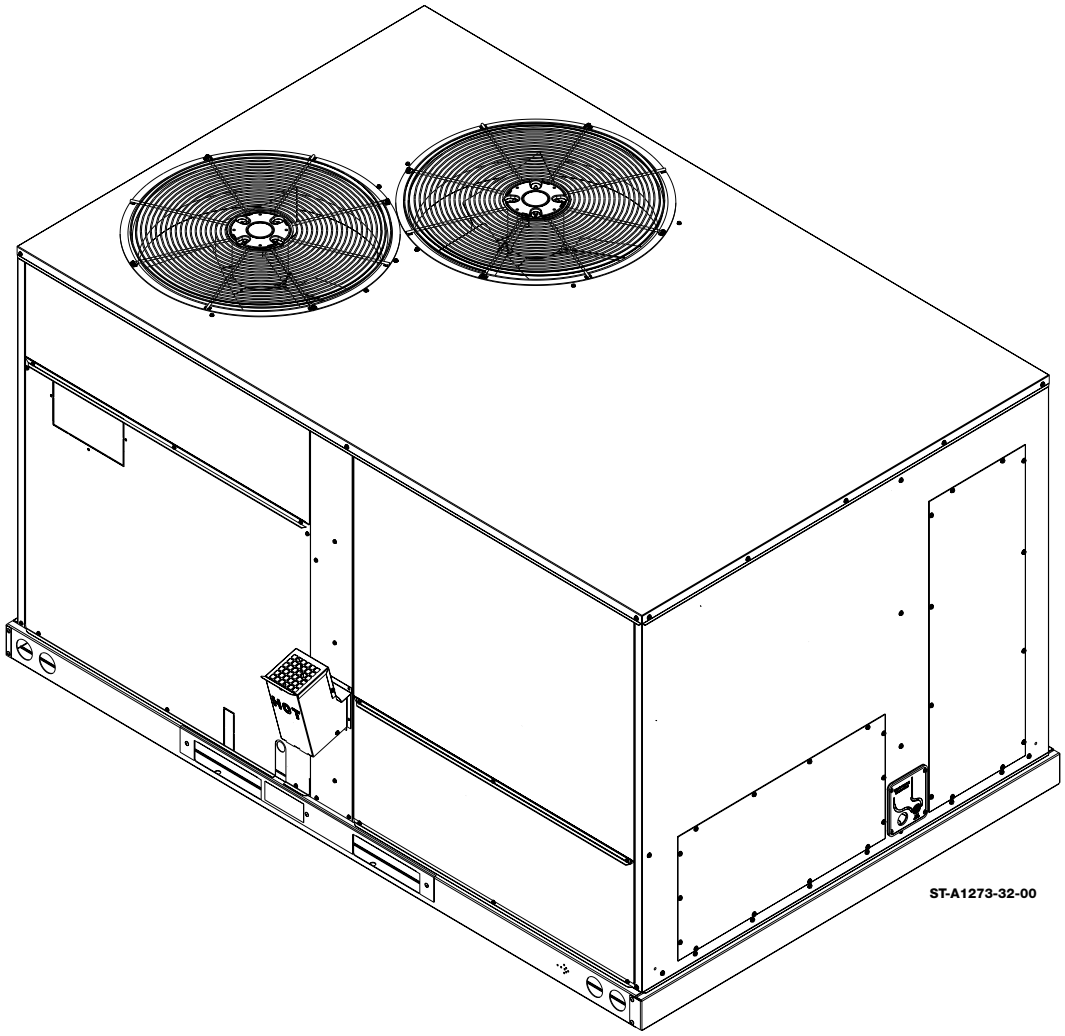
INSTALLATION INSTRUCTIONS

FOR PACKAGED GAS ELECTRIC UNITS

(-)GED SERIES 7.5, 8.5, 10.0 & 12.5 TON [26.4, 29.9, 35.2 & 44.0 KW] 60 HZ MODELS WITH R-454B REFRIGERANT



ST-A1273-32-00

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

92-106166-07-01

RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠WARNING

IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT, CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠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.

⚠WARNING

— Do not store or use gasoline or other flammable vapors and liquids, or other combustible materials in the vicinity of this or any other appliance.

— WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Do not return to your home until authorized by the gas supplier or fire department.

— DO NOT RELY ON SMELL ALONE TO DETECT LEAKS. DUE TO VARIOUS FACTORS, YOU MAY NOT BE ABLE TO SMELL FUEL GASES.
- U.L. recognized fuel gas and CO detectors are recommended in all applications, and their installation should be in accordance with the manufacturer's recommendations and/or local laws, rules, regulations, or customs.

— Improper installation, adjustment, alteration, service or maintenance can cause injury, property damage or death. Refer to this manual. Installation and service must be performed by a qualified installer, service agency or the gas supplier. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

BA001-02

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

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A. IMPORTANT SAFETY AND GENERAL INFORMATION

A.1. Introduction

This booklet contains the installation and operating instructions for your 7.5 ton, 8.5 ton, 10 ton, or 12.5 ton combination gas heating/electric cooling 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.

The images contained within this document may not be an exact representation of every unit, accessory, installation, etc. We reserve the right to change the content of this document at any time.

⚠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.

A.2. Agency Performance Audit and Efficiency Testing Notice

NOTICE: BREAK-IN PERIOD

Prior to agency testing, run the compressor for 20 hours at 115°F outdoor ambient temperature and 80°F dry bulb / 75°F wet bulb indoor ambient temperature.

NOTICE: EFFICIENCY TESTING NOTICE

For the purposes of verifying or testing efficiency ratings, the test procedure in Title 10 Appendix A to Subpart F of Part 431 (Uniform Test Method for the Measurement of Energy Consumption of Air-Cooled Small (≥65,000 Btu/h), Large, and Very Large Commercial Package Air Conditioning and Heating Equipment) and the clarifying provisions provided in the standards listed on this page 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 - 2022
- ANSI/ASHRAE 103 (2022)
- AHRI Operations for Unitary Large AC Equipment 340/360 (2023)
- CSA Z21.47 (2021)

SAFETY

- UL 20335-2-40 4th Edition
- CSA Z21.47 (2021)
- CSA C22.2 No 60335-2-40 4th Edition

QUALITY

- ISO 9001: 2015

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.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment must be on site. A dry powder CO2 fire extinguisher must be near the charging area at all times during installation, commissioning, service, and decommissioning.

A. IMPORTANT SAFETY AND GENERAL INFORMATION

A.3.1. Working Personnel Qualifications

Every installation, maintenance, service, and repair working procedure must be conducted by qualified personnel who have been trained in operating and servicing units that employ flammable refrigerants such as R-454B.

Examples of working procedures include but are not limited to:

- Breaking into the refrigeration circuit
- Opening sealed components
- Opening ventilated enclosures

This appliance is not intended for use by persons (including children) when reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

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: Use only with type of gas approved for this unit. Refer to the unit rating plate.

⚠WARNING: Install this unit only in a location and position as specified in the location requirements and considerations section of these instructions. Provide adequate combustion and ventilation air to the unit space as specified in the venting section of these instructions.

⚠WARNING: Provide adequate combustion and ventilation air to the unit space as specified in the combustion and ventilation air section of these instructions.

⚠WARNING: Combustion products must be discharged outdoors. Refer to local building codes for ducting combustion exhaust.

⚠WARNING: Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in gas supply and piping section of these instructions.

⚠WARNING: Always install unit to operate within the unit's intended temperature–rise range with a duct system which has an external static pressure within the allowable range, as specified in ducting section of these instructions. See also unit rating plate.

⚠WARNING: When a unit is installed so that supply ducts carry air circulated by the unit to areas outside the space containing the unit, the return air shall also be handled by duct(s) sealed to the unit casing and terminating outside the space containing the unit.

⚠WARNING: This unit may be used to heat the building or structure during construction if the following installation requirements are met. Installation must comply with all installation instructions including:

- Furnace operating under thermostatic control;
- Return air duct sealed to the furnace;
- Air filters in place;
- Set furnace input rate and temperature rise per rating plate marking;
- Return air temperature maintained between 55°F (13°C) and 80°F (27°C);
- Clean furnace, duct work and components upon substantial completion of the construction process, and verify furnace operating conditions including ignition input rate, temperature rise and venting, according to the instructions.

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.

⚠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. Failure to ground this unit can result in fire or electrical shock causing property damage, severe personal injury, or death.

⚠DANGER: Risk of fire or explosion. Flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.

⚠WARNING: Risk of fire or explosion. Dispose of properly in accordance with Federal Or Local Regulations. Flammable refrigerant used.

⚠DANGER: Risk of fire or explosion. Flammable refrigerant used. Consult the repair manual/owner's guide before attempting to service this product. All safety precautions must be followed.

⚠DANGER: Risk of fire or explosion due to flammable refrigerant used. Follow handling instructions carefully in compliance with National Regulations.

⚠WARNING: Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

⚠WARNING: The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

⚠WARNING: Do not pierce or burn.

⚠WARNING: Be aware that refrigerants may not contain an odor.

⚠WARNING: If this unit is connected via an air duct system to one or more rooms with an area less than the specified minimum area, that room shall be without continuously operating flames or other potential ignition sources. See ***Appendix F – A2L Refrigerant Installation Safety Data***.

⚠WARNING: Auxiliary devices which may be a potential ignition source shall not be installed in the ductwork.

⚠WARNING: If this unit is connected via duct to one or more rooms, only auxiliary devices approved by the manufacturer that are declared suitable with A2L refrigerants shall be installed in the connecting ductwork.

⚠WARNING: Appliance shall be installed, operated, and stored in a room with a floor area larger than 'X'm^2. See ***Appendix F – A2L Refrigerant Installation Safety Data***.

⚠WARNING: If this unit is connected via duct to one or more rooms, only auxiliary devices approved by the manufacturer that are declared suitable with A2L refrigerants shall be installed in the connecting ductwork.

B. GENERAL SPECIFICATIONS

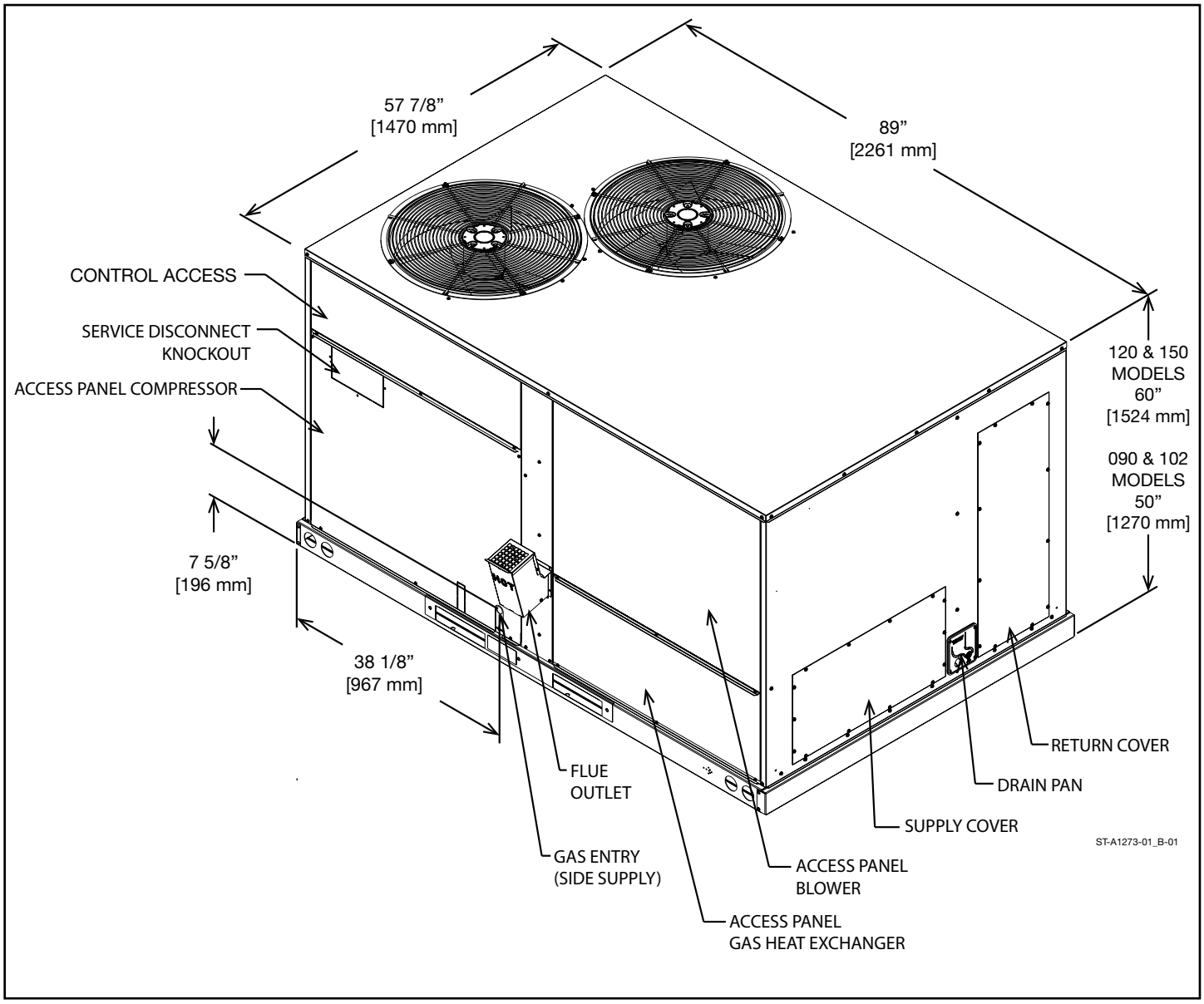
B.2. Major Components

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

B.3. Product Data Information

B.3.1. Dimensional Information

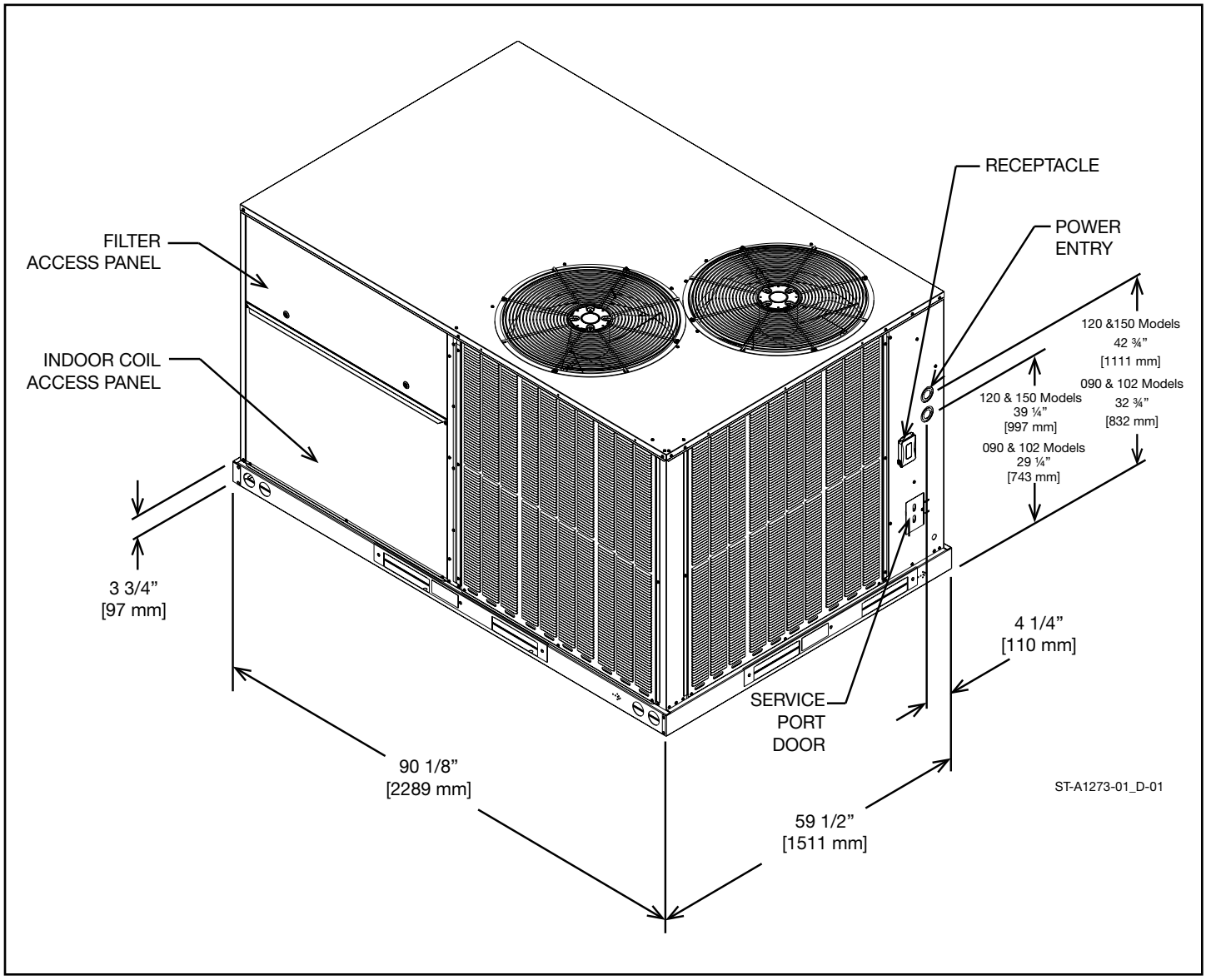
IMPORTANT: This unit must be mounted level in both directions to allow water to drain from the condenser section and condensate pan.



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 Gas Electric rooftop unit is available with 150k, 205k, or 225k BTUHs heating input. Cooling capacity is 7.5, 8.5, 10, or 12.5 nominal tons. Units are convertible from horizontal supply/return to bottom 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 or death.

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

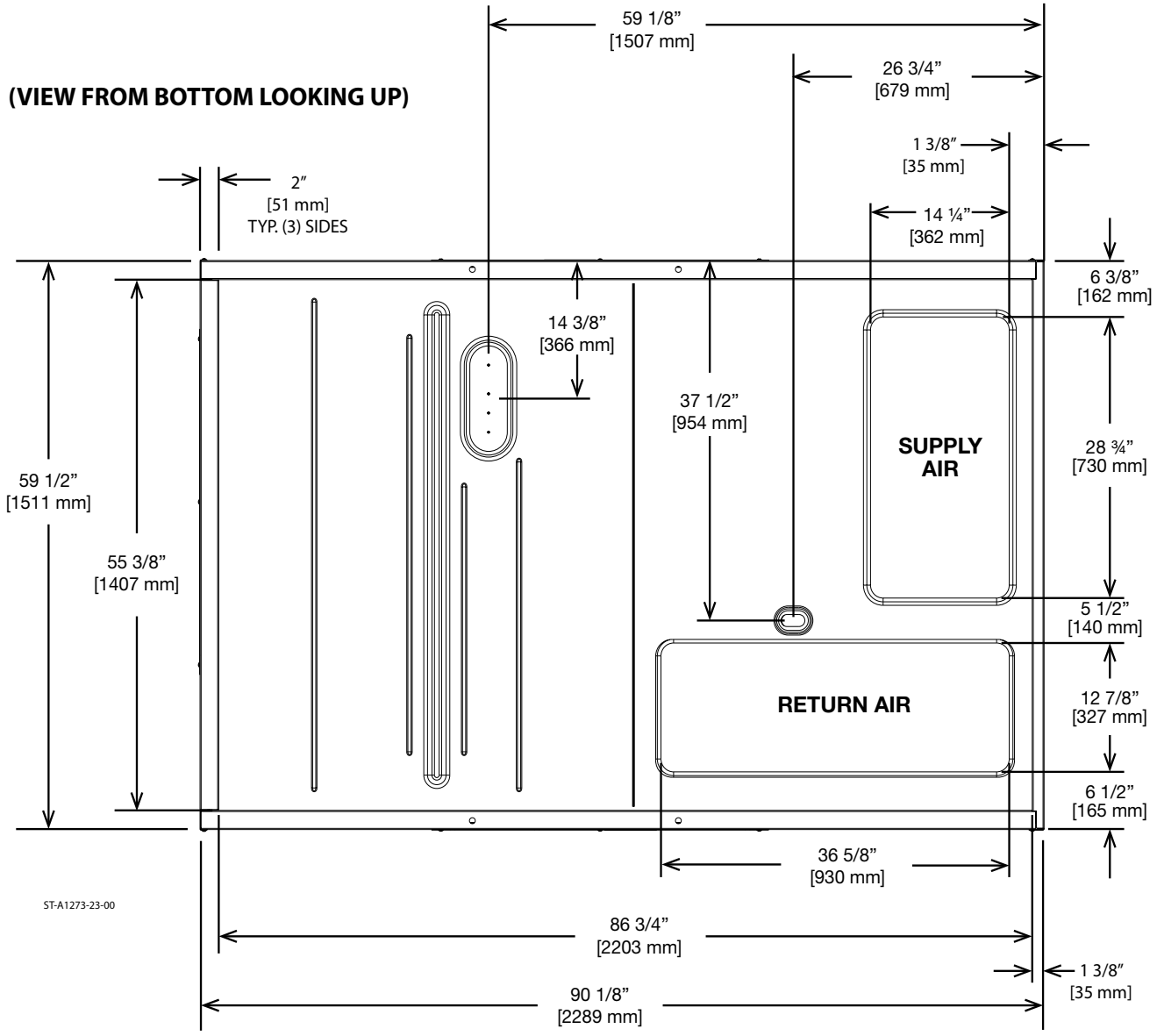
See ***Appendix B*** towards the end of this manual for Electrical Data.

B.3.5. Air Flow Performance Data

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

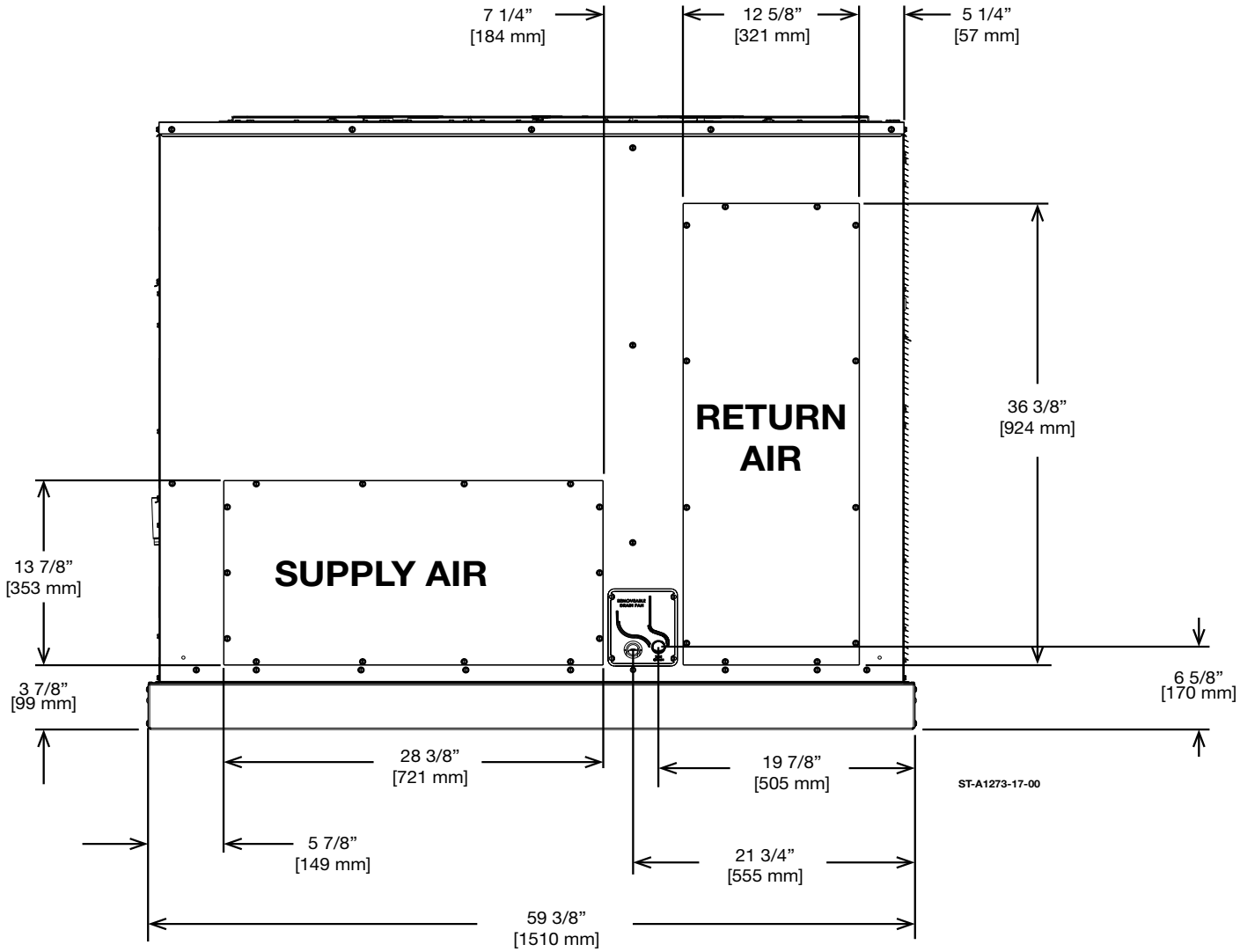
B.3.6. Supply and Return Duct Dimensions

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



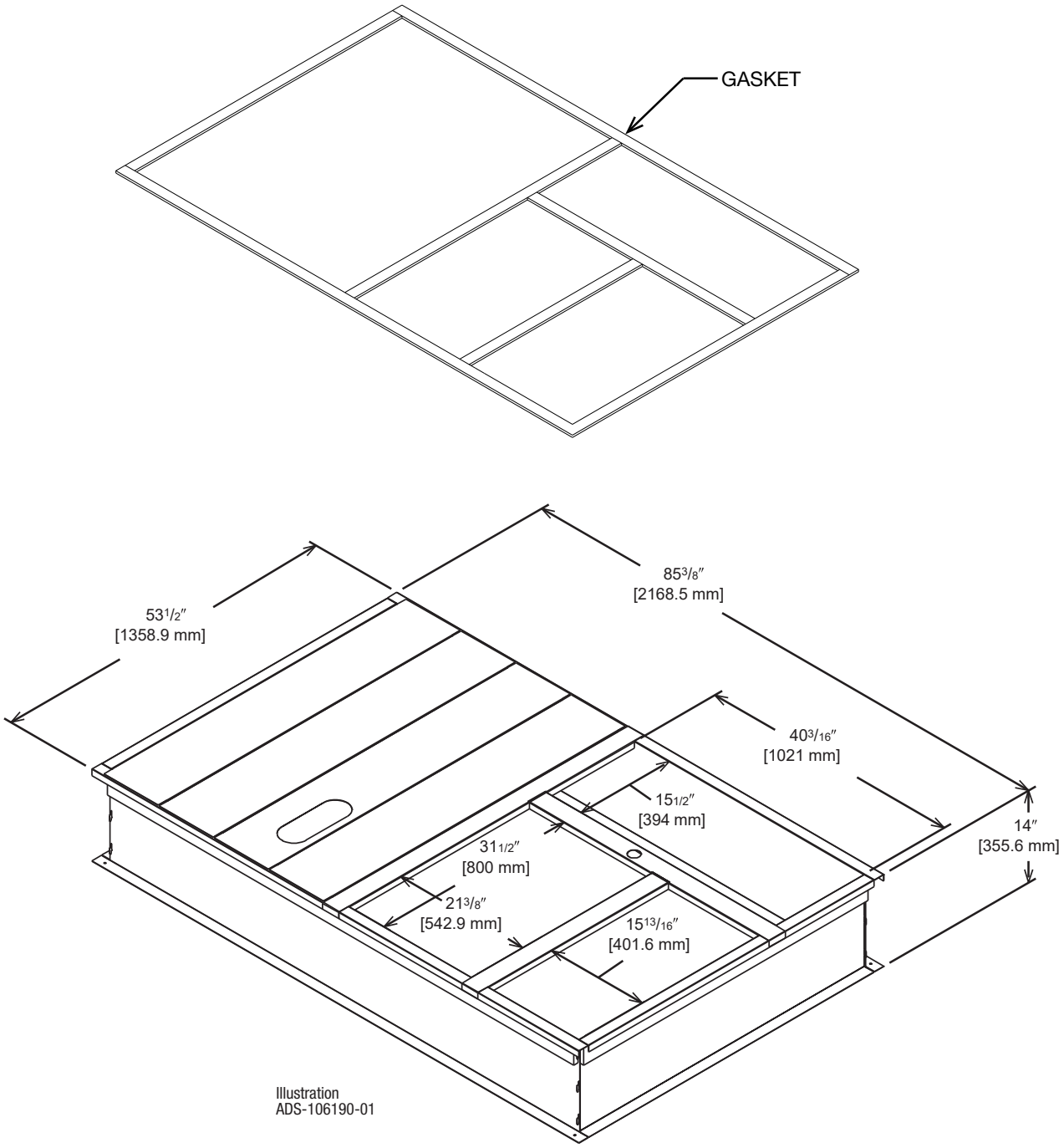
B. GENERAL SPECIFICATIONS

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 The American National Standard Z223.1-latest edition booklet entitled "National Fuel Gas Code", and the requirements or codes of the local utility or other authority having jurisdiction. Additional helpful publications available from the "National Fire Protection Association are:

- NFPA-90A - Installation of Air Conditioning and Ventilating Systems 2018 or latest edition.
- NFPA-90B - Warm Air Heating and Air Conditioning Systems 2018 or latest edition.

These publications are available from:

National Fire Protection

Association, Inc.

NFPA.ORG

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
- Gas supply and piping
- Air duct connections and sizing
- Drain facilities and connections
- Location for minimum noise and vibration - away from bedroom windows

C.2. Tool and Refrigerant

A leak detection system is installed in this unit. The unit must be powered at all times except during service.

This unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

C.2.1. Tools Required for Installing and Servicing R-454B 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-454B

All units are factory charged with R-454B Refrigerant.

Application: R-454B is not a drop-in replacement for R-410A. Equipment designs must accommodate the safety group A2L of R-454B. It cannot be retrofitted into R-410A units.

Physical Properties: R-454B has an atmospheric bubble point of 59.6°F [50.9°C] and an atmospheric dew point of -58.0°F [-50.0°C]. Its bubble point saturation pressure at 77F [25C] is 213 PSIG [1469 kPa] and dew point saturation pressure at 77°F [25°C] is 205 PSIG [1415 kPa].

Pressure: The pressure of R-454B is similar to that of R-410A. Recovery and recycling equipment, pumps, hoses, and the like must have design pressure ratings appropriate for R-454B. Manifold sets need to range up to 800 PSIG [5,516 kPa] high-side and 250 PSIG [1,724 kPa] low-side with a 550 PSIG [3,792 kPa] low-side retard. Hoses need to have a service pressure rating of 800 PSIG [5,516 kPa]. Recovery cylinders need to have a 400 PSIG [2,758 kPa] service pressure rating, DOT 4BA400 or DOT BW400.

Flammability: R-454B is classified as safety group A2L, where the 2L indicates flammability class.

R-454B and air should never be mixed in cylinders or supply lines or be allowed to accumulate in storage cylinders. Leak checking should never be done with a mixture of R-454B and air.

C. INSTALLATION OF THE UNIT

C.2.3. Quick Reference Guide for R-454B

Ensure that servicing equipment is designed to operate with R-454B.

- R-454B refrigerant operates at pressures similar to R-410A. However, it is classified in safety group A2L. Ensure that servicing equipment is compatible with R-454B.
- Refrigerant cylinders are no longer color-coded. R-454B refrigerant cylinders are light green grey in color with a red band on the shoulder or top of the cylinder to indicate flammability.
- R-454B, as with other HFCs is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil.
- R-454B 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-454B.

C.2.4. Evaporator Coil/TXV

The thermostatic expansion valve is specifically designed to operate with R-454B. If required, the existing TXV and/or evaporator coil must be replaced with the factory specified components specifically designed for R-454B.

⚠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.

C.2.5. Minimum Room Area

Because this unit uses R-454B refrigerant, UL requires a minimum room area for the total conditioned space (TAmin) that is supplied by this equipment.

The UL Safety Standard defines an individual room area as the room area enclosed by floors, walls, partitions, and doors of the space where the unit is installed, also as the room area into which refrigerant can leak. Each room/ conditioned space will need to be considered for the total area requirements.

The minimum room area of the total conditioned space for each base model is listed in ***Appendix F – A2L Refrigerant Installation Safety Data.***

C.2.6. No Ignition Sources

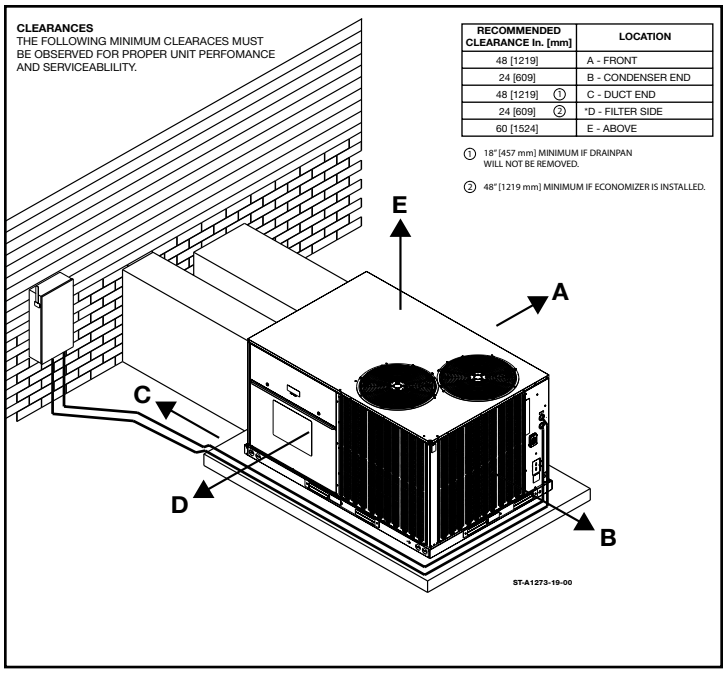
When performing work that involves exposing any pipework, no person working on or near the refrigerant system may use any ignition sources that could lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept far away from the site during installation, repair, removal, or disposal, during which refrigerant can possibly be released into the surrounding space. Before work takes place, the area around the equipment must be surveyed to ensure that there are no flammable hazards or ignition risks. Additionally, "No Smoking" signs must be displayed.

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



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. Installation inside can also cause recirculation of flue products into the conditioned space resulting in personal injury or death.

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 and to allow combustion air to enter the combustion air inlet.

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, sulfur 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.

4. 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.

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

6. A good liquid cleaner may be used several times a year to remove matter that will not wash off with water.

Several different types of protective coatings are offered in some areas. These coatings may provide some benefit, but the effectiveness of such coating materials cannot be verified by the equipment manufacturer. The best protection is frequent cleaning, maintenance and minimal exposure to contaminants.

C. INSTALLATION OF THE UNIT

C.3.5. Cover Panel Installation/Conversion Procedure

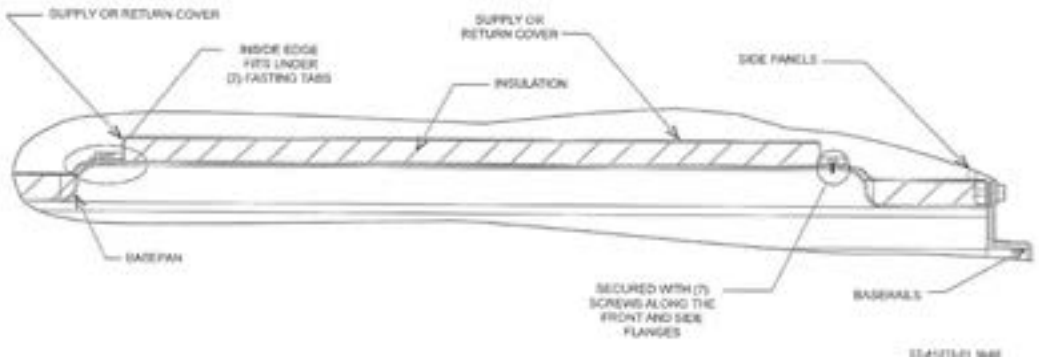
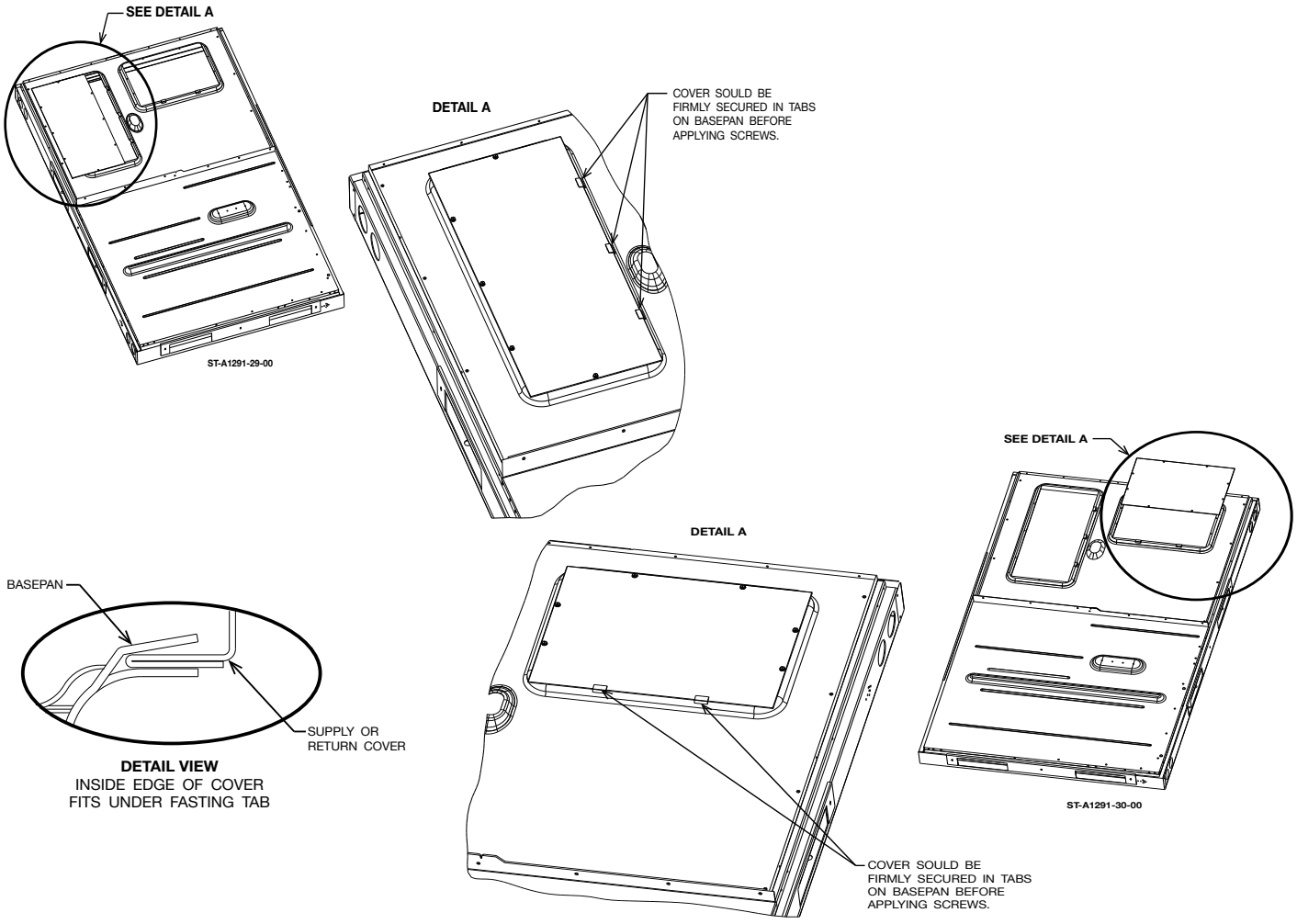


Figure C.3.5. – A: Downflow to Horizontal Conversion



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.

C.4. Setting the Unit

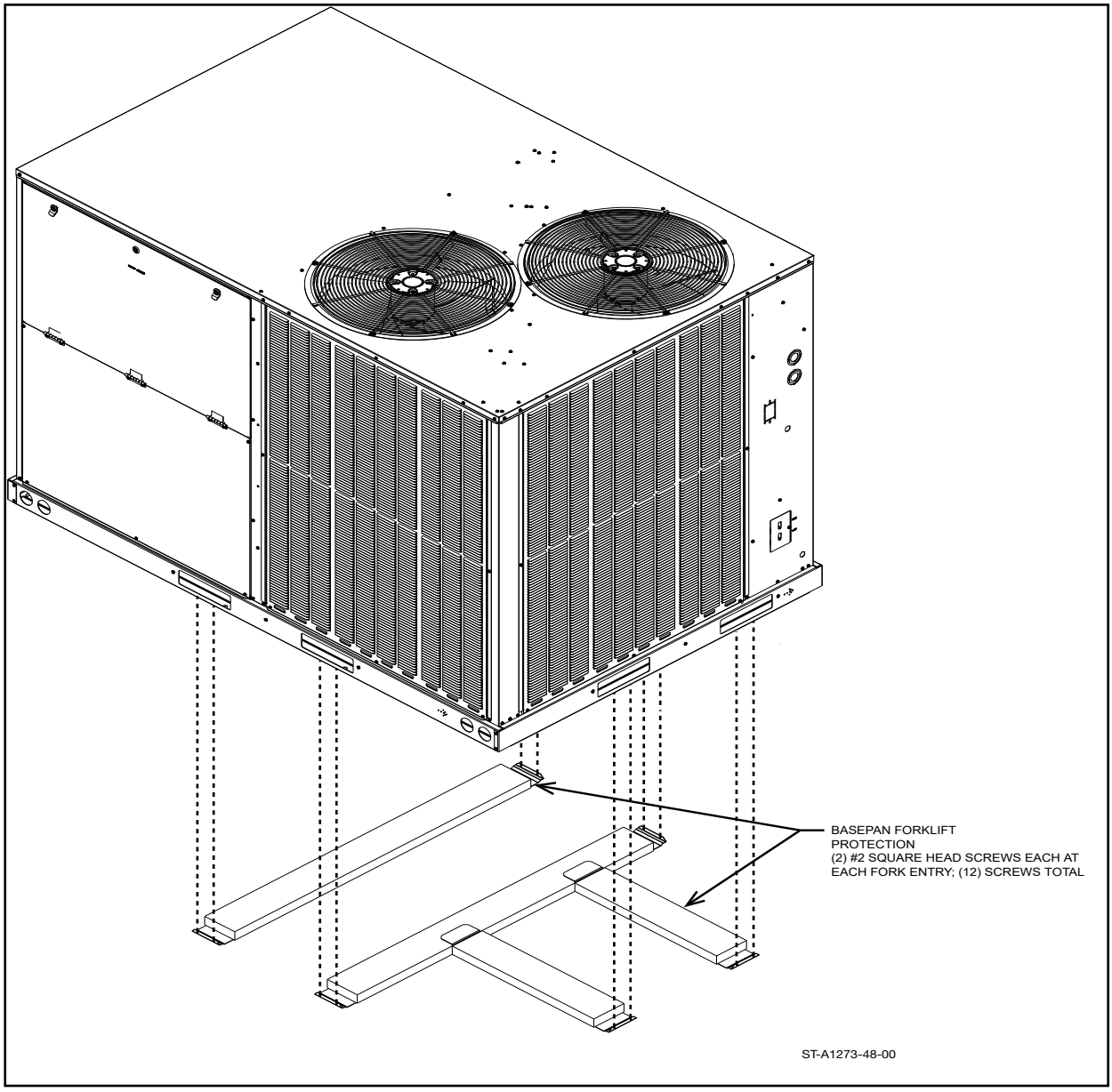
C.4.1. Removing Shipping Material

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

•**Wood Board 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 protection boards from underneath, and it may be removed when the unit is lifted.

• **Shipping Screws** – Shipping screws are type #2 square head screws.

Figure C.4.1. – A: Basepan Protection Assembly

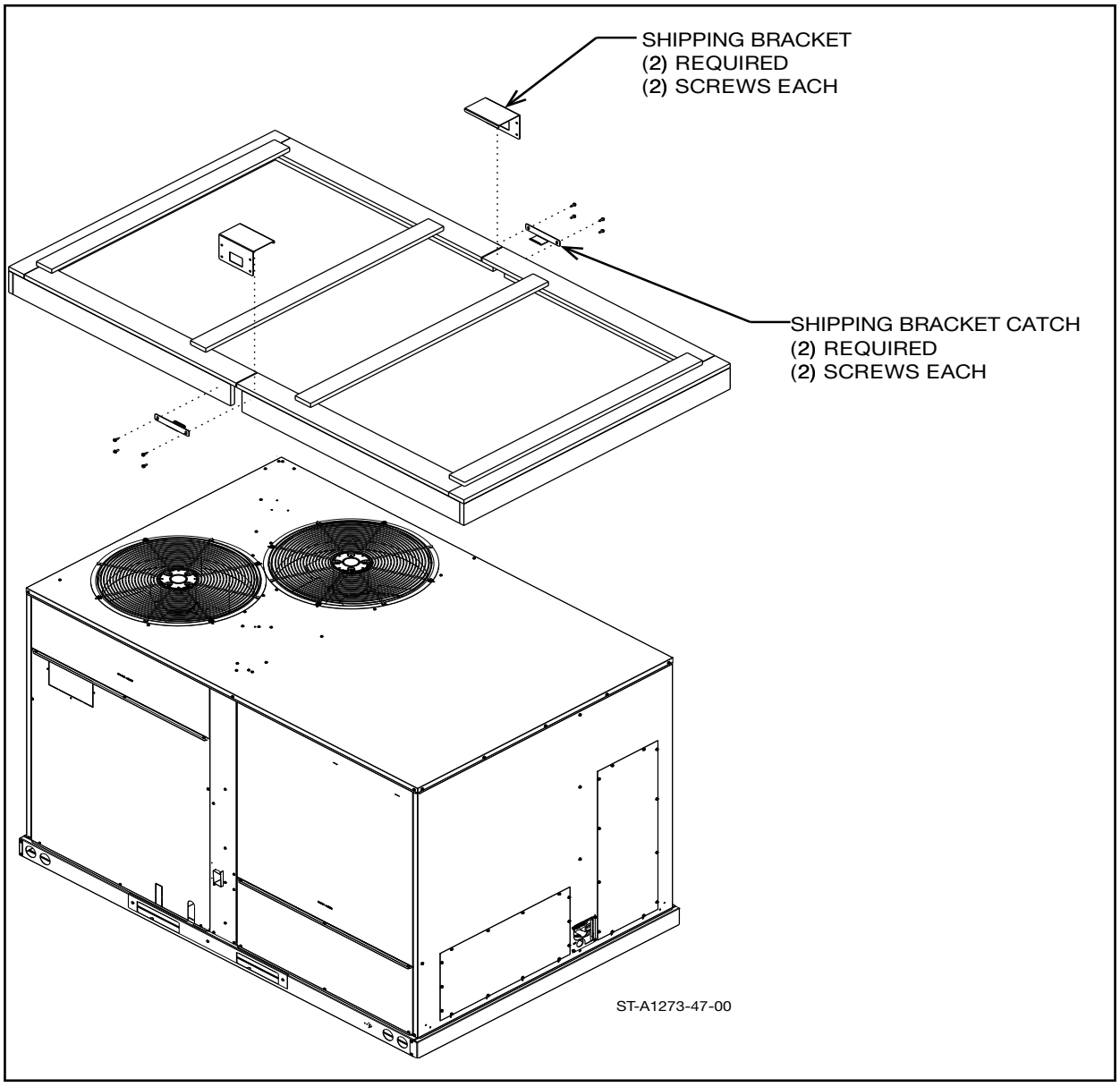


C. INSTALLATION OF THE UNIT

• **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.

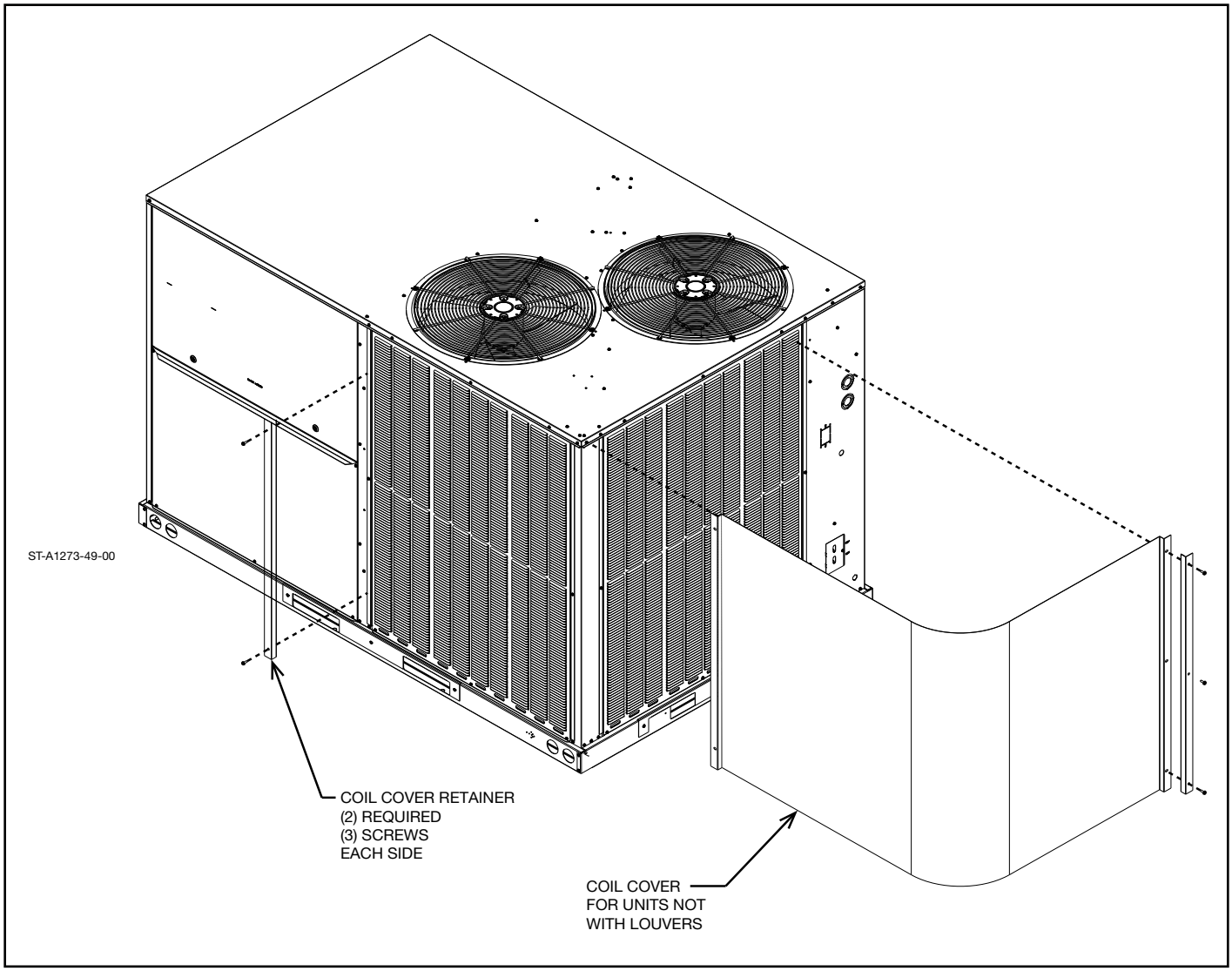
If the unit is to be lifted by a crane, it is recommended to leave the top skid on until after the unit is on the roof to provide extra protection if spreader bars are not used.

Figure C.4.1. – A: Wooden Skid Assembly



• **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.

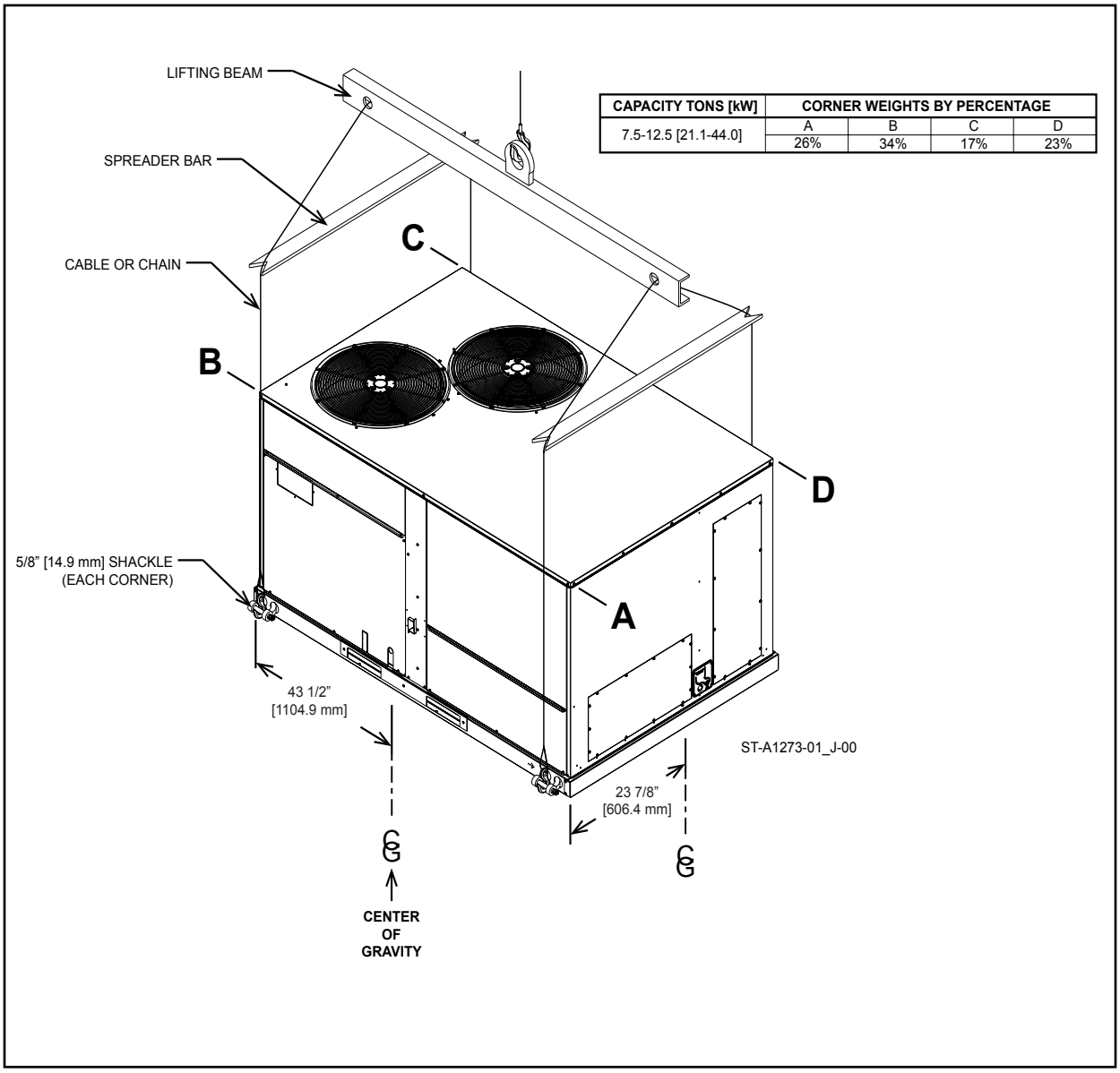
Figure C.4.1. – C: Condenser Coil Protection Assembly



C. INSTALLATION OF THE UNIT

C.4.2. Lifting the Unit

Figure C.4.2. – A : Lifting Detail



CAPACITY TONS [kW]	CORNER WEIGHTS BY PERCENTAGE			
	A	B	C	D
7.5-12.5 [21.1-44.0]	26%	34%	17%	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.

C.4.3.2. Setting the Unit

See Figure C.4.3.2. -A: Setting the unit on the 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***.

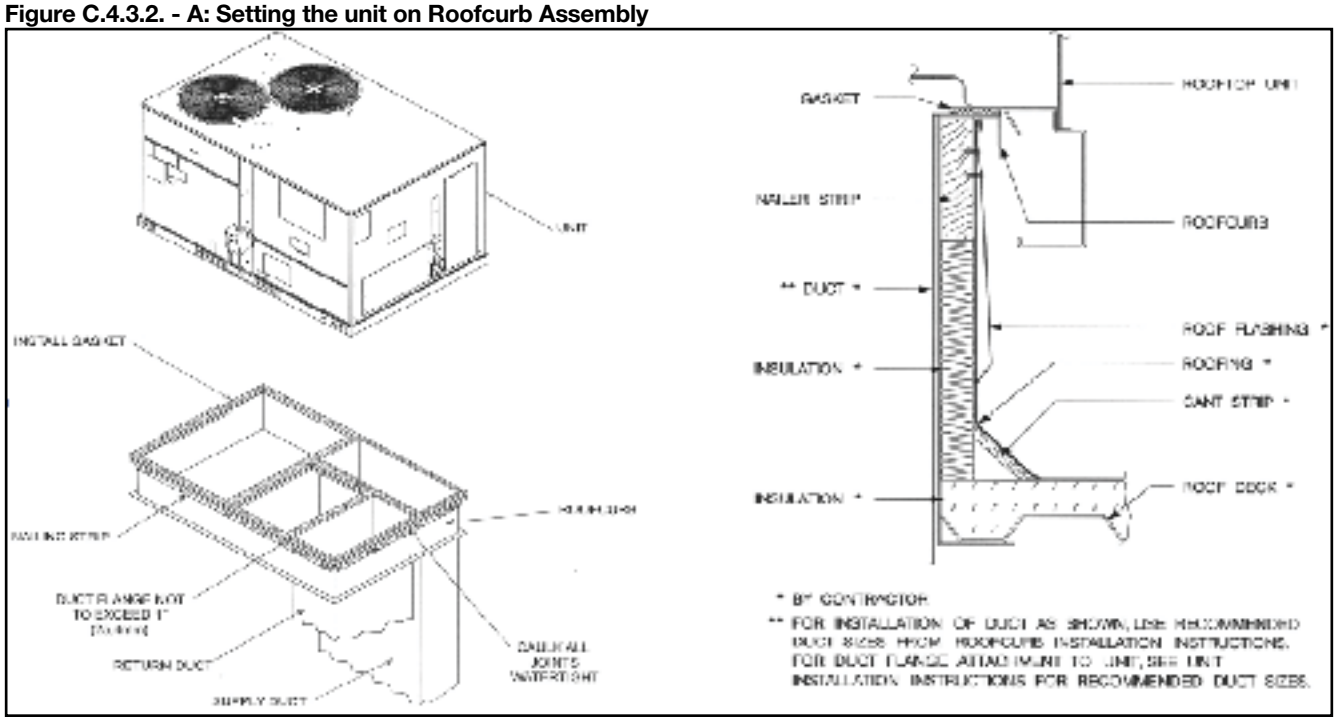
C.5. Installing Condensate Drain

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.

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

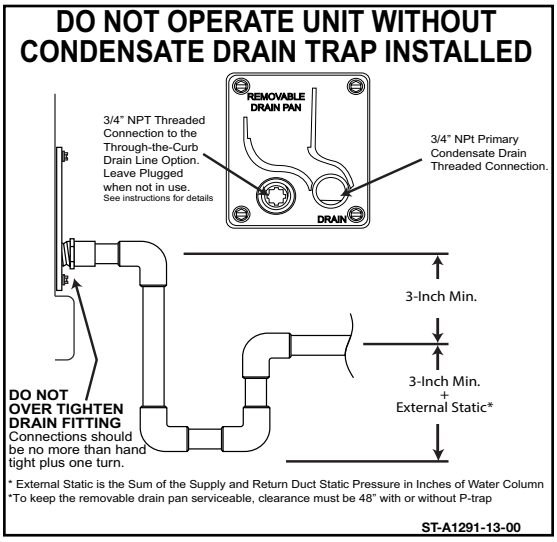


C. INSTALLATION OF THE UNIT

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

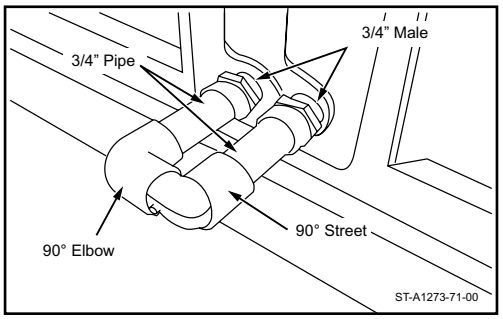
To use the removable drain pan feature of this unit, some of the condensate line joints should assembled for easy removal and cleaning. Drain line **MUST NOT** block service access panels.

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.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.

C.6.4. Install Flue Hood for Gas Heat

These gas heat package units are shipped with the flue hood fastened onto the condenser basepan in the compressor access section.

Remove the flue hood from the basepan, and install it over the flue opening on the outside of the unit before operating.

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 installation 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 at www.acca.org. for more information.

⚠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.

⚠WARNING: Only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

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/business owner must be informed against future changes in construction which might change this to a "confined space."

Also, caution the user/business owner 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 following dimensions are approximations. The installer is responsible for verifying all dimensions before installation.

The supply duct opening for roof curb installations is 28 3/4" x 14 1/4", the supply duct opening for horizontal ducted installations is 28 3/8" x 13 7/8". ***See Figure B.3.6. – A and B*** for reference. The installer is responsible for verifying all dimensions before unit installation.

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 following dimensions are approximations. The installer is responsible for verifying all dimensions before installation.

The return duct opening for roof curb installations is 36 5/8" x 12 7/8", the return duct opening for horizontal ducted installations is 36 3/8" x 12 5/8". See ***Figure B.3.6. – A and – B*** for reference. The installer is responsible for verifying all dimensions before unit installation.

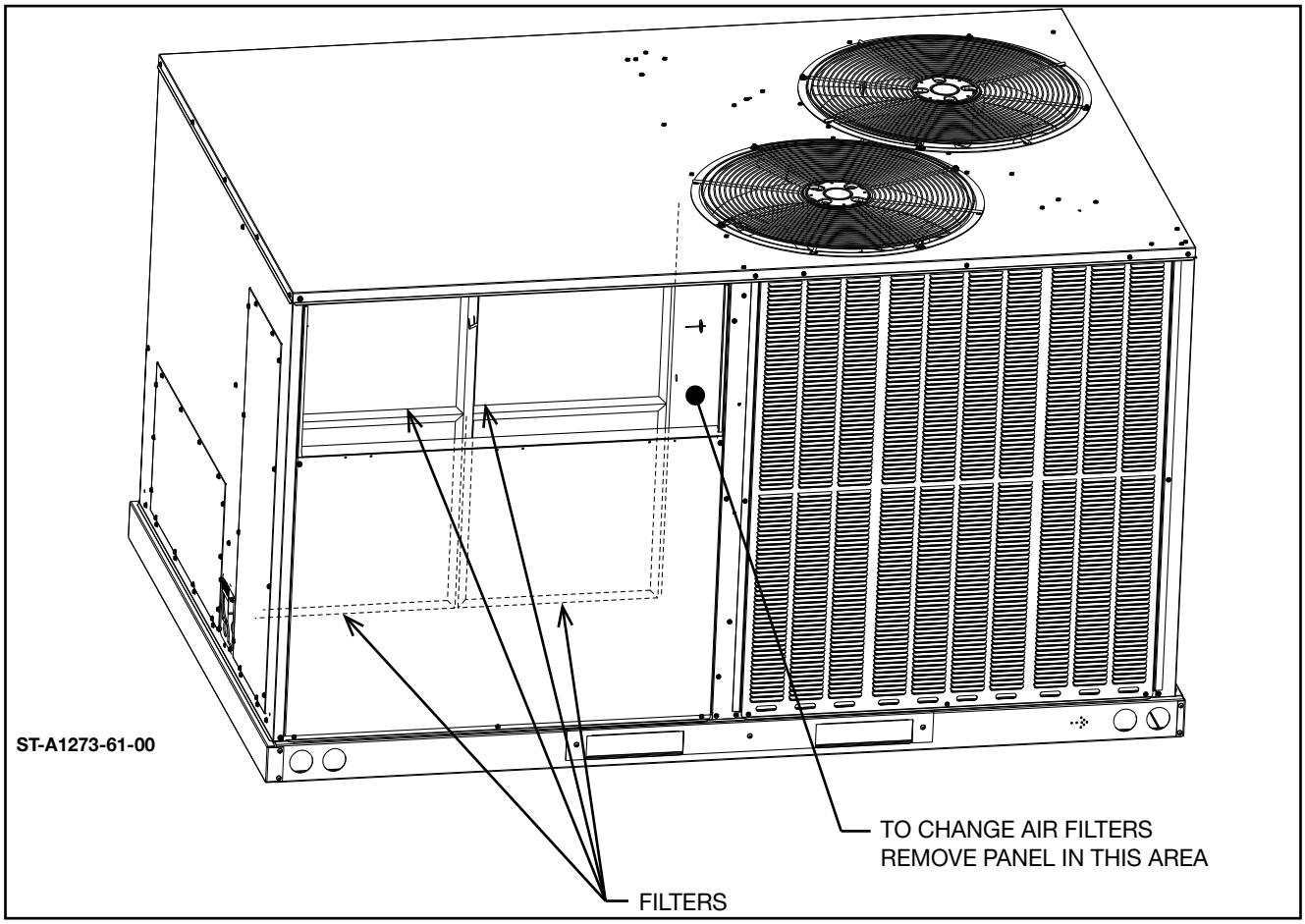
D. DUCT AND VENTING

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.

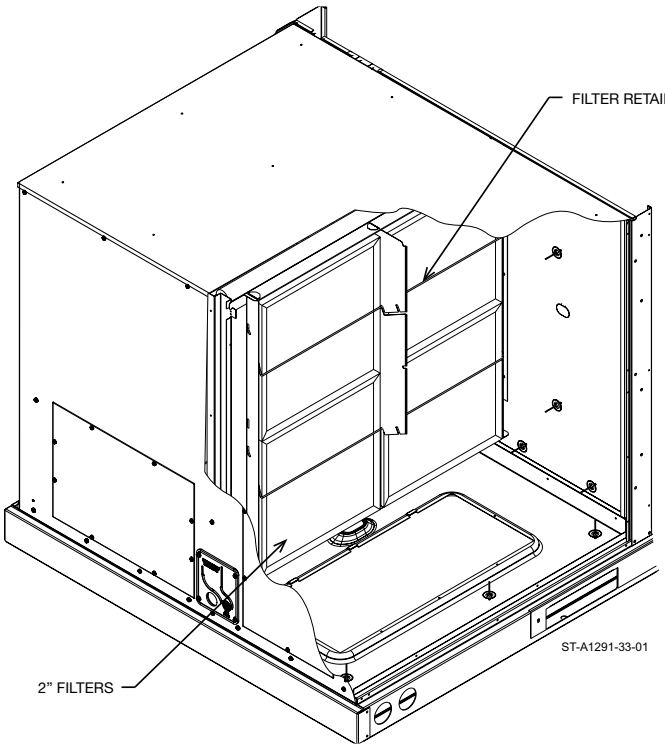
D.3. Filters

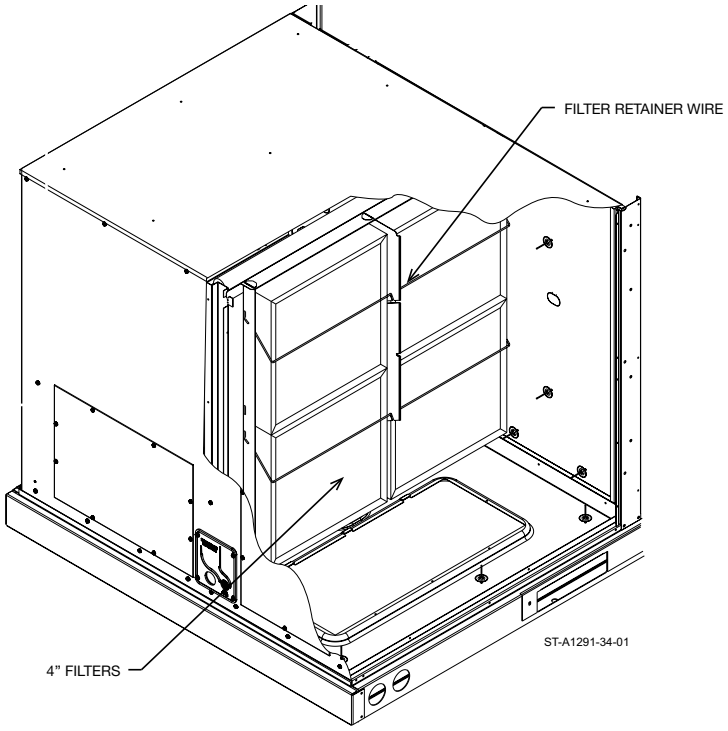
D.3.1. Installing Filters



D.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 20" x 20" 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. DUCT AND VENTING

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).

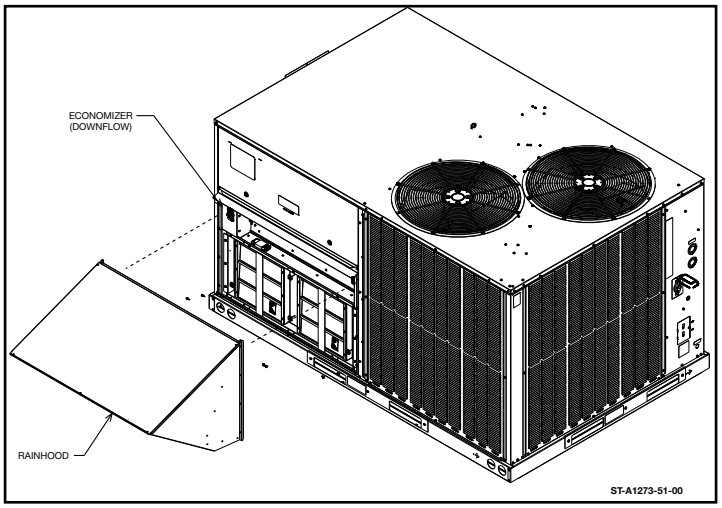
The Horizontal Economizer is designed specifically for units setup in a horizontal flow configuration. The horizontal economizer utilizes independently actuated return-air and fresh air dampers to enable the most efficient handling of air achievable with this platform. The horizontal economizer also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

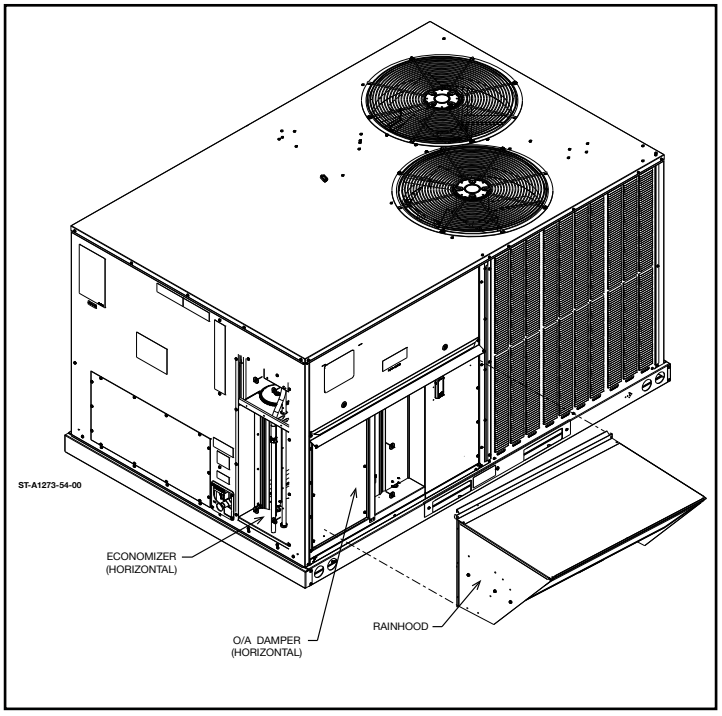
All units with economizers come shipped from the factory with a parts bag and a separate document for Economizer Installation & Operation instructions. Refer to that document for information on how to install the economizer, connect the controls, and adjust the airflow. Accessory economizers purchased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

For reference, the Installation Instructions for economizers may be found in the parts bag of the unit for factory installed economizers, in the box with the field installed economizer, or on the manufacturer's website.

Refer to ***Section J.1.1.1. Refrigerant Leak Detection System*** for instructions on how to relocate the factory-installed A2L sensor when a field-installed economizer is installed in this unit.

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





Note: Louver protections are optional.

D.4.2. Fresh Air Dampers

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

The blade inside the hood is manually set 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, it introduces 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.

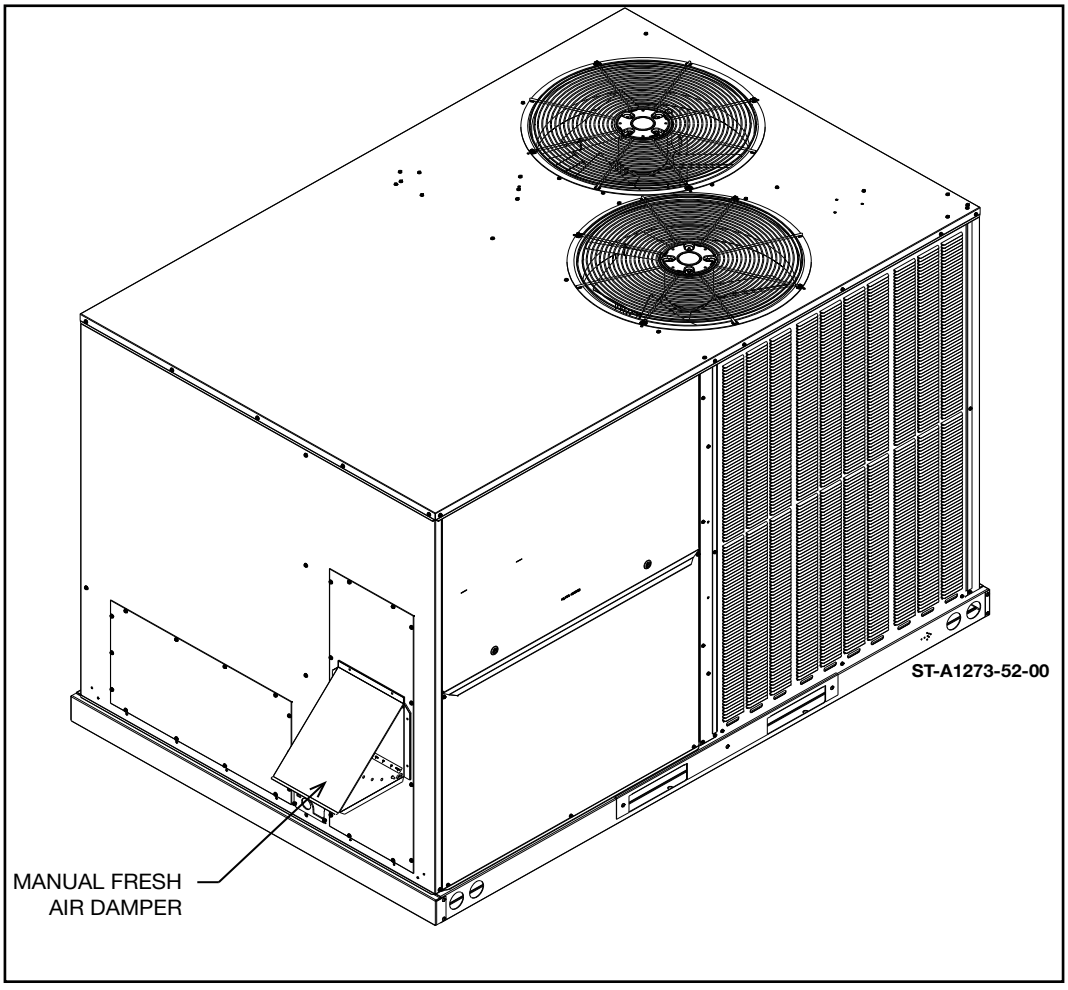
The advantage of the motorized damper is that the outside air is no longer a factor once the RTU fan is cycled off.

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 in the parts bag for the factory installed dampers, in the box for field installed dampers, or on the manufacturer's website for the product.

