INSTALLATION INSTRUCTIONS

FOR THE RHEEM H2AC ROOFTOP UNIT
FEATURING eSYNC INTEGRATION TECHNOLOGY
RLHL-D SERIES 15 TON [52.8 kW]
ASHRAE 90.1 2007 COMPLIANT, WITH CLEAR CONTROL

eSYNC™
WITH **H2AC** TECHNOLOGY

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.

AHRI CERTIFIED™ www.ahridirectory.org
Unitary Large AC
AHRI Standard 340/360
Certification applies only when the complete system is listed with AHRI.

c UL us LISTED

Accredited by the RvA
ABS Quality Evaluations, Inc. Management System Certification
ANAB ACCREDITED
ISO 9001:2008
Certificate Number: 30164

DO NOT DESTROY THIS MANUAL
PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE BY A SERVICEMAN

[ ] INDICATES METRIC CONVERSIONS

I. TABLE OF CONTENTS

⚠ WARNING

PROPOSITION 65: THIS APPLIANCE CONTAINS FIBERGLASS INSULATION. RESPIRABLE PARTICLES OF FIBERGLASS ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

⚠ 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.

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.

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 H_2AC Rooftop Unit with optional Electric Heat is available with a Cooling capacity of 15 nominal tons and optional 20, 40, 60 or 75 kW electric heat.

Potable water heating capacities range from approximately 117,000 BTUH to 145,000 BTUH depending on water temperature, indoor air temperatures, and indoor CFM.

Units are designed for downflow-only supply and return air and are weatherized and intended for outdoor installation.

Since the H_2AC Rooftop Unit only functions during the cooling mode, the unit should be installed to serve the area of the structure having the largest cooling run-time load, for instance the kitchen area of the restaurant, in order to provide the greatest water heating and energy saving benefits.

The information on the rating plate is in compliance with the FTC and DOE rating for single phase units. 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 unit includes a hermetically-sealed refrigerating system (consisting of a compressor, evaporator coil with thermal expansion valve), a circulation air blower, a condenser fan, a refrigerant to air heat exchanger assembly, a refrigerant to water heat exchanger assembly, 3-way valve, two solenoid valves, 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: <u>R-410A is not a drop-in replacement for R-22;</u> equipment designs must accommodate its higher pressures. It cannot be retrofitted into R-22 units.

<u>Pressure: The pressure of R-410A is approximately 60% (1.6 times) greater than R-22.</u> 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. **<u>R-410A and air should never be mixed in tanks or supply lines, or be allowed to accumulate in storage tanks.</u> <u>Leak checking should never be done with a mixture of R-410A and air.</u>** 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.**

⚠ 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.

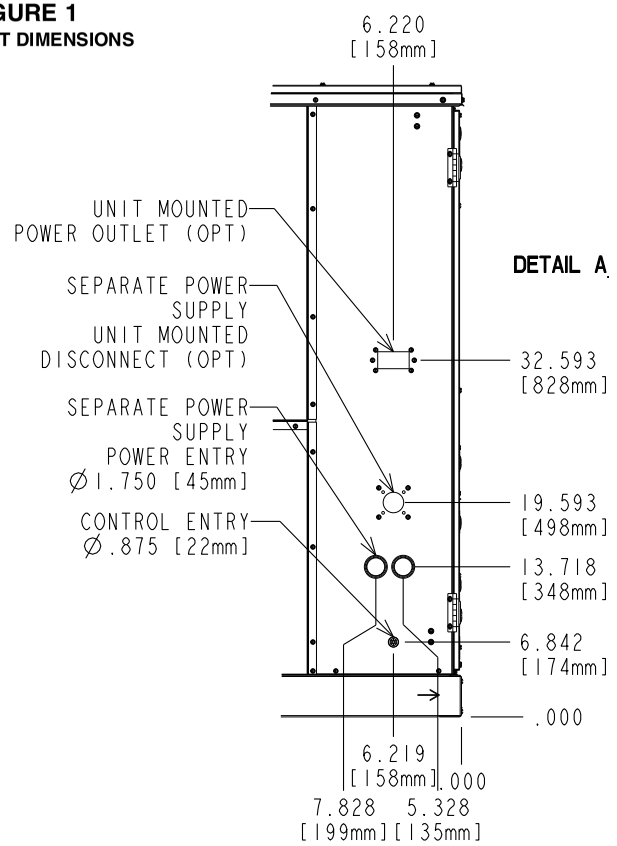
4. Tools Required For Installing & Servicing R-410A Models

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

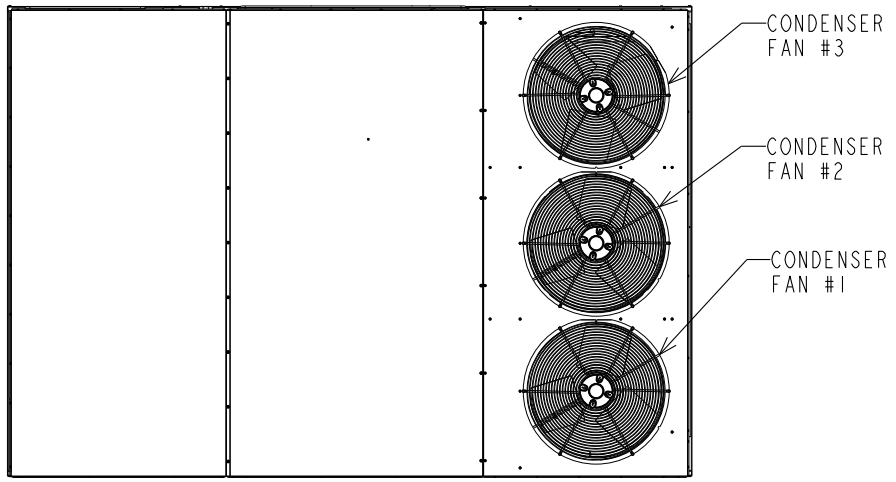
Manifold Hoses:
-Service Pressure Rating of 800 PSIG

