

INSTALLATION INSTRUCTIONS

R410A PACKAGED AIR CONDITIONERS

***MRHR Series 3.5 - 6.5 TONS [12.3 - 22.8 kW]
50 & 60 Hz Models**



*E or V



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.



Accredited by the BvA



ISO 9001:2015

DO NOT DESTROY THIS MANUAL

PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN

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[] INDICATES METRIC CONVERSION

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► Installation instructions are updated on a regular basis. This is done as product changes occur or if new information becomes available. In this publication, an arrow (►) denotes changes from the previous edition or additional new material.

I. 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.

⚠ WARNING

THE MANUFACTURER'S WARRANTY DOES NOT COVER ANY DAMAGE OR DEFECT TO THE AIR CONDITIONER 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 AIR CONDITIONER. YOU SHOULD BE AWARE THAT THE USE OF UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES MAY ADVERSELY AFFECT THE OPERATION OF THE AIR CONDITIONER 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

UNITS ARE NOT DESIGN CERTIFIED TO BE INSTALLED INSIDE THE STRUCTURE. DOING SO CAN CAUSE INADEQUATE UNIT PERFORMANCE AS WELL AS PROPERTY DAMAGE AND CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY 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 IN THE ELECTRIC HEAT KIT FOR A GROUND WIRE. 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

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO CHANGE BLOWER SPEEDS. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK OR SEVERE PERSONAL INJURY OR DEATH.

⚠ CAUTION

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

⚠ CAUTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

II. INTRODUCTION

This booklet contains the installation and operating instructions for your self-contained air conditioner. There are a few precautions that should be taken to derive maximum satisfaction from it. Improper installation can result in unsatisfactory operation or dangerous conditions.

Read this booklet and any instructions packaged with separate equipment required to make up the system prior to installation. Give this booklet to the owner and explain its provisions. The owner should retain this booklet for future reference.

III. CHECKING PRODUCT RECEIVED

Upon receiving the unit, inspect it for any damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. Check the unit model number, electrical characteristics, and accessories to determine if they are correct.

IV. EQUIPMENT PROTECTION FROM THE ENVIRONMENT

The metal parts of this unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment's useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray directly on the unit cabinet.
2. In coastal areas, locate the unit on the side of the building away from the waterfront.
3. Shielding provided by a fence or shrubs may give some protection.
4. Elevating the unit off its slab or base enough to allow air circulation will help avoid holding water against the basepan.

Regular maintenance will reduce the buildup of contaminants and help to protect the unit's finish.

WARNING

DISCONNECT ALL POWER TO THE UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN RESULT IN SEVERE ELECTRICAL SHOCK OR DEATH.

1. Frequent washing of the cabinet, fan blade and coil with fresh water will remove most of the salt or other contaminants that build up on the unit.
2. Regular cleaning and waxing of the cabinet with an automobile polish will provide some protection.
3. A liquid cleaner may be used several times a year to remove matter that will not wash off with water

Several different types of protective coatings are offered in some areas. These coatings may provide some benefit, but the effectiveness of such coating materials cannot be verified by the equipment manufacturer.

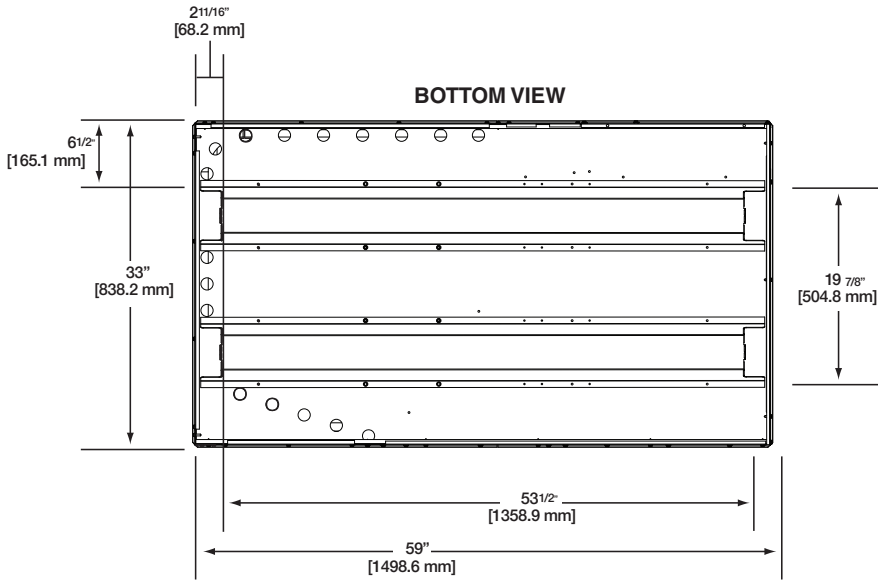
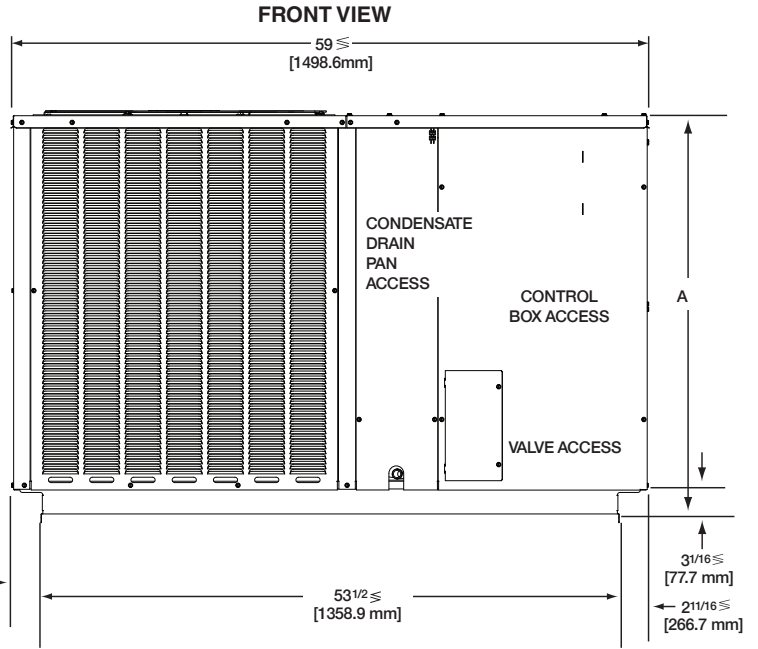
The best protection is frequent cleaning, maintenance and minimal exposure to contaminants.

V. SPECIFICATIONS

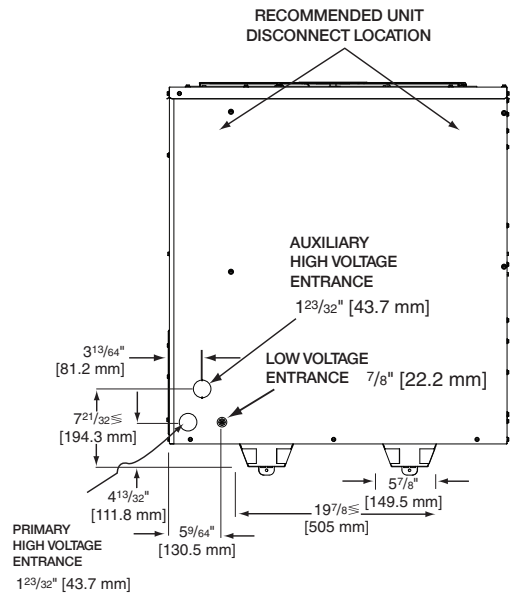
Suitable for use in mobile homes, manufactured housing, and conventionally constructed residential and commercial buildings where horizontally-ducted systems are preferred.

FIGURE 1
UNIT DIMENSIONS AND ACCESS LOCATIONS

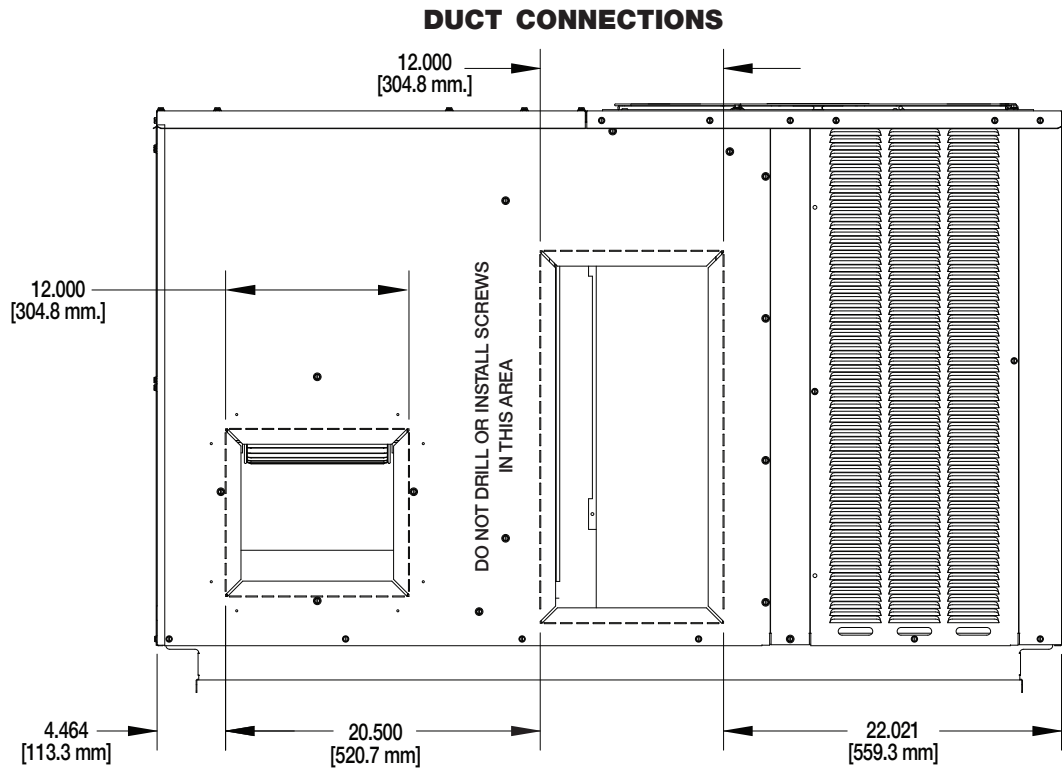
Model	Height "A"
042, 054, 060, 066, 072, 078	37 1/8"



ELECTRICAL CONNECTIONS



DUCT CONNECTIONS



IMPORTANT: DO NOT SCREW OR DRILL OUTSIDE THE DESIGNATED AREAS.

WARNING

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A. GENERAL

The Packaged Air Conditioner is available with cooling capacities of 3.5, 4.5, 5.0, 5.5, 6.0 and 6.5 nominal tons of cooling are available.

The units are weatherized for mounting outside of the building (IPX4).

Reference the model nameplate on the unit for the following product information:

- Model Number
- Serial Number
- Country of Origin
- Rated Voltage and Frequency
- Rated T1 and T3 conditions for:
 - Rated Current
 - Rated Power (kW)
 - Rated Capacity
 - Rated EER

The Estimated Annual Energy Consumption of this product is calculated using the following formula:

Estimated Annual Energy Consumption = Rated Power (kW) at T1 conditions multiplied by 2700 working hours.

B. MAJOR COMPONENTS

The unit includes a hermetically-sealed refrigerating system (consisting of a compressor, condenser coil, evaporator coil with refrigerant metering device), a circulation air blower, a condenser fan, and all necessary internal electrical wiring. The cooling system of these units is factory-evacuated, charged and performance tested. Refrigerant amount and type are indicated on rating plate.

C. R-410A REFRIGERANT

All units are factory charged with R-410A refrigerant.

1. Specification of R-410A:

Application: *R-410A is not a drop-in replacement for R-22*; equipment designs must accommodate its higher pressures. It cannot be retrofitted into R-22 units.

Pressure: *The pressure of R-410A is approximately 60% (1.6 times) greater than R-22.* Recovery and recycle equipment, pumps, hoses and the like need to have design pressure ratings appropriate for R-410A. *Manifold sets need to range up to 800 psig high-side and 250 psig low-side with a 550 psig low-side retard. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating.* DOT 4BA400 or DOT BW400.

Combustibility: At pressures above 1 atmosphere, mixture of R-410A and air can become combustible. *R-410A and air should never be mixed in tanks or supply lines, or be allowed to accumulate in storage tanks. Leak checking should never be done with a mixture of R-410A and air.* Leak checking can be performed safely with nitrogen or a mixture of R-410A and nitrogen.

2. Quick Reference Guide For R-410A

- R-410A refrigerant operates at approximately 60% higher pressure (1.6 times) than R-22. Ensure that servicing equipment is designed to operate with R-410A.
- R-410A refrigerant cylinders are pink.
- R-410A, as with other HFC's is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil.
- R-410A systems are to be charged with liquid refrigerants. Prior to March 1999, R-410A refrigerant cylinders had a dip tube. These cylinders should be kept upright for equipment charging. Post March 1999 cylinders do not have a dip tube and should be inverted to ensure liquid charging of the equipment.

- Do not install a suction line filter drier in the liquid line.
- A liquid line filter drier is standard on every unit.
- Desiccant (drying agent) must be compatible for POE oils and R-410A.

3. Evaporator Coil / TXV

The thermostatic expansion valve is specifically designed to operate with R-410A. **DO NOT use an R-22 TXV. The existing evaporator must be replaced with the factory specified TXV evaporator specifically designed for R-410A.**

4. Tools Required For Installing & Servicing R-410A Models

Manifold Sets:

- Up to 800 PSIG High side
- Up to 250 PSIG Low Side
- 550 PSIG Low Side Retard

Manifold Hoses:

- Service Pressure Rating of 800 PSIG

Recovery Cylinders:

- 400 PSIG Pressure Rating
- Dept. of Transportation 4BA400 or BW400

⚠ CAUTION

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

VI. INSTALLATION

A. GENERAL

1. PRE-INSTALLATION CHECK-POINTS

Before attempting any installation, the following points should be carefully considered:

- Structural strength of supporting members.
(rooftop installation)
- Clearances and provision for servicing.
- Power supply and wiring.
- Air duct connections.
- Drain facilities and connections.
- Location for minimum noise.

2. LOCATION

These units are designed for outdoor installations (IPX4). They can be mounted on a slab or rooftop. They are not to be installed within any part of a structure such as an attic, crawl space, closet, or any other place where condenser air flow is restricted or other than outdoor ambient conditions prevail. Since the application of the units is of the outdoor type, it is important to consult your local code authorities at the time the first installation is made.

B. OUTSIDE SLAB INSTALLATION

(Typical outdoor slab installations are shown in Figure 2.)

1. Select a location where external water drainage cannot collect around the unit.
2. Provide a level concrete slab extending 3" beyond all four sides of the unit. The slab should be sufficient above grade to prevent ground water from entering the unit.
IMPORTANT: To prevent transmission of noise or vibration, slab should not be connected to building structure.
3. The location of the unit should be such as to provide proper access for inspection and servicing.
4. Locate unit where operating sounds will not disturb owner or neighbors.
5. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.

FIGURE 2
PACKAGE AIR CONDITIONER
 OUTSIDE SLAB INSTALLATION, BASEMENT OR
 CRAWL SPACE DISTRIBUTING SYSTEM

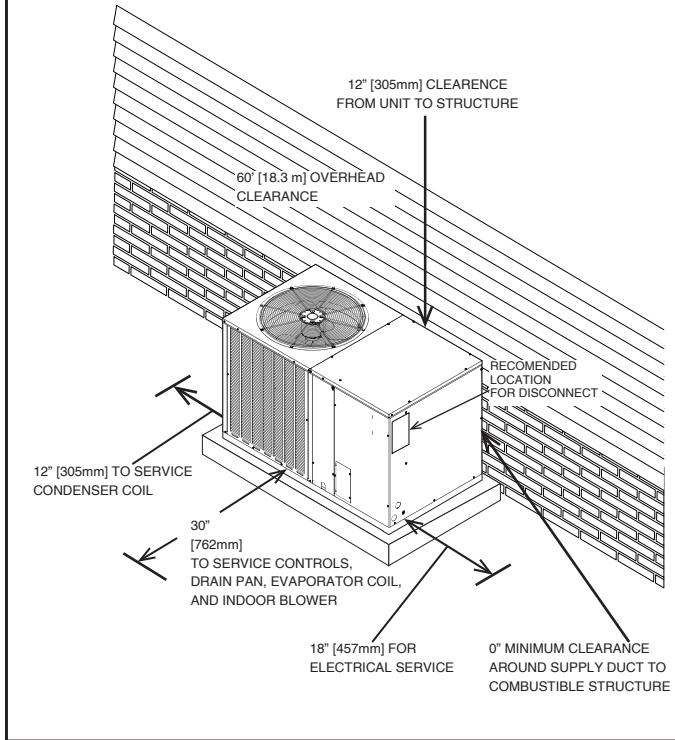
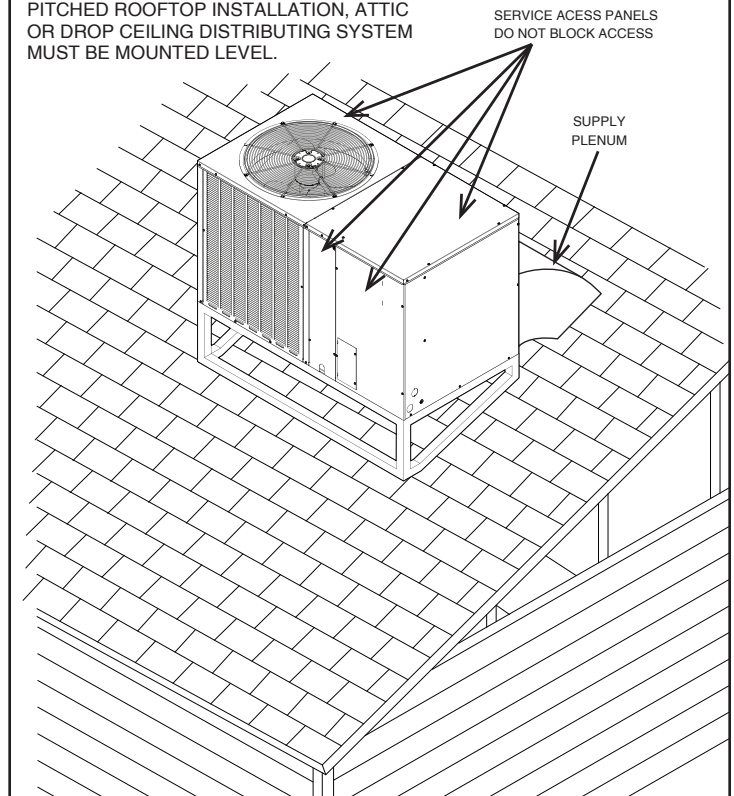


FIGURE 3
PACKAGE AIR CONDITIONER
 PITCHED ROOFTOP INSTALLATION, ATTIC
 OR DROP CEILING DISTRIBUTING SYSTEM
 MUST BE MOUNTED LEVEL.



C. CLEARANCES

The following minimum clearances must be observed for proper unit performance and serviceability.

1. Provide 30" minimum clearance at the front and 18" on the right side of the unit for service access. Provide 12" minimum clearance on the left side of the unit for air inlet and 12" minimum clearance from unit to structure on back side.
2. Provide 60" minimum clearance from top of unit.
3. Unit is design certified for application on combustible flooring with 0" minimum clearance.
4. See Figure 2 for illustration of minimum installation-service clearances.

D. ROOFTOP INSTALLATION

1. Before locating the unit on the roof, make sure that the strength of the roof and beams is adequate at that point to support the weight involved. (See specification sheet for weight of unit.) This is very important and user's responsibility.
2. The unit should be placed on a solid and level platform of adequate strength.
3. The location of the unit on the roof should be such as to provide proper access for inspection and servicing (Figure 3).

IMPORTANT: If unit will not be put into service immediately, cover supply and return openings to prevent excessive condensation.

VII. DUCTWORK

Ductwork should be fabricated by the installing contractor in accordance with local codes and NFPA90A. Industry manuals may be used as a guide when sizing and designing the duct system - contact Air Conditioning Contractors of America, 1513 16th St. N.W., Washington, D.C. 20036.

⚠ 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.

Place the unit as close to the space to be air conditioned as possible allowing clearance dimensions as indicated. Run ducts as directly as possible to supply and return outlets. Use of non-flammable waterproof flexible connectors on both supply and return connections at the unit to reduce noise transmission is recommended.

