IDEAL AIR
Portable Air Conditioners
Models: 700870, 700875, 700877

SERVICE MANUAL
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Disassembly
Control panel removal
Electrical parts and relay board removal
Fan motor removal

REFRIGERANT SYSTEM REPAIR

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GENERAL DESCRIPTION

General air conditioning system

1) conventional air conditioners cool the entire enclosed environment.
2) They act as “heat exchangers”, requiring an interior unit (evaporator) to blow cool air into the interior and an exterior unit (condenser) to exhaust exchanged heat to the outdoors.

Portable air conditioning system

1) The 700870 / 700875 / 700877 is a spot cooler which directs cool air to particular areas or objects.
2) The 700870 / 700875 / 700877 has the following features.
3) The innovative design of the 700870 / 700875 / 700877 has resulted in one compact unit, replacing the need for two separate units.
4) With the whole cooling system built into one compact unit, the 700870 / 700875 / 700877 requires no piping and can be easily transported and installed.
5) The 700870 / 700875 / 700877 is economical because it cools only the area or objects which need to be cooled.
SPECIFICATIONS

Exterior Dimension Diagram
<700877>

Dimensions:
- Width: 22.1 inches
- Height: 42.1 inches
- Depth: 24.4 inches

Airflow:
- Total airflow: 22.1 cubic feet per minute

Energy Consumption:
- Power requirement: 36.4 watts

Environmental Specifications:
- Outdoor temperature range: -4°F to 122°F
- Indoor temperature range: 50°F to 100°F

Other Features:
- Portable design
- Durable construction
- Easy-to-use controls
## Technical Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Unit</th>
<th>700870</th>
<th>700875</th>
<th>700877</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooling Capacity</strong></td>
<td>Btu/h</td>
<td>13,200</td>
<td>19,500 / 21,000</td>
<td>28,000 / 29,000</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td></td>
<td>Single</td>
<td>Single</td>
<td></td>
</tr>
<tr>
<td>Volts</td>
<td></td>
<td>115</td>
<td>208 / 230</td>
<td>208 / 230</td>
</tr>
<tr>
<td>Hertz</td>
<td></td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>Watts</td>
<td>1,300</td>
<td>2,300</td>
<td>3,100</td>
</tr>
<tr>
<td><strong>Rated Current</strong></td>
<td>Amps</td>
<td>Toshiba 11.5</td>
<td>LG 10.9</td>
<td></td>
</tr>
<tr>
<td><strong>EER</strong></td>
<td>Btu/Wh</td>
<td>8.6</td>
<td>8.9</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Circuit Breaker Size</strong></td>
<td>Amps</td>
<td>15</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Nema Plug</strong></td>
<td>Type</td>
<td>5-15P</td>
<td>6-15P</td>
<td>6-20P</td>
</tr>
<tr>
<td><strong>Power Cord Gauge</strong></td>
<td>Awg</td>
<td>14</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td><strong>Power Cord Length</strong></td>
<td>ft</td>
<td>10</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Dimensions (W x H x D)</strong></td>
<td>In.(mm)</td>
<td>17.5 x 54.9 x 19.9 (445 x 1395 x 505)</td>
<td>22.0 x 62 x 24.4 (560 x 1575 x 620)</td>
<td>22.0 x 62 x 24.4 (560 x 1575 x 620)</td>
</tr>
<tr>
<td><strong>Weight (Net / Gross)</strong></td>
<td>Lbs(kg)</td>
<td>132 / 145.5 (60 / 66)</td>
<td>198 / 216 (90 / 98)</td>
<td>209 / 227 (95 / 103)</td>
</tr>
<tr>
<td><strong>Condensate tank</strong></td>
<td>Gallons(Liters)</td>
<td>3.17 (12)</td>
<td>3.17 (12)</td>
<td>3.17 (12)</td>
</tr>
<tr>
<td><strong>No. of Cool Air Outlets</strong></td>
<td>Pcs</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Ambient temperature range</strong></td>
<td>°F(°C)</td>
<td>64<del>113 (18</del>45)</td>
<td>64<del>113 (18</del>45)</td>
<td>64<del>113 (18</del>45)</td>
</tr>
<tr>
<td><strong>Setting temperature (Room cool mode)</strong></td>
<td>°F(°C)</td>
<td>64<del>86 (18</del>30)</td>
<td>64<del>86 (18</del>30)</td>
<td>64<del>86 (18</del>30)</td>
</tr>
<tr>
<td><strong>Setting temperature (Spot cool mode)</strong></td>
<td>°F(°C)</td>
<td>32<del>86 (0</del>30)</td>
<td>32<del>86 (0</del>30)</td>
<td>32<del>86 (0</del>30)</td>
</tr>
<tr>
<td><strong>Application Area (Room cool mode)</strong></td>
<td>ft²(m²)</td>
<td>377 (35)</td>
<td>527 (50)</td>
<td>743 (70)</td>
</tr>
<tr>
<td><strong>Refrigerant</strong></td>
<td>Type</td>
<td>R-410A</td>
<td>R-410A</td>
<td>R-410A</td>
</tr>
<tr>
<td><strong>Design Pressure - Hi/Low</strong></td>
<td>Psig</td>
<td>42.3 (1200)</td>
<td>39.9 (1130)</td>
<td></td>
</tr>
<tr>
<td><strong>Indoor Air Flow (High/Low)</strong></td>
<td>CFM(CMH)</td>
<td>283 / 247 (480 / 420)</td>
<td>512 / 477 (870 / 810)</td>
<td>583 / 547 (990 / 930)</td>
</tr>
<tr>
<td><strong>Wheels</strong></td>
<td>pcs</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hot Air Duct Diameter</strong></td>
<td>In.(mm)</td>
<td>12 (300)</td>
<td>16 (400)</td>
<td>16 (400)</td>
</tr>
<tr>
<td><strong>Maximum Duct Length</strong></td>
<td>ft(m)</td>
<td>16 (5)</td>
<td>30 (9)</td>
<td>30 (9)</td>
</tr>
<tr>
<td><strong>Safety Devices</strong></td>
<td></td>
<td>Compressor overload protector, Anti-freezing thermister, Full drain tank switch, Automatic restart (Power interruption), Compressor time delay program, High pressure switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
<td>Temperature control, Self-diagnostic function, Two speeds fan, Optional drain pump kit, Washable filters, °F(°C) display</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Specifications are subject to change without notice.
CONSTRUCTION

