

INSTALLATION INSTRUCTIONS

WALL MOUNTED PACKAGE AIR CONDITIONERS

MODELS

WA181

WA241

DATE: 05-15-96

**MANUAL 2100-200 REV. I
SUPERSEDES REV. H
FILE VOL. III, TAB 16**

SECTION 1 --GETTING OTHER INFORMATION AND PUBLICATIONS

These publications can help you install the air conditioner or heat pump. You can usually find these at your local library or purchase them directly from the publisher. Be sure to consult current edition of each standard.

National Electrical Code	-ANSI/NFPA 70
Standard For The Installation Of Air Conditioning and Ventilating Systems	-ANSI/NFPA 90A
Standard For Warm Air Heating and Air Conditioning Systems	-ANSI/NFPA 90B
Load Calculation For Residential Winter and Summer Air Conditioning	-ACCA Manual J
Duct Design For Residential Winter and Summer Air Conditioning and Equipment Selection	-ACCA Manual D

FOR MORE INFORMATION, CONTACT THESE PUBLISHERS

ACCA:	AIR CONDITIONING CONTRACTORS OF AMERICA 1513 16th Street NW Washington, DC 20036 Telephone: (202) 483-9370	Fax: (202) 234-4721
ANSI:	AMERICAN NATIONAL STANDARDS INSTITUTE 11 West Street, 13th Floor New York, NY 10036 Telephone: (212) 642-4900	Fax: (212) 302-1286
ASHRAE:	AMERICAN SOCIETY OF HEATING REFRIGERATING AND AIR CONDITIONING ENGINEERS, INCORPORATED 1791 Tullie Circle, N.E. Atlanta, GA 30329-2305 Telephone: (404) 636-8400	Fax: (404) 321-5478
NFPA:	NATIONAL FIRE PROTECTION ASSOCIATION Batterymarch Park P. O. Box 9101 Quincy, MA 02269-9901 Telephone: (800) 344-3555	Fax: (617) 984-7057

Manufactured under the following U.S. patent numbers
5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,936; 4,432,409.
Other patents pending.

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BRYAN, OH 43506 USA

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PART 1 -- WALL MOUNT GENERAL INFORMATION

AIR CONDITIONER WALL MOUNT MODEL NOMENCLATURE

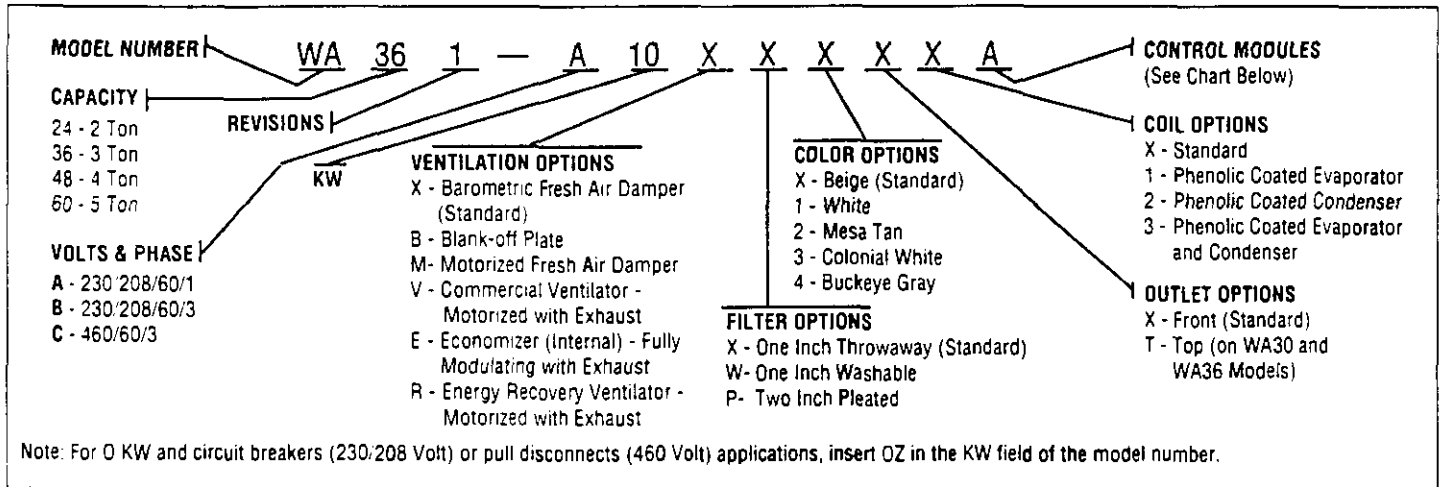


TABLE 1 ELECTRIC HEAT TABLE

Models	WA181-A				WA241-A				WA241-B			
	240-1		208-1		240-1		208-1		240-3		208-3	
	KW	A	BTU	A	BTU	A	BTU	A	BTU	A	BTU	
4					16.7	13650	14.4	10240				
5	20.8	17065	18.1	12800	20.8	17065	18.1	12800				
8	33.3	27300	28.8	20475	33.3	27300	28.8	20475				
10	41.6	34130	36.2	25600	41.6	34130	36.2	25600				
6									14.4	20500	12.5	15360
9									21.7	30600	18.7	23030

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.

FIGURE 1
 SIZE SPECS FOR MIS-278

UNIT	WIDTH (V)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN		E	F	G	I	J	K	L	M	N	O	P	Q
				A	B	C	B												
18 & 24	32-7/8	16-7/8	70-1/2	7-7/8	19-7/8	11-7/8	19-7/8	34-7/8	18-1/4	25-3/4	20-3/4	26-3/4	28	29-1/4	27	2-9/16	34	22-1/16	10-1/2

