GENERAL
The YorkGuard V Demand Defrost control is a replacement part for prior versions of the YorkGuard control (YorkGuard IV).

CAUTION: Following the detailed instructions for modifications of both the indoor and outdoor units is critical.

NOTE: For direct replacement of YorkGuard V, replace the control only.

Service replacement kit consists of:
1. YorkGuard "V" Defrost Control
2. Mounting plate and hardware (4 - #6 screws)
3. 2-wire harnesses, terminals (1/4" and 3/16")
4. Wiring diagrams for both electric heat connections and fossil fuel connections.

OUTDOOR UNIT MODIFICATIONS
1. Disconnect all high and 24V voltage power to the unit and the control circuit.
2. Mark and disconnect all thermostat, sensor and low voltage control connections from the YorkGuard IV control.
3. Remove the two #10 screws holding the control and remove the control.
4. Using the two #10 screws removed in step 3, secure the mounting plate supplied in the kit in the same location as the control that was removed.
5. Using the 4 - #6 screws supplied in the kit, secure the YorkGuard V control to the mounting plate in all four corners. The control should be oriented with the thermostat connections to the left side.

NOTE: There is an extra stand-off for support purposes and does not require a screw.

6. Remove the screws mounting the defrost relay and replace the screws in the two empty holes to seal the control box.

NOTE: Move the relay to the side but do not disconnect.

7A. Re-wire per Figure 2 and 3 for E*FH and E*EB.

NOTE: All E*EB wires are number coded versus color coded. All E*EB wires are noted in [ ].

a. Remove wire nut holding Yellow (HP) [BLK], Black (RS) [52B] and Blue wire. Terminate the black (RS) [52] wire with an insulated 1/4" terminal an plug into “COM” on control at Rev Valve.

b. Remove the Black (RS) [65A] wire from the defrost relay and plug into the control at Rev Valve.

c. Remove two fan leads (Black) from the defrost relay and plug into the two terminals on the new control for the condenser fan.

d. Remove the following wires from the defrost relay and dispose of the wires: (per Figure 2)
   1. Blue [52] @ B
   2. Orange [65] @ 4
   3. Red [51] @ 7
   4. Gray [54] @ A

e. Remove Yellow [57] wire from contractor and strip end with plug (previously connected to the control.) Wire nut to Yellow (HP) [BLK] wire from (a) above. Plug into control at PS.

f. Remove Yellow (HP) [BLK] wire from contactor and plug into control at PS.

g. Install the new Blue wire (from kit) from the common side of the contactor to “C” on the new control.

h. Remove Brown [56] wire from contactor and install the new Brown wire (from kit) from the contactor to “M” on the control. Note the connection at the control is with a 3/16” terminal.

7B. Re-wire per Figure 4 and 5 for E*CS.

a. Remove the 65A (RS) and 52A wire from the defrost relay and plug into the control at Rev Valve and Rev Com.

b. Remove the two fan leads (Black) from the defrost relay and plug into the two terminals on the new control for the condenser fan.

c. Remove the following wires from the defrost relay and dispose of the wires:
   1. 52 @ B
   2. 51 @ 7
   3. 65 @ 4
   4. 54 @ A

d. Remove 57 wire from contactor and strip end with plug (previously connected to the control.) Disconnect 52B @ Rev. Valve Sol, Strip and wire nut to 57. The wire length may need to be extended.

e. Remove 57A (HP) wire from contactor and plug into control at PS. The wire length may need to be extended or a new wire fabricated.

f. Install the new Blue wire (from kit) from the common side of the contactor to “C” on the new control.
g. Remove 56 wire from contactor and install the new Brown wire (from kit) from the contactor to "M" on the control. Note the connection at the control is with a 3/16" terminal.

8. Rewire sensor leads as follows.
   a. Liquid line sensor leads (blue) - cut and strip and reterminate with 1/4" terminals. Connect to the control.
   b. Ambient sensor leads (yellow) - cut and strip and reterminate with one 1/4" and one 3/16" terminal. Connect to control.
   c. Discharge sensor leads (red) - cut and strip and reterminate with 3/16" terminals. Connect to control.