Internal Structure

<700870>
REFRIGERANT SYSTEM CONSTRUCTION

<700870,700875,700877>

Flow of Refrigerant

Condenser Air Outlet

Condenser Motor

Condenser

Evaporator

Capillary tube

Compressor

Accumulator

Drier
Compressor

The construction of a rotary type compressor is divided into two mechanisms; the drive mechanism (compressor motor), and the compression mechanism (compressor). When the rotor shaft of the motor (drive mechanism) turns, the roller (compression mechanism) rotates to compress the refrigerant.
Compressor operation

1) Start of compression
1) The cylinder is filled with low pressure gas.
2) Since pressure in the discharge chamber is higher than in the cylinder, the discharge valve is kept closed.

2) Suction and compression
1) The pressure in the cylinder increases gradually.
2) Refrigerant suction begins on the suction side of the cylinder.
3) The discharge valve remains closed.

3) Discharge
1) The pressure in the cylinder exceeds that in the discharge chamber, and the discharge valve opens.
2) On the suction side, refrigerant suction continues.

4) Completion of compression
1) When compression is completed, all of the refrigerant has been drawn from the suction chamber.
2) Operation then returns to step 1)(Start of compression) and the above process of suction and compression continues repeatedly in succession.
Compressor lubrication

The lubrication system is comprised of a hollow shaft, an oil scraper mounted at the end face, hollow shaft, a shaft journal (shaft bearing), and the lubrication groove for the shaft journal. The lubrication groove is wider than the oil hole. When the shaft turns, oil is scraped upward by the oil scraper along the inside diameter of the hollow shaft. The oil is fed through the oil hole by centrifugal force, then supplied to the lubrication groove for each shaft journal, lubricating the bearing. In this lubrication system, oil enters into each bearing separately and returns to the oil reservoir. This system effectively prevents bearing temperature increases, and offers high reliability. In addition, the specially treated shaft journal keeps the bearing from being damaged during high temperature operation.

Condenser

1) The condenser is a heat exchanger with Louver fins.
2) Heat is given off and absorbed by air being pulled across the condenser fins by the axial fan. The air is then expelled through the condenser air outlet.
Capillary Tube

The capillary tube is a long thin tube that utilizes line flow resistance as an expansion valve. The length and the inner diameter of the capillary tube are determined according to the capacity of the refrigeration system, operating conditions, and the amount of refrigerant. The high pressure, high temperature liquid refrigerant sent from the condenser expands rapidly as the refrigerant is sprayed out through the fixed orifice in the capillary tube. As a result, the temperature and state of the refrigerant becomes low and mist-like, and therefore evaporates easily.

Evaporator

The evaporator is a heat exchanger covered with slit fins. Heat is removed from the air being pulled across the evaporator by the centrifugal fan. The resulting cool air is expelled through the cooling air ducts.

Accumulator

The accumulator is mounted on the suction gas piping between the evaporator and the compressor. The accumulator separates the liquid refrigerant from the gas refrigerant, allowing only the gas refrigerant to enter the compressor. In the accumulator, suction gas is led into a cylindrical vessel where the speed of the gas is decreased. This process separates the refrigerant contained in the gas by the force of gravity, causing the refrigerant to accumulate at the bottom of the vessel. As a result, the compressor is protected from possible damage caused by liquid refrigerant intake.
ELECTRICAL SYSTEM

Circuit Diagram

<700870>
Control panel
Before operating the unit, it is important to be familiar with the basic operation of the control panel.

1. **POWER BUTTON**
   - Activates unit when POWER BUTTON is pressed.
   - Fan starts on low speed.
   - If POWER BUTTON is pressed during operation, unit stops.

