40QAC / 38HDR  
40QAQ / 38QRR  
Ceiling—Suspended Duct Free Split System  
Sizes 018 to 060

Installation Instruction

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature attached to the unit. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

Recognize safety information. This is the safety-alert symbol △. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury or property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could result in personal injury or equipment damage.

Puron refrigerant systems operate at higher pressures than standard R-22 systems. To avoid damage to the unit or possible personal injury, do not use R-22 service equipment or components on Puron refrigerant equipment.

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

CAUTION

PERSONAL INJURY AND EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and / or equipment damage.

DO NOT operate the unit without a filter or with grille removed.

NOTE: Read the entire instruction manual before starting the installation.

40QAC, QAQ Unit

38HDR, QRR Unit
DIMENSIONS - INDOOR

NOTES:
1. Dimensions in [ ] are in millimeters.
2. → Direction of airflow.
3. Standard unit clearances are as follows:
   - 0 in. on top and rear
   - 3 in. on left side
   - 12 in. on right side
   - 36 in. on bottom
   (When facing unit discharge.)

![Diagram of 40QA Dimensions](image)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>024</td>
<td>108</td>
<td>110</td>
<td>4-215/16</td>
<td>1294</td>
<td>3-10</td>
<td>1169</td>
<td>4-15/8</td>
<td>1260</td>
<td></td>
</tr>
<tr>
<td>036</td>
<td>117</td>
<td>119</td>
<td>4-1013/16</td>
<td>1493</td>
<td>4-57/8</td>
<td>1368</td>
<td>4-9/16</td>
<td>1459</td>
<td></td>
</tr>
<tr>
<td>048</td>
<td>149</td>
<td>151</td>
<td>5-119/16</td>
<td>1817</td>
<td>5-86/8</td>
<td>1692</td>
<td>5-101/4</td>
<td>1783</td>
<td>1-97/8</td>
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<td>060</td>
<td>179</td>
<td>181</td>
<td>7-8</td>
<td>2336</td>
<td>7-3</td>
<td>2211</td>
<td>7-62/8</td>
<td>2302</td>
<td>1-115/8</td>
</tr>
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</table>

Fig. 1 - 40QA Dimensions
UNIT SERIES ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>MOUNTING PAD DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/230-460</td>
<td>23&quot; x 42&quot;</td>
</tr>
<tr>
<td>208/230-600</td>
<td>24&quot; x 50&quot;</td>
</tr>
<tr>
<td>40QAC/38HDR</td>
<td>40QAQ/38QRR</td>
</tr>
</tbody>
</table>

REQUIRED CLEARANCES:
- With coil facing wall: Allow 6" min clearance on coil side and coil end and 36" min clearance on compressor end and fan side.
- With fan facing wall: Allow 8" min clearance on fan side and coil end and 36" min clearance on compressor end and coil side.
- With multi-unit application: Arrange units so discharge of one does not enter inlet of another.

MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE 35°F, MAX. 125°F.

SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.

CENTER OF GRAVITY

ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

FIELD POWER SUPPLY CONN. HOLE SIZES PROVIDED:
- 7/8"-1/2" TRADE
- 1 3/16"-3/4" TRADE
- 1 3/8"-1" TRADE

3/8" LIQUID LINE FEMALE SWEAT Conn.

VAPOR LINE CONN.

JUNCTION BOX FOR POWER SUPPLY AND CONTROL CONNECTIONS

Fig. 2 - 38HDR Outdoor Unit Dimensions - English
### UNIT SERIES ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>SHIP</th>
<th>OPERATING</th>
<th>WEIGHTING</th>
<th>WEIGHTING</th>
<th>WEIGHTING</th>
<th>DIMENSIONS (L x W x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR018 1 X O O O 638.2 938.2 369.9 406.4 595.3 436.6 435.0 558.8 330.3 168.3 285.9 15.9 74.6 152.4 70.4 157.7 1090.2 X 457.7 X 714.3</td>
</tr>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR024 1,2 X O O O 790.6 938.2 369.9 406.4 595.3 436.6 507.4 711.7 335.6 171.5 295.5 15.9 74.6 152.4 81.8 101.4 1282.7 X 520.7 X 866.7</td>
</tr>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR030 1 X O O O 944.6 1131.9 433.4 468.3 774.7 498.5 741.4 1017.9 347.7 206.4 403.2 19.0 87.3 165.1 90.9 109.8 1282.7 X 520.7 X 1020.7</td>
</tr>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR036 1 X O X X 944.6 1131.9 433.4 468.3 774.7 498.5 741.4 1017.9 347.7 206.4 403.2 19.0 87.3 165.1 129.0 140.4 1282.7 X 520.7 X 1173.1</td>
</tr>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR048 1,2 X O X X 1097.0 1131.9 433.4 468.3 774.7 498.5 741.4 1017.9 347.7 206.4 403.2 19.0 87.3 165.1 133.6 145.0 1282.7 X 520.7 X 1173.1</td>
</tr>
<tr>
<td>208-220-60</td>
<td>30,36,48,60</td>
<td>19.0</td>
<td>22.2</td>
<td>12.70 TRADE</td>
<td>34.92 - 25.40 TRADE</td>
<td>38HDR060 1,2 X O X X 1097.0 1131.9 433.4 468.3 774.7 498.5 741.4 1017.9 347.7 206.4 403.2 19.0 87.3 165.1 139.6 149.0 1282.7 X 520.7 X 1173.1</td>
</tr>
</tbody>
</table>

### Required Clearances:
1. Required clearances with coil facing wall: Allow 132.4 mm clearance on coil size and coil end and 914.4 mm clearance on compressor end and fan side. With fan facing wall: Allow 203.2 mm clearance on fan side and coil end and 914.4 mm clearance on compressor end and coil size. With multi unit application: Arrange units so discharge of one does not enter inlet of another.
2. Minimum outdoor operating ambient in cooling mode is 12.8°C, max. 51.7°C.
3. Series designation is the 13th position of the unit model number.
4. Center of gravity.
5. All dimensions are in “mm” unless noted.

### Minimum Mounting Pad Dimensions
- 16.74 584.2 X 1066.8
- 30.36, 48, 60 609.6 X 1270.0

---

**Fig. 3 - 38HDR Outdoor Unit Dimensions - SI**
**UNIT SIZE**

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>MINIMUM MOUNTING PAD DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>18, 24</td>
<td>21.7&quot; x 42&quot;</td>
</tr>
<tr>
<td>30, 36, 48, 60</td>
<td>24&quot; x 30&quot;</td>
</tr>
</tbody>
</table>

### REQUIRED CLEARANCES:

1. **WITH COIL FACING WALL:**
   - ALLOW 6" MIN CLEARANCE ON COIL SIDE AND COIL END.
   - ALLOW 36" MIN CLEARANCE ON COMPRESSOR END, FAN SIDE.

