

INSTALLATION INSTRUCTIONS

WALL MOUNTED PACKAGE AIR CONDITIONERS

MODEL

WA121

DATE: 04-12-94

**MANUAL 2100-234 REV. A
SUPERSEDES REV.
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

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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

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Other patents pending.

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PART 1 -- WALL MOUNT GENERAL INFORMATION

AIR CONDITIONER WALL MOUNT MODEL NOMENCLATURE

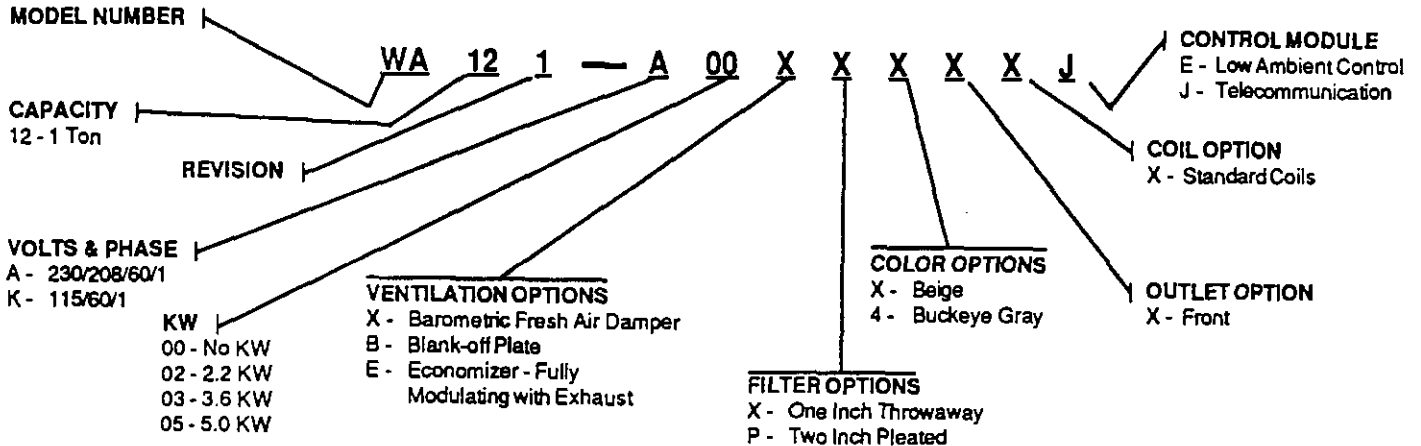


TABLE 1 ELECTRIC HEAT TABLE

Models	WA121-A						WA121-K	
	240-1V			208-1V			120V	
	KW	A	BTU	A	BTU	A	BTU	
03	15.0	12285	13.0	9230				
05	20.8	17065	18.1	12800				
02						18.3	7510	

