BHH

INSTALLATION INSTRUCTIONS

OPERATION AND MAINTENANCE

FOREWORD

The following information is to be used by the installer as a guide. Since each installation is unique unto itself, only general topics are covered. The order in which topics may be presented may not be those required by the actual installation.

This guide does NOT supersede or circumvent any applicable national, state or local code.

The installation is to be performed only by individuals whose experience meets or exceeds the requirements of the work involved.

The installer MUST read the entire contents of this guide and develop a thorough understanding before beginning.

Due to a continuing program of product research, ICP reserves the right to discontinue or change without notice, any or all specifications or designs without incurring obligations.

INSPECTION

Thoroughly inspect all packages upon receipt. Ensure carton(s) have not been dropped, crushed or punctured. Inspect all contents for damage. If damage is found, immediately file a claim with the delivering carrier.

SAFETY

The installation and/or servicing of comfort conditioning equipment can be hazardous due to system pressures and electrical devices.

ONLY TRAINED/QUALIFIED PERSONNEL SHOULD PERFORM SERVICE AND/OR INSTALLATION

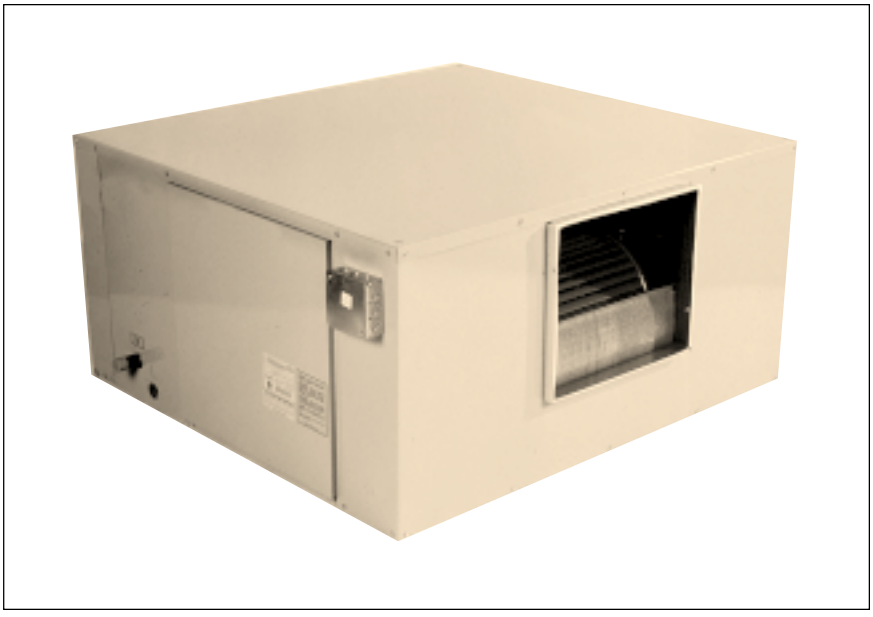
OBSERVE ALL PRECAUTIONS AND WARNINGS IN PRODUCT DATA OR ATTACHED TO UNIT.

Follow all safety codes. Wear eye protection and gloves. Have a fire extinguisher readily available.

DISCONNECT ALL POWER SUPPLIES BEFORE ACCESSING EQUIPMENT.

DISCONNECTING MORE THAN ONE POWER SUPPLY MAY BE REQUIRED TO DE-ENERGIZE SOME EQUIPMENT.

ELECTRIC SHOCK CAN CAUSE DEATH



INSTALLATION

OPTIONAL EQUIPMENT

1. Discharge grille/plenum
2. Return air grille
3. Two row hot water heating coil (reheat or preheat location)
4. Mixing boxes
5. Heat pump kit

STEP 1 – DUCTWORK

Use accepted industry practices and design guidelines of the ASHRAE FUNDAMENTALS HANDBOOK. Ductwork must comply with all building codes and the NATIONAL FIRE PROTECTION ASSOCIATION's pamphlet 90A and 90B.