2. **WITH FAN FACING WALL:**
   - ALLOW 8" MIN CLEARANCE ON FAN SIDE AND COIL END.
   - ALLOW 36" MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE.

3. **WITH MULTI UNIT APPLICATION:**
   - ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.

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**AIR CONDUCTORS**

- FIELD CONTROL SUPPLY WIRE ENTRY: 7/8" HOLE WITH GROMMET
- FIELD POWER SUPPLY CONN.: 3/8"-1" TRADE
- VAPOR LINE CONN.: 1/8" FEMALE SWEAT CONN.
- LIQUID LINE CONN.: 1/2" MALE FLARE CONN.

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**Fig. 4 - 38QRR Outdoor Unit Dimensions - English**
1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MM CLEARANCE ON COIL SIDE AND COIL END AND 914.4 MM CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 203.2 MM CLEARANCE ON FAN SIDE AND COIL END AND 914.4 MM CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.

2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C, MAX. 51.7°C.

3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.

4. CENTER OF GRAVITY

5. ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.

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Fig. 5 - 38QRR Outdoor Unit Dimensions - SI
These installation instructions cover the installation of the matched systems listed in table 2.

Parts List

**Indoor Unit**

The following items are included with the indoor unit:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Name of Part</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Side Panels</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Hex Head Bolts</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Mounting Bracket</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Pistons</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Adapter Tubes</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1 – Installation Materials

**Outdoor Unit**

The following items are included with the outdoor unit:

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Liquid Phase</th>
<th>Vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td>38HDR</td>
<td>3/8</td>
<td>5/8</td>
</tr>
<tr>
<td>38QRR</td>
<td>3/8</td>
<td>3/4</td>
</tr>
</tbody>
</table>

Table 2 – Matched Systems

**SYSTEM REQUIREMENTS**

**Clearances**

Allow sufficient space around the indoor and outdoor unit for proper airflow circulation and servicing. Refer to Fig. 1 through Fig. 5 for minimum required clearances.

**Piping**

Piping and insulation is field supplied.

**Piping Lengths**

The minimum length between the indoor and outdoor units is 10 ft (3 m). Refer to table 3 for the maximum lengths allowed.

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Max Line Length ft(m)</th>
<th>Max Elevation (ID over OD) ft(m)</th>
<th>Max Elevation (OD over OD) ft(m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>24K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>30K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>36K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>48K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>60K</td>
<td>200 (61)</td>
<td>65 (19.8)</td>
<td>200 (61)</td>
</tr>
</tbody>
</table>

Note: For lengths greater than 25 ft (7.6 m), refer to the Duct Free Long Line Guide.

**Pipe Sizes**

Refer to table 4 for pipe sizes.

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Liquid Phase</th>
<th>Vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>3/8</td>
<td>5/8</td>
</tr>
<tr>
<td>24</td>
<td>3/8</td>
<td>5/8</td>
</tr>
<tr>
<td>30</td>
<td>3/8</td>
<td>3/4</td>
</tr>
<tr>
<td>36</td>
<td>3/8</td>
<td>3/4</td>
</tr>
<tr>
<td>48</td>
<td>3/8</td>
<td>7/8</td>
</tr>
<tr>
<td>60</td>
<td>3/8</td>
<td>7/8</td>
</tr>
</tbody>
</table>

Note: On heat pumps, both lines need to be insulated using at least 1/2 inch closed foam insulation.
**Refrigerant Charge**

The 38HDR and 38QRR units can be matched with multiple outdoor units and thus additional charge might be required when matched with the 40QAC or 40QAQ units.

**Table 5 – Additional Charge**

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>38HDR (lb.)</th>
<th>38QRR (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>018</td>
<td>0.7 (0.32)</td>
<td>0.7 (0.32)</td>
</tr>
<tr>
<td>024</td>
<td>1.3 (0.59)</td>
<td>0.8 (0.36)</td>
</tr>
<tr>
<td>030</td>
<td>1.4 (0.64)</td>
<td>0</td>
</tr>
<tr>
<td>036</td>
<td>0.2 (0.1)</td>
<td>0.5 (0.23)</td>
</tr>
<tr>
<td>048</td>
<td>0.2 (0.1)</td>
<td>0</td>
</tr>
<tr>
<td>060</td>
<td>0.5 (0.23)</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note:* The above additional charge is required amount for line lengths up to 25 ft (7.6 m). For line lengths exceeding 25 ft (7.6 m), additional charge will be required. Refer to the Duct Free Splits Long Line Guide.

**Metering Device**

The 40QAC and 40QAQ units use an accurator or a TXV as shown in Table 6.

**Table 6 – Accurator Sizes**

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Cooling Only</th>
<th>Heat Pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>018</td>
<td>TVX</td>
<td>49</td>
</tr>
<tr>
<td>024</td>
<td>TVX</td>
<td>55</td>
</tr>
<tr>
<td>030</td>
<td>TVX</td>
<td>65</td>
</tr>
<tr>
<td>036</td>
<td>TVX</td>
<td>70</td>
</tr>
<tr>
<td>048</td>
<td>TVX</td>
<td>80</td>
</tr>
<tr>
<td>060</td>
<td>TVX</td>
<td>80</td>
</tr>
</tbody>
</table>

*NOTE:* Pistons are supplied with either the indoor or outdoor units.

**Power and Connecting Cables - Field Supplied**

**Power:**
- The main power is supplied to both the indoor and outdoor units.
- Consult local building codes, NEC (National Electric Code) or CEC (Canadian Electric Code) for any special requirements.
- Use Table 7 for the electrical requirements for the outdoor units and Table 8 for the indoor units to correctly size the cables and disconnect switches.

**Control Wiring**

Thermostat wires should be used for control wiring between the indoor and outdoor units. A two conductor cable is required for the cooling only units and a seven conductor cable is required on heat pumps. 18 AWG is recommended for any length up to 200 ft (61.0 m).

**User Interface - Finished Goods Accessory**

Any of the following three thermostats can be used depending on the type of system on hand and the desired features. Refer to Table 9 to select the proper thermostat.

