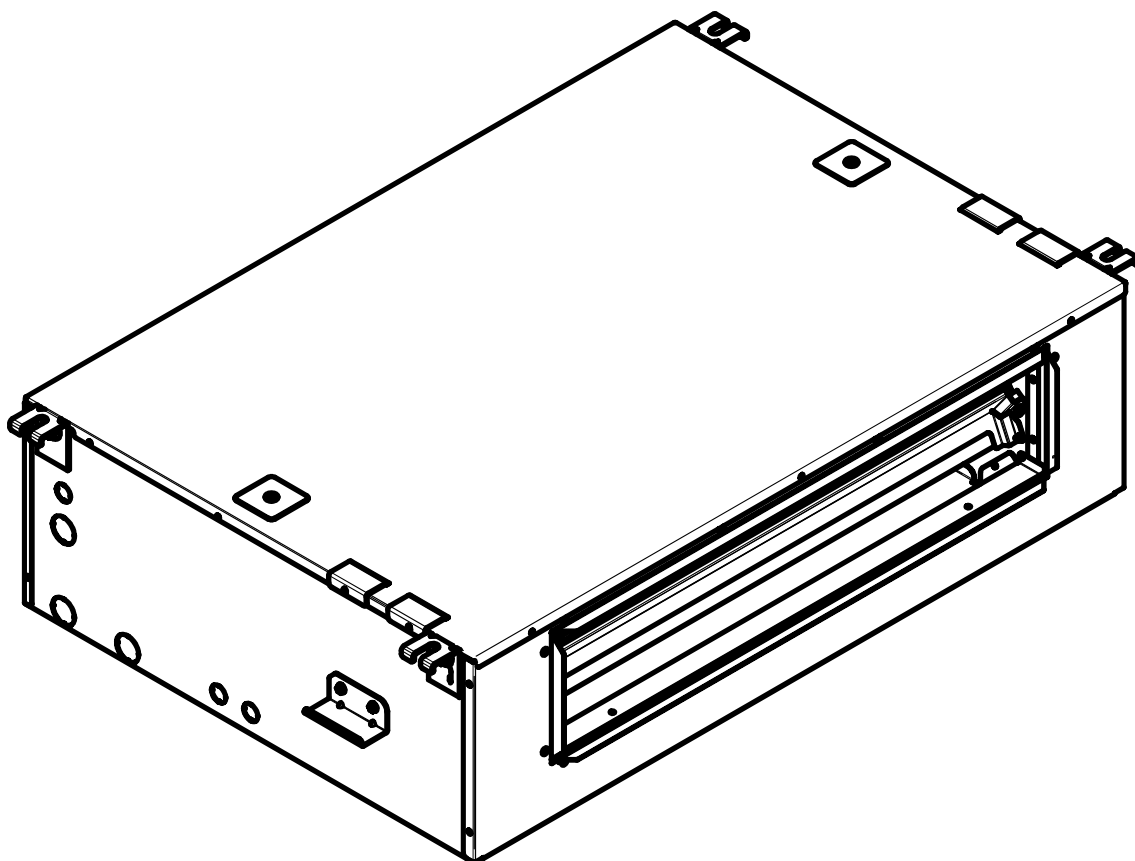


INSTALLATION INSTRUCTIONS

HIGH EFFICIENCY CEILING-MOUNT AIR HANDLERS 1.5-3Tons

FEATURING R-410A REFRIGERANT



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instruction may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



DO NOT DESTROY THIS MANUAL

Please read carefully and keep in a safe place for future reference by a serviceman.

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This document is customer property and is to remain with this unit. These instructions do not cover all the different variations systems nor does it provide for every possible contingency to be met in connection with installation. All phases of this installation must comply with NATIONAL STATE AND LOCAL CODES. If additional information is required please contact your local distributor.

1.0 SAFETY



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.



This is an attention alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.



WARNING

Disconnect all Power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.



WARNING

If removal of the blower assembly is required, all disconnect switches supplying Power to the equipment must be de-energized and locked (if not in sight of unit) so the field Power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.



WARNING

Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by a trained, qualified service personnel. Consumer service is recommended only for filter cleaning / replacement. Never operate the unit with the access panels removed.



WARNING

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.



WARNING

PROPOSITION 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to State of California to cause cancer.

All manufacturer products meet current federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.

California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.

