INSTALLATION INSTRUCTIONS

FOR THE RHEEM H2AC ROOFTOP UNIT FEATURING eSYNC™ INTEGRATION TECHNOLOGY
RLHL SERIES 10 TON [35.2 kW]

eSYNC™ INTEGRATION TECHNOLOGY



Featuring Industry Standard R-410A

R-410A

c UL us LISTED

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

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

⚠ Recognize this symbol as an indication of Important Safety Information!

DO NOT DESTROY
PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

⚠ 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.

[ ] Designates Metric Conversions

92-23577-120-01
SUPERSEDES 92-23577-120-00

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II. INTRODUCTION

⚠ 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.

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 H2AC Rooftop Unit with optional Electric Heat is available with a Cooling capacity of 10 nominal tons and optional 10, 15, 20, 30, 40, or 50 kW of electric heat.

For the single stage 10 ton model (LHL-C120), potable water heating capacities range from approximately 120,000 BTUH to 168,000 BTUH depending on water temperature, indoor air temperatures, and indoor CFM.

For the two stage 10 ton model (LHL-D120), potable water heating capacities range from approximately 80,000 BTUH to 100,000 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 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 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: **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.

Unit Dimensions (LHL-C120)

IMPORTANT: THIS UNIT MUST BE MOUNTED LEVEL IN BOTH DIRECTIONS TO ALLOW WATER TO DRAIN FROM THE CONDENSER SECTION AND CONDENSATE PAN.

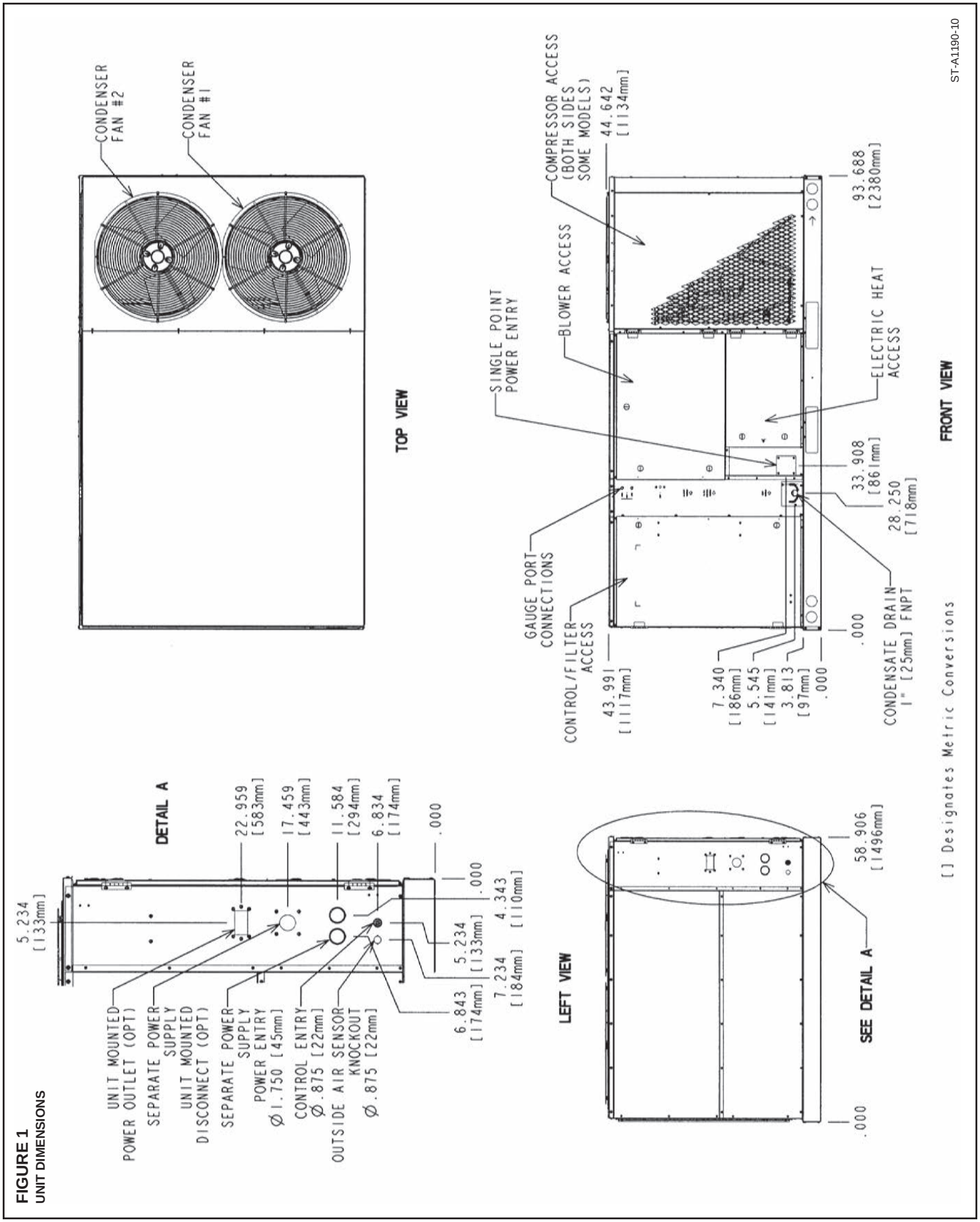


FIGURE 1
UNIT DIMENSIONS

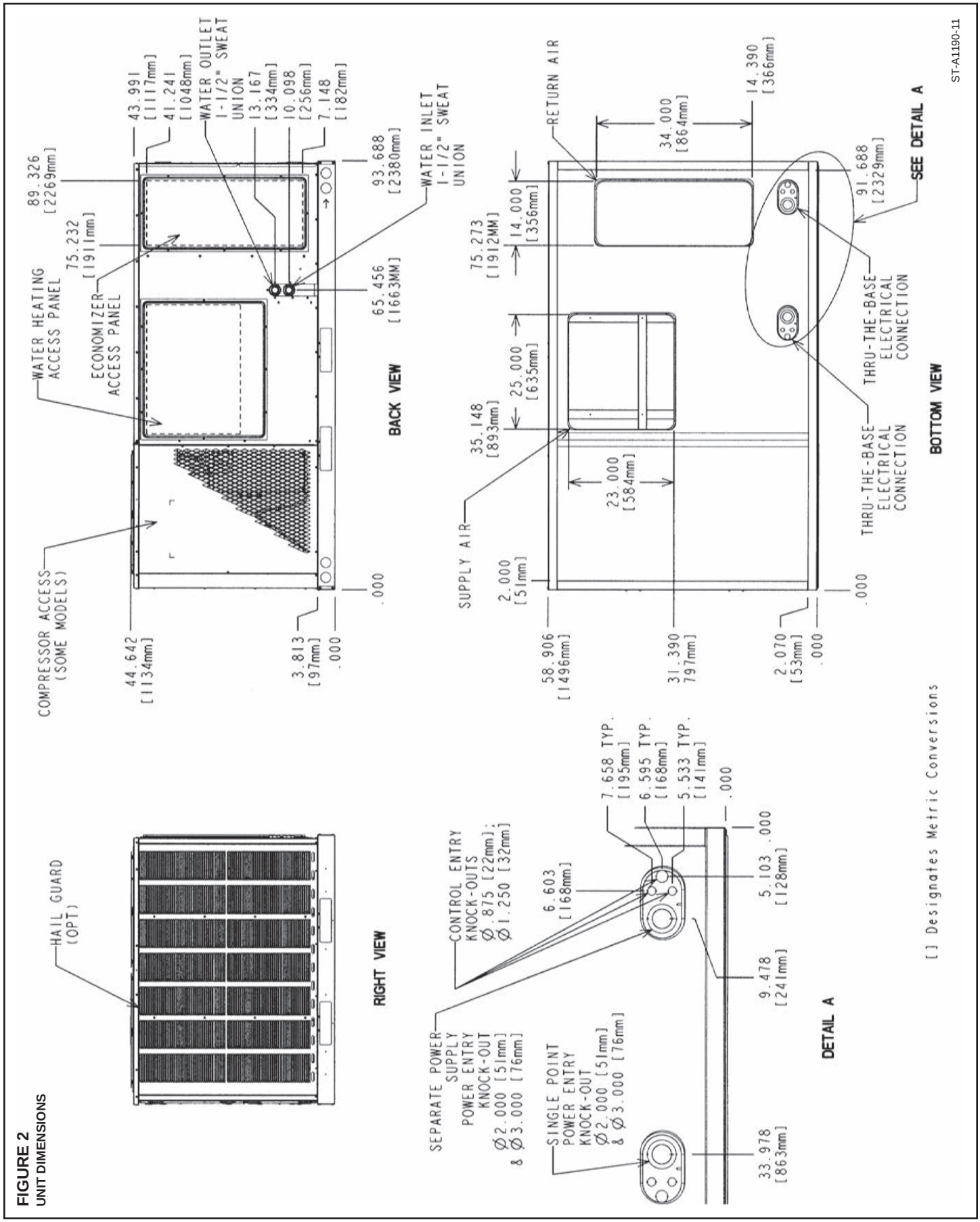


FIGURE 2
UNIT DIMENSIONS

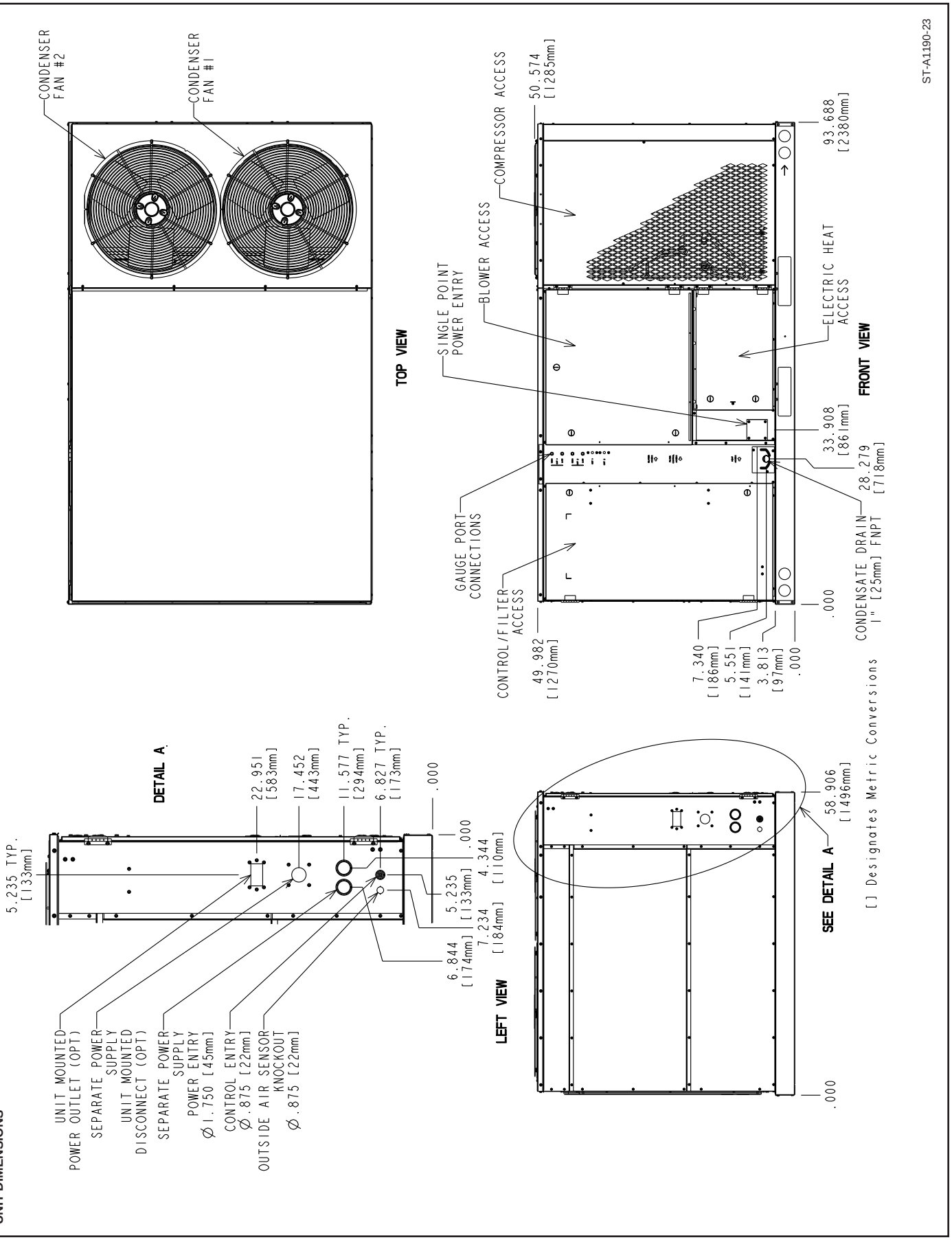


FIGURE 3
UNIT DIMENSIONS

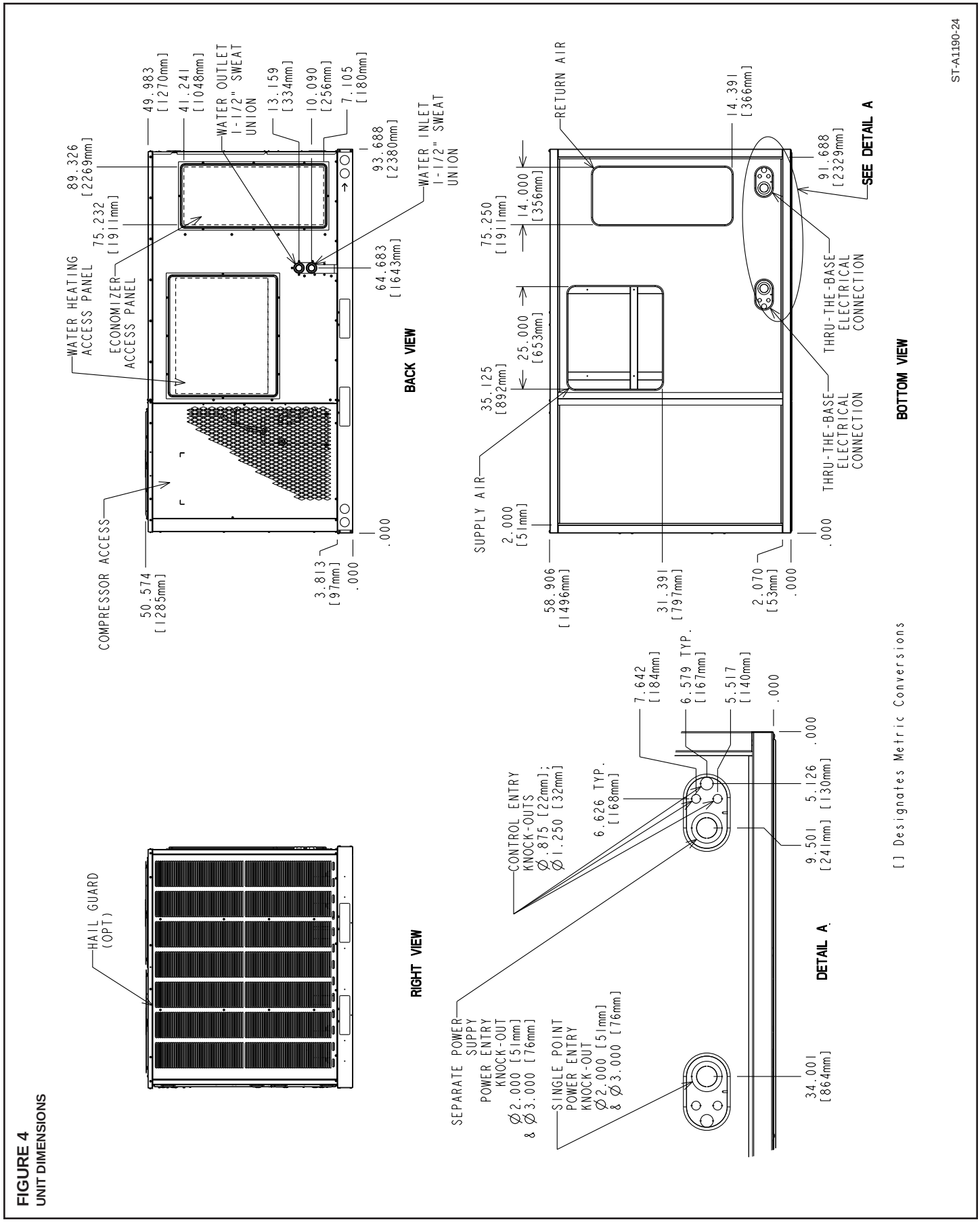
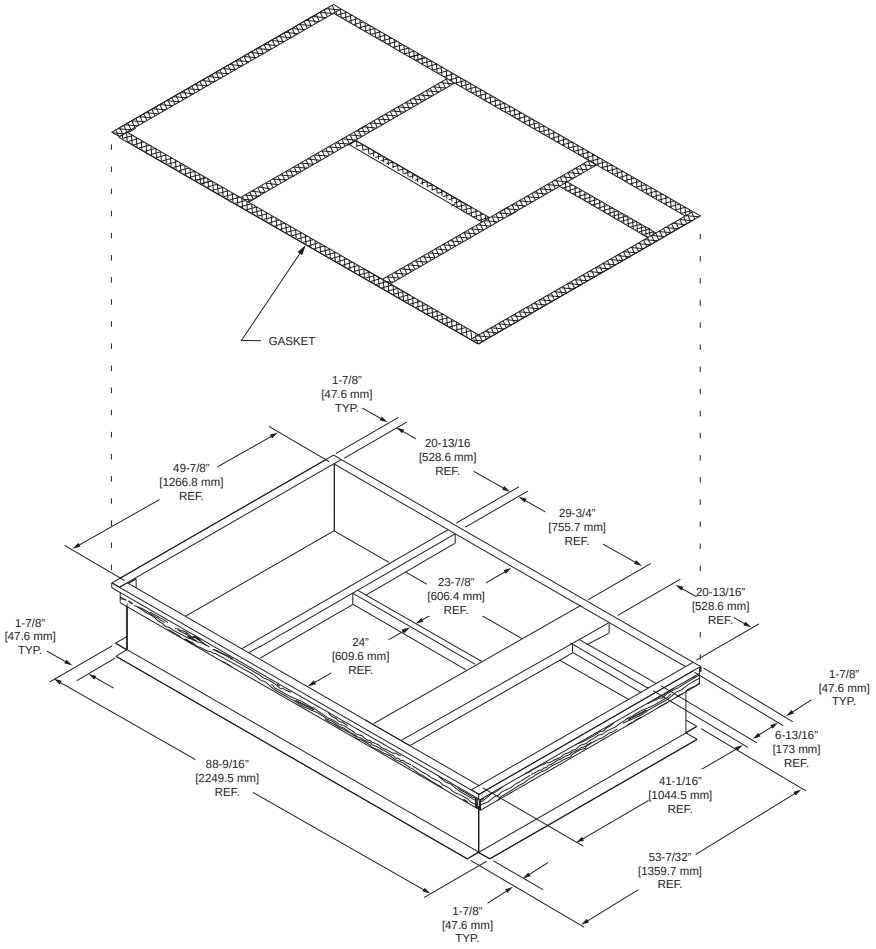


FIGURE 4
UNIT DIMENSIONS

FIGURE 5



ST-A1190-11

GENERAL DATA - RLHL

NOM. SIZE 10 TON [35.2 kW]

Model RLHL-Series	C120CL	C120CM	C120DL	C120DM
Cooling Performance[1]				CONTINUED →
Gross Cooling Capacity Btu [kW]	119,000 [34.87]	119,000 [34.87]	119,000 [34.87]	119,000 [34.87]
EER/SEER[2]	11.25/NA	11.25/NA	11.25/NA	11.25/NA
Nominal CFM/AHRI Rated CFM [L/s]	4000/3600 [1888/1699]	4000/3600 [1888/1699]	4000/3600 [1888/1699]	4000/3600 [1888/1699]
AHRI Net Cooling Capacity Btu [kW]	115,000 [33.69]	115,000 [33.69]	115,000 [33.69]	115,000 [33.69]
Net Sensible Capacity Btu [kW]	85,300 [24.99]	85,300 [24.99]	85,300 [24.99]	85,300 [24.99]
Net Latent Capacity Btu [kW]	29,700 [8.7]	29,700 [8.7]	29,700 [8.7]	29,700 [8.7]
IEER[3]	11.9	11.9	11.9	11.9
Net System Power kW	10.2	10.2	10.2	10.2
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)[5]	88	88	88	88
Outdoor Coil—Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Tube Size in. [mm] OD	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	27 [2.51]	27 [2.51]	27 [2.51]	27 [2.51]
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]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	13.5 [1.25]	13.5 [1.25]	13.5 [1.25]	13.5 [1.25]
Rows / FPI [FPcm]	2 / 22 [9]	2 / 22 [9]	2 / 22 [9]	2 / 22 [9]
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]	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]	8400 [3964]	8400 [3964]	8400 [3964]	8400 [3964]
No. Motors/HP	2 at 1/3 HP	2 at 1/3 HP	2 at 1/3 HP	2 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]	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
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]	(6)2x18x18 [51x457x457]	(6)2x18x18 [51x457x457]	(6)2x18x18 [51x457x457]	(6)2x18x18 [51x457x457]
Refrigerant Charge Oz. [g]	217.6 [6169]	217.6 [6169]	217.6 [6169]	217.6 [6169]
Weights				
Net Weights lbs. [kg]	984 [446]	992 [450]	984 [446]	992 [450]
Ship Weights lbs. [kg]	1021 [463]	1029 [467]	1021 [463]	1029 [467]