Figure D.4.2. – A: Fresh Air Damper



D. DUCT AND VENTING

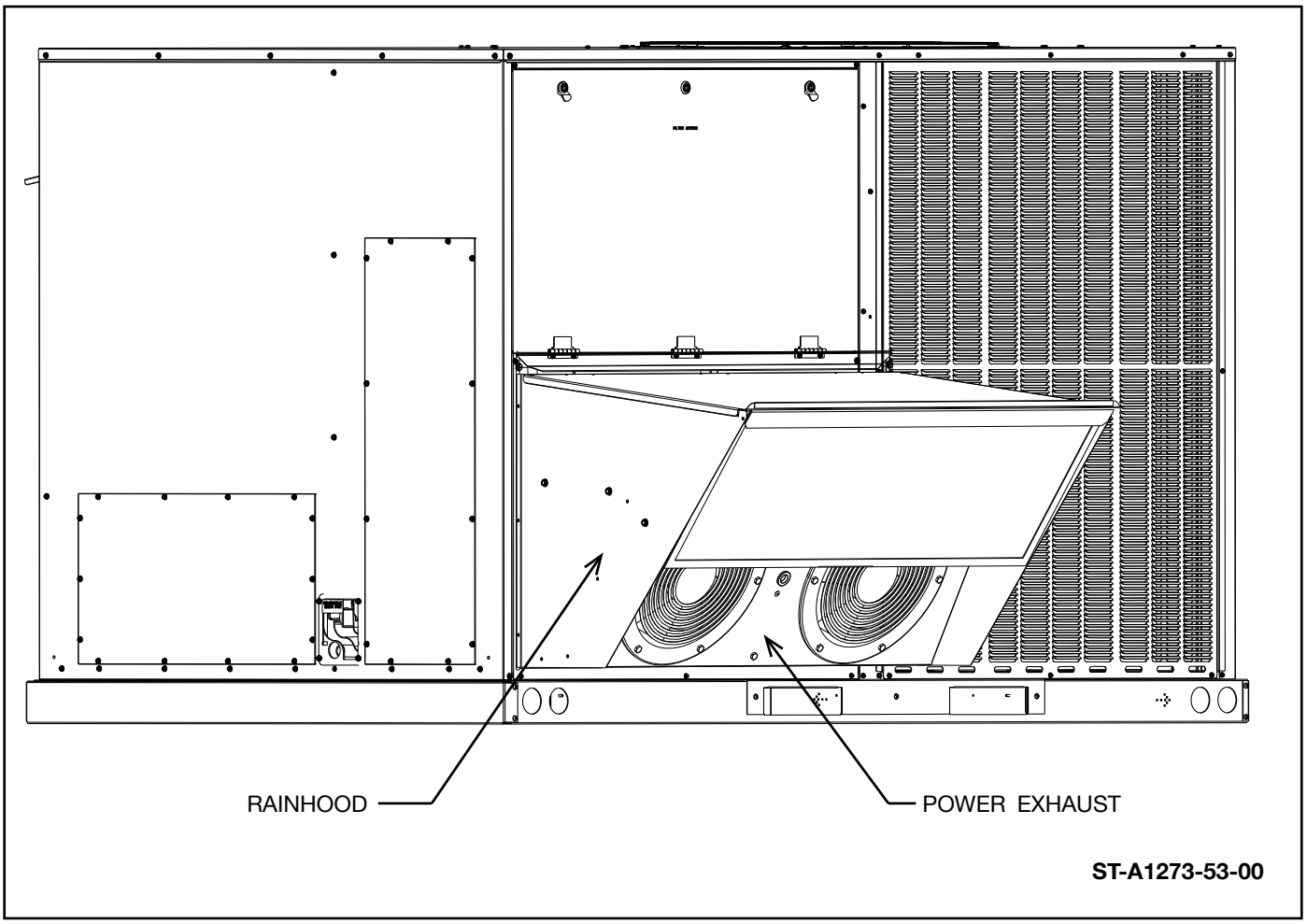
D.4.3. Powered Exhaust

POWER EXHAUST - This field-installed 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 spots within a room.

Accessory appearance may vary.

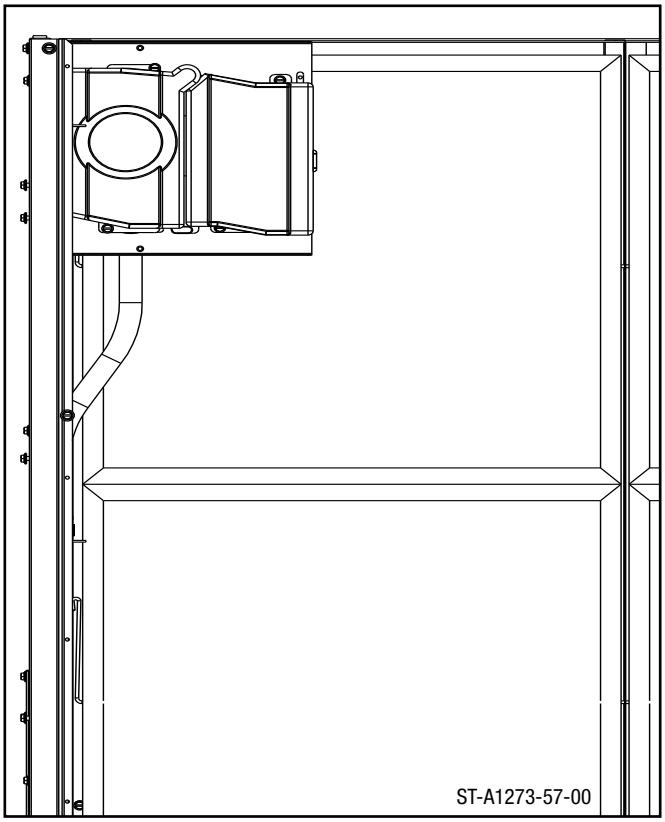
Note: For horizontal applications the accessory is mounted in the ductwork.

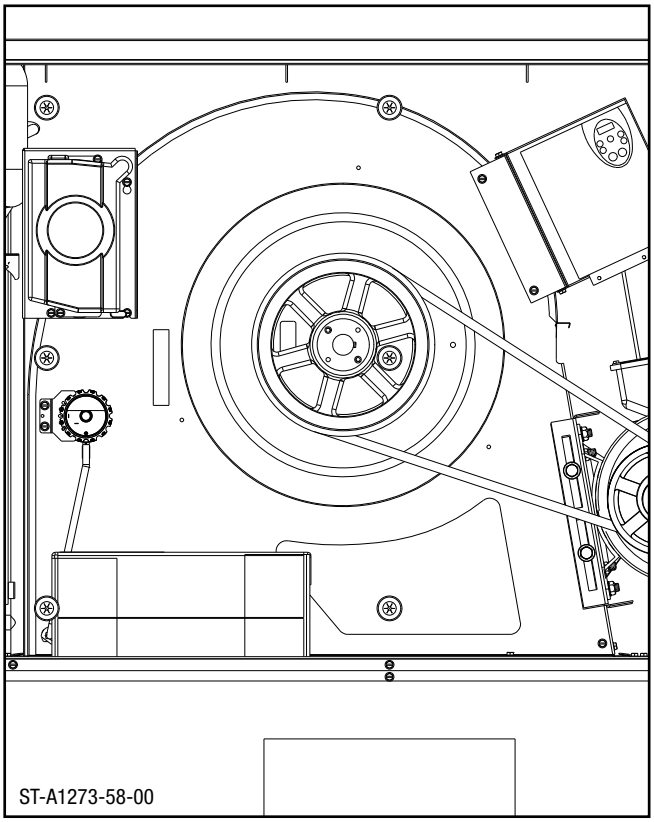
Figure D.4.3. – A: Powered Exhaust



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.

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 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.

D.5.2. Remote Smoke Detection Reference

Refer to ***Section F.1.2. Occupancy and Remote Smoke Detector Connections*** for Non-DDC connections.

Refer to ***Section F.2.5.1. Remote Smoke Detector/Fire Control Connection*** for DDC connections.

E. ELECTRICAL

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.3. – A: Power and Control Routing***. All fittings and conduit are field supplied for this application. Reference the chart with ***Figure F.3. – 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.

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.

Select the equivalent aluminum wire size from the tabulation below:

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. 208/230 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.1.3. 460 Volt Operation

460V units will not require any additional setup.

E.1.4. 575 Volt Operation

Setup for 575V units will not require any additional setup. There will be an additional transformer in the unit that is stored in a metal box and mounted next to the compressor. It will be pre-wired from the factory and no setup will be needed.

E.1.5. Potential Ignition Sources

The UL safety standard defines potential ignition sources as hot surfaces, flames, and current carrying devices which can be the source of arcing or sparking.

In case any internal electrical components need to be replaced, those replacement parts must be ordered from the unit manufacturer's website to ensure that the internal electrical components are not potential ignition sources.

Examples of internal electrical components include contactors, relays, and control boards. This is not an exhaustive list. For the safety of customers and technicians, refer to the unit manufacturer's website for proper unit component replacement.

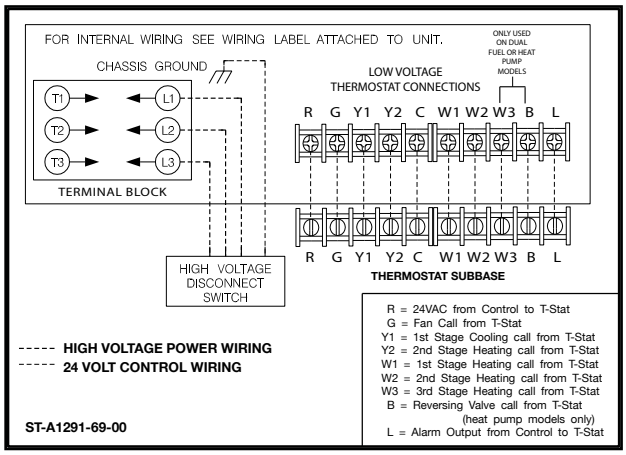
E. ELECTRICAL

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

Refer to ***Figure F.3. – A: Power and Control Routing*** for location of wiring entrances, and ***Figure F.3. – 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 for more information.

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 refrigerant 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 in ***Figure E.3.1.1 — B***.

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

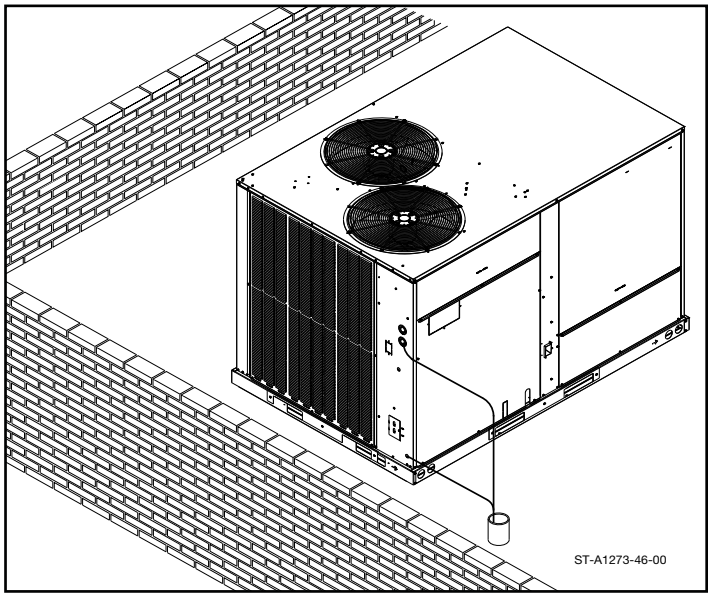


Figure E.3.1.1. – B: Label Showing Where to NOT Use Screws



E.3.1.2. Routing Wires into Cabinet

See ***Figure F.3. – 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 terminal block 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 H*** for the unit wiring diagrams, and to ***Figure F.3. – A*** for locations to route wires into the cabinet 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.3.*** 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.

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 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. It is recommended that a phase rotation meter be used to verify the system is connected properly to the three-phase power. This helps prevent compressor damage.

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 24VAC Thermostat Circuits***.

F. CONTROL / THERMOSTAT WIRING

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)					

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(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.

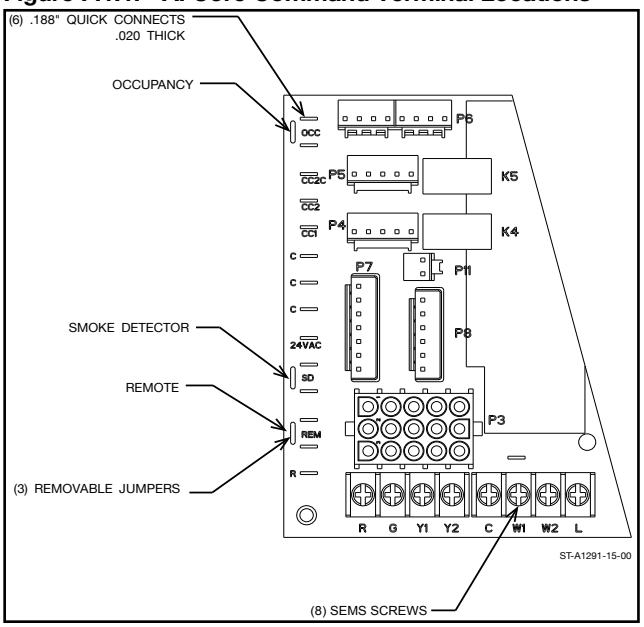
Install the room thermostat in accordance with the instruction sheet packed in the box with the thermostat. Run the thermostat lead wires through the control entry opening ***(Figure F.2. – A: Electrical and Piping Routing)*** and connect to the low voltage thermostat connections (see ***Appendix H*** 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 H*** 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

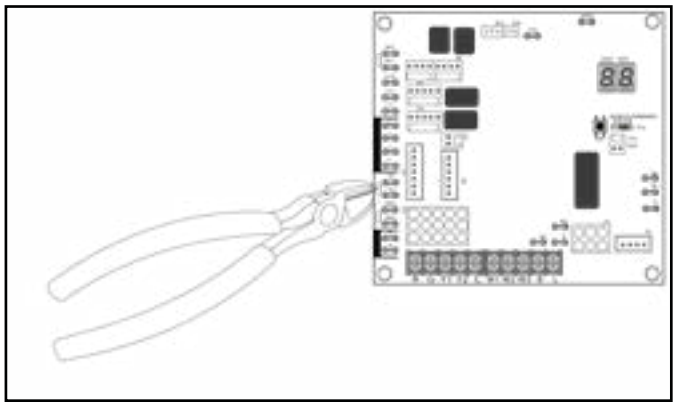


Figure F.1.2. - B: Non-DDC Board

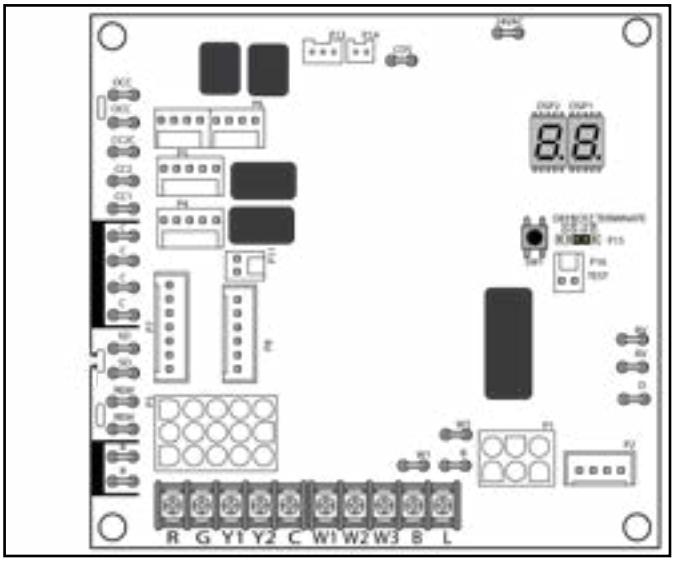
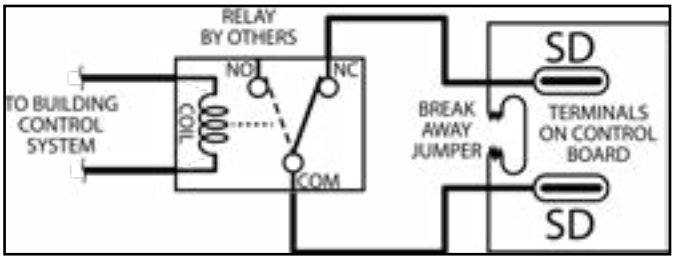


Figure F.1.2. - C: Using a Dry-Contact Relay



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 Connections*** for reference.

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 undesirable 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 Connections*** 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 Connections*** 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 Auxiliary 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.2.5.2. - 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 Auxiliary 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.2. DDC Control Inputs

F.2.1. 24VAC Thermostat Control/ Operation

Figure F.2.1. - A 24VAC Thermostat Circuits

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)					

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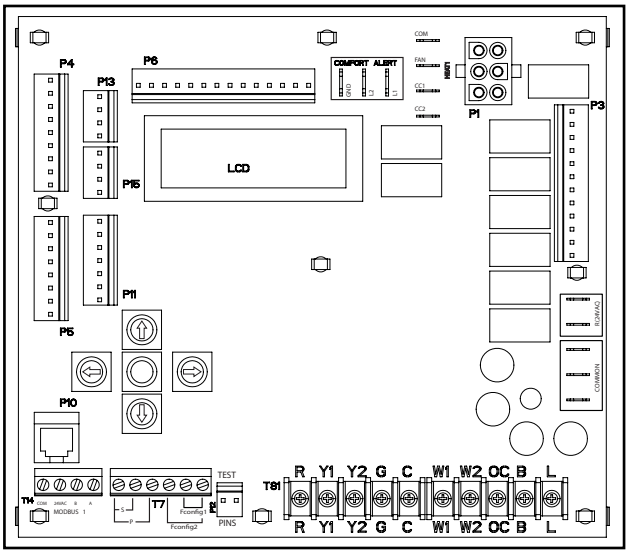
(1) THE TOTAL WIRE LENGTH IS THE DISTANCE FROM THE FURNACE TO THE THERMOSTAT AND BACK TO THE FURNACE.

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.3. – A: Electrical and Piping Routing)*** and connect to the low voltage thermostat connections (see ***Appendix H*** for wiring diagrams). 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.2.2. DDC Automated Stand-Alone Operation.

Figure F.2.1. - B: Clear Control Terminal Locations



F. CONTROL / THERMOSTAT WIRING

F.2.2.1. Setting the Unit Up: Mode Settings

The unit will need to be configured as follows.

1. The Mode must be set to Auto. This will allow the unit to automatically switch between heating and cooling operation based on the return air temperature or space temperature sensor, if installed (See Section ***F.2.3. External Sensor Connections***).

The following Automatic Modes can be selected:

AUTO - run both heating and cooling.

Cool Only - run only cooling.

Heat Only - run only heating.

Fan Only - run only the fan with no heating or cooling.

2. To select the Mode, use the right arrow key to navigate to "MODE," press the middle button and use the up and down arrow keys to select the desired operating mode for the unit, and then press the middle button to confirm. Control by Thermostat (Crtl by Tstat) is not an automatic operation mode.
3. Next the Occupancy Control must be set up. While in the Mode Menu, use the down arrow key to navigate to the Occupancy Menu option. Press the middle button to change the setting and use the up and down arrows to select the option required by the application. Then, press the middle button to confirm the setting.
   - If the system is going to run in stand-alone mode with no external inputs for Occupancy control (refer to section ***F.2.2. DDC Automated Stand-Alone Operation***), set the occupancy to "occupied." In this setting, the system will run in a continuous occupied state and the operation of the fan will be based on the indoor fan mode. Refer to section ***F.2.2.2. Indoor Fan Mode***.
   - If "unoccupied" is selected, the unit will run in a continuous state of unoccupied, and only turning on the fan when heating or cooling for the unoccupied setpoint is needed. In this mode, if a zone sensor with an override button is installed (refer to section ***F.2.3.2. Zone Sensor Occupancy Override***), then the unit can be triggered to run in an occupied mode based on the tenant override timer. The zone sensor occupancy button will also trigger an occupied state for all occupancy control modes.
   - If "local switch" is selected, then the unit will look for an external 24VAC input on the OC terminal of the T8 terminal strip.
   - This 24VAC source can be from an external time clock or building occupancy controller. When 24VAC is applied to the OC terminal, the unit will enter an occupied state of operation.
   - If "network" is selected, the unit will look for an occupancy command coming from a Building Management System through the Modbus interface of the control board. Optional BACnet or LonTalk translator cards will carry this function as well.

For information on setting up the system for stand-alone operation, including preparing the unit for Building Management Control, refer to section ***F.2.2. DDC Automated Stand-Alone Operation*** and ***F.2.4. Building Management/Control Connections Using DDC***.

F.2.2.2. Indoor Fan Mode

If the unit is running in an occupied state, the system does not have to continuously run the fan. In the Mode Menu, use the down arrow to navigate to "Indoor Fan Mode." There are two selectable options: continuous and auto-mode. Continuous will run the fan continually in the occupied mode, while auto-mode will only run the fan when there is a call for heating or cooling.

F.2.2.3. Occupancy Control External Input 24VAC

Occupancy can be triggered externally to the unit via a 24VAC input on the OC terminal of the T8 thermostat terminal strip. To connect, run the wire from the "R" 24VAC terminal and the "OC" terminal to an occupancy controller in the building. The control needs to have a dry contact relay. When the relay is closed, 24VAC will be passed to the OC terminal and trigger the unit into an occupied operating mode. When the relay is open, the 24VAC to the OC terminal will be lost and the unit will run in an unoccupied state.

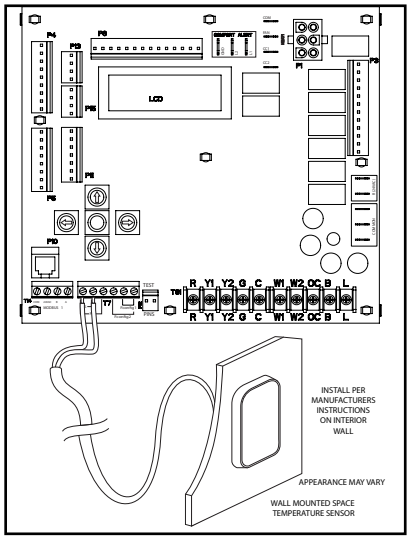
F.2.2.4. Temperature Setpoints

There are two temperature setpoints for occupied and unoccupied modes, heating and cooling. Using the control board's navigation buttons, proceed to the Setpoints Menu and use the down arrow key to select "occupied or unoccupied cool and heat setpoints." Press the middle button to select the first setpoint and use the up and down arrow keys to adjust the setpoint as required for the application. Then, press the middle button to confirm the setting and advance to the second setpoint. Again, use the up and down arrow keys to adjust the setting, and press the middle button to confirm this setpoint and the settings for the occupancy mode.

There is an automatic temperature differential between heating and cooling. This is adjusted and set in the "Cool Diff" and "Heat Diff" menu items.

F.2.3. External Sensor Connections

Figure F.2.3.1. - A: Space Temperature Sensor



F.2.3.1. Space Temperature Sensor

1. When using a DDC unit with Clear Control in conjunction with a Building Management System or an Automated Operational Mode, the use of a Space Temperature Sensor can greatly improve the accuracy and operation of the unit in maintaining the comfort in the space in both cooling and heating.
2. The space temperature sensor requirements is a 10k type II sensor.
3. Install the sensor on an interior wall in the space served by the packaged unit and connect the wires according to the manufacturer's instructions of the sensor type and style selected.
4. Run these wires from the sensor to the control panel of the unit.
5. After routing the sensor wires through the control panel and to the control board, strip 1/4" of insulations off the ends of the wires.
6. At the control board, locate the T7 green terminal strip. Loosen the two screw terminals marked with "S" (the two left most terminals), insert one of each of the two wires into the terminal opening on the bottom of the strip, and tighten the screw terminal. The connections are not polarity specific, either wire can be connected to either terminal, unless a setpoint adjustment option is used, they will use a shared common, the left most terminal. See the sensor manufacturer's instructions for details.
7. Verify the sensor is reading properly, power up the unit, use the left arrow key to navigate to the Temperatures Menu. Use the down arrow key to go to the space temp option, it should be showing a temperature reading. Use a test instrument to verify the air temperature at the sensor is within 1 to 3 degrees of the reading on the control board. An incorrect type sensor, excessive wire length, or bad connections will cause a significant discrepancy in the readings.
8. For more accurate operation, use the Space Temp Offset menu option to adjust the sensor reading on the Clear Control by +/-3 degrees to match the reading on the test instrument.
9. If the Clear Control is in the control by Thermostat Mode, the Space Temperature sensor will not be used for the operation of the unit.

F.2.3.2. Zone Sensor Occupancy Override

If the wall sensor has an override button for triggering occupancy, the override button needs to be set up as follows. The override trigger is looking for a 1.2 to 1.6 Ohm resistance across the space temperature sensor input.

1. Depending on the design of the sensor, some provide separate connections for the override output. If this is the case, use a short piece of wire to connect one side of the override output to one side of the temperature sensor output, and then use a 2k Ohm resistor (field-supplied) as the jumper from the other leg of the override output and the other temperature output wire.
2. Prerequisites: Occupancy Control must be set to Unoccupied, Network when controlled through a BMS or Local Switch and there is a 24VAC Input on the OCC terminal, such as using a time based controller. Units set to "Occupied" in the Occupancy Menu, the override button will have no effect, since the button triggers occupancy.
3. To adjust how long the override lasts, navigate to the Time Delays Menu and use the down arrow to select the Tenant Override Timer (Ten Ovr. Time), press the middle button to adjust the time between the required range of 2 to 6 hours.

F. CONTROL / THERMOSTAT WIRING

Figure F.2.3.2. - A: Common Sensor Back Plane - Setpoint and 2k Override.

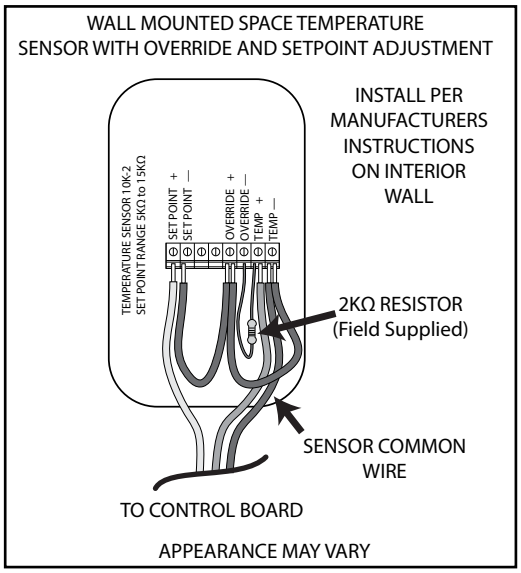
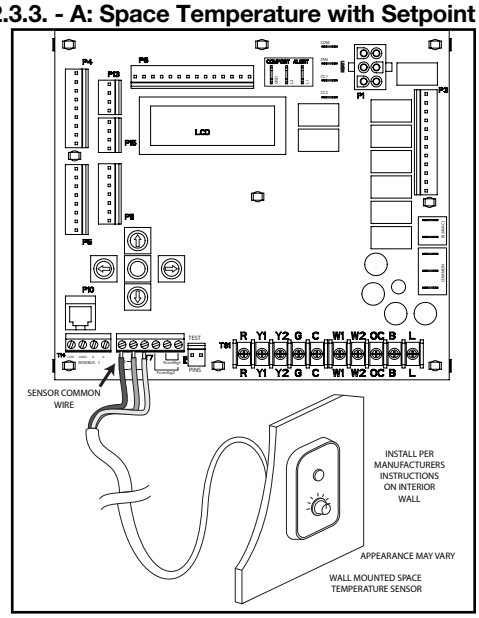


Figure F.2.3.3. - A: Space Temperature with Setpoint



F.2.3.3. Set-Point Adjustment

In an Automatic Operation Mode or controlled by a BMS, a zone sensor with a setpoint adjustment is used to vary or adjust the setpoint temperature for the space that the unit is serving. This does require some specific setup to configure the operation and limitations for the adjustment range.

The zone sensor must have a setpoint adjustment range of 5k or 15k Ohms of resistance to provide the 55°F to 90°F set point adjustment range. Zone control devices with other resistance ranges are not compatible and will not function properly with the Clear Control and can cause operational errors or shutdown.

At the control board, locate the T7 green terminal strip. Loosen the two screw terminals marked with “P” (the left most and third from the left terminals), insert one of each of the two wires into the terminal opening on the bottom of the strip and tighten the screw terminal. The connections are polarity specific, and commonly connected with a temperature sensor. The setpoint adjustment and temperature sensor will use a shared common, the left most terminal. Refer to the sensor manufacturer’s instructions for details for connections at the sensor.

Once the sensor is connected and installed, power up the unit. The following menu items need to be setup and adjusted according to the requirements for the application.

Prerequisites, the unit must be set up in Automatic Mode or configured to operate with a Building Management System. The setpoint adjustment will not function if the unit is set to “Control by Thermostat.”

1. Power on the unit and proceed to the Setpoints Menu. Use the down arrow key to navigate to the Setpoint Adjust Enable (Stpnt Adj Enable) menu item, press the middle button, and use the up or down arrow key to select “Enable,” press the middle button again to confirm.
2. At the remote sensor, adjust the setting to the middle position and notate the temperature value. Commonly, it is 76°F, but this reading may vary by manufacturer. See their instructions on determining the middle temperature value.
3. At the Clear Control, navigate to the Setpoint Adjust menu item, press the middle button, and use the up and down arrows to select the temperature that the remote sensor is set to. Then, press the middle button to confirm the setting. This set is important to ensure that adjustment and control setpoint temperature align, especially with remote sensors that have a display or marked temperature value.

4. Navigate to the Set Cool Limit menu item. This setting allows the installer to limit the lowest cooling setpoint allowed. Press the middle button and use the up and down arrows to adjust as required by the application, press the middle button to confirm the setting. The range is 55°F to 89°F.
5. Navigate to the Set Heat Limit menu item, this setting allows the installer to limit the highest heating setpoint allowed. Press the middle button and use the up and down arrows to adjust as required by the application. Then, press the middle button to confirm the setting. The range is 56°F to 90°F.

F.2.3.4. Humidity Sensor

Field Configurable Input #2 can be used to connect an indoor relative humidity sensor that has a 0-10 Vdc output for a 0-100% indoor relative humidity input. Models with the HumidiDry™ option require this indoor relative humidity sensor to determine humidity control demand. Because this is a “powered” sensor, an additional wire to the 24 Vac power supply from the unit is required. The “R” thermostat input can be used for this purpose. The indoor relative humidity sensor can be used along with thermostat control or a zone sensor in combination with a building management system (BAS) that will be controlled from a central location. Some models of the Indoor Relative Humidity Sensor also have a space temperature sensor included eliminating the need for a separate zone sensor.

F.2.4. 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.

F.2.5. Smoke Detection Shutdown

The DDC system is designed with an option to trigger and shutdown the unit during a Smoke Fault Condition, as triggered by a factory smoke detector. See the following two sections for more information.

The operation of the smoke fault system can be changed dependent on what is required by the application. Navigate to the Economizer Menu and use the down arrow key to select the Smoke Detection option. The passcode, 5555, is required. Enter the password, press the middle button, use the up arrow key to set the first digit to 5, then press the middle button to confirm and move to the next character. Repeat until all 4 characters are entered. If successful, “Access Granted” will display. Then press the down arrow key to select Smoke Options. These options will change the operation as follows:

Shutdown - Stops all operations and turns off the indoor fan.

Pressurize - Ramps the VFD to full speed, opens the economizer up 100%, stops all heating and cooling functions.

Purge - Ramps the VFD to full speed, opens the economizer up 100%, turns on the power exhaust, stops all heating and cooling functions.

Purge with Heat - Ramps the VFD to full speed, opens the economizer up 100%, turns the heating system on full capacity.

Exhaust - Stops all operations, cooling, heating, and indoor fan, opens the economizer up 100% and turns on the power exhaust system.

F. CONTROL / THERMOSTAT WIRING

F.2.5.1. Factory Smoke Detector Kit

If a field or factory installed smoke detector kit is used, the kit contains a wiring harness that connects to the 12-Molex plug in the economizer section in place of the 3-wire jumper plug. Retain the jumper plug for future service or maintenance. Use a zip tie to secure the jumper plug to the main wiring harness. Remote fire control panels or other options for the smoke detector will connect directly to the smoke detector controls. Refer to the instructions with those accessories for more information.

F.2.5.2. Remote Smoke Detector/Fire 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.2.5.2. - B*** 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 Auxiliary 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.2.5.2. – A: Wiring Harness location in Air-Filter Section

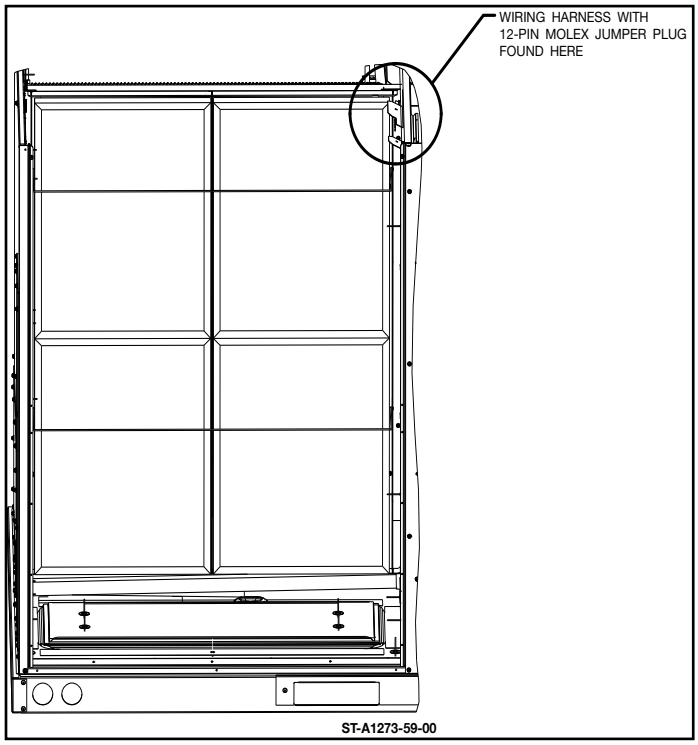
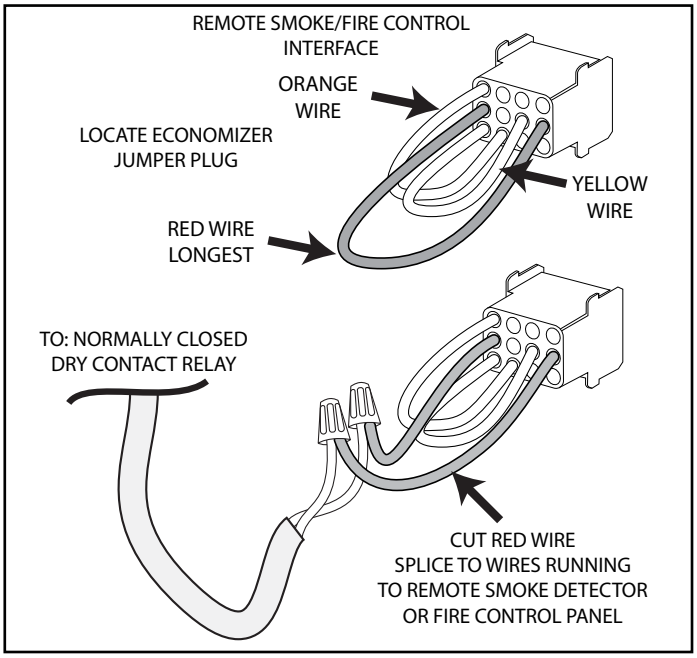


Figure F.2.5.2. – B: Smoke Detector Connection (DDC)



F.3. Routing Control Wiring

Figure F.3. – A: Electrical and Piping Routing

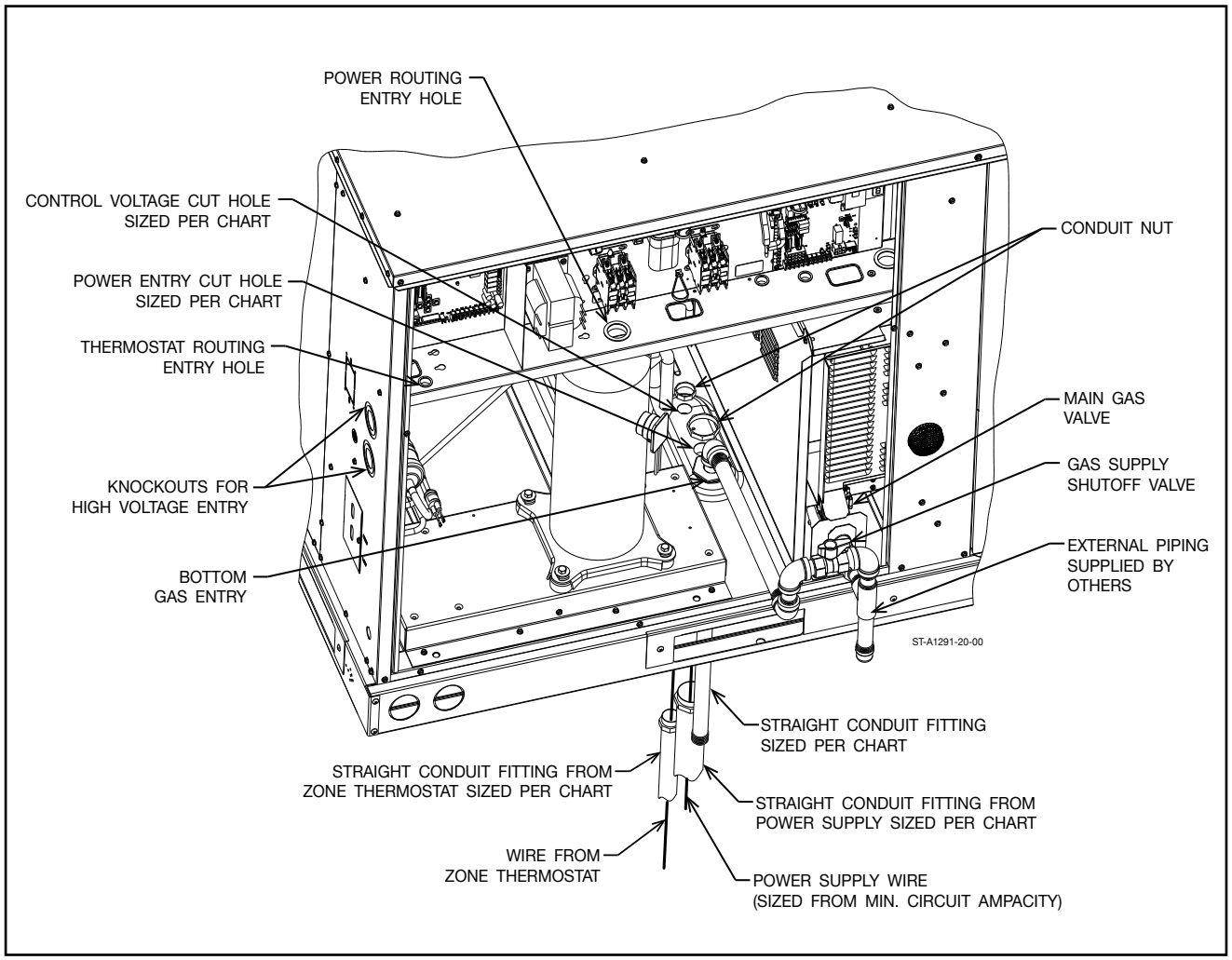


Figure F.3. – B: Hole Sizing for Conduit

	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.4. 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.

G. GAS

G.1. Gas Piping Requirements

Install gas piping in accordance with local codes and regulations of the local utility company. In the absence of local codes, the installation must conform to the specifications of the national Fuel Gas Code, ANSI Z223.1 – latest edition.

IMPORTANT: Connect this unit only to gas supplied by a commercial utility.

G.1.1. Pipe Material Requirements

Ridged black iron pipe and fittings are recommended for the gas lines, or other materials as local codes allow or considered best practice. The use of flexible connectors is not recommended. Install a Union joint near the unit, after the cut off valve, for service.

G.1.2. Tools Required

Pipe wrenches, pliers, gas rated thread sealant, and leak detection fluid or soap and water is required.

G.1.3. Code Requirements

Local codes should be followed for the installation and marking of the gas piping. In the absence of local codes follow the National Fuel Gas Code NFPA 54 ANSI Z223.1 (Latest Revision), International Fuel Gas Code IFGC 408.4 (Latest Revision), or the Canadian CAN CSA B149.1HB (Latest Revision), must be followed.

G.1.4. Gas Pressures and Regulation

IMPORTANT: ENSURE that the furnace gas valve is not to be subjected to high gas line supply pressures.

DISCONNECT the furnace and its individual manual gas stop from the gas supply piping during any pressure testing that exceeds 1/2 PSIG (3.48 kPa). Natural gas supply pressure must be 5” to 10.5” WC LP gas supply pressure must be 11” to 13” WC. This pressure must be maintained with all other gas-fired appliances in operation. The minimum gas supply pressure to the gas valve for proper furnace input adjustments is 5” w.c. for natural gas, however 6” to 7” is recommended. The minimum gas supply pressure is 11” WC for LP gas.

See sections ***J.5.1.1. “Measuring and Adjusting Supply Gas Pressures” and J.5.1.2. “Measuring and Adjusting Manifold Gas Pressures”*** for more details.

⚠WARNING

ELEVATIONS ABOVE 2000 FT. REQUIRE THAT THE FURNACE INPUT RATING BE ADJUSTED AND THAT THE SIZE OF THE BURNER ORIFICES BE RECALCULATED BASED ON ELEVATION AND GAS HEATING VALUE. THE BURNER ORIFICES MAY (OR MAY NOT) NEED TO BE CHANGED. SEE THE SECTION TITLED “HIGH ALTITUDE INSTALLATIONS” OF THIS BOOK FOR INSTRUCTIONS.

G.1.5. Flue Diverter

Flue diverter and inlet air diverter are pictured at the bottom of this page. ***See Figure G.1.5.***

G.1.5.1. Flue Diverter Installation

Using integrated hooks, insert into the appropriate slots on post to the right of the furnace access door. The opening should be facing up towards the top of the unit. Once slots and hooks are mated, secure with one (1) screw (included) in topmost flange, and installation is complete.

The door hood is secured onto the furnace access door with six (6) screws (included). There are four (4) key holes cut into the air hood for easy mounting. Insert screws into the door and the left and right edges leaving enough space to put on the hood. Then place the door hood onto the door and finish by securing the screws tightly. Secure the final two (2) screws at the tops of the hood to complete the installation.

⚠WARNING

NEVER PURGE A GAS LINE INTO THE COMBUSTION CHAMBER. NEVER USE MATCHES, FLAME OR ANY IGNITION SOURCE FOR CHECKING LEAKAGE. FAILURE TO ADHERE TO THIS WARNING CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH. TO CHECK FOR GAS LEAKAGE, USE AN APPROVED CHLORIDE-FREE SOAP AND WATER SOLUTION, OR OTHER APPROVED METHOD.

GAS VALVE

This furnace has a 24-volt gas valve. It has ports for measuring supply and manifold gas pressure. The valve body contains a pressure regulator to maintain proper manifold gas pressure. A control switch is on the valve body. It can be set to only the **"ON"** or **"OFF"** positions. The gas valve is a slow-opening valve. See Figure ***G.1.4. – A.***

When energized, it takes 2 to 3 seconds to fully open.

Figure G.1.4. – A White-Rodgers Two-Stage Gas Valve

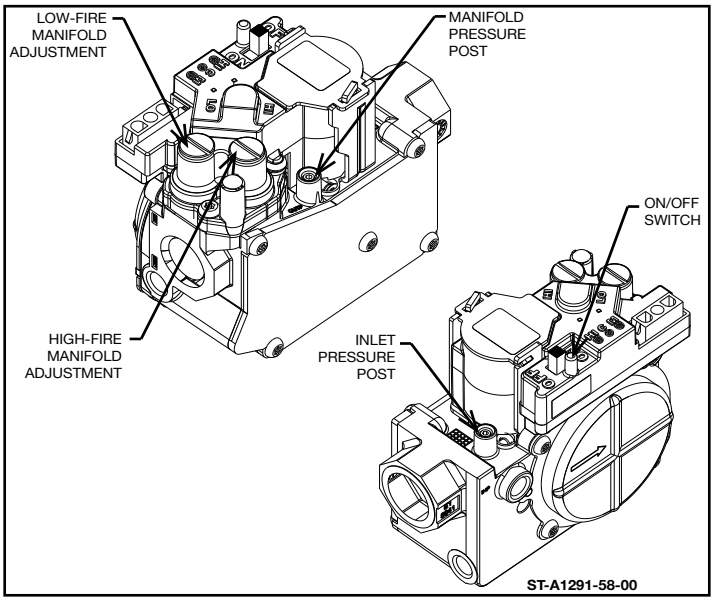


Figure G.1.4. - B: Burner Assembly Front View

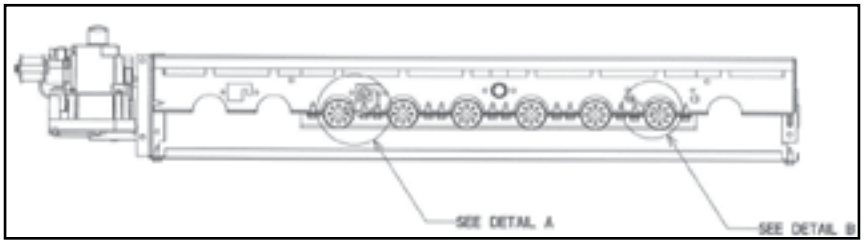
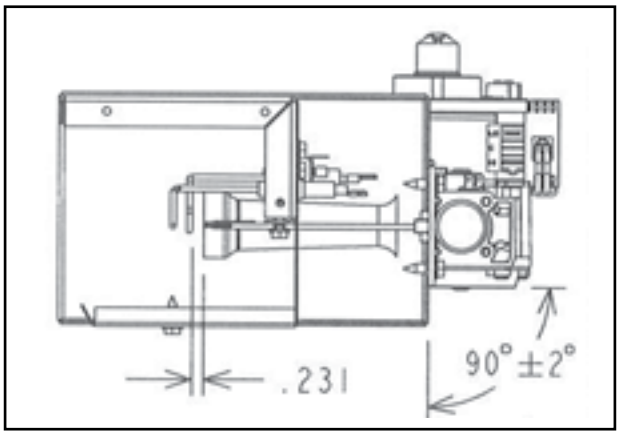


Figure G.1.4. - C: Burner Assembly Side View

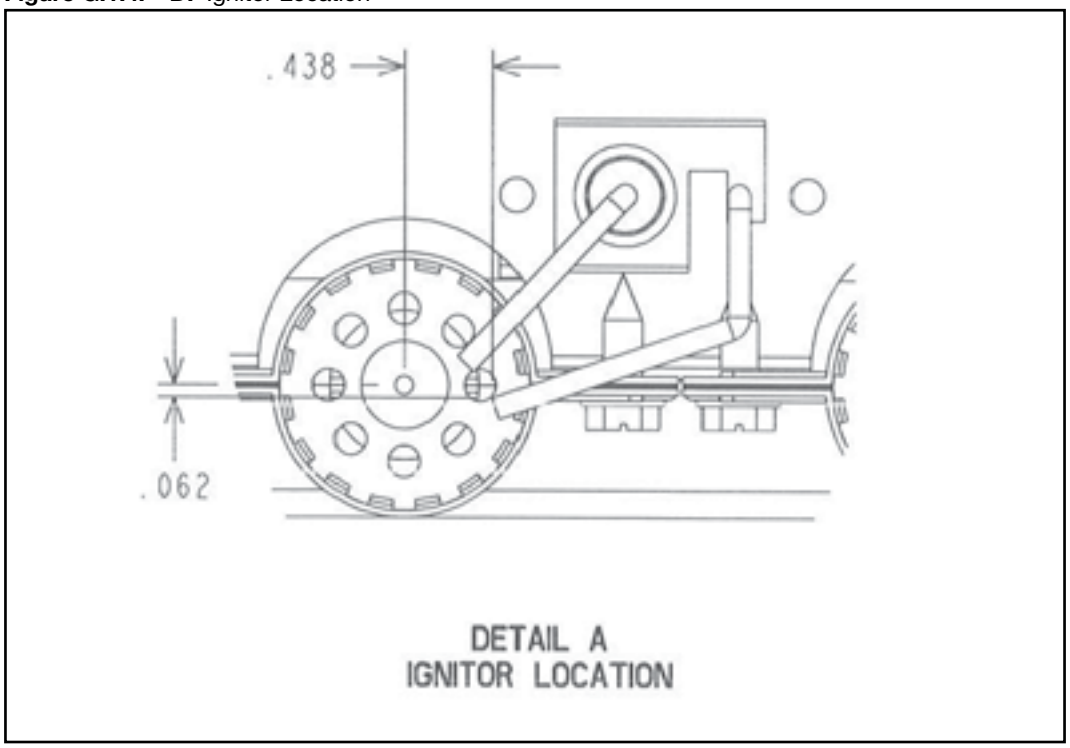


G. GAS

For 75,000 BTU input furnaces, the outside manifold orifice taps are plugged. The ignitor and flame sense are located on the outside of the center burner.

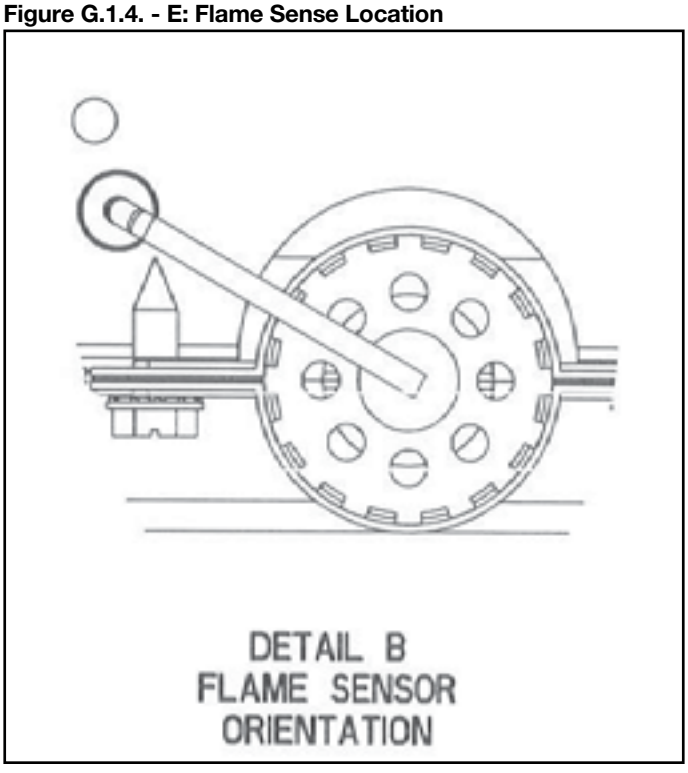
Ignitor location is critical for insuring a consistent carryover of the burner flame during ignition. The top of the electrode at dimension (0,0) must remain inside the hatched area

Figure G.1.4. – D: Ignitor Location



Correct location of the flame sensor will help to eliminate weak or no flame sense issues.

Figure G.1.4. - E: Flame Sense Location



G.1.6. Sealing Threaded Connections – Best Practice

Use a gas rated and approved liquid, paste, or tape thread sealant on all threaded connections. Apply sealant to the male threads and tighten the fitting using wrenches to hold both the fitting and the pipe. DO NOT OVERTIGHTEN THE PIPE GOING INTO THE GAS VALVE, DAMAGE MAY OCCUR. Test all threaded connections with leak test fluid or soap and water.

G.1.7. Gas Pipe Sizing and Capacity

Size the gas line to the furnace adequate enough to prevent undue pressure drop and never less than 3/4" pipe.

See ***Table G.1.6. - A*** for Gas Pipe Capacity. The capacities of gas pipe of different diameters and lengths in Cubic Ft/hr with pressure drop of 0.3 in. and specific gravity of 0.60 (natural gas) are shown in ***Table G.1.6. - A.*** After determining the pipe length, select the pipe size which will provide the minimum cubic foot/hour required for the gas input rating of the furnace.

By formula:

$$\frac{ft^3}{hr}\ \text{required} = \frac{\text{Gas Input of Furnace } \frac{BTU}{hr}}{\text{Heating Value of Gas } \frac{BTU}{hr}}$$

The gas input of the furnace is marked on the furnace rating plate. The heating value of the gas (BTU/FT3) may be determined by consulting the local natural gas utility or the L.P. gas supplier.

Table G.1.6 - A

NATURAL GAS PIPE CAPACITY TABLE (CU FT/HR)
Maximum capacity of pipe in thousands of BTU/hr of natural gas
Inlet pressure: less than 2 psi
Pressure Drop: 0.3 in. W.C.
Specific Gravity: 0.60

Nominal Iron Pipe* Size, Inches	Length of Pipe, Feet									
	10	20	30	40	50	60	70	80	90	100
1/2	131	90	72	62	55	50	46	42	40	38
3/4	273	188	151	129	114	104	95	89	83	79
1.0	514	353	284	243	215	195	179	167	157	148
1-1/4	1,060	726	583	499	442	400	368	343	322	304
1-1/2	1,580	1,090	873	747	662	600	552	514	484	455

After the length of pipe has been determined, select the pipe size which will provide the minimum cubic feet per hour reqired for the gas input rating of the furnace. By formula:

$$\text{Cubic feet per hour required} = \frac{\text{Gas Input of Furnace (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$

The gas input of the furnace is marked on the furnace rating plate. Call your local natural gas utility for the heating value of the gas (BTU/FT^3).

*Schedule 40 metallic pipe.

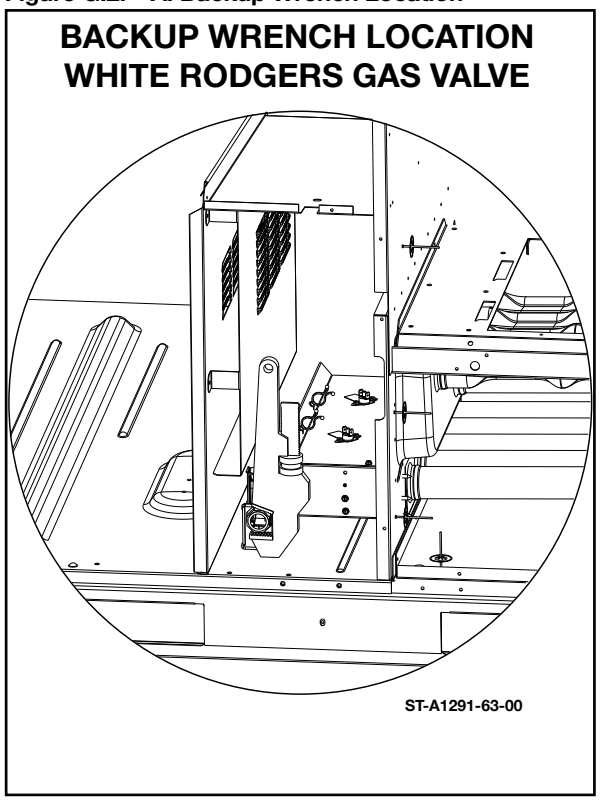
Reference the **National Fuel Gas Code NFPA 54, ANSI Z223.1- Pipe Sizing** for more information.

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G.2. Procedure: Connecting Gas Lines to Gas Valve

1. Place backup wrench on valve, shown below in ***Figure G.2. - A.***

Figure G.2. – A: Backup Wrench Location



2. Connect the gas line to the gas valve supplied with unit. Routing can be through the gas pipe opening shown in ***Figure G.2.1.*** or through the base as shown in ***Figure F.3. – A: Electrical and Piping Routing***.

In making gas connections, avoid strains as they may cause noise and damage the controls. A backup wrench is required to be used on the valve to avoid damage.

3. Size the gas line to the furnace adequate enough to prevent undue pressure drop and never less than 3/4" pipe. See ***Section G.1.6*** on Gas Pipe Sizing and Capacity.

4. Install a drip leg or sediment trap in the gas supply line as close to the unit as possible. See ***Section G.2.1*** on Drip Leg Requirements.

5. Install an outside ground joint union to connect the gas supply to the control assembly at the burner tray.

6. Gas valves have been factory installed. Install a manual gas valve where local codes specify a shut-off valve outside the unit casing. ***(See Figure G.2.1.)***

7. Make sure piping is tight. **A pipe compound resistant to the action of liquefied petroleum gases must be used at all threaded pipe connections.**

IMPORTANT: Any additions, changes or conversions required for the furnace to satisfactorily meet the application should be made by a qualified installer, service agency or the gas supplier, using factory specified or approved parts. In the commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter for appropriate fuel.

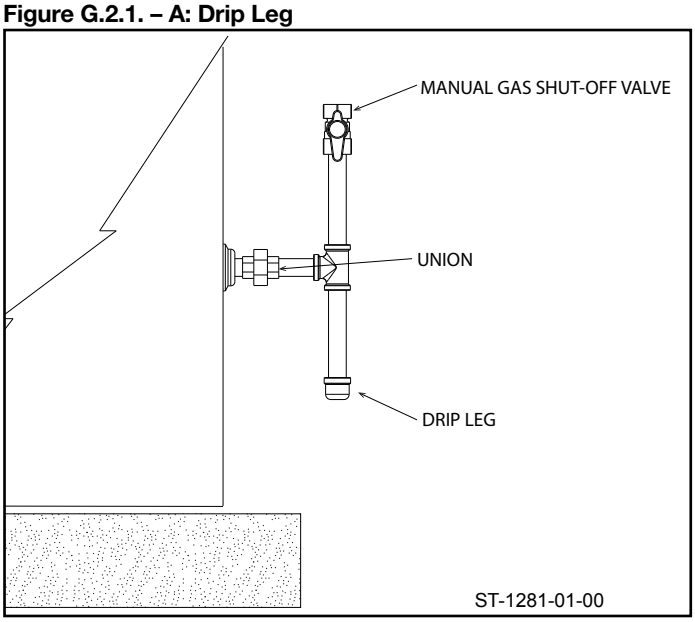
IMPORTANT: *Disconnect the furnace and its individual shutoff valve from the gas supply piping during any pressure testing of that system at test pressures in excess of 1/2 pound per square inch gauge or isolate the system from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of this gas supply system at pressures equal to or less than 1/2 PSIG.*

IMPORTANT: *Check the rating plate to make certain the appliance is equipped to burn the type of gas supplied. Care should be taken after installation of this equipment that the gas control valve not be subjected to high gas supply line pressure.*

G.2.1. Drip Leg Requirement

When connecting the supply gas to the gas valve, install a drip leg/sediment trap in compliance with the International Residential Code G2419.4.

Figure G.2.1. – A: Drip Leg



G.2.2. Purging Gas Lines

It may be necessary to purge any air from the gas lines prior to operation. This can be done through the gas pressure tap on the gas valve or at a union in the gas line. Follow best practices to purge the gas line. Ensure all fittings are sealed and tight after purging.

G.2.3. Leak Testing

To check for gas leaks, use a soap and water solution or other approved method. **DO NOT USE AN OPEN FLAME.**

G.3. LP Conversion

⚠WARNING: **DO NOT** use an open flame to check for leaks. The use of an open flame can result in fire, explosion, property damage, personal injury or death.

⚠WARNING: This unit is equipped at the factory for use on natural gas only. Conversion to LP gas requires a special kit supplied by the distributor or manufacturer. Mailing addresses are listed on the furnace rating plate, parts list and warranty. Failure to use the proper conversion kit can cause fire, carbon monoxide poisoning, explosion, personal injury, property damage or death.

NOTE: The valve can be converted to use liquefied petroleum (LP) gas by replacing the high and low fire pressure regulator springs with the conversion kit springs. The LP kit springs allow the regulator to maintain the proper manifold pressure at high and low fire for LP gas.

NOTE: Order the correct LP conversion kit from the furnace manufacturer.

See Conversion Kit Index shipped with unit and table below for proper LP kit number.

A qualified technician must perform furnace conversion to LP gas.

Model Number	Kit Number U.S./Canadian
(-)GED 150k, 205k, 225 k	FP39

G.3.1. Orifice Installation

LP Gas is a manufactured gas that has consistent heating value across most regions. The Sea Level input should still be reduced by 4% per thousand ft. above 2,000 feet and the orifice size must be selected based on the reduced input selection chart in High Alt. Instruction Section.

To change orifice spuds for conversion to LP:

1. Shut off the gas supply and remove gas connection to the gas valve.
2. Remove the gas manifold.
3. Replace the natural gas orifices with LP orifices.
4. Reassemble in reverse order.
5. Refer to section ***J.5.1.1. Measuring and Adjusting Supply Gas Pressures*** for confirming inlet pressure and adjusting manifold pressure.

⚠WARNING: LP tanks from local LP supplier must not be used to store anything (such as fertilizer) except LP gas. This includes all delivery vessels (LP trucks). If material other than LP gas is used in the same vessels/tank as the LP gas, the LP gas can become contaminated and damage the furnace. This will void the manufacturer's warranty. Contact the supplier to make sure fertilizer is not used in the same tanks used to store and deliver LP gas.

Table G.3 - A

LP GAS PIPE CAPACITY TABLE (CU FT/HR)
Maximum capacity of pipe in thousands of BTU/hr of undiluted liquified petroleum gases (at 11.0" W.C. inlet pressure)

(Based on a Pressure Drop of 0.5" W. C.)

Nominal Iron Pipe* Size, Inches	Length of Pipe, Feet											
	10	20	30	40	50	60	70	80	90	100	125	150
1/2	275	189	152	129	114	103	96	89	83	78	69	63
3/4	567	393	315	267	237	217	196	182	173	162	146	132
1.0	1,071	732	590	504	448	409	378	346	322	307	275	252
1-1/4	2,205	1,496	1,212	1,039	913	834	771	724	677	630	567	511
1-1/2	3,307	2,299	1,858	1,559	1,417	1,275	1,181	1,086	1,023	976	866	787
2.0	6,221	4,331	3,465	2,992	2,646	2,394	2,205	2,047	1,921	1,811	1,606	1,496

Example (LP): Input BTU requirement of unit, 120,000
Equivalent length of pipe, 60 ft. = 3/4" Inside Diameter required
*Schedule 40 metallic pipe.
Reference the **National Fuel Gas Code NFPA 54, ANSI Z223.1- Pipe Sizing** for more information.

G.4. Operation and Testing

G.4.1. Warnings

⚠WARNING: DO NOT attempt to manually light this furnace with a match or any open flame. Attempting to do so can cause an explosion or fire resulting in property damage, personal injury or death.

⚠WARNING: The spark ignitor and ignition lead from the ignition control are high voltage.

Keep hands or tools away to prevent electrical shock. Shut off electrical power before servicing any of the controls. Failure to adhere to this warning can result in personal injury or death.

⚠WARNING: Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the furnace. Failure to do so can result in an explosion or fire causing severe personal injury or death!

G.4.2. First Time Operation

G.4.2.2. Normal Furnace Sequence Of Operation

1. Thermostat initiates call for heat.

2. Core Command runs self-diagnostic. Core Command confirms the Main Limit Control (MLC) is closed; the Negative Pressure Control (NPC) is open and checks Manual Reset Limit Controls (MRLC) for continuity.

3. Core Command energizes Induced Draft Motor (IDM).

4. Core Command confirms NPC is closed.

5. If NPC is closed, the Core Command starts a 30-second prepurge.

6. Following 30 second prepurge, the Core Command energizes the Spark Electrode (SE) up to 7 seconds or until the Remote Flame Sensor proves burner flame. Core Command de-energizes the SE and begins the 20-second blower ON delay.

7. The furnace will respond to thermostat command following 20-second blower ON delay.

Sequences - system doesn't light or doesn't sense flame:

• NPC Remains Open After the IDM is Energized:

1. The IDM will run for 60 seconds in an attempt to close the NPC. IDM is de-energized then energized and the ignition attempt is repeated.

2. After four attempts to close the NPC, the system will enter a 1-hour lockout period.

• Failed Ignition or Core Command Doesn't Sense Flame:

1. Following the 30-second prepurge period, the SE and gas valve are energized up to 8 seconds.

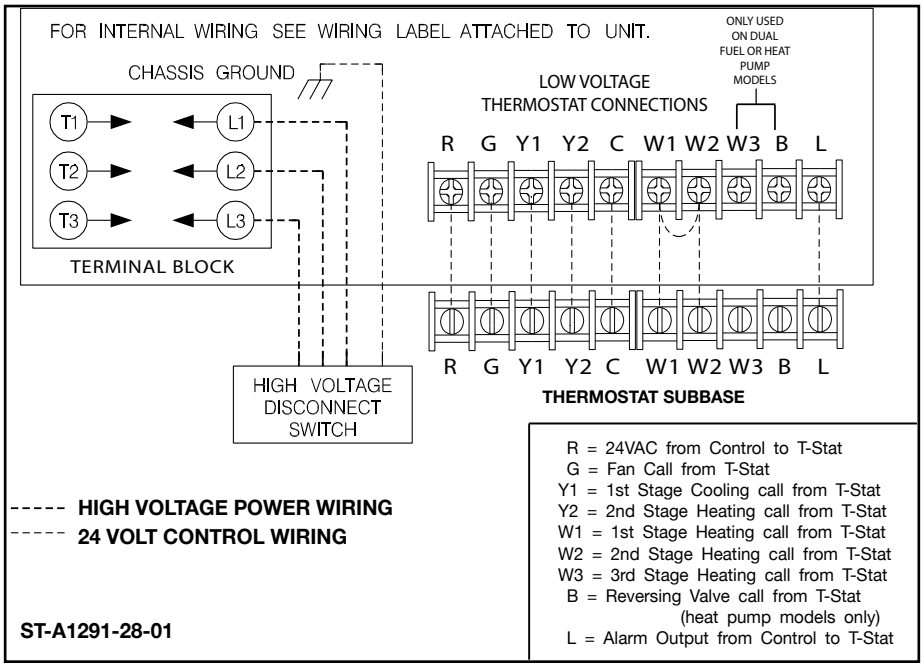
2. If flame is not sensed during the 8-second period after the gas valve is energized, the gas valve and SE are de-energized.

3. IDM is de-energized and the Core Command verifies that the NPC is open. Once the NPC is confirmed open, the Core Command will begin a second ignition attempt.

4. The system will attempt three tries at ignition. Following a third failed attempt the system will enter a 1-hour lockout period.

G.4.2.3. Single-Stage Thermostat and Auto-Staging: 208/230V, 460V, & 575V

Application where a single-stage thermostat is used with this two-stage furnace. Furnace will run at low-fire input for a 15 minute period. If thermostat demand is not satisfied, Core Command will automatically stage to high fire until thermostat demand is met. To accommodate auto-staging, simply secure a jumper wire between W1 and W2 on the Core Command. See ***Figure G.4.2.3. - A*** for details.



G.4.2.4. Gas Pressure Testing and Adjustment

Refer to ***Section J.5.1.1***. for detailed instructions on testing and adjusting gas pressure.

G.4.2.5. Flame inspection

Inspect burner flame after the indoor blower motor is energized. Burner flame should be directed down the center of primary heat exchanger tube with little or no lifting. Carry-over flame should not impinge on center panel. Any flame turbulence could be an indication of an air leak between the burner and heat exchanger compartment or a partially blocked burner orifice.

Natural Gas Flame: almost completely blue with some yellow in the center of the flame.

LP Gas Flame: predominantly a blue flame with some yellow tipping.

G.4.2.6. Orifice Selection and High Altitude Adjustments

Notice: Derating of the heating input for high altitude in the field is unlawful in Canada (refer to CAN/CGA 2.17). Units installed in altitudes greater than 2,000 feet (610 meters) must be shipped from the factory or from a factory authorized conversion station with the heating input derated by 10% so as to operate properly in altitudes from 2,000 - 4,500 feet (610 - 1,373 meters).

NATURAL GAS AT HIGH ALTITUDES

Furnaces installed above 2,000 feet require the furnace to be de-rated 4% per thousand feet above sea level.

IMPORTANT: Factory installed orifices are calculated and sized based on a sea level Natural Gas heating value of 1050 BTU per cubic ft.

NOTE: Orifices are available through your local distributor. Reference the following tables for approximate orifice sizing.

The following are examples of orifice sizing using the “Flow of Gas Through Fixed Orifices” section in the National Fuel Gas Code.

For a simplified estimation of orifice size based on gas heating value and elevation, the following tables may be used. However, calculations are the best method.

G. GAS

Example: 900 BTU/ft3 Regional Natural Gas Heating Value

I/H = Q

25000 / 900 = 27.78 ft3

I = Sea Level input (per burner): 25000

H = Sea Level Heating Value: 900

Q = 27.78 ft3 Natural Gas per hour.

From Table E1.1a of National Fuel Gas Code, 2015 (3.5” w.c.).

Orifice required at Sea Level: #40 from the National Fuel Gas Code.

Orifice required at 5000 ft. elevation (4% de-rate per thousand ft): #42

Orifice required at 8000 ft. elevation (4% de-rate per thousand ft.): #44

Example: 1050 BTU/ft3 Regional Natural Gas Heating Value

I / H = Q

25000 / 1050 = 23.81ft3

I = Sea Level input (per burner): 25000

H = Sea Level Heating Value: 1050

Q = 23.81 ft3 Natural Gas per hour.

From the National Fuel Gas Code, (3.5” w.c.).

Orifice required at Sea Level: #43 From the National Fuel Gas Code,

Orifice required at 5000 ft. elevation (4% de-rate per thousand ft.): #45

Orifice required at 8000 ft elevation (4% de-rate per thousand ft): #47

ORIFICE ORDERING INFORMATION

Orifice sizes are selected by adding the 2-digit drill size required in the orifice part number. Drill sizes available are 39 through 64; metric sizes available 1.10mm (-90) and 1.15mm (-91):

Orifice Part Number 62-22175-(drill size)

Example 1:

60 drill size orifice required

Example 2:

1.15mm drill size orifice required

NATURAL GAS ORIFICE SELECTION BASED ON HEATING VALUE & ELEVATION*

HIGH ALTITUDE

Notes:

1. Furnaces are factory equipped with orifices sized for 1050 sea level heating value gas.

2. Installer must be aware of the local heating value (sea level standard) to use the chart below.

3. This chart is based on the National Fuel Gas Code (NFGC) and based on natural gas with a specific gravity of 0.60

4. The recommended orifices below allow the furnace to operate within 10% of design rate. However, NFGC calculations are the best method.

5. Furnace operation is optimized when operating at design rate. Installer is responsible to verify rate.

NATURAL GAS ORIFICE SELECTION BASED ON HEATING VALUE & ELEVATION*

22,800 BTU/burner

		ELEVATION								
Grey Cells Indicate Factory Orifice Size		Sea Level to 2,000'	2001' to 3,000'	3,001' to 4,000'	4,001' to 5,000'	5,001' to 6,000'	6,001 to 7,000'	7,001' to 8,000'	8,001' to 9,000'	9,001' to 10,000'
Gas Heating Value (BTU/ft3) @ Sea Level**	1,100	44	45	45	45	46	47	47	48	48
	1,050	43	44	44	44	45	45	46	47	47
	1,000	43	43	44	44	45	45	46	47	47
	950	42	42	43	43	43	44	44	45	46
	900	42	42	43	43	43	44	44	45	46
	850	40	41	42	42	42	43	43	44	44
	800	39	40	41	41	42	42	43	43	44
	750	37	38	39	39	40	41	42	42	43
	700	36	37	38	38	39	40	41	41	42

20,800 BTU/burner (50 HZ model)

		ELEVATION								
Grey Cells Indicate Factory Orifice Size		Sea Level to 2,000' FT	2001' to 3,000' FT	3,001' to 4,000' FT	4,001' to 5,000' FT	5,001' to 6,000' FT	6,001 to 7,000' FT	7,001' to 8,000' FT	8,001' to 9,000' FT	9,001' to 10,000' FT
Gas Heating valve (BTU/ft3)	1100	46	47	47	47	48	48	49	49	50
	1050	45	46	47	47	47	48	48	49	49
	1000	44	45	45	45	46	47	47	48	48
	950	43	44	44	44	45	45	46	47	47
	900	43	44	44	44	45	45	45	47	47
	850	42	42	43	43	43	44	44	45	46
	800	41	42	42	42	43	43	44	44	45
	750	40	41	42	42	42	43	43	44	44
	700	38	39	40	41	41	42	42	43	43

19,000 BTU/burner (50 HZ model)

		ELEVATION								
Grey Cells Indicate Factory Orifice Size		SEA LEVEL TO 2,000 FT	2,001 TO 3,000 FT	3,001 TO 4,000 FT	4,001 TO 5,000 FT	5,001 TO 6,000 FT	6,001 TO 7,000 FT	7,001 TO 8,000 FT	8,001 TO 9,000 FT	9,001 TO 10,000 FT
Gas Heating valve (BTU/ft3)	1100	47	48	48	49	49	49	50	50	51
	1050	46	47	47	47	48	48	49	49	50
	1000	45	46	47	47	47	48	48	49	49
	950	45	46	47	47	47	48	48	49	49
	900	44	45	45	45	46	47	47	48	48
	850	43	44	44	44	45	45	46	47	47
	800	43	44	44	44	45	45	46	47	47
	750	42	42	43	43	43	44	44	45	46
	700	40	41	42	42	42	43	43	44	44

* Tables are derived from the National Fuel Gas Code. To determine the correct orifice for your installation consult the National Fuel Gas Code

** Be sure to use sea level heating value. Heating value may be obtained from a local utility, heating value must be converted to sea level equivalent sea level equivalent in order to use this table.

G. GAS

LP GAS AT HIGH ALTITUDES

NOTICE: The conversion shall be carried out by a manufacturer's authorized representative, in accordance with the requirements of the manufacturer, provincial, or territorial authorities having jurisdiction and in accordance with the requirements of the CSA b149.1 Or CSA b149.2 Installation codes.

NOTE: Keep any parts removed during LP conversion procedure stored with the product literature for future use.

LP Gas is a manufactured gas that has consistent heating value across most regions.

The NFGC guidelines are used with the following exception:

The recommended LP Gas high altitude orifice selections differ slightly in that the NFGC LP orifice chart, as they are not accurate for these products. The National Fuel Gas Code LP orifices are based on an 11" of water column pressure at the orifice, which differs from products that use 10" of water column at the orifice. This difference requires a deviation from the NFGC orifice size recommendations. The Sea Level input should still be reduced by 4% per thousand ft. and the orifice size must be selected based on the reduced input in the following tables.

LP Gas BTU/hr per Burner based on Orifice Size & Elevation

Orifice Pressure: 10" W.C.

		ELEVATION								
BTU/hr per burner	Electrical Frequency	SEA LEVEL TO 2,000 FT	2,001 TO 3,000 FT	3,001 TO 4,000 FT	4,001 TO 5,000 FT	5,001 TO 6,000 FT	6,001 TO 7,000 FT	7,001 TO 8,000 FT	8,001 TO 9,000 FT	9,001 TO 10,000 FT
25,000 BTU/hr	60 HZ models	54	54	54	54	55	55	56	56	56
22,800 BTU/hr		54	55	55	55	55	55	56	56	56
20,800 BTU/hr	50 HZ models	55	55	55	56	56	56	56	56	57
19,000 BTU/hr		56	56	57	57	57	58	59	59	60

LP Gas BTU/hr per Burner based on Orifice Size & Elevation

Orifice Pressure: 10" W.C.

	ELEVATION	
BTU/hr per burner	Sea Level to 2,000'	2,001' to 3,000'
20,000 BTU/hr	55	56
25,000 BTU/hr	54	54

J. STARTUP AND OPERATION

J.1. Final Inspection

J.1.1. Check for Refrigerant Leaks

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere.

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

Under no circumstances shall potential sources of ignition be used to search for or detect refrigerant leaks. A halide torch or any other detector using a naked flame must not be used.

Electronic leak detectors may be used to detect refrigerant leaks, but the sensitivity may not be accurate and may need recalibration to accurately detect R-454B. Before use, ensure that the detector is not a potential ignition source and is suitable for R-454B.

Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and must be calibrated to R-454B.

Leak detection fluids are also suitable but do not use detergents containing chlorine. Examples of leak detection fluids are the bubble method and fluorescent method agents.

If a leak is suspected, all naked flames must be extinguished.

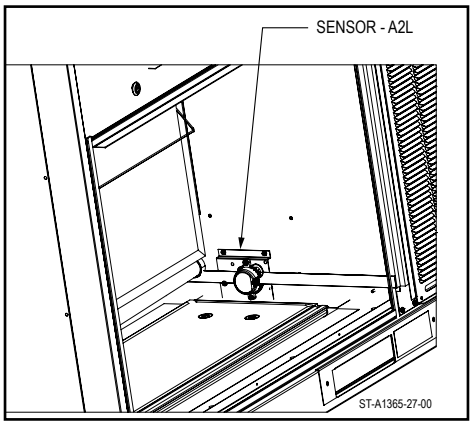
If a refrigerant leak is found that requires brazing, all of the refrigerants must be removed from the system.

J.1.1.1. Refrigerant Leak Detection System

The refrigerant leak detection system will continuously monitor the air for a refrigerant leak. If the leak detection system detects a leak, the system will begin mitigation procedures: the blower will turn on and the compressors will shut down. Note: Gas or electric heat functions may continue during mitigation.

At the end of 15 years or if the refrigerant leak detection system becomes inoperable, the leak detection system must be replaced with components specified by the unit's manufacturer. Refer to the manufacturer's website for replacement components. Refer to the alarm code diagnostics section for refrigerant leak detection system error codes.

Figure J.1.1.1. – A: Refrigerant Detection System Location



If a vertical field-installed economizer will also be installed during the unit installation, the A2L leak detection sensor must be relocated by completing the following steps:

1. Remove the indoor coil access panel assembly and the filter access panel assembly.
2. Disconnect the wire harness attached to the A2L refrigerant detection sensor.
3. Uninstall the A2L refrigerant detection sensor from the bracket by removing the screws securing the sensor to the bracket.
4. Using the same screws, mount the A2L refrigerant detection sensor to the economizer as shown in ***Figure J.1.1.1. – B: Alternate Refrigerant Leak Detection System Location***.

NOTE: ***Figure J.1.1.1. — B*** does not depict every economizer/A2L refrigerant detection sensor available for use in this unit, and only shows one potential unit configuration.

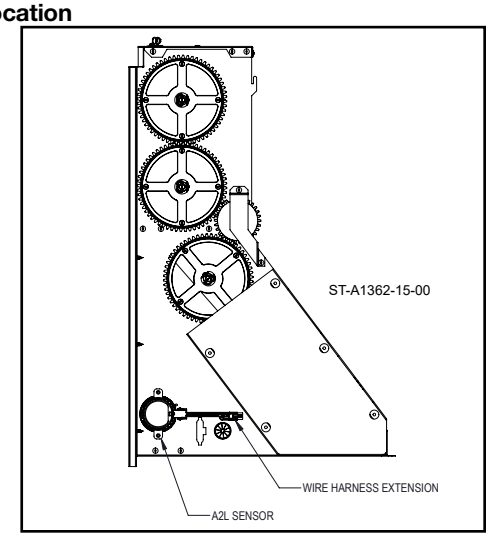
5. Connect the extension harness provided with the field-installed economizer to the wire harness that was disconnected in Step 2. The wire harness will still be connected to the bracket.
6. Route the wire harness along the bulkhead to the unit exterior for visibility.
7. Install the economizer partway, with approximately 4 inches extended outside the unit, leaving access to the A2L refrigerant leak detection sensor. Then, connect the wire harness.

CAUTION: Do not pull the wire harness as this may cause damage to the harness and break the wire ties that hold the wire harness in place.

8. Complete the field-installed economizer's installation according to the economizer Installation and Operation Manual shipped with the accessory.

J. STARTUP AND OPERATION

Figure J.1.1.1. – B: Alternate Refrigerant Detection System Location



J.1.1.2. Operation When a Leak is Detected

When the unit receives a signal from the A2L refrigerant detection system (RDS), circulation airflow is activated, and the control board will display an error (for DDC units) or a fault code (for Non-DDC units). The following mitigation actions will also be activated:

1. Energize the indoor blower of the appliance to deliver indoor airflow at or above the minimum airflow. See ***Appendix F – A2L Refrigerant Installation Safety Data***.
   a. The fans will be energized following the input signal to turn on the fan(s)
2. The system de-energizes compressor operation.
3. Activate additional mechanical ventilation, if applicable.

The above-mentioned actions will continue for at least 5 minutes after the leak detection system begins mitigation. If the leak is no longer detected, the leak detection system will reset. If the leak is still present, mitigation actions will continue for another 5 minutes. This cycle will repeat until no leak is detected.

For DCC units, user-selectable Fan Off Delay will remain in effect after the A2L RDS triggers the mitigation procedure.

J.1.1.3. Removal and Evacuation of Refrigerant

The refrigerant charge must be recovered into R-454B recovery cylinders. The unit system must be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants, such as R-454B, again. DO NOT USE compressed air or oxygen for purging R-454B refrigerant systems.

Refrigerant purging is achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to the atmospheric pressure to enable work to take place.

The outlet for the vacuum pump must not be close to any potential ignition sources.

Ventilation is required during removal and evacuation.

When breaking into the refrigeration circuit for any reason, this procedure must be followed:

1. Ensure there is no power to the unit.
2. With an accurate scale, ½ oz., set the refrigerant recovery cylinder in the upright position.
3. Connect the recovery cylinder to the unit using the service valves.
4. Evacuate refrigerant from the unit until the vacuum pump reads a minimum of 500 microns.
5. Purge the refrigeration circuit with inert gas until there is no refrigerant within the system.
6. Evacuate the circuit again.
7. Once all inert gas is removed, pull a vacuum on the unit to check for any leaks in the system.
8. If leaks are present, spray a soapy substance over the refrigeration circuit. Bubbles will help locate the leak.
   a. Patch the leak and pull a vacuum again.
   b. If leaks are still detected, repeat steps seven and eight.
9. If no leaks are present, charge the system as directed in the next section.
10. Remove the vacuum pump from suction, discharge, and liquid shut-off.

J.1.2. Check Level of Unit

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

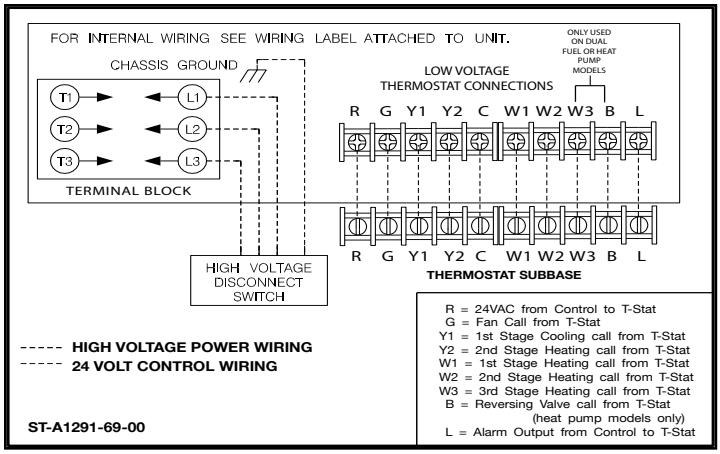
J.1.3. Check Electrical Connections for Proper Torque

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.1.8. Check Wiring

After completing refrigerant removal, evacuation, and charging, check that the internal and field wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

J.1.9. Check For Gas Leaks

Double-check for any gas leaks on the installed piping. Refer to ***Section G.2.3.*** for more information.

J. STARTUP AND OPERATION

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

J.2.2.1. Standard Blower Rotation

Verify that the compressor is running correctly.

J.2.2.2. VFD Blower Rotation

As a reminder, all units with a 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.2.4. Units with a Blower VFD

No adjustments required for installation or operation of this unit.

J.2.4.1. VFD Mode

The following VFD brands and models could be installed in the unit.

- Control Tech C200
- Schneider ATV320U or ATV320U
- Delta MS23, MS43, or MS53
- Mitsubishi FR-E860, FR-E840, or FR-E860
- Yaskawa CIMR-VU2A, CIMR-VU4A or CIMR-ZU5A

J.2.4.2. Replacement

The VFD is horsepower and voltage specific. Therefore, replacement must be the same model as the existing. A preprogrammed VFD is recommended and available from ProStock. A non-programmed VFD set up exactly as instructed in the ***VFD I&O Manual*** programming guide may also be used.

J.2.4.3. General Information

The purpose of the VFD is to allow low airflow in Fan Only (G) and First-Stage Cooling (Y1) operation of a two-stage unit. Unit air balancing should be performed at 100% airflow (60 Hz at VFD) during a Y2 call by adjusting the blower motor sheave. First-Stage Cooling and Fan Only speeds are independently adjustable at the RTU-C. The VFD display will indicate an equivalent value in Hz (i.e. Low Cool adjusted to 60% at RTU-C will display as 36Hz at the VFD). A 20 second (adjustable at the VFD) ramp-up or ramp-down is used whenever the blower speed is increased or decreased. Low speed blower operation first ramps to 75%, to close fan proving switch, before ramping to the desired speed. Since the VFD operates on 24VDC control voltage, a blower relay (with 24VAC across the coil) is used to turn the VFD on. Blower speeds arechanged via Modbus communication from the RTU-C.

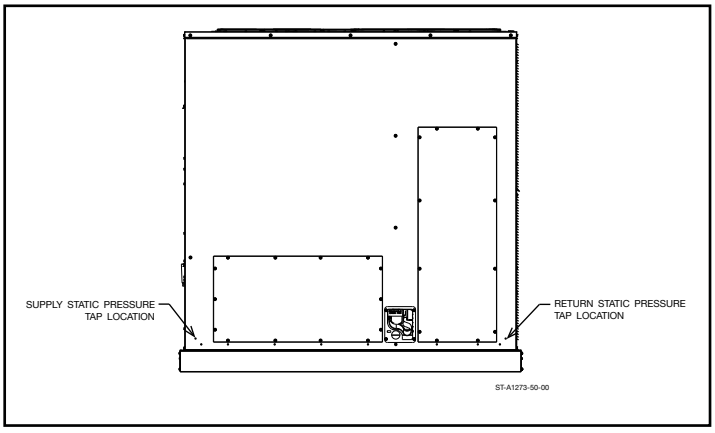
For more information see ***VFD I&O Manual*** shipped with the unit.

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.***

For the minimum rated airflows for this unit's base models, see ***Appendix F — A2L Refrigerant Installation Safety Data.***

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



J.3.1. Static Pressures and Measurements

- To measure the static pressure of the system, find 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

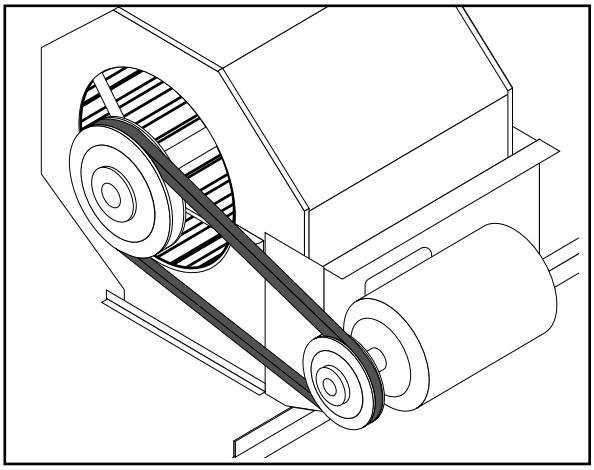
Use a calibrated monometer to measure the static pressure of the blower. Insert the meter probe into the tap location. Make sure any economizer or outside air dampers are closed and run the fan at the maximum, full speed setting. Record the reading for the return air and supply air separately.

J.3.2. Air Flow Measurements and Adjustments

- Measure the supply/ return static to get the unit static pressure by drilling out the simple locations shown in ***Figure J.3.2 - A.***
- Take the measured static pressure and match to the static listed on the airflow table to find your CFM.

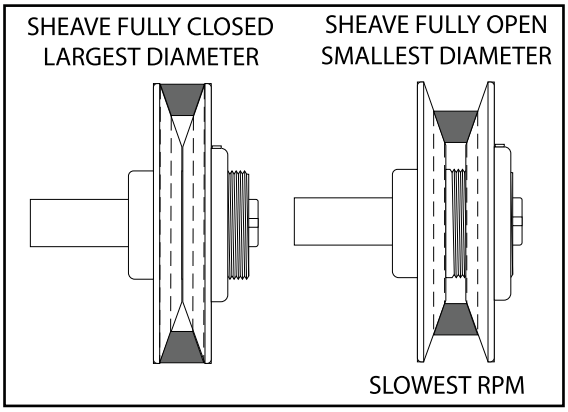
Use the charts and guide provided in the Installation and Operation instructions provided with the unit to calculate the airflow, against the measured static pressures and number of turns on the adjustable blower sheave. Verify the measured air flow against the charts.

Figure J.3.2. – A: Blower Assembly and Motor



If adjustment is needed, turn off the power to the entire system, and adjust the adjustable blower motor sheave. To do this, loosen the belt tension and remove the belt. Using an Allen wrench to loosen the set screw on the end of the adjustable blower sheave, turn the blower sheave in until it is fully closed.

Figure J.3.2. – B: Adjustable Blower Motor Sheave



Using the charts determine the total number of turns needed on the sheave. Make those turns in half turn increments, once set, align the set screw with the Flat section on the sheave threads. Tighten the set screw to secure the sheave.

Reinstall the belt and tension properly and power on the system. Allow the thermostat to call for cooling or heating, make sure the VFD ramps the blower to the correct speed.

Once the fan is at full speed, measure the air flow and static pressure, compare against the charts. If additional adjustment is needed, repeat the adjustment procedure.

J.3.2.1. 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.

These I&Os can also be found on the manufacturer's website.

J.3.2.2. Adjusting Fresh Air Flow with Damper

All dampers are field installed 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.

These I&Os can also be found on the manufacturer's website.

J. STARTUP AND OPERATION

J.4. Checking Cooling Operation

COOLING SEQUENCE OF OPERATION

A. Call for first-stage cooling.

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

2. Inputs 'Y1' and 'G' to the control are energized.

3. The control senses input to 'Y1' and 'G'. After a 1 second delay, the control energizes both the indoor blower and first-stage compressor.

4. The control enters the normal operating loop where 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-stage compressor 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 1 second delay, the control energizes the indoor blower, and the first and second-stage compressors.

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 1 second and then release.

FAULT RECALL OPERATION for non-DDC units

To enter FAULT RECALL mode, press the SW1 button with an insulated probe for 2 seconds 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 5 seconds and release. T

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 diagnostics during installation.

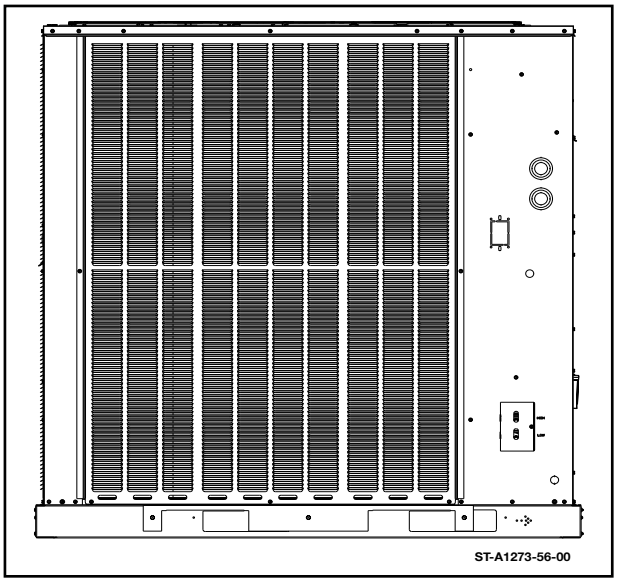
Please refer to the ***Clear Control I&O***.

J.4.1. Checking Refrigerant Pressures

This unitary packaged system comes fully charged and tested with R-454B refrigerant from the factory. Adjustment of the refrigerant charge is not required. If the unit is suspected of not having the proper refrigerant charge, any adjustment must not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

See ***Section C.2.1. Tools Required For Installing And Servicing R-454B Models.***

Figure J.4.1. –A: Service Port Location



J.4.1.1. Refrigerant Pressure Charts

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

J.4.2. Checking Sub Cooling for Adjusting Charge Weight

When breaking into the refrigeration circuit for any reason the procedure included in section ***J.1.1.3. Removal and Evacuation of Refrigerant*** must be followed.

Prior to recharging the system, complete a leak check and purge the system with inert gas as detailed in ***J.1.1.3. Removal and Evacuation of Refrigerant***.

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

Note: Factory charge chart and/or design target subcooling are for gross charge verification.

Charge verification instructions:

1. Allow the unit to operate for 15 minutes before checking or adjusting the charge.
2. Ensure that the contamination of different refrigerants does not occur when using charging equipment. Hoses of lines must be as short as possible to minimize the amount of refrigerant contained in them.
3. Ensure that the unit is properly grounded.
4. Return air temperature must be within comfort conditions (72°F - 82°F).
5. Remove caps from the high-side and low-side pressure service fittings.
6. Cylinders must be kept in an upright position for the entirety of the testing and charging procedure.
7. Record the following measurements:
   a. High-side pressure at service fitting
   b. Liquid line temperature
8. Using R-454B refrigerant saturation T-P tables, find the corresponding refrigerant saturation temperature relative to the measured high-side pressure.
9. To determine subcooling, subtract the liquid line temperature measured in Step 7 from the saturation temperature found in Step 8.
10. Compare the subcooling result from Step 9 to the subcooling table located on the unit or in the I&O manual.
11. If the subcooling value from Step 9 is more than 1°F above the value listed in the subcooling table, remove charge to match the value listed in the table, ± 0.5°F.
    a. Take extreme care not to overfill the refrigerating system.
12. If the subcooling value from Step 9 is more than 1°F below the value listed in the subcooling table, add charge to match the value listed in the table, ± 0.5°F.
    a. Take extreme care not to overfill the refrigerating system.

After charging is complete, a leak test must be done. Before leaving the site an additional leak test must also be done at the end of the installation. Refer to ***J.1.1.3. Removal and Evacuation of Refrigerant.***

J. STARTUP AND OPERATION

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.4.2.1. - A: Line Temperature 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.

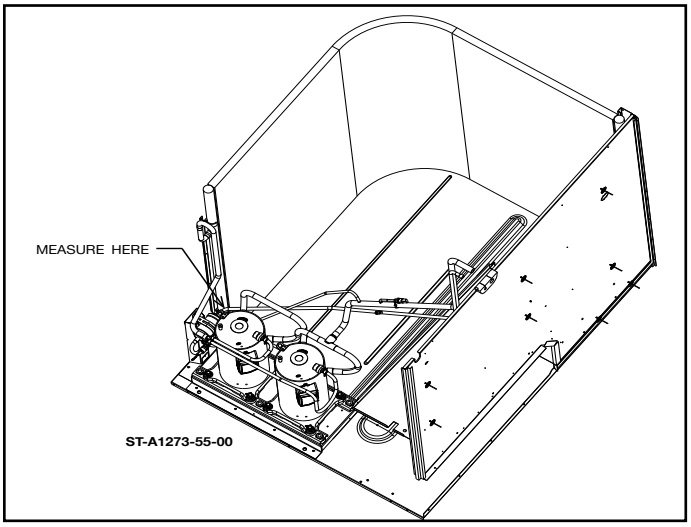
Measuring line temperature:

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

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 Heating Operation

J.5.1. Gas Furnace

J.5.1.1. Measuring and Adjusting Supply Gas Pressures

The maximum gas inlet pressure to the furnace should be 10.5” WC for natural gas and 13.0” WC for LP gas the minimum gas inlet pressure for purposes of input adjustments to the furnace should be 5.0” WC for natural gas and 11.0” WC for LP gas.

The inlet pressure tap is on the input side of the gas valve. A calibrated manometer is required to measure gas pressure readings accurately.

1. Ensure the gas is shut off to the furnace at the manual gas valve installed outside the unit.

2. Remove the inlet pressure tap plug using a 3/16” allen wrench; see Figure G.1.4. –A.

3. Install a 1/8” NPT pressure tap fitting and tighten using a 7/16” open end wrench.

4. Connect manometer using 1/4” I.D. hose over the pressure tap fitting.

5. Turn on the gas supply and operate the furnace and all other gas-fire units on the same gas line as the furnace.

6. Note or adjust the inlet gas pressure to give:

   A: 5” - 10.5” W.C. for natural gas

   B: 11” - 13” W.C. for LP gas

7. Shut off the gas at the manual gas-valve a remove the manometer and hose.

8. Replace 1/8” NPT pressure tap fitting with the pressure tap plug and tighten using a 3/16” allen wrench.

9. Turn ON the gas supply and check for gas leaks using an approved leak detector. Do NOT use a flame of any kind to check for leaks. Repair any leaks and repeat.

If the supply gas inlet pressure is above the specified ranges, install an in-line gas regulator to the furnace for the natural gas units. For LP gas furnace, have the LP supplier reduce the inlet pressure at the regulator.

If the supply gas inlet pressure is below the specified ranges, either remove the restrictions in the gas supply piping or enlarge the gas pipe for a natural gas furnace; see ***Table G.1.6. - A.*** For LP gas furnaces have the LP supplier adjust the inlet pressure at the regulator; see ***Table G.3. - A***.

J.5.1.2. Measuring and Adjusting Manifold Gas Pressures

The manifold pressure should be set at 3.5” WC high fire, 1.7” WC low fire, for natural gas and 10.0” W.C. high fire and 4.9” W.C. low fire for LP gas. Only small variations in the gas flow should be made by means of the pressure regulator adjustment. In no case should the final manifold pressure vary more than ± 0.3” WC for natural gas and ± 0.5” WC for LP gas from the above specified pressures.

1. Ensure the gas is shut off to the furnace at the manual gas valve installed outside the unit.

2. Remove the manifold pressure tap plug using a 3/16” allen wrench; see ***Figure G.1.4. – A.***

3. Install a 1/8” NPT pressure tap fitting and tighten using a 7/16” open end wrench.

4. Connect manometer using 1/4” I.D. hose over the pressure tap fitting.

5. Turn on the gas supply and operate the furnace by applying a heat call.

6. Note or adjust the manifold gas pressure to give:

C. 3.5” (± 0.3”) W.C. high fire, 1.7” (± 0.3”) W.C low fire for natural gas

D. 10.0” (± 0.5”)W.C. high fire and 4.9” (± 0.5) W.C. low fire for LP gas

7. To adjust the pressure regulators, remove adjustment screw cover.

8. Using the 3/32’allen wrench, turn the adjustment screw clockwise increase pressure, or counterclockwise to decrease the outlet pressure.

9. Replace the adjustment screw cover.

10. Shut off the gas at the manual gas-valve a remove the manometer and hose.

11. Replace 1/8” NPT pressure tap fitting with the pressure tap plug and tighten using a 3/16” allen wrench.

12. Turn ON the gas supply and apply a heat call to the furnace. Then check for gas leaks using an approved leak detector. Do NOT use a flame of any kind to check for leaks.

Repair any leaks and repeat.

J.5.1.3. Verifying BTU Performance and Capacity

Checking furnace input is important to prevent over-firing beyond its design rated input.

NEVER SET INPUT ABOVE THAT SHOWN ON THE RATING PLATE FOR ELEVATIONS UP TO 2,000 FT. Use the following table or formula to determine input rate. Start the furnace and measure the time required to burn on cubic foot of gas. Prior to checking the furnace input, make certain that all other gas appliances are shut off, with the exception of pilot burners.

Time the meter with only the furnace in operation.

METER TIME IN MINUTES AND SECONDS FOR NORMAL INPUT RATING OF FURNACE QUIPPED FOR NATURAL GAS									
INPUT (BTU/HR)	METER SIZE (FT^3/REV)	HEATING VALUE OF GAS (BTU/FT^3)							
		900		1000		1050		1100	
		MIN	SEC	MIN	SEC	MIN	SEC	MIN	SEC
75,000	ONE	0	43	0	48	0	50	0	53
	TEN	7	12	8	0	8	24	8	48
100,000	ONE	0	32	0	36	0	38	0	40
	TEN	5	24	6	0	6	18	6	36
120,000	ONE	0	27	0	30	0	32	0	33
	TEN	4	30	5	0	5	15	5	30
RATE (BTU/HR) = HEATING VALUE OF GAS X 3600 / TIME (IN SECONDS) FOR 1 CUBIC FOOT OF GAS									

J. STARTUP AND OPERATION

The factory installed orifice on a furnace are sized for natural gas having a heating value of 1050 BTU/cu.ft and a specific gravity of 0.60. Since heating values vary geographically, the manifold pressure and/or gas orifice size may need to be changed to adjust the furnace to its nameplate input. Consult the local gas utility to obtain the yearly average heating value. Refer to section ***G.4.2.6. Orifice Selection and High Altitude Adjustments*** for more info.

NOTE: Refer to the High Altitude Section of this manual and the National Fuel Gas Code for high altitude rate adjustment above 2,000 ft.

To change the orifice spuds, s hut t he manual gas-valve and remove the gas manifold. Replace all the orifice with correct sizes based on the Orifice Selection Charts, and carefully replace the manifold in its position.

J.5.1.4. To Shut Down Furnace

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control door.
4. Move control switch/knob on the gas valve to the “OFF” position.
5. Replace control door.

⚠WARNING: SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT OFF, SHUT OFF THE MANUAL GAS VALVE TO THE APPLIANCE BEFORE SHUTTING OFF THE ELECTRICAL SUPPLY. FAILURE TO DO SO CAN RESULT IN AN EXPLOSION OR FIRE CAUSING PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH!

J.5.1.5. Checking Air Temperatures

The importance of proper air flow over the heat exchanger cannot be over emphasized. One of the most common causes of heat exchanger failure is over-heating due to low air flow.

To determine whether the heating air flow is correct, follow the steps to check the temperature rise.

1. Insert a thermometer in the supply air duct as close to the furnace as possible yet out of a direct line from the heat exchanger. (See ***Figure J.3. – A: Static Pressure and Air Temp Measurement Location***)
2. Insert a thermometer in the return air duct as close to the filters as possible.
3. Operate the furnace for a minimum of 15 minutes in the gas heat mode.
4. When the thermometer in the supply air duct stops rising (approximately five minutes), subtract the return air temperature from the supply air temperature. The difference is the temperature rise.
5. Compare the measured temperature rise to the approved temperature rise range listed on the furnace name plate or in ***Appendix E: Heating Performance***.

If the measured temperature rise is above the approved range, the air flow is too low. Airflow must be increased by removing the restrictions in the duct system, or by changing the air flow. If the measured temperature rise is below the approved range, the air flow is too much. Check the duct sizing or see Section ***J.3.2. Air Flow Measurements and Adjustments***.

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

J.6. Safety Checks

At all times the manufacturer’s maintenance and service guidelines must be followed. If in doubt, contact the manufacturer’s technical support for assistance.

Before leaving the installation site the following safety checks must be completed:

- Ensure all electrical components in this system are approved by the manufacturer.
- Confirm the actual refrigerant charge complies with the minimum room size requirements outlined in Appendix H. A2L Refrigerant Installation Safety Data
- Ensure that the ventilation machinery and outlets are operating correctly and are not obstructed.
- If an indirect refrigerant circuit is being used, the secondary circuit must be checked for the presence of refrigerant.
- Ensure that all the equipment labels and markings are visible and legible. Markings, labels, and signs that are illegible must be corrected.
- Confirm that any refrigerating pipe or components are installed in a position where they are unlikely to be exposed to corrosion, unless the refrigerant-containing components are constructed of corrosion-resistant materials or are protected from corrosion.

K. TEST AND BALANCE

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 7.5-12.5 Ton Units

See ***Section J.3.2. Air Flow Measurements and Adjustments*** on how to increase the blower speed and increase airflow for the 7.5-12.5T units.

K.3. Economizer Adjustments

An economizer is designed to provide fresh air into the building and offer the potential for “Free” cooling when the outdoor temperature and humidity conditions are favorable to help save energy in the overall operation of the unit.

Having a properly operating economizer is important. See the instructions provided with the Economizer for the proper setup and operation of the system. Some models will feature a self-contained control module for programming and setup, others may use the control board, such as the Clear Control™ DDC, for managing the operation of the economizer.

Do not bypass the economizer or “fix” the dampers blades in an open position when the unit is off, this will cause the potential for undesired operations and conditions in the space.

M. HUMIDITY CONTROL

M.1. Dehumidification System Information

With the factory installed dehumidification option, in addition to a thermostat or space temperature sensor that is normally present, an indoor relative humidity sensor is installed in the occupied space and connected to the Rooftop Unit Controller (RTU-C) which then controls the capacity of the cooling coil to remove moisture from the supply air and maintain space relative humidity below an adjustable limit visible on the RTU-C display.

The default value is the ASHRAE recommended limit of 60% RH. With this option, a refrigerant reheat coil is installed downstream from the evaporator coil. When the space humidity is too high and reheat is energized, this coil uses some of the heat that is normally rejected to the outside by the condenser coil to instead reheat the cold air from the evaporator coil just enough to avoid overcooling the space. Providing “neutral air” to the occupied space.

Because the demand for dehumidification can be different from the cooling demand, the unit will first satisfy the demand for cooling and then if the space humidity is still too high, dehumidification mode is energized. When in dehumidification mode, the supply air leaving the unit will be near the entering air temperature, but at a much lower humidity. The unit will exit the dehumidification mode when the humidity set point is satisfied; or if the load is increased, it will return to normal cooling mode.

Reheat is not available during the gas-heating mode.

Figure M.1. - A

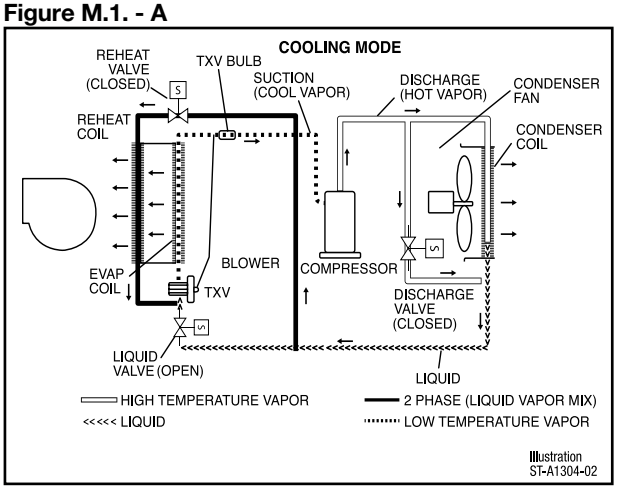


Figure M.1. - A shows the refrigerant path during the normal cooling mode. The liquid refrigerant leaves the TXV with the sudden pressure drop causing the liquid to expand to a vapor and absorbing the heat from the supply air going through the evaporator coil. The refrigerant vapor then travels to the compressor where it is elevated to a higher pressure and temperature.

The superheated refrigerant vapor next carries the heat to the outside coil where the heat is then rejected and the refrigerant condenses into a subcooled liquid where the process repeats itself.

Figure M.1. – B

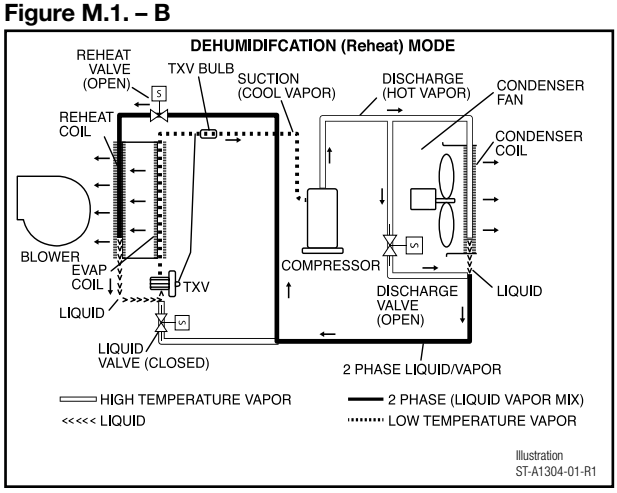


Figure M.1. - B shows the refrigerant path during the reheat mode. When the reheat cycle is energized by the RTU-C, the reheat solenoid valve, upstream of the reheat coil opens. The liquid solenoid valve ahead of the TXV, closes. The discharge solenoid valve, in the compressor discharge line, opens. The liquid refrigerant leaves the TXV with the sudden pressure drop causing the liquid to expand to a vapor and absorbing the heat from the supply air going through the evaporator coil. The refrigerant vapor then travels to the compressor where it is elevated to a higher pressure and temperature. The refrigerant next carries the heat to a parallel path between the outside condenser coil and a bypass circuit. Some of the heat is rejected outdoor. The ratio of heat rejected outdoors versus indoors is controlled by an outdoor fan motor controller (OFMC) that monitors the two phase temperature and varies the fan speed. This 2-phase refrigerant vapor is then sent to the reheat coil. As the refrigerant travels through the reheat coil is condenses into a subcooled liquid where the process repeats itself.

M.2. Humidity Sensor Installation

The Humidity control unit requires the use of a zone mounted humidity sensor. The sensor should be located in the conditioned space, approximately 5ft from the floor, on an interior wall. Take care to locate it away from direct sunlight and away from air flow from vents or drafts from doors. The humidity sensors output is a 0-10VDC signal and will be connected to the DDC Control.

The Rheem ZNS-5 meets the requirement and includes an optional space temperature sensor. The control wiring should be a minimum of 18AWG Solid Copper wire with 5 Conductors and is connected from the DDC Control to the sensor as follows:

RED = R to V+ (+24VAC)

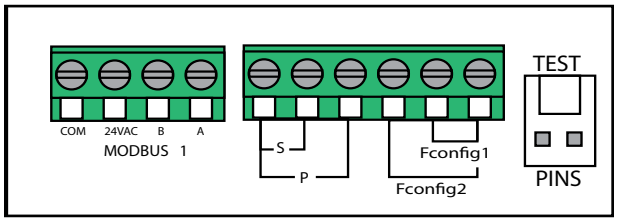
GREEN = Field Confg 1 & 2 (Right most terminal) to GROUND

BLUE = Field Config 2 (3rd terminal from right) to VOut

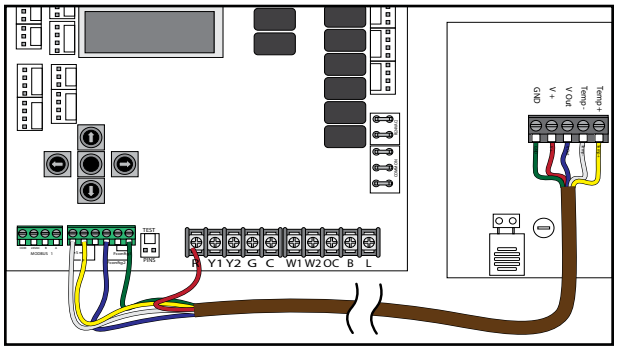
WHITE = S & P (Left most terminal) to Temp -

YELLOW = S (2nd terminal from left) to Temp+

See the installation instructions for additional details.



ZNS-5 HUMIDITY/TEMPERATURE SENSOR



HONEYWELL DUCT MOUNTED HUMIDITY SENSOR

This optional wires the same except the temperature sensor connects

directly to a Honeywell Thermostat.

RED = R to V+ (+24VAC)

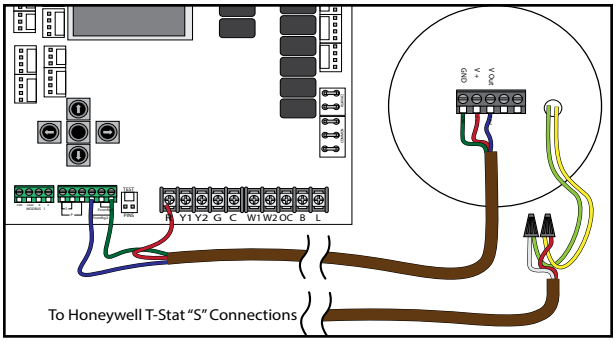
GREEN = Field Confg 1 & 2 (Right most terminal) to GROUND

BLUE = Field Config 2 (3rd terminal from right) to VOut

Other = Honeywell S- Terminal to Yellow Wire

Other = Honeywell S+ Terminal to Green Wire

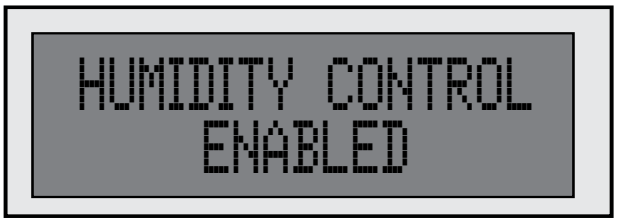
See the installation instructions for additional details.



M. HUMIDITY CONTROL

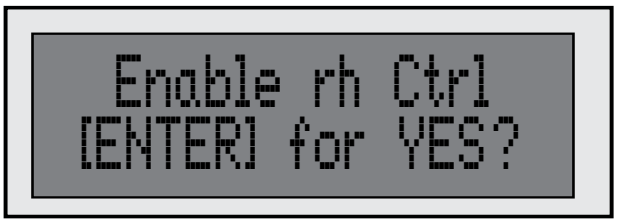
M.3. Humidity Control Settings and Configuration

The Clear Control is designed to operate in conjunction with the zone sensor discussed earlier in the guide. These are the steps to verify the zone sensor and adjust the humidity set-point and operating modes. The system can be programmed to a humidity level as low as 35%, and can be set to run dehumidification as part of the cooling cycle or as a stand alone system regardless of the cooling or fan call status from the thermostat, recommended.

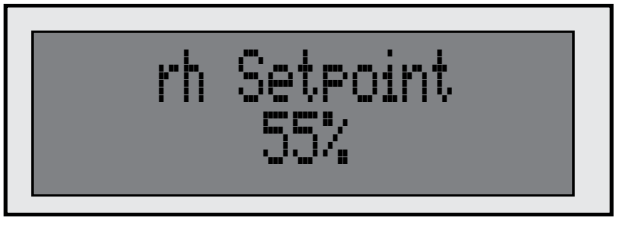


NOTICE: The system will not operate the humidity control when the outdoor ambient temperature is below 60°F, this is because the humidity control uses hot refrigerant bypassed from the outdoor coil,. When the ambient temperature is too low, insufficient heat will be retained in the refrigerant to properly operate the Reheat system for proper dehumidification. The Reheat system in this packaged unit is not designed for industrial or process applications, it is intended for human comfort zones.

Navigate through the Clear Control menu to “Humidity Control” it should say Enabled. If it says “Disabled” press the Enter button twice to Enable rh Control.



Next set the desired Relative Humidity Set-point. This set-point will be where the control will run the associated dehumidification cycles to bring the humidity in the zone down to this percentage.



Now set the Reheat Mode, there are three functions to choose from, Reheat in Occupied, will only run dehumidification when there is a Fan or Cooling Call. Reheat in Unoccupied, will on run dehumidification when there is no fan or cooling call; Reheat ALL, (recommended) will run reheat based on the humidity reading regardless of the thermostat operation.



Checking the Humidity Sensor reading, Navigate to Humidity Control then down to Indoor rh, this will display the reading from the humidity zone sensor. If this shows “4%” then it means that

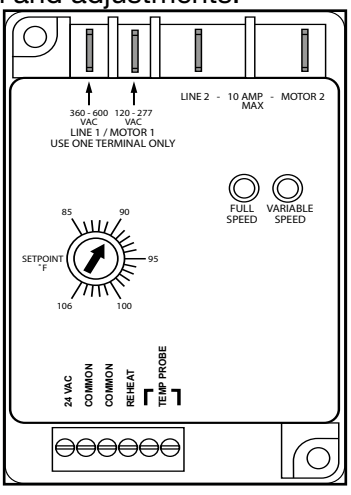
the zone sensor is not connected properly or malfunctioning.

Verify a 0-10VDC signal across the Field Cnfg 2 terminals on the control board. 10VDC = 100%, 5VDC - 50%.



The humidity control system is also equipped with an Outdoor Fan Motor Controller, OFMC, this controller changes the speed of the outdoor fans to allow for more or less heat in the bypassed refrigerant used to operate the reheat system. Adjustments to the OFMC are not needed unless undesirable operation occurs.

Consult the Installation instructions provided with the system for details on the OFMC operation and adjustments.



N.1. Diagnostics Chart

N.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 • Thermostat out of calibration-set too high • Defective contactor • Blown fuses • Transformer defective • High pressure control open (if provided) • Interconnecting low voltage wiring damaged	• Check for correct voltage at compressor contactor in control box • Reset • Check for 24 volts at contactor coil - replace if contacts are open • Replace fuses • Check wiring-replace transformer • Reset-also see high head pressure remedy- • Replace thermostat wiring"
Condenser fan runs, compressor doesn't	• Run capacitor defective (single phase only) • Loose connection • Compressor stuck, grounded or open motor winding open internal overload. • Low voltage condition	• Replace • Check for correct voltage at compressor - check & tighten all connections • Wait at least 2 hours for overload to reset. If still open, replace the compressor. At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating."
Insufficient cooling	• Improperly sized unit • Improper airflow • Incorrect refrigerant charge • Air, non-condensibles or moisture in system • Incorrect voltage	• Recalculate load • Check - should be approximately 400 CFM [188.78 L/s] per ton. • Charge per procedure attached to unit service panel. • Recover refrigerant, evacuate & recharge, add filter drier • At compressor terminals, voltage must be within 10% of rating plate volts when unit is operating."
Compressor short cycles	• Incorrect voltage • Defective overload protector • Refrigerant undercharge	• At compressor terminals, voltage must be ± 10% of nameplate marking when unit is operating. • Replace - check for correct voltage • Add refrigerant
Registers sweat	• Low evaporator airflow • Room thermostat set too low	• Increase speed of blower or reduce restriction - replace air filter • Raise thermostat set point
High head-low vapor pressures	• Restriction in liquid line, expansion device or filter drier • Flow check piston size too small • Incorrect capillary tubes	• Remove or replace defective component • Change to correct size piston • Change coil assembly
High head-high or normal vapor pressure - Cooling mode	• Dirty condenser coil • Refrigerant overcharge • Condenser fan not running • Air or non-condensibles in system	• Clean coil • Correct system charge • Repair or replace • Recover refrigerant, evacuate & recharge
High head-high or normal vapor pressure - Heating mode	• Low air flow - condenser coil • Refrigerant overcharge • Air or non-condensibles in system • Dirty condenser coil	• Check filters - correct to speed • Correct system charge • Recover refrigerant, evacuate & recharge • Check filter - clean coil
Low head-high vapor pressures	• Defective Compressor valves	• Replace compressor
Low vapor - cool compressor - iced evaporator coil	• Low evaporator airflow • Operating below 65°F outdoors • Moisture in system • Liquid line limiting refrigerant flow	• Increase speed of blower or reduce restriction - replace air filter • Add Low Ambient Kit • Recover refrigerant - evacuate & recharge - add filter drier • Replace drier
High vapor pressure	• Excessive load • Defective compressor	• Recheck load calculation • Replace
Fluctuating head & vapor pressures	• Severe overcharge • Air or non-condensibles in system	• Adjust refrigerant charge • Recover refrigerant, evacuate & recharge
Gurgle or pulsing noise at expansion device or liquid line	• Air or non-condensibles in system	• Recover refrigerant, evacuate & recharge

N. DIAGNOSTICS

N.1.2. Gas Heating 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
Induced draft blower motor (IDM) does not start	• No 208/230 Vac to IDM • Faulty low voltage transformer • Wired incorrectly • No line voltage to integrate furnace control (IFC) • Faulty IDM	• Check the wiring from the board to the motor - check for power at the motor - replace the IFC • Replace transformer • Check wiring per the diagram in the I&O • Check unit power connect - check power at L1 and L2 - Replace the IFC • If IDM is receiving power and will not start, replace the IDM
Ignitor will not spark	• Bad wire or corroded ignitor • Negative pressure switch not closing • Open rollout limit • Open limit control • Ignitor is not grounded • Ignitor wired incorrectly • Faulty IFC	• Check wire for damage - check the connection to the high voltage spark tower - replace corroded ignitor • Check for blocked hose – check for exhaust blockage - check that the negative pressure on the IDM is enough to close pressure switch - replace pressure switch • Check for blockage in the intake, heat exchanger, and exhaust - clear blockage and reset limit • Check temperature rise (see general data in I&O) - check for proper airflow – check for proper gas pressure - replace the limit • Check that ignitor is firmly secured to burner assembly • Check wiring per the diagram in the I&O • Replace IFC
No ignition/burner will not light	• No inlet pressure • Gas valve is not receiving 24 V • Gas valve is not opening • Orifice is blocked	• Check for gas pressure • Check wiring from IFC to gas valve - check for power at the gas valve - replace IFC • Replace valve • Remove orifice and clean - replace orifice if it is damaged
Flame not sustained	• Flame sense wired incorrectly • Flame sense damage or not in correct position • Flame sense dirty or corroded • Microamps are low or not present • Unit is not properly grounded • Faulty IFC	• Check wiring per the diagram in the I&O • Check flame sense position - replace flame sense • Clean flame sense with steel wool • Check for 4 microamps - replace flame sensor • Check unit grounding - correct bad grounding • Replace IFC
Indoor blower motor (IBM) does not start after 30 seconds	• No 208/230 Vac across IBM motor terminals on the IFC • Dead capacitor • Faulty IBM	• Check the wiring per the diagram in the I&O - replace IFC • Replace capacitor • Replace IBM
Heating does not stop after call for heat has been satisfied	• Thermostat wired incorrectly/faulty thermostat • Faulty valve	• Check thermostat wiring is correct - check that thermostat is operating correctly - replace thermostat • Remove gas valve lead and check if valve closes - replace valve
After 5 second post-purge, IDM stops, or IBM does not stop running after off delay (specified in furnace section of I&O)	• Open limit control • Open rollout limit	• Check temperature rise (see general data in I&O) - check for proper airflow – check for proper gas pressure - replace the limit • Check for blockage in the intake, heat exchanger, and exhaust - clear blockage and reset limit

N.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	2ND STAGE 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
40	Refrigerant Leak Detection System	Shutdown
42	Invalid Thermostat Selection	Warning
44	1ST. STAGE COMBUSTION PRESS SWITCH CLOSED	Problem
46	1ST. STAGE COMBUSTION PRESS SWITCH 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	2ND STAGE COMBUSTION PRESSURE SWITCH OPEN	Problem, shutdown
59	Condensate Drain Plugged	Shutdown
61	BLOWER FAULT - NO RUN	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

N. DIAGNOSTICS

N.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
H = Gas Heating 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 not making 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	

N. 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	
	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	
40	**REFRIGERANT LEAK DETECTION SYSTEM**	Shutdown
	DESCRIPTION:	
	1. The refrigerant leak detection system detects an event and mitigation procedure occurs.	
	2. The mitigation procedure is triggered when no event occurs.	
	SOLUTION: The solution will depend on the cause.	
	1. Check for refrigerant leaks	
	2a. Organic compounds could be falsely triggering mitigation procedure. Check the installation location for potential contaminants.	
	2b. The sensor is faulty; replace the sensor	
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	

N. DIAGNOSTICS

Fault Codes with Descriptions and Solutions:

Alarm Codes - Cooling Only		
CODE	**DESCRIPTION**	**FAULT LEVEL**
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	
84	**Outdoor Air Temperature Sensor Fail-OAT**	Problem
	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	
88	**Emergency Stop Fault**	Shutdown
	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.	
93	**CONTROL Fault**	Shutdown
	DESCRIPTION:	
	1. Internal Control fault.	
	SOLUTION: The solution will depend on the cause.	
	1. Replace Control	
91	**Smoke Detection**	Shutdown
	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 installed correctly on control	
	2. Check Smoke Detection Circuit, if no Smoke Detector is installed, ensure Economizer Smoke Bypass plug is installed	

N.2.2. Heating 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

H = Gas Heating 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 - Heating Only		
CODE	**DESCRIPTION**	**FAULT LEVEL -0, 1, 2, 3***
0	STANDBY	None
F	CONTINUOUS FAN	None
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
22	MAIN LIMIT OPEN	Problem
33	MRLC (Rollout Limit) OPEN	Problem
42	INVALID THERMOSTAT SELECTION	Warning
44	LOW-FIRE NEGATIVE PRESSURE CONTROL CLOSED	Problem
46	LOW-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem
55	High-Fire NEGATIVE PRESSURE CONTROL CLOSED	Problem
57	HIGH-FIRE NEGATIVE PRESSURE CONTROL OPEN	Problem, Shutdown
61	BLOWER FAULT - NO RUN	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
F	Displayed anytime thermostat calls for continuous fan
h	Lower-case “h” displayed anytime thermostat calls for low-fire heat
H	Upper-case “H” displayed anytime thermostat calls for high-fire heat

N. DIAGNOSTICS

Fault Codes with Descriptions and Solutions:

Alarm Codes - Heating Only	
CODE	**FAILED IGNITION**
11	**DESCRIPTION:** This fault is displayed when a failed ignition has occurred three times in a row. The Core Command will enter a one-hour lockout following the third ignition attempt.
	CAUSE:
	1. Flame sense rod is unable to sense flame
	2. Gas valve is turned OFF.
	3. The ignitor is not working properly.
	4. The Core Command is not working properly
	5. Burner flame is not carrying over from first burner to the last.
	SOLUTION: the solution will depend on the cause.
	1. Clean or replace flame sense rod. Confirm flame sense is in burner flame. Check wire and all connections between flame sense and Core Command. Make sure furnace is properly grounded.
	2. Turn gas valve ON.
	3. Replace or reposition the ignitor. Refer to section G.1.4 for proper ignitor location. Check wire and all connections between ignitor and Core Command.
	4. Replace furnace Core Command.
	5. Check manifold pressure during ignition (see Measuring and Adjusting Manifold Gas Pressures section). Watch the burner during ignition if the first burner lights but the second, third and so on do not light (incomplete carry-over), the burner may need to be replaced.
12	**LOW FLAME SENSE**
	DESCRIPTION: Furnace operation will continue in low and high-fire modes. This problem may be elevated to the level of fault code “13” or “11” if flame cannot be sensed at all.
	CAUSE:
	1. Most common cause is that the flame sense rod may need cleaning.
	2. Flame sense rod may not be properly connected.
	3. Wiring between the rod and furnace control may be shorted or opened.
	SOLUTION:
	1. Clean or replace flame sense rod.
	2. Check wire and all connections between the flame sense and Core Command.
	3. Make sure the furnace is properly grounded.

Fault Codes with Descriptions and Solutions:

Alarm Codes - Heating Only	
CODE	**FLAME LOST**
13	**DESCRIPTION:** if flame is lost after it is established, subsequent ignition attempts will follow and normal operation should resume.
	CAUSE:
	1. Most common cause is that the flame sense rod may need cleaning.
	2. My not be properly connected.
	3. Wiring between flame sense and Core Command may be shorted or opened.
	4. Improperly mounted
	5. Improperly grounded.
	6. Burner flame pattern may be unstable.
	SOLUTION:
	1. Clean or replace the flame sense rod.
	2. Check wire and all connections between the flame sense and Core Command.
	3. Confirm flame sense rod is in the flame. See section G.1.4 for proper flame sense location.
	4. Confirm furnace is properly grounded.
	5. Check that all burner assembly components are properly installed. Confirm that burner flame is steady and directed down the center of tube. If turbulence is noted, check for air leaks between the burner and blower compartment.
14	**UNEXPECTED FLAME**
	DESCRIPTION: this fault should rarely if ever be seen in the field. Furnace will not operate with this fault present.
	CAUSE:
	1. Field mis-wiring of 24VAC to the gas valve main solenoid.
	2. Faulty gas valve stuck in the “OPEN” position.
	3. Faulty furnace Core Command (signal improperly sensed when it should not be sensed at all).
	SOLUTION:
	1. Correct wiring
	2. Replace the gas valve.
	3. Replace the Core Command.
15	**HIGH-FIRE GAS VALVE IMPROPER VOLTAGE**
	DESCRIPTION: High-fire coil energized during call for low-fire heat. This fault should rarely if ever be seen in the field.
	CAUSE: Gas valve relay contacts on Core Command welded shut. Hi and low-fire miswired.
	SOLUTION:
	1. Replace Core Command if gas valve wiring is correct
	2. Turn off power to unit. Use a pin remover to reverse locations for BLUE and WHITE/BLACK wires in 3-pin connector.

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Fault Codes with Descriptions and Solutions:

Alarm Codes - Heating Only	
CODE	**MAIN LIMIT OPEN**
22	**DESCRIPTION:** The furnace will not operate in gas heat mode.
	CAUSE:
	1. No airflow or dead blower
	2. Insufficient airflow
	3. Faulty limit control
	4. Loose or faulty wiring.
	5. Incorrect blower tap
	6. Furnace input is too high.
	SOLUTION:
	1. Check for proper blower operation. If a blower motor fault has occurred fault code “61” should also be present. Check the wiring to the motor then the motor.
	2. Check filters and ductwork. Determine static pressure and confirm it is not above published values found in the Checking and Adjusting Airflow section.
	3. Replace the limit control
	4. Check wiring and connections.
	5. Confirm proper blower speed taps for high and low-fire.
	6. Insure properly sized burner orifices are installed. Check manifold pressure at high and low-fire and compare to values found in Measuring and Adjusting Manifold Gas Pressures section. Check rate and compare to nameplate input, high and low-fire. Adjust as necessary.
33	**MRLC (Manual Reset Limit Control) OPEN**
	DESCRIPTION: The MRLC is also known as the rollout limit. There are two rollout limits on these gas units. When one or more of these limits open, they must be manually reset to the closed position. This fault can occur when burner flames are not directed down the center of the burner tube and roll out into the burner assembly. This fault indicates a serious problem that must be repaired before furnace operation can continue.
	CAUSE:
	1. Faulty limit.
	2. Loose or faulty wiring.
	3. Damaged heat exchanger
	4. Insufficient combustion air or blocked flue pipe.
	5. Overfired condition.
	6. Air leak between burner and blower compartment.
	SOLUTION:
	1. Replace limit if limit will not reset. Observe flame pattern for normal operation after limit has been replaced.
	2. Check wiring and connections. Replace and/or repair as necessary

Fault Codes with Descriptions and Solutions:

33	3. Confirm that burner flame is steady and directed down center of burner tube. If flame turbulence is evident, note if turbulence began when indoor blower motor was energized. This could be an indication of a damaged heat exchanger, i.e. breached primary tube or loose wedge joint.
	4. Confirm louvered panels are unobstructed. Confirm flue pipe is unobstructed.
	5. Insure properly sized burner orifices are installed. Check manifold pressure at high and low-fire and compare to values found in Measuring and Adjusting Manifold Gas Pressures section. Check rate and compare to nameplate input, high and low-fire. Adjust as necessary.
	6. Check that all burner assembly components are properly installed. Confirm that burner flame is steady and directed down the center of tube. If turbulence is noted, check for air leaks between the burner and blower compartment.
44	**LOW FIRE NEGATIVE PRESSURE CONTROL (NPC) CLOSED (230V & 575V ONLY)**
	DESCRIPTION: The low-fire NPC should be open when the inducer is not operating. Before any heat cycle can begin, the NPC is tested to confirm the contacts are open. An ignition sequence will not occur if the low-fire NPC remains closed.
	CAUSE:
	1. NPC contacts are welded shut/faulty switch.
	2. loose or faulty wiring
	SOLUTION:
	1. Replace low fire NPC.
	2. Check wiring or connections, replace or repair as necessary

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Fault Codes with Descriptions and Solutions:

46	**LOW FIRE NEGATIVE PRESSURE CONTROL (NPC) OPEN (230V & 575V ONLY)**
	DESCRIPTION: Core command will energize the inducer for 30 seconds (pre-purge) in an attempt to close the low fire NPC. The Core Command will make four attempts to close the low-fire NPC before declaring a fault and entering a one hour lockout.
	CAUSE:
	1. Faulty inducer.
	2. Faulty Core Command
	3. Loose or faulty wiring.
	4. Disconnected, blocked, split or cut pressure switch hose.
	5. Severe wind gusts (sporadic)
	6. Faulty low fire pressure switch
	SOLUTION:
	1. Repair or replace inducer. Check inducer pressure to confirm negative pressure is adequate to close pressure switch.
	2. Replace Core Command after confirming that NPC contacts are closed while inducer is running.
46	3. Check NPC wiring and connections to Core Command.
	4. Confirm pressure switch hose is attached to pressure port on IDM and port on pressure switch. Confirm there is no split or cut in hose.
	5. Consider using the flue "snorkel" accessory.
	6. Replace pressure switch.
55	HIGH-FIRE NEGATIVE PRESSURE CONTROL (NPC) CLOSED
	DESCRIPTION: The high-fire NPC should be open when the inducer is not operating. Before any heat cycle can begin, the NPC is tested to confirm the contacts are open. An ignition sequence will not occur if the high-fire NPC remains closed.
	CAUSE:
	1. NPC contacts are welded shut/faulty switch.
	2. Loose or faulty wiring
	SOLUTION:
	1. Replace high-fire NPC.
	2. Check wiring or connections, replace or repair as necessary

57	**High-Fire NEGATIVE PRESSURE CONTROL (NPC) OPEN (230V & 575V ONLY)**
	DESCRIPTION: Furnace will ignite and operate in low-fire mode. Fault display established when thermostat calls for high-fire mode. Inducer high speed is energized and will remain on high speed for 60 seconds in an attempt to close high fire pressure switch. If pressure switch does not close after 60 seconds the inducer will drop to low speed and furnace will continue operation at low fire until high fire pressure switch closes or thermostat demand is satisfied.
	CAUSE:
	1. Faulty inducer or tap pressure inadequate to close high-fire NPC
	2. Faulty Core Command
	3. Loose or faulty wiring.
	4. Disconnected, blocked, split or cut pressure switch hose.
	5. Severe wind gusts (sporadic)
	6. Faulty high fire pressure switch
	SOLUTION:
	1. Repair or replace inducer. Check inducer pressure to confirm negative pressure is adequate to close pressure switch.
	2. Replace Core Command after confirming that NPC contacts are closed while inducer is running.
	3. Check NPC wiring and connections to Core Command.
	4. Confirm pressure switch hose is attached to pressure port on IDM and port on pressure switch. Confirm there is no split or cut in hose.
	5. Consider using the flue hood accessory.
	6. Replace pressure switch.

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Fault Codes with Descriptions and Solutions:

61	BLOWER FAULT - MOTOR CANNOT RUN
	DESCRIPTION: This is a critical blower fault- such as an internal thermal overload that prevents the motor from running. Furnace will shut down if this fault occurs during heating operation. No other operations, including thermostat calls, will occur until this fault is cleared. this fault will occur during heating operation after the main limit control has been open for more than 150 seconds (2 min:30 sec.). If this happens, the Core Command determines that the motor is not functional and enters a hard lockout condition requiring repair of the motor and manual reset of power to the furnace.
	CAUSE:
	1. The motor has tripped on thermal overload because of a restriction or bearing failure.
	2. Wiring to the motor has become compromised.
	3. The blower wheel has become damaged or is not properly attached to the motor shaft.
	4. The motor has failed catastrophically.
	SOLUTION:
	1. Remove restriction or replace motor
	2. Inspect and replace or repair wiring and/or connections to the motor
	3. Replace blower wheel and/or attach wheel to motor shaft properly.
	4. Replace motor.

Fault Codes with Descriptions and Solutions:

460V NEGATIVE PRESSURE CONTROL FAULTS	
55 & 44	**NEGATIVE PRESSURE CONTROL (NPC) CLOSED**
	460V furnace uses a single-speed inducer and one pressure switch for low and high-fire operation. The NPC should be open when the inducer is not operating.
	DESCRIPTION: Before any heat cycle can begin, the NPC is tested to confirm the contacts are open. An ignition sequence will not occur if the NPC remains closed. Core Command will flash a “55” & “44” fault code (230V & 460V units use same Core Command, “44” is normal under this scenario).
	See **CAUSE** and **SOLUTION** for fault code “55” above.
57 & 46	**NEGATIVE PRESSURE CONTROL (NPC) OPEN**
	DESCRIPTION: The inducer will run for 20 seconds in an attempt to close the pressure switch. At that time the Core Command will flash a “57” & “46” fault code (230V & 460V units use same Core Command, “46” is normal under this scenario). Inducer will continue to run an additional 40 seconds before being de-energized. After a five minute period the Core Command will make another attempt to close the pressure switch. This cycle will repeat until the pressure switch closes or call for heat is removed.
	See **CAUSE** and **SOLUTION** for fault code “57” above.

N.2.3. 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		
21	REFRIGERANT LOW PRESSURE SWITCH OPEN – CIRCUIT 2	Problem
30	REFRIGERANT HIGH PRESSURE SWITCH OPEN – CIRCUIT 2	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
50	FREEZE SWITCH OPEN – CIRCUIT 2	Problem

N.2.4. Phase Monitoring

DDC Units:

• The Phase Monitor is activated by a menu item in the General Information menu on the DDC board.

• When a phase monitoring fault occurs, the control will go into a shutdown. When the error is corrected, the unit will try and operate after the ASCD.

Non-DDC Units:

• The Phase Monitor is connected to the contractor.

• When a phase monitoring fault occurs the system will go into shutdown.

• For phase monitoring diagnostics, consider checking the following:

1. Compressor fuse is open on one phase.
2. Broken wire on connector on one phase.
3. Compressor motor winding is damaged.
4. Utility supply has dropped one phase.

N. DIAGNOSTICS

N.2.5. VFD Codes

This VFD Section may not be applicable to all unit configurations. See ***Appendix H*** towards the end of this manual for Low Voltage Connections for VFDs.

N.2.5.1. Yaskawa VFD Codes

Some units come equipped with a Yaskawa V1000 Variable Frequency Drive attached to the blower assembly in the blower motor compartment.

When the drive detects a fault, the ALM indicator LED remaines lit without flashing. If the LED flashes, the drive has detected a minor fault or alarm. Conditions such as overvoltage or external faults can trip both faults and minor faults, therefore it is important to note whether the LED remaines lit or if the LED flashes.

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 can be found below and on the following page.

More fault codes can be found on the manufacturer's website. In the blower compartment, on the right side VFD assembly there is a label that gives the model number of the VFD. Use that model number to find the VFD Installation Manual on the manufacturer's website.

V1000 Drive: https://www.yaskawa.com/products/drives/industrial-ac-drives/microdrives/v1000-drive

Z1000 Drive: https://www.yaskawa.com/products/drives/hvac-drives/fan-pump-drives/z1000-drive

Digital Operator Display	Name	Minor Fault Output (H2 - □□ = 10)
CE	MEMOBUS/Modbus Communication Error	YES
CrST	Can Not Reset	YES
dnE	Drive Disabled	YES
EF1 to EF7	External Fault (input terminal S1 to S7)	YES
HCA	Current Alarm	YES
LT-1	Cooling Fan Maintenance Alarm	No Output <1>
LT-2	Capacitor Maintenance Alarm	No Output <1>
LT-3	Soft Charge Bypass Relay Maintenance Time	No Output <1>
LT-4	IGBT Maintenance Time (50%)	No Output <1>
oH	Heatsink Overheat	YES
oH2	Drive Overheat	YES
oH3	Motor Overheat	YES
oL3	Overtorque 1	YES
oL4	Overtorque 2	YES
oL5	Mechanical Weakening Direction 1	YES
oS	Overspeed (for Simple V/f with PG	YES
oV	Overvoltage	YES
Pgo	PG Disconnect (for Simple V/f with PG)	YES

N.2.5.1. Yaskawa VFD Codes (Cont.)

Digital Operator Display	Name
bUS	Option Communication Error
CE	MEMOBUS/Mobus Communication Error
CF	Control Fault
CPF02	A/D Conversion Error
CPF07	Terminal Board Communication Fault
CPF08	EEPROM Serial Communications Fault
CPF011	RAM Fault
CPF012	FLASH Memory Fault
CPF013	Watchdog Circuit Exception
CPF014	Control Circuit Fault
CPF016	Clock Fault
CPF017	Timing Fault
CPF018	Control Circuit Fault
CPF019	Control Circuit Fault
CPF020 or CPF21	RAM Fault
	FLASH Memory Fault
	Watchdog Circuit Exception
	Clock Fault
EF0	Option External Fault
EF1 to EF7	External Fault (input terminal S1 to S7)
Err	EEPROM Write Error
GF	Ground Fault
LF	Output Phase Loss
LF2	Current Imbalance
oC	Overcurrent
oH	Heat Sink Overheat
oH1	Heat Sink Overheat
oL1	Motor Overload
oL2	Drive Overload
oL3	Overtorque Detection 1
oL4	Overtorque Detection 2
oL5	Mechanical Weakening Detection 1
oL6	Overvoltage
oL7	Input Phase Loss
oL8	IGBT Short Circuit
oL9	Undervoltage
oL10	Control Power Supply Undervoltage
oL11	Soft Charge Circuit Fault

N. DIAGNOSTICS

N.2.5.2. Mitsubishi VFD Codes

Some units come equipped with a Mitsubishi FR-E800 Variable Frequency Drive attached to the blower assembly in the blower motor compartment.

When the drive detects a fault, an “E” with a Three Character Fault Code will be displayed on the LED display (Example: E.LUP). The drive may not stop the drive from running unless it is not corrected. The drive will store the last 10 fault codes, a condensed list of fault codes and operating codes can be found below.

More fault codes can be found on the manufacturer’s website. In the blower compartment, on the right side VFD assembly there is a label that gives the model number of the VFD. Use that model number to find the VFD Installation Manual on the manufacturer’s website.

Operation Panel Indication	Code	Name
E.OC1	16 (H10)	Overcurrent trip during acceleration
E.OC2	17 (H11)	Overcurrent trip during constant speed
E.OC3	18 (H12)	Overcurrent trip during deceleration or stop
E.OV1	32 (H20)	Regenerative overvoltage trip during acceleration
E.OV2	33 (H21)	Regenerative overvoltage trip during constant speed
E.OV3	34 (H22)	Regenerative overvoltage trip during deceleration or stop
E.THT	48 (H30)	Inverter overload trip (electronic thermal relay function)
E.THM	49 (H31)	Motor overload trip (electronic thermal relay function)
E.FIN	64 (H40)	Heat sink overheat
E.UVT	81 (H51)	Undervoltage
E.ILF	82 (H52)	Input phase loss
E.OLT	96 (H60)	Stall prevention stop
E.SOT	97 (H61)	Loss of synchronism detection
E.LUP	98 (H62)	Upper limit fault detection
E.LDN	99 (H63)	Lower limit fault detection
E.BE	112 (H70)	Brake transistor alarm detection
E.GF	128 (H80)	Output side earth (ground) fault overcurrent
E.LF	129 (H81)	Output phase loss
E.OHT	144 (H91)	External thermal relay operation
E.PTC	145 (H91)	PTC thermistor operation
E.OPT	160 (HA0)	Option Fault

N.2.5.3. Other Suppliers

Some units may be equipped with VFDs from other suppliers. In the blower compartment, on the right side of the VFD assembly, there is a label with the model number of the VFD. For more information about those VFDs, visit the appropriate website listed below.

Delta MS300:
https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&CID=06&itemID=060101&downloadID=MS300&dataType=2&sort_expr=cdate&sort_dir=DESC

ControlTechC200:
https://acim.nidec.com/en-us/drives/control-techniques/products/ac-drives/commander-c-general-purpose-drives

N.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

Model (-)GEDYB Series	090	102	120	150
Cooling Performance[A]				
Gross Cooling Capacity Btu/h [kW]	88,000 [25.78]	99,000 [29.01]	118,000 [34.57]	148,000 [43.36]
EER	11	11	11	10.8
IEER[B]	14.6	14.6	14.6	14
Nominal CFM/AHRI Rated CFM [L/s]	3000/3400 [1416/1605]	3400/3300 [1604/1557]	4000/4000 [1888/1888]	5000/4025 [2360/1899]
AHRI Net Cooling Capacity Btu/h [kW]	85,000 [24.9]	96,000 [28.13]	114,000 [33.4]	142,000 [41.61]
Net Sensible Capacity Btu/h [kW]	63,750 [18.68]	72,000 [21.10]	85,500 [25.06]	106,500 [31.21]
Net Latent Capacity Btu/h [kW]	21,250 [6.23]	24,000 [7.03]	28,500 [8.35]	35,500 [10.40]
Net System Power kW	7.73	8.73	10.36	13.15
Compressor				
No./Type	1/Scroll	1/Scroll	1/Scroll	2/Tandem Scroll
No. Stages	2	2	2	2
Outdoor Sound Rating (dB)[C]	83	81	88	87
Outdoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.71 [18]	0.81 [20.6]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	25.4 [2.36]	25.6 [2.38]	31.5 [2.93]	31.5 [2.93]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]	1 / 23 [9]
Indoor Coil - Fin Type	Louvered	Louvered	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1 [25.4]	1.26 [32]	1 [25.4]	1 [25.4]
Face Area sq. ft. [sq. m]	11 [1.02]	10.9 [1.01]	13.8 [1.28]	13.8 [1.28]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]	2 / 18 [7]	2 / 18 [7]
Refrigerant Control	TX Valves	TX Valves	TX Valves	TX Valves
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]	1/0.75 [19.05]
Outdoor Fan - Type	Propeller	Propeller	Propeller	Propeller
No. Used/Diameter in. [mm]	2/24 [609.6]	2/24 [609.6]	2/24 [609.6]	2/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1	Direct/1	Direct/1
CFM [L/s]	8000 [3775]	8000 [3775]	8500 [4011]	9000 [4247]
No. Motors/HP	2 at 1/5 HP	2 at 1/5 HP	2 at 1/3 HP	2 at 3/4 HP
Motor RPM	820	820	1075	1100
Indoor Fan - Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/15x15 [381x381]	1/15x15 [381x381]	1/15x15 [381x381]	1/15x15 [381x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)	Belt (Adjustable)
No. Speeds	2	2	2	2
No. Motors	1	1	1	1
Motor RPM	1725	1725	1725	1725
Motor Frame Size	56	56	56	184
Filter - Type	Disposable	Disposable	Disposable	Disposable
Furnished	Yes	Yes	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(4)2x20x20 [51x508x508]	(4)2x20x20 [51x508x508]	(4)2x20x20 [51x508x508]	(4)2x20x25 [51x508x635]
Refrigerant Charge Oz. [g]	88 [2495]	114 [3232]	171 [4848]	168 [4763]
Weights				
Net Weight lbs. [kg]	839 [381]	868 [394]	1004 [455]	1094 [496]
Ship Weight lbs. [kg]	878 [398]	907 [411]	1043 [473]	1133 [514]

Note: Please look at the rating plates pasted on the side of the unit to understand the model number of your unit.

Appendix A – General Product Data (Cont.)

GENERAL DATA - (-)GEDYB MODELS
7.5 - 12.5 TON [26.4 - 44.0 kW]

NOTES:
A. Cooling Performance is rated at 95° F ambient, 80° F entering dry bulb, 67° F entering wet bulb. Gross capacity does not include the effect of fan motor heat. AHRI capacity is net and includes the effect of fan motor heat. Units are suitable for operation to 20% of nominal cfm. Units are certified in accordance with the Unitary Air Conditioner Equipment certification program, which is based on AHRI Standard 340/360.
B. EER and Integrated Energy Efficiency Ratio (IEER) are rated in accordance with AHRI Standard 340/360 and with DOE test procedures.
C. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270.

WEIGHTED SOUND POWER LEVEL								
Model	Std. Rating (dBA)	Frequency (Hz)						
		125	250	500	1000	2000	4000	8000
(-)GEDYB090	82.0	59	65	71	74	67	63	55
(-)GEDYB102	83.0	61	66	73	73	71	66	59
(-)GEDYB120	86.0	64	73	75	76	73	70	65
(-)GEDYB150	88.0	66	73	79	78	74	69	66

P. APPENDICES

Appendix B – Electrical Data

ELECTRICAL DATA - (-)GEDYB SERIES							
		090ACF15 090ACF20	**090ACG15 090ACG20 090ACH15 090ACH20**	**090ADF15 090ADF20**	**090ADG15 090ADG20 090ADH15 090ADH20**	**090AYF15 090AYF20**	**090AYG15 090AYG20 090AYH15 090AYH20**
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506	518-633	518-633
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Hz	60	60	60	60	60	60
	Minimum Circuit Ampacity	41/41	44/44	18	20	15	16
	Minimum Circuit Ampacity with Powered Exhaust	46/46	49/49	21	23	17	18
	Minimum Overcurrent Protection Device Size	50/50	50/50	25	25	20	20
	Minimum Overcurrent Protection Device Size with Powered Exhaust	60/60	60/60	25	25	20	20
	Maximum Overcurrent Protection Device Size	60/60	60/60	25	30	20	20
	Maximum Overcurrent Protection Device Size with Powered Exhaust	70/70	70/70	30	30	25	25
Compressor Motor	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Amps (RLA), Comp. 1	25.2	25.2	10.6	10.6	8.6	8.6
	Amps (LRA), Comp. 1	178.5	178.5	79.1	79.1	65.0	65.0
Condenser Motor	No.	2	2	2	2	2	2
	Volts	208/230	208/230	460	460	575	575
	Phase	1	1	1	1	1	1
	HP	1/5	1/5	1/5	1/5	1/5	1/5
	Amps (FLA, each)	1.2	1.2	0.8	0.8	0.6	0.6
	Amps (LRA, each)	2.3	2.3	1.4	1.4	1.1	1.1
Evaporator Fan	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	HP	2	3	2	3	2	3
	Amps (FLA, each)	6.2	9.2	3.0	4.6	2.4	3.5
	Amps (LRA, each)	47.0	74.5	24.0	38.1	19.0	30.0

Appendix B – Electrical Data (Cont.)

ELECTRICAL DATA - (-)GEDYB SERIES							
		102ACF15 102ACF22	**102ACG15 102ACG22 102ACH15 102ACH22**	**102ADF15 102ADF22**	**102ADG15 102ADG22 102ADH15 102ADH22**	**102AYF15 102AYF22**	**102AYG15 102AYG22 102AYH15 102AYH22**
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506	518-633	518-633
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Hz	60	60	60	60	60	60
	Minimum Circuit Ampacity	43/43	46/46	21	22	16	17
	Minimum Circuit Ampacity with Powered Exhaust	48/48	51/51	23	25	18	19
	Minimum Overcurrent Protection Device Size	50/50	60/60	25	25	20	20
	Minimum Overcurrent Protection Device Size with Powered Exhaust	60/60	60/60	30	30	20	25
	Maximum Overcurrent Protection Device Size	60/60	70/70	30	30	20	25
	Maximum Overcurrent Protection Device Size with Powered Exhaust	70/70	70/70	35	35	25	25
Compressor Motor	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Amps (RLA), Comp. 1	26.8	26.8	12.5	12.5	9.4	9.4
	Amps (LRA), Comp. 1	190.7	190.7	100.2	100.2	65.0	65.0
Condenser Motor	No.	2	2	2	2	2	2
	Volts	208/230	208/230	460	460	575	575
	Phase	1	1	1	1	1	1
	HP	1/5	1/5	1/5	1/5	1/5	1/5
	Amps (FLA, each)	1.2	1.2	0.8	0.8	0.6	0.6
	Amps (LRA, each)	2.3	2.3	1.4	1.4	1.1	1.1
Evaporator Fan	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	HP	2	3	2	3	2	3
	Amps (FLA, each)	6.2	9.2	3.0	4.6	2.4	3.5
	Amps (LRA, each)	47.0	74.5	24.0	38.1	19.0	30.0

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Appendix B – Electrical Data (Cont.)

ELECTRICAL DATA - (-)GEDYB SERIES							
		120ACF15 120ACF22	**120ACG15 120ACG22 120ACH15 120ACH22**	**120ADF15 120ADF22**	**120ADG15 120ADG22 120ADH15 120ADH22**	**120AYF15 120AYF22**	**120AYG15 120AYG22 120AYH15 120AYH22**
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506	518-633	518-633
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Hz	60	60	60	60	60	60
	Minimum Circuit Ampacity	45/45	48/48	24	25	19	20
	Minimum Circuit Ampacity with Powered Exhaust	50/50	53/53	26	28	21	22
	Minimum Overcurrent Protection Device Size	60/60	60/60	30	30	25	25
	Minimum Overcurrent Protection Device Size with Powered Exhaust	60/60	60/60	30	35	25	25
	Maximum Overcurrent Protection Device Size	70/70	70/70	35	35	30	30
	Maximum Overcurrent Protection Device Size with Powered Exhaust	70/70	70/70	35	40	30	30
Compressor Motor	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Amps (RLA), Comp. 1	26.5	26.5	14.0	14.0	11.5	11.5
	Amps (LRA), Comp. 1	255.0	255.0	123.0	123.0	93.7	93.7
Condenser Motor	No.	2	2	2	2	2	2
	Volts	208/230	208/230	460	460	575	575
	Phase	1	1	1	1	1	1
	HP	1/3	1/3	1/3	1/3	1/3	1/3
	Amps (FLA, each)	2.4	2.4	1.4	1.4	1.0	1.0
	Amps (LRA, each)	4.7	4.7	2.4	2.4	4.7	4.7
Evaporator Fan	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	HP	2	3	2	3	2	3
	Amps (FLA, each)	6.2	9.2	3.0	4.6	2.4	3.5
	Amps (LRA, each)	47.0	74.5	24.0	38.1	19.0	30.0

Appendix B – Electrical Data (Cont.)