All "new equipment" shipped for sale in California will have labels stating that the product and /or produces Proposition contains 65 chemicals. Although we have not changed our processes, having the same label on all our produced facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.

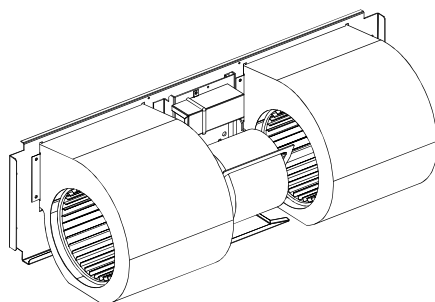
You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air-conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.

Glass Wool (Fiberglass) Insulation
Carbon Monoxide (CO).
Formaldehyde
Benzene

More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.



WARNING



Make sure the blower motor support is tight then check to see if wheel is secured to motor shaft before operating unit.



WARNING

INSTALLATION PLACE

- There is enough room for installation and maintenance.
- The ceiling is horizontal, and its structure can endure the weight of the indoor unit.
- The air outlet and the air inlet are not impeded, and the influence of external air is the least.
- The air flow can reach throughout the room.
- The connecting pipe and drainpipe could be extracted out easily.
- There is no direct radiation from heaters.



WARNING

Location in the following places may cause malfunction of the machine. (If unavoidable, please consult your local dealer.)

- a. There exists petrolatum.
- b. There is salty air surrounding(near the coast).
- c. There is caustic gas(the sulfide, for example) existing in the air (near a hot spring).
- d. The Volt vibrates violently(in the factories).
- e. In buses or cabinets.
- f. In kitchen where it is full of oil gas.
- g. There is strong electromagnetic wave existing.
- h. There are inflammable materials or gas.
- i. There is acid or alkaline liquid evaporating.
- j. Other special conditions.



CAUTION

The maximum static pressure in the outside of the unit is 0.3 Inches W.C.



CAUTION

Mount with the lowest moving parts at least 2.4 m (8 ft) above floor or grade level.