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 nom cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
2. EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
3. IEER is rated in accordance with AHRI Standard 340/360.
4. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

GENERAL DATA - RLHL

NOM. SIZE 10 TON [35.2 kW]

Model RLHL-Series	D120CL	D120CM	D120DL	D120DM
Cooling Performance[1]				CONTINUED →
Gross Cooling Capacity Btu [kW]	124,000 [36.33]	124,000 [36.33]	124,000 [36.33]	124,000 [36.33]
EER/SEER[2]	11.5/NA	11.5/NA	11.5/NA	11.5/NA
Nominal CFM/AHRI Rated CFM [L/s]	4000/3575 [1888/1687]	4000/3575 [1888/1687]	4000/3575 [1888/1687]	4000/3575 [1888/1687]
AHRI Net Cooling Capacity Btu [kW]	120,000 [35.16]	120,000 [35.16]	120,000 [35.16]	120,000 [35.16]
Net Sensible Capacity Btu [kW]	87,600 [25.67]	87,600 [25.67]	87,600 [25.67]	87,600 [25.67]
Net Latent Capacity Btu [kW]	32,400 [9.49]	32,400 [9.49]	32,400 [9.49]	32,400 [9.49]
IEER[3]	13.8	13.8	13.8	13.8
Net System Power kW	9.62	9.62	9.62	9.62
Compressor				
No./Type	2/Scroll	2/Scroll	2/Scroll	2/Scroll
Outdoor Sound Rating (dB)[5]	88	88	88	88
Outdoor Coil—Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
Tube Size in. [mm] OD	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	27 [2.51]	27 [2.51]	27 [2.51]	27 [2.51]
Rows / FPI [FPcm]	2 / 23 [9]	2 / 23 [9]	2 / 23 [9]	2 / 23 [9]
Indoor Coil—Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Rifled	Rifled	Rifled	Rifled
Tube Size in. [mm]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	15.75 [1.46]	15.75 [1.46]	15.75 [1.46]	15.75 [1.46]
Rows / FPI [FPcm]	4 / 13 [5]	4 / 13 [5]	4 / 13 [5]	4 / 13 [5]
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]	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]	8000 [3775]	8000 [3775]
No. Motors/HP	2 at 1/3 HP	2 at 1/3 HP	2 at 1/3 HP	2 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]	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
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]	(3)2x18x18 [51x457x457] (3)2x18x24 [51x457x610]	(3)2x18x18 [51x457x457] (3)2x18x24 [51x457x610]	(3)2x18x18 [51x457x457] (3)2x18x24 [51x457x610]	(3)2x18x18 [51x457x457] (3)2x18x24 [51x457x610]
Refrigerant Charge Oz. [g]	155/170 [4394/4820]	155/170 [4394/4820]	155/170 [4394/4820]	155/170 [4394/4820]
Weights				
Net Weights lbs. [kg]	1169 [530]	1177 [534]	1169 [530]	1177 [534]
Ship Weights lbs. [kg]	1206 [547]	1214 [551]	1206 [547]	1214 [551]

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 nom cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
2. EER and/or SEER are rated at AHRI conditions and in accordance with DOE test procedures.
3. IEER is rated in accordance with AHRI Standard 340/360.
4. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

ELECTRICAL DATA - RLHL

ELECTRICAL DATA - RLHL- SERIES										
		C120CL	C120CM	C120DL	C120DM	D120CL	D120CM	D120DL	D120DM	
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506	187-253	187-253	414-506	414-506	
	Volts	208/230	208/230	460	460	208/230	208/230	460	460	
	Phase	3	3	3	3	3	3	3	3	
	Hz	60	60	60	60	60	60	60	60	
	Minimum Circuit Ampacity	61	66	35	38	52	57	25	28	
	Minimum Overcurrent Protection Device Size	60	70	35	35	60	70	30	30	
	Maximum Overcurrent Protection Device Size	90	100	50	50	60	70	30	30	
Compressor Motor	No.	1	1	1	1	2	2	2	2	
	Volts	200/240	200/240	480	480	200/240	200/240	480	480	
	Phase	3	3	3	3	3	3	3	3	
	RPM	3450	3450	3450	3450	3450	3450	3450	3450	
	HP, Compressor 1	10	10	10	10	4	4	4	4	
	Amps (RLA), Comp. 1	37.1	37.1	20.9	20.9	15.9	15.9	7.1	7.1	
	Amps (LRA), Comp. 1	225	225	114	114	110	110	52	52	
	HP, Compressor 2					4	4	4	4	
	Amps (RLA), Comp. 2					16.6	16.6	7.5	7.5	
	Amps (LRA), Comp. 2					110	110	52	52	
Condenser Motor	No.	2	2	2	2	2	2	2	2	
	Volts	208/230	208/230	460	460	208/230	208/230	460	460	
	Phase	1	1	1	1	1	1	1	1	
	HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	
	Amps (FLA, each)	2.4	2.4	1.4	1.4	2.4	2.4	1.4	1.4	
	Amps (LRA, each)	4.7	4.7	2.4	2.4	4.7	4.7	2.4	2.4	
Evaporator Fan	No.	1	1	1	1	1	1	1	1	
	Volts	208/230	208/230	460	460	208/230	208/230	460	460	
	Phase	3	3	3	3	3	3	3	3	
	HP	2	3	2	3	2	3	2	3	
	Amps (FLA, each)	8	13	4	7	8	13	4	7	
	Amps (LRA, each)	56	74.5	28	38.1	56	74.5	28	38.1	
Water Pump	No.	1	1	1	1	1	1	1	1	
	Volts	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	
	Phase	1	1	1	1	1	1	1	1	
	HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	
	Amps (FLA, each)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	Amps (LRA, each)	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	

HEATER KIT CHARACTERISTICS

AUXILIARY HEATER KITS CHARACTERISTICS AND APPLICATION (RLHL 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				
RHEEM Model Number	Heater Kit					Air Conditioner			Heater Kit		Air Conditioner		
	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. Ckt. Ampacity 208/240V	Max. Fuse Size 208/240V	Min. Circuit Ampacity 208/240V	Over Current Protective Device Size	
							Min./Max. @ 208 V	Min./Max. @ 240 V				Min./Max. @ 208 V	Min./Max. @ 240 V
RLHL-C120CL	No Heat	-----	-----	-----	-----	61/61	80/90	80/90	-----	-----	61/61	80/90	80/90
	CC10C	1	7.2/9.6	24.56/32.75	20/23.1	61/61	80/90	80/90	25/29	25/30	61/61	80/90	80/90
	CC15C	1	10.8/14.4	36.84/49.13	30/34.6	61/61	80/90	80/90	38/44	40/45	61/61	80/90	80/90
	CC20C	1	14.4/19.2	49.13/65.5	40/46.2	63/70	80/90	80/90	50/58	50/60	61/61	80/90	80/90
	CC30C	1	21.6/28.8	73.69/98.25	60/69.3	88/99	90/90	100/100	75/87	80/90	61/61	80/90	80/90
	CC40C	1	28.8/38.4	98.25/131	80.1/92.4	113/128	125/125	150/150	101/116	110/125	61/61	80/90	80/90
	CC50C	1	36.1/48	123.16/163.75	100.1/115.5	138/157	150/150	175/175	126/145	150/150	61/61	80/90	80/90
RLHL-D120CL	No Heat	-----	-----	-----	-----	52/52	60/60	60/60	-----	-----	52/52	60/60	60/60
	CC10C	1	7.2/9.6	24.56/32.75	20/23.1	52/52	60/60	60/60	25/29	25/30	52/52	60/60	60/60
	CC15C	1	10.8/14.4	36.84/49.13	30/34.6	52/56	60/60	60/60	38/44	40/45	52/52	60/60	60/60
	CC20C	1	14.4/19.2	49.13/65.5	40/46.2	63/70	70/70	70/70	50/58	50/60	52/52	60/60	60/60
	CC30C	1	21.6/28.8	73.69/98.25	60/69.3	88/99	90/90	100/100	75/87	80/90	52/52	60/60	60/60
	CC40C	1	28.8/38.4	98.25/131	80.1/92.4	113/128	125/125	150/150	101/116	110/125	52/52	60/60	60/60
	CC50C	1	36.1/48	123.16/163.75	100.1/115.5	138/157	150/150	175/175	126/145	150/150	52/52	60/60	60/60
RLHL-C120CM	No Heat	-----	-----	-----	-----	66/66	80/100	80/100	-----	-----	66/66	80/100	80/100
	CC10C	1	7.2/9.6	24.56/32.75	20/23.1	66/66	80/100	80/100	25/29	25/30	66/66	80/100	80/100
	CC15C	1	10.8/14.4	36.84/49.13	30/34.6	66/66	80/100	80/100	38/44	40/45	66/66	80/100	80/100
	CC20C	1	14.4/19.2	49.13/65.5	40/46.2	69/77	80/100	80/100	50/58	50/60	66/66	80/100	80/100
	CC30C	1	21.6/28.8	73.69/98.25	60/69.3	94/106	100/100	110/110	75/87	80/90	66/66	80/100	80/100
	CC40C	1	28.8/38.4	98.25/131	80.1/92.4	119/134	125/125	150/150	101/116	110/125	66/66	80/100	80/100
	CC50C	1	36.1/48	123.16/163.75	100.1/115.5	144/163	150/150	175/175	126/145	150/150	66/66	80/100	80/100
RLHL-D120CM	No Heat	-----	-----	-----	-----	57/57	70/70	70/70	-----	-----	57/57	70/70	70/70
	CC10C	1	7.2/9.6	24.56/32.75	20/23.1	57/57	70/70	70/70	25/29	25/30	57/57	70/70	70/70
	CC15C	1	10.8/14.4	36.84/49.13	30/34.6	57/62	70/70	70/70	38/44	40/45	57/57	70/70	70/70
	CC20C	1	14.4/19.2	49.13/65.5	40/46.2	69/77	70/70	80/80	50/58	50/60	57/57	70/70	70/70
	CC30C	1	21.6/28.8	73.69/98.25	60/69.3	94/106	100/100	110/110	75/87	80/90	57/57	70/70	70/70
	CC40C	1	28.8/38.4	98.25/131	80.1/92.4	119/134	125/125	150/150	101/116	110/125	57/57	70/70	70/70
	CC50C	1	36.1/48	123.16/163.75	100.1/115.5	144/163	150/150	175/175	126/145	150/150	57/57	70/70	70/70

HEATER KIT CHARACTERISTICS

AUXILIARY HEATER KITS CHARACTERISTICS AND APPLICATION (RLHL MODELS)

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				
RHEEM Model Number	Heater Kit					Air Conditioner			Heater Kit		Air Conditioner		
		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. Ckt. Ampacity 480V	Max. Fuse Size 480V	Min. Circuit Ampacity 480V	Over Current Protective Device Size	
							Min./Max. @ 480 V	Min./Max. @ 480 V				Min./Max. @ 480 V	Min./Max. @ 480 V
RLHL-C120DL	No Heat	-----	-----	-----	-----	35	40/50	-----	-----	-----	35	40/50	-----
	CC10D	1	9.6	32.75	11.5	35	40/50	-----	15	15	35	40/50	-----
	CC15D	1	14.4	49.13	17.3	35	40/50	-----	22	25	35	40/50	-----
	CC20D	1	19.2	65.5	23.1	37	40/50	-----	29	30	35	40/50	-----
	CC30D	1	28.8	98.25	34.6	51	60/60	-----	44	45	35	40/50	-----
	CC40D	1	38.4	131	46.2	65	70/70	-----	58	60	35	40/50	-----
	CC50D	1	48	163.75	57.7	80	80/80	-----	73	80	35	40/50	-----
RLHL-D120DL	No Heat	-----	-----	-----	-----	25	30/30	-----	-----	-----	25	30/30	-----
	CC10D	1	9.6	32.75	11.5	25	30/30	-----	15	15	25	30/30	-----
	CC15D	1	14.4	49.13	17.3	29	30/30	-----	22	25	25	30/30	-----
	CC20D	1	19.2	65.5	23.1	37	40/40	-----	29	30	25	30/30	-----
	CC30D	1	28.8	98.25	34.6	51	60/60	-----	44	45	25	30/30	-----
	CC40D	1	38.4	131	46.2	65	70/70	-----	58	60	25	30/30	-----
	CC50D	1	48	163.75	57.7	80	80/80	-----	73	80	25	30/30	-----
RLHL-C120DM	No Heat	-----	-----	-----	-----	38	45/50	-----	-----	-----	38	45/50	-----
	CC10D	1	9.6	32.75	11.5	38	45/50	-----	15	15	38	45/50	-----
	CC15D	1	14.4	49.13	17.3	38	45/50	-----	22	25	38	45/50	-----
	CC20D	1	19.2	65.5	23.1	40	45/50	-----	29	30	38	45/50	-----
	CC30D	1	28.8	98.25	34.6	55	60/60	-----	44	45	38	45/50	-----
	CC40D	1	38.4	131	46.2	69	70/70	-----	58	60	38	45/50	-----
	CC50D	1	48	163.75	57.7	84	90/90	-----	73	80	38	45/50	-----
RLHL-D120DM	No Heat	-----	-----	-----	-----	28	30/30	-----	-----	-----	28	30/30	-----
	CC10D	1	9.6	32.75	11.5	28	35/35	-----	15	15	28	30/30	-----
	CC15D	1	14.4	49.13	17.3	33	35/35	-----	22	25	28	30/30	-----
	CC20D	1	19.2	65.5	23.1	40	40/40	-----	29	30	28	30/30	-----
	CC30D	1	28.8	98.25	34.6	55	60/60	-----	44	45	28	30/30	-----
	CC40D	1	38.4	131	46.2	69	70/70	-----	58	60	28	30/30	-----
	CC50D	1	48	163.75	57.7	84	90/90	-----	73	80	28	30/30	-----

GROSS SYSTEMS PERFORMANCE DATA — RLHL-C120

ENTERING INDOOR AIR @ 80°F [26.7°C] dbE ①

COOLING PERFORMANCE DATA - RLHL-C120C

Entering Indoor Air @ 80ºF [26.7ºC] dbE ①											
wbE			71ºF [21.7ºC]			67ºF [19.4ºC]			63ºF [17.2ºC]		
CFM [L/s]			4800 [2265]	3600 [1699]	3200 [1510]	4800 [2265]	3600 [1699]	3200 [1510]	4800 [2265]	3600 [1699]	3200 [1510]
DR ①			0.11	0.05	0.03	0.11	0.05	0.03	0.11	0.05	0.03
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total BTUH [kW]	146.9 [43]	138.5 [40.6]	135.7 [39.8]	138.9 [40.7]	130.9 [38.4]	128.3 [37.6]	132.6 [38.9]	125 [36.6]	122.5 [35.9]
		Sens BTUH [kW]	88.9 [26.1]	77 [22.6]	73 [21.4]	106.4 [31.2]	92.1 [27]	87.3 [25.6]	120.3 [35.3]	104.1 [30.5]	98.7 [28.9]
		Power	7.6	7.4	7.3	7.5	7.3	7.2	7.5	7.2	7.2
	80ºF [26.7ºC]	Total BTUH [kW]	144.2 [42.2]	135.9 [39.8]	133.2 [39]	136.1 [39.9]	128.4 [37.6]	125.8 [36.9]	129.9 [38.1]	122.4 [35.9]	120 [35.2]
		Sens BTUH [kW]	89 [26.1]	77 [22.6]	73 [21.4]	106.5 [31.2]	92.2 [27]	87.4 [25.6]	120.4 [35.3]	104.2 [30.5]	98.8 [29]
		Power	8	7.8	7.7	7.9	7.7	7.6	7.8	7.6	7.5
	85ºF [29.4ºC]	Total BTUH [kW]	141.2 [41.4]	133.2 [39]	130.5 [38.2]	133.2 [39]	125.6 [36.8]	123 [36.1]	126.9 [37.2]	119.7 [35.1]	117.3 [34.4]
		Sens BTUH [kW]	88.6 [26]	76.6 [22.5]	72.7 [21.3]	106.1 [31.1]	91.8 [26.9]	87 [25.5]	120 [35.2]	103.8 [30.4]	98.4 [28.8]
		Power	8.4	8.1	8.1	8.3	8.1	8	8.2	8	7.9
	90ºF [32.2ºC]	Total BTUH [kW]	138.1 [40.5]	130.2 [38.1]	127.6 [37.4]	130 [38.1]	122.6 [35.9]	120.1 [35.2]	123.8 [36.3]	116.7 [34.2]	114.3 [33.5]
		Sens BTUH [kW]	87.6 [25.7]	75.8 [22.2]	71.9 [21.1]	105.1 [30.8]	91 [26.7]	86.3 [25.3]	119.1 [34.9]	103 [30.2]	97.7 [28.6]
		Power	8.8	8.5	8.5	8.7	8.5	8.4	8.6	8.4	8.3
	95ºF [35.0ºC]	Total BTUH [kW]	134.7 [39.5]	127 [37.2]	124.4 [36.5]	126.7 [37.1]	119.4 [35]	117 [34.3]	120.4 [35.3]	113.5 [33.3]	111.2 [32.6]
		Sens BTUH [kW]	86.2 [25.3]	74.6 [21.9]	70.7 [20.7]	103.7 [30.4]	89.7 [26.3]	85.1 [24.9]	117.6 [34.5]	101.8 [29.8]	96.5 [28.3]
		Power	9.2	9	8.9	9.2	8.9	8.8	9.1	8.8	8.7
	100ºF [37.8ºC]	Total BTUH [kW]	131.1 [38.4]	123.6 [36.2]	121.1 [35.5]	123.1 [36.1]	116.1 [34]	113.7 [33.3]	116.8 [34.2]	110.2 [32.3]	107.9 [31.6]
		Sens BTUH [kW]	84.3 [24.7]	72.9 [21.4]	69.1 [20.3]	101.8 [29.8]	88.1 [25.8]	83.5 [24.5]	115.7 [33.9]	100.1 [29.3]	94.9 [27.8]
		Power	9.7	9.4	9.4	9.6	9.4	9.3	9.6	9.3	9.2
	105ºF [40.6ºC]	Total BTUH [kW]	127.3 [37.3]	120.1 [35.2]	117.6 [34.5]	119.3 [35]	112.5 [33]	110.2 [32.3]	113 [33.1]	106.6 [31.2]	104.4 [30.6]
		Sens BTUH [kW]	81.8 [24]	70.8 [20.8]	67.1 [19.7]	99.3 [29.1]	86 [25.2]	81.5 [23.9]	113 [33.1]	98 [28.7]	92.9 [27.2]
		Power	10.2	9.9	9.8	10.2	9.9	9.8	10.1	9.8	9.7
	110ºF [43.3ºC]	Total BTUH [kW]	123.3 [36.1]	116.3 [34.1]	113.9 [33.4]	115.3 [33.8]	108.7 [31.9]	106.5 [31.2]	109 [31.9]	102.8 [30.1]	100.7 [29.5]
		Sens BTUH [kW]	78.9 [23.1]	68.3 [20]	64.7 [19]	96.4 [28.2]	83.4 [24.4]	79.1 [23.2]	109 [31.9]	95.5 [28]	90.5 [26.5]
		Power	10.8	10.5	10.4	10.7	10.4	10.3	10.6	10.3	10.2
	115ºF [46.1ºC]	Total BTUH [kW]	119.1 [34.9]	112.3 [32.9]	110 [32.2]	111.1 [32.5]	104.7 [30.7]	102.6 [30.1]	104.8 [30.7]	98.8 [29]	96.8 [28.4]
		Sens BTUH [kW]	75.5 [22.1]	65.3 [19.1]	61.9 [18.1]	93 [27.2]	80.4 [23.6]	76.3 [22.3]	104.8 [30.7]	92.5 [27.1]	87.7 [25.7]
		Power	11.3	11	10.9	11.3	10.9	10.8	11.2	10.9	10.7
	120ºF [48.9ºC]	Total BTUH [kW]	114.7 [33.6]	108.1 [31.7]	105.9 [31]	106.6 [31.2]	100.5 [29.5]	98.5 [28.9]	100.4 [29.4]	94.6 [27.7]	92.7 [27.2]
		Sens BTUH [kW]	71.5 [21]	61.9 [18.1]	58.7 [17.2]	89 [26.1]	77 [22.6]	73 [21.4]	100.4 [29.4]	89.1 [26.1]	84.5 [24.8]
		Power	11.9	11.6	11.5	11.9	11.5	11.4	11.8	11.4	11.3
	125ºF [51.7ºC]	Total BTUH [kW]	110 [32.2]	103.7 [30.4]	101.6 [29.8]	102 [29.9]	96.2 [28.2]	94.2 [27.6]	95.7 [28]	90.2 [26.4]	88.4 [25.9]
		Sens BTUH [kW]	67.1 [19.7]	58.1 [17]	55 [16.1]	84.6 [24.8]	73.2 [21.4]	69.4 [20.3]	95.7 [28]	85.2 [25]	80.8 [23.7]
		Power	12.6	12.2	12.1	12.5	12.1	12	12.4	12	11.9

DR —Depression ratio Total —Total capacity x 1000 BTUH NOTES:

dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH ① When the entering air dry bulb is other than 80°F [27°C], adjust the sensible

wbE—Entering air wet bulb Power—KW input capacity from the table by adding [1.10 x CFM x (1 – DR) x (dbE – 80)].

