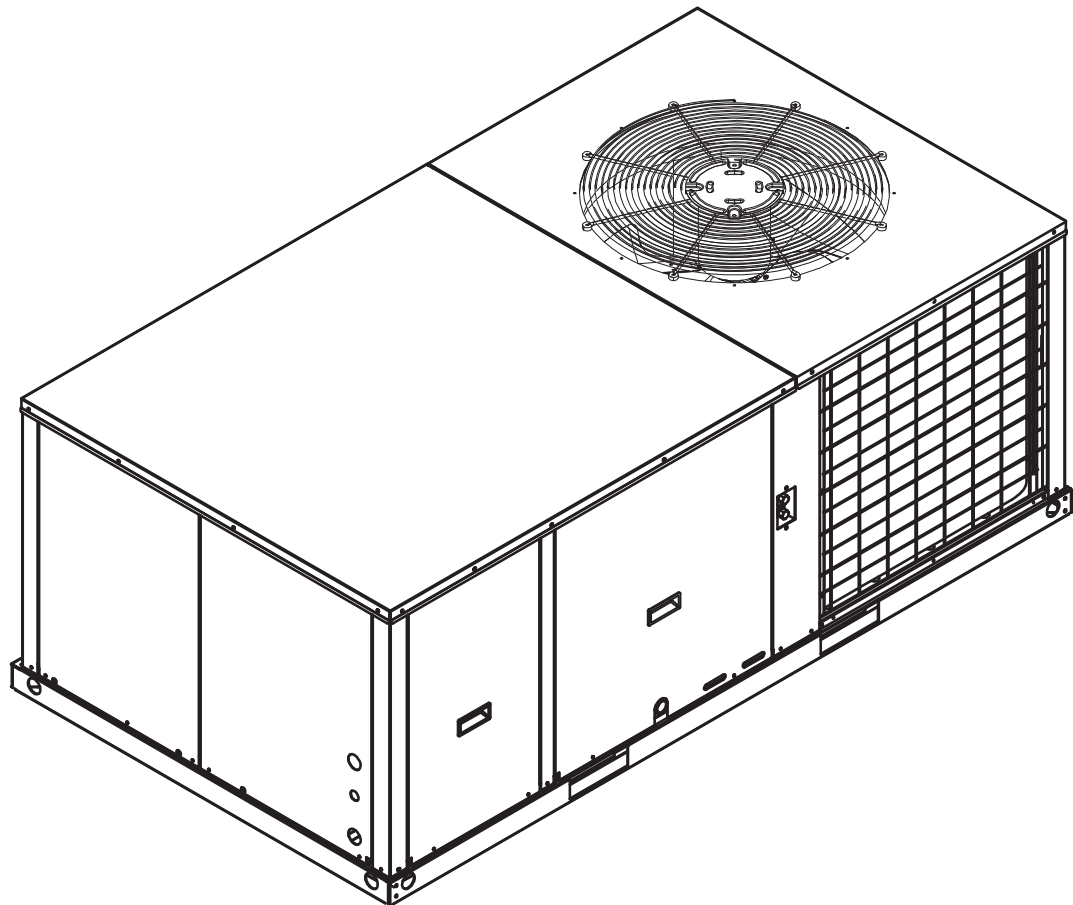


# INSTALLATION INSTRUCTIONS

## PACKAGE HEAT PUMP & AIR CONDITIONING

### FEATURING R-410A

14 SEER SERIES - (3-5Tons)(208/230V~, 60Hz, 3Ph)



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.



### CAUTION

**Only use this unit in well-ventilated spaces and ensure that there are no obstructions that could impede the airflow into and out of the unit. Do not use this unit in the following locations:**

- Locations with mineral oil.
- Locations with saline atmospheres, such as seaside locations.
- Locations with sulphurous atmospheres, such as near natural hot springs.
- Where high voltage electricity is present, such as in certain industrial locations.
- On vehicles or vessels, such as trucks or ferry boats.
- Where exposure to oily or very humid air may occur, such as kitchens.
- In proximity to sources of electromagnetic radiation, such as high-frequency transmitters or other high strength radiation devices.