2. **BLOWER BUTTON**
   - Changes fan speed from LOW to HIGH when pressed.

3. **SPOT / COOL BUTTON**
   - Activates compressor and begins producing cool air 5 seconds after button is pressed.
   - Regulates temperature based on outlet cool air temperature.

4. **ROOM / COOL BUTTON**
   - Activates compressor and produces cool air 5 seconds after button is pressed.
   - Regulates temperature based on inlet ambient air temperature.
5. **SET TEMP BUTTON**
   - Change target temperature / data value by ± 1.
   - Change data value by ± 10 by pressing continually.
   - Press the SET TEMP BUTTONS to set temperature.
   - Upper button is to heighten temperature and Lower button is to lower temperature.

6. **ALARM**
   - Alarm indicator light blinks and indicates abnormal system operation.
   - If Alarm occurs, compressor stops.
   - System operation stops when ALARM light is activated / blinking longer than 3 minutes.

7. **CURRENT TEMP**
   - Room cool mode displays current room temperature in display in Fahrenheit.
   - SPOT / COOL Mode displays outlet (cool air) temperature during normal operations.
   - In order to change °F to °C, press SPOT / COOL and ROOM / COOL buttons together for 2 seconds.
   - °C will blink 2 times and the figure will change to °C
   - ALARM codes blink and are displayed when abnormal operation occurs.

8. **TARGET TEMP**
   - Displays the unit set temperature for ROOM COOL mode only.

**NOTE:** The room temperature display range is from 14 °F to 122 °F.
(When displayed in “°C” the range is from -10 °C to 50 °C)
Program Setting

Temperature Setting

![Temperature Setting Diagram]

Program Setting (Auto restored when no setting is made in each mode)

![Program Setting Diagram]

<table>
<thead>
<tr>
<th>Indication</th>
<th>Description</th>
<th>the range of setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>dt</strong></td>
<td>Delay time setting of COMP operation. Ex) If setting is 3mins, it takes 3mins to be ON after COMP is OFF.</td>
<td>1-5 minutes, control is available per 1 minute</td>
</tr>
<tr>
<td><strong>df</strong></td>
<td>Deviation temp setting. Ex) It operates between 30°C to 34°C (±2°C), if df setting is 2°C under 32°C (temp setting).</td>
<td>1°C ~ 5°C</td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td>Temperature Correction</td>
<td>-10°C ~ +10°C</td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td>Temperature Correction</td>
<td>-10°C ~ +10°C</td>
</tr>
<tr>
<td><strong>IC</strong></td>
<td>IC temperature setting (Frost prevention sensor)</td>
<td>-5°C ~ +5°C</td>
</tr>
</tbody>
</table>
Relay Board

The relay board contains the compressor and fan on relays, in addition to a step-down transformer that converts the line voltage (700870: 115 VAC, 700875: 208/230, 700877: 208/230 VAC) to 12V. This voltage is then converted from AC to DC and used for relay coil activation. The 12 V (DC) power is sent to the control panel assembly.

1) Power supply requirements
The 700870 requires a single-phase 115 V, 60 Hz power supply, while the 700875 / 700877 requires a single-phase 208/230 V, 60 Hz power supply.

2) Relay board fuse
The relay board fuse is the only serviceable component on the relay board assembly. This fuse provides protection against damage to the step-down transformer. The fuse must be replaced with the exact same part, or a suitable equivalent.

Specifications: 3.15 A 250 VAC

⚠️ CAUTION  
*Failure to use the exact same fuse may result in damage to the unit and/or components, and will also void the unit warranty.*
3) Input Signal
The relay board receives inputs from the control panel, sensors, and external devices to perform device control.

**Control Panel Input**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Indication</th>
<th>Function</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON/OFF Button</td>
<td>If POWER BUTTON is pressed during operation, unit stops.</td>
<td>CON8</td>
<td></td>
</tr>
<tr>
<td>FAN Button</td>
<td>Changes fan speed from LOW to HIGH when pressed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET TEMP △ Button</td>
<td>Regulates temperature based on outlet cool air temperature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET TEMP ▽ Button</td>
<td>Regulates temperature based on inlet ambient air temperature.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sensor Input**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Specification</th>
<th>Connector</th>
</tr>
</thead>
</table>
| TH1    | OUT TEMP SENSOR    | 10 k ohm at 77 °F (25 °C)  
181 °F (83 °C) or more  
-29 °F (-34 °C) or less | TH1       |
| TH2    | IN TEMP SENSOR     | 10 k ohm at 77 °F (25 °C)  
181 °F (83 °C) or more  
-29 °F (-34 °C) or less | TH2       |
| TH3    | ICE TEMP SENSOR    | 10 k ohm at 77 °F (25 °C)  
181 °F (83 °C) or more  
-29 °F (-34 °C) or less | TH3       |

