

**INSTALLATION INSTRUCTIONS**

**SINGLE PACKAGE AIR CONDITONERS**

**MODELS**

**P1142A2**

**P1148A1**

**P1160A1**

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

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## 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

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### 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
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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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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
P1142A2	230/208-1	197-253	23.7	50	31	8	10
P1148A1	230/208-1	197-253	26.1	50	36	8	10
P1148A1-B	230/208-3	187-253	18.8	35	23	8	10
P1148A1-C	460-3	414-506	8.5	20	13	12	12
P1060A1	230/208-1	197-253	33.9	60	42	8	10
P1060A1-B	230/208-3	187-253	23.7	45	28	8	10
P1060A1-C	460-3	414-506	11.2	20	14	12	12

\*Maximum time delay fuse or HACR type circuit breaker. HACR type not applicable to 460 volt.  
\*\*75°C copper wire size, basic unit only.

TABLE 2  
OPTIONAL FIELD INSTALLED HEATER PACKAGES  
ARE ONLY TO BE USED WITH THE HEAT PUMP MODELS AS INDICATED BELOW

Heater Package Model No.	Volts and Phase	P	P	P	P	P	P	P
		1	1	1	1	1	1	1
		1	1	1	1	0	0	0
		4	4	4	4	6	6	6
		2	8	8	8	0	0	0
		A	A	A	A	A	A	A
		2	1	1	1	1	1	1
				B	C		B	C
EH5PB-A05	240/1	S	S	A	A	S	A	A
EH5PB-A10		S	S	A	A	S	A	A
EH5PB-A15		S	S	A	A	S	A	A
EH5PB-A20		S	S	A	A	S	A	A
EH5PB-B09	240/3		A	S	A	A	S	A
EH5PB-B15			A	S	A	A	S	A
EH5PB-B18			A	S	A	A	S	A
EH5PB-C09	480/3		A	A	S	A	A	S
EH5PB-C15			A	A	S	A	A	S
EH5PB-C18			A	A	S	A	A	S

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				
		KW	BTUH	KW	BTUH			No. Field Ckts.	Minimum Circuit Ampacity	(1) Maximum Overcurrent Protection	(2) Field Power Wiring	(3) Ground Wire Size
EH5PB-A05	240/208-1	5	17,100	3.75	12,800	20.8		1	26	30	10	10
EH5PB-A10	240/208-1	10	34,100	7.5	26,000	41.7		1	53	60	6	10
EH5PB-A15	240/208-1	15	51,200	11.25	38,400	62.5	30/60	1	79	80	4	8
EH5PB-A20	240/208-1	20	68,200	15	51,200	83.2	60/60	1	104	110	2	6
EH5PB-B09	240/208-3	9	30,700	6.75	23,000	21.7		1	28	30	10	10
EH5PB-B15	240/208-3	15	51,200	11.25	38,400	36.2		1	46	50	8	10
EH5PB-B18	240/208-3	18	61,400	13.5	46,100	43.4		1	55	60	6	10
EH5PB-C09	460-3	9	30,700	6.75	23,000	10.8		1	15	15	14	14
EH5PB-C15	460-3	15	51,200	11.25	38,400	18.0		1	23	25	10	10
EH5PB-C18	460-3	18	61,400	13.5	46,100	21.7		1	28	30	10	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 75°C. Other wiring materials must be rated for marked "Minimum Circuit Ampacity" or greater.
- (3) Based upon Table 250-95 of N.E.C. 1993. See electrical data for basic heat pump for Ckt. A wiring specification requirements.

**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.

### GENERAL INSTRUCTIONS

#### IMPORTANT

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

**FIELD INSTALLED HEATER PACKAGES (OPTIONAL)**

These packaged heat pumps are manufactured without supplementary electric heaters. Supplementary heaters EH5PB series (to fit P1142A2, P1148A1, and P1060A1) are available for simple, fast, field installation.

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

**IMPORTANT:** Refer to Tables 4 and 5 when designing ductwork for maximum available static pressure with heater installed.

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.

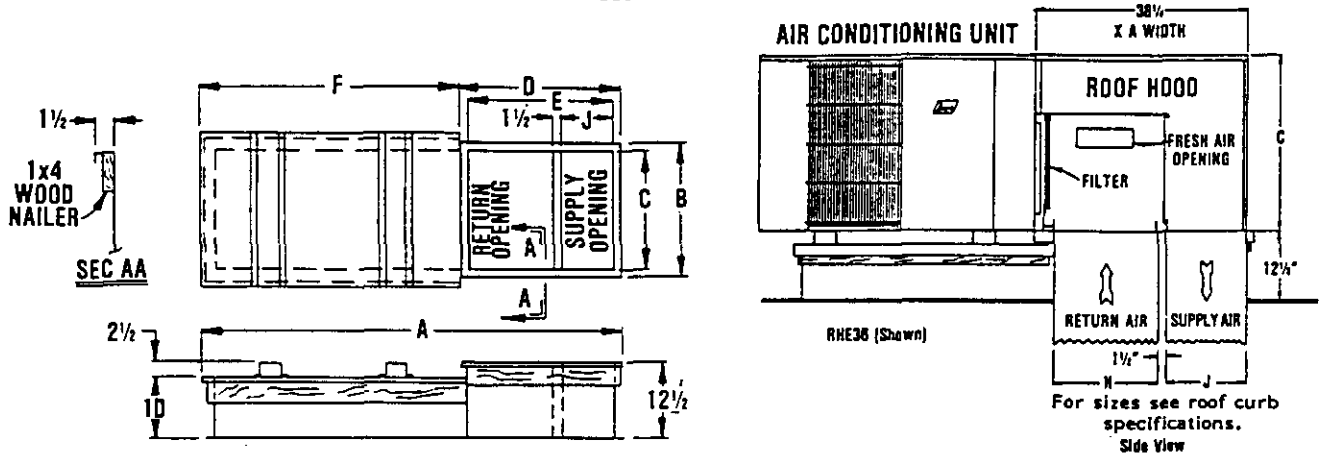
**TABLE 4  
MAXIMUM ESP OF OPERATION**

	P1142A2	P1148A1	P1060A1
A00	.50	.50	.50
A05	.50	.50	.50
A10	.50	.50	.50
A15	.40	.50	.50
A20	.40	.50	.50
B00	---	.50	.50
B09	---	.50	.50
B15	---	.50	.50
B18	---	.50	.50
C00	---	.50	.50
C09	---	.50	.50
C15	---	.50	.50
C18	---	.50	.50

N/A - Not applicable.