ELECTRICAL DATA - (-)GEDYB SERIES							
		150ACF15 150ACF22	**150ACG15 150ACG22**	**150ADF15 150ADF22**	**150ADG15 150ADG22**	**150AYF15 150AYF22**	**150AYG15 150AYG22**
Unit Information	Unit Operating Voltage Range	187-253	187-253	414-506	414-506	518-633	518-633
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Hz	60	60	60	60	60	60
	Minimum Circuit Ampacity	68/68	75/75	29	31	23	24
	Minimum Circuit Ampacity with Powered Exhaust	74/74	80/80	32	34	25	26
	Minimum Overcurrent Protection Device Size	80/80	90/90	35	35	25	30
	Minimum Overcurrent Protection Device Size with Powered Exhaust	80/80	90/90	35	40	30	30
	Maximum Overcurrent Protection Device Size	90/90	90/90	35	35	25	30
	Maximum Overcurrent Protection Device Size with Powered Exhaust	90/90	100/100	40	40	30	30
Compressor Motor	No.	2	2	2	2	2	2
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	Amps (RLA), Comp. 1	22.4	22.4	8.8	8.8	7.2	7.2
	Amps (LRA), Comp. 1	166.2	166.2	74.6	74.6	54.0	54.0
	Amps (RLA), Comp. 2	22.4	22.4	8.8	8.8	7.2	7.2
	Amps (LRA), Comp. 2	166.2	166.2	74.6	74.6	54.0	54.0
Condenser Motor	No.	2	2	2	2	2	2
	Volts	208/230	208/230	460	460	575	575
	Phase	1	1	1	1	1	1
	HP	3/4	3/4	3/4	3/4	3/4	3/4
	Amps (FLA, each)	4.2	4.2	2.3	2.3	1.2	1.2
	Amps (LRA, each)	11.5	11.5	5.9	5.9	4.2	4.2
Evaporator Fan	No.	1	1	1	1	1	1
	Volts	208/230	208/230	460	460	575	575
	Phase	3	3	3	3	3	3
	HP	3	5	3	5	3	5
	Amps (FLA, each)	9.2	15.7	4.6	6.3	3.5	5.1
	Amps (LRA, each)	74.5	95.0	38.1	47.5	30.0	38.0

Air Flow	Model (-)GEDYB090 - Downflow Voltage 208/230, 460, 575 / 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2400 [1133]	–	–	551	782	585	814	619	848	652	885	684	926	717	969	748	1016	780	1065	810	1118	841	1174	870	1233	900	1294	929	1359	957	1427	985	1498	1012	1572	1039	1649	1065	1729	1091	1813
2500 [1180]	–	–	562	816	596	848	629	884	661	923	693	964	725	1009	756	1057	787	1108	817	1162	846	1219	876	1279	904	1343	933	1409	960	1478	987	1550	1014	1626	1040	1704	1066	1786	1092	1870
2600 [1227]	–	–	574	851	607	885	639	922	671	962	702	1006	733	1052	764	1101	794	1153	823	1209	852	1267	881	1329	909	1393	937	1461	964	1531	990	1605	1016	1682	1042	1762	1067	1844	1092	1930
2700 [1274]	553	857	585	889	618	925	650	963	681	1004	712	1049	742	1096	772	1147	801	1201	830	1258	858	1317	886	1380	914	1446	941	1515	967	1587	993	1662	1019	1740	1044	1821	1068	1905	1092	1993
2800 [1321]	565	896	597	930	629	966	660	1006	691	1049	721	1095	751	1144	780	1196	808	1251	837	1309	864	1370	892	1434	919	1501	945	1572	971	1645	996	1721	1021	1801	1045	1883	1069	1969	1093	2057
2900 [1368]	577	937	609	972	640	1010	670	1051	701	1096	730	1143	759	1193	788	1246	816	1303	843	1362	871	1425	897	1490	923	1559	949	1630	974	1705	999	1783	1023	1864	1047	1948	1070	2035	1093	2124
3000 [1416]	590	981	621	1017	651	1057	681	1099	710	1145	739	1193	768	1245	796	1300	823	1357	850	1418	877	1482	903	1549	928	1619	953	1692	978	1768	1002	1847	1026	1929	1049	2014	1072	2103	1094	2194
3100 [1463]	602	1027	633	1065	662	1105	692	1149	720	1196	749	1246	777	1299	804	1355	831	1414	857	1476	883	1541	908	1610	933	1681	958	1755	982	1833	1005	1913	1028	1997	1051	2083	1073	2173	1094	2266
3200 [1510]	615	1075	645	1114	674	1157	702	1202	731	1250	758	1301	785	1356	812	1413	838	1473	864	1537	889	1603	914	1673	938	1746	962	1821	986	1900	1008	1982	1031	2067	1053	2155	1074	2246	1095	2340
3300 [1557]	628	1126	657	1166	685	1210	713	1256	741	1306	768	1359	794	1414	820	1473	846	1535	871	1600	896	1668	920	1739	944	1813	967	1890	989	1970	1012	2053	1033	2139	1055	2229	1075	2321	1096	2416
3400 [1604]	640	1179	669	1221	697	1266	724	1314	751	1365	777	1419	803	1476	829	1536	854	1599	878	1665	902	1734	926	1807	949	1882	971	1960	993	2042	1015	2126	1036	2214	1057	2305	1077	2398	1097	2495
3500 [1652]	653	1235	681	1278	708	1324	735	1373	761	1425	787	1481	812	1539	837	1601	861	1665	885	1733	909	1803	932	1877	954	1954	976	2034	997	2116	1018	2202	1039	2291	1059	2383	1078	2478	1097	2576
3600 [1699]	666	1292	693	1337	720	1384	746	1435	771	1489	797	1545	821	1605	845	1668	869	1734	892	1803	915	1875	938	1950	959	2028	981	2109	1001	2193	1022	2280	1042	2371	1061	2464	1080	2560	1098	2660

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK84H						AK84H						AK84H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	767	721	**678**	635	590	548	992	949	908	866	823	**782**	1108	1067	1029	987	946	**905**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Vertical Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
2400 [1133]	0.96	0.89	0.98	0.04 [.01]	0.01 [.00]	0.66 [.16]	0.53 [.13]	0.093 [.02]	0.047 [.01]
2500 [1180]	0.96	0.90	0.99	0.05 [.01]	0.02 [.00]	0.71 [.18]	0.57 [.14]	0.098 [.02]	0.055 [.01]
2600 [1227]	0.97	0.92	0.99	0.05 [.01]	0.02 [.01]	0.75 [.19]	0.60 [.15]	0.103 [.02]	0.062 [.01]
2700 [1274]	0.97	0.93	0.99	0.05 [.01]	0.03 [.01]	0.80 [.20]	0.65 [.16]	0.108 [.03]	0.070 [.02]
2800 [1321]	0.98	0.95	0.99	0.06 [.01]	0.04 [.01]	0.85 [.21]	0.69 [.17]	0.113 [.03]	0.078 [.02]
2900 [1368]	0.98	0.96	1.00	0.06 [.02]	0.04 [.01]	0.91 [.23]	0.74 [.18]	0.117 [.03]	0.085 [.02]
3000 [1416]	0.99	0.97	1.00	0.07 [.02]	0.05 [.01]	0.96 [.24]	0.79 [.20]	0.122 [.03]	0.093 [.02]
3100 [1463]	1.00	0.99	1.00	0.07 [.02]	0.06 [.02]	1.02 [.25]	0.86 [.21]	0.127 [.03]	0.100 [.02]
3200 [1510]	1.00	1.00	1.01	0.07 [.02]	0.07 [.02]	1.08 [.27]	0.92 [.23]	0.132 [.03]	0.108 [.03]
3300 [1557]	1.01	1.02	1.01	0.08 [.02]	0.08 [.02]	1.15 [.29]	0.99 [.25]	0.137 [.03]	0.115 [.03]
3400 [1604]	1.01	1.03	1.01	0.08 [.02]	0.09 [.02]	1.21 [.30]	1.05 [.26]	0.142 [.03]	0.123 [.03]
3500 [1652]	1.02	1.05	1.01	0.09 [.02]	0.10 [.02]	1.29 [.32]	1.09 [.27]	0.147 [.04]	0.131 [.03]
3600 [1699]	1.02	1.06	1.02	0.09 [.02]	0.11 [.03]	1.36 [.34]	1.13 [.28]	0.152 [.04]	0.138 [.03]

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

Appendix C – Air Flow Performance Data (Cont.)

Air Flow	Model (-)GEDYB090 - Sideflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2400 [1133]	–	–	–	–	558	822	594	853	629	887	663	925	697	965	730	1009	763	1056	794	1106	826	1159	856	1216	886	1275	915	1338	943	1404	971	1474	998	1546	1025	1622	1051	1700	1076	1782
2500 [1180]	–	–	–	–	568	848	604	881	638	917	672	956	705	998	738	1044	769	1092	801	1144	831	1199	861	1258	890	1319	919	1384	947	1452	974	1523	1001	1597	1027	1674	1052	1755	1077	1838
2600 [1227]	–	–	543	846	579	877	613	912	647	950	681	991	713	1035	745	1082	777	1132	807	1186	837	1243	867	1303	895	1366	923	1433	951	1502	978	1575	1004	1651	1029	1730	1054	1812	1078	1898
2700 [1274]	–	–	554	877	589	910	623	946	657	986	689	1029	722	1074	753	1124	784	1176	814	1231	844	1290	872	1352	901	1417	928	1485	955	1556	981	1631	1007	1708	1032	1789	1056	1873	1079	1961
2800 [1321]	–	–	566	911	600	946	634	984	666	1026	699	1070	730	1118	761	1169	792	1223	821	1280	850	1340	878	1404	906	1470	933	1540	959	1613	985	1690	1010	1769	1034	1852	1058	1938	1081	2027
2900 [1368]	543	916	577	949	611	986	644	1026	676	1069	708	1115	739	1164	770	1217	799	1273	828	1332	857	1394	885	1459	912	1528	938	1599	964	1674	989	1752	1014	1833	1037	1918	1061	2005	1083	2096
3000 [1416]	555	955	589	990	622	1029	655	1070	687	1115	718	1163	748	1214	778	1269	807	1326	836	1387	864	1451	891	1518	918	1588	944	1662	969	1738	994	1818	1017	1901	1041	1987	1063	2077	1085	2169
3100 [1463]	568	998	601	1035	634	1075	666	1118	697	1165	728	1215	758	1268	787	1324	816	1383	844	1445	871	1511	898	1580	924	1652	949	1727	974	1806	998	1887	1022	1972	1044	2060	1066	2151	1088	2245
3200 [1510]	581	1044	614	1083	646	1125	677	1170	708	1218	738	1270	768	1324	796	1382	824	1443	852	1507	879	1575	905	1646	931	1719	955	1796	980	1876	1003	1960	1026	2046	1048	2136	1070	2229	1091	2325
3300 [1557]	594	1093	626	1134	658	1178	689	1225	719	1275	749	1328	778	1384	806	1444	833	1507	860	1573	887	1642	912	1714	937	1790	962	1869	985	1951	1008	2036	1031	2124	1052	2216	1073	2310	1094	2408
3400 [1604]	607	1146	639	1189	670	1234	701	1283	730	1335	759	1390	788	1448	815	1509	843	1574	869	1642	895	1713	920	1787	944	1864	968	1945	991	2028	1014	2115	1036	2205	1057	2298	1077	2395	1097	2494
3500 [1652]	621	1203	652	1247	683	1294	713	1344	742	1398	770	1455	798	1515	825	1578	852	1644	878	1714	903	1786	928	1862	952	1941	975	2024	997	2109	1019	2198	1041	2290	1061	2385	1081	2483	1101	2584
3600 [1699]	635	1262	666	1308	696	1357	725	1409	754	1465	782	1523	809	1585	836	1650	862	1718	887	1789	912	1864	936	1941	959	2022	982	2106	1004	2194	1025	2284	1046	2378	1066	2474	1086	2574	1104	2677

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK84H						AK84H						AK84H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	765	720	**676**	633	589	544	989	949	908	865	823	**780**	1108	1067	1029	987	946	**905**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Horizontal Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
2400 [1133]	0.96	0.89	0.98	0.04 [.01]	0.21 [.05]	0.66 [.16]	0.53 [.13]	0.093 [.02]	0.047 [.01]
2500 [1180]	0.96	0.90	0.99	0.05 [.01]	0.25 [.06]	0.71 [.18]	0.57 [.14]	0.098 [.02]	0.055 [.01]
2600 [1227]	0.97	0.92	0.99	0.05 [.01]	0.28 [.07]	0.75 [.19]	0.60 [.15]	0.103 [.02]	0.062 [.01]
2700 [1274]	0.97	0.93	0.99	0.05 [.01]	0.32 [.08]	0.80 [.20]	0.65 [.16]	0.108 [.03]	0.070 [.02]
2800 [1321]	0.98	0.95	0.99	0.06 [.01]	0.36 [.09]	0.85 [.21]	0.69 [.17]	0.113 [.03]	0.078 [.02]
2900 [1368]	0.98	0.96	1.00	0.06 [.02]	0.39 [.10]	0.91 [.23]	0.74 [.18]	0.117 [.03]	0.085 [.02]
3000 [1416]	0.99	0.97	1.00	0.07 [.02]	0.43 [.11]	0.96 [.24]	0.79 [.20]	0.122 [.03]	0.093 [.02]
3100 [1463]	1.00	0.99	1.00	0.07 [.02]	0.47 [.12]	1.02 [.25]	0.86 [.21]	0.127 [.03]	0.100 [.02]
3200 [1510]	1.00	1.00	1.01	0.07 [.02]	0.51 [.13]	1.08 [.27]	0.92 [.23]	0.132 [.03]	0.108 [.03]
3300 [1557]	1.01	1.02	1.01	0.08 [.02]	0.54 [.14]	1.15 [.29]	0.99 [.25]	0.137 [.03]	0.115 [.03]
3400 [1604]	1.01	1.03	1.01	0.08 [.02]	0.58 [.14]	1.21 [.30]	1.05 [.26]	0.142 [.03]	0.123 [.03]
3500 [1652]	1.02	1.05	1.01	0.09 [.02]	0.62 [.15]	1.29 [.32]	1.09 [.27]	0.147 [.04]	0.131 [.03]
3600 [1699]	1.02	1.06	1.02	0.09 [.02]	0.66 [.16]	1.36 [.34]	1.13 [.28]	0.152 [.04]	0.138 [.03]

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

Air Flow	Model (-)GEDYB102 - Downflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2700 [1274]	—	—	561	894	596	934	631	975	665	1018	698	1062	730	1108	762	1155	793	1203	823	1253	853	1304	882	1357	910	1411	937	1467	964	1524	990	1583	1015	1643	1039	1704	1063	1767	1086	1832
2800 [1321]	—	—	573	927	608	969	642	1013	676	1058	708	1104	740	1152	771	1201	802	1252	832	1304	861	1358	889	1413	917	1470	943	1528	970	1587	995	1648	1020	1711	1044	1775	1067	1840	1090	1907
2900 [1368]	—	—	586	964	620	1008	654	1054	687	1101	719	1150	750	1200	781	1252	811	1305	840	1360	869	1416	897	1473	924	1532	950	1593	976	1654	1001	1718	1025	1782	1048	1848	1071	1916	1093	1985
3000 [1416]	564	959	599	1004	633	1051	666	1099	698	1149	730	1200	761	1253	791	1307	820	1362	849	1419	877	1477	904	1537	931	1598	957	1661	982	1725	1006	1791	1030	1858	1053	1926	1075	1996	1097	2067
3100 [1463]	578	1001	612	1048	645	1098	678	1148	710	1200	741	1254	771	1308	801	1365	830	1423	858	1482	886	1542	912	1605	939	1668	964	1733	989	1800	1012	1868	1036	1937	1058	2008	1080	2080	1101	2154
3200 [1510]	592	1046	625	1096	658	1148	690	1201	721	1255	752	1311	782	1368	811	1427	840	1487	867	1548	894	1611	921	1676	946	1742	971	1809	995	1878	1019	1948	1041	2020	1063	2093	1085	2168	1105	2244
3300 [1557]	605	1096	638	1148	671	1202	702	1257	733	1314	763	1372	793	1432	821	1493	849	1555	877	1619	903	1684	929	1751	954	1819	979	1889	1002	1960	1025	2033	1047	2107	1069	2182	1090	2259	1110	2337
3400 [1604]	619	1149	652	1204	684	1260	715	1317	745	1376	775	1437	804	1499	832	1562	860	1627	886	1693	912	1761	938	1830	962	1900	986	1972	1009	2046	1032	2121	1053	2197	1074	2275	1095	2354	1114	2435
3500 [1652]	634	1206	666	1263	697	1322	728	1382	758	1443	787	1506	815	1570	843	1635	870	1702	896	1771	922	1841	946	1912	970	1985	994	2060	1017	2135	1038	2213	1060	2291	1080	2371	1100	2453	1119	2536
3600 [1699]	648	1267	680	1326	711	1387	741	1449	770	1513	799	1578	827	1645	854	1713	880	1782	906	1853	931	1925	955	1999	979	2074	1002	2151	1024	2229	1045	2308	1066	2389	1086	2472	1105	2556	1124	2641
3700 [1746]	663	1332	694	1393	724	1456	754	1521	783	1587	811	1654	838	1723	865	1793	891	1865	916	1938	941	2013	965	2089	988	2167	1010	2246	1032	2326	1053	2408	1073	2491	1092	2576	1111	2662	1129	2750
3800 [1793]	678	1400	708	1464	738	1529	767	1596	795	1665	823	1734	850	1805	876	1878	902	1952	926	2028	951	2105	974	2183	996	2263	1018	2344	1039	2427	1060	2511	1080	2597	1099	2684	1117	2772	1134	2862
3900 [1840]	693	1472	723	1538	752	1606	781	1675	808	1746	836	1818	862	1892	888	1966	913	2043	937	2121	961	2200	983	2281	1005	2363	1027	2447	1048	2532	1067	2618	1087	2706	1105	2796	1123	2886	1140	2979
4000 [1888]	708	1548	737	1617	766	1687	794	1758	822	1831	848	1906	874	1981	900	2059	924	2137	948	2218	971	2299	993	2382	1015	2467	1036	2553	1056	2640	1075	2729	1094	2819	1112	2911	1129	3004	1146	3099
4100 [1935]	723	1628	752	1699	781	1771	808	1845	835	1920	861	1997	887	2075	911	2155	935	2236	959	2318	981	2402	1003	2488	1024	2574	1045	2663	1064	2752	1083	2844	1101	2936	1119	3030	1136	3126	1152	3223

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK79H						AK79H						AK79H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	804	758	**710**	661	616	559	1048	1003	959	914	872	**826**	1168	1128	1087	1044	1002	**957**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Vertical Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
2700 [1274]	0.97	0.93	0.99	0.07 [.02]	0.03 [.01]	0.80 [.20]	0.65 [.16]	0.108 [.03]	0.070 [.02]
2800 [1321]	0.98	0.94	0.99	0.07 [.02]	0.03 [.01]	0.85 [.21]	0.69 [.17]	0.113 [.03]	0.078 [.02]
2900 [1368]	0.98	0.96	0.99	0.08 [.02]	0.04 [.01]	0.91 [.23]	0.74 [.18]	0.117 [.03]	0.085 [.02]
3000 [1416]	0.99	0.97	1.00	0.08 [.02]	0.05 [.01]	0.96 [.24]	0.79 [.20]	0.122 [.03]	0.093 [.02]
3100 [1463]	0.99	0.99	1.00	0.09 [.02]	0.06 [.01]	1.02 [.25]	0.86 [.21]	0.127 [.03]	0.100 [.02]
3200 [1510]	1.00	1.00	1.00	0.10 [.02]	0.07 [.02]	1.08 [.27]	0.92 [.23]	0.132 [.03]	0.108 [.03]
3300 [1557]	1.01	1.01	1.00	0.10 [.03]	0.08 [.02]	1.15 [.29]	0.99 [.25]	0.137 [.03]	0.115 [.03]
3400 [1604]	1.01	1.03	1.01	0.11 [.03]	0.09 [.02]	1.21 [.30]	1.05 [.26]	0.142 [.03]	0.123 [.03]
3500 [1652]	1.02	1.04	1.01	0.11 [.03]	0.10 [.02]	1.29 [.32]	1.09 [.27]	0.147 [.04]	0.131 [.03]
3600 [1699]	1.02	1.06	1.01	0.12 [.03]	0.11 [.03]	1.36 [.34]	1.13 [.28]	0.152 [.04]	0.138 [.03]
3700 [1746]	1.03	1.07	1.02	0.13 [.03]	0.12 [.03]	1.43 [.36]	1.18 [.29]	0.157 [.04]	0.146 [.04]
3800 [1793]	1.03	1.09	1.02	0.13 [.03]	0.13 [.03]	1.50 [.37]	1.23 [.31]	0.162 [.04]	0.153 [.04]
3900 [1840]	1.04	1.10	1.02	0.14 [.04]	0.15 [.04]	1.59 [.40]	1.31 [.33]	0.167 [.04]	0.161 [.04]
4000 [1888]	1.05	1.12	1.02	0.14 [.04]	0.16 [.04]	1.68 [.42]	1.38 [.34]	0.171 [.04]	0.169 [.04]
4100 [1935]	1.05	1.13	1.03	0.15 [.04]	0.17 [.04]	1.74 [.43]	1.44 [.36]	0.176 [.04]	0.176 [.04]

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

Appendix C – Air Flow Performance Data (Cont.)

Air Flow	Model (-)GEDYB102 - Sideflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2700 [1274]	–	–	–	–	577	932	611	969	644	1009	677	1052	710	1098	742	1147	774	1199	806	1254	837	1312	868	1373	898	1437	929	1505	959	1575	988	1648	1017	1725	1046	1804	1074	1886	1102	1972
2800 [1321]	–	–	556	926	589	962	622	1000	655	1042	687	1087	719	1134	751	1185	783	1239	814	1295	844	1355	875	1418	905	1484	934	1553	963	1624	992	1699	1021	1777	1049	1858	1077	1942	1105	2029
2900 [1368]	–	–	568	958	601	995	633	1036	666	1079	697	1125	729	1174	760	1227	791	1282	821	1340	851	1402	881	1466	911	1533	940	1604	968	1677	997	1754	1025	1834	1052	1916	1080	2002	1107	2090
3000 [1416]	–	–	580	994	613	1033	645	1074	676	1119	708	1167	738	1218	769	1272	799	1329	829	1389	859	1452	888	1518	917	1587	945	1659	973	1734	1001	1812	1029	1894	1056	1978	1082	2065	1109	2155
3100 [1463]	561	996	593	1033	624	1073	656	1117	687	1163	718	1213	748	1265	778	1321	808	1379	837	1441	866	1506	895	1573	923	1644	951	1718	978	1794	1006	1874	1033	1957	1059	2043	1085	2132	1111	2224
3200 [1510]	574	1037	605	1076	636	1118	667	1163	698	1211	728	1262	758	1316	787	1373	816	1434	845	1497	873	1563	902	1632	929	1705	957	1780	984	1858	1010	1940	1037	2024	1063	2112	1088	2202	1113	2296
3300 [1557]	587	1082	618	1122	648	1166	679	1212	709	1262	738	1315	767	1371	796	1430	825	1491	853	1556	881	1624	908	1695	936	1769	962	1846	989	1926	1015	2009	1041	2095	1066	2184	1091	2276	1116	2372
3400 [1604]	600	1130	630	1172	660	1217	690	1266	720	1317	749	1371	777	1429	806	1489	834	1553	861	1619	888	1689	915	1761	942	1837	968	1916	994	1997	1020	2082	1045	2170	1070	2260	1094	2354	1118	2451
3500 [1652]	613	1182	643	1226	672	1273	702	1323	730	1376	759	1432	787	1491	815	1553	842	1618	869	1686	896	1757	922	1831	948	1909	974	1989	999	2072	1024	2158	1049	2248	1073	2340	1097	2436	1121	2534
3600 [1699]	626	1238	656	1283	685	1332	713	1383	741	1438	769	1495	797	1556	824	1620	851	1687	877	1756	904	1829	929	1905	955	1984	980	2066	1005	2151	1029	2238	1053	2329	1077	2423	1100	2520	1123	2621
3700 [1746]	640	1297	668	1344	697	1394	725	1447	753	1504	780	1563	807	1625	833	1690	860	1759	886	1830	911	1905	937	1982	961	2063	986	2146	1010	2233	1034	2322	1057	2415	1081	2510	1103	2609	1126	2711
3800 [1793]	653	1360	681	1409	709	1460	737	1515	764	1573	790	1634	817	1698	843	1765	869	1835	894	1908	919	1984	944	2063	968	2145	992	2230	1016	2318	1039	2410	1062	2504	1084	2601	1107	2701	1128	2805
3900 [1840]	667	1426	694	1477	721	1530	748	1587	775	1646	801	1709	827	1774	852	1843	878	1914	902	1989	927	2067	951	2147	975	2231	998	2318	1021	2408	1044	2500	1066	2596	1088	2695	1110	2797	1131	2902
4000 [1888]	680	1496	707	1548	734	1604	760	1662	786	1723	812	1787	837	1854	862	1924	887	1998	911	2074	935	2153	958	2235	981	2321	1004	2409	1027	2501	1049	2595	1071	2693	1092	2793	1113	2897	1134	3003
4100 [1935]	694	1570	720	1624	746	1681	772	1740	797	1803	822	1869	847	1938	872	2009	896	2084	919	2162	943	2243	965	2327	988	2414	1010	2504	1032	2597	1054	2693	1075	2792	1096	2895	1116	3000	1137	3108

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK79H						AK79H						AK79H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	802	754	**707**	662	616	555	1048	1005	960	916	870	**827**	1170	1126	1085	1044	1000	**956**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Horizontal Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
2700 [1274]	0.97	0.93	0.99	0.07 [.02]	0.32 [.08]	0.80 [.20]	0.65 [.16]	0.108 [.03]	0.070 [.02]
2800 [1321]	0.98	0.94	0.99	0.07 [.02]	0.36 [.09]	0.85 [.21]	0.69 [.17]	0.113 [.03]	0.078 [.02]
2900 [1368]	0.98	0.96	0.99	0.08 [.02]	0.39 [.10]	0.91 [.23]	0.74 [.18]	0.117 [.03]	0.085 [.02]
3000 [1416]	0.99	0.97	1.00	0.08 [.02]	0.43 [.11]	0.96 [.24]	0.79 [.20]	0.122 [.03]	0.093 [.02]
3100 [1463]	0.99	0.99	1.00	0.09 [.02]	0.47 [.12]	1.02 [.25]	0.86 [.21]	0.127 [.03]	0.100 [.02]
3200 [1510]	1.00	1.00	1.00	0.10 [.02]	0.51 [.13]	1.08 [.27]	0.92 [.23]	0.132 [.03]	0.108 [.03]
3300 [1557]	1.01	1.01	1.00	0.10 [.03]	0.54 [.14]	1.15 [.29]	0.99 [.25]	0.137 [.03]	0.115 [.03]
3400 [1604]	1.01	1.03	1.01	0.11 [.03]	0.58 [.14]	1.21 [.30]	1.05 [.26]	0.142 [.03]	0.123 [.03]
3500 [1652]	1.02	1.04	1.01	0.11 [.03]	0.62 [.15]	1.29 [.32]	1.09 [.27]	0.147 [.04]	0.131 [.03]
3600 [1699]	1.02	1.06	1.01	0.12 [.03]	0.66 [.16]	1.36 [.34]	1.13 [.28]	0.152 [.04]	0.138 [.03]
3700 [1746]	1.03	1.07	1.02	0.13 [.03]	0.70 [.17]	1.43 [.36]	1.18 [.29]	0.157 [.04]	0.146 [.04]
3800 [1793]	1.03	1.09	1.02	0.13 [.03]	0.74 [.18]	1.50 [.37]	1.23 [.31]	0.162 [.04]	0.153 [.04]
3900 [1840]	1.04	1.10	1.02	0.14 [.04]	0.77 [.19]	1.59 [.40]	1.31 [.33]	0.167 [.04]	0.161 [.04]
4000 [1888]	1.05	1.12	1.02	0.15 [.04]	0.81 [.20]	1.68 [.42]	1.38 [.34]	0.171 [.04]	0.169 [.04]
4100 [1935]	1.05	1.13	1.03	0.15 [.04]	0.85 [.21]	1.74 [.43]	1.44 [.36]	0.176 [.04]	0.176 [.04]

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

Air Flow	Model (-)GEDYB120 - Downflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3200 [1510]	613	890	643	963	672	1036	701	1111	729	1186	757	1262	785	1339	812	1416	838	1494	864	1573	889	1653	914	1734	939	1815	962	1898	986	1981	1009	2064	1031	2149	1053	2234	1074	2320	1095	2407
3300 [1557]	626	959	656	1034	685	1110	713	1186	741	1263	768	1341	795	1419	822	1498	848	1579	873	1660	898	1741	922	1824	946	1907	970	1991	993	2076	1015	2162	1037	2248	1059	2335	1080	2423	1100	2512
3400 [1604]	640	1033	669	1109	697	1186	725	1265	753	1343	780	1423	806	1503	832	1585	858	1667	882	1750	907	1833	931	1918	954	2003	977	2089	1000	2175	1022	2263	1043	2351	1064	2440	1085	2530	1105	2621
3500 [1652]	654	1110	682	1188	710	1267	738	1347	765	1428	791	1509	817	1592	843	1675	868	1759	892	1843	916	1929	940	2015	963	2102	985	2190	1007	2279	1029	2368	1050	2458	1070	2549	1090	2641	1110	2733
3600 [1699]	668	1190	696	1271	723	1352	750	1434	777	1516	803	1600	828	1684	853	1769	878	1854	902	1941	925	2028	948	2117	971	2205	993	2295	1015	2386	1036	2477	1056	2569	1076	2662	1096	2755	1115	2850
3700 [1746]	682	1275	709	1357	736	1440	763	1524	789	1608	814	1694	840	1780	864	1866	888	1954	912	2043	935	2132	957	2222	980	2313	1001	2404	1022	2496	1043	2590	1063	2684	1083	2778	1102	2874	1120	2970
3800 [1793]	696	1364	723	1448	750	1532	776	1618	801	1704	826	1791	851	1879	875	1968	899	2058	922	2148	945	2239	967	2331	988	2423	1009	2517	1030	2611	1050	2706	1070	2802	1089	2899	1108	2996	1126	3094
3900 [1840]	710	1456	737	1542	763	1628	789	1716	814	1804	839	1893	863	1983	886	2074	910	2165	932	2257	954	2350	976	2444	997	2538	1018	2634	1038	2730	1058	2827	1077	2924	1096	3023	1114	3122	1132	3222
4000 [1888]	725	1552	751	1640	777	1728	802	1818	827	1908	851	1999	875	2090	898	2183	921	2276	943	2370	964	2465	986	2560	1006	2657	1027	2754	1046	2852	1066	2951	1084	3050	1103	3151	1120	3252	1138	3354
4100 [1935]	740	1652	766	1742	791	1832	816	1923	840	2015	863	2108	887	2202	909	2296	932	2391	953	2487	975	2584	995	2681	1016	2779	1035	2878	1055	2978	1074	3079	1092	3180	1110	3282	1127	3385	1144	3489
4200 [1982]	755	1756	780	1847	805	1940	829	2033	853	2127	876	2221	899	2317	921	2413	943	2510	964	2608	985	2706	1005	2805	1025	2906	1045	3007	1063	3108	1082	3211	1099	3314	1117	3418	1134	3523	–	–
4300 [2029]	770	1864	795	1957	819	2051	843	2146	866	2242	889	2338	911	2435	933	2534	955	2632	975	2732	996	2833	1016	2934	1035	3036	1054	3139	1072	3242	1090	3347	1107	3452	1124	3558	1141	3664	–	–
4400 [2076]	785	1975	810	2070	834	2166	857	2263	880	2361	902	2459	924	2558	945	2658	966	2759	987	2860	1006	2963	1026	3066	1045	3170	1063	3274	1081	3380	1098	3486	1115	3593	1132	3701	1148	3810	–	–
4500 [2123]	801	2090	825	2188	848	2285	871	2384	893	2484	915	2584	937	2685	958	2787	978	2889	998	2993	1017	3097	1036	3202	1055	3307	1073	3414	1090	3521	1107	3629	1123	3738	1139	3848	–	–	–	–
4600 [2171]	817	2210	840	2309	863	2408	885	2509	907	2610	929	2712	950	2815	970	2919	990	3023	1010	3129	1029	3235	1047	3341	1065	3449	1082	3558	1099	3667	1116	3777	1132	3888	1147	3999	–	–	–	–
4700 [2218]	833	2333	855	2433	878	2535	900	2637	921	2741	942	2845	963	2949	983	3055	1002	3161	1021	3268	1040	3376	1058	3485	1075	3595	1092	3705	1109	3816	1125	3928	1140	4040	–	–	–	–	–	–
4800 [2265]	849	2459	871	2562	893	2666	915	2770	936	2875	956	2981	976	3087	996	3195	1015	3303	1033	3412	1051	3522	1069	3633	1086	3744	1102	3856	1119	3969	1134	4083	1149	4197	–	–	–	–	–	–

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK79H						AK79H						AK79H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	1032	765	**722**	681	637	593	1032	994	951	911	868	**827**	1146	1107	1068	1031	993	**952**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Vertical Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
3200 [1510]	0.97	0.93	0.99	0.10 [.02]	0.07 [.02]	0.74 [.18]	0.56 [.14]	0.132 [.03]	0.108 [.03]
3300 [1557]	0.98	0.94	0.99	0.10 [.03]	0.08 [.02]	0.79 [.20]	0.59 [.15]	0.137 [.03]	0.115 [.03]
3400 [1604]	0.98	0.96	0.99	0.11 [.03]	0.09 [.02]	0.84 [.21]	0.62 [.15]	0.142 [.03]	0.123 [.03]
3500 [1652]	0.99	0.97	1.00	0.11 [.03]	0.10 [.02]	0.90 [.22]	0.66 [.16]	0.147 [.04]	0.131 [.03]
3600 [1699]	0.99	0.98	1.00	0.12 [.03]	0.11 [.03]	0.95 [.24]	0.69 [.17]	0.152 [.04]	0.138 [.03]
3700 [1746]	1.00	0.99	1.00	0.13 [.03]	0.12 [.03]	1.00 [.25]	0.73 [.18]	0.157 [.04]	0.146 [.04]
3800 [1793]	1.00	1.01	1.00	0.13 [.03]	0.13 [.03]	1.04 [.26]	0.76 [.19]	0.162 [.04]	0.153 [.04]
3900 [1840]	1.01	1.02	1.00	0.14 [.04]	0.15 [.04]	1.09 [.27]	0.80 [.20]	0.167 [.04]	0.161 [.04]
4000 [1888]	1.01	1.03	1.01	0.15 [.04]	0.16 [.04]	1.13 [.28]	0.84 [.21]	0.171 [.04]	0.169 [.04]
4100 [1935]	1.02	1.04	1.01	0.15 [.04]	0.17 [.04]	1.19 [.30]	0.88 [.22]	0.176 [.04]	0.176 [.04]
4200 [1982]	1.02	1.06	1.01	0.16 [.04]	0.19 [.05]	1.24 [.31]	0.92 [.23]	0.181 [.04]	0.184 [.05]
4300 [2029]	1.03	1.07	1.01	0.17 [.04]	0.20 [.05]	1.31 [.33]	0.97 [.24]	0.186 [.05]	0.191 [.05]
4400 [2076]	1.03	1.08	1.01	0.18 [.04]	0.21 [.05]	1.37 [.34]	1.02 [.25]	0.191 [.05]	0.199 [.05]
4500 [2123]	1.04	1.09	1.02	0.19 [.05]	0.23 [.06]	1.43 [.35]	1.07 [.27]	0.196 [.05]	0.207 [.05]
4600 [2171]	1.04	1.11	1.02	0.19 [.05]	0.24 [.06]	1.48 [.37]	1.11 [.28]	0.201 [.05]	0.214 [.05]
4700 [2218]	1.05	1.12	1.02	0.20 [.05]	0.26 [.06]	1.54 [.38]	1.15 [.29]	0.206 [.05]	0.222 [.05]
4800 [2265]	1.05	1.13	1.02	0.21 [.05]	0.28 [.07]	1.59 [.40]	1.19 [.30]	0.211 [.05]	0.229 [.06]

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

Appendix C – Air Flow Performance Data (Cont.)

Air Flow	Model (-)GEDYB120 - Sideflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3200 [1510]	613	893	642	968	672	1044	700	1120	728	1197	756	1275	783	1353	810	1432	836	1512	861	1593	886	1674	911	1756	935	1838	958	1921	981	2005	1004	2090	1025	2175	1047	2261	1068	2347	1088	2435
3300 [1557]	625	962	655	1039	684	1116	712	1195	740	1274	767	1354	794	1434	820	1515	845	1597	871	1680	895	1763	919	1847	943	1931	966	2017	988	2103	1010	2189	1032	2276	1053	2364	1073	2453	1093	2543
3400 [1604]	638	1034	667	1113	696	1193	724	1273	751	1354	778	1436	804	1519	830	1602	855	1686	880	1771	904	1856	928	1942	951	2029	974	2116	996	2204	1018	2293	1039	2382	1059	2472	1079	2563	1099	2654
3500 [1652]	652	1110	680	1191	708	1273	736	1356	763	1439	789	1523	815	1607	840	1693	865	1779	890	1866	914	1953	937	2041	960	2130	982	2219	1004	2309	1025	2400	1045	2492	1066	2584	1085	2677	1104	2770
3600 [1699]	665	1190	693	1273	721	1357	748	1442	774	1527	801	1613	826	1700	851	1787	876	1876	899	1964	923	2054	946	2144	968	2235	990	2327	1011	2419	1032	2512	1052	2605	1072	2700	1091	2795	1110	2890
3700 [1746]	678	1274	706	1359	733	1445	760	1532	786	1620	812	1708	837	1797	862	1886	886	1976	909	2067	932	2159	955	2251	977	2344	998	2438	1019	2532	1040	2627	1060	2723	1079	2819	1098	2916	1116	3014
3800 [1793]	692	1362	720	1449	746	1537	773	1626	798	1716	824	1806	848	1897	873	1989	896	2081	920	2174	942	2268	964	2362	986	2457	1007	2553	1027	2649	1047	2746	1067	2844	1086	2943	1104	3042	1122	3142
3900 [1840]	706	1453	733	1543	759	1633	785	1724	811	1816	836	1908	860	2001	884	2095	907	2190	930	2285	952	2380	974	2477	995	2574	1016	2672	1036	2770	1055	2870	1074	2970	1093	3070	1111	3171	1128	3273
4000 [1888]	720	1549	747	1641	773	1733	798	1826	823	1920	848	2015	872	2110	895	2206	918	2302	940	2399	962	2497	983	2596	1004	2695	1024	2795	1044	2896	1063	2997	1082	3099	1100	3202	1118	3305	1135	3409
4100 [1935]	734	1649	760	1743	786	1837	811	1932	836	2028	860	2125	883	2222	906	2320	929	2419	951	2518	972	2618	993	2719	1014	2820	1033	2922	1053	3025	1071	3128	1090	3232	1108	3337	1125	3442	1141	3548
4200 [1982]	749	1753	774	1848	800	1945	824	2042	848	2140	872	2239	895	2338	918	2438	940	2539	962	2640	983	2743	1003	2845	1023	2949	1043	3053	1061	3158	1080	3263	1098	3369	1115	3476	1132	3584	–	–
4300 [2029]	763	1860	788	1958	813	2057	838	2156	861	2256	885	2357	907	2459	930	2561	951	2663	972	2767	993	2871	1013	2976	1033	3081	1052	3188	1070	3295	1088	3402	1106	3510	1123	3619	1139	3729	–	–
4400 [2076]	778	1972	803	2072	827	2173	851	2274	874	2376	897	2479	920	2583	941	2687	963	2792	984	2897	1004	3004	1023	3111	1043	3218	1061	3327	1079	3436	1097	3545	1114	3656	1131	3767	–	–	–	–
4500 [2123]	792	2087	817	2189	841	2292	865	2396	888	2500	910	2605	932	2711	953	2817	974	2924	995	3032	1015	3140	1034	3249	1053	3359	1071	3469	1089	3580	1106	3692	1123	3805	1139	3918	–	–	–	–
4600 [2171]	807	2207	832	2311	855	2416	878	2522	901	2628	923	2735	945	2843	966	2951	986	3060	1006	3170	1026	3280	1044	3392	1063	3503	1081	3616	1098	3729	1115	3843	1131	3958	–	–	–	–	–	–
4700 [2218]	823	2330	846	2436	870	2544	892	2651	915	2760	936	2869	957	2979	978	3089	998	3200	1018	3312	1037	3425	1055	3538	1073	3652	1091	3767	1108	3882	1124	3998	1140	4115	–	–	–	–	–	–
4800 [2265]	838	2457	861	2566	884	2675	906	2785	928	2895	950	3007	970	3119	991	3231	1010	3344	1029	3458	1048	3573	1066	3688	1084	3804	1101	3921	1117	4039	1133	4157	–	–	–	–	–	–	–	–

NOTE: F-Drive left of the first bold line, G-Drive between the bold lines, H-Drive right of both bold line.

Drive Package	F						G						H					
Motor H.P. [W]	2 [1491.4]						3 [2237.1]						3 [2237.1]					
Blower Sheave	AK79H						AK79H						AK79H					
Motor Sheave	1VL40						1VP50						1VP56					
Belt	A49						A50						A51					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**	0	1	2	3	4	**5**
RPM	805	761	**719**	679	635	588	1028	991	949	910	867	**825**	1143	1106	1068	1029	991	**951**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Horizontal Economizer RA Damper Open	Concentric Diffuser RXRN-AEF2000 & Concentric Adapter RXMC-DD01 (Flush)	Concentric Diffuser RXRN-AED2000 & Concentric Adapter RXMC-DD01 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
3200 [1510]	0.97	0.93	0.99	0.10 [.02]	0.51 [.13]	0.74 [.18]	0.56 [.14]	0.132 [.03]	0.108 [.03]
3300 [1557]	0.98	0.94	0.99	0.10 [.03]	0.54 [.14]	0.79 [.20]	0.59 [.15]	0.137 [.03]	0.115 [.03]
3400 [1604]	0.98	0.96	0.99	0.11 [.03]	0.58 [.14]	0.84 [.21]	0.62 [.15]	0.142 [.03]	0.123 [.03]
3500 [1652]	0.99	0.97	1.00	0.11 [.03]	0.62 [.15]	0.90 [.22]	0.66 [.16]	0.147 [.04]	0.131 [.03]
3600 [1699]	0.99	0.98	1.00	0.12 [.03]	0.66 [.16]	0.95 [.24]	0.69 [.17]	0.152 [.04]	0.138 [.03]
3700 [1746]	1.00	0.99	1.00	0.13 [.03]	0.70 [.17]	1.00 [.25]	0.73 [.18]	0.157 [.04]	0.146 [.04]
3800 [1793]	1.00	1.01	1.00	0.13 [.03]	0.74 [.18]	1.04 [.26]	0.76 [.19]	0.162 [.04]	0.153 [.04]
3900 [1840]	1.01	1.02	1.00	0.14 [.04]	0.77 [.19]	1.09 [.27]	0.80 [.20]	0.167 [.04]	0.161 [.04]
4000 [1888]	1.01	1.03	1.01	0.15 [.04]	0.81 [.20]	1.13 [.28]	0.84 [.21]	0.171 [.04]	0.169 [.04]
4100 [1935]	1.02	1.04	1.01	0.15 [.04]	0.85 [.21]	1.19 [.30]	0.88 [.22]	0.176 [.04]	0.176 [.04]
4200 [1982]	1.02	1.06	1.01	0.16 [.04]	0.89 [.22]	1.24 [.31]	0.92 [.23]	0.181 [.04]	0.184 [.05]
4300 [2029]	1.03	1.07	1.01	0.17 [.04]	0.93 [.23]	1.31 [.33]	0.97 [.24]	0.186 [.05]	0.191 [.05]
4400 [2076]	1.03	1.08	1.01	0.18 [.04]	0.97 [.24]	1.37 [.34]	1.02 [.25]	0.191 [.05]	0.199 [.05]
4500 [2123]	1.04	1.09	1.02	0.19 [.05]	1.01 [.25]	1.43 [.35]	1.07 [.27]	0.196 [.05]	0.207 [.05]
4600 [2171]	1.04	1.11	1.02	0.19 [.05]	1.06 [.26]	1.48 [.37]	1.11 [.28]	0.201 [.05]	0.214 [.05]
4700 [2218]	1.05	1.12	1.02	0.20 [.05]	1.10 [.27]	1.54 [.38]	1.15 [.29]	0.206 [.05]	0.222 [.05]
4800 [2265]	1.05	1.13	1.02	0.21 [.05]	1.14 [.28]	1.59 [.40]	1.19 [.30]	0.211 [.05]	0.229 [.06]

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

Air Flow	Model (-)GEDYB150 - Downflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
	External Static Pressure - Inches of Water [kPa]																																			
CFM [L/s]	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4000 [1888]	766	1776	795	1806	824	1842	851	1883	878	1931	904	1985	929	2044	953	2110	976	2181	998	2259	1019	2342	1040	2431	1059	2526	1078	2627	1096	2734	1113	2847	1129	2966	1144	3091	1158	3221	1171	3358
4100 [1935]	778	1820	807	1856	835	1897	862	1944	888	1997	913	2056	937	2120	961	2191	983	2268	1005	2350	1026	2439	1045	2533	1064	2634	1082	2740	1099	2852	1116	2970	1131	3094	1145	3224	1159	3360	1171	3502
4200 [1982]	792	1875	820	1915	847	1961	873	2014	899	2072	923	2136	947	2206	969	2282	991	2364	1012	2451	1032	2545	1051	2645	1070	2750	1087	2862	1103	2979	1119	3102	1134	3232	1147	3367	1160	3508	1172	3655
4300 [2029]	806	1938	833	1984	859	2036	885	2093	910	2156	934	2226	957	2301	979	2382	1000	2469	1020	2562	1040	2661	1058	2766	1076	2877	1092	2993	1108	3116	1123	3244	1137	3379	1150	3519	1162	3665	1174	3818
4400 [2076]	820	2012	847	2063	873	2119	898	2182	922	2251	945	2325	967	2406	989	2492	1009	2584	1029	2682	1048	2787	1065	2897	1082	3013	1098	3134	1113	3262	1128	3396	1141	3536	1154	3681	1165	3833	1176	3990
4500 [2123]	835	2095	861	2151	886	2213	911	2281	934	2355	957	2434	978	2520	999	2611	1019	2709	1038	2812	1056	2922	1073	3037	1090	3158	1105	3285	1119	3418	1133	3557	1146	3702	1158	3853	1168	4009	1178	4172
4600 [2171]	851	2187	876	2249	901	2316	925	2389	947	2468	969	2553	990	2644	1010	2740	1030	2843	1048	2952	1065	3066	1082	3187	1097	3313	1112	3445	1126	3584	1139	3728	1151	3878	1162	4034	1172	4196	1182	4363
4700 [2218]	867	2290	892	2356	916	2428	939	2507	961	2591	982	2681	1003	2777	1022	2879	1041	2987	1058	3101	1075	3220	1091	3346	1106	3478	1120	3615	1133	3759	1145	3908	1157	4063	1167	4224	1177	4391	1186	4564
4800 [2265]	884	2401	908	2473	932	2551	954	2634	975	2723	996	2819	1016	2920	1034	3027	1052	3140	1069	3259	1085	3384	1101	3515	1115	3652	1128	3795	1141	3943	1153	4098	1163	4258	1173	4425	1182	4597	1190	4775
4900 [2312]	902	2523	925	2599	948	2682	969	2771	990	2866	1010	2966	1029	3073	1047	3185	1065	3303	1081	3427	1097	3558	1111	3694	1125	3836	1138	3984	1149	4137	1160	4297	1170	4463	1180	4634	1188	4812	1195	4995
5000 [2359]	920	2653	943	2736	965	2824	986	2917	1006	3017	1025	3123	1044	3235	1061	3352	1078	3476	1093	3605	1108	3741	1122	3882	1135	4029	1147	4182	1158	4341	1169	4506	1178	4677	1187	4854	1194	5036	1201	5225
5100 [2407]	939	2794	961	2881	982	2974	1003	3073	1022	3179	1041	3289	1058	3406	1075	3529	1091	3658	1106	3792	1120	3933	1134	4079	1146	4232	1158	4390	1168	4554	1178	4725	1187	4901	1194	5083	1201	5270	1208	5464
5200 [2454]	958	2944	980	3036	1000	3135	1020	3239	1039	3349	1057	3465	1074	3588	1090	3716	1105	3849	1120	3989	1133	4135	1146	4287	1158	4444	1168	4608	1178	4777	1187	4953	1196	5134	1203	5321	1209	5514	1215	5713
5300 [2501]	978	3103	999	3201	1019	3305	1038	3414	1056	3530	1074	3651	1090	3778	1106	3912	1120	4051	1134	4196	1147	4347	1159	4504	1170	4666	1180	4835	1189	5010	1198	5190	1205	5377	1212	5569	1217	5767	1222	5972
5400 [2548]	999	3273	1019	3376	1038	3484	1057	3599	1074	3720	1091	3846	1107	3979	1122	4117	1136	4261	1149	4412	1161	4568	1172	4730	1183	4898	1192	5072	1201	5252	1209	5438	1215	5629	1221	5827	1226	6030	—	—
5500 [2595]	1020	3451	1040	3559	1058	3673	1076	3793	1093	3919	1109	4051	1124	4189	1138	4332	1152	4482	1164	4637	1176	4799	1186	4966	1196	5139	1205	5318	1213	5503	1220	5694	1226	5891	—	—	—	—	—	—
5600 [2643]	1042	3640	1061	3753	1079	3872	1096	3997	1112	4128	1128	4265	1142	4408	1156	4557	1168	4712	1180	4872	1191	5039	1201	5212	1210	5390	1218	5574	1226	5765	—	—	—	—	—	—	—	—	—	—
5700 [2690]	1064	3838	1083	3956	1100	4080	1117	4211	1132	4347	1147	4489	1161	4637	1174	4791	1186	4951	1197	5117	1207	5289	1216	5467	1225	5650	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800 [2737]	1088	4045	1105	4169	1122	4298	1138	4434	1153	4575	1167	4723	1180	4876	1192	5035	1204	5200	1214	5371	1224	5548	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900 [2784]	1111	4262	1128	4391	1144	4526	1160	4666	1174	4813	1187	4966	1200	5124	1211	5289	1222	5459	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000 [2831]	1136	4489	1152	4623	1167	4763	1182	4909	1196	5061	1208	5218	1220	5382	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: F-Drive left of the bold line, G-Drive right of the bold line.

Drive Package	F						G					
Motor H.P. [W]	3 [2237.1]						5 [3728.5]					
Blower Sheave	AK71H						AK79H					
Motor Sheave	1VL44						1VP60					
Belt	A48						A52					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**
RPM	1003	958	**912**	863	814	764	1220	1171	1127	1085	1039	**994**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure.

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Vertical Economizer RA Damper Open	Concentric Diffuser RXRN-AEF3618 & Concentric Adapter RXMC-DD03 (Flush)	Concentric Diffuser RXRN-AED3618 & Concentric Adapter RXMC-DD03 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
4000 [1888]	1.01	1.03	1.01	0.15 [.04]	0.16 [.04]	0.76 [.19]	0.68 [.17]	0.132 [.03]	0.108 [.03]
4100 [1935]	1.02	1.04	1.01	0.16 [.04]	0.17 [.04]	0.79 [.20]	0.72 [.18]	0.136 [.03]	0.114 [.03]
4200 [1982]	1.02	1.06	1.01	0.17 [.04]	0.19 [.05]	0.82 [.20]	0.75 [.19]	0.140 [.03]	0.120 [.03]
4300 [2029]	1.03	1.07	1.01	0.17 [.04]	0.20 [.05]	0.86 [.21]	0.79 [.20]	0.144 [.03]	0.126 [.03]
4400 [2076]	1.03	1.08	1.01	0.18 [.05]	0.21 [.05]	0.90 [.22]	0.83 [.21]	0.148 [.04]	0.132 [.03]
4500 [2123]	1.04	1.09	1.02	0.19 [.05]	0.23 [.06]	0.94 [.23]	0.86 [.21]	0.152 [.04]	0.138 [.03]
4600 [2171]	1.04	1.11	1.02	0.20 [.05]	0.24 [.06]	0.98 [.24]	0.89 [.22]	0.156 [.04]	0.145 [.04]
4700 [2218]	1.05	1.12	1.02	0.21 [.05]	0.26 [.06]	1.02 [.25]	0.94 [.23]	0.160 [.04]	0.151 [.04]
4800 [2265]	1.05	1.13	1.02	0.21 [.05]	0.28 [.07]	1.06 [.26]	0.98 [.24]	0.164 [.04]	0.157 [.04]
4900 [2312]	1.06	1.14	1.02	0.22 [.06]	0.29 [.07]	1.10 [.27]	1.01 [.25]	0.168 [.04]	0.163 [.04]
5000 [2359]	1.06	1.16	1.03	0.23 [.06]	0.31 [.08]	1.14 [.28]	1.04 [.26]	0.172 [.04]	0.169 [.04]
5100 [2407]	1.07	1.17	1.03	0.24 [.06]	0.33 [.08]	1.18 [.29]	1.07 [.27]	0.176 [.04]	0.175 [.04]
5200 [2454]	1.07	1.18	1.03	0.25 [.06]	0.35 [.09]	1.22 [.30]	1.10 [.27]	0.180 [.04]	0.182 [.04]
5300 [2501]	1.08	1.19	1.03	0.26 [.06]	0.36 [.09]	1.27 [.32]	1.15 [.29]	0.184 [.05]	0.188 [.05]
5400 [2548]	1.08	1.21	1.03	0.27 [.07]	0.38 [.09]	1.33 [.33]	1.20 [.30]	0.188 [.05]	0.194 [.05]
5500 [2595]	1.09	1.22	1.04	0.28 [.07]	0.40 [.10]	1.37 [.34]	1.25 [.31]	0.192 [.05]	0.200 [.05]
5600 [2643]	1.09	1.23	1.04	0.29 [.07]	0.42 [.10]	1.42 [.35]	1.30 [.32]	0.196 [.05]	0.206 [.05]
5700 [2690]	1.10	1.24	1.04	0.30 [.07]	0.44 [.11]	1.47 [.37]	1.34 [.33]	0.200 [.05]	0.212 [.05]
5800 [2737]	1.10	1.26	1.04	0.31 [.08]	0.46 [.11]	1.52 [.38]	1.38 [.34]	0.204 [.05]	0.219 [.05]
5900 [2784]	1.10	1.27	1.05	0.32 [.08]	0.48 [.12]	1.56 [.39]	1.42 [.35]	0.208 [.05]	0.225 [.05]
6000 [2831]	1.11	1.28	1.05	0.33 [.08]	0.51 [.13]	1.60 [.40]	1.45 [.36]	0.212 [.05]	0.231 [.06]

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

Appendix C – Air Flow Performance Data (Cont.)

Air Flow	Model (-)GEDYB150 - Sideflow Voltage 208/230, 460, 575 — 3 phase 60 Hz																																			
CFM [L/s]	External Static Pressure - Inches of Water [kPa]																																			
	0.1 [.02]		0.2 [.05]		0.3 [.07]		0.4 [.10]		0.5 [.12]		0.6 [.15]		0.7 [.17]		0.8 [.20]		0.9 [.22]		1.0 [.25]		1.1 [.27]		1.2 [.30]		1.3 [.32]		1.4 [.35]		1.5 [.37]		1.6 [.40]		1.7 [.42]		1.8 [.45]		1.9 [.47]		2.0 [.50]	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4000 [1888]	—	—	791	1757	819	1824	846	1892	872	1961	897	2031	922	2101	946	2173	970	2245	993	2318	1015	2392	1036	2467	1057	2542	1077	2619	1096	2696	1115	2774	1133	2853	1150	2933	1167	3014	1183	3095
4100 [1935]	782	1773	809	1841	836	1911	863	1982	888	2053	913	2125	937	2198	961	2272	984	2346	1006	2422	1027	2498	1048	2576	1068	2654	1088	2733	1106	2812	1124	2893	1142	2975	1158	3057	1174	3140	1189	3224
4200 [1982]	801	1860	828	1932	854	2004	880	2077	905	2150	929	2225	952	2300	975	2377	997	2454	1019	2532	1040	2611	1060	2691	1079	2771	1098	2853	1116	2935	1133	3018	1150	3102	1166	3187	1181	3272	1196	3359
4300 [2029]	819	1954	845	2028	871	2102	896	2177	920	2254	944	2331	967	2409	989	2488	1011	2567	1032	2648	1052	2729	1071	2811	1090	2894	1108	2978	1125	3063	1142	3149	1158	3235	1174	3323	1188	3411	1202	3500
4400 [2076]	837	2053	863	2129	888	2207	912	2284	936	2363	959	2443	981	2523	1003	2605	1024	2687	1044	2770	1064	2854	1082	2938	1101	3024	1118	3110	1135	3197	1151	3286	1166	3375	1181	3464	1195	3555	1208	3646
4500 [2123]	855	2159	880	2237	905	2317	929	2397	952	2479	974	2561	996	2644	1016	2727	1037	2812	1056	2897	1075	2984	1093	3071	1111	3159	1128	3248	1144	3338	1159	3428	1174	3520	1188	3612	1201	3705	1214	3799
4600 [2171]	873	2270	898	2351	921	2433	944	2516	967	2600	988	2684	1009	2770	1030	2856	1049	2943	1068	3031	1086	3120	1104	3210	1121	3300	1137	3392	1152	3484	1167	3577	1181	3671	1195	3766	1207	3861	1219	3958
4700 [2218]	891	2387	914	2471	938	2556	960	2641	982	2727	1003	2814	1023	2902	1043	2991	1062	3080	1080	3171	1097	3262	1114	3354	1130	3447	1146	3541	1161	3636	1175	3732	1188	3828	1201	3925	1213	4023	—	—
4800 [2265]	908	2511	931	2597	954	2684	975	2772	996	2860	1017	2950	1036	3040	1055	3132	1074	3224	1091	3317	1108	3410	1124	3505	1140	3601	1155	3697	1169	3794	1182	3892	1195	3991	1207	4091	1219	4191	—	—
4900 [2312]	925	2640	947	2729	969	2818	990	2908	1011	3000	1031	3092	1050	3184	1068	3278	1086	3373	1102	3468	1119	3565	1134	3662	1149	3760	1163	3859	1177	3958	1190	4059	1202	4160	1213	4262	—	—	—	—
5000 [2359]	942	2775	964	2866	985	2958	1005	3051	1025	3145	1044	3239	1062	3335	1080	3431	1097	3528	1113	3626	1129	3725	1144	3824	1158	3925	1172	4026	1185	4128	1197	4231	1208	4335	1219	4440	—	—	—	—
5100 [2407]	958	2916	979	3010	1000	3104	1020	3200	1039	3296	1057	3393	1075	3491	1092	3589	1108	3689	1124	3789	1139	3891	1153	3993	1167	4096	1180	4200	1192	4304	1204	4410	1214	4516	—	—	—	—	—	—
5200 [2454]	975	3063	995	3160	1015	3256	1034	3354	1053	3453	1070	3552	1087	3653	1104	3754	1120	3856	1135	3959	1149	4063	1162	4167	1175	4273	1188	4379	1199	4486	1210	4594	1220	4703	—	—	—	—	—	—
5300 [2501]	991	3217	1010	3315	1030	3415	1048	3515	1066	3616	1083	3718	1100	3821	1115	3924	1130	4029	1145	4134	1158	4241	1171	4348	1184	4456	1195	4564	1206	4674	1216	4785	—	—	—	—	—	—	—	—
5400 [2548]	1006	3376	1026	3477	1044	3579	1062	3681	1079	3785	1096	3889	1111	3995	1126	4101	1141	4208	1155	4316	1168	4425	1180	4534	1192	4645	1203	4756	1213	4868	—	—	—	—	—	—	—	—	—	—
5500 [2595]	1022	3541	1040	3644	1058	3749	1075	3854	1092	3960	1108	4067	1123	4175	1137	4283	1151	4393	1164	4503	1177	4614	1188	4726	1199	4839	1210	4953	1219	5068	—	—	—	—	—	—	—	—	—	—
5600 [2643]	1037	3712	1055	3818	1072	3924	1089	4032	1105	4141	1120	4250	1134	4361	1148	4472	1161	4584	1174	4697	1185	4810	1196	4925	1207	5040	1216	5156	—	—	—	—	—	—	—	—	—	—	—	—
5700 [2690]	1052	3888	1069	3997	1086	4106	1102	4217	1117	4328	1132	4440	1145	4552	1159	4666	1171	4780	1183	4896	1194	5012	1204	5129	1214	5247	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5800 [2737]	1067	4071	1083	4182	1099	4294	1115	4407	1129	4520	1143	4635	1156	4750	1169	4866	1181	4983	1192	5101	1202	5220	1212	5339	1221	5460	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900 [2784]	1081	4260	1097	4374	1113	4488	1127	4603	1141	4719	1154	4836	1167	4954	1179	5073	1190	5192	1200	5312	1210	5433	1219	5555	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000 [2831]	1095	4455	1111	4571	1126	4688	1139	4805	1153	4924	1165	5043	1177	5164	1188	5285	1199	5407	1209	5529	1218	5653	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE: F-Drive left of the first bold line, G-Drive right of the bold line.

Drive Package	F						G					
Motor H.P. [W]	3 [2237.1]						5 [3728.5]					
Blower Sheave	AK71H						AK79H					
Motor Sheave	1VL44						1VP60					
Belt	A48						A52					
Turns Open	0	1	**2**	3	4	5	0	1	2	3	4	**5**
RPM	1002	955	**909**	862	813	765	1208	1171	1127	1084	1038	**995**

Notes:
1. Factory sheave settings are shown in bold type.
2. Do not set sheave below minimum or maximum turns open shown.
3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure.
4. Add component resistance (below) to duct resistance to determine total External Static Pressure

Airflow	AIRFLOW CORRECTION FACTORS *			COMPONENT AIRFLOW RESISTANCE					
				Wet Coil	Horizontal Economizer RA Damper Open	Concentric Diffuser RXRN-AEF3618 & Concentric Adapter RXMC-DD03 (Flush)	Concentric Diffuser RXRN-AED3618 & Concentric Adapter RXMC-DD03 (Drop)	Pressure Drop MERV 8	Pressure Drop MERV 13
CFM [L/s]	Total kBtu/h	Sensible kBtu/h	Power kW	Resistance — Inches of Water [kPa]					
4000 [1888]	1.01	1.03	1.01	0.15 [.04]	0.73 [.18]	0.76 [.19]	0.68 [.17]	0.132 [.03]	0.108 [.03]
4100 [1935]	1.02	1.04	1.01	0.16 [.04]	0.78 [.19]	0.79 [.20]	0.72 [.18]	0.136 [.03]	0.114 [.03]
4200 [1982]	1.02	1.06	1.01	0.17 [.04]	0.83 [.21]	0.82 [.20]	0.75 [.19]	0.140 [.03]	0.120 [.03]
4300 [2029]	1.03	1.07	1.01	0.17 [.04]	0.88 [.22]	0.86 [.21]	0.79 [.20]	0.144 [.03]	0.126 [.03]
4400 [2076]	1.03	1.08	1.01	0.18 [.05]	0.93 [.23]	0.90 [.22]	0.83 [.21]	0.148 [.04]	0.132 [.03]
4500 [2123]	1.04	1.09	1.02	0.19 [.05]	0.98 [.24]	0.94 [.23]	0.86 [.21]	0.152 [.04]	0.138 [.03]
4600 [2171]	1.04	1.11	1.02	0.20 [.05]	1.03 [.26]	0.98 [.24]	0.89 [.22]	0.156 [.04]	0.145 [.04]
4700 [2218]	1.05	1.12	1.02	0.21 [.05]	1.07 [.27]	1.02 [.25]	0.94 [.23]	0.160 [.04]	0.151 [.04]
4800 [2265]	1.05	1.13	1.02	0.21 [.05]	1.12 [.28]	1.06 [.26]	0.98 [.24]	0.164 [.04]	0.157 [.04]
4900 [2312]	1.06	1.14	1.02	0.22 [.06]	1.17 [.29]	1.10 [.27]	1.01 [.25]	0.168 [.04]	0.163 [.04]
5000 [2359]	1.06	1.16	1.03	0.23 [.06]	1.21 [.30]	1.14 [.28]	1.04 [.26]	0.172 [.04]	0.169 [.04]
5100 [2407]	1.07	1.17	1.03	0.24 [.06]	1.26 [.31]	1.18 [.29]	1.07 [.27]	0.176 [.04]	0.175 [.04]
5200 [2454]	1.07	1.18	1.03	0.25 [.06]	1.30 [.32]	1.22 [.30]	1.10 [.27]	0.180 [.04]	0.182 [.04]
5300 [2501]	1.08	1.19	1.03	0.26 [.06]	1.35 [.34]	1.27 [.32]	1.15 [.29]	0.184 [.05]	0.188 [.05]
5400 [2548]	1.08	1.21	1.03	0.27 [.07]	1.39 [.35]	1.33 [.33]	1.20 [.30]	0.188 [.05]	0.194 [.05]
5500 [2595]	1.09	1.22	1.04	0.28 [.07]	1.44 [.36]	1.37 [.34]	1.25 [.31]	0.192 [.05]	0.200 [.05]
5600 [2643]	1.09	1.23	1.04	0.29 [.07]	1.48 [.37]	1.42 [.35]	1.30 [.32]	0.196 [.05]	0.206 [.05]
5700 [2690]	1.10	1.24	1.04	0.30 [.07]	1.52 [.38]	1.47 [.37]	1.34 [.33]	0.200 [.05]	0.212 [.05]
5800 [2737]	1.10	1.26	1.04	0.31 [.08]	1.57 [.39]	1.52 [.38]	1.38 [.34]	0.204 [.05]	0.219 [.05]
5900 [2784]	1.10	1.27	1.05	0.32 [.08]	1.61 [.40]	1.56 [.39]	1.42 [.35]	0.208 [.05]	0.225 [.05]
6000 [2831]	1.11	1.28	1.05	0.33 [.08]	1.65 [.41]	1.60 [.40]	1.45 [.36]	0.212 [.05]	0.231 [.06]

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

P. APPENDICES

Appendix D – Cooling Data for (-)GEDYB 7.5 Ton

COOLING PERFORMANCE DATA - (-)GEDYB090											
Entering Indoor Air @ 80ºF [26.7ºC] dbE 1											
wbE			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]		
CFM [L/s]			3550 [1675]	3400 [1605]	2375 [1121]	3550 [1675]	3400 [1605]	2375 [1121]	3550 [1675]	3400 [1605]	2375 [1121]
DR			.05	.09	.12	.05	.09	.12	.05	.09	.12
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	105 [30.8] 60 [17.6] 6.4	104.1 [30.5] 58.8 [17.2] 6.4	98.4 [28.8] 50.5 [14.8] 6.2	99.4 [29.1] 70.9 [20.8] 6.4	98.6 [28.9] 69.4 [20.3] 6.4	93.2 [27.3] 59.7 [17.5] 6.2	93.8 [27.5] 81.7 [23.9] 6.4	93 [27.3] 80.1 [23.5] 6.3	87.9 [25.8] 68.8 [20.2] 6.2
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	102.5 [30] 59 [17.3] 6.7	101.7 [29.8] 57.8 [16.9] 6.7	96.1 [28.2] 49.7 [14.6] 6.5	96.9 [28.4] 69.9 [20.5] 6.7	96.1 [28.2] 68.5 [20.1] 6.6	90.9 [26.6] 58.8 [17.2] 6.5	91.3 [26.8] 80.7 [23.7] 6.6	90.6 [26.6] 79.1 [23.2] 6.6	85.6 [25.1] 68 [19.9] 6.4
	85ºF [29.4ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	100 [29.3] 58 [17] 7.0	99.2 [29.1] 56.8 [16.6] 7.0	93.8 [27.5] 48.8 [14.3] 6.8	94.4 [27.7] 68.9 [20.2] 7.0	93.7 [27.5] 67.5 [19.8] 6.9	88.6 [26] 58 [17] 6.7	88.8 [26] 79.8 [23.4] 6.9	88.1 [25.8] 78.1 [22.9] 6.9	83.3 [24.4] 67.2 [19.7] 6.7
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	97.6 [28.6] 57 [16.7] 7.3	96.8 [28.4] 55.9 [16.4] 7.3	91.5 [26.8] 48 [14.1] 7.1	92 [27] 67.9 [19.9] 7.3	91.3 [26.8] 66.5 [19.5] 7.2	86.2 [25.3] 57.2 [16.8] 7.1	86.4 [25.3] 78.8 [23.1] 7.2	85.7 [25.1] 77.2 [22.6] 7.2	81 [23.7] 66.3 [19.4] 7.0
	95ºF [35ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	95.1 [27.9] 56 [16.4] 7.6	94.4 [27.7] 54.9 [16.1] 7.6	89.2 [26.1] 47.2 [13.8] 7.4	89.5 [26.2] 66.9 [19.6] 7.6	88.8 [26] 65.6 [19.2] 7.6	83.9 [24.6] 56.3 [16.5] 7.4	83.9 [24.6] 77.8 [22.8] 7.6	83.3 [24.4] 76.2 [22.3] 7.5	78.7 [23.1] 65.5 [19.2] 7.3
	100ºF [37.8ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	92.7 [27.2] 55.1 [16.1] 8.0	91.9 [26.9] 54 [15.8] 8.0	86.9 [25.5] 46.4 [13.6] 7.8	87.1 [25.5] 65.9 [19.3] 8.0	86.4 [25.3] 64.6 [18.9] 7.9	81.6 [23.9] 55.5 [16.3] 7.7	81.5 [23.9] 76.8 [22.5] 7.9	80.8 [23.7] 75.3 [22.1] 7.9	76.4 [22.4] 64.7 [19] 7.7
	105ºF [40.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	90.2 [26.4] 54.1 [15.9] 8.4	89.5 [26.2] 53 [15.5] 8.4	84.6 [24.8] 45.5 [13.3] 8.1	84.6 [24.8] 65 [19.1] 8.3	83.9 [24.6] 63.6 [18.6] 8.3	79.3 [23.2] 54.7 [16] 8.1	79 [23.2] 75.8 [22.2] 8.3	78.4 [23] 74.3 [21.8] 8.3	74.1 [21.7] 63.8 [18.7] 8.1
	110ºF [43.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	87.8 [25.7] 53.1 [15.6] 8.8	87.1 [25.5] 52 [15.2] 8.8	82.3 [24.1] 44.7 [13.1] 8.5	82.2 [24.1] 64 [18.8] 8.7	81.5 [23.9] 62.7 [18.4] 8.7	77 [22.6] 53.9 [15.8] 8.5	76.6 [22.5] 74.8 [21.9] 8.7	75.9 [22.2] 73.3 [21.5] 8.7	71.8 [21] 63 [18.5] 8.4
	115ºF [46.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	85.3 [25] 52.1 [15.3] 9.2	84.6 [24.8] 51.1 [15] 9.2	80 [23.4] 43.9 [12.9] 8.9	79.7 [23.4] 63 [18.5] 9.2	79.1 [23.2] 61.7 [18.1] 9.1	74.7 [21.9] 53 [15.5] 8.9	74.1 [21.7] 73.9 [21.7] 9.1	73.5 [21.5] 72.4 [21.2] 9.1	69.5 [20.4] 62.2 [18.2] 8.9
	120ºF [48.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	82.8 [24.3] 51.1 [15] 9.7	82.2 [24.1] 50.1 [14.7] 9.6	77.7 [22.8] 43.1 [12.6] 9.4	77.2 [22.6] 62 [18.2] 9.6	76.6 [22.5] 60.8 [17.8] 9.6	72.4 [21.2] 52.2 [15.3] 9.3	71.6 [21] 71.6 [21] 9.6	71.1 [20.8] 71.1 [20.8] 9.5	67.2 [19.7] 61.4 [18] 9.3
	125ºF [51.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	80.4 [23.6] 50.1 [14.7] 10.1	79.7 [23.4] 49.1 [14.4] 10.1	75.4 [22.1] 42.2 [12.4] 9.8	74.8 [21.9] 61 [17.9] 10.1	74.2 [21.7] 59.8 [17.5] 10.0	70.1 [20.5] 51.4 [15.1] 9.8	69.2 [20.3] 69.2 [20.3] 10.0	68.6 [20.1] 68.6 [20.1] 10.0	64.9 [19] 60.5 [17.7] 9.7

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)].

Appendix D – Cooling Data for (-)GEDYB 8.5 Ton

COOLING PERFORMANCE DATA - (-)GEDYB102												
Entering Indoor Air @ 80ºF [26.7ºC] dbE 1												
wbE			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			
CFM [L/s]			3900 [1841]	3300 [1557]	2600 [1227]	3900 [1841]	3300 [1557]	2600 [1227]	3900 [1841]	3300 [1557]	2600 [1227]	
DR			.05	.09	.12	.05	.09	.12	.05	.09	.12	
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	119.4 [35] 69.7 [20.4] 7.3	115.6 [33.9] 64.3 [18.8] 7.2	111.1 [32.6] 57.9 [17] 7.1	112.3 [32.9] 83 [24.3] 7.3	108.7 [31.9] 76.5 [22.4] 7.2	104.6 [30.7] 68.9 [20.2] 7.1	106 [31.1] 95.9 [28.1] 7.2	102.6 [30.1] 88.4 [25.9] 7.1	98.6 [28.9] 79.7 [23.4] 6.9	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	116.8 [34.2] 68.4 [20] 7.7	113 [33.1] 63 [18.5] 7.6	108.7 [31.9] 56.8 [16.6] 7.5	109.7 [32.2] 81.6 [23.9] 7.7	106.2 [31.1] 75.3 [22.1] 7.6	102.1 [29.9] 67.8 [19.9] 7.4	103.3 [30.3] 94.6 [27.7] 7.5	100 [29.3] 87.2 [25.6] 7.4	96.2 [28.2] 78.5 [23] 7.3	
	85ºF [29.4ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	114 [33.4] 66.9 [19.6] 8.1	110.3 [32.3] 61.7 [18.1] 8.0	106.1 [31.1] 55.6 [16.3] 7.8	106.9 [31.3] 80.2 [23.5] 8.1	103.5 [30.3] 73.9 [21.7] 7.9	99.5 [29.2] 66.6 [19.5] 7.8	100.5 [29.5] 93.1 [27.3] 7.9	97.3 [28.5] 85.8 [25.1] 7.8	93.6 [27.4] 77.3 [22.7] 7.7	
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	111 [32.5] 65.4 [19.2] 8.5	107.5 [31.5] 60.3 [17.7] 8.3	103.3 [30.3] 54.3 [15.9] 8.2	103.9 [30.5] 78.6 [23] 8.4	100.6 [29.5] 72.5 [21.2] 8.3	96.7 [28.3] 65.3 [19.1] 8.1	97.6 [28.6] 91.6 [26.8] 8.3	94.5 [27.7] 84.4 [24.7] 8.2	90.8 [26.6] 76.1 [22.3] 8.0	
	95ºF [35ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	107.9 [31.6] 63.7 [18.7] 8.9	104.5 [30.6] 58.7 [17.2] 8.7	100.4 [29.4] 52.9 [15.5] 8.6	100.8 [29.5] 77 [22.6] 8.8	97.6 [28.6] 71 [20.8] 8.7	93.8 [27.5] 63.9 [18.7] 8.5	94.5 [27.7] 89.9 [26.3] 8.7	91.4 [26.8] 82.9 [24.3] 8.5	87.9 [25.8] 74.7 [21.9] 8.4	
	100ºF [37.8ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	104.6 [30.7] 62 [18.2] 9.2	101.3 [29.7] 57.1 [16.7] 9.1	97.4 [28.5] 51.5 [15.1] 8.9	97.6 [28.6] 75.2 [22] 9.2	94.4 [27.7] 69.4 [20.3] 9.0	90.8 [26.6] 62.5 [18.3] 8.9	91.2 [26.7] 88.2 [25.8] 9.1	88.3 [25.9] 81.3 [23.8] 8.9	84.9 [24.9] 73.2 [21.5] 8.7	
	105ºF [40.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	101.2 [29.7] 60.1 [17.6] 9.6	98 [28.7] 55.4 [16.2] 9.5	94.2 [27.6] 49.9 [14.6] 9.3	94.1 [27.6] 73.4 [21.5] 9.6	91.1 [26.7] 67.6 [19.8] 9.4	87.6 [25.7] 60.9 [17.8] 9.2	87.8 [25.7] 86.3 [25.3] 9.4	85 [24.9] 79.5 [23.3] 9.3	81.7 [23.9] 71.7 [21] 9.1	
	110ºF [43.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	97.6 [28.6] 58.1 [17] 10.0	94.5 [27.7] 53.6 [15.7] 9.8	90.9 [26.6] 48.3 [14.2] 9.6	90.6 [26.6] 71.4 [20.9] 9.9	87.7 [25.7] 65.8 [19.3] 9.8	84.3 [24.7] 59.3 [17.4] 9.6	84.2 [24.7] 84.2 [24.7] 9.8	81.5 [23.9] 77.7 [22.8] 9.7	78.4 [23] 70 [20.5] 9.5	
	115ºF [46.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	93.9 [27.5] 56.1 [16.4] 10.4	90.9 [26.6] 51.7 [15.2] 10.2	87.4 [25.6] 46.6 [13.7] 10.0	86.8 [25.4] 69.3 [20.3] 10.3	84.1 [24.6] 63.9 [18.7] 10.2	80.8 [23.7] 57.6 [16.9] 10.0	80.5 [23.6] 80.5 [23.6] 10.2	77.9 [22.8] 75.8 [22.2] 10.0	74.9 [22] 68.3 [20] 9.8	
	120ºF [48.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	90 [26.4] 53.9 [15.8] 10.7	87.2 [25.6] 49.7 [14.6] 10.6	83.8 [24.6] 44.8 [13.1] 10.4	83 [24.3] 67.2 [19.7] 10.7	80.3 [23.5] 61.9 [18.1] 10.5	77.2 [22.6] 55.8 [16.4] 10.3	76.6 [22.5] 76.6 [22.5] 10.6	74.1 [21.7] 73.8 [21.6] 10.4	71.3 [20.9] 66.5 [19.5] 10.2	
	125ºF [51.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	86 [25.2] 51.6 [15.1] 11.1	83.2 [24.4] 47.6 [14] 10.9	80 [23.4] 42.9 [12.6] 10.7	78.9 [23.1] 64.9 [19] 11.1	76.4 [22.4] 59.8 [17.5] 10.9	73.4 [21.5] 53.9 [15.8] 10.7	72.6 [21.3] 72.6 [21.3] 10.9	70.2 [20.6] 70.2 [20.6] 10.8	67.5 [19.8] 64.6 [18.9] 10.6	

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)].

P. APPENDICES

Appendix D – Cooling Data for (-)GEDYB 10 Ton

COOLING PERFORMANCE DATA - (-)GEDYB120												
Entering Indoor Air @ 80ºF [26.7ºC] dbE 1												
wbE			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			
CFM [L/s]			4925 [2324]	4000 [1888]	3275 [1546]	4925 [2324]	4000 [1888]	3275 [1546]	4925 [2324]	4000 [1888]	3275 [1546]	
DR			.05	.09	.12	.05	.09	.12	.05	.09	.12	
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total kBtu/h [kW]	151 [44.3]	144.9 [42.5]	140.1 [41.1]	141.7 [41.5]	136 [39.9]	131.5 [38.5]	134 [39.3]	128.5 [37.7]	124.3 [36.4]	
		Sens kBtu/h [kW]	89.7 [26.3]	80.9 [23.7]	74.1 [21.7]	109.5 [32.1]	98.8 [29]	90.4 [26.5]	130.8 [38.3]	118.1 [34.6]	108.1 [31.7]	
		Power	9.3	9.1	9.0	9.2	9.0	8.9	9.1	8.9	8.7	
	80ºF [26.7ºC]	Total kBtu/h [kW]	147.9 [43.3]	141.9 [41.6]	137.3 [40.2]	138.6 [40.6]	133 [39]	128.6 [37.7]	130.9 [38.4]	125.6 [36.8]	121.4 [35.6]	
		Sens kBtu/h [kW]	88.4 [25.9]	79.8 [23.4]	73 [21.4]	108.2 [31.7]	97.6 [28.6]	89.4 [26.2]	129.5 [38]	116.9 [34.3]	107 [31.4]	
		Power	9.7	9.5	9.3	9.6	9.4	9.2	9.5	9.3	9.1	
	85ºF [29.4ºC]	Total kBtu/h [kW]	144.6 [42.4]	138.8 [40.7]	134.2 [39.3]	135.3 [39.7]	129.8 [38]	125.6 [36.8]	127.6 [37.4]	122.4 [35.9]	118.4 [34.7]	
		Sens kBtu/h [kW]	86.9 [25.5]	78.5 [23]	71.8 [21]	106.7 [31.3]	96.3 [28.2]	88.2 [25.8]	127.6 [37.4]	115.6 [33.9]	105.8 [31]	
		Power	10.1	9.9	9.7	10.0	9.8	9.6	9.8	9.6	9.5	
	90ºF [32.2ºC]	Total kBtu/h [kW]	141.1 [41.4]	135.4 [39.7]	130.9 [38.4]	131.8 [38.6]	126.5 [37.1]	122.3 [35.8]	124.1 [36.4]	119.1 [34.9]	115.1 [33.7]	
		Sens kBtu/h [kW]	85.4 [25]	77 [22.6]	70.5 [20.7]	105.1 [30.8]	94.9 [27.8]	86.9 [25.5]	124.1 [36.4]	114.2 [33.5]	104.5 [30.6]	
		Power	10.4	10.2	10.1	10.4	10.1	10.0	10.2	10.0	9.8	
	95ºF [35ºC]	Total kBtu/h [kW]	137.4 [40.3]	131.8 [38.6]	127.5 [37.4]	128.1 [37.5]	122.9 [36]	118.8 [34.8]	120.3 [35.3]	115.5 [33.9]	111.7 [32.7]	
		Sens kBtu/h [kW]	83.6 [24.5]	75.5 [22.1]	69.1 [20.3]	103.4 [30.3]	93.3 [27.3]	85.4 [25]	120.3 [35.3]	112.6 [33]	103.1 [30.2]	
		Power	10.8	10.6	10.4	10.7	10.5	10.3	10.6	10.4	10.2	
	100ºF [37.8ºC]	Total kBtu/h [kW]	133.4 [39.1]	128.1 [37.5]	123.8 [36.3]	124.1 [36.4]	119.1 [34.9]	115.2 [33.8]	116.4 [34.1]	111.7 [32.7]	108 [31.7]	
		Sens kBtu/h [kW]	81.7 [23.9]	73.8 [21.6]	67.5 [19.8]	101.5 [29.7]	91.6 [26.8]	83.9 [24.6]	116.4 [34.1]	110.9 [32.5]	101.5 [29.7]	
		Power	11.2	11.0	10.8	11.1	10.9	10.7	11.0	10.8	10.6	
	105ºF [40.6ºC]	Total kBtu/h [kW]	129.3 [37.9]	124.1 [36.4]	120 [35.2]	120 [35.2]	115.1 [33.7]	111.3 [32.6]	112.3 [32.9]	107.7 [31.6]	104.2 [30.5]	
		Sens kBtu/h [kW]	79.7 [23.4]	72 [21.1]	65.9 [19.3]	99.5 [29.2]	89.8 [26.3]	82.2 [24.1]	112.3 [32.9]	107.7 [31.6]	99.8 [29.2]	
		Power	11.6	11.3	11.2	11.5	11.3	11.1	11.3	11.1	10.9	
	110ºF [43.3ºC]	Total kBtu/h [kW]	124.9 [36.6]	119.9 [35.1]	115.9 [34]	115.6 [33.9]	111 [32.5]	107.3 [31.4]	107.9 [31.6]	103.5 [30.3]	100.1 [29.3]	
		Sens kBtu/h [kW]	77.6 [22.7]	70 [20.5]	64.1 [18.8]	97.3 [28.5]	87.9 [25.8]	80.4 [23.6]	107.9 [31.6]	103.5 [30.3]	98.1 [28.8]	
		Power	12.0	11.7	11.5	11.9	11.6	11.4	11.7	11.5	11.3	
	115ºF [46.1ºC]	Total kBtu/h [kW]	120.4 [35.3]	115.5 [33.9]	111.7 [32.7]	111.1 [32.6]	106.6 [31.2]	103.1 [30.2]	103.3 [30.3]	99.2 [29.1]	95.9 [28.1]	
		Sens kBtu/h [kW]	75.2 [22]	67.9 [19.9]	62.2 [18.2]	95 [27.8]	85.8 [25.1]	78.5 [23]	103.3 [30.3]	99.2 [29.1]	95.9 [28.1]	
		Power	12.3	12.1	11.9	12.2	12.0	11.8	12.1	11.9	11.7	
	120ºF [48.9ºC]	Total kBtu/h [kW]	115.6 [33.9]	110.9 [32.5]	107.3 [31.4]	106.3 [31.2]	102 [29.9]	98.6 [28.9]	98.5 [28.9]	94.6 [27.7]	91.5 [26.8]	
		Sens kBtu/h [kW]	72.8 [21.3]	65.7 [19.3]	60.1 [17.6]	92.6 [27.1]	83.5 [24.5]	76.5 [22.4]	98.5 [28.9]	94.6 [27.7]	91.5 [26.8]	
		Power	12.7	12.5	12.3	12.6	12.4	12.2	12.5	12.2	12.0	
	125ºF [51.7ºC]	Total kBtu/h [kW]	110.6 [32.4]	106.1 [31.1]	102.6 [30.1]	101.3 [29.7]	97.2 [28.5]	94 [27.5]	93.5 [27.4]	89.8 [26.3]	86.8 [25.4]	
		Sens kBtu/h [kW]	70.2 [20.6]	63.3 [18.6]	58 [17]	90 [26.4]	81.2 [23.8]	74.3 [21.8]	93.5 [27.4]	89.8 [26.3]	86.8 [25.4]	
		Power	13.1	12.8	12.6	13.0	12.7	12.5	12.9	12.6	12.4	

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)].

Appendix D – Cooling Data for (-)GEDYB 12.5 Ton

COOLING PERFORMANCE DATA - (-)GEDYB150												
Entering Indoor Air @ 80ºF [26.7ºC] dbE 1												
wbE			71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			
CFM [L/s]			6000 [2832]	4025 [1900]	4000 [1888]	6000 [2832]	4025 [1900]	4000 [1888]	6000 [2832]	4025 [1900]	4000 [1888]	
DR			.05	.09	.12	.05	.09	.12	.05	.09	.12	
Outdoor Dry Bulb Temperature	75ºF [23.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	193.6 [56.7] 116.5 [34.1] 7.5	177.8 [52.1] 94.8 [27.8] 7.2	177.6 [52.1] 94.5 [27.7] 7.2	181.3 [53.1] 136.8 [40.1] 7.8	166.5 [48.8] 111.3 [32.6] 7.5	166.3 [48.7] 111 [32.5] 7.5	170.3 [49.9] 155.5 [45.6] 7.3	156.3 [45.8] 126.6 [37.1] 7.0	156.1 [45.8] 126.2 [37] 7.0	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	189.3 [55.5] 114.1 [33.4] 7.9	173.8 [50.9] 92.9 [27.2] 7.6	173.6 [50.9] 92.6 [27.1] 7.6	177 [51.9] 134.4 [39.4] 8.3	162.5 [47.6] 109.4 [32.1] 7.9	162.3 [47.6] 109 [31.9] 7.9	165.9 [48.6] 153.2 [44.9] 7.7	152.3 [44.6] 124.6 [36.5] 7.4	152.2 [44.6] 124.3 [36.4] 7.4	
	85ºF [29.4ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	184.9 [54.2] 111.6 [32.7] 8.4	169.8 [49.8] 90.8 [26.6] 8.0	169.6 [49.7] 90.6 [26.6] 8.0	172.6 [50.6] 131.9 [38.7] 8.7	158.5 [46.5] 107.3 [31.4] 8.3	158.3 [46.4] 107 [31.4] 8.3	161.5 [47.3] 150.7 [44.2] 8.2	148.3 [43.5] 122.6 [35.9] 7.8	148.2 [43.4] 122.3 [35.8] 7.8	
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	180.5 [52.9] 109.1 [32] 8.8	165.7 [48.6] 88.7 [26] 8.4	165.5 [48.5] 88.5 [25.9] 8.4	168.1 [49.3] 129.3 [37.9] 9.1	154.4 [45.3] 105.2 [30.8] 8.8	154.2 [45.2] 104.9 [30.7] 8.8	157.1 [46] 148.1 [43.4] 8.6	144.2 [42.3] 120.5 [35.3] 8.2	144.1 [42.2] 120.2 [35.2] 8.2	
	95ºF [35ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	175.9 [51.6] 106.4 [31.2] 9.2	161.5 [47.3] 86.6 [25.4] 8.8	161.4 [47.3] 86.3 [25.3] 8.8	163.6 [47.9] 126.6 [37.1] 9.6	150.2 [44] 103 [30.2] 9.2	150 [44] 102.8 [30.1] 9.2	152.6 [44.7] 145.4 [42.6] 9.0	140.1 [41.1] 118.3 [34.7] 8.7	139.9 [41] 118 [34.6] 8.7	
	100ºF [37.8ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	171.3 [50.2] 103.6 [30.4] 9.7	157.3 [46.1] 84.3 [24.7] 9.3	157.1 [46] 84 [24.6] 9.3	159 [46.6] 123.8 [36.3] 10.0	146 [42.8] 100.8 [29.5] 9.6	145.8 [42.7] 100.5 [29.5] 9.6	148 [43.4] 142.6 [41.8] 9.5	135.8 [39.8] 116 [34] 9.1	135.7 [39.8] 115.7 [33.9] 9.1	
	105ºF [40.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	166.7 [48.9] 100.7 [29.5] 10.1	153 [44.8] 81.9 [24] 9.7	152.9 [44.8] 81.7 [23.9] 9.7	154.4 [45.3] 120.9 [35.4] 10.4	141.7 [41.5] 98.4 [28.8] 10.0	141.6 [41.5] 98.1 [28.8] 10.0	143.3 [42] 139.7 [40.9] 9.9	131.6 [38.6] 113.7 [33.3] 9.5	131.4 [38.5] 113.3 [33.2] 9.5	
	110ºF [43.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	161.9 [47.5] 97.6 [28.6] 10.5	148.7 [43.6] 79.4 [23.3] 10.1	148.5 [43.5] 79.2 [23.2] 10.1	149.6 [43.8] 117.9 [34.6] 10.9	137.4 [40.3] 95.9 [28.1] 10.4	137.2 [40.2] 95.7 [28] 10.4	138.6 [40.6] 136.7 [40.1] 10.3	127.2 [37.3] 111.2 [32.6] 9.9	127.1 [37.3] 110.9 [32.5] 9.9	
	115ºF [46.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	157.1 [46] 94.5 [27.7] 11.0	144.3 [42.3] 76.9 [22.5] 10.5	144.1 [42.2] 76.7 [22.5] 10.5	144.8 [42.4] 114.8 [33.6] 11.3	132.9 [39] 93.4 [27.4] 10.8	132.8 [38.9] 93.1 [27.3] 10.8	133.8 [39.2] 133.5 [39.1] 10.8	122.8 [36] 108.7 [31.9] 10.3	122.7 [36] 108.3 [31.7] 10.3	
	120ºF [48.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	152.3 [44.6] 91.2 [26.7] 11.4	139.8 [41] 74.2 [21.7] 10.9	139.6 [40.9] 74 [21.7] 10.9	139.9 [41] 111.5 [32.7] 11.7	128.5 [37.7] 90.7 [26.6] 11.3	128.3 [37.6] 90.5 [26.5] 11.2	128.9 [37.8] 128.9 [37.8] 11.2	118.3 [34.7] 106 [31.1] 10.7	118.2 [34.6] 105.7 [31] 10.7	
	125ºF [51.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	147.3 [43.2] 87.9 [25.8] 11.8	135.2 [39.6] 71.5 [21] 11.3	135.1 [39.6] 71.3 [20.9] 11.3	135 [39.6] 108.2 [31.7] 12.2	123.9 [36.3] 88 [25.8] 11.7	123.8 [36.3] 87.7 [25.7] 11.7	123.9 [36.3] 123.9 [36.3] 11.6	113.8 [33.4] 103.3 [30.3] 11.2	113.7 [33.3] 103 [30.2] 11.2	

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 – Reheat Data for (-)GEDYB 7.5 Ton

GROSS SYSTEMS PERFORMANCE DATA (LOW REHEAT MODE) - (-)GEDYB090												
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1												
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]			
CFM [L/s]			2190 [1034]	1825 [861]	1460 [689]	2190 [1034]	1825 [861]	1460 [689]	2190 [1034]	1825 [861]	1460 [689]	
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	28.8 [8.4] 3.2 [0.9] 4.5	27.8 [8.1] 2.9 [0.8] 4.4	26.8 [7.8] 2.6 [0.8] 4.4	25.4 [7.4] 3.8 [1.1] 4.5	24.5 [7.2] 3.5 [1] 4.4	23.6 [6.9] 3.1 [0.9] 4.4	24.6 [7.2] 7.3 [2.1] 4.5	23.8 [7] 6.7 [2] 4.4	22.9 [6.7] 6.1 [1.8] 4.4	
	65ºF [18.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	28.6 [8.4] 3.1 [0.9] 4.5	27.6 [8.1] 2.9 [0.8] 4.4	26.6 [7.8] 2.6 [0.8] 4.4	25.2 [7.4] 3.8 [1.1] 4.5	24.3 [7.1] 3.4 [1] 4.5	23.4 [6.9] 3.1 [0.9] 4.4	24.4 [7.2] 7.3 [2.1] 4.5	23.6 [6.9] 6.7 [2] 4.4	22.7 [6.7] 6.1 [1.8] 4.4	
	70ºF [21.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	28.3 [8.3] 3 [0.9] 4.5	27.3 [8] 2.7 [0.8] 4.5	26.3 [7.7] 2.5 [0.7] 4.4	24.8 [7.3] 3.6 [1.1] 4.6	24 [7] 3.3 [1] 4.5	23.1 [6.8] 3 [0.9] 4.4	24.1 [7.1] 7.1 [2.1] 4.5	23.3 [6.8] 6.5 [1.9] 4.5	22.4 [6.6] 5.9 [1.7] 4.4	
	75ºF [23.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	27.8 [8.2] 2.7 [0.8] 4.6	26.8 [7.9] 2.4 [0.7] 4.5	25.9 [7.6] 2.2 [0.6] 4.4	24.4 [7.1] 3.3 [1] 4.6	23.5 [6.9] 3 [0.9] 4.5	22.7 [6.6] 2.7 [0.8] 4.4	23.6 [6.9] 6.9 [2] 4.6	22.8 [6.7] 6.3 [1.8] 4.5	22 [6.4] 5.7 [1.7] 4.4	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	27.2 [8] 2.3 [0.7] 4.6	26.3 [7.7] 2.1 [0.6] 4.5	25.3 [7.4] 1.9 [0.5] 4.4	23.8 [7] 2.9 [0.8] 4.6	23 [6.7] 2.6 [0.8] 4.5	22.1 [6.5] 2.4 [0.7] 4.5	23.1 [6.8] 6.4 [1.9] 4.6	22.3 [6.5] 5.9 [1.7] 4.5	21.4 [6.3] 5.3 [1.6] 4.4	
	85ºF [29.4ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	26.5 [7.8] 1.7 [0.5] 4.6	25.6 [7.5] 1.6 [0.5] 4.6	24.6 [7.2] 1.4 [0.4] 4.5	23.1 [6.8] 2.3 [0.7] 4.7	22.3 [6.5] 2.1 [0.6] 4.6	21.5 [6.3] 1.9 [0.6] 4.5	22.3 [6.5] 5.9 [1.7] 4.6	21.6 [6.3] 5.4 [1.6] 4.6	20.8 [6.1] 4.9 [1.4] 4.5	
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	25.7 [7.5] 1 [0.3] 4.7	24.8 [7.3] 0.9 [0.3] 4.6	23.9 [7] 0.8 [0.2] 4.5	22.2 [6.5] 1.6 [0.5] 4.7	21.5 [6.3] 1.5 [0.4] 4.6	20.7 [6.1] 1.4 [0.4] 4.5	21.5 [6.3] 5.2 [1.5] 4.7	20.7 [6.1] 4.8 [1.4] 4.6	20 [5.9] 4.3 [1.3] 4.5	

GROSS SYSTEMS PERFORMANCE DATA (HIGH REHEAT MODE) - RGECZT090												
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1												
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]			
CFM [L/s]			3600 [1699]	3150 [1487]	2400 [1133]	3600 [1699]	3150 [1487]	2400 [1133]	3600 [1699]	3150 [1487]	2400 [1133]	
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	48.5 [14.2] 4.1 [1.2] 7	47.3 [13.9] 3.8 [1.1] 6.9	45.3 [13.3] 3.4 [1] 6.7	32 [9.4] 1.9 [0.5] 6.9	31.2 [9.1] 1.8 [0.5] 6.8	29.9 [8.8] 1.6 [0.5] 6.7	31.1 [9.1] 7.6 [2.2] 7	30.3 [8.9] 7.2 [2.1] 6.9	29 [8.5] 6.4 [1.9] 6.7	
	70ºF [21.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	50.8 [14.9] 6.9 [2] 6.9	49.6 [14.5] 6.5 [1.9] 6.8	47.4 [13.9] 5.7 [1.7] 6.6	34.3 [10.1] 4.6 [1.4] 6.8	33.5 [9.8] 4.4 [1.3] 6.7	32 [9.4] 3.9 [1.1] 6.6	33.4 [9.8] 10.4 [3.1] 6.9	32.5 [9.5] 9.8 [2.9] 6.8	31.1 [9.1] 8.7 [2.5] 6.6	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	51.6 [15.1] 8 [2.4] 6.9	50.3 [14.7] 7.5 [2.2] 6.8	48.1 [14.1] 6.7 [2] 6.7	35.1 [10.3] 5.8 [1.7] 6.8	34.2 [10] 5.4 [1.6] 6.8	32.7 [9.6] 4.8 [1.4] 6.6	34.1 [10] 11.6 [3.4] 6.9	33.3 [9.8] 10.9 [3.2] 6.8	31.8 [9.3] 9.7 [2.8] 6.7	
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	50.8 [14.9] 7.6 [2.2] 7	49.6 [14.5] 7.1 [2.1] 6.9	47.4 [13.9] 6.3 [1.8] 6.8	34.3 [10.1] 5.3 [1.6] 7	33.5 [9.8] 5 [1.5] 6.9	32 [9.4] 4.4 [1.3] 6.7	33.4 [9.8] 11.1 [3.3] 7	32.5 [9.5] 10.4 [3.1] 6.9	31.1 [9.1] 9.3 [2.7] 6.8	
	100ºF [37.8ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	48.5 [14.2] 5.5 [1.6] 7.2	47.3 [13.9] 5.1 [1.5] 7.1	45.3 [13.3] 4.6 [1.3] 7	32 [9.4] 3.2 [0.9] 7.2	31.2 [9.1] 3 [0.9] 7.1	29.9 [8.7] 2.7 [0.8] 6.9	31.1 [9.1] 9 [2.6] 7.2	30.3 [8.9] 8.5 [2.5] 7.1	29 [8.5] 7.5 [2.2] 7	
	110ºF [43.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	44.7 [13.1] 1.8 [0.5] 7.5	43.6 [12.8] 1.6 [0.5] 7.4	41.7 [12.2] 1.5 [0.4] 7.3	28.2 [8.3] -0.5 [-0.1] 7.5	27.5 [8] -0.5 [-0.1] 7.4	26.3 [7.7] -0.4 [-0.1] 7.2	27.2 [8] 5.3 [1.6] 7.5	26.5 [7.8] 5 [1.5] 7.4	25.4 [7.4] 4.4 [1.3] 7.3	
	120ºF [48.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	39.3 [11.5] -3.6 [-1.1] 7.9	38.3 [11.2] -3.4 [-1] 7.8	36.6 [10.7] -3 [-0.9] 7.7	22.8 [6.7] -5.8 [-1.7] 7.9	22.2 [6.5] -5.5 [-1.6] 7.8	21.2 [6.2] -4.9 [-1.4] 7.6	21.8 [6.4] 0 [0] 7.9	21.3 [6.2] 0 [0] 7.8	20.3 [6] 0 [0] 7.7	

Appendix D – Reheat Data for (-)GEDYB 8.5 Ton

GROSS SYSTEMS PERFORMANCE DATA (LOW REHEAT MODE) - (-)GEDYB102											
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1											
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]		
CFM [L/s]			2420 [1142]	2015 [951]	1610 [760]	2420 [1142]	2015 [951]	1610 [760]	2420 [1142]	2015 [951]	1610 [760]
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW]	38.5 [11.3]	37.1 [10.9]	35.8 [10.5]	32.6 [9.5]	31.4 [9.2]	30.3 [8.9]	28.3 [8.3]	27.3 [8]	26.3 [7.7]
		Sens kBtu/h [kW]	5.2 [1.5]	4.7 [1.4]	4.3 [1.3]	5.1 [1.5]	4.6 [1.4]	4.2 [1.2]	6.9 [2]	6.3 [1.8]	5.7 [1.7]
		Power	5.3	5.2	5.1	5.1	5.1	5	5	4.9	4.8
	65ºF [18.3ºC]	Total kBtu/h [kW]	37.9 [11.1]	36.5 [10.7]	35.2 [10.3]	31.9 [9.3]	30.8 [9]	29.7 [8.7]	27.6 [8.1]	26.7 [7.8]	25.7 [7.5]
		Sens kBtu/h [kW]	4.2 [1.2]	3.8 [1.1]	3.5 [1]	4.1 [1.2]	3.7 [1.1]	3.4 [1]	5.9 [1.7]	5.4 [1.6]	4.9 [1.4]
		Power	5.4	5.3	5.2	5.2	5.1	5	5	5	4.9
	70ºF [21.1ºC]	Total kBtu/h [kW]	37.2 [10.9]	35.8 [10.5]	34.5 [10.1]	31.2 [9.1]	30.1 [8.8]	29 [8.5]	26.9 [7.9]	26 [7.6]	25 [7.3]
		Sens kBtu/h [kW]	3.4 [1]	3.1 [0.9]	2.8 [0.8]	3.3 [1]	3 [0.9]	2.7 [0.8]	5.1 [1.5]	4.7 [1.4]	4.2 [1.2]
		Power	5.5	5.4	5.3	5.3	5.2	5.1	5.1	5	4.9
	75ºF [23.9ºC]	Total kBtu/h [kW]	36.4 [10.7]	35.1 [10.3]	33.8 [9.9]	30.5 [8.9]	29.4 [8.6]	28.3 [8.3]	26.2 [7.7]	25.3 [7.4]	24.4 [7.1]
		Sens kBtu/h [kW]	2.9 [0.8]	2.6 [0.8]	2.4 [0.7]	2.7 [0.8]	2.5 [0.7]	2.3 [0.7]	4.5 [1.3]	4.2 [1.2]	3.8 [1.1]
		Power	5.5	5.4	5.3	5.3	5.3	5.2	5.2	5.1	5
	80ºF [26.7ºC]	Total kBtu/h [kW]	35.6 [10.4]	34.4 [10.1]	33.1 [9.7]	29.7 [8.7]	28.6 [8.4]	27.6 [8.1]	25.4 [7.4]	24.5 [7.2]	23.6 [6.9]
		Sens kBtu/h [kW]	2.5 [0.7]	2.3 [0.7]	2.1 [0.6]	2.4 [0.7]	2.2 [0.6]	2 [0.6]	4.2 [1.2]	3.8 [1.1]	3.5 [1]
		Power	5.5	5.4	5.4	5.4	5.3	5.2	5.2	5.1	5
	85ºF [29.4ºC]	Total kBtu/h [kW]	34.8 [10.2]	33.5 [9.8]	32.3 [9.5]	28.8 [8.4]	27.8 [8.1]	26.8 [7.9]	24.6 [7.2]	23.7 [6.9]	22.8 [6.7]
		Sens kBtu/h [kW]	2.3 [0.7]	2.1 [0.6]	1.9 [0.6]	2.2 [0.6]	2 [0.6]	1.8 [0.5]	4 [1.2]	3.7 [1.1]	3.3 [1]
		Power	5.6	5.5	5.4	5.4	5.3	5.2	5.2	5.1	5
	90ºF [32.2ºC]	Total kBtu/h [kW]	33.9 [9.9]	32.7 [9.6]	31.5 [9.2]	27.9 [8.2]	27 [7.9]	26 [7.6]	23.7 [6.9]	22.8 [6.7]	22 [6.4]
		Sens kBtu/h [kW]	2.3 [0.7]	2.1 [0.6]	1.9 [0.6]	2.2 [0.6]	2 [0.6]	1.8 [0.5]	4 [1.2]	3.7 [1.1]	3.3 [1]
		Power	5.6	5.5	5.4	5.4	5.3	5.2	5.2	5.1	5.1

GROSS SYSTEMS PERFORMANCE DATA (HIGH REHEAT MODE) - (-)GEDYB102											
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1											
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]		
CFM [L/s]			4080 [1926]	3375 [1593]	2720 [1284]	4080 [1926]	3375 [1593]	2720 [1284]	4080 [1926]	3375 [1593]	2720 [1284]
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW]	69.8 [20.5]	67.3 [19.7]	64.9 [19]	50.2 [14.7]	48.3 [14.2]	46.6 [13.7]	50.1 [14.7]	48.2 [14.1]	46.5 [13.6]
		Sens kBtu/h [kW]	17.7 [5.2]	16.1 [4.7]	14.7 [4.3]	14.6 [4.3]	13.3 [3.9]	12.1 [3.5]	22.7 [6.6]	20.6 [6]	18.8 [5.5]
		Power	7.1	6.9	6.8	7	6.9	6.8	7.1	6.9	6.8
	70ºF [21.1ºC]	Total kBtu/h [kW]	64.5 [18.9]	62.1 [18.2]	60 [17.6]	44.9 [13.1]	43.2 [12.7]	41.7 [12.2]	44.8 [13.1]	43.1 [12.6]	41.6 [12.2]
		Sens kBtu/h [kW]	12.5 [3.7]	11.4 [3.3]	10.3 [3]	9.4 [2.8]	8.6 [2.5]	7.8 [2.3]	17.4 [5.1]	15.9 [4.7]	14.5 [4.2]
		Power	7.1	7	6.9	7.1	6.9	6.8	7.1	7	6.9
	80ºF [26.7ºC]	Total kBtu/h [kW]	60.8 [17.8]	58.5 [17.2]	56.5 [16.5]	41.1 [12.1]	39.6 [11.6]	38.2 [11.2]	41 [12]	39.5 [11.6]	38.1 [11.2]
		Sens kBtu/h [kW]	9 [2.6]	8.2 [2.4]	7.4 [2.2]	5.9 [1.7]	5.3 [1.6]	4.9 [1.4]	13.9 [4.1]	12.7 [3.7]	11.5 [3.4]
		Power	7.3	7.1	7	7.2	7.1	7	7.3	7.2	7
	90ºF [32.2ºC]	Total kBtu/h [kW]	58.6 [17.2]	56.4 [16.5]	54.5 [16]	39 [11.4]	37.5 [11]	36.2 [10.6]	38.9 [11.4]	37.4 [11]	36.1 [10.6]
		Sens kBtu/h [kW]	7.1 [2.1]	6.5 [1.9]	5.9 [1.7]	4 [1.2]	3.7 [1.1]	3.3 [1]	12.1 [3.5]	11 [3.2]	10 [2.9]
		Power	7.5	7.4	7.3	7.5	7.4	7.2	7.6	7.4	7.3
	100ºF [37.8ºC]	Total kBtu/h [kW]	58 [17]	55.9 [16.4]	53.9 [15.8]	38.4 [11.2]	37 [10.8]	35.7 [10.4]	38.3 [11.2]	36.9 [10.8]	35.6 [10.4]
		Sens kBtu/h [kW]	7 [2.1]	6.4 [1.9]	5.8 [1.7]	3.9 [1.1]	3.6 [1]	3.2 [0.9]	12 [3.5]	10.9 [3.2]	9.9 [2.9]
		Power	7.9	7.8	7.6	7.9	7.7	7.6	7.9	7.8	7.6
	110ºF [43.3ºC]	Total kBtu/h [kW]	59 [17.3]	56.8 [16.6]	54.8 [16.1]	39.3 [11.5]	37.9 [11.1]	36.6 [10.7]	39.2 [11.5]	37.8 [11.1]	36.5 [10.7]
		Sens kBtu/h [kW]	8.6 [2.5]	7.8 [2.3]	7.1 [2.1]	5.5 [1.6]	5 [1.5]	4.5 [1.3]	13.5 [4]	12.3 [3.6]	11.2 [3.3]
		Power	8.4	8.2	8.1	8.3	8.2	8	8.4	8.2	8.1
	120ºF [48.9ºC]	Total kBtu/h [kW]	61.5 [18]	59.2 [17.4]	57.2 [16.7]	41.9 [12.3]	40.3 [11.8]	38.9 [11.4]	41.8 [12.2]	40.2 [11.8]	38.8 [11.4]
		Sens kBtu/h [kW]	11.8 [3.5]	10.8 [3.2]	9.8 [2.9]	8.7 [2.6]	7.9 [2.3]	7.2 [2.1]	16.8 [4.9]	15.3 [4.5]	13.9 [4.1]
		Power	8.9	8.8	8.6	8.9	8.7	8.6	8.9	8.8	8.6

P. APPENDICES

Appendix D – Reheat Data for (-)GEDYB 10 Ton

GROSS SYSTEMS PERFORMANCE DATA (LOW REHEAT MODE) - (-)GEDYB120											
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1											
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]		
CFM [L/s]			2880 [1359]	2400 [1133]	1920 [906]	2880 [1359]	2400 [1133]	1920 [906]	2880 [1359]	2400 [1133]	1920 [906]
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW]	39.3 [11.5]	37.9 [11.1]	36.6 [10.7]	34 [10]	32.8 [9.6]	31.6 [9.3]	29.6 [8.7]	28.5 [8.4]	27.5 [8.1]
		Sens kBtu/h [kW]	3.9 [1.1]	3.6 [1]	3.2 [0.9]	3.7 [1.1]	3.4 [1]	3 [0.9]	4.9 [1.4]	4.5 [1.3]	4.1 [1.2]
		Power	4.8	4.7	4.7	4.8	4.8	4.7	4.9	4.8	4.8
	65ºF [18.3ºC]	Total kBtu/h [kW]	38.2 [11.2]	36.9 [10.8]	35.5 [10.4]	32.9 [9.6]	31.8 [9.3]	30.6 [9]	28.4 [8.3]	27.4 [8]	26.4 [7.7]
		Sens kBtu/h [kW]	2.5 [0.7]	2.3 [0.7]	2.1 [0.6]	2.3 [0.7]	2.1 [0.6]	1.9 [0.6]	3.5 [1]	3.2 [0.9]	2.9 [0.8]
		Power	4.9	4.8	4.7	4.9	4.8	4.7	5	4.9	4.8
	70ºF [21.1ºC]	Total kBtu/h [kW]	37.5 [11]	36.2 [10.6]	34.8 [10.2]	32.2 [9.4]	31.1 [9.1]	29.9 [8.8]	27.7 [8.1]	26.7 [7.8]	25.8 [7.6]
		Sens kBtu/h [kW]	1.7 [0.5]	1.6 [0.5]	1.4 [0.4]	1.5 [0.4]	1.3 [0.4]	1.2 [0.4]	2.7 [0.8]	2.5 [0.7]	2.2 [0.7]
		Power	4.9	4.8	4.8	4.9	4.9	4.8	5	4.9	4.9
	75ºF [23.9ºC]	Total kBtu/h [kW]	37.2 [10.9]	35.8 [10.5]	34.5 [10.1]	31.9 [9.3]	30.8 [9]	29.6 [8.7]	27.4 [8]	26.4 [7.7]	25.5 [7.5]
		Sens kBtu/h [kW]	1.5 [0.4]	1.4 [0.4]	1.3 [0.4]	1.3 [0.4]	1.2 [0.3]	1.1 [0.3]	2.5 [0.7]	2.3 [0.7]	2.1 [0.6]
		Power	5	4.9	4.8	5	4.9	4.9	5.1	5	4.9
	80ºF [26.7ºC]	Total kBtu/h [kW]	37.2 [10.9]	35.9 [10.5]	34.6 [10.1]	31.9 [9.4]	30.8 [9]	29.7 [8.7]	27.5 [8]	26.5 [7.8]	25.5 [7.5]
		Sens kBtu/h [kW]	2 [0.6]	1.8 [0.5]	1.6 [0.5]	1.8 [0.5]	1.6 [0.5]	1.5 [0.4]	3 [0.9]	2.7 [0.8]	2.5 [0.7]
		Power	5.1	5	4.9	5.1	5	4.9	5.2	5.1	5
	85ºF [29.4ºC]	Total kBtu/h [kW]	37.7 [11]	36.4 [10.7]	35 [10.3]	32.4 [9.5]	31.3 [9.2]	30.1 [8.8]	27.9 [8.2]	26.9 [7.9]	26 [7.6]
		Sens kBtu/h [kW]	3 [0.9]	2.8 [0.8]	2.5 [0.7]	2.8 [0.8]	2.6 [0.8]	2.3 [0.7]	4 [1.2]	3.7 [1.1]	3.4 [1]
		Power	5.2	5.1	5	5.2	5.2	5.1	5.3	5.2	5.1
	90ºF [32.2ºC]	Total kBtu/h [kW]	38.6 [11.3]	37.2 [10.9]	35.8 [10.5]	33.3 [9.7]	32.1 [9.4]	30.9 [9.1]	28.8 [8.4]	27.8 [8.1]	26.8 [7.8]
		Sens kBtu/h [kW]	4.7 [1.4]	4.3 [1.3]	3.9 [1.2]	4.5 [1.3]	4.1 [1.2]	3.7 [1.1]	5.7 [1.7]	5.2 [1.5]	4.8 [1.4]
		Power	5.4	5.3	5.2	5.4	5.3	5.2	5.5	5.4	5.3

GROSS SYSTEMS PERFORMANCE DATA (HIGH REHEAT MODE) - (-)GEDYB120											
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1											
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]		
CFM [L/s]			4800 [2265]	3940 [1859]	3200 [1510]	4800 [2265]	3940 [1859]	3200 [1510]	4800 [2265]	3940 [1859]	3200 [1510]
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW]	91.7 [26.9]	88.2 [25.8]	85.2 [25]	63.4 [18.6]	61 [17.9]	58.9 [17.3]	72.9 [21.4]	70.1 [20.5]	67.7 [19.8]
		Sens kBtu/h [kW]	21.7 [6.4]	19.7 [5.8]	18 [5.3]	15.5 [4.5]	14 [4.1]	12.8 [3.8]	26.5 [7.8]	24 [7]	21.9 [6.4]
		Power	7.7	7.6	7.5	7.6	7.5	7.3	7.7	7.6	7.4
	70ºF [21.1ºC]	Total kBtu/h [kW]	77.4 [22.7]	74.4 [21.8]	71.9 [21.1]	49.1 [14.4]	47.2 [13.8]	45.6 [13.4]	58.6 [17.2]	56.3 [16.5]	54.4 [15.9]
		Sens kBtu/h [kW]	15.2 [4.5]	13.8 [4]	12.6 [3.7]	8.9 [2.6]	8.1 [2.4]	7.4 [2.2]	19.9 [5.8]	18.1 [5.3]	16.5 [4.8]
		Power	7.7	7.6	7.5	7.6	7.4	7.3	7.7	7.5	7.4
	80ºF [26.7ºC]	Total kBtu/h [kW]	68 [19.9]	65.4 [19.2]	63.1 [18.5]	39.6 [11.6]	38.1 [11.2]	36.8 [10.8]	49.1 [14.4]	47.3 [13.9]	45.7 [13.4]
		Sens kBtu/h [kW]	11.2 [3.3]	10.2 [3]	9.3 [2.7]	5 [1.5]	4.5 [1.3]	4.1 [1.2]	16 [4.7]	14.5 [4.2]	13.2 [3.9]
		Power	7.9	7.8	7.6	7.8	7.6	7.5	7.9	7.7	7.6
	90ºF [32.2ºC]	Total kBtu/h [kW]	63.4 [18.6]	61 [17.9]	58.9 [17.3]	35.1 [10.3]	33.7 [9.9]	32.6 [9.5]	44.6 [13.1]	42.9 [12.6]	41.4 [12.1]
		Sens kBtu/h [kW]	9.8 [2.9]	8.9 [2.6]	8.1 [2.4]	3.6 [1]	3.2 [0.9]	2.9 [0.9]	14.5 [4.3]	13.2 [3.9]	12 [3.5]
		Power	8.3	8.1	8	8.1	8	7.9	8.2	8.1	8
	100ºF [43.3ºC]	Total kBtu/h [kW]	63.7 [18.7]	61.3 [17.9]	59.2 [17.3]	35.4 [10.4]	34 [10]	32.8 [9.6]	44.9 [13.1]	43.1 [12.6]	41.7 [12.2]
		Sens kBtu/h [kW]	11 [3.2]	9.9 [2.9]	9.1 [2.7]	4.7 [1.4]	4.3 [1.2]	3.9 [1.1]	15.7 [4.6]	14.2 [4.2]	13 [3.8]
		Power	8.9	8.7	8.6	8.7	8.6	8.4	8.8	8.7	8.5
	110ºF [43.3ºC]	Total kBtu/h [kW]	68.8 [20.2]	66.2 [19.4]	63.9 [18.7]	40.5 [11.9]	39 [11.4]	37.6 [11]	50 [14.7]	48.1 [14.1]	46.4 [13.6]
		Sens kBtu/h [kW]	14.7 [4.3]	13.3 [3.9]	12.1 [3.6]	8.4 [2.5]	7.6 [2.2]	7 [2]	19.4 [5.7]	17.6 [5.2]	16.1 [4.7]
		Power	9.6	9.5	9.3	9.5	9.3	9.2	9.6	9.4	9.3
	120ºF [48.9ºC]	Total kBtu/h [kW]	78.8 [23.1]	75.8 [22.2]	73.2 [21.5]	50.5 [14.8]	48.6 [14.2]	46.9 [13.7]	60 [17.6]	57.7 [16.9]	55.7 [16.3]
		Sens kBtu/h [kW]	20.9 [6.1]	19 [5.6]	17.3 [5.1]	14.7 [4.3]	13.3 [3.9]	12.1 [3.6]	25.6 [7.5]	23.3 [6.8]	21.2 [6.2]
		Power	10.6	10.4	10.2	10.5	10.3	10.1	10.6	10.4	10.2

Appendix D – Reheat Data for (-)GEDYB 12.5 Ton

GROSS SYSTEMS PERFORMANCE DATA (LOW REHEAT MODE) - (-)GEDYB150												
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1												
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]			
CFM [L/s]			3020 [1425]	2515 [1187]	2010 [949]	3020 [1425]	2515 [1187]	2010 [949]	3020 [1425]	2515 [1187]	2010 [949]	
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	43.9 [12.9] 16 [4.7] 4.6	42.4 [12.4] 14.7 [4.3] 4.5	40.8 [12] 13.3 [3.9] 4.4	42.2 [12.4] 20.3 [5.9] 4.5	40.8 [11.9] 18.5 [5.4] 4.4	39.3 [11.5] 16.8 [4.9] 4.4	33.9 [9.9] 13.2 [3.9] 4.5	32.7 [9.6] 12 [3.5] 4.4	31.5 [9.2] 10.9 [3.2] 4.4	
	65ºF [18.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	38.7 [11.3] 6 [1.8] 4.4	37.3 [10.9] 5.5 [1.6] 4.3	35.9 [10.5] 5 [1.5] 4.3	37 [10.8] 10.3 [3] 4.4	35.7 [10.5] 9.4 [2.8] 4.3	34.4 [10.1] 8.5 [2.5] 4.2	28.7 [8.4] 3.2 [0.9] 4.4	27.7 [8.1] 2.9 [0.8] 4.3	26.6 [7.8] 2.6 [0.8] 4.2	
	70ºF [21.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	34.8 [10.2] -1.1 [-0.3] 4.4	33.6 [9.8] -1 [-0.3] 4.3	32.4 [9.5] -0.9 [-0.3] 4.2	33.1 [9.7] 3.2 [0.9] 4.3	32 [9.4] 2.9 [0.8] 4.2	30.8 [9] 2.6 [0.8] 4.1	24.8 [7.3] -3.9 [-1.2] 4.3	24 [7] -3.6 [-1.1] 4.2	23.1 [6.8] -3.3 [-1] 4.2	
	75ºF [23.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	32.4 [9.5] -5.3 [-1.5] 4.4	31.3 [9.2] -4.8 [-1.4] 4.3	30.2 [8.8] -4.4 [-1.3] 4.2	30.8 [9] -1 [-0.3] 4.3	29.7 [8.7] -1 [-0.3] 4.2	28.6 [8.4] -0.9 [-0.3] 4.2	22.4 [6.6] -8.2 [-2.4] 4.3	21.6 [6.3] -7.5 [-2.2] 4.3	20.9 [6.1] -6.8 [-2] 4.2	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	31.5 [9.2] -6.6 [-1.9] 4.5	30.4 [8.9] -6 [-1.8] 4.4	29.3 [8.6] -5.5 [-1.6] 4.3	29.8 [8.7] -2.4 [-0.7] 4.4	28.8 [8.4] -2.2 [-0.6] 4.3	27.7 [8.1] -2 [-0.6] 4.3	21.5 [6.3] -9.5 [-2.8] 4.4	20.7 [6.1] -8.7 [-2.5] 4.3	20 [5.9] -7.9 [-2.3] 4.3	
	85ºF [29.4ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	32 [9.4] -5 [-1.5] 4.7	30.9 [9] -4.6 [-1.3] 4.6	29.7 [8.7] -4.2 [-1.2] 4.5	30.3 [8.9] -0.8 [-0.2] 4.6	29.2 [8.6] -0.7 [-0.2] 4.5	28.2 [8.3] -0.7 [-0.2] 4.4	22 [6.4] -7.9 [-2.3] 4.6	21.2 [6.2] -7.2 [-2.1] 4.5	20.4 [6] -6.5 [-1.9] 4.4	
	90ºF [32.2ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	33.9 [9.9] -0.6 [-0.2] 4.9	32.7 [9.6] -0.5 [-0.2] 4.8	31.5 [9.2] -0.5 [-0.1] 4.7	32.2 [9.4] 3.7 [1.1] 4.9	31.1 [9.1] 3.4 [1] 4.8	29.9 [8.8] 3 [0.9] 4.7	23.9 [7] -3.4 [-1] 4.9	23.1 [6.8] -3.1 [-0.9] 4.8	22.2 [6.5] -2.9 [-0.8] 4.7	

GROSS SYSTEMS PERFORMANCE DATA (HIGH REHEAT MODE) - (-)GEDYB150												
Entering Indoor Air @ 75ºF [23.9ºC] dbE 1												
wbE			65.3°F [18.5°C]			64°F [17.8°C]			62.5°F [16.9°C]			
CFM [L/s]			6000 [2832]	4300 [2029]	4000 [1888]	6000 [2832]	4300 [2029]	4000 [1888]	6000 [2832]	4300 [2029]	4000 [1888]	
Outdoor Dry Bulb Temperature	60ºF [15.6ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	86.7 [25.4] 22.2 [6.5] 9.4	80.9 [23.7] 18.8 [5.5] 9.1	79.9 [23.4] 18.2 [5.3] 9.1	85 [24.9] 30.1 [8.8] 9.2	79.3 [23.2] 25.4 [7.4] 8.9	78.3 [22.9] 24.6 [7.2] 8.8	76.8 [22.5] 39.8 [11.7] 9.3	71.7 [21] 33.6 [9.9] 9	70.8 [20.7] 32.5 [9.5] 9	
	70ºF [21.1ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	82 [24] 11.2 [3.3] 9.7	76.5 [22.4] 9.4 [2.8] 9.4	75.6 [22.1] 9.1 [2.7] 9.4	80.3 [23.5] 19 [5.6] 9.5	75 [22] 16.1 [4.7] 9.2	74 [21.7] 15.6 [4.6] 9.1	72.2 [21.1] 28.8 [8.4] 9.7	67.3 [19.7] 24.3 [7.1] 9.3	66.5 [19.5] 23.5 [6.9] 9.3	
	80ºF [26.7ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	77.2 [22.6] 2.1 [0.6] 10.3	72.1 [21.1] 1.7 [0.5] 9.9	71.1 [20.8] 1.7 [0.5] 9.8	75.5 [22.1] 9.9 [2.9] 10	70.5 [20.7] 8.4 [2.5] 9.7	69.6 [20.4] 8.1 [2.4] 9.6	67.4 [19.7] 19.7 [5.8] 10.2	62.8 [18.4] 16.6 [4.9] 9.8	62.1 [18.2] 16.1 [4.7] 9.8	
	90ºF [32.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	72.3 [21.2] -5.1 [-1.5] 11	67.4 [19.8] -4.3 [-1.3] 10.6	66.6 [19.5] -4.2 [-1.2] 10.5	70.6 [20.7] 2.8 [0.8] 10.7	65.9 [19.3] 2.4 [0.7] 10.4	65 [19.1] 2.3 [0.7] 10.3	62.4 [18.3] 12.5 [3.7] 10.9	58.2 [17.1] 10.6 [3.1] 10.5	57.5 [16.8] 10.2 [3] 10.4	
	100ºF [37.8ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	67.2 [19.7] -10.3 [-3] 11.9	62.7 [18.4] -8.7 [-2.5] 11.5	61.9 [18.1] -8.4 [-2.5] 11.4	65.5 [19.2] -2.4 [-0.7] 11.7	61.1 [17.9] -2 [-0.6] 11.3	60.3 [17.7] -1.9 [-0.6] 11.2	57.3 [16.8] 7.3 [2.2] 11.8	53.5 [15.7] 6.2 [1.8] 11.4	52.8 [15.5] 6 [1.8] 11.3	
	110ºF [43.3ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	62 [18.2] -13.5 [-4] 13	57.8 [16.9] -11.4 [-3.3] 12.6	57.1 [16.7] -11 [-3.2] 12.5	60.3 [17.7] -5.6 [-1.6] 12.8	56.2 [16.5] -4.7 [-1.4] 12.3	55.5 [16.3] -4.6 [-1.3] 12.3	52.1 [15.3] 4.1 [1.2] 12.9	48.6 [14.2] 3.5 [1] 12.5	48 [14.1] 3.4 [1] 12.4	
	120ºF [48.9ºC]	Total kBtu/h [kW] Sens kBtu/h [kW] Power	56.6 [16.6] -14.7 [-4.3] 14.3	52.8 [15.5] -12.4 [-3.6] 13.8	52.1 [15.3] -12 [-3.5] 13.8	54.9 [16.1] -6.9 [-2] 14.1	51.2 [15] -5.8 [-1.7] 13.6	50.6 [14.8] -5.6 [-1.6] 13.5	46.7 [13.7] 2.9 [0.8] 14.2	43.6 [12.8] 2.4 [0.7] 13.8	43 [12.6] 2.3 [0.7] 13.7	

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Appendix E – Heating Performance

Models: (-)GED **Gas Heat Performance Specifications**

Model (-)GEDYB	Heating Input Btu/h [kW] (1st Stage / 2nd Stage)	Heating Output Btu/h [kW] (1st Stage / 2nd Stage)	Temperature Rise Range ˚F [˚C] (1st Stage / 2nd Stage)	Steady State Efficiency (%)	No. Burners	No. Stages	Gas Connection Pipe Size In. [mm]
090A**15**A	105,000/150,000 [30.76/43.95]	85,050/121,500 [24.92/35.6]	10-40 [5.6-22.2] / 25-55 [13.9-30.6]	81	6	2	0.75 [19]
090A**20**A	143,000/205,000 [42.06/60.06]	116,200/166.050 [34.07/48.66]	20-50 [11.1-27.8] / 35-65 [19.4-36.1]	81	9	2	0.75 [19]
102A**15**A	105,000/150,000 [30.76/43.95]	85,050/121,500 [24.92/35.6]	5-35 [2.8-19.4] / 15-45 [8.3-25]	81	6	2	0.75 [19]
102A**22**A	157,500/225,000 [46.16/65.92]	127,500/182,250 [37.39/53.4]	15-45 [8.3-25] / 35-65 [19.4-36.1]	81	9	2	0.75 [19]
120A**15**A	105,000/150,000 [30.76/43.95]	85,050/121,500 [24.92/35.6]	10-40 [5.6-22.2] / 20-50 [11.1-27.8]	81	6	2	0.75 [19]
120A**22**A	157,500/225,000 [46.16/65.92]	127,500/182,250 [37.39/53.4]	15-45 [8.3-25] / 35-65 [19.4-36.1]	81	9	2	0.75 [19]
150A**15**A	105,000/150,000 [30.76/43.95]	85,050/121,500 [24.92/35.6]	5-35 [2.8-19.4] / 15-45 [8.3-25]	81	6	2	0.75 [19]
150A**22**A	157,500/225,000 [46.16/65.92]	127,500/182,250 [37.39/53.4]	10-40 [5.6-22.2] / 25-55 [13.9-30.6]	81	9	2	0.75 [19]

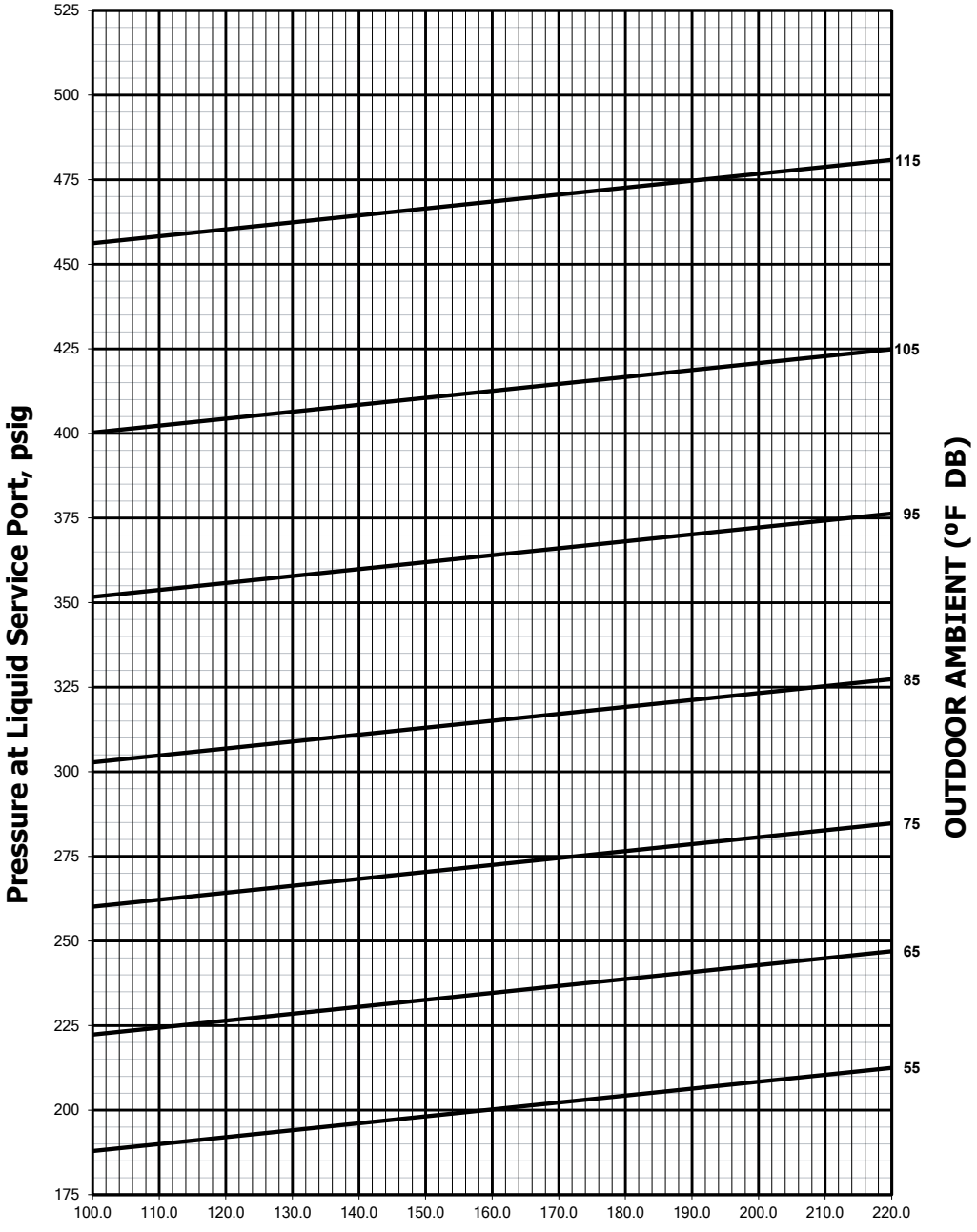
Appendix F. A2L Refrigerant Installation Safety Data

		(-)GEDYB090	(-)GEDYB102	(-)GEDYB120	(-)GEDYB150	(-)GEDYB090 w/ Reheat	(-)GEDYB102 w/ Reheat	(-)GEDYB120 w/ Reheat	(-)GEDYB150 w/ Reheat
Refrigerant Charge Weight (oz)		88	113.6	171.2	168	120	152	210.4	214.4
Minimum Circulation Airflow, Qmin (cfm)		293	378	569	559	399	506	700	713
Installed Altitude (ft above sea level)	Altitude Adjustment Factor	Minimum total space area, TAmin (sq-ft)							
0	1.000	162	209	316	310	221	280	388	395
1000	1.025	166	215	323	317	227	287	398	405
2000	1.051	170	220	332	325	232	294	408	415
3000	1.078	175	226	340	334	238	302	418	426
4000	1.107	180	232	349	343	245	310	429	437
5000	1.138	185	238	359	352	252	319	441	450
6000	1.170	190	245	369	362	259	328	454	462
6500	1.187	193	249	375	368	263	333	460	469

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Appendix G – Refrigerant Charging Charts

7.5 TON COOLING CHARGE CHART



Design Target Subcooling At 95°F: 15.75 ± 0.5°F.

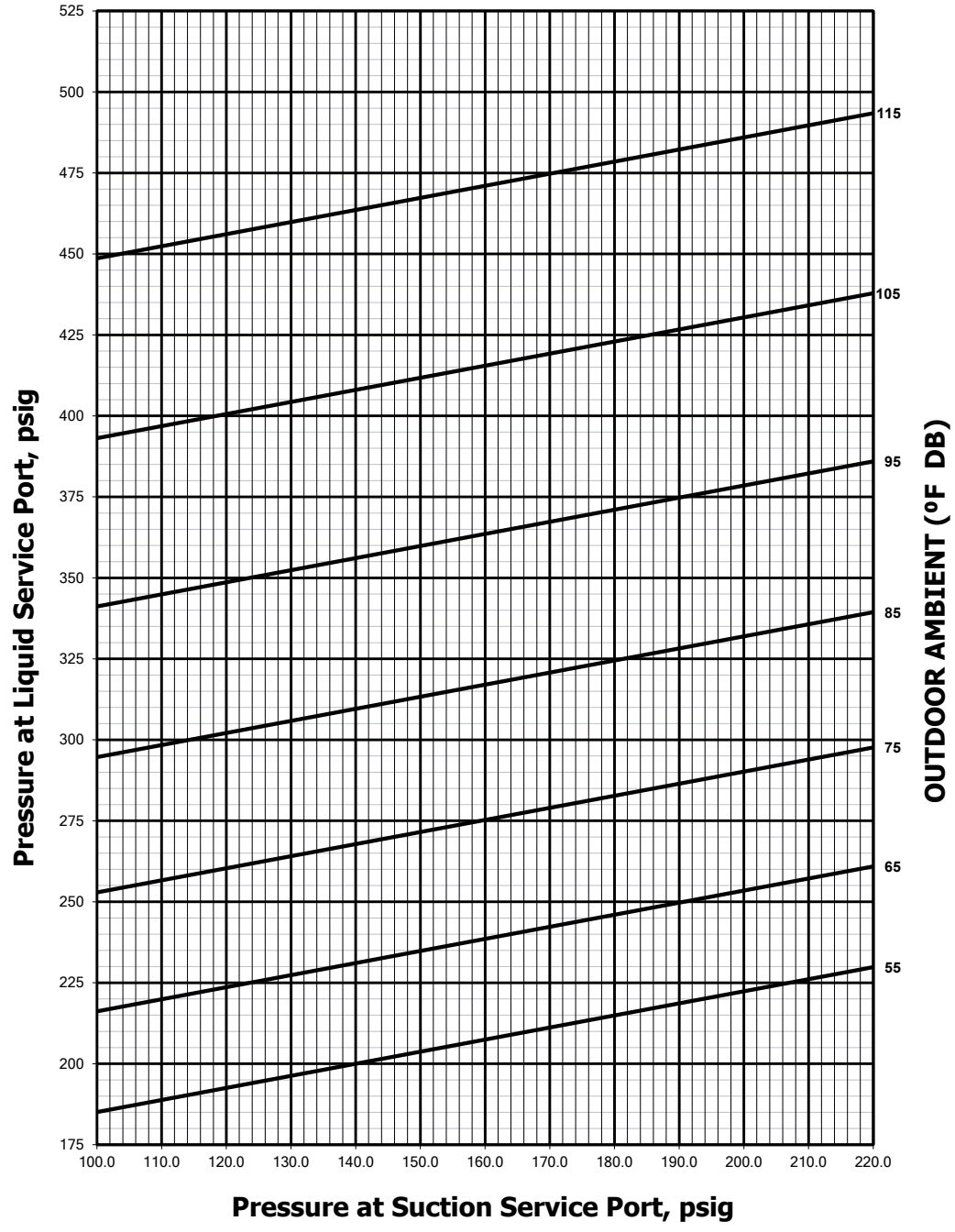
NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-01-00

Appendix G – Refrigerant Charging Charts (Cont.)

7.5 TON REHEAT COOLING CHARGE CHART



Design Target Subcooling At 95°F: 14.0 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

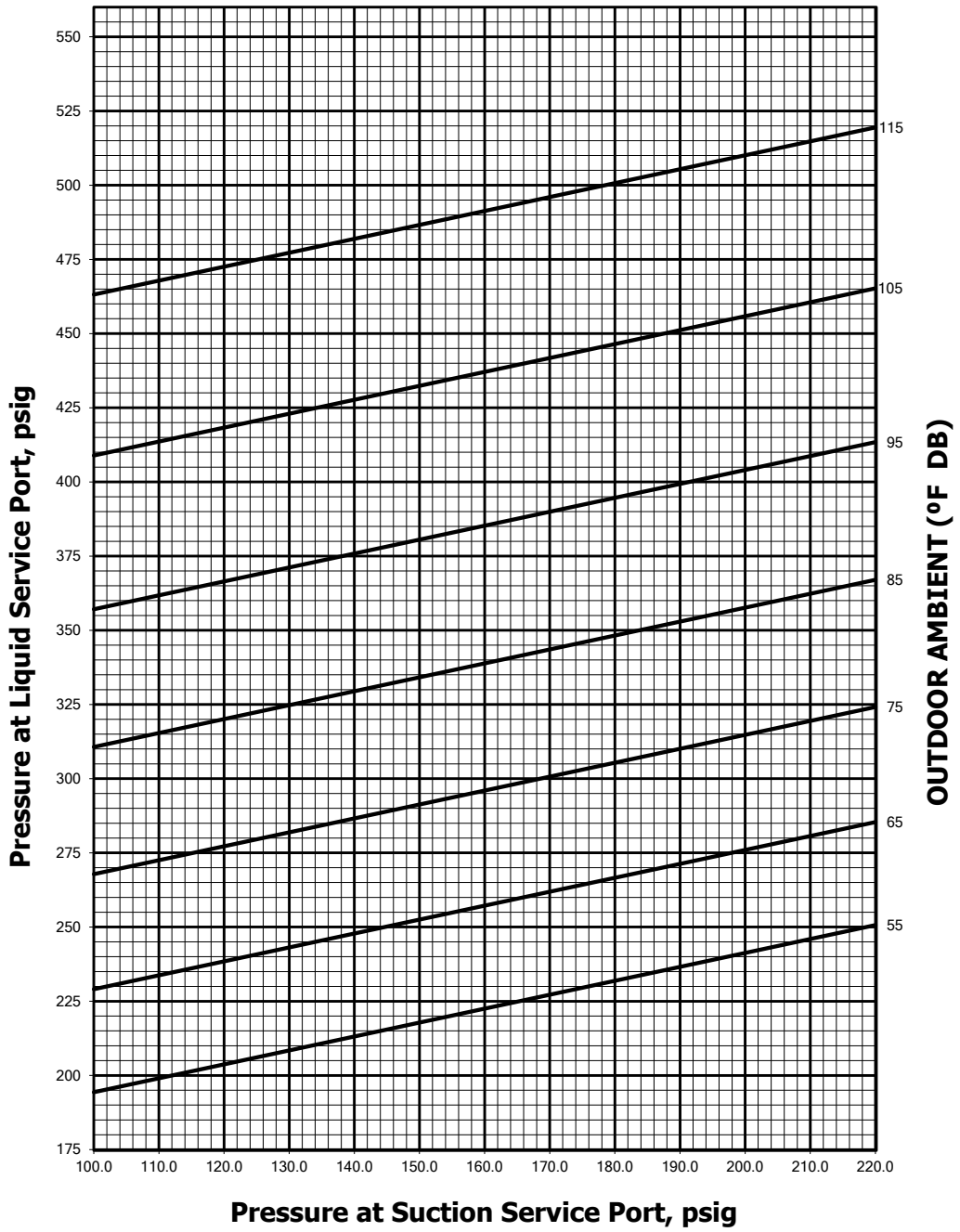
Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-02-00

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Appendix G – Refrigerant Charging Charts (Cont.)

8.5 TON COOLING CHARGE CHART



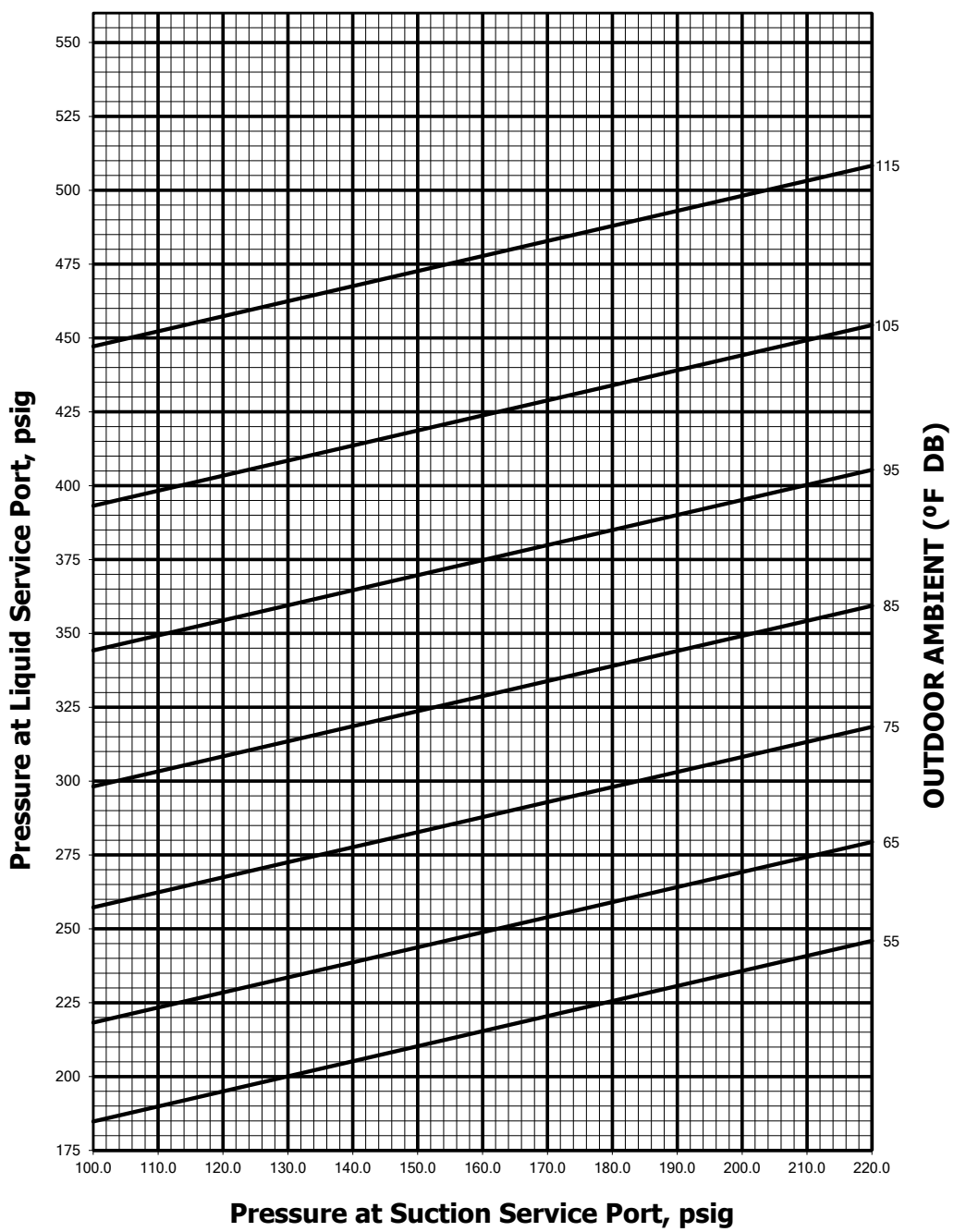
Design Target Subcooling At 95°F: 15.4 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-03-00

Appendix G – Refrigerant Charging Charts (Cont.)



Design Target Subcooling At 95°F: 14.75 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

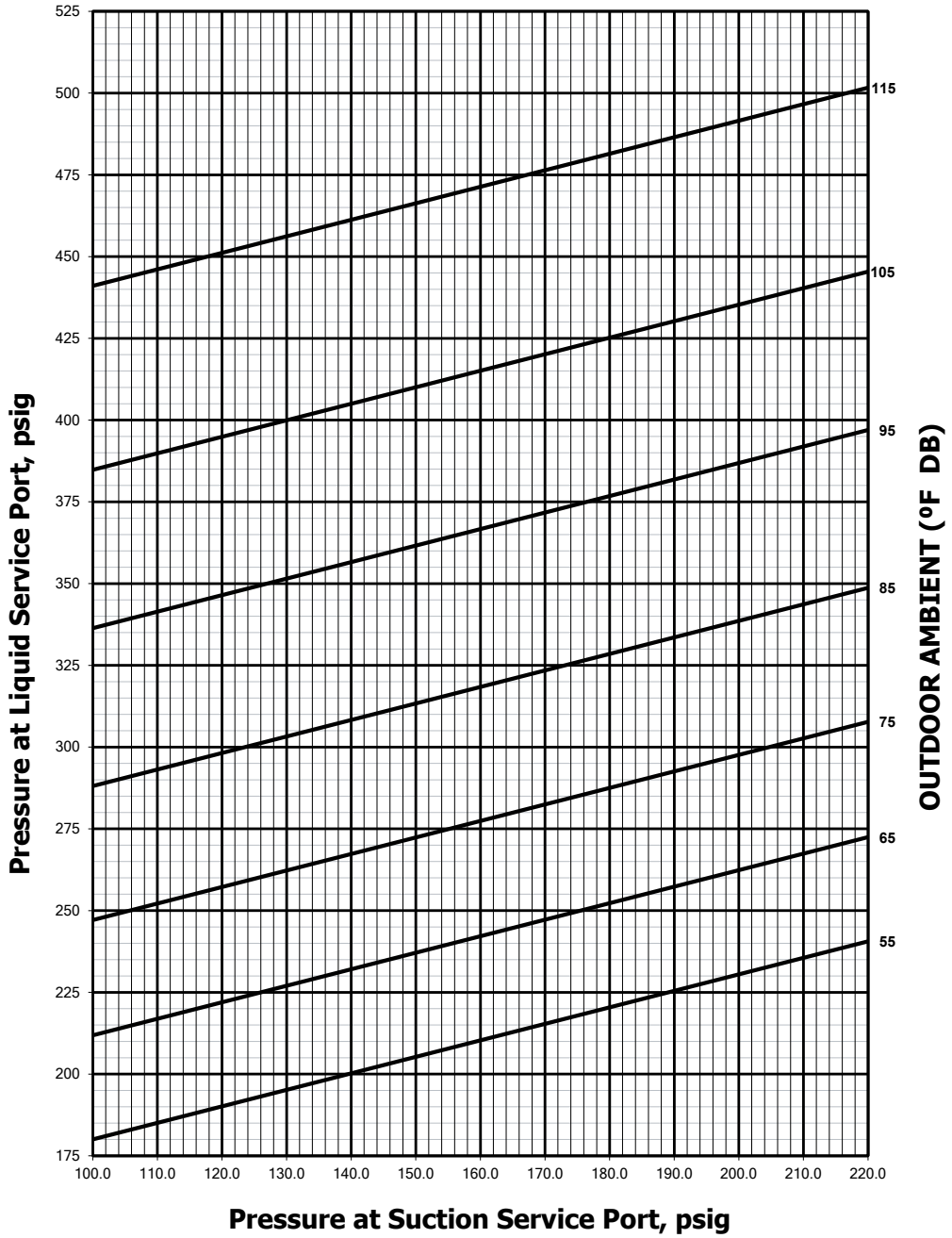
Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-04-00

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Appendix G – Refrigerant Charging Charts (Cont.)

10 TON COOLING CHARGE CHART



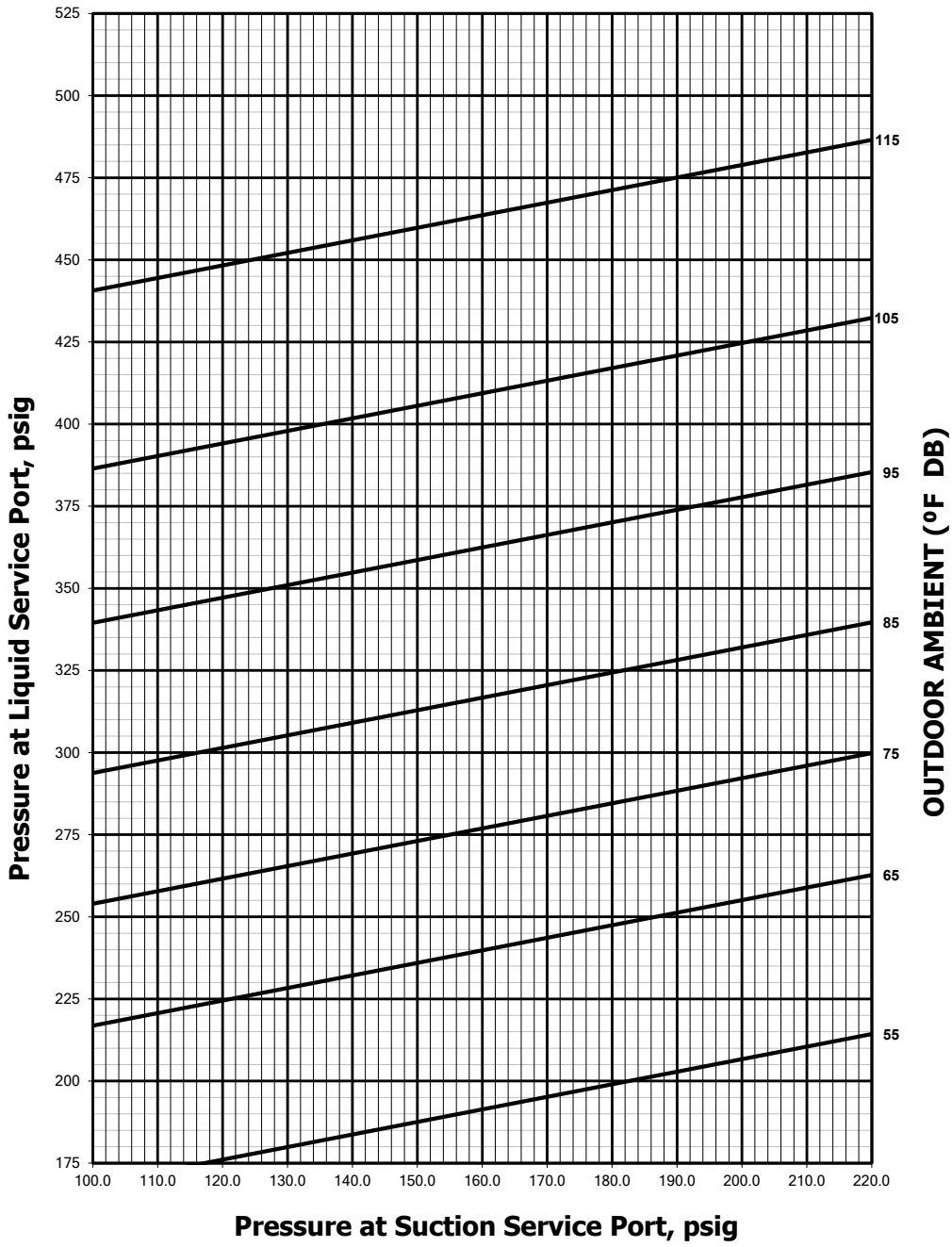
Design Target Subcooling At 95°F: 16.5 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-05-00

Appendix G – Refrigerant Charging Charts (Cont.)