2.0 GENERAL

2.1 UNIT DIMENSIONS

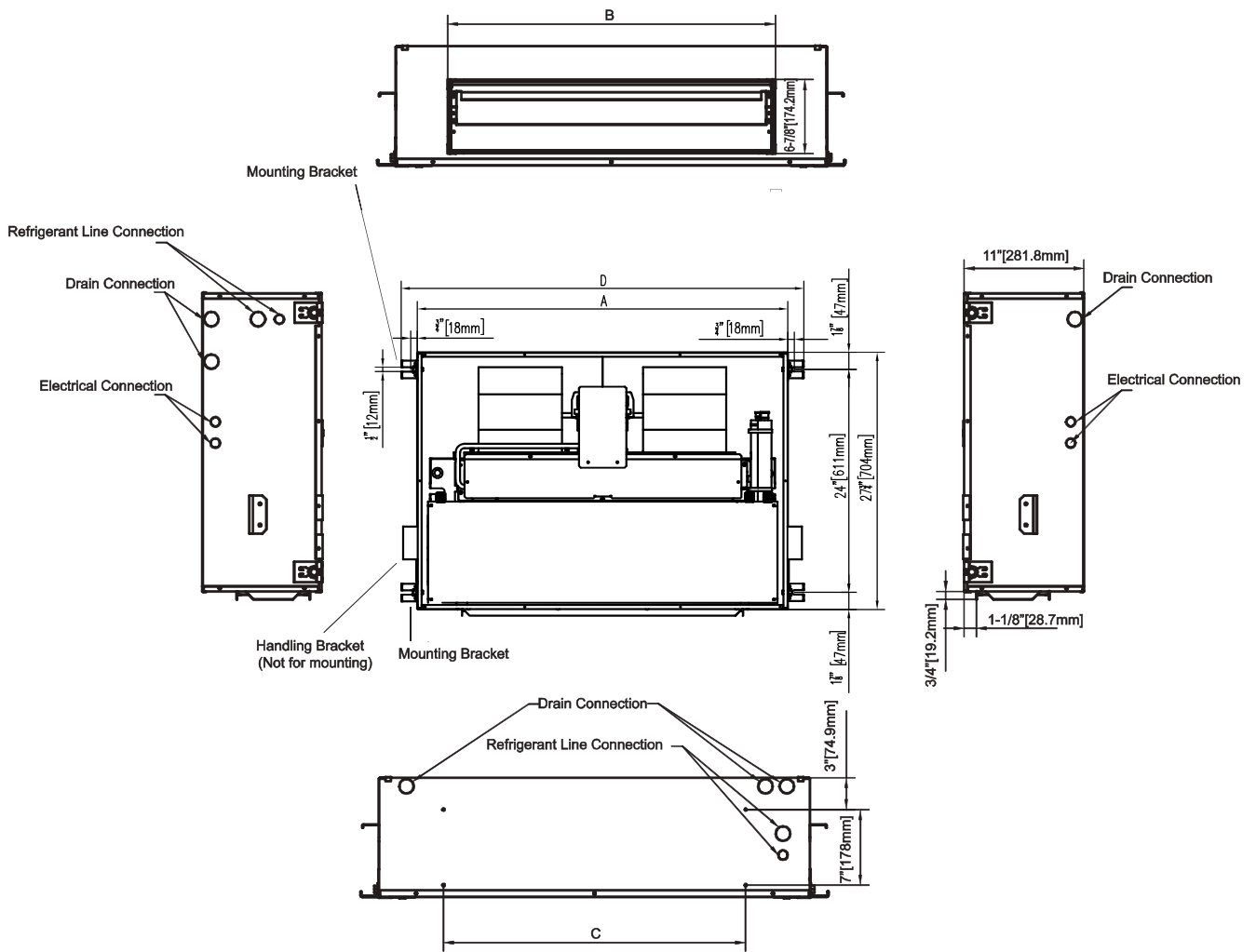


Fig.1 DIMENSIONS

DIMENSIONAL DATA

Model Size	Dimensions- inches [mm]			
	A	B	C	D
18	39-3/4 [1010]	30-3/8 [771]	28 [711]	43-3/8 [1101]
24	39-3/4 [1010]	30-3/8 [771]	28 [711]	43-3/8 [1101]
30	51-3/4 [1315]	42-3/8 [1076]	40 [1016]	55-3/8 [1406]
36	51-3/4 [1315]	42-3/8 [1076]	40 [1016]	55-3/8 [1406]

3.0 AIR HANDLER INSTALLATIONS

3.1 INSTALL THE MAIN BODY

Installing $\phi 1"$ hanging screw bolts. (6 bolts)

- Please refer to the following figure for the distance measurement between the screw bolts.
- Please install with $\phi 1"$ hanging screw bolts.
- The handling to the ceiling varies from the constructions, consult the construction personnels for the specific procedures.
 - (1) The size of the ceiling to be handled ... do keep the ceiling flat.
Consolidate the roof beam for possible vibration.
 - (2) Cut off the roof beam.
 - (3) Strengthen the place cut off, and consolidate the roof beam.
- Carry out the pipe and line operation in the ceiling after finishing the installation of the main body. While choosing where to start the operation, determine the direction of the pipes to be drawn out. Especially in case there is a ceiling, position the refrigerant pipes, drain pipes, indoor & outdoor lines to the connection places before hanging up the machine.
- The installation of hanging screw bolts.

WOODEN CONSTRUCTION

Put the square timber transversely over the roof beam, then install the hanging screw bolts.

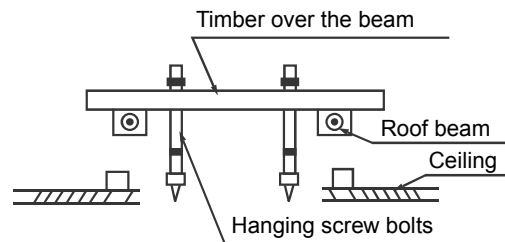


Fig.2

NEW CONCRETE BRICKS

Inlaying or embedding the screw bolts.

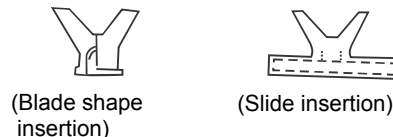


Fig.3

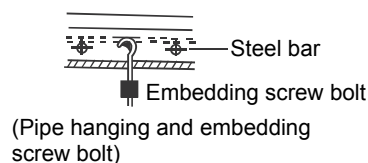


Fig.4

FOR ORIGINAL CONCRETE BRICKS

Install the hanging hook with expansible bolt into the concrete deep to 2" to prevent loose.

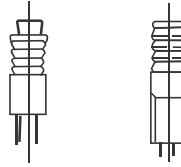


Fig.5

STEEL ROOF BEAM STRUCTURE

Install and use directly the supporting angle steel.

