INSTALLATION INSTRUCTION

ADD-ON FOSSIL FUEL CONTROL PANEL
FOR USE WITH E*FD, E*RA, E*RC, E*RE E*BA, E*BC OR E*BE HEAT PUMPS

Supersedes: 545.02-N2V (1098) | 545.02-N2V (399)

035-13167

MODELS 2AC02700701

GENERAL

This control panel provides the interface between the furnace and the heat pump system.

The Heat Pump is the primary source of heat for the building when the outdoor temperature is above the balance point. The furnace provides supplemental heat when the outdoor temperature is below the balance point. When the outdoor temperature is below the setting of the low temperature cut-off, only the furnace can operate.

A complete Add-On System consists of the following components (all shipped separately).

1. Outdoor Unit - E*FD, E*RA, E*RC, E*RE E*BA, E*BC, E*BE
2. Indoor Coil - G-UA, G+FD or G-HD
3. Add-on Control Panel - 2AC02700701
4. Heat Pump Thermostat
5. Interconnecting Refrigerant Lines
6. Furnace (gas, oil or electric)
7. Low Temperature Cutout (optional)

Anti-short cycle timer is integrated in E*RE and E*BE demand defrost control. The indoor coil must be installed down-stream of the furnace discharge. The furnace/heat pump orientation may be upflow or downflow. Make sure that the indoor coil is being applied within its application limitations.

LIMITATIONS

The installation of this unit shall be in accordance with all the regulations of the authorities having jurisdiction. All local/national codes and standards on electrical system, fuel-burning appliances, and mechanical refrigerant systems must be observed.

Observe all of the application limitations and clearance requirements for the outdoor unit, the furnace and the indoor coil.

ELECTRICAL DATA FOR CONTROL PANEL

MODEL	2AC02700701
Power Supply*	115-1-60
Voltage Min. - Max.	103 - 127
Min. Ckt. Amp.	.5
Max. Fuse Size, Amps	15
Min. Wire Size (60°C), AWG	14
Control Voltage	24
Control Voltage Fuse Size, Amps	5.0

*Power supply for the Add-on control panel only. See the installation instructions and the unit instructions and the unit data plate for the power supply of the outdoor unit.

The voltage limitations of the furnace must be determined by the installer.

Determine the CFM capability of the furnace and the CFM requirement of the heat pump system, and make sure the CFM's are compatible. If the furnace can't deliver enough air or delivers too much air, the system will not operate properly. *Do not add a heat pump to any furnace where the existing furnace blower can not provide sufficient air flow.*

WARNING: Some indoor coils may be shipped with a substantial refrigerant charge. Never allow a furnace to operate on the heating cycle with one of these coils in place but not connected to the rest of the heat pump system.

INDOOR COIL - LOCATION AND MOUNTING

The indoor coil must be installed in the discharge air side of the furnace. The coil should be centered on the furnace discharge in a factory supplied casing. *No modification of any part of the furnace is permitted.*

The casing provides an insulated enclosure which properly locates the indoor coil at the minimum required distance from the furnace. At least 1" space must be maintained between the furnace discharge and the underside of the coil drain pan.

See coil installation instruction for more information concerning coil mounting.

CAUTION

THIS PRODUCT MUST BE INSTALLED IN STRICT COMPLIANCE WITH THE ENCLOSED INSTALLATION INSTRUCTIONS AND ANY APPLICABLE LOCAL, STATE, AND NATIONAL CODES INCLUDING, BUT NOT LIMITED TO, BUILDING, ELECTRICAL, AND MECHANICAL CODES.

WARNING

INCORRECT INSTALLATION MAY CREATE A CONDITION WHERE THE OPERATION OF THE PRODUCT COULD CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

CONTROL PANEL MOUNTING

The control panel should be mounted on a nearby wall within the reach of its 8 foot long bonnett sensor leads. This sensor should be carefully routed from the control panel into the indoor coil casing. See Figures 3, 4 and 5.

CAUTION: Avoid routing the sensor leads over any sharp sheet metal edges or any high temperature surfaces.

Mounting holes and screws are provided to secure the control panel to the mounting surface. See Figure 1 for control panel dimensions and hole locations.