Carefully inspect any previously installed ductwork to determine suitability.

NOTE: Ductwork should be of a size meeting requirements of the installation. Ductwork should transition gradually from a smaller size blower outlet to required duct run size to avoid excessive loss of air velocity.

STEP 2 – CHECK DUCT INSULATION AND VAPOR PROOFING

Previously installed heating supply ductwork my already have adequate insulation against excessive heat loss. This insulation may be satisfactory for protection against heat gain from summer cooling. Depending upon application, it may be required to add more insulation.

Externally insulated ductwork must have adequate vapor seal for summer operation, particularly where duct is exposed to high humidity conditions such as in attic, vented crawl space, unconditioned basement or utility room.

STEP 3 – DUCTWORK

1. When return air duct connection is smaller than coil inlet opening, construct the transition piece so that vertical and horizontal dimensions of transition do not increase more than one inch for every 7 inches of length.
2. Allow a minimum of 3 feet of straight ductwork preceding equipment inlet.
3. Install unit with 1/8 inch pitch toward condensate drain opening.

NOTE: Unit has a drain opening on each side. Ensure unused drain opening is sealed.

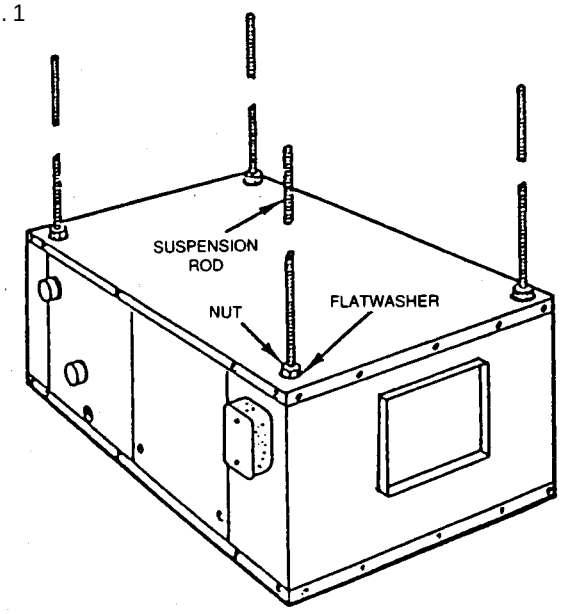
4. Suspend unit or support it from floor. The 3-5 ton models have 3/8-16 weld nuts provided in each corner of the top for suspending the unit with threaded rod (Fig. 1).

WARNING:

BEFORE INSTALLING UNIT, DETERMINE WHETHER UNIT WEIGHT CAN BE SAFELY SUPPORTED.
POSSIBLE INJURY AND DAMAGE MAY RESULT DUE TO JOIST/TRUSS OVERLOADING

5. Be careful that suspension rods are located so they do not block access panels, nor interfere with electrical, mechanical or drain functions of unit.

Fig. 1



STEP 4 – SOUND ATTENUATION

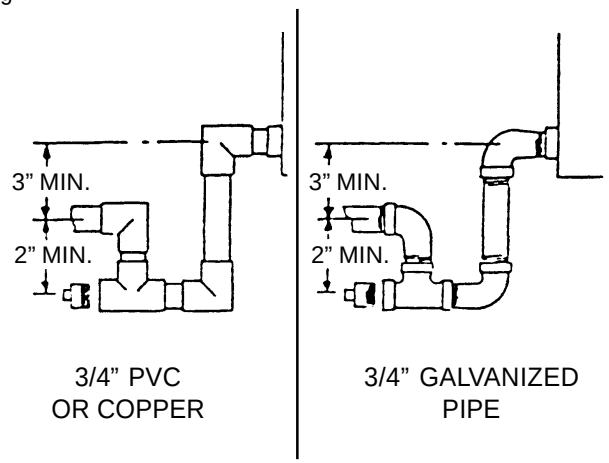
Flexible duct connections should be used between the unit and both the supply and return ducts.

