O P E R A T I O N & M A I N T E N A N C E M A N U A L

MECHANICAL EQUIPMENT LOCATED AT:

CHILD CARE BUILDING LCH - 4025
MIDWAY PARK FAMILY HOUSING AREA
CAMP LEJEUNE, NC 28542

CONTRACTOR:

CONTRACTORS & MECHANICAL ASSOCIATES, INC.

CONTRACT NUMBER:

N62470-86-C-5431

MECHANICAL EQUIPMENT INSTALLED BY:

Contractors & Mechanical Associates, Inc.
2340-D Beatties Ford Road
(704) 392-9801
(Charles L. Brewington)

LOCAL REPRESENTATIVE:

Oscar Heating & Air Conditioning
869 Blue Creek Road
Jacksonville, NC 28540
(919) 347-2688

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DESCRIPTION:

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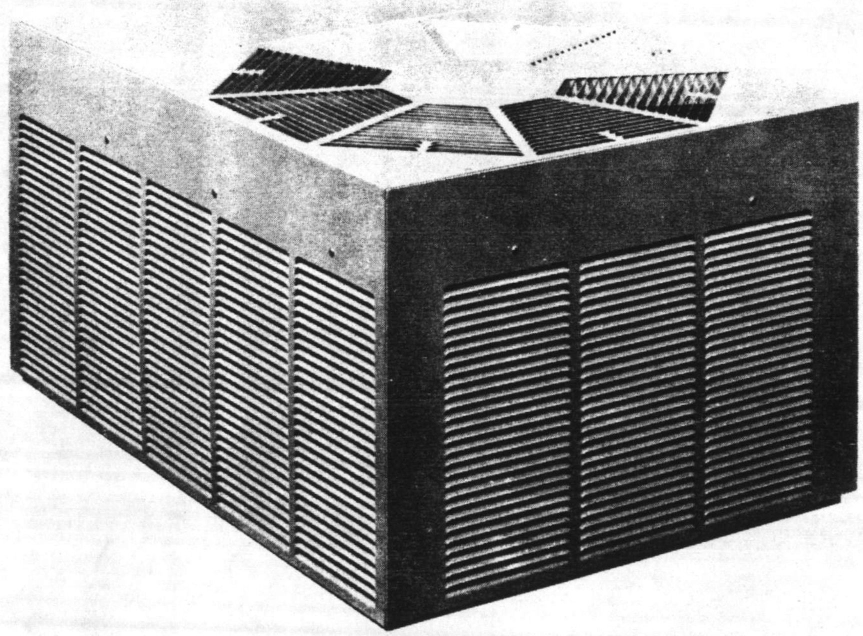
INSTALLATION INSTRUCTIONS FOR HEAT PUMP OUTDOOR UNIT

MODEL SERIES
(-)PCB-, (-)PFA-, (-)PGB-



92-20522-05-03

CONTENTS

UNIT MODEL NUMBER EXPLANATION

(-) P C B -013 J A S

- COOLING CONNECTION FITTINGS
  S = SWEAT
- VARIATIONS
- ELECTRICAL DESIGNATION
  C = 208/230V 3Ø
  D = 460 V 3Ø
  J = 208/230V 1Ø
- COOLING CAPACITY (NOMINAL)
  013 = 13,000 BTU/HR.
  018 = 18,000 BTU/HR.
  024 = 24,000 BTU/HR.
  030 = 30,000 BTU/HR.
  036 = 36,000 BTU/HR.
  042 = 42,000 BTU/HR.
  048 = 48,000 BTU/HR.
  060 = 60,000 BTU/HR.
- DESIGN SERIES
- REMOTE OUTDOOR UNIT
  C = STANDARD EFFICIENCY
  F = HIGHER EFFICIENCY
  G = HIGHEST EFFICIENCY
- HEAT PUMP
- MODEL DESIGNATION

DIMENSIONS

FIG. 1

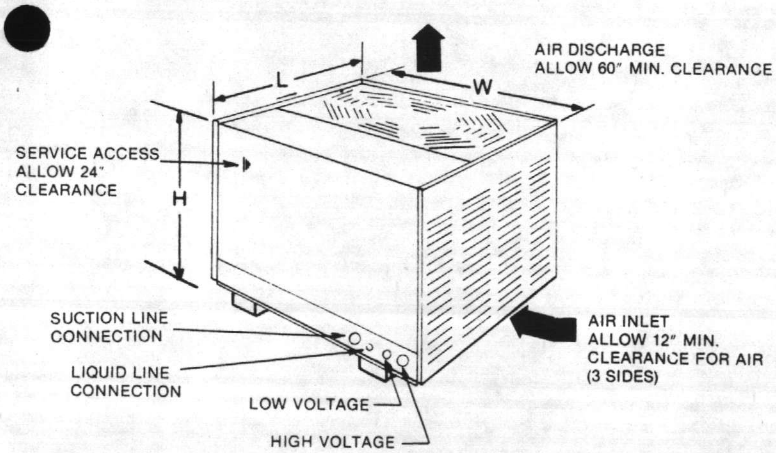


FIG. 2

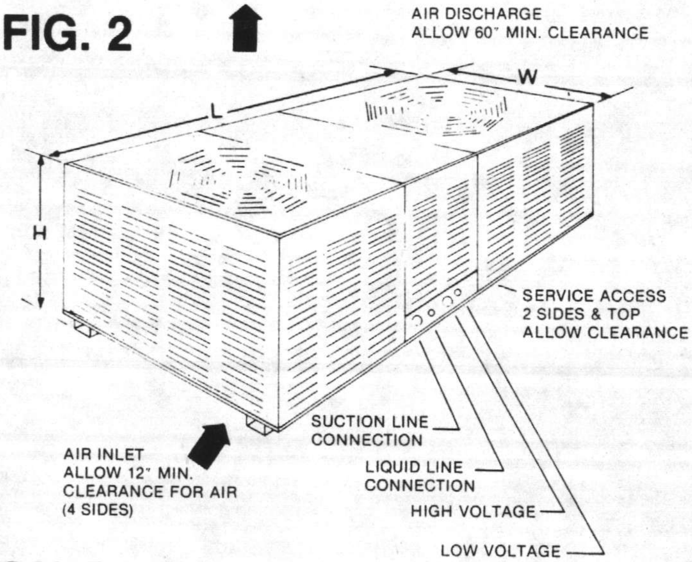


TABLE 1 — PHYSICAL DATA

HEAT PUMP UNIT MODEL								
	(-)PCB-	013	018, 024	030	036			
	(-)PFA-		018, 024	030	036	042, 048 060		
	(-)PGB						018, 024 030, 036	042, 048 060
DIMENSIONS FIG. NO.		1	1	1	1	1	1	2
HEIGHT "H"		16-11/16	19-3/16	19-15/16	22-11/16	26-11/16	27-9/16	27-9/16
LENGTH "L"		33-1/16	36-5/16	42-9/16	42-9/16	42-9/16	42-9/16	80
WIDTH "W"		23-1/4	26	31	31	31	31	31
LOW VOLTAGE CONN.		7/8	7/8	7/8	7/8	7/8	7/8	7/8
LINE VOLTAGE CONN.		1-23/64	1-23/64	1-23/64	1-23/64	1-23/64	1-23/64	1-23/64

WARNING: THE MANUFACTURER'S WARRANTY DOES NOT COVER ANY DAMAGE OR DEFECT TO THE HEAT PUMP CAUSED BY THE ATTACHMENT OR USE OF ANY COMPONENTS, ACCESSORIES OR DEVICES (OTHER THAN THOSE AUTHORIZED BY THE MANUFACTURER) INTO, ONTO OR IN CONJUNCTION WITH THE HEAT PUMP. YOU SHOULD BE AWARE THAT THE USE OF UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES MAY ADVERSELY AFFECT THE OPERATION OF THE HEAT PUMP AND MAY ALSO ENDANGER LIFE AND PROPERTY. THE MANUFACTURER DISCLAIMS ANY RESPONSIBILITY FOR SUCH LOSS OR INJURY RESULTING FROM THE USE OF SUCH UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES.

RECEIVING

Immediately upon receipt, all cartons and contents should be inspected for transit damage. Units with damaged cartons should be opened immediately. If damage is found, it should be noted on the delivery papers and a damage claim filed with the last carrier.

GENERAL

Installing a heat pump is essentially the same as installing an air conditioner. The most important differences are:

- The outdoor unit must be installed with a compatible indoor unit as designated in the specification data or in the Directory of Certified Unitary Heat Pumps published by the Air-Conditioning and Refrigeration Institute. Using unmatched components may not only affect the performance of the system, but may also cause the warranty applicable to the equipment not to apply.

  CAUTION: *We are not responsible for the performance of a mismatched system.*
- A heat gain calculation for cooling and heat loss for heating should be made. Some auxiliary heat should be provided. Even when the heat loss does not justify auxiliary heat, a minimum of 5 K.W. is desirable during defrost periods to prevent cold air from blowing through ducts.
- Suction line and liquid line must not be in contact with each other. The suction line must be insulated.

IMPORTANT

- The indoor coil **must** be located in the airstream ahead of any electric resistance heaters (on the inlet air side of the auxiliary heaters).
- If the heat pump is used with a fossil fuel furnace, the indoor coil **must** be located on the **outlet** of the furnace. A Fossil Fuel Kit must be used in the control circuit to prevent the furnace and heat pump from operating at the same time.
- Cleanliness and complete evacuation of air and water from the refrigerant system is very important to any air conditioner. It is doubly important to heat pumps.
- Since a heat pump heats with relatively large quantities of low temperature air, it is important to do a good job of placing and sizing ducts and registers to minimize uncomfortable sensation of drafts and noise.

LOCATING UNIT

Consult local building codes or ordinances for special installation requirements. When selecting a site to locate the outdoor unit consider the following:

- A minimum clearance of 24″ for service access, 12″ for air inlets (sides and end) and 60″ for air discharge (unit top) is required. (See Figure 1)
- The unit must be located outdoors and cannot be connected to duct work.
- The length of the refrigerant piping and wiring should be as short as possible to avoid capacity loss and increased operating cost.
- Locate unit where operating sound will not disturb owner or neighbors.
- Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.
- It is essential to provide for condensate drainage and possible refreezing of condensation, provide a base pad for mounting the unit which is slightly pitched away from the house. Route condensate off base pad to an area which will not become slippery and result in personal injury.
- **Where snowfall is anticipated, the unit must be elevated above the base pad to prevent ice buildup and coil damage. Mount the unit high enough to be above the average accumulated area snowfall. See Figure 3.**

CAUTION: *Do not obstruct openings in bottom of unit. See Figure 4.*

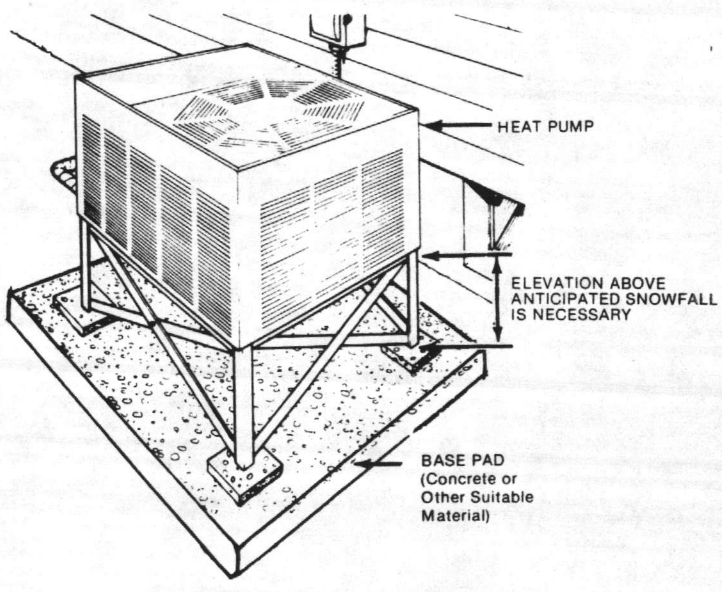


FIGURE 3. SUGGESTED MOUNTING

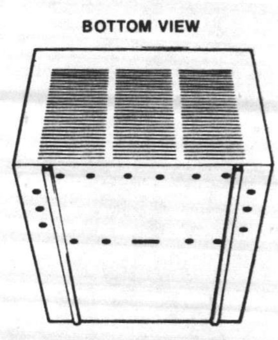


FIGURE 4. CONDENSATE DRAIN OPENINGS

ELECTRICAL WIRING

Field wiring must comply with the National Electric Code and any applicable local ordinance.

POWER WIRING

- It is important that proper electrical power is available at the heat pump contactor. Voltage should not vary more than 10% of that stamped on the rating plate. Interphase variation on the three-phase units must not be more than 3%.
- Install a branch circuit disconnect within sight of the unit and of adequate size to handle the starting current. (See Table 2B).
- For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from Table 2A using the circuit ampacity found on the unit rating plate. From the unit disconnect to unit, the smallest wire size allowable in Table 2A should be used.
- Power wiring must be run in grounded, raintight conduit. Conduit must be run through the connector panel below the service cover up and attached to the bottom of the control box.
- **DO NOT** connect aluminum field wire to outdoor heat pump contactor terminals.
- Connect power wiring to contactor located in outdoor heat pump electrical box. (See wiring diagram attached to unit access panel.)
- Check all electrical connections, including factory wiring within the unit and make sure all connections are tight.

SPECIAL INSTRUCTIONS FOR POWER WIRING WITH ALUMINUM CONDUCTORS:

- Select the equivalent aluminum wire size from the tabulation below:

AWG Copper Wire Size	AWG Aluminum Wire Size	Connector Type and Size (or equivalent)	
#12	#10	T & B Wire Nut	PT2
#10	# 8	T & B Wire Nut	PT3
# 8	# 6	Sherman Split Bolt	TSP6
# 6	# 4	Sherman Split Bolt	TSP4
# 4	# 2	Sherman Split Bolt	TSP2

- Attach a length (6″ or more) of recommended size copper wire to the unit contactor terminals L1 and L3 for single phase, L1, L2 and L3 for three phase.
- Splice copper wire pigtails to aluminum wire with U.L. recognized connectors for copper-aluminum splices. Follow these instructions very carefully to make a positive and lasting connection:
  - Strip insulation from aluminum conductor.
  - Coat the stripped end of the aluminum wire with the recommended inhibitor, and wire brush aluminum surface through inhibitor. INHIBITORS: Brundy-Pentex "A"; Alcoa-No. 2EJC; T & B-KPOR Shield.
  - Clean and recoat aluminum conductor with inhibitor.
  - Make the splice using the above listed wire nuts or split bolt connectors.
  - Coat the entire connection with inhibitor and wrap with electrical insulating tape.

WARRANTY MAY NOT APPLY IF CONNECTIONS ARE NOT MADE PER INSTRUCTIONS.

GROUNDING

WARNING: The unit must be permanently grounded. A grounding lug is provided near contactor for a ground wire. Grounding may be accomplished by grounding the power wire conduit to the condensing unit. Make sure the conduit nut locking teeth have pierced the insulating paint film.

THERMOSTAT

It is necessary that only heat pump thermostats be used. Please contact your distributor for part number information on various manual changeover, auto changeover, and set-back models or see thermostat and subbase selection information in your product list.

TABLE 2A

COPPER WIRE SIZE — AWG.
(1% Voltage Drop)

SUPPLY WIRE LENGTH-FEET	15	20	25	30	35	40	45	50
200	6	4	4	4	3	3	2	2
150	8	6	6	4	4	4	3	3
100	10	8	8	6	6	6	4	4
50	14	12	10	10	8	8	6	6

SUPPLY CIRCUIT AMPACITY

CONTROL WIRING

- Low voltage control wire should not be run in conduit with power wiring, unless Class 1 wire of proper voltage rating is used.
- Control wiring is routed through a seven-eights inch bushed hole connected to pigtails supplied with unit. Connect as shown in wiring diagram booklet.

TABLE 2B — OUTDOOR UNIT ELECTRICAL DATA

UNIT MODEL NUMBER	ELECTRICAL CHARACTERISTICS	ELECTRICAL OPERATING CURRENT			MIN. CIRCUIT AMPACITY AMPS.	FUSE OR HACR-TYPE CIRCUIT BREAKER AMP. MIN. & MAX.
		COMP. R.L.A.	COMP. L.R.A.	FAN MTR. F.L.A.		
(-)PCB-013JA	1-60-208/230	7.1/7.1	35/35	.9	10/10	15/15
-018JA	1-60-208/230	10.5/10.5	50/50	.9	14/14	20/20
-018JB	1-60-208/230	10.5/10.5	50/50	.9	14/14	20/20
-024JA	1-60-208/230	15.8/15.8	65/65	.9	21/21	25/25
-030JA	1-60-208/230	16.4/16.4	90/90	.9	22/22	30/30
-036JA	1-60-208/230	20.4/20.4	95/95	2.0	28/28	35/35
(-)PFA-018JA	1-60-208/230	10.5/10.5	50/50	.8	14/14	20/20
-024JA	1-60-208/230	15.8/15.8	65/65	.8	21/21	25/25
-030JA	1-60-208/230	16.4/16.4	90/90	.8	22/22	30/30
-036JA	1-60-208/230	20.4/20.4	95/95	.8	28/28	35/35
-036CA	3-60-208/230	13.9/13.9	70/70	2.0	19/19	25/25
-042JA	1-60-208/230	25.3/25.3	110/110	2.0	34/34	40/40
-042CA	3-60-208/230	17.4/17.4	78/78	2.0	24/24	30/30
-048JA	1-60-208/230	28.5/28.5	118/118	2.0	38/38	45/45
-048CA	3-60-208/230	20.1/20.1	92/92	2.0	27/27	35/35
-048DA	3-60-460	9.1	46	1.0	12	15
-060JA	1-60-208/230	35.3/35.3	180/180	2.0	46/46	60/60
-060CA	3-60-208/230	24.2/24.2	158/158	2.0	32/32	40/40
-060DA	3-60-460	11.0	82	1.0	15	20
(-)PGB-018JA	1-60-208/230	9.5/9.5	49/49	.75	13/13	15/15
-024JA	1-60-208/230	13.7/13.7	63/63	.75	18/18	25/25
-030JA	1-60-208/230	14.4/14.4	66/66	.75	19/19	25/25
-036JA	1-60-208/230	20.5/20.5	78.8/78.8	1.0	27/27	35/35
-036CA	3-60-208/230	12.4/12.4	65.1/65.1	1.0	17/17	25/25
-042JA	1-60-208/230	22/22	97/97	.75 EA	29/29	40/40
-042CA	3-60-208/230	13.3/13.3	78/78	.75 EA	19/19	25/25
-048JA	1-60-208/230	23/23	110/110	.75 EA	31/31	40/40
-048CA	3-60-208/230	15.4/15.4	82/82	.75 EA	21/21	30/30
-048DA	3-60-460	6.9	41	.50 EA	10	15
-060JA	1-60-208/230	36/36	138/138	1.0 EA	47/47	60/60
-060CA	3-60-208/230	20.3/20.3	106/106	1.0 EA	28/28	35/35
-060DA	3-60-460	9.3	53	.50 EA	14	20

① Comply with local codes. Wire size based on N.E.C. for 60°C type copper conductors.

TUBING INSTALLATION

Observe the following when installing refrigerant tubing between the outdoor unit and indoor coil:

- Use clean, dehydrated, sealed refrigeration grade tubing.
- Always keep tubing sealed until tubing is in place and connections are to be made.
- For best operation, keep tubing run as short as possible with a minimum number of elbows or bends.
- Locations where the tubing will be exposed to mechanical damage should be avoided. If it is necessary to use such locations, copper tubing should be housed to prevent damage.
- Route the tubing using temporary hangers, then straighten the tubing and install permanent hangers. Lines must be adequately supported.
- Use care in routing tubing and do not kink or twist. Use a good tubing bender on the suction line to prevent kinking.
- The suction line must be insulated to prevent dripping (sweating). **Armaflex** and **Rubatex** are satisfactory insulations for this purpose.
- Check Table 3 for correct liquid and suction line sizing for heat pump size and length of run.

Tubing Connections

- Be certain both refrigerant shutoff valves at the outdoor unit are front seated (turn fully clockwise).

  Brass Valve Note:

  The brass valve is not a backseating valve. Opening or closing valve does not close service port. **Extreme caution must be exercised not to force valve stem against the retaining ring. If the valve stem is backed out past the retaining ring, system pressure could force the valve stem out of the valve body and possibly cause personal injury.** In the event that the retaining ring is missing, do not attempt to open the valve.
- Clean the inside of fittings and the outside of the tubing with steel wool or sand cloth before soldering. Always keep chips, steel wool, dirt, etc., out of the inside when cleaning. Assemble tubing part way into fitting. Apply flux all around the outside of the tubing and push tubing into stop. This procedure will keep the flux from getting inside the system.
- **Wrap valves with a wet rag before applying heat,** braze the tubing between outdoor unit and indoor coil. Flow dry nitrogen into the shutoff valve port and through the tubing while brazing. (Refrigerant-22 will decompose and form harmful acids at soldering temperatures).
- Connect a tank of Refrigerant-22 to the liquid valve service port, purge refrigerant through the lines and indoor coil and out the suction port.
- Replace the suction line service port cap and build up tank pressure in the lines and coil. Leak test all joints. (See leak testing section.) If a leak is found, release charge and follow Step 3 to repair.

  The indoor coil and tubing of sweat type units must be evacuated before operating unit. See evacuation procedure below.

Maximum Length of Interconnecting Tubing

There is no fixed maximum length for interconnecting tubing, but if over 200 feet add 3 ounces of dry refrigerant oil for each 10 feet of line over 200 feet. Oil may be added not to exceed 3 fluid ounces for each ten feet over 60 feet. Connecting lines should be kept as short as possible as there is a capacity loss for each foot of suction line tubing used. The multiplier chart, Table 3 shows multipliers to be used to determine capacity for various suction line length and diameters. The losses that occur due to lines being exposed to outdoor conditions are not included. Systems equipped with over 60′ of lines must be equipped with crankcase heaters.

Vertical Separation Between Indoor and Outdoor Sections

Since both sections act as both condensers and evaporators, the maximum vertical separation should not exceed 20 feet. However, vertical separation up to 40 feet may be tolerated if liquid line is increased to next larger size than shown in Table 3. Oil traps are not required.

LEAK TESTING

All units must be leak tested after making connections. A G.E. leak detector Model H-10 is excellent for finding small leaks. Leak test all piping within the heat pump unit and cooling coil as well as interconnecting tubing.

EVACUATION PROCEDURE

This is the most important part of the entire service procedure. The life and efficiency of the equipment is dependent upon the thoroughness exercised by the serviceman when evacuating air and moisture from the system.

Air in a system causes high condensing temperature and pressure, resulting in increased power input and reduced performance.

Moisture chemically reacts with the refrigerant and oil to form corrosive hydrofluoric and hydrochloric acids. These attack motor windings and parts, causing breakdown.

After the system has been leak checked and proven sealed, purge the unit with R-22 and connect the vacuum pump. Triple evacuation of the refrigerant system is highly recommended. This evacuation is twice to 1,500 microns and a third and final evacuation to 500 microns, breaking the vacuum each time with R-22 to a point at least 3 psig or more. The vacuum pump must be connected to both the high and low sides of the system through adequate connections. Use the largest size connections available, since restrictive service connections may make the process so slow as to be unacceptable. This may lead to false readings because of pressure drop through the fittings.

CHARGING

Charge for all types of systems should be checked against the "Refrigerant Charging Procedure" attached to unit service panel, or in separate instruction sheet included with the unit.

Charging by Weight

Generally, it is more convenient and accurate to charge the system with R-22 by using the "refrigerant charging procedure"; however, the weight method may be used. To charge by weight proceed as follows:

- Evacuate entire system.
- Calculate the required system charge using Table 3. Note that charge varies with length of interconnecting lines.
- With an accurate scale (± 1 ounce) or calibrated cylinder, add calculated charge to system.
- ***CAUTION:*** *DO NOT operate compressor without charge in system.*
- After weighing in charge, check and adjust charge as described on charging chart attached to outdoor unit access cover.

TABLE 3 — REFRIGERANT LINE SIZE INFORMATION

HEAT PUMP REFRIGERANT TUBING DATA

MODEL																						
(-)PCB-	013	018			024			—			—		—				—		—			
(-)PFA-			018			024			030			036		042				048		060		
(-)PGB-				018			024			030					036	042					048	060
REFRIGERANT SUCTION CONN. SIZE ON UNIT	5/8'' I.D. SWEAT				3/4'' I.D. SWEAT										7/8'' I.D. SWEAT						1-1/8'' I.D.	
REFRIGERANT LIQUID CONN. SIZE ON UNIT	5/16'' I.D. SWEAT													3/8'' I.D. SWEAT								
REVISE TO "FACTORY CHARGE" ①	54	55	55	112	60	60	111	—	75	164	—	95	—	115	184	192	—	129	—	200	200	330

② CAPACITY MULTIPLIER FOR VARYING SUCTION LINE SIZES AND LENGTH RUNS

SUCTION TUBING SIZE O.D.	5/8 3/4	5/8 3/4	5/8 3/4	5/8 3/4	3/4 7/8	3/4 7/8	3/4 7/8		3/4 7/8	3/4 7/8		3/4 7/8		3/4 7/8	7/8 1-1/8	7/8 1-1/8		7/8 1-1/8		7/8 1-1/8	1-1/8 1-3/8	1-1/8 1-3/8
30 FT. LENGTH	1.00 1.01	1.00 1.01	1.00 1.01	1.00 1.01	1.00 1.01	1.00 1.01	1.00 1.01		1.00 1.01	1.00 1.01		1.00 1.01		1.00 1.01	1.00 1.01	1.00 1.01		1.00 1.01		1.00 1.01	1.00 1.01	1.00 1.01
60 FT. LENGTH	.99 1.00	.98 1.00	.98 1.00	.98 1.00	.98 1.00	.99 1.00	.98 1.00		.98 1.00	.98 1.00		.98 1.00		.97 1.00	.99 1.00	.98 1.00		.98 1.00		.98 1.00	1.00 1.01	1.00 1.01
90 FT. LENGTH	.98 1.00	.97 .99	.97 .99	.97 .99	.97 .99	.97 .99	.97 .99		.97 .99	.97 .99		.96 .99		.95 .99	.98 1.00	.97 .99		.97 .99		.96 .99	.99 1.00	.99 1.00
120 FT. LENGTH	.97 .98	.95 .99	.95 .99	.95 .99	.95 .99	.95 .99	.95 .99		.95 .99	.95 .99		.94 .98		.93 .97	.98 1.00	.95 .99		.95 .99		.94 .98	.99 1.00	.99 1 00
150 FT. LENGTH	.95 .99	.94 .98	.94 .98	.94 .99	.94 .99	.94 .99	.94 .99		.94 .98	.94 .98		.93 .97		.90 .96	.97 1.00	.94 .98		.94 .98		.92 .97	.99 1.00	.98 1.00

RECOMMENDED SUCTION AND LIQUID LINE SIZES FOR VARIOUS LENGTH RUNS **③ SEE NOTE FOR LINE SIZE**

LENGTHS UP TO 30 FEET	SUCT.	5/8'' O.D.	3/4'' O.D.	7/8'' O.D.	1-1/8'' O.D
	LIQ.	1/4'' O.D.		3/8'' O.D.	
LENGTHS 31 TO 45 FEET	SUCT.	5/8'' O.D.	3/4'' O.D.	7/8'' O.D.	1-1/8'' O.D
	LIQ.	24' - 1/4'' O.D. Balance 5/16'' O.D.		26' - 3/8'' O.D., Balance 1/2'' O.D.	
LENGTHS 46 TO 60 FEET	SUCT.	3/4'' O.D.	3/4'' or 7/8'' O.D. See Capacity Multiplier②	7/8'' or 1-1/8'' O.D. See Cap. Mult.②	1-1/8'' O.D.
	LIQ.	18' - 1/4'' O.D. -, Balance 5/16'' O.D.		22' - 3/8'' O.D., Balance 1/2'' O.D.	
LENGTHS 61 TO 90 FEET	SUCT.	3/4'' O.D.	3/4'' or 7/8'' O.D. See Capacity Multiplier②	7/8'' or 1-1/8'' O.D. See Cap. Mult.②	1-1/8'' O.D.
	LIQ.	7' - 1/4'' O.D., Balance 5/16'' O.D.		15' - 3/8'' O.D., Balance 1/2'' O.D.	
LENGTHS 91 to 120 FEET	SUCT.	3/4'' O.D.	3/4'' or 7/8'' O.D. See Capacity Multiplier②	7/8'' or 1-1/8'' O.D., See Cap. Mult.②	1-1/8'' O.D.
	LIQ.	90' - 5/16'' O.D. Balance 3/8'' O.D.		8' - 3/8'' O.D., Balance 1/2'' O.D.	
LENGTHS 121 TO 150 FEET	SUCT.	3/4'' O.D.	3/4'' or 7/8'' O.D. See Capacity Multiplier②	7/8'' or 1-1/8'' O.D. See Cap. Mult.②	1-1/8'' O.D.
	LIQ.	85' - 5/16'' O.D., Balance 3/8'' O.D.		1/2'' O.D.	

NOTE: For suction line runs of over 60 ft., added suction line insulation may be required.
NOTE: See Table 4 for (-)PCB, (-)PFA unit basic charge with alternate indoor coils.

① Factory charge is sufficient for outdoor unit, indoor coil and 25 ft. of recommended liquid line. For different lengths, adjust charge accordingly.

¼" Liquid Line ± .3 oz per foot
5/16" Liquid Line ± .4 oz per foot
⅜" Liquid Line ± .6 oz per foot
½" Liquid Line ± 1.2 oz per foot

② Capacity multiplier x rated capacity = actual capacity
Example -024 with 60' of ¾'' O.D. Vapor Line
24,200 x .98 = 23,716

③ For (-)PFA-042 use suction line information shown in table to left and liquid line information shown in table to right.

Prestart Check

- An initial start-up, or after extended shutdown periods, make sure crankcase heat is energized for at least 4 hours, preferably 12 hours before compressor is started. (Disconnect switch closed and wall thermostat in "off" position.)
- Is unit grounded and connected to correct voltage and phase, and all wire connections tight and properly fused?
- Is unit elevated to allow drainage?
- Is air free to travel to and from outdoor unit?
- Is suction line and duct work insulated?
- Has tubing been purged and evacuated?
- Have all joints been leak tested?
- Have the service valves been opened?
- On units with shipping brackets, are brackets removed?

Start-Up Check

- Turn thermostat system switch to "off", turn fan switch to "on"; indoor blower should run.
- Turn fan switch to "auto". Turn system switch to "cool" and turn temperature setting below room temperature. Both indoor and outdoor units should operate. (Time Delay Optional)
- Turn thermostat system switch to "heat". Unit should stop. Raise temperature setting to above room temperature. Unit should run after about 30 to 50 seconds auxiliary strip heaters, if installed, should come on.
- If above 65° outside, check charge in the cooling mode. If below 65°, check charge in the heating mode. See charge chart on access panel.

- After charge has been checked and adjusted per procedure on inside of access panel, record the following:

  Liquid pressure @ service valve ______________psig.

  Suction pressure @ compressor ______________psig.

  Suction line temp. @ compressor ______________°F

  Super heat @ compressor ______________°F

  At contactor ____________voltage ____________amps.

  Indoor temp. D.B. __________°F. W.B. __________°F.

  Outdoor temp. D.B. __________°F. W.B. __________°F.

  Model No. ____________Serial No. ____________

  Location & owner ______________________
- Instruct the owner and/or user on operation and maintenance.

Operation

Most single phase units are operated PSC (no start relay or start capacitor). It is important that such systems be off for a minimum of 5 minutes before restarting to allow equalization of pressures. The thermostat should not be moved to cycle unit without waiting five minutes. To do so may cause the compressor to stop on an automatic opening overload device or blow a fuse. Poor electrical service can cause nuisance tripping on overloads or blow fuses. For PSC type operation, the refrigerant metering must be done with cap tubes, flow check, or bleed type expansion valve because of low starting torque.

CAUTION: *The compressor has an internal overload protector. Under some conditions, it can take up to 2 hours for this overload to reset. Make sure overload has had time to reset before condemning the compressor.*

AUXILIARY HEAT

The amount of auxiliary heat required depends on the heat loss of the structure to be heated and the capacity of the heat pump. It is good practice to install strip heat to maintain at least 60°F indoor temperatures in case of compressor failure. See instructions packed with indoor section. Most indoor sections are equipped with controls that eliminate the need to use outdoor thermostats.

TROUBLE SHOOTING CHART

***WARNING — Disconnect all power to unit before servicing. Contactor may break only one side of line.**

SYMPTON	POSSIBLE CAUSE	REMEDY
High head-low suction	a. Restriction in liquid line or capillary tube or filter drier b. Flow check piston size too small	a. Remove or replace defective component b. Change to correct size piston
High head - high or normal suction - Cooling Mode	a. Dirty outdoor coil b. Overcharged c. Outdoor fan not running	a. Clean coil b. Correct system charge c. Repair or replace
High head-high or normal suction-heating mode	a. Low air flow - indoor coil b. Overcharged	a. Check filters - correct fan speed b. Correct system charge
Low head-high suction	a. Incorrect capillary tube b. Defective compressor valves c. Flow check piston size too large	a. Replace indoor coil assembly b. Replace compressor c. Change to correct size piston
Unit will not run	a. Power off or loose electrical connection b. Thermostat out of calibration-set too high c. Defective contactor d. Blown fuses e. Transformer defective f. High pressure control open (if provided) g. Compressor overload contacts open	a. Check for correct voltage at contactor in condensing unit b. Reset c. Check for 24 volts at contactor coil - replace if contacts are open d. Replace fuses e. Check wiring-replace transformer. f. Reset-also see high head pressure remedy. The high pressure control opens at 430 PSI g. If external overload - replace OL. If internal replace compressor. NOTE: Wait at least 2 hours for overload to reset
Outdoor fan runs, compressor doesn't	a. Run or start capacitor defective b. Start relay defective c. Loose connection d. Compressor stuck, grounded or open motor winding. open internal overload e. Low voltage condition	a. Replace b. Replace c. Check for correct voltage at compressor - check & tighten all connections d. Wait at least 2 hours for overload to reset. If still open, replace the compressor. e. Add start kit components
Low suction - cool compressor — iced indoor coil	a. Low indoor airflow	a. Increase speed of blower or reduce restriction - replace air filter
Compressor short cycles	a. Defective overload protector	a. Replace - check for correct voltage
Registers sweat	a. Low indoor airflow	a. Increase speed of blower or reduce restriction - replace air filter
High suction pressure	a. Excessive load b. Defective compressor	a. Recheck load calculation b. Replace
Insufficient cooling	a. Improperly sized unit b. Improper indoor airflow c. Incorrect refrigerant charge d. Incorrect indoor voltage	a. Recalculate load b. Check - should be approximately 400 CFM per ton. c. Charge per procedure attached to unit service panel d. At compressor terminals, voltage must be ± 10% of nameplate marking when unit is operating

TIME TEMPERATURE DEFROST CONTROL
(-)PCB OR (-)PFA HEAT PUMP MODELS
MECHANICAL CLOCK TIMER TYPE RANCO
MODEL E-15.

Some styles of heat pumps use the Ranco Timer system as the interlock on the initiation of the defrost cycle. This device also contains the defrost terminator switching along with the temperature sensing bulb.

The Ranco Timer system has a selective defrost interval. This unit has 2 positions of defrost timing: 90 or 45 minute intervals. The desired timing is selected by turning a knurled dial by hand to the timing needed.

The time interval selection will be aligned with a "one way" screwdriver slot on top of the dial. This "one way" slot will also be instrumental in testing defrost actions.

Each service call should not be completed until the defrost action has been tested successfully. There are several easy methods, (temperature permitting) to be used:

- Allow frost to build on outdoor coil. Block air flow through this coil as completely as possible. Outdoor fan could be stopped by removing power as second choice. However, this is not the preferred method.
- As the frost covers the coil surfaces, the temperature of the coil tubing will drop to approximately 30°F. At this coil temperature the defrost terminator bulb should close the interval contacts of the defrost control. No action is possible until the clock timer initiates the timed portion of the defrost cycle. To accelerate the timing action, **very slowly** rotate the "one way" slot on top of the timer dial.
- As the dial "clocks" into position, the unit should:
  - Stop outdoor fans
  - Return transfer valve to cooling position
  - Close contacts for one stage of auxiliary heating
- With the disappearing of the frost covering on the coil and the coil temperature reaching 60°F., a successful defrost cycle should automatically return the unit to the heating cycle.
- For a fast response, the bulb could be attached to the coil with the capillary leading out the bottom end. If the bulb is attached to the coil in the inverted position, the response will be slower allowing a longer time for the coil to de-ice.

SOLID STATE TIMER TYPE
ESSEX (621-110), THERM-O-DISC [23E11 (8054)], ROBERTSHAW (TD-11) OR HONEYWELL (ST74A1004)

OPERATION — In operation power is provided to the circuit board when the thermostat selector switch is in the heat position through terminals marked "24 VAC" and "COM". Timing periods of 50, 70 or 90 minutes between defrosts may be selected by connecting the circuit board jumper wire to T1, T2 or T3 respectively. Accumulation of time for the timing period selected starts and stops with the wall thermostat call for heating through "hold" terminal on circuit board. At the end of a timing period a 10 minute defrost period is provided during which the "out" terminal feeds to the "COM" terminal providing 24 VAC to the defrost relay through the defrost sensor. The defrost temperature sensor which is clamped to a feeder tube entering the outdoor coil will, if closed, provide power to the defrost relay permitting defrost. The sensor closes at approximately 28°F. The defrost cycle is terminated when the sensor opens (approximately 60°) and the timing period is reset through terminal "RST" by the defrost relay. If the defrost cycle is not terminated due to the sensor temperature, a 10 minute override interrupts the defrost period and resets the timing period.

"TEST" FEATURE — To initiate a defrost cycle the two "TST" pins should be shorted together until a defrost cycle is initiated. All timing functions are sped up by a factor from 50, 70 or 90 minutes to 11.7, 16.4, or 20.3 seconds. After defrost initiation, the short must be **instantly removed** or the defrost period will last only 2.3 seconds.

DEMAND DEFROST CONTROL
(-)PGA OR (-)PGB HEAT PUMP MODELS
ESSEX CONTROL MODEL 149-480 OR 149-600

The Essex defrost control is a printed circuit board assembly consisting of solid state control devices with electromechanical outputs. The device is used to control the heat pump defrost cycle.

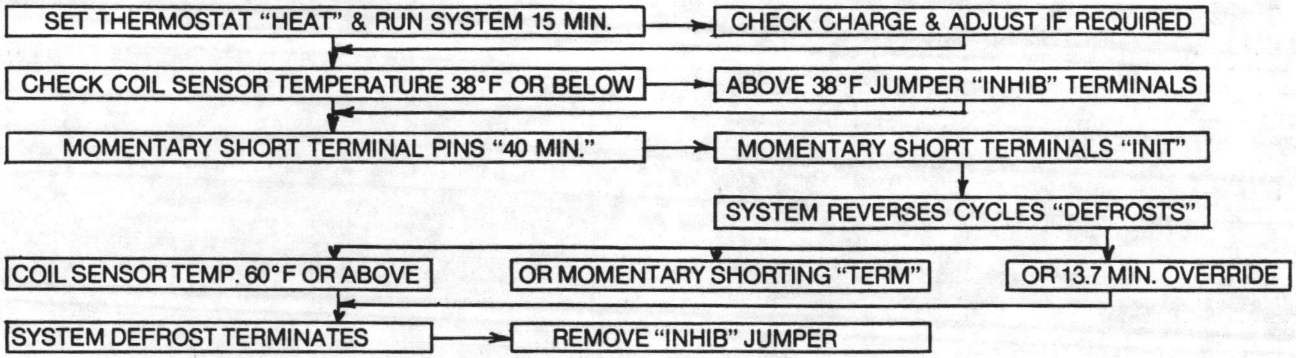
OPERATION — The thermistor sensors sense the ambient air and the outdoor coil temperatures providing the control with the information necessary to determine the point at which defrost of the outdoor coils is necessary. When temperatures remain at or below this point for 4.5 min., the control will energize the defrost relay to provide the switching functions for the reversing valve and outdoor fan motor. The defrost cycle will be terminated when the coil sensor indicates a coils temperature of 60°F. If the sensor does not see 60°F within 13.7 minutes after defrost initiation, then defrost will be terminated by the 13.7 minute override time feature. After defrost termination, a 40 minute delay is provided to prevent another defrost within a 40 minute time period regardless of what sensor temperatures are. A forced defrost feature is provided to force defrost every 6 hours 4 minutes of continuous running time if the coil temperature is below 38°F. Inihibit feature prevents any defrost from occurring if the coil sensor temperature is above 38°F.

TEMPERATURE SENSORS — The plastic coil sensor (blue leads) is clamped to the outdoor coil tube on the end attached to the T.X.V. distribution tubes. The sensor is mounted with the small radius toward the 3/8″ tube and clamped with the toggle clamp provided. The clamp screw should be torqued to 25 in. lb. to seat sensor then reduced to 16 in. lb. The sensor and tube should be wrapped with (1) layer of presstite insulation tape. The air sensor (red leads) is attached to the coil sensor leads approximately 3″ from the coil sensor. The ambient sensor must be located in free air and must be located so that it does not come into contact with coil tubing or other internal parts.

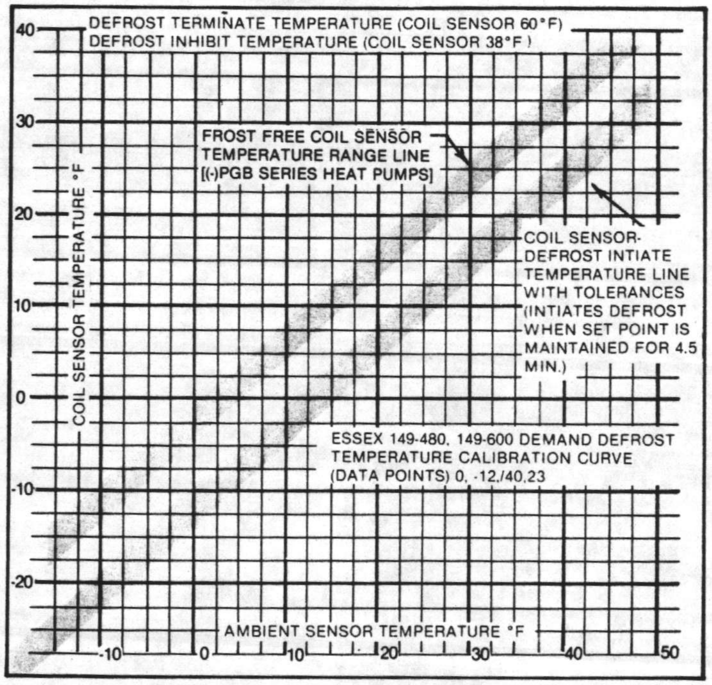
TEST TERMINAL INSTRUCTIONS — The defrost control board is located in a separate box attached to the normal control box in the outdoor unit. Remove the cover to expose the board and test terminals.

TEST TERMINALS	DESCRIPTION OF TEST TERMINAL FUNCTION
"INIT"	Momentary short initiates defrost cycle when temperature of the sensor does not initiate a defrost.
"TERM"	Momentary short terminates defrost cycle when temperature conditions of the sensors do not terminate defrost.
"INHIB"	Jumper terminals to disable temperature inhibit when temperature conditions inhibit defrost.
"40 MIN"	Momentary short disables "40 min. minimum time between defrost" for one time only (if disabling is desired). Function must be disabled after each defrost termination.

CHECKING OPERATION — ESSEX DEMAND DEFROST

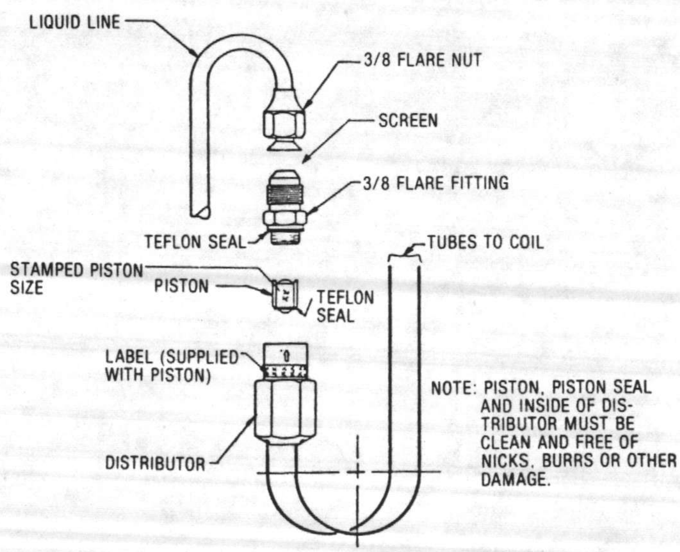


DEMAND DEFROST TEMPERATURE SENSOR CURVE



PISTON AND DISTRIBUTOR ASSEMBLY

(SEE PAGE 11)



HEAT PUMP APPROVED APPLICATION MATCHES WITH FLOW CHECK PISTON SIZES REQUIRED

TABLE 4

Heat Pump Outdoor Unit Model & Size	Heat Pump Indoor Unit Model & Size	Piston Size Required		Piston Size Supplied		System Basic Charge Oz**
		Outdoor	Indoor	Outdoor	Indoor	
(-)PCB-013	RCPS-A013	None	42	None	Same	46
(-)PCB/(-)PFA-018	(-)EQ#-9XXXXE	42	53	Same	Same	47
(-)PCB/(-)PFA-018	RCPB-B018	42	53	Same	Same	47
(-)PCB/(-)PFA-018	RCPB-B024	42	53*	Same	(61)	53
(-)PCB/(-)PFA-024	(-)EQ#-9XXXXF	51	63	Same	Same	52
(-)PCB/(-)PFA-024	RCPB-B024	51	61	Same	Same	52
(-)PCB/(-)PFA-024	RCPB-B027	51	57	Same	Same	68
(-)PFA-030	RCPB-B036	57	68	Same	Same	67
(-)PFA-030	RCPB-B039	57	65*	Same	(73)	85
(-)PFA-036	RCPB-B036	59	74*	Same	(68)	87
(-)PFA-036	RCPB-B039	59	73	Same	Same	95
(-)PFA-042	RCPB-B042	65	80	Same	Same	100
(-)PFA-042	RCPB-B048	65	76*	Same	(84)	125
(-)PFA-048	RCPB-B048	71	84	Same	Same	113
(-)PFA-048	RCPB-B060	71	80*	Same	(93)	134
(-)PFA-060	RCPB-B060	74	93	Same	Same	185

* Indicates new piston size required, ( ) indicates piston size supplied that must change. Pistons may be ordered from Service Parts under number 61-22119-(piston size).
** Basic charge = system charge with zero length lines. See Table 3 for liquid line charge.

FLOW CHECK PISTON

The flow check piston is a multi-purpose device. With flow into the flare nut end from the liquid line, the piston is in a check position and acts as the expansion device with flow through the metering hole in the center of the piston. The teflon gasket on the end of the piston prevents refrigerant from bypassing the metering. The piston metering is protected on the inlet side by a screen located in the 3/8" flare fitting on the end of the distrubitor. Flow from the metering is centered into a distributor which serves to evenly distribute refrigerant to the evaporator circuits. With flow in the reverse direction (direction of arrows on the distributor body), the piston is forced off the seat and liquid from the condenser is allowed to free flow around the piston.

It is essential that the heat pump indoor and outdoor sections be properly matched. Use only matched components as shown in sales specification sheets. Combinations for indoor and outdoor sections that incorporate a distributor with a flow check piston are shown in Table 4. Combinations indicated by a ( ) require a piston size change to the size shown by * in the "Piston Size Required" column.

A piston size that is too small will cause starving and one that is too large will cause flooding. In either case, system performance, reliability and charge balance (heating to cooling) will be unacceptable.

If a combination is used that requires a piston size change (see Table 4), the combination **cannot** be used without changing to the correct size piston.

Change the piston in the distributor on the indoor coil before installing the coil and charging the system following the procedure shown below.

- Using a back-up wrench on the flare fitting, remove the 3/8" flare nut.
- Using a back-up wrench on the distributor body, remove the 3/8" flare fitting and teflon seal.
- Using the wire provided with replacement pistons, run wire (hooked end) through hole in piston.
- Hook nose end of piston and lift gently from distributor body.
- Replace piston with one of proper size (see Table 4), install piston with teflon seal end of piston in distributor first. Do not force piston into distributor.
- NOTE: With piston in distributor, seal end should be down and should not be seen looking in end of distributor. Piston must be free to rotate and move up and down. Make sure piston is free to move in distributor body.
- Replace 3/8" flare fitting with teflon seal using back-up wrench on distributor body. Torque fitting with 8 to 10 ft. lb. Do not over tighten.
- Replace 3/8" flare nut using back-up wrench on flare fitting. Torque 3/8" flare nut with 40 to 45 ft. lb.
- Remove old piston size label from outside of distributor body. Remove new piston size label from poly bag new piston came in and install new size label on outside of distributor.
- Check fittings for leaks after installation, evacuation and charging is complete.

CAUTION: *Do not attempt to drill pistons to size in the field. Metering holes are a special tapered orifice and cannot be modified.*

REFRIGERANT CHARGING PROCEDURE FOR (-)PCB-/(-)PFA- SERIES HEAT PUMPS

The (-)PCB-/(-)PFA- units should be charged by the superheat method for both the cool and heat modes of operation; except that below 40°F, the head pressure method is used. Below 40°F, normal superheat is too low to be a practical method of charging.

FOR EITHER METHOD OF CHARGING TO WORK PROPERLY, THE INDOOR WET BULB AND DRY BULB TEMPERATURES MUST BE WITHIN 2° OF DESIRED COMFORT CONDITIONS.

Charging by Superheat — Capillary System

1. Attach thermocouple or thermometer to the suction line between compressor and accumulator. Insulate to insure accurate measurement.
2. Attach suction gauge to suction port on compressor.
3. When suction line temperature and pressure have stabilized (**15 to 30 minutes after start up or after defrost**), record suction line pressure, outdoor temperature and suction line temperature. Find the correct charging chart for the model number being serviced. Find the intersection of suction line pressure and ambient temperature in Table 1. The suction line temperature should coincide with the table reading.

   Adding R-22 will raise the suction pressure and lower the suction line temperature. **CAUTION** — If adding R-22 raises both pressure and temperature, the unit is overcharged. If unit is in the heat mode and has frost on the outdoor coil, it should be run through a defrost cycle before adjusting charge.

   Should the intersection of the suction pressure and ambient temperature fall in the open area to left of the numbers in Table 1, the following are likely causes:

   In cooling mode: A. Low indoor airflow
   B. Restricted refrigerant line.
   C. Low charge.

   In heating mode: A. Low outdoor airflow. Check for frost or dirt on coil.
   B. Restricted refrigerant line.
   C. Low charge.

   Should the intersection of the suction pressure and ambient temperature fall in the open area to right of the number, the most likely causes are gross overcharge, low indoor airflow on the heating cycle or defective compressor.

Charging by Head Pressure — Heating Mode

1. Attach high pressure gauge to gauge port on **large refrigerant line** (hot gas) at unit, measure indoor air temperature and outdoor ambient. Run unit through defrost cycle and wait 15 minutes for unit to stabilize. Head pressure should coincide with pressure shown in Table 2. Adding charge raises head pressure.

   CAUTION: DO NOT add 30°F, or any other fixed number of degrees, to ambient temperature and charge to that condensing temperature. This will almost always result in a mischarged system.

   Quite often a system charged correctly in either the heat or cool mode will, when switched to the other mode, appear to be either a little over or a little undercharged. This is due to actual conditions at the installation being different from design conditions.

   THE INFORMATION BELOW INDICATES DIRECTION OF CHARGE ADJUSTMENT REQUIRED FOR A SYSTEM DUE TO CONDITIONS CHANGING FROM DESIGN CONDITIONS.

Condition Change	R-22 Change Cooling Mode	Heating Mode
Decrease Indoor Airflow	Decrease	Increase
Increase Indoor Airflow	Increase	Decrease
Lower Indoor Temperature	Decrease	Increase
Raise Indoor Temperature	Increase	Decrease
75° Indoor Heat or Cool	Decrease	Decrease
65° Indoor Heat or Cool	Decrease	Increase

(REF. NO. 92-20477-54-02)

MODEL OUTDOOR UNIT: (-)PFA-060 MODEL INDOOR UNIT/COIL RCPB-B060

Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
COOL	105+													42	44	45	46	48	49	50	52
COOL	105												44	45	47	48	49	51	52	53	55
COOL	100												48	49	51	52	53	55	56	57	59
COOL	95											50	52	53	55	56	57	59	60	61	
COOL	90										54	55	57	58	60	61	62	64	65		
COOL MODE	85									56	58	59	61	62	64	65	66	68			
COOL MODE	80									60	62	63	65	66	68	69	70				
COOL MODE	75								64	65	67	68	70	71	73	74					
COOL MODE	70							66	68	69	71	72	74	75	77						
COOL MODE	65						69	70	72	73	75	76	78	79							
HEAT MODE	62						51	52	54	55	57	58	60								
HEAT MODE	57					44	46	47	49	50	52	53									
HEAT MODE	52				38	40	42	43	45	46	48										
HEAT MODE	47		31	33	34	36	38	39	41												
HEAT MODE	42	25	27	29	30	32	34	35													

TABLE 1

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT	37	207	227	243	24
HEAT	32	190	208	228	22
HEAT	27	176	193	215	20
HEAT	22	164	181	204	18
HEAT	17	153	172	194	16
MODE	12	143	163	186	14
MODE	7	134	156	178	12
MODE	2	128	151	173	10
MODE	-3	123	147	169	8
MODE	-8	120	143	166	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-65-03)

MODEL OUTDOOR UNIT: (-)PFA-048 MODEL INDOOR UNIT/COIL RCPB-B048

Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C 105+													41	43	44	45	47	48	49	51
O 105												46	47	49	50	51	53	54	55	57
O 100												48	49	51	52	53	55	56	57	59
L 95											49	51	52	54	55	56	58	59	60	
90										51	52	54	55	57	58	59	61	62		
M 85									52	54	55	57	58	60	61	62	64			
O 80									55	57	58	60	61	63	64	65				
D 75								56	57	59	60	62	63	65	66					
E 70							57	59	60	62	63	65	66	68						
65						59	60	62	63	65	66	68	69							
H M 62						54	55	57	58	60	61	63								
E O 57					47	49	50	52	53	55	56									
A D 52				41	43	45	46	48	49	51										
T E 47		34	36	37	39	41	42	44												
42	28	30	32	33	35	37	38													

Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H 37	168	190	211	22
E 32	158	180	200	20
A 27	150	171	191	18
T 22	143	164	184	16
17	137	159	178	15
M 12	133	154	174	13
O 7	129	151	170	12
D 2	126	147	167	10
E -3	123	145	164	8
-8	121	143	162	6

MODEL OUTDOOR UNIT: (-)PFA-048 MODEL INDOOR UNIT/COIL RCPB-B060

Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C 105+													41	43	44	45	47	48	49	51
O 105												43	44	46	47	48	50	51	52	54
O 100												47	48	50	51	52	54	55	56	58
L 95											47	49	50	52	53	54	56	57	58	
90										49	50	52	53	55	56	57	59	60		
M 85									51	53	54	56	57	59	60	61	63			
O 80									54	56	57	59	60	62	63	64				
D 75								56	57	59	60	62	63	65	66					
E 70							57	59	60	62	63	65	66	68						
65						60	61	63	64	66	67	69	70							
H M 62						57	58	60	61	63	64	66								
E O 57					51	53	54	56	57	59	60									
A D 52				45	47	49	50	52	53	55										
T E 47		38	40	41	43	45	46	48												
42	32	34	36	37	39	41	42													

TABLE 1

Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H 37	166	188	206	22
E 32	155	177	194	20
A 27	146	169	185	18
T 22	140	162	178	16
17	134	156	172	15
M 12	129	151	167	13
O 7	125	147	163	12
D 2	122	143	160	10
E -3	119	140	157	8
-8	117	138	154	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-64-02)

MODEL OUTDOOR UNIT: (-)PFA-042 MODEL INDOOR UNIT/COIL RCPB-B042

Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
C	105+													41	43	44	45	47	48	49	51
O	105												46	47	49	50	51	53	54	55	57
O	100												49	50	52	53	54	56	57	58	60
L	95											52	54	55	57	58	59	61	62	63	
	90										56	57	59	60	62	63	64	66	67		
M	85									59	61	62	64	65	67	68	69	71			
O	80									64	66	67	69	70	72	73	74				
D	75								68	69	71	72	74	75	77	78					
E	70							71	73	74	76	77	79	80	82						
	65						75	76	78	79	81	82	84	85							
H M	62						55	56	58	59	61	62	64								
E O	57					49	51	52	54	55	57	58									
A D	52				42	44	46	47	49	50	52										
T E	47		35	37	38	40	42	43	45												
	42	29	31	33	34	36	38	39													

	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	186	208	223	21
E	32	173	195	211	19
A	27	162	183	202	17
T	22	153	174	194	15
	17	145	167	186	13
M	12	139	162	181	11
O	7	134	156	176	9
D	2	129	151	172	7
E	-3	125	147	168	5
	-8	122	144	165	4

MODEL OUTDOOR UNIT: (-)PFA-042 MODEL INDOOR UNIT/COIL RCPB-B048

Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
C	105+													41	43	44	45	47	48	49	51
O	105												41	42	44	45	46	48	49	50	52
O	100												45	46	48	49	50	52	53	54	56
L	95											48	50	51	53	54	55	57	58	59	
	90										52	53	55	56	58	59	60	62	63		
M	85									54	56	57	59	60	62	63	64	66			
O	80									59	61	62	64	65	67	68	69				
D	75								63	64	66	67	69	70	72	73					
E	70							65	67	68	70	71	73	74	76						
	65						69	70	72	73	75	76	78	79							
H M	62						55	56	58	59	61	62	64								
E O	57					48	50	51	53	54	56	57									
A D	52				42	44	46	47	49	50	52										
T E	47		35	37	38	40	42	43	45												
	42	29	31	33	34	36	38	39													

TABLE 1

	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	178	203	218	22
E	32	165	188	206	20
A	27	155	178	197	18
T	22	147	170	190	16
	17	140	163	183	14
M	12	135	157	177	12
O	7	130	152	173	10
D	2	126	148	169	8
E	-3	122	144	166	6
	-8	120	141	163	5

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-63-02)

MODEL OUTDOOR UNIT: (-)PFA-036 MODEL INDOOR UNIT/COIL RCPB-B036

Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
C	105+													45	47	48	49	51	52	53	55
O	105												49	50	52	53	54	56	57	58	60
O	100												53	54	56	57	58	60	61	62	64
L	95											53	55	56	58	59	60	62	63	64	
	90										57	58	60	61	63	64	65	67	68		
M	85									59	61	62	64	65	67	68	69	71			
O	80									62	64	65	67	68	70	71	72				
D	75								65	66	68	69	71	72	74	75					
E	70							67	69	70	72	73	75	76	78						
	65						69	70	72	73	75	76	78	79							
H M	62						50	51	53	54	56	57	59								
E O	57					44	46	47	49	50	52	53									
A D	52				38	40	42	43	45	46	48										
T E	47		31	33	34	36	38	39	41												
	42	25	27	29	30	32	34	35													

	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	195	220	250	21
E	32	183	207	237	20
A	27	173	196	225	18
T	22	164	186	214	16
	17	156	178	204	14
M	12	150	171	196	12
O	7	144	164	189	11
D	2	138	158	183	9
E	-3	133	153	177	7
	-8	129	149	172	5

MODEL OUTDOOR UNIT: (-)PFA-036 MODEL INDOOR UNIT/COIL RCPB-B039

Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
C	105+													47	49	50	51	53	54	55	57
O	105												51	52	54	55	56	58	59	60	62
O	100												55	56	58	59	60	62	63	64	66
L	95											55	57	58	60	61	62	64	65	66	
	90										59	60	62	63	65	66	67	69	70		
M	85									61	63	64	66	67	69	70	71	73			
O	80									64	66	67	69	70	72	73	74				
	75								67	68	70	71	73	74	76	77					
E	70							69	71	72	74	75	77	78	80						
	65						71	72	74	75	77	78	80	81							
H M	62						60	61	63	64	66	67	69								
E O	57					54	56	57	59	60	62	63									
A D	52				48	50	52	53	55	56	58										
T E	47		41	43	44	46	48	49	51												
	42	35	37	39	40	42	44	45													

TABLE 1

	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	183	208	237	21
E	32	172	196	224	20
A	27	163	186	213	18
T	22	156	178	204	16
	17	149	171	195	14
M	12	143	165	189	12
O	7	138	159	182	11
D	2	133	153	176	9
E	-3	128	148	171	7
	-8	124	144	166	5

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-62-02)

MODEL OUTDOOR UNIT: (-)PCB-036 MODEL INDOOR UNIT/COIL RCPB-B036

Mode	Outdoor Ambient °F	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F: 42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
COOL MODE	105+													45	47	48	49	51	52	53	55
	105												49	50	52	53	54	56	57	58	60
	100												53	54	56	57	58	60	61	62	64
	95											53	55	56	58	59	60	62	63	64	
	90										57	58	60	61	63	64	65	67	68		
	85									59	61	62	64	65	67	68	69	71			
	80									62	64	65	67	68	70	71	72				
	75								65	66	68	69	71	72	74	75					
	70							67	69	70	72	73	75	76	78						
	65						69	70	72	73	75	76	78	79							
HEAT MODE	62						50	51	53	54	56	57	59								
	57					44	46	47	49	50	52	53									
	52				38	40	42	43	45	46	48										
	47		31	33	34	36	38	39	41												
	42	25	27	29	30	32	34	35													

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 (Head-PSIG*)	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE	37	195	220	250	21
	32	183	207	237	20
	27	173	196	225	18
	22	164	186	214	16
	17	156	178	204	14
	12	150	171	196	12
	7	144	166	189	11
	2	138	158	183	9
	-3	133	153	177	7
	-8	129	149	172	5

MODEL OUTDOOR UNIT: (-)PCB-036 MODEL INDOOR UNIT/COIL RCPB-B039

Mode	Outdoor Ambient °F	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F: 42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
COOL MODE	105+													47	49	50	51	53	54	55	57
	105												51	52	54	55	56	58	59	60	62
	100												55	56	58	59	60	62	63	64	66
	95											55	57	58	60	61	62	64	65	66	
	90										59	60	62	63	65	66	67	69	70		
	85									61	63	64	66	67	69	70	71	73			
	80									64	66	67	69	70	72	73	74				
	75								67	68	70	71	73	74	76	77					
	70							69	71	72	74	75	77	78	80						
	65						71	72	74	75	77	78	80	81							
HEAT MODE	62						60	61	63	64	66	67	69								
	57					54	56	57	59	60	62	63									
	52				48	50	52	53	55	56	58										
	47		41	43	44	46	48	49	51												
	42	35	37	39	40	42	44	45													

TABLE 1

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 (Head-PSIG*)	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE	37	183	208	237	21
	32	172	196	224	20
	27	163	186	213	18
	22	156	178	204	16
	17	149	171	195	14
	12	143	165	189	12
	7	138	159	182	11
	2	133	153	176	9
	-3	128	148	171	7
	-8	124	144	166	5

TABLE 2

PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-58-02)

MODEL OUTDOOR UNIT: (-)PFA-030 MODEL INDOOR UNIT/COIL RCPB-B036

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C	105+													52	54	55	56	58	59	60	62
O	105												54	55	57	58	59	61	62	63	65
O	100												56	57	59	60	61	63	64	65	67
L	95											57	59	60	62	63	64	66	67	68	
	90										58	59	61	62	64	65	66	68	69		
M	85									58	60	61	63	64	66	67	68	70			
O	80									60	62	63	65	66	68	69	70				
D	75								61	62	64	65	67	68	70	71					
E	70							61	63	64	66	67	69	70	72						
	65						63	64	66	67	69	70	72	73							
H M	62						58	59	61	62	64	65	67								
E O	57					52	54	55	57	58	60	61									
A D	52				46	48	50	51	53	54	56										
T E	47		39	41	42	44	46	47	49												
	42	33	35	37	38	40	42	43													

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	177	202	229	22
E	32	169	194	220	20
A	27	162	186	211	18
T	22	156	180	204	17
	17	151	174	198	15
M	12	146	168	192	13
O	7	142	164	187	12
D	2	139	160	183	10
E	-3	136	157	179	8
	-8	133	153	176	6

MODEL OUTDOOR UNIT: (-)PFA-030 MODEL INDOOR UNIT/COIL RCPB-B039

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C	105+													52	54	55	56	58	59	60	62
O	105												54	55	57	58	59	61	62	63	65
O	100												56	57	59	60	61	63	64	65	67
L	95											57	59	60	62	63	64	66	67	68	
	90										58	59	61	62	64	65	66	68	69		
M	85									58	60	61	63	64	66	67	68	70			
O	80									60	62	63	65	66	68	69	70				
D	75								61	62	64	65	67	68	70	71					
E	70							61	63	64	66	67	69	70	72						
	65						63	64	66	67	69	70	72	73							
H M	62						56	57	59	60	62	63	65								
E O	57					50	52	53	55	56	58	59									
A D	52				44	46	48	49	51	52	54										
T E	47		37	39	40	42	44	45	47												
	42	31	33	35	36	38	40	41													

TABLE 1

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
H	37	171	198	224	22
E	32	164	190	215	20
A	27	157	182	207	18
T	22	151	175	200	17
	17	146	170	194	15
M	12	142	165	188	13
O	7	138	160	183	12
D	2	135	156	179	10
E	-3	132	153	175	8
	-8	129	150	172	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-61-02)

MODEL OUTDOOR UNIT: (-)PCB-030 MODEL INDOOR UNIT/COIL RCPB-B036

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE	105+													52	54	55	56	58	59	60	62
	105												54	55	57	58	59	61	62	63	65
	100												56	57	59	60	61	63	64	65	67
	95											57	59	60	62	63	64	66	67	68	
	90										58	59	61	62	64	65	66	68	69		
	85									58	60	61	63	64	66	67	68	70			
	80									60	62	63	65	66	68	69	70				
	75								61	62	64	65	67	68	70	71					
	70							61	63	64	66	67	69	70	72						
	65						63	64	66	67	69	70	72	73							
HEAT MODE	62						58	59	61	62	64	65	67								
	57					52	54	55	57	58	60	61									
	52				46	48	50	51	53	54	56										
	47		39	41	42	44	46	47	49												
	42	33	35	37	38	40	42	43													

Mode	Outdoor Ambient °F	Indoor Temp. °F 60	70	80	Temp. °F Change Across Indoor Coil
		Head-PSIC*			
HEAT MODE	37	177	202	229	22
	32	169	194	220	20
	27	162	186	211	18
	22	156	180	204	17
	17	151	174	198	15
	12	146	168	192	13
	7	142	164	187	12
	2	139	160	183	10
	-3	136	157	179	8
	-8	133	153	176	6

MODEL OUTDOOR UNIT: (-)PCB-030 MODEL INDOOR UNIT/COIL RCPB-B039

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE	105+													52	54	55	56	58	59	60	62
	105												54	55	57	58	59	61	62	63	65
	100												56	57	59	60	61	63	64	65	67
	95											57	59	60	62	63	64	66	67	68	
	90										58	59	61	62	64	65	66	68	69		
	85									58	60	61	63	64	66	67	68	70			
	80									60	62	63	65	66	68	69	70				
	75								61	62	64	65	67	68	70	71					
	70							61	63	64	66	67	69	70	72						
	65						63	64	66	67	69	70	72	73							
HEAT MODE	62						56	57	59	60	62	63	65								
	57					50	52	53	55	56	58	59									
	52				44	46	48	49	51	52	54										
	47		37	39	40	42	44	45	47												
	42	31	33	35	36	38	40	41													

TABLE 1

Mode	Outdoor Ambient °F	Indoor Temp. °F 60	70	80	Temp. °F Change Across Indoor Coil
		Head-PSIG*			
HEAT MODE	37	171	198	224	22
	32	164	190	215	20
	27	157	182	207	18
	22	151	175	200	17
	17	146	170	194	15
	12	142	165	188	13
	7	138	160	183	12
	2	135	156	179	10
	-3	132	153	175	8
	-8	129	150	172	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-57-02)

MODEL OUTDOOR UNIT: (-)PCB-024/(-)PFA-024 MODEL INDOOR UNIT/COIL (-)EQ#-9XXXXF

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C	105+													46	48	49	50	52	53	54	56
O	105												49	50	52	53	54	56	57	58	60
O	100												53	54	56	57	58	60	61	62	64
L	95											56	58	59	61	62	63	65	66	67	
	90										60	61	63	64	66	67	68	70	71		
M	85									63	65	66	68	69	71	72	73	75			
O	80									68	70	71	73	74	76	77	78				
D	75								72	73	75	76	78	79	81	82					
E	70							75	77	78	80	81	83	84	86						
	65						79	80	82	83	85	86	88	89							
H M	62						55	56	58	59	61	62	64								
E O	57					49	51	52	54	55	57	58									
A D	52				43	45	47	48	50	51	53										
T E	47		36	38	39	41	43	44	46												
	42	30	32	34	35	37	39	40													

	Outdoor Ambient °F	Indoor Temp. °F 60	70	80 Head-PSIG*	Temp. °F Change Across Indoor Coil
H	37	180	203	234	23
E	32	170	192	222	21
A	27	162	184	213	19
T	22	155	177	205	17
	17	149	171	198	15
M	12	144	165	192	13
O	7	140	161	187	10
D	2	136	157	183	8
E	-3	134	154	179	6
	-8	131	151	176	4

MODEL OUTDOOR UNIT: (-)PCB-024/(-)PFA-024 MODEL INDOOR UNIT/COIL RCPB-B024

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C	105+													45	47	48	49	51	52	53	55
O	105												50	51	53	54	55	57	58	59	61
O	100												54	55	57	58	59	61	62	63	65
L	95											56	58	59	61	62	63	65	66	67	
	90										59	60	62	63	65	66	67	69	70		
M	85									61	63	64	66	67	69	70	71	73			
O	80									65	67	68	70	71	73	74	75				
D	75								68	69	71	72	74	75	77	78					
E	70							70	72	73	75	76	78	79	81						
	65						73	74	76	77	79	80	82	83							
H M	62						50	51	53	54	56	57	59								
E O	57					44	46	47	49	50	52	53									
A D	52				38	40	42	43	45	46	48										
T E	47		31	33	34	36	38	39	41												
	42	25	27	29	30	32	34	35													

	Outdoor Ambient °F	Indoor Temp. °F 60	70	80 Head-PSIG*	Temp. °F Change Across Indoor Coil
H	37	176	200	230	23
E	32	167	190	219	21
A	27	159	181	210	19
T	22	152	174	202	17
	17	147	168	195	15
M	12	142	163	190	13
O	7	138	158	185	10
D	2	135	155	181	8
E	-3	132	152	177	6
	-8	129	149	174	4

MODEL OUTDOOR UNIT: (-)PCB-024/(-)PFA-024 MODEL INDOOR UNIT/COIL RCPB-B027

	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
C	105+													41	43	44	45	47	48	49	51
O	105												46	47	49	50	51	53	54	55	57
O	100												52	53	55	56	57	59	60	61	63
L	95											53	55	56	58	59	60	62	63	64	
	90										55	56	58	59	61	62	63	65	66		
M	85									56	58	59	61	62	64	65	66	68			
O	80									60	62	63	65	66	68	69	70				
D	75								62	63	65	66	68	69	71	72					
E	70							63	65	66	68	69	71	72	74						
	65						66	67	69	70	72	73	75	76							
H M	62						50	51	53	54	56	57	59								
E O	57					44	46	47	49	50	52	53									
A D	52				38	40	42	43	45	46	48										
T E	47		31	33	34	36	38	39	41												
	42	25	27	29	30	32	34	35													

TABLE 1

	Outdoor Ambient °F	Indoor Temp. °F 60	70	80 Head-PSIG*	Temp. °F Change Across Indoor Coil
H	37	171	196	226	23
E	32	162	185	214	21
A	27	154	176	204	19
T	22	148	169	196	17
	17	142	163	190	15
M	12	138	159	184	13
O	7	134	155	180	10
D	2	131	151	176	8
E	-3	128	148	173	6
	-8	126	146	170	4

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-87-01)

MODEL OUTDOOR UNIT: (-)PCB-018/(-)PFA-018 MODEL INDOOR UNIT/COIL (-)EQ#-9XXXXE

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE	105+													52	54	55	56	58	59	60	62
	105												54	55	57	58	59	61	62	63	65
	100												56	57	59	60	61	63	64	65	67
	95											57	59	60	62	63	64	66	67	68	
	90										59	60	62	63	65	66	67	69	70		
	85									59	61	62	64	65	67	68	69	71			
	80									62	64	65	67	68	70	71	72				
	75								63	64	66	67	69	70	72	73					
	70							64	66	67	69	70	72	73	75						
	65						66	67	69	70	72	73	75	76							
HEAT MODE	62						61	62	64	65	67	68	70								
	57					56	58	59	61	62	64	65									
	52				50	52	54	55	57	58	60										
	47		43	45	46	48	50	51	53												
	42	37	39	41	42	44	46	47													

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE	37	181	202	225	23
	32	171	192	215	21
	27	162	183	205	19
	22	154	174	196	17
	17	147	167	189	15
	12	142	161	182	13
	7	137	156	177	12
	2	133	152	173	10
	-3	130	149	170	8
	-8	128	147	166	6

MODEL OUTDOOR UNIT: (-)PCB-018/(-)PFA-018 MODEL INDOOR UNIT/COIL RCPB-B018

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE	105+													52	54	55	56	58	59	60	62
	105												54	55	57	58	59	61	62	63	65
	100												56	57	59	60	61	63	64	65	67
	95											57	59	60	62	63	64	66	67	68	
	90										59	60	62	63	65	66	67	69	70		
	85									59	61	62	64	65	67	68	69	71			
	80									63	65	66	68	69	71	72	73				
	75								65	66	68	69	71	72	74	75					
	70							65	67	68	70	71	73	74	76						
	65						67	68	70	71	73	74	76	77							
HEAT MODE	62						58	59	61	62	64	65	67								
	57					52	54	55	57	58	60	61									
	52				46	48	50	51	53	54	56										
	47		39	41	42	44	46	47	49												
	42	33	35	37	38	40	42	43													

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE	37	178	200	222	19
	32	168	190	212	18
	27	160	181	202	16
	22	152	172	194	15
	17	145	165	186	13
	12	139	159	180	12
	7	134	154	175	10
	2	131	150	171	8
	-3	128	147	168	7
	-8	126	145	166	5

MODEL OUTDOOR UNIT: (-)PCB-018/(-)PFA-018 MODEL INDOOR UNIT/COIL RCPB-B024

Mode	Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
		Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE	105+													47	49	50	51	53	54	55	57
	105												50	51	53	54	55	57	58	59	61
	100												55	56	58	59	60	62	63	64	66
	95											57	59	60	62	63	64	66	67	68	
	90										60	61	63	64	66	67	68	70	71		
	85									62	64	65	67	68	70	71	72	74			
	80									67	69	70	72	73	75	76	77				
	75								69	70	72	73	75	76	78	79					
	70							72	74	75	77	78	80	81	83						
	65						75	76	78	79	81	82	84	85							
HEAT MODE	62						57	58	60	61	63	64	66								
	57					51	53	54	56	57	59	60									
	52				45	47	49	50	52	53	55										
	47		38	40	41	43	45	46	48												
	42	32	34	36	37	39	41	42													

TABLE 1

Mode	Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE	37	174	195	218	20
	32	164	185	207	19
	27	155	175	198	17
	22	147	167	190	15
	17	140	161	182	14
	12	135	154	176	12
	7	131	150	171	11
	2	127	146	168	9
	-3	125	143	165	8
	-8	123	141	163	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-86-01)

MODEL OUTDOOR UNIT: (-)PCB-013 MODEL INDOOR UNIT/COIL RCPS-A013

Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE 105+														41	42	43	45	46	47	48
105													41	43	44	45	47	48	49	50
100													43	45	46	47	49	50	51	52
95												45	46	48	49	50	52	53	54	55
90											52	54	55	57	58	59	61	62	63	
85										61	62	64	65	67	68	69	71	72		
80									64	65	66	67	69	71	72	73	75			
75								65	67	68	69	71	72	74	75	76				
70							67	68	70	71	72	74	75	77	78					
65						69	70	71	73	74	75	77	78	80						
HEAT MODE 62						55	57	59	60	62	63	65	66	67						
57					48	49	51	53	54	56	57	59	60	61						
52				39	41	43	44	46	47	49	50	52	53							
47			31	32	34	36	37	39	40	42	43	45								
42		24	25	26	28	30	31	33	34	36	37									

Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE 37	180	199	220	20
32	166	188	209	18
27	158	179	199	17
22	150	169	190	14
17	142	162	182	12
12	135	155	175	10
7	128	148	168	8
2	121	141	161	7
-3	114	134	154	6
-8	107	127	147	5

MODEL OUTDOOR UNIT: (-)PCB-013 MODEL INDOOR UNIT/COIL (-)EQ#-9XXXXD

Outdoor Ambient °F	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
	Suction Pressure At Compressor - PSIG / Suction Line Temperature At Compressor - °F																			
COOL MODE 105+									42	43	45	46	47	48	49	50	51	53		
105								45	46	47	49	50	51	53	54	55	56			
100								51	52	53	54	55	56	58	59	60				
95							52	54	55	56	57	59	60	62	63					
90						60	61	62	63	64	65	67	68	70						
85					64	65	67	68	69	71	72	74	75							
80					68	69	71	72	73	75	76	78								
75				70	71	72	74	75	76	78	79									
70			71	72	74	75	76	78	79	80										
65		73	74	75	76	78	79	80												
HEAT MODE 62		56	57	58	59	61	63	65	66	68										
57		52	53	55	56	57	59	61	62											
52	45	47	48	49	51	52	54	56												
47	39	40	42	43	45	46	48	50												
42	31	33	35	36	38	39	41													

TABLE 1

Outdoor Ambient °F	Indoor Temp. °F 60 Head-PSIG*	70	80	Temp. °F Change Across Indoor Coil
HEAT MODE 37	192	212	230	22
32	180	195	213	19
27	165	184	202	17
22	155	175	193	16
17	147	167	185	15
12	139	159	177	13
7	131	151	169	10
2	123	143	161	8
-3	115	135	153	7
-8	109	129	147	6

TABLE 2

*PSIG AT HOT GAS SERVICE PORT.

Below 40°F in heating mode, use head pressure table.

Temperature change across indoor coil greater than shown indicates low indoor airflow.

(REF. NO. 92-20477-53-04)

TYPICAL REMOTE HEAT PUMP SYSTEM WIRING SCHEMATICS

The outdoor units, covered by schematics shown in this booklet, include (-)PCB, (-)PFA and (-)PGB-, [(-)PGA produced after 12/1/84]. The changeover relay on these models is energized in the heating mode rather than the cooling mode. These units require a different heat pump thermostat and subbase than used on previous heat pump models. All models requiring the new thermostats and subbase are provided with a blue caution tag attached to the blue low voltage lead in the outdoor unit. The blue lead must be connected to "B" terminal on the thermostat subbase. Previous models had an orange lead connected to "O" terminal on the subbase.

Includes:

- Typical outdoor heat pump sections "(-)PCB", "(-)PFA", "(-)PGA-" & "(-)PGB-"
- Typical indoor heat pump sections "(-)HQA"
- Typical indoor fossil fuel furnace
- Typical heat pump thermostat

Thermostat Number					With Matching Sub-base No.
41-20796- M/H T874R	25, 1459,	28, 1442,	32 1434	Manual Changeover	41-20796- 24 M/H Q674L1504
41-20796- M/H T841A	35, 1092,	38, 1035,	42 1076	Manual Changeover	Included in Thermostat
41-20806- W/R 1F58-	17, 65,	18, 66,	19 67	Manual Changeover	41-20806- 21 W/R S28 - 24
41-20796- M/H T874C	27, 1612,	30 1620		Manual Changeover (Special Temp. Range)	41-20796- 24 M/H Q674L1504
41-21594- M/H T8300A1011	01			Night Setback	41-21594- 02 M/H Q6300A1002
41-20797- M/H T874G1493	18			Automatic Changeover	41-20797- 17 M/H Q674F1360

- Optional outdoor stats & emerg. heat relay "RXPT-A04"
- Optional heat pump monitor "RXPM-B01"-
- Fossil fuel kit "RXPF-C01"
- Fossil fuel kit "RXPF-D02"
- Optional zero degree low ambient control package RXPZ-C01
  DO NOT use RXPZ-B01 (for outdoor units energized in cooling only)

NOTE: Monitor pressure sensor (SM) must be mounted in liquid line. **DO NOT** mount sensor in discharge (suct) line on (-)PCB & (-)PFA units.

