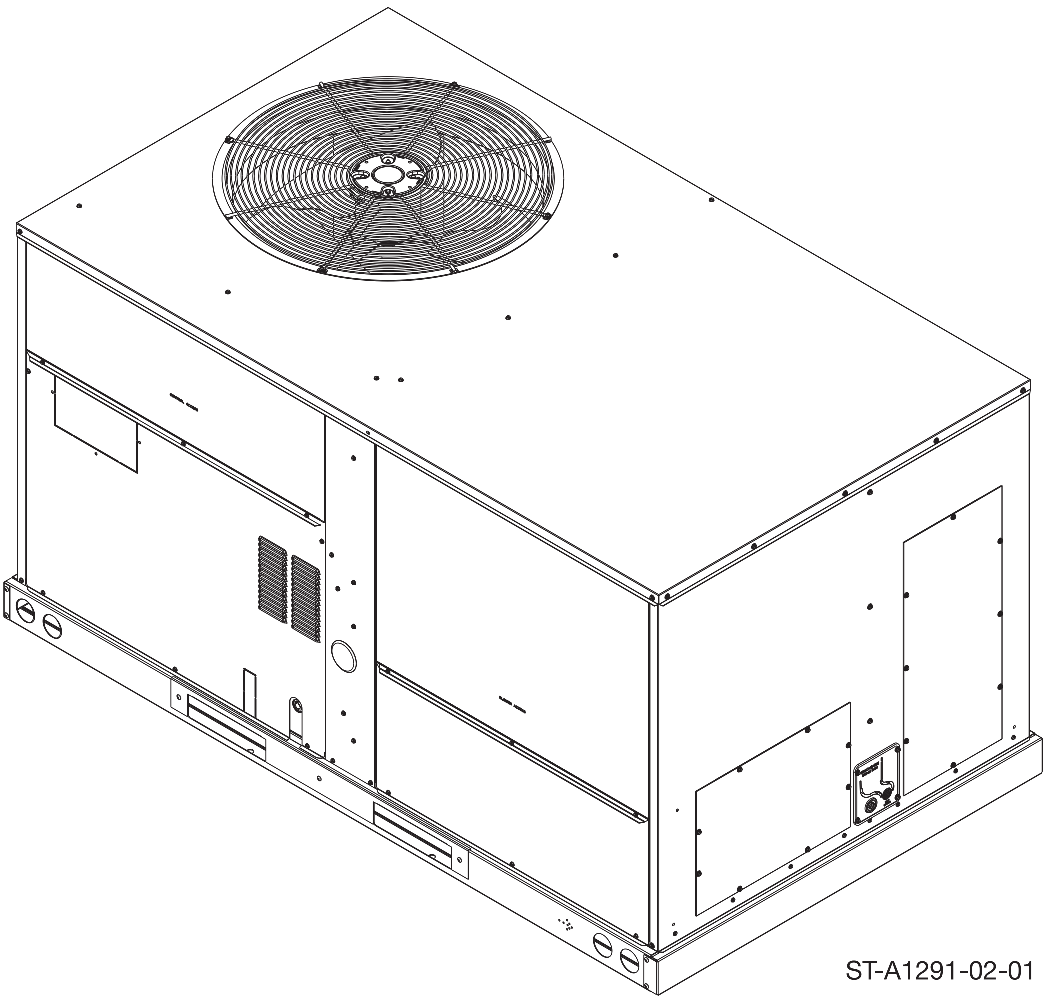
INSTALLATION INSTRUCTIONS

FOR PACKAGE HEAT PUMP UNITS

HPC SERIES 3.0, 4.0, 5.0 & 6.0 TON [10.6, 14.1, 17.6 & 21.1 KW]
60 HZ MODELS
WITH R-410A REFRIGERANT



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CONTENTS

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

92-107219-01-04

Accredited by the RvA

ABS Quality Evaluations, Inc. Management System Certification

ANAB ACCREDITED

ISO 9001:2015

Certificate Number: 30164

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AHRI Standard 340/360
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RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠ WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED 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, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠ WARNING

PROPOSITION 65 WARNING: THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

BA001-02

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

CONTENTS (DETAILED)

A. IMPORTANT SAFETY AND GENERAL INFORMATION

A.1 Introduction

This booklet contains the installation and operating instructions for your 3 ton, 4 ton, 5 ton, or 6 ton ton packaged heat pump unit. There are some precautions that should be taken to ensure proper operation. 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.

⚠WARNING: The manufacturer's warranty does not cover any damage or defect to the heat pump caused by the attachment or use of any components, accessories or devices (other than those authorized by the manufacturer) into, onto or in conjunction with the 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.

A.2 Agency Performance Audit and Efficiency Testing Notice

NOTICE: BREAK-IN PERIOD

Prior to agency testing, run the compressor for 16 hours at 115°f outdoor ambient temperature and 80° dry bulb / 75° wet bulb indoor ambient temperature.

NOTICE: EFFICIENCY TESTING NOTICE

For purposes of verifying or testing efficiency ratings, the test procedure in Title 10 Appendix M to Subpart B of Part 430 (Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps), and the clarifying provisions provided in the standards listed below that were applicable at the date of manufacture should be used for test set up and performance.

SETUP

- ASHRAE 37 - 2009 (RA 2019)

PERFORMANCE:

- ANSI/ASHRAE 90.1 - 2016
- ANSI/ASHRAE 103 (2017)
- AHRI Operations for Unitary Small AC Equipment 210/240 (2017) for 3-5T
- AHRI Operations for Unitary Large AC Equipment 340/360 (2015) for 6T

SAFETY

UL 1995 5th Edition

A.3. Importance of a Quality Installation

Optimal system performance and longevity depend upon a quality and proper installation. Failure to properly setup and commission this unit could result in undesirable operation and subsequent faults and potential failures.

Carefully follow all guidelines listed in the manual and industry best practices. Conform to all local code requirements. Contact your local technical representative with any questions or concerns.

A.4. Importance of Air Flow and Setup

Optimal system performance is also dependent upon having the ideal airflow across the condensing and evaporating coils, and upon matching the charge weight to the manufacturer's spec for the unit. Improper or restricted air flow, and incorrect charge weight, will hinder the performance of the unit. Please refer to the manufacturer's recommended clearances for setting the unit and the included guide for setting air flow. Refer to the rating plate for the charge weight.

A.5. Checking Product and Inspection

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. IMPORTANT: Check the unit model number, heating size, electrical characteristics, and accessories to determine if they are correct.

B. GENERAL SPECIFICATIONS

B.1 Safety Warnings

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

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

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.

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

WARNING: The unit must be permanently grounded. A grounding lug is provided in the electric heat 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.

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.

B. GENERAL SPECIFICATIONS

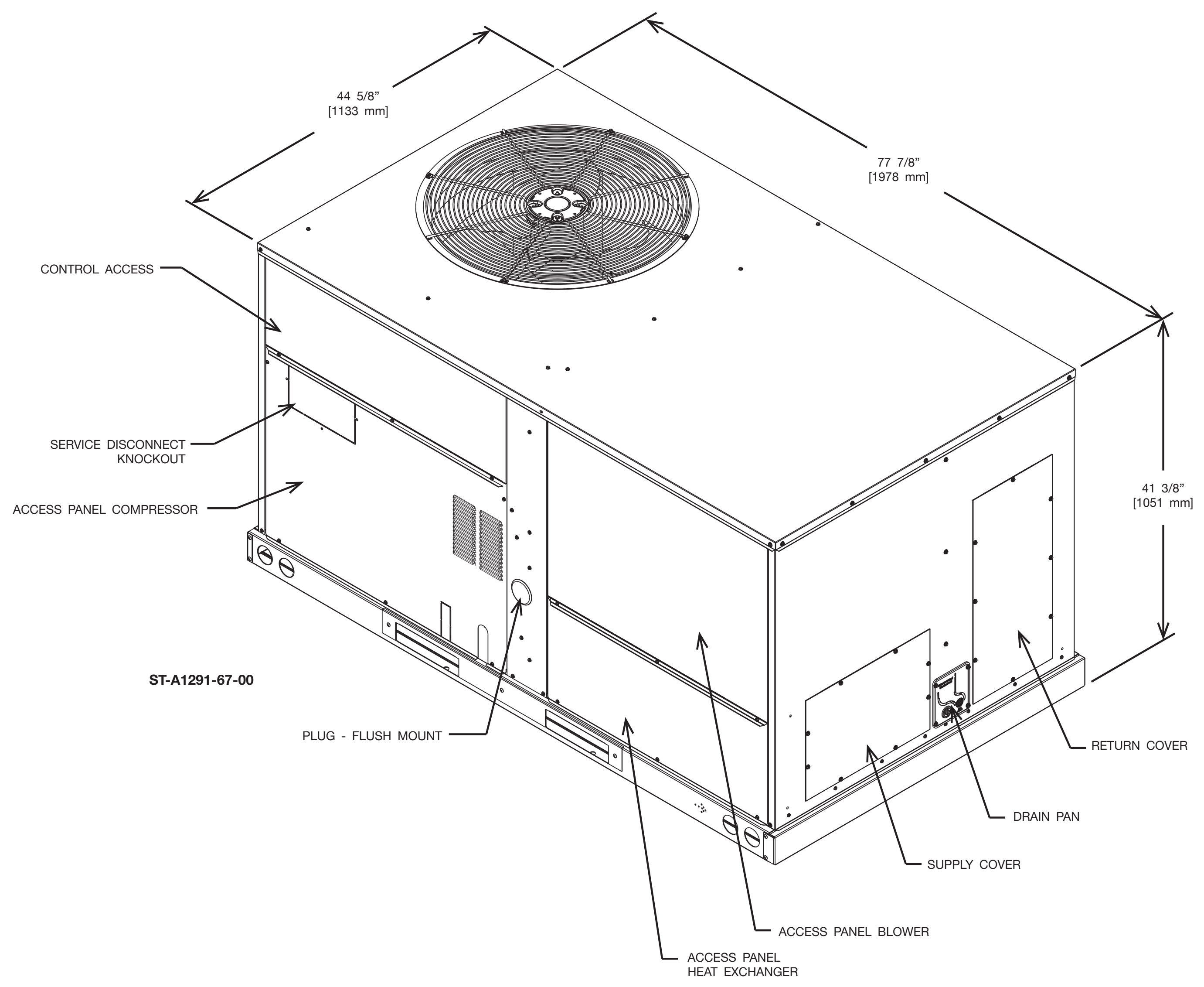
B.2. Major Components

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

B.3. Product Data Information

B.3.1. Dimensional Information

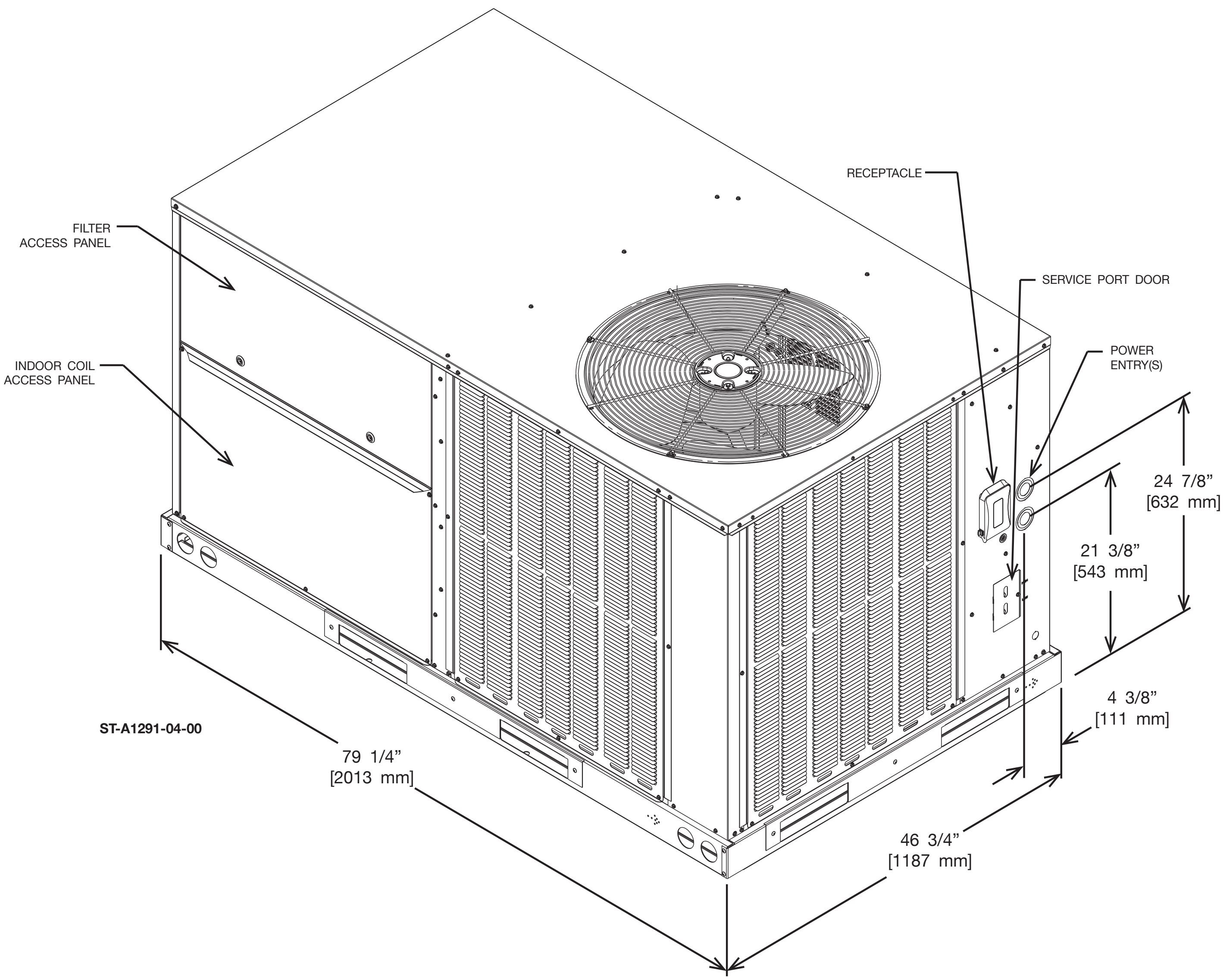
IMPORTANT: This unit must be mounted level in both directions to allow water to drain from the condenser section and condensate pan.



B.3. Product Data Information

B.3.1. Dimensional Information (Cont.)

IMPORTANT: This unit must be mounted level in both directions to allow water to drain from the condenser section and condensate pan.



B.3.2. Product Specifications

The packaged Heat pump rooftop unit is available both without auxiliary heat or with 10, 15, 20, or 24 KW electric heat input (either factory installed or field installed). Cooling capacity is 3.0, 4.0, 5.0, and 6.0 nominal tons. Units are convertible from downflow supply/return to sideflow supply/return by relocation of supply/return cover panels. See section ***C.3.5. Cover Panel Installation/Conversion Procedure*** for more details.

The units are weatherized for mounting outside of the building.

⚠WARNING: Units are not design certified to be installed inside the structure. Doing so can cause inadequate unit performance as well as property damage.

B. GENERAL SPECIFICATIONS

B.3. Product Data Information

B.3.3. General Data

See ***Appendix A*** *towards the end of this manual for General Data.*

B.3.4. Electrical Data Reference

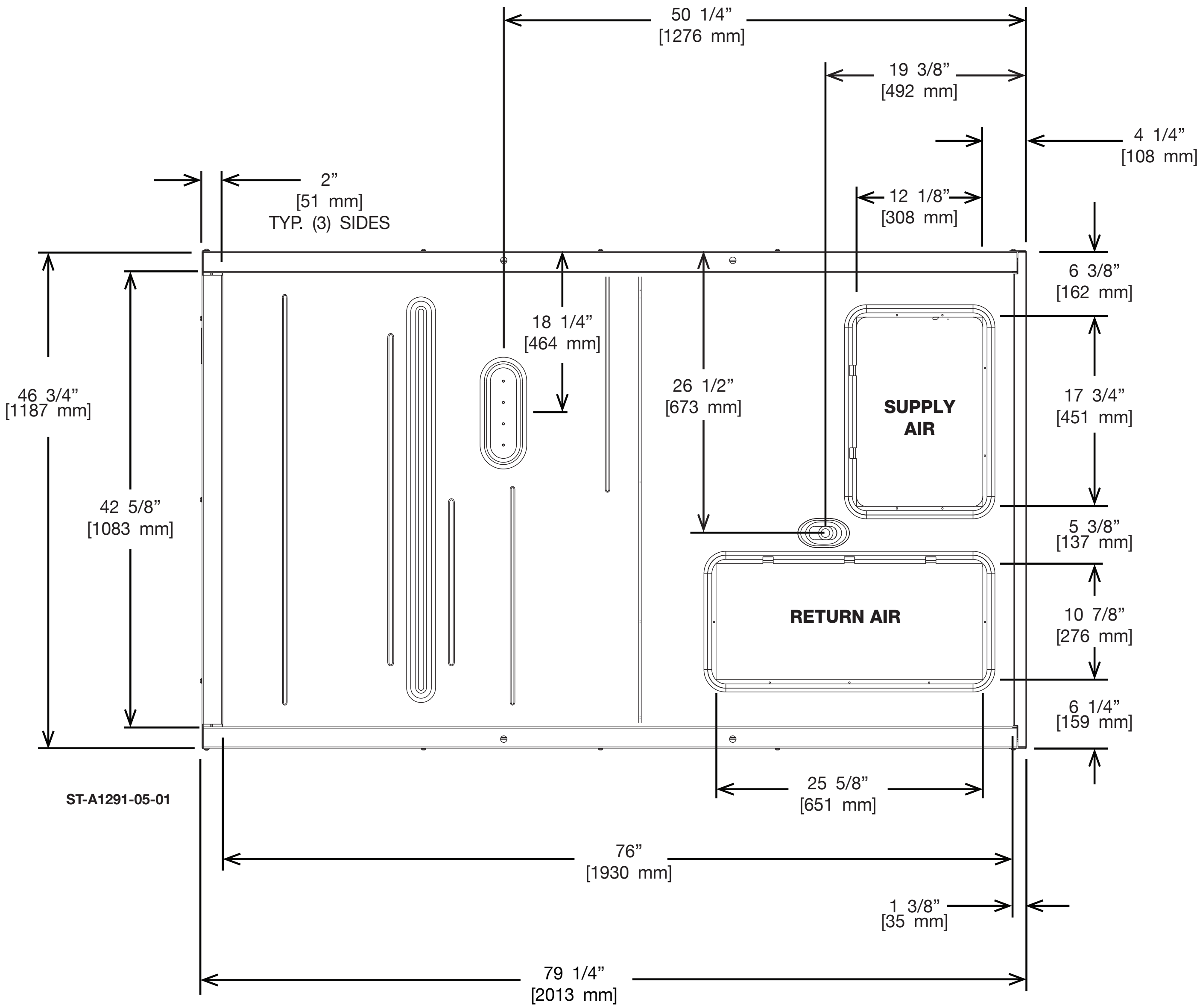
See ***Appendix B*** *towards the end of this manual for Electrical Data.*

B.3.5. Air Flow Performance Data

See ***Appendix C*** *towards the end of this manual for Air Flow Performance Data.*

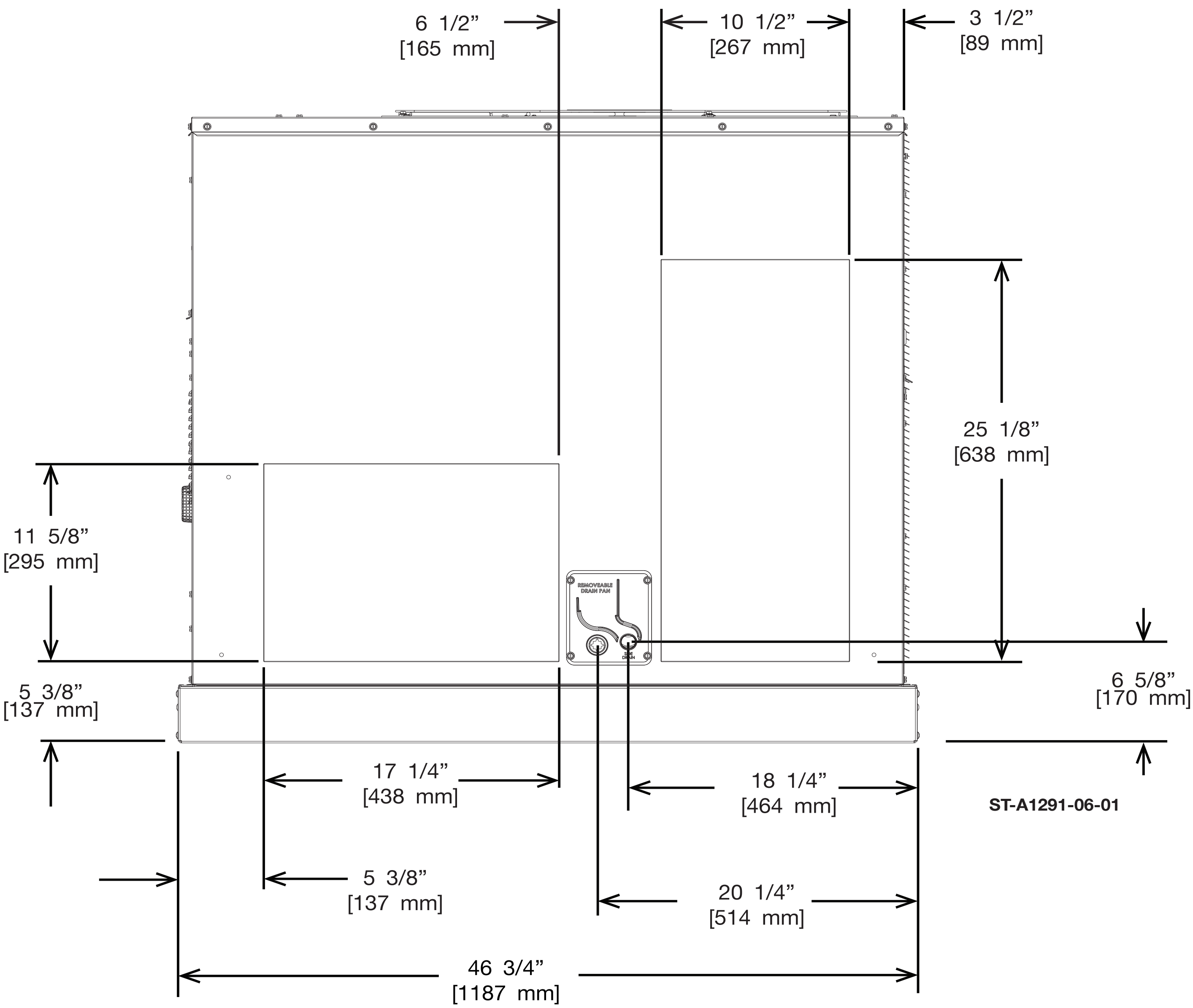
B.3.6. Supply and Return Duct Dimensions

Figure B.3.6. - A: Supply And Return Dimensions For Downflow Applications (Bottom View Looking Up)



B.3.6. Supply and Return Duct Dimensions

Figure B.3.6. - B: Supply And Return Dimensions For Horizontal Applications



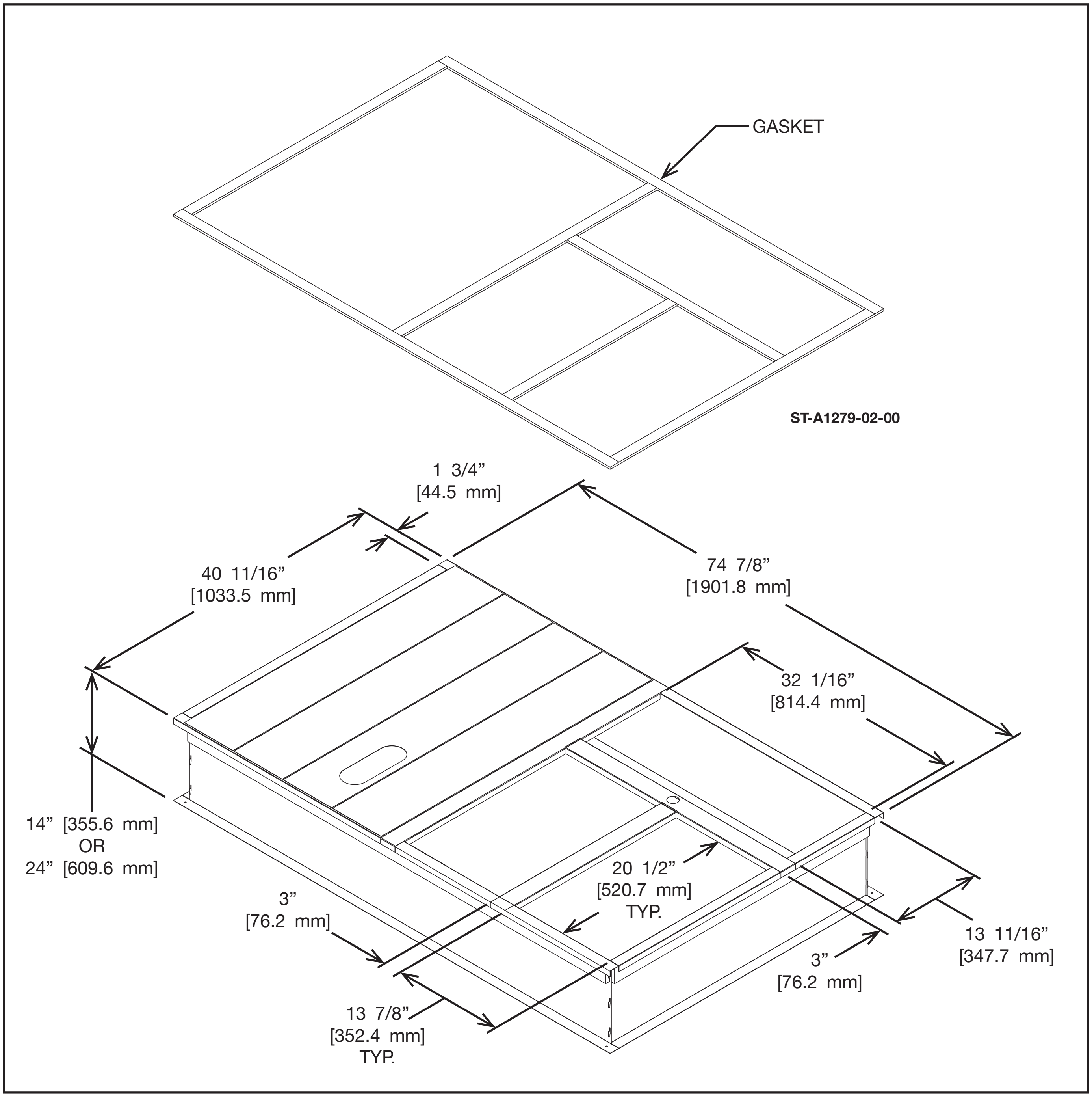
B. GENERAL SPECIFICATIONS

B.3. Product Data Information

B.3.7. Curb Dimensions

NOTE: See section C.3.3. Rooftop Installation for more information for installing the unit on a curb.

Figure B.3.7. – A: Roofcurb Complete Assembly



C. INSTALLATION OF THE UNIT

C.1. General

C.1.1. Installation

Install this unit in accordance with local and national standards. Any and all work must be done by authorized personnel.

C.1.2. Pre-Installation Checkpoints

Before attempting any installation, carefully consider the following points:

- Structural strength of supporting members (Rooftop Installation)
- Clearances and provision for servicing
- Power supply and wiring
- Air duct connections and sizing
- Drain facilities and connections
- Location for minimum noise and vibration - away from bedroom windows

C.2. Tool and Refrigerant

C.2.1. Tools Required for Installing and 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
- Zero-loss fittings

Recovery Cylinders:

- 400 PSIG Pressure Rating

Dept. of Transportation

- 4BA400 or BW400

C.2.2. Specifications of R-410A

All units are factory charged with R-410a Refrigerant.

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.

C.2.3. Quick Reference Guide for R-410A

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.
- 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.

C. INSTALLATION OF THE UNIT

C.2. Tool and Refrigerant

C.2.4. Evaporator Coil/TXV

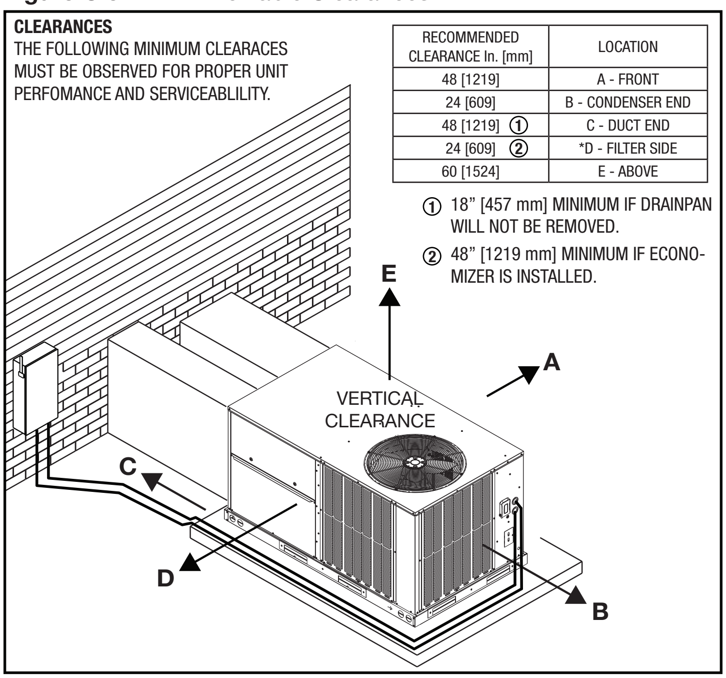
The thermostatic expansion valve is specifically designed to operate with R- 410A. **The existing evaporator must be replaced with the factory specified TXV evaporator specifically designed for R-410A.**

C.3. Choosing a Location

C.3.1.Unit Location: Allowable Clearances and Operational Issues

The unit location must comply with the allowable clearances listed in ***Figure C.3.1. - A.*** Failure to comply with the recommended clearances may result in operational issues such as decreased capacity, restricted condenser airflow, and condenser motor fatigue.

Figure C.3.1. - A: Allowable Clearances



RECOMMENDED CLEARANCE In. [mm]	LOCATION
48 [1219]	A - FRONT
24 [609]	B - CONDENSER END
48 [1219] ①	C - DUCT END
24 [609] ②	*D - FILTER SIDE
60 [1524]	E - ABOVE

C.3.2. Outside Installation

WARNING: These units are designed certified for outdoor installation only. Installation inside any part of a structure can result in inadequate unit performance as well as property damage.

1. Select a location where external water drainage cannot collect around unit.

2. Provide a level slab sufficiently high enough above grade to prevent surface water from entering the unit

3. Locate the unit to provide proper access for inspection and servicing as shown in ***Figure C.3.1. - A.***

4. Locate unit where operating sounds will not disturb owner or neighbors.

5. Locate unit so roof runoff water does not pour directly on the unit. Provide gutter or other shielding at roof level. Do not locate unit in an area where excessive snow drifting may occur or accumulate.

6. Where snowfall is anticipated, the height of the unit above the ground level must be considered. Mount unit high enough to be above anticipated maximum area snowfall.

7. Select an area which will keep the areas of the vent, air intake, and A/C condenser fins free and clear of obstructions such as weeds, shrubs, vines, snow, etc. Inform the user accordingly.

C.3.3. Rooftop Installation

1. Before locating the unit on the roof, make sure that the roof structure is adequate to support the weight involved. (See Electrical & Physical Tables in this manual.) **THIS IS VERY IMPORTANT AND IS THE INSTALLER’S RESPONSIBILITY.**

2. For rigging and roofcurb details, see section ***C.4.3.***

3. 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, block off supply and return air openings to prevent excessive condensation.*

C.3.4. Corrosive Environments

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, give special attention to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray directly on the unit cabinet.

2. In coastal areas, install the unit on the side of the building away from the waterfront.

3. In some situations, fencing or shrubs may give some protection against contaminants. Be mindful of the allowable clearances.

WARNING: Disconnect all power to unit before starting maintenance. Failure to do so can cause electrical shock resulting in personal injury or death. Regular maintenance will reduce the buildup of contaminants and help to protect the unit’s finish.

1. Frequent washing of the cabinet, fan blade and coil with fresh water will remove most of the salt or other contaminants that build up on the unit.

2. Regular cleaning and waxing of the cabinet with an automobile polish will provide some protection.

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.

C.3.5. Cover Panel Installation/ Conversion Procedure

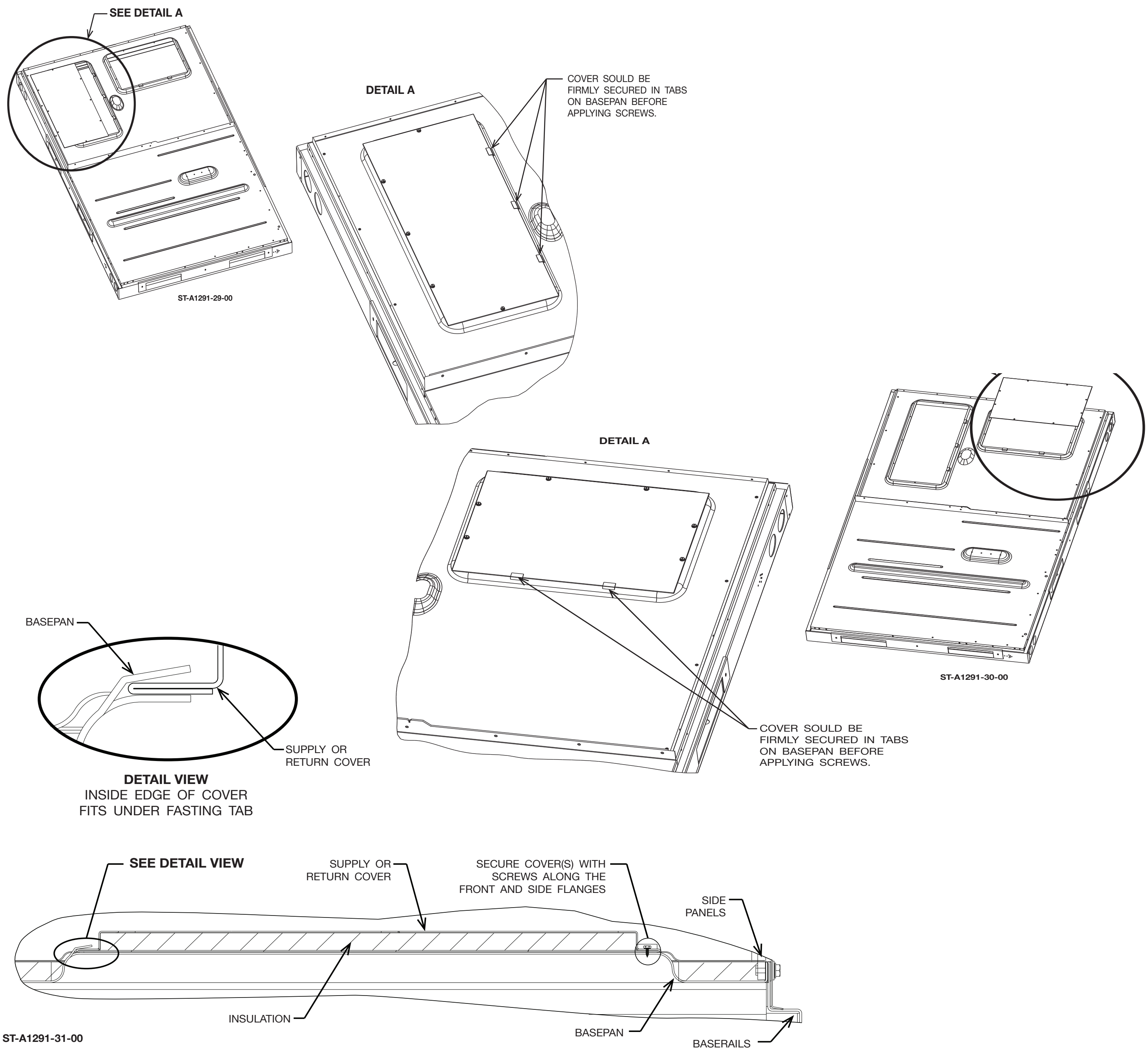
FROM DOWNFLOW TO HORIZONTAL

1. Remove the covers from the supply and return openings on the unit. ***See Figure B.3.6. – B*** for reference.

2. Install the covers over the supply and return openings in the basepan, painted side up, inserting the leading flange under the bracket provided. Place the back flange to top of the front bracket provided. ***See Figure C.3.5. –A*** for reference.

3. Secure the return and supply cover to front bracket with screws.

Figure C.3.5. – A: Downflow to Horizontal Conversion



C. INSTALLATION OF THE UNIT

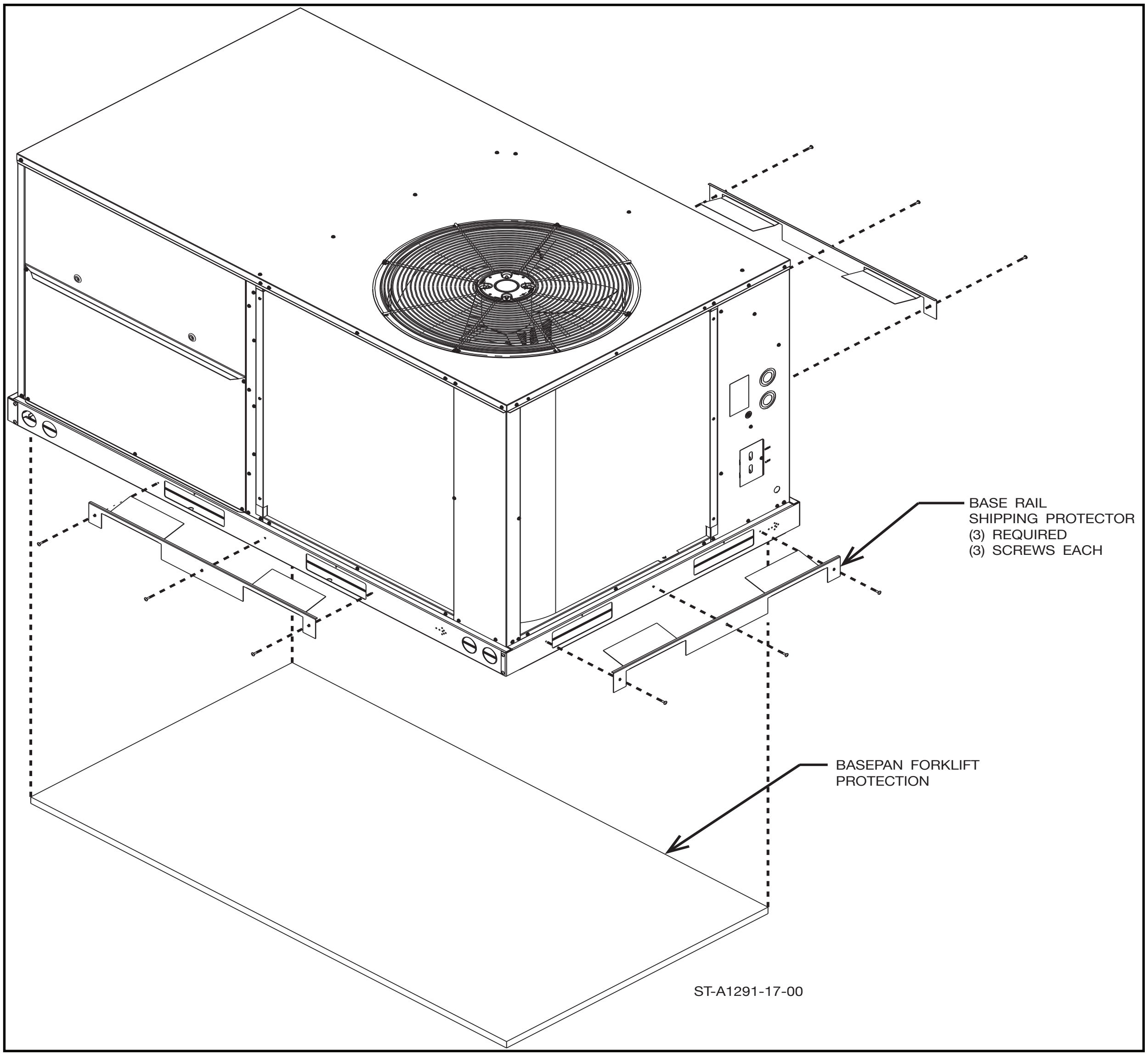
C.4.Setting the Unit

C.4.1. Removing Shipping material

There will be three types of shipping material that will need to be removed: The cardboard basepan protection underneath, the wooden skid on the top, and the condenser coil protection (on non-louver panel units).

• **Cardboard Basepan Protection** – Remove the screws that attach the metal brackets for each of the forklift fork-entry points, and remove the brackets. This will release the cardboard from underneath, and it may be removed when the unit is lifted.

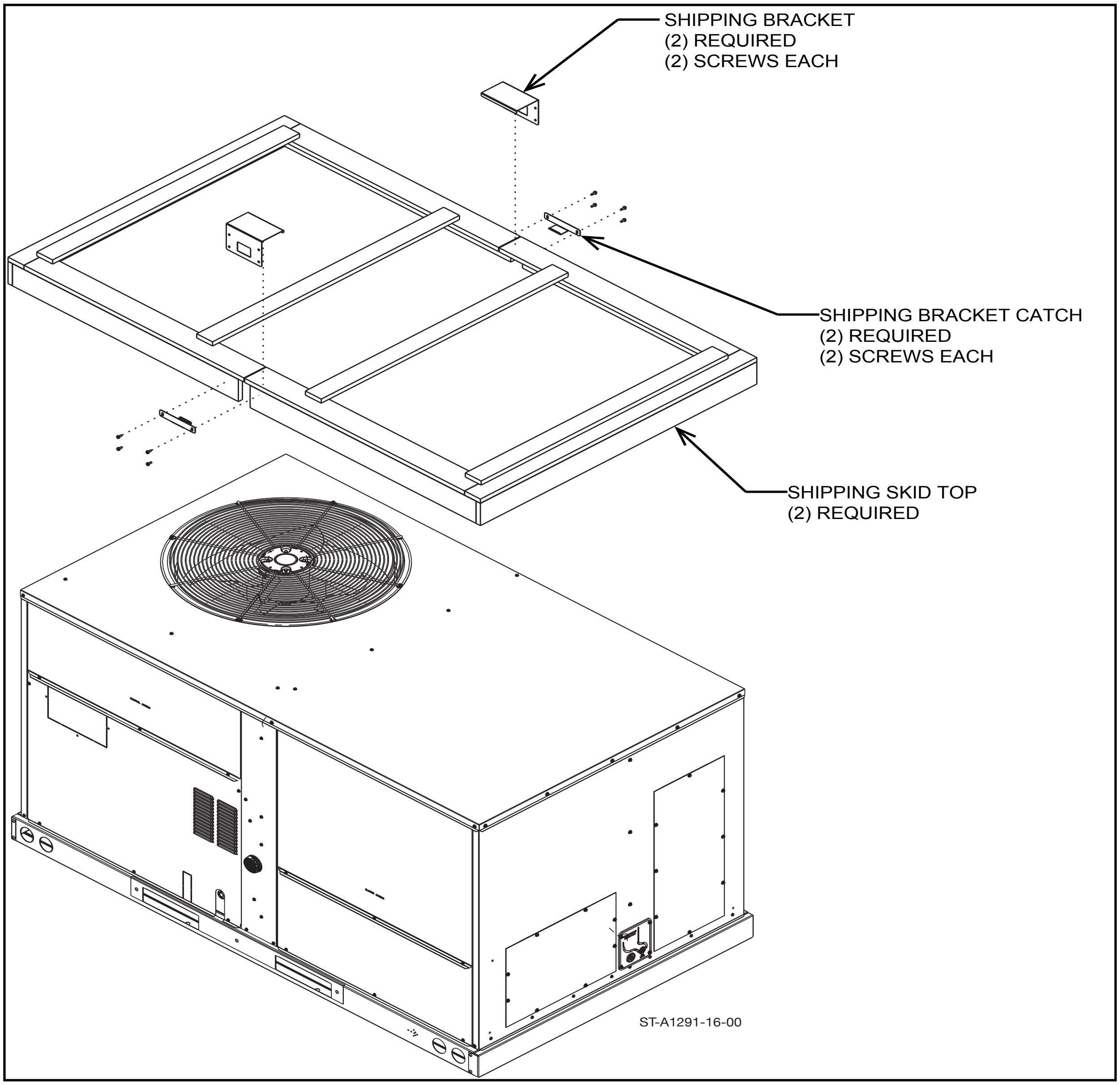
Figure C.4.1. – A: Basepan Protection Assembly



• **Wooden Skid –** Remove the screws from the metal brackets located in the middle along both long sides of the unit. This will detach the two sections of the wooden skid and allow them to be lifted off.

If the unit is to be lifted by a crane, it is recommended to leave the top skid on until after the unit is on the roof to provide extra protection if spreader bars are not used.

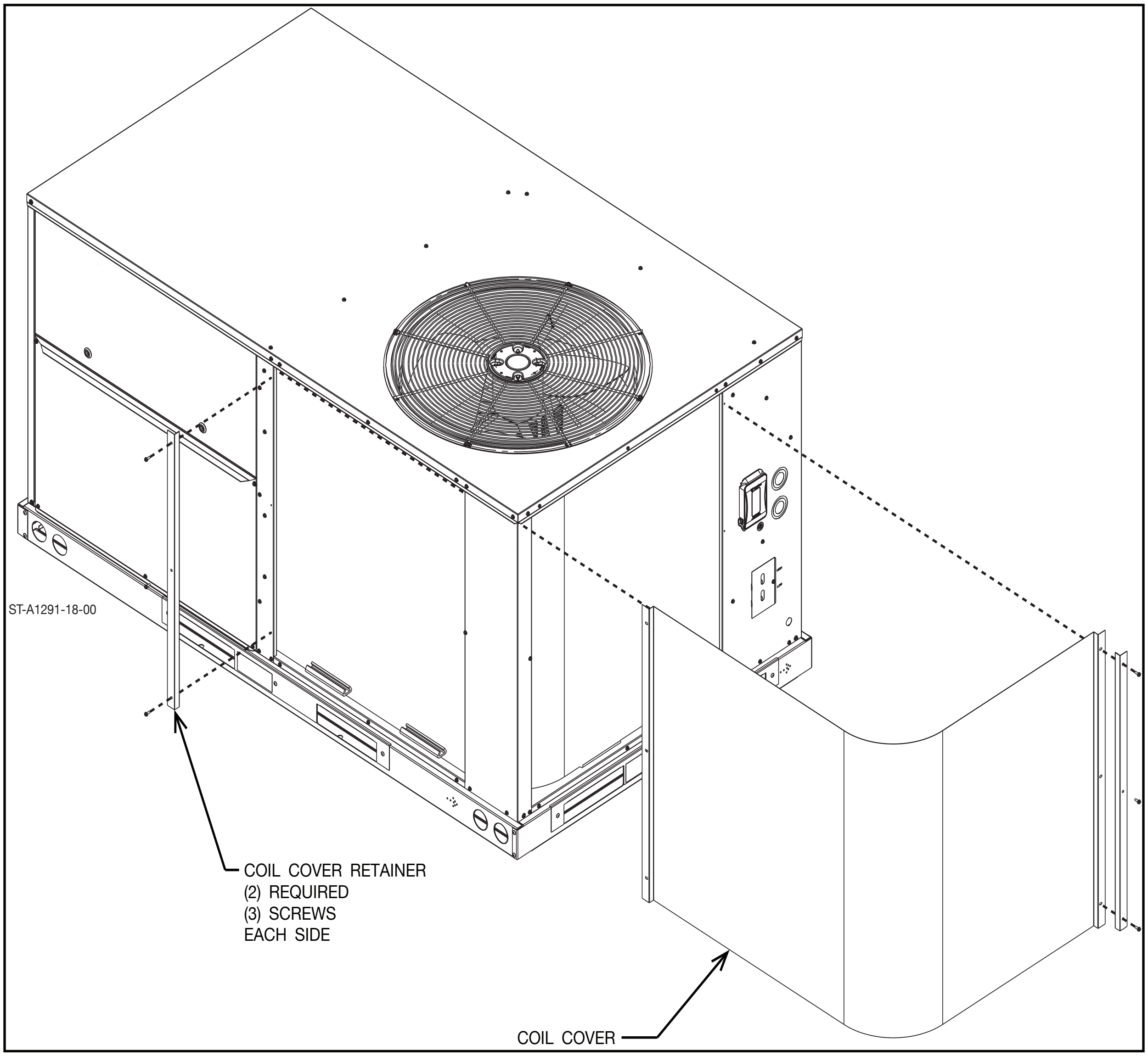
Figure C.4.1. – A: Wooden Skid Assembly



C. INSTALLATION OF THE UNIT

• **Condenser Coil Protection –** Remove the screws along the perimeter of the coil protector. This will allow the protector to be removed. If the unit has louver panels, it will not have the condenser coil protection.

