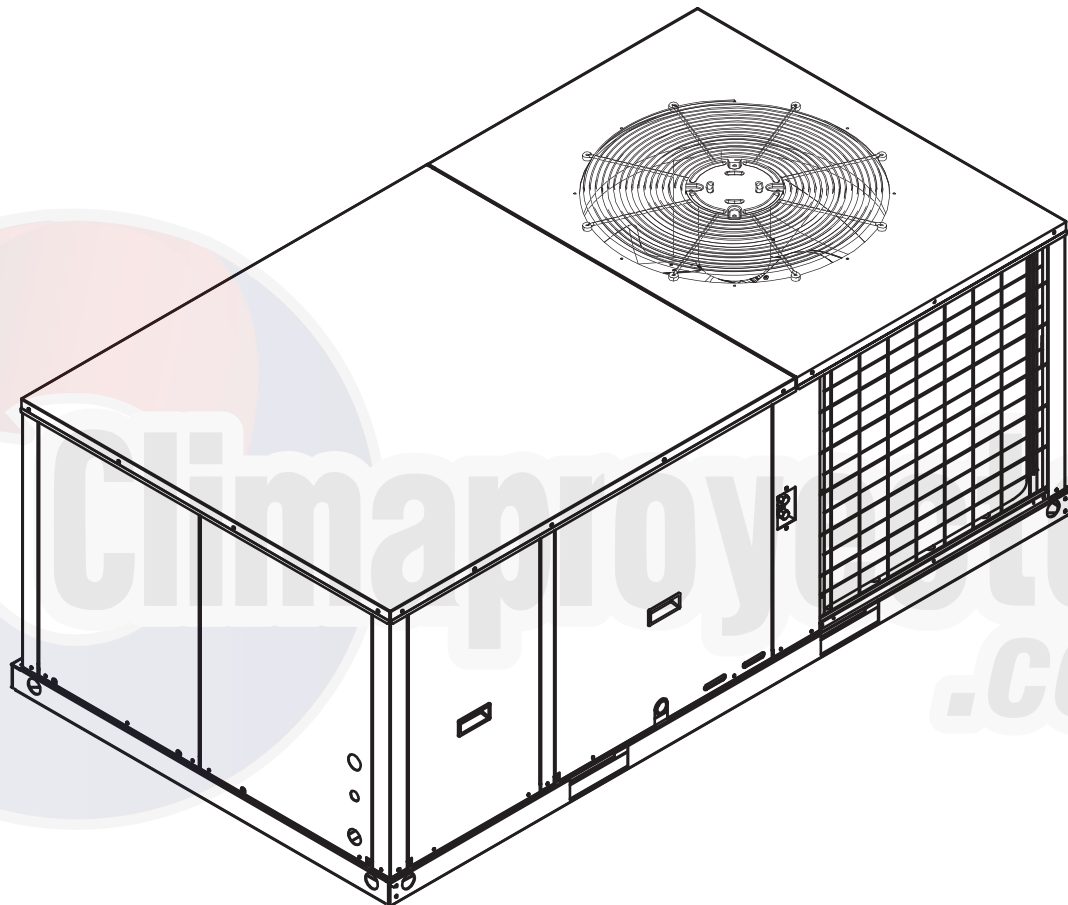


INSTALLATION INSTRUCTIONS

PACKAGE HEAT PUMP & AIR CONDITIONING

FEATURING R-410A

14 SEER & 12 EER_a SERIES - (2-5Tons)



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



DO NOT DESTROY THIS MANUAL

Please read carefully and keep in a safe place for future reference by a serviceman.

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This document is customer property and is to remain with this unit. These instructions do not cover all the different variations of systems nor does it provide for every possible contingency to be met in connection with installation.


All phases of this installation must comply with NATION, STATE AND LOCAL CODES. If additional information is required please contact your local distributor.


1.0 SAFETY


When you see the symbols below on labels or in the manual, be alert to the potential or immediate hazards of personal injury, property and/or product damage. It is the owner's or installer's responsibility to comply with all safety instructions and information accompanying these symbols.


 **WARNING:** This is a safety alert symbol indicating a potential hazardous situation, which could result in personal injury, property and/or product damage or death.

 **CAUTION:** This is a safety alert symbol indicating a potential hazardous situation, which could result in moderate personal injury, and/or property and product damage.

	WARNING
These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.	

	WARNING
The manufacturer's warranty does not cover any damage or defect to the heat pump caused by the attachment or use of any components, accessories or devices (other than those authorized by the manufacturer) into, onto or in conjunction with the heat pump. You should be aware that the use of unauthorized components, accessories or devices may adversely affect the operation of the heat pump and may also endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized components, accessories or devices.	

	WARNING
Disconnect all power to the unit before starting maintenance. Failure to do so can result in severe electrical shock or death.	

	WARNING
Do not, under any circumstances, connect return ductwork to any other heat producing device such as a fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, property damage, severe personal injury or death.	



WARNING

The unit must be permanently grounded. A grounding lug is provided. Failure to ground this unit can result in fire or electrical shock causing property damage, severe personal injury or death.



WARNING

Only electric heater kits supplied by this manufacturer as described in this publication have been designed, tested, and evaluated by a nationally recognized safety testing agency for use with this unit. Use of any other manufactured electric heaters installed within this unit may cause hazardous conditions resulting in property damage, fire, bodily injury or death.



WARNING

Proposition 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the state of California to cause cancer.

1.1 INSPECTION

As soon as unit is received, it should be inspected and noted for possible shipping damage during transportation. It is carrier's responsibility to cover the cost of shipping damage. Manufacturer or distributor will not accept the claims from dealer for any transportation damage.

1.2 LIMITATIONS

Refer to *Fig. 2-2, 2-3* for unit physical data and to *Table 7-1* for electrical data. If components are to be added to a unit they must meet local codes, they are to be installed at the dealer's and /or the customer's expense. Size of unit for proposed installation should be based on heat loss / heat gain calculations made in accordance with industry recognized procedures identified by the Air conditioning contractors of America.

2.0 INSTALLATION

2.1 PRE-INSTALLATION

Before installation, carefully check the following:

1. Unit should be installed in accordance with national and local safety codes, including but not limit to ANSI/NFPA No. 70 or Canadian Electrical Code Part 1, C22.1, local plumbing and wastewater codes and any other applicable codes.
2. For rooftop installation, be sure the structure has enough strength to support the weight of unit. Unit should be installed on roof curb and leveled.
3. For ground level installation, a level slab should be used.
4. Condenser airflow should not be restricted.
5. On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb.

2.2 CLEARANCE

All units require certain clearance for proper operation and service. Refer to *Table 2-1* for the clearances required for construction, servicing and proper unit operation.

2.3 RIGGING AND HANDING

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, **MUST** be used across the top of the unit.



CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.



CAUTION

All panels must be secured in place when the unit is lifted. The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

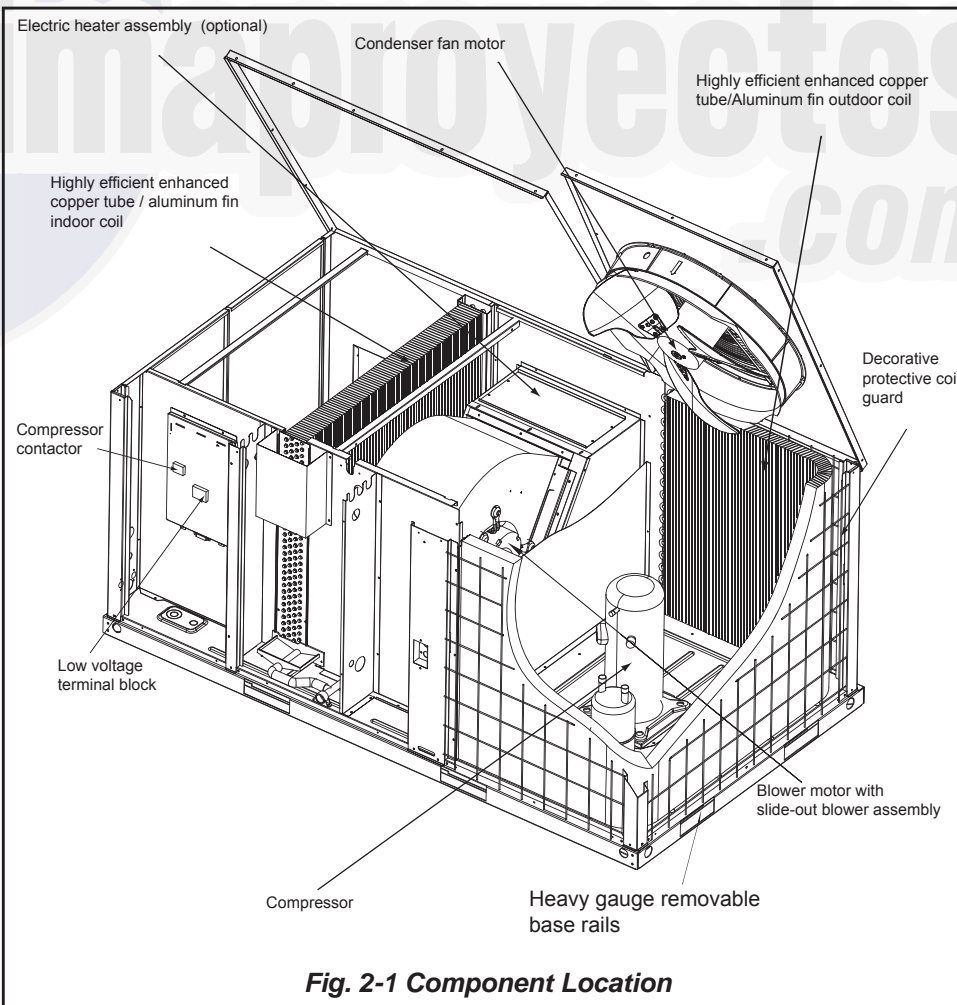


Fig. 2-1 Component Location

* The above figure for reference purpose only.

Unit size	Dimensions
	A
024, 030, 036	28-3/32"
042, 048, 060	33-3/64"

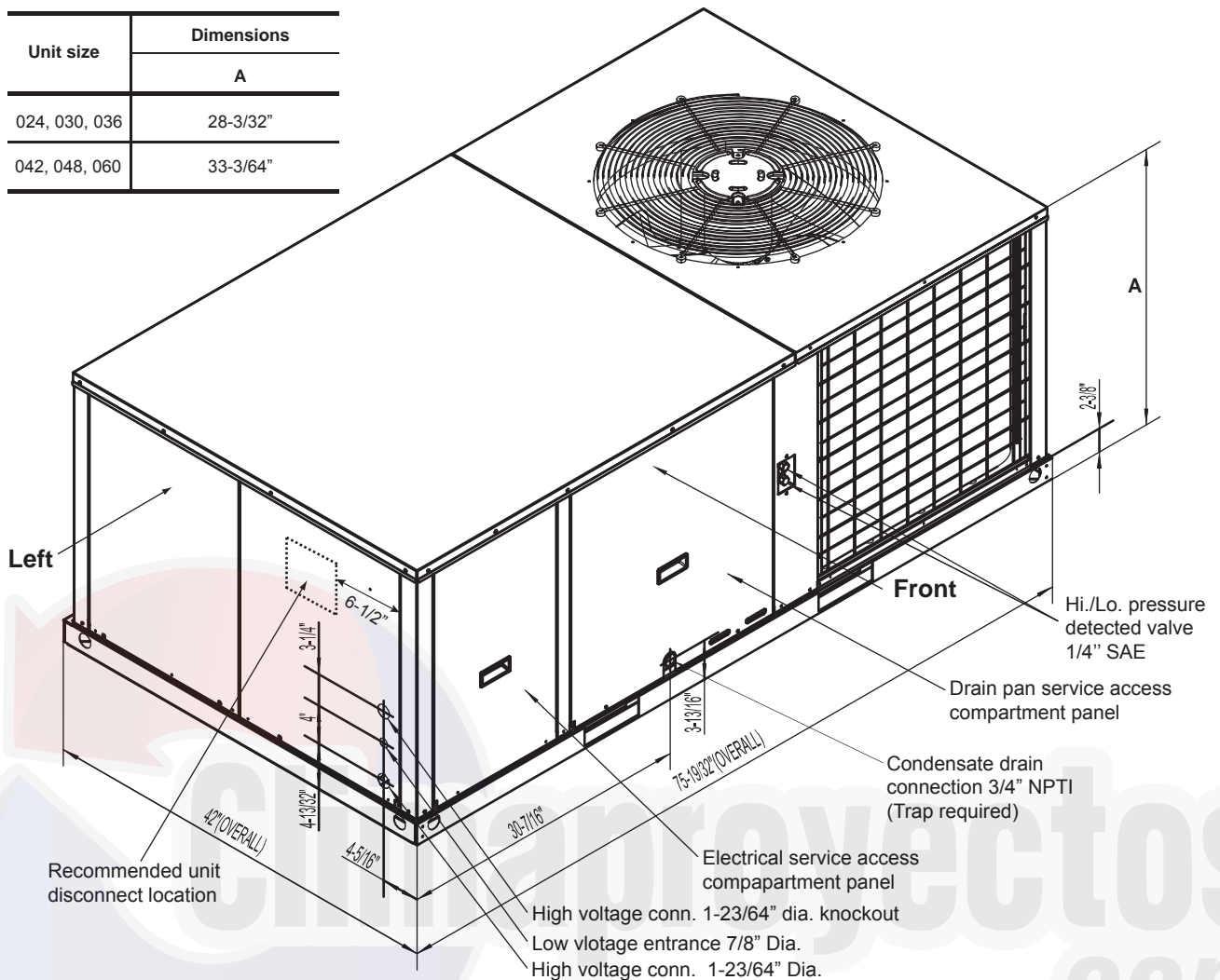


Fig. 2-2 Unit Dimensions

* The above figure for reference purpose only.

