



INSTALLATION INSTRUCTIONS **AIR COOLED HEAT PUMP CONVERTIBLE 2 - 15 TONS**



INTRODUCTION

Units are design to meet many different air conditioning installation requirements. Their design permits floor mounting or suspension from ceilings. The unit may be turned on its side to permit passage through narrow entrances. In addition, the unit is convertible so that the outdoor air section may be installed remotely from the indoor air section. If the indoor section and the outdoor section are separated, they are reconnected by using available stub kits (STB45) and properly sized lengths of processed liquid and suction/discharge lines. Refrigerant (R-22) is then added to compensate for the additional tubing volume.

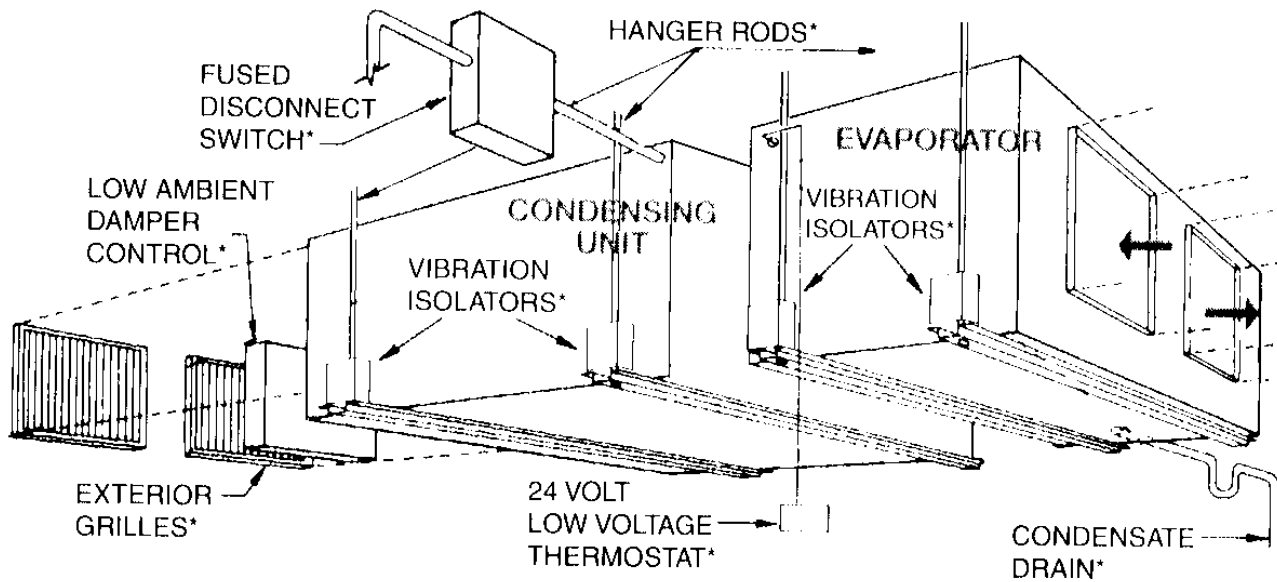
INSPECTION OF EQUIPMENT

Upon receipt of the unit, inspect for visible or concealed damage. Report any damage to the carrier, and file a damage claim.

SELECTION OF INSTALLATION SITE

Before unit is installed, a thorough study should be made of the structure. Careful consideration must be given to location of wiring, condensate disposal, ductwork, and adequate accessibility to the unit for maintenance and servicing. It is recommended that a minimum of 24" clearance space be allowed on each side of the unit to accommodate maintenance and servicing. Attention must also be given to the floor or wall load limitations.

UNIT MOUNTING



**Field installed and supplied by others*

As shown in FIG. 1, units are shipped as an integral package with a cross-member angle attached to both sides of the unit at each of the four mounting channels.