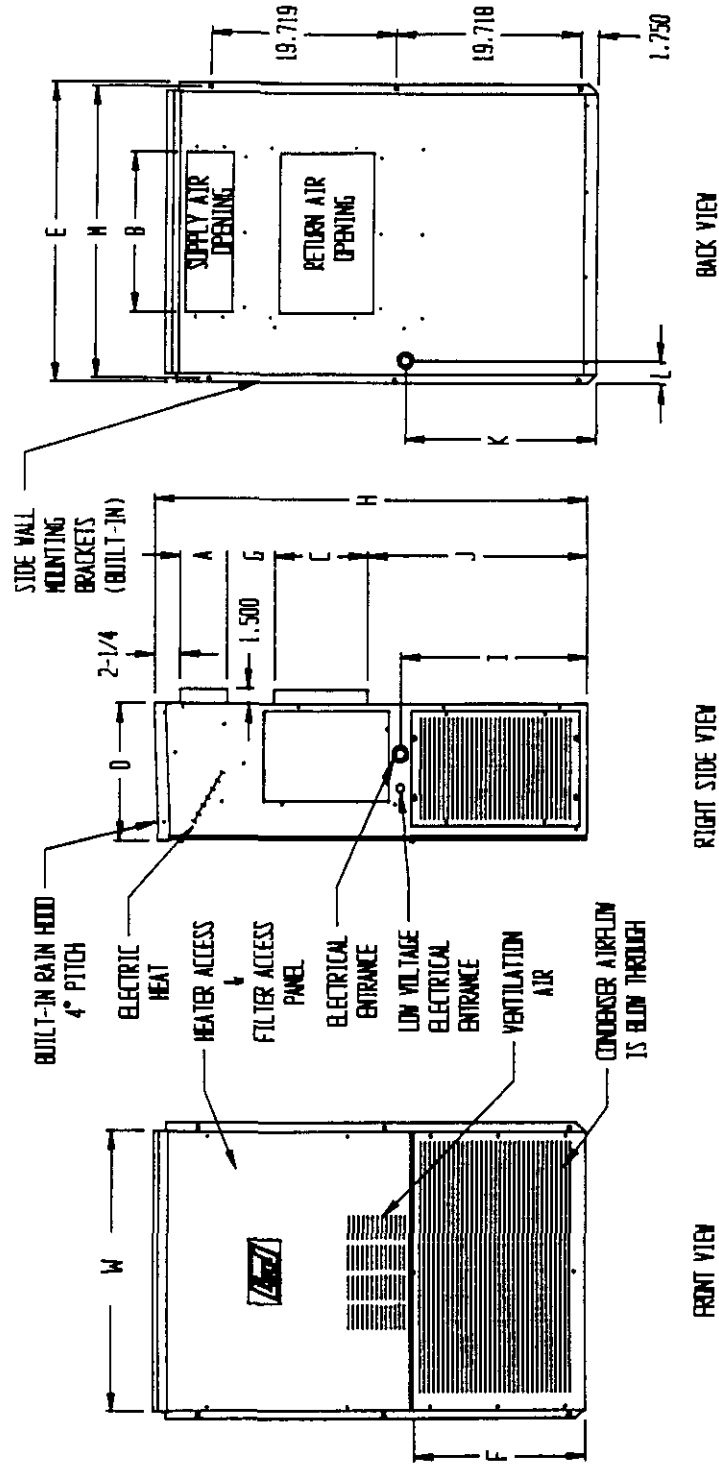
SHIPPING DAMAGE

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
UNIT DIMENSIONS

SIZE SPECS FOR HTS-500

UNIT	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY			RETURN			E	F	G (*)	I	J (*)	K	L	M
				A	B	C	L	B									
VA121	30-1/8	14-5/8	46	5	17	10	17	32	18-1/4	2	1R 5	19-7/8	23-3/4	2R 26-3/4	20-1/4	2-1/2	31-1/16



(*) POSITION OF RETURN AIR FLANGES ARE INTERCHANGEABLE BETWEEN TWO POSITIONS. FACTORY BUILT AT 5 INCHES.

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
WA121-A00	230/208-1	1	8	15	14	14
A03		1	20	20	12	12
A05		1	27	30	10	10
WA121-K00	115-1	1	17	25	10	10
K02		1	25	30	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, NEPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NEPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

DUCT WORK

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 8 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.

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

Some installations may not require any return air duct. It is recommended that on this type of installation that a filter grille be located in the wall. 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 2-inch pleated filter is also available as an optional accessory. 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.

The fresh air damper assembly is standard equipment with the unit because of the variety of state or local codes requiring fresh air capability. It is shipped already attached to each unit.

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

This unit employs an automatic condensate disposal system consisting of a base drain pan, drain valve and fan blade with slinger ring. A plastic drain hose extends from the evaporator drain pan at the top of the unit to the base drain pan at the bottom. At temperatures above 40°, the drain valve located between the condenser coil and fan shroud is closed allowing water to build up in the base to a height of 5/8" to 3/4". The fan blade with slinger then rotates in this water and throws the water onto the condenser coil. This disposes of the water by evaporating it on the hot condenser.

At temperatures below 40°, the drain valve opens draining the base pan and preventing freeze ups that could damage the coil or fan blade.

PART 2 -- INSTALLATION INSTRUCTIONS

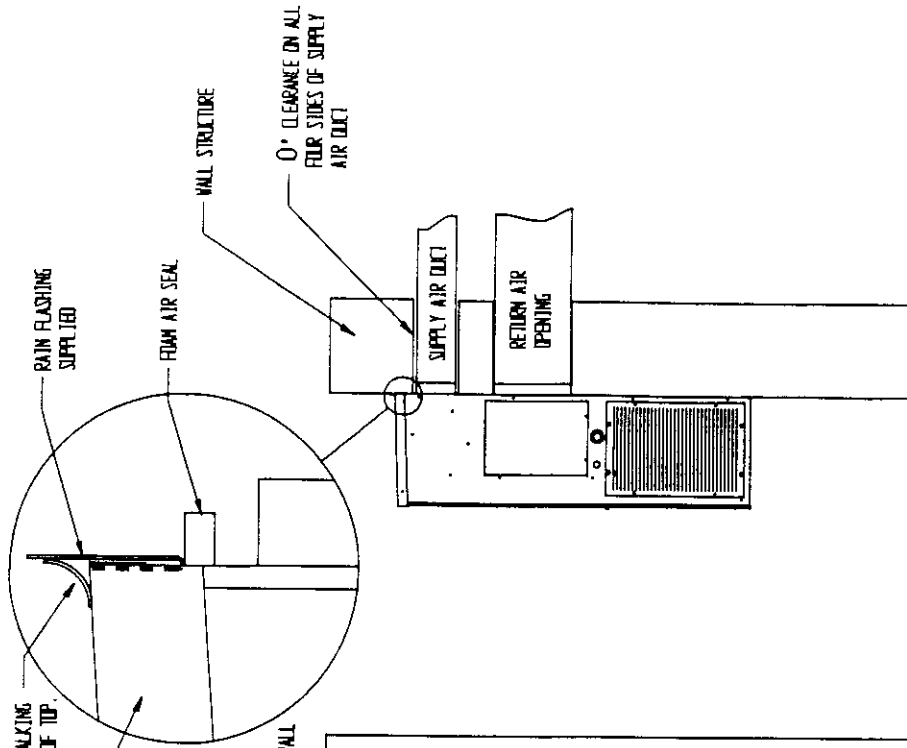
WALL MOUNTING INFORMATION

1. These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides.
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.