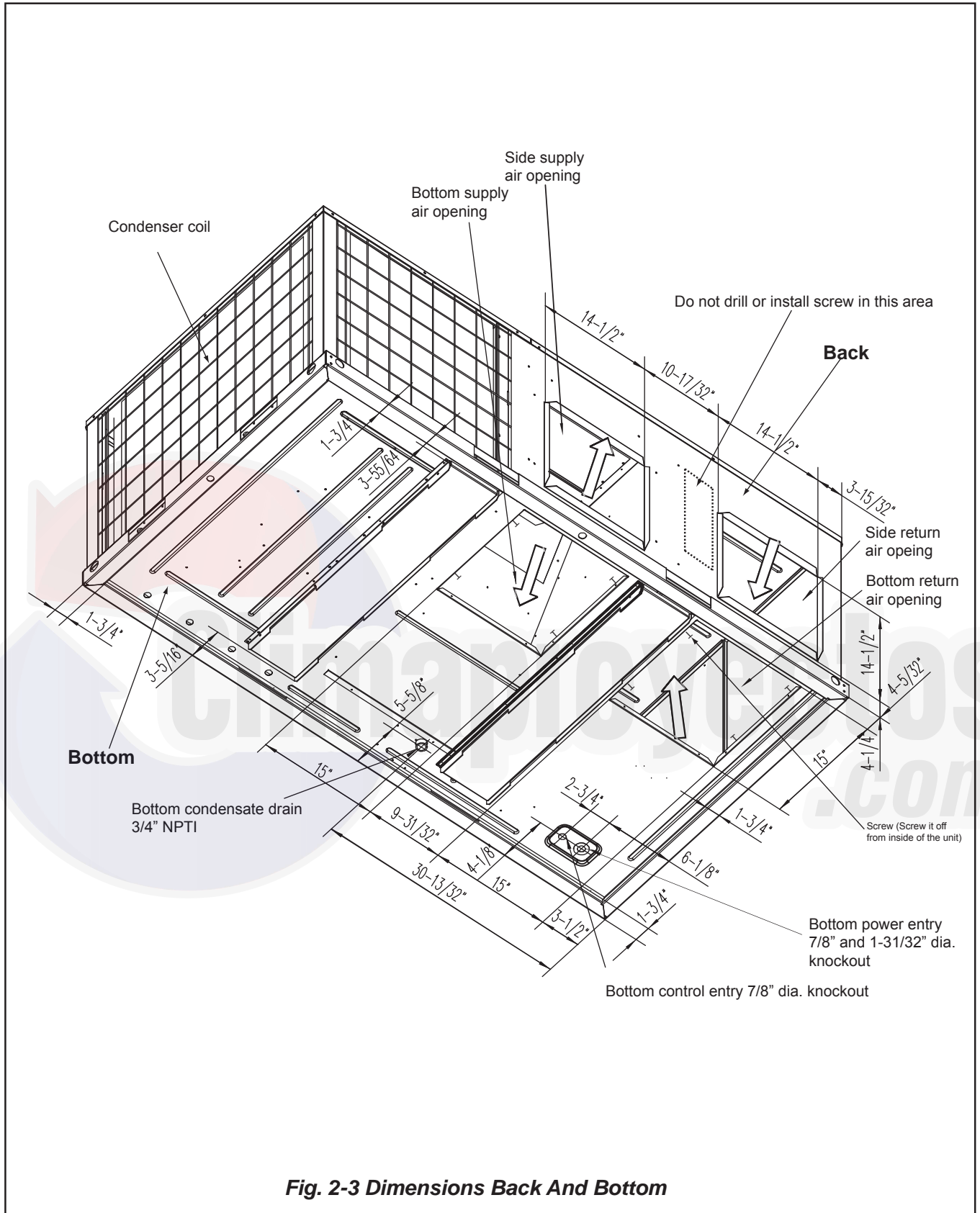
Table 2-1: Unit Clearance

Direction	Distance (in.)	Direction	Distance (in.)
Top ¹	60	Right	12
Front	30	Left	24
Rear	18 ²	Bottom ³	0

Duct clearance: 1 inch clearance for all sides of air supply duct.

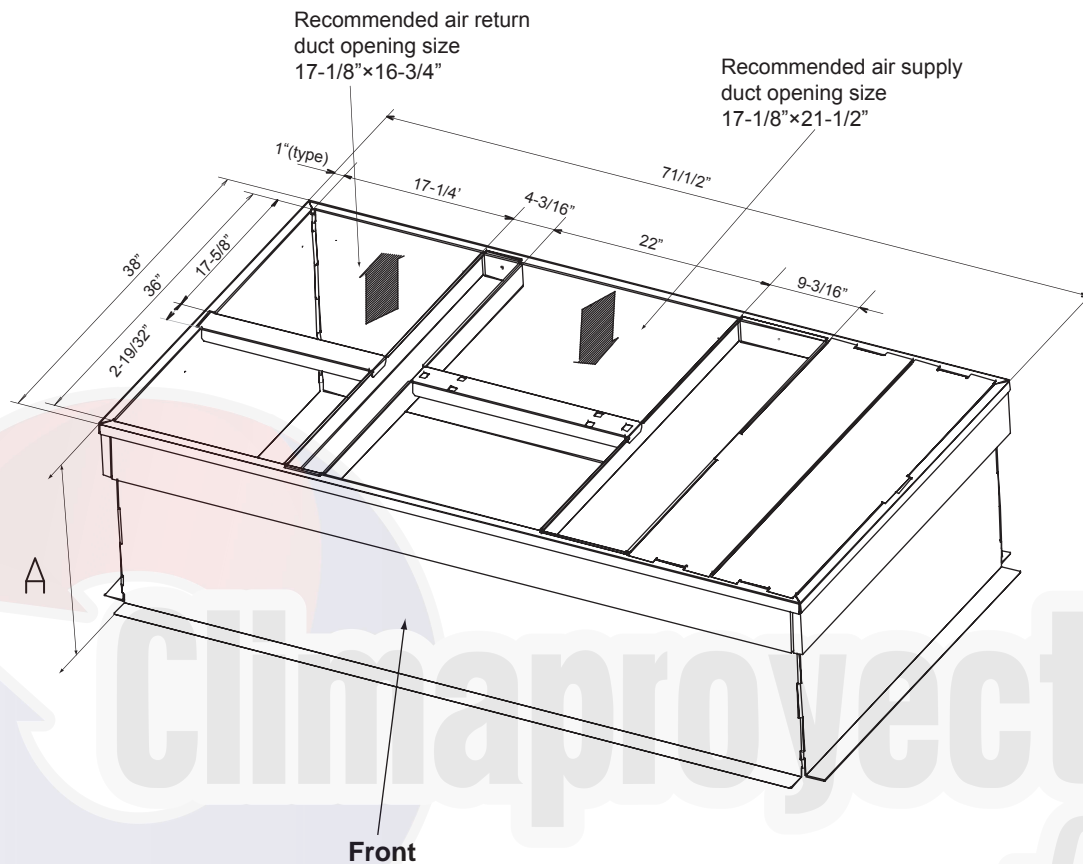
- Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
- The minimum clearance without economizer/fresh air damper. For distance with Economizer/fresh air damper, please refer to the relevant Install requirement.

NOTE
For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.



* The above figures for reference purpose only.

A Dimensions	8"
	14"



Supply and return air (including duct support rails) shown are typical for bottom duct applications. For location of horizontal duct applications (on back of unit), refer to unit dimension details.

Fig. 2-4 Roof Curb Dimension

* The above figures for reference purpose only.



NOTE

Be sure to note supply and return openings. Refer to Fig.2-3, 2-4 for information concerning rear and bottom supply and return air duct openings.

2.4 ROOF CURB

On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb. (See Fig. 2-4 ROOF CURB DIMENSION)

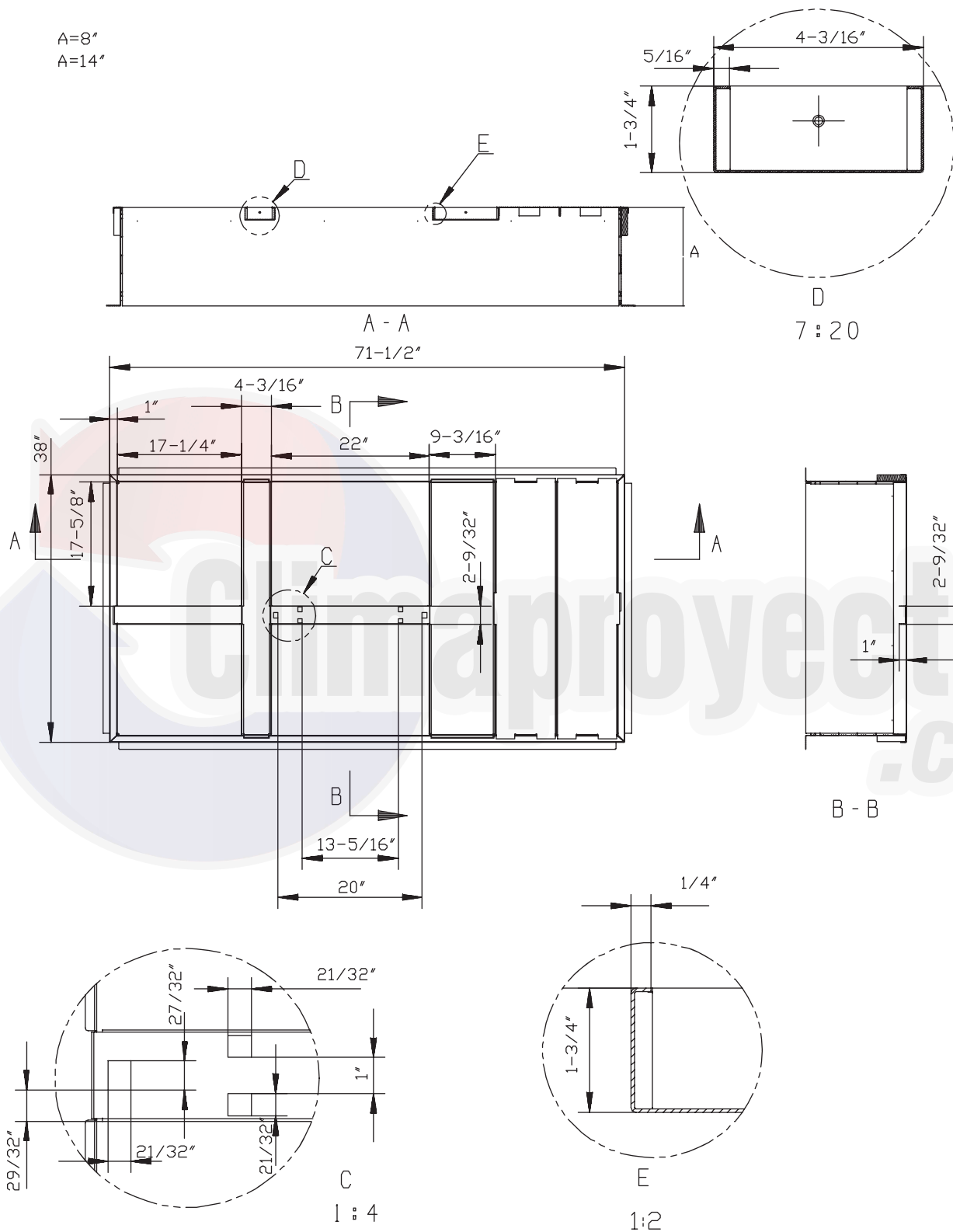



Fig.2-5 Roof Curb Details

3.0 DUCTWORK


Ductwork should be made and sized by installer and in accordance with Air Manual from Conditioning Contractors of America and local codes.


	NOTE
On ductwork exposed to outside air conditioning space, use at least 2" of insulation and a vapor barrier. Flexible joint may be used to reduce noise.	

These units are adaptable to downflow use as well as rear supply and return air duct openings. To convert to downflow, use the following steps:

1. Remove the duct covers found in the bottom return and supply air duct openings. There are four (4) screws securing each duct cover (save these to use in step 2).
2. Install the duct cover (removed in step one) to the rear supply and return air openings. Secure with the four (4) screws used in steps one.
3. Seal duct covers with silicone caulk.

A closed return duct system shall be used. This shall not preclude use of economizers or ventilation air intake. Flexible joints may be used in the supply and return duct work to minimize the transmission of noise.

	CAUTION
When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulation and waterproofed.	

	NOTE
Be sure to note supply and return openings. Refer to Fig. 3 and 4 for information concerning rear and bottom supply and return air duct openings.	

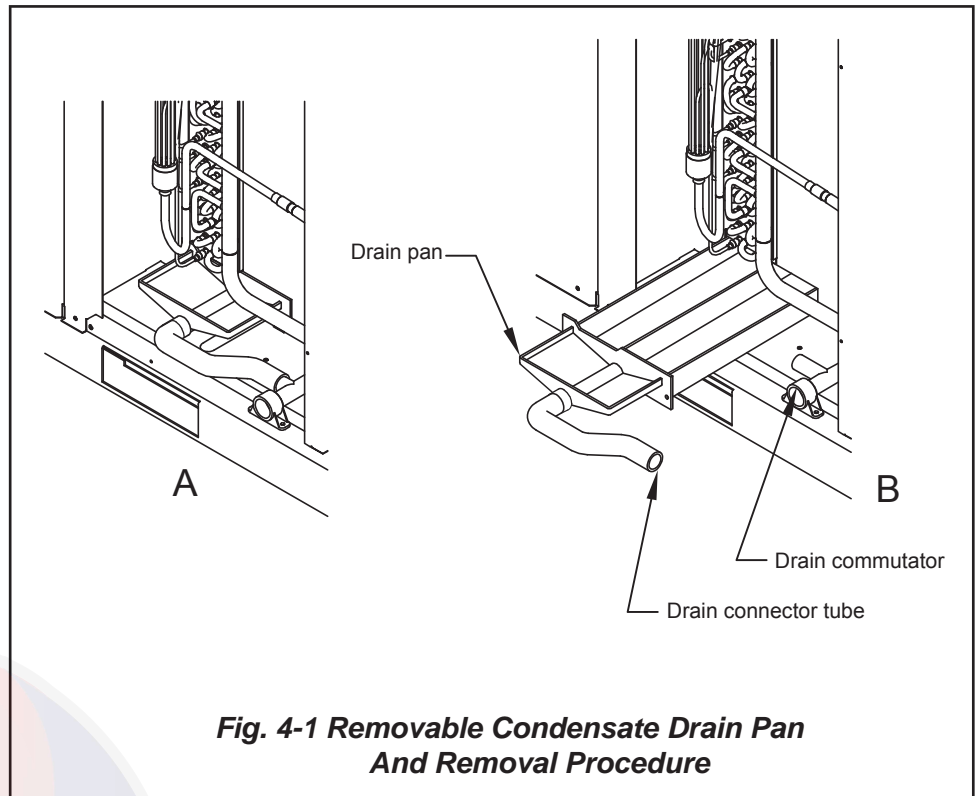
4.0 CONDENSATE DRAIN CONNECTION

Consult local codes for special requirements.

To provide extra protection from water damage, install an additional drain pan, provided by installer, under the entire unit with a separate drain line. Manufacturer will not be responsible for any damages due to the failure to follow these requirements.

4.1 INSTALL DRAIN PIPE

1. Use female NPT threaded fitting for outside connection and make sure that drain holes are not blocked.
2. Insulation may be needed for drain line to prevent sweating.
3. Drain pan has two drain connections on each side to provide flexibility of connection and drainage. Make sure proper pitch and plugging if second connection is not used.
4. Use a sealing compound on male pipe threads. Install the condensate drain line (NPT) to spill into an open drain.



**Fig. 4-1 Removable Condensate Drain Pan
And Removal Procedure**

4.2 REMOVAL AND CLEAN THE DRAIN PAN

See above Figure.4-1 B, disconnect the Connective Tube and Drain Commutator, screw off the two fixed screws of Drain Pan, and then along with the rail pull out the Drain Pan and Connective Tube from the bottom of evaporator. Using a wet cloth or water to wash out the drain pan carefully.

5.0 FILTERS

Units are shipped without a filter or filter racks. It is the responsibility of the installer to secure a filter in the return air ductwork or install a filter/frame Kit.

Filter must always be used and must be kept clean. When filter become dirt laden, insufficient air will be delivered by the blower, decreasing your units efficiency and increasing operation costs and wear-and tear on the unit and controls.

Filters should be checked monthly; this is especially important since this unit is used for both heating and cooling.

6.0 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (NEC) or Canadian Electrical Code (CEC) and any applicable local ordinance.



WARNING

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

6.1 POWER WIRING

1. Proper electrical power should be available at unit. Voltage tolerance should not be over 10% from rating voltage.
2. If any of the wire must be replaced, replacement wire must be the same type as shown in nameplate, wiring diagram and electrical data sheet.
3. Install a branch circuit disconnect of adequate size to handle starting current, located within sight of, and readily accessible to the unit.
4. **ELECTRIC HEATER** - If the Electric Heater is installed, unit may be equipped with 25~60A. circuit breakers or fuse. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.
 - Supply circuit power wiring must be 221 °F minimum copper conductors only. See Electrical Data in this section for ampacity, wire size and circuit protector requirements. Supply circuit protective devices may be either fuses or "HACR" type circuit breakers.
 - An 1-3/8" knockouts inside cabinet is provided for connection of power wiring to electric heater.
 - Power wiring is connected to the power terminal block in unit electric cabinet.