It is preferable to install the unit on the roof of the structure if the registers or diffusers are located on the wall or in the ceiling. Consider a slab installation when the registers are low on a wall or in the floor.

On ductwork exposed to outside air conditions of temperature and humidity, use a minimum of 2" of insulation and a vapor barrier. Distribution system in attic, furred space or crawl space should be insulated with at least 2" of insulation with vapor barrier. One-half to 1" thickness of insulation is usually sufficient for ductwork inside the air conditioned space.

Provide balancing dampers for each branch duct in the supply system. Properly support the ductwork from the structure.

VIII. FILTERS

Permanent filter(s) are provided with this unit. See General Data for size(s) and quantity.

IX. CONDENSATE DRAIN

The indoor coil condensate drain ends with a PVC stub. A trap is provided in for proper condensate drainage and to prevent debris from being drawn into the unit. Do not connect drain to closed sewer line. It is not recommended that a PVC cement or other permanent installation be used so that the drain line and/or drain pan can be easily cleaned in the future. The drain trap is located in the control box during shipping. To install, slide clear plastic tube over drain pan connection. The white PVC trap can be oriented as required by installation

FIGURE 4

REMOVABLE CONDENSATE DRAIN PAN AND REMOVAL PROCEDURE

A small side panel grants access to a removable, sloped drain pan (A), which helps to ensure indoor air quality (IAQ) throughout the life of the unit. A drain trap (B) assembly is provided for convenience.



X. ELECTRICAL WIRING

Field wiring must comply with the National Electrical Code and applicable national and local codes.

WARNING

TURN OFF ELECTRIC POWER AT THE FUSE BOX OR SERVICE PANEL BEFORE MAKING ANY ELECTRICAL CONNECTIONS.

ALSO, THE GROUND CONNECTION MUST BE COMPLETED BEFORE MAKING LINE VOLTAGE CONNECTIONS. FAILURE TO DO SO CAN RESULT IN ELECTRICAL SHOCK, SEVERE PERSONAL INJURY OR DEATH.

A. POWER WIRING

1. It is important that proper electrical power is available at the unit. Voltage should not vary more than 10% from that stamped on the unit rating plate. On three phase units, phases must be balanced within 3%.
2. Install a branch circuit disconnect within sight of the unit and of adequate size to handle the starting current.
3. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size can be determined from the National Electrical Code or Canadian Electrical Code or nameplate or from Heater Kit Tables.
4. This unit supports both single point electrical connection for unit.
5. Power wiring must be run in grounded rain-tight conduit.

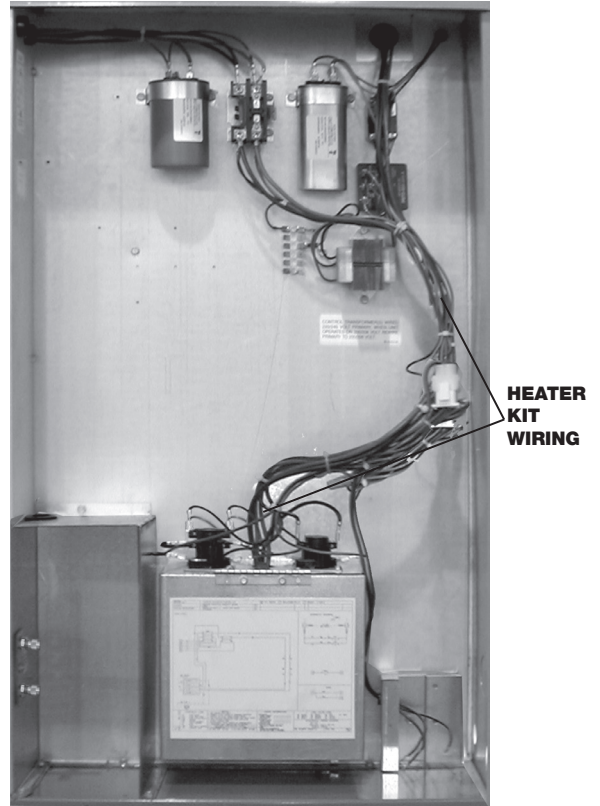
B. POWER WIRING AND ELECTRIC HEATER KIT INSTRUCTIONS

1. Turn off power to unit.
2. Remove control box access panel.
3. Remove unit indoor section top cover.
4. Remove wire notch cover from control bulkhead and discard. Retain screw.
5. Remove heater element cover plate from blower outlet opening and discard. Retain screws.
6. Mount heater fuse block assembly in location indicated with the three include screws.
7. Route wire harness assembly through wire notch in control bulkhead and mount element assembly in blower outlet opening with screws previously retained.
8. Center wire routing plate over notch in blower bulkhead and secure with screw previously retained.
9. Route and tie wiring as shown in Figure 5. Wiring must not contact moving parts or uninsulated electrical connections.
10. Replace unit indoor top cover.
11. Connect power and control wiring as indicated below:
 - a. **Single-point wiring:** Connect high voltage field power leads to heater kit fuse block and connect included unit power pigtailed from heater kit fuse block to unit contactor L1 and L3 connections. Connect ground lead to ground lug on heater kit fuse block.
 - b. **Dual-circuit wiring:** Remove unit power pigtailed from heater kit fuse block and discard. Connect one set of high voltage field power circuit leads to the heater kit fuse block and connect ground lead to ground lug on heater kit fuse block. Connect the second set of high voltage field power leads to L1 and L3 on the unit contactor. Connect ground lead to ground lug on control box bulkhead.
 - c. Connect heater kit control plug to receptacle in control box.
12. Replace control box access panel.
13. Restore power to unit and verify proper unit and heater kit operation.

C. CONTROL WIRING (Class II)

1. Do not run low voltage wiring in conduit with power wiring.
2. Control wiring is routed through the 7/8" hole corner adjacent to the control box. See Electrical Connections, Figure 1. Use a minimum #18 AWG thermostat wire. For wire lengths exceeding 50', use #16 AWG thermostat wire. The low voltage wires are connected to the unit pigtailed which are supplied with the unit in the low voltage connection box located within the unit control box. See Figure 5.
3. Figure 6 shows representative low voltage connection diagrams. Read your thermostat installation instructions for any special requirements for your specific thermostat.

FIGURE 5
HEATER KIT INSTALLATION



D. INTERNAL WIRING

1. A diagram of the internal wiring of this unit is located on the electrical control box cover. If any of the original wire as supplied with the appliance must be replaced, the wire gauge and insulation must be the same as original wiring.

E. GROUNDING

⚠ 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.

F. THERMOSTAT

Mount the thermostat on an inside wall about five feet above the floor in a location where it will not be affected by unconditioned air, sun, or drafts from open doors or other sources. READ installation instructions in air conditioner thermostat package CAREFULLY because each has some different wiring requirements.

XI. INDOOR AIR FLOW DATA

All units are equipped with multi-speed indoor blower motors. Each unit is shipped factory wired for the proper speed at a normal external static. See Airflow Performance Table for blower performance.

INDOOR AIRFLOW PERFORMANCE

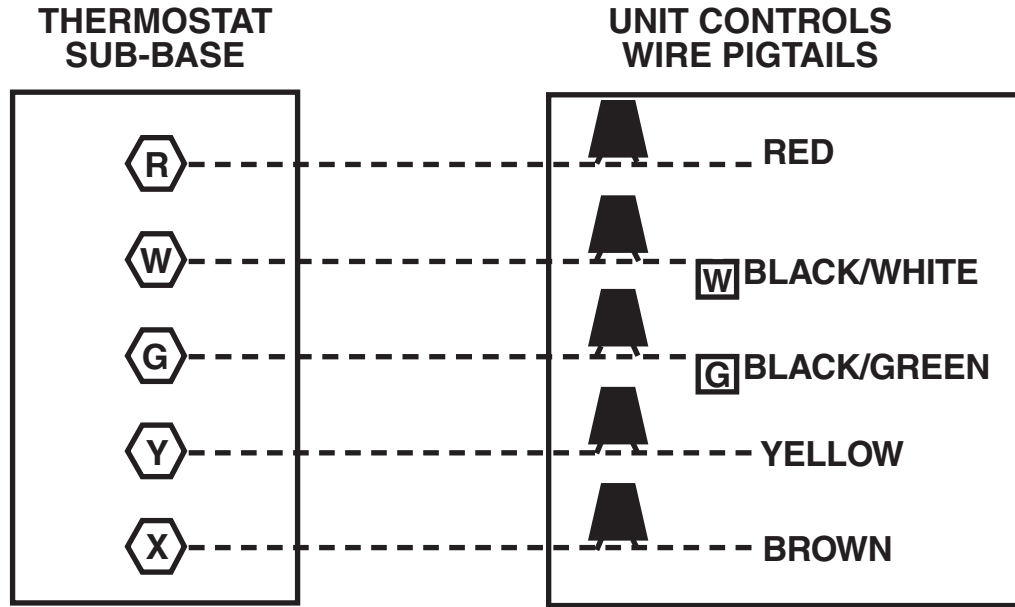
INDOOR AIRFLOW PERFORMANCE - 3.5, 4.5, 5.5 and 6.5 TON [12.3, 15.8, 19.3 and 22.8kW] Voltage 380-415V -3 Phase 50Hz.															
Nominal Cooling Capacity Tons	Motor Speed From Factory	Manufacturer Recommended Air-Flow Range (Min / Max) CFM	Blower Size/ Motor HP & # of Speeds	Motor Speed	CFM [L/s]	CFM Air Delivery/RPM/Watts									
						External Static Pressure-Inches W.C. [kPa]									
						0.1 [0.2]	0.2 [0.5]	0.3 [0.7]	0.4 [1.0]	0.5 [1.2]	0.6 [1.5]	0.7 [1.7]	0.8 [2.0]	0.9 [2.2]	1.00 [2.5]
3.5	Low (Tap2)	1225/1575	11x9 3/4 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	1435 [677]	1372 [648]	1329 [627]	1289 [608]	1248 [589]	1207 [570]	1153 [544]	857	-	-
					RPM	589	629	675	718	762	805	857	-	-	
					Watts	205	214	231	243	257	272	288	-	-	
					CFM [L/s]	-	1579 [745]	1543 [728]	1506 [711]	1468 [693]	1431 [675]	1395 [658]	1355 [639]	1312 [619]	
4.5	Low (Tap2)	1575/2025	11x9 1 2 Speed (X-13 Motor)	High (Tap 1)	CFM [L/s]	-	666	706	747	788	827	864	905	946	402
					RPM	-	290	305	322	339	355	368	385	402	
					Watts	-	1840 [868]	1810 [854]	1794 [847]	1778 [839]	1762 [832]	1734 [818]	1703 [804]	1670 [788]	1636 [772]
					CFM [L/s]	725	746	766	779	801	826	848	862	895	930
5.5	Low (Tap2)	1925/2475	11x9 1 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	-	430	448	459	472	488	505	524	542	977
					RPM	-	1896 [895]	1870 [883]	1857 [876]	1847 [872]	1819 [858]	1789 [844]	1758 [830]	1725 [814]	
					Watts	-	786	808	826	848	878	910	943	977	
					CFM [L/s]	2106 [994]	2077 [980]	2047 [966]	2040 [963]	2010 [949]	1978 [934]	1943 [917]	1911 [902]	1879 [887]	1848 [872]
6.5	Low (Tap2)	1925/2475	11x9 1 2 Speed (X-13 Motor)	High (Tap 1)	CFM [L/s]	737	766	781	809	831	861	898	928	957	989
					RPM	523	539	550	560	576	595	616	633	650	668
					Watts	2262 [1068]	2242 [1058]	2221 [1048]	2197 [1037]	2176 [1027]	2139 [1009]	2107 [994]	2070 [977]	2034 [960]	2002 [945]
					CFM [L/s]	785	799	816	838	858	891	920	952	983	1012
6.5	Low (Tap2)	1925/2475	11x9 1 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	659	666	676	691	706	724	741	759	776	792
					RPM	2283 [1077]	2255 [1064]	2226 [1051]	2199 [1038]	2166 [1022]	2131 [1006]	2098 [990]	2067 [976]	2021 [954]	1976 [933]
					Watts	757	784	812	840	871	903	933	963	998	1035
					CFM [L/s]	648	668	688	705	727	749	767	781	803	823
6.5	Low (Tap2)	1925/2475	11x9 1 2 Speed (X-13 Motor)	High (Tap 1)	CFM [L/s]	2386 [1126]	2361 [1114]	2332 [1101]	2305 [1088]	2269 [1071]	2239 [1057]	2203 [1040]	2176 [1027]	2138 [1009]	2094 [988]
					RPM	796	823	851	881	907	936	963	992	1019	1053
					Watts	773	789	809	828	849	867	885	900	915	934
					CFM [L/s]	773	789	809	828	849	867	885	900	915	934

INDOOR AIRFLOW PERFORMANCE

INDOOR AIRFLOW PERFORMANCE - 5.0, 5.5 and 6.0 TON [17.5, 19.3 and 21.1kW] Voltage 380-400V - 3 Phase 60Hz															
Nominal Cooling Capacity Tons	Motor Speed From Factory	Manufacturer Recommended Air-Flow Range (Min / Max) CFM	Blower Size/ Motor HP & # of Speeds	Motor Speed	CFM Air Delivery/RPM/Watts										
					External Static Pressure-Inches W.C. [kPa]										
					0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]	0.9 [.22]	1.0 [.25]	
5.0	Low (Tap2)	1750/2250	11x9 3/4 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	2025 [956]	1991 [940]	1959 [925]	1924 [908]	1890 [892]	1856 [876]	1821.2 [859]	1779 [840]	1746.6 [824]	1711 [807]
					RPM	690	720	751	781	813	844	876	915	944	978
					Watts	435	451	467	483	500	519	536	558	571	589
					CFM [L/s]	2191 [1034]	2160 [1019]	2128 [1004]	2090 [986]	2059 [972]	2028 [957]	1990 [939]	1955 [923]	1921 [907]	1886 [890]
5.5	Low (Tap2)	1925/2475	11x9 1 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	2275 [1074]	2240 [1057]	2203 [1040]	2172 [1025]	2133 [1007]	2102 [992]	2062 [973]	2019 [953]	1983 [936]	1963 [922]
					RPM	740	769	801	831	862	894	923	955	986	1015
					Watts	592	612	633	654	672	695	709	727	743	759
					CFM [L/s]	-	2375 [1121]	2337 [1103]	2310 [1090]	2273 [1073]	2240 [1057]	2205 [1041]	2165 [1022]	2136 [1008]	2091 [987]
6.0	Low (Tap2)	2100/2700	11x9 1 2 Speed (X-13 Motor)	Low (Tap 2)	CFM [L/s]	-	2256 [1065]	2201 [1039]	2160 [1019]	2128 [1004]	2087 [985]	2052 [968]	2007 [947]	1973 [931]	1935 [913]
					RPM	-	776	801	830	863	894	919	955	978	1006
					Watts	-	656	674	692	714	733	746	771	781	797
					CFM [L/s]	-	-	-	-	2269 [1071]	2230 [1052]	2187 [1032]	2145 [1012]	2109 [995]	2068 [976]
RPM	-	-	-	-	891	891	891	891	891	891	891	891	891	891	891
Watts	-	-	-	-	844	844	844	844	844	844	844	844	844	844	844

FIGURE 6

VOLTAGE CONNECTIONS DIAGRAMS - STANDARD CONTROL WIRING



XII. PRE-START CHECK

1. Is unit properly located and level?
2. Is ductwork insulated, weatherproofed, with proper spacing to combustible materials?
3. Is air free to travel to and from outdoor coil? (See Figure 1.)
4. Is the wiring correct, tight, and according to unit wiring diagram?
5. Is unit grounded?
6. Are field supplied air filters in place and clean?
7. Do the outdoor fan and indoor blower turn freely without rubbing, and are they tight on the motor shafts?

XIII. STARTUP

1. Turn thermostat to "OFF," turn "on" power supply at disconnect switch.
2. Turn temperature setting as high as it will go.
3. Turn fan switch to "ON."
4. Indoor blower should run. Be sure it is running in the right direction.
5. Turn fan switch to "AUTO." Turn system switch to "COOL" and turn temperature setting below room temperature. Unit should run in cooling mode.
6. Is outdoor fan operating correctly in the right direction?
7. Is compressor running correctly.
8. Turn thermostat system switch to "HEAT." Unit should stop. Wait 5 minutes, then raise temperature setting to above room temperature. After about 30 to 50 seconds auxiliary heaters, if installed, should come on.
9. Check the refrigerant charge using the instructions located on control box cover. Replace service port caps. Service port cores are for system access only and will leak if not tightly capped.
10. Turn thermostat system switch to proper mode "HEAT" or "COOL" and set thermostat to proper temperature setting. Record the following after the unit has run some time.
 - A. Operating Mode _____
 - B. Discharge Pressure (High) _____ PSIG
 - C. Vapor Pressure at Compressor (Low) _____ PSIG
 - D. Vapor Line Temperature at Compressor _____ °F.
 - E. Indoor Dry Bulb _____ °F.
 - F. Indoor Wet Bulb _____ °F.
 - G. Outdoor Dry Bulb _____ °F.
 - H. Outdoor Wet Bulb _____ °F.
 - I. Voltage at Contactor _____ Volts

J. Current at Contactor _____ Amps
K. Model Number _____
L. Serial Number _____
M. Location _____
N. Owner _____
O. Date _____

11. Adjust discharge air grilles and balance system.
12. Check ducts for condensation and air leaks.
13. Check unit for tubing and sheet metal rattles.
14. Instruct the owner on operation and maintenance.
15. Leave "USE AND CARE" instructions with owner.

XVI. OPERATION

Most single phase units are not equipped with start relay or start capacitor. It is important that such systems be off for a minimum of 5 minutes before restarting to allow equalization of pressures. Do not move the thermostat to cycle unit without waiting five minutes. To do so may cause the compressor to stop on an automatic open overload device or blow a fuse. Poor electrical service can cause nuisance tripping in overloads or blow fuses.

IMPORTANT: The compressor has an internal overload protector. Under some conditions, it can take up to 2 hours for this overload to reset. Make sure overload has had time to reset before condemning the compressor.

A. CONTROL SYSTEM OPERATION

1. In the cooling mode, the thermostat will, on a call for cooling, energize the compressor contactor and the indoor blower relay. The indoor blower can be operated continuously by setting the thermostat fan switch at the "ON" position.
2. In the heating mode, the first heat stage of the thermostat will energize one or more supplementary resistance heaters. If required or considered desirable, the resistance heat may also be controlled by outdoor thermostats. In the heating mode, the thermostat will, on a call for heating, energize the indoor blower relay.

XV. GENERAL DATA - *MRHR

NOMINAL SIZES 3.5-6.5 TONS [12.3 - 22.8 kW]

Model *MRHR Series	X042ANT	X054ANT	X066ANT	X078ANT
Compressor				Continued >
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)	77	72	73	79
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	MicroChannel
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	NA
MicroChannel Depth in. [mm]	NA	NA	NA	1 [25.4]
Face Area sq. ft [sq.m]	16.88 [1.57]	16.88 [1.57]	16.88 [1.57]	16.20 [2.50]
Rows/ FPI [FPcm]	2/22 [9]	2/22 [9]	2/22 [9]	1/23 [9]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	MicroChannel
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	NA
MicroChannel Depth in. [mm]	NA	NA	NA	1.26 [32]
Face Area sq. ft [sq.m]	5.78 [0.54]	5.78 [0.54]	5.78 [0.54]	5.60 [.52]
Rows/ FPI [FPcm]	4/13 [5]	4/13 [5]	4/13 [5]	1/20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/1 [25.4]	1/1 [25.4]	1/1 [25.4]	1/1 [25.4]
Outdoor Fan Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in [mm]	1/24 [609.6]	1/24 [609.6]	1/24 [609.6]	1/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	3400 [1604]	3400 [1604]	3400 [1604]	4000 [1888]
No. Motors/HP	1 at 1/3 HP	1 at 1/3 HP	1 at 1/2 HP	1 at 3/4 HP
Motor RPM	1050	1050	944	1200
Indoor Fan Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in [mm]	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	3/4	1	1	1
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter Type	Permanent	Permanent	Permanent	Permanent
Furnished	No	No	No	No
(NO.) Size Recommended in. [mmxmmxmm]	(1) 1x12x24 [25x304x609]	(1) 1x12x24 [25x304x609]	(1) 1x12x24 [25x304x609]	(1) 1x12x24 [25x304x609]
Refrigerant Charge Oz. [g]	205 [5811]	186 [5273]	182 [5159]	85 [2409]
Weights				
Net Weight lbs. [kg]	440 [200]	444 [201]	447 [203]	379 [172]
Ship Weight lbs. [kg]	466 [211]	470 [213]	473 [215]	405 [184]

*E or V

NOTES:

1. Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.
2. Standard 3/4" PVC P-Trap provided.

