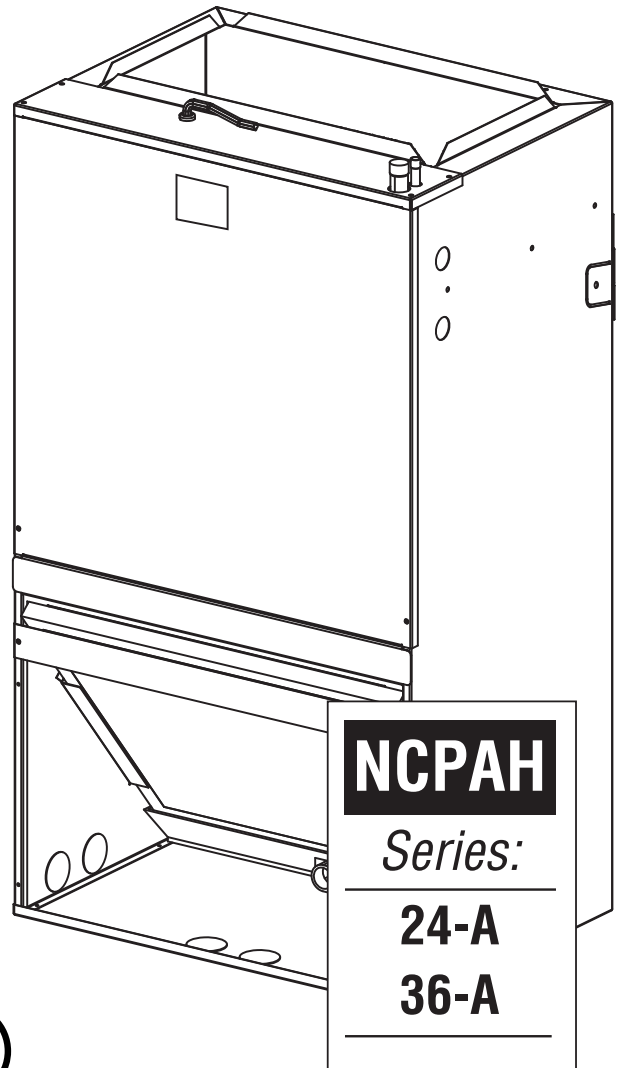


Cooling Comfort for Multi-Family Construction

Installation Guide

Apartment Air Handler

This unit is designed to be installed in a **CLOSET, UTILITY ROOM, ALCOVE** and can be **WALL MOUNTED**.



*Please read the entire installation guide before starting the installation.
All phases of this installation must comply with National, State and Local codes.*

National Comfort Products®

A Division of National Refrigeration & Air Conditioning Products, Inc.

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Important: This Document is customer property and is to remain with this unit.

**DO NOT DESTROY OR THROW AWAY THIS MANUAL.
IT SHOULD BE KEPT IN A SAFE PLACE FOR FUTURE REFERENCE.**

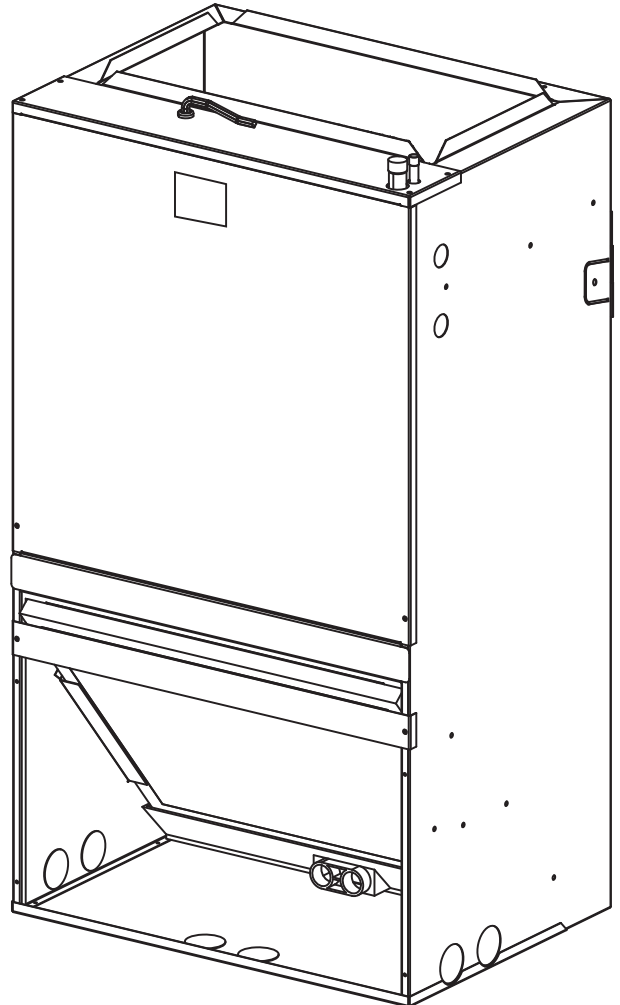
High Efficiency Wall-Mount Air Handlers 2-3 Tons