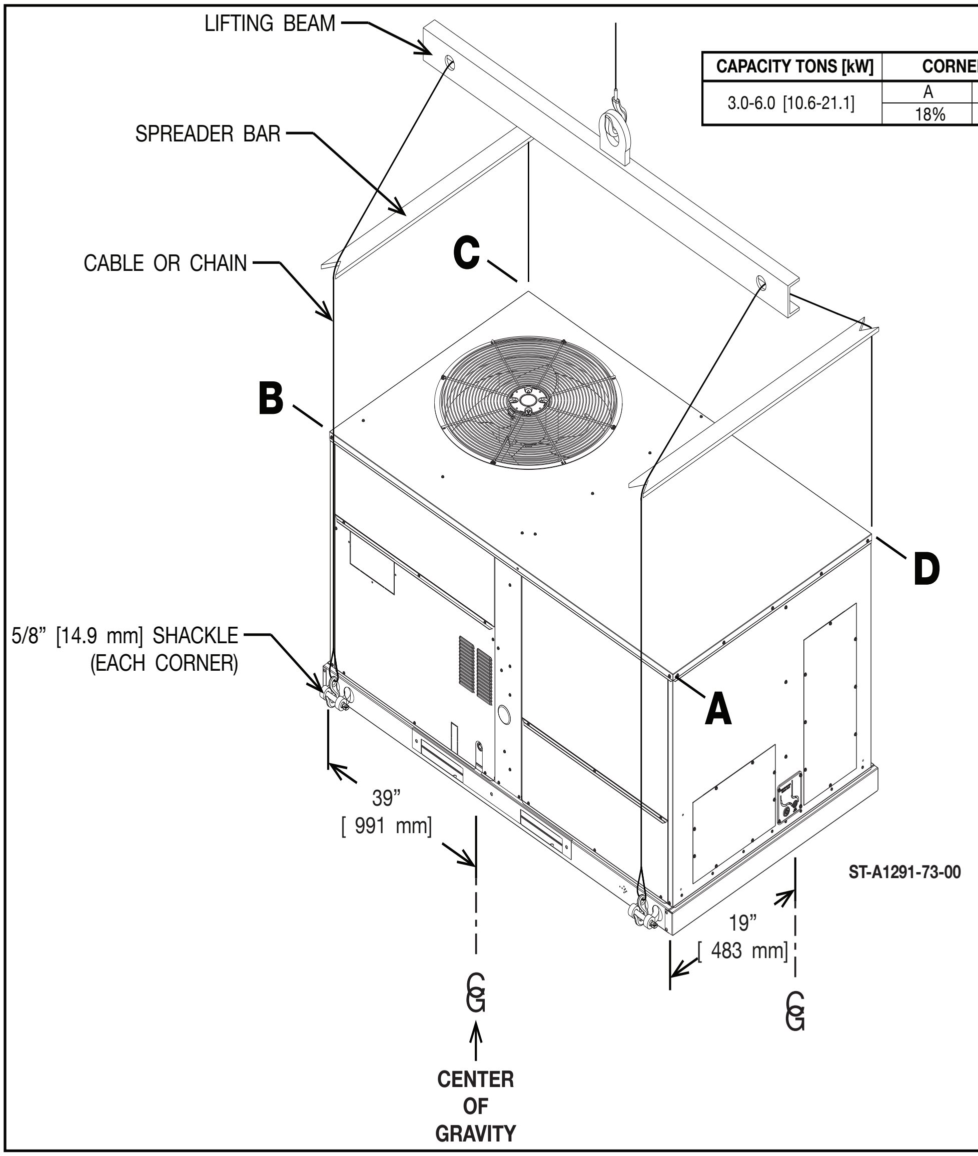
Figure C.4.1. – C: Condenser Coil Protection Assembly



C.4.2. Lifting the Unit

Figure C.4.2. – A : Lifting Detail

CAPACITY TONS [kW]	CORNER WEIGHTS BY PERCENTAGE			
	A	B	C	D
3.0-6.0 [10.6-21.1]	18%	40%	19%	23%



C.4.3. On a Roof Curb

Refer to ***Figure C.3.1. - A*** in section ***C.3.1. "Unit Location: Allowable Clearances and Operational Issues"*** before installing the unit on a roof curb.

Only use manufacturer-approved roofcurb products for the unit.

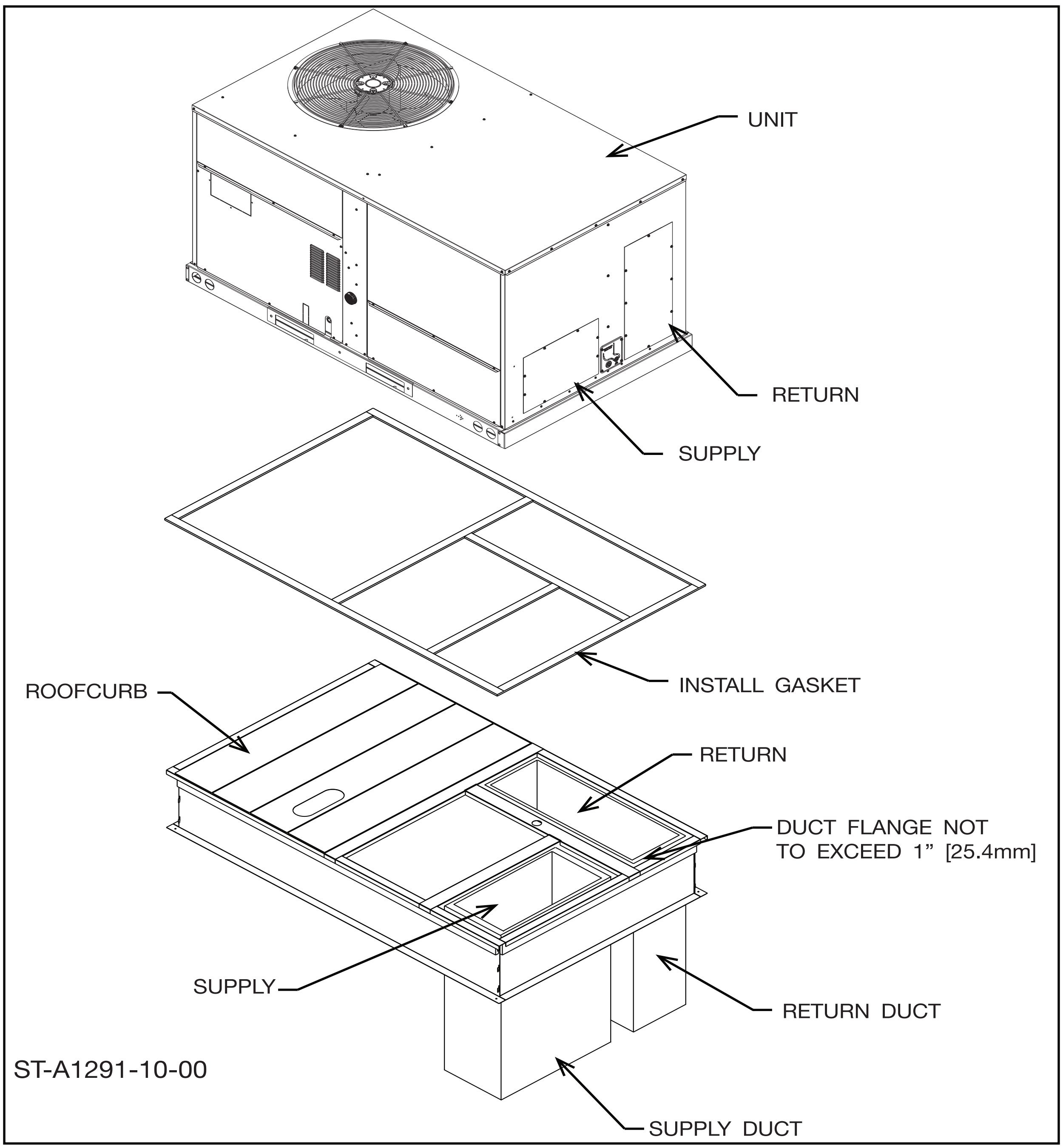
C.4.3.1. Installing the Roof Curb

Refer to the separate Installation Instructions for installing a roof curb. These instructions are listed under these Manufacturer Part numbers:

- 14" and 21" Roofcurb: 92-107192-21
- Roofcurb Adapter: 92-107192-23

C.4.3.2. Setting the Unit

Figure C.4.3.2. - A: Setting the unit on Roofcurb Assembly



C.4.3.3. High Wind and Seismic Tie-Down Methods

The units must be secured in compliance with ASCE 7-10 and the Florida Building Code 5th Edition. Please refer to ***Appendix J: Unit Tie-Down Methods.***

C.4.4. On a slab

C.4.4.1. Setting the Unit

Set the unit on a stable concrete pad with adequate clearances around the sides of the unit, and make sure the unit is level before securing.

Before setting/securing the unit, use this opportunity to convert the unit from a downflow configuration to a sideflow configuration if necessary. Refer to section ***C.3.5. Cover Panel Installation/Conversion Procedure.***

C.4.4.2. High Wind and Seismic Tie-Down Methods

Slab-installed units must also be secured in compliance with ASCE 7-10 and the Florida Building Code 5th Edition. Please refer to ***Appendix J: Unit Tie-Down Methods.***

C.5. Installing Condensate Drain

IMPORTANT: Install a condensate trap to ensure proper condensate drainage. See ***Figure C.5.1 - A*** for reference.

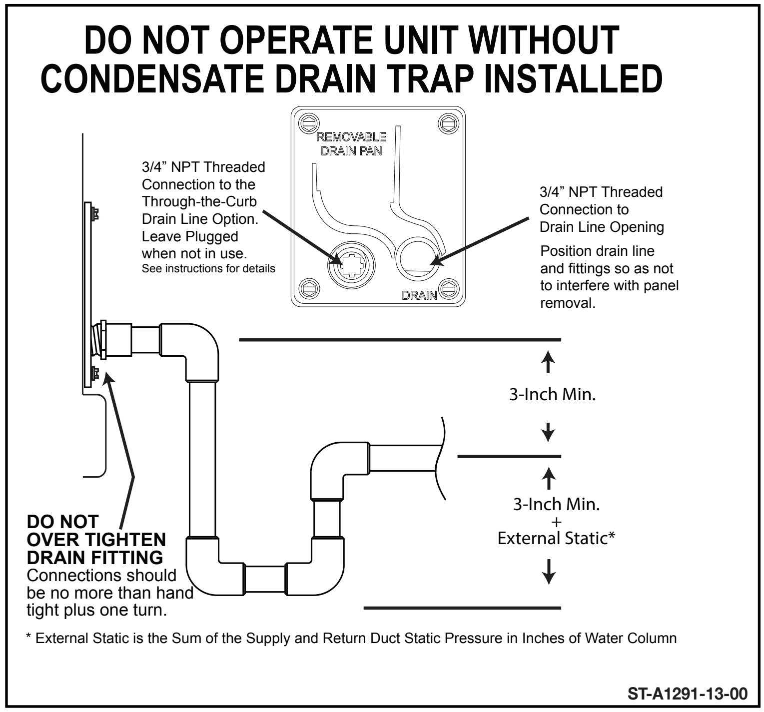
The condensate drain pan has a threaded female 3/4 inch NPT (11.5 TPI) connection. Drain line must be no smaller than drain pan outlet and adequately sized to accommodate the condensate discharge from the unit. Drain line must be routed to an acceptable drain or outdoors in accordance with local codes. Consult local codes or ordinances for specific requirements of condensate drain piping and disposal.

DO NOT connect condensate drain line to a closed sewer pipe.

C.5.1. Determine Drain Trap Height Requirement

The drain line should be a minimum of 3 inches deep, plus 1 inch for every inch of external static pressure from the blower and duct system. For Example, if the external duct static is 1 inch of water column, the drain trap from the bottom of the trap to the bottom of the drain outlet should be 4 inches, the drain outlet should be 3 inches below the drain connection on the condensate pan. Ensure the outlet of the trap is routed to a suitable drain location as required by local code. See ***Figure C.5.1 - A*** for reference.

Figure C.5.1 – A: Condensate Drain Tap



C.5.2. Keeping the condensate drain pan serviceable

To use the removable drain pan feature of this unit, some of the condensate line joints should assembled for easy removal and cleaning. Drain line **MUST NOT** block service access panels.

C.5.3. Connecting the Drain trap

- 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 be routed to an acceptable drain or outdoors in accordance with local codes.
- Drain line should slope away from unit a minimum of 1/8" per foot to ensure proper drainage.

C.5.4. Connecting the Drain to the through the curb option

The through the curb drain option is available for installations in freezing conditions or that do not want water draining on the roof. Use adapters and elbows to turn out of the drain opening on the right and into the curb drain opening on the left. Under the unit connect a ¾" male treaded fitting, use thread sealant, into the opening between the supply and return duct openings under the unit. Install a properly sized drain trap in the conditioned space of the building and route to a suitable drain location as code requires.

C. INSTALLATION OF THE UNIT

C.5.5. Freezing Condition considerations

• Drain line may need insulation or freeze protection in certain applications.

• Drain line should slope away from unit a minimum of 1/8” per foot to ensure proper drainage.

C.6. Final Installation Inspection

C.6.1. Remove Shipping Material

Before the unit is secured to the slab/roofcurb, check that all shipping material has been removed. See section ***C.4.1.*** for how to remove shipping material.

NOTE: Failure to remove the condenser coil protector on non-louver panel units will negatively impact performance and be harmful to system components. Failure to remove the cardboard basepan protector will block all indoor airflow for downflow configurations.

Open all compartments to ensure there are no tools or other misc parts remaining in the unit from setup. This is most important on the blower section to avoid damage to the blower assembly.

C.6.2. Checking Level and Slope

This unit must be mounted level in both directions to allow water to properly drain from the condenser section and condensate pan.

C.6.3. Condensation and Sweating

In certain regions or climates, portions of the exterior of the unit may condensate or sweat during cooling operation. This is normal and expected.

D. DUCT AND VENTING

D.1. Air Flow and Static Pressure

See ***Appendix C*** towards the end of this manual for Air Flow Performance Data. For Air Flow adjustment and set up, see section ***J.3. “Checking and Adjusting Air Flow”.***

D.2. Duct Requirements and Best Practices

The installing contractor should fabricate ductwork in accordance with local codes.

Use industry manuals 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 fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury, property damage or death.

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

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

Provide balancing dampers for each branch duct in the supply system.

Properly support ductwork from the structure.

IMPORTANT: In the event that the return air ducts must be run through an “unconfined” space containing other fuel burning equipment, it is imperative that the user/homeowner must be informed against future changes in construction which might change this to a “confined space.” Also, caution the user/homeowner against any future installation of additional equipment (such as power ventilators, clothes dryers, etc.), within the existing unconfined and/or confined space which might create a negative pressure within the vicinity of other solid, liquid, or gas fueled appliances.

D.2.1. Supply Duct Systems

A properly designed supply duct system, meeting all local codes and best practices, must be installed to ensure proper air flow and minimize the static pressure on the blower.

The supply duct opening for roof curb installations is 17 3/4” x 16 3/8”, the supply duct opening for horizontal ducted installations is 18 5/8” x 13 1/8”. See ***Figure B.3.6. – A and – B*** for reference.

D.2.2. Return Duct Systems

A properly designed return duct system, meeting all local codes and best practices, must be installed to ensure proper air flow and minimize the static pressure on the blower.

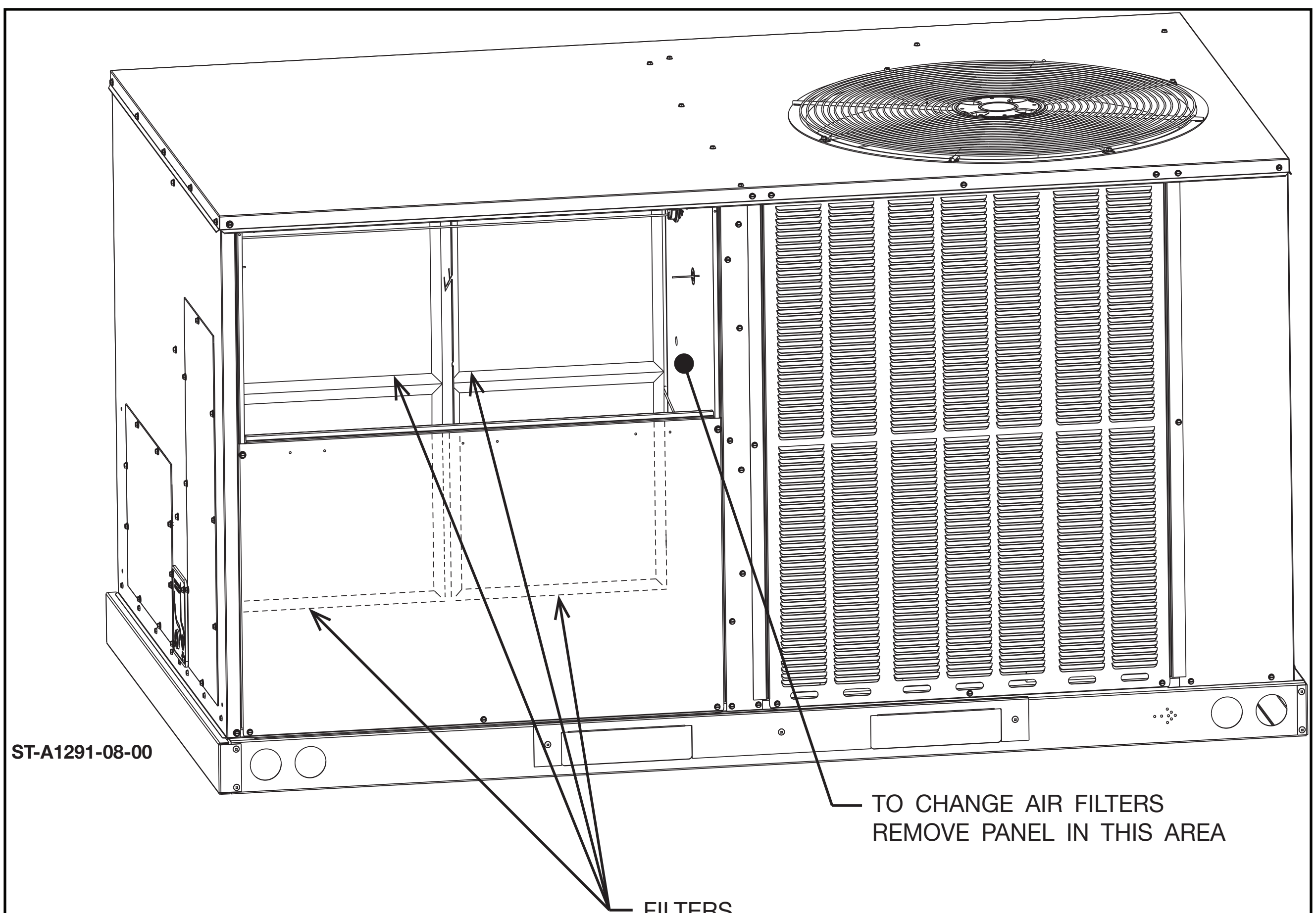
The return duct opening for roof curb installations is 25 5/8” x 12 1/8”, the return duct opening for horizontal ducted installations is 26 5/8” x 12”. See ***Figure B.3.6. – A and – B*** for reference.

D.2.3. Isolation for Noise abatement

Noise from operational vibration can occur with this equipment, the use of flexible duct adapters and vibration damping curb adapters maybe required depending upon the building type and use. Consult with a local mechanical engineer on the duct and building design to determine if any noise abatement solutions need to be considered before installation.

D.3. Filters

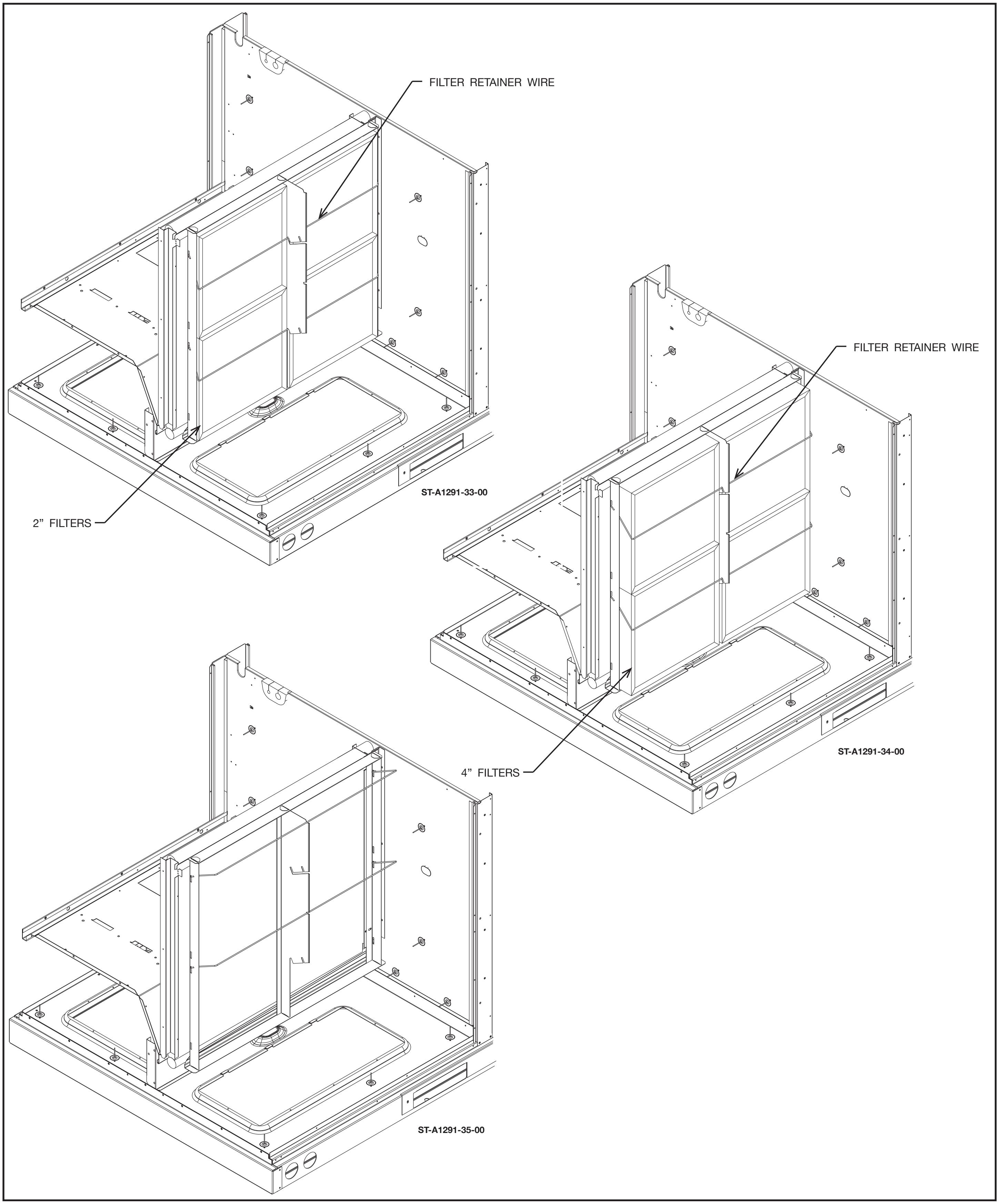
D.3.1. Installing Filters



D. DUCT AND VENTING

D.3. Filters

D.3.1. Installing Filters (Cont.)



This product will accept both 2” and 4” filters. A new unit ships with four 2” x 16” x 16” filters. For units with an economizer, only use 2” filters due to fitment clearances. To replace filters, follow these steps:

1. Remove “Filter Access” panel.
2. Pull downwards on retainer wire and rotate upwards to unlock filters.
3. Secure retainer wire in notch.
4. Remove and discard current filters.
5. Install new filters with airflow arrow pointing towards evaporator coil.
6. Rotate retainer wire downward to original position and secure in notch.
7. Install “Filter Access” panel.

D.4. Economizers and Fresh Air Dampers

D.4.1. Economizer Information

ECONOMIZERS - Mechanical devices used to make the Heating Ventilation and Air Conditioning (HVAC) unit more efficient by regulating the return air and outside air. Economizers for this product come in several configurations.

The Downflow Economizer is designed specifically for units setup in a downflow configuration. The downflow economizer fits inside the package unit and sits over the return-air opening along the bottom of the unit. All economizers are equipped with horizontal gear driven blades and a gravity relief damper (Barometric Relief).

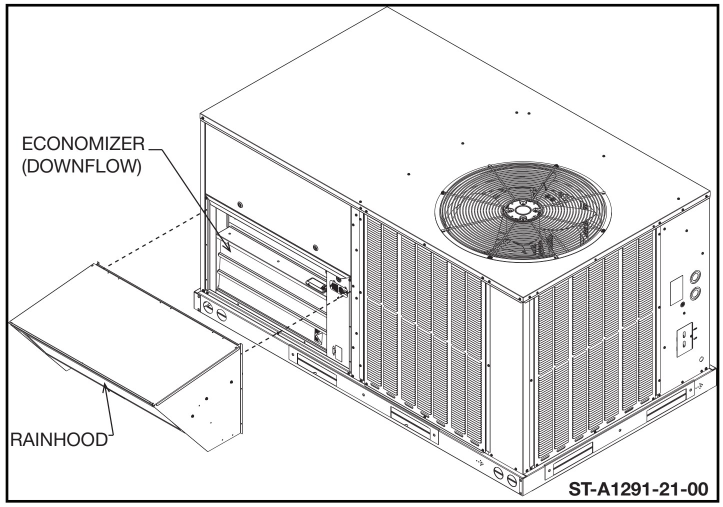
The Horizontal Economizer is designed specifically for units setup in a horizontal flow configuration. The horizontal economizer utilizes independently actuated return-air and fresh air dampers to enable the most efficient handling of air achievable with this platform. The horizontal economizer also includes an externally-mounted (to the duct work) gravity relief damper.

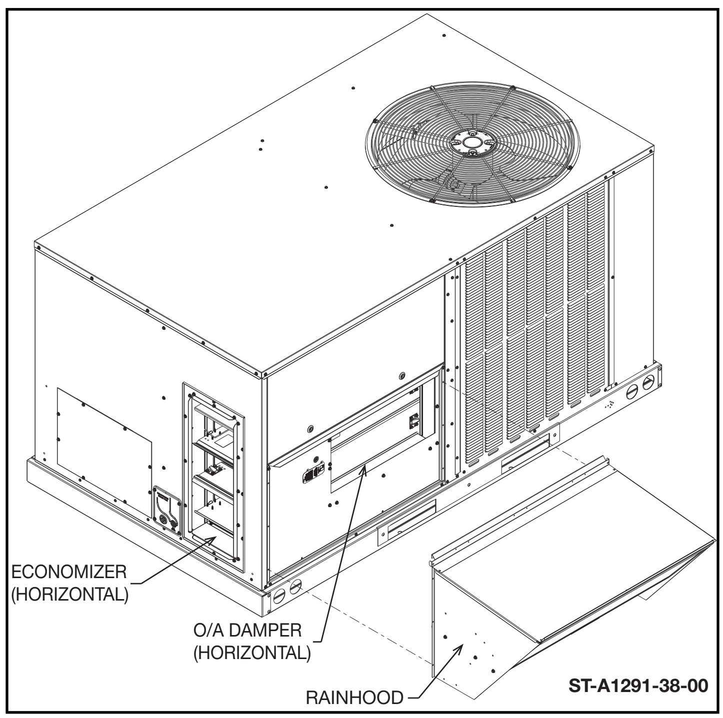
All units with economizers come shipped from the factory with a parts bag and a separate document for Economizer Installation & Operation instructions. Refer to that document for information on how to install the economizer, connect the controls, and adjust the airflow. Accessory economizers purchased separately will also come with the parts bag and instructional document.

For reference, the Installation Instructions for economizers may be found under these Manufacturer part numbers:

- Downflow Economizer: 92-107192-17
- Horizontal Economizer: 92-107192-18
- Downflow Economizer w/ DDC: 92-107192-19
- Horizontal Economizer w/ DDC: 92-107192-20

Figure D.4.1. – A: Downflow Economizer with Hood





D.4.2. Fresh Air Dampers

MANUAL DAMPER HOODS – Manual damper hoods are often installed as a low cost substitute for an economizer.

The idea is to manually set the blade located inside the hood to restrict the opening by introducing Static Pressure, thereby balancing the outside air with the return air entering the RTU.

The drawback to a manual damper is that it is open 24 hours a day, 365 days a year. Therefore they introduce outside air during occupied and unoccupied modes increasing the load on the rooftop unit.

MOTORIZED DAMPER HOODS – A motorized damper is economical, and provides more comfort than a manually adjusted hood damper.

The motorized damper is coupled to an actuator, and designed to open when the RTU fan is running, and close when the fan is off. The advantage of the motorized damper is that the outside air is no longer a factor once the RTU fan is cycled off.

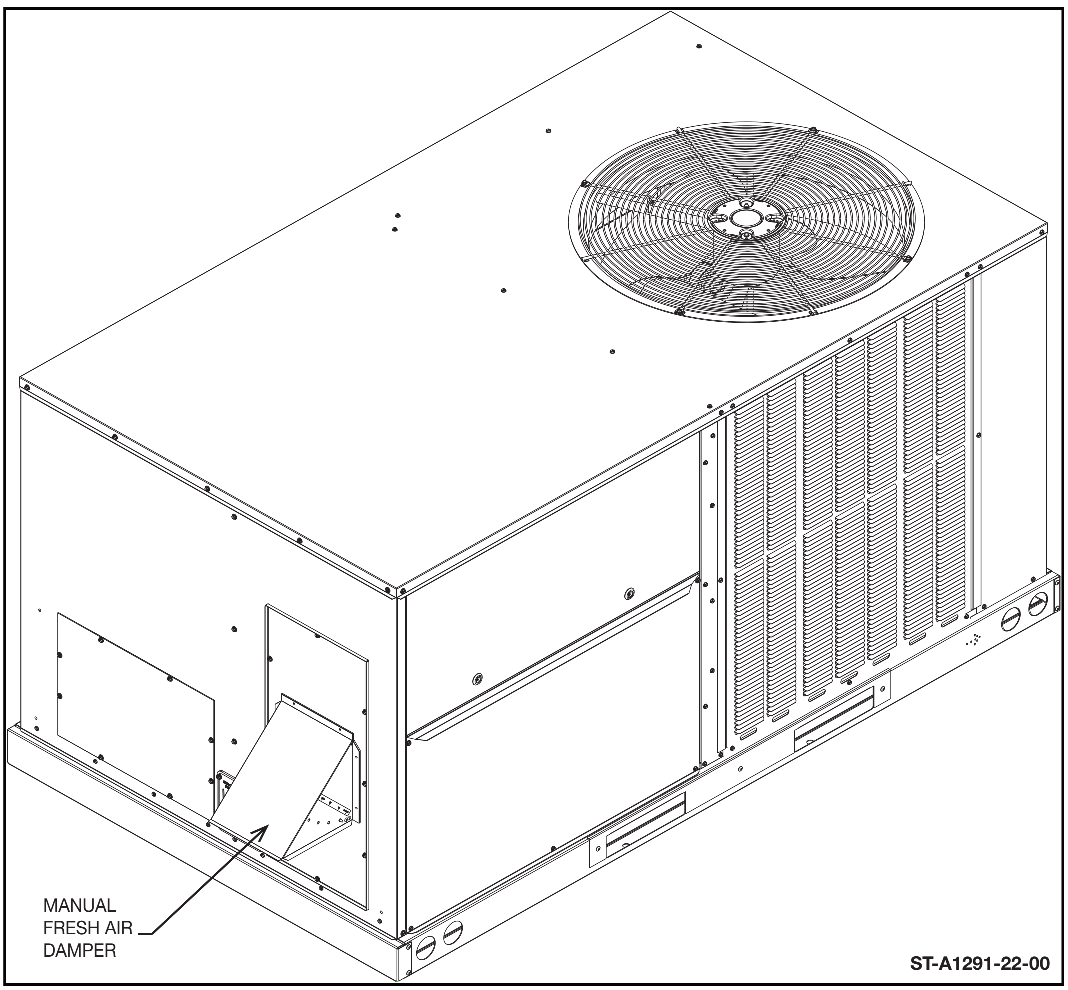
By connecting a Timer, CO2 Sensor or Smoke Detector in series between the RTU fan (“G” on the Thermostat) and actuator, the damper can be controlled during “Unoccupied” hours, or allow the damper to only introduce outside air during “On-Demand Occupancy.”

Fresh Air Dampers come shipped with a separate document for Installation & Operation instructions. Refer to that document for information on how to install and adjust the dampers.

For reference, the Installation Instructions for Fresh Air Dampers may be found under these manufacturer part numbers:

- Manual Fresh Air Damper: 92-107192-25
- Motorized Fresh Air Damper: 92-107192-26

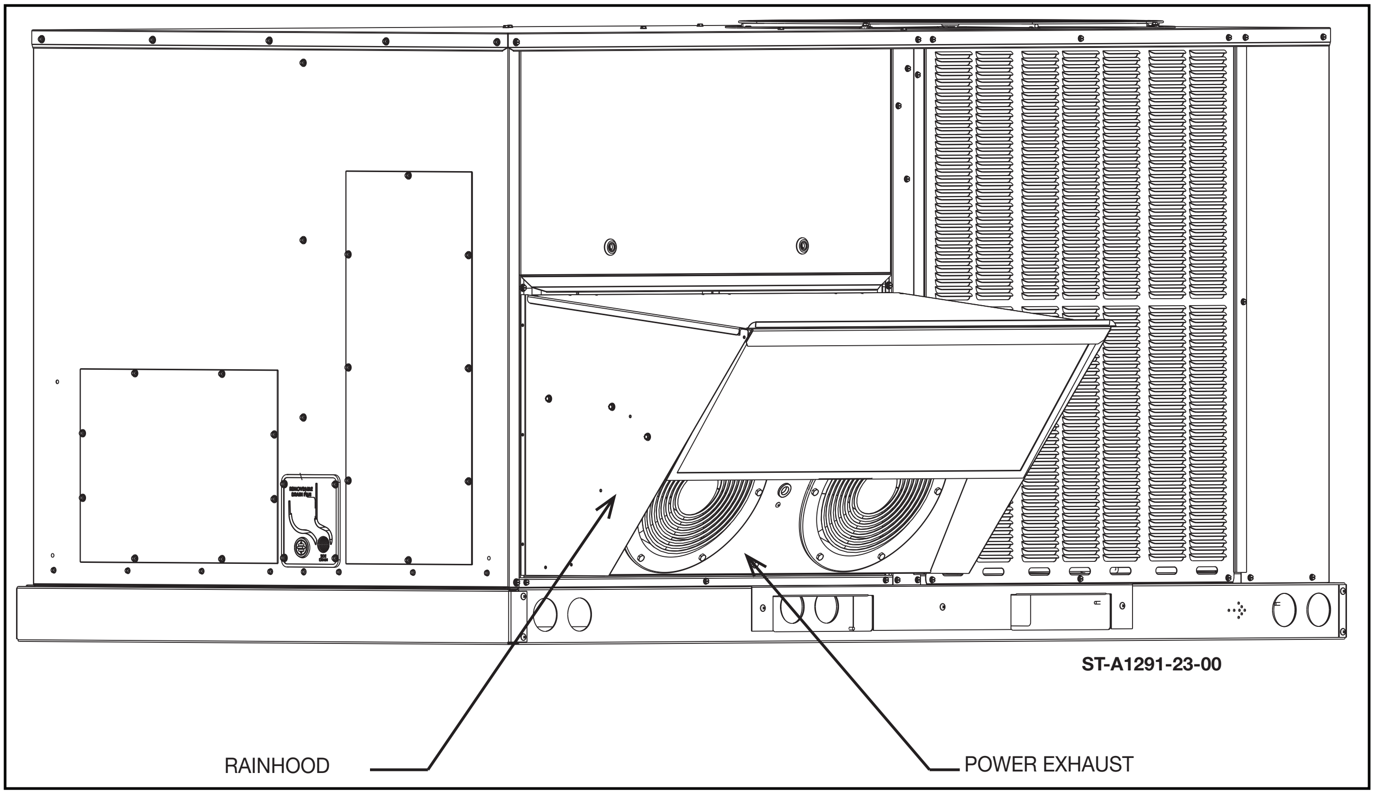
Figure D.4.2. – A: Fresh Air Damper



D.4.3. Powered Exhaust

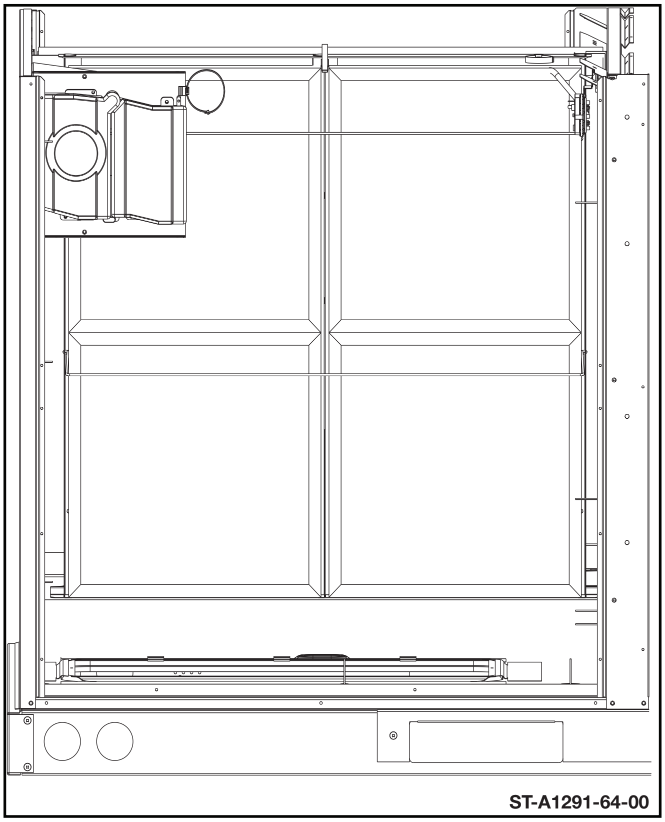
POWER EXHAUST - This accessory is a motorized fan designed to remove air from the conditioned space efficiently. While this is useful for removing a high positive pressurization, caution must be taken in the setup of the system to avoid creating a negative pressure within the conditioned space. If negative pressure occurs, leaky windows, doors, and electrical fixtures will allow the outside air to creep in causing drafts or hot sports within a room.

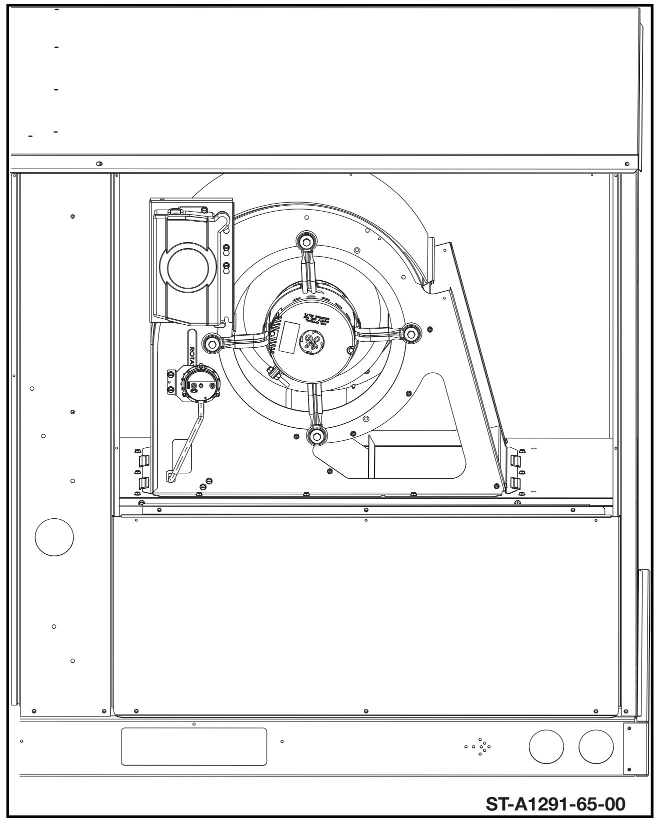
Figure D.4.3. – A: Powered Exhaust



D.5. Smoke Detectors

Figure D.5. – A: Smoke Detector Assembly





D.5.1. Supply Duct Smoke Detectors

D.5.1.1. Field Installed – Installation, Wiring and setup

Field install Supply and Return Duct Smoke Detectors come shipped with a separate document for Installation & Operation instructions. Refer to the separate Installation Instructions for installing, wiring, and setup of a supply and return smoke detector. These instructions are listed under ***Manufacturer Part number: 92-106191-03.***

D.5.1.2. Factory Installed – Inspection and setup

Inspect the smoke detector assembly for any damage during shipping. Use ***Figure D.5. – A*** for reference. Confirm that all wiring connections are still secure. Refer to the separate Installation Instructions, ***Manufacturer Part Number 92-106191-03***, for smoke detector for wiring diagrams and additional assembly instructions.

D.5.1.3. Field Installed 3rd Party Smoke Detectors or Fire Control Panels

See **section F.1.2.** for the proper connection points for a remote smoke detector. **DO NOT** break 24vac to the Thermostat: shutdown will not occur. **DO NOT** break 24vac from the transformer: it can overload the smoke detector controls.

E.1. Electrical Safety Information

E.1.1. Information on Power Supply

⚠**WARNING:** Turn off the main electrical power at the branch circuit disconnect closest to the unit before attempting any wiring. Failure to do so can cause electrical shock resulting in personal injury or death.

1. All wiring should be made in accordance with the **National Electrical Code**. Consult the local power company to determine the availability of sufficient power to operate the unit. Check the voltage at power supply to make sure it corresponds to the unit's RATED VOLTAGE REQUIREMENT. Install a branch circuit disconnect near the rooftop, in accordance with the N.E.C., C.E.C. or local codes.

2. It is important that proper electrical power is available at the unit. Voltage should not vary more than 10% from that stamped on the unit nameplate. On **three phase units**, phases must be balanced within 3%.

3. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from the **N.E.C.** using the circuit ampacity found on the unit rating plate. Use the smallest wire size allowable in ***Figure F. – A*** from the unit disconnect to unit.

4. For through the base wiring entry reference ***Figure F.2. – A: Power and Control Routing***. All fittings and conduit are field supplied for this application. Reference the chart with ***Figure F.2. – B: Hole Sizing for Conduit*** for proper hole and conduit size.

NOTES:

1. For branch circuit wiring (main power supply to unit disconnect), the minimum wire size for the length of run can be determined from ***Appendix B "Electrical Data"*** or the unit rating plate for circuit ampacity and the National Electrical Code to determine proper wire sizing. From the unit disconnect to unit, the smallest wire size allowable in ***Figure F. – A*** for the circuit ampacity may be used, as the disconnect must be in sight of the unit.

2. Wire size based on 75°C rated wire insulation for 1% voltage drop.

3. For more than 3 conductors in a raceway or cable, see the National Electrical Code (or C.E.C. in Canada) for derating the ampacity of each conductor.

IMPORTANT: This unit is approved for use with copper conductors only connected to unit contactor.

WARRANTY MAY BE JEOPARDIZED IF ALUMINUM WIRE IS CONNECTED TO UNIT CONTACTOR.

E. ELECTRICAL

Special instructions apply for power wiring with aluminum conductors:

Warranty is void if connections are not made per instructions.

Attach a length (6” or more) of recommended size copper wire to the unit contactor terminals L1, L2 and L3 for three phase.

Refer to the National Electric Code (NEC) for sizing wire to elec heat / single point. See Appendix E - Heater Kit Characteristics for additional info.

Splice copper wire pigtails to aluminum wire with U.L. recognized connectors for copper-aluminum splices. Please exercise the following instructions very carefully to obtain a positive and lasting connection:

1. Strip insulation from aluminum conductor.

2. Coat the stripped end of the aluminum wire with the recommended inhibitor, and wire brush the aluminum surface through inhibitor. INHIBITORS: Brundy-Pentex “A”; Alcoa-No. 2EJC; T & B-KPOR Shield.

3. Clean and recoat aluminum conductor with inhibitor.

4. Make the splice using the above listed wire nuts or split bolt connectors.

5. Coat the entire connection with inhibitor and wrap with electrical insulating tape.

NOTE: Wiring to be done in the field between the unit and devices not attached to the unit, or between separate devices which are field installed and located, shall conform with the temperature limitation for Type T wire [63°F rise (35°C)] when installed in accordance with the manufacturer’s instructions.

E.1.2. 208/240 Volt Operation and Required Adjustments

E.1.2.1.Low Voltage Transformer Tap Adjustment for 208Volt

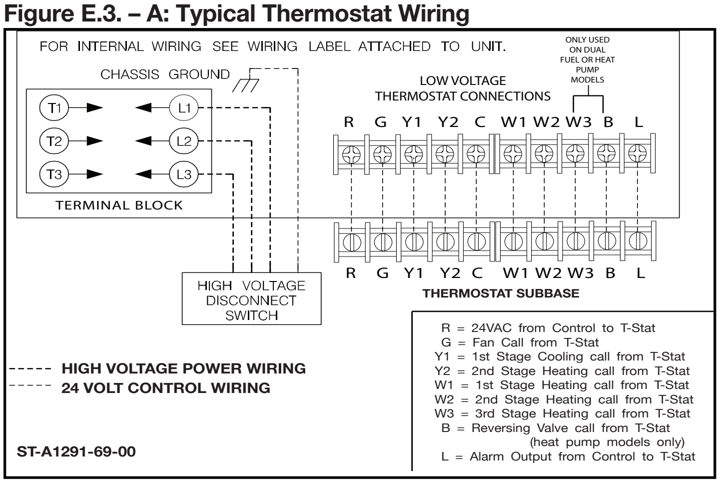
Transformer is factory wired for 230 volts on 208-230 volt models and must be changed for 208 volt applications. See unit wiring diagram for 208 volt wiring.

E.2. Electrical Data

See ***Appendix B*** towards the end of this manual for Electric Data.

E.3. Electrical Connections

Figure E.3. – A: Typical Thermostat Wiring



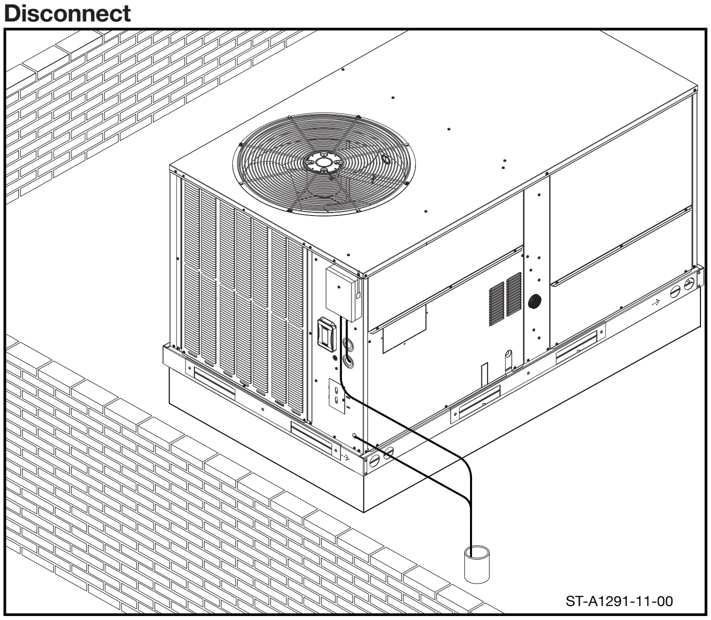
Use to ***Appendix B*** "Electrical Data" and National Electrical Code for circuit ampacity to determine proper wire sizing.

Refer to ***Figure F.2. – A: Power and Control Routing*** for location of wiring entrances, and ***Figure F.2. – B: Hole Sizing for Conduit.***

E.3.1. Field Supplied Disconnect

The field supplied service disconnect will come with a separate Installation Instruction document. Please refer to that document, or ***Manufacturer part number: 92-106191-04.***

Figure E.3.1.1. – A: Standard Location for Mounting Disconnect



E.3.1.1. Mounting Disconnect on Cabinet

Attach the disconnect to the top of the left hand side of the control box, above the knockouts and refridgerant test ports. Do not use screws above or below the label specifying "TO PREVENT COIL DAMAGE – DO NOT ADD SCREWS HERE, ABOVE, OR BELOW LABEL" as hidden coil and tubing could be damaged. An example of this label is shown below.

Figure E.3.1.1. – B: Label Showing Where to NOT Use Screws

E.3.1.2. Routing Wires into Cabinet

See ***Figure F.2. – A: Electrical and Piping Routing*** for conduit entry points and routing locations for wiring into the control box.

See ***Figure E.3. – A: Typical Thermostat Wiring*** for wiring to the contactor and thermostat in the control box.

E.3.1.3. Routing Wires through Curb (Option)

Use liquid tight connectors and tubing to connect the electrical and low voltage control cables between the base of the cabinet at the raised section (See ***Figure B.3.6. - A: Supply And Return Dimensions For Downflow Applications*** for location of raised section) and bottom of the control panel. Conduit and fittings must meet all applicable codes.

Use Silicon and gaskets to seal the connection at the base pan

E.3.1.4. Connecting to Contactor terminal blocks

The recommended torque for securing wiring to the contactor is **40 in-lb**.

See ***Figure E.3. – A: Typical Thermostat Wiring*** for wiring to the contactor.

E.3.2. Factory Installed Disconnect

Refer to ***Appendix G*** for the unit wiring diagrams, and to ***Figure F.2. – A*** for locations to route wires into the cabinent or through the curb/basepan of the unit.

E.3.2.1. Routing Wires into Cabinet

Refer to section ***E.3.1.1.*** and/or section ***F.2.*** for routing wires into the cabinet with a factory installed disconnect.

E.3.2.2. Routing wires through Curb (Option)

Refer to section ***E.3.1.3.*** for routing wires through the curb with a factory installed disconnect.

E.3.3. Connecting the Convenience Outlet

E.3.3.1. Non-powered

The non-powered convenience outlet, if purchased as an option for the unit, will come shipped in a box within the blower compartment of the unit. It will need to be removed and installed into its proper configuration.

For connecting the non-powered convenience outlet and all other information, refer to the installation instructions for the accessory.

Manufacturer I&O part number: 92-42576-03

E.3.3.2. Powered

The powered convenience outlet, if purchased as an option for the unit, will come shipped pre-installed into the unit. No addional hook-up will be needed, but ensure the connections remained secure from shipping before powering the unit.