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

FIGURE 1



CURB AND ROOF HOOD DETAILS

	A	B	C*	D	E	F	J*	H*	Roof Hood Model	Air Conditioning Units
9042-004	82-3/8	44-1/8	41-1/8	38-3/8	35-3/8	44	14-3/4	19-1/8	RHE60	P1142A2, P1148A1, P1060A1

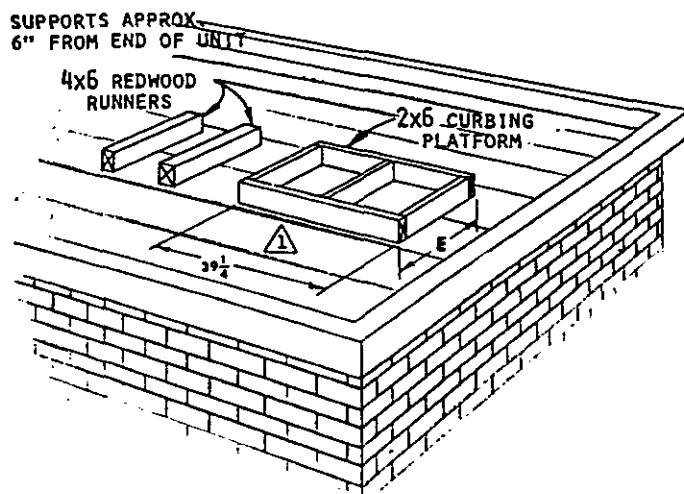
**\* Duct Sizing Information**

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

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

**FIELD FABRICATED CURBING**

FIGURE 2



Roof Hood Model	Unit Model	E
RHE60	P1142A2 P1148A1 P1060A1	44-7/8

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



## INSTALLATION

### LOCATION

**GENERAL**--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.

**SLAB MOUNTING**--In areas where winter temperatures DO NOT go below 32°F for periods over twelve hours, the unit may be slab mounted at grade level. When installing unit at grade level, install on a concrete slab at least four inches above finished grade level. Slab should have a slope tolerance away from the building structure of at least 1/4 inch per foot, while being level from side to side. This will prevent ice buildup under the unit during defrost cycles. Place slab in a location where run-off water from higher ground will not collect around unit. See Figure 4.

A minimum of 18 inches should be provided between the coil inlet and any building surfaces. Provide at least four feet between coil outlet and any building wall, fences or other vertical structures. Provide a minimum of three feet clearance on the service access side of the unit. See Figure 6.

**ROOF MOUNTING**--When a unit is installed in areas where low ambient temperatures or strong winter winds exist, it should be placed so prevailing winter winds are not in direct line with the outdoor coil. If this is not possible, a wind barrier should be constructed. Place barrier 24 inches from the coil inlet side of the unit and in the direction of prevailing winds. Size barrier at least the same height and width as the unit. This may be necessary on ground level installations. See Figure 3.

**WINTER INSTALLATION BELOW 32°F**--In areas where winter conditions go below 32°F for extended periods, the unit must be elevated above the mounting surface to prevent snowfall or defrost ice accumulation from interfering with the operation of the unit. A minimum of twelve inch elevation is recommended, while greater elevation may be required for areas of high snow accumulation. Poured concrete, steel framework, brick, cement block, etc., can be utilized to construct a suitable raised mounting platform. See Figure 5.

**DUCTWORK**--Refer to Tables 4, 5 and 5A when designing ductwork for maximum static pressure available with the specific model and heater package being installed.

TABLE 5

RATED CFM AND EXTERNAL STATIC PRESSURE (ESP) WET COIL (COOLING)			
Model	Rated CFM	Rated ESP	Recommended Air Flow Range
P1142A2	1400	.20	1260 - 1540 CFM
P1148A1	1550	.40	1400 - 1700 CFM
P1060A1	1700	.20	1530 - 1870 CFM

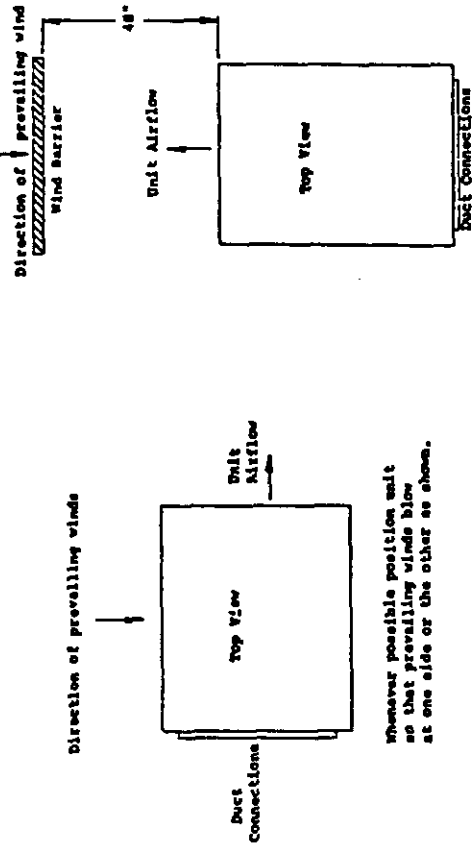
TABLE 5A

ESP Inches H <sub>2</sub> O	P1142A2 PH11421 Dry/Wet	P1148A1 PH1048 Dry/Wet	P1048A1 PH160 Dry/Wet
0	1650/1625	1950/1920	1850/1850
.1	1550/1525	1860/1830	1800/1780
.2	1435/1400	1780/1750	1725/1700
.3	1340/1310	1680/1660	1660/1625
.4	1230/1210	1580/1550	1580/1540
.5	1120/1100	1500/1480	1500/1475

Figure 3

SCOTTY APPLICATION

(May also be required for ground level installations)



Whenever possible position unit so that prevailing winds blow at one side or the other as shown.

If outdoor coil must face prevailing wind, construct a wind barrier to assure proper defrost.

Figure 5

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

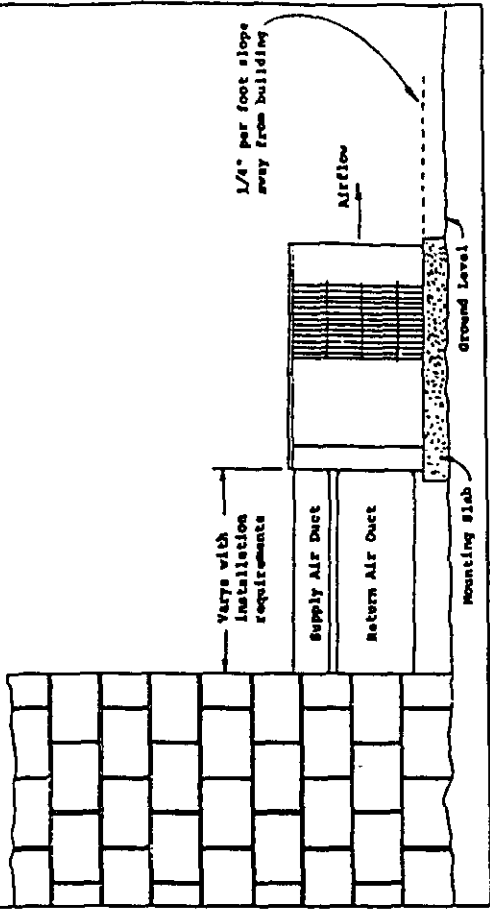
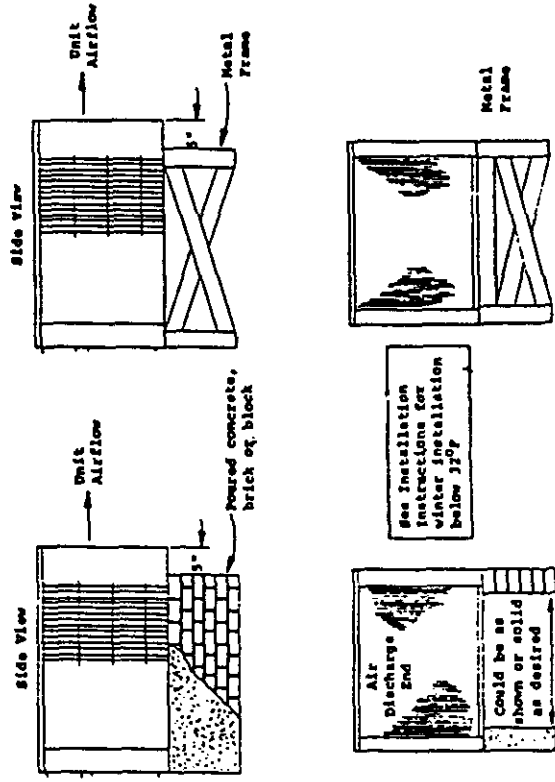


