installation, start-up and service instructions

IN-CEILING CASSETTE FAN COIL UNITS

619FNF
619FNQ
Sizes 018-03036

Cancels: New

II 619F-18-1
4/1/06

CONTENTS

SAFETY CONSIDERATIONS

Installing and servicing air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install or service air-conditioning equipment.

Untrained personnel can perform basic maintenance, such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe safety precautions in literature, tags, and labels attached to unit.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions *thoroughly*. Consult local building codes and the National Electrical Code (NEC) for special installation requirements.

⚠ **WARNING:** Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause serious personal injury.

GENERAL

⚠ **CAUTION:** This system uses Puron® refrigerant (R-410A), which has higher pressures than R-22 and other refrigerants. No other refrigerant may be used in this system. All equipment must be designed to handle R-410A refrigerant. If unsure about equipment, consult the equipment manufacturer.

⚠ **CAUTION:** Do not operate the unit without a filter or with the grille removed. Damage to the unit or personal injury may result.

These instructions cover the installation, start-up and service of in-ceiling cassette fan coil units. See Fig. 1.

The following accessories can be used with 619FNF, FNQ units. See the price pages for part numbers and additional information for the following accessories:

- photocatalytic and electrostatic filter with mount
- air supply outlet obstruction kit
- wired room controller
- room controller wiring kit for multiple units
- zone manager kit for multiple units
- zone manager
- infrared remote kit

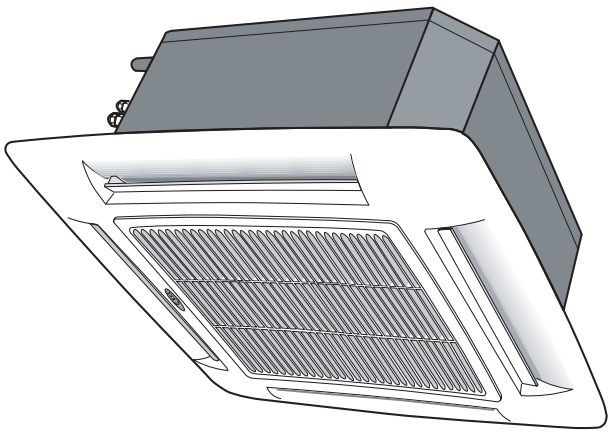


Fig. 1 — 619FNF, FNQ Unit

INSTALLATION

I. STEP 1 — COMPLETE PRE-INSTALLATION CHECKS

A. Unpack Unit (See Fig. 1)

Move the unit to final location. The grille panel and the remote control are packed separately for maximum protection. Remove unit from carton, being careful not to lift the unit by the condensate drain discharge pipe or by the refrigerant connections. Handle by the four corners of the unit. See Table 1 for field-supplied installation materials required for installation.

B. Inspect Shipment

File a claim with the shipping company if shipment is damaged or incomplete. Check the unit nameplates to ensure units match job requirements.

C. Consider System Requirements

Consult local building codes and NEC for special installation requirements. Use only designated indoor units with outdoor units. See Tables 2-4B.

See Fig. 2 for unit dimensions. Allow sufficient space for airflow clearance, wiring, refrigerant piping, and servicing units.

Avoid mounting the unit in areas that are:

- exposed to direct sunlight
- too close to heat sources
- damp or in areas exposed to water
- located in areas that could obstruct air circulation, such as near curtains or furniture

Table 1 — Field-Supplied Installation Materials

NAME	SPECIFICATIONS
Connection Pipe	619FNF018,024/FNQ01824: 5/8 in. (Mixed Phase)/3/8 in. (Liquid) 619FNF, FNQ03036: 3/4 in. (Mixed Phase)/3/8 in. (Liquid)
Wall Sleeve	—
Wall Cap	—
Finishing Tape	PVC Film
Fastening Tape	—
Tube Insulation	—
Drain Hose	1 in. ID
Sealer Putty	—
Outdoor Power Supply Cable	619FNF018-03036: AWG 14 619FNQ01824-03036: AWG 12
Control Wire Electrical Connecting Cable Between Indoor and Outdoor Unit	Cable Type: AWG 22 synthetic rubber insulation with Neoprene coating, according to NEC codes.
Wire Nuts	—
Conduit	—

LEGEND

AWG — American Wire Gage
NEC — National Electrical Code

Table 2 — Matching Indoor Units to Outdoor Units*

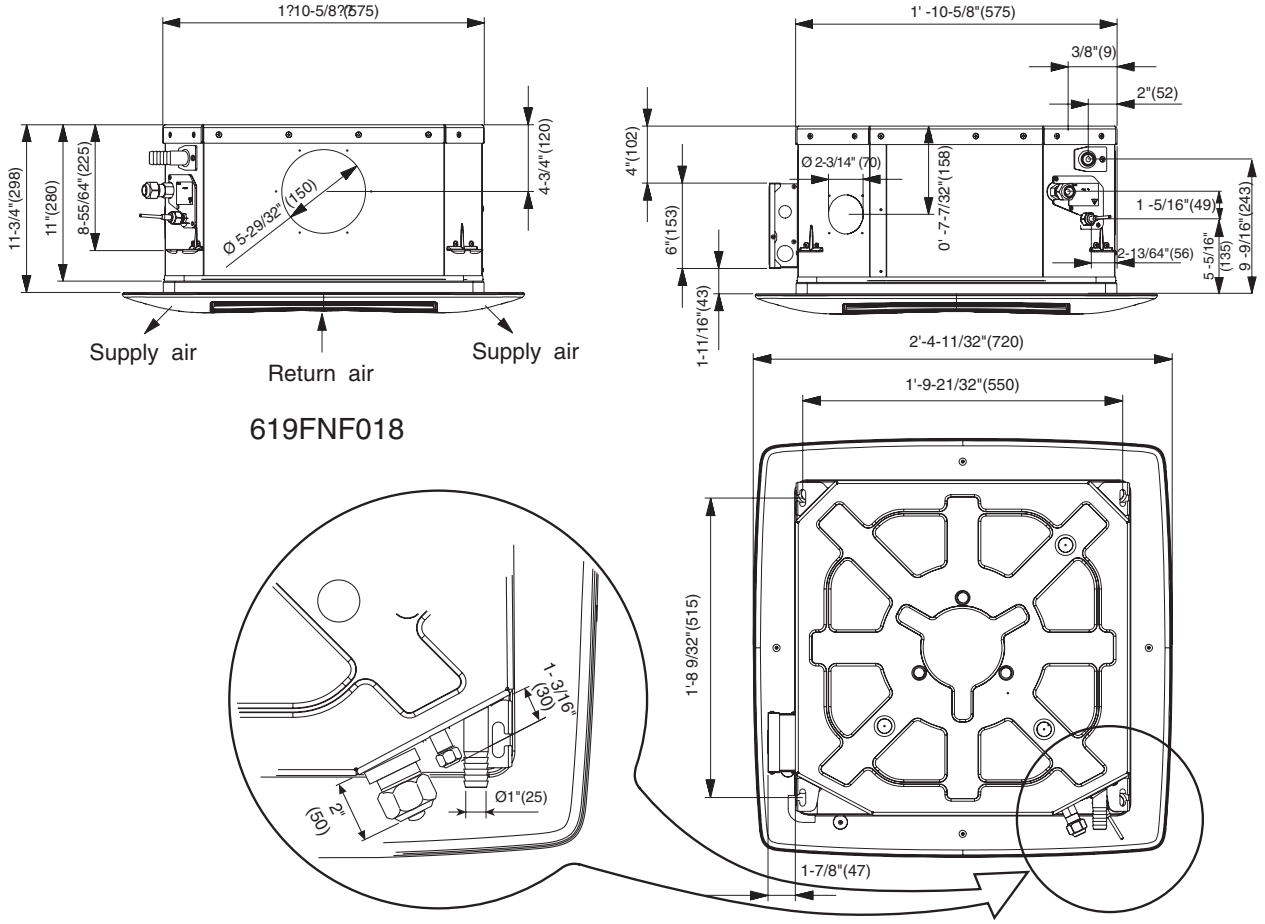
SYSTEM TYPE	SYSTEM SIZE	OUTDOOR UNIT	INDOOR UNIT MODEL NUMBER	INDOOR UNIT GRILLE ITEM NUMBER
Cooling Only	018	538ENF018000	619FNF018000	619FN9005
	024	538ENF024000	619FNF024000	619FN9006
	030	538ENF030000	619FNF030360	619FN9006
	036	538ENF036000	619FNF030360	619FN9006
Cooling with Electric Heat	018	538ENF018000	619FNQ018240	619FN9006
	024	538ENF024000	619FNQ018240	619FN9006
	030	538ENF030000	619FNQ030360	619FN9006
	036	538ENF036000	619FNQ030360	619FN9006
Heat Pump	018	538QNF018000	619FNQ018240	619FN9006
	024	538QNF024000	619FNQ018240	619FN9006
	030	538QNF030000	619FNQ030360	619FN9006
	036	538QNF036000	619FNQ030360	619FN9006

*All units use R-410A refrigerant only.

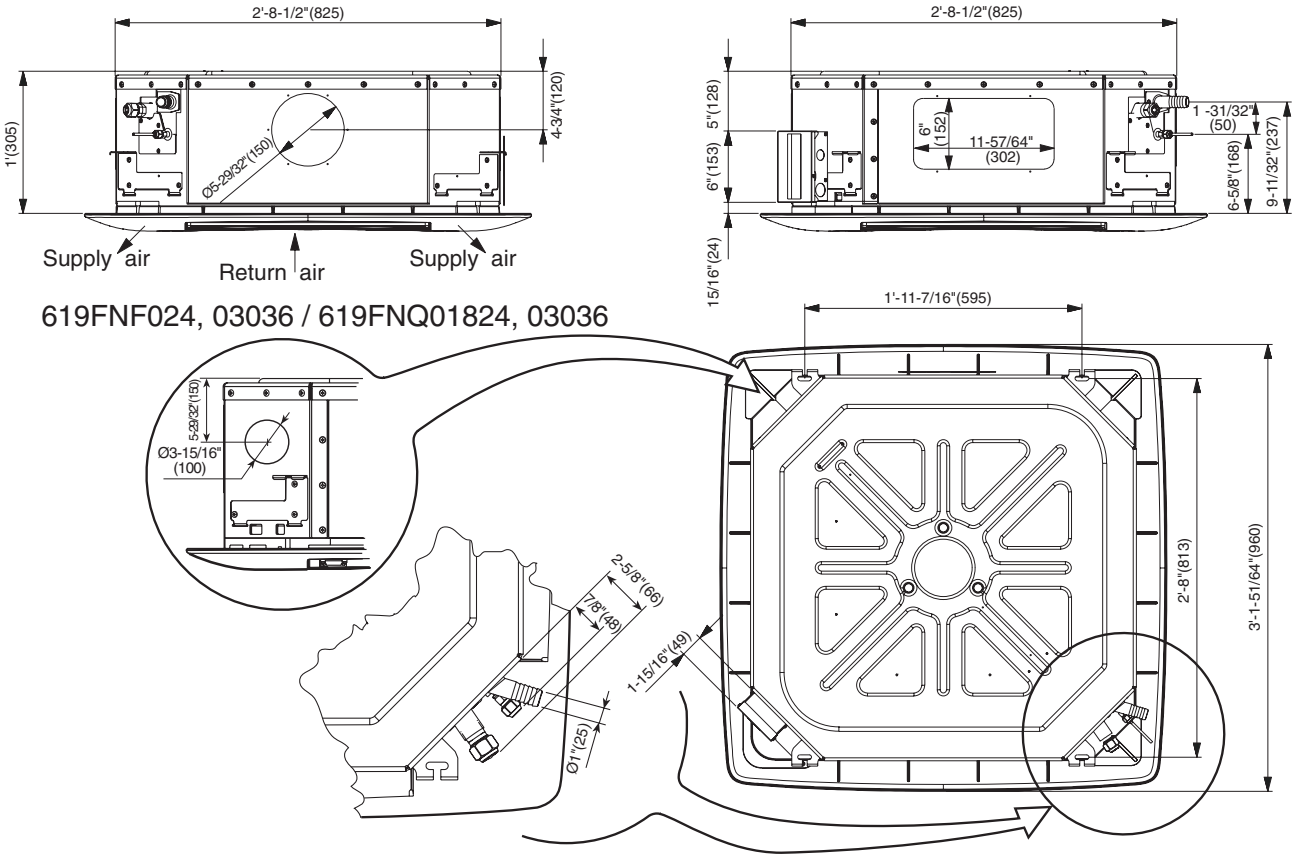
Table 3 — AccuRator* Control Sizes and Refrigerant Charge Requirements

SYSTEM TYPE	SYSTEM SIZE	COOLING ACCURATOR	HEATING ACCURATOR	ACCURATOR TYPE	FACTORY CHARGE† (lb)	ADDITIONAL FIELD CHARGE REQUIRED† (lb)
Cooling Only	018	0.049	—	B	4.8	0.0
	024	0.057	—	B	5.3	1.2
	030	0.061	—	B	5.0	3.0
	036	0.074	—	B	7.0	2.3
Cooling with Electric Heat	018	0.049	—	B	4.8	0.0
	024	0.057	—	B	5.3	1.2
	030	0.061	—	B	5.0	3.0
	036	0.074	—	B	7.0	2.3
Heat Pump	018	0.051	0.046	B	5.5	0.0
	024	0.055	0.053	B	6.9	0.0
	030	0.063	0.055	B	10.7	1.8
	036	0.07	0.063	B	10.5	0.0

*AccuRator controls are for outdoor units. See the outdoor installation instructions for more information.
†The outdoor unit is either fully charged or under charged from the factory.



619FNF018



619FNF024, 03036 / 619FNQ01824, 03036

NOTE: Dimensions in ( ) are in mm.