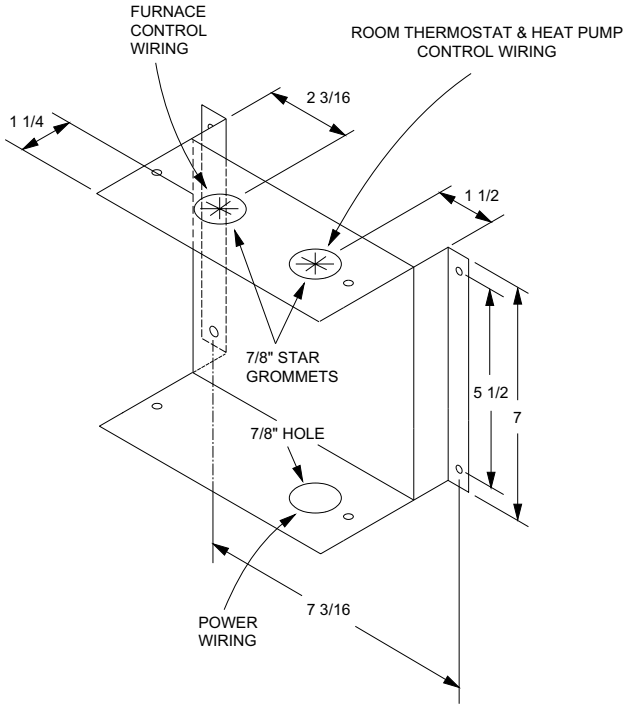


FIGURE 1 - CONTROL PANEL DIMENSIONS AND MOUNTING HOLE LOCATIONS

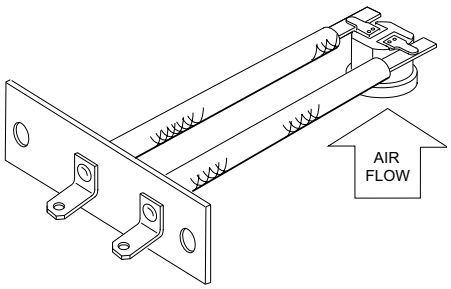
NOTE: The control panel should never be mounted in or on the furnace enclosure or discharge plenum. During heating operation, high temperatures could damage some of its components.

BONNET SENSOR INSTALLATION

Installer must modify indoor unit to provide bonnett sensor opening.

NOTE: Minimum opening required to insert bonnet sensor is 5/8" high by 1- 1/8" wide. Opening width should not exceed 1- 5/8".

CAUTION: Sensor must be installed with disc facing entering air. (See Figure below)



CAUTION: Do Not install sensor where air flow from furnace to sensor could be restricted.

Avoid routing sensor leads over any sharp edges or high temperature surfaces. Seal any air leaks created during installation.

CONTROL PANEL WIRING

Route the power wiring through the 7/8" hole in the enclosure near the transformer primary leads. Route low voltage wiring through star grommetts. Field power wiring shown in Figure 2.

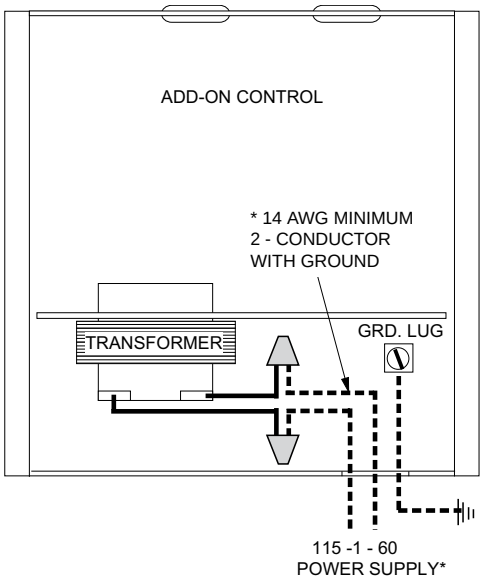
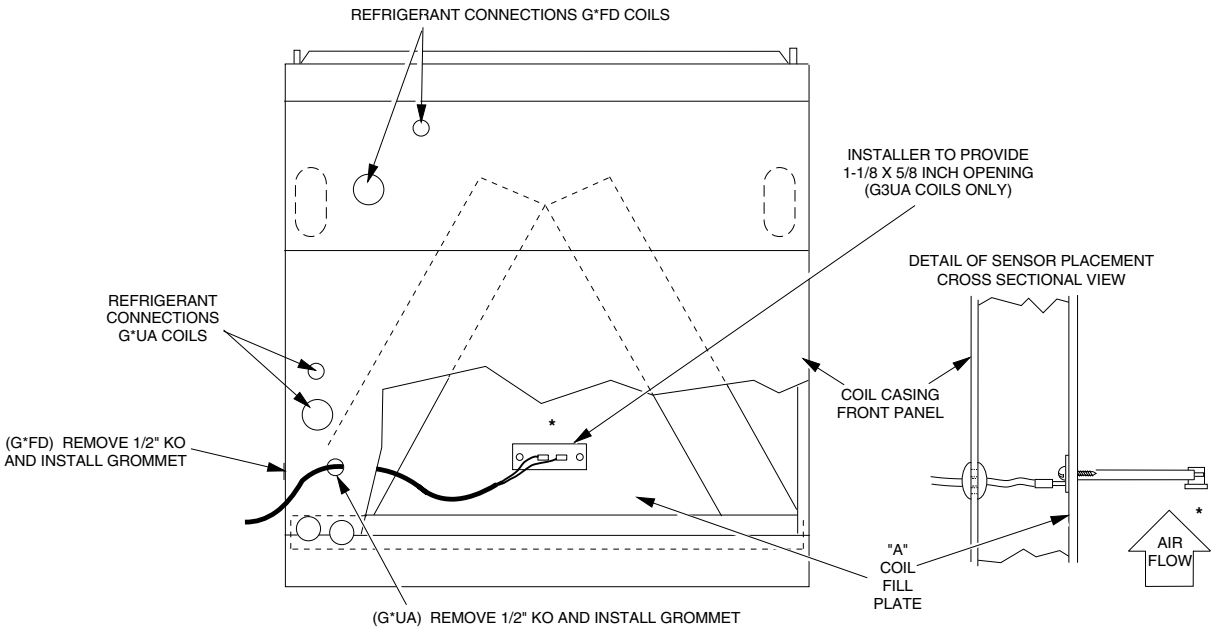


