

*Defrost Operation
Confirmation*

How It Works

- On heat pump units, when in the heating mode, the reversing valve is not energized. As long as the thermostat is set for heating, the reversing valve will be in the de-energized position for heating except during a defrost cycle.
- If the temperature of the outdoor coil is low enough to cause the defrost thermostat to be closed when the defrost board checks it, the board will initiate a defrost cycle. Ice does not need to be present to initiate defrost cycle.

- When a defrost cycle is initiated, defrost board turns off the outdoor fan. The defrost board supplies 24 Volts AC to “O” and “W2”. The reversing valve is energized and turns on the electric heater(s). The unit will continue to run in this mode until the defrost cycle is completed.
- When the temperature of the outdoor coil rises high enough to causes the defrost thermostat to open, the defrost cycle will be terminated. If at the end of 12 minute the defrost board will automatically terminate the defrost cycle. When the defrost cycle is terminated, The defrost board will start the outdoor fan and turn off the reversing valve and electric heater(s). The unit will now be back in a normal heating mode with a heat pump demand for heating.

Field Testing

1. *Run unit in heat mode.*
2. *Check the unit for proper charge.*
Note: Bands of frost may indicate a low refrigerant charge.
3. *Shut off power to unit.*
4. *Disconnect the outdoor fan by removing the fan lead from defrost control.*
5. *Restart unit in heating mode and allow frost to accumulate.*

Field Testing

5. *After a few minutes of operation, the defrost thermostat should close.*
 1. *To verify this, check for 24 volts between "DFT" and "C" on board.*
 2. *If the temperature at the thermostat is less than 28°F and the thermostat is open, replace the thermostat.*
6. *When the defrost thermostat has closed, short the "test" pins on the board until the reversing valve shifts, indicating defrost.*

Field Testing

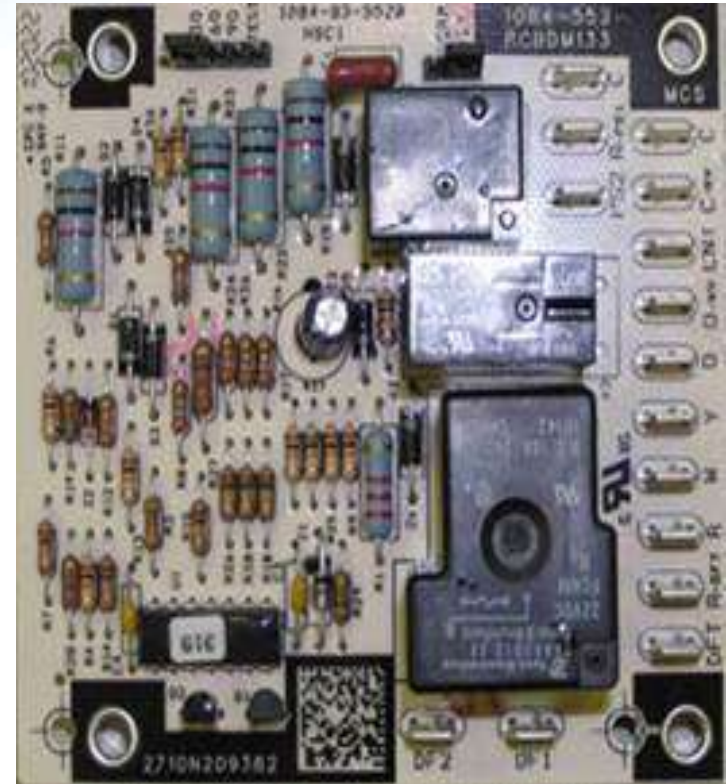
- 7. Placing the jumper in the test position will accelerate the timing by a factor of 128.***
- 8. With the 30/60 control closed a 90 minute defrost interval will time out in approximately 42 seconds, a 14 minute defrost will time out in approximately 7 seconds.***
- 9. If the jumper is in the test position at power up of the board, the jumper will be ignored.***

Field Testing

- 10. After the defrost cycle has terminated check the defrost thermostat for 24 volts between "DFT" and "C". The reading should indicate 0 volts (open sensor)***
- 11. Shut off power to unit.***
- 12. Replace outdoor fan motor lead and tur on power.***

