FB4P Fan Coil Units – 50Hz

Quality Assurance
Certificate Reg. No:
04 100 950420

Puron
the environmentally sound refrigerant

Subject to change without notice

Installation Operation Maintenance Manual

Manufacturer's Name: Saudi Airconditioning Manufacturing Co. Ltd.
Country of origin : Jeddah, Saudi Arabia
Nearest port of embarkation: Jeddah Islamic port
Product classification: Commercial and Residential

FB4P – 50Hz

Nominal Cooling Capacity 1.5 – 5.0 Tons
HFC R-410A Refrigerant

FB4P Direct Expansion multipoise fan coil units are available in 6 sizes with nominal cooling capacity range from 1.5 to 5.0 Tons. Each unit is designed to occupy a minimum space. No complex system controls are required for Carrier fan coil units. Piping, drain, and wiring connections are readily accessible and mounting holes and slots are predrilled to save installation time and field labor expense. They are compact and ready to fit where needed in the basement, crawlspace, attic, utility room, or closet.

Contact your local Carrier representative for additional reference materials.

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SAFETY CONSIDERATIONS

General

Improper installation, adjustment, alteration, service, maintenance or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer; service 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 the safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes for special requirements. In absence of local codes, it is recommended that the USA standard ANSI/NFPA 70, National Electrical Code (NEC), be followed.

It is important to 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 the signal words DANGER, WARNING, CAUTION**,** and NOTE**.** These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury of death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Installation Safety Considerations

After the unit has been received and when it is ready to be installed or reinstalled, it must be inspected for damage. If damage is detected upon receipt, immediately file a claim with the shipping company or repair.

This machine must be installed in a location that is not accessible to the public and protected against access by non-authorized people. This machine must not be installed in an explosive atmosphere.

Do not remove the skid or the packaging until the unit is in its final position. The units can also be lifted with slings, using only the designated lifting points marked on the unit (labels on the chassis and a label with all unit handling instructions are attached to the unit). Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied for the unit.

Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel. These units are not designed to be lifted from above.

Warranty

Warranty is based on the general terms and conditions of the manufacturer. Any modifications to the design and/or installation made without discussion with Carrier and without advance written agreement will result in the loss of the right to any warranty claims and any claim for injury to personnel as a result of these modifications.

Physical Data - FB4P Series

Unit Model	18	24	30	36	48	60
Unit size (Tons)	1.5	2	2.5	3.0	4.0	5.0
Motor HP	1/3		1/2		3/4	
Evaporator Coil						
Coil Material (HP Tube)	3/8" Dia. Copper Tube					
Coil Material (Finplate)	Aluminum					
Rows / Fins Per Inch	2 / 14.5	3 / 14.5	2 / 16	3 / 14.5		
Refrigerant						
Metering Device	Bypass AccuRater					
Piston Size	52	55	59	61	80	84
Filter Type	Polyester Fiber					
Filter Qty. / Size (mm)	1 / 332 x 547 x 21		1 / 547 x 416.5 x 21		1 / 547 x 505.5 x 21	
Unit Dimensions						
Net Weight, kg	43.5	50.8	54.4	57.6	71.2	79.4

Electrical Data

Indoor Model	Power Supply	Vol - Min	Vol - Max	Fan FLA	MCA	MOCP
FB4PSSF018000E	230V-1Phz-50Hz	207	253	2.8	3.5	15
FB4PSSF024000E						
FB4PSSF030000E				4.1	5.1	
FB4PSSF036000E						
FB4PSSF048000E				6.0	7.5	
FB4PSSF060000E						

Combination Matrix and Ratings

Indoor Model	Outdoor Model	Capacity (Btu/hr)		EER (Btu/hr) / W		Power Input (kW)		AMPS	
		AHRI	T3	AHRI	T3	AHRI	T3	AHRI	T3
FB4PSSF018000E	38PKC18DS70-02	20600	17000	11.85	8.60	1.74	1.98	8.5	9.5
FB4PSSF024000E	38PKC24DS70-02	25700	20600	11.90	8.55	2.16	2.41	10.5	11.5
FB4PSSF030000E	38PKC30DS70-02	30000	24000	11.90	8.40	2.52	2.85	11.0	12.4
FB4PSSF036000E	38PKS36DS90-01	35000	29000	11.95	8.65	2.93	3.35	5.3	5.6
FB4PSSF048000E	38PKS48DS90-01	49000	45000	11.81	8.61	4.15	5.23	6.4	7.9
FB4PSSF060000E	38PKS60DS90-01	56000	49500	12.10	8.65	4.63	5.72	7.3	8.9

Legend and Notes

EER — Energy Efficiency Ratio

AHRI — Air-Conditioning, Heating, and Refrigerant Institute

RLA — Rated Load Amps

LRA — Locked Rotor Amps

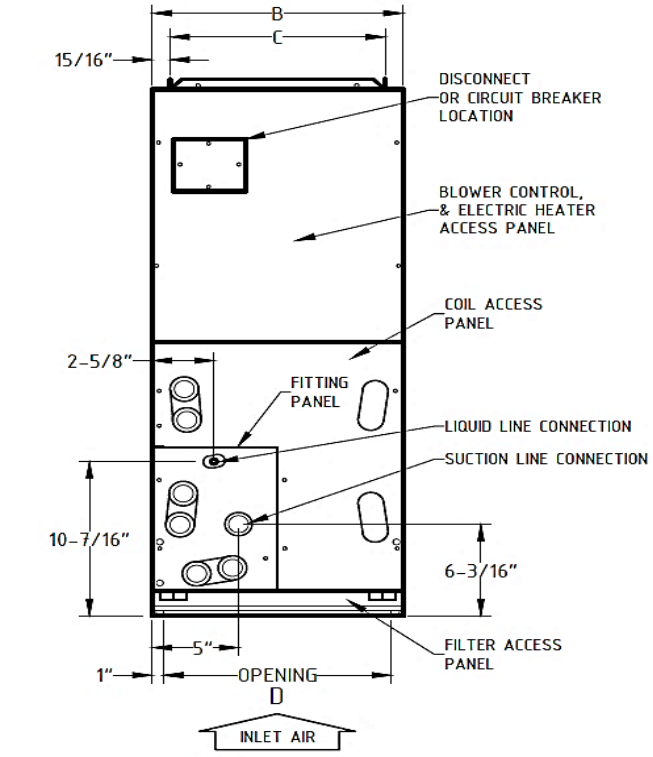
FLA — Full Load Amps

MCA — Minimum Circuit Amps

MOCP — Maximum Overcurrent Protection

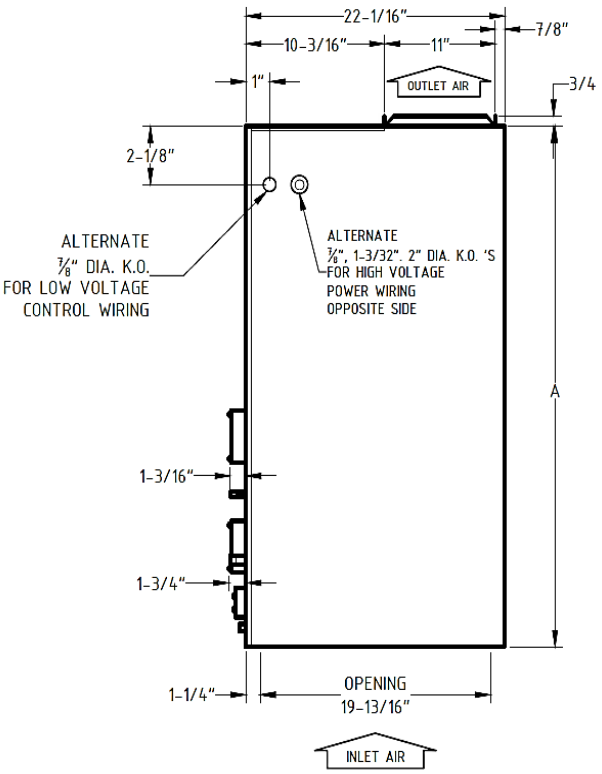
Notes: Testing as per AHRI testing standard and UAE.S ISO 13253:2011 (T3)

Unit Dimensional Drawing

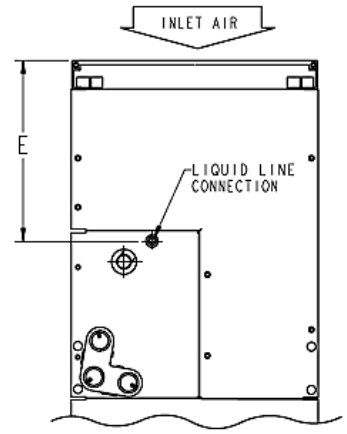


FRONT VIEW

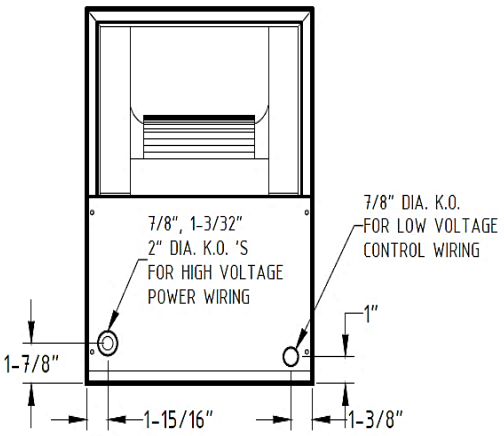
SHOWN WITH "A" COIL DETAILS CONNECTION LOCATIONS FOR UPFLOW OR HORIZONTAL APPLICATIONS



RIGHT SIDE VIEW



ACCESS PANEL CONFIG. FOR
SLOPE COILS
DOWNFLOW OR HORIZ.
RIGHT APPLICATIONS



TOP VIEW

Unit Size	Coil Type	A		B		C		D		E	
		in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.
018	Slope	42-11/16	1084.3	14-5/16	363.5	12-7/16	316.0	12-5/16	312.7	10-7/16	265.1
024	Slope	42-11/16	1084.3	14-5/16	363.5	12-7/16	316.0	12-5/16	312.7	10-7/16	265.1
030	Slope	47-11/16	1211.5	17-5/8	447.5	15-3/4	400.1	15-5/8	396.9	15-3/8	390.5
036	Slope	49-5/8	1260.5	17-5/8	447.5	15-3/4	400.1	15-5/8	396.9	15-3/8	390.5
048	A	49-5/8	1260.5	21-1/8	536.5	19-1/4	489.0	19-1/8	485.8	15-11/16	398.3
060	A	53-7/16	1375.3	21-1/8	536.5	19-1/4	489.0	19-1/8	485.8	19-1/2	495.3

Unit Connection Sizes:

- Suction: 030 & 060 – $^{5}/_{8}$" I.D Sweat
- Liquid: $^{3}/_{8}$" I.D Sweat
- Condensate: $^{3}/_{4}$" FPT

Introduction

This document contains general installation instructions for the FB4P unit Fan Coils. Refer to the unit-wiring diagram installed on the control box or specific manufacturer literature for any other type of factory mounted controls.

See drawings for unit configurations, dimensions, clearances, and pipe connections. Refer to unit wiring label for all electrical connections; follow NEC (National Electrical Code) and local codes.

Receiving

FB4P fan coil units are shipped individually packed in carton boxes. When cartons are individually off loaded from the truck, do not roll, nor throw, or drop the carton to avoid damage to the contents. Store boxes upright as the symbols on the boxes indicated.

Inspection

Check the shipment against shipping list and remove unit from the carton and take off protective covering. If the unit has been damaged, file claim with transportation company and notify Carrier immediately.

Protection

Protect unit from damage caused by job site debris. Do not allow dust, debris and water to get into the unit. This will damage unit's component and unit's performance will be affected.

Preliminary Check

Following is a checklist which should be checked before the installation is started. The installer should be familiar with each of the following requirements before the actual installation.

a) Space requirement and clearance
b) Ceiling or mounting strength.
c) Piping connections.
d) Condensate drain connection.
e) Power supply and wiring.
f) Air duct connections.
g) The condensing unit model number is the recommended by the factory (as per the below table).

Prepare Jobsite for Unit Installation

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire, and duct connection requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their part of the installation.

Identify and Prepare Units

Be sure power requirements match available power source. Refer to unit nameplate and wiring diagram.
1. Check all tags on unit to determine if shipping screws are to be removed. Remove screws as directed.
2. Rotate the fan wheel by hand to ensure that the fan is unrestricted and can rotate freely. Check for shipping damage and fan obstructions.

Unit Configuration

The piping connections, drain pan outlet and control box are located on the right side of the unit facing the airflow direction as factory standard as shown in the unit picture. Left hand side connection is factory option. However, the connections side can be relocated at site.

Rigging and Unpacking

Unit should not be removed from carton until reaching final location to avoid damage. Inspect unit for shipping damage and file claim with transportation company if necessary, check nameplate voltage against available power supply. For special installation, consult local building and electrical codes.

Installation

Placing Unit in Position

1. Select the unit location. Allow adequate space for free air circulation, service clearances, piping and electrical connections, and any necessary ductwork. For specific unit dimensions, refer to the submittal drawings.
Allow clearances according to the local and national electrical codes.
2. Be sure either the ceiling is able to support the weight of the unit. See physical data for nominal unit weight.
3. Move unit into position. Ensure unit is level or pitched towards drain to ensure proper drainage and operation.
4. Mounting units to the ceiling - When unit is lifted, access to the mounting holes is on the top panel of the unit. Hanger rods, fasteners, and other required hardware must be field-supplied.

Mount Unit

Unit can stand or lie on floor, or hang from ceiling or wall. Allow space for wiring, piping and servicing unit.

Important: When unit is installed over a finished ceiling and/or living area, building codes may require a field-supplied secondary condensate pan installed.

Under the entire unit. Some localities may allow as an alternative the running of a separate secondary condensate line. Consult local codes for additional restrictions or precautions.

A. **Upflow Installation:** If return air is to be ducted through a floor, set unit on floor over opening and use 1/8" to 1.4" inch thick fireproof resilient gasket between duct unit and floor. Cut opening as per dimensions (See Fig. 1). A field supplied bottom closure is required.
B. **Downflow Installation:** In this application, field conversion of the evaporator coil is required, using accessory downflow kit. Along with an accessory base kit. See installation instructions packaged with accessory kits. See product data for kit pan numbers.
C. **Horizontal Installation:** Units must not be installed with access panels facing up or down. All other units are factory built for horizontal left installation. When suspending unit from ceiling, dimples in casing indicate suitable location and screws for mounting metal support straps (See Fig. 2).

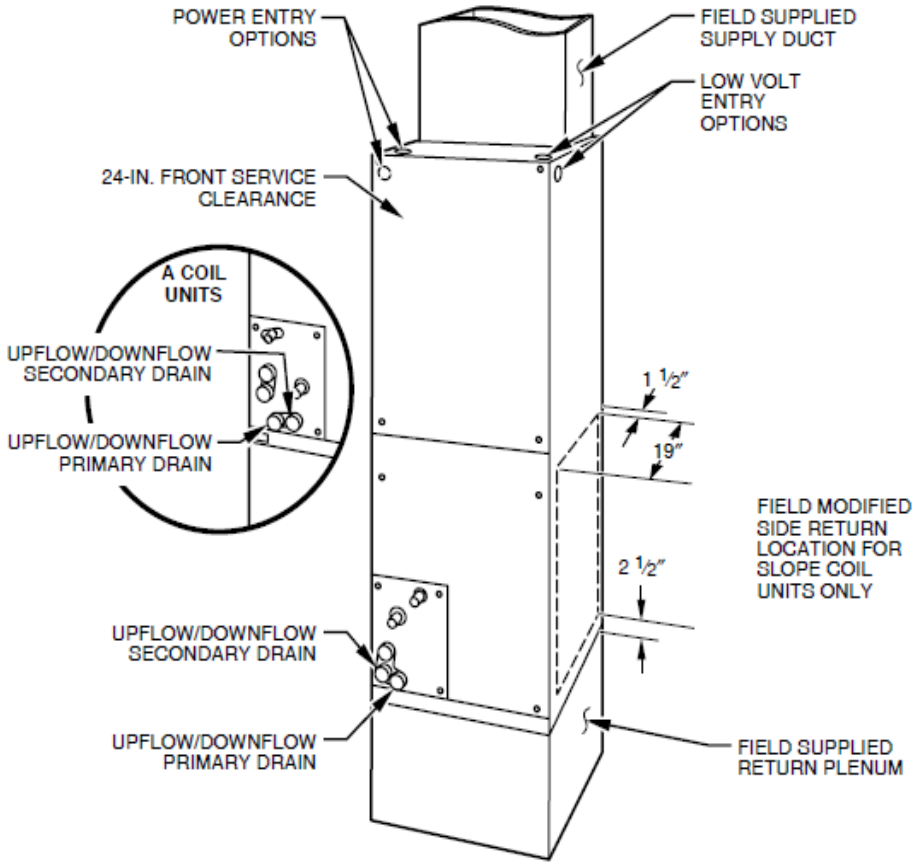


Fig - 1 Slope Coil Unit in Upflow Application

CAUTION

For optimum condensate drainage performance in horizontal installations, unit should be leveled along its length and width.

Note: Modular units can be dissembled and components moved separately to installation area for reassembly. This process accommodates small scuttle holes and limiting entrances to installation sites. (See Fig. 3.)

Horizontal Right Conversion of Units with Slope Coils

1. Remove blower and coil access panels and fitting panel. (See Fig. 4.)
2. Remove coil mounting screw securing coil assembly to right-side casing flange.
3. Remove coil assembly.
4. Lay fan coil unit on its right side and reinstall coil assembly with condensate pan down. (See Fig. 4.)
5. Attach coil to casing flange using coil mounting screw previously removed.
7. Align holes with tubing connections and condensate pan connections, and reinstall access panels and fitting panel. Make sure liquid and suction tube grommets are in place to prevent air leaks and cabinet sweating. Install after brazing.

Horizontal Right Conversion for 048 and 060

1. Remove blower and coil access panels. (See Fig. 5)
2. Remove metal clip securing fitting panel to condensate pan. Remove fitting panel.
3. Remove 2 snap-in clips securing A-coil in unit. Remove horizontal pan bracket and drain pan support by removing the screw.
4. Slide coil and pan assembly out of unit.
5. Remove horizontal drain pan support bracket from coil support rail on left side of unit and reinstall on coil support rail on right side of unit.
6. Convert air-seal assembly for horizontal right
    a. Remove air -seal assembly from coil by removing 4 screws.
    b. Remove air splitter (B) from coil seal assembly by removing 3 screws. (See Fig.5 - factory-shipped inset.)
    c. Remove filler plate (A) and install air splitter (B) in place of filler plate.
    d. Install filler plate (A) as shown in horizontal right application.
    e. Remove condensate (C) and install on opposite tube sheets.
7. Install horizontal pan on right side of coil assembly.
8. Slide coil assembly into casing. Be sure coil bracket on each comer of vertical pan engages coil support rails.
9. Reinstall 2 snap-in clips to correctly position and secure coil assembly in unit. Be sure clip with large offset is used on right side of unit to secure horizontal pan.
10. Reinstall horizontal pan bracket, drain pan support and secure with a screw previously removed.
11. Remove knockout on right side of coil access panel.
12. Reinstall access and fitting panels, aligning holes with tubing connections and condensate pan connections.

Be sure to reinstall metal clip between fitting panel and vertical condensate pan. Make sure liquid and suction tube grommets are in place to prevent air leaks and cabinet sweating.

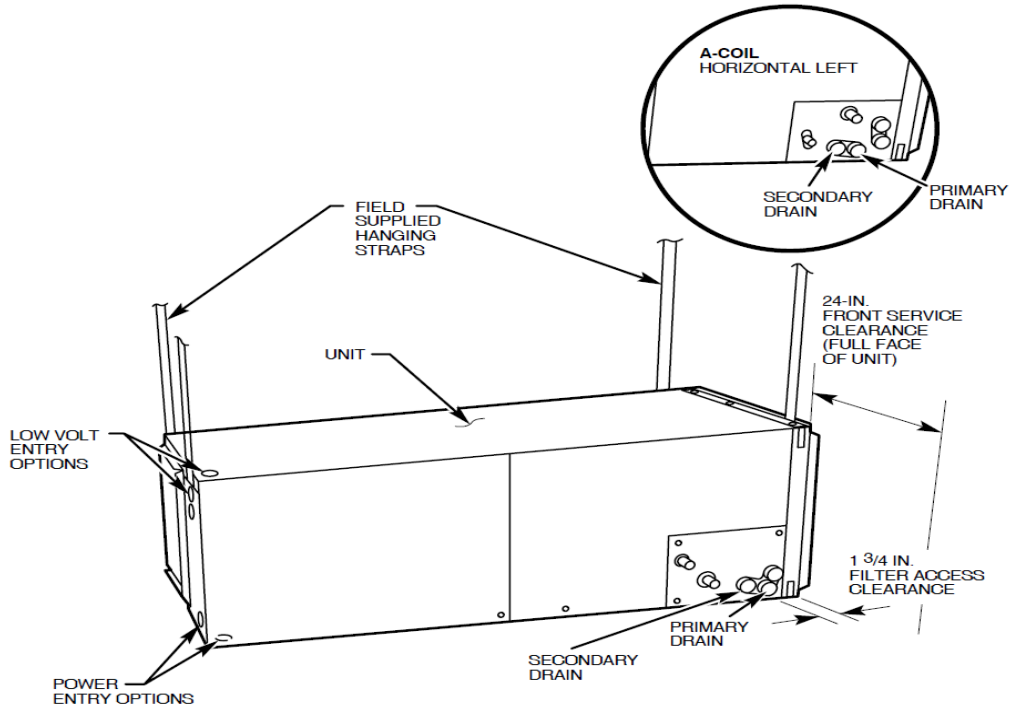


Fig - 2 Slope Coil Unit in Horizontal Left Application

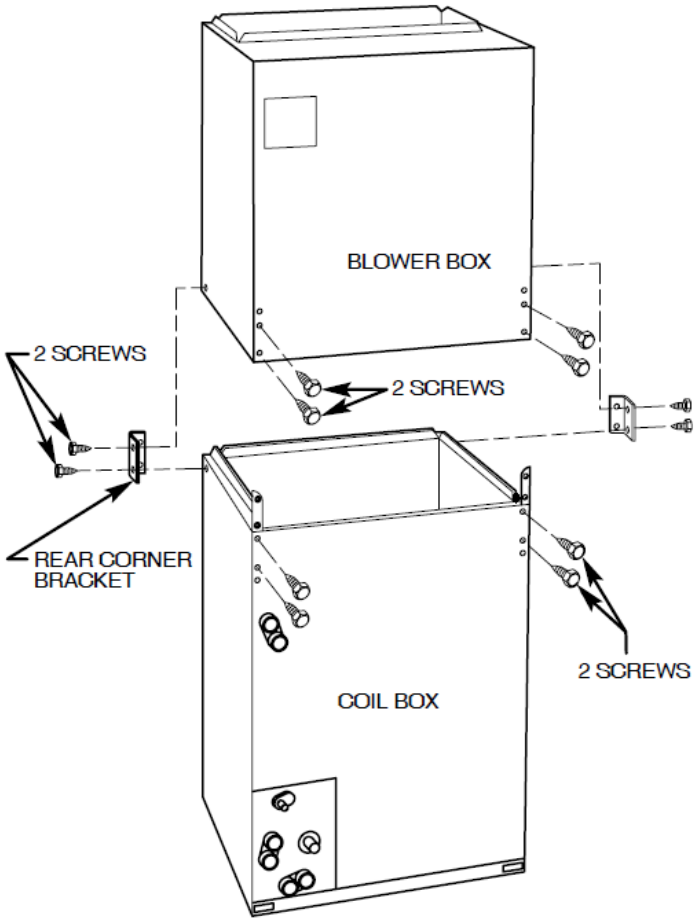


Fig - 3 Removal of Brackets on Modular Unit

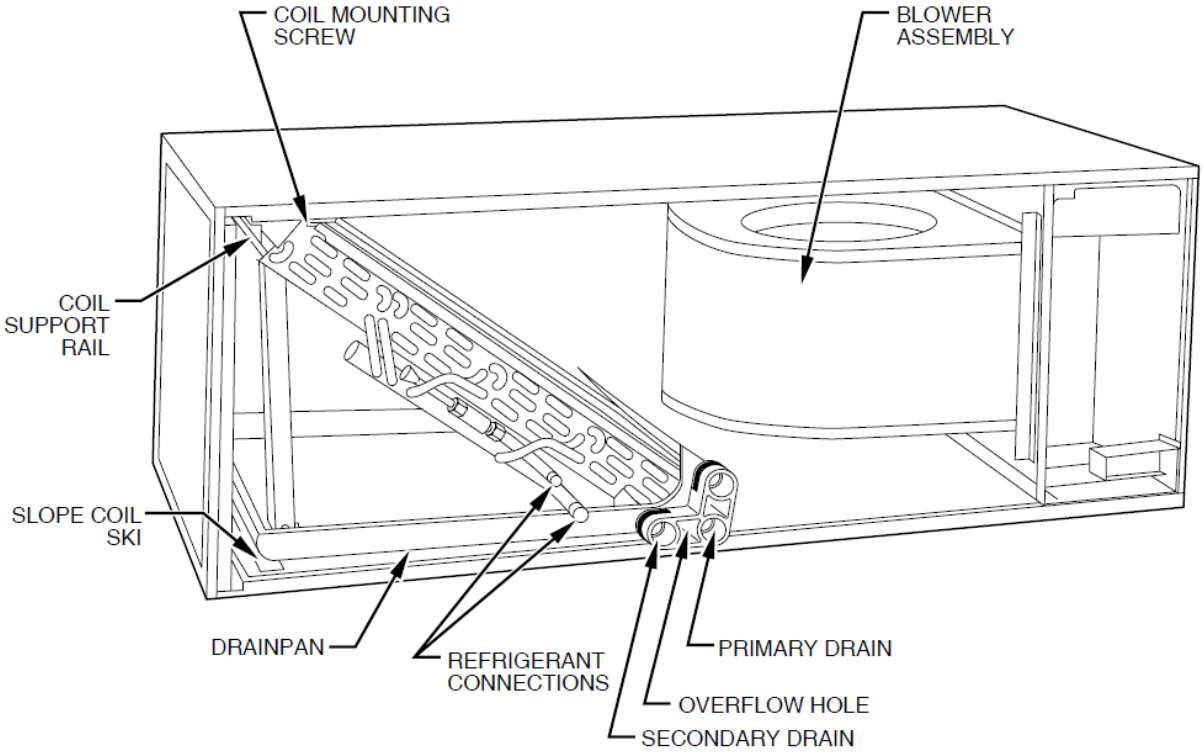


Fig - 4 Conversion for Horizontal Right Applications Using a Slope Coil

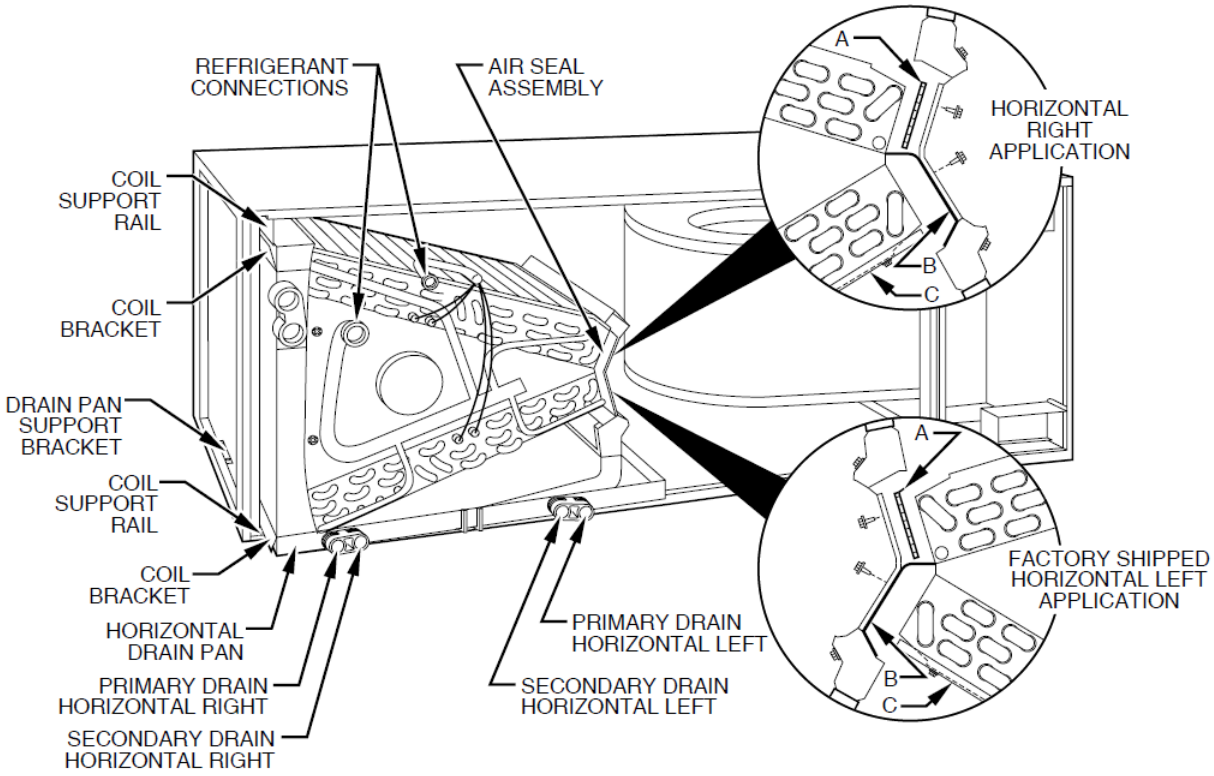


Fig - 5 Conversion for Horizontal Right Applications Using A-Coil

Air Ducts

Connect the supply-air duct over the outside of the 3/4-in. flanges provided on the supply-air opening. Secure the duct to the flange, using proper fasteners for the type of duct used, and seal the duct-to-unit joint. If return-air flanges are required, install factory-authorized accessory kit. Use flexible connectors between ductwork and unit to prevent transmission of vibration. When electric heater is installed, use heat-resistant material for flexible connector between ductwork and unit at discharge connection. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier.

A. Ductwork Acoustical Treatment

Metal duct systems that do not have a 90° elbow and 10 ft of main duct to first branch takeoff may require internal acoustical insulation lining. As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of SMACNA construction standard on fibrous glass ducts. Both acoustical lining and fibrous ductwork shall comply with National Fire Protection Association as tested by UL Standard IK I for Class I air ducts.

Make Electrical Connections

Refer to unit nameplate for required supply voltage, fan and heater amperage and required circuit amp. Refer to unit wire diagram for unit and field wiring. Make sure all electrical connections are in accordance with unit wiring diagram and all applicable codes. The fan motor(s) should never be controlled by any wiring or device other than the factory-supplied control board and remote control. All field wiring must be in accordance with governing codes and ordinances. Any modification of unit wiring without factory authorization will invalidate all factory warranties and nullify any agency listings.
- Select proper wall location to fix display pad
- Connect communication cable end to its location in the PCB as shown in the wiring diagram.

IMPORTANT	CAUTION
Wiring diagrams shown depict typical control functions. Refer to unit wiring label for specific functions.	If a disconnect switch is to be mounted on the unit, select a location where drill or fastener will not contact electrical or refrigerant components.

WARNING

Field wires on the line side of the disconnect found In the fan coil unit remain live, even when the pull-out is removed. Service and maintenance to incoming wiring cannot be performed until the main disconnect switch (remote to the unit) is turned off. Failure to do so will result In electrical shock causing personal Injury or death.

NOTES:

1. The control kit is factory supplied, no thermostat required.
2. The wall mounted wired room controller can control all system functions without wireless remote control.
3. Standard wire length for the control board is 15 m. If extension is required, please contact your local carrier dealer.

B. Ground Connections

Use UL-lifted conduit and conduit connector for connecting supply wire(s) to unit to obtain proper grounding. Grounding may also be accomplished by using grounding lugs provided in control box.

WARNING

According to NEC, ANSI/NFPA 70, and local codes, the 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. Failure to follow this warning could result in electric shock, fire, or death.

Refrigerant Tubing

Use accessory tubing package or field-supplied tubing of refrigerant grade. Suction tube must be insulated. Do not use damaged, dirty, or contaminated tubing because it may plug refrigerant flow-control device. ALWAYS evacuate the coil and field-supplied tubing to 500 microns before opening outdoor unit service valves.

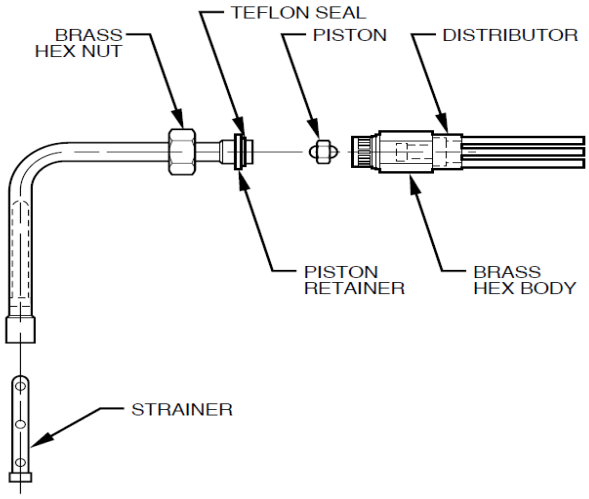


Fig – 6 Refrigerant Flow-Control Device

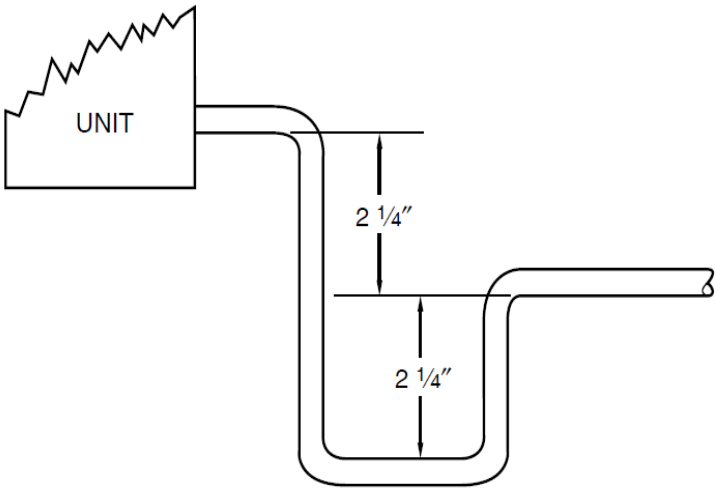


Fig – 7 Recommended Condensate Trap

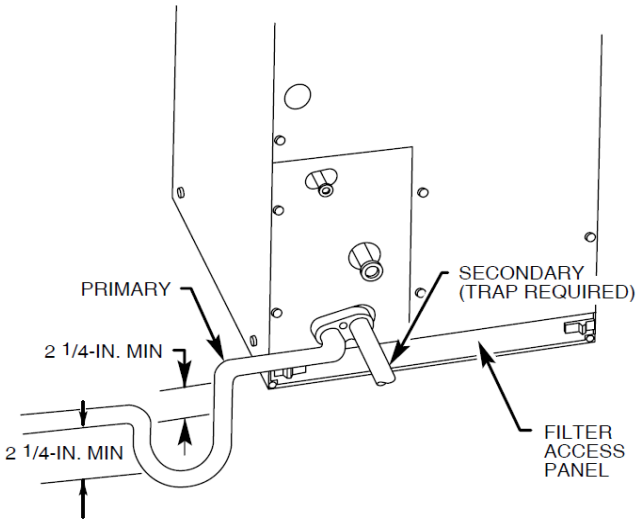


Fig – 8 Condensate Drain

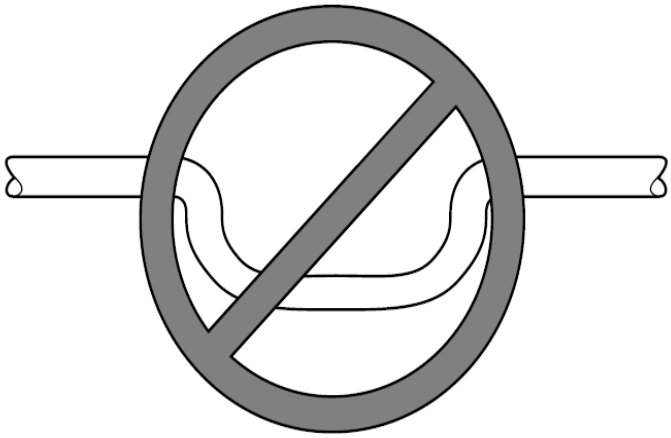


Fig – 9 Insufficient Condensate Trap

CAUTION

Braze with Sil-Fos or Phos-copper on copper to copper joints and wrap a wet cloth around rear of fitting.

Refrigerant Flow-Control Device

Replace piston if required. Check piston size shown on indoor unit rating plate to see if it matches required piston shown on outdoor unit rating plate. If it does not match, replace indoor piston with piston shipped with outdoor unit. The piston shipped with outdoor unit is correct for any approved indoor coil combination.

Condensate Drains

Units are equipped with primary and secondary 3/4 in.FPT drain connections. To prevent property damage and achieve optimum drainage performance. BOTH primary and secondary drain lines should be installed and include properly-sized condensate traps. Be sure to install plastic push-in plugs in unused condensate drain fittings. It is recommended that PV'C fittings be used on the plastic condensate pan. Do not over-lighten. Finger-tighten plus 1-1/2 turns. Use pipe dope. NOTE: No secondary drain line on horizontal application for A-coil unit.

CAUTION

Shallow, running traps are inadequate and DO NOT allow proper condensate drainage.

NOTE: When connecting condensate drain lines, avoid blocking filter access panel, preventing filter removal. Prime both primary and secondary .condensate traps after connecting to drain pan.

If the unit is located in or above a living space where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place.

As an alternative to using an external condensate pan. some localities may allow the running of a separate 3/4 in condensate line (with appropriate trap) to a place where the condensate will be noticeable. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan. the unit requires servicing or water damage will occur. Install traps in the condensate lines as close to the coil as possible. Make sure that the outlet of each trap is below its connection to the condensate pan to prevent condensate from overflowing the drain pan. Prime all traps, test for leaks, and insulate traps if located above a living area. Condensate drain lines should be pitched downward at a minimum slope of I in. for every 10 ft of length. Consult local codes for additional restrictions or precautions.

Controller For Ducted Fan Coil Units

Features: The controller is used to control air cooled ducted split unit, supports the following functions:
- Modes: Cool, Dry, Fan, Heat
- Indoor fan speed: Auto, High, Medium, Low
- Sleep mode
- Compressor protections:
  Comp 3 minutes restart protection
  Indoor coil anti-freeze
  Room sensor and indoor coil sensor failure monitoring
- Non volatile memory – keep system settings
- Programmable On/Off timer
- Random restart to minimize voltage dip during compressor first cut in cycle upon power up.

Hardware Setting: A 2 way DIP switch is used to configure:

DIP Switch	On	Off
SW1	Cool	Cool-Heat
SW2	Water System	DX System

Error Code: If multiple faults happen at the same time, the corresponding error code will be shown one after another

Fault	Error code
Room sensor fault	E1
Indoor coil sensor fault	E2
Comp fault	E4

Split System Description

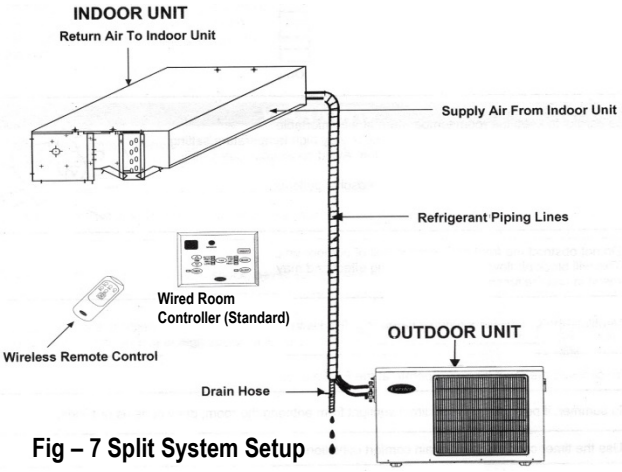


Fig – 7 Split System Setup

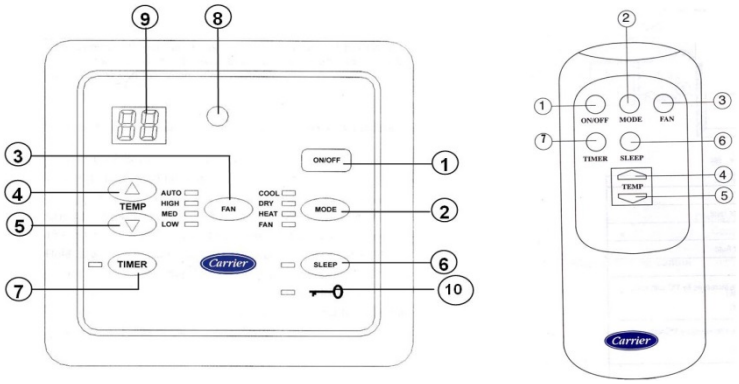


Fig - 8 System Room Controllers

Notes: The wired room controller is mounted on the wall and can control all system functi

(You can hear a receiving beep). If you press this key immediately after turning off the system, the compressor will not operate for 3 minutes to prevent overloading.

2) Operation Mode Selection Key: Toggles the operation mode: Cool, Dry, Heat, or Fan only

"COOL" Led	Lights on when selecting COOL mode.
"DRY" Led	Lights on when selecting DRY mode.
"HEAT" Led	Lights on when selecting Heat mode.
"FAN" Led	Lights on when selecting FAN mode.

3) Fan Speed Selection Key: Toggles the fan speed: Auto, High, Medium, or Low, Note: Fan key is invalid in Dry mode.

4) Temperature Up Key: By pressing Temperature up Key, the setting temperature increases by 1ºC with each press.

5) Temperature Down Key: By pressing temperature down key, the setting temperature decreases by 1ºC with each press. If you set the desired room temperature, then system will maintain the room temperature as set. Upon setting the desired room temperature the system will maintain the room temperature

Cool Mode: If the room temperature is higher than the setting, the compressor will automatically turn on provide a cooling effect. On the hand, if the room temperature is lower than the setting, the compressor will automatically turn off to stop cooling operation. If indoor fan is programed to be turned off with comp signal, it will turn off once comp is cut off

Heat Mode: If the room temperature is lower than the setting, the Electric heater will automatically turn on to provide a heating effect. If the room temperature is higher than the setting, the heater will automatically turn off to stop heating operation. If indoor fan is programed to be turned off with heater signal, it will turn off once heater is cut off but subject to 30 sec dispersing remaining heat timing.

Dry Mode: The fan speed runs automatically at low speed and compressor stopping and running is controlled by the difference between room and setting temperatures and by continuous running time. If indoor fan is programed to be turned off with comp signal, it will turn off once comp is cut off

- In Dry mode, the humidity is reduced in the space to be air-conditioned.

Fan Mode: There will be no cooling or heating effects; only the fans of indoor unit will run for ventilation at the selected speed (High, Med, and Low).

- In COOL or HEAT mode and if AUTO fan speed is selected; Fan speed is automatically selected by controller according to the difference between setting temperature and room temperature, fan will be continuously running at low speed after setting temperature is achieved.

Notes:

a) Temperature setting range is 16ºC to 30ºC or 60ºF to 85ºF.
b) Hold down at the same time for about 5 seconds, Temp down and fan keys will toggle the temperature setting from degree C to degree F and vice versa.
c) Press any temperature key will flash the current setting temperature for 4 seconds, Should there be no further key press, it will revert to room temperature display. Temperature display range is 0 C to 50 C or 32 F to 99 F.
d) Temp keys are invalid in Fan mode.

6) Sleep Key: Press this key to set the SLEEP timer and then the sleep led will light on, to cancel the sleep timer press this key again.

- Sleep function for healthy sleep to control automatically the room temperature and stop automatically the operation of the air conditioner after certain set off time.
- Sleep mode is valid in cool or heat mode and invalid in Fan mode.

7) Timer Key: Upon count down of the set hours, the system will switch from OFF to ON or vice-versa.

- OFF Timer Function to stop automatically, the air conditioner after certain set OFF time.
- ON Timer Function to start automatically, the air conditioner after certain set ON time.

* Timer setting is 1 Hour to 24 Hour. The timer led will light on when operating the Timer Function
First key press will flash the digital display and Timer Led for 3 seconds.

Notes:

a) The digital displays show the number of hours previously set, only the Timer Led flashes.
b) Subsequent 3 seconds will show the number of hours previously set; only the timer led flashes.
c) Should there be no further key press, it will revert to normal mode.
d) Should Timer key is not released timer setting will increase automatically every 0.5-second.

8) Sensor: Receives the remote controller's signal

9) Display Screen: Displays the set temperature and displays also the TIMER settings when adjusting it.

10) Key Lock Mode: To activate key lock mode, hold down for 3 seconds, temp. Down Key (5) and Mode Key (2). In key lock mode, all keys are not valid except ON/OFF Key (1) to turn ON/OFF the system.

a) Hold down Temp Down and Sleep button for one second to enter into coil temperature display mode. Press Temp Up key to display indoor coil temperature, High Fan LED flashes. With the same sequence to exit coil temperature display mode. Temperature display range is -9C to 78 ºC.
b) Hold down ▽ and FAN buttons for only 1 second to activate the system control parameter setting. Press mode button to go through the desired menu steps (1 to 3) as per the below table. For each setting step press ▽ or △ button to change the setting from 1 to 2, after completing all setting steps hold down for 3 seconds temp down ▽ and mode buttons to exit the key lock mode.

Menu	Parameter	Set Range	Default value	Remarks
1	Temperature display, Auto fan LED flashing	1~2	1	1: Disable room temp display
				2: Enable room temp display
2	Cool mode fan control function, Auto & High fan LED flashing	1~2	1	1: Comp OFF, Fan ON
				2: Comp OFF, Fan OFF
3	Heat mode fan control function, Auto & Medium fan LED flashing	1~2	1	1: Heater OFF, Fan ON
				2: Heater OFF, Fan OFF

ECM Motor Troubleshooting

CAUTION

It is recommended that the electrical connections on the ECM be facing down or between the 4 and 8 oclock position, and a drip loop formed out of the wiring harness leaving the motor

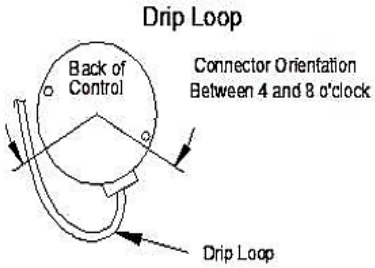


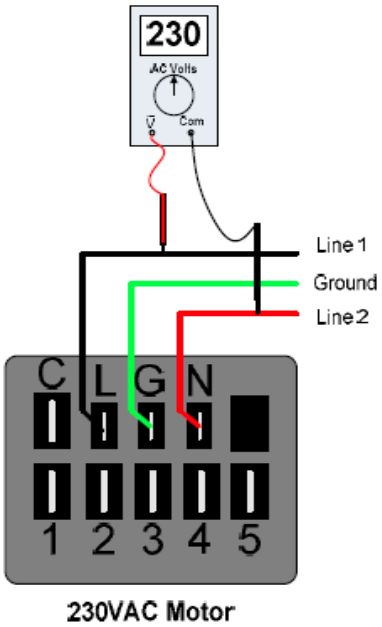
Fig – 9 Drip Loop

If the motor is running: but the system is noisy, shutting down on its limits or safeties or the evaporator coil is freezing, there is a good chance the motor is good. The problem is most likely external to the motor.

- Check the tap selections using the HVAC OEM guide
- Check the air distribution system components for dirt load and closed dampers, registers and grilles.
- Measure the total external static pressure. Make repair(s) if above the HVAC OEM recommended maximum level and confirm airflow at the new total ESP with the performance charts.

If the motor is not running: The following checks will diagnose whether it is operational. There are two inputs needed to operate this motor, a high voltage constant power source, and the low voltage communication that selects the torque value in each tap per demand.

Checking the high voltage input: First check the high voltage to terminals (L) and (N). There should be 230VAC there is power to the system, regardless of a demand call. Applying incorrect high voltage to the X13 motor may cause the motor to not operate, or even damage the motor. If this voltage is missing, fix the problem in the system and try to run the motor. If the voltage is within ± 10% of these ratings then move on to the next step. If the voltage is above or below the ± 10% of these ratings, fix the voltage problem first, and try to run the motor. Proper grounding should always be checked and repaired if needed.



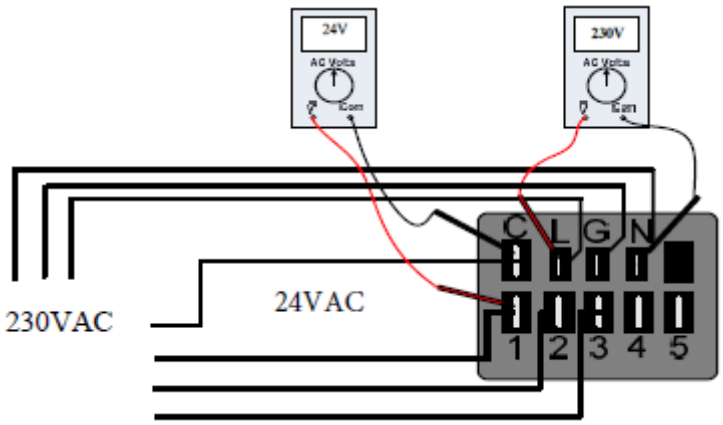


Fig – 10 High Voltage checking schematic

Fig – 11 Low Voltage checking schematic

Checking the low voltage communication input: The following information must be known before troubleshooting the low voltage communication to this motor.

- Which tap(s) have been programmed and what are their purposes (heating airflow, cooling airflow, constant fan airflow).
- Where on the manufacturer's controls or circuit board the low voltage communication comes from by demand
- The sequence of operation of the manufacturer's controls or circuit board (when the low voltage communication is sent to the motor from each thermostat demand and if there are any delays).

If no low voltage communication (typically 24vac) is measured at the motor on taps 1- 3, check the HVAC system wiring, controls and demand call. Always check low voltage between terminals 1-3 and (C) at the motor, never ground.

Once the problem is corrected, confirm that the low voltage communication is applied to a programmed tap. If proper low voltage communication is present at a programmed tap, with proper high voltage to the motor and it still does not operate, the motor is failed.

Repair: The X13 motor is programmed specifically for each HVAC OEM model and size unit it is used in. The replacement motor must be an exact match to the system it was removed from including the voltage. There are no universal replacement motors. Using the wrong motor voids all product warranties and may produce unexpected results. Always follow all instructions included with the replacement motor.

Start-Up

Refer to outdoor unit installation instruction for system start-up instructions and refrigerant charging method details.

CAUTION
Never operate unit without a filter. Damage to blower or coil may result. Factory authorized filter kits must be used when locating the filter inside the unit. For those applications where access to an internal filter is impractical, field-supplied filter must be installed in the return duct system.

Application and Accessories

Model FB4P are designed for flexibility and can be used for upflow, horizontal and downflow (kit required) applications. Factory authorized electric heater packages are available, see product data literature for available accessory kits.

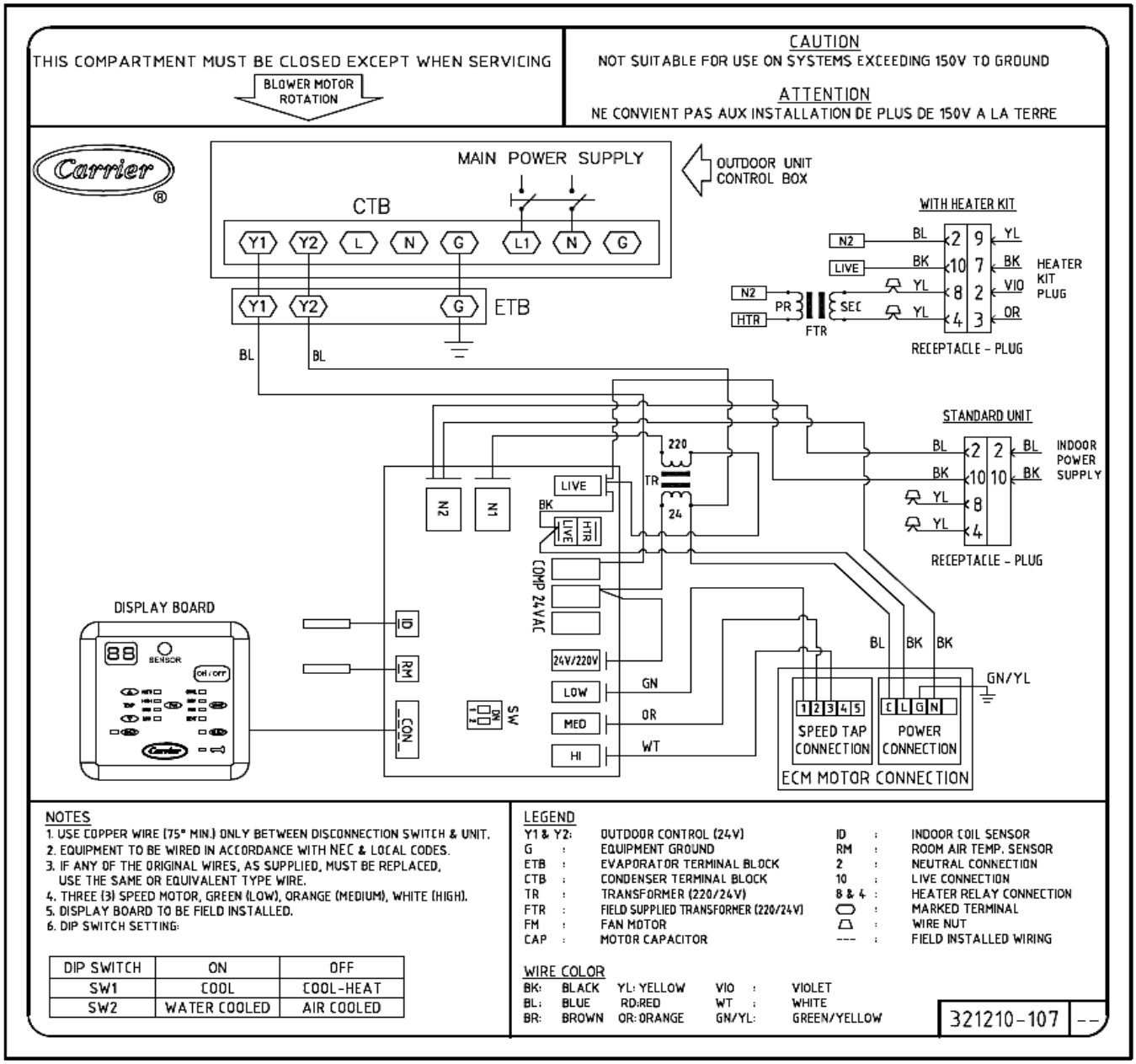
Heater packages: All units are not equipped with electric heater package. A factory approved, field installed UL listed heater package is available from your equipment supplier. See unit rating plate for a list of factory approved heaters. Heaters that are not factory approved could cause damage which would not be covered under the equipment warranty.

CAUTION
Before installing or servicing a unit, always turn off all power to unit. There may be more than 1 disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury or death.

Care and Maintenance

To continue high performance and minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment consult your local dealer as to the proper frequency of maintenance and the availability of a maintenance contract.

Typical Wiring Schematic



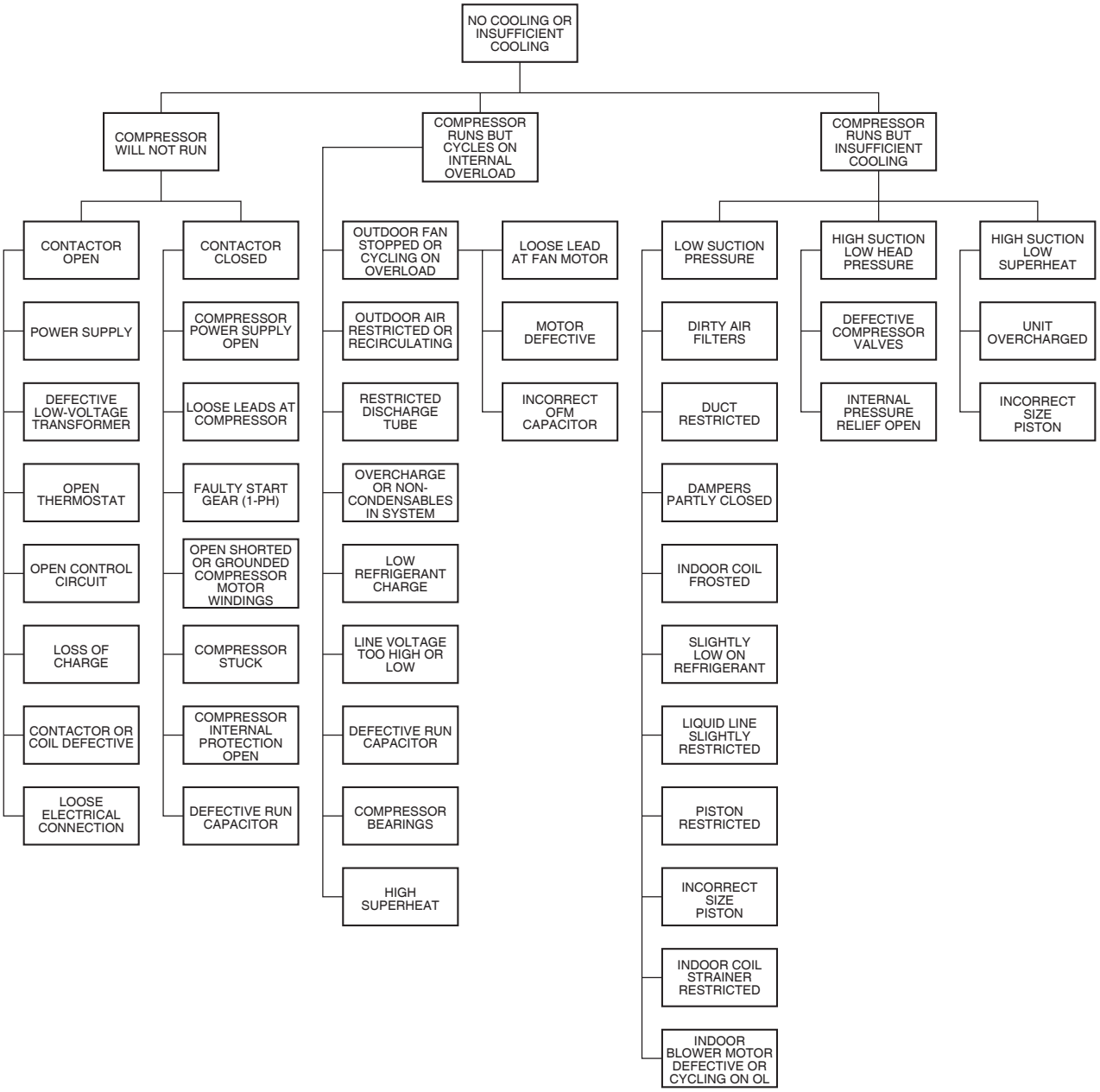
Wiring Diagram: FCU FB ECM Motor Cool and Electric Heater
Application: 50Hz (18 - 60)

ATTENTION INSTALLERS AND SERVICE TECHNICIANS!

R-410A Refrigerant Quick Reference Guide

- R-410A refrigerant operates at 50-70 percent higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with R-410A refrigerant.
- R-410A refrigerant cylinders are rose colored.
- Recovery cylinder service pressure rating must be 400 psig, DOT 4BA400 or DOT BW400.
- R-410A refrigerant systems should be charged with liquid refrigerant. Use a commercial type metering device in the manifold hose when charging into suction line with compressor operating.
- Manifold sets should be 700 psig high side and 180 psig low side with 550 psig low-side retard.
- Use hoses with 700 psig service pressure rating.
- Leak detectors should be designed to detect HFC refrigerant.
- R-410A refrigerant, as with other HFCs, is only compatible with POE oils.
- Vacuum pumps will not remove moisture from oil.
- Do not use liquid-line filter driers with rated working pressures less than 600 psig.
- Do not leave R-410A refrigerant suction line filter driers in line longer than 72 hours.
- Do not install a suction-line filter drier in liquid-line.
- POE oils absorb moisture rapidly. Do not expose oil to atmosphere.
- POE oils may cause damage to certain plastics and roofing materials.
- Wrap all filter driers and service valves with wet cloth when brazing.
- A factory-approved liquid-line filter drier is required on every unit.
- Do NOT use an R-22 expansion device.
- If indoor unit is equipped with an R-22 expansion device, it must be changed to a hard-shutoff R-410A refrigerant expansion device.
- Never open system to atmosphere while it is under a vacuum.
- When system must be opened for service, recover refrigerant, evacuate then break vacuum with dry nitrogen and replace filter driers. Evacuate to 500 microns prior to recharging.
- All indoor coils must be installed with a hard-shutoff R-410A refrigerant expansion metering device.
- Do not vent R-410A refrigerant into the atmosphere.
- Do not use capillary tube coils.
- Observe all **warnings**, **cautions**, and **bold** text.

AIR CONDITIONER TROUBLESHOOTING CHART



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Air Conditioner Troubleshooting Chart

MANDATORY START-UP CHECK LIST AND RECORD

IMPORTANT!

This page is a mandatory checklist & record – the check to be executed and data to be recorded for future reference incase of failure.
A copy of this checklist data has to be submitted to carrier representative. Completion of this checklist is a must for any field claim, no field support will be provided for incomplete or blank checklists.

TEAR ALONG THE DOTTED LINE

Preliminary Information

Outdoor Model Number:	Outdoor Serial Number:
Indoor Model Number:	Indoor Serial Number:
Startup Date:	Technician Name:
Additional Accessories:	

Pre-Start-Up Checklist	Yes	No	NA
Outdoor Unit			
Is there any shipping damage?			
If the unit is damaged, Please specifiy where:			
Will this damage prevent the unit start-up?			
Check power supply to see if it matches the unit data plate?			
Has the ground wire been properly connected?			
Are the circuit protection to the unit sized and installed properly?			
Are the power wires to the unit sized and intalled properly?			
Piping			
Are refrigerant lines connected to service valve sets?			
Are control power lines connected to control power terminal block?			
Are terminal snug in the housing?			
Are the service valves opened and backseated ?			
Are the Stem Valves Installed and snug?			
Have all the refrigerant connections and piping joints checked for leaks?			
Indoor Fan Coil Unit Piping			
Check if the accurater device is installed in fan coil unit?			
Have refrigerant connections been checked for leak?			
Is condensate line connected?			
Does condensate line drain freely?			
Controls			
Are control power lines and control cables routed separately (Not in the same conduit and not in same multi-conductor cable?			
Are control wires connected to the same circuit as associated refrigerant lines?			
Check to make sure the subbase mounting to wall is secure? (Don't apply excessive force to mounting screw)			
Units With Wireless Remote Controller			
Check mounting of interface board, are standoffs used to maintain fixed sepration above sheet metal chassis?			
Check connection of power supply plug (2-circuit molex plug) on interface board, is the blue lead connected to pin1?			
Are fresh batteries intalled properly in the fan coil remote controller?			
Does remote controller backlight illuminate when the button is pressed?			
Fan System			
Does fan rotate freely?			
Are air filters in place?			
Indoor Power Supply			
Does the power supply match the fan coil unit data plate?			
Is ground wire connected?			
Start-Up Checklist	**Yes**	**No**	**NA**
Check Indoor Fan Operation Under Ceiling Fan Coil Units			
Select fan mode, then initiate test sequence. Does the fan coil start at low speed , then shift to medium then to high?			
Start System Operation at the Fan Coil Unit			
Select cooling mode and adjust set point to be below current room temperature, Observe operation of outdoor condensing unit			
Does compressor start (After Initial Time Delay) and Run?			
Does outdoor fan run or cycle according to space requirements?			

De-select cooling mode at indoor fan coil unit, after atleast 15 minutes of running time and record all information below:

Outdoor Unit	
Compressor Amps(L1/L2/L3)	
Oil Pressure	
Vapor Line Pressure	
Vapor Line Temp	
Discharge Pressure	
Discharge Line Temp	
Entering Outdoor Air Temp	
Leaving Outdoor Air Temp	

Fan Coil Unit	
Indoor Entering Air dB(Dry Bulb) Temp	
Indoor Entering Air dB(Wet Bulb) Temp	
Indoor Leaving Air dB(Wet Bulb) Temp	
Indoor Leaving Air dB(Wet Bulb) Temp	


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