Section 1. Features

The wall mount air handler is designed for installation in a closet, utility room, alcove and can be wall mounted. These versatile units are applicable to air conditioning and heat pump applications. Field installed electric resistance heaters are available.

1.1 Standard Features

- FRONT OR BOTTOM RETURN AIR.
- STURDY POLYCARBONATE DRAIN PANS
 - The wall mount air handler has factory installed drain pans and is shipped for upflow applications only.
- 208/230 VAC OPERATION
- MULTI-SPEED DIRECT DRIVE BLOWER CONSTANT TORQUE ECM MOTOR WITH FAN-OFF TIME DELAY PROGRAMMING
- FACTORY INSTALLED R-410A THERMAL EXPANSION VALVE
- STUD OR WALL MOUNTING TABS
- FULLY INSULATED CABINET
- 3/4" NPT PRIMARY AND SECONDARY DRAINS



1.2 Optional Accessories

- 5, 7.5 and 10 kW SINGLE PHASE ELECTRIC HEATERS
 - Circuit breakers are standard on all single

Section 2. Safety Information



WARNING

SAFETY HAZARD! This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.



WARNING

HAZARDOUS VOLTAGE!

Disconnect all electrical power, including remote disconnects before installing or servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.



WARNING

LIVE ELECTRICAL COMPONENTS! During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



WARNING

EXPLOSION HAZARD!

Do not store corrosive or combustible materials, gasoline, or other flammable vapors or liquids near the unit. Failure to follow this warning could result in property damage, serious personal injury, or death.



WARNING

ELECTRICAL HAZARD!

Grounding Required! Follow proper local and state electrical code on requirements for grounding. Failure to follow this warning could result in property damage, serious personal injury, or death.



WARNING

HAZARDOUS VAPORS! Do not install an air handler with a non-ducted return in the same closet, alcove, or utility room as a fossil fuel device. Hazardous vapors can be distributed throughout the conditioned space and equipment damage can result.

Important: These instructions do not cover all variations in systems nor provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

Important: Installation of this unit shall be made in accordance with the National Electric Code, NFPA No. 90A and 90B, and any other local codes or utilities requirements.

Note: The small air handlers have been evaluated in accordance with the Code of Federal Regulations, Chapter XX, Part 3280 or the equivalent. "SUITABLE FOR MOBILE HOME USE."



CAUTION

CORROSION HAZARD! To prevent shortening its service life, the air handler should not be used during the finishing phases of construction. The low return air temperatures can lead to the formation of condensate. Condensate in the presence of chlorides and fluorides from paint, varnish, stains, adhesives, cleaning compounds, and cement creates a corrosive condition which may cause rapid deterioration of the cabinet and internal components.



CAUTION

SAFETY HAZARD! Sharp Edge Hazard. Be careful of sharp edges on equipment or any cuts made on sheet metal while installing or servicing. Personal injury may result.



WARNING

THIS PRODUCT CONTAINS FIBERGLASS WOOL INSULATION! FIBERGLASS DUST AND CERAMIC FIBERS ARE BELIEVED BY THE STATE OF CALIFORNIA TO CAUSE CANCER THROUGH INHALATION. GLASSWOOL FIBERS MAY ALSO CAUSE RESPIRATORY, SKIN, OR EYE IRRITATION.

PRECAUTIONARY MEASURES

- Avoid breathing fiberglass dust
- Use a NIOSH approved dust/mist respirator
- Avoid contact with the skin or eyes. Wear long-sleeved, loose fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing, rinse washer thoroughly.
- Operations, such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator in these situations.