[] Designates Metric Conversions

XV. GENERAL DATA - *MRHR

NOMINAL SIZES 3.5-6.0 TONS [12.3 - 21.1 kW]

Model *MRHR Series	X060AVT	X066AVT	X072AVT
Compressor			
No./Type	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)	77	77	86
Outdoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled
Face Area sq. ft [sq.m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows/ FPI [FPcm]	16.88 [1.57]	16.88 [1.57]	16.88 [1.57]
	2/22 [9]	2/22 [9]	2/22 [9]
Indoor Coil - Fin Type			
Tube Type	Louvered	Louvered	Louvered
Tube Size in. [mm] OD	Rifled	Rifled	Rifled
Face Area sq. ft [sq.m]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Rows/ FPI [FPcm]	5.78 [0.54]	5.78 [0.54]	5.78 [0.54]
Refrigerant Control	4/13 [5]	4/13 [5]	4/13 [5]
Drain Connection No./Size in. [mm]	TX Valves	TX Valves	TX Valves
	1/1 [25.4]	1/1 [25.4]	1/1 [25.4]
Outdoor Fan Type			
No. Used/Diameter in [mm]	Propeller	Propeller	Propeller
Drive Type/No. Speeds	1/24 [609.6]	1/24 [609.6]	1/24 [609.6]
CFM [L/s]	Direct/1	Direct/1	Direct/1
No. Motors/HP	3400 [1604]	3400 [1604]	3400 [1604]
Motor RPM	1 at 1/3 HP	1 at 1/3 HP	1 at 1/2 HP
	1075	1075	944
Indoor Fan Type			
No. Used/Diameter in [mm]	FC Centrifugal	FC Centrifugal	FC Centrifugal
Drive Type	1/11x9 [279x229]	1/11x9 [279x229]	1/11x9 [279x229]
No. Speeds	Direct	Direct	Direct
No. Motors	Multiple	Multiple	Multiple
Motor HP	1	1	1
Motor RPM	1	1	1
Motor Frame Size	1050	1050	1050
	48	48	48
Filter Type			
Furnished	Permanent	Permanent	Permanent
(NO.) Size Recommended in. [mmxmmxmm]	No	No	No
	(1) 1x12x24 [25x304x609]	(1) 1x12x24 [25x304x609]	(1) 1x12x24 [25x304x609]
Refrigerant Charge Oz. [g]	196 [5556]	181 [5131]	189 [5358]
Weights			
Net Weight lbs. [kg]	444 [201]	444 [201]	446 [202]
Ship Weight lbs. [kg]	470 [213]	470 [213]	472 [214]

*E or V

NOTES:

1. Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.
2. Standard 3/4" PVC P-Trap provided.

[] Designates Metric Conversions

XVI. MISCELLANEOUS

ELECTRICAL DATA

ELECTRICAL DATA - *MRHR SERIES								
		X042ANT	X054ANT	X066ANT	X060AVT	X066AVT	X072AVT	X078ANT
Unit Information	Unit Operating Voltage Range	342-456	342-456	342-456	342-440	342-440	342-440	342-456
	Volts	380-415	380-415	380-415	380-400	380-400	380-400	380-415
	Phase	3	3	3	3	3	3	3
	Hz	50	50	50	60	60	60	50
	Minimum Circuit Ampacity	12	15	17	16	19	20	24
	Minimum Overcurrent Protection Device Size	15	20	20	20	25	25	30
	Maximum Overcurrent Protection Device Size	15	20	20	20	25	25	35
Compressor Motor	No.	1	1	1	1	1	1	1
	Volts	380-420	380-420	380-420	380	380	380	380-420
	Phase	3	3	3	3	3	3	3
	RPM	2900	2900	2900	3450	3500	3500	2900
	Amps (RLA), Comp. 1	6.1	7.8	8	7.9	10.7	10.3	13
	Amps (LRA), Comp. 1	43	51.5	67.1	66	83	83	101
	HP, Compressor 2							
	Amps (RLA), Comp. 2							
Amps (LRA), Comp. 2								
Condenser Motor	No.	1	1	1	1	1	1	1
	Volts	380-415	380-415	380-415	380-400	380-400	380-400	380-415
	Phase	1	1	1	1	1	1	1
	HP	1/3	1/3	1/2	1/3	1/3	1/2	3/4
	Amps (FLA, each)	1.0	1.0	2.5	1.4	1.4	2.8	3.1
	Amps (LRA, each)	2.2	2.2	N/A	3.1	3.1	N/A	N/A
Evaporator Fan	No.	1	1	1	1	1	1	1
	Volts	380-415	380-415	380-415	380-400	380-400	380-400	380-415
	Phase	1	1	1	1	1	1	1
	HP	3/4	1	1	1	1	1	1
	Amps (FLA, each)	3.2	4.0	4.0	4.0	4.0	4.0	4.0
	Amps (LRA, each)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*E or V

1. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

FIGURE 7
WIRING DIAGRAM - *MRHR - WITH X-13 BLOWER MOTOR

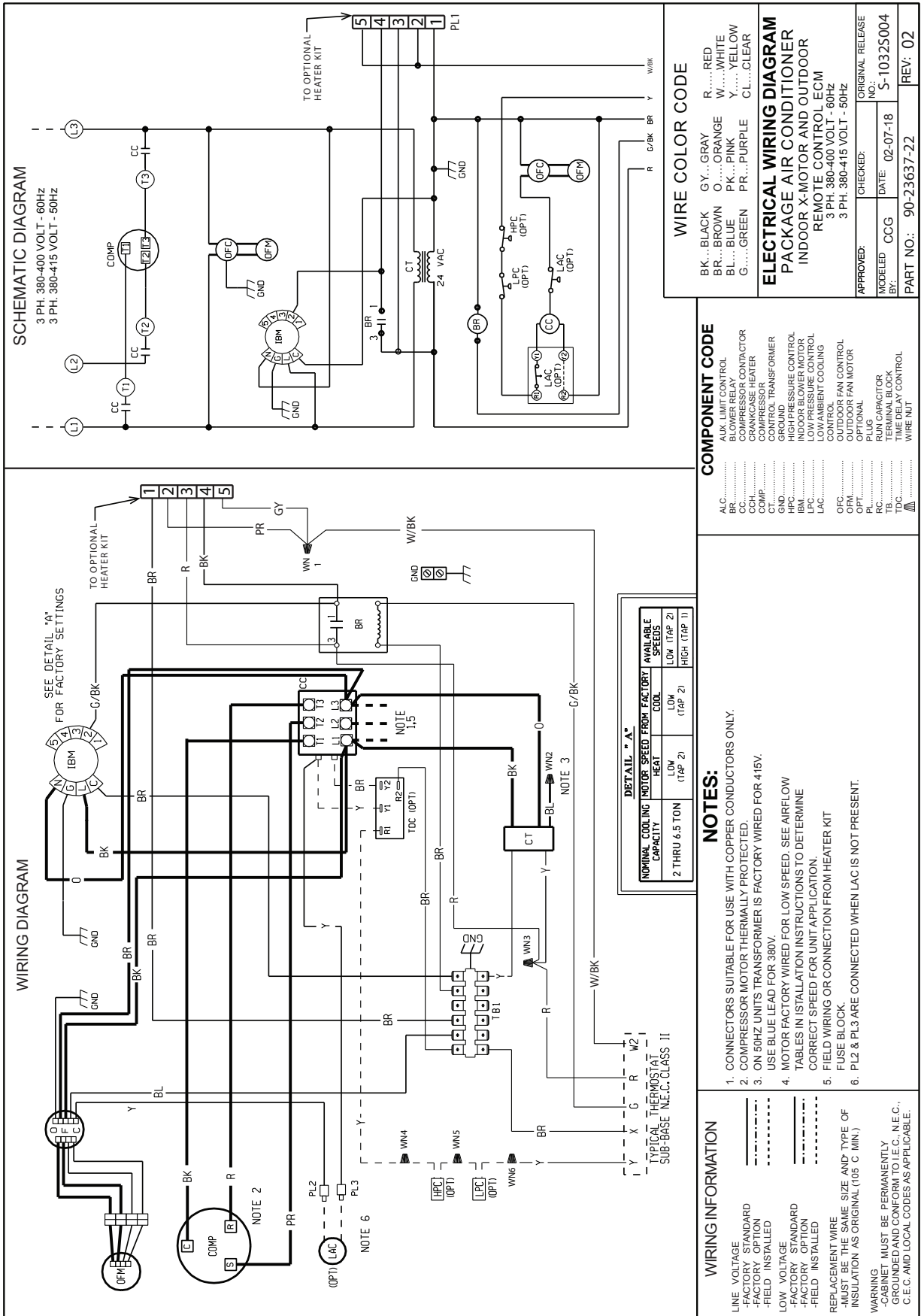


FIGURE 8
WIRING DIAGRAM

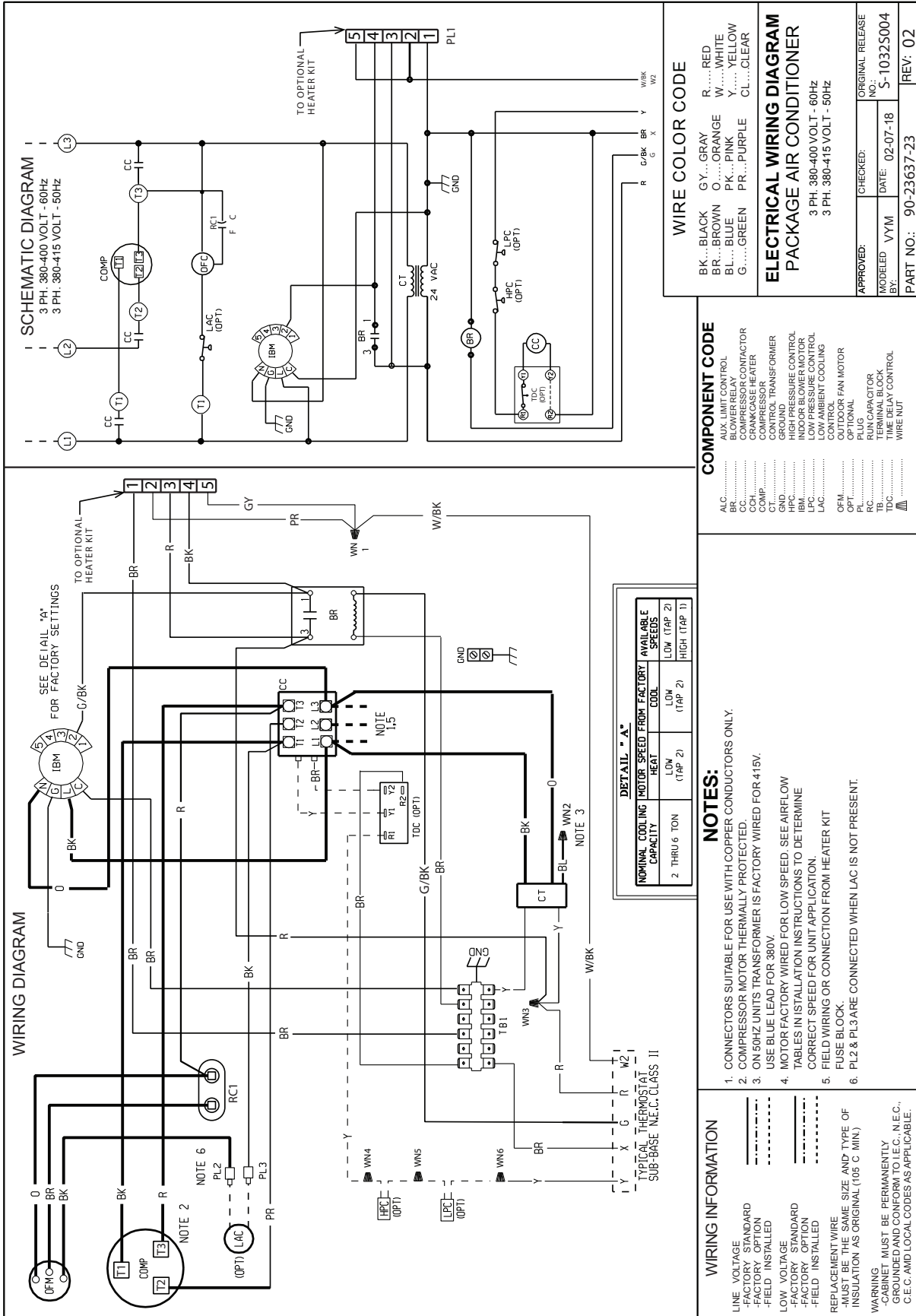
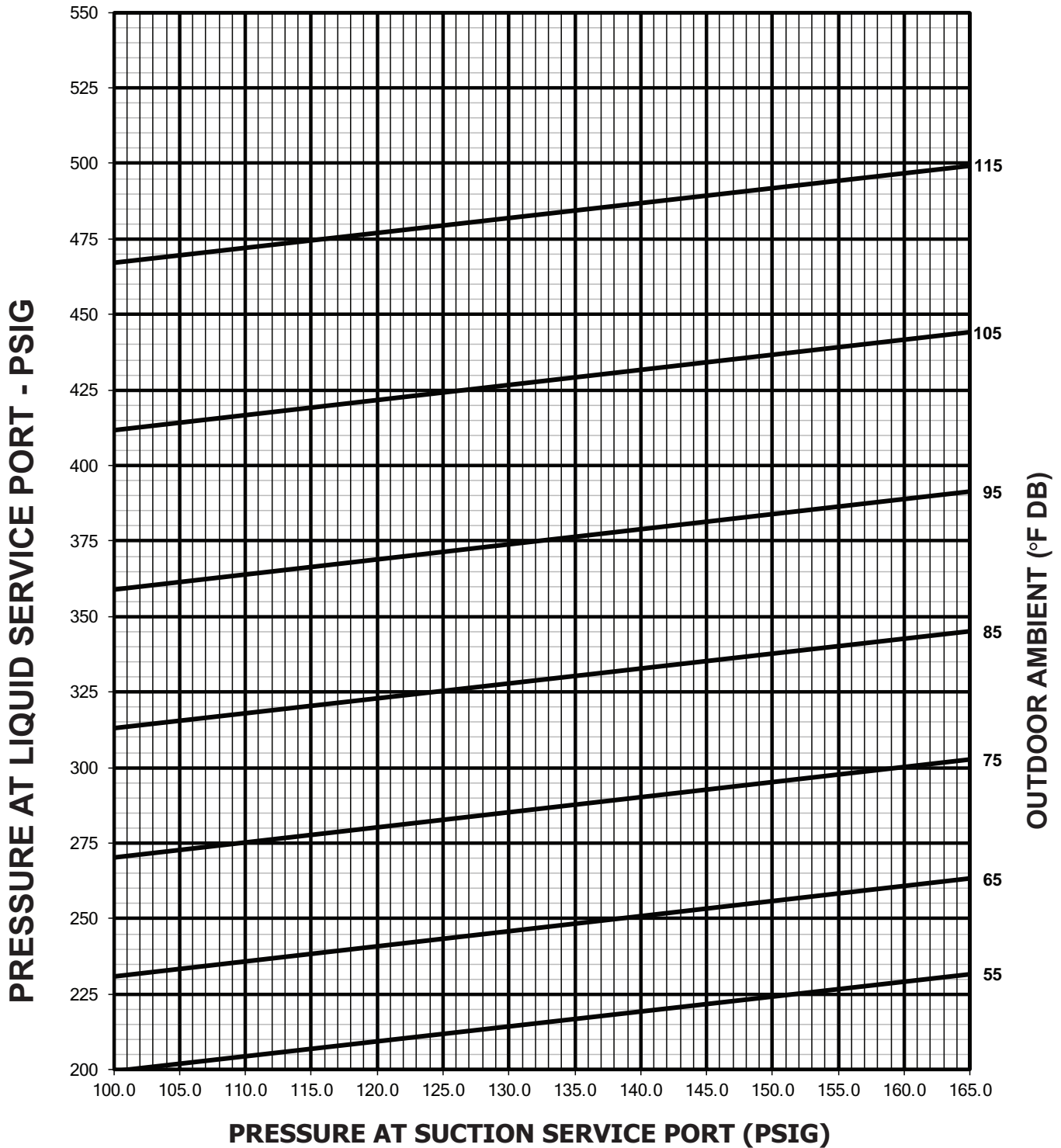


FIGURE 9
3.5 TON AIR CHARGING CHART

3.5 TON - 50Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



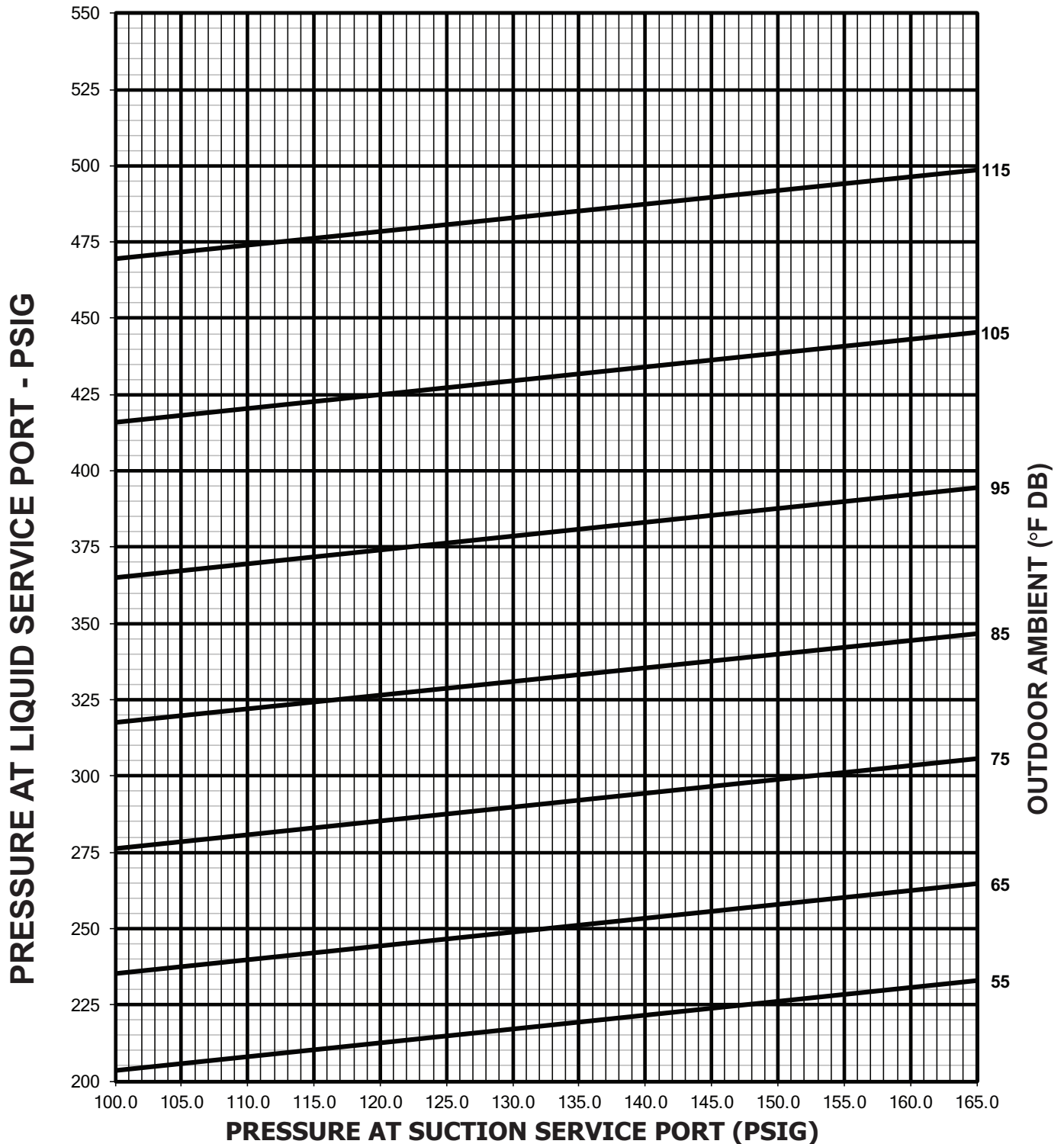
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 10
4.5 TON AIR CHARGING CHART