See Electrical Heater Installation Instruction for details.

6.2 GROUNDING



WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.

6.3 CONTROL WIRING

IMPORTANT: Class 2 low voltage control wiring **SHOULD NOT** be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 AWG color-coded. For lengths longer than 50 ft, 16 AWG wire should be used.
- Two 7/8" holes can be used for control wires going into the unit, one on left side and one at the bottom.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

Thermostat should be mounted on an inside wall about 58" from floor and will not be affected by unconditioned air, sun and/or heat exposure. Follow the instruction carefully because there are many wiring requirements.

See Fig. 6-1 ~ 2, Table 7-1 ~ 4

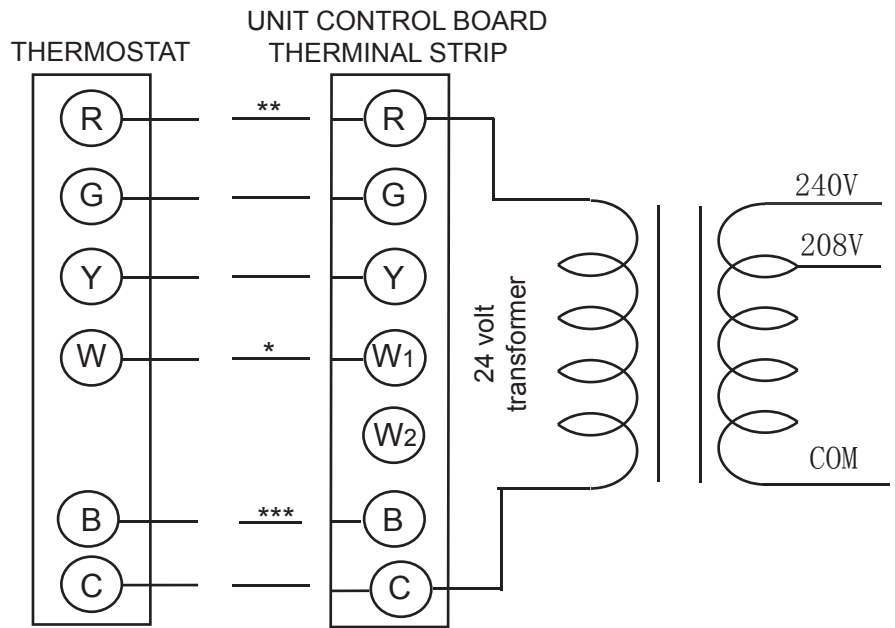


Fig. 6-1 Typical Field Control Wiring Diagram

- *** B wire be used with heat pump system only.
- ** Minimum wire size of 18 AWG wire should be used for all field installed 24 volt wire.
- * Only required on units with supplemental electric heat.



CAUTION

Label all wire prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

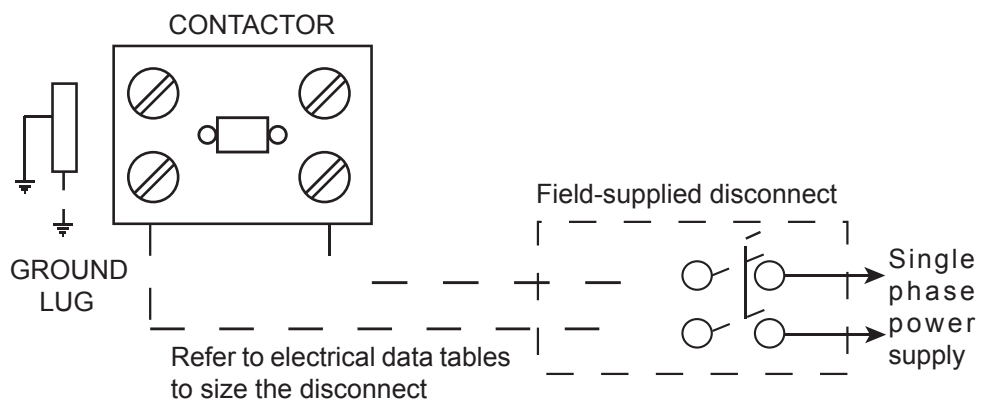


Fig. 6-2 Typical Field Power Wiring Diagram

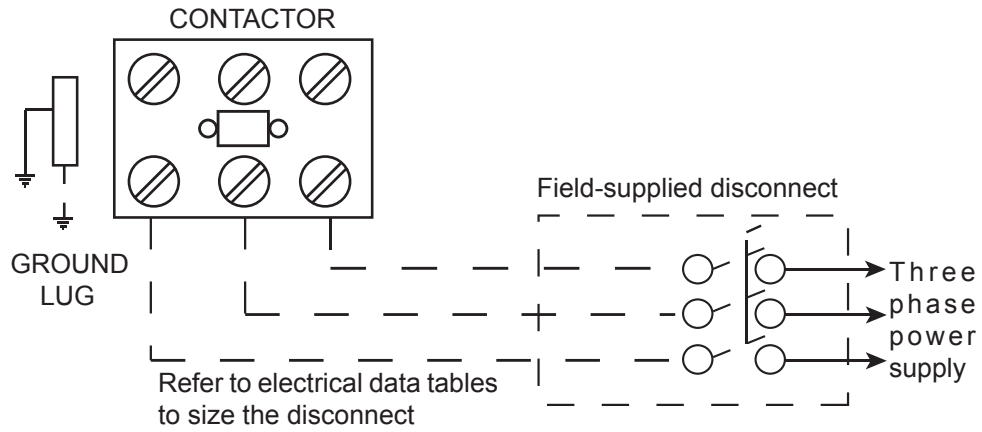


Fig. 6-2 Typical Field Power Wiring Diagram (Continued)

Table 6-1: 14 SEER Heat Pump W/Without Electric Heat

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Electric Heat Option				MCA ¹ (Amps)	Max Fuse ² / Breaker ³ Size (Amps)
		RLA	LRA	MCC	FLA	FLA	Model	kW	Stages	Amps		
024 (2.0)	208/230-1-60	13.5A	58A	21.0A	0.57A	1.73A	None	-	-	None	19.3	30
							EHK-05C	3.8/5	1	18.1/20.8	41.9/45.3	50/50
							EHK-08C	5.6/7.5	1	27.1/31.3	53.2/58.4	60/60
							EHK-10C	7.5/10	1	36.1/41.7	64.4/71.4	70/80
030 (2.5)	208/230-1-60	14.1A	73A	22.0A	1.08A	2.03A	None	-	-	None	20.8	30
							EHK-05C	3.8/5	1	18.1/20.8	43.4/46.8	50/50
							EHK-08C	5.6/7.5	1	27.1/31.3	54.6/59.9	60/60
							EHK-10C	7.5/10	1	36.1/41.7	65.9/72.4	70/80
							EHK-15C	11.3/15	2	54.2/62.5	88.5/98.9	90/100
036 (3.0)	208/230-1-60	16.7A	79A	26.0A	1.08A	2.45A	None	-	-	None	24.5	40
							EHK-05C	3.8/5	1	18.1/20.8	47.1/50.5	50/60
							EHK-08C	5.6/7.5	1	27.1/31.3	58.3/63.6	60/70
							EHK-10C	7.5/10	1	36.1/41.7	69.6/76.6	70/80
							EHK-15C	11.3/15	2	54.2/62.5	92.2/102.6	100/110
036 (3.0)	208/230-3-60	10.4A	73A	16.3A	1.08A	2.45A	None	-	-	None	16.6	25
							EHK-10D	7.5/10	1	20.9/24.1	42.7/46.7	45/50
							EHK-15D	11.3/15	2	31.4/36.1	55.8/61.7	60/70
							None	-	-	None	27.7	40
042 (3.5)	208/230-1-60	17.9A	112A	27.8A	1.74A	3.53A	EHK-05C	3.8/5	1	18.1/20.8	50.3/53.7	60/60
							EHK-08C	5.6/7.5	1	27.1/31.3	61.5/66.8	70/70
							EHK-10C	7.5/10	1	36.1/41.7	72.8/79.8	80/80
							EHK-15C	11.3/15	2	54.2/62.5	95.4/105.8	100/110
							EHK-20C	15/20	2	72.2/83.3	117.9/131.8	125/150
							None	-	-	None	32.6	50
048 (4.0)	208/230-1-60	21.8A	117A	34.0A	1.74A	3.54A	EHK-05C	3.8/5	1	18.1/20.8	55.2/58.6	70/70
							EHK-08C	5.6/7.5	1	27.1/31.3	66.5/71.7	80/80
							EHK-10C	7.5/10	1	36.1/41.7	77.7/84.7	90/90
							EHK-15C	11.3/15	2	54.2/62.5	100.3/110.7	110/125
							EHK-20C	15/20	2	72.2/83.3	122.8/136.7	150/150
							None	-	-	None	22.5	35
048 (4.0)	208/230-3-60	13.7A	83.1A	21.4A	1.74A	3.54A	EHK-10D	7.5/10	1	20.9/24.1	48.6/52.6	50/60
							EHK-15D	11.3/15	2	31.4/36.1	61.7/67.6	70/70
							EHK-20D	15/20	2	41.7/48.2	74.6/82.7	80/90
							None	-	-	None	40.3	60
060 (5.0)	208/230-1-60	26.4A	134A	41.2A	1.74A	5.5A	EHK-05C	3.8/5	1	18.1/20.8	62.9/66.3	80/80
							EHK-08C	5.6/7.5	1	27.1/31.3	74.2/79.4	90/90
							EHK-10C	7.5/10	1	36.1/41.7	85.4/92.4	100/100
							EHK-15C	11.3/15	2	54.2/62.5	108.0/118.4	110/125
							EHK-20C	15/20	2	72.2/83.3	130.5/144.4	150/150
							None	-	-	None	27.3	40
060 (5.0)	208/230-3-60	16A	110A	24.9A	1.74A	5.5A	EHK-10D	7.5/10	1	20.9/24.1	53.4/57.4	60/60
							EHK-15D	11.3/15	2	31.4/36.1	66.5/72.4	70/80
							EHK-20D	15/20	2	41.7/48.2	79.4/87.5	80/90
							None	-	-	None	27.3	40

Table 6-2: 14 SEER Cooling only W/Without Electric Heat

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Electric Heat Option				MCA ¹ (Amps)	Max Fuse ² / Breaker ³ Size (Amps)
		RLA	LRA	MCC	FLA	FLA	Model	kW	Stages	Amps		
024 (2.0)	208/230-1-60	13.5A	58A	21.0A	0.57A	1.73A	None	-	-	-	19.3	30
							EHK-05C	3.8/5	1	18.1/20.8	24.8/28.2	30/30
							EHK-08C	5.6/7.5	1	27.1/31.3	36.1/41.3	40/45
							EHK-10C	7.5/10	1	36.1/41.7	47.3/54.3	50/60
030 (2.5)	208/230-1-60	14.1A	73A	22.0A	1.08A	2.03A	None	-	-	-	19.4	30
							EHK-05C	3.8/5	1	18.1/20.8	25.4/28.8	30/30
							EHK-08C	5.6/7.5	1	27.1/31.3	36.7/41.9	40/45
							EHK-10C	7.5/10	1	36.1/41.7	47.9/54.9	50/60
							EHK-15C	11.3/15	2	54.2/62.5	70.5/80.9	80/90
036 (3.0)	208/230-1-60	16.7A	79A	26.0A	1.08A	2.45A	None	-	-	-	24.5	40
							EHK-05C	3.8/5	1	18.1/20.8	25.7/29.1	40/40
							EHK-08C	5.6/7.5	1	27.1/31.3	37.0/42.2	40/45
							EHK-10C	7.5/10	1	36.1/41.7	48.2/55.2	50/60
							EHK-15C	11.3/15	2	54.2/62.5	70.9/81.2	80/90
036 (3.0)	208/230-3-60	10.4A	73A	16.3A	1.08A	2.45A	None	-	-	-	16.6	25
							EHK-10D	7.5/10	1	20.9/24.1	29.2/33.2	30/35
							EHK-15D	11.3/15	2	31.4/36.1	42.4/48.2	45/50
042 (3.5)	208/230-1-60	17.9A	112A	27.8A	1.08A	3.53A	None	-	-	-	27	40
							EHK-05C	3.8/5	1	18.1/20.8	27.3/30.7	40/40
							EHK-08C	5.6/7.5	1	27.1/31.3	38.5/43.8	40/45
							EHK-10C	7.5/10	1	36.1/41.7	49.8/56.8	50/60
							EHK-15C	11.3/15	2	54.2/62.5	72.4/82.8	80/90
							EHK-20C	15/20	2	72.2/83.3	94.9/108.8	100/110
048 (4.0)	208/230-1-60	21.8A	117A	34.0A	1.74A	3.54A	None	-	-	-	32.6	50
							EHK-05C	3.8/5	1	18.1/20.8	32.6/32.6	50/50
							EHK-08C	5.6/7.5	1	27.1/31.3	38.3/43.6	50/50
							EHK-10C	7.5/10	1	36.1/41.7	49.6/56.6	50/60
							EHK-15C	11.3/15	2	54.2/62.5	72.2/82.6	80/90
							EHK-20C	15/20	2	72.2/83.3	94.7/108.6	100/110
048 (4.0)	208/230-3-60	13.7A	83.1A	21.4A	1.74A	3.54A	None	-	-	-	22.5	35
							EHK-10D	7.5/10	1	20.9/24.1	30.6/34.6	35/35
							EHK-15D	11.3/15	2	31.4/36.1	43.7/49.6	45/50
							EHK-20D	15/20	2	41.7/48.2	56.6/64.7	60/70
060 (5.0)	208/230-1-60	26.4A	134A	41.2A	1.74A	5.5A	None	-	-	-	40.3	60
							EHK-05C	3.8/5	1	18.1/20.8	40.3/40.3	60/60
							EHK-08C	5.6/7.5	1	27.1/31.3	40.8/46.0	60/60
							EHK-10C	7.5/10	1	36.1/41.7	52.0/59.0	60/60
							EHK-15C	11.3/15	2	54.2/62.5	74.7/85.0	80/90
							EHK-20C	15/20	2	72.2/83.3	97.2/111.0	100/125
060 (5.0)	208/230-3-60	16A	110.0A	24.9A	1.74A	5.5A	None	-	-	-	27.3	40
							EHK-10D	7.5/10	1	20.9/24.1	33.0/37.0	40/40
							EHK-15D	11.3/15	2	31.4/36.1	46.2/52.0	50/60
							EHK-20D	15/20	2	41.7/48.2	59.0/67.2	60/70
							EHK-25D	18.8/25	2	52.2/60.2	72.2/82.2	80/90

1. Minimum Circuit Ampacity.
2. Maximum Over Current Protection per Standard UL 1995.
3. Fuse or HACR circuit breaker size installed at factory or field installed.