**External Input Signal Specification**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Signal</th>
<th>Specification</th>
<th>Function</th>
<th>Connector</th>
</tr>
</thead>
</table>
| CO     | Comp Overload       | On: Between 10 to 20 mA at DC12 V  
Off: No signal                                                                                   | On: Activates “Defect control”  
(Contact: Normally open)  
LED shows “CO”, Output signal “ON”                                                                 | CO        |
| FU     | External Pump Failure | On: Between 10 to 20 mA at DC12 V  
Off: signal                                                                                   | Off: Activates “Defect control”  
(Contact: Normally open)  
LED shows “FU”, Output signal “ON”                                                                 | FU        |
| PS     | Pressure Switch     | On: Between 10 to 20 mA at DC12 V  
Off: signal                                                                                   | On: Activates “Defect control”  
(Contact: Normally closed)  
LED shows “PS” output signal “ON”                                                                 | PS        |
| FT     | Tank Full Switch    | On: Between 10 to 20 mA at DC12 V  
Off: signal                                                                                   | On: Activates “Defect control”  
(Contact: Normally closed)  
LED shows “FT”, Output signal “ON”                                                                 | FT        |
Control Specifications

1) EVAPORATOR FAN MOTOR
   • When the BLOWER button is pressed, the RL1/3 (fan motor HI/LOW) relay on the relay board turns on, operating the fan.

Specifications:
- RL1/3 (Fan motor HI-LOW) relay output: 10 A at AC 250 V

2) Compressor start control
   • When the ON/OFF button is pressed, the RL4 relay on the relay board turns on, operating the compressor.

Specifications:
- RL4 (Compressor On-Off) relay output: 5 A at AC 250 V

3) Anti-freeze control
   • Anti-freeze controls turns the compressor on and off by turning the RL4 relay on in accordance with the freeze protection thermistor (TH3) temperature. As a result, decreases in cooling performance due to frost buildup on the evaporator are prevented.
   • Compressor off conditions: Freeze protection thermistor (TH3) temperature ≤ 28.4 °F (-2 °C)
   • Compressor on (recovery) conditions: TH3 (ICE temperature) ≥ 33.8 °F (1 °C)

\[ \begin{array}{c|c|c|c|}
   & ON & OFF & \\
   C3 & | & | & \\
   \hline
   28.4 °F & 33.8 °F & \rightarrow & \text{TH3 temperature} \\
   (-2 °C) & (1 °C) & & \text{(Evaporator out temperature)} \\
\end{array} \]
4) Compressor time delay control (compressor protection)
Compressor protection consists of a time delay program within the microprocessor. This program prevents a heavy load from being applied to the compressor motor when restarting the unit (room/cool mode or spot/cool mode) after a very short period of time. This “delay” is in effect any time the compressor is turned on by either the POWER ON/OFF button or ROOM/COOL or SPOT/COOL ON/OFF button.

**Specifications:**
- Time Delay: 120 sec.

5) Automatic restart and recovery function
• The microprocessor contains a feature that automatically restart the unit after power is lost and regained, and also has memory to store and recover operation status in the even of a power loss.

**Status of memory during power interruption**
• When the input power is off, the status items below are saved in the memory.
  - Running status (on or off)
  - Operating mode: Cool mode or fan only mode
  - Set temperature
  - Temperature mode (°F or °C)
6) Temperature control

- During cool mode, temperature control changes the RL4 (compressor on/off) relay status according to TH3 temperature in the available range (-4 °F to 140 °F (-20 °C to 60 °C)).

![Diagram]

When compressor operation continues within this range for more than 5 minutes, the RL4 relay stops.
# Self-Diagnostic Codes

Self-diagnostic codes are displayed on the Display Panel under the following conditions.

<table>
<thead>
<tr>
<th>Alarm Display</th>
<th>Problem</th>
<th>Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| 11            | Frost prevention sensor and Abnormal temperature sensor value | • Indoor heat exchanger temperature too low  
• TH3 temperature sensor has a loose or broken connection | • Do not use the air conditioner if ambient temperature is lower than 18°C (64°F)  
• Contact a qualified service agent |
| 15            | Refrigerant high pressure switch | • Blocked air filter  
• Blocked / kinked exhaust duct  
• Ambient temperature is too high | • Clean air filter  
• Ensure exhaust duct is not blocked / kinked  
• Do not use the air conditioner if ambient temperature is higher than 45°C (113°F) |
| 31            | Abnormal temperature sensor value | TH1(Outlet) temperature sensor has a loose or broken connection | Contact a qualified service agent |
| 32            | Abnormal temperature sensor value | TH2(Inlet) temperature sensor has a loose or broken connection | Contact a qualified service agent |
| 10            | Compressor overloaded | • Ambient temperature is too high  
• Unstable voltage supply  
• Defective compressor | • Do not use the air conditioner if ambient temperature is higher than 45°C (113°F)  
• Contact a qualified service agent  
• Replace compressor |
| 11            | Condensate water level alarm | Condensate tank is full | • Empty the water tank  
• After installation of the water tank, press the SPOT/COOL or ROOM/COOL button to resume operation |
| 11            | Drain pump alarm | Drain pump defective or improper hose connection (including kink or blockage) | • Check the hose connection and hose  
• Replace drain pump |
Compressor

1) Compressor motor
- The compressor motor is a single-phase motor and is contained within the same housing as the compressor.