90-21780-04
- Outdoor unit - Solid State time-temp defrost 3ø 460 volt "(-)PCB", "(-)PFA"
  Indoor unit - Typical heat pump air handler "(-)HQA"
  Optional - Outdoor stats & emerg. heat relay "RXPT-A04"
  Optional - Heat pump monitor "RXPM-B01"
- Outdoor unit - Solid State time-temp defrost 1ø 208/230 "(-)PCB", "(-)PFA"
  Indoor unit - Typical heat pump air handler "(-)HQA"
  (Solid State time-temp defrost control could be: Essex (621-110), Thermo-disc (23E11 (8054)), Robertshaw (TD-11), or Honeywell (ST74A1004))

90-21780-05
- Outdoor unit - Solid State demand defrost 3ø 460 volt "(-)PGA", "(-)PGB-"
  Indoor unit - Typical fossil fuel furnace (gas or oil)
  Accessory - Fossil fuel kit "RXPF-D02"
  Optional - Heat pump monitor "RXPM-B01"
- Outdoor unit - Solid State demand defrost 1ø 208/230 "(-)PGA", "(-)PGB-"
  Indoor unit - Typical fossil fuel furnace (gas or oil)
  Accessory - Fossil fuel kit "RXPF-D02"
  (Demand defrost control could be Essex 149-480 or 149-600)

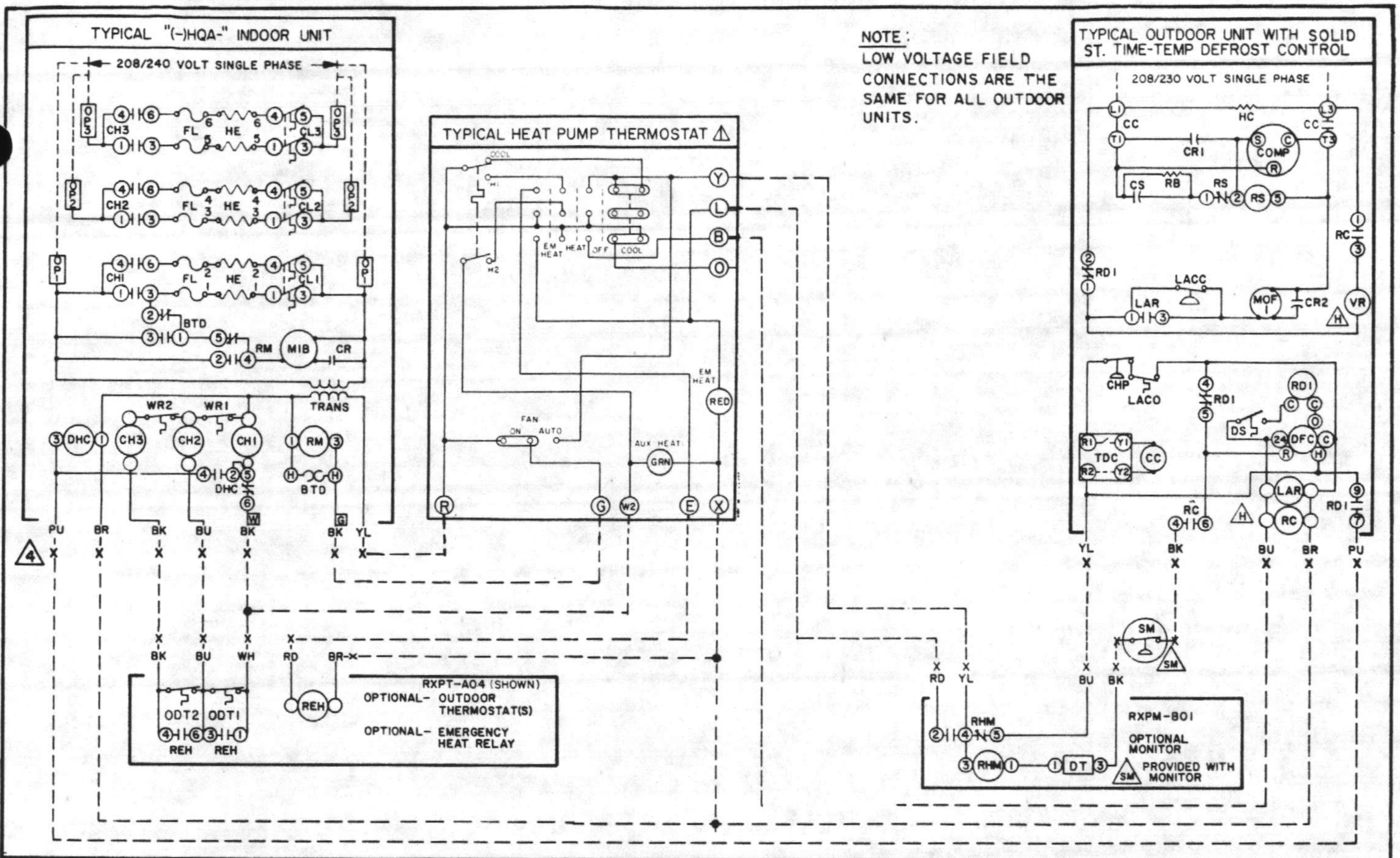
90-21780-06
- Outdoor unit - Ranco time-temp defrost 1ø 208/230 "(-)PCB", "(-)PFA"
  Indoor unit - Typical fossil fuel furnace (gas or oil)
  Accessory - Fossil fuel kit "RXPF-C01"
  Optional - Heat pump monitor "RXPM-B01"
- Outdoor unit - Ranco time-temp defrost (621) 3ø 460 volt "(-)PCB", "(-)PFA"
  Indoor unit - Typical fossil fuel furnase (gas or oil)
  Accessory - Fossil fuel kit "RXPF-C01"

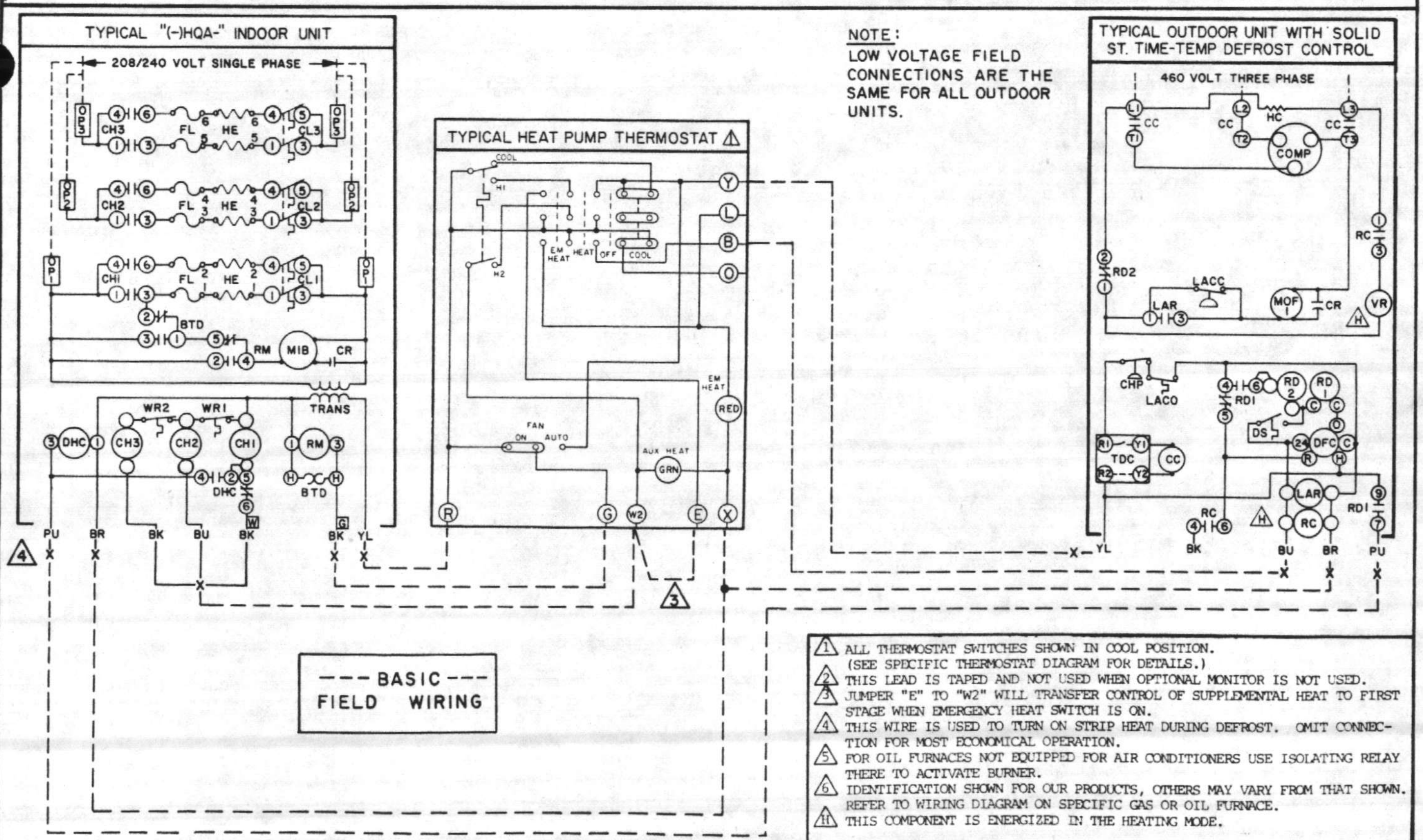
NOTE:
LOW VOLTAGE FIELD CONNECTIONS ARE THE SAME FOR ALL OUTDOOR UNITS

NOTE: Low voltage control schematics for 3ø 208/230 volt outdoor units are the same as that for 1ø 208/230 volt outdoor units.

CAUTION: Refer to wiring diagrams attached to equipment and accessories which may reflect revisions in wiring not shown on typical system schematics.

92-21779-02-04





1. ALL THERMOSTAT SWITCHES SHOWN IN COOL POSITION. (SEE SPECIFIC THERMOSTAT DIAGRAM FOR DETAILS.)
2. THIS LEAD IS TAPED AND NOT USED WHEN OPTIONAL MONITOR IS NOT USED.
3. JUMPER "E" TO "W2" WILL TRANSFER CONTROL OF SUPPLEMENTAL HEAT TO FIRST STAGE WHEN EMERGENCY HEAT SWITCH IS ON.
4. THIS WIRE IS USED TO TURN ON STRIP HEAT DURING DEFROST. OMIT CONNECTION FOR MOST ECONOMICAL OPERATION.
5. FOR OIL FURNACES NOT EQUIPPED FOR AIR CONDITIONERS USE ISOLATING RELAY THERE TO ACTIVATE BURNER.
6. IDENTIFICATION SHOWN FOR OUR PRODUCTS, OTHERS MAY VARY FROM THAT SHOWN. REFER TO WIRING DIAGRAM ON SPECIFIC GAS OR OIL FURNACE.

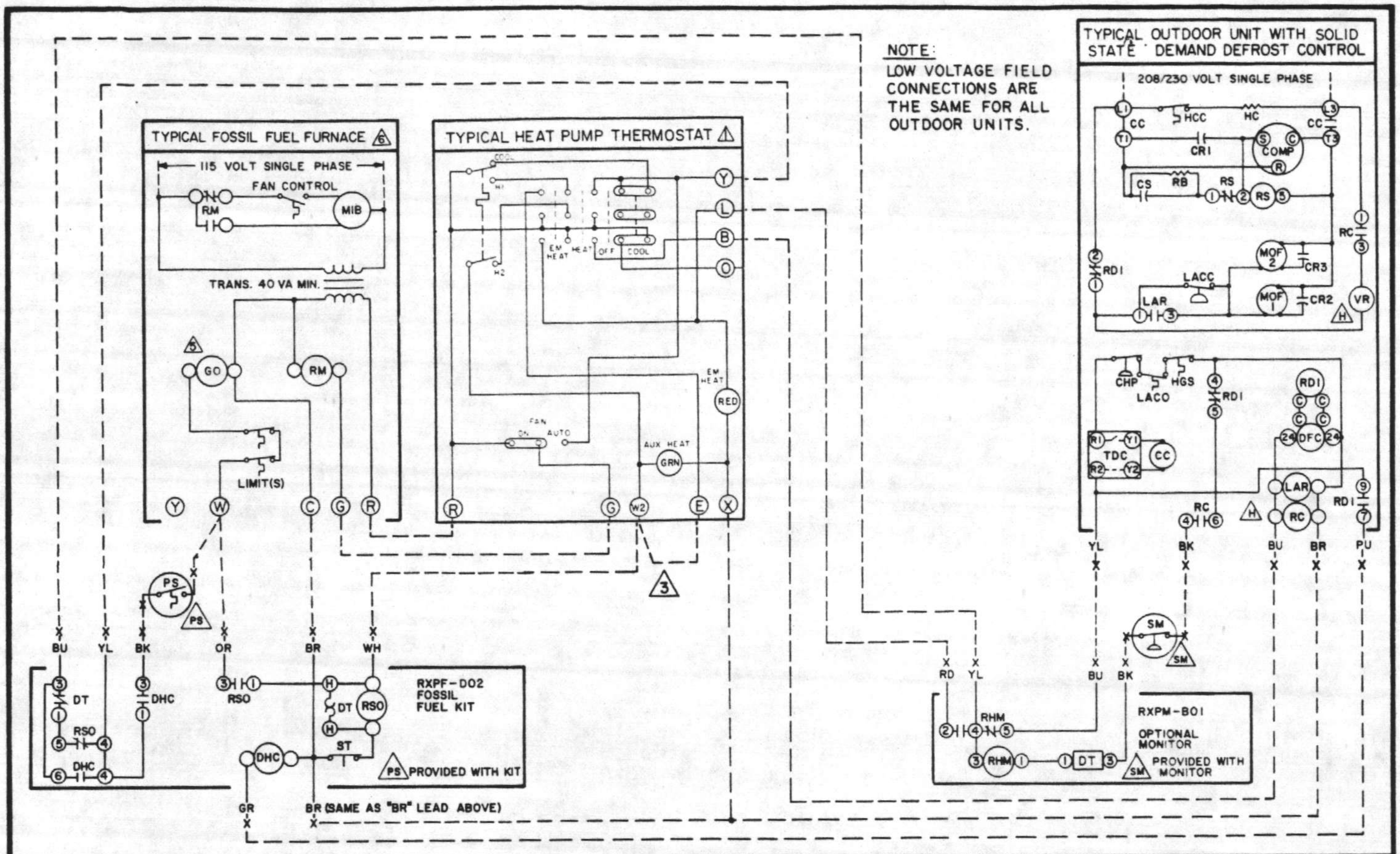
H. THIS COMPONENT IS ENERGIZED IN THE HEATING MODE.

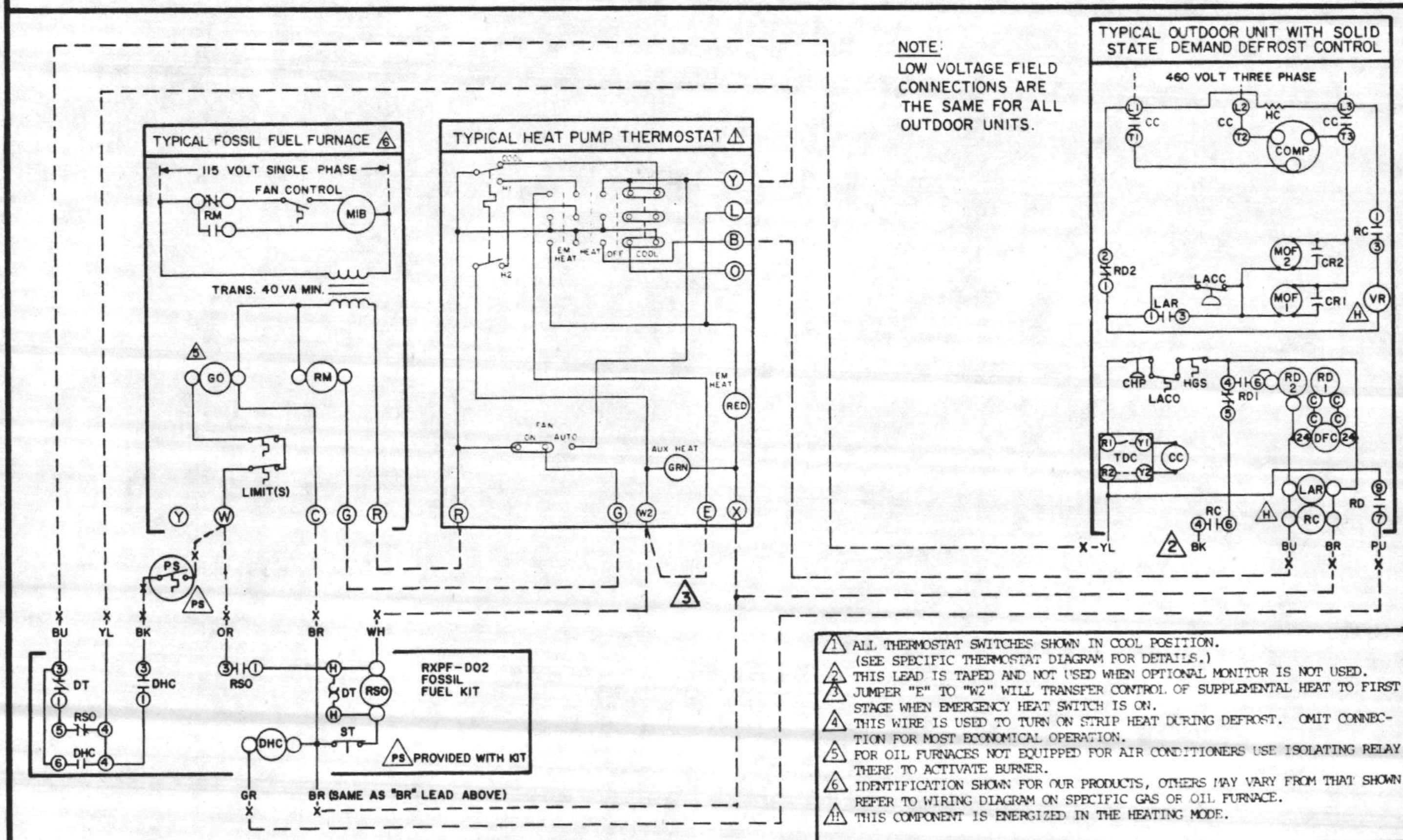
BTD	BLOWER TIME DELAY	DS	DEFROST SENSOR	LAR	RELAY LOW AMBIENT (OPT)	RHM	RELAY HEAT MONITOR (OPT)	WR	WATT RESTRICTOR
CC	CONTACTOR	DT	DELAY TIMER	MIB	MOTOR INDOOR BLOWER	RM	RELAY, BLOWER MOTOR		
CH	HEATER CONTROL	FL	FUSE LINK	MOF	MOTOR OUTDOOR FAN	RS	RELAY START (OPT)	X	WIRE NUT
CHP	CONTROL HIGH PRESSURE	GO	GAS VALVE OR BURNER CONTROL	ODT	OUTDOOR THERMOSTAT	RSO	RELAY SWITCHOVER	BK	BLACK
CL	LIMIT CONTROL	HC	HEATER CRANKCASE	OP	OVERCURRENT PROTECTOR	SM	SENSOR MONITOR	BU	BLUE
COMP	COMPRESSOR	HCC	CRANKCASE HEAT CONTROL (OPT)	PS	PLENUM SWITCH	ST	SWITCH TOGGLE	BR	BROWN
CR	CAPACITOR RUN	HE	HEATER ELEMENT	RB	RESISTOR BLEED (OPT)	TD	TIMER DEFROST	GR	GREEN
CS	CAPACITOR START (OPT)	HGS	HOT GAS SENSOR	RC	RELAY CHANGEOVER	TDC	TIME DELAY CONTROL (OPT)	---	FACTORY
DFC	DEFROST CONTROL	LACC	LOW AMB.COOLING CONT.(OPT)	RD	RELAY DEFROST	TRANS	TRANSFORMER		
DHC	DEFROST, HEATER CONTROL	LACO	LOW AMBIENT CUTOUT (OPT)	REH	RELAY EMERGENCY HEAT	VR	VALVE, REVERSING		

WIRE CODE

OR	ORANGE
PU	PURPLE
RD	RED
WH	WHITE
YL	YELLOW
---	FIELD

90-21780-04-02





1. ALL THERMOSTAT SWITCHES SHOWN IN COOL POSITION. (SEE SPECIFIC THERMOSTAT DIAGRAM FOR DETAILS.)
2. THIS LEAD IS TAPED AND NOT USED WHEN OPTIONAL MONITOR IS NOT USED.
3. JUMPER "E" TO "W2" WILL TRANSFER CONTROL OF SUPPLEMENTAL HEAT TO FIRST STAGE WHEN EMERGENCY HEAT SWITCH IS ON.
4. THIS WIRE IS USED TO TURN ON STRIP HEAT DURING DEFROST. OMIT CONNECTION FOR MOST ECONOMICAL OPERATION.
5. FOR OIL FURNACES NOT EQUIPPED FOR AIR CONDITIONERS USE ISOLATING RELAY THERE TO ACTIVATE BURNER.
6. IDENTIFICATION SHOWN FOR OUR PRODUCTS, OTHERS MAY VARY FROM THAT SHOWN. REFER TO WIRING DIAGRAM ON SPECIFIC GAS OF OIL FURNACE.

H. THIS COMPONENT IS ENERGIZED IN THE HEATING MODE.

BTD	BLOWER TIME DELAY	DS	DEFROST SENSOR	LAR	RELAY LOW AMBIENT (OPT)	RHM	RELAY HEAT MONITOR (OPT)
CC	CONTACTOR	DT	DELAY TIMER	MIB	MOTOR INDOOR BLOWER	RM	RELAY, BLOWER MOTOR
CH	HEATER CONTROL	FL	FUSE LINK	MOF	MOTOR OUTDOOR FAN	RS	RELAY START (OPT)
CHP	CONTROL HIGH PRESSURE	GO	GAS VALVE OR BURNER CONTROL	ODT	OUTDOOR THERMOSTAT	RSO	RELAY SWITCHOVER
CL	LIMIT CONTROL	HC	HEATER CRANKCASE	OP	OVERCURRENT PROTECTOR	SM	SENSOR MONITOR
COMP	COMPRESSOR	HCC	CRANKCASE HEAT CONTROL (OPT)	PS	PLENUM SWITCH	ST	SWITCH TOGGLE
CR	CAPACITOR RUN	HE	HEATER ELEMENT	RP	RESISTOR BLEED (OPT)	TD	TIMER DEFROST
CS	CAPACITOR START (OPT)	HGS	HOT GAS SENSOR	RC	RELAY CHANGEOVER	TDC	TIME DELAY CONTROL (OPT)
DFC	DEFROST CONTROL	LACC	LOW AMB. COOLING CONT. (OPT)	RD	RELAY DEFROST	TRANS	TRANSFORMER
DHC	DEFROST, HEATER CONTROL	LACO	LOW AMBIENT CUTOUT (OPT)	REH	RELAY EMERGENCY HEAT	VR	VALVE, REVERSING

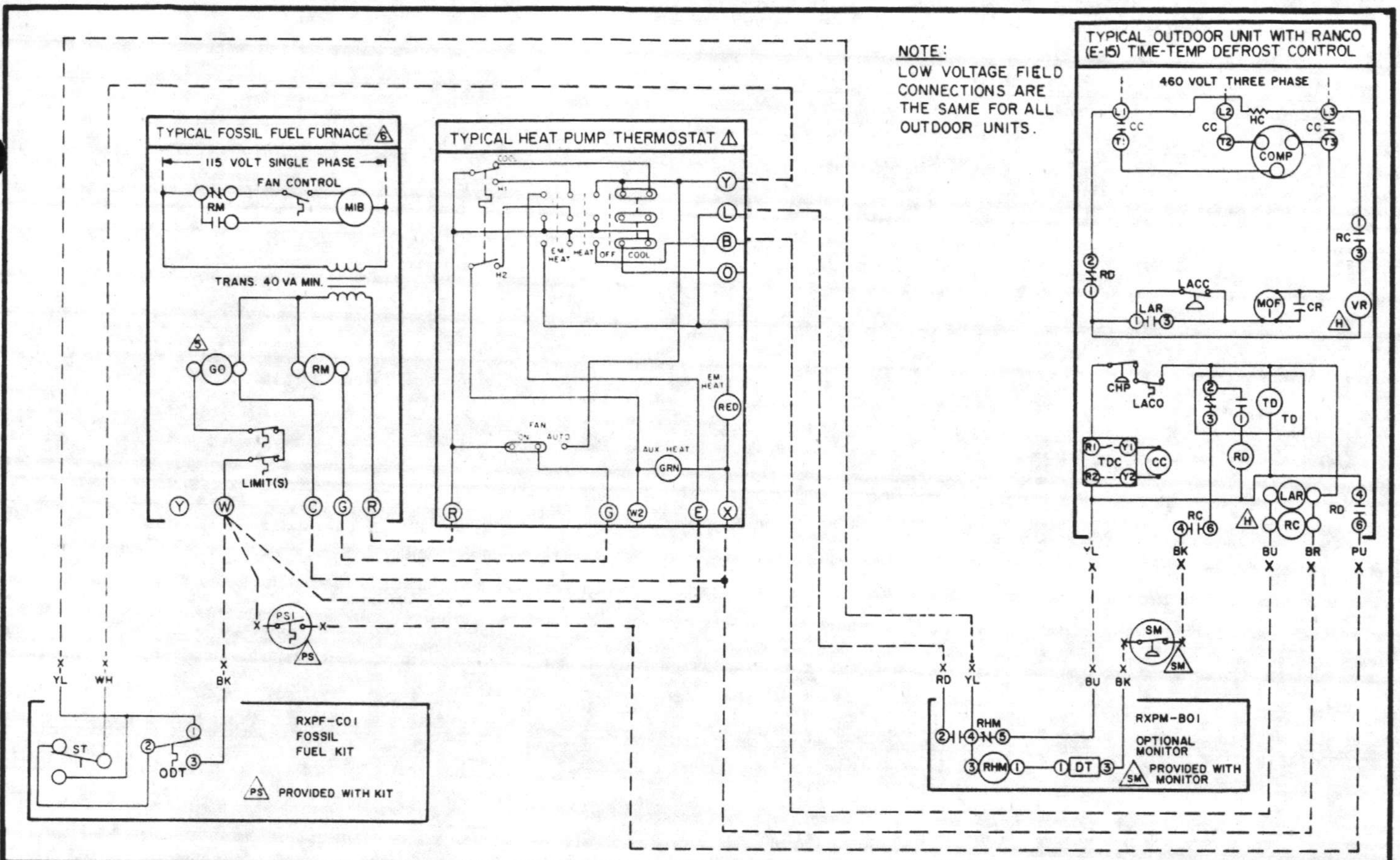
WR WATT RESTRICTOR

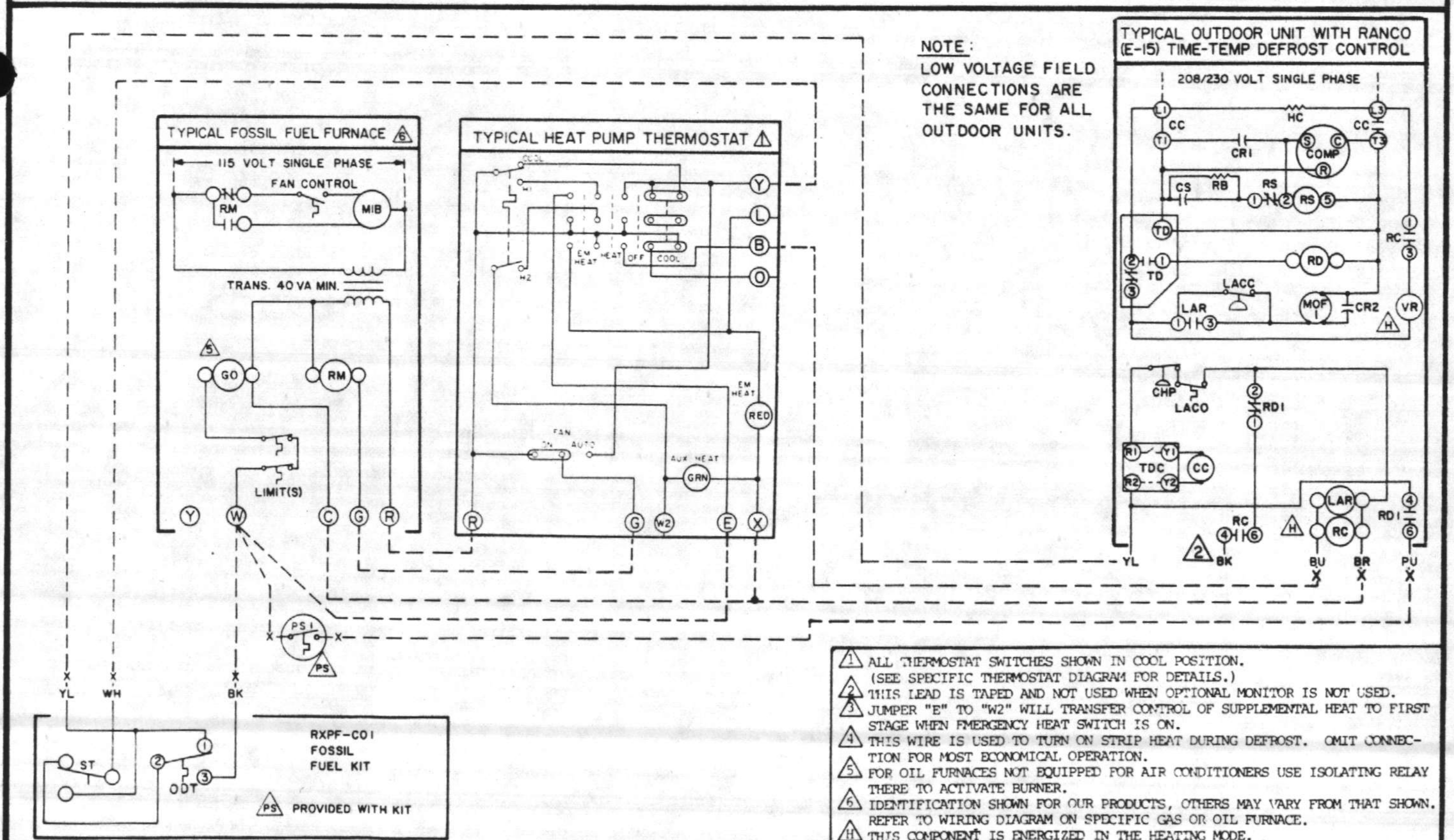
X WIRE NUT

WIRE CODE

BK	BLACK	OR	ORANGE
BU	BLUE	PU	PURPLE
BR	BROWN	RD	RED
GR	GREEN	WH	WHITE
---	FACTORY	YL	YELLOW
		---	FIELD

90-21780-05-02





1. ALL THERMOSTAT SWITCHES SHOWN IN COOL POSITION. (SEE SPECIFIC THERMOSTAT DIAGRAM FOR DETAILS.)
2. THIS LEAD IS TAPED AND NOT USED WHEN OPTIONAL MONITOR IS NOT USED.
3. JUMPER "E" TO "W2" WILL TRANSFER CONTROL OF SUPPLEMENTAL HEAT TO FIRST STAGE WHEN EMERGENCY HEAT SWITCH IS ON.
4. THIS WIRE IS USED TO TURN ON STRIP HEAT DURING DEFROST. OMIT CONNECTION FOR MOST ECONOMICAL OPERATION.
5. FOR OIL FURNACES NOT EQUIPPED FOR AIR CONDITIONERS USE ISOLATING RELAY THERE TO ACTIVATE BURNER.
6. IDENTIFICATION SHOWN FOR OUR PRODUCTS, OTHERS MAY VARY FROM THAT SHOWN. REFER TO WIRING DIAGRAM ON SPECIFIC GAS OR OIL FURNACE.
H. THIS COMPONENT IS ENERGIZED IN THE HEATING MODE.

BTD	BLOWER TIME DELAY	DS	DEFROST SENSOR	LAR	RELAY LOW AMBIENT (OPT)	RHM	RELAY HEAT MONITOR (OPT)	WR	WATT RESTRICTOR				
CC	CONTACTOR	DT	DELAY TIMER	MIB	MOTOR INDOOR BLOWER	RM	RELAY, BLOWER MOTOR						
CH	HEATER CONTROL	FL	FUSE LINK	MOF	MOTOR OUTDOOR FAN	RS	RELAY START (OPT)	X	WIRE NUT			OR	ORANGE
CHP	CONTROL HIGH PRESSURE	GO	GAS VALVE OR BURNER CONTROL	ODT	OUTDOOR THERMOSTAT	RSO	RELAY SWITCHOVER	BK	BLACK			PU	PURPLE
CL	LIMIT CONTROL	HC	HEATER CRANKCASE	OP	OVERCURRENT PROTECTOR	SM	SENSOR MONITOR	BU	BLUE	WIRE		RD	RED
COMP	COMPRESSOR	HCC	CRANKCASE HEAT CONTROL (OPT)	PS	PLENUM SWITCH	ST	SWITCH TOGGLE	BR	BROWN	CODE		WH	WHITE
CR	CAPACITOR RUN	HE	HEATER ELEMENT	RB	RESISTOR BLEED (OPT)	TD	TIMER DEFROST	GR	GREEN			YL	YELLOW
CS	CAPACITOR START (OPT)	HGS	HOT GAS SENSOR	RC	RELAY CHANGEOVER	TDC	TIME DELAY CONTROL (OPT)	---	FACTORY			---	FIELD
DFC	DEFROST CONTROL	LACC	LOW AMB. COOLING CONT. (OPT)	RD	RELAY DEFROST	TRANS	TRANSFORMER						
DHC	DEFROST, HEATER CONTROL	LACO	LOW AMBIENT CUTOUT (OPT)	REH	RELAY EMERGENCY HEAT	VR	VALVE, REVERSING						

90-21780-06-04

OWNER'S INFORMATION MANUAL FOR HEAT PUMPS

IMPORTANT! BEFORE YOU TURN YOUR HEAT PUMP ON!

1. Be sure the electrical power has been turned on at the outdoor unit for at least 8 hours. In cold weather 12 hours is better. This is to prevent damage to your compressor.
2. Be sure all supply and return grilles are open and not obstructed.
3. Check to see that your indoor unit has clean air filters installed to prevent clogging the fins on the coil.

HOW YOUR HEAT PUMP WORKS

COOLING

During the cooling season, your Heat Pump works like any other summer air conditioner. It uses an indoor coil, a compressor and an outdoor coil to move heat from inside to outside. Fans move air across the coils and circulate air in the conditioned space. A thermostat turns the fans and compressor on and off as cooling is needed. Hotter weather means more cooling is required, so your unit will run longer. When the temperature is highest, the unit may run continuously for several hours.

HEATING

In the heating season, the use of the coils is reversed. The outdoor coil picks up heat from the air and the indoor coil releases this heat to warm your home. Colder weather increases heat needed and the unit runs longer. In most areas the temperature will sometimes drop low enough that the Heat Pump will run continuously. This outdoor temperature at which the heat needed is equal to your Heat Pump's capacity is known as the system "Balance Point". This temperature will vary with each installation, depending on the heat loss of the home and the size of the heat pump selected. Below the Balance Point, the Heat Pump will run continuously and the auxiliary electric resistance heat will be cycled on and off by the thermostat, as needed. Your Heat Pump will continue to operate efficiently at outdoor temperatures below 0°F.

Heat Pumps operate with much lower air temperatures than gas furnaces and other types of heating equipment. The air coming from supply grilles and registers will be only 15° to 30° warmer than the air in your home. It will feel cool if it blows directly on you, but will provide the heat needed to keep your home warm and comfortable.

DEFROST CYCLE

When the outdoor temperature drops below 45°, frost may start to form on the outdoor coil. Frost buildup will be heaviest on damp days with the temperature at 35° to 40°. The Heat Pump has an automatic control which will reverse the system and stop the outdoor fan to defrost the coil when needed. Some units operate on a timer at 45 to 90 minute intervals. Others have an electronic control which senses coil and air temperatures to determine when a defrost cycle is needed. They may go as long as 6 hours between defrosts. The coil may be almost completely covered with frost at some times. Don't worry unless it continues to build up a thicker layer with areas of hard clear ice. If excessive ice buildup should occur, call your serviceman.

When the Heat Pump is defrosting, a cloud of steam may rise from the outdoor unit for a short time. This is normal and harmless.

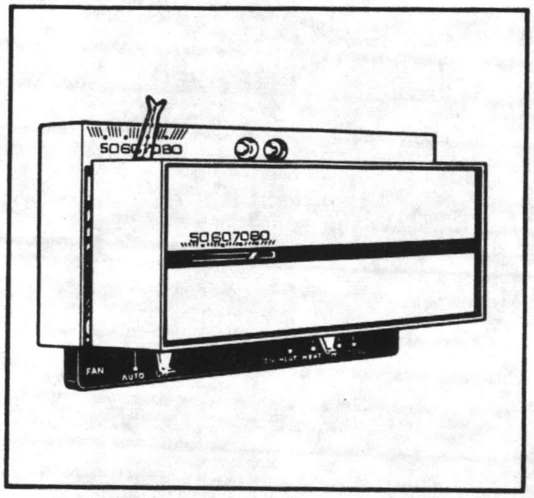
The water which runs from the defrosting coil must be drained away from the unit. Snow drifts must be kept cleared away to prevent ice buildup in the coil from defrost water.

Important things to remember about the Defrost Cycle.

1. Water must drain away from the coil and unit to prevent damage from ice buildup. Keep snow cleared away.
2. The outdoor fan stops. The unit may make some strange hissing or gurgling noises and a cloud of steam. They are normal.
3. Call your serviceman if you notice excessive frost and clear ice buildup.

HOW TO OPERATE YOUR HEAT PUMP

The control center for your Heat Pump is your thermostat. Many different types are used, but they are similar to operate.



Your thermostat will have switches to select some or all of the following functions.

COOL - Turns cooling on when temperature rises above setpoint.

HEAT - Turns Heat Pump heating on when temperature drops below setpoint. If room temperature drops another 2°, turns on the auxiliary resistance heat. Heat pump continues to run.

AUTO - Turns on cooling or heating as required to maintain setpoints. Most thermostats have at least 4° separation between heating and cooling settings.

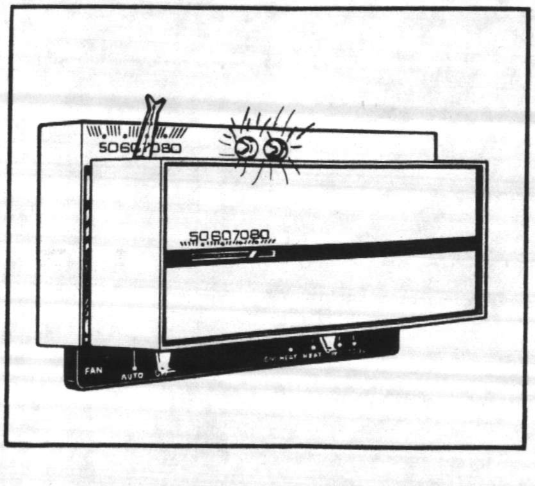
OFF - Turns heating and cooling modes off (Fan may still run in FAN-ON).

FAN-ON - Turns fan on for continuous operation.

FAN-AUTO - Fan cycles on and off with cooling or heating operation.

EMERGENCY HEAT - Turns Heat Pump compressor and outdoor fan off and provides heat from electric strips only. Use this switch to manually turn the Heat Pump off and change to the auxiliary heat in case of Heat Pump problems.

A lever is used to set the temperature that you desire. Some thermostats have two levers, one for heating and one for cooling.



Lights may be used to indicate that the auxiliary electric heat is operating. The lights may be different colors on different types of thermostats. Typical lights will be blue or green for normal auxiliary heating and red for emergency heat.

For the most economical operation of your system, select the highest summer setting and the lowest winter setting at which you are comfortable. Typical temperatures are 78° on cooling and 70° on heating. Your operating cost is increased from 3% to 8% for each degree lower setting in cooling and for each degree higher setting in heating. When heating, let the Heat Pump do the work whenever possible. Do not change temperature settings more than necessary. If you turn the temperature setting up 2° or more you will bring on the auxiliary resistance heat. This costs more to operate than the Heat Pump.

NIGHT SETBACK THERMOSTATS

Night Setback thermostats are available to automatically turn the temperature down at night and back up in the morning. **Only** Setback thermostats with gradual, incremental or "Intelligent" recovery should be used with Heat Pumps. Setback thermostats without gradual recovery will use the electric strip heaters to warm the air in the morning, and may use more electricity than was saved during the night. Ask your contractor for advice before installing a Setback or "Energy Saving" thermostat.

HEAT PUMP MONITOR

A control called a Heat Pump Monitor may be installed with your system. If so, it will check the performance of your Heat Pump and turn it off if a problem occurs. It will switch to the auxiliary heat and turn on the Emergency Heat Light on your thermostat to tell you that the system requires attention.

OPERATING ECONOMICALLY

Here are other ways to save electricity and improve your system's performance.

1. Keep all grilles and registers open and clear of obstructions such as drapes or furniture.
2. Keep doors and windows closed.
3. Be sure all air ducts are well insulated and sealed with a vapor barrier.
4. Let the sun in during the winter. Keep it out during the summer.
5. Be sure clothes driers are vented to the outside. (Away from your outdoor unit.)
6. Fireplaces are pleasant, but most fireplaces bring in more cold outside air for combustion and flue draft than they heat. Your Heat Pump may actually run more!
7. Use kitchen and bathroom exhaust fans only when necessary.
8. Add insulation, storm windows and insulated outside doors. Seal cracks to prevent air leakage.
9. Keep your filters clean. Reduced air flow in your unit reduces efficiency.
10. Operate your indoor fan on AUTO. It costs less and will provide better humidity control in the summer.
11. Keep lamps, TV's and other heat sources away from your thermostat.
12. Leave the power on at the outdoor unit at all times. If

you have a power failure, leave your Heat Pump off until power has been back on as long as it was off, up to 8 hours. Switch to Emergency Heat if needed while Heat Pump is off.

13. Protect the outdoor unit from roof runoff to prevent excess ice buildup.

MAINTENANCE FOR YOUR HEAT PUMP

DANGER: SHUT OFF ELECTRICAL POWER BEFORE PERFORMING ANY MAINTENANCE TO PREVENT SERIOUS INJURY FROM SHOCK.

FILTERS

Keep your air filters clean. You may have any one of these types:

1. Glass Fiber (Throwaway) - Replace these when dirty. Do not clean.
2. Plastic Fiber or Foam — Vacuum clean and reinstall these.
3. Aluminum Mesh - Wash with detergent and water. Always recoat these per the manufacturer's instructions. They **will not** filter out dust and dirt without the adhesive coating.

Filters should be checked at least once a month and cleaned or replaced when needed. Replace throwaway filters at least twice a year.

LUBRICATION

The compressor requires no oiling or other maintenance. The fan motors have prelubricated sleeve bearings and may not require attention for an indefinite period of time. However, our recommendations are as follows.

1. Motors without oiling ports -
   Prelubricated and sealed. No further lubrication should be required, but in case of bearing problems, the blower and the motor end bells can be disassembled and the bearings relubricated by a qualified service person.
2. Motors with oiling ports -
   Add from 10 to 20 drops of Electric Motor Oil or an SE grade of non-detergent SAE-10 or 20 motor oil to each bearing every two years for somewhat continuous duty, or at least every five years for light duty. Take care not to over oil, because excessive lubrication can damage the motor.

In any event, clean the indoor air blower motor periodically to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior. And, as suggested elsewhere in the instructions, the air filters should be kept clean because dirty filters can restrict airflow. The indoor air blower motor depends upon sufficient air flowing across and through it to keep from overheating.

CLEANLINESS

Keep the outdoor coil clean and free of restrictions. Free air flow is essential. Keep fences, shrubs, snow drifts or other obstructions at least two feet from all coil air inlets.

Keep the coil free of grass clippings, weeds, leaves, etc. **TURN ELECTRICITY OFF BEFORE CLEANING!**

Cleaning and waxing the cabinet of the outdoor unit with automotive polish will improve its appearance and extend the life of the finish.

Never use a weather cover over the outdoor unit, even if it is turned off for long periods of time. A cover will hold moisture in the unit and cause more rust buildup and damage to electrical parts than exposure to weather.

Never use your Heat Pump as a stand for garden hoses or tools. Do not permit children to play near its moving parts or electrical components. Use caution with lawn mower and trimmer to avoid damaging refrigerant piping or electrical wiring.

Keep your filters clean!

IN CASE OF HEAT PUMP PROBLEMS

1. Check to see that electrical power is on. Check breakers or fuses for both indoor and outdoor units.
2. Check to see that air flow is not restricted. Indoors, check grilles, registers and filter. Outdoors, check coil and see that the fan is running. (Remember it stops for a short time during defrost cycles).
3. Check to be sure your thermostat is set properly. System switch should be on HEAT, COOL or AUTO as appropriate. Temperature set point must be above room temperature on heating or below room temperature on cooling for system to start.

CALL YOUR SERVICEMAN IF:

1. You observe excess ice buildup.
2. You hear new, unusual noises.
3. The Heat Pump is short-cycling (turning on and off rapidly) and not heating or cooling properly.
4. Annually for a routine check.

Periodic inspections by your professional serviceman will help to keep your Heat Pump operating at peak efficiency and reduce the chance of major repairs.

Limited Warranty - Parts

ELECTRIC AIR CONDITIONER OR HEAT PUMP—OUTDOOR UNIT

GENERAL: Manufacturer, RHEEM AIR CONDITIONING DIVISION, will furnish a replacement for ANY PART of this product which fails in normal use and service within the applicable periods specified below, in accordance with the terms of this Warranty. The exchanged part will be warranted for only the unexpired portion of the original warranty.

COMPRESSOR: If the motor-compressor fails within FIVE (5) YEARS after original installation and operation, RHEEM will furnish a replacement compressor.

ANY OTHER PART: If any other part fails within ONE (1) YEAR after original installation and operation, RHEEM will furnish a replacement part.

THIS WARRANTY WILL NOT APPLY: a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; b) to damage from abuse, accident, fire, flood and the like; c) to parts used in connection with normal maintenance, such as cleaning or replacing air filters; d) to units which are not installed in the United States of America or Canada; e) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices; or f) to defects or damage caused by the use of any attachment, accessory or component not authorized by RHEEM.

SHIPPING COSTS: You will be responsible for the cost of shipping warranty replacement parts from our factory to our RHEEM distributor and from the distributor to the location of your product. You also are responsible for any shipping cost of returning the failed part to the distributor. (If in Alaska, Hawaii or Canada, you also must pay the shipping cost of returning the failed part to the port of entry into the continental United States.)

SERVICE LABOR RESPONSIBILITY: This Warranty does not cover any labor expenses for service, nor for removing or reinstalling parts. All such expenses are your responsibility unless a service labor agreement exists between you and your contractor. (If a replacement RHEEM part is for any reason unavailable, RHEEM will repair the failed part at its designated repair center, without charge for repair labor.)

HOW TO OBTAIN WARRANTY PERFORMANCE: Normally, the installing contractor from whom the unit was purchased will be able to take the necessary corrective action by obtaining through his RHEEM air conditioning distributor any replacement parts. If the contractor is not available, simply contact any other local contractor handling RHEEM air conditioning products. The name and location of a local contractor can usually be found in your telephone directory or by contacting a RHEEM air conditioning distributor. If necessary, the following RHEEM office can advise you of the nearest RHEEM distributor:

5600 Old Greenwood Road
Fort Smith, Arkansas 72903
501-646-4311

(FOR CALIFORNIA ONLY)
14300 Alondra Boulevard
LaMirada, California 90638
213-860-7761

HOWEVER, ANY REPLACEMENTS ARE MADE SUBJECT TO VALIDATION BY RHEEM OF IN-WARRANTY COVERAGE. An item to be replaced must be made available in exchange for the replacement.

MISCELLANEOUS: No one is authorized to make any warranties on behalf of RHEEM. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIODS SPECIFIED ABOVE. RHEEM'S SOLE LIABILITY WITH RESPECT TO DEFECTIVE PARTS SHALL BE AS SET FORTH IN THIS WARRANTY, AND ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARE EXPRESSLY EXCLUDED. Some states do not allow limitations on how long an implied warranty lasts, or for the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

RHEEM suggests that you immediately complete the information on *the reverse side* and retain this Warranty Certificate in the event warranty service is needed. Reasonable proof of the effective date of the warranty must be presented, otherwise the effective date will be based upon the date of manufacture plus 30 days. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

92-20800-31-03

Please become familiar with all the provisions of the Warranty. We suggest that your installing contractor either complete the data listed below, or furnish you with the necessary information so that you can enter this data below. If necessary, you may obtain the model and serial numbers from the data plate which is affixed to the side of the outdoor unit.

Name of Owner__________ Name of Contractor __________

Address __________ Address __________

City/State/Zip Code __________ City/State/Zip Code __________

Model Number __________ Serial Number __________

Date of Installation: __________ Date of Initial Operation If Subsequent to Installation Date: __________

We suggest you RETAIN THIS FORM for possible future reference.

**RHEEM
AIR CONDITIONING
DIVISION**
A Division of Rheem Manufacturing Company
5600 Old Greenwood Road, P.O. Box 6444, Fort Smith, Arkansas 72906

TAB PLACEMENT HERE

DESCRIPTION:

B.

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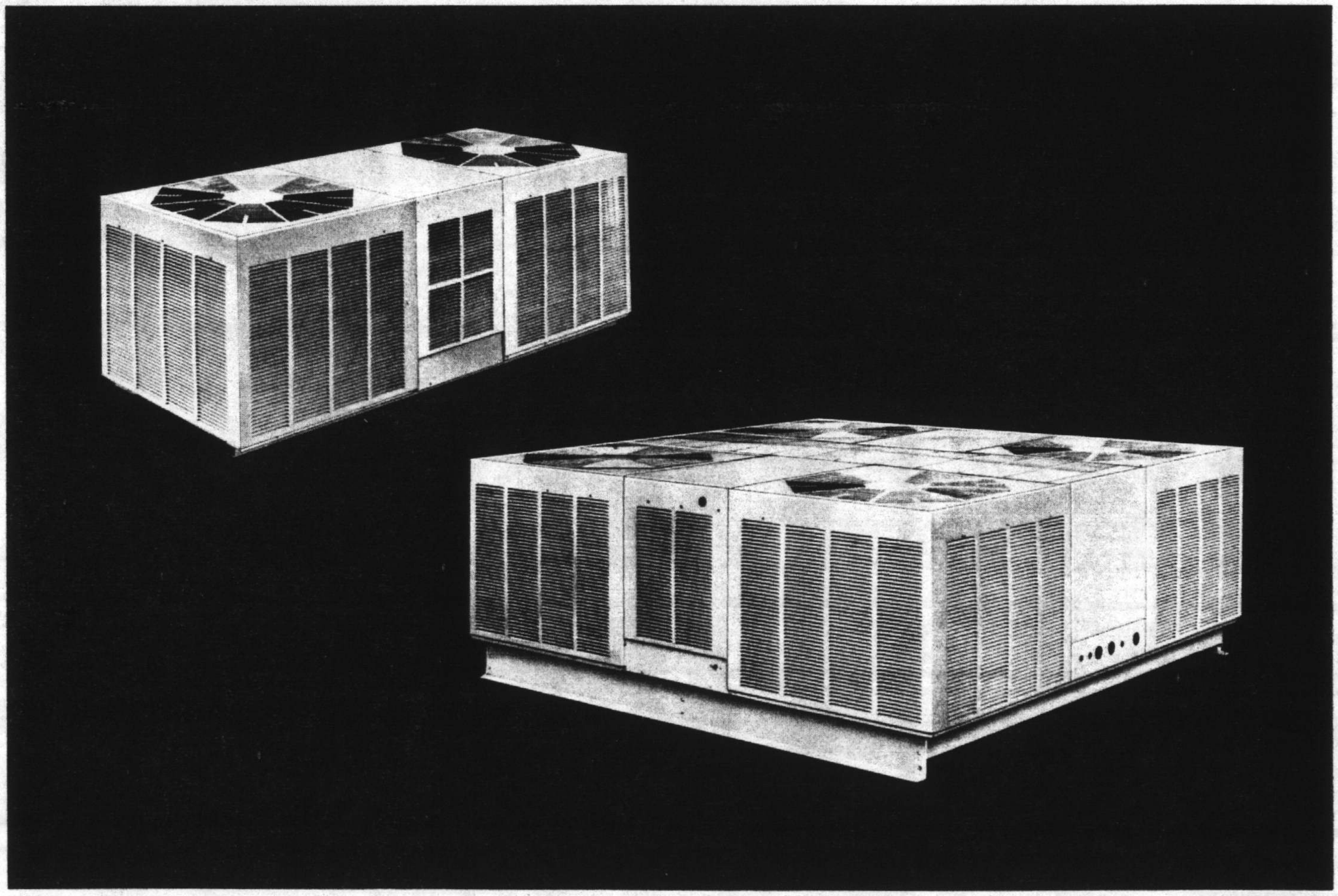
Commercial Heat Pump Outdoor Units

Rheem®

THE AIR OF QUALITY



7.5 THROUGH 20 NOMINAL TON UNITS
RPWB- SERIES

INDEX

WHY USE AN AIR COOLED SPLIT SYSTEM?

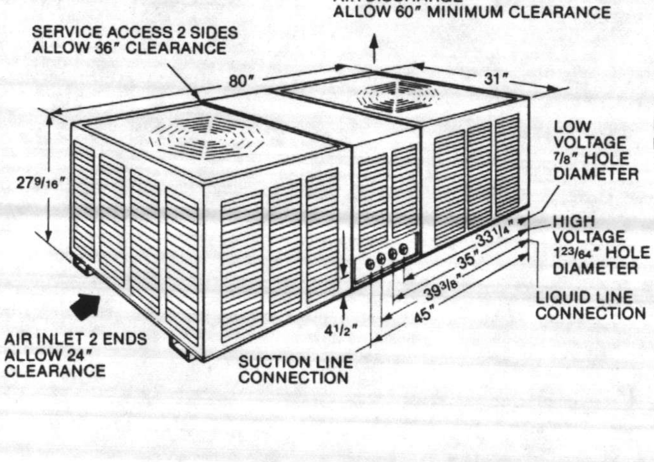
- With an air cooled system, you have no water or sewer connections to make, and no troublesome and costly water treatment problems.
- Since the compressor bearing unit is located outside the building, and the low profile air handling unit can be installed in the drop ceiling or in the conditioned space, you will not need a separate equipment room which takes up valuable building space.
- Because of the simple design of the Rheem outdoor unit, installation is quick and simple, and very little maintenance is required.
- Remote mounting of the already quiet outdoor unit keeps the compressor and condenser fan noise outside, and the vertical discharge fans carry the sound up and away from the surrounding area.

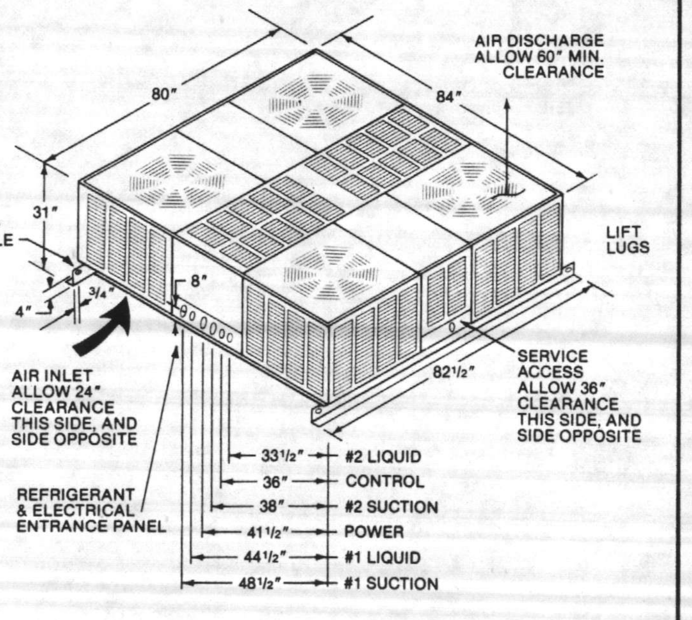
MODEL NUMBER DESIGNATION

R P W B- 075 C A S

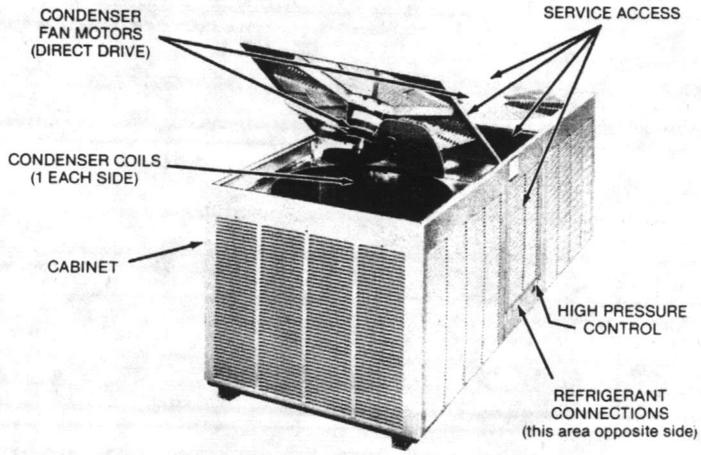
- S — Connection Type: S-Sweat
- A — Design Variation: A-Standard
- C — Electrical Designation: C-208/230-3-60, D-460-3-60
- 075 — Nominal Tonnage: 075 = 7.5 Tons, 100 = 10 Tons, 150 = 15 Tons, 200 = 20 Tons
- B — Design Series: B-Second Design Series
- W — Type: W-High Efficiency Commercial
- P — Heat Pump
- R — Rheem

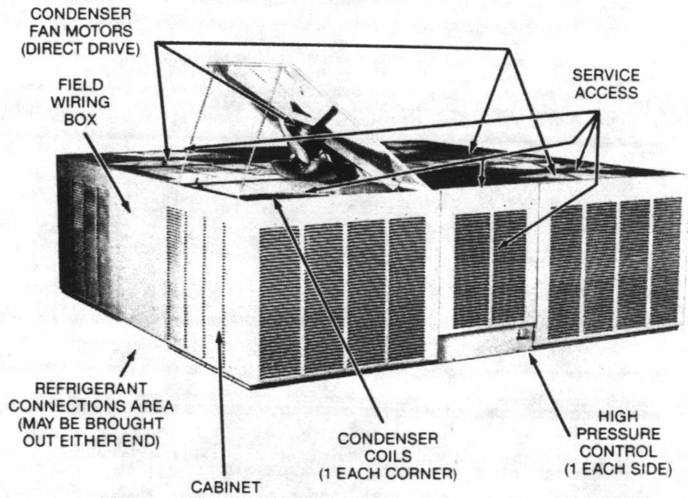
UNIT DIMENSIONS

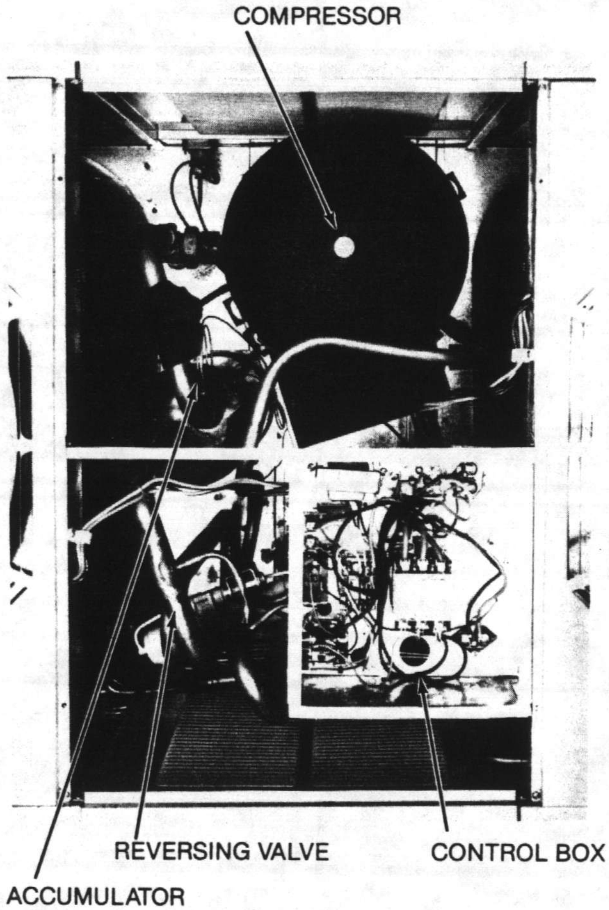




STANDARD UNIT FEATURES







TYPICAL COMPRESSOR AREA
(1)-075/100 (2)-150/200

CABINET—Galvanized steel with durable baked enamel finish. The cabinet front and sides are formed into a one piece unitized design with stamped louvers to provide protection for the condenser coils.

SERVICE ACCESS—Control box with line and control voltages, as well as compressor and other refrigerant controls are accessible through removable top and side panels (without affecting normal operation of unit).

Condenser fan motors are mounted on removable top panels which bring the motors out to you and expose entire condenser coil for cleaning.

Coil design permits compressor operation with the service panels removed.

COMPRESSOR—Hermetically sealed with internal high temperature protection, antislug device, and durable insulation on motor windings. The compressor motor is internally spring mounted and the entire compressor is mounted on rubber grommets to reduce vibration and noise.

COILS—Constructed with copper tubes and aluminum fins mechanically bonded to tubes for maximum heat transfer capabilities. All coil assemblies are leak tested at 450 PSIG internal pressure prior to installation into the units.

REFRIGERANT CONNECTIONS—All field sweat joints are made external of the unit and are located close to the ground for a neat looking installation.

CRANKCASE HEATERS—Standard, all models.

HIGH PRESSURE CONTROL—Manual reset control deactivates system if abnormally high pressure occurs.

SERVICE VALVE—Standard on liquid line.

FILTER DRIER—(Not visible) Installed in liquid line, all models.

CONDENSER FAN MOTORS—Direct-drive, PSC, single-phase motors.

TRANSFORMER—Step down type, from Line to 24 volts.

CONTACTOR—The contactor is an electrical switch which operates the compressor and condenser fans. Its 24 volt coil is activated through the High Pressure Control and Low Pressure Control on a call for operation.

CAPACITORS—Help provide starting torque necessary to boost the condenser fan motors to operating speed by directing their stored energy to the starter winding in step with the running winding.

EQUIPMENT GROUND—Lug for field connection of ground wire.

TESTING—All units are run tested at the factory prior to shipment. Units are shipped with a holding charge of refrigerant.

TIME-TEMPERATURE DEFROST—Used when unit is in heating mode to defrost outdoor coil.

TX VALVE—Used when unit is in heating mode and outdoor coil functions as evaporator.

SUCTION LINE ACCUMULATOR—To prevent slugging of compressor.

LOW PRESSURE CONTROL—Stops compressor operation if refrigerant charge is lost. Manual Reset.

PERFORMANCE RATINGS—HEAT PUMP UNITS RATED IN ACCORDANCE WITH ARI STANDARD 240 AND ARI STANDARD 270

MODEL	COOLING		HIGH TEMP. HEAT		LOW TEMP. HEAT		RATED CFM	SOUND RATING BELS
	BTU/H	EER	BTU/H	COP	BTU/H	COP		
RPWB-075CAS, DAS RHPA-075G	90,000	8.2	88,000	3.0	46,000	2.0	3000	8.8
RPWB-075CAS RHPA-075E								
RPWB-100CAS, DAS RHPA-100G	118,000	8.2	118,000	2.8	60,000	2.0	3900	9.0
RPWB-100CAS RHPA-100E								
*RPWB-150CAS, DAS RHPA-150G	178,000	8.2	176,000	3.0	92,000	2.0	6000	—
*RPWB-150CAS RHPA-150E								
*RPWB-200CAS, DAS RHPA-200G	234,000	8.2	234,000	2.8	119,000	2.0	8000	—
*RPWB-200CAS RHPA-200E								

*Not ARI Certified

SELECTION PROCEDURE—MATCHED SYSTEMS

Example 1: Determine the Net System Performance of RPWB-100 & RHPA-100 at 3900 CFM @ .3″ external static pressure, 80°F DBE/67°F WBE entering indoor air and 95°F DB outdoor ambient.

From System Performance Data in this book by interpolation*:

Total Cap. (gross) = 123.4 × 1000 = 123,400 BTUH
Sens. Cap. (gross) = 95.1 × 1000 = 95,100 BTUH
Power (gross) = 12.8 × 1000 = 12,800 WATTS

From RHPA- Form No. P11-715 and Wet Coil Air Flow Performance Data by interpolation*:

Power = 1580 WATTS
= 1580 × 3.412 = 5390 BTUH

Therefore the Net Performance is:

Total Cap. (Net) = 123,400 − 5,390 = 118,010 BTUH
Sens. Cap. (Net) = 95,100 − 5,390 = 89,710 BTUH
Power (Net) = 12,800 + 1,580 = 14,380 WATTS
EER = 118,010 ÷ 14,380 = 8.2 BTU/WATT

Example 2: Determine the Net Sensible Capacity at 75°F DBE indoor air with the other conditions from Example 1 being the same.

From the Systems Performance Data in this book:

Depression Ratio (DR) = .09 (@ 3900 CFM)
Adjusted Sens. Cap. (gross) = Sens. Cap. @ 80°F DBE + [Adjustment, Note 1]
= 95,100 + [1.10 × 3900 × (1 − .09) × (75 − 80)]
= 95,100 + [− 19,519] = 75,581 BTUH
Adjusted Sens. Cap. (Net) = 75,581 − 5,390 = 70,191 BTUH

From Example 1, Total Cap. (Net), Power (Net) and EER remain the same.

*Extrapolation of data from tables not permissible.

SYSTEMS PERFORMANCE DATA — GROSS CAPACITY AND POWER ②

CONDENSING UNIT **RPWB-075C/D** WITH BLOWER COIL **RHPA-075EK,GK**

ENTERING INDOOR AIR @ 80°F dbE ①										
wbE		71°F			67°F			63°F		
CFM		3450	3000	2550	3450	3000	2550	3450	3000	2550
DR ①		.14	.12	.11	.14	.12	.11	.14	.12	.11
OUTDOOR DRY BULB TEMPERATURE °F 75	Total	115.3	112.9	109.7	107.7	105.2	102.1	100.4	98.0	94.8
	Sens	66.8	63.0	59.2	81.3	75.8	70.0	92.7	87.3	82.0
	Power	9.4	9.3	9.2	9.1	9.0	8.8	8.8	8.6	8.5
80	Total	111.6	109.2	106.0	104.0	101.6	98.4	96.7	94.3	91.1
	Sens	65.9	62.1	58.3	80.4	75.0	69.1	91.7	86.4	81.1
	Power	9.7	9.6	9.4	9.4	9.3	9.1	9.0	8.9	8.8
85	Total	108.5	106.1	102.9	100.8	98.4	95.2	93.6	91.2	88.0
	Sens	64.7	60.9	57.1	79.2	73.8	67.9	90.7	85.2	79.9
	Power	10.0	9.9	9.7	9.6	9.5	9.4	9.3	9.2	9.0
90	Total	105.7	103.2	100.1	98.0	95.6	92.4	90.8	88.3	85.2
	Sens	63.3	59.5	55.7	77.8	72.4	66.6	89.3	83.8	78.5
	Power	10.3	10.2	10.0	9.9	9.8	9.6	9.6	9.5	9.3
95	Total	103.1	100.6	97.5	95.4	93.0	89.8	88.2	85.7	82.6
	Sens	61.8	58.0	54.3	76.4	70.9	65.1	87.6	82.3	77.0
	Power	10.6	10.4	10.3	10.2	10.1	9.9	9.9	9.8	9.6
100	Total	100.5	98.1	94.9	92.9	90.5	87.3	85.6	83.2	80.0
	Sens	60.4	56.6	52.9	74.9	69.5	63.7	85.6	80.9	75.6
	Power	10.8	10.7	10.6	10.5	10.4	10.2	10.2	10.1	9.9
105	Total	97.9	95.5	92.3	90.3	87.8	84.7	83.0	80.6	77.4
	Sens	59.1	55.3	51.6	73.7	68.2	62.4	83.0	79.6	74.3
	Power	11.1	11.0	10.8	10.8	10.7	10.5	10.4	10.3	10.2
110	Total	95.1	92.6	89.5	87.4	85.0	81.8	80.2	77.7	74.6
	Sens	58.1	54.3	50.6	72.7	67.2	61.4	80.2	77.7	73.3
	Power	11.4	11.3	11.1	11.1	10.9	10.8	10.7	10.6	10.4
115	Total	91.9	89.5	86.3	84.2	81.8	78.6	77.0	74.6	71.4
	Sens	57.5	53.7	49.9	72.0	66.6	60.7	77.0	74.6	71.4
	Power	11.7	11.6	11.4	11.3	11.2	11.1	11.0	10.9	10.7

CONDENSING UNIT **RPWB-100C/D** WITH BLOWER COIL **RHPA-100EK,GK**

ENTERING INDOOR AIR @ 80°F dbE ①										
wbE		71°F			67°F			63°F		
CFM		4480	3900	3320	4480	3900	3320	4480	3900	3320
DR ①		.10	.09	.07	.10	.09	.07	.10	.09	.07
OUTDOOR DRY BULB TEMPERATURE °F 75	Total	144.7	141.5	137.3	137.2	133.9	129.7	126.4	123.2	118.9
	Sens	86.2	81.0	76.0	104.9	97.5	89.7	116.8	109.7	102.8
	Power	11.8	11.7	11.5	11.4	11.3	11.1	11.2	11.1	10.8
80	Total	143.0	139.8	135.6	135.4	132.2	128.0	124.6	121.4	117.2
	Sens	86.8	81.6	76.6	105.5	98.1	90.3	117.2	110.3	103.4
	Power	12.2	12.1	11.8	11.8	11.7	11.5	11.6	11.4	11.2
85	Total	140.6	137.4	133.1	133.0	129.8	125.6	122.2	119.0	114.8
	Sens	86.1	81.0	75.9	104.8	97.5	89.7	116.9	109.6	102.7
	Power	12.6	12.4	12.2	12.2	12.0	11.8	12.0	11.8	11.6
90	Total	137.6	134.4	130.2	130.0	126.8	122.6	119.2	116.0	111.8
	Sens	84.9	79.7	74.6	103.5	96.2	88.4	115.8	108.2	101.4
	Power	13.0	12.8	12.6	12.6	12.4	12.2	12.3	12.2	12.0
95	Total	134.2	131.0	126.8	126.6	123.4	119.2	115.8	112.6	108.4
	Sens	83.7	78.6	73.5	102.4	95.1	87.3	114.0	107.7	100.5
	Power	13.3	13.2	13.0	13.0	12.8	12.6	12.7	12.6	12.4
100	Total	130.4	127.2	123.0	122.9	119.7	115.4	112.1	108.9	104.6
	Sens	83.5	78.3	73.2	102.1	94.8	87.0	112.1	106.6	100.3
	Power	13.7	13.6	13.4	13.3	13.2	13.0	13.1	13.0	12.7
105	Total	126.5	123.3	119.1	118.9	115.7	111.5	108.1	104.9	100.7
	Sens	84.7	79.5	74.5	103.4	96.0	88.2	108.1	104.9	100.7
	Power	14.1	14.0	13.7	13.7	13.6	13.4	13.5	13.3	13.1
110	Total	122.4	119.2	115.0	114.9	111.7	107.4	104.1	100.9	96.7
	Sens	88.2	83.0	78.0	106.9	99.5	91.7	104.1	100.9	96.7
	Power	14.5	14.3	14.1	14.1	13.9	13.7	13.9	13.7	13.5
115	Total	118.4	115.2	111.0	110.8	107.6	103.4	100.1	96.9	92.6
	Sens	94.7	89.5	84.4	110.8	106.0	98.2	100.1	96.9	92.6
	Power	14.9	14.7	14.5	14.5	14.3	14.1	14.2	14.1	13.9

CONDENSING UNIT **RPWB-150C/D** WITH BLOWER COIL **RHPA-150EK,GK**

ENTERING INDOOR AIR @ 80°F dbE ①										
wbE		71°F			67°F			63°F		
CFM		7130	6200	5270	7130	6200	5270	7130	6200	5270
DR ①		.09	.07	.05	.09	.07	.05	.09	.07	.05
OUTDOOR DRY BULB TEMPERATURE °F 75	Total	225.6	220.8	214.5	210.9	206.1	199.8	197.3	192.5	186.1
	Sens	137.8	129.8	121.9	168.0	156.6	144.4	194.2	182.2	171.5
	Power	18.8	18.5	18.2	17.9	17.7	17.4	17.2	17.0	16.6
80	Total	220.6	215.8	209.4	205.9	201.1	194.8	192.3	187.5	181.1
	Sens	135.0	127.0	119.2	165.3	153.8	141.7	191.5	180.8	168.4
	Power	19.2	19.0	18.7	18.4	18.2	17.8	17.6	17.4	17.1
85	Total	215.5	210.7	204.3	200.8	196.0	189.7	187.2	182.4	176.0
	Sens	132.9	124.9	117.1	163.1	151.7	139.5	187.2	178.4	167.1
	Power	19.7	19.4	19.1	18.8	18.6	18.3	18.1	17.8	17.5
90	Total	210.3	205.5	199.1	195.6	190.8	184.5	182.0	177.2	170.8
	Sens	131.2	123.2	115.3	161.4	150.0	137.8	182.0	175.2	165.3
	Power	20.1	19.9	19.6	19.3	19.1	18.7	18.5	18.3	18.0
95	Total	205.0	200.2	193.8	190.3	185.5	179.2	176.7	171.9	165.5
	Sens	129.6	121.6	113.8	159.9	148.4	136.2	176.7	171.9	162.7
	Power	20.5	20.3	20.0	19.7	19.5	19.2	19.0	18.7	18.4
100	Total	199.6	194.8	188.4	184.9	180.1	173.8	171.3	166.4	160.1
	Sens	128.0	120.0	112.2	158.3	146.8	134.6	171.3	166.4	160.1
	Power	21.0	20.8	20.4	20.2	19.9	19.6	19.4	19.2	18.9
105	Total	194.1	189.2	182.9	179.4	174.6	168.2	165.7	160.9	154.6
	Sens	126.2	118.2	110.3	156.4	145.0	132.8	165.7	160.9	154.6
	Power	21.4	21.2	20.9	20.6	20.4	20.1	19.8	19.6	19.3
110	Total	188.4	183.6	177.2	173.7	168.9	162.6	160.1	155.3	148.9
	Sens	123.9	115.9	108.0	154.1	142.6	130.5	160.1	155.3	148.9
	Power	21.9	21.6	21.3	21.1	20.8	20.5	20.3	20.1	19.7
115	Total	182.6	177.8	171.5	167.9	163.1	156.8	154.3	149.5	143.1
	Sens	120.9	112.8	105.0	151.1	139.6	127.5	154.3	149.5	143.1
	Power	22.3	22.1	21.8	21.5	21.3	21.0	20.7	20.5	20.2

CONDENSING UNIT **RPWB-200C/D** WITH BLOWER COIL **RHPB-200EK1,GK1**

ENTERING INDOOR AIR @ 80°F dbE ①										
wbE		71°F			67°F			63°F		
CFM		9200	8000	6800	9200	8000	6800	9200	8000	6800
DR ①		.09	.07	.06	.09	.07	.06	.09	.07	.06
OUTDOOR DRY BULB TEMPERATURE °F 75	Total	315.7	309.3	300.9	286.9	280.5	272.1	278.4	272.1	263.7
	Sens	189.3	178.6	168.0	223.5	208.5	192.7	260.8	246.5	231.6
	Power	23.8	23.5	23.1	22.7	22.5	22.0	21.7	21.5	21.0
80	Total	310.2	303.8	295.4	281.5	275.1	266.7	273.0	266.6	258.2
	Sens	187.1	176.4	165.8	221.3	206.3	190.5	260.9	244.3	229.4
	Power	24.5	24.2	23.8	23.4	23.1	22.7	22.4	22.1	21.7
85	Total	301.7	295.3	286.9	272.9	266.5	258.1	264.4	258.0	249.6
	Sens	183.4	172.7	162.1	217.6	202.7	186.8	256.9	240.6	225.7
	Power	25.1	24.9	24.4	24.1	23.8	23.4	23.1	22.8	22.4
90	Total	291.4	285.0	276.6	262.6	256.2	247.8	254.1	247.7	239.3
	Sens	178.9	168.2	157.6	213.1	198.1	182.3	250.1	235.8	221.2
	Power	25.8	25.5	25.1	24.7	24.4	24.0	23.7	23.4	23.0
95	Total	280.8	274.4	266.0	252.0	245.6	237.2	243.5	237.1	228.7
	Sens	174.3	163.5	153.0	208.4	193.5	177.6	243.5	232.2	216.5
	Power	26.5	26.2	25.8	25.4	25.1	24.7	24.4	24.1	23.7
100	Total	271.2	264.8	256.4	242.4	236.1	227.7	234.0	227.6	219.2
	Sens	170.2	159.4	148.9	204.3	189.4	173.5	234.0	226.4	212.4
	Power	27.1	26.8	26.4	26.0	25.8	25.3	25.0	24.7	24.3
105	Total	264.1	257.7	249.3	235.4	229.0	220.6	226.9	220.5	212.1
	Sens	167.3	156.6	146.0	201.5	186.5	170.7	226.9	220.5	209.6
	Power	27.8	27.5	27.1	26.7	26.4	26.0	25.7	25.4	25.0
110	Total	260.9	254.5	246.1	232.1	225.7	217.3	223.6	217.2	208.8
	Sens	166.4	155.6	145.1	200.5	185.6	169.7	223.6	217.2	208.6
	Power	28.4	28.2	27.7	27.4	27.1	26.7	26.4	26.1	25.7
115	Total	262.9	256.5	248.1	234.1	227.7	219.3	225.6	219.3	210.9
	Sens	168.0	157.2	146.7	202.1	187.2	171.4	225.6	219.3	210.2
	Power	29.1	28.8	28.4	28.0	27.7	27.3	27.0	26.7	26.3

DR — Depression ratio
dbE — Entering air dry bulb
wbE — Entering air wet bulb

Total — Total capacity × 1000 BTUH
Sens — Sensible capacity × 1000 BTUH
Power — KW input

NOTES: ① When the entering air dry bulb is other than 80°F, adjust the sensible capacity from the table by adding [1.10 × CFM × (1-DR) × (dbE − 80)].
② Data includes 25 feet of recommended suction and liquid lines.