FIGURE 2 - FIELD POWER WIRING



*** IMPORTANT** : Sensor MUST BE mounted with disc facing the entering air as shown.

FIGURE 3 - SENSOR PLACEMENT - G*UA AND G*FD COILS

WIRING CONNECTIONS

All field wiring must comply with the limitations listed in this instruction, including compliance with all local codes, the National Electrical Code, and the Canadian Electrical Code.

All high voltage field wiring, being applied to the furnace must be of the same wire temperature and voltage rating as specified for field wiring by the furnace manufacturer.

All low voltage wiring, being applied to the furnace must be kept separate from all high voltage wiring and be of the same wire temperature rating as specified by the furnace manufacturer. If the low and high voltage wiring cannot be kept separate, the low voltage field wiring must additionally have a voltage rating which meets or exceeds the high voltage wire rating as specified by the furnace manufacturer.

IF ANY OF THE ABOVE REQUIREMENTS CANNOT BE MET, THIS ADD-ON CONTROL CANNOT BE APPLIED TO THE PARTICULAR FURNACE.

Figures 6 and 7 show low voltage field wiring of the add-on control with and without the “TH3" control.

NOTE: Orange jumper wire furnished with kit must be installed in outdoor unit defrost control as shown.

Figure 8 shows the Add-On Control System Wiring used with the heat pump.

Note that the TH3 Low Temperature Cutout (Honeywell Tradeline T675A1565) is an Accessory Control which is not included with the Control Panel.

The TH3 cutout (adjustable between 0 and 50°F) is recommended to cutoff the compressor and shift the furnace to the first stage of the thermostat below the economic balance point. The demand defrost control on the E*RE and E*BE heat pumps includes an anti-short cycle timer, which is necessary to prevent short cycling of the compressor which can occur with some furnace applications.

SEQUENCE OF OPERATION

Cooling Operation

The heat pump will be energized through Y2 and the furnace blower will be energized through G and/or Y.

Heating Operation

Upon a call for first stage heat, the heat pump (only) operates in heating. If the outdoor temperature is high enough that the heat pump can handle the load, then first stage will be satisfied after the required run time.

If the outdoor temperature is below the balance point of the system, the heat pump will operate until the temperature in the room drops to the point the thermostat calls for second stage heat. The Kl and K2 relays are energized to turn on the furnace and turn off the heat pump. The furnace will continue to run until both second and first stage heat of the thermostat is satisfied when Jumper J1 is installed. If Jumper J1 is removed, then the furnace will run until second stage heat is satisfied, and the heat pump will restart and run to satisfy the first stage heat or until there is another call for second stage heat at which time the heat pump will shut down and the furnace is restarted.

If an outdoor Low Temperature Cutout control is used, when the outdoor temperature is below the cutout balance point, the heat pump will not run and the furnace will be energized through the K6 relay for first stage heat.