FIRST AID MEASURES

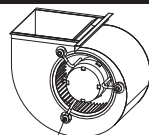
EYE CONTACT: FLUSH EYES WITH WATER TO REMOVE DUST IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SKIN CONTACT: WASH AFFECTED AREA GENTLY WITH SOAP AND WARM WATER AFTER HANDLING.

Note: The manufacturer recommends installing ONLY A.H.R.I. approved, matched indoor and outdoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance, and the best overall system reliability.



WARNING



BLOWER MOTOR SHIPPING BOLT

Make sure the blower motor support is tight (3-motor mount bolts) then check to see if wheel is secured to motor shaft before operating unit.

Section 3. Installation Instructions

3.1 Unpacking

Carefully unpack the unit and inspect the contents for damage. If any damage is found at the time of delivery, proper notification and claims should be made with the carrier.

Check the rating plate to assure model number and voltage, plus any kits match with what you ordered. The manufacturer should be notified within 5 days of any discrepancy or parts shortage.

3.2 Location

The small air handler should be centrally located and may be installed in a closet, alcove, utility room, basement. Minimum clearances must be met.

The air handler comes standard with two different options for mounting, wall mount or frame mount. Both mounting options require the unit to be level from side to side and from front to back in order to allow condensate to properly drain from the unit. Failure to do this will result in condensate to leak out from the unit potentially causing structural damage to the surrounding support structures, dry wall, carpet, etc. around the unit. Also, both mounting structures require the ability to accommodate a minimum of 150 lb load. Failure to do this will cause damage to the support structure and potentially damage the unit.

3.2.1 WALL MOUNT

The air handler comes standard with a wall mounting bracket and air handler mounting bracket. Reference Figure 3-1 for more detail.

1. Remove lower wall mounting bracket from the back of the unit by removing one screw which attaches the bracket to the air handler. Note: Discard the screw after you have removed the wall mounting bracket.

2. Install bracket on the wall by using 3 wood screws (not provided). Make sure the bracket is level in order to provide proper drainage from the unit. Note: Do not attach the wall mounting bracket into unsupported dry wall. Make sure that the wood screws are going into a structure that can support a minimum of 150 lb load.

3. Lift the air handler above the wall mounting bracket and attached the unit to the installed bracket. Reference Figure 3-1.

4. Install the additional bottom plate for extra support for this type mounting (see figure 3-1).

Note: The additional plate is shipped in the bottom of the shipping carton.

3.2.2 FRAME MOUNT

The air handler comes with 8 clearance holes 4 on each side. These holes are used to mount the air handler inside of a frame structure (see Figure 3-2). When mounting in this fashion, make sure that the wood screws are mounted from within the air handler and not outside of the unit. Installing the screws from the outside of the unit, and notice don't damage to the coil.

For ensure the proper installation for frame mount, Select the enough solid and level site. Ensure enough space required for installation and maintenance(See Figure. 3-3)

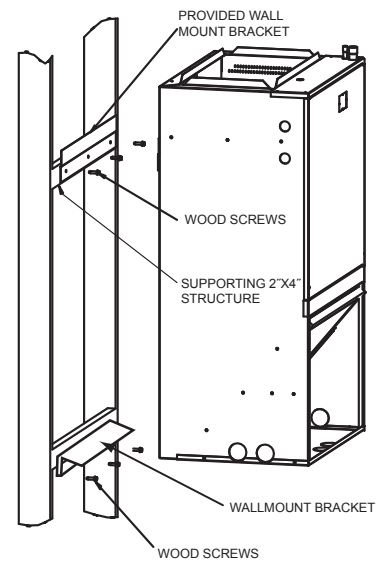
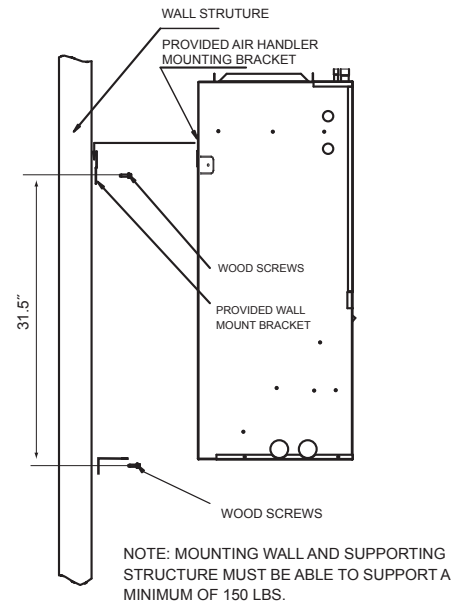