NET HEATING CAPACITY

RPWB-075/RHPA-075

RHPA-075 AT 2550 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	25.2	1.46	24.0	1.36	22.8	1.26
10	38.3	1.90	36.5	1.78	34.7	1.66
20	51.5	2.28	49.0	2.13	46.6	1.98
30	64.4	2.62	61.3	2.45	58.2	2.28
40	81.3	3.03	77.4	2.83	73.5	2.63
50	94.6	3.24	90.1	3.03	85.6	2.82
60	107.0	3.38	101.9	3.16	96.8	2.94

RHPA-075 AT 3000 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	25.7	1.47	24.5	1.37	23.3	1.27
10	39.1	1.93	37.2	1.80	35.3	1.67
20	52.5	2.30	50.0	2.15	47.5	2.00
30	65.6	2.64	62.5	2.47	59.4	2.30
40	83.0	3.06	79.0	2.86	75.1	2.66
50	96.5	3.27	91.9	3.06	87.3	2.85
60	109.2	3.41	104.0	3.19	98.8	2.97

RHPA-075 AT 3450 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	26.3	1.47	25.0	1.37	23.8	1.27
10	39.8	1.93	37.9	1.80	36.0	1.67
20	53.6	2.30	51.0	2.15	48.5	2.00
30	67.0	2.64	63.8	2.47	60.6	2.30
40	84.6	3.06	80.6	2.86	76.6	2.66
50	98.4	3.27	93.7	3.06	89.0	2.85
60	111.4	3.41	106.1	3.19	100.8	2.97

MBH = BTUH × 1,000
C.O.P. = Coefficient of Performance

RPWB-100/RHPA-100

RHPA-100 AT 3300 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	35.7	1.45	33.5	1.37	31.2	1.29
10	51.3	1.95	48.5	1.84	45.4	1.71
20	66.6	2.16	62.3	2.03	58.7	1.88
30	81.7	2.42	77.5	2.27	75.8	2.10
40	108.3	2.90	103.7	2.71	98.8	2.51
50	124.2	3.00	119.1	2.78	114.0	2.57
60	140.3	3.06	134.8	2.82	128.9	2.59

RHPA-100 AT 3900 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	36.8	1.44	34.5	1.36	32.2	1.28
10	52.9	1.95	50.2	1.86	46.8	1.71
20	68.7	2.16	64.2	2.05	60.5	1.88
30	84.2	2.42	79.9	2.27	75.8	2.10
40	111.7	2.91	106.9	2.72	101.9	2.52
50	128.0	3.05	122.8	2.83	117.5	2.62
60	144.6	3.15	139.0	2.90	132.9	2.67

RHPA-100 AT 4500 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F					
	60		70		80	
	MBH	C.O.P.	MBH	C.O.P.	MBH	C.O.P.
0	38.3	1.43	35.9	1.35	33.5	1.27
10	54.8	1.93	51.8	1.82	48.5	1.70
20	69.7	2.14	66.1	2.01	62.3	1.87
30	86.3	2.39	81.9	2.24	77.7	2.08
40	114.5	2.91	109.6	2.72	104.4	2.52
50	131.2	3.06	125.9	2.84	120.5	2.63
60	148.2	3.16	142.5	2.91	136.2	2.67

NET HEATING CAPACITY

RPWB-150/RHPA-150

RHPA-150 AT 5100 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	50.4	1.46	48.0	1.36	45.6	1.26
10	76.6	1.90	73.0	1.78	69.4	1.66
20	103.0	2.28	98.0	2.13	93.2	1.98
30	128.8	2.62	122.6	2.45	116.4	2.28
40	162.6	3.03	154.8	2.83	147.0	2.63
50	189.2	3.24	180.2	3.03	171.2	2.82
60	214.0	3.38	203.8	3.16	193.6	2.94

RHPA-150 AT 6000 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	51.4	1.47	49.0	1.37	46.6	1.27
10	78.2	1.93	74.4	1.80	70.6	1.67
20	105.0	2.30	100.0	2.15	95.0	2.00
30	131.2	2.64	125.0	2.47	118.8	2.30
40	166.0	3.06	158.0	2.86	150.2	2.66
50	193.0	3.27	183.8	3.06	174.6	2.85
60	218.4	3.41	208.0	3.19	197.6	2.97

RHPA-150 AT 6900 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	52.6	1.47	50.0	1.37	47.6	1.27
10	79.6	1.93	75.8	1.80	72.0	1.67
20	107.2	2.30	102.0	2.15	97.0	2.00
30	134.0	2.64	127.6	2.47	121.2	2.30
40	169.2	3.06	161.2	2.86	153.2	2.66
50	196.8	3.27	187.4	3.06	178.0	2.85
60	222.8	3.41	212.2	3.19	201.6	2.97

MBH = BTUH × 1,000
C.O.P. = Coefficient of Performance

RPWB-200/RHPA-200

RHPA-200 AT 6800 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	70.8	1.45	66.4	1.37	61.9	1.29
10	101.7	1.95	96.2	1.84	90.0	1.71
20	132.1	2.16	123.5	2.03	116.4	1.88
30	162.0	2.42	153.7	2.27	150.3	2.10
40	214.8	2.90	205.6	2.71	195.9	2.51
50	246.3	3.00	236.2	2.78	226.1	2.57
60	278.2	3.06	267.3	2.82	255.6	2.59

RHPA-200 AT 8000 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	73.0	1.44	68.4	1.36	63.9	1.28
10	104.9	1.95	99.5	1.86	92.8	1.71
20	136.2	2.16	127.3	2.05	120.0	1.88
30	167.0	2.42	158.4	2.27	150.3	2.10
40	221.5	2.91	212.0	2.72	202.1	2.52
50	253.8	3.05	243.5	2.83	233.0	2.62
60	286.7	3.15	275.6	2.90	263.5	2.67

RHPA-200 AT 9200 CFM

OUTDOOR AMBIENT TEMP. °F	INDOOR AIR ENTERING COIL °F 60 MBH	60 C.O.P.	70 MBH	70 C.O.P.	80 MBH	80 C.O.P.
0	75.9	1.43	71.2	1.35	66.4	1.27
10	108.7	1.93	102.7	1.82	96.2	1.70
20	138.2	2.14	131.1	2.01	123.5	1.87
30	171.1	2.39	162.4	2.24	154.1	2.08
40	227.1	2.91	217.3	2.72	207.0	2.52
50	260.2	3.06	249.7	2.84	239.0	2.63
60	293.9	3.16	282.6	2.91	270.1	2.67

PHYSICAL DATA TABLE

MODEL	075	100	150	200
Operating Weight (approximate lbs.)	420	440	1075	1195
Shipping Weight (approximate lbs.)	500	520	1235	1355
REFRIGERANT: Shipping Charge (holding charge only—oz.)	32	48	32 Each	48 Each
COMPRESSOR: Quantity	1	1	2	2
Type	Full Hermetic		Full Hermetic	
RPM	3500	3500	3500	3500
CONDENSER FANS: Quantity	2	2	4	4
CFM (ea.)	3900	3800	3900	3800
Diameter (inches)	22	22	22	22
Drive	Direct	Direct	Direct	Direct
Motor Horsepower (ea.)	1/3	1/3	1/3	1/3
Type	PSC	PSC	PSC	PSC
RPM	1075	1075	1075	1075
CONDENSER COIL: Quantity	2	2	4	4
Rows	1	2	1	2
Fins Per Inch	20	18	20	18
Square Feet	32	31.125	64	62.25
Fins/Tubes	Al/Cu	Al/Cu	Al/Cu	Al/Cu
Tube Size, O.D. (inches)	3/8	3/8	3/8	3/8
REFRIGERANT CONNECTIONS: Suction—(inches) Sweat type:	(1) 1 1/8 O.D.	(1) 1 3/8 O.D.	(2) 1 1/8 O.D.	(2) 1 3/8 O.D.
Liquid—(inches) Sweat type:	(1) 5/8 O.D.	(1) 5/8 O.D.	(2) 5/8 O.D.	(2) 5/8 O.D.
CABINET: Finish	Baked Enamel	Baked Enamel	Baked Enamel	Baked Enamel
Sheet Metal	Galvanized	Galvanized	Galvanized	Galvanized
Gauge (nominal) Top	20	20	20	20
Sides	20	20	20	20
Base Rail	14	14	14	14

ELECTRICAL DATA TABLE

MODEL	075CA	075DA	100CA	100DA
COMPRESSOR MOTOR: Electrical Characteristics	208/230-3-60	460-3-60	208/230-3-60	460-3-60
OPERATING CURRENT: Rated Load Amps*	30/27.8	14.3	38.5/38.5	18.9
Locked Rotor Amps*	172	87.1	229	116
CONDENSER FAN MOTORS: Quantity	2	2	2	2
Horsepower	⅓	⅓	⅓	⅓
RPM	1075	1075	1075	1075
Volts & Phase	208/230-1	460-1	208/230-1	460-1
Full Load Amps (each)	2.0	1.0	2.0	1.0
SYSTEM CHARACTERISTICS: (OUTDOOR UNIT) Kilowatt Input*	10.4/10.1	10.1	13.1/12.8	12.8
Minimum Circuit Ampacity*	41/39	20	52/52	25
Maximum Fuse Size (Amps)	60	30	60	35
Wire Size 50′/100′ Cu. 75°C	6/6	12/8	6/4	10/8
Disconnect Size	60	30	60	60

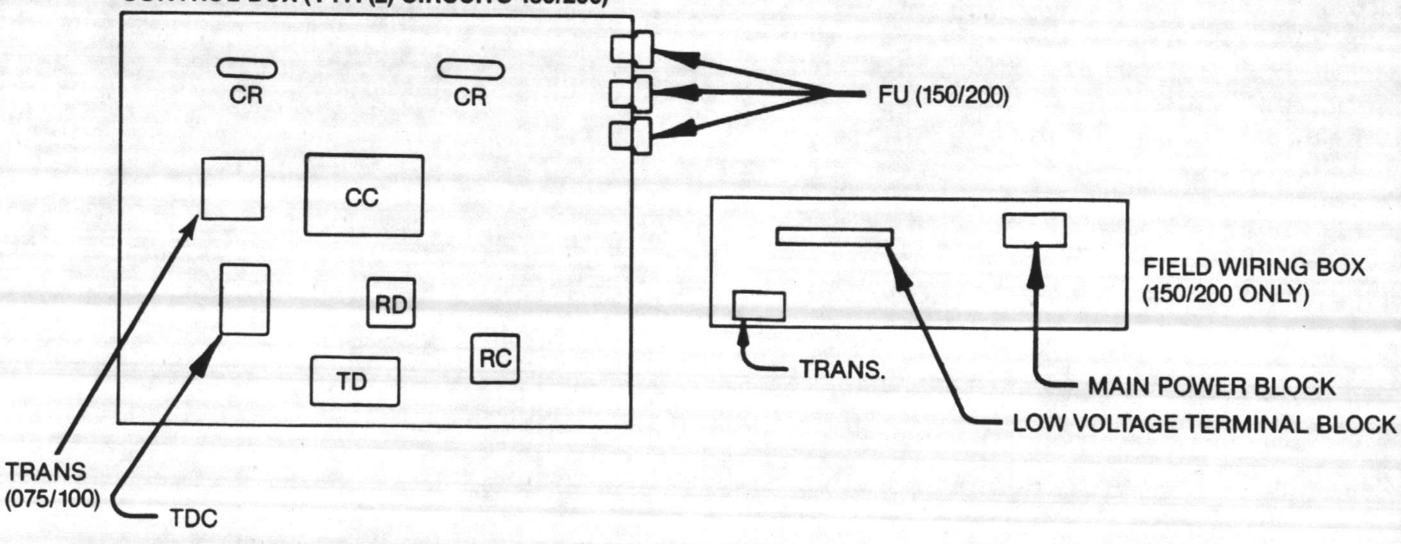
NOTES: Local codes take precedence over suggested wire and disconnect sizes.
*Values shown are the most severe and may vary slightly dependent on compressor model supplied.

MODEL	150CA	150DA	200CA	200DA
COMPRESSOR MOTOR: Electrical Characteristics	208/230-3-60	460-3-60	208/230-3-60	460-3-60
OPERATING CURRENT: (Per Compressor) Rated Load Amps*	31.9/29.2	15.6	38.5/38.5	18.9
Locked Rotor Amps*	172	87.1	229	116
CONDENSER FAN MOTORS: Quantity	4	4	4	4
Horsepower	⅓	⅓	⅓	⅓
RPM	1075	1075	1075	1075
Volts & Phase	208/230-1	460-1	208/230-1	460-1
Full Load Amps (each)	2.0	1.0	2.0	1.0
SYSTEM CHARACTERISTICS: Kilowatt Input*	19.8/19.5	19.5	25.4/25.1	25.1
Minimum Circuit Ampacity*	80	39	95	47
Maximum Fuse Size (Amps)	100	50	125	60
Wire Size 50′/100′ Cu. 75°C	4/3	8/6	3/2	8/4
Disconnect Size	100	60	200	60

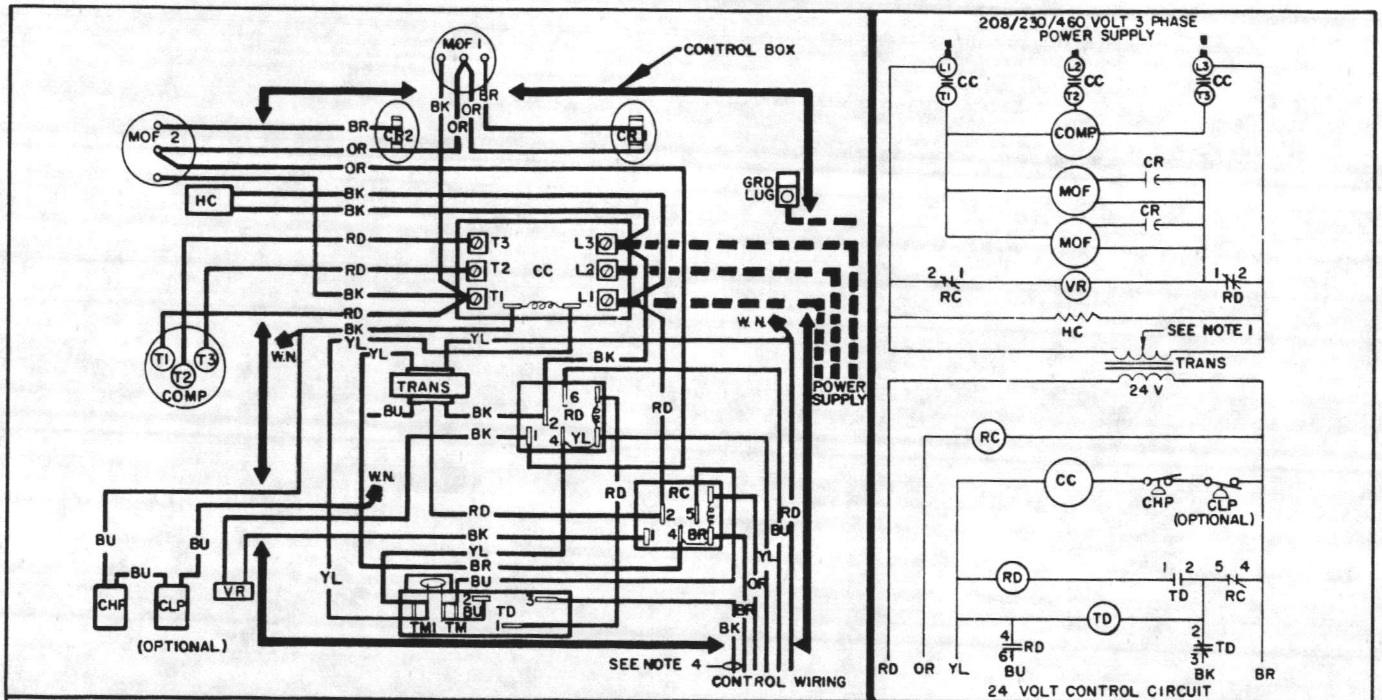
NOTES: Local codes take precedence over suggested wire and fuse sizes.
*Values shown are the most severe and may vary slightly dependent on compressor model supplied.

ELECTRICAL CONTROLS

CONTROL BOX (TYP. (2) CIRCUITS-150/200)

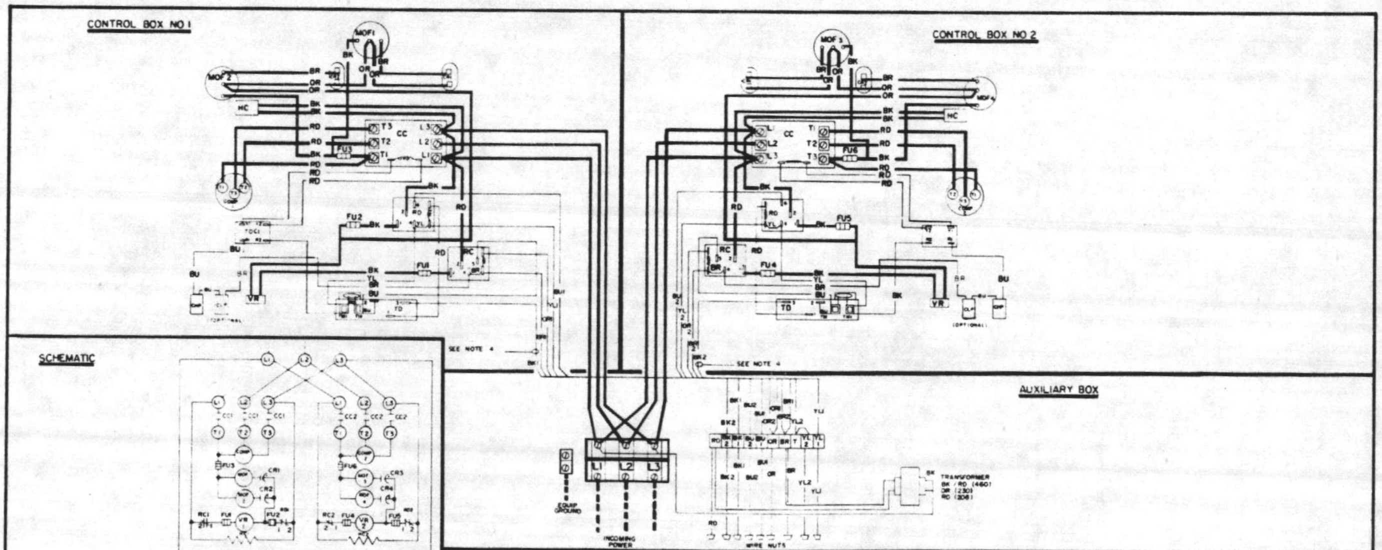


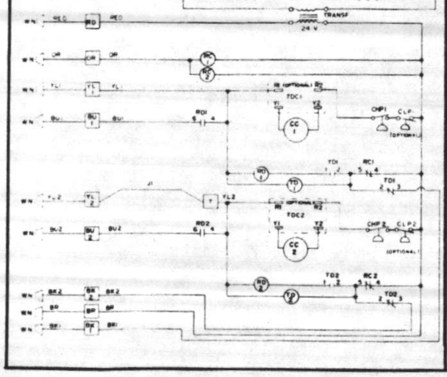
TYPICAL WIRING DIAGRAMS RPWB-075 & RPWB-100



NOTES	COMPONENT CODE	WIRING	WIRE COLOR CODE
1. TRANSFORMER FACTORY WIRED FOR MAXIMUM POWER SUPPLY VOLTAGE. USE RED AND BLUE (WHEN AVAILABLE) FOR LOWER VOLTAGE APPLICATIONS. 2. REFER TO WIRING DIAGRAM INSIDE COMPRESSOR CONTROL BOX FOR SERVICING MOTOR PROTECTION SYSTEM. 3. USE COPPER CONDUCTORS ONLY. 4. FOR USE WITH RXPM MONITOR. NO MORE THAN 4VA LOAD.	CC CONTACTOR CHP CONTROL HIGH PRESSURE CLP CONTROL LOW PRESSURE COMP COMPRESSOR CR CAPACITOR RUN HC CRANKCASE HEATER MCP COMPRESSOR PROTECTION MODULE MOF OUTDOOR FAN MOTOR RC COOLING RELAY RD DEFROST RELAY TD DEFROST TIMER TRANS TRANSFORMER VR REVERSING VALVE WN WIRE NUT	1. LINE VOLTAGE FACTORY STANDARD OPTIONAL COMPONENT 2. LOW VOLTAGE FACTORY STANDARD OPTIONAL COMPONENT 3. FIELD INSTALLED POWER 4. FIELD INSTALLED CONTROL NOTE 1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL. 2. REPLACEMENT CAPACITOR MUST BE A U.L. RECOGNIZED FUSED CAPACITOR.	BK—BLACK PU—PURPLE BU—BLUE RD—RED BR—BROWN WH—WHITE GR—GREEN YL—YELLOW OR—ORANGE 90-41173-01-04

RPWB-150 & RPWB-200





NOTES

1. TRANSFORMER FACTORY WIRED FOR MAXIMUM POWER SUPPLY VOLTAGE. USE RED AND BLUE (WHEN AVAILABLE) FOR LOWER VOLTAGE APPLICATIONS.
2. REFER TO WIRING DIAGRAM INSIDE COMPRESSOR CONTROL BOX FOR SERVICING MOTOR PROTECTION SYSTEM.
3. USE COPPER CONDUCTORS ONLY.
4. FOR USE WITH RXPM MONITORS. NO MORE THAN 4VA LOAD.
5. ALL FUSE REPLACEMENT TO BE CLASS CC-10 AMP.

COMPONENT CODE	WIRING -	WIRE COLOR CODE
CC CONTACTOR CDT COMPRESSOR TIME DELAY CHP CONTROL HIGH PRESSURE CLP CONTROL LOW PRESSURE COMP COMPRESSOR CR CAPACITOR RUN FU FUSE HC CRANKCASE HEATER MCP COMPRESSOR PROTECTION MODULE MOF OUTDOOR FAN MOTOR RC COOLING RELAY RD DEFROST RELAY TD DEFROST TIMER TDC ANTI SHORT CYCLE TIMER TRANS TRANSFORMER VR REVERSING VALVE WN WIRE NUT	1. LINE VOLTAGE FACTORY STANDARD OPTIONAL COMPONENT 2. LOW VOLTAGE FACTORY STANDARD OPTIONAL COMPONENT 3. FIELD INSTALLED POWER 4. FIELD INSTALLED CONTROL NOTE 1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL.	BK—BLACK PU—PURPLE BU—BLUE RD—RED BR—BROWN WH—WHITE GR—GREEN YL—YELLOW OR—ORANGE 90-41124-02-04

GUIDE SPECIFICATIONS

075/100

Furnish and install as shown on the drawing Rheem Model ______________ air cooled heat pump outdoor section with matching indoor unit, Rheem Model ______________.

COMPRESSOR—Unit shall have (1) compressor. It is to be of the welded hermetic type internally spring mounted with crank case heater, inherent (high temperature) motor overload protection, an antislug device, and durable insulation on the motor windings. It shall be externally mounted on rubber grommets to reduce vibration transmission and noise to surrounding area. Maximum power input shall not be more than ______ on 7.5 nominal ton units and ______ on 10 nominal ton units at conditions specified.

CAPACITY—Capacity shall be ______ BTU/HR when operating at ______°F saturated suction temperature.

MOTORS & FANS—Each unit shall have two 1075 RPM sleeve bearing, permanently lubricated motors fixed with direct-drive, dual or multibladed fans. Motors shall be mounted to minimize vibration and noise and be equipped with inherent overload protection. Motors & fans shall be mounted on removable top panel for easy access. Condenser air shall discharge vertically.

COILS—Coils shall be fabricated of ⅜" O.D. seamless copper tubing and aluminum fins with die-formed collars mechanically bonded to tubes arranged in a staggered pattern. All coils shall be submitted to an air pressure test of 450 PSIG after fabrication and dehydrated prior to assembling in unit. Units shall be shipped with a refrigerant holding charge. Coil design shall permit removal of service panels without affecting operation of the unit. Airflow shall be draw through design providing uniform air distribution across the coil surface.

CASINGS—Shall make unit suitable for outdoor installation. Casing and framework shall be manufactured of 20 gauge galvanized sheet metal subjected to multistage cleaning, primed, and finished with a durable baked enamel paint. Service access shall be provided at top and two sides. Openings shall be provided for power. Refrigerant stubs shall be extended through the cabinet for external field connection without affecting accessibility to compressor compartment. Dimensions of entire assembly shall be not more than 28 inches high, 80.5 inches long and 31.5 inches wide.

REFRIGERATION CIRCUIT—Shall include the compressor, the condenser coils, all internal refrigerant piping, suction accumulator, TX valve, check valve, a filter drier and liquid line service valve. Refrigerant stubs shall be extended through the cabinet for external field connection without affecting accessibility to compressor compartment.

CONTROL PANEL—The panel shall be designed for single power source to the compressor and fan motors and shall include time-temperature controls, cooling relay, defrost relay, control transformer and compressor contactor.

FACTORY TESTING—All units shall be test run at the factory. They shall experience the following control testing procedures: High pressure control, switching of electrical components, and compressor operation.

150/200

Furnish and install as shown on the drawing Rheem Model ______________ air cooled heat pump outdoor section with matching indoor unit, Rheem Model ______________.

COMPRESSOR—Unit shall have (2) compressors. They are to be of the welded hermetic type internally spring-mounted with crank case heater, inherent (high temperature) motor overload protection, an antislug device, and durable insulation on the motor windings. They shall be externally mounted on rubber grommets to reduce vibration transmission and noise to surrounding area. Maximum power input shall not be more than ______ on 15 nominal ton units and ______ on 20 nominal ton units at conditions specified.

CAPACITY—Capacity shall be ______ BTU/HR when operating at ______°F saturated suction temperature.

MOTORS & FANS—Each unit shall have four 1075 RPM sleeve bearing, permanently lubricated motors fixed with direct-drive, dual or multibladed fans. Motors shall be mounted to minimize vibration and noise and be equipped with inherent overload protection. Motors & fans shall be mounted on hinged top panel for easy access. Condenser air shall discharge vertically.

COILS—Coils shall be fabricated of ⅜" O.D. seamless copper tubing and aluminum fins with die-formed collars mechanically bonded to tubes arranged in staggered pattern. All coils shall be submitted to an air pressure test of 450 PSIG after fabrication and dehydrated prior to assembling in unit. Units shall be shipped with a refrigerant holding charge. Coil design shall permit removal of service panels without affecting operation of the unit. Airflow shall be draw through design providing uniform air distribution across the coil surface.

CASINGS—Shall make unit suitable for outdoor installation. Casing and framework shall be manufactured of 20 gauge galvanized sheet metal subjected to multistage cleaning, primed, and finished with a durable baked enamel paint. Service access shall be provided at top and two sides. Openings shall be provided for power. Refrigerant stubs shall be extended through the cabinet for external field connection without affecting accessibility to compressor compartment. Dimensions of entire assembly shall be not more than 31.5 inches high, 84.5 inches long and 83 inches wide.

REFRIGERATION CIRCUIT—Shall include the compressor, the condenser coils, all internal refrigerant piping, a filter drier and liquid line service valve. Refrigerant stubs shall be extended through the cabinet for external field connection without affecting accessibility to compressor compartment.

MAIN POWER PANEL—The panel shall be designed for single power source to the compressors and fan motors and shall include the control transformer and low voltage terminal block.

CONTROL PANELS (2)—The panels shall be designed for single power source to the compressor and fan motors and shall include time-temperature controls, cooling relay, defrost relay and compressor contactor.

FACTORY TESTING—All units shall be test run at the factory. They shall experience the following control testing procedures: High pressure control, switching of electrical components, and compressor operation.

SEQUENCE OF OPERATION— CONSULT WIRING DIAGRAMS PAGE 10

COOLING MODE

1. With thermostat in the cool mode, fan auto and the room temperature higher than the thermostat setting:
   a. Indoor blower contactor (CM) is energized through thermostat contact (G).
   b. Compressor contactor (CC) is energized through thermostat contact (Y) and high pressure control (CHP).
   c. Cooling relay is energized through thermostat contact (O).
      1. Cooling relay locks out the defrost relay (RD), defrost timer (TD) and reversing valve (VR).
   d. The system will continue in the cooling operation as long as all safety controls are closed until the thermostat is satisfied.
      1. The reversing valve remains in the cooling mode when the thermostat is satisfied.

HEATING MODE

1. With the thermostat in the heat mode, fan auto and the room temperature lower than the thermostat setting.
   a. Indoor blower contactor (CM) is energized through thermostat contact (G).
   b. Compressor contactor (CC) is energized through thermostat contact (Y) and high pressure control (CHP).
   c. Cooling relay (RC) de-energized.
      1. Reversing valve (VR) and defrost timer (TD) are energized through normal closed contacts of cooling relay (RC).
      2. The defrost timer (TD) will energize the defrost relay (RD) on a time/temperature basic as required (See G).
   d. Should the heat requirement be more than the heat pump can supply, a portion of the electric heat accessory (if supplied) is energized through thermostat contact (W2). (See electric heat kit accessory section.)
   e. The system will continue the heating operation as long as all safety controls are closed until the thermostat is satisified.
      1. The reversing valve remains in the heating mode when the thermostat is satisified.
   f. The unit will function in a defrost mode, reversing the compressor cycle to cooling and energizing the electric heat kit (if supplied), as required through the defrost relay (RD).
   g. If the refrigerant system becomes inoperable during a need for heating, the thermostat may be set to "emergency heat" which will energize the remaining portion of the electric heat kit (if supplied).

NOTE: The 150 & 200 units have two (2) compressors. Thermostat (Y2) brings in the second compressor, (W3) controls additional electric heat if used.

ACCESSORY EQUIPMENT

0° AMBIENT KIT

RXPZ-B48Z
(208/230/460 volt)
Two (2) Kits Required for 150 & 200

Kit allows for operation in the cooling mode under low ambient conditions by cycling of the condenser fans on the outdoor unit. It is locked out of the system when the unit is in the heating mode.

ANTI-SHORT-CYCLE TIMER

RXRU-A50 (075/100)
RXRU-A51 (150/200)

Prevents restarting of unit for five minutes if shut down for any reason. (See wiring diagram and schematic in this specification sheet for proper location and installation; item TDC.)

HEAT PUMP MONITOR

RXPM-B01

When this accessory is installed properly, the owner is notified of the following when the red light on the indoor wall thermostat comes on:

1. The heat pump is not operating properly.
2. Heat is being supplied by auxiliary electric elements only; thus, service is required.
3. Owner may need to switch the indoor wall thermostat to "Emergency Heat" in order to make all electric heat available for heating purposes.

HEAT PUMP THERMOSTAT

ZXMT-A78 (150 & 200)

The recommended heat pump thermostat has two stages of cooling and three stages of heat. During cooling, the dual compressors are controlled by the first and second stages respectively. In the heating mode the compressors are cycled by the first and second stages, and the auxiliary heat is controlled by the third stage. These thermostats have an emergency heat switch and indicator light. With this switch on, the compressors are locked out and the auxiliary heat is transferred to the first stage control mode.

HEAT PUMP THERMOSTAT

ZXMT-C70 (manual)
ZXMT-B79 (automatic)
(075 & 100)

The recommended heat pump thermostat has one stage of cooling and two stages of heat. During cooling, the compressor is controlled by the one stage of cooling. In the heating mode, the compressor is cycled by the first stage and the auxiliary heat is controlled by the second stage. These thermostats have an emergency heat switch and indicator light. With this switch on, the compressor is locked out and the auxiliary heat is transferred to the first stage control mode.

OUTDOOR THERMOSTAT

RXPT-A01

When outdoor ambient drops below thermostat setting, a circuit is completed to allow all auxiliary heat available to be energized on demand.

INSTALLATION

IMPORTANT MESSAGE TO OWNER

The manufacturer assumes no responsibility for equipment installed in violation of any code, status or regulation. The operation portion of this manual gives instructions as to the service and care of the unit. It is recommended that the installer go over the operational portion of this manual with the owner so that there is a full understanding of the equipment and how it is intended to function.

These instructions should be read and kept for future reference. It is suggested that this booklet be affixed to or adjacent to the indoor equipment. It is addressed to your dealer and serviceman, but we highly recommend that you read it—paying particular attention to the section titled "MAINTENANCE".

CAUTION: We are not responsible for the performance of a mismatched system. The outdoor unit must be installed with a compatible indoor unit as designated in the specification data or in the Directory of Certified Unitary Heat Pumps as published by the Air Conditioning and Refrigeration Institute. Using unmatched components may not only affect the performance of the system, but may jeopardize the warranty status of the equipment.

A calculation of heat gain for cooling and heat loss for heating should be made. Some auxiliary heat should be provided even when the heat loss does not justify auxiliary heat, because it is desirable during defrost periods to prevent cold air from blowing through ducts.

Since a heat pump heats with relatively large quantities of low temperaure air, it is important to do a good job of placing and sizing ducts and registers to minimize uncomfortable sensation of drafts and noise.

INSPECTION AND HANDLING

Inspect exterior of unit for evidence of rough handling in shipment. If damage is found, enter claim at once. Unpack carefully after moving unit to approximate location. Any damage should be reported immediately to the transportation company. Material in this shipment was inspected at the factory and released to the common carrier with no known damage.

ORDERING PARTS

When reporting shortages or damaged parts, or when ordering repair parts, give the complete unit model and series number which is stamped on the Series and Rating Plate.

MAINTENANCE AND OPERATION

1. All access panels must be in place when unit is in operation.
2. For maximum efficiency, the condenser coil must be kept clean. Periodic inspections, depending on local conditions are recommended. If it is necessary to clean the condenser coil, use a common garden hose.
3. Never operate the unit without filters installed in the air handler.

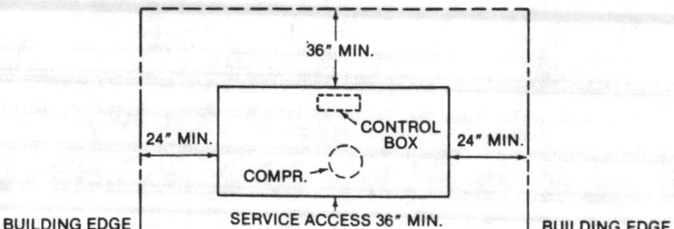
CRANKCASE HEATERS

All units are equipped with a crankcase heater. These crankcase heaters are factory wired in such a manner that they are in operation whenever the main power supply to the unit is "on". Before starting the equipment after prolonged shut-down or at the time of initial start-up, be sure that the circuits to the condensing units are closed for at least 24 hours.

INSTALLATION—GENERAL

Consult local building codes or ordinances for special installation requirements. When selecting a site to locate the heat pump, consider the following:

1. A minimum clearance of 36″ for service access, 24″ for air inlets (sides and end) and 60″ for air discharge (unit top) is required.
2. The unit must be located outdoors and cannot be connected to duct work.
3. The length of the refrigerant piping and wiring should be as short as possible to avoid capacity loss and increased operating cost.
4. Locate unit so runoff water does not pour directly on the unit. Provide gutter on other shielding at roof level.



5. With heat pump applications where snowfall is anticipated the height of the unit above the ground level should be considered for such weather conditions. Mount unit high enough to be above average area snowfall to allow for proper drainage provisions. We suggest mounting the unit on an angle iron support frame with the mounting supports securely fastened to concrete pads. Clearances must meet those specified in these installation instructions to insure an adequate service access area and air flow requirements. The unit should be level and rigidly mounted to the frame to maintain this position. Provide a 12 inch gravel bed, out and away from the perimeter of the unit support frame and unit to prevent mud splashing. Route condensate to an area which would not become slippery and result in personal injury. Visually inspect unit drainage openings. Construct the support frame in such a way that it will not interfere with these drainage openings.

ROOFTOP INSTALLATION

If rooftop installation is required, make certain that the building construction is adequate for the weight of the unit. (Refer to physical data chart.)

REFRIGERANT PIPING

SUCTION AND LIQUID LINES

Keep all lines clean and dry until connection is made. Connect the piping to the evaporator coil first. Refer to the refrigerant line size chart, Table I.

Always use the shortest length possible with a minimum number of bends. Use a tube bender for short bends to insure that there are no kinks in the line. To prevent noise transmission, never position the suction or liquid lines in direct contact with the building structure. Also use an isolated or suspension type hanger when possible.

The suction line must be insulated.

MAXIMUM LENGTH OF INTERCONNECTING PIPING

The use of the long connecting lines should be avoided as there is a capacity loss for each foot of piping used. Also the extra R22 required tends to shorten compressor life. See Suction and Liquid Line charts to determine line size.

Refrigerant charging must be by liquid pressure method. See the Charge Chart attached inside the service panel on the unit and in this manual.

MAXIMUM VERTICAL SEPARATION BETWEEN INDOOR AND OUTDOOR SECTIONS

Since both sections act as both condenser and evaporator, the maximum vertical separation should not exceed 60 feet. However, line sizes should not exceed those recommended in Tables IIIA and IIIB.

SWEAT FITTINGS

All lines should be assembled with type "L" refrigerant piping and **not with copper water pipe.** They should be brazed with the following alloys:

Copper to Copper—5% Silver Alloy

Copper to Steel or Brass—35% Silver Alloy (with flux)

Filter driers are supplied in the liquid line of each unit. Use the following procedure in making piping connections:

1. Be sure both refrigerant shutoff valves at the outdoor units are front seated. (Turn fully clockwise.)
2. Unseal piping stubs one at a time, just prior to making preparations to solder the joints.
3. Clean the inside of the fitting and the outside of the piping with steel wool or sand cloth before soldering. Always keep chips, steel wool, dirt, etc. out of the inside when cleaning. Assemble piping part way into the fitting. Apply flux all around the outside of the piping when required, and push piping into the joint. This procedure will keep the flux from getting inside the system.
4. When soldering the joints on the outdoor unit, wrap the service valves with a wet rag before applying heat.
5. Flow dry nitrogen into the shutoff valve port through the piping while brazing (Refrigerant 22 will decompose and form harmful acids at high soldering temperatures.)
6. Connect a tank of R22 to the liquid valve service port, purge refrigerant through the lines and indoor coil and out the schrader valve suction port.
7. Replace the suction line port cap and build up tank pressure in the lines and coil. Leak test all joints. If a leak is found, release charge and follow step 5 to repair.

NOTE: Be sure to tighten all schrader valve caps to prevent leakage.

TABLE I

MODEL RPWB-RHPA-	UNIT LINE CONNECTION SIZE		BASIC CHARGE-R22 WITH 25 FT OF LINE*
	LIQUID	SUCTION	
075	(1) 5/8" I.D. Sweat	(1) 1 1/8" I.D. Sweat	18#
100	(1) 5/8" I.D. Sweat	(1) 1 3/8" I.D. Sweat	28#
150	(2) 5/8" I.D. Sweat	(2) 1 1/8" I.D. Sweat	18#/CIRC.
200	(2) 5/8" I.D. Sweat	(2) 1 3/8" I.D. Sweat	28#/CIRC.

*For each additional foot of line, add 1.9 oz. to basic charge.

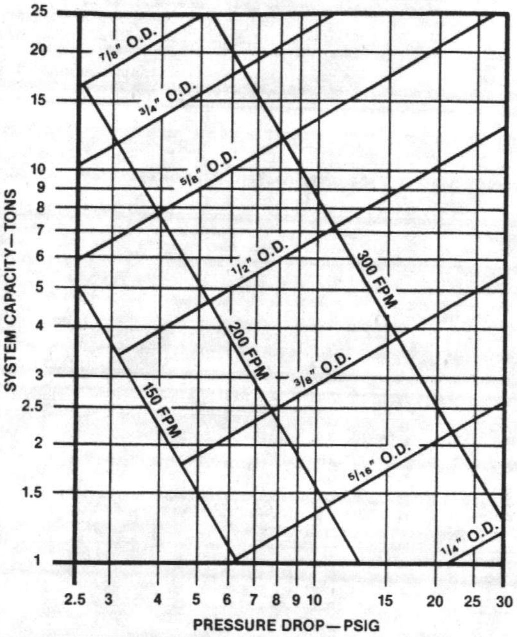
NOTE: Additional Refrigerant Oil (Sunisco 3GS or Equal) is required at 3 fluid ounces for each 10 feet of line length over 200 feet. Oil may be added for each 10 feet of line run over 60 feet.

TABLE II

EQUIVALENT LENGTH (FT.) OF STRAIGHT TYPE "L" TUBING FOR NON-FERROUS VALVES AND FITTINGS (BRAZED)						
TUBE SIZE INCHES O.D.	SOLENOID VALVE	ANGLE VALVE	SHORT RADIUS ELL	LONG RADIUS ELL	TEE LINE FLOW	TEE BRANCH FLOW
1/2	70	24	4.7	3.2	1.7	6.6
5/8	72	25	5.7	3.9	2.3	8.2
3/4	75	25	6.5	4.5	2.9	9.7
7/8	78	28	7.8	5.3	3.7	12.0
1 1/8	87	29	2.7	1.9	5.2	8.0
1 3/8	102	33	3.2	2.2	6.9	10.0
1 5/8	115	34	3.8	2.6	8.7	12.0
2 1/8	141	39	5.2	3.4	12.0	16.0

TABLE III A

LIQUID LINE PRESSURE DROP PER 100 FEET EQUIVALENT LENGTH (TYPE L COPPER TUBING)

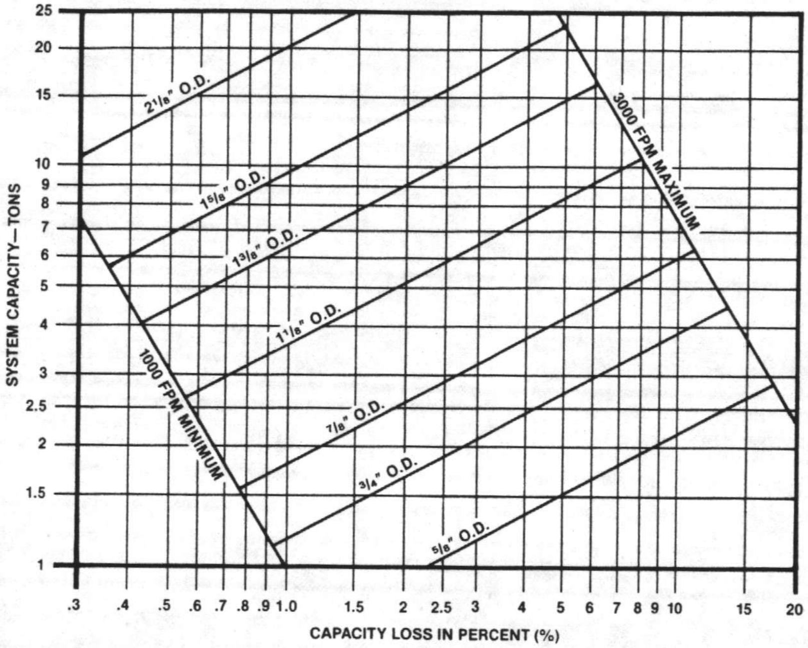


NOTES:

1. When evaporator coil is above condenser, the pressure drop due to vertical lift (.5 PSIG per foot of lift) **must** be added to the pressure drop derived from this curve.
2. Size liquid line for **no more** than 10°F loss (approximately 30 PSIG total pressure drop).
3. **Do not oversize liquid line.** Oversize liquid lines add significantly to the amount of refrigerant required to charge the system.
4. The maximum recommended velocity with solenoid valves or other quick closing devices in the liquid line is 300 FPM.

TABLE III B

SUCTION LINE SYSTEM CAPACITY LOSS IN PERCENT PER 100 FEET EQUIVALENT LENGTH (TYPE L COPPER TUBING)



NOTES:

1. The minimum velocity line is for vertical applications with compressor above evaporator coil.
2. For suction line pressure drop (PSIG) multiply percent (%) loss by 1.18.

EVACUATION

Good evacuation is very important on a heat pump. If the outdoor unit has not lost its holding charge, it does not need to be evacuated if the unit suction and liquid line valves remain closed.

1. Use a refrigerant-type vacuum pump capable of evacuation in the 500 micron range.
2. Use a three-way service valve with gauges that read from 30″ vacuum to 400 PSIG.
3. Evacuate the system to 29.5″ vacuum. Break the vacuum with a gas charge of R22, then repeat two times.
4. Shut off the three-way service valves (and open unit suction and liquid line valves).

CHARGING

See instructions on the unit service cover for calculating and marking total charge on the rating plate.

1. Connect a tank of Refrigerant 22 to the three-way liquid service valve.
2. Purge charging hose with refrigerant from tank before tightening the line.
3. With an accurate scale set refrigerant tank up so its weight can be measured while in a position to charge liquid.
4. Turn liquid service valve two turns clockwise off its back-seat. Open valve on refrigerant tank.

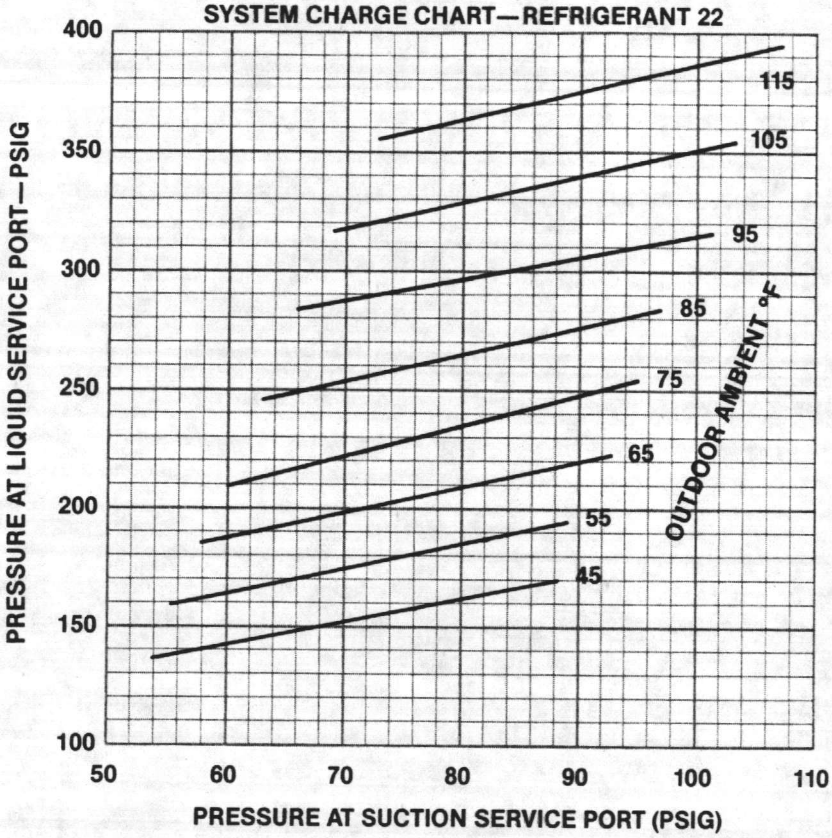
CAUTION: Never start unit while under a vacuum.

5. Charge unit with the weight as shown in Table I. When unit has been charged with correct amount, turn tank valve off and backseat the liquid valve, if provided.
6. Check all joints for leaks.
7. Unit may be started at this point. Check and adjust charges as described on charging table attached to the unit's service cover and in this manual.

SPLIT HEAT PUMP NOMINAL 7.5 TONS

COOLING

SYSTEM CHARGE CHART—REFRIGERANT 22

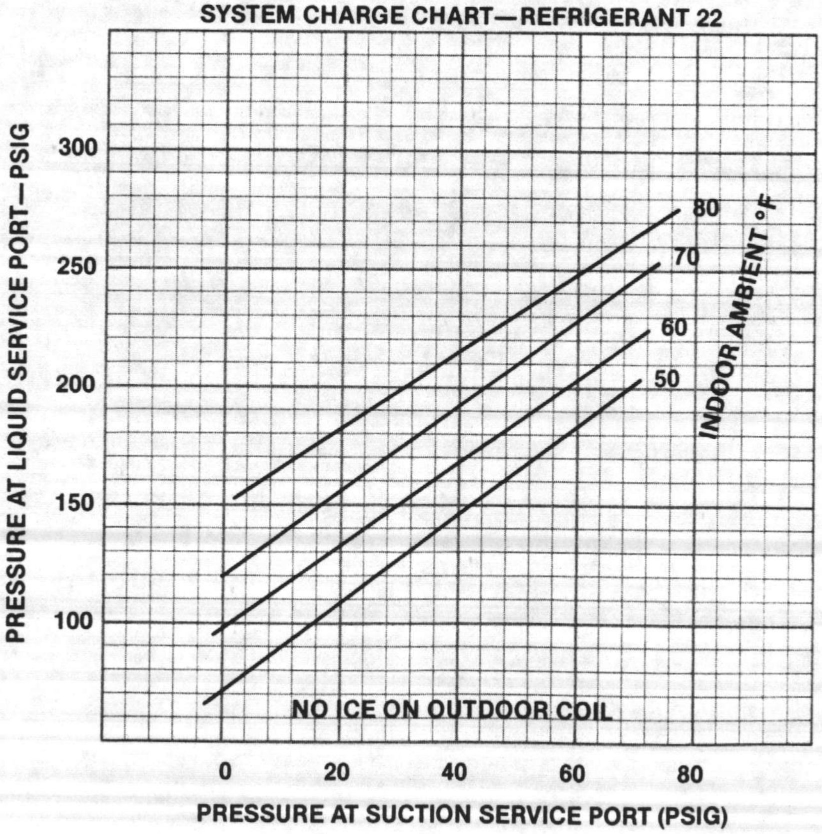


NOTES:

1. Connect pressure gauges to suction and liquid ports at outdoor unit.
2. Measure air temperature to the unit (outdoor dry bulb ambient).
3. Place an "X" on the chart where the suction and liquid pressure cross.
4. If "X" is below outdoor temperature line, add charge and repeat 3.
5. If "X" is above outdoor temperature line, remove charge and repeat 3.

HEATING

SYSTEM CHARGE CHART—REFRIGERANT 22



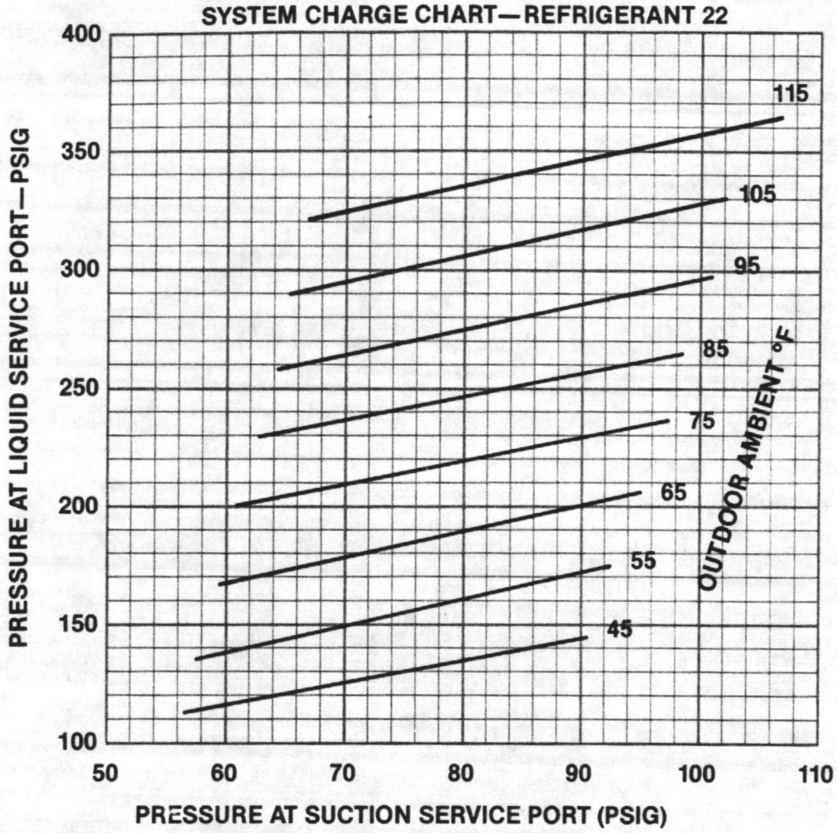
NOTES:

1. Connect pressure gauges to suction and liquid ports at outdoor unit.
2. Measure air temperature to the unit (indoor dry bulb ambient).
3. Place an "X" on the chart where the suction and liquid pressure cross.
4. If "X" is below indoor temperature line, add charge and repeat 3.
5. If "X" is above indoor temperature line, remove charge and repeat 3.

SPLIT HEAT PUMP NOMINAL 10 TONS

COOLING

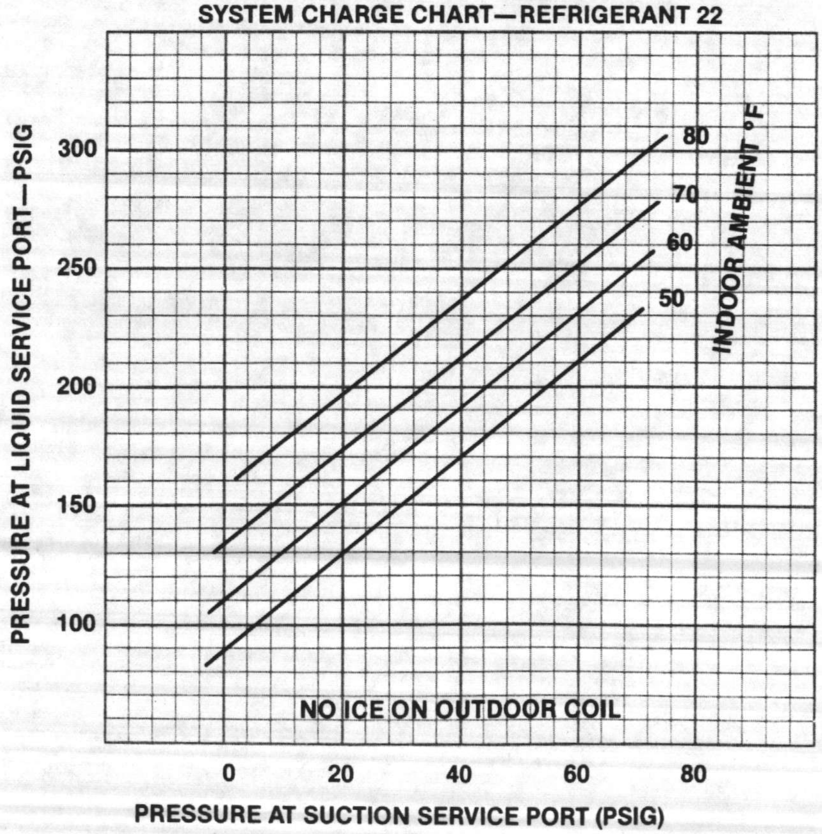
SYSTEM CHARGE CHART—REFRIGERANT 22



NOTES:
1. Connect pressure gauges to suction and liquid ports at outdoor unit.
2. Measure air temperature to the unit (outdoor dry bulb ambient).
3. Place an "X" on the chart where the suction and liquid pressure cross.
4. If "X" is below outdoor temperature line, add charge and repeat 3.
5. If "X" is above outdoor temperature line, remove charge and repeat 3.

HEATING

SYSTEM CHARGE CHART—REFRIGERANT 22



NOTES:
1. Connect pressure gauges to suction and liquid ports at outdoor unit.
2. Measure air temperature to the unit (indoor dry bulb ambient).
3. Place an "X" on the chart where the suction and liquid pressure cross.
4. If "X" is below indoor temperature line, add charge and repeat 3.
5. If "X" is above indoor temperature line, remove charge and repeat 3.

CHARGING HINTS

SYMPTOM	POSSIBLE CAUSE	REMEDY
High head pressure	a. Air flow to or from condenser restricted or dirty condenser. b. Faulty condenser fan or motor. c. Overcharge of refrigerant. d. Air in system.	a. Remove obstruction, relocate condensing unit—if necessary clean condenser. b. Replace. c. Bleed charge. d. Evacuate and recharge.
Low head pressure	a. Short of refrigerant. b. Low evaporator air flow.	a. Check for leak, add charge. b. Increase blower speed, check filters.
Low suction & hot compressor	a. Short of refrigerant.	a. Check for leak, add refrigerant.
Excessive sweating of compressor	a. Low indoor airflow. b. Excess refrigerant.	a. Increase speed of blower or reduce restriction—replace air filter. b. Slowly bleed off charge.

POWER SUPPLY AND CONTROL CIRCUITS

POWER SUPPLY

All wiring must comply with NEC and local codes. See Electrical Data Chart or rating plate on the unit for volts, frequency, maximum fuse size and minimum branch circuit ampacity. Refer to the wiring diagram inside the unit service cover before connecting to power supply.

For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from Table IV using the circuit ampacity found on the unit rating plate. From the disconnect to unit, the smallest wire size allowable in Table IV should be used, as the disconnect must be in sight of the unit. All units require a fused disconnect. Only copper wire can be attached to the unit contactor (075 & 100).

WARNING: This unit must be permanently grounded. A ground lug is provided near the contactor (075/100) or in the field wiring box (150/200).

Special instructions for power wiring with aluminum conductors (075/100):

a. Attach a length (6″ or more) of recommended size copper wire to the unit contactor terminals L1 and L3 for single phase, L1, L2 and L3 for three phase.

b. Splice copper wire pigtails to aluminum wire with U.L. recognized connectors for copper-aluminum splices. Please exercise the following instructions very carefully to obtain a positive and lasting connection:

1. Strip insulation from aluminum conductor.
2. Coat the stripped end of the aluminum wire with the recommended inhibitor, and wire brush aluminum surface through inhibitor. INHIBITORS: Brundy-Pentex "A", Alcoa-No. 2EJC; T & B-KPOR Shield.
3. Clean and recoat aluminum conductor with inhibitor.
4. Make the splice using the above listed wire nuts or split bolt connectors.
5. Coat the entire connection with inhibitor and wrap with electrical insulating tape.

TABLE IV

COPPER OR ALUMINUM WIRE SIZE FOR 1% VOLTAGE DROP

SUPPLY CIRC. AMPACITY	COPPER WIRE SIZE—AWG					ALUMINUM WIRE SIZE—AWG				
	SUPPLY WIRE LENGTH—FEET					SUPPLY WIRE LENGTH—FEET				
	100	150	200	250	300	100	150	200	250	300
20	8	6	4	4	4	6	4	4	3	1
25	8	6	4	4	3	6	4	3	2	1
30	6	4	4	3	2	4	3	2	1	1/0
35	6	4	3	2	1	4	2	1	1/0	2/0
40	6	4	3	2	1	3	2	1	1/0	3/0
45	4	3	2	1	1/0	3	1	1/0	2/0	3/0
50	4	3	2	1	1/0	3	1	1/0	2/0	3/0
60	4	2	1	1/0	2/0	2	1/0	2/0	3/0	4/0
70	3	2	1/0	2/0	3/0	1	2/0	3/0	4/0	4/0
80	3	1	1/0	2/0	3/0	1	2/0	3/0	4/0	300
90	2	1/0	2/0	3/0	4/0	1/0	3/0	4/0	250	300
100	2	1/0	2/0	3/0	4/0	1/0	3/0	4/0	300	350
110	1	2/0	3/0	4/0	250	2/0	4/0	250	300	400

CONTROL SUPPLY

If the low voltage control wiring is run in conduit with the power supply, Class I insulation is required. Class II insulation is required if run separate. Low voltage wiring may be run through the insulated bushing provided in the ⅞ hole in the connector panel, up to and attached to the terminals or pigtails from the bottom of the control box. Conduit can be run to the connector panel if desired by removing the insulated bushing. A control transformer is supplied in the unit. See hook-up wiring diagram in these instructions for reference.

WARNING
After completion of wiring check all electrical connections, including factory wiring within the unit, and make sure all connections are tight, replace and secure all electrical box covers and access doors before leaving unit or turning on power to circuit supplying unit.

PRE-START CHECK

1. Is condensing unit properly located and level?
2. Is air free to travel to and from condensing unit?
3. Is the wiring correct and according to the unit wiring diagram?
4. Are wiring connections tight? (Including those in unit and compressor electrical box.)
5. Is the unit properly grounded?
6. Is circulating air blower correctly wired?
7. Is condensing unit properly fused?
8. Is the thermostat level, correctly wired, and in a good location?
9. Is the ductwork correctly sized, run, taped and insulated?
10. Is refrigerant tubing neatly run and suction line thoroughly insulated?
11. Is condensate drain properly sized, run, trapped and pitched?
12. Are refrigerant connections tight and leak tested?
13. Is filter clean and in place?
14. Does the condenser fan turn free without rubbing?
15. Is the fan tight on the fan shaft?
16. Are all covers and access panels in place to prevent air loss?
17. Are refrigerant service valves open for full flow?

OPERATION AND SERVICE

GENERAL

Before starting the equipment after prolonged shut down or at the time of initial start up, be sure that the main power to the unit has been energized for at least 24 hours to allow crankcase heater function.

It is important that systems be off for a minimum of 2 minutes before restarting to allow equalization of pressure. The thermostat should not be moved to cycle unit without waiting 2 minutes. To do so may cause the compressor to go off on an automatic overload device or blow a fuse. Poor electrical service can also cause nuisance tripping on overloads or blow fuses.

CAUTION: The compressor has an internal overload protector, under some conditions, it can take up to 2 hours for this overload to reset. Make sure overload has had time to reset before condemning the compressor.

HIGH PRESSURE CONTROLS (CHP)

This control keeps the compressor from operating in pressure ranges which can damage it. The control is in the low voltage control circuit, and is a manual reset type which operates near 450 PSIG. Do not reset arbitrarily without first determining what caused it to function.

COMPRESSOR CRANKCASE HEAT (HC)

All heaters are located on the lower half of the compressor shell. Its purpose is to drive refrigerant from the compressor shell during long off cycles, thus preventing damage to the compressor during starting.

At initial start-up or after extended shutdown periods make sure the heater is energized for at least 24 hours before the compressor is started. (Disconnect switch on and wall thermostat off.)

TIME-TEMPERATURE DEFROST (TD)

The E15 De-ice Control is designed to control the removal of ice, or frost from the outdoor coil of central system and window unit heat pump installations.

De-icing is initiated at a pre-selected time interval, provided the outdoor coil is below a preset initiation temperature. The de-icing cycle is terminated as soon as the outdoor coil rises to a preset temperature, or after a preset length of time.

If the outdoor coil cannot reach the desired preset temperature due to weather conditions, or a malfunction, a "time-safe" termination will occur after 10 minutes. This termination of the de-ice cycle will restore the heat pump to the normal heat cycle.

The frequency of initiation of de-ice cycle is controlled by setting the knurled frequency selector knob to one of the three time positions—30 minutes, 45 minutes, or 90 minutes. (90 minutes is recommended and factory set.)

To select frequency, rotate knurled knob to align 30, 45, or 90 with edge of screwdriver slot.

The timer shaft (concentric with knurled Frequency Selector knob) can be turned to manually rotate the timer cam into, or through the de-ice position; to provide a production and/or field check of de-ice operation.

NOTE: Due to a one way screwdriver slot, the timer cam can be turned clockwise only.

Each service call should not be completed until the defrost action has been tested successfully. There are several easy methods, (temperature permitting) to be used:

1. Allow frost to build on outdoor coil. Block air flow through this coil as completely as possible. Outdoor fan could be stopped by removing power as second choice. However, this is not the preferred method.
2. As the frost covers the coil surfaces, the temperature of the coil tubing will drop to approximately 27°F. At this coil temperature the defrost terminator bulb should close the integral contacts of the defrost control. No action is possible until the clock timer initiates the timed portion of the defrost cycle. To accelerate the timing action, **very slowly** rotate the "one way" slot on the timer dial.
   a. As the dial "clocks" into position, the unit should:
      1. Stop outdoor fans
      2. Return reversing valve to cooling position
      3. Close contacts for one stage of auxiliary heating
   b. With the disappearing of the frost covering on the coil and the coil temperature reaching 60°F., a successful defrost cycle should automatically return the unit to the heating cycle.

TESTING REVERSING VALVE (VR)

Occasionally the reversing valve may stick in the heating or cooling position or in the mid-position.

When stuck in the mid-position, part of the discharge gas from the compressor is directed back to the suction side, resulting in excessively high suction pressure.

The coil to this valve is energized in the heating mode. The system must have operating pressures imposed on the valve, before it will change modes properly.

Check the operation of the valve by starting the system and switching the operation from COOLING to HEATING and then back to COOLING.

If the valve fails to change its position, check for line voltage at the valve coil while the system is on the HEATING cycle.

If voltage is registered at the coil, turn off the power and test the continuity of the valve coil. If the coil tests NOT continuous—replace it.

REVERSING VALVE REPLACEMENT

Remove the refrigerant charge from the system.

When brazing a reversing valve into the system, it is of extreme importance that the temperature of the valve does not exceed 250°F. at any time.

Wrap the reversing valve with a large rag saturated with water. "Wet" the rag and thoroughly cool the valve after each brazing operation of the three joints involved. The discharge line connection from the compressor to the valve is not so critical, since the length of this line is long enough. The wet rag around the reversing valve will eliminate conduction of heat to the valve body when brazing the line connection.

LOW PRESSURE CONTROL (LPC)

This control keeps the compressor from operating if a refrigerant loss occurs. The control is in the low voltage circuit and is a manual reset which opens in the range of 10″ vacuum, thus allowing operation in the heating mode without nuisance tripping. Do not reset arbitrarily without first determining what caused the control to open.

EXPANSION VALVE REPLACEMENT

The expansion valves used in this equipment are nonadjustable as they are preset by the vendor for proper superheat.

It is not necessary to disassemble sweat-type valves when soldering to the connecting lines. Any commonly used types of solder such as Sil-Fos, Easy-Flow, Phos.-copper or equivalents are satisfactory. It is important, however, regardless of the solder used, to direct the flame away from the valve body and avoid excessive heat on the diaphragm. As an extra precaution, a damp cloth should be wrapped around the diaphragm during the soldering operation.

The location of the bulb is extremely important for proper operation of the equipment. Locate the bulb in the same location as received from the factory with the capillary tube coming out at the top.

The pressure equalizing line is equally important, and must be reconnected in the same location when replacing an expansion valve.

TRANSFORMER (TRANS.)

(38 to 50VA on 7½ and 10 ton units;
75VA on 15 and 20 ton units.)

The transformer has line voltage primary and 24 volt secondary output. It is used for the system control circuit supply in conjunction with the thermostat and duct heater.

RHEEM
AIR CONDITIONING
DIVISION

5600 Old Greenwood Road, P.O. Box 6444, Fort Smith, Arkansas 72906

"In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice."

PRINTED IN U.S.A. 4-86 BP FORM NO. P11-714 REV. 0 (92-41530-01-00)

COMMERCIAL REMOTE AIR CONDITIONING EQUIPMENT

PRE START UP INSPECTION

We suggest this completed form be retained by installing or servicing contractor for reference in case operating difficulties are experienced and consultation with factory representatives are desired.

1. Unit should be visually inspected for possible damage to external or internal components. Any damage should be noted on carrier's Delivery Receipt. A damage claim may need to be filed with the carrier.
2. Check to see if all components are included with the unit. Some accessory parts may be packed in the unit.
3. Verify that unit agrees with order specifications; such as, check for proper size unit for use with correct voltage.
4. Confirm that electrical service is proper size. Disconnects, conductors and conduit must comply with local, state and national codes.
5. Inspect duct work for proper sizing. Be certain that ducts are open. Fire dampers, if used, must be open.
6. Make sure all electrical connections are tight, including the terminal strips in control panel and compressor lugs in its control box. Verify compressor solid state module is for correct voltage.
7. Insure that all blowers and fan blades are free and set screws tight.
8. Open all compressor and line service valves (suction, discharge, liquid line and hot gas bypass).
9. Insure that the compressor has oil and system is full of dry refrigerant.

CONDENSING UNIT

1. Locate date plate and record:

   (A) Model Number: ____________________

   (B) Serial Number: ____________________

   (C) Line Voltage: ____________________

2. With control switch off or fuse pulled, switch unit disconnect to "ON" position.
   Note control voltage: ______

3. Energize control circuit with thermostat in satisfied position. Note crankcase heater amp draw: ____________________ (Allow 24 hours for crankcase heater to warm compressor oil.)

4. Apply power momentarily and check to see if blades run in the proper direction

5. Install refrigeration gauges on unit and note the following:

   (A) Suction Pressure: ____________________

   (B) Discharge Pressure: ____________________

6. Check amp draws and note:

   (A) Compressor amps: #1 L1 _____ L2 _____ L3 _____ RLA

   #2 L1 _____ L2 _____ L3 _____ RLA

   (B) Condenser Fan amps: 1. _____ 2. _____ 3. _____

   FLA _____

7. Check high pressure cutout setting at __________ psi.

8. Check low pressure cutout setting at __________ psi.

9. Check pump down cutout setting at __________ psi.

   Check fan cycle switch setting at __________.

   Check condenser entering air __________ F. leaving air __________ F.

   Check superheat at compressor suction __________ F.

   Does unit respond to room thermostat? __________

HEAT PUMP MODELS ONLY

10. Check reversing valve and defrost control operation as outlined in I & O Manual.

AIR HANDLER

1. Record from Data Plate:

   (A) Model Number: __________

   (B) Serial Number: __________

2. Does indoor blower wheel run free in its scroll? __________

3. Is belt tension okay? __________

4. Check indoor blower motor HP _____ Volts _____ FLA _____

5. Check indoor blower motor running amps L1 _____ L2 _____ L3 _____

6. Record return air temperature D.B. _____ W.B. _____

7. Record supply air temperature D.B. _____ W.B. _____

8. Does unit respond to the room thermostat? __________

START UP PERFORMED BY ______________________________ **DATE** ______________

UNIVERSAL PARTS

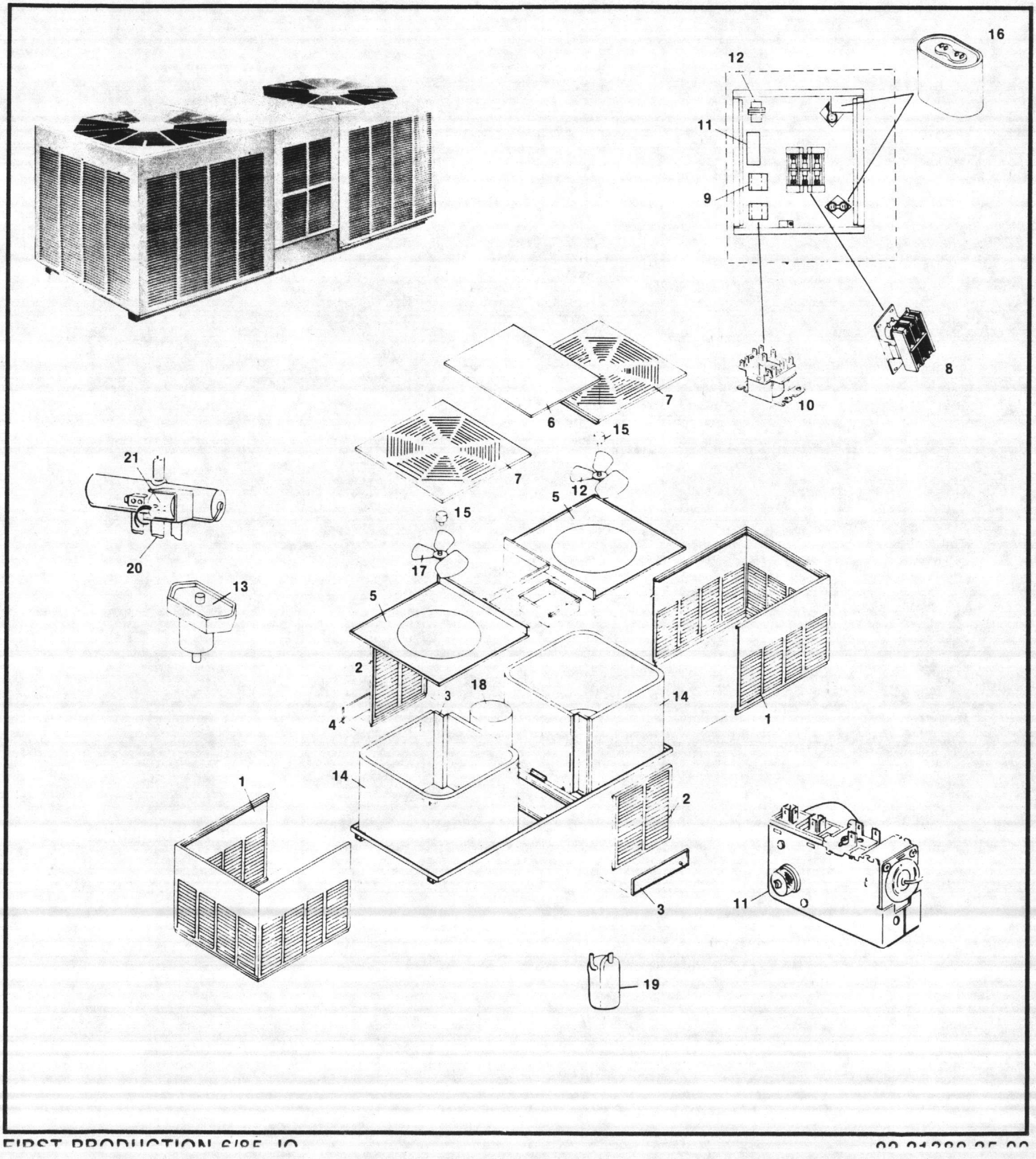
RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL (-)PWB HEAT PUMP

SERIES B **SIZE 075 AND 100**



UNIVERSAL PARTS
R/R RELIABLE REPLACEMENTS
Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

EXPLANATION OF MODEL NUMBER

MODEL NUMBER

[—] P W B — 075 C

TYPE

A S

- [—] MODEL DESIGNATION: R,U
- P TYPE UNIT: P = REMOTE HEAT PUMP
- W: W = COMMERCIAL
- B DESIGN SERIES: B = 1ST DESIGN
- 075 NOMINAL COOLING CAPACITY:
  - 075 — 7.5 TONS
  - 100 — 10 TONS
- C ELECTRICAL DESIGNATION:
  - C = 208/230V 3Ø
  - D = 460 V Ø
- A VARIATIONS
- S COOLING FITTINGS: S = SWEAT

AIR CONDITIONING DIVISION
PARTS CENTER LOCATION
P.O. Box 6444
Fort Smith, AR 72906-0444

Roberson Mill Road
Milledgeville, GA 31061

UNIVERSAL PARTS

RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL (-)PWB HEAT PUMP

SERIES B **SIZE 075 AND 100**

Item No.	Part Description	Notes	(-)PWB 075C 208-230/3	(-)PWB 075D 460/3	(-)PWB 100C 208-230/3	(-)PWB 100D 460/3
	PANELS & S/M PARTS					
1	Cabinet	☎	AE-52503-01	AE-52503-01	AE-52503-01	AE-52503-01
2	Panel-Access	☎	AE-51849-02	AE-51849-02	AE-51849-02	AE-51849-02
3	Panel-Connection, Piping	☎	AE-76746-01	AE-76746-01	AE-76746-01	AE-76746-01
4	Panel-Connection, Electrical	☎	AE-51850-06	AE-51850-06	AE-51850-06	AE-51850-06
5	Venturi	☎	AE-57050-01	AE-57050-01	AE-57050-01	AE-57050-01
6	Panel-Top	☎	AE-51848-01	AE-51848-01	AE-51848-01	AE-51848-01
7	Grille	☎	AS-51602-01	AS-51602-01	AS-51602-01	AS-51602-01
	ELECTRIC GROUP					
8	Contactor, 24V	☐	42-19487-04	42-17412-01	42-40594-01	42-17412-01
9	Relay-Defrost, 24V Coil	☐	42-19736-05	42-19736-05	42-19736-05	42-19736-05
10	Relay-Cooling, 24V Coil	☐	42-19736-05	42-19736-05	42-19736-05	42-19736-05
11	Timer-Defrost, RANCO	☐	47-17719-02	47-17719-02	47-17719-02	47-17719-02
12	Transformer	☐	46-18788-05	46-20479-01	46-18788-05	46-20479-01
▲	Low Pressure Control	☐	47-42003-01	47-42003-01	47-42003-01	47-42003-01
13	High Pressure Control	☐	47-20458-01	47-20458-01	47-20458-01	47-20458-01
	COIL GROUP					
14	Coil-Condenser	☎	AS-77073-03	AS-77073-03	AS-77017-01	AS-77017-01
	FAN GROUP					
15	Motor, ¼ HP, 208-230, 1 spd.	☐ ✓	51-21185-01		51-21185-01	
15	Motor, ¼ HP, 460, 1 spd.	☐ ✓		51-41314-01		51-41314-01
16	Capacitor, 5/370, Oval	☐	43-20847-04	43-20847-04	43-20847-04	43-20847-04
▲	Motor Mounting Kit	✓	AS-55306-01	AS-55306-01	AS-55306-01	AS-55306-01
17	Fan Blade, 22″	☐	70-20558-01	70-20558-01	70-20558-01	70-20558-01
	ORIGINAL EQUIPMENT COMPRESSOR GROUP					
18	Compressor-Copeland	☐	55-41191-09	55-41191-10	55-41191-11	55-41191-12
	REFRIG. SPECIALTY & MISC.					
19	Accumulator	☐	83-20605-08	83-20605-08	83-20605-09	83-20605-09
20	Valve-Reversing Valve, ALCO	☐	61-20649-06	61-20649-06	61-20649-07	61-20649-07
21	Coil-Solenoid, ALCO	☐	61-20649-04	61-20649-05	61-20649-04	61-20649-05
▲	Valve-Expansion, Sporlan	☐	61-40513-04	61-40513-04	61-40513-05	61-40513-05

UNIVERSAL PARTS

RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL (-)PWB HEAT PUMP

SERIES B SIZE 075 AND 100

3340 G 24 84 9999

- 3340 — COMPRESSOR IDENTIFICATION NUMBER — See Identification Sheets
- G — PRODUCTION LOCATION — G - GREENVILLE
- 24 — WEEK OF PRODUCTION
- 84 — YEAR OF PRODUCTION
- 9999 — PRODUCTION NUMBER

NOTES:

WHEN A PARTICULAR COLOR IS REQUIRED IT MUST BE SPECIFIED WHEN ORDERING.

☛ SPECIAL INFORMATION, PLEASE READ CAREFULLY AND FOLLOW APPLICABLE NOTES.

* THIS IS A NEW REPLACEMENT PART.

☐ THESE PARTS SHOULD BE STOCKED IN THE FIELD.

⊡ THIS IS A NEW REPLACEMENT PART AND SHOULD BE STOCKED IN THE FIELD.

△ PRIMARY PART USED IN PRODUCTION.

† ALTERNATE PART USED IN PRODUCTION.

☎ COILS, PANELS AND OTHER MANUFACTURED PARTS ARE AVAILABLE WHILE UNIT IS IN PRODUCTION. AFTER UNIT IS OUT OF PRODUCTION ORDERING SUCH PARTS MUST BE CLEARED WITH THE PARTS DEPARTMENT AS PRICE AND AVAILABILITY WILL VARY. **WHEN A PARTICULAR COLOR IS REQUIRED IT MUST BE SPECIFIED WHEN ORDERING.**

▲ PARTS NOT SHOWN ON PICTORIAL COVER PAGE.

✓ THE REPLACEMENT PART IS EQUAL TO OR BETTER THAN THE ORIGINAL EQUIPMENT PART.

Limited Warranty - Parts

ELECTRIC AIR CONDITIONER OR HEAT PUMP—OUTDOOR UNIT

GENERAL: Manufacturer, RHEEM AIR CONDITIONING DIVISION, will furnish a replacement for ANY PART of this product which fails in normal use and service within the applicable periods specified below. in accordance with the terms of this Warranty. The exchanged part will be warranted for only the unexpired portion of the original warranty.

COMPRESSOR: If the motor-compressor fails within FIVE (5) YEARS after original installation and operation, RHEEM will furnish a replacement compressor.

ANY OTHER PART: If any other part fails within ONE (1) YEAR after original installation and operation, RHEEM will furnish a replacement part.

THIS WARRANTY WILL NOT APPLY: a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; b) to damage from abuse, accident, fire, flood and the like; c) to parts used in connection with normal maintenance, such as cleaning or replacing air filters; d) to units which are not installed in the United States of America or Canada; e) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices: or f) to defects or damage caused by the use of any attachment, accessory or component not authorized by RHEEM.

SHIPPING COSTS: You will be responsible for the cost of shipping warranty replacement parts from our factory to our RHEEM distributor and from the distributor to the location of your product. You also are responsible for any shipping cost of returning the failed part to the distributor. (If in Alaska, Hawaii or Canada, you also must pay the shipping cost of returning the failed part to the port of entry into the continental United States.)

SERVICE LABOR RESPONSIBILITY: This Warranty does not cover any labor expenses for service, nor for removing or reinstalling parts. All such expenses are your responsibility unless a service labor agreement exists between you and your contractor. (If a replacement RHEEM part is for any reason unavailable, RHEEM will repair the failed part at its designated repair center, without charge for repair labor.)

HOW TO OBTAIN WARRANTY PERFORMANCE: Normally, the installing contractor from whom the unit was purchased will be able to take the necessary corrective action by obtaining through his RHEEM air conditioning distributor any replacement parts. If the contractor is not available, simply contact any other local contractor handling RHEEM air conditioning products. The name and location of a local contractor can usually be found in your telephone directory or by contacting a RHEEM air conditioning distributor. If necessary, the following RHEEM office can advise you of the nearest RHEEM distributor:

5600 Old Greenwood Road
Fort Smith, Arkansas 72903
501-646-4311

(FOR CALIFORNIA ONLY)
14300 Alondra Boulevard
LaMirada, California 90638
213-860-7761

HOWEVER, ANY REPLACEMENTS ARE MADE SUBJECT TO VALIDATION BY RHEEM OF IN-WARRANTY COVERAGE. An item to be replaced must be made available in exchange for the replacement.

MISCELLANEOUS: No one is authorized to make any warranties on behalf of RHEEM. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIODS SPECIFIED ABOVE. RHEEM'S SOLE LIABILITY WITH RESPECT TO DEFECTIVE PARTS SHALL BE AS SET FORTH IN THIS WARRANTY, AND ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARE EXPRESSLY EXCLUDED. Some states do not allow limitations on how long an implied warranty lasts, or for the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

RHEEM suggests that you immediately complete the information on *the reverse side* and retain this Warranty Certificate in the event warranty service is needed. Reasonable proof of the effective date of the warranty must be presented, otherwise the effective date will be based upon the date of manufacture plus 30 days. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

92-20800-31-03

Please become familiar with all the provisions of the Warranty. We suggest that your installing contractor either complete the data listed below, or furnish you with the necessary information so that you can enter this data below. If necessary, you may obtain the model and serial numbers from the data plate which is affixed to the side of the outdoor unit.