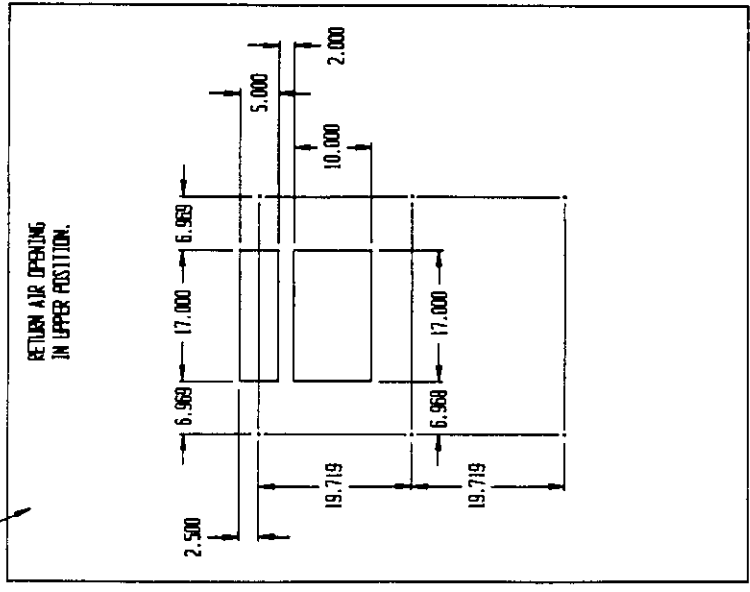
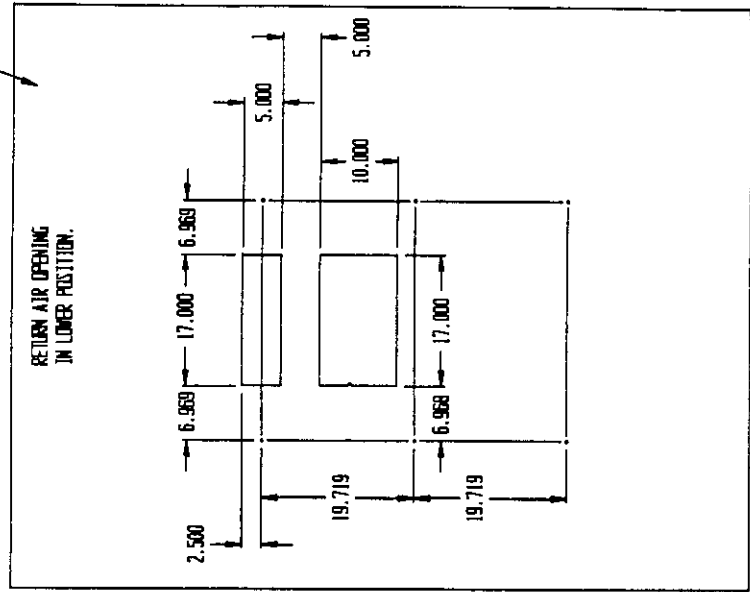
MOUNTING THE UNIT

1. Two holes, for the supply and return air openings, must be cut through the wall as shown in Figure 2.
2. Locate and mark lag bolt locations and bottom mounting bracket location, if desired. See Figure 2.
3. 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.
4. Position unit in opening and secure with 5/16 lag bolts; use 7/8 inch diameter flat washers on the lag bolts.
5. Secure rain flashing to wall and caulk across entire length of top. See Figure 2.
6. 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.
7. On side by side installations, maintain a minimum of 20 inches clearance on right side to allow access to control panel and allow proper airflow to outdoor coil. Additional clearance may be required to meet local or national codes.

FIGURE 2
MOUNTING INSTRUCTIONS



NOTE:
IT IS RECOMMENDED THAT A BEAD OF SILICONE CHALKING BE PLACED BEHIND THE SIDE MOUNTING FLANGES AND UNDER TOP FLASHING AT TIME OF INSTALLATION.



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.

WIRING: LOW VOLTAGE WIRING

230/208V, 1 phase equipment use 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
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).

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 3.

TABLE 3 THERMOSTAT WIRE SIZE

Transformer VA	FLA	Wire Gauge	Maximum Distance In Feet
40	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	8404-012	1 stage cool, 2 stage heat
T874C1760	Q674A1001	System: heat-auto-cool Fan: on-auto
8403-002	8404-003	1 stage heat, 1 stage cool
T87F3111	Q539A1220	System: heat-off-cool Fan: on-auto
8403-009	----	1 stage heat, 1 stage cool
1F56-318		System: heat-off-cool Fan: on-auto

FIGURE 3
LOW VOLTAGE WIRING

T87F DR 1F56
THERMOSTAT



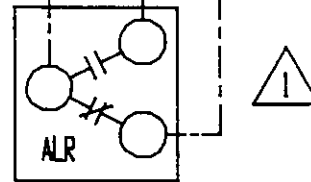
1 STAGE COOL
1 STAGE HEAT
THERMOSTAT

T874C1760
G674A1001
THERMOSTAT



1 STAGE COOL
2 STAGE HEAT
THERMOSTAT

UNIT 24V
TERMINAL BLOCK



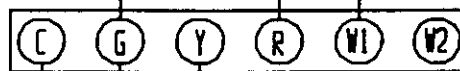
OPTIONAL ALARM RELAY PROVIDED ON UNITS WITH CONTROL MODULE "J" FACTORY
INSTALLED. CONTACT RATING 24VAC @ 125VA

OPTIONAL ECONOMIZER LOW VOLTAGE WIRING

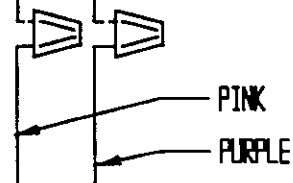
T874D1934
G674A1001
THERMOSTAT



UNIT 24V
TERMINAL STRIP



ECONOMIZER WIRING
HARNES



PART 3 -- START-UP

IMPORTANT INSTALLER NOTE

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

SERVICE HINTS

1. Caution owner 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. The unit is equipped with a high pressure cut out switch.
3. Check all power fuses or circuit breakers to be sure they are the correct rating.
4. 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.