4.5 TON - 50Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



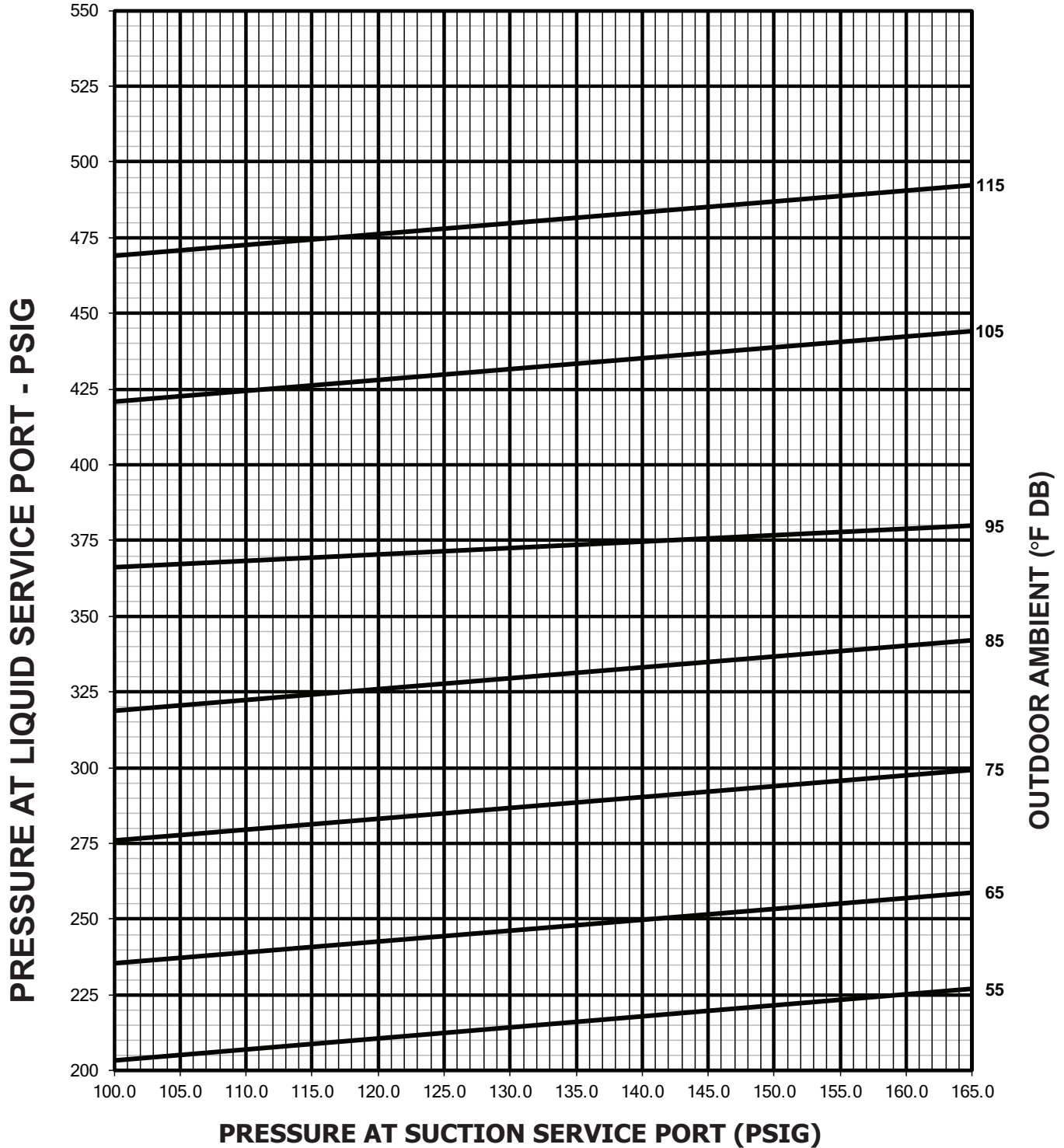
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 11
5.0 TON AIR CHARGING CHART

5.0 TON - 60Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



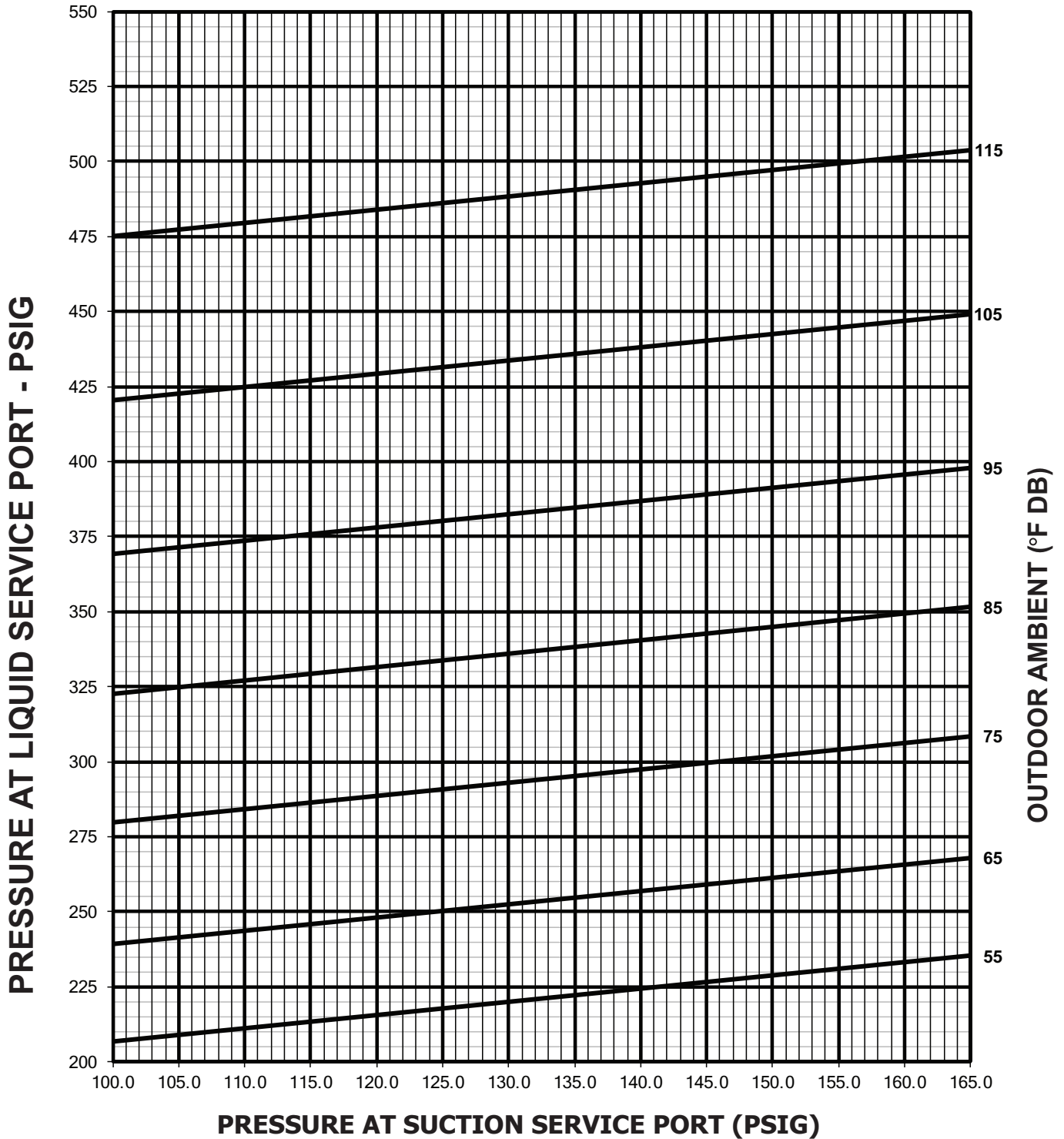
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 12
5.5 TON AIR CHARGING CHART

5.5 TON - 50Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



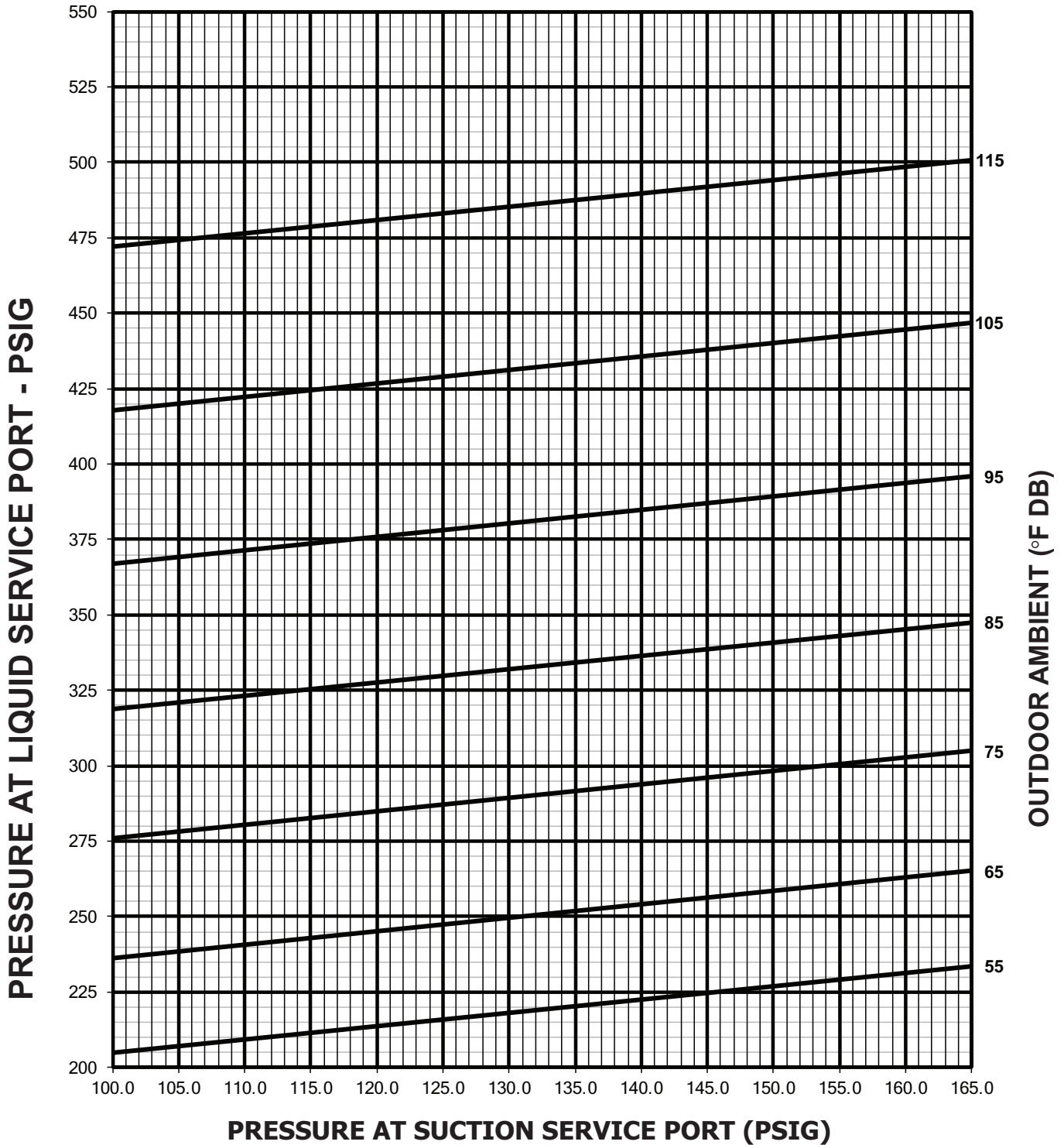
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 13
5.5 TON AIR CHARGING CHART

5.5 TON - 60Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



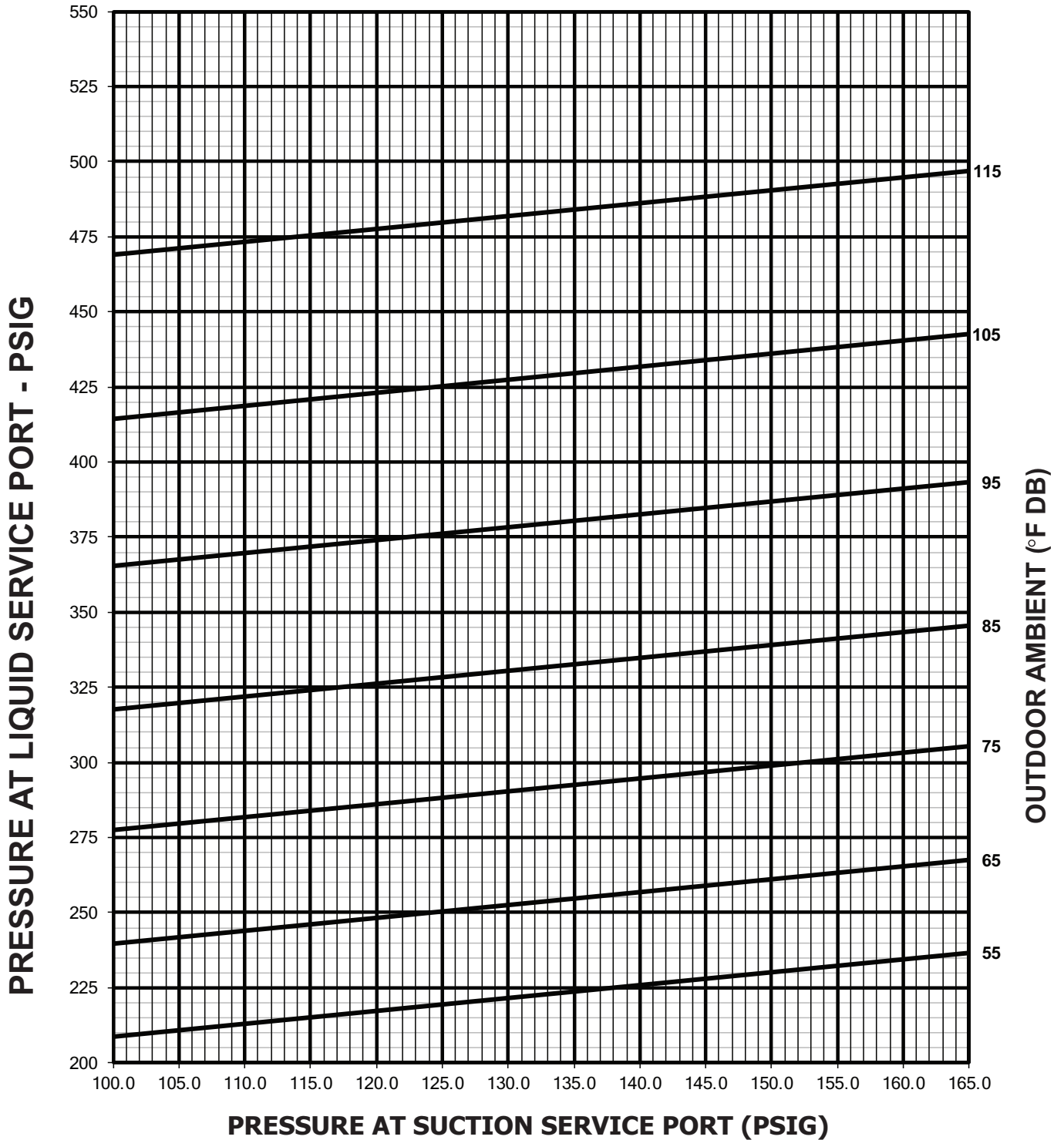
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 14
6.0 TON AIR CHARGING CHART

6.0 TON - 60Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



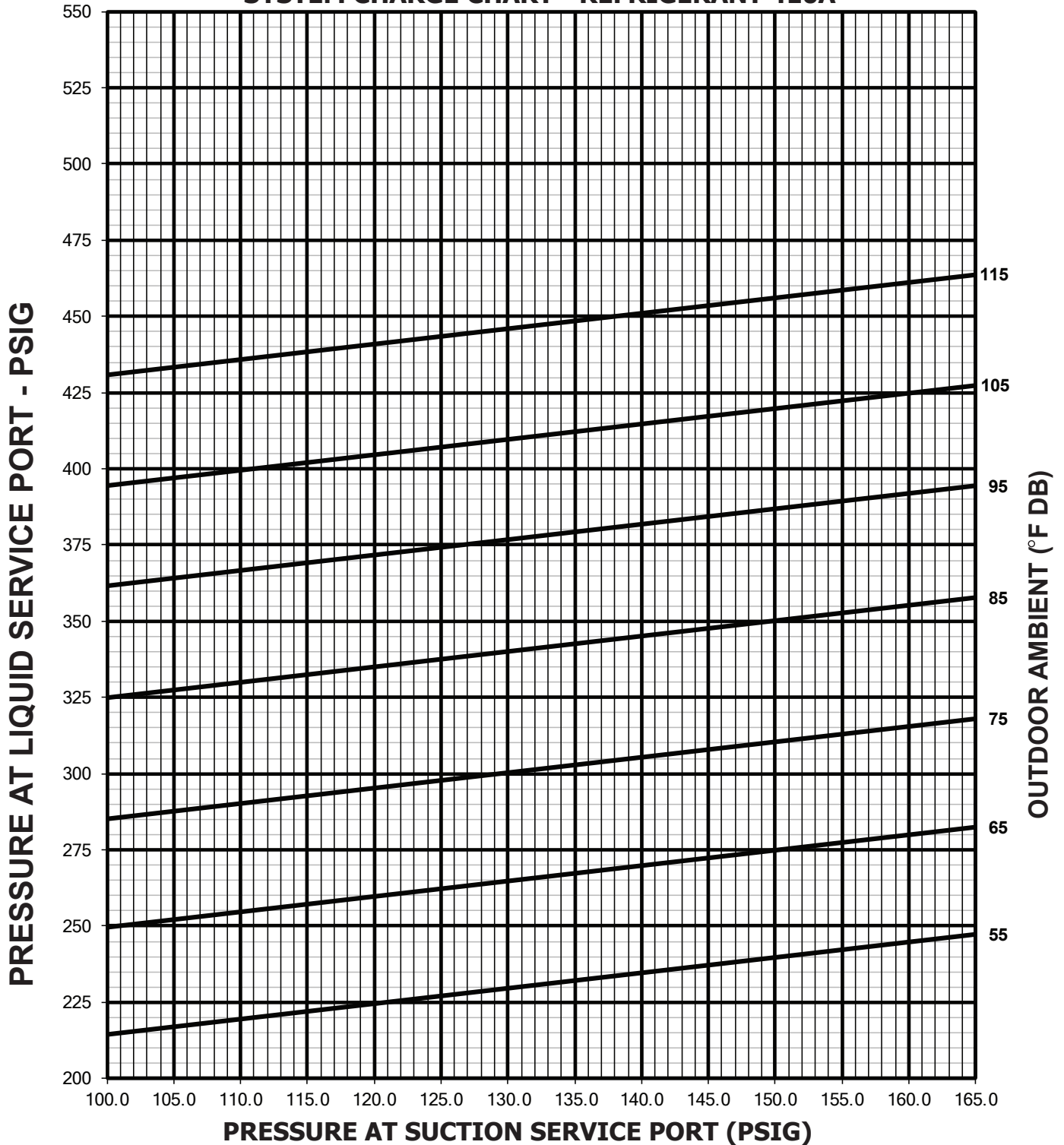
CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AND "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

FIGURE 15
6.5 TON AIR CHARGING CHART

6.5 TON - 50Hz COOLING
SYSTEM CHARGE CHART - REFRIGERANT 410A



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

92-107024-07-00

TROUBLE SHOOTING CHART

⚠ WARNING

DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

SYMPTOM	POSSIBLE CAUSE	REMEDY
Unit will not run	<ul style="list-style-type: none"> • Power off or loose electrical connection • Thermostat out of calibration-set to high • Defective contactor • Blown fuses • Transformer defective • High pressure control open (if provided) • Interconnecting low voltage wiring damaged 	<ul style="list-style-type: none"> • Check for correct voltage at compressor contactor in control box • Reset • Check for 24 volts at contactor coil - replace if contacts are open • Replace fuses • Check wiring-replace transformer • Reset-also see high head pressure remedy - The high pressure control opens at 450 PSIG • Replace thermostat wiring
Condenser fan runs, compressor doesn't	<ul style="list-style-type: none"> • Run or start capacitor defective (single phase only) • Start relay defective (single phase only) • Loose connection • Compressor stuck, grounded or open motor winding, open internal overload. • Low voltage condition • Low voltage condition 	<ul style="list-style-type: none"> • Replace. • Replace. • Check for correct voltage at compressor-check & tighten all connections. • Wait at least 2 hours for overload to reset. If still open, replace the compressor. At compressor terminals, voltage must be within 10% of rating plates volts when unit is operating. • Add start kit components.
Insufficient cooling	<ul style="list-style-type: none"> • Improperly sized unit • Improper airflow • Incorrect refrigerant charge • Air, non-condensibles or moisture in system • Incorrect voltage 	<ul style="list-style-type: none"> • Recalculate load • Check - should be approximately 400 CFM per ton. • Charge per procedure attached to unit service panel. • Recover refrigerant, evacuate & recharge, add filter drier • At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	<ul style="list-style-type: none"> • Incorrect voltage • Defective overload protector • Refrigerant undercharge 	<ul style="list-style-type: none"> • At compressor terminals, voltage be $\pm 10\%$ of nameplate marking when unit is operating. • Replace - check for correct voltage • Add refrigerant
Registers sweat	<ul style="list-style-type: none"> • Low evaporator airflow 	<ul style="list-style-type: none"> • Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressures	<ul style="list-style-type: none"> • Restriction in liquid line, expansion device or filter drier • Flow check piston size too small • Incorrect capillary tubes • TXV does not open 	<ul style="list-style-type: none"> • Remove or replace defective component • Change to correct size piston • Change coil assembly • Replace TXV
High head-high or normal vapor pressure - Cooling mode	<ul style="list-style-type: none"> • Dirty condenser coil • Refrigerant overcharge • Condenser fan not running • Air or non-condensibles in system 	<ul style="list-style-type: none"> • Clean coil • Correct system charge • Repair or replace • Recover refrigerant, evacuate & recharge
High head-high or normal vapor pressure - Heating mode	<ul style="list-style-type: none"> • Low air flow - condenser coil • Refrigerant overcharge • Air or non-condensibles in system • Dirty condenser coil 	<ul style="list-style-type: none"> • Check filters - correct to speed • Correct system charge • Recover refrigerant, evacuate & recharge • Check filter - clean coil
Low head-high vapor pressures	<ul style="list-style-type: none"> • Flow check piston size too large • Defective Compressor valves • Incorrect capillary tubes 	<ul style="list-style-type: none"> • Change to correct size piston • Replace compressor • Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	<ul style="list-style-type: none"> • Low evaporator airflow • Operating below 65°F outdoors • Moisture in system • TXV limiting refrigerant flow 	<ul style="list-style-type: none"> • Increase speed of blower or reduce restriction - replace air filter • Add low Ambient Kit • Recover refrigerant, evacuate & recharge - add filter drier • Replace TXV
High vapor pressure	<ul style="list-style-type: none"> • Excessive load • Defective compressor 	<ul style="list-style-type: none"> • Recheck load calculation • Replace
Fluctuating head & vapor pressures	<ul style="list-style-type: none"> • TXV hunting • Air or non-condensate in system 	<ul style="list-style-type: none"> • Check TXV bulb clamp - check air distribution on coil - replace TXV • Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	<ul style="list-style-type: none"> • Air or non-condensibles in system 	<ul style="list-style-type: none"> • Recover refrigerant, evacuate & recharge

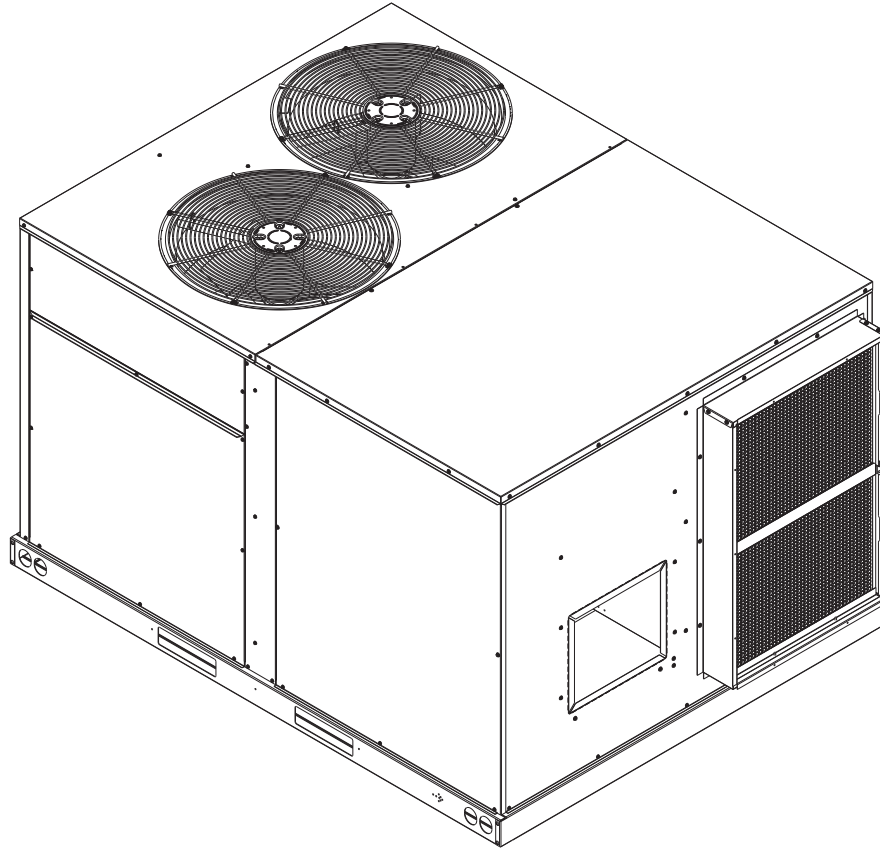
INSTALLATION INSTRUCTIONS

PACKAGE AIR CONDITIONERS

R410A REFRIGERANT **R410A**

*MRHR SERIES 8.0 - 10.0

50 & 60 HZ MODELS



*E or V



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.



ISO 9001:2015

DO NOT DESTROY THIS MANUAL

PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN



[] Designates Metric Conversions

92-107086-01-00

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► Installation instructions are updated on a regular basis. This is done as product changes occur or if new information becomes available. In this publication, an arrow (►) denotes changes from the previous edition or additional new material.

▲ NOTICE

BREAK-IN PERIOD

PRIOR TO AGENCY TESTING, RUN THE COMPRESSOR FOR 16 HOURS AT 115°F OUTDOOR AMBIENT TEMPERATURE AND 80° DRY BULB/75° WET BULB INDOOR AMBIENT TEMPERATURE.

▲ NOTICE

EFFICIENCY TESTING NOTICE

FOR PURPOSES OF VERIFYING OR TESTING EFFICIENCY RATINGS, THE TEST PROCEDURE IN TITLE 10 PART 431 APPENDIX A TO SUBPART F (UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF SMALL, LARGE, AND VERY LARGE COMMERCIAL PACKAGE AIR CONDITIONING AND HEATING EQUIPMENT), AND THE CLARIFYING PROVISIONS PROVIDED IN THE AHRI OPERATIONS MANUALS FOR UNITARY LARGE EQUIPMENT 340/360, 365 THAT WERE APPLICABLE AT THE DATE OF MANUFACTURE SHOULD BE USED FOR TEST SET UP AND PERFORMANCE.

I. 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.

▲ WARNING

THE MANUFACTURER'S WARRANTY DOES NOT COVER ANY DAMAGE OR DEFECT TO THE AIR CONDITIONER 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 AIR CONDITIONER. YOU SHOULD BE AWARE THAT THE USE OF UNAUTHORIZED COMPONENTS, ACCESSORIES OR DEVICES MAY ADVERSELY AFFECT THE OPERATION OF THE AIR CONDITIONER 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

UNITS ARE NOT DESIGN CERTIFIED TO BE INSTALLED INSIDE THE STRUCTURE. DOING SO CAN CAUSE INADEQUATE UNIT PERFORMANCE AS WELL AS PROPERTY DAMAGE AND CARBON MONOXIDE POISONING RESULTING IN PERSONAL INJURY 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 IN THE ELECTRIC HEAT KIT FOR A GROUND WIRE. 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

DISCONNECT MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO CHANGE BLOWER SPEEDS. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK OR SEVERE PERSONAL INJURY OR DEATH.

▲ CAUTION

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

▲ CAUTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

II. INTRODUCTION

This booklet contains the installation and operating instructions for your air conditioner. There are a few precautions that should be taken to derive maximum satisfaction from it. Improper installation can result in unsatisfactory operation or dangerous conditions.

Read this booklet and any instructions packaged with separate equipment required to make up the system prior to installation. Give this booklet to the owner and explain its provisions. The owner should retain this booklet for future reference.

III. CHECKING PRODUCT RECEIVED

Upon receiving the unit, inspect it for any damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. Check the unit model number, heating size, electrical characteristics, and accessories to determine if they are correct.

IV. EQUIPMENT PROTECTION FROM THE ENVIRONMENT

The metal parts of this unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment's useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray direction on the unit cabinet.
2. In coastal areas, locate the unit on the side of the building away from the waterfront.
3. Shielding provided by a fence or shrubs may give some protection.

Regular maintenance will reduce the buildup of contaminants and help to protect the unit's finish.

WARNING

DISCONNECT ALL POWER TO THE UNIT BEFORE STARTING MAINTENANCE. FAILURE TO DO SO CAN RESULT IN SEVERE ELECTRICAL SHOCK OR DEATH.

1. Frequent washing of the cabinet, fan blade and coil with fresh water will remove most of the salt or other contaminants that build up on the unit.
2. Regular cleaning and waxing of the cabinet with a good automobile polish will provide some protection.
3. A good liquid cleaner may be used several times a year to remove matter that will not wash off with water.

Several different types of protective coatings are offered in some areas. These coatings may provide some benefit, but the effectiveness of such coating materials cannot be verified by the equipment manufacturer.

The best protection is frequent cleaning, maintenance and minimal exposure to contaminants.

V. SPECIFICATIONS

A. GENERAL

The Packaged Air Conditioner is available with cooling capacities 8.0, 8.5 and 10 nominal tons of cooling are available. Units are horizontally-ducted systems.

The units are weatherized for mounting outside of the building.

The following information is for three phase units which are not covered under the DOE certification program.

1. The efficiency rating of this unit is a product thermal efficiency rating determined under continuous operating conditions independent of any installed system.

B. MAJOR COMPONENTS

The typical unit includes a hermetically-sealed refrigerating system (consisting of a compressor, condenser coil, evaporator coil with thermal expansion valve), a circulation air blower, a condenser fan, and all necessary internal electrical wiring. The cooling system of these units are factory-evacuated, charged and performance tested. Refrigerant amount and type are indicated on rating plate.

C. R-410A REFRIGERANT

All units are factory charged with R-410A refrigerant.

1. Specification of R-410A:

Application: **R-410A is not a drop-in replacement for R-22;** equipment designs must accommodate its higher pressures. It cannot be retrofitted into R-22 units.

Pressure: **The pressure of R-410A is approximately 60% (1.6 times) greater than R-22.** Recovery and recycle equipment, pumps, hoses and the like need to have design pressure ratings appropriate for R-410A. *Manifold sets need to range up to 800 psig high-side and 250 psig low-side with a 550 psig low-side retard. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating.* DOT 4BA400 or DOT BW400.

Combustibility: At pressures above 1 atmosphere, mixture of R-410A and air can become combustible. **R-410A and air should never be mixed in tanks or supply lines, or be allowed to accumulate in storage tanks. Leak checking should never be done with a mixture of R-410A and air.** Leak checking can be performed safely with nitrogen or a mixture of R-410A and nitrogen.

2. Quick Reference Guide For R-410A

- R-410A refrigerant operates at approximately 60% higher pressure (1.6 times) than R-22. Ensure that servicing equipment is designed to operate with R-410A.
- R-410A refrigerant cylinders are pink.
- R-410A, as with other HFC's is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil.
- R-410A systems are to be charged with liquid refrigerants. Prior to March 1999, R-410A refrigerant cylinders had a dip tube. These cylinders should be kept upright for equipment charging. Post March 1999 cylinders do not have a dip tube and should be inverted to ensure liquid charging of the equipment.
- Do not install a suction line filter drier in the liquid line.
- A liquid line filter drier is standard on every unit.
- Desiccant (drying agent) must be compatible for POE oils and R-410A.

3. Evaporator Coil / Expansion Device

The expansion device is specifically designed to operate with R-410A. **DO NOT use an R-22 device. The existing evaporator must be replaced with the factory specified evaporator specifically designed for R-410A.**

4. Tools Required For Installing & Servicing R-410A Models

Manifold Sets:

- Up to 800 PSIG High side
- Up to 250 PSIG Low Side
- 550 PSIG Low Side Retard

Manifold Hoses:

- Service Pressure Rating of 800 PSIG

Recovery Cylinders:

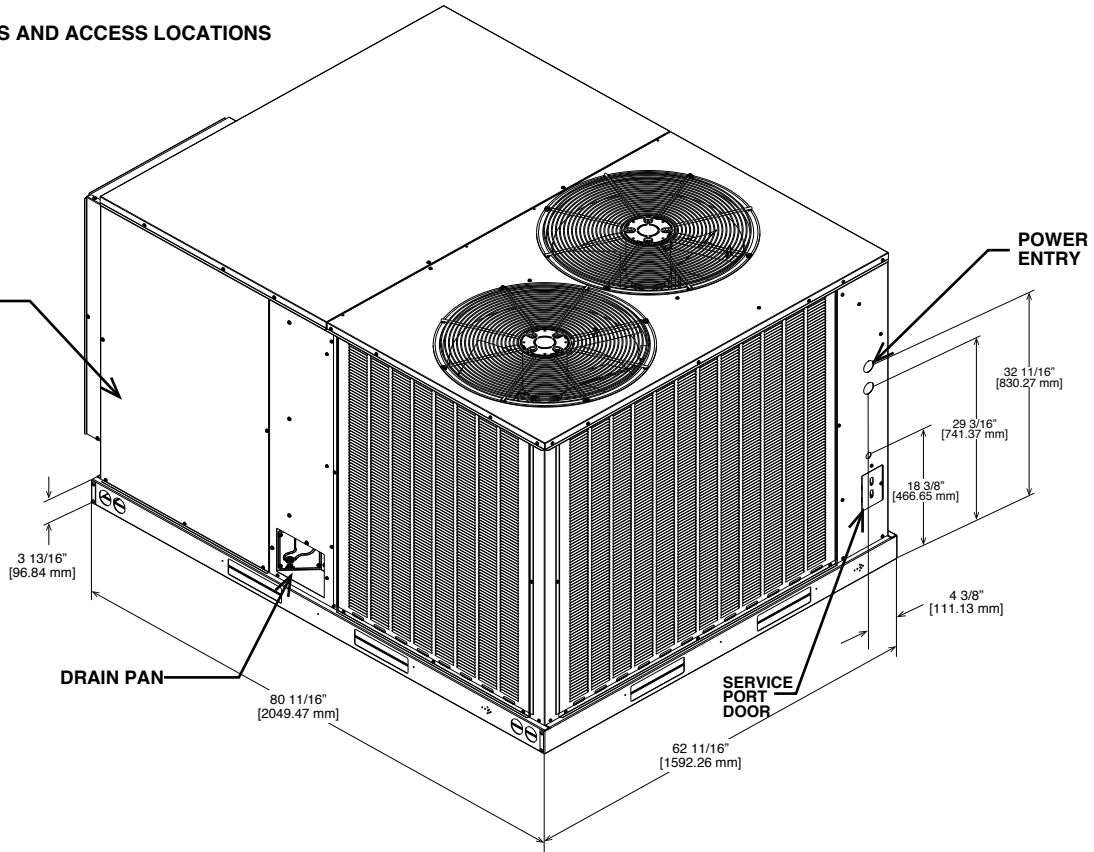
- 400 PSIG Pressure Rating
- Dept. of Transportation 4BA400 or BW400

▲ CAUTION

R-410A systems operate at higher pressures than R-22 systems. Do not use R-22 service equipment or components on R-410A equipment.

**FIGURE 1
UNIT DIMENSIONS AND ACCESS LOCATIONS**

INDOOR COIL ACCESS



**FIGURE 2
UNIT DIMENSIONS AND ACCESS LOCATIONS**

CONTROL ACCESS

ACCESS PANEL COMPRESSOR

ACCESS PANEL BLOWER

FILTER RACK

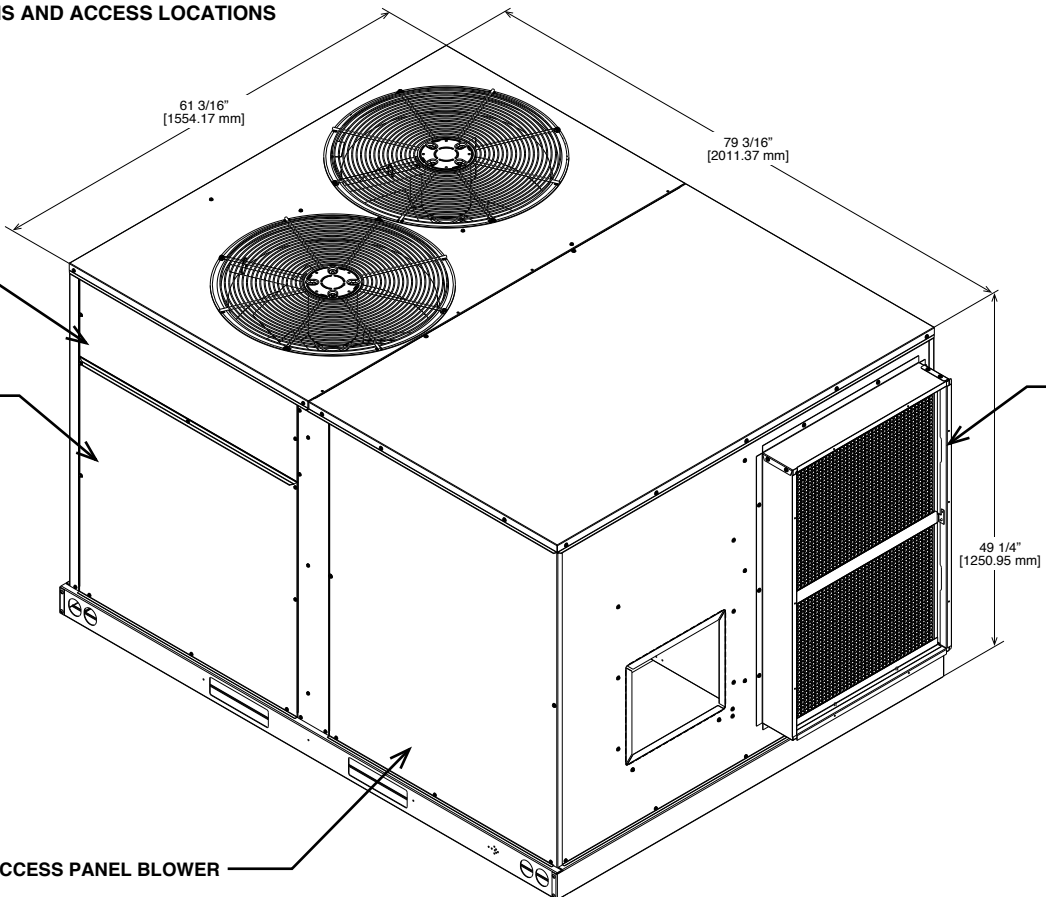
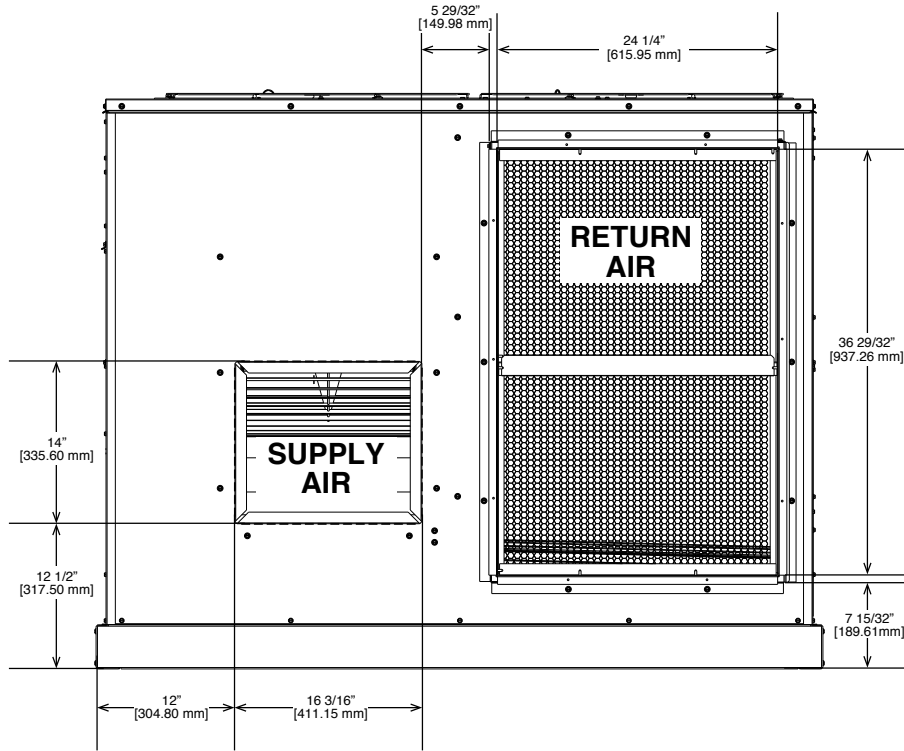