For connecting the powered convenience outlet and all other information, refer to the installation instructions for the accessory.

Manufacturer I&O part number: 92-106973-01

E.3.4. Checking Phase and Motor Rotation

When using 3 phase power the only device that is rotation dependent is the compressor. The outdoor fan and indoor blower do not require any adjustment and will turn backwards if the phase is incorrect. Verify the direction of rotation for the indoor blower motor before starting up the compressors.

E.3.4.1. Checking Phase with VFD Drive

On any models equipped with an ECM Direct Drive Blower Motor or belt drive units with a Variable Frequency Drive, VFD, the motor will always rotate in the correct direction. Correction phase must be checked by the operation of the compressor.

E.3.5. Grounding Requirements

Refer to local codes as required. Must be grounded to a common earth ground.

National Electric Code (NEC) / International Building Code / Canadian Electrical Code

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

The low voltage wiring should be sized as shown in ***Figure F. – A: Field Wire Size for 24v Thermostat Circuits.***

Figure F. - A

FIELD WIRE SIZE FOR 24 VOLT THERMOSTAT CIRCUITS

THERMOSTAT LOAD - AMPS	SOLID COPPER WIRE - AWG.					
3.0	16	14	12	10	10	10
2.5	16	14	12	12	12	10
2.0	16	16	14	12	12	10
	50	100	150	200	250	300
	LENGTH OD RUN - FEET (1)					

ST-A1291-14-00

(1) THE TOTAL WIRE LENGTH IS THE DISTANCE FROM THE FURNACE TO THE THERMOSTAT AND BACK TO THE FURNACE.

NOTE: DO NOT USE CONTROL WIRING SMALLER THAN NO. 18 AWG.

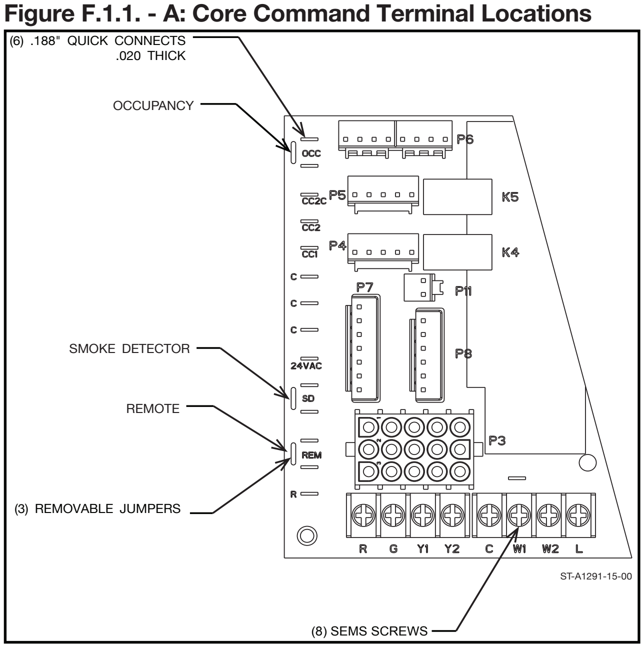
Install the room thermostat in accordance with the instruction sheet packed in the box with the thermostat. Run the thermostat lead wires through the control entry opening ***Figure F.2. – A: Electrical and Piping Routing)*** and connect to the low voltage thermostat connections (see ***Appendix G*** for wiring diagrams and ***Section F.1.*** for T-Stat field connections). Never install the thermostat on an outside wall or where it will be influenced by drafts, concealed hot or cold water pipes or ducts, lighting fixtures, radiation from fireplace, sun rays, lamps, televisions, radios or air streams from registers. Refer to instructions packed with the thermostat for "heater" selection or adjustment.

F.1. T-Stat field connections

F.1.1. Misc. Connections

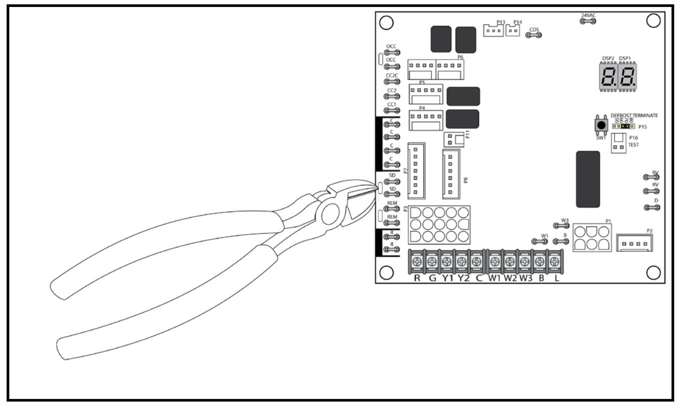
Refer to ***Appendix G*** for the unit wiring diagrams and to ***Figure E.3. – A: Typical Thermostat Wiring.***

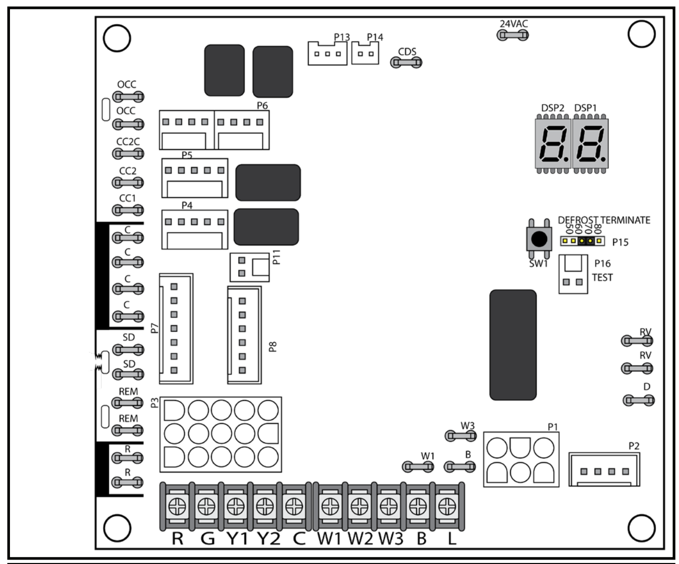
Figure F.1.1. - A: Core Command Terminal Locations

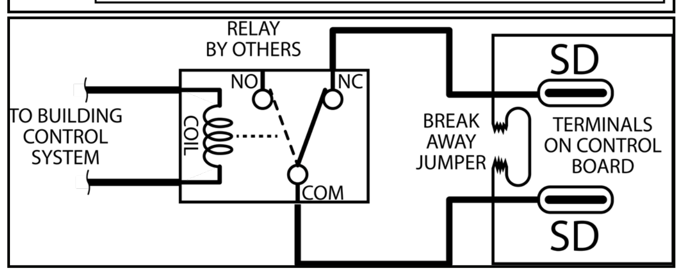


F.1.2. Occupancy connections / Remote connections / Etc

Figure F.1.2. – A: Occupancy and Remote Connections







NOTE: This is an example of breaking the jumper for Smoke Detector connections, apply the same process for the Occupancy and/or Remote connections.

These features are only available on the Non-DDC Furnace, Heat pump, or cooling only control boards.

OCC – Occupancy Control. This feature shuts down the dampers on the economizer or motorized damper option when outdoor/fresh air is not required for the building. Locate the terminals at the left side of the board mark "OCC". See Figure ***F.1.2. – A: Occupancy and Remote Connetions*** for reference.

F. CONTROL / THERMOSTAT WIRING

For connecting Remote Smoke Detectors or Fire Control Panels to this control DO NOT break the 24VAC to the thermostat or from the power supply transformer. Either could cause an undersirable operating condition that would not shut the unit down in the event of an emergency situation. See the instructions for the type of control board this unit is equipped with.

Using cutters or a small screw driver, break the edge of the board between the to terminals marked with “OCC”. Use 3/16” blade connector, and a minimum of 18AWG wire to connect to a Normally Closed Dry Contact Relay or Switch. Do not connect multiple control boards to the same dry contact relay or switch.

REM – Remote Shutdown Control. This feature allows the unit to be turned off remotely ignoring the thermostat calls for cooling or heat. Locate the terminals at the left side of the board mark “REM”. See Figure ***F.1.2. – A: Occupancy and Remote Connetions*** for reference.

Using cutters or a small screw driver, break the edge of the board between the to terminals marked with “REM”. Use 3/16” blade connector, and a minimum of 18AWG wire to connect to a Normally Closed Dry Contact Relay or Switch. Do not connect multiple control boards to the same dry contact relay or switch.

F.1.3. Connecting a Smoke Detector

F.1.3.1. Core Command Connection

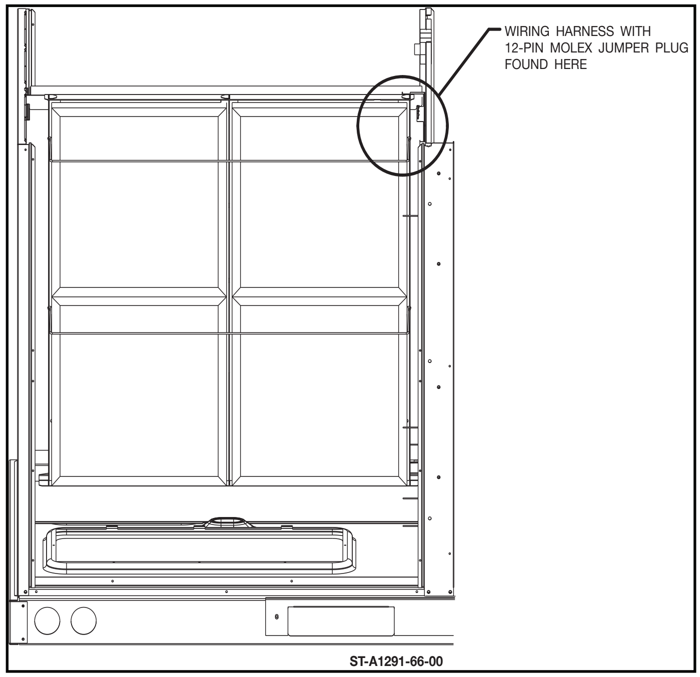
SD – Remote Smoke Detection. This feature allows for the proper shutdown of the controls in the event of an emergency situation. Locate the terminals at the left side of the board mark “SD”. See ***Figure F.1.2. – A: Occupancy and Remote Connetions*** for reference.

Using cutters or a small screw driver, break the edge of the board between the to terminals marked with “SD”. Use 3/16” blade connector, and a minimum of 18AWG wire to connect to a Normally Closed Dry Contact Relay, or in common Fire Control Panels and Smoke Detectors, the Auxilary Connections for C and NC. See the instructions for the remote devices. Do not connect multiple control boards to the same dry contact relay.

F.1.3.2. DDC Control Connection

In the air-filter section or on the side economizer, locate the 12-pin Molex jumper plug with the long Red, short Yellow and Orange wire loops; see ***Figure F.1.3.2. - A*** for reference. Cut the Red wire loop and connect these to a minimum of 18AWG wire that will be connected to a Normally Closed Dry Contact Relay, or in common Fire Control Panels and Smoke Detectors, the Auxilary Connections for C and NC. See the instructions for the remote devices. Do not connect multiple control boards to the same dry contact relay.

Figure F.1.5.3. – A: Wiring Harness location in Air-Filter Section



F.1.4. Building Management / Control Connections using DDC –

In an application where a third party building management / controls are in use or will be incorporated, units with the integral Rooftop Unit Controller (RTU-C) are communication compatible with the system that supports the BACnet Application Specific Controller device profile, LonMark Space Comfort Controller functional profile, or LonMark Discharge Air Controller functional profile. This is accomplished with a field installed BACnet or LonMark communication module. Refer to the Clear control/DDC manual for more detail; **Manufacturer Part number: 92-103249-01.**

F.2. Routing Control wiring

Figure F.2. – A: Electrical and Piping Routing

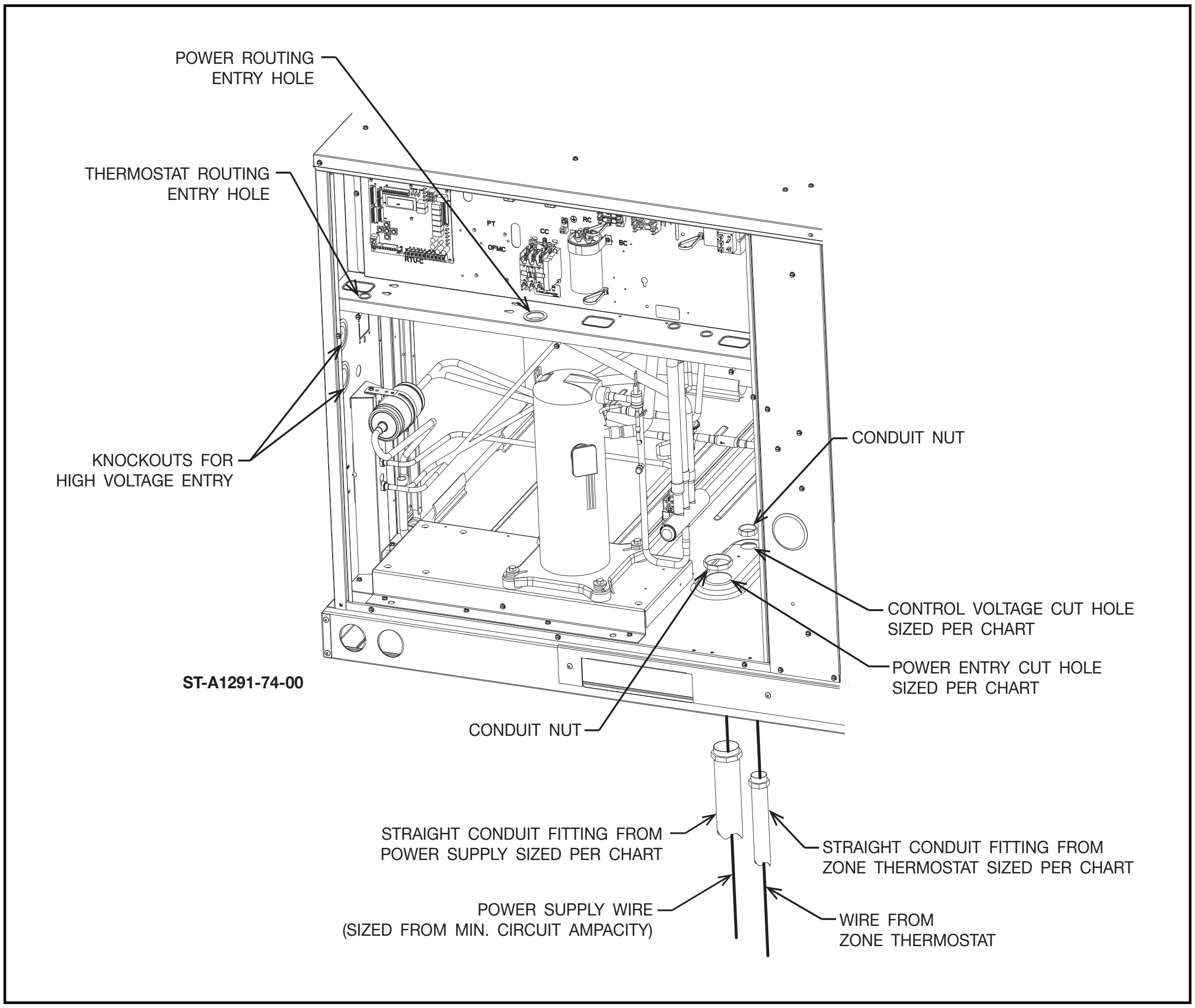


Figure F.2. – B: Hole Sizing for Conduit

	WIRE SIZE, AWG											
	14	12	10	8	6	4	3	2	1	0	00	000
CONDUIT SIZE	1/2"	1/2"	1/2"	3/4"	1"	1"	1-1/4"	1-1/4"	1-1/2"	1-1/2"	2"	2"
HOLE SIZE	7/8"	7/8"	7/8"	1-31/32"	1-23/64"	1-23/64"	1-23/32"	1-23/32"	1-31/32"	1-31/32"	2-15/32"	2-15/32"

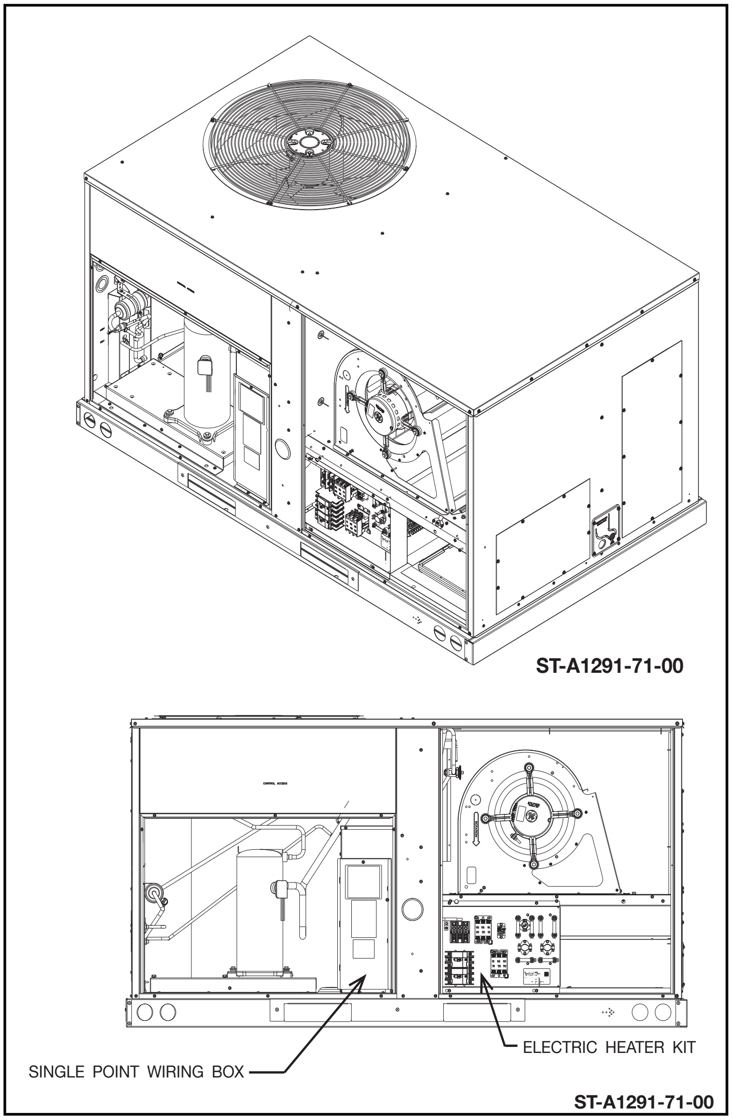
NOTES: 1. DETERMINE REQUIRED WIRE SIZE FROM MINIMUM CIRCUIT AMPACITY SHOWN IN INSTALLATION & OPERATING INSTRUCTION.
2. BOTTOM POWER ENTRY WILL NOT ACCOMMODATE WIRE LARGER THAN #2 AWG (SHADED AREA).

F.3. Measuring Control Voltage Loads

Use a voltmeter to measure the low voltage and low voltage amp draws during operation. Accessories such as remote smoke detectors and excessive wire length can increase the amp draw on the low voltage wiring. Verify that the total amp draw on the 24Vac side is less than 0.3A in full operation.

H. ELECTRIC HEAT

Figure H. - A: Electric Heat with Single Point Wiring



H.1. FACTORY INSTALLED ELECTRIC HEAT

Units shipped with factory installed electric heat will come with a separate document (included in the parts bag) with details regarding the electric heater kits. Refer to this document for diagrams and additional info. Refer to ***Appendix E*** for heater kit characteristics such as Minimum Circuit Ampacity and Max Fuse sizes.

H.2. FIELD INSTALLED ELECTRIC HEAT

Electric heater kits will be shipped with their own installation document in the box. Use the instructions supplied with the kit for best practice. Install all electric heat kits in accordance with the National Electric Code. Refer to ***Appendix E*** for manufacturer-approved heater kit characteristics such as Minimum Circuit Ampacity and Max Fuse sizes.

J. STARTUP AND OPERATION

J.1. Final Inspection

J.1.1. Check for Refrigerant Leaks

Inspect the unit for any damage to the coils and tubing that could cause a leak.

J.1.2. Check Level of Unit

Refer to ***Section C.6.2.*** for setting/checking the level of the unit.

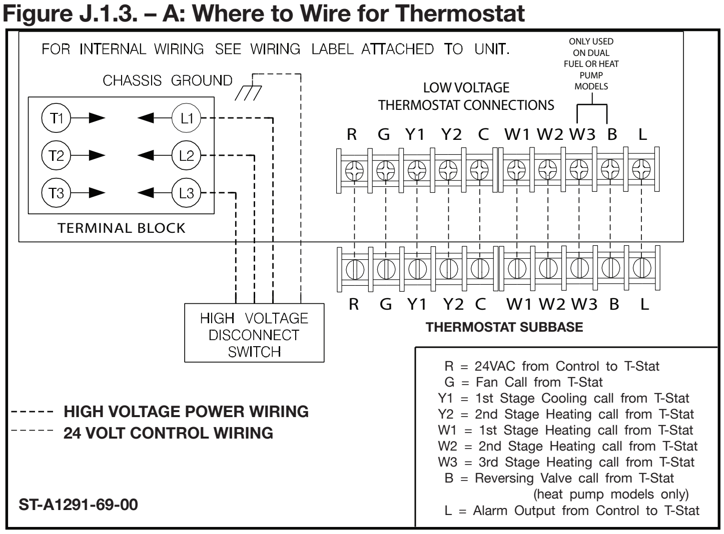
J.1.3. Check Electrical Connections For Proper Torque

Use an Inch Pound rated torque wrench to ensure proper torque. DO NOT CONFUSE THIS WITH A FOOT POUND RATED WRENCH, Damage will occur.

Recommended torques for securing wiring:

- To the contactor: 40 in-lb.
- From the T-stat to the control board: 8.0 in-lb.

Figure J.1.3. – A: Where to Wire for Thermostat



J.1.4. Check Control Cables For Proper Connection

Verify all cables are seated and connected in the unit as some might come loose during shipping and transport.

J.1.5. Check Filter Installation

Verify that filters are seated and oriented correctly in the unit as some might come displaced during shipping and transport. Refer to ***Section D.3.*** for more information on filters and filter installation.

J.1.6. Check Condensate Drain installation

Verify the Condesate Drain Trap is a minium of 3 inches deep, plus the Blower Fan Static Pressure. Verify the Outlet of the drain trap is a minimum of 3 inches below the outlet of the drain pan. Ensure the outlet of the trap is routed to a suitable drain location as required by local code. Refer to ***Section C.5*** and ***Figure C.5.1*** – A for more information.

J.1.7. Check Blower Compartment for Accessories

Open all compartments to ensure there are no tools or other misc parts remaining in the unit from setup. This is most important on the blower section to avoid damage to the blower assembly.

J.2. Turning on Power for the First time

J.2.1. Checking for Proper 3-Phase Voltage

Verify that proper power has been supplied to the unit. This is critical for correct operation of the compressor.

J.2.2. Check For Proper Phase

Verify that the compressor is running correctly.

J.2.2.1. Standard Blower Rotation

As a reminder, all units with an ECM-drive blower motor will have the correct rotation even if the phase to the unit is wired incorrectly. See ***Section E.3.4. Checking Phase and Motor Rotation*** for more information.

J.2.2.2. VFD Blower Rotation

As a reminder, all units with VFD driven blower motor will have the correct rotation even if the phase to the unit is wired incorrectly. See ***Section E.3.4.1. Checking Phase with VFD Drive*** for more information.

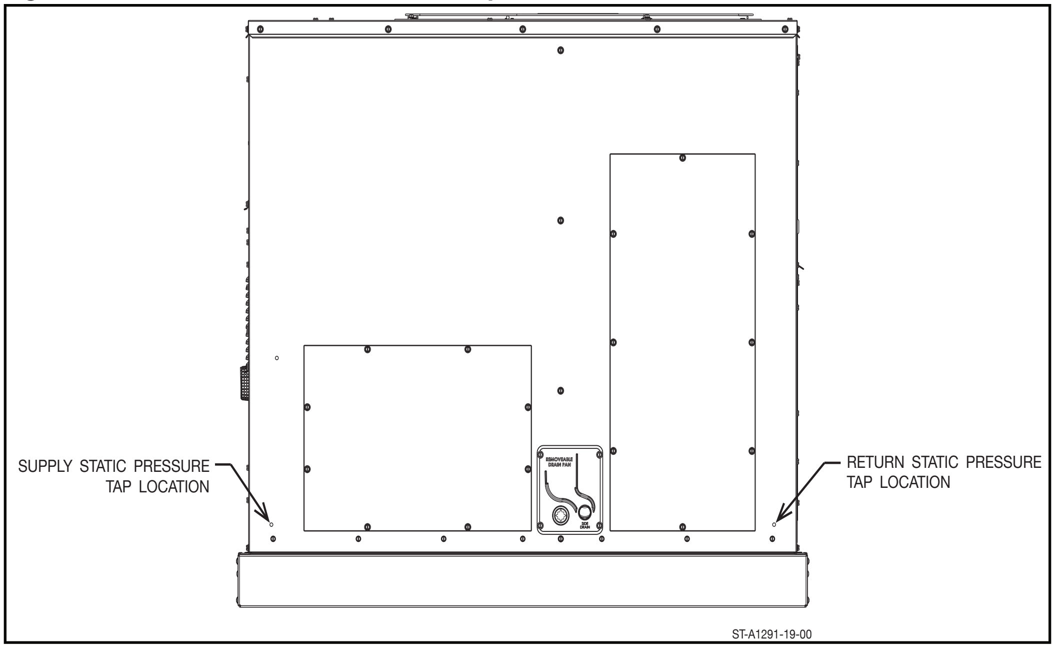
J.2.3. Checking Low (Control) Voltage

Use a voltmeter to measure the low voltage and low voltage amp draws during operation. Accessories such as remote smoke detectors and excessive wire length can increase the amp draw on the low voltage wiring. Verify that the total amp draw on the 24Vac side is less than 0.3A in full operation. Refer to ***figure F. – A*** for proper low voltage wire lengths.

J.3. Checking and Adjusting Air Flow

For Economizer and Diffuser Pressure Drop Data, please refer to the end of ***Appendix C: Airflow Performance Data.***

Figure J.3. – A: Static Pressure and Air Temp Measurement Location



J.3.1. Static Pressures and Measurements

•To measure the static pressure of the system, locate the locating dimples near the supply/return duct openings, and drill a hole to the size necessary for the test probe. The location of these dimples are shown in ***Figure J.3. - A***.

• NOTE: After taking airflow measurements, seal these openings per best practice to prevent airflow leakage and water entry into the unit.

• NOTE: Drilling test tap locations in other panels or doors could put the test probe in a turbulent zone providing false readings.

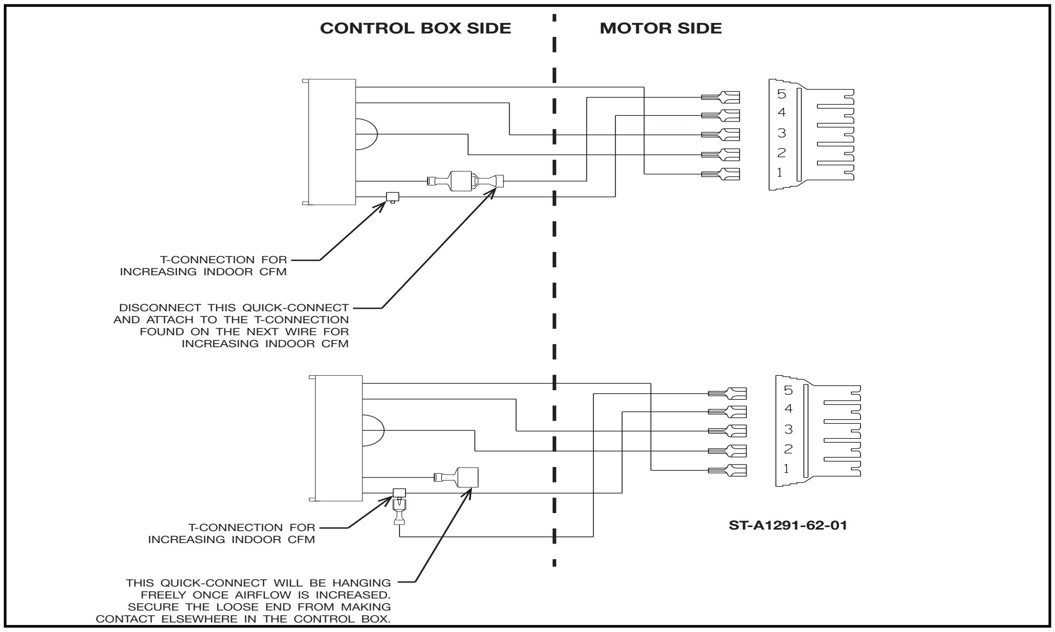
J.3.1.1. Using Tools

Use a water monometer to measure the static pressure of the blower. Insert the meter probe into the tap location. Make sure any economizer or outside air dampers are closed and run the fan at the maximum, full speed setting. Record the reading for the return air and supply air separately.

J.3.2. Air Flow Measurements and Adjustments

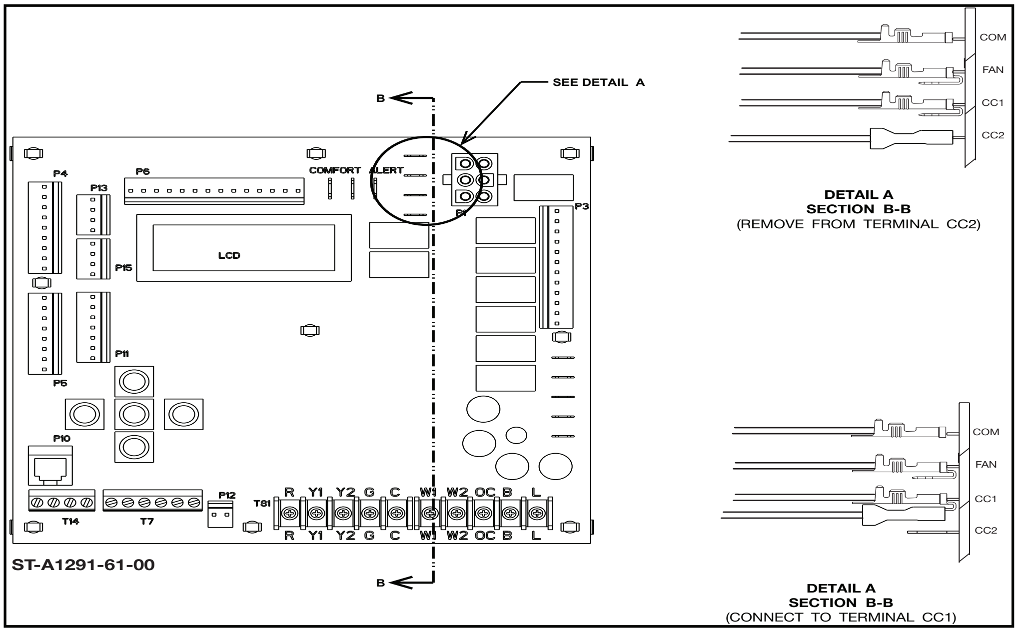
- Measure the supply/return static to get the unit static pressure by drilling out the dimple locations shown in ***Figure J.3. - A.***
- Take the measured static pressure and match to the static listed on the airflow table to find your CFM.
- For non-DDC units, the unit ships standard with the orange wire (wire 607) having a quick-connect towards the control board-end of the harness.
  - o If more airflow is needed, unplug the orange wire and reattach to the the T-connection on the yellow wire (yellow 608). Refer to ***Figure J.3.2. – A.***

Figure J.3.2. – A: How to Increase Airflow for non-DDC Units



- For DDC units, the unit ships with the orange wire for the indoor fan connected to the CC2 terminal on the board.
  - o If more airflow is needed, remove the wire from CC2 and connect to the CC1 terminal. Refer to ***Figure J.3.2. – B***.

Figure J.3.2. – B: How to Increase Airflow for DDC Units



J.3.2.1. Increasing Air Flow – Blower Motor Controller on 5 Ton High-Static 460V and all 6 Ton units.

If more airflow is needed for a 5 ton High Static 460V or any 6 ton unit, the procedure will be the same as the products without the Blower Motor Controller. See ***Section J.3.2. Airflow Measurements and Adjustments*** for details.

J.3.2.2. Adjusting Fresh Air Flow with Economizer

See the above sections for measuring airflow, and refer to the I&O included with the Economizers for more information on adjusting airflow.

Manufacturer I&O Part numbers:

- Downflow: 92-107192-17
- Downflow DDC: 92-107192-19
- Horizontal: 92-107192-18
- Horizontal DDC: 92-107192-20

J.3.2.3. Adjusting Fresh Air Flow with Damper

All dampers are field install accessories. See the above sections for measuring airflow, and refer to the I&O included with the fresh air dampers for more information on adjusting airflow. Refer to local building codes for any fresh air requirements.

Manufacturer I&O Part numbers:

- Manual Fresh Air Damper: 92-107192-25
- Motorized Fresh Air Damper: 92-107192-26

J.4. Checking Cooling Operation

Note: In the below section, first and second stage cooling applies to ONLY the 6 ton units. For 3-5T units, only first stage applies.

COOLING SEQUENCE OF OPERATION

A. Call for cooling

1. The zone thermostat contacts close, and a call for cooling is initiated.

2. Inputs ‘Y1’ and ‘G’ to the control are energized.

3. The control senses input to ‘Y1’ and ‘G’. After a 1sec delay, the control energizes both the indoor blower and first stage compressor.

4. The control enters normal operating loop were all inputs are continuously checked.

5. Zone thermostat is satisfied.

6. The blower will continue to run for a preset period of time after the zone thermostat is satisfied.

7. The control goes into standby mode displaying a “O”.

B. Call for second stage cooling. After first stage cooling established; starting from A6.

1. If a call for second stage cooling is initiated after a call for first stage cooling is established, the control energizes ‘Y2’ and energizes the second stage compressor.

2. Then the control enters the normal operating loop where all inputs are continuously checked.

C. Second stage satisfied and first stage still called for; starting from B2.

1. ‘Y2’ is de-energized and the second compressor stage is de-energized.

D. First stage and second stage called simultaneously.

1. The zone thermostat contacts close, and a call for first and second stage cooling is initiated.

2. Inputs ‘Y1’, ‘Y2’ and ‘G’ to the control are energized.

3. The control senses ‘Y1’, ‘Y2’ and ‘G’. After a 1sec delay, the control energizes the indoor blower, and the first and second compressor stages.

E. First stage and second stage removed simultaneously.

1. Upon a loss of ‘Y1’ and ‘Y2’, the compressor is de-energized. The control de-energizes the indoor blower relay, and cuts off the blower after an indoor blower delay.

2. The control goes into standby mode displaying a “O”.

CONTINUOUS FAN MODE

A ‘G’ input only indicates a zone thermostat call for continuous indoor blower operation.

TIME DELAY BYPASS for non-DDC units

The Time Delay Bypass resets the ICC (Integrated Compressor Control) from any lockout mode or bypasses compressor anti-short cycle delay timer. To bypass the time delay, press the SW1 button with an an insulated probe for 1sec and then release.

FAULT RECALL OPERATION for non-DDC units

To enter FAULT RECALL mode, press the SW1 button with an insulated probe for 2sec and release. Upon entering and exiting the FAULT RECALL mode, the top bottom segments of the 7-segment display will be activated. The ICC will automatically scroll through the stored faults on the 7-segment display. Each fault is displayed one time with the top segment of the 7-segment display activated between faults. Each fault is displayed with the most recent fault displayed first. An “O” will be displayed when no faults are stored. The ICC will automatically exit the FAULT RECALL mode after displaying stored faults.

An example of one LPC fault and one HPC fault scrolled on the display is shown as: ¯21¯23¯

CLEAR FAULT HISTORY for non-DDC units

To clear FAULT HISTORY, press the SW1 button with an insulated probe for 5sec and release. The top and bottom segments of the 7-segment display will be activated and flash to indicate the history has been cleared.

Example: ======

TEST MODE for DDC Units

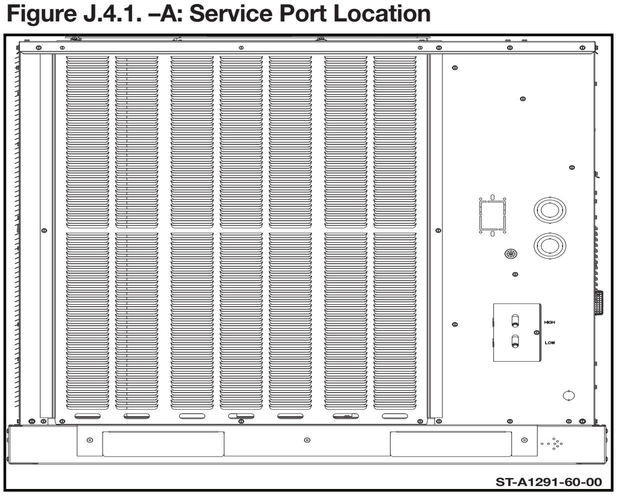
For units with DDC, there is a “Run Test” mode that will aid in dignostics during installation. Please refer to the CLEAR CONTROL MANUAL for more info; Manufacturer Part Number: 92-103249-01

J.4.1. Checking Refrigerant Pressures

To check refrigerant pressures, attach R410a manifold gauges to the high/lo service ports. The upper port is the high pressure port, and the lower is the low pressure port. **BE SURE TO USE ZERO LOSS FITTINGS WHILE MEASURING PRESSURE; ANY LOSS OF CHARGE MAY IMPACT PERFORMANCE.**

See section ***C.2.1.Tools Required for Installing and Servicing R-410A Models.***

Figure J.4.1. –A: Service Port Location



J.4.1.1. Refrigerant Pressure Charts

See ***Appendix F*** towards the end of this manual for Refrigerant Pressure Charts.

J.4.2. Checking Sub Cooling for Adjusting Charge Weight

See ***Appendix F*** towards the end of this manual for Refrigerant Charging Charts.

NOTE: This procedure is very important for optimizing this product’s performance.

How to check the unit’s subcooling to fine-tune refrigerant charge:

1. The Indoor ambient temperature must be between 72 °F and 82 °F dry bulb at the indoor coil.

2. Confirm the indoor air supply is at the rated CFM listed in ***Appendix A***.

3. Allow the system to run long enough for temperatures and pressures to stabilize; at least fifteen minutes.

4. Measure liquid pressure and line temperature at the liquid line service port (refer to section ***J.4.2.1.*** below for the liquid line temperature measurement location). USE ZERO LOSS FITTINGS WHILE MEASURING PRESSURE; ANY LOSS OF CHARGE MAY IMPACT PERFORMANCE.

5. To find the saturation temperature at the measured pressure, subtract the measured liquid line temperature from the saturation pressure to get the sub-cooling.

6. Check if the Sub-Cooling is within +/- 1.5 °F tolerance.

7. If the sub-cooling values are significantly different (> 20 psig) from those listed on the table in Appendix F, there may be an airflow or component issue. Refer to section M. Diagnostics for more information.

J.4.2.1. Measuring Air Temperature and Liquid Line Temperature

Measuring air temperature:

1. Insert a thermometer in the supply air duct as close to the unit as possible.

2. Insert a thermometer in the return air duct as close to the filters as possible.

3. If preferred, use the locations shown in ***Figure J.3. – A: Static Pressure and Air Temp Measurement Location*** instead of the supply/return ductwork.

4. Operate the unit for a minimum of 15 minutes in cooling mode.

5. When the thermometer in the supply air duct stops changing (approximately five minutes), subtract the return air temperature from the supply air temperature. This is the cooling mode temperature difference.

If the measured temperature difference is not reducing, or if the return air is not reaching the thermostat set point, the air flow is too low. Airflow must be increased by either removing the restrictions in the duct system, or by changing the air flow. See ***Section J.3.2. Air Flow Measurements and Adjustments*** for changing air flow.

IMPORTANT: Some high-efficiency filters have a greater than normal resistance to airflow. This can negatively affect airflow. BE SURE TO CHECK THE AIRFLOW if using any filter other than the factory-provided filter.

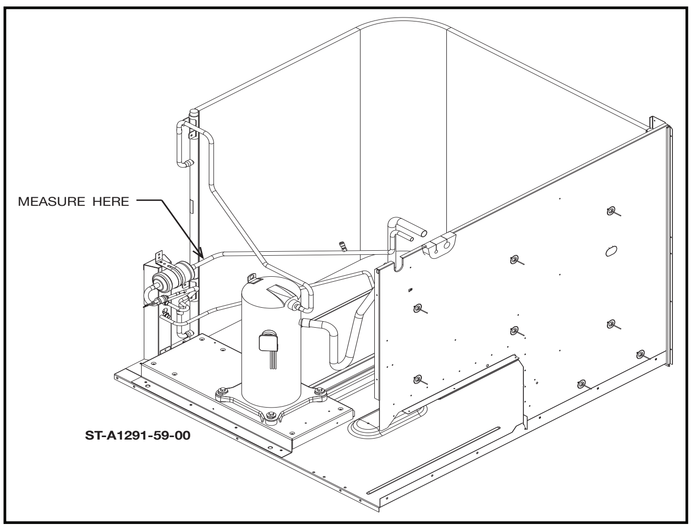
Measuring line temperature:

1. Attach a thermometer or thermocouple to the liquid refrigerant line right after the filter-dryer. See ***Figure J.4.2.1. - A***.

2. Operate the unit for a minimum of 15 minutes in cooling mode.

3. When the measurement of the temperature stops changing (approximately five minutes), record the temperature.

Figure J.4.2.1. – A: Line Temperature Measurement Location



J.4.3. Measuring Compressor Electrical Loads

See ***Appendix B*** towards the end of this manual for Compressor Electrical Data.

J.5. Checking Electric Heat Operation

Electric heater kits will have their own separate instructional document. For factory installed heater kits the document will be found in the parts bag, and for field installed heater kits the document will be found in the box. Refer to these documents for any info regarding checking electric heat operation.

J.6. Checking Heating Mode Operation

J.6.1. Heating Mode

With thermostat in the heat mode, fan auto and the room temperature lower than the thermostat setting:

A. Indoor blower contactor is energized through thermostat contact (G).

B. Compressor contactor is energized through thermostat contact (Y1). A 5 minute short cycle delay is standard on this unit. Compressor will start immediately if test pins on the defrost board are shorted and released.

C. Reversing valve is energized in the heating mode through thermostat contact (B).

D. Economizer enthalpy control (if installed) is electrically bypassed with the heat pump control relay during heating operation.

E. Should the heat requirement be more than the heat pump can supply, a portion of the electric heat accessory (if supplied) is energized through thermostat contact (W3).

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

G. The unit will function in a defrost mode, reversing the refrigerant cycle to cooling and energizing the electric heat (if supplied) as required through the defrost relay.

H. If the refrigerant system becomes inoperable during a need for heating, the thermostat may be set to emergency heat which will energize the electric heat (if supplied).

At initial start-up or after extended shutdown periods make sure the crankcase heater is energized for at least 12 hours before the compressor is started.

J.6.2. Demand Defrost Control And High/Low Pressure Controls

The demand defrost control monitors the outdoor ambient temperature, outdoor coil temperature and the compressor run time to determine when a defrost cycle is required.

Enhanced Feature Demand Defrost Control: This defrost control has high and low pressure control inputs with unique pressure switch logic built into the microprocessor to provide compressor and system protection without nuisance lockouts. The control cycles the compressor off for 30 seconds at the beginning and the end of the defrost cycle to eliminate the increased compressor noise caused by rapidly changing system pressures when the reversing valve switches. See next page for diagnostic flash codes and sensor resistance values at various temperatures.

DEFROST INITIATION

A defrost will be initiated when the three conditions below are satisfied:

1. The outdoor coil temperature is below 35°F as measured by a good coil sensor,
2. The compressor has operated for at least 34 minutes with the outdoor coil temperature below 35°F and
3. The measured difference between the ambient temperature and the outdoor coil temperature is greater than the calculated difference determined by the defrost control microprocessor.

DEFROST TERMINATION

Once a defrost is initiated, the defrost will continue until fourteen minutes has elapsed or the coil temperature has reached the selected termination temperature. The factory setting is 70°F but can be changed to 50°F, 60°F, or 80°F by relocating the jumper on the control board.

TEMPERATURE SENSORS

The coil sensor is located on the outdoor coil near the point fed by the distribution tubes from the expansion device, on the top most cross-over tube. The ambient air sensor is located outside the control box so it can sense outdoor temperatures.

If the ambient sensor fails, the defrost control will initiate a defrost every 34 minutes of compressor run time with the coil temperature below 35°F.

If the coil sensor fails, the defrost control will not initiate a defrost.

TEST MODE

The test mode is initiated by shorting the TEST pins. The unit must have an active heat pump heating call to enter the test mode. In this mode of operation, the enable temperature is ignored and all timers are sped up. To initiate a manual defrost, short and hold the TEST pins. Remove the short when the system switches to defrost mode after the compressor noise abatement delay. The defrost will terminate on time (14 minutes) or when the termination temperature has been reached.

Test Sequence of Operation:

1) Provide a heating call to the heat pump.

2) Short test pins to bypass anti-short cycle timer. (If unit is running, this step is not necessary.)

3) Short test pins and hold them shorted to enter defrost mode.

4) Release test pins once control exits noise abatement delay.

5) Monitor coil temperature when control exits defrost.

6) Unit should return to heating mode.

TROUBLESHOOTING DEMAND DEFROST

During the test mode the coil temperature should be monitored. If the system exits defrost at approximately the termination temperature, the control is operating normlly. If not, check the coil and ambient temperature sensor resistances, using the sensor temperature vs. resistance table at the end of this section.

Immerse the sensor in water and measure the resistance of the sensor. At 35°F the resistance of the sensor should be approximately 30,000 ohms.

Ensure that the coil sensor is properly installed that is not loose or touching the cabinet.

HIGH/LOW PRESSURE CONTROL MONITORING - ENHANCED DEFROST CONTROL

Status of high and low pressure controls is monitored by the enhanced feature demand defrost control and the following actions are taken.

J. STARTUP AND OPERATION

High Pressure Control – Provides active protection in both cooling and heating modes at all outdoor ambient temperatures. The high pressure control is an automatic reset type and opens at approximately 610 psig and closes at approximately 420 psig. The compressor and fan motor will stop when the high pressure control opens and will start again if the high side pressure drops to approximately 420 psig where the automatic reset high pressure control resets. If the high pressure control opens 3 times within a particular call for heating or cooling operation, the defrost control will lock out compressor and outdoor fan operation.

Low Pressure Control – Provides active protection in both heating and cooling modes at all outdoor ambient temperatures. The low pressure control is an automatic reset type and opens at approximately 15 psig and closes at approximately 40 psig. Operation is slightly different between cooling and heating modes.

Cooling Mode: The compressor and fan motor will stop when the low pressure control opens and will start again when the low side pressure rises to approximately 40 psig after the low pressure control automatically resets. If the low pressure switch opens 3 times within a particular call for cooling operation, the defrost control will lock out compressor and outdoor fan operation.

Heating Mode: The compressor and outdoor fan motor will stop when the low pressure control opens and will start again when the low side pressure rises to approximately 40 psig when the low pressure control automatically resets. If the low pressure switch trips 3 times within 120 minutes of operation during a particular call for heating operation, the defrost control will lock out compressor and outdoor fan operation. If the lock-out due to low pressure occurs at an outdoor ambient temperature below 5°F, the defrost control will automatically exit the lock-out mode when the outdoor ambient temperature rises to 5°F. This feature is necessary since the low pressure control could possibly have opened due to the outdoor ambient being very low rather than an actual system fault.

Exiting Lock-Out Mode: To exit the lock-out mode, remove 24 volts to the defrost control by removing power to the unit or by shorting the two defrost control pins together.

DIAGNOSTIC CODES
SENSOR TEMPERATURE VS. RESISTANCE

LED 1	LED 2	Control Board Status
OFF	OFF	No Power
ON	ON	Coil Sensor Failure
OFF	ON	Ambient Sensor Failure
FLASH	FLASH	Normal
OFF	FLASH	Low Pressure Lockout (short test pins to reset)
FLASH	OFF	High Pressure Lockout (short test pins to reset)
ON	FLASH	Low Pressure Control Open
FLASH	ON	High Pressure Control Open
Alternate Flashing		5 Minute Time Delay

TABLE
REPLACEMENT PARTS

Degrees C	Degrees F	Ohms
-20	-4	96,974
-10	14	55,298
0	32	32,650
10	50	19,903
20	68	12,493
25	77	10,000
30	86	8,056
40	104	5,324

K.1. Air Flow Charts and Information

See ***Appendix C*** towards the end of this manual for Air Flow Performance Data.

K.2. Air Flow Adjustments

K.2.1. Blower Speed for 3-5 Ton Units

See ***Section J.3.2. Air Flow Measurements and Adjustments*** on how to increase the blower speed and increase airflow for the 3-5T units.

K.2.2. Blower Motor Controller for 5 ton High Static 460V and all 6 ton units.

See ***Section J.3.2. Air Flow Measurements and Adjustments*** on how to increase the blower speed and increase airflow on the 5 Ton High Static 460V and 6 Ton units that use a Blower Motor Controller.