Table 6-3: 14 SEER Physical Data

Component	Models							
	MRB-24CWN1-M14B	MRB-24HWN1-M14B	MRB-30CWN1-M14	MRB-30HWN1-M14	MRB-36CWN1-M14	MRB-36HWN1-M14B	MRB-36CWN1-X14	MRB-36HWN1-X14B
Nominal Tonnage	2.0	2.0	2.5	2.5	3.0	3.0	3.0	3.0
ARI COOLING PERFORMANCE								
Gross Capacity @ ARI A point (Btu)	24,800	24,000	30,313	29,913	37,388	36,163	37,563	36,763
ARI net capacity (Btu)	23,800	23,000	29,000	28,600	35,800	34,600	36,000	35,200
EER	12	12	12	12	12	12	12	12
SEER	14	14	14	14	14	14	14	14
Nominal CFM	835	835	1050	1050	1250	1250	1250	1250
System power (kW)	1.93	1.88	2.35	2.42	2.98	2.95	3.00	2.96
Refrigerant type	R410a	R410a	R410a	R410a	R410a	R410a	R410a	R410a
Refrigerant charge (lb-oz)	6-10	7-8	6-6	6-10	6-10	8-9	7-1	8-6
ARI HEATING PERFORMANCE								
47°F Capacity Rating (Btu)	—	22,800	—	28,800	—	36,000	—	36,000
System Power (kW)	—	1.75	—	2.24	—	2.83	—	2.80
17°F Capacity Rating (Btu)	—	12,600	—	16,200	—	19,800	—	19,600
System Power(kW)	—	1.6	—	2.04	—	2.45	—	2.45
HSPF (BTU/Watts-hr.)	—	8.0	—	8.0	—	8.0	—	8.0
DIMENSIONS (Inches)								
Length	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32
Width	42	42	42	42	42	42	42	42
Height	28-3/32	28-3/32	28-3/32	28-3/32	28-3/32	28-3/32	28-3/32	28-3/32
OPERATING WT. (lbs)	432	441	432	441	432	452	432	452
COMPRESSORS								
Type	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd
Quantity	1	1	1	1	1	1	1	1
CONDENSER COIL DATA								
Face area (Sq. Ft)	14.49	14.49	14.49	14.49	14.49	14.49	14.49	14.49
Rows	2	2	2	2	2	2.7	2	2.7
Fins per inch	20	20	20	20	20	20	20	20
Tube diameter	9/32	9/32	9/32	9/32	9/32	9/32	9/32	9/32
Circuitry Type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
EVAPORATOR COIL DATA								
Face area (Sq. Ft)	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
Rows	3	3	3	3	3	3	3	3
Fins per inch	16	16	16	16	16	16	16	16
Tube diameter	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
Circuitry Type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
Refrigerant control	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
CONDENSER FAN DATA								
Fan diameter (Inch)	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8
Type	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop
Drive type	Direct	Direct	Direct	Direct	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1	1	1	1	1
Number of motors	1	1	1	1	1	1	1	1
Motor HP each	1/12	1/12	1/6	1/6	1/6	1/6	1/6	1/6
RPM	1075	1075	825	825	825	825	825	825
Nominal total CFM	2440	2440	3145	3145	3145	3145	3145	3145
DIRECT DRIVE EVAP FAN DATA								
Quantity	1	1	1	1	1	1	1	1
Fan Size (Inch)	10×10	10×10	10×10	10×10	10×10	10×10	10×10	10×10
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. speeds	3	3	3	3	3	3	3	3
Motor HP each	1/4	1/4	1/3	1/3	1/2	1/2	1/2	1/2
RPM	1075	1075	1075	1075	1075	1075	1075	1075
Motor frame size	48	48	48	48	48	48	48	48
FILTERS								
(No.) Size Recommended in.	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1

* The above Table data for reference only.

Table 6-3: 14 SEER Physical Data (Continued)

Component	Models							
	MRB-42CWN1-M14	MRB-42HWN1-M14	MRB-48CWN1-M14	MRB-48HWN1-M14	MRB-48CWN1-X14	MRB-48HWN1-X14	MRB-60CWN1-M14B	MRB-60HWN1-M14B
Nominal Tonnage	3.5	3.5	4.0	4.0	4.0	4.0	5.0	5.0
ARI COOLING PERFORMANCE								
Gross Capacity @ ARI A point (Btu)	43,813	43,813	49,913	49,913	49,913	49,625	61,775	61,275
ARI net capacity (Btu)	42,000	42,000	48,000	48,000	48,000	48,000	59,500	59,000
EER	12	12	12	12	12	12	12	12
SEER	14	14	14	14	14	14	14	14
Nominal CFM	1450	1450	1550	1550	1550	1550	1820	1820
System power (kW)	3.53	3.63	4.00	4.00	4.00	3.98	4.86	4.95
Refrigerant type	R410a	R410a	R410a	R410a	R410a	R410a	R410a	R410a
Refrigerant charge (lb-oz)	7-15	8-13	9-8	10-2	9-8	9-8	9-11	10-13
ARI HEATING PERFORMANCE								
47°F Capacity Rating (Btu)	—	42,000	—	48,000	—	48,000	—	59,000
System Power (kW)	—	3.21	—	3.79	—	3.63	—	4.45
17°F Capacity Rating (Btu)	—	24,200	—	28,800	—	27,400	—	32,800
System Power(kW)	—	3.0	—	3.5	—	3.30	—	3.91
HSPF (BTU/Watts-hr.)	—	8.0	—	8.0	—	8.0	—	8.0
DIMENSIONS (Inches)								
Length	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32	75-19/32
Width	42	42	42	42	42	42	42	42
Height	28-3/32	28-3/32	33-3/64	33-3/64	33-3/64	33-3/64	33-3/64	33-3/64
OPERATING WT. (lbs)	496	505	496	505	496	505	507	516
COMPRESSORS								
Type	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd	Scroll 1-spd
Quantity	1	1	1	1	1	1	1	1
CONDENSER COIL DATA								
Face area (Sq. Ft)	17.39	17.39	17.39	17.39	17.39	17.39	17.39	17.39
Rows	2	2	3	3	3	3	3	3
Fins per inch	20	20	20	20	20	20	20	20
Tube diameter	9/32	9/32	9/32	9/32	9/32	9/32	9/32	9/32
Circuitry Type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
EVAPORATOR COIL DATA								
Face area (Sq. Ft)	6.34	6.34	6.34	6.34	6.34	6.34	6.34	6.34
Rows	4	4	4	4	4	4	4	4
Fins per inch	16	16	16	16	16	16	16	16
Tube diameter	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
Circuitry Type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
Refrigerant control	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
CONDENSER FAN DATA								
Fan diameter (Inch)	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8	23-5/8
Type	Prop	Prop	Prop	Prop	Prop	Prop	Prop	Prop
Drive type	Direct	Direct	Direct	Direct	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1	1	1	1	1
Number of motors	1	1	1	1	1	1	1	1
Motor HP each	1/6	1/3	1/3	1/3	1/3	1/3	1/3	1/3
RPM	825	1075	1075	1075	1075	1075	1075	1075
Nominal total CFM	3145	4245	4245	4245	4245	4245	4245	4245
DIRECT DRIVE EVAP FAN DATA								
Quantity	1	1	1	1	1	1	1	1
Fan Size (Inch)	10×10	10×10	10×10	10×10	10×10	10×10	10×10	10×10
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. speeds	3	3	3	3	3	3	3	3
Motor HP each	3/4	3/4	3/4	3/4	3/4	3/4	1	1
RPM	1075	1075	1075	1075	1075	1075	variable	variable
Motor frame size	48	48	48	48	48	48	48	48
FILTERS								
(No.) Size Recommended in.	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1	(1) 22×14×1

* The above Table data for reference only.

Table 6-3: 14 SEER Physical Data (Continued)

Component	Models						
	MRB-60CWN1-X14B	MRB-60HWN1-X14B					
Nominal Tonnage	5.0	5.0					
ARI COOLING PERFORMANCE							
Gross Capacity @ ARI A point (Btu)	61,775	61,275					
ARI net capacity (Btu)	59,500	59,000					
EER	12	12					
SEER	14	14					
Nominal CFM	1820	1820					
System power (kW)	4.87	4.94					
Refrigerant type	R410a	R410a					
Refrigerant charge (lb-oz)	9-15	9-15					
ARI HEATING PERFORMANCE							
47°F Capacity Rating (Btu)	—	58,500					
System Power (kW)	—	4.20					
17°F Capacity Rating (Btu)	—	31,800					
System Power (kW)	—	3.76					
HSPF (BTU/Watts-hr.)	—	8.0					
DIMENSIONS (Inches)							
Length	75-19/32	75-19/32					
Width	42	42					
Height	33-3/64	33-3/64					
OPERATING WT. (lbs)	507	516					
COMPRESSORS							
Type	Scroll 1-spd	Scroll 1-spd					
Quantity	1	1					
CONDENSER COIL DATA							
Face area (Sq. Ft)	17.39	17.39					
Rows	3	3					
Fins per inch	20	20					
Tube diameter	9/32	9/32					
Circuitry Type	interlaced	interlaced					
EVAPORATOR COIL DATA							
Face area (Sq. Ft)	6.34	6.34					
Rows	4	4					
Fins per inch	16	16					
Tube diameter	5/16	5/16					
Circuitry Type	interlaced	interlaced					
Refrigerant control	Orifice	Orifice					
CONDENSER FAN DATA							
Fan diameter (Inch)	23-5/8	23-5/8					
Type	Prop	Prop					
Drive type	Direct	Direct					
No. speeds	1	1					
Number of motors	1	1					
Motor HP each	1/3	1/3					
RPM	1075	1075					
Nominal total CFM	4245	4245					
DIRECT DRIVE EVAP FAN DATA							
Quantity	1	1					
Fan Size (Inch)	10×10	10×10					
Type	Centrifugal	Centrifugal					
No. speeds	3	3					
Motor HP each	1	1					
RPM	variable	variable					
Motor frame size	48	48					
FILTERS							
(No.) Size Recommended in.	(1) 22×14×1	(1) 22×14×1					

* The above Table data for reference only.

7.0 AIRFLOW PERFORMANCE

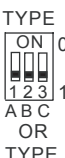
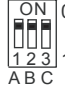




Airflow performance data is based on cooling performance with a coil and no filter in place. Use this performance table for appropriate unit size, external static applied to unit and allow operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

7.1 AIRFLOW PERFORMANCE DATA

Table 7-1 Side Duct Application

Model Number	Motor Speed	CFM(L/S)(Watts)								
		External Static Pressure-Inches W.C.[kPa]								
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]
24	Low	CFM(L/S)	955(451)	882 (417)	811 (383)	731(345)	596 (281)	494 (233)	387(183)	283(134)
		RPM	497	562	623	684	764	813	859	901
		Watts	192	188	185	180	173	167	162	155
		Amps	0.84	0.82	0.8	0.78	0.75	0.73	0.71	0.68
	Middle	CFM(L/S)	1200(566)	1127(532)	1063(502)	995(469)	917(433)	826(390)	646(305)	525(248)
		RPM	616	669	716	760	803	851	911	947
		Watts	288	280	274	267	259	250	236	226
		Amps	1.26	1.22	1.2	1.17	1.14	1.1	1.04	1.01
	High	CFM(L/S)	1410(665)	1340(633)	1275(602)	1205(569)	1125(531)	1035(489)	925(437)	720(337)
		RPM	712	751	789	825	859	894	951	980
		Watts	376	369	361	352	342	331	318	297
		Amps	1.65	1.62	1.59	1.55	1.52	1.47	1.42	1.34
30	Low	CFM(L/S)	1165 (550)	1104 (521)	1051 (496)	991 (468)	918 (434)	779 (368)	672 (317)	573 (271)
		RPM	572	630	684	734	788	860	904	941
		Watts	278	272	266	258	250	236	226	216
		Amps	1.24	1.22	1.21	1.18	1.16	1.12	1.1	1.07
	Middle	CFM(L/S)	1293 (611)	1228 (580)	1181 (558)	1124 (531)	1065 (503)	983 (464)	808 (382)	697 (329)
		RPM	624	675	725	769	814	861	925	961
		Watts	337	326	317	308	299	288	270	257
		Amps	1.5	1.47	1.45	1.42	1.4	1.37	1.32	1.29
	High	CFM(L/S)	1499 (708)	1441 (681)	1385 (654)	1332 (629)	1271 (600)	1191 (562)	1092 (516)	892 (421)
		RPM	709	753	793	831	866	902	939	988
		Watts	441	432	423	414	404	390	375	347
		Amps	2.01	1.98	1.96	1.93	1.9	1.87	1.83	1.76
36	Low	CFM(L/S)	1341 (633)	1286 (607)	1242 (586)	1193 (563)	1134 (535)	1063 (502)	895 (425)	775 (366)
		RPM	630	676	720	764	809	854	927	960
		Watts	361	355	348	340	331	319	298	284
		Amps	1.57	1.55	1.52	1.51	1.46	1.41	1.34	1.29
	Middle	CFM(L/S)	1510 (713)	1468 (693)	1420 (671)	1369 (647)	1292 (610)	1218 (575)	1128 (533)	934 (441)
		RPM	701	741	779	814	854	892	928	987
		Watts	447	438	428	419	408	394	377	347
		Amps	1.95	1.92	1.88	1.84	1.8	1.75	1.69	1.59
	High	CFM(L/S)	1705 (805)	1658 (783)	1604 (758)	1549 (731)	1489 (703)	1416 (669)	1321 (624)	1179 (557)
		RPM	781	815	849	880	908	938	969	1006
		Watts	558	547	536	524	511	493	474	445
		Amps	2.45	2.41	2.36	2.32	2.26	2.21	2.14	2.04
42	Low	CFM(L/S)	1566 (740)	1519 (717)	1488 (703)	1409 (665)	1336 (631)	1263 (596)	1060 (501)	856 (404)
		RPM	714	761	798	824	850	876	891	906
		Watts	473	459	452	434	420	405	370	335
		Amps	2.08	2.03	2.01	1.99	1.93	1.86	1.77	1.67
	Middle	CFM(L/S)	1771 (836)	1717 (811)	1653 (781)	1598 (755)	1529 (722)	1444 (682)	1329 (628)	1214 (573)
		RPM	794	833	870	886	905	926	939	952
		Watts	589	574	560	543	524	509	486	462
		Amps	2.63	2.58	2.53	2.48	2.43	2.38	2.32	2.25
	High	CFM(L/S)	2010 (949)	1937 (915)	1865 (881)	1793 (847)	1688 (797)	1599 (755)	1491 (704)	1382 (653)
		RPM	917	940	960	972	985	1000	1010	1017
		Watts	759	740	720	700	680	657	633	608
		Amps	3.44	3.39	3.4	3.27	3.21	3.15	3.08	3
48	Low	CFM(L/S)	1658 (783)	1603 (757)	1546 (730)	1491 (704)	1427 (674)	1354 (639)	1265 (598)	1125 (531)
		RPM	747	779	811	843	871	903	932	972
		Watts	510	500	489	478	464	449	431	405
		Amps	2.33	2.3	2.26	2.23	2.19	2.14	2.09	2.02
	Middle	CFM(L/S)	1837 (868)	1776 (839)	1724 (814)	1647 (778)	1576 (744)	1502 (709)	1413 (667)	1295 (611)
		RPM	816	845	869	894	918	942	964	992
		Watts	615	602	587	575	558	542	522	498
		Amps	2.84	2.8	2.76	2.72	2.67	2.63	2.58	2.51
	High	CFM(L/S)	2019 (954)	1954 (923)	1892 (893)	1819 (859)	1745 (825)	1656 (782)	1565 (739)	1459 (689)
		RPM	891	910	931	949	968	986	1002	1020
		Watts	756	741	723	706	689	672	649	627
		Amps	3.54	3.5	3.45	3.41	3.35	3.3	3.23	3.16

Table 7-1 Side Duct Application (Continued)

Model Number	Motor Speed	External Static Pressure-Inches W.C. [kPa]									
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]
		CFM	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts
60 TYPE  OR TYPE 		1600	252	292	328	354	400	435	473	510	552
	 OR 	1800	353	385	422	452	496	544	584	624	665
		2000	441	494	531	560	617	668	718	769	819

* The above airflow data for reference only.