## 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.



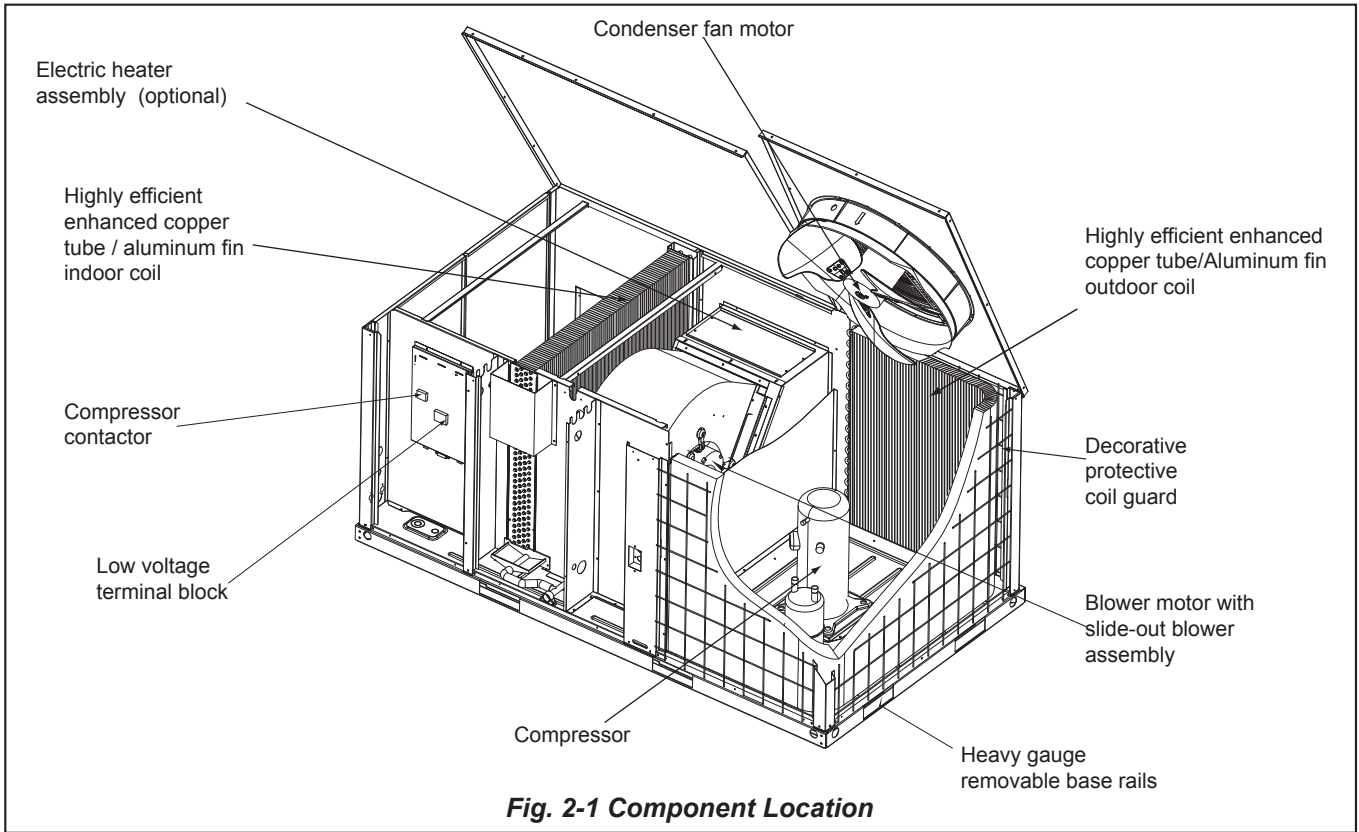
#### WARNING

Check the electric wire, water and gas pipeline layout inside the wall, floor and ceiling before installation. Do not implement drilling unless confirm safety with the user, especially for the hidden power wire. An electroprobe can be used to test whether a wire is passing by at the drilling location, to prevent physical injury or death caused by insulation broken cords.

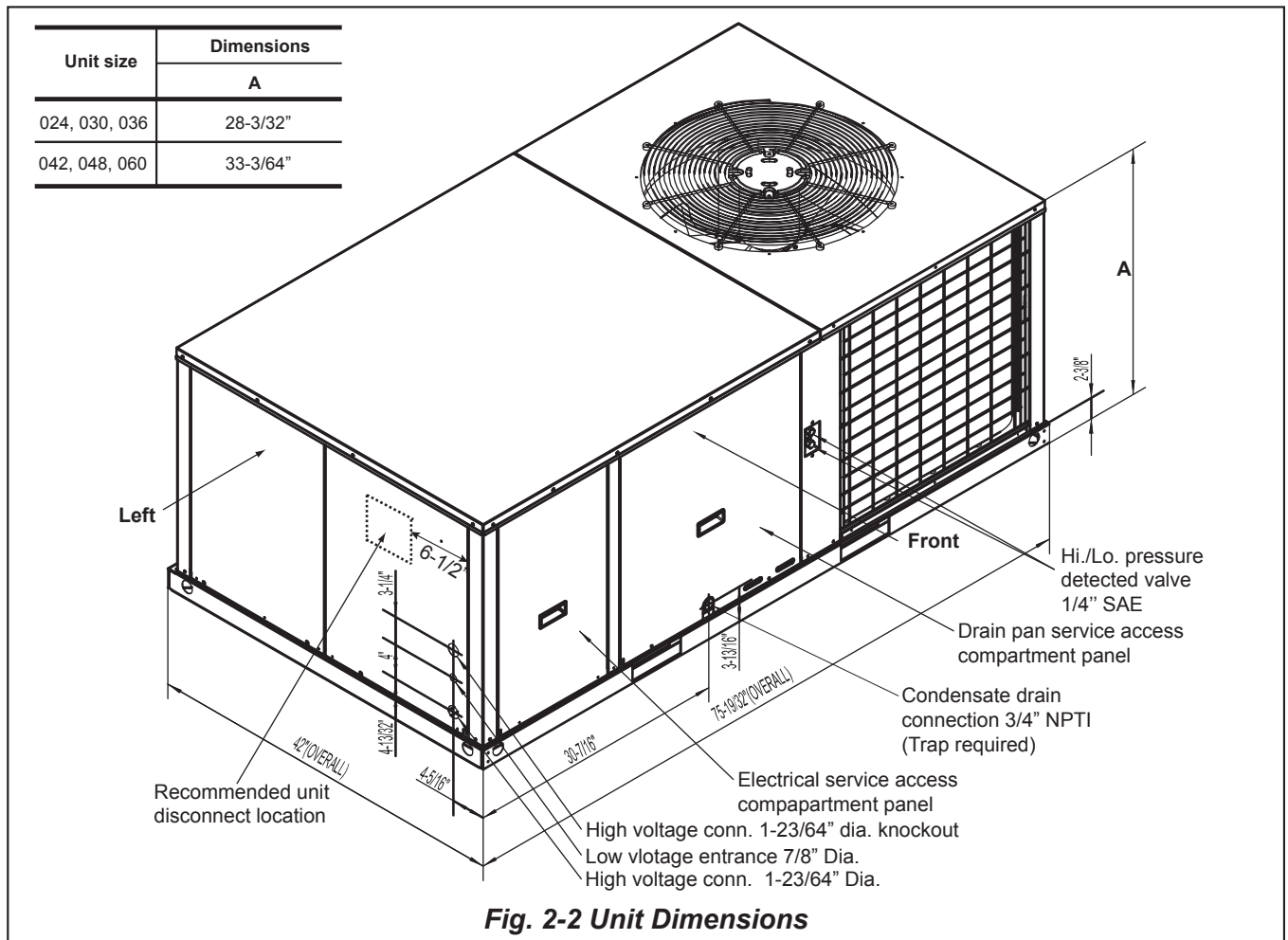


#### WARNING

Check the power supply before installation. Ensure that the power supply must be reliably grounded following local, state and National Electrical Codes. If not, for example, if the ground wire is detected charged, installation is prohibited before it is rectified. Otherwise, there is a risk of fire and electric shock, causing physical injury or death.



\* The above figure for reference purpose only.



\* The above figure for reference purpose only.

**Table 2-1: Unit Clearance**

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

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

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.