GROSS SYSTEMS PERFORMANCE DATA — RLHL-D120

ENTERING INDOOR AIR @ 80°F [26.7°C] dbE ①

COOLING PERFORMANCE DATA - RLHL-D120C

Entering Indoor Air @ 80ºF [26.7ºC] dbE ①												
wbE			71ºF [21.7ºC]			67ºF [19.4ºC]			63ºF [17.2ºC]			
CFM [L/s]			4800 [2265]	3575 [1687]	3200 [1510]	4800 [2265]	3575 [1687]	3200 [1510]	4800 [2265]	3575 [1687]	3200 [1510]	
DR ①			0.1	0.04	0.02	0.1	0.04	0.02	0.1	0.04	0.02	
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total BTUH [kW]	153.8 [45.1]	144.8 [42.4]	142 [41.6]	145.6 [42.7]	137.1 [40.2]	134.5 [39.4]	140.5 [41.2]	132.3 [38.8]	129.7 [38]	
		Sens BTUH [kW]	96.5 [28.3]	83.2 [24.4]	79.1 [23.2]	114 [33.4]	98.3 [28.8]	93.5 [27.4]	132 [38.7]	113.8 [33.4]	108.2 [31.7]	
		Power	7	6.8	6.8	7	6.8	6.7	6.9	6.7	6.6	
	80ºF [26.7ºC]	Total BTUH [kW]	150.4 [44.1]	141.6 [41.5]	138.9 [40.7]	142.3 [41.7]	134 [39.3]	131.4 [38.5]	137.2 [40.2]	129.1 [37.8]	126.6 [37.1]	
		Sens BTUH [kW]	94.5 [27.7]	81.4 [23.9]	77.4 [22.7]	112 [32.8]	96.6 [28.3]	91.9 [26.9]	130 [38.1]	112.1 [32.8]	106.6 [31.2]	
		Power	7.4	7.2	7.1	7.4	7.1	7.1	7.3	7.1	7	
	85ºF [29.4ºC]	Total BTUH [kW]	147 [43.1]	138.4 [40.6]	135.7 [39.8]	138.9 [40.7]	130.7 [38.3]	128.2 [37.6]	133.7 [39.2]	125.9 [36.9]	123.5 [36.2]	
		Sens BTUH [kW]	92.5 [27.1]	79.7 [23.4]	75.8 [22.2]	110.1 [32.3]	94.9 [27.8]	90.2 [26.4]	128 [37.5]	110.4 [32.3]	105 [30.8]	
		Power	7.8	7.6	7.5	7.8	7.5	7.5	7.7	7.5	7.4	
	90ºF [32.2ºC]	Total BTUH [kW]	143.5 [42.1]	135.1 [39.6]	132.5 [38.8]	135.4 [39.7]	127.4 [37.3]	125 [36.6]	130.2 [38.2]	122.6 [35.9]	120.3 [35.2]	
		Sens BTUH [kW]	90.6 [26.5]	78.1 [22.9]	74.3 [21.8]	108.2 [31.7]	93.3 [27.3]	88.7 [26]	126.1 [37]	108.7 [31.9]	103.4 [30.3]	
		Power	8.3	8	8	8.2	8	7.9	8.2	7.9	7.8	
	95ºF [35.0ºC]	Total BTUH [kW]	139.9 [41]	131.7 [38.6]	129.2 [37.9]	131.8 [38.6]	124.1 [36.4]	121.7 [35.7]	126.7 [37.1]	119.2 [34.9]	117 [34.3]	
		Sens BTUH [kW]	88.8 [26]	76.5 [22.4]	72.8 [21.3]	106.3 [31.2]	91.7 [26.9]	87.2 [25.5]	124.3 [36.4]	107.2 [31.4]	101.9 [29.9]	
		Power	8.7	8.5	8.4	8.7	8.4	8.3	8.6	8.4	8.3	
	100ºF [37.8ºC]	Total BTUH [kW]	136.3 [39.9]	128.3 [37.6]	125.8 [36.9]	128.1 [37.6]	120.6 [35.3]	118.3 [34.7]	123 [36]	115.8 [33.9]	113.6 [33.3]	
		Sens BTUH [kW]	87 [25.5]	75 [22]	71.3 [20.9]	104.5 [30.6]	90.1 [26.4]	85.7 [25.1]	122.5 [35.9]	105.6 [31]	100.5 [29.4]	
		Power	9.2	9	8.9	9.2	8.9	8.8	9.1	8.8	8.8	
	105ºF [40.6ºC]	Total BTUH [kW]	132.5 [38.8]	124.8 [36.6]	122.4 [35.9]	124.4 [36.5]	117.1 [34.3]	114.9 [33.7]	119.3 [35]	112.3 [32.9]	110.1 [32.3]	
		Sens BTUH [kW]	85.3 [25]	73.5 [21.5]	69.9 [20.5]	102.8 [30.1]	88.6 [26]	84.3 [24.7]	119.3 [35]	104.1 [30.5]	99 [29]	
		Power	9.8	9.5	9.4	9.7	9.4	9.3	9.6	9.4	9.3	
	110ºF [43.3ºC]	Total BTUH [kW]	128.7 [37.7]	121.2 [35.5]	118.9 [34.8]	120.6 [35.3]	113.5 [33.3]	111.4 [32.6]	115.5 [33.8]	108.7 [31.9]	106.6 [31.2]	
		Sens BTUH [kW]	83.6 [24.5]	72.1 [21.1]	68.5 [20.1]	101.2 [29.6]	87.2 [25.6]	82.9 [24.3]	115.5 [33.8]	102.7 [30.1]	97.7 [28.6]	
		Power	10.3	10	9.9	10.2	9.9	9.8	10.2	9.9	9.8	
	115ºF [46.1ºC]	Total BTUH [kW]	124.8 [36.6]	117.5 [34.4]	115.3 [33.8]	116.7 [34.2]	109.9 [32.2]	107.8 [31.6]	111.6 [32.7]	105 [30.8]	103 [30.2]	
		Sens BTUH [kW]	82 [24]	70.7 [20.7]	67.2 [19.7]	99.6 [29.2]	85.8 [25.2]	81.6 [23.9]	111.6 [32.7]	101.3 [29.7]	96.4 [28.2]	
		Power	10.9	10.5	10.4	10.8	10.5	10.4	10.7	10.4	10.3	
	120ºF [48.9ºC]	Total BTUH [kW]	120.9 [35.4]	113.8 [33.3]	111.6 [32.7]	112.8 [33]	106.1 [31.1]	104.1 [30.5]	107.6 [31.5]	101.3 [29.7]	99.4 [29.1]	
		Sens BTUH [kW]	80.4 [23.6]	69.3 [20.3]	66 [19.3]	98 [28.7]	84.5 [24.8]	80.4 [23.5]	107.6 [31.5]	100 [29.3]	95.1 [27.9]	
		Power	11.5	11.1	11	11.4	11.1	11	11.3	11	10.9	
	125ºF [51.7ºC]	Total BTUH [kW]	116.8 [34.2]	110 [32.2]	107.9 [31.6]	108.7 [31.9]	102.3 [30]	100.4 [29.4]	103.6 [30.4]	97.5 [28.6]	95.6 [28]	
		Sens BTUH [kW]	79 [23.1]	68.1 [19.9]	64.7 [19]	96.5 [28.3]	83.2 [24.4]	79.1 [23.2]	103.6 [30.4]	97.5 [28.6]	93.9 [27.5]	
		Power	12.1	11.7	11.6	12	11.7	11.6	12	11.6	11.5	

DR —Depression ratio Total —Total capacity x 1000 BTUH NOTES:

dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH ① When the entering air dry bulb is other than 80°F [27°C], adjust the sensible

wbE—Entering air wet bulb Power—KW input capacity from the table by adding [1.10 x CFM x (1 – DR) x (dbE – 80)].

WATER HEATING PERFORMANCE DATA - C120

ENTERING INDOOR AIR @ 80°F [26.7°C] dbe												
wbE CFM [Ls]			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			
			4800 [2265]	3600 [1699]	3200 [1510]	4800 [2265]	3600 [1699]	3200 [1510]	4800 [2265]	3600 [1699]	3200 [1510]	
OUTLET WATER TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	168.4 [49.4]	166.7 [48.9]	161.7 [47.4]	157.0 [46.3]	156.4 [45.8]	151.7 [44.5]	147.5 [43.2]	146.0 [42.8]	141.6 [41.5]	
		Power, Watts	8.8	8.0	7.6	8.6	7.8	7.4	8.5	7.7	7.3	
	80 [26.7]	Total BTUH [kW]	166.1 [48.7]	164.5 [48.2]	159.6 [46.8]	155.7 [45.6]	154.2 [45.2]	149.6 [43.8]	145.2 [42.6]	143.8 [42.1]	139.5 [40.9]	
		Power, Watts	9.3	8.5	8.1	9.1	8.3	7.9	9.0	8.2	7.8	
	85 [29.4]	Total BTUH [kW]	163.9 [48.7]	162.3 [47.6]	157.4 [46.1]	153.5 [45.0]	152.0 [44.5]	147.4 [43.2]	143.0 [41.9]	141.6 [41.5]	137.4 [40.3]	
		Power, Watts	9.7	8.9	8.5	9.5	8.7	8.3	9.4	8.6	8.2	
	90 [32.2]	Total BTUH [kW]	161.7 [47.4]	160.1 [46.9]	155.3 [45.5]	151.3 [44.3]	149.8 [43.9]	145.3 [42.6]	140.8 [41.3]	139.4 [40.9]	135.2 [39.6]	
		Power, Watts	10.1	9.3	8.9	9.9	9.1	8.7	9.8	9.0	8.6	
	95 [35.0]	Total BTUH [kW]	159.5 [46.7]	157.9 [46.3]	153.2 [44.9]	149.1 [43.7]	147.6 [43.3]	143.2 [42.0]	138.6 [40.6]	137.2 [40.2]	133.1 [39.0]	
		Power, Watts	10.5	9.7	9.3	10.3	9.5	9.1	10.2	9.4	9.0	
	100 [37.8]	Total BTUH [kW]	157.3 [46.1]	155.7 [45.6]	151.0 [44.3]	146.9 [43.1]	145.4 [42.6]	141.0 [41.3]	136.4 [40.0]	135.0 [39.6]	131.0 [38.4]	
		Power, Watts	11.0	10.2	9.8	10.8	10.00	9.6	10.7	9.9	9.5	
	105 [40.6]	Total BTUH [kW]	155.0 [45.4]	153.5 [45.0]	148.9 [43.6]	144.6 [42.4]	143.2 [42.0]	138.9 [40.7]	134.1 [39.3]	132.8 [38.9]	128.8 [37.7]	
		Power, Watts	11.4	10.6	10.2	11.2	10.4	10.0	11.1	10.3	9.9	
	110 [43.3)	Total BTUH [kW]	152.8 [44.8]	151.3 [44.3]	146.8 [43.0]	142.4 [41.7]	141.0 [41.3]	136.8 [40.1]	131.9 [38.7]	130.6 38.3	126.7 [37.1]	
		Power, Watts	11.8	11.0	10.6	11.6	10.8	10.4	11.5	10.7	10.3	
	115 [46.1]	Total BTUH [kW]	150.6 [44.1]	149.1 [43.7]	144.6 [42.4]	140.2 [41.1]	138.8 [40.7]	134.6 [39.4]	129.7 [38.0]	128.4 [37.6]	124.5 [36.5]	
		Power, Watts	12.3	11.5	11.1	12.1	11.3	10.9	12.0	11.2	10.8	
	120 [48.9]	Total BTUH [kW]	148.4 [43.5]	146.9 [43.1]	142.5 [41.8]	138.0 [40.4]	136.6 [40.0]	132.5 [38.8]	127.5 [37.4]	126.2 [37.0]	122.4 [35.9]	
		Power, Watts	12.7	11.9	11.5	12.5	11.7	11.3	12.4	11.6	11.2	
	125 [51.7]	Total BTUH [kW]	146.1 [42.8]	144.7 [42.4]	140.4 [41.1]	135.7 [39.8]	134.4 [39.4]	130.4 [38.2]	125.2 [36.7]	124.0 [36.3]	120.3 [35.3]	
		Power, Watts	13.1	12.3	11.9	12.9	12.1	11.7	12.8	12.0	11.6	

GROSS WATER HEATING CAPACITY - D120

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]			4800 [2265]	3550 [1675]	3200 [1510]	4800 [2265]	3550 [1675]	3200 [1510]	4800 [2265]	3550 [1675]	3200 [1510]
OUTLET WATER TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	100.5 [29.5]	98.5 [28.9]	98.0 [28.7]	96.5 [28.3]	92.5 [27.1]	92.5 [27.1]	96.5 [28.3]	92.4 [27.1]	89.3 [26.2]
		Power kW	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
	80 [26.7]	Total BTUH [kW]	99.0 [29.0]	97.1 [28.5]	96.6 [28.3]	95.3 [27.9]	91.3 [26.8]	91.3 [26.8]	95.3 [27.9]	91.4 [26.8]	88.4 [25.9]
		Power kW	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	85 [29.4]	Total BTUH [kW]	97.4 [28.5]	95.6 [28.0]	95.2 [27.9]	94.1 [27.6]	90.2 [26.4]	90.1 [26.4]	94.1 [27.6]	90.4 [26.5]	87.5 [25.6]
		Power kW	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	90 [32.2]	Total BTUH [kW]	95.9 [28.1]	94.2 [27.6]	93.8 [27.5]	93.0 [27.3]	89.1 [26.1]	88.9 [26.1]	93.0 [27.3]	89.4 [26.2]	86.6 [25.4]
		Power kW	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1
	95 [35.0]	Total BTUH [kW]	94.4 [27.7]	92.8 [27.2]	92.4 [27.1]	91.8 [26.9]	88.0 [25.8]	87.7 [25.7]	91.8 [26.9]	88.4 [25.9]	85.7 [25.1]
		Power kW	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3
	100 [37.8]	Total BTUH [kW]	92.8 [27.2]	91.4 [26.8]	91.0 [26.7]	90.6 [26.6]	86.9 [25.5]	86.6 [25.4]	90.6 [26.6]	87.4 [25.6]	84.8 [24.9]
		Power kW	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5
	105 [40.6]	Total BTUH [kW]	91.3 [26.8]	90.0 [26.4]	89.6 [26.3]	89.5 [26.2]	85.7 [25.1]	85.4 [25.0]	89.5 [26.2]	86.4 [25.3]	83.9 [24.6]
		Power kW	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
	110 [43.3]	Total BTUH [kW]	89.8 [26.3]	88.6 [26.0]	88.2 [25.8]	88.3 [25.9]	84.6 [24.8]	84.2 [24.7]	88.3 [25.9]	85.4 [25.0]	83.0 [24.3]
		Power kW	4.0	4.0	4.0	4.0	4.0	4.1	4.0	4.0	4.0
	115 [46.1]	Total BTUH [kW]	88.2 [25.8]	87.1 [25.5]	86.8 [25.4]	87.1 [25.5]	83.5 [24.5]	83.0 [24.3]	87.1 [25.5]	84.4 [24.7]	82.1 [24.1]
		Power kW	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
	120 [48.9]	Total BTUH [kW]	86.7 [25.4]	85.7 [25.1]	85.4 [25.0]	85.9 [25.2]	82.4 [24.1]	81.8 [24.0]	85.9 [25.2]	83.4 [24.4]	81.2 [23.8]
		Power kW	4.6	4.6	4.6	4.6	4.6	4.7	4.6	4.6	4.6
	125 [51.7]	Total BTUH [kW]	85.2 [25.0]	84.3 [24.7]	84.0 [24.6]	84.8 [24.9]	81.2 [23.8]	80.6 [23.6]	84.8 [24.9]	82.4 [24.1]	80.3 [23.5]
		Power kW	4.9	5.0	5.0	4.9	5.0	5.0	4.9	5.0	5.0

GROSS WATTS 2ND STAGE kW ADD FOR MIXED MODE OPERATION - D120

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 [L/s]			4800 [2265]	3550 [1675]	3200 [1510]	4800 [2265]	3550 [1675]	3200 [1510]	4800 [2265]	3550 [1675]	3200 [1510]
OUTDOOR DRY BULB TEMPERATURE °F [°C]	75	[23.9]	3.9	3.8	3.7	3.8	3.7	3.7	3.8	3.7	3.7
	80	[26.7]	4.1	4.0	3.9	4.0	3.9	3.9	4.0	3.9	3.8
	85	[29.4]	4.3	4.2	4.1	4.2	4.1	4.1	4.2	4.1	4.0
	90	[32.2]	4.5	4.4	4.3	4.5	4.3	4.3	4.4	4.3	4.3
	95	[35.0]	4.7	4.6	4.6	4.7	4.6	4.5	4.7	4.5	4.5
	100	[37.8]	5.0	4.8	4.8	4.9	4.8	4.8	4.9	4.8	4.7
	105	[40.6]	5.2	5.1	5.0	5.2	5.0	5.0	5.2	5.0	5.0
	110	[43.3]	5.5	5.3	5.3	5.5	5.3	5.3	5.4	5.3	5.2
	115	[46.1]	5.8	5.6	5.6	5.8	5.6	5.5	5.7	5.5	5.5
	120	[48.9]	6.1	5.9	5.9	6.1	5.9	5.8	6.0	5.8	5.8
	125	[51.7]	6.4	6.2	6.2	6.4	6.2	6.1	6.3	6.1	6.1

The Kw values in the table are added to the water heating watt values when unit is operating in a mixed mode operation (first stage providing water heating, second stage in cooling mode).

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.

2. LOCATION

   These units are designed for outdoor installations. They can be mounted on 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. H2AC ROOFTOP UNIT SPECIAL CONSIDERATIONS

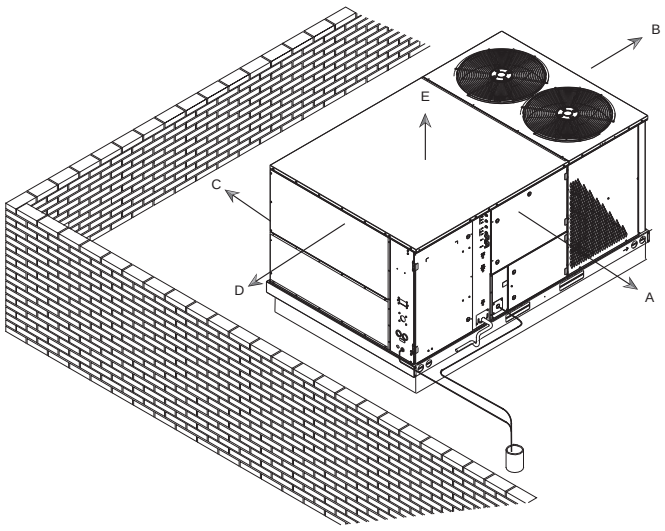
Since the waste-heat recovery/water heating feature of the H2AC Rooftop unit only functions during the cooling mode, the unit should be installed to serve the area of the structure having the largest cooling run-time, for instance the kitchen area of a restaurant, in order to provide the greatest water heating and energy saving benefits.

The H2AC 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 H2AC 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.

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.

FIGURE 6
ROOFTOP INSTALLATION



C. CLEARANCES

The following minimum clearances must be observed for proper unit performance and serviceability. See Figure 6.