K.2.3. Economizer Adjustments

Do not Fix a minimum postion on an economizer, set the minimum position through the control board only. See the instructions provided with the economizer for more info. The part numbers for these instructions are listed in section ***D.4.1. Economizer Information.***

M. DIAGNOSTICS

M.1. Diagnostics Chart

M.1.1.Cooling Diagnostics 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	• Check for correct voltage at compressor contactor in control box
	• Thermostat out of calibration-set too high	• Reset
	• Failed contactor	• Check for 24 volts at contactor coil - replace if contacts are open
	• Blown fuses	• Replace fuses
	• Transformer defective	• Check wiring-replace transformer
	• High pressure control open (if provided)	• Reset-also see high head pressure remedy-The high pressure control opens at 450 PSIG
	• Interconnecting low voltage wiring damaged	• Replace thermostat wiring
Condenser fan runs, compressor doesn't	• Loose connection	• Check for correct voltage at compressor - check & tighten all connections
	• Compressor stuck, grounded or open motor winding open internal overload.	• Wait at least 2 hours for overload to reset. If still open, replace the compressor.
	• Low voltage condition	At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
	• Low voltage condition	• Add start kit components
Insufficient cooling	• Improperly sized unit	• Recalculate load
	• Improper airflow	• Check - should be approximately 400 CFM per ton.
	• Incorrect refrigerant charge	• Charge per procedure attached to unit service panel.
	• Air, non-condensibles or moisture in system	• Recover refrigerant, evacuate & recharge, add filter drier
	• Incorrect voltage	• At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating.
Compressor short cycles	• Incorrect voltage	• At compressor terminals, voltage must be ± 10% of nameplate marking when unit is operating.
	• Defective overload protector	• Replace - check for correct voltage
	• Refrigerant undercharge	• 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	• Remove or replace defective component
	• Flow check piston size too small	• Change to correct size piston
	• Incorrect capillary tubes	• Change coil assembly
	• TXV does not open	• Replace TXV
High head-high or normal vapor pressure - Cooling mode	• Dirty condenser coil	• Clean coil
	• Refrigerant overcharge	• Correct system charge
	• Condenser fan not running	• Repair or replace
	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge
Low head-high vapor pressures	• Defective Compressor valves	• Replace compressor
	• Incorrect capillary tubes	• Replace coil assembly
Low vapor - cool compressor - iced evaporator coil	• Low evaporator airflow	• Increase speed of blower or reduce restriction - replace air filter
	• Operating below 65°F outdoors	• Add Low Ambient Kit
	• Moisture in system	• Recover refrigerant - evacuate & recharge - add filter drier
High vapor pressure	• Excessive load	• Recheck load calculation
	• Defective compressor	• Replace
Fluctuating head & vapor pressures	• TXV hunting	• Check TXV bulb clamp - check air distribution on coil - replace TXV
	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge

M.2. Alarm Codes – Full List

Alarm Codes		
CODE	Description	FAULT LEVEL
0	STAND BY	None
c	COMPRESSOR ON - Low (Flashing if in time delay)	None
C	COMPRESSOR ON - High (Flashing if in time delay)	None
E	Economizer Cooling - No Compressor	None
F	CONTINUOUS FAN	None
h	GAS HEAT ON - LOW-FIRE	None
H	GAS HEAT ON -HIGH-FIRE	None
4	Comfort Alert Code 4 for Compressor Circuit 1	Shutdown
5	Comfort Alert Code 5 for Compressor Circuit 1	Shutdown
6	Comfort Alert Code 6 for Compressor Circuit 1	Shutdown
7	Comfort Alert Code 7 for Compressor Circuit 1	Shutdown
8	Comfort Alert Code 8 for Compressor Circuit 1	Shutdown
9	Comfort Alert Code 9 for Compressor Circuit 1	Shutdown
11	FAILED IGNITION	Problem
12	LO FLAME SENSE	Warning
13	FLAME LOST	Problem
14	UNEXPECTED FLAME	Shutdown
15	HIGH-FIRE GAS VALVE IMPROPER VOLTAGE	Problem
20	REFRIGERANT LOW PRESSURE SWITCH OPEN - CIRCUIT 1	Problem
21	REFRIGERANT LOW PRESSURE SWITCH OPEN - CIRCUIT 2	Problem
22	MAIN LIMIT OPEN	Problem
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN - CIRCUIT 1	Problem
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN - CIRCUIT 2	Problem
33	MRLC (Rollout Limit) OPEN	Problem
34	Comfort Alert Code 4 for Compressor Circuit 2	Shutdown
35	Comfort Alert Code 5 for Compressor Circuit 2	Shutdown
36	Comfort Alert Code 6 for Compressor Circuit 2	Shutdown
37	Comfort Alert Code 7 for Compressor Circuit 2	Shutdown
38	Comfort Alert Code 8 for Compressor Circuit 2	Shutdown
39	Comfort Alert Code 9 for Compressor Circuit 2	Shutdown
42	Invalid Thermostat Selection	Warning
44	LOW-FIRE NEGATIVE PRESSURE CONTROL CLOSED	Problem
46	LOW-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem
49	FREEZE SWITCH OPEN - CIRCUIT 1	Problem
50	FREEZE SWITCH OPEN - CIRCUIT 2	Problem
55	2nd stage COMBUSTION PRESSURE SWITCH CLOSED	Problem
57	HIGH-FIRE NEGATIVE PRESSURE CONTROL CLOSED	Problem
59	Condensate Drain Plugged	Shutdown
61	HIGH-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem, Shutdown
83	Condenser Coil Temp Sensor Fail-OAT	Problem
84	Outdoor Air Temperature Sensor Fail-OAT	Problem
88	Emergency Stop Fault	Shutdown
93	CONTROL Fault	Shutdown
97	Smoke Detection	Shutdown

M. DIAGNOSTICS

M.2.1. Cooling Alarm Codes and Diagnostics

All Core Command come standard with a 7-segment diagnostic display. During standby mode with no fault codes present, the display will read “0” (zero). During normal thermostat heating, cooling or continuous fan operation, a letter will be displayed to describe the mode of operation as follows:

C = Cooling

F = Continuous Fan Operation

When the control senses a fault present, it will display a code to help in diagnoses. A list of normal operating codes and potential fault codes follows:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
0	Standby	None
c	Compressor On – Low (Flashing If In Time Delay)	None
C	Compressor On – High (Flashing If In Time Delay)	None
E	Economizer Cooling – No Compressor	None
F	Continuous Fan	None
4	Comfort Alert Code 4 For Compressor Circuit 1	Shutdown
5	Comfort Alert Code 5 For Compressor Circuit 1	Shutdown
6	Comfort Alert Code 6 For Compressor Circuit 1	Shutdown
7	Comfort Alert Code 7 For Compressor Circuit 1	Shutdown
8	Comfort Alert Code 8 For Compressor Circuit 1	Shutdown
9	Comfort Alert Code 9 For Compressor Circuit 1	Shutdown
20	Refrigerant Low Pressure Switch Open – Circuit 1	Problem
29	Refrigerant High Pressure Switch Open – Circuit 1	Problem
49	Freeze Switch Open – Circuit 1	Problem
59	Condensate Drain Plugged	Shutdown
83	Condenser Coil Temp Sensor Fail-Oct	Problem
84	Outdoor Air Temperature Sensor Fail-Oat	Problem
88	Emergency Stop Fault	Shutdown
93	Control Fault	Shutdown
97	Smoke Detection	Shutdown

The method for displaying a two-digit fault is to display the first digit for one second immediately followed by the second digit – which is also displayed for a duration of one second. A ½ second pause is then displayed. Cycle repeats until the fault is cleared. Each fault is flashed (displayed) a minimum of two times even if the fault condition has cleared before the fault can be displayed twice.

Normal Operation Mode:

0	Displayed anytime there is no fault present and no thermostat call present
c	COMPRESSOR ON - Low (Flashing if in time delay)
C	COMPRESSOR ON - High (Flashing if in time delay)
E	When the system uses Economizer Cooling with No Compressor
F	Displayed anytime thermostat calls for continuous fan

Fault Codes with Descriptions and Solutions:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
0	STANDBY	None
c	COMPRESSOR ON – Low (Flashing if in time delay)	None
C	COMPRESSOR ON – High (Flashing if in time delay)	None
E	Economizer Cooling – No Compressor	None
F	CONTINUOUS FAN	None
4	**Comfort Alert Code 4 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Locked Rotor Circuit 1	
	DESCRIPTION:	
	1. Circuit 1 shutdown and retry after Anti-Short Cycle Delay (ASCD) Maximum is 3 attempts.	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Low line voltage	
	2. Excessive Refrigerant in compressor	
	3. Seized bearings in compressor	
5	**Comfort Alert Code 5 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Open Circuit 1	
	DESCRIPTION:	
	1. Circuit 1 shutdown and retry after ASCD. Note: This alarm is sent by the Comfort Alert Module only after the fault has been sensed for a minimum of 4 hours.	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Condensing unit power disconnect is open	
	2. Compressor circuit breaker or fuses are open	
	3. Compressor contactor has failed open High pressure switch is open and requires manual reset	
	4. Broken supply wires or connector is notmaking contact	
	5. Unusually long compressor protector reset time due to extreme ambient temperature	
	6. Compressor windings are damaged	
6	**Comfort Alert Code 6 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Missing Phase Circuit 1	
	DESCRIPTION:	
	1. Circuit 1 shutdown	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Compressor fuse is open on one phase	
	2. Broken wire or connector on one phase	
	3. Compressor motor winding is damaged	
	4. Utility supply has dropped one phase	

M. DIAGNOSTICS

Fault Codes with Descriptions and Solutions:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
7	**Comfort Alert Code 7 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Reverse Phase Circuit 1	
	DESCRIPTION:	
	1. Run outdoor and indoor fans continuously for circuit 1 and change mode of operation to Unoccupied Auto. This procedure prevents the Space Temperature from reaching extreme values.	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Compressor running backward due to supply phase reversal	
8	**Comfort Alert Code 8 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Welded Contactor Circuit 1	
	DESCRIPTION:	
	1. Circuit 1 shutdown	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Compressor contactor has failed closed	
	2. Thermostat demand signal not connected to module	
9	**Comfort Alert Code 9 for Compressor Circuit 1**	Shutdown
	ALARM Designation: Low Voltage Circuit 1	
	DESCRIPTION:	
	1. Circuit 1 Shutdown and wait for voltage to return to operational levels.	
	SOLUTION/STATUS/Possible - Troubleshooting Information	
	1. Control circuit transformer is overloaded	
	2. Low line voltage to compressor	
20	**DESCRIPTION:** REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	Problem
	CAUSE:	
	1. Low evaporator airflow	
	2. Refrigerant undercharge	
	3. Restriction in liquid line, expansion device or filter drier	
	4. Operating below 65°F outdoors	
	5. Moisture in system	
	SOLUTION: The solution will depend on the cause.	
	1. Increase speed of blower or reduce restriction - replace air filter filter	
	2. Check for leaks - add refrigerant	
	3. Remove or replace defective component	
	4. Add Low Ambient Kit	
	5. Recover refrigerant - evacuate & recharge - add or replace filter drier	

Fault Codes with Descriptions and Solutions:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
29	**DESCRIPTION:** REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	Problem
	CAUSE:	
	1. Restriction in liquid line, expansion device or filter drier	
	2. Refrigerant overcharge	
	3. Condenser fan not running	
	4. Air or non-condensibles in system	
	SOLUTION: The solution will depend on the cause.	
	1. Recover refrigerant - evacuate & recharge remove or replace defective component	
	2. Remove refrigerant	
	3. Check voltage, Run Capacitor & Outdoor Motor Repair or replace	
	4. Recover refrigerant, evacuate & recharge	
49	**FREEZE SWITCH OPEN – CIRCUIT 1**	Problem
	DESCRIPTION:	
	1. Occurs when sensors are either open or shorted.	
	SOLUTION: The solution will depend on the cause.	
	1. Replace the sensor	
	2. Check sensor Is installed correctly on control	
59	**Condensate Drain Plugged**	Shutdown
	DESCRIPTION:	
	1. Condensate line is blocked water inside of unit	
	SOLUTION: The solution will depend on the cause.	
	1. Remove blockage	
	2. Remove condensate pan and clean	
83	**Condenser Coil Temp Sensor Fail-OCT**	Problem
	DESCRIPTION:	
	1. No defrost operation, but unit continues to operate in either heating or cooling.	
	SOLUTION: The solution will depend on the cause.	
	1. Extreme temperatures	
	2. Replace the sensor	
	3. Check that sensor is installed correctly on control	

M. DIAGNOSTICS

Fault Codes with Descriptions and Solutions:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
84	**Outdoor Air Temperature Sensor Fail-OAT** **DESCRIPTION:** 1. No defrost operation, but unit continues to operate in either heating or cooling. 2. The heat source continues to be heat pump, independently of the outdoor air temperature **SOLUTION:** The solution will depend on the cause. 1. Extreme temperatures 2. Replace the sensor 3. Check that sensor is installed correctly on control	Problem
88	**Emergency Stop Fault** **DESCRIPTION:** 1. Complete shutdown **SOLUTION:** The solution will depend on the cause. 1. Cannot be cleared by the 'Clear All Alarms" command. Must be cleared by changing the Emergency Stop Fault network value.	Shutdown
93	**CONTROL Fault** **DESCRIPTION:** 1. Internal Control fault. **SOLUTION:** The solution will depend on the cause. 1. Replace Control	Shutdown
91	**Smoke Detection** **DESCRIPTION:** 1. RTU-C reads the smoke detection input as open -- complete shutdown. **SOLUTION:** The solution will depend on the cause. 1. If not due to a fire, Replace the sensor, Check sensor is in stalled correctly on control 2. Check Smoke Detection Circuit, if no Smoke Detector is installed, ensure Economizer Smoke Bypass plug is installed	Shutdown

M.2.2. Non-applicable Fault Codes

The controls used in this product are common with a few other product families. Because of this, there are several fault codes that are programmed into the controls but DO NOT APPLY to this product. If one of these fault codes appear, clear the fault and continue diagnostics. If the code persists, power down the unit and reapply power before continuing diagnostics.

These non-applicable fault codes are listed below:

Alarm Codes - NON-APPLICABLE FAULT CODES		
CODE	Description	FAULT LEVEL
h	GAS HEAT ON - LOW-FIRE	None
H	GAS HEAT ON -HIGH-FIRE	None
11	FAILED IGNITION	Problem
12	LO FLAME SENSE	Warning
13	FLAME LOST	Problem
14	UNEXPECTED FLAME	Shutdown
15	HIGH-FIRE GAS VALVE IMPROPER VOLTAGE	Problem
21	REFRIGERANT LOW PRESSURE SWITCH OPEN - CIRCUIT 2	Problem
22	MAIN LIMIT OPEN	Problem
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN - CIRCUIT 2	Problem
33	MRLC (Rollout Limit) OPEN	Problem
34	Comfort Alert Code 4 for Compressor Circuit 2	Shutdown
35	Comfort Alert Code 5 for Compressor Circuit 2	Shutdown
36	Comfort Alert Code 6 for Compressor Circuit 2	Shutdown
37	Comfort Alert Code 7 for Compressor Circuit 2	Shutdown
38	Comfort Alert Code 8 for Compressor Circuit 2	Shutdown
39	Comfort Alert Code 9 for Compressor Circuit 2	Shutdown
42	Invalid Thermostat Selection	Warning
44	LOW-FIRE NEGATIVE PRESSURE CONTROL CLOSED	Problem
46	LOW-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem
50	FREEZE SWITCH OPEN - CIRCUIT 2	Problem
55	2nd stage COMBUSTION PRESSURE SWITCH CLOSED	Problem
57	HIGH-FIRE NEGATIVE PRESSURE CONTROL CLOSED	Problem
61	HIGH-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem, Shutdown

M.3. Common Mistakes

- These are a list of common mistakes made during installation.
- Drain Pan Connections, drain trap connected to the wrong outlet side, not connected at all, or insufficient trap depth.
- Connecting a W2 call only to try and get full heat all the time, Connect both W1 and W2 together if the job requirement or thermostat is setup for single stage heating.
- Connecting a Y2 call only to try and get full cooling all the time, Connect both Y1 and Y2 together if the job requirement or thermostat is setup for single stage cooling.
- Economizer connections, not installing the 3-wire jumper plug into the economizer wiring harness, if a factory option smoke detector is not used, this will cause a Smoke Detection Fault.

P. APPENDICES

Appendix A – General Product Data

GENERAL DATA - (-)HPC MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZR Series	036ACT	036ACU	036ADT	036ADU
Cooling Performance				Continued ->
Gross Cooling Capacity Btu [kW]	36,000 [10.55]	36,000 [10.55]	36,000 [10.55]	36,000 [10.55]
EER/SEER	11/14	11/14	11/14	11/14
Nominal CFM/AHRI Rated CFM [L/s]	1200/1280 [566/604]	1200/1280 [566/604]	1200/1280 [566/604]	1200/1280 [566/604]
AHRI Net Cooling Capacity Btu [kW]	35,400 [10.37]	35,400 [10.37]	35,400 [10.37]	35,400 [10.37]
Net Sensible Capacity Btu [kW]	26,300 [7.71]	26,300 [7.71]	26,300 [7.71]	26,300 [7.71]
Net Latent Capacity Btu [kW]	9,100 [2.67]	9,100 [2.67]	9,100 [2.67]	9,100 [2.67]
Net System Power kW	2.78	2.78	2.78	2.78
Heating Performance (Heat Pumps)				
High Temp. Btuh [kW] Rating	34,400 [10.08]	34,400 [10.08]	34,400 [10.08]	34,400 [10.08]
System Power KW / COP	2.82/3.7	2.82/3.7	2.82/3.7	2.82/3.7
Low Temp. Btuh [kW] Rating	20,000 [5.86]	20,000 [5.86]	20,000 [5.86]	20,000 [5.86]
System Power KW / COP	2.68/2.24	2.68/2.24	2.68/2.24	2.68/2.24
HSPF (Btu/Watts-hr)	8	8	8	8
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.71 [18]	0.71 [18]	0.71 [18]
Face Area sq. ft. [sq. m]	16.48 [1.53]	16.48 [1.53]	16.48 [1.53]	16.48 [1.53]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Smooth	Smooth	Smooth	Smooth
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	4600 [2171]	4600 [2171]	4600 [2171]	4600 [2171]
No. Motors/HP	1 at 1/5 HP	1 at 1/5 HP	1 at 1/5 HP	1 at 1/5 HP
Motor RPM	820	820	820	820
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	3/4	1 1/2	3/4	1
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	91 [2580]	91 [2580]	91 [2580]	91 [2580]
Weights				
Net Weight lbs. [kg]	557 [253]	557 [253]	557 [253]	557 [253]
Ship Weight lbs. [kg]	595 [270]	595 [270]	595 [270]	595 [270]

Appendix A – General Product Data

GENERAL DATA - (-)HPCZR MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZR Series	036AJT	036AJU
Cooling Performance		Continued ->
Gross Cooling Capacity Btu [kW]	36,000 [10.55]	36,000 [10.55]
EER/SEER	11/14	11/14
Nominal CFM/AHRI Rated CFM [L/s]	3000/1280 [1416/604]	3000/1280 [1416/604]
AHRI Net Cooling Capacity Btu [kW]	35,400 [10.37]	35,400 [10.37]
Net Sensible Capacity Btu [kW]	26,300 [7.71]	26,300 [7.71]
Net Latent Capacity Btu [kW]	9,100 [2.67]	9,100 [2.67]
Net System Power kW	2.78	2.78
Heating Performance (Heat Pumps)		
High Temp. Btuh [kW] Rating	34,400 [10.08]	34,400 [10.08]
System Power KW / COP	2.82/3.7	2.82/3.7
Low Temp. Btuh [kW] Rating	20,000 [5.86]	20,000 [5.86]
System Power KW / COP	2.68/2.24	2.68/2.24
HSPF (Btu/Watts-hr)	8	8
Compressor		
No./Type	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)	88	88
Outdoor Coil - Fin Type	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.71 [18]
Face Area sq. ft. [sq. m]	25.4 [2.36]	25.4 [2.36]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]
Refrigerant Control	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	11 [1.02]	11 [1.02]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller
No. Used/Diameter in. [mm]	2/24 [609.6]	2/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1
CFM [L/s]	8000 [3775]	8000 [3775]
No. Motors/HP	2 at 1/5 HP	2 at 1/5 HP
Motor RPM	820	820
Indoor Fan - Type	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Belt (Adjustable)	Belt (Adjustable)
No. Speeds	Single	Single
No. Motors	1	1
Motor HP	3/4	1 1/2
Motor RPM	1050	1050
Motor Frame Size	48	48
Filter - Type	Disposable	Disposable
Furnished	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x20x20 [51x508x508]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	91 [2580]	91 [2580]
Weights		
Net Weight lbs. [kg]	557 [253]	557 [253]
Ship Weight lbs. [kg]	595 [270]	595 [270]

P. APPENDICES

Appendix A – General Product Data

GENERAL DATA - (-)HPCZR MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZR Series	048ACT	048ACU	048ADT	048ADU
Cooling Performance				**Continued ->**
Gross Cooling Capacity Btu [kW]	47,000 [13.77]	47,000 [13.77]	47,000 [13.77]	47,000 [13.77]
EER/SEER	11/14	11/14	11/14	11/14
Nominal CFM/AHRI Rated CFM [L/s]	1600/1685 [755/795]	1600/1685 [755/795]	1600/1685 [755/795]	1600/1685 [755/795]
AHRI Net Cooling Capacity Btu [kW]	46,000 [13.48]	46,000 [13.48]	46,000 [13.48]	46,000 [13.48]
Net Sensible Capacity Btu [kW]	34,680 [10.16]	34,680 [10.16]	34,680 [10.16]	34,680 [10.16]
Net Latent Capacity Btu [kW]	11,320 [3.32]	11,320 [3.32]	11,320 [3.32]	11,320 [3.32]
Net System Power kW	4.04	4.04	4.04	4.04
Heating Performance (Heat Pumps)				
High Temp. Btuh [kW] Rating	46,000 [13.48]	46,000 [13.48]	46,000 [13.48]	46,000 [13.48]
System Power KW / COP	3.82/3.5	3.82/3.5	3.82/3.5	3.82/3.5
Low Temp. Btuh [kW] Rating	20,000 [5.86]	20,000 [5.86]	20,000 [5.86]	20,000 [5.86]
System Power KW / COP	3.6/2	3.6/2	3.6/2	3.6/2
HSPF (Btu/Watts-hr)	8	8	8	8
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Sound Rating (dB)	0	0	0	0
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.71 [18]	0.71 [18]	0.71 [18]
Face Area sq. ft. [sq. m]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Smooth	Smooth	Smooth	Smooth
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	5900 [2784]	5900 [2784]	5900 [2784]	5900 [2784]
No. Motors/HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	3/4	1 1/2	3/4	1
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	142 [4026]	142 [4026]	142 [4026]	142 [4026]
Weights				
Net Weight lbs. [kg]	580 [263]	580 [263]	580 [263]	580 [263]
Ship Weight lbs. [kg]	618 [280]	618 [280]	618 [280]	618 [280]

Appendix A – General Product Data

GENERAL DATA - (-)HPCZR MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZR Series	048AJT	048AJU	060ACT	060ACU
Cooling Performance				**Continued ->**
Gross Cooling Capacity Btu [kW]	47,000 [13.77]	47,000 [13.77]	59,500 [17.43]	59,500 [17.43]
EER/SEER	11/14	11/14	11/14	11/14
Nominal CFM/AHRI Rated CFM [L/s]	1600/1685 [755/795]	1600/1685 [755/795]	2000/2050 [944/967]	2000/2050 [944/967]
AHRI Net Cooling Capacity Btu [kW]	46,000 [13.48]	46,000 [13.48]	57,500 [16.85]	57,500 [16.85]
Net Sensible Capacity Btu [kW]	34,680 [10.16]	34,680 [10.16]	43,020 [12.6]	43,020 [12.6]
Net Latent Capacity Btu [kW]	11,320 [3.32]	11,320 [3.32]	14,480 [4.24]	14,480 [4.24]
Net System Power kW	4.04	4.04	4.96	4.96
Heating Performance (Heat Pumps)				
High Temp. Btuh [kW] Rating	46,000 [13.48]	46,000 [13.48]	57,500 [16.85]	57,500 [16.85]
System Power KW / COP	3.82/3.5	3.82/3.5	5.09/3.5	5.09/3.5
Low Temp. Btuh [kW] Rating	20,000 [5.86]	20,000 [5.86]	35,000 [10.25]	35,000 [10.25]
System Power KW / COP	3.6/2	3.6/2	5.1/2	5.1/2
HSPF (Btu/Watts-hr)	8	8	8	8
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.71 [18]	0.71 [18]	0.71 [18]
Face Area sq. ft. [sq. m]	16.48 [1.53]	16.48 [1.53]	16.52 [1.53]	16.52 [1.53]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Smooth	Smooth	Smooth	Smooth
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	5900 [2784]	5900 [2784]	5900 [2784]	5900 [2784]
No. Motors/HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	3/4	1 1/2	1	1 1/2
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	142 [4026]	142 [4026]	160 [4536]	160 [4536]
Weights				
Net Weight lbs. [kg]	580 [263]	580 [263]	583 [264]	583 [264]
Ship Weight lbs. [kg]	618 [280]	618 [280]	621 [282]	621 [282]
Ship Weight lbs. [kg]	595 [270]	595 [270]		

P. APPENDICES

Appendix A – General Product Data

GENERAL DATA - (-)HPCZR MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZR Series	060ADT	060ADU	060AJT	060AJU
Cooling Performance				
Gross Cooling Capacity Btu [kW]	59,500 [17.43]	59,500 [17.43]	59,500 [17.43]	59,500 [17.43]
EER/SEER	11/14	11/14	11/14	11/14
Nominal CFM/AHRI Rated CFM [L/s]	2000/2050 [944/967]	2000/2050 [944/967]	2000/2050 [944/967]	2000/2050 [944/967]
AHRI Net Cooling Capacity Btu [kW]	57,500 [16.85]	57,500 [16.85]	57,500 [16.85]	57,500 [16.85]
Net Sensible Capacity Btu [kW]	43,020 [12.6]	43,020 [12.6]	43,020 [12.6]	43,020 [12.6]
Net Latent Capacity Btu [kW]	14,480 [4.24]	14,480 [4.24]	14,480 [4.24]	14,480 [4.24]
Net System Power kW	4.96	4.96	4.96	4.96
Heating Performance (Heat Pumps)				
High Temp. Btuh [kW] Rating	57,500 [16.85]	57,500 [16.85]	57,500 [16.85]	57,500 [16.85]
System Power KW / COP	5.09/3.5	5.09/3.5	5.09/3.5	5.09/3.5
Low Temp. Btuh [kW] Rating	35,000 [10.25]	35,000 [10.25]	35,000 [10.25]	35,000 [10.25]
System Power KW / COP	5.1/2	5.1/2	5.1/2	5.1/2
HSPF (Btu/Watts-hr)	8	8	8	8
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.71 [18]	0.71 [18]	0.71 [18]
Face Area sq. ft. [sq. m]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	Smooth	Smooth	Smooth	Smooth
Tube Size in. [mm] OD	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]	0.375 [9.5]
Face Area sq. ft. [sq. m]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	5900 [2784]	5900 [2784]	5900 [2784]	5900 [2784]
No. Motors/HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP	1 at 1/2 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	1	1 1/5	1	1 1/2
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	160 [4536]	160 [4536]	160 [4536]	160 [4536]
Weights				
Net Weight lbs. [kg]	583 [264]	583 [264]	583 [264]	583 [264]
Ship Weight lbs. [kg]	621 [282]	621 [282]	621 [282]	621 [282]
Ship Weight lbs. [kg]	618 [280]	618 [280]	618 [280]	618 [280]

Appendix A – General Product Data

GENERAL DATA - (-)HPCZT MODELS
3.0-6.0 TON [10.6 - 21.1 kW]

Model (-)HPCZT Series	072ACT	072ACU	072ADT	072ADU
Cooling Performance1				
Gross Cooling Capacity Btu [kW]	70,000 [20.51]	70,000 [20.51]	70,000 [20.51]	70,000 [20.51]
EER/SEER2	11/NA	11/NA	11/NA	11/NA
Nominal CFM/AHRI Rated CFM [L/s]	2400/2400 [1133/1133]	2400/2400 [1133/1133]	2400/2400 [1133/1133]	2400/2400 [1133/1133]
AHRI Net Cooling Capacity Btu [kW]	68000 [19.92]	68000 [19.92]	68000 [19.92]	68000 [19.92]
Net Sensible Capacity Btu [kW]	50199.9 [14.71]	50199.9 [14.71]	50199.9 [14.71]	50199.9 [14.71]
Net Latent Capacity Btu [kW]	17800.1 [5.22]	17800.1 [5.22]	17800.1 [5.22]	17800.1 [5.22]
IEER3	14.1	14.1	14.1	14.1
Net System Power kW	6.18	6.18	6.18	6.18
Heating Performance (Heat Pumps)				
High Temp. Btuh [kW] Rating	68000 [19.92]	68000 [19.92]	68000 [19.92]	68000 [19.92]
System Power KW / COP	5.85/3.4	5.85/3.4	5.85/3.4	5.85/3.4
Low Temp. Btuh [kW] Rating	41000 [12.01]	41000 [12.01]	41000 [12.01]	41000 [12.01]
System Power KW / COP	5.34/2.25	5.34/2.25	5.34/2.25	5.34/2.25
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
MicroChannel Depth in. [mm]	1.26 [32]	1.26 [32]	1.26 [32]	1.26 [32]
Face Area sq. ft. [sq. m]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]	16.52 [1.53]
Rows / FPI [FPcm]	1 / 16 [9]	1 / 16 [9]	1 / 16 [9]	1 / 16 [9]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1.26 [32]	1.26 [32]	1.26 [32]	1.26 [32]
Face Area sq. ft. [sq. m]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]	7.52 [0.7]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]	1/26 [660.4]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	5900 [2784]	5900 [2784]	5900 [2784]	5900 [2784]
No. Motors/HP	1 at 1 HP	1 at 1 HP	1 at 1 HP	1 at 1 HP
Motor RPM	1075	1075	1075	1075
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]	1/11x11 [279x279]
Drive Type	Direct	Direct	Direct	Direct
No. Speeds	Multiple	Multiple	Multiple	Multiple
No. Motors	1	1	1	1
Motor HP	1 1/5	1 1/5	1 1/5	1 1/5
Motor RPM	1050	1050	1050	1050
Motor Frame Size	48	48	48	48
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]	(4)2x16x16 [51x406x406]
Refrigerant Charge Oz. [g]	160 [4536]	160 [4536]	160 [4536]	160 [4536]
Weights				
Net Weight lbs. [kg]	583 [264]	583 [264]	583 [264]	583 [264]
Ship Weight lbs. [kg]	621 [282]	621 [282]	621 [282]	621 [282]

P. APPENDICES

Appendix B – Electrical Data

See Appendix E for Electrical Data and Fuse Sizing specific to the Manufacturer's approved Electric Heater Kits.

ELECTRICAL DATA - (-)HPCZR SERIES										
		036ACT	036ACU	036ADT	036ADU	036AJT	036AJU	048ACT	048ACU	048ADT
Unit Information	Unit Operating Voltage Range	187-253	187-253	418-506	418-506	187-253	187-253	187-253	187-253	418-506
	Volts	208/230	208/230	460	460	208/230	208/230	208/230	208/230	460
	Phase	3	3	3	3	1	1	3	3	3
	Hz	60	60	60	60	60	60	60	60	60
	Minimum Circuit Ampacity	20	26	12	11	29	34	26	32	13
	Minimum Overcurrent Protection Device Size	25	30	15	15	35	40	30	35	15
	Maximum Overcurrent Protection Device Size	30	35	15	15	40	50	35	40	15
Compressor Motor	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	480	480	208/230	208/230	208/230	208/230	460
	Phase	3	3	3	3	1	1	3	3	3
	RPM	3450	3450	3450	3450	3450	3450	3450	3450	3450
	HP, Compressor 1	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3 1/2	3 1/2	3 1/2
	Amps (RLA), Comp. 1	11.6	11.6	6.4	6.4	22.6	22.6	15.3	15.3	6.9
	Amps (LRA), Comp. 1	73	73	38	38	79	79	83.1	83.1	41
Condenser Motor	No.	1	1	1	1	2	2	1	1	1
	Volts	208/230	208/230	480	480	208/230	208/230	208/230	208/230	460
	Phase	1	1	1	1	1	1	1	1	1
	HP	1/5	1/5	1/5	1/5	1/5	1/5	1/2	1/2	1/2
	Amps (FLA, each)	1.2	1.2	0.8	0.8	1.2	1.2	2.5	2.5	1.5
	Amps (LRA, each)	2.3	2.3	1.4	1.4	2.3	2.3	5.6	5.6	3.1
Evaporator Fan	No.	1	1	1	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	208/230	208/230	208/230	208/230	460
	Phase	1	1	1	1	1	1	1	1	1
	HP	3/4	1 1/2	3/4	1	3/4	1 1/2	3/4	1 1/2	3/4
	Amps (FLA, each)	6	6	3.2	3.2	6	6	6	6	3.2

Appendix B – Electrical Data (Cont.)

See Appendix E for Electrical Data and Fuse Sizing specific to the Manufacturer’s approved Electric Heater Kits.

ELECTRICAL DATA - (-)HPCZR SERIES										
		048ADU	048AJT	048AJU	060ACT	060ACU	060ADT	060ADU	060AJT	060AJU
Unit Information	Unit Operating Voltage Range	418-506	187-253	187-253	187-253	187-253	418-506	418-506	187-253	187-253
	Volts	460	208/230	208/230	208/230	208/230	460	460	208/230	208/230
	Phase	3	1	1	3	3	3	3	1	1
	Hz	60	60	60	60	60	60	60	60	60
	Minimum Circuit Ampacity	12	36	42	33	37	17	16	46	50
	Minimum Overcurrent Protection Device Size	15	45	50	40	45	20	20	60	60
Compressor Motor	Maximum Overcurrent Protection Device Size	15	50	60	45	50	20	20	70	70
	No.	1	1	1	1	1	1	1	1	1
	Volts	460	208/230	208/230	208/230	208/230	460	460	208/230	208/230
	Phase	3	1	1	3	3	3	3	1	1
	RPM	3450	3450	3450	3450	3450	3450	3450	3450	3450
	HP, Compressor 1	3 1/2	3 1/2	3 1/2	4	4	4	4	4	4
	Amps (RLA), Comp. 1	6.9	24.3	24.3	17.8	17.8	8.6	8.6	29.4	29.4
Condenser Motor	Amps (LRA), Comp. 1	41	117	117	110	110	52	52	134	134
	No.	1	1	1	1	1	1	1	1	1
	Volts	460	208/230	208/230	208/230	208/230	460	460	208/230	208/230
	Phase	1	1	1	1	1	1	1	1	1
	HP	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	Amps (FLA, each)	1.5	2.5	2.5	2.5	2.5	1.5	1.5	2.5	2.5
Evaporator Fan	Amps (LRA, each)	3.1	5.6	5.6	5.6	5.6	3.1	3.1	5.6	5.6
	No.	1	1	1	1	1	1	1	1	1
	Volts	460	208/230	208/230	208/230	208/230	460	460	208/230	208/230
	Phase	1	1	1	1	1	1	1	1	1
	HP	1 1/2	3/4	1 1/2	1	1 1/2	1	1 1/5	1	1 1/2
	Amps (FLA, each)	3.2	6	6	11.5	11.5	4	3.7	11.5	11.5

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Appendix B – Electrical Data

See Appendix E for Electrical Data and Fuse Sizing specific to the Manufacturer's approved Electric Heater Kits.

ELECTRICAL DATA - (-)HPCZT SERIES					
		072ACT	072ACU	072ADT	072ADU
Unit Information	Unit Operating Voltage Range	187-253	187-253	418-506	418-506
	Volts	208/230	208/230	460	460
	Phase	3	3	3	3
	Hz	60	60	60	60
	Minimum Circuit Ampacity	36	36	18	18
	Minimum Overcurrent Protection Device Size	45	45	25	25
	Maximum Overcurrent Protection Device Size	50	50	25	25
Compressor Motor	No.	1	1	1	1
	Volts	230	230	460	460
	Phase	3	3	3	3
	RPM	3450	3450	3450	3450
	HP, Compressor 1	5	5	5	5
	Amps (RLA), Comp. 1	17.6	17.6	8.5	8.5
	Amps (LRA), Comp. 1	136	136	66.1	66.1
	HP, Compressor 2				
	Amps (RLA), Comp. 2				
	Amps (LRA), Comp. 2				
Condenser Motor	No.	1	1	1	1
	Volts	230	230	460	460
	Phase	1	1	1	1
	HP	1	1	1	1
	Amps (FLA, each)	7.4	7.4	3.6	3.6
	Amps (LRA, each)				
Evaporator Fan	No.	1	1	1	1
	Volts	230	230	460	460
	Phase	1	1	1	1
	HP	1 1/5	1 1/5	1 1/5	1 1/5
	Amps (FLA, each)	6.6	6.6	3.7	3.7
	Amps (LRA, each)				

Appendix C – Air Flow Performance Data

3-5T - Low Static - Sideflow (208-230V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
(-)HPCZR036 (3T)	1050/1350	3/4 HP [559]	Fan - Tap 1	CFM	895	809	730	642	555	497	420	367
				WATTS	52	59	66	73	79	80	85	86
		3/4 HP [559]	Tap 2	CFM	1189	1111	1041	964	889	832	763	711
				WATTS	145	153	162	171	179	184	192	197
		3/4 HP [559]	Tap 3	CFM	1370	1297	1232	1163	1095	1038	974	922
				WATTS	201	211	221	231	240	248	257	264
		3/4 HP [559]	Cooling - Tap 4 *	CFM	1170	1091	1020	943	867	810	740	688
				WATTS	138	147	156	164	172	177	185	189
		3/4 HP [559]	High Speed - Tap 5	CFM	1513	1445	1389	1322	1269	1210	1153	1097
				WATTS	232	242	252	264	275	285	295	302
(-)HPCZR048 (4T)	1400/1800	3/4 HP [559]	Fan - Tap 1	CFM	895	809	730	642	555	497	420	367
				WATTS	52	59	66	73	79	80	85	86
		3/4 HP [559]	Tap 2	CFM	1288	1212	1144	1072	1001	944	878	825
				WATTS	175	185	194	203	212	219	227	233
		3/4 HP [559]	Tap 3	CFM	1567	1499	1439	1378	1318	1261	1203	1151
				WATTS	263	274	285	296	306	317	328	338
		3/4 HP [559]	Cooling - Tap 4 *	CFM	1507	1438	1376	1313	1250	1193	1133	1081
				WATTS	244	255	265	276	286	296	307	316
		3/4 HP [559]	High Speed - Tap 5	CFM	1876	1817	1766	1718	1671	1614	1564	1512
				WATTS	360	373	386	399	411	427	440	454
(-)HPCZR060 (5T)	1750/2250	1 HP [745]	Fan - Tap 1	CFM	1169	1092	1022	950	874	783	715	640
				WATTS	129	138	147	158	165	173	180	187
		1 HP [745]	Tap 2	CFM	1586	1519	1459	1399	1339	1279	1221	1161
				WATTS	283	294	305	316	329	340	351	361
		1 HP [745]	Tap 3	CFM	1852	1794	1738	1684	1628	1575	1523	1471
				WATTS	437	450	463	476	491	503	516	529
		1 HP [745]	Cooling - Tap 4 *	CFM	1954	1899	1845	1792	1739	1688	1639	1590
				WATTS	496	510	524	537	553	566	580	594
		1 HP [745]	High Speed - Tap 5	CFM	2298	2254	2199	2154	2106	2059	2014	1976
				WATTS	929	956	981	1001	1030	1056	1081	1105

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

Appendix C – Air Flow Performance Data (Cont.)

3-5T - High Static - Sideflow (208-230V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.8 [.2]	0.9 [.22]	1 [.25]	1.1 [.27]	1.2 [.3]	1.3 [.32]	1.4 [.35]	1.5 [.37]
(-)HPCZR036 (3T)	1050/1350	1 1/2 HP [1118.5]	Fan - Tap 1	CFM	1037	974	913	851	795	786	729	676
				WATTS	261	270	279	287	294	298	306	312
		1 1/2 HP [1118.5]	Tap 2	CFM	1393	1338	1286	1232	1183	1158	1107	1058
				WATTS	474	485	497	509	520	529	540	549
		1 1/2 HP [1118.5]	Tap 3	CFM	1588	1538	1491	1442	1397	1363	1314	1268
				WATTS	591	603	617	630	644	655	668	680
		1 1/2 HP [1118.5]	Cooling - Tap 4 *	CFM	1037	974	913	851	795	786	729	676
				WATTS	261	270	279	287	294	298	306	312
		1 1/2 HP [1118.5]	High Speed - Tap 5	CFM	1495	1443	1398	1352	1303	1252	1202	1147
				WATTS	493	508	519	531	542	555	563	575
(-)HPCZR048 (4T)	1400/1800	1 1/2 HP [1118.5]	Fan - Tap 1	CFM	1371	1316	1264	1209	1160	1109	1057	1008
				WATTS	461	472	484	495	506	517	527	537
		1 1/2 HP [1118.5]	Tap 2	CFM	1675	1627	1582	1535	1492	1444	1397	1352
				WATTS	643	656	671	684	699	712	725	738
		1 1/2 HP [1118.5]	Tap 3	CFM	1740	1693	1650	1605	1563	1516	1470	1426
				WATTS	681	695	711	725	740	754	768	781
		1 1/2 HP [1118.5]	Cooling - Tap 4 *	CFM	1360	1305	1252	1198	1148	1097	1045	996
				WATTS	454	466	477	488	499	510	520	530
		1 1/2 HP [1118.5]	High Speed - Tap 5	CFM	1800	1762	1721	1676	1641	1587	1546	1512
				WATTS	692	706	719	737	755	768	780	795
(-)HPCZR060 (5T)	1750/2250	1 1/2 HP [1118.5]	Fan - Tap 1	CFM	1527	1476	1427	1377	1330	1281	1232	1185
				WATTS	554	567	580	592	605	617	629	640
		1 1/2 HP [1118.5]	Tap 2	CFM	1523	1471	1423	1372	1326	1277	1227	1180
				WATTS	552	564	577	590	602	614	626	637
		1 1/2 HP [1118.5]	Tap 3	CFM	1935	1893	1855	1814	1776	1732	1689	1647
				WATTS	798	813	831	846	864	880	895	910
		1 1/2 HP [1118.5]	Cooling - Tap 4 *	CFM	1581	1531	1484	1435	1390	1341	1293	1247
				WATTS	587	599	613	626	640	652	664	676
		1 1/2 HP [1118.5]	High Speed - Tap 5	CFM	2151	2115	2082	2046	2013	1972	1932	1893
				WATTS	928	945	964	981	1001	1020	1037	1054

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

Appendix C – Air Flow Performance Data (Cont.)

3-5T - Low Static - Sideflow (460V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
(-)HPCZR036 (3T)	1050/1350	3/4 HP [559]	Fan - Tap 1	CFM	1110	956	870	792	709	630	549	512
				WATTS	79	78	84	91	98	104	110	111
		3/4 HP [559]	Low Heat -Tap 2	CFM	1255	1120	1040	965	887	813	738	697
				WATTS	145	147	155	163	172	179	186	190
		3/4 HP [559]	High Heat -Tap 3	CFM	1621	1534	1467	1401	1337	1273	1212	1163
				WATTS	311	321	334	346	357	368	379	388
		3/4 HP [559]	Cooling - Tap 4	CFM	1392	1276	1200	1128	1056	986	916	872
				WATTS	207	212	222	232	241	250	259	264
		3/4 HP [559]	High Speed - Tap 5	CFM	1745	1673	1618	1549	1497	1435	1388	1334
				WATTS	341	357	370	384	396	407	418	430
(-)HPCZR048 (4T)	1400/1800	3/4 HP [559]	Fan - Tap 1	CFM	1110	956	870	792	709	630	549	512
				WATTS	79	78	84	91	98	104	110	111
		3/4 HP [559]	Low Heat -Tap 2	CFM	1345	1222	1145	1072	998	926	854	812
				WATTS	186	190	199	208	217	225	234	239
		3/4 HP [559]	High Heat -Tap 3	CFM	1755	1686	1624	1561	1503	1443	1387	1334
				WATTS	372	386	399	413	425	437	449	461
		3/4 HP [559]	Cooling - Tap 4	CFM	1738	1667	1604	1541	1482	1422	1365	1313
				WATTS	365	378	391	404	417	429	441	452
		3/4 HP [559]	High Speed - Tap 5	CFM	2081	2034	1981	1922	1873	1816	1769	1722
				WATTS	560	576	592	609	625	641	657	672
(-)HPCZR060 (5T)	1750/2250	1 HP [745]	Fan - Tap 1	CFM	1235	1155	1077	1013	955	882	778	691
				WATTS	150	159	169	177	185	193	204	211
		1 HP [745]	Low Heat -Tap 2	CFM	1453	1382	1311	1246	1188	1131	1064	1002
				WATTS	186	198	209	219	228	236	246	255
		1 HP [745]	High Heat -Tap 3	CFM	1975	1921	1863	1808	1756	1707	1654	1602
				WATTS	541	557	573	590	605	618	632	644
		1 HP [745]	Cooling - Tap 4	CFM	2049	1996	1941	1887	1836	1788	1737	1687
				WATTS	591	608	625	642	657	672	686	699
		1 HP [745]	High Speed - Tap 5	CFM	2408	2367	2318	2267	2226	2177	2139	2089
				WATTS	861	884	900	921	939	957	974	996

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

Appendix C – Air Flow Performance Data (Cont.)

3-5T - High Static - Sideflow (460V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.8 [.2]	0.9 [.22]	1 [.25]	1.1 [.27]	1.2 [.3]	1.3 [.32]	1.4 [.35]	1.5 [.37]
(-)HPCZR036 (3T)	1050/1350	1 HP [745]	Fan - Tap 1	CFM	958	895	828	768	722	669	684	653
				WATTS	226	235	247	259	280	304	337	371
		1 HP [745]	Low Heat -Tap 2	CFM	958	895	828	768	722	669	684	653
				WATTS	226	235	247	259	280	304	337	371
		1 HP [745]	High Heat -Tap 3	CFM	1591	1540	1486	1434	1375	1311	1263	1179
				WATTS	637	649	659	668	670	667	664	649
		1 HP [745]	Cooling - Tap 4	CFM	1064	1002	938	879	831	776	780	741
				WATTS	295	304	315	327	345	365	391	417
		1 HP [745]	High Speed - Tap 5	CFM	1526	1481	1440	1392	1336	1285	1231	1175
				WATTS	531	540	552	563	578	588	598	610
(-)HPCZR048 (4T)	1400/1800	1 HP [745]	Fan - Tap 1	CFM	1061	1000	935	877	828	774	778	739
				WATTS	293	302	314	325	344	363	390	416
		1 HP [745]	Low Heat -Tap 2	CFM	1438	1384	1327	1272	1217	1156	1123	1052
				WATTS	537	549	559	569	576	579	585	581
		1 HP [745]	High Heat -Tap 3	CFM	1629	1579	1526	1474	1415	1350	1298	1211
				WATTS	662	674	684	693	694	689	684	666
		1 HP [745]	Cooling - Tap 4	CFM	1434	1380	1323	1269	1213	1152	1120	1049
				WATTS	535	546	557	567	574	577	583	580
		1 HP [745]	High Speed - Tap 5	CFM	1795	1751	1710	1668	1629	1581	1538	1490
				WATTS	721	734	745	758	770	784	795	811
(-)HPCZR060 (5T)	1750/2250	1 1/5 HP [895]	Fan - Tap 1	CFM	1063	1000	909	849	796	743	695	644
				WATTS	311	319	331	341	355	365	375	384
		1 1/5 HP [895]	Low Heat -Tap 2	CFM	1063	1000	909	849	796	743	695	644
				WATTS	311	319	331	341	355	365	375	384
		1 1/5 HP [895]	High Heat -Tap 3	CFM	1444	1390	1335	1279	1220	1161	1090	1035
				WATTS	468	487	488	499	505	514	513	521
		1 1/5 HP [895]	Cooling - Tap 4	CFM	1826	1795	1754	1714	1674	1636	1590	1540
				WATTS	681	700	720	738	757	774	787	799
		1 1/5 HP [895]	High Speed - Tap 5	CFM	2127	2076	2045	2000	1966	1930	1894	1871
				WATTS	906	924	941	958	977	1008	1021	1049

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

Appendix C – Air Flow Performance Data (Cont.)

6T - Low Static -Sideflow (230V)

Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa] 0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
(-)HPCZT072 (6T)	2100/2700	1.2 HP [895]	Fan/Low heat - Tap 1	CFM	1384	1319	1249	1188	1127	1066	1006	947
				WATTS	192	204	215	225	240	245	255	265
		1.2 HP [895]	High Heat -Tap 2	CFM	1874	1833	1778	1730	1680	1630	1584	1539
				WATTS	421	435	450	466	480	495	510	525
		1.2 HP [895]	Low Cool -Tap 3	CFM	1546	1488	1427	1372	1316	1261	1203	1149
				WATTS	258	270	282	298	310	318	330	338
		1.2 HP [895]	High Cool - Tap 4	CFM	2331	2290	2245	2204	2159	2118	2072	2036
				WATTS	700	718	730	745	760	782	797	820
		1.2 HP [895]	High Speed - Tap 5	CFM	2363	2330	2280	2237	2198	2164	2110	2071
				WATTS	771	792	808	824	843	860	875	890

6T - High Static -Sideflow (230V)

Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa] 0.8 [.2]	0.9 [.22]	1 [.25]	1.1 [.27]	1.2 [.3]	1.3 [.32]	1.4 [.35]	1.5 [.37]
(-)HPCZT072 (6T)	2100/2700	1.2 HP [895]	Fan/Low heat - Tap 1	CFM	1237	1182	1137	1076	996	961	906	853
				WATTS	364	373	386	396	405	409	421	431
		1.2 HP [895]	High Heat -Tap 2	CFM	2043	2004	1953	1917	1879	1828	1783	1750
				WATTS	834	850	861	876	891	906	925	938
		1.2 HP [895]	Low Cool -Tap 3	CFM	1149	1082	1030	969	891	837	781	728
				WATTS	338	345	357	365	374	383	393	403
		1.2 HP [895]	High Cool - Tap 4	CFM	2036	1996	1945	1908	1871	1819	1773	1743
				WATTS	820	835	845	860	877	890	910	924
		1.2 HP [895]	High Speed - Tap 5	CFM	2462	2416	2371	2337	2294	2251	2214	2165
				WATTS	1053	1063	1078	1085	1100	1113	1121	1135

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

P. APPENDICES

Appendix C – Air Flow Performance Data (Cont.)

6T - Low Static - Sideflow (460V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.1 [.02]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
(-)HPCZT072 (6T)	2100/2700	1.2 HP [895]	Fan/Low heat - Tap 1	CFM	1384	1319	1249	1188	1127	1066	1006	947
				WATTS	192	204	215	225	240	245	255	265
		1.2 HP [895]	High Heat -Tap 2	CFM	1863	1821	1765	1717	1650	1617	1571	1526
				WATTS	413	428	442	459	474	488	503	518
		1.2 HP [895]	Low Cool -Tap 3	CFM	1546	1488	1427	1372	1316	1261	1203	1149
				WATTS	258	270	282	298	310	318	330	338
		1.2 HP [895]	High Cool - Tap 4	CFM	2331	2290	2245	2204	2159	2118	2072	2036
				WATTS	700	718	730	745	760	782	797	820
		1.2 HP [895]	High Speed - Tap 5	CFM	2363	2330	2280	2237	2198	2164	2110	2071
				WATTS	771	792	808	824	843	860	875	890

6T - High Static - Sideflow (460V)												
Unit Model (Tonnage)	Manufacturer Recommended Airflow Range (Min/Max) CFM	Motor HP [W]	Motor Speed	CFM/ WATTS	External Static Pressure - Inches W.C. [kPa]							
					0.8 [.2]	0.9 [.22]	1 [.25]	1.1 [.27]	1.2 [.3]	1.3 [.32]	1.4 [.35]	1.5 [.37]
(-)HPCZT072 (6T)	2100/2700	1.2 HP [895]	Fan/Low heat - Tap 1	CFM	1237	1182	1137	1076	996	961	906	853
				WATTS	364	373	386	396	405	409	421	431
		1.2 HP [895]	High Heat -Tap 2	CFM	2043	2004	1953	1917	1879	1828	1783	1750
				WATTS	834	850	861	876	891	906	925	938
		1.2 HP [895]	Low Cool -Tap 3	CFM	1149	1082	1030	969	891	837	781	728
				WATTS	338	345	357	365	374	383	393	403
		1.2 HP [895]	High Cool - Tap 4	CFM	2036	1996	1945	1908	1871	1819	1773	1743
				WATTS	820	835	845	860	877	890	910	924
		1.2 HP [895]	High Speed - Tap 5	CFM	2462	2416	2371	2337	2294	2251	2214	2165
				WATTS	1053	1063	1078	1085	1100	1113	1121	1135

NOTES: For 575V units, add 30W (transformer wattage) to the watt values mentioned in the table.
Pressure drops across the 3-5T CFM range (1050 - 2250)
Wet coil: ~0.09 Inches W.C.*
Downflow: ~0.1 Inches W.C.*
Reheat coil: ~0.09 Inches W.C.*

Appendix C – Air Flow Performance Data (Cont.)

FLUSH MOUNT CONCENTRIC DIFFUSER PERFORMANCE INFORMATION								
Diffuser Model Number	CFM	Minimum Throw (feet)	Maximum Throw (feet)	Static Pressure Drop (Diffuser)	Static Pressure Drop (Adapter)	Sound (in Db)	Diffuser Face Return Area (sq. ft.)	Diffuser Face Supply Area (sq. ft.)
					CN-1805-142			
1017-0200A-00010	1000	9	12	0.14	0.057	20	2.1	3.37
	1200	12	16	0.2	0.08	25	2.1	3.37
	1400	15	20	0.26	0.105	30	2.1	3.37
	1600	17	23	0.33	0.134	30	2.1	3.37
	1800	20	26	0.41	0.17	35	2.1	3.37
	2000	22	29	0.5	0.21	40	2.1	3.37
	2400	25	32	0.68	0.29	45	2.1	3.37

DROP CONCENTRIC DIFFUSER PERFORMANCE INFORMATION								
Diffuser Model Number	CFM	Minimum Throw (feet)	Maximum Throw (feet)	Static Pressure Drop (Diffuser)	Static Pressure Drop (Adapter)	Sound (in Db)	Diffuser Face Return Area (sq. ft.)	Diffuser Face Supply Area (sq. ft.)
					CN-1805-142			
1018-0200A-00010	1000	9	23	0.07	0.057	12	4.06	2.82
	1200	10	24	0.11	0.08	15	4.06	2.82
	1400	12	26	0.15	0.105	19	4.06	2.82
	1600	13	28	0.19	0.134	21	4.06	2.82
	1800	15	30	0.24	0.17	26	4.06	2.82
	2000	17	32	0.3	0.21	30	4.06	2.82
	2400	19	34	0.43	0.29	32	4.06	2.82

FLUSH MOUNT CONCENTRIC DIFFUSER PERFORMANCE INFORMATION								
Diffuser Model Number For	CFM	Minimum Throw (feet)	Maximum Throw (feet)	Static Pressure Drop (Diffuser)	Static Pressure Drop (Adapter)	Sound (in Db)	Diffuser Face Return Area (sq. ft.)	Diffuser Face Supply Area (sq. ft.)
					CN-1805-141			
1017-300A-00010	2600	17	24	0.49	0.21	30	3.48	3.76
	2800	18	28	0.55	0.24	35	3.48	3.76
	3000	20	30	0.62	0.27	35	3.48	3.76
	3200	22	33	0.69	0.31	40	3.48	3.76
	3400	23	37	0.77	0.34	40	3.48	3.76

DROP CONCENTRIC DIFFUSER PERFORMANCE INFORMATION								
Diffuser Model Number	CFM	Minimum Throw (feet)	Maximum Throw (feet)	Static Pressure Drop (Diffuser)	Static Pressure Drop (Adapter)	Sound (in Db)	Diffuser Face Return Area (sq. ft.)	Diffuser Face Supply Area (sq. ft.)
					CN-1805-141			
1018-300A-00010	2600	22	39	0.34	0.21	32	5.69	3.1
	2800	23	40	0.39	0.24	38	5.69	3.1
	3000	25	42	0.45	0.27	40	5.69	3.1
	3200	26	43	0.53	0.31	41	5.69	3.1
	3400	27	45	0.61	0.34	42	5.69	3.1

Appendix C – Air Flow Performance Data (Cont.)

Airflow (cfm)	Downflow dP (inH20)	Horizontal dP (inH20)
1050	0.06	0.01
1150	0.07	0.01
1250	0.09	0.01
1350	0.10	0.01
1450	0.12	0.01
1550	0.13	0.02
1650	0.15	0.02
1750	0.17	0.02
1850	0.19	0.02
1950	0.21	0.02
2050	0.23	0.03
2150	0.26	0.03
2250	0.28	0.03
2350	0.31	0.04

Appendix D – Performance Data for 3Ton

COOLING PERFORMANCE DATA - (-)HPCZR036A																
Entering Indoor Air @ 80ºF [26.7ºC] dbE																
wbE		**71ºF [21.7ºC]**			**67ºF [19.4ºC]**			**63ºF [17.2ºC]**			**61ºF [16.1ºC]**			**59ºF [15.0ºC]**		
CFM [L/s]		1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]
DR		0.2	0.19	0.15	0.2	0.19	0.15	0.2	0.19	0.15	0.2	0.19	0.15	0.2	0.19	0.15
Outdoor Dry Bulb Temperature 75ºF [23.9ºC]	Total BTUH [kW]	44.1 [12.9]	43.7 [12.8]	42.3 [12.4]	41.4 [12.1]	41 [12]	39.7 [11.6]	39.4 [11.5]	39 [11.4]	37.7 [11.1]	38.7 [11.3]	38.3 [11.2]	37.1 [10.9]	38.3 [11.2]	37.9 [11.1]	36.7 [10.7]
	Sens BTUH [kW]	24.9 [7.3]	24.3 [7.1]	22.2 [6.5]	30.1 [8.8]	29.4 [8.6]	26.9 [7.9]	34.1 [10]	33.3 [9.8]	30.5 [8.9]	35.5 [10.4]	34.6 [10.1]	31.7 [9.3]	36.2 [10.6]	35.3 [10.3]	32.4 [9.5]
	Power	2.1	2.1	2	2.1	2.1	2	2.1	2.1	2	2.1	2.1	2	2.1	2.1	2
80ºF [26.7ºC]	Total BTUH [kW]	43 [12.6]	42.5 [12.5]	41.1 [12.1]	40.3 [11.8]	39.9 [11.7]	38.6 [11.3]	38.2 [11.2]	37.8 [11.1]	36.6 [10.7]	37.5 [11]	37.1 [10.9]	35.9 [10.5]	37.1 [10.9]	36.8 [10.8]	35.6 [10.4]
	Sens BTUH [kW]	24.4 [7.1]	23.8 [7]	21.8 [6.4]	29.6 [8.7]	28.9 [8.5]	26.5 [7.8]	33.6 [9.9]	32.8 [9.6]	30 [8.8]	34.9 [10.2]	34.1 [10]	31.2 [9.1]	35.7 [10.5]	34.8 [10.2]	31.9 [9.3]
	Power	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.1
85ºF [29.4ºC]	Total BTUH [kW]	41.7 [12.2]	41.3 [12.1]	40 [11.7]	39 [11.4]	38.6 [11.3]	37.4 [11]	37 [10.8]	36.6 [10.7]	35.4 [10.4]	36.3 [10.6]	35.9 [10.5]	34.8 [10.2]	35.9 [10.5]	35.5 [10.4]	34.4 [10.1]
	Sens BTUH [kW]	23.8 [7]	23.2 [6.8]	21.2 [6.2]	29 [8.5]	28.3 [8.3]	25.9 [7.6]	33 [9.7]	32.2 [9.4]	29.5 [8.6]	34.4 [10.1]	33.5 [9.8]	30.7 [9]	35.1 [10.3]	34.2 [10]	31.4 [9.2]
	Power	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
90ºF [32.2ºC]	Total BTUH [kW]	40.4 [11.8]	40 [11.7]	38.7 [11.3]	37.7 [11.1]	37.4 [10.9]	36.1 [10.6]	35.7 [10.5]	35.3 [10.4]	34.2 [10]	35 [10.3]	34.6 [10.2]	33.5 [9.8]	34.6 [10.1]	34.3 [10]	33.1 [9.7]
	Sens BTUH [kW]	23.1 [6.8]	22.5 [6.6]	20.6 [6]	28.3 [8.3]	27.6 [8.1]	25.3 [7.4]	32.3 [9.5]	31.5 [9.2]	28.9 [8.5]	33.7 [9.9]	32.8 [9.6]	30.1 [8.8]	34.4 [10.1]	33.6 [9.8]	30.8 [9]
	Power	2.5	2.5	2.4	2.5	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
95ºF [35.0ºC]	Total BTUH [kW]	39.1 [11.4]	38.7 [11.3]	37.4 [11]	36.4 [10.7]	36 [10.6]	34.8 [10.2]	34.3 [10.1]	34 [10]	32.9 [9.6]	33.6 [9.9]	33.3 [9.8]	32.2 [9.4]	33.2 [9.7]	32.9 [9.6]	31.8 [9.3]
	Sens BTUH [kW]	22.4 [6.6]	21.8 [6.4]	20 [5.9]	27.6 [8.1]	26.9 [7.9]	24.7 [7.2]	31.6 [9.3]	30.8 [9]	28.2 [8.3]	32.9 [9.7]	32.1 [9.4]	29.4 [8.6]	33.2 [9.7]	32.8 [9.6]	30.1 [8.8]
	Power	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.6	2.6	2.5
100ºF [37.8ºC]	Total BTUH [kW]	37.7 [11]	37.3 [10.9]	36.1 [10.6]	35 [10.2]	34.6 [10.1]	33.5 [9.8]	32.9 [9.6]	32.6 [9.5]	31.5 [9.2]	32.2 [9.4]	31.9 [9.3]	30.9 [9]	31.8 [9.3]	31.5 [9.2]	30.5 [8.9]
	Sens BTUH [kW]	21.5 [6.3]	21 [6.2]	19.2 [5.6]	26.8 [7.9]	26.1 [7.7]	23.9 [7]	30.8 [9]	30 [8.8]	27.5 [8.1]	32.1 [9.4]	31.3 [9.2]	28.7 [8.4]	31.8 [9.3]	31.5 [9.2]	29.4 [8.6]
	Power	2.8	2.8	2.7	2.8	2.8	2.7	2.8	2.8	2.7	2.8	2.8	2.7	2.8	2.8	2.7
105ºF [40.6ºC]	Total BTUH [kW]	36.2 [10.6]	35.8 [10.5]	34.6 [10.2]	33.5 [9.8]	33.1 [9.7]	32.1 [9.4]	31.4 [9.2]	31.1 [9.1]	30.1 [8.8]	30.7 [9]	30.4 [8.9]	29.4 [8.6]	30.3 [8.9]	30 [8.8]	29.1 [8.5]
	Sens BTUH [kW]	20.7 [6.1]	20.1 [5.9]	18.5 [5.4]	25.9 [7.6]	25.3 [7.4]	23.1 [6.8]	29.9 [8.8]	29.2 [8.5]	26.7 [7.8]	30.7 [9]	30.4 [8.9]	27.9 [8.2]	30.3 [8.9]	30 [8.8]	28.6 [8.4]
	Power	3	3	2.9	3	3	2.9	3	3	2.9	3	2.9	2.9	3	2.9	2.9
110ºF [43.3ºC]	Total BTUH [kW]	34.6 [10.1]	34.3 [10]	33.2 [9.7]	31.9 [9.4]	31.6 [9.3]	30.6 [9]	29.9 [8.8]	29.6 [8.7]	28.6 [8.4]	29.2 [8.6]	28.9 [8.5]	28 [8.2]	28.8 [8.4]	28.5 [8.4]	27.6 [8.1]
	Sens BTUH [kW]	19.7 [5.8]	19.2 [5.6]	17.6 [5.2]	25 [7.3]	24.3 [7.1]	22.3 [6.5]	29 [8.5]	28.2 [8.3]	25.9 [7.6]	29.2 [8.6]	28.9 [8.5]	27.1 [7.9]	28.8 [8.4]	28.5 [8.4]	27.6 [8.1]
	Power	3.2	3.2	3.1	3.2	3.2	3.1	3.2	3.2	3.1	3.2	3.1	3.1	3.2	3.1	3.1
115ºF [46.1ºC]	Total BTUH [kW]	33 [9.7]	32.7 [9.6]	31.6 [9.3]	30.3 [8.9]	30 [8.8]	29.1 [8.5]	28.3 [8.3]	28 [8.2]	27.1 [7.9]	27.6 [8.1]	27.3 [8]	26.4 [7.7]	27.2 [8]	26.9 [7.9]	26 [7.6]
	Sens BTUH [kW]	18.7 [5.5]	18.2 [5.3]	16.7 [4.9]	23.9 [7]	23.3 [6.8]	21.4 [6.3]	27.9 [8.2]	27.2 [8]	25 [7.3]	27.6 [8.1]	27.3 [8]	26.1 [7.7]	27.2 [8]	26.9 [7.9]	26 [7.6]
	Power	3.4	3.4	3.3	3.4	3.4	3.3	3.4	3.4	3.3	3.4	3.4	3.3	3.4	3.4	3.3
120ºF [48.9ºC]	Total BTUH [kW]	31.4 [9.2]	31 [9.1]	30 [8.8]	28.7 [8.4]	28.4 [8.3]	27.5 [8]	26.6 [7.8]	26.3 [7.7]	25.5 [7.5]	25.9 [7.6]	25.7 [7.5]	24.8 [7.3]	25.5 [7.5]	25.3 [7.4]	24.4 [7.2]
	Sens BTUH [kW]	17.6 [5.2]	17.1 [5]	15.7 [4.6]	22.8 [6.7]	22.3 [6.5]	20.4 [6]	26.6 [7.8]	26.2 [7.7]	24 [7]	25.9 [7.6]	25.7 [7.5]	24.8 [7.3]	25.5 [7.5]	25.3 [7.4]	24.4 [7.2]
	Power	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.5	3.6	3.6	3.5
125ºF [51.7ºC]	Total BTUH [kW]	29.6 [8.7]	29.3 [8.6]	28.4 [8.3]	26.9 [7.9]	26.7 [7.8]	25.8 [7.6]	24.9 [7.3]	24.6 [7.2]	23.8 [7]	24.2 [7.1]	23.9 [7]	23.2 [6.8]	23.8 [7]	23.6 [6.9]	22.8 [6.7]
	Sens BTUH [kW]	16.4 [4.8]	16 [4.7]	14.7 [4.3]	21.7 [6.4]	21.1 [6.2]	19.4 [5.7]	24.9 [7.3]	24.6 [7.2]	22.9 [6.7]	24.2 [7.1]	23.9 [7]	23.2 [6.8]	23.8 [7]	23.6 [6.9]	22.8 [6.7]
		3.9	3.9	3.8	3.9	3.9	3.8	3.9	3.9	3.8	3.9	3.8	3.8	3.9	3.8	3.8

DR —Depression ratio Total —Total capacity x 1000 BTUH NOTES:
dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH 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)].

P. APPENDICES

Appendix D – Performance Data for 3Ton

HEATING PERFORMANCE DATA - (-)HPCZR036A											
IDB			**60ºF [15.5ºC]**			**70ºF [21.1ºC]**			**80ºF [26.7ºC]**		
CFM [L/s]			1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]	1350 [637]	1280 [604]	1050 [496]
Outdoor Dry Bulb Temperature	0ºF [-17.8ºC]	Total BTUH [kW]	44.1 [12.9]	43.7 [12.8]	42.3 [12.4]	41.4 [12.1]	41 [12]	39.7 [11.6]	39.4 [11.5]	39 [11.4]	37.7 [11.1]
		Power	2.1	2.1	2	2.1	2.1	2	2.1	2.1	2
	5ºF [-15.0ºC]	Total BTUH [kW]	43 [12.6]	42.5 [12.5]	41.1 [12.1]	40.3 [11.8]	39.9 [11.7]	38.6 [11.3]	38.2 [11.2]	37.8 [11.1]	36.6 [10.7]
		Power	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1
	10ºF [-12.2ºC]	Total BTUH [kW]	41.7 [12.2]	41.3 [12.1]	40 [11.7]	39 [11.4]	38.6 [11.3]	37.4 [11]	37 [10.8]	36.6 [10.7]	35.4 [10.4]
		Power	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	15ºF [-9.4ºC]	Total BTUH [kW]	40.4 [11.8]	40 [11.7]	38.7 [11.3]	37.7 [11.1]	37.4 [10.9]	36.1 [10.6]	35.7 [10.5]	35.3 [10.4]	34.2 [10]
		Power	2.5	2.5	2.4	2.5	2.4	2.4	2.5	2.4	2.4
	20ºF [-6.7ºC]	Total BTUH [kW]	39.1 [11.4]	38.7 [11.3]	37.4 [11]	36.4 [10.7]	36 [10.6]	34.8 [10.2]	34.3 [10.1]	34 [10]	32.9 [9.6]
		Power	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
	25ºF [-3.9ºC]	Total BTUH [kW]	37.7 [11]	37.3 [10.9]	36.1 [10.6]	35 [10.2]	34.6 [10.1]	33.5 [9.8]	32.9 [9.6]	32.6 [9.5]	31.5 [9.2]
		Power	2.8	2.8	2.7	2.8	2.8	2.7	2.8	2.8	2.7
	30ºF [-1.1ºC]	Total BTUH [kW]	36.2 [10.6]	35.8 [10.5]	34.6 [10.2]	33.5 [9.8]	33.1 [9.7]	32.1 [9.4]	31.4 [9.2]	31.1 [9.1]	30.1 [8.8]
		Power	3	3	2.9	3	3	2.9	3	3	2.9
	35ºF [1.7ºC]	Total BTUH [kW]	34.6 [10.1]	34.3 [10]	33.2 [9.7]	31.9 [9.4]	31.6 [9.3]	30.6 [9]	29.9 [8.8]	29.6 [8.7]	28.6 [8.4]
		Power	3.2	3.2	3.1	3.2	3.2	3.1	3.2	3.2	3.1
	40ºF [4.4ºC]	Total BTUH [kW]	33 [9.7]	32.7 [9.6]	31.6 [9.3]	30.3 [8.9]	30 [8.8]	29.1 [8.5]	28.3 [8.3]	28 [8.2]	27.1 [7.9]
		Power	3.4	3.4	3.3	3.4	3.4	3.3	3.4	3.4	3.3
	45ºF [7.2ºC]	Total BTUH [kW]	31.4 [9.2]	31 [9.1]	30 [8.8]	28.7 [8.4]	28.4 [8.3]	27.5 [8]	26.6 [7.8]	26.3 [7.7]	25.5 [7.5]
		Power	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5
	50ºF [10.0ºC]	Total BTUH [kW]	29.6 [8.7]	29.3 [8.6]	28.4 [8.3]	26.9 [7.9]	26.7 [7.8]	25.8 [7.6]	24.9 [7.3]	24.6 [7.2]	23.8 [7]
		Power	3.9	3.9	3.8	3.9	3.9	3.8	3.9	3.9	3.8

IDB—Indoor air dry bulb [ ] Designates Metric Conversions

Appendix D – Performance Data for 4Ton

COOLING PERFORMANCE DATA - (-)HPCZR048A																
Entering Indoor Air @ 80ºF [26.7ºC] dbE																
wbE		**71ºF [21.7ºC]**			**67ºF [19.4ºC]**			**63ºF [17.2ºC]**			**61ºF [16.1ºC]**			**59ºF [15.0ºC]**		
CFM [L/s]		1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]
DR		0.19	0.17	0.13	0.19	0.17	0.13	0.19	0.17	0.13	0.19	0.17	0.13	0.19	0.17	0.13
Outdoor Dry Bulb Temperature 75ºF [23.9ºC]	Total BTUH [kW]	58.5 [17.1]	57.7 [16.9]	56 [16.4]	54.3 [15.9]	53.7 [15.7]	52 [15.2]	50.7 [14.8]	50 [14.7]	48.5 [14.2]	49 [14.4]	48.4 [14.2]	46.9 [13.7]	47.5 [13.9]	46.9 [13.7]	45.4 [13.3]
	Sens BTUH [kW]	34.3 [10]	33.2 [9.7]	30.6 [9]	40.1 [11.7]	38.8 [11.4]	35.8 [10.5]	44.3 [13]	42.9 [12.6]	39.5 [11.6]	45.5 [13.3]	44.1 [12.9]	40.6 [11.9]	45.8 [13.4]	44.4 [13]	40.9 [12]
	Power	3	3	2.9	3	3	2.9	3	2.9	2.9	3	2.9	2.9	2.9	2.9	2.9
80ºF [26.7ºC]	Total BTUH [kW]	56.9 [16.7]	56.2 [16.5]	54.4 [16]	52.7 [15.4]	52.1 [15.3]	50.5 [14.8]	49.1 [14.4]	48.5 [14.2]	47 [13.8]	47.4 [13.9]	46.8 [13.7]	45.4 [13.3]	45.9 [13.4]	45.3 [13.3]	43.9 [12.9]
	Sens BTUH [kW]	33.6 [9.8]	32.5 [9.5]	30 [8.8]	39.4 [11.5]	38.2 [11.2]	35.1 [10.3]	43.6 [12.8]	42.3 [12.4]	38.9 [11.4]	44.8 [13.1]	43.4 [12.7]	40 [11.7]	45.1 [13.2]	43.7 [12.8]	40.3 [11.8]
	Power	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3
85ºF [29.4ºC]	Total BTUH [kW]	55.2 [16.2]	54.6 [16]	52.9 [15.5]	51.1 [15]	50.5 [14.8]	48.9 [14.3]	47.4 [13.9]	46.9 [13.7]	45.4 [13.3]	45.8 [13.4]	45.2 [13.3]	43.8 [12.8]	44.3 [13]	43.7 [12.8]	42.4 [12.4]
	Sens BTUH [kW]	32.8 [9.6]	31.8 [9.3]	29.3 [8.6]	38.6 [11.3]	37.4 [11]	34.5 [10.1]	42.9 [12.6]	41.5 [12.2]	38.3 [11.2]	44.1 [12.9]	42.7 [12.5]	39.3 [11.5]	44.3 [13]	43 [12.6]	39.6 [11.6]
	Power	3.3	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.2	3.3	3.3	3.2	3.3	3.3	3.2
90ºF [32.2ºC]	Total BTUH [kW]	53.6 [15.7]	52.9 [15.5]	51.3 [15]	49.5 [14.5]	48.9 [14.3]	47.4 [13.9]	45.8 [13.4]	45.2 [13.3]	43.8 [12.8]	44.1 [12.9]	43.6 [12.8]	42.3 [12.4]	42.6 [12.5]	42.1 [12.3]	40.8 [12]
	Sens BTUH [kW]	32.1 [9.4]	31.1 [9.1]	28.6 [8.4]	37.9 [11.1]	36.7 [10.8]	33.8 [9.9]	42.1 [12.3]	40.8 [12]	37.6 [11]	43.3 [12.7]	41.9 [12.3]	38.6 [11.3]	42.6 [12.5]	42.1 [12.3]	38.9 [11.4]
	Power	3.5	3.5	3.4	3.5	3.5	3.4	3.5	3.5	3.4	3.5	3.5	3.4	3.5	3.5	3.4
95ºF [35.0ºC]	Total BTUH [kW]	51.9 [15.2]	51.3 [15]	49.7 [14.6]	47.8 [14]	47.2 [13.8]	45.8 [13.4]	44.1 [12.9]	43.6 [12.8]	42.2 [12.4]	42.5 [12.4]	42 [12.3]	40.7 [11.9]	40.9 [12]	40.4 [11.9]	39.2 [11.5]
	Sens BTUH [kW]	31.2 [9.2]	30.3 [8.9]	27.9 [8.2]	37 [10.9]	35.9 [10.5]	33.1 [9.7]	41.3 [12.1]	40 [11.7]	36.8 [10.8]	42.5 [12.4]	41.1 [12.1]	37.9 [11.1]	40.9 [12]	40.4 [11.9]	38.2 [11.2]
	Power	3.7	3.7	3.6	3.7	3.7	3.6	3.7	3.7	3.6	3.7	3.7	3.6	3.7	3.7	3.6
100ºF [37.8ºC]	Total BTUH [kW]	50.2 [14.7]	49.6 [14.5]	48.1 [14.1]	46.1 [13.5]	45.5 [13.3]	44.1 [12.9]	42.4 [12.4]	41.9 [12.3]	40.6 [11.9]	40.8 [12]	40.3 [11.8]	39 [11.4]	39.3 [11.5]	38.8 [11.4]	37.6 [11]
	Sens BTUH [kW]	30.4 [8.9]	29.4 [8.6]	27.1 [7.9]	36.2 [10.6]	35 [10.3]	32.3 [9.5]	40.4 [11.8]	39.1 [11.5]	36 [10.6]	40.8 [12]	40.3 [11.8]	37.1 [10.9]	39.3 [11.5]	38.8 [11.4]	37.4 [11]
	Power	3.9	3.9	3.9	3.9	3.9	3.8	3.9	3.9	3.8	3.9	3.9	3.8	3.9	3.9	3.8
105ºF [40.6ºC]	Total BTUH [kW]	48.5 [14.2]	47.9 [14]	46.5 [13.6]	44.4 [13]	43.9 [12.8]	42.5 [12.5]	40.7 [11.9]	40.2 [11.8]	39 [11.4]	39.1 [11.5]	38.6 [11.3]	37.4 [11]	37.5 [11]	37.1 [10.9]	35.9 [10.5]
	Sens BTUH [kW]	29.4 [8.6]	28.5 [8.4]	26.3 [7.7]	35.2 [10.3]	34.1 [10]	31.4 [9.2]	39.5 [11.6]	38.2 [11.2]	35.2 [10.3]	39.1 [11.5]	38.6 [11.3]	36.3 [10.6]	37.5 [11]	37.1 [10.9]	35.9 [10.5]
	Power	4.2	4.2	4.1	4.2	4.1	4.1	4.2	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
110ºF [43.3ºC]	Total BTUH [kW]	46.8 [13.7]	46.2 [13.5]	44.8 [13.1]	42.7 [12.5]	42.1 [12.3]	40.8 [12]	39 [11.4]	38.5 [11.3]	37.3 [10.9]	37.3 [10.9]	36.9 [10.8]	35.8 [10.5]	35.8 [10.5]	35.4 [10.4]	34.3 [10]
	Sens BTUH [kW]	28.5 [8.3]	27.6 [8.1]	25.4 [7.4]	34.3 [10]	33.2 [9.7]	30.6 [9]	38.5 [11.3]	37.3 [10.9]	34.3 [10.1]	37.3 [10.9]	36.9 [10.8]	35.4 [10.4]	35.8 [10.5]	35.4 [10.4]	34.3 [10]
	Power	4.4	4.4	4.3	4.4	4.4	4.3	4.4	4.4	4.3	4.4	4.4	4.3	4.4	4.4	4.3
115ºF [46.1ºC]	Total BTUH [kW]	45 [13.2]	44.5 [13]	43.1 [12.6]	40.9 [12]	40.4 [11.8]	39.2 [11.5]	37.2 [10.9]	36.8 [10.8]	35.7 [10.4]	35.6 [10.4]	35.2 [10.3]	34.1 [10]	34.1 [10]	33.6 [9.9]	32.6 [9.6]
	Sens BTUH [kW]	27.4 [8]	26.6 [7.8]	24.5 [7.2]	33.2 [9.7]	32.2 [9.4]	29.7 [8.7]	37.2 [10.9]	36.3 [10.6]	33.4 [9.8]	35.6 [10.4]	35.2 [10.3]	34.1 [10]	34.1 [10]	33.6 [9.9]	32.6 [9.6]
	Power	4.7	4.7	4.6	4.7	4.7	4.6	4.7	4.6	4.6	4.7	4.6	4.6	4.7	4.6	4.6
120ºF [48.9ºC]	Total BTUH [kW]	43.3 [12.7]	42.7 [12.5]	41.4 [12.1]	39.1 [11.5]	38.6 [11.3]	37.5 [11]	35.5 [10.4]	35 [10.3]	33.9 [9.9]	33.8 [9.9]	33.4 [9.8]	32.4 [9.5]	32.3 [9.5]	31.9 [9.3]	30.9 [9.1]
	Sens BTUH [kW]	26.4 [7.7]	25.5 [7.5]	23.5 [6.9]	32.2 [9.4]	31.2 [9.1]	28.7 [8.4]	35.5 [10.4]	35 [10.3]	32.5 [9.5]	33.8 [9.9]	33.4 [9.8]	32.4 [9.5]	32.3 [9.5]	31.9 [9.3]	30.9 [9.1]
	Power	5	4.9	4.9	5	4.9	4.9	5	4.9	4.9	4.9	4.9	4.8	4.9	4.9	4.8
125ºF [51.7ºC]	Total BTUH [kW]	41.5 [12.2]	41 [12]	39.7 [11.6]	37.3 [10.9]	36.9 [10.8]	35.7 [10.5]	33.7 [9.9]	33.2 [9.7]	32.2 [9.4]	32 [9.4]	31.6 [9.3]	30.6 [9]	30.5 [8.9]	30.1 [8.8]	29.2 [8.5]
	Sens BTUH [kW]	25.2 [7.4]	24.5 [7.2]	22.5 [6.6]	31 [9.1]	30.1 [8.8]	27.7 [8.1]	33.7 [9.9]	33.2 [9.7]	31.5 [9.2]	32 [9.4]	31.6 [9.3]	30.6 [9]	30.5 [8.9]	30.1 [8.8]	29.2 [8.5]
	Power	5.3	5.2	5.2	5.3	5.2	5.2	5.3	5.2	5.1	5.2	5.2	5.1	5.2	5.2	5.1

DR —Depression ratio Total —Total capacity x 1000 BTUH NOTES:
dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH 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)].

P. APPENDICES

Appendix D – Performance Data for 4Ton

HEATING PERFORMANCE DATA - (-)HPCZR048A										
IDB		60ºF [15.5ºC]			70ºF [21.1ºC]			80ºF [26.7ºC]		
CFM [L/s]		1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]	1800 [850]	1685 [795]	1400 [661]
Outdoor Dry Bulb Temperature 0ºF [-17.8ºC]	Total BTUH [kW]	13.3 [3.9]	13.2 [3.9]	13 [3.8]	12.8 [3.7]	12.7 [3.7]	12.6 [3.7]	12.3 [3.6]	12.3 [3.6]	12.1 [3.5]
	Power	3.1	3.1	3.2	3.2	3.2	3.3	4	4.1	4.2
5ºF [-15.0ºC]	Total BTUH [kW]	16.7 [4.9]	16.6 [4.9]	16.4 [4.8]	16.2 [4.8]	16.1 [4.7]	15.9 [4.7]	15.7 [4.6]	15.7 [4.6]	15.5 [4.5]
	Power	3.1	3.1	3.2	3.2	3.2	3.3	4.1	4.1	4.2
10ºF [-12.2ºC]	Total BTUH [kW]	20.1 [5.9]	20 [5.9]	19.8 [5.8]	19.6 [5.8]	19.5 [5.7]	19.3 [5.7]	19.2 [5.6]	19.1 [5.6]	18.9 [5.5]
	Power	3.1	3.2	3.2	3.2	3.3	3.3	4.1	4.1	4.2
15ºF [-9.4ºC]	Total BTUH [kW]	23.5 [6.9]	23.4 [6.9]	23.1 [6.8]	23.1 [6.8]	23 [6.7]	22.7 [6.6]	22.6 [6.6]	22.5 [6.6]	22.2 [6.5]
	Power	3.2	3.2	3.3	3.3	3.3	3.4	4.1	4.2	4.2
20ºF [-6.7ºC]	Total BTUH [kW]	27 [7.9]	26.8 [7.9]	26.5 [7.8]	26.5 [7.8]	26.4 [7.7]	26.1 [7.6]	26 [7.6]	25.9 [7.6]	25.6 [7.5]
	Power	3.2	3.2	3.3	3.3	3.3	3.4	4.2	4.2	4.3
25ºF [-3.9ºC]	Total BTUH [kW]	30.4 [8.9]	30.2 [8.9]	29.9 [8.8]	29.9 [8.8]	29.8 [8.7]	29.4 [8.6]	29.5 [8.6]	29.3 [8.6]	29 [8.5]
	Power	3.2	3.2	3.3	3.3	3.3	3.4	4.2	4.2	4.3
30ºF [-1.1ºC]	Total BTUH [kW]	33.8 [9.9]	33.7 [9.9]	33.3 [9.7]	33.4 [9.8]	33.2 [9.7]	32.8 [9.6]	32.9 [9.6]	32.7 [9.6]	32.3 [9.5]
	Power	3.2	3.3	3.3	3.3	3.4	3.4	4.2	4.2	4.3
35ºF [1.7ºC]	Total BTUH [kW]	37.2 [10.9]	37.1 [10.9]	36.6 [10.7]	36.8 [10.8]	36.6 [10.7]	36.2 [10.6]	36.3 [10.6]	36.1 [10.6]	35.7 [10.5]
	Power	3.3	3.3	3.4	3.4	3.4	3.5	4.2	4.3	4.4
40ºF [4.4ºC]	Total BTUH [kW]	40.7 [11.9]	40.5 [11.9]	40 [11.7]	40.2 [11.8]	40 [11.7]	39.5 [11.6]	39.7 [11.6]	39.6 [11.6]	39.1 [11.5]
	Power	3.3	3.3	3.4	3.4	3.4	3.5	4.3	4.3	4.4
45ºF [7.2ºC]	Total BTUH [kW]	44.1 [12.9]	43.9 [12.9]	43.4 [12.7]	43.6 [12.8]	43.4 [12.7]	42.9 [12.6]	43.2 [12.7]	43 [12.6]	42.4 [12.4]
	Power	3.3	3.4	3.4	3.4	3.5	3.5	4.3	4.3	4.4
50ºF [10.0ºC]	Total BTUH [kW]	47.5 [13.9]	47.3 [13.9]	46.7 [13.7]	47.1 [13.8]	46.8 [13.7]	46.3 [13.6]	46.6 [13.7]	46.4 [13.6]	45.8 [13.4]
	Power	3.4	3.4	3.5	3.4	3.5	3.6	4.3	4.4	4.4

IDB—Indoor air dry bulb [ ] Designates Metric Conversions

Appendix D – Performance Data for 5Ton

COOLING PERFORMANCE DATA - (-)HPCZR060A																
Entering Indoor Air @ 80ºF [26.7ºC] dbE																
wbE		71ºF [21.7ºC]			67ºF [19.4ºC]			63ºF [17.2ºC]			61ºF [16.1ºC]			59ºF [15.0ºC]		
CFM [L/s]		2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]
DR		0.17	0.15	0.12	0.17	0.15	0.12	0.17	0.15	0.12	0.17	0.15	0.12	0.17	0.15	0.12
Outdoor Dry Bulb Temperature																
75ºF [23.9ºC]	Total BTUH [kW]	75.4 [22.1]	74.1 [21.7]	72.1 [21.1]	69.6 [20.4]	68.4 [20]	66.6 [19.5]	64.2 [18.8]	63.1 [18.5]	61.4 [18]	61.6 [18.1]	60.5 [17.7]	58.9 [17.3]	59.1 [17.3]	58.1 [17]	56.5 [16.6]
	Sens BTUH [kW]	46.2 [13.5]	44.2 [12.9]	41.1 [12.1]	51.9 [15.2]	49.6 [14.5]	46.2 [13.5]	54.7 [16]	52.3 [15.3]	48.8 [14.3]	55.1 [16.1]	52.7 [15.4]	49.1 [14.4]	54.8 [16.1]	52.4 [15.4]	48.8 [14.3]
	Power	3.4	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.2
80ºF [26.7ºC]	Total BTUH [kW]	73.3 [21.5]	72 [21.1]	70.1 [20.5]	67.5 [19.8]	66.3 [19.4]	64.6 [18.9]	62.1 [18.2]	61 [17.9]	59.4 [17.4]	59.5 [17.4]	58.5 [17.1]	56.9 [16.7]	57 [16.7]	56 [16.4]	54.5 [16]
	Sens BTUH [kW]	45.1 [13.2]	43.1 [12.6]	40.2 [11.8]	50.8 [14.9]	48.5 [14.2]	45.2 [13.3]	53.6 [15.7]	51.3 [15]	47.8 [14]	54 [15.8]	51.7 [15.1]	48.1 [14.1]	53.7 [15.7]	51.3 [15]	47.8 [14]
	Power	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.5	3.5	3.4
85ºF [29.4ºC]	Total BTUH [kW]	71.1 [20.8]	69.8 [20.5]	68 [19.9]	65.3 [19.1]	64.2 [18.8]	62.5 [18.3]	59.9 [17.6]	58.8 [17.2]	57.3 [16.8]	57.3 [16.8]	56.3 [16.5]	54.8 [16.1]	54.8 [16.1]	53.8 [15.8]	52.4 [15.4]
	Sens BTUH [kW]	43.9 [12.9]	42 [12.3]	39.1 [11.5]	49.6 [14.5]	47.4 [13.9]	44.2 [12.9]	52.5 [15.4]	50.2 [14.7]	46.7 [13.7]	52.8 [15.5]	50.5 [14.8]	47.1 [13.8]	52.5 [15.4]	50.2 [14.7]	46.8 [13.7]
	Power	3.9	3.8	3.8	3.8	3.8	3.7	3.8	3.7	3.7	3.8	3.7	3.7	3.7	3.7	3.6
90ºF [32.2ºC]	Total BTUH [kW]	68.7 [20.1]	67.5 [19.8]	65.7 [19.3]	63 [18.5]	61.9 [18.1]	60.2 [17.7]	57.6 [16.9]	56.6 [16.6]	55.1 [16.1]	55 [16.1]	54 [15.8]	52.6 [15.4]	52.5 [15.4]	51.6 [15.1]	50.2 [14.7]
	Sens BTUH [kW]	42.7 [12.5]	40.8 [12]	38 [11.1]	48.3 [14.2]	46.2 [13.6]	43.1 [12.6]	51.2 [15]	49 [14.4]	45.6 [13.4]	51.6 [15.1]	49.3 [14.5]	46 [13.5]	51.3 [15]	49 [14.4]	45.7 [13.4]
	Power	4.1	4.1	4.1	4.1	4.1	4	4.1	4	4	4	4	3.9	4	4	3.9
95ºF [35.0ºC]	Total BTUH [kW]	66.3 [19.4]	65.1 [19.1]	63.4 [18.6]	60.5 [17.7]	59.5 [17.4]	57.9 [17]	55.1 [16.1]	54.2 [15.9]	52.7 [15.4]	52.5 [15.4]	51.6 [15.1]	50.2 [14.7]	50 [14.7]	49.2 [14.4]	47.8 [14]
	Sens BTUH [kW]	41.4 [12.1]	39.6 [11.6]	36.9 [10.8]	47 [13.8]	45 [13.2]	41.9 [12.3]	49.9 [14.6]	47.7 [14]	44.5 [13]	50.3 [14.7]	48.1 [14.1]	44.8 [13.1]	50 [14.6]	47.8 [14]	44.5 [13]
	Power	4.5	4.4	4.4	4.4	4.4	4.3	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2
100ºF [37.8ºC]	Total BTUH [kW]	63.7 [18.7]	62.6 [18.3]	60.9 [17.9]	58 [17]	57 [16.7]	55.4 [16.2]	52.5 [15.4]	51.6 [15.1]	50.3 [14.7]	50 [14.6]	49.1 [14.4]	47.8 [14]	47.5 [13.9]	46.6 [13.7]	45.4 [13.3]
	Sens BTUH [kW]	40 [11.7]	38.2 [11.2]	35.6 [10.4]	45.7 [13.4]	43.7 [12.8]	40.7 [11.9]	48.6 [14.2]	46.4 [13.6]	43.3 [12.7]	48.9 [14.3]	46.8 [13.7]	43.6 [12.8]	47.5 [13.9]	46.5 [13.6]	43.3 [12.7]
	Power	4.8	4.8	4.7	4.8	4.7	4.7	4.7	4.7	4.6	4.7	4.7	4.6	4.7	4.6	4.6
105ºF [40.6ºC]	Total BTUH [kW]	61 [17.9]	60 [17.6]	58.4 [17.1]	55.3 [16.2]	54.3 [15.9]	52.9 [15.5]	49.9 [14.6]	49 [14.4]	47.7 [14]	47.3 [13.9]	46.4 [13.6]	45.2 [13.2]	44.8 [13.1]	44 [12.9]	42.8 [12.5]
	Sens BTUH [kW]	38.6 [11.3]	36.9 [10.8]	34.4 [10.1]	44.2 [13]	42.3 [12.4]	39.4 [11.6]	47.1 [13.8]	45.1 [13.2]	42 [12.3]	47.3 [13.9]	45.4 [13.3]	42.3 [12.4]	44.8 [13.1]	44 [12.9]	42 [12.3]
	Power	5.2	5.2	5.1	5.2	5.1	5.1	5.1	5.1	5	5.1	5.1	5	5.1	5	5
110ºF [43.3ºC]	Total BTUH [kW]	58.2 [17.1]	57.2 [16.8]	55.7 [16.3]	52.5 [15.4]	51.5 [15.1]	50.2 [14.7]	47 [13.8]	46.2 [13.5]	45 [13.2]	44.5 [13]	43.7 [12.8]	42.5 [12.5]	42 [12.3]	41.2 [12.1]	40.1 [11.8]
	Sens BTUH [kW]	37.1 [10.9]	35.4 [10.4]	33 [9.7]	42.7 [12.5]	40.9 [12]	38.1 [11.2]	45.6 [13.4]	43.6 [12.8]	40.7 [11.9]	44.5 [13]	43.7 [12.8]	41 [12]	42 [12.3]	41.2 [12.1]	40.1 [11.8]
	Power	5.6	5.6	5.5	5.6	5.6	5.5	5.6	5.5	5.4	5.5	5.5	5.4	5.5	5.5	5.4
115ºF [46.1ºC]	Total BTUH [kW]	55.3 [16.2]	54.3 [15.9]	52.9 [15.5]	49.5 [14.5]	48.7 [14.3]	47.4 [13.9]	44.1 [12.9]	43.3 [12.7]	42.2 [12.4]	41.5 [12.2]	40.8 [12]	39.7 [11.6]	39 [11.4]	38.3 [11.2]	37.3 [10.9]
	Sens BTUH [kW]	35.5 [10.4]	33.9 [9.9]	31.6 [9.3]	41.2 [12.1]	39.4 [11.5]	36.7 [10.8]	44.1 [12.9]	42.1 [12.3]	39.3 [11.5]	41.5 [12.2]	40.8 [12]	39.6 [11.6]	39 [11.4]	38.3 [11.2]	37.3 [10.9]
	Power	6.1	6.1	6	6.1	6	5.9	6	6	5.9	6	5.9	5.9	6	5.9	5.8
120ºF [48.9ºC]	Total BTUH [kW]	52.2 [15.3]	51.3 [15]	50 [14.6]	46.5 [13.6]	45.7 [13.4]	44.5 [13]	41.1 [12]	40.3 [11.8]	39.3 [11.5]	38.5 [11.3]	37.8 [11.1]	36.8 [10.8]	36 [10.5]	35.3 [10.4]	34.4 [10.1]
	Sens BTUH [kW]	33.9 [9.9]	32.4 [9.5]	30.2 [8.8]	39.6 [11.6]	37.8 [11.1]	35.2 [10.3]	41.1 [12]	40.3 [11.8]	37.8 [11.1]	38.5 [11.3]	37.8 [11.1]	36.8 [10.8]	36 [10.5]	35.3 [10.4]	34.4 [10.1]
	Power	6.6	6.6	6.5	6.6	6.5	6.4	6.5	6.5	6.4	6.5	6.4	6.4	6.5	6.4	6.3
125ºF [51.7ºC]	Total BTUH [kW]	49.1 [14.4]	48.2 [14.1]	46.9 [13.8]	43.3 [12.7]	42.6 [12.5]	41.4 [12.1]	37.9 [11.1]	37.2 [10.9]	36.2 [10.6]	35.3 [10.3]	34.7 [10.2]	33.8 [9.9]	32.8 [9.6]	32.2 [9.4]	31.4 [9.2]
	Sens BTUH [kW]	32.2 [9.4]	30.8 [9]	28.7 [8.4]	37.9 [11.1]	36.2 [10.6]	33.7 [9.9]	37.9 [11.1]	37.2 [10.9]	36.2 [10.6]	35.3 [10.3]	34.7 [10.2]	33.8 [9.9]	32.8 [9.6]	32.2 [9.4]	31.4 [9.2]
	Power	7.2	7.1	7	7.1	7.1	7	7.1	7	6.9	7	7	6.9	7	7	6.9

DR —Depression ratio Total —Total capacity x 1000 BTUH NOTES:
dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH 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)].

P. APPENDICES

Appendix D – Performance Data for 5Ton

HEATING PERFORMANCE DATA - (-)HPCZR060A											
IDB			60ºF [15.5ºC]			70ºF [21.1ºC]			80ºF [26.7ºC]		
CFM [L/s]			2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]	2250 [1062]	2050 [967]	1750 [826]
Outdoor Dry Bulb Temperature	0ºF [-17.8ºC]	Total BTUH [kW]	23.3 [6.8]	23.2 [6.8]	22.9 [6.7]	22.3 [6.5]	22.1 [6.5]	21.9 [6.4]	21.2 [6.2]	21.1 [6.2]	20.9 [6.1]
		Power	5	5	5.1	5.1	5.1	5.2	6.1	6.2	6.3
	5ºF [-15.0ºC]	Total BTUH [kW]	26.9 [7.9]	26.7 [7.8]	26.4 [7.7]	25.9 [7.6]	25.7 [7.5]	25.4 [7.4]	24.8 [7.3]	24.6 [7.2]	24.4 [7.1]
		Power	4.9	4.9	5	5	5.1	5.2	6	6.1	6.2
	10ºF [-12.2ºC]	Total BTUH [kW]	30.5 [8.9]	30.3 [8.9]	29.9 [8.8]	29.4 [8.6]	29.2 [8.6]	28.9 [8.5]	28.4 [8.3]	28.2 [8.3]	27.9 [8.2]
		Power	4.8	4.9	5	4.9	5	5.1	6	6	6.1
	15ºF [-9.4ºC]	Total BTUH [kW]	34.1 [10]	33.8 [9.9]	33.5 [9.8]	33 [9.7]	32.8 [9.6]	32.4 [9.5]	32 [9.4]	31.7 [9.3]	31.4 [9.2]
		Power	4.8	4.8	4.9	4.9	4.9	5	5.9	6	6.1
	20ºF [-6.7ºC]	Total BTUH [kW]	37.6 [11]	37.4 [11]	37 [10.8]	36.6 [10.7]	36.3 [10.6]	36 [10.5]	35.5 [10.4]	35.3 [10.3]	34.9 [10.2]
		Power	4.7	4.8	4.8	4.8	4.9	5	5.8	5.9	6
	25ºF [-3.9ºC]	Total BTUH [kW]	41.2 [12.1]	40.9 [12]	40.5 [11.9]	40.2 [11.8]	39.9 [11.7]	39.5 [11.6]	39.1 [11.5]	38.9 [11.4]	38.4 [11.3]
		Power	4.6	4.7	4.8	4.7	4.8	4.9	5.8	5.8	5.9
	30ºF [-1.1ºC]	Total BTUH [kW]	44.8 [13.1]	44.5 [13]	44 [12.9]	43.7 [12.8]	43.4 [12.7]	43 [12.6]	42.7 [12.5]	42.4 [12.4]	42 [12.3]
		Power	4.6	4.6	4.7	4.7	4.7	4.8	5.7	5.8	5.9
	35ºF [1.7ºC]	Total BTUH [kW]	48.4 [14.2]	48 [14.1]	47.5 [13.9]	47.3 [13.9]	47 [13.8]	46.5 [13.6]	46.3 [13.6]	46 [13.5]	45.5 [13.3]
		Power	4.5	4.6	4.6	4.6	4.7	4.8	5.6	5.7	5.8
	40ºF [4.4ºC]	Total BTUH [kW]	51.9 [15.2]	51.6 [15.1]	51 [15]	50.9 [14.9]	50.5 [14.8]	50 [14.7]	49.9 [14.6]	49.5 [14.5]	49 [14.4]
		Power	4.4	4.5	4.6	4.5	4.6	4.7	5.6	5.6	5.7
	45ºF [7.2ºC]	Total BTUH [kW]	55.5 [16.3]	55.1 [16.2]	54.6 [16]	54.5 [16]	54.1 [15.9]	53.5 [15.7]	53.4 [15.7]	53.1 [15.6]	52.5 [15.4]
		Power	4.4	4.4	4.5	4.5	4.5	4.6	5.5	5.6	5.7
	50ºF [10.0ºC]	Total BTUH [kW]	59.1 [17.3]	58.7 [17.2]	58.1 [17]	58.1 [17]	57.7 [16.9]	57 [16.7]	57 [16.7]	56.6 [16.6]	56 [16.4]
		Power	4.3	4.4	4.4	4.4	4.5	4.6	5.4	5.5	5.6

IDB—Indoor air dry bulb [ ] Designates Metric Conversions

Appendix D – Performance Data for 6 Ton

COOLING PERFORMANCE DATA - (-)HPCZT072A

Entering Indoor Air @ 80ºF [26.7ºC] dbE

wbE		71ºF [21.7ºC]			67ºF [19.4ºC]			63ºF [17.2ºC]			61ºF [16.1ºC]			59ºF [15.0ºC]		
CFM [L/s]		2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]
DR		0.18	0.16	0.13	0.18	0.16	0.13	0.18	0.16	0.13	0.18	0.16	0.13	0.18	0.16	0.13
Outdoor Dry Bulb Temperature																
75ºF [23.9ºC]	Total BTUH [kW]	90.5 [26.5]	88.5 [25.9]	86.5 [25.3]	84.2 [24.7]	82.3 [24.1]	80.4 [23.6]	78.7 [23.1]	76.9 [22.5]	75.2 [22]	76.4 [22.4]	74.7 [21.9]	73 [21.4]	74.5 [21.8]	72.9 [21.3]	71.2 [20.9]
	Sens BTUH [kW]	53.4 [15.6]	50.4 [14.8]	47.5 [13.9]	65.3 [19.1]	61.7 [18.1]	58.1 [17]	74.4 [21.8]	70.3 [20.6]	66.2 [19.4]	76.4 [22.4]	73.2 [21.4]	68.9 [20.2]	74.5 [21.8]	72.9 [21.3]	70.4 [20.6]
	Power	4.1	4.1	4	4	4	3.9	4	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8
80ºF [26.7ºC]	Total BTUH [kW]	87.5 [25.6]	85.6 [25.1]	83.6 [24.5]	81.2 [23.8]	79.4 [23.3]	77.6 [22.7]	75.7 [22.2]	74 [21.7]	72.3 [21.2]	73.4 [21.5]	71.8 [21]	70.2 [20.6]	71.6 [21]	70 [20.5]	68.4 [20]
	Sens BTUH [kW]	50.8 [14.9]	48 [14.1]	45.2 [13.2]	62.7 [18.4]	59.3 [17.4]	55.8 [16.4]	71.8 [21]	67.9 [19.9]	63.9 [18.7]	73.4 [21.5]	70.7 [20.7]	66.6 [19.5]	71.6 [21]	70 [20.5]	68.1 [20]
	Power	4.4	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2	4.1	4.2	4.1	4.1
85ºF [29.4ºC]	Total BTUH [kW]	84.5 [24.8]	82.6 [24.2]	80.8 [23.7]	78.2 [22.9]	76.5 [22.4]	74.7 [21.9]	72.7 [21.3]	71.1 [20.8]	69.5 [20.4]	70.4 [20.6]	68.8 [20.2]	67.3 [19.7]	68.5 [20.1]	67 [19.6]	65.5 [19.2]
	Sens BTUH [kW]	48.3 [14.2]	45.7 [13.4]	43 [12.6]	60.3 [17.7]	56.9 [16.7]	53.6 [15.7]	69.4 [20.3]	65.5 [19.2]	61.7 [18.1]	70.4 [20.6]	68.4 [20]	64.4 [18.9]	68.5 [20.1]	67 [19.6]	65.5 [19.2]
	Power	4.7	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.4	4.5	4.5	4.4	4.5	4.4	4.4
90ºF [32.2ºC]	Total BTUH [kW]	81.5 [23.9]	79.6 [23.3]	77.8 [22.8]	75.1 [22]	73.5 [21.5]	71.8 [21]	69.6 [20.4]	68.1 [20]	66.5 [19.5]	67.4 [19.7]	65.9 [19.3]	64.4 [18.9]	65.5 [19.2]	64 [18.8]	62.6 [18.3]
	Sens BTUH [kW]	46 [13.5]	43.5 [12.7]	40.9 [12]	57.9 [17]	54.7 [16]	51.5 [15.1]	67 [19.6]	63.3 [18.6]	59.6 [17.5]	67.4 [19.7]	65.9 [19.3]	62.3 [18.3]	65.5 [19.2]	64 [18.8]	62.6 [18.3]
	Power	5	4.9	4.9	4.9	4.9	4.8	4.9	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.7
95ºF [35.0ºC]	Total BTUH [kW]	78.3 [23]	76.6 [22.4]	74.9 [21.9]	72 [21.1]	70.4 [20.6]	68.8 [20.2]	66.5 [19.5]	65 [19.1]	63.6 [18.6]	64.2 [18.8]	62.8 [18.4]	61.4 [18]	62.4 [18.3]	61 [17.9]	59.6 [17.5]
	Sens BTUH [kW]	43.8 [12.8]	41.4 [12.1]	38.9 [11.4]	55.7 [16.3]	52.6 [15.4]	49.6 [14.5]	64.8 [19]	61.2 [17.9]	57.6 [16.9]	64.2 [18.8]	62.8 [18.4]	60.3 [17.7]	62.4 [18.3]	61 [17.9]	59.6 [17.5]
	Power	5.3	5.3	5.2	5.3	5.2	5.2	5.2	5.2	5.1	5.2	5.1	5.1	5.2	5.1	5
100ºF [37.8ºC]	Total BTUH [kW]	75.2 [22]	73.5 [21.5]	71.8 [21]	68.9 [20.2]	67.3 [19.7]	65.8 [19.3]	63.4 [18.6]	62 [18.2]	60.5 [17.7]	61.1 [17.9]	59.7 [17.5]	58.4 [17.1]	59.2 [17.3]	57.9 [17]	56.6 [16.6]
	Sens BTUH [kW]	41.7 [12.2]	39.4 [11.5]	37.1 [10.9]	53.6 [15.7]	50.6 [14.8]	47.7 [14]	62.7 [18.4]	59.2 [17.4]	55.8 [16.3]	61.1 [17.9]	59.7 [17.5]	58.4 [17.1]	59.2 [17.3]	57.9 [17]	56.6 [16.6]
	Power	5.7	5.7	5.6	5.7	5.6	5.5	5.6	5.5	5.5	5.6	5.5	5.4	5.5	5.5	5.4
105ºF [40.6ºC]	Total BTUH [kW]	72 [21.1]	70.4 [20.6]	68.8 [20.1]	65.6 [19.2]	64.2 [18.8]	62.7 [18.4]	60.1 [17.6]	58.8 [17.2]	57.5 [16.8]	57.8 [17]	56.6 [16.6]	55.3 [16.2]	56 [16.4]	54.7 [16]	53.5 [15.7]
	Sens BTUH [kW]	39.7 [11.6]	37.5 [11]	35.3 [10.3]	51.6 [15.1]	48.8 [14.3]	45.9 [13.5]	60.1 [17.6]	57.3 [16.8]	54 [15.8]	57.8 [17]	56.6 [16.6]	55.3 [16.2]	56 [16.4]	54.7 [16]	53.5 [15.7]
	Power	6.1	6	6	6	6	5.9	6	5.9	5.9	5.9	5.9	5.8	5.9	5.9	5.8
110ºF [43.3ºC]	Total BTUH [kW]	68.7 [20.1]	67.2 [19.7]	65.6 [19.2]	62.4 [18.3]	61 [17.9]	59.6 [17.5]	56.9 [16.7]	55.6 [16.3]	54.3 [15.9]	54.6 [16]	53.4 [15.6]	52.2 [15.3]	52.7 [15.4]	51.5 [15.1]	50.4 [14.8]
	Sens BTUH [kW]	37.8 [11.1]	35.7 [10.5]	33.6 [9.9]	49.7 [14.6]	47 [13.8]	44.2 [13]	56.9 [16.7]	55.6 [16.3]	52.3 [15.3]	54.6 [16]	53.4 [15.6]	52.2 [15.3]	52.7 [15.4]	51.5 [15.1]	50.4 [14.8]
	Power	6.5	6.5	6.4	6.5	6.4	6.3	6.4	6.3	6.3	6.4	6.3	6.2	6.3	6.3	6.2
115ºF [46.1ºC]	Total BTUH [kW]	65.4 [19.2]	63.9 [18.7]	62.5 [18.3]	59 [17.3]	57.7 [16.9]	56.4 [16.5]	53.5 [15.7]	52.4 [15.3]	51.2 [15]	51.3 [15]	50.1 [14.7]	49 [14.4]	49.4 [14.5]	48.3 [14.1]	47.2 [13.8]
	Sens BTUH [kW]	36.1 [10.6]	34.1 [10]	32.1 [9.4]	48 [14.1]	45.3 [13.3]	42.7 [12.5]	53.5 [15.7]	52.4 [15.3]	50.8 [14.9]	51.3 [15]	50.1 [14.7]	49 [14.4]	49.4 [14.5]	48.3 [14.1]	47.2 [13.8]
	Power	7	6.9	6.8	6.9	6.8	6.8	6.8	6.8	6.7	6.8	6.7	6.7	6.8	6.7	6.6
120ºF [48.9ºC]	Total BTUH [kW]	62 [18.2]	60.6 [17.8]	59.2 [17.4]	55.7 [16.3]	54.4 [16]	53.2 [15.6]	50.2 [14.7]	49.1 [14.4]	47.9 [14]	47.9 [14]	46.8 [13.7]	45.8 [13.4]	46 [13.5]	45 [13.2]	44 [12.9]
	Sens BTUH [kW]	34.4 [10.1]	32.5 [9.5]	30.6 [9]	46.4 [13.6]	43.8 [12.8]	41.2 [12.1]	50.2 [14.7]	49.1 [14.4]	47.9 [14]	47.9 [14]	46.8 [13.7]	45.8 [13.4]	46 [13.5]	45 [13.2]	44 [12.9]
	Power	7.4	7.4	7.3	7.4	7.3	7.2	7.3	7.2	7.1	7.3	7.2	7.1	7.2	7.2	7.1
125ºF [51.7ºC]	Total BTUH [kW]	58.6 [17.2]	57.3 [16.8]	56 [16.4]	52.2 [15.3]	51.1 [15]	49.9 [14.6]	46.7 [13.7]	45.7 [13.4]	44.7 [13.1]	44.5 [13]	43.5 [12.7]	42.5 [12.4]	42.6 [12.5]	41.6 [12.2]	40.7 [11.9]
	Sens BTUH [kW]	32.9 [9.6]	31.1 [9.1]	29.3 [8.6]	44.8 [13.1]	42.4 [12.4]	39.9 [11.7]	46.7 [13.7]	45.7 [13.4]	44.7 [13.1]	44.5 [13]	43.5 [12.7]	42.5 [12.4]	42.6 [12.5]	41.6 [12.2]	40.7 [11.9]
	Power	7.9	7.8	7.8	7.9	7.8	7.7	7.8	7.7	7.6	7.8	7.7	7.6	7.7	7.6	7.6

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

dbE —Entering air dry bulb Sens —Sensible capacity x 1000 BTUH 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)].

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Appendix D – Performance Data for 6 Ton

HEATING PERFORMANCE DATA - (-)HPCZT072A											
IDB			60ºF [15.5ºC]			70ºF [21.1ºC]			80ºF [26.7ºC]		
CFM [L/s]			2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]	2700 [1274]	2400 [1133]	2100 [991]
Outdoor Dry Bulb Temperature	0ºF [-17.8ºC]	Total BTUH [kW]	12.5 [3.7]	12.4 [3.6]	12.3 [3.6]	9.7 [2.8]	9.6 [2.8]	9.5 [2.8]	6.9 [2]	6.8 [2]	6.7 [2]
		Power	4	4.1	4.1	4.5	4.6	4.7	5.2	5.2	5.3
	5ºF [-15.0ºC]	Total BTUH [kW]	18.5 [5.4]	18.4 [5.4]	18.2 [5.3]	15.7 [4.6]	15.6 [4.6]	15.4 [4.5]	12.9 [3.8]	12.8 [3.7]	12.6 [3.7]
		Power	4.1	4.1	4.2	4.6	4.7	4.7	5.2	5.3	5.4
	10ºF [-12.2ºC]	Total BTUH [kW]	24.5 [7.2]	24.3 [7.1]	24.1 [7.1]	21.7 [6.4]	21.5 [6.3]	21.3 [6.2]	18.9 [5.5]	18.7 [5.5]	18.5 [5.4]
		Power	4.1	4.2	4.2	4.7	4.7	4.8	5.3	5.4	5.4
	15ºF [-9.4ºC]	Total BTUH [kW]	30.6 [9]	30.3 [8.9]	30 [8.8]	27.7 [8.1]	27.5 [8.1]	27.2 [8]	24.9 [7.3]	24.7 [7.2]	24.4 [7.2]
		Power	4.2	4.2	4.3	4.7	4.8	4.9	5.3	5.4	5.5
	20ºF [-6.7ºC]	Total BTUH [kW]	36.6 [10.7]	36.2 [10.6]	35.9 [10.5]	33.7 [9.9]	33.4 [9.8]	33.1 [9.7]	30.9 [9.1]	30.6 [9]	30.3 [8.9]
		Power	4.2	4.3	4.3	4.8	4.8	4.9	5.4	5.5	5.6
	25ºF [-3.9ºC]	Total BTUH [kW]	42.6 [12.5]	42.2 [12.4]	41.8 [12.3]	39.7 [11.6]	39.4 [11.5]	39 [11.4]	36.9 [10.8]	36.6 [10.7]	36.2 [10.6]
		Power	4.3	4.3	4.4	4.8	4.9	5	5.4	5.5	5.6
	30ºF [-1.1ºC]	Total BTUH [kW]	48.6 [14.2]	48.1 [14.1]	47.7 [14]	45.7 [13.4]	45.3 [13.3]	44.9 [13.2]	42.9 [12.6]	42.5 [12.5]	42.1 [12.3]
		Power	4.3	4.4	4.5	4.9	5	5	5.5	5.6	5.7
	35ºF [1.7ºC]	Total BTUH [kW]	54.6 [16]	54.1 [15.9]	53.6 [15.7]	51.7 [15.2]	51.3 [15]	50.8 [14.9]	48.9 [14.3]	48.5 [14.2]	48 [14.1]
		Power	4.4	4.4	4.5	4.9	5	5.1	5.5	5.6	5.7
	40ºF [4.4ºC]	Total BTUH [kW]	60.6 [17.8]	60.1 [17.6]	59.5 [17.4]	57.8 [16.9]	57.2 [16.8]	56.7 [16.6]	54.9 [16.1]	54.4 [15.9]	53.9 [15.8]
		Power	4.4	4.5	4.6	5	5.1	5.1	5.6	5.7	5.8
	45ºF [7.2ºC]	Total BTUH [kW]	66.6 [19.5]	66 [19.3]	65.4 [19.2]	63.8 [18.7]	63.2 [18.5]	62.6 [18.4]	60.9 [17.9]	60.4 [17.7]	59.8 [17.5]
		Power	4.5	4.6	4.6	5	5.1	5.2	5.7	5.7	5.8
	50ºF [10.0ºC]	Total BTUH [kW]	72.6 [21.3]	72 [21.1]	71.3 [20.9]	69.8 [20.4]	69.1 [20.3]	68.5 [20.1]	66.9 [19.6]	66.3 [19.4]	65.7 [19.3]
		Power	4.5	4.6	4.7	5.1	5.2	5.3	5.7	5.8	5.9

IDB—Indoor air dry bulb [ ] Designates Metric Conversions

Appendix E – Heater Kit Characteristics

208/230V, THREE PHASE, 60 Hz, AUXILARY ELECTRIC HEATER KIT CHARACTERISTICS AND APPLICATION									
Single Power Supply for Both Unit and Heater Kit						Separate Power Supply for Both Unit and Heater Kit			
	Heater Kit			Air Conditioner		Heater Kit		Air Conditioner	
UNIT MODEL NUMBER	MODEL NO. RXJJ-	Rated Heater KW @ 208/230	FLA	UNIT MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)
(-)HPCZR036ACT	NONE	-	-	19/19	25/25	-	-	19/19	25/25
	DC10CP	7.5/10	20.9/24.1	34/38	35/40	27/31	30/35	19/19	25/25
	DC15CP	11.3/15	31.4/36.2	47/53	50/60	40/46	40/50	19/19	25/25
	DC20CP	15/20	41.7/48.1	60/68	60/70	53/61	60/70	19/19	25/25
(-)HPCZR036ACU	NONE	-	-	25/25	35/35	-	-	25/25	35/35
	DC10CP	7.5/10	20.9/24.1	41/45	45/45	27/31	30/35	25/25	35/35
	DC15CP	11.3/15	31.4/36.2	54/60	60/60	40/46	40/50	25/25	35/35
	DC20CP	15/20	41.7/48.1	67/75	70/80	53/61	60/70	25/25	35/35
(-)HPCZR048ACT	NONE	-	-	25/25	35/35	-	-	25/25	35/35
	DC10CP	7.5/10	20.9/24.1	34/38	35/40	27/31	30/35	25/25	35/35
	DC15CP	11.3/15	31.4/36.2	47/53	50/60	40/46	40/50	25/25	35/35
	DC20CP	15/20	41.7/48.1	60/68	60/70	53/61	60/70	25/25	35/35
(-)HPCZR048ACU	NONE	-	-	31/31	40/40	-	-	31/31	40/40
	DC10CP	7.5/10	20.9/24.1	41/45	45/45	27/31	30/35	31/31	40/40
	DC15CP	11.3/15	31.4/36.2	54/60	60/60	40/46	40/50	31/31	40/40
	DC20CP	15/20	41.7/48.1	67/75	70/80	53/61	60/70	31/31	40/40
(-)HPCZR060ACT	NONE	-	-	34/34	45/45	-	-	34/34	45/45
	DC10CP	7.5/10	20.9/24.1	41/45	45/45	27/31	30/35	34/34	45/45
	DC15CP	11.3/15	31.4/36.2	54/60	60/60	40/46	40/50	34/34	45/45
	DC20CP	15/20	41.7/48.1	67/75	70/80	53/61	60/70	34/34	45/45
(-)HPCZR060ACU	NONE	-	-	34/34	45/45	-	-	34/34	45/45
	DC10CP	7.5/10	20.9/24.1	41/45	45/45	27/31	30/35	34/34	45/45
	DC15CP	11.3/15	31.4/36.2	54/60	60/60	40/46	40/50	34/34	45/45
	DC20CP	15/20	41.7/48.1	67/75	70/80	53/61	60/70	34/34	45/45

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Appendix E – Heater Kit Characteristics

208/230V, SINGLE PHASE, 60 Hz, AUXILARY ELECTRIC HEATER KIT CHARACTERISTICS AND APPLICATION

UNIT MODEL NUMBER	Single Power Supply for Both Unit and Heater Kit					Separate Power Supply for Both Unit and Heater Kit			
	Heater Kit			Air Conditioner		Heater Kit		Air Conditioner	
	MODEL NO. RXJJ-	Rated Heater KW @ 208/230	FLA	UNIT MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)
(-)HPCZR036AJT	NONE	-	-	25/25	35/35	-	-	25/25	35/35
	DC10JT	7.5/10	36.2/41.7	53/60	60/60	46/53	50/60	25/25	35/35
	DC15JT	11.3/15	54.3/62.7	76/86	80/90	68/79	70/80	25/25	35/35
	DC20JT	15/20	72.2/83.3	98/112	100/125	91/105	100/110	25/25	35/35
(-)HPCZR036AJU	NONE	-	-	31/31	40/40	-	-	31/31	40/40
	DC10JT	7.5/10	36.2/41.7	60/67	60/70	46/53	50/60	31/31	40/40
	DC15JT	11.3/15	54.3/62.7	83/93	90/100	68/79	70/80	31/31	40/40
	DC20JT	15/20	72.2/83.3	105/119	110/125	91/105	100/110	31/31	40/40
(-)HPCZR048AJT	NONE	-	-	34/34	50/50	-	-	34/34	50/50
	DC10JT	7.5/10	36.2/41.7	53/60	60/60	46/53	50/60	34/34	50/50
	DC15JT	11.3/15	54.3/62.7	76/86	80/90	68/79	70/80	34/34	50/50
	DC20JT	15/20	72.2/83.3	98/112	100/125	91/105	100/110	34/34	50/50
(-)HPCZR048AJU	NONE	-	-	40/40	50/50	-	-	40/40	50/50
	DC10JT	7.5/10	36.2/41.7	60/67	60/70	46/53	50/60	40/40	50/50
	DC15JT	11.3/15	54.3/62.7	83/93	90/100	68/79	70/80	40/40	50/50
	DC20JT	15/20	72.2/83.3	105/119	110/125	91/105	100/110	40/40	50/50
(-)HPCZR060AJT	NONE	-	-	46/46	70/70	-	-	46/46	70/70
	DC10JT	7.5/10	36.2/41.7	60/67	70/70	46/53	50/60	46/46	70/70
	DC15JT	11.3/15	54.3/62.7	83/93	90/100	68/79	70/80	46/46	70/70
	DC20JT	15/20	72.2/83.3	105/119	110/125	91/105	100/110	46/46	70/70
(-)HPCZR060AJU	NONE	-	-	46/46	70/70	-	-	46/46	70/70
	DC10JT	7.5/10	36.2/41.7	60/67	70/70	46/53	50/60	46/46	70/70
	DC15JT	11.3/15	54.3/62.7	83/93	90/100	68/79	70/80	46/46	70/70
	DC20JT	15/20	72.2/83.3	105/119	110/125	91/105	100/110	46/46	70/70

Appendix E – Heater Kit Characteristics

460V, THREE PHASE, 60 Hz, AUXILARY ELECTRIC HEATER KIT CHARACTERISTICS AND APPLICATION									
	Single Power Supply for Both Unit and Heater Kit					Separate Power Supply for Both Unit and Heater Kit			
	Heater Kit			Air Conditioner		Heater Kit		Air Conditioner	
UNIT MODEL NUMBER	MODEL NO. RXJJ-	Rated Heater KW @ 208/230	FLA	UNIT MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)
(-)HPCZR036ADT	NONE	-	-	11	15	-	-	11	15
	DC10DNV	10	12	19	20	15	15	11	15
	DC15DNV	15	18.1	27	30	23	25	11	15
	DC20DNV	20	24.1	35	35	31	35	11	15
(-)HPCZR036ADU	NONE	-	-	10	15	-	-	10	15
	DC10DNV	10	12	18	20	15	15	10	15
	DC15DNV	15	18.1	26	30	23	25	10	15
	DC20DNV	20	24.1	33	35	31	35	10	15
(-)HPCZR048ADT	NONE	-	-	13	15	-	-	13	15
	DC10DNV	10	12	19	20	15	15	13	15
	DC15DNV	15	18.1	27	30	23	25	13	15
	DC20DNV	20	24.1	35	35	31	35	13	15
(-)HPCZR048ADU	NONE	-	-	12	15	-	-	12	15
	DC10DNV	10	12	18	20	15	15	12	15
	DC15DNV	15	18.1	26	30	23	25	12	15
	DC20DNV	20	24.1	33	35	31	35	12	15
(-)HPCZR060ADT	NONE	-	-	15	20	-	-	15	20
	DC10DNV	10	12	20	20	15	15	15	20
	DC15DNV	15	18.1	28	30	23	25	15	20
	DC20DNV	20	24.1	36	40	31	35	15	20
(-)HPCZR060ADU	NONE	-	-	15	20	-	-	15	20
	DC10DNV	10	12	20	20	15	15	15	20
	DC15DNV	15	18.1	28	30	23	25	15	20
	DC20DNV	20	24.1	36	40	31	35	15	20

P. APPENDICES

Appendix E – Heater Kit Characteristics

460V, THREE PHASE, 60 Hz, AUXILIARY ELECTRIC HEATER KIT CHARACTERISTICS AND APPLICATION

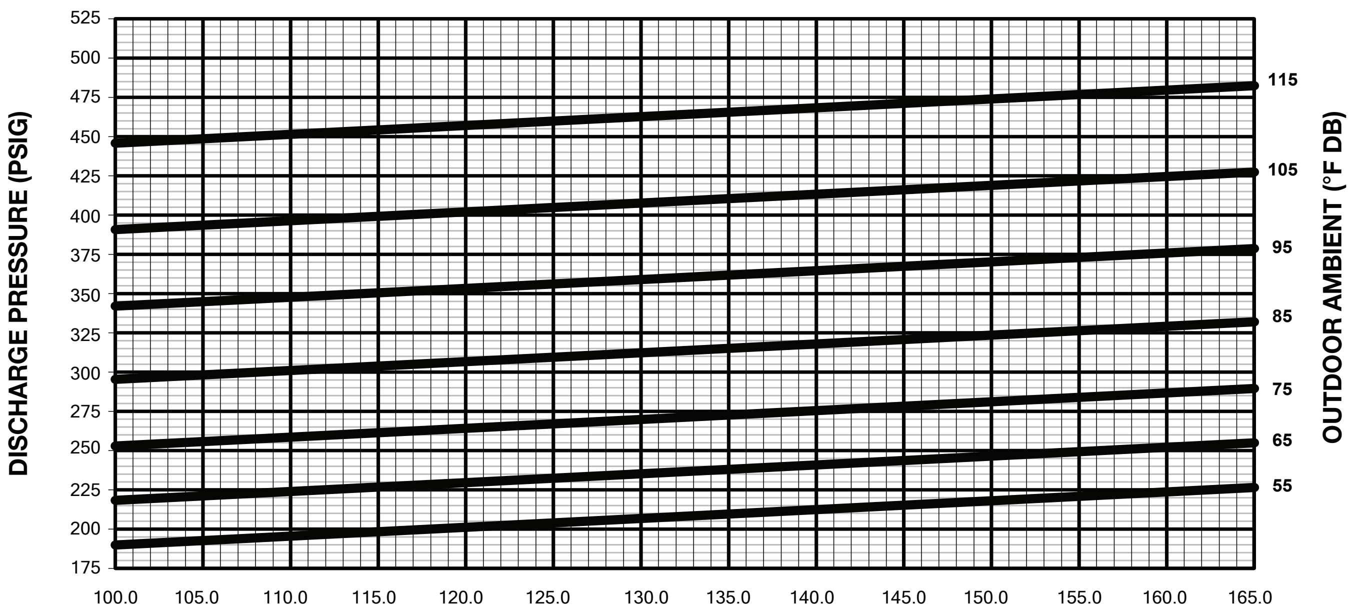
	Single Power Supply for Both Unit and Heater Kit					Separate Power Supply for Both Unit and Heater Kit			
	Heater Kit			Air Conditioner		Heater Kit		Air Conditioner	
UNIT MODEL NUMBER	MODEL NO. RXJJ-	Rated Heater KW @ 208/230	FLA	UNIT MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)
(-)HPCZT072ADT	-NONE-	-	-	18	25	-	-	18	25
	DC15DNV	15.0	18.1	41	45	23	25	18	25
	DC20DNV	20.0	24.1	49	50	31	35	18	25
	DC24DNV	24.0	28.9	55	60	37	40	18	25
(-)HPCZT072ADU	-NONE-	-	-	18	25	-	-	18	25
	DC15DNV	15.0	18.1	41	45	23	25	18	25
	DC20DNV	20.0	24.1	49	50	31	35	18	25
	DC24DNV	24.0	28.9	55	60	37	40	18	25

208/230V, THREE PHASE, 60 Hz, AUXILARY ELECTRIC HEATER KIT CHARACTERISTICS AND APPLICATION

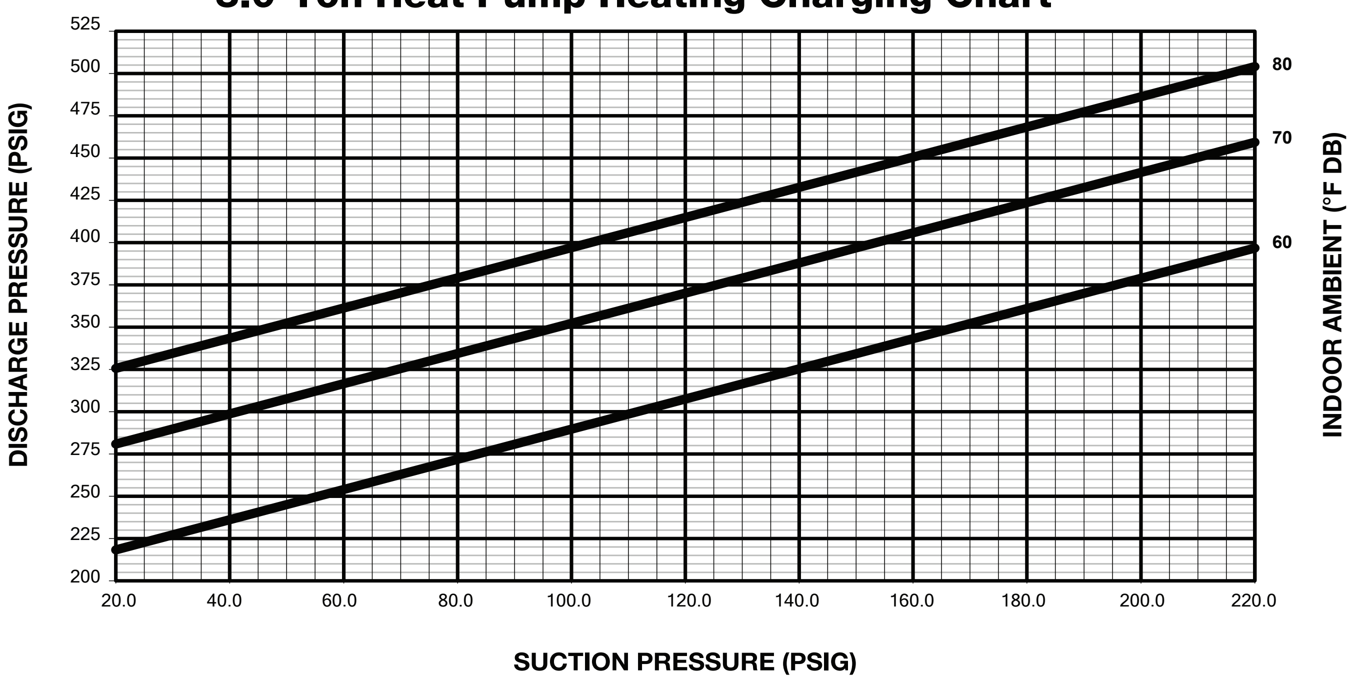
	Single Power Supply for Both Unit and Heater Kit					Separate Power Supply for Both Unit and Heater Kit			
	Heater Kit			Air Conditioner		Heater Kit		Air Conditioner	
UNIT MODEL NUMBER	MODEL NO. RXJJ-	Rated Heater KW @ 208/230	FLA	UNIT MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)	MIN. CKT. AMPACITY	MAX FUSE OR CKT. BKR. SIZE (CKT. BKR. MUST BE HACR TYPE FOR USA)
(-)HPCZT072ACT	-NONE-	-	-	36/36	50/50	-	-	36/36	50/50
	DC15CP	11.3/15.0	31.4/36.2	76/82	80/90	40/46	40/50	36/36	50/50
	DC20CP	15.0/20.0	41.7/48.1	89/97	100/100	53/61	60/70	36/36	50/50
	DC24CP	18.0/24.0	50.0/57.7	99/109	110/125	63/73	70/80	36/36	50/50
(-)HPCZT072ACU	-NONE-	-	-	36/36	50/50	-	-	36/36	50/50
	DC15CP	11.3/15.0	31.4/36.2	76/82	80/90	40/46	40/50	36/36	50/50
	DC20CP	15.0/20.0	41.7/48.1	89/97	100/100	53/61	60/70	36/36	50/50
	DC24CP	18.0/24.0	50.0/57.7	99/109	110/125	63/73	70/80	36/36	50/50

Appendix F – Refrigerant Charging Charts

3.0-Ton Heat Pump Cooling Charging Chart



3.0-Ton Heat Pump Heating Charging Chart

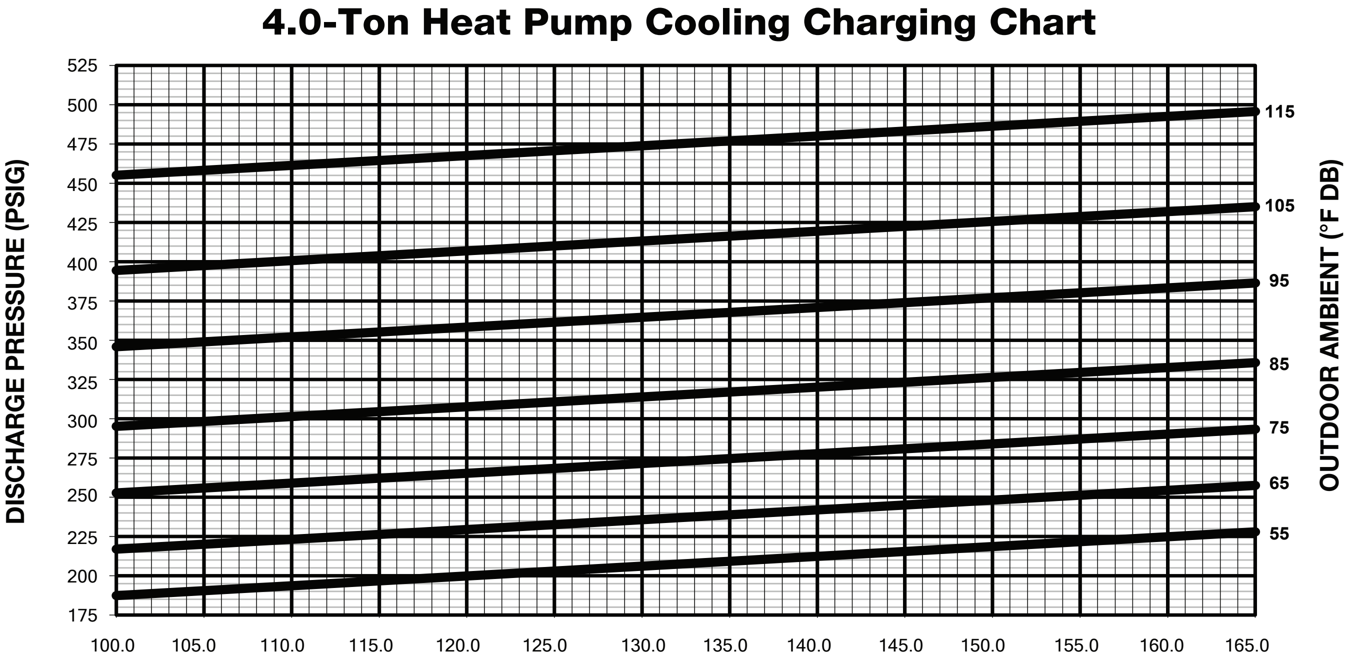


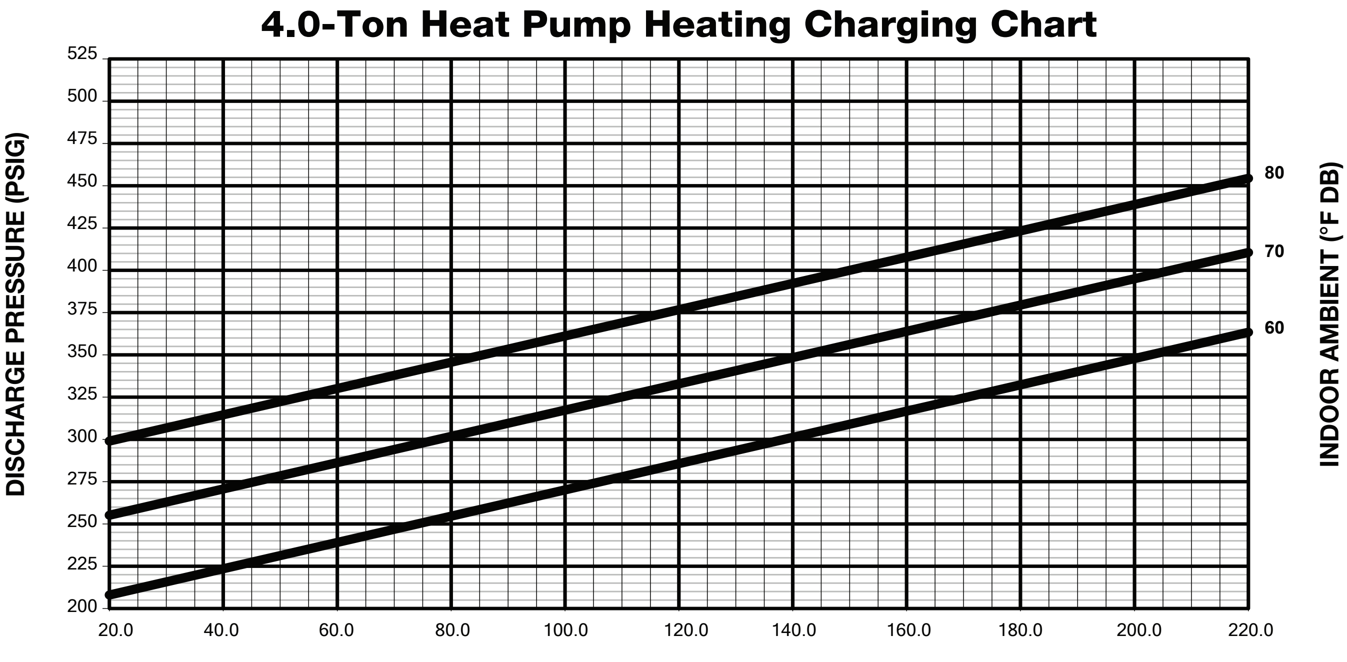
CAUTION 1. RETURN AIR TEMPERATURE MUST BE WITHIN COMFORT CONDITIONS BEFORE FINAL REFRIGERANT CHECK!

INSTRUCTIONS:
1. MEASURE PRESSURE AT COMPRESSOR SUCTION AND L IOUID.
2.MEASURE OUTDOOR AMBIENT TO UNIT.
3.PLACE X ON CHART WHERE SUCTION AND LIOUID 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.

92-106139-07-00

Appendix F – Refrigerant Charging Charts (Cont.)





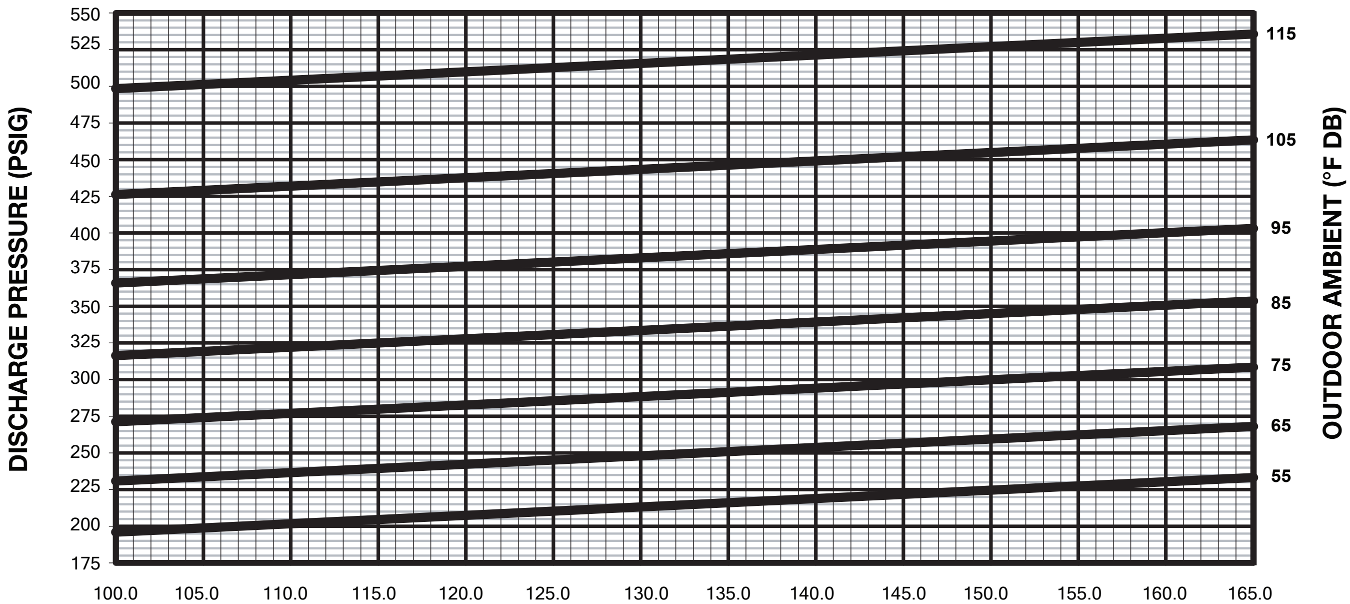
CAUTION INSTRUCTIONS:

1. RETURN AIR TEMPERATURE MUST BE WITHIN COMFORT CONDITIONS BEFORE FINAL REFRIGERANT CHECK!
1. MEASURE PRESSURE AT COMPRESSOR SUCTION AND L IOUID.
2.MEASURE OUTDOOR AMBIENT TO UNIT.
3.PLACE X ON CHART WHERE SUCTION AND LIOUID 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.

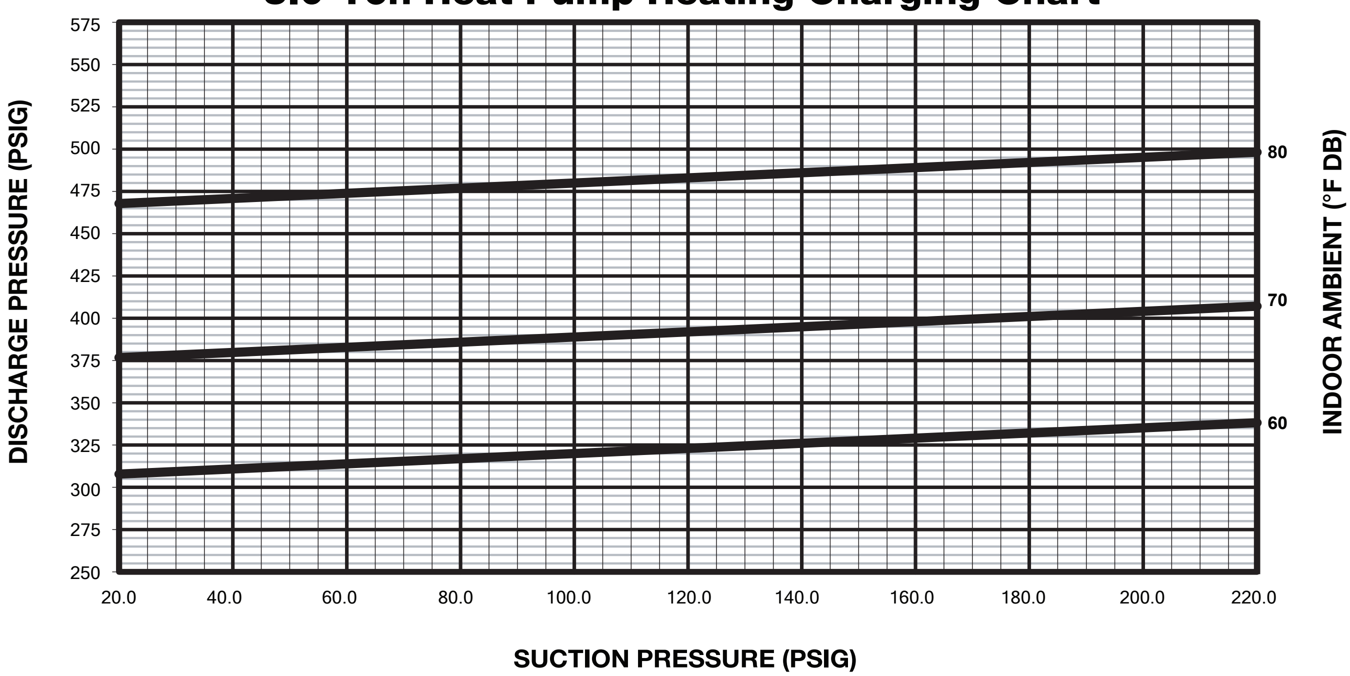
92-106139-08-00

Appendix F – Refrigerant Charging Charts (Cont.)

5.0-Ton Heat Pump Cooling Charging Chart



5.0-Ton Heat Pump Heating Charging Chart



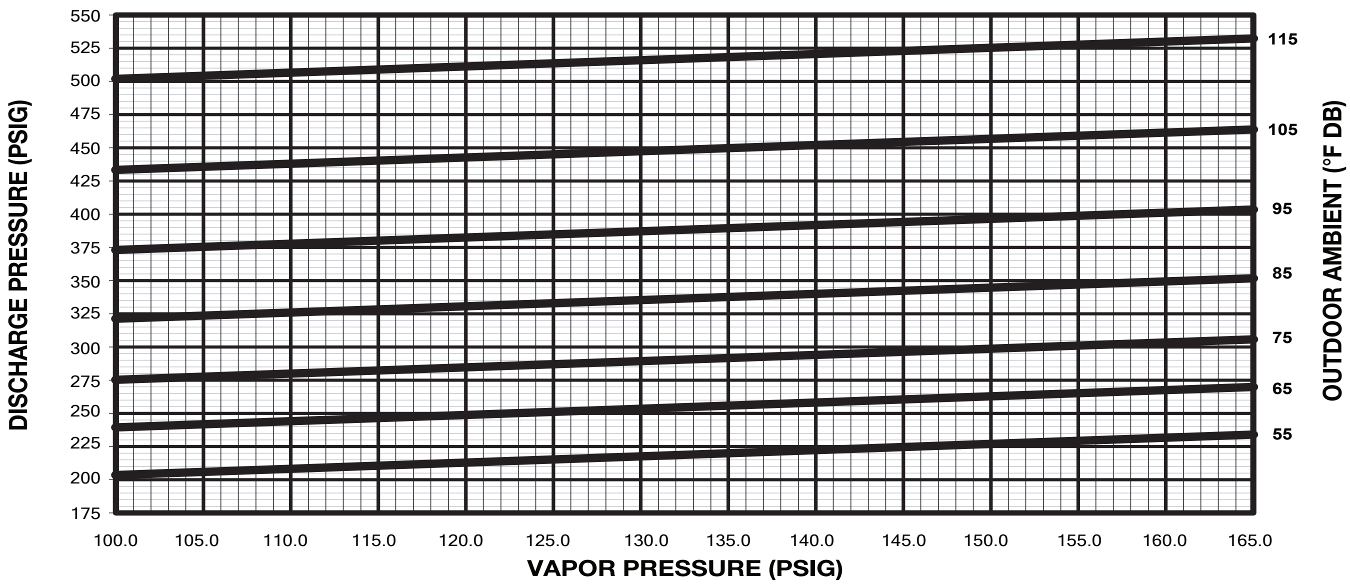
CAUTION INSTRUCTIONS:

1. RETURN AIR TEMPERATURE MUST BE WITHIN COMFORT CONDITIONS BEFORE FINAL REFRIGERANT CHECK!
1. MEASURE PRESSURE AT COMPRESSOR SUCTION AND L IOUID.
2.MEASURE OUTDOOR AMBIENT TO UNIT.
3.PLACE X ON CHART WHERE SUCTION AND LIOUID 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.