**Table 7 – 38HDR / QRR Electrical Requirements**

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>V−PH−Hz</th>
<th>38HDR</th>
<th>38QRR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MIN CKT AMPS</td>
<td>FUSE/HACR BKR AMPS</td>
</tr>
<tr>
<td>018</td>
<td>208/230−1−60</td>
<td>12.1</td>
<td>20</td>
</tr>
<tr>
<td>024</td>
<td>208/230−1−60</td>
<td>17.7</td>
<td>25</td>
</tr>
<tr>
<td>030</td>
<td>208/230−1−60</td>
<td>19.1</td>
<td>30</td>
</tr>
<tr>
<td>036</td>
<td>208/230−1−60</td>
<td>19.1</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>208/230−3−60</td>
<td>13.0</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>460−3−60</td>
<td>7.9</td>
<td>10</td>
</tr>
<tr>
<td>048</td>
<td>208/230−1−60</td>
<td>26.4</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>208/230−3−60</td>
<td>17.9</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>460−3−60</td>
<td>8.4</td>
<td>15</td>
</tr>
<tr>
<td>060</td>
<td>208/230−1−60</td>
<td>34.5</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>208/230−3−60</td>
<td>21.5</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>460−3−60</td>
<td>10.6</td>
<td>15</td>
</tr>
</tbody>
</table>

**Table 8 – 40QAC / QAQ Electrical Requirements**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>VOLTAGE V−Ph−60 Hz</th>
<th>40QAC</th>
<th>MCA</th>
<th>MOCP</th>
<th>40QAQ</th>
<th>MCA</th>
<th>MOCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>024</td>
<td>208/230−1</td>
<td>0.83</td>
<td>15.0</td>
<td></td>
<td>9.29</td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td>036</td>
<td>208/230−1</td>
<td>1.60</td>
<td>15.0</td>
<td></td>
<td>17.7</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>048</td>
<td>208/230−1</td>
<td>2.00</td>
<td>15.0</td>
<td></td>
<td>23.8</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>060</td>
<td>208/230−1</td>
<td>3.30</td>
<td>15.0</td>
<td></td>
<td>28.7</td>
<td>30.0</td>
<td></td>
</tr>
</tbody>
</table>

**Table 9 – Thermostat Selection**

<table>
<thead>
<tr>
<th>Features</th>
<th>7 Day Programmable</th>
<th>5+1+1 Day Programmable</th>
<th>Remote Room Sensor</th>
<th>Dry Contact Equipped</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Type</strong></td>
<td>53DFS250−SL</td>
<td>53DFS250−FS</td>
<td>53DST2−NP</td>
<td></td>
</tr>
<tr>
<td><strong>Cooling Only &amp; HP</strong></td>
<td>√</td>
<td>–</td>
<td>√</td>
<td>–</td>
</tr>
<tr>
<td><strong>Cooling Only</strong></td>
<td>–</td>
<td>–</td>
<td>√</td>
<td>–</td>
</tr>
</tbody>
</table>
Operating Range
Ensure that the system operates within the application guidelines shown in the following tables.

**Cooling operating range:**

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DB °F (°C)</td>
<td>WB °F (°C)</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td>125 (51.7)</td>
<td>-</td>
</tr>
<tr>
<td>Indoor Unit</td>
<td>95 (35)</td>
<td>71 (21.7)</td>
</tr>
</tbody>
</table>

**Heating operating range:**

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DB °F (°C)</td>
<td>WB °F (°C)</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td>75 (23.9)</td>
<td>67 (19.4)</td>
</tr>
<tr>
<td>Indoor Unit</td>
<td>80 (26.7)</td>
<td>71 (21.7)</td>
</tr>
</tbody>
</table>

**Accessories**

An extensive list of field installed accessories is available for both indoor and outdoor units. Identify what accessories, if any, are required for the application at hand and consult the separate installation instructions for the accessories. Some of the accessories, especially on the indoor units, can be installed much easier if planned ahead.

**INSTALLATION**

**Complete Pre-installation Checks**

1. **Unpack Unit** – Store the indoor and outdoor units in the original packaging until it is moved to the final site for installation.

2. **Inspect Shipment** – Upon receipt of shipment, check the indoor and outdoor units for damage. If there is any damage, forward claim papers directly to the transportation company. Manufacturer is not responsible for damage incurred in transit.

3. **Inspect Parts Supplied With Units** – Check all items against parts list (see page 7). If any items are missing, notify your distributor or Carrier office. To prevent loss or damage, leave all parts in original packages until installation.

**Consider System Requirements**

1. Consult local building codes and NEC for special installation requirements.

2. When deciding the location of the indoor and outdoor units, ensure that the piping run does not exceed the allowed distances listed in Table 3.

3. Make sure the indoor and outdoor units are easily accessible to electrical power.

4. Allow sufficient clearances for airflow, wiring, refrigerant piping, and servicing the unit. See Fig. 1 through Fig. 5.

5. Condensate piping can be directed through the inside wall to an approved drain or straight outside.

**INSTALL INDOOR UNIT**

Plan the installation carefully before you begin.

1. Select indoor unit location. If possible, place the unit adjacent to an outside wall if fresh air is required, and ensure that the location allows for complete air distribution.

   **NOTE:** If unit is not installed adjacent to an outside wall and fresh air is required, a power ventilation kit accessory is available.

2. Remove the indoor unit from the carton and place it upside down and perform the following steps:
   a. Remove side panels by sliding forward, then away from sides of the unit. See Fig. 9.

   **Fig. 9 - Removal of Mounting Brackets from Indoor Unit**

   b. Remove air filters from inlet grilles; then remove and retain screws securing inlet grilles to indoor unit.

   c. Remove inlet grilles from indoor unit by sliding forward.

   d. If a size 024 indoor unit is to be matched with a size 018 outdoor unit, switch the Molex plug on the motor. The Molex plugs are labeled as 018 or 024.

   e. Loosen hex bolts on the side of the unit and remove the mounting brackets by sliding them out in direction shown in Fig. 10. Allow approximately 3/8 inch space between the bolt head and the unit as shown in Fig. 10.

   **Fig. 10 - Installing Hex-Head Mounting Bolts in Fan Coil Unit**

   f. If piping is going to be run from the right hand side, open knock-out by removing the pre-split portion in the rear of the right hand side panel with a saw or cutter knife.
3. Mount Unit - the installation location should have already been identified taking into account the piping length, wiring and piping connections, and clearances. See Fig. 11 and Fig. 12.

