

INSTALLATION INSTRUCTIONS

HIGH EFFICIENCY PACKAGED AIR CONDITIONER

MODELS

P1124A1

P1130A1

P1136A1

P1142A1

**FOR RESIDENTIAL AND COMMERCIAL
HEATING/COOLING APPLICATIONS**

MANUAL 2100-176 REV. A
SUPERSEDES REV.
FILE VOL. II, TAB 10

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BRYAN, OHIO

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TABLE 1
ELECTRICAL DATA

Model	Rated Volts & PH	Operating Voltage Range	Max. Unit Amps	Req'd. Maximum External Fuses Or Ckt. Brk *	Minimum Circuit Ampacity	Field Power Wiring**	Ground Wire Size**
				Ckt. A	Ckt. A	Ckt. A	Ckt. A
P1124A	230/208-1	197-253	13.3	25	18	12	12
P1130A	230/208-1	197-253	17.2	30	22	10	10
P1136A	230/208-1	197-253	18.7	40	27	10	10
P1142A	230/208-1	197-253	23.5	50	31	10	10

*Maximum time delay fuse or HACR type circuit breaker.

**60 degree C copper wire size, basic unit only.

TABLE 2
OPTIONAL FIELD INSTALLED HEATER PACKAGES
ARE ONLY TO BE USED WITH THE AIR CONDITIONING
MODEL AS INDICATED BELOW

Heater Package Model No.	Volts and Phase	P1124A	P1130A	P1136A	P1142A
EH3PA-A05	240/1	S	S	S	
EH3PA-A08		S	S	S	
EH3PA-A10		S	S	S	
EH3PA-A15			S	S	
EH3PA-B09	240/3	A	A	A	
EH3PA-B15			A	A	
EH5PA-A05	240/208-1				S
EH5PA-A10					S
EH5PA-A15					S
EH5PA-A20					S
EH5PA-B09	240/208-3				A
EH5PA-B15					A
EH5PA-B18					A

S - Standard application--Heater volts and phase same as basic unit.

A - Alternate application--Heater volts and phase different from basic unit.

**TABLE 3
OPTIONAL FIELD-INSTALLED ELECTRIC HEATER TABLE**

Heater Pkg. Model No.	Unit Volts Phase	Htr. KW & Cap. @240V (or 480V if applicable)		Heater KW & Capacity @208 Volts		@240V or 480V as Applicable Htr. Amps	Heater Internal Fuses	Circuit B				
								No. Field Ckts.	Minimum Circuit Ampacity	(1) Maximum Overcurrent Protection	(2) Field Power Wiring	(3) Ground Wire Size
BH3PA-A05	240/208-1	5	17,100	3.75	12,800	20.8		1	26	30	10	10
BH3PA-A08	240/208-1	8	27,300	6	20,500	33.3		1	42	45	6	10
BH3PA-A10	240/208-1	10	34,100	7.5	26,000	41.7		1	53	60	6	10
BH3PA-A15	240/208-1	15	51,200	11.25	38,400	62.5	30/60	1	79	80	3	8
BH3PA-B09	240/208-3	9	30,700	6.75	23,000	21.7		1	28	30	10	10
BH3PA-B15	240/208-3	15	51,200	11.25	38,400	36.2		1	46	50	6	10
BH5PA-A05	240/208-1	5	17,100	3.75	12,800	20.8/18.1		1	26/23	30/25	10/10	10
BH5PA-A10	240/208-1	10	34,100	7.5	26,000	41.6/36.2		1	53/46	60/50	6/6	10
BH5PA-A15	240/208-1	15	51,200	11.25	38,400	62.5/54.1	30/60	1	79/68	80/70	3/4	8
BH5PA-A20	240/208-1	20	68,200	15.0	51,200	83.2/72.1	60/60	1	104/91	110/100	2/3(4)	6
BH5PA-R09	240/208-3	9	30,700	6.75	23,000	21.7/18.7		1	28/24	30/25	10/10	10
BH5PA-B15	240/208-3	15	51,200	11.25	38,400	36.2/31.2		1	46/39	50/40	6/8	10
BH5PA-B18	240/208-3	18	61,400	13.5	46,100	43.4/37.5		1	55/47	60/50	6/6	10

- (1) Time delay fuses or "HACR Type" circuit breakers must be used for 60 and smaller sizes. Standard fuses or circuit breakers are suitable for sizes 70 and larger. 480V circuit breakers are not "HACR Type".
- (2) Based on wire suitable for 60 degrees C. Other wiring materials must be rated for marked "Minimum Circuit Ampacity" or greater.
- (3) Based upon Table 250-95 of N.E.C. 1984. See electrical data for basic heat pump for Ckt. A wiring specification requirements.
- (4) For ampacities over 100 amperes use wire suitable for at least 75° C.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect, properly size fuses and conductor wires in accordance with the National Electrical Code and all existing local codes.