Recommended Clearance	Location
48” [1219.2 mm]	A - Front
18” [457.2 mm]	B - Condenser Coil
18” [457.2 mm]	C - Duct Side
18”* [457.2 mm]	D - Evaporator End
60” [1524 mm]	E - Above
*Without Economizer. 48” [1219.2 mm] With Economizer	

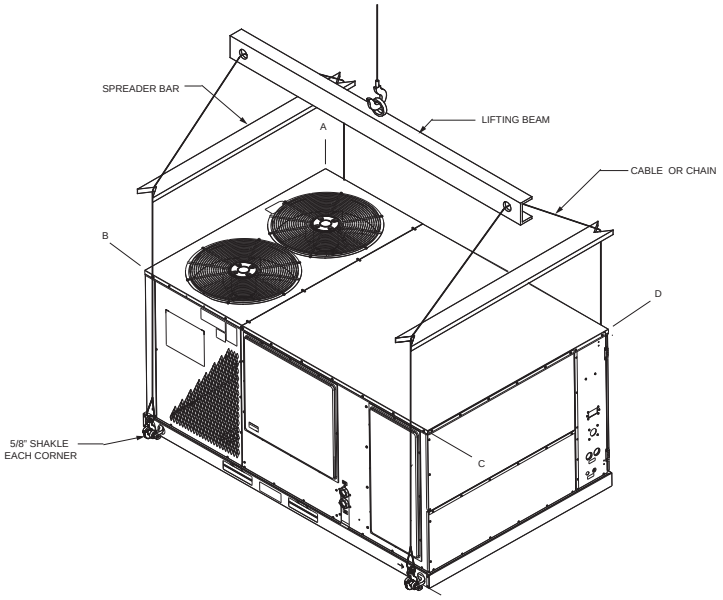
D. ROOFTOP INSTALLATION

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 7 and 8. Use field-furnished spreaders.
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 9.
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.*

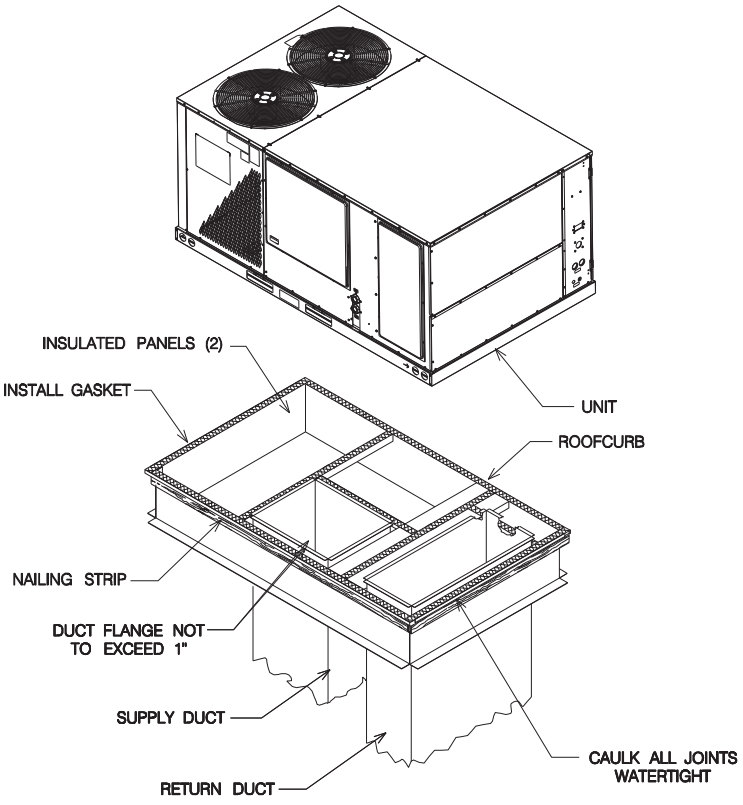
FIGURE 7
RIGGING FOR LIFTING

CORNER WEIGHTS BY PERCENTAGE			
A	B	C	D
29%	29%	21%	26%

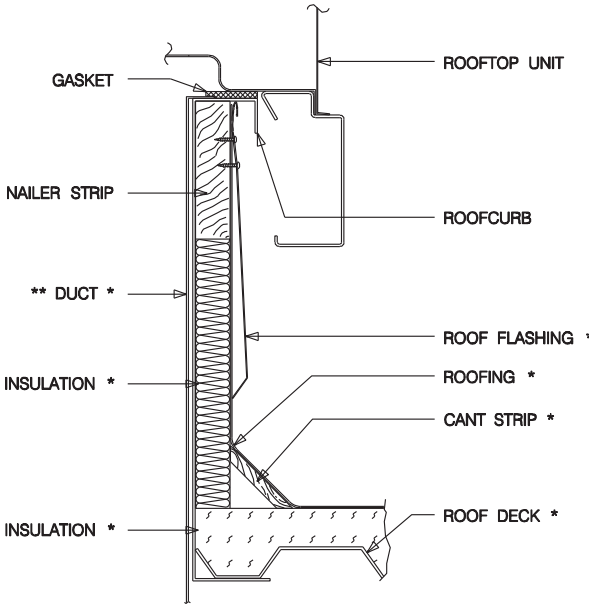


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FIGURE 8
ROOFCURB INSTALLATION



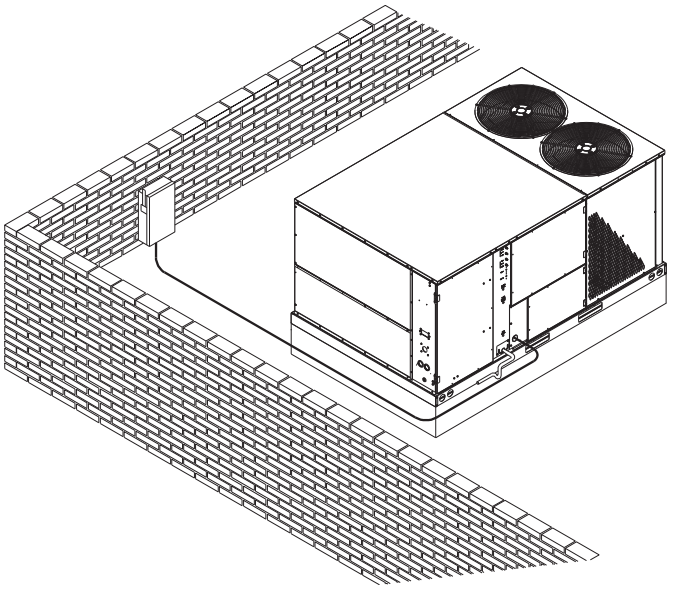
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* BY CONTRACTOR

** 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.

FIGURE 9
FLAT ROOFTOP INSTALLATION, ATTIC OR DROP CEILING DISTRIBUTION SYSTEM. MOUNTED ON ROOFCURB. CURB MUST BE LEVEL



A1112-03

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.

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.

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" [0 mm] for the first 3 feet [.91 m] of discharge duct. Clearance to unit top and side is 0" [0 mm].

VIII. FILTERS

The single stage 10 ton model (LHL-C120) is provided with 6 – 18" x 18" x 2" disposable filters. The two-stage 10 ton model (LHL-D120) is provided with 3 – 18" x 18" x 2" disposable filters and 3 – 18" x 24" x 2" disposable filters. When replacing filters, ensure they are inserted fully to the back to prevent bypass.

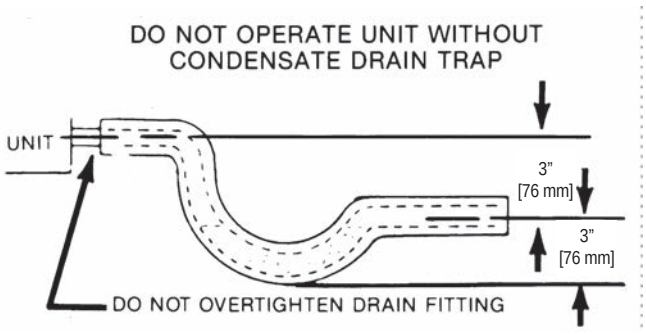
IX. CONDENSATE DRAIN

IMPORTANT: Install a condensate trap to ensure proper condensate drainage. See Figure 10.

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.
- 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.

FIGURE 10
CONDENSATE DRAIN



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 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. Use the unit rating plate or RLHL Electrical Data 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:

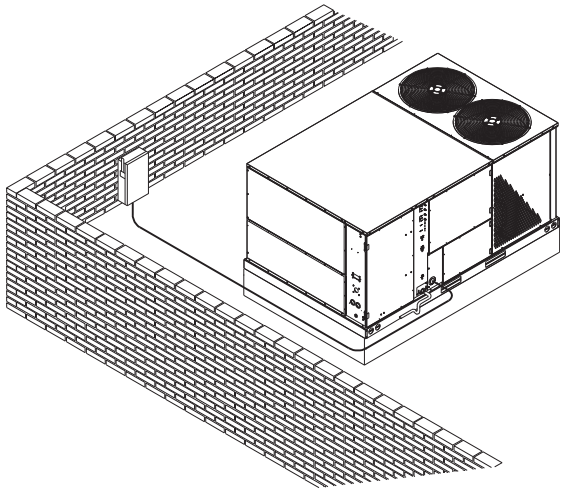
   UNITS WITHOUT ELECTRIC HEAT - Connect power wiring to the power terminal block located on the left side of the electric heat compartment. Connect the ground wire to the adjacent ground lug.

   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 wires to unit contactor (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 9 of the 12 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" [22 mm] hole in the unit side panel. See Figure 12. 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 12.
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.

FIGURE 11
BRANCH CIRCUIT DISCONNECT LOCATION



4. Figure 16 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.

   Transformer is factory-wired for 230 volts on 208/230 volt models and must be changed for 208-volt applications. See unit wiring diagram for 208-volt 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 Tables C through G for blower performance.

XII. CRANKCASE HEAT (OPTIONAL)

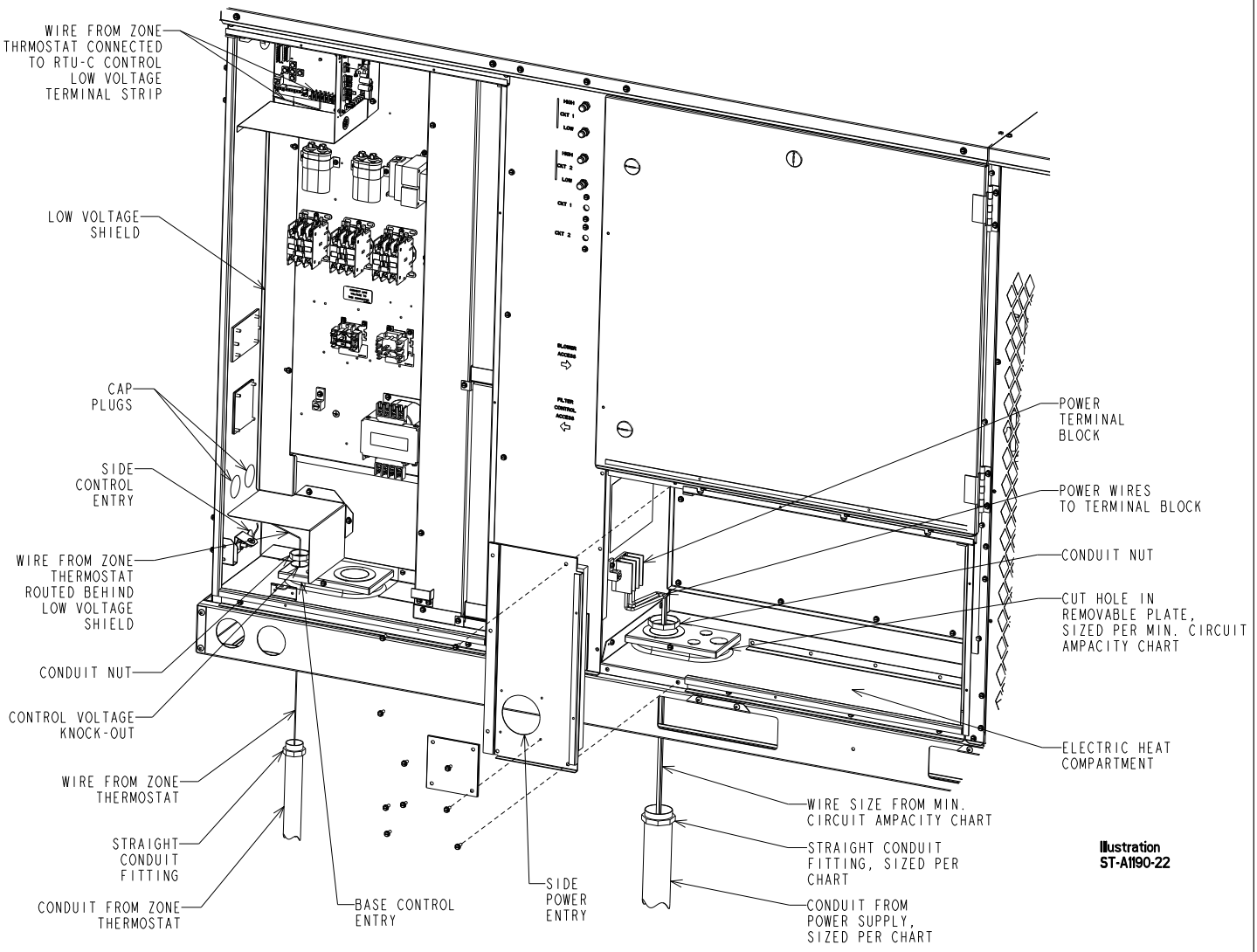
Crankcase heat is not required but may be desirable under certain conditions.

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.

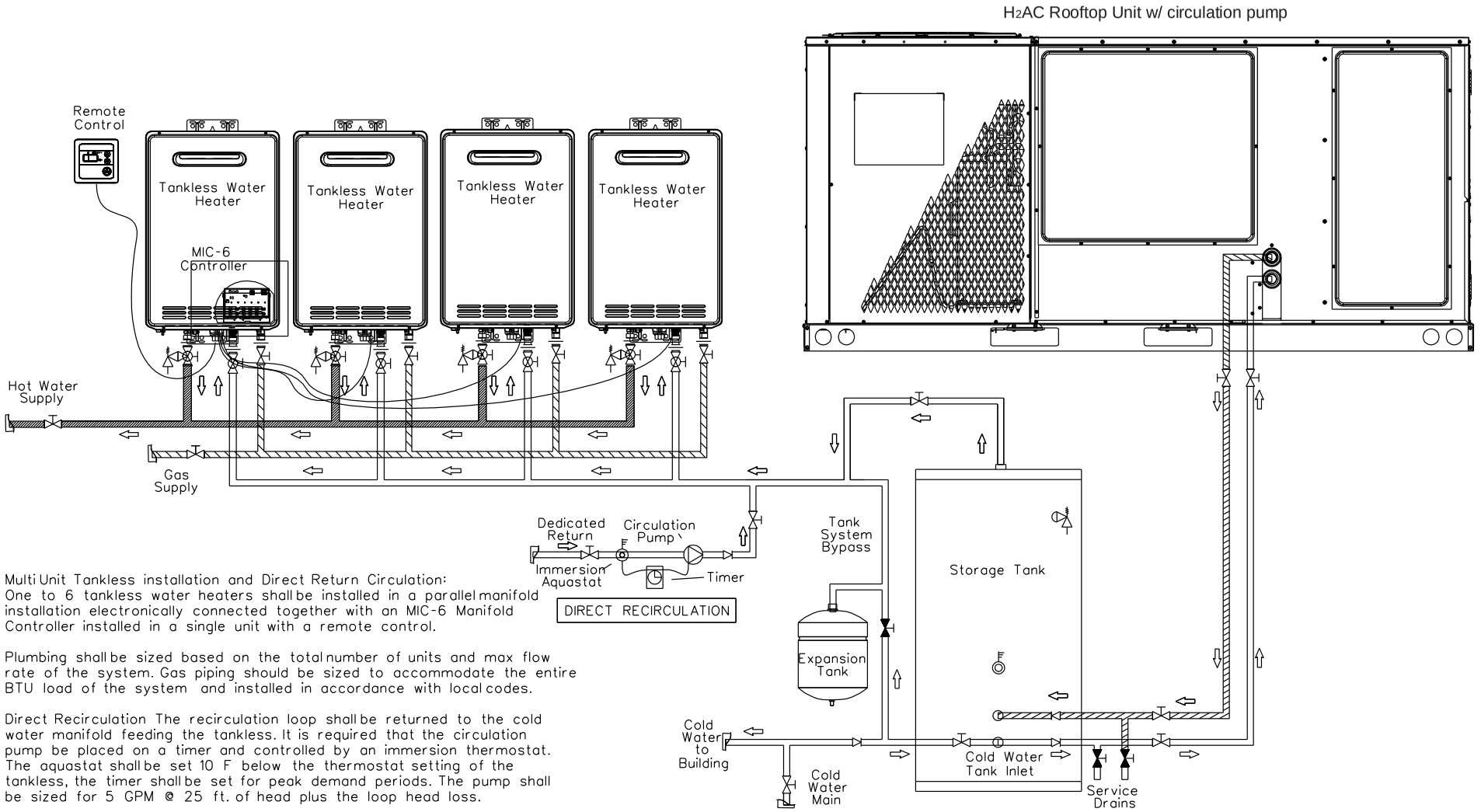
FIGURE 12



2. The H2AC 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 H2AC Rooftop unit be installed with isolation/flushing valves (see illustration, 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 H2AC 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



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.

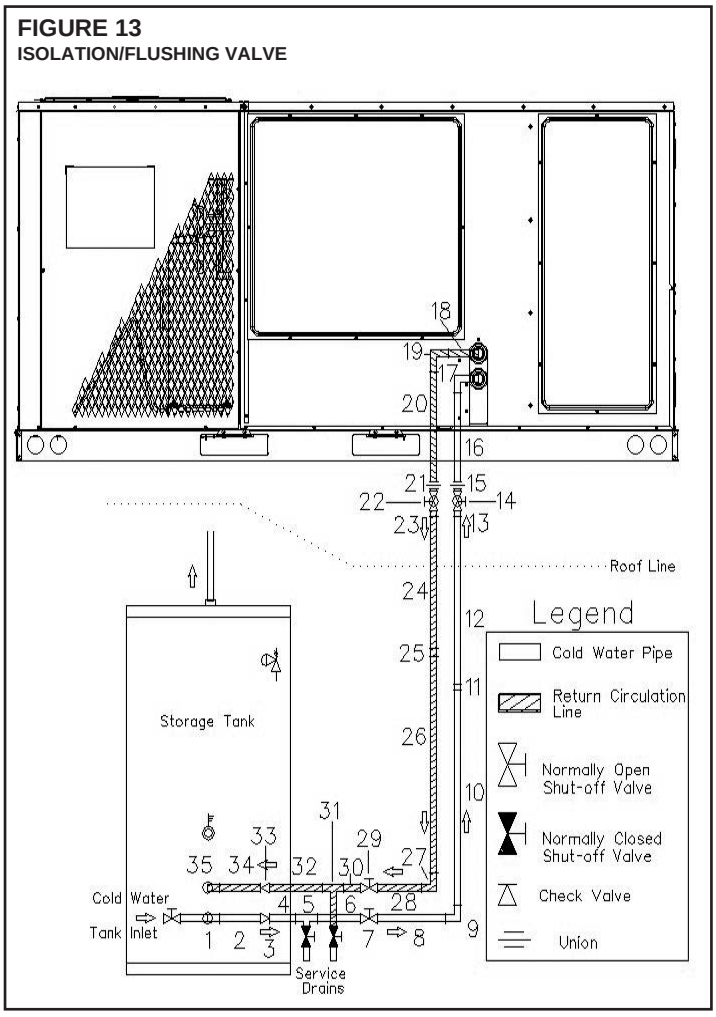
Data condensed from Table 7 of the Copper Development Organization.

Allowances are for streamlined soldered fittings and recessed threaded fittings.