Name of Owner____________________ Name of Contractor ____________________

Address ____________________ Address ____________________

City/State/Zip Code ____________________ City/State/Zip Code ____________________

Model Number ____________________ Serial Number ____________________

Date of Installation:____________________ Date of Initial Operation If Subsequent to Installation Date: ____________________

We suggest you RETAIN THIS FORM for possible future reference.

RHEEM
AIR CONDITIONING
DIVISION
A Division of Rheem Manufacturing Company
5600 Old Greenwood Road, P.O. Box 6444, Fort Smith, Arkansas 72906

TAB PLACEMENT HERE

DESCRIPTION:

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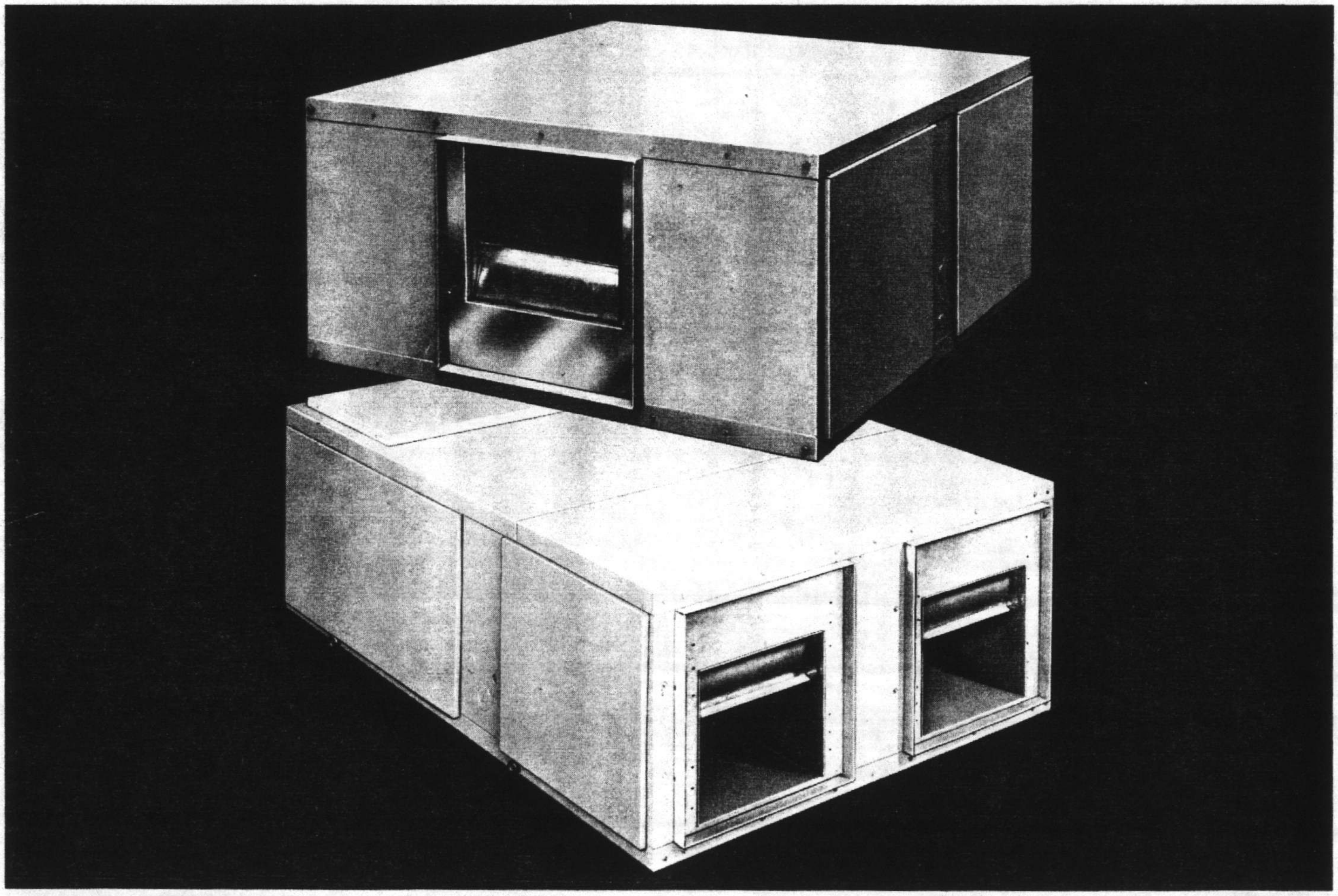
Confidential Records Management, Inc.
New Bern, NC
1-888-622-4425
9/08

FORM NO. P11-715 REV. 0

Commercial Indoor Heat Pump Air Handler



7.5 through 20 NOMINAL TON UNITS
RHPA- SERIES

INDEX

MODEL NUMBER DESIGNATION

R H P A- 075 G K I

- R — Rheem
- H — Air Handler
- P — Heat Pump
- A- — Design Series
- 075 — Nominal Tonnage (Cooling)
  075-7½ Tons
  100-10 Tons
  150-15 Tons
  200-20 Tons
- G — Voltage
  E-208-3-60
  G-230/460-3-60
- K — K-Standard
  L, M-Optional
- I — 200 Only

DRIVE PACKAGE

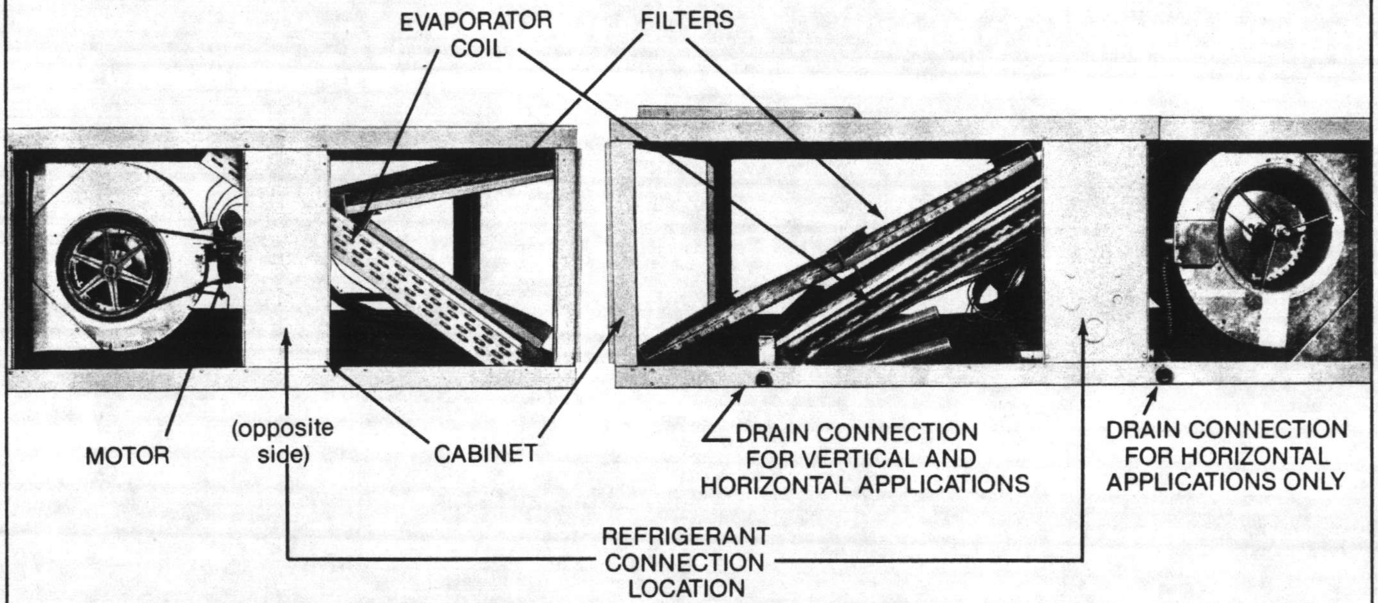
See Blower Performance Data, Page 5

WHY USE AN AIR COOLED SPLIT SYSTEM HEAT PUMP?

- With an air cooled system, you have no water or sewer connections to make, and no troublesome and costly water treatment problems.
- Since the compressor bearing unit is located outside the building, and the low profile air handling unit can be installed in the drop ceiling or in the conditioned space, you will not need a separate equipment room which takes up valuable building space.
- Because of the simple design and the versatility of the Rheem indoor air handling unit, almost any installation requirements can be met quickly and simply.
- The split system concept which requires the remote mounting of the compressor bearing unit, allows the indoor section to be mounted in or near the conditioned space which is a definite advantage over the rooftop type of unit when used on multi-story buildings.

AN INDEPENDENT LABORATORY · UL ® · TESTING FOR PUBLIC SAFETY

MANUFACTURER CERTIFIED TO ARI AS COMPLYING WITH ARI STANDARD 240 · UNITARY HEAT PUMP EQUIPMENT ®



7½-10 nominal tons unit with side panel removed for coil connections & air filter access.

15-20 nominal tons unit with side panel removed for blower and air filter access.

STANDARD UNIT FEATURES

CABINET—Galvanized steel with durable baked enamel finish. Matching plenums and decorative supply and return grilles are available for use when units are to be installed within conditioned space.

MOTOR—Inherently protected motors are mounted inside of insulated cabinet to reduce motor noise and provide a neat looking installation.

LOW PROFILE—Allows for horizontal installation in most standard drop ceiling applications, and the movement of units through most standard doorways for addition or replacement work.

THERMAL EXPANSION VALVES (not visible)—Standard on all models.

FILTERS—One inch throwaway filters are standard, but filter racks are designed to accept either one inch or two inch filters.

EVAPORATOR COIL—Constructed with copper tubes and aluminum fins mechanically bonded to the tubes for maximum heat transfer capabilities. All coil assemblies are leak tested at 450 PSIG internal pressure under water prior to installation into units.

MOTOR CONTROLLER—Factory mounted 24 volt contactor is provided for motor starting.

REFRIGERANT CONNECTIONS—Field piping connections are made through a fixed panel or post between two access panels. This allows complete removal of all access panels after installation is complete.

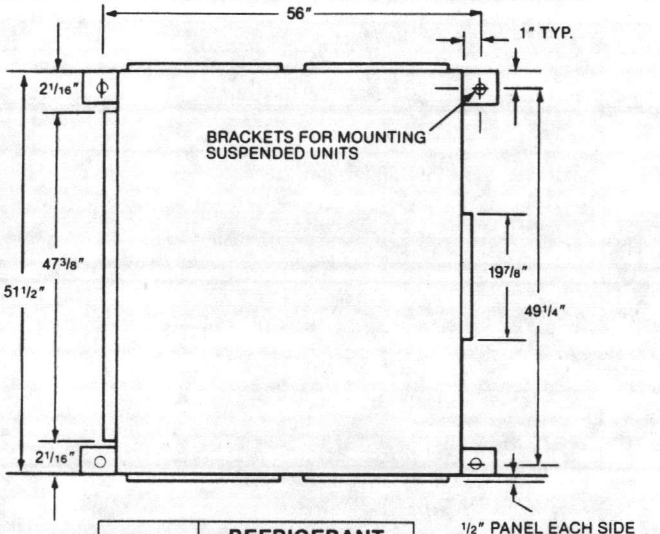
DRAIN PAN (not visible)—The zinc coated steel drain pan is designed to trap condensate in either vertical or horizontal installations. All pans are insulated, with fiberglass insulation between the bottom of the pan and the unit.

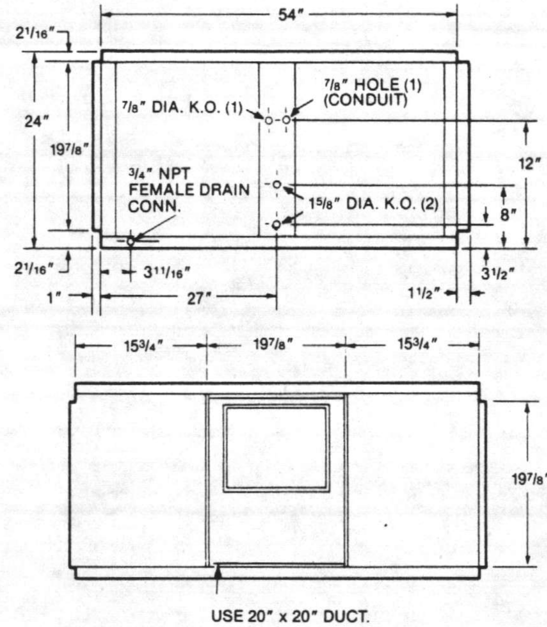
SERVICE ACCESS—Removable panels on each side of unit are easily removed for access to motors, blowers, sheaves, and filters.

HORIZONTAL OR VERTICAL—All models are designed for either application. Fifteen and twenty ton models can be installed in either position as supplied from the factory and an optional return air plenum is available for vertical installation of 7½ and 10 ton models.

TESTING—All units are run tested at the factory prior to shipment. Units are shipped with a holding charge of refrigerant.

UNIT DIMENSIONS
7½ AND 10 NOMINAL TONS

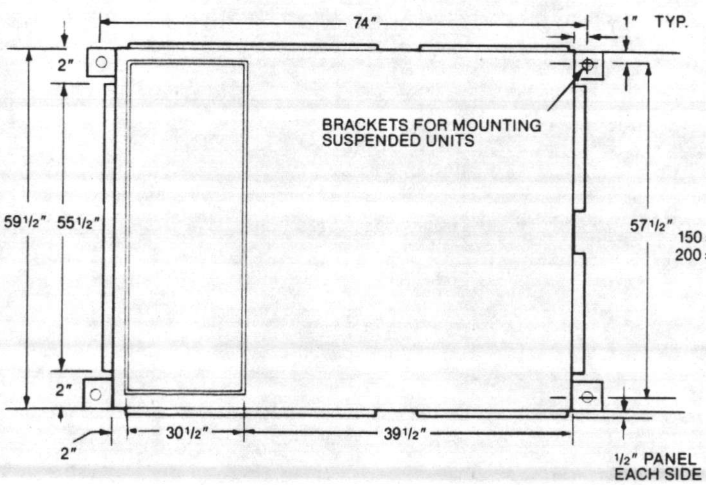


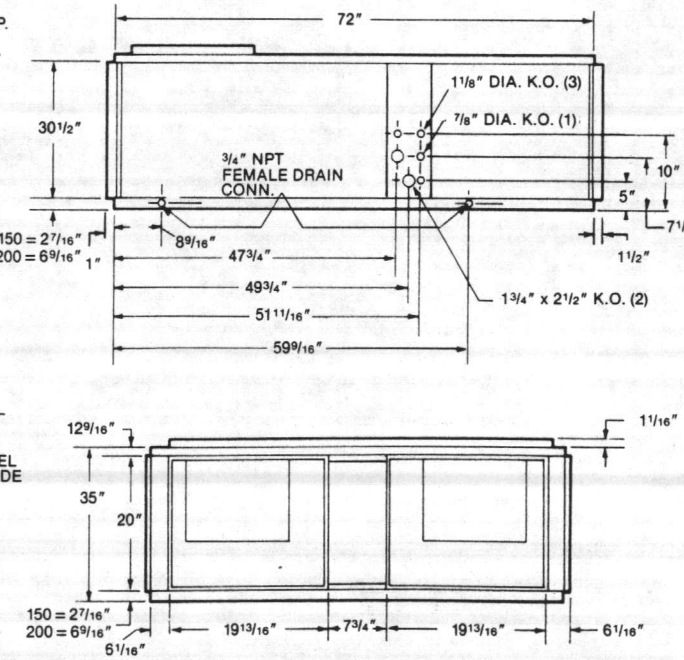


MODEL	REFRIGERANT STUB SIZE (O.D.)	
	LIQUID	SUCTION
075	5/8"	1 1/8"
100	5/8"	1 3/8"

NOTE: SUPPLY CONDUITS TO TERMINATE AT CONTACTOR BOX.

15 AND 20 NOMINAL TONS





MODEL	REFRIGERANT STUB SIZE (O.D.)	
	LIQUID	SUCTION
150	5/8" (2)	1 1/8" (2)
200	5/8" (2)	1 3/8" (2)

SUPPLY DUCT
a. FOR DUAL DUCT APPLICATION WITH OR WITHOUT ELECTRIC HEAT, USE 20" x 20" DUCT.
b. FOR COOLING ONLY SINGLE DUCT APPLICATION, USE 20" x 47 1/2" DUCT.

NOTE: When units are suspended in horizontal position with discharge plenum, hanger brackets shown above cannot be used. In this arrangement, the unit should be suspended from field supplied angle iron or channels located under unit.

WET COIL BLOWER PERFORMANCE DATA
CFM vs. EXTERNAL STATIC PRESSURE

RHPA-075

DRIVE	CFM	EXTERNAL STATIC PRESSURE—INCHES WATER .1		.2		.3		.4		.5		.6		.7		.8		.9		1.0		1.1		1.2	
		RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
K 1 HP	2400	—	—	—	—	630	570	675	600	715	635	760	705	800	770	855	840	885	905	915	995	945	1050	970	1145
	2600	—	—	620	615	660	640	700	680	740	730	780	810	810	870	865	925	900	1010	925	1100	960	1185	985	1250
L 1½ HP	2800	615	665	650	690	690	735	725	780	760	850	800	920	850	970	885	1050	915	1135	945	1240	975	1310	1000	1385
	3000	650	750	685	790	720	850	750	915	790	990	835	1010	875	1100	900	1190	930	1305	960	1380	990	1470	1020	1545
M 1½ HP	3200	690	870	720	930	745	970	785	1060	825	1080	860	1170	890	1255	920	1350	950	1450	980	1560	1010	1630	1035	1730
	3400	725	1020	750	1060	795	1070	820	1160	855	1250	885	1345	910	1435	940	1550	970	1670	1000	1745	1030	1850	1060	1945

RHPA-100

DRIVE	CFM	.1 RPM	.1 W	.2 RPM	.2 W	.3 RPM	.3 W	.4 RPM	.4 W	.5 RPM	.5 W	.6 RPM	.6 W	.7 RPM	.7 W	.8 RPM	.8 W	.9 RPM	.9 W	1.0 RPM	1.0 W	1.1 RPM	1.1 W	1.2 RPM	1.2 W
	3300	—	—	—	—	—	—	800	1070	810	1105	880	1270	915	1335	945	1560	985	1610	1010	1670	1040	1770	1070	1835
	3500	—	—	—	—	800	1150	820	1180	870	1360	910	1420	945	1610	975	1705	1005	1790	1035	1875	1065	1955	1095	2105
K 2 HP	3700	—	—	795	1230	830	1360	880	1470	905	1525	945	1710	975	1815	1005	1905	1030	1990	1055	2065	1085	2130	—	—
	3900	800	1335	835	1465	880	1580	910	1655	940	1820	975	1930	1000	2020	1025	2110	1055	2205	1085	2275	—	—	—	—
L 3 HP	4100	840	1595	885	1705	915	1780	940	1935	975	2060	1000	2150	1030	2260	1055	2360	1085	2430	—	—	—	—	—	—
	4300	890	1845	920	1945	940	2055	975	2210	1005	2300	1030	2410	1060	2530	1090	2595	—	—	—	—	—	—	—	—
	4400	925	2125	950	2235	980	2365	1010	2480	1035	2610	1065	2715	1095	2800	—	—	—	—	—	—	—	—	—	—

RHPA-150

DRIVE	CFM	EXTERNAL STATIC PRESSURE—INCHES WATER .1		.2		.3		.4		.5		.6		.7		.8		.9		1.0		1.1		1.2	
		RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
	5300	—	—	—	—	—	—	810	1495	850	1585	885	1680	920	1795	950	1895	990	2075	1020	2165	1050	2290	1075	2425
K 3 HP	5600	—	—	—	—	805	1575	845	1685	880	1785	915	1900	945	2010	975	2140	1010	2270	1040	2380	1065	2510	1095	2630
	5900	—	—	800	1670	840	1790	875	1905	910	2020	940	2135	970	2260	1000	2370	1030	2490	1060	2635	1085	2750	1120	2850
L 5 HP	6200	795	1775	835	1905	870	2030	905	2145	940	2275	970	2385	1000	2480	1025	2620	1055	2755	1080	2880	1110	2980	1135	3160
	6500	830	2030	865	2150	900	2285	935	2420	970	2525	995	2635	1025	2775	1050	2915	1085	3050	1110	3150	1130	3280	1155	3405
M 5 HP	6800	865	2285	900	2430	935	2575	970	2670	995	2790	1025	2930	1050	3085	1080	3210	1110	3305	1130	3405	1155	3540	1175	3620
	7100	900	2580	935	2730	960	2820	1000	2945	1025	3100	1055	3250	1080	3380	1110	3495	1135	3635	1160	3745	1180	3870	1210	4000

RHPA-200

DRIVE	CFM	.1 RPM	.1 W	.2 RPM	.2 W	.3 RPM	.3 W	.4 RPM	.4 W	.5 RPM	.5 W	.6 RPM	.6 W	.7 RPM	.7 W	.8 RPM	.8 W	.9 RPM	.9 W	1.0 RPM	1.0 W	1.1 RPM	1.1 W	1.2 RPM	1.2 W
	6800	—	—	—	—	—	—	—	—	—	—	—	—	830	2780	855	2915	880	3025	905	3200	930	3375	955	3495
	7200	—	—	—	—	—	—	—	—	—	—	830	2970	855	3110	880	3230	905	3385	930	3555	950	3680	970	3845
K 5 HP	7600	—	—	—	—	—	—	—	—	835	3200	860	3340	880	3470	905	3635	930	3795	950	3940	970	4105	995	4215
	8000	—	—	—	—	815	3285	840	3460	860	3610	885	3750	910	3920	930	4090	955	4230	980	4405	1000	4495	1020	4705
L 7½ HP	8400	—	—	820	3560	850	3755	867	3890	890	4060	915	4260	935	4420	955	4585	980	4635	1005	4800	1025	4970	1045	5135
	8800	830	3875	855	4045	875	4205	900	4410	920	4600	940	4775	965	4785	990	4950	1005	5110	1030	5280	1055	5480	1075	5690
	9200	860	4375	885	4550	905	4790	930	4830	950	4965	970	5100	995	5290	1015	5470	1040	5670	1065	5885	1085	6090	1105	6340

NOTES:
1. Motors are 1750 RPM.
2. Units are 208/60/3 or 230-460/60/3.
3. Motor Efficiency
   1, 2 and 3 HP = .80
   5, 7½ and 10 HP = .85
4. $BHP = \frac{W (Watts) \times Motor\ Efficiency}{746}$
5. Standard Air (.075 lbs. per ft.^{3}).

DRIVE PACKAGE DATA

UNITS	DRIVE PACKAGE	HP	APPROXIMATE BLOWER RPM @ MOTOR SHEAVE TURNS OPEN						
			0	1	2	3	4	5	6
075	K	1	800	770	740	710	680	650	620
	L*	1½	925	900	875	850	825	800	775
	M*	1½	1100	1070	1040	1110	980	950	920
100	K	2	930	905	880	855	830	805	780
	L*	3	1090	1060	1030	1000	970	940	910
150	K	3	955	920	885	855	820	785	750
	L*	5	1110	1075	1040	1005	970	935	900
	M*	5	1200	1165	1130	1095	1060	1025	990
200	K	5	980	950	915	885	855	825	795
	L*	7½	1135	1095	1055	1015	980	940	900

*Optional

PHYSICAL DATA TABLE

ITEM		MODEL NO. RHPA-			
		075	100	150	200
Nominal Size (tons)		7.5	10	15	20
Cooling Capacity (BTUH) Rated with RPWB- outdoor unit		90,000	118,000	178,000	234,000
Heating Capacity (BTUH) @ 47°F with RPWB- unit @ 17°F		88,000 46,000	118,000 60,000	176,000 92,000	234,000 119,000
Nominal CFM @ ESP		3000 @ .25″	3900 @ .30″	6000 @ .35″	8000 @ .40″
MOTOR HORSEPOWER:*	Standard—1750 RPM 3 Ø	1 HP	2 HP	3 HP	5 HP
	Optional—1750 RPM 3 Ø	1½ HP	3 HP	5 HP	7½ HP
Blower Size—diameter & width-inches, and (Quantity)		12-11(1)	12-12(1)	12-12(2)	15-11(2)
Blower Shaft Size (diameter)		¾″	¾″	¾″	¾″
Blower Sheave		10″	12″	9″	10″
Bearings—Quantity/Type		2/ball	2/ball	4/ball	4/ball
Motor Sheave Size Adjustment (std.)		3.4-4.4	5.2-6.2	3.7-4.7	4.3-5.3
Belt Type & Size (std.)		4L52	4L57	B55	B58
Coil Face Area (sq. feet)		12	12	18	18
Coil Tube Diameter		5/16″	5/16″	5/16″	5/16″
Coil, Rows Deep-Fins Per Inch		4-13	4-13	4-16	4-16
Fins/Tubes		Al/Cu	Al/Cu	Al/Cu	Al/Cu
Refrigerant Control—Thermal Expansion Valves (Quantity)		**XVE-5 (1)**	**NPVE-11(1)**	**TCLE-7½-HW (2)**	**TCLE-10-HW (2)**
Filter Size and Number Required (Disposable)**		20x25x1(4)	20x25x1(4)	20x25x1(3) 20x20x1(3)	20x25x1(3) 20x20x1(3)
CABINET: Finish		Baked Enamel	Baked Enamel	Baked Enamel	Baked Enamel
Sheet Metal		Galvanized	Galvanized	Galvanized	Galvanized
Gauge (nominal) Top		18	18	16	16
Sides		16	16	16	16
Bottom		18	18	16	16
UNIT WEIGHTS: Operating		347	347	490	490
Shipping		377	377	550	550
OPTIONAL ACCESSORIES, WEIGHTS: Hot Water Coils		200	200	200	200
Steam Heating Coils		200	200	200	200
Inlet Plenum		62	62	not required	
Inlet Grille		9	9	12	12
Discharge Plenum		38	38	62	62
Discharge Grille		15	15	23	23

*See blower performance data for proper option.
**1″, will accept 2″.

ELECTRICAL DATA TABLE

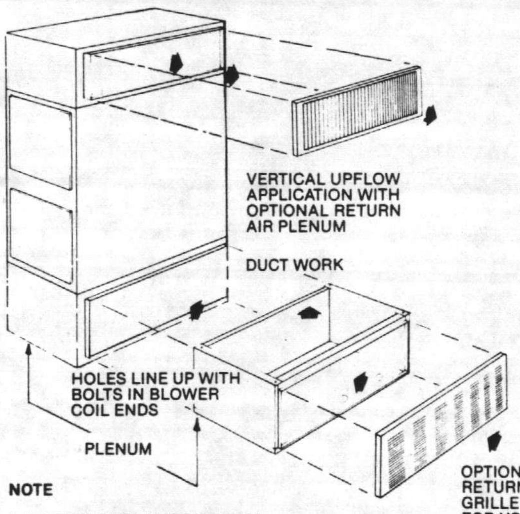
NOMINAL TONS	HP	RATING PLATE AMPS			MOTOR LRA			WIRE AMPACITY			RECOMMENDED COPPER WIRE, 75°C 1% VOLTAGE DROP PER 100 FEET			RECOMMENDED BRANCH CIRCUIT PROTECTION "DUAL ELEMENT"		
		200	230	460	200	230	460	200	230	460	200	230	460	200	230	460
7½	1	4.0	3.6	1.8	34.5	30	15	5	5	3	14	14	14	7	7	4
	1½	5.5	5.0	2.5	46	40	20	7	7	4	14	14	14	10	9	5
10	2	6.7	6.0	3.0	57.5	50	25	9	8	4	12	14	14	12	12	7
	3	9.3	8.4	4.2	73.6	64	32	12	11	6	10	10	14	20	15	8
15	3	9.3	8.4	4.2	73.6	64	32	12	11	6	10	10	14	20	15	8
	5	14.8	13.2	6.6	105.8	92	46	19	17	9	8	8	12	30	25	12
20	5	14.8	13.2	6.6	105.8	92	46	19	17	9	8	8	12	30	25	12
	7½	23	20	10	147	127	64	29	25	13	6	8	14	45	35	20

Motors are dual voltage 230/460 and are factory wired for 230 volt. Motor wiring must be changed in the field for 460 volt application.

TYPICAL APPLICATION

VERTICAL

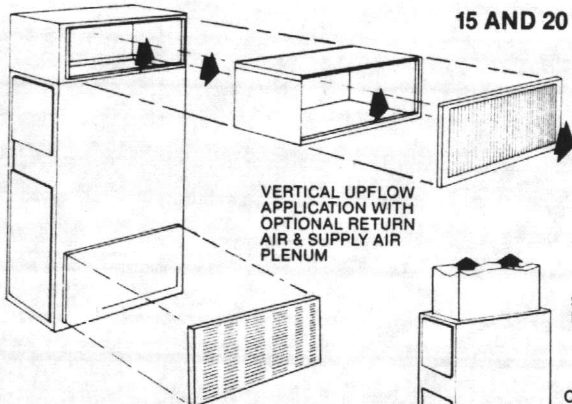
7½ AND 10 NOMINAL TONS



NOTE

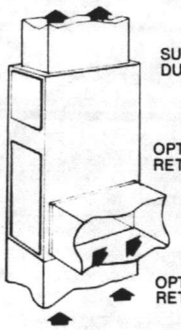
1. UNIT SHIPPED KNOCK-DOWN
2. INSULATION ½" NEOPRENE COATED FIBERGLASS

15 AND 20 NOMINAL TONS



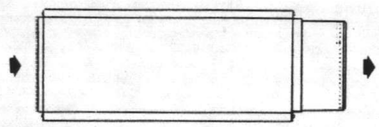
UNIT ILLUSTRATED SHOWN IN VERTICAL POSITION WITH OPTIONAL SUPPLY AIR PLENUM. RETURN AIR ENTERS AT BOTTOM FRONT SIDE AS INDICATED, WITHOUT AN ACCESSORY RETURN AIR PLENUM.

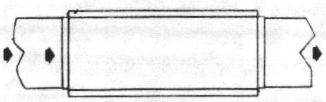
15 AND 20 TON UNITS WITH OPTIONAL RETURN AIR GRILLE SUPPLY AIR DISCHARGE PLENUM



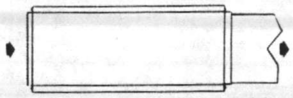
HORIZONTAL

7½, 10, 15 AND 20 NOMINAL TONS



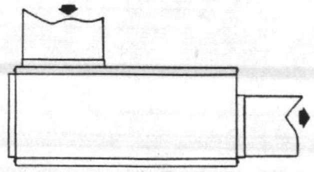


7½-20 TON APPLICATION WITH DUCT WORK FOR BOTH SUPPLY AND RETURN AIR

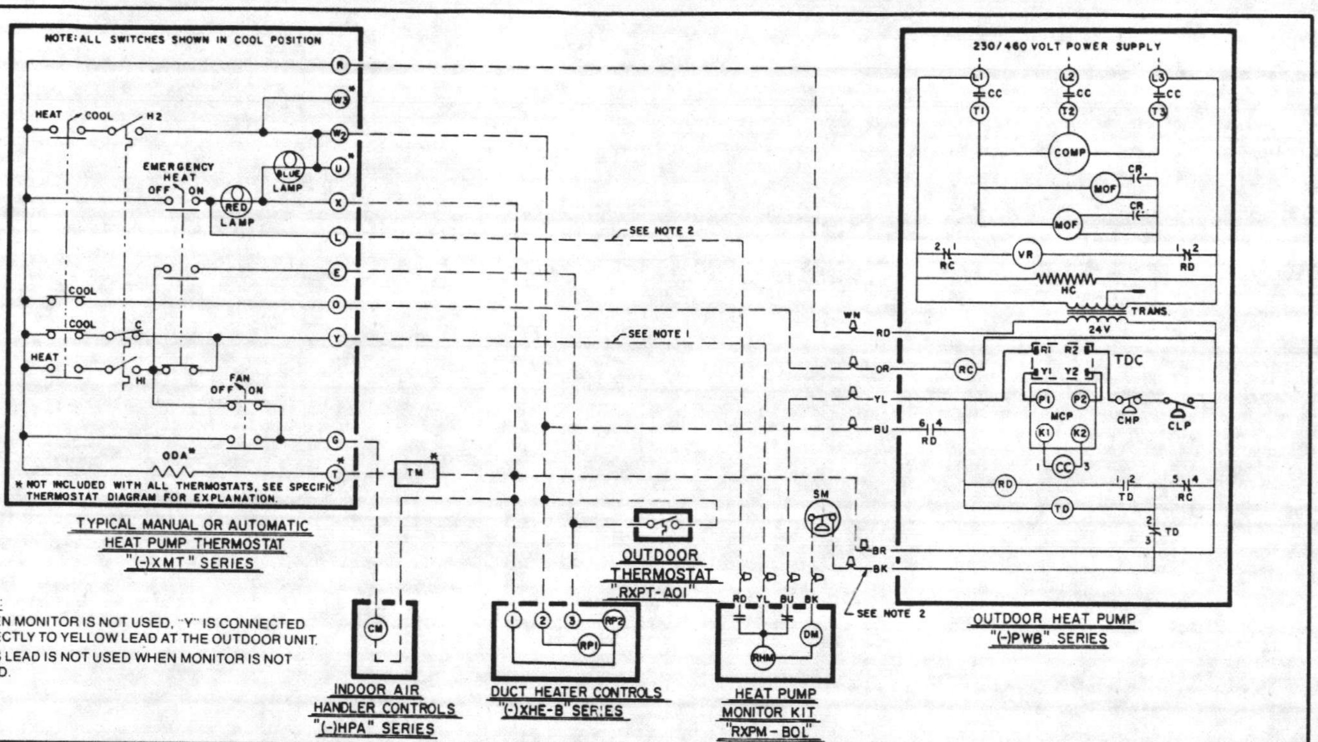


FIELD SUPPLIED RETURN AIR GRILLE

15 AND 20 TON UNITS ONLY SPECIAL APPLICATION



15 AND 20 TON UNITS ONLY WITH VARIATION OF RETURN AIR DUCT INLET OPENINGS



NOTES:
1. WHEN MONITOR IS NOT USED, "Y" IS CONNECTED DIRECTLY TO YELLOW LEAD AT THE OUTDOOR UNIT.
2. THIS LEAD IS NOT USED WHEN MONITOR IS NOT USED.

COMPONENT CODE

CC	CONTACTOR	RC	COOLING RELAY
CHP	CONTROL, HIGH PRESSURE	RD	DEFROST RELAY
CL	LIMIT CONTROL	RHM	MONITOR RELAY
CLP	CONTROL, LOW PRESSURE	SA	AIR SWITCH
CM	MOTOR CONTROLLER	SM	MONITOR SENSOR
COMP	COMPRESSOR	TD	DEFROST TIMER
CR	RUN CAPACITOR	TDC	ANTI SHORT CYCLE TIMER
DM	MONITOR TIME DELAY	TM	OUTDOOR THERMISTOR
HC	CRANKCASE HEATER	TRANS	TRANSFORMER
MCP	COMPRESSOR PROTECTION MODULE	VR	REVERSING VALVE
MOF	OUTDOOR FAN MOTOR	WN	WIRE NUT
ODT	OUTDOOR THERMOSTAT KIT		

WIRING CODE

1. LINE VOLTAGE
   - -FACTORY STANDARD
   - -OPTIONAL COMPONENT
2. LOW VOLTAGE
   - -FACTORY STANDARD
   - -OPTIONAL COMPONENT
3. FIELD INSTALLED POWER
4. FIELD INSTALLED CONTROL

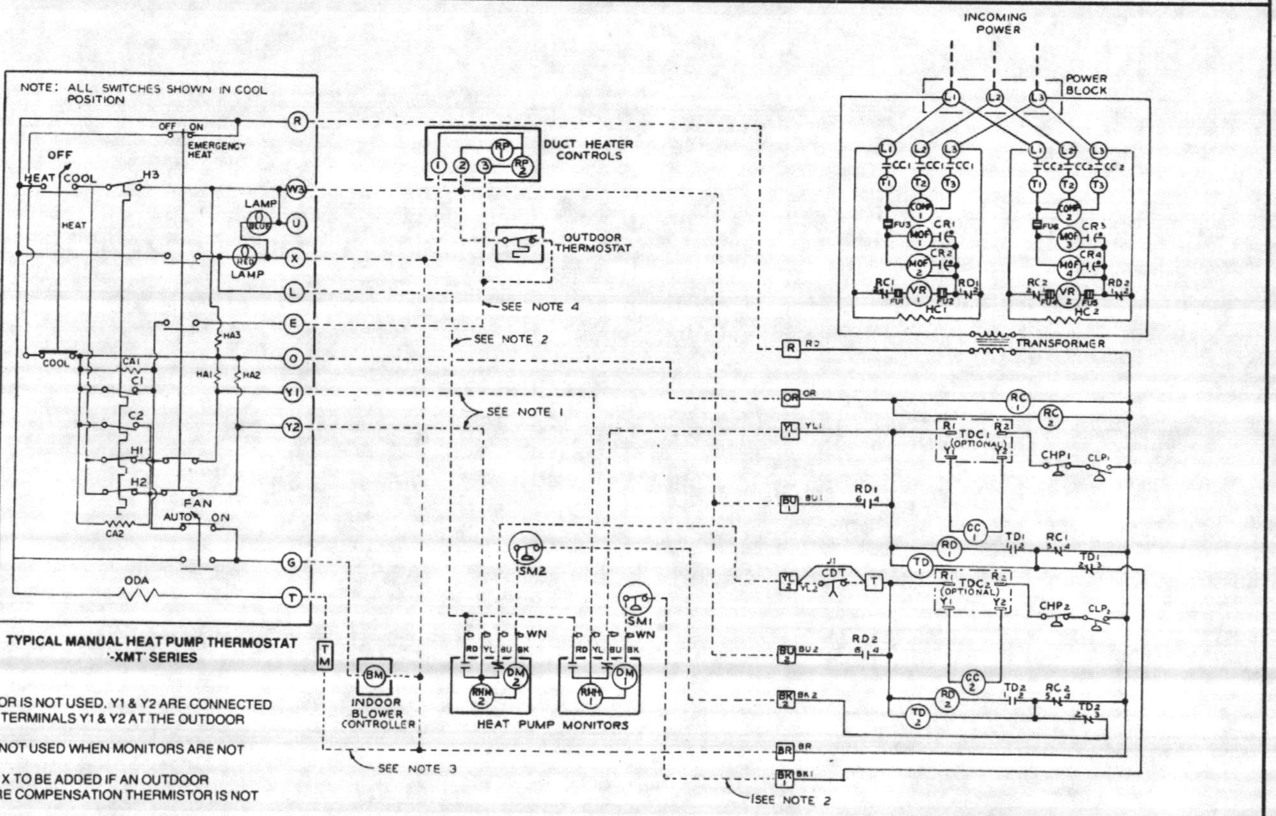
NOTE 1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL.
2. REPLACEMENT CAPACITOR MUST BE A U.L. RECOGNIZED FUSED CAPACITOR.

WIRE COLOR CODE

BK—BLACK	PU—PURPLE
BU—BLUE	RD—RED
BR—BROWN	WH—WHITE
GR—GREEN	YL—YELLOW
OR—ORANGE	

7½ & 10 TON HEAT PUMP TIME-TEMP DEFROST HOOK-UP DIAGRAM & SCHEMATIC

90-21102-01-07



TYPICAL MANUAL HEAT PUMP THERMOSTAT 'XMT' SERIES

NOTES:
1. WHEN MONITOR IS NOT USED, Y1 & Y2 ARE CONNECTED DIRECTLY TO TERMINALS Y1 & Y2 AT THE OUTDOOR UNIT.
2. THIS LEAD IS NOT USED WHEN MONITORS ARE NOT USED.
3. JUMPER T TO X TO BE ADDED IF AN OUTDOOR TEMPERATURE COMPENSATION THERMISTOR IS NOT USED.
4. IF NO EMERGENCY HEAT RELAY IS USED, JUMPER W3 TO E TO TRANSFER CONTROL TO FIRST HEAT.

WIRING CODE

FACTORY INSTALLED WIRING
FIELD INSTALLED WIRING

WIRE COLOR CODE

BK—BLACK	BR—BROWN	RD—RED
BU—BLUE	OR—ORANGE	YL—YELLOW

COMPONENT CODE

CC	CONTACTOR	RC	COOLING RELAY
CDT	COMPRESSOR TIME DELAY	RD	DEFROST RELAY
CHP	CONTROL, HIGH PRESSURE	SM	MONITOR SENSOR
CLP	CONTROL, LOW PRESSURE	TD	DEFROST TIMER
COMP	COMPRESSOR	TDC	ANTI SHORT CYCLE TIMER
CR	CAPACITOR, RUN	TM	OUTDOOR THERMISTER
HC	CRANKCASE HEATER	VR	REVERSING VALVE
MOF	OUTDOOR FAN MOTOR	WN	WIRE NUT

150 & 200 HEAT PUMP TIME-TEMPERATURE DEFROST SUGGESTED HOOK-UP SCHEMATIC

90-41125-01-06

GUIDE SPECIFICATIONS

Furnish and install as shown on the drawing Rheem Model ____________ draw through air handler suitable for both horizontal and vertical applications.

MOTOR & DRIVE—A complete drive package shall be standard and factory installed. Package shall consist of a 3 phase 1750 RPM open drip proof internally protected motor, with contactor provided. Variable pitch motor sheave, fixed pitch fan sheave, and belt.

COILS—Coils shall be fabricated of 5/16″ O.D. seamless tubing expanded into aluminum fins, corrugated with rippled edges. There shall be 4 rows of coil with a minimum of 13 fins per inch. All coils shall be submitted to an air pressure test of 450 PSIG under water after fabrication and dehydrated prior to assembly in unit. Airflow shall be draw through design providing uniform air distribution across the coil surface.

BLOWER, BEARINGS AND SHAFT—Fans shall be a double width, double inlet, forward curve, centrifugal type, statically and dynamically balanced, and constructed of galvanized steel. They shall be mounted on 3/4″ diameter solid shafts made of high carbon steel, centerless ground and polished, supported by resilient mounted sealed ball bearings.

DRAIN PAN—The drain pan shall be manufactured of zinc coated steel. The pan shall have internally threaded pipe size drain connections and shall be designed to accept condensate in either horizontal or vertical type applications.

FILTERS—Filter mounting hardware shall be designed to accept up to 2″ filters for field replacement. One inch throw away filters shall be furnished with the unit.

CABINETS—Cabinets shall be manufactured of minimum 18 gauge bonderized steel subjected to multi-stage cleaning and finished with baked enamel paint. Units shall have removable service access panels on each side.

INSULATION—Cabinets shall be insulated with 1/2″ by 1 1/2 pound density fiberglass insulation coated with neoprene and bonded to the cabinet surface with a U.L. approved adhesive. Insulation shall have fire retarding characteristics in accordance with smoke developed rating of 50 and flame spread rating of 25 per Underwriters Laboratories testing procedures.

FACTORY TESTING—In addition to the pre-assembly testing mentioned above, each coil shall be leak tested with a mixture of dry air and R-22 after assembly into the unit. While under pressure, the coil shall be leak tested using a Halogen Inficon Leak Detector at a setting of 1/2 oz. per year sensitivity.

OPERATING SEQUENCE

NOTE: Please refer to specification sheet covering Outdoor Heat Pumps RPWA- for operating sequence.

ACCESSORIES

INLET PLENUM (RXHL-B71A)—with baked enamel finish to match unit cabinet, for vertical installation of 7½ and 10 ton models only. Fifteen and twenty ton models can be installed vertically without the use of a separate base plenum.

INLET GRILLE (RXHG-B71A or RXHG-B20A)—a decorative grille with matching baked enamel finish for use when unit is installed within the conditioned space is available for all models.

DISCHARGE PLENUM (RXHL-A71B, RXHL-A20B)—with baked enamel finish to match unit cabinet, for free standing applications where duct work is not required.

DISCHARGE GRILLE (RXHG-B72B, RXHG-B20B)—aluminum, with adjustable double deflection louvers for free standing applications.

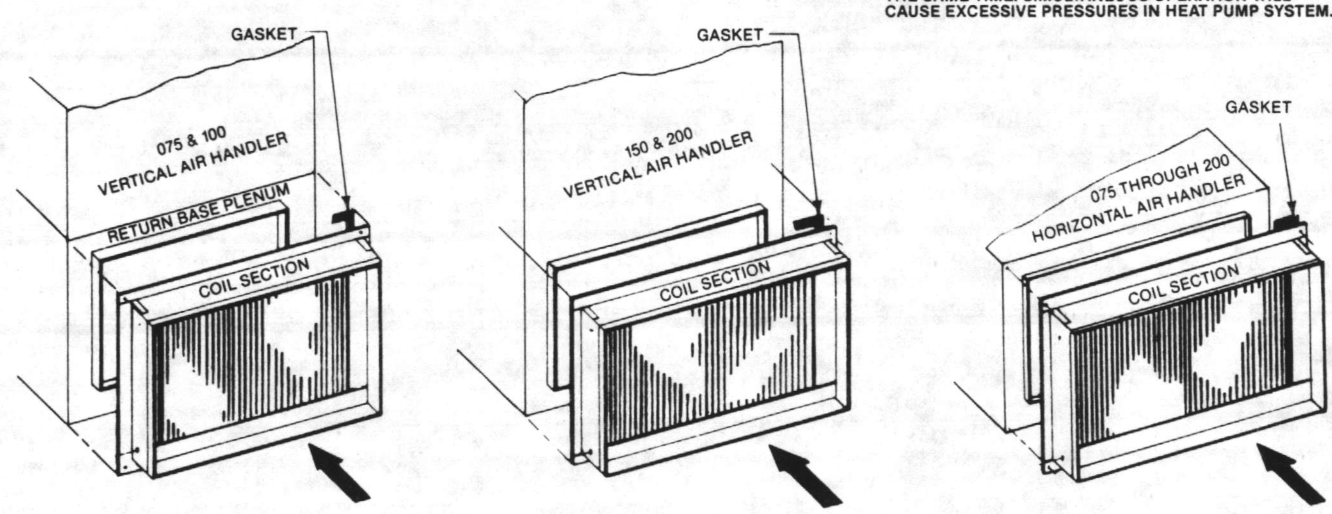
PERMANENT FILTERS (RXHR-A10, RXHR-A20)—for field installation. Two inch cleanable filters to replace standard one inch throw away type installed at the factory.

HOT WATER OR STEAM COILS (RXHC-B72W, RXHC-B20W, RXHC-B72S, RXHC-B20S)—both hot water and steam coils are available for field installation on unit inlet. These coils can be applied with the unit in either decorative grilles or duct work attached to inlet side of coil.

ELECTRIC HEAT (RXHE-)—electric duct heaters are available in sizes ranging from 20KW through 40KW. Slip-in or flanged duct heaters.

HOT WATER OR STEAM COILS

CAUTION: DO NOT OPERATE HEAT PUMP AND WATER COILS AT THE SAME TIME. SIMULTANEOUS OPERATION WILL CAUSE EXCESSIVE PRESSURES IN HEAT PUMP SYSTEM.



RXHC-B72W or RXHC-B72S

RXHC-B20W
RXHC-B20S

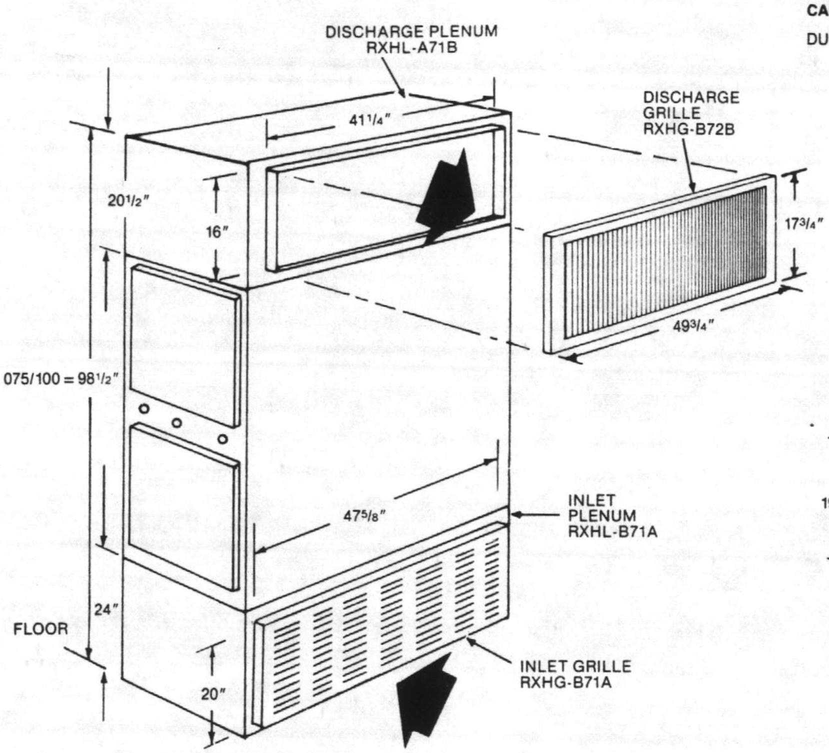
(075/100) RXHC-B72W
RXHC-B72S
or
(150/200) RXHC-B20W
RXHC-B20S

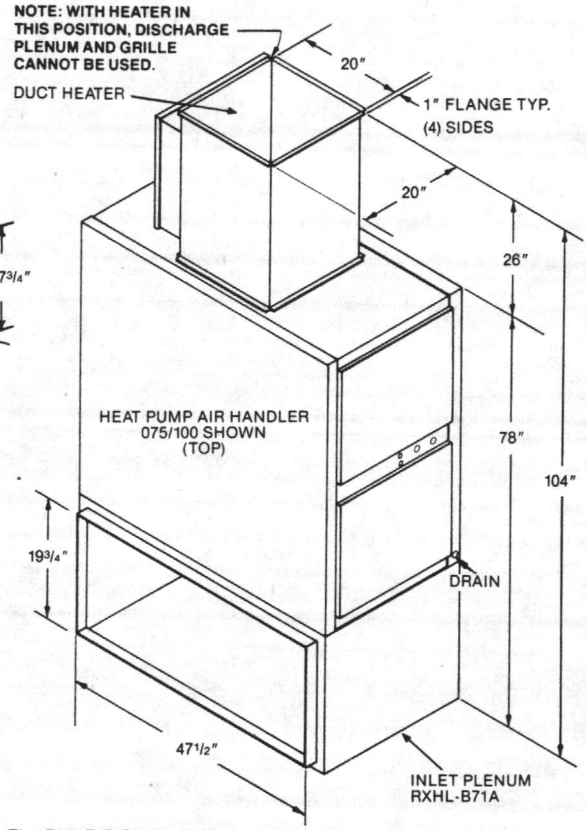
DISCHARGE GRILLES

MODEL NO.	TYPE	USE WITH MODEL NO.	NOMINAL CFM	FT. OF THROW
RXHG-B72B	DOUBLE DEFLECTION	RHPA-075	3000	0° DEFLECTION - 35′ 22° DEFLECTION - 30′ 45° DEFLECTION - 18′
RXHG-B72B	DOUBLE DEFLECTION	RHPA-100	4000	0° DEFLECTION - 45′ 22° DEFLECTION - 39′ 45° DEFLECTION - 23′
RXHG-B20B	DOUBLE DEFLECTION	RHPA-150	6000	0° DEFLECTION - 39′ 22° DEFLECTION - 33′ 45° DEFLECTION - 22′
RXHG-B20B	DOUBLE DEFLECTION	RHPA-200	8000	0° DEFLECTION - 55′ 22° DEFLECTION - 48′ 45° DEFLECTION - 31′

ACCESSORY AND EQUIPMENT DIMENSIONS

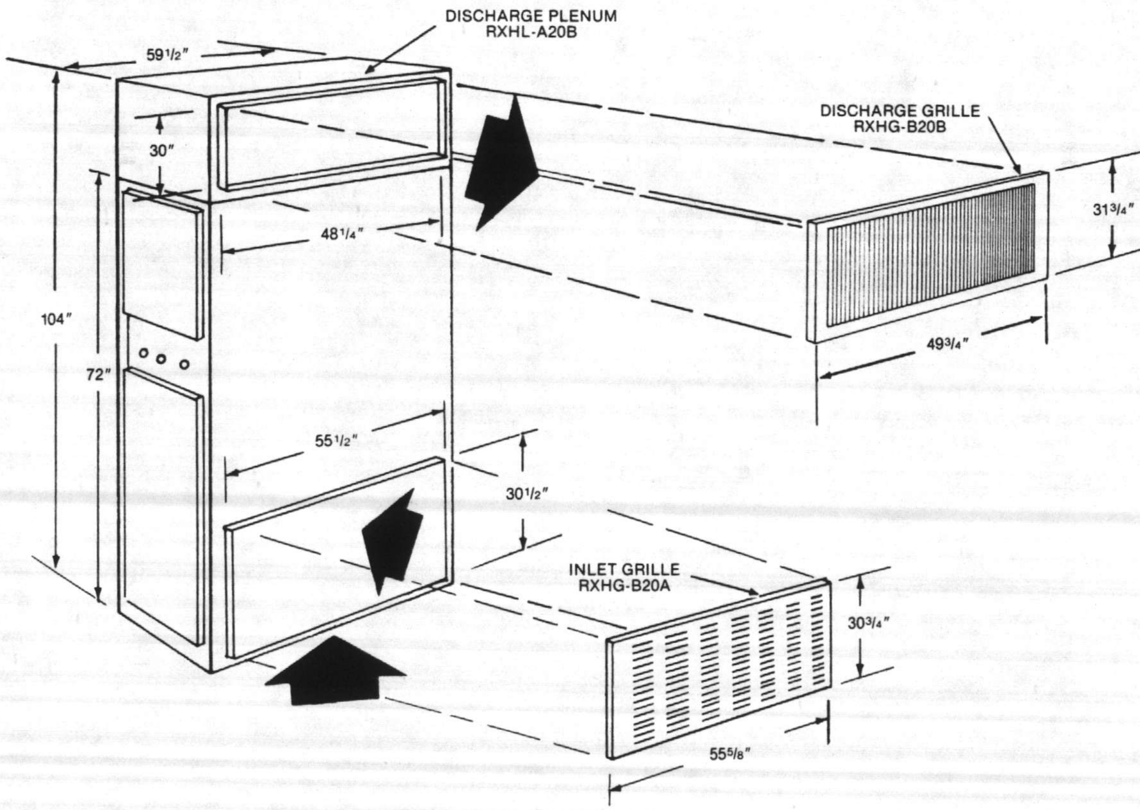
7½ AND 10 NOMINAL TONS





The RXHE-B Series flanged model duct heaters have been tested and approved as shown, attached directly to the RHPA- air handler. **The heater must be applied with the control box positioned as shown, and as indicated by the labels on the heater.** The unit and heater may be applied in the horizontal position when coupled the same as shown.

15 AND 20 NOMINAL TONS



INSPECTION

The complete unit should be examined thoroughly upon receipt, for either hidden or apparent damage, and if necessary, a claim should be entered at once against the last carrier. It is the responsibility of the consignee to file such a claim since the unit is shipped F.O.B. Factory.

LOCATION

The location of the unit must be determined with the following factors in mind: available electric power, plumbing facilities and ample space for arranging the refrigeration equipment, and conforming with proper duct design. In addition, provision should also be made for accessibility to service parts and for complete removal and replacement of any replaceable part.

INSTALLATION

The construction of the building must be substantial enough to support the unit. Set the Air Handler on a suitable foundation so that the weight is evenly distributed. After locating the unit, shim up the side opposite the drain to allow the water to drain from the pan.

The units may also be suspended from the ceiling.

See page 7 for example of both vertical and horizontal mounting. If return air duct is not used, local codes may limit this unit to single story structures only.

MAXIMUM VERTICAL SEPARATION BETWEEN INDOOR AND OUTDOOR SECTIONS

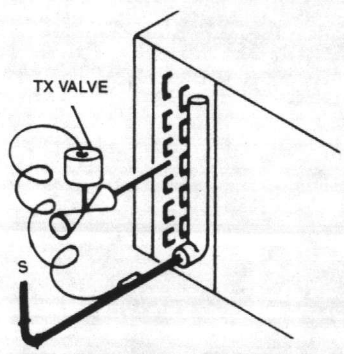
Since both sections act as both condenser and evaporator, the maximum vertical separation should not exceed 60 feet.

REFRIGERANT PIPING

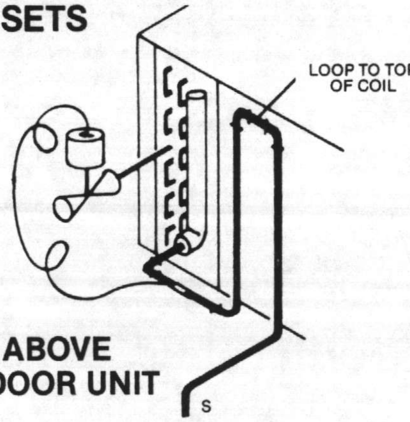
The following will be of help in accomplishing a successful installation.

1. Size liquid line for no more than 1°F loss which corresponds to approximately 1.5 PSI pressure drop.
2. Size suction lines for no more than 2°F loss which corresponds to approximately 3 PSI pressure drop.
3. When making up refrigerant piping, take every precaution to prevent dirt and moisture from entering the piping.
4. A dry nitrogen flow should be established through tubing during brazing of line sets to reduce copper oxide contamination in refrigerant system.
5. Locate the outdoor unit and indoor unit as close together as possible to minimize piping runs.

TYPICAL PIPING RECOMMENDATIONS
7½-10 TON (1) LINE SET
15-20 TON (2) LINE SETS



COIL BELOW OUTDOOR UNIT



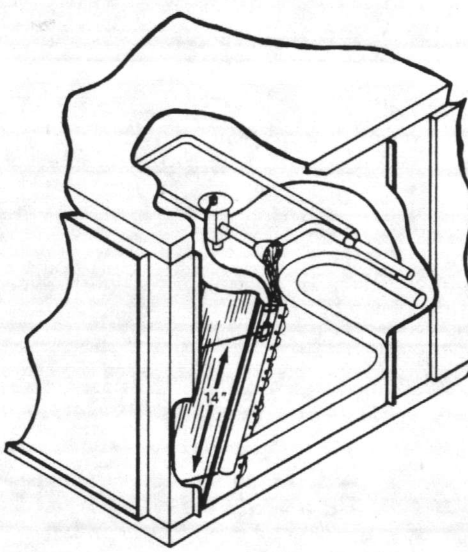
COIL ABOVE OUTDOOR UNIT

RECOMMENDED LINE SIZE 7½-10 TON (1) SET—15-20 TON (2) SETS			
EQUIVALENT LINE LENGTH (FEET)	LIQUID O.D. SIZES (IN.)	SUCTION LINE O.D. SIZES (IN.)	
	ALL MODELS	075 & 150	100 & 200
0- 50	5/8	1 1/8	1 3/8
51-100	5/8	1 3/8	1 5/8
101-150	5/8	1 5/8	1 5/8
151-200	5/8	1 5/8	1 5/8

EQUIVALENT LENGTH (FT.) OF STRAIGHT TYPE "L" TUBING FOR NON-FERROUS VALVES AND FITTINGS (BRAZED)						
TUBE SIZE INCHES O.D.	SOLENOID VALVE	ANGLE VALVE	SHORT RADIUS ELL	LONG RADIUS ELL	TEE LINE FLOW	TEE BRANCH FLOW
1/2	70	24	4.7	3.2	1.7	6.6
5/8	72	25	5.7	3.9	2.3	8.2
3/4	75	25	6.5	4.5	2.9	9.7
7/8	78	28	7.8	5.3	3.7	12.0
1 1/8	87	29	2.7	1.9	5.2	8.0
1 3/8	102	33	3.2	2.2	6.9	10.0
1 5/8	115	34	3.8	2.6	8.7	12.0
2 1/8	141	39	5.2	3.4	12.0	16.0

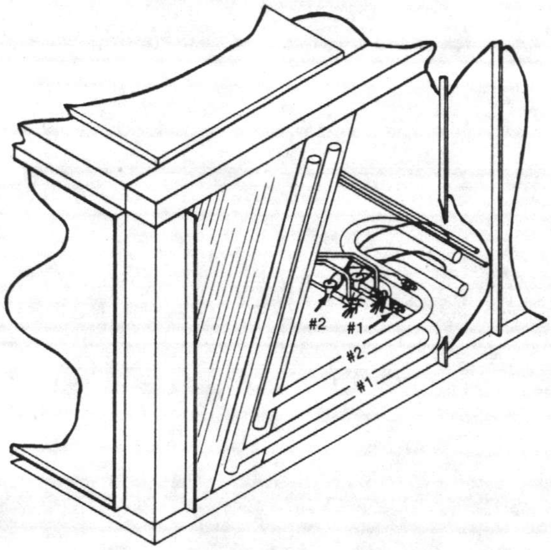
EXPANSION VALVE (TX) BULB LOCATION

MODELS 075 AND 100



NOTES:
1. MODELS 075 AND 100 HAVE BULB FACTORY MOUNTED ON HEADER.

MODELS 150 AND 200

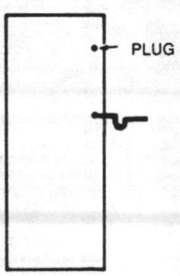


NOTES:
1. MAKE SUCTION LINE WELD BEFORE CLAMPING TX BULB TO LINE.
2. LOCATE EACH TX BULB ON PROPER SUCTION LINE (LINES ARE LABELED "1" OR "2") BETWEEN TEN O'CLOCK AND TWO O'CLOCK.
3. SECURE WITH TWO (2) BULB CLAMPS. CHECK FOR GOOD CONTACT BETWEEN BULB(S) AND LINE(S) MAKING SURE CLAMPS ARE TIGHT. INSULATE BULB WITH SUITABLE MATERIAL SO THAT BULB SENSES ONLY LINE TEMPERATURE AND IS NOT AFFECTED BY CONDITIONED AIR.

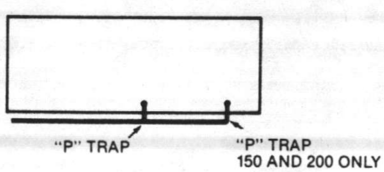
CONDENSATE DRAIN PIPING

- Two drain couplings are provided on 15 and 20 ton models only.
- Consult local codes or ordinances for specific requirements regarding condensate drain.
- Condensate drain is open to atmosphere and must be trapped. Trap must be at least 3 inches deep and made of flexible material or fabricated to prevent freeze-up.
- Pitch the drain line at least ¼ inch per foot away from the drain pan.
- Do not reduce the drain line size from the connection size provided on the unit.
- Do not connect the drain line to a closed sewer line.

7½-20 NOMINAL TONS



VERTICAL

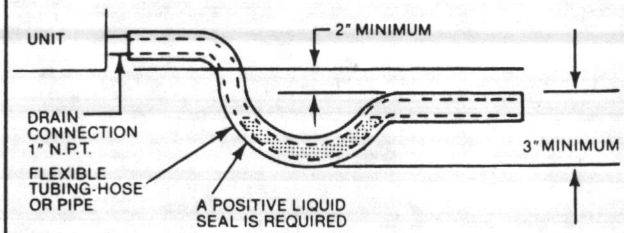


HORIZONTAL
(RECOMMEND DRAIN
FROM BOTH OUTLETS)

IMPORTANT

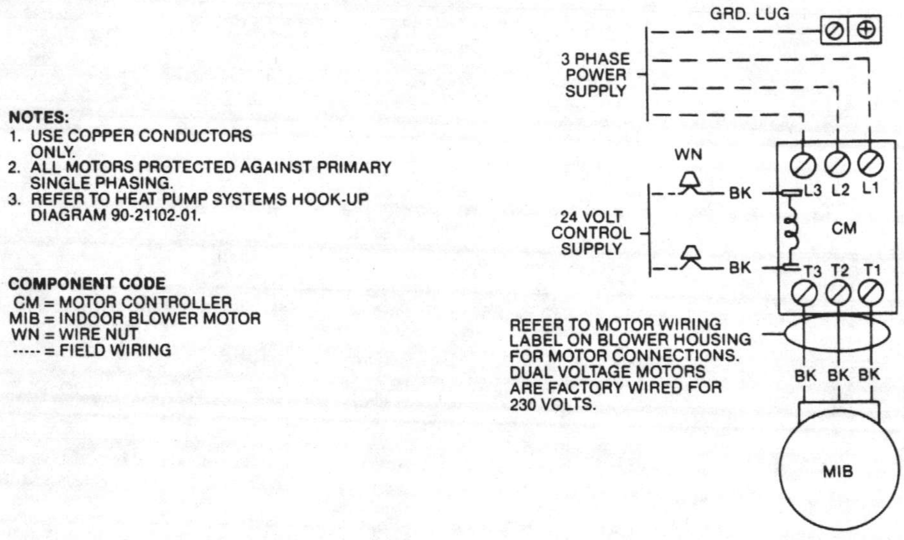
CONDENSATE DRAIN

INSTALL CONDENSATE DRAIN TRAP AS SHOWN BELOW. USE DRAIN CONNECTION SIZE OR LARGER. DO NOT OPERATE UNIT WITHOUT TRAP. UNIT MUST BE SLIGHTLY INCLINED TOWARD DRAIN.



NOTE: TWO OUTLETS ON 15 AND 20 TON MODELS ONLY.

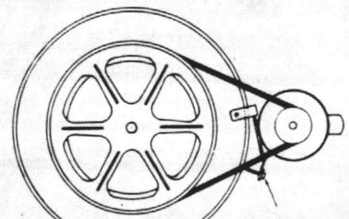
WIRING DIAGRAM

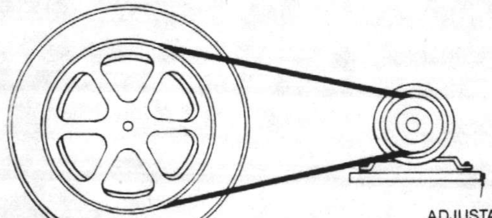


MOTOR MOUNTING

One of the most critical aspects of an air handler installation is the mounting of the motor, motor sheave, fan pulley and the belts, and the adjustment of these items.

The motor base for the air handlers is raised or lowered by means of the adjusting hex nut or slide base as indicated.





FAN BELT ALIGNMENT AND ADJUSTMENT

Place belt on the groove of the fan pulley and motor sheave to obtain the approximate alignment and belt tension. Remove the belt and align the fan pulley and motor sheave using a straight edge. When the pulley and sheave are properly aligned, re-install belt. Do not force or pry the belt on to the pulley and sheave. With the belt in place, adjust so that all the slack is on one side of the drive. The belt should have from 3/4″ to 1″ of slack. Adjust the belt to this tension, by raising or lowering the swing base (7 1/2-10) via the adjusting rod and nut or side-base (15-20) adjusting nut.

MOTOR SHEAVE AND FAN PULLEY MOUNTING AND ADJUSTMENT

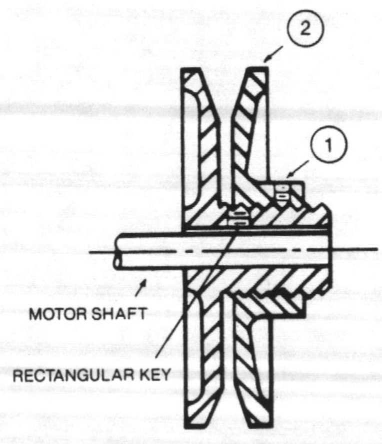
The adjustable pitch sheave which is mounted on the motor shaft controls the fan speed. To adjust the fan speed refer to figure at right and proceed as follows:

a. Loosen the set screw, item 1.

b. Rotate the adjustable sheave, item 2, to the desired position.

c. Lock the adjustable sheave in place by tightening the set screw, item 1.

NOTE: The adjustable sheave is not to be used to adjust belt tension.



WARNING

Before making fan adjustments, open the disconnect switch to prevent possible injury due to accidental operation of the motor.

PRE-START CHECK LIST

1. Leak test entire system.
2. Check motor mounting to make sure all nuts are tight.
3. Check motor sheave and fan pulley to make sure they are in proper alignment and set screws are tight.
4. Check belt tension—belts should be fairly tight for the initial "start up".
5. Check bearing—collar set screws on fan shaft to make sure they are tight.
6. Ball type bearings are factory lubricated and do not require additional grease before starting.
7. Rotate blower shaft by hand to be sure it is free.
8. Check motor and fan rotation.
9. Check all screws, bolts, set screws and piping connections for tightness.
10. Properly vent coils and check drains.
11. Insure that filters are in place.
12. Insure all manual valves are open.
13. Be sure that electrical controls and motors are properly wired and fused in accordance with applicable codes.
14. Check wheel position in scrolls. See Fig. 1 a and b.

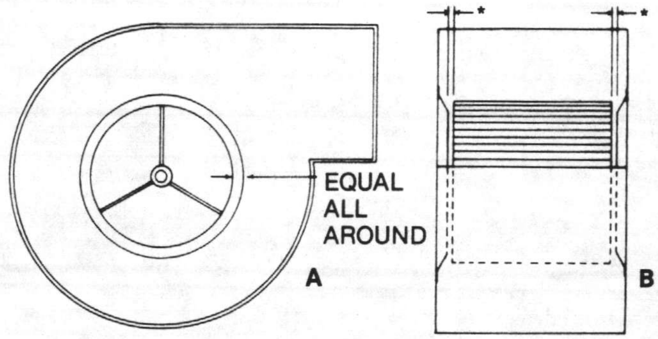


Figure 1

OPERATING INSTRUCTIONS

1. Start fan motor—immediately observe noise level and secure fan motor if unusual sound is heard. Check bearings in particular for proper noise level and temperature. Be sure fans do not rub on scrolls.
2. Check fan RPM and adjust as necessary.
3. Check for motor overloading.
4. Check for proper CFM delivery.
5. Check all accessory items and controls for proper operation.
6. Insure that condensate is being properly discharged from drain pan.
7. If humidifier is installed insure that it is controlled such that the by-pass damper closes tightly when the damper is in a closed position.

PERIODIC SERVICE AND MAINTENANCE

1. Filters—Dirty filters reduce airflow and, in turn, the capacity of the unit. Therefore, when dirty, replace or clean, depending on the type.
2. Coils—Dirt should not be permitted to build up on the fins of the coils. An air, steam or water jet can be used to remove dirt and lint.
3. Check all moving parts for wear and alignment every six (6) months.
4. Check bearing-collar set screws on fan shaft to make sure they are still tight. Do this at least every six months. THIS IS VERY IMPORTANT.
5. Expansion Valve Replacement—The expansion valves used in this equipment are non-adjustable as they are preset at the factory for proper super-heat.

It is not necessary to disassemble sweat-type valves when soldering to the connecting lines. Any commonly used types of solder such as Sil-Fos, Easy-Flow, Phos.-copper or equivalents are satisfactory. It is important, however, regardless of the solder used, to direct the flame away from the valve body and avoid excessive heat on the diaphragm. As an extra precaution, a damp cloth should be wrapped around the diaphragm and valve body during the soldering operation.

The location of the bulb is extremely important for proper operation of the equipment. Locate the bulb in the same location as received from the factory with the capillary tube coming out at the top.

The pressure equalizing line is equally important, and must be reconnected in the same location when replacing an expansion valve.

WARNING

Before performing periodic service and maintenance, open the disconnect to the motor to prevent possible injury due to accidental operation of the motor.

LUBRICATION

GREASING BALL BEARINGS—MOTORS

All ball bearing motors are prelubricated and do not require the addition of grease at time of installation. However, periodic cleaning out and renewal of grease in ball bearings is necessary. Please note that extreme care must be exercised to prevent foreign matter from entering the bearing. It is also important to avoid overgreasing. Only a high grade, clean mineral grease having the following characteristics should be used:

Consistency a little stiffer than that of vaseline, maintained over the operating temperature range; melting point preferably over 150°C. (302°F); freedom from separation of oil and soap under operating and storage conditions; and freedom from abrasive matter, acid, alkali and moisture.

Specific greasing instructions are to be found on a tag attached to the motor and should be generally adhered to.

OILING SLEEVE BEARINGS—MOTORS

In general, sleeve bearings must be oiled before being placed in use after installation. Drain plugs should be checked to see that they are tight and the oil-well filled to the proper level while the motor is at rest.

The oil level should be checked periodically with the motor stopped. If the oil is dirty, it should be drained and the bearing flushed with clean oil until the outcoming oil is clean. Then the oil-well should be refilled.

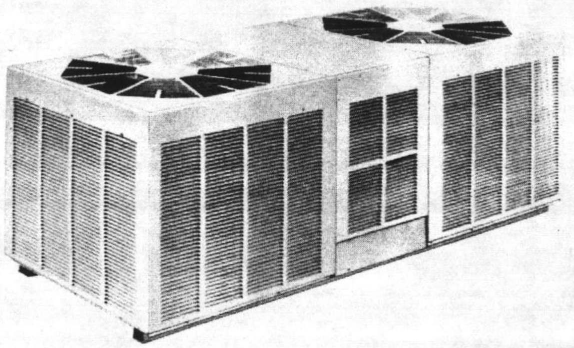
While the wool yarn packed bearings of fractional horsepower are impregnated with oil by the motor manufacturer, it is advisable to check the oil supply before starting the motor. This is necessary because of the possibility of the loss of oil during storage and shipment.

Use only a high grade mineral oil of SAE 20 weight for normal operation. Follow, in general, the oiling instructions on the tag attached to the motor.

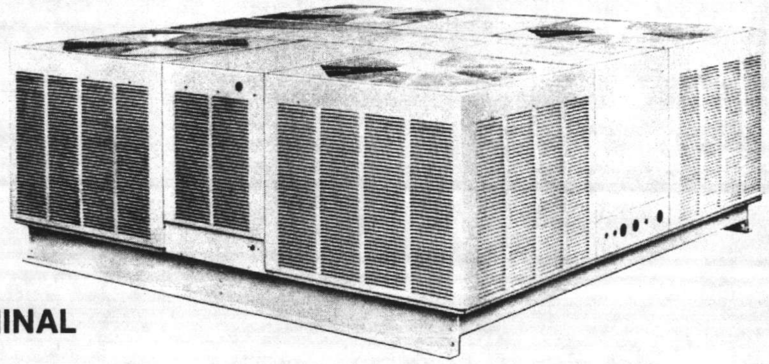
FAN BEARINGS

All models have permanently lubricated ball bearings which require no oiling.

MATCHING RPWB- HEAT PUMP UNITS



RPWB- 7.5 & 10 NOMINAL TON UNITS



RPWB- 15 & 20 NOMINAL TON UNITS

RHEEM
AIR CONDITIONING
DIVISION

5600 Old Greenwood Road, P.O. Box 6444, Fort Smith, Arkansas 72906

PRINTED IN U.S.A. 6-86 BP

FORM NO. P11-715 REV. 0 (92-41591-01-00)

UNIVERSAL PARTS

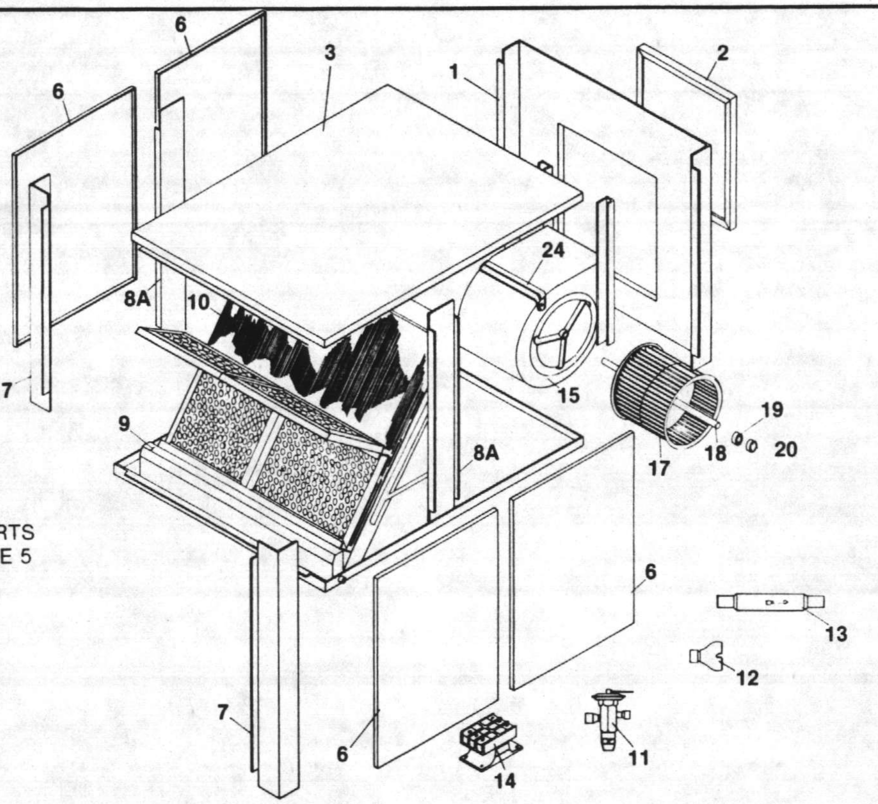
RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

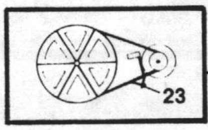
REPLACEMENT PARTS LIST

MODEL [-]HPA
HEAT PUMP AIR HANDLERS
SIZES 075, 100, 150 & 200

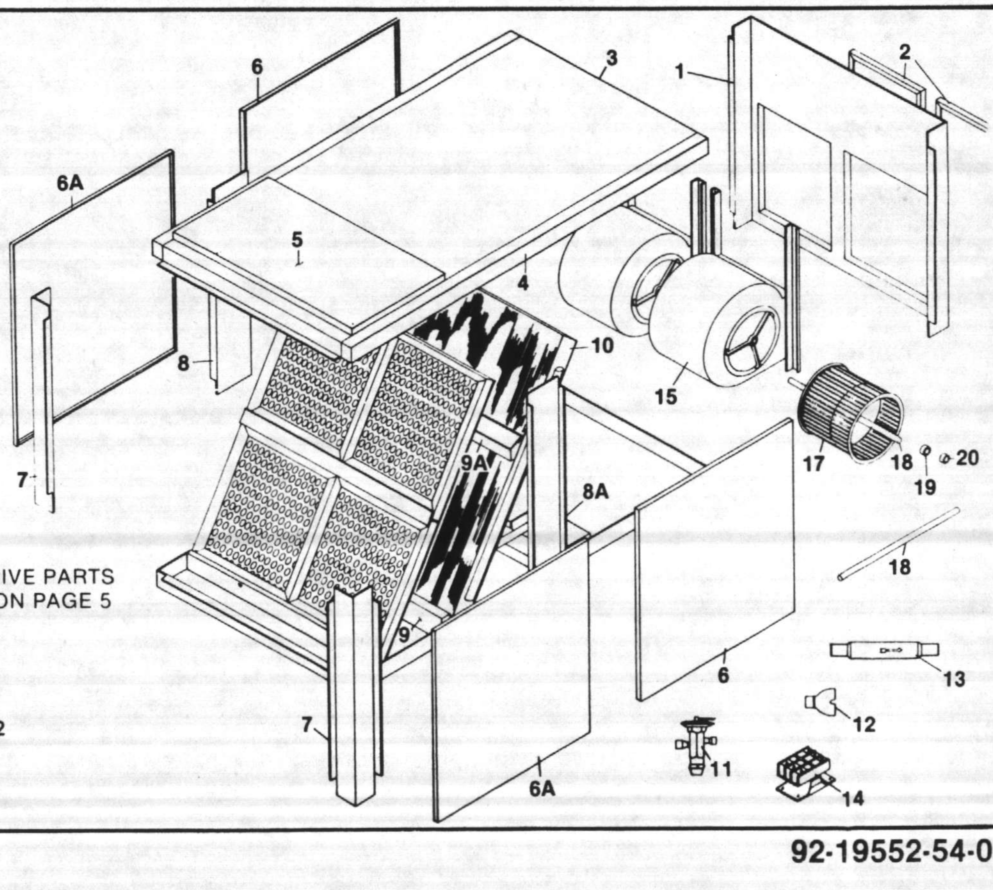
[-]HPA 075/100
FIRST PRODUCTION 7/83



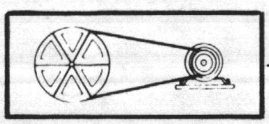
NOTE: FOR BLOWER MOTOR AND DRIVE PARTS SEE SERIAL NUMBER CHART ON PAGE 5 AND TABLE ON PAGE 6



[-]HPA 150/200
FIRST PRODUCTION 7/83



NOTE: FOR BLOWER MOTOR AND DRIVE PARTS SEE SERIAL NUMBER CHART ON PAGE 5 AND TABLE ON PAGE 6



UNIVERSAL PARTS

RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

EXPLANATION OF MODEL NUMBER

MODEL NUMBER

[-] H P A – 075 G K 1

DESIGNATES NEW BLOWER IN 20 TON UNIT PRODUCED AFTER JUNE 1985. SEE PAGE 3 [-]HPA-200 EK1 & GK1.