TRANSFORMERS

230/208V, 1 phase and 3 phase equipment employ dual primary voltage transformers. All equipment leaves the factory wired on 240V tap. For 208V operation, reconnect from 240V to 208V tap. The acceptable operating voltage range for the 240 and 208V taps are:

<u>Tap</u>	<u>Range</u>
240	253 - 216
208	220 - 187

NOTE: The voltage should be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).

IMPORTANT

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians. All duct work, supply and return, must be properly sized for the design air flow requirement of the equipment. ACCA is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

SHIPPING DAMAGE

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

GENERAL

The refrigerant system is completely assembled and charged. All internal wiring is complete.

The unit is designed for use with or without duct work. Flanges are provided for attaching the supply and return ducts.

These instructions explain the recommended method to install the air cooled self-contained unit and the electrical wiring connections to the unit.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made.

INSTALLATION

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of National Warm Air Heating and Air Conditioning Association. The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

LOCATION

The unit must be located outside, or in a well ventilated area. It must not be in the space being heated or cooled. A sound absorbing material should be considered if the unit is to be installed in such a position or location that might cause transmission of sound or vibration to the living area or adjacent buildings.

TYPICAL INSTALLATION

1. **ROOF MOUNTED**--The unit is mounted on a sturdy base on the roof of the building. Return air to the unit is brought through a single return grille (grilles with built-in filters are best, since they enable easy access for filter changing). Return air ducts are attached to the lower section of the front panel. Supply air is brought from the unit to attic duct work or to a furred down hall. Supply air duct is attached to the top of the front panel. **CAUTION:** All outdoor duct work must be thoroughly insulated and weatherproofed. All attic duct work must be thoroughly insulated. One inch thick insulation with suitable vapor barrier is recommended for both outdoor and attic runs. In rooftop installations, as in all installations, the unit must be level from side to side. However, the unit should have a pitch along the length to assure complete external drainage of precipitation and of defrost condensate.
2. **CRAWL SPACE**--Duct work installed in crawl space must be well insulated and provided with a vapor barrier. In addition, the crawl space must be thoroughly ventilated and provided with a good vapor barrier as a ground cover. It is most desirable to install the unit outdoors, rather than inside the crawl space, so that it will be readily accessible for service. In addition, it is necessary to dispose of the condensate from the outdoor coil on the heating cycle, and this is virtually impossible with the unit installed inside the crawl space.

3. **SLAB MOUNTED AT GROUND LEVEL**--This type installation is ideal for homes with a slab floor construction, where a roof mounted unit is not desired. The supply and return duct work can be run through a furred closet space.
4. **THRU-THE-WALL**--This type installation requires a suitable framework to be fabricated capable of withstanding the unit weight. Normally the unit will be insulated so as to minimize supply and return duct work.
5. **OTHER INSTALLATIONS**--Many other installations are possible with the packaged air conditioner. No matter what the installation, always consider the following facts:
 - A. Insure that the discharge air is not obstructed in any way so as to cause operation difficulties.
 - B. The indoor coil drain pan is equipped with a coupling that must be piped through a condensate drain trap to a suitable drain.
 - C. Always mount the unit in such a position that it may be easily reached for servicing and maintenance.
 - D. Insure that the unit is clear so that proper air flow over the outdoor coil will be maintained.

TABLE 4

RATED CFM AND EXTERNAL STATIC PRESSURE (ESP) WET COIL (COOLING)			
Model	Rated CFM	Rated ESP	Recommended Air Flow Range
P1124A	800	.20	720 - 880 CFM
P1130A	1150	.35	1020 - 1275 CFM
P1136A	1275	.30	1150 - 1400 CFM
P1142A	1400	.25	1260 - 1540 CFM

WIRING--MAIN POWER

Refer to the unit rating plate for wire sizing information and maximum fuse size or "HACR Type" circuit breaker size. Each outdoor unit is marked with a "Minimum Circuit Ampacity". This means that the field wiring used must be sized to carry that amount of current. If field installed heaters are added to the basic unit, a second, separate power supply circuit will be required. The heater rating plate located adjacent to the basic unit rating plate will show the appropriate circuit ampacity, fuse size, etc. (Also see "Electrical Data" on pages 1 and 2). Some models are suitable only for connection with copper wire, while others can be wired with either copper or aluminum wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only" or "Use Copper or Aluminum Conductors". These instructions MUST BE adhered to. Refer to the National Electrical Code for complete current carrying capacity data on the various insulation grades of wiring material.