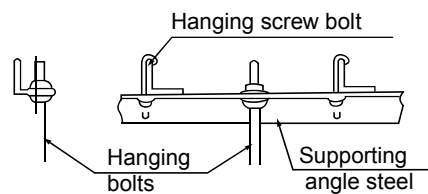


Fig.6

3.2 OVERHANGING THE MAIN BODY

- Overhang the indoor unit onto the hanging screw bolts with block.
- Position the indoor unit in a flat level by using the level indicator, unless it may cause leakage.

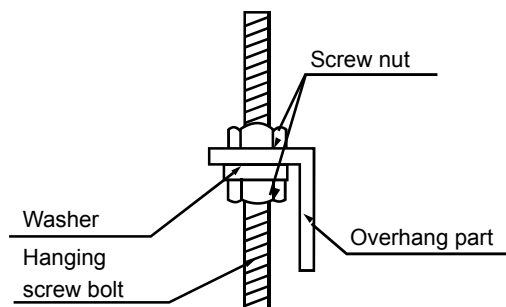


Fig.7

3.3 INSTALLING THE DUST PROOF NET AND CANVAS AIR PASSAGE

1. Install the dust proof net according to the installation manual;
2. Install the canvas air passage underneath the dust proof net.

3.4 PIPE CONNECTION

- The maximum static pressure in the outside of the unit is 0.3 inches W.C, the length of the air pipe attached is determined by this parameter.

4.0 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance.



WARNING

Disconnect all Power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

4.1 Power WIRING

It is important that proper electrical Power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- **IMPORTANT:** After the Electric Heater is installed, units may be equipped with one, two, or three 30/60 amp. circuit breakers. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.
- Supply circuit Power wiring must be 75°C minimum copper conductors only. See Electrical Data in this section for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or "HACR" type circuit breakers.
- Power wiring may be connected to either the right, left side or top. Three 7/8", 1-3/8", 1-3/4" dia. concentric knockouts are provided for connection of Power wiring to unit.
- Power wiring is connected to the Power terminal block in unit electric cabinet.

4.2 CONTROL WIRING

IMPORTANT: Class 2 low voltage control wiring should not be run in conduit with main Power wiring and must be separated from Power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 Awg. color-coded. For lengths longer than 100 ft., 16 Awg. wire should be used.
- Low voltage control connections are made to low voltage pigtails extending from top of air handler (upflow position - see Figure 3). Connections for control wiring are made with wire nuts. Control wiring knockouts (5/8 and 7/8) are also provided on the right and left side of the unit for side connection.
- See wiring diagrams attached to indoor and outdoor sections to be connected.
- Make sure, after installation, separation of control wiring and Power wiring has been maintained.

4.3 GROUNDING



WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

5.0 AIRFLOW PERFORMANCE

AIRFLOW PERFORMANCE DATA (for 240 Vac with dry coil and no filter in place)

Use for Selecting Electric Heat Speed

Model	Motor Speed	CFM Dry Coil without Filter or Electric Heat						
		External Static Pressure-Inches W.C. [kPa]						
		0 [0]	0.05 [.01]	0.1 [.02]	0.15 [.04]	0.2 [.05]	0.25 [.06]	0.3 [.07]
18	Low	762	724	686	642	598	513	448
	Medium	1033	981	932	876	819	735	667
	High	1062	1007	953	888	825	764	722
24	Low	762	724	686	642	598	513	448
	Medium	1033	981	932	876	819	735	667
	High	1062	1007	953	888	825	764	722
30	Low	1200	1152	1116	1073	1039	989	924
	Medium	1331	1285	1242	1205	1165	1121	1050
	High	1449	1402	1361	1322	1284	1235	1198
36	Low	1200	1152	1116	1073	1039	989	924
	Medium	1331	1285	1242	1205	1165	1121	1050
	High	1449	1402	1361	1322	1284	1235	1198

Use for Selecting Cooling and Heat Pump Speed

Model	Motor Speed	CFM Wet Coil without Filter or Electric Heat						
		External Static Pressure-Inches W.C. [kPa]						
		0 [0]	0.05 [.01]	0.1 [.02]	0.15 [.04]	0.2 [.05]	0.25 [.06]	0.3 [.07]
18	Low	747	671	623	575	528	469	397
	Medium	996	912	833	765	683	609	518
	High	1051	974	888	816	742	665	576
24	Low	747	671	623	575	528	469	397
	Medium	996	912	833	765	683	609	518
	High	1051	974	888	816	742	665	576
30	Low	1211	1150	1069	1017	958	906	849
	Medium	1313	1261	1216	1151	1105	1051	984
	High	1428	1377	1315	1244	1198	1148	1089
36	Low	1211	1150	1069	1017	958	906	849
	Medium	1313	1261	1216	1151	1105	1051	984
	High	1428	1377	1315	1244	1198	1148	1089

– Shaded boxes represent airflow outside the required 300-450 cfm/ton.