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

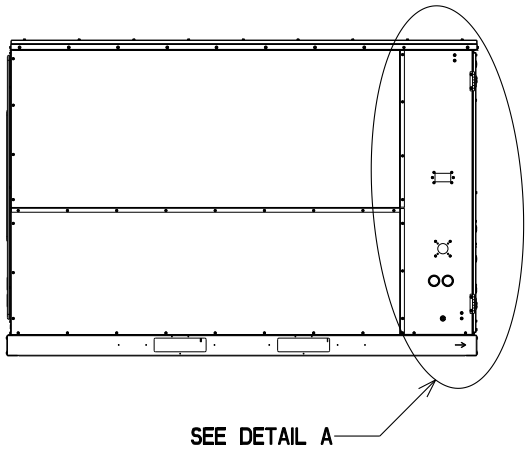
FIGURE 1
UNIT DIMENSIONS



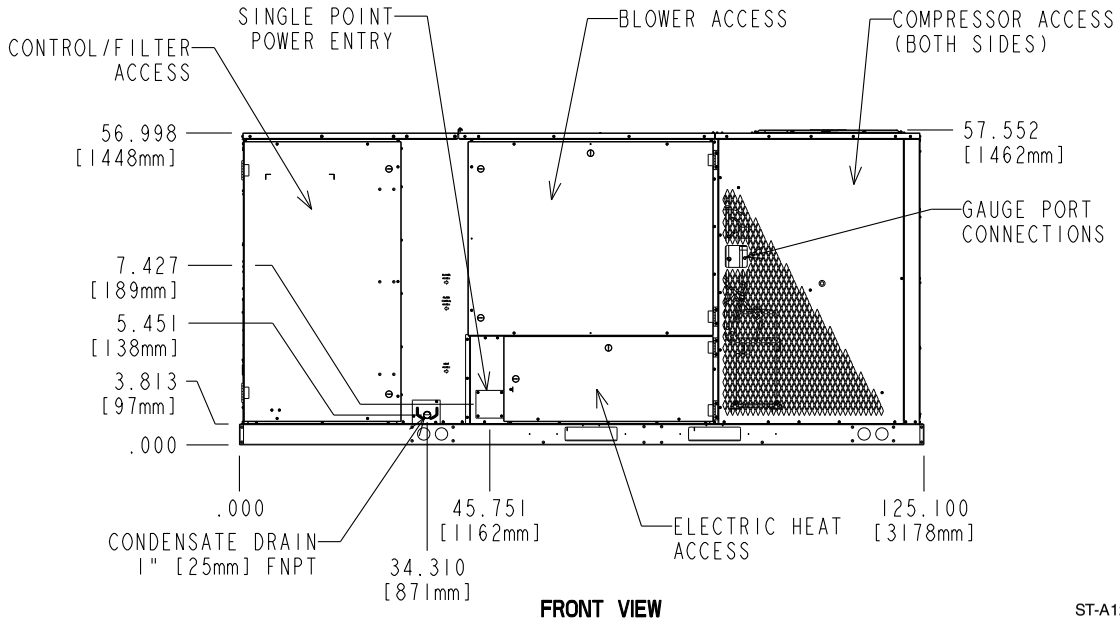
[] Designates Metric Conversions



TOP VIEW



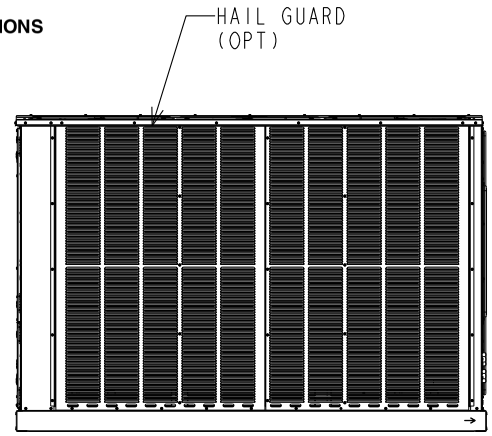
LEFT VIEW



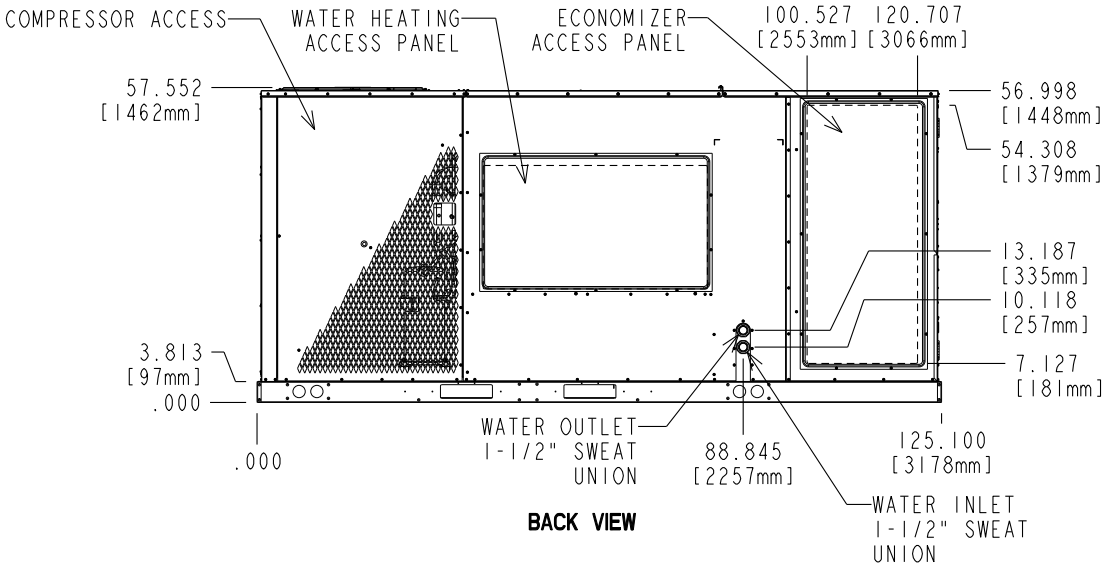
FRONT VIEW

ST-A1207-10

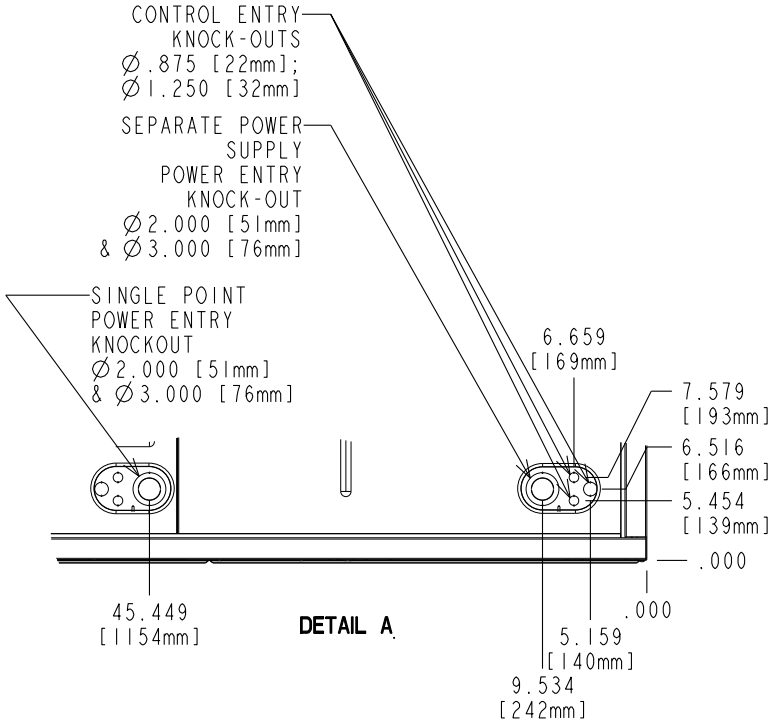
FIGURE 2
UNIT DIMENSIONS



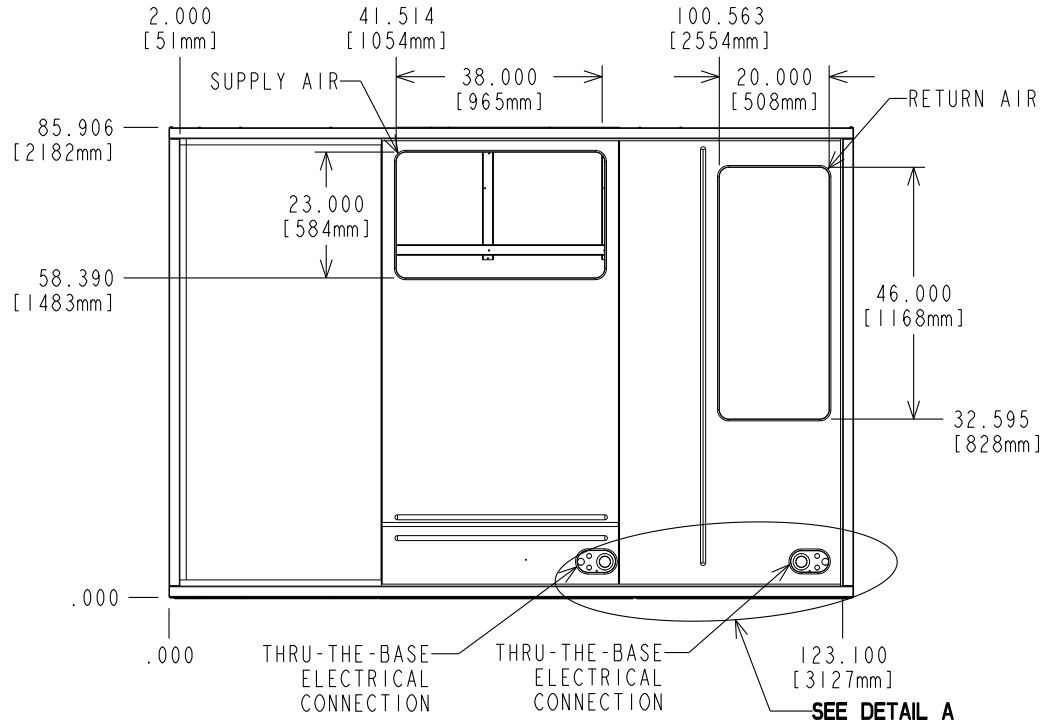
RIGHT VIEW



BACK VIEW



DETAIL A



BOTTOM VIEW

[] Designates Metric Conversions

ST-A1207-11

GENERAL DATA - RLHL

Model RLHL- Series	D180CL	D180CM	D180DL	D180DM
Cooling Performance[1]				
Gross Cooling Capacity Btu [kW]	182,000 [53.33]	182,000 [53.33]	182,000 [53.33]	182,000 [53.33]
EER/SEER[2]	12.4/NA	12.4/NA	12.4/NA	12.4/NA
Nominal CFM/AHRI Rated CFM [L/s]	6000/5800 [2831/2737]	6000/5800 [2831/2737]	6000/5800 [2831/2737]	6000/5800 [2831/2737]
AHRI Net Cooling Capacity Btu [kW]	176,000 [51.57]	176,000 [51.57]	176,000 [51.57]	176,000 [51.57]
Net Sensible Capacity Btu [kW]	130,400 [38.21]	130,400 [38.21]	130,400 [38.21]	130,400 [38.21]
Net Latent Capacity Btu [kW]	45,600 [13.36]	45,600 [13.36]	45,600 [13.36]	45,600 [13.36]
IEER[3]	13	13	13	13
Net System Power kW	14.23	14.23	14.23	14.23
Compressor				
No./Type	2/Scroll	2/Scroll	2/Scroll	2/Scroll
Outdoor Sound Rating (dB)[5]	91	91	91	91
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	50.8 [4.72]	50.8 [4.72]	50.8 [4.72]	50.8 [4.72]
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	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	26.67 [2.48]	26.67 [2.48]	26.67 [2.48]	26.67 [2.48]
Rows / FPI [FPcm]	2 / 18 [7]	2 / 18 [7]	2 / 18 [7]	2 / 18 [7]
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]	3/24 [609.6]	3/24 [609.6]	3/24 [609.6]	3/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	10000 [4719]	10000 [4719]	10000 [4719]	10000 [4719]
No. Motors/HP	3 at 1/3 HP	3 at 1/3 HP	3 at 1/3 HP	3 at 1/3 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	2/18x9 [457x229]	2/18x9 [457x229]	2/18x9 [457x229]	2/18x9 [457x229]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds	Single	Single	Single	Single
No. Motors	1	1	1	1
Motor HP	3	5	3	5
Motor RPM	1725	1725	1725	1725
Motor Frame Size	56	184	56	184
Potable Water Heat Recovery				
Heat Exchanger Type	Vented Double-Wall Flat Plate	Vented Double-Wall Flat Plate	Vented Double-Wall Flat Plate	Vented Double-Wall Flat Plate
Material	Cu Brazed Stainless Steel	Cu Brazed Stainless Steel	Cu Brazed Stainless Steel	Cu Brazed Stainless Steel
No. Flat Plates	50	50	50	50
Unit Water Connections No./Size in. [mm]	2/1.625 [41.3]	2/1.625 [41.3]	2/1.625 [41.3]	2/1.625 [41.3]
Water Pump - Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
Housing Material	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
GPM [L/s]	30 [1.89]	30 [1.89]	30 [1.89]	30 [1.89]
Head Pressure ft. H2O [kPa]	25 [74.7]	25 [74.7]	25 [74.7]	25 [74.7]
Motor HP	1/3	1/3	1/3	1/3
Motor RPM	3450	3450	3450	3450
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(8)2x25x20 [51x635x508]	(8)2x25x20 [51x635x508]	(8)2x25x20 [51x635x508]	(8)2x25x20 [51x635x508]
Refrigerant Charge Oz. (Sys. 1/Sys. 2) [g]	171/201 [4848/5698]	171/201 [4848/5698]	171/201 [4848/5698]	171/201 [4848/5698]
Weights				
Net Weight lbs. [kg]	1895 [860]	1924 [873]	1895 [860]	1924 [873]
Ship Weight lbs. [kg]	2022 [917]	2051 [930]	2022 [917]	2051 [930]

NOTES:

1. Cooling Performance is rated at 95° F ambient, 80° F entering dry bulb, 67° F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to ±20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on AHRI Standard 210/240 or 360.
2. EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
3. Integrated Energy Efficiency Ratio (IEER) is rated in accordance with AHRI Standard 210/240 or 340/360.
4. Not applicable to these units.
5. Outdoor Sound Rating shown is tested in accordance with ARI Standard 270. 25 Ton Model (B300) is outside the scope of AHRI Standard 340/360.

ELECTRICAL DATA - RLHL

ELECTRICAL DATA - RLHL- SERIES										
		D180CL	D180CM	D180DL	D180DM					
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506					
	Volts	208/230	208/230	460	460					
	Minimum Circuit Ampacity	77/77	81/81	40	42					
	Minimum Overcurrent Protection Device Size	90/90	90/90	45	45					
	Maximum Overcurrent Protection Device Size	100/100	100/100	50	50					
Compressor Motor	No.	2	2	2	2					
	Volts	200/230	200/230	460	460					
	Phase	3	3	3	3					
	RPM	3450	3450	3450	3450					
	HP, Compressor 1	7 1/2	7 1/2	7 1/2	7 1/2					
	Amps (RLA), Comp. 1	25/25	25/25	12.8	12.8					
	Amps (LRA), Comp. 1	164/164	164/164	100	100					
	HP, Compressor 2	7 1/2	7 1/2	7 1/2	7 1/2					
	Amps (RLA), Comp. 2	25/25	25/25	12.8	12.8					
	Amps (LRA), Comp. 2	164/164	164/164	100	100					
Condenser Motor	No.	3	3	3	3					
	Volts	208/230	208/230	460	460					
	Phase	1	1	1	1					
	HP	1/3	1/3	1/3	1/3					
	Amps (FLA, each)	2.4/2.4	2.4/2.4	1.4	1.4					
	Amps (LRA, each)	4.7/4.7	4.7/4.7	2.4	2.4					
Evaporator Fan	No.	1	1	1	1					
	Volts	208/230	208/230	460	460					
	Phase	3	3	3	3					
	HP	3	5	3	5					
	Amps (FLA, each)	11.5/11.5	14.9/14.9	4.6	6.6					
	Amps (LRA, each)	74.5/74.5	95/95	38.1	47.5					
Water Pump	No.	1	1	1	1					
	Volts	208/230	208/230	208/230	208/230					
	Phase	1	1	1	1					
	HP	1/3	1/3	1/3	1/3					
	Amps (FLA, each)	1.7	1.7	1.7	1.7					
	Amps (LRA, each)	5.1	5.1	5.1	5.1					

GROSS WATER HEATING CAPACITY - D180

ENTERING INDOOR AIR @ 80°F [26.7°C] dbE												
wbE			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			
CFM [Ls]			7200 [3398]	5800 [2737]	4800 [2265]	7200 [3398]	5800 [2737]	4800 [2265]	7200 [3398]	5800 [2737]	4800 [2265]	
OUTLET WATER TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	145.0 [42.5]	142.9 [41.9]	140.3 [41.1]	140.9 [41.3]	132.3 [38.8]	131.9 [38.7]	141.4 [41.4]	134.6 [39.4]	129.3 [37.9]	
		Power kW	4.2	4.2	4.4	4.2	5.9	4.3	4.2	4.5	4.2	
	80 [26.7]	Total BTUH [kW]	142.8 [41.9]	140.8 [41.3]	138.7 [40.6]	139.0 [40.7]	130.9 [38.4]	130.4 [38.2]	139.5 [40.9]	133.2 [39.0]	128.2 [37.6]	
		Power kW	4.4	4.4	4.5	4.4	5.7	4.4	4.4	4.7	4.4	
	85 [29.4]	Total BTUH [kW]	140.7 [41.2]	138.7 [40.6]	137.1 [40.2]	137.2 [40.2]	129.4 [37.9]	128.9 [37.8]	137.5 [40.3]	131.8 [38.6]	127.0 [37.2]	
		Power kW	4.6	4.6	4.7	4.6	5.5	4.6	4.6	4.9	4.6	
	90 [32.2]	Total BTUH [kW]	138.5 [40.6]	136.6 [40.0]	135.5 [39.7]	135.3 [39.7]	128.0 [37.5]	127.4 [37.3]	135.6 [39.7]	130.3 [38.2]	125.9 [36.9]	
		Power kW	4.8	4.8	4.9	4.8	5.5	4.8	4.8	5.2	4.8	
	95 [35.0]	Total BTUH [kW]	136.4 [40.0]	134.4 [39.4]	133.9 [39.2]	133.4 [39.1]	126.5 [37.1]	126.0 [36.9]	133.7 [39.2]	128.9 [37.8]	124.7 [36.5]	
		Power kW	5.1	5.1	5.2	5.1	5.5	5.1	5.1	5.4	5.1	
	100 [37.8]	Total BTUH [kW]	134.3 [39.4]	132.3 [38.8]	132.4 [38.8]	131.5 [38.5]	125.1 [36.7]	124.5 [36.5]	131.7 [38.6]	127.5 [37.4]	123.6 [36.2]	
		Power kW	5.4	5.3	5.4	5.4	5.7	5.4	5.4	5.7	5.4	
	105 [40.6]	Total BTUH [kW]	132.1 [38.7]	130.2 [38.2]	130.8 [38.3]	129.7 [38.0]	123.6 [36.2]	123.0 [36.0]	129.8 [38.0]	126.1 [37.0]	122.4 [35.9]	
		Power kW	5.7	5.7	5.7	5.7	6.0	5.7	5.7	6.0	5.7	
	110 [43.3]	Total BTUH [kW]	130.0 [38.1]	128.1 [37.5]	129.2 [37.9]	127.8 [37.5]	122.2 [35.8]	121.6 [35.6]	127.9 [37.5]	124.7 [36.5]	121.3 [35.5]	
		Power kW	6.0	6.0	6.0	6.0	6.3	6.0	6.0	6.4	6.0	
	115 [46.1]	Total BTUH [kW]	127.9 [37.5]	126.0 [36.9]	127.6 [37.4]	125.9 [36.9]	120.7 [35.4]	120.1 [35.2]	125.9 [36.9]	123.3 [36.1]	120.1 [35.2]	
		Power kW	6.4	6.4	6.4	6.4	6.6	6.4	6.4	6.8	6.4	
	120 [48.9]	Total BTUH [kW]	125.7 [36.8]	123.8 [36.3]	126.0 [36.9]	124.1 [36.4]	119.3 [35.0]	118.6 [34.8]	124.0 [36.3]	121.9 [35.7]	119.0 [34.9]	
		Power kW	6.8	6.8	6.8	6.8	7.1	6.8	6.8	7.2	6.8	
	125 [51.7]	Total BTUH [kW]	123.6 [36.2]	121.7 [35.7]	124.4 [36.5]	122.2 [35.8]	117.8 [34.5]	117.2 [34.3]	122.1 [35.8]	120.5 [35.3]	117.8 [34.5]	
		Power kW	7.3	7.3	7.2	7.3	7.5	7.3	7.3	7.7	7.3	

VI. INSTALLATION

A. GENERAL

1. PRE-INSTALLATION CHECK-POINTS
   Before attempting any installation, the following points should be carefully considered:
   a. Structural strength of supporting members. (rooftop installation)
   b. Clearances and provision for servicing.
   c. Power supply and wiring.
   d. Air duct connections.
   e. Drain facilities and connections.
   f. Location for minimum noise.
   g. Water piping supply length and routing
2. LOCATION
   These units are designed for outdoor installations. 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.

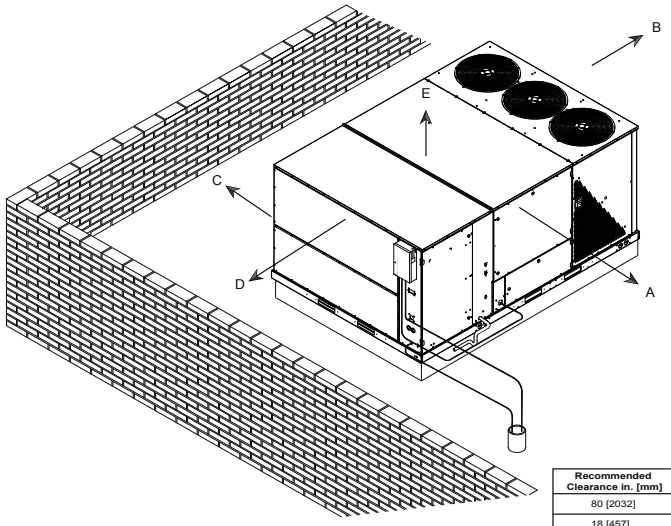
B. H_2AC ROOFTOP UNIT SPECIAL CONSIDERATIONS

Since the waste-heat recovery/water heating feature of the H_2AC rooftop unit only functions during the cooling mode, the unit should be installed to serve the area of the structure having the largest cooling run-time, for instance the kitchen area of a restaurant, in order to provide the greatest water heating and energy saving benefits.

The H_2AC rooftop unit is equipped with an outdoor temperature sensor that energizes the water pump continuously below 35°F to minimize the chance of the water system freezing, however this is not intended to be the sole method of unit freeze protection. **If the H_2AC rooftop unit is installed in a geographic location where freezing temperature can occur, the water lines, valves, and couplings connected outside the unit must be adequately protected with insulation and heat tape suitable for the lowest expected temperatures.**

Alternately, the unit and all connecting lines can be drained of water and the unit heat exchanger, pump, and internal piping winterized using a non-toxic recreational vehicle type of anti-freeze suitable for potable water systems.

FIGURE 3
PACKAGED AIR CONDITIONER
FLAT ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTING SYSTEM.
MOUNTED ON ROOFCURB. CURB MUST BE LEVEL.



Recommended Clearance in. [mm]	Location
80 [2032]	A - Front
18 [457]	B - Condenser Coil
18 [457]	C - Duct Side
18 [457]*	D - Evaporator End
60 [1524]	E - Above

* Without Economizer 48 [1219] With Economizer

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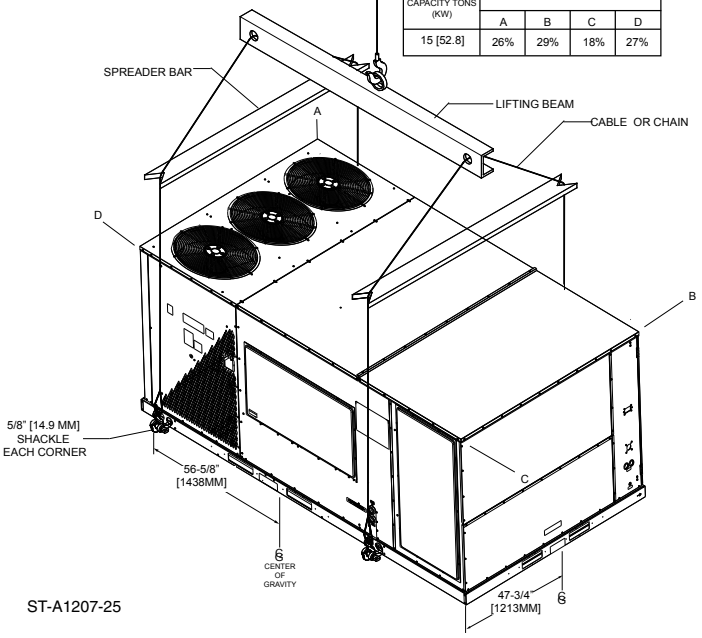
FIGURE 4
PACKAGED AIR CONDITIONER
RIGGING FOR LIFTING

CAPACITY TONS (KW)	CORNER WEIGHTS BY PERCENTAGE			
	A	B	C	D
15 [52.8]	26%	29%	18%	27%



The H2AC rooftop unit is equipped with a water leak sensor designed to sense water that would accumulate in the pan under the water pump and refrigerant-to-water heat exchanger assembly located on the blower deck. If a leak is sensed in that area an alarm is triggered on the RTU-C (ClearControl) control board and a water shutoff relay is energized to activate the **optional** RXMV-AH electric water shut-off valve. It is strongly recommended that the RXMV-AH be installed to minimize the chance of water damage to the structure in case of a water leak in the unit.

C. CLEARANCES

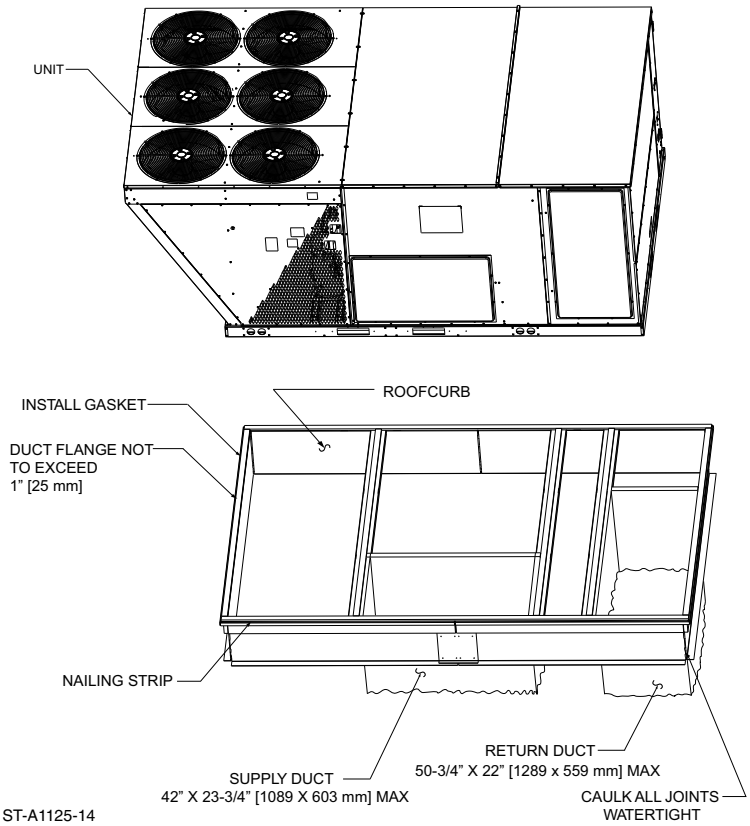
The following minimum clearances must be observed for proper unit performance and serviceability.