9. Apply a new wiring diagram for either electric heat installations (035-14185-000) or fossil fuel installations (035-14214-000) supplied in the kit to the inside of the control box of the outdoor unit. Note: The wiring diagram notes colored wires.

10. Verify the settings for the balance point and low temperature cut-out. The settings are found at the top left of the control and are set using the supplied jumpers.

INDOOR UNIT MODIFICATIONS

CAUTION: Failure to follow steps 1 or 2 below can result in the shorting of the transformer and potential damage to the control.

NOTE: The YorkGuard V control is grounded through the metal stand-offs in the outdoor unit to the "C" 24V circuit. This is to improve the accuracy of the thermistor operation. Prior YorkGuard controls were not grounded in this manner.

1. ELECTRIC HEAT APPLICATION - If the system is used with an air handler with electric heat, verify that the transformer on the indoor unit has the common side grounded. In some older models such as the F1SA models, the "R" side of the 24V circuit was grounded. It will be necessary to remove the ground from the "R" side of the transformer and ground the "C" of the transformer.

   NOTE: Do not just switch "R" and "C" at the transformer.

Once this is complete, follow the start-up operations.

2. FOSSIL FUEL APPLICATION - If the system is used with a Gas Furnace and the Add-on fossil fuel kit 2AC02700401 is used, one of the two following changes must be made before power is restored. Failure to do so will result in at least a transformer failure.

   a. It will be necessary to break the ground connection from the board of the add-on control (through the stand-off) to the sheet metal box. Removing the screw does not insure the ground circuit is broken. There are two methods - 1) insulate the stand-off from the control box or 2) remove the stand-off all together.

   b. Replace the 2AC02700401 Add-on Control with the new 2AC02700801 control. Follow the wiring diagram in the control.
**B1PH CONTROL REPLACEMENT**

**YorkGuard IV REMOVAL**
Remove YorkGuard IV from B1PH units as follows:
1. Disconnect the unit power supply.
2. Mark and disconnect all thermostat, sensor, and low voltage wires at the YorkGuard IV control.
3. Remove the two #10 screws holding the old YorkGuard IV control and remove the control.
4. Remove the two screws mounting the defrost relay 2R and move the relay to the side but do not disconnect the wires.

**YorkGuard V INSTALLATION**
Use the two #10 screws removed in step 3 above, to attach the YorkGuard V mounting plate to the control box. Install YorkGuard V control oriented with the thermostat connections to the left, to the mounting plate with #6 screws supplied.

**RE-WIRING B1PH CONTROL BOX**
See Figure 6 (Before) and Figure 7 (After) or the enclosed wiring diagram 035-14219-000 to re-wire the B1PH control box, or follow the step-by-step procedure below:
1. Disconnect the Black OD fan motor wire from relay 2R-3 and connect to YorkGuard V - COND FAN.
2. Disconnect the Black wire from relay 2R-9 and connect to the other terminal at YorkGuard V - COND FAN.
3. Disconnect the Black wire from relay 2R-7 and connect to YorkGuard V - REV VAL.
4. Disconnect the Orange wire from relay 2R-4 and TB1-51 and connect between TB1-52 and YorkGuard V - COM.
5. Remove relay 2R and discard the remaining attached wires and the relay.
6. Disconnect the two Brown high pressure switch wires (one at TB1-51 and one at 1M coil) and connect them to YorkGuard V-PS. NOTE: There are several Brown wires at TB1-51. The wire connected to the high pressure switch can be easily confused with the wire connected to the reversing valve. You may want to use an meter to check continuity through the high pressure switch to find the correct wire.
7. Cut the Purple and Blue wires at the low voltage plug that was connected to the old YorkGuard IV. Terminate the cut end of the Blue wire with a 3/16" push-on terminal and connect to YorkGuard V - M. Terminate the cut end of the Purple wire with a 1/4" push-on terminal and connect to YorkGuard V - COM.
10. Cut the Orange wire from TB1-51 to the low voltage plug at the plug and strip the end about 1/2". Connect this wire and the Red low voltage wire to YorkGuard V - R screw terminal.
11. Connect the remaining low voltage wires to the YorkGuard V - screw terminals.
12. Remove and discard the low voltage plug and the wires still attached to it.
13. Rewire the sensor leads as follows:
   a. Liquid line sensor leads (Blue) - cut at plug, strip end, and re-terminate with 1/4" terminals. Connect to the YorkGuard V - LL.
   b. Ambient sensor leads (yellow) - cut at plug, strip end, and re-terminate with one 1/4" terminals and one 3/16" terminal. Connect to the YorkGuard V - OD.
   c. Discharge sensor leads (red) - cut at plug, strip end, and re-terminate with 3/16" terminals. Connect to the YorkGuard V - DIS.