NOTES

1. Airflow data is without filter or electric heat accessory. Heater adds 0.05–in. static.
2. Use dry coil data for determining electric heater airflow.
3. Use wet coil data for determining cooling airflow.
4. Accessory louver panel adds 0.05–in. Static.

Required CFM Range for Cooling or Heat Pump Operation

Size	CFM	
	Min	Max
18	450	675
24	600	900
30	750	1125
36	900	1350

The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.

Heat pump systems require a specified airflow. Each ton of cooling requires between 300 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.

Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.

Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.

The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.

An air velocity meter or airflow hood can give a reading of system CFM.

6.0 DUCTWORK

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.



WARNING

Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See airflow performance tables in this manual.
- Design the duct system in accordance with "ACCA" Manual "0" Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: "ACCA" Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates flexible air duct, be sure pressure drop information (straight length plus all turns) shown in "ACCA" Manual "D" is accounted for in system.
- Supply plenum is attached to the 3/4" duct flanges supplied with the unit. Attach flanges around the blower outlet.

IMPORTANT: If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

- **IMPORTANT:** The front flange on the return duct if connected to the blower casing must not be screwed into the area where the Power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

7.0 REFRIGERANT CONNECTIONS

Keep the coil connections sealed until refrigerant connections are made. See the Installation Instructions for the outdoor unit for details on line sizing, tubing installation, and charging information.

Coil is shipped with "No charge". Evacuate the system before charging with refrigerant.

Install refrigerant tubing so that it does not block service access to the front of the unit.

Nitrogen should flow through the refrigerant lines while brazing.

Use a brazing shield to protect the cabinet's paint and a wet rag to protect the rubber grommet from being damaged by torch flames. After the refrigerant connections are made, seal the gap around the connections with pressure sensitive gasket.

8.0 CONDENSATE DRAIN TUBING

8.1 INSTALL INDOOR UNIT DRAIN PIPE

The outlet has NPT 3/4" screw thread, Please use sealing materials and pipe sheath (fitting) when connecting PVC pipes.



CAUTION

To ensure smooth drainage, drain pan is designed to have a slope toward drain port and should not be leveled. It is required that unit be leveled and bulb on level meter should not go across either line of the level meter.



CAUTION

- The drain pipe of indoor unit must be heat insulated, or it will condense dew, as well as the connections of the indoor unit.
- Hard PVC binder must be used for pipe connection, and make sure there is no leakage.
- With the connection part to the indoor unit, please be noted not to impose pressure on the side of indoor unit pipes.
- When the declivity of the drain pipe downwards is over 1/100, there should not be any winding.
- The total length of the drain pipe when pulled out transversely shall not exceed 65 feet, when the pipe is over long, a prop stand must be installed to prevent winding.
- Refer to the Fig.8 for the installation of the pipes.
- All three drain connectors (connecting ports) should be connected to drain pipes.