Specifications:

<table>
<thead>
<tr>
<th></th>
<th>Rated Voltage</th>
<th>Rated Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>700870</td>
<td>115V</td>
<td>1175W ±5%</td>
</tr>
<tr>
<td>700877</td>
<td>208/230 V</td>
<td>2700W / 2715W ±5%</td>
</tr>
</tbody>
</table>

2) Compressor overload relay
- The compressor overload relay is used to protect the compressor motor. The relay interrupts the flow of current when there is an overload condition and, high temperature builds up in the compressor.
**Evaporator Fan Motor**

- The fan motor is a single phase, induction type. The motor rotates the fan.
- The following table shows the specifications of the fan motor used for each model.

**NOTE:** An internal overload relay is used to protect the fan motor. This relay is built into the fan motor and interrupts the flow of current when there is an over current situation, or if abnormally high temperature builds up in the fan motor.

---

**Condenser Fan Motor**

- The fan motor is a single phase, induction type. The motor rotates the fan.
- The following table shows the specifications of the fan motor used for each model.

**NOTE:** An internal overload relay is used to protect the fan motor. This relay is built into the fan motor and interrupts the flow of current when there is an over current situation, or if abnormally high temperature builds up in the fan motor.
Capacitor Capacitor

- The capacitor is used to improve the rotational power of the fan motor and compressor at start up. The specification for each capacitor is shown below.

<table>
<thead>
<tr>
<th>Capacitor</th>
<th>Rated Voltage</th>
<th>Capacitance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>250 v</td>
<td>45uF</td>
</tr>
<tr>
<td>Evaporator Fan Motor</td>
<td>450 v</td>
<td>10uF</td>
</tr>
<tr>
<td>Condenser Fan Motor</td>
<td>450 v</td>
<td>3.5uF</td>
</tr>
<tr>
<td>Compressor</td>
<td>370 v</td>
<td>50uF</td>
</tr>
<tr>
<td>Evaporator Fan Motor</td>
<td>450 v</td>
<td>8uF</td>
</tr>
<tr>
<td>Condenser Fan Motor</td>
<td>450 v</td>
<td>8uF</td>
</tr>
<tr>
<td>Compressor</td>
<td>370 v</td>
<td>50uF</td>
</tr>
<tr>
<td>Evaporator Fan Motor</td>
<td>450 v</td>
<td>5uF</td>
</tr>
<tr>
<td>Condenser Fan Motor</td>
<td>450 v</td>
<td>7uF</td>
</tr>
</tbody>
</table>

Temperature Sensor

- Outlet temp sensor (TH1) is installed on top of the evaporator, and detects evaporator outlet temperature as a resistance value.
- Inlet temp sensor (TH2) is installed in front of evaporator, and detects evaporator inlet temperature as a resistance value.
- Ice temp sensor (TH3) is installed in the evaporator outlet piping, and detects low temperature on the evaporator as a resistance value.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Specification Characteristic</th>
<th>&quot;Short&quot;Detection</th>
<th>&quot;Open&quot;Detection</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH1</td>
<td>OUT TEMP SENSOR</td>
<td>10 k ohm at 77 °F (25 °C)</td>
<td>181 °F (83 °C) or more</td>
<td>-29 °F (-34 °C) or less</td>
<td>TH1</td>
</tr>
<tr>
<td>TH2</td>
<td>IN TEMP SENSOR</td>
<td>10 k ohm at 77 °F (25 °C)</td>
<td>181 °F (83 °C) or more</td>
<td>-29 °F (-34 °C) or less</td>
<td>TH2</td>
</tr>
<tr>
<td>TH3</td>
<td>ICE TEMP SENSOR</td>
<td>10 k ohm at 77 °F (25 °C)</td>
<td>181 °F (83 °C) or more</td>
<td>-29 °F (-34 °C) or less</td>
<td>TH3</td>
</tr>
</tbody>
</table>
Drain Tank Switch

- The drain switch activates and stop the operation of compressor motor and fan motor when approximately 3.17 gal (12 L) of drain water accumulates in the drain tank. At the same time, control panel display “FL”, and compressor and fan operations stop. This system uses a 250 V, 0.1 A rating micro switch for this function.
- When approximately 3.17 gal (12 L) of drain water accumulates in the drain tank, the drain tank base plate, which is supported at fulcrum (a), is pushed down in the direction of the arrow.
- When the drain tank base plate is forced down, “portion A”, located at the top of the drain tank base plate, turns off micro switch contacts (1)-(2).
ASSEMBLY

Component parts

Cool air outlet hose
Top fan wire grille
Display / Control board
Evaporator / filter
Guide bar for condensate water tank
Condensate water tank (Water level is sensed, and the unit operation is stopped when tank is full. An alarm will be displayed. Empty the tank and replace to resume operation)

1. Take out the cord holder from the accessory box.
2. Place the cord holder on the back side of air conditioner.
3. Use screws (enclosed inside of accessory box with cord holder) to install the cord holder on the air conditioner as shown in Figure 3.