1. Provide 80" minimum clearance at the front of the unit to facilitate removal of the drain pan and return air filters. Provide 18" minimum clearance at all other sides of the unit.
2. Provide 60" minimum clearance between top of unit and maximum 3 foot overhang.
3. Unit is design certified for application on combustible flooring with 0" minimum clearance.
4. See Figure 3 for illustration of minimum installation-service clearances.

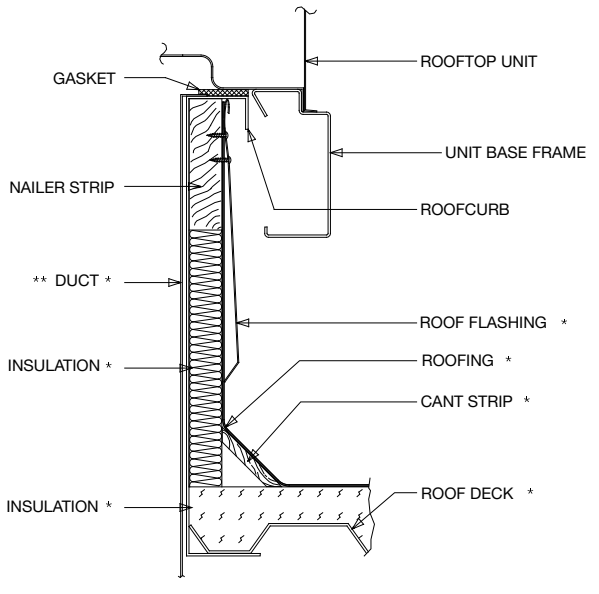
D. ROOFTOP INSTALLATION

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 and roofcurb details, see Figures 4 and 5. Use field-furnished spreaders.

FIGURE 5



PACKAGED AIR CONDITIONER
ROOFCURB INSTALLATION



* BY CONTRACTOR

** FOR INSTALLATION OF DUCT AS SHOWN, USE RECOMMENDED DUCT SIZES FROM ROOFCURB INSTALLATION INSTRUCTIONS. FOR DUCT FLANGE ATTACHMENT TO UNIT, SEE UNIT INSTALLATION INSTRUCTIONS FOR RECOMMENDED DUCT SIZES.

3. For roofcurb assembly, see Roofcurb Installation Instructions.
4. If the roofcurb is not used, provisions for disposing of condensate water runoff must be provided.
5. The unit should be placed on a solid and level roofcurb or platform of adequate strength. See Figure 6.
6. 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, 2800 Shirlington Road, Suite 300, Arlington, VA 22206, http:/www.acca.org.

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" 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.

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

When installing ductwork, consider the following items:

1. Noncombustible flexible connectors should be used between ductwork and unit to reduce noise and vibration transmission into the ductwork.
2. When auxiliary heaters are installed, use noncombustible flexible connectors and clearance to combustible material of 0" for the first 3 feet of discharge duct. Clearance to unit top and side is 0".

VIII. FILTERS

This unit is provided with 8 - 20" x 25" x 2" disposable filters. When replacing filters, ensure they are inserted fully to the back to prevent bypass. See Figure 1.

Recommended supplier of this filter is Glassfloss Industries, Inc. or

AAF International
215 Central Avenue
P.O. Box 35690
Louisville, KY 40232
Phone: 1-800-501-3146
Part #: 54-42541-04 (20” x 25” x 2”)

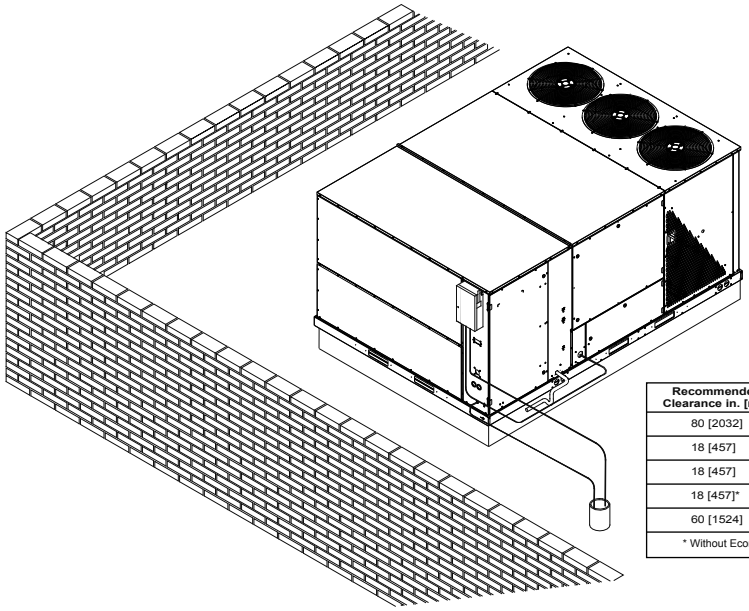
IX. CONDENSATE DRAIN

IMPORTANT: *Install a condensate trap to ensure proper condensate drainage. See Figure 7.*

The condensate drain pan has a threaded female 1 inch NPT (11.5 TPI) 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 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.

FIGURE 6
PACKAGED AIR CONDITIONER
FLAT ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTION SYSTEM. MOUNTED ON ROOFCURB. CURB MUST BE LEVEL.



Recommended Clearance in. [mm]	Location
80 [2032]	A - Front
18 [457]	B - Condenser Coil
18 [457]	C - Duct Side
18 [457]*	D - Evaporator End
60 [1524]	E - Above
* Without Economizer 48 [1219] With Economizer	

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- 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 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.

X. ELECTRICAL WIRING

Field wiring must comply with the National Electrical Code* and local ordinances that may apply.

*C.E.C. in Canada

A. POWER WIRING

1. This unit incorporates single-point electrical connections for the unit and electric heat accessory.
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 8. Use the unit rating plate or Tables A, B, C, and D to determine the required size.
4. The branch circuit wire must be sized in accordance with the National Electrical Code (C.E.C. in Canada) 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:

   UNITS WITHOUT ELECTRIC HEAT - Connect power wiring to the power terminal block located on the left side of the electric heat compartment. Connect the ground wire to the adjacent ground lug.

   UNITS WITH FACTORY INSTALLED ELECTRIC HEAT - Connect power wiring to the power terminal block located on the electric heater kit. Connect the ground wire to the adjacent ground lug. DO NOT connect aluminum wiring directly to the electric heater terminal block. Wiring to the unit contactors is factory-connected.

6. For field installation of an electric heater kit, follow the instructions below. Refer to the information supplied with the kit.
   a. Removing screws as required, open heater access door and detach adjacent power entry panel.
   b. Remove unit contactor wires (1L1, 1L2, 1L3) from unit terminal block on the left side of the electric heat compartment. Remove and discard the terminal block and the adjacent ground lug.
   c. Remove the heater kit block-off panel and install the heater kit in its place using the screws previously removed.
   d. Connect the unit contactor wires (1L1, 1L2, 1L3) to the compressor fuse block on the heater kit.
   e. Re-install the power entry panel & run conduit and the proper size field wiring through the opening in the panel.
   f. Connect field wiring to the power terminal block located on the electric heater kit. Connect ground wire to the adjacent ground lug.
   g. Connect heater kit control plug to the receptacle on the control wiring harness.
   h. Close heater access door and secure with screws previously removed.

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" hole in the unit side panel. See Figures 1 and 10. Use a minimum #18 AWG thermostat wire. For wire lengths exceeding 50', use #16 AWG thermostat wire. Connect the control wiring to the low voltage terminal block inside the unit control box.
   3. Recommended thermostats can be found in the thermostat specifications catalog T11-001.
   4. Figure 9 shows representative low voltage connection diagrams. Read your thermostat installation instructions for any special requirements for your specific thermostat.

      NOTE — Units installed in Canada require that an outdoor thermostat (30,000 min. cycles of endurance) be installed and be wired with C.E.C. Class I wiring.

D. INTERNAL WIRING
   1. A diagram of the internal wiring of this unit is located on the inside of the electrical access panel. 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. 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 heat pump thermostat package CAREFULLY because each has some different wiring requirements.

⚠ 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.

FIGURE 7
CONDENSATE DRAIN

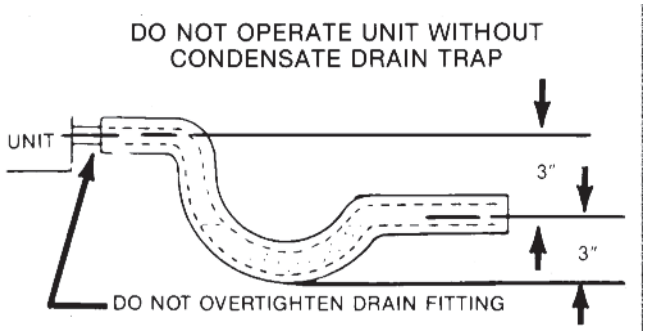
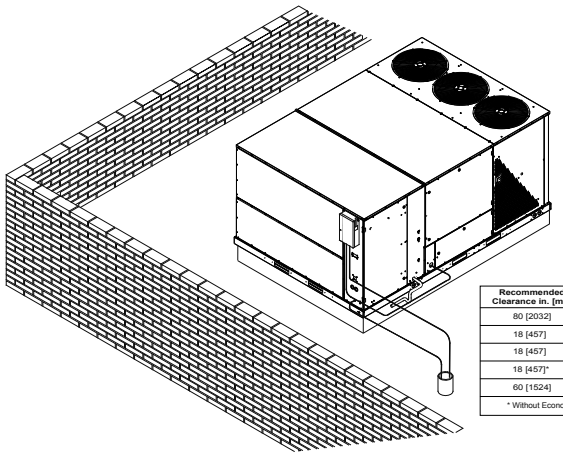


FIGURE 8
BRANCH CIRCUIT DISCONNECT LOCATION



Recommended Clearance in. [mm]	Location
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* Without Economizer 48 [1219] With Economizer

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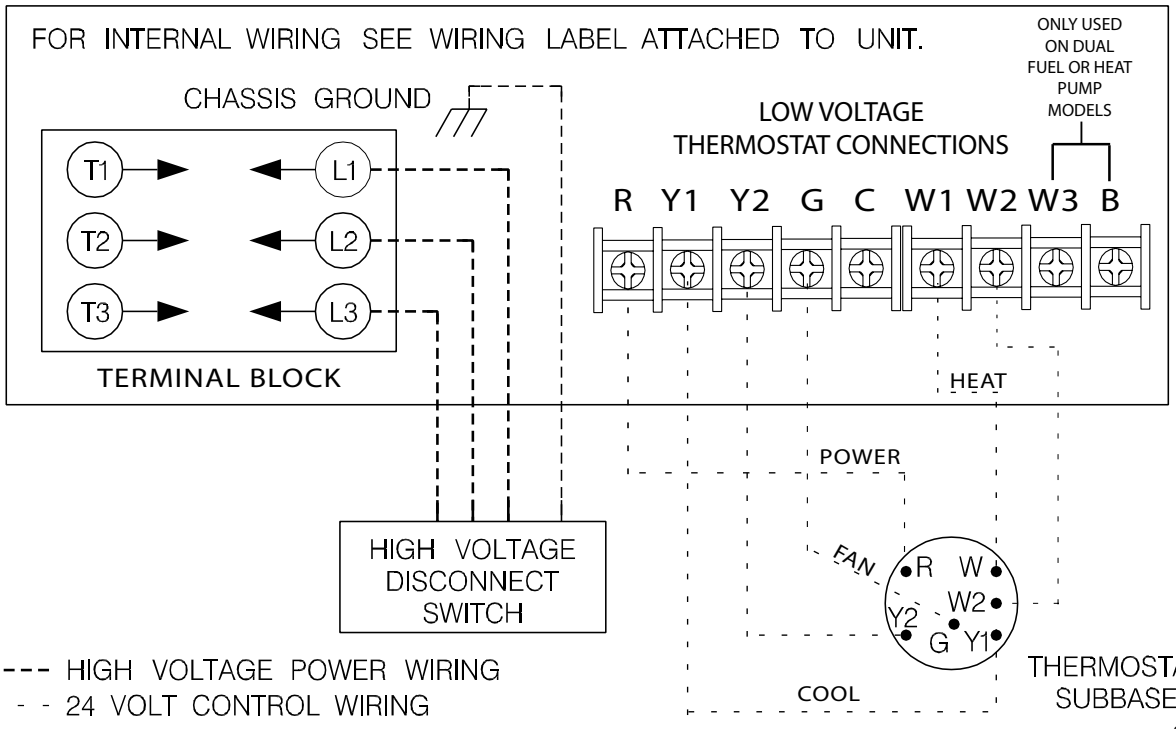
FIGURE 9



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XI. INDOOR AIR FLOW DATA

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

XII. CRANKCASE HEAT (OPTIONAL)

Crankcase heat is not required on scroll type compressors, but may be desirable under certain conditions. Wires have been provided for the addition of crankcase heaters (see wiring diagrams).

FIGURE 10

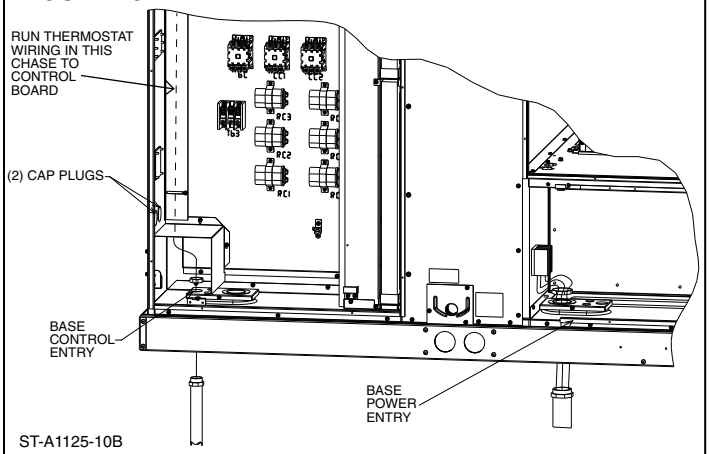

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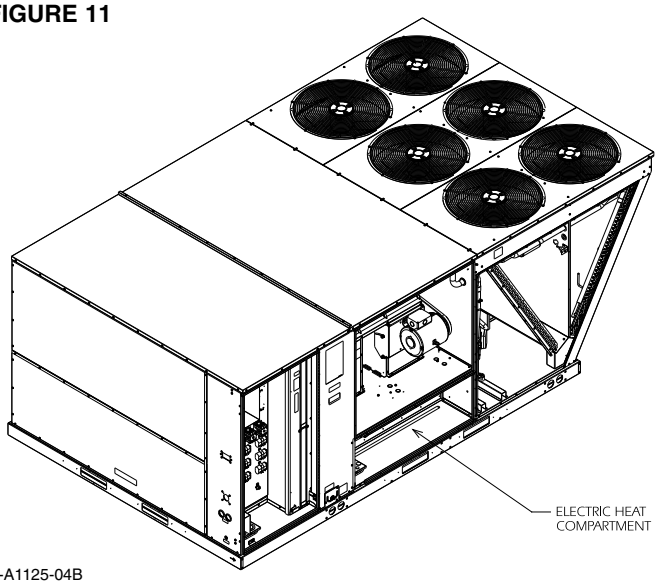
FIGURE 11



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AIRFLOW PERFORMANCE — 15 TON [52.7kW] — 60 Hz — DOWNFLOW

Air Flow CFM [L/s]	Model RLHL-D180 Voltage 208/230, 460 — 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]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
4800 [2265]	—	—	—	—	—	—	—	—	—	—	600	1409	629	1536	656	1671	684	1814	711	1964	738	2121	764	2286	790	2459	815	2640	840	2828	865	3023	889	3226	913	3437	—	—	—	—
5000 [2359]	—	—	—	—	—	—	—	—	581	1358	609	1479	637	1608	664	1744	691	1888	718	2040	744	2199	770	2366	795	2541	820	2723	844	2912	869	3109	892	3314	916	3527	—	—	—	—
5200 [2454]	—	—	—	—	—	—	—	—	590	1434	618	1557	645	1688	672	1826	699	1972	725	2125	750	2286	776	2454	800	2630	825	2814	849	3005	873	3204	896	3411	919	3625	—	—	—	—
5400 [2548]	—	—	—	—	—	—	572	1402	600	1519	627	1644	654	1776	680	1916	706	2063	732	2218	757	2381	782	2551	806	2729	830	2914	854	3107	877	3307	900	3515	922	3731	—	—	—	—
5600 [2643]	—	—	—	—	—	—	583	1494	610	1613	637	1739	663	1873	689	2014	714	2163	740	2320	764	2484	789	2656	812	2835	836	3022	859	3216	882	3419	904	3628	926	3846	—	—	—	—
5800 [2737]	—	—	—	—	—	—	594	1594	620	1714	647	1842	672	1978	698	2121	723	2271	747	2430	772	2595	795	2769	819	2950	842	3138	864	3335	887	3538	908	3750	930	3969	—	—	—	—
6000 [2831]	—	—	—	—	578	1588	605	1702	631	1824	657	1954	682	2091	707	2236	731	2388	756	2548	779	2715	803	2890	826	3073	848	3263	870	3461	892	3666	913	3879	—	—	—	—	—	—
6200 [2926]	—	—	—	—	590	1703	616	1819	642	1942	667	2074	692	2212	716	2359	740	2513	764	2674	787	2843	810	3020	833	3204	855	3396	876	3596	897	3803	918	4017	—	—	—	—	—	—
6400 [3020]	—	—	577	1716	602	1826	628	1944	653	2069	678	2202	702	2342	726	2490	750	2646	773	2809	796	2980	818	3158	840	3344	861	3538	883	3739	903	3947	924	4164	—	—	—	—	—	—
6600 [3114]	—	—	589	1846	615	1958	640	2077	665	2204	689	2338	713	2480	736	2630	759	2787	782	2952	804	3124	826	3304	848	3492	869	3687	889	3890	909	4100	929	4318	—	—	—	—	—	—
6800 [3209]	577	1878	603	1984	628	2098	652	2219	677	2347	700	2483	724	2627	747	2778	769	2937	791	3104	813	3278	834	3459	855	3648	876	3845	896	4050	916	4262	—	—	—	—	—	—	—	—
7000 [3303]	591	2023	616	2131	641	2246	665	2368	689	2499	712	2636	735	2782	757	2935	779	3095	801	3263	822	3439	843	3622	864	3813	884	4012	903	4218	923	4431	—	—	—	—	—	—	—	—
7200 [3398]	606	2177	630	2286	654	2402	678	2527	701	2659	724	2798	746	2945	768	3099	790	3262	811	3431	832	3609	852	3794	872	3986	892	4186	911	4394	930	4609	—	—	—	—	—	—	—	—

NOTE: L-Drive left of bold line, M-Drive right of bold line.