** Default as high speed of factory settings.

Table 7-2 Bottom Duct Application

Model Number	Motor Speed	CFM(L/S)(Watts)								
		External Static Pressure-Inches W.C. [kPa]								
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]
24	Low	CFM(L/S)	955(451)	882(417)	811(383)	731(345)	596(281)	494(233)	387(183)	283(134)
		RPM	497	562	623	684	764	813	859	901
		Watts	192	188	185	180	173	167	162	155
		Amps	0.84	0.82	0.8	0.78	0.75	0.73	0.71	0.68
	Middle	CFM(L/S)	1200(566)	1127(532)	1063(502)	995(469)	917(433)	826(390)	646(305)	525(248)
		RPM	616	669	716	760	803	851	911	947
		Watts	288	280	274	267	259	250	236	226
		Amps	1.26	1.22	1.2	1.17	1.14	1.1	1.04	1.01
	High	CFM(L/S)	1410(665)	1340(633)	1275(602)	1205(569)	1125(531)	1035(489)	925(437)	720(337)
		RPM	712	751	789	825	859	894	951	980
		Watts	376	369	361	352	342	331	318	297
		Amps	1.65	1.62	1.59	1.55	1.52	1.47	1.42	1.34
30	Low	CFM(L/S)	1165(550)	1104(521)	1051(496)	991(468)	918(434)	779(368)	672(317)	573(271)
		RPM	572	630	684	734	788	860	904	941
		Watts	278	272	266	258	250	236	226	216
		Amps	1.24	1.22	1.21	1.18	1.16	1.12	1.1	1.07
	Middle	CFM(L/S)	1293(611)	1228(580)	1181(558)	1124(531)	1065(503)	983(464)	808(382)	697(329)
		RPM	624	675	725	769	814	861	925	961
		Watts	337	326	317	308	299	288	270	257
		Amps	1.5	1.47	1.45	1.42	1.4	1.37	1.32	1.29
	High	CFM(L/S)	1499(708)	1441(681)	1385(654)	1332(629)	1271(600)	1191(562)	1092(516)	892(421)
		RPM	709	753	793	831	866	902	939	988
		Watts	441	432	423	414	404	390	375	347
		Amps	2.01	1.98	1.96	1.93	1.9	1.87	1.83	1.76
36	Low	CFM(L/S)	1341(633)	1286(607)	1242(586)	1193(563)	1134(535)	1063(502)	895(425)	775(366)
		RPM	630	676	720	764	809	854	927	960
		Watts	361	355	348	340	331	319	298	284
		Amps	1.57	1.55	1.52	1.51	1.46	1.41	1.34	1.29
	Middle	CFM(L/S)	1510(713)	1468(693)	1420(671)	1369(647)	1292(610)	1218(575)	1128(533)	934(441)
		RPM	701	741	779	814	854	892	928	987
		Watts	447	438	428	419	408	394	377	347
		Amps	1.95	1.92	1.88	1.84	1.8	1.75	1.69	1.59
	High	CFM(L/S)	1705(805)	1658(783)	1604(758)	1549(731)	1489(703)	1416(669)	1321(624)	1179(557)
		RPM	781	815	849	880	908	938	969	1006
		Watts	558	547	536	524	511	493	474	445
		Amps	2.45	2.41	2.36	2.32	2.26	2.21	2.14	2.04

Table 7-2 Bottom Duct Application (Continued)

Model Number	Motor Speed	CFM(L/S)(Watts)								
		External Static Pressure-Inches W.C.[kPa]								
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]
42	Low	CFM(L/S)	1566 (740)	1519 (717)	1488 (703)	1409 (665)	1336 (631)	1263 (596)	1060(501)	856 (404)
		RPM	714	761	798	824	850	876	891	906
		Watts	473	459	452	434	420	405	370	335
		Amps	2.08	2.03	2.01	1.99	1.93	1.86	1.77	1.67
	Middle	CFM(L/S)	1771 (836)	1717 (811)	1653 (781)	1598 (755)	1529 (722)	1444 (682)	1329 (628)	1214(573)
		RPM	794	833	870	886	905	926	939	952
		Watts	589	574	560	543	524	509	486	462
		Amps	2.63	2.58	2.53	2.48	2.43	2.38	2.32	2.25
	High	CFM(L/S)	2010 (949)	1937 (915)	1865 (881)	1793 (847)	1688 (797)	1599 (755)	1491 (704)	1382 (653)
		RPM	917	940	960	972	985	1000	1010	1017
		Watts	759	740	720	700	680	657	633	608
		Amps	3.44	3.39	3.4	3.27	3.21	3.15	3.08	3
48	Low	CFM(L/S)	1658 (783)	1603 (757)	1546 (730)	1491 (704)	1427 (674)	1354 (639)	1265 (598)	1125 (531)
		RPM	747	779	811	843	871	903	932	972
		Watts	510	500	489	478	464	449	431	405
		Amps	2.33	2.3	2.26	2.23	2.19	2.14	2.09	2.02
	Middle	CFM(L/S)	1837 (868)	1776 (839)	1724 (814)	1647 (778)	1576 (744)	1502 (709)	1413 (667)	1295 (611)
		RPM	816	845	869	894	918	942	964	992
		Watts	615	602	587	575	558	542	522	498
		Amps	2.84	2.8	2.76	2.72	2.67	2.63	2.58	2.51
	High	CFM(L/S)	2019 (954)	1954 (923)	1892 (893)	1819 (859)	1745 (825)	1656 (782)	1565 (739)	1459 (689)
		RPM	891	910	931	949	968	986	1002	1020
		Watts	756	741	723	706	689	672	649	627
		Amps	3.54	3.5	3.45	3.41	3.35	3.3	3.23	3.16

Model Number	Motor Speed	External Static Pressure-Inches W.C.[kPa]									
		0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]	
		CFM	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts
60 TYPE ON 0 123 1 ABC OR TYPE ON 0 123 1 ABC	ADJ ON 0 12 1 DE	1600	252	292	328	354	400	435	473	510	552
	ADJ ON 0 12 1 DE OR ADJ ON 0 12 1 DE	1800	353	385	422	452	496	544	584	624	665
	ADJ ON 0 12 1 DE **	2000	441	494	531	560	617	668	718	769	819

* The above airflow data for reference only.

** Default as high speed of factory settings.

- The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.
- Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.
- Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.
- Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.
- The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.
- An air velocity meter or airflow hood can give a reading of system CFM.
- When installation, installer should select the air speed according to the actual setting static pressure. Please refer to the *Table 7-1, 7-2 AIRFLOW PERFORMANCE DATA*.

Table 7-3 Refrigerant charge for A/C system

24K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
		165			271	284	298	318	336	364	394	416	433	453	472
161			268	281	295	314	332	358	389	410	427	447	467		
157			265	278	292	310	328	353	383	404	421	442	463		
153		250	262	275	289	307	324	348	378	398	414	437	460		
149		247	259	272	286	303	319	338	367	389	411	434	457		
145		243	255	268	282	299	315	334	361	386	408	431	454		
141	224	240	252	265	279	296	312	332	357	383	405	428	450		
137	219	236	248	261	275	292	309	329	354	380	402	425	447		
133	214	232	244	257	271	289	306	325	350	376	398	421	443		
129	209	228	240	253	267	285	302	321	346	373	395	417	439		
125	204	224	236	249	263	281	298	317	342	369	391	413	435		
121	199	220	232	245	259	277	294	313	338	365	388	410	431		
117	194	216	228	241	255	273	290	309	334	362	385	406	427		
113	189	212	224	237	251	269	286	305	330	358	382	403	423		
109	184	208	220	233	247	265	282	301	326	355	379	399	419		
105	179	204	216	229	243	261	278	297	322	351	376	395	414		

Table 7-4 Refrigerant charge for H/P system

24K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
		165			271	284	298	318	336	364	394	416	433	453	472
161			268	281	295	314	332	358	389	410	427	447	467		
157			265	278	292	310	328	353	383	404	421	442	463		
153		250	262	275	289	307	324	348	378	398	414	437	460		
149		247	259	272	286	303	319	338	367	389	411	434	457		
145		243	255	268	282	299	315	334	361	386	408	431	454		
141	224	240	252	265	279	296	312	332	357	383	405	428	450		
137	219	236	248	261	275	292	309	329	354	380	402	425	447		
133	214	232	244	257	271	289	306	325	350	376	398	421	443		
129	209	228	240	253	267	285	302	321	346	373	395	417	439		
125	204	224	236	249	263	281	298	317	342	369	391	413	435		
121	199	220	232	245	259	277	294	313	338	365	388	410	431		
117	194	216	228	241	255	273	290	309	334	362	385	406	427		
113	189	212	224	237	251	269	286	305	330	358	382	403	423		
109	184	208	220	233	247	265	282	301	326	355	379	399	419		
105	179	204	216	229	243	261	278	297	322	351	376	395	414		

Table 7-5 Refrigerant charge for H/P system

24K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage												
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)												
		60	62	64	66	68	70	72	74	76	78	80	82	
Pressure after Switchover Valve-Suction to Compressor(psig) Pression Apres La Vanne D-inversion-Aspiration au compresseur(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)												
				135	333	339	345	351	357	363	373	382	391	400
		128	326	331	337	343	348	353	362	371	380	389	398	416
		121	319	324	330	335	341	347	351	358	365	373	388	406
		114	311	316	320	325	329	334	340	347	354	361	378	396
		107	305	308	311	315	319	323	331	338	345	352	371	389
		100	298	302	305	308	311	314	321	328	335	343	356	374
		93	291	293	296	299	302	305	310	318	326	335	341	359
		86	282	285	288	291	294	297	306	313	320	327	334	352
		79	270	273	276	279	282	285	296	305	312	319	327	345
		72	261	265	268	271	274	277	290	297	304	311	318	336
		65	254	257	260	264	267	270	277	284	291	299	307	325
		58				256	259	263	268	283	288	293	298	316
		51					248	252	259	266	274	281	289	307
		44						241	249	257	265	269	281	299
		37							237	247	253	259	273	291
		30												

Table 7-6 Refrigerant charge for A/C system

30K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig) Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
				165			236	256	278	299	321	346	370	392	414
		161			232	254	276	298	319	342	366	388	410	434	458
		157			231	253	275	296	317	340	364	386	408	431	453
		153		208	230	252	273	294	314	337	360	383	405	428	450
		149		207	228	250	272	292	312	335	357	380	402	426	449
		145		205	227	249	270	291	311	333	355	377	399	423	446
		141	180	202	224	246	268	288	308	330	352	373	395	418	442
		137	177	198	220	242	264	284	304	323	342	367	391	415	439
		133	175	196	218	240	262	282	302	324	346	367	388	412	437
		129	172	194	215	237	259	279	299	320	341	363	385	410	434
		125	169	191	213	235	256	276	296	316	337	358	380	405	430
		121	167	189	210	232	254	274	294	314	334	356	378	403	429
		117	164	186	208	230	251	271	292	311	331	353	374	400	426
		113	161	182	204	226	248	268	288	307	327	348	370	396	422
		109	159	181	202	224	246	266	286	305	324	346	367	394	420
		105	156	178	200	221	243	263	284	302	321	343	364	391	418

Table 7-7 Refrigerant charge for H/P system

30K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig) Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
				165			236	256	278	299	321	346	370	392	414
		161			232	254	276	298	319	342	366	388	410	434	458
		157			231	253	275	296	317	340	364	386	408	431	453
		153		208	230	252	273	294	314	337	360	383	405	428	450
		149		207	228	250	272	292	312	335	357	380	402	426	449
		145		205	227	249	270	291	311	333	355	377	399	423	446
		141	180	202	224	246	268	288	308	330	352	373	395	418	442
		137	177	198	220	242	264	284	304	323	342	367	391	415	439
		133	175	196	218	240	262	282	302	324	346	367	388	412	437
		129	172	194	215	237	259	279	299	320	341	363	385	410	434
		125	169	191	213	235	256	276	296	316	337	358	380	405	430
		121	167	189	210	232	254	274	294	314	334	356	378	403	429
		117	164	186	208	230	251	271	292	311	331	353	374	400	426
		113	161	182	204	226	248	268	288	307	327	348	370	396	422
		109	159	181	202	224	246	266	286	305	324	346	367	394	420
		105	156	178	200	221	243	263	284	302	321	343	364	391	418

Table 7-8 Refrigerant charge for H/P system

30K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage														
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)														
		60	62	64	66	68	70	72	74	76	78	80	82			
Pressure after Switchover Valve-Suction to Compressor(psig) Pression Apres La Vanne D-inversion-Aspiration au compresseur(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)														
		135	292	303	314	326	337	348	359	370	381	392	403	414		
		128	285	297	308	319	331	342	352	362	372	383	393	403		
		121	276	287	299	310	321	333	342	352	361	371	381	390		
		114	271	282	293	304	314	325	334	343	352	361	370	379		
		107	267	277	287	298	308	319	326	334	342	350	357	365		
		100	257	268	278	289	299	310	316	323	330	336	343	349		
		93	251	261	271	281	291	301	307	313	319	325	331	337		
		86	246	256	265	274	283	293	299	305	312	318	325	331		
		79	234	243	253	262	271	281	287	294	301	308	315	322		
		72	224	233	243	252	262	271	279	286	293	300	308	315		
		65							271	279	287	295	303	311		
		58								267	274	282	289	297		
		51									267	275	282	290		
		44										267	275	283		
37											264	272				
30																

Table 7-9 Refrigerant charge for A/C system

36K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement														
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)														
		55	60	65	70	75	80	85	90	95	100	105	110	115		
Low Pressure Detected Valve(psig) Vanne Détecée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecée de Pression Haute(en psig)														
		165			308	323	338	352	365	386	407	432	456	482	508	
		161			304	319	334	348	361	382	403	428	452	478	503	
		157			300	315	330	344	357	378	399	423	447	473	499	
		153		281	296	311	326	340	353	374	395	419	443	469	495	
		149		277	292	307	322	336	349	370	391	415	439	465	490	
		145		273	288	303	318	332	345	367	388	412	435	461	487	
		141	248	269	284	299	314	328	341	363	385	408	431	457	482	
		137	243	265	280	295	310	325	339	360	381	405	428	458	488	
		133	238	261	276	291	306	321	336	357	378	402	425	450	474	
		129	233	257	272	287	302	318	334	355	375	399	422	448	473	
		125	228	253	268	283	298	314	330	352	373	396	419	444	469	
		121	223	249	264	279	294	310	326	348	370	393	416	441	465	
		117	218	245	260	275	290	306	322	345	367	390	413	437	461	
		113	213	241	256	271	286	302	318	341	364	387	410	434	457	
109	208	237	252	267	282	298	314	338	361	384	407	430	453			
105	203	233	248	263	278	294	310	334	358	381	404	427	449			