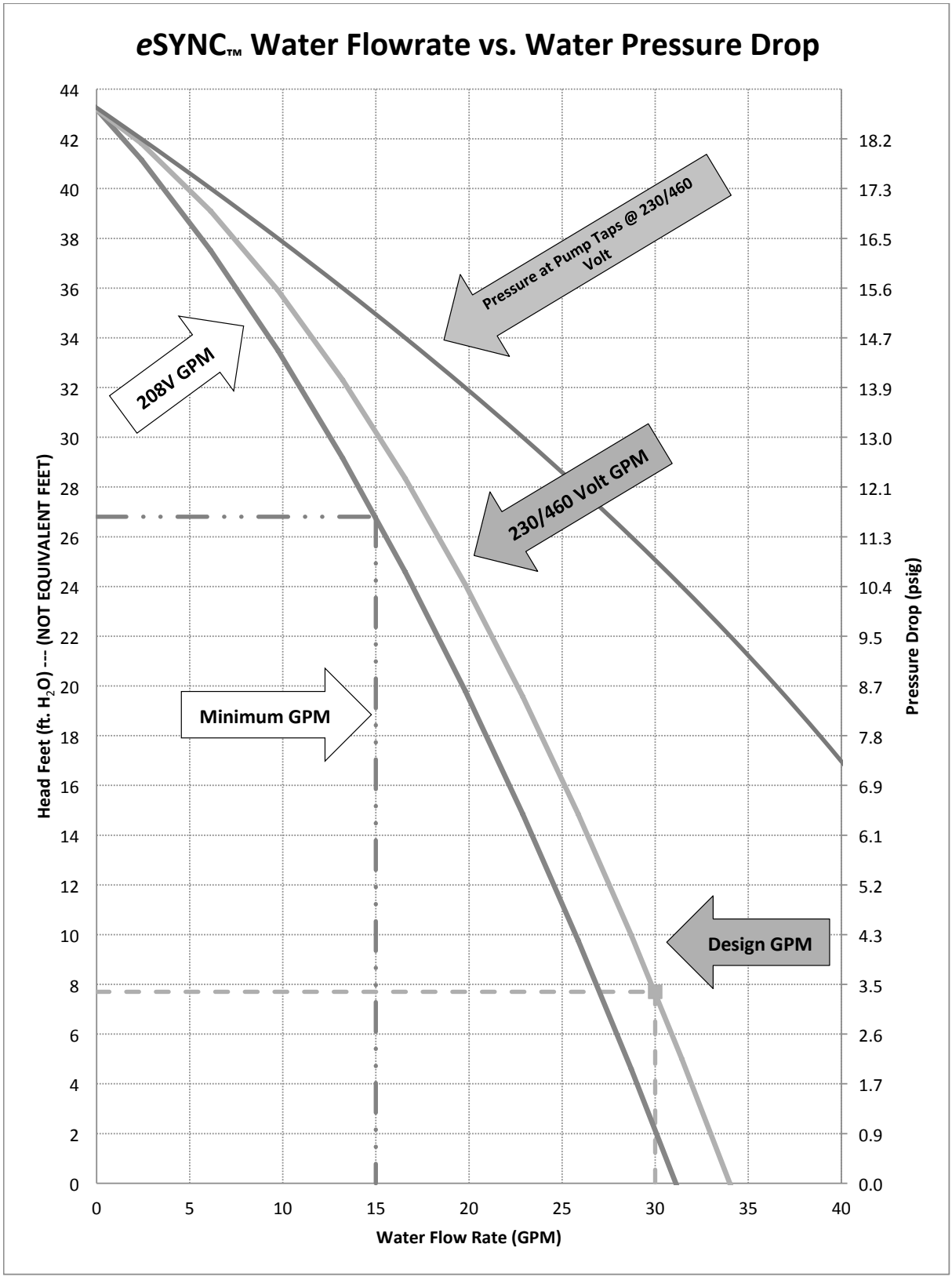
The equivalent lengths presented above are based upon a C factor of 150 in the Hazen-Williams friction loss formula. The lengths shown are rounded to the nearest half foot.

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

FIGURE 13
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


eSYNC™ Water Flowrate vs. Water Pressure Drop
Pressure at Pump Taps @ 230/460 Volt
208V GPM
230/460 Volt GPM
Minimum GPM
Design GPM
Head Feet (ft. H2O) --- (NOT EQUIVALENT FEET)
Pressure Drop (psig)
Water Flow Rate (GPM)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
0.0
0.9
1.7
2.6
3.5
4.3
5.2
6.1
6.9
7.8
8.7
9.5
10.4
11.3
12.1
13.0
13.9
14.7
15.6
16.5
17.3
18.2
0
5
10
15
20
25
30
35
40

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.

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. If the unit was installed without valves, it is recommended that flushing be performed by a plumbing professional.

FIGURE 14
ISOLATION/FLUSHING VALVE (WEBSTONE #41436 OR SIMILAR



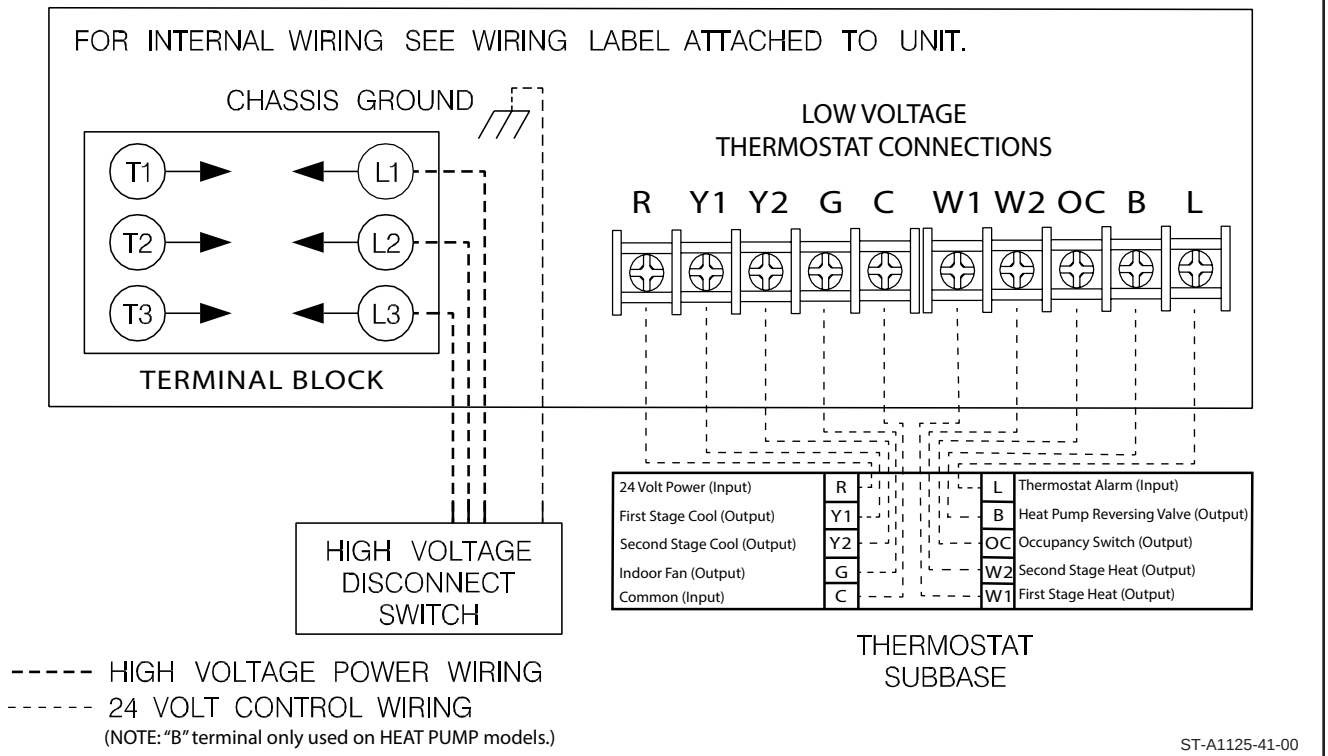
Required items:

- 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.

FIGURE 15
THERMOSTAT CONNECTIONS DIAGRAM



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 6.)
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.

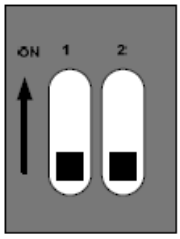
WATER HEATING MODE (H2AC SEQUENCE OF OPERATION)

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).

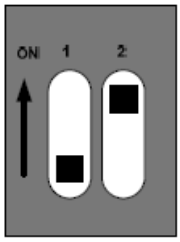
FAULTS/LOCKOUTS/MISC.

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 and 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 under-charge 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 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.

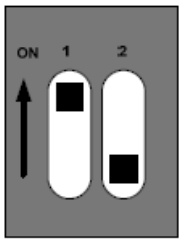
FIGURE 16



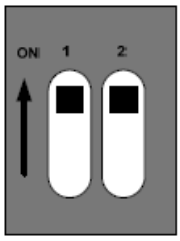
Both Positions OFF
300 seconds (5 minutes)



Position 2 is ON and Position 1 is OFF
600 seconds (10 minutes)



Position 2 is OFF and Position 1 is ON
900 seconds (15 minutes)



Both Positions ON
1200 seconds (20 minutes)

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.

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.

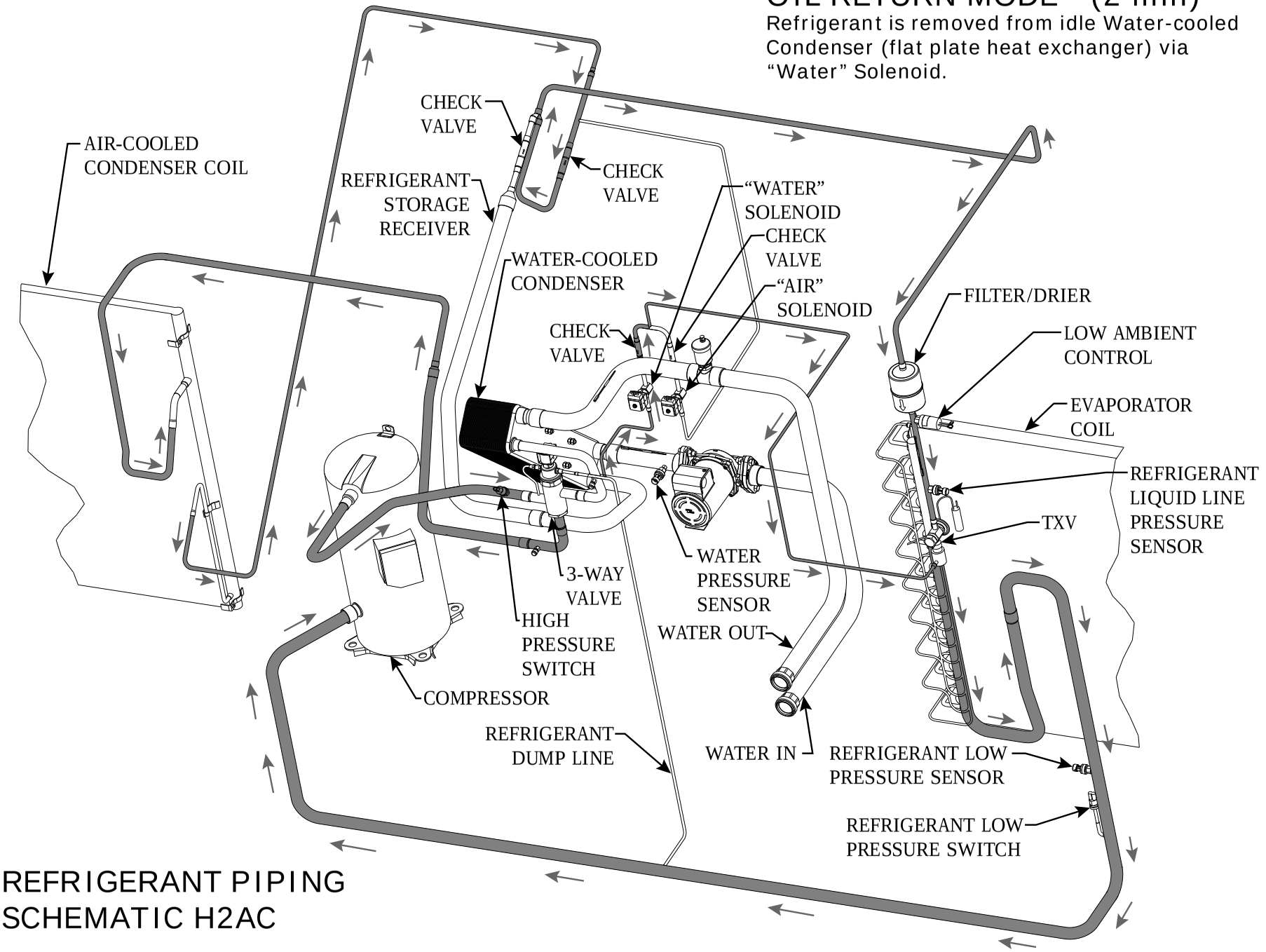
XIX. MISCELLANEOUS

REPLACEMENT PARTS

Contact your local distributor for a complete parts list.

OIL RETURN MODE - (2 min)

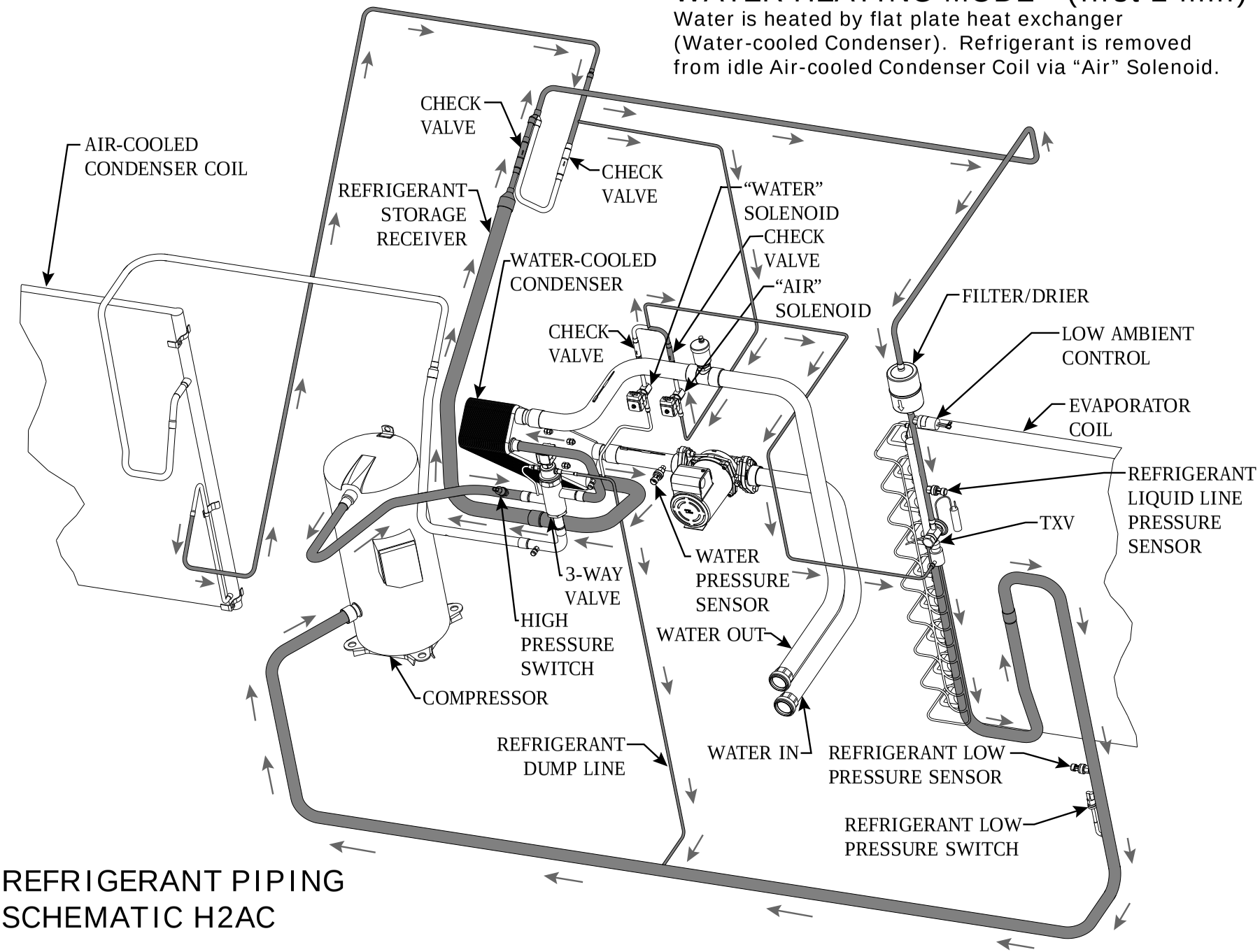
Refrigerant is removed from idle Water-cooled Condenser (flat plate heat exchanger) via "Water" Solenoid.



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING MODE - (first 2 min)

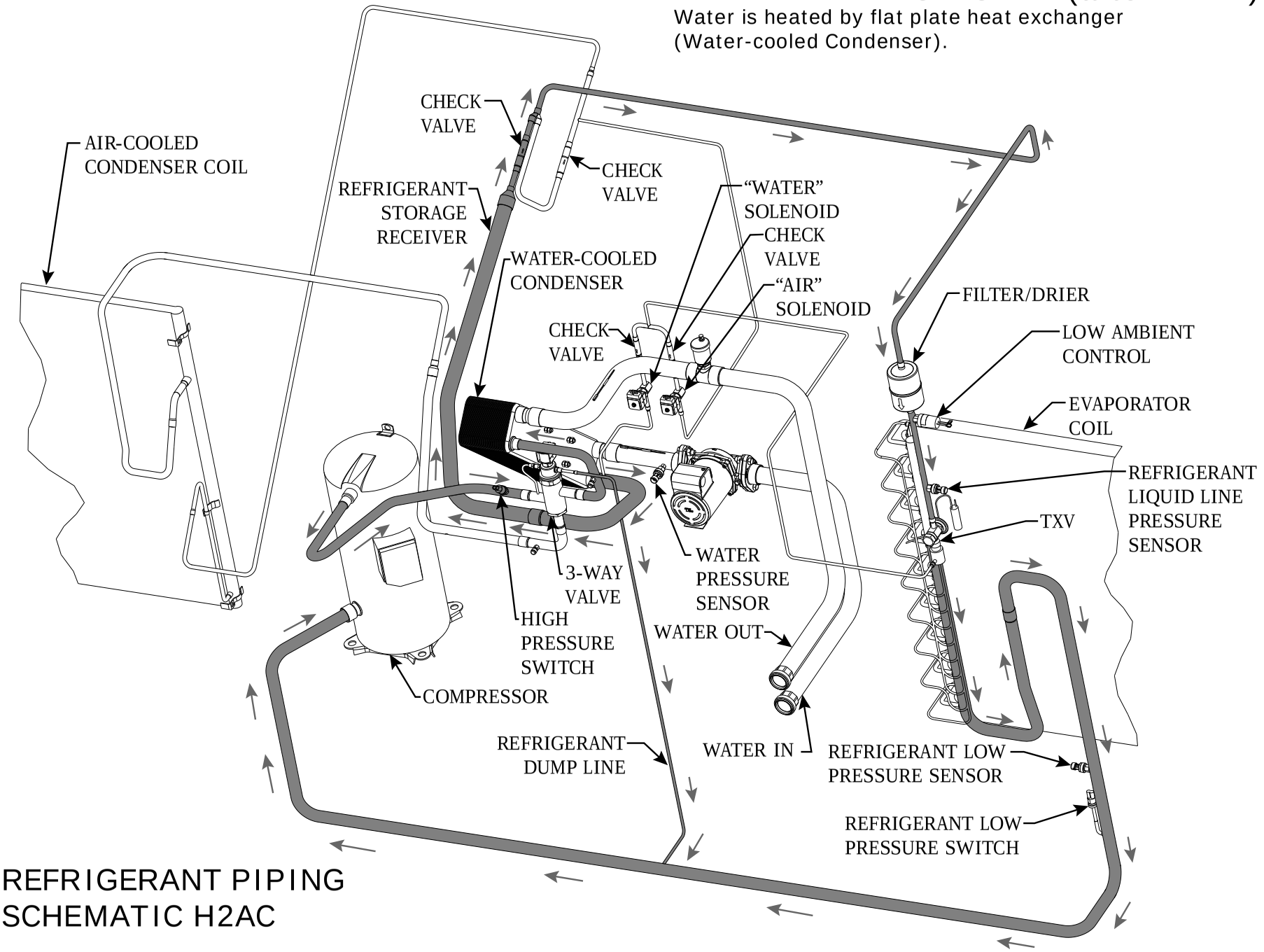
Water is heated by flat plate heat exchanger (Water-cooled Condenser). Refrigerant is removed from idle Air-cooled Condenser Coil via “Air” Solenoid.