Design Target Subcooling At 95°F: 17.25 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

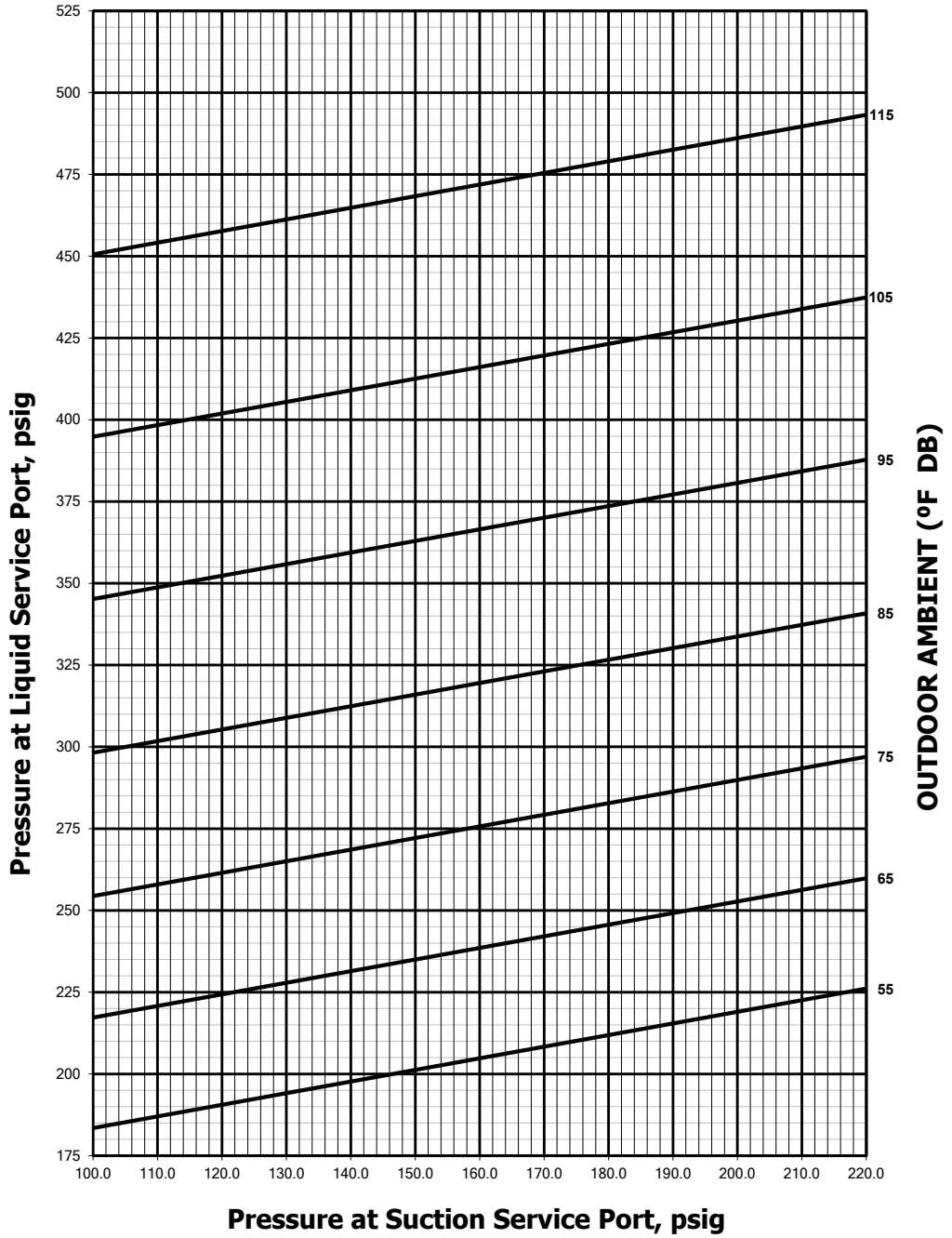
Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-06-00

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Appendix G – Refrigerant Charging Charts (Cont.)

12.5 TON COOLING CHARGE CHART



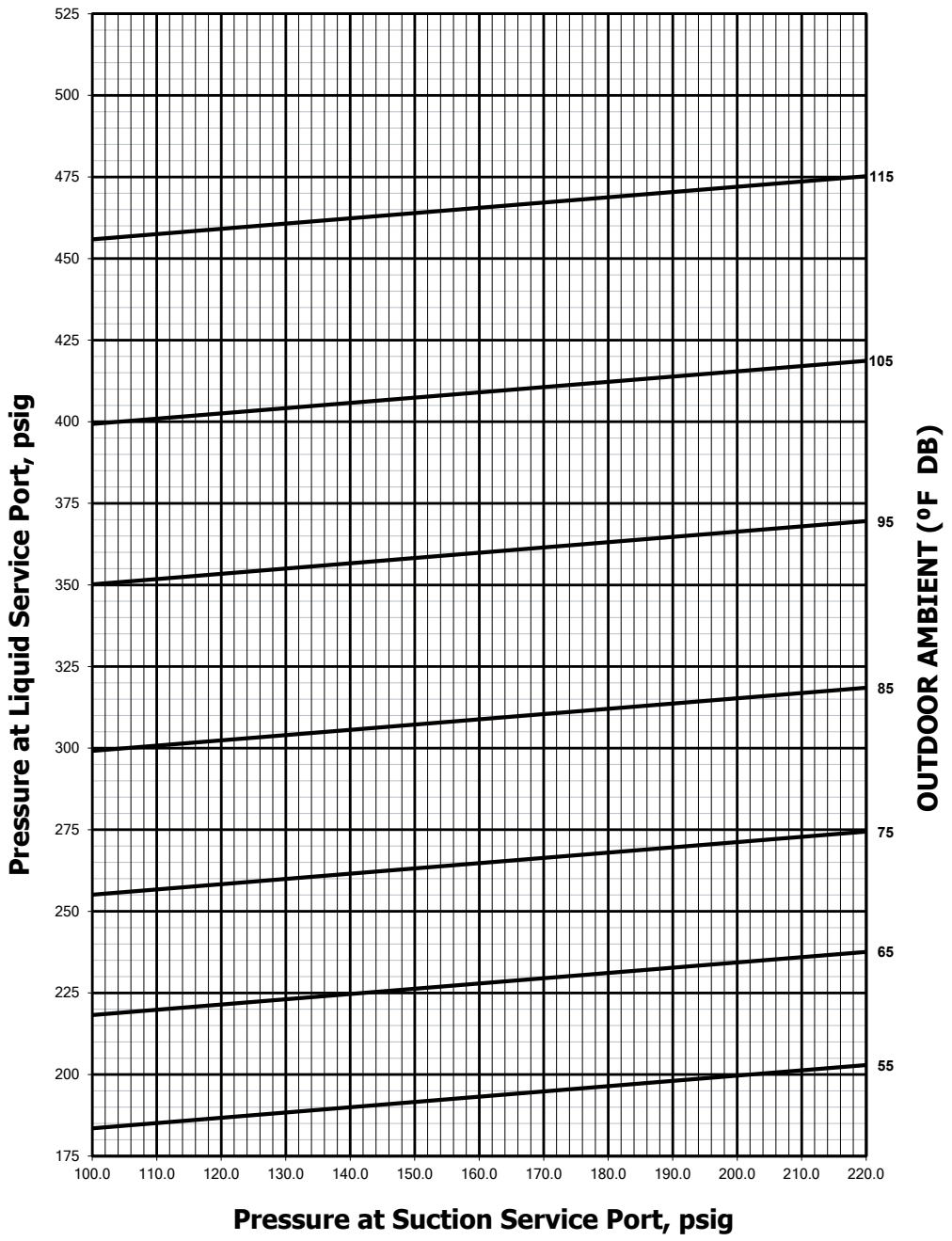
Design Target Subcooling At 95°F: 12.0 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-07-01

Appendix G – Refrigerant Charging Charts (Cont.)



Design Target Subcooling At 95°F: 13.0 ± 0.5°F.

NOTE: Factory charge chart and/or design target subcooling are for gross charge verification. Any adjustment shall not exceed 2% of the total refrigerant weight listed on the rating plate of the unit and should not supersede correctly weighed-in refrigerant.

Refer to the refrigerant charge verification and adjustment section in the I&O manual for instructions on using this charge chart.

92-110039-08-00

P. APPENDICES

Appendix G – Refrigerant Charging Charts (Cont.)

PRESSURE REQUIREMENTS – GROSS CHARGE CHECK (REFER CHARGE CHART)

OUTDOOR DRY BULB (°F)	7.5 -TON	7.5 - TON with reheat	8.5 -TON	8.5 - TON with reheat	10 -TON	10 - TON with reheat	12.5 -TON	12.5 - TON with reheat
	LIQUID /VAPOR PRESSURE (PSIG)							
115	464/139	462/135	479/135	465/135	452/140	455/138	461/128	461/129
105	408/136	406/133	424/132	410/133	400/138	400/135	404/125	404/127
95	359/133	353/132	371/130	360/131	349/136	352/133	354/124	355/127
85	309/130	306/130	324/129	313/129	303/134	306/131	307/122	303/124
75	266/126	263/127	280/127	271/127	263/132	265/128	292/123	359/123
65	227/123	225/124	240/124	231/125	227/130	227/126	225/120	223/121
55	192/119	193/120	204/120	196/122	193/124	183/137	190/118	187/119

SUB COOLING REQUIREMENTS – FINAL CHARGE VERIFICATION

OUTDOOR DRY BULB (°F)	7.5 -TON	7.5 - TON with reheat	8.5 -TON	8.5 - TON with reheat	10 -TON	10 - TON with reheat	12.5 -TON	12.5 - TON with reheat
	SUBCOOLING (°F)							
115	16.9	16.1	16.3	15.8	12.7	16.6	13.0	14.4
105	16.4	15.4	16.3	14.8	12.3	16.1	12.4	13.4
95	15.8	14.7	15.4	13.5	12.2	16.4	11.6	12.9
85	15.3	13.8	14.2	12.3	12.1	15.5	9.6	9.8
75	14.6	13.2	13.0	11.2	13.2	15.2	8.7	7.7
65	13.3	12.7	11.8	10.5	13.5	14.6	4.3	6.5
55	12.7	12.9	11.2	10.4	14.2	10.5	4.3	7.5

Charge verification instructions:

1. Allow the unit to operate for 15 minutes before checking or adjusting the charge.

2. Ensure that the contamination of different refrigerants does not occur when using charging equipment. Hoses of lines shall be as short as possible to minimize the amount of refrigerant contained in them.

3.Ensure that the unit is properly grounded.

4. Return air temperature must be within comfort conditions (72°F - 82°F).

5. Remove caps from the high-side and low-side pressure service fittings.

6.Cylinders shall be kept in an upright position for the entirety of the testing and charging procedure.

7. Record the following measurements:

   a. High-side pressure at service fitting

   b. Liquid line temperature

8. Using R-454B refrigerant saturation T-P tables, find the corresponding refrigerant saturation temperature relative to the measured high-side pressure.

9. To determine subcooling, subtract the liquid line temperature measured in Step 7 from the saturation temperature found in Step 8.

10. Compare the subcooling result from Step 9 to the subcooling table located on the unit or in the I&O manual.

11. If the subcooling value from Step 9 is more than 1°F above the value listed in the subcooling table, remove charge to match the value listed in the table, ± 0.5°F.

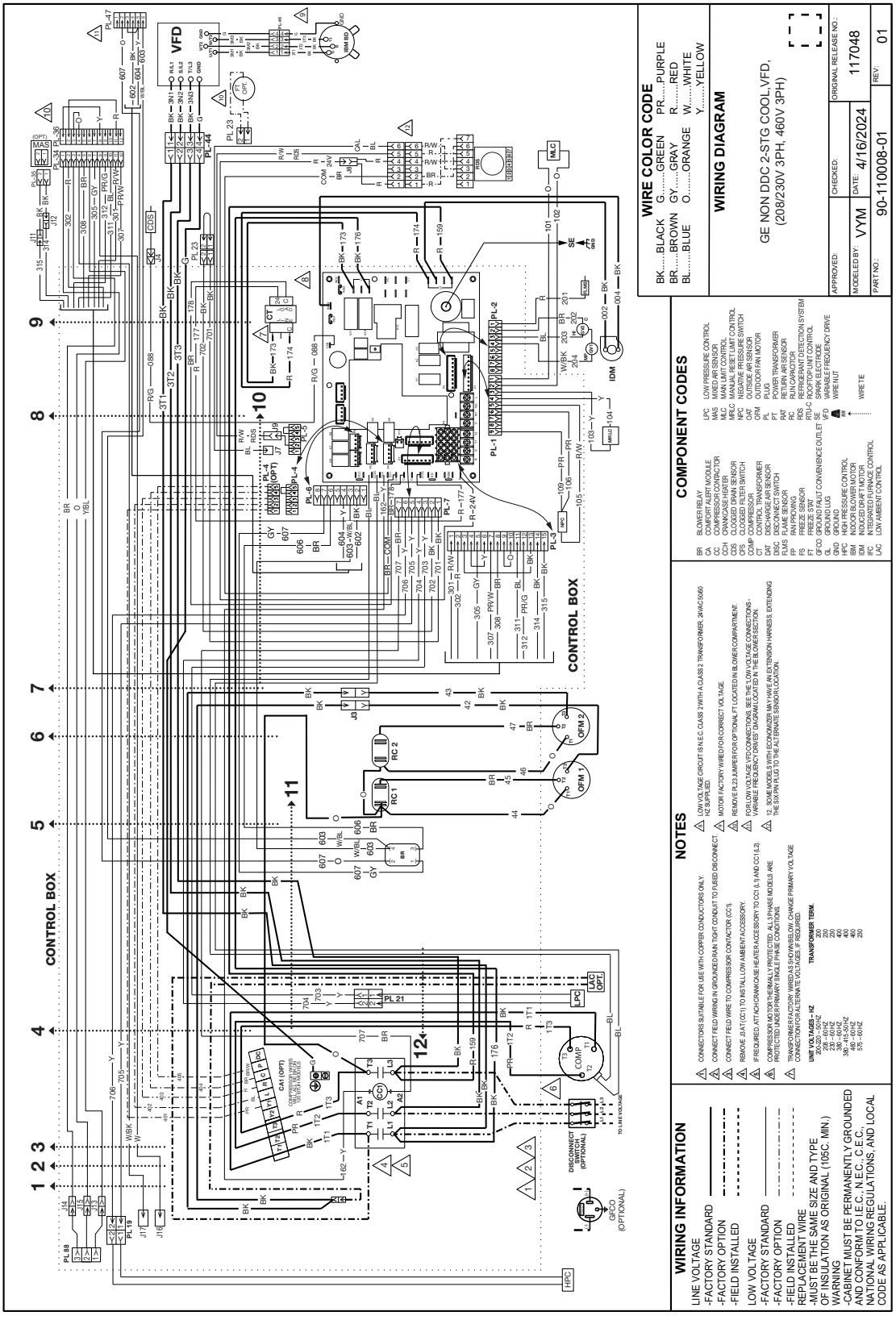
   a.Take extreme care not to overfill the refrigerating system.

12. If the subcooling value from Step 9 is more than 1°F below the value listed in the subcooling table, add charge to match the value listed in the table, ± 0.5°F.

   a.Take extreme care not to overfill the refrigerating system.

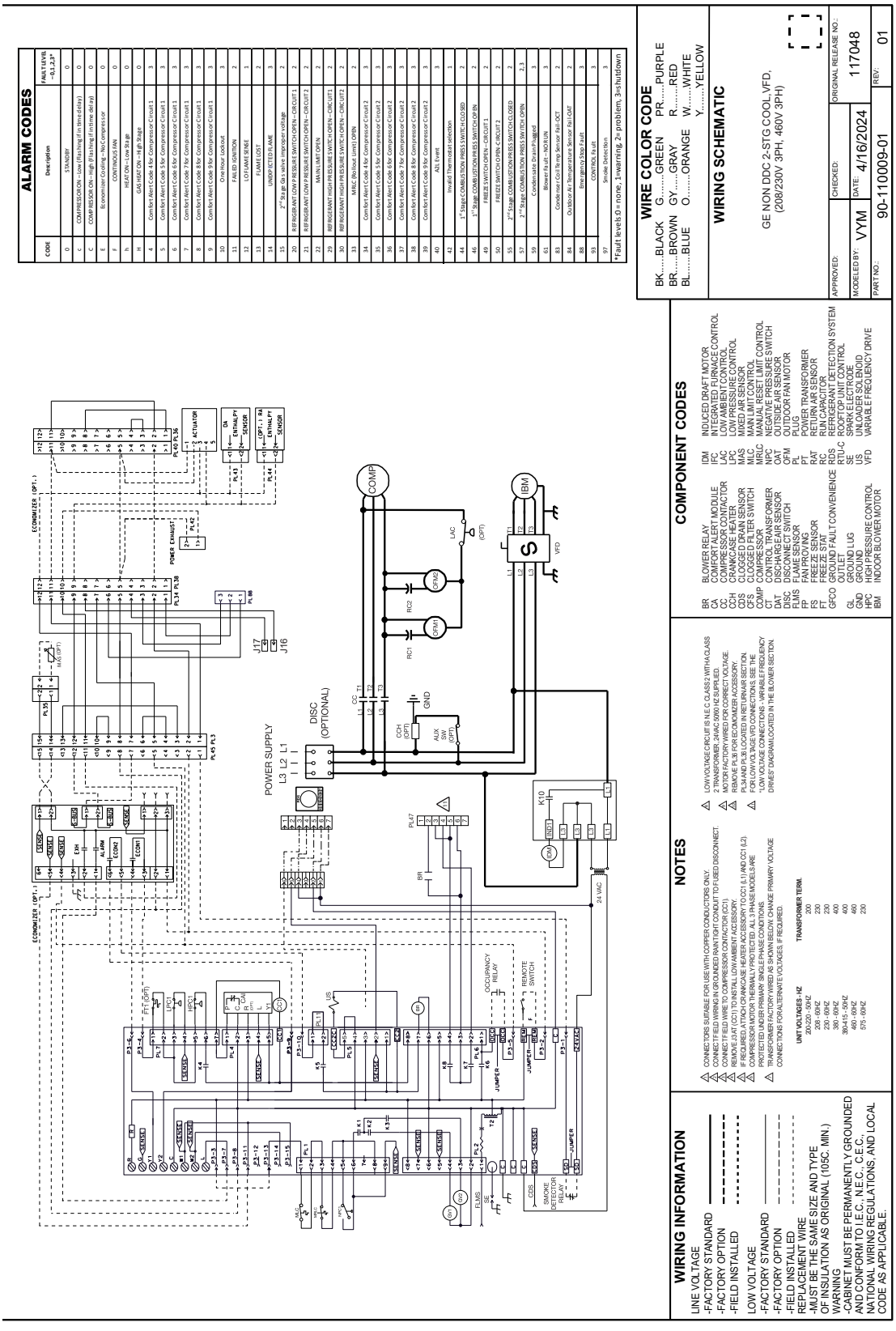
After charging is complete, a leak test must be done. Before leaving the site an additional leak test must also be done at the end of the installation. Refer to ***J.1.1.3. Removal and Evacuation of Refrigerant.***

Appendix H. Wiring Diagrams & Schematics

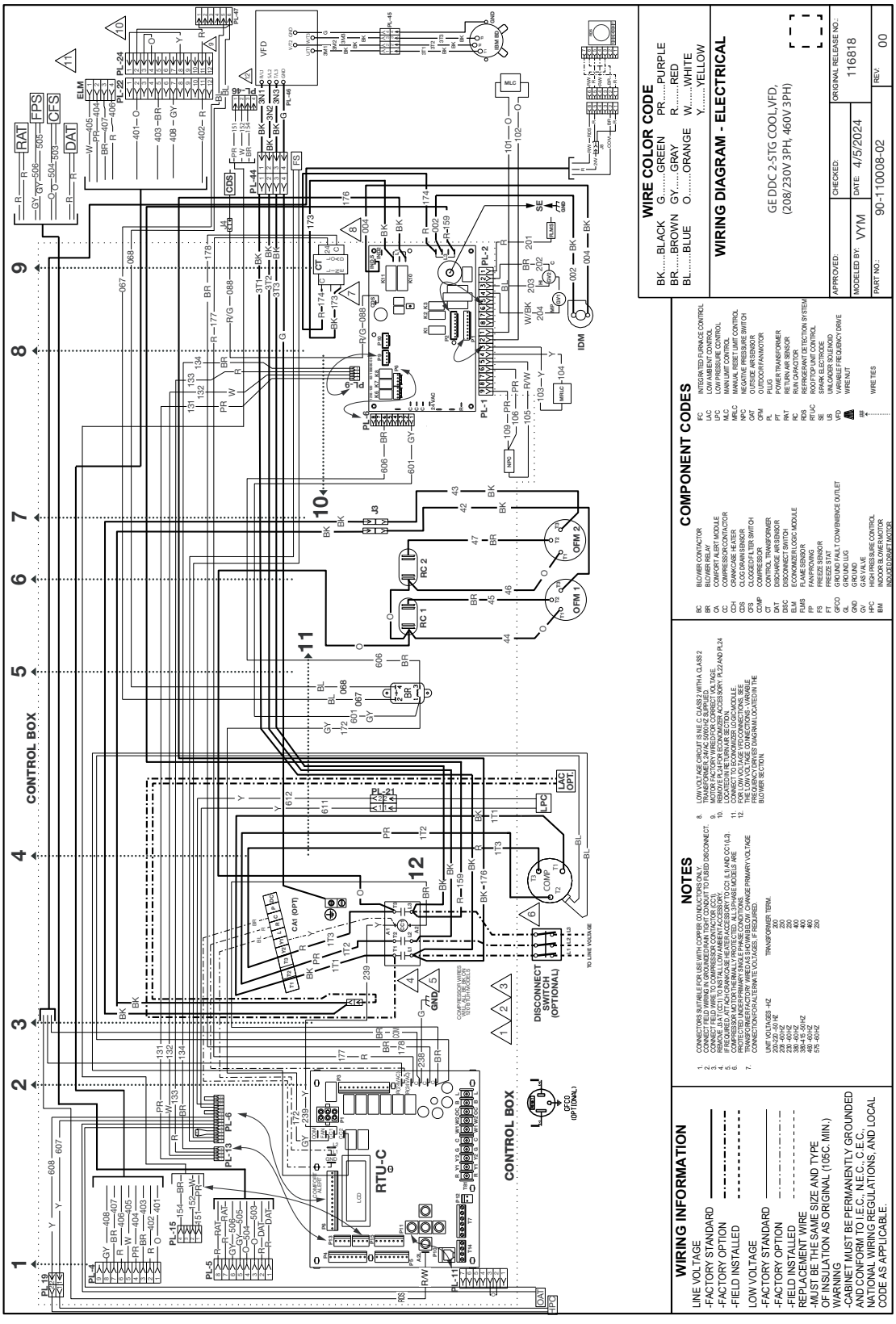


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Appendix H. Wiring Diagrams & Schematics (Cont.)

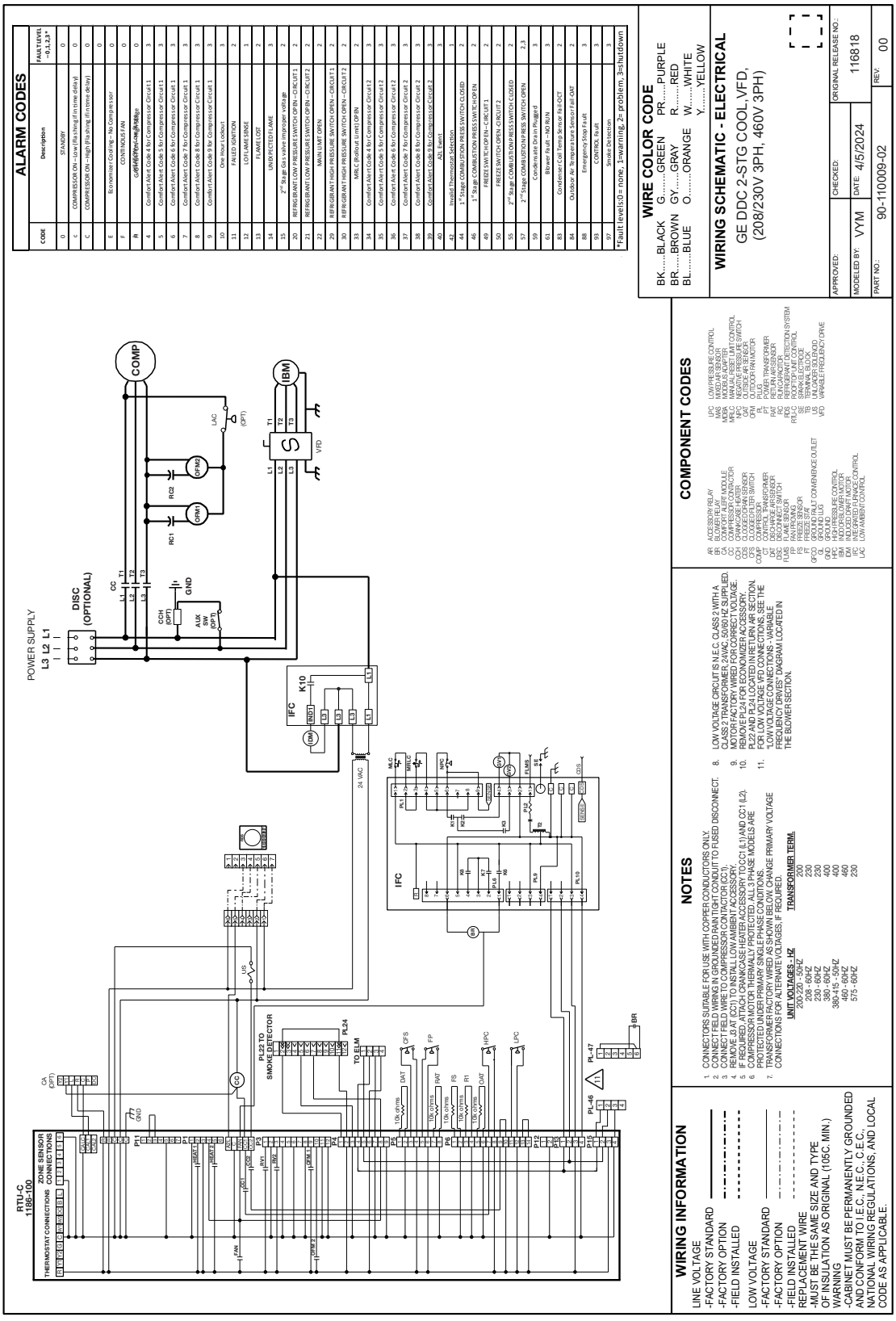


Appendix H. Wiring Diagrams & Schematics (Cont.)

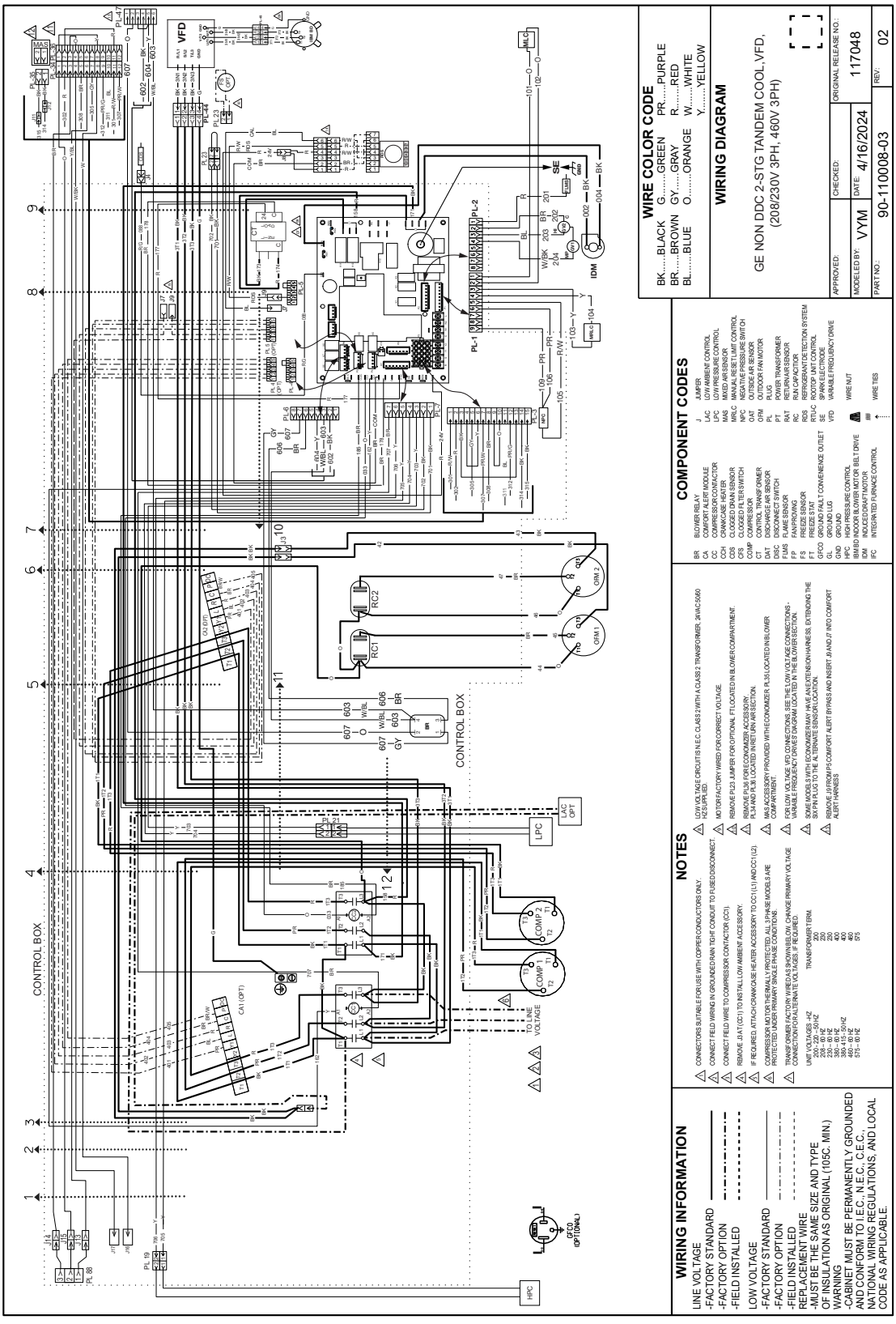


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Appendix H. Wiring Diagrams & Schematics (Cont.)

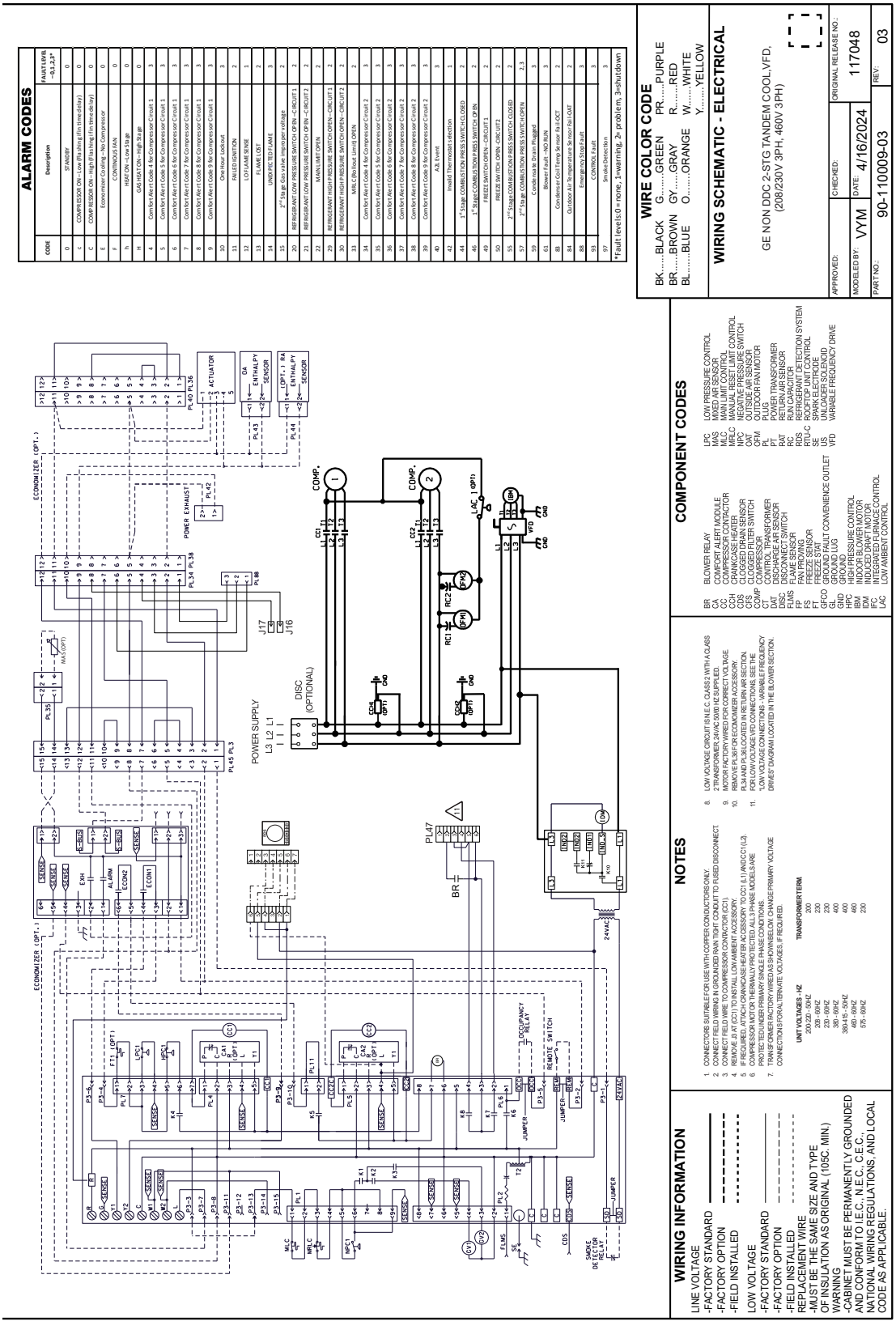


Appendix H. Wiring Diagrams & Schematics (Cont.)

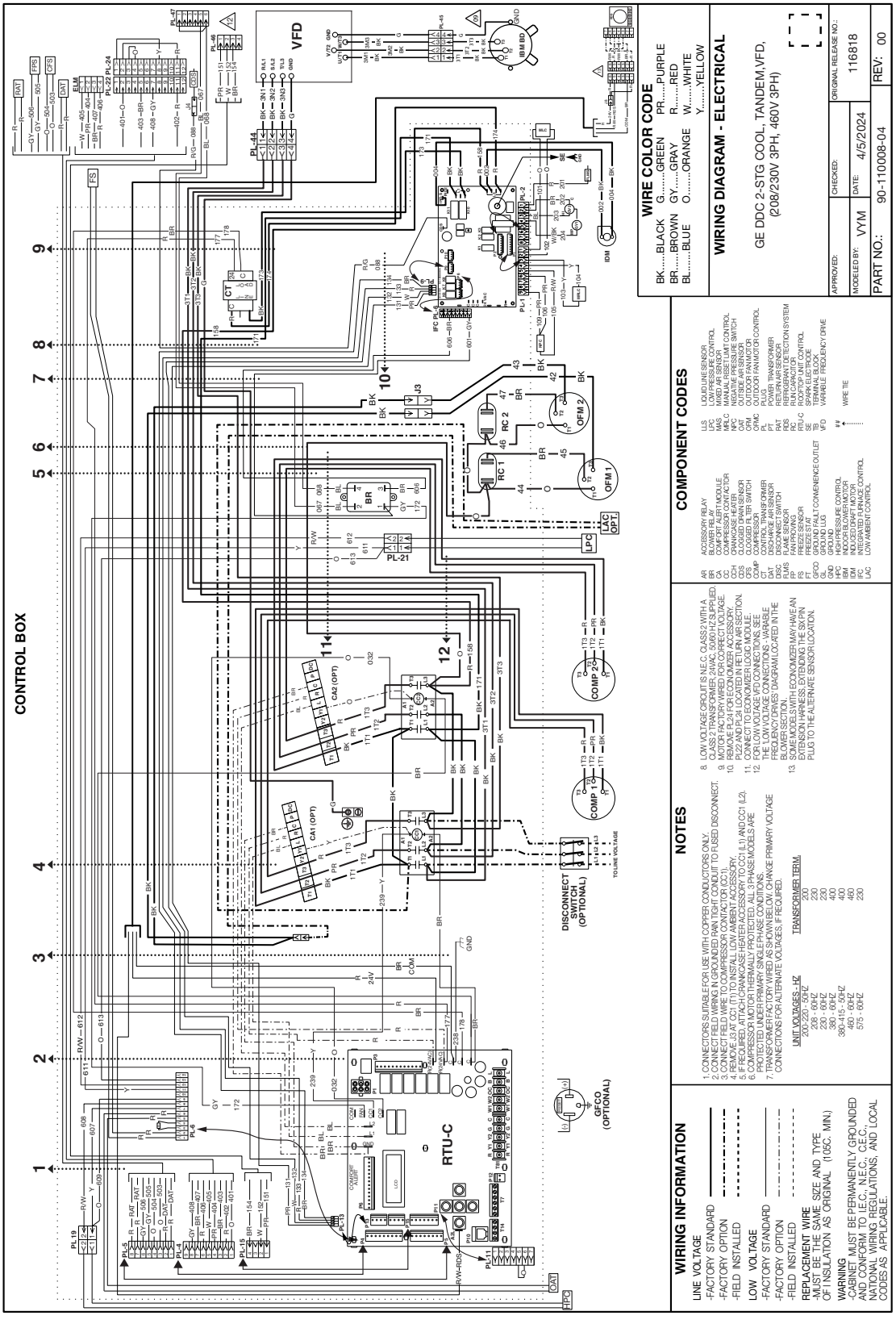


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Appendix H. Wiring Diagrams & Schematics (Cont.)

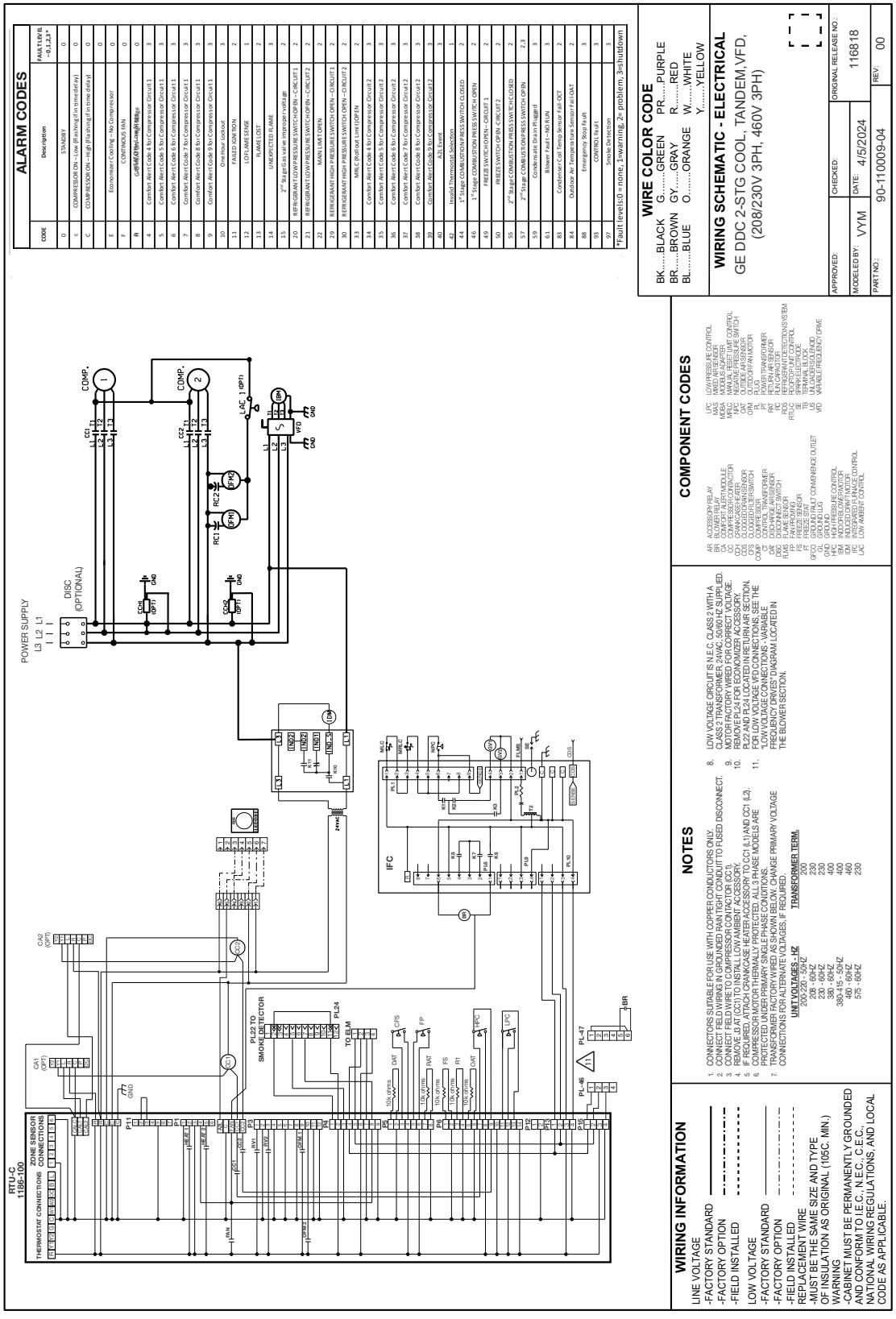


Appendix H. Wiring Diagrams & Schematics (Cont.)

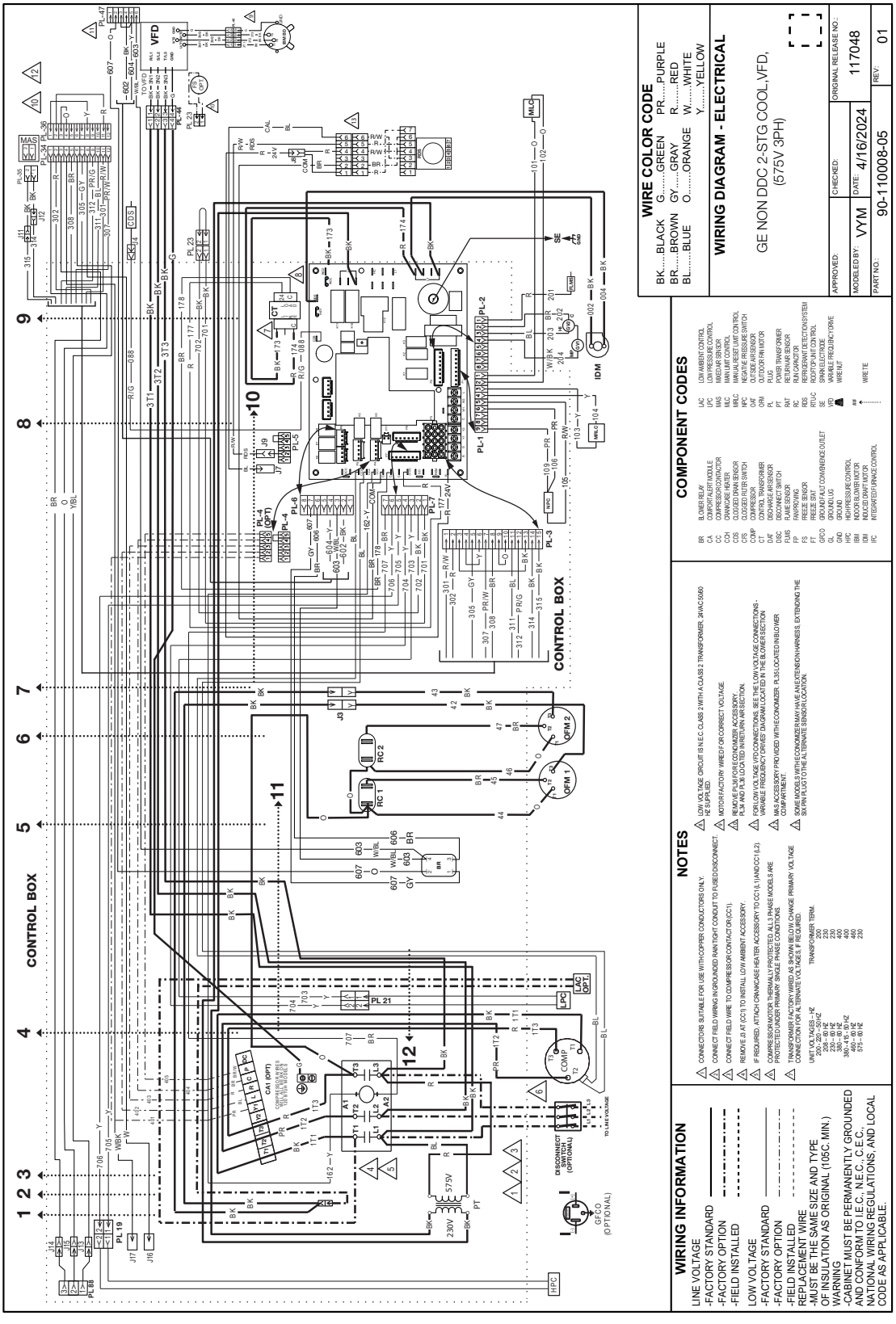


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Appendix H. Wiring Diagrams & Schematics (Cont.)

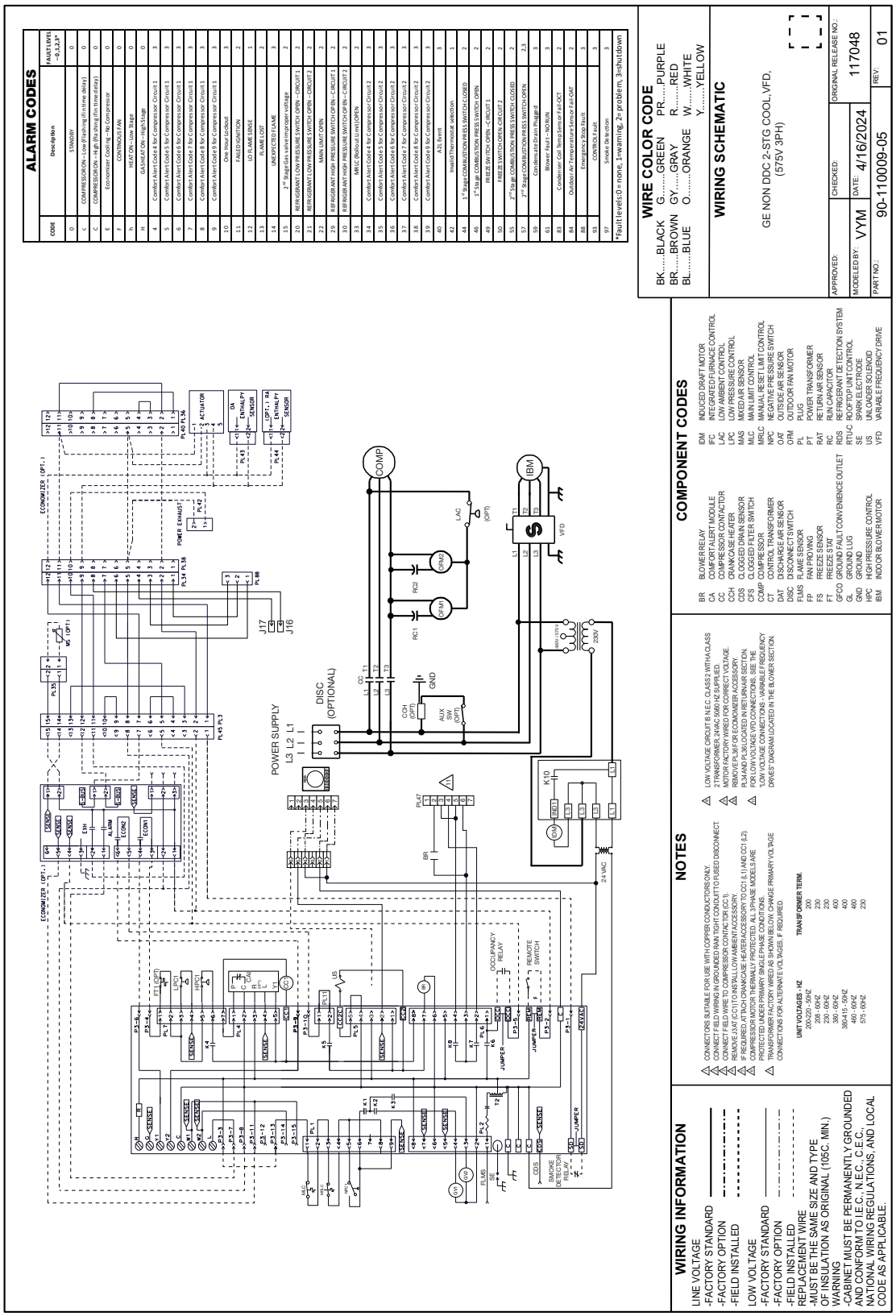


Appendix H. Wiring Diagrams & Schematics (Cont.)

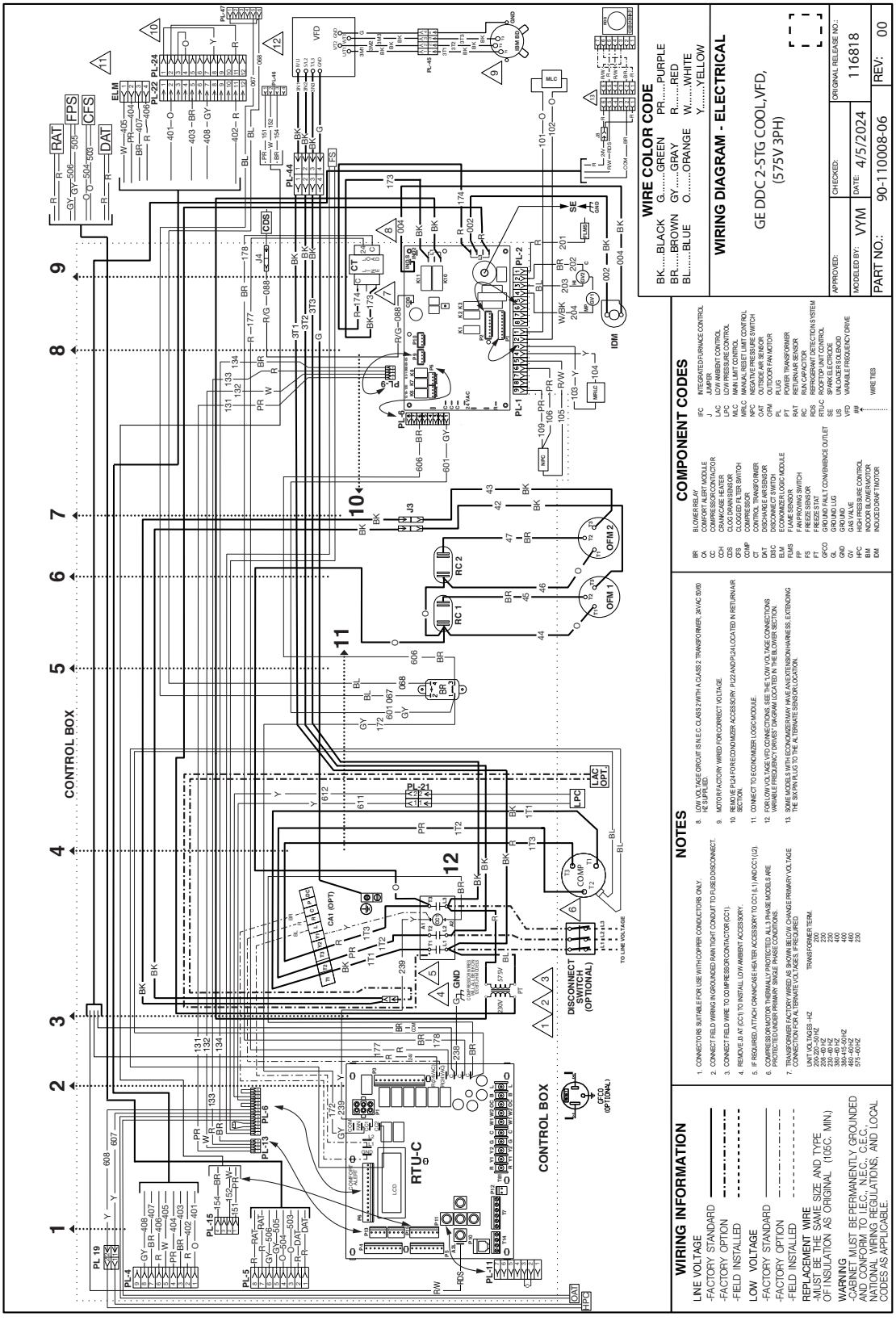


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Appendix H. Wiring Diagrams & Schematics (Cont.)

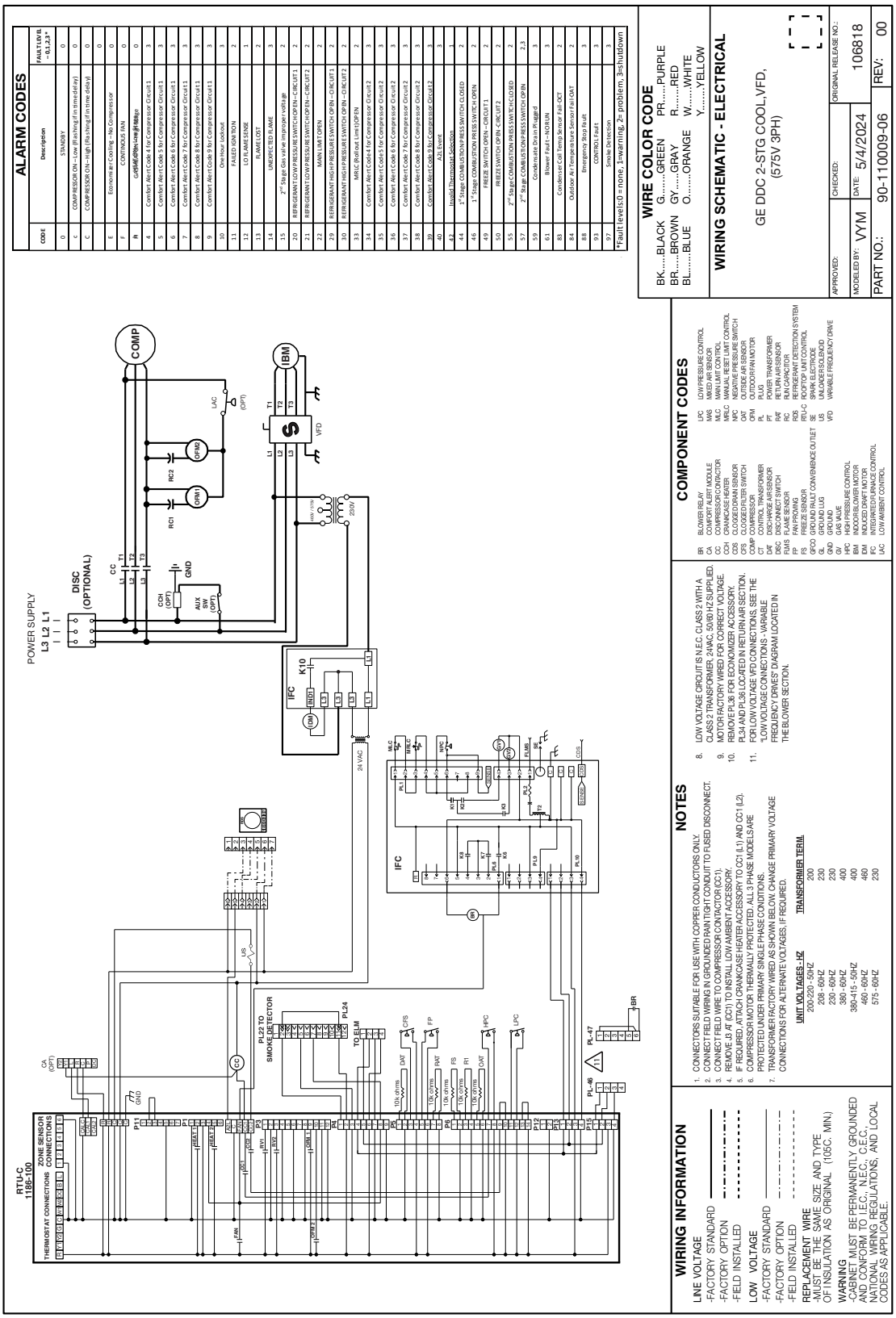


Appendix H. Wiring Diagrams & Schematics (Cont.)

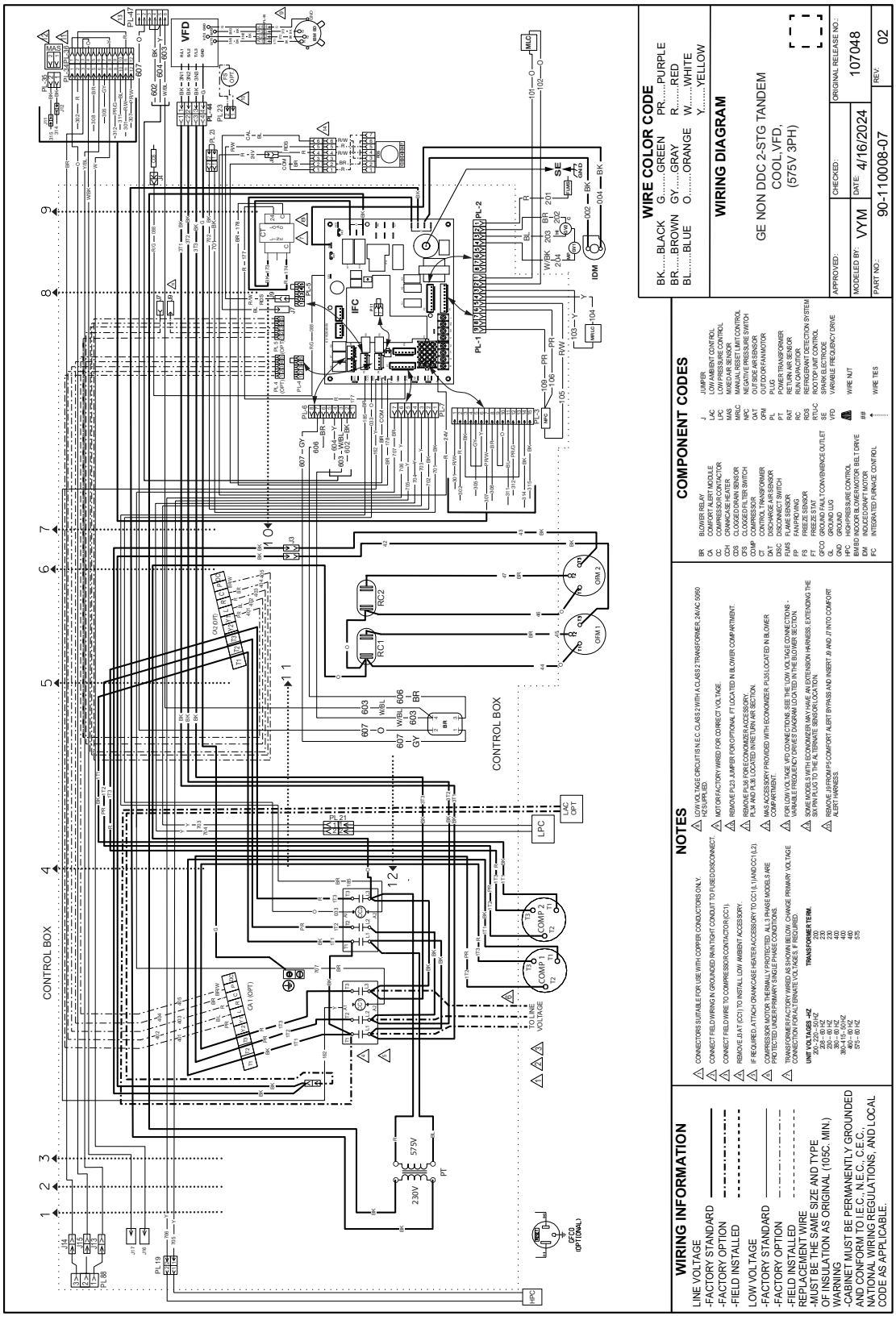


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Appendix H. Wiring Diagrams & Schematics (Cont.)

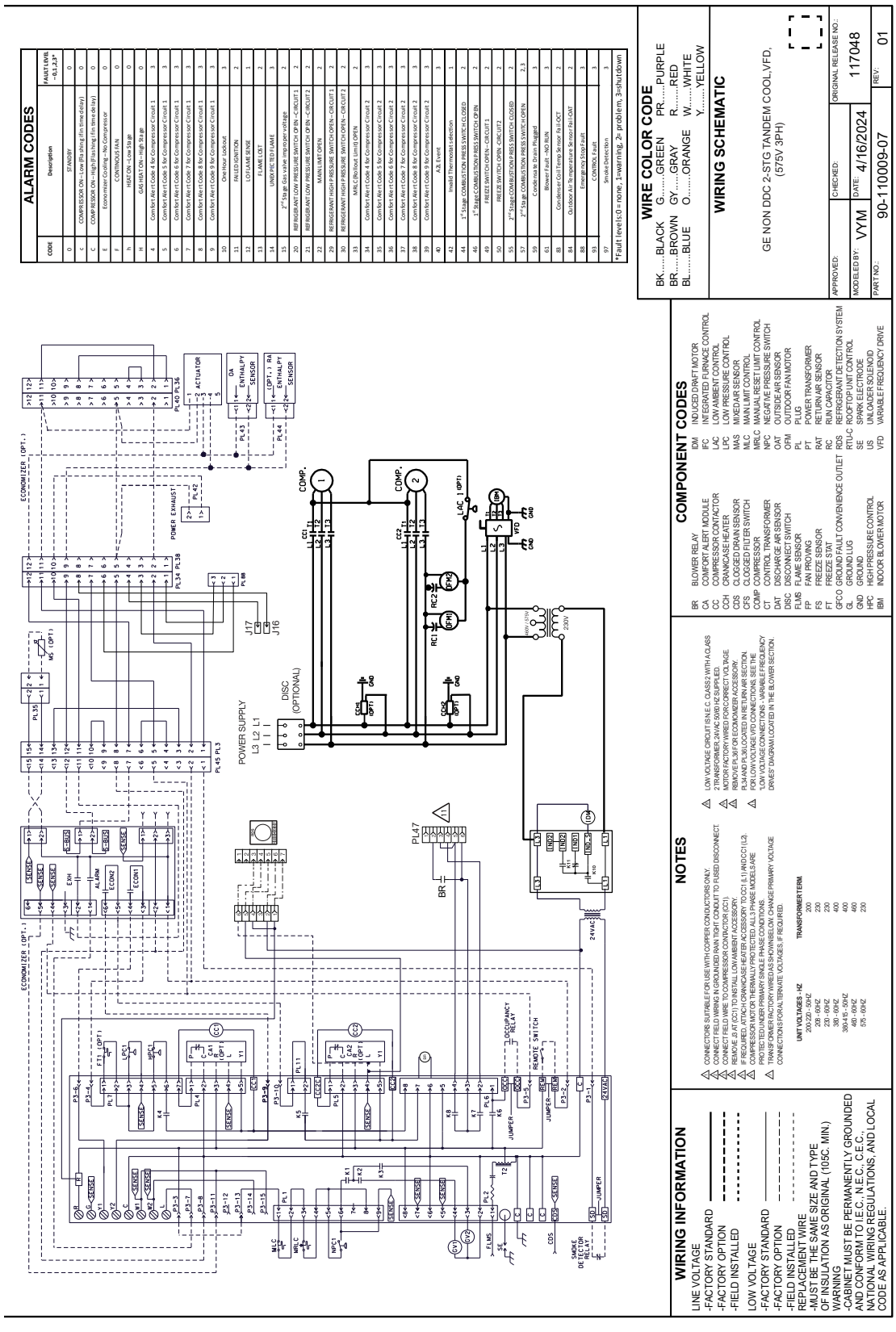


Appendix H. Wiring Diagrams & Schematics (Cont.)

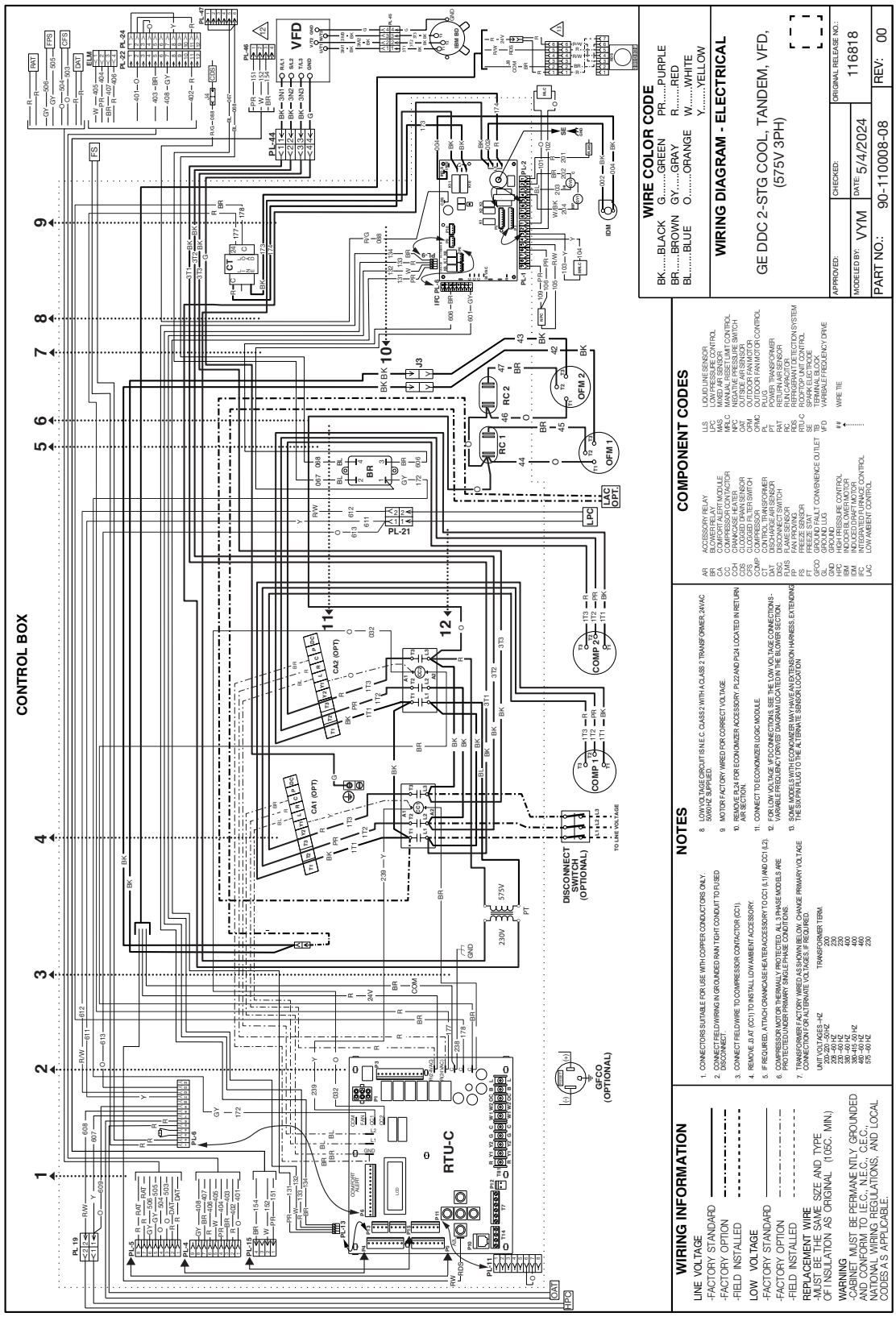


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Appendix H. Wiring Diagrams & Schematics (Cont.)

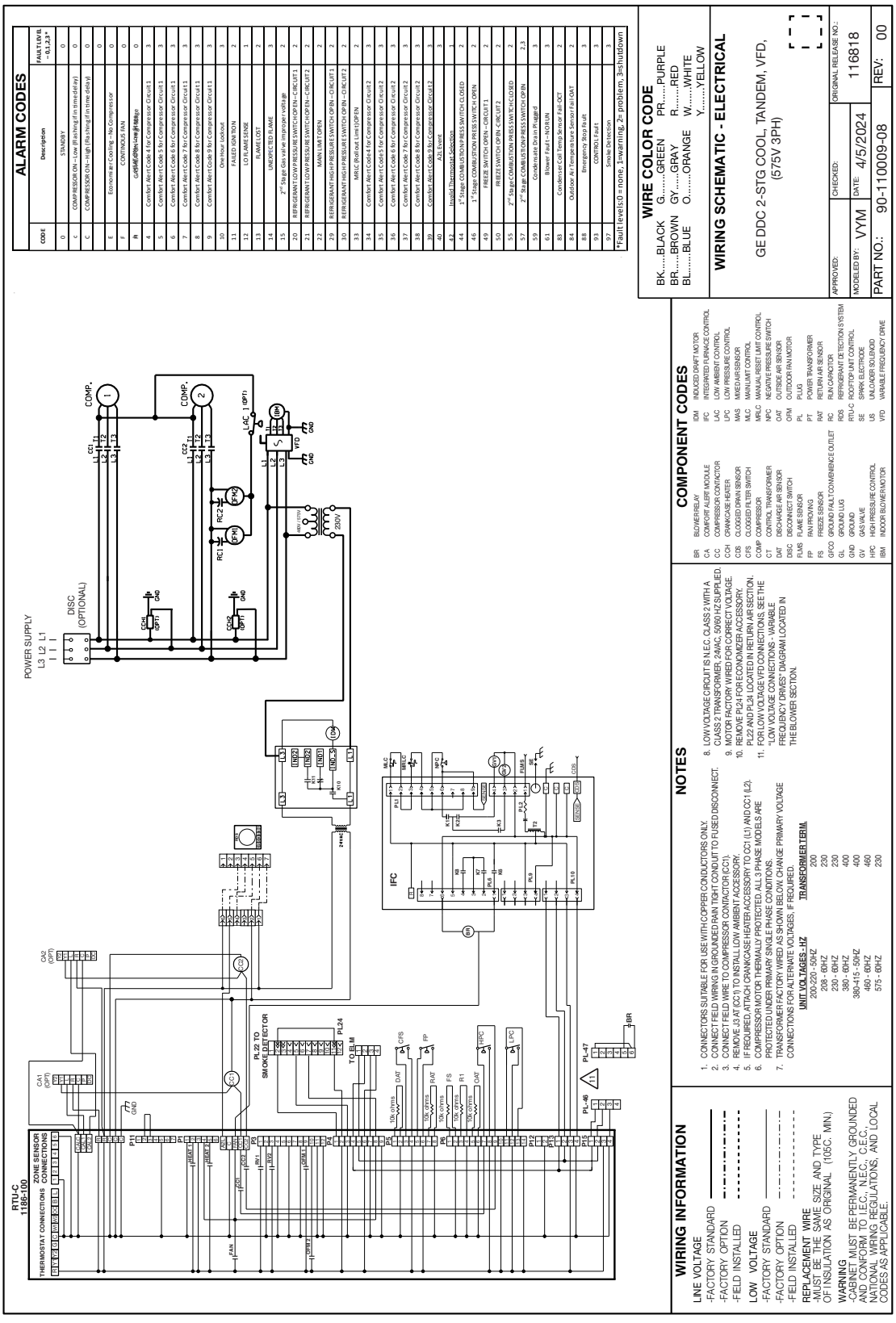


Appendix H. Wiring Diagrams & Schematics (Cont.)

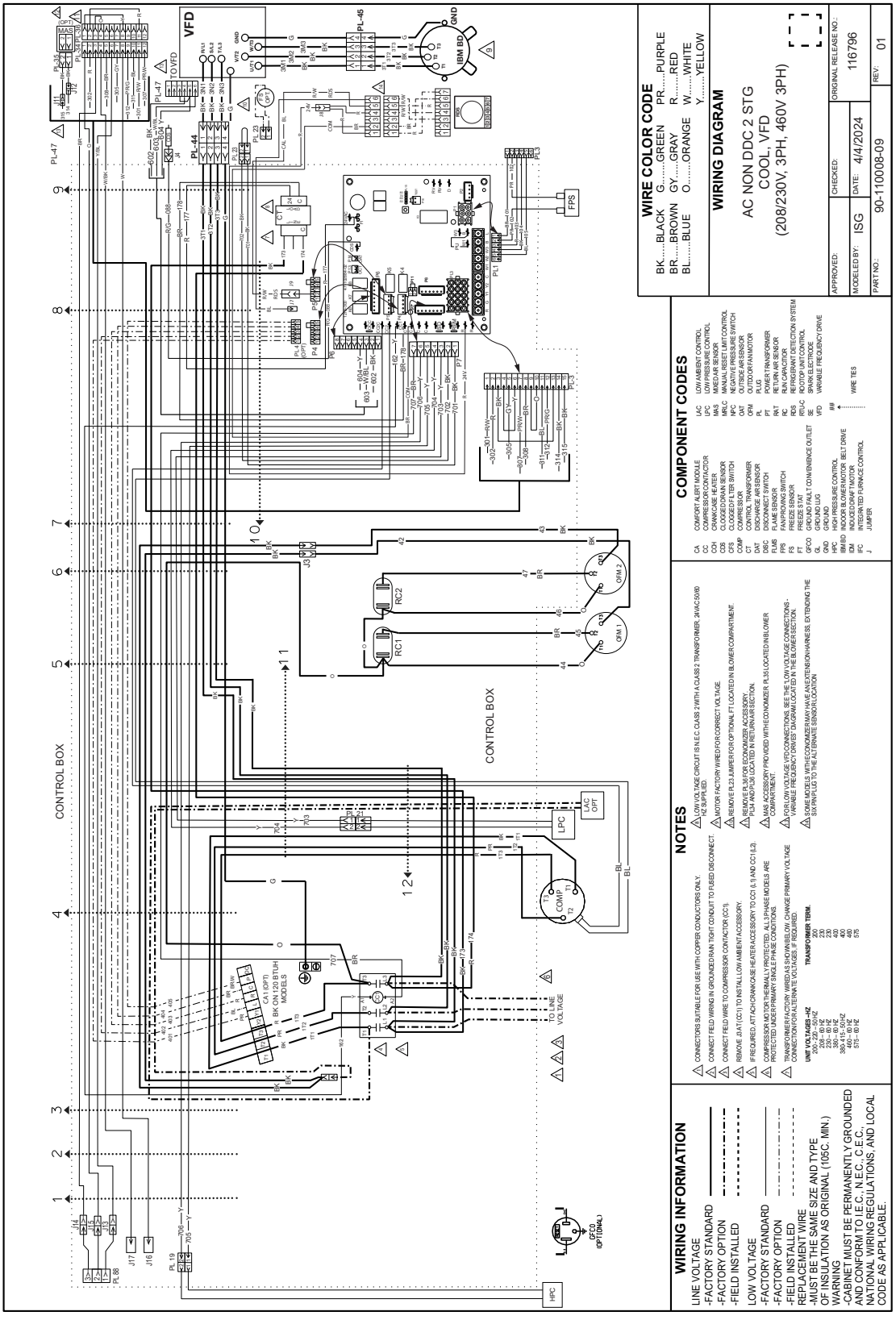


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Appendix H. Wiring Diagrams & Schematics (Cont.)