Fig. 3-1 WALL MOUNT

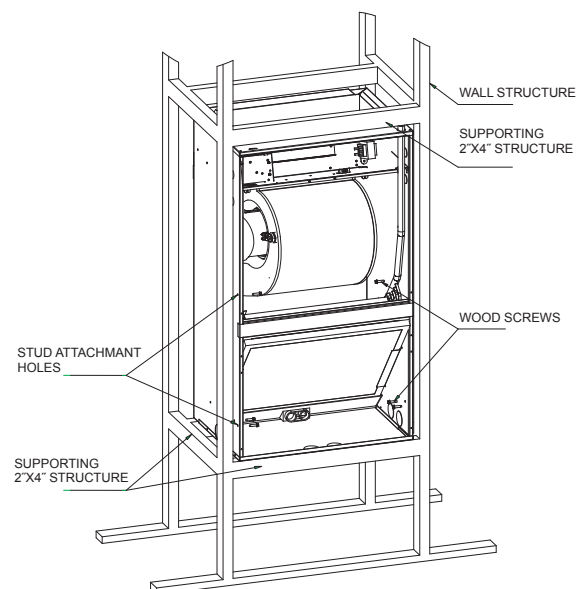
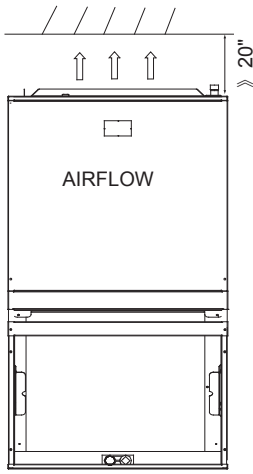


Fig. 3-2 FRAME MOUNT



Top view of the indoor unit clearance(including air duct).

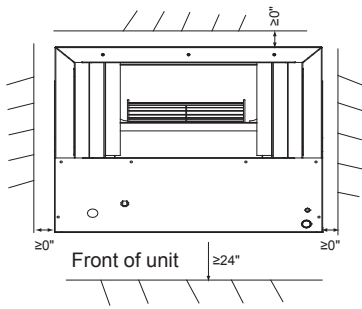


Fig.3-3 Space for frame mount

3.2.3 CONFIGURATIONS

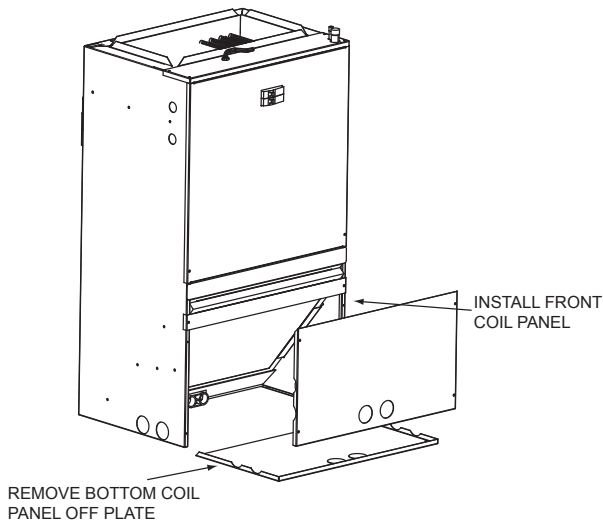


Fig. 3-4 DIFFERENT AIR SUPPLY

Bottom Return Conversion: Divert the return air from the factory standard front return to a bottom return. Remove the cross brace when converting cabinet to bottom return.

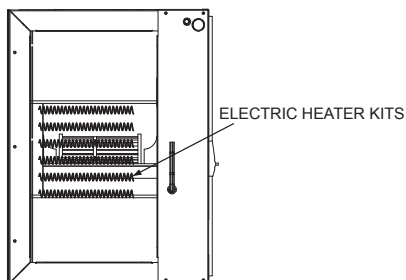


Fig. 3-5 HEATER ELEMENTS INSTALLATION

3.3 Duct Work

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 "O" 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.

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.