Unit vibration isolation will be required for both suspended and base mounted units.

STEP 5 – INSTALLATION OF CONDENSATE DRAIN

Condensate drain must consist of a minimum of 3/4 in. copper tubing or 3/4 in. galvanized iron pipe or PVC-type plastic pipe (Fig. 2). The condensate drain trap must be properly designed to ensure the removal of condensate (incorrect trapping can hold water in pan causing overflow). Be sure drain pitches downward at a slope of one inch every 10 feet.

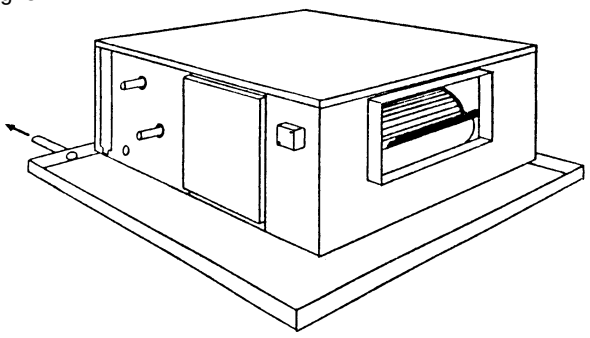
Fig. 2



CAUTION:

If unit is located above an occupied space, or where damage can result from condensate overflow, install a watertight pan of corrosion-resistant metal beneath unit to catch any overflow due to restricted drain lines. A separate 3/4 in. condensate drain must be provided from this added pan (Fig. 3).

Fig. 3



NOTE: Consult local codes for additional procedures before installing condensate drain.

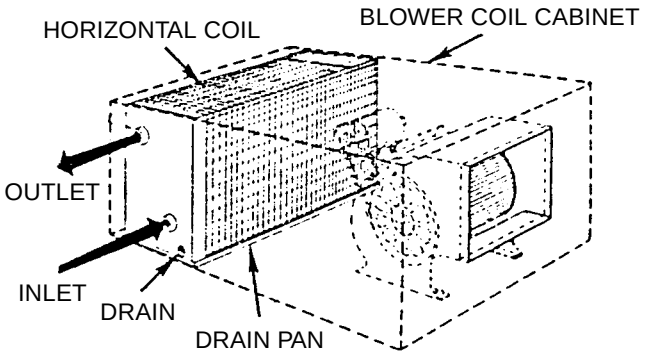
STEP 6 – DIRECT EXPANSION REFRIGERANT PIPING

Always use the condensing unit manufacturer's recommended line sizes. The suction line must be insulated for satisfactory operation. Observe all condensing unit manufacturer's recommendation or requirements. Use refrigerant grade copper only. If unit is to be used when installed as the indoor coil of a heatpump, a bypass check valve must be used. (See Page 6.)

NOTE: It is recommended that a freeze-stat (by other) be installed when a hot water coil is used and is mounted in the reheat position.

STEP 7 – WATER PIPING

All piping must be supported independent of coils. Swing joints or flexible fittings must be provided to absorb expansion and contraction strains. Rigid piping reduces the effectiveness of vibration isolators. The water supply should always be connected so that the entering water is on the leaving air side of the coil (Fig. 4). Coils must be adequately vented in order to prevent air binding. Freeze-ups due to low entering air temperatures are not covered under the ICP Warranty.



BLOWER COIL CONNECTIONS
(STANDARD RIGHT HAND UNIT)

Fig. 4

STEP 8 – MOTORS AND DRIVES

Extreme care should be taken to ensure proper alignment and belt tension.

STEP 9 – ELECTRICAL CONNECTIONS

A control box is mounted on each unit and the motor is to be wired to this box.

NOTE: Unit must be permanently grounded in accordance with NEC and local codes and ordinances. See typical wiring diagram (Fig. 5).