Drive Package	L							M						
Motor H.P. [W]	3 [2237.1]							5 [3728.5]						
Blower Sheave	BK105H							BK105H						
Motor Sheave	1VP-44							1VP-56						
Turns Open	0	1	2	**3**	4	5	6	0	1	2	3	**4**	5	6
RPM	|	732	701	**670**	642	608	575	|	925	896	866	**838**	805	774

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. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow CFM [L/s]	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
	Total MBH	Sensible MBH	Power kW	Wet Coil		Downflow Economizer RA Damper Open		Concentric Grill RXRN-AD80 or RXRN-AD81 & Transition RXMC-CJ07	Concentric Grill RXRN-AD86 & Transition RXMC-CK08
				Resistance — Inches of Water [kPa]					
4800 [2265]	0.97	0.92	0.98	0.03 [.01]		0.09 [.02]		—	—
5000 [2359]	0.97	0.94	0.99	0.04 [.01]		0.10 [.02]		—	—
5200 [2454]	0.98	0.95	0.99	0.05 [.01]		0.10 [.02]		—	—
5400 [2548]	0.99	0.97	0.99	0.06 [.01]		0.11 [.03]		—	—
5600 [2643]	0.99	0.98	0.99	0.06 [.01]		0.12 [.03]		0.35 [.09]	—
5800 [2737]	1.00	1.00	1.00	0.07 [.02]		0.13 [.03]		0.39 [.10]	—
6000 [2831]	1.01	1.02	1.00	0.08 [.02]		0.13 [.03]		0.43 [.11]	—
6200 [2926]	1.01	1.03	1.00	0.09 [.02]		0.14 [.03]		0.46 [.11]	—
6400 [3020]	1.02	1.05	1.01	0.10 [.02]		0.15 [.04]		0.50 [.12]	—
6600 [3114]	1.02	1.06	1.01	0.10 [.02]		0.16 [.04]		0.54 [.13]	—
6800 [3209]	1.03	1.08	1.01	0.11 [.03]		0.16 [.04]		—	—
7000 [3303]	1.04	1.10	1.01	0.12 [.03]		0.17 [.04]		—	—
7200 [3398]	1.04	1.11	1.02	0.13 [.03]		0.18 [.04]		—	0.38 [.09]

* Multiply correction factor times gross performance data — resulting sensible capacity cannot exceed total capacity.

[ ] Designates Metric Conversions

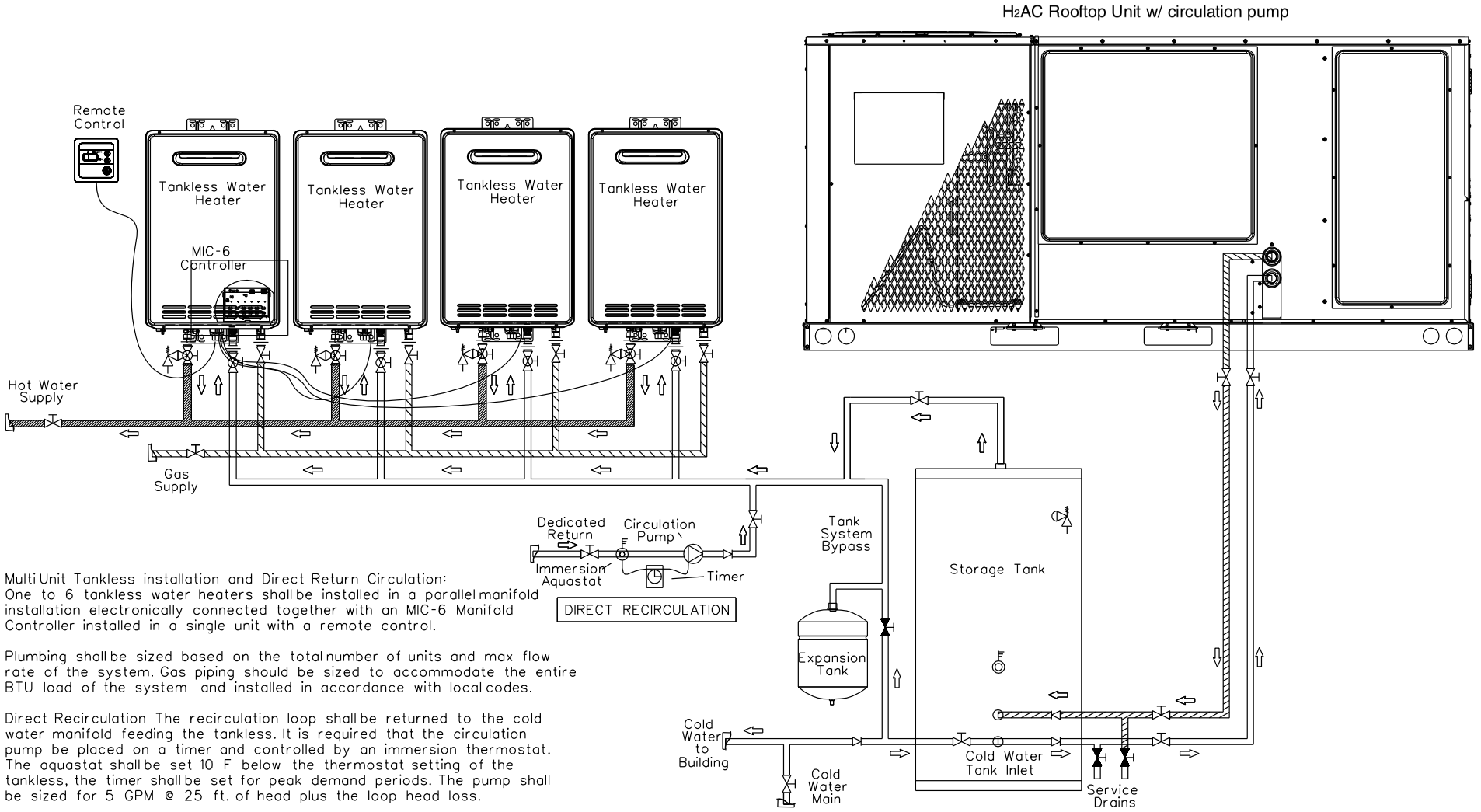
XIII. WATER CONNECTIONS AND START UP FOR POTABLE WATER HEATING

A. WATER PIPING

1. Use of copper pipe suitable for potable water is recommended. Plumbing must meet applicable national and local plumbing and building codes.
2. The H_2AC Rooftop unit should be installed as close to the storage tank as possible to minimize heat loss from interconnecting piping.
3. Use only solder, brazing, and pipe thread sealing materials approved for potable water systems.
4. Refer to connection diagram for typical piping, storage tank, and valve configurations.
5. **It is highly recommended that the H_2AC Rooftop unit be installed with isolation/flushing valves (see illustration Figure 13, Webstone #40436 or similar) on the inlet and outlet water connections to facilitate required periodic lime and scale removal from the water-to-refrigerant heat exchanger.**
6. Maximum equivalent length of water piping is to be in accordance with the procedure shown in this manual. Consult the pressure loss tables for the values associated with the required water fittings, valves, and straight lengths.
7. Use the H_2AC Rooftop Unit Water Flowrate vs. Water Pressure Drop graph to verify that total system equivalent piping length will not result in less than the 15 GPM minimum flow rate.

B. SYSTEM PRESSURE TEST AND START UP

1. Pressure test system complete system after all plumbing connections are made using accepted plumbing leak test procedures.
2. **The refrigerant-to-water heat exchanger and water pump housing will contain a small amount of non-toxic RV-type water system anti-freeze left over from the factory run test. Be certain to flush the unit and all connecting piping with fresh water prior to start up and initial use.**
3. Verify that air bleed valve in blower section on Hybrid unit is open during initial filling with water. Air must be bled from the highest point in the system. If unit installation results in a higher point than the integral air bleed valve, an additional valve needs to be installed at that point.
4. Start unit and verify the correct sequence of operation.



Multi Unit Tankless installation and Direct Return Circulation: One to 6 tankless water heaters shall be installed in a parallel manifold installation electronically connected together with an MIC-6 Manifold Controller installed in a single unit with a remote control.

Plumbing shall be sized based on the total number of units and max flow rate of the system. Gas piping should be sized to accommodate the entire BTU load of the system and installed in accordance with local codes.

Direct Recirculation The recirculation loop shall be returned to the cold water manifold feeding the tankless. It is required that the circulation pump be placed on a timer and controlled by an immersion thermostat. The aquastat shall be set 10 F below the thermostat setting of the tankless, the timer shall be set for peak demand periods. The pump shall be sized for 5 GPM @ 25 ft. of head plus the loop head loss.

Legend

- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Circulation Pump
- Normally Open Shut-off Valve
- Normally Closed Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

This drawing is intended as a guide only. It is not to be used as an alternative to a professionally engineered project drawing. This drawing does not imply compliance with local building codes. Installation may vary, depending on installation location, and must be done in accordance with all local building codes. Consult with local building officials prior to installation.

PROCEDURE FOR CALCULATING THE TOTAL EQUIVALENT LENGTH OF TUBING

List all piping components from the storage tank to the H_2AC rooftop unit and back again. The equivalent length of straight tubing is the same as the actual length. The equivalent length of fittings are obtained from the table below. Sum all of the individual component lengths to find the Total Equivalent Length.

***Pressure Loss in Fittings and Valves Expressed as Equivalent Length of Tube, feet**

Nominal or Standard Size, in		1-1/2"	2"
Fittings	Standard 90° Elbow	4	5.5
	Standard 45° Elbow	1.5	2
	90° Tee - Side Branch	7	9
	90° Tee - Straight Run	0.5	0.5
	Coupling	0.5	0.5
Valves	Ball	0.5	0.5
	Gate	—	0.5
	Btfly	—	7.5
	Check	6.5	9

No.	Inlet	EQUIV. Length (ft.)	No.	Outlet	EQUIV. Length (ft.)
1	side branch Tee	7	18	straight tubing	1
2	straight tubing	1	19	90° elbow	4
3	Check valve	6.5	20	straight tubing	0.5
4	straight tubing	0.5	21	1-1/2" MPT adapter ①	1
5	straight run Tee	0.5	22	Ball Isolation valve	0.5
6	straight tubing	1.5	23	1-1/2" MPT adapter ①	1
7	Ball valve	0.5	24	straight tubing	20
8	straight tubing	5	25	coupling	0.5
9	90° elbow	4	26	straight tubing	19.6
10	straight tubing	20	27	90° elbow	4
11	coupling	0.5	28	straight tubing	4
12	straight tubing	20	29	Ball valve	0.5
13	1-1/2" MPT adapter ①	1	30	straight tubing	1.5
14	Ball Isolation valve	0.5	31	straight run Tee	0.5
15	1-1/2" MPT adapter ①	1	32	straight tubing	0.5
16	straight tubing	0.5	33	Check valve	6.5
17	90° elbow - fitting	4	34	straight tubing	1
			35	90° elbow	4
		74.0			70.6
	Total Equivalent length (ft.)	144.6			

*NOTES: ① For threaded fittings, double the allowances shown in the table.

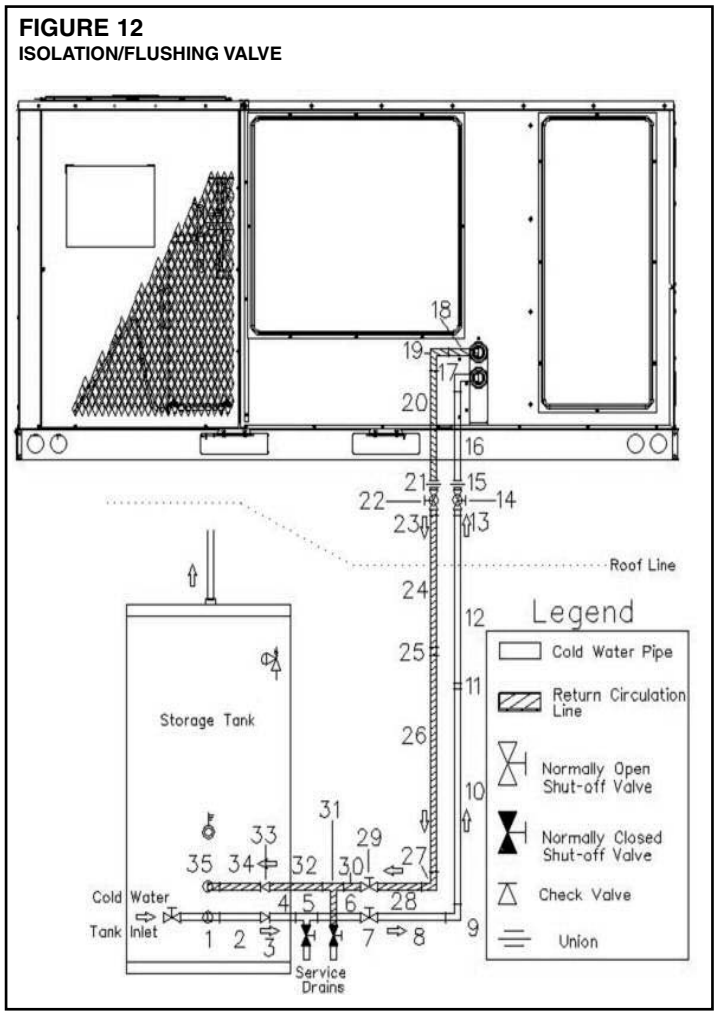
Data condensed from Table 7 of the Copper Development Organization.

Allowances are for streamlined soldered fittings and recessed threaded fittings.

The equivalent lengths presented above are based upon a C factor of 150 in the Hazen-Williams friction loss formula. The lengths shown are rounded to the nearest half foot.

In a closed system application the static (elevation) head is ignored. Only the pipe friction is used to calculate pressure drop.