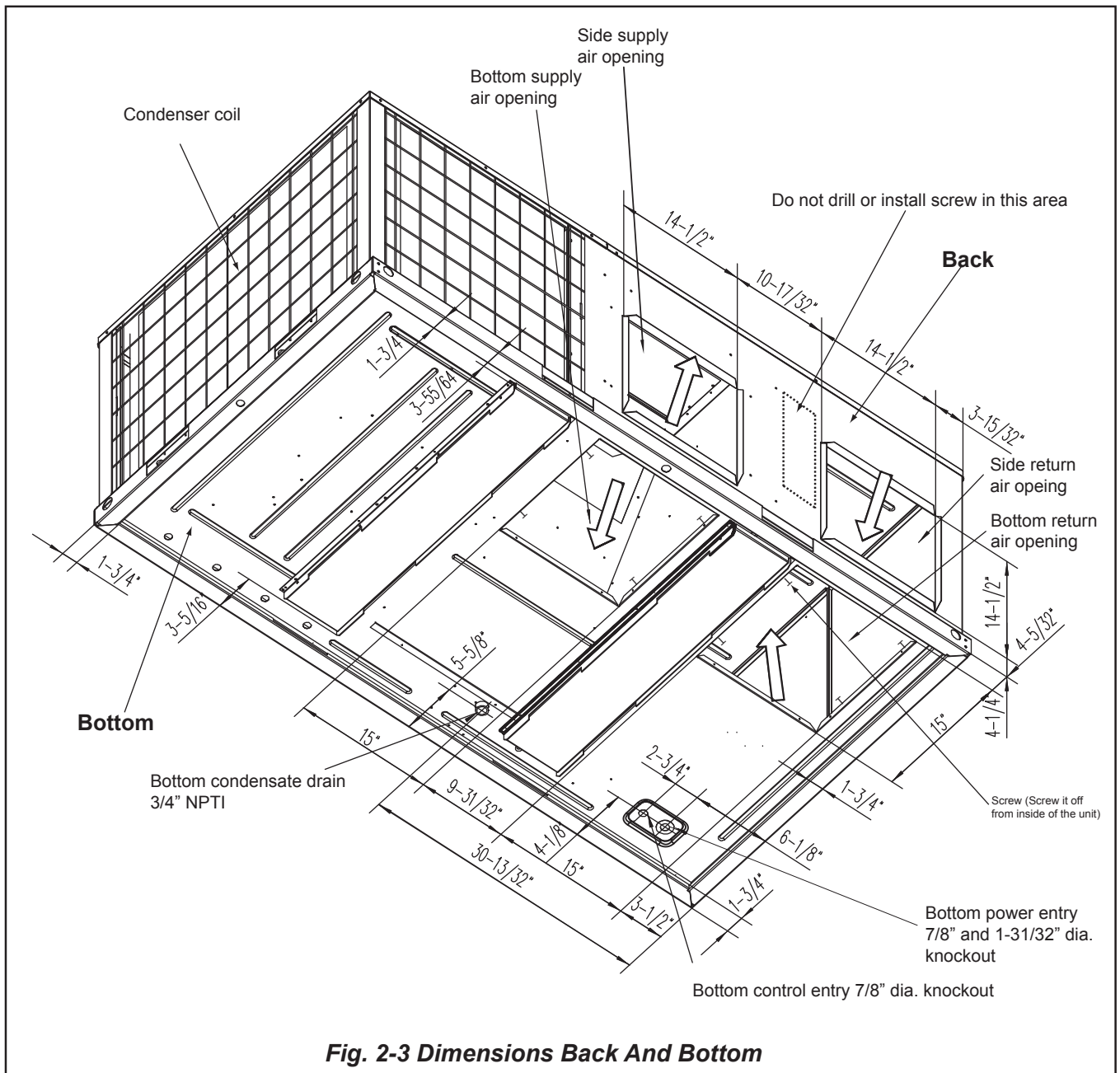
2. The minimum clearance without economizer/fresh air damper. For distance with Economizer/fresh air damper, please refer to the relevant Install requirement.

3. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.



**NOTE**

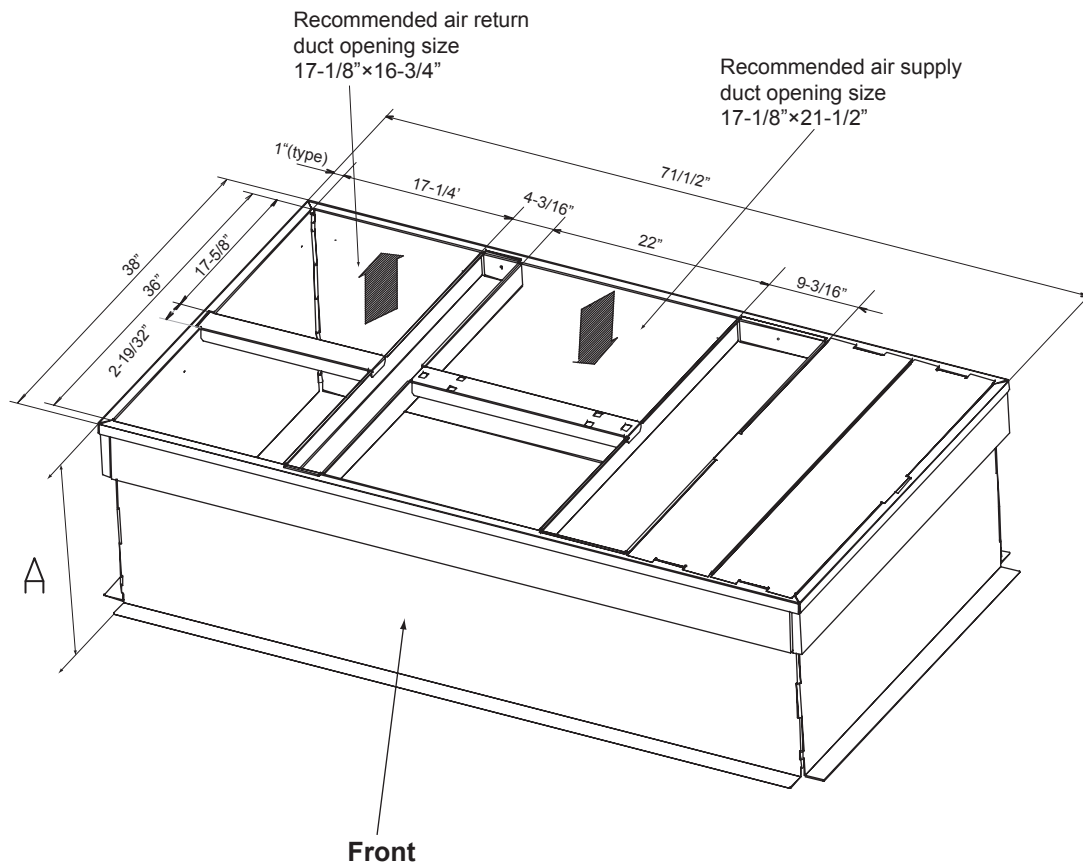
For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.



