Installation
Operation
Maintenance

Basic Series Fan-Coil
Room Conditioners
Horizontal Concealed

Sizes 040-080

October 1997 - SV-TD-FCXC-FCXC-IOM-1
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Basic series fan-coil units are single room air conditioners designed for cooling and heating load capabilities of 400 to 800 cfm. Units can be selected with either one hydronic circuit (2-pipe) or two hydronic circuits (4-pipe) coil connections.

The Basic Series Fan-Coil design is for the market that requires only the basic features of our standard UniTrane Fan-Coil. Units are horizontal concealed and are available with an exposed fan, plenum, or ceiling access panel.

Ship-loose accessories include a remote-mounted fan speed switch, ball valves, and control valves.

Figure 1. Basic Series fan-coil unit.
Model Number Description

Each Basic Series fan-coil unit is identified by a multiple character model number unique to that particular unit. To determine a unit’s specific options, reference the model number that is located on the unit nameplate on the fan scroll. The unit nameplate also identifies the serial number and sales order number. A detailed explanation of the model number follows below.

**Digit 1, 2 — Unit Type**
FC = Fan-coil

**Digit 3 — Model**
X = Exposed fan
P = With plenum, ship separate
R = With ceiling access panel, ship separate

**Digit 4 — Development Sequence**
“C”

**Digit 5, 6 — Unit Size**
040
060
080

**Digit 7 — Coil**
B = 3 row cooling/heating
C = 4 row cooling/heating
D = 2 row cooling/1 row heating
E = 2 row cooling/2 row heating
F = 3 row cooling/1 row heating

**Digit 8 — Unit Voltage**
1 = 115/60/1
2 = 208/60/1
3 = 277/60/1
4 = 230/60/1
5 = 110-120/50/1
6 = 220-240/50/1

**Digit 9 — Piping Connections**
L = Left hand connections
R = Right hand connections

**Digit 12 — Motor**
A = Free discharge
B = High static

**Digit 13 — Control**
0 = None
F = Fan speed switch

**Digit 14 — Future Use**
0 = None

**Digit 15 — End Valve**
0 = None
1 = Ball valve, supply & return

**Digit 16 — Main Control Valve**
0 = None
A = 2 way, 2 pos, NO
B = 3 way, 2 pos, NO
C = 2 way, 2 pos, NC
D = 3 way, 2 pos, NC

**Digit 17 — Auxiliary Control Valve**
0 = None
A = 2 way, 2 pos, NO
B = 3 way, 2 pos, NO
C = 2 way, 2 pos, NC
D = 3 way, 2 pos, NC
The Basic Unit ships in an individual carton for maximum protection during shipment and storage. Each carton has tagging information that includes the model number, sales order number, serial number, unit size, and piping connections to identify the unit. If requested, the unit will ship with tagging designated by the customer.

Complete the following checklist before accepting delivery of units to detect any shipping damage.

☐ 1. Inspect each piece of the shipment before accepting it. Check for rattles, bent carton corners, or other visible indications of shipping damage.

☐ 2. If the carton appears damaged, open it immediately and inspect the contents before accepting. Do not refuse the shipment. Make specific notations concerning the damage on the freight bill. Check the unit casing, fan rotation, coil, and all accessories.

☐ 3. Inspect the unit for concealed damage and missing components soon after delivery and before storing. Report concealed damage to the delivering carrier within the carrier’s allotted time after delivery.

☐ 4. Do not move damaged material from the receiving location if possible. It is the receiver’s responsibility to provide reasonable evidence that concealed damage did not occur after delivery.

☐ 5. Do not continue to unpack shipment if it appears damaged. Retain all internal packing, cartons, and crate. Take photos of the damaged material if possible.

☐ 6. Notify the carrier’s terminal of damage immediately by phone and mail. Request an immediate joint inspection of the damage by the carrier and consignee.