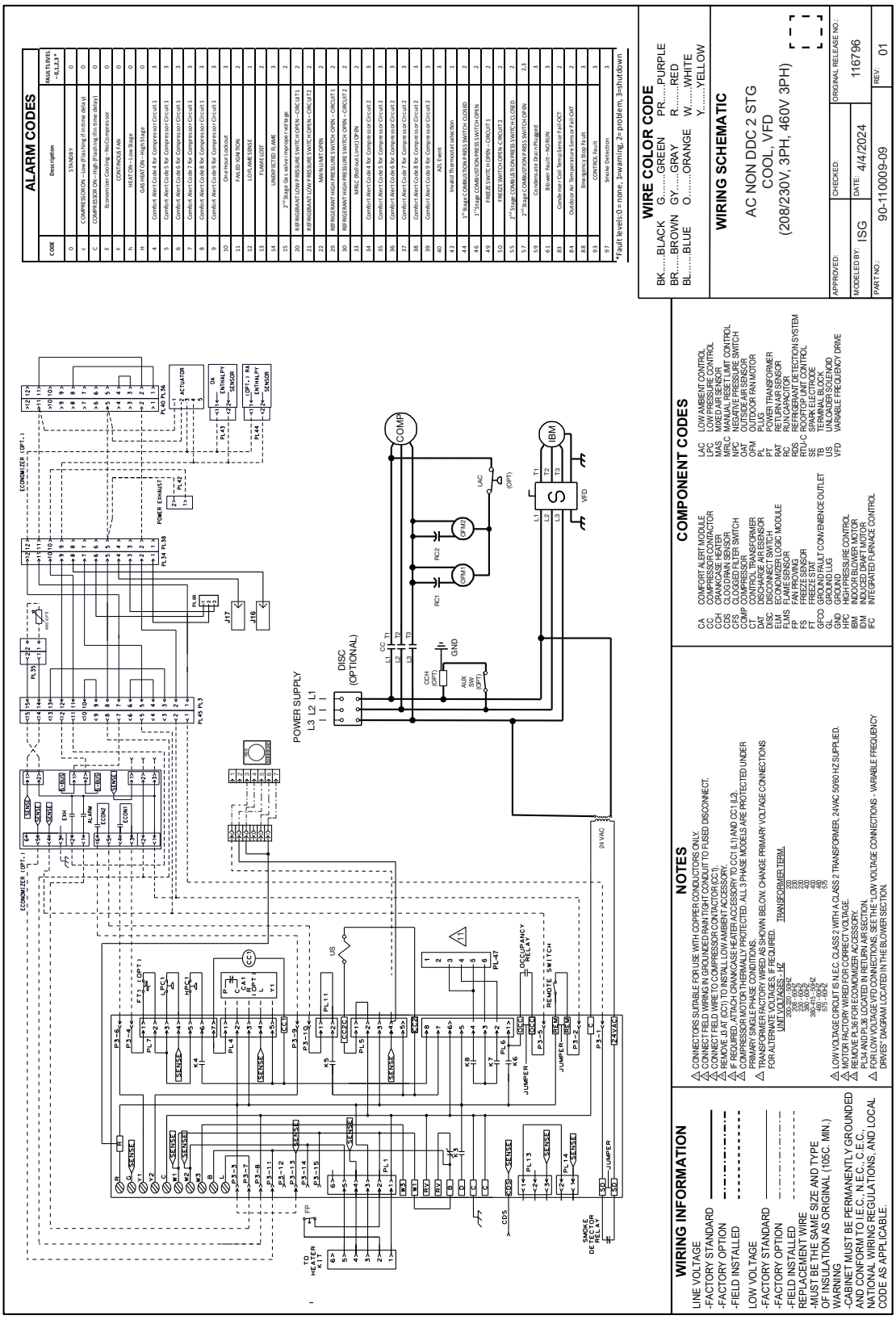


Appendix H. Wiring Diagrams & Schematics (Cont.)

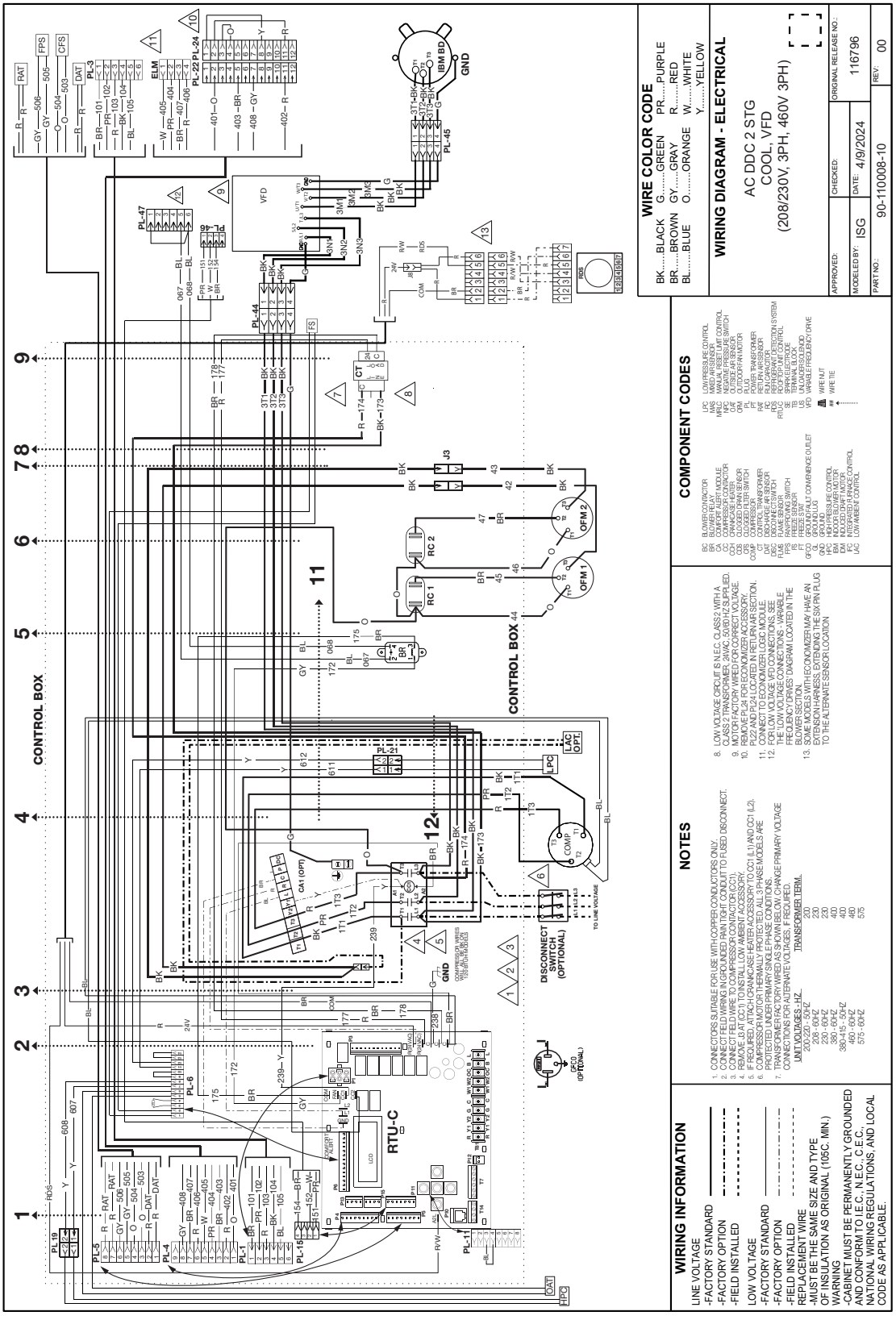


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Appendix H. Wiring Diagrams & Schematics (Cont.)

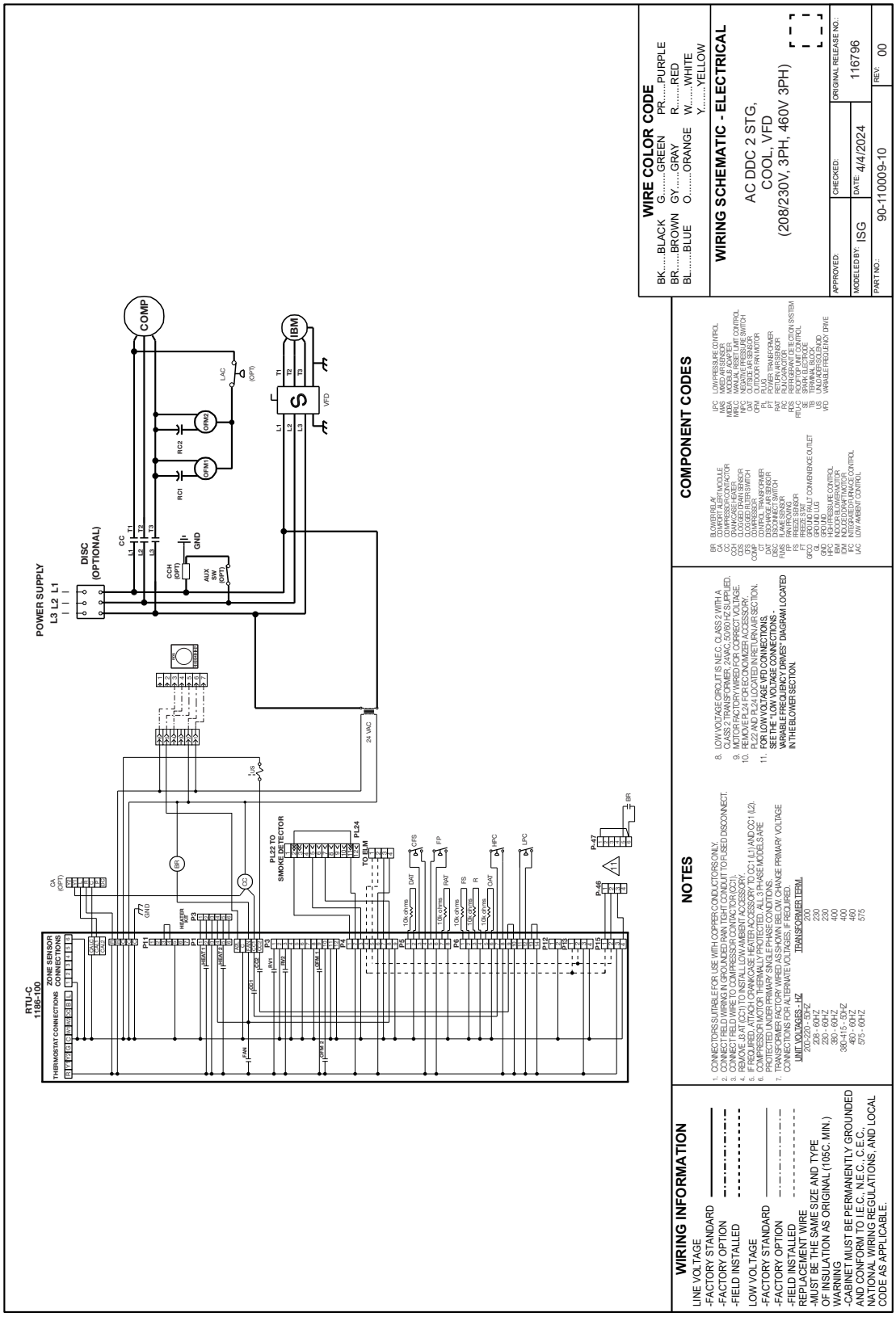


Appendix H. Wiring Diagrams & Schematics (Cont.)

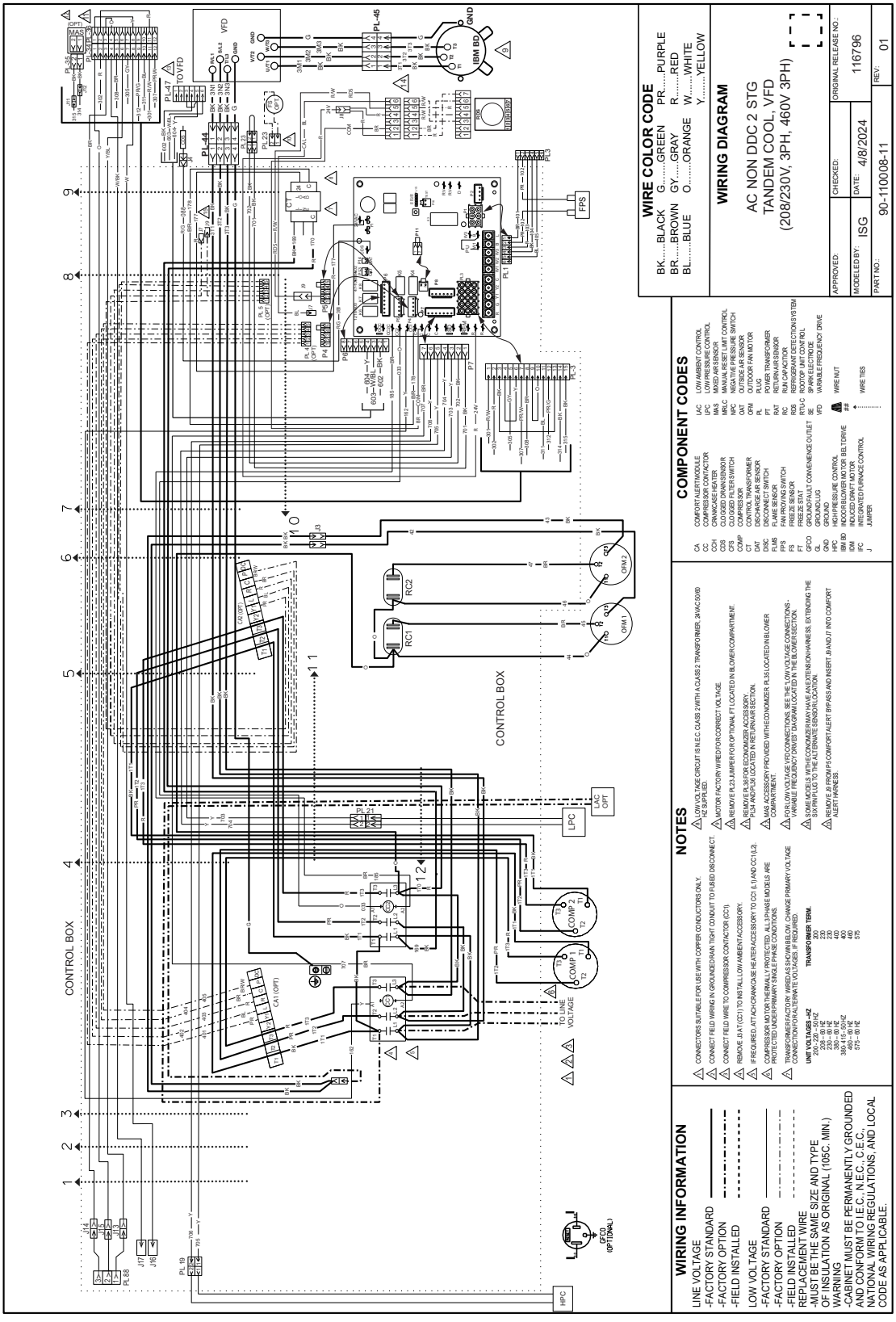


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Appendix H. Wiring Diagrams & Schematics (Cont.)

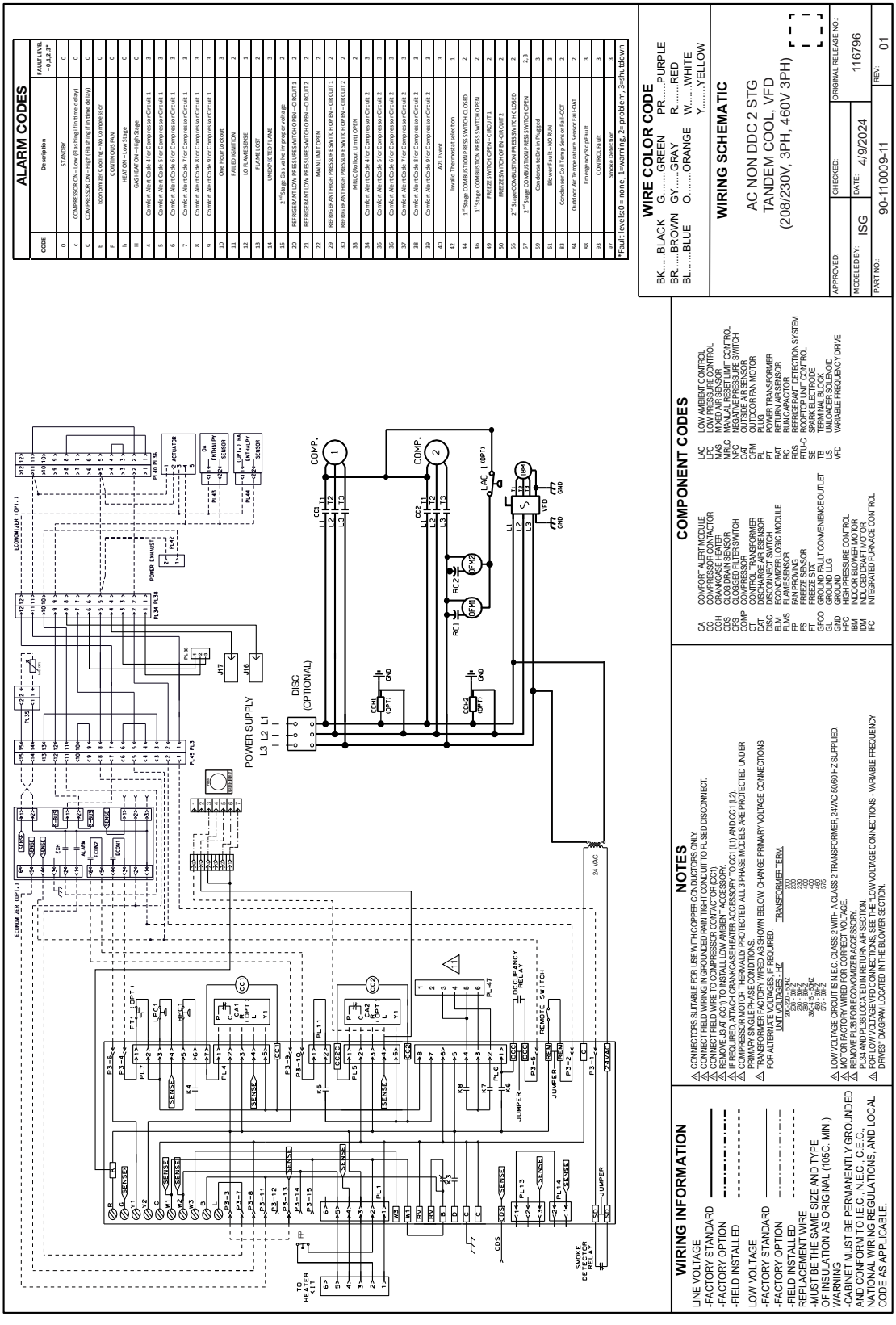


Appendix H. Wiring Diagrams & Schematics (Cont.)

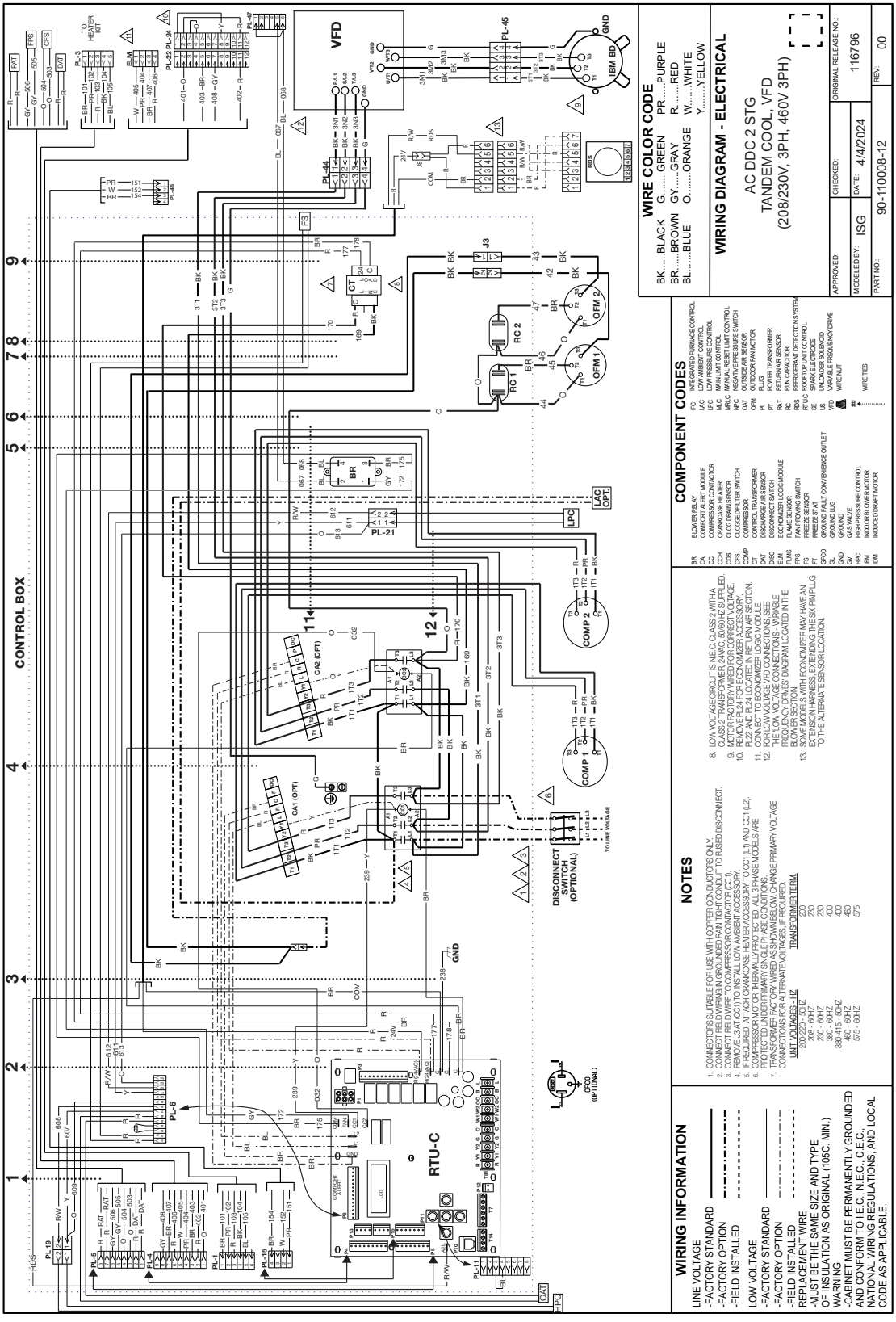


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Appendix H. Wiring Diagrams & Schematics (Cont.)

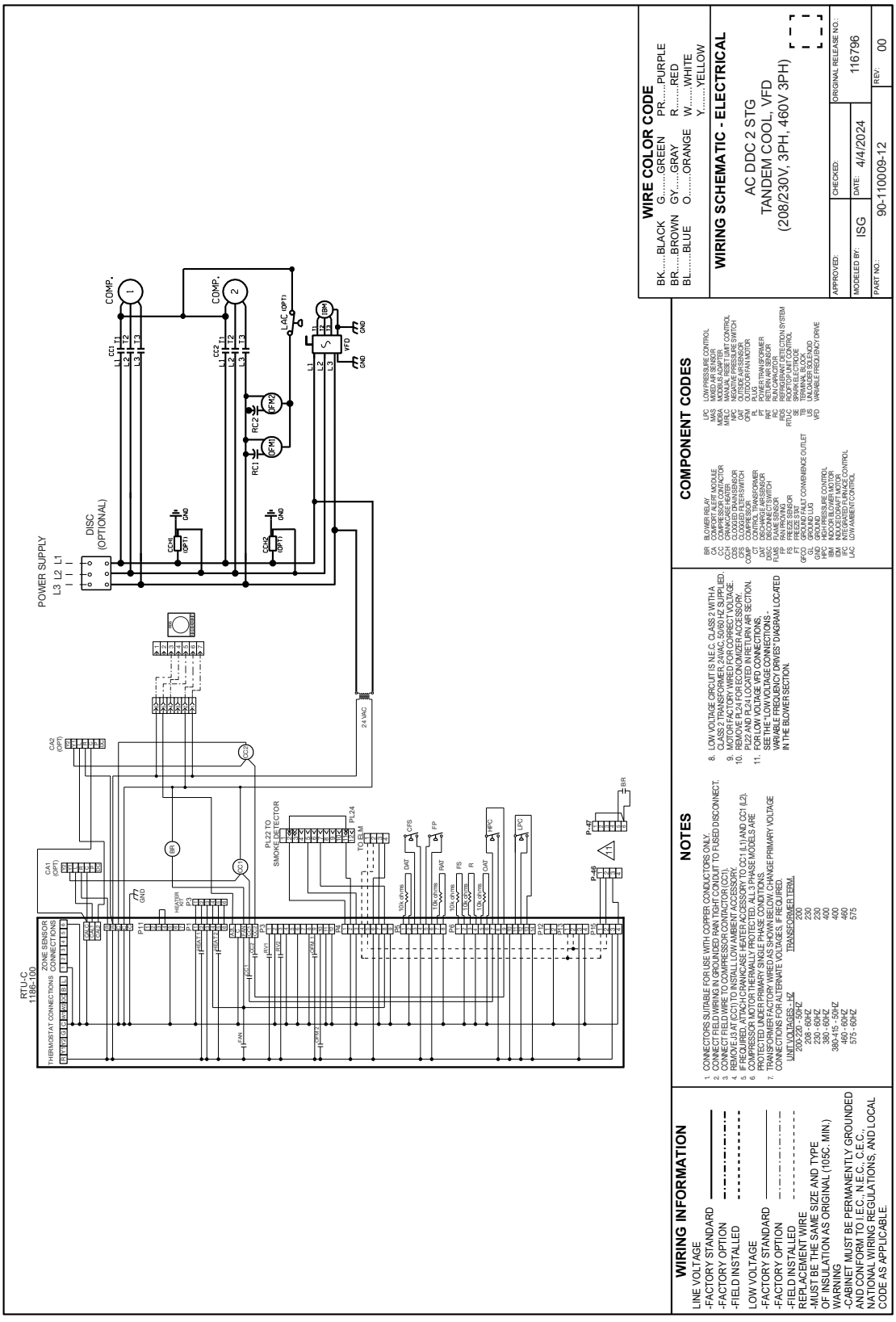


Appendix H. Wiring Diagrams & Schematics (Cont.)

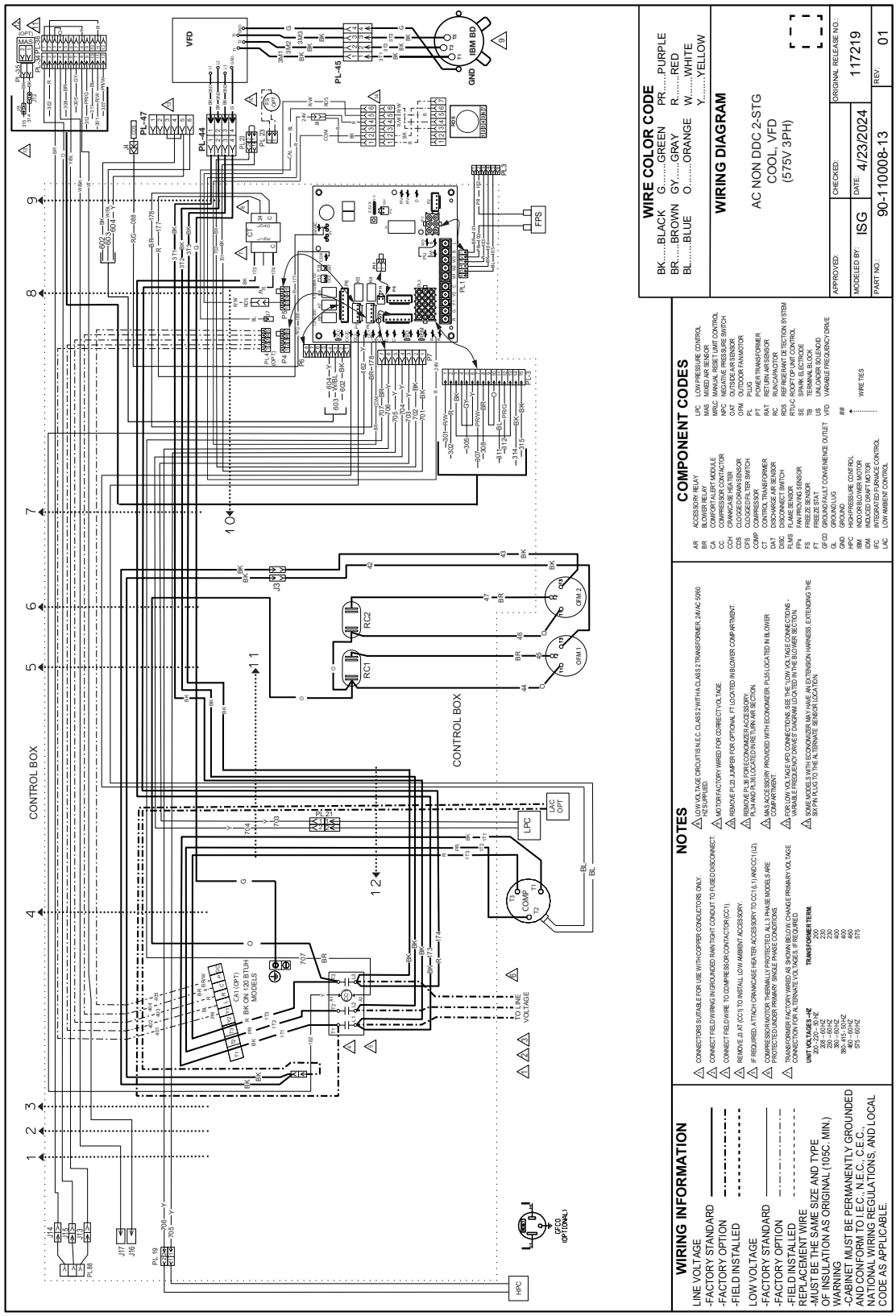


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Appendix H. Wiring Diagrams & Schematics (Cont.)

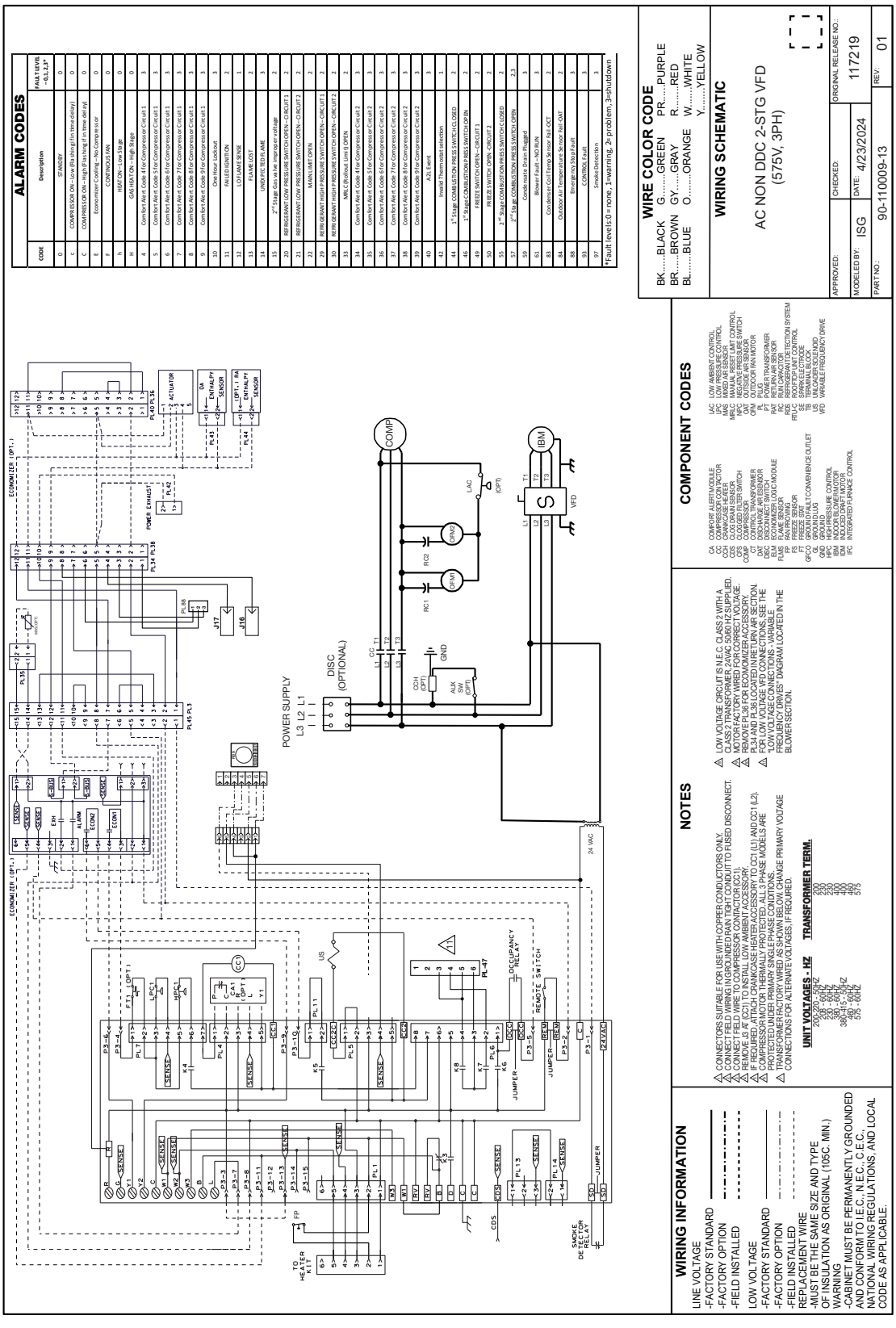


Appendix H. Wiring Diagrams & Schematics (Cont.)

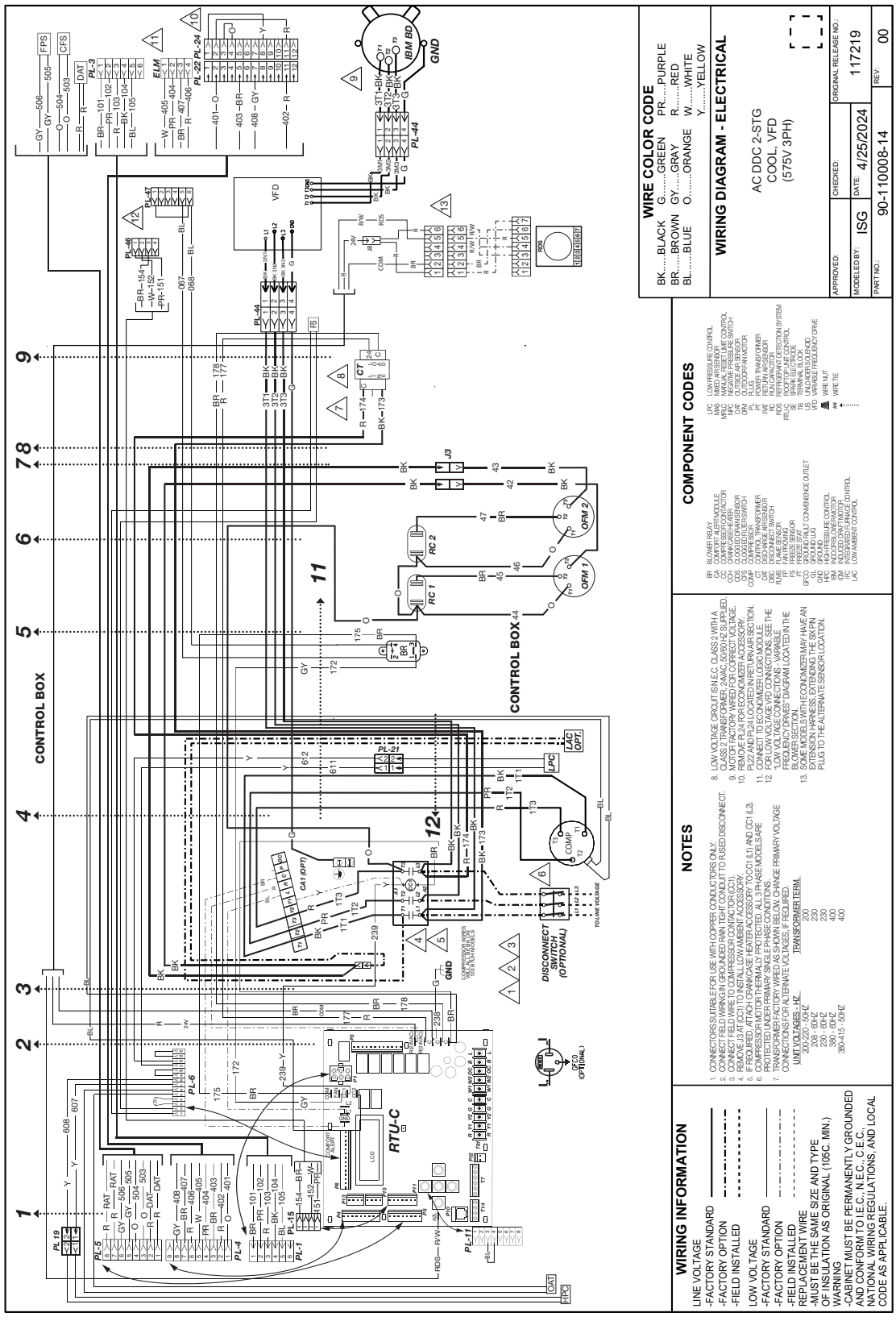


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Appendix H. Wiring Diagrams & Schematics (Cont.)

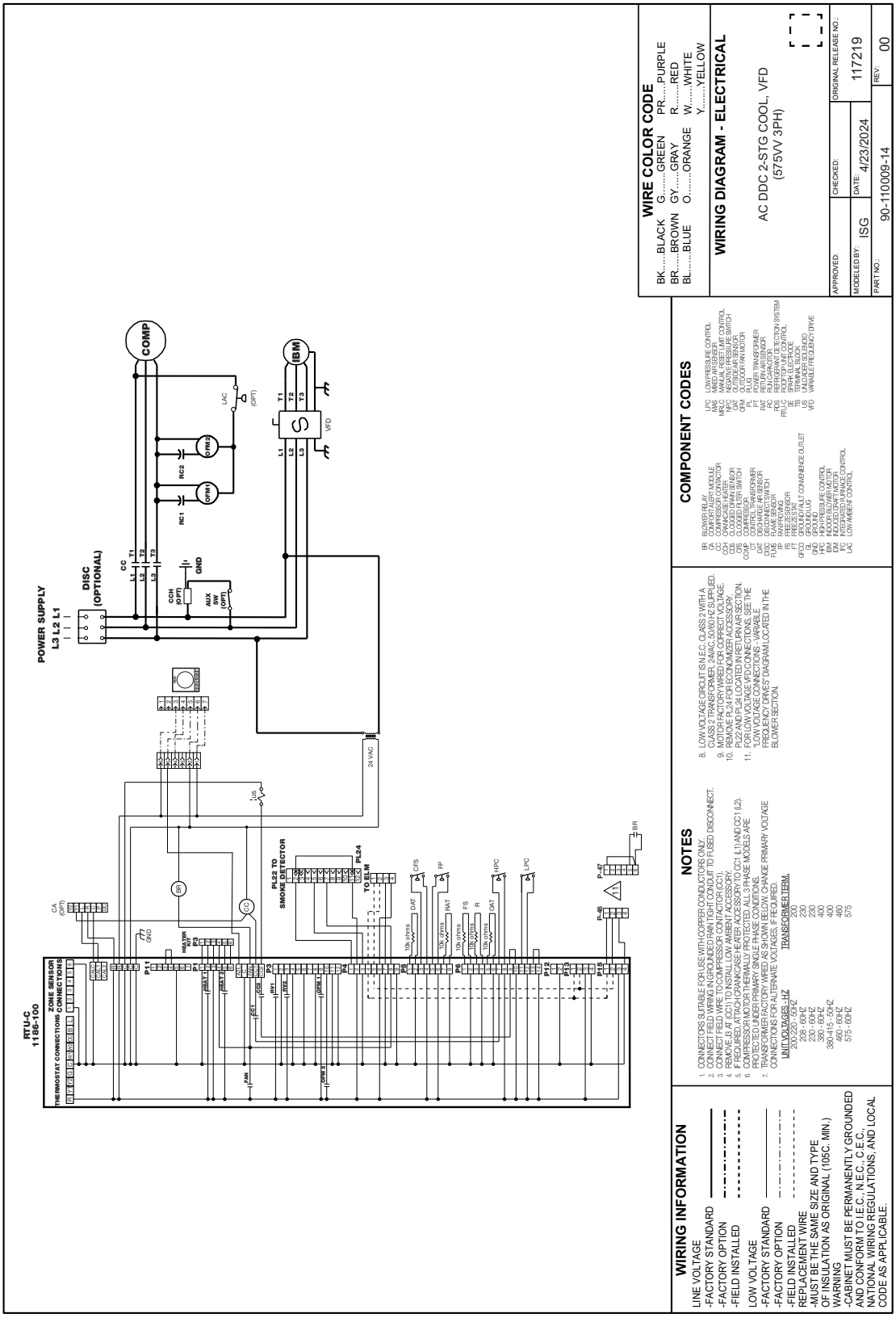


Appendix H. Wiring Diagrams & Schematics (Cont.)

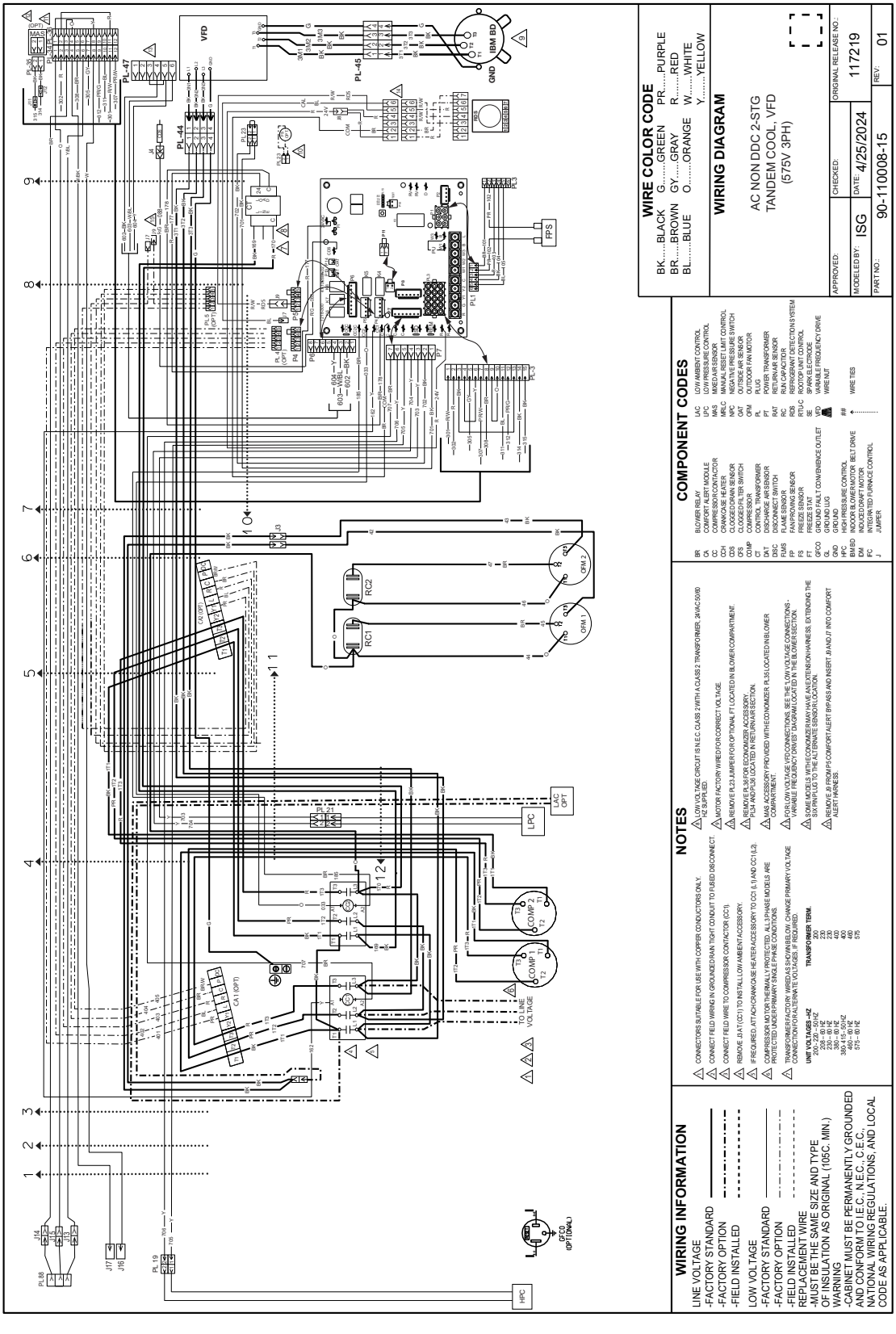


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Appendix H. Wiring Diagrams & Schematics (Cont.)

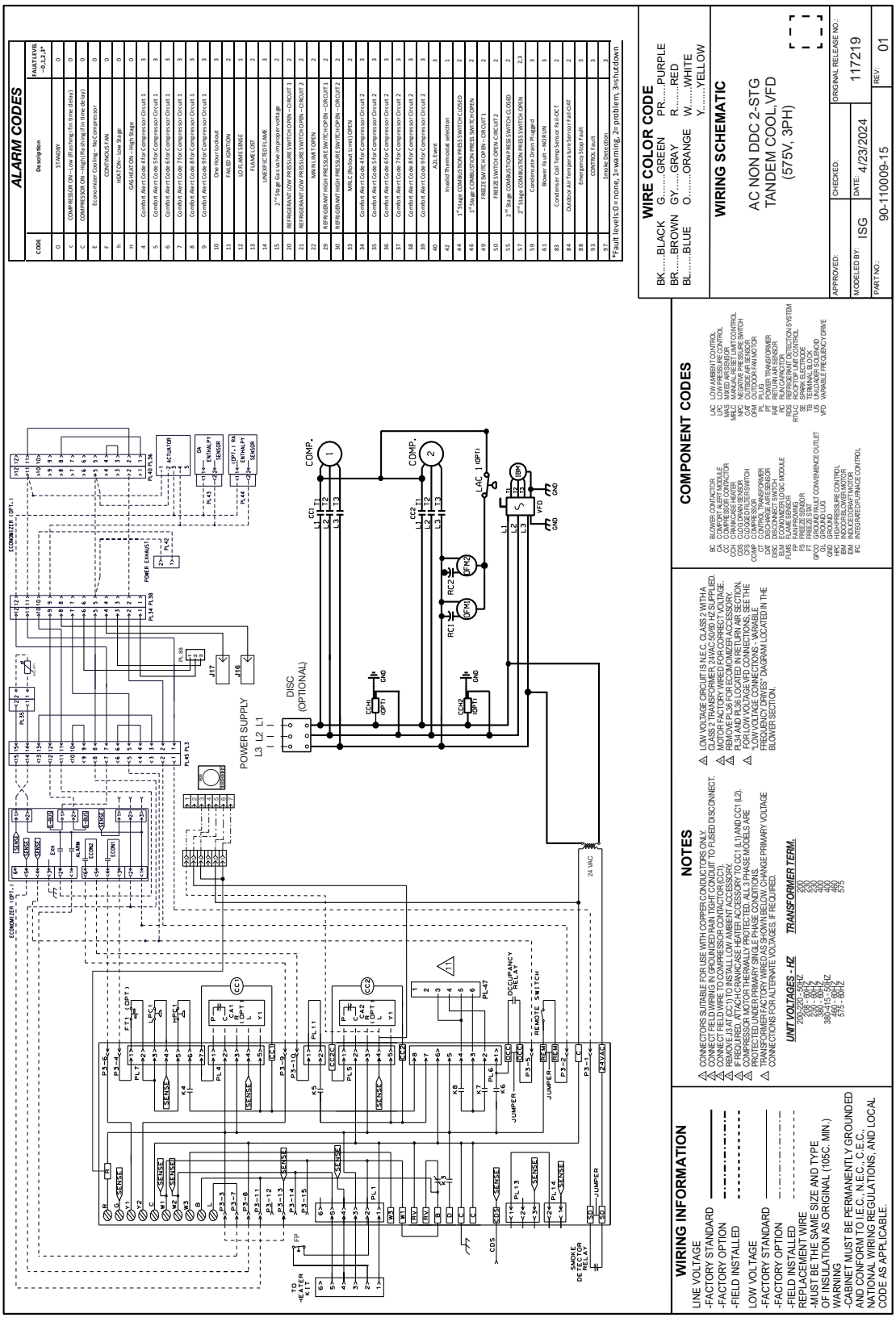


Appendix H. Wiring Diagrams & Schematics (Cont.)

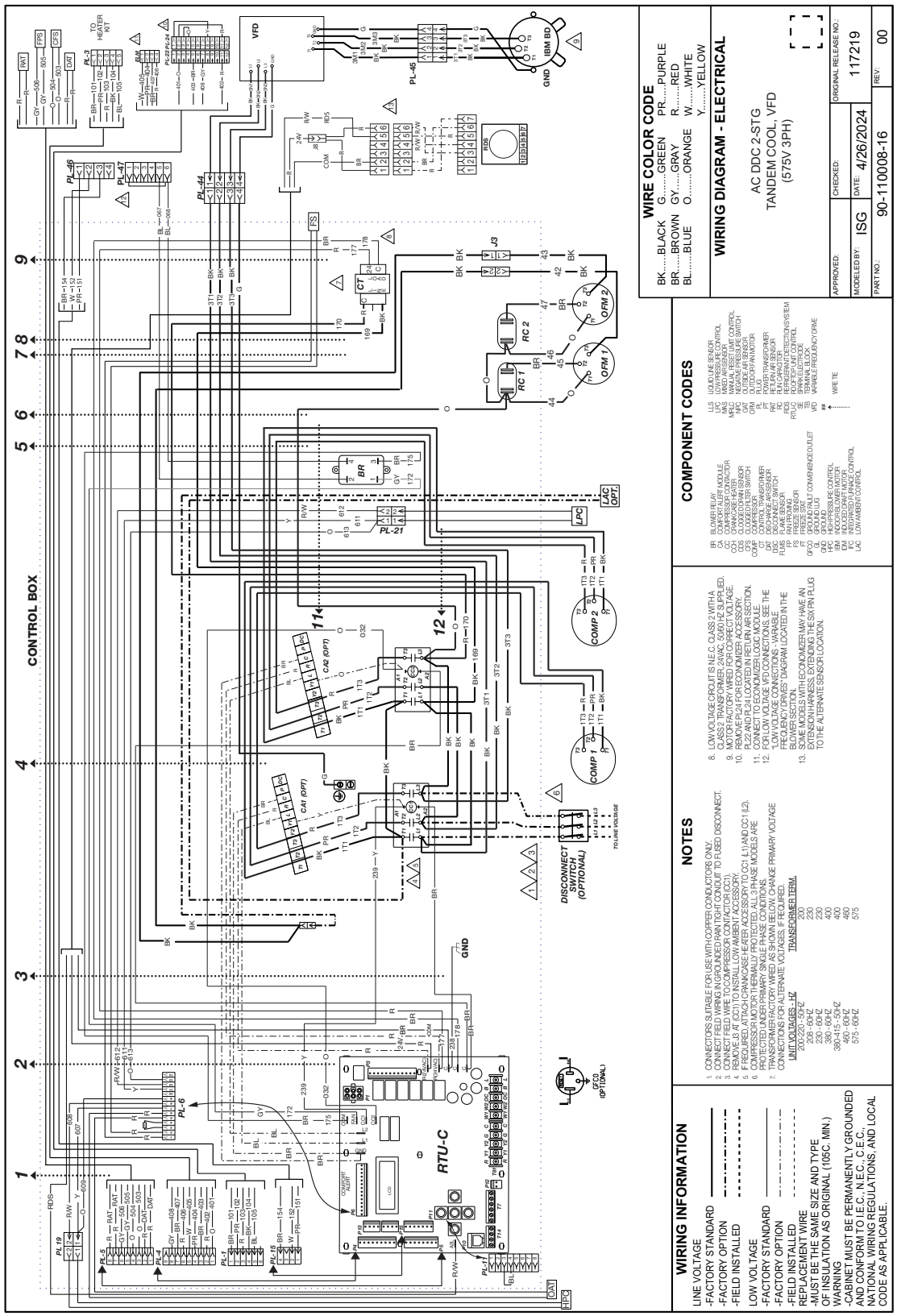


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Appendix H. Wiring Diagrams & Schematics (Cont.)

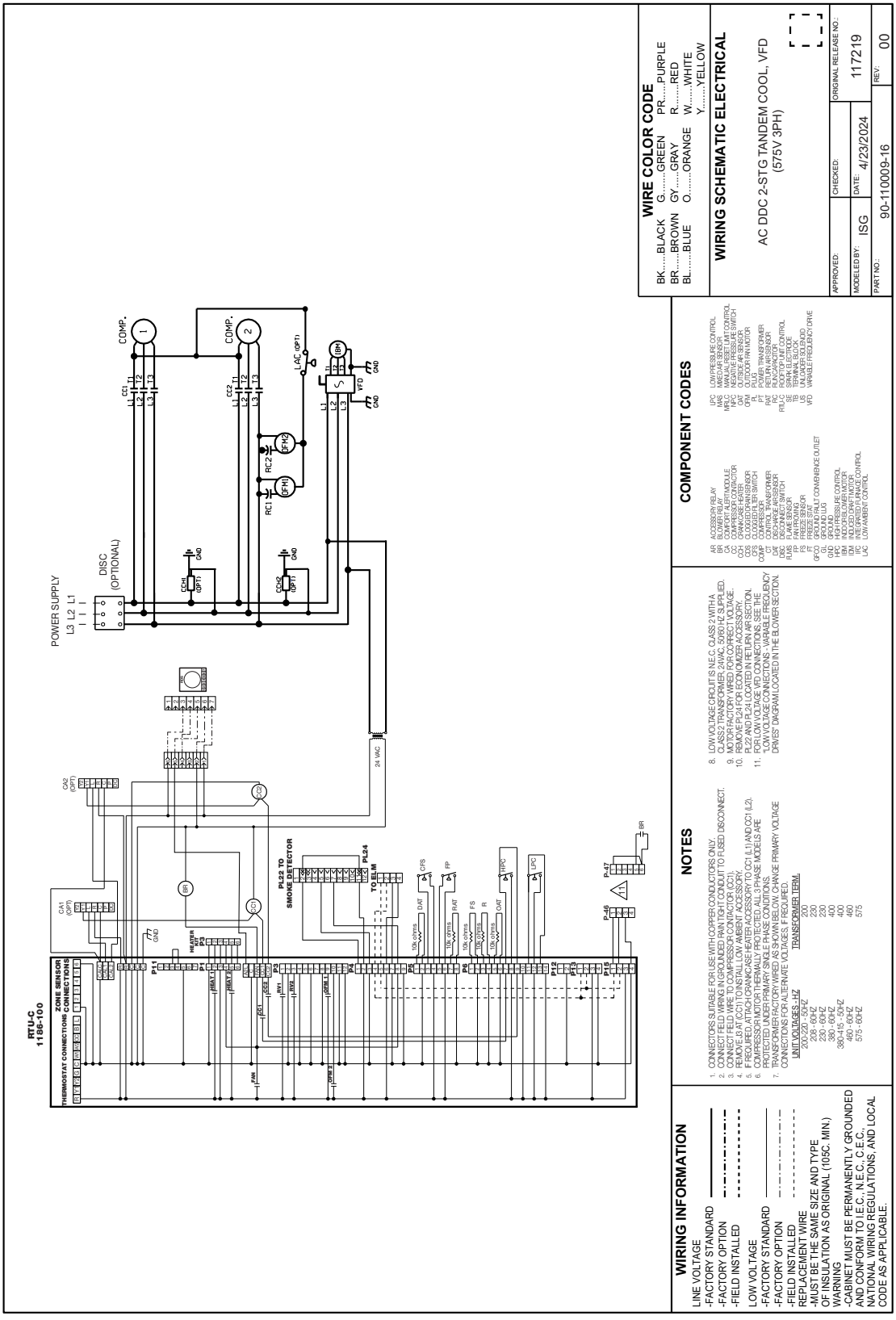


Appendix H. Wiring Diagrams & Schematics (Cont.)

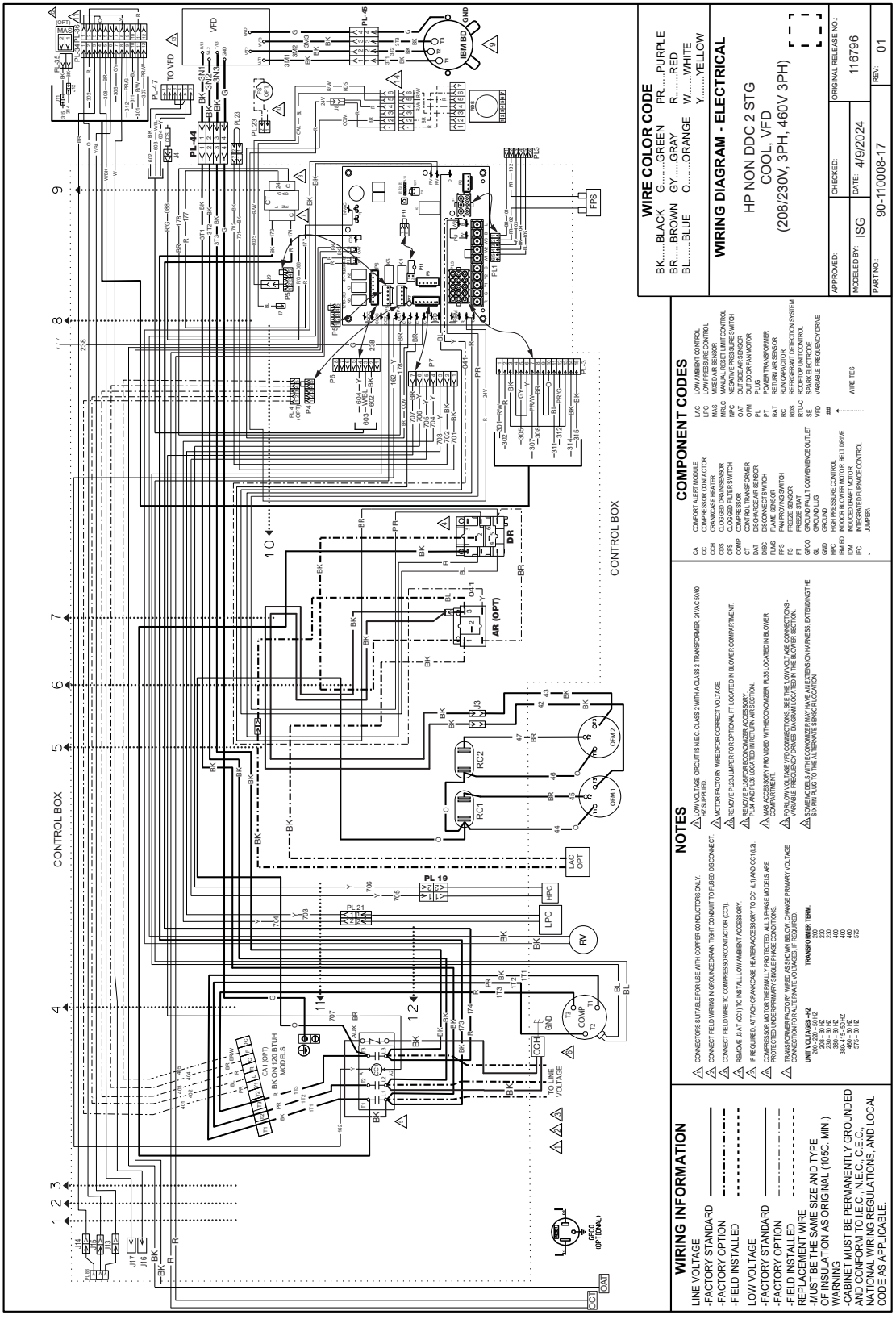


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Appendix H. Wiring Diagrams & Schematics (Cont.)

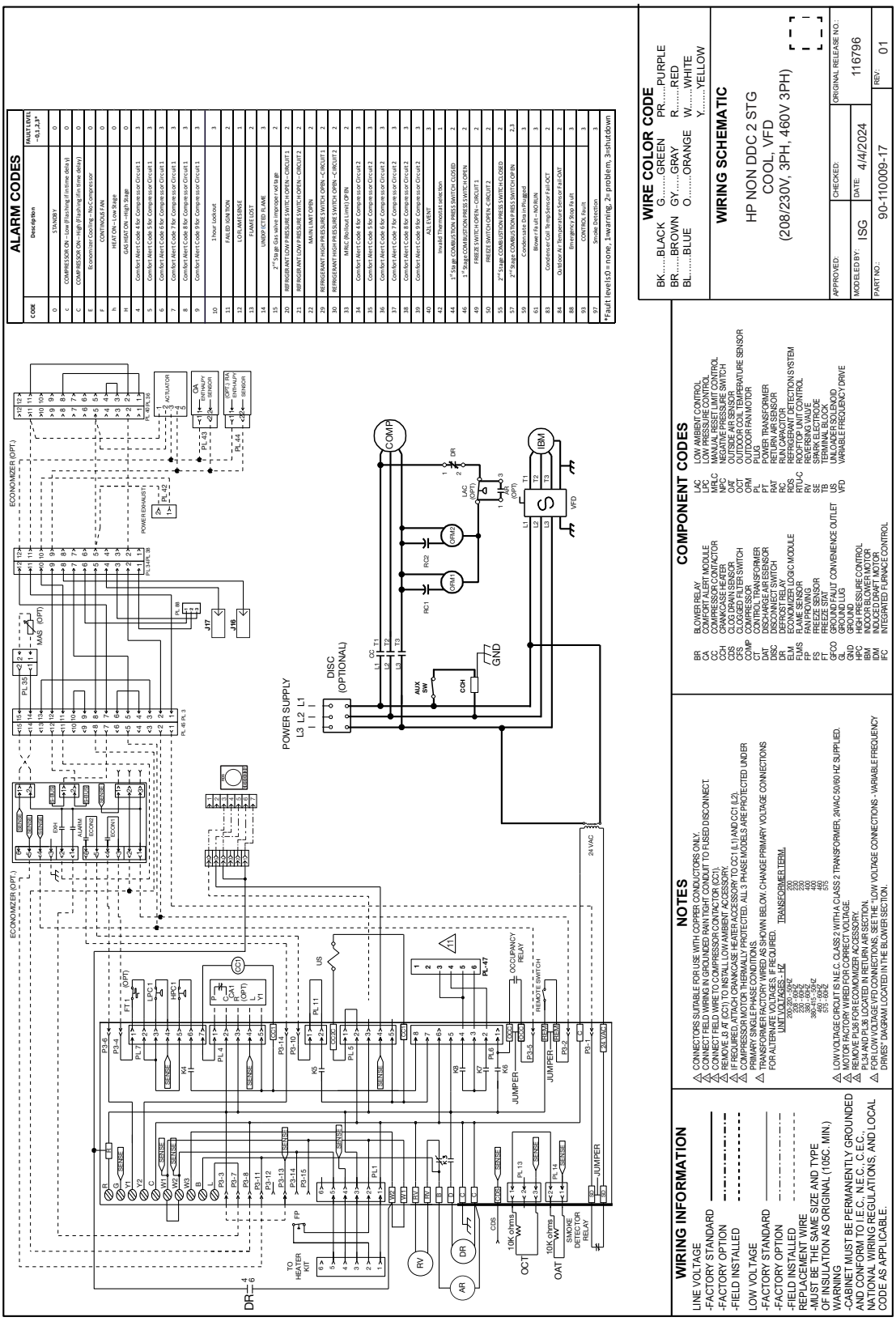


Appendix H. Wiring Diagrams & Schematics (Cont.)

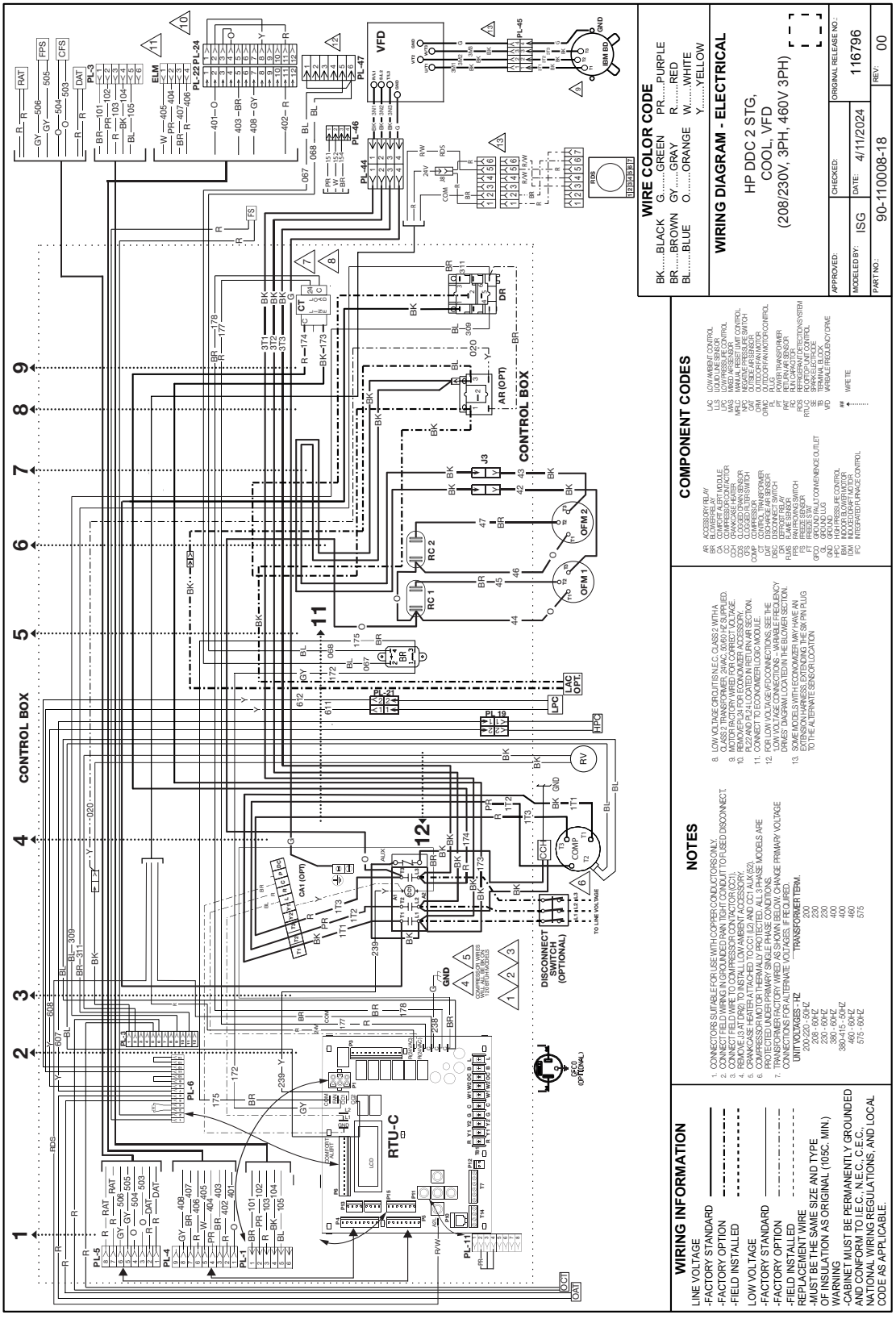


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Appendix H. Wiring Diagrams & Schematics (Cont.)

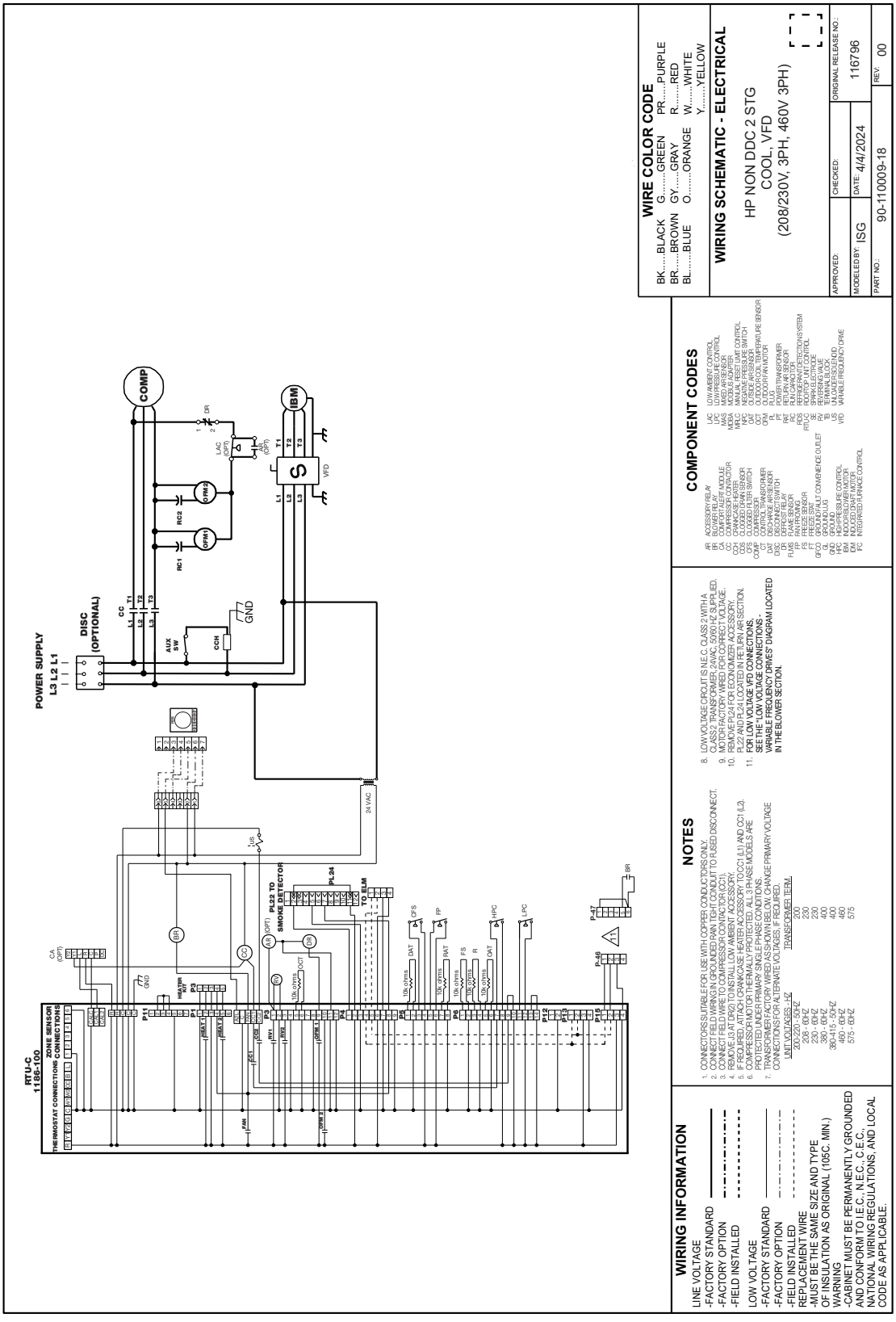


Appendix H. Wiring Diagrams & Schematics (Cont.)

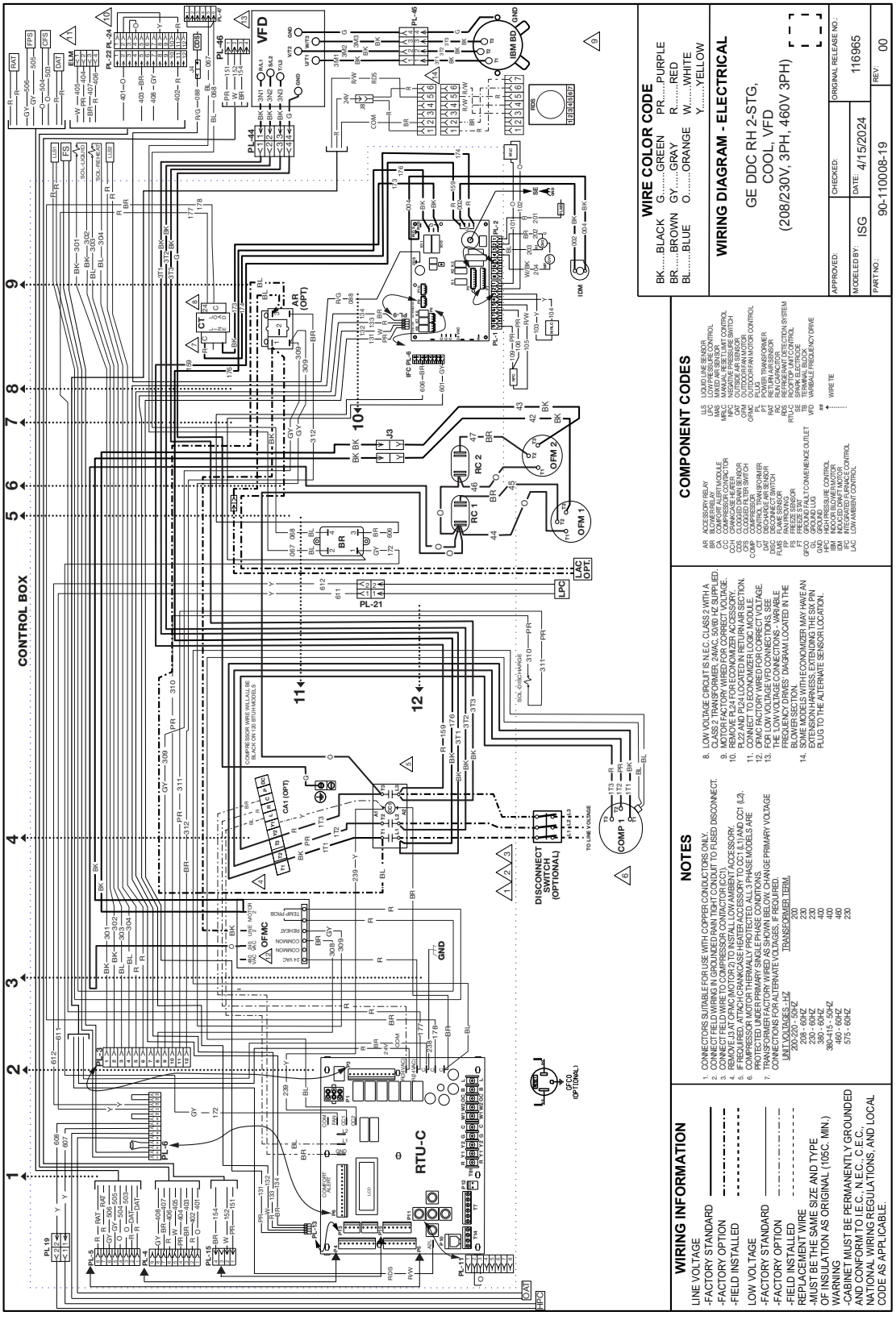


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Appendix H. Wiring Diagrams & Schematics (Cont.)