**Fig. 2-3 Dimensions Back And Bottom**

\* The above figures for reference purpose only.

<b>A Dimensions</b>	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.

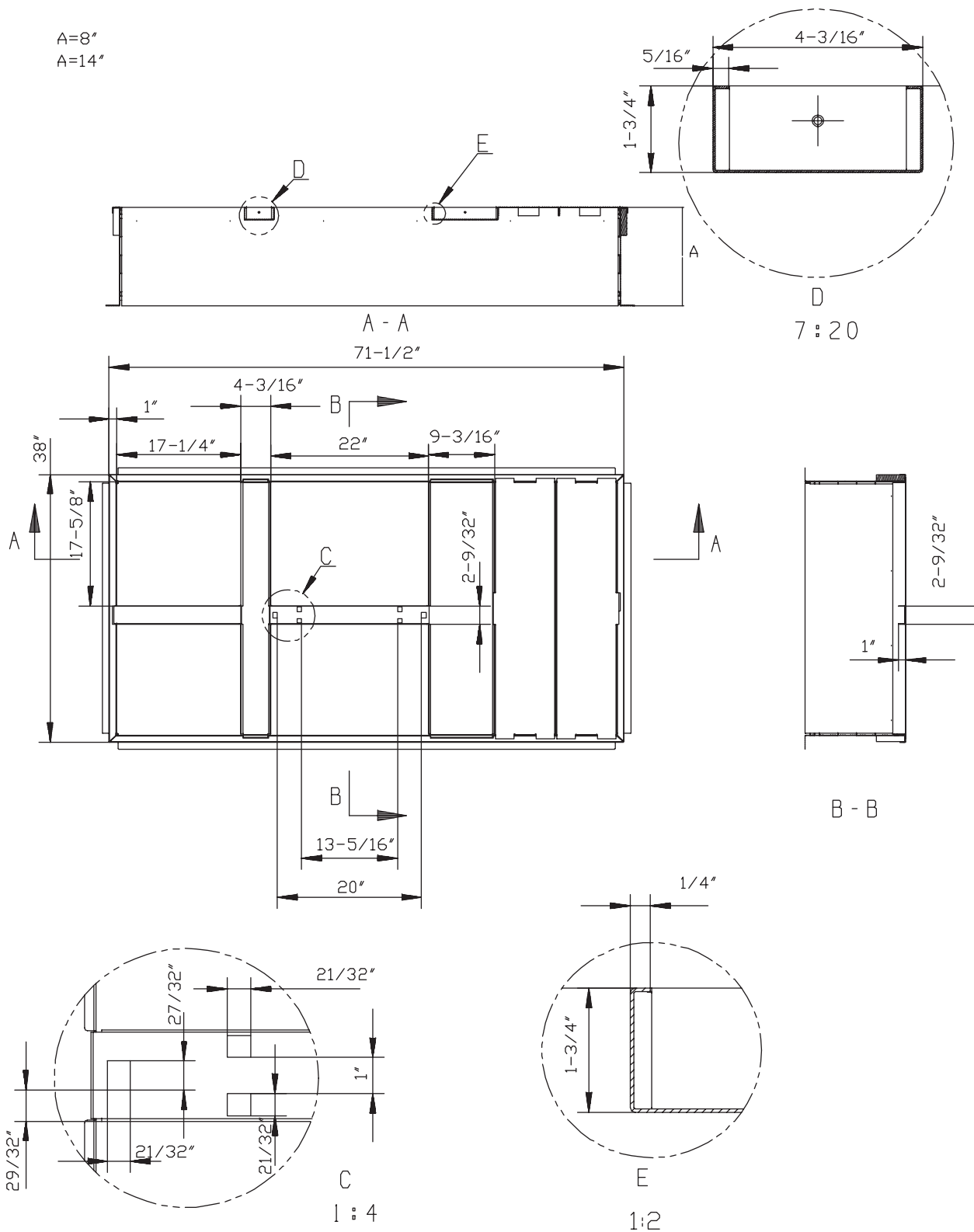


**NOTE**

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.


	<b>NOTE</b>
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.

	<b>CAUTION</b>
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.	

	<b>NOTE</b>
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

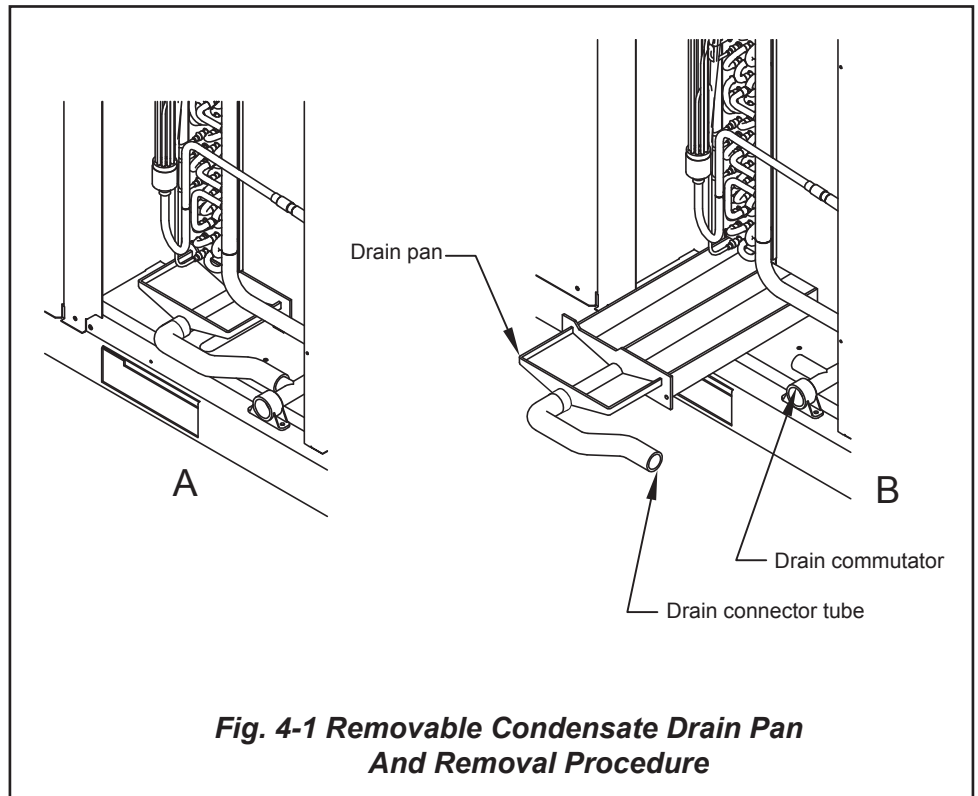
Consult local codes for special requirements.