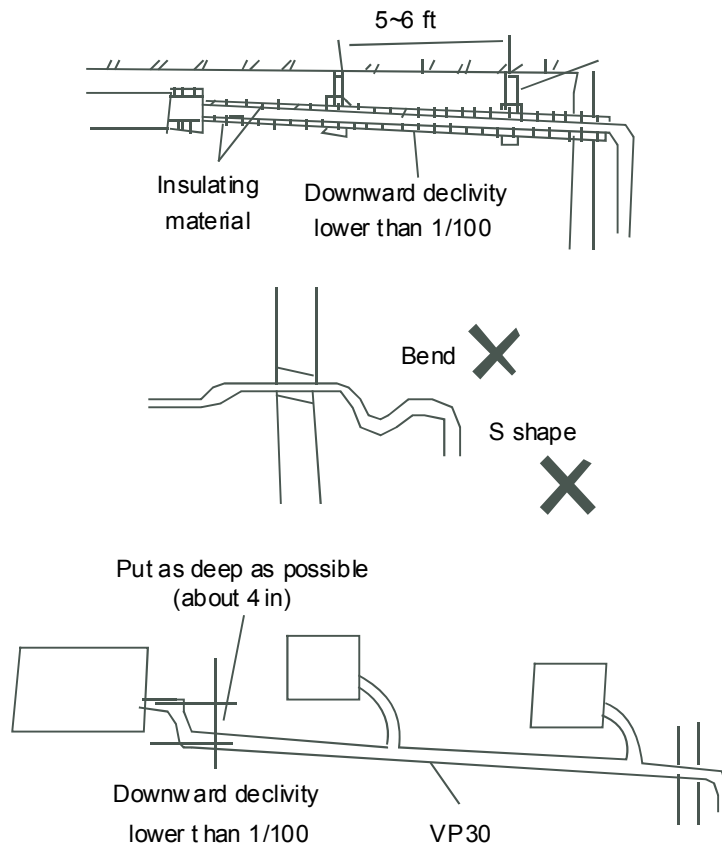


Fig.8

8.2 DRAINAGE TEST

- Check whether the drainpipe is unhindered
- New built house should have this test done before paving the ceiling.

9.0 OPTIONAL ACCESSORIES

- Heater - for 24K/30K/36K unit with 5/8/10kW (field installed)
18K unit with 5/8kW (field installed)

Heater Installation

1. Remove control box cover
2. Remove control box assembly
3. Remove sealing plate from control box assembly
4. Install heater onto control box assembly
5. Re-install control box assembly back to unit
6. Re-install control box cover back to control box assembly