☐ 7. Notify the Trane sales representative of the damage and arrange for repair. Have the carrier inspect the damage before beginning any repairs to the unit.
Installation Considerations

Complete the following checklist before installing the unit, and complete the installation checklist on page 7 to ensure proper and safe operation.

☐ 1. Clearances
Allow adequate space for free air circulation, service clearances, piping and electrical connections, and any necessary ductwork. For specific unit dimensions, refer to the submittals. Allow clearances according to local and national electric codes. See the following section on Service Access for recommended service and operating clearances. Provide removable ceiling panel, for models X and P, to access the unit.

☐ 2. Structural Support
The installer is responsible to supply adequate support rods for installing units in ceiling. Units with a ceiling access panel may require additional support since access panels attach directly to the ceiling.

☐ 3. Level
If necessary, prepare the ceiling to ensure level installation of the unit.

Level the unit using the chassis end panels as a reference point. Do not use the coil or drain pan as a reference since the coil is pitched and the drain pan is sloped to provide proper drainage.

☐ 4. Condensate Line
A continuous pitch of 1 inch per 10 feet of condensate line run is necessary for adequate condensate drainage.

☐ 5. Wall and Ceiling Openings
Units with ceiling access panels only:
Refer to the submittal for ceiling opening dimensions before attempting to install the unit.

The installation of horizontal concealed units must meet the requirements of the National Fire Protection Association (N.F.P.A.) Standard 90A or 90B concerning the use of concealed ceiling spaces as return air plenums.

Service Access

Service access is available from the bottom of the unit. Model R units have a removable bottom panel to allow ceiling access to the unit. The Trane Company recommends a minimum service clearance of 28 inches beneath the ceiling and 8.5 inches from the left and right side.

Units have either right or left hand piping. Reference piping locations by facing the front of the unit (airflow discharges from the front). The control panel is always on the end opposite the piping.
The following checklist is only an abbreviated guide to the detailed installation procedures given in this manual. Use this list to ensure that all necessary procedures are complete. For more detailed information, refer to the appropriate sections in this manual.

**WARNING:** Disconnect electrical power and allow rotating fan to stop before servicing equipment. Failure to do so may cause severe personal injury or death.

1. Inspect the units for shipping damage.
2. Level installation location to support the unit weight adequately. Prepare necessary ceiling openings to allow adequate air flow and service clearances.
3. Ensure that the unit chassis is level.
4. Secure the unit and any accessory items properly to the ceiling support rods.
5. Complete necessary duct connections.
6. Complete all interconnection wiring for the remote mounted fan speed switch per the wiring schematic and guidelines established in the Interconnection Wiring Section.
7. Install the remote mounted fan speed switch properly.
8. Connect electrical supply power according to the NEC and unit wiring diagrams.
9. Remove any miscellaneous debris such as sheetrock that may have infiltrated the unit during construction.
10. Replace the air filter as required.
Installing the Unit

Suspend the unit from the ceiling using the four 5/8 inch diameter hanger holes, located on top of the unit. The hanger holes allow a maximum shank size of 5/16 inch diameter threaded rods or lag screws (installer provided). Follow the installation procedure below.

**Note:** Follow the requirements of National Fire Protection Association (NFPA) Standard 90A or 90B, concerning the use of concealed ceiling spaces as return air plenums.

1. Prepare the ceiling openings for the ceiling access panel. Reference the unit submittal for dimensions.

2. Position and install the suspension rods or a suspension device (supplied by installer). Refer to the weight range chart given in Table 1.

3. Level the unit by referencing the chassis end panels. Adjust the suspension device.

4. Complete piping and wiring connections, in addition to any necessary ductwork as instructed in the following sections.

5. Ensure condensate drain line is pitched 1 inch per 10 feet of pipe away from unit.

<table>
<thead>
<tr>
<th>Table 1 — Operating Weights, lbs. (kg)</th>
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</thead>
<tbody>
<tr>
<td>Unit Size</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>040</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>060</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>080</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Installing the plenum:
1. Remove the screws in the plenum alignment holes on the sides of the fan.
2. Slide the plenum over the fan, so that the alignment holes meet. Insert the screws through alignment holes.