Heat Pump Defrost Components

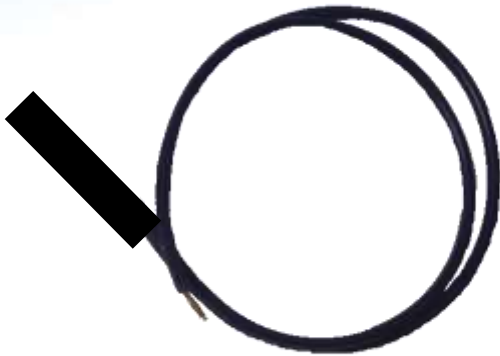
- Mechanical Controls



Heat Pump Defrost Components

16 and 18 SEER Units

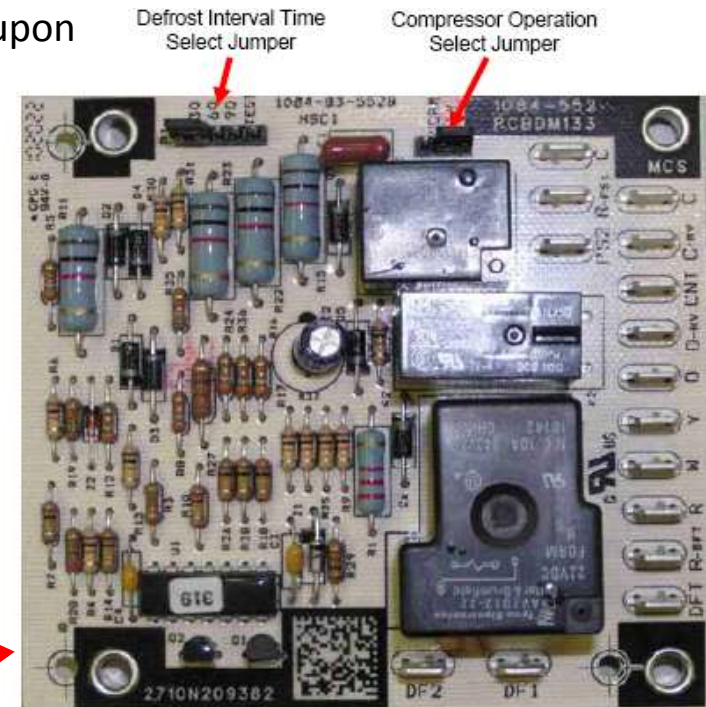
- Electronic Controls



Defrost Control PCBDM133

- Compressor Contactor Powered From CNT Terminal
- Three Minute Compressor Anti Short Cycle Timer
- Low Pressure Switch Connected to R-PS1 and PS2
 - Control ignores LPS for first 5 minutes following defrost initiation and 5 minutes after defrost termination
- Compressor Operation Selector Jumper
 - NORM - Compressor continues to run during defrost initiation and termination
 - DLY-(F) - Compressor is de-energized for 30 seconds upon defrost initiation and termination
- Time/Temp Defrost System
- Field Adjustable Cycles
 - 30, 60 (F), 90 Minutes
 - Begins accumulating compressor run time from Y terminal after 24 volts is applied to DFT (Defrost Thermostat Closes)
- 12 Minute Override
 - Maximum 12 Minute Defrost Cycle
- Test Pins to Speed Up Timer
- (F)= Factory Setting

▪ **Current Defrost Board** →



Sequence of Operations

Defrost Cycle

Defrost sensor closes and appropriate defrost timing has elapsed

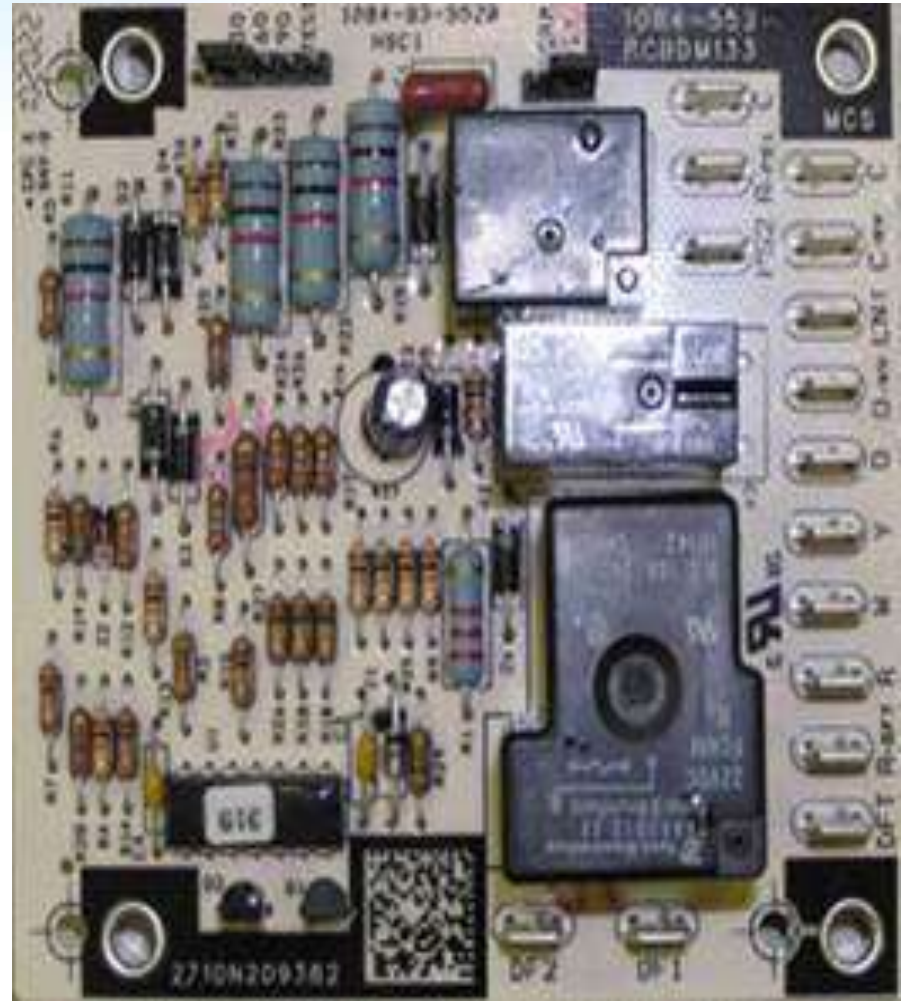
1. “W1” signal is sent to the ignition control immediately starting Trial-for-ignition sequence.
2. Compressor stops for 30 sec. “Smart Shift” delay. (if selected)
3. Reversing valve shifts from heat to cool position.
4. Condenser fan turns off.
5. After 30 seconds the compressor restarts in cooling to de-ice condenser coil.