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.

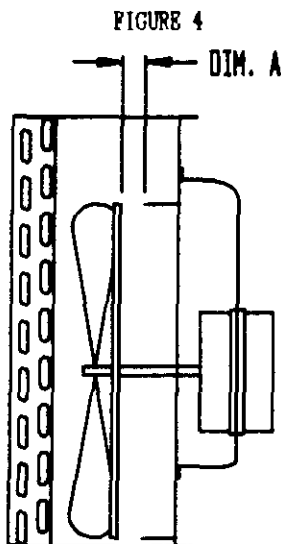


TABLE 4

Model	Dimension A
WA121	1/2"

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
WA121	400	54 - 56	65 - 67

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	WA121 230V	
	Dry	Wet
.0	530	500
.1	485	460
.2	440	425
.3	390	375
.4	325	300

TABLE 7

Model	Rated CFM*	Rated ESP*	Recommended Airflow Range
WA121	400	.25	500 - 300
*Rated CFM and ESP on high speed tap.			

MAXIMUM ESP OF OPERATION

TABLE 8 ELECTRIC HEAT ONLY

Model	ESP
WA121 A00	.35
WA121 A03	.35
WA121 A05	.35
WA121 K00	.35
WA121 K02	.35
Values shown are for units equipped with STD 1" throw-away filter. Derate ESP by .15 for 2" pleated filters.	

COOLING

TABLE 9

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temperature	Pressure	Air Temperature Entering Outdoor Coil °F								
			75	80	85	90	95	100	105	110	115
WA121	75 deg. DB	Low Side	72	74	76	79	81	83	86	88	91
	62 deg. WB	High Side	187	201	216	232	248	265	282	300	319
	80 deg. DB	Low Side	76	79	82	84	87	90	92	95	97
	67 deg. WB	High Side	192	207	222	238	255	272	290	309	328
	85 deg. DB	Low Side	81	85	88	91	94	97	99	102	104
	72 deg. WB	High Side	198	214	230	247	264	282	300	319	339

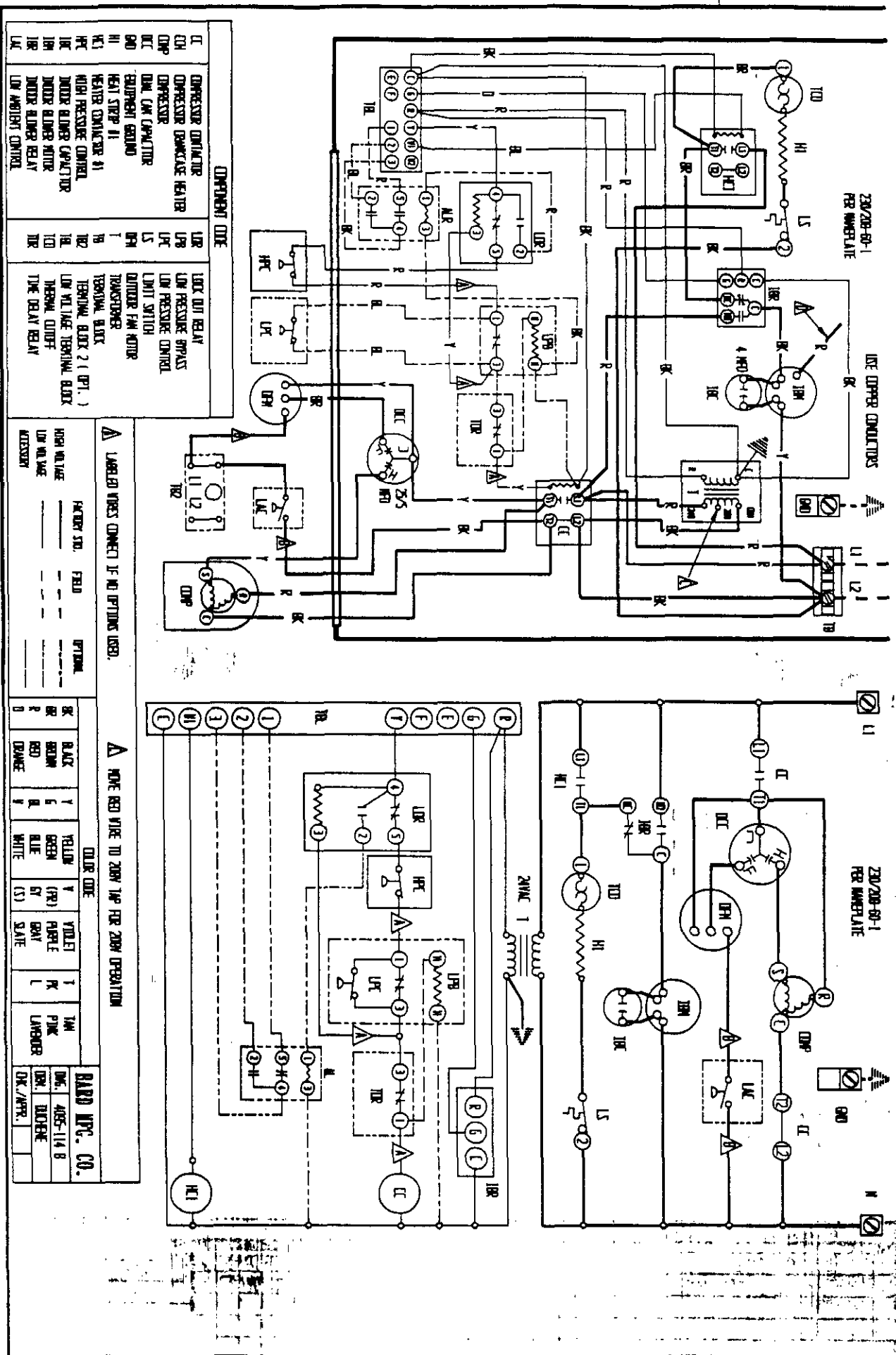
Low side pressure + 2 PSIG

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 FIELD INSTALLED ACCESSORIES

Model	Description	W A 1 2 1
BOP-1A	Blank Off Plate	x
BFAD-1	Barometric Fresh Air Damper	x
EIFM-1	Economizer With Exhaust	x
CMA-6	Low Ambient Control	x
CMA-20	LPC + TDR + LAC	x

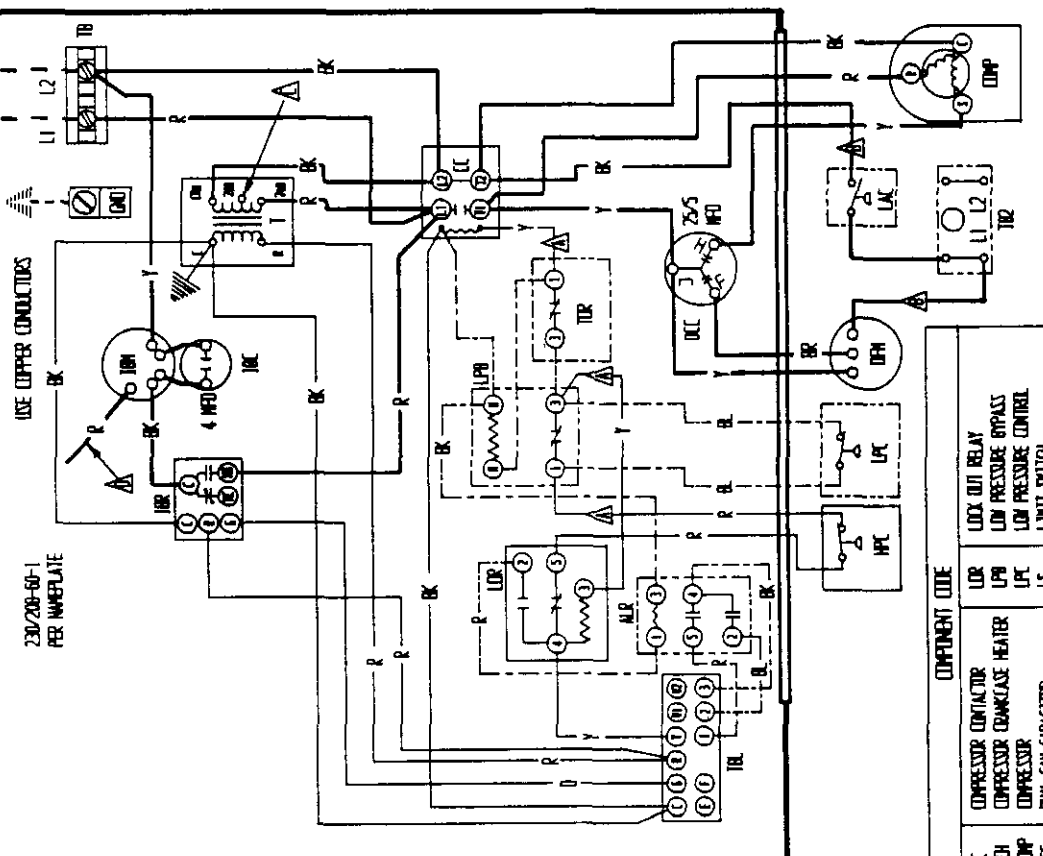
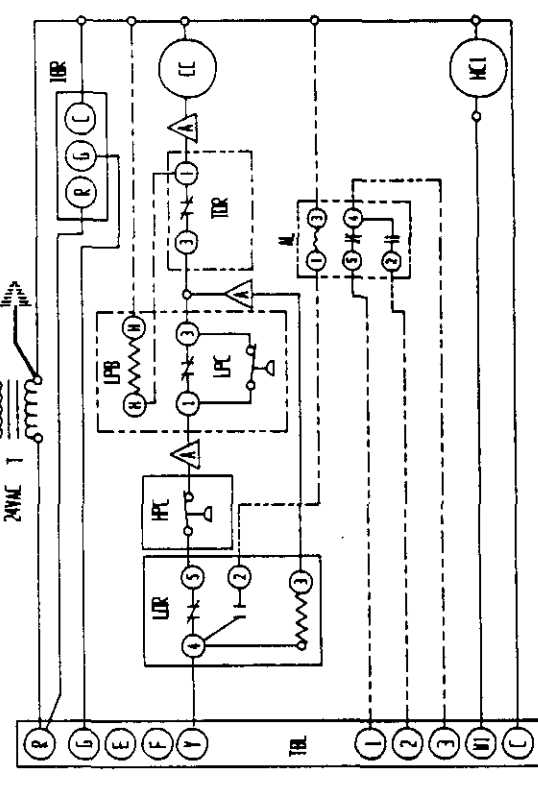
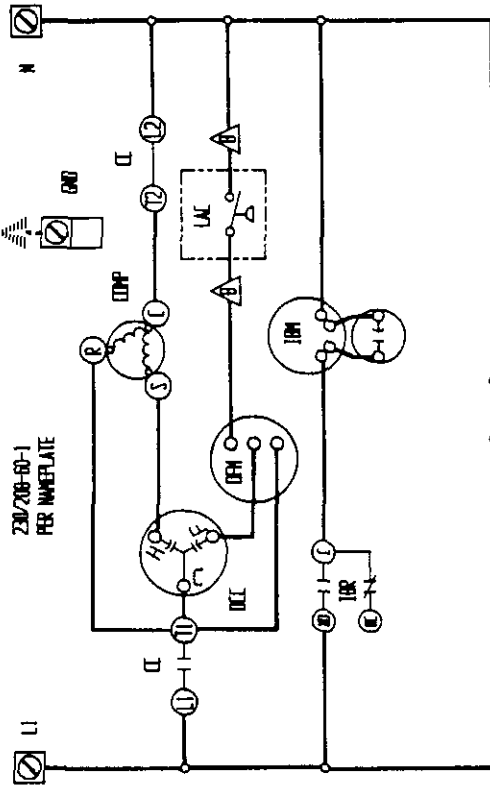