**FIGURE 6 - B1PH Control Wiring (Before)**
14. Apply a new B1PH wiring diagram (035-14219-000) supplied with the kit to the inside of the control box cover.

15. Use the jumper pins supplied on the control to set the balance point (BAL PT) and low temperature cut-out (LTCO) settings to the same settings that were on the control.

B2CH REPLACEMENT FOR YORKGUARD

YorkGuard IV REMOVAL

Remove YorkGuard IV from B2CH units as follows:

1. Disconnect the unit power supply.
2. Remove and dispose of:
   a. Wire #165 (TB3 to DR)
   b. Wire #515 (YG to DR)
   c. Wire #150 (2R to DR)
   d. Wire #186 (2R to DR)
3. Mark and disconnect all thermostat, sensor and low voltage wires at YorkGuard control.
4. Remove control.

YorkGuard V INSTALLATION

Use the two #10 screws removed in Step 4 above to attach the YorkGuard V mounting plate to the control box. Install YorkGuard V control oriented with the thermostat connections to the left, to the mounting plate with #6 screws supplied.

RE-WIRING B2CH CONTROL BOX

1. Switch ground connection on the secondary side of the transformer (from #161 at transformer to #152/#153 at circuit breaker).
2. Disconnect wire #107 from DR and connect to YorkGuard V at COND FAN.
3. Disconnect wire #113 from DR and connect to YorkGuard V at COND FAN.
4. Attach wire #178 from contactor to YorkGuard V at COM. (May use BRN wire supplied or re-terminate)
5. Attach wire #173 from contactor to YorkGuard V at “M”. (May use BLU wire supplied or re-terminate)
6. Remove wire #213 from contactor and connect to YorkGuard V at PS.
7. Remove wire #188 from TBB and connect to YorkGuard V at PS. (May need to lengthen wire)
8. Remove wire #185 from DR and connect to YorkGuard V at REV VAL.
9. Remove wire #155 from TB3 and connect to YorkGuard V at COM.
10. Remove DR (Defrost Relay) - re-plug holes with screw used to mount relay.
11. Reconnect wire to YorkGuard V wire #183 to R, #160 to B/C, #192 to Y, #184 to O, #191 to W, #179 to E/X, #177 to W2/66, #174 to W2/60.
12. Reconnect sensor leads - re-terminate with quick connect terminals supplied
   a. Liquid line sensor leads (Blue) - cut and strip and reterminate with 1/4” terminals. Connect to the control.
   b. Ambient sensor leads (Yellow) - cut and strip and reterminate with one 1/4” and one 3/16” terminal. Connect to control.
   c. Discharge sensor leads (Red) - cut and strip and reterminate with 3/16” terminals. Connect to control.
13. Verify the settings for the balance point and low temperature cut-out.
**FIGURE 8 - B2CH Control Wiring (Before)**

**FIGURE 9 - B2CH Control Wiring (After)**
B1PS, B2PS, B3PS CONTROL REPLACEMENT

YorkGuard IV REMOVAL
Remove YorkGuard IV from B*PS units as follows:
1. Disconnect the unit power supply.
2. Remove and dispose of:
   a. Wire #89 (B1PS), #63 (B2PS, B3PS) (YG to 2R)
   b. Wire #54 (Y6 to 2R)
   c. Wire #51A (2R to 2TB)
   d. Wire #52A (2R to 2TB)
3. Mark and disconnect all thermostat, sensor and low voltage wires at YorkGuard control.
4. Remove control.