DESIGN SERIES
A = 1ST SERIES

VARIATIONS
K = STANDARD
L = OPTIONAL
M = OPTIONAL

FOR ADDITIONAL INFORMATION ON BLOWER MOTORS AND DRIVE PARTS SEE EXPLANATION OF UNITS SERIAL NUMBER ON PAGE 5 AND TABLE ON PAGE 6.

MODEL DESIGNATION
R,U

P = HEAT PUMP

ELECTRICAL DESIGNATION
E = 208 V 3Ø
G = 230V/460V 3Ø

TYPE UNIT
H = AIR HANDLER

NOMINAL COOLING CAPACITY
075 = 7.5 TONS (90,000 BTUH)
100 = 10.0 TONS (120,000 BTUH)
150 = 15.0 TONS (180,000 BTUH)
200 = 20.0 TONS (240,000 BTUH)

AIR CONDITIONING DIVISION
PARTS CENTER LOCATIONS

P.O. Box 6444
Fort Smith, AR 72906-0444
501-646-4311

Roberson Mill Road
Milledgeville, GA 31061
912-453-7575

UNIVERSAL PARTS

RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL [-]HPA
HEAT PUMP AIR HANDLERS
SIZES 075, 100, 150 & 200

Item No.	Part Description	Notes	075/100		150/200		
			(-)HPA-075 E & G	(-)HPA-100 E & G	(-)HPA-150 E & G	(-)HPA-200 E & G	(-)HPA-200 EK1 & GK1
	PANEL AND CABINET PARTS						
1	Front Plate Assy.	☎	AS-76876-01	AS-76876-01	AS-76878-01	AS-76878-01	AS-76878-01
2	Duct Flange Outlet	☎	AE-76847-01	AE-76847-01	AE-76847-01	AE-76847-01	AE-76847-01
3	Top Panel Assy.	☎	AS-76864-01	AS-76864-01	AS-76872-01	AS-76872-01	AS-76872-01
4	Top Rail Assy.	☎	NAATT	NAATT	AS-77005-01	AS-77005-01	AS-77005-01
5	Inlet Cap Assy.	☎	NAATT	NAATT	AS-76894-01	AS-76894-01	AS-76894-01
6	Panel-Access	☎	AS-72421-02	AS-72421-02	AS-72391-01	AS-72391-01	AS-72391-01
6A	Panel-Access	☎			AS-72391-02	AS-72391-02	AS-72391-02
			Qty. 4	Qty. 4	Qty. 2 Ea.	Qty. 2 Ea.	Qty. 2 Ea.
	POST ASSEMBLY AND INTERNAL FAB PARTS						
7	Corner Post	☎	AS-76874-01	AS-76874-01	AS-76875-01	AS-76875-01	AS-76875-01
8	Center Post (LH)	☎	NAATT	NAATT	AS-76873-02	AS-76873-02	AS-76873-02
8A	Center Post (RH)	☎	AS-76717-02	AS-76717-02	AS-76873-01	AS-76873-01	AS-76873-01
9	Drain Pan	☎	AS-76716-01	AS-76716-01	AS-76882-01	AS-76882-01	AS-76882-01
9A	Drain Pan Auxillary	☎	NAATT	NAATT	AS-76058-02	AS-76058-02	AS-76058-02
	COIL AND MISC. PARTS						
10	Coil-Evaporator	☎	AS-54435-01	AS-54436-01	AS-76239-01	AS-76239-02	AS-76239-02
11	Valve-Expansion	□	61-40513-05	61-20739-02	61-40533-03	61-40533-04	61-40533-04
12	Distributor	*	83-17467-15	83-17467-15	83-17467-15	83-17467-15	83-17467-15
			Qty. 1	Qty. 1	Qty. 2	Qty. 2	Qty. 2
12	Distributor	*	83-17467-19	83-17467-18	83-17467-18	83-17467-18	83-17467-18
			Qty. 1	Qty. 1	Qty. 2	Qty. 2	Qty. 2
13	Valve-Check	□	61-19528-02	61-19528-02	61-19528-02	61-19528-02	61-19528-02
	ELECTRIC GROUP						
14	Contactor-Blower Mtr, 25 AMP	□ ✓	42-17810-01	42-17810-01	42-17810-02	42-17810-02	42-17810-02
	BLOWER GROUP						
	Blower Assy. (Less Drive Pkg. of Motor, Pulley Belt	☎2	AS-76811-12	AS-76812-14	[AS-76812-12]	[AS-76812-12]	[70-41581-01]
15	Blower Housing	☎	AS-76811-02	AS-76812-04	AS-76812-02	AS-76812-02	70-41465-02
17	Blower Wheel	□	70-40514-01	70-40514-02	70-40514-02	70-40514-02	70-41465-05
▲	Cut-Off	☎	AE-72264-02	AE-72264-03	AE-72264-03	AE-72264-03	70-41465-06
18	Shaft	□	70-41018-01	70-41018-01	70-41018-02	70-41018-02	70-41537-01
19	Bearing & Locking Collar	□	70-17023-01	70-17023-01	70-17023-01	70-17023-01	70-21037-05
			Qty. 2	Qty. 2	Qty. 4	Qty. 4	Qty. 4
20	Bearing Cushion	□	56-17414-01	56-17414-01	56-17414-01	56-17414-01	56-17414-01
▲	Drive Package Includes	☛	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]
▲	Motor-Belt Drive	☛	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]
▲	Pulley-Motor	☛	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]
▲	Pulley-Pulley Belt	☛	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]
▲	Conduit Assy.	☛	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]	[See Page 5]
	MISC. ITEMS						
24	Motor Mounting Bracket	☎	AE-60445-07	AE-72344-01	AS-76892-02	AS-76892-01	AS-76892-01
▲	Sliding Mtr Base, 5 & 7.5 HP	☎	NAATT	NAATT	AS-76928-01	AS-76928-01	AS-76928-01
▲	Back Mtr Base, 5 & 7.5 HP	☎	NAATT	NAATT	AS-76929-01	AS-76929-01	AS-76929-01
▲	Sliding Mtr Base, 3 HP	☎	NAATT	NAATT	AS-76928-02	NAATT	NAATT
▲	Back Mtr Base, 3 HP	☎	NAATT	NAATT	AS-76929-02	NAATT	NAATT
▲	Ground Lug	□	45-19000-01	45-19000-01	45-19000-01	45-19000-01	45-19000-01

UNIVERSAL PARTS

(R/R) RELIABLE REPLACEMENTS

Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL [-]HPA
HEAT PUMP AIR HANDLERS
SIZES 075, 100, 150 & 200

Item No.	Part Description	Notes	075/100 (-)HPA-075 E & G	075/100 (-)HPA-100 E & G	150/200 (-)HPA-150 E & G	150/200 (-)HPA-200 E & G		
	MISC. ITEMS (Continued)							
	DISPOSABLE							
▲	Filter 20″ x 25″ x 1″	1	[54-17531-06]	[54-17531-06]	[54-17531-06]	[54-17531-06]		
▲	Filter 20″ x 20″ x 1″	1	NAATT	NAATT	[54-17531-04]	[54-17531-04]		
	PERMANENT							
▲	Filter 20″ x 25″ x 1″	1	[54-19655-07]	[54-19655-07]	[54-19655-07]	[54-19655-07]		
▲	Filter 20″ x 20″ x 1″	1	NAATT	NAATT	[54-19655-05]	[54-19655-05]		

[-]HPA DRIVE ASSEMBLY PARTS

SELECTION MADE BY FIRST THREE DIGITS OF SERIAL NUMBER CODE (SEE FOOTNOTE)

SERIAL* NUMBER	UNIT MODEL	MOTORS P/N	MOTOR DESCRIPTION 1800 R.P.M.	MOTOR PULLEY & VENDOR NO.*	BLOWER PULLEY & VENDOR	BELT & VENDOR	QTY.	CONDUIT ASSY.
-035	HPA075E	51-40423-01	1 HP 208V 3 Phase 143T Frame	71-40427-17 1VP50 x 7/8	71-40432-36 AZ100 x 3/4	71-17033-51 V Belt 51″	(1)	AS-76936-01
-036	HPA075G	51-40423-02	1 HP 230/460V 3 Phase 143T Frame	71-40427-17 1VP50 x 7/8	71-40432-36 AZ100 x 3/4	71-17033-51 V Belt 51″	(1)	AS-76936-02
-037	HPA075E	51-40423-03	1.5 HP 208V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-37 AZ120 x 3/4	71-17033-57 V Belt 57″	(1)	AS-76936-01
-038	HPA075G	51-40423-04	1.5 HP 230/460V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-37 AZ120 x 3/4	71-17033-57 V Belt 57″	(1)	AS-76936-02
-039	HPA075E	51-40423-03	1.5 HP 208V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-36 AZ100 x 3/4	71-17033-53 V Belt 53″	(1)	AS-76936-01
-040	HPA075G	51-40423-04	1.5 HP 230/460V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-36 AZ100 x 3/4	71-17033-53 V Belt 53″	(1)	AS-76936-02
-041	HPA100E	51-40423-05	2 HP 208V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-37 AZ120 x 3/4	71-17033-57 V Belt 57″	(1)	AS-76936-01
-042	HPA100G	51-40423-06	2 HP 230/460V 3 Phase 145T Frame	71-40427-23 1VP68 x 7/8	71-40432-37 AZ120 x 3/4	71-17033-57 V Belt 57″	(1)	AS-76936-02
-043	HPA100E	51-40423-07	3 HP 208V 3 Phase 182T Frame	71-40427-21 1VP68 x 1-1/8	71-40432-36 AZ100 x 3/4	71-17033-55 V Belt 55″	(1)	AS-76936-01
-044	HPA100G	51-40423-08	3 HP 230/460V 3 Phase 182T Frame	71-40427-21 1VP68 x 1-1/8	71-40432-36 AZ100 x 3/4	71-17033-55 V Belt 55″	(1)	AS-76936-02

UNIVERSAL PARTS
R/R RELIABLE REPLACEMENTS
Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL [-]HPA
HEAT PUMP AIR HANDLERS
SIZES 075, 100, 150 & 200

[-]HPA DRIVE ASSEMBLY PARTS

SELECTION MADE BY FIRST THREE DIGITS OF SERIAL NUMBER CODE (SEE FOOTNOTE)

SERIAL* NUMBER	UNIT MODEL	MOTORS P/N	MOTOR DESCRIPTION 1800 R.P.M.	MOTOR PULLEY & VENDOR NO. *	BLOWER PULLEY & VENDOR	BELT & VENDOR	QTY.	CONDUIT ASSY.
-045	HPA150E	51-40423-07	3 HP 208V 3 Phase 182T Frame	71-40427-26 1VP50 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-03 AS-76936-07
-046	HPA150G	51-40423-08	3 HP 230/460V 3 Phase 182T Frame	71-40427-26 1VP50 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-05 AS-76936-07
-047	HPA150E	51-40423-09	5 HP 208V 3 Phase 184T Frame	71-40427-04 1VP56 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-03 AS-76936-07
-048	HPA150G	51-40423-10	5 HP 230/460V 3 Phase 184T Frame	71-40427-04 1VP56 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-05 AS-76936-07
-049	HPA150E	51-40423-10	5 HP 230/460V 3 Phase 184T Frame	71-40427-20 1VP62 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-03 AS-76936-07
-050	HPA150G	51-40423-10	5 HP 230/460V 3Phase 184T Frame	71-40427-20 1VP62 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-05 AS-76936-07
-051	HPA200E	51-40423-09	5 HP 208V 3 Phase 184T Frame	71-40427-20 1VP62 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-03 AS-76936-07
-052	HPA200G	51-40423-10	5 HP 230/460V 3 Phase 184T Frame	71-40427-20 1VP62 x 1-1/8	71-40432-43 BZ90 x 3/4	71-40438-27 V Belt #B-55	(1) (2)	AS-76936-05 AS-76936-07
-053	HPA200E	51-40423-11	7.5 HP 208V 3 Phase 213T Frame	71-40427-46 1VP71A with 71-40437-50 AZ x 1-3/8 Bushing	71-40432-43 BZ90 x 3/4	71-40438-30 V Belt #B-58	(1) (2)	AS-76936-04 AS-76936-08
-054	HPA200G	51-40423-12	7.5 HP 230/460 3 Phase 213T Frame	71-40427-46 1VP71A with 71-40437-50 AZ x 1-3/8 Bushing	71-40432-43 BZ90 x 3/4	71-40438-30 V Belt #B-58	(1) (2)	AS-76936-06 AS-76936-08
-055	HPA200EK1	51-40423-09	5 HP 208V 3 Phase 184T frame	71-40427-06 1VP60x1-1/8	71-40432-50 BZ100x1	71-40438-30 V Belt #58		AS-76936-03 AS-76936-07
-056	HPA200GK1	51-40423-10	5 HP 230/460V 3 Phase 184T Frame	71-40427-06 1VP60x1-1/8	71-40432-50 BZ100x1	71-40438-30 V Belt #58		AS-76936-05 AS-76936-07
-057	HPA200EL1	51-40423-11	7.5 HP 208V 3 Phase 213T Frame	71-40427-52 1VP6S with 71-40437-50 AZx1-3/8 Bushing	71-40432-50 BZ100x1	71-40438-31 V Belt #59		AS-76935-04 AS-76936-08
-058	HPA200GL1	51-40423-12	7.5 HP 230/460V 3 Phase 213T Frame	71-40427-52 1VP6S with 71-40437-50 AZx1-3/8 Bushing	71-40432-50 BZ100x1	71-40432-31 V Belt #59		AS-76936-06 AS-76937-04

(1) BLOWER JUNCTION BOX TO MOTOR JUNCTION BOX
(2) BLOWER JUNCTION BOX TO CONTROL BOX

EXAMPLE: TO DETERMINE THE DRIVE COMPONENTS MATCH THE FIRST 3 DIGITS OF THE UNITS' SERIAL NUMBER WITH THE NUMBER IN THE LEFT HAND COLUMN.

A UNIT WITH S/N 035 G 1284 1030 INDICATES THAT THIS UNIT IS SHIPPED WITH A 1 HP 208 VOLT 3 PHASE DRIVE.

UNIVERSAL PARTS
RELIABLE REPLACEMENTS
Fort Smith, Arkansas 72906-0444

REPLACEMENT PARTS LIST

MODEL [-]HPA
HEAT PUMP AIR HANDLERS
SIZES 075, 100, 150 & 200

EXPLANATION OF SERIAL NUMBER CODE

035 G 20 85 1030

1030 — PRODUCTION NUMBER

85 — YEAR PRODUCED

20 — WEEK OF YEAR PRODUCED

G — PRODUCTION LOCATION
F = FORT SMITH, AR
G = GREENVILLE, AL
M = MILLEDGEVILLE, GA

035 — DRIVE COMPONENTS
NOTE: THE FIRST THREE (3) DIGITS OF THE SERIAL NUMBER TELL WHAT BLOWER DRIVE PACKAGE IS USED. FOR DETAILS SEE PAGES 4 & 5.

NOTES:

WHEN A PARTICULAR COLOR IS REQUIRED IT MUST BE SPECIFIED WHEN ORDERING.

- ☛ SPECIAL INFORMATION. PLEASE READ CAREFULLY AND FOLLOW APPLICABLE NOTES.
- * THIS IS A NEW REPLACEMENT PART.
- □ THESE PARTS SHOULD BE STOCKED IN THE FIELD.
- ⊡ THIS IS A NEW REPLACEMENT PART AND SHOULD BE STOCKED IN THE FIELD.
- ☎ COILS AND PANELS ARE AVAILABLE WHILE UNIT IS IN PRODUCTION. AFTER UNIT IS OUT OF PRODUCTION ORDERING SUCH PARTS MUST BE CLEARED WITH THE PARTS CENTER AS PRICE AND AVAILABILITY WILL VARY. **WHEN A PARTICULAR COLOR IS REQUIRED IT MUST BE SPECIFIED WHEN ORDERING.**
- DNA DOES NOT APPLY
- ▲ PART NOT SHOWN ON PICTORIAL COVER PAGE.
- [ ] PART NUMBERS IN BRACKETS CALLS SPECIAL ATTENTION AGAINST THESE NUMBERS.
- 1 THIS IS A "HARDWARE STORE" ITEM. SIZE AND PART NUMBER INFORMATION IS PROVIDED FOR REFERENCE ONLY.
- NAATT NOT AVAILABLE AT THIS TIME.
- 2 THIS PART NUMBER DOES NOT INCLUDE SHAFT.

USE AND CARE INSTRUCTIONS
FOR
INDOOR HEAT PUMP UNIT,
BLOWER/COIL UNIT,
AND/OR
ELECTRIC WARM AIR FURNACE

The indoor unit to which these instructions apply is versatile, and your installing contractor may have applied it with an outdoor heat pump section, a summer electric cooling unit, or as an electric heating only unit.

Please become familiar with the provisions of the limited warranty applicable to this unit. We suggest you record on your Limited Warranty the complete model and serial number and date of installation of this new indoor unit. The model and serial number is a part of the data shown on the rating plate located on the inner control box panel. This information may be helpful if a replacement part is required at a later date.

Except for the need to clean or change the air filters, your unit will require little service. Therefore, these instructions include only a few suggestions relating to the use and care of this unit, but you should become familiar with these pointers.

CAUTION: Do not remove service access panels and attempt unit service without first opening all power disconnects.

Blower Motor: The blower motor sleeve bearings are prelubricated by the motor manufacturer and may not require attention for an indefinite period of time. However, our recommendations are as follows:

A. Motors without oiling ports—
Prelubricated and sealed. No further lubrication should be required, but in case of bearing problems, the blower and the motor end bells can be disassembled and the bearings relubricated by a qualified service person.

B. Motors with oiling ports—
Add from 10 to 20 drops of Electric Motor Oil or an SE grade of non-detergent SAE-10 or 20 motor oil to each bearing every two years for somewhat continuous duty, or at least every five years for light duty. Take care not to over oil, because excessive lubrication can damage the motor.

In any event, clean motor periodically to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior. And, as suggested elsewhere in these instructions, the air filters should be kept clean because dirty filters can restrict airflow and the motor depends upon sufficient air flowing across and through it to keep from overheating.

Fuse Links: These are provided as back-up protection for the primary automatic reset high temperature limits. If a fuse link should open without an obvious reason, such as insufficient air flow, the primary limit should be checked for proper calibration or replaced. **Warning:** The fuse link must be replaced, not jumped. Jumping fuse link may help to create an unsafe condition.

Filter Maintenance: Check filter every sixty (60) days of operation under normal use and, if required, clean or replace. Replacement filters should be the same size, or larger, and the same type as originally supplied. If these filters are a permanent type they may be cleaned in warm soapy water and replaced. The unit must not run without a filter, nor with a dirty filter for a long period of time.

If system is equipped with electronic air cleaner instead of conventional type air filters, consult the air cleaner maintenance instruction.

Indoor Coil (if applicable): Check periodically and clean if necessary with warm water and mild detergent.

TAB PLACEMENT HERE

DESCRIPTION:

D

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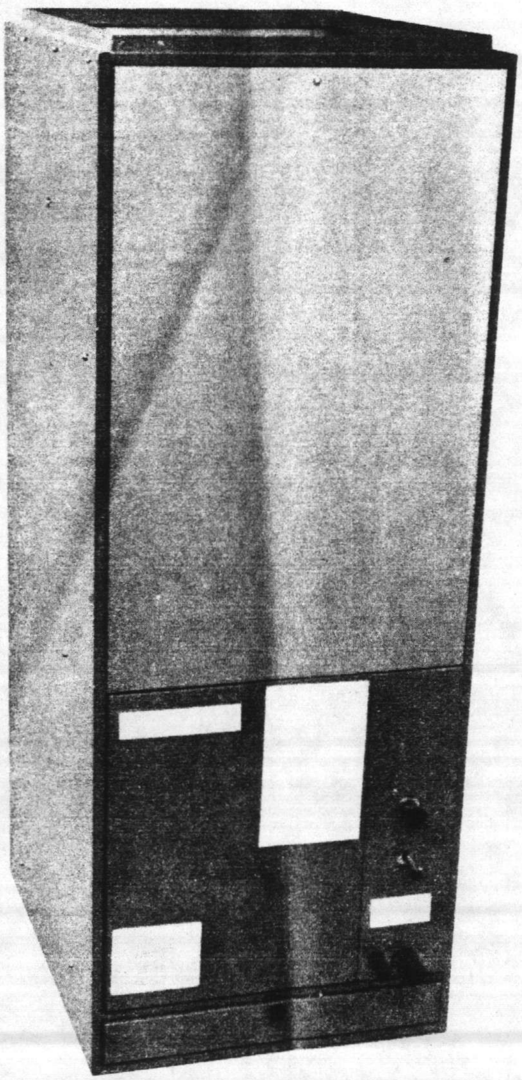
INSTALLATION INSTRUCTIONS
FOR
HEAT PUMP AIR HANDLERS
AND
FAN COIL AIR HANDLERS

MODEL SERIES "(-)HQA-"



92-20521-01-22

Model Identification — Heat Pump Air Handlers or Fan Coil Air Handlers — W/O Electric Heat

Model Unit Available	Model (-)	Air Handler (Optional Electric Heat) H	Heat Pump Q	Design Series A-	Nom. Air Volume 10	Number Represents the Nominal Unit Electric Heat K.W. 10	K.W. (1)·(2) Converted in BTU/Hr.	J Electrical Designation Power Supply And Internal Overcurrent Protection	D Indoor Coils Factory Installed (5)·(6) Vertical Application	Horizontal Application	S Fittings Blank No Coil
* (-)HQA-08	(-)	H	Q	A	08 800 CFM	00 = No Heat 03 = 2.8 KW 05 = 4.8 KW 07 = 6.6 KW 08 = 7.6 KW 10 = 9.6 KW	 9.556 16.382 22.526 25.939 32.765	A = 115 10 Non-Fused — No Heat B = 240/208 1Ø Non-Fused — 10 KW or Less S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less	A = RCPS-A013 H = RCPB-B018 J = RCPB-B024 (7) K = RCPB-B024 (8) BLANK NO COIL	N = RCPS-A013 V = RCPB-B018 W = RCPB-B024 (7) X = RCPB-B024 (8) BLANK NO COIL	S S S BLANK NO FITTING
(-)HQA-10	(-)	H	Q	A	10 1000 CFM	00 = No Heat 03 = 2.8 KW 05 = 4.8 KW 07 = 6.6 KW 08 = 7.6 KW 10 = 9.6 KW 12 = 11.4 KW 15 = 14.4 KW	 9.556 16.382 22.526 25.939 32.765 38.908 49.147	B = 240/208 1Ø Non-Fused — 10 KW or Less J = 240/208 10 Fused Single Circuit — 11 KW or More S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less T = 240/208 1Ø Circuit Breaker Comb. Circuit — 11 KW or More	H = RCPB-B018 J = RCPB-B024(7) K = RCPB-B024(8) BLANK NO COIL	V = RCPB-B018 W = RCPB-B024(7) X = RCPB-B024(8) BLANK NO COIL	S S S S S S S BLANK NO FITTING
(-)HQA-12	(-)	H	Q	A	12 1200 CFM	00 = No Heat 03 = 2.8 KW 05 = 4.8 KW 07 = 6.6 KW 08 = 7.6 KW 09 = 8.4 KW 10 = 9.6 KW 12 = 11.4 KW 15 = 14.4 KW 20 = 19.2 KW	 9.556 16.382 22.526 25.939 28.644 32.765 38.908 49.147 65.530	B = 240/208 1Ø Non-Fused — 10 KW or Less J = 240/208 1Ø Fused Single Circuit — 11 KW or More K = 240/208 3Ø Fused Single Circuit — 20 KW or More Non-Fused Single Circuit — 18 KW or Less S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less T = 240/208 1Ø Circuit Breaker Comb. Circuit (9) 11 KW or More	A = RCPB-B036(3) B = RCPB-B036(4) M = RCPB-B039 BLANK NO COIL	N = RCPB-B036(3) P = RCPB-B036(4) Z = RCPB-B039 BLANK NO COIL	S S S S S S S S BLANK NO FITTING
* (-)HQA-13	(-)	H	Q	A	13 1200 CFM	00 = No Heat 03 = 2.8 KW 05 = 4.8 KW 07 = 6.6 KW 08 = 7.6 KW 09 = 8.4 KW 10 = 9.6 KW 12 = 11.4 KW 15 = 14.4 KW 20 = 19.2 KW	 9.556 16.382 22.526 25.939 28.644 32.765 38.875 49.147 65.530	A = 115 1Ø Non-Fused — No Heat B = 240/208 1Ø Non-Fused — 10 KW or Less J = 240/208 1Ø Fused Single Circuit — 11 KW or More K = 240/208 3Ø Fused Single Circuit — 20 KW or More Non-Fused Single Circuit — 18 KW or Less S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less T = 240/208 1Ø Circuit Breaker Comb. Circuit (9) 11 KW or More	A = RCPB-B036(3) B = RCPB-B036(4) M = RCPB-B039 BLANK NO COIL	N = RCPB-B036(3) P = RCPB-B036(4) Z = RCPB-B039 BLANK NO COIL	S S S BLANK NO FITTING
* (-)HQA-16	(-)	H	Q	A	16 1600 CFM	00 = No Heat 05 = 4.8 KW 08 = 7.6 KW 10 = 9.6 KW 12 = 11.4 KW 15 = 14.4 KW 18 = 17.2 KW 20 = 19.2 KW 22 = 22 KW 23 = 22.4 KW 24 = 24 KW 31 = 30.4 KW 39 = 38.4 KW	 16.382 25.939 32.765 38.875 49.147 58.704 65.530 75.086 76.430 81.912 103.725 131.020	A = 115 1Ø Non-Fused — No Heat B = 240/208 1Ø Non-Fused — 10 KW or Less J = 240/208 1Ø Fused Single Circuit — 11 KW or More K = 240/208 3Ø Fused Single Circuit — 20 KW or More Non-Fused Single Circuit — 18 KW or Less S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less T = 240/208 1Ø Circuit Breaker Comb. Circuit (9) 11 KW or More F = 480 3Ø Non-Fused Single Circuit 12 KW or More G = 480 1Ø Non-Fused — No Heat	A = RCPB-B042 C = RCPB-B048 BLANK NO COIL	N = RCPB-B042 Q = RCPB-B048 BLANK NO COIL	S S S S S BLANK NO FITTING
* (-)HQA-20	(-)	H	Q	A	20 2000 CFM	00 = No Heat 09 = 8.4 KW 10 = 9.6 KW 12 = 11.4 KW 15 = 14.4 KW 20 = 19.2 KW 22 = 22 KW 23 = 22.4 KW 24 = 24 KW 27 = 26.8 KW 29 = 28.8 KW 31 = 30.4 KW 39 = 38.4 KW	 28.644 32.765 38.875 49.147 65.530 75.086 76.430 81.912 91.468 98.294 103.725 131.020	A = 115 1Ø Non-Fused — No Heat B = 240/208 1Ø Non-Fused — 10 KW or Less J = 240/208 1Ø Fused Single Circuit — 11 KW or More K = 240/208 3Ø Fused Single Circuit — 20 KW or More Non-Fused Single Circuit — 18 KW or Less S = 240/208 1Ø Circuit Breaker Single Circuit — 10 KW or Less T = 240/208 1Ø Circuit Breaker Comb. Circuit (9) 11 KW or More F = 480 3Ø Non-Fused Single Circuit 12 KW or More G = 480 1Ø Non-Fused — No Heat	E = RCPB-B060 BLANK NO COIL	S = RCPB-B060 BLANK NO COIL	S S BLANK NO FITTING

(1) K.W. & BTU/H derated @ 208V. Refer to page 7 for operation at voltages other than 240V.
(2) Element K.W. does not include fan motor power.
(3) Piston size 68 for use with (-)PCB-, (-)PFA-030 outdoor unit. See application table in outdoor unit installation instructions.
(4) Piston size 74 for use with (-)PCB, (-)PFA-036 outdoor unit. See application table in outdoor unit installation instructions.
(5) See chart on page 3 for list of field installed coils and application information for both factory and field installed coils.
(6) See specification sheet for coil application with outdoor heat pump models.
(7) Piston size 53 for use with (-)PCB-, (-)PFA-018 outdoor unit.
(8) Piston size 61 for use with (-)PCB-, (-)PFA-024 outdoor unit.
(9) Combination circuit for single or multiple power supplies.

NOTE: Electrical and Heating Designations are not available for all model combinations.

TABLE I APPLICATION DATA — HEAT PUMP AIR HANDLER OR FAN COIL AIR HANDLER WITHOUT ELECTRIC HEAT

Air Handler Model	Indoor Coil Model①	Outdoor Unit Size	Model No. = Max KW	Blower Speed ⑤	Application Notes	Motor HP	No. Speeds	Blower Size	Volts	Phase	Horiz. ① Drain Pan Kit RXCH-	Cleanable Filter⑦
HEAT PUMP INDOOR COILS FOR "(-)PCB" OR "(-)PFA" OUTDOOR UNITS ONLY⑧												
(-)HQA-08	RCPS-A013 RCPB-B018 RCPB-B024 RCPB-B024 RCPB-B027	-013 -018 -018 -024 -024	10 10 - 10 10 10	Lo Lo Lo Hi Hi	 ③ ⑥ ③ ③	1/8	2	9 x 7	208/240	1	A10	17 x 19-1/4
(-)HQA-10	RCPB-B018 RCPB-B024 RCPB-B024 RCPB-B027	-018 -018 -024 -024	12 12 15 15	Med-Hi Med-Hi Hi Hi	 ③ ⑥ ③ ③	1/4	4	9 x 7				
(-)HQA-12	RCPB-B036 RCPB-B036 RCPB-B039 RCPB-B039	-030 -036 -030 -036	15 20 15 20	Med-Hi Hi Med-Hi Hi	③ ③ ⑥ ⑥	1/3	4	10 x 7	208/240	1 or 3	A14	17 x 21-3/8
(-)HQA-13	RCPB-B036 RCPB-B036 RCPB-B039 RCPB-B039	-030 -036 -030 -036	15 20 15 20	Lo Hi Lo Hi	③ ③ ⑥ ⑥	1/4	2	11 x 7				
(-)HQA-16	RCPB-B042 RCPB-B048 RCPB-B048 RCPB-B060	-042 -042 -048 -048	22 22 24 24	Lo Lo Hi Hi	 ⑥ ⑥	1/3	2	11 x 10	208/240 480	1 or 3	B16	22 x 23-7/8
(-)HQA-20	RCPB-B060	-060	29	Hi		1/2	1	12 x 9				
HEAT PUMP INDOOR COILS FOR "(-)PGB" OUTDOOR UNITS ONLY W/EXPANSION VALVE												
(-)HQA-08	RCQB-B018 RCQB-B024	-018 -024	10 10	Lo Hi	③ ③	1/8	2	9 x 7	208/240	1	A10	17 x 19-1/4
(-)HQA-13	RCQB-B030 RCQB-B036	-030 -036	15 20	Lo Hi		1/4	2	11 x 7	208/240	1 or 3	A14	17 x 21-3/8
(-)HQA-16	RCQB-B042 RCQB-B048	-042 -048	22 24	Lo Hi		1/3	2	11 x 10	208/240 480	1 or 3	B16	22 x 23-7/8
(-)HQA-20	RCQB-B060	-060	29	Hi		1/2	1	12 x 9				
STANDARD COOLING COILS⑧												
(-)HQA-08	RCAS-A013 RCAS-A018 RCAB-A021 RCAB-A025	-013 -018 -018 -024	00 00 00 00	Lo Lo Lo Lo		1/8	2	9 x 7	115 208/240	1	A10	17 x 19-1/4
(-)HQA-13	RCAB-A031 RCAB-A037	-030 -036	00 00	Lo Hi		1/4	2	11 x 7	115 208/240	1 or 3	A14	17 x 21-3/8
(-)HQA-16	RCAB-A049 RCAB-A049	-042 -048	00 00	Lo Hi	④ ④	1/3	1	11 x 10	115 208/240 480	1 or 3	B16	22 x 23-7/8
(-)HQA-20	RCEB-A059	-060	00	Hi	②	1/2	1	12 x 9				
HIGH EFFICIENCY COOLING COILS												
(-)HQA-08	RCLB-A024 RCLB-A024	-018 -024	00 00	Lo Hi	③ ③	1/8	2	9 x 7	115 208/240	1	A10	17 x 19-1/4
(-)HQA-13	RCLB-A030 RCLB-A036	-030 -036	00 00	Lo Hi		1/4	2	11 x 7	115 208/240	1 or 3	A14	17 x 21-3/8
(-)HQA-16	RCLB-A048 RCLB-A048 RCMB-A048	-042 -048 -048	00 00 00	Lo Hi Hi	④ ④	1/3	2	11 x 10	115 208/240 480	1 or 3	B16	22 x 23-7/8
(-)HQA-20	RCMB-A060	-060	00	Hi		1/2	1	12 x 9				
HIGH EFFICIENCY COOLING COILS W/EXPANSION VALVE												
(-)HQA-08	RCTB-A018 RCTB-A024	-018 -024	00 00	Lo Hi	 ③	1/8	2	9 x 7	115 208/240	1	A10	17 x 19-1/4
(-)HQA-13	RCTB-A025 RCTB-A036 RCTB-A036	-024 -030 -036	00 00 00	Lo Lo Hi		1/4	2	11 x 7	115 208/240	1 or 3	A14	17 x 21-3/8
(-)HQA-16	RCTB-A037 RCTB-A048 RCTB-A048	-036 -042 -048	00 00 00	Lo Lo Hi	④ ④ ④	1/3	2	11 x 10	115 208/240 480	1 or 3	B16	22 x 23-7/8
(-)HQA-20	RCTB-B060	-060	00	Hi		1/2	1	12 x 9				

(REF. NO. 92-21595-04-01

① All coils are suitable for upflow, downflow and horizontal airflow unless otherwise noted. All horizontal applications require horizontal drain pan kits as indicated.
② Coil is not suitable for downflow application.
③ Coil will fit in (-)HQA unit size shown with removal and replacement of internal parts. This requires access to screws on either side of air handler.
④ Coil installation requires RXCA-B16 adapter kit.
⑤ This is the normal heating or cooling speed and the minimum electric heating speed for maximum KW shown in chart. For other than normal duct static or voltage, see unit airflow table 6, page 7.
⑥ This indoor coil and outdoor unit size combination requires a flow check piston size change on the indoor coil to obtain an approved match. See application table in outdoor unit installation instructions.
⑦ All filters are cleanable.
⑧ CSA Certified Systems.

INSTALLATION

General

Improper installations, or installations not made in accordance with the Underwriters' Laboratory certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions, and are not covered by the unit warranty.

Helpful publications available from the "National Fire Protection Association" are:

NFPA 90A Installation of Air Conditioning and Ventilating Systems, 1981 or latest edition.

NFPA 90B Warm Air Heating and Air Conditioning Systems, 1980 or latest edition.

NFPA 70 National Electric Code, 1984 or latest edition.

These publications are available from:

National Fire Protection Association, Inc.
Batterymarch Park
Quincy, MA 02269

The unit must be installed in such a way as to allow free access to the filter compartment, control compartment, blower compartment and the power supply; and should be in a level position. **WARNING: WHEN USED ON COOLING APPLICATIONS, EXCESSIVE SWEATING MAY OCCUR WHEN INSTALLED IN AN UNCONDITIONED SPACE. IF INSTALLED IN AN UNCONDITIONED SPACE, CAULKING SHOULD BE APPLIED AROUND THE POWER AND CONTROL WIRES ENTERING THE CONTROL BOX. THIS WILL PREVENT AIR LEAKAGE INTO AND CONDENSATE FROM FORMING INSIDE THE CONTROL BOX.**

NOTICE TO INSTALLER:

If return air duct is not used, applicable installation codes may limit this cabinet to single-story residences only.

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.

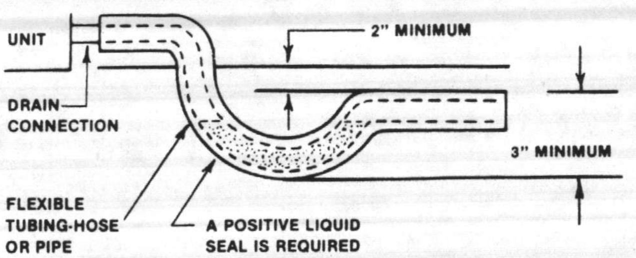
Condensate Drain Tubing

Units equipped with refrigerant coils are provided with a 3/4 inch male pipe drain and a 5/8 inch copper overflow. These coils must have a condensate drain trap installed. The 5/8 inch overflow drain must be open. ***CAUTION:*** *The drain fitting on piping must not be installed in front of the control or blower compartment doors. All drain lines must be pitched away from the unit at a minimum of 1/4 inch per foot of line to insure proper drainage and performance of unit. The unit must also be checked for level. The coil must not be installed with any pitch away from the drain tube. Do not connect condensate drain line to a closed sewer, run line to an open drain or outdoors. Condensate line should not be exposed to an open sewer pipe.*

IMPORTANT

CONDENSATE DRAIN

INSTALL CONDENSATE DRAIN TRAP SHOWN BELOW. USE DRAIN CONNECTION SIZE OR LARGER. DO NOT OPERATE UNIT WITHOUT TRAP. UNIT MUST BE LEVEL OR SLIGHTLY INCLINED TOWARD DRAIN.



Refrigerant Tubing

Keep coil connections sealed until unit and tubing have been installed and connections are to be made. See the condensing unit manual for tubing installation instructions, evacuation and charging as required.

Clearances

The cabinet is designed for "0" inches clearance on all but the front, which must have a minimum of 3 inches when closet installed and 24 inches free access for servicing. The warm air plenum and extending ducts must be installed with 1 inch clearance to the plenum and the first 3 feet of the ducts. These units need not be installed in a ventilated space.

ELECTRICAL WIRING

Wiring Installation

All wiring should conform to the National Electric Code as well as the local codes, When circuit breakers are supplied, they may serve as the unit disconnect.

The power supply wiring can be connected only on the right side of the unit. Conduit holes are supplied for the maximum wire size to be used with any cabinet. Use reducing washers for smaller conduit sizes.

The low voltage — thermostat connections can be made only on the right side of the unit.

See Table 8 for Electrical Specifications.

See the wiring diagram and the nameplate on the unit for internal or supply circuit overcurrent protection. Either fuses or circuit breakers may be used on most models.

Either copper or aluminum supply wiring may be used. See Table 9 for proper wire size.

For aluminum wire, the following procedure must be used for termination:

Warranty void if connections are not made per instructions.

- The insulation should be stripped with a whittling motion to prevent the conductor from being nicked.
- Clean the conductor with a wire brush to remove oxides from the surface.
- An oxide inhibitor should be applied to the conductor immediately prior to the installation. (Two recognized compounds are Penetrox A and Alnox-UG.)
- Insert the conductor in the terminal lug and tighten set screw. After 1 minute, the set screw should be retightened to insure a good connection.

WARNING: This unit must be permanently grounded. A lug is provided in the control compartment.

WARNING: THIS UNIT MUST BE PERMANENTLY GROUNDED. A LUG IS PROVIDED IN THE CONTROL COMPARTMENT.

Home Thermostat

See Table 2 for heat anticipator setting. See instructions with Outdoor Section for recommended thermostats.

TABLE 2
THERMOSTAT 2ND STAGE
HEAT ANTICIPATOR SETTING**

HEATER RELAYS	NUMBER OF ELEMENTS*							
	1	2	3	4	5	6	7	8
Honeywell	.23	.23	.46	.46	.69	.69	.92	.92
T.I., Klixon or Therm-O-Disc	.2	.2	.5	.5	.9	.9	1.2	1.2

*See Table 8 for number of elements reference to KW rating of unit.

**Normally, the first stage heat has a fixed setting. Some thermostats also have a fixed setting on the second stage.

NOTE: Some thermostats have a "W3" terminal. For these thermostats the first stage of strip heat may be connected to "W2" and the remaining stages connected to "W3" of the thermostat. When this is done the heat anticipator is set as required by the first stage.

Control System

In the cooling mode, the thermostat will, on a call for cooling, energize the compressor contactor and the indoor blower relay. The indoor blower can be operated continuously by setting the thermostat fan switch at the "On" position.

In the heating mode, the first heat stage of the thermostat will energize the compressor contactor and the indoor blower relay. The second heat stage will turn on one or more supplementary resistance heaters. If the indoor unit contains more than 4.8 KW of resistance heat, in -HQA-10, 9.6 KW in -HQA-12, 13, 16 and 20, the "watt restrictor" will prevent the additional resistance heat from coming on until needed, as determined by the output of the heat pump. If required or considered desirable, the resistance heat may also be controlled by outdoor thermostats.

TABLE 3
UNIT DIMENSIONS

	(-)HQA-		
	08/10	12/13	16/20
DIM.	INCH	INCH	INCH
A	42-1/2	47-1/4	60-1/2
B	18-1/8	18-1/8	23-1/4
C	19-7/8	22	24-1/2
D	16-5/8	16-5/8	21-3/4
E	18	20-1/8	22-5/8
F	15-5/8	15-5/8	20-3/4
G	17-3/8	19-1/2	22
H	12-1/4	12-1/4	12-1/4
J	9-5/8	9-5/8	9-5/8
K	4-1/8	4-1/8	4-1/8
L	2-7/8	2-7/8	2-3/4
M	17-1/4	19-3/8	22-1/8
N	14-1/4	16-3/8	19-1/8
P	34-3/4	39-1/2	50
Q	35-1/4	41	51-1/2
R	6-1/4	8-3/8	16-5/8
S	8	10-1/4	18-1/2
T	10-5/8	12-7/8	21-1/4
U	14-1/4	14-1/4	14-1/4
V	25-1/2	28	32-7/8
W	31-7/8	34-3/8	39-1/4
X	34-1/2	37	42

***CAUTION:** All horizontal units should have an external drip pan installed under the unit.* This will insure that no condensate water will drip from the installation due to a malfunction of the unit or abnormal operating conditions.

A duct flange is standard on the air outlet end of the units. A screw-on duct flange with the same dimensions as the outlet end is available as an accessory for the air inlet end of the units.

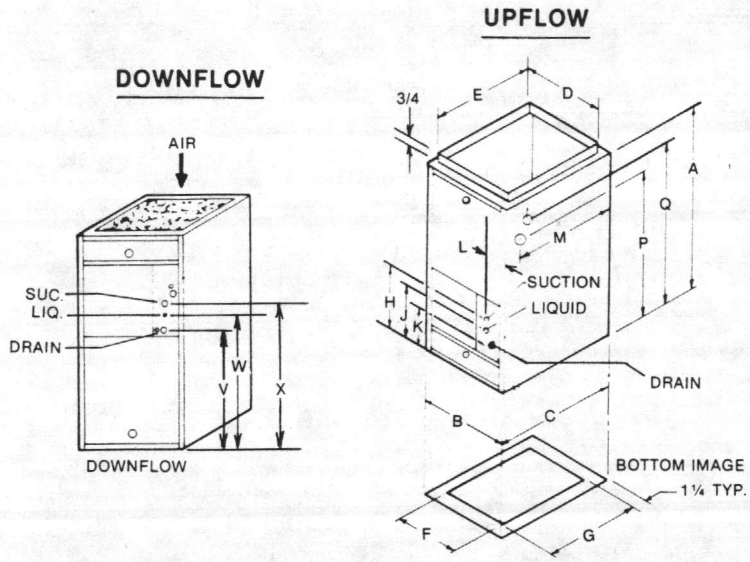
Condensate drain must be pitched 1/4" per ft./minimum to allow proper drainage. (These coils must have a condensate drain trap installed. See Illustration, Page 4.)

CONVERTING UPFLOW TO DOWNFLOW

- Vertical units are shipped assembled for upflow applications.
- For downflow, remove coil door and coil.
- Turn unit upside down and place coil back in coil compartment.
- Replace coil door.

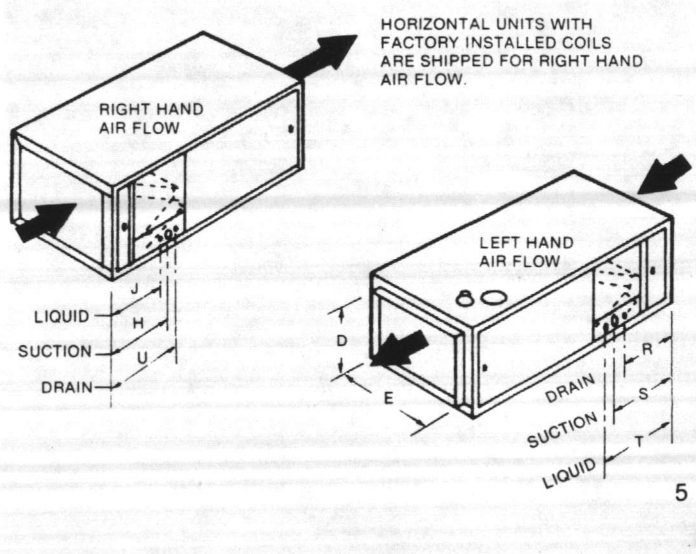
WARNING: A COMBUSTIBLE FLOOR BASE IS REQUIRED WHEN AN ELECTRIC HEAT UNIT IS APPLIED COUNTERFLOW ON COMBUSTIBLE FLOORING.

VERTICAL UNIT



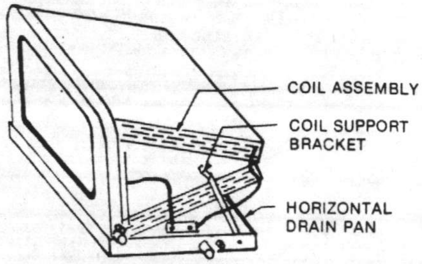
NOTE: ALL DRAIN FITTINGS ARE ¾ MALE PIPE THREAD

HORIZONTAL UNIT



DRAIN PAN KIT

Horizontal units can use the same indoor coil sections as vertical and counterflow units with the addition of a drain pan kit. (See Table 1)



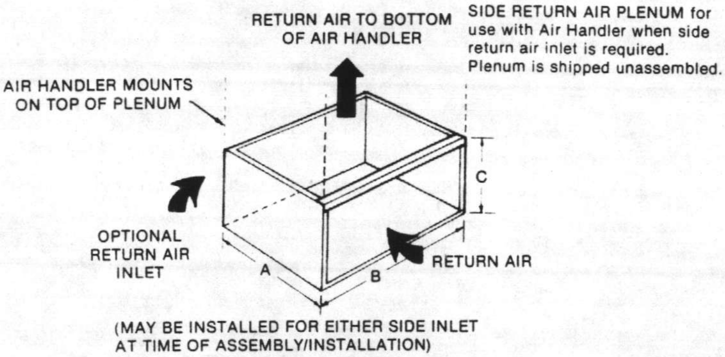


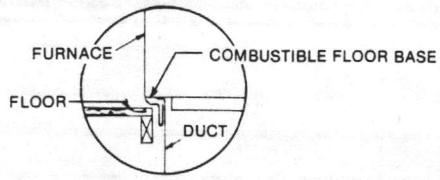
TABLE 4
SIDE RETURN AIR PLENUM

Model No.	Use with Model	A	B	C	Air Opening
RXHL-A10A	(-)HQA-08, 10	$18\frac{1}{8}$	$19\frac{7}{8}$	10	$8\frac{1}{2} \times 13\frac{3}{8}$
RXHL-A12A	(-)HQA-12, 13	$18\frac{1}{8}$	22	12	$10\frac{1}{2} \times 20\frac{1}{2}$
RXHL-A16A	(-)HQA-16, 20	$23\frac{1}{4}$	$24\frac{1}{2}$	$17\frac{1}{4}$	$15\frac{3}{4} \times 23$

COMBUSTIBLE FLOOR BASE/COUNTERFLOW

WARNING: A COMBUSTIBLE FLOOR BASE IS REQUIRED WHEN UNIT IS APPLIED COUNTERFLOW ON COMBUSTIBLE FLOORING.

TYPICAL CROSS-SECTION



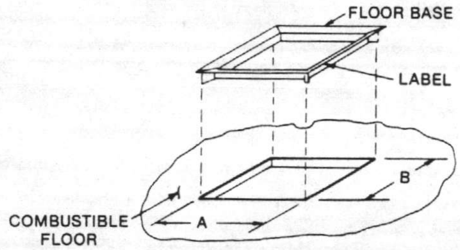


TABLE 5

Model Number	A	B	Use With
RXEC-A10	$20\frac{5}{8}$	$19\frac{1}{4}$	(-)HQA-08, 10
RXEC-A14	$22\frac{3}{4}$	$19\frac{1}{4}$	(-)HQA-12, 13
RXEC-A16	$25\frac{1}{4}$	$24\frac{3}{8}$	(-)HQA-16, 20

TABLE 6
UNIT AIRFLOW DATA

MODEL	SPEED	VOLTS	CFM/EXTERNAL DUCT STATIC INCHES H20				
			.10	.20	.30	.40	.50
(-)HQA-08 ① ②	Hi	115/230	770	700	610	—	—
		208	740	675	595	—	—
	Lo	115/230	695	645	575	—	—
		208	600	590	535	—	—
(-)HQA-10 ① ②	High	230	1025	985	950	890	830
		208	970	950	920	875	810
	Med/Hi	230	890	880	850	810	755
		208	750	760	750	720	675
	Med/Lo	230	730	730	720	705	670
		208	565	595	600	600	590
	Lo	230	535	555	565	570	560
		208	370	425	470	495	505
(-)HQA-12 ② ③	Hi	230	1375	1350	1325	1280	1230
		208	1250	1245	1230	1205	1170
	Med/Hi	230	1100	1140	1140	1120	1080
		208	900	950	965	970	965
	Med/lo	230	870	900	930	930	925
		208	730	775	800	820	815
	Lo	230	755	805	830	835	840
		208	620	660	690	710	730
(-)HQA-13 ② ③	Hi	115/230	1300	1215	1140	1055	
		208	1244	1175	1110	1030	
	Lo	115/230	1170	1110	1050	980	
		208	1060	1010	970	900	
(-)HQA-16 ④ ⑤	Hi	115/230/460	1750	1670	1575	1440	1290
		208	1640	1640	1510	1395	1240
	Lo	115/230/460	1620	1550	1440	1300	
		208	1360	1390	1340	1250	
(-)HQA-20 ⑤ ⑥	Hi	115/230/460	2110	2010	1910	1780	1600
		208	2060	1960	1850	1740	1585

① Air flow shown with (4) elements. Increase CFM ½% for each element less than (4).
② Air flow shown with coil. Increase CFM 4% for no coil.
③ Air flow shown with (6) elements. Increase CFM ½% for each element less than (6).
④ Air flow shown with (7) elements. Increase CFM ½% for each element less than (7).
⑤ Air flow shown with dry coil. Decrease CFM 1% for wet coil. Increase CFM 3% for no coil.
⑥ Air flow shown with (8) elements. Increase CFM ½% for each element less than (8).
⑦ Single speed motor.

TABLE 7
SUPPLEMENTARY HEAT SPECIFICATIONS
TEMPERATURE RISE °F*

CFM	TOTAL KW					
	5	10	15	20	25	30
500	32					
600	26					
700			68			
800		40	59			
900		35	53	70		
1000		32	47	63		
1100		29	43	57	72	
1200		26	40	53	66	
1300			36	49	61	73
1400			34	45	56	67
1500			32	42	53	63
1600			30	39	49	59
1700			28	37	46	56
1800			26	35	44	53
1900			25	33	42	50
2000				32	40	47
2100				30	38	45
2200				29	36	43

*Based on actual KW without heat pump.

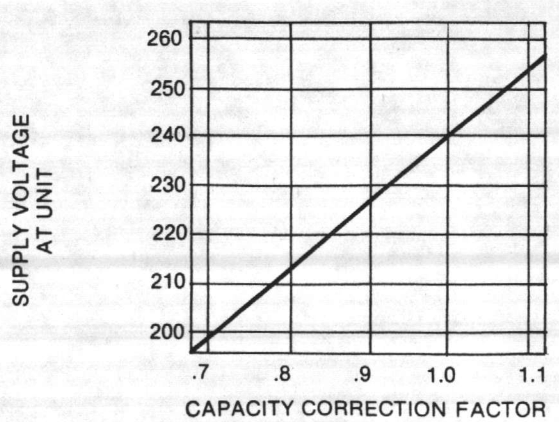
HEATING TEMPERATURE RISE

FORMULA: For Resistance Heat Only

$$\text{TEMP. RISE °F} = \frac{3.16 \times \text{Watts}}{\text{CFM}}$$

WHERE:
3.16 = CONSTANT
WATTS = VOLTS X AMPS
CFM = AIR FLOW

HEATING CORRECTION FACTOR



NOTE:
For correction of strip heat output, multiply the correction factor times the KW rating at 240 volts. For correction of temperature rise, multiply the correction factor times the rise calculated for the rate KW at 240 volts.

TABLE 8 — POWER SUPPLY SPECIFICATIONS

SUPPLEMENTARY HEAT

Unit Nominal KW	Element KW 240/208V	Phase	No. of Elements	Single Power Supply		Multiple Power Supplies ("T" Designation Only) ②						
				Circuit Ampacity	Circuit Protector ①	Circuit Ampacity				Circuit Protector ①		
						CKT 1	CKT 2	CKT 3	CKT 4	CKT 1	CKT 2	CKT 3
03	2.8/2.1	1	1	25/20	25/20	—	—	—	—	—	—	—
05	4.8/3.6	1	1	30/25	30/25	—	—	—	—	—	—	—
07	6.6/4.9	1	2	40/35	40/35	—	—	—	—	—	—	—
08	7.6/5.7	1	2	45/40	45/40	—	—	—	—	—	—	—
08	7.6/5.7	3	2	40/35	40/35	—	—	—	—	—	—	—
09	8.4/6.3	1	2	50/45	50/45	—	—	—	—	—	—	—
09	8.4/6.3	3	3	30/30	30/30	—	—	—	—	—	—	—
10	9.6/7.2	1	2	60/50	60/50	—	—	—	—	—	—	—
12	11.4/8.6	1	3	70/60	70/60	45/40	20	—	—	45/40	20	—
12	11.4/8.6	3	3	40/35	40/35	—	—	—	—	—	—	—
15	14.4/10.8	1	3	80/70	80/70	60/50	30	—	—	60/50	30	—
15	14.4/10.8	3	3	50/45	50/45	—	—	—	—	—	—	—
18	17.2/12.9	1	4	100/90	100/90	60/50	40/40	—	—	60/50	40/40	—
18	17.2/12.9	3	4	60/50	60/50	—	—	—	—	—	—	—
20	19.2/14.4	1	4	110/100	110/100	60/50	50/50	—	—	60/50	50/50	—
20	19.2/14.4	3	4	70/60	70/60	—	—	—	—	—	—	—
22	22.0/16.5	1	5	125/110	125/110	60/50	50/50	15	—	60/50	50/50	15
22	22.0/16.5	3	5	80/80	80/80	—	—	—	—	—	—	—
24	24.0/18.0	1	5	150/125	150/125	60/50	50/50	30	—	60/50	50/50	25
24	24.0/18.0	3	5	90/80	90/90	—	—	—	—	—	—	—
27	26.8/20.0	1	6	150/125	150/125	60/50	50/50	40/40	—	60/50	50/50	40/40
27	26.8/20.0	3	6	90/80	90/90	—	—	—	—	—	—	—
29	28.8/21.6	1	6	175/150	175/150	60/50	50/50	50/50	—	60/50	50/50	50/50
29	28.8/21.6	3	6	90/80	90/90	—	—	—	—	—	—	—

Unit Nominal KW	Element KW 480V	Phase	No. of Elements	Single Power Supply		Multiple Power Supplies						
				Circuit Ampacity	Circuit Protector ①	Circuit Ampacity				Circuit Protector ①		
						CKT 1	CKT 2	CKT 3	CKT 4	CKT 1	CKT 2	CKT 3
12	11.2	3	3	20	20	—	—	—	—	—	—	—
20	19.2	3	3	35	35	—	—	—	—	—	—	—
23	22.4	3	6	40	40	—	—	—	—	—	—	—
31	30.4	3	6	60	60	—	—	—	—	—	—	—
39	38.4	3	6	60	60	—	—	—	—	—	—	—

① Supply circuit protective devices must be either fuses or "HACR" type circuit breakers.

② ONLY MODELS WITH A "T" ELECTRICAL DESIGNATION MAY BE CHANGED FOR MULTIPLE POWER SUPPLIES. This unit is shipped with terminal block connections for a single power supply. The terminal block and wiring to circuit breakers on "T" models may be removed, allowing multiple power supplies to be wired directly to the circuit breakers, as shown on the wiring diagram.

TABLE 9 — WIRE SIZE — AWG. (FOR 3% VOLTAGE DROP)

COPPER = CU
ALUMINUM = AL

SUPPLY WIRE LENGTH-FEET	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL	CU/AL
300	8/6	8/6	6/4	6/4	6/4	6/3	4/3	4/2	3/1	3/1	2/0	2/0	1/00	1/00	0/000	0/000	00/0000	000/250	0000/③
250	10/8	8/6	8/4	6/4	6/4	6/4	6/4	4/3	4/2	4/2	3/1	2/0	2/0	2/0	1/00	0/000	00/0000	000/250	0000/
200	12/8	10/8	8/6	8/6	8/6	6/4	6/4	6/4	4/3	4/2	3/1	3/1	2/0	2/0	1/00	0/000	00/0000	000/250	0000/
150	12/10	10/8	10/8	10/8	8/6	8/6	6/4	6/4	6/4	4/3	4/2	3/2	3/1	2/0	1/00	0/000	00/0000	000/250	0000/
100	14/12	12/10	10/10	10/8	8/8	8/8	8/6	6/6	6/4	4/3	4/2	3/2	3/1	2/0	1/00	0/000	00/0000	000/250	0000
SUPPLY CIRCUIT AMPACITY	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150	175	200	225

NOTE: 1. WIRE SIZE BASED ON 75°C RATED WIRE.
2. FOR MORE THAN 3 CONDUCTORS IN A RACEWAY OR CABLE. SEE THE N.E.C. FOR DERATING THE AMPACITY OF EACH CONDUCTOR.
3. ALUMINUM WIRE CANNOT BE USED AT 225 CIRCUIT AMPACITY (40KW).

Base (Return Air) Plenum Accessory For 7½ & 10 Ton Air Handler 7½ & 10 Ton Heat Pump Air Handler

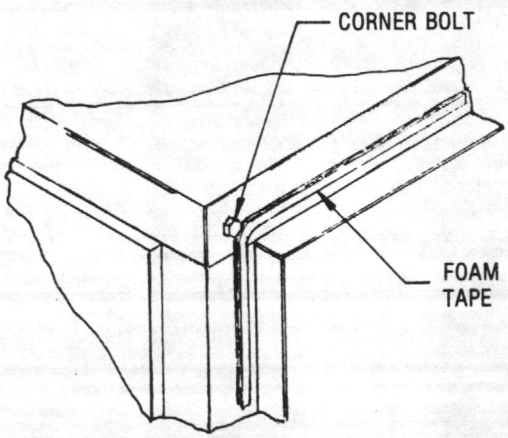
(Do not use for other units unless compatibility is first assured by Purchaser.)

WARNING: THIS ACCESSORY IS INTENDED FOR USE BY A QUALIFIED, LICENSED SERVICE PERSON. TO AVOID UNSATISFACTORY OPERATION OR DAMAGE TO THE PRODUCT AND POSSIBLE UNSAFE CONDITIONS, INCLUDING ELECTRICAL SHOCK, REFRIGERANT LEAKAGE AND FIRE, THE INSTALLATION INSTRUCTIONS PROVIDED WITH THIS ACCESSORY MUST BE STRICTLY FOLLOWED AND THE PARTS SUPPLIED USED WITHOUT SUBSTITUTION. DAMAGE TO THE PRODUCT RESULTING FROM NOT FOLLOWING THE INSTRUCTIONS OR USING UNAUTHORIZED PARTS IS EXCLUDED FROM THE MANUFACTURER'S PRODUCT WARRANTY COVERAGE.

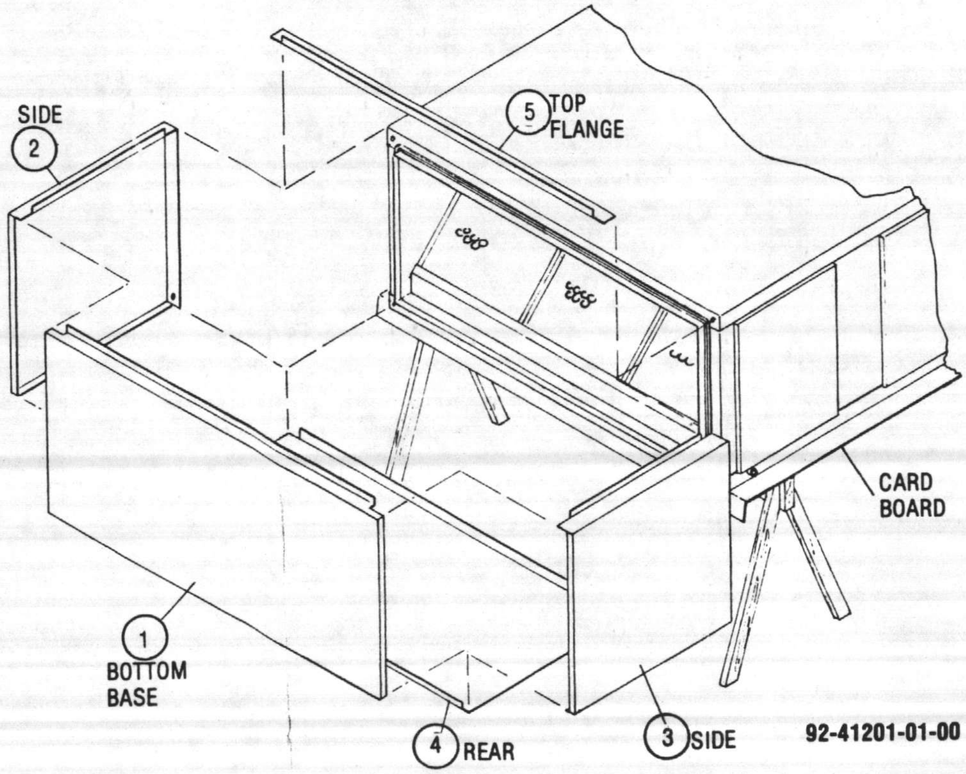
The base plenum is used for floor mounted vertical unit installation. The plenum is designed to be mounted to the air handler for front or rear return air. The plenum requires a return air duct or return air grill accessory.

Assembly:

1. Place unit in a horizontal position (drain connection down) being careful not to damage the paint. It is recommended the unit be positioned at work bench height for ease of plenum installation.
2. Apply foam tape approximately ½" from duct flange edge around full perimeter of unit.
3. Assemble sides (2) & (3) and rear (4).
4. Remove unit corner bolts and retain.



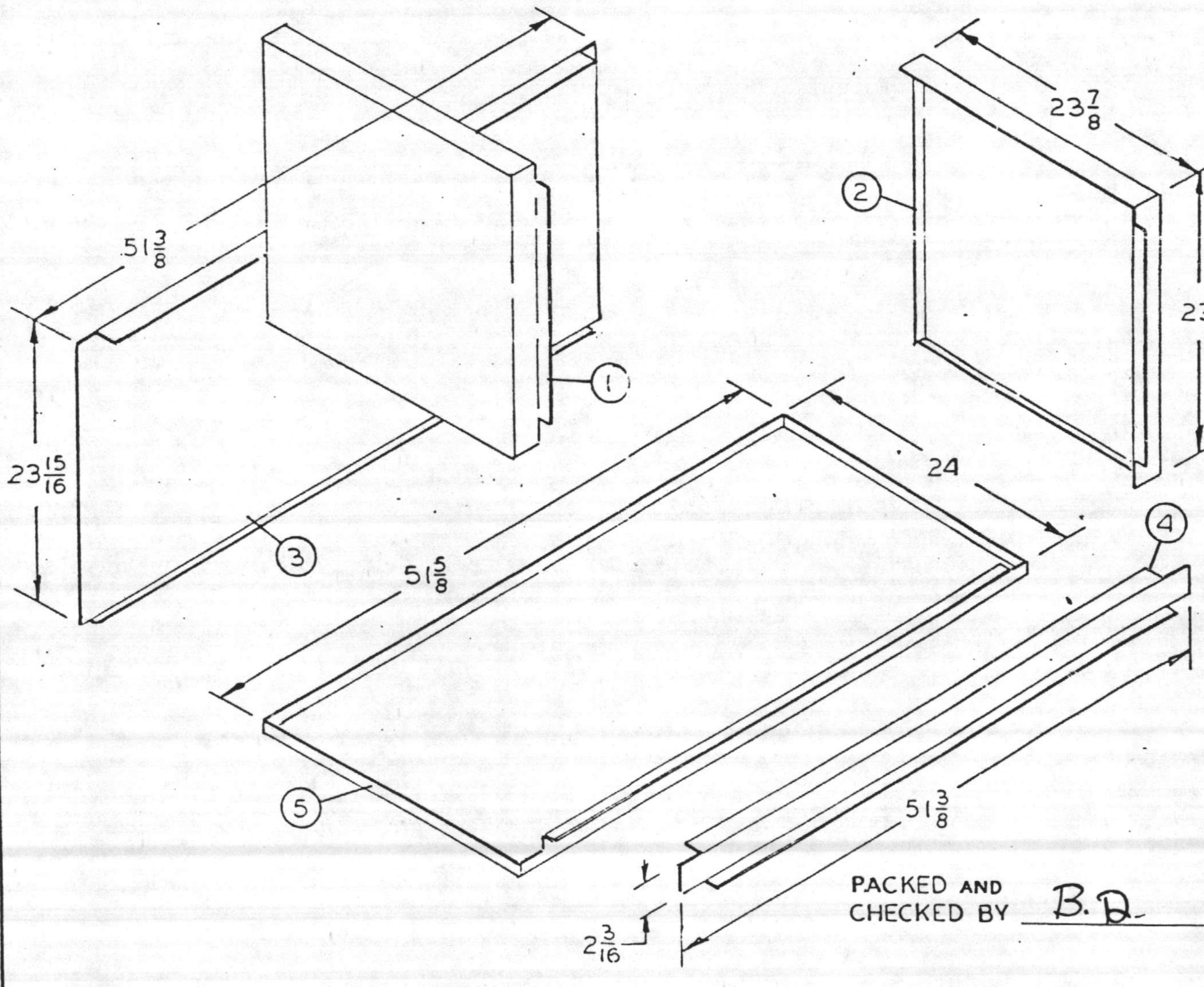
5. Install assembly from point 3 using the previously removed corner bolts.
   a. Install assembly with duct flanges up for rear air inlet and down for front air inlet.
6. Install panel (1) and secure to sub-assembly from point 3.
   a. If front air return is used or if rear air return is used and unit has been supported above the floor secure rear panel (4) to bottom panel (1).
   b. If rear air return is used and the unit has not been supported above floor level only the side (2 & 3) and base panel (1) can be assembled at this time.
7. Install top duct flange (5) and secure to side panels (2 & 3).
   a. See notes 6a and 6b.
8. Place unit in vertical position.
   a. Secure base (1) to rear (4) and top duct flange (5) to sides (2 & 3) if not previously done.
9. Position unit and install duct or louver accessory to duct flange.



92-41201-01-00

PACKING LIST - BASE ACCESSORY FOR 7½ & 10 TON AIR HANDLERS

PC.	PART	PART NUMBER	QTY	PACKED
1	SIDE - BASE	AE-72274-01	1	
2	SIDE - BASE	AE-72274-02	1	
3	REAR	AE-72275-01	1	
4	FRONT	AE-72276-01	1	
5	BOTTOM BASE PAN	AE-72273-01	1	
	FOAM TAPE - 3/16" x 1/2" x 80" LONG	AE-70075-77	2	
	SCREW - #8 x 5/8" LONG	63-19228-11	29	

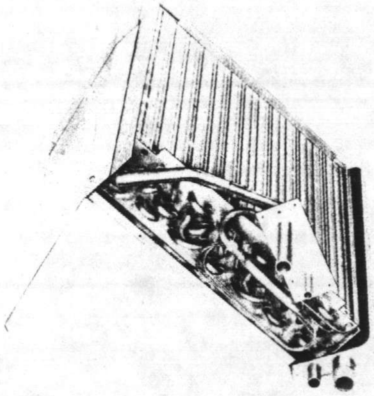


PACKED AND CHECKED BY B.D.

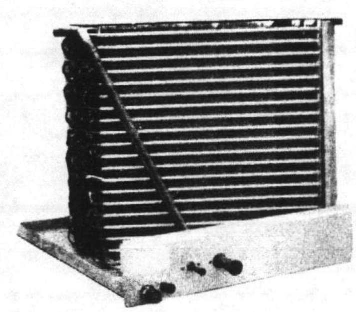
92-41372-01-02

02/G-321

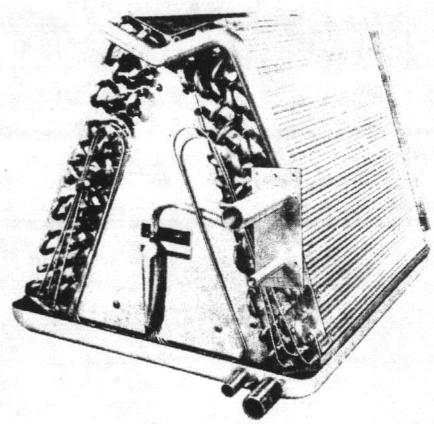
INSTALLATION INSTRUCTIONS FOR COOLING COILS & COOLING COIL ACCESSORIES



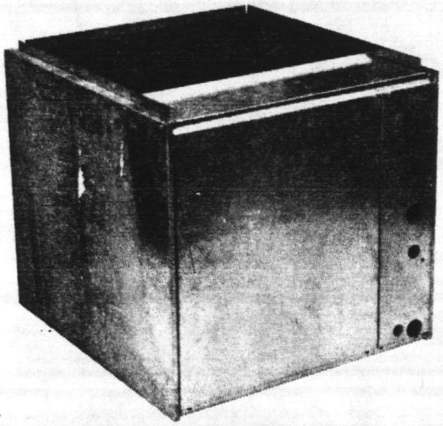
SLOPE COILS
RCAS-A



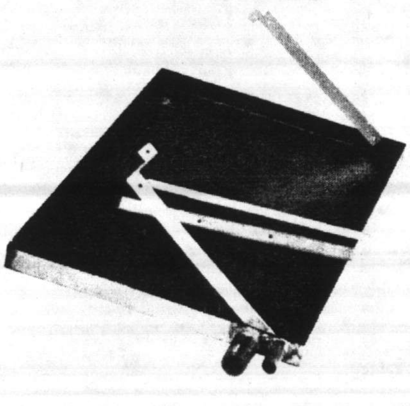
(-)CEH-Z COOLING COIL
HORIZONTAL APPLICATION ONLY



TYPICAL UPFLOW-DOWNFLOW COOLING COIL



TYPICAL
COOLING COIL
PLENUM



OPTIONAL
HORIZONTAL
DRAIN PAN KIT
APPLICATIONS
SEE PAGE 4

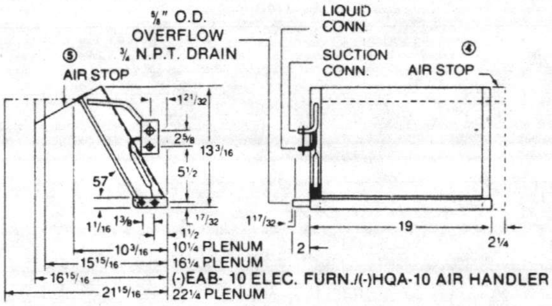
	MODEL
Cooling Coils	RCAS-A RCAB-A RCEB-A (-)CEH-Z RCLB-A/B RCMB-A RCTB-A/B
Heat Pump Indoor Coils	RCPB-B RCPS-A RCQB-B
Cooling Coil Plenums	RXAL-B
Horizontal Drain Pan Kits	RXCH-A/B
Plenum Adapters	RXAA-Z/A/B

Cooling Coil Data

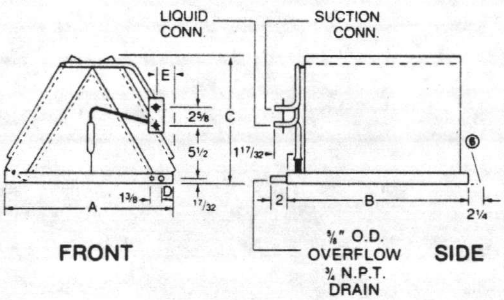
Coil Model Number	Type ③ Air Flow ①	Approx. Design Air Flow CFM Range	Face Area Sq. Ft.	Fins-in. Rows Deep	Tubing Set Size RTCZ-	Ship-ping Wt.. lbs.	Static Pressure Drop Through Wet Cooling Coil (Inches H_2O) CFM① 600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
STANDARD COOLING COILS																						
RCAS-A013	U-D-H④	400/600	1.36	12/3	10/11	15	.18 @ 400 CFM — .26 @ 500 CFM															
RCAS-A018	U-D-H④	600/700	1.58	10/4	10/11	16	.25	.32														
RCAB-A021	U-D-H④	600/700	2.71	12/3	10/11	21	.11	.14														
RCAB-A025	U-D-H④	900/1050	2.71	12/3	10/11	21	.11	.14	.18	.22	.26	.31										
RCAB-A031	U-D-H④	900/1350	3.80	13/3	11	27				.16	.19	.22	.25	.30	.33							
RCAB-A037	U-D-H④	900/1350	3.80	13/3	11	27				.16	.19	.22	.25	.30	.33							
RCAB-A049	U-D-H④	1500/1800	4.56	13/3	11or12	34								.19	.21	.24	.26	.29	.33			
RCAB-A059	U-H	1800/2250	5.41	13/3	12	37												.21	.23	.25	.28	.31
RCEB-A059	U-H④	1800/2250	5.41	13/3	12	38												.21	.23	.25	.28	.31
HIGH EFFICIENCY COOLING COILS																						
RCLB-A024	U-D-H②	500/800	3.16	13/4	11	28	.13	.16	.20	.24	.28	.33										
RCLB-A030	U-D-H②	800/1200	3.80	13/4	11	32			.16	.19	.22	.26	.30	.34								
RCLB-A036	U-D-H②	800/1200	3.80	13/4	11or12	32			.16	.19	.22	.26	.30	.34								
RCLB-A048	U-D-H②	1200/1600	4.56	13/4	11or12	37							.18	.21	.24	.27	.30	.33				
RCLB-B048	U-D	1400/2000	5.13	13/4	12	43										.21	.23	.25	.28	.30	.33	
RCMB-A048	U-D-H②	1400/2000	5.13	13/4	12	44										.21	.23	.25	.28	.30	.33	
RCLB-A060	U-D	1400/2000	5.13	13/4	12	43										.21	.23	.25	.28	.30	.33	
RCMB-A060	U-D-H②	1400/2000	5.13	13/4	12	44										.21	.23	.25	.28	.30	.33	
HIGH EFFICIENCY COOLING COILS WITH EXPANSION VALVE Evaporator coils are equipped with a non-bleed type expansion valve and must be used with condensing units equipped with hard start components.																						
RCTB-A018	U-D-H②	500/600	2.71	12/3	10/11	22	.07 @ 500 CFM — .11 @ 600 CFM															
RCTB-A024	U-D-H②	500/800	3.16	13/4	11	34	.13	.16	.20	.24	.28	.33										
RCTB-A025	U-D-H②	500/800	3.80	13/4	11	42	.09	.13	.16	.19	.22	.26										
RCTB-A036	U-D-H②	800/1200	3.80	13/4	11or12	42			.16	.19	.22	.26	.30	.34								
RCTB-A037	U-D-H②	800/1200	4.56	13/4	11or12	42			.06	.09	.12	.15	.18	.21								
RCTB-A048	U-D-H②	1200/1600	4.56	13/4	11or12	44							.18	.21	.24	.27	.30	.33				
RCTB-A060	U-D	1400/2000	5.13	13/4	12	46										.21	.23	.25	.28	.30	.33	
RCTB-B060	U-D-H②	1400/2000	5.13	13/4	12	46										.21	.23	.25	.28	.30	.33	
HEAT PUMP INDOOR COILS Indoor coils for use with (-)PCB & (-)PFA outdoor units only (see outdoor unit installation instructions for approved application matches and flow check piston sizes required.																						
RCPS-A013	U-D-H④	400/600	1.58	13/4	10/11	17	.13 @ 450 CFM — .22 @ 600 CFM															
RCPB-B018	U-D-H④	500/700	2.71	12/3	10/11	21	.11	.14	.18	.22												
RCPB-B024	U-D-H④	700/900	3.16	13/3	11	23		.14	.18	.22	.26											
RCPB-B027	U-D-H④	700/900	3.16	13/4	11	27		.16	.20	.24	.28											
RCPB-B036	U-D-H④	900/1250	4.06	13/3	11	28					.15	.18	.21	.24	.29							
RCPB-B039	U-D-H④	900/1250	3.80	13/4	11/12	32					.19	.22	.26	.30	.34							
RCPB-B042	U-D-H④	1300/1500	5.13	13/3	11/12	36								.12	.14	.16	.17	.19	.22			
RCPB-B048	U-D-H④	1300/1700	5.13	13/4	12	44										.17	.19	.21	.23	.25	.28	.30
RCPB-B060	U-D-H④	1700/2100	6.83	13/4	12	56										.15	.17	.19	.21	.23	.26	.29
HIGH EFFICIENCY HEAT PUMP COILS WITH EXPANSION VALVE For use with (-PGB) OUTDOOR UNITS ONLY. Indoor coils are equipped with a non-bleed type expansion valve and must be used with heat pump units equipped with hard start components.																						
RCQB-B018	U-D-H	500/700	3.16	13/3		23		.14	.18	.22	.26											
RCQB-B024	U-D-H	700/900	3.16	13/4		27		.16	.20	.24	.28											
RCQB-B030	U-D-H	900/1100	3.80	13/4		35⑤				.19	.22	.26										
RCQB-B036	U-D-H	1100/1250	3.80	13/4		36⑤						.26	.30	.34								
RCQB-B042	U-D-H	1300/1500	5.69	13/4		53⑤								.17	.18	.19						
RCQB-B048	U-D-H	1500/1800	6.83	13/4		66⑤										.15	.17	.19	.21			
RCQB-B060	U-D-H	1800/2100	6.83	13/4		68⑤													.21	.23	.26	.29

Data given for upflow application. For downflow multiply figures by 1.10.
May be used in horizontal position in (-)HQA- or (-)EAB- series electric units with addition of horizontal drain pan kit (optional).
③ U = upflow, D = downflow and H = horizontal.
④ For horizontal installation in (-)HQA- air handlers **ONLY**. Requires horizontal drain pan kit.
⑤ Coil weight only.