OPERATING CODE		
UH	UH	UPPER CONDUCTOR
UL	UL	UPPER CONDUCTOR
LH	LH	LOWER CONDUCTOR
LL	LL	LOWER CONDUCTOR
H1	H1	HEATER
H2	H2	HEATER
H3	H3	HEATER
H4	H4	HEATER
H5	H5	HEATER
H6	H6	HEATER
H7	H7	HEATER
H8	H8	HEATER
H9	H9	HEATER
H10	H10	HEATER
H11	H11	HEATER
H12	H12	HEATER
H13	H13	HEATER
H14	H14	HEATER
H15	H15	HEATER
H16	H16	HEATER
H17	H17	HEATER
H18	H18	HEATER
H19	H19	HEATER
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H91	H91	HEATER
H92	H92	HEATER
H93	H93	HEATER
H94	H94	HEATER
H95	H95	HEATER
H96	H96	HEATER
H97	H97	HEATER
H98	H98	HEATER
H99	H99	HEATER
H100	H100	HEATER

Labeled Wires Connect If No Options Used.		
Factor 50	Factor 50	Factor 50
Factor 51	Factor 51	Factor 51
Factor 52	Factor 52	Factor 52
Factor 53	Factor 53	Factor 53
Factor 54	Factor 54	Factor 54
Factor 55	Factor 55	Factor 55
Factor 56	Factor 56	Factor 56
Factor 57	Factor 57	Factor 57
Factor 58	Factor 58	Factor 58
Factor 59	Factor 59	Factor 59
Factor 60	Factor 60	Factor 60
Factor 61	Factor 61	Factor 61
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Factor 71	Factor 71	Factor 71
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Factor 73	Factor 73	Factor 73
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Factor 75	Factor 75	Factor 75
Factor 76	Factor 76	Factor 76
Factor 77	Factor 77	Factor 77
Factor 78	Factor 78	Factor 78
Factor 79	Factor 79	Factor 79
Factor 80	Factor 80	Factor 80
Factor 81	Factor 81	Factor 81
Factor 82	Factor 82	Factor 82
Factor 83	Factor 83	Factor 83
Factor 84	Factor 84	Factor 84
Factor 85	Factor 85	Factor 85
Factor 86	Factor 86	Factor 86
Factor 87	Factor 87	Factor 87
Factor 88	Factor 88	Factor 88
Factor 89	Factor 89	Factor 89
Factor 90	Factor 90	Factor 90
Factor 91	Factor 91	Factor 91
Factor 92	Factor 92	Factor 92
Factor 93	Factor 93	Factor 93
Factor 94	Factor 94	Factor 94
Factor 95	Factor 95	Factor 95
Factor 96	Factor 96	Factor 96
Factor 97	Factor 97	Factor 97
Factor 98	Factor 98	Factor 98
Factor 99	Factor 99	Factor 99
Factor 100	Factor 100	Factor 100