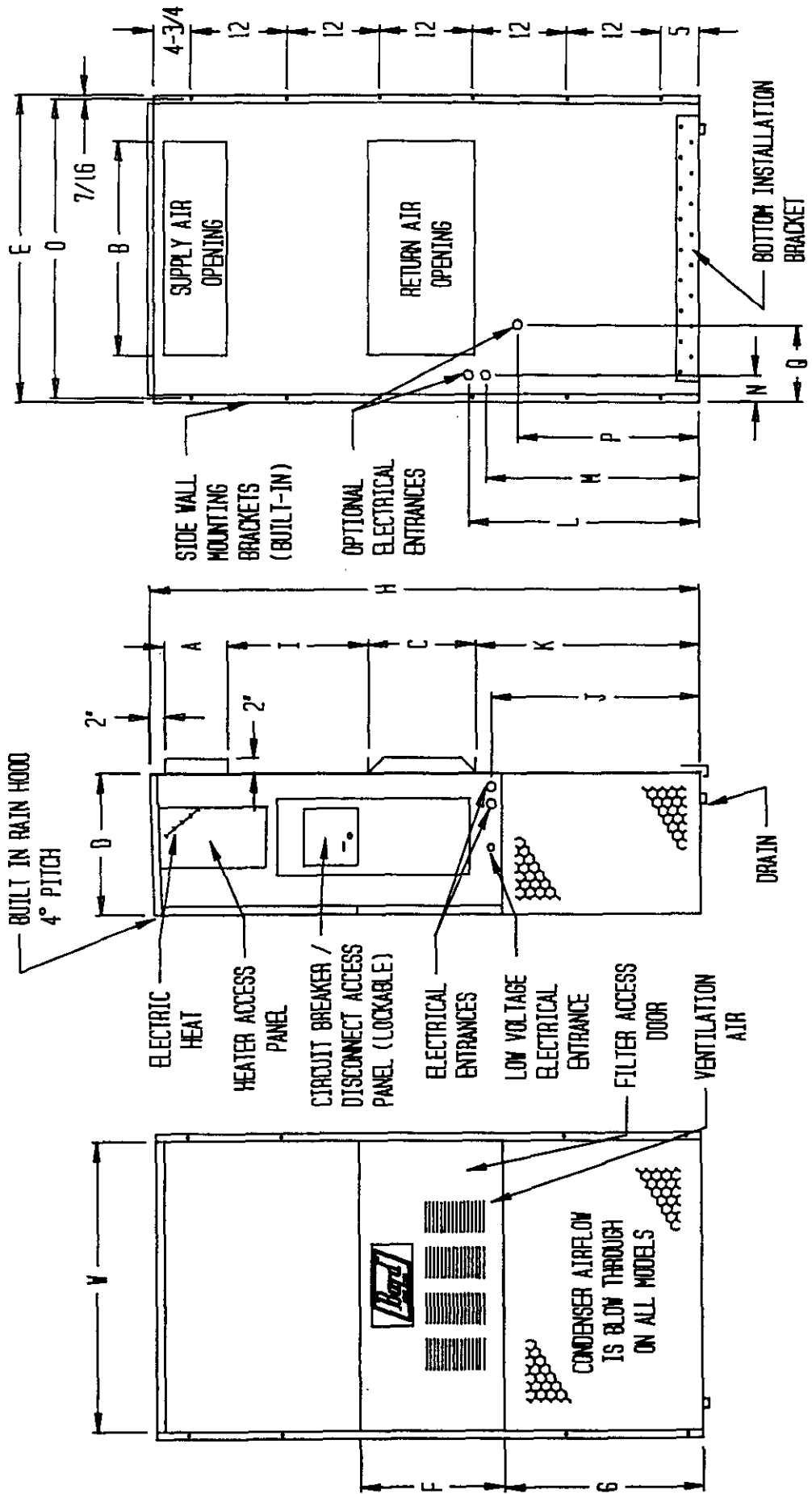


TABLE 2

SINGLE CIRCUIT						
Model	Rated Volts and Phase	No. Field Power Ckts.	(3) Minimum Circuit Ampacity	(1) Maximum External Fuse Or Circuit Breaker	(2) Field Power Wire Size	(2) Ground Wire Size
WA181-A00, A0Z	230/208-1	1	16	20	12	12
A05		1	30	30	10	10
A08		1	45	45	8	10
A10		1	56	60	6	10
WA241-A00, A0Z	230/208-1	1	17	20	12	12
A04		1	24	25	10	10
A05		1	30	30	10	10
A08		1	45	45	8	10
A10		1	56	60	6	10
WA241-B00, B0Z	230/208-3	1	13	15	14	12
B06		1	22	25	10	10

(1) Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.

(2) Based on 75°C copper wire. All wiring must conform to NEC and all local codes.

(3) These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical Code (latest revision), article 310 for power conductor sizing. Caution: When more than one field power conductor circuit is run thru one conduit, the conductors must be derated. Pay special attention to note 8 of table 310 regarding Ampacity Adjustment Factors when more than 3 conductors are in a raceway.

GENERAL

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians.

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. See Page 1 for information on codes and standards.

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America (ACCA). 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.

DUCT WORK

Any heat pump is more critical of proper operating charge and an adequate duct system than a straight air conditioning unit. All duct work, supply and return, must be properly sized for the design air flow requirement of the equipment. Air Conditioning Contractors of America (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.

Refer to Table 10 for maximum static pressure available for duct design.

Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct runs through unheated spaces, it should be insulated with a minimum of one inch of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum.

A 1/4-inch clearance to combustible material for the first three feet of duct attached to the outlet air frame is required. See Wall Mounting Instructions and Figures 3 for further details.

Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.

CAUTION: Some installations may not require any return air duct. A metallic return air grille is required with installations not requiring a return air duct. The spacing between louvers on the grille shall not be larger than 5/8 inches.

Any grille that meets the 5/8 inch lower criteria, may be used. It is recommended that Bard Return Air Grille Kit RG2 thru RG5 or RFG2 thru RFG5 be installed when no return duct is used. Contact distributor or factory for ordering information. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm.

NOTE: If no return air duct is used, applicable installation codes may limit this cabinet to installation only in a single story structure.

FILTERS

A 1-inch throwaway filter is supplied with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the service door. A 1-inch washable filter and 2-inch pleated filter are also available as optional accessories. The internal filter brackets are adjustable to accommodate the 2-inch filter by loosening 2 screws in each bracket assembly and sliding the brackets apart to the required width and retightening the 4 screws.

FRESH AIR INTAKE

All units are built with a fresh air inlet slots punched in the service panel.

If the unit is equipped with a fresh air damper assembly, the assembly is shipped already attached to the unit. The damper blade is locked in the closed position. To allow the damper to operate, the maximum and minimum blade position stops must be installed. See Figure 2.

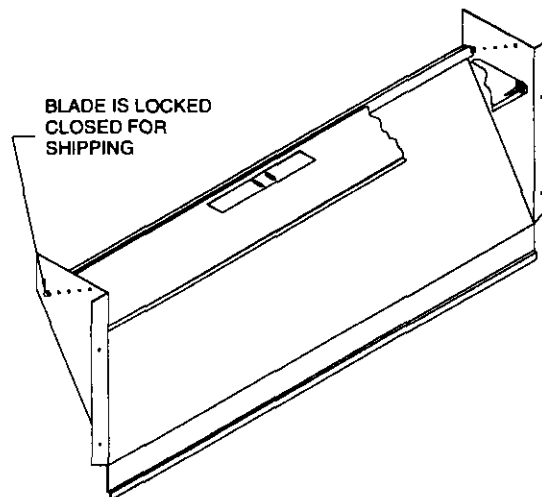
All capacity, efficiency and cost of operation information as required for Department of Energy "Energyguide" Fact Sheets is based upon the fresh air blank-off plate in place and is recommended for maximum energy efficiency.

The blank-off plate is available upon request from the factory and is installed in place of the fresh air damper shipped with each unit.

CONDENSATE DRAIN

A plastic drain hose extends from the drain pan at the top of the unit down to the unit base. There are openings in the unit base for the drain hose to pass through. In the event the drain hose is connected to a drain system of some type, it must be an open or vented type system to assure proper drainage.

Figure 2



PART 2 -- INSTALLATION INSTRUCTIONS

WALL MOUNTING INFORMATION

1. These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides. A bottom mounting bracket is provided for ease of installation, but is not required.
2. On wood-frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration.
3. Concrete block walls must be thoroughly inspected to insure that they are capable of carrying the weight of the installing unit.

MOUNTING THE UNIT

1. Two holes, for the supply and return air openings, must be cut through the wall as shown in Figure 3.
2. Locate and mark lag bolt locations and bottom mounting bracket location, if desired. See Figure 3.
3. Mount bottom mounting bracket, if used.
4. Hook top rain flashing under back bend of top. Top rain flashing is shipped attached to the back of the unit on the right side.
5. Position unit in opening and secure with 5/16 lag bolts; use 7/8 inch diameter flat washers on the lag bolts.
6. Secure rain flashing to wall and caulk across entire length of top. See Figure 3.
7. For additional mounting rigidity, the return air and supply air frames or collars can be drilled and screwed or welded to the structural wall itself (depending upon wall construction). Be sure to observe required clearance if combustible wall. Additional clearance may be required to meet local or national codes.
8. On side by side installations, maintain a minimum of 20 inches clearance on right side to allow access to control panel and heat strips and allow proper airflow to outdoor coil.

Wiring — Low Voltage Wiring

230/208V, 1 phase and 3 phase equipment 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:

Table 4 — Operating Voltage Range

TAP	RANGE
240V	253 - 216
208V	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).

Five (5) wires should be run from thermostat subbase to the 24V terminal board in the unit. A five conductor, 18 gauge copper, color-coded thermostat cable is recommended. The connection points are shown in Figure 10.

Table 5 — Thermostat Wire Size

TRANSFORMER VA	FLA	WIRE GAUGE	MAXIMUM DISTANCE IN FEET
55	2.3	20 gauge	45
		18 gauge	60
		16 gauge	100
		14 gauge	160
		12 gauge	250

Table 6 — Wall Thermostat and Subbase Combinations

THERMOSTAT	SUBBASE	PREDOMINATE FEATURES
B403-002	B404-003	1 stage heat, 1 stage cool
T87F#111	Q539A1220	System: heat-off-cool Fan: auto-on
8103-009	—	1 stage heat, 1 stage cool
1F56-318	—	—
B403-019	B404-012	1 stage cool, 2 stage heat
T874C1760	Q674A1001	System: heat-auto-cool Fan: auto-on
B403-035	—	Programmable
1F95-80	—	Electronic