Table 7-10 Refrigerant charge for H/P system

36K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement														
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)														
		55	60	65	70	75	80	85	90	95	100	105	110	115		
Vapor Pressure at Large Service Valve(psig) Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)														
		165				287	307	326	346	365	388	410	433	455	485	515
		161				284	303	323	342	361	383	405	428	451	480	509
		157				281	300	320	339	358	379	399	424	449	474	499
		153			258	277	297	316	335	354	376	397	422	446	470	495
		149			255	274	294	313	332	351	373	394	418	442	466	490
		145			251	271	290	310	330	350	371	392	415	438	463	487
		141	229	248	268	287	307	327	348	368	389	412	435	459	484	
		137	225	245	264	284	303	324	345	365	386	408	431	456	481	
		133	222	242	261	281	300	321	342	362	381	405	428	453	479	
		129	219	239	258	278	297	318	338	358	377	401	425	450	474	
		125	216	236	255	275	294	314	334	353	373	397	422	447	471	
		121	212	232	251	271	290	309	328	349	370	394	419	443	468	
		117	209	229	248	268	287	305	323	346	368	392	416	440	464	
		113	206	226	245	265	284	301	318	342	366	390	413	437	461	
109	203	222	242	261	281	297	313	339	364	387	410	434	457			
105	200	219	239	258	278	293	308	335	362	385	408	431	454			

Table 7-11 Refrigerant charge for H/P system

36K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Thermometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
Pressure after Switchover Valve-Suction to Compressor(psig) Pression Apres La Vanne D-inversion-Aspiration au compresseur(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
		135	368	388	403	418	433	448	458	465	472	480	487	494	
		128	357	375	389	403	417	431	440	447	454	461	467	474	
		121	346	363	375	388	401	413	422	429	435	442	448	455	
		114	335	350	362	373	385	396	404	410	416	422	428	434	
		107	323	337	348	358	368	379	386	392	398	403	409	415	
		100	312	324	333	343	352	361	370	376	383	389	396	402	
		93	302	311	319	326	333	341	351	359	367	375	383	391	
		86	292	299	305	311	317	323	335	343	352	360	368	377	
		79	283	289	293	297	302	306	318	328	337	346	355	365	
		72	264	271	276	281	286	292	304	314	323	333	342	352	
		65							291	300	309	319	328	337	
		58								284	293	302	310	319	
		51									286	294	302	310	
		44										285	292	298	
		37											282	289	
30															

Table 7-12 Refrigerant charge for A/C system

42K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig) Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
		165			280	301	322	344	367	392	416	439	461	487	515
		161			276	298	319	341	364	388	412	434	455	483	511
		157			273	295	317	339	361	384	408	430	452	480	507
		153		248	270	292	314	336	357	380	403	426	449	476	504
		149		244	267	289	312	333	354	376	399	422	446	473	501
		145		241	263	286	309	330	351	373	394	418	442	470	497
		141	214	237	261	284	307	328	348	370	392	415	438	466	494
		137	210	234	257	281	305	325	345	368	390	412	434	462	490
		133	206	230	254	278	302	321	341	365	389	410	431	459	487
		129	202	227	251	276	300	319	338	361	384	406	428	455	483
		125	198	223	248	273	297	316	336	358	380	402	425	453	480
		121	194	219	244	269	294	313	332	354	377	400	422	449	476
		117	191	215	240	265	290	310	331	352	373	396	419	446	472
		113	187	212	237	262	287	308	328	349	370	393	416	442	469
		109	183	208	233	258	283	304	325	346	366	390	413	439	465
105	179	204	229	254	280	301	323	343	362	386	410	436	461		

Table 7-13 Refrigerant charge for H/P system

42K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig) Pression de Vapeur a la grosse vanne de service(en psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
		165			280	301	322	344	367	392	416	439	461	487	515
		161			276	298	319	341	364	388	412	434	455	483	511
		157			273	295	317	339	361	384	408	430	452	480	507
		153		248	270	292	314	336	357	380	403	426	449	476	504
		149		244	267	289	312	333	354	376	399	422	446	473	501
		145		241	263	286	309	330	351	373	394	418	442	470	497
		141	214	237	261	284	307	328	348	370	392	415	438	466	494
		137	210	234	257	281	305	325	345	368	390	412	434	462	490
		133	206	230	254	278	302	321	341	365	389	410	431	459	487
		129	202	227	251	276	300	319	338	361	384	406	428	455	483
		125	198	223	248	273	297	316	336	358	380	402	425	453	480
		121	194	219	244	269	294	313	332	354	377	400	422	449	476
		117	191	215	240	265	290	310	331	352	373	396	419	446	472
		113	187	212	237	262	287	308	328	349	370	393	416	442	469
		109	183	208	233	258	283	304	325	346	366	390	413	439	465
105	179	204	229	254	280	301	323	343	362	386	410	436	461		

Table 7-14 Refrigerant charge for H/P system

42K		Heating Charge Chart/Tableau De Charge de Chauffage												
Heating Mode		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)												
Mode		60	62	64	66	68	70	72	74	76	78	80	82	
De Chauffage		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)												
Pressure after Switchover Valve-Suction to Compressor(psig)	Pression Apres La Vanne D~inversion-Aspiration au compresseur(en psig)	135	300	310	320	330	340	350	363	376	389	402	415	427
		128	293	303	314	324	335	345	357	368	380	392	403	415
		121	285	296	307	318	329	340	351	361	372	382	392	403
		114	278	289	301	312	324	335	344	354	363	372	381	391
		107	271	281	292	302	313	323	333	343	352	362	371	381
		100	263	277	291	305	320	334	339	343	348	353	358	363
		93	255	269	282	295	309	322	327	332	338	343	348	353
		86	249	262	274	286	298	310	316	321	327	332	338	343
		79	241	252	264	276	287	299	305	311	317	323	330	336
		72	234	244	255	266	276	287	294	301	308	314	321	328
		65	223	234	244	254	265	275	282	290	298	305	313	321
		58							271	279	288	296	305	313
		51								269	279	288	297	307
		44									269	279	289	298
37										270	281	292		
30											273	284		

Table 7-15 Refrigerant charge for A/C system

48K		Cooling Charge Chart/Tableau De Charge de Refroidissement													
Cooling Mode		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
Mode		55	60	65	70	75	80	85	90	95	100	105	110	115	
De Refroidissement		High Pressure Detected Valve(psig)/Vanne Déteçté de Pression Haute(en psig)													
Low Pressure Detected Valve(psig)	Vanne Déteçtée de Pression Basse(en psig)	165			291	310	328	347	365	392	418	442	466	496	525
		161			282	298	324	344	363	389	415	440	464	493	522
		157			284	303	321	342	362	387	412	437	462	491	520
		153		262	281	299	318	339	360	385	410	435	460	489	517
		149		260	279	297	316	337	358	382	407	433	458	486	513
		145		258	277	296	315	335	355	380	405	430	456	483	509
		141	237	255	273	292	311	332	353	378	402	428	453	477	501
		137	235	253	272	290	309	330	351	373	394	419	444	469	494
		133	233	251	270	288	307	327	346	366	386	412	437	462	486
		129	230	248	266	284	302	322	341	361	381	406	430	454	478
		125	226	244	262	280	297	315	334	355	377	400	423	447	471
		121	222	239	256	273	291	308	326	349	372	394	416	440	464
		117	215	232	249	266	284	300	315	341	367	388	409	433	457
		113	209	226	243	260	278	292	306	334	362	382	402	426	450
		109	203	220	237	254	272	285	298	328	357	376	395	419	443
		105	197	214	231	248	266	278	293	321	347	370	388	412	436

Table 7-16 Refrigerant charge for H/P system

48K		Cooling Charge Chart/Tableau De Charge de Refroidissement													
Cooling Mode		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
Mode		55	60	65	70	75	80	85	90	95	100	105	110	115	
De Refroidissement		High Pressure Detected Valve(psig)/Vanne Déteçté de Pression Haute(en psig)													
Low Pressure Detected Valve(psig)	Vanne Déteçtée de Pression Basse(en psig)	165			291	310	328	347	365	392	418	442	466	496	525
		161			282	298	324	344	363	389	415	440	464	493	522
		157			284	303	321	342	362	387	412	437	462	491	520
		153		262	281	299	318	339	360	385	410	435	460	489	517
		149		260	279	297	316	337	358	382	407	433	458	486	513
		145		258	277	296	315	335	355	380	405	430	456	483	509
		141	237	255	273	292	311	332	353	378	402	428	453	477	501
		137	235	253	272	290	309	330	351	373	394	419	444	469	494
		133	233	251	270	288	307	327	346	366	386	412	437	462	486
		129	230	248	266	284	302	322	341	361	381	406	430	454	478
		125	226	244	262	280	297	315	334	355	377	400	423	447	471
		121	222	239	256	273	291	308	326	349	372	394	416	440	464
		117	215	232	249	266	284	300	315	341	367	388	409	433	457
		113	209	226	243	260	278	292	306	334	362	382	402	426	450
		109	203	220	237	254	272	285	298	328	357	376	395	419	443
		105	197	214	231	248	266	278	293	321	347	370	388	412	436

Table 7-17 Refrigerant charge for H/P system

48K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Base(en psig)	135	333	340	347	354	361	370	382	390	398	406	414	426	
		128	325	332	339	346	353	360	376	383	390	397	404	416	
		121	318	325	332	339	346	353	367	374	381	388	396	408	
		114	310	317	324	331	338	347	358	366	374	382	390	402	
		107	302	309	316	323	330	337	348	355	362	369	379	391	
		100	295	302	309	316	323	330	338	345	352	359	369	379	
		93	287	294	301	308	315	322	330	337	344	351	359	368	
		86	278	285	292	299	306	313	319	327	335	343	351	359	
		79	269	276	283	290	297	304	310	318	326	334	342	350	
		72	258	265	272	279	287	295	305	312	319	326	333	342	
		65							293	304	310	319	326	334	
		58								299	305	313	321	328	
		51									301	308	316	323	
		44										304	311	317	
		37											307	314	
30															



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Table 7-18 Refrigerant charge for A/C system

60K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
Vapor Pressure at Large Service Valve(psig)	Pression de Vapeur a la grosse vanne de service(en psig)	165			278	300	322	341	360	382	405	429	454	479	505
		161			276	297	319	338	357	379	402	427	453	477	502
		157			273	294	316	335	354	376	399	424	450	474	499
		153		246	270	292	315	334	352	374	396	422	448	472	496
		149		242	267	289	312	331	350	371	393	419	445	469	493
		145		239	264	286	309	328	348	369	390	416	442	466	490
		141	216	235	261	283	306	326	347	367	387	413	439	464	489
		137	214	231	258	280	305	325	345	365	384	410	437	462	487
		133	211	228	255	277	302	322	342	362	381	408	434	459	484
		129	209	224	252	274	299	319	339	359	379	405	431	456	482
		125	206	220	249	271	296	316	336	356	376	402	428	453	479
		121	204	217	247	268	293	313	334	353	373	399	425	451	477
		117	202	213	244	265	292	312	332	351	370	396	422	449	476
		113	199	210	241	263	289	309	329	348	367	393	419	446	473
		109	197	206	238	260	286	306	326	345	364	390	416	444	471
105	191	204	235	257	283	303	323	342	361	387	413	441	468		

Table 7-19 Refrigerant charge for H/P system

60K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Vapor Pressure at Large Service Valve(psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
Vapor Pressure at Large Service Valve(psig)	Pression de Vapeur a la grosse vanne de service(en psig)	165			278	300	322	341	360	382	405	429	454	479	505
		161			276	297	319	338	357	379	402	427	453	477	502
		157			273	294	316	335	354	376	399	424	450	474	499
		153		246	270	292	315	334	352	374	396	422	448	472	496
		149		242	267	289	312	331	350	371	393	419	445	469	493
		145		239	264	286	309	328	348	369	390	416	442	466	490
		141	216	235	261	283	306	326	347	367	387	413	439	464	489
		137	214	231	258	280	305	325	345	365	384	410	437	462	487
		133	211	228	255	277	302	322	342	362	381	408	434	459	484
		129	209	224	252	274	299	319	339	359	379	405	431	456	482
		125	206	220	249	271	296	316	336	356	376	402	428	453	479
		121	204	217	247	268	293	313	334	353	373	399	425	451	477
		117	202	213	244	265	292	312	332	351	370	396	422	449	476
		113	199	210	241	263	289	309	329	348	367	393	419	446	473
		109	197	206	238	260	286	306	326	345	364	390	416	444	471
105	191	204	235	257	283	303	323	342	361	387	413	441	468		

Table 7-20 Refrigerant charge for H/P system

60K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
Pressure after Switchover Valve-Suction to Compressor(psig)		Lipuid Pressure at Small Service Valve(psig)/Pression lipuide a la petite vanne di service(en psig)													
Pressure after Switchover Valve-Suction to Compressor(psig)	Pression Apres La Vanne D-inversion-Aspiration au compresseur(en psig)	135	341	353	364	376	388	400	404	408	414	420	426	432	
		128	337	349	360	372	384	396	400	404	408	412	416	428	
		121	329	340	351	362	373	384	389	394	399	404	408	420	
		114	321	331	342	353	364	371	377	383	389	395	401	413	
		107	313	321	329	337	345	354	362	370	378	386	394	406	
		100	305	313	321	329	337	345	353	361	369	377	386	398	
		93	297	305	313	321	329	338	344	350	356	362	369	386	
		86	289	296	303	311	318	326	333	340	347	354	362	374	
		79	278	285	292	300	307	315	324	331	339	347	355	367	
		72	267	274	281	289	296	304	315	322	331	340	348	360	
		65	256	264	271	279	287	296	306	312	322	331	341	353	
		58							297	302	313	324	334	346	
		51								294	304	315	327	339	
		44									297	304	320	332	
		37										296	313	325	
30											308	320			

8.0 SYSTEM OPERATION

8.1 COMPRESSOR CRANKCASE HEATER(Optional)

Refrigerant migration during the off cycle can result in a noisy start up. Add a crankcase heater to minimize refrigeration migration, and to help eliminate any start up noise or bearing “wash out”.

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

At initial start-up or after extended shutdown periods, make sure the heater is energized for at least 12 hours before the compressor is started. (Disconnect switch on and wall thermostat off.)

The crankcase heater start-up conditions:

If the outdoor ambient temp. is $< 37.4^{\circ}\text{F}$ and the compressor stopped for more than three hours or the unit powered on once more, the crank heater will be on.

Crankcase heater shut-down conditions:

If the outdoor ambient temp. is $> 44.6^{\circ}\text{F}$ or the compressor start running, the crank heater will be off.

8.2 Protection (For HP system only)

When the sensor T3 (**Condenser pipe temperature**) & T4 (**Outdoor ambient temperature**) was checked open-circuit, the compressor, outdoor fan motor and 4-way valve will be off.

Discharge temperature protection

When discharge temp. is $> 275^{\circ}\text{F}$, the compressor will be off,

When discharge temp. is $< 194^{\circ}\text{F}$, the compressor will start running.

High pressure protection

When high pressure is $> 638\text{PSIG}$, the compressor and the outdoor fan motor will stop running.

When high pressure is $< 464\text{PSIG}$, the compressor and the outdoor fan motor will start running(3 minutes delay necessary).

Low pressure protection

When low pressure is $< 21\text{PSIG}$, the compressor and the outdoor fan motor will stop running.

When low pressure is $> 44\text{PSIG}$, the compressor and the outdoor fan motor will start running(3 minutes delay necessary).

In stand-by status, if low pressure protection was checked out, the compressor would not start running.

If protection cycles occur four times within 30 mins, the system must power on once more.

T4 function:

When T4 is $< 5^{\circ}\text{F}$, the compressor will stop. If the electrical heater kit is installed

in the indoor unit, the outdoor unit will send the operation signal to the indoor unit.

When T4 is $> 10.4^{\circ}\text{F}$, the compressor will restart.