1. Take out the rubber stoppers from the accessory box.
2. Place the rubber stoppers on the back side of air conditioner.
3. Use screws (enclosed inside of accessory box with rubber stoppers) to install the rubber stoppers on the air conditioner as shown in Figure 4.

1. Remove cool air outlet hose(s) from carton.
2. Place the cool air outlet hose(s) on the front top of air conditioner.
3. Use screws (enclosed inside of box with cool air outlet hose(s) to install the cool air outlet hose(s) on the air conditioner as shown in Figure 5.

(Official)
A warm air top exhaust duct can be purchased separately. Exhaust duct fits over the top exhaust fan duct improving cooling efficiency, allowing hot air to be exhausted to another location.
1. Remove duct from carton.
2. Place duct on the top of air conditioner.
3. Use screws (enclosed inside of box with duct) to install duct on air conditioner as shown in Figure 6.
General Safety Information

Please read this manual carefully for instructions on correct installation and usage. Please read all safeguards.

1. Transport and store the unit in an upright position only. Leave unit in an upright position for at least 3 hours before first use.
2. Always place the unit on an even, level surface.
3. Ensure the unit is connected to a grounded power supply of the correct rating/capacity.
4. The unit will cool when the room temperature is between 18°C (64.4°F) ~ 45°C (113°F) depending on the thermostat setting.
5. DO NOT use this unit for functions other than those described in this instruction manual.
6. DO NOT tilt the unit.
7. DO NOT cover or obstruct the unit’s inlet and outlet grilles.
8. DO NOT use the unit in areas where it will be exposed to rain or water.
9. NEVER unplug the unit while it is operating.

![WARNING] DO NOT use the unit in wet environments, such as a laundry room, to avoid the risk of electrical shock.

10. DO NOT place any foreign objects on the unit.
11. DO NOT operate the unit with wet or damp hands.
12. DO NOT allow chemical substances to come into contact with the unit.
13. DO NOT operate the unit in the presence of flammable substances or vapors such as alcohols, pesticides, gasoline, etc.

![WARNING] DO NOT operate the unit in explosive or flammable environments.

14. DO NOT use the plug to start and to stop the unit. Always use the control panel to start and to stop the unit.
15. Always turn off the unit when it is not in use and unplug the power plug from the electrical outlet.
16. Always turn the unit off and unplug the main power plug from the electrical outlet before cleaning, moving or performing maintenance.
17. AVOID the use of adapter plugs or extension cords. If it is necessary to use an extension cord or an adapter plug to operate the unit, ensure that they are correctly rated for the application. Consult a local qualified electrician and all local electrical codes to ensure proper setup. Any extension cord used with this device must be rated for a minimum of 15A.

18. DO NOT unplug the unit by pulling on the electrical cord. Keep electrical cord away from heat sources and always completely unroll the cord to avoid overheating. If the power cord becomes damaged, a qualified service agent, qualified electrician, or similarly qualified person must replace it, in order to avoid a hazard or shock.

**WARNING**  
DO NOT operate a unit with a damaged power cord.

19. The filters must be used with the product at all times. When the filters are removed for cleaning, always ensure that the unit has been turned off and unplugged from the electrical outlet.

20. Regularly clean the filters to maintain efficiency. If the filters are not cleaned regularly, the units output performance and efficiency will decline and energy consumption will increase.

21. DO NOT operate the unit with a damaged power cord or plug, after it malfunctions, has been dropped or damaged.

22. Only use in the upright position on an even, flat surface. Unit must be positioned at least 24 inches (60 cm) from the nearest object in any direction.