DIMENSIONS:

Model No.	A	B	C	D	E
024 & 036	59	43 1/8	22	34 1/2	24 1/2
048 & 060	68 1/2	51 1/4	29	40 1/4	28 1/4
072 & 096	68 1/2	51 1/4	29	40 1/4	28 1/4
120, 144 & 180	89 1/2	70	29	55	34 1/2

FIG. 1 can be used for dimensioning of mounting system if the indoor air section is separated from the outdoor air section. If unit is to be hung, use field-supplied 3/8" diameter minimum hanging rods, with proper washers and locknuts.

SEPARATION OF SECTIONS

If the unit is to be connected as a split system, the following steps must be carefully followed in performing the separation.

1. Remove indoor air section panel (see Fig. 2).
2. Using open-end wrench, disconnect the suction/discharge line and liquid line female portions of the valves.
3. Remove the unit top tie-piece, removing only those screws, which attach the top, piece to the two covers. (See Item 3, Fig.2).
4. Remove and discard the wires which run between the two internal control boxes. (See Fig. 3)
5. Remove the two side cross-member angles. (See Item 5, Fig. 2)
6. Carefully pull the indoor air section away from the outdoor air section. Double check that the quick-connector valves are completely disengaged.
7. Apply the protective caps supplied in the STB45 kit to male halves projecting from the outdoor air section.
8. The sections may now be moved into their individual locations.

INTERCONNECTING TUBING

After the separated sections have been installed, the interconnection tubing can be run using the quick-connects supplied in the STB45 kit. It is recommended that some refrigerant oil be placed on the valve threads to facilitate threading. The following instructions apply:

1. Remove the protective caps from the outdoor air section quick-connects. Hand thread the female halves of the quick-connects in the STB45 kit onto the male half of the quick-connect on the outdoor air section approximately 1 to 1 1/2 turns. This is to make sure that the interconnection tubing will be routed and brazed with the quick-connect couplings in their final proper location, so that there will be no difficulty when the final coupling assembly is made.
2. Attach the male quick-connects in the STB45 kit to the back panel of the indoor air section at the location vacated by the original quick-connect, using the flanges and screws provided in the kits. Note: The panel has holes to accept the screw to be utilized.
3. Run the interconnection tubing as required. CAUTION: When brazing tubing to the quick-connect stubs, be sure to use a wet rag on the quick-connect to prevent overheating the valve in each end of both the liquid and suction/discharge lines.
4. Unthread the female half of the coupling from the outdoor air section. Use the male plugs supplied with the STB45 kit; seal the end of the female halves. On the indoor air section of the interconnecting tubing, apply the caps supplied in the kit to the male half-coupling.
5. Using the Shrader valve fitting installed in the interconnection lines, evacuate each line completely. Check to make sure that each line holds a vacuum after removal of the vacuum pump (indicating no leaks). Then add a holding charge of Refrigerant-22. Remove plugs from the female half-coupling at the outdoor air section end of the interconnecting tubing, and the caps from the male coupling at the indoor air section. Hand thread each half coupling to its mate until resistance is felt (approximately 1 1/2 to 1 3/4 turns). Complete the connection of the mating with a wrench. The suction/discharge line valve will be totally engaged after an additional 5 1/2 to 5 3/4 turns. The liquid line valves will be totally engaged after an additional 4 1/2 to 4 3/4 turns.
6. Insulate the interconnecting suction/discharge lines completely with 1/2" thick neoprene tubing insulation.
7. Add R-22 charge to the system to compensate for the additional interconnecting tubing, as follows:

For 3/8" liquid line	Add 0.6 ounces per foot
For 1/2" liquid line	Add 1.2 ounces per foot
For 5/8" liquid line	Add 1.8 ounces per foot

NOTE: Installations may be made with up to 100 feet equivalent lengths by installing the recommended tube sizes and adding the necessary refrigerant, R-22. A maximum length of 150 feet of interconnection tubing is permitted if the following additional steps are taken

Install a suction line accumulator close to the condensing units. (**Note: 6 ton system is multiple 3 ton circuits, 8 & 12 ton systems are multiple 4 ton circuits, 10 & 15 ton systems are multiple 5 ton circuits**)

	<u>2 & 3 Ton</u>	<u>4 & 5 Ton</u>
Refrig. Research	3670	3738
AC&R	S7046	S7057
Virginia Chemical	VA54-7SRD	VA57-7SRD

Add three ounces of refrigerant oil for each 10 feet of tubing over 100 feet.