The electrical data lists fuse and wire sizes (60 degree F copper) for all models, including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters.

The unit rating plate lists a "Maximum Time Delay Fuse" or "HACR" type circuit breaker that is to be used with the equipment. The correct size must be used for proper circuit protection and also to assure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

PRESSURE SERVICE PORTS

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure charts can be found later in the manual covering all models on both cooling and heating cycles. It is imperative to match the correct pressure table to the unit by model number.

COMPRESSOR OPERATION

All P11 series models feature scroll compressors. Since the scroll is a new type of compressor, there are a number of application characteristics that are different than the traditional reciprocating compressor.

Discharge (Top Cap) Thermostat

Internal discharge temperatures reached under some extreme operating conditions (such as loss of charge or extremely high compression ratio caused by failure of evaporator fan) can cause compressor damage. In order to guarantee positive compressor protection, a thermostat has been designed into the Compliant Scroll which senses dangerous discharge temperature levels and removes power from the compressor until temperature levels are safe again. The approximate thermostat cut-out/cut-in temperatures are 290/140° F. THIS PROTECTIVE DEVICE SHOULD NEVER BE BYPASSED FOR ANY PURPOSE.

The thermostat can be tested for proper operation by the following procedures:

To check for low temperature operation, check electrical continuity with the thermostat below 140° F. If the thermostat shows open, it should be replaced.

To check for high temperature protection, the thermostat should remain closed for increasing discharge line temperatures up to 290° F. and then open as temperature rises above 290° F. If the thermostat is open when temperature is between 140 and 290° F., the thermostat will have to be allowed to cool to 140° F to close before testing high temperature operation. If the thermostat opens below 290° F. with rising temperature, it should be replaced.

The thermostat can be replaced by following these steps. Carefully pry the plastic cover open with a screwdriver. The thermostat is held to the bottom of the well with adhesive. Pry the thermostat from the well. The replacement thermostat does not require adhesive but must be held down with the neoprene spacer provided with the cover. The new cover is held down by snapping the prongs into the rim of the thermostat well after a silicone sealant provided to reseal the cover, is applied to the rims of the well cover.

Because of its very high volumetric efficiency, a Compliant Scroll Compressor will draw extremely low vacuums when the suction side of the compressor is closed or severely restricted. These vacuums, if achieved, can cause internal Fusite arcing resulting in a damaged or failed compressor. Damage resulting from internal Fusite arcing due to low pressure is obvious at compressor teardown and will result in denial of warranty claims.

In addition to possibly damaging the Fusite, the internal arcing caused by operation of Compliant Scroll compressors at deep vacuum conditions may cause tripping of circuit breakers, blowing of fuses, or tripping of the external compressor thermostat.

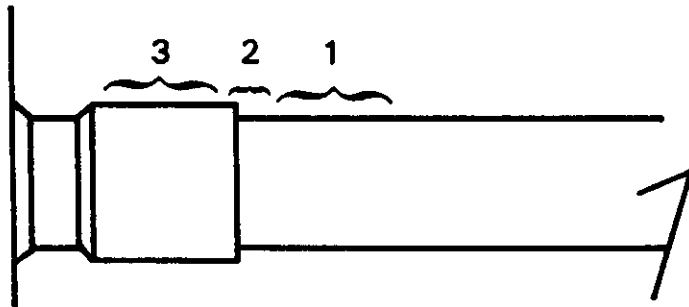
Suction And Discharge Tubes

Compliant Scroll Compressors have copper plated steel suction tubes. These tubes are far more rugged and less prone to leaks than copper tubes used on other compressors. Due to the different thermal properties of steel and copper, brazing procedures may have to be changed from those commonly used.

SCROLL SUCTION TUBE BRAZING

- To disconnect: Heat joint Areas 2 and 3 slowly and uniformly until braze material softens and tube can be pulled out of suction fitting.
- To reconnect:
 - Recommended brazing materials: Silfos with minimum 5% silver or silver braze material with flux.
 - Reinsert tube into fitting.
 - Heat tube uniformly in Area 1, moving slowly to Area 2. When joint reaches brazing temperature, apply brazing material.
 - Heat joint uniformly around the circumference to flow braze material completely around the joint.
 - Slowly move torch into Area 3 to draw braze material into the joint.
 - Do not overheat joint.

FIGURE 1



AIR FILTERS

Air filters for the return air side of the system are not provided as part of the basic piece of equipment because of various types of applications for these models, and must be field supplied and installed as part of the final installation.

Prior thought should be given to return air location and placement of the air filter(s). The air filter(s) must be of adequate size and readily accessible to the operator of the equipment. Filters must be adequate in size and properly maintained for proper operation. If this is not done, excessive energy use, poor performance, and multiple service problems will result. IT IS IMPOSSIBLE TO OVERSIZE AIR FILTERS. Generous sizing will result in cleaner air and coils, as well as lower operating costs and extend the time between required changes. The following table shows minimum filter areas and recommended filter sizes. Actual filter sizes can vary with the installation due to single or multiple returns utilizing a filter/grille arrangement or being placed immediately ahead of the indoor coil face in the return air duct.

TABLE 5

Model	Minimum Filter Areas	Recommended Size
P1124A, P1130A, P1136A	462 sq.in. (3.21 sq.ft.)	15 x 30-5/8 x 1
P1142A	608 sq.in. (4.62 sq.ft.)	(2) 16 x 20 x 1

NOTE: If roof hood accessory is to be used, information on air filters may be found under that heading in this manual. Air filters are supplied as part of that package.

REFRIGERANT CHARGE

The correct system R-22 charge is shown on the unit rating plate. Optimum unit performance will occur with a refrigerant charge resulting in a suction line temperature (6" from compressor) as shown in the following table:

TABLE 6

Model	Rated Airflow	95 Degree F OD Temperature	82 Degree F OD Temperature
P1124A	800	56 - 58	63 - 65
P1130A	1150	56 - 58	63 - 65
P1136A	1275	57 - 59	58 - 60
P1142A	1400	54 - 56	62 - 64

The above suction line temperatures are based upon 80 degree F dry bulb/67 degree F wet bulb (50 percent RH) temperature and rated airflow across the evaporator during cooling cycle.

COMPRESSOR TIME DELAY

The compressor contactor has a built in 5 minute time delay relay

The time delay relay is a time delay device which will hold off the compressor contactor for a fixed time cycle of five minutes.

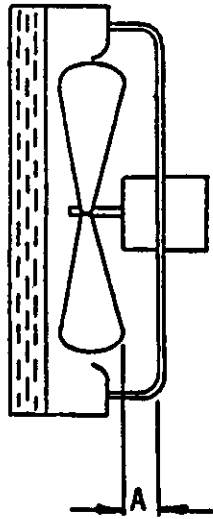
The time delay relay is a solid state device designed to allow the compressor contactor to operate on demand from the wall thermostat under normal conditions. As long as the "off" time of the air conditioner or heat pump system is longer than the delay period of the relay (five minutes), the compressor contactor will operate immediately. Once the contactor has been energized and then cycled off, for whatever reason, the relay will prevent the compressor contactor from operating until the nominal five minute period has elapsed.

FAN BLADE SETTING DIMENSIONS

Shown in the drawing below are the correct fan blade setting dimensions for proper air delivery across the outdoor coil.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.

FIGURE 2



Model	Dimension A
P1124A1	1.00"
P1130A1	.75"
P1136A1	1.00"
P1142A1	1.25"

IMPORTANT INSTALLER NOTES

For improved start-up performance, wash the indoor coil with a dishwasher detergent.

OPTIONAL ELECTRIC HEATERS

These packaged air conditioners are manufactured without supplementary electric heaters. Supplementary heaters BR3PA series (to fit P1124A, P1130A, and P1136A) and BR5PA series (to fit P1142A1) are available for simple, fast field installation.

A separate field power circuit is required for the supplementary heaters.

Refer to the electrical data shown on pages 1 and 2 for proper application information on all available heater combinations and what units they can be used with. It also shows the applicable circuit ampacities, fuse size, and wire size for each heater combination.

Refer to the installation instructions packed with the heater for details on how to insert it into the basic unit.

If this unit is operated in cooling below a 65 degree outdoor ambient temperature, the installation of low ambient control (LAC-1) to unit is required.

Figure 3

ROOFTOP APPLICATION

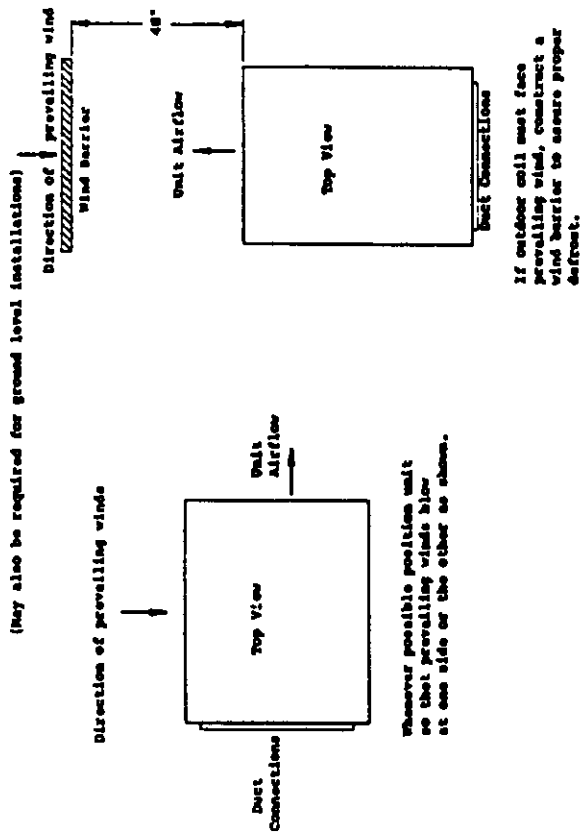


Figure 5

SLAB MOUNTING AT GROUND LEVEL
(Above 32°F Outside Temperature)

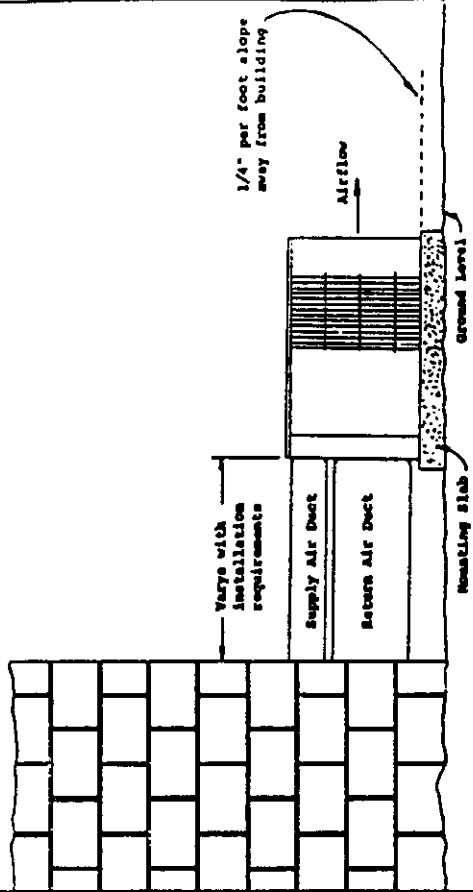


Figure 4

ELEVATED MOUNTING PLATFORMS

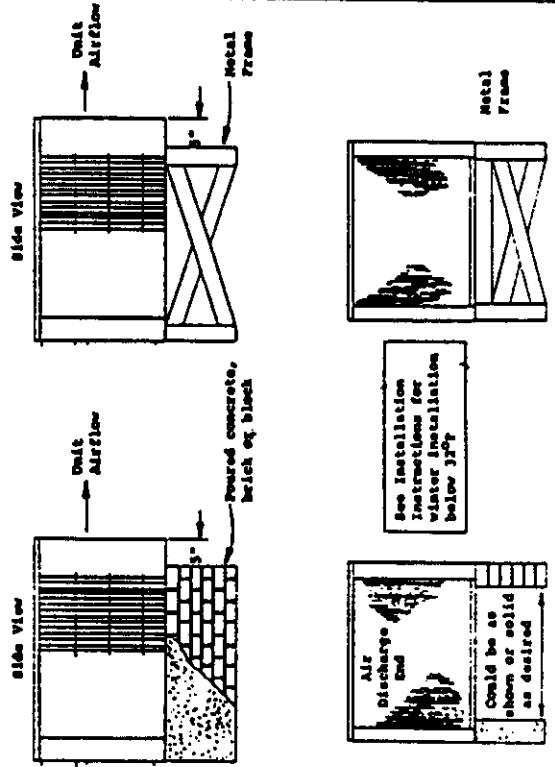
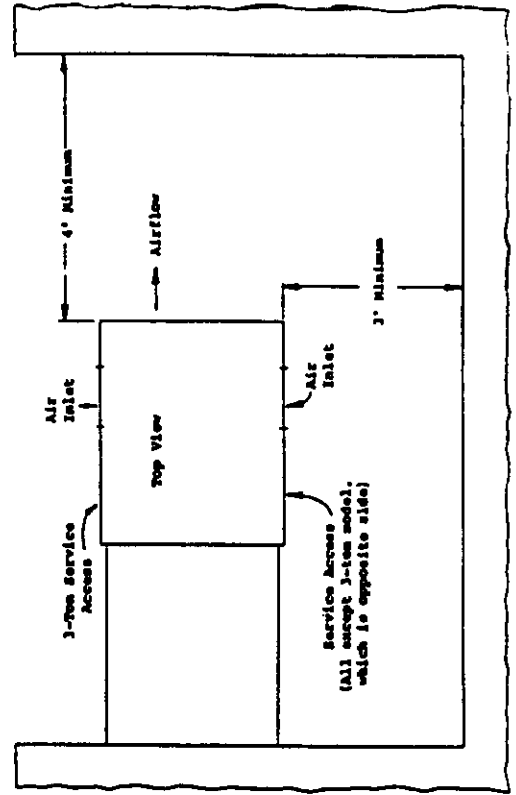


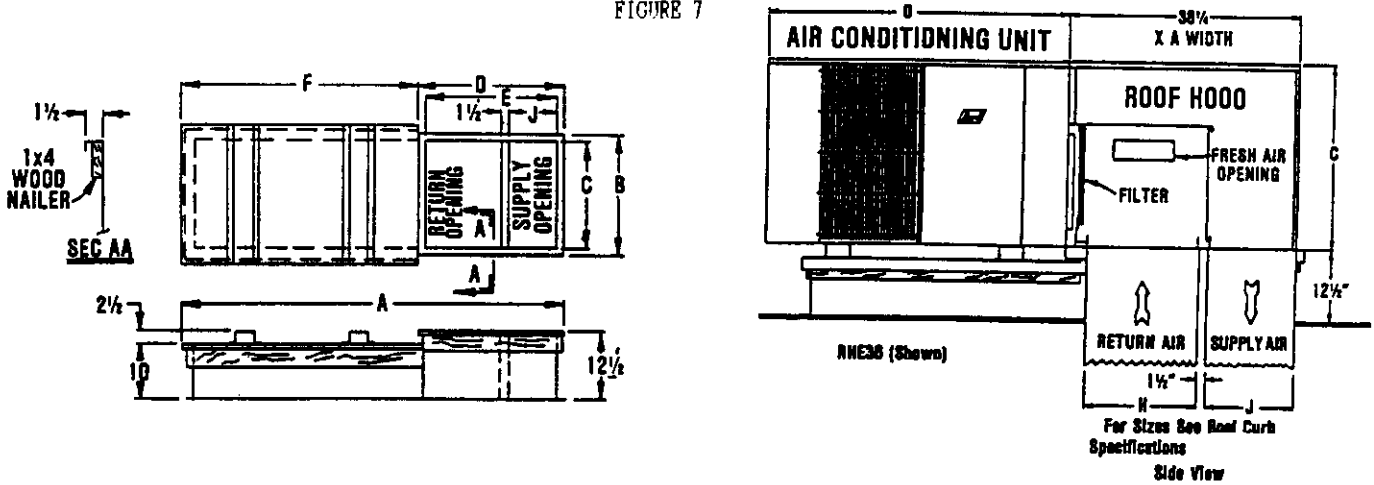
Figure 6

AIRFLOW AND SERVICE ACCESS CLEARANCES



PREFABRICATED ROOF CURB SPECIFICATIONS
HEAVY GAUGE GALVANIZED WITH WOOD NAILING STRIP, WELDED/LEAKPROOF
ONE PIECE CONSTRUCTION--READY TO INSTALL

FIGURE 7



CURB AND ROOF HOOD DETAILS

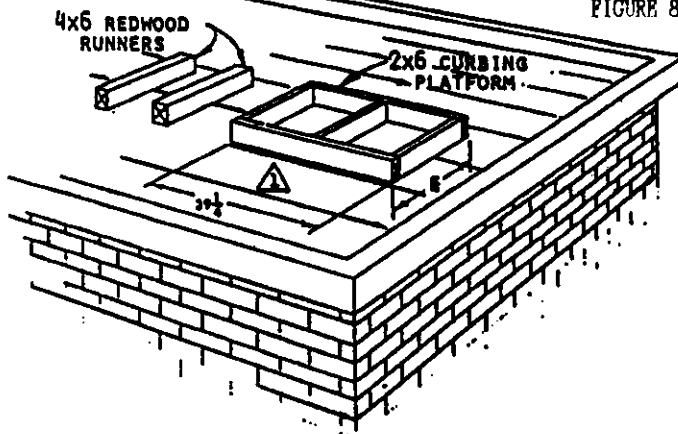
	A	B	C*	D	E	F	J*	H*	Roof Hood Model	Heat Pump and Air Conditioning Units
P36 Curb	80-3/8	40-1/4	37-1/4	38-3/8	35-3/8	42	14-3/4	19-1/8	RHE36	P1124A, P1130A, P1136A
P60 Curb	82-3/8	44-1/8	41-1/8	35-3/8	35-3/8	44	14-3/4	19-1/8	RHE60	P1142A

*** Duct Sizing Information**

Return Air Dimension "C" is length
 Return Air Dimension "H" is width

Supply Air Dimension "C" is length
 Supply Air Dimension "J" is width

SUPPORTS APPROX 6" FROM END OF UNIT
FIELD FABRICATED CURBING
 FIGURE 8



Roof Hood Model	Unit Model	E
RHE36	P1130A P1136A	41
RHE60	P1142A	44-7/8

(1) A separate metal flashing should be installed around wood curbing. Caulk and seal all joints and weatherproof.