Figure 4

ELEVATED MOUNTING PLATFORMS

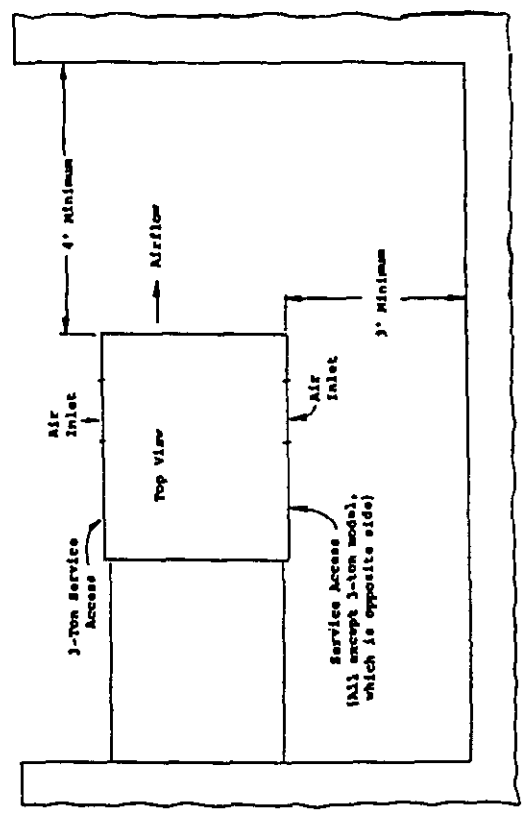


Air Discharge End  
Could be as shown or solid as desired

See Installation Instructions for winter installation below 32°F

Figure 6

AIRFLOW AND SERVICE ACCESS CLEARANCES



## TYPICAL INSTALLATIONS

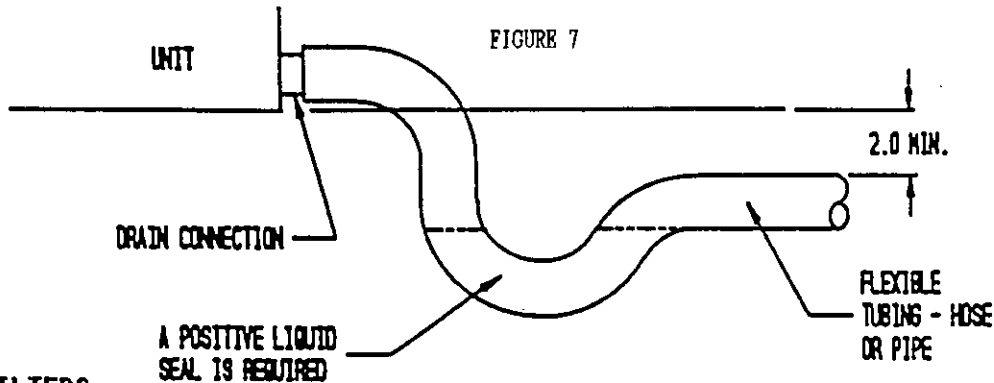
1. **ROOF MOUNTED**--The unit is mounted on a sturdy base on the roof of the building. Return air to the unit is brought through a single return grille (grilles with built-in filters are best, since they enable easy access for filter changing). Return air ducts are attached to the lower section of the 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. Two inch thick insulation with suitable vapor barrier is recommended for both outdoor and attic runs. In rooftop installations, as in all installations, the heat pump 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 heat pump. 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.

If this unit is operated in cooling below a 65° outdoor ambient temperature, the installation of low ambient controls (CMA-6) to unit is required.

## CONDENSATE DRAIN TRAP

It is very important to provide a trap in the condensate drain line to allow a positive liquid seal in the line and assure correct drainage from the coil condensate pan.

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. With a trap installed on a unit located in an unconditioned area, water in the trap may freeze. It is recommended that the trap material be of a type that will allow for expansion of water when it freezes.



## AIR FILTERS

Air filters for the return air side of the system are not provided as part of the 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 6

Model	Minimum Filter Areas	Recommended Size
P1142A2, P1148A1, P1060A1	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.

## WIRING--MAIN POWER

Refer to the unit rating plate for wire sizing information and maximum fuse 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). All models are suitable only for connection with copper wire only. 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 specifications on pages 1 and 2 lists fuse and wire sizes (75°F copper) for all models, including the most commonly used heater sizes.

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.

## WIRING--24V LOW VOLTAGE CONTROL CIRCUIT

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 on most of the wiring diagrams and are also shown below.

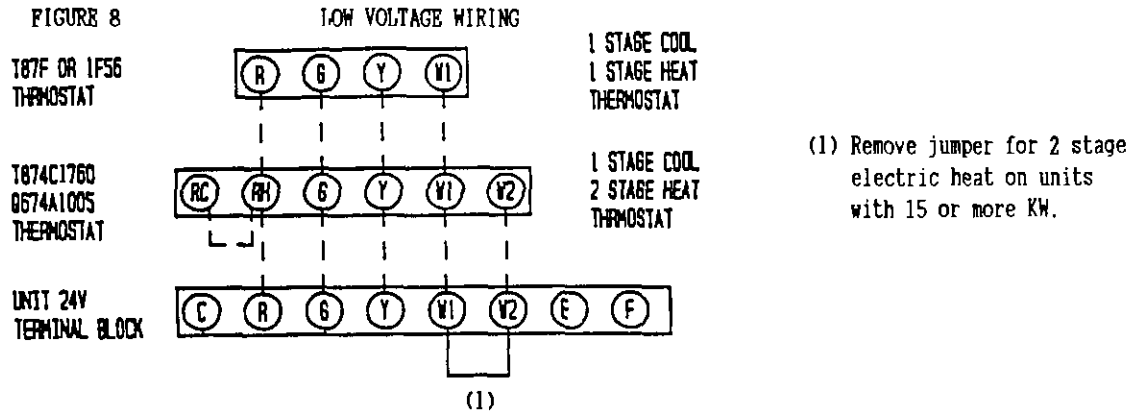


TABLE 7 THERMOSTAT WIRE SIZE

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

**IMPORTANT NOTE:** Only the thermostat and subbase combinations as shown above will work with this equipment. The thermostat and subbase **MUST** be matched, and correct operation can be assured only by proper selection and application of these parts.

## THERMOSTATS

See specific wiring information for the different models, heater KW's, and voltages on pages 12 and 13.

TABLE 8

WALL THERMOSTAT AND SUBBASE COMBINATIONS		
Thermostat	Subbase	Predominant Feature
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 (IF56-318)	-----	1 stage heat, 1 stage cool

- (1) No automatic changeover position--must manually place in heat or cool. Reversing valve remains energized at all times system switch is in heat position (except during defrost cycle). No pressure equalization noise when thermostat is satisfied on either heating or cooling.
- (2) Allows thermostat to control both heating and cooling operation when set in "AUTO" position. Reversing valve deenergizes at end of each "ON" heating cycle.

**IMPORTANT NOTE:** Both thermostat and subbase combinations shown above incorporate the following features: Man-Auto fan switch, Off-Heat-Cool-Em. Heat Switch, and two (2) indicator lamps--one for emergency heat and one for compressor malfunction.