YorkGuard V INSTALLATION
Use the two #10 screws removed in step 4 above to attach the YorkGuard V mounting plate to the control box. Install YorkGuard V control oriented with the thermostat connections to the left, to the mounting plate with #6 screws supplied.

RE-WIRING B*PS CONTROL BOX
1. Switch ground connection on the secondary side of the transformer (from #51 at transformer to #52 at circuit breaker).
2. Disconnect wire 3B from 2R and connect to YorkGuard V at COND FAN.
3. Disconnect wire BLK (FAN) from 2R and connect to YorkGuard V at COND FAN.
4. Attach wire #55 from contactor to YorkGuard V at "M".
5. Attach wire #56 from contactor to YorkGuard V at "M". (May use BRN wire supplied or re-terminate)
6. Remove wire #56A from contactor and connect to YorkGuard V at PS.
7. Remove wire #52F from 2TB and connect to YorkGuard V at PS.
8. Remove wire #61A from DR and connect to YorkGuard V at REV VAL.
9. Remove wire #52B from 2TB and connect to YorkGuard V at COM.
10. Remove 2R (Defrost Relay) - re-plug holes with screw used to mount relay.
11. Reconnect thermostat wires to YorkGuard V and wire #60A to W2/60 and wire #66A to W2/66.
12. Reconnect sensor leads - re-terminate with quick connect terminals supplied
   a. Liquid line sensor leads (Blue) - cut and strip and re-terminate with 1/4" terminals. Connect to the control.
   b. Ambient sensor leads (Yellow) - cut and strip and re-terminate with one 1/4" and one 3/16" terminal. Connect to control.
   c. Discharge sensor leads (Red) - cut and strip and re-terminate with 3/16" terminals. Connect to control.
13. Verify the settings for the balance point and low temperature cut-out.

FIGURE 10 - B*PS Control Wiring (Before)
START-UP OPERATION

1. Re-apply power to the unit and the control voltage circuit.
2. The LED on the defrost control will flash on and off when there is power to the control and it is working properly.
3. Use of the Service Analyzer will require the Interface Control to operate with the YorkGuard V.
4. Verify unit operation. Fault codes are the same as the YorkGuard IV and will flash at the control.

THE FOLLOWING FEATURES HAVE BEEN UPGRADED OR CHANGED BETWEEN THE YORKGUARD IV AND V DEFROST CONTROLS.

1. Fault Code 5 will be a “soft” failure for the first two occurrences of a fault code 5 condition during a 12 hour period. The control will lock out the unit for 2 hours and then reset. This can occur two times, however on the third fault code 5 condition that occurs within 12 hours, the control will go into a hard lock-out mode.
2. There is no terminal 53 for three stages of heat. If 53 was used, connect thermostat lead 53 at the control at terminal 60.
3. The unit can be operated by jumpering the appropriate thermostat terminals at the outdoor unit (R to Y for heating and R to Y + R to O for cooling). Note if the unit is to be run for any period of time, then make sure the indoor blower is operating.
4. The 5 minute anti-short cycle timer is the same. To bypass the anti-short cycle timer, jumper the two terminals marked TEST for at least 1 sec. The unit will start immediately if there is a Y signal.
5. Forced defrost can be accomplished by jumpering the two terminals marked TEST.

Note: Defrost is instantaneous if the unit is running or after 5 seconds of holding the test terminals to start the unit (by 4 above).
6. Bonnet Sensor with Add-on Furnace - the unit will turn off the compressor if the bonnet sensor is 98°F or above during heating operations. This may cause the furnace to continue operating and complete the heat cycle following a defrost and leave the compressor off.
7. There is a third defrost exit routine. If during defrost the liquid line maintains 45°F for 3 minutes, it will exit defrost and return to heating.
8. This control has a six hour forced defrost. The control will initiate a defrost if the unit has accumulated six hours of run time with the liquid line below 45°F.