None Red Wire to 208V Tap for 208V Operation		
Color Code	Wire Color	Terminal
Black	Black	1
Red	Red	2
Blue	Blue	3
White	White	4
Yellow	Yellow	5
Green	Green	6
Blue	Blue	7
White	White	8
Violet	Violet	9
Purple	Purple	10
Gray	Gray	11
White	White	12
Black	Black	13
Red	Red	14
Blue	Blue	15
White	White	16
Yellow	Yellow	17
Green	Green	18
Blue	Blue	19
White	White	20
Violet	Violet	21
Purple	Purple	22
Gray	Gray	23
White	White	24
Black	Black	25
Red	Red	26
Blue	Blue	27
White	White	28
Yellow	Yellow	29
Green	Green	30
Blue	Blue	31
White	White	32
Violet	Violet	33
Purple	Purple	34
Gray	Gray	35
White	White	36
Black	Black	37
Red	Red	38
Blue	Blue	39
White	White	40
Yellow	Yellow	41
Green	Green	42
Blue	Blue	43
White	White	44
Violet	Violet	45
Purple	Purple	46
Gray	Gray	47
White	White	48
Black	Black	49
Red	Red	50
Blue	Blue	51
White	White	52
Yellow	Yellow	53
Green	Green	54
Blue	Blue	55
White	White	56
Violet	Violet	57
Purple	Purple	58
Gray	Gray	59
White	White	60
Black	Black	61
Red	Red	62
Blue	Blue	63
White	White	64
Yellow	Yellow	65
Green	Green	66
Blue	Blue	67
White	White	68
Violet	Violet	69
Purple	Purple	70
Gray	Gray	71
White	White	72
Black	Black	73
Red	Red	74
Blue	Blue	75
White	White	76
Yellow	Yellow	77
Green	Green	78
Blue	Blue	79
White	White	80
Violet	Violet	81
Purple	Purple	82
Gray	Gray	83
White	White	84
Black	Black	85
Red	Red	86
Blue	Blue	87
White	White	88
Yellow	Yellow	89
Green	Green	90
Blue	Blue	91
White	White	92
Violet	Violet	93
Purple	Purple	94
Gray	Gray	95
White	White	96
Black	Black	97
Red	Red	98
Blue	Blue	99
White	White	100

BAIRD INC. CO.
 INC. 405-114 B
 INC. 405-114 B
 OK/APP.



▲ NINE RED WIRE TO 208V TAP PER 208V OPERATION

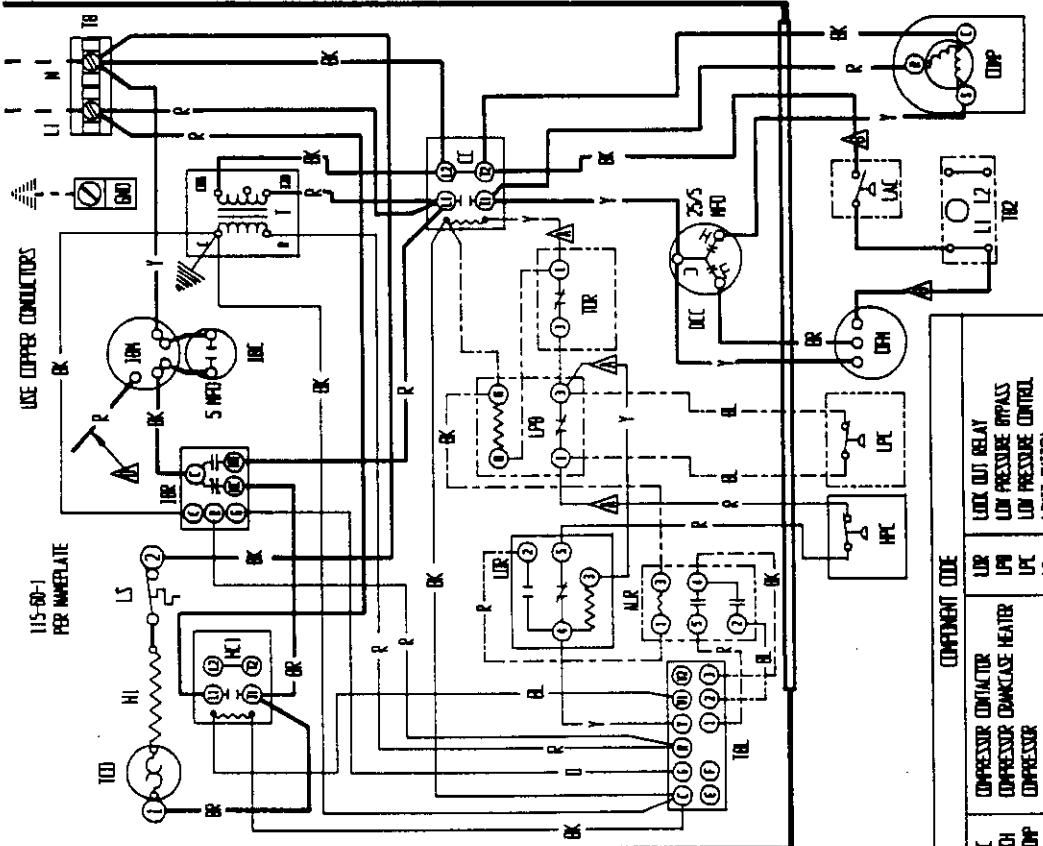
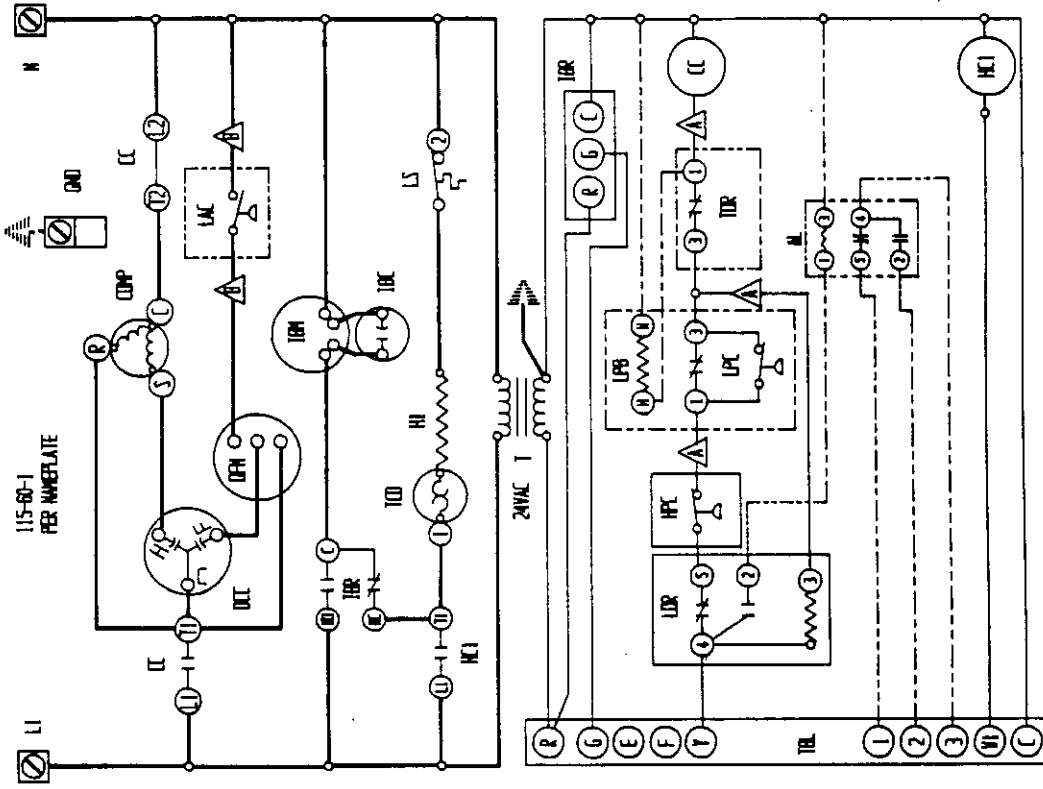
COLOR CODE		TAP	
BLACK	Y	PINK	L
BROWN	G	PURPLE	L
RED	B	GRAY	L
ORANGE	W	SLATE	(S)