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING MODE - (after 2 min)

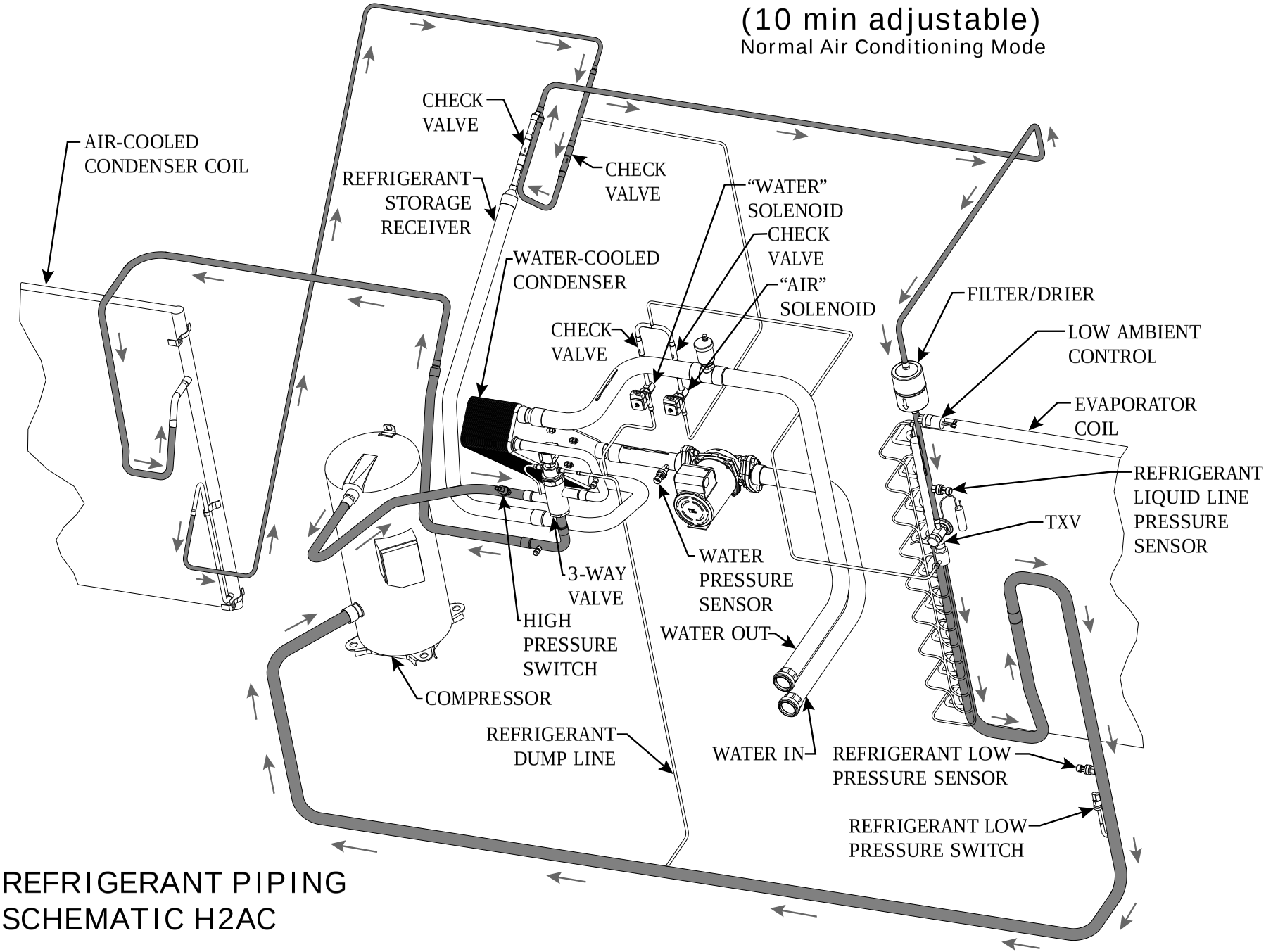
Water is heated by flat plate heat exchanger (Water-cooled Condenser).



REFRIGERANT PIPING SCHEMATIC H2AC

WATER HEATING DELAY MODE - (10 min adjustable)

Normal Air Conditioning Mode



REFRIGERANT PIPING SCHEMATIC H2AC

XX. AIRFLOW DATA TABLES

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

Airflow CFM [L/s]	Model RKHL/RLHL-C120 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
3200 [1510]	—	—	—	—	—	—	682	1152	715	1221	747	1294	779	1370	810	1449	840	1532	870	1618	899	1708	928	1801	956	1898	984	1998	1010	2102	1037	2209	1062	2319	1088	2433	1112	2551	1136	2671
3300 [1557]	—	—	—	—	—	—	694	1216	726	1286	758	1360	789	1438	820	1519	850	1603	879	1691	908	1782	936	1877	963	1975	990	2076	1016	2181	1042	2290	1067	2402	1092	2517	1116	2636	1139	2758
3400 [1604]	—	—	—	—	675	1215	707	1284	739	1356	770	1431	801	1510	830	1592	860	1678	888	1767	917	1860	944	1956	971	2056	997	2159	1023	2265	1048	2375	1073	2488	1097	2605	1120	2725	—	—
3500 [1652]	—	—	—	—	689	1286	721	1356	752	1430	783	1507	812	1587	842	1671	871	1758	899	1849	926	1943	953	2040	980	2141	1005	2246	1030	2353	1055	2465	1079	2580	1102	2698	1125	2820	—	—
3600 [1699]	—	—	673	1294	704	1362	735	1433	766	1508	796	1586	825	1668	854	1753	882	1842	910	1934	937	2030	963	2129	989	2231	1014	2337	1038	2446	1062	2559	1086	2675	1109	2795	1131	2918	—	—
3700 [1746]	—	—	689	1372	720	1442	750	1515	780	1591	810	1671	839	1754	867	1840	894	1931	921	2024	948	2121	973	2221	999	2325	1023	2433	1047	2543	1071	2658	1093	2775	1116	2896	1137	3021	—	—
3800 [1793]	675	1388	706	1455	736	1526	766	1600	796	1678	824	1759	853	1844	880	1932	907	2024	934	2118	959	2217	985	2319	1009	2424	1033	2533	1057	2645	1079	2761	1102	2880	1123	3002	—	—	—	—
3900 [1840]	693	1474	723	1543	753	1615	783	1691	811	1770	840	1852	867	1938	894	2028	921	2121	947	2217	972	2317	996	2420	1020	2527	1044	2637	1067	2751	1089	2868	1111	2989	1132	3113	—	—	—	—
4000 [1888]	712	1564	742	1634	771	1708	800	1785	828	1866	856	1950	883	2037	909	2128	935	2223	960	2321	985	2422	1009	2527	1032	2635	1055	2746	1078	2862	1099	2980	1120	3102	—	—	—	—	—	—
4100 [1935]	731	1659	761	1731	789	1806	818	1884	845	1966	872	2052	899	2141	925	2233	950	2329	975	2428	999	2531	1022	2637	1045	2747	1067	2860	1089	2976	1110	3096	1131	3220	—	—	—	—	—	—
4200 [1982]	751	1758	780	1831	809	1908	836	1988	863	2071	890	2158	916	2249	941	2342	966	2440	990	2540	1013	2645	1036	2752	1058	2863	1080	2978	1101	3096	1122	3217	—	—	—	—	—	—	—	—
4300 [2029]	772	1862	801	1936	828	2014	855	2096	882	2181	908	2269	933	2361	958	2456	982	2555	1005	2657	1028	2763	1051	2872	1072	2984	1094	3100	1114	3220	1134	3342	—	—	—	—	—	—	—	—
4400 [2076]	794	1970	822	2046	849	2125	875	2208	901	2294	927	2384	951	2478	975	2574	999	2674	1022	2778	1044	2885	1066	2996	1087	3110	1108	3227	1128	3348	—	—	—	—	—	—	—	—	—	—
4500 [2123]	816	2082	844	2160	870	2241	896	2325	921	2413	946	2504	970	2599	994	2697	1017	2798	1039	2903	1061	3012	1082	3124	1103	3239	1123	3358	—	—	—	—	—	—	—	—	—	—	—	—
4600 [2171]	839	2199	866	2278	892	2360	917	2446	942	2535	966	2628	990	2724	1013	2824	1035	2927	1057	3033	1078	3143	1099	3257	1119	3373	1138	3494	—	—	—	—	—	—	—	—	—	—	—	—
4700 [2218]	863	2320	889	2401	914	2485	939	2572	963	2662	987	2757	1010	2854	1032	2955	1054	3060	1075	3168	1096	3279	1116	3394	1135	3512	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800 [2265]	888	2446	913	2528	938	2613	962	2702	985	2794	1008	2890	1031	2989	1053	3091	1074	3197	1095	3306	1115	3419	1134	3535	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Drive Package	L						M					
Motor H.P. [W]	2 [1491.4]3 [2237.1]											
Blower Sheave	BK90HBK65H											
Motor Sheave	1VP-441VP-44											
Turns Open	1	**2**	3	4	5	6	1	2	3	4	**5**	
RPM	845	**810**	775	739	704	669	1138	1089	1041	992	**943**	894

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

Airflow CFM [L/s]	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil		Downflow Economizer RA Damper Open		Concentric Grill RXRN-AA61 or RXRN-AA71 & Transition RXMC-CE05	Concentric Grill RXRN-AA66 or RXRN-AA76 & Transition RXMC-CF06
	Total MBH	Sensible MBH	Power kW	Resistance — Inches of Water [kPa]					
3200 [1510]	0.98	0.92	0.99	0.07 [.02]		0.09 [.02]		—	—
3400 [1604]	0.99	0.96	0.99	0.07 [.02]		0.10 [.02]		—	—
3600 [1699]	1.00	1.00	1.00	0.08 [.02]		0.11 [.03]		0.16 [.04]	—
3800 [1793]	1.01	1.05	1.01	0.08 [.02]		0.12 [.03]		0.19 [.05]	—
4000 [1888]	1.02	1.09	1.01	0.09 [.02]		0.13 [.03]		0.21 [.05]	—
4200 [1982]	1.03	1.13	1.02	0.09 [.02]		0.14 [.03]		0.24 [.06]	—
4400 [2076]	1.04	1.17	1.02	0.10 [.02]		0.15 [.04]		0.27 [.07]	—
4600 [2171]	1.05	1.21	1.03	0.10 [.02]		0.16 [.04]		0.30 [.07]	0.30 [.07]
4800 [2265]	1.06	1.25	1.03	0.11 [.03]		0.17 [.04]		0.33 [.08]	0.32 [.08]

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

[ ] Designates Metric Conversions

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

Air Flow CFM [L/s]	Model RKHL-D120 or RLHL-D120 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
3200 [1510]	—	—	—	—	691	1030	721	1101	752	1172	781	1244	810	1316	838	1390	866	1464	893	1539	919	1615	945	1691	970	1768	995	1846	1019	1925	1042	2004	1065	2084	1087	2165	1109	2247	1129	2329
3300 [1557]	—	—	673	1016	704	1088	734	1161	764	1235	793	1309	821	1385	849	1460	877	1537	903	1615	929	1693	955	1772	980	1852	1004	1932	1028	2013	1051	2095	1073	2178	1095	2261	1116	2346	1136	2430
3400 [1604]	—	—	686	1076	717	1151	747	1227	776	1303	805	1380	833	1458	861	1536	888	1615	914	1695	940	1776	965	1858	989	1940	1013	2023	1036	2107	1059	2191	1081	2276	1102	2362	1123	2449	1143	2537
3500 [1652]	669	1065	699	1142	730	1219	759	1297	788	1376	817	1455	845	1536	872	1617	899	1698	925	1781	950	1864	975	1948	999	2033	1022	2119	1045	2205	1067	2292	1089	2380	1110	2468	1131	2558	1150	2648
3600 [1699]	682	1133	713	1212	743	1292	772	1372	801	1454	829	1536	857	1619	883	1702	910	1787	935	1872	960	1957	985	2044	1008	2131	1032	2219	1054	2308	1076	2398	1097	2488	1118	2579	1138	2671	1158	2764
3700 [1746]	697	1206	727	1287	756	1370	785	1453	814	1537	841	1621	869	1707	895	1793	921	1880	946	1967	971	2056	995	2145	1018	2235	1041	2325	1063	2417	1085	2509	1106	2602	1126	2695	1146	2789	1165	2885
3800 [1793]	711	1283	741	1368	770	1452	798	1538	826	1625	854	1712	881	1800	907	1888	932	1978	957	2068	981	2159	1005	2250	1028	2343	1051	2436	1073	2530	1094	2624	1114	2720	1134	2816	1154	2913	1172	3011
3900 [1840]	725	1366	755	1453	783	1540	812	1628	839	1717	866	1807	893	1897	919	1989	944	2081	968	2173	992	2267	1016	2361	1038	2456	1060	2551	1082	2648	1103	2745	1123	2843	1143	2942	1162	3041	—	—
4000 [1888]	740	1454	769	1543	797	1633	825	1724	852	1815	879	1907	905	2000	931	2094	955	2188	980	2284	1003	2380	1026	2476	1048	2574	1070	2672	1091	2771	1112	2871	1132	2971	1151	3073	1170	3174	—	—
4100 [1935]	754	1546	783	1638	811	1730	839	1824	865	1918	892	2013	917	2108	943	2204	967	2301	991	2399	1014	2498	1037	2597	1059	2697	1080	2798	1101	2899	1121	3001	1141	3104	1160	3208	—	—	—	—
4200 [1982]	769	1644	797	1738	825	1833	852	1929	879	2025	905	2123	930	2221	955	2320	979	2419	1002	2519	1025	2620	1048	2722	1069	2825	1090	2928	1111	3032	1130	3137	1150	3243	1168	3349	—	—	—	—
4300 [2029]	784	1746	812	1843	839	1941	866	2039	892	2138	918	2238	943	2338	967	2440	991	2542	1014	2645	1036	2748	1058	2853	1080	2958	1100	3064	1120	3170	1140	3278	1159	3386	—	—	—	—	—	—
4400 [2076]	798	1854	826	1953	853	2053	880	2154	906	2256	931	2358	955	2461	979	2565	1003	2670	1026	2775	1048	2881	1069	2988	1090	3096	1111	3204	1130	3313	1149	3423	1168	3534	—	—	—	—	—	—
4500 [2123]	813	1966	841	2068	868	2171	894	2274	919	2378	944	2483	968	2589	992	2695	1015	2802	1038	2910	1059	3019	1081	3128	1101	3238	1121	3349	1140	3461	1159	3573	—	—	—	—	—	—	—	—
4600 [2171]	829	2083	856	2188	882	2293	908	2399	933	2506	957	2613	981	2721	1005	2830	1027	2940	1049	3050	1071	3162	1092	3274	1112	3386	1132	3500	1151	3614	1169	3729	—	—	—	—	—	—	—	—
4700 [2218]	844	2206	870	2313	897	2420	922	2529	947	2638	971	2748	994	2859	1017	2970	1040	3082	1062	3195	1083	3309	1103	3424	1123	3539	1142	3655	1161	3772	—	—	—	—	—	—	—	—	—	—
4800 [2265]	859	2333	886	2442	911	2553	936	2664	961	2775	985	2888	1008	3001	1030	3115	1052	3230	1074	3346	1094	3462	1115	3579	1134	3697	1153	3815	1171	3934	—	—	—	—	—	—	—	—	—	—

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

Drive Package	L						M					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]					
Blower Sheave	BK90H						BK65H					
Motor Sheave	1VP-44						1VP-44					
Turns Open	1	**2**	3	4	5	6	1	2	3	4	**5**	6
RPM	857	**822**	785	747	706	667	1160	1117	1068	1014	**960**	902

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 vertical airflow with dry coil. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow CFM [L/s]	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE						
				Wet Coil	Downflow	Downflow Economizer RA Damper Open	Horizontal Economizer RA Damper Open	Concentric Grill RXRN-FA65 or RXRN FA75 & Transition RXMC-CD04	Concentric Grill RXRN-AA61 or RXRN-AA71 & Transition RXMC-CE05	Concentric Grill RXRN-AA66 or RXRN-AA76 & Transition RXMC-CF06
	Total MBH	Sensible MBH	Power kW	Resistance — Inches of Water [kPa]						
3200 [1510]	0.98	0.93	0.99	0.06 [.01]	0.00 [.00]	0.09 [.02]	0.05 [.01]	0.31 [.08]	—	—
3400 [1604]	0.99	0.97	0.99	0.07 [.02]	0.00 [.00]	0.10 [.02]	0.06 [.01]	0.37 [.09]	—	—
3600 [1699]	1.00	1.01	1.00	0.08 [.02]	0.00 [.00]	0.11 [.03]	0.06 [.01]	—	0.16 [.04]	—
3800 [1793]	1.01	1.05	1.01	0.08 [.02]	0.00 [.00]	0.12 [.03]	0.07 [.02]	—	0.19 [.05]	—
4000 [1888]	1.02	1.09	1.01	0.09 [.02]	0.00 [.00]	0.13 [.03]	0.07 [.02]	—	0.21 [.05]	—
4200 [1982]	1.03	1.13	1.02	0.09 [.02]	0.00 [.00]	0.14 [.03]	0.08 [.02]	—	0.24 [.06]	—
4400 [2076]	1.04	1.17	1.02	0.10 [.02]	0.00 [.00]	0.15 [.04]	0.08 [.02]	—	0.27 [.07]	—
4600 [2171]	1.05	1.22	1.03	0.10 [.02]	0.00 [.00]	0.16 [.04]	0.09 [.02]	—	—	0.30 [.07]
4800 [2265]	1.06	1.26	1.04	0.11 [.03]	0.00 [.00]	0.17 [.04]	0.10 [.02]	—	—	0.32 [.08]

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

[ ] Designates Metric Conversions

XXI. TROUBLE SHOOTING CHART

⚠ WARNING

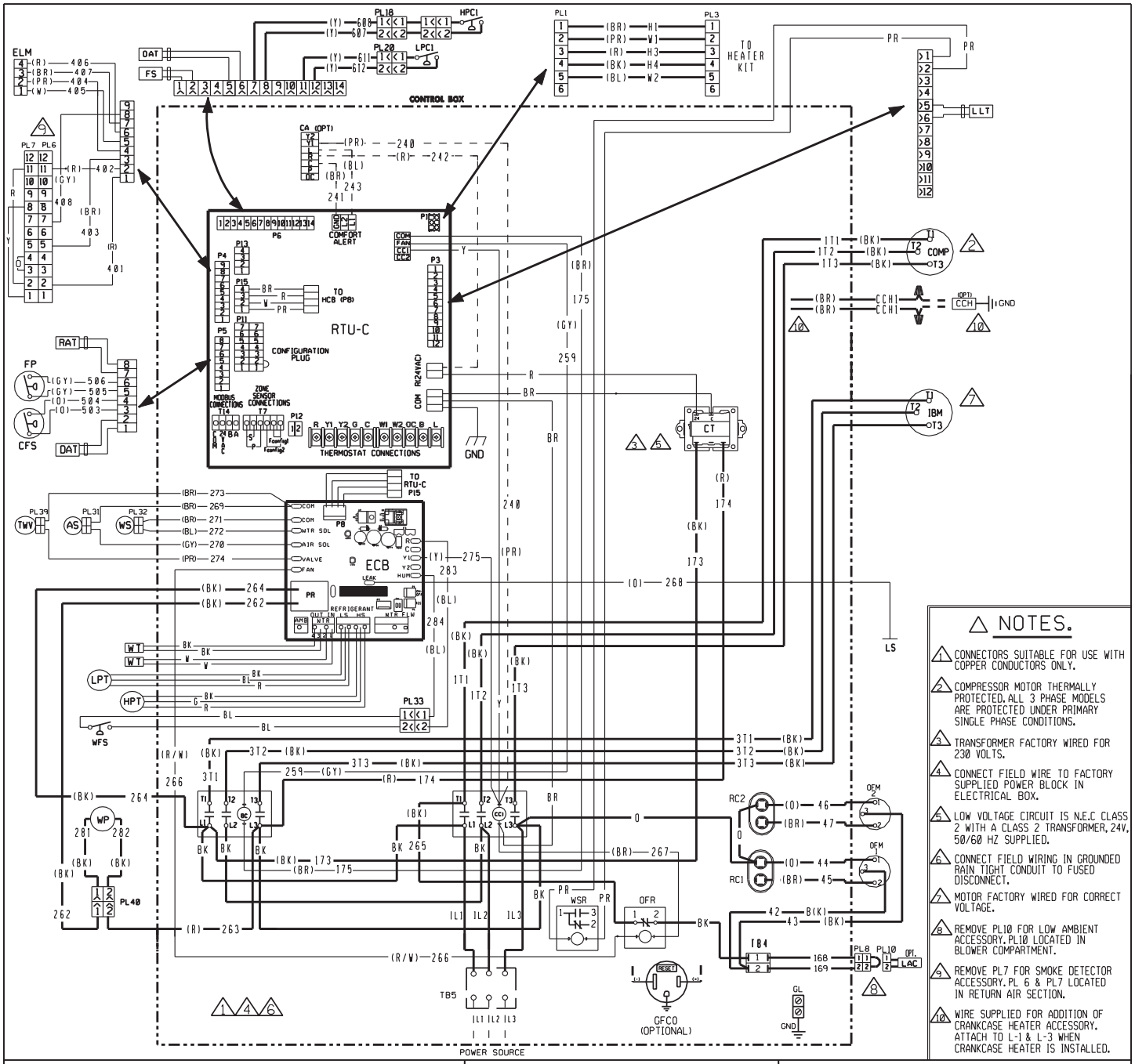
DISCONNECT ALL POWER TO UNIT BEFORE SERVICING. CONTACTOR MAY BREAK ONLY ONE SIDE. FAILURE TO SHUT OFF POWER CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

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 [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	• 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 • Flow check piston size too small • Incorrect capillary tubes • TXV does not open	• Remove or replace defective component • Change to correct size piston • Change coil assembly • 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
High head-high or normal vapor pressure - Heating mode	• Low air flow - condenser coil • Refrigerant overcharge • Air or non-condensibles in system • Dirty condenser coil	• Check filters - correct to speed • Correct system charge • Recover refrigerant, evacuate & recharge • Check filter - clean coil
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 • TXV limiting refrigerant flow	• 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	• 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

XXII. 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 (H2AC) 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	Obsolete (replaced by switch) 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 energlzed 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 by sending a "Clear All Alarms" command through the BAS network or after 24 hr lockout timer is reset.**	> 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 conditioning 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.