![Image of Indoor Unit with bolt and dimensions]

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>DIMENSIONS in. (cm)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>024</td>
<td>50 - 15/16</td>
<td>46</td>
<td>49 - 5/8</td>
</tr>
<tr>
<td></td>
<td>(129.4)</td>
<td>(116.8)</td>
<td>(126.0)</td>
</tr>
<tr>
<td>036</td>
<td>53 - 7/8</td>
<td>57 - 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(136.8)</td>
<td>(146.1)</td>
<td></td>
</tr>
<tr>
<td>048</td>
<td>66 - 5/8</td>
<td>70 - 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(169.2)</td>
<td>(178.4)</td>
<td></td>
</tr>
<tr>
<td>060</td>
<td>87</td>
<td>90 - 5/8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(221)</td>
<td>(230.2)</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 11 - Fan Coil Unit Hanging Dimensions

**NOTE:** If fresh air is required, a minimum of 3 inch (76.2 mm) clearance is required in back of unit.

g. Mount hanging brackets on ceiling (see Fig. 13) for either concealed or exposed bolt hanging position.

![Image of Mounting Included with Fan Coil Unit]

**Fig. 12 - Mounting Included with Fan Coil Unit**

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>DIMENSIONS in. (cm)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>024</td>
<td>46</td>
<td>49 - 5/8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(116.8)</td>
<td>(126.0)</td>
<td></td>
</tr>
<tr>
<td>036</td>
<td>53 - 7/8</td>
<td>57 - 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(136.8)</td>
<td>(146.1)</td>
<td></td>
</tr>
<tr>
<td>048</td>
<td>66 - 5/8</td>
<td>70 - 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(169.2)</td>
<td>(178.4)</td>
<td></td>
</tr>
<tr>
<td>060</td>
<td>87</td>
<td>90 - 5/8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(221)</td>
<td>(230.2)</td>
<td></td>
</tr>
</tbody>
</table>

* - Concealed mounting holes
† - Exposed mounting holes.

![Image of Mounting Hanging Brackets]

**Fig. 13 - Mounting Hanging Brackets**
When mounting brackets, select the proper type of hardware from the guidelines below. See Fig. 14

⚠️ CAUTION

PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and/or equipment damage.

Solid structure in ceiling MUST be used due to weight of the unit.

Wooden Structure:
Install hanging bolts on a square wooden piece placed over beams.

Newly Built Concrete Slab:
Install hanging bolts with inserts, embedded bolts, etc.

Metal Structure:
Install hanging bolts utilizing an existing angle or by installing a new support angle.

Previously Built Concrete Slab:
Install hanging bolts with expansion anchor.

h. Drill holes for routing refrigerant lines, condensate line and electrical and control connections.

i. Lift the unit into place, and fit the hex-head bolts on sides of indoor unit into mounting slots of mounting brackets. Ensure unit is mounted with a slight tilt to the rear side for proper drainage.

j. Tighten indoor unit hex-head bolts securely.

INSTALL OUTDOOR UNIT

The outdoor units can be installed on the ground, on the roof, or mounted on a wall.

NOTE: Install the unit so that the coil does not face into prevailing winds. If this is not possible and constant wind winds above 25 mph are expected, use accessory wind baffle. See installation instructions provided with accessory kit. Wind baffles should also be used on all units with accessory low ambient temperature control.

Mounting on Ground

1. Mount unit on a solid level concrete pad.
2. If a heat pump is being installed, use a field-provided snow stand or ice rack where prolonged subfreezing temperatures or heavy snow occurs.
3. Position unit so water or ice from roof does not fall directly onto unit.
4. On cooling only units, an accessory stacking kit can be used when units are to be stacked. See installation instructions provided with the accessory kit.

Mounting on Roof

⚠️ CAUTION

PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and/or equipment damage.

Be sure unit panels are securely in place prior to rigging.

1. Rig the unit. Keep the unit upright and lift using a sling. Use cardboard or padding under the sling, and spreader bars to prevent sling damage to the unit. See Fig. 15. See Fig. 2 through Fig. 5 for center of gravity reference
2. Mount unit on a solid concrete pad or platform.
3. Isolate unit and piping from structure
4. If a heat pump is being installed, use a field-provided snow stand or ice rack where prolonged subfreezing temperatures or heavy snow occurs.
5. On cooling only units, an accessory stacking kit can be used when units are to be stacked. See installation instructions provided with accessory kit.

Mounting Unit on Wall

The units can also be mounted on the wall using the accessory mounting kit.
Complete Outdoor Refrigerant Piping Connections

Follow the following general guidelines:

1. Use refrigerant grade field – supplied tubing.
   Refer to Table 4 for the correct line sizes.
2. Do not use less than 10 ft (93.05 m) of interconnecting tubing.

**CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

If any section of pipe is buried, there must be a 6 in. (152.4 mm) vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler, buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

When more than 80 ft (24.4 m) of interconnecting tubing is used, consult the Duct-Free Split System Long Line Application Guide for required accessories.

3. On cooling only units, insulate the liquid line. On heat pumps, insulate both lines. A minimum of 1/2 inch foam pipe insulation is recommended.
4. Run the refrigerant tubes as directly as possible and avoid unnecessary turns and bends.
5. Suspend refrigerant tubes to avoid damage to insulation or tubes so they do not transmit vibration to the structure.
6. When passing refrigerant tubes through the wall, seal the opening so rain and insects do not enter the structure. Leave some slack in refrigerant tubes between structure and outdoor unit to absorb vibration.

**NOTE:** A fusible plug is located in unit suction line; do not cap this plug. If local codes require additional safety devices, install as directed.

Connection at Outdoor Unit

**CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

To prevent damage to unit or service valves observe the following:

- A brazing shield **MUST** be used.
- Wrap service valves with wet cloth or use a heat sink material.

1. Braze the connector tubes (field supplied for the 38HDR units and factory supplied for the 38QRR units) to the inlet of the factory supplied filter drier. If a cooling only unit is being installed move to step 3 (see Fig. 8).
2. Remove the plastic cap from the liquid and suction service valve on the 38QRR unit and assemble the heating piston and piston cap supplied with the outdoor unit as shown in Fig. 16.

**NOTE:** The Teflon seal on the piston should point towards the liquid service valve.

The size of the factory supplied piston might have to be adjusted for long line applications (over 80 ft / 24.4 m). Refer to the Duct Free Long Line Application Guide for additional information.

3. On 38HDR units, remove the plastic caps on the liquid and suction service valves. Braze the completed filter drier assembly (from Step 1) to the liquid service valve. On the 38QRR unit, connect the completed filter drier assembly (from Step 1) to the piston cap.
4. Braze the field supplied line set to the filter drier assembly and to the suction valve.
5. Insulate any exposed areas between the filter drier and the liquid valve.

Complete Outdoor Power and Control Wiring

**WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

The unit cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.

**CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation could void any applicable Carrier warranty.
**WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before performing service or maintenance, be sure indoor unit main power switch is turned OFF and indoor blower has stopped.

Lock out and tag switch with suitable warning label.

**Power Wiring**

1. Mount outdoor power disconnect. The unit is factory wired for the voltage shown on the unit nameplate. The fused disconnect switch must be provided within sight of the unit, readily accessible, but out of reach of children. Provisions for locking the disconnect switch on the OFF (open) position is advisable. The disconnect switch must comply with NEC and local codes. Protect the unit and wiring using only the recommended fuse/circuit breaker size. See Table 10...

2. Run power wiring from main box to disconnect per NEC and local codes.

3. Run power wiring from the disconnect switch to outdoor unit. Use only minimum 60°C copper conductors between the disconnect switch and the unit for field power connection.

4. Route the field power wires through the conduit connection opening in the unit side panel and connect in junction box as shown in Fig 17. The unit and power wiring must be grounded.

**Control Wiring**

The control circuit is 24 volts AC (minimum 40VA) supplied from the indoor unit.

1. Make sure you have enough control wires to cover the distance between the indoor and outdoor unit.

2. Route one end of the control wiring through the opening provided in the unit side panel and connect to the control terminal strip using either Fig. 18 for 38HDR units and Fig. 19 for 38QRR units.

**NOTE:** Operating unit on improper line voltage constitutes abuse and could affect Carrier warranty. DO NOT install unit in a system where voltage may fluctuate above or below permissible limits.

![Fig. 17 - Line Power Connections](image1)

**Fig. 17 - Line Power Connections**

**NOTE:** Use No. 18 AWG color-coded, insulated (35°C minimum) wire. If the distance between the indoor and outdoor unit is greater than 100 ft. (30.5 m), as measured along the control voltage wires, use No. 16 AWG color-coded wire to avoid excessive voltage drop.
### Table 10 – 38HDR Electrical Data

<table>
<thead>
<tr>
<th>38HDR UNIT SIZE</th>
<th>V-PH-Hz</th>
<th>VOLTAGE RANGE*</th>
<th>COMPRESSOR</th>
<th>OUTDOOR FAN MOTOR</th>
<th>MIN CKT AMPS</th>
<th>FUSE/CKT BKR AMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max</td>
<td>RLA</td>
<td>LRA</td>
<td>FLA</td>
<td>NEC Hp</td>
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<tr>
<td>018 – 31</td>
<td>208/230 – 1 – 60</td>
<td>187</td>
<td>253</td>
<td>9.0</td>
<td>48.0</td>
<td>0.8</td>
</tr>
<tr>
<td>024 – 32</td>
<td>208/230 – 1 – 60</td>
<td>187</td>
<td>253</td>
<td>13.5</td>
<td>58.3</td>
<td>0.8</td>
</tr>
<tr>
<td>030 – 31</td>
<td>208/230 – 1 – 60</td>
<td>187</td>
<td>253</td>
<td>14.1</td>
<td>73.0</td>
<td>1.5</td>
</tr>
<tr>
<td>036 – 31</td>
<td>208/230 – 1 – 60</td>
<td>187</td>
<td>253</td>
<td>14.1</td>
<td>77.0</td>
<td>1.5</td>
</tr>
<tr>
<td>048 – 32</td>
<td>208/230 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.8</td>
</tr>
<tr>
<td>060 – 32</td>
<td>208/230 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.8</td>
</tr>
<tr>
<td>460 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.8</td>
<td>0.250</td>
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</tbody>
</table>

### Table 11 – 38QRR Electrical Data

<table>
<thead>
<tr>
<th>38QRR UNIT SIZE</th>
<th>V-PH-Hz</th>
<th>VOLTAGE RANGE*</th>
<th>COMPRESSOR</th>
<th>OUTDOOR FAN MOTOR</th>
<th>WIRE GAUGE 60°C/75°C</th>
<th>WIRE LENGTH 60°C/75°C</th>
<th>MIN CKT AMPS</th>
<th>FUSE/ACR CKT AMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max</td>
<td>RLA</td>
<td>LRA</td>
<td>FLA</td>
<td>NEC Hp</td>
<td>kw Out</td>
<td></td>
</tr>
<tr>
<td>018</td>
<td>208/230 – 1 – 60</td>
<td>187</td>
<td>253</td>
<td>9.0</td>
<td>48.0</td>
<td>0.80</td>
<td>0.125</td>
<td>0.09</td>
</tr>
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<td>024</td>
<td>208/230 – 1 – 60</td>
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<td>253</td>
<td>14.4</td>
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<td>0.80</td>
<td>0.125</td>
<td>0.09</td>
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<td>253</td>
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<td>1.5</td>
<td>0.25</td>
<td>0.19</td>
</tr>
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<td>036</td>
<td>208/230 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.80</td>
<td>0.25</td>
<td>0.19</td>
</tr>
<tr>
<td>048</td>
<td>208/230 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.80</td>
<td>0.25</td>
<td>0.19</td>
</tr>
<tr>
<td>060</td>
<td>208/230 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.80</td>
<td>0.25</td>
<td>0.19</td>
</tr>
<tr>
<td>460 – 3 – 60</td>
<td>414</td>
<td>506</td>
<td>7.8</td>
<td>52.0</td>
<td>0.80</td>
<td>0.25</td>
<td>0.19</td>
<td>14/14</td>
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</table>

### Table 12 – 40QAC/QAQ Electrical Data

<table>
<thead>
<tr>
<th>UNIT</th>
<th>VOLTAGE V-PH-Hz</th>
<th>VOLTAGE RANGE*</th>
<th>FAN FLA</th>
<th>HEATER</th>
<th>POWER</th>
<th>MINIMUM WIRE SIZE (AWG)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
<td>kW</td>
<td>FLA</td>
<td>kW</td>
<td>FLA</td>
</tr>
<tr>
<td>40QAC024 – 3</td>
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<td>—</td>
<td>—</td>
</tr>
<tr>
<td>40QAC036 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>1.30</td>
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<td>—</td>
</tr>
<tr>
<td>40QAC048 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>1.60†</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>40QAC060 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>2.60†</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>40QAQ024 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>0.50</td>
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<tr>
<td>40QAQ036 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>1.30</td>
<td>3.00</td>
<td>13.00</td>
</tr>
<tr>
<td>40QAQ048 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>1.60†</td>
<td>4.00</td>
<td>17.40</td>
</tr>
<tr>
<td>40QAQ060 – 3</td>
<td>208/230 – 1</td>
<td>187</td>
<td>253</td>
<td>2.60†</td>
<td>5.00</td>
<td>21.70</td>
</tr>
</tbody>
</table>

**NOTES**
- * Permissible limits of the voltage range at which the unit will operate satisfactorily
- † One fan is 1.1 amps, the second fan is 0.5 amps.
- ‡ Two fans each operating at 1.3 amps.
Fig. 20 - 38HDR and 40QAC Cooling System Wiring Diagram
Fig. 21 - 38QRR and 40QAQ Heat Pump System Wiring Diagram
**Complete Indoor Piping**

The piping to the indoor unit can be routed from the back, side and top. If the unit is being piped from the top or the side see note below.