DISCONNECT POWER SUPPLY BEFORE SERVICING EQUIPMENT

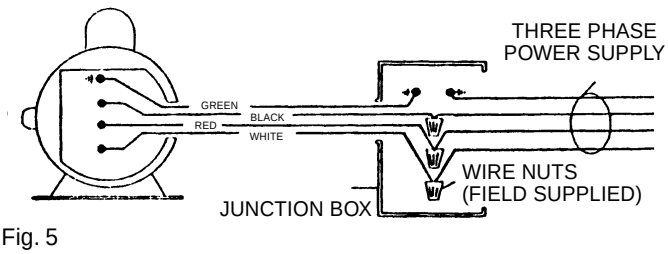


Fig. 5

START-UP

Ensure all shipping bolts/screws are removed and all other bolts and screws are tight. Check the sheaves to see if they are in alignment and ensure the set screws are tight. Check for proper rotation of the blower pulley. Three phase motor rotation can be reversed by exchanging two of the three leads at the motor. Ensure all filters are installed. Do this with all doors, panels, etc. in place. Check the amperage draw of the motor. This should not exceed the nameplate amps shown on the motor serial plate. Never assume the voltage and phase on the unit name plate is the same as the motor is wired.

OPERATION & MAINTENANCE

WARNING:

Disconnect electrical power to all circuits before servicing unit. Failure to do so may result in personal injury from electrical shock or moving parts.

RETURN AIR FILTERS
Filter access is from either side of unit. Inspect on a regular basis (at least monthly) and clean or replace.

CAUTION:

Never operate unit without a filter or with filter access door removed. Damage to blower motor may result.

STEP 8 – WATER PIPING – ALL DRAIN
Coil is easily cleaned when dry. To check or clean, remove the unit access panel, filter access door and filters. Use accepted industry methods for cleaning. Remove all foreign matter from pan and condensate drain line. Check for rust and holes.

BELT AND PULLEY
Proper pulley alignment and belt tension must be maintained at all times. Speed is reduced by adjusting pulley faces so they are farther apart. Speed is increased with faces closer together. Check pulley setscrews and bolts.

MOTOR
Use electric motor oil or SAE20 nondetergent oil. Tighten motor mount bracket and base bolts as required. DO NOT OVER-OIL!

BLOWER
Check bearing for wear. Replace as required. Check wheel for accumulation of dirt and clean as required.

HOT WATER COIL INSTALLATION INSTRUCTIONS
(in reheat position)

1. Remove access panel from both sides of cabinet. (See Figure 6.)

2. Remove knockouts from hot water coil stubouts. Coils stub out the cabinet for left-hand connections (facing airflow).

3. Remove two galvanized strips from hot water coil pack age. Install angle strip with notches resting in drain pan, and 1/2 in. flange pointing toward blower. Secure this angle strip to end plate of cooling coil by clips supplied in package (Fig. 7). Place clips at each end of strip as close as possible to flange.

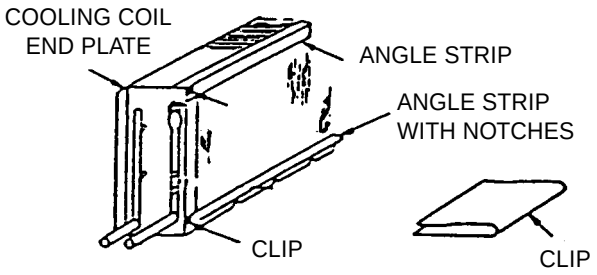


Fig.6 INSTALLING ANGLE STRIPS

4. Install other angle strip at top of cooling coil, with 1/2" flange resting on top of cooling coil, pointing to rear. Place clip as high as possible on this strip. Secure it to end plate of cooling coil. Metal strips prevent air from bypassing heating coil and serve as support for coil.

5. After strips are secured, install coil inside through access door opposite side where connections stub out. Raise coil slightly above drain pan and line up stubouts with knockout holes in cabinet. When stubouts are extended through holes, hot water coil should rest on flange of bottom angle strip with hot water coil and cooling coil end plates lined up evenly.