![Figure 2. Align the plenum over these holes.](image)

Installing the ceiling access panel:
Materials needed: Five 0.25-20x mounting bolts

1. Insert the mounting bolts through the panel and attach to the ceiling securely.
2. Install the bottom panel by placing the hinged end on the trim ring hinged end (always at the return end of the unit).
3. Safety chain assembly: close s-hook on each end of chain. Insert s-hooks through holes in unit and door. Close s-hook on door.
4. Insert retaining screws through bottom panel door and place retaining rings on screws.
5. Swing the bottom panel upward into position. Hook the safety chain to the bottom panel and unit. Do not over tighten the removable front access panel.

*Note: The ceiling must be level to accommodate the trim ring properly.*
1. Properly vent the coil to allow water flow through the unit.

2. Ensure the air filter is in place.

Note: Some circumstances may require the unit to run before building construction is complete. These operating conditions may be beyond the design parameters and adversely affect the unit.
Piping

Before connecting piping to the coil, note the considerations listed below.

• All coil connections are 5/8 inch O.D. (or 1/2 inch nominal) female copper connections.

• The supply and return piping should not interfere with the condensate line.

• The installer must provide adequate water piping system filtration and water treatment.

• Condensate may be an issue if field-installed piping does not have a control valve.

Refer to Figure 4 for supply and return header locations.

**CAUTION:** When installing piping, ensure piping does not extend beyond the drain pan. Do not overheat piping connections to prevent leaks.

*Note:* The installer is responsible for adequately insulating piping that extends beyond the drain pan.

**Connecting field piping to coil:**

1. Slide a 1/2 inch I.D. sweat connection coupling (installer provided) onto the coil headers.

2. Insulate all piping to coil connections as necessary after connections are complete.

*Note:* Maintain a minimum distance of one foot between the reduction fitting for the 1/2 inch diameter line and the unit piping connections.

---

**Figure 4. Coil connections**
Two-pipe units with a fan speed switch ship with an changeover sensor that determines heating or cooling mode based on the supply water temperature.

The factory attaches the sensor and the coiled lead wires to the coil stubs. The installer should attach the sensor parallel to and in direct contact with the supply water pipe so that the sensor will detect active water temperature. Otherwise, the unit may fail to sense the correct supply temperature and disable temperature control.

The maximum length of the automatic changeover wire cannot exceed 10 feet from the control panel. If the sensor extends beyond the unit chassis, use shielded conductors to eliminate radio frequency interference (RFI).

When using 3-way valves, position the changeover sensor upstream of the valve on the supply water pipe.

When using 2-way control valves, position the changeover sensor so that it will detect active water temperature. The unit must always be able to sense the correct water temperature of the system, regardless of the control valve position.

The coil has a manual air vent above the coil connections to release air from the unit. However, this vent is not sufficient to vent the water piping system in the building.

Perform the following steps to vent the coil after completing the unit installation.

1. Pressurize the building piping system with water and vent any trapped air at system vents.
2. Back the set screw out to expel air from the unit and then retighten the set screw.
Duct Connections

When making duct turns and transitions avoid sharp turns and use proportional splits, turning vanes, and air scoops when necessary.

When possible, construct and orient supply ductwork turns in the same direction as the fan rotates.

Run discharge ductwork in a straight line, unchanged in size or direction, for a minimum equivalent distance of 3 fan diameters from the unit (approximately 20 inches).

The Trane Company recommends the use of galvanized sheet metal ductwork with fan-coil units. Slide the sheetmetal duct over the duct collar flange of the unit, seal the joint and fasten with sheetmetal screws.

Note: Do not run screws through the removable front panel on model R units.

Install all air ducts according to National Fire Protection Association standards for the Installation of Air Conditioning and Ventilating Systems (NFPA 90A and 90B).