1. On heat 40QAQ024 – 048, the cooling piston (indoor) is shipped in the factory installed metering device with the indoor unit. Use Table 6 to verify that you have the correct piston size for the system being installed.
2. Run the line set and the control wiring from the outdoor to the indoor unit through the hole in the wall. Keep the piping general guidelines in mind.
3. Cut the liquid and suction line to the correct length using a tube cutter.
4. Remove the flare nuts from the indoor piping connections. Install them onto the liquid and suction lines and make flare connections.
5. Apply a small amount of refrigerant oil to the flare connection and tubing.
6. Align the tubing with the refrigerant connections on the indoor unit.
7. Tighten the flare nut and finish the installation using two wrenches as shown in Fig. 22.

**NOTE:** When piping is being routed from the top or side, two pipe adaptors are supplied with the unit. Flare the pipe adaptors to the indoor unit connections and sweat the other ends to the line set.

8. Insulate both connections on the 38QRR and the liquid line connection on the 38HDR units.

**Connect Condensate Drain Line**

Observe all local sanitary codes when installing condensate drains. Refer to Fig. 23 for drain pipe connection from indoor unit.

1. Use hard polyvinyl chloride (PVC) pipe material with nominal ID of 3/4 in. to connect at drain line. Use pipe insulation 1/4 in. thick, such as Armaflex insulation, on exposed piping inside the conditioned space.
2. To insure regular flow of condensate water, the drain pipe should be pitched toward an open drain or sump at a downward slope of at least 1/4 in. per ft.
3. If the drain piping is routed through the side of the unit, attach a field fabricated piece of sheet metal to support the drain pipe as shown in Fig. 23.
4. Attach drain pipe with nylon wire tie passing through hole as shown in Fig. 23.

**NOTE:** Do not fasten nylon wire ties tight enough to deform the insulation, as this affects performance.

5. Install an external trap at the end of the condensate line.

**NOTE:** Should the installation require one, a condensate pump may be ordered as a fields-installed accessory. It is easier to install pump before hanging the unit.
Complete Control Wiring

1. Run the control wiring close to the terminal block on the indoor unit.
2. Connect the wires as shown in Fig 18 and Fig. 20 for 38HDR units, and Fig. 19 and Fig. 21 for 38QRR units.

Complete Power Connection To Indoor Unit

Be sure field wiring complies with local building codes and NEC, and unit voltage is within limits shown in Table 12. Contact local power company for correction of improper line voltage.

 WARNING

ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

 CAUTION

UNIT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation could void any applicable Carrier warranty.

NOTE: Use copper wire only between disconnect switch(es) and unit.
NOTE: Install branch circuit disconnect of adequate size to handle unit starting current per NEC. Locate disconnect within sight of, and readily accessible from, unit, per section 440-14 of NEC. Some codes allow indoor unit to share disconnect with outdoor unit if disconnect can be locked; check local code before installing in this manner.

1. Route ground and power wires.

 WARNING

ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
According to NEC and most local codes, the unit must have an uninterrupted, unbroken ground to minimize personal injury if an electric fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.

2. Route line power leads from inside disconnect to the fan coil. Place wire through the whole on the control box.
3. Connect wire to high voltage terminal board (TB1) and ground screw.

NOTE: When routing the wire in the unit, use care to keep the wire away from refrigerant and condensate piping and any sharp edges.

NOTE: The 208/230-v units are factory wired for 230-v to 24-v transformer operation, For 208-v to 24-v operation, interchange the blue (208-v) and red (230-v) wires. Cap any unused wires with wire nuts.

Install Thermostat

These systems use a three speed thermostat. Refer to Table 9 for a list of recommended thermostats.

1. Mount thermostat to a wall in the occupied space using hardware provided with the thermostat. Locate the thermostat, preferably on an interior wall, in an area that is not subjected to drafts or direct sunlight through windows.
2. Run the thermostat wires to the control box of the indoor unit. If running the thermostat through the back of the unit, 3/8 in. space between the unit and the wall is required.
3. Route wires over refrigerant and drain piping as shown in Fig. 24.

 Fig. 24 - Routing Wires Over Piping

NOTE: Do not route wires under the piping, or wires could impede air filter removal.

4. Connect the thermostat wires to the indoor unit per Fig 25 for a 40QAC unit and Fig. 26 for a 40QAQ unit.
Reassemble Indoor Unit
1. Reinstall filters and inlet grilles
2. Reinstall the side panels

START-UP

Preliminary Checks
1. Check condensate drainage system; on the opposite side of the drain connection, insert a water bottle up into the fan coil unit and fill the drain pan (see Fig. 27). Water must flow steadily; if not, check the pipe slope or inspect for any pipe restrictions.

CAUTION
Failure to follow this caution may result in equipment damage or improper operation.
Never use the system compressor as a vacuum pump.

Using Vacuum Pump
1. Completely tighten flare nuts A, B, C, D, connect manifold gage charge hose to a charge port of the low side service valve. (See Fig. 28.)
2. Connect charge hose to vacuum pump.
3. Fully open the low side of manifold gage. (See Fig. 29.)
4. Start vacuum pump
5. Evacuate using either deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gage and stop operation of vacuum pump.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft (8 m), add 0.3 oz. per foot of extra piping up to the maximum allowable length.
8. Disconnect charge hose from charge connection of the low side service valve.
9. Fully open service valves B and A.
10. Securely tighten caps of service valves.

Evacuate and Dehydrate the System

Fig. 25 - Thermostat Wire Connection for 40QAC

Fig. 26 - Thermostat Wire Connection for 40QAQ

Fig. 27 - Inserting Water Into Drain Pan

Fig. 28 - Service Valve
Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 30)

Triple Evacuation Method

The triple evacuation method should only be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum and system does not contain any liquid water.

Refer to Fig. 31 and proceed as follows:

1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig. 31. System will then be free of any contaminants and water vapor.

