INSTALLATION INSTRUCTIONS

AIR HANDLERS

(-)B2T

• MODELS FEATURING EARTH-FRIENDLY R-454B REFRIGERANT

RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION!

⚠WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

c UL us LISTED

Accredited by the RvA

ABS Quality Evaluations, Inc. Management System Certification

ANAB ACCREDITED

ISO 9001:2015

DO NOT DESTROY THIS MANUAL

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

92-20521-158-01

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1.0 SAFETY INFORMATION

⚠ WARNING

Duct leaks can create an unbalanced system and draw pollutants such as dirt, dust, fumes and odors into the home causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the living space through leaking ducts and unbalanced duct systems causing personal injury or death (see Figure 1).

- **If air-moving equipment or ductwork is located in garages or off-garage storage areas - all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.**
- **If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers – all joints, seams, and openings in the equipment and duct must also be sealed to prevent depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the living space.**

⚠ WARNING

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

⚠ WARNING (SEE SECTION 3.10.2: GROUNDING)

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

⚠ CAUTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.
The fixed wiring insulation must be protected, for example, by insulating sleeving having an appropriate temperature rating.
Any means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

⚠ CAUTION

This unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard, UL 60335-2-40/CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.

⚠ CAUTION

-Single-pole contactors are used on all standard single-phase units through 5 tons. Caution must be exercised when servicing as only one leg of the power supply is broken by the contactor.
-Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
-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).
-Do not pierce or burn.
-Be aware that refrigerants may not contain an odor.

⚠ WARNING (SEE SECTION 4.0: ELECTRICAL WIRING)

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

⚠ WARNING (SEE SECTION 12.5: BLOWER ASSEMBLY REMOVAL & REPLACEMENT)

If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.

⚠ WARNING

Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by a trained, qualified service personnel. Consumer service is recommended only for filter cleaning/replacement. Never operate the unit with the access panels removed.

⚠ CAUTION

The indoor coil must be equipped with an electronically powered leak detection system. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

⚠ WARNING (SEE SECTION 3.5: DUCTWORK)

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 or property damage.

⚠ WARNING (SEE SECTION 3.6: AIR FILTER)

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the heating elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house.

Soot damage may occur even with filters in place when certain types of candles, oil lamps or standing pilots are burned.

⚠ WARNING

The first 36 inches of supply air plenum and ductwork must be constructed of sheet metal as required by NFPA 90B. The supply air plenum or duct must have a solid sheet metal bottom directly under the unit with no openings, registers or flexible air ducts located in it. If flexible supply air ducts are used they may be located only in the vertical walls of a rectangular plenum, a minimum of 6 inches from the solid bottom. Metal plenum or duct may be connected to the combustible floor base, if not, it must be connected to the unit supply duct flanges such that combustible floor or other combustible material is not exposed to the supply air opening from the downflow unit. Exposing combustible (non-metal) material to the supply opening of a downflow unit can cause a fire resulting in property damage, personal injury or death.

Exceptions to downflow warnings:

• Installations on concrete floor slab with supply air plenum and ductwork completely encased in not less than 2 inches of concrete (See NFPA 90B).

⚠ CAUTION (SEE SECTION 3.3: AUXILIARY OVERFLOW PAN)

In compliance with recognized codes, an auxiliary drain pan must be installed under all equipment containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping. See Section 6.5 of this manual for auxiliary horizontal overflow pan accessory information (model RXBM).

⚠ NOTICE

Improper installation, or installation not made in accordance with the Underwriters Laboratory (UL) certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions and are not covered by the unit warranty.

⚠ WARNING (SEE WARNINGS IN REGARD TO DUCTWORK)

DO NOT INSTALL THIS UNIT IN MANUFACTURED (MOBILE) HOMES. IMPROPER INSTALLATION IS MORE LIKELY IN MANUFACTURED HOUSING DUE TO DUCTWORK MATERIAL, SIZE, LOCATION, AND ARRANