(s) is wired in series with the second stage. When adjusted to the correct setting(s), the outdoor thermostat(s) prevents the operation of the auxiliary electric heat at temperatures above the setting(s). Through the contacts of the emergency heat relay, located in the outdoor thermostat accessory, the outdoor thermostat(s) are bypassed, placing the control of the electric heat solely in response of the wall thermostat's second stage.

**The emergency heat relay is energized by one of the following occurrences:**

- The system switch of the wall thermostat is placed in the "emergency heat" position.
- The system's compressor is locked out due to a high temperature" or a high pressure" limit tripping action.

The setting(s) of the outdoor thermostat(s) is described in a later section of these instructions.

# INSTALLATION

**⚠WARNING**

***SHOCK HAZARD -*** *Disconnect electric power to equipment before installation to prevent equipment damage and possible personal injury.*

## LOCATION

This accessory is designed to be installed in an outdoor environment. However, constant shade is the determining factor in selecting a location for the outdoor thermostat. Radiant heat from direct rays of the sun could affect the operation of the thermostat.

There may be some heat pump models that provide an attachment location for the outdoor thermostat, most models do not. Careful selection should be used in locating the outdoor thermostat. The electric cable provided is long enough to allow the thermostat to be mounted on a nearby structure.

## WIRING

Route the electrical cable through the low voltage hole provided in the outdoor heat pump.

Connect the cable wiring per the wiring diagram that pertains to the application as listed below.

Use Figures 1 (single thermostat) or 2 (dual thermostat) for applications with BRHS, DRHS, FRHS, BH(Q), DH (Q), or BH(Q) model series with a revision code of "D" or higher at the end of the model number.

Use Figure 3 for applications with BRHQ and DRHQ model series with a revision code of "D" or higher at the end of the model number.

For all models listed below, modification of the wiring in the outdoor thermostat assembly will be required. Follow the dashed optional lines in wiring diagrams for details.

Use Figures 4 (single thermostat) or 5 (dual thermostat) for applications with PHP packaged heat pump.

Use Figures 6 (dual thermostat) or 7 (single thermostat) for applications with FRHS model series with a revision code of "A", "B", or "C" at the end of the model number.

Use Figures 8 (dual thermostat) or 9 (single thermostat) for applications with BRH(S,Q), DRH(S,Q), BH(Q), DH(Q) model series with a revision code of "A", "B", or "C" at the end of the model number.

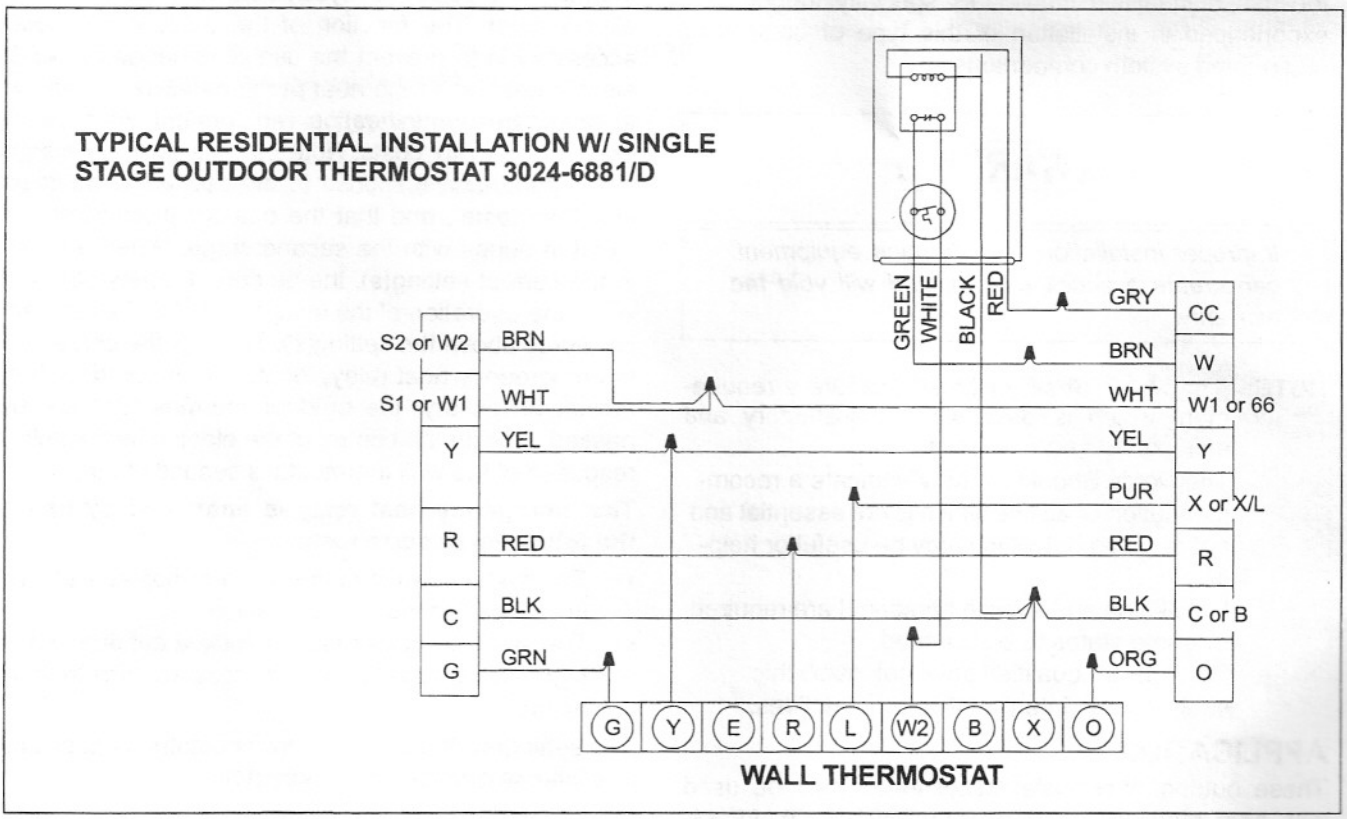



**FIGURE 1 -** WIRING CONNECTIONS FOR BRHS, DRHS, FRHS, BH(Q), DH(Q), OR FH WITH REVISION CODE OF "D" OR HIGHER

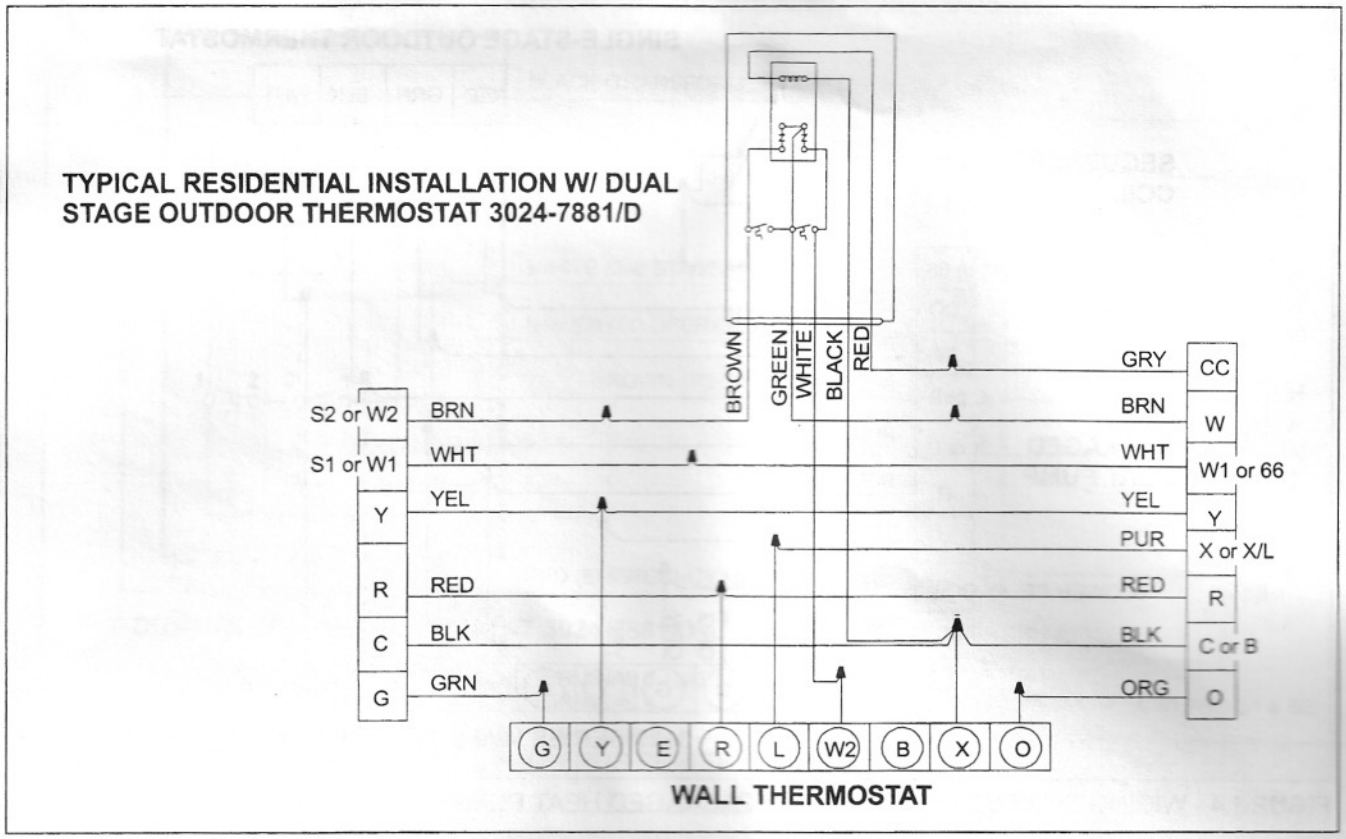



**FIGURE 2 -** WIRING CONNECTIONS FOR BRHS, DRHS, FRHS, BH(Q), DH(Q), OR FH WITH REVISION CODE OF "D" OR HIGHER

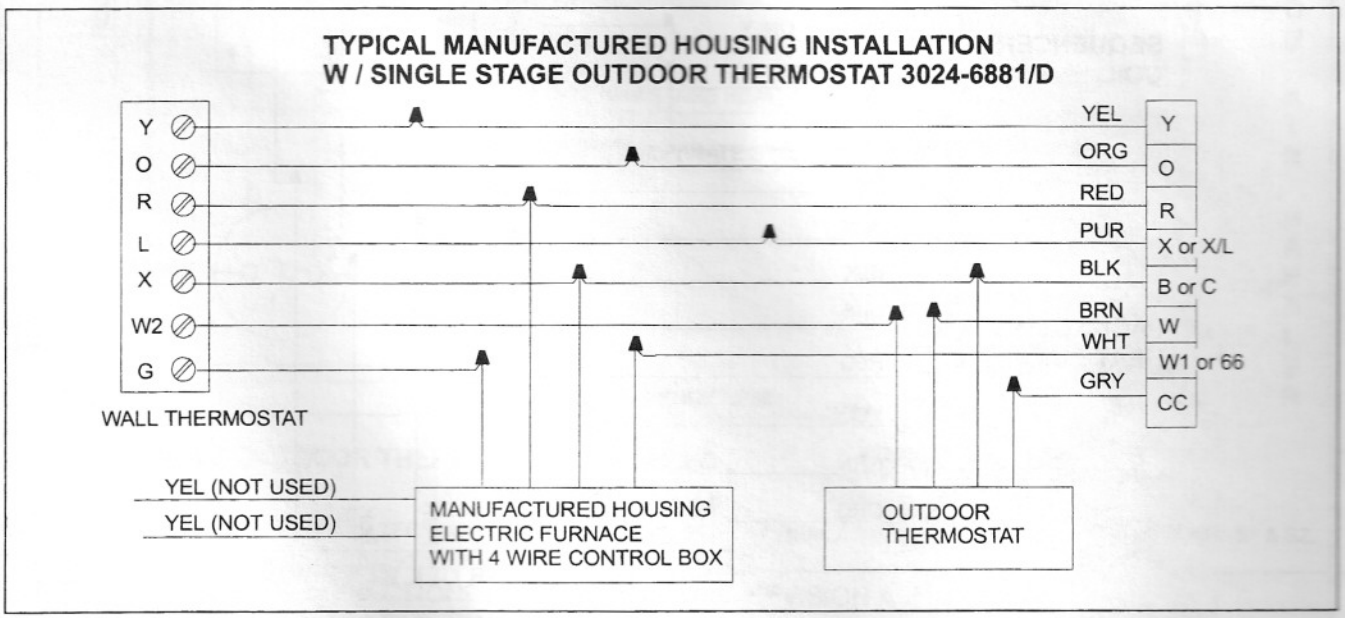



**FIGURE 3 -** WIRING CONNECTIONS FOR BRHQ, DRHQ WITH REVISION CODE OF "D" OR HIGHER

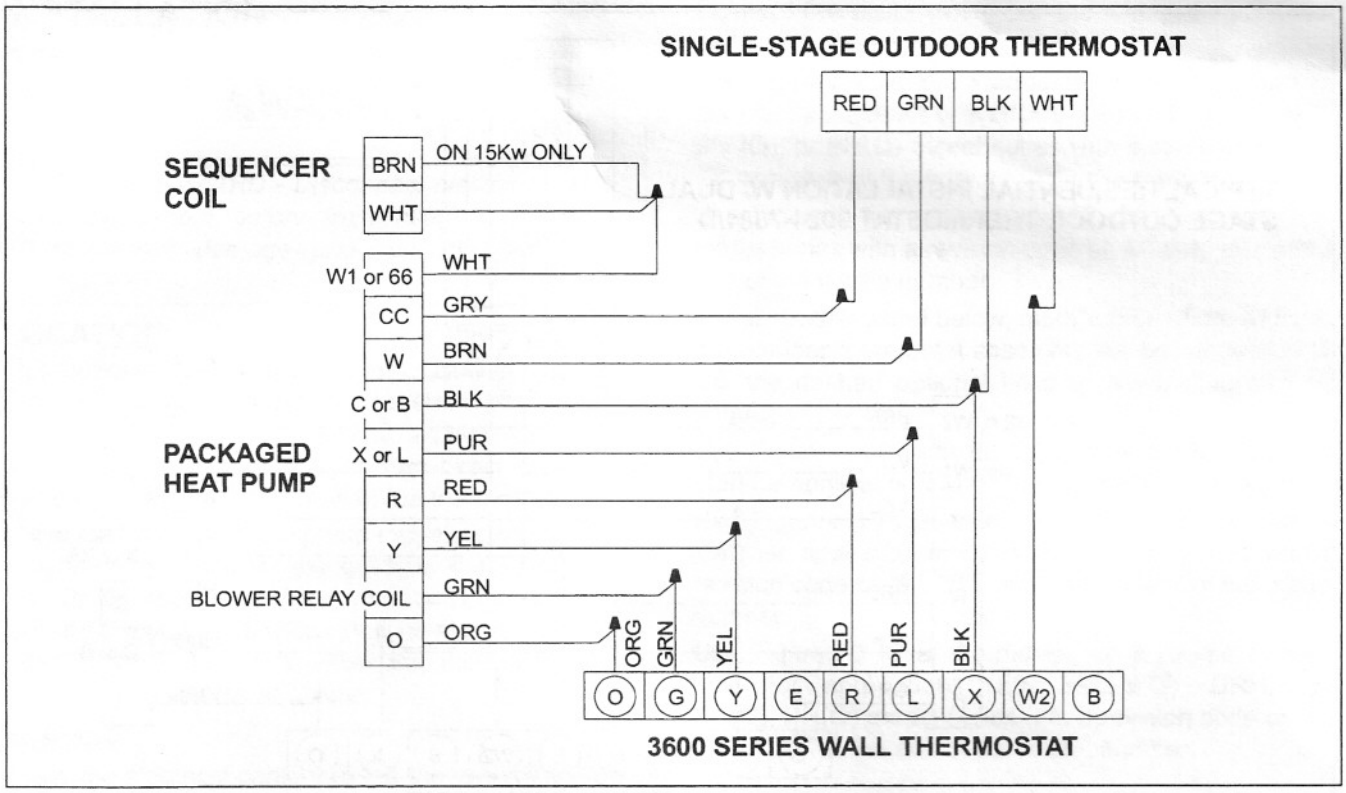



**FIGURE 4 -** WIRING CONNECTIONS FOR PHP PACKAGED HEAT PUMP

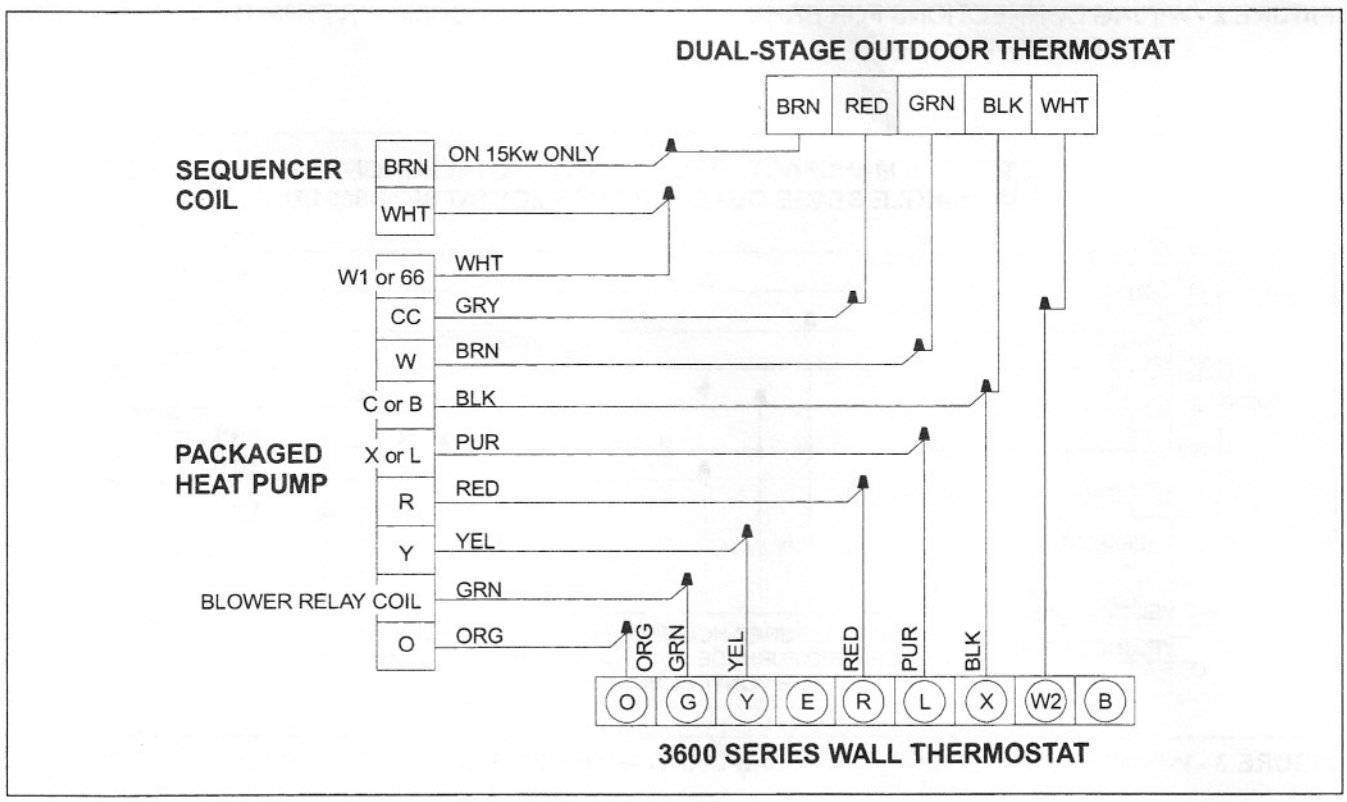



**FIGURE 5 -** WIRING CONNECTIONS FOR PHP PACKAGED HEAT PUMP

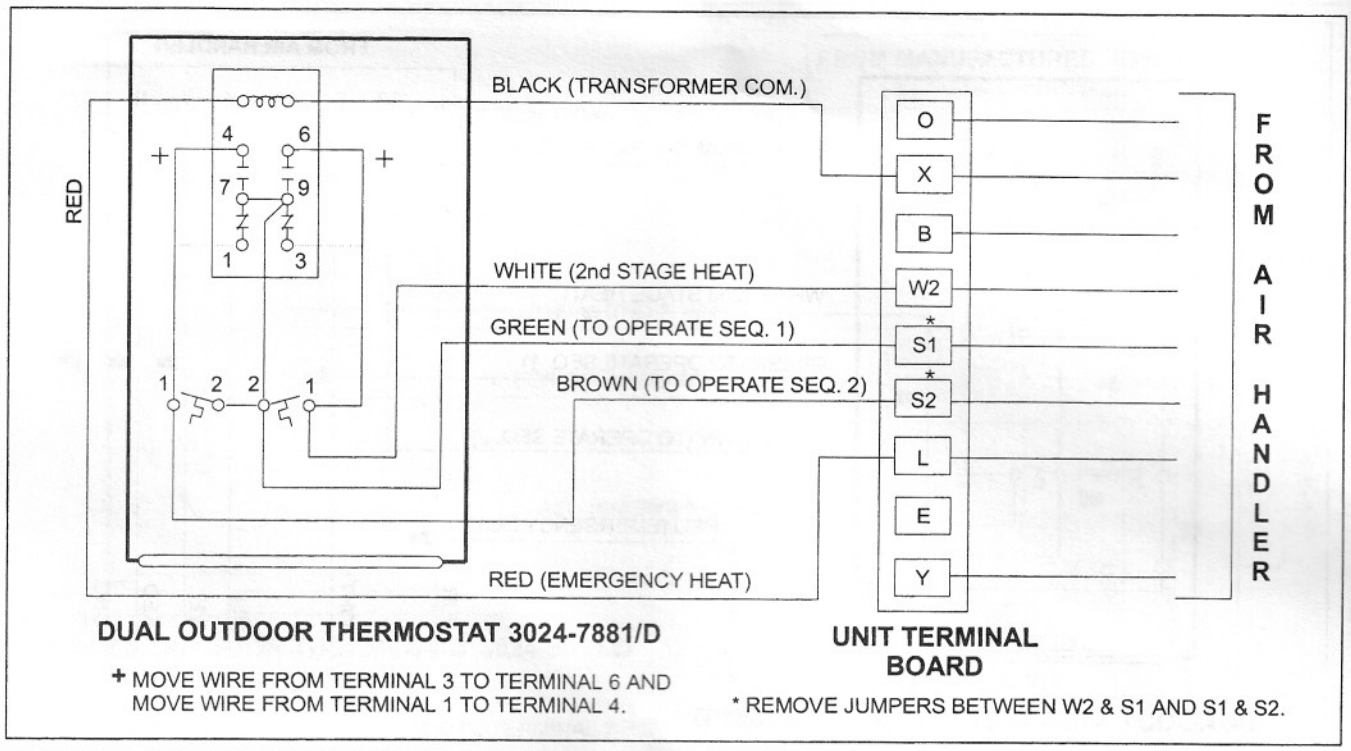



**FIGURE 6** - WIRING CONNECTIONS FOR FRHS SERIES (REVISION A, B, OR C)

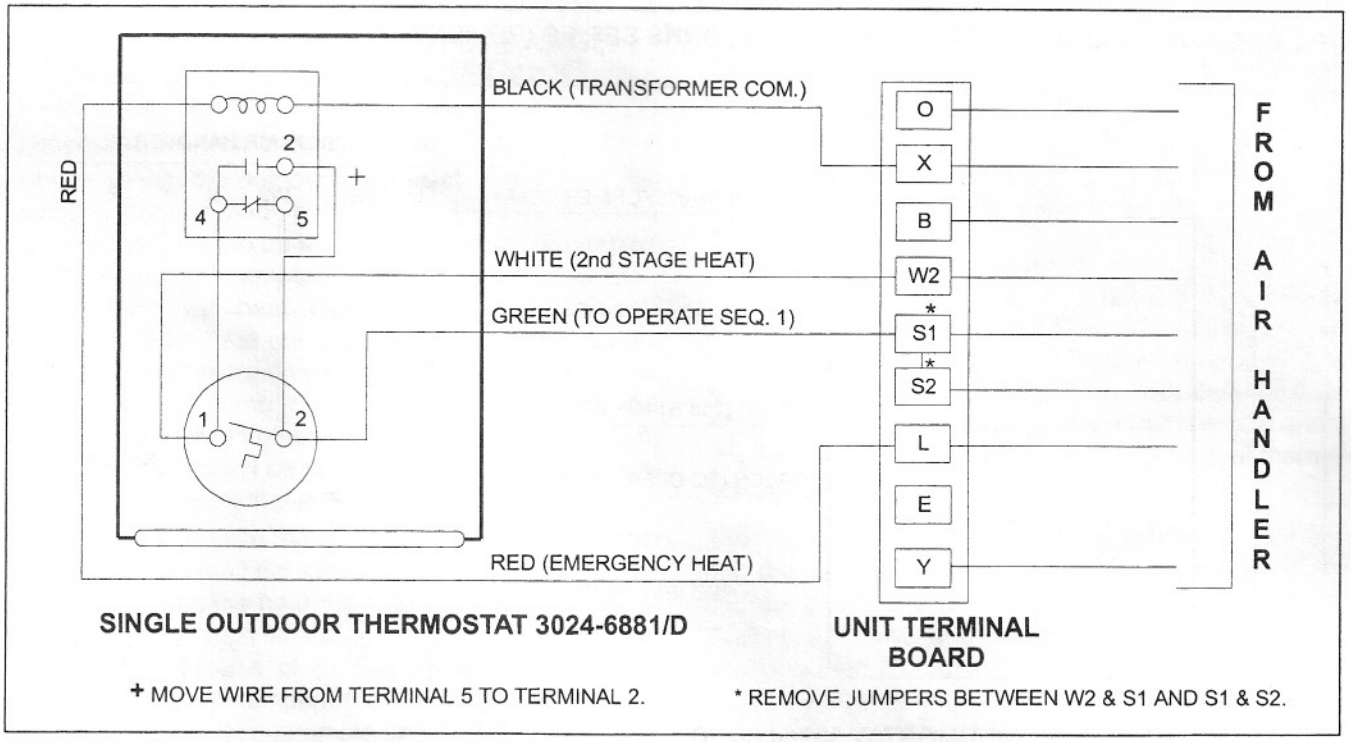



**FIGURE 7** - WIRING CONNECTIONS FOR FRHS SERIES (REVISION A, B, OR C)

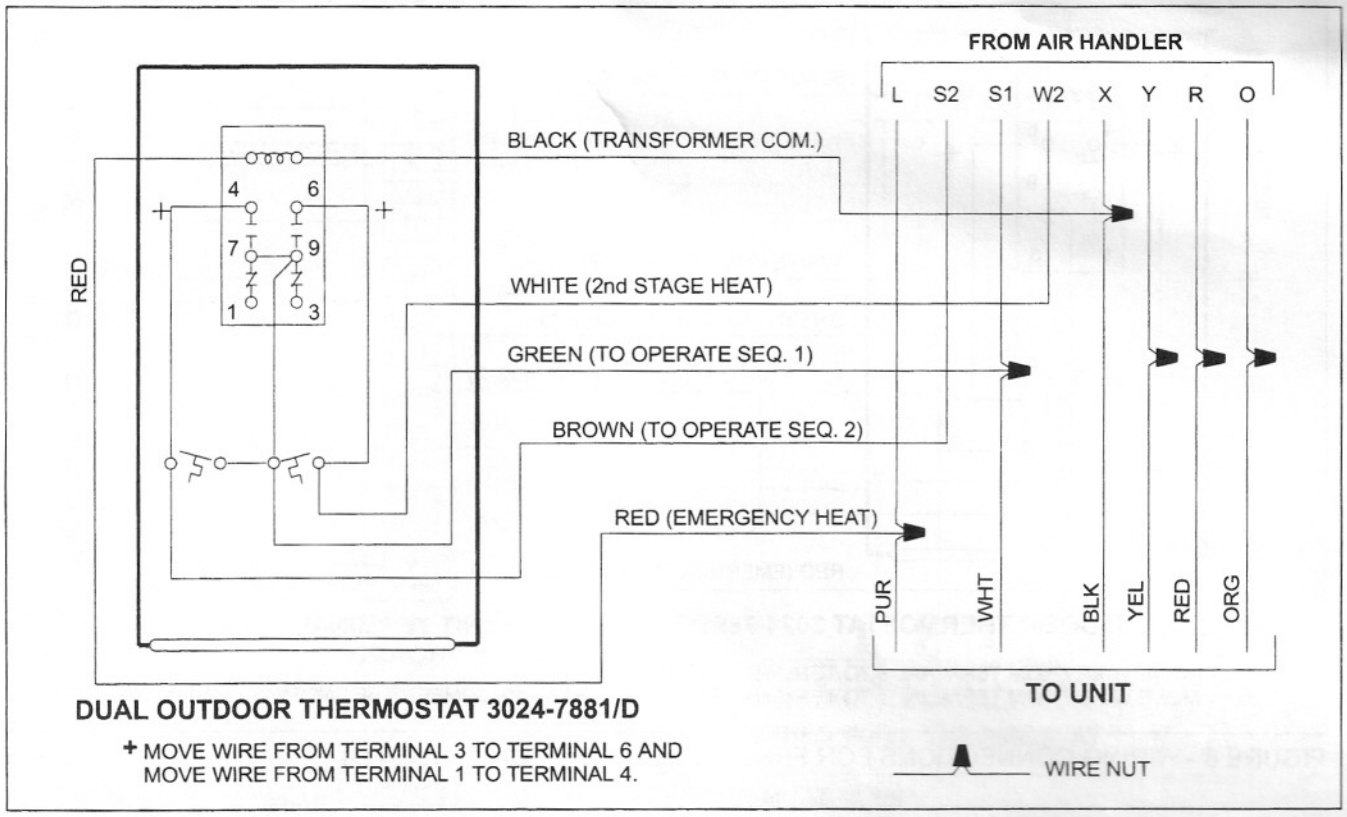



**FIGURE 8 -** WIRING CONNECTIONS FOR BRHS, DRHS SERIES (REVISION A, B, OR C)

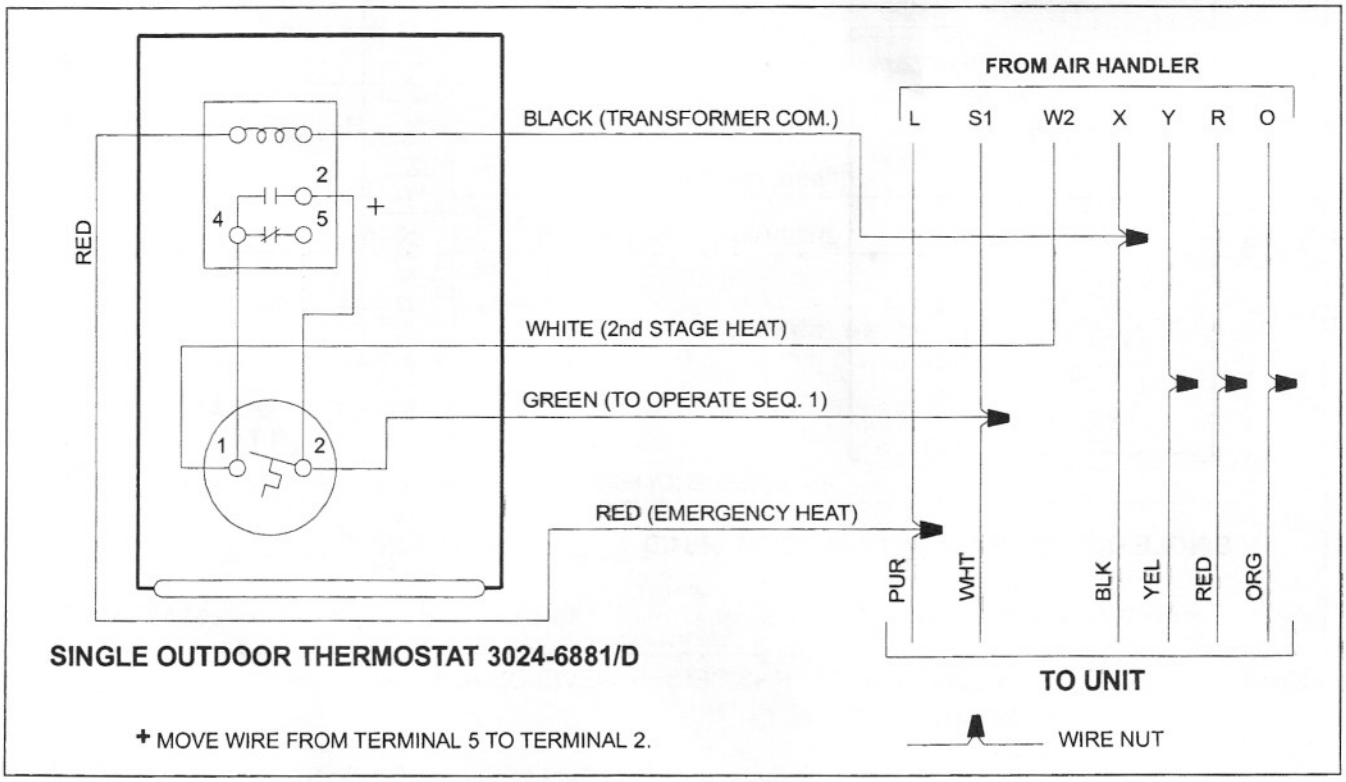



**FIGURE 9 -** WIRING CONNECTIONS FOR BRHS, DRHS SERIES (REVISION A, B, OR C)

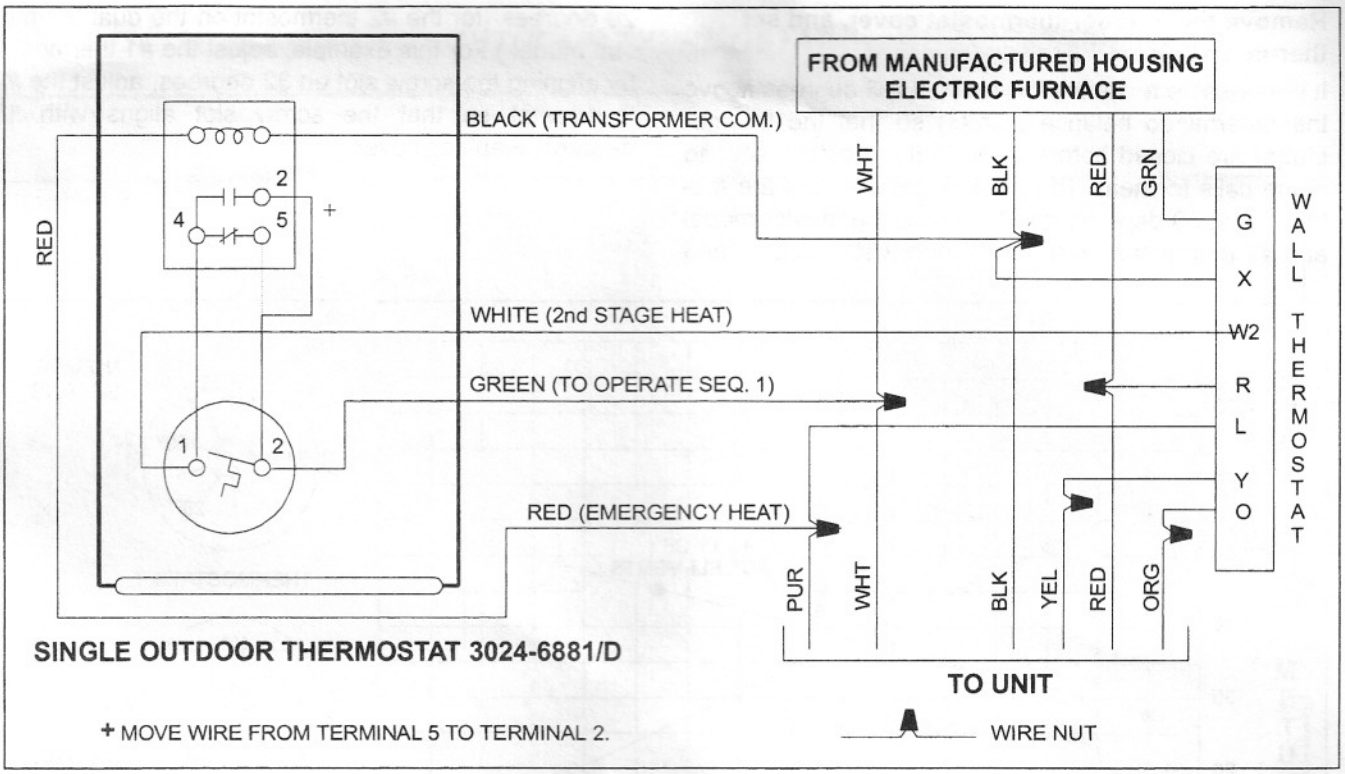



**FIGURE 10 -** WIRING CONNECTIONS FOR BRHQ, DRHQ SERIES (REVISION A, B, OR C)

## OUTDOOR THERMOSTAT(S) BALANCE POINT TEMPERATURE ADJUSTMENT FOR THE HOME

**Determine the first balance point:**

Before setting the outdoor thermostat, a heat loss calculation must be made of the home. The heat loss of a home is assumed to be linear and inversely proportionate to the outdoor temperature. As the outdoor temperature drops, the heat loss of the home increases. Conversely the heat pump capacity is reduced as the outdoor temperature drops. At some outdoor temperature, the heat pump capacity will balance with the homes heat loss. In other words, at that point, the heat loss of the home will be identical to the amount of heat produced by the heat pump.