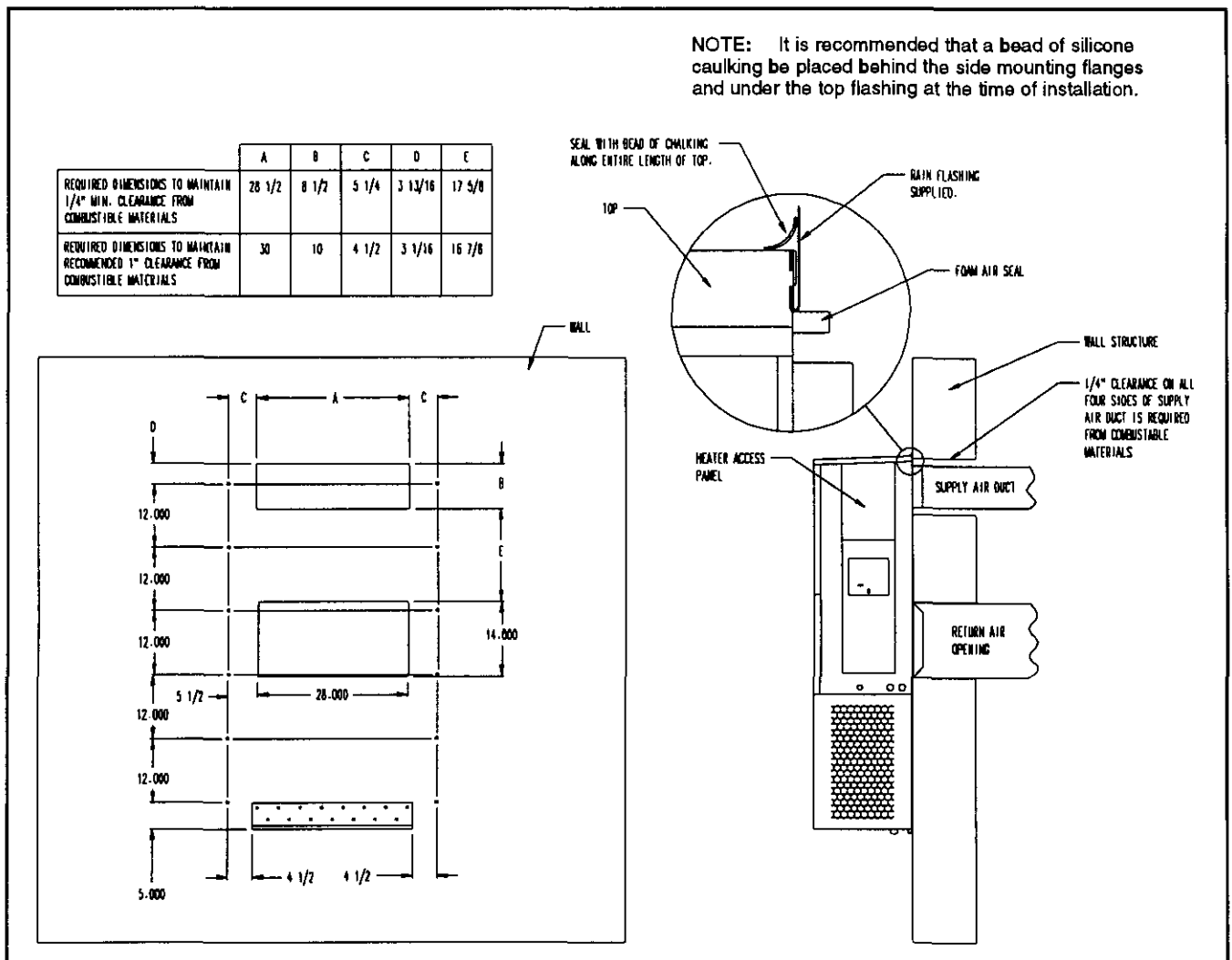


Figure 3 — Mounting Instructions

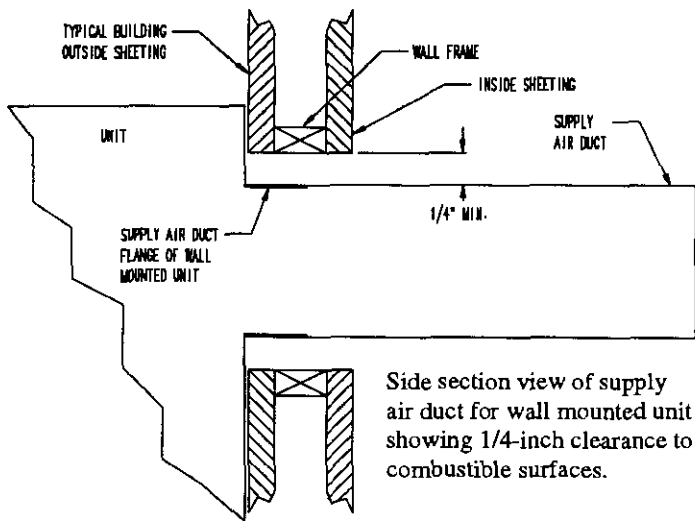


Figure 4 — Electric Heat Clearance

Side section view of supply air duct for wall mounted unit showing 1/4-inch clearance to combustible surfaces.



WARNING

- A minimum of 1/4-inch clearance must be maintained between the supply air duct and combustible materials. This is required for the first 3-feet of ducting.
- It is important to insure that the 1/4-inch minimum spacing is maintained at all points.
- Failure to do this could result in overheating the combustible material and may result in fire.

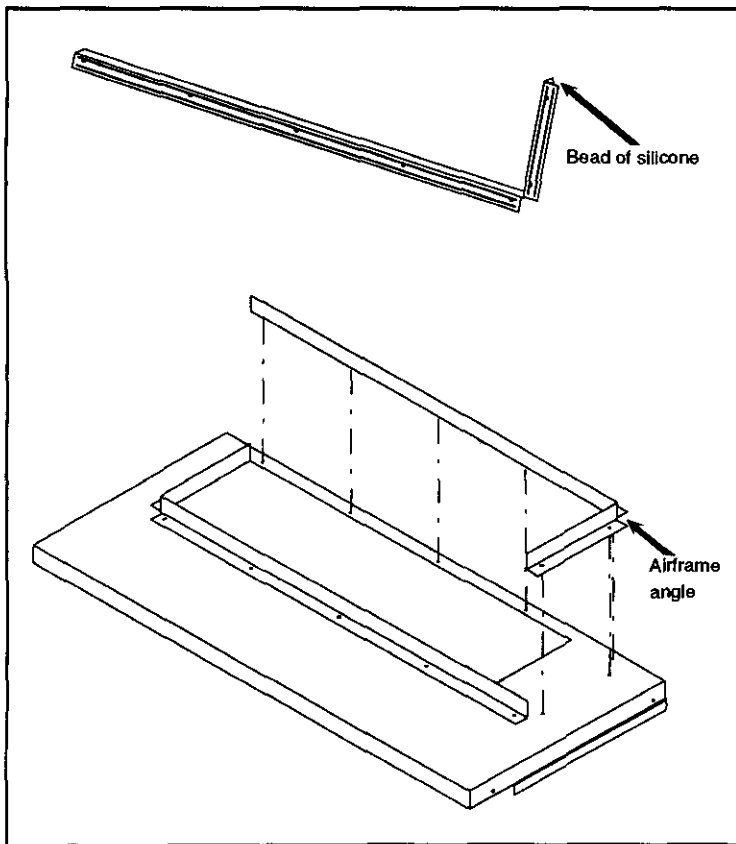


Figure 5 — Airframe Angles

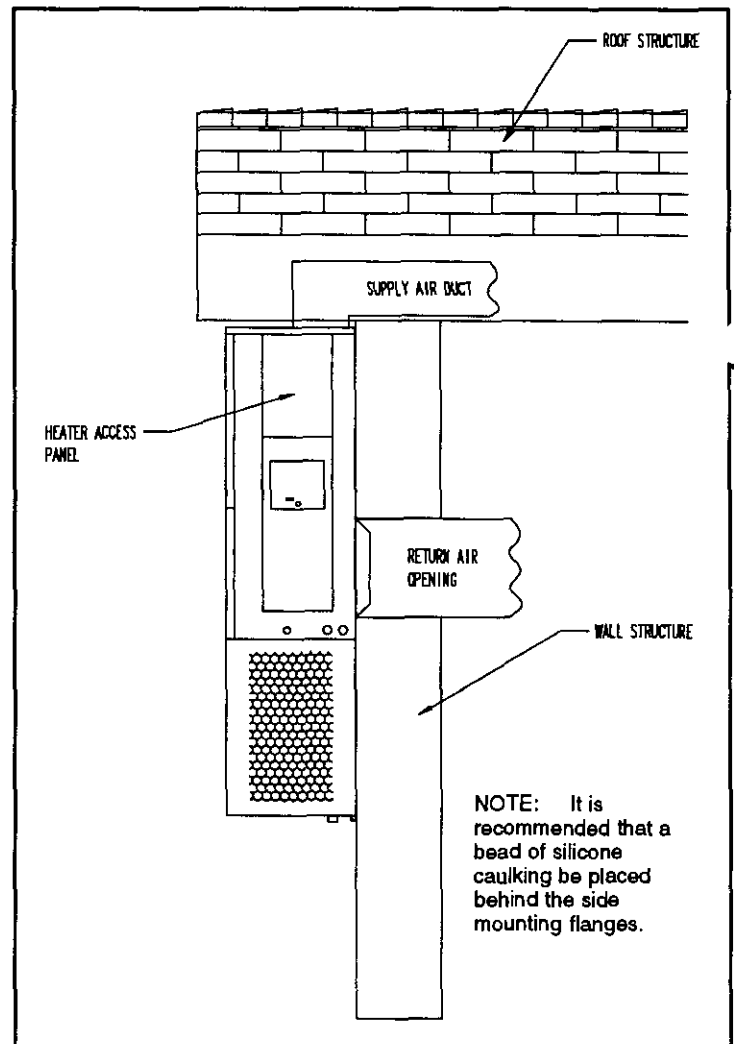
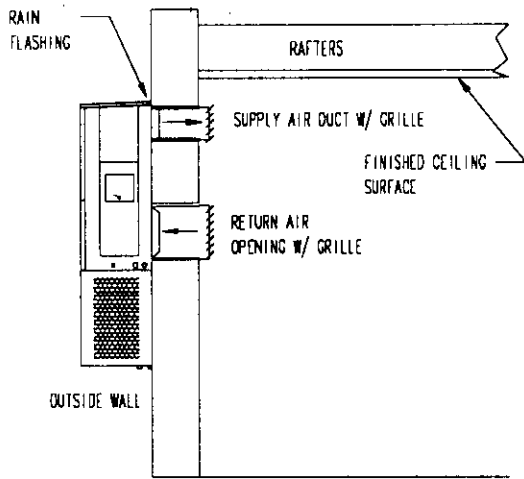
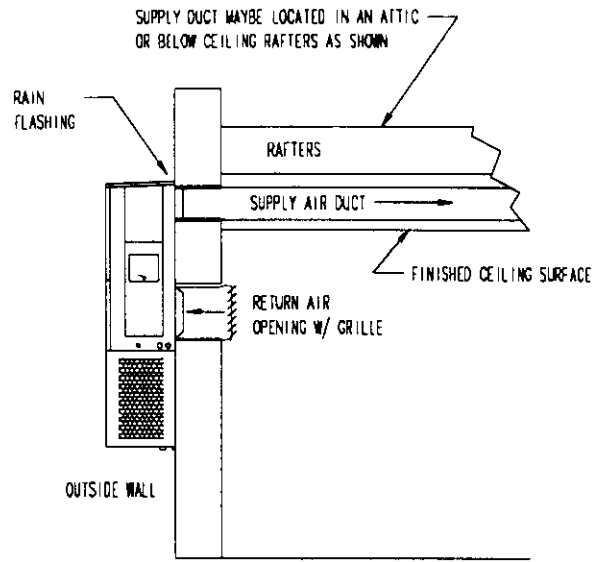


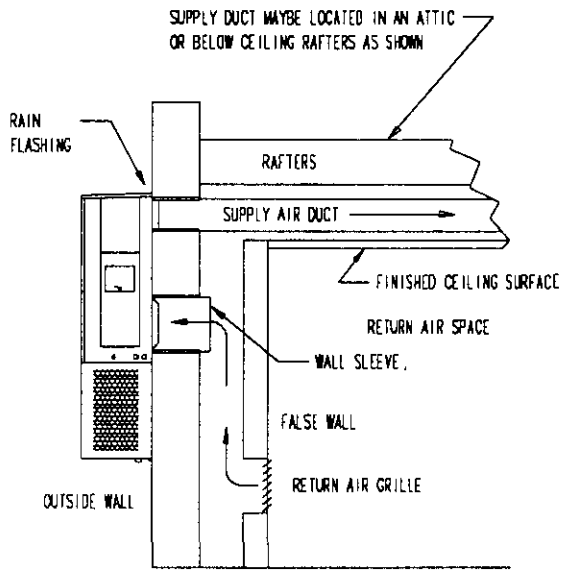
Figure 6 — Soffit Installation



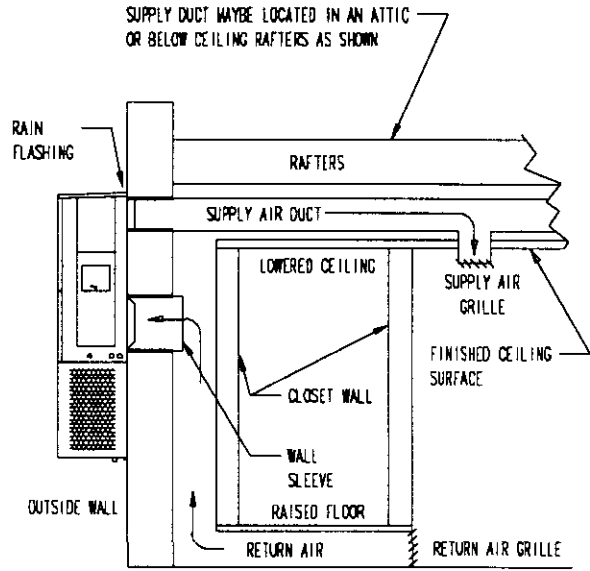
FREE AIR FLOW
NO DUCT



DUCTED SUPPLY
RETURN AT UNIT



FALSE WALL INSTALLATION



CLOSET INSTALLATION

Figure 6 — Common Wall-Mounting Installations

WIRING--MAIN POWER

Refer to the unit rating plate for wire sizing information and maximum fuse 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. Depending on the installed KW of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate. All models are suitable only for connection with copper wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only". These instructions MUST BE adhered to. Refer to the National Electrical Code (NEC) for complete current carrying capacity data on the various insulation grades of wiring material. All wiring must conform to NEC and all local codes.

The electrical data lists fuse and wire sizes (75°C 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 Relay 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.

The disconnect access door on this unit may be locked to prevent unauthorized access to the disconnect. To convert for the locking capability, bend the tab located in the bottom left hand corner of the disconnect opening under the disconnect access panel straight out. This tab will now line up with the slot in the door. When shut, a padlock may be placed through the hole in the tab preventing entry.

WIRING: LOW VOLTAGE WIRING

230/208V, 1 phase and 3 phase equipment 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:

TAP	RANGE
240	253 - 216
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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).

Five (5) wires should be run from thermostat subbase to the 24V terminal board in the unit. A five conductor, 18 gauge copper, color-coded thermostat cable is recommended. The connection points are shown in Figure 7.

TABLE 3 THERMOSTAT WIRE SIZE

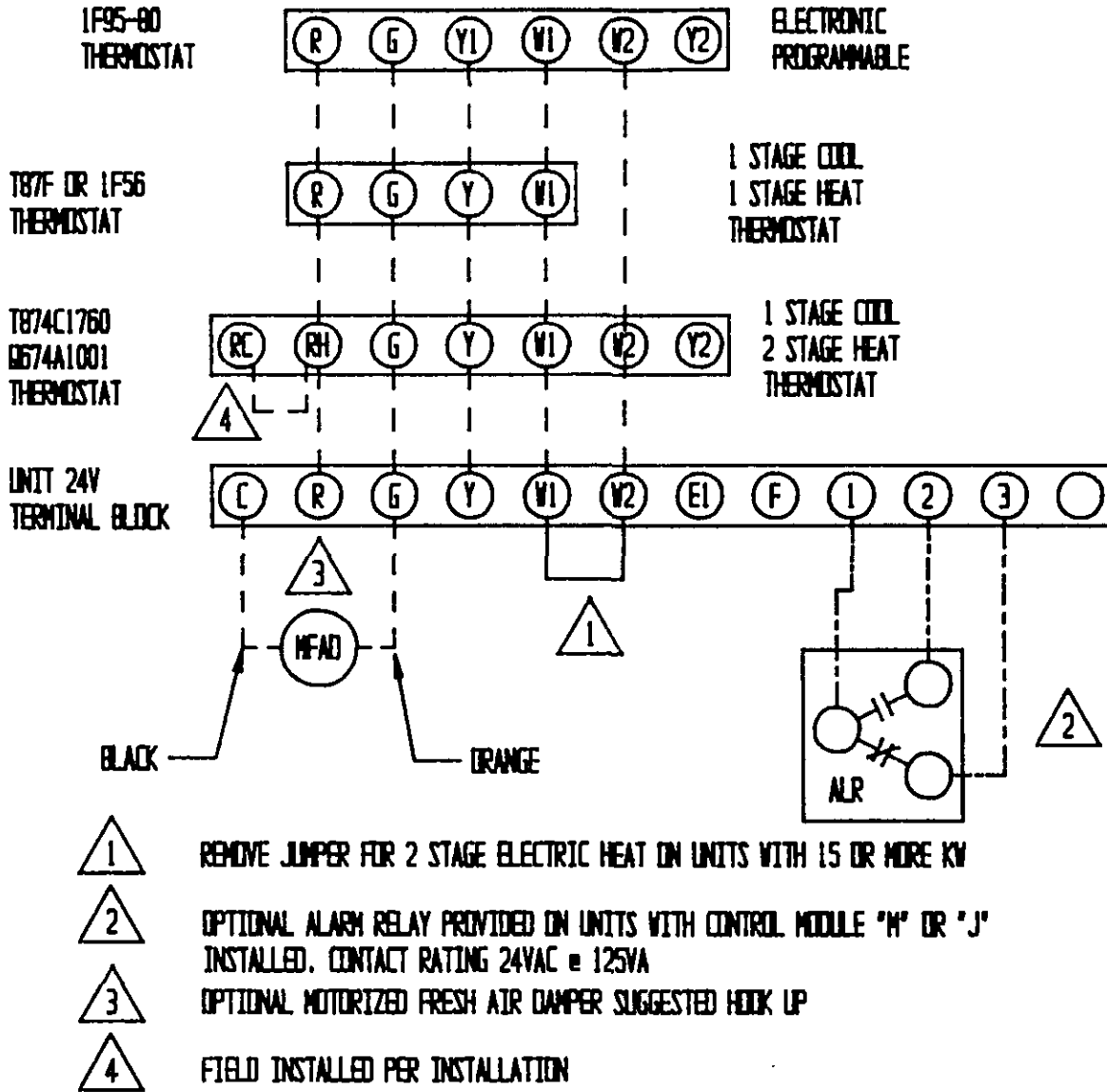
Transformer VA	FLA	Wire Gauge	Maximum Distance In Feet
55	2.3	20 Gauge	45
		18 "	60
		16 "	100
		14 "	160
		12 "	250

TABLE 3A WALL THERMOSTAT AND SUBBASE COMBINATIONS

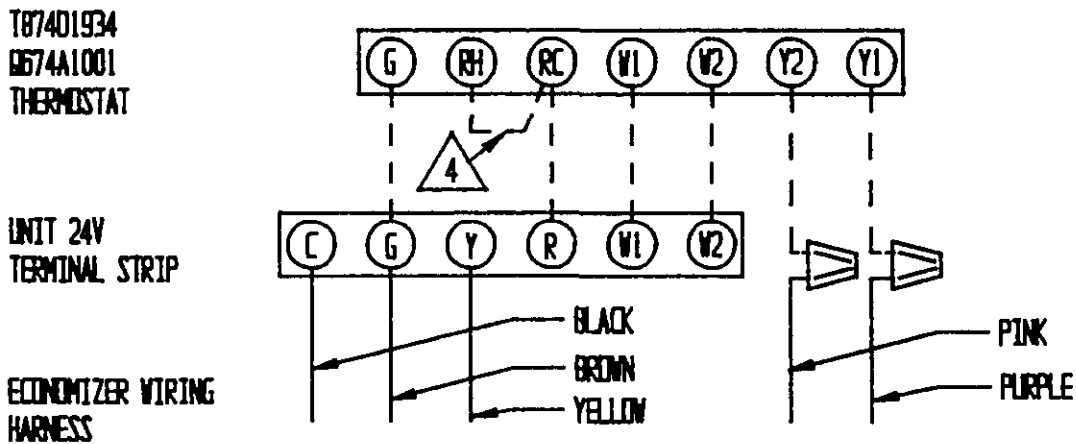
Thermostat	Subbase	Predominate Features
8403-019 T874C1760	8404-012 Q674A1001	1 stage cool, 2 stage heat System: heat-auto-cool Fan: on-auto
8403-002 T87F3111	8404-003 Q539A1220	1 stage heat, 1 stage cool System: heat-off-cool Fan: on-auto
8403-009 1F56-318	----	1 stage heat, 1 stage cool
8403-035 1F95-80	----	Programmable Electronic

Figure 7

LOW VOLTAGE WIRING



OPTIONAL ECONOMIZER LOW VOLTAGE WIRING



PART 3 -- START-UP

IMPORTANT INSTALLER NOTE

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

CRANKCASE HEATERS

All units are provided with some form of compressor crankcase heat.

All single and three phase models have an insertion well-type heater located in the lower section of the compressor housing. This is a self-regulating type heater that draws only enough power to maintain the compressor at a safe temperature.

Some form of crankcase heat is essential to prevent liquid refrigerant from migrating to the compressor, causing oil pump out on compressor start-up and possible valve failure due to compressing a liquid.

The decal in Figure 8 is affixed to all outdoor units detailing start-up procedure. This is very important. Please read carefully.

FIGURE 8

IMPORTANT

THESE PROCEDURES MUST BE FOLLOWED AT INITIAL START-UP AND AT ANY TIME POWER HAS BEEN REMOVED FOR 12 HOURS OR LONGER.

TO PREVENT COMPRESSOR DAMAGE WHICH MAY RESULT FROM THE PRESENCE OF LIQUID REFRIGERANT IN THE COMPRESSOR CRANKCASE.

1. MAKE CERTAIN THE ROOM THERMOSTAT IS IN THE "OFF" POSITION. (THE COMPRESSOR IS NOT TO OPERATE).
2. APPLY POWER BY CLOSING THE SYSTEM DISCONNECT SWITCH THIS ENERGIZES THE COMPRESSOR HEATER WHICH EVAPORATES THE LIQUID REFRIGERANT IN THE CRANKCASE.
3. ALLOW 4 HOURS OR 60 MINUTES PER POUND OF REFRIGERANT IN THE SYSTEM AS NOTED ON THE UNIT RATING PLATE, WHICHEVER IS GREATER.
4. AFTER PROPERLY ELAPSED TIME THE THERMOSTAT MAY BE SET TO OPERATE THE COMPRESSOR.
5. EXCEPT AS REQUIRED FOR SAFETY WHILE SERVICING — DO NOT OPEN SYSTEM DISCONNECT SWITCH.

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SERVICE HINTS

1. Caution homeowner to maintain clean air filters at all times. Also, not to needlessly close off supply and return air registers. This reduces air flow through the system, which shortens equipment service life as well as increasing operating costs.
2. Switching to heating cycle at 75°F or higher outside temperature may cause a nuisance trip of the remote reset high pressure switch. Turn thermostat off, then on to reset the high pressure switch.
3. The heat pump wall thermostats perform multiple functions. Be sure that all function switches are correctly set for the desired operating mode before trying to diagnose any reported service problems.
4. Check all power fuses or circuit breakers to be sure they are the correct rating.
5. Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

SEQUENCE OF OPERATION

COOLING--Circuit R-Y makes at thermostat pulling in compressor contactor, starting the compressor and outdoor motor. The G (indoor motor) circuit is automatically completed on any call for cooling operation or can be energized by manual fan switch on subbase for constant air circulation. On a call for heating, circuit R-W1 make at the thermostat pulling in heat contact for the strip heat and blower operation. On a call for second stage heat, R-W2 makes bringing on second heat contactor, if so equipped.

PRESSURE SERVICE PORTS

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

PART 4 -- TROUBLESHOOTING

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 9

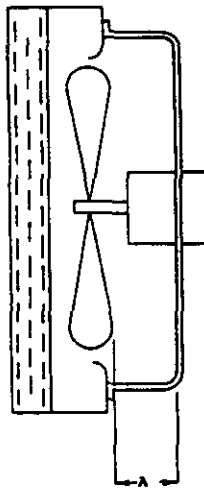


TABLE 4

Model	Dimension A
WA181	1.00
WA241	

REMOVAL OF THE FAN SHROUD

1. Disconnect all power to unit.
2. Remove the screws holding both grills--one on each side of unit--and remove grills.
3. Remove screws holding fan shroud to condenser and bottom. (9) screws.
4. Unwire condenser fan motor.
5. Slide complete motor, fan blade, and shroud assembly out the left side of the unit.
6. Service motor/fan as needed.
7. Reverse steps to reinstall.

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 5

Model	Rated Airflow	95° F OD Temperature	82° F OD Temperature
WA181	650	51 - 53	63 - 65
WA241	800	61 - 63	63 - 65

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

TABLE 6 INDOOR BLOWER PERFORMANCE--CFM @ 230V

E.S.P. In H ₂ O	WA181, WA241	
	230V	
	Dry / Wet	
.0	1020	975
.1	960	905
.2	865	800
.3	820	735
.4	735	650
.5	615	535

TABLE 7

Model	Rated CFM*	Rated ESP*	Recommended Airflow Range
WA181	650	.40	575 - 725
WA241	800	.20	700 - 950

*Rated CFM and ESP on high speed tap.

MAXIMUM ESP OF OPERATION

TABLE 8 ELECTRIC HEAT ONLY		ESP
Model		
WA181	A00	.50
WA181	A05	.50
WA241	A08	.50
	B00	.50
WA241	B06	.50

Values shown are for units equipped with STD 1" throw-away filter or 1" washable filter. Derate ESP by .15 for 2" pleated filters.