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.



#### 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 25~50A. 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

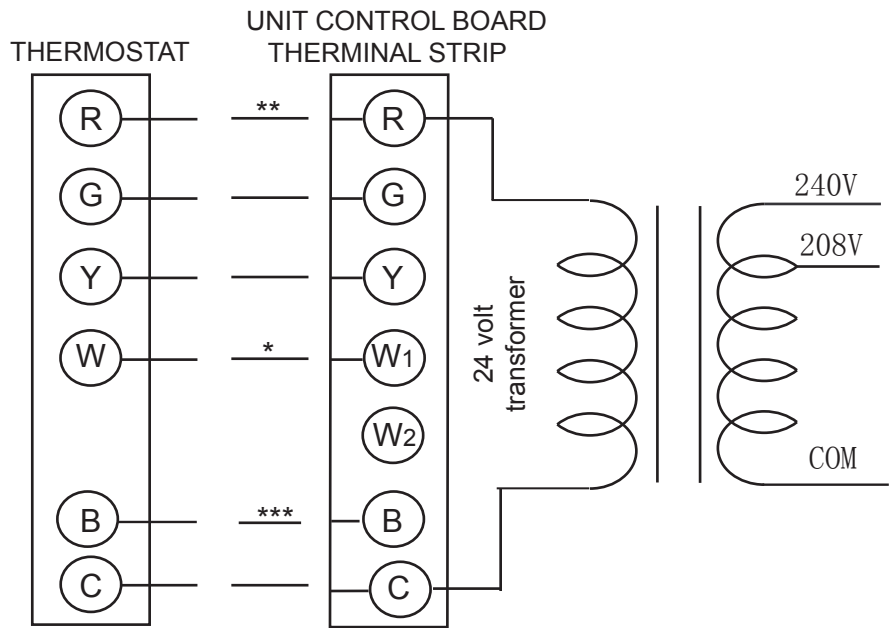
**IMPORTANT:** Class 2 low voltage control wiring SHOULD NOT be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- 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





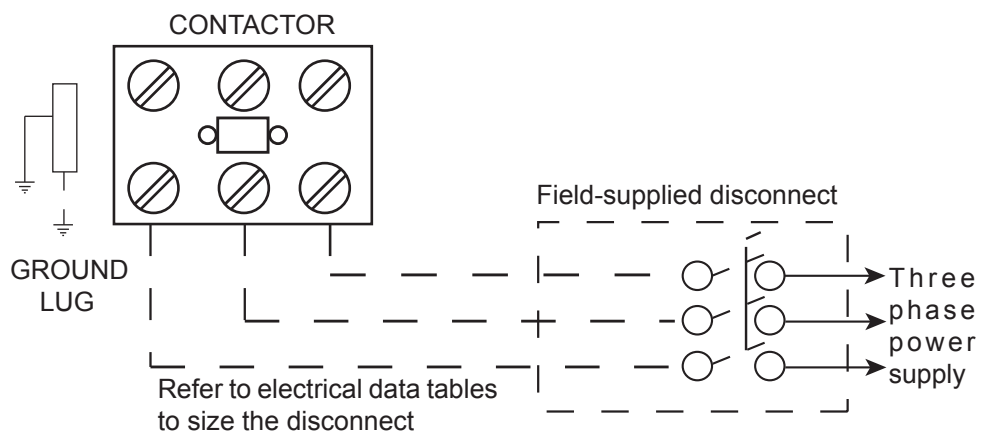
**Fig. 6-1 Typical Field Control Wiring Diagram**

- \*\*\* 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**

**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 <sup>1</sup> (Amps)	Max Fuse <sup>2</sup> / Breaker <sup>3</sup> Size (Amps)
		RLA	LRA	MCC	FLA	FLA	Model	kW	Stages	Amps		
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
048 (4.0)	208/230-3-60	13.7A	83.1A	21.4A	1.74A	3.54A	None	-	-	None	22.5	35
							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
060 (5.0)	208/230-3-60	16A	110.0A	24.9A	1.74A	3.92A	None	-	-	None	25.7	40
							EHK-10D	7.5/10	1	20.9/24.1	51.8/55.8	60/60
							EHK-15D	11.3/15	2	31.4/36.1	65/70.8	70/80
							EHK-20D	15/20	2	41.7/48.2	77.8/86	80/90

**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 <sup>1</sup> (Amps)	Max Fuse <sup>2</sup> / Breaker <sup>3</sup> Size (Amps)
		RLA	LRA	MCC	FLA	FLA	Model	kW	Stages	Amps		
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	29.2/33.2	30/35
							EHK-15D	11.3/15	2	31.4/36.1	42.4/48.2	45/50
048 (4.0)	208/230-3-60	13.7A	83.1A	21.4A	1.74A	3.54A	None	-	-	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)	208/230-3-60	16A	110.0A	24.9A	1.74A	3.92A	None	-	-	None	25.7	40
							EHK-10D	7.5/10	1	20.9/24.1	31.1/35.1	40/40
							EHK-15D	11.3/15	2	31.4/36.1	44.2/50.1	45/60
							EHK-20D	15/20	2	41.7/48.2	57.1/65.2	60/70
							EHK-25D	18.8/25	2	52.2/60.2	70.2/80.2	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-36CWN1-X14	MRB-36HWN1-X14	MRB-36HWN1-X14B	MRB-48CWN1-X14	MRB-48HWN1-X14	MRB-60CWN1-X14	MRB-60HWN1-X14
Nominal Tonnage	3.0	3.0	3.0	4.0	4.0	5.0	5.0
<b>ARI COOLING PERFORMANCE</b>							
Gross Capacity @ ARI A point (Btu)	37544	36525	36794	49940	49940	61350	61350
ARI net capacity (Btu)	36000	35000	35200	48000	48000	59000	59000
EER	12	11.5	12	12	12	11.5	11.5
SEER	14	14	14	14	14	14	14
Nominal CFM	1250	1250	1250	1550	1550	1880	1880
System power (kW)	3.00	3.04	2.93	4.00	3.98	5.15	5.13
Refrigerant type	R410a	R410a	R410a	R410a	R410a	R410a	R410a
Refrigerant charge (lb-oz)	7-1	7-1	8-6	9-8	9-8	9-15	10-2
<b>ARI HEATING PERFORMANCE</b>							
47°F Capacity rating (Btu)	—	35400	36000	—	48000	—	60000
System power (kW)	—	2.77	2.81	—	3.63	—	4.51
17°F Capacity rating (Btu)	—	19800	19700	—	27400	—	34200
System power (kW)	—	2.45	2.45	—	3.30	—	4.03
HSPF (BTU/Watts-hr.)	—	8.0	8.0	—	8.0	—	8.0
<b>DIMENSIONS (Inches)</b>							
Length	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
Height	28-3/32	28-3/32	28-3/32	33-3/64	33-3/64	33-3/64	33-3/64
OPERATING WT. (lbs)	432	441	454	496	505	507	516
<b>COMPRESSORS</b>							
Type	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
<b>CONDENSER COIL DATA</b>							
Face area (Sq. Ft)	14.49	14.49	14.49	17.39	17.39	17.39	17.39
Rows	2	2	2.7	3	3	3	3
Fins per inch	20	20	20	20	20	20	20
Tube diameter	9/32	9/32	9/32	9/32	9/32	9/32	9/32
Circuitry type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
<b>EVAPORATOR COIL DATA</b>							
Face area (Sq. Ft)	5.15	5.15	5.15	6.34	6.34	6.34	6.34
Rows	3	3	3	4	4	4	4
Fins per inch	16	16	16	16	16	16	16
Tube diameter	5/16	5/16	5/16	5/16	5/16	5/16	5/16
Circuitry type	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced	interlaced
Refrigerant control	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
<b>CONDENSER FAN DATA</b>							
Fan diameter (inch)	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
Drive type	Direct	Direct	Direct	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1	1	1	1
Number of motors	1	1	1	1	1	1	1
Motor HP each	1/6	1/6	1/6	1/3	1/3	1/3	1/3
RPM	825	825	825	1075	1075	1075	1075
Nominal total CFM	3145	3145	3145	4245	4245	4245	4245
<b>DIRECT DRIVE EVAP FAN DATA</b>							
Quantity	1	1	1	1	1	1	1
Fan Size (Inch)	10×10	10×10	10×10	10×10	10×10	10×10	10×10
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. speeds	3	3	3	3	3	3	3
Motor HP each	1/2	1/2	1/2	3/4	3/4	1	1
RPM	1075	1075	1075	1075	1075	1075	1075
Motor frame size	48	48	48	48	48	48	48
<b>FILTERS</b>							
(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

\* 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]	
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
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
60	Low	CFM(L/S)	2064(975)	2004(946)	1942(917)	1875(886)	1806(853)	1726(815)	1643(776)	1538(726)
		RPM	905	929	953	974	993	1011	1028	1045
		Watts	731	712	687	666	643	618	595	570
		Amps	3.19	3.11	3.03	2.94	2.86	2.77	2.69	2.61
	Middle	CFM(L/S)	2177(1028)	2111(997)	2041(964)	1971(931)	1886(891)	1806(853)	1704(804)	1604(758)
		RPM	955	973	992	1007	1021	1036	1052	1065
		Watts	807	779	751	730	703	679	651	624
		Amps	3.54	3.43	3.34	3.26	3.16	3.08	2.98	2.89
	High	CFM(L/S)	2277(1075)	2209(1043)	2135(1008)	2056(971)	1974(932)	1881(888)	1781(841)	1668(788)
		RPM	998	1012	1023	1036	1049	1060	1071	1082
		Watts	878	852	828	801	777	747	719	687
		Amps	3.92	3.81	3.72	3.64	3.53	3.43	3.33	3.22

\* The above airflow data for reference only.

**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]	
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
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
60	Low	CFM(L/S)	2064(975)	2004(946)	1942(917)	1875(886)	1806(853)	1726(815)	1643(776)	1538(726)
		RPM	905	929	953	974	993	1011	1028	1045
		Watts	731	712	687	666	643	618	595	570
		Amps	3.19	3.11	3.03	2.94	2.86	2.77	2.69	2.61
	Middle	CFM(L/S)	2177(1028)	2111(997)	2041(964)	1971(931)	1886(891)	1806(853)	1704(804)	1604(758)
		RPM	955	973	992	1007	1021	1036	1052	1065
		Watts	807	779	751	730	703	679	651	624
		Amps	3.54	3.43	3.34	3.26	3.16	3.08	2.98	2.89
	High	CFM(L/S)	2277(1075)	2209(1043)	2135(1008)	2056(971)	1974(932)	1881(888)	1781(841)	1668(788)
		RPM	998	1012	1023	1036	1049	1060	1071	1082
		Watts	878	852	828	801	777	747	719	687
		Amps	3.92	3.81	3.72	3.64	3.53	3.43	3.33	3.22

\* The above airflow data for reference only.

- 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**

MRB-36CWN1-X14 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	
Low Pressure Detected Valve (psig) Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté 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 7-4 Refrigerant charge for H/P system**

MRB-36HWN1-X14 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	
Low Pressure Detected Valve (psig) Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté 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 7-5 Refrigerant charge for H/P system**

MRB-36HWN1-X14 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		
Low Pressure Detected Valve (psig) Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		135	336	347	358	369	380	392	399	406	413	420	424	432	
		128	328	339	350	361	372	384	390	396	402	408	413	421	
		121	320	331	342	353	364	376	381	386	391	396	402	410	
		114	313	324	335	346	351	358	363	370	377	384	391	399	
		107	305	313	321	329	337	345	352	359	366	373	380	388	
		100	295	303	311	319	327	335	342	349	356	363	369	377	
		93	286	294	301	309	316	323	330	337	344	351	358	366	
		86	277	284	291	298	305	312	319	326	333	340	347	355	
		79	267	274	280	287	294	300	307	314	321	328	336	344	
		72	258	265	271	277	283	289	296	303	311	318	326	334	
		65	248	254	260	266	272	278	285	293	300	307	315	323	
		58					260	268	275	283	290	297	305	313	
		51						259	266	273	280	287	294	302	
		44							256	263	270	277	284	292	
		37								258	265	272	279	287	
30															

Table 7-6 Refrigerant charge for H/P system

MRB-36HWN1-X14B 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 Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(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 7-7 Refrigerant charge for H/P system

MRB-36HWN1-X14B 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		
Low Pressure Detected Valve(psig)  Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(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 7-8 Refrigerant charge for A/C system**

MRB-48CWN1-X14 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	
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
Low Pressure Detected Valve(psig)	Vanne Détectée 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 7-9 Refrigerant charge for H/P system**

MRB-48HWN1-X14 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	
		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
Low Pressure Detected Valve(psig)	Vanne Détectée 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 7-10 Refrigerant charge for H/P system**

MRB-48HWN1-X14 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 Basse(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													



**Table 7-11 Refrigerant charge for A/C system**

MRB-60CWN1-X14 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 Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(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 7-12 Refrigerant charge for H/P system**

MRB-60HWN1-X14 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 Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(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 7-13 Refrigerant charge for H/P system**

MRB-60HWN1-X14 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		
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(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  $< 41^{\circ}\text{F}$  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)

#### **Manual defrost mode**

To manually cycle the defrost mode, set switch SW3-1 to the “ON” position (See Fig 7). The system will engage a defrost cycle, and automatically exit defrost mode once the **Shut-down conditions of defrost mode** described below are met.

**Caution:** Once the manual defrost mode is finished, please set switch SW3-1 back to “OFF”.

#### **Start-up conditions of defrost mode:**

When SW3-3 switch is set to “ON”(See Fig 7), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and T3 is  $< 30.2^{\circ}\text{F}$ , the system will perform a defrost cycle every 30 minutes of operation.

2. When T3 is < 28.4 °F and the compressor is operating for the first time after being connected power.
3. When T3 is < 28.4 °F and The system has been in standby for two hours .

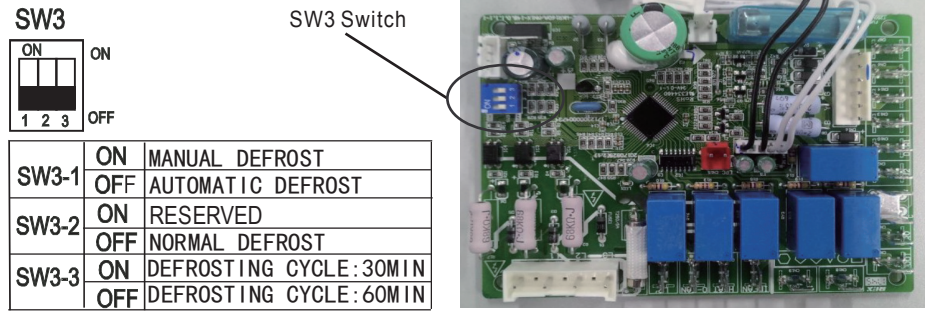


Fig.7 SW3 Switch Location in the PCB Board(For reference only)

When SW3-3 switch is set to “OFF”(See in Fig 7), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and T3 is < 30.2 °F, the system will perform a defrost cycle every 60 minutes of operation.
2. When T3 is < 28.4 °F and the compressor is operating for the first time after being connected power.
3. When T3 is < 28.4 °F and the system has been in standby for two hours .

**Shut-down conditions of defrost mode:**

The mode will shut down in any of the following conditions:

1. The defrosted time lasting for 10 minutes;
2. T3 is ≥ 77 °F when T4 ≥ 28.4 °F;
3. Compressor stop operating;
4. T3 is ≥ 77 °F last for 60s when T4 < 28.4 °F.


**8.4 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

<b>G &amp; B &amp; Y &amp; W1 &amp; W2</b>	<b>ON</b>	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON Heater 1 instant ON Heater 2 instant ON
	<b>OFF</b>	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

### 8.5 Phase sequence protection:

	<b>NOTE</b>
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.

## 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:

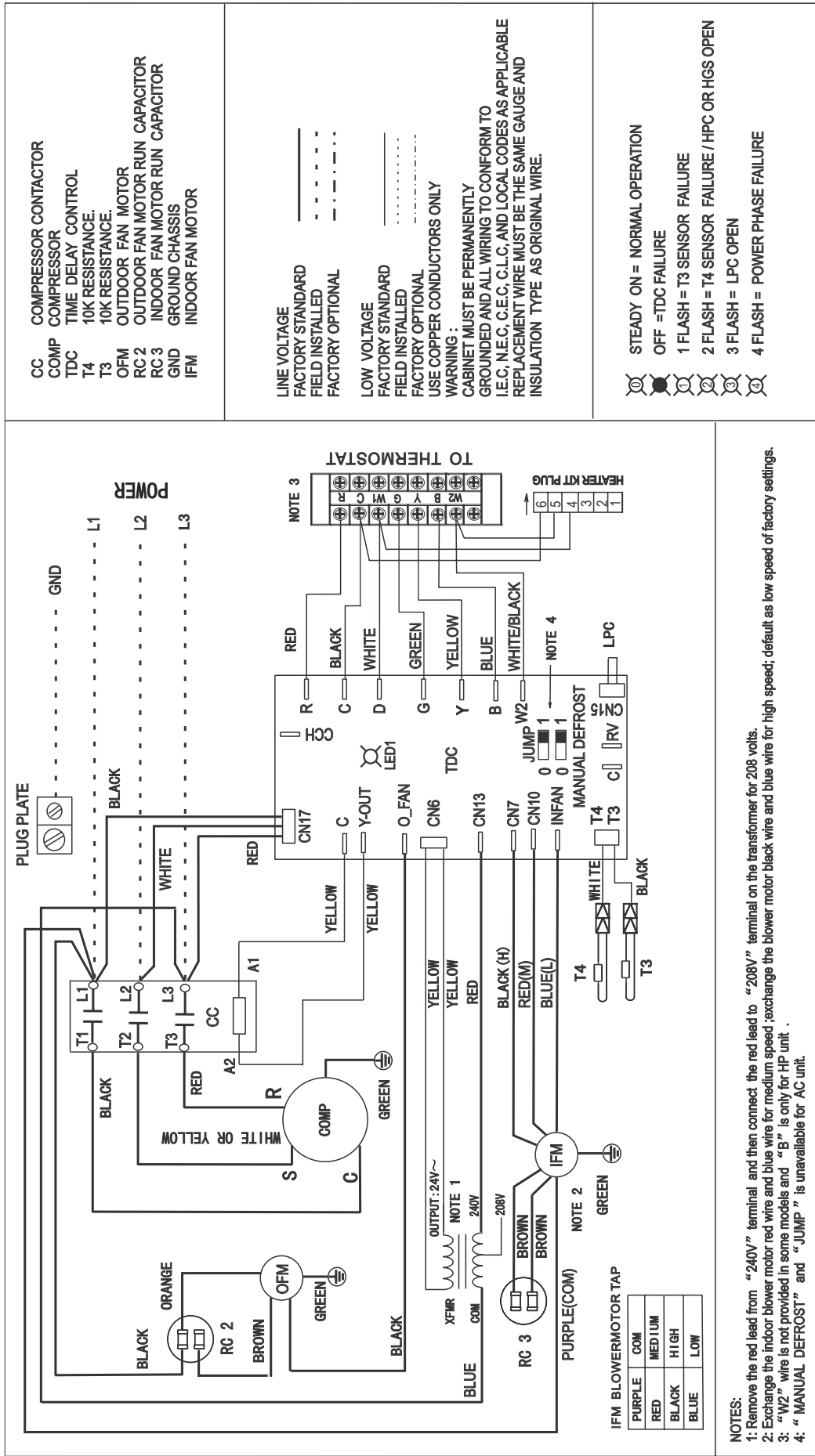
1. Are fans running properly?
2. Is compressor running correctly?
3. Check refrigerant change.
4. Check duct connection and leaks.
5. Check tubing and sheet metal rattles.