In order to determine the exact balance point, it is necessary to chart the heat loss against the capacity of the heat pump. See the heat pump Tabular Data Sheet for capacity information at various outdoor temperatures. Chart the capacities of the heat pump at the corresponding outdoor temperatures on a graph and connect the points. See example chart. The vertical axis represents BTU's (in thousands) and the horizontal axis represents outdoor temperature.

For the purpose of this example, let us assume that the calculated heat loss of the home is 50,800 BTU's per hour at an outdoor design temperature of + 10° F. Moving up the vertical axis, at 10° F, locate the number of BTU's per hour heat loss and mark that point on the graph. Placing a straight edge on this point, and aligning with the 70° F (the normal indoor comfort condition) in the lower right-hand corner, connect these two points with a straight line. Locate the point at which the heat loss crosses the capacity curve of the heat pump. This intersection is the balance point temperature for the example application. This is the only balance point needed for applying the single thermostat model and is the first balance point when applying the dual thermostat model.

**Determining the second balance point:**

On the vertical axis at the first balance point, add 22,000 BTU's which is the capacity of the electrical heating elements, and mark this point. This represents the combined capacity of the heat pump and the electric elements. From this point draw a line parallel to the heat pump capacity curve. Where this new line intersects the heat loss line is the second balance point.

**Remove the outdoor thermostat cover, and set thermostat(s):**

It is advisable to set the thermostat(s) 3 degrees above the determined balance point(s) so that the thermostat(s) are closed before the wall thermostat's second stage calls for heat. The outdoor thermostats are factory set at 30 degrees (for the single thermostat model and #1 thermostat on the dual thermostat model.) and 20 degrees (for the #2 thermostat on the dual thermostat model.) For this example, adjust the #1 thermostat by aligning the screw slot on 32 degrees, adjust the #2 thermostat so that the screw slot aligns with 10 degrees. Replace cover.

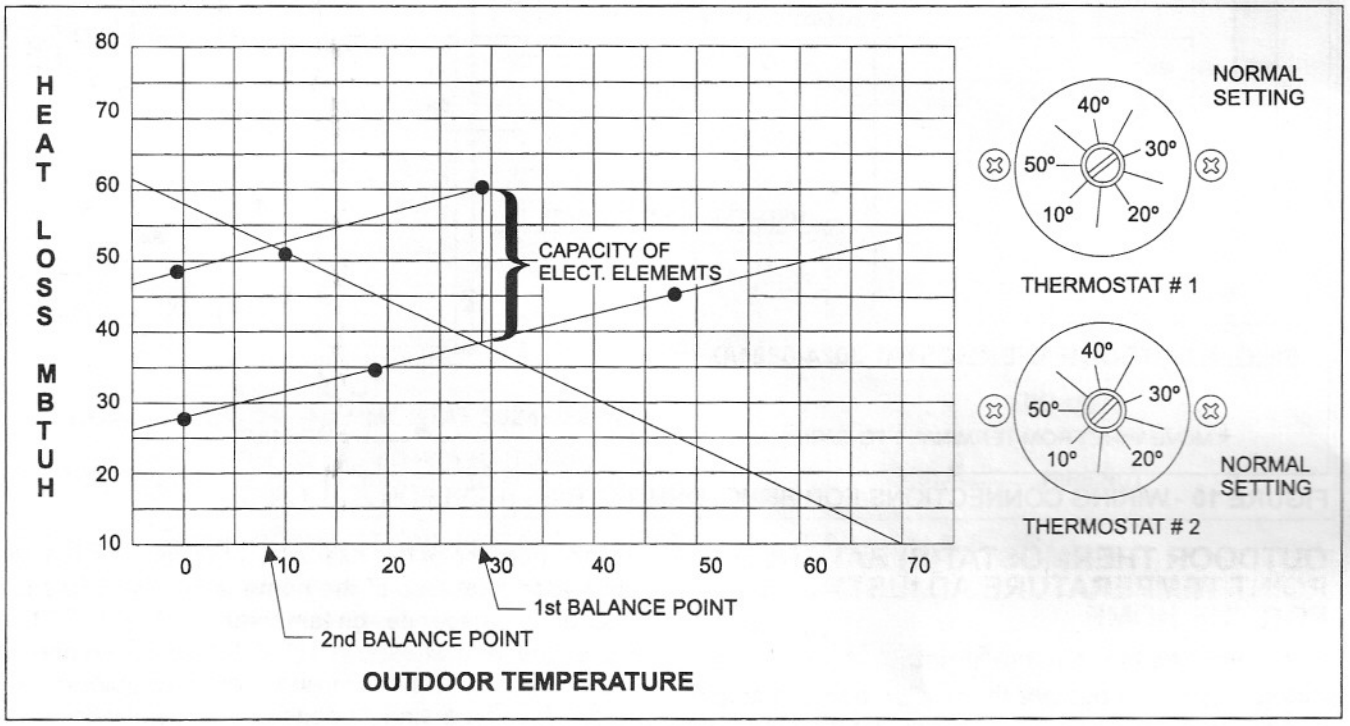



**FIGURE 11 -** BALANCE POINT DETERMINATION CHART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