▲ LABELLED WIRES CONNECT IF NO OPTIONS USED.

HIGH VOLTAGE	LOW VOLTAGE	ACCESSORY	OPTIONAL
FACTORY STD.	FIELD	OPTIONAL	

COMPONENT CODE	DESCRIPTION
CC	COMPRESSOR CONTACTOR
CH	COMPRESSOR CONTACTOR HEATER
CLC	COMPRESSOR CAPACITOR
CLM	INDOOR FAN CAPACITOR
CLN	EQUIPMENT GROUND
CLP	HEAT STRIP #1
CLQ	HEATER CONTACTOR #1
CLR	HIGH PRESSURE CONTROL
CLS	INDOOR BLOWER CAPACITOR
CLT	INDOOR BLOWER MOTOR
CLU	INDOOR BLOWER RELAY
CLV	LOW AMBIENT CONTROL
LOR	LOCK OUT RELAY
LPH	LOW PRESSURE BYPASS
LPC	LOW PRESSURE CONTROL
LS	LIMIT SWITCH
LFM	OUTDOOR FAN MOTOR
T	TRANSFORMER
TB	TERMINAL BLOCK
TB2	TERMINAL BLOCK 2 (OPT.)
TBL	LOW VOLTAGE TERMINAL BLOCK
TCD	THERMAL CUTOFF
TDR	TIME DELAY RELAY

BEARD MFG. CO.			
DRG.	4055-115 B		
DES.	DIETHE		
CHK./APP.			



COMPONENT CODE		COLOR CODE					BARD MFG. CO.	
CC	COMPRESSOR CONTACTOR	BK	BLK	Y	Y	V	1	IM
CH	COMPRESSOR CHARGE HEATER	BR	BROWN	G	GREEN	(PR)	R	PK
OMP	COMPRESSOR OVERLOAD PROTECTIVE SWITCH	R	RED	B	BLUE	GT	L	LANE
CC	CAPACITOR	D	ORANGE	V	WHITE	(S)		
BD	DIAPHRAGM							
HI	HEATER							
LK1	HEATER CONTACTOR #1							
HPC	HIGH PRESSURE CONTROL							
TRC	HEATER BLOWER CAPACITOR							
TRM	HEATER BLOWER MOTOR							
TRR	HEATER BLOWER RELAY							
LAL	LOW AMBIENT CONTROL							
LOR	LOW OIL RELAY							
LPH	LOW PRESSURE BYPASS							
LPC	LOW PRESSURE CONTROL							
LMT	LIMIT SWITCH							
TFM	TRANSFORMER							
TBL	TERMINAL BLOCK							
TBL 2	TERMINAL BLOCK 2 (OPT.)							
TRV	LOW VOLTAGE TERMINAL BLOCK							
TTC	THERMAL CUTOFF							
TRR	TIME RELAY							
FACTORY CTR.	FACTORY CONTROL							
OPTIONAL	OPTIONAL							
ADJ. VOLTAGE	ADJUSTABLE VOLTAGE							
NECESSARY	NECESSARY							

▲ LABELED WIRES CONNECT IF NO OPTIONS USED.