## TRANSFORMER TAPS

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).

## START UP AND OPERATION

### THREE PHASE SCROLL COMPRESSOR START UP INFORMATION

Scroll compressors, like several other types of compressors, will only compress in one rotational direction. Direction of rotation is not an issue with single phase compressors since they will always start and run in the proper direction.

However, three phase compressors will rotate in either direction depending upon phasing of the power. Since there is a 50-50 chance of connecting power in such a way as to cause rotation in the reverse direction, verification of proper rotation must be made. Verification of proper rotation direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level over that with correct rotation, as well as, substantially reduced current draw compared to tabulated values.

Verification of proper rotation must be made at the time the equipment is put into service. If improper rotation is corrected at this time there will be no negative impact on the durability of the compressor. However, reverse operation for over one hour may have a negative impact on the bearings due to oil pump out.

NOTE: If compressor is allowed to run in reverse rotation for several minutes the compressor's internal protector will trip.

All three phase ZR\*3 compressors are wired identically internally. As a result, once the correct phasing is determined for a specific system or installation, connecting properly phased power leads to the same Fusite terminals should maintain proper rotation direction.

THE DIRECTION OF ROTATION OF THE MOTOR MAY BE CHANGED BY REVERSING ANY TWO LINE CONNECTIONS TO THE UNIT.

### 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.

HEATING--A circuit R-W1 is completed on each heating cycle energizing electric heat if so equipped.

### START UP NOTES

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

## SERVICE AND TROUBLESHOOTING

### 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. Check all power fuses or circuit breakers to be sure that they are the correct rating.
3. Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

### PRESSURE SERVICE PORTS

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure tables 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.

### 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 9

Model	Rated Airflow	95° OD Temperature	82° OD Temperature
P1142A2	1400	57 - 59	58 - 60
P1148A1	1550	55 - 57	59 - 61
P1060A1	1700	47 - 49	54 - 56

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

### FAN BLADE SETTINGS

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.

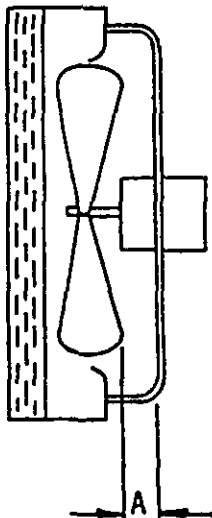


FIGURE 9

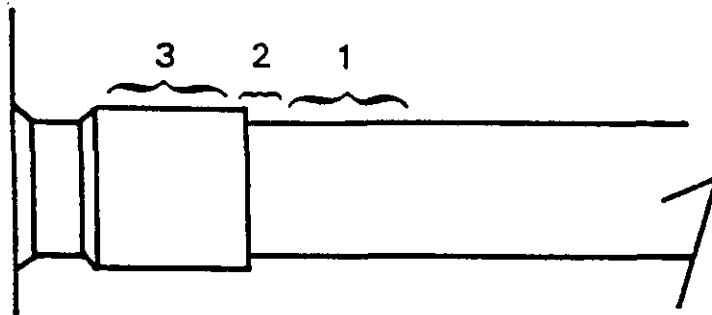
Model	Dimension A
P1142A2	1.75"
P1148A1	1.75"
P1060A1	1.75"

## SUCTION AND DISCHARGE TUBE BRAZING

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

- 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 joint.
  - Do no overheat joint.

FIGURE 10



## DISCHARGE (TOP CAP) THERMOSTAT (P1142A2 ONLY)

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.

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, 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. (See Figure 14) 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. The sensor terminals are located outside the compressor terminal box. Figure 15 shows the arrangement of compressor line voltage terminals and discharge sensor terminals.

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.

FIGURE 11

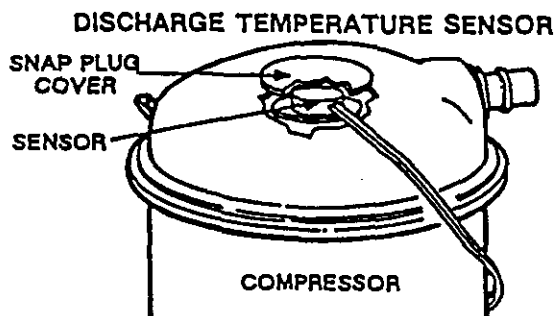


FIGURE 12

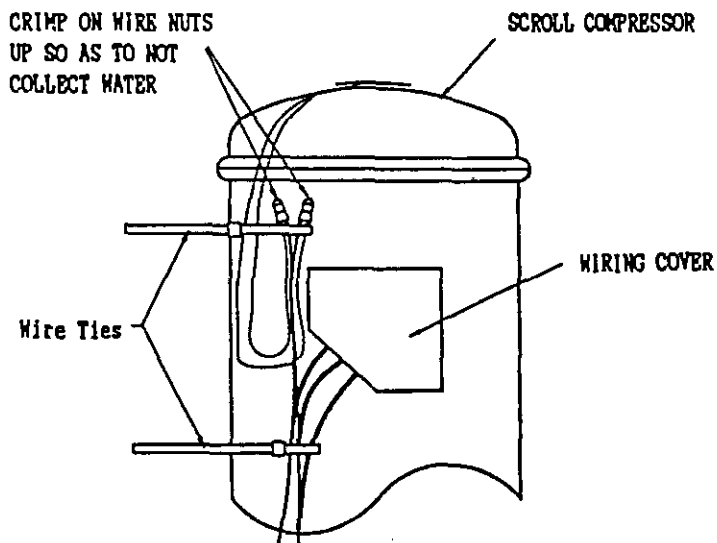
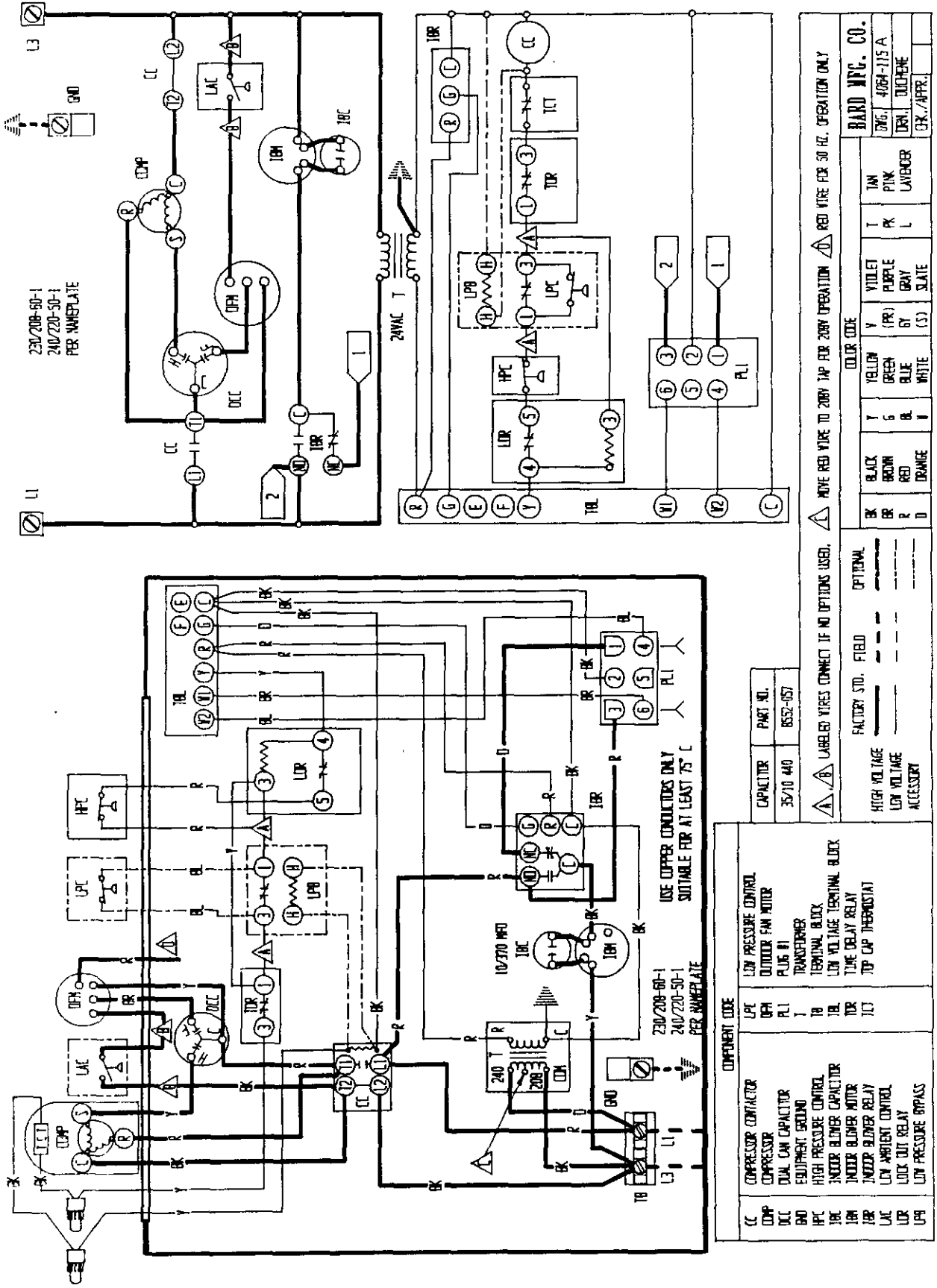