FIGURE 12
ISOLATION/FLUSHING VALVE



Water Flow Rate (GPM) (15 GPM minimum)		15	20	25	**30**
Water Velocity using 1-1/2” Nom. Type L Copper Tubing (fps)		2.71	3.61	4.51	5.41
Available Pressure Head at Unit @ 230/460 Volts	(Head ft.) (psig)	30.3 13.1	23.8 10.3	16.3 7.1	7.7 3.3
Maximum Equivalent Feet of 1-1/2 Nom. Type L. Copper tubing (ft.) at 230/460V		1504	695	314	106
Available Pressure Head at Unit @ 208 Units	(Head ft.) (psig)	26.8 11.6	19.5 8.4	11.3 4.9	2.2 0.9
Maximum Equivalent Feet of 1-1/2” Nom. Type L Copper Tubing (ft.) @ 208 V		1332	569	218	30

H_2AC Water Flowrate vs. Water Pressure Drop

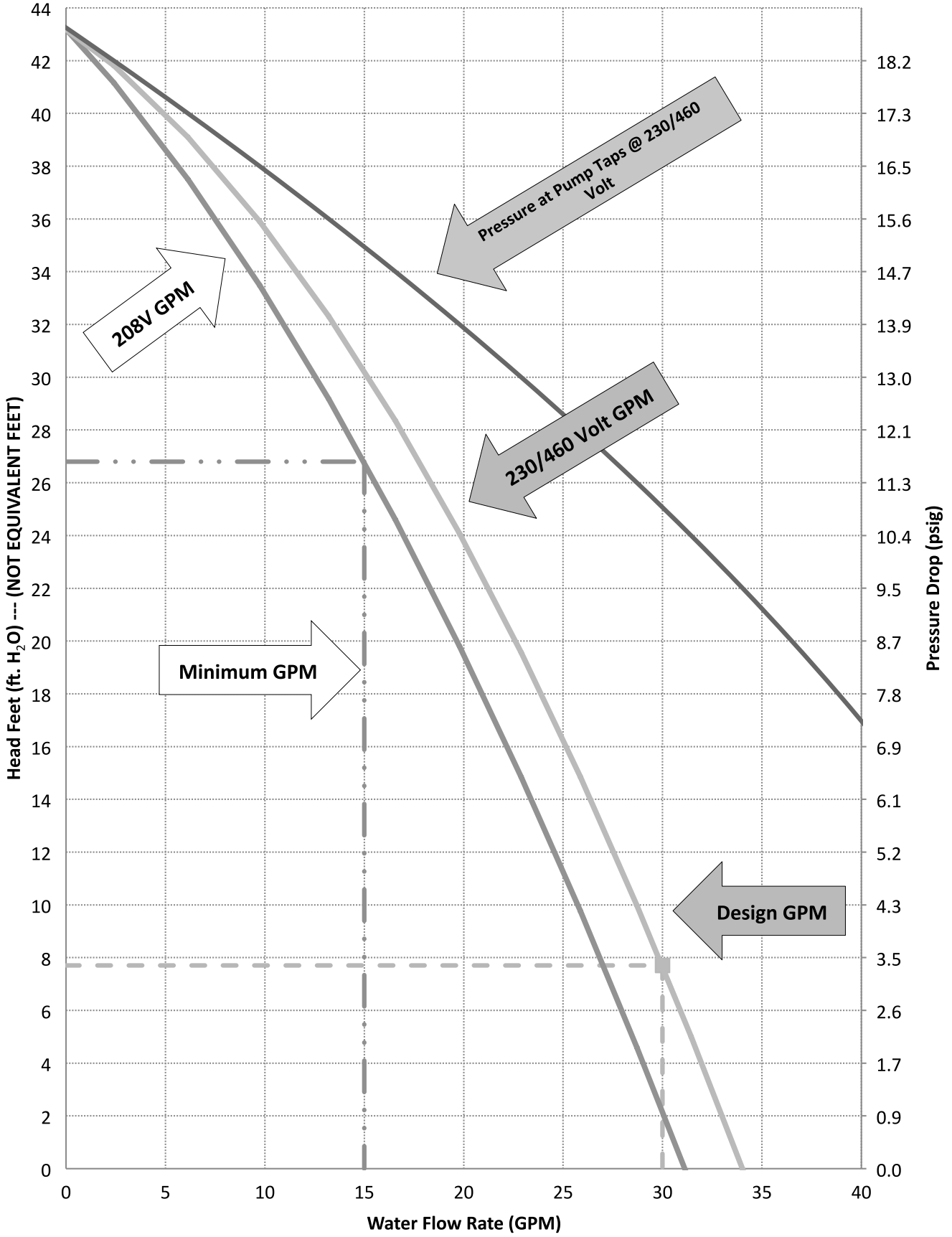


FIGURE 13
ISOLATION/FLUSHING VALVE (WEBSTONE #41436 OR SIMILAR

⚠ 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.

XIV. LIME AND SCALE FLUSHING PROCEDURE

Periodic flushing is required for the refrigerant-to-water heat exchanger contained in the Rheem H_2AC Rooftop Unit to remove lime and scale buildup and to prevent degradation of water heating performance. How often this is required depends on the hardness of the water in your area and the run time in the water heating mode. The below instructions provide a safe and effective means of removing the lime and scale buildup in the heat exchanger. If you are not comfortable with the procedure, seek out the assistance of a plumbing professional.

This procedure assumes that isolation/flushing valves have been installed on the unit water inlet and outlet connections (see Figure 13). If the unit was installed without valves, it is recommended that flushing be performed by a plumbing professional.

Required items:

- Five gallon bucket
- Small circulation pump
- Hoses with connections suitable for the unit drain valves and pump.
- 2-3 gallons of food-grade white vinegar.
- **The bucket, pump, and hoses can be ordered as Rheem flush kit RTG20124.**

Instructions:

1. Turn off the electric supply to the unit.
2. Shut off the water supply to the unit using the isolation ball valves. Consult the valve manufacturer's instructions for specifics in using their valve assemblies.
3. Attach a short hose to the threaded fittings on each drain valve. Connect the hose on the inlet valve to the outlet of a small circulation pump.
4. Pour approximately two to three gallons of food-grade white vinegar into the pail.
5. Place the inlet hose from the pump and the drain hose from the outlet valve on the unit into the pail.
6. Open the drain valves and turn on the pump. Allow the vinegar solution to circulate for 45-60 minutes.
7. Turn off pump and drain vinegar from the heat exchanger. Close the inlet water drain valve.
8. Open the inlet water supply shutoff valve and allow fresh water to flush the heat exchanger for at least five minutes to remove all traces of vinegar from the system.
9. Close the outlet water drain valve and open the outlet water supply shut-off valve.
10. Restore electrical power and verify correct unit operation.

XV. 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?

XVI. 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.
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.

XVII. OPERATION

COOLING MODE

NOTE: For this two-stage cooling and potable water heating unit, the water heating section is located on the rear (second stage) refrigerant system. Because of the presence of the eSYNC control, the unit will always start the rear compressor first (lag mode is permanently engaged), and then a Y2 call will energize the front compressor.

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 contactors are energized through thermostat contacts (Y1) & (Y2) and pressure controls.

C. Economizer enthalpy control (if installed) controls operation of first-stage cooling and positions fresh air damper to maintain mixed air temperature. Second-stage cooling operates normally as required by second stage of thermostats.

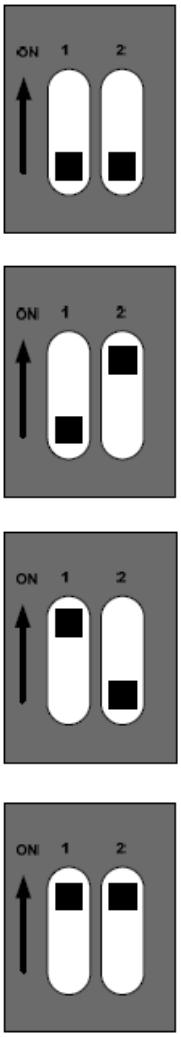
D. The system will continue in cooling operation as long as all safety controls are closed, until the thermostat is satisfied.

WATER HEATING MODE (H2AC SEQUENCE OF OPERATION)

1. On a call for cooling (“Y” from T’stat energized), unit always starts in air-cooled condenser mode and runs for two minutes.
   a. Liquid line solenoid from water-cooled heat exchanger is energized during this time to expedite transfer of refrigerant from water-cooled condenser.
2. After two minutes water pump is energized for 60 seconds while water temperature is sampled by a thermistor.
   a. If water pressure switch does not sense adequate pressure (5 psig), or water inlet temperature is >95°F go to step 7.
3. If water pressure switch senses adequate pressure and water inlet temperature is <95°F, unit switches to water-cooled condenser mode*.
   a. Three-way valve is energized.
   b. Outdoor fans are switched off.
   c. Outdoor coil liquid line solenoid is energized for two minutes to expedite return of liquid refrigerant in air-cooled condenser.

4. Unit operates in water-cooled condenser (water heating) mode until the call for cooling ends, outlet water temperature reaches 138°F, or liquid line pressure >565 psig.
5. The control will record the water inlet temperature when the refrigerant pressure reaches 550 psig. The control will use this value minus 20°F for the H_2AC water inlet restart temperature.
6. If termination of a call for cooling ends the water-cooled condenser (water heating) cycle, the unit will restart as described in item 1 above on the next call for cooling.
7. If the water-cooled condenser (water heating) cycle terminates on water temperature rise (138°F) or pressure (>565 psig) and there is still a call for cooling, the unit three-way valve switches back to the air-cooled condenser mode, turns on the outdoor fans, and energizes the liquid line solenoid from the water-cooled condenser for two minutes.
8. If a cooling ("Y") call continues, return to Step 2 after a selectable delay (default is ten minutes).

FIGURE 14



FAULTS/LOCKOUTS/MISC.

1. **Low-temperature lockout** - Occurs at 40°F for the water-cooled condenser (water heating) mode. Unit will only operate in the air-cooled condenser mode below 40°F.
2. **Standard DDC control lockouts** – High pressure control, low pressure control, low ambient control, etc.
3. **Three-way valve failure or water pump failure** – A rapid rise in liquid line pressure will occur. If liquid line pressure increases above 530 psig in less than one

minute. If three of these trips occur during a call for cooling, a hard lockout of the water heating mode will occur, but the unit will still function in the air-cooled condenser mode. The alarm is reset after a 24-hour delay.

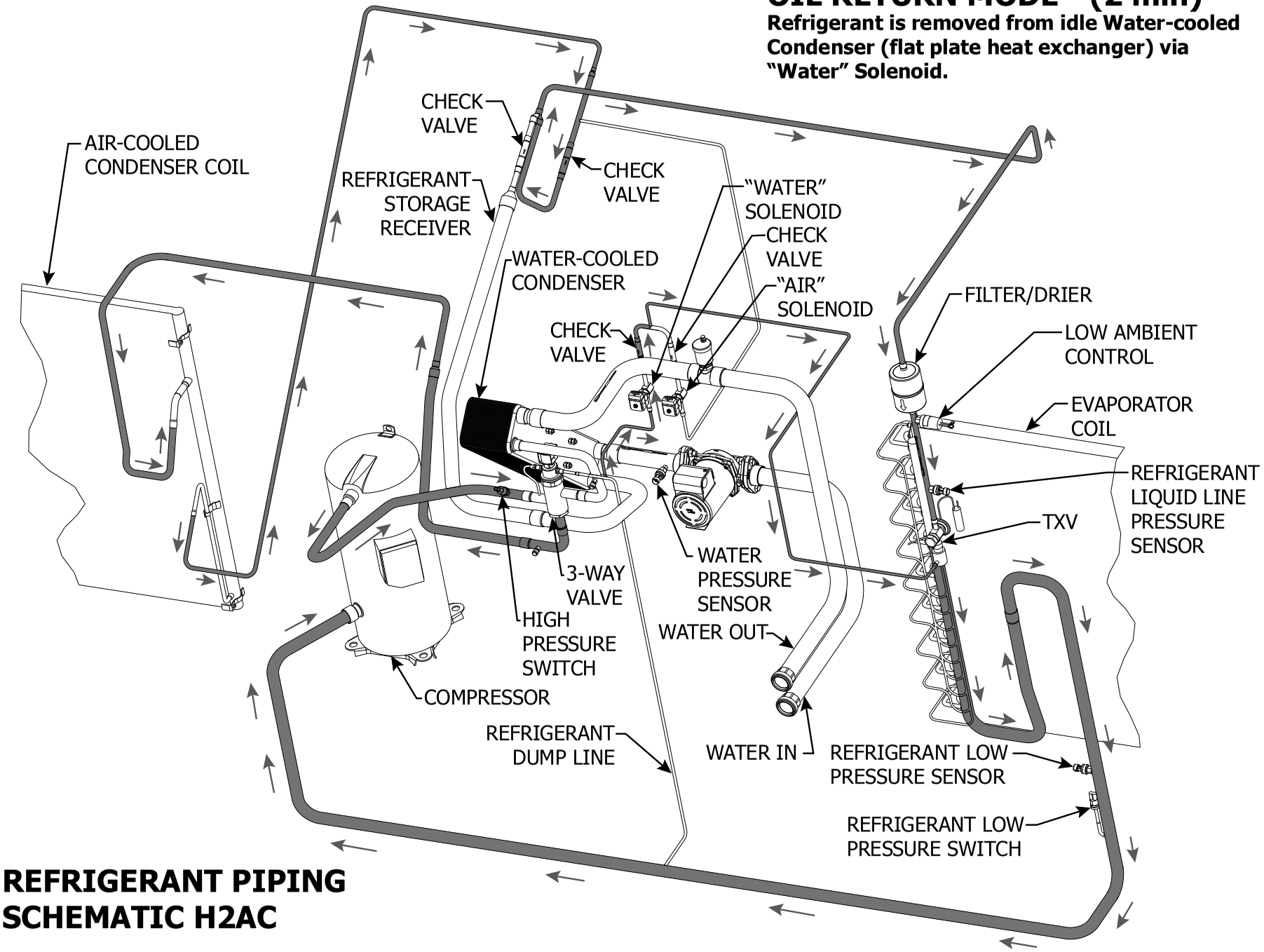
4. **Airside solenoid valve failure** – shows up as an undercharge in the water heating mode. Four minutes after the 3-way valve has shifted, if subcooling less than 4° or superheat more than 25° is continuously measured for more than 30 seconds, unit will return to air cooled mode. If this happens three times in a row without a successful run of at least four minutes in the water heating mode, then a hard lockout of the water heatiing mode will occur, but the unit will still function in the air-cooled condenser mode. The alarm is reset after a 24-hour delay.
5. **Freeze protection** - If ambient is <35°F, water pump is energized until ambient is >37°F.
6. **Leak detection** - If leak detector senses water, an alarm signal is sent to the thermostat and waterside operation is locked out until leak detection ends.

Misc.

1. Water pump is energized once for 6 minutes every 24 hours to keep water from stagnating in times of no cooling operation.

OIL RETURN MODE - (2 min)

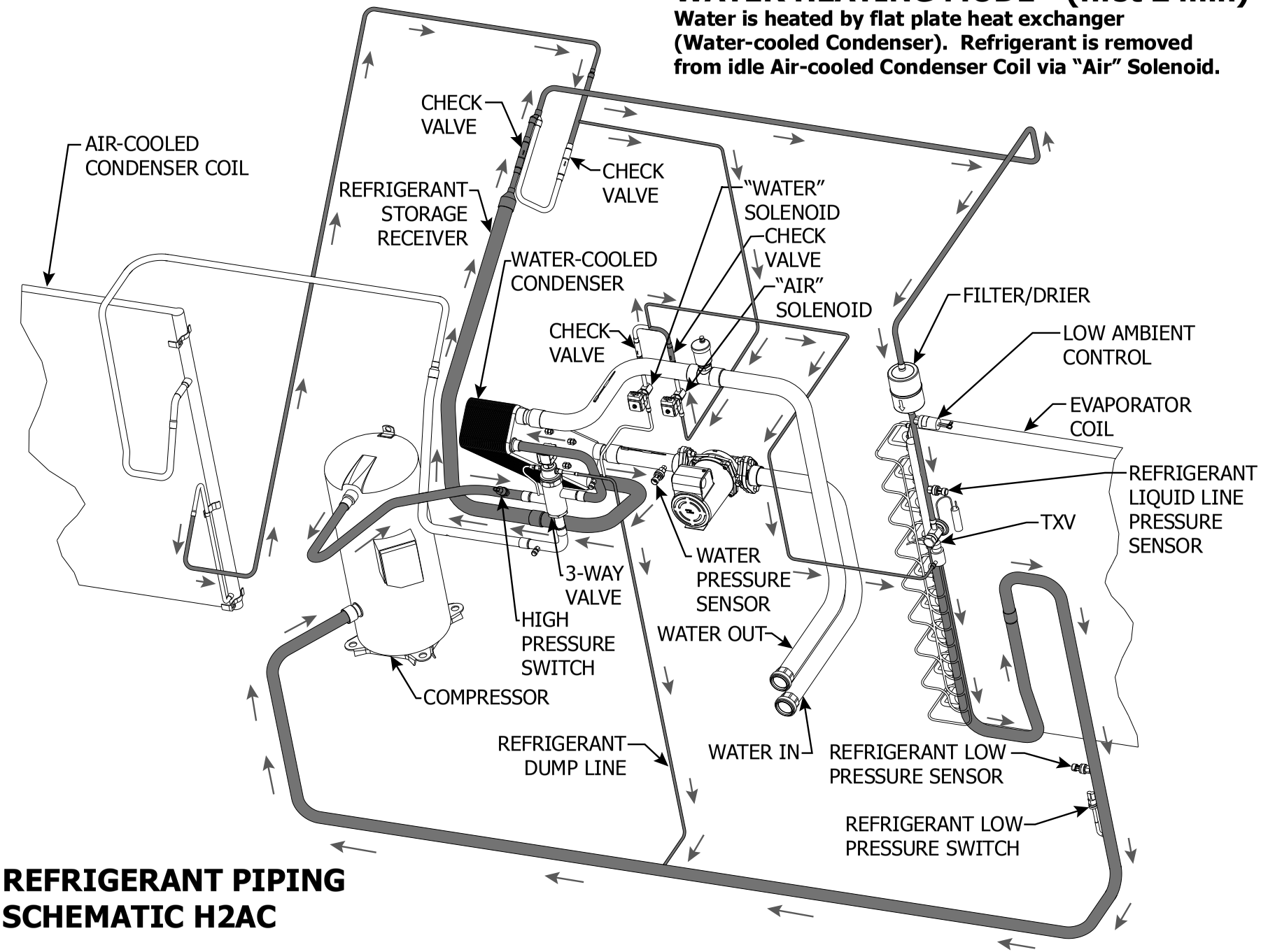
Refrigerant is removed from idle Water-cooled Condenser (flat plate heat exchanger) via "Water" Solenoid.