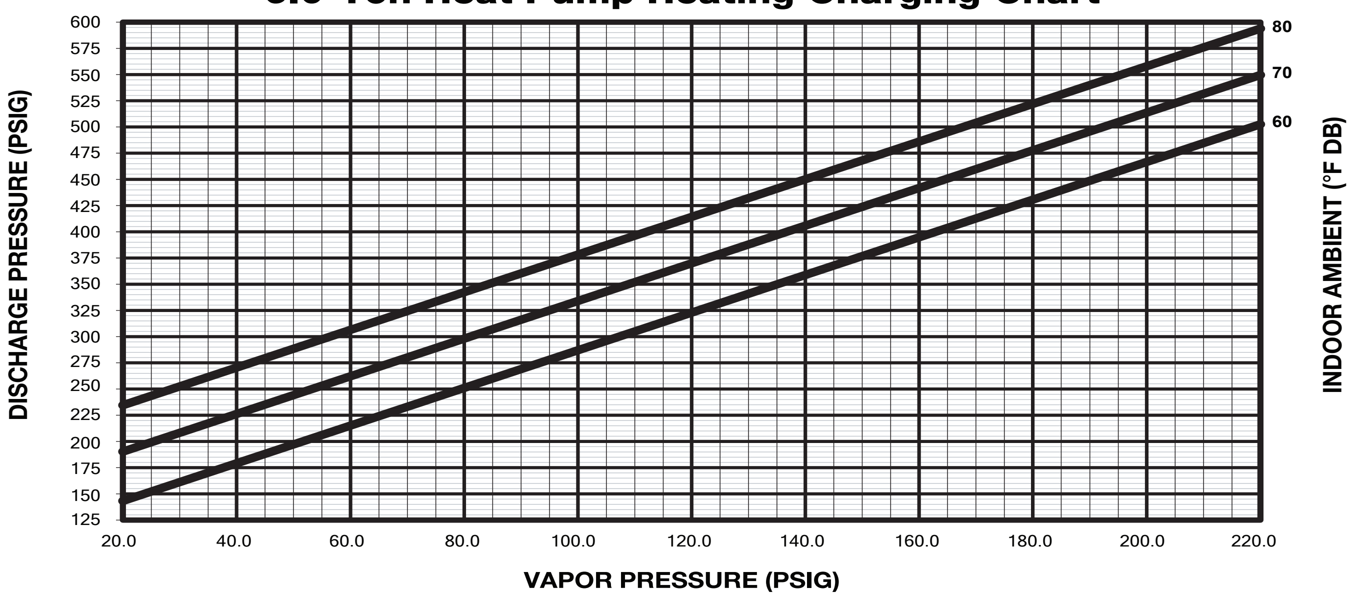
92-106139-09-01

Appendix F – Refrigerant Charging Charts (Cont.)

6.0-Ton Heat Pump Cooling Charging Chart



6.0-Ton Heat Pump Heating Charging Chart



CAUTION INSTRUCTIONS:

1. RETURN AIR TEMPERATURE MUST BE WITHIN COMFORT CONDITIONS BEFORE FINAL REFRIGERANT CHECK!
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.

92-106139-10-00

Appendix F – Refrigerant Charging Charts (Cont.)

SYSTEM CHARGE CHART – REFRIGERANT 410 A

PRESSURE REQUIREMENTS – GROSS CHARGE CHECK (REFER CHARGE CHART)

OUTDOOR DRY BULB (°F)	3 -TON	4 -TON	5 -TON	6 -TON
	LIQUID /VAPOR PRESSURE (PSIG)			
115	464 / 156	470 / 153	478 / 150	524 / 146
105	408 / 154	411 / 151	422 / 148	453 / 143
95	358 / 152	361 / 149	366 / 146	392 / 140
85	312 / 150	313 / 148	324 / 143	339 / 137
75	272 / 148	271 / 146	279 / 140	292 / 135
65	238 / 147	237 / 145	245 / 138	255 / 132
55	205 / 145	204 / 142	213 / 133	217 / 129

SUB COOLING REQUIREMENTS – FINAL CHARGE VERIFICATION

OUTDOOR DRY BULB (°F)	3 -TON	4 -TON	5 -TON	6 -TON
	SUBCOOLING (°F)			
115	11	12	11	20
105	11	11	10	18
95	10	11	10	16
85	10	10	9	15
75	9	9	8	14
65	11	10	9	14
55	11	10	11	14

NOTE: For heat pump units, the preferred mode to charge the unit is **COOLING MODE.** If the unit has to be charged during heating season, it is recommended to simply evacuate the factory charge from the unit, and then weigh in the refrigerant charge per the charge weight on the rating plate. Then, ***the charge will need to be verified per the subcooling chart above when outdoor ambient allows the unit to operate in cooling mode.***

1. This is required to fine-tune unit charge.

2. The Indoor ambient temperature must be between 72 °F and 82 °F dry bulb at the indoor coil.

3. Confirm the indoor air supply is at the rated CFM listed in ***Appendix A.***

4. Allow the system to run long enough for temperatures and pressures to stabilize; at least fifteen minutes.

5. Measure liquid pressure and line temperature at the liquid line service port (refer to section J.4.2.1. for the liquid line temperature measurement location). BE SURE TO USE ZERO LOSS FITTINGS WHILE MEASURING PRESSURE; ANY LOSS OF CHARGE MAY IMPACT PERFORMANCE.

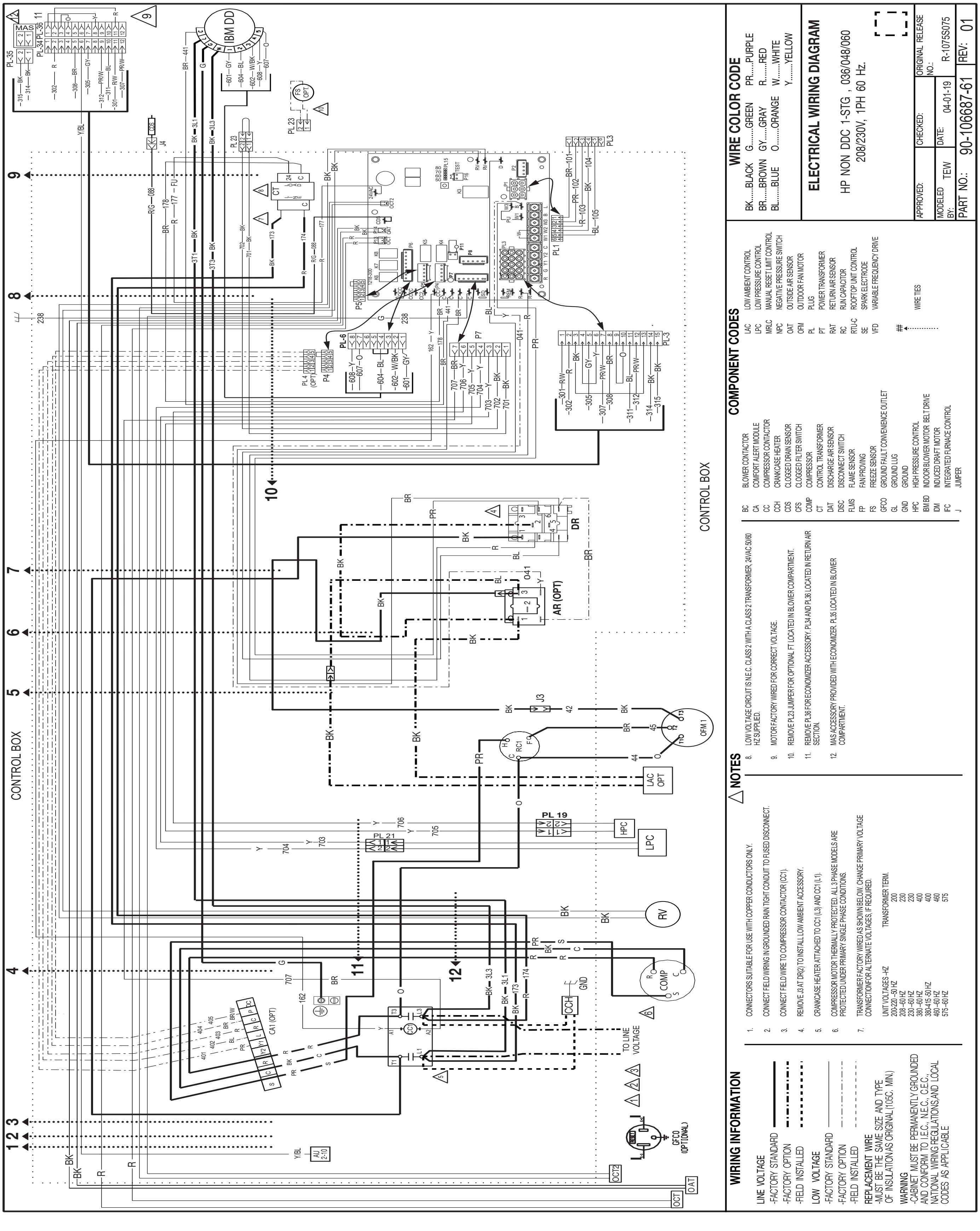
6. To find the saturation temperature at the measured pressure, subtract the measured liquid line temperature from the saturation pressure to get the sub-cooling.

7. Check if the Sub-Cooling is within +/- 2.0 °F tolerance.

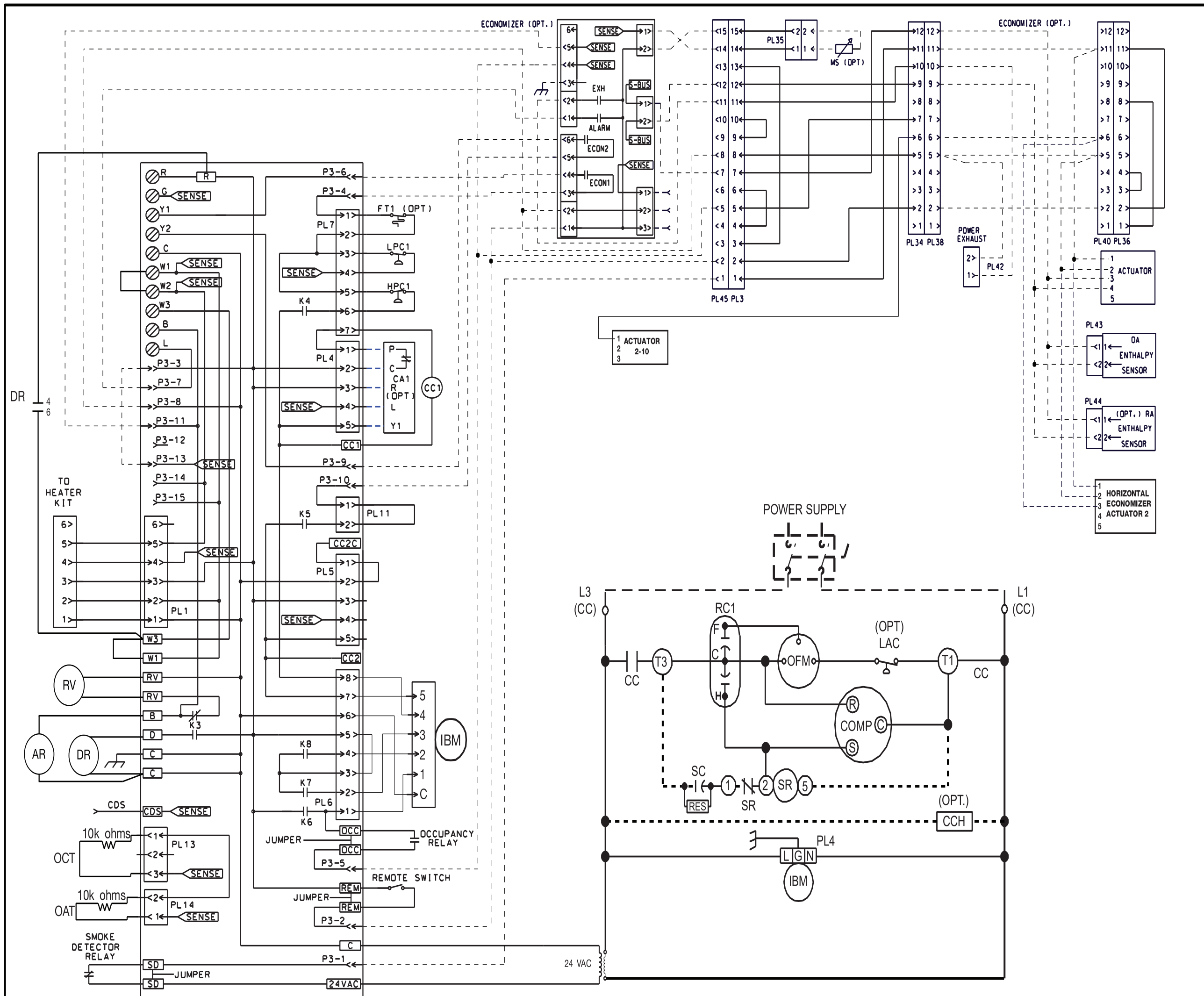
8.If the sub-cooling values are significantly different (> 20 psig) from those listed on the table in ***Appendix F***, there may be an airflow or component issue. Refer to section M. Diagnostics for more information.

P. APPENDICES

Appendix G. Wiring Diagrams & Schematics



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES		
CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT (CC1) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.
8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL36 FOR ECOMOMIZER ACCESSORY. PL34 AND PL36 LOCATED IN RETURN AIR SECTION.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

COMPONENT CODES

BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOG DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR ESENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
ELM	ECONOMIZER LOGIC MODULE
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
RV	REVERSING VALVE
SE	SPARK ELECTRODE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID

WIRE COLOR CODE

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

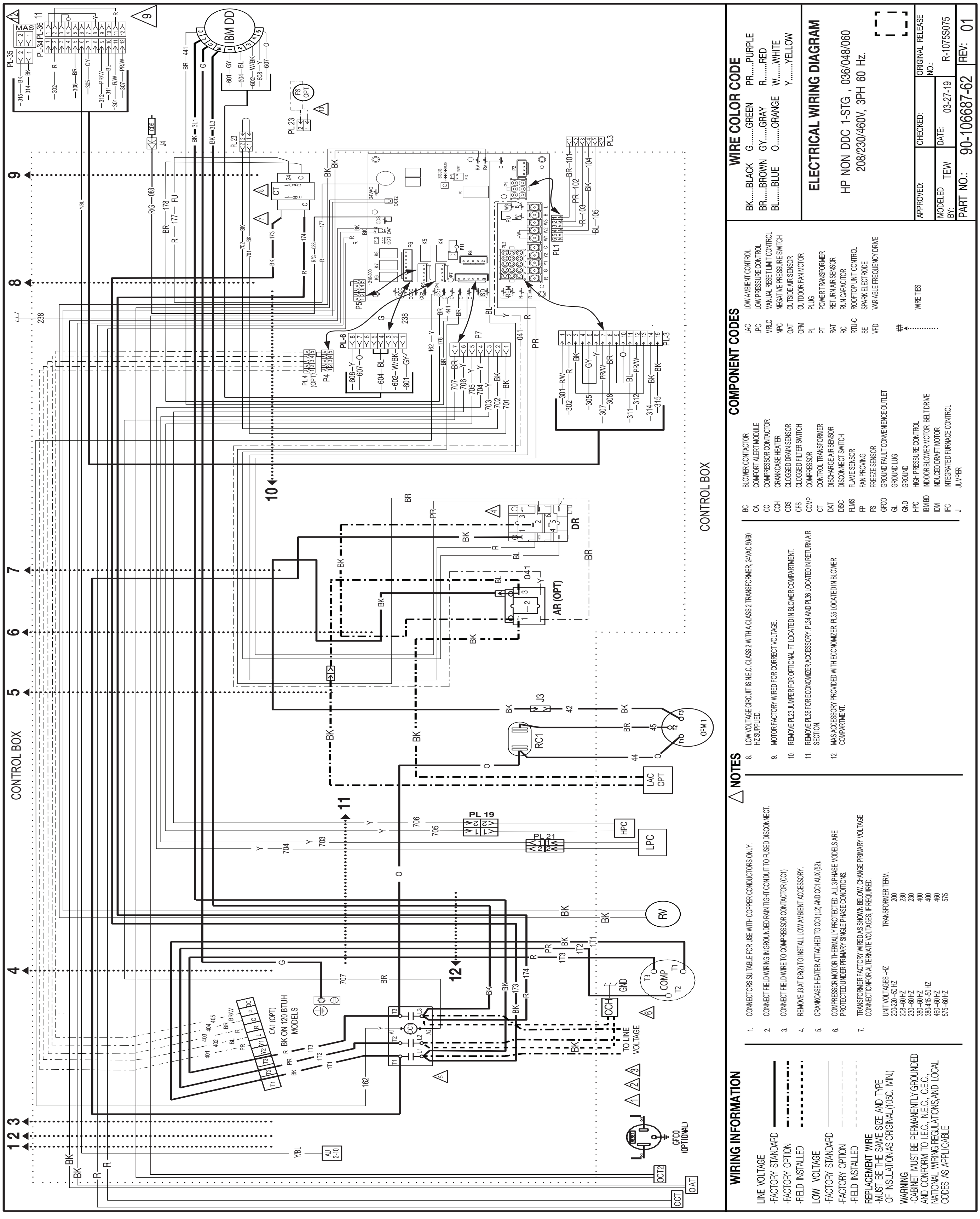
ELECTRICAL WIRING SCHEMATIC

HP NON DDC 1-STG , 036/048/060
208/230V, 1PH 60 Hz.

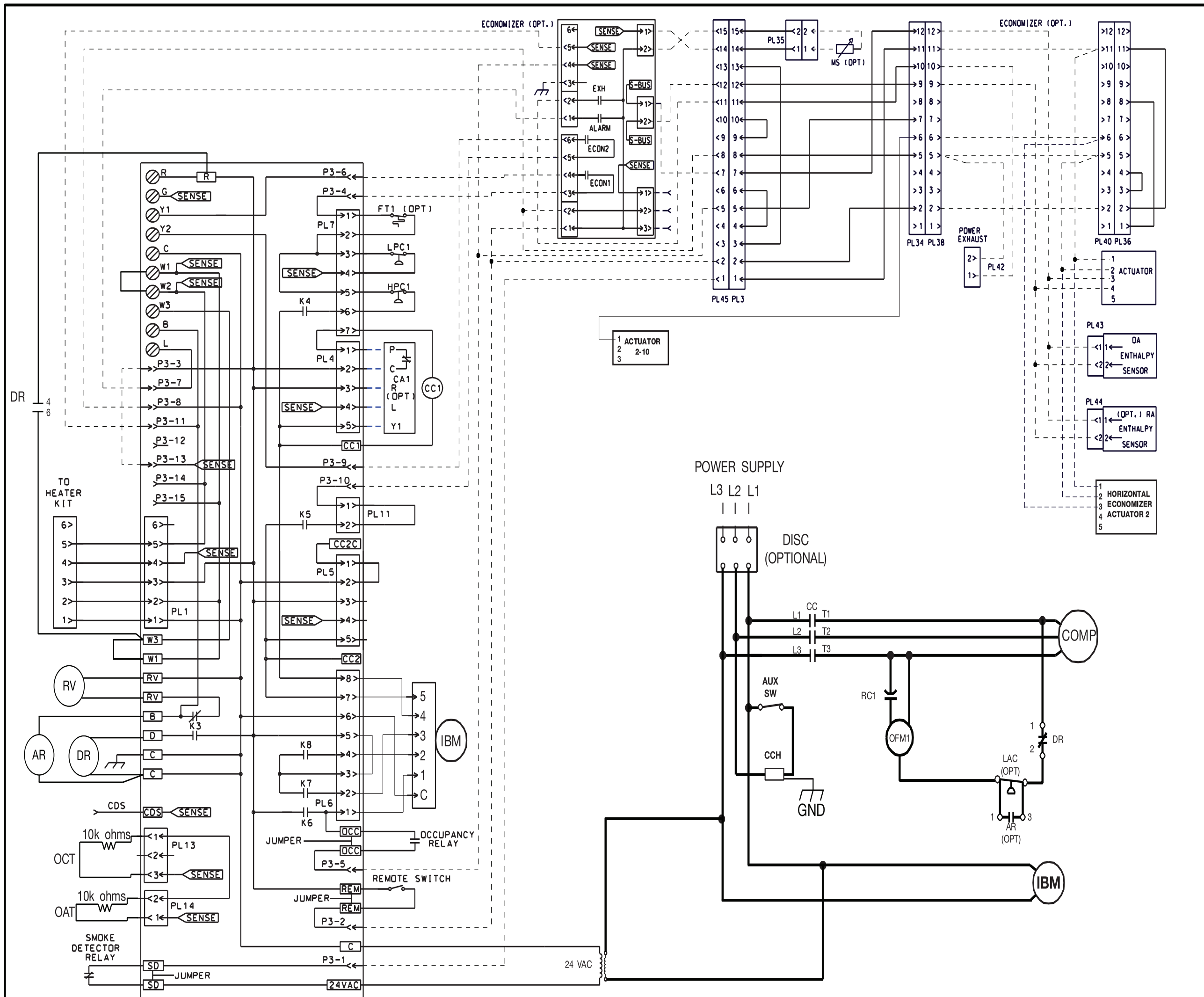
APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: TEW	DATE: 03-27-19	R-1073S075
PART NO.: 90-106688-61		REV: 00

P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



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- FACTORY STANDARD
- FACTORY OPTION
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- MUST BE THE SAME SIZE AND TYPE OF INSULATION AS ORIGINAL (105°C MIN.)

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4. REMOVE J3 AT (CC1) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.
8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL36 FOR ECOMOMIZER ACCESSORY. PL34 AND PL36 LOCATED IN RETURN AIR SECTION.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

COMPONENT CODES

BR	BLOWER RELAY	LAC	LOW AMBIENT CONTROL
CA	COMFORT ALERT MODULE	LPC	LOW PRESSURE CONTROL
CC	COMPRESSOR CONTACTOR	MRLC	MANUAL RESET LIMIT CONTROL
CCH	CRANKCASE HEATER	NPC	NEGATIVE PRESSURE SWITCH
CDS	CLOG DRAIN SENSOR	OAT	OUTSIDE AIR SENSOR
CFS	CLOGGED FILTER SWITCH	OCT	OUTDOOR COIL TEMPERATURE SENSOR
COMP	COMPRESSOR	OFM	OUTDOOR FAN MOTOR
CT	CONTROL TRANSFORMER	PL	PLUG
DAT	DISCHARGE AIR ESENSOR	PT	POWER TRANSFORMER
DISC	DISCONNECT SWITCH	RAT	RETURN AIR SENSOR
DR	DEFROST RELAY	RC	RUN CAPACITOR
ELM	ECONOMIZER LOGIC MODULE	RTU-C	ROOFTOP UNIT CONTROL
FLMS	FLAME SENSOR	RV	REVERSING VALVE
FP	FAN PROVING	SE	SPARK ELECTRODE
FS	FREEZE SENSOR	TB	TERMINAL BLOCK
FT	FREEZE STAT	US	UNLOADER SOLENOID
GFCO	GROUND FAULT CONVENIENCE OUTLET		
GL	GROUND LUG		
GND	GROUND		
HPC	HIGH PRESSURE CONTROL		
IBM	INDOOR BLOWER MOTOR		
IDM	INDUCED DRAFT MOTOR		
IFC	INTEGRATED FURNACE CONTROL		

WIRE COLOR CODE

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

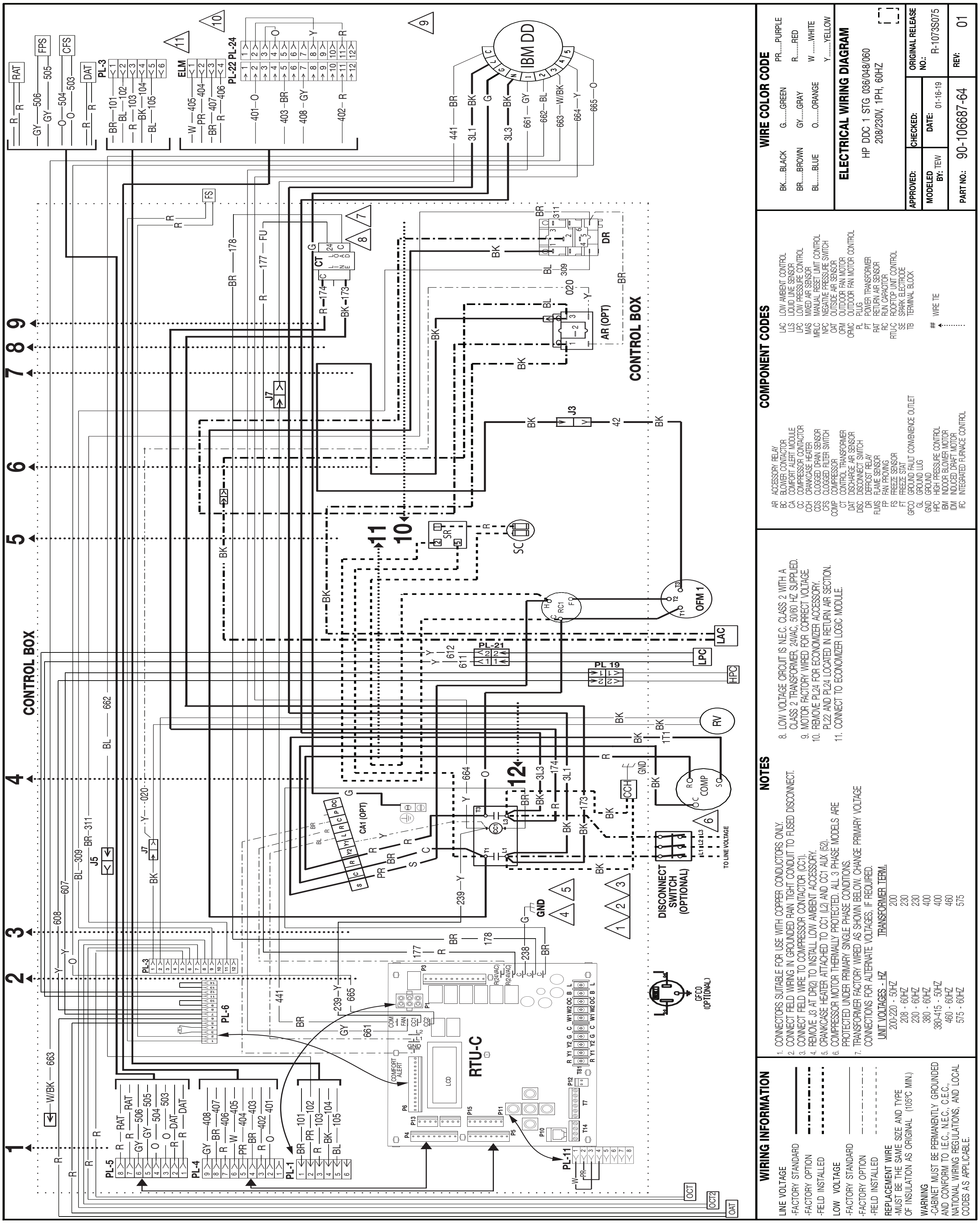
ELECTRICAL WIRING SCHEMATIC

HP NON DDC 2-STG, 036/048/060
208/230/460V, 3PH 60 Hz.

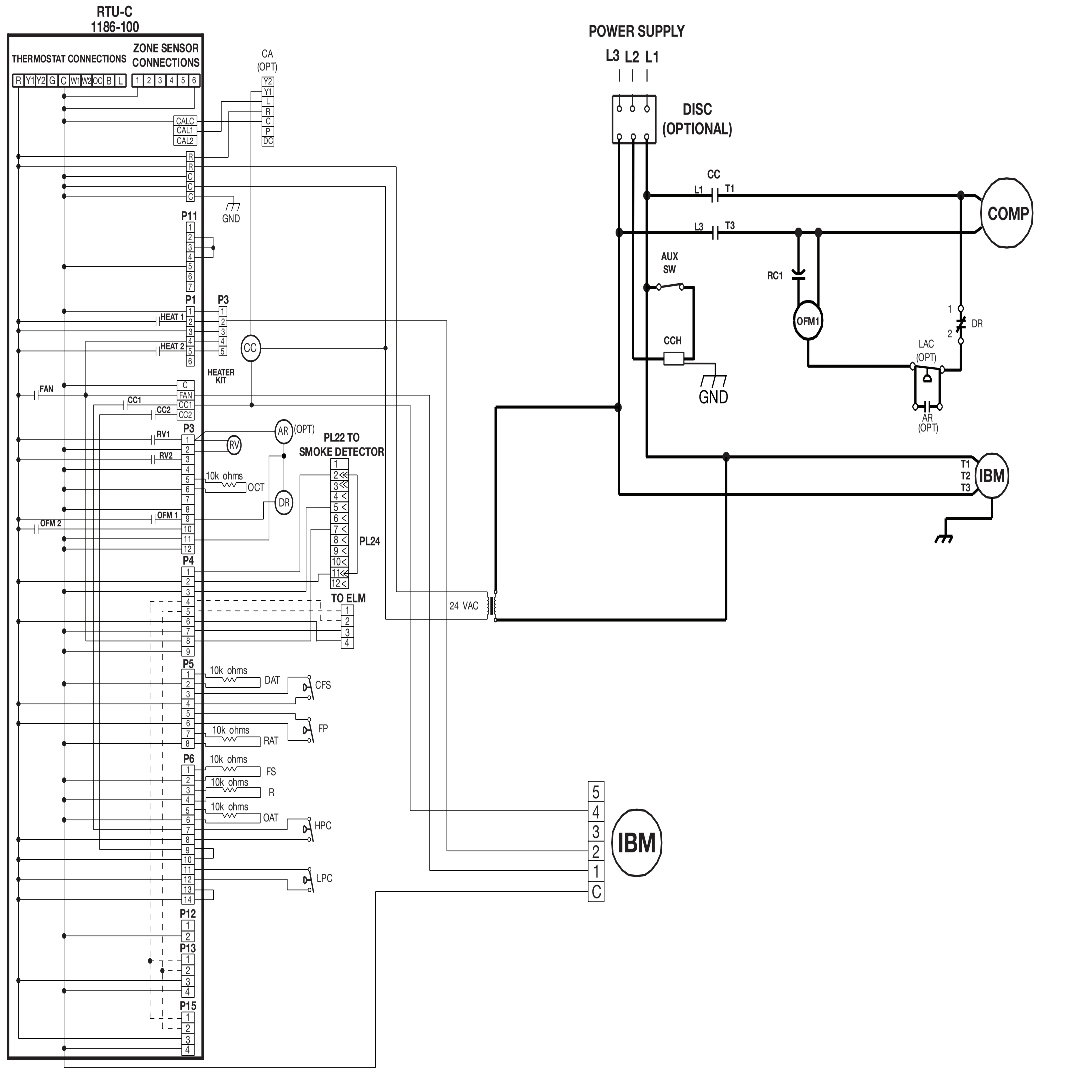
APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: TEW	DATE: 03-27-19	R-1073S075
PART NO.:	90-106688-62	REV: 00

P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES

CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT DR(2) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC, 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL24 FOR ECONOMIZER ACCESSORY. PL22 AND PL24 LOCATED IN RETURN AIR SECTION.

COMPONENT CODES

AR	ACCESSORY RELAY
BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOGGED DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR SENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MAS	MIXED AIR SENSOR
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
SE	SPARK ELECTRODE
RV	REVERSING VALVE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID
VFD	VARIABLE FREQUENCY DRIVE

WIRE COLOR CODE

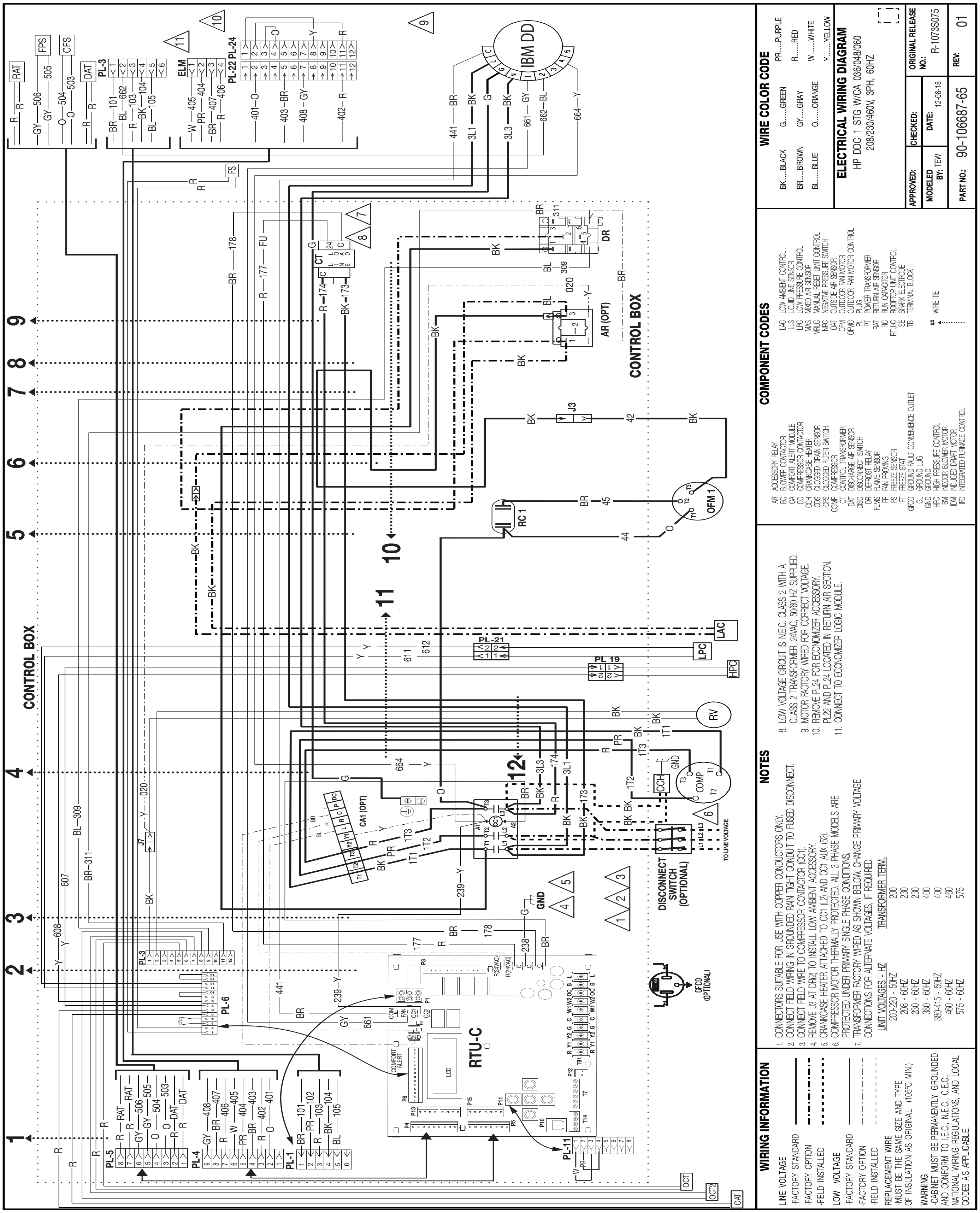
BK......BLACK	G........GREEN	PR......PURPLE
BR......BROWN	GY......GRAY	R........RED
BL.......BLUE	O........ORANGE	W ....WHITE
		Y........YELLOW

ELECTRICAL WIRING SCHEMATIC

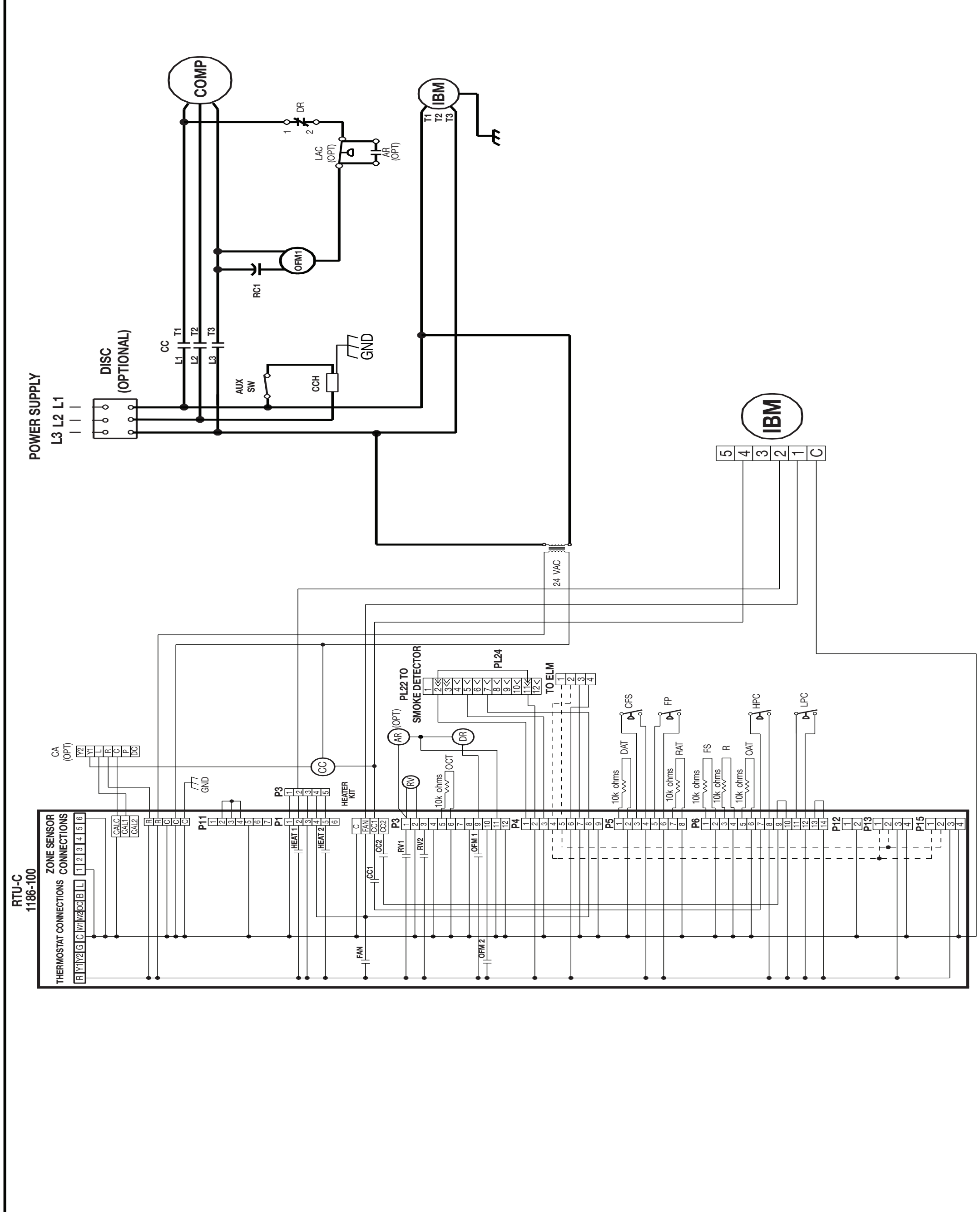
HP DDC 1 STG 036/048/060
208/230V, 1PH, 60HZ

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: TEW	DATE: 01-16-19	R-1073S075
PART NO.: 90-106688-64		REV: 01

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES		
CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

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2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT DR(2) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC, 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL24 FOR ECONOMIZER ACCESSORY. PL22 AND PL24 LOCATED IN RETURN AIR SECTION.

COMPONENT CODES

AR ACCESSORY RELAY
BR BLOWER RELAY
CA COMFORT ALERT MODULE
CC COMPRESSOR CONTACTOR
CCH CRANKCASE HEATER
CDS CLOGGED DRAIN SENSOR
CFS CLOGGED FILTER SWITCH
COMP COMPRESSOR
CT CONTROL TRANSFORMER
DAT DISCHARGE AIR SENSOR
DISC DISCONNECT SWITCH
DR DEFROST RELAY
FLMS FLAME SENSOR
FP FAN PROVING
FS FREEZE SENSOR
FT FREEZE STAT
GFCO GROUND FAULT CONVENIENCE OUTLET
GL GROUND LUG
GND GROUND
HPC HIGH PRESSURE CONTROL
IBM INDOOR BLOWER MOTOR
IDM INDUCED DRAFT MOTOR
IFC INTEGRATED FURNACE CONTROL
LAC LOW AMBIENT CONTROL
LPC LOW PRESSURE CONTROL
MAS MIXED AIR SENSOR
MRLC MANUAL RESET LIMIT CONTROL
NPC NEGATIVE PRESSURE SWITCH
OAT OUTSIDE AIR SENSOR
OCT OUTDOOR COIL TEMPERATURE SENSOR
OFM OUTDOOR FAN MOTOR
PL PLUG
PT POWER TRANSFORMER
RAT RETURN AIR SENSOR
RC RUN CAPACITOR
RTU-C ROOFTOP UNIT CONTROL
SE SPARK ELECTRODE
RV REVERSING VALVE
TB TERMINAL BLOCK
US UNLOADER SOLENOID
VFD VARIABLE FREQUENCY DRIVE

WIRE COLOR CODE

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

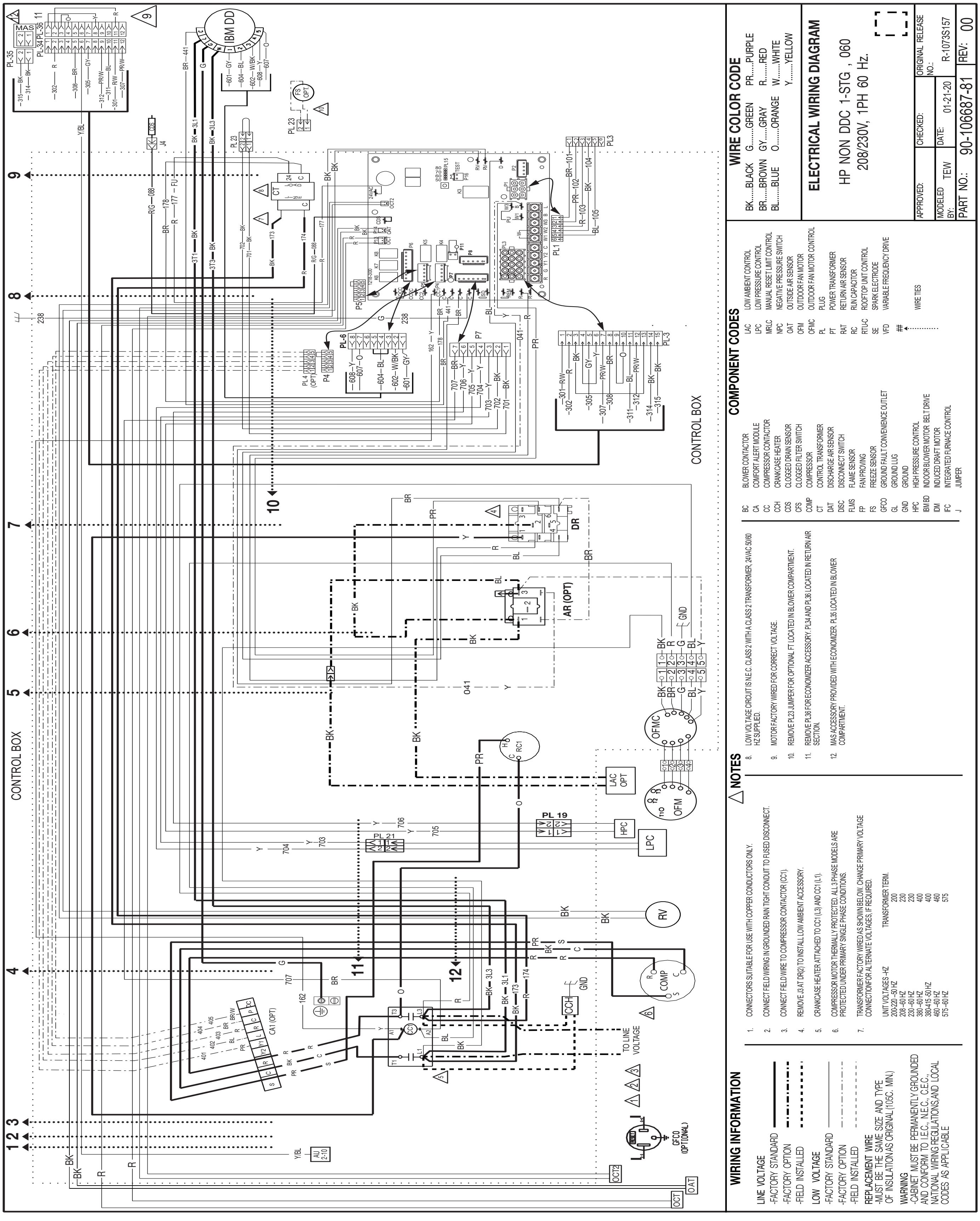
ELECTRICAL WIRING SCHEMATIC

HP DDC 1 STG W/CA 036/048/060
208/230/460V, 3PH, 60HZ

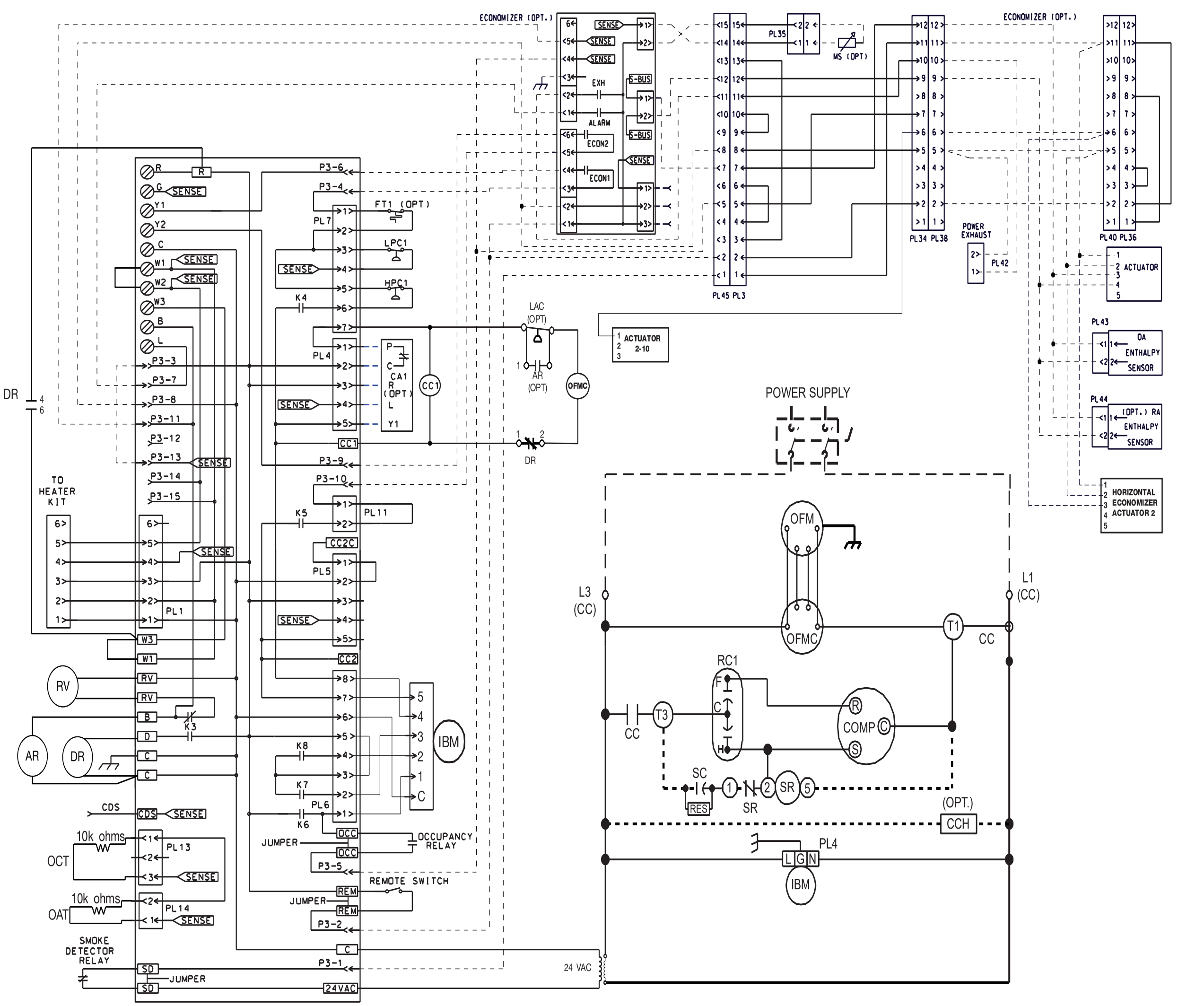
APPROVED:	CHECKED:	ORIGINAL RELEASE NO.: R-1073S075
MODELED BY: TEW	DATE: 12-06-18	
PART NO.: 90-106688-65		REV: 00

P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES		
CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT (CC1) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.
8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL36 FOR ECOMOMIZER ACCESSORY. PL34 AND PL36 LOCATED IN RETURN AIR SECTION.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

COMPONENT CODES

BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOG DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR ESENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
ELM	ECONOMIZER LOGIC MODULE
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROLLER
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
RV	REVERSING VALVE
SE	SPARK ELECTRODE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID

WIRE COLOR CODE

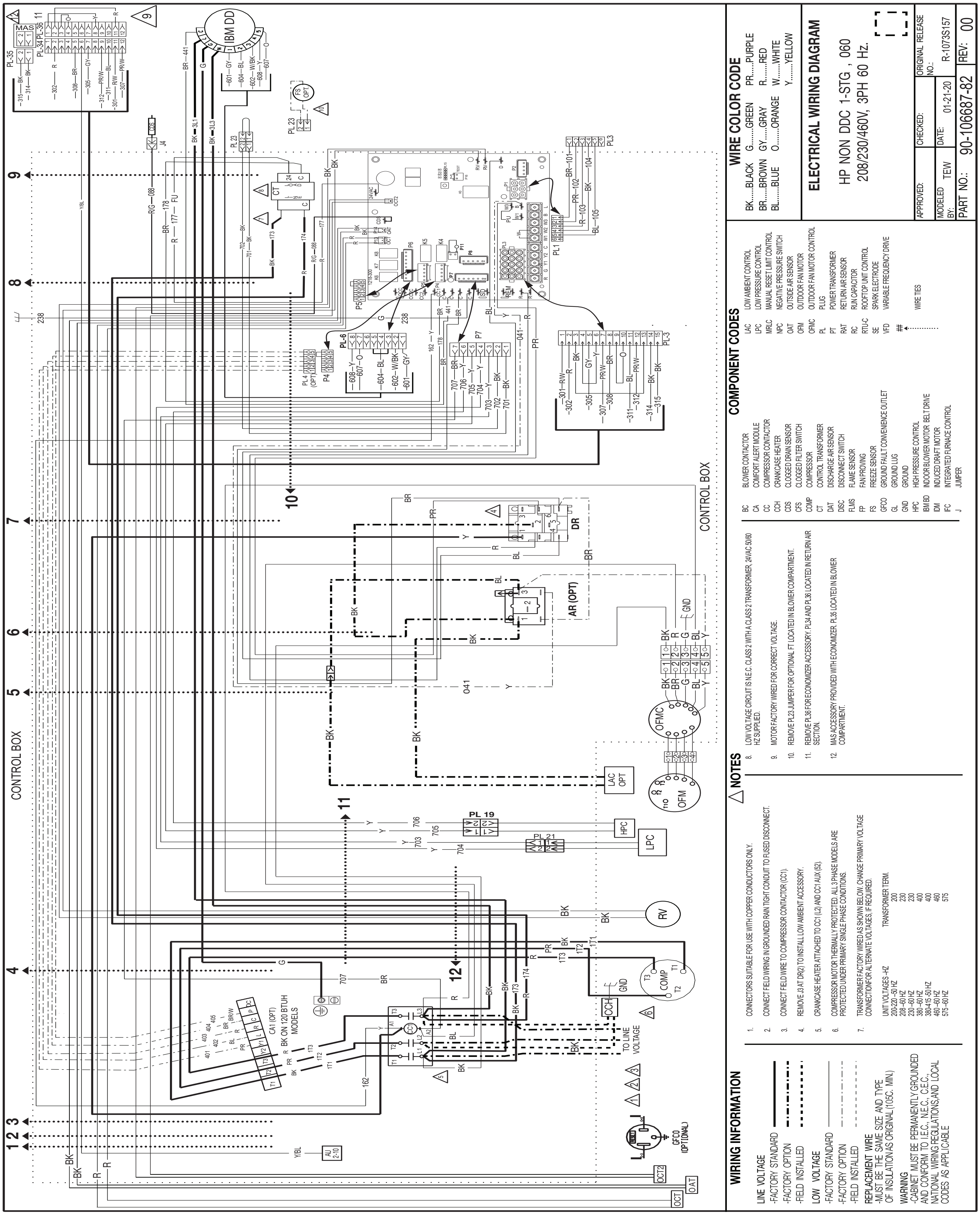
BK......BLACK	G........GREEN	PR......PURPLE
BR......BROWN	GY......GRAY	R........RED
BL.......BLUE	O........ORANGE	W ....WHITE
		Y........YELLOW

ELECTRICAL WIRING SCHEMATIC

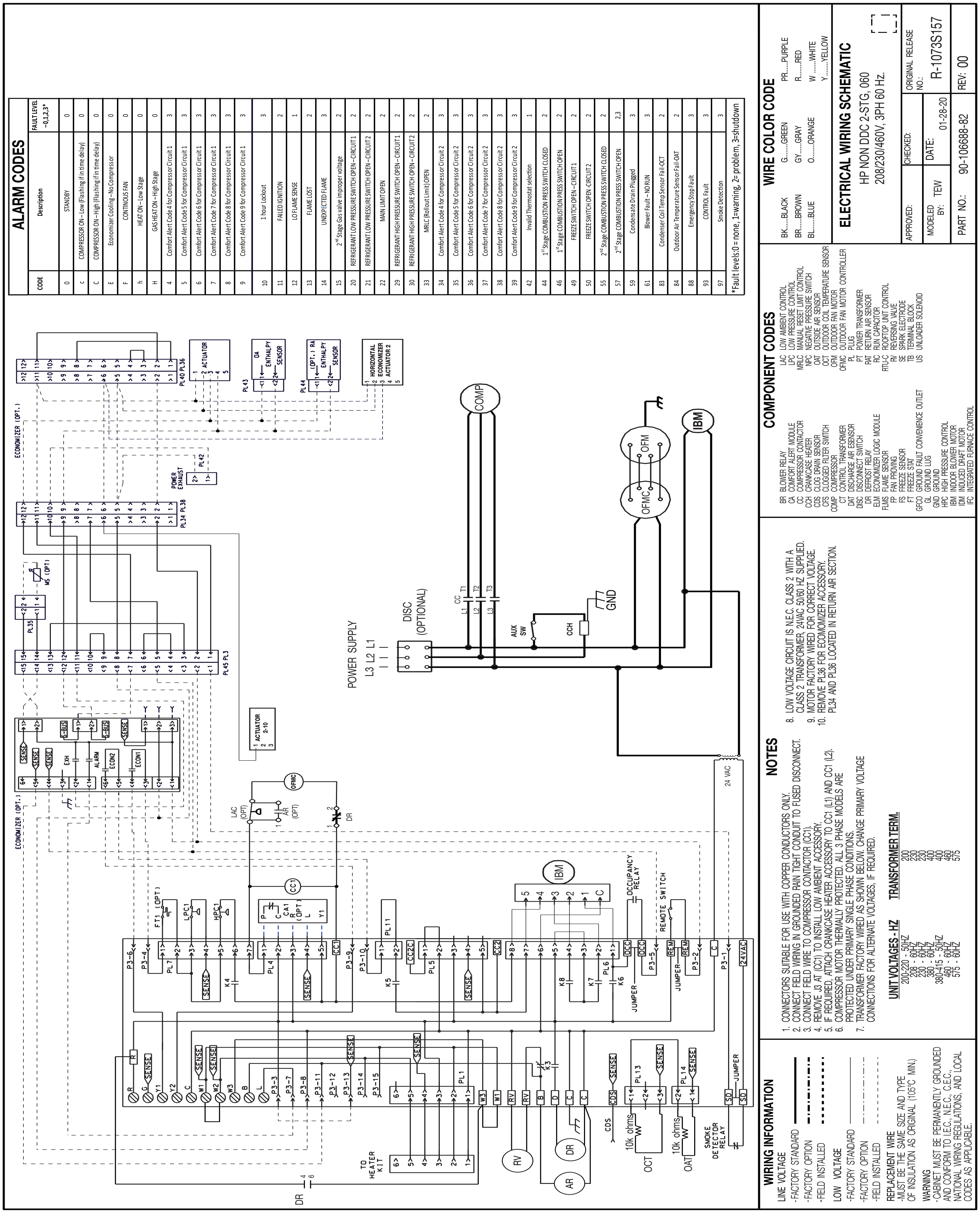
HP NON DDC 1-STG , 060
208/230V, 1PH 60 Hz.