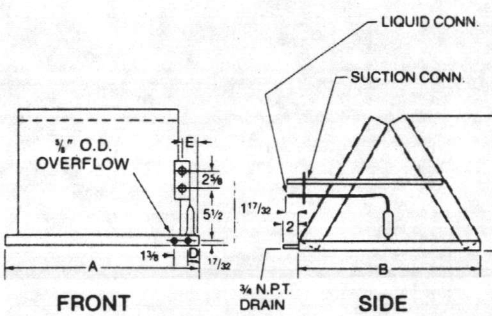
Dimensions/Coils



SLOPE COIL
(RCAS-/RCPS-)



"A" COILS



"A" COILS
RCAB- A059, RCLB- B048, RCLB- A060, AND RCTB- A060— NOTE ORIENTATION OF REFRIGERANT AND DRAIN FITTINGS)

COIL MODEL NUMBER	SWEAT CONNECTIONS①		DIMENSIONS						
	Liquid I.D.	Suction I.D.	A	B	C	D	E	F③	G③
STANDARD									
RCAS-A013	1/4②	5/8	See Line Drawing					—	—
RCAS-A018	1/4②	5/8	See Line Drawing					—	—
RCAB-A021	1/4②	3/4	15 15/16	19	11 1/2	1 1/2	1 21/32	10 1/16	15 3/4
RCAB-A025	1/4②	3/4	15 15/16	19	11 1/2	1 1/2	1 21/32	10 1/16	15 3/4
RCAB-A031	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCAB-A037	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCAB-A049	3/8	7/8	19 15/16	21 1/8	17 7/16	1 1/2	1 21/32	14 1/16	17 7/8
RCAB-A059	3/8	7/8	23 3/8	21 5/16	17 9/16	1 3/16	1 11/32	20 3/8	15 7/16
RCEB-A059	3/8	7/8	21 5/16	23 3/8	17 9/16	1 1/2	1 21/32	15 7/16	20 3/8
HIGH EFFICIENCY									
RCLB-A024	1/4②	3/4	15 15/16	19	14	1 1/2	1 21/32	10 1/16	15 3/4
RCLB-A030	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCLB-A036	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCLB-A048	3/8	7/8	19 15/16	21 1/8	17 7/16	1 1/2	1 21/32	14 1/16	17 7/8
RCLB-B048	3/8	7/8	23 3/8	21 5/16	17 1/8	1 3/16	1 11/32	20 3/8	15 7/16
RCMB-A048	3/8	7/8	21 5/16	23 3/8	17 1/8	1 1/2	1 21/32	15 7/16	20 3/8
RCLB-A060	3/8	7/8	23 3/8	21 5/16	17 1/8	1 3/16	1 11/32	20 3/8	15 7/16
RCMB-A060	3/8	7/8	21 5/16	23 3/8	17 1/8	1 1/2	1 21/32	15 7/16	20 3/8
HIGH EFFICIENCY WITH EXPANSION VALVE Evaporator coils are equipped with a non-bleed type expansion valve and must be used with condensing units equipped with hard start components.									
RCTB-018	1/4	5/8	15 15/16	19	11 1/2	1 1/2	1 21/32	10 1/16	15 3/4
RCTB-A024	1/4	3/4	15 15/16	19	14	1 1/2	1 21/32	10 1/16	15 3/4
RCTB-A025	1/4	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCTB-A036	1/4	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCTB-A037	3/8	7/8	19 15/16	21 1/8	17 7/16	1 1/2	1 21/32	14 1/16	17 7/8
RCTB-A048	3/8	7/8	19 15/16	21 1/8	17 7/16	1 1/2	1 21/32	14 1/16	17 7/8
RCTB-A060	3/8	7/8	23 3/8	21 5/16	17 1/8	1 3/16	1 21/32	20 3/8	15 7/16
RCTB-B060	3/8	7/8	21 5/16	23 3/8	17 1/8	1 1/2	1 21/32	15 7/16	20 3/8
HEAT PUMP (For use with (-)PCB/(-)PFA outdoor heat pumps only)									
RCPS-A013	1/4②	5/8	See Line Drawing					—	—
RCPB-B018	1/4②	5/8	15 15/16	19	11 1/2	1 1/2	1 21/32	10 1/16	15 3/4
RCPB-B024	1/4②	3/4	15 15/16	19	11 1/2	1 1/2	1 21/32	10 1/16	15 3/4
RCPB-B027	1/4②	3/4	15 15/16	19	14	1 1/2	1 21/32	10 1/16	15 3/4
RCPB-B036	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCPB-B039	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCPB-B042	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCPB-B048	1/4	7/8	21 5/16	23 3/8	17 9/16	1 1/2	1 21/32	15 7/16	20 3/8
RCPB-B060	1/4	7/8	23 3/8	21 5/16	17 9/16	1 3/16	1 7/16	20 3/8	15 7/16
HIGH EFFICIENCY HEAT PUMP COILS WITH EXPANSION VALVE Indoor coils are equipped with a non-bleed type expansion valve and must be used with heat pump units equipped with hard start components. For use with (-)PGB outdoor units only.									
RCQB-B018	1/4②	3/4	15 15/16	19	13 7/8	1 1/2	1 21/32	10 1/16	15 3/4
RCQB-B024	1/4②	3/4	15 15/16	19	14	1 1/2	1 21/32	10 1/16	15 3/4
RCQB-B030	1/4②	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCQB-B036	3/8	3/4	15 15/16	21 1/8	15	1 1/2	1 21/32	10 1/16	17 7/8
RCQB-B042	3/8	7/8	21 5/16	23 3/8	19 5/16	1 1/2	1 21/32	15 7/16	20 3/8
RCQB-B048	3/8	7/8	21 5/16	23 3/8	23 1/2	1 1/2	1 21/32	15 7/16	20 3/8
RCQB-B060	3/8	7/8	21 5/16	23 3/8	23 1/2	1 1/2	1 21/32	15 7/16	20 3/8

① Line conn. (Stub Out) on coil.
② OR 3/8 O.D. sweat.
③ "F" & "G" dimensions are openings in drain pan base. (Not shown on coil assembly.)
④ Req'd. only when coil is used in plenum. Air stop provided with coil.
⑤ One air stop furnished with coil to fit 16 1/4 plenum, (-)EAB-10 furn. and (-)HQA-10 air handler. A field fab. air stop will be req'd. for 22 1/4 plenum. Air stop removed for 10 1/4 plenum.
⑥ Air stop provided with 024 & 025 cooling coils with 19" long pans to fit plenum. Not req'd. on (-)HQA- or (-)EAB- units. (Also provided with 018 and 024 heat pump coils.)

Coil Application

Coil can be matched to products as listed in table below. Horizontal drain pan kits can be installed on coils shown for (-)HQA- series indoor heat pump section for horizontal applications. Horizontal kits cannot be installed on coils for use in upflow-downflow coil plenums.

COIL MODEL NUMBER	(-)EAB- SERIES ELEC. FURNACE SIZES				(-)HQA- SERIES INDOOR AIR HANDLER SIZES						UPFLOW-DOWNFLOW COIL PLENUM RXAL-B(*)BU						HORIZONTAL DRAIN PAN KIT RXCH-			
	10	14	16	20	08	10	12	13	16	20	*11	*16	*20	*22	*25	*28	A10	A14	A16	B16
STANDARD COOLING COILS (NOTE APPLICATION DIFFERENCES OF 059 COILS)																				
RCAS-A013	X				⑤						X	X		X			⑦			
RCAS-A018	X				⑤						X	X		X			⑦			
RCAB-A021	X				⑤							X	X	X	X		⑦			
RCAB-A025	X				⑤							X	X	X	X		⑦			
RCAB-A031		X						⑤				X	X	X	X			⑦		
RCAB-A037		X						⑤				X	X	X	X			⑦		
RCAB-A049			X						①⑤				X	X	X	X				⑦
RCAB-A059															④	④				
RCEB-A059				④						⑤④										⑦
HIGH EFFICIENCY COOLING COILS (NOTE APPLICATION DIFFERENCES OF 060 COILS)																				
RCLB-A024	②				⑤⑧							X	X	X	X		⑨			
RCLB-A030		X						⑤				X	X	X	X			⑨		
RCLB-A036		X						⑤				X	X	X	X			⑨		
RCLB-A048			X						①⑤				X	X	X	X			⑥⑨	⑦
RCLB-B048															X	X				
RCMB-A048				⑤					⑤										⑥⑨	⑦
RCLB-A060															X	X				
RCMB-A060				X						⑤									⑥⑨	⑦
HIGH EFFICIENCY COOLING COILS WITH EXPANSION VALVE (NOTE APPLICATION DIFFERENCES OF 060 COILS) Evaporator coils are equipped with a non-bleed type expansion valve and must be used with condensing units equipped with hard start components. (RAGB- & RAGC-)																				
RCTB-A018	X				⑤							X	X	X	X		⑨			
RCTB-A024	②				⑤⑧							X	X	X	X		⑨			
RCTB-A025		X						⑤				X	X	X	X			⑨		
RCTB-A036		X						⑤				X	X	X	X			⑨		
RCTB-A037			X						①⑤				X	X	X				⑥⑨	⑦
RCTB-A048			X						①⑤				X	X	X	X			⑥⑨	⑦
RCTB-A060															X	X				
RCTB-B060				X						⑤									⑥⑨	⑦
HEAT PUMP INDOOR COILS ③⑤ INDOOR COILS FOR USE WITH (-)PCB & (-)PFA OUTDOOR UNITS ONLY (SEE OUTDOOR UNIT INSTALLATION INSTRUCTIONS FOR APPROVED APPLICATION MATCHES AND FLOW CHECK PISTON SIZES REQUIRED.)																				
RCPS-A013					X						X						X			
RCPB-B018					X	X						X	X	X			X			
RCPB-B024					⑧	⑧						X	X	X			X			
RCPB-B027					⑧	⑧						X	X	X	X		X			
RCPB-B036							⑧	⑧				X	X	X	X			X		
RCPB-B039							X	X				X	X	X	X			X		
RCPB-B042									X											X
RCPB-B048									X											X
RCPB-B060										X										X
HIGH EFFICIENCY HEAT PUMP COILS WITH EXPANSION VALVE③⑤ Indoor coils are equipped with a non-bleed type expansion valve and must be used with heat pump units equipped with hard start components.																				
RCQB-B018					⑤⑧							X	X	X	X		X			
RCQB-B024					⑤⑧							X	X	X	X		X			
RCQB-B030								⑤				X	X	X	X			X		
RCQB-B036								⑤				X	X	X	X			X		
RCQB-B042									⑤											X
RCQB-B048									⑤											X
RCQB-B060										⑤										X

Notes ① thru ⑨ see page 5.

***CAUTION** — When coils are used with air handlers or furnaces and installed above a finished ceiling or living area, it is recommended that an auxiliary sheet metal condensate drain pan be fabricated and installed under entire unit.*

Never locate the coil in return duct to a gas or oil furnace. Provide a service inlet to the coil for inspection and cleaning. Keep the coil pitched toward the drain connection.

COIL REFRIGERANT CONNECTIONS

Coil refrigerant connections are sweat type.

NOTE: For elimination of possible water blow-off and maximum performance, coil should be sprayed with liquid detergent thoroughly before installation. If coil is not sprayed with detergent, approximately 50 hours of break time is required before equivalent performance is obtained.

APPLICATION NOTES FOR FACING PAGE

① Can be used but requires field modification or use adapter kit RXCA-B16.

② Coil RCLB-A024 and RCTB-A024 may be used upflow and horizontal (R.H. supply) only in (-)EAB-10 elecric furnace. Coil will not fit downflow or horizontal (L.H. supply). Installation requires the removal of supply duct flange from furnace.

③ For fossil fuel applications, always locate coil **downstream** of the furnace heat exchanger.

④ RCAB-/RCEB-A059 should not be used in downflow applications.

⑤ Field installed only.

⑥ For horizontal application in (-)EAB- series electric furnaces.

⑦ For horizontal application in (-)HQA- air handlers only.

⑧ **Coil will fit in air handler with removal and replacement of internal parts. This requires access to screws on one side of furnace.**

⑨ An optional horizontal drain pan extension kit is available as needed for horizontal applications in (-)EAB- series electric furnaces only. (Ref. page 7.)

CONDENSATE DRAIN

A ¾" male pipe connection is provided for condensate and a ⅝" O.D. copper tube is provided for overflow (horizontal drain pans are provided with fittings as above). Use a back-up wrench when connecting to main drain fittings.

Consult local codes or ordinances for specific requirements.

Do not connect the drain line to a closed sewer, run line to an open drain or outdoors.

Never terminate an open sewer or drain connection within the return air duct, platform or return plenum.

Pitch the drain line at least ¼" per foot away from the drain pan.

If condensate drain connection is on the negative side of the blower, a trap must be installed to insure positive drainage.

Condensate drain lines should not be reduced in size from the connection size suplied.

NOTE: Be sure that the rubber washer on the coil suction line is positioned to allow water running down the heater to drop into the drain pan. Not required on "(-)CEH-Z" coils.

The drain line should be insulated where necessary, to prevent sweating and damage due to condensate forming on the outside surface of the line.

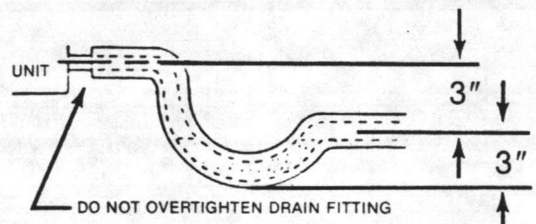
For installations where overflow due to a clogged drain line could be hazardous, or cause damage, it is suggested that the ⅝" overflow be used. If so, it is recommended that it be individually run to an open drain and trapped.

Test condensate drain line with water before operating system.

IMPORTANT

CONDENSATE DRAIN

DO NOT OPERATE UNIT WITHOUT CONDENSATE DRAIN TRAP

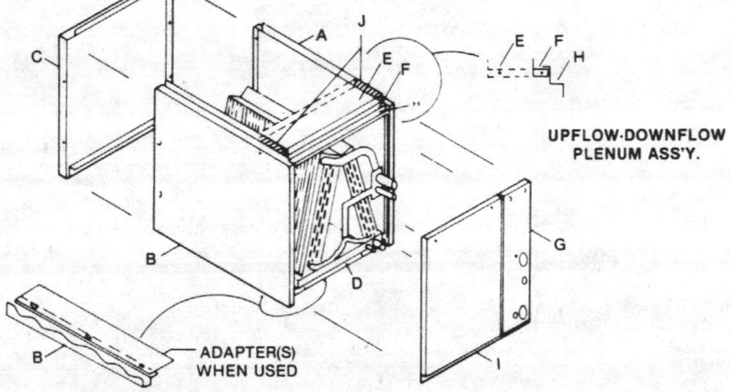


UNIT MUST BE SLIGHTLY INCLINED TOWARD DRAIN CONNECTION.

ASSEMBLY INSTRUCTIONS
"Combination Upflow-Downflow Plenums"

1. Locate sides (A & B) on level surface and install rear panel (C) using 8 screws provided.
2. Locate bottom base (D) as indicated between sides (A & B). (DO NOT secure with screws until coil is installed.)
3. Locate top tie bar (E) or (F). Tie bar (E) is used for all counterflow gas furnaces. If tie bar (E) is used, cut off or bend shaded area (J) of duct flange shown below. Top tie bar (F) is used on all upflow furnaces and all counterflow oil furnaces. Secure top tie bar through sides A & B with 2 screws (tie bar (F)) or 4 screws (tie bar (E)).
4. Install appropriate coil adapter (S) if required to side (B) as shown. If coil assembly includes an adapter (19" long coils) assemble in rear of plenum on panel (C).
5. Cut insulation from coil panel holes (G) and install panel on coil using (2) ½" long screws.
6. Place coil in plenum to extreme right side next to panel (A). Check adapter (S) position if used to make sure air will not bypass.
7. Install front tie bar (H) and secure with 2 screws. Secure bottom base (D) with 2 screws.
8. Secure coil panel (G) and door (I) to front tie bar (H) and botton base (D) with 8 screws provided.
9. Place plenum and coil assembly on furnace (UPFLOW) or furnace on plenum assembly (downflow).
10. When installing plenum on mismatching furnace sizes an accessory up or downflow plenum adapter is required.
11. When installing plenum on counterflow oil furnace use 1½" or 4½" filler panel provided to fill gap at rear of furnace. (See plenum application instructions.)

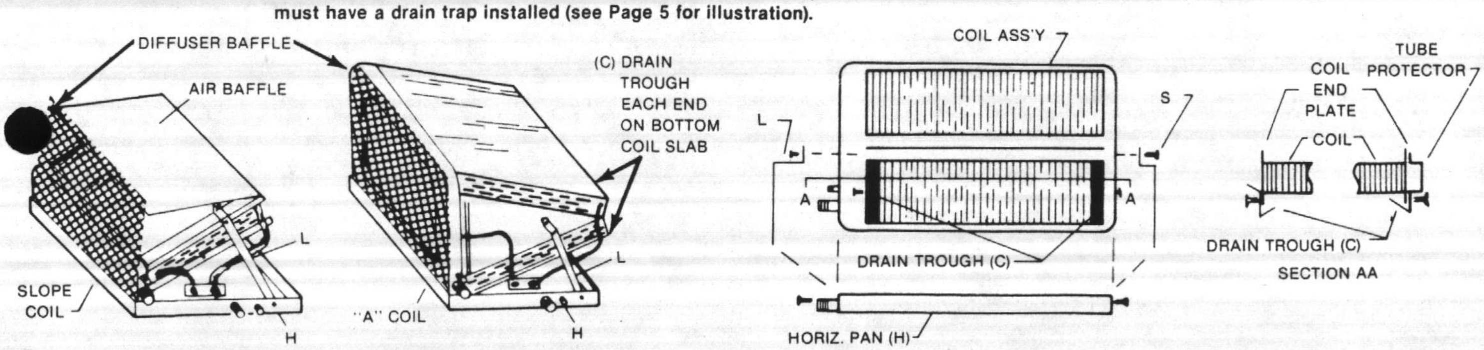
NOTE: If plenum is assembled before coil is installed, some coil models will require removing front tie bar (H) and removing screws securing sides to bottom base (D) so sides (A & B) can be spread at bottom to clear coil drain pan.



ASSEMBLY INSTRUCTIONS
"Horizontal Drain Pan Kits"

1. Select proper Horizontal Drain Pan Kit for coil used per Table on page 4.
2. Install coil drain troughs (C) on bottom coil slab end plates. (See Section AA.) Troughs (C) must be installed on each end of bottom coil slab. Make sure trough is even with top of coil slab and secure to end plate (1- screw in each). Drain troughs are not required on slope coil.
3. Place standard coil drain pan in horizontal pan (H) as shown with drain connections on both pans toward front of coil and horizontal pan on side of coil next to refrigerant connections.
4. Install brace (L) with large offset on connection end of coil. Secure brace as shown from coil to horizontal pan with 2 screws. Install brace (S) with small offset on coil opposite connection end and install as above with 2 screws. NOTE: On back of RCAB-A049 and RCLB-A048 only use extra brace (L) with large offset in lieu of brace (S). On slope coil use second hole in brace (L) and (S) so offset is over top of coil as shown below.
5. Remove rubber plug from horizontal pan and use to plug drain in standard vertical pan.
6. After horizontal coil assembly is installed make sure horizontal pan is level or pitched toward drain. Test with water to check for drainage without water build-up in pan.
7. Install diffuser baffle over drain pan opening with double face tape provided (if required, see Table on Page 7).

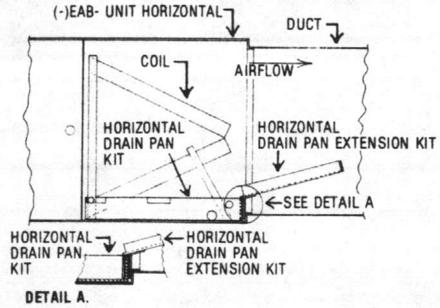
IMPORTANT — Condensate drain line must be pitched ¼" per/ft. minimum to allow proper drainage. These coils must have a drain trap installed (see Page 5 for illustration).



ASSEMBLY INSTRUCTIONS
"Horizontal Drain Pan Extension Kit"

1. Select proper horizontal drain pan extension kit from the application table.
2. Attach the two parallel flanges on the drain pan extension over the vertical flange on the horizontal drain pan. The drain pan extension will extend into the duct as shown in the illustration.

HORIZONTAL DRAIN PAN KIT	EXTENSION KIT	ELECTRIC FURNACE
RXCH-A10	RXCH-A101	(-)EAB-10
RXCH-A14	RXCH-A141	(-)EAB-14
RXCH-A16	RXCH-A161	(-)EAB-16
RXCH-A16	RXCH-A161	(-)EAB-20



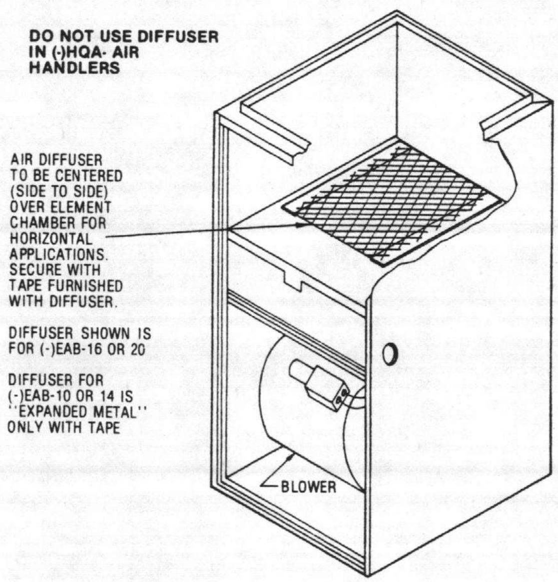
AIR DIFFUSER LOCATION INSTRUCTIONS

IMPORTANT

AIR DIFFUSER IS **NOT** REQUIRED ON THE FOLLOWING MODELS:
(-)EAB-10 WITH 11 KW OR MORE ELECTRIC HEAT INSTALLED
(-)EAB-14 WITH 18 KW OR MORE ELECTRIC HEAT INSTALLED
(-)EAB-16 WITH ANY AMOUNT OF ELECTRIC HEAT INSTALLED
(-)EAB-20 WITH 23 KW OR MORE ELECTRIC HEAT INSTALLED

NOTE: AIR DIFFUSER TO BE CENTERED (SIDE BY SIDE) OVER ELEMENT CHAMBER FOR HORIZONTAL APPLICATIONS. SECURE AIR DIFFUSER WITH TAPE FURNISHED WITH DIFFUSER. DO NOT USE WITH (-)CEH-Z COILS.

DO NOT USE DIFFUSER IN (-)HQA- AIR HANDLERS

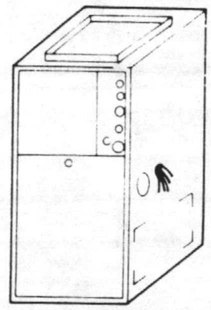


CAUTION

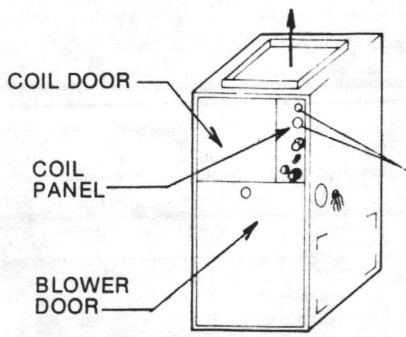
AIR DIFFUSER MAY HAVE SHARP EDGES - HANDLE WITH CARE.

CHECK TO BE SURE THE HORIZONTAL CONDENSATE PAN IS PITCHED SLIGHTLY TOWARD THE DRAIN CONNECTION & THE DRAIN IS NOT OBSTRUCTED.

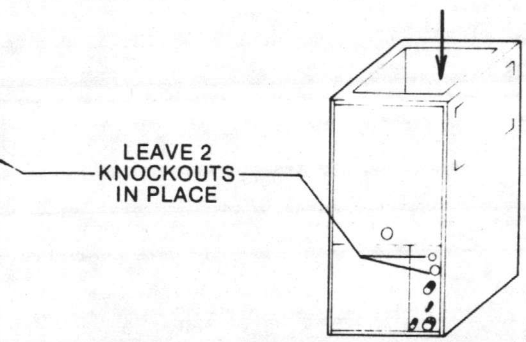
COIL APPLICATION IN (-)EAB- ELECTRIC FURNACE



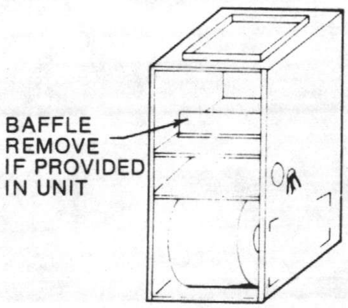
(-)EAB- UNIT
AS RECEIVED
WITHOUT COIL



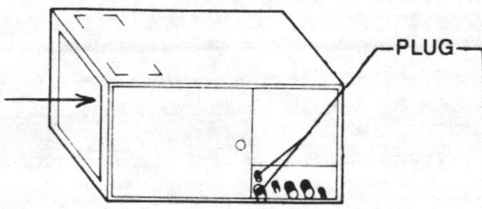
(-)EAB- UNIT
UPFLOW



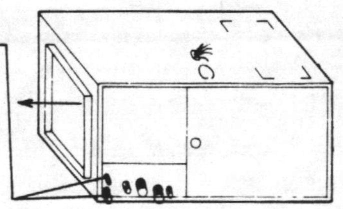
(-)EAB- UNIT
DOWNFLOW



(-)EAB- UNIT

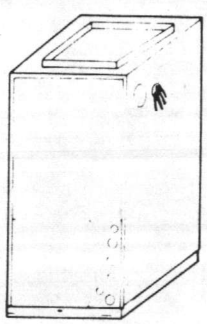


(-)EAB- UNIT
HORIZONTAL
R.H. SUPPLY

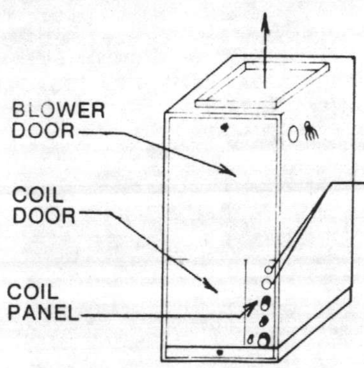


(-)EAB- UNIT
HORIZONTAL
L.H. SUPPLY

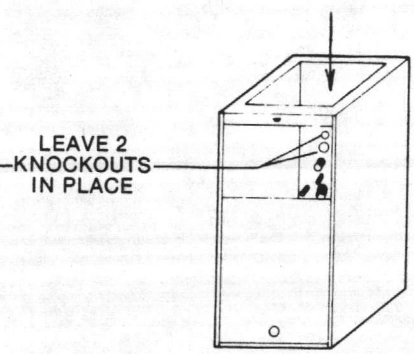
COIL APPLICATION IN (-)HQA- AIR HANDLER



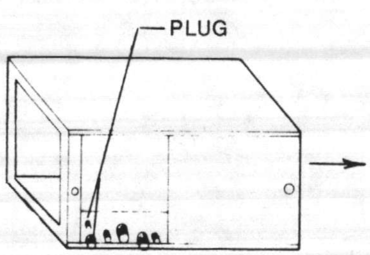
(-)HQA- UNIT
AS RECEIVED
WITHOUT COIL



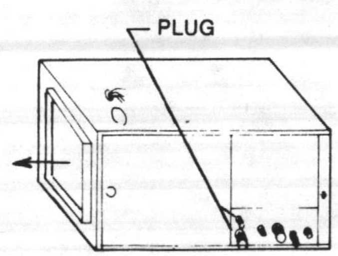
(-)HQA- UNIT
UPFLOW



(-)HQA- UNIT
DOWNFLOW



(-)HQA- UNIT
HORIZONTAL
R.H. SUPPLY



(-)HQA- UNIT
HORIZONTAL
L.H. SUPPLY

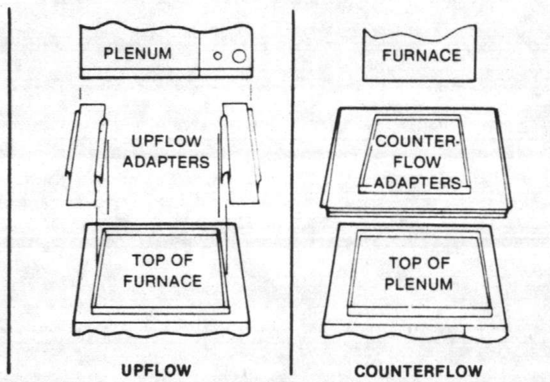
COIL INSTALLATION INSTRUCTIONS FOR (-)EAB- ELECTRIC FURNACE AND (-)HQA- AIR HANDLERS

***CAUTION:** Read instructions completely and study unit illustration before installing unit.*

1. Remove blower door, coil door and coil panel.
2. If (-)CEH- Horizontal coil is to be installed in (-)EAB- unit see instructions elsewhere in this booklet. (-)CEH-Z coils are used only in (-)EAB- units horizontal L.H. supply.
3. Place unit in upflow, downflow or horizontal position.
4. Installing RCAS- coils in (-)HQA-10 or (-)EAB-10 unit:
   (a) Upflow application - Attach Top Coil Air Stop to top of coil with (2) #8 sheet metal screws. See illustration of RCAS- coil on page 3. Slide coil into -10 unit. Screw Top Coil Air Stop to side of -10 unit using (2) #8 sheet metal screws.
   (b) Downflow application - remove back coil support from back of (-)HQA-10 unit. Place unit downflow position and reinstall back coil support such that back of coil drain pan will rest on back coil support. Screw Top Coil Air Stop to side of unit.
   (c) Back coil support change noted in (b) above does not apply to (-)EAB-10 unit.
5. If unit is to be installed horizontal see instructions for horizontal drain pan kits elsewhere in this booklet. Kits not required on (-)CEH-Z coils.
6. Place coil in unit. ***CAUTION:** Make sure drain pan is level or pitched toward drain (test with water).* Mount coil panel to coil assembly using 2 screws provided. Knockout **only** holes required for coil panel to fit on coil assembly. Replace coil door and blower door.
7. If unit is installed horizontal unused drains must be plugged. Use rubber plugs furnished with horizontal drain pan.

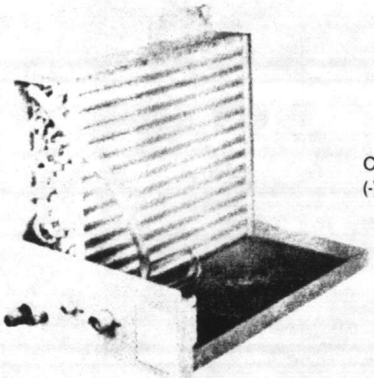
PLENUM ADAPTERS

Plenum adapters are required in some instances for use with the gas, oil, or electric furnaces for either upflow or counterflow applications when plenum and furnace size do not match.

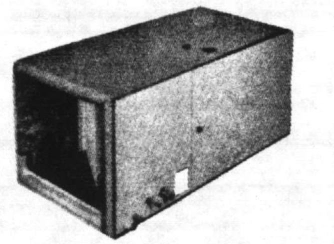


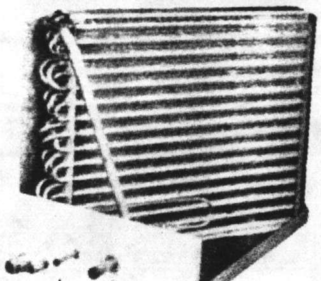
PLENUM		FURNACE WIDTH		PLENUM ADAPTERS UPFLOW	PLENUM ADAPTERS DOWNFLOW
RXAL-	WIDTH	UPFLOW OIL	GAS		
B16BU	16¼		10½	RXAA-B156	
			14	RXAA-B157	RXAA-B164
B20BU	20¼		14	RXAA-B158	RXAA-B165
			17½	RXAA-B159	RXAA-B166
B22BU	22¼		21	RXAA-B160	RXAA-B168
B25BU	25¼		17½	RXAA-B161	RXAA-B167
			21	RXAA-B162	RXAA-B169
		22¼		RXAA-Z142	
			24¼	RXAA-B163	RXAA-B170

COOLING COILS FOR USE WITH (-)EAB- ELECTRIC FURNACE (HORIZONTAL APPLICATIONS ONLY)

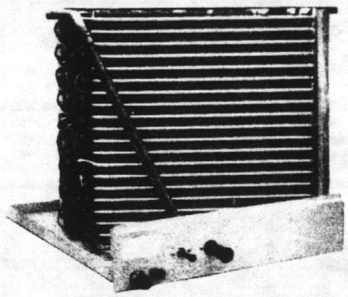


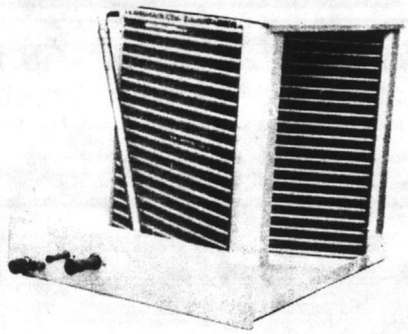
Coil #(-)CEH-Z021 (★) fits furnace (-)EAB-10





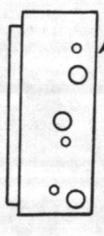
Coil #(-)CEH-Z025 (★) fits furnace (-)EAB-10





Coil #(-)CEH-Z031 (★) fits furnace (-)EAB-14
Coil #(-)CEH-Z037 (★) fits furnace (-)EAB-14
Coil #(-)CEH-Z049 (★) fits furnace (-)EAB-16
Coil #(-)CEH-Z059 (★) fits furnace (-)EAB-20

* Sweat Fittings



Coil panel on (-)EAB- unit is to be discarded when "(-)CEH-Z" coil is installed. (A similar panel is part of coil assembly.)

Coil Application

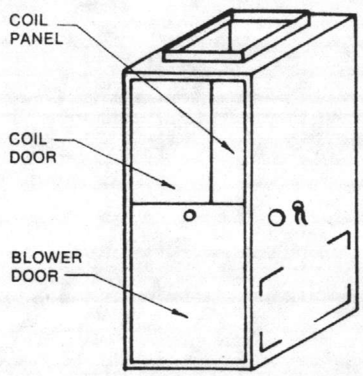
COIL MODEL NUMBER	(-)EAB- SERIES ELEC. FURNACE SIZES				
	10	14	16	20	
(-)CEH-Z021 ①	①				Factory installed only in (-)EBB-10. May be field installed in (-)EAB-10.
(-)CEH-Z025 ①	①				
(-)CEH-Z031 ①		①			Factory installed only in (-)EBB-14. May be field installed in (-)EAB-14.
(-)CEH-Z037 ①		①			
(-)CEH-Z049 ①			①		Factory installed only in (-)EBB-16. May be field installed in (-)EAB-16.
(-)CEH-Z059 ①				①	Factory installed only in (-)EBB-20. May be field installed in (-)EAB-20.

① Horizontal application only. Electric furnace must be installed on left side, with air flow from right to left into the throat of the coil.

(-)CEH- HORIZONTAL
COIL INSTALLATION INSTRUCTIONS

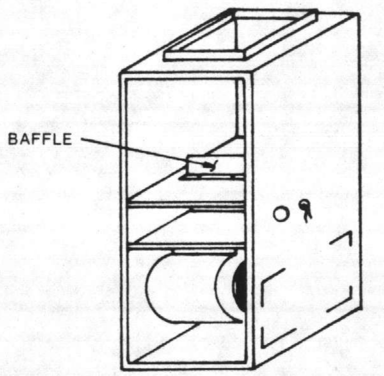
NOTE: FIGURES 3 AND 4 FOR INSTALLATION OF (-)CEH-Z049
COIL IN (-)EAB-16 ELECTRIC FURNACE

FIGURE 1



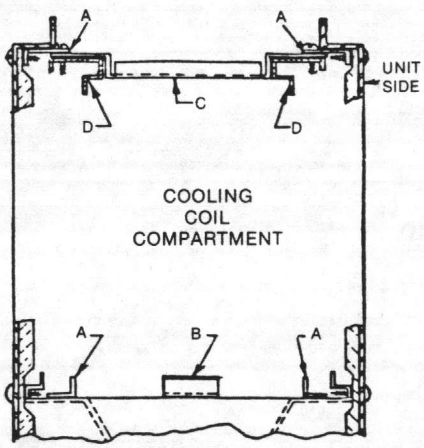
(-)EAB- UNIT AS RECEIVED WITHOUT COIL

FIGURE 2



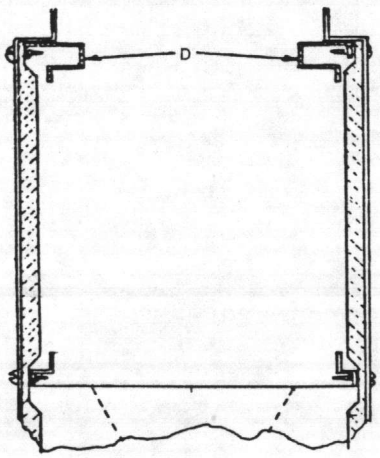
1. REMOVE BLOWER DOOR, COIL DOOR AND COIL PANEL. DISCARD COIL PANEL.
2. REMOVE & DISCARD BAFFLE, IF SUPPLIED IN UNIT.

FIGURE 3



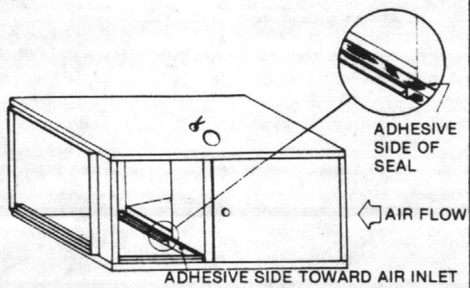
REMOVE AND DISCARD PARTS A, B AND C.
PART A - - - (4) SIDE FILLER ANGLES
PART B - - - (1) COIL STOP
PART C - - - (1) COIL SUPPORT

FIGURE 4



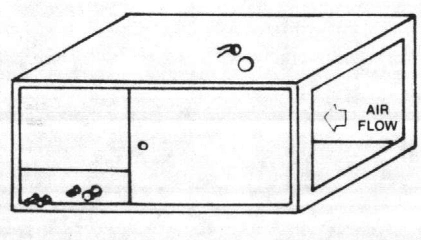
REINSTALL (2) PARTS D TO SIDES OF UNIT AT TOP.

FIGURE 5
HORIZONTAL COIL SEAL INSTALLATION



RUBBER STRIPPING PROVIDED WITH COIL MUST BE INSTALLED AS SHOWN ABOVE, TO SEAL BOTTOM SIDE OF HORIZONTAL COIL DRAIN PAN.

FIGURE 6
HORIZONTAL

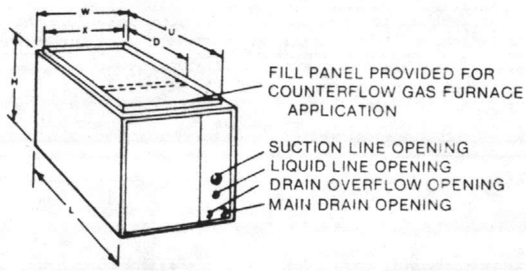


1. PLACE COIL IN UNIT AS SHOWN.
2. REPLACE COIL DOOR & BLOWER DOOR.

NOTE: SEE INSTRUCTIONS FOR INSTALLATION OF COIL SEAL.

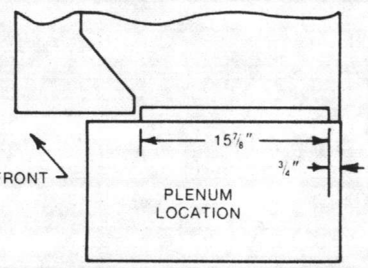
COMBINATION UPFLOW-DOWNFLOW PLENUM

PLENUM DIMENSIONS	RXAL-B11BU	RXAL-B16BU	RXAL-B20BU	RXAL-B22BU	RXAL-B25BU	RXAL-B28BU
W Plenum Width	10½	16¼	20¼	22¼	25¼	28
L Plenum Length	21⅞	21⅞	21⅞	21⅞	21⅞	21⅞
H Plenum Height	16¼	16¼	18¾	18¾	18¾	18¾
X Duct Flange Width	9	14¾	18¾	20¾	23¾	26½
U Upflow Flange Length	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛
D Downflow Flange Length	NA	15⅝	15⅝	20⅛	15⅝	15⅝
Duct Flange Height	¾	¾	¾	¾	¾	¾
Approx. Shp. Weight	14	17	22	23	24	25

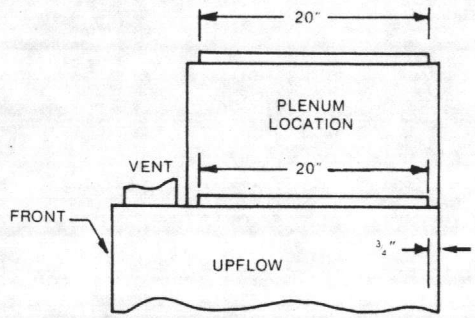


- Plenum is shipped unassembled.
- When used on counterflow oil furnace 20⅛" opening is used. Oil furnace overhangs plenum in rear and filler is used to fill gap between furnace and plenum. NOTE: For counterflow maximum floor opening dimensions should be at least 2" less than "W" & "L" to allow adequate support.
- If plenum is assembled before coil is installed, some coil models will require removing front tie bar and removing screws securing sides to bottom base so sides can be spread at bottom to clear coil drain pan.

PLENUM APPLICATION GAS FURNACE

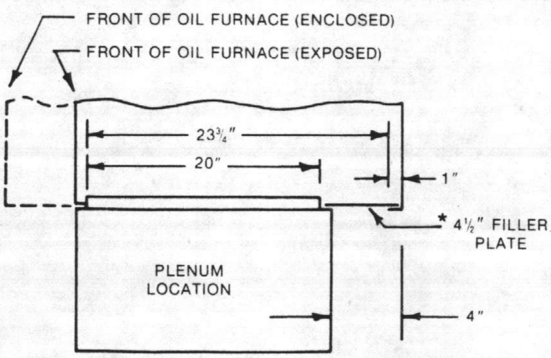


DOWNFLOW GAS (SIDE VIEW)

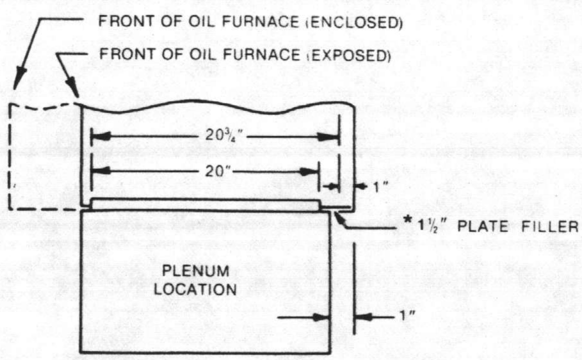


UPFLOW GAS (SIDE VIEW)

OIL FURNACE

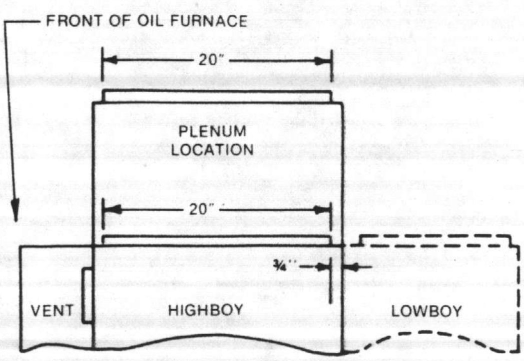


25¼" WIDE COUNTERFLOW OIL (SIDE VIEW)



22¼" WIDE COUNTERFLOW OIL (SIDE VIEW)

* FILLER PLATE PROVIDED WITH PLENUM FOR USE ON COUNTERFLOW OIL FURNACES AS SHOWN ABOVE. TURN FURNACE ON BACK AND INSTALL FILLER IN REAR OF FURNACE SUPPLY OPENING. SECURE FILLER UNDER BOTTOM INSULATION SUPPORT ANGLES.



UPFLOW OIL FURNACE (SIDE VIEW)

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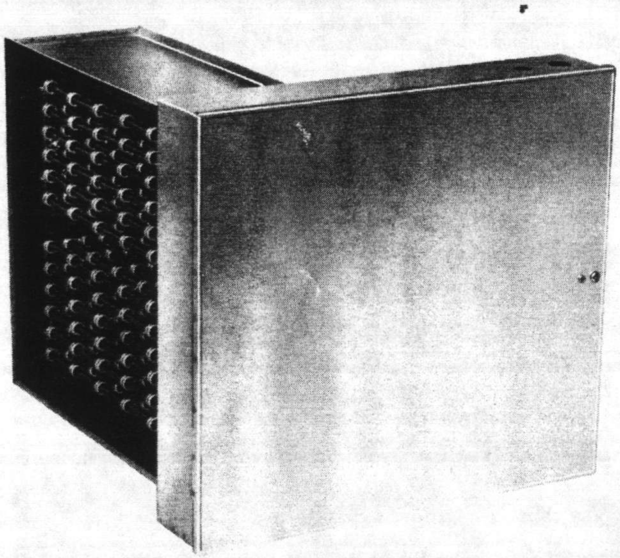
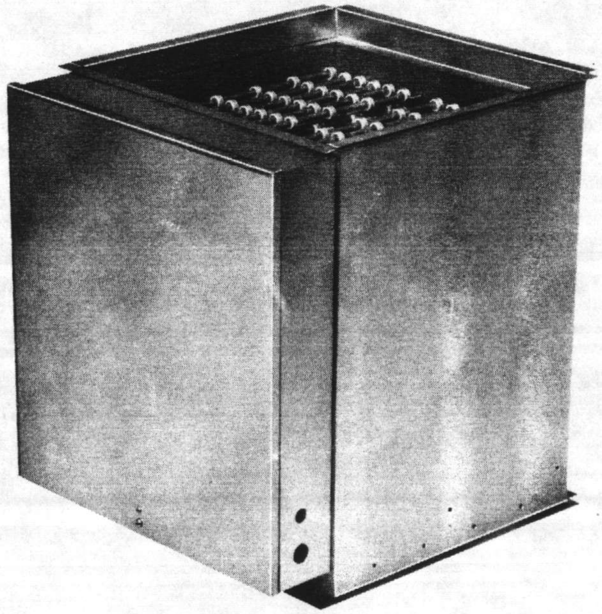
FORM NO. X33-1104 REV. 4

COMMERCIAL ELECTRIC DUCT HEATERS

RXHE- SERIES

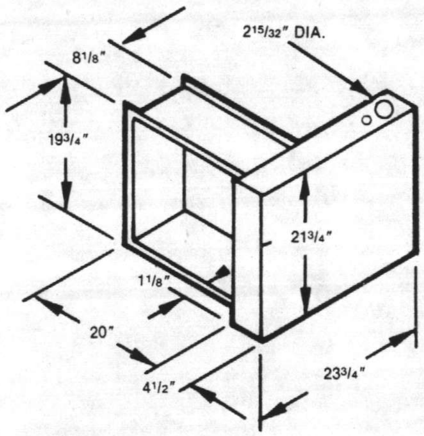




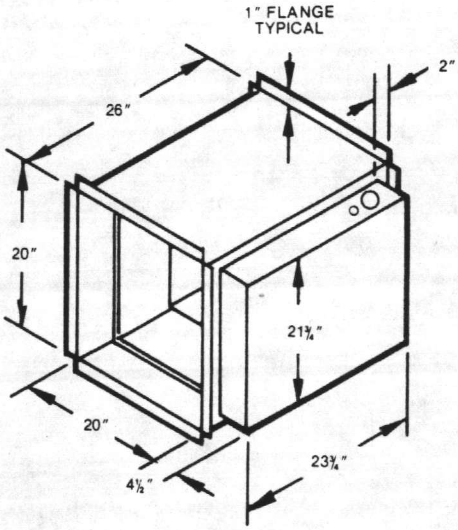
WARNING: *THIS KIT IS INTENDED FOR INSTALLATION BY A QUALIFIED LICENSED SERVICE PERSON. TO AVOID UNSATISFACTORY OPERATION OR DAMAGE TO THE PRODUCT AND POSSIBLE UNSAFE CONDITIONS, INCLUDING ELECTRICAL SHOCK, REFRIGERANT LEAKAGE AND FIRE, THE INSTALLATION INSTRUCTIONS PROVIDED WITH THIS KIT MUST BE STRICTLY FOLLOWED AND THE PARTS SUPPLIED USED WITHOUT SUBSTITUTION. DAMAGE TO THE PRODUCT RESULTING FROM NOT FOLLOWING THE INSTRUCTIONS OR USING UNAUTHORIZED PARTS IS EXCLUDED FROM THE MANUFACTURER'S WARRANTY COVERAGE.*

CONTENTS

DIMENSIONS

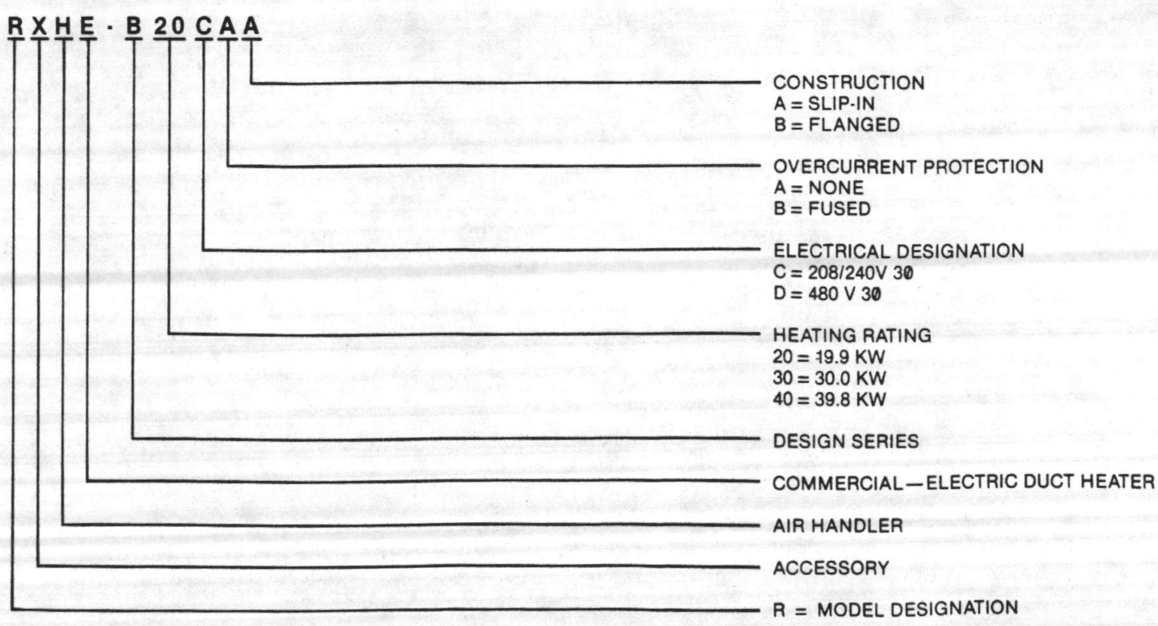


SLIP-IN TYPE

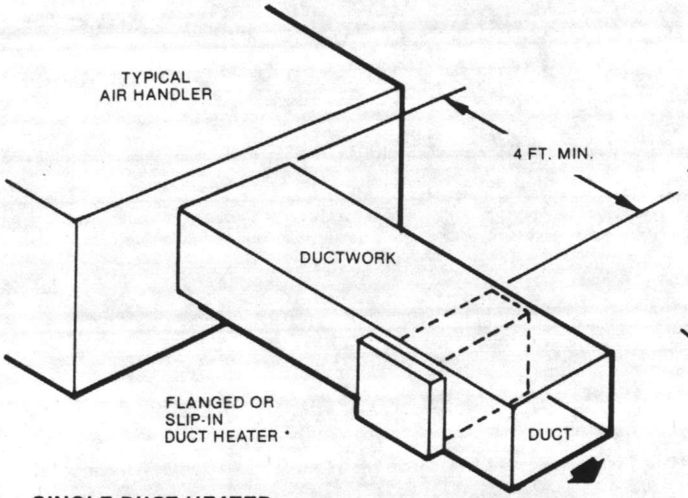


FLANGED TYPE

MODEL NUMBER DESIGNATION

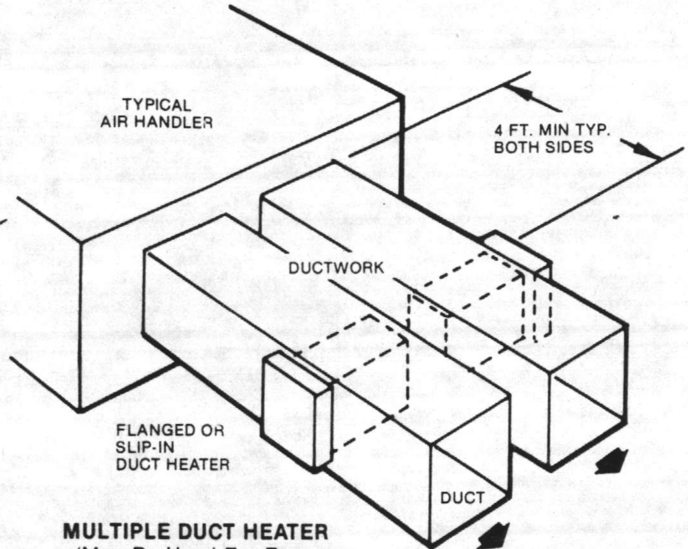


TYPICAL APPLICATIONS



SINGLE DUCT HEATER

*Heaters may be installed in series if at least (4) four feet apart, and if the inlet air temp. to each heater is 100°F or less.



MULTIPLE DUCT HEATER
(May Be Used For Zone Heating Applications)

NOTE:
The duct heater may also be applied in a vertical upflow duct system.

WARNING: ONLY ELECTRIC HEATER KITS SUPPLIED BY THIS MANUFACTURER AS DESCRIBED IN THIS PUBLICATION HAVE BEEN DESIGNED, TESTED, AND HAVE NECESSARY APPROVALS INCLUDING UNDERWRITERS LABORATORY (UL) FOR USE WITH THIS UNIT. USE OF ANY OTHER MANUFACTURED ELECTRIC HEATERS INSTALLED WITHIN THE UNIT MAY CAUSE HAZARDOUS CONDITIONS RESULTING IN PROPERTY DAMAGE, FIRE, OR BODILY INJURY.

OPERATION

CAUTION—DO NOT OPERATE WITHOUT AIR

For efficient and trouble-free operation it is important that air distribution be uniform over all the heating coils in the entire heated section and particularly the area where the coils terminate. No electric duct heater should ever be operated with insufficient airflow or overheating and subsequent damage will result. The minimum velocity required at any point should be determined from Table I below.

TABLE I

MINIMUM VELOCITY—FEET PER MINUTE
SUPPLY AIR TO DUCT HEATER

NOMINAL HEATER KW	15.0	19.9	22.5	30.0	39.8
INLET AIR @ 80°F or less	300	400	500	600	700
INLET AIR @ 81°F to 100°F	400	500	600	700	800

Electric duct heaters differ from other types of heating coils (such as steam or hot water coils) in that they produce 100% heat as long as the elements are energized, regardless of airflow. Therefore, problems may arise if portions of the heater are blocked. Listed below are some of the important items to watch when installing any duct heater.

DO NOT OPERATE WITHOUT AIR

DO NOT OPERATE HEATER WITH INADEQUATE AIRFLOW

DO NOT OPERATE HEATER WITH UNEVEN AIR DISTRIBUTION

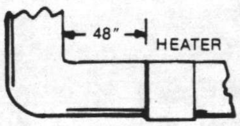
AIR MUST BE FILTERED and free of combustible particles and hazardous vapors.

DO NOT MOUNT HEATER WITH TERMINAL BOX ON TOP OR BOTTOM OF HORIZONTAL DUCT.

DO NOT INSULATE EXTERIOR OF TERMINAL BOX

DO NOT INSTALL HEATER where face area may be blocked by frame members, filters, filter supports, insulation, cooling coil headers, humidifiers or any other kind of obstruction.

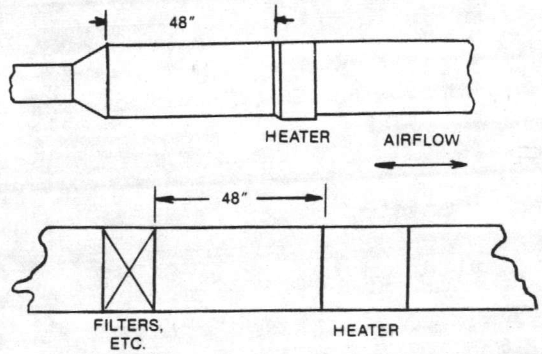
LEAVE AT LEAST 48" BETWEEN DUCT HEATER AND ANY TURN OR ELBOW in the ductwork. If less than 48" between heater and elbow, provide turning vanes. Absolute minimum between heater and elbow is 24".



ZERO CLEARANCE TO COMBUSTIBLE MATERIALS

Slip-in heaters may be installed in ducts which have zero clearance.
Flanged heaters may be installed with zero clearance.

LEAVE AT LEAST 48 INCHES BETWEEN HEATER AND HEAT PUMP, AIR CONDITIONER, FILTERS, HUMIDIFIERS OR DUCT TRANSITIONS.



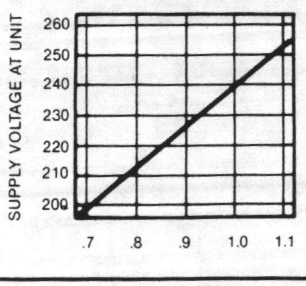
TEMPERATURE RISE

FORMULA:

$$\text{TEMP. RISE. F}^\circ = \frac{3160 \times \text{KW}}{\text{CFM}}$$

3160 = CONSTANT
KW = KW RATING OF UNIT
CFM = AIR FLOW AT SPECIFIED CONDITIONS

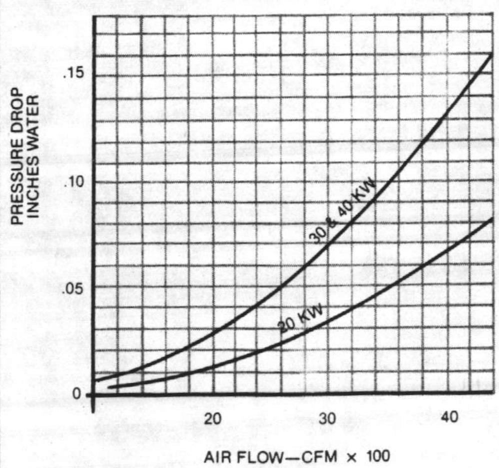
HEATING CORRECTION FACTOR



CAPACITY CORRECTION FACTOR

For correction of unit output, multiply the correction factor times the kw rating at 240 volts. For correction of temperature rise, multiply the correction factor times the rise calculated for the rated kw at 240 volts.

PRESSURE DROP THRU HEATER



GENERAL FORMULAS

BTUH = 3414 × KW
BTUH = BRITISH THERMAL UNITS PER HOUR
3414 = CONSTANT

$$\textbf{KW} = \text{KILOWATTS} = \frac{\text{WATTS}}{1000}$$

$$\textbf{KW} = \frac{\text{VOLTS} \times \text{AMPS} \times 1.73}{1000} \text{ (3 PHASE)}$$

$$\textbf{KW} = \frac{\text{VOLTS} \times \text{AMPS}}{1000} \text{ (1 PHASE)}$$

$$\textbf{VELOCITY} = \frac{\text{CFM}}{\text{AREA}}$$

VELOCITY = AIR THROUGH HEATER IN FT./MIN.
AREA = 2.78 FT.^2 (CONSTANT ON THESE HEATERS)
CFM = AIRFLOW IN FT.^3/MIN.

$$\textbf{TEMP. RISE F}^\circ = \frac{3.16 \times \text{VOLTS} \times \text{AMPS} \times 1.73}{\text{CFM}} \text{ (3 PHASE)}$$

$$\textbf{TEMP. RISE F}^\circ = \frac{\text{BTUH}}{\text{CFM} \times 1.08}$$

TABLE II

ELECTRICAL SPECIFICATIONS

MODEL RXHE-	VOLTAGE	KW	HEATING CAPACITY BTUH	SINGLE SUPPLY CIRCUIT		STAGES	NOM. KW / STAGE
				SUPPLY AMPACITY	CIRCUIT PROTECTIVE DEVICE		
20C	208-3-60	15.0	51,209	52	60	2	10/10
	240-3-60	19.9	67,939	60	60		
20D	480-3-60	19.9	67,939	30	30		
30C	208-3-60	22.5	76,819	78	80		15/15
	240-3-60	30.0	102,419	91	100		
30D	480-3-60	30.0	102,419	46	50		
40C	208-3-60	30.0	102,419	104	110		20/20
	240-3-60	39.8	135,879	120	125		
40D	480-3-60	39.8	135,879	60	60		

TABLE III

COPPER WIRE SIZE—AWG.
(FOR 3% VOLTAGE DROP)

SUPPLY WIRE LENGTH-FEET															
300	8	8	6	6	6	6	4	4	3	3	2	2	1	1	0
250	10	8	8	6	6	6	6	4	4	4	3	2	1	1	0
200	12	10	8	8	8	6	6	6	4	4	3	2	1	1	0
150	12	10	10	10	8	8	6	6	4	4	3	2	1	1	0
100	14	12	10	10	8	8	6	6	4	4	3	2	1	1	0
	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125

SUPPLY CIRCUIT AMPACITY

NOTES: 1. WIRE SIZE BASED ON 75°C RATED WIRE.
2. FOR MORE THAN 3 CONDUCTORS IN A RACEWAY OR CABLE, SEE THE N.E.C. FOR DERATING THE AMPACITY OF EACH CONDUCTOR.

TABLE IV

ALUMINUM WIRE SIZE—AWG.
(FOR 3% VOLTAGE DROP)

SUPPLY WIRE LENGTH-FEET														
300	6	6	4	4	4	3	3	2	1	1	0	0	00	00
250	8	6	4	4	4	4	4	3	2	2	1	0	0	00
200	8	8	6	6	6	4	4	4	3	2	1	0	0	00
150	10	8	8	8	6	6	4	4	3	2	1	0	0	00
100	12	12	10	8	6	6	4	4	3	2	1	0	0	00
	15	20	25	30	35	40	45	50	60	70	80	90	100	110

SUPPLY CIRCUIT AMPACITY

NOTES: 1. WIRE SIZE BASED ON 75°C WIRE.
2. ALUMINUM WIRE CANNOT BE USED AT 125 CIRCUIT AMPACITY.
3. FOR MORE THAN 3 CONDUCTORS IN A RACEWAY OR CABLE, SEE THE N.E.C. FOR DERATING THE AMPACITY OF EACH CONDUCTOR.

POWER SUPPLY AND CONTROL CIRCUITS

Power Supply

All wiring should conform to the National Electrical Code as well as the local codes.

The power supply wiring can be connected through one side of control box. Conduit holes are supplied for the maximum wire size to be used with any unit. Use reducing washers for smaller conduit sizes.

See the wiring diagram and the nameplate on the unit for internal or supply circuit overcurrent protection. Either fuses or circuit breakers may be used in the supply circuit.

Either copper or aluminum supply wiring may be used. See Tables III or IV for proper wire size. For aluminum wire, the following procedure is recommended for termination:

1. The insulation should be stripped with a whittling motion to prevent the conductor from being nicked.
2. Clean the conductor with a wire brush to remove oxides from the surface.
3. An oxide inhibitor should be applied to the conductor immediately prior to installation. (Two recognized compounds are Penetrox A and Alnox-UG.)
4. Insert the conductor in the terminal lug and tighten set screw. After 1 minute, the set screw should be retightened to insure a good connection.

WARNING: This unit must be permanently grounded. A lug is provided in the control compartment.

Control Supply

A thermostat and an external 24 V 40VA minimum transformer is needed for the control circuit. See wiring diagram for reference.

The low voltage control must be run in conduit as an N.E.C. Class 1 system using #18 AWG. minimum conductor.

Thermostat

Some thermostats, whether single* or two-stage, have an adjustable heat anticipator. For proper adjustment, add the current draw in amperes of all components controlled by the particular stage. Set the anticipator to this total. See the instructions packed with the thermostat for specific information.

Heat anticipator settings for all duct heaters in this series should be .25 amperes.

*For single stage thermostat, jumper terminals two (2) and three (3) on the RXHE- terminal block.

INSTALLATION

These heaters are suitable for mounting in a vertical or horizontal duct with airflow as indicated by arrow on control box. All models shall have duct systems applied per the National Fire Protection Association (NFPA) Standards No. 90A or 90B.

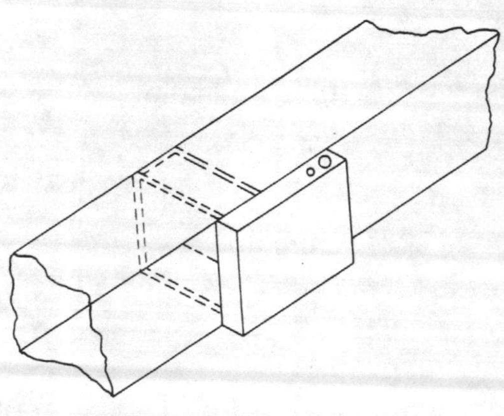


Fig. 1 Installation of Slip-In Heater

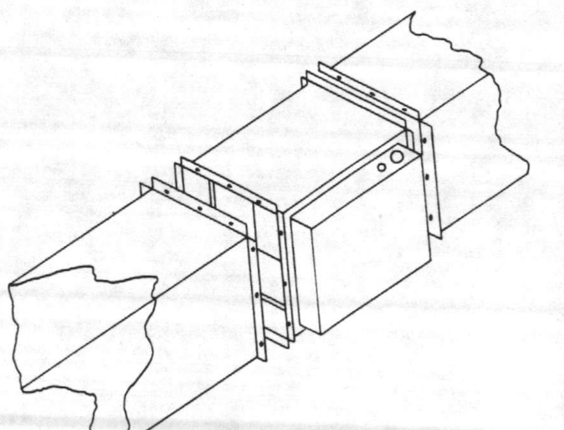


Fig. 2 Installation of Flanged Heater

MOUNTING

Step 1—Cut hole in side of duct 1/8″ larger than heater body.

Step 2—Insert heater body all the way into duct until terminal box covers opening.

Step 3—Secure heater in place with sheet metal screws.

MOUNTING

Step 1—Provide flanges on both ends of duct to match heater flanges.

Step 2—Secure heater flanges to duct with sheet metal screws or bolts.

Note: When flanges are aligned properly, the entire coil section should be within the air stream.

SERVICE

WARNING: HAZARDOUS VOLTAGE. CAN CAUSE SEVERE INJURY OR DEATH. DISCONNECT ALL ELECTRICAL POWER BEFORE SERVICING. MORE THAN ONE DISCONNECT SWITCH MAY BE REQUIRED TO DE-ENERGIZE THE EQUIPMENT.

Air Flow Switch & Probe (SA)
The sensing probe must be mounted with the arrow pointed in the direction of air flow. The switch and probe will sense total pressure (velocity plus static) in the duct. The switch setting is .05″ W.C. ± .02″. The switch is in the control circuit, with the purpose of preventing the contactor from making until airflow is proven.

Contactors (CC)
The contactors are magnetic type, and are not sensitive to mounting position. Each contactor is separately controlled which allows staging of the heating load.

Transformer (TRANS)
The transformer is a 40 VA minimum with a 24 volt secondary output. It supplies only the contactors and this circuit must remain isolated from the system control circuit which controls the pilot relays (RP).

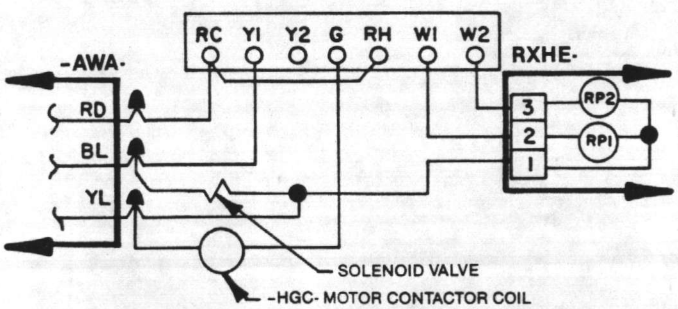
Pilot Duty Primary Limit Control (CL)
There is a primary limit control in each element mounting plate within the unit. These controls are automatic reset types which prevent the unit from overheating in case of a malfunction. If replacement becomes necessary they must be replaced by the same type and same temperature specifications.

Back-Up Limit Controls (LB)
There may be only one (1) limit for two (2) elements. These line break limits are for the purpose of preventing any overheating due to the malfunction of the main pilot duty limit. These limits are not resettable, and must be replaced with identical controls if they ever open.

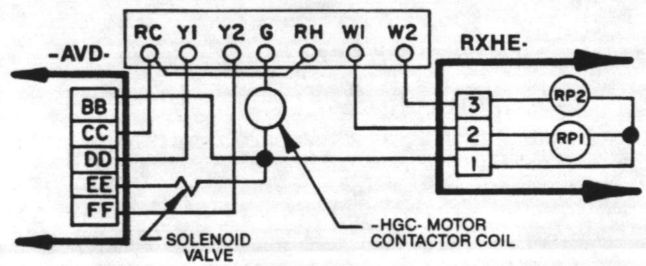
Pilot Relay (RP)
These pilot duty relays are for the purpose of reducing the current draw of the 24 volt control circuit. This in turn increases the control voltage at the duct heater. The (RP) relay is used to control the first stage of heating. The (RP2) relay is used to control the second stage of heating or emergency heat when called for by the thermostat.

INTERCONNECTING WIRING

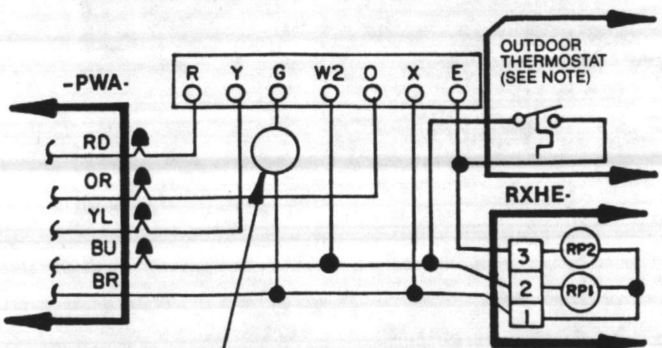
(-)AWB-/(-)HGC-075/100 WITH RXHE- THERMOSTAT



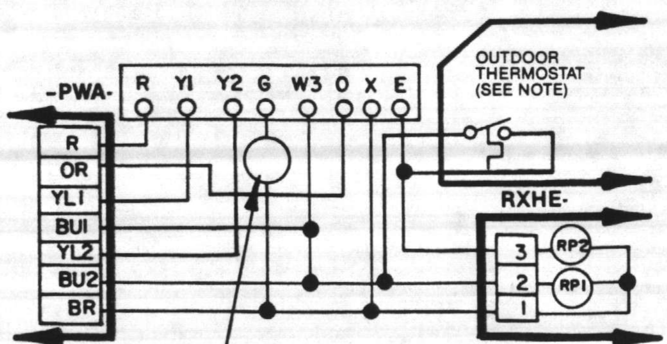
(-)AVD-/(-)HGC-150/200 WITH RXHE- THERMOSTAT



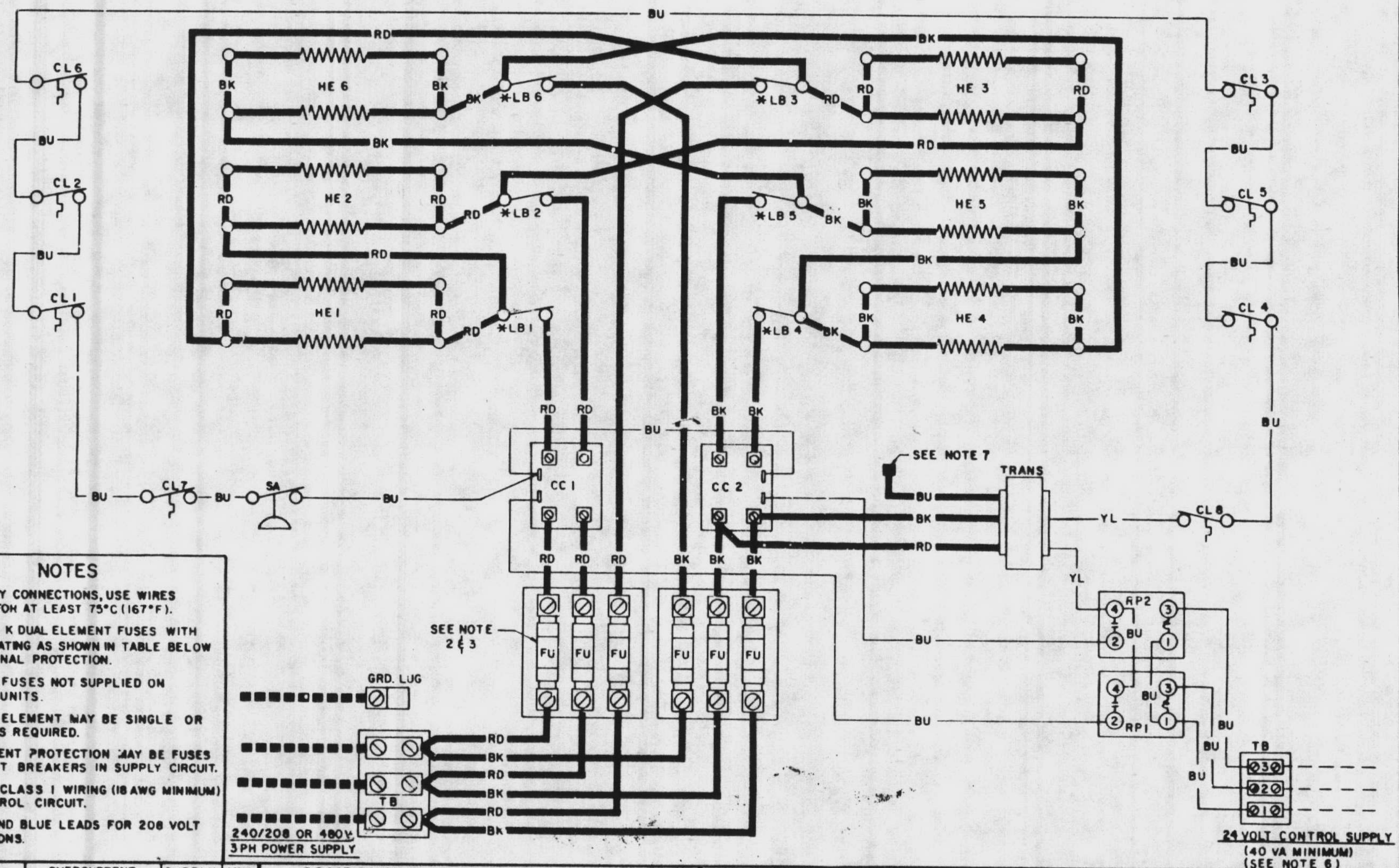
(-)PWB-/(-)HPA-075/100 WITH RXHE- THERMOSTAT



(-)PWB-/(-)HPA-150/200 WITH RXHE- THERMOSTAT



NOTE: If no outdoor thermostat is used jumper W2 (075/100), W3 (150/200) to E to transfer control to first stage heat.



NOTES

1. FOR SUPPLY CONNECTIONS, USE WIRES SUITABLE FOR AT LEAST 75°C (167°F).
2. USE CLASS K DUAL ELEMENT FUSES WITH AMPERE RATING AS SHOWN IN TABLE BELOW FOR INTERNAL PROTECTION.
3. INTERNAL FUSES NOT SUPPLIED ON 480 VOLT UNITS.
4. RESISTIVE ELEMENT MAY BE SINGLE OR DOUBLE AS REQUIRED.
5. OVERCURRENT PROTECTION MAY BE FUSES OR CIRCUIT BREAKERS IN SUPPLY CIRCUIT.
6. USE NEC CLASS I WIRING (18 AWG MINIMUM) FOR CONTROL CIRCUIT.
7. USE RED AND BLUE LEADS FOR 208 VOLT APPLICATIONS.

DWG NO. 90-21110-01 REV 01

UNIT KW	VOLTS	OVERCURRENT PROTECTION		SUPPLY CIRCUIT AMPACITY	MIN. AWG
		INTERNAL	SUPPLY		
19.9	240	30	60	60	4
30	240	50	100	91	1
39.8	240	60	125	120	0
19.9	480	—	30	30	10
30	480	—	50	46	6
39.8	480	—	60	60	4
15	208	30	60	52	4
22.5	208	40	80	78	3
30	208	60	110	104	1

COMPONENT CODE

CC	CONTACTOR
CL	LIMIT CONTROL
FU	FUSE
HE	HEATING ELEMENTS
*LB	BACK-UP LIMIT
RA	AUXILLARY RELAY
RP	PILOT RELAY
SA	AIR SWITCH
TB	TERMINAL BLOCK
TRANS	TRANSFORMER

* REPLACEMENT LIMITS MUST BE THERMODISC MARKED 71F84 AND L200

WIRING

1. LINE VOLTAGE
   - FACTORY STANDARD
   - OPTIONAL COMPONENT
2. LOW VOLTAGE
   - FACTORY STANDARD
   - OPTIONAL COMPONENT
3. FIELD INSTALLED POWER
4. FIELD INSTALLED CONTROL

NOTE 1. REPLACEMENT WIRE MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL.

WIRE COLOR CODE

BK — BLACK	PU — PURPLE
BU — BLUE	RD — RED
BR — BROWN	WH — WHITE
GR — GREEN	YL — YELLOW
OR — ORANGE	

WIRING SCHEMATIC DUCT HEATER

DR BY	APP BY	DATE	DWG NO	
CP	JC	3-2-78	90-21110-01	01

TAB PLACEMENT HERE

DESCRIPTION:

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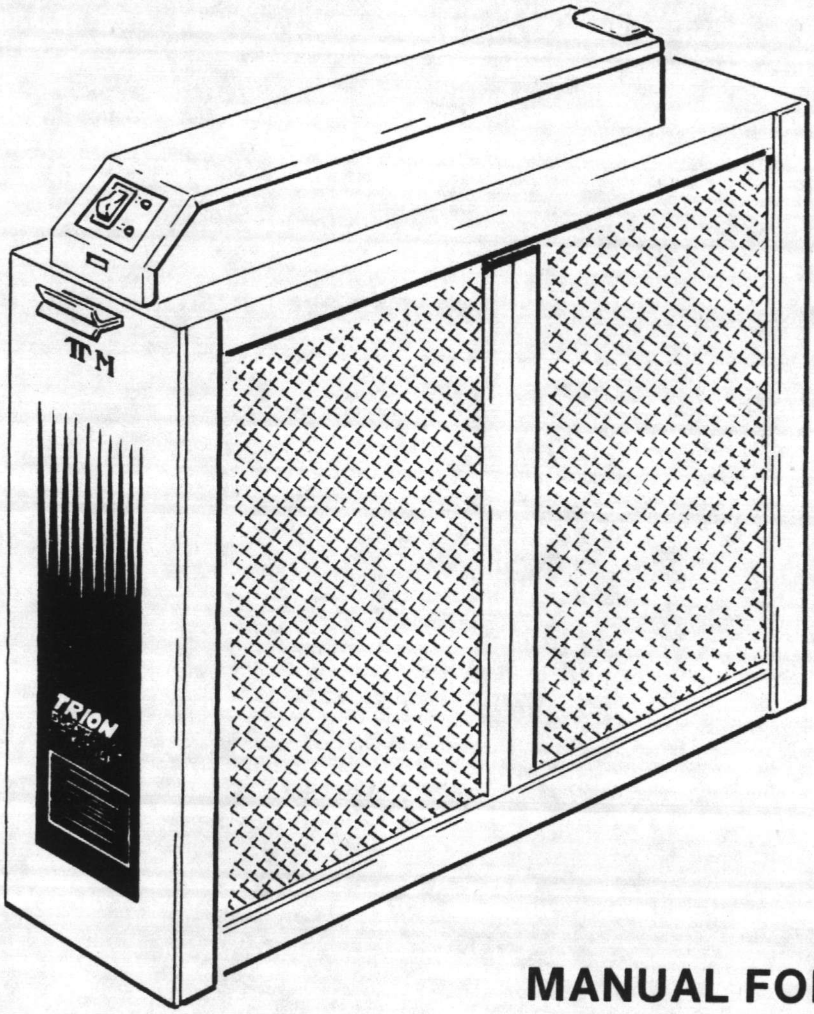
TRION

Att 2

DUCT MOUNT

ELECTRONIC AIR CLEANER



MANUAL FOR:

- **INSTALLATION**
- **OPERATION**
- **SERVICE**
- **MAINTENANCE**

CAUTION: Read installation instructions and rules carefully for safe operation. Exercise the usual precautions when working with high voltage.

TABLE OF CONTENTS

This manual provides information for location, installation, operation and service. Before installation and use of the air cleaner, carefully read these instructions to insure maximum benefits from the unit and to avoid needless service cost that can result from improper installation.

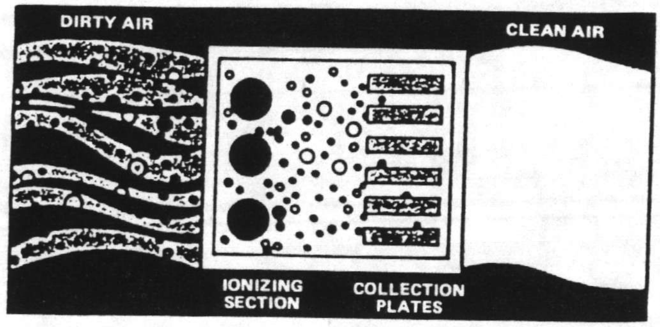
I. INTRODUCTION

This electronic air cleaner is technically known as a two-stage electrostatic precipitator. It is designed to remove airborne particles - dust, dirt, smoke - from indoor air.