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING MODE - (first 2 min)

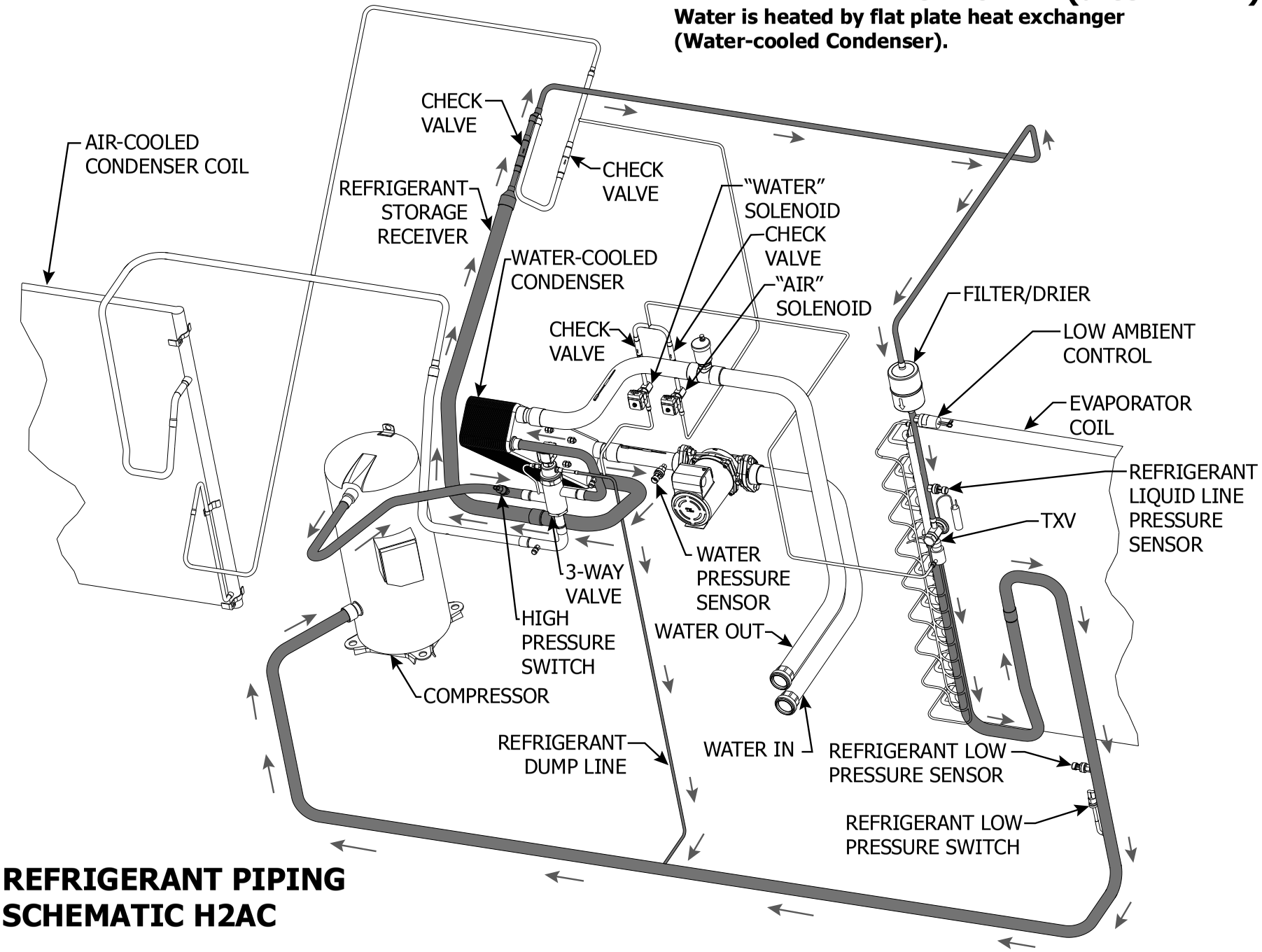
Water is heated by flat plate heat exchanger (Water-cooled Condenser). Refrigerant is removed from idle Air-cooled Condenser Coil via "Air" Solenoid.



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING MODE - (after 2 min)

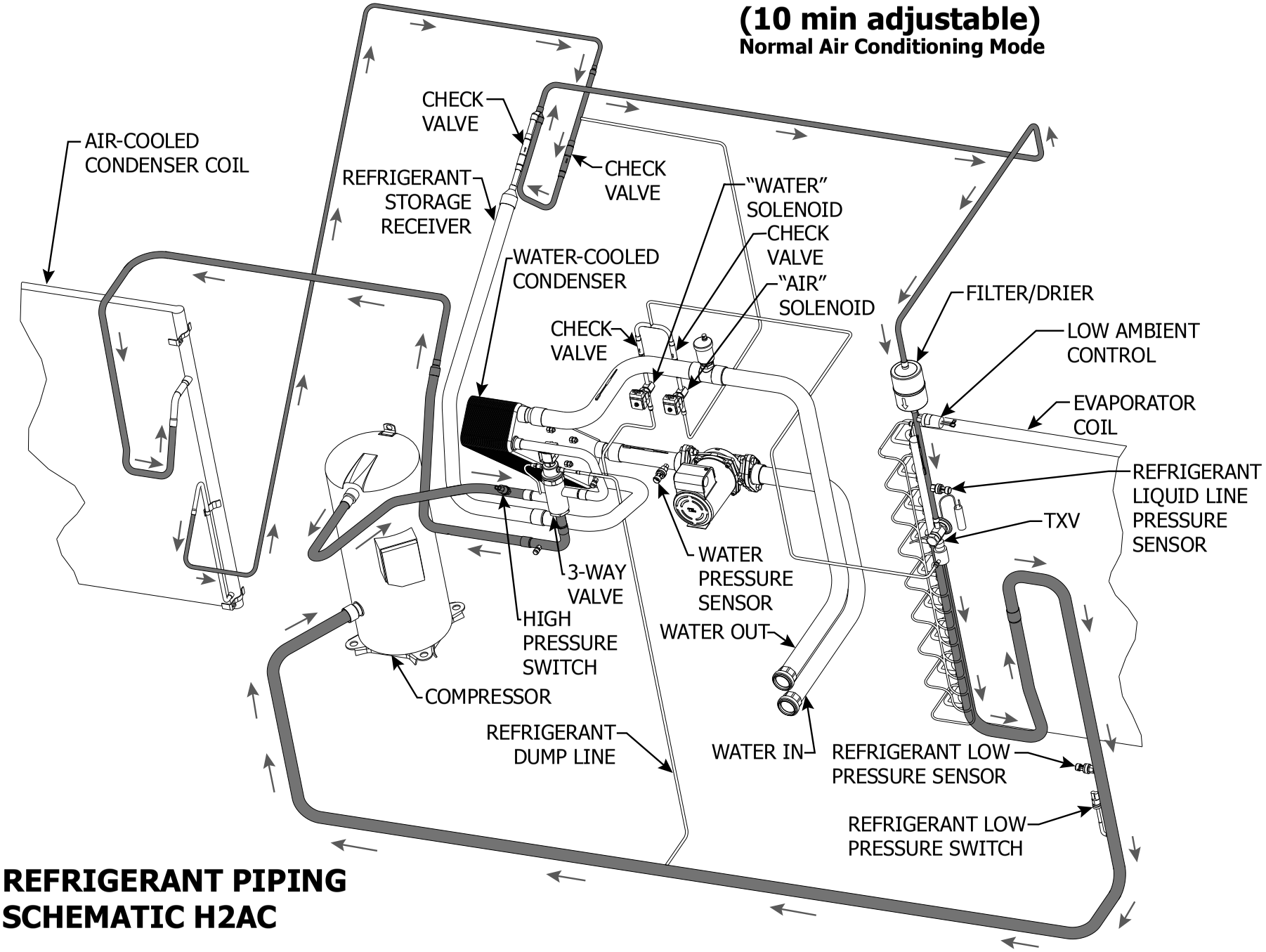
Water is heated by flat plate heat exchanger (Water-cooled Condenser).



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING DELAY MODE - (10 min adjustable)

Normal Air Conditioning Mode



REFRIGERANT PIPING SCHEMATIC H2AC

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).

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XVIII. AUXILIARY HEAT

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

REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

CHARGE INFORMATION

Refer to the appropriate charge chart on the unit, or in this booklet.

TROUBLESHOOTING

Refer to the troubleshooting chart included in this manual.

WIRING DIAGRAMS

Refer to the appropriate wiring diagram included in this manual.

XIX. HEATER KIT CHARACTERISTICS
AUXILIARY HEATER KITS CHARACTERISTICS AND APPLICATION (15 & 20 TON MODELS)

208/240 VOLT, THREE PHASE, 60 HZ, AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION

	Single Power Supply for Both Unit and Heater Kit								Separate Power Supply for Both Unit and Heater Kit				
	Heater Kit					Air Conditioner			Heater Kit		Air Conditioner		
RHEEM Model Number	RXJJ- Heater Kit Nominal kW	No. of Sequence Steps	Rated Heater kW @ 208/240 V	Heater KBTU/Hr @ 208/240 V	Heater Amp. @ 208/240 V	Unit Min. Ckt. Ampacity @ 208/240 V	Over Current Protective Device Size Min./Max. @ 208 V	Over Current Protective Device Size Min./Max. @ 240 V	Min. Ckt. Ampacity 208/240V	Max. Fuse Size 208/240V	Min. Circuit Ampacity 208/240V	Over Current Protective Device Size Min./Max. @ 208 V	Over Current Protective Device Size Min./Max. @ 240 V
RLHL-D180CL	No Heat	-----	-----	-----	-----	77/77	90/100	90/100	-----	-----	77/77	90/100	90/100
	CE20C	1	14.4/19.2	49.13/65.5	40/46.2	77/77	90/100	90/100	50/58	50/60	77/77	90/100	90/100
	CE40C	2	28.8/38.3	98.25/130.66	79.9/92.2	117/132	125/125	150/150	100/116	100/125	77/77	90/100	90/100
	CE60C	2	43.2/57.5	147.38/196.16	119.9/138.3	167/190	175/175	200/200	150/173	150/175	77/77	90/100	90/100
	CE75C	2	54/71.9	184.22/245.29	149.8/172.8	204/233	225/225	250/250	188/217	200/225	77/77	90/100	90/100
RLHL-D180CM	No Heat	-----	-----	-----	-----	81/81	90/100	90/100	-----	-----	81/81	90/100	90/100
	CE20C	1	14.4/19.2	49.13/65.5	40/46.2	81/81	90/100	90/100	50/58	50/60	81/81	90/100	90/100
	CE40C	2	28.8/38.3	98.25/130.66	79.9/92.2	121/136	125/125	150/150	100/116	100/125	81/81	90/100	90/100
	CE60C	2	43.2/57.5	147.38/196.16	119.9/138.3	171/194	175/175	200/200	150/173	150/175	81/81	90/100	90/100
	CE75C	2	54/71.9	184.22/245.29	149.8/172.8	209/237	225/225	250/250	188/217	200/225	81/81	90/100	90/100

480 VOLT, THREE PHASE, 60 HZ, AUXILIARY ELECTRIC HEATER KITS CHARACTERISTICS AND APPLICATION

	Single Power Supply for Both Unit and Heater Kit								Separate Power Supply for Both Unit and Heater Kit				
	Heater Kit					Air Conditioner			Heater Kit		Air Conditioner		
RHEEM Model Number		No. of Sequence Steps	Rated Heater kW @ 480 V	Heater KBTU/Hr @ 480 V	Heater Amp. @ 480 V	Unit Min. Ckt. Ampacity @ 480 V	Over Current Protective Device Size Min./Max. @ 480 V	Over Current Protective Device Size Min./Max. @ 480 V	Min. Ckt. Ampacity 480V	Max. Fuse Size 480V	Min. Circuit Ampacity 480V	Over Current Protective Device Size Min./Max. @ 480 V	Over Current Protective Device Size Min./Max. @ 480 V
RLHL-D180DL	No Heat	-----	-----	-----	-----	40	45/50	-----	-----	-----	40	45/50	-----
	CE20D	1	19.2	65.5	23.1	40	45/50	-----	29	30	40	45/50	-----
	CE40D	2	38.4	131	46.2	66	70/70	-----	58	60	40	45/50	-----
	CE60D	2	57.6	196.5	69.3	95	100/100	-----	87	90	40	45/50	-----
	CE75D	2	72	245.63	86.6	117	125/125	-----	109	110	40	45/50	-----
RLHL-D180DM	No Heat	-----	-----	-----	-----	42	45/50	-----	-----	-----	42	45/50	-----
	CE20D	1	19.2	65.5	23.1	42	45/50	-----	29	30	42	45/50	-----
	CE40D	2	38.4	131	46.2	69	70/70	-----	58	60	42	45/50	-----
	CE60D	2	57.6	196.5	69.3	98	100/100	-----	87	90	42	45/50	-----
	CE75D	2	72	245.63	86.6	119	125/125	-----	109	110	42	45/50	-----

TROUBLE SHOOTING CHART

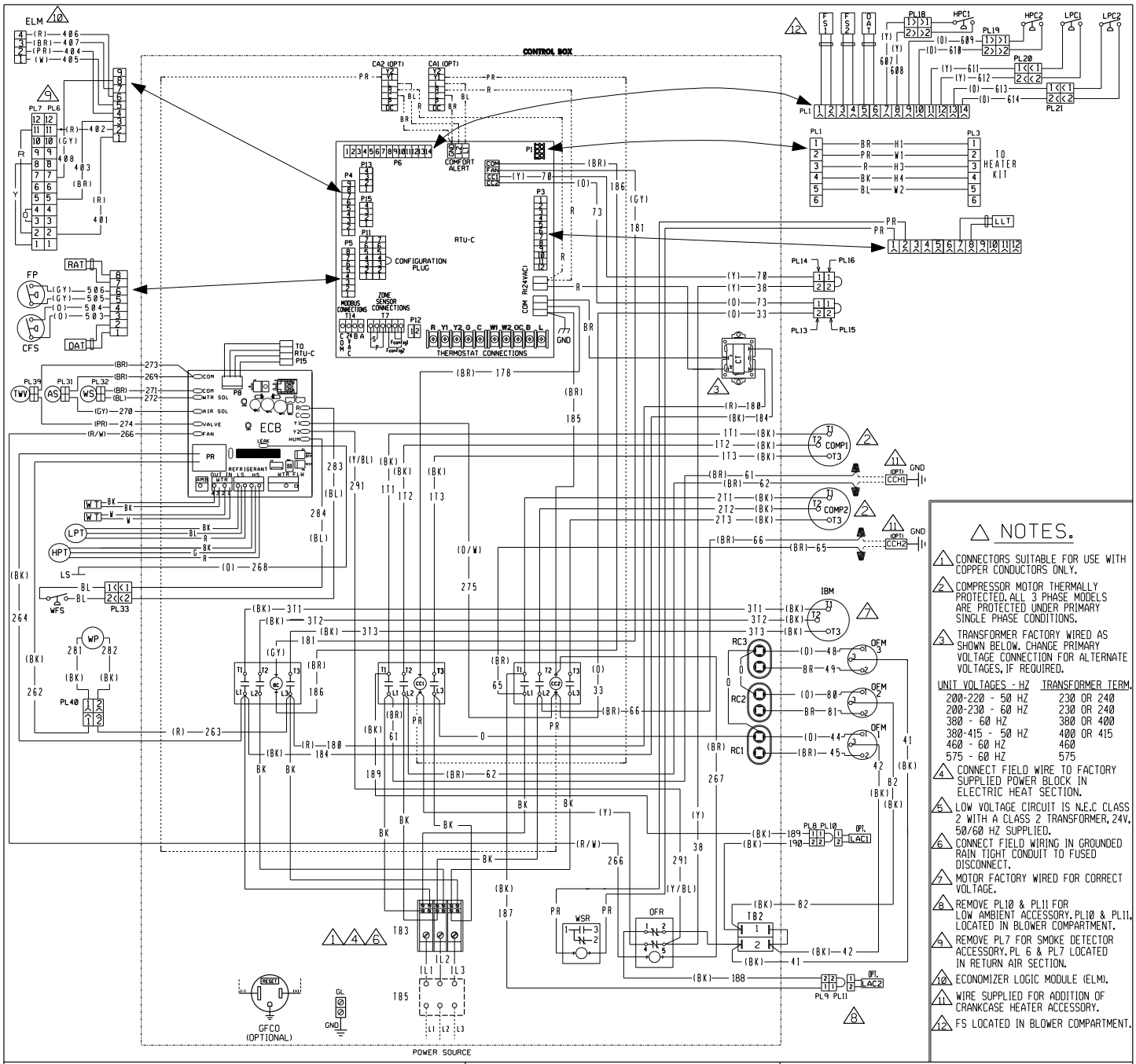
⚠ WARNING

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	• 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	• 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	• Run capacitor defective (single phase only) • Loose connection • Compressor stuck, grounded or open motor winding open internal overload. • Low voltage condition	• 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	• Improperly sized unit • Improper airflow • Incorrect refrigerant charge • Air, non-condensibles or moisture in system • Incorrect voltage	• 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	• Incorrect voltage • Defective overload protector • Refrigerant undercharge	• At compressor terminals, voltage must be ± 10% of nameplate marking when unit is operating. • Replace - check for correct voltage • Add refrigerant
Registers sweat	• Low evaporator airflow	• Increase speed of blower or reduce restriction - replace air filter
High head-low vapor pressures	• Restriction in liquid line, expansion device or filter drier • TXV does not open	• Remove or replace defective component • Replace TXV
High head-high or normal vapor pressure - Cooling mode	• Dirty condenser coil • Refrigerant overcharge • Condenser fan not running • Air or non-condensibles in system	• Clean coil • Correct system charge • Repair or replace • Recover refrigerant, evacuate & recharge
Low head-high vapor pressures	• Defective Compressor valves	• Replace compressor
Low vapor - cool compressor - iced evaporator coil	• Low evaporator airflow • Operating below 65°F outdoors • Moisture in system • Dirty evaporator coil, bent fins	• Increase speed of blower or reduce restriction - replace air filter • Add Low Ambient Kit • Recover refrigerant - evacuate & recharge - add filter drier • Clean evaporator coil, straighten fins
High vapor pressure	• Excessive load • Defective compressor	• Recheck load calculation • Replace
Fluctuating head & vapor pressures	• TXV hunting • Air or non-condensibles in system	• 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	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge

XX. H2AC ROOFTOP UNIT ALARMS AND TROUBLESHOOTING

Alarm Designation	MODBUS "Current Alarm" Code	Description	Troubleshooting Information
H2AC Rooftop Unit Water Leakage	102	The sensor in the water heating (hybrid) section of the unit has detected a water leak and stopped water heating operation. A relay output for an optional field-installed water shutoff valve is energized.	> Check for loose or defective air vent valve on water discharge line in water heating section. > Check for water pump seal leakage. > Check that sensor is installed correctly on control. > Replace the sensor.
H2AC Rooftop Unit Low Water Pressure	103	No alarm is set. The water sensor measures potable water pressure in the water heating section. If the water pressure is below 5 PSIG, water heating operation will not begin. If the sensor becomes unavailable, water heating operation terminates. The unit can continue to operate in cooling mode.	> Check that sensor is correctly installed on control. > The sensor has three wires that attach to the hybrid control. Check for 5VDC between the outer terminals. If 5VDC is not present, replace the hybrid control. > Replace the sensor.
H2AC Rooftop Unit Freeze Protection Mode	104	The outdoor ambient sensor on the RTU-C has detected outdoor ambient temperature below 35°F. The water pump is energiced continuously until the outdoor ambient temperature rises above 38°F.	> Check that sensor is installed correctly on control. > Check sensor location. > Replace the sensor.
H2AC Rooftop Unit Solenoid Fault	105	At the beginning of each water heating cycle, if the high pressure sensor value exceeds 530 PSIG after 3 seconds but before 60 seconds are elapsed, an alarm is set.	> Check water pump operation, shut-off valves, etc. for adequate water flow. > Check for 24VAC at control transformer > Check for 24VAC at hybrid unit 3-way refrigerant valve. > Increase water sample delay time using DIP switches on hybrid control. > Replace 3-way refrigerant valve if it fails to shift.
H2AC Rooftop Unit Ambient Sensor Fault	106	The water pump is energzed continuously until the sensor becomes available.	> Extreme temperatures. > Check that sensor is installed correctly. > Replace the sensor.
H2AC Rooftop Unit Water Inlet Sensor Fault	107	If the sensor becomes unavailable, an alarm will be set and water heating operation terminates. Unit can continue to operate in cooling mode.	> Extreme temperatures. > Check that sensor is installed correctly. > Replace the sensor.
H2AC Rooftop Unit Water Outlet Sensor Fault	108	If the sensor becomes unavailable, an alarm will be set and water heating operation terminates. Unit can continue to operate in cooling mode.	> Extreme temperatures. > Check that sensor is installed correctly. > Replace the sensor.
H2AC Rooftop Unit Water Inlet and Outlet Sensor Fault	109	If both sensors becomes unavailable, an alarm will be set and water heating operation terminates. Unit can continue to operate in cooling mode.	> Extreme temperatures. > Check that sensor is installed correctly. > Replace the sensors.
H2AC Rooftop Unit High Pressure Sensor Fault	110	The high pressure sensor measures liquid refrigerant pressure. If the sensor becomes unavailable, water heating operation terminates and an alarm is set. Unit can continue to operate in cooling mode.	> Check that sensor is correctly installed on control. > The sensor has three wires that attach to the hybrid control. Check for 5VDC between the outer terminals. If 5VDC is not present, replace the hybrid control. > Replace the sensor.
H2AC Rooftop Unit Low Pressure Sensor Fault	111	The low pressure sensor measures liquid refrigerant pressure. If the sensor becomes unavailable, water heating operation terminates and an alarm is set. Unit can continue to operate in cooling mode.	> Check that sensor is correctly installed on control. > The sensor has three wires that attach to the hybrid control. Check for 5VDC between the outer terminals. If 5VDC is not present, replace the hybrid control. > Replace the sensor.
H2AC Rooftop Unit Lockout Fault	112	If alarms 105, 115, 116, 117, or 118 are initiated more than 3 times from unit power-up, an alarm is set and water heating mode is terminated until the alarm is cleared. **The lockout fault can only be cleared by removing power to the unit or by sending a "Clear All Alarms" command through the BAS network.**	> Check individual alarms.
H2AC Rooftop Unit Low Subcooling - water heating mode	115	If, 4 minutes after the 3-way valve has shifted, low subcooling was continuously measured for more than 30 seconds during the water heating mode an alarm is set. Unit operation continues.	> If low subcooling occurs after exiting the air conditioning mode, check wiring and verify operation of outdoor refrigerant (air side) solenoid. > Check location of liquid line temperature sensor. > Verify correct refrigerant charge.
Low Subcooling - air conditioning mode	116	If, 4 minutes after the 3-way valve has shifted, low subcooling was continuously measured for more than 30 seconds during the air conditining mode an alarm is set. Unit operation continues.	> If low subcooling occurs after exiting the water heating mode, check wiring and verify operation of flat plate heat exchanger (water side) solenoid. > Check location of liquid line temperature sensor. > Verify correct refrigerant charge.
High Superheat - water heating mode	117	If, 4 minutes after the 3-way valve has shifted, high superheat was continuously measured for more than 30 seconds during the water heating mode an alarm is set. Unit operation continues.	> High internal building load. > Expansion valve is not operating correctly.
High Superheat - air conditioning heating mode	118	If, 4 minutes after the 3-way valve has shifted, high superheat was continuously measured for more than 30 seconds during the air conditioning mode an alarm is set. Unit operation continues.	> If high superheat occurs after exiting the water heating mode, check wiring and verify operation of flat plate heat exchanger (water side) solenoid. > High internal building lode. > Expansion valve is not operating correctly.



NOTES.

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
3. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTION FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50 HZ	230 OR 240
200-230 - 60 HZ	230 OR 240
380 - 60 HZ	380 OR 400
380-415 - 50 HZ	400 OR 415
460 - 60 HZ	460
575 - 60 HZ	575

4. CONNECT FIELD WIRE TO FACTORY SUPPLIED POWER BLOCK IN ELECTRIC HEAT SECTION.
5. LOW VOLTAGE CIRCUIT IS N.E.C CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
7. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
8. REMOVE PL10 & PL11 FOR LOW AMBIENT ACCESSORY. PL10 & PL11, LOCATED IN BLOWER COMPARTMENT.
9. REMOVE PL7 FOR SMOKE DETECTOR ACCESSORY. PL 6 & PL7 LOCATED IN RETURN AIR SECTION.
10. ECONOMIZER LOGIC MODULE (ELM).
11. WIRE SUPPLIED FOR ADDITION OF CRANKCASE HEATER ACCESSORY.
12. FS LOCATED IN BLOWER COMPARTMENT.

COMPONENT CODE

AS	AIR SOLENOID
BC	BLOWER CONTACTOR
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR SENSOR
DISC	DISCONNECT SWITCH
ECB	ESYNC CONTROL BOARD
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
HPT	HIGH PRESSURE TRANSDUCER
IBM	INDOOR BLOWER MOTOR BELT DRIVE
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT COOLING CONTROL
LLT	LIQUID LINE TEMPERATURE
LPC	LOW PRESSURE CONTROL
LPT	LOW PRESSURE TRANSDUCER
LS	LEAK SENSOR
OAT	OUTSIDE AIR SENSOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PL	PLUG
PR	PUMP RELAY
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
TB	TERMINAL BLOCK
TWV	THREE-WAY VALVE
WFS	WATER FLOW SWITCH
WP	WATER PUMP
WS	WATER SOLENOID
WSR	WATER SHUTOFF RELAY
WT	WATER TEMPERATURE SENSER
	WIRE NUT

WIRING INFORMATION

LINE VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

LOW VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

REPLACEMENT WIRE
- -MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105° C MIN.)

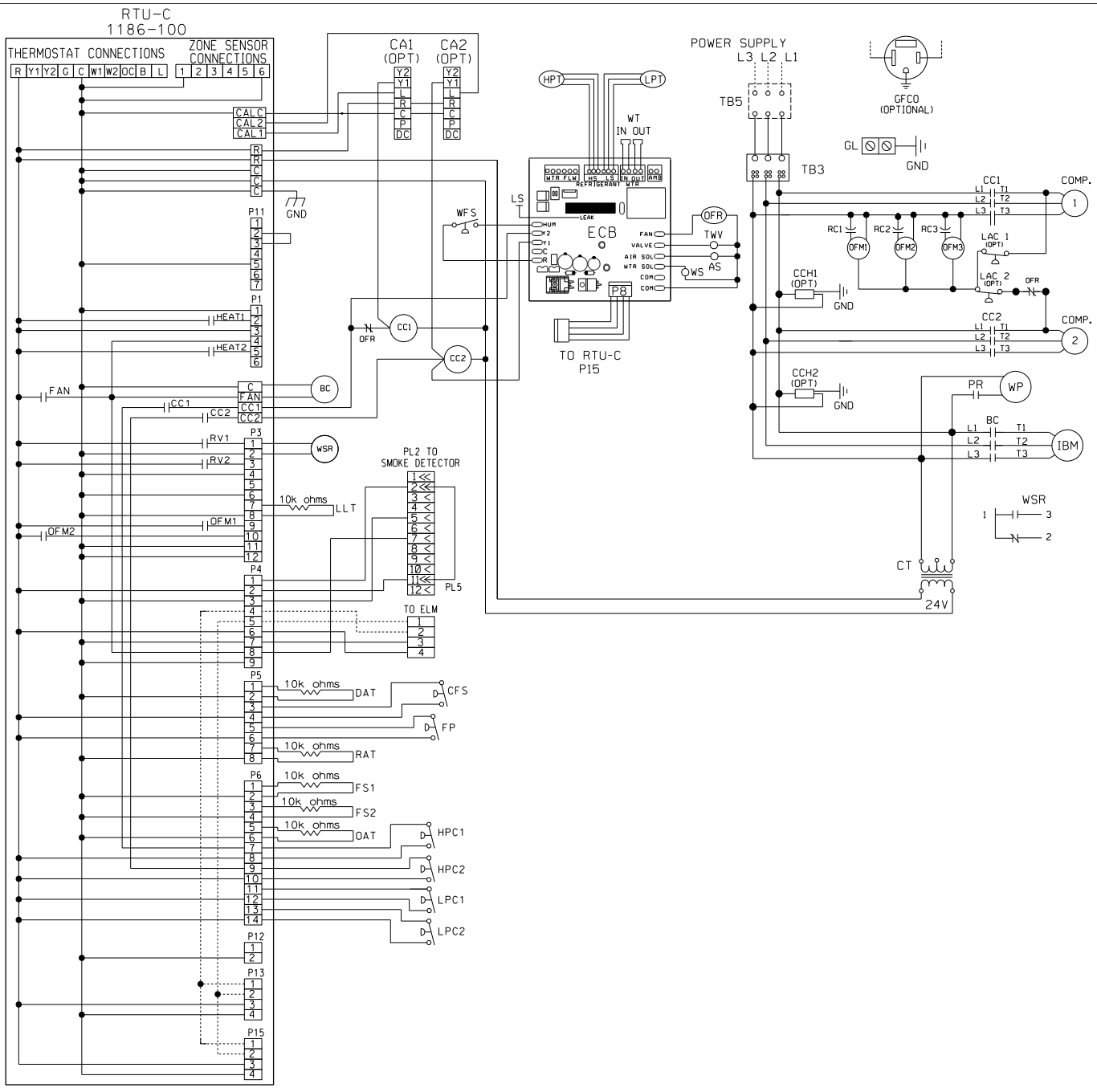
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

WIRE COLOR CODE

BK	BLACK	O	ORANGE
BR	BROWN	PR	PURPLE
BL	BLUE	R	RED
G	GREEN	W	WHITE
GY	GRAY	Y	YELLOW

WIRING DIAGRAM
RLHL-D180
208-230V 3 PH, 60 HZ.
PACKAGED A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-4-13	90-104652-03	00



COMPONENT CODE

AS	AIR SOLENOID	HPT	HIGH PRESSURE TRANSDUCER	TWV	THREE-WAY VALVE
BC	BLOWER CONTACTOR	IBM	INDOOR BLOWER MOTOR BELT DRIVE	WFS	WATER FLOW SWITCH
CA	COMFORT ALERT MODULE	IFC	INTEGRATED FURNACE CONTROL	WP	WATER PUMP
CC	COMPRESSOR CONTACTOR	LAC	LOW AMBIENT COOLING CONTROL	WS	WATER SOLENOID
CCH	CRANKCASE HEATER	LLT	LIQUID LINE TEMPERATURE	WSR	WATER SHUTOFF RELAY
CFS	CLOGGED FILTER SWITCH	LPC	LOW PRESSURE CONTROL	WT	WATER TEMPERATURE SENSER
COMP	COMPRESSOR	LPT	LOW PRESSURE TRANSDUCER		WIRE NUT
CT	CONTROL TRANSFORMER	LS	LEAK SENSOR		
DAT	DISCHARGE AIR SENSOR	OAT	OUTSIDE AIR SENSOR		
DISC	DISCONNECT SWITCH	OFM	OUTDOOR FAN MOTOR		
ECB	ESYNC CONTROL BOARD	OFR	OUTDOOR FAN RELAY		
FP	FAN PROVING	PL	PLUG		
FS	FREEZE SENSOR	PR	PUMP RELAY		
GFCO	GROUND FAULT CONVENIENCE OUTLET	RAT	RETURN AIR SENSOR		
GL	GROUND LUG	RC	RUN CAPACITOR		
GND	GROUND	RTU-C	ROOFTOP UNIT CONTROL		
HPC	HIGH PRESSURE CONTROL	TB	TERMINAL BLOCK		

WIRING INFORMATION

LINE VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

LOW VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

REPLACEMENT WIRE
- -MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105° C MIN.)

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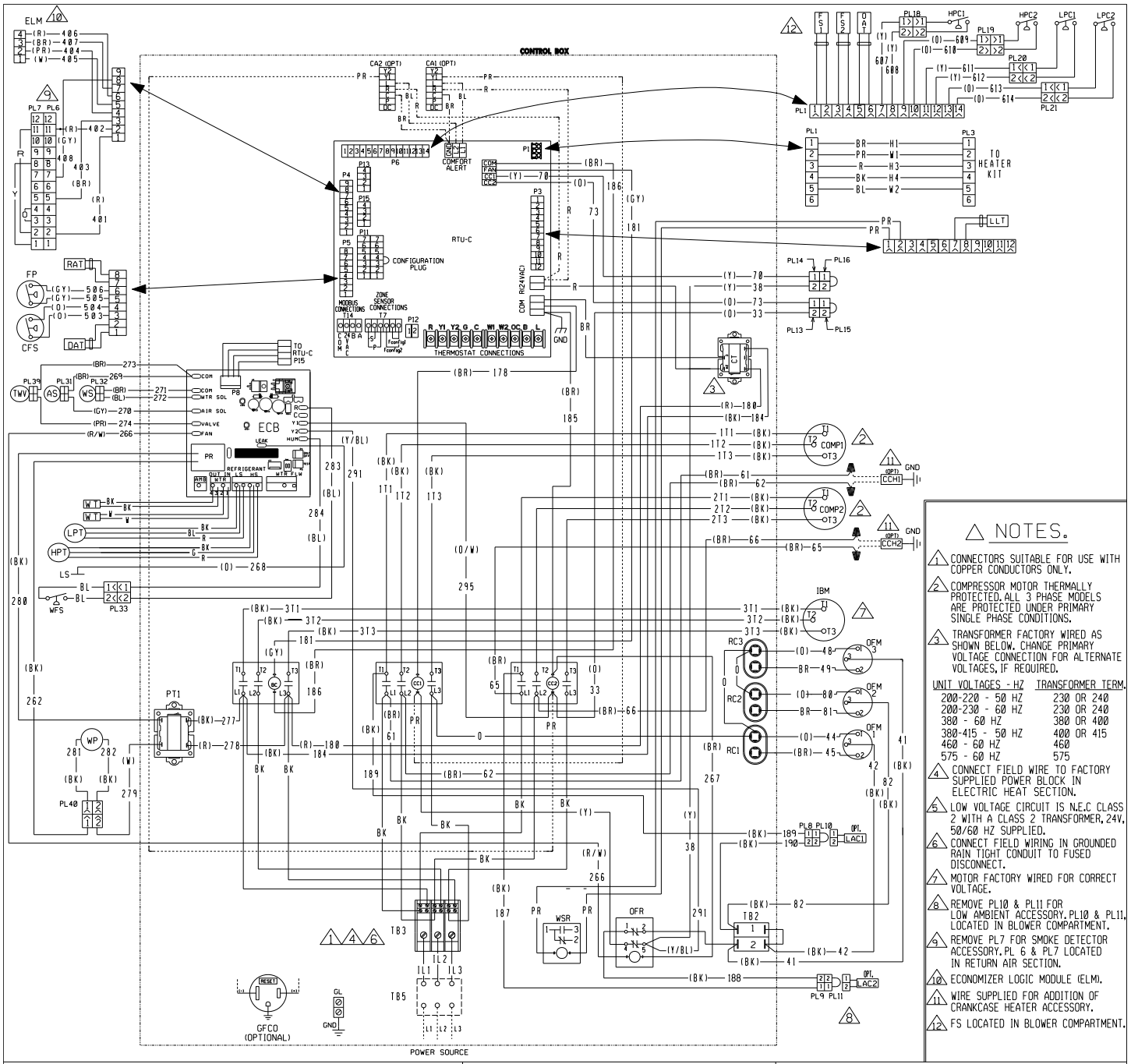
WIRE COLOR CODE

BK__BLACK	O___ORANGE
BR__BROWN	PR__PURPLE
BL__BLUE	R___RED
G___GREEN	W___WHITE
GY__GRAY	Y___YELLOW

WIRING SCHEMATIC
RLHL-D180
208-230V 3 PH, 60 HZ.
PACKAGED A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-7-13	90-104655-03	00



NOTES.