TABLE 10

## COOLING

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temperature	Pressure	°	°	°	°	°	°	°	°	°
			75	80	85	90	95	100	105	110	115
P1142A2	75 deg. DB	Low Side	70	72	75	77	78	79	80	81	82
	62 deg. WB	High Side	208	223	239	254	271	288	305	324	342
	80 deg. DB	Low Side	75	77	80	82	84	85	86	87	88
	67 deg. WB	High Side	213	229	245	261	278	295	313	332	351
	85 deg. DB	Low Side	81	83	86	88	90	91	92	94	95
	72 deg. WB	High Side	220	237	254	270	288	305	324	344	363
P1148A1	75 deg. DB	Low Side	73	74	75	76	78	79	80	81	82
	62 deg. WB	High Side	203	217	231	246	264	278	294	312	330
	80 deg. DB	Low Side	78	79	81	82	83	84	86	87	88
	67 deg. WB	High Side	208	222	237	252	268	285	302	320	338
	85 deg. DB	Low Side	83	85	87	88	87	91	92	93	94
	72 deg. WB	High Side	215	230	245	261	273	295	313	331	350
P1060A1	75 deg. DB	Low Side	65	66	68	69	70	72	74	75	76
	62 deg. WB	High Side	214	230	247	264	284	299	318	336	355
	80 deg. DB	Low Side	69	71	72	74	76	77	79	80	82
	67 deg. WB	High Side	219	236	253	271	289	307	326	345	364
	85 deg. DB	Low Side	74	76	78	79	81	83	85	86	88
	72 deg. WB	High Side	227	244	262	280	296	318	337	357	377



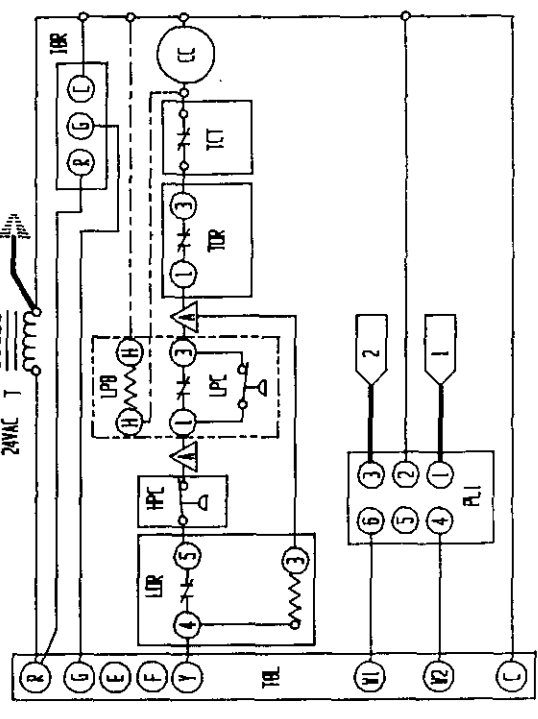
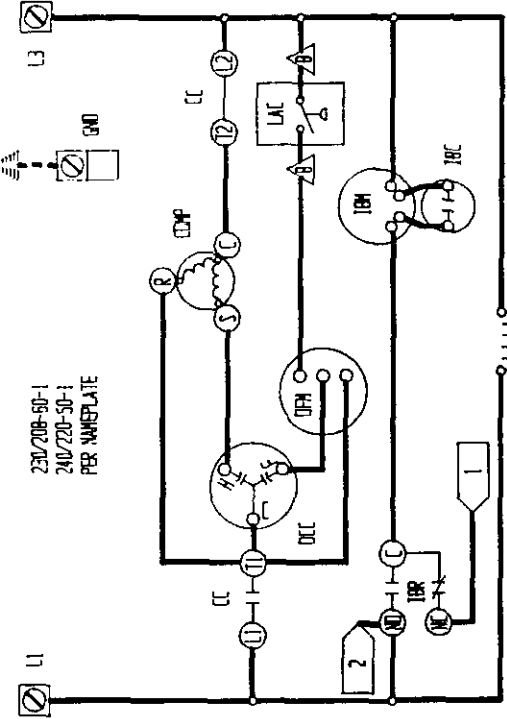
230/208-50-1  
240/220-50-1  
PER NAMEPLATE

△ Labeled wires connect if no options used.  
△ Move red wire to 208V tap for 208V operation  
△ Red wire for 50 Hz. operation only

COMPONENT CODE	COMPONENT	FUNCTION
CC	COMPRESSOR CONTACTOR	LOW PRESSURE CONTROL
DCC	COMPRESSOR DUAL CAP CAPACITOR	INDOOR FAN MOTOR PLUS H1
BG	EQUIPMENT GROUND	TRANSFORMER
HPC	HIGH PRESSURE CONTROL	TERMINAL BLOCK
IBC	INDOOR BLOWER CAPACITOR	LOW VOLTAGE TERMINAL BLOCK
IM	INDOOR BLOWER MOTOR	TIME DELAY RELAY
IR	INDOOR BLOWER RELAY	TP CAP THERMOSTAT
LAC	INDOOR BLOWER RELAY LOCK OUT RELAY	
LPC	LOW PRESSURE CONTROL	
LV	LOW VOLTAGE	
TP	LOW VOLTAGE ACCESSORY	
		OPTIONAL