TABLE 9

COOLING

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temperature	Pressure	°	°	°	°	°	°	°	°	°
			75	80	85	90	95	100	105	110	115
WA181	75 deg. DB	Low Side	71	73	75	77	79	81	82	84	85
	62 deg. WB	High Side	194	208	223	238	253	268	284	299	315
	80 deg. DB	Low Side	76	78	80	83	84	86	88	90	91
	67 deg. WB	High Side	199	214	229	244	259	275	291	307	323
	85 deg. DB	Low Side	81	84	86	89	91	93	95	96	98
	72 deg. WB	High Side	206	221	237	253	268	285	301	318	334
WA241	75 deg. DB	Low Side	72	75	78	80	82	84	86	87	89
	62 deg. WB	High Side	198	214	230	246	261	276	291	305	319
	80 deg. DB	Low Side	74	77	80	82	84	86	88	90	91
	67 deg. WB	High Side	211	229	246	263	280	295	311	326	341
	85 deg. DB	Low Side	77	80	83	85	87	89	91	93	94
	72 deg. WB	High Side	227	246	265	283	300	318	334	351	367

Low side pressure + 2 PSIG

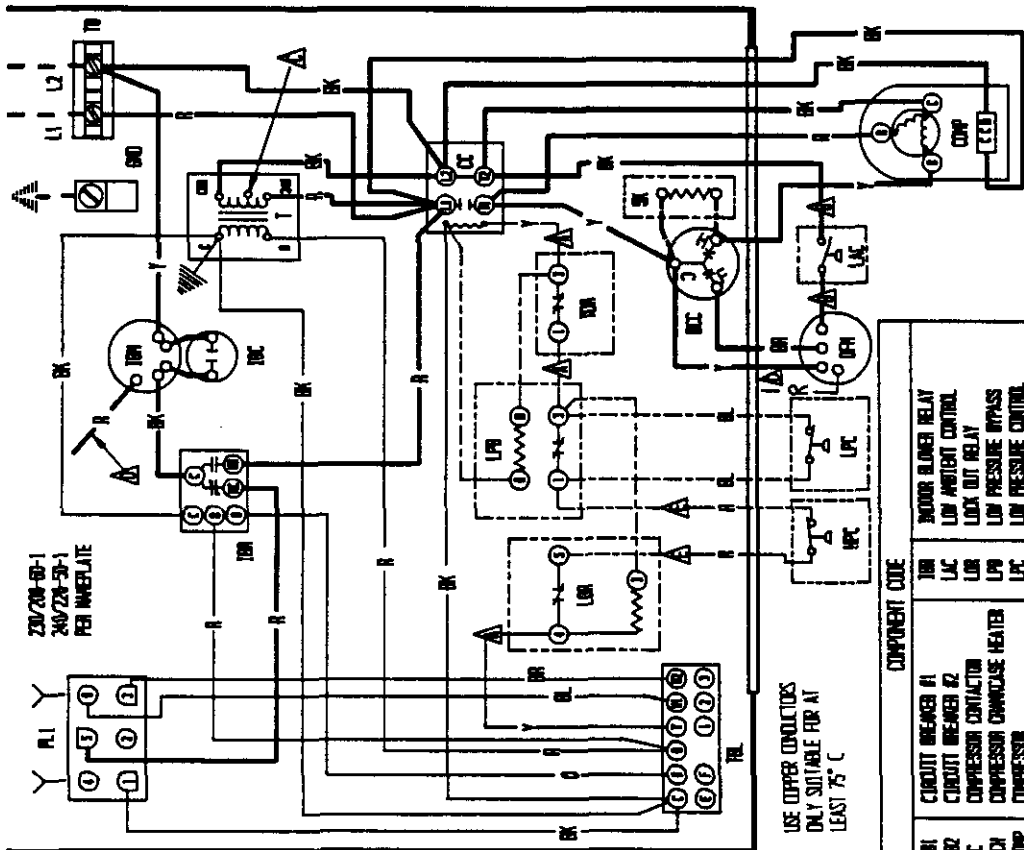
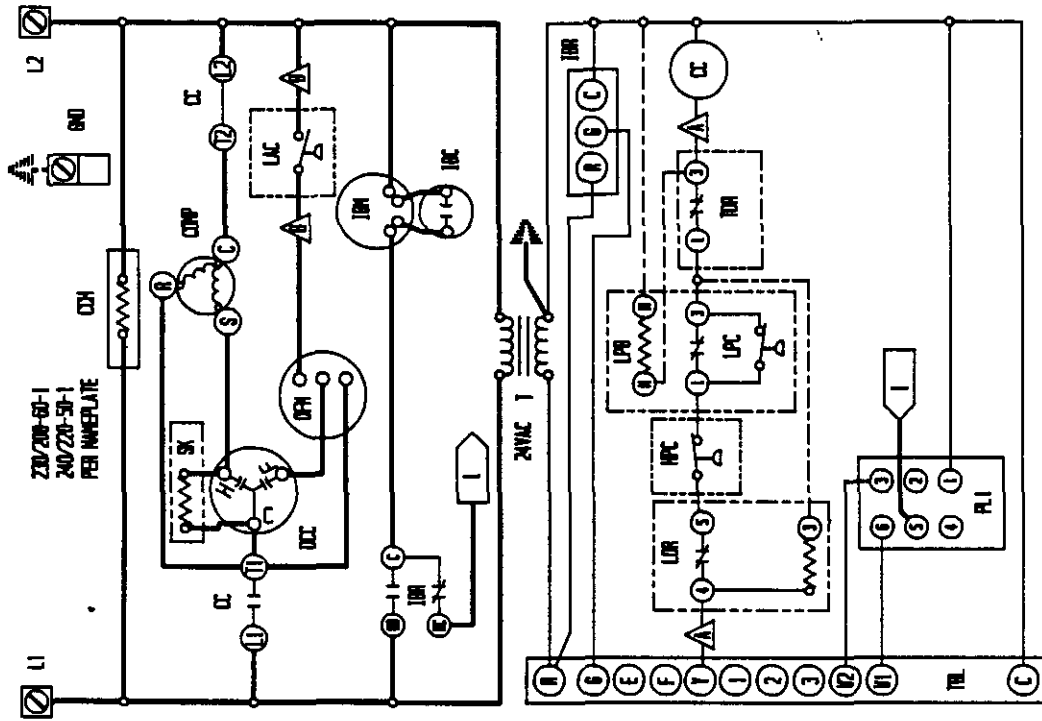
High side pressure + 5 PSIG

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.

TABLE 10

OPTIONAL ACCESSORIES

Model	Description	W	W	W
		A	A	A
		1	2	2
		8	4	4
		1	1	1
		-	-	-
		A	A	B
BHWA24-A04	Heater Packages		X	
BHWA02-A05	Heater Packages	X	X	
BHWA02-A08	Heater Packages	X	X	
BHWA02-A10	Heater Packages	X	X	
BHWA24-B06	Heater Packages			X
BOP-2	Blank Off Plate	X	X	X
BFAD-2	Barometric Fresh Air Damper	X	X	X
MFAD-2	Motorized Fresh Air Damper	X	X	X
CRV-2	Classroom Ventilator With Exhaust	X	X	X
EIFM-2	Economizer With Exhaust	X	X	X
WBRV-A2A	Energy Recovery Ventilator	X	X	X
CMA-1	High Pressure Control (HPC)	X	X	X
CMA-2	Low Pressure Control (LPC)	X	X	X
CMA-4	Low and High Pressure Control	X	X	X
CMA-5	Time Delay Relay (TDR)	X	X	X
CMA-6	Low Ambient Control (LAC)	X	X	X
CMA-8	TDR + HPC	X	X	X
CMA-10	LPC + HPC + TDR	X	X	X
CMA-11	LPC + HPC + LAC	X	X	X
CMA-12	LAC + TDR	X	X	X
CMA-13	LPC + HPC + TDR + LAC	X	X	X
CMC-15	Start Kit	X	X	
WMCB-02A	Circuit Breaker Kits	X	X	
WMCB-01B	Circuit Breaker Kits			X