TABLE 7

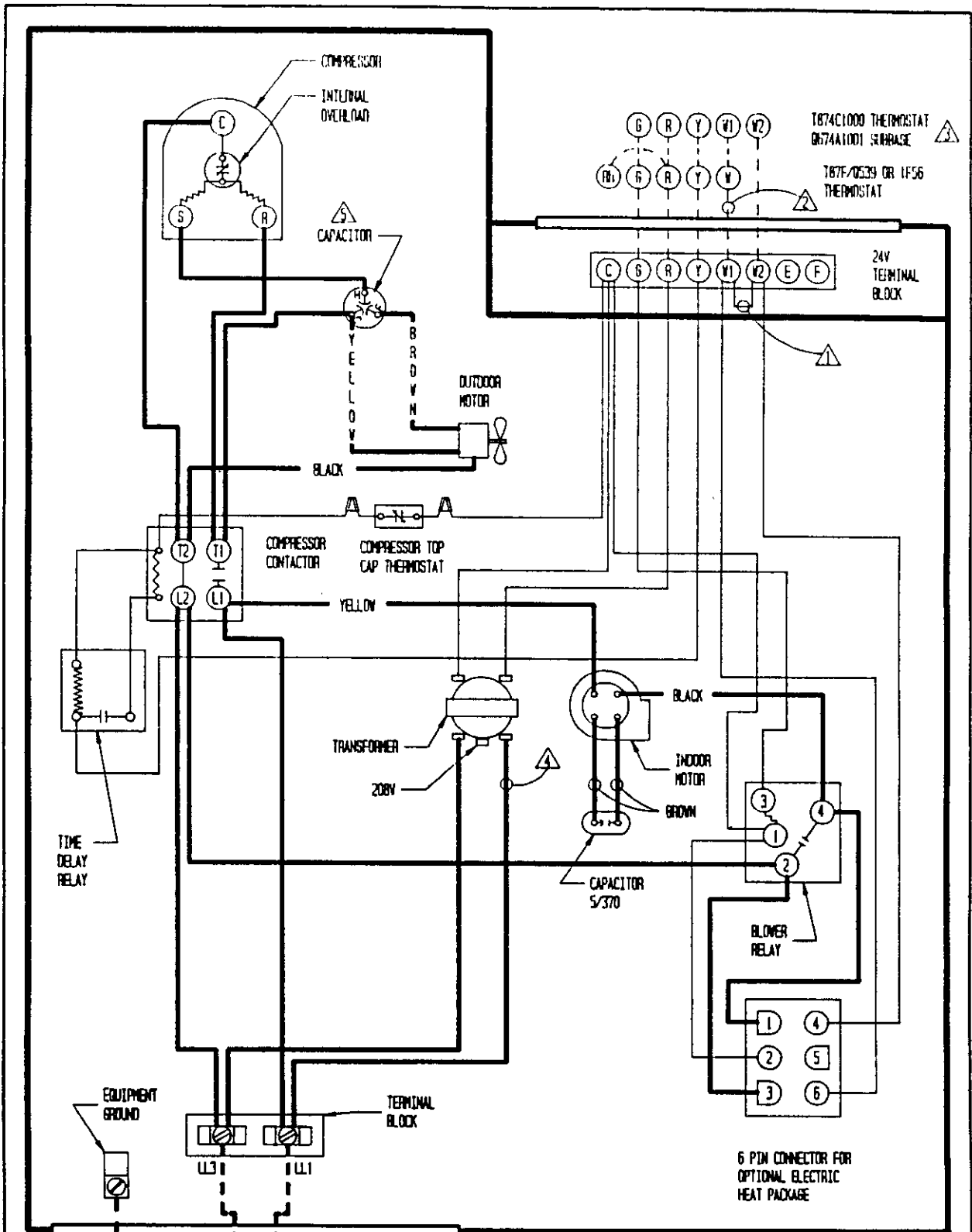
COOLING

Air Temperature Entering Outdoor Coil Degree F

Model	Return Air Temperature	Pressure	°	°	°	°	°	°	°	°	°
			75	80	85	90	95	100	105	110	115
P1124A1	75 deg. DB	Low Side	70	74	77	79	80	82	83	84	85
	62 deg. WB	High Side	219	220	224	234	248	258	276	293	316
	80 deg. DB	Low Side	75	79	82	84	86	88	89	90	91
	67 deg. WB	High Side	224	225	230	240	254	265	283	300	324
P1130A1	85 deg. DB	Low Side	81	85	88	90	92	95	96	97	98
	72 deg. WB	High Side	232	233	238	248	263	274	293	311	335
	75 deg. DB	Low Side	73	75	76	77	79	80	81	82	83
	62 deg. WB	High Side	200	219	234	254	271	288	307	327	342
P1136A1	80 deg. DB	Low Side	78	80	81	82	84	85	86	87	88
	67 deg. WB	High Side	205	225	240	260	278	295	315	335	351
	85 deg. DB	Low Side	84	86	87	88	90	91	92	94	95
	72 deg. WB	High Side	212	233	248	269	287	305	326	347	363
P1142A1	75 deg. DB	Low Side	67	71	73	75	77	78	79	80	81
	62 deg. WB	High Side	195	215	229	249	263	282	302	317	336
	80 deg. DB	Low Side	72	76	78	80	82	84	85	86	87
	67 deg. WB	High Side	200	220	235	255	270	290	310	325	345
P1142A1	85 deg. DB	Low Side	77	82	84	86	88	90	91	92	94
	72 deg. WB	High Side	207	228	243	264	279	300	321	336	357
	75 deg. DB	Low Side	72	73	73	74	75	76	78	80	82
	62 deg. WB	High Side	192	207	223	239	254	271	290	307	327
P1142A1	80 deg. DB	Low Side	77	78	78	79	80	82	84	86	88
	67 deg. WB	High Side	197	212	229	245	261	278	297	315	335
	85 deg. DB	Low Side	83	84	84	85	86	88	90	92	95
	72 deg. WB	High Side	204	219	237	254	270	288	307	326	347

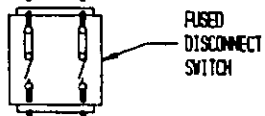
Low side pressure \pm 2 PSIGHigh side pressure \pm 5 PSIG

Tables are based upon rated CFM (airflow) across the evaporator coil and should be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged to serial plate instructions.



USE COPPER OR ALUMINUM WIRE

230/208V 60HZ 1-φH



- ⚠ REMOVE JUMPER FOR TWO STAGE HEAT
- ⚠ NOT REQUIRED WHEN OPTIONAL HEAT PACKAGES ARE NOT INSTALLED
- ⚠ REQUIRED ONLY FOR USE WITH OPTIONAL ELECTRIC HEAT PACKAGES: EHCPA-A15, EHCPA-B12, EHCPA-B15, WHEN TWO STAGE HEAT IS DESIRED.
- ⚠ FOR 208V OPERATION MOVE THIS WIRE TO 208V TRANSFORMER TAP.

MODEL NO.	CAPACITOR
P1130A1	35/5-370
P1136A1	35/5-370

	FACTORY WIRING	FIELD WIRING
LOW VOLTAGE	—	- - -
HIGH VOLTAGE	—	- - -