Oil specifications are: Texaco Capella WF-32 Viscosity 150 Suniso 3GS Viscosity 155

RECOMMENDED LINE SIZES ARE AS FOLLOWS:

TONAGE/COMPRESSOR		SUCTION LINE				LIQUID LINE	
		Evaporator lower than Condenser Unit maximum lift 40 feet		Evaporator higher than or on same level as Condenser Unit		Up to 100 feet Over 100 feet	
		Up to 100 feet	Over 100 feet	100 Up to feet	Over 100 feet		
2 ton		3/4	3/4	3/4	7/8	3/8	3/8
3 ton		3/4	7/8	7/8	1 1/8	3/8	3/8
4 ton		7/8	7/8	1 1/8	1 1/8	3/8	1/2
5 ton		7/8	1 1/8	1 1/8	1 3/8	1/2	5/8
6 ton	(2) 3T Comp.	(2) 3/4	(2) 7/8	(2) 7/8	(2) 1 1/8	(2) 3/8	(2) 3/8
8 ton	(2) 4T Comp.	(2) 7/8	(2) 7/8	(2) 1 1/8	(2) 1 1/8	(2) 3/8	(2) 1/2
10 ton	(2) 5T Comp.	(2) 7/8	(2) 1 1/8	(2) 1 1/8	(2) 1 3/8	(2) 1/2	(2) 5/8
12 ton	(3) 4T Comp.	(3) 7/8	(3) 7/8	(3) 1 1/8	(3) 1 1/8	(3) 3/8	(3) 1/2
15 ton	(3) 5T Comp.	(3) 7/8	(3) 1 1/8	(3) 1 1/8	(3) 1 3/8	(3) 1/2	(3) 5/8

ELECTRICAL WIRING

Units are internally wired at the factory for normal supply voltages. Check the heat pump specification plate for required voltage, and for wire and fuse sizing. The factory wiring for the heat pump terminates in two boxes, one each in the indoor air and the outdoor air sections. These control boxes are located behind the outer access panels, which are each supplied with individual control box covers. *If installation includes an electric duct heater for supplementary heat, check its specification plate also for required voltage and phase. A separate power supply is required for the duct heater.

SPLIT SYSTEM (SEE FIG. 3)

If the unit is split (outdoor air section remote from indoor air section), The thermostat and heater low voltage wiring is to be brought through connection (A). Power wiring for the outdoor air section is to be brought through connection (B). Interconnection low voltage wiring (replacements for wires in Item 4, Pg. 2); will be brought through (A) & (C).

Power wiring to the outdoor air section and power wiring to the indoor air section must come through fused disconnects. Minimum circuit ampacity and maximum fuse size for the outdoor air section is shown on the outdoor air section specification plate. Power wiring to the indoor air section must be 14 gauge (copper) minimum. Refer to specification plate for indoor air motor current, and fuse size per National Electric Code. For low voltage wiring, 18 gauge wire may be used for up to 50 ft. lengths, 16 gauge wire for up to 100 ft. lengths.