FIGURE 3
REAR VIEW



GENERAL DATA - *MRHRX MODELS

NOM. SIZES 8.0-10.0 TON [28.1 - 35.2 kW]

Model -MRHRX Series	096AVA	102ANA	120AVA	120ANA
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)⁵	78	81	90	84
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18.00]	0.81 [20.6]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	25.4 [2.36]	25.6 [2.38]	25.6 [2.38]	25.6 [2.38]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1 [25.4]	1.26 [32]	1.26 [32]	1.26 [32]
Face Area sq. ft. [sq. m]	11 [1.02]	10.9 [1.01]	10.9 [1.01]	10.9 [1.01]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	2/24 [609.6]	2/24 [609.6]	2/24 [609.6]	2/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	8000 [3775]	8000 [3775]	8500 [4011]	9000 [4247]
No. Motors/HP	2 at 1/5 HP	2 at 1/3 HP	2 at 1/3 HP	2 at 3/4 HP
Motor RPM	820	1075	1075	1100
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/15x15 [381x381]	1/15x15 [381x381]	1/15x15 [381x381]	1/15x15 [381x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds	Single	Single	Single	Single
No. Motors	1	1	1	1
Motor HP	2	3	2	3
Motor RPM	1725	1725	1725	1725
Motor Frame Size	56	56	56	56
Filter - Type	Permanent	Permanent	Permanent	Permanent
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(2) .875x18x24 [22x457x610]	(2) .875x18x24 [22x457x610]	(2) .875x18x24 [22x457x610]	(2) .875x18x24 [22x457x610]
Refrigerant Charge Oz. [g]	98 [2778]	120 [3411]	134 [3799]	128 [3629]
Weights				
Net Weight lbs. [kg]	757 [343]	757 [343]	827 [375]	827 [375]
Ship Weight lbs. [kg]	799 [362]	799 [362]	869 [394]	869 [394]

*E or V

ELECTRICAL DATA - *MRHR

ELECTRICAL DATA - *MRHR SERIES					
		X096AVA	X102ANA	X120AVA	X120ANA
Unit Information	Unit Operating Voltage Range	342-440	342-456	342-440	342-456
	Volts	380/400	380/415	380/400	380/415
	Phase	3	3	3	3
	Hz	60	50	60	50
	Minimum Circuit Ampacity	23	26	28	30
	Minimum Overcurrent Protection Device Size	30	30	35	35
	Maximum Overcurrent Protection Device Size	35	40	40	45
Compressor Motor	No.	1	1	1	1
	Volts	380	380/420	380	380/420
	Phase	3	3	3	3
	RPM	3500	2900	3500	2900
	Amps (RLA), Comp. 1	13.9	14.7	16.0	16.0
	Amps (LRA), Comp. 1	94.3	128	135	139
Condenser Motor	No.	2	2	2	2
	Volts	380/400	380/415	380/400	380/415
	Phase	1	1	1	1
	HP	1/5	1/3	1/3	3/4
	Amps (FLA, each)	0.8	1.0	1.7	2.3
	Amps (LRA, each)	1.1	1.8	2.5	4.9
Evaporator Fan	No.	1	1	1	1
	Volts	380/400	380/415	380/400	380/415
	Phase	3	3	3	3
	HP	2	3	2	3
	Amps (FLA, each)	3.75	5.3	3.75	5.3
	Amps (LRA, each)	27.4	38.1	27.4	38.1

***E or V**

VI. INSTALLATION

A. GENERAL

1. PRE-INSTALLATION CHECK-POINTS

Before attempting any installation, the following points should be carefully considered:

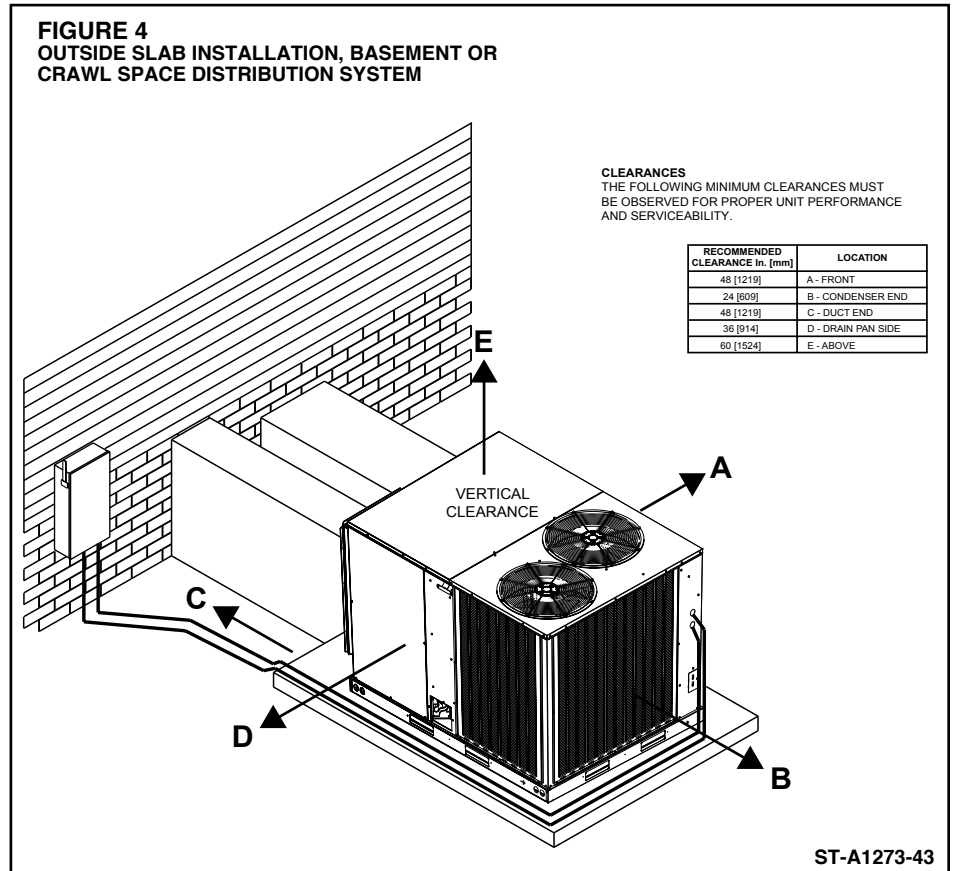
- Structural strength of supporting members.
(rooftop installation)
- Clearances and provision for servicing.
- Power supply and wiring.
- Air duct connections.
- Drain facilities and connections.
- Location for minimum noise.

2. LOCATION

These units are designed for outdoor installations. They can be mounted on a slab or rooftop. They are not to be installed within any part of a structure such as an attic, crawl space, closet, or any other place where condenser air flow is restricted or other than outdoor ambient conditions prevail. Since the application of the units is of the outdoor type, it is important to consult your local code authorities at the time the first installation is made.

B. OUTSIDE SLAB INSTALLATION (Typical outdoor slab installations are shown in Figure 4.)

- Select a location where external water drainage cannot collect around the unit.
- Provide a level concrete slab extending 3" [76.2 mm] beyond all four sides of the unit. The slab should be sufficient above grade to prevent ground water from entering the unit. **IMPORTANT:** To prevent transmission of noise or vibration, slab should not be connected to building structure.



3. The location of the unit should be such as to provide proper access for inspection and servicing.
4. Locate unit where operating sounds will not disturb owner or neighbors.
5. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.

C. CLEARANCES

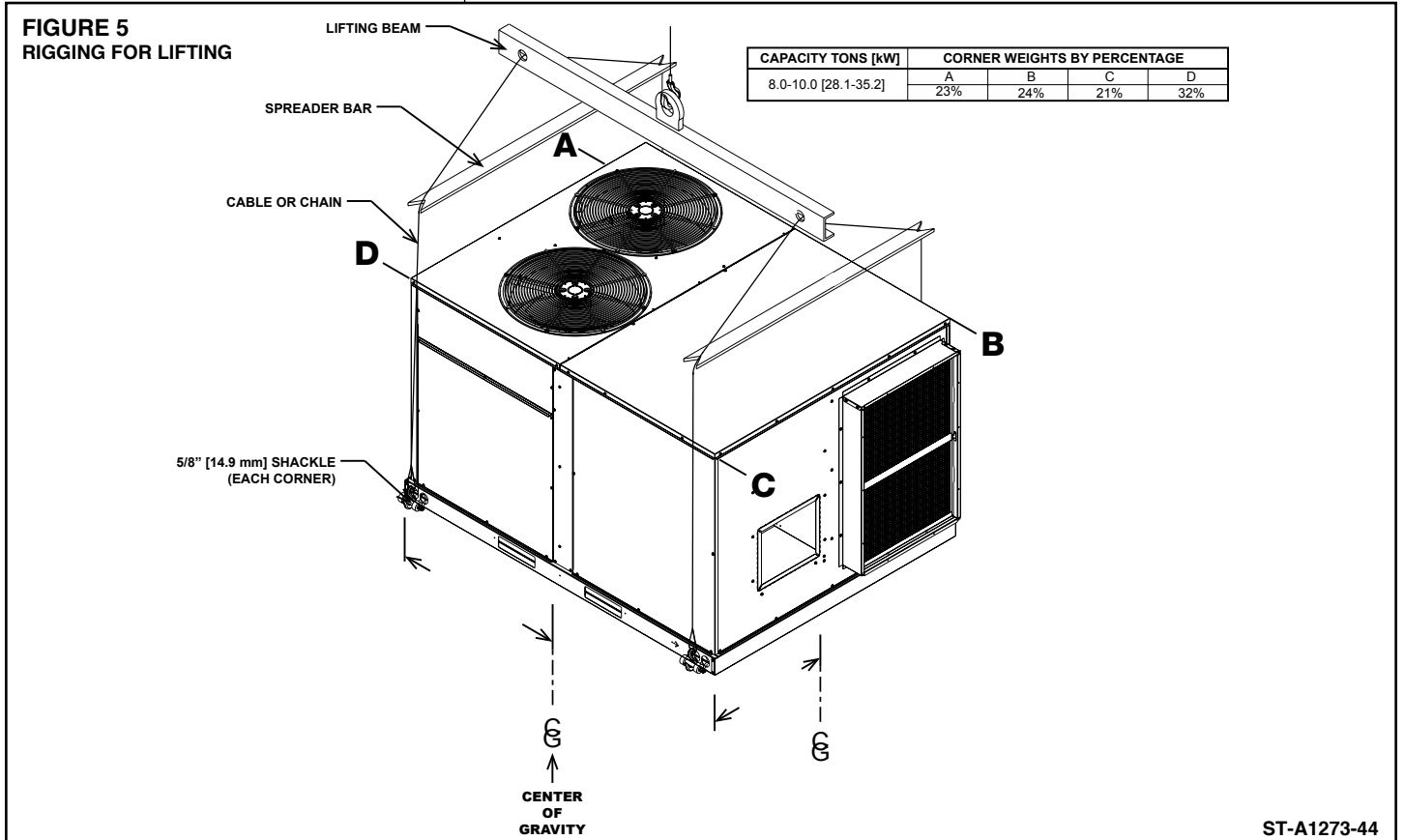
The following minimum clearances must be observed for proper unit performance and serviceability.

1. Unit is design certified for application on combustible flooring with 0" [0 mm] minimum clearance.
2. See Figure 4 for illustration of minimum installation-service clearances.

D. ROOFTOP INSTALLATION

1. Before locating the unit on the roof, make sure that the strength of the roof and beams is adequate at that point to support the weight involved. **This is very important and user's responsibility.**
2. For rigging details, see Figures 5. Use field-furnished spreaders.
3. The unit should be placed on a solid and level platform of adequate strength.
4. The location of the unit on the roof should be such as to provide proper access for inspection and servicing.

IMPORTANT: If unit will not be put into service immediately, cover supply and return openings to prevent excessive condensation.



VII. DUCTWORK

Ductwork should be fabricated by the installing contractor in accordance with local codes and NFPA90A. Industry manuals may be used as a guide when sizing and designing the duct system - contact Air Conditioning Contractors of America, 1513 16th St. N.W., Washington, D.C. 20036.

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.

The unit should be placed as close to the space to be air conditioned as possible allowing clearance dimensions as indicated. Ducts should be run as directly as possible to supply and return outlets. Use of non-flammable waterproof flexible connectors on both supply and return connections at the unit to reduce noise transmission is recommended.

It is preferable to install the unit on the roof of the structure if the registers or diffusers are located on the wall or in the ceiling. A slab installation could be considered when the registers are low on a wall or in the floor.

On ductwork exposed to outside air conditions of temperature and humidity, use a minimum of 2" [50.8 mm] of insulation and a vapor barrier. Distribution system in attic, furred space or crawl space should be insulated with at least 2" [50.8 mm] of insulation with vapor barrier. One-half to 1" [25.4 mm] thickness of insulation is usually sufficient for ductwork inside the air conditioned space.

Balancing dampers should be provided for each branch duct in the supply system. Ductwork should be properly supported from the structure.

VIII. FILTERS

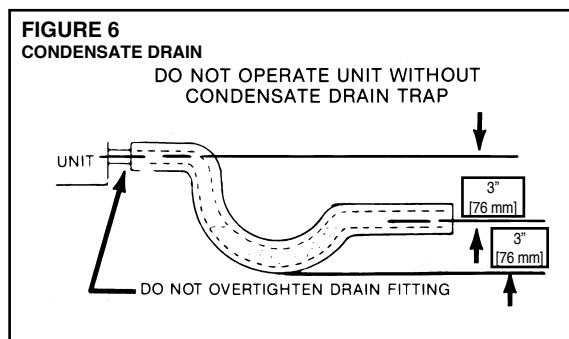
Permanent filter(s) are provided with this unit. See General Data for size(s) and quantity.

IX. CONDENSATE DRAIN

IMPORTANT: Install a condensate trap to ensure proper condensate drainage. See Figure 6.

The condensate drain pan has a threaded female $\frac{3}{4}$ inch NPT connection. Consult local codes or ordinances for specific requirements of condensate drain piping and disposal.

- To use the removable drain pan feature of this unit, some of the condensate line joints should be assembled for easy removal and cleaning.
- Use a thin layer of Teflon tape or paste on drain pan connections and install only hand tight.
- Do not over tighten drain pan connections as damage to the drain pan may occur.
- Drain line MUST NOT block service access panels.
- Drain line must be no smaller than drain pan outlet and adequately sized to accommodate the condensate discharge from the unit.
- Drain line should slope away from unit a minimum of $\frac{1}{8}$ " per foot to ensure proper drainage.
- Drain line must be routed to an acceptable drain or outdoors in accordance with local codes.
- Do not connect condensate drain line to a closed sewer pipe.
- Drain line may need insulation or freeze protection in certain applications.



⚠ WARNING

TURN OFF ELECTRIC POWER AT THE FUSE BOX OR SERVICE PANEL BEFORE MAKING ANY ELECTRICAL CONNECTIONS.

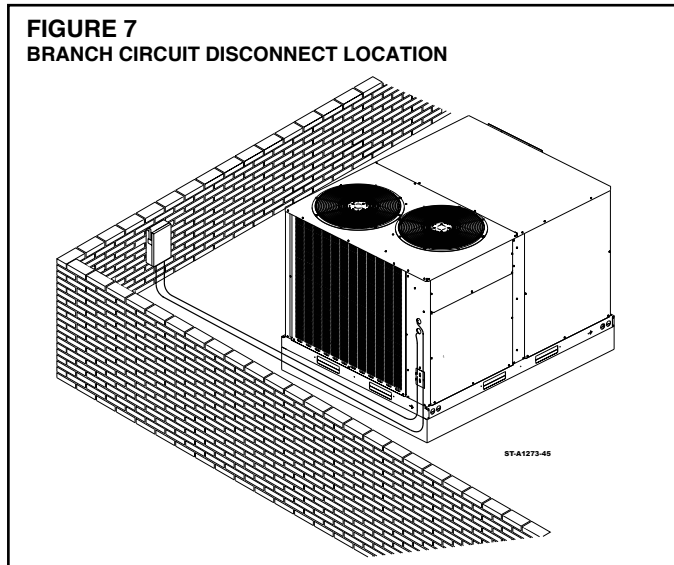
ALSO, THE GROUND CONNECTION MUST BE COMPLETED BEFORE MAKING LINE VOLTAGE CONNECTIONS. FAILURE TO DO SO CAN RESULT IN ELECTRICAL SHOCK, SEVERE PERSONAL INJURY OR DEATH.

X. ELECTRICAL WIRING

Field wiring must comply with the National Electrical Code (CEC in Canada) and local ordinances that may apply.

A. POWER WIRING

1. This unit supports single point electrical connection.
2. It is important that proper electrical power is available to the unit. Voltage should not vary more than 10% from the values marked on the unit rating plate. Phase voltages must be balanced within 3%.
3. Install a branch circuit disconnect within sight of the unit. See Figure 7. Use the unit rating plate or *MRHR Electrical Data to determine the required size.
4. The branch circuit wire must be sized in accordance with the National Electrical Code and local ordinances that may apply using the minimum circuit ampacity found on the unit rating plate.
5. Field-installed power wiring must be run through grounded rain-tight conduit attached to the unit power entry panel and connected as follows:



B. CONTROL WIRING (Class II)

1. Low voltage wiring should not be run in conduit with power wiring.
2. Control wiring is routed through the 7/8" [22 mm] hole in the unit side panel. Use a minimum #18 AWG thermostat wire. For wire lengths exceeding 50' [15.24 m] use #16 AWG thermostat wire. Connect the control wiring to the low voltage terminal block located on the unit integrated control. Route wires under the control voltage shield. See Figure 13.
3. It is necessary that only approved thermostats be used. Please contact your distributor for part number information. See thermostat specification catalog for recommended thermostat.
4. Figure 8 shows representative low voltage connection diagrams. Read your thermostat installation instructions for any special requirements for your specific thermostat.

C. INTERNAL WIRING

1. A diagram of the internal wiring of this unit is located on the inside of the control access panel and in this manual. If any of the original wiring must be replaced, the wire gauge and insulation must be the same as original wiring.

D. GROUNDING

WARNING

THE UNIT MUST BE PERMANENTLY GROUNDED. A GROUNDING LUG IS PROVIDED IN THE ELECTRIC HEAT ACCESS AREA FOR A GROUND WIRE. FAILURE TO GROUND THIS UNIT CAN RESULT IN FIRE OR ELECTRICAL SHOCK CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

E. THERMOSTAT

The thermostat should be mounted on an inside wall about five feet above the floor in a location where it will not be affected by unconditioned air, sun, or drafts from open doors or other sources. READ installation instructions in air conditioner thermostat package CAREFULLY because each has some different wiring requirements.

XI. INDOOR AIR FLOW DATA

Belt-drive blower models have motor sheaves set for proper CFM at a typical external static. See pages 17 - 20 for blower performance.

XII. PRE-START CHECK

1. Is unit properly located and slightly slanted toward indoor condensate drain?
2. Is ductwork insulated, weatherproofed, with proper spacing to combustible materials?
3. Is air free to travel to and from outdoor coil? (See Figure 3.)
4. Is the wiring correct, tight, and according to unit wiring diagram?
5. Is unit grounded?
6. Are field supplied air filters in place and clean?
7. Do the outdoor fan and indoor blower turn freely without rubbing, and are they tight on the motor shafts?