Air movement through the unit is controlled by the heating and/or air conditioning system blower. As dirty air enters the unit it passes through a pre-filter. The pre-filter strains our carpet lint, pet hair and other large particles by direct impingement.

The pre-filtered air then passes through a two stage electrostatic precipitator. In the first stage of electrical operation, all airborne particles, even of submicroscopic size, are electrically charged (positive) as they pass through the ionizer. In the second stage of operation, the charged particles pass into an electrical field established between a series of parallel plates, forming the negative element of the field. Here the positively charged particles are attracted to the plates.

The air cleaner must be wired to operate in conjunction with the system blower.



The air cleaner can only remove the airborne contaminants delivered to it by the ventilating system. To obtain maximum efficiency, adjust the system blower controls for continuous or as near continuous operation as practical.

II. PLANNING THE INSTALLATION

Because air handling systems vary greatly in arrangement and style, factors such as accessibility, ambient temperature ratings, transitions and other requirements must be carefully considered.

The unit must be readily accessible for periodic inspection and cleaning of the protective screens and electronic cells to maintain maximum efficiency and trouble-free operation. When selecting the unit location for a Trim-T unit, allow a minimum of 25" clear space in front of the access panel and 12" of clear space above the power pack cover plate for component removal and service space. For a double pre-filter unit, allow a minimum of 18" clear space in front of the access panel and 12" of clear space above the power pack cover plate for component removal and service space.

***Air Conditioning**

Whenever possible, install the electronic air cleaner upstream of the cooling coils.

***Humidifiers**

Location of the system humidifier is important to the operation of the air cleaner. When an evaporative type humidifier is used, it may be installed between the furnace warm air duct and the return air duct without affecting the electronic air cleaner. Atomizing and spray type humidifiers should be installed downstream of the air cleaner. If it must be installed upstream, allow at least 6' between air cleaner and humidifier.

SPECIFICATIONS

MODEL	MAX 4 1400	MAX 4 2000	TRIM-T
Rated Capacity	1400 CFM (2520 m³/hr.)	2000 CFM (3600 m³/hr.)	800 - 2000 CFM (3600 m³/hr.)
Max. Pressure Drop	.17 in. w.g. @ 1400 CFM	.19 in. w.g. @ 2000 CFM	.16 in. w.g. @ 2000 CFM
Cell Weight	(2) 9½ lbs. ea.	(2) 11 lbs. ea.	(2) 5 lbs. ea.
Unit Weight	43 lbs.	49 lbs.	30 lbs.
Power Consumption	40 watts maximum	48 watts maximum	40 watts maximum
Electrical Input	120 V, 60 HZ, 1 PH	120 V, 60 HZ, 1 PH	120 V, 60 HZ, 1 PH
Electrical Output	2.5 MA @ 6800 VDC	3.2 MA @ 6800 VDC	2.5 MA @ 6800 VDC

*Outdoor Air

When outdoor air is added to the return air duct, sufficient heat should be added to maintain the return air temperature at 40° F (4° C) minimum. Lower temperatures can cause ionizer wire failure under certain conditions.

CAUTION: Only a trained, experienced serviceman should install this electronic air cleaner. Power supply should be disconnected before installation and a thorough checkout of the unit installation should be completed before unit operation.

THIS AIR CLEANER SHOULD NOT BE INSTALLED ON THE HOT AIR SIDE OF DUCT-TYPE SYSTEMS.

*Sheet Metal Installation

The electronic air cleaner is adaptable to all new or existing residential forced air furnace or cooling systems.

*Transitions

If the air duct does not fit the air cleaner cabinet opening: (1) Gradual transitions are recommended to reduce air turbulence thru the air cleaner to maximize efficiency. (2) Not more than 20" (about 4" per running foot) of expansion should be used on each side of the transition fitting.

*Turning Vanes

If the air cleaner is installed adjacent to a 90° duct elbow, add turning vanes inside the duct to improve the air distribution across the face of the air cleaner.

III. INSTALLATION

1. Remove unit access panel, and slide the lint screen(s) and ionizing-collecting cells out of the cabinet. Place them safely aside with the warranty registration card.
2. Locate the cabinet in the cold air return duct so that all of the return air flows thru the unit. It may be positioned for air flow in any direction: horizontal, left or right, vertical, up or down, or at an angle to the duct work. Maintain adequate space in front of the unit (18") for component removal and above the power pack (12") for service. Holes are provided for duct work attachment. The .140" holes are sized for number eight sheet metal screws and will also accommodate a number six sheet metal screw or ⅛" rivet. If the adjoining duct work is flanged, install the screws so that the screw heads are inside the cabinet to permit easy installation of lint screen and any after filter accessory. When adjoining duct work has been secured, seal seams air tight with duct tape or caulking.

FIELD WIRING COMPARTMENT

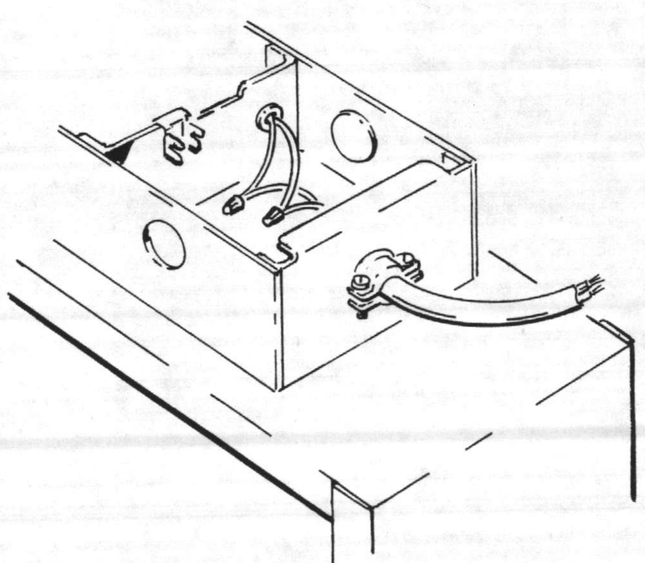
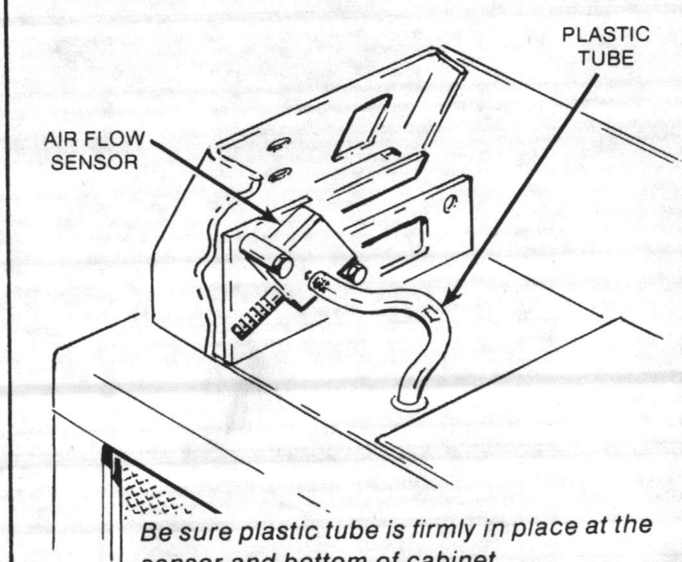


FIGURE 1



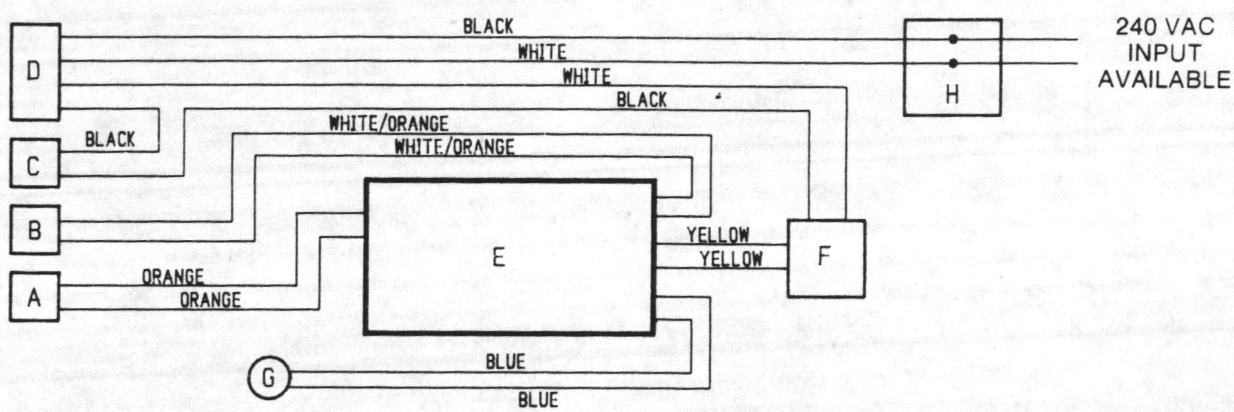
Be sure plastic tube is firmly in place at the sensor and bottom of cabinet.

FIGURE 2

3. Reinstall the lint screen on the air entering side of the cabinet.

4. **To change the air flow direction**, a positioning screw is located inside the bottom of the cabinet to index the installation of the ionizing-collecting cells in the proper position with respect to airflow. The screw must be installed in the hole provided closest to the air leaving side of the cabinet. Install the screw in the proper hole, seal the hole not used with duct tape and reinstall the cells. The directional arrows on the cell end plates must point in the direction of airflow.

5. Reinstall cabinet access panel.



A - OUTPUT VOLTAGE LIGHT
B - INPUT VOLTAGE LIGHT
C - ON/OFF POWER SWITCH
D - SAFETY SWITCH
E - POWER SUPPLY
F - TRANSFORMER
G - AIR FLOW SWITCH
H - FIELD WIRING COMPARTMENT

FIGURE 3

IV. ELECTRICAL WIRING

The Trion MAX 4 and Trim-T models are simple to wire. The 120 VAC power can be picked up from any convenient source. **It is not necessary to install relays or sail switches to insure air cleaner operation with the blower system.**

This electronic air cleaner has a BUILT-IN AUTOMATIC AIR FLOW SENSOR. The location of the air flow sensor is shown in Figure 2, page 2.

Another unique feature of your Trion electronic air cleaner is the **option to power this unit with either 120 VAC or 24 VAC**. If your requirements call for a **240 VAC power supply, this is available from the factory** on special request.

PROCEDURE

1. Remove power pack cover plate.

2. Wire unit to 120 volt, 60 Hertz, 1 phase supply. The air flow sensor will automatically cycle your Trion electronic air cleaner with the blower system. The sensor is activated when the fan is on and air flow is present in the duct. It is preset at the factory and needs no adjustment (Figure 2, page 2.)

INPUT POWER
120 Volt

If for some reason you find it necessary to connect the air cleaner to operate in conjunction with a multi-speed motor, a device such as a sail switch, an extra 120 VAC double pole, a double throw relay must be used (Ref. Figure 4, page 4.) The air flow sensor built into your Trion air cleaner makes it unnecessary to do the additional wiring under normal conditions.

WARNING

IMPROPER FIELD WIRING WILL VOID ALL WARRANTIES ON THIS PRODUCT.

NOTE: DIRECT WIRING TO A MULTI-SPEED BLOWER MOTOR WILL CAUSE FAILURE OF THE POWER SUPPLY IN THIS UNIT.

PLEASE REFER TO THE FOLLOWING TYPICAL WIRING DIAGRAMS FOR PROPER INSTALLATION.

REMOVE CARDBOARD PACKING INSERT FROM TOP OF COLLECTING CELLS.

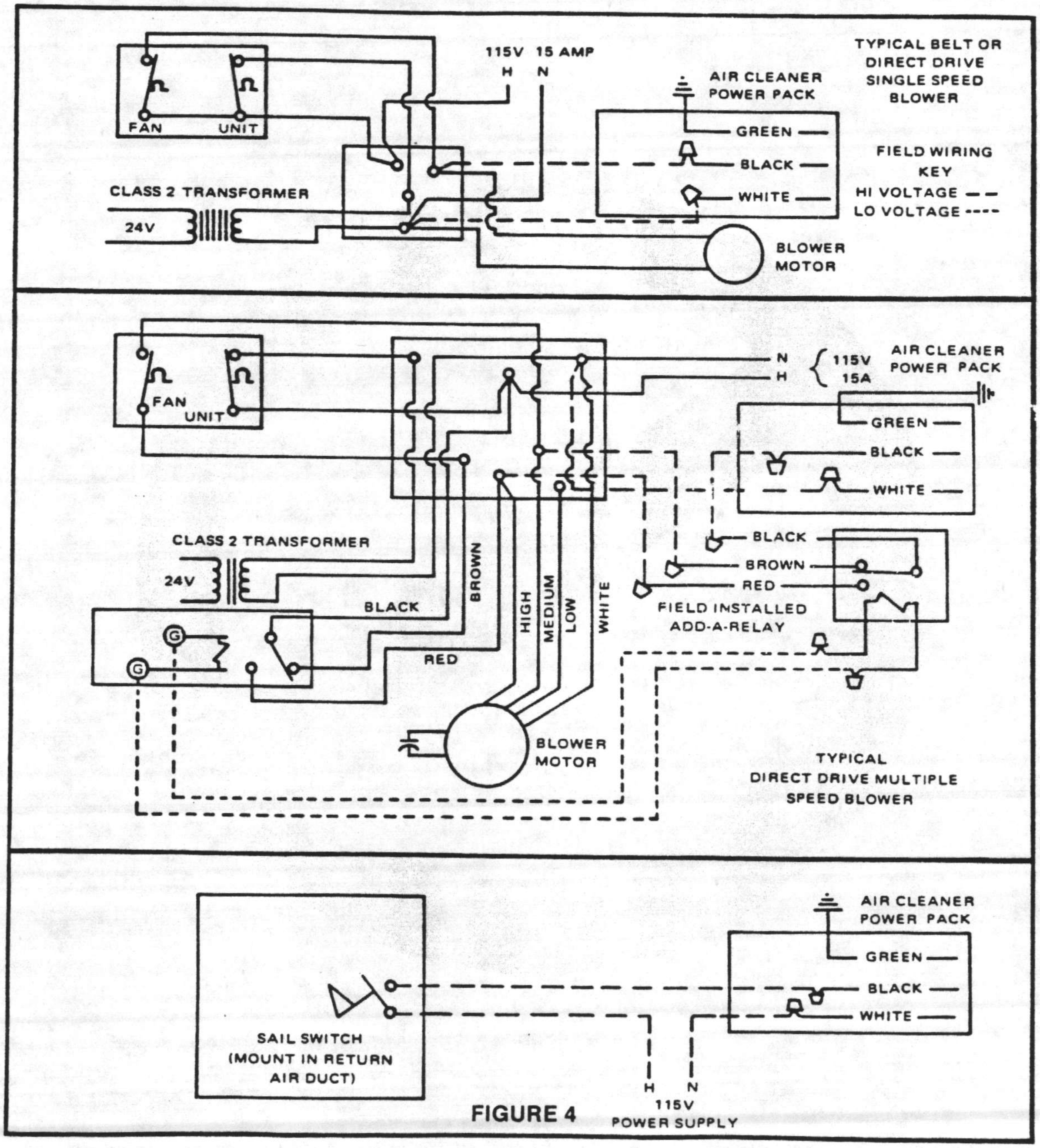


FIGURE 4

NOTE:

The Trion Air Cleaner is equipped with an integral air flow sensor switch which automatically cycles the air cleaner on/off with the central system blower. Therefore, it is not necessary to wire the unit into the blower circuit or utilize an external "sail switch". (Figure 4)

V. SYSTEM CHECK OUT

After installing the unit, move the On/Off switch to the "ON" position. (Be sure system blower is "ON".)

A. Both the input (120 VAC) indicating light (green) and the output voltage indicating light (red) should now be on.

1. Input voltage indicating light (green) shows unit has power.
2. Output voltage indicating light (red) shows high voltage output to collecting cells.

B. Check to see if indicating lights dim under the following conditions:

1. When system blower is off. If not, check continuity of air flow sensor.
2. When the power switch is in the off position.
3. When access door is removed.

C. Refer to Quick Reference Trouble Chart (Page 12) if detailed troubleshooting is required.

D. See that owner/operator is provided with the owner's manual and the equipment warranty.

VI. TROUBLESHOOTING

The following instructions are for use by qualified personnel:

> **WARNING:** THE FOLLOWING PROCEDURES WILL EXPOSE HAZARDOUS LIVE PARTS. DISCONNECT POWER BEFORE PROCEEDING.

Recommended Service Tools

— Test light, 120/240 VAC Neon.
— Screw Driver, 8" common with insulated handle.
— Needle nose pliers.
— Ohmmeter, 10,000 (plus) OHM Range.
— Kilovolt meter, 10,000 (Plus) KVDC
Positive Polarity Range.

A. INDICATION OF ELECTRICAL TROUBLE

The output indicating light is wired into the circuit so that it will monitor both the primary and secondary circuits. (Electrically, the ionizing-collecting cell is a component in the secondary circuit.)

When the unit is in normal state of operation, system fan running, access door in place, control switch in the "ON" position, and the output indicating light goes "dim", there is an electrical problem. The problem is a shorted secondary. Although the failure of the output indicating light itself should not be overlooked, this condition is unusual and rather remote. The light is a L.E.D. and is very reliable.

B. ISOLATING ELECTRICAL TROUBLE TO MAJOR COMPONENTS

When the unit is in normal state of operation and the output indicating light goes "dim", the trouble can be readily isolated to either the ionizing-collecting cells or power pack. Turn the unit "OFF", remove both ionizing-collecting cells, close the access panel and turn unit "ON". If the light remains "dim" with the cells removed, the trouble is in the power supply or in the primary circuit to the power supply.

If output indicating light is "ON" - trouble is in the cells.

C. ELECTRICAL TROUBLES & THEIR CORRECTIONS

> **CAUTION:**
>
> — EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE.
> — WHEN THE CIRCUIT HAS BEEN DE-ENERGIZED, ALWAYS DISCHARGE ANY RESIDUAL CURRENT IN THE SECONDARY WITH AN INSULATED HANDLE SCREWDRIVER.
> — ALWAYS GROUND POWER SUPPLY AND IONIZING-COLLECTING CELL WHEN BENCH TESTING.

There are two areas in which the majority of service problems originate:

* The Ionizing-Collecting Cell
* The Power Supply

The cell, which is removed from the unit periodically to wash away the collected dirt, is more susceptible to physical damage through handling, than the power supply. The cell, also contains one component, the ionizing wires, which due to their function, have to be designed with a minimum of structural support and therefore susceptible to some expected breakage.

The power supply, like other electrical items exposed to "high voltage" is susceptible to the usual stresses.

Trouble related to either of these two items, is readily shown by the OUTPUT indicating light and can be easily and quickly isolated to one, or the other, by a simple procedure.

1. POWER SUPPLY CHECK
Use DC High Volt Meter.
Take reading with the high voltage meter at cell contact point. Should range 8.5 + 10% KV or higher (without cell connected).

If voltage is above 8.5 + 10% KV, the problem is in the cell (see Figure 6, page 7.)

If voltage is below 8.5 + 10% KV (without cell connected), the problem is in the power supply.

Proceed as follows:

a. Remove power pack from the unit.
b. Check for loose wires; if loose wire is found, reconnect.
c. If defective power supply is indicated, replace.

OUTPUT: This is a high frequency solid state circuit designed for electronic air cleaners with high performance reliability.

— 3.2 milliamps on MAX 4 2000
— 2.5 MA on the MAX 4 1400 and Trim-T
— 6.8 + .6 KVDC (with cell connected)
— 8.8 + .8 KVDC (without cell connected)

2. PRIMARY CIRCUIT BREAKER

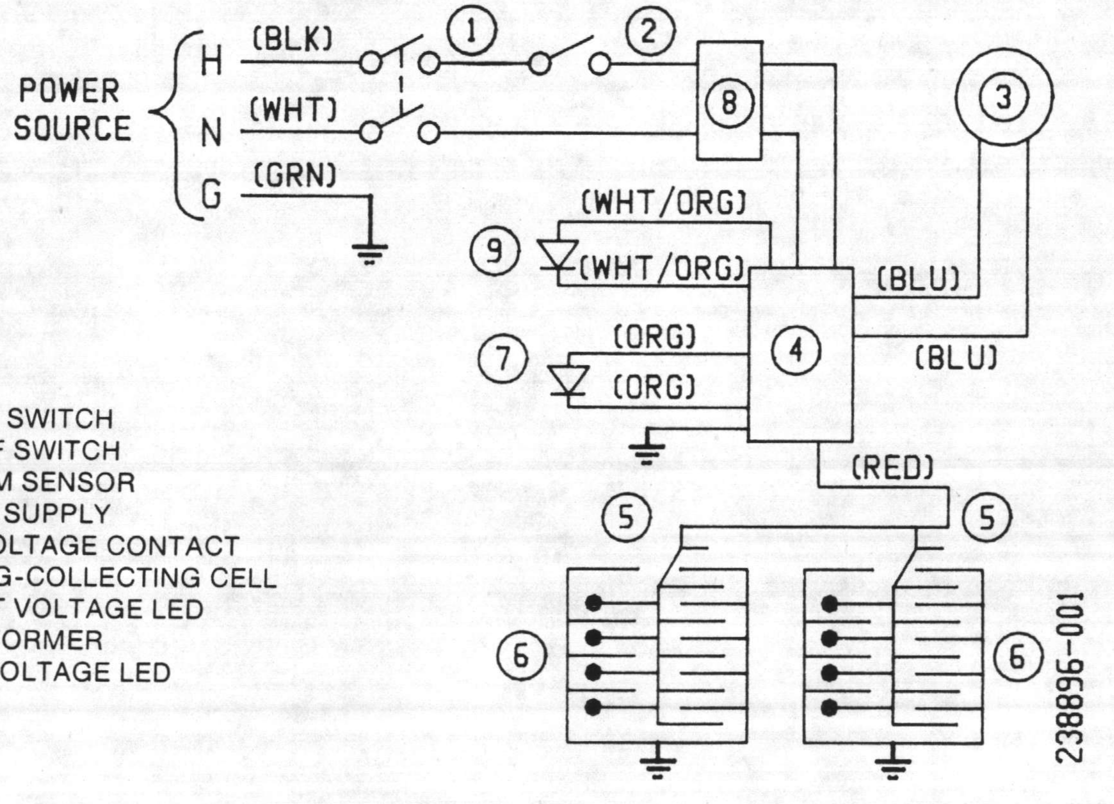
If there is supply line voltage at the service connections and no input voltage to the power supply, the outage can be located by checking operation of the safety switch and control switch as well as the interconnecting wiring, with a test light. Refer to circuit diagram, Figure 5. If there is power to the line side of either switch, and no power on the load side when the switch is closed, the switch is defective and should be replaced.

3. IONIZING-COLLECTING CELL CHECK

The cell is electrically energized through a contact terminal located at the top center of a cell. The ionizing wires and every other collector plate are electrically charged while each interleaving plate is grounded.

If the space between the charged and ground components is bridged with conductive or semi-conductive material, a short circuit develops. The bridging or short may be caused by damaged components or foreign material lodged between or on the components. .

Most troubles in the cell can be visually detected.



LEGEND
1) SAFETY SWITCH
2) ON/OFF SWITCH
3) VACUUM SENSOR
4) POWER SUPPLY
5) HIGH VOLTAGE CONTACT
6) IONIZING-COLLECTING CELL
7) OUTPUT VOLTAGE LED
8) TRANSFORMER
9) INPUT VOLTAGE LED

FIGURE 5

CAUSES	CORRECTIONS	CAUSES	CORRECTIONS
Loose ionizing wire(s)	Repair or replace	Excessive dirt build-up	Wash
Excessively dirty cell components	Clean	Large pieces of foreign matter lodged between plates	Remove
Damaged (bent) plates	Straighten or replace	Very dirty insulators	Clean
Defective or loose high voltage lead or contact assembly	Repair or replace	Broken ionizing wires	Remove all pieces of broken wires and replace
Improper ground	Check ground and correct if necessary	Excessively bent or mis-aligned components due to mishandling	Straighten or replace
		Externally broken or cracked insulators	Replace

FIGURE 6 - IONIZING-COLLECTING CELL CHECKOUT PROCEDURE

D. OTHER FACTS YOU SHOULD KNOW

1. Arcing Noise

When an arcing noise is noted, it is usually located in the DC high voltage circuit. The ionizing-collecting cell is part of this circuit and normally the trouble will be found to be in the cell. The noise is caused by high voltage arcing to ground.

An occasional arcing noise is normal and inherent in all precipitators. These occasional arcs are caused by large particles of dirt in the air such as a cigarette ash, insect, etc. Constant or repeated intermittent arcing must be corrected.

2. HISSING NOISE

A hissing noise (or frying sound) usually stems from a loose high voltage connection or from an improper ground. The reduction in the designed spacing usually is caused by bends or deformities in the cell from mishandling.

Check for:

CAUSES	CORRECTIONS
Damaged (bent) plates of ionizer	Straighten or replace
Loose ionizing wires	Repair or replace
Defective high voltage contact assembly	Repair or replace
Dirty cell or large piece of foreign material between plates	Clean
Poor connection between cell and contact assembly	Repair
Loose high voltage wiring	Repair
Improper ground	Check and correct if necessary

3. HUMMING NOISE

The ionizing wires have a normal tendency to vibrate when charged. On some occasions, when atmospheric conditions are just right and the humidity is exceptionally low, the vibration is aggravated to the point where an audible hum can be noted. It is usually more in the northern sections of the country during the winter months. This condition can be further aggravated if the ionizing-collecting cell is very dirty. The condition is self-correcting when the relative humidity is increased or can be alleviated by washing the cell.

4. RADIO AND/OR TELEVISION INTERFERENCE

This trouble is not common but when occurring is usually due to either a continuous high voltage "leak or discharge", or from the absence of a good common electrical ground. Refer to checks listed under 1. Arcing Noise and 2. Hissing Noise.

5. WHITE DUST

One of the most difficult service calls to handle is the complaint of the presence of white dust. The majority of these complaints are from residential users. In many instances, the statement is made, "We have more dust now than we ever had". These service calls are difficult because the limitations of the installation must be explained.

White dust actually can be described as "clean dirt". Where it is noticed, an examination will show the user that it is largely lint. It is most noticeable on dark furniture, and is usually found in homes containing new furnishings such as carpeting, drapes, etc., which give off more lint than such items that have been used and cleaned for some time. The amount of lint generated is increased by activity in the air; especially by children, pets and heavy house traffic.

Visible lint particles, like cigarette ashes, are heavy as compared to the extremely small, individual dirt particles which make up cigarette smoke. Their weight causes the lint particles to "fall out" on furniture, floors, etc., just as cigarette ashes fall to the floor while cigarette smoke particles remain suspended in the air. Dirt particles, such as heavy pieces of lint or ash, which do not remain airborne, never reach the electronic air cleaner and the unit cannot remove these air particles.

Fortunately, the black, greasy dirt particles with the damaging staining power are light in weight, remain in the air stream, and do reach the electronic air cleaner. It is their removal from the air that keeps the lint clean, and therefore, more visible.

There is no question that the electronic air cleaner is capable of collecting lint in addition to other atmospheric contaminants. This is easily confirmed by examining the air entering side of the ionizing-collecting cell before it is washed. You will note that along with the black, greasy dirt collected, there are lint particles that did stay airborne long enough to reach the electronic air cleaner.

Lint from new furnishings will decrease with wear. The length of time depends on the amount and type of fabric in the furnishings and the air circulation. In some areas, a bedroom for example, a lint condition may always remain.

Normally, continuous fan operation (24 hours a day) will minimize this problem. If this cannot be accomplished, the controls should be set as near continuous fan operation as possible. In some instances the use of a two speed fan motor is advantageous.

Cold air returns should not be restricted in any manner, particularly from rooms in which lint is prevalent. If the returns in these rooms are blocked, the return air will seek another, longer path. In traveling a greater distance, lint fallout is increased.

Actually, the presence of large, clean lint particles is further proof that the air cleaner is doing its superior air cleaning job. Electronic air cleaners are dependent on the movement of air currents to bring the dirt particles to the unit for their removal. Weighty, non-airborne particles such as cigarette ashes weigh too much to remain in the air currents while other particles, such as cigarette smoke, remain suspended and are carried to the electronic air cleaner for removal.

6. OZONE

Under normal operating conditions all electrostatic air cleaners produce minute quantities of ozone as an incidental by-product, as do televisions and other electrical appliances. The design of the unit has been tested and is far below the published permissible limits. The level of detection (when it is noticed) varies from individual to individual, some being more susceptible than others.

Usually a new unit will produce more ozone than one that has been in operation for several weeks. This is due to the normal amount of sharp corners or manufacturing burrs on the ionizing-collecting cell. The voltage working on these areas however, tends to round them-off, thereby they are self-correcting.

An ionizing-collecting cell that has been damaged, where the designed spacing between electrically charged and ground components has been decreased, may also produce an abnormal amount of ozone.

If there appears to be excess ozone, check for:

CAUSES	**CORRECTIONS**
Damaged (bent) plates	Straighten or replace
Loose ionizing wires	Repair or replace
Dirty cell	Clean
Loose high voltage connections	Repair or replace
Unit "ON" when system fan is not running	Set fan for continuous operation or wire so unit will operate only when system fan is running.

Maintenance

Washing Cell and Pre-Filter

Regular washing is necessary to insure proper performance. A thorough washing once every two months will be adequate for most installations. More frequent washings (once a month) may be necessary on some installations (new homes for example) where there is new carpeting, plaster dust, or there is above normal cigarette smoke, etc.

1. To remove cell(s) and pre-filter

A. Push "Air Cleaner" switch to "OFF". Wait 15 seconds. Open access door.

B. Carefully remove cells and pre-filter and set aside.

C. Avoid damage to cell plates and ionizing wires.

2. To wash in a tub

A. Place enough hot water in a utility tub to cover the cell.

B. Dissolve 2 to 4 oz. of automatic dishwasher detergent (not laundry detergent) in the water.

3. Soaking

A. Lay cell on its side in the container and allow to soak for 30 minutes. Repeat with second cell.

B. Then "slosh" cell up and down in the solution until it appears clean. Remove cell from the container.

C. Next "slosh" the pre-filter up and down in the solution until it appears clean. Drain out dirty water.

4. Rinsing

A. Hold cell upright in container.

B. With a hose, rinse with warm water.

C. Hose should be held about 10-in. from cell plates and at a slight angle for better cleaning results. Rinse both sides until water runs clear.

D. Thoroughly rinse the cell frame along the edges to dislodge any trapped dirt or lint. Carefully wipe a damp cloth along the ionizing wires.

e. Stand cells and pre-filter up to drain. Wait about two hours to dry.

5. To wash in dishwasher

A. Cells and pre-filter may be washed together or one at a time in an automatic dishwasher if they can fit without damaging the ionizing wires on the cells.

B. Use normal amount of automatic dishwasher detergent (powder form).

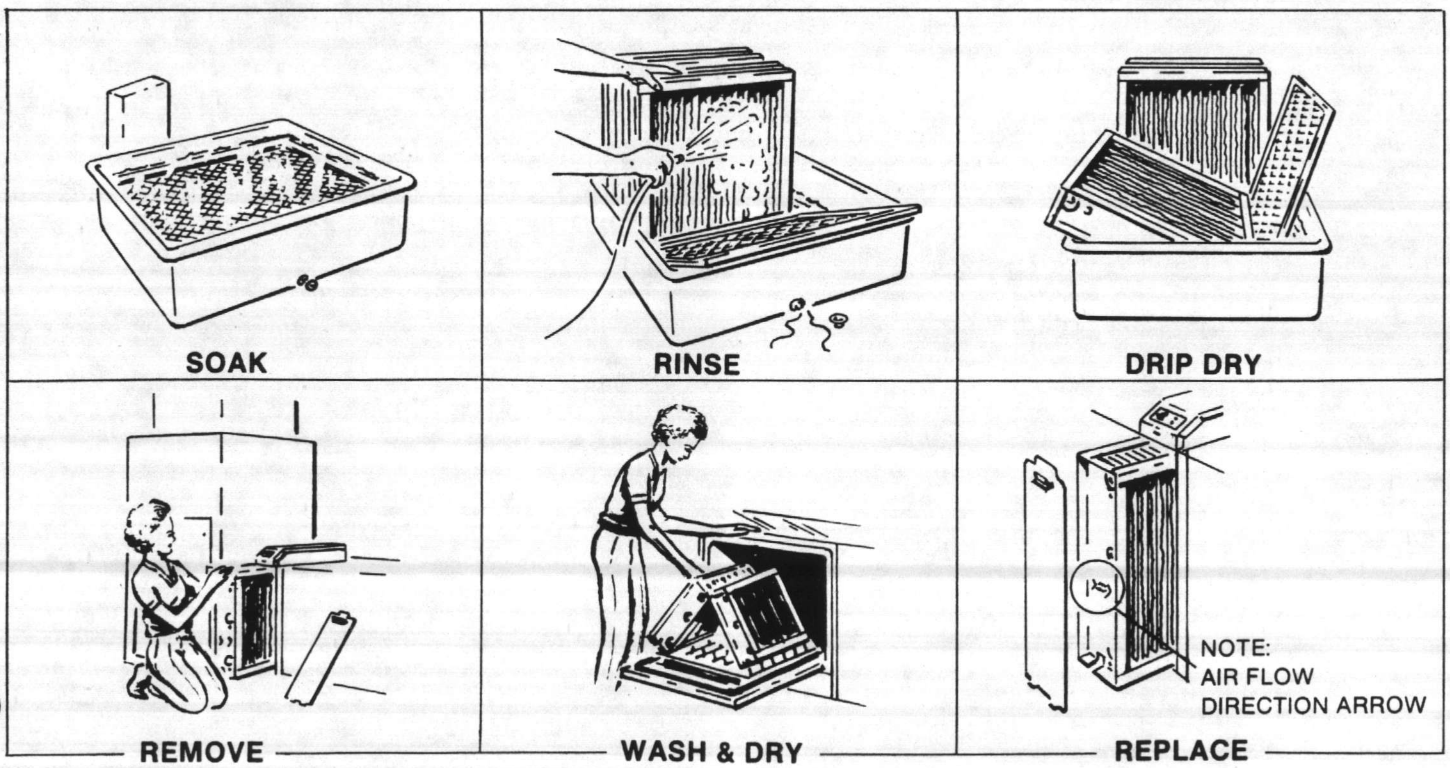
C. Repeat washing if necessary.

6. To replace cell

A. Replace pre-filter and cells in cabinet. Check that arrow on cells points in same direction as air flows through the duct. (If you have to force it pass guide screw on bottom, it is probably in a wrong position.)

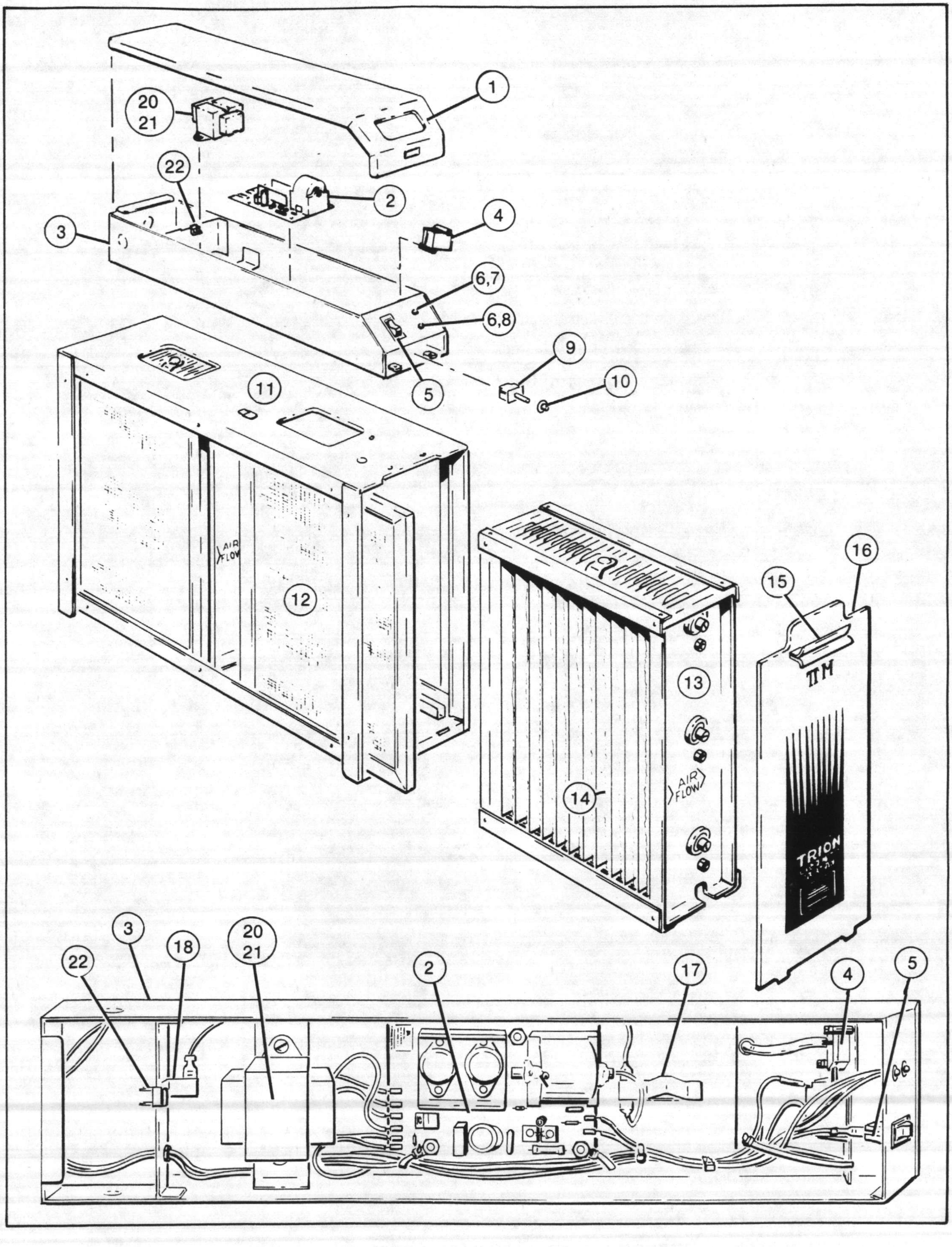
B. Reposition access door (engage tips on lower edge of door into slots in cabinet). Carefully close door.

C. Turn air cleaner switch to "ON".



PARTS LIST

Ref. No.	Trim-T Part No.	MAX 4 1400 Part No.	MAX 4 2000 Part No.	Part Description
1	334370-005	334370-005	334370-005	Power Pack Cover
2	338749-401B	338749-401B	338749-401B	High Frequency Power Supply
3	438881-002	438881-002	438881-001	Power Pack Assembly
4	235500-001	235500-001	235500-001	Mini Switch Air Flow Sensor
5	138586-001	138586-001	138586-001	On/Off Switch
6	133548-001	133548-001	133548-001	LED Mounting Clip
7	134516-007	134516-007	134516-007	Input Voltage LED Assembly (Green)
8	134516-006	134516-006	134516-006	Output Voltage LED Assembly (Red)
9	132311-001	132311-001	132311-001	Pushbutton Switch (Double Pole)
10	132122-001	132122-001	132122-001	Pushbutton Cap (On Safety Switch)
11	338751-002	338892-002	338892-001	Cabinet Assembly
12	123324-008	123324-005	123324-004	Pre-Filter
13	422167-503	422085-501	422086-501	Cell, Ionizing-Collecting
14	220111-021	220111-020	220111-029	Ionizing Wire Assembly
15	135104-001	135104-001	135104-001	Handle
16	338906-001	338905-001	338904-001	Front Panel Door Assembly
17	234458-005	234458-005	234458-005	Front Contact Board Assembly
18	234458-002	234458-002	234458-002	Rear Contact Board Assembly
19	227833-005	227833-003	227833-004	Charcoal Filter (Optional) (Not Shown)
20	239071-001	239071-001	239071-001	Step Down Transformer 120 to 24 Volts AC
21	239071-003	239071-003	239071-003	Step Down Transformer 240 to 24 Volts AC
22	138885-001	138885-001	138885-001	Grounding Clip



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SERVICE

IX. QUICK REFERENCE TROUBLE CHART

Condition or Symptom	Trouble Description	Probable Location	Possible Cause	Correction
Input Voltage LED (Green) Out	Open Primary Circuit	Primary Wiring	No power from service connection to power supply	Obtain power
			Blower not on	Energize blower
		On/Off switch	Loose wiring	Repair
			Defective wiring	Replace
	Light out but unit working	Power Indicating Light	Defective Light	Replace
Output Voltage LED (Red) Dim	Short Circuit	Power Supply	Defective Power Supply	Replace
		Cell	Broken Ionizing Wire	Remove & replace
			Excessive Dirt	Wash
			Object between plates	Remove
			Damaged (bent) plates	Straighten or replace
			Damaged (bent) ionizer	Straighten or replace
			Broken insulator	Replace
Cracking Noise	Objectionable Noise	Cell	Loose Ionizing Wire	Replace
			Dirty Cell	Wash
			Damaged (bent) plates	Straighten or replace
			Damaged (bent) ionizer	Straighten or replace
Loud Hissing Noise	Objectionable Noise	Cell	Dirty Cell	Wash
		Hi-Voltage	Loose Hi-Voltage Connection	Correct
			Insufficient Ground	Correct
Radio and/or TV Interference	Objectionable Noise	Cell	Improper Ground	Correct
		Hi-Voltage Connection	Loose Hi-Voltage Connection	Correct
Odor of Ozone	Objectionable Noise		See page 8	

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TRION ELECTRONIC AIR CLEANER

TRION

®

INSTALLATION
OPERATION
SERVICE
MANUAL

MODEL 80
CUSTOM PACKAGED

TRION, INC. BOX 760 SANFORD, NORTH CAROLINA 27330

TRION®
MODEL 80
LIGHT COMMERCIAL
ELECTRONIC
AIR CLEANER

INSTALLATION
OPERATION
SERVICE

TABLE OF CONTENTS

Application

Trion ® Model 80 Electronic Air Cleaners are designed to provide electronic air cleaning in applications where a centrally ducted air handling system is employed. Equipment is available in 16 sizes covering a range from 3600 to 19,200 CFM.

Model 80's are designed for horizontal airflow and incorporate built-in wash systems that may be manually, semi-automatically or automatically controlled. The strong heavy guage steel cabinet can be installed on support legs (standard) or suspended for overhead installations (order less legs). Suspension design, installation, and hardware to be supplied by others.

Installation Planning

Because air handling systems vary greatly, unit location, air distribution, and service clearances require careful consideration prior to installation:

Things to Remember

- Install for horizontal air flow in the return air duct system.
- Water wash manifold must be positioned on the air entering side of the unit.
- A clearance of 36" is required in front of the cell access door for cell removal and power pack service.
- Air flow entering the unit should be evenly distributed across the face of the unit.

IMPORTANT

- If make-up air is added to the return air system, it should preceed the Model 80 and be maintained at a temperature between 50^{o} and 125^{o}F.
- Cooling coils should be located downstream from the air cleaner.

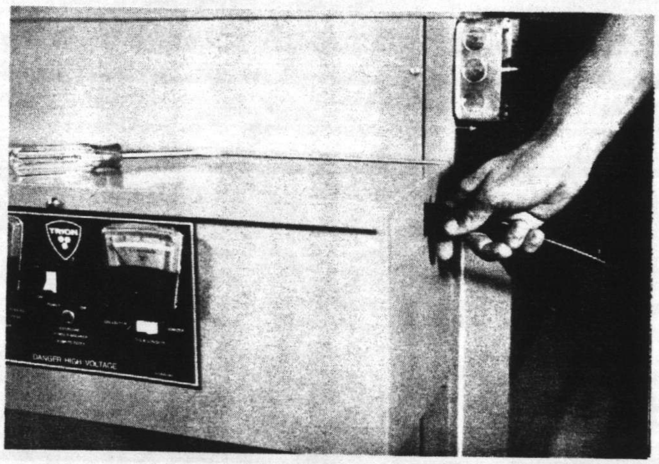
Unpacking and Inspection

At the time the equipment is received, all cartons and contents should be carefully examined for damage.

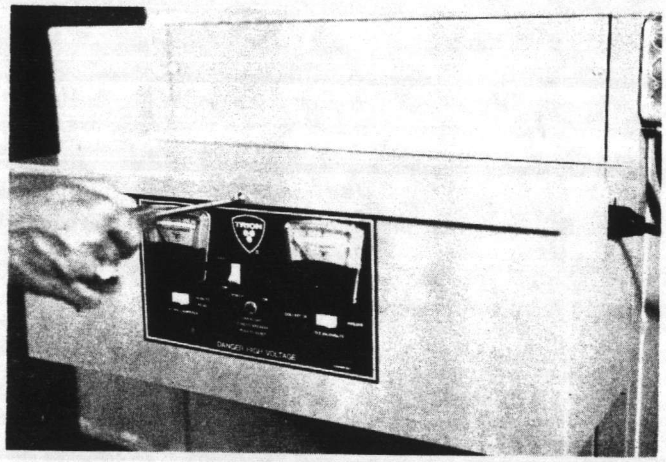
Model 80's are usually shipped completely assembled, and where unit size permits, the ionizing/collecting cells are shipped inside the cabinet. On larger units upper cells may be shipped in separate containers.

All components and accessory items are shipped in cartons as designated on the packing list.

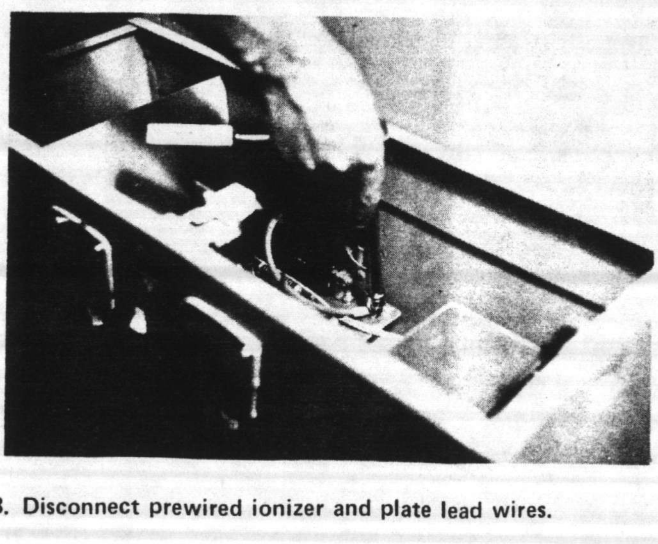
DAMAGE INCURRED IN SHIPMENT MUST BE IMMEDIATELY REPORTED TO THE CARRIER. AN INSPECTION REPORT COMPLETED, AND A CLAIM FILED AT THE RECEIVING POINT.



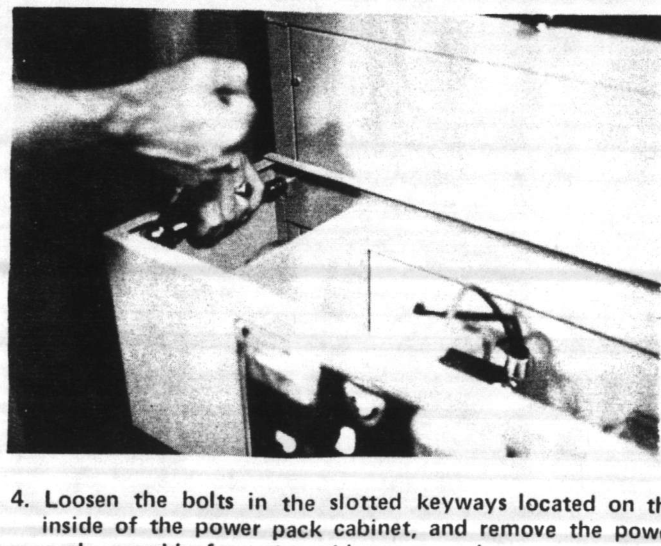
1. Unplug the primary power cable from the power pack.



2. Loosen the safety interlock screw on the power pack, and remove the power pack top.



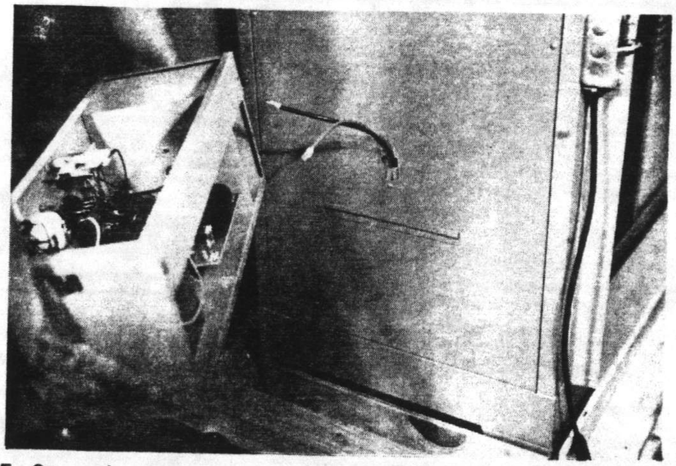
3. Disconnect prewired ionizer and plate lead wires.



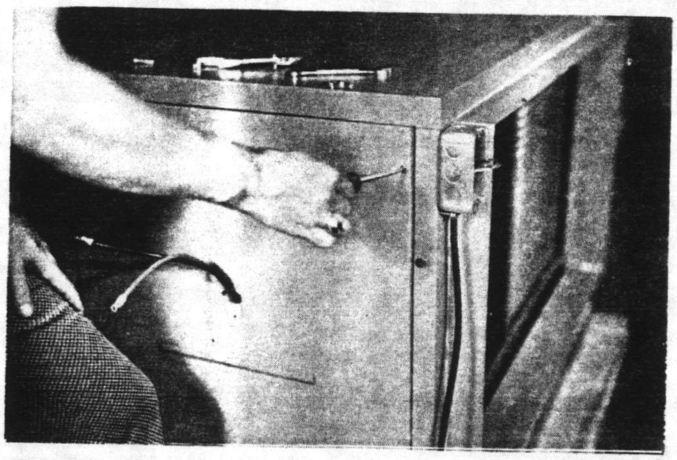
4. Loosen the bolts in the slotted keyways located on the inside of the power pack cabinet, and remove the power pack assembly from the cabinet access door.

Accessories

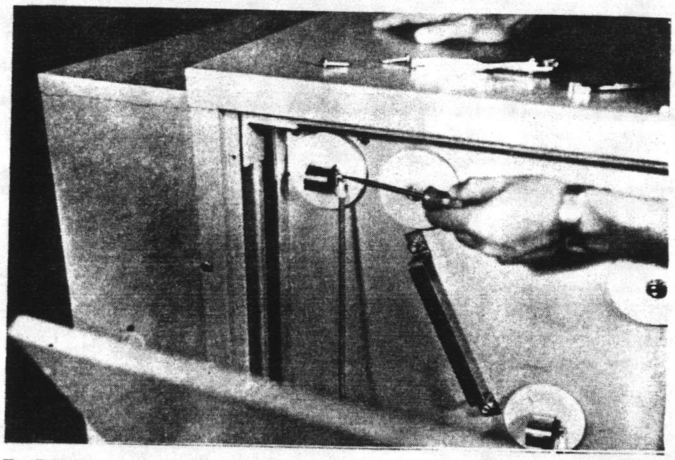
Remove any additional components - wash controls, detergent systems, valves, etc., from their shipping containers, examine them for damage, and place them safely with the other equipment. Unless the unit is to be immediately installed, all equipment should be covered to prevent damage.



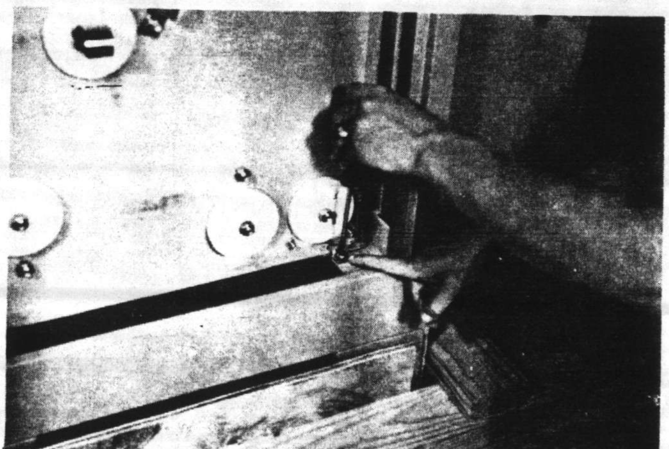
5. Store the power pack in a protected, dry area until it is to be installed.



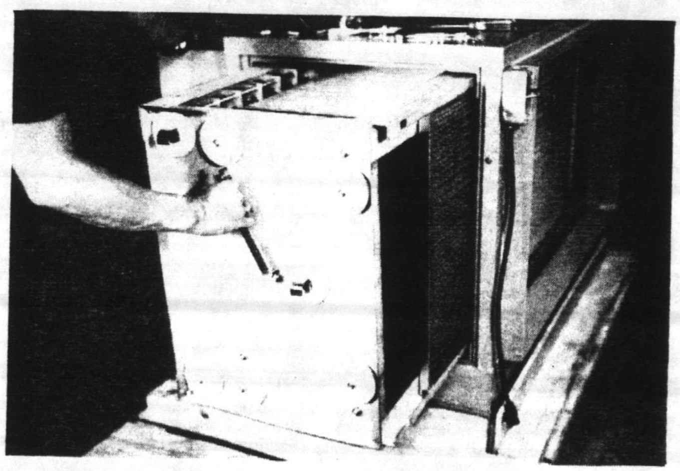
6. Remove the access door and all wood or cardboard blocking used in packing.



7. Disconnect the ionizer and plate high voltage leads from the first cell. Note their relative positions for later reassembly.



8. Remove the retaining clips located on the bottom cell support rails (front and back).



9. Slide the ionizing/collecting cells from the air cleaner cabinet. Store them with the power pack until they are ready to be installed.

Air Distribution in Ductwork

The Model 80 Electronic Air cleaner operates most efficiently when all air entering the unit is distributed across the ionizing/collecting cells at a uniform velocity.

1. Installations with uneven air distribution should have turning vanes or baffles installed.

Gradual transitions to the air cleaner cabinet are recommended in all duct work larger or smaller than the collar openings.

2. If transitions are used, they should not exceed 20° (4" per lineal ft.).

Water Damage Protection

1. When the air cleaner is installed overhead, a sheet metal drip pan should be provided under the air cleaner cabinet. This is important in case of water leaks in the duct work or a plugged drain.

2. Always caulk sheet metal seams where they join the air cleaner cabinet. Also caulk any other seams subjected to water spray or mist.

Plumbing

A suitable drain, installed in accordance with local plumbing codes, should be connected to the pipe nipple which is provided in the drain pan. The drain should be equipped with an air tight seal such as a lid, trap or valve. If a water seal or trap is used, it should hold sufficient water to assure that the loss of water from evaporation between cleaning periods will not break the seal. The drain line should not be smaller than the size of the drain nipple. NOTE: Drain connections should be complete before duct work is connected.

Installing the Air Cleaner

The electronic air cleaner should be installed on the inlet air side of the air handler. In special applications where the air cleaner must be located on the discharge side of the air handler, the air cleaner must be a minimum of 4 ft. from the discharge opening.

The cabinet less the ionizing/collecting cells should be connected to the duct work. Recommended procedure is that the tops and the sides of the connecting ductwork be attached to the outside of the collars and that the bottom of the ductwork be attached to the inside of the collars. This insures that any water overspray will wash back in the air cleaner drain pan. Ductwork bottom should be sloped slightly toward the air cleaner for proper water drainage.

1. After necessary drains and transitions have been installed set cabinet in position.

   a. Standard mounting legs are provided for stand alone installations. Adjustments should be made to insure that the cabinet is level.
   b. When unit is to be suspended, cabinet must be level to insure proper drainage.

2. Attach ductwork to cabinet inlet and outlet collars.

   a. Drill pilot holes in cabinet collars and ductwork in positions which will not cause leaking.
   b. Fasten duct to cabinet collars with sheet metal screws.
   c. Use caulking compound to seal all duct connections with the collars on both the inlet and outlet side at least 3 ft. from the cabinet.

3. Install ionizing/collecting cells. Inspect the cells before installing them in the air cleaner cabinet to be sure that no damage occurred or foreign material became lodged between the collecting plates while they were placed aside after unpacking.

   a. Install the mechanical afterfilters in the support channels located on the ionizing/collecting cells.
   b. Place the cells in the support rails and slide them into the cabinet in accordance with the air flow arrows and markings.
   c. Air cleaner models having more than one tier of ionizing/collecting cells require that the cells be electrically interconnected with high voltage jumpers.
   d. Connect the jumpers to the terminals provided.

4. Replace access door.

Electrical

Trion Model 80 Electronic Air Cleaners that are designated for remote power pack installation (optional accessory) will have a factory mounted safety switch that is activated by a bolt secured to the access panel. This serves as a safety measure to electrically interlock and interrupt the power supply to the power pack when the access apnel is removed.

On installations in which there is to be additional access to the ionizing/collecting cells other than thru the electrically interlocked access panel - such as thru duct access doors, hand holes, etc. - the door opening covers, etc., must be electrically interlocked in series with the other safety switch in the system.

For integral power pack installations, the power pack mounting channel prevents opening the access panel without first de-energizing the power pack by removing the primary power cable and removing the power pack from the access panel.

Integral Power Pack Wiring

Reconnect high voltage leads to ionizing/collecting cells. Mount power pack to the cabinet access door.

Install the two high voltage leads to electrically connect the ionizing/collecting cells to the power pack. The red lead connects to the ionizer on the ionizing/collecting cell and to terminal marked ionizer in the power pack. The black lead is for the plates and is connected to the terminal marked collector in the power pack. NOTE: Do not cut or splice the high voltage lead at the conduit connection box or at any point throughout the lead length.

Remote Power Pack Wiring

For remote power pack installations, the two high voltage leads connecting the ionizing/collecting cells are connected to the high voltage remote cable at a conduit connection box located on the side of the air cleaner cabinet. NOTE: High voltage leads are to be run in separate conduit.

The red lead connects to the terminal marked ionizer in the remote power pack. The black lead connects to the terminal marked collector in the remote power pack. See Wiring Diagram , page .

NOTE: Do not cut or splice the high voltage leads at the conduit connection box or at any point throughout the lead length.

On remote power pack installations, a lead-in power cord assembly is factory wired to a primary junction box that should be mounted next to the power pack. The lead-in power cord prevents removing the power pack top without first disconnecting the power cord. See Wiring Diagram , page .

Lead wiring should be run from the lead-in power cord junction box to the safety access switch located above the access door on the air cleaner cabinet and then connected to the primary power source. The safety switch serves as a safety measure to electrically interlock and interrupt the power supply to the power pack when the access panel is removed.

Primary Wiring

On integral power pack installations a lead-in power cord assembly is factory wired to a primary wiring junction box located on the side of the air cleaner cabinet. As an added safety feature, the lead-in power cord prevents removing the power pack top without first disconnecting the power cord.

Operation

Principle of Operation

Trion Electronic Air Cleaners are technically known as electrostatic precipitators. In this type of equipment all airborne particles, even of sub-microscopic size, are electrically charged as they pass thru a high voltage ionizing zone. These charged particles are then attracted and adhere to a series of parallel collecting plates which form the negative elements of an electrostatic field.

The ionizing zone consists of charged tungsten wires suspended between grounded electrodes. The collecting section consists of parallel plates arranged so that each alternate plate is charged while the inter-leaving plates are electrically grounded.

Periodically, depending on the type and concentration of contamination in the iar, the dirt is washed from the plates by the integrally constructed water wash system.

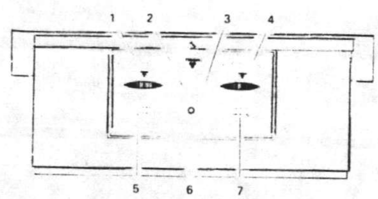
Three distinct functional components comprise the air cleaner.

1. Ionizing/collecting cells to ionize and collect airborne particulate matter.
2. Power pack to supply high voltage direct current to the ionizing/collecting cells.
3. Water wash system to wash away collected dirt.

Operational Checkout

After the air cleaner has been correctly installed, both mechanically and electrically, it is ready to put in operation.

Check the power pack terminal board connections and all system wiring connections to make certain that they are correct and complete. Close all access doors and panels being sure the time delay screws are completely seated (if applicable).



FRONT VIEW MODEL 80 POWER SUPPLY

Powering the Unit

1. To supply power to the air cleaner, move the rocker switch (2) on the front panel of the power pack to the "ON" position.
2. The indicator light (3) located next to the rocker switch should illuminate, indicating that power is being supplied to the primary circuit. If the light does not glow, recheck each time delay screw to be certain that they are properly seated and push circuit breaker reset button (6). If the indicating light still does not illuminate refer to the service chapter in this manual.
3. The milliammeter (1) is located on the left hand side of the power pack face. This meter is used to measure the total load current to the ionizer and collector. Push the spring loaded "Push to Read" switch (5) located directly under the milliammeter to the "ON" position. While the switch is depressed the milliammeter should register the proper load range as listed on the Output Adjustment Chart located on the Operation Adjustment section of the manual.
4. A single scale microammeter (4), calibrated in kilovolts, is located on the right hand face of the power pack. This meter is used to read voltage for both the ionizer and collector. A two position rocker switch (7) located directly under the meter allows selection of either ionizer voltage or collector voltage. Kilovolt readings for both the ionizer and collector voltage should correspond to the calibrations located in the Operation Adjustment section in this manual.

Improper operation of the electronic air cleaner may be caused by an electrical outage of one kind or another and is indicated by one or more of the following four conditions:

1. Low meter reading
2. High meter reading
3. Circuit breaker open
4. Power pack panel light out

If any of the following conditions exist during startup procedures refer to the Service Section of this manual.

Wash Controls
Manual Operation

1. Shut off all power to the air handling system and electronic air cleaner.
2. If the air cleaner has a moving wash manifold the manifold motor must be turned on. (ON-OFF switch and junction box supplied by others).
3. Open the hand valve located on the water line and allow wash system to operate from three to four minutes. During this time check air cleaner and duct work for possible water leaks.
4. Shut off water supply.
5. Turn off manifold motor (where applicable).
6. Actuate air handling system and allow ionizing/collecting cells to dry for approximately 60 minutes.
7. After ionizing/collecting cells are dry, power pack may be energized and air cleaner returned to operation.

Semi-Auto Wash Control Operation

Trion semi-automatic wash controls are preprogrammed at the factory prior to installation. A manual switch located on the wash control box is used to activate an internal cam driven clock which shuts off the air handling system and the electronic air cleaner. The control then sequences the wash, dry and return to operation of the unit automatically.

Automatic Wash Control Operation

Trion automatic wash controls consist of a master control box with a cam driven wash control timing mechanism and a seven-day automatic time clock. The time clock is pre-programmed for operation during any hour of a seven day cycle. When the time clock activates the wash control mechanism all power to the air handling system and electronic air cleaner is shut off. The control them sequences the wash, dry and return to operation of the unit.

Service and Adjustment Guide

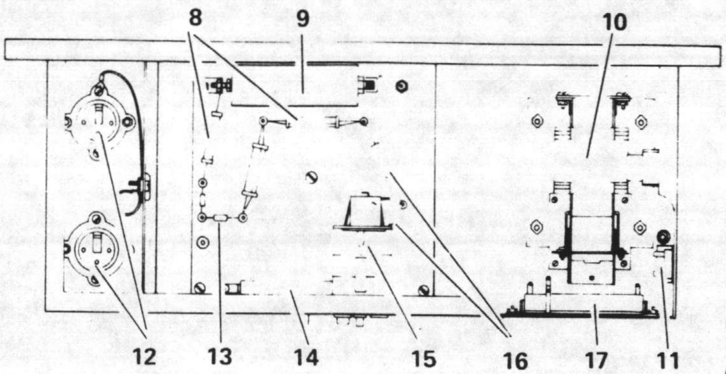
Adjustment Procedures

The following table should be used to determine the proper operating ranges for your Trion Model 80 Light Commercial Electronic Air Cleaner. To use the table, locate the model number of your unit in the left hand column, then read across to determine the required ranges.

Model 80 Operating Ranges

MODEL NO.	OUTPUT VOLTAGE (KVDC)		OUTPUT CURRENT
	IONIZER	COLLECTOR	
80-103-00	11-15	5-7	1.2-1.5
80-104-00	11-15	5-7	1.6-2.2
80-105-00	11-15	5-7	2.0-2.6
80-106-00	11-15	5-7	2.4-3.0
80-107-00	11-15	5-7	2.8-3.7
80-108-00	11-15	5-7	3.2-4.1
80-109-00	11-15	5-7	3.6-4.5
80-110-00	11-15	5-7	4.0-5.5
80-203-00	11-15	5-7	2.4-3.0
80-204-00	11-15	5-7	3.2-4.4
80-205-00	11-15	5-7	2.0-5.2
80-206-00	11-15	5-7	4.8-6.0 (1)
80-207-00	11-15	5-7	5.6-7.4 (1)
80-208-00	11-15	5-7	6.4-8.2 (2)
80-303-00	11-15	5-7	3.6-4.5
80-304-00	11-15	5-7	4.8-6.6 (1)

1. Consult the factory before attempting to attain higher end currents.
2. Consult the factory before adjusting the power supply.



TOP VIEW - (Cover Removed) MODEL 80 POWER SUPPLY

(8) Meter Multiplier Resistors - Prolong meter life and insure accurate readings.
(9) Capacitor - Part of voltage doubler circuit
(10) High Voltage Transformer - Produces the necessary voltage for ionization of particles
(11) Triac Gate Resistor - prevents overheating of the transformer primary
(12) Ballast Bulbs - Absorb excess voltage during shorting conditions.
(13) Voltage Divider Resistors - Complete meter circuitry and act as voltage bleeders
(14) Surge Resistor - Limits the amplitude of arcs in both the ionizer and collector sections.
(15) Safety Switch - Immediately breaks the circuit when power pack top is removed
(16) Avalanche Recitfiers - Complete the voltage doubler circuitry. Do not deteriorate with age like selenium rectifiers.
(17) Adjustable Resistor - Allows tunable output over a load range.

Power Supply Adjustment

The Model 80's power supply should be adjusted at installation and should, under normal circumstances, require no additional adjustment. However, infrequently local power fluctuation or changes in conditions may make it necessary for readjustment at a later time.

1. Turn off power and remove the top cover assembly.
2. Loosen the screw on the band on the adjustable resistor (17).
3. When adjusting the power supply, it will be necessary to adjust the resistor, then depress the safety switch (15) to read the results. BE CAREFUL there is both HIGH VOLTAGE and LINE VOLTAGE present.
4. Move the band to the right to increase the output voltage or to the left to decrease the output voltage.
5. Moniter the output voltage for the ionizer section and adjust the resistor for a voltage reaching as near to 13 KVDC as possible.
6. When the output voltage is set, the MA meter should read in accordance with the range specified for your model.

Service Procedure

There are several general symptoms which indicate that the air cleaner is not working properly.

1. No meter readings.
2. Low meter readings.
3. High meter readings.
4. Fluctuating meter readings.
5. Circuit breaker kicking off.
6. Loud humming noise
7. Constant or intermittent arcing
8. Air not being cleaned.

1. **NO METER READING**

This is an indication that power is not being supplied to the secondary circuit.

CAUSE	REMEDY
(A) Safety screw retaining power pack access panel not properly seated.	Back safety screw(s) out five complete turns, then screw in until faint click is heard denoting the closing of the safety switch.
(B) Supply line power not being supplied to unit.	Check fuse or power supply.
(C) Defective safety switch.	Check switch with trouble light and replace if necessary.
(D) Defective power supply.	See power supply trouble shooting procedures.
(E) Disconnected high tension leads.	Connect same.
(F) Broken or disconnected wiring inside power pack.	Check for any broken or disconnected wiring inside power pack.
(G) Ballast tubes burned out.	Replace with new ballast tubes.
(H) Circuit breaker tripped.	Reset circuit breaker. If it again trips out, refer to circuit breaker tripping section.
(I) Thermal overload tripped.	Reset. If it trips out again, refer to power supply trouble shooting.

2. **LOW METER READING**

CAUSE	REMEDY
(A) Missing ionizing wire (s).	Replace same.
(B) Low supply line voltage.	Refer to initial adjustment procedures.
(C) Ionizing/collecting cell electrically disconnected on multi-cell units.	Connect same. (Electrical connection to both ionizing and collecting plate sections.)
(D) Milliammeter set below zero when power is off.	When power is off, adjust required meter reading to zero with zero calibration screw on front of meter.
(E) One ballast tube burned out.	Replace.
(F) Defective power supply.	Refer to power supply trouble shooting section.

3. **HIGH METER READING**

CAUSE	REMEDY
(A) High supply line voltage.	Refer to initial adjustment procedures.
(B) Extremely dirty collecting cell.	Clean same.
(C) Dirty insulators.	Clean same.
(D) Defective insulators.	Replace same.
(E) Wet cell or damp insulators.	Allow to dry.
(F) Foreign material such as hair or lint bridging collecintg plates.	Remove same.
(G) Meter set above zero when power is off.	When power is off, adjust required meter reading to zero with zero calibration screw on front of meter.

4. FLUCTUATING METER READING

CAUSE	REMEDY
(A) Loose ionizing wire(s).	Repair or replace same.
(B) Fluctuating supply line voltage.	Find stable source of supply.
(C) Loose ground.	Tighten same.
(D) Loose electrical connection between ionizing/collecting cells on multi-cell units.	Tighten same.
(E) Loose power pack wiring.	Tighten same.
(F) Defective power supply.	Refer to power supply trouble shooting section.

5. CIRCUIT BREAKER KICKING OFF

When the circuit breaker kicks off, it is usually accompanied by extremely high meter readings and is an indication of a short circuit. A short circuit can be easily isolated to the power pack or ionizing/collecting cell(s).

Disconnect the high voltage leads, either inside the power pack or at the ionizing/collecting cell(s). Support them away from any point of contact and energize the power pack.

With the high voltage leads disconnected, all the normal load is removed from the circuit and the meters should therefore read zero upon energizing.

If the meter reading is zero and the circuit breaker does not trip, with the high voltage leads disconnected, the power pack is operating normally and the short circuit is in the ionizing/collecting cell(s). If a reading is indicated on the meter with the high voltage leads disconnected or if the breaker continues to trip, then the short circuit is in the power pack.

If the short circuit is isolated to the ionizing/collecting cell(s), it may be isolated furtiier to the ionizing section or plate section by connecting each respective high voltage lead individually, energizing the power pack and observing the milliammeter reading.

On units consisting of more than one ionizing/collecting cell, the electrical connections between cells may be removed in such a way to isolate the short to a group of cells, then, further removed so as to isolate it to one particular cell.

If short is found to be in the power pack, refer to the power supply troubleshooting section.

CAUSE	REMEDY
(A) Broken ionizing wires.	Replace same.
(B) Large particles of dirt or foreign material lodged between collecting plates.	Clean.
(C) Broken or defective insulators.	Replace same.
(D) Broken electrical connectors between cells on multi-cell units.	Repair or replace same.

If short is found to be in the power pack, refer to the power supply troubleshooting section.

6. LOUD HUMMING NOISE

CAUSE	REMEDY
(A) Atmospheric conditions - low humidity. (Under normal circumstances, this condition may only be evident several days a year.)	Wash unit to temporarily raise humidity.
(B) Unit not properly grounded.	Check ground and correct if necessary.
(C) Ionizing/collecting cell(s) in need of washing.	Clean cell(s) manually if necessary.
(D) Loose ionizing wires.	Repair or replace.

7. CONSTANT OR INTERMITTENT ARCING

CAUSE	REMEDY
(A) Water leak or defective valve.	Repair or replace.
(B) Loose or defective ionizing wire.	Repair or replace.
(C) Voltage too high (indicated by high meter reading).	Adjust to correct operating range.
(D) Excessively dirty cell.	Clean same.
(E) Foreign material such as string, etc., lodged in or close to cell and flapping in air stream.	Remove same.
(F) High voltage leads to cell reversed.	Correct same.

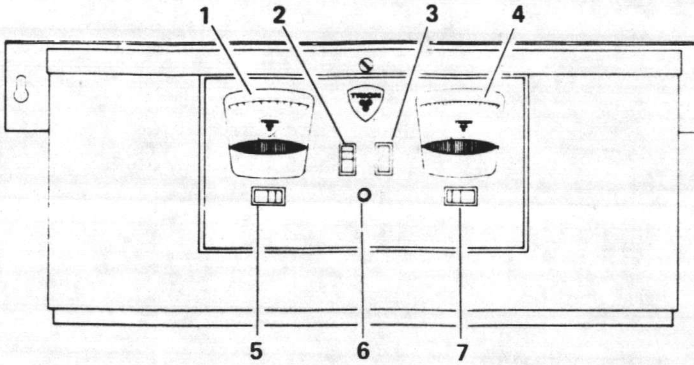
8. AIR NOT BEING CLEANED

Be sure the meter readings are within the specified operating range, indicating proper electrical operation.

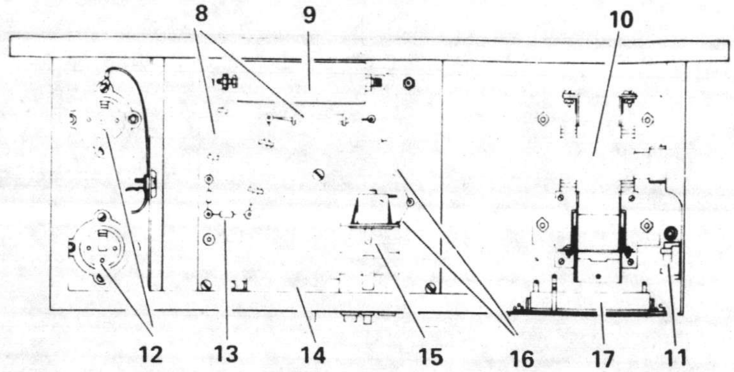
CAUSE	REMEDY
(A) Air volume through unit too great.*	Reduce air flow to the designed cfm rating.
(B) Unsealed openings in or near unit enclosure such as open drains, etc. Such openings permit infiltration of uncleaned air contaminating air cleaned by the unit.	Seal or close openings. Drains should be trapped in accordance with local plumbing codes or sealed with length of collapsible drain hose.
(C) Leaks in ductwork on blower box and other parts of system under negative pressure on clean air side of the unit.	Seal with duct tape or caulking compound.
(D) Dirty air not being delivered to the unit. A common cause for this in residential units is the blocking of return air grills with drapes, furniture, etc.	Remove obstruction.
(E) Eneven air distribution across the face of the ionizing/collecting cell(s). **	Install turning vanes, air baffles or provide means for even air distribution.

* A good indication of too much volume is excessive build-up of dirt on the trailing edges of the collecting plates and after filters. (Dirt build-up should not be confused with dirt stains. Dirt stain on the after filters and plates is normal.)

** Uneven air distribution across the face of the ionizing/collecting cell(s) may be determined in many instances by examining the dirt pattern before washing. The entering side of the cell should be covered evenly with the dirt collected.