CAPACITOR	PART NO.
35/10 440	8552-057

FABRIKY STD.	FIELD	OPTIONAL
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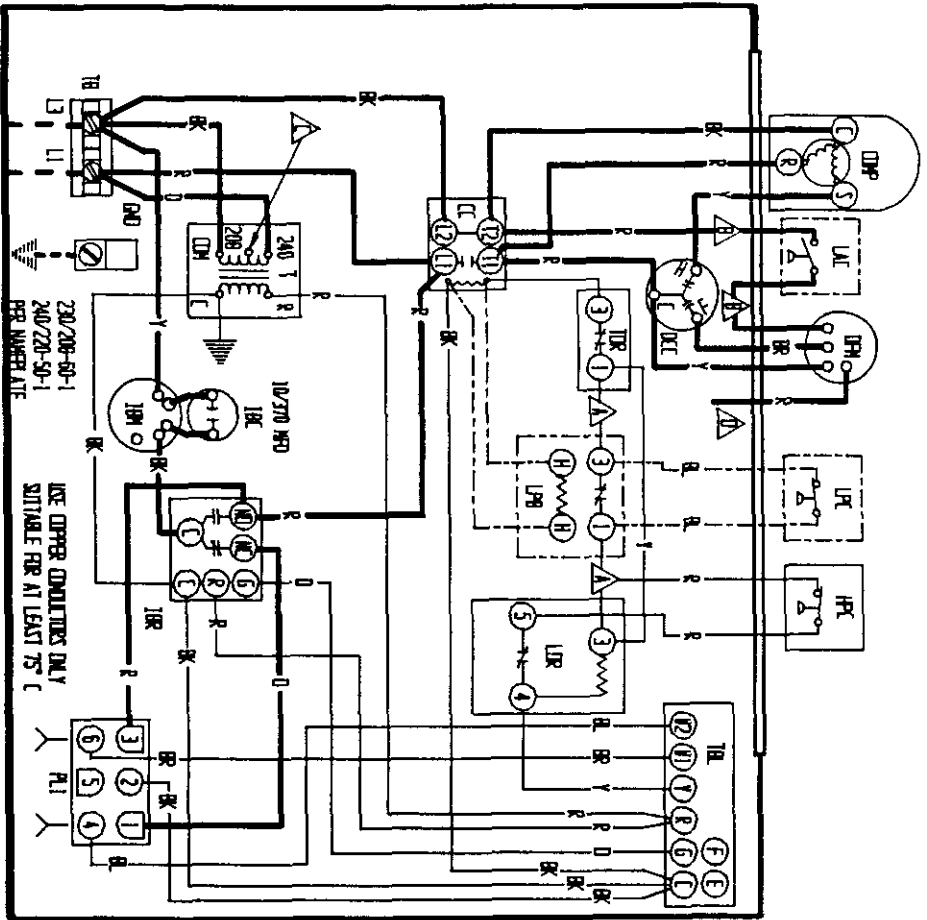


BLACK	Y	YELLOW	V	VIOLET	T	TAN
BROWN	S	GREEN	B	PURPLE	PK	PINK
RED	R	BLUE	6Y	GRAY	L	LAVENDER
ORANGE	W	WHITE	(S)	SLATE		

RED	Y	YELLOW	V	VIOLET	T	TAN
GREEN	S	GREEN	B	PURPLE	PK	PINK
BLUE	R	BLUE	6Y	GRAY	L	LAVENDER
WHITE	W	WHITE	(S)	SLATE		

**BAIRD MFG. CO.**

230V	4684-115-A
240V	4684-115-A
208V	4684-115-A
220V	4684-115-A

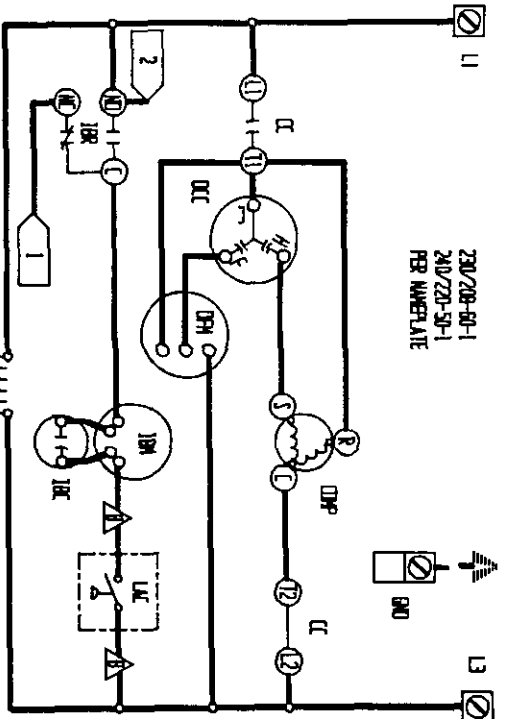
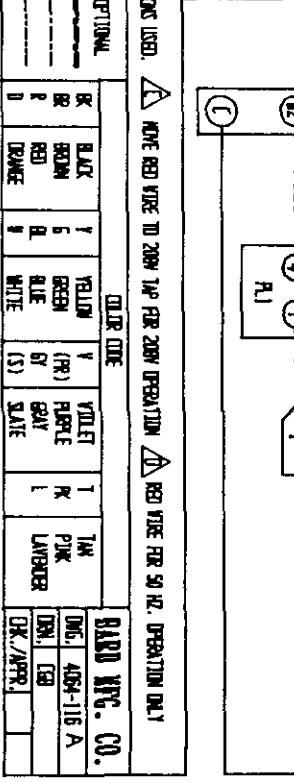


COMPONENT	COMPONENT CODE	LOW VOLTAGE CONTROL
COMPRESSOR	DFC	DIMMER FAN CAPACITOR
LOW FAN CAPACITOR	DFM	DIMMER FAN MOTOR
EQUIPMENT GROUND	FLG	FLUORESCENT
HIGH PRESSURE CONTROL	TRM	TERMINAL BLOCK
MOTOR LOWER MOTOR	TRM	LOW VOLTAGE TERMINAL BLOCK
MOTOR UPPER MOTOR	TRM	TIME DELAY RELAY
LOW AMBIENT CONTROL	TRM	
LOW OUT RELAY		
LOW PRESSURE BYPASS RELAY		

MODEL	CAPACITOR	PART NO.
PI/MA/1	60/10 370	852-059
PI/MA/1	60/10 370	852-059

WIRE COLORS TO BE USED FOR 200V OPERATION

WIRE COLOR	WIRE COLOR
BLACK	YELLOW
BROWN	GREEN
RED	RED
ORANGE	WHITE
	YELLOW
	GREEN
	RED
	WHITE
	VIOLET
	PURPLE
	GRAY
	SLATE
	PINK
	LAVENDER