Defrost sensor re-opens

1. W1” signal is removed to the ignition control immediately turning off gas valve and starting post purge sequence.
2. Compressor stops for 30 sec. “Smart Shift” delay. (if selected)
3. Reversing valve shifts from cool to heat position.
4. Condenser fan turns on.
5. After 30 seconds compressor restarts in heating delivering heat to the space.

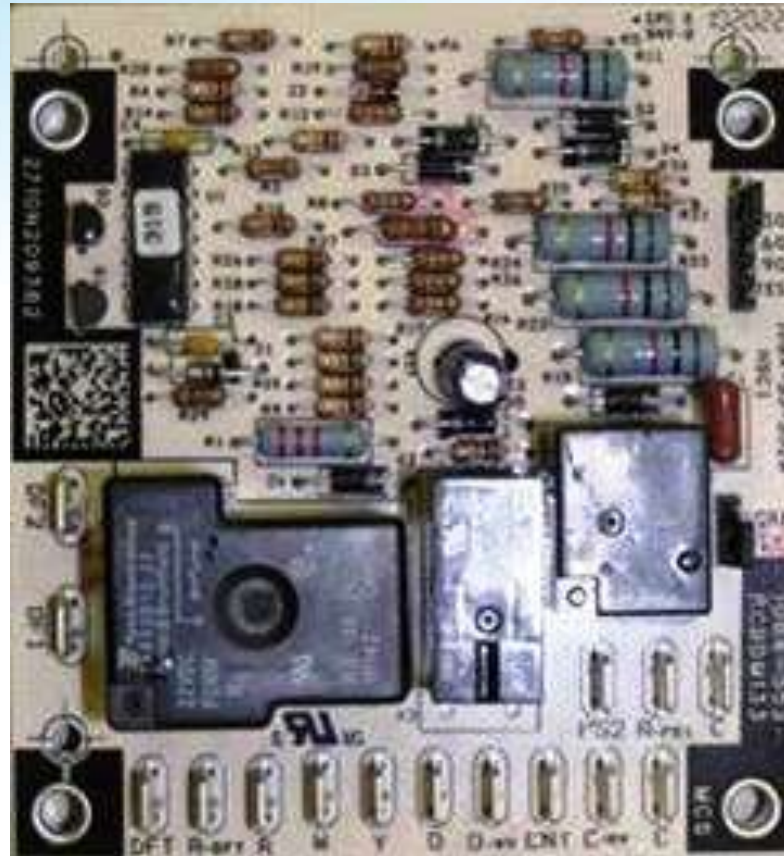
Defrost Methods

- *Temperature*
- *Time & Temperature*



Troubleshooting

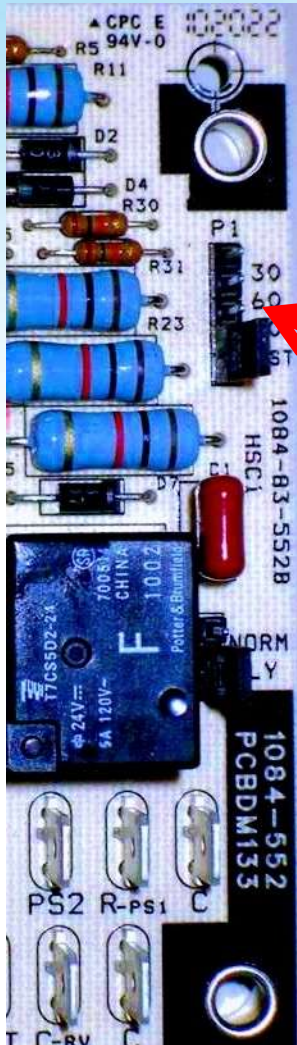
Defrost Control System Check



Check for 24 volts to defrost control.

Troubleshooting

Defrost Control System Check



Install jumper wire across test terminals of control board.

After a few seconds outdoor fan should stop and unit should reverse cycle.

If checks are good, set for shorter defrost time interval.