6. Secure hot water coil to cooling coil by fastening 2 clips over cooling coil and hot water coil end plates (Fig. 7).

NOTE: When used in reheat position with DX coil, install a freeze-stat in system to prevent freeze-up.

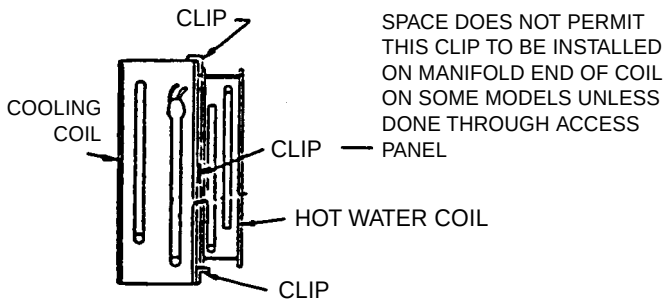


Fig.7 SECURING HOT WATER COIL

HOT WATER COIL INSTALLATION INSTRUCTIONS
(in preheat position)

Follow same procedures as before except cooling coil must be removed from cabinet.

GRILLE PLENUM INSTALLATION

1. Mount grille plenum to front of cabinet using pre-punched holes in plenum.

NOTE: Some holes are 1/4 in. diameter and others are 1/2 in. diameter. Locations match screws in front of cabinet.

2. Remove screws from front of cabinet that line up with 1/4 in. holes in plenum. *Do not remove remaining screws.* The 1/2 in. holes in grille plenum clear the 1/2 in. screw heads in unit.

3. Line up grille plenum on front of unit (Fig. 8).

4. Replace the screws removed previously, by reaching through the grille opening. Tighten screws to secure the plenum.

5. Place grille in opening of plenum. Secure grille using screws provided.

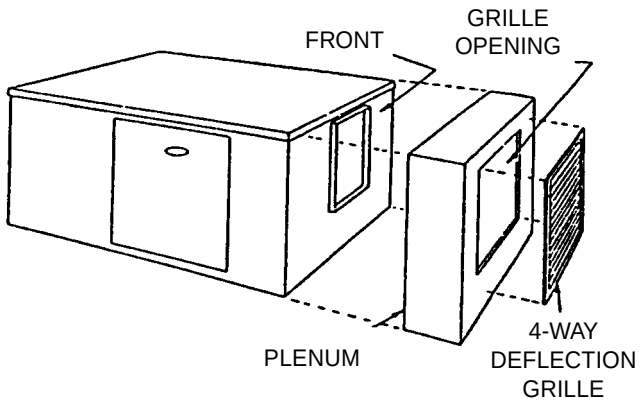


Fig. 8 GRILLE PLENUM INSTALLATION

6. Appropriate grille louvers may be adjusted manually, up-down, right-left, to provide 4-way air deflection.

MIXING BOX INSTALLATION

BEFORE INSTALLATION:
NOTE: See dimensions Table 1 and Fig. 9. Inspect desired installation location. Determine if space provides sufficient work and safety clearances. If determined that ample space is available in work area, make all sheet metal connections and attachments prior to moving completed assembly to duct connections.

1. One side of mixing box has 2 plastic plugs. These may be removed and moved to opposite end to plug unused 7/8 in. holes in end of cabinet where 5/16 in. rods do not extend out of cabinet.

2. Choose side of cabinet most accessible for servicing to mount damper motor. Remove bolt for each damper shaft on that end and extend shaft until second bolt hole in shaft lines up with hole in damper blade. Replace bolt. Connect 2 shafts with the 2 crankarms, and the 5/16 linkage rod furnished with mixing box.

3. Mount damper motor on the selected side of mixing box cabinet by drilling necessary holes and securing with either screws or bolts and nuts.

INSTALLATION:
1. Attach mixing box to unit return-air duct flange. Vertical duct flange connections at rear of unit are prepunched to match prepunched holes in mixing boxes. Mixing boxes may be mounted for top-rear or bottom-rear connections.