Follow the general recommendations listed below when installing ductwork for the fan-coil unit.

• Discharge ductwork should run in a straight line, unchanged in size or direction, for a minimum equivalent distance of 3 fan diameters from the unit (approximately 20 inches).

• When making duct turns and transitions avoid sharp turns and use proportional splits, turning vanes, and air scoops when necessary.

• When possible, construct, and orient supply ductwork turns in the same direction as the rotation of the fan.
Electrical Connections

Supply Power Wiring

Refer to the unit nameplate to obtain the minimum circuit ampacity (MCA) and maximum fuse size (MFS) or maximum circuit breaker (MCB) to properly size field supply wiring and fuses or circuit breakers. Refer to the unit operating voltage listed on the unit wiring schematic or nameplate and to the wiring schematic for specific wiring connections.

⚠️ WARNING: Hazardous voltage! Disconnect all electric power including remote disconnects before servicing. Failure to do so may cause severe personal injury or death.

Locate the wiring diagrams in the unit’s accessory bag.

All field wiring should conform to NEC and all applicable state and local code requirements.

⚠️ CAUTION: Use copper conductors only! Unit terminals are not designed to accept other types of conductors. Failure to do so may cause fire or damage to the equipment.

The basic series unit has either right or left hand piping connections. The control panel box is always on the opposite end of the piping connections. For example, a right hand piped unit has the control panel box on the left side of the unit.

To access the control box, remove the two screws that secure the front cover. The power leads and capped ground wire are inside the control panel box.

⚠️ WARNING: All power wire must be insulated from sheetmetal ground. Failure to do so may cause electrical shorts resulting in personal injury or death.

Electrical Grounding Restrictions

All sensor and input circuits are normally at or near ground (common) potential.

All input/output circuits (except isolated relay contacts and optically isolated inputs) assume a grounded source, either a ground wire at the supply transformer to control panel chassis, or an installer supplied ground.

Note: Do not connect any sensor or input circuit to an external ground connection.
The installer must provide interconnection wiring to connect the fan speed switch. Refer to the unit wiring schematic for specific wiring details and point-to-point wiring connections. Dashed lines indicate field wiring on the unit wiring schematics and submittals. All interconnection wiring must conform to NEC Class 2 wiring requirements and any state and local requirements. Refer to Table 3 for the wire size range and maximum wiring distance for each device.

### Table 3 — Maximum Wiring Distances

<table>
<thead>
<tr>
<th>Fan Speed Switch</th>
<th>Wire Size Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 ft.</td>
<td>14-22 AWG</td>
</tr>
<tr>
<td>152.4 m</td>
<td></td>
</tr>
</tbody>
</table>

**Wall Mounted Control Interconnection Wiring**
Installing the Fan Speed Switch

The fan speed switch ships loose with the unit. Follow the steps below to install the fan speed switch remotely.

Items needed:
2 x 4 electrical junction box

1. Remove the brown wire if not using a field-supplied damper. Remove the terminals, cut and strip wires as required for installation.

2. Level and position a 2 x 4 electrical junction box. Follow the instructions given in the “Interconnection Wiring” section and route the wires as shown in the wiring diagram. Refer to the typical wiring diagram on pages 17 and 18 or to the diagram shipped with the unit.

3. Position the fan speed switch over the junction box with the two screws supplied.
Typical Wiring Diagram

NOTES:
1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. SOLID LINES INDICATE WIRING BY TRANE CO.
2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.

For reference only:
This schematic show typical wiring of a fan-coil. It is not intended for a basis of design or for equipment installation purposes in the field. For an as-built schematic specific to a particular unit, please see the shipped schematic for that specific unit.
Typical Wiring Diagram

NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIREFRAME BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. SOLID LINES INDICATE WIRING BY TRANE CO.

2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.