8.3 DEFROST MODE* (For HP system only)

Defrosting condition:

When JUMP switch is set to “1”, the defrost mode will start if one of following conditions is satisfied:

1. Compressor keeps running, when T4 is $> 28.4^{\circ}\text{F}$ and T3 is $< 32^{\circ}\text{F}$ and last for 40 minutes;
2. Compressor keeps running, when T4 is $< 28.4^{\circ}\text{F}$ and T3 is $< 32^{\circ}\text{F}$ and last for 50 minutes.

* When defrosting Actions, if the electrical heater kit is installed in the indoor unit, the outdoor unit would deliver the Aux. heater operation signal to the indoor unit.

When JUMP switch is set to “0”:
Compressor keeps running, when T3 is < 32 °F and last for 30 minutes.

Ending conditions of defrost mode:

The mode will end if one of following conditions is satisfied:

1. The defrosted time lasting for 10 minutes;
2. When JUMP switch is set to “1”, T3 is ≥64.4°F;
3. When JUMP switch is set to “0”, T3 is ≥77°F.

8.4 MANUAL DEFROST MODE (For HP system only)

When MANUAL DEFROST switch in PCB is set to “1”, system will perform as above 8.3 description.

When the switch is set to “0”, T3<32°F, compressor keeps working last for about 40 seconds, after then system turns to the Defrost Mode. By the logic of 8.3 to exit the Defrost Mode.

Caution: Once finishes the manual defrost, please switch the MANUAL DEFROST in PCB to “1”.

8.5 THERMOSTAT SIGNALS

Table 8-1: Thermostat Signals

Signal	State	Board Function
G	ON	Blower instant ON
	OFF	Blower 90 sec. delay OFF
G & W1	ON	Blower instant ON Heater bank 1 elec.onstant ON
	OFF	Heater bank 1 elec.instant OFF Blower 90 sec. delay OFF
G & W & W2	ON	Blower instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	Blower 90 sec. delay OFF Heater 1 instant OFF Heater 2 instant OFF
G & Y	ON	Blower instant ON Compressor and outdoor fan instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF
G & B & Y	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF 4-way valve instant OFF
G & B & Y & W1	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON Heater 1 instant ON
	OFF	Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF 4-way valve instant OFF Heater 1 instant OFF
G & B & Y & W1 & W2	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF 4-way valve instant OFF Heater 1 instant OFF Heater 2 instant OFF

8.6 Phase sequence protection (For 3 phase system only)



NOTE

Cut off the power supply when outdoor appear "POWER PHASE FAILURE". Switch on power supply again after 10 seconds if correct wiring connected.

When connected to the power in the right order but the compressor does not work, the LED indicator in the PCB board of the condensing unit will flash four times a cycle. To correct, make sure that the power supply is three phase, then exchange any two of the power input terminals among the L1, L2 or L3 and this should correct problem.

8.7 DC motor protection (For 60K system only)

If the speed of the DC motor is too high or too low, then it will enter to the fault state, and under fan fault that the electric heater and the compressor will be switched off, and then the fan will be re-operated after 1 minute; If there are 3 times fault occur in 1 hour, then it will be recovered until power off.

9.0 OPERATION CHECK-UP

• Cooling Startup

1. Turn thermostat to OFF and turn power to ON
2. Turn ON thermostat and set as high as possible
3. Turn Fan switch ON and indoor blower should run
4. Turn fan switch to AUTO, system switch to COOL and thermostat temperature setting below room temperature.
Unit should run in COOLING mode.

• Heating Startup

After normal cooling run

1. Turn thermostat switch to HEAT. After unit stops, wait about 5 minutes.
2. Turn thermostat setting above room temperature.
Unit should run in HEATING mode.

After unit has run for a while, check the following:

1. Are fans running properly?
2. Is compressor running correctly?
3. Check refrigerant change.
4. Check duct connection and leaks.
5. Check tubing and sheet metal rattles.

(See Wiring Diagram for electric connection detail.)

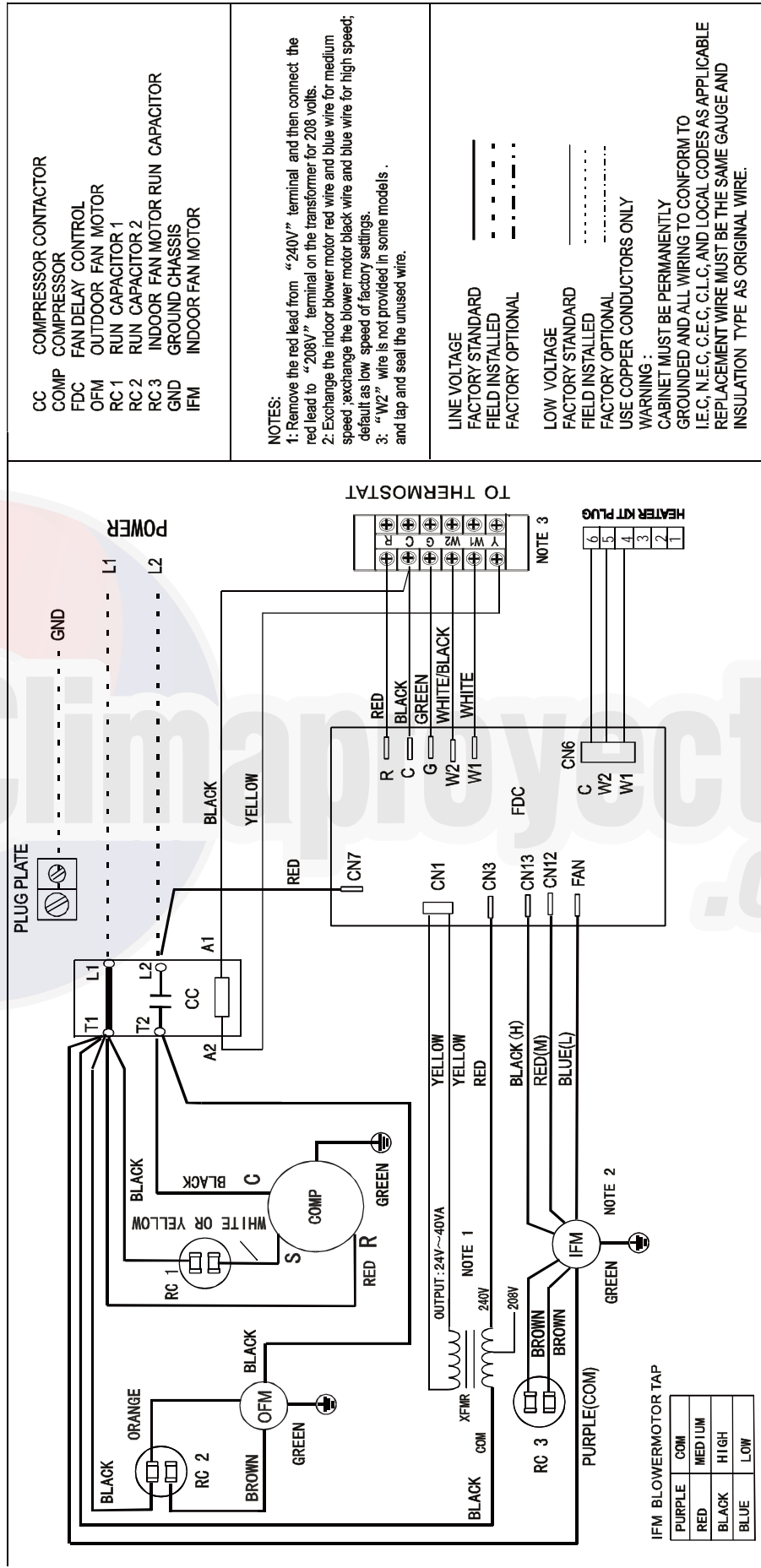
10.0 TROUBLE SHOOTING



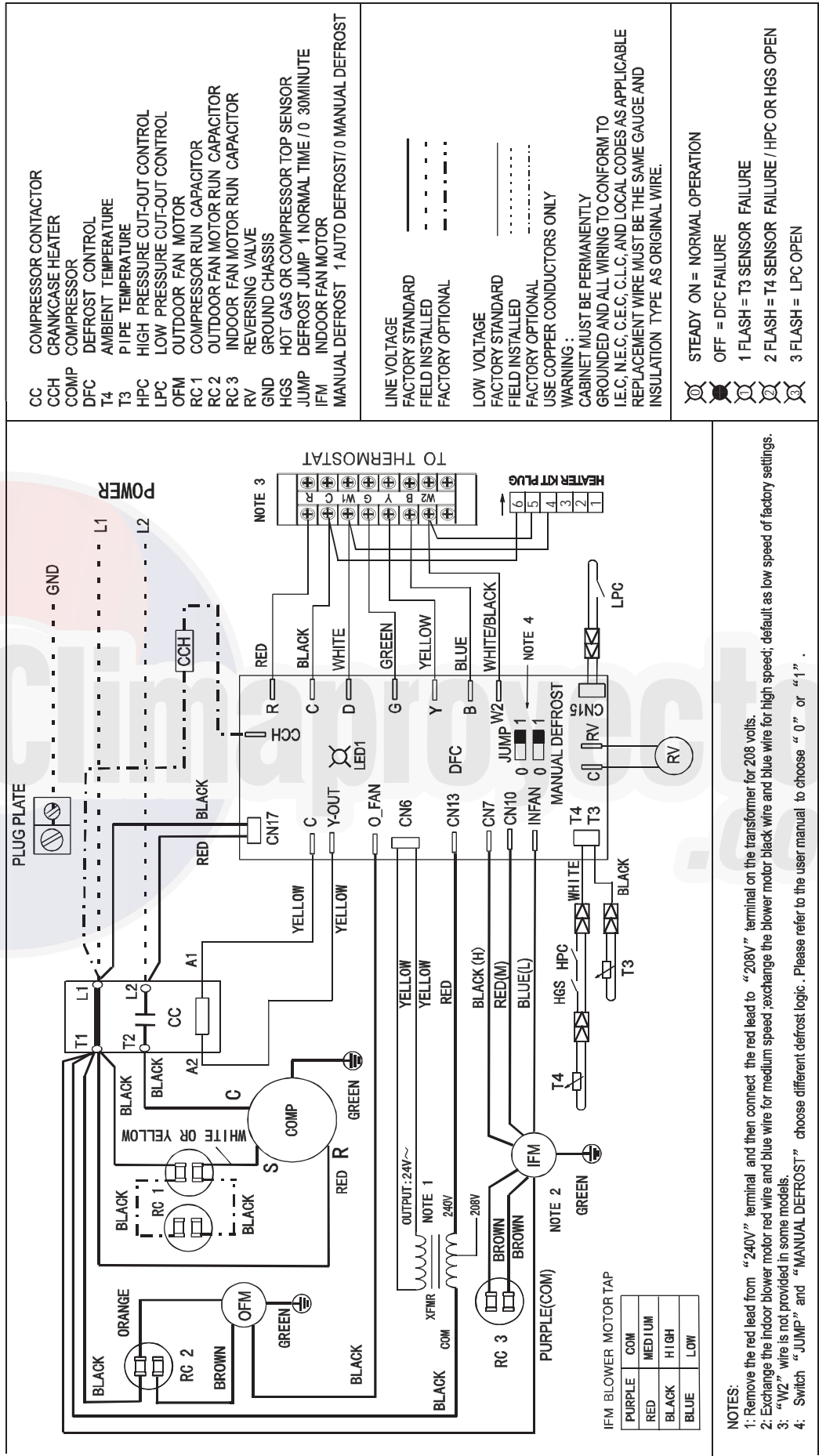
WARNING

Components trouble shooting requires opening control box with power on. Use extreme care while working on this condition. Check nameplate and this instruction when making wire connections.

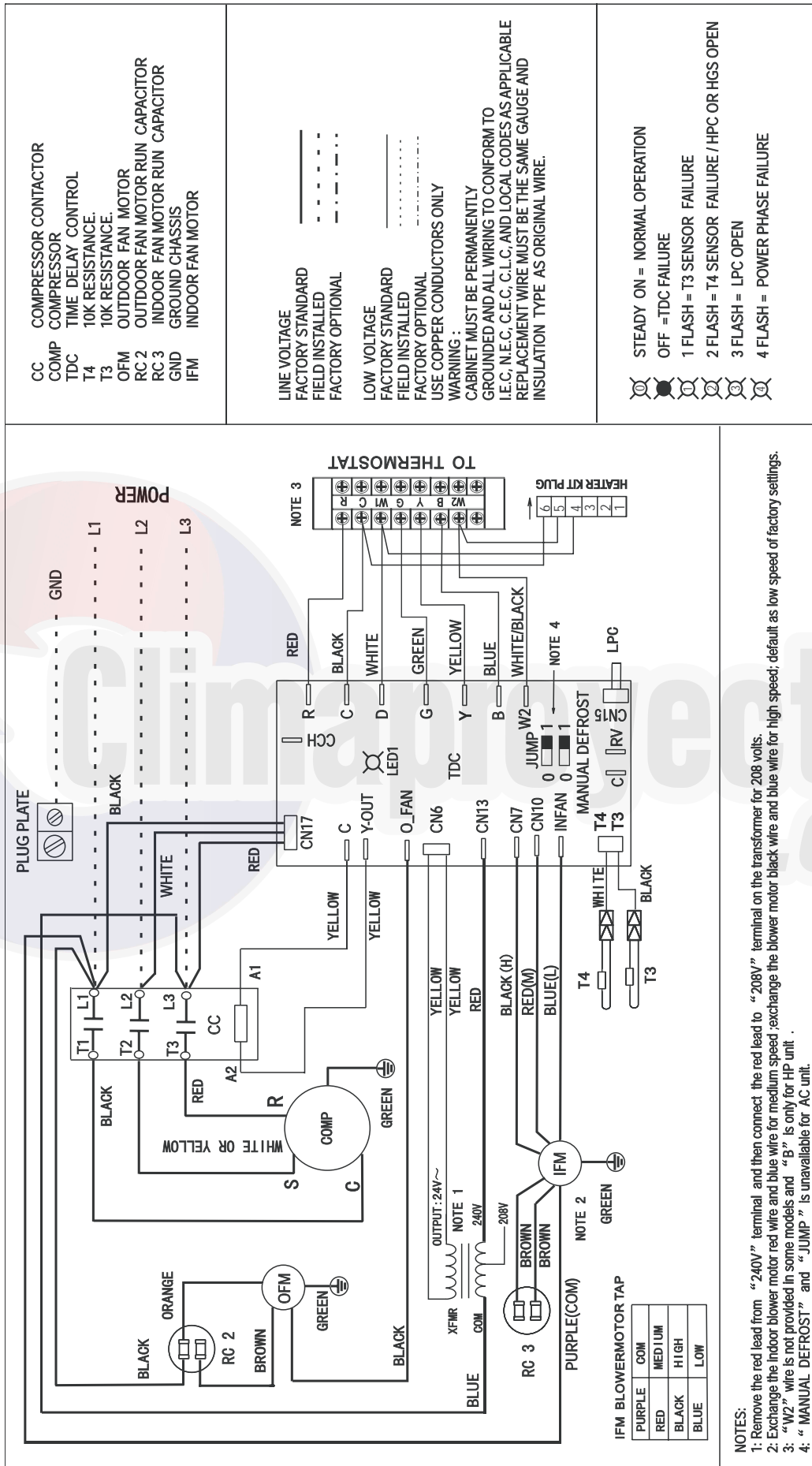
AC System Wiring Diagram (24/30/36/42/48K 1 phase)