3.4 Condensate Drain

The unit is supplied with primary and auxiliary condensate drains that have 3/4" NPT connections. Both drains must be trapped outside the unit and piped in accordance with applicable building codes. Do not reduce the drain line size less than the connection size on the drain pan. Condensate should be piped to an open drain or to the outside. All drains must pitch downward away from the unit a minimum of 1/4" per foot of line to ensure proper drainage. Insulate the primary drain line to prevent sweating where dew point temperatures may be met. (Insulation is optional depending on climate and application needs.)

Important: If cleanout Tee is used, standpipe must be sealed/capped.

3.5 Refrigerant Piping

Refrigerant pipe connections are located on the top of the unit. Refrigerant piping external to the unit shall be sized in accordance with the instructions of the outdoor equipment. When units are recessed mounted in the wall, make certain that piping connections are pressure tested prior to the wall being closed. While brazing, be sure to protect the cabinet and grommets from heat damage.

3.6 Metering Device

All units are shipped and installed with an internally-checked, non-bleed TXV designed for air conditioning or heat pump operation. Pressures equalize after shut down. Some outdoor models may require a start assist kit. See outdoor unit for more information.

3.7 Blower

This unit is supplied with a multi-speed motor with a direct drive blower wheel which can obtain various air flows. The unit is shipped with factory set cooling and heating speed taps. Airflow performance tables are available for additional speed taps. Disconnect all power to the unit before making any adjustments to the motor speed taps. Be sure to check the air flow and the temperature drop across the evaporator coil to ensure sufficient air flow.

3.8 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.

3.8.1 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 are equipped with one 60 amp. circuit breaker. 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 or left side. Two 7/8" 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.

3.8.2 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 pigtailed extending from top of air handler (see Figure 1). Connections for control wiring are made with wire nuts. Control wiring knockouts (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.

3.8.3 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 or by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Ground lug(s) are located close to wire entrance on left side of unit (up-flow). Lug(s) may be moved to marked locations near wire entrance on right side of unit (upflow). If alternate location is more convenient.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

3.8.4 MOTOR SPEED

ECM Motor Speed Taps(Model number 24, 36)

Tap	Delay-off Time (s)	24	36
Tap 1	30	—	—
Tap 2	90	—	—
Tap 3	30	—	—
Tap 4	90	Default	Default
Tap 5	30	—	—

3.9 Air Filter

To protect the coil, blower and other internal parts from excessive dirt and dust an air filter must be installed before air enters the evaporator coil. A filter must be installed. Consult the filter manufacturer for proper sizing and maximum velocity requirements.

Filter Sizes

Model	Filter Size In. (mm)
24	16x20x1 (406x508x25)
36	20x20x1 (508x508x25)

3.10 Thermostat

Select a thermostat that is commonly used with HP or AC single stage heating/cooling with electric heat. The thermostat will energize the fan on a demand for heat or cool.

Install the thermostat on an inside wall, away from drafts, lights or other heat sources in a location that has sufficient air circulation from other rooms being controlled by the thermostat. The thermostat should be mounted 4 to 5 feet above the floor.

3.11 Sequence of Operation

Cooling (cooling only)

Constant torque version – When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is energized directly by the 24VAC signal from the thermostat.

The circuit from R to Y is also complete energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

Cooling (heat pump)

Constant torque version – When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is energized directly by the 24VAC signal from the thermostat.

The circuit from R to Y is also complete energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

Circuit R to O energizes the reversing valve to the cooling position.

Heating (heat pump)

Constant torque version – When the thermostat calls for heating, the circuit from R to G is completed and the blower motor is energized directly by the 24VAC signal from the thermostat.

The circuit from R to Y is also complete energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

In the heating mode, the reversing valve of the outdoor unit is not energized.

If the indoor temperature continues to fall, the R to W circuit is completed energizing the electric heat contactor(s).

Heating (electric heat only)

Note: The thermostat must be setup to bring the blower on when the electric heat is energized.

Constant torque version - When the thermostat calls for heating, the circuit from R to G is completed and the blower motor is energized directly by the 24VAC signal from the thermostat. The circuit from R to W is completed energizing the heating contactor(s).

Defrost

Supplemental heat during defrost can be provided by connecting the X2 (black) wire from the outdoor unit to W1 at the indoor unit. This will prevent cold air from being discharged from the indoor unit during defrost.