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.: R-1073S157
MODELED BY: TEW	DATE: 01-28-20	
PART NO.: 90-106688-81		REV: 00

Appendix G. Wiring Diagrams & Schematics (Cont.)

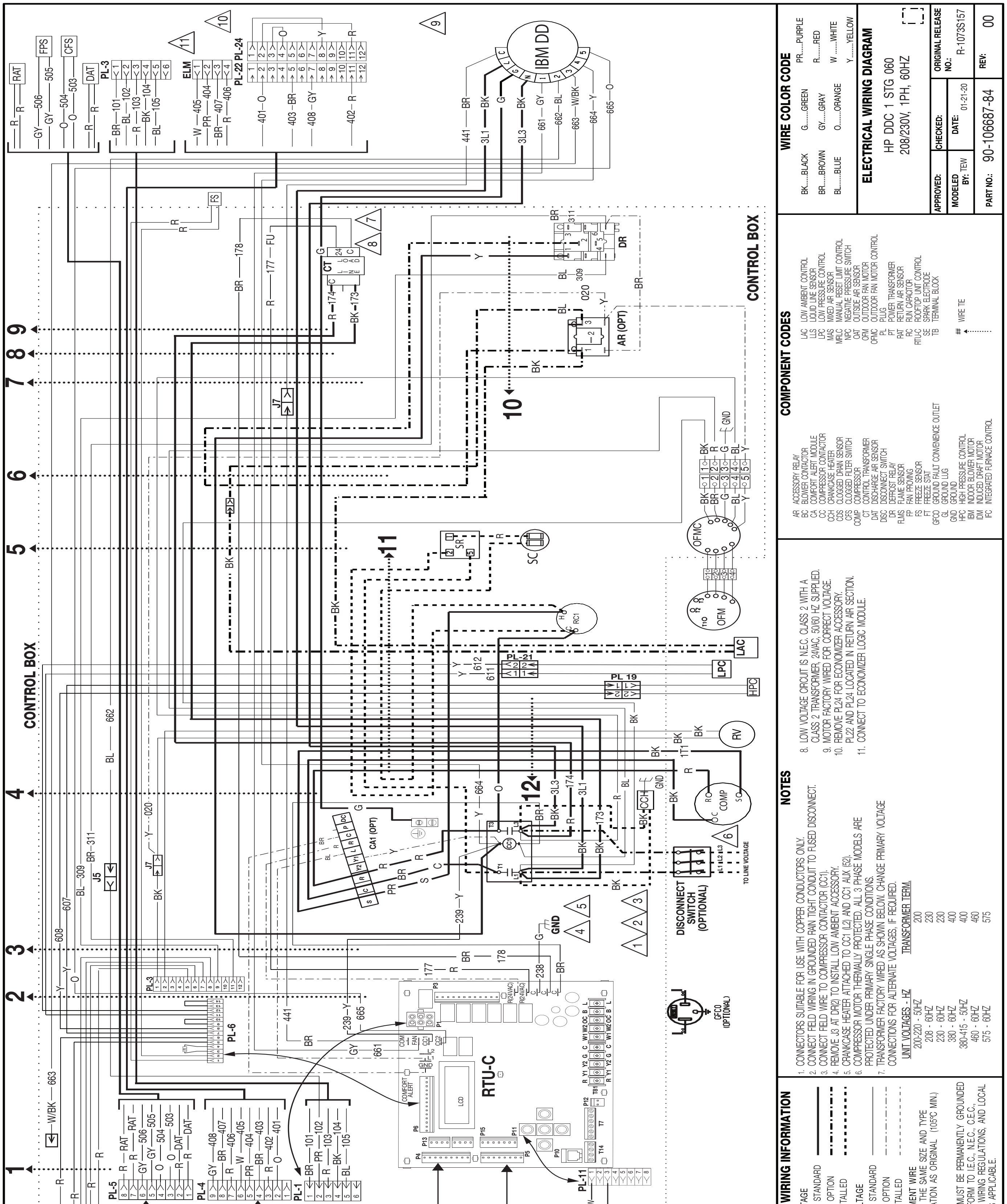


Appendix G. Wiring Diagrams & Schematics (Cont.)

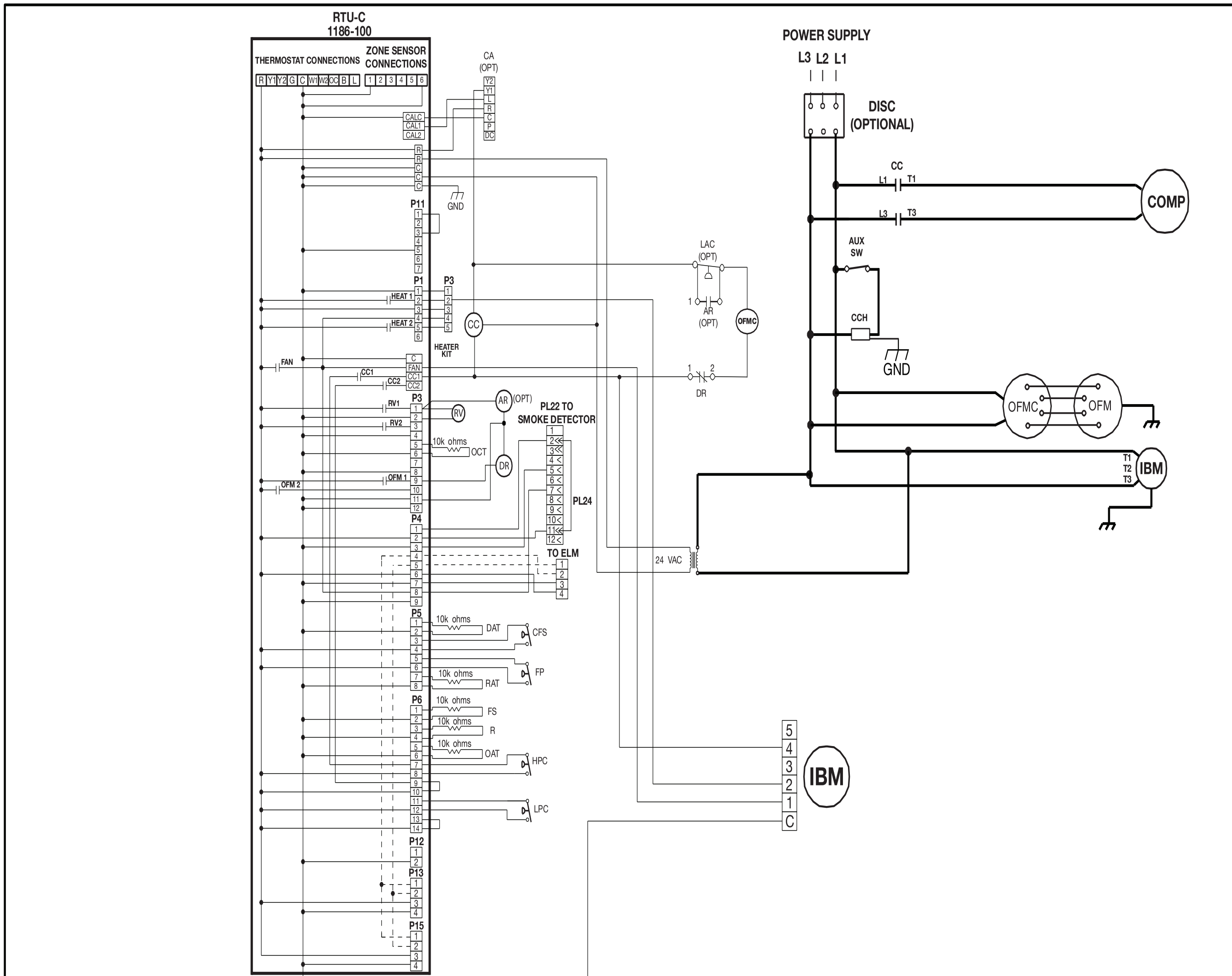


P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES

CODE	Description	FAULT LEVEL – 0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT DR(2) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC, 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL24 FOR ECONOMIZER ACCESSORY. PL22 AND PL24 LOCATED IN RETURN AIR SECTION.

COMPONENT CODES

AR	ACCESSORY RELAY
BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOGGED DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR SENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MAS	MIXED AIR SENSOR
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROLLER
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
SE	SPARK ELECTRODE
RV	REVERSING VALVE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID
VFD	VARIABLE FREQUENCY DRIVE

WIRE COLOR CODE

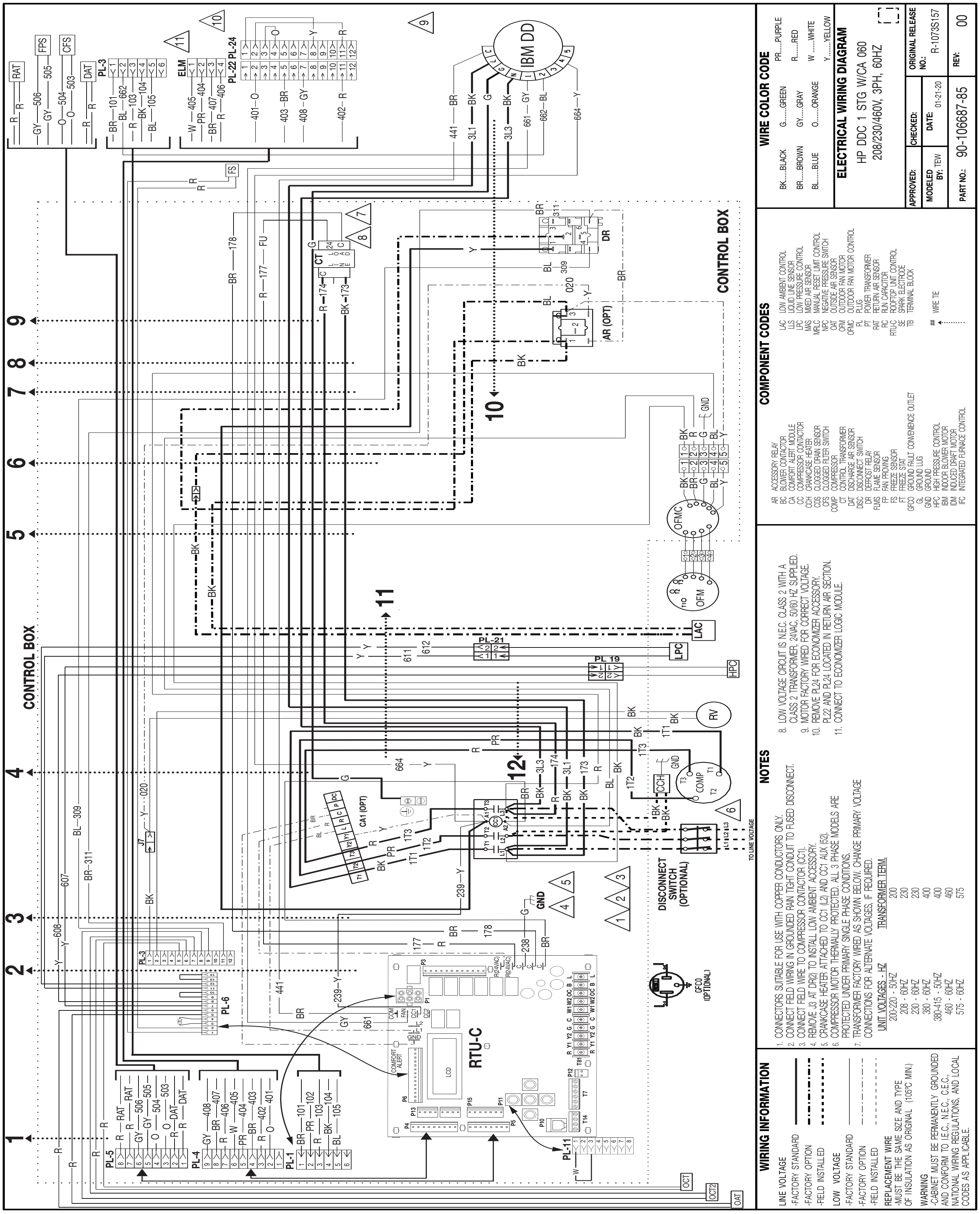
BK......BLACK	G........GREEN	PR......PURPLE
BR......BROWN	GY......GRAY	R........RED
BL.......BLUE	O........ORANGE	W ....WHITE
		Y ....YELLOW

ELECTRICAL WIRING SCHEMATIC

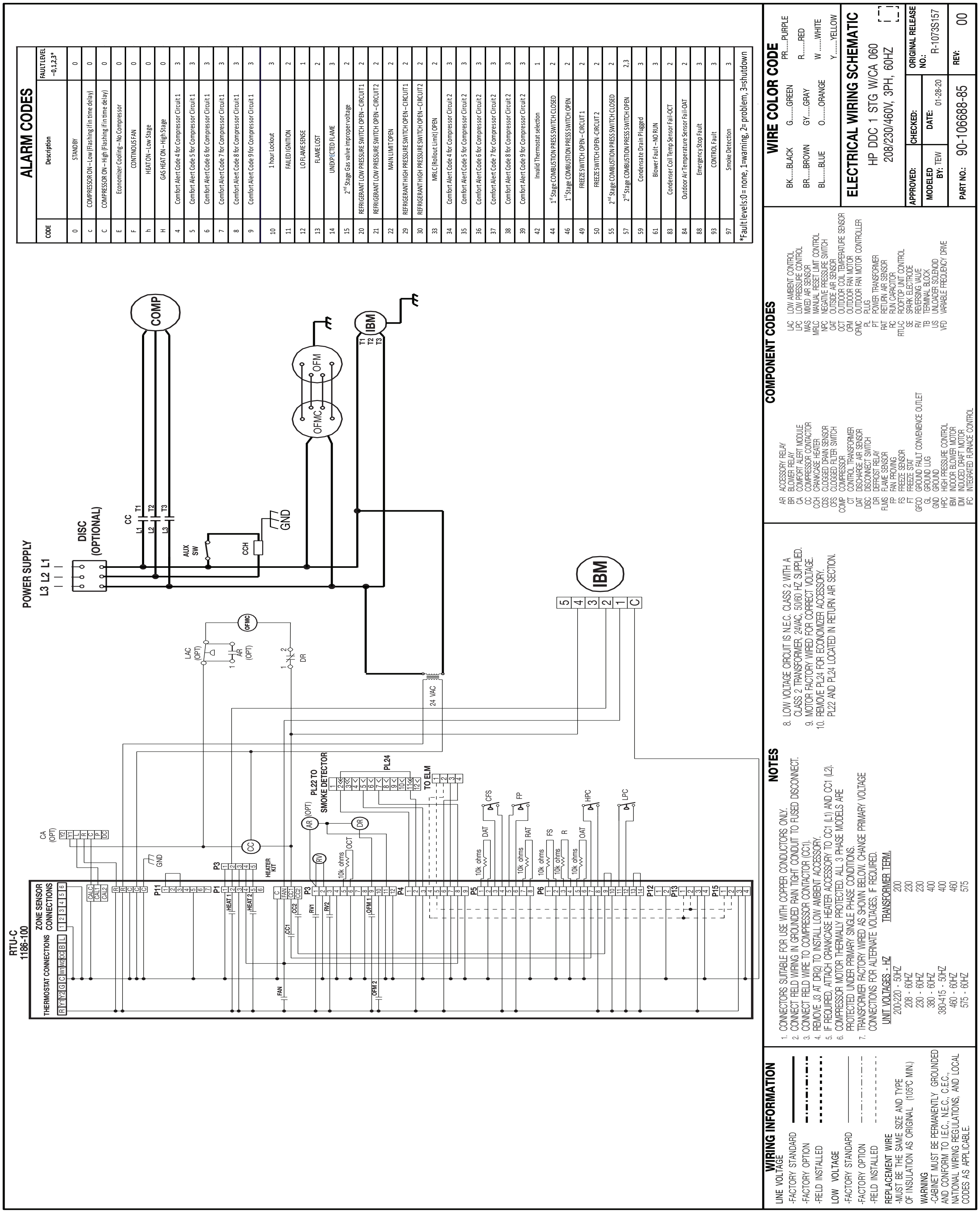
HP DDC 1 STG 060
208/230V, 1PH, 60HZ

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: TEW	DATE: 01-28-20	R-1073S157
PART NO.: 90-106688-84		REV: 00

Appendix G. Wiring Diagrams & Schematics (Cont.)

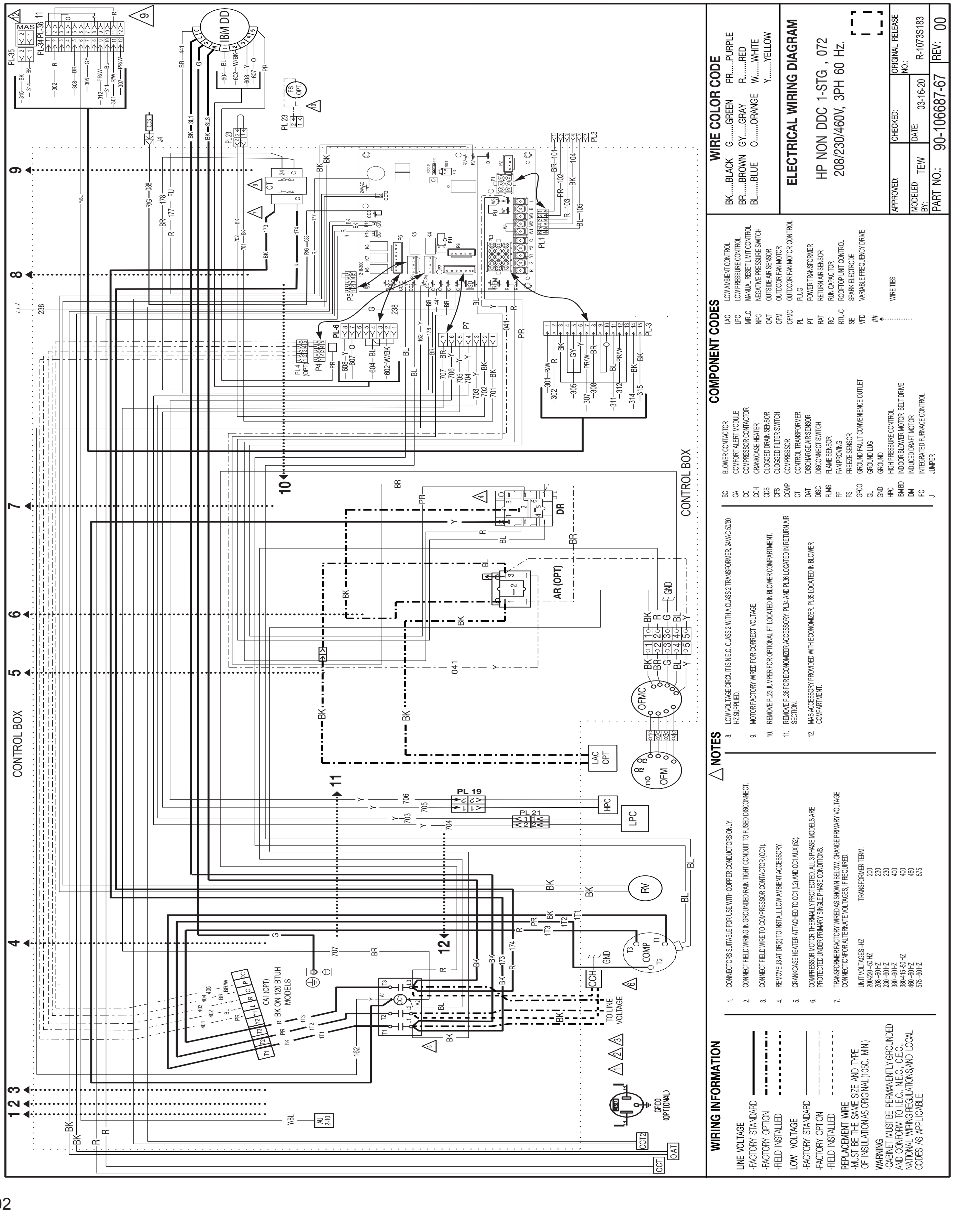


Appendix G. Wiring Diagrams & Schematics (Cont.)

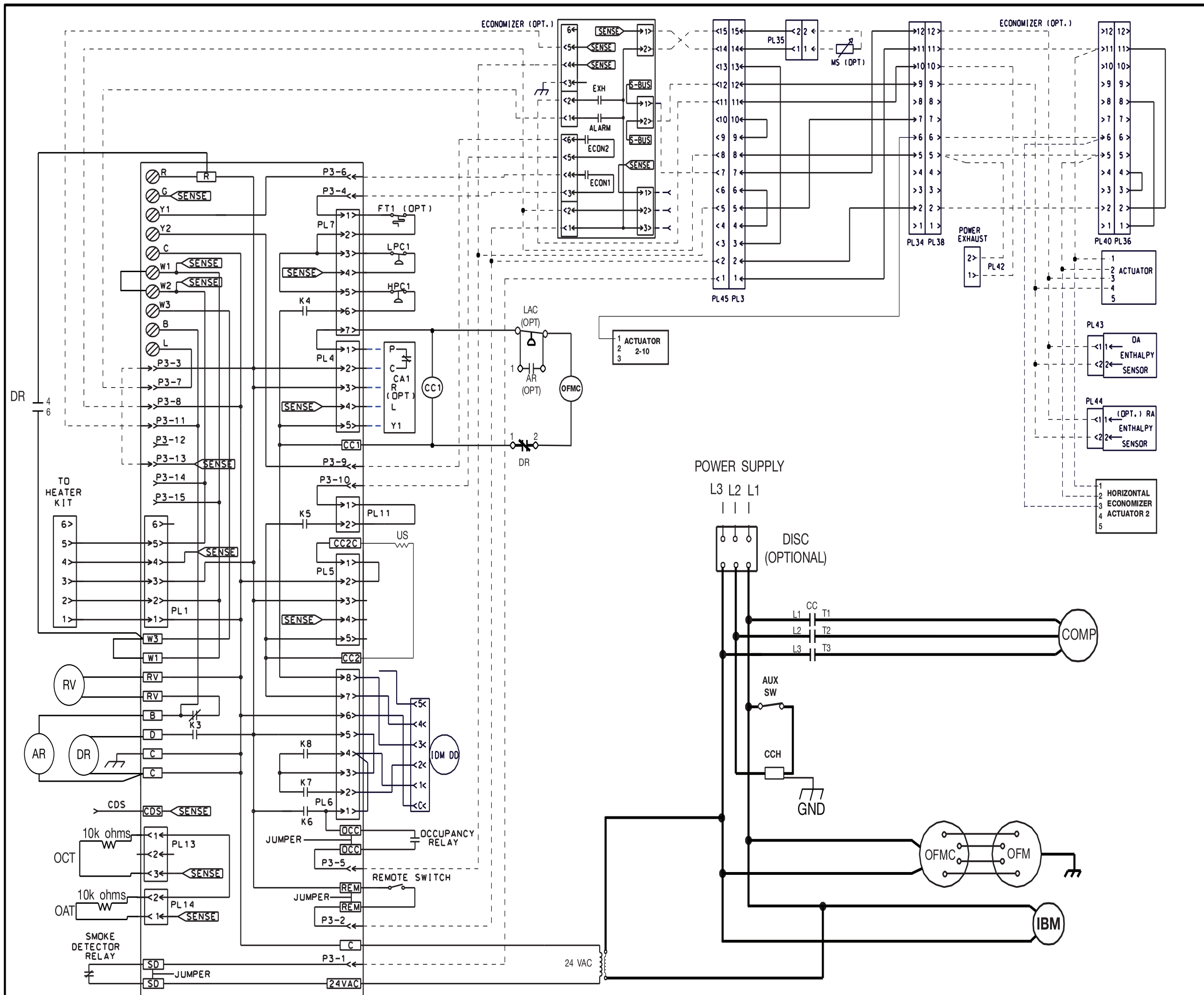


P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)



ALARM CODES

CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
4	Comfort Alert Code 4 for Compressor Circuit 1	3
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN -CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels:0 = none, 1=warning, 2= problem, 3=shutdown

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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT (CC1) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.
8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL36 FOR ECOMOMIZER ACCESSORY. PL34 AND PL36 LOCATED IN RETURN AIR SECTION.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

COMPONENT CODES

BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOG DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR ESENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
ELM	ECONOMIZER LOGIC MODULE
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROLLER
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
RV	REVERSING VALVE
SE	SPARK ELECTRODE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID

WIRE COLOR CODE

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

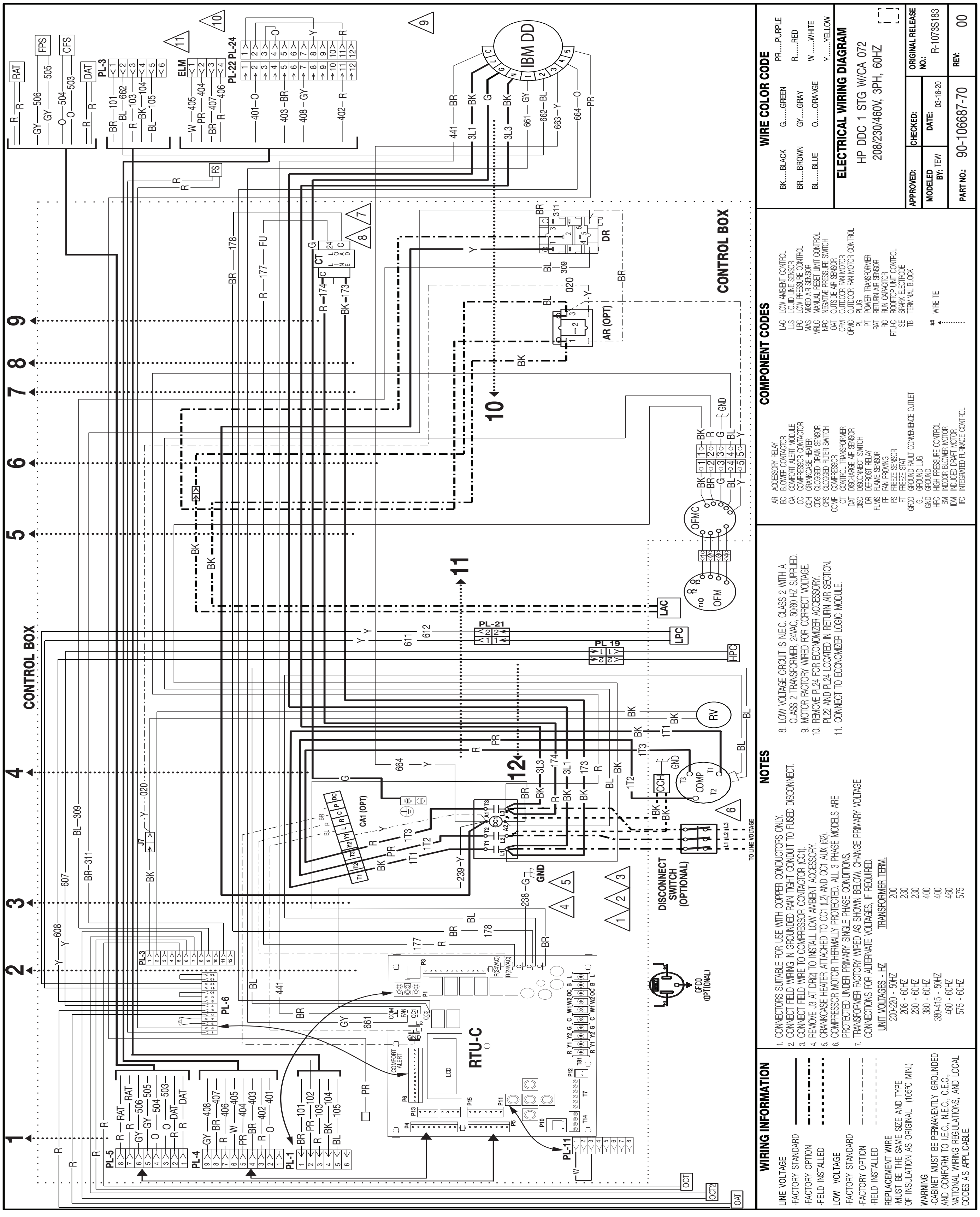
ELECTRICAL WIRING SCHEMATIC

HP NON DDC 2-STG, 072
208/230/460V, 3PH 60 HZ

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: TEW	DATE: 03-16-20	R-1073S183
PART NO.:	90-106688-67	REV: 00

P. APPENDICES

Appendix G. Wiring Diagrams & Schematics (Cont.)



Appendix G. Wiring Diagrams & Schematics (Cont.)

ALARM CODES

CODE	Description	FAULT LEVEL –0,1,2,3*
0	STANDBY	0
c	COMPRESSOR ON – Low (Flashing if in time delay)	0
C	COMPRESSOR ON – High (Flashing if in time delay)	0
E	Economizer Cooling – No Compressor	0
F	CONTINOUS FAN	0
h	HEAT ON – Low Stage	0
H	GAS HEAT ON – High Stage	0
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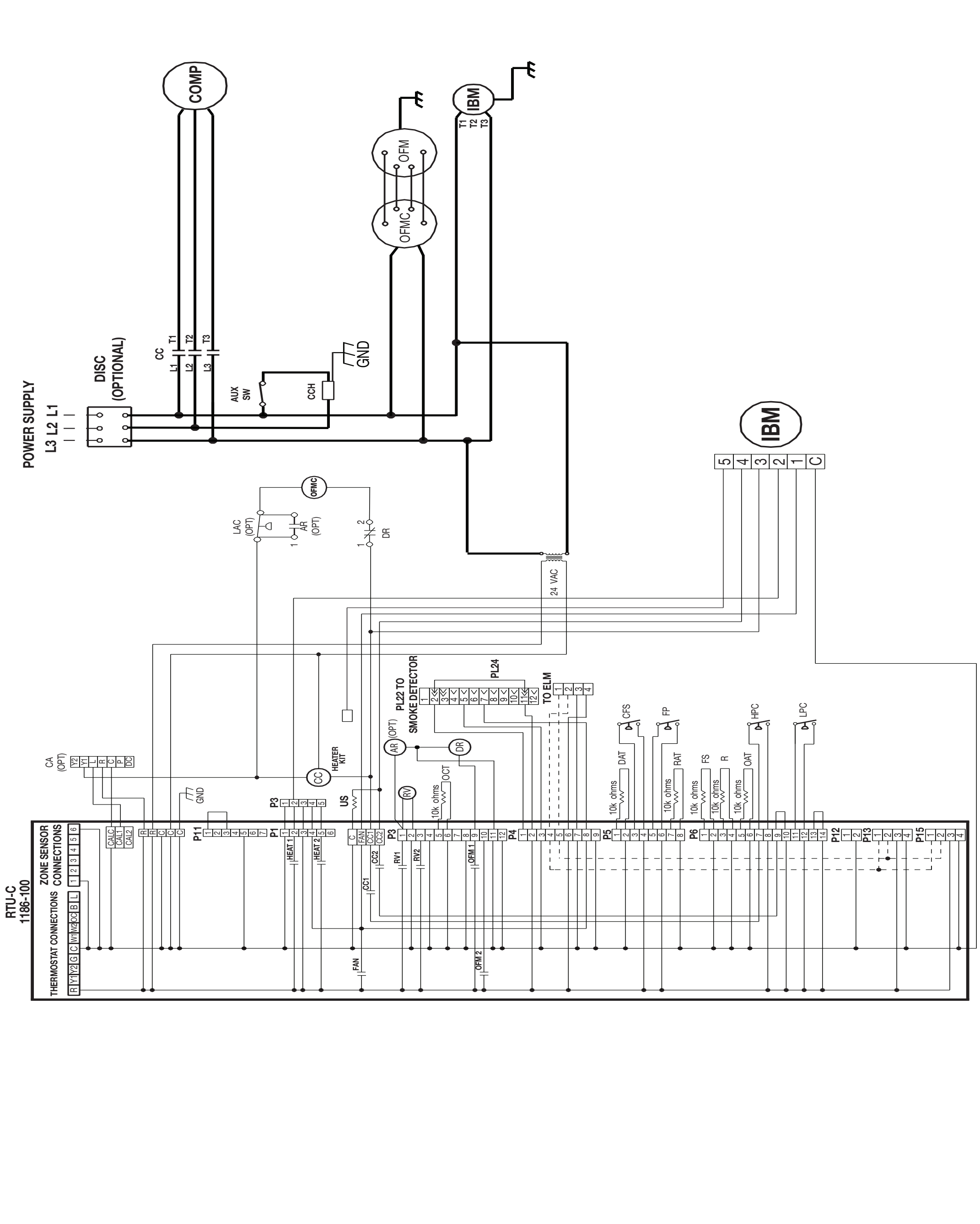
5	Comfort Alert Code 5 for Compressor Circuit 1	3
6	Comfort Alert Code 6 for Compressor Circuit 1	3
7	Comfort Alert Code 7 for Compressor Circuit 1	3
8	Comfort Alert Code 8 for Compressor Circuit 1	3
9	Comfort Alert Code 9 for Compressor Circuit 1	3
10	1 hour Lockout	3
11	FAILED IGNITION	2
12	LO FLAME SENSE	1
13	FLAME LOST	2
14	UNEXPECTED FLAME	3
15	2nd Stage Gas valve improper voltage	2
20	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 1	2
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	2
22	MAIN LIMIT OPEN	2
29	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 1	2
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	2
33	MRLC (Rollout Limit) OPEN	2
34	Comfort Alert Code 4 for Compressor Circuit 2	3
35	Comfort Alert Code 5 for Compressor Circuit 2	3
36	Comfort Alert Code 6 for Compressor Circuit 2	3
37	Comfort Alert Code 7 for Compressor Circuit 2	3
38	Comfort Alert Code 8 for Compressor Circuit 2	3
39	Comfort Alert Code 9 for Compressor Circuit 2	3
42	Invalid Thermostat selection	1
44	1st Stage COMBUSTION PRESS SWITCH CLOSED	2
46	1st Stage COMBUSTION PRESS SWITCH OPEN	2
49	FREEZE SWITCH OPEN – CIRCUIT 1	2
50	FREEZE SWITCH OPEN – CIRCUIT 2	2
55	2nd Stage COMBUSTION PRESS SWITCH CLOSED	2
57	2nd Stage COMBUSTION PRESS SWITCH OPEN	2,3
59	Condensate Drain Plugged	3
61	Blower Fault – NO RUN	3
83	Condenser Coil Temp Sensor Fail-OCT	2
84	Outdoor Air Temperature Sensor Fail-OAT	2
88	Emergency Stop Fault	3
93	CONTROL Fault	3
97	Smoke Detection	3

*Fault levels: 0 = none, 1=warning, 2= problem, 3=shutdown



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., NATIONAL WIRING REGULATIONS, AND LOCAL CODES AS APPLICABLE.

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. CONNECT FIELD WIRING IN GROUNDED RAIN TIGHT CONDUIT TO FUSED DISCONNECT.
3. CONNECT FIELD WIRE TO COMPRESSOR CONTACTOR (CC1).
4. REMOVE J3 AT DR(2) TO INSTALL LOW AMBIENT ACCESSORY.
5. IF REQUIRED, ATTACH CRANKCASE HEATER ACCESSORY TO CC1 (L1) AND CC1 (L2).
6. COMPRESSOR MOTOR THERMALLY PROTECTED. ALL 3 PHASE MODELS ARE PROTECTED UNDER PRIMARY SINGLE PHASE CONDITIONS.
7. TRANSFORMER FACTORY WIRED AS SHOWN BELOW. CHANGE PRIMARY VOLTAGE CONNECTIONS FOR ALTERNATE VOLTAGES, IF REQUIRED.

UNIT VOLTAGES - HZ	TRANSFORMER TERM.
200-220 - 50HZ	200
208 - 60HZ	230
230 - 60HZ	230
380 - 60HZ	400
380-415 - 50HZ	400
460 - 60HZ	460
575 - 60HZ	575

8. LOW VOLTAGE CIRCUIT IS N.E.C. CLASS 2 WITH A CLASS 2 TRANSFORMER, 24VAC, 50/60 HZ SUPPLIED.
9. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.
10. REMOVE PL24 FOR ECONOMIZER ACCESSORY. PL22 AND PL24 LOCATED IN RETURN AIR SECTION.

COMPONENT CODES

AR	ACCESSORY RELAY
BR	BLOWER RELAY
CA	COMFORT ALERT MODULE
CC	COMPRESSOR CONTACTOR
CCH	CRANKCASE HEATER
CDS	CLOGGED DRAIN SENSOR
CFS	CLOGGED FILTER SWITCH
COMP	COMPRESSOR
CT	CONTROL TRANSFORMER
DAT	DISCHARGE AIR SENSOR
DISC	DISCONNECT SWITCH
DR	DEFROST RELAY
FLMS	FLAME SENSOR
FP	FAN PROVING
FS	FREEZE SENSOR
FT	FREEZE STAT
GFCO	GROUND FAULT CONVENIENCE OUTLET
GL	GROUND LUG
GND	GROUND
HPC	HIGH PRESSURE CONTROL
IBM	INDOOR BLOWER MOTOR
IDM	INDUCED DRAFT MOTOR
IFC	INTEGRATED FURNACE CONTROL
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
MAS	MIXED AIR SENSOR
MRLC	MANUAL RESET LIMIT CONTROL
NPC	NEGATIVE PRESSURE SWITCH
OAT	OUTSIDE AIR SENSOR
OCT	OUTDOOR COIL TEMPERATURE SENSOR
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROLLER
PL	PLUG
PT	POWER TRANSFORMER
RAT	RETURN AIR SENSOR
RC	RUN CAPACITOR
RTU-C	ROOFTOP UNIT CONTROL
SE	SPARK ELECTRODE
RV	REVERSING VALVE
TB	TERMINAL BLOCK
US	UNLOADER SOLENOID
VFD	VARIABLE FREQUENCY DRIVE

WIRE COLOR CODE

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

ELECTRICAL WIRING SCHEMATIC

HP DDC 1 STG W/CA 072
208/230/460V, 3PH, 60HZ

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.: R-1073S183
MODELED BY: TEW	DATE: 03-16-20	
PART NO.: 90-106688-70		REV: 00

R. INFORMATION FOR THE OWNER

R.1. Information for the Owner: Maintenance and service

For routine maintenance, general diagnostics for cooling and heating, and other generalized information regarding filter changing, cleaning the condensate pan, cleaning the coils, and general inspections, refer to the included User's Information Manual for the owner.

Manufacturer Part number: 92-106692-01

R.2. Product Model and Serial Number

The product model and serial number are both located on the rating plate found on the supply/ return panel of the unit. Refer to the product spec for the breakdown of each character in the model number.

Commercial Job Site Information

Site Information and Application Details:

Business Name : ______________________

Address : ______________________

City : __________ State : ______ Zip : ______

Site Contact : ______________________

Phone : __________ Mobile : __________

Email : ______________________

Model Number : ______________________

(Please include all letters and digits of the model number)

Serial Number : ______________________

(Please include all letters and digits of the serial number)

Date of Install : ______________________

(When was the unit installed, month, day, and year)

Dealer/Contractor Information:

Business Name : ______________________

Address : ______________________

City : __________ State : ______ Zip : ______

Site Contact : ______________________

Phone : __________ Mobile : __________

Email : ______________________

Technician Name : ______________________

Visit Date: ______________________

Technician Name : ______________________

Visit Date: ______________________

Technician Name : ______________________

Visit Date: ______________________

Distributor and Support Details:

Distributor Name : ______________________

City : __________ State : ______

Rep Name : ______________________

Visit Date: ______________________

Unit Setup and Operational Information

Voltage and Amperage Information :

Line Voltage Measurements :

Base Voltage : 208 240 460 (Circle one) Phase : 1 3 (Circle one)

Measured Line Voltage :

Phase A to B : __________ Phase A to Ground : __________

Phase B to C : __________ Phase B to Ground : __________

Phase C to A : __________ Phase C to Ground : __________

Breaker Size : __________ Conductor Size: __________

24VAC Low Voltage Measurements :

Transformer Tap : 208 240 460 (Circle one)

24VAC Measured Voltage : R to C : __________

24VAC Measured Amp Load :

Transformer Load: __________

T-stat Load: __________

Amperage and Power Measurements :

	Full Running Load	Blower	Compressor 1	Compressor 2	Outdoor Fans					
Phase A :										
Phase B :										
Phase C :										

Refrigerant Circuit Information :

Circuit 1 :

Suction Line

Pressure (PSI) : __________

Temperature (°F) : __________

Superheat (°F) : __________

Liquid Line

Pressure (PSI) : __________

Temperature (°F) : __________

Sub-cooling (°F) : __________

Circuit 2 :

Suction Line

Pressure (PSI) : __________

Temperature (°F) : __________

Sub-cooling (°F) : __________

Liquid Line

Pressure (PSI) : __________

Temperature (°F) : __________

Sub-cooling (°F) : __________

Outdoor Air Temperature (°F) : __________

Outdoor Air Wet Bulb (°F) : __________

Return Air Temperature (°F) : __________

Return Air Wet Bulb (°F) : __________

Supply Air Temperature (°F) : __________

Supply Air Wet Bulb (°F) : __________

S. INSTALLATION CHECK LIST AND JOB SITE SHEET

Commercial Job Site Information

Site Information and Application Details:

Business Name : ____________________ Model Number : ____________________

(Please include all letters and digits of the model number)

Address : ____________________

City : __________ State : ______ Zip : ______ Serial Number : ____________________

(Please include all letters and digits of the serial number)

Site Contact : ____________________

Phone : __________ Mobile : __________ Date of Install : ____________________

(When was the unit installed, month, day, and year)

Email : ____________________

Dealer/Contractor Information:

Business Name : ____________________ Technician Name : ____________________

Address : ____________________ Visit Date: ____________________

City : __________ State : ______ Zip : ______ Technician Name : ____________________

Site Contact : ____________________ Visit Date: ____________________

Phone : __________ Mobile : __________ Technician Name : ____________________

Email : ____________________ Visit Date: ____________________

Distributor and Support Details:

Distributor Name : ____________________ Rep Name : ____________________

City : __________ State : ______ Visit Date: ____________________

Unit Setup and Operational Information

Voltage and Amperage Information :

Line Voltage Measurements :

Base Voltage : 208 240 460 (Circle one) Phase : 1 3 (Circle one)

Measured Line Voltage :

Phase A to B : ______ Phase A to Ground : ______

Phase B to C : ______ Phase B to Ground : ______

Phase C to A : ______ Phase C to Ground : ______

Breaker Size : ______ Conductor Size: ______

24VAC Low Voltage Measurements :

Transformer Tap : 208 240 460 (Circle one)

24VAC Measured Voltage : R to C : ______

24VAC Measured Amp Load :

Transformer Load: ______

T-stat Load: ______

Amperage and Power Measurements :

	Full Running Load	Blower	Compressor 1	Compressor 2	Outdoor Fans
Phase A :					
Phase B :					
Phase C :					

Refrigerant Circuit Information :

Circuit 1 :

Suction Line		Liquid Line	
Pressure (PSI) :		Pressure (PSI) :	
Temperature (°F) :		Temperature (°F) :	
Superheat (°F) :		Sub-cooling (°F) :	

Circuit 2 :

Suction Line		Liquid Line	
Pressure (PSI) :		Pressure (PSI) :	
Temperature (°F) :		Temperature (°F) :	
Sub-cooling (°F) :		Sub-cooling (°F) :	

Outdoor Air Temperature (°F) : ______ Return Air Temperature (°F) : ______ Supply Air Temperature (°F) : ______

Outdoor Air Wet Bulb (°F) : ______ Return Air Wet Bulb (°F) : ______ Supply Air Wet Bulb (°F) : ______

CLIMATEMASTER®

A NIBE GROUP MEMBER

7300 S.W. 44th Street
Oklahoma City, OK 73179
Phone: 405-745-6000
Fax: 405-745-6058
climatemaster.com

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