Fig. 2 — Unit Dimensions

Table 4A — 619FNF Physical Data

SYSTEM SIZE	018	024	030	036
NOMINAL CAPACITY (Btuh)	17,000	23,600	29,000	36,400
OPERATING WEIGHT (lb)	49	91	95	95
SEER	13			
REFRIGERANT*	R-410A			
Control (Cooling)	AccuRator Control			
INDOOR FAN	Direct Drive Centrifugal			
Rpm/Cfm High	1000/470	440/690	660/910	660/910
Rpm/Cfm Medium	890/420	360/560	550/760	550/760
Rpm/Cfm Low	730/340	300/470	470/670	470/670
Motor Watts	120	110	210	210
Blowers Quantity...Size (in.)	1...11.1			
INDOOR COIL	Copper Tube, Aluminum Fin			
Face Area (sq ft)	3.2	4.8	4.6	4.6
No. of Rows	2	2	3	3
Fins/in.	22	18	18	18
Circuits	5	6	10	10
FILTERS	Cleanable			
Quantity...Size (in.)	1...17 x 16			
AIRSWEEP				
Horizontal	Auto/Preset			
OPERATING LIMITS				
Cooling (Min/Max)	55 F/125 F			
CONTROLS	Integrated Microprocessor			
Remote Controller Options	Wireless, CRC			
Diagnostics	Yes			
Defrost Method	Demand Defrost			
Timer Mode	Yes			
Warm Start Feature	Yes			
Test Mode	Yes			
Freeze Protection	Yes			
Dehumidification Mode	Yes			
Fan Mode	High/Medium/Low/Auto			
Auto Changeover	Yes			
Auto Restart	Yes			
Control Voltage	24			
System Voltage	208/230			
REFRIGERANT LINES				
Connection Type	Flare	Flare	Flare	Flare
Mixed-Phase Line (in.) OD	3/8	3/8	3/8	3/8
Vapor Line (in.) OD	5/8	5/8	3/4	3/4
Max Length (ft)	200	200	200	200
Max Lift (Fan Coil Above) (ft)	60	60	60	60
Max Lift (Fan Coil Below) (ft)	60	60	60	60
CONDENSATE DRAIN SIZE (in.)	1	1	1	1

LEGEND

CRC — Carrier Room Controller
SEER — Seasonal Energy Efficiency Ratio

*See Table 3 for factory charge and additional field charge requirements.

Table 4B — 619FNQ Physical Data

SYSTEM SIZE	018	024	030	036
NOMINAL CAPACITY (Btuh)				
Heat Pump				
Cooling	17,900	22,600	29,200	33,400
Heating	16,800	20,800	27,400	32,400
Cooling with Electric Heat	17,000	22,600	29,000	36,000
SEER	13			
HSPF	7.7			
OPERATING WEIGHT (lb)	91	91	95	95
REFRIGERANT*	R-410A			
Control (Cooling)	AccuRator Control			
Control (Heating)	AccuRator Control			
INDOOR FAN	Direct Drive Centrifugal			
Rpm/Cfm High	440/690	440/690	660/910	660/910
Rpm/Cfm Medium	360/560	360/560	550/760	550/760
Rpm/Cfm Low	300/470	300/470	470/670	470/670
Motor Watts	110	110	210	210
Blowers Quantity...Size (in.)	1...18			
INDOOR COIL	Copper Tube, Aluminum Fin			
Face Area (sq ft)	4.8	4.8	4.6	4.6
No. of Rows	2	2	3	3
Fins/in.	18	18	18	18
Circuits	6	6	10	10
FILTERS	Cleanable			
Quantity...Size (in.)	1...24 x $23^{5}/_{16}$			
AIRSWEEP				
Horizontal	Auto/Preset			
OPERATING LIMITS				
Heating (Min/Max)	15 F/75 F			
Cooling (Min/Max)	55 F/125 F			
CONTROLS	Integrated Microprocessor			
Remote Controller Options	Wireless CRC			
Diagnostics	Yes			
Defrost Method	Demand Defrost			
Timer Mode	Yes			
Warm Start Feature	Yes			
Test Mode	Yes			
Freeze Protection	Yes			
Dehumidification Mode	Yes			
Fan Mode	High/Medium/Low/Auto			
Auto Changeover	Yes			
Auto Restart	Yes			
Control Voltage	24			
System Voltage	208/230			
REFRIGERANT LINES				
Connection Type	Flare	Flare	Flare	Flare
Mixed-Phase Line (in.) OD	$^{3}/_{8}$	$^{3}/_{8}$	$^{3}/_{8}$	$^{3}/_{8}$
Vapor Line (in.) OD	$^{5}/_{8}$	$^{5}/_{8}$	$^{3}/_{4}$	$^{3}/_{4}$
Max Length (ft)	200	200	200	200
Max Lift (Fan Coil Above) (ft)	60	60	60	60
Max Lift (Fan Coil Below) (ft)	60	60	60	60
CONDENSATE DRAIN SIZE (in.)	1	1	1	1

LEGEND

CRC — Carrier Room Controller
HSPF — Heating Seasonal Performance Factor
SEER — Seasonal Energy Efficiency Ratio

*See Table 3 for factory charge and additional field charge requirements.

II. STEP 2 — LOCATING AND MOUNTING THE UNIT

A. Locating the Unit

Install the unit as centrally as possible in the room. The airflow direction can be controlled by the remote control (where used) or automatically, according to the unit operating mode (cooling or heating). Controlling the airflow automatically will ensure optimum distribution of the air in the room.

In Cooling mode, the louvers should be positioned so that the air is directed towards the ceiling. Refer to Fig. 3. In Heating mode, the louvers should be positioned so that the air is directed toward the floor to prevent layers of hot air forming close to the ceiling. Refer to Fig. 3. The louvers will be automatically positioned when the louvers are set to Automatic mode. Alternatively, the louvers can be placed in intermediate positions (with infrared remote accessory kit only) or allowed to move continuously (Swing mode).

In order to allow easy and rapid installation and maintenance, ensure that the unit is mounted in a location that is easily accessible.

Restricting Air Outlets

A maximum of two air outlets can be restricted at one time. See Fig. 3. The air supply outlet obstruction accessory kit can be used to obstruct air outlets. Contact your local dealer for more information.

B. Mounting the Unit

Use a stacker to lift the unit to the installation location. Refer to Fig. 4. If the mounting location is in a plaster board ceiling, the maximum dimensions of the unit housing cutout must not exceed 2 ft, 2 in. square for 619FNF018 units and 2 ft, 11 in. square for 619FNF024, 03036 and 619FNQ01824, 03036 units.

NOTE: In rooms with high humidity, brackets should be insulated using self-adhesive insulation.

Mark the position of the hangers, refrigerant lines and condensate drain pipe, power supply cables and remote control cable (see Fig. 2 for dimensions). The cardboard template (supplied with the unit) may be used as a guide. Depending on the type of ceiling, the hangers can be fixed as shown in Fig. 5.

Once the threaded hangers have been positioned, do not tighten the nuts. Insert the washers as shown in Fig. 5. First position the refrigerant lines, which will be connected in the Complete Refrigerant Piping Connections section. Remove the "T" bar in the ceiling to facilitate installation. See Fig. 6.

Carefully lift the unit (without the frame) using the four suspension brackets (or the four corners), and insert it into the false ceiling. If the "T" bar cannot be removed from the ceiling the unit may need to be tilted. See Fig. 7.

NOTE: Tilting the unit may only be carried out with false ceilings with a minimum height of 11 ft-$^{13}/_{16}$ inches.

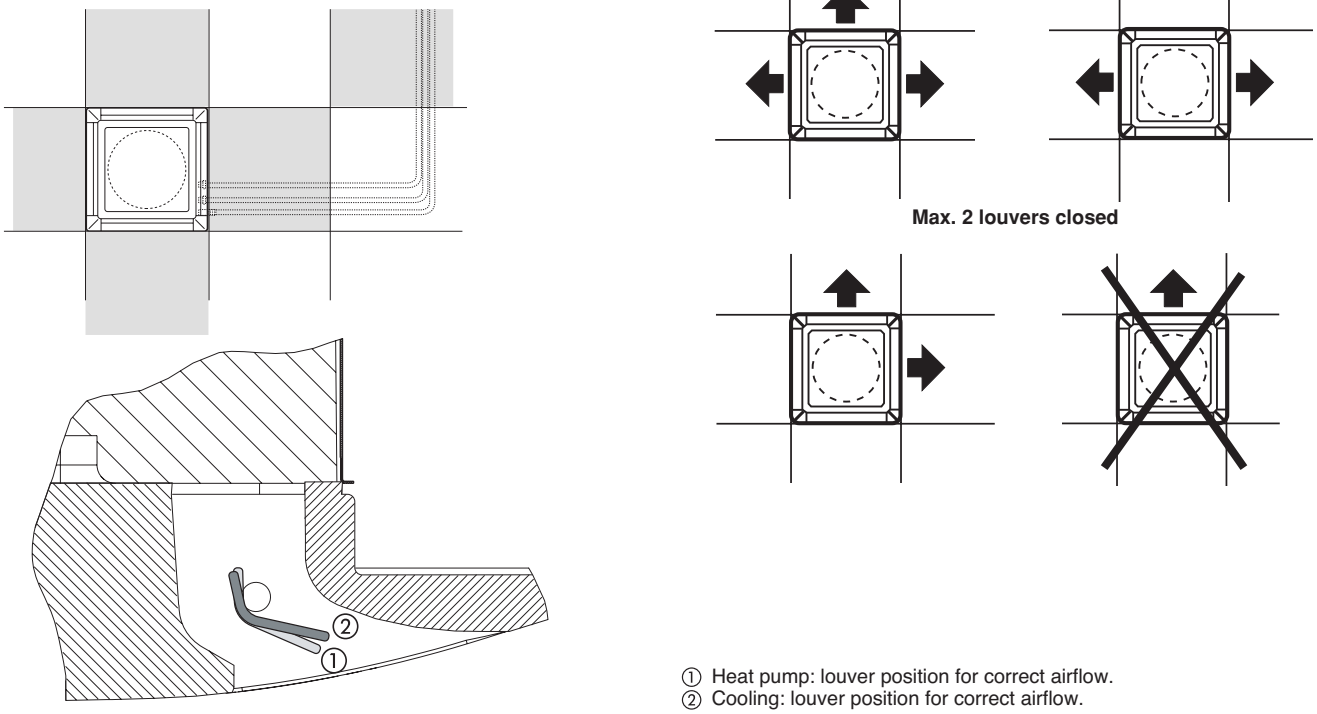
Align and level the unit by adjusting the nuts and locknuts on the threaded hangers, maintaining a distance of 1 in. to $1^{3}/_{16}$ in. between the sheet metal body and the underside of the false ceiling. See Fig. 8. Reposition the "T" bar and align the unit in relation to the bar by tightening the nuts and locknuts. After connection of the condensate drain line and the refrigerant lines, carry out a final check to make sure that the unit is level.

Drilling the Hole for Connection Pipes in the External Wall

After positioning the units and determining the connection position, drill a $2^{3}/_{4}$ in. hole in the wall. The same hole can be used as a condensate drain pipe conduit. The hole should have a $^{3}/_{16}$ in. to $^{3}/_{8}$ in. slope toward the outside. Refer to Fig. 9. Insert the plastic conduit. Pass the power connection cables through the conduit. The power connection cables will be connected in the Make Electrical Connections section.

Running the Condensate Drain Piping

To ensure correct condensate water flow, the drain pipe should have a gradient of 2% without obstructions. Additionally, a trap of at least 2 in. depth should be made to prevent unpleasant odors from reaching the room.



① Heat pump: louver position for correct airflow.
② Cooling: louver position for correct airflow.