XXIII. WIRING DIAGRAMS



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
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
HPT	HIGH PRESSURE TRANSFORMER
IBM	INDOOR BLOWER MOTOR BELT DRIVE
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
WFS	WATER FLOW SWITCH
WP	WATER PUMP
WS	WATER SOLENOID
WSR	WATER SHUTOFF RELAY
WT	WATER TEMPERATURE SENSOR
	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

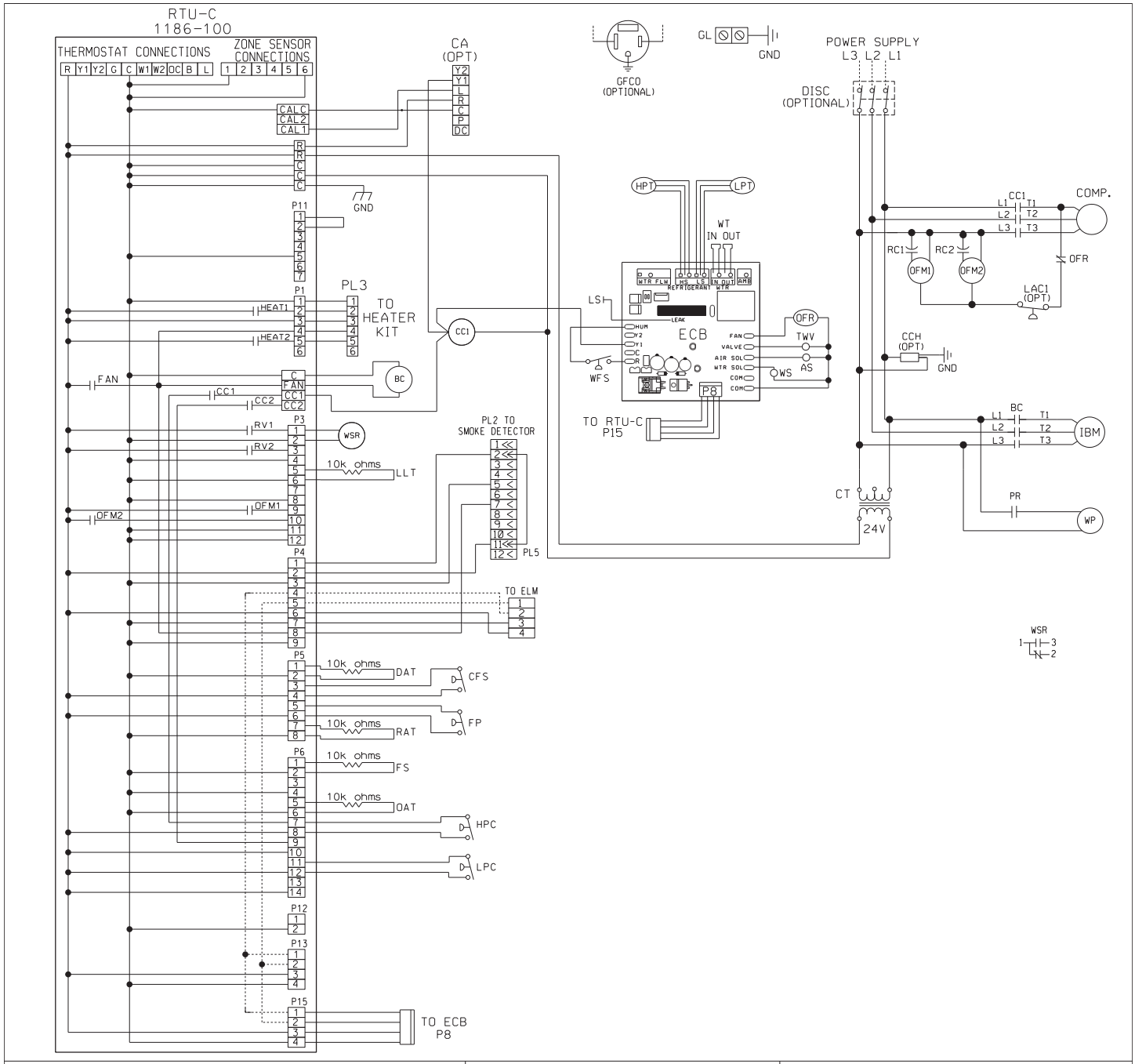
WIRING DIAGRAM

?LHL-C120C

208-230V 3 PH, 60 HZ.

PACKAGE A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-14-11	90-103089-15	05



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
ELM	ECONOMIZER LOGIC MODULE
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
GV	GAS VALVE
HPC	HIGH PRESSURE CONTROL
HPT	HIGH PRESSURE TRANSFORMER
IBM	INDOOR BLOWER MOTOR BELT DRIVE
LAC	LOW AMBIENT COOLING CONTROL
LC	LIMIT 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
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
TB	TERMINAL BLOCK
WFS	WATER FLOW SWITCH
WP	WATER PUMP
WS	WATER SOLENOID
WSR	WATER SHUTOFF RELAY
WT	WATER TEMPERATURE SENSOR
	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.)

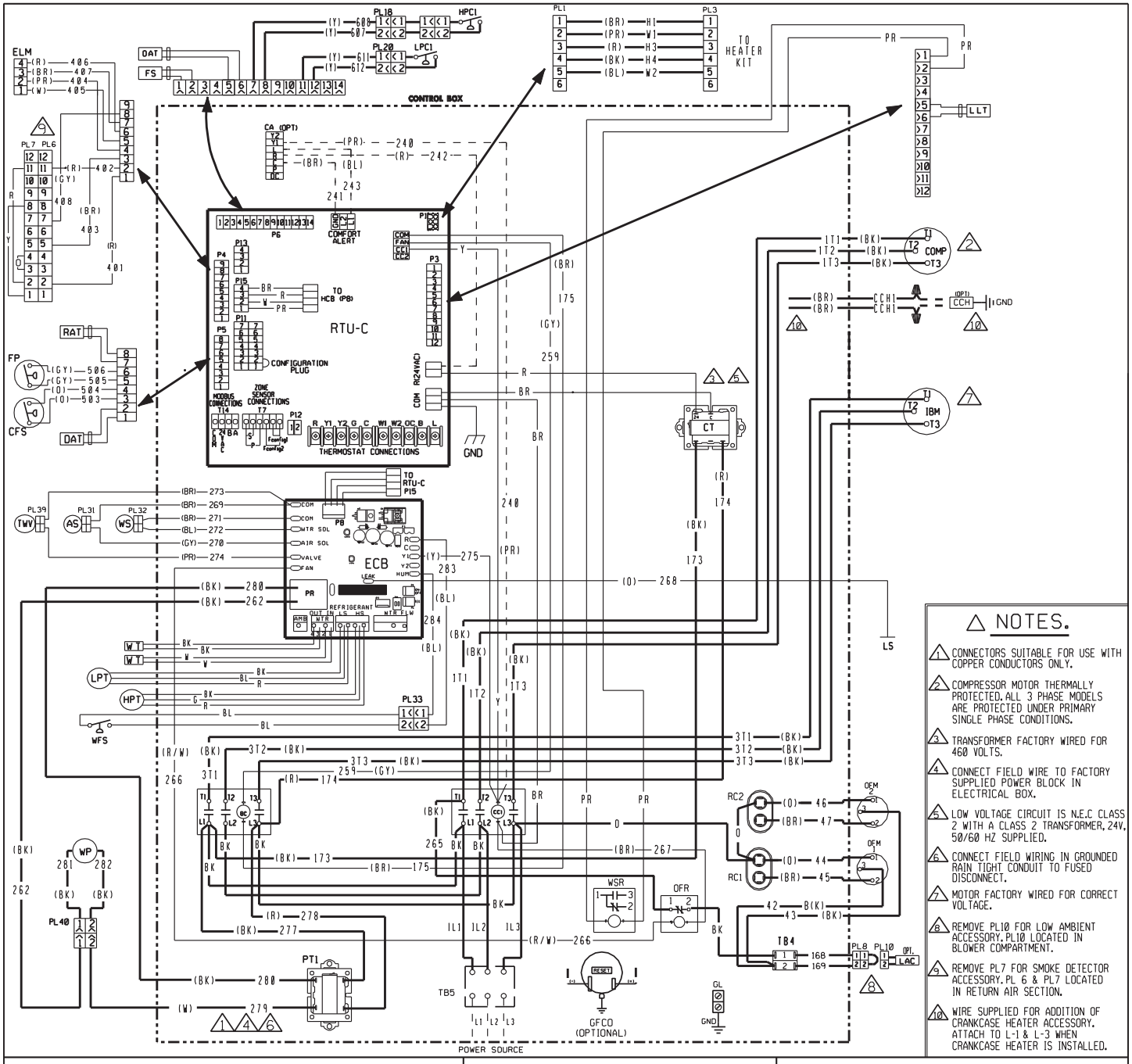
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

WIRE COLOR CODE

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

WIRING SCHEMATIC
?LHL-C120C
208-230V 3 PH, 60 HZ.
PACKAGE A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-28-10	90-103246-15	Ø3



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 FOR 460 VOLTS.
4. CONNECT FIELD WIRE TO FACTORY SUPPLIED POWER BLOCK IN ELECTRICAL BOX.
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 FOR LOW AMBIENT ACCESSORY. PL10 LOCATED IN BLOWER COMPARTMENT.
9. REMOVE PL7 FOR SMOKE DETECTOR ACCESSORY. PL 6 & PL7 LOCATED IN RETURN AIR SECTION.
10. WIRE SUPPLIED FOR ADDITION OF CRANKCASE HEATER ACCESSORY. ATTACH TO L-1 & L-3 WHEN CRANKCASE HEATER IS INSTALLED.

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
FLMS	FLAME SENSOR
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
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
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
TB	TERMINAL BLOCK
WFS	WATER FLOW SWITCH
WP	WATER PUMP
WS	WATER SOLENOID
WSR	WATER SHUTOFF RELAY
WT	WATER TEMPERATURE SENSOR
▲	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.)

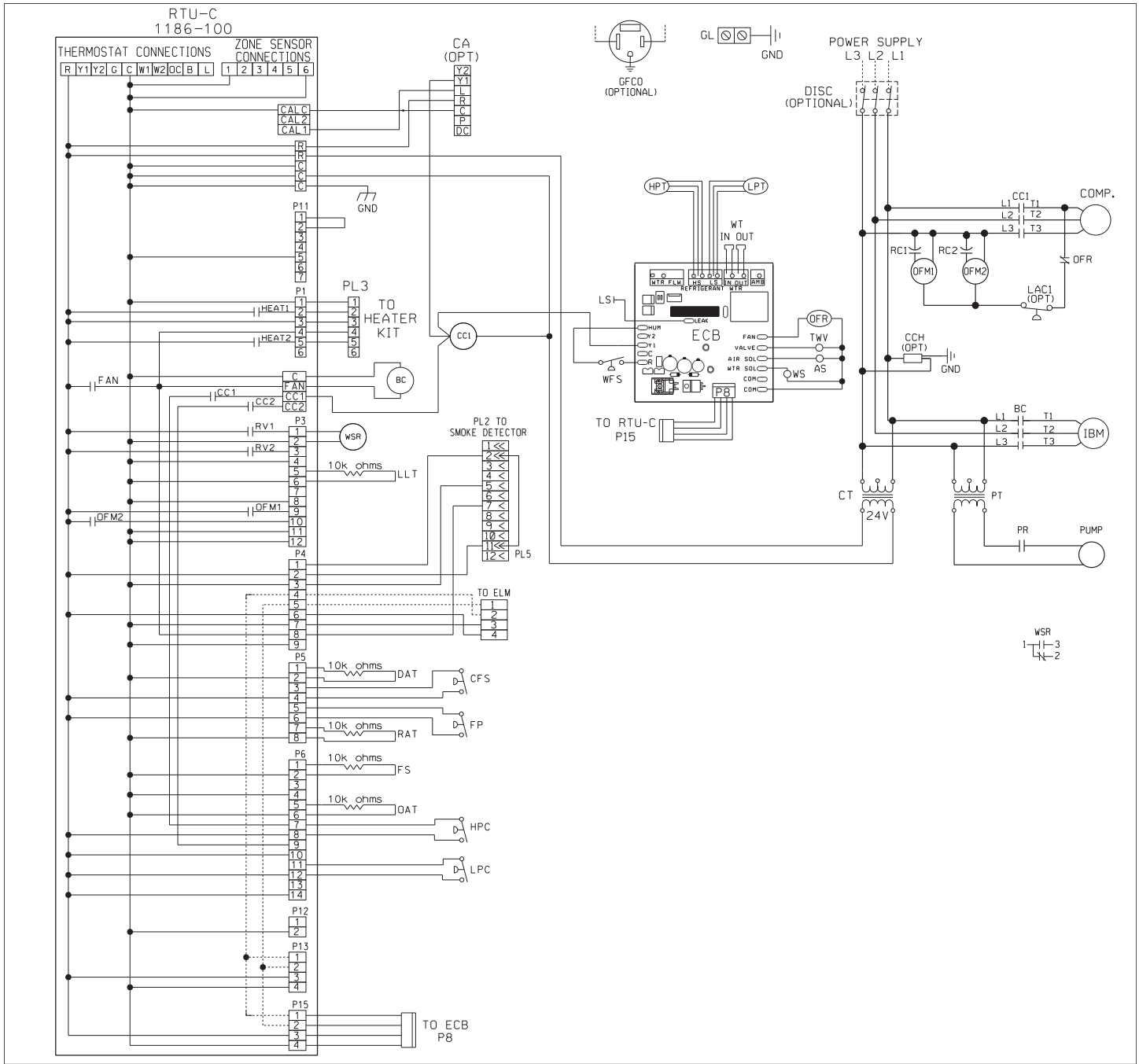
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

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
?LHL-C120D
460V 3 PH, 60 HZ.
PACKAGE A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-14-11	90-103089-17	05



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
ELM	ECONOMIZER LOGIC MODULE
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
HPT	HIGH PRESSURE TRANSFORMER
IBM	INDOOR BLOWER MOTOR BELT DRIVE
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
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
TB	TERMINAL BLOCK
WFS	WATER FLOW SWITCH
WP	WATER PUMP
WS	WATER SOLENOID
WSR	WATER SHUTOFF RELAY
WT	WATER TEMPERATURE SENSOR
⚠	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.)

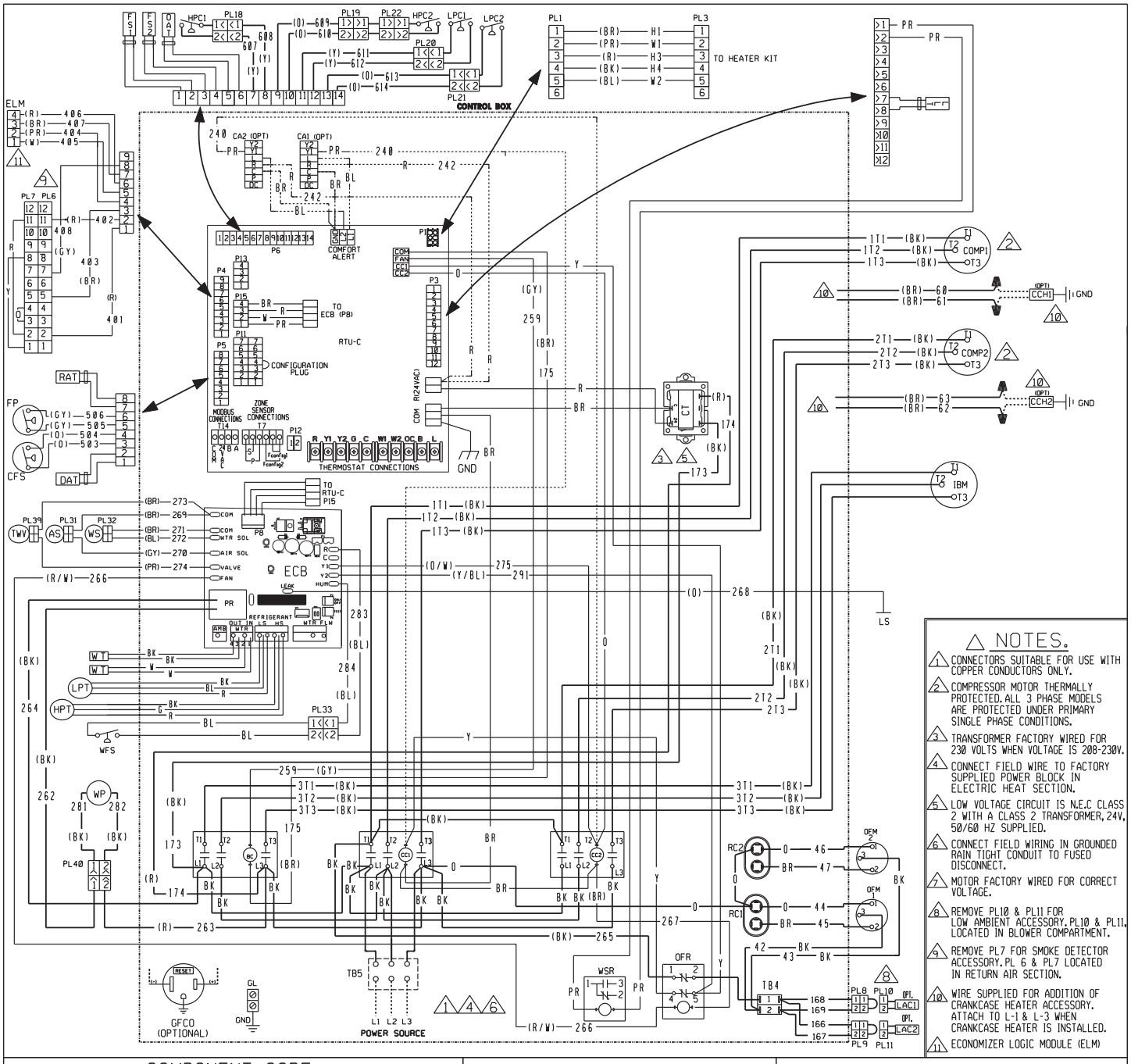
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

WIRE COLOR CODE

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

WIRING SCHEMATIC
?LHL-C120D
460V 3 PH, 60 HZ.
PACKAGE A/C W/RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		1-28-11	90-103246-17	Ø3



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 FOR 230 VOLTS WHEN VOLTAGE IS 208-230V.
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. WIRE SUPPLIED FOR ADDITION OF CRANKCASE HEATER ACCESSORY. ATTACH TO L-1 & L-3 WHEN CRANKCASE HEATER IS INSTALLED.
11. ECONOMIZER LOGIC MODULE (ELM)

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
ECB	eSYNC CONTROL BOARD
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR BELT DRIVE
LAC	LOW AMBIENT COOLING CONTROL
LPC	LOW PRESSURE CONTROL
OAT	OUTSIDE AIR SENSOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PL	PLUG
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
TB	TERMINAL BLOCK
TWV	THREE-WAY VALVE
WFS	WATER FLOW SWITCH
WSR	WATER SHUTOFF RELAY
	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.)