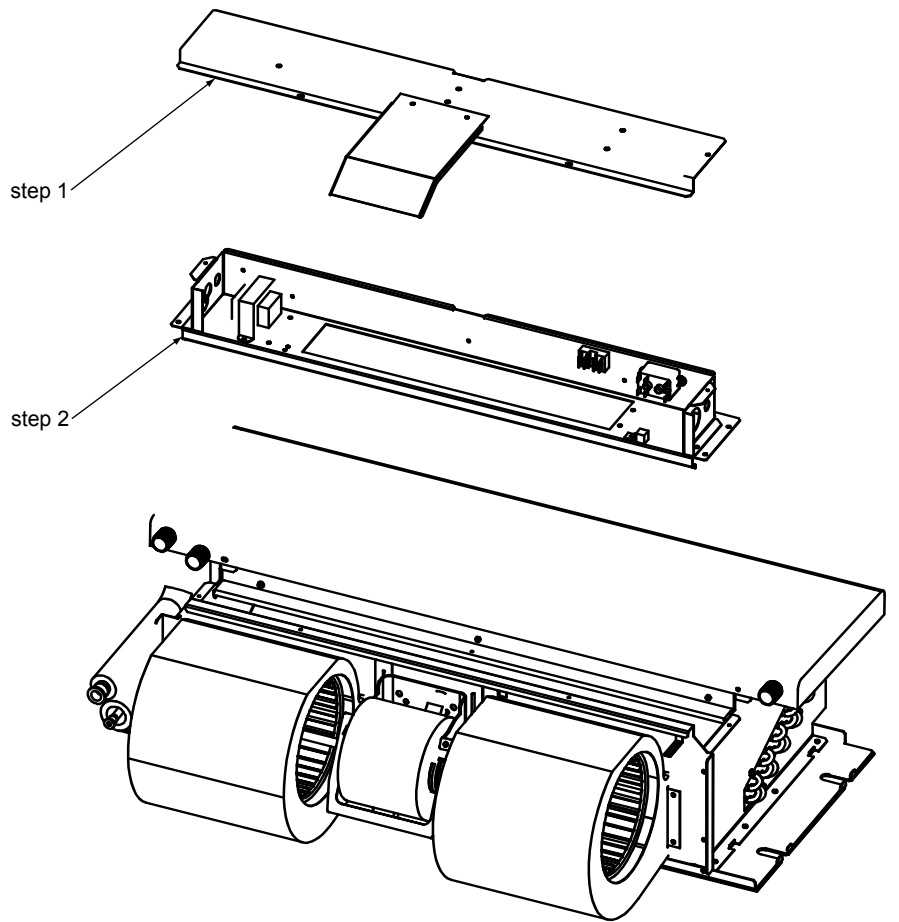


Fig.10

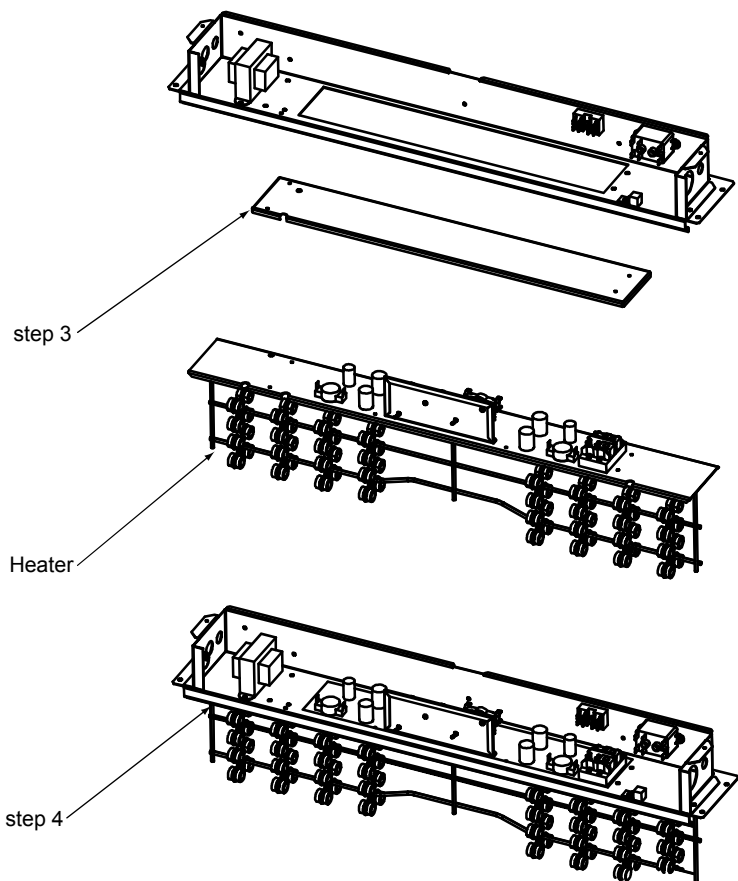


Fig.11

10.0 WIRING DIAGRAM

1. To avoid the electrical shock, please connect the air conditioner with the ground lug. The main Power plug in the air conditioner has been joined with the ground wiring, please don't change it freely.
2. The Power socket is used as the air conditioner specially.
3. Don't pull the Power wiring hard.
4. When connecting the air conditioner with the ground, observe the local codes.
5. If necessary, use the Power fuse or the circuit, breaker or the corresponding scale ampere.