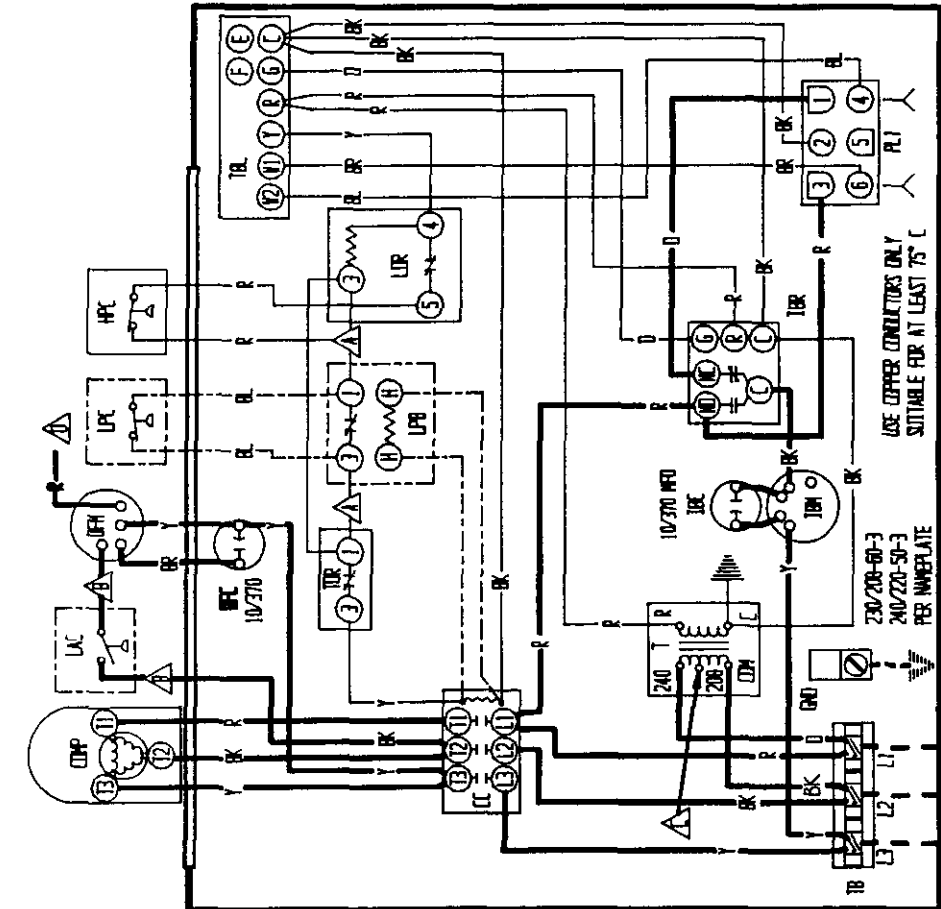
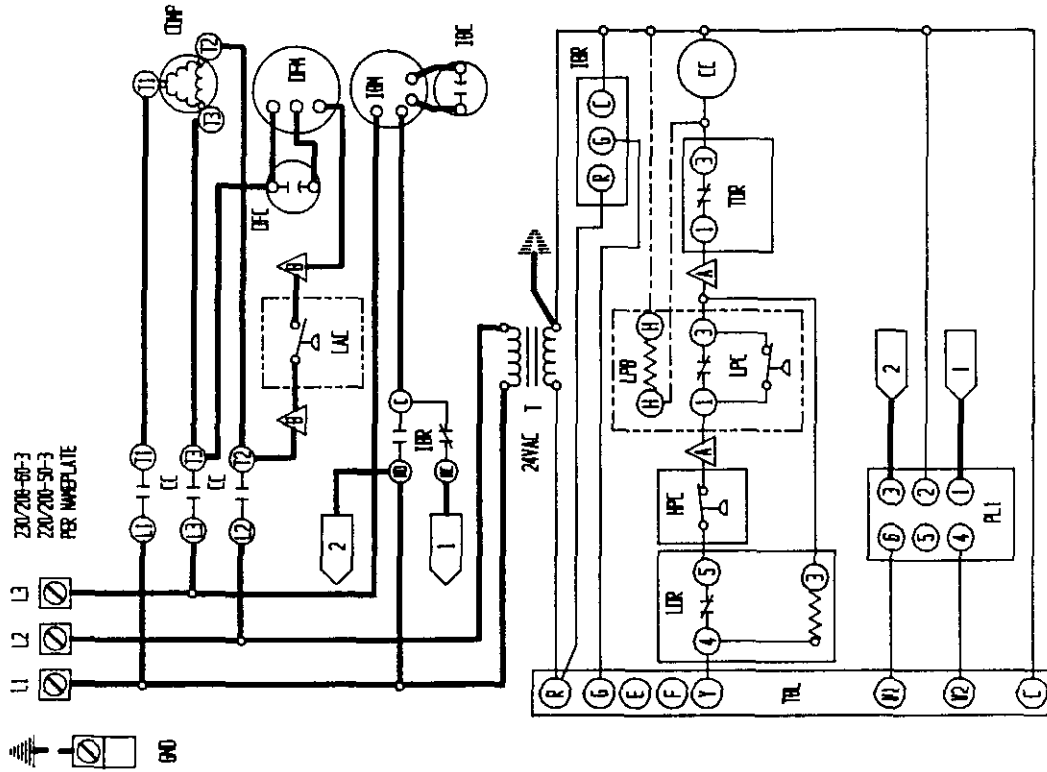


USE UPPER CAPACITORS ONLY  
SUITABLE FOR AT LEAST 75°C

240V 20A-50-1  
240V 20A-50-1  
PER WAVEPLATE

240V 20A-50-1  
240V 20A-50-1  
PER WAVEPLATE

BAIRD KWC. CO.  
DNG 4054-116 A  
DNI 120  
OK / APPROV



COMPONENT CODE	
CC	COMPRESSOR CONTACTOR
OFC	OUTDOOR FAN CAPACITOR
OFM	OUTDOOR FAN MOTOR
DFC	DUAL FAN CAPACITOR
IBM	INDOOR BLOWER MOTOR
IBR	INDOOR BLOWER RELAY
IBC	INDOOR BLOWER CAPACITOR
IBR	INDOOR BLOWER RELAY
LAC	LOW AMBIENT CONTROL
UR	LOCK OUT RELAY
UR	LOW PRESSURE BYPASS
UR1	LOW PRESSURE CONTROL
UR2	OUTDOOR FAN CAPACITOR
UR3	OUTDOOR FAN MOTOR
T	TRANSFORMER
TB	TERMINAL BLOCK
TBL	LOW VOLTAGE TERMINAL BLOCK
TR	TIME DELAY RELAY