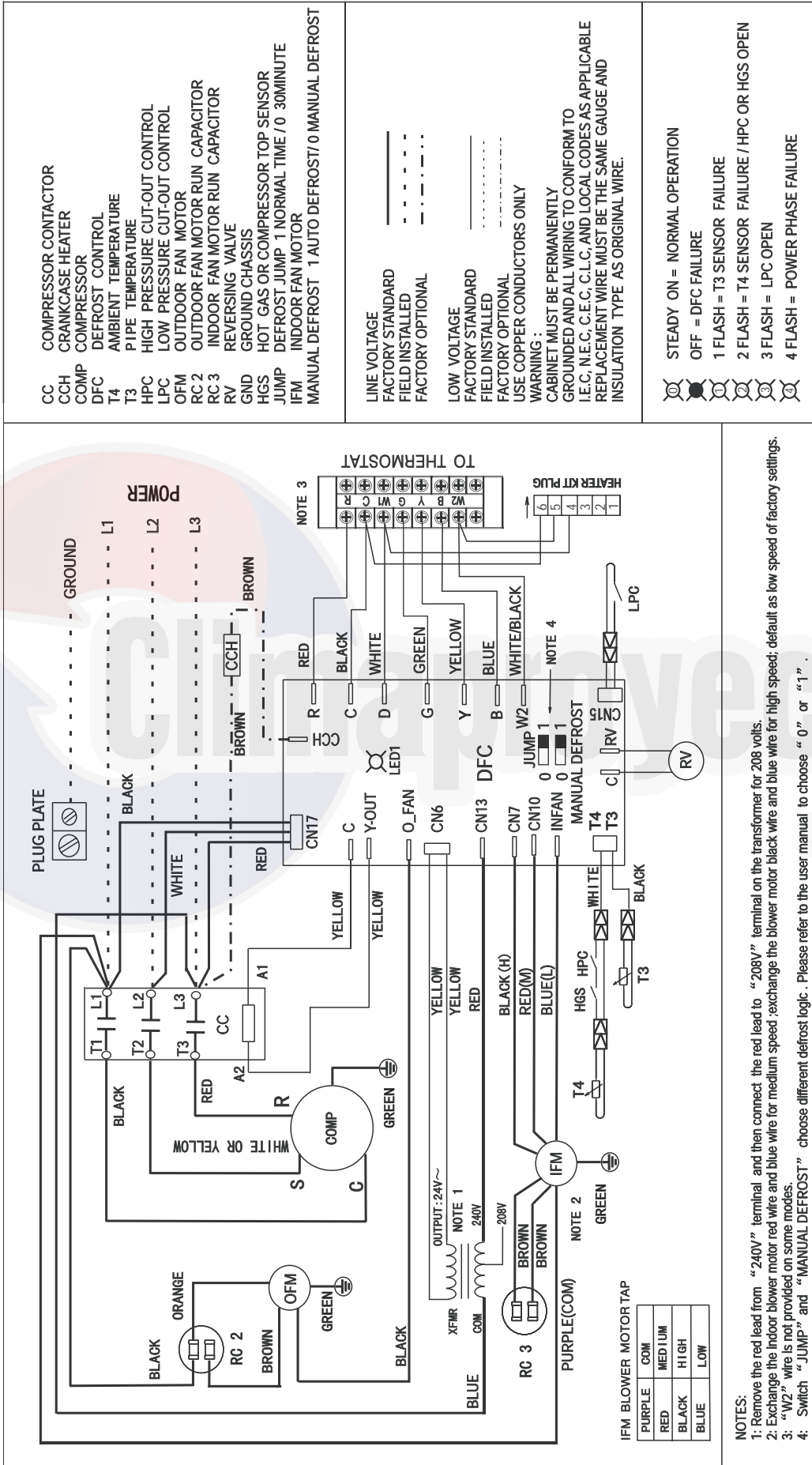
HP System Wiring Diagram (24/30/36/42/48K 1 phase)



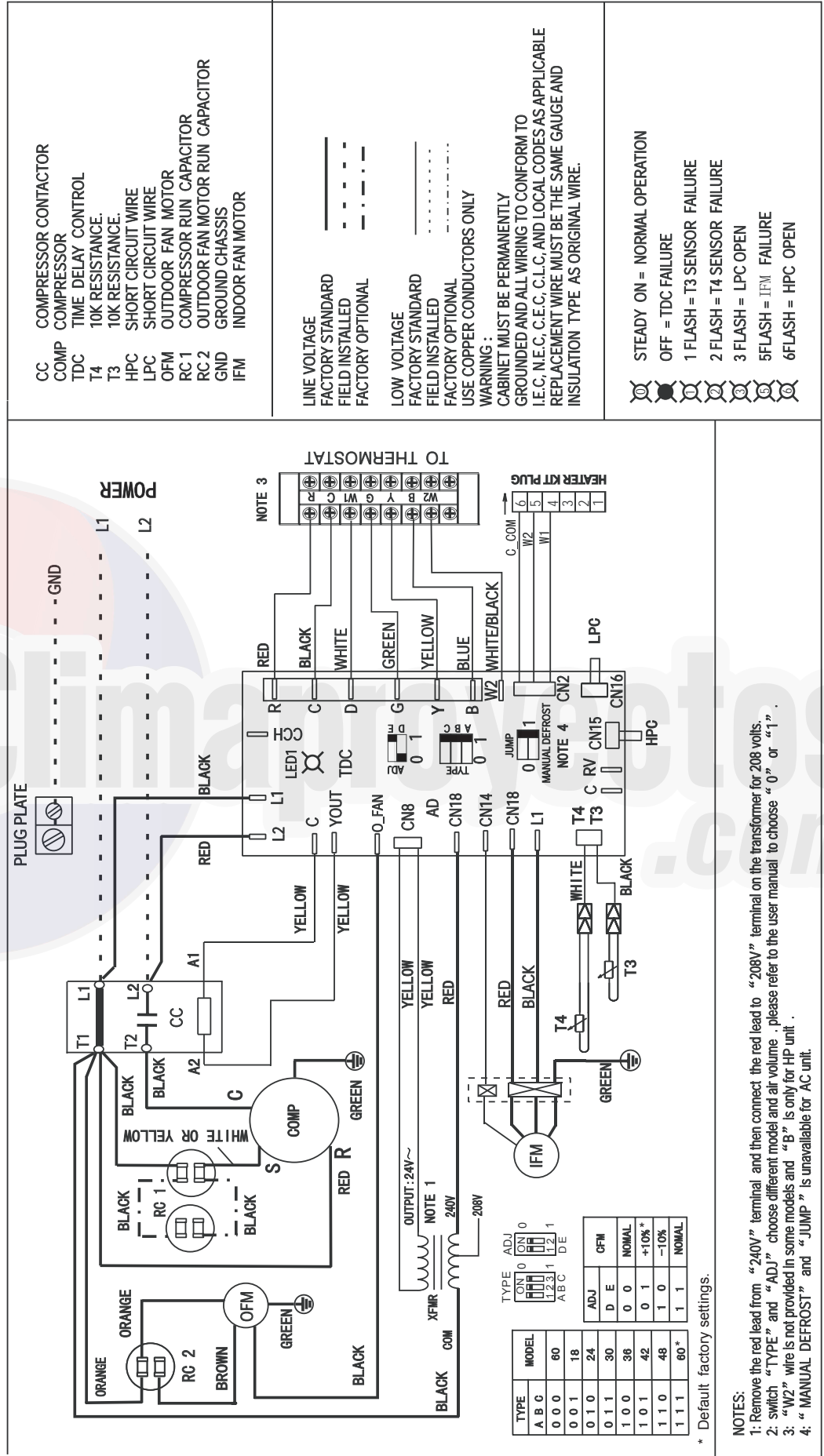
AC System Wiring Diagram (36/48K 3 phase)



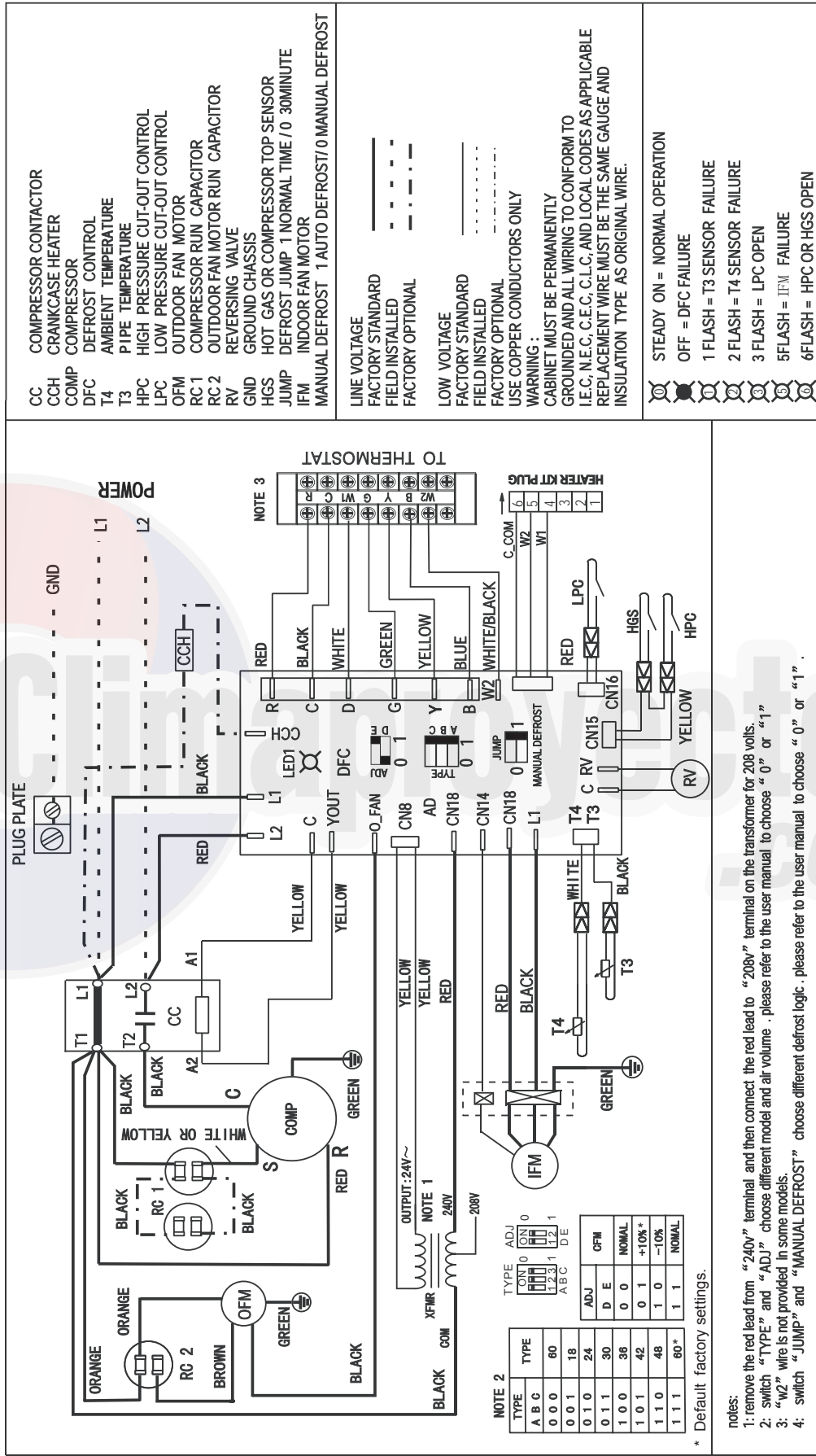
HP System Wiring Diagram (36/48K 3 phase)



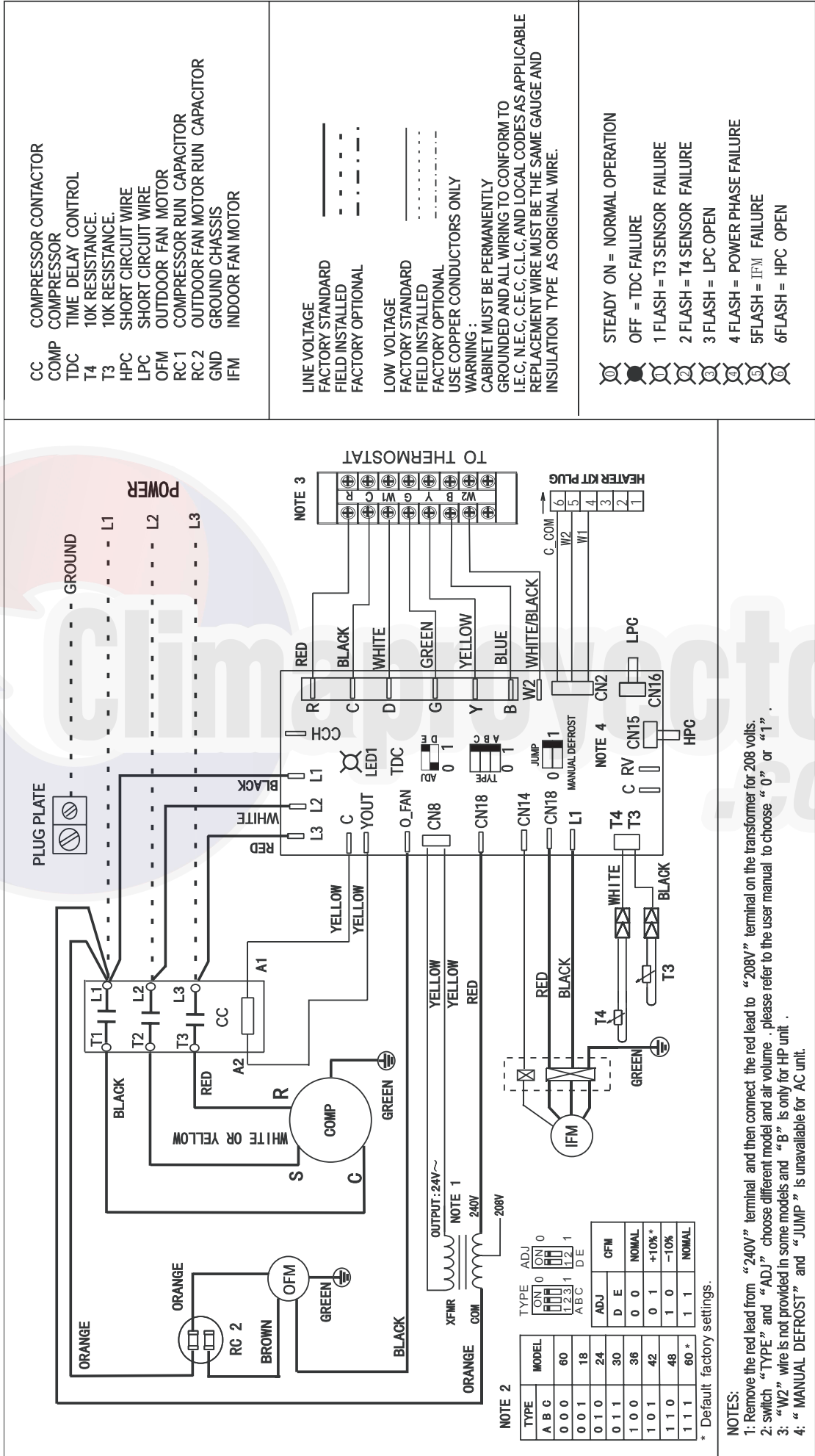
AC System Wiring Diagram (60K 1 phase)



HP System Wiring Diagram (60K 1 phase)



AC System Wiring Diagram (60K 3 phase)



HP System Wiring Diagram (60K 3 phase)