Defrost Cycle

When the heat pump initiates a defrost cycle, the furnace will be energized through the K6 relay. The furnace will cycle off when the bonnet sensor opens at approximately 105 °F and will restart when the limit closes at approximately 90 °F . If there is a call for second stage heat during the defrost mode, the defrost cycle will be discontinued and the furnace will run until either second or first stage heat is satisfied (depending on jumper J1.)

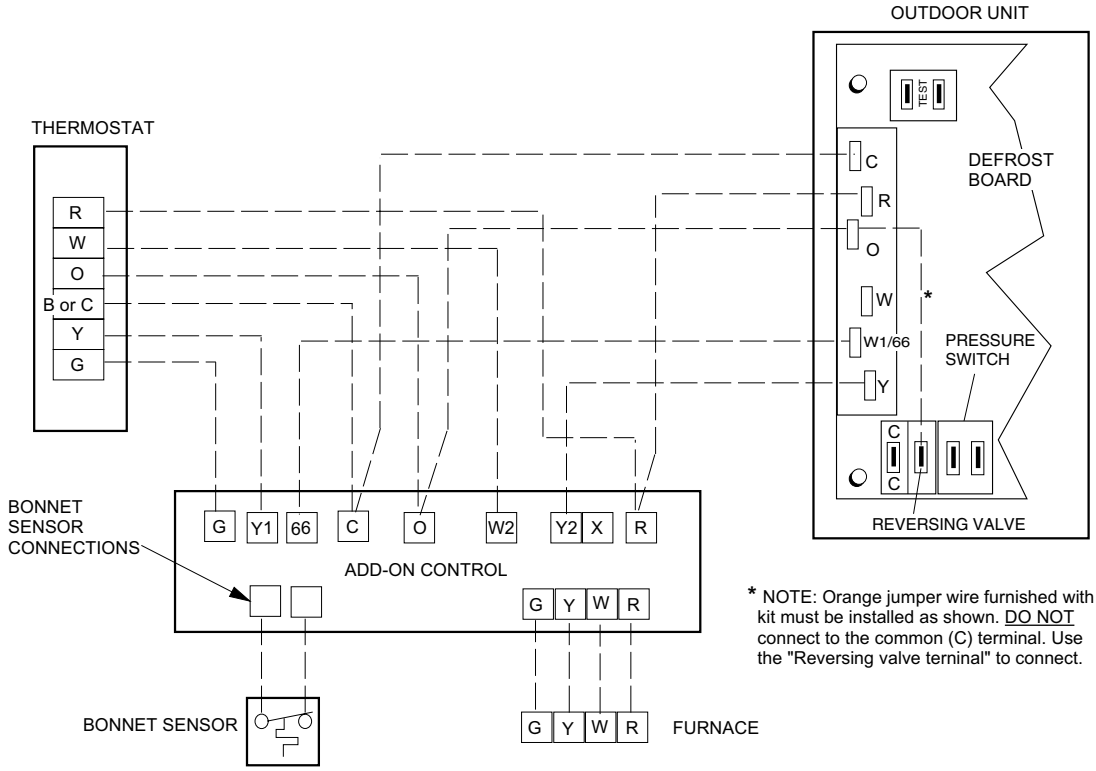


FIGURE 4 - LOW VOLTAGE FIELD WIRING - E*RA, E*RC, E*RE, E*FD, E*BA, E*BC, E*BE

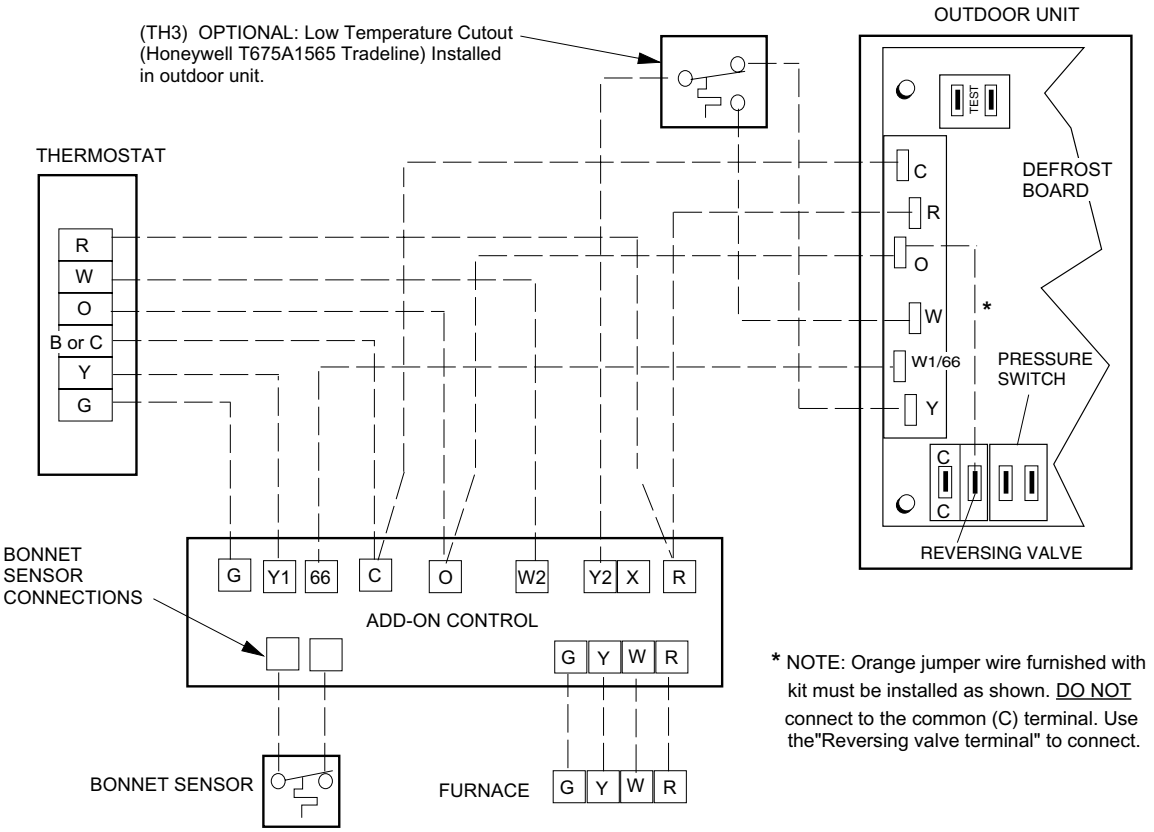