USE UPPER CONDUCTORS
ONLY SUITABLE FOR AT
LEAST 75 °C

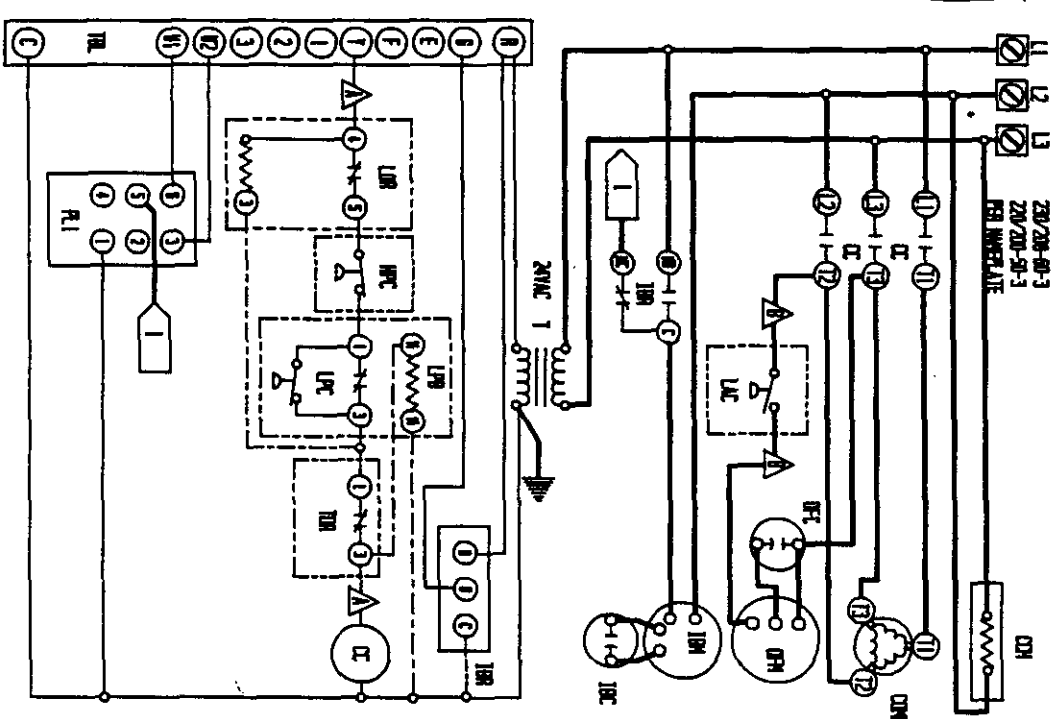
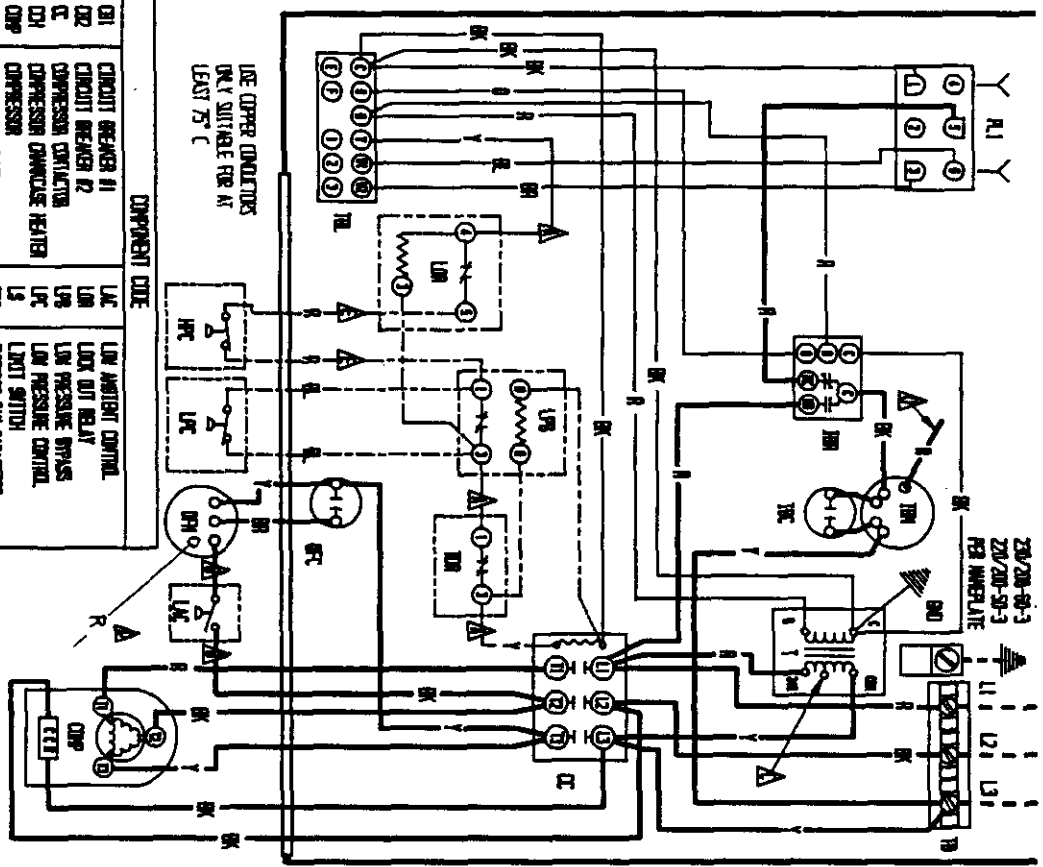
COMPONENT CODE	DESCRIPTION
CB1	CIRCUIT BREAKER #1
CB2	CIRCUIT BREAKER #2
CC	COMPRESSOR CONTACTOR
CCX	COMPRESSOR CONTACTOR HEATER
CCP	COMPRESSOR CAPACITOR
CCG	CONDENSER CAPACITOR
CS	COMPRESSOR START
CS1	COMPRESSOR START #1
CS2	COMPRESSOR START #2
HC1	HEATER CONTACTOR #1
HC2	HEATER CONTACTOR #2
HPC	HIGH PRESSURE CONTROL
IMC	INDOOR BLOWER MOTOR
IMR	INDOOR BLOWER RELAY
LAC	LOW AMBIENT CONTROL
LOR	LOCK OUT RELAY
LPP	LOW PRESSURE BYPASS
LPC	LOW PRESSURE CONTROL
LS	LIMIT SWITCH
OPM	OUTDOOR FAN MOTOR
PL1	PLUS #1
ST	START KIT
TR	TRANSFORMER
TB	TERMINAL BLOCK
TBL	LOW VOLTAGE TERMINAL BLOCK
TBR	TERMINAL CUTOFF
TDR	THE DELAY RELAY

▲ Labeled wires connect if no options used. ▲ Move red wire to 200V tap for 200V operation ▲ Red (L1) Black (L2) Where applicable

FACTORY STD.	FIELD	OPTIONAL
HIGH VOLTAGE	---	---
LOW VOLTAGE	---	---
ACCESSORY	---	---

BLACK	BROWN	RED	ORANGE	WHITE	GRAY	SLATE	VIOLET	PURPLE	PINK	TAN
BK	BR	RD	OR	WH	GR	SL	VL	PL	PK	TN

BARB MFG. CO.
DWS 4055-110 C
DWN. CSB
DWR./APR.



COMPONENT CODE

C01	CIRCUIT BREAKER #1	LAC	LOW AMBIENT CONTROL
C02	CIRCUIT BREAKER #2	LOR	LOCK OUT RELAY
C	COMPRESSOR CONTACTOR	LPS	LOW PRESSURE SWITCH
C04	COMPRESSOR CONTACTOR HEATER	LPP	LOW PRESSURE CONTROL
CM	CONDENSER FAN MOTOR	LPT	LOW TEMPERATURE CONTROL
CO	CONDENSER	LRS	ROOM SENSING CONTROL
CP	CONDENSER PUMP	LRF	ROOM SENSING RELAY
CS	CONDENSER SENSING CONTROL	LRI	ROOM SENSING RELAY
CS0	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS1	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS2	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS3	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS4	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS5	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS6	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS7	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS8	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS9	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS10	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS11	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS12	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS13	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS14	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS15	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS16	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS17	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS18	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS19	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS20	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS21	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS22	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS23	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS24	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS25	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS26	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY
CS27	CONDENSER SENSING RELAY	LRI	ROOM SENSING RELAY
CS28	CONDENSER SENSING RELAY	LRT	ROOM SENSING RELAY
CS29	CONDENSER SENSING RELAY	LRS	ROOM SENSING RELAY
CS30	CONDENSER SENSING RELAY	LRF	ROOM SENSING RELAY