FRONT VIEW - MODEL 80 POWER SUPPLY



TOP VIEW - (Cover Removed) MODEL 80 POWER SUPPLY

Power Pack Parts

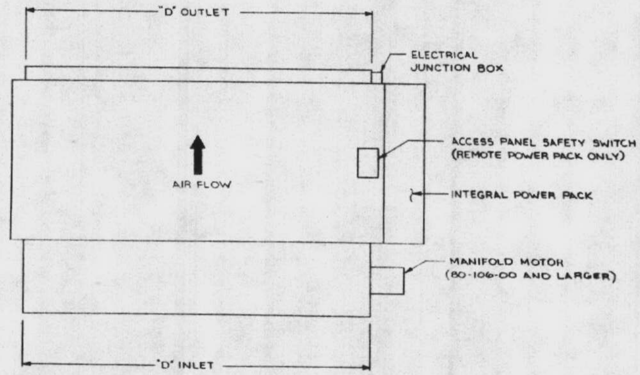
6	CB6 CIRCUIT BREAKER	124955-001 (Models 107-304)
		124955-002 (Models 103-105)
9	C1 CAPACITOR	221307-001
10	T1 TRANSFORMER	325639-001
14	R4 RESISTOR	221448-029
16 (TOP)	CR1 RECTIFIER	124962-001
16 (BOTTOM)	CR2 RECTIFIER	124962-001

Trouble Shooting Guide

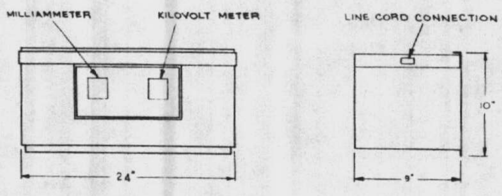
CONDITION	PROBABLE CAUSE	CORRECTION
Meters reading, Circuit breaker on, Indicating light off.	Bad Indicating Light	Replace Light
No meter reading, circuit breaker on, indicating light off.	(A) Safety Switch Open	Tighten Safety Switch
	(B) No Input Voltage	Supply Input Voltage
	(C) Open Wire in Primary	Reconnect or Replace Wire
	(D) Circuit Breaker "6" Open	Reset CB6
No meter reading, circuit breaker on, indicating light on.	(A) Rectifier CR2 Open	Replace CR2
	(B) Resistor R4 Open	Replace R4
	(C) Transformer T1 Primary Open (No Output Voltage)	Replace T1
	(D) Meter Bad	Replace Meter
Circuit breaker holds for a few seconds then trips. Meter indicates low before CB6 trips	(A) Rectifier CR1 Shorted	Replace CR1
	(B) Rectifier CR2 Shorted	Replace CR2
	(C) Capacitor C1 Open - If Breaker trips, Will do so After 10-30 Sec.	Replace C1
Circuit breaker trips immediately	(A) Capacitor C1 Shorted	Replace C1
	(B) Resistor R4 Shorted	Replace R4
	(C) Transformer T1 Shorted	Replace T1
	(D) Trash on Board Shorting to Ground	Clean Board
Low meter reading - trouble isolated to power supply.	(A) Rectifier CR1 Open	Replace CR1
	(B) Capacitor C1 Open	Replace C1
	(C) Ballast Lamp Burned Out	Replace Lamp

Blue- IonizER
BlAck Collector

MODEL NUMBER	"A"	"B"	"C"	"D"	"E"	RATED CFM	SHIP WT. LBS.
80-103-00	3'-1 3/8"	2'-11 1/4"	2'-0 5/8"	2'-9 1/4"	3'-4"	3,600	402
80-104-00	4'-0 1/4"	2'-11 1/4"	2'-0 5/8"	3'-8 1/8"	2'-4"	4800	463
80-105-00	4'-11 7/16"	2'-11 1/4"	2'-0 5/8"	4'-7 5/16"	3'-4"	6,000	532
80-106-00	5'-10 9/16"	2'-11 1/4"	2'-0 5/8"	5'-6 7/16"	3'-4"	7,200	644
80-107-00	6'-9 1/2"	2'-11 1/4"	2'-0 5/8"	6'-5 3/8"	3'-4"	8,400	680
80-108-00	7'-8 5/8"	2'-11 1/4"	2'-0 5/8"	7'-4 1/2"	3'-4"	9,600	715
80-109-00	8'-7 13/16"	2'-11 1/4"	2'-0 5/8"	8'-3 11/16"	3'-4"	10,800	768
80-110-00	9'-7"	2'-11 1/4"	2'-0 5/8"	9'-2 7/8"	3'-4"	12,000	836
80-203-00	3'-1 3/8"	4'-11 3/8"	4'-1"	2'-9 1/4"	3'-4"	7,200	567
80-204-00	4'-0 1/4"	4'-11 3/8"	4'-1"	3'-8 1/8"	2'-4"	9,600	665
80-205-00	4'-11 7/16"	4'-11 3/8"	4'-1"	4'-7 5/16"	3'-4"	12,000	768
80-206-00	5'-10 9/16"	4'-11 5/8"	4'-11"	5'-6 7/16"	3'-4"	14,400	934
80-207-00	6'-9 1/2"	4'-11 5/8"	4'-1"	6'-5 3/8"	3'-4"	16,800	1034
80-208-00	7'-8 5/8"	4'-11 5/8"	4'-1"	7'-4 1/2"	3'-4"	19,200	1140
80-303-00	3'-1 3/8"	7'-0"	6'-1 3/8"	2'-9 1/4"	3'-4"	10,800	705
80-304-00	4'-0 1/4"	7'-0"	6'-1 3/8"	3'-8 1/8"	2'-4"	14,400	916



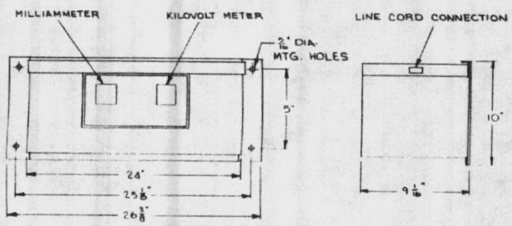
PLAN VIEW



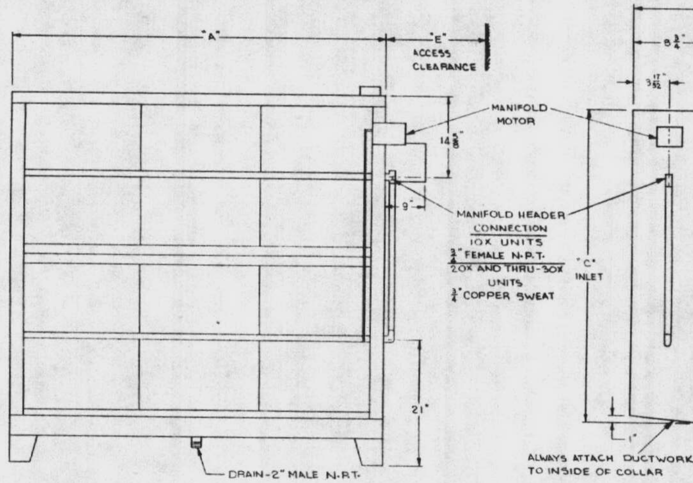
FRONT

SIDE

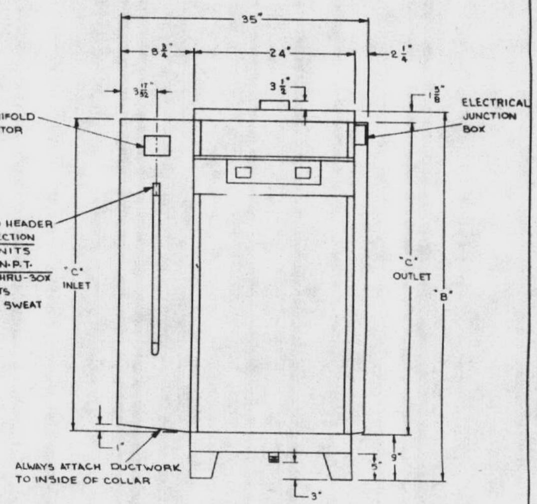
INTEGRAL POWER PACK



REMOTE POWER PACK



FRONT ELEVATION



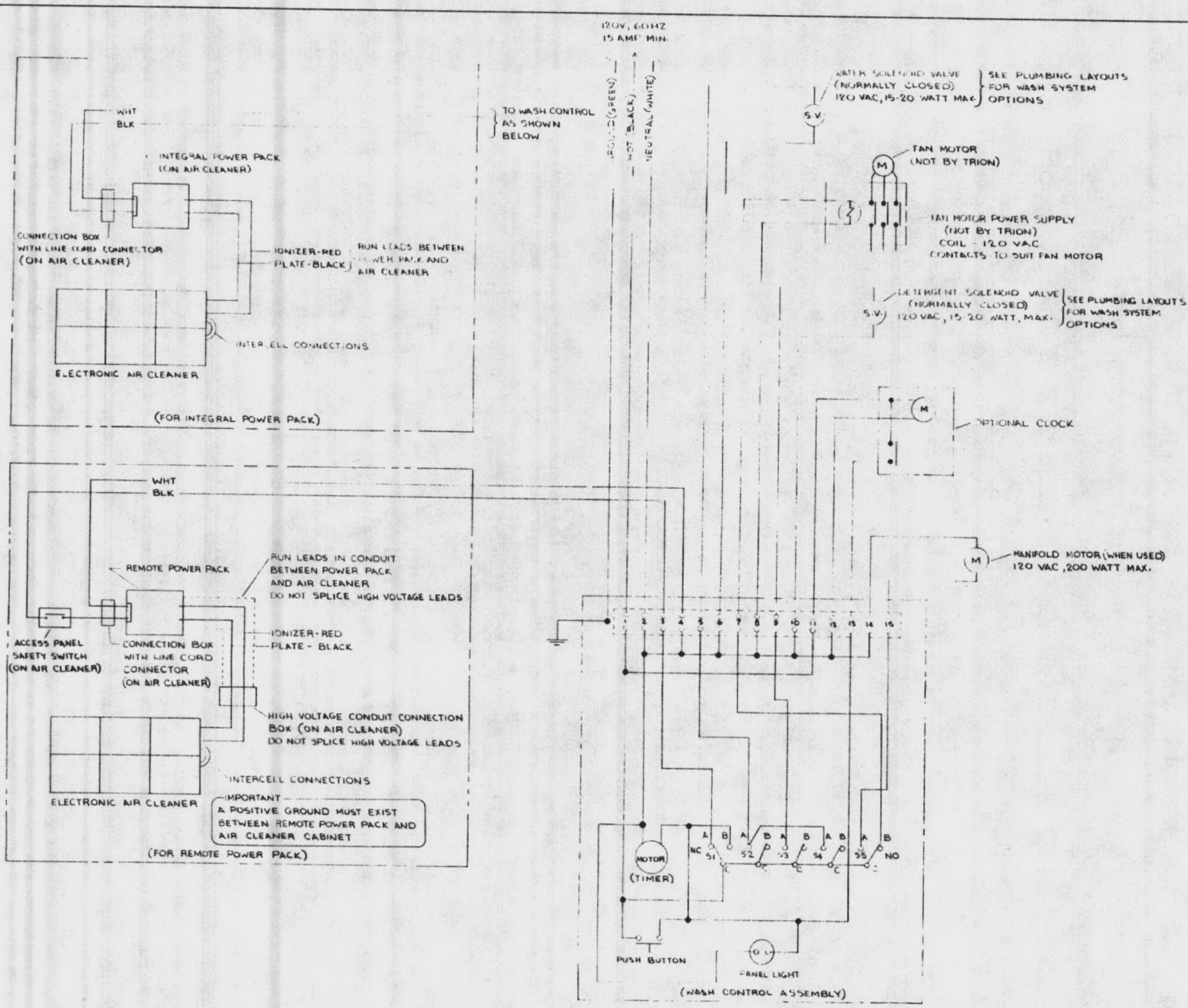
ACCESS SIDE ELEVATION

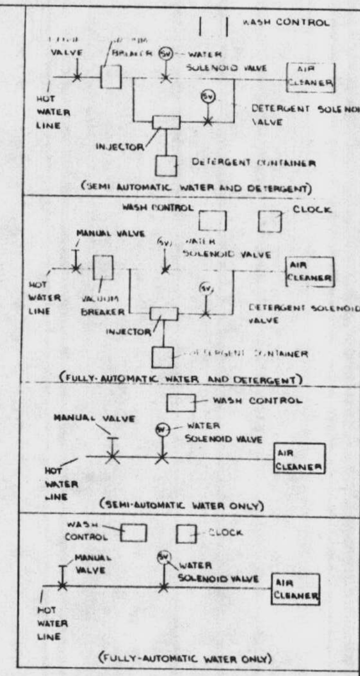
NOTE: UNIT SHOWN IS TYPICAL 80 20X-00 WITH INTEGRAL POWER PACK.

REFERENCE:

INTERCONNECTING WIRING AND PIPING 426799

UNLESS OTHERWISE SPECIFIED USE				OUTLINE DRAWING - MODEL 80-XXX-00	
SCALE ~	FRACT. DIM	DEC. DIM	ANGLES		REVISIONS
DR. CDA	CHKD. [illegible]	APP. MEY		TRION, INC.	DWG 426788
DATE 2-6-78	DATE 2-8-78	DATE 2-8-78			THIS DRAWING PROPERTY OF TRION INC.





MODEL NUMBER	WATER REQ. GPM AT 45 PSI
80-103-00	10.5
80-104-00	14.5
80-105-00	18.5
80-106-00	7
80-107-00	8.5
80-108-00	9.5
80-109-00	10.5
80-110-00	12
80-203-00	7
80-204-00	9
80-205-00	11
80-206-00	14
80-207-00	17
80-208-00	19
80-303-00	10.5
80-304-00	13.5

REFERENCE:
MODEL 80 OUTLINE 426788

REVISIONS

UNLESS OTHERWISE SPECIFIED USE
SCALE -- | FRACT DIM | DEC DIM | ANGLES
DR CDA DATE 2-7-78 | CHKD [illegible] DATE 2-8-78 | APP [illegible] DATE 2-2[illegible]

INTERCONNECTING WIRING AND PIPING
MODEL 80

TRION, INC.
SANFORD, NORTH CAROLINA

DWG 426799

TRION

PACKAGED PRODUCTS

FINAL INSPECTION

DATE: 6-28-88 MODEL: 80-101-00 RH

PART NO.: 425181-002 SERIAL NO.: MOD 80V-88-~~[illegible]~~ 00017

MECHANICAL CHECK

ACCEPT.	
✓	CHECK WIRING (ROUTING, TERMINAL SECUREMENT)
	BLOWER ASSY. PROPERLY SECURED
✓	DOORS AND PANELS FIT PROPERLY
✓	DOOR LATCH FUNCTIONS CORRECTLY
	GRILL FITS PROPERLY
✓	GENERAL COMPONENTS SECURE AND CORRECT
✓	ALL TAGS AND LABELS PRESENT
✓	PAINT QUALITY
✓	OVERALL APPEARANCE

INSPECTION STAMP W.W

OPERATIONAL TEST

ACCEPT.	
✓	INPUT VOLTAGE 120 VOLTS
	CURRENT DRAW ______ AMPS
	SPEED CONTROL SETTING (IF APPLICABLE) ______ VAC
	BLOWER OPERATION (EACH SPEED), DIRECTION OF ROTATION
✓	DOOR INTERLOCK OPERATION
✓	PILOT LAMP OPERATION
	NOISE AND VIBRATION LEVEL

✓	CELL VOLTAGE 6.0 KVDC
✓	IONIZER VOLTAGE 12.0 KVDC
✓	HIGH VOLTAGE LIGHT "SHORT CELL"

OUTPUT CURRENT 2.2

INSPECTION STAMP Phillip Degoffenreath

PACKAGING CHECK

EAC

______ PREFILTER
______ IONIZER
______ COLLECTOR CELL
______ CHARCOAL FILTER
______ WALL MOUNTING KIT
______ OWNERS MANUAL
______ MODULE (SPEC. TYPE) ______
______ PLENUM (SPEC. TYPE)

MEDIA

______ PREFILTER (SPEC. TYPE) ______
______ PRIMARY FILTER (SPEC. TYPE) ______
______ MOUNTING KIT (EYEBOLTS)
______ OWNERS MANUAL
______ AIR FLOW (STRAIGHT THROUGH, SIDE BLOW)
______ PLENUM (SPEC. TYPE) ______
______ PRESSURE GAGE KIT

SPECIAL OPTIONS ______

INSPECTION STAMP ______

LIMITED TWO-YEAR WARRANTY
ELECTRONIC AIR CLEANER
TRION, INC.

FOR OWNER'S INFORMATION

PRODUCT MODEL ______ INSTALLATION DATE ______

UNIT SERIAL NO. ______

INSTALLED BY (DEALER) ______

PLEASE READ REVERSE SIDE TO PROTECT YOUR INVESTMENT

OWNER RESPONSIBILITIES

The completion and return of the Warranty Registration Card is a condition precedent to warranty coverage and performance. This warranty is not valid unless this card is completed and mailed to the factory within fifteen (15) days of equipment installation.

TRION, INC.
ELECTRONIC AIR CLEANER
LIMITED TWO-YEAR WARRANTY

WARRANTY REGISTRATION CARD

PRODUCT MODEL			INSTALLATION DATE
UNIT SERIAL NO.			
OWNER'S NAME			
ADDRESS	CITY	STATE	ZIP CODE
DEALER'S NAME			
ADDRESS	CITY	STATE	ZIP CODE

TRION, INC. P.O. BOX 760 McNEILL ROAD
SANFORD, NORTH CAROLINA 27330

Form No. 66-0015

ELECTRONIC AIR CLEANER
LIMITED TWO-YEAR WARRANTY

This limited warranty covers Trion Residential Type Electronic Air Cleaners, excluding duct work, wiring and installation.

Trion, Inc. warrants that all new Trion Electronic Residential Air Cleaners are free from defects in material and workmanship under normal, non-commercial use and service. Trion will remedy any such defects if they appear within 24 months from the date of original installation as evidenced by receipt of the warranty registration card, subject to the terms and conditions of this Limited Two-Year Warranty stated below:

1. THIS LIMITED TWO-YEAR WARRANTY IS GRANTED BY TRION® INC., McNEILL ROAD, P.O. BOX 760, SANFORD, NORTH CAROLINA 27330.

2. This warranty shall extend only to any non-commercial owner who has purchased the residential electronic air cleaner other than for purposes of resale.

3. The completion and return of the Warranty Registration Card is a condition precedent to warranty coverage and performance. This warranty is not valid unless this card is completed and mailed to the factory within fifteen (15) days of equipment installation.

4. All components are covered by this limited warranty except expendable items, such as charcoal filters and disposable dirt holding pads.

5. If within the warranty period any Trion residential electronic air cleaner unit or component requires service it must be performed by a competent heating and/or air conditioning contractor (preferably the installing contractor). Trion, Inc. will not pay shipping charges, or labor charges to remove or replace such defective parts or components. If the part or component is found by inspection to contain such defective material and workmanship it will be either repaired or exchanged free of charge at Trion's option, and returned freight collect.

6. In order to obtain the benefits of this limited two-year warranty, the owner must notify the dealer or distributor in writing of any defect within 30 days of it's discovery. If after reasonable time you have not received an adequate response from the dealer or distributor, notify in writing Trion, Inc., McNeill Road, P.O. Box 760, Sanford, North Carolina 27330. Console or portable models of the electronic air cleaner may be returned intact freight prepaid, but electronic air cleaners which have been installed or become part of real estate cannot be returned. Trion will receive, freight prepaid, only removable parts or components of such defective electronic air cleaners.

7. This limited warranty does not apply to any part or component that is: damaged in transit or when handling, has been subject to misuse, neglect or accident; has not been installed, operated and serviced according to Trion's instruction; has been operated beyond the factory rated capacity; or altered in any such way that its performance is affected. There is no warranty due to neglect, alteration or ordinary wear and tear. Trion's liability is limited to replacement of defective parts or components and does not include the payment of the cost of labor charges to remove or replace such defective components or parts.

8. Trion will not be responsible for loss of use of any product; loss of time, inconvenience, or any other indirect, incidental or consequential damages with respect to person or property, whether as a result of breach of warranty, neglect or otherwise. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE LIMITATION OR EXCLUSION IN THE PRECEDING SENTENCE MAY NOT APPLY TO YOU.

9. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

10. Any warranty work will be performed within a reasonable time, usually within 120 days after notice of defect and delivery to the Trion factory, subject to delays beyond Trion's control.

11. Any warranty be Trion of merchantability, fitness for use or any other warranty (express, implied or statutory), representation or guarantee other than those set forth herein, shall expire at the expiration date of this express limited warranty. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE LIMITATION IN THE PRECEDING SENTENCE MAY NOT APPLY TO YOU.

12. Trion reserves the right to make changes in the design and material of its products without incurring any obligation to incorporate such changes in units completed on the effective date of such change.

TRION, INC.

PLACE
STAMP
HERE

TRION, INC.
P. O. BOX 760
McNEILL ROAD
SANFORD, NORTH CAROLINA
27330

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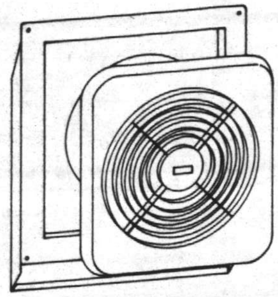
Confidential Records Management, Inc.
New Bern, NC
1-888-622-4425
9/08

BROAN®

A NORTEK COMPANY

Models 508, 509 & 509S AUTOMATIC WALL FANS



READ AND SAVE THESE INSTRUCTIONS

SAFETY NOTES

1. ALL ELECTRICAL WORK MUST BE DONE IN ACCORDANCE WITH LOCAL AND/OR NATIONAL ELECTRICAL CODE AS APPLICABLE. **FOR SAFETY, THIS PRODUCT MUST BE GROUNDED.** IF YOU ARE UNFAMILIAR WITH METHODS OF INSTALLING ELECTRICAL WIRING, SECURE THE SERVICES OF A QUALIFIED ELECTRICIAN.
2. TURN OFF POWER AT SERVICE ENTRANCE BEFORE INSTALLING, WIRING OR SERVICING THIS PRODUCT.
3. **CAUTION: Always vent this product to the outside - NOT into spaces within walls or ceilings, attics, crawl spaces, garages, etc.**
4. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc. off power unit.
5. Fireplaces, gas furnaces, water heaters and the like, require proper flow of combustion air and exhaust. Make sure this flow is not altered when using any exhaust fan.
6. Please read specification label on product for further information and requirements.

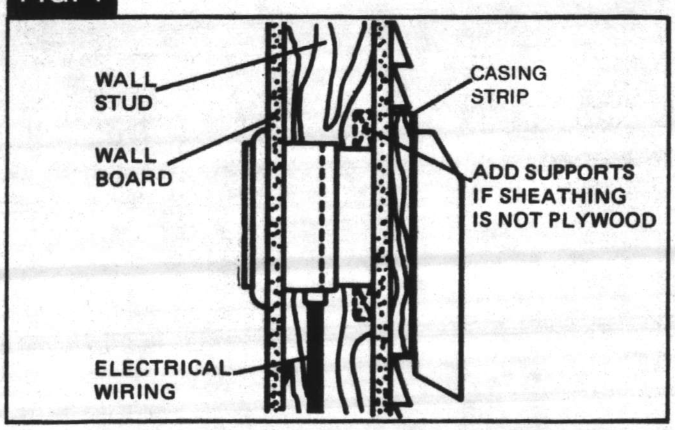
TOOLS AND MATERIALS REQUIRED

- ☐ Straight blade screwdriver
- ☐ Drill, electric or ratchet drive
- ☐ Hammer
- ☐ Pliers
- ☐ 1¼" Spade bit
- ☐ Circle saw
- ☐ Saber saw
- ☐ Tape measure or ruler and pencil
- ☐ Electrical supplies of type needed to comply with local codes
- ☐ 4½' of 1x2 for framing installation opening
- ☐ High quality caulking compound

TYPICAL INSTALLATION

This unit mounts between walls 4-1/2" to 9-1/2" thick. Outside housing flange is fastened to casing strips (1 x 2's). See Fig. 1. If sheathing behind siding is not wood, provide extra supports between walls (nailed or screwed to siding).

FIG. 1



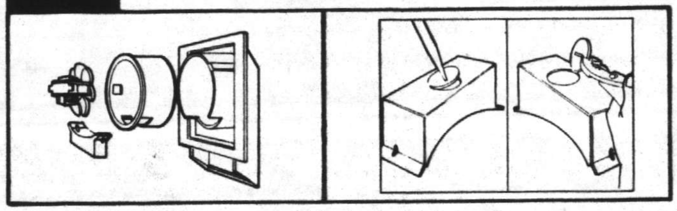
INSTALLER: Leave this manual with the homeowner.
HOMEOWNER: Use and Care information on page 4.

PREPARE FAN

1. Remove motor assembly by loosening mounting screws, rotating assembly and lifting motor assembly out of inner housing (Figure 2).
2. Pull inner housing out of outer housing.
3. Remove wiring knockout from bottom of wiring box (provided in plastic parts bag) (Figure 2).

NOTE
Remove bottom knockout ONLY!

FIG. 2

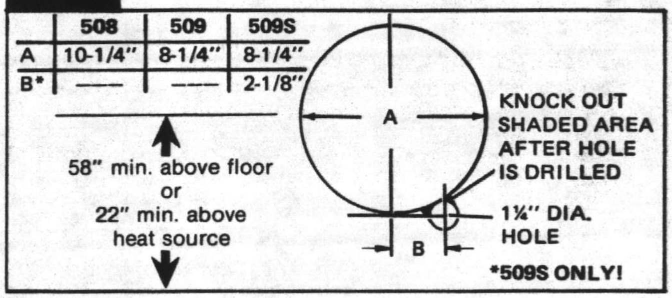


INSTALL FAN

1. Choose location on inside wall. Make sure that wall stud does not run through opening. Lay out hole on wall. (Figure 3) **NOTE:** If fan is installed above a cooking surface, grille center must be located at least 58" above floor or at least 22" above heat source.
2. **509S ONLY.** Lay out smaller hole for rotary switch as shown in Figure 3. Measure from bottom of large circle to the right.

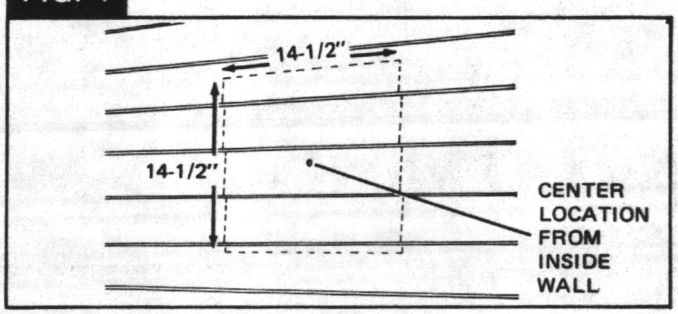
FIG. 3

	508	509	509S
A	10-1/4"	8-1/4"	8-1/4"
B*	----	----	2-1/8"



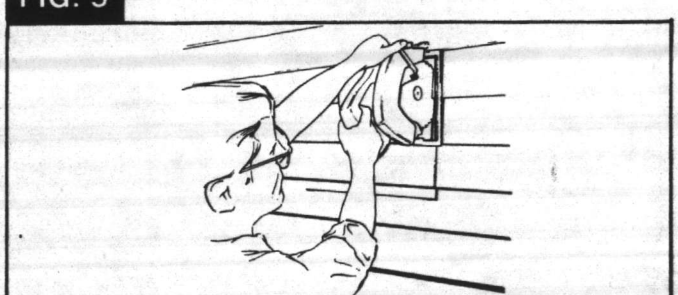
3. Transfer center of hole to outside wall.
4. Cut out hole on inside wall.
5. Lay out 14½" square around center location transferred from inside room (Figure 4).

FIG. 4



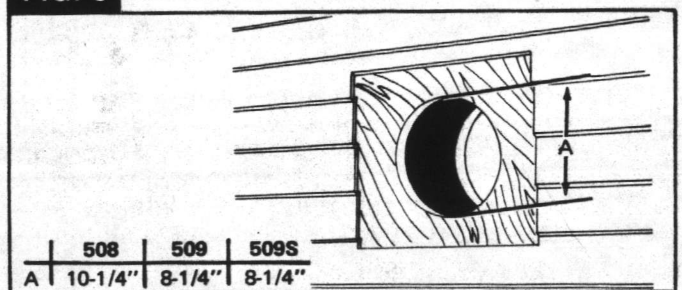
6. Cut square hole in **SIDING ONLY!** DO NOT CUT SHEATHING (Figure 5)! Nail down all siding ends.

FIG. 5



7. Cut round hole for fan housing in sheathing (Figure 6).

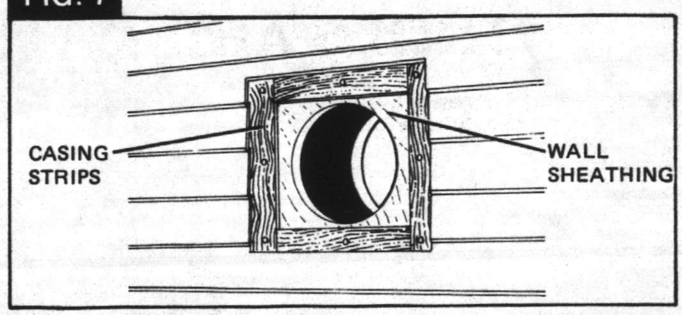
FIG. 6



	508	509	509S
A	10-1/4"	8-1/4"	8-1/4"

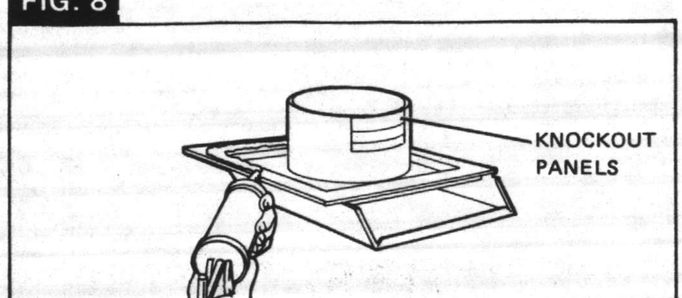
8. Nail or screw 1x2 casing strips inside square opening (Figure 7).

FIG. 7



9. Put a large bead of caulk on the inside of flange on outer housing (Figure 8).
10. If wall is less than 8" thick, remove one or more knockouts on outer sleeve (Figure 8). Use inner sleeve for test fit.

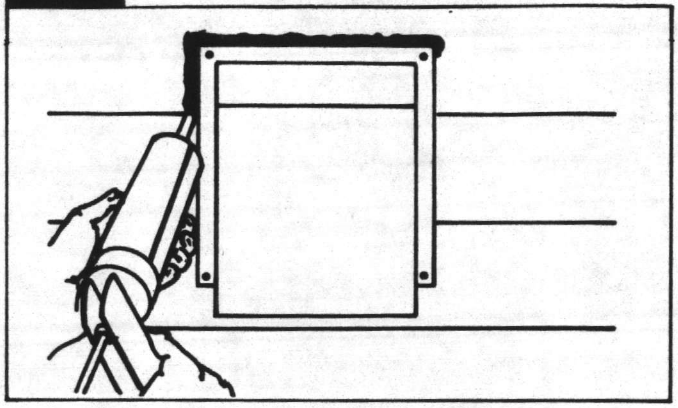
FIG. 8



INSTALL FAN (Cont'd.)

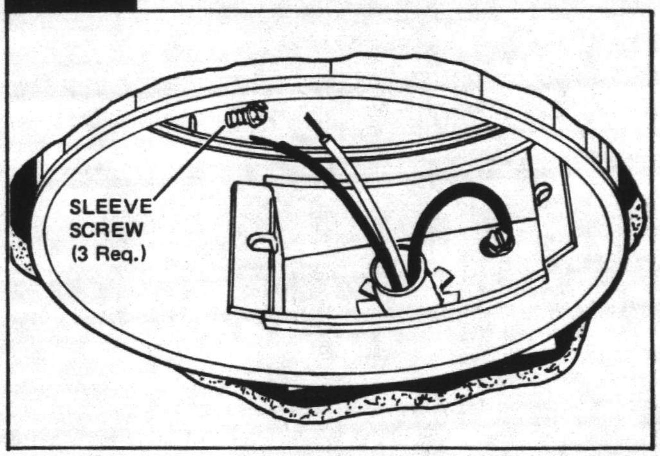
11. Insert outer housing through hole on outside wall and nail or screw housing to casing strips. Caulk all around filler strips and flange (Figure 9).

FIG. 9



12. Run wiring to fan location. Pull wire through both sleeves (Figure 10). Insert inner sleeve into opening and fasten sleeves together with three black sheet metal screws provided in plastic bag.

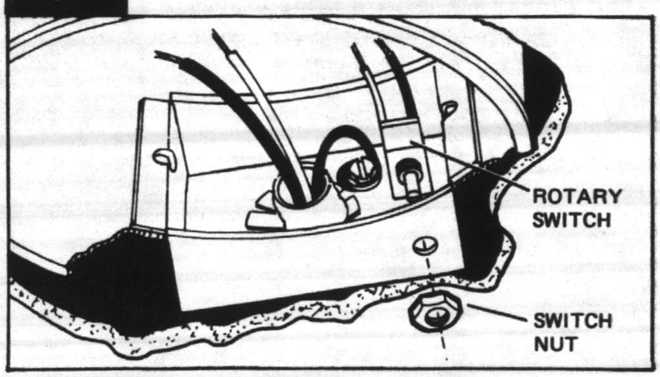
FIG. 10



13. Attach wiring to wiring box with proper connector for type of wire being used. Drop box into opening in housing.

14. **509S ONLY!** Insert switch into wiring box and fasten with nut provided (Figure 11).

FIG. 11



15. Make electrical connections as shown in Figures 12 and 12A. Make sure unit is grounded using green ground screw.

FIG. 12

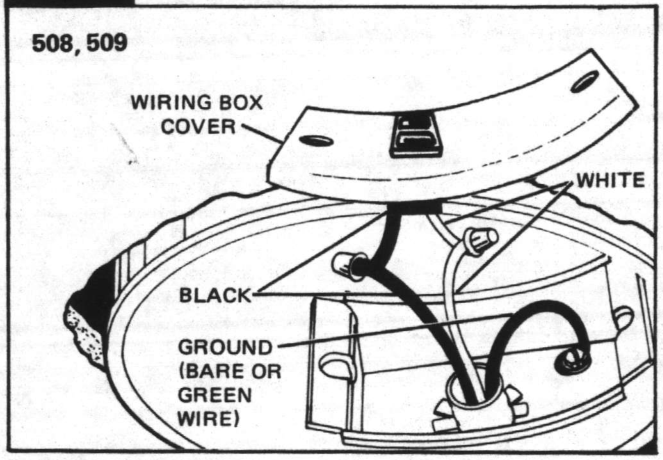
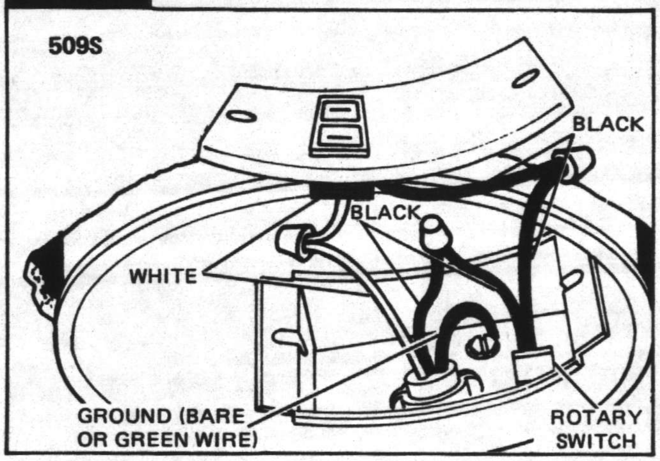


FIG. 12A

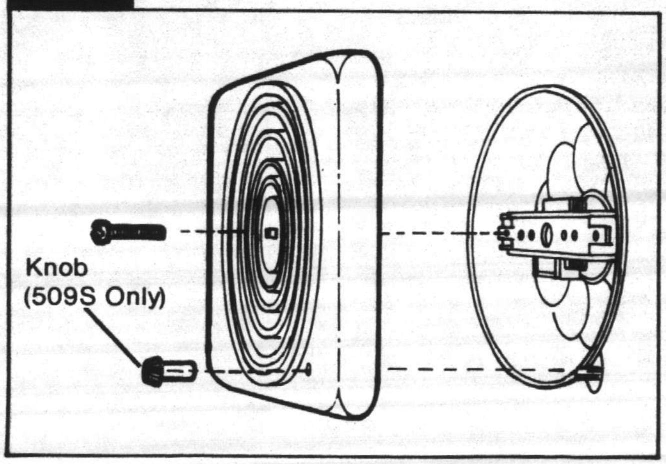


16. Install wiring box cover. Use two screws provided in plastic bag.

17. Reinstall motor assembly and plug in motor.

18. Install grille with two screws provided in plastic bag. Push on knob (Fig. 13).

FIG. 13



USE AND CARE

DISCONNECT ELECTRICAL POWER SUPPLY BEFORE SERVICING FAN.

Always unplug the fan motor before servicing the fan. The motor bearings on this fan are lifetime lubricated and will never need oiling.

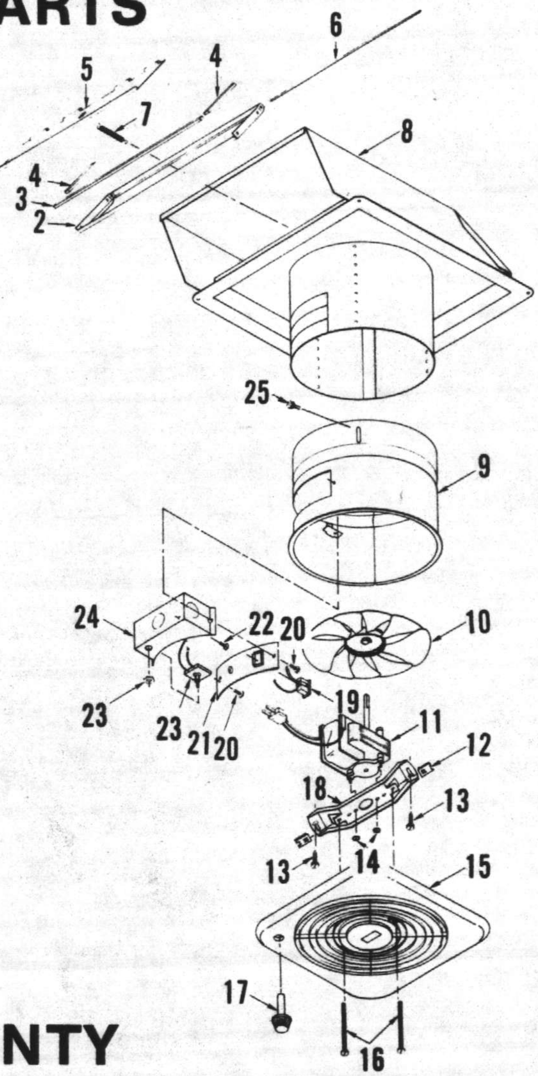
Clean the fan blade and motor every six months by removing the grille, unplugging the motor, and gently vacuuming the fan blade and motor.

Clean the grille in warm, soapy water. Use a mild detergent, such as a dishwashing liquid. DO NOT USE ABRASIVE CLOTHS, STEEL WOOL OR SCOURING POWDERS.

SERVICE PARTS

KEY NO.	PART NO. 508 10" FAN	PART NO. 509 & 509S 8" FANS	DESCRIPTION
1	97008755	97008755	Damper Assembly (Incl. Key Nos. 2 thu 6)
2	98007037	98007037	Damper Frame
3	99100430	99100430	Foam - Long
4	99100431	99100431	Foam - Short (2 required)
5	98006086	98006086	Damper Flap
6	98006048	98006048	Damper Rod
7	99140145	99140145	Damper Spring
8	97008754	97008753	Outer Housing
9	97007088	97007085	Inner Housing
10	99020166	99020165	Fan Blade
11	99080177	99080180	Motor
12	99420479	99420479	Sheet Metal Nuts (2 required)
13	99150479	99150479	#8-32 x 1/2 Hex Head Self Tapping Screws (2 required)*
14	99260425	99260466	Motor Nuts (2 required)
15	99110567	99110566	Grille
		99110576	Grille (509S Only)
16	99160322	99160322	}10-12 x 3 Pan Head Screws (2 required)
17	——	99360116	Rotary Switch Knob (509S Only)
18	98006066	98006063	Motor Bracket
19	99270011	99270011	Receptacle
20	——	——	#8B x 3/8 Hex Head Self Tapping Screws (2 required)*
21	98006047	98006047	Wiring Box Cover
22	——	——	#10-32 x 1/2 Hex Head Self Tapping Screw*
23	——	97005328	Rotary Switch (509S Only) Inclu. Nut
24	98006046	98006046	Wiring Box
25	——	——	#8A x 1/4 Hex Head Sheet Metal Screws (3 required)*
26	97007087	97007087	Parts Bag (Incl. Key Nos. 16, 20, 21, 22, 24, 25)**

*Standard Hardware. May be purchased locally.
**Not Illustrated.



WARRANTY

BROAN ONE YEAR LIMITED WARRANTY

Broan Mfg. Co., Inc. warrants that its products will be free from defects in materials or workmanship for a period of one year from the date of original purchase. During this one-year period, Broan will repair or replace, at its option, any product or part which is found to be defective under normal use and service without charge. Broan's obligation to repair or replace, at Broan's option, shall be the purchaser's sole and exclusive remedy under this warranty.

THIS WARRANTY DOES NOT EXTEND TO FLUORESCENT LAMP STARTERS AND TUBES, FILTERS, DUCTS, ROOF CAPS, WALL CAPS AND OTHER ACCESSORIES FOR DUCTING. This warranty does not include normal maintenance and service and does not apply to any products or parts which have been subject to misuse, negligence, accident, improper maintenance or repair by others than Broan, faulty installation or installation contrary to recommended installation instructions.

THERE IS NO OTHER EXPRESS WARRANTY. The duration of any implied warranty is limited to the one-year period as specified in the express warranty. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you. BROAN SHALL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH PRODUCT USE OR PERFORMANCE EXCEPT AS MAY OTHERWISE BE ACCORDED BY LAW. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty supersedes all prior warranties.

For service, notify Broan Mfg. Co., Inc., Hartford, Wisconsin 53027 (Telephone: 414-673-4340) or, in California, notify Broan Mfg. Co., Inc., La Mirada, California 90638 (Telephone: 213-926-0595), giving the model number, part identification and nature of any defect in the product or part. At the time of requesting warranty service, evidence of the original purchase date must be presented.

BROAN MFG. CO., INC.
926 West State Street
Hartford, WI 53027

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Confidential Records Management, Inc.
New Bern, NC
1-888-622-4425
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Honeywell

T874C, T874G, T874R THERMOSTATS AND Q674F, Q674L SUBBASES (for Rheem and Ruud Heat Pumps)

INSTALLATION INSTRUCTIONS FOR THE TRAINED SERVICE TECHNICIAN

APPLICATION

These Honeywell thermostat/subbase combinations provide 24 to 30 Vac control for heat pump systems. See table below. T874C models are shipped with a restricted set point of 72 F [22 C] maximum for heating and 78 F [26 C] minimum for cooling or 75 F [24 C] maximum for heating and 75 F [24 C] minimum for cooling.

THERMOSTAT/ SUBBASE MODEL[a]	NUMBER OF STAGES		CHANGEOVER STAGE		TYPE OF SWITCHING		SEE FIG.
	HEATING	COOLING	HEATING	COOLING	SYSTEM	FAN	
T874C/Q674L	2	1	—	b	EM.HT.-HEAT-OFF-COOL	AUTO-ON	5,6
T874G/Q674F1238	2	1	—	1	OFF-COOL-AUTO-HEAT-EM.HT.	AUTO-ON	7
T874G/Q674F1360	2	1	1	—	OFF-COOL-AUTO-HEAT-EM.HT.	AUTO-ON	10
T874R/Q674L	2	1	—	b	EM.HT.-HEAT-OFF-COOL	AUTO-ON	8,9

[a]The Q674 Subbases provide wiring terminals, system switch and fan switching for the system operation.

[b]Provided manually with the subbase system switch in COOL position.

INSTALLATION

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

CAUTION

1. Disconnect power supply to prevent electrical shock or equipment damage.
2. To prevent interference with the thermostat linkage, keep wire length to a minimum and run wires as close to the subbase as possible.
3. Do not overtighten thermostat captive mounting screws, as damage to subbase threads may result.
4. Do not short across coil terminals on relay. This may burn out the thermostat heat anticipator.

LOCATION

Install the thermostat about 5 ft [1.5 m] above the floor in an area with good air circulation at average temperature.

Do not install the thermostat where it may be affected by—

—drafts, or dead spots behind doors and in corners.
—hot or cold air from ducts.
—radiant heat from sun or appliances.
—concealed pipes and chimneys.
—unheated (uncooled) areas, such as an outside wall, behind the thermostat.

MOUNTING THE SUBBASE

The thermostat subbase can be mounted on a vertical outlet box, horizontal outlet box or directly on the wall.

1. If you must mount the subbase on a vertical outlet box, order 193121A Adapter Assembly (Fig. 1). The assembly includes an adapter ring, two screws and a cover plate to cover marks on the wall. Install the ring and cover plate on the vertical outlet box.

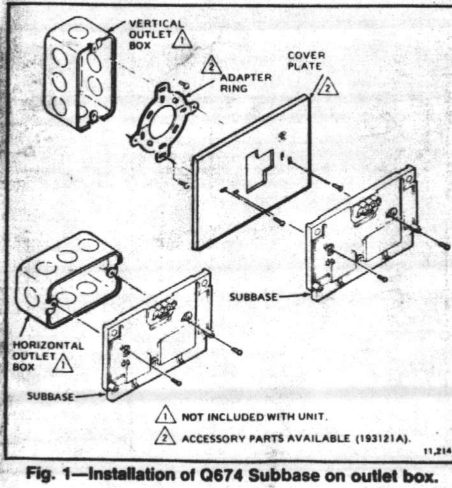

Fig. 1—Installation of Q674 Subbase on outlet box.

For a wall installation, hold subbase in position and mark holes for anchors (Fig. 2). Wall anchors must be obtained from a local hardware store. Take care that the wires do not fall back into the wall opening. Set subbase aside. Drill four 3/16 inch holes and gently tap anchors into the holes until flush with the wall.

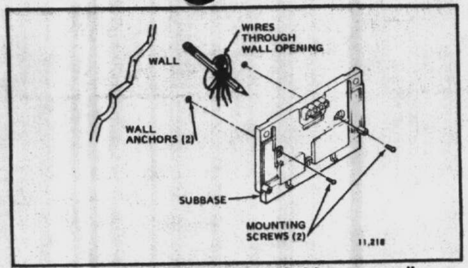

Fig. 2—Installation of Q674 Subbase on wall.

2. Pull wires through the cover plate (if used) and thermostat cable opening (Fig. 3).

3. Secure the cover plate (if used) and subbase with the screws provided. Do not fully tighten the subbase screws.

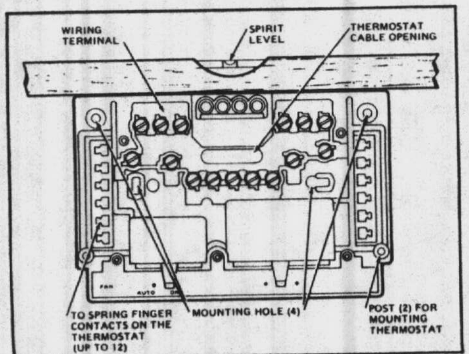

Fig. 3—Subbase components and leveling procedure.

4. Level the subbase using a spirit level, as shown in Fig. 3, and firmly tighten subbase mounting screws. The subbase mounting holes provide for minor out-of-level adjustments.

IMPORTANT

A subbase incorrectly leveled will cause the temperature control to deviate from set point.

WIRING THE SUBBASE

Disconnect power supply to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances. Follow equipment manufacturer's wiring instructions when available. To wire subbase, proceed as follows:

1. Connect the system wires to the subbase as shown in Fig. 5 through 10. A letter code is near each terminal for identification. The terminal barrier permits straight or conventional wraparound wiring connection (Fig. 4).
2. Firmly tighten each terminal screw.
3. Fit wires as close to the subbase as possible. Push excess wire back into hole.
4. Plug hole with nonflammable insulation to prevent drafts from affecting the thermostat.

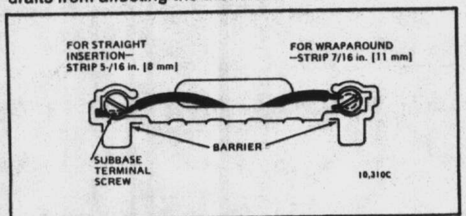

Fig. 4—Wiring connections.

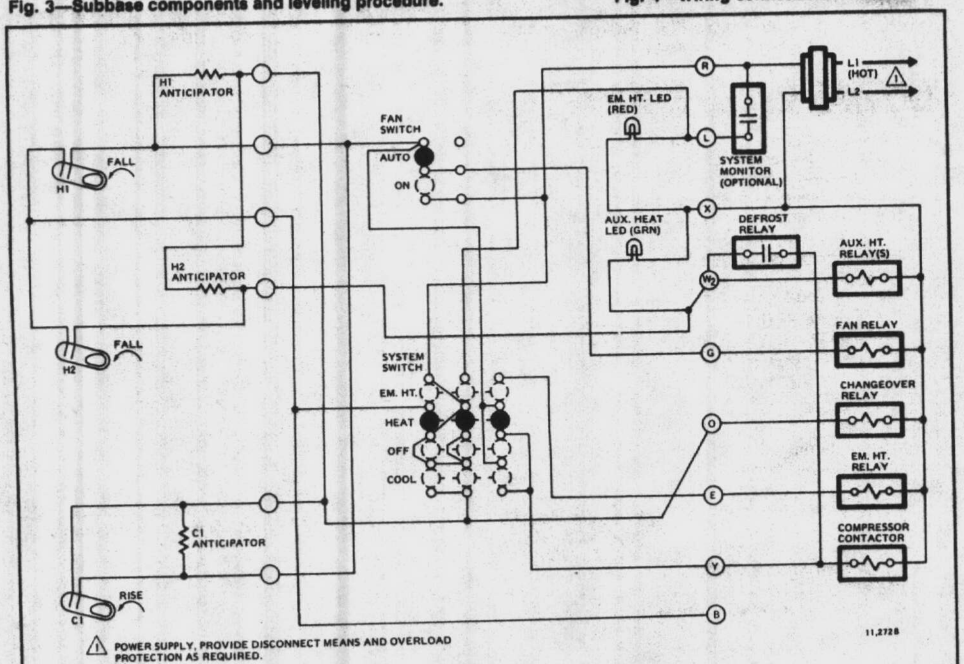

Fig. 5—Internal schematic and typical wiring diagram for T874C and Q674L1157.

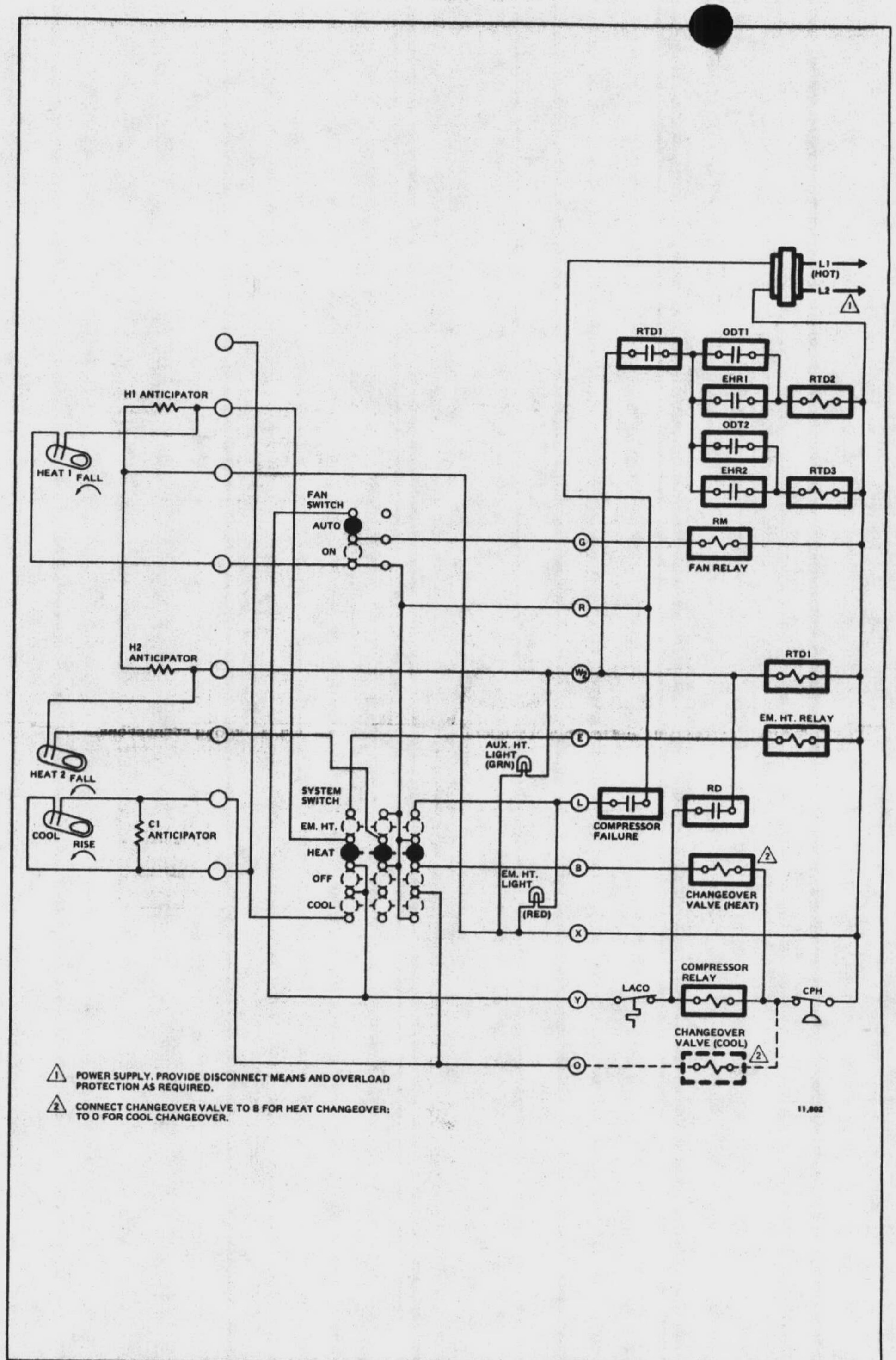

Fig. 6—Internal schematic and typical wiring diagram for T874C and Q674L1504.

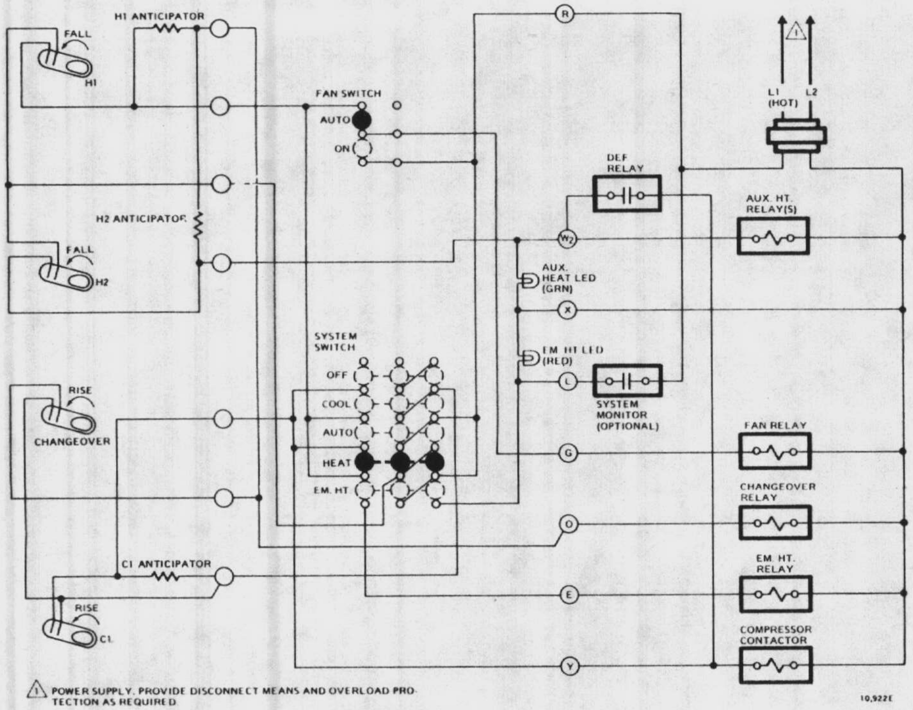

Fig. 7—Internal schematic and typical wiring diagram for T874G and Q674F1238.

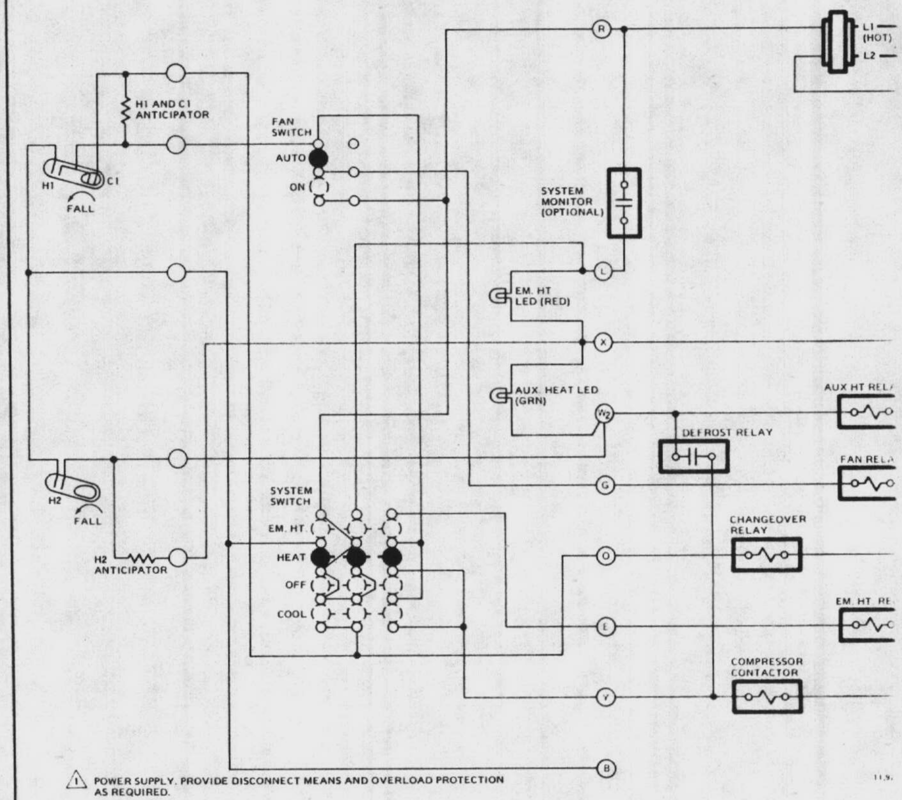

Fig. 8—Internal schematic and typical wiring diagram for T874R and Q674L1157.

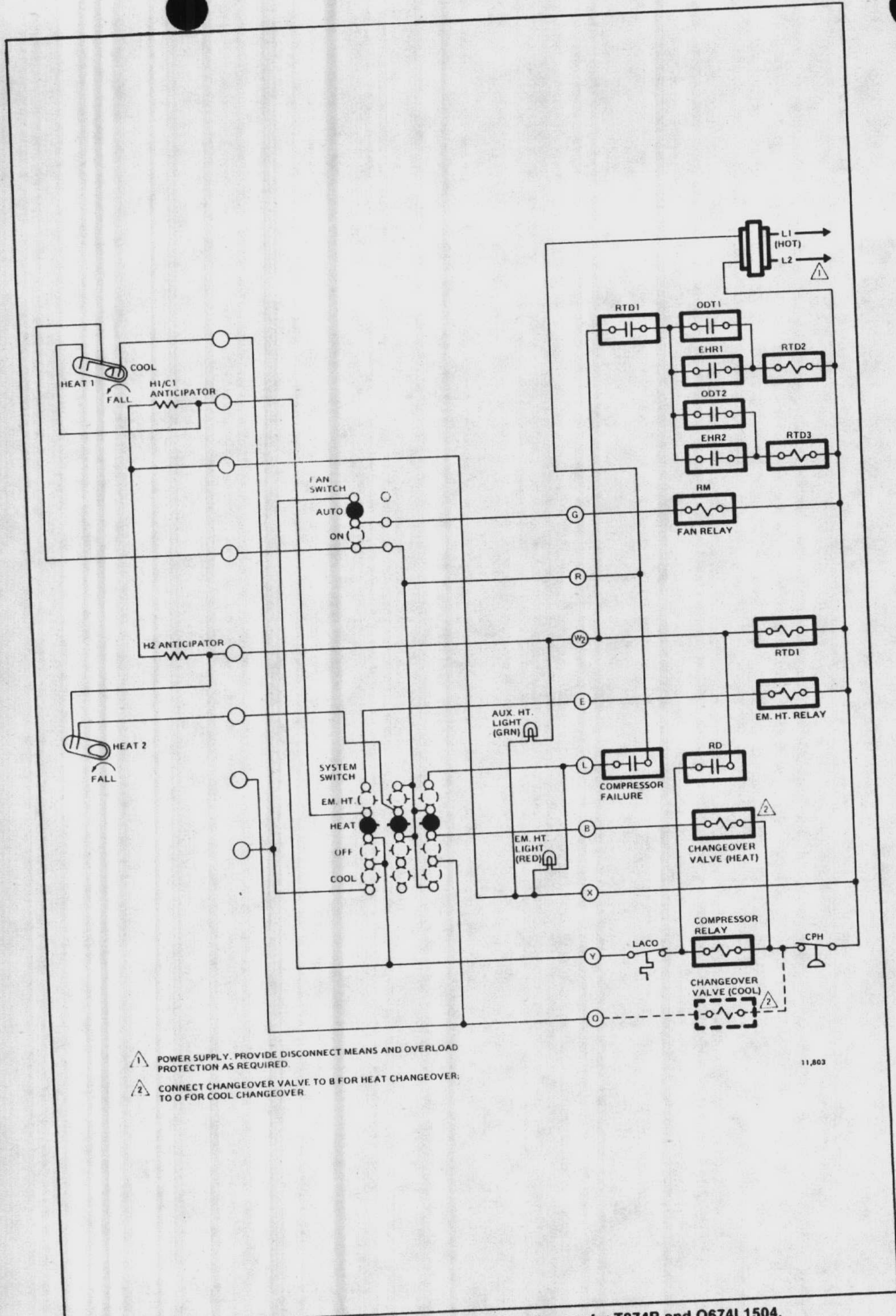

Fig. 9—Internal schematic and typical wiring diagram for T874R and Q674L1504.

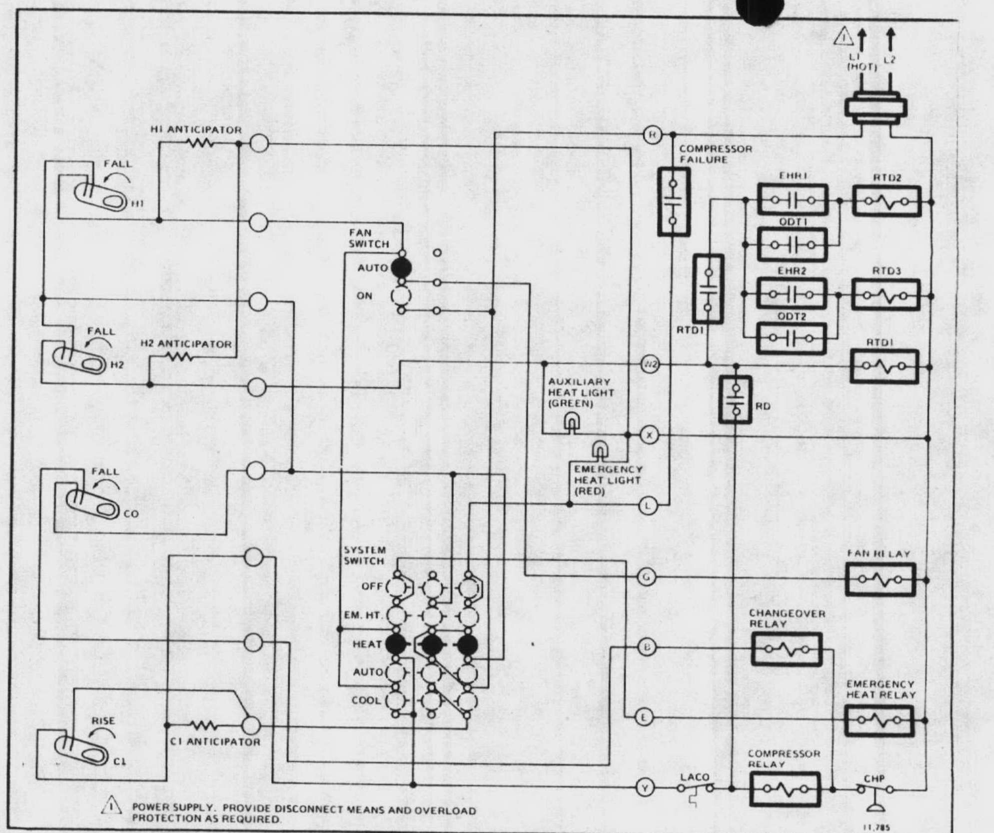

Fig. 10—Internal schematic and typical wiring diagram for T874G and Q674F1360.

MOUNTING THE THERMOSTAT

1. Remove the thermostat cover by pulling the bottom edge of the cover upward until it snaps free of the mounting slots.

NOTE: The cover is hinged at the top and must be removed by pulling up at the bottom.

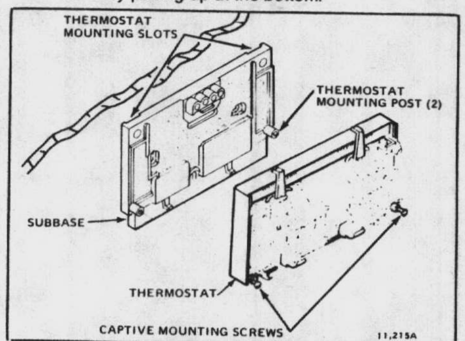

Fig. 11—Mounting thermostat on subbase.

2. Carefully remove and discard the polystyrene packing insert which protects the mercury switches during shipment.

3. Turn thermostat base over and note the spring fingers which engage the subbase contacts. Make sure the spring fingers are NOT bent flat. Flat fingers prevent proper electrical contact with the subbase.

4. Note the two tabs on the top inside edge of the thermostat base. The tabs fit into corresponding slots on top of the subbase. Mount the thermostat on the subbase.

5. Align the two captive mounting screws in the thermostat base with the posts on the subbase (Fig. 11). Tighten both screws. DO NOT OVERTIGHTEN SCREWS or damage to subbase posts may result.

SETTINGS

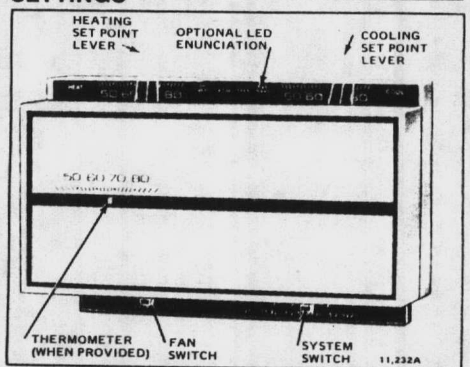

Fig. 12—Location of external components.

TEMPERATURE SETTING

The T874C and G have separate heating and cooling set point levers, the T874R has one set point lever for heat and cool. Move the heating and cooling set point lever(s) (Fig. 12) to the desired comfort position(s). The minimum differential between heating and cooling set point is 3 F [2 C] on T874C,G.

SUBBASE SETTING

The subbase switching positions control the system operation as described below (Fig. 12).

SYSTEM SWITCH (some subbases do not have all of the following functions).

OFF—both the heating and cooling systems are off. If the fan switch is at AUTO position, the cooling fan is also off.

AUTO—thermostat automatically changes between heating and cooling system operation, depending upon the indoor temperature.

HEAT—heating system is automatically controlled by the thermostat. Cooling system is off.

COOL—cooling system is automatically controlled by the thermostat. Heating system is off.

EM. HT.—emergency heat relay is automatically controlled by the thermostat. Cooling system is off.

FAN SWITCH

ON—fan operates continuously.

AUTO—fan operates automatically with heating and cooling equipment as controlled by the thermostat.

To move the subbase switches to the desired control positions, use thumb and index finger to slide lever. Lever must stop over desired function indicator position for proper circuit operation.

LED OPERATION

Two light emitting diode (LED) indicators are supplied on your subbase. These LEDs light up when something specific happens within the system. The LEDs are not field replaceable. The meaning for each light is as follows:

EM.HT.—LED lights when system switch is placed in the EM.HT. position by the homeowner. Emergency heat equipment is operating and the heat pump is off.

AUX.HT.—LED lights when auxiliary heat equipment is operating. Usually means that the heat pump can't handle the load.

CHECKOUT

HEATING

Move the system switch on the Q674 to HEAT or AUTO (if used) and the fan switch to AUTO. Move the heating set point lever on the T874 about 10 F [6 C] above room temperature. Heating equipment should start and the fan should run. Move the heat lever about 10 F [6 C] below room temperature. The heating equipment and fan should shut off.

NOTE: In heat pump applications, time delays are involved before the compressor is activated to prevent short cycling. The delays are provided by a timer which prevents the compressor from starting for several minutes after the thermostat last turned the compressor off, or after the system first received power.

COOLING

CAUTION

Do not operate cooling if outdoor temperature is below 50 F [10 C]. Refer to manufacturer's recommendations.

Move the system switch on the Q674 to COOL or AUTO (if used) and the fan switch to AUTO. Move the cooling set point lever on the T874 about 10 F [6 C] below room temperature. The cooling equipment should start (see NOTE above). Move the cool lever about 10 F [6 C] above room temperature. The cooling equipment and fan should shut off.

FAN

Move the subbase system switch to OFF and the fan switch to ON. The fan should run continuously. Move the fan switch to AUTO. In this position, fan operation is controlled by the heating or cooling system control circuit.

CALIBRATION

THERMOSTAT

T874 Thermostats are accurately calibrated at the factory. THEY DO NOT HAVE PROVISION FOR FIELD CALIBRATION.

THERMOMETER

The thermometer in your thermostat has been accurately calibrated at the factory. The thermometer should only need adjustment if it has been dropped or mishandled.

If the set point lever and the thermometer reading do not agree, follow the procedure below.

1. Remove the thermostat cover by pulling up from the bottom of cover until it clears the mounting slots.
2. Set the thermostat cover on a table near an accurate thermometer.
3. Allow 5 minutes for cover thermometer to sense area temperature; compare the readings. Be careful not to touch thermometer or breathe on it.
4. If the readings are the same, replace cover and put the system into operation.
5. If the readings are different, insert a small screwdriver in the thermometer slot (Fig. 13) and turn it until the thermometers have the same reading.
6. Replace thermostat cover and put the system into operation.

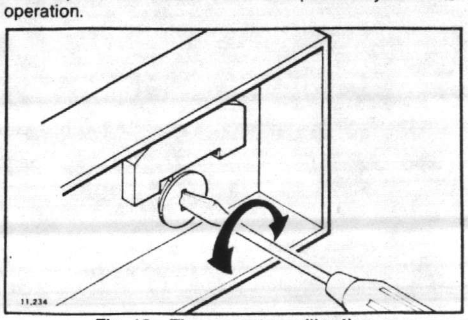

Fig. 13—Thermometer calibration.

Honeywell Inc.
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Golden Valley, MN 55422-4386

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ATTENTION INSTALLER

THIS ONE-PIECE THERMOSTAT WITH PROVISIONS FOR FRONT WIRING HAS A CABLE HOLE IN LINE WITH THE WIRE ENTRANCE IN THE WALL. THIS FEATURE INCREASES THE NEED TO PLUG THE WIRE HOLE IN THE WALL BEHIND THE THERMOSTAT TO ELIMINATE THE EFFECTS OF WALL DRAFTS ENTERING THE THERMOSTAT AND AFFECTING PERFORMANCE. THE HOLE IN THE WALL MUST BE PLUGGED IN ORDER TO ALWAYS INSURE PROPER PERFORMANCE.

(Duct seal or a comparative material is suggested as the best sealant. **DO NOT** use thermostat packing foam)

THE FOAM PAD ATTACHED TO THE BACK OF THE THERMOSTAT PROVIDES ADDITIONAL ASSURANCE THAT THROUGH-THE-WALL AIR FLOW DOES NOT AFFECT THERMOSTAT PERFORMANCE. DO NOT REMOVE OR DAMAGE THE PAD AS THIS MAY RESULT IN IMPROPER CYCLING OF THE SYSTEM.

FOR BEST PERFORMANCE THE PAD MUST REMAIN IN PLACE AND THE WALL HOLE MUST BE PLUGGED.

74-130356
1/87

INSTALLATION INSTRUCTIONS

HEAT PUMP THERMOSTAT MANUAL CHANGEOVER

TWO STAGE HEAT, ONE STAGE COOL

74-130297 Rev. 0
October 1985

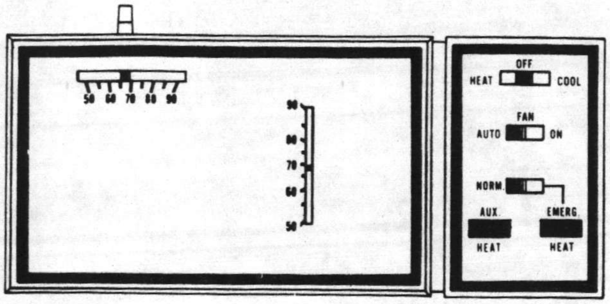


Figure 1. Thermostat

SPECIFICATIONS

Range 50° to 90° on heating cycle. 50° to 90° on cooling cycle.
Adjustment Means: Single setting lever used for heating or cooling control. Heating or cooling selection made by positioning system switch.
Differential: Heating or cooling 2°F.
Switch Rating: Mercury switches 1.5 amps at 24 volts. Slide switches 2 amps at 24 volts.
Scale Markings: 5 degrees per division, numbered every 10 degrees.
Dimensions: 6.3" x 2.75" x 1.72".

IMPORTANT

The thermostat is specially packed for shipment. However, it must be handled carefully.

INSTALLATION

Location: Locate the thermostat on an inside wall since the temperature of outside walls varies with outdoor conditions.

1. The position on the inside wall must be at least 18 inches from the junction with an outside wall.
2. The vertical location should be about five feet above the floor and should permit a free flow of room air over the thermostat.
3. Having made a tentative selection of the best mounting location, check against the following possible objections:

   a. Steam pipes, water pipes, or warm air stacks in adjacent partition space.
   b. Cold, unused room on opposite side of partition.
   c. Kitchen range on opposite side of partition.
   d. Subject to radiation from fireplace or direct sun effect from windows.
   e. Subject to drafts from stairwells or outside doors.
   f. In direct path of air currents from air delivery registers.
   g. Heat from nearby floor lamps, radios, or television sets.

UNPACKING

After removing thermostat from carton, disassemble as follows:

1. Remove the thermostat cover by pulling the bottom edge of cover upward until it snaps free.
2. Carefully remove and discard the packing which protects the mercury switches and thermometer during shipment.
3. Place cover in a safe place while mounting the thermostat.

THERMOSTAT MOUNTING

1. At the location selected, prepare an opening for the thermostat wiring.
2. Check unit wiring diagrams and required optional equipment for determining number of wires needed at thermostat.
3. Run low voltage thermostat wires to the location and pull about 4 inches through the wall opening and lead through large opening in thermostat indicated in Figure 2.
4. Fasten thermostat on wall or a horizontal outlet box using two elongated holes as indicated in Figure 2.
5. Level the thermostat using a carpenter's level. Minor out-of-level adjustments can be made by using the elongated mounting holes.

IMPORTANT

Inaccurate leveling will cause thermostat control deviation. Care must be taken to mount thermostat in a <u>true level position.</u>

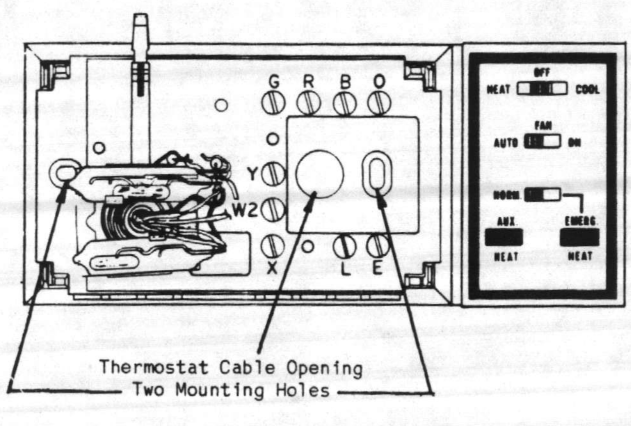
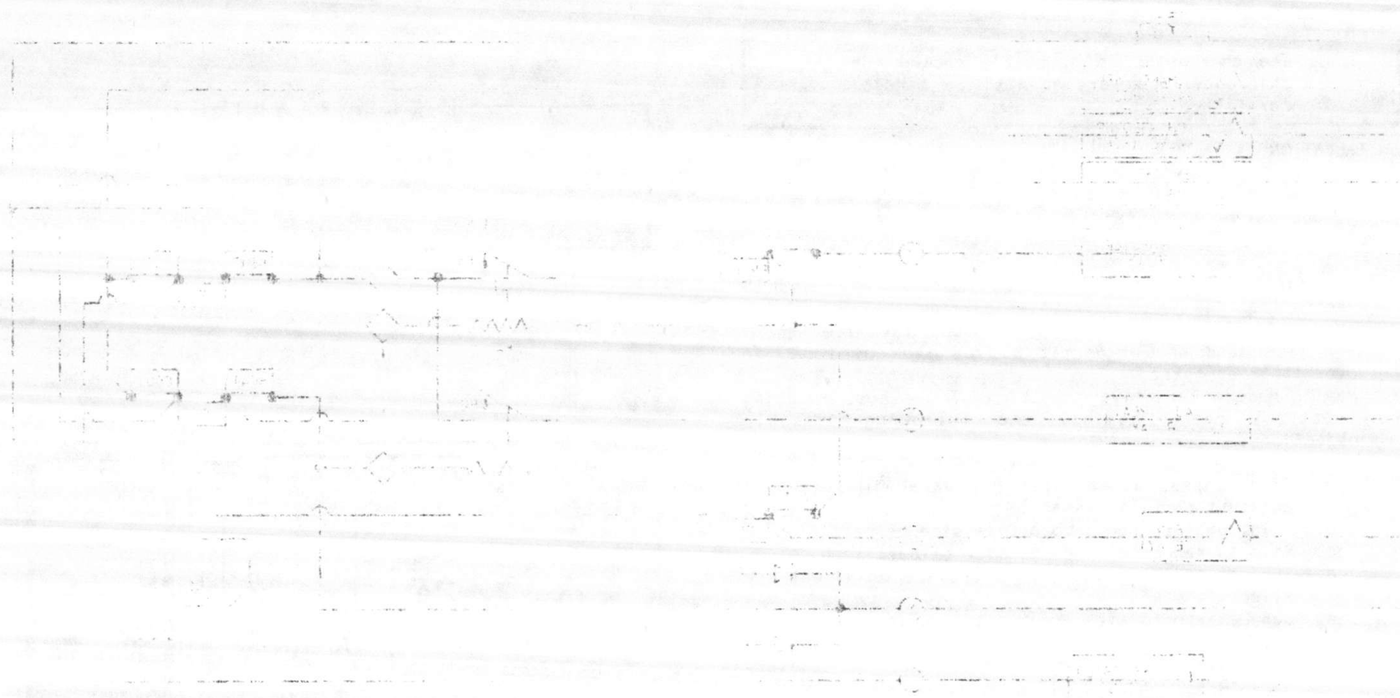


Figure 2. Thermostat with Cover Removed



WIRING

1. All wiring must comply with applicable codes and ordinances. Use color coded thermostat wiring for ease of wiring.
2. Connect leads to terminals of heat pump unit and room thermostat. Refer to Installation Instructions of the heat pump and Figure 3 for wiring instructions.
3. A letter code is near each terminal for easy identification.
4. Push excess wire back into wall and plug wall opening with putty or caulking material to prevent drafts from affecting thermostat.
5. Snap cover into place by slipping it over the four plastic pressure springs at the corners of the thermostat.

NOTE:

If emergency heat relay or outdoor thermostats are not used, a jumper between "W2" and "E" can be installed to transfer control of heating to the first stage when NORMal switch is in the EMERGency HEAT position.

SETTING AND ADJUSTING

No adjustments are necessary as the heating and cooling anticipators are the voltage type and no change is required when installed with various control systems (limited 1.5 amps). Move the temperature set lever to the desired position. It takes at least one hour after the room temperature has reached the thermostat setting for all sensors to stabilize.

CONTROL PANEL OPERATION

To the right there is a control panel which has three switches and two lamps. The "SYSTEM" switch, "FAN" switch and "NORMal" switch. The lamps are blue "AUX HEAT" and red "EMERGency HEAT".

"SYSTEM" switching positions control thermostat operation as follows:

HEAT - Heating system is controlled by the thermostat. Cooling system is off.

OFF - Both the heating and cooling systems are off. If the "FAN" switch is at "AUTO" position, the fan is also off.

COOL - Thermostat controls cooling system. Heating system is off.

"FAN" switching positions control fan operation as follows:

AUTO - Fan operates with heat pump.

ON - Fan operates continuously.

"NORMal" switching positions control heating operation as follows:

NORMal - Heat pump and auxiliary heaters operate normally. Emergency heat lamp is off.

EMERG. HEAT - Energizes auxiliary heaters through thermostat operation and de-energizes the heat pump. The red emergency heat lamp is on all of the time.

AUX. HEAT LAMP - Blue lamp will be on when the auxiliary heaters are energized.

EMERG. HEAT LAMP - Red lamp is on when NORMal switch is in the EMERGency HEAT position. Check optional equipment installed for other lamp functions.

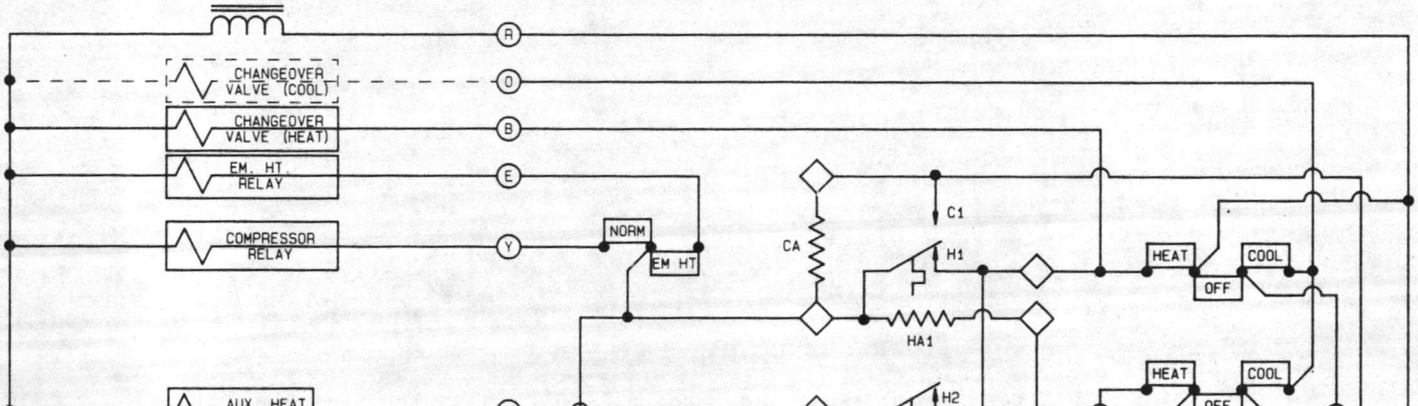


Figure 3. Internal Wiring Schematic

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ALCO MANUFACTURING

Division of RACHELS INDUSTRIES, INC.

ALCO CLASS I SOFT-FLEXIBLE DUCT
INSTALLATION INSTRUCTIONS

SPLICES & CONNECTIONS

CONNECTIONS

1. Determine correct length and cut all materials with scissors or knife. Snip wire with wire cutters.
2. Pull back outer jacket and insulation 3-4'' from end of duct exposing inner core.
3. Slip inner core over 3'' of metal collar — making sure at least 2 coils of wire are past the bead on the end of the collar.
   Secure core to collar with 2 wraps of duct tape.
4. Return insulation and outer jacketing over exposed core, and secure with a 1/2 or 5/8'' solid or perforated metal band clamp — on the collar side of beading.
   Secured collar may now be attached to plenum or fitting as required.

SPLICING

1. Pull back outer jacket and insulation 3-4'' from end of duct exposing inner core.
2. Slip each end of inner cores to be spliced over 3'' of connector collar — making sure minimum 2 coils of wire are past the male bead on each end of the collar.
   Secure both pieces of core to the collar with 2 wraps of duct tape.
3. Return insulation and outer jacketing over exposed core from both ducts, and secure each duct to the connector with a solid or perforated metal band clamp — being sure clamps are past or inside the beading on the collar.

NOTE: 1. Recommended collars should be minimum 28 gauge, 6" long, with a male bead 1" in from each end.

2. Duct tape to be Nashua #357 — 2" wide.