COLOR CODE	
BK	BLACK
BR	BROWN
R	RED
O	ORANGE
Y	YELLOW
G	GREEN
BL	BLUE
GY	GRAY
W	WHITE
V	VIOLET
PK	PINK
L	LAVENDER
T	TAN

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

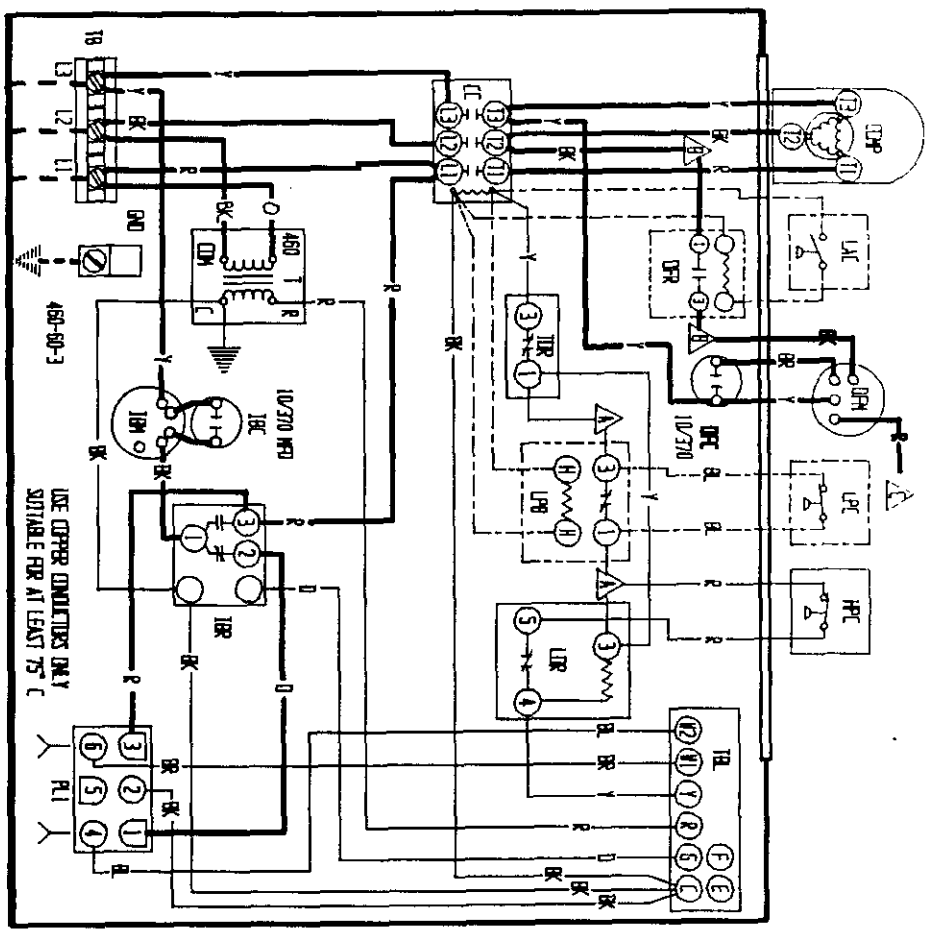
NOTE: RED WIRE TO 230V TAP PER 208V OPERATION. RED WIRE PER 50 Hz. OPERATION ONLY.

USE COPPER CONDUCTORS ONLY. SUITABLE FOR AT LEAST 75°C.

230/200-50-3  
240/220-50-3  
PER NAMEPLATE

24VAC T

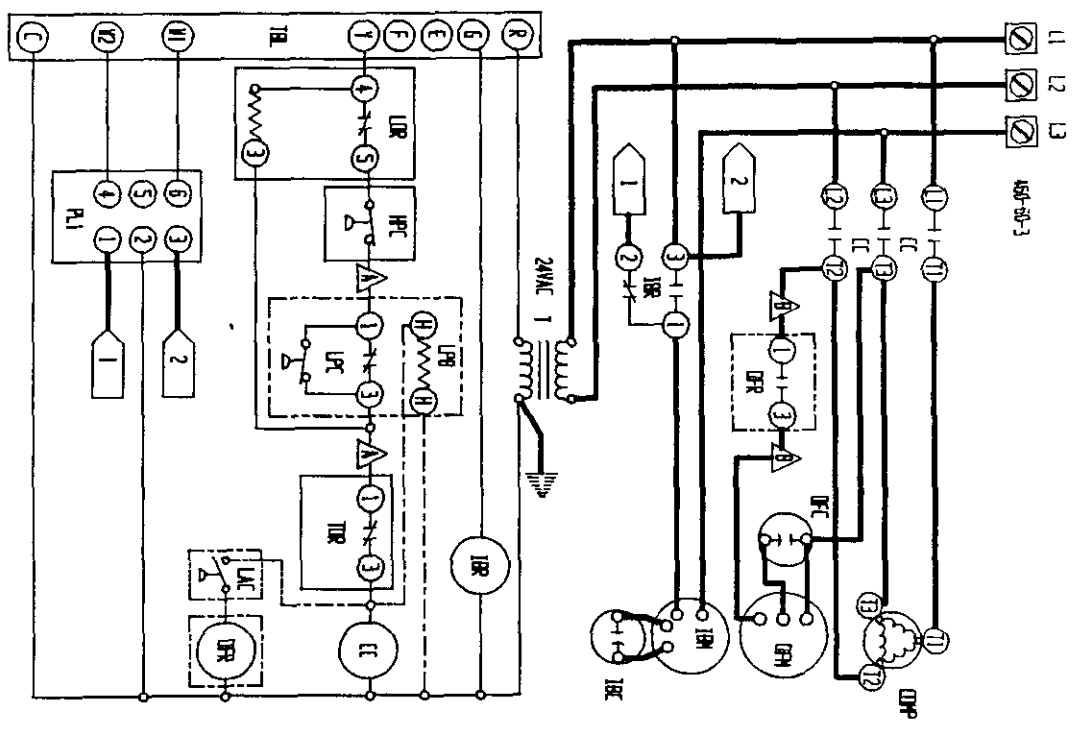
BARCO MFG. CO.  
DMG: 4064-213 A  
DRN: CG8  
DK: APPR: J



COMPONENT CODE	DESCRIPTION
L1	COMPRESSOR CONTACTOR
L2	COMPRESSOR CONTACTOR
L3	COMPRESSOR CONTACTOR
L4	COMPRESSOR CONTACTOR
L5	COMPRESSOR CONTACTOR
L6	COMPRESSOR CONTACTOR
L7	COMPRESSOR CONTACTOR
L8	COMPRESSOR CONTACTOR
L9	COMPRESSOR CONTACTOR
L10	COMPRESSOR CONTACTOR
L11	COMPRESSOR CONTACTOR
L12	COMPRESSOR CONTACTOR
L13	COMPRESSOR CONTACTOR
L14	COMPRESSOR CONTACTOR
L15	COMPRESSOR CONTACTOR
L16	COMPRESSOR CONTACTOR
L17	COMPRESSOR CONTACTOR
L18	COMPRESSOR CONTACTOR
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L48	COMPRESSOR CONTACTOR
L49	COMPRESSOR CONTACTOR
L50	COMPRESSOR CONTACTOR

COMPONENT CODE	DESCRIPTION
L1	LINE PRESSURE CONTROL
L2	OUTDOOR FAN CAPACITOR
L3	OUTDOOR FAN MOTOR
L4	OUTDOOR FAN RELAY
L5	LINE VOLTAGE TERMINAL BLOCK
L6	LINE VOLTAGE TERMINAL BLOCK
L7	LINE VOLTAGE TERMINAL BLOCK
L8	LINE VOLTAGE TERMINAL BLOCK
L9	LINE VOLTAGE TERMINAL BLOCK
L10	LINE VOLTAGE TERMINAL BLOCK
L11	LINE VOLTAGE TERMINAL BLOCK
L12	LINE VOLTAGE TERMINAL BLOCK
L13	LINE VOLTAGE TERMINAL BLOCK
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L46	LINE VOLTAGE TERMINAL BLOCK
L47	LINE VOLTAGE TERMINAL BLOCK
L48	LINE VOLTAGE TERMINAL BLOCK
L49	LINE VOLTAGE TERMINAL BLOCK
L50	LINE VOLTAGE TERMINAL BLOCK

WIRE COLOR	WIRE SIZE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE
BLACK	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
BROWN	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
RED	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
ORANGE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
YELLOW	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
GREEN	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
BLUE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
WHITE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
GREY	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
SLATE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
PINK	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
LAVENDER	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN



WIRE COLOR	WIRE SIZE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE	WIRE TYPE
BLACK	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
BROWN	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
RED	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
ORANGE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
YELLOW	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
GREEN	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
BLUE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
WHITE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
GREY	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
SLATE	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
PINK	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN
LAVENDER	14	THHN	THHN	THHN	THHN	THHN	THHN	THHN

BARCO INC. CO.  
 Dwg. 464-311 A  
 Rev. 03  
 DR./ARR.