DEVICE PREFIX LOCATION CODE

<table>
<thead>
<tr>
<th>AREA</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CONTROL PANEL</td>
</tr>
<tr>
<td>2</td>
<td>CONTROL END</td>
</tr>
<tr>
<td>3</td>
<td>PIPING END</td>
</tr>
<tr>
<td>4</td>
<td>FAN SECTION</td>
</tr>
<tr>
<td>5</td>
<td>COIL SECTION</td>
</tr>
<tr>
<td>6</td>
<td>CUSTOMER</td>
</tr>
</tbody>
</table>

LEGEND

<table>
<thead>
<tr>
<th>DEVICE DESIGNATION</th>
<th>DESCRIPTION</th>
<th>LINE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>6S1</td>
<td>FAN SWITCH</td>
<td>8</td>
</tr>
<tr>
<td>4B1</td>
<td>FAN MOTOR</td>
<td>8</td>
</tr>
</tbody>
</table>

For reference only:
This schematic shows typical wiring of a fan-coil. It is not intended for a basis of design or for equipment installation purposes in the field. For an as-built schematic specific to a particular unit, please see the ship-with schematic for that specific unit.
Maintenance

Listed below are the recommended maintenance schedules. Instructions for specific maintenance procedures are given in the sections following the checklist.

⚠️ **WARNING:** Disconnect electrical power and allow rotating fan to stop before servicing equipment. Failure to do so may cause severe personal injury or death.

### Periodic Maintenance Checklist

#### Monthly
1. Inspect the unit air filters. Clean or replace dirty filters.

*Note: Building conditions may require filter change more or less frequently.*

2. Check the drain pan to ensure it is clean and does not impede condensate flow through the drain line or that it permits microbial growth contamination.

#### Yearly
1. Inspect the unit cabinet for corrosion and clean to provide unit protection.

2. Inspect the fan wheel and housing for damage. Rotate the fan wheel manually to ensure it moves freely.

3. Inspect the coil fins for excessive dirt or damage. Remove dirt and straighten fins.

4. Clean and tighten all electrical connections.

### Maintenance Procedures

#### Filters

Change or clean air filters at least twice a year. Filters require more frequent care under high load conditions or dirty air since a clogged filter reduces airflow.

#### Drain Pans

Clean the drain pan to ensure proper condensate drainage for the unit and to help prevent microbial growth contamination.

### Table 3. Filter Dimensions

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Filter, in. cm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>040</td>
<td>1 x 9.75 x 20.25</td>
</tr>
<tr>
<td></td>
<td>2.5 x 24.77 x 51.44</td>
</tr>
<tr>
<td>060</td>
<td>1 x 9.75 x 29.75</td>
</tr>
<tr>
<td></td>
<td>2.5 x 24.77 x 75.57</td>
</tr>
<tr>
<td>080</td>
<td>1 x 9.75 x 38.25</td>
</tr>
<tr>
<td></td>
<td>2.5 x 24.77 x 97.16</td>
</tr>
</tbody>
</table>
Winterizing the Coil

Make provisions to ensure adequate protection against coil freeze-up. If the fan-coil units are not in operation, the coil should be vented at the coil vent and drained at the piping system drain port. See Table 4 for approximate hydronic coil volumes.

It is necessary to properly prepare the units for cold weather. If a coil is not in use and is subject to temperatures below 32° F, drain the coil at the (installer provided) piping drain to prevent coil freezeup.

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Total # Rows</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>040</td>
<td>1</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>.15</td>
</tr>
<tr>
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<tr>
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<td>2.1</td>
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</tbody>
</table>

Note: 1 and 2-row coil volumes applies to the 1 and 2-row heating coil in 4-pipe configurations.

CAUTION: Failure to winterize the coil can cause it to freeze-up and burst, resulting in property damage.
Contact your local Trane Service Parts Center to purchase replacement parts. To order, the Trane parts center will need the unit model number or the serial number, which are located on the unit nameplate.
Since the Trane Company has a policy of continuous product improvement, it reserves the right to change specifications and design without notice.

An American-Standard Company