Low voltage control wiring should be 18 Awg, color coded (105 degree C minimum). For lengths longer than 100ft., 16 Awg wire should be used. Make certain that separation of control wiring and power wiring has been maintained.

3.12 Operational And Checkout Procedures

To obtain proper performance, all units must be operated and charge adjustments made in accordance with procedures found in the Service Facts document of the outdoor unit.

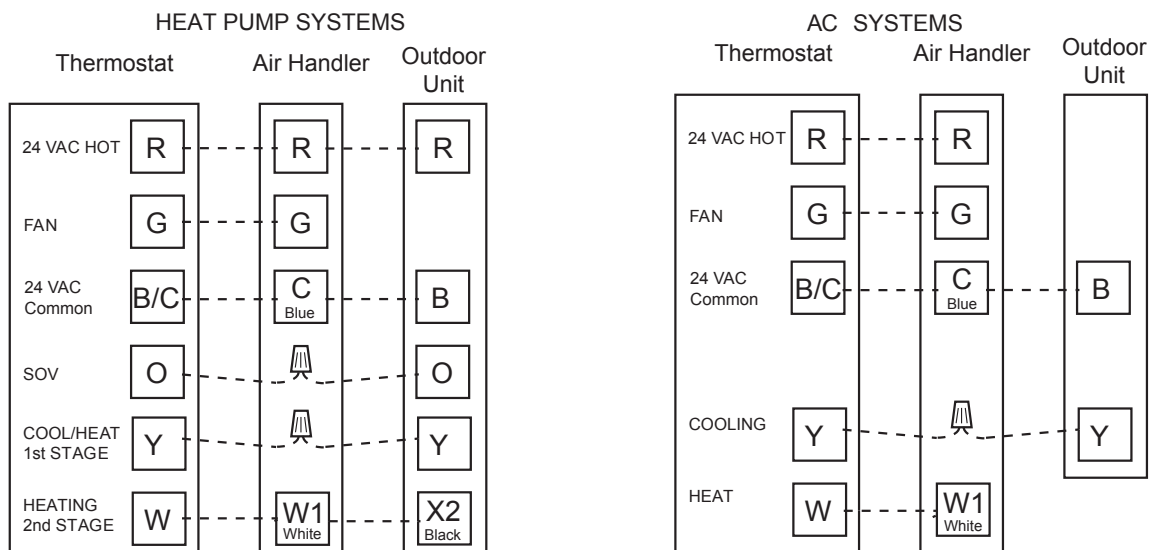
After installation has been completed, it is recommended that the entire system be checked against the following list:

- [] 1. Be sure unit suspension (if used) is secure and there are no tools or loose debris in, around or on top of the unit.
- [] 2. Properly insulate suction lines and fittings.
- [] 3. Properly secure and isolate all refrigerant lines.
- [] 4. Verify that all electrical connections are tight.
- [] 5. Check all duct outlets; they must be open and unrestricted.
- [] 6. Check drain lines and be sure all joints are tight.
- [] 7. Be sure the return air filter is installed.
- [] 8. Operate complete system in each mode to verify proper performance. Verify operation of supplementary electric heater.

3.13 Maintenance

The system air filter(s) should be inspected, cleaned or replaced at least monthly. Make certain that the access panels are replaced and secured properly before placing the unit back in operation. This product is designed for dependable service; however, periodic maintenance should be scheduled and conducted by trained professional service personnel. This service should be conducted at least annually, and should include testing and inspection of electrical and refrigerant components. The heat transfer surface should be cleaned. The blower motor is permanently lubricated for normal operating conditions.