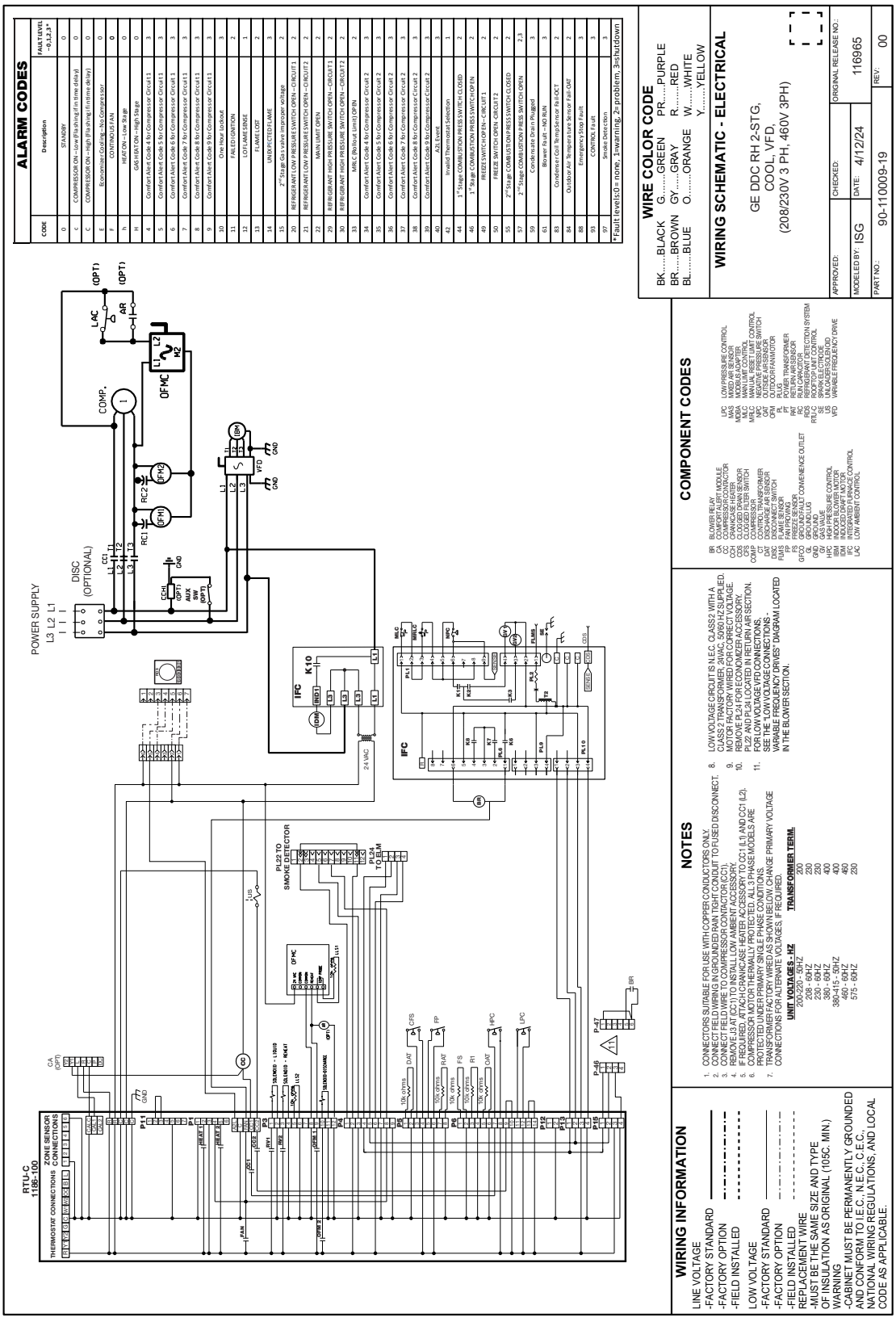


Appendix H. Wiring Diagrams & Schematics (Cont.)



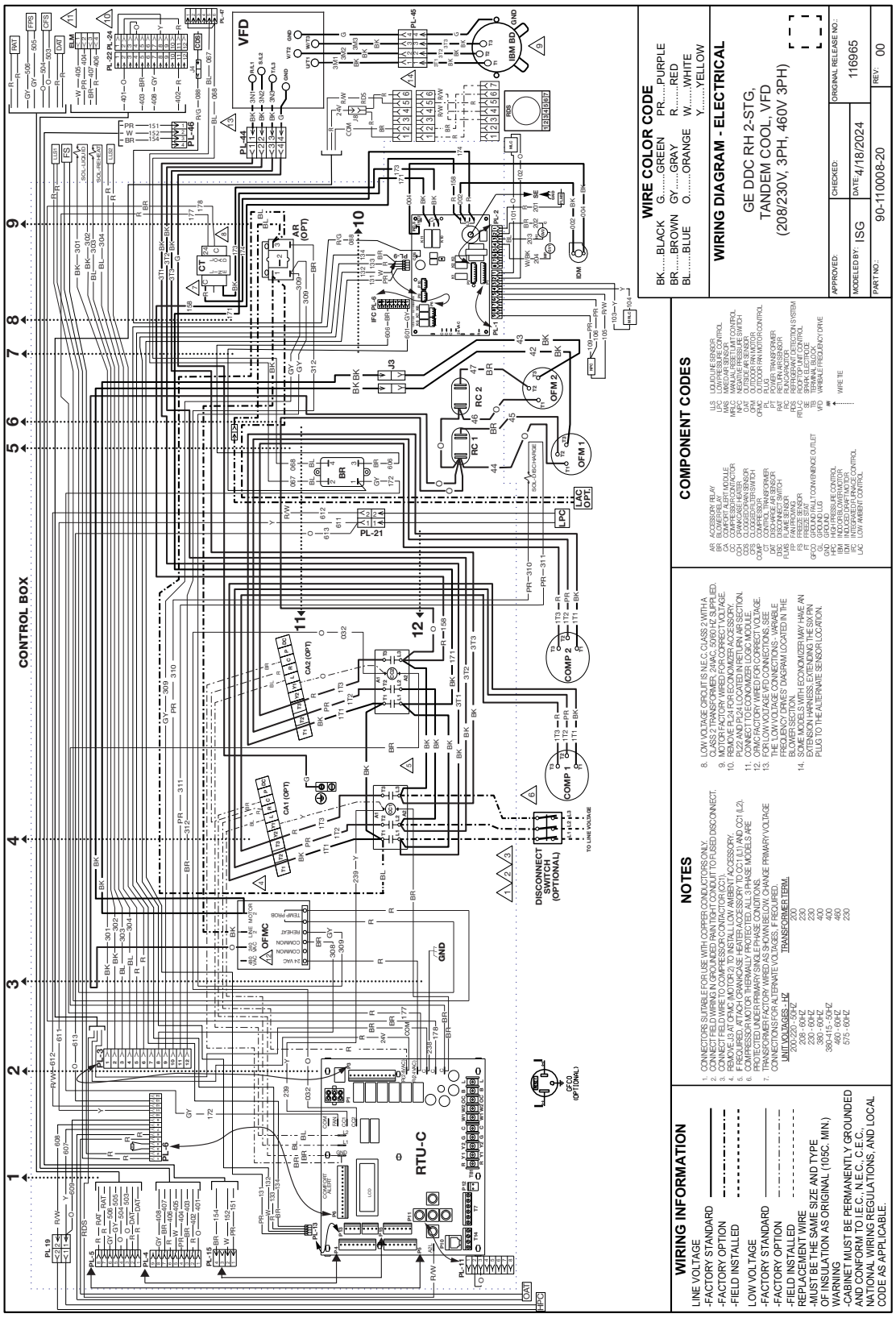
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Appendix H. Wiring Diagrams & Schematics (Cont.)



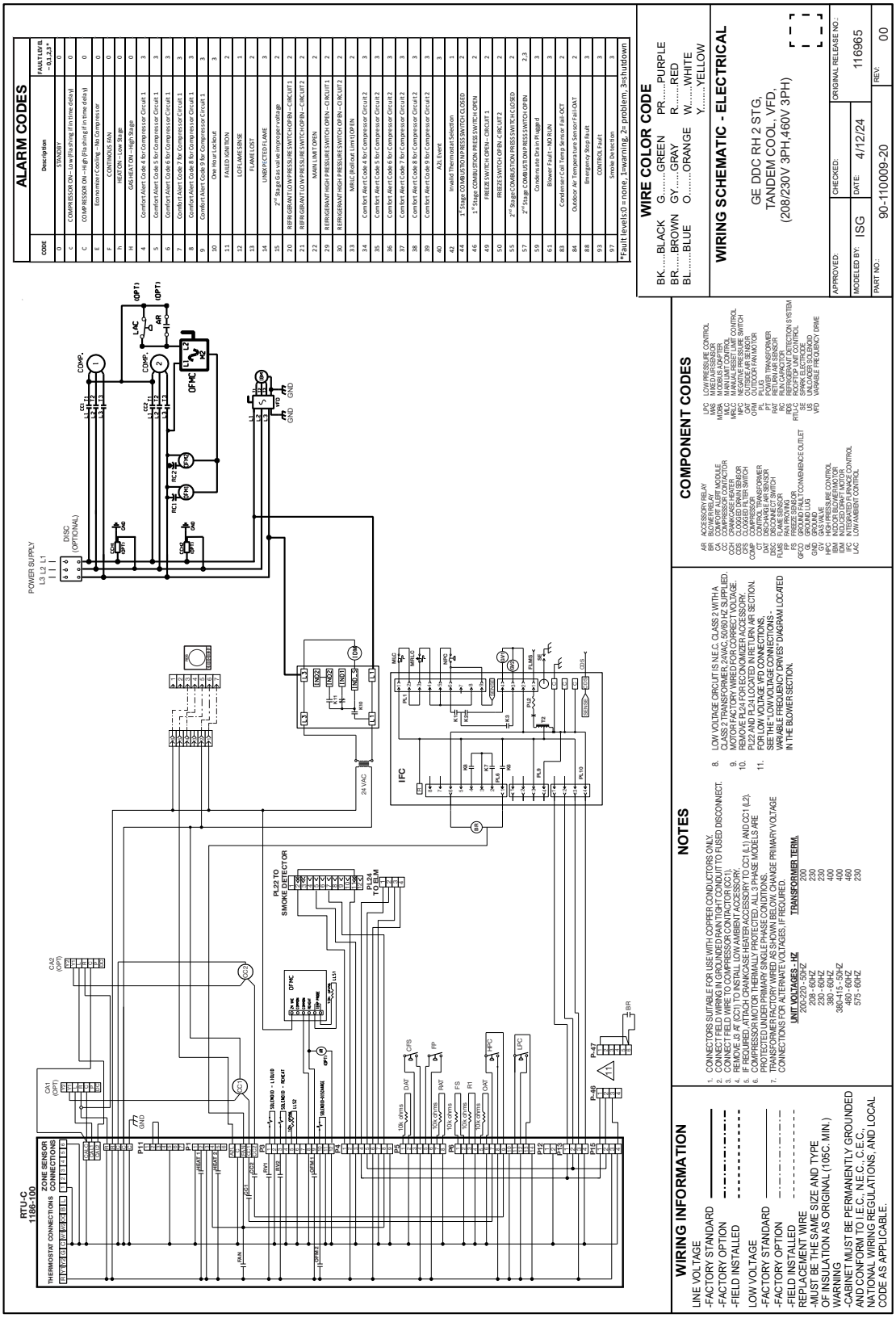
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Appendix H. Wiring Diagrams & Schematics (Cont.)

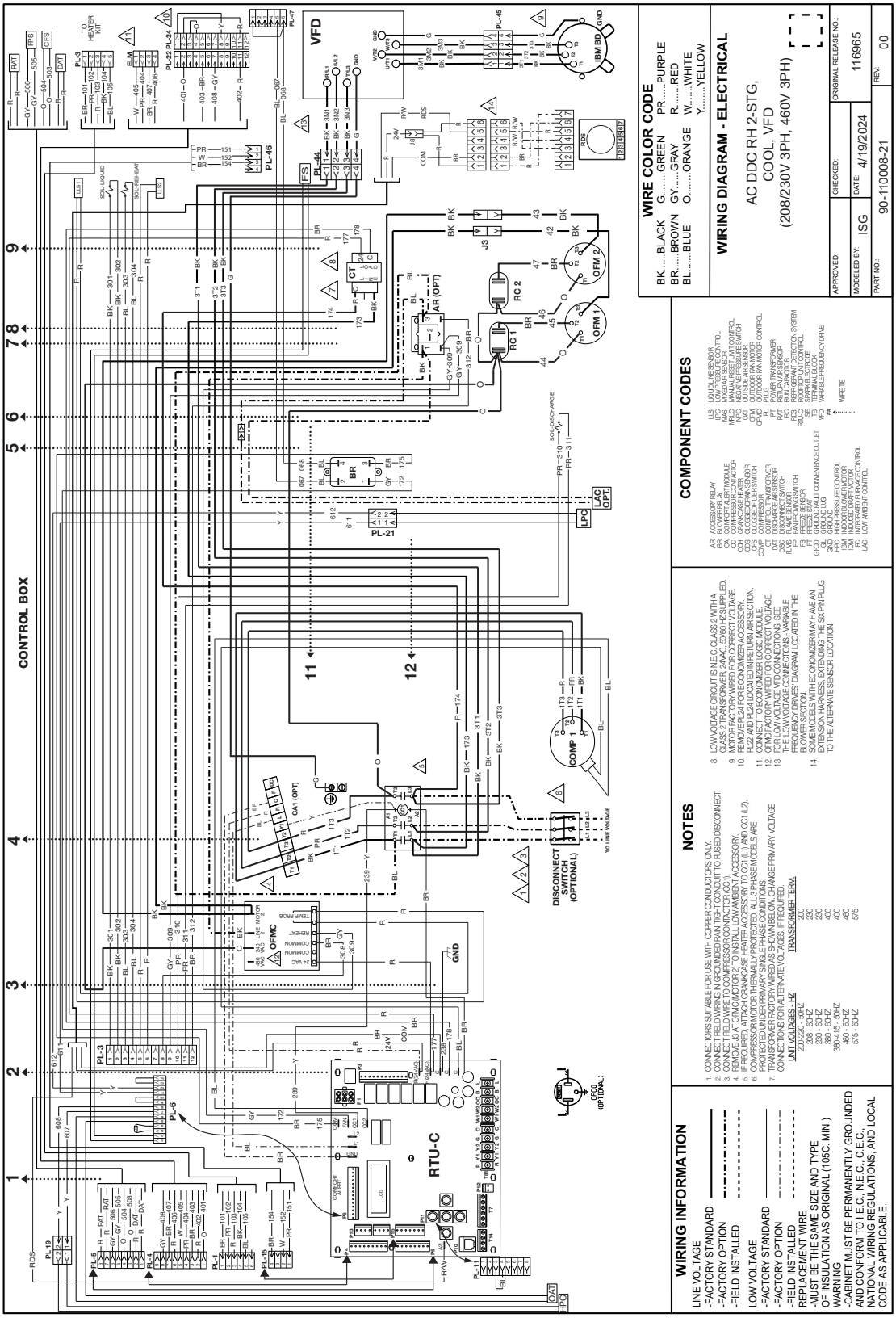


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Appendix H. Wiring Diagrams & Schematics (Cont.)

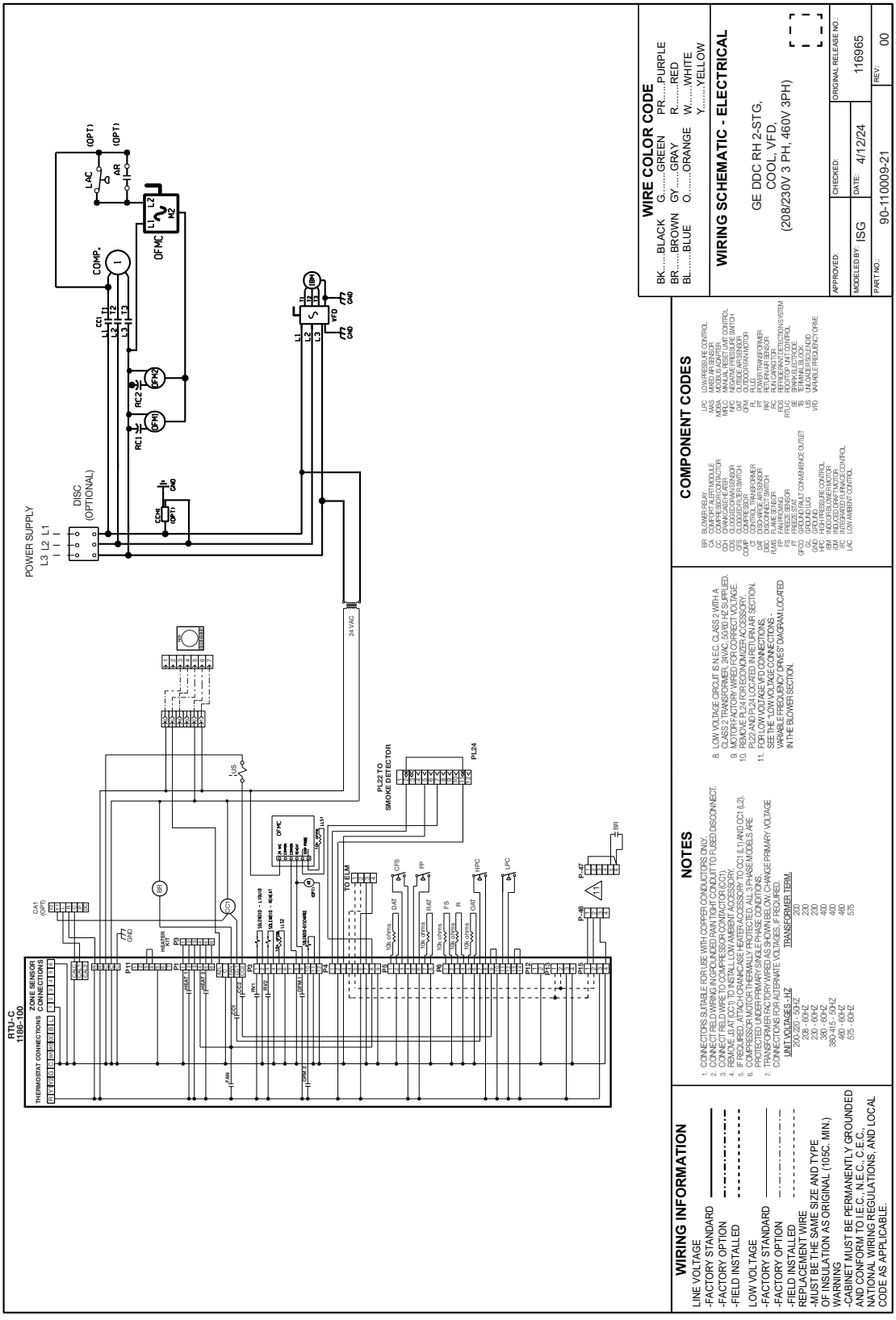


Appendix H. Wiring Diagrams & Schematics (Cont.)

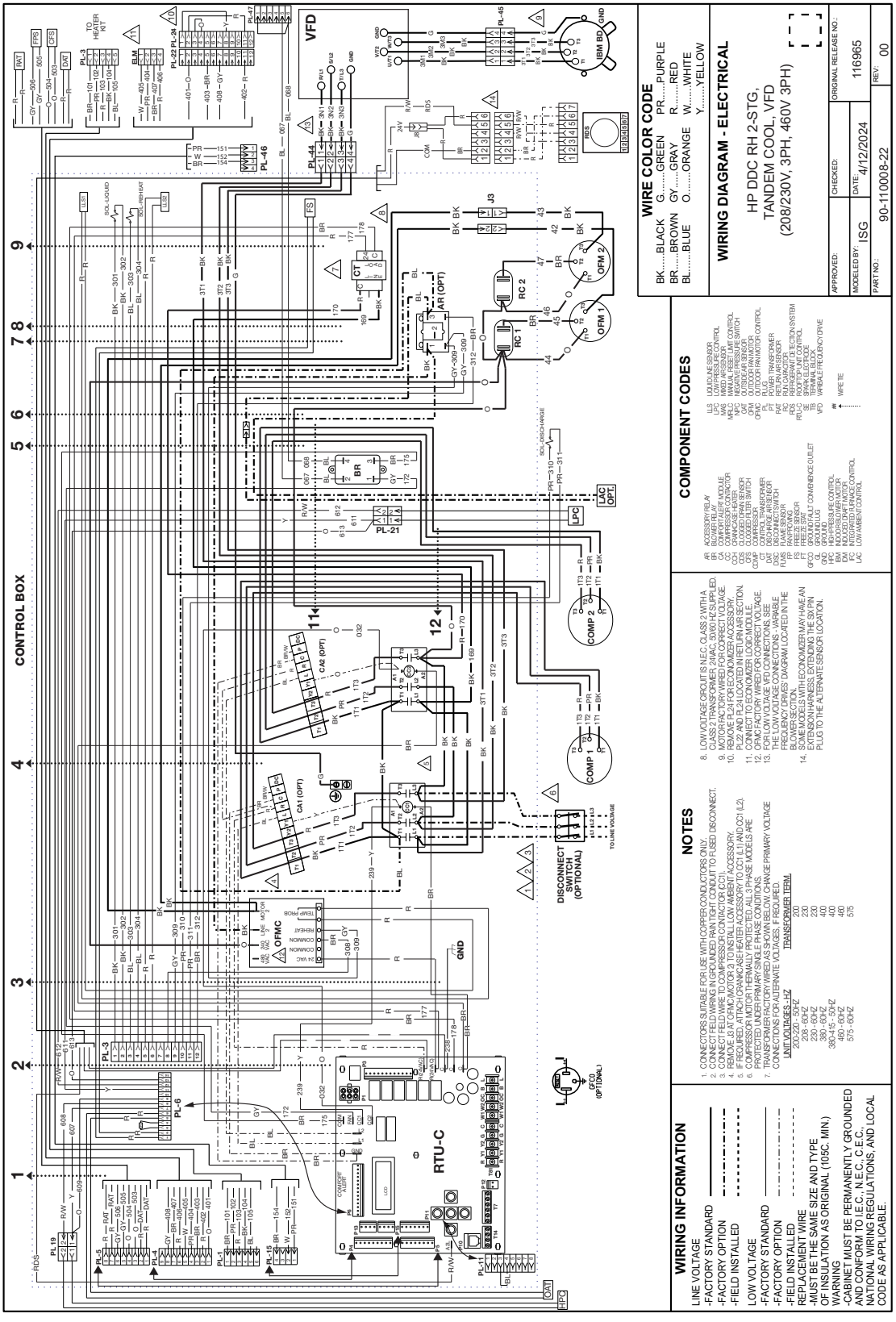


P. APPENDICES

Appendix H. Wiring Diagrams & Schematics (Cont.)

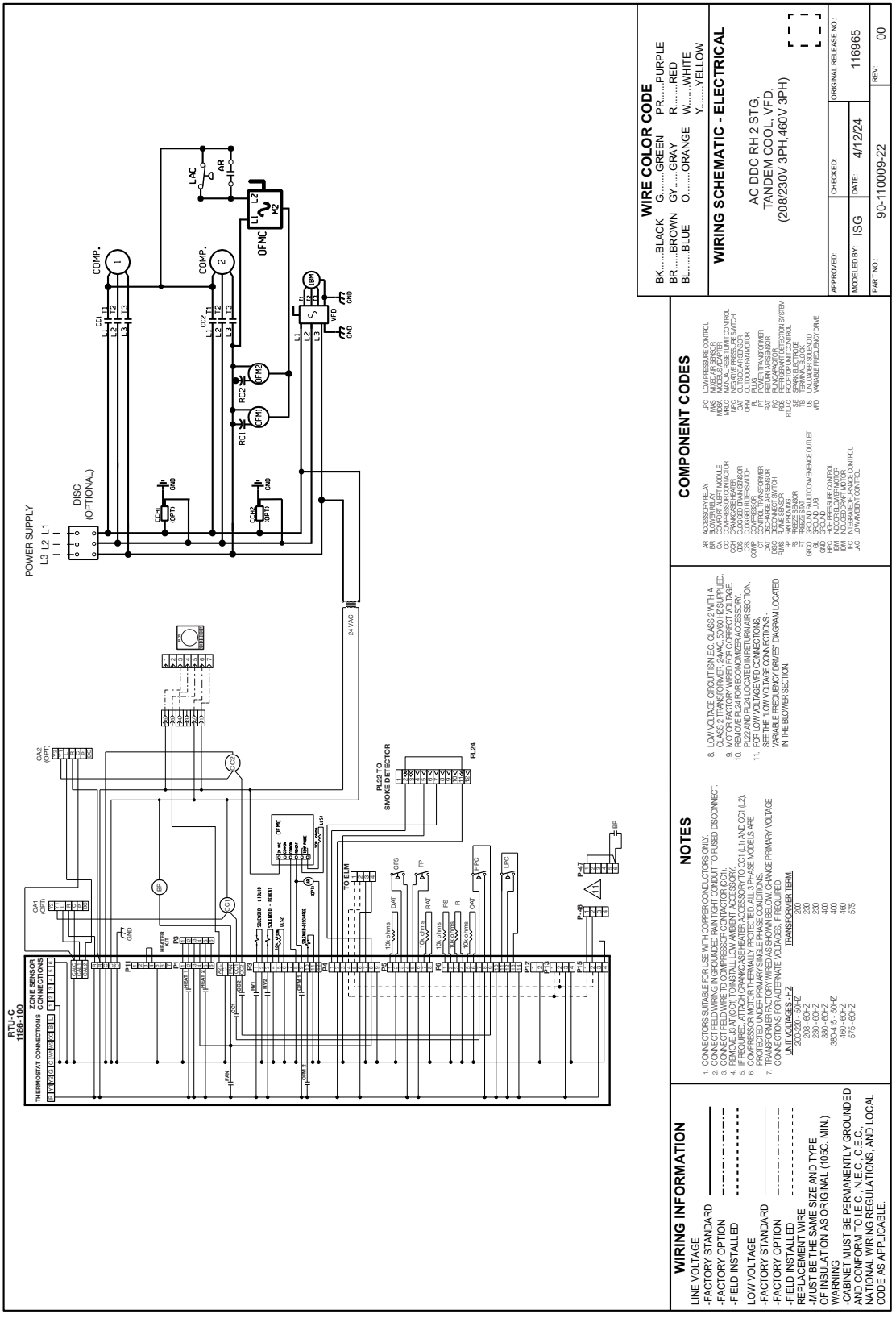


Appendix H. Wiring Diagrams & Schematics (Cont.)

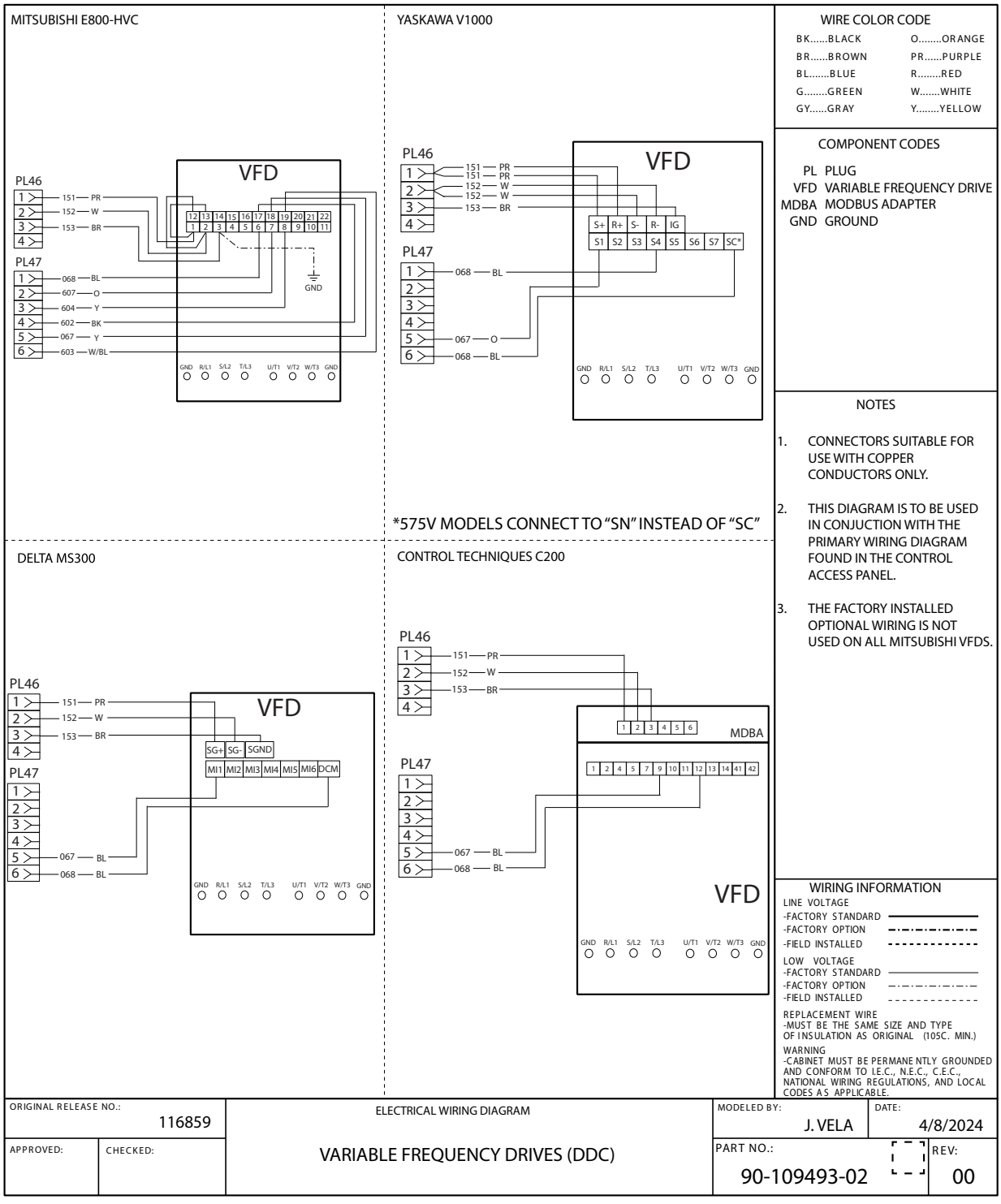


P. APPENDICES

Appendix H. Wiring Diagrams & Schematics (Cont.)



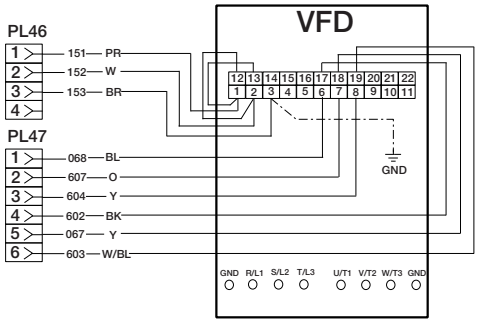
Appendix H. Wiring Diagrams & Schematics (Cont.)



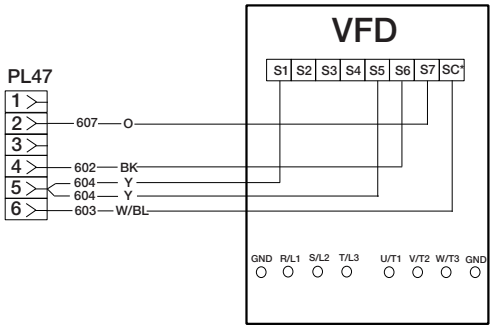
P. APPENDICES

Appendix H. Wiring Diagrams & Schematics (Cont.)

MITSUBISHI E800-HVC

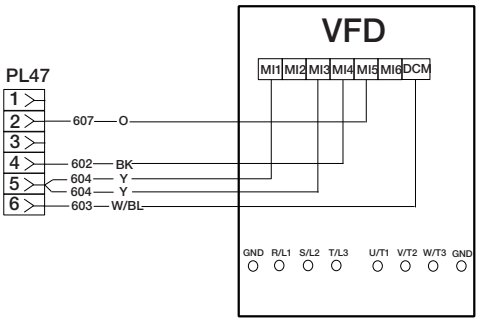


YASKAWA V1000

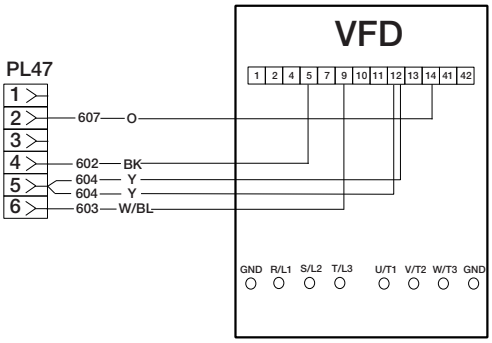


*575V MODELS CONNECT TO "SN" INSTEAD OF "SC"

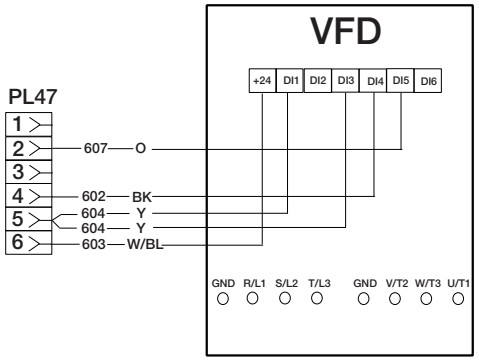
DELTA MS300



CONTROL TECHNIQUES C200



SCHNEIDER ATV320



WIRE COLOR CODE

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

COMPONENT CODES

PL	PLUG
VFD	VARIABLE FREQUENCY DRIVE
MDBA	MODBUS ADAPTER
GND	GROUND

NOTES

1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.
2. PL46 IS NOT USED ON NON-DDC MODELS WITH A MITSUBISHI VFD.
3. THIS DIAGRAM IS TO BE USED IN CONJUCTION WITH THE PRIMARY WIRING DIAGRAM FOUND IN THE CONTROL ACCESS PANEL.
4. THE FACTORY INSTALLED OPTIONAL WIRING IS NOT USED ON ALL MITSUBISHI VFDS.

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 (105C. 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.

ORIGINAL RELEASE NO.: 116859		ELECTRICAL WIRING DIAGRAM	MODELED BY: J. VELA	DATE: 4/8/2024
APPROVED:	CHECKED:	VARIABLE FREQUENCY DRIVES (NON-DDC)	PART NO.: 90-109493-03	REV: 01

J. Unit Tie-Down

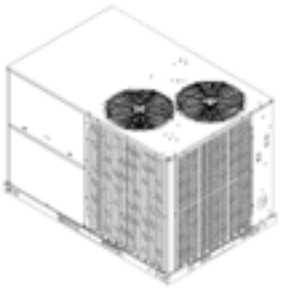
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BOCA RATON, FL 33431

Performance Evaluation

FL 26981.1
THIS DOCUMENT CONTAINS (8) PAGES.

EVALUATION SUBJECT: **RHEEM PACKAGED UNITS** 23-61432

REPORT HOLDER:
RHEEM MANUFACTURING COMPANY, INC.
1100 ABERNATHY ROAD SUITE 1400
ATLANTA, GA, USA
770-351-3000 | RHEEM.COM



NOTE: THE GRAPHICAL DEPICTIONS IN THIS EVALUATION ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

SCOPE OF EVALUATION (compliance with the following codes):

THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN.
UNDER NO CIRCUMSTANCE DOES THIS PERFORMANCE EVALUATION GUARANTEE, IMPLY, OR STATE PERFORMANCE OF THE UNIT IS MAINTAINED DURING OR AFTER A DESIGN EVENT.

This Performance Evaluation is being issued in accordance with the requirements of the **Florida Building Code Eighth Edition (2023)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, and FS 471.025. The product noted in this performance evaluation has been tested and/or evaluated as summarized herein.

SUBSTANTIATING DATA:
• Product Evaluation Documents Test Reports
Substantiating documentation has been submitted to provide this TER and is summarized in the sections below.
Test Report: 0320.01-18 (American Test Lab of South FL)

• Structural Engineering Calculations
Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Max. allowable lateral & uplift wind pressures certified herein
- Max. allowable sliding forces, uplift forces, & overturning moments (see Unit Reactions from Wind Guide on last page)
- Tie-down configuration and anchor capacity for concrete and steel host substrates (host by others).

Calculation summary is included in this product evaluation and appears herein.

LIMITATIONS & CONDITIONS OF USE:
Use of the product(s) listed herein shall be in strict accordance with this product evaluation as noted herein and manufacturer-provided model specifications. Installation shall conform to the minimum standards stated in the referenced building code(s) in addition to the specifications and limitations stated herein. See herein for complete limitations & conditions of use.

OPTIONS:
This evaluation is valid for the models described herein. The critical unit designs have been determined and used in this evaluation. Any structural changes outside of the design as described herein would void this certification.

UNIT CASING MATERIALS:
20ga galv. sheet steel ASTM A653 Type B.
Removable Top & side covers secured with #10 Sheet metal Hex Head Screws
Knockouts provided for utility & control connections.
Contact Report Holder for further unit construction information.

TERMINOLOGY:
See herein for definitions of terms and abbreviations used in this evaluation.

STRUCTURAL PERFORMANCE:
Models referenced herein are subject to the following design limitations:

Maximum Rated Wind Pressures*:
± 140 psf Lateral, 111 psf Uplift

- Required design wind pressures shall be determined according to the guide provided in the Appendix (see last page of this document) or on a site-specific basis in accordance with ASCE 7 and applicable sections of the building code(s) being referenced in accordance with ASD methodology.
- Required design pressures shall be less than or equal to the maximum pressures listed herein.
- *Maximum Rated Wind Pressures indicate the maximum pressures that all units listed herein are approved for. Valid for at-grade and rooftop applications. See limitations herein.
- Valid for use inside and outside the High-Velocity Hurricane Zone (HVHZ).
- Site-specific wind analysis may produce alternate limitations provided maximum rated wind pressures stated herein are not exceeded.

VISIT ECALC.IO/RHEEM
FOR MORE INFORMATION AND DEVIATIONS TO THIS EVALUATION OR SCAN THE QR CODE TO THE RIGHT >

Engineer Signature & Seal:

FRANK L. BENNARDO LICENSE NO. PE0046549 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Frank Bennardo
Date: 2024.02.23 12:24:02 -05'00'

February 23, 2024

Frank Bennardo, P.E.
ENGINEERING EXPRESS®
FL PE #0046549 FLCA #9885

P. APPENDICES
J. Unit Tie-Down

MODELS SUMMARY, DIMENSION & NOTES

TABLE 1: Qualified Tested Unit Construction Metal Cabinetry				
Unit Model	Operating Dimensions w/ screw heads			Operating Weight (lbs)
	Width (in)	Length (in)	Height (in)	
RGEDZR - 150	59 1/2	90 1/10	59 7/10	1070

TESTED UNIT LIMITATIONS

1. The unit model listed above was tested and designed as worst-case configurations of model units listed in *Evaluation Model Series Matrix*, remaining unit models are certified by this approval as long as they have identical construction as those listed above and are of equal or lesser dimensions (length, width, height).
2. Dimensions shown are measured from outermost points of unit, including screw heads.
3. Curb clips shall be as close as possible from the shown locations; installers shall verify any interference between clip attachment and internal components of the unit and move clip within the tolerance allowed.

REQUIRED WIND PRESSURES

Design pressures calculated for use with these units shall be determined by others on a job-specific basis in accordance with the governing code. Site specific load requirements for wind load shall be determined in accordance with ASCE 7 and the codes referenced herein by separate engineering certification and shall be less or equal to design pressures capacity values listed herein for any assembly as shown.

TEST REPORTS UTILIZED

Design and certification of the unit cabinetry is approved through *American Test Lab of South Florida*
Report #: 0320.01-18
Tested according ASTM E330-05 and TAS 202-94.

TABLE 2: Evaluation Model Sereis Matrix (Unit Construction Metal Cabinetry)				
Unit Model	Operating Dimensions w/ screw heads			Operating Weight (lbs)
	Width (in)	Length (in)	Height (in)	
(-)ACC - 036	46 3/4	78 3/8	41 3/8	453
(-)ACC - 048	46 3/4	78 3/8	41 3/8	477
(-)ACC - 060	46 3/4	78 3/8	41 3/8	482
(-)ACC - 072	46 3/4	78 3/8	41 3/8	689
(-)ACD - 090	59 15/32	89 5/16	49 1/4	722
(-)ACD - 102	59 15/32	89 5/16	49 1/4	748
(-)ACD - 120	59 15/32	89 5/16	49 1/4	777
(-)ACD - 150	59 1/2	90 1/10	59 7/10	946

TABLE 2.1: Evaluation Model Sereis Matrix (Unit Construction Metal Cabinetry)				
Unit Model	Operating Dimensions w/ screw heads			Operating Weight (lbs)
	Width (in)	Length (in)	Height (in)	
(-)GEC - 036	46 3/4	78 3/8	41 3/8	453
(-)GEC - 048	46 3/4	78 3/8	41 3/8	477
(-)GEC - 060	46 3/4	78 3/8	41 3/8	482
(-)GEC - 072	46 3/4	78 3/8	41 3/8	689
(-)GED - 090	59 15/32	89 5/16	49 1/4	846
(-)GED - 102	59 15/32	89 5/16	49 1/4	872
(-)GED - 120	59 15/32	89 5/16	49 1/4	901

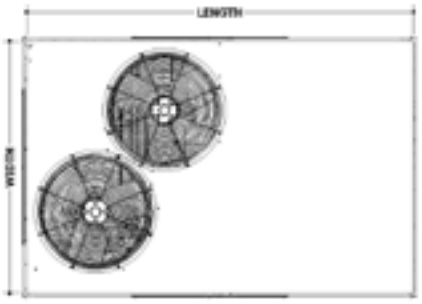
TABLE 2.2: Evaluation Model Series Matrix (Unit Construction Metal Cabinetry)				
Unit Model	Operating Dimensions w/ screw heads			Operating Weight (lbs)
	Width (in)	Length (in)	Height (in)	
(-)HPC - 036	78 3/8	46 3/4	41 3/8	528
(-)HPC - 048	78 3/8	46 3/4	41 3/8	551
(-)HPC - 060	78 3/8	46 3/4	41 3/8	553
(-)HPC - 072	78 3/8	46 3/4	41 3/8	553
(-)HPD - 090	89 5/16	59 1/2	49 1/4	786
(-)HPD - 102	89 5/16	59 1/2	49 1/4	822
(-)HPD - 120	89 5/16	59 1/2	59 7/10	874

Unit Model Note: '(-)' designates equivalent trade brands with similar cabinetry and may vary depending on brand

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J. Unit Tie-Down

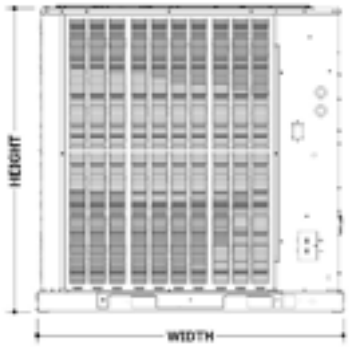
UNIT VIEWS & ELEVATIONS



TOP VIEW



ELEVATION VIEW



SIDE VIEW

Note: RGEDZR-150 illustration selected for dimensional purposes

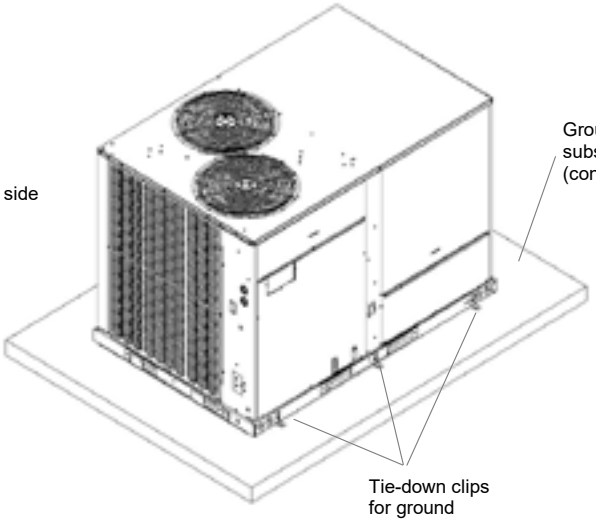
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P. APPENDICES

J. Unit Tie-Down

PRODUCT INSTALLATION

GROUND MOUNT APPLICATIONS
CONFIGURATION A
Note: Design & installation of ground host is by others per site specific conditions





TIE-DOWN CLIP
(GROUND APPLICATION)

Miami Tech CUTD 1" wide ASTM A653 galvanized steel 0.07" thick of varying length (FL19731.2) or *equivalent* for all cabinets tied down to a ground structure; fasten clip to structure using anchor from Anchor Schedule A to Host Structure Table and (3) #12 SAE Gr 2 self-drilling screw to fasten clip to unit base rail. Install in unit with quantities shown ((3) per side). Locate clips at 8.5" min away from the appropriate corner using three clips per side and three clips opposite side in the same configuration.

ANCHOR SCHEDULE TO HOST STRUCTURE

Pressure Lateral (Uplift) (psf)	Concrete	Steel Curb With Clip	Steel Curb Screw
Ground	A	-	-
Up to 81 (64)	-	-	C
Up to 200 (133)	-	B	-

A. – 5/16" DEWALT ULTRACON Anchor embedded 2" in 3,515 psi concrete. 3 1/8" from edge minimum & 5" spacing minimum. NOA No. 17-1227.22

B. – #12 TEK Screws, (14) screws per clip, (5) top front side, (4) top back side and (5) bottom front side.

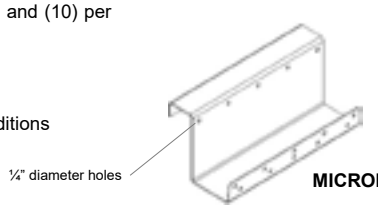
C. – 3/8" SAE Grade 5 Self-Drilling Screw at 6" O.C, (15) per long side and (10) per short side.

STEEL CURB
(ROOF APPLICATION)

Steel curb to be a minimum of 16ga ASTM A653 steel

Curb Clip to be 14ga ASTM A653 steel min (Microhold)

CURB MOUNT APPLICATIONS
CONFIGURATION B
Note: Design & installation of curb to host by others per site specific conditions

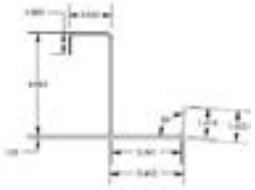


MICROHOLDS

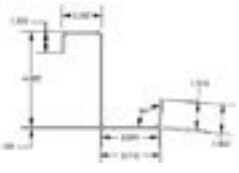




Curb Clip A



Curb Clip C



Curb Clip B

J. Unit Tie-Down

CURB CLIP LOCATION

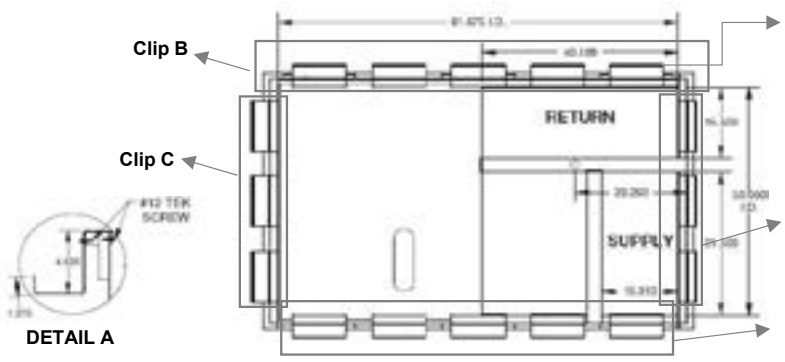


Table 3: Clip Curb Schedule			
Unit Model			Number of Clips (Pcs)
(-)GEC - 036	(-)ACC - 036	(-)HPC - 036	4 LS - 2 SS
(-)GEC - 048	(-)ACC - 048	(-)HPC - 048	4 LS - 2 SS
(-)GEC - 060	(-)ACC - 060	(-)HPC - 060	4 LS - 2 SS
(-)GEC - 072	(-)ACC - 072	(-)HPC - 072	4 LS - 2 SS
(-)GED - 090	(-)ACD - 090	(-)HPD - 090	5 LS - 3 SS
(-)GED - 102	(-)ACD - 102	(-)HPD - 102	5 LS - 3 SS
(-)GED - 120	(-)ACD - 120	(-)HPD - 120	5 LS - 3 SS
(-)GED - 150	(-)ACD - 150		5 LS - 3 SS

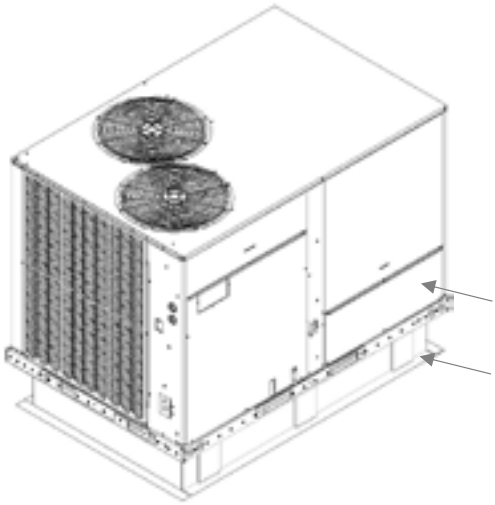
#Clip Designation (5 LS= 5 clips each Long Side; 3 SS= 3 clips each Short Side) equally spaced

Unit Model Note: '(-)' designates equivalent trade brands with similar cabinetry and may vary depending on brand

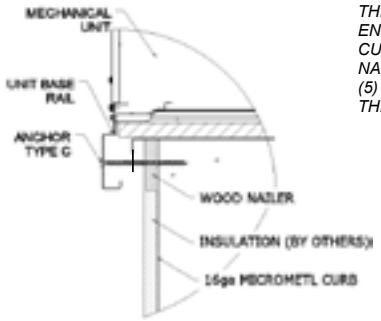
See pressures on page (4) for alternative anchor limitations

ALTERNATIVE ANCHORAGE TO CURB

STEEL CURB WITH SCREW *CONFIGURATION C*



DETAIL B



DETAIL B

INSTALLER TO ENSURE THAT THREADED PORTION ENGAGES STEEL CURB BEYOND WOOD NAILER WITH MINIMUM (5) PITCHES PAST THE THREAD PLANE

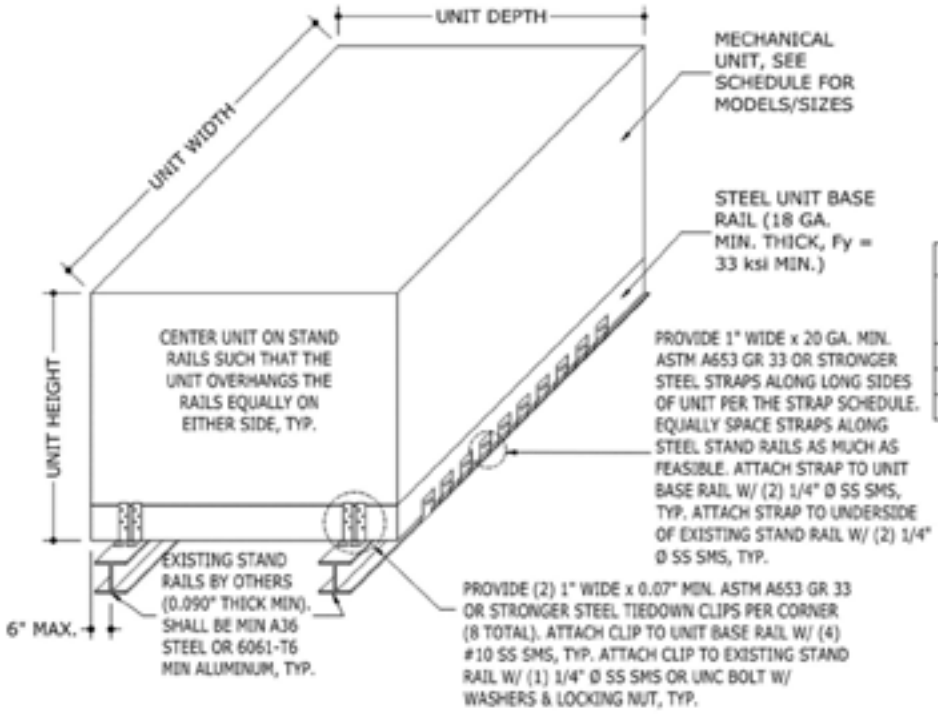
Mechanical Unit Curb Mounted

P. APPENDICES

J. Unit Tie-Down

STAND MOUNT TIEDOWN OPTION

If stand mount option is required, unit-to-stand attachment shall be per detail below. This detail is applicable for both at-grade and rooftop applications. Stand Integrity by others.



STRAP SCHEDULE	
LATERAL ASD DESIGN PRESSURE (PSF)	NO. OF STRAPS PER LONG SIDE
UP TO ±80	5
UP TO ±110	8
UP TO ±140	10

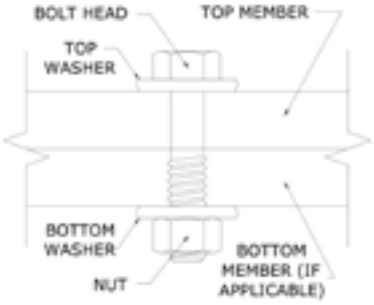
NOTES: FOR ALL STRAP FASTENERS, PROVIDE 3X FASTENER DIAMETER MIN. SPACING & 1.5X FASTENER DIAMETER MIN. EDGE DISTANCE TO ANY MEMBER IN CONTACT EDGE. STAGGER FASTENERS IF REQUIRED TO COMPLY WITH THIS REQUIREMENT.

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J. Unit Tie-Down

TERMINOLOGY, CONTINUED

The following abbreviations may appear in this report: “Addtl.” for “additional”, “AHJ” for “Authority Having Jurisdiction”, “alum” for “aluminum”, “ASCE” for “American Society of Civil Engineers”, “ASD” for “Allowable Stress Design”, “ASTM” for “American Society for Testing and Materials”, “EA.” for “each”, “E.D.” for edge distance”, “EDDS” for “extra deep drawing steel”, “e.g.” for “*exempli gratia*” or “for example”, “equiv.” for “equivalent”, “FBC” for “Florida Building Code”, “FEA” for “Finite Element Analysis”, “FLCA” for “Florida Certificate of Authorization”, “FS” for “Florida Statutes”, “Fu” for “ultimate tensile strength” or “ultimate tensile stress”, “Fy” for “yield strength” or “yield stress” “GA” for “gauge”, “GR." or “Gr.” for “grade”, “HVAC” for “heating, ventilation, and air conditioning”, “HVHZ” for “High-Velocity Hurricane Zone”, “i.e. ” for “*id est*” or “in other words”, “in” for “inch”, “lb” for “pound (force)”, “max.” for “maximum”, “min.” for “minimum”, “mm” for “millimeter”, “NTS” for “not to scale”, “O.C. ” for “on center”, “OD” for “outer diameter”, “pcf” for “pounds (force) per cubic foot”, “PE” for “Professional Engineer”, “qty” for “quantity”, “SAE” for “Society of Automotive Engineering”, “SMS” for “sheet metal screws”, “SS” for “stainless steel”, “TER” for “Technical Evaluation Report”, “typ.” for “typical”, “ult” for “ultimate loads”, “U.N.O.” for “unless noted otherwise”, “UTS” for “ultimate tensile strength” or “ultimate tensile stress”, “WLL” for “working load limit”, “w/o” for “without”, “YS” for “yield strength” or “yield stress”, “#” for “number”, “&” for “and”, and “Ø” for “diameter”. For additional abbreviation/terminology clarifications, please contact this office.



SAMPLE THRU-BOLT
SCALE: NTS SECTION VIEW

Note: The term “Thru-Bolt” or through bolt, if used herein, refers to a bolt passing through the member(s) in contact and is fastened by a nut at the end opposite the screw head. Nut shall be equivalent to or exceed the strength of the bolt U.N.O. Nut shall be sized to accommodate the same nominal diameter as the bolt U.N.O. See diagram above-right for a sample thru-bolt configuration.

Note: For instances herein which list material specifications as *“[material type] or stronger”:*
U.N.O. herein, the term “stronger” refers to a material with a UTS value equal to or greater than the UTS value of the stated material type. Consult appropriate literature for established material UTS values.

Note: Equivalent steel gauge thicknesses as used in this evaluation, U.N.O., are as follows:
22 GA (.030”), 20 GA (.036”), 18 GA (.048”), 16 GA (.060”), 14 GA (.075”), 12 GA (.098”).

LIMITATIONS & CONDITIONS OF USE, CONTINUED

Use of this product shall be in strict accordance with this product evaluation as noted herein. The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the authority having jurisdiction. Host structure conditions which are not accounted for in this product’s respective anchor schedule shall be designed for on a site-specific basis by a registered Professional Engineer. No evaluation is offered for the host supporting structure by use of this document. Adjustment factors noted herein and the applicable building codes must be considered, where applicable. Product components shall be of the material(s) specified in the manufacturer-provided product specifications. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. All fasteners and anchors shall be installed in accordance with the applicable provisions specified herein in addition to the anchor/fastener manufacturers’ published installation instructions. Fasteners must penetrate the supporting members such that the full length of the threaded portion is embedded within the main member. This evaluation does not offer any evaluation to meet large missile impact debris requirements under any circumstances.

All of the wind-resisting exterior panels (with accompanying retrofits) individually meet or exceed their capacity to resist the design wind loads as stated in the calculations as required by the codes and standards stated herein. Due to the indeterminate nature of these units, distortion, deflection, and material deformation cannot be accurately evaluated, but with the diaphragm action of external components and internal stiffeners, the base unit (with accompanying retrofits stated herein as applicable) has the capacity to withstand the design wind loads without detaching from the unit and becoming flying debris.

Survivability: This performance evaluation is valid for a newly installed unit and do not include certification of the product beyond a design event or if impacted by any debris. Inspections shall be implemented annually by the end user and after every named storm. All fasteners and cabinet components are to be verified, and all damaged, loose, corroded and/or broken fasteners and cabinet components shall be replaced to ensure structural integrity against hurricane wind forces. Contact this office for any reevaluation needs or as designated by the Authority Having Jurisdiction.

Durability: Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed plastic components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami Dade counties.

Extent of Certification: Certification pertains to the overall structural integrity of the unit components listed within the evaluation as required by code, subject to the limitations and criteria stated herein. Operability during or after a design event is not included in this certification. Water infiltration is outside the bounds of this certification. No other certifications are intended other than as described herein. This evaluation alone does not offer any evaluation for large missile impact debris or cyclic wind requirements unless specifically stated herein.

Proj. #	Remarks	By	Checked	Date	Proj. #	Remarks	By	Checked	Date
20-28788	Prev. Submittal				23-61432	Stand Mount Option Added	MRT	RWN	02/23/24
23-61432	2020 FBC Update	MRT	RWN	09/25/2023					

P. APPENDICES

J. Unit Tie-Down

APPENDIX A: DESIGN WIND PRESSURE GUIDE

Max. Ult. Wind Speed (V_{ult})	Max. MRH (Roof Height)	Exposure Category	Required Design Wind Pressures (ASD)	
			Lateral Pressure	Uplift Pressure
140 mph	At-Grade (0 ft)	C	± 26 psf	0* psf
		D	± 31 psf	0* psf
	100 ft	C	± 63 psf	50 psf
		D	± 71 psf	56 psf
	200 ft	C	± 72 psf	57 psf
		D	± 80 psf	63 psf
175 mph	At-Grade (0 ft)	C	± 40 psf	0* psf
		D	± 49 psf	0* psf
	100 ft	C	± 98 psf	77 psf
		D	± 111 psf	87 psf
	200 ft	C	± 113 psf	89 psf
		D	± 124 psf	98 psf
186 mph	At-Grade (0 ft)	C	± 46 psf	0* psf
		D	± 54 psf	0* psf
	100 ft	C	± 111 psf	87 psf
		D	± 125 psf	99 psf
	200 ft	C	± 127 psf	100 psf
		D	± 140 psf	111 psf

~~100 psf~~ Note: Any table values with the format shown left, if present, indicate design wind pressures and site conditions that are **not approved for use** by this evaluation. Seek additional engineering or contact this firm for design solutions.

DIRECTIVE: This design pressure guide is for reference only and shall be approved for use by the Authority Having Jurisdiction (AHJ). If the design pressures listed in this guide are not used, required design pressures shall be calculated separately. For site-specific scenarios classified as Exposure Category B, the required design pressures stated for Exposure Category C in the above guide shall be used or design pressures shall be calculated separately. For heights and parameters beyond the parameters listed in this guide, visit our Online Calculator via the website link (https://ecalc.io/forces) or QR Code below, or obtain calculations separately by others.

The required ASD design pressures listed in this guide were calculated per the table's listed corresponding site conditions. The project design professional or permitting contractor shall verify that the site-specific conditions are equal to or less than the approved design parameters listed in the guide. Per the note below table: any values shown as "~~XX psf~~", indicate wind pressures and corresponding site conditions that are **not valid for use** with this evaluation (exceeds the max. rated pressures).

*Note: Per the codes and standards referenced herein, uplift is not required for mechanical equipment at-grade. If uplift at-grade is required by the AHJ, contact this firm for a site-specific evaluation.

At-Grade (0 ft MRH) Required Design Pressures:

- ASCE 7 "Design Wind Loads: Other Structures"
- Structure Shape = Square, flat terrain
- Height of structure (unit + stand or curb, if used) = 6 ft max.
- Width of unit = 1 ft min., Depth of unit = 11 in min.

Rooftop (>15 ft MRH) Required Design Pressures:

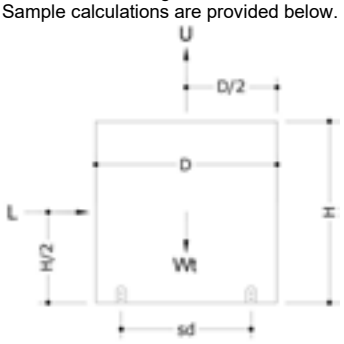
- ASCE 7 "Design Wind Loads: Other Structures: Rooftop Structures and Equipment for Buildings"
- Structure Shape = Square, flat terrain
- z = up to 7 ft, where z = height of stand or curb + ½ unit height
- Lateral GC_f = 1.90; Uplift GC_f = 1.50

VISIT ECALC.IO/FORCES

FOR DESIGN AID CALCULATORS AND RESOURCES RELATED TO THIS EVALUATION & GUIDES HEREIN, OR SCAN THE QR CODE RIGHT >

UNIT REACTIONS FROM WIND GUIDE

DIRECTIVE: This guide is intended for use by a design professional. Design parameters shall abide all specifications and limitations stated in this evaluation. Design professional shall consider all forces, including seismic and snow loads, per the governing building code. Unit reactions obtained from this guide shall be verified by a registered Professional Engineer. Reactions are applicable for unit-to-host connections only. Sample calculations are provided below.



Design Parameters:

- Lateral Wind Pressure, P_lat
- Unit Height, H
- Unit Width, W
- Support Spacing across Depth, sd
- Uplift Wind Pressure, P_up
- Unit Depth, D
- Unit Weight, Wt
- Support Spacing across Width, sw

Unit Reaction Equations:

Long Side (Width x Height):

- Sliding Force, L = P_lat x W x H
- Uplift Force, U = P_up x W x D
- Total Tension per Long Side = (L x H/2 + U x sd/2 – Wt x 0.6 x sd/2) / sd

Short Side (Depth x Height):

- Sliding Force, L = P_lat x D x H
- Uplift Force, U = P_up x W x D
- Total Tension per Short Side = (L x H/2 + U x sw/2 – Wt x 0.6 x sw/2) / sw

Example: A (48" W x 36" D x 42" H), 250 lb net weight unit at wind pressures of 120 psf lateral and 95 psf uplift, on a 24" wide roof stand, shall have the following unit reactions:

Long Side (Width x Height):

1. Sliding Force, L = P_lat x W x H
   = (120 psf) x (48 in) x (42 in) x (1 in^2 / 144 ft^2) = **1680 lb**
2. Uplift Force, U = P_up x W x D
   = (95 psf) x (48 in) x (36 in) x (1 in^2 / 144 ft^2) **= 1140 lb**
3. Total Tension per Long Side =
   = (L x H/2 + U x sd/2 – Wt x 0.6 x sd/2) / sd
   = ((1680 lb x 42/2 in) + (1140 lb x 24/2 in) – (250 lb x 0.6 x 24/2 in)) / 24 in **= 1965 lb**

Short Side (Depth x Height):

1. Sliding Force, L = P_lat x D x H
   = (120 psf) x (36 in) x (42 in) x (1 in^2 / 144 ft^2) **= 1260 lb**
2. Uplift Force, U = P_up x W x D
   = (95 psf) x (48 in) x (36 in) x (1 in^2 / 144 ft^2) **= 1140 lb**
3. Total Tension per Short Side =
   = (L x H/2 + U x sw/2 – Wt x 0.6 x sw/2) / sw
   = ((1260 lb x 42/2 in) + (1140 lb x 48/2 in) – (250 lb x 0.6 x 48/2 in)) / 48 in **= 1046 lb**

IN ALL CONDITIONS IT IS THE RESPONSIBILITY OF THE PERMIT HOLDER TO ENSURE THE HOST STRUCTURE IS CAPABLE OF WITHSTANDING THE RATED GRAVITY, LATERAL, AND UPLIFT FORCES BY SITE-SPECIFIC DESIGN. NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS OFFERED BY ENGINEERING EXPRESS AS TO THE INTEGRITY OF THE HOST STRUCTURE TO CARRY DESIGN FORCE LOADS INCURRED BY THIS UNIT.

Q. DECOMMISSIONING

Q.1. Before Beginning Decommissioning

Before carrying out decommissioning, the technician performing decommissioning must be familiar with the equipment and its safety procedures, and ensure electrical power is available to the unit. See ***Section A.3.1. Working Personnel Qualifications*** for more information.

Before recovering the refrigerant, an oil and refrigerant sample must be taken if the technician intends to reuse the recovered refrigerant to have a record.

Before beginning any work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. See ***C.2.6. No Ignition Sources***.

Before beginning any work on the system or conducting any hot work, ensure that the area is in the open or that it is adequately ventilated. Ventilation must continue while the unit is being worked on. Ventilation is required to safely disperse any released refrigerant into the atmosphere.

Work shall be undertaken under a controlled procedure so as to minimize the risk of flammable gas or vapor being present while work is being performed. See ***A.3. Importance of a Quality Installation***.

All maintenance staff and others working in the local area shall be instructed on the nature of the work being performed. Work in confined spaces shall be avoided.

The area shall be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres.

Q.2. Decommissioning Procedure

Follow the decommissioning procedure outlined below:

READ ALL STEPS BEFORE BEGINNING.

1. Become familiar with the equipment, its operation, and its safety procedures.
2. Isolate the system electrically.
3. Ensure that mechanical handling equipment for the refrigerant cylinders is at hand, if required.
4. Ensure personal, protective equipment is being used correctly.
5. A competent supervisor must be present during the refrigerant recovery process. Ensure such a person is available on site.
6. Confirm that the recovery equipment and cylinders are correct for the equipment and its refrigerant.
7. Follow the steps outlines in ***Section J.1.1. Check for Refrigerant Leaks*** and ***Section J.1.1.3. Removal and Evacuation of Refrigerant.***
8. If possible, pump down the refrigerant system.
9. If a vacuum is not possible, make a manifold so that the refrigerant can be removed from various parts of the system.
10. Make sure that the recovery cylinder is situated on the scale before recovery begins.
11. Start the recovery machine and operate it in accordance with its instructions.
12. Do not overflow the cylinders. No more than 80% volume liquid charge is allowed.
13. Do not exceed the maximum working pressure of the cylinder, even temporarily.
14. When the cylinders have been filled correctly and the process is complete, make sure that the cylinders and the recovery equipment are removed from the site promptly.
15. Verify all isolation valves on the unit are closed (off).
16. Recovered refrigerant shall not be charged into another unit unless a sample was taken prior to recovering the refrigerant and its been cleaned and checked.

Q.3. Labeling

When performing any maintenance or troubleshooting on the refrigerating equipment or associated parts, a dry powder or CO2 fire extinguisher shall be nearby for emergency use.

Equipment must be labeled stating that is has been decommissioned and emptied of refrigerant. The label must be dated and signed. Ensure that there are label(s) on the unit stating that this equipment contains **flammable refrigerant**.

R. INFORMATION FOR THE OWNER

R.1. 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.

R.2. 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 User's Information Manual which can be found on the manufacturer's website.

At least once a year, scheduled service checks must be made to verify the safety systems in this unit are working as intended.

R.2.1. Filter Changing

WARNING: DISCONNECT THE MAIN POWER TO THE OUTDOOR UNIT BEFORE ATTEMPTING ANY MAINTENANCE OPERATION. FAILURE TO DO SO CAN RESULT IN SEVERE ELECTRICAL SHOCK OR DEATH.

1. Keep air filters clean. There are several types of material used in air filters and there are many possible locations for air filters. Consult with your contractor as to the locations of the filters and type of material in use.

2. How To Clean:

Glass Fiber (Throwaway) — This is a disposable type of filter. Inspect monthly and replace when necessary. A new building will normally require more frequent attention to the filters.

Aluminum Mesh — Wash with detergent and water. Air dry thoroughly and renew the coating in compliance with the manufacturer's instructions.

Pleated or MERV Filters (Throwaway) —There are various types and levels of filtration available. These may require more frequent inspection or replacement. Consult with the filter manufacturer.

IMPORTANT: Do not operate your system for extended periods without filters, as the dust contained in the air may pack into the fin area of the evaporator coil creating a condition which could require extensive repairs.

WARNING: A PORTION OF THE DUST CONTAINED IN THE AIR MAY TEMPORARILY LODGE IN THE AIR DUCT RUNS AND AT THE SUPPLY REGISTERS. ANY RECIRCULATED DUST PARTICLES WILL BE HEATED AND CHARRED BY CONTACT WITH THE ELECTRIC HEATING ELEMENTS. THIS RESIDUE WILL SOIL CEILINGS, WALLS, FLOORING, AND OTHER BUILDING ARTICLES.

R.2.2. Cleaning Condensate Pan

Check annually and, if necessary, clean drain pan and drain line. In winter, keep drain and trap dry or protect against freezeup. If this unit is installed with proper clearances, then the drain pan on most units is removable (check unit Specification Sheet to determine whether or not your unit is equipped with a slide-out drain pan). Refer to the unit Installation and Operation Manual for specific instruction on clearances and how to clean the drain pan.

R.2.3. Cleaning Coils

NOTE: Clean the Microchannel using only water. Due to the aluminum construction, do not use cleaners or detergents because they may cause corrosion to the Microchannel, leading to refrigerant leaks.

Directions to clean the Microchannel coils are as follows:

1. Disconnect power to the unit.

2. Wear proper personal protection equipment such as a face shield, gloves, and waterproof clothing.

3. Remove panels from the unit to gain safe access to the microchannel coils.

NOTE: Clean the coil from the inside out, in the opposite direction of normal airflow, allowing the debris to be pushed out rather than further in.

4. Use a soft brush or vacuum to remove base debris or surface-loaded fibers from both sides of the coil.

R.2.3. Cleaning Coils (Cont.)

5. Using a sprayer and water ONLY, clean the coil following the guidelines below:

a. Use a 90° sprayer nozzle attachment to aid in cleaning the closely spaced coils. Sprayer nozzle pressure should not exceed 600 psi. Use a flat fan spray nozzle with an angle of at least 15 degrees.

b. Spray perpendicular to the face of the coil. The maximum source angle should not exceed 25 degrees to the face of the coil.

c. Spray approximately 1”-3” from the coil surface.

6. Do not allow the sprayer to come in contact with the tube and fin as it may damage the coil.

R.2.4. Checking Electrical Components

Repair and maintenance of electrical components must include safety checks and component inspections.

If a fault exists that could compromise safety, then no electrical supply can be connected to the unit until the error causing the fault is repaired. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution must be used. The temporary solution must be communicated to the owner.

Initial safety checks include:

- Confirming that the capacitors are discharged. This must be done safely to avoid the possibility of sparking.
- Ensure that no live electrical components or wiring are exposed while charging, recovering, or purging the system.
- Confirm that the unit grounding is constant and secure.

R.3. Refrigerant Recovery

When removing refrigerant from a unit, either for service or decommissioning, the following practices are required to safely remove the refrigerant.

When transferring the refrigerant into cylinders, ensure that only the appropriate recovery cylinders are employed.

- Ensure that the correct number of recovery cylinders are available to hold the total system charge.
- All cylinders used must be designed for recovering R-454B refrigerant.
- Cylinders shall be complete with a pressure-relief valve and shut-off valves, all in working order.
- Empty recovery cylinders must be evacuated and cooled before refrigerant recovery occurs.

The following equipment is required to be on site and in good working condition prior to and during refrigerant recovery:

- The technician’s recovery equipment
- The recovery equipment’s instructions that details the proper recovery of flammable refrigerant.
- A set of calibrated weighing scales
- Hoses, which much be complete with leak-free disconnect couplings.

If in doubt, contact the manufacturer about recovering flammable refrigerant.

The recovered refrigerant must be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. DO NOT MIX REFRIGERANTS IN RECOVERY UNITS OR RECOVERY CYLINDERS.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to make certain that the flammable refrigerant, R-454B, does not remain within the lubricant. The compressor body must not be heated by an open flame or other ignition sourced to accelerate this process. When oil is drained from a system, it shall be carried out safely.

R.4. Warranty Information

For more information on this unit’s factory warranty, see the warranty card shipped with the unit. The warranty card is also provided on the manufacturer’s website.

S. INSTALLATION CHECK LIST AND JOB SITE SHEET

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)

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 :					

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) : _____

S. INSTALLATION CHECK LIST AND JOB SITE SHEET

Commercial Job Site Information

Air Flow CFM :

Building Design CFM : _____

Operating System CFM : _____

Blower Speed :

Motor RPM : _____

Blower RPM : _____

Blower Sheave Turns : _____

(Turns are measured from a fully closed position)

Static Pressure :

Return Static Pressure : _____

Supply Static Pressure : _____

Total Static Pressure : _____

Variable Frequency Drive (VFD) : (low fan speed settings are located in DDC Control)

Factory Equiped: Yes No (Circle one)

Active VFD Display (Hz) : _____

LOC/REM Light On?: Yes No (Circle one)

Power Setting (uLu) : _____

Runs to 45hz on Start?: Yes No (Circle one)

Runs to 60hz 2nd Stage?: Yes No (Circle one)

Low Fan Speed % : _____

1stg Cooling Speed % : _____

Low Economizer % : _____

Economizer Setup and Information :

Outdoor Air:

Design CFM : _____

Design % : _____

Measured CFM : _____

Measured % : _____

Blade Position and Settings:

Minimum Position - Low : _____

Minimum Position - High : _____

Min Position Shaft Angle : _____

Measured % : _____

Program Settings:

Enthalpy Zone Setting : A B C D E (Circle one)

Mixed Air Temperature : _____

Min Position Shaft Angle : _____

Measured % : _____

Heat or Furnace Information :

Gas Heat :

Fuel Type : Natural LP (Circle one)

Input BTU : _____

Measured BTU : _____

Line Gas Pressure : _____

Manifold Pressure - Low : _____

Manifold Pressure - High : _____

Number of Orifices : _____

Orifice Size : _____

Flame Signal - microamp (s) : _____

	Voltage: Line 1	Voltage: Line 2	Amperage: Line 1	Amperage: Line 2	RPM	Pressure Switches (measured in inches w.c.) Low	High	Close	Open
Inducer 1:									
Inducer 2:									
Inducer 3:									
Inducer 4:									

Main Limit Closed: Yes No (Circle one)

Over Temp Limit Closed: Yes No (Circle one)

Spark Visible at Igniter : Yes No (Circle one)

Burner Flames Blue : Yes No (Circle one)

Electric Heat :

System Voltage : 208 240 460 (Circle one)

Total Kw input Rating : _____

	Stage 1 Amps:	Stage 2 Amps:	Stage 1 Watts:	Stage 2 Watts:
Phase A :				
Phase B :				
Phase C :				

Notes and Comments :

_____

_____

_____

_____