2. After vertical flange has been bolted, drill holes in horizon tal duct flanges. Secure with screws or bolts and nuts.

3. Use field-supplied hardware to connect motor shaft to one of the damper shafts.

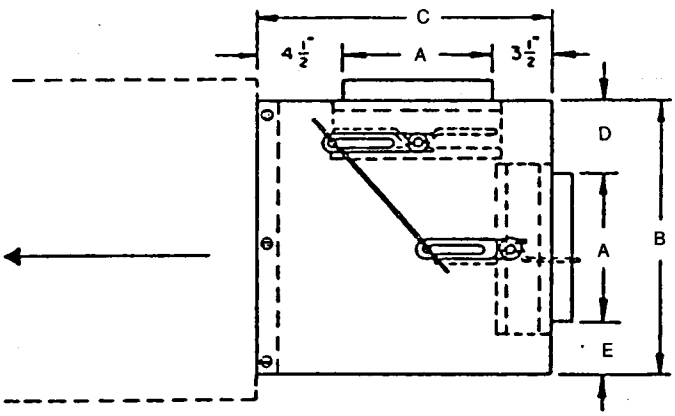
4. Connect duct to the 1" duct flange provided on mixing box for return and fresh air makeups as needed.

NOTE: Steps 1, 2, 3 above may follow Steps 1, 2 under "BEFORE INSTALLATION" if preferred.

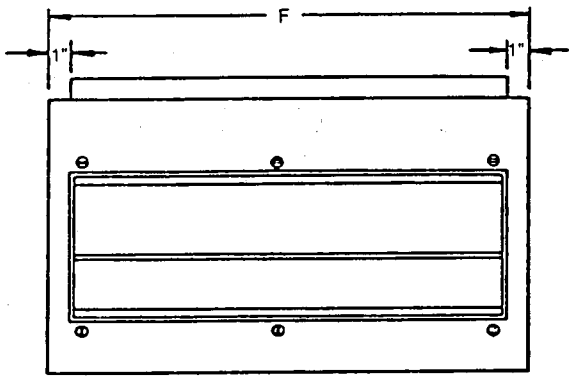
(SEE "MIXING BOX DIMENSIONS" ON NEXT PAGE)

MIXING BOX DIMENSIONS

Fig.9



SIDE VIEW



REAR VIEW

MODEL	A	B	C	D	E	F	DAMPER	SHIPPING WT	CFM	S.P.
AMB36MBA	8	16	16	6	2	27.5	2-26 X 8	49	1200	.08"
AMB48MBA	8	20	16	8	4	29	2-26 X 8	53	1600	.10"
AMB60MBA	8	20	16	8	4	36	2-34 X 8	63	2000	.07"

DIMENSIONS TABLE 1

OPTIONAL HEAT PUMP BYPASS ASSEMBLY

Fig.10

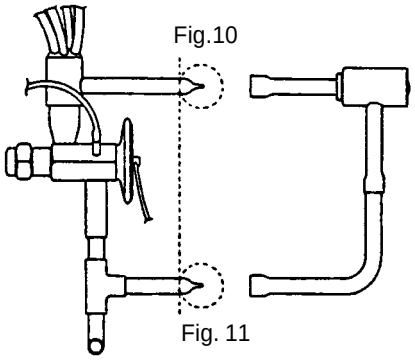


Fig. 11

EXPANSION VALVE DISTRIBUTOR ASSEMBLY AS IT APPEARS ON THE UNITS.

CHECK VALVE BYPASS ASSEMBLY

INSTALLATION PROCEDURE

1. Cut off the ends of the stub-out tubes near the location of the dotted line (See Fig.10 and 11).
2. Slip the swedged ends of the bypass kit over the open tube ends where the ends were cut off.
3. Make sure the bypass assembly is in the same position as shown above.
4. Braze the two joints and then check to be sure there are no leaks in the welded joints.