23. Stop operation immediately if abnormal noise or odor is noticed. Contact a local service center.

24. Appliance is not to used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

25. Children being supervised not to play with appliance.

26. That the appliance shall be installed in accordance with national wiring regulations.

27. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

SAVE THESE INSTRUCTIONS
## Troubleshooting chart

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause(s)</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water leakage</td>
<td>High water level in condensate tank</td>
<td>1. Remove blockage from drain hose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Remove any object stuck underneath of the black panel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>under the water tank</td>
</tr>
<tr>
<td>The unit doesn’t work</td>
<td>1. Check the power supply to verify that power is</td>
<td>1. Reset the circuit breaker and restart the unit</td>
</tr>
<tr>
<td></td>
<td>available to the unit</td>
<td>2. Connect power cord</td>
</tr>
<tr>
<td></td>
<td>2. Verify that the power cord is connected</td>
<td></td>
</tr>
<tr>
<td>No cold air flows from the cold air outlet</td>
<td>1. Ambient air cannot be properly cooled if the filter</td>
<td>1. Clean the filter</td>
</tr>
<tr>
<td></td>
<td>is dirty and not regularly cleaned</td>
<td>2. Wait 2 minutes after unit is turned off before turning the unit</td>
</tr>
<tr>
<td></td>
<td>2. Compressor will not work if the unit is turned</td>
<td>3. The temperature of the compressor can be higher when the ambient</td>
</tr>
<tr>
<td></td>
<td>off and on quickly</td>
<td>temperature is too high. The compressor will not work unless</td>
</tr>
<tr>
<td></td>
<td>3. The ambient air temperature may be too high</td>
<td>the ambient air temperature is within the acceptable operating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>range of the unit</td>
</tr>
<tr>
<td>Water flow can be heard after compressor</td>
<td>No cause</td>
<td>Common to hear coolant flowing after unit shuts off</td>
</tr>
<tr>
<td>shuts off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm displays “FT” with less than half of</td>
<td>Spring is possibly broken</td>
<td>Replace a new spring</td>
</tr>
<tr>
<td>condensate water in the tank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring is possibly broken</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DISASSEMBLY (For 700870)

Disassembly

1) Remove the drain tank.
2) Take out the four (4) screws, and then remove the cooling air duct.

3) Take out the three (3) screws, and then remove the electric cover.

4) Off the circuit breaker. (For safety)
5) Take out the seven (7) screws. Unfasten two (2) screws to a half point. Pull the front panel forward.

6) Disconnect the connector from the control panel and then remove the front panel.

7) Take out the five (5) screws, and then remove the upper panel.
8) Take out the five (5) screws, and then remove the back cover.

9) Remove the air filter from the right-side panel.
10) Take out the ten (10) screws, and then remove the Right-side panel.

⚠️ CAUTION

Be careful not to damage temperature sensor.

11) Remove the air filter from the left-side panel.
12) Take out the eight (8) screws, and then remove the Left-side panel.
Control Panel Removal

1) Take out the four (4) screws, and then remove the control panel.
Electrical parts and relay board removal

<700870>

- Capacitor for Compressor
- Condenser Motor
- TH1, TH2, TH3
- Data Cable Connector
- MC: Magnetic Contactor
- Compressor (R-C)
- Fan Motor for Condenser
- OCR: Over Current Relay
- MCCB: Mold Case Current Braker
- Full Drain Switch

Diagram showing electrical parts and connections.
Fan Motor Removal

1) Take off the three (3) bolts of evaporator top cover.
2) Loosen the set screw with a hex key, and then remove the evaporator fan.
3) Take off the five (5) bolts of the Eva scroll, and then remove the Eva scroll.
4) Loosen the set screw with a hex key, and then remove the condenser axial fan.
5) Take off the four (4) hex bolts from the condenser motor bracket, and then remove the condenser fan motor.
6) Take off the four (4) hex bolts from the evaporator motor bracket, and then remove the evaporator fan motor.
**DISASSEMBLY (For 700875,700877)**

Disassembly

1) Remove the drain tank.
2) Remove two (2) support lines and remove front panel.
3) Take out the twelve (12) screws, and then remove the cooling air duct. (700875 : eight (8) screws)

4) Take out the three (3) screws, and then remove the service panel.

5) Off the circuit breaker. (For safety)
6) Take out the fourteen (14) screws, and then remove the upper panel.

7) Unfasten the connector from the control panel and then remove the front panel.

8) Remove the air filter from the back panel.

9) Take out the two (2) screws, and then remove the back plate panel.
10) Take out the eight (8) screws, and then remove the back cover panel.

11) Take out the four (4) screws. Unfasten two (2) screws to a half point and then remove the low cover panel.

12) Take out the eight (8) screws, and then remove the right-side panel.
13) Take out the eight (8) screws, and then remove the left-side panel.

Control Panel Removal

1) Take out the four (4) screws, and then remove the control panel.
Electrical parts and relay board removal

<700875,700877>

- MC: Magnetic Contactor
- Capacitor for Compressor
- Capacitor for Condenser Motor
- Capacitor for Evaporator Motor
- Fan Motor for Condenser
- Data cable connector
- Full Drain Switch
- TH1, TH2, TH3
- MCCB: Mold case
- Current Braker
- OCR: Over Current Relay
- Compressor (R-C)
- Compressor (S)
- Condenser Motor
- Evaporator Motor
Fan Motor Removal

1) Take off the three (3) bolts of evaporator top cover.
2) Loosen the set screw with a hex key, and then remove the evaporator fan.
3) Take off the five (5) bolts of the Eva scroll, and then remove the Eva scroll.
4) Loosen the set screw with a hex key, and then remove the condenser axial fan.
5) Take off the four (4) hex bolts from the condenser motor bracket, and then remove the condenser fan motor.
6) Take off the four (4) hex bolts from the evaporator motor bracket, and then remove the evaporator fan motor.
REFRIGERANT SYSTEM REPAIR

Brazing

• In the event of a leak, obstruction, or trouble in the refrigerant system of the unit, replace or repair the defective component. After replacing defective component, braze all connections.