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3. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTION FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50 HZ	230 OR 240
200-230 - 60 HZ	230 OR 240
380 - 60 HZ	380 OR 400
380-415 - 50 HZ	400 OR 415
460 - 60 HZ	460
575 - 60 HZ	575

4. CONNECT FIELD WIRE TO FACTORY SUPPLIED POWER BLOCK IN ELECTRIC HEAT SECTION.
5. LOW VOLTAGE CIRCUIT IS N.E.C CLASS 2 WITH A CLASS 2 TRANSFORMER, 24V, 50/60 HZ SUPPLIED.
6. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
7. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
8. REMOVE PL10 & PL11 FOR LOW AMBIENT ACCESSORY. PL10 & PL11, LOCATED IN BLOWER COMPARTMENT.
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10. ECONOMIZER LOGIC MODULE (ELM).
11. WIRE SUPPLIED FOR ADDITION OF CRANKCASE HEATER ACCESSORY.
12. FS LOCATED IN BLOWER COMPARTMENT.

COMPONENT CODE

AS	AIR SOLENOID	HPT	HIGH PRESSURE TRANSDUCER	TB	TERMINAL BLOCK
BC	BLOWER CONTACTOR	IBM	INDOOR BLOWER MOTOR BELT DRIVE	TWV	THREE-WAY VALVE
CA	COMFORT ALERT MODULE	IFC	INTEGRATED FURNACE CONTROL	WFS	WATER FLOW SWITCH
CC	COMPRESSOR CONTACTOR	LAC	LOW AMBIENT COOLING CONTROL	WP	WATER PUMP
CCH	CRANKCASE HEATER	LLT	LIQUID LINE TEMPERATURE	WS	WATER SOLENOID
CFS	CLOGGED FILTER SWITCH	LPC	LOW PRESSURE CONTROL	WSR	WATER SHUTOFF RELAY
COMP	COMPRESSOR	LPT	LOW PRESSURE TRANSDUCER	WT	WATER TEMPERATURE SENSER
CT	CONTROL TRANSFORMER	LS	LEAK SENSOR		WIRE NUT
DAT	DISCHARGE AIR SENSOR	OAT	OUTSIDE AIR SENSOR		
DISC	DISCONNECT SWITCH	OFM	OUTDOOR FAN MOTOR		
ECB	ESYNC CONTROL BOARD	OFR	OUTDOOR FAN RELAY		
FP	FAN PROVING	PL	PLUG		
FS	FREEZE SENSOR	PR	PUMP RELAY		
GFCO	GROUND FAULT CONVENIENCE OUTLET	PT	POWER TRANSFORMER		
GL	GROUND LUG	RAT	RETURN AIR SENSOR		
GND	GROUND	RC	RUN CAPACITOR		
HPC	HIGH PRESSURE CONTROL	RTU-C	ROOFTOP UNIT CONTROL		

WIRING INFORMATION

LINE VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

LOW VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

REPLACEMENT WIRE
- -MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105° C MIN.)

WARNING
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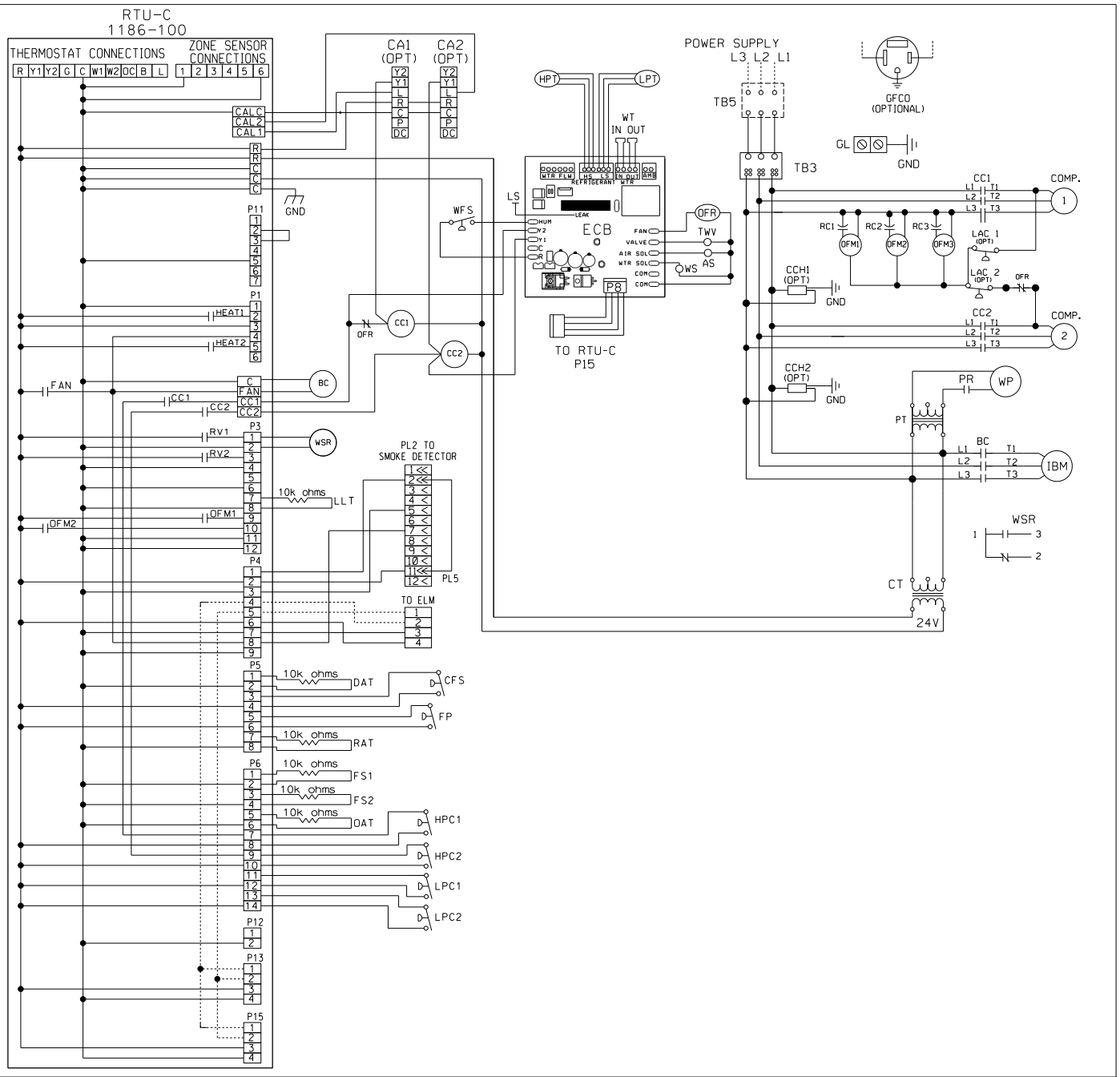
WIRE COLOR CODE

BK	BLACK	O	ORANGE
BR	BROWN	PR	PURPLE
BL	BLUE	R	RED
G	GREEN	W	WHITE
GY	GRAY	Y	YELLOW

WIRING DIAGRAM
RLHL-D180
460V 3 PH, 60 HZ.
PACKAGED A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-4-13	90-104652-04	00



COMPONENT CODE

AS	AIR SOLENOID	HPT	HIGH PRESSURE TRANSDUCER	TB	TERMINAL BLOCK
BC	BLOWER CONTACTOR	IBM	INDOOR BLOWER MOTOR BELT DRIVE	TWV	THREE-WAY VALVE
CA	COMFORT ALERT MODULE	IFC	INTEGRATED FURNACE CONTROL	WFS	WATER FLOW SWITCH
CC	COMPRESSOR CONTACTOR	LAC	LOW AMBIENT COOLING CONTROL	WP	WATER PUMP
CCH	CRANKCASE HEATER	LLT	LIQUID LINE TEMPERATURE	WS	WATER SOLENOID
CFS	CLOGGED FILTER SWITCH	LPC	LOW PRESSURE CONTROL	WSR	WATER SHUTOFF RELAY
COMP	COMPRESSOR	LPT	LOW PRESSURE TRANSDUCER	WT	WATER TEMPERATURE SENSER
CT	CONTROL TRANSFORMER	LS	LEAK SENSOR		WIRE NUT
DAT	DISCHARGE AIR SENSOR	OAT	OUTSIDE AIR SENSOR		
DISC	DISCONNECT SWITCH	OFM	OUTDOOR FAN MOTOR		
ECB	ESYNC CONTROL BOARD	OFR	OUTDOOR FAN RELAY		
FP	FAN PROVING	PL	PLUG		
FS	FREEZE SENSOR	PR	PUMP RELAY		
GFCO	GROUND FAULT CONVENIENCE OUTLET	PT	POWER TRANSFORMER		
GL	GROUND LUG	RAT	RETURN AIR SENSOR		
GND	GROUND	RC	RUN CAPACITOR		
HPC	HIGH PRESSURE CONTROL	RTU-C	ROOFTOP UNIT CONTROL		

WIRING INFORMATION

LINE VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

LOW VOLTAGE
- -FACTORY STANDARD
- -FACTORY OPTION
- -FIELD INSTALLED

REPLACEMENT WIRE
- -MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105° C MIN.)

WARNING
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WIRING SCHEMATIC
RLHL-D180
460V 3 PH, 60 HZ.
PACKAGED A/C W/RTU-C

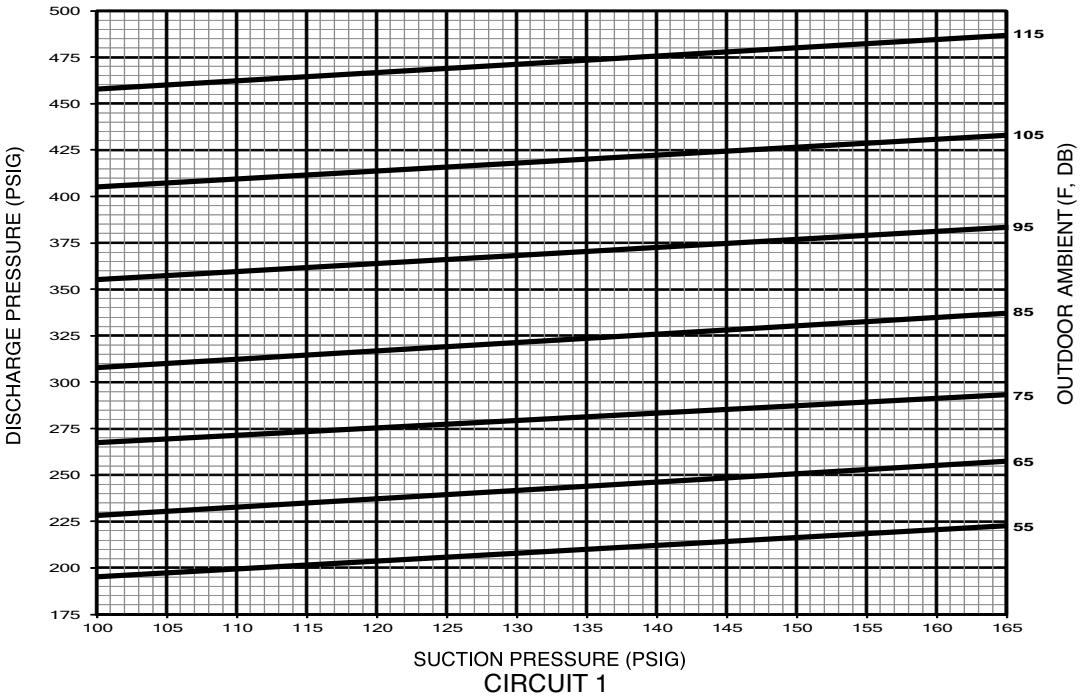
DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-7-13	90-104655-04	00

RLHL SERIES – 15 TON

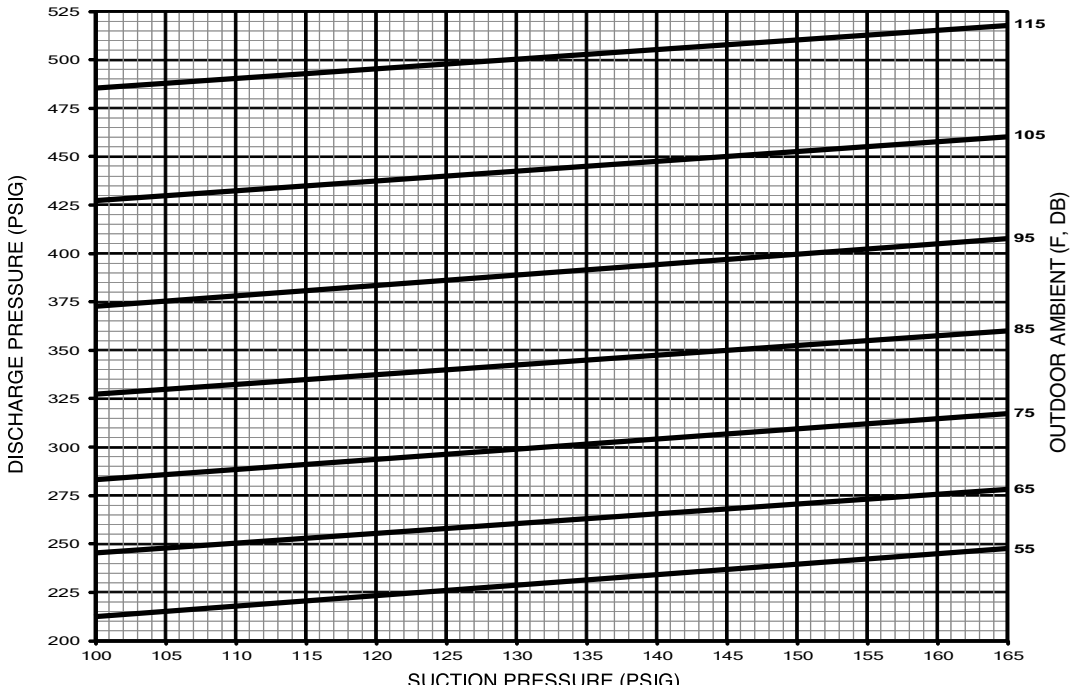
SYSTEM CHARGE CHART - REFRIGERANT 410A
15 TON, CIRCUITS 1 & 2

CAUTION:
1. BOTH COMPRESSORS MUST BE OPERATING BEFORE CHECKING REFRIGERANT CHARGE.
2. RETURN AIR TEMPERATURE MUST BE WITHIN COMFORT CONDITIONS BEFORE FINAL REFRIGERANT CHECK!

INSTRUCTIONS:
1. MEASURE PRESSURE AT COMPRESSOR SUCTION AND DISCHARGE.
2. MEASURE OUTDOOR AMBIENT TO UNIT.
3. PLACE (X) ON CHART WHERE SUCTION AND DISCHARGE INTERSECT.
4. IF (X) IS BELOW OUTDOOR AMBIENT LINE, ADD CHARGE AND REPEAT STEPS 1-3.
5. IF (X) IS ABOVE OUTDOOR AMBIENT LINE, RECOVER EXCESS CHARGE AND REPEAT STEPS 1-3.



CIRCUIT 1



CIRCUIT 2

92-103943-05-00