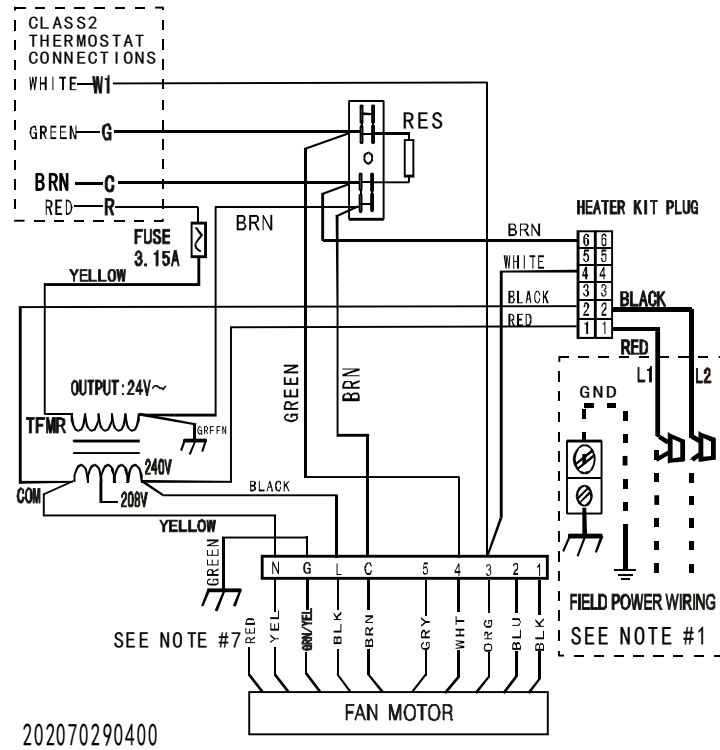
Section 4. Wiring



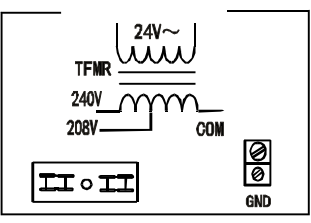
SCHEMATIC DIAGRAM

**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



COMPONENT ARRANGEMENT



SPEED TAP SELECTION

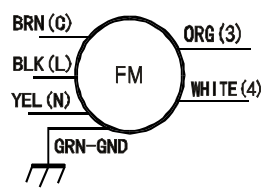
- 1 LOW
- 2 MEDIUM LOW
- 3 MEDIUM
- 4 MEDIUM HIGH
- 5 HIGH

SEE NOTE #5, #6 & #8.

202070290400

NOTES:

- 1: Use Copper Wire (75°C Min) Only Between Disconnect Switch And Unit .
- 2: To Be Wired In Accordance With NEC And Local Codes.
- 3: If Any Of The Original Wire ,As Supplied, Must Be Replaced. Use The Same Or Equivalent Type Wire.
- 4: Connect R To R, G To G, Etc. See Outdoor Instruction For Details.
- 5: To Change Speed Tap, Move Green Wire Desired Terminal.
- 6: See Airflow Tables For Tap Usage.
- 7: Factory Wires May Be Present, DO NOT USE.
- 8: Taps 2 & 4 Have a 90s Delay Off, Taps 1, 3 & 5 are 30s.



- TFMR TRANSFORMER
- FM FAN MOTOR
- GND GROUND
- RES RESISTOR
- - - FIELD POWER WIRING

Section 5. Performance

Airflow performance data is based on cooling performance with a coil and no filter in place. Select performance table for appropriate unit size external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

Airflow Performance(Standard CFM)

MODEL SIZE	BLOWER SPEEDS	EXTERNAL STATIC PRESSURE (IN WC.)								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
24	Tap (5)	884	854	833	803	771	737	700	668	632
	Tap (4) - Factory	796	767	737	709	675	645	612	579	538
	Tap (3)	714	681	654	616	588	555	527	494	459
	Tap (2)	653	619	584	558	525	494	463	434	396
	Tap (1)	581	545	511	472	440	407	374	344	329
36	Tap (5)	1309	1272	1236	1200	1164	1125	1088	1051	1010
	Tap (4) - Factory	1122	1088	1056	1022	986	950	915	877	836
	Tap (3)	1109	1073	1038	1003	973	937	901	867	828
	Tap (2)	1010	975	941	904	869	835	793	751	704
	Tap (1)	936	899	862	833	793	755	710	664	619

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

NOTES:

1. Airflow based upon dry coil at 230V with no electric heat. no filter. For 24, 30 and 36 sizes, airflow at 208V is approximately the same as 230V because the multi-tap ECM motor is a constant torque motor. The torque doesn't drop off at the speeds in which the motor operates.
2. Airflow is equivalent for front or bottom return configurations.
3. SCFM is nearly the same with cooling performance airflow, the gap is in the 1 to 2%.

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 350 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 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. 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.

