

# Addendum to EC Series Manual P/N 4209026 Temperature Control/Schematic



Replace the Temperature Control section on page 11 of the EC Series Service Manual. P/N 4209026 with the following:

## TEMPERATURE CONTROL

This mode is used to set the operating parameters within the refrigeration system.

Enter *Service Mode* by pressing the Service Mode Button. Enter Refrigeration control by Pressing the [ **B** ] key.

° *d E G* will display for approximately 1 second followed by the actual temperature as read by the temperature sensor. The display will show four dashes if the controller cannot detect the sensor. If the temperature is over 75°F the display will read *HOT* or if the temperature is below 28°F the display will read *COLD*.

With the temperature displaying, press the [ **A** ] key to display Cut-in temperature or press the [ **B** ] key to display the Cut-out temperature.

With the Cut-in or Cut-out temperature displaying press the [ \* ] key to scroll the set point up or the [ # ] key to scroll the set point down. Pressing the [ **C** ] key at this time will switch the readout to either **C** (Celsius) or **F** (Fahrenheit). Press any other key to save the current value and return to the main *Service Mode* menu.

**Table 5. Controller Default Settings**

SETTING	DEFAULT	RANGE - MIN/MAX
Compressor Cut-In	57°F (14°C)	28° - 75°F (-2.2° - 24°C)
Compressor Cut-Out	52°F (11°C)	28° - 75°F (-2.2° - 24°C)
Defrost Time	15 Minutes (non-adjustable)	

## NOTE

There must be a 5 degree minimum differential between the cut-in and cut-out temperatures.

## Operation

The Operation Section of Temperature Control remains the same.

## Status LEDs

The Status LEDs section of Temperature Control should be deleted from the manual. This section no longer applies.

## REFRIGERATION TROUBLESHOOTING

Replace the Refrigeration Troubleshooting section on pages 12 to 13 of the EC Series Service Manual. P/N 4209026 with the following:

## CAUTION

**Breaking the refrigerant joints or seals on this system voids the unit warranty.**

**Failure to keep the condenser coil clean and free of debris voids the unit warranty**

If the refrigeration unit is turned off or the power is interrupted, the refrigeration unit will not start for at least three (3) minutes regardless of the temperature.

Know and understand how to service the unit and how it operates. Units may vary, but the operation is basically the same. Never guess at the problem; find the symptom before attempting any repair.

## NOTE:

Most refrigeration problems are electrical.

The sealed hermetic system was not meant to be worked on outside the Factory Service Center. The three things that can go wrong with a sealed system and should be repaired at the Factory Service Center are:

1. Low Charge - usually caused by leaks; look for oil around seals and welds. Unit will not cool properly. The capillary tube will be frosted before it enters the evaporator inlet tube.
2. Restriction in Systems (unit frost, then melts) - not cooling properly.
3. Bad valves - unit does not cool properly; noisy compressor.

## Compressor will not start

Compressor has no power:

- Machine not plugged in.
- Tripped breaker or blown fuse.
- Faulty wall outlet.
- Short or tear in power cord.
- Sensor circuit is open. Check with the Multi-Meter.
- Improper wiring.
- Low voltage: 5 % below. Check the power source with the Multi-Meter.
- Overload defective: Trips too fast. Check overload with the Multi-Meter.
- Start relay defective: Check start relay with the Multi-Meter.
- Compressor has open windings. Check compressor windings with a Multi-Meter.
- Defective refrigeration relay.
- Unplug power to the machine; remove the relay plate. Use an insulated jumper wire to short the wires on relay terminals 2 and 4 or 6 and 8; then restore power to the machine. The compressor should start, indicating a problem in the control circuit.
- Check relay terminals 1 to 0 with a Multi-Meter. Should have 24VDC applied to them.
- No DC voltage: Check control board output terminal for a loose connection.

## Compressor trips on Overload

1. Improper voltage: 5-10% above, 5% below. Check power source with Multi-Meter.
2. Overload defective: Trips too fast. Check overload with Multi-Meter.
3. Relay defective: Won't open after starting. Check relay with Multi-Meter.
4. Compressor has shorted windings: Check compressor windings with Multi-Meter.