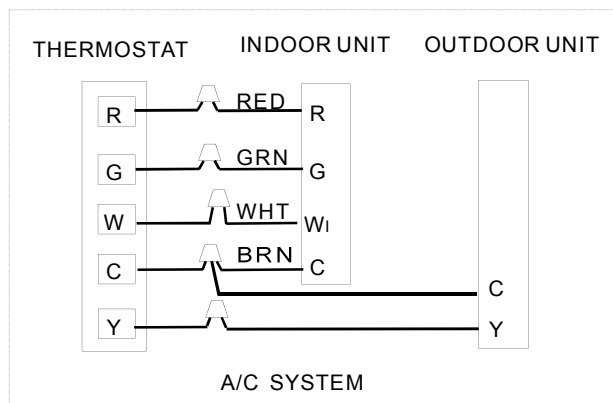
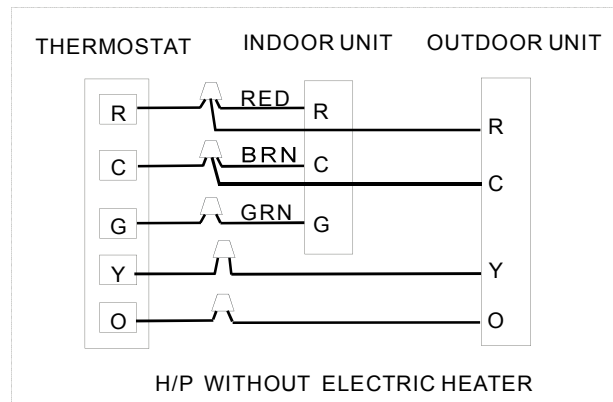
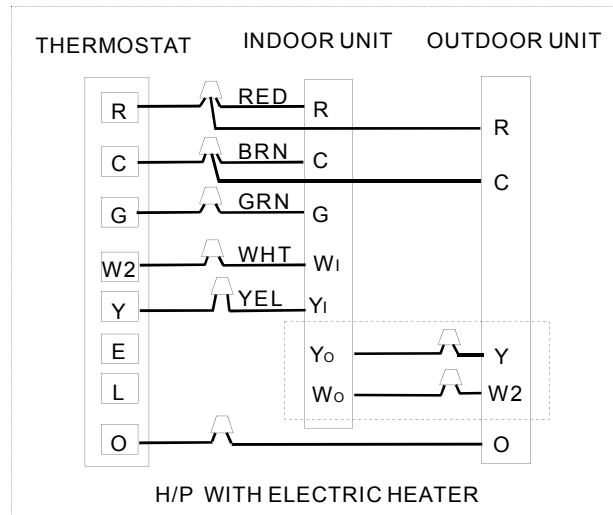
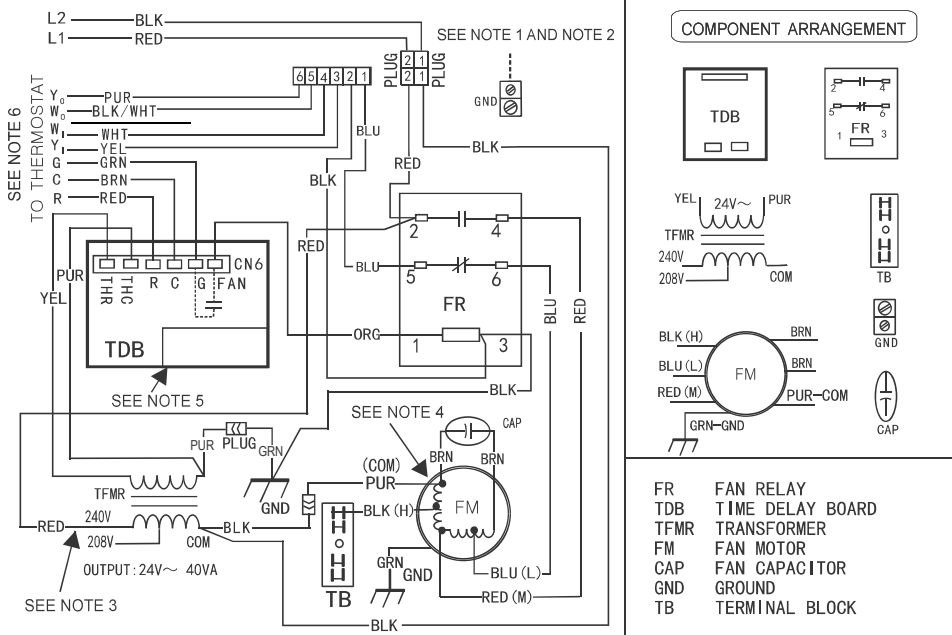


Fig.12

SCHEMATIC DIAGRAM
SEE RATING PLATE FOR VOLTS&HERTZ
FIELD POWER WIRING

CAUTION:
NOT SUITABLE FOR USE ON SYSTEMS EXCEEDING 150V TO GROUND
ATTENTION:
NE CONVIENT PAS AUX INSTALLATIONS DE PLUS DE 150V ALA TERRE

ELECTRIC HEAT WIRING CONNECTION (WHEN APPLIED)



- NOTES:**
- 1: Use copper wire(75°C min) only between disconnect switch and unit, To be wired in accordance with N.E.C. and local codes, Fan coils equipped with electric heater connect power supply to terminal block.Cooling controls wiring not used with electric heaters.
 - 2: If any of the original wire as supplied must be replaced,use the same or equivalent type wire.
 - 3: Remove the red lead from "240V" terminal and then connect the red lead to "208V" terminal on the transformer for 208 volts.
 - 4: Factory default fan speed is Medium,FM red wire connected to FR #4;For HI speed connect FM black wire to FR #4;For LOW speed connect FM blue wire to FR #4,and FM red wire connected to FR #6 . Always connect the unused FM wire to the dummy terminal block.
 - 5: TDB has a 90-100s off delay when "G" is de-energized.
 - 6:Connect R to R, G to G, etc. See outdoor or indoor instructions for details.
 - 7:N.E.C.Class 2,24volts.

Fig.13

16123000A11099