1) Proper brazing techniques
• When brazing, use a slightly reduced flame. Oxyacetylene is commonly used since the flame condition can be easily judged and adjusted. Unlike gas welding, a secondary flame is used for brazing. Properly preheat the base metal according to the shape, size and thermal conductivity of the brazed fitting.
• The most important point in flame brazing is to bring the entire brazed fitting to a proper brazing temperature. Care should be taken not to cause overflow of the brazing filler metal, oxidation of the brazing filler metal, or filler metal deterioration due to overheating the flux.

2) Brazed fittings and fitting clearance
• In general, the strength of the brazing filler metal is lower than that of the base metal. As such, the shape and clearance of brazed fittings are very important. Concerning the shape of brazed fittings, adhesive area must be maximized. In addition, the clearance of the brazed fitting must be minimized so that the brazing filler metal will flow into the fitting via capillary action.
3) Cleaning brazing filler metal and piping
   • When the refrigerant system has been opened, exposure to heat may cause the brazing filler metal to stick to the inside and outside of the piping. Brazing filler metal may also combine with oxygen in the air to form an oxide film. In addition, grease and oils may stick to the pipe during handling. All these factors will reduce the effectiveness of brazing. Therefore, excess brazing filler metal must be removed with sand paper, and by thorough cleaning with a solvent such as Trichlene.

4) Dry Nitrogen gas use
   • During brazing, the inside of the pipe undergoes an oxidative reaction due to the brazing flame. Introduce dry nitrogen gas (0.3 gal/min (1 L/min); adjust with the flow regulator) through the pinch-off tube of the refrigerant cycle to prevent oxidation.

   **NOTE:** Do not get foreign matter such as dirt, water, or oil into the piping.

5) Vertical joints
   • For vertical joints, heat the entire brazed fitting to the proper brazing temperature. Bring the brazing filler metal into contact with the fitting so that the brazing filler metal begins to flow.
   • Stop heating the fitting as soon as the brazing filler metal has flown into the gap (clearance). Since the brazing filler metal flows easily into portions heated to the proper temperature, the entire fitting must be kept at the proper brazing temperature.
Charging the System with R-410A Refrigerant

- Always ensure that the refrigerant system has been properly evacuated before charging with the specified amount of R-410A.
- Equipments is only for R-410A.
- Liquid charge (no gas charge).
- Make sure not to use more than 90% of the initial weight of R-410A in the cylinder.

**WARNING**

- When handling refrigerant (R-410A), the following precautions should always be observed:
  - Always wear proper eye protection while handling refrigerant.
  - Maintain the temperature of the refrigerant container below 104 °F (40 °C).
  - Perform repairs in a properly ventilated area. (Never in an enclosed environment.)
  - Do not expose refrigerant to an open flame.
  - Never smoke while performing repairs, especially when handling refrigerant.
  - Be careful the liquid refrigerant does not come in contact with the skin.
- If liquid refrigerant strikes eye or skin:
  - Do not rub the eye or the skin.
  - Splash large quantities of cool water on the eye or the skin.
  - Apply clean petroleum jelly to the skin.
  - Go immediately to a physician or to a hospital for professional treatment.
Connection of gauge manifold

1) Connect the charging hoses (low pressure side) for the gauge manifold to the tube fitting.

**NOTE:** Connect the hoses using care not to mistake the high pressure side for the low pressure side and vice versa.

2) Connect the charging hose at the center of the gauge manifold to the vacuum pump.

Evacuation

1) Open the high pressure valve (LOW) of the gauge manifold.
2) Turn on the vacuum pump to start evacuation. (Evacuate the system for approximately 30 min.)
3) When the low pressure gauge indicates 30 inHg (100 kPa), turn off the vacuum pump and close the Low pressure valves of the gauge manifold.
4) Leave the high pressure valve and the low pressure valve of the gauge manifold closed for five min or more, and confirm that the gauge pointer does not return to zero.
Refrigerant Charging Work

Refrigerant charging
1) Remove the charging hose from the vacuum pump, and connect it to the refrigerant cylinder (R-410A).
2) Loosen the nut on the gauge manifold side of the charging hose. Open the valve of the charging hose. Open the valve of the refrigerant cylinder. After air purging, tighten this nut and close the valve of the refrigerant cylinder.
3) Securely place the refrigerant cylinder on a scale with a weighing capacity of 70 lb (30 kg) that is graduated by 0.2 oz (5 g).
4) Open the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder. Charge the system with refrigerant to the specified amount. Standard Amount of Refrigerant:
   - 700870: Toshiba 15.9 oz (451 g), LG 15.5 oz (400 g)
   - 700875: 42.3 oz (1200 g)
   - 700877: 51.8 oz (1470 g)
5) Close the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder.

**CAUTION**

The amount of refrigerant charged has a great effect on the cooling capacity of the unit. Charge to the specified amount, always observing the scale graduations while charging.

**WARNING**

• Do not attempt any repair on a charged system.

**WARNING**

• Before checking for gas leaks, fully confirm that there is nothing flammable in the area to cause an explosion or fire. Contact of refrigerant with an open fire generates toxic gas.