Fig. 3 — Louver Positioning

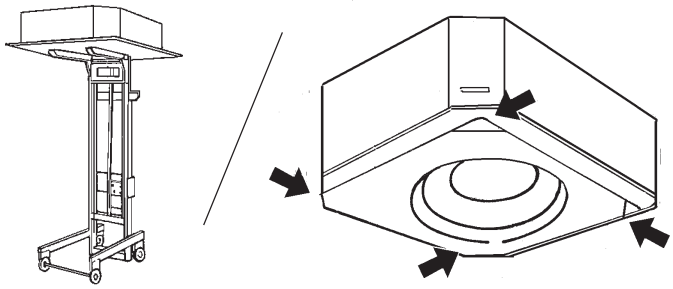


Fig. 4 — Positioning Unit

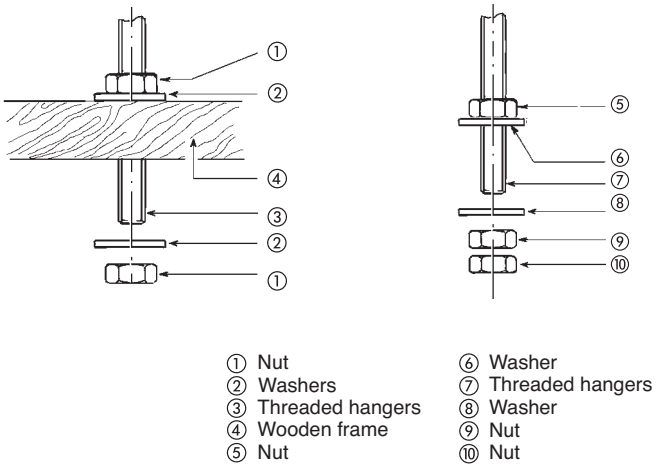


Fig. 5 — Attaching Hangers to Ceiling

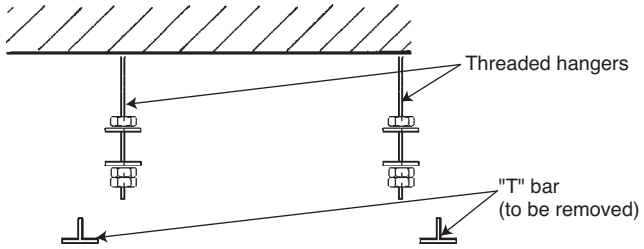


Fig. 6 — Threaded Hangers and T Bar

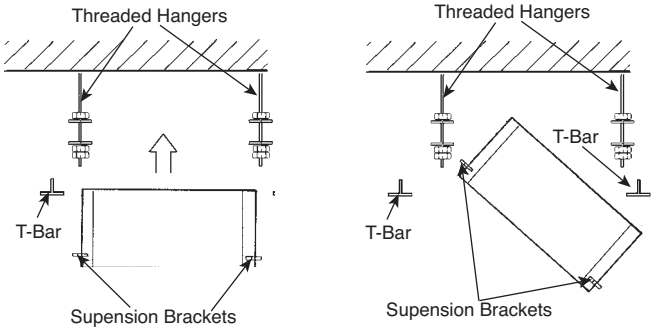


Fig. 7 — Positioning Unit in Ceiling

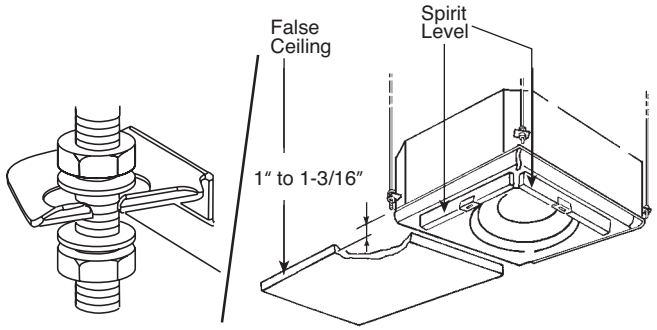


Fig. 8 — Align and Level the Unit

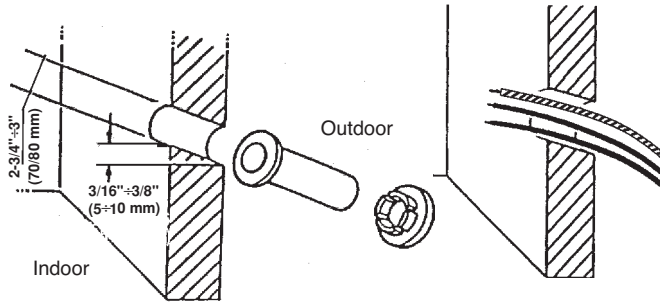


Fig. 9 — Drilling for Connections

The condensate may be discharged at a maximum height of $7^{7}/_{8}$ in. above the unit, as long as the ascending tube is vertical and aligned with the drainage flange.

If it is necessary to discharge the condensate from a level above $7^{7}/_{8}$ in., install an auxiliary water discharge pump and float valve. A float valve is recommended to stop the compressor if there is a fault at the auxiliary pump.

The condensate pipe must be insulated with condensation proof material such as polyurethane, propylene or neoprene of $^{3}/_{16}$ in. to $^{3}/_{8}$ in. thickness. See Fig. 10.

⚠ **CAUTION:** The drain tube extension must be securely fastened to the condensate drain. Failure to do so could result in condensate water dripping on to the floor, which could cause personal injury.

NOTE: If more than one unit is installed in the room, the drain system can be designed as shown in Fig. 10.

Installing the Grille and Frame Assembly

Carefully unpack the assembly and check for damage sustained in transport. Attach the assembly to the unit by using the two hooks. See Fig. 11. Tighten the four screws, link the electrical connectors and insert the wires in the cable clamp. Use the screws supplied to fix the frame in to position. See Fig. 12.

Ensure that the frame is not distorted by excessive tightening, that it is aligned with the false ceiling and that there is a seal between the air inlet and outlet. See Fig. 13. Gasket "A" prevents return air from mixing with the supply air and gasket "B" prevents the supply air from leaking into the ceiling void. Once the unit is mounted in the ceiling, the gap between the unit frame and the false ceiling must not be more than $^{3}/_{16}$ in. wide.

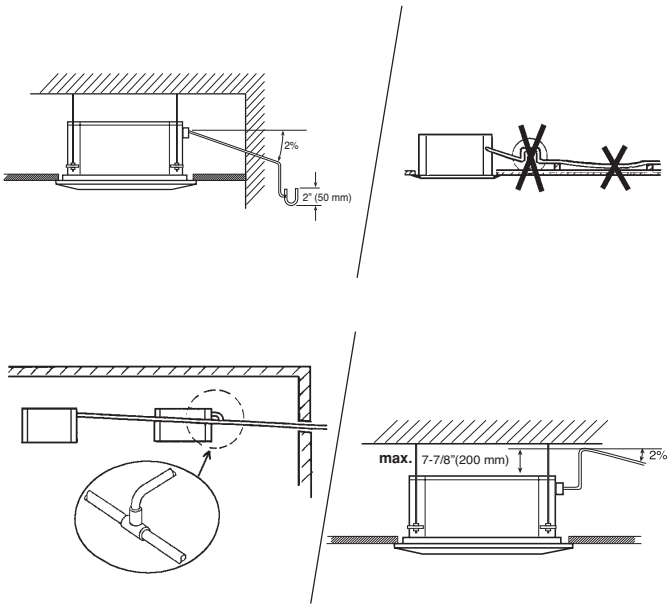


Fig. 10 — Condensate Drain Pipe

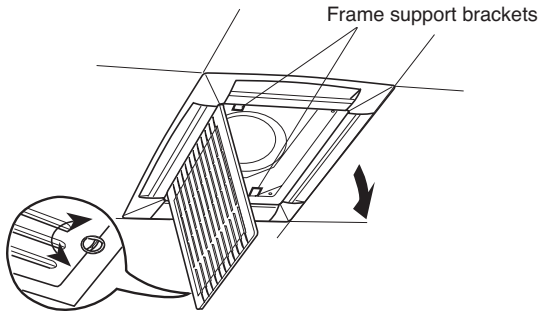


Fig. 11 — Attach Frame Assembly

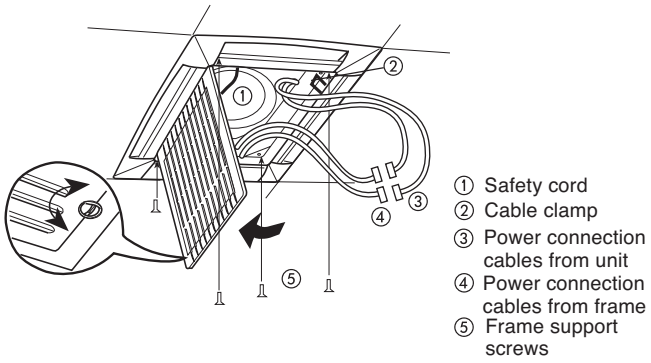


Fig. 12 — Fix Frame in Position

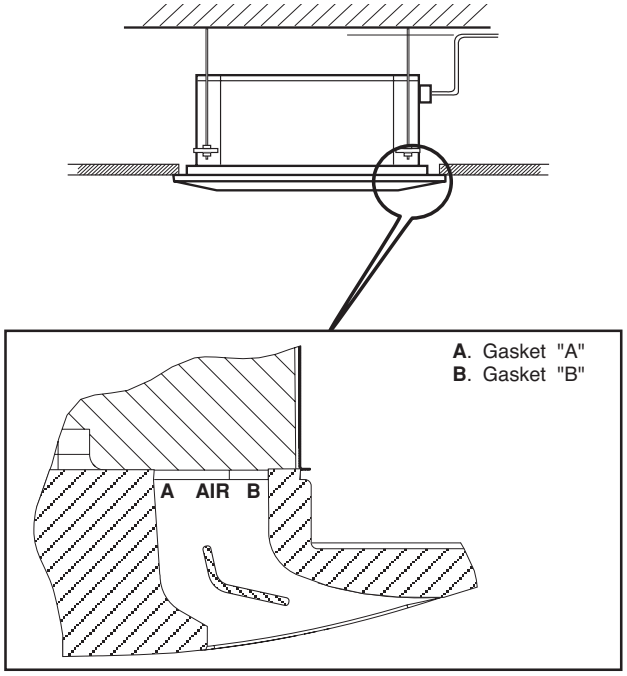


Fig. 13 — Gasket Location

III. STEP 3 — LOCATING AND MOUNTING THE ROOM CONTROLLER

⚠ **WARNING:** Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

A. Locating the Room Controller

See Fig. 14 for room controller dimensions. If the air sensor in the room controller is going to be used, the room controller should be located by considering the following:

- Position controller with a minimum clearance of 5 ft from the floor.
- Locate the unit in the same area as the fan coil unit; preferably on an inside partitioning wall.
- Locate on a section of the wall without pipes or ductwork.
- *Do not* locate close to a window, on an outside wall, or next to a door leading to the outside.
- *Do not* locate where the controller is exposed to direct light and heat from a lamp, sun, fireplace, or other temperature-radiating object that may cause a false reading.
- *Do not* locate close to, or in direct airflow of, a heating or cooling supply.
- *Do not* locate in areas with poor circulation, such as behind a door or in an alcove.

NOTE: Do not exceed 500 ft of network wiring when mounting the room controller.

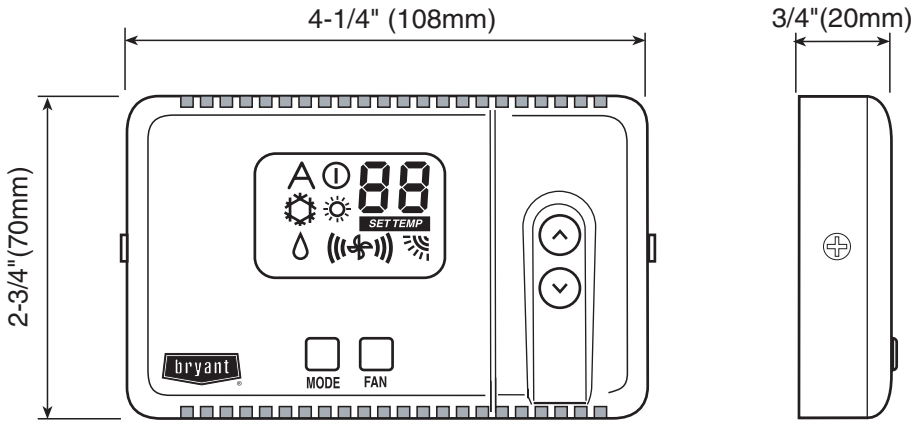


Fig. 14 — Room Controller Dimensions

B. Mounting the Room Controller (Fig. 15-17)

Unscrew the side fixing screw. Open the room controller rear mounting base to expose the mounting holes. The base can be removed to simplify mounting (snap apart carefully at hinge to separate mounting base from the rest of the room controller). Route the room controller wires through the large hole in the mounting base. Level the mounting base against the wall (for aesthetic value only, as the room controller does not need to be level for proper operation) and mark the wall through the two mounting holes. Drill two $^{3}/_{16}$ in. mounting holes in the wall where marked. Secure the mounting base correctly (UP) to the wall with the two screws and two anchors provided, (additional anchoring holes are available for more secure mounting if necessary) making sure all wires extend through the hole in the mounting base. Adjust the length and routing of each wire to reach the proper terminal in the connector block on the mounting base, with $^{1}/_{4}$ in. of extra wire (strip only $^{1}/_{4}$ in. of insulation from each wire to prevent adjacent wires from shorting together when connected).

Match and connect equipment wires to proper terminals in the connector block. Both power and communication wires must be connected correctly for proper room controller operation.

Push any excess wire into the wall and against mounting base. If the air sensor is being used on the room controller, seal the hole in the wall to prevent air leaks. Leaks can affect sensor operation.

Push the room controller snap hinge to the base and tighten the side fixing screw.

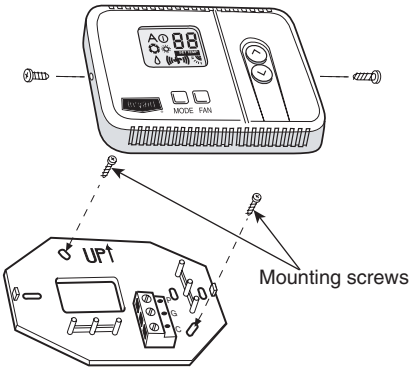


Fig. 15 — Mounting the Room Controller

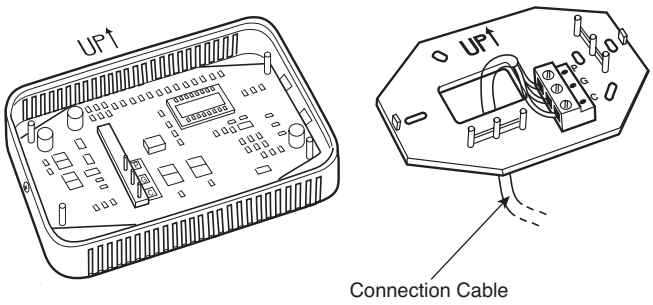


Fig. 16 — Locating the Connection Cable

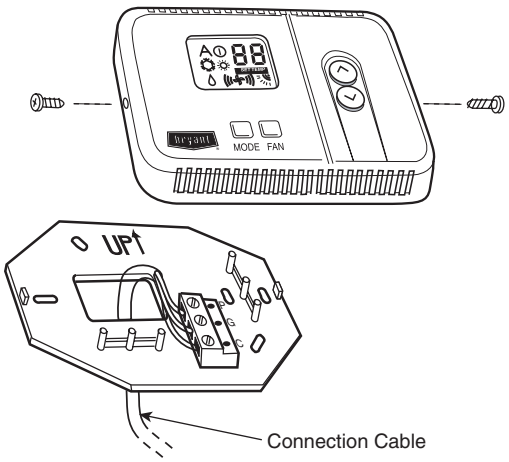


Fig. 17 — Connecting the Room Controller

IV. STEP 4 — COMPLETE REFRIGERANT PIPING CONNECTIONS

IMPORTANT: During unit installation make the refrigerant connections first and then the electrical connections. If the unit is uninstalled, disconnect the electrical cables first and then the refrigerant connections. Refer to the outdoor unit installation instructions for tube sizing and limitations.

Use field-supplied refrigerant grade piping designed for use with R-410A refrigerant.