WIRE TO 200V TAP FOR 200V OPERATION

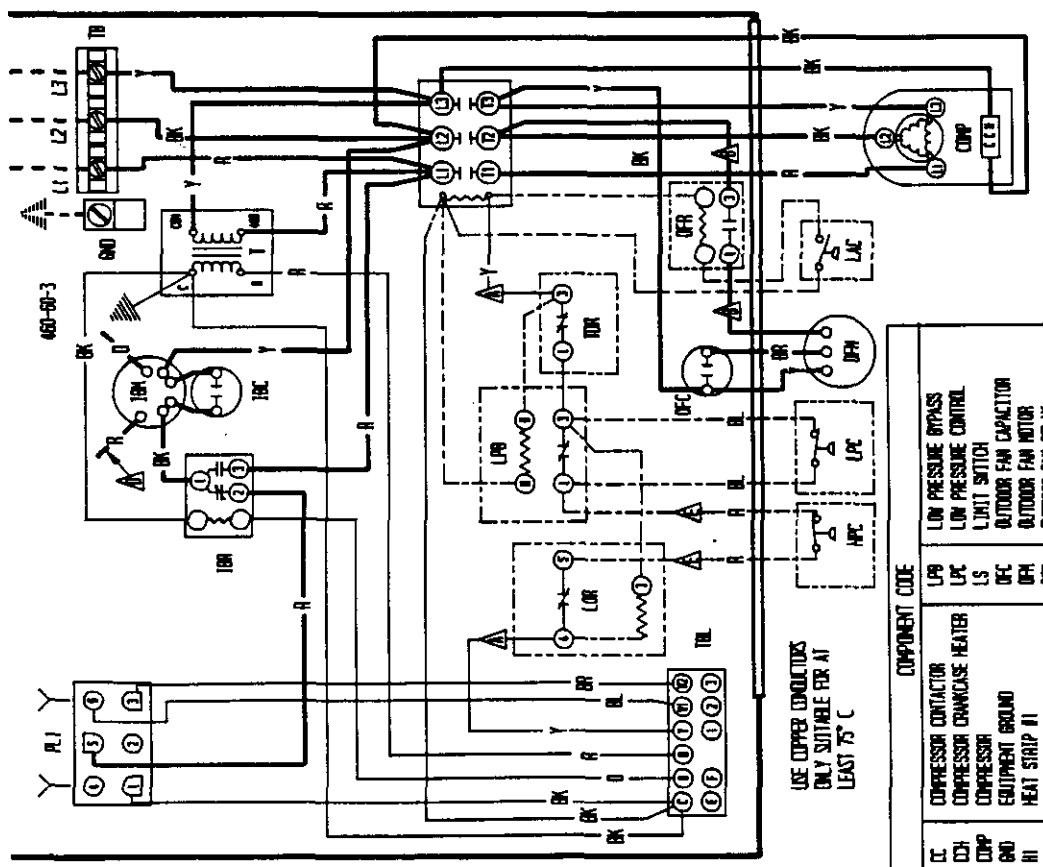
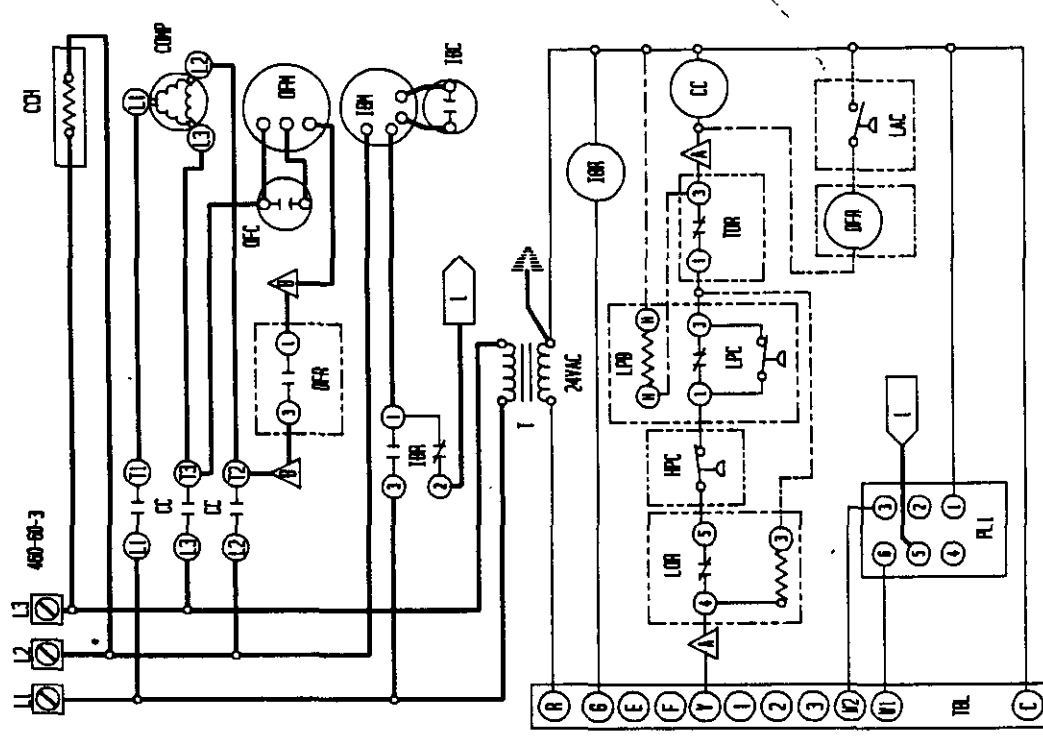
RED DOWN BLACK UP/W/AN

WHERE APPLICABLE

FACTORY NO.	FIELD	WIRING
NO	NO	NO
YES	YES	YES

COLOR CODE	
BLACK	Y
BROWN	B
RED	R
ORANGE	O
YELLOW	Y
GREEN (FRI)	G
BLUE	B
WHITE	W
VIOLET	V
PURPLE	P
GRAY	G
SLATE	S
TAN	T
PINK	P
LAMP/B	L

BARB WPC. CO.	100%	4055-210 D
	100%	CSB
	OK/APP.	



USE COPPER CONDUCTORS
ONLY SUITABLE FOR AT
LEAST 75° C

COMPONENT CODE	
CC	COMPRESSOR CAPACITOR
CD	COMPRESSOR CAPACITOR HEATER
COMP	COMPRESSOR
GRD	EQUIPMENT GROUND
H1	HEAT STRIP #1
H2	HEAT STRIP #2
H1C	HEATER CONTACTOR #1
H2C	HEATER CONTACTOR #2
HPC	HIGH PRESSURE CONTROL
IBC	INDOOR BLOWER CAPACITOR
IBM	INDOOR BLOWER MOTOR
IBR	INDOOR BLOWER RELAY
LAC	LOW AMBIENT CONTROL
LOR	LOCK OUT RELAY
LOR	LOW PRESSURE BYPASS
LPS	LOW PRESSURE CONTROL
LS	LOW PRESSURE SWITCH
OFC	OUTDOOR FAN CAPACITOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PO	PULL OUT DISCONNECT
PL1	PLUG #1
TR	TRANSFORMER
TB	TERMINAL BLOCK
TBL	LOW VOLTAGE TERMINAL BLOCK
TOO	TEMPERATURE OUT OF RANGE
TOR	TIME DELAY RELAY

▲ Labeled wires connect if no options used. ▲ For low speed connect black and orange wires together and insulate. Connect red wire to terminal 1 of TR.

COLOR CODE		BARD MFG. CO.	
BLACK	Y	TAN	1
BROWN	6	PINK	7
RED	8	LAUREN	8
ORANGE	0	GRAY	9
		SLATE	10
		WHITE	11
		BLUE	12
		GREEN	13
		PURPLE	14
		VIOLET	15
		YELLOW	16
		YELLOW (PR)	17
		GRAY	18
		SLATE	19
		WHITE	20
		BLUE	21
		GREEN	22
		PURPLE	23
		VIOLET	24
		YELLOW	25
		YELLOW (PR)	26
		GRAY	27
		SLATE	28
		WHITE	29
		BLUE	30
		GREEN	31
		PURPLE	32
		VIOLET	33
		YELLOW	34
		YELLOW (PR)	35
		GRAY	36
		SLATE	37
		WHITE	38
		BLUE	39
		GREEN	40
		PURPLE	41
		VIOLET	42
		YELLOW	43
		YELLOW (PR)	44
		GRAY	45
		SLATE	46
		WHITE	47
		BLUE	48
		GREEN	49
		PURPLE	50
		VIOLET	51
		YELLOW	52
		YELLOW (PR)	53
		GRAY	54
		SLATE	55
		WHITE	56
		BLUE	57
		GREEN	58
		PURPLE	59
		VIOLET	60
		YELLOW	61
		YELLOW (PR)	62
		GRAY	63
		SLATE	64
		WHITE	65
		BLUE	66
		GREEN	67
		PURPLE	68
		VIOLET	69
		YELLOW	70
		YELLOW (PR)	71
		GRAY	72
		SLATE	73
		WHITE	74
		BLUE	75
		GREEN	76
		PURPLE	77
		VIOLET	78
		YELLOW	79
		YELLOW (PR)	80
		GRAY	81
		SLATE	82
		WHITE	83
		BLUE	84
		GREEN	85
		PURPLE	86
		VIOLET	87
		YELLOW	88
		YELLOW (PR)	89
		GRAY	90
		SLATE	91
		WHITE	92
		BLUE	93
		GREEN	94
		PURPLE	95
		VIOLET	96
		YELLOW	97
		YELLOW (PR)	98
		GRAY	99
		SLATE	100
		WHITE	101
		BLUE	102
		GREEN	103
		PURPLE	104
		VIOLET	105
		YELLOW	106
		YELLOW (PR)	107
		GRAY	108
		SLATE	109
		WHITE	110
		BLUE	111
		GREEN	112
		PURPLE	113
		VIOLET	114
		YELLOW	115
		YELLOW (PR)	116
		GRAY	117
		SLATE	118
		WHITE	119
		BLUE	120
		GREEN	121
		PURPLE	122
		VIOLET	123
		YELLOW	124
		YELLOW (PR)	125
		GRAY	126
		SLATE	127
		WHITE	128
		BLUE	129
		GREEN	130
		PURPLE	131
		VIOLET	132
		YELLOW	133
		YELLOW (PR)	134
		GRAY	135
		SLATE	136
		WHITE	137
		BLUE	138
		GREEN	139
		PURPLE	140
		VIOLET	141
		YELLOW	142
		YELLOW (PR)	143
		GRAY	144
		SLATE	145
		WHITE	146
		BLUE	147
		GREEN	148
		PURPLE	149
		VIOLET	150