5. Short in other component: Isolate and eliminate each electrical component until short is found.
6. Compressor is too hot.
  - Dirty condenser.
  - Faulty condenser motor or blade.
  - Restricted air flow.

### CAUTION

Condenser must be kept clean of dirt and debris to allow for proper air circulation.

## Noisy or vibrating unit

1. Components rubbing or touching each other.
  - Check fan blades and motor.
  - Loose shrouds and harness.
  - Copper tubing.
  - Loose or unsecured parts.
2. Worn or aged grommets.
3. Compressor
  - Bad valves
  - Slugging
  - Bad windings (See Figure 7)
  - Low voltage

## Unit short cycles

1. Sensor defective or not mounted in the return air duct.
2. Defective control board.
3. Temperature setting set too warm. See Temperature Control section of this manual.

## Unit operates long or continuously

Sensor defective or not mounted in the return air duct.

1. Refrigeration relay shorted.
2. Air flow restricted
  - Faulty evaporator motor or blades causing coils to ice over.
  - Loose connections on evaporator motor. (One motor not running.)
  - Air flow blocked by product in front of evaporator or air duct openings
3. Gasket leak around door.
4. Excessive load: After loading, unit will run longer to pull out excessive heat from product.
5. Shortage of refrigerant or restriction.

- 6. Bad controller.

### Refrigerated space too cold

- Sensor defective. Check with Multi-Meter.
- Refrigeration control setting too cold. See Temperature Control section of this manual.
- Refrigeration relay bad. Check with Multi-Meter.
- Faulty control board.

### Refrigerated space too warm

1. Sensor defective. Check with Multi-Meter.
2. Refrigeration control setting too warm. See Temperature Control section of this manual.
3. Refrigeration relay bad
4. Faulty control board
5. Restricted evaporator space  
Evaporator motor or blades faulty, causing the coils to ice over the evaporator  
Condenser air flow restricted
  - Plugged or dirty condenser
  - Condenser motor or blades bad
  - Blade stuck
 Condensing space restricted
  - Unit placed too close to a wall.
 Compressor - bad valves
  - Capillary tube will start frosting 8 to 10 inches past evaporator connection tube.
  - Check for oil around brazed connections.

### Troubleshooting circuits with Multi-Meter

- Check the power source. Use voltage section of the Multi-Meter. Should measure within 5-10% above, 5% below.
- Check overload.

NOTE:

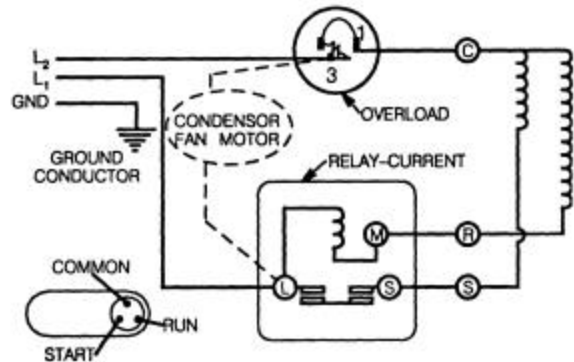
Power must be off and fan circuit open.

Using the resistance section of the Multi-Meter, check terminals 1 and 3 for continuity. If no continuity is measured (infinity), overload may be tripped. Wait 10 minutes and try again. If still no continuity, overload is defective.

- Check relay (See Figure 7) Unscrew lead terminals and remove relay from compressor. (NOTE: keep relay upright)  
Check terminals 1 and S, or L and S with the Multi-Meter. Replace relay if continuity exists.
- Check Sensor with the Multi-Meter.
- Check compressor windings as shown in Figure 7.  
Check winding resistance with the Multi-Meter. If readings are not within 2 Ohms, the compressor is faulty.

### CAUTION

Wiring diagrams must be followed as shown. Any miswiring can cause serious electrical hazard and potential damage or rupture component electrical parts



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Figure 7. Compressor Schematic

Table 7. Winding Resistance

MEASURED BETWEEN	OHMS
COMMON to START	12
COMMON to RUN	2
COMMON to SHELL	No Continuity
RUN to START	14

### SCHEMATIC

Replace the schematic on page 16 with the new schematic on page four of this addendum.

# SCHEMATIC

42Q9038  
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