XIII. STARTUP

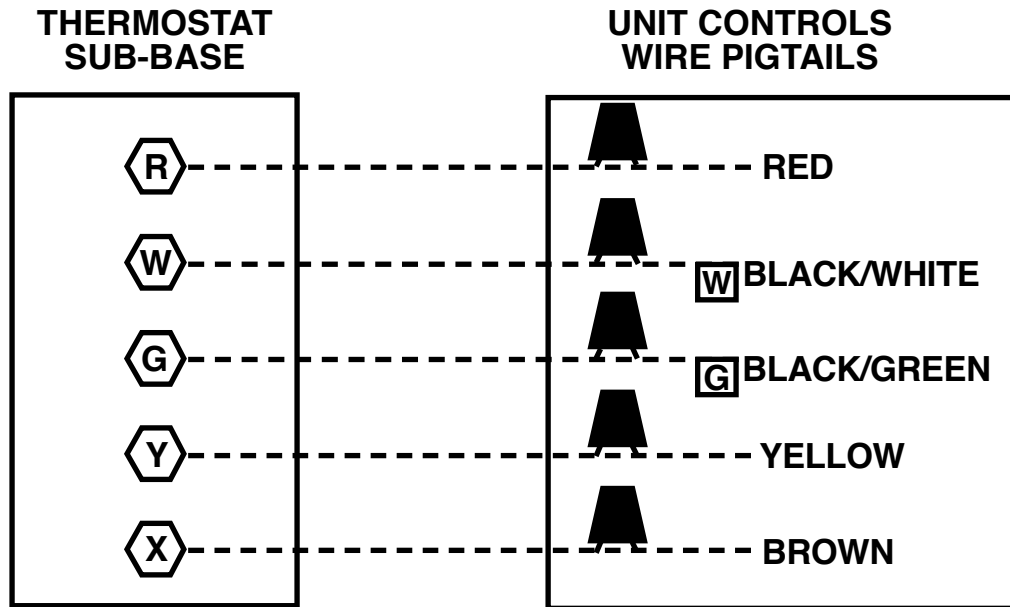
1. Turn thermostat to "OFF," turn "on" power supply at disconnect switch.
2. Turn temperature setting as high as it will go.
3. Turn fan switch to "ON."
4. Indoor blower should run. Be sure it is running in the right direction.
5. Turn fan switch to "AUTO." Turn system switch to "COOL" and turn temperature setting below room temperature. Unit should run in cooling mode.
6. Is outdoor fan operating correctly in the right direction?
7. Is compressor running correctly.

Record the following after the unit has run some time.

- A. Operating Mode _____
- B. Discharge Pressures (High) _____ PSIG [kPa]
- C. Vapor Pressure at Compressors (Low) _____ PSIG [kPa]
- D. Vapor Line Temperature at Compressors _____ °F [C°].
- E. Indoor Dry Bulb _____ °F [C°].
- F. Indoor Wet Bulb _____ °F [C°].
- G. Outdoor Dry Bulb _____ °F [C°].
- H. Outdoor Wet Bulb _____ °F [C°].
- I. Voltage at Contactor _____ Volts
- J. Current at Contactors _____ Amps
- K. Model Number _____
- L. Serial Number _____
- M. Location _____
- N. Owner _____
- O. Date _____

8. Turn thermostat system switch to "HEAT." Unit compressors should stop. Raise temperature setting to above room temperature. Unit should run in heating mode and auxiliary heaters, if installed, should come on.
9. Check the refrigerant charge using the instructions located on unit charging chart. Replace service port caps. Service port cores are for system access only and will leak if not tightly capped.

FIGURE 8
VOLTAGE CONNECTIONS DIAGRAMS - STANDARD CONTROL WIRING



10. Adjust discharge air grilles and balance system.
11. Check ducts for condensation and air leaks.
12. Check unit for tubing and sheet metal rattles.
13. Instruct the owner on operation and maintenance.
14. Leave "INSTALLATION" and "USE AND CARE" instructions with owner.

XIV. OPERATION

COOLING MODE

With thermostat in the cool mode, fan auto and the room temperature higher than the thermostat setting:

- A. Indoor blower contactor is energized through thermostat contact (G).
- B. Compressor contactor is energized through thermostat contacts (Y) and safety controls.
- C. The system will continue in cooling operation as long as all safety controls are closed, until the thermostat is satisfied.

HEATING MODE

With the thermostat in heat mode, fan on auto, and the room temperature lower than the thermostat setting, the Indoor blower contactor is energized through thermostat contact (G).



WARNING

ONLY ELECTRIC HEATER KITS SUPPLIED BY THIS MANUFACTURER AS DESCRIBED IN THIS PUBLICATION HAVE BEEN DESIGNED, TESTED, AND EVALUATED 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.

In the heating mode, the thermostat will energize one or more supplementary heaters.

XV. MISCELLANEOUS

REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

AIRFLOW PERFORMANCE - EMRHR *102*

Air Flow CFM [L/s]		Voltage 380-415 / 3 phase / 50 Hz																							
		External Static Pressure — Inches of Water [kPa]																							
		0.1 [0.2]	0.2 [0.05]	0.3 [0.07]	0.4 [0.10]	0.5 [0.12]	0.6 [0.15]	0.7 [0.17]	0.8 [0.20]	0.9 [0.22]	1.0 [0.25]	1.1 [0.27]													
RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W		
2700 [1274]	—	—	497	588	633	567	685	601	743	634	809	668	880	—	—	—	—	—	—	—	—	—	—		
2800 [1321]	—	—	505	617	539	684	573	717	607	777	640	844	672	918	—	—	—	—	—	—	—	—	—	—	
2900 [1368]	—	—	512	648	546	696	580	752	613	814	645	882	677	958	—	—	—	—	—	—	—	—	—	—	
3000 [1416]	—	—	520	681	553	732	586	789	619	852	651	923	682	1000	—	—	—	—	—	—	—	—	—	—	
3100 [1463]	—	494	672	717	561	769	593	828	625	893	657	965	688	1044	—	—	—	—	—	—	—	—	—	—	
3200 [1510]	—	503	708	755	568	809	600	870	632	937	663	1010	—	—	—	—	—	—	—	—	—	—	—	—	
3300 [1557]	—	511	747	796	576	851	607	913	638	982	669	1058	—	—	—	—	—	—	—	—	—	—	—	—	
3400 [1604]	—	520	788	839	583	896	614	960	645	1030	675	1107	—	—	—	—	—	—	—	—	—	—	—	—	
3500 [1652]	497	786	529	832	560	884	591	943	622	1008	652	1081	681	1159	—	—	—	—	—	—	—	—	—	—	
3600 [1699]	506	830	538	878	569	932	599	992	629	1059	659	1133	688	1214	—	—	—	—	—	—	—	—	—	—	
3700 [1746]	516	877	547	926	577	981	607	1044	637	1113	666	1188	—	—	—	—	—	—	—	—	—	—	—	—	
3800 [1793]	526	926	556	976	586	1034	616	1098	645	1168	673	1246	—	—	—	—	—	—	—	—	—	—	—	—	
3900 [1840]	536	977	566	1029	595	1088	624	1154	653	1226	681	1305	—	—	—	—	—	—	—	—	—	—	—	—	
4000 [1888]	546	1030	576	1084	605	1145	633	1213	661	1287	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
4100 [1935]	557	1086	585	1142	614	1204	642	1274	669	1349	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

Drive Package	A				
Motor H.P. [W]	3 [2237.1]				
Blower Sheave	AK79H				
Motor Sheave	1VP40*7/8				
Belt	A59				
Turns Open	0	1	2	3	5
RPM	680	645	608	572	496

- NOTES:
1. Factory sheave settings are shown in bold type.
 2. Do not set motor sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure
 4. Drive data shown is for horizontal airflow with wet coil.

AIRFLOW PERFORMANCE - EMRHR *120*

AIRFLOW PERFORMANCE — 10 TON [35.1kW] — 50 Hz — SIDEFLOW

Air Flow CFM [L/s]		Model EMRHR*120* Voltage 380-415 / 3 phase / 50 Hz																							
		External Static Pressure — Inches of Water [kPa]																							
		0.1 [0.02]		0.2 [0.05]		0.3 [0.07]		0.4 [0.10]		0.5 [0.12]		0.6 [0.15]		0.7 [0.17]		0.8 [0.20]		0.9 [0.22]		1.0 [0.25]		1.1 [0.27]			
RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W				
3200 [1510]	—	—	—	—	—	—	—	563	771	595	830	626	895	656	965	687	1040	717	1121	747	1208	—			
3300 [1557]	—	—	—	—	—	—	—	571	809	602	870	632	937	663	1009	693	1087	723	1170	753	1259	—			
3400 [1604]	—	—	—	—	—	—	—	578	850	609	913	639	982	669	1057	699	1137	728	1223	758	1314	—			
3500 [1652]	—	—	—	—	—	556	833	586	893	616	959	646	1030	675	1107	705	1190	734	1278	763	1371	—			
3600 [1699]	—	—	—	—	—	564	878	594	940	623	1008	653	1082	682	1161	711	1245	740	1336	769	1431	—			
3700 [1746]	—	—	—	—	—	572	925	601	990	631	1060	660	1136	689	1217	717	1304	746	1396	—	—	—			
3800 [1793]	—	—	—	—	—	580	975	609	1042	638	1115	667	1193	696	1277	724	1366	752	1460	—	—	—			
3900 [1840]	—	—	—	—	560	965	589	1029	617	1098	646	1173	674	1253	703	1430	758	1527	—	—	—	—			
4000 [1888]	—	—	—	—	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	—	—			
4100 [1935]	—	—	—	—	578	1076	606	1144	634	1218	662	1297	689	1382	717	1473	744	1569	—	—	—	—			
4200 [1982]	559	1071	587	1136	615	1207	642	1283	670	1364	697	1451	724	1544	751	1642	—	—	—	—	—	—			
4300 [2029]	569	1132	596	1199	624	1272	651	1350	678	1434	705	1524	732	1619	758	1719	—	—	—	—	—	—			
4400 [2076]	578	1196	606	1265	633	1340	660	1421	686	1507	713	1599	739	1696	765	1799	—	—	—	—	—	—			
4500 [2123]	588	1263	615	1334	642	1412	669	1494	695	1583	721	1677	747	1776	—	—	—	—	—	—	—	—			
4600 [2171]	598	1332	625	1406	651	1486	678	1571	704	1662	729	1758	755	1860	—	—	—	—	—	—	—	—			
4700 [2218]	609	1405	635	1481	661	1563	687	1650	712	1743	738	1842	763	1946	—	—	—	—	—	—	—	—			
4800 [2265]	619	1481	645	1559	670	1643	696	1733	721	1828	746	1929	771	2035	—	—	—	—	—	—	—	—			

Drive Package	A				
Motor H.P. [W]	3 [2237.1]				
Blower Sheave	AK71H				
Motor Sheave	1VP40*7/8				
Belt	A57				
Turns Open	0	1	2	3	4
RPM	758	722	683	642	599
				5	558

- NOTES:
1. Factory sheave settings are shown in bold type.
 2. Do not set motor sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure
 4. Drive data shown is for horizontal airflow with wet coil.

AIRFLOW PERFORMANCE - EMRHR *096*

Air Flow CFM [L/s]		Model EMRHR*096* Voltage 380-400 / 3 phase / 60 Hz																							
		External Static Pressure — Inches of Water [kPa]																							
		0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]			
RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W		
2500 [1180]	—	—	—	466	567	505	619	543	681	580	751	616	831	651	920	—	—	—	—	—	—	—			
2600 [1227]	—	—	—	473	595	511	650	549	713	585	786	620	868	655	959	—	—	—	—	—	—	—			
2700 [1274]	—	—	—	481	625	518	682	555	748	590	823	625	907	659	1001	—	—	—	—	—	—	—			
2800 [1321]	—	—	—	489	657	525	716	561	784	596	862	630	948	663	1044	—	—	—	—	—	—	—			
2900 [1368]	—	—	—	460	639	497	691	533	753	568	823	602	903	635	992	—	—	—	—	—	—	—			
3000 [1416]	—	—	—	469	673	505	728	540	791	574	864	608	946	640	1037	—	—	—	—	—	—	—			
3100 [1463]	—	—	—	478	710	513	766	548	832	581	907	614	992	646	1085	—	—	—	—	—	—	—			
3200 [1510]	451	698	487	748	807	522	807	556	875	589	953	621	1039	652	1135	—	—	—	—	—	—	—			
3300 [1557]	462	737	497	789	850	531	850	564	921	596	1000	627	1089	658	1187	—	—	—	—	—	—	—			
3400 [1604]	472	777	506	832	895	540	895	572	968	604	1050	634	1141	664	1241	—	—	—	—	—	—	—			
3500 [1652]	483	820	517	876	942	549	942	581	1017	612	1101	641	1195	—	—	—	—	—	—	—	—	—			
3600 [1699]	494	865	527	924	992	559	992	590	1069	620	1155	649	1251	—	—	—	—	—	—	—	—	—			
3700 [1746]	505	912	537	973	1043	568	1043	599	1123	628	1211	656	1309	—	—	—	—	—	—	—	—	—			
3800 [1793]	517	961	548	1024	1097	578	1097	608	1179	636	1270	664	1370	—	—	—	—	—	—	—	—	—			
3900 [1840]	528	1012	559	1078	1153	589	1153	617	1237	645	1330	—	—	—	—	—	—	—	—	—	—	—			

Drive Package	A					
Motor H.P. [W]	2 [1491.4]					
Blower Sheave	AK84H					
Motor Sheave	1VP34*7/8					
Belt	A58					
Turns Open	0	1	2	3	4	5
RPM	659	619	580	537	495	453

- NOTES:
1. Factory sheave settings are shown in bold type.
 2. Do not set motor sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure
 4. Drive data shown is for horizontal airflow with wet coil.

AIRFLOW PERFORMANCE - EMRHR *120*

AIRFLOW PERFORMANCE — 10 TON [35.1kW] — 60 Hz — SIDEFLOW

Air Flow CFM [L/s]	Model EMRHR*120* Voltage 380-400 / 3 phase / 60 Hz																							
	External Static Pressure												Inches of Water [kPa]											
	0.1 [0.02]	0.2 [0.05]	0.3 [0.07]	0.4 [0.10]	0.5 [0.12]	0.6 [0.15]	0.7 [0.17]	0.8 [0.20]	0.9 [0.22]	1.0 [0.25]	1.1 [0.27]	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	
3200 [1510]	—	—	—	—	608	921	640	1005	672	1089	703	1174	733	1260	762	1346	790	1433	—	—	—	—		
3300 [1557]	—	—	—	—	616	967	648	1053	679	1139	709	1226	739	1313	767	1401	794	1489	—	—	—	—		
3400 [1604]	—	—	—	591	931	1018	655	1105	686	1192	716	1281	744	1369	772	1459	799	1549	—	—	—	—		
3500 [1652]	—	—	—	600	984	1072	663	1160	693	1249	722	1339	750	1429	778	1520	804	1612	—	—	—	—		
3600 [1699]	—	—	—	609	1040	1129	671	1219	700	1310	729	1401	756	1493	783	1585	—	—	—	—	—	—		
3700 [1746]	—	—	586	1009	649	1190	678	1282	707	1374	735	1467	762	1560	788	1654	—	—	—	—	—	—		
3800 [1793]	—	—	596	1071	627	1162	657	1255	686	1348	715	1442	742	1536	769	1631	794	1726	—	—	—	—		
3900 [1840]	—	—	606	1136	636	1229	666	1323	694	1418	722	1513	749	1608	775	1705	800	1802	—	—	—	—		
4000 [1888]	—	—	616	1204	645	1299	674	1395	702	1491	730	1587	756	1685	781	1783	806	1881	—	—	—	—		
4100 [1935]	—	595	1181	625	1277	655	1373	683	1470	711	1568	737	1666	763	1765	788	1864	—	—	—	—	—		
4200 [1982]	—	606	1255	635	1353	664	1451	692	1549	719	1648	745	1748	770	1848	794	1949	—	—	—	—	—		
4300 [2029]	586	1235	616	1333	646	1432	674	1531	701	1631	727	1732	753	1833	777	1935	801	2037	—	—	—	—		
4400 [2076]	598	1315	627	1415	656	1515	683	1616	710	1717	736	1820	761	1922	785	2025	808	2129	—	—	—	—		
4500 [2123]	609	1399	638	1500	666	1602	693	1704	719	1807	744	1911	769	2015	792	2120	—	—	—	—	—	—		
4600 [2171]	621	1486	649	1588	676	1692	703	1796	728	1900	753	2005	777	2111	799	2217	—	—	—	—	—	—		
4700 [2218]	632	1576	660	1681	687	1785	713	1891	738	1997	762	2103	785	2211	807	2318	—	—	—	—	—	—		
4800 [2265]	644	1671	671	1776	697	1883	723	1990	747	2097	770	2205	793	2314	—	—	—	—	—	—	—	—		

Drive Package	A					
Motor H.P. [W]	2 [1491.4]					
Blower Sheave	AK79H					
Motor Sheave	1VL40*7/8					
Belt	A58					
Turns Open	0	1	2	3	4	5
RPM	790	753	716	675	632	590

- NOTES:
1. Factory sheave settings are shown in bold type.
 2. Do not set motor sheave below minimum or maximum turns open shown.
 3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure
 4. Drive data shown is for horizontal airflow with wet coil.