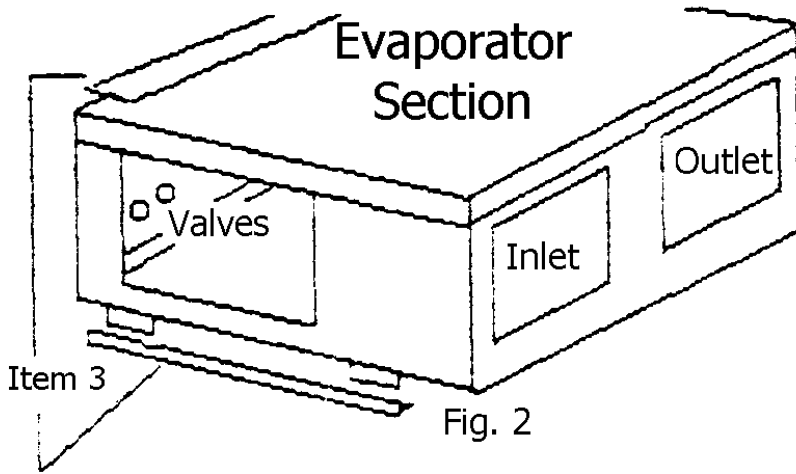


Fig. 2

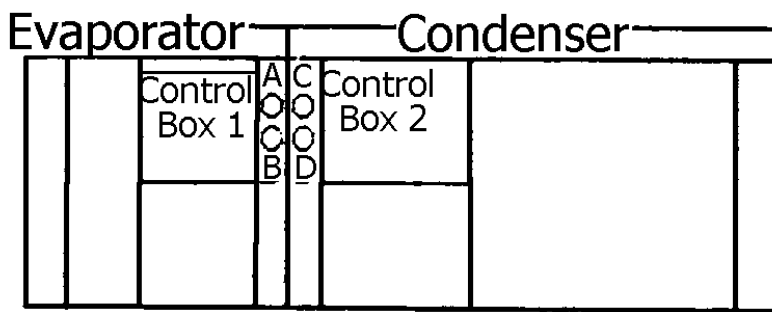


Fig. 3

CONDENSATE DRAINS

Units are equipped with two 3/4" IPS drains, one for the indoor air section condensate and one for the outdoor air section condensate or rainwater. It is extremely important that the drain lines attached to these connections contain a trap, to ensure positive draining. It is highly recommended that the trap be primed with water prior to start-up. Also, if the drain lines may be exposed to subfreezing temperatures, they must be wrapped with some form of heating cable (field supplied).

FILTERS

Throwaway filters are supplied with the unit and are an Underwriters Laboratories Class 2 pleated extended surface type. Filters should be checked monthly for dirt accumulation and changed when necessary. Replacement filters must be same as originally supplied. Field access is attained by removing the cover located on the right front corner of the unit (Fig. 1). Note: Unit must be shut off at the disconnect switch before the filters are serviced. Be sure to check the airflow direction arrows on the filters points in the right direction.

Model	Filter size	Quantity
2 & 3 Ton	20 x 20 x 2	1
4,5,6,8,&10 Ton	16 x 25 x 2	2
12 & 15 Ton	16 x 20 x 2	3

AIR FLOW

Units are equipped with adjustable motor and blower combinations. The drives have been selected such that, at the mid-position of the adjustable sheaves, the units will supply airflow with .3 external pressure as follows:

Air Flow - CFM		
Model	Indoor Air Section	Outdoor Air Section
2 Ton	800	1600
3 Ton	1200	2000
4 Ton	1600	2500
5 Ton	2000	3200
6 Ton	2400	3800
8 Ton	3000	4000
10 Ton	4000	6000
12 Ton	4800	6000
15 Ton	5400	6300

The drive may be adjusted for different static pressures. If such an adjustment is made, check the motor current draw does not exceed the motor nameplate current by more than 10%. On units with three phase fan motors, check for proper blower rotation at start-up. If they are running backwards, interchange two of the incoming power leads.

ELECTRIC HEAT

The electric heat option is in the form of a duct heater and must be installed a minimum of 4 feet downstream from the unit in the indoor air discharge duct. A separate power supply is required for the reheat. Consult wiring diagrams in this instruction and on the electric heater and heater pump thermostat. Also refer to the specification plate on the heater for proper voltage, kilowatts, and wiring requirements.

DEFROST CONTROL

The *Skil-Aire* heat pump utilizes a defrost system controlled by a temperature sensing device. The defrost cycle initiates when the bulb attached to the outdoor coil senses a temperature of 30 F or less. This means that the unit (when in the heating cycle) will go into a defrost cycle only if the outdoor coil is cold enough to accumulate frost. The defrost cycle ends when the outdoor coil temperature rises to 80 F.