To Start the Unit:

1. If the outdoor unit is equipped with a crankcase heater, turn on the indoor and outdoor disconnect switches to supply power the system 12 hours before starting the system.
2. Release charge into the system by opening (back-seating) liquid and suction line service valves.
3. Set the wireless remote control or wired remote control below ambient temperature. Operate the unit for 15 minutes.
4. Refer to Table 5 to determine if additional charge is required. Also, if you have a long line application, refer to the Duct Free Long Line Application Guide to determine the additional charge that is required beyond 25 ft (7.6 m).
5. Calculate the total additional charge required and weigh in.
6. Charge should be added as liquid (not gas) slowly and carefully to low side to avoid liquid slugging.
OPERATING SEQUENCE

Ceiling-suspended fan coil units have a relay board which controls system operation in response to a room thermostat. The user may manually select any one of 3 fan speeds for unit operation. The discharge louveres on the unit can be stationary or swing continuously. A switch located at the bottom of the unit will turn the swing function on and off.

Ceiling-suspended systems may be equipped with an accessory power ventilation kit and/or condensate pump.

FAN OPERATION — Fan coils are capable of 3-speed operation. See thermostat instructions for fan speed selection. When the fan(s) is operating in medium or high speed and the unit is equipped with the power ventilation kit, the ventilation fan will operate to provide fresh air.

COOLING MODE OPERATION — When the room thermostat senses a demand for cooling, the fan coil relay board is energized. The indoor fan(s) will start in the selected speed (if it is not already operating). The reversing valve (heat pump only) will energize for cooling operation.

The internal condensate pump (if so equipped) runs whenever the reversing valve is energized (heat pump only) and/or the unit is in cooling. As long as the condensate float switch and freeze protection thermostat are closed, the cooling relays in the fan coil unit will close. This energizes the compressor and outdoor fan in the outdoor unit.

The compressor will continue to operate until the room thermostat is satisfied. When the cooling demand is satisfied, the compressor and outdoor fan will stop. If the system is in the AUTO position, the indoor fan will stop with the compressor.

If the unit has the accessory ventilation kit, the ventilation fan will operate whenever the indoor fan is set for medium or high speed.

HEAT PUMP OPERATION — When the room thermostat senses a demand for heating the indoor fan will start in the selected speed (if not already operating), and the reversing valve will not be energized.

The internal condensate pump (if supplied) and freeze protection thermostat are not operated during heating operation. The control relay (CR2) closes, and the compressor and outdoor fan are energized through the defrost board (DFB), which is located in the outdoor unit. The microprocessor logic in the DFB is energized when the compressor starts, and the defrost timer runs. Once every 90 minutes (factory default setting) of compressor run time, the DFB logic checks the defrost thermostat (DFT). If the DFT is open, the unit continues in heating operation. If the DFT is closed, the DFB switches the unit to defrost mode. The timing on the DFB may be set at either 30, 50, or 90 minutes.

DEFROST (Heat Pump Only) — The DFB energizes the RVS (reversing valve solenoid), and the reversing valve switches to the cooling position. The K1 relay on the DFB opens and the outdoor fan stops. The W2 contact on the DFB is also energized, which in turn energizes the defrost relay on the fan coil relay board, turns off the electric heater and stops the indoor fan.

The DFB logic checks the 10-minute defrost timer and the DFT. If the DFT opens in less than 10 minutes, the DFB switches the unit back to normal heating operation. If the DFT remains closed, the DFB switches the unit back to heating operation after 10 minutes. When the DFB changes back to heating mode, the RVR (reversing valve relay) is de-energized and the reversing valve switches back to heating operation. Both the outdoor and indoor fans come back on, and if necessary, the electric heater also turns on.

SAFETIES — The system is equipped with the following safety devices to protect system components: Indoor coil freeze protection thermostat — If a coil temperature of 28°F (-2.2°C) or lower is sensed, the compressor and outdoor fan will be shut down until the coil temperature exceeds 28°F (-2.2°C). The indoor fan will continue to run. Condensate float switch (units equipped with accessory condensate pump, cooling cycle only) — If the level of condensate in the drain pan rises too high, the condensate float switch will turn the system off.

CLEANING AND MAINTENANCE

CLEAN OR REPLACE FILTERS

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Operating the system with dirty air filters may damage the indoor unit and can cause reduced cooling performance, intermittent system operation, frost build-up on the indoor coil, and blown fuses. Inspect and clean or replace the air filters monthly.

REMOVE AIR FILTERS — Remove filters by pulling them straight out.

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

For proper system operation, perform the cleaning and maintenance operations in Table 13.

Lubrication — The indoor-fan, automatic air sweep, and the outdoor-fan motors are factory lubricated and require no oiling.

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

To avoid shrinkage, do not wash filter in water over 120°F (48.9°C). To avoid damage, do not expose filter to fire or direct sunlight. Clean the filter more frequently when air is extremely dirty.

AIR FILTERS

To avoid damage, do not expose filter to fire or direct sunlight. Clean the filter more frequently when air is extremely dirty.

To avoid damage, do not expose filter to fire or direct sunlight. Clean the filter more frequently when air is extremely dirty.

REFERENCE: 40QAC/38HDR = 40QAQ/38QR

LOCK OUT

Position. There may be more than 1 disconnect switch.

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

For proper system operation, perform the cleaning and maintenance operations in Table 13.

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Failure to follow this caution may result in equipment damage or improper operation.

Operating the system with dirty air filters may damage the indoor unit and can cause reduced cooling performance, intermittent system operation, frost build-up on the indoor coil, and blown fuses. Inspect and clean or replace the air filters monthly.

REMOVE AIR FILTERS — Remove filters by pulling them straight out.

CLEAN OR REPLACE FILTERS — Filters can be vacuumed or washed in warm water. Shake filter to remove any excess water, and replace by sliding filter behind grille until filter snaps in place. Refer to Fig. 32. If the filter has begun to break down or is torn, replace it. Replacement filters are available through your dealer.
### Table 13 – Cleaning and Maintenance Schedule

<table>
<thead>
<tr>
<th>TASK</th>
<th>MONTHLY</th>
<th>QUARTERLY</th>
<th>YEARLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDOOR UNIT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Air Filters</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Drain Pipe</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clean Condensate Drain Pan</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Clean Indoor Coil</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Clean Indoor Unit Front Panel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OUTDOOR UNIT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean the Fins From Outside</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Open the Unit and Clean Fins Inside</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove Dust From Electrical Parts</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check Electrical Connections are Tight</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clean Outdoor Fan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Outdoor Coil</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check that Outdoor Fan Assembly is Tight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Drain Pan</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**NOTE:** Maintenance procedures for the outdoor units are in the individual unit installation instructions.

**CLEAN INDOOR UNIT BOTTOM PANEL** — If the bottom panel of the unit becomes dirty or smudged, wipe the outside of the panel with a soft dry cloth. Use a mild liquid detergent and wipe off carefully with a dry cloth.

**CLEAN INDOOR COIL** — To clean the coil, remove indoor unit bottom panel and vacuum the coil fins, using care not to bend or damage fins.