(See Wiring Diagram for electric connection detail.)

## 10.0 TROUBLE SHOOTING

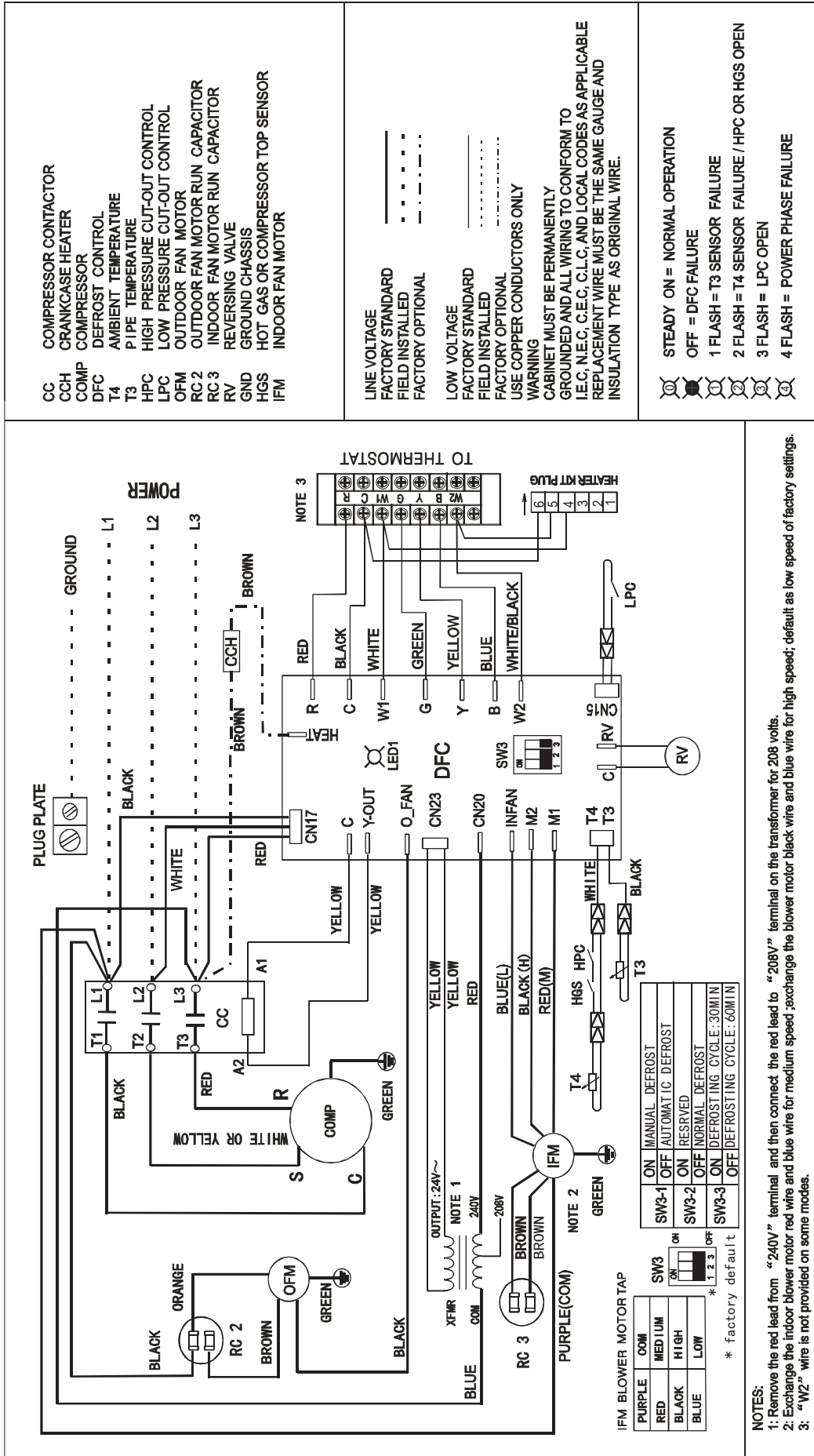
	<b>WARNING</b>
Components trouble shooting requires opening control box with power on. Use extreme care while working on this condition. Check nameplate and this instruction when making wire connections.	

# AC System Wiring Diagram



Refer to wiring diagram on the unit for actual wiring.

HP System Wiring Diagram:



Refer to wiring diagram on the unit for actual wiring.



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