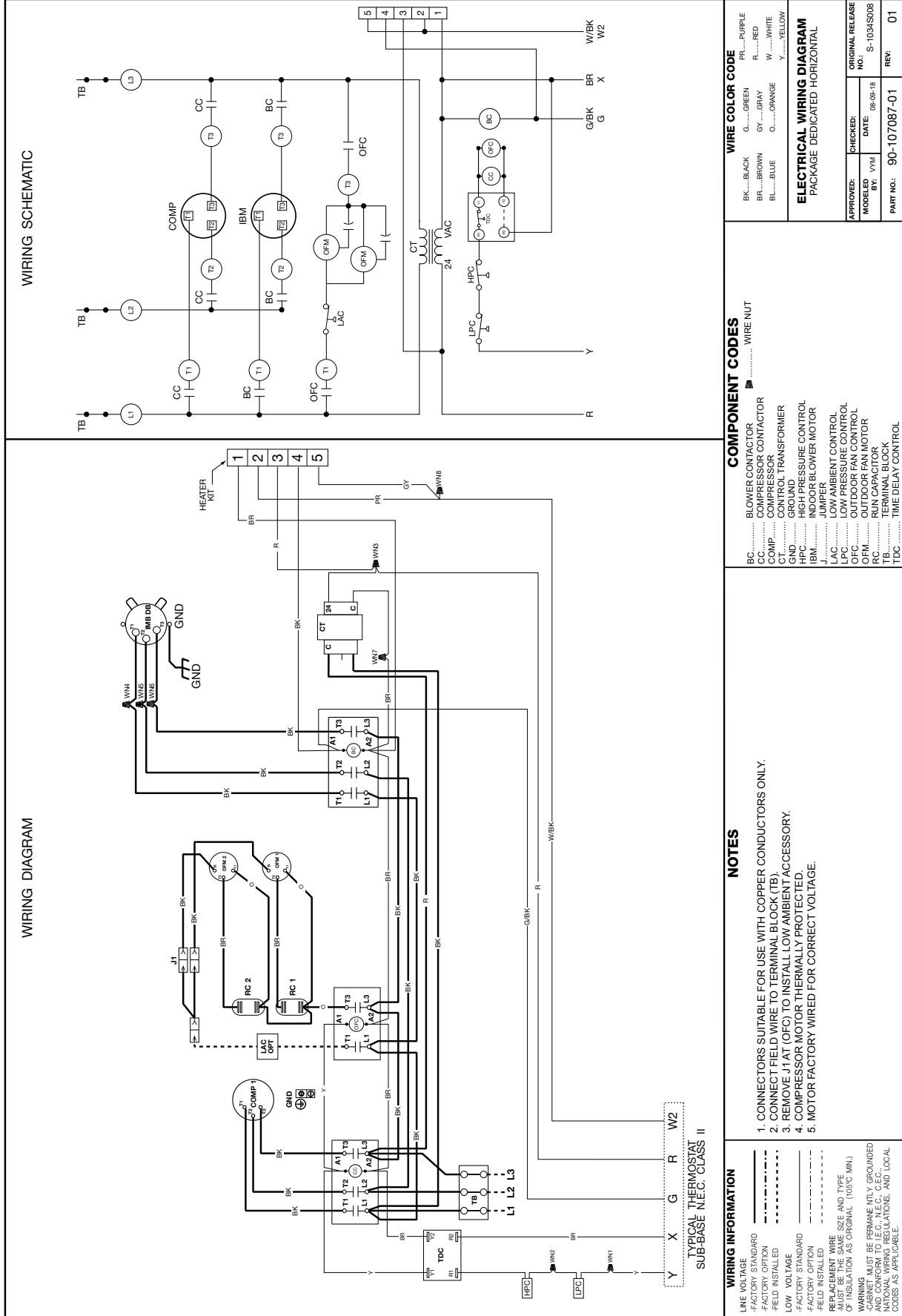
XVI. TROUBLESHOOTING CHART

▲ WARNING

DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

SYMPTOM	POSSIBLE CAUSE	REMEDY
Unit will not run	<ul style="list-style-type: none"> • Power off or loose electrical connection • Thermostat out of calibration-set too high • Defective contactor • Blown fuses • Transformer defective • High pressure control open (if provided) • Interconnecting low voltage wiring damaged 	<ul style="list-style-type: none"> • Check for correct voltage at compressor contactor in control box • Reset • Check for 24 volts at contactor coil - replace if contacts are open • Replace fuses • Check wiring-replace transformer • Reset-also see high head pressure remedy- • Replace thermostat wiring
Condenser fan runs, compressor doesn't	<ul style="list-style-type: none"> • Run capacitor defective (single phase only) • Loose connection • Compressor stuck, grounded or open motor winding open internal overload. • Low voltage condition 	<ul style="list-style-type: none"> • Replace • Check for correct voltage at compressor - check & tighten all connections • Wait at least 2 hours for overload to reset. If still open, replace the compressor. At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Insufficient cooling	<ul style="list-style-type: none"> • Improperly sized unit • Improper airflow • Incorrect refrigerant charge • Air, non-condensibles or moisture in system • Incorrect voltage 	<ul style="list-style-type: none"> • Recalculate load • Check - should be approximately 400 CFM [188.78 L/s] per ton. • Charge per procedure attached to unit service panel. • Recover refrigerant, evacuate & recharge, add filter drier • At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	<ul style="list-style-type: none"> • Incorrect voltage • Defective overload protector • Refrigerant undercharge 	<ul style="list-style-type: none"> • At compressor terminals, voltage must be \pm 10% of nameplate marking when unit is operating. • Replace - check for correct voltage • Add refrigerant
Registers sweat	<ul style="list-style-type: none"> • Low evaporator airflow • Room thermostat set too low 	<ul style="list-style-type: none"> • Increase speed of blower or reduce restriction - replace air filter • Raise thermostat set point
High head-low vapor pressures	<ul style="list-style-type: none"> • Restriction in liquid line, expansion device or filter drier • Flow check piston size too small • Incorrect capillary tubes 	<ul style="list-style-type: none"> • Remove or replace defective component • Change to correct size piston • Change coil assembly
High head-high or normal vapor pressure - Cooling mode	<ul style="list-style-type: none"> • Dirty condenser coil • Refrigerant overcharge • Condenser fan not running • Air or non-condensibles in system 	<ul style="list-style-type: none"> • Clean coil • Correct system charge • Repair or replace • Recover refrigerant, evacuate & recharge
High head-high or normal vapor pressure - Heating mode	<ul style="list-style-type: none"> • Low air flow - condenser coil • Refrigerant overcharge • Air or non-condensibles in system • Dirty condenser coil 	<ul style="list-style-type: none"> • Check filters - correct to speed • Correct system charge • Recover refrigerant, evacuate & recharge • Check filter - clean coil
Low head-high vapor pressures	<ul style="list-style-type: none"> • Defective Compressor valves 	<ul style="list-style-type: none"> • Replace compressor
Low vapor - cool compressor - iced evaporator coil	<ul style="list-style-type: none"> • Low evaporator airflow • Operating below 65°F outdoors • Moisture in system • Liquid line limiting refrigerant flow 	<ul style="list-style-type: none"> • Increase speed of blower or reduce restriction - replace air filter • Add Low Ambient Kit • Recover refrigerant - evacuate & recharge - add filter drier • Replace drier
High vapor pressure	<ul style="list-style-type: none"> • Excessive load • Defective compressor 	<ul style="list-style-type: none"> • Recheck load calculation • Replace
Fluctuating head & vapor pressures	<ul style="list-style-type: none"> • Severe overcharge • Air or non-condensibles in system 	<ul style="list-style-type: none"> • Adjust refrigerant charge • Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	<ul style="list-style-type: none"> • Air or non-condensibles in system 	<ul style="list-style-type: none"> • Recover refrigerant, evacuate & recharge

XVII. WIRING DIAGRAMS



XVIII. CHARGE CHARTS

FIGURE 21

SYSTEM CHARGE CHART - REFRIGERANT 410A

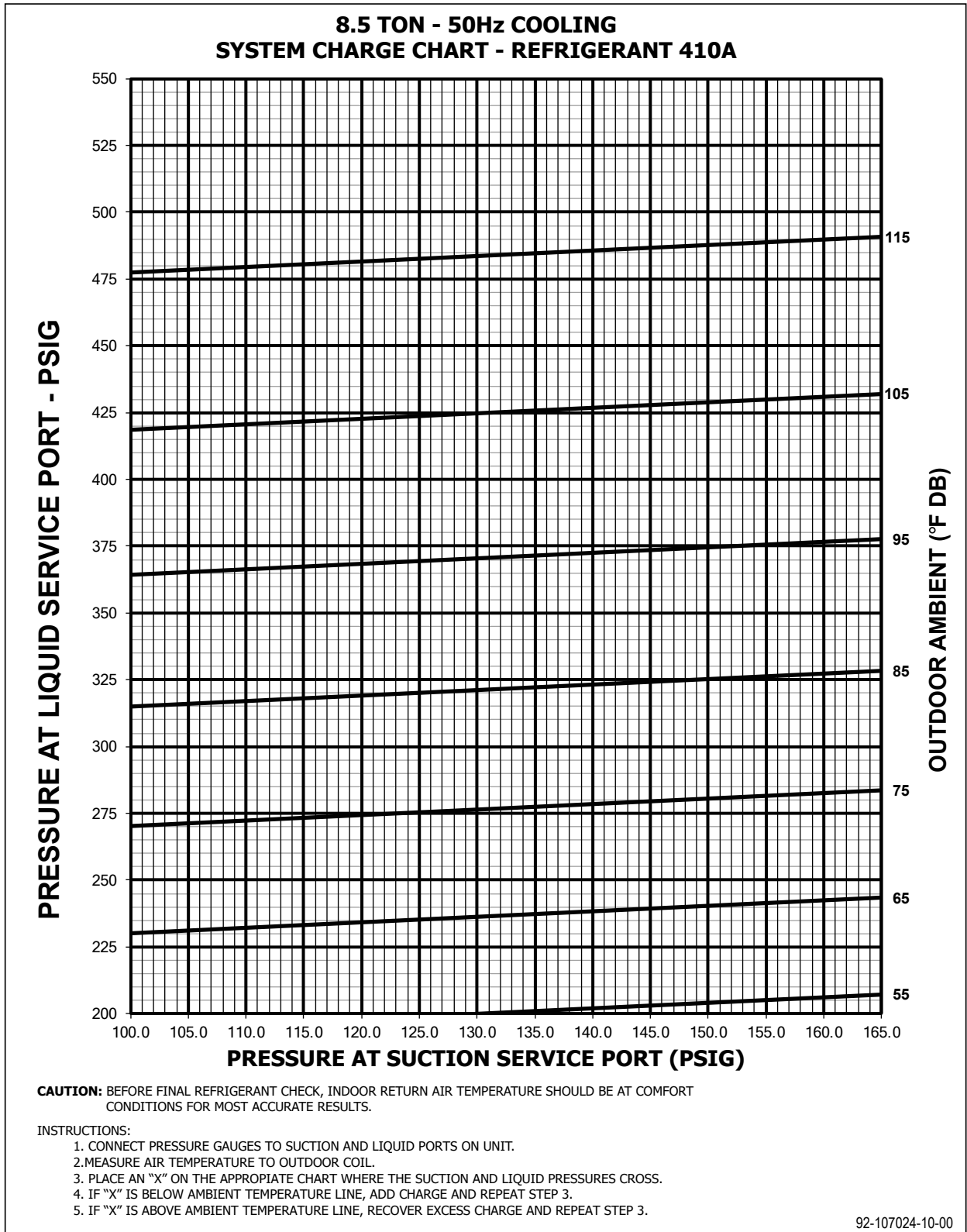


FIGURE 22

SYSTEM CHARGE CHART - REFRIGERANT 410A

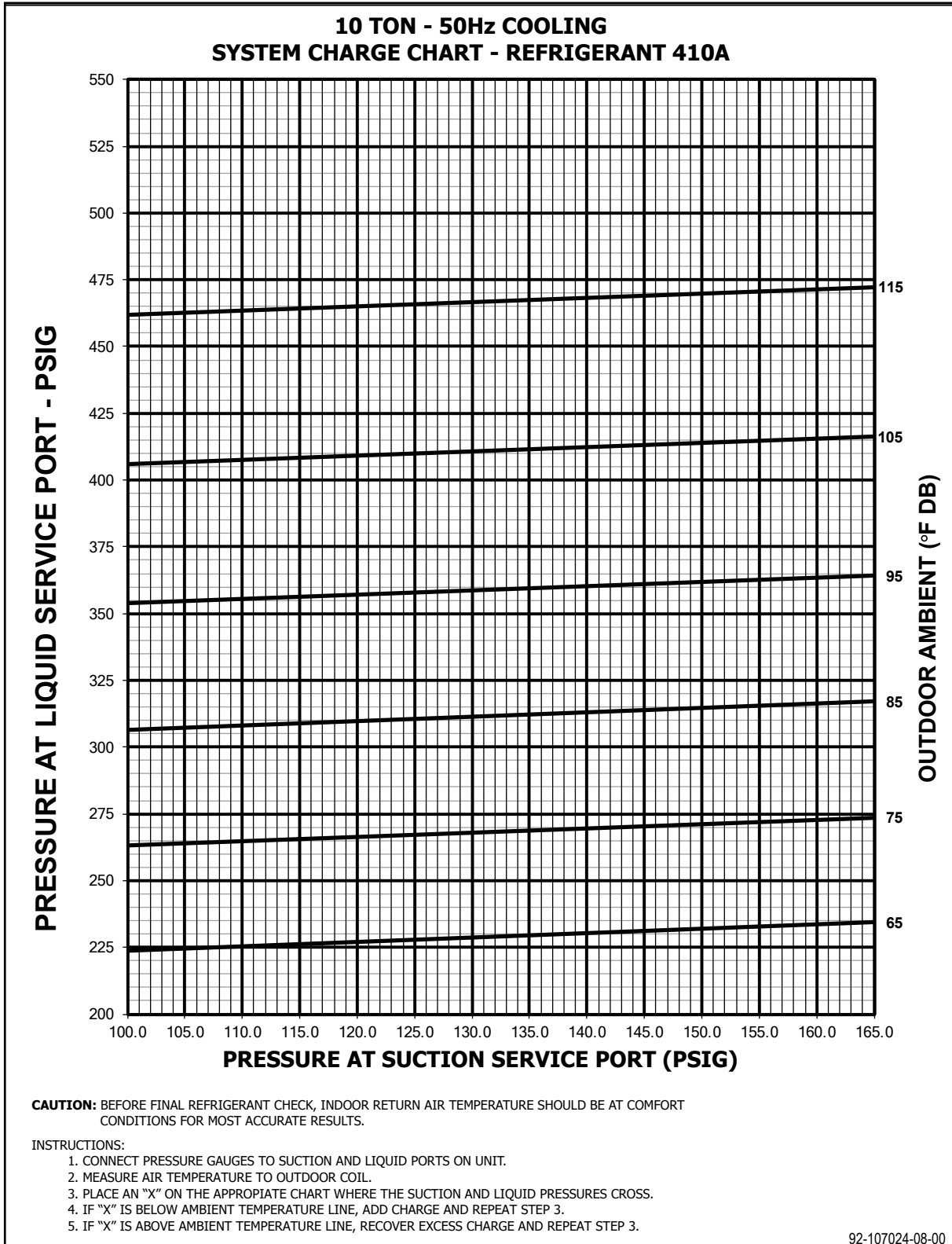


FIGURE 23

SYSTEM CHARGE CHART - REFRIGERANT 410A

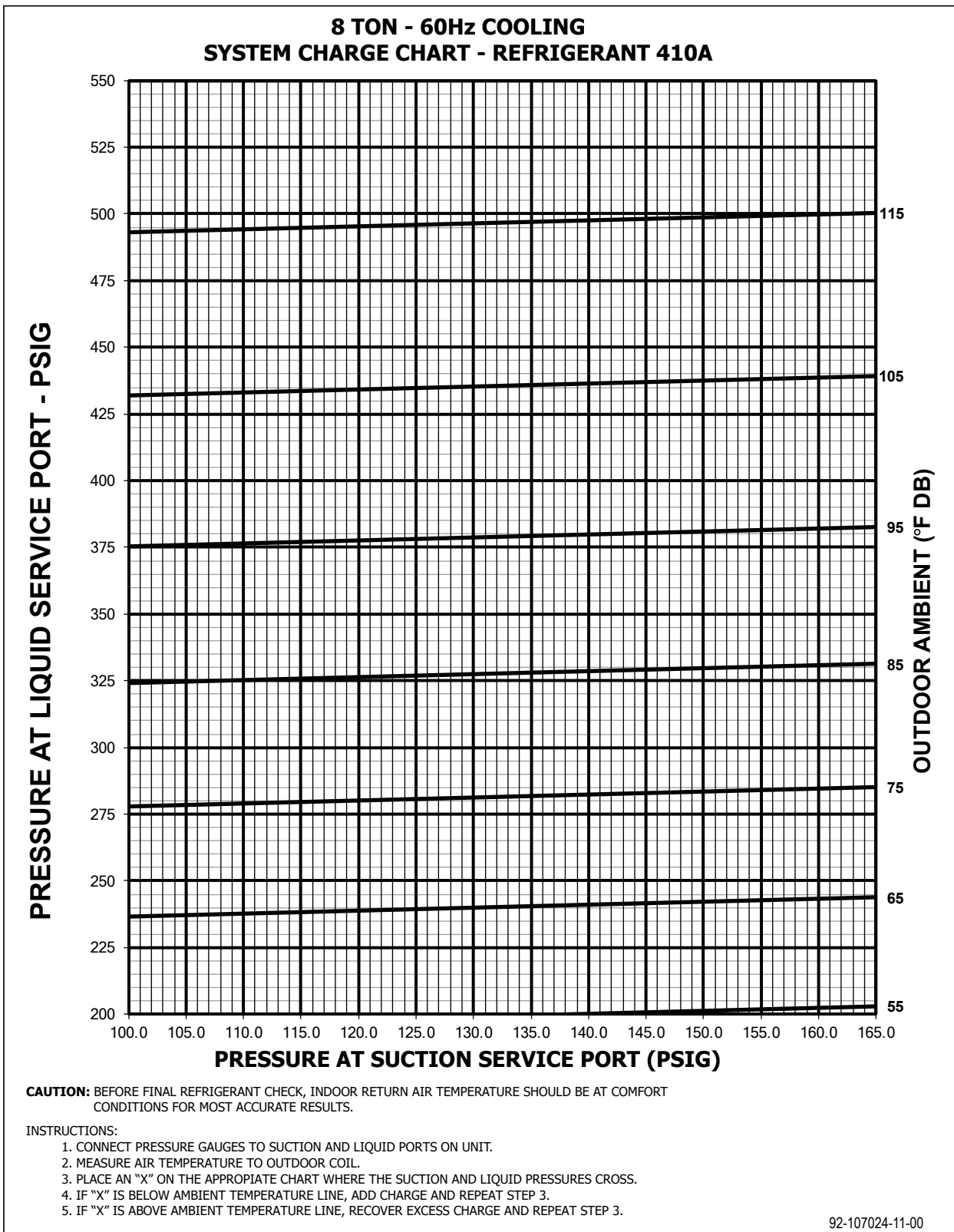
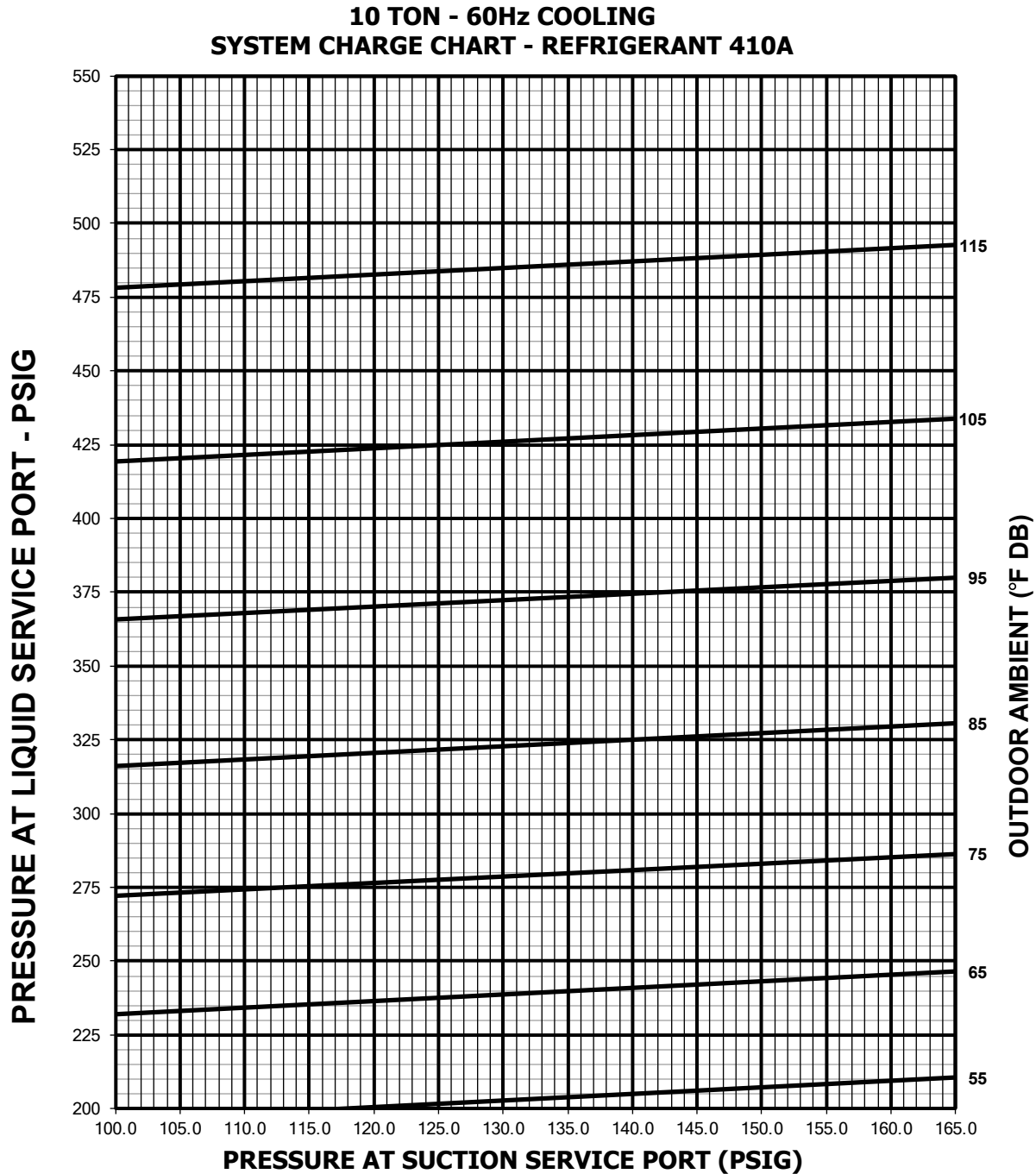


FIGURE 24

SYSTEM CHARGE CHART - REFRIGERANT 410A



CAUTION: BEFORE FINAL REFRIGERANT CHECK, INDOOR RETURN AIR TEMPERATURE SHOULD BE AT COMFORT CONDITIONS FOR MOST ACCURATE RESULTS.

INSTRUCTIONS:

1. CONNECT PRESSURE GAUGES TO SUCTION AND LIQUID PORTS ON UNIT.
2. MEASURE AIR TEMPERATURE TO OUTDOOR COIL.
3. PLACE AN "X" ON THE APPROPRIATE CHART WHERE THE SUCTION AND LIQUID PRESSURES CROSS.
4. IF "X" IS BELOW AMBIENT TEMPERATURE LINE, ADD CHARGE AND REPEAT STEP 3.
5. IF "X" IS ABOVE AMBIENT TEMPERATURE LINE, RECOVER EXCESS CHARGE AND REPEAT STEP 3.

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In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

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