Section 6 Dimensional Data

6.1 UNIT DIMENSIONS

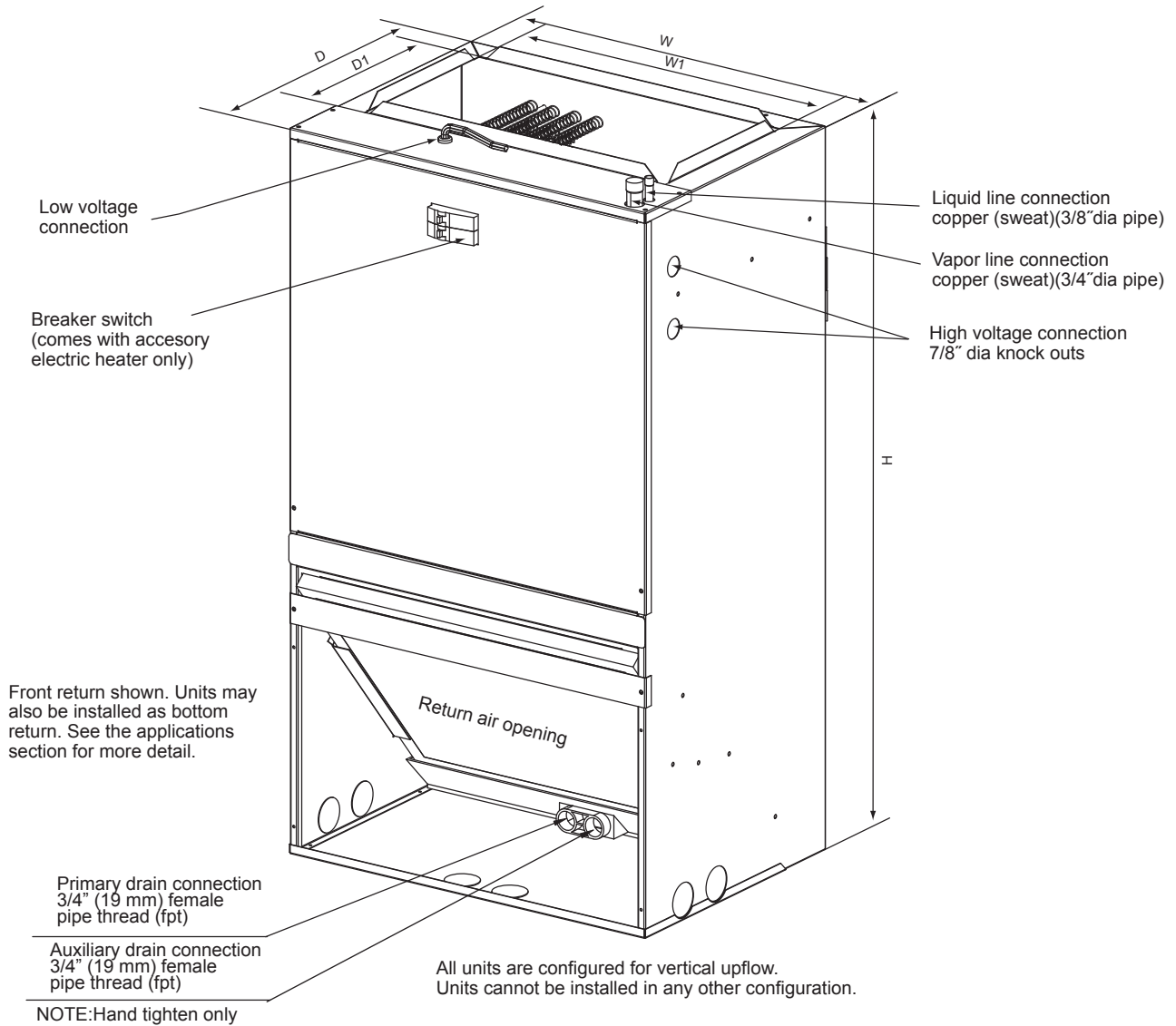


Fig. 7-1 DIMENSIONS

DIMENSIONAL DATA

Model	Dimensions inch [mm]							UNIT WEIGHT /SHIPPING WEIGHT (LBS.[kg])
	H	W	W1	D	D1	Flow Control	Gas Line Braze	
24	36-1/2(928)	20-1/2(521)	17-4/5(452)	15(381)	9-1/2(242)	TXV	3/4"	88/99(40/45)
36	39-1/2"[1004]	22"[559]	18-3/4"[477]	19"[483]	9-1/2"[242]	TXV	3/4"	110/121(50/55)



HEATING & A/C EQUIPMENT

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