**CLEAN OUTDOOR COIL (Outdoor Unit)**

#### CAUTION

**CUT HAZARD**

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when cleaning. Clean coil carefully.

#### To clean the outdoor coil:

1. Remove any dirt or obstruction from discharge opening.
2. Use a garden hose to spray water on the coil. Debris that collects between coil fins inhibits heat transfer — direct the water spray between coil fins to flush out debris.

**CLEAN CONDENSATE DRAINS** — Clean all drains and drain pans at the start of each cooling season. Check the flow by pouring water into the drain.

#### To clean or replace drain pan:

1. Place a plastic sheet on the floor to catch any water that may spill from drain pan.
2. Remove the intake grille and distribution assembly (attached).
3. Remove the condensate water in the drain pan by letting water drain into a 3-gallon bucket.

#### CAUTION

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage.

Do not use a screwdriver to pry drain pan out of assembly — it could damage the pan.

4. Remove the 4 screws holding the drain pan.
5. Carefully hold the drain pan to remove it from the assembly.

**SERVICE**

#### WARNING

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

#### CAUTION

**ENVIRONMENTAL HAZARD**

Failure to follow this caution may result in environmental damage.

Federal regulations require that you do not vent refrigerant to the atmosphere. Recover during system repair or final unit disposal.
Before Calling for Service
Save the cost of a service call by doing the following:
1. Be sure main power to system is turned on.
2. Press Mode button until OFF is displayed. Wait 5 minutes.
3. Press Mode button until either COOL or HEAT is displayed (as desired).
4. Adjust thermostat set point to desired room temperature. If system starts within a few minutes, service may not be necessary. If system does not operate properly, check Table 14 for typical solutions.

IF SYSTEM FAILS TO OPERATE — Be sure:
• unit ON/OFF switch is in ON position
• fuse or circuit breaker is not tripped

FRESH AIR INSTALLATION OPTION
The units have an installation option, which allows for field installation of fresh air ventilation. Plan the installation carefully. Before beginning, measure carefully and follow acceptable building practices, NEC, and local codes.

Ventilation-Air Accessory — Refer to ventilation air accessory installation instructions.

TROUBLESHOOTING
If the under-ceiling fan coil unit fails to start or operate properly, sometimes the problem is minor and can be handled without a service call. Refer to Table 14 for some common problems, causes, and typical solutions. See Fig. 36 and 37 for additional system troubleshooting details. If the problem cannot be corrected, contact a local dealer for further assistance.

Table 14 – Troubleshooting

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>TYPICAL SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Does Not Start.</td>
<td>Blown fuse or circuit breaker tripped at building power entry.</td>
<td>Replace fuse or reset circuit breaker.*</td>
</tr>
<tr>
<td></td>
<td>Indoor and/or outdoor unit disconnect switch is off.</td>
<td>Turn on disconnect switch(es).</td>
</tr>
<tr>
<td></td>
<td>Thermostat is set to night mode.</td>
<td>Cancel mode using Day/Night button on thermostat.</td>
</tr>
<tr>
<td></td>
<td>Power failure.</td>
<td>Restore power.</td>
</tr>
<tr>
<td></td>
<td>Unit is in off mode.</td>
<td>Press Mode button on thermostat until thermostat displays the desired unit mode.</td>
</tr>
<tr>
<td></td>
<td>Three-minute time delay is running.</td>
<td>Wait for 3 minutes.</td>
</tr>
<tr>
<td></td>
<td>Temperature is above or below the selected temperature.</td>
<td>Select new temperature using the thermostat.</td>
</tr>
<tr>
<td>System Does Not Cool Properly.</td>
<td>Air filter(s) in indoor unit is dirty or needs to be replaced.</td>
<td>Clean or replace air filter(s).</td>
</tr>
<tr>
<td></td>
<td>Temperature is set too high or too low.</td>
<td>Reset temperature to desired comfort setting using the thermostat.</td>
</tr>
<tr>
<td></td>
<td>Outdoor unit outdoor coil restricted.</td>
<td>Remove obstruction.</td>
</tr>
<tr>
<td></td>
<td>Fan speed is set too low.</td>
<td>Adjust fan speed to high or auto. using the Fan button on the thermostat.</td>
</tr>
<tr>
<td>System Does not Heat Properly.</td>
<td>Air filter(s) in indoor unit is dirty or needs to be replaced.</td>
<td>Clean or replace air filter(s).</td>
</tr>
<tr>
<td></td>
<td>Temperature is set too high or too low.</td>
<td>Reset temperature to desired comfort setting using the thermostat.</td>
</tr>
<tr>
<td></td>
<td>Outdoor unit outdoor coil restricted.</td>
<td>Remove obstruction.</td>
</tr>
<tr>
<td></td>
<td>Fan speed is set too low.</td>
<td>Adjust fan speed to high or auto. using the Fan button on the thermostat.</td>
</tr>
<tr>
<td></td>
<td>Outdoor unit outdoor coil is frosted up.</td>
<td>Check manual defrost timer setting and adjust as necessary.</td>
</tr>
<tr>
<td>Ice or frost has Formed on Indoor Coil.†</td>
<td>Low outdoor–air temperature.</td>
<td>Run system in fan–only mode until frost is gone.</td>
</tr>
<tr>
<td></td>
<td>Air filter(s) in indoor unit is dirty or needs to be replaced.</td>
<td>Clean or replace air filter(s).</td>
</tr>
<tr>
<td>Insufficient Airflow.</td>
<td>Air filter(s) in indoor unit is dirty or needs to be replaced.</td>
<td>Clean or replace air filter(s).</td>
</tr>
<tr>
<td></td>
<td>Fan coil unit coil is blocked.</td>
<td>Clean air discharge louvers.</td>
</tr>
</tbody>
</table>

* If fuse blows or circuit breaker trips again after first start attempt, DO NOT attempt to start system again. Contact your local dealer for assistance.
† When outdoor temperature is approximately 55°F (12.8°C) or below, indoor coil frosting may occur when system is operated in cooling or maximum dehumidification mode. Units are not intended to operate below 55°F (12.8°C) without appropriate accessories.
LEGEND

NC — Normally Closed
ODT — Outdoor Thermostat

NOTE: For systems with indoor units equipped with microprocessor control, see separate controls, service, and troubleshooting manual.

Fig. 33 - Troubleshooting the Heating Cycle
LEGEND
NC — Normally Closed
ODT — Outdoor Thermostat

NOTE: For systems with indoor units equipped with microprocessor control, see separate controls, service, and troubleshooting manual.

Fig. 34 - Troubleshooting the Cooling Cycle