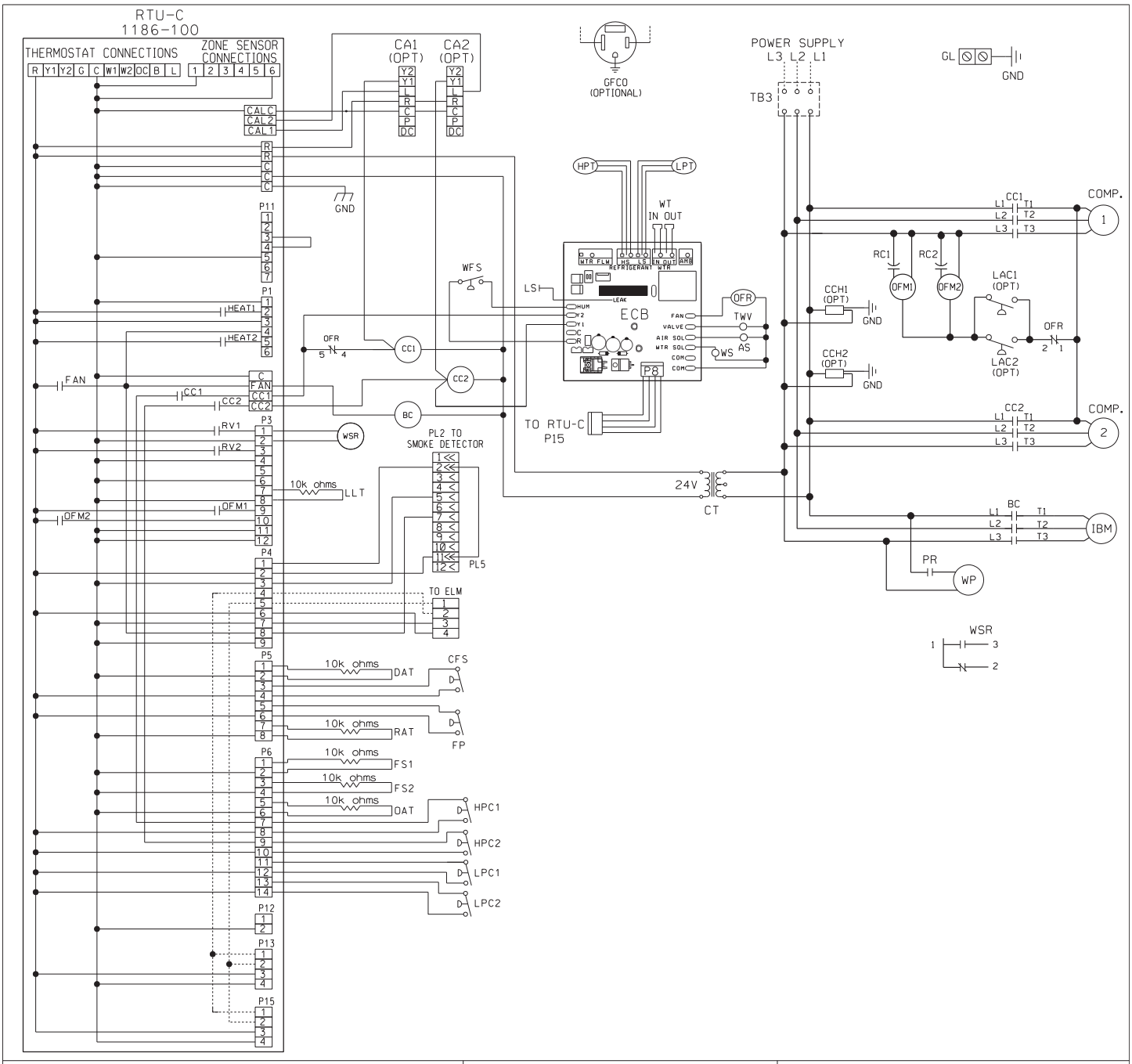
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

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
(-)LHL-D120C
208-230V 3 PH, 60 HZ.
PACKAGED A/C WITH RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		2-13-12	90-103089-34	03



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
ECB	eSYNC CONTROL BOARD
ELM	ECONOMIZER LOGIC MODULE
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
LAC	LOW AMBIENT COOLING CONTROL
LLT	LIQUID LINE TEMPERATURE
LPC	LOW PRESSURE CONTROL
LPT	LOW PRESSURE TRASNSDUCER
LS	LEAK SENSOR
OAT	OUTSIDE AIR SENSOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PL	PLUG
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 SENSOR
	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.)

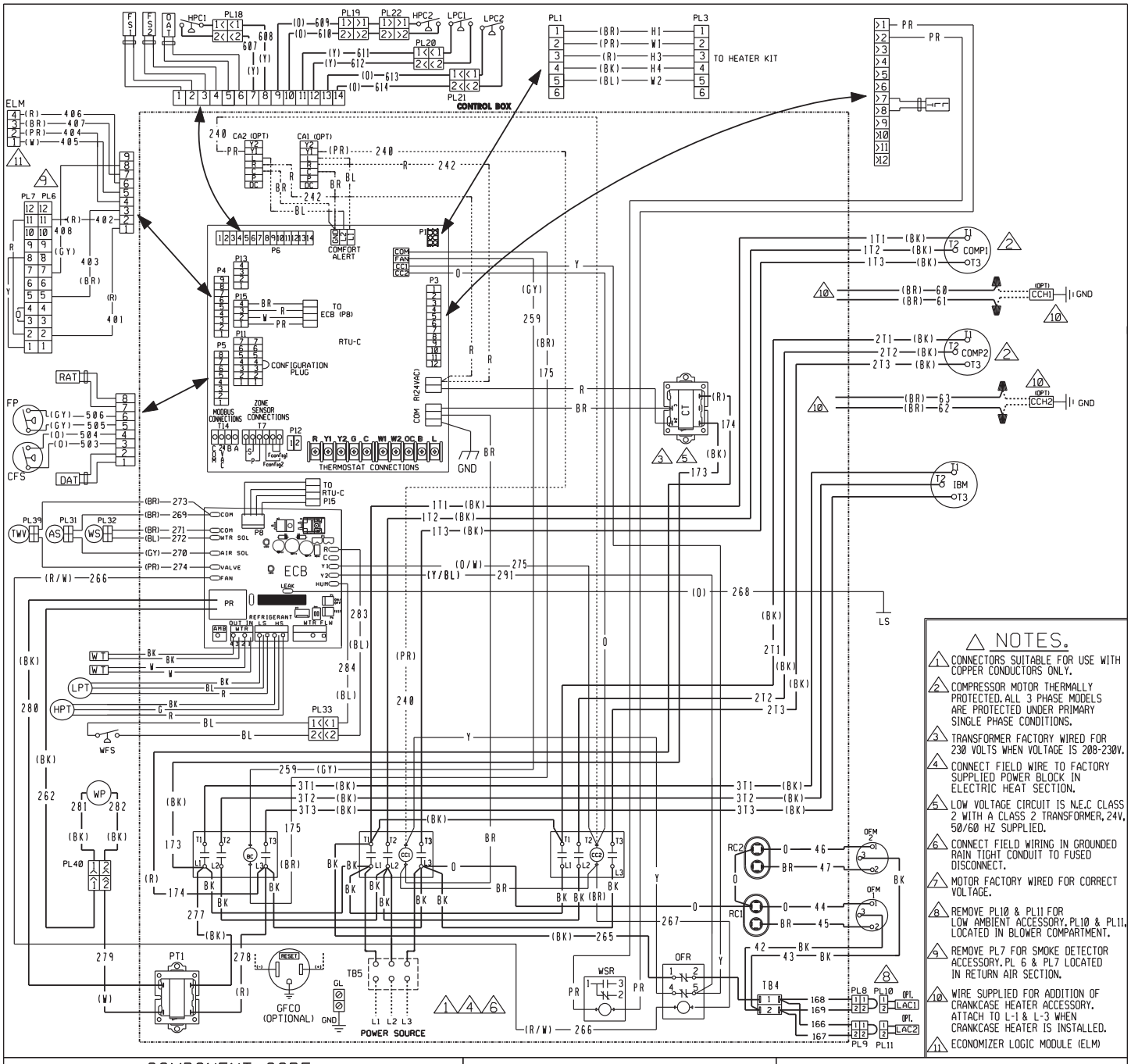
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

WIRE COLOR CODE

BK__BLACK	O___ORANGE
BR__BROWN	PR__PURPLE
BL__BLUE	R___RED
G___GREEN	W___WHITE
GY__GRAY	Y___YELLOW

WIRING SCHEMATIC
(-)LHL-D120C
208-230V 3 PH, 60 HZ.
PACKAGED A/C WITH RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		2-28-12	90-103246-34	02



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
ECB	eSYNC CONTROL BOARD
FP	FAN PROVING
FS	FREEZE SENSOR
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR BELT DRIVE
LAC	LOW AMBIENT COOLING CONTROL
LPC	LOW PRESSURE CONTROL
OAT	OUTSIDE AIR SENSOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PL	PLUG
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
WSR	WATER SHUTOFF RELAY
▲	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.)

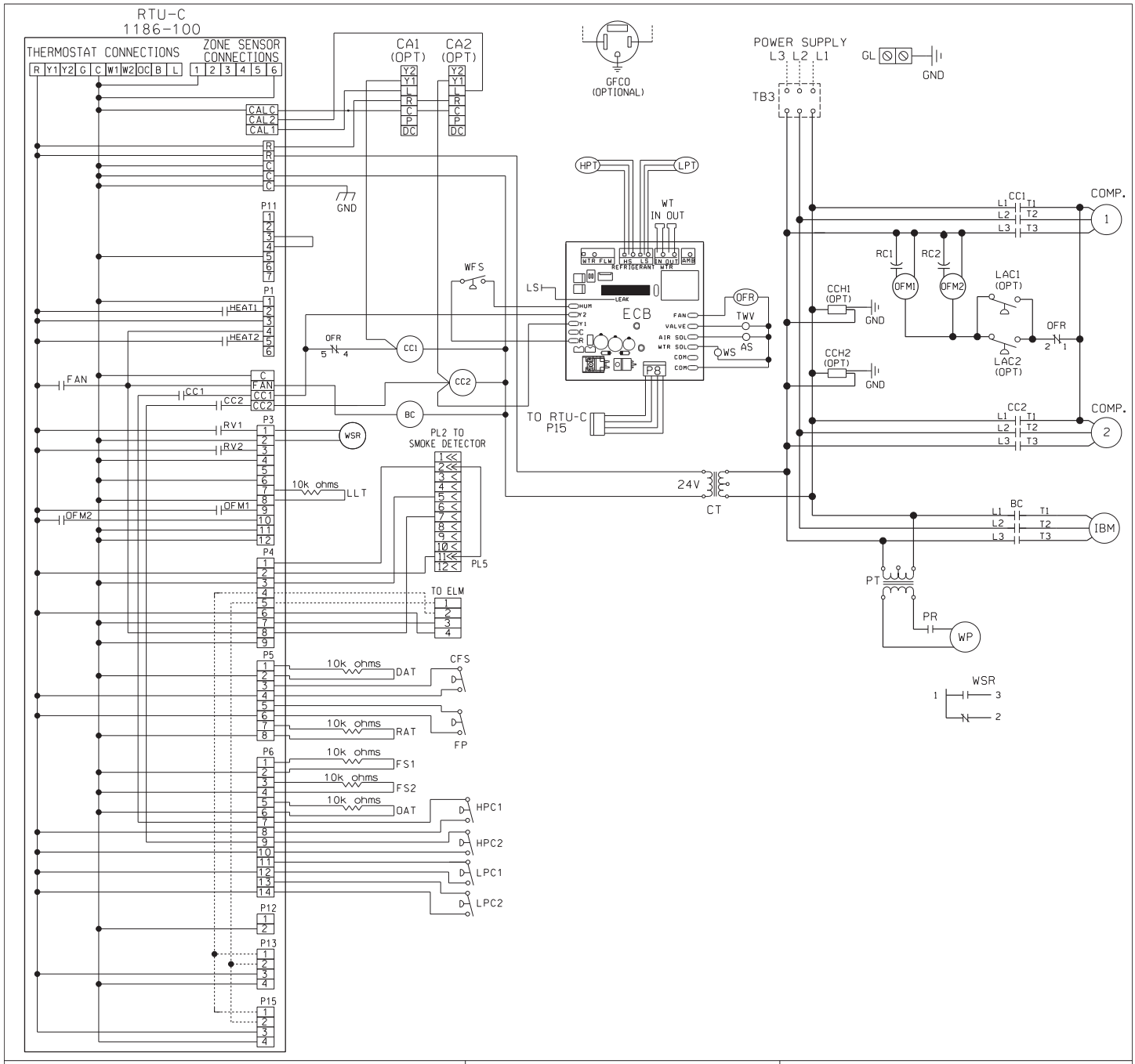
WARNING
- -CABINET MUST BE PERMANENTLY GROUNDED AND CONFORM TO I.E.C., N.E.C., C.E.C., AND LOCAL CODES AS APPLICABLE.

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
(-)LHL-D120D
460V 3 PH, 60 HZ.
PACKAGED A/C WITH RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		9-12-12	90-103089-36	Ø1



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
ECB	eSYNC CONTROL BOARD
ELM	ECONOMIZER LOGIC MODULE
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
LAC	LOW AMBIENT COOLING CONTROL
LLT	LIQUID LINE TEMPERATURE
LPC	LOW PRESSURE CONTROL
LPT	LOW PRESSURE TRASNSDUCER
LS	LEAK SENSOR
OAT	OUTSIDE AIR SENSOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
PL	PLUG
PT	POWER TRANSFORMER
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 SENSOR
	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

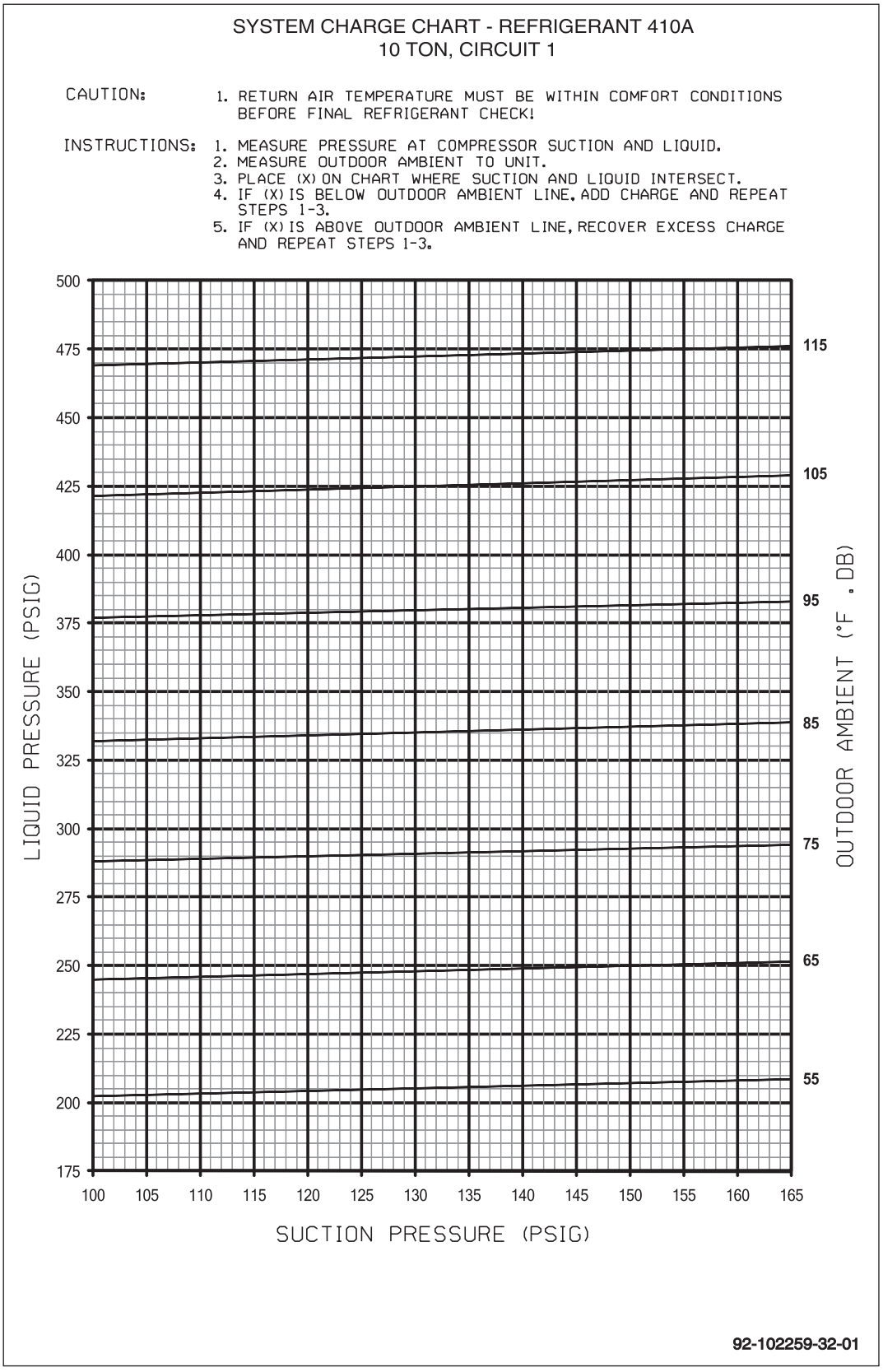
WIRING SCHEMATIC
(-)LHL-D120D
460V 3 PH, 60 HZ.
PACKAGED A/C WITH RTU-C

DR. BY	APP. BY	DATE	DWG. NO.	REV
MGR		9-12-12	90-103246-36	00

XXIV. CHARGING CHART

RLHL-C120 SYSTEM CHARGE CHART

FIGURE 17



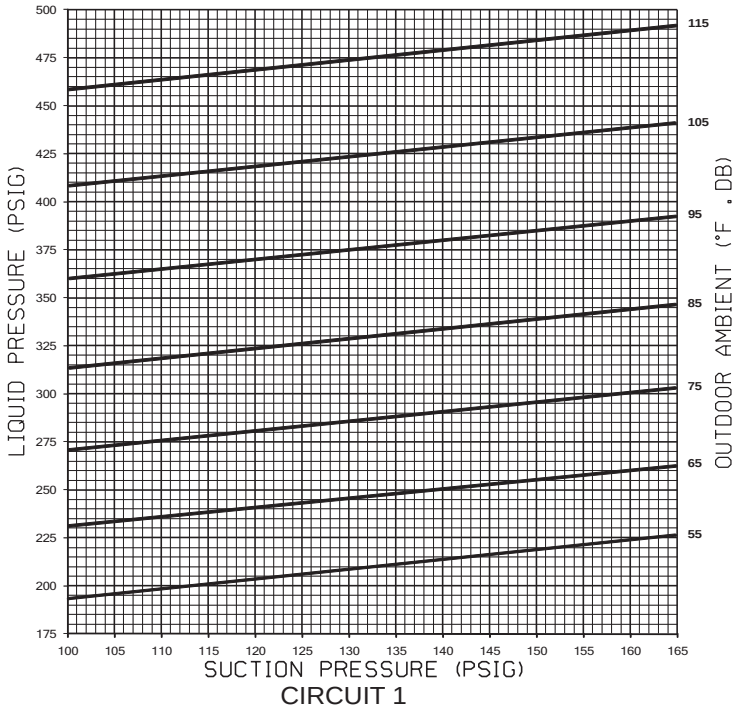
RLHL-D120 SYSTEM CHARGE CHART

FIGURE 18

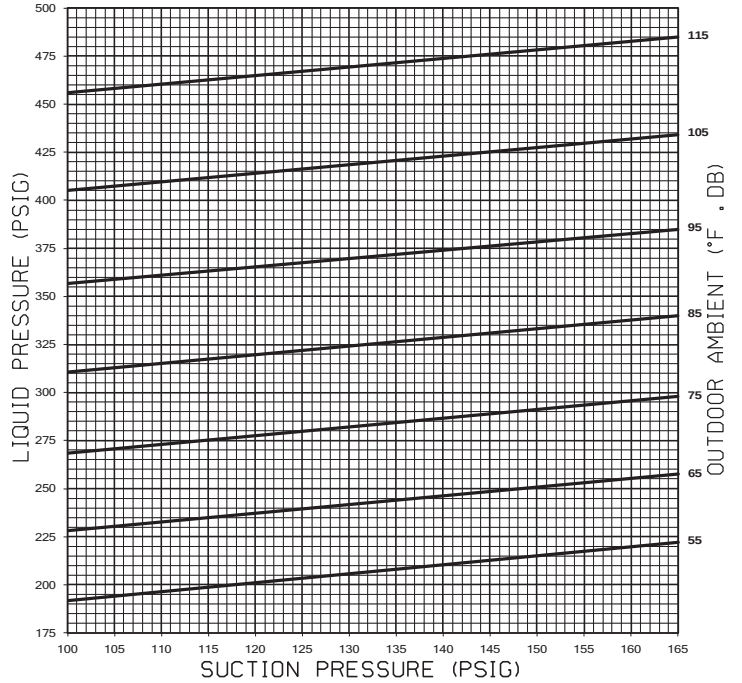
SYSTEM CHARGE CHART - REFRIGERANT 410A
10 TON, CIRCUITS 1 & 2

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 LIQUID.
2. MEASURE OUTDOOR AMBIENT TO UNIT.
3. PLACE (X) ON CHART WHERE SUCTION AND LIQUID 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

92-102259-36-01