FIGURE 5 - LOW VOLTAGE FIELD WIRING WITH OPTIONAL LOW TEMPERATURE CUTOUT - ERA, ERC, ERE, EFD, EBA, EBC, EBE

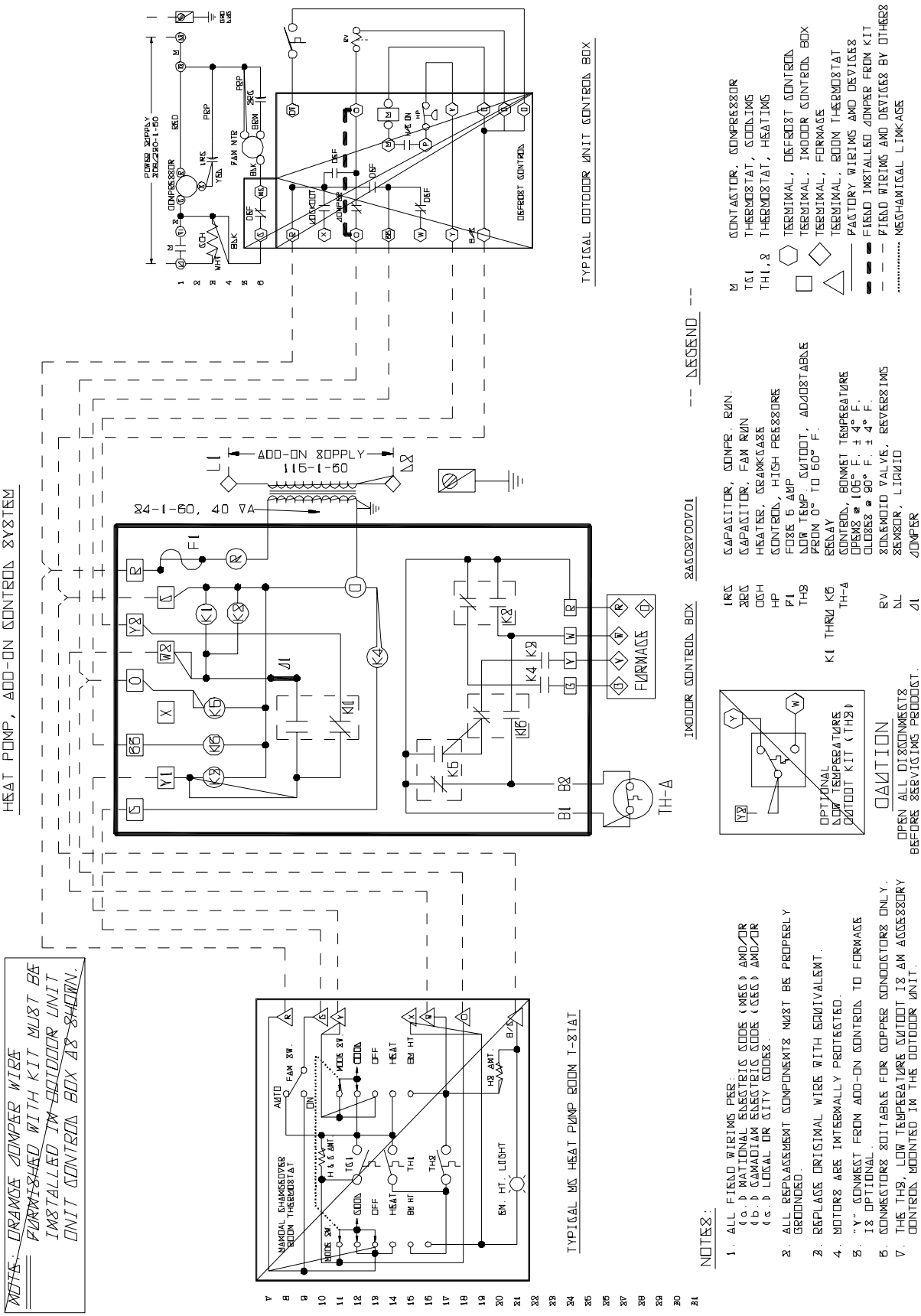


FIGURE 6 - WIRING LABEL 035-13739

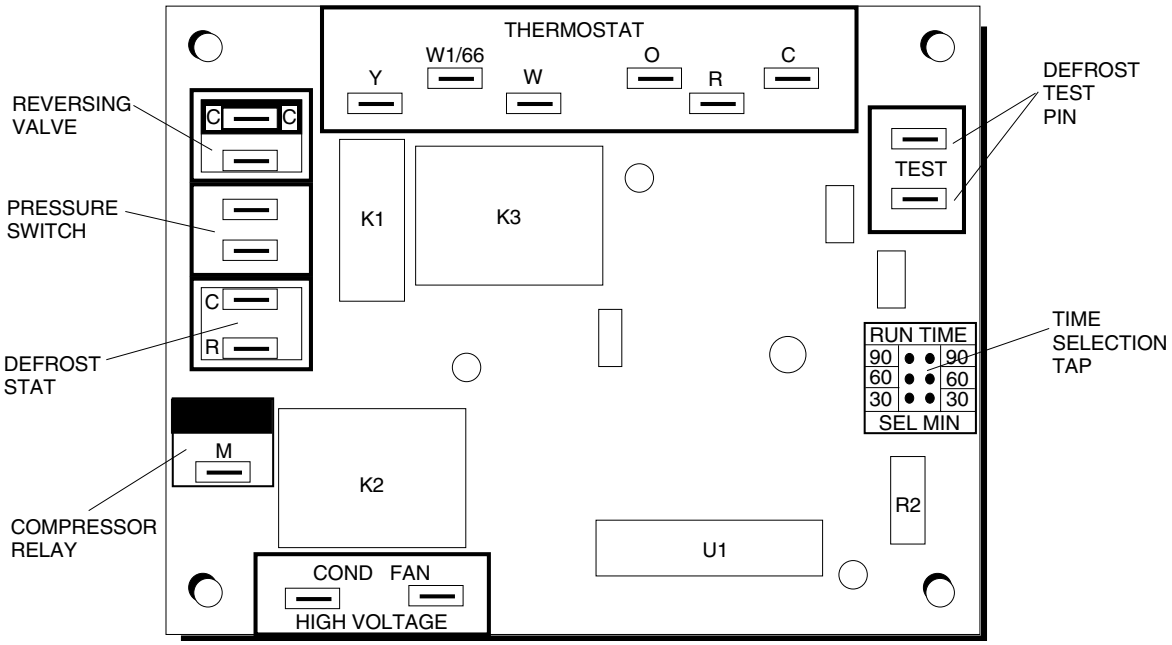


FIGURE 7 - TIME / TEMPERATURE DEFROST BOARD

Code: SBY, L, F

545.02-N2V (399)

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