A. Flaring the Ends of Pipes

Remove the protective caps from the copper pipe ends. Holding the tube downward, cut the extreme end off, removing any copper shavings with a deburring blade. Remove the flare nuts from the "FLARE" connection body of the indoor unit and insert them into the pipes. Make the flare to the pipe end with the proper flaring tool. The flare end must not have any burrs or imperfections. The length of the flared walls must be uniform. See Fig. 18 and 19.

Lubricate the end of pipe and the thread of the flare connection with anti-freeze oil. Tighten by hand and then use two wrenches to tighten all connections fully, applying the tightening torque shown in Table 5. Refer to Fig. 20.

Table 5 — Tightening Torque

TUBE DIAMETER (in.)	TORQUE (ft-lb)
3/8 in.	31
5/8 in.	48
3/4 in.	74

B. Piping Connection to the Unit

Use two wrenches to tighten all connections.

⚠ **CAUTION:** Insufficient tightening torque could cause a refrigerant leak from the connection. Excessive tightening torque will damage the pipe flare.

Once all connections have been completed, check for leaks using soapy water. If no leaks were found, wrap connections with anti-condensate insulation and tighten with tape, without exerting excessive pressure on the insulation. Repair and cover any possible cracks in the insulation.

⚠ **CAUTION:** DO NOT BURY MORE THAN 36 IN. OF REFRIGERANT PIPE IN THE GROUND. If any section of pipe is buried, there must be a 6-in. 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.

If either refrigerant tubing or indoor coil is exposed to the atmosphere, the system must be evacuated following good refrigeration practices.

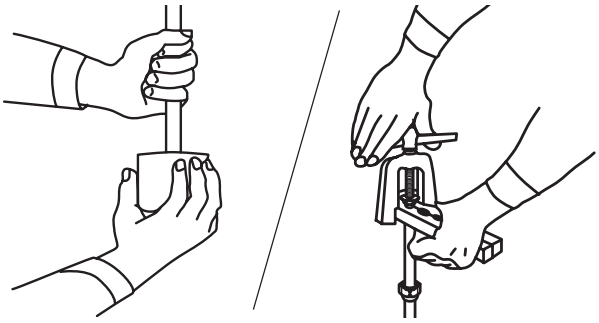


Fig. 18 — Removing Burrs

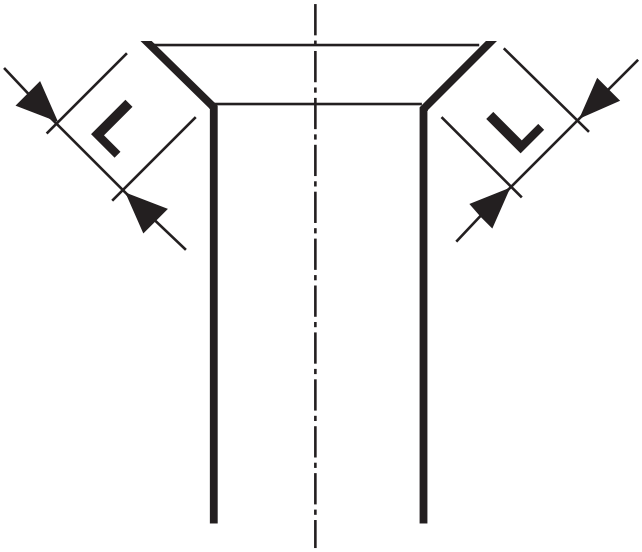


Fig. 19 — Flared Walls are Equal

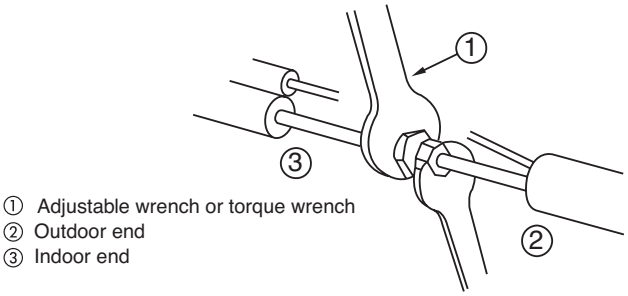


Fig. 20 — Tightening Connections

V. STEP 5 — MAKE ELECTRICAL CONNECTIONS

⚠ **WARNING:** Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC, and local electrical codes. Failure to follow this warning could result in the installer being liable for the personal injury of others.

⚠ **CAUTION:** 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 would invalidate any applicable Bryant warranty.

⚠ **WARNING:** Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

See Tables 6A and 6B for electrical information.

A. Units With Electric Heater

The unit is equipped with two thermostats: one with automatic reset and one with manual (electric) reset that can be reactivated by switching the power supply off and then back on.

B. Power Wiring (Fig. 21-26)

The unit is factory wired for voltage shown on nameplate. Provide adequate, fused disconnect switch within sight from unit, readily accessible, but out of reach of children. Provision for locking the switch open (off) is advisable to prevent power from being turned on while unit is being serviced. Disconnect switch, fuses, and field wiring must comply with the NEC and local code requirements. Use copper wire only between the disconnect switch and unit. Use minimum 60 C wire for the field power connection.

Remove the external box cover. Route the low voltage wires from the outdoor unit to the indoor unit:

1. Place wiring through $^{7}/_{8}$ in. knockouts on the left or right hand side of external control box (low voltage side).
2. Connect the R and Y wires to the 2 pin terminal block for cooling only units (619FNF) and heat pump units (619FNQ) that are matched to 538ENF outdoor units.
3. Connect the R, Y, O, G, DT, A, and B wires to the (PGB-1) 1 terminal for 619FNQ indoor units matched with 538QNF outdoor units.

Route the line power leads from the indoor disconnect to the fan coil unit.

1. Place wiring through $^{7}/_{8}$ in. or $1^{1}/_{8}$ in. knockouts on the left and on the right hand side of external control box (high voltage side).
2. Connect L1 to the black wire and L2 to the red wire using wire nuts and fix the ground wire between the 2 washers.

See Fig. 27 for a view of the internal control panel. The internal control panel can be accessed by opening the grille and removing the metal cover attached by four screws.

NOTE: The internal control panel does not need to be accessed during the installation process unless there is a need for service.

Table 6A — 619FNF Fan Coil Electrical Data

SYSTEM SIZE	V-PH-Hz	VOLTAGE RANGE*		FAN		CONDENSATE PUMP FLA	LOUVER MOTOR FLA	POWER		MIN WIRE SIZE AWG
		Min	Max	FLA	Motor Power (Watts)			MCA	MOCP	
018	208/230-1-60	187	253	0.55	120	0.06	0.01	0.8	15	14
024	208/230-1-60	187	253	0.50	110	0.06	0.01	0.7	15	14
030	208/230-1-60	187	253	0.95	210	0.06	0.01	1.3	15	14
036	208/230-1-60	187	253	0.95	210	0.06	0.01	1.3	15	14

LEGEND

AWG — American Wire Gage
FLA — Full Load Amps
MCA — Minimum Circuit Amps per NEC Section 430-24
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code

*Permissible limits of the voltage range at which unit will operate satisfactorily.

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or equipped with a breaker.

Table 6B — 619FNQ Fan Coil Electrical Data

SYSTEM SIZE	V-PH-Hz	VOLTAGE RANGE*		FAN		CONDENSATE PUMP FLA	LOUVER MOTOR FLA	ELECTRIC HEATERS		POWER		MIN WIRE SIZE AWG
		Min	Max	FLA	Motor Power (Watts)			kW	FLA	MCA	MOCP	
018	208/230-1-60	187	253	0.50	110.0	0.06	0.01	3	12.5	16.3	20	12
024	208/230-1-60	187	253	0.50	110.0	0.06	0.01	3	12.5	16.3	20	12
030	208/230-1-60	187	253	0.95	210.0	0.06	0.01	3	12.5	16.9	20	12
036	208/230-1-60	187	253	0.95	210.0	0.06	0.01	3	12.5	16.9	20	12

LEGEND

AWG — American Wire Gage
FLA — Full Load Amps
MCA — Minimum Circuit Amps per NEC Section 430-24
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code

*Permissible limits of the voltage range at which unit will operate satisfactorily.

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or equipped with a breaker.

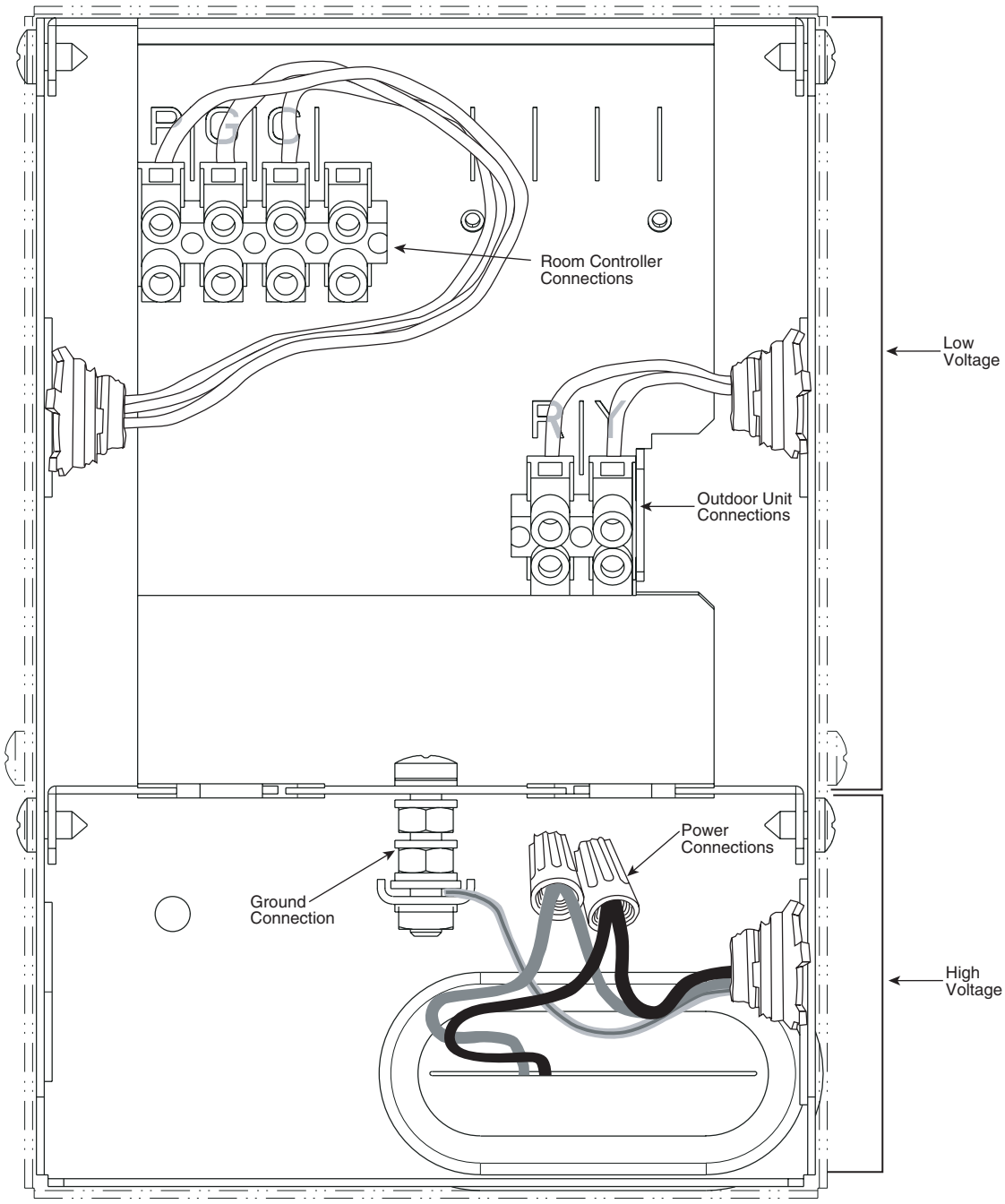


Fig. 21 — 619FNF Unit Matched to 538ENF Outdoor Unit — Wiring Connection (Cooling Only System)

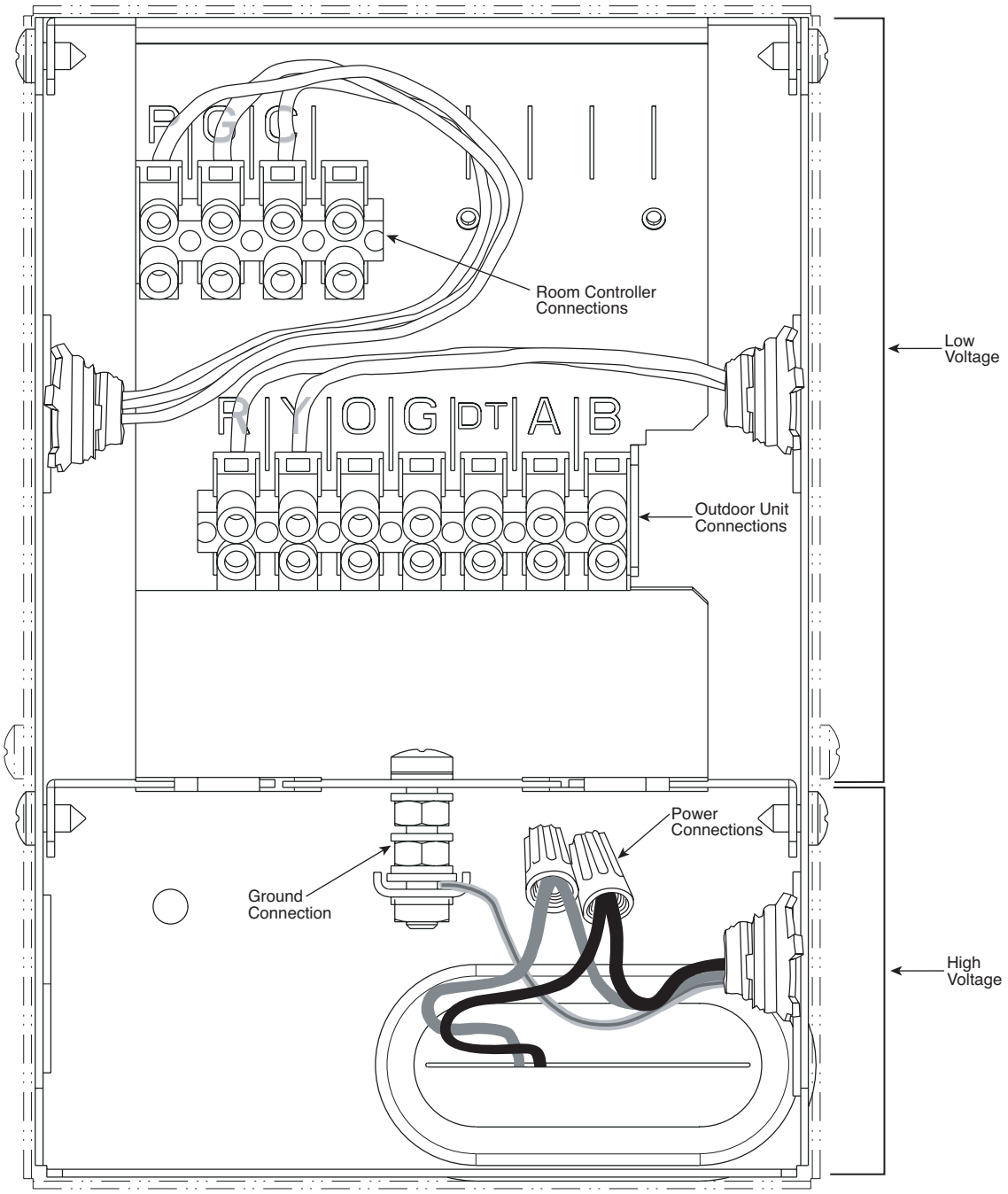


Fig. 22 — 619FNQ Unit Matched to 538ENF Outdoor Unit — Wiring Connection (Cooling with Electric Heat System)

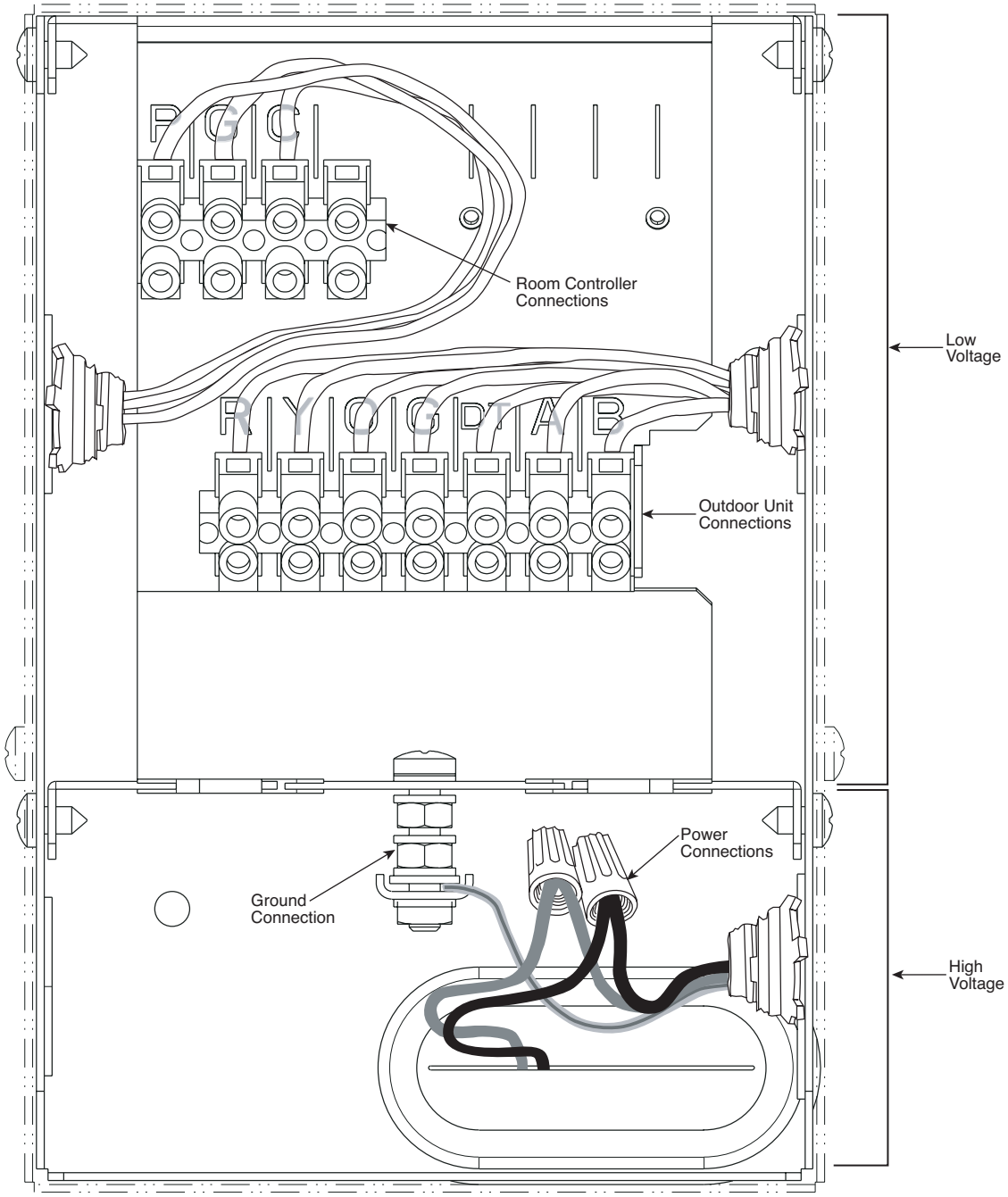
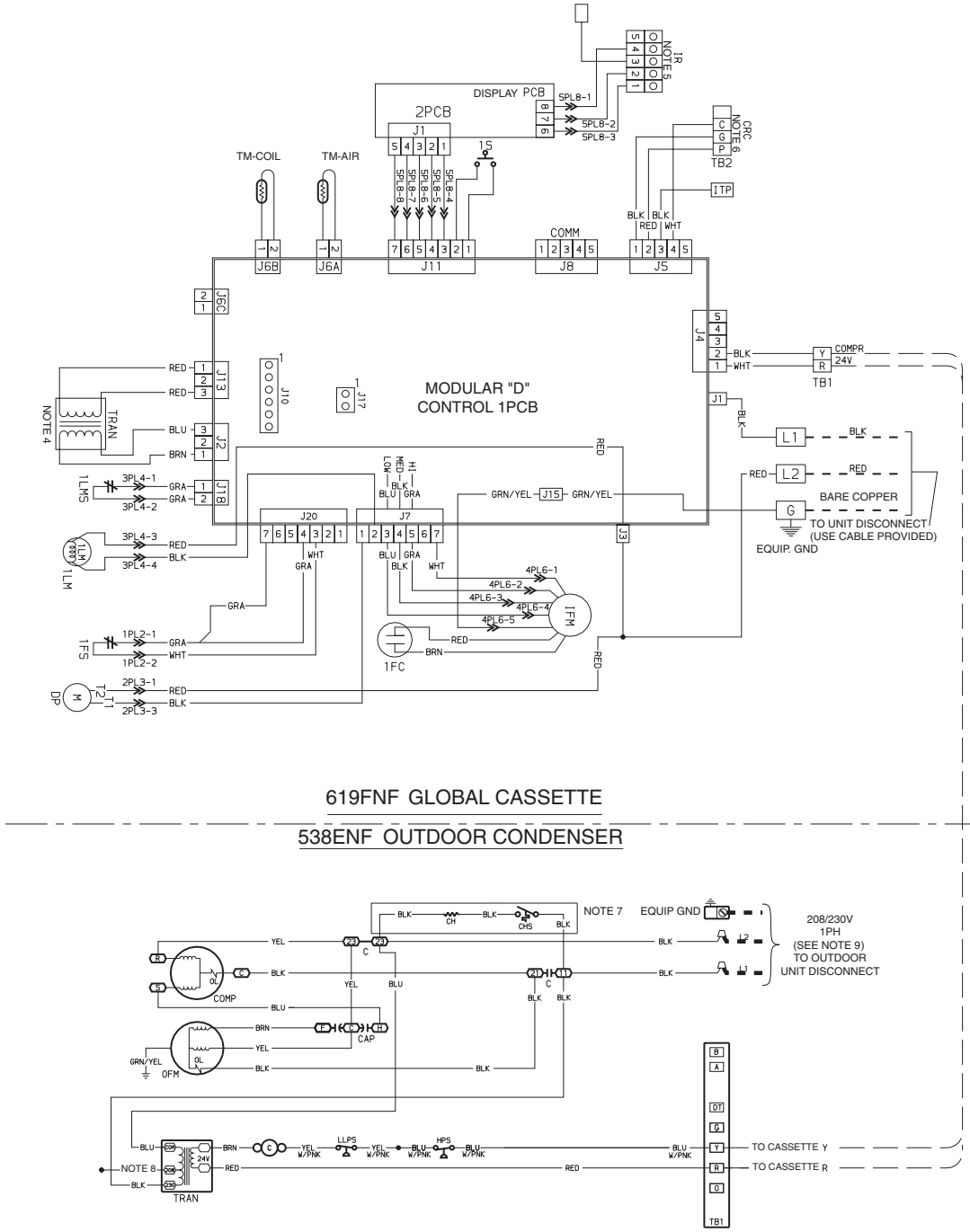


Fig. 23 — 619FNQ Unit Matched to 538QNF Outdoor Unit — Wiring Connection (Heat Pump System)



LEGEND

1PCB	—	Main Control Printed Circuit Board
2PCB	—	Display Board
C	—	Contactor
CAP	—	Capacitor
CH	—	Crankcase Heater
CHS	—	Crankcase Heater Switch
COMP	—	Compressor
CRC	—	Carrier Room Controller
DP	—	Drain Pump
EQUIP. GND	—	Equipment Ground
FC	—	Fan Capacitor
FS	—	Float Switch
GND	—	Ground
HPS	—	High Pressure Switch
IFM	—	Indoor Fan Motor
IR	—	Infrared
ITP	—	Indoor Test Point
LLPS	—	Liquid Low Pressure Switch
LM	—	Louver Motor
LMS	—	Louver Micro Switch
OFM	—	Outdoor Fan Motor
OL	—	Overload
S	—	Emergency
TB	—	Terminal Block
TM	—	Sensor
TRAN	—	Transformer

Terminal (Marked)

Terminal (Unmarked)

Splice

Terminal Block

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

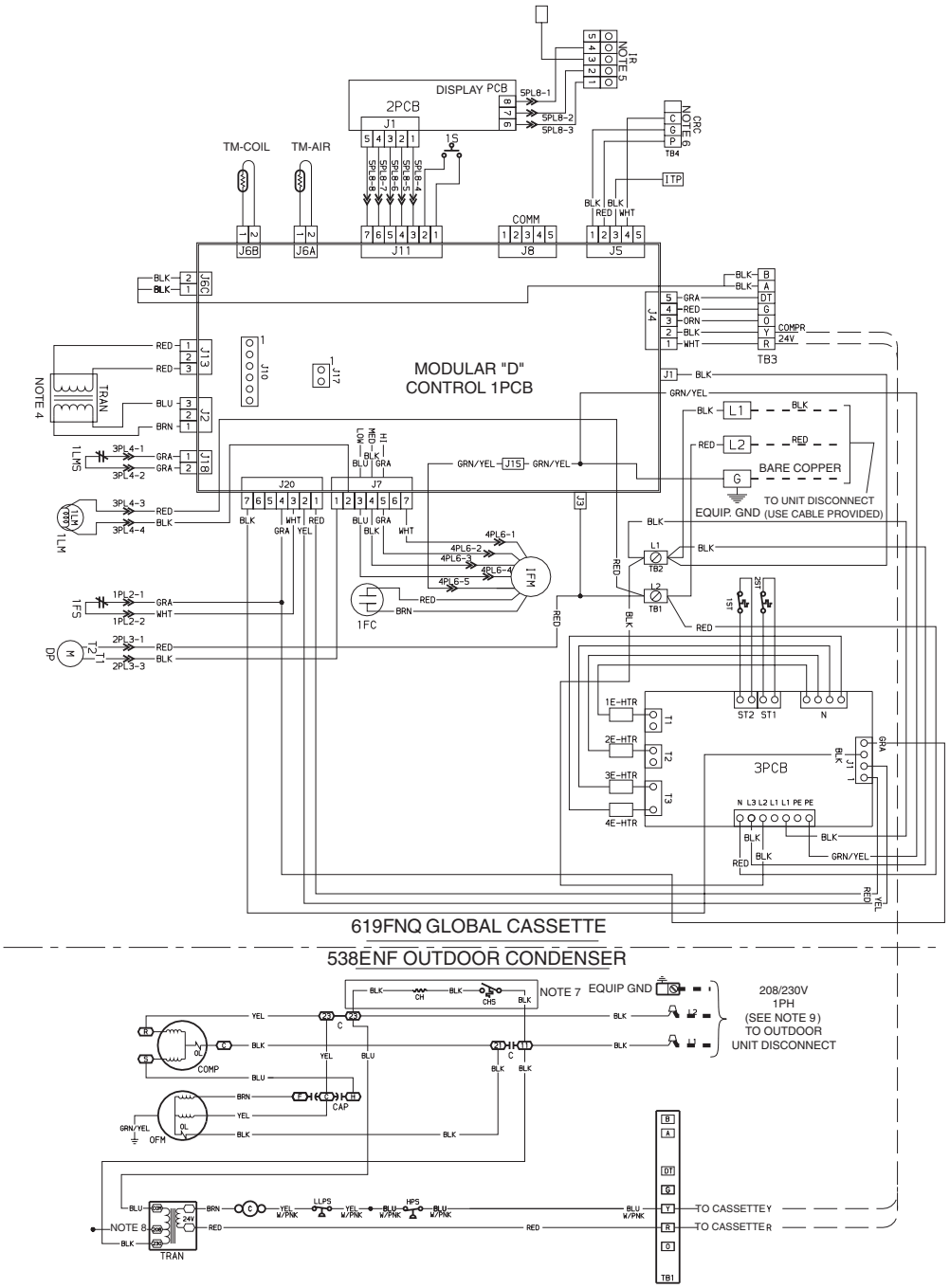
Plug Connector

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90° C wire or its equivalent.
2. Wire in accordance with National Electrical Code (NEC) and local codes.
3. Compressor and fan motors are protected by internal thermal overloads.
4. Indoor unit transformer has internal 2A thermal fuse on the primary side.
5. Infrared (IR) connection to be inserted on "J5" (replace the actual factory-installed "CRC" connector) for IR option.
6. Terminal strip for Carrier Room Controller (CRC) connection.
7. Compressor crankcase heater installed on 538QNF035 and 538QNF030 only.
8. Outdoor unit transformer is factory wired for 230 v. For 208 v move the black wire to the 208-v tap.
9. Use minimum 60° C wire for the field power wiring.

THERMISTOR EQUIVALENCE		
TEMPERATURE		**RESISTANCE**
°F	**°C**	Ω
95	**35**	6,500
72	**22**	11,400
32	**0**	32,500

NOTE: All thermistors are identical.

Fig. 24 — 619FNF/538ENF Cooling Only System Wiring Diagram



LEGEND

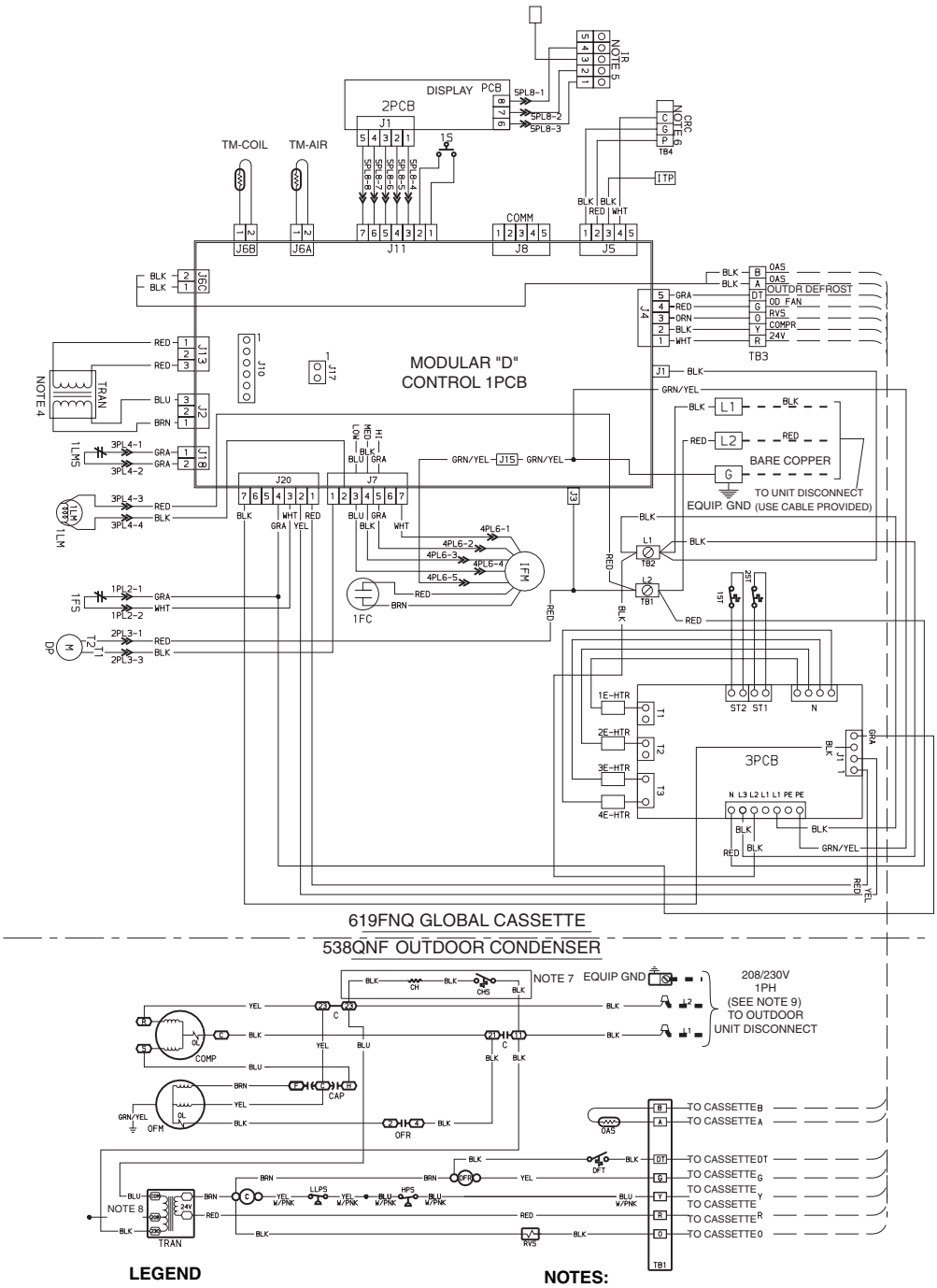
1PCB	— Main Control Printed Circuit Board	**LMS**	— Louver Micro Switch
2PCB	— Display Board	**OFM**	— Outdoor Fan Motor
3PCB	— Printed Circuit Board for Electric Heat	**OL**	— Overload
C	— Contactor	**S**	— Emergency
CAP	— Capacitor	**ST**	— Safety Thermostat
CH	— Crankcase Heater	**TB**	— Terminal Block
CHS	— Crankcase Heater Switch	**TM**	— Sensor
COMP	— Compressor	**TRAN**	— Transformer
CRC	— Carrier Room Controller	⟨X⟩	Terminal (Marked)
DP	— Drain Pump	○	Terminal (Unmarked)
E-HTR	— Electric Heater	●	Splice
EQUIP. GND	— Equipment Ground	[X]	Terminal Block
FC	— Fan Capacitor	———	Factory Wiring
FS	— Float Switch	— — —	Field Control Wiring
GND.	— Ground	- - - -	Field Power Wiring
HPS	— High Pressure Switch	—— - ——	Accessory or Optional Wiring
IFM	— Indoor Fan Motor	⟩⟩—	Plug Connector
IR	— Infrared		
ITP	— Indoor Test Point		
LLPS	— Liquid Low Pressure Switch		
LM	— Louver Motor		

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90° C wire or its equivalent.
2. Wire in accordance with National Electrical Code (NEC) and local codes.
3. Compressor and fan motors are protected by internal thermal overloads.
4. Indoor unit transformer has internal 2A thermal fuse on the primary side.
5. Infrared (IR) connection to be inserted on "J5" (replace the actual factory-installed "CRC" connector) for IR control.
6. Terminal strip for Carrier Room Controller (CRC) connection.
7. Compressor crankcase heater installed on 538QNF035 and 538QNF030 only.
8. Outdoor unit transformer is factory wired for 230 v. For 208 v move the black wire to the 208-v tap.
9. Use minimum 60° C wire for the field power wiring.

THERMISTOR EQUIVALENCE		
TEMPERATURE		**RESISTANCE**
°F	**°C**	Ω
95	**35**	6,500
72	**22**	11,400
32	**0**	32,500

NOTE: All thermistors are identical.

Fig. 25 — 619FNQ/538ENF Heat/Cool System Wiring Diagram with Electric Heaters



LEGEND

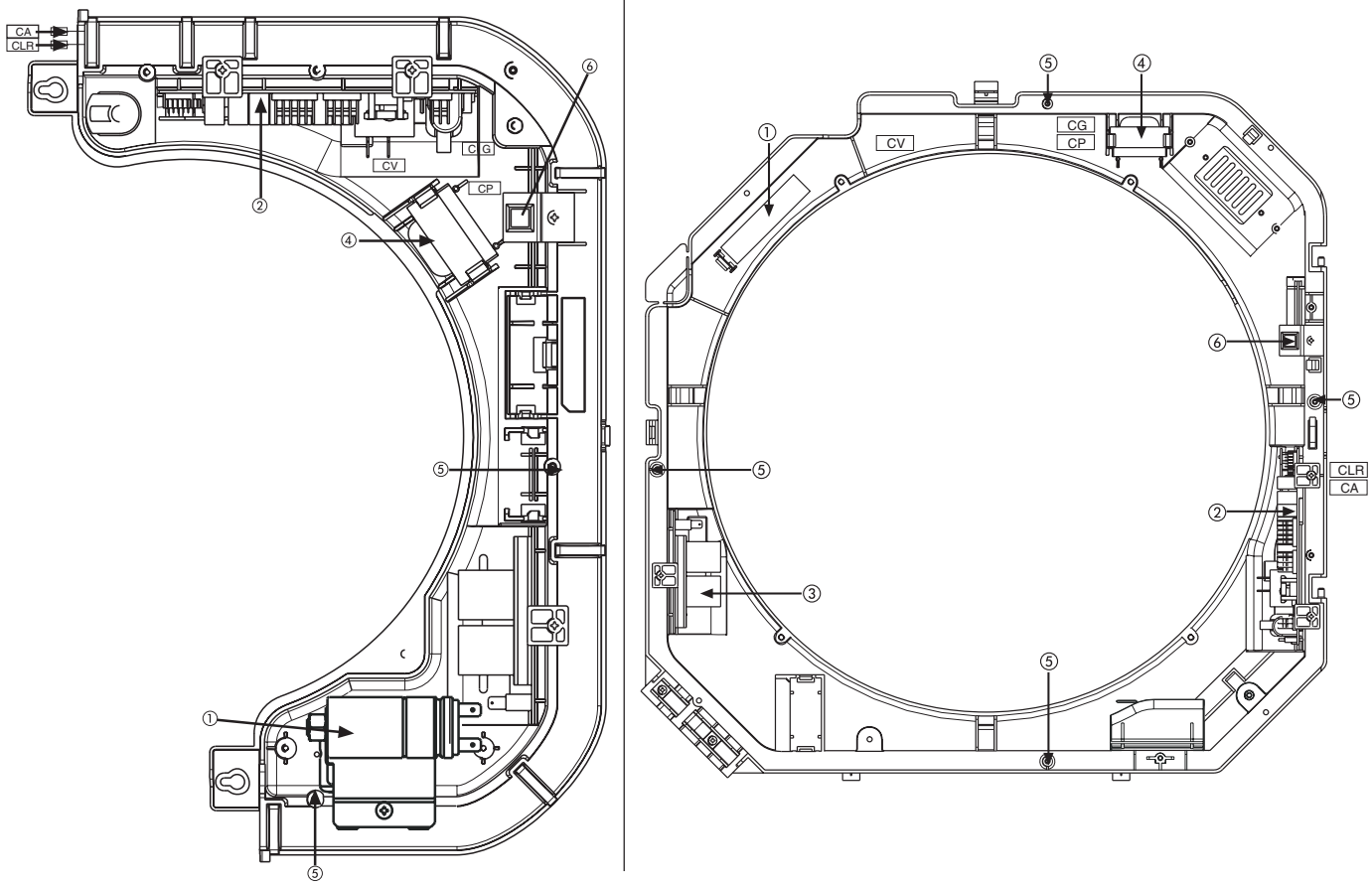
1PCB	—	Main Control Printed Circuit Board
2PCB	—	Display Board
3PCB	—	Printed Circuit Board for Electric Heat
C	—	Contactor
CAP	—	Capacitor
CH	—	Crankcase Heater
CHS	—	Crankcase Heater Switch
COMP	—	Compressor
CRC	—	Carrier Room Controller
DFT	—	Defrost Thermostat
DP	—	Drain Pump
E-HTR	—	Electric Heater
EQUIP. GND	—	Equipment Ground
FC	—	Fan Capacitor
FS	—	Float Switch
GND	—	Ground
HPS	—	High Pressure Switch
IFM	—	Indoor Fan Motor
IR	—	Infrared
ITP	—	Indoor Test Point
LLPS	—	Liquid Low Pressure Switch
LM	—	Louver Motor
LMS	—	Louver Micro Switch
OAS	—	Outdoor Air Sensor
OFM	—	Outdoor Fan Motor
OFR	—	Outdoor Fan Relay
OL	—	Overload
RVS	—	Reversing Valve Solenoid
S	—	Emergency
ST	—	Safety Thermostat
TB	—	Terminal Block
TM	—	Sensor
TRAN	—	Transformer
		Terminal (Marked)
		Terminal (Unmarked)
		Splice
		Terminal Block
		Factory Wiring
		Field Control Wiring
		Field Power Wiring
		Accessory or Optional Wiring
		Plug Connector

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90° C wire or its equivalent.
2. Wire in accordance with National Electrical Code (NEC) and local codes.
3. Compressor and fan motors are protected by internal thermal overloads.
4. Indoor unit transformer has internal 2A thermal fuse on the primary side.
5. Infrared (IR) connection to be inserted on “J5” (replace the actual factory-installed “CRC” connector) for IR option.
6. Terminal strip for Carrier Room Controller (CRC) connection.
7. Compressor crankcase heater installed on 538QNF035 and 538QNF030 only.
8. Outdoor unit transformer is factory wired for 230 v. For 208 v move the black wire to the 208-v tap.
9. Use minimum 60° C wire for the field power wiring.

THERMISTOR EQUIVALENCE		
TEMPERATURE		**RESISTANCE**
°F	**°C**	Ω
95	**35**	6,500
72	**22**	11,400
32	**0**	32,500

NOTE: All thermistors are identical.

Fig. 26 — 619FNQ/538QNF Heat Pump System Wiring Diagram with Electric Heaters



INTERNAL CONTROL PANEL
619FNF018

INTERNAL CONTROL PANEL
619FNF024, 03036
619FNQ01824, 03036

① Capacitor
② GMC board
③ Electric heater board
(only on models with electric heater)
④ Transformer
⑤ Holes for fixing panel in position
⑥ Emergency push-button

CV Fan connector
CLR LED/RECEIVER connector
CG Float connector
CP Pump connector
CA Louver connector

Fig. 27 — Internal Control Panel

C. Wiring the Room Controller

The room controller is capable of controlling from 1 to 6 fan coil units. The total run length of the wire connecting the room controller to the fan coil units should be kept to under 500 feet. Wire the room controller to the unit using daisy chain wiring. See Fig. 28. The room controller connects to the receiver board connection on the electronic board inside the unit.

Wiring the Power Connection to the Room Controller

The thermostat will be powered by unregulated nominal 12.5 volts DC (10V min to 20V max) which is provided by the electronic board inside the unit. The power consumption will be 50 mA 12.5 volts DC. For applications where more than one fan coil unit is to be controlled, the fan coil unit closest to the room controller will be the only one that supplies power to the room controller. The control should be protected from damage in case of accidental wiring of power, ground and signal wiring occurs.

Wiring the Room Controller to the Indoor Unit

Loosen the screws of terminals P (DC Power), G (GROUND) and C (SIGNAL) on the indoor unit and room controller terminal blocks. Refer to Fig. 29 and connect the indoor unit terminal block to the room controller terminal block.

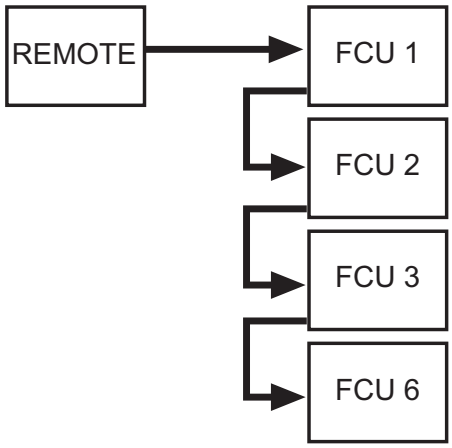


Fig. 28 — Room Controller Daisy Chain Wiring (Multidrop)

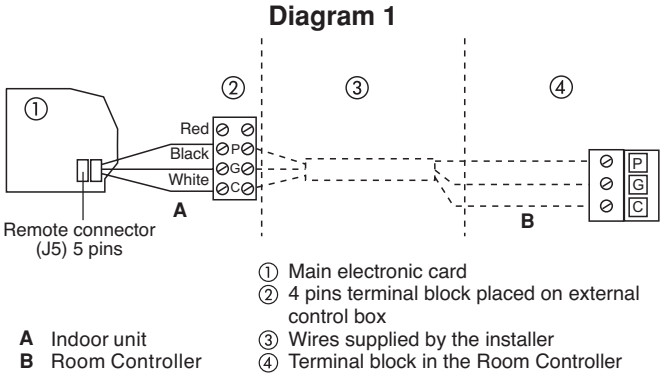


Fig. 29 — Wiring the Room Controller to the Indoor Unit

INSTALLATION OPTIONS

The 619FNF, FNQ units can be used to cool an adjacent room or for fresh-air ventilation. Plan the installation carefully. Measure carefully and follow acceptable building practices and the National Electric Code (NEC).

I. FRESH AIR INTAKE

1. Using Fig. 30, locate and remove the factory-installed insulation from the side of the unit where the pre-punched knockouts are located.
2. Remove the pre-punched knockouts for fresh air intake. Refer to Fig. 30. Be careful not to damage internal parts such as the heat exchanger coil.
3. If installing a 619FNF018 unit, install baffle. Refer to Fig. 30.
4. Install ductwork using field-supplied, insulated flex duct, or insulated sheet metal suitable for working temperatures up to 140 F. Conduits can be of flexible polyester (with spiral core) or corrugated aluminum, externally covered with anti-condensate material (fiberglass from 1/4 in. to 1 in. thickness).
5. Use Fig. 31 to determine the allowable static pressure loss for the ductwork airflow. The ductwork design must not exceed this value or the job airflow requirements will not be met.
6. Use a field-supplied fan if airflow does not meet job requirements. The field-supplied fan motor for outside air intake must be controlled by a bipolar ON/OFF switch with safety fuses.

IMPORTANT: Ventilated air must not exceed 10% of the total airflow or problems with operation will result. If the ventilated air surpasses 10% of the total airflow, a field-supplied primary air treatment system with separate deflectors is recommended.

7. Install an air inlet grille with filter inspection port to prevent dust and dirt from entering and fouling the indoor unit heat exchanger. Filter installation also makes the installation of a duct closing damper during shutdown periods unnecessary.
8. All non-insulated ducts must be covered with anti-condensate insulation (such as expanded neoprene, 1/4 in. thickness).

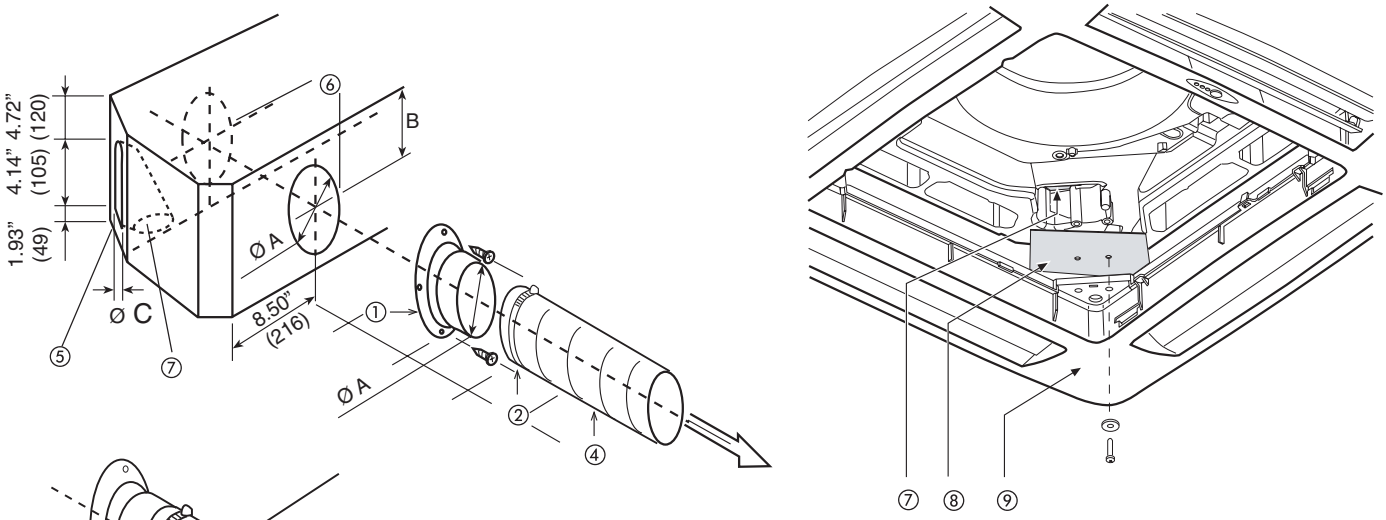
II. CONDITIONED AIR SUPPLY TO ADJACENT ROOM

Air supply to an adjacent room requires that the outlet corresponding with the duct is closed, using the air supply outlet obstruction accessory kit.

NOTE: The accessory kit cannot be used in units equipped with an electric heater.

An air inlet grille must be fitted (if possible near the floor) between the air conditioned room (where the unit is situated) and the adjacent room or, alternatively, the door must be undercut, as shown in Fig. 30. The duct lengths can be calculated in accordance with Fig. 30, also taking into account the pressure drop through air diffusers and fresh air filters.

IMPORTANT: DO NOT use active carbon or electrostatic filter kits for ducts towards adjacent rooms.



Unit	619FNF018	619FNF024, 03036 619FNQ01824, 03036
Ø A	5-29/32"(150 mm)	5-29/32"(150 mm)
B	4-3/4"(120 mm)	4-3/4"(120 mm)
Ø C	2-3/4"(70 mm)	3-15/16"(100 mm)

① Duct connection flange
② Clip
③ 1/4" (6 mm) neoprene gasket
④ Insulated flexible duct
⑤ Fresh air intake
⑥ Conditioned air supply to an adjacent room
⑦ Polystyrene partition
⑧ Baffle (619FNF018 only)
⑨ Frame

NOTE: Dimensions in ( ) are in mm.

Air intake grille

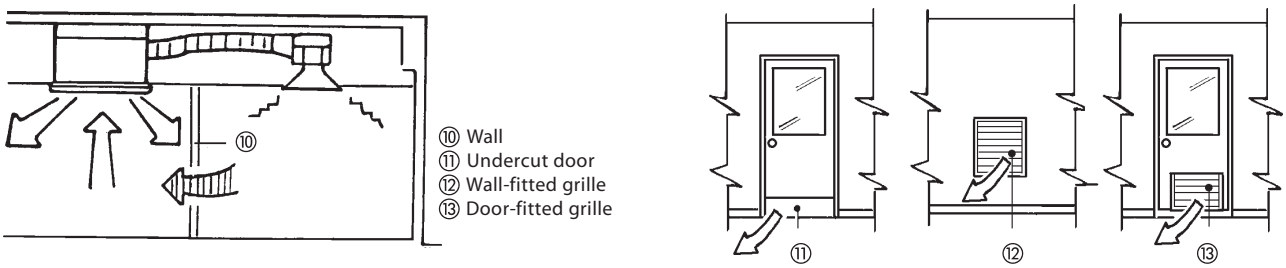
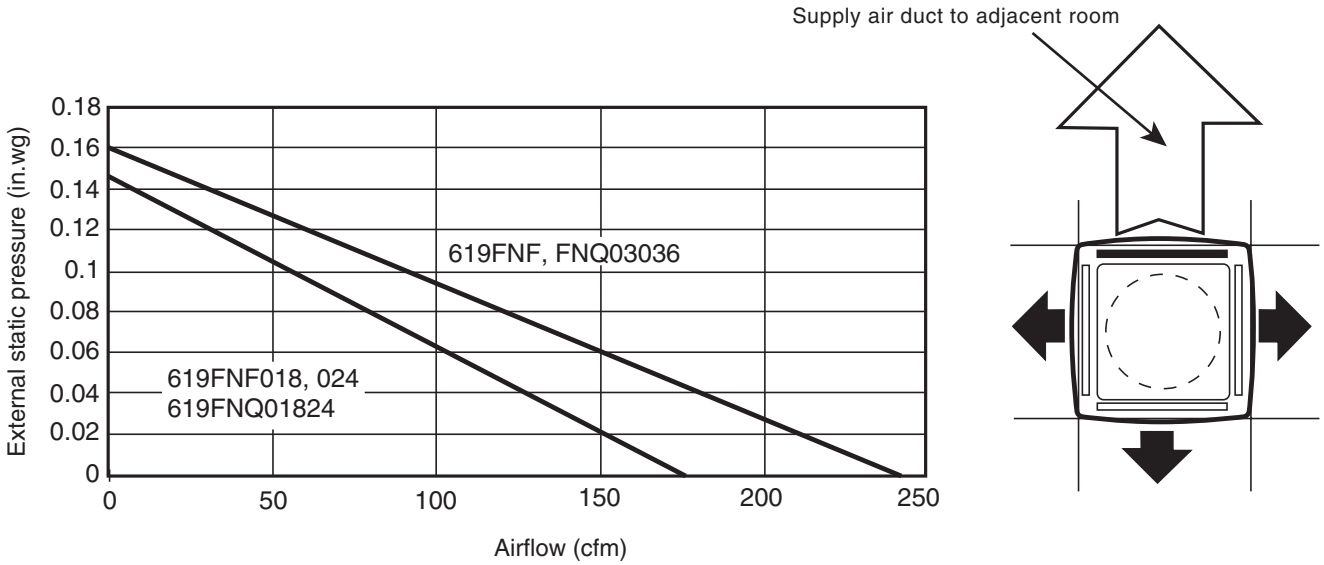


Fig. 30 — Installation Options



NOTE: When two louvers are closed, the fresh airflow towards the adjacent room is 50% higher than when one louver is closed (with equal static external pressure).

Fig. 31 — Pressure Drop for Conditioned Air Supply to an Adjacent Room: One Louver Closed

III. ROOM CONTROLLER CONFIGURATION SETUP

To configure the room controller, press the Mode button for 5 seconds. After 5 seconds, "10" will appear. This indicates that the user is setting the first software configuration item. To display the value of configuration item 10, press the Mode button again. The value of the Heat/Cool vs Cooling only remote configuration will be displayed along with the "Set Temp" icon to indicate that the number displayed is the configuration data. Refer to Table 7 for configuration values. To change the Heat/Cool vs Cooling only remote Configuration, press the Up and Down buttons. To move to the next setting, press the Mode button again and the "10" will be displayed. Press the up button and the display will change to "11." Refer to Fig. 32. The Mode button will toggle the display between the items and the configuration value. The Up and Down buttons will change either the index or the value, whichever is displayed at the time. Press the Fan button to exit the Configuration Setup Mode. This mode will exit automatically after 10 seconds of inactivity. Once a configuration value is changed, the last value displayed will be the new configuration value for the room controller.

NOTE: The only way to abort a configuration change is to change the value back to its original value.

Table 7 — Room Controller Configuration Values

ITEM	VALUE	DESCRIPTION
10	H*	Heat/Cool Remote
	C	Cooling Only Remote
11	On	Room Thermistor Override Active.
	Of*	Control and display room air temperature at the room controller. Room Thermistor Override Inactive. Do not display room air temperature at the room controller and control to unit room air thermistor(s).
12	C*	Temperatures displayed in degrees Celsius.
	F	Temperatures displayed in degrees Fahrenheit.

* Factory default.

1. Configuration Item 10: Heat Pump vs Cooling Mode

   H — The Room Controller will allow and display the following modes:

   - Off
   - Fan
   - Auto
   - Cool
   - Dry
   - Heat

   C — The Room Controller will allow and display the following modes:

   - Off
   - Fan
   - Cool
   - Dry

2. Configuration Item 11: Room Thermistor Override

   On — Room Thermistor Override is active. Units will be controlled to the air temperature displayed via the Room Controller.

   Of (Off) — Room Thermistor Override is not active. All units will be controlled to the room air thermistors located on the units.

3. Configuration Item 12: Celsius vs Fahrenheit

   C — Temperatures will be displayed in degrees Celsius.

   F — Temperatures will be displayed in degrees Fahrenheit.

IV. LOUVER MODE SELECTION

To enter louver mode selection, ensure the room controller is on and then press the Fan button for 5 seconds. After 5 seconds, the selected louver setting will be displayed. Press the up and down arrows to modify the louver setting between swing and auto. Refer to Fig. 33. The two settings will be displayed as follows:

S with Swing Louver Icon	Represents the swing louver
A with Auto Louver Icon	Represents the auto louver

The fan icon will also be displayed in the louver mode. Press Fan button to exit the Louver Mode selection. This mode will exit automatically after 10 seconds of inactivity. The only way to abort a louver change is to change the value back to its original value.

NOTE: If units are grouped to one room controller, all units will have the same louver value. Louver Mode selection is not available during OFF mode.

V. MAIN BOARD CONFIGURATION

To configure the main electronic board, push the Up and Down arrows for 5 seconds while the room controller is off.

After 5 seconds, a "20" will appear. This indicates that the user is setting the first software configuration item. To check the value of configuration item "20," press the Mode button. The value for the Heat Pump/AC Only configuration will be displayed. To change the value, use the Up and Down buttons. Once the desired value is selected, press the Fan button to send that configuration data to the unit. Refer to Table 8.

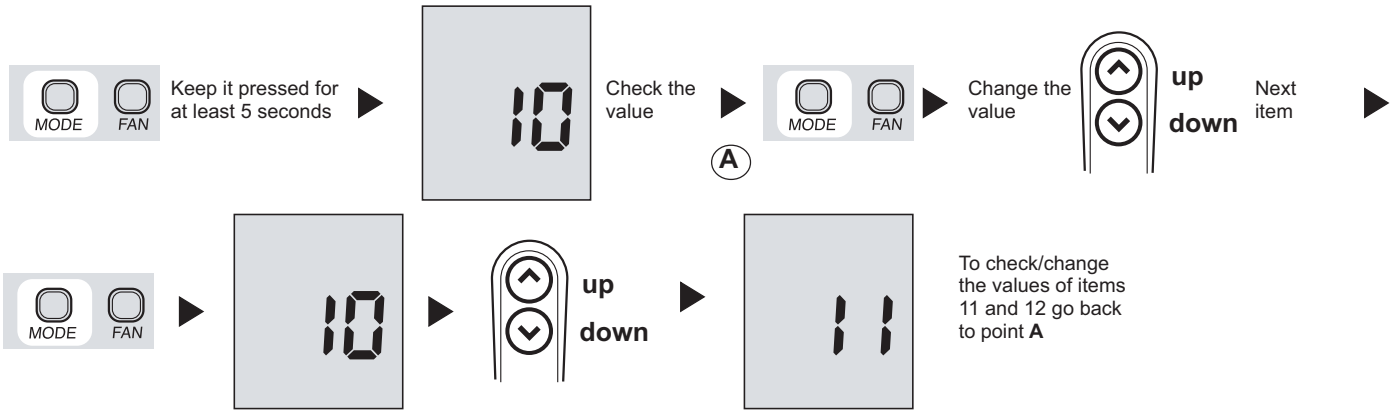


Fig. 32 — Room Controller Configuration Steps

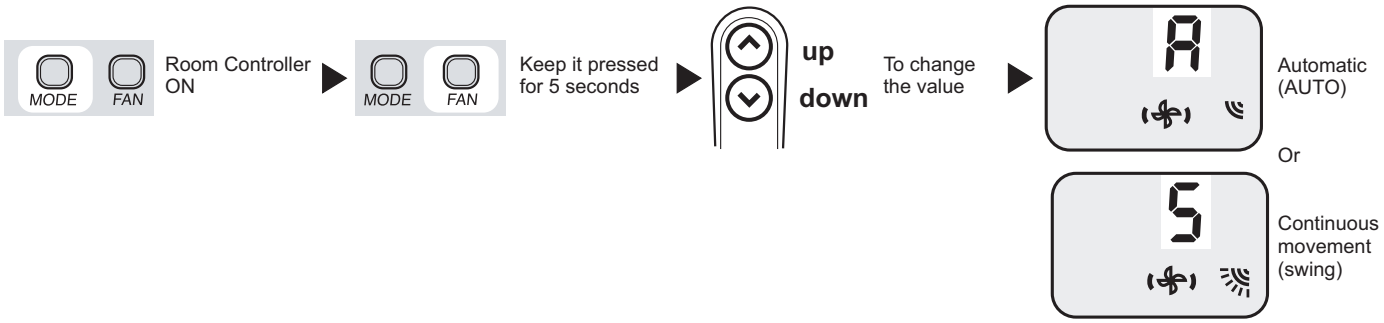


Fig. 33 — Selecting the Louver Mode

Table 8 — Modular Platform D Unit Configuration Values

ITEM	VALUE	COMMENT
20	1: Heat Pump 0: AC only (indoor unit with or without electric heaters)	Unit Configuration defaults to heat pump
21	1-199 in increments of 1	CCN Address of the unit. Defaults to 1. To display the hundreds, push ⏻.
22	0-199 in increments of 1	Zone number - Communications zone the system is located in Defaults to 0 To display the hundreds, push ⏻ .
24	0: Start in Off mode 1: Start in last active mode	Auto Restart Defaults to "On"

Only the current value being displayed is transmitted. Once the Fan button is pressed, the room controller will switch to displaying the configuration item number. To move to the next setting, press the Mode button again and the "20" will be displayed. Press the Up button and the display will change to "21." The Mode button will toggle the display between the software configuration item number (i.e., "20," "21," etc.) and the configuration value. The Up and Down buttons will change either the item number or the value, whichever is displayed at the time.

This mode will exit automatically after 30 seconds of inactivity.

NOTE: If units are grouped to one room controller, all units will have the same configuration value.

VI. SERVICE TEST MODE

Prior to start-up, conduct the Service Test mode to ensure the unit is ready for start-up.

There is a hidden Service Test mode that is initiated through a combination of button presses when the remote is off. The following buttons need to be pressed, in sequence, within 6 seconds:

1. Down arrow
2. Fan button
3. Up arrow
4. Fan button
5. Mode button

Once in Service Test mode, the Service Test mode message will be sent, and **Sr** will be displayed in the temperature icons until the Down button is pressed. During Service Test mode all the icons are off, and the only button that is active is the Down button. To cancel Service Test mode, press the Down button to send a message of Off mode to the unit. Service Test mode automatically times out after 30 minutes and the remote will operate normally.

When test mode is selected, the unit will operate as described below:

- The Unit Status (Green) and Timer (Yellow) LEDs blink every 2 seconds.
- The indoor fan will operate according to user-selected speed. If user-selected speed is Auto, the fan will run in High speed.
- If the unit is configured as an A/C Only unit, it will operate in cool mode with demand.
- If the unit is configured as a Heat Pump unit, the louver will operate according to user-selected position. If user selected louver is Auto, louver operates according to auto heat or cool louver based on operating mode.
- The unit will run in cool mode for 3 minutes, then it will run in heat mode for 2 minutes, or until the indoor coil is greater than 104 F. The unit will run in cool mode until test mode is exited.

Any of the following will cancel the Service Test mode:

- When the unit is turned off by the controller.
- If the power is cycled during the Test Mode, the unit will return to its normal operating mode.
- After 30 minutes of receiving the last valid test request message.
- Fail Mode.

START-UP

The following checks should be made before system start-up. Refer to outdoor unit Installation, Start-Up, and Service manual for system start-up instructions and refrigerant charging methods. Be sure to use the refrigerant charge shown in Table 3.

1. Check condensate drainage system.
   a. Remove grille and frame from the unit.
   b. On the opposite side of the drain connection, insert a water bottle up into the fan coil unit and fill drain pan. Refer to Fig. 34. Water must flow regularly with condensate pump energized. If water does not, check the pipe slope or see if there are any pipe restrictions.
   NOTE: The unit is equipped with a safety float switch to deenergize the compressor if the drain water level gets too high.
2. Make sure that all wiring connections are correct and that they are tight.
3. Make sure that all barriers, covers, and panels are in place.

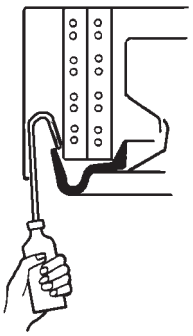


Fig. 34 — Inserting Water into Drain Pan

4. Ensure that the filters and return air grilles have been installed and that the discharge louvers are correctly positioned.

⚠ CAUTION: Never operate unit without a filter or with grille removed. Damage to the unit or personal injury may result.

SERVICE AND MAINTENANCE

Remove unit grille, filter, and condensate pan for cleaning, lubricating, or replacing parts.

⚠ CAUTION: To avoid personal injury or damage to unit, do not service until all power sources are shut down, locked out, and tagged out. Failure to do so could result in personal injury or unit damage.

I. MINIMUM MAINTENANCE

1. Check, clean, or replace air filter each month or as required.
2. Check cooling coil, drain pan, condensate trap, and condensate drain pan each cooling season for cleanliness. Clean as necessary.
3. Check fan motor and wheel for cleanliness each heating and cooling season.
4. Check electrical connections for tightness and controls for proper operation each heating and cooling season. Service as necessary.

II. SERVICE

A. To Clean or Replace Air Filters

1. Place a plastic sheet on the floor to catch any water that may spill from drain pan.
2. Slide filter out.
3. Vacuum clean or wash filter with soapy water. Rinse and let air dry. If filter needs replacing, filters are available from the local dealer.

⚠ CAUTION: If air filter is not replaced in the unit, dust and dirt gather in air conditioner and operation becomes impaired.

B. 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 air intake and distribution assembly. Remove the condensate water in the drain pan by pulling out the rubber drain plug and letting water drain into a 3-gallon bucket.

⚠ CAUTION: Do not use a screw driver to pry drain pan out of assembly. It could damage the pan.

3. Remove screws holding the drain pan. Carefully hold the drain pan to remove it from the assembly.
4. Reinstall the drain pan using the appropriate number of screws. Center and align the metal fan inlet orifice with the fan. Ensure the fan spins freely.

TROUBLESHOOTING

See Table 9 and Fig. 35 for troubleshooting information.

I. FAULT CODE

Once a failure occurs with the indoor unit in operation, the green LED on the indoor unit flashes at intervals of 0.5 seconds. The fault code is deduced from the number of times the green LED flashes, blocking unit operation. Between one flash cycle and the next one, a pause of 5 seconds elapses. See Fig. 35.

Table 9 — Fault Codes

CODE	DESCRIPTION
2	Condensate discharge pump
3	Room air sensor fault
4	Indoor unit coil sensor fault
6*	Filter dirty
7	Outdoor unit failure
10	EEPROM corrupt
11	Card serial number damaged
12	Address or zone incomplete
13	Gas flow distributor corrupt
14	Outdoor air thermistor fault

*When code is enabled.

A. Using the Emergency Button

The Emergency button is for use by a qualified service technician only. The Emergency button is for use when the room controller is inoperative. Use a screwdriver to press the emergency button through the metal protection grille. See Fig. 35.

Emergency Operation

When the unit is in the OFF mode and the Emergency button is pressed for 5 seconds, the unit will operate as follows:

- Automatic mode
- temperature preset to 72 F
- automatic fan speed
- louvers set automatically according to the operating mode
- Timer function is cancelled
- buzzer beeps

When the unit is ON and the Emergency button is pressed for 5 seconds, the unit will operate as follows:

- the unit is turned off
- buzzer beeps

When a signal is received by the remote control, the unit operates accordingly.

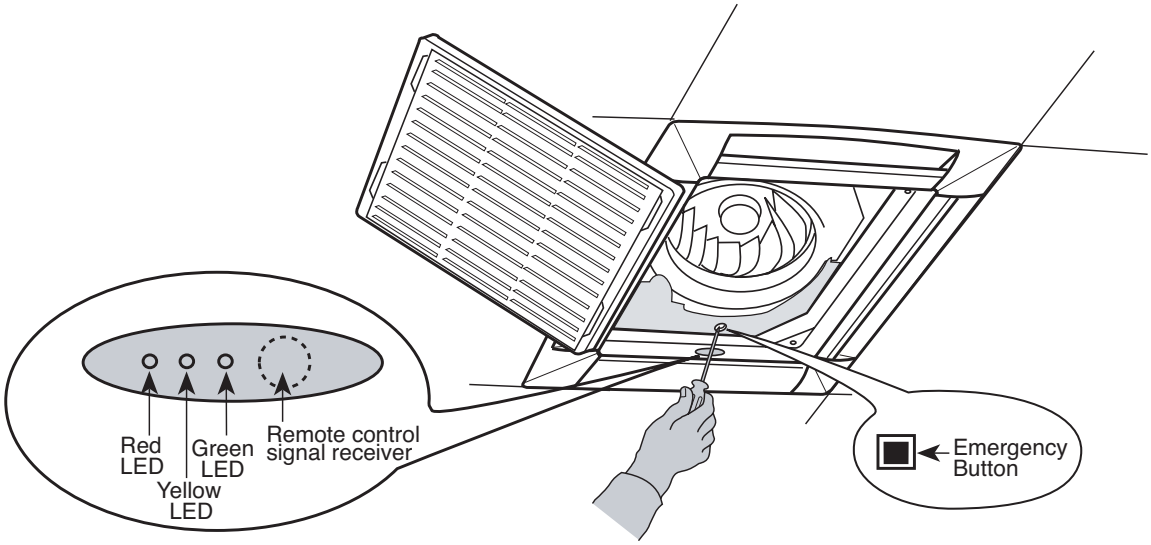


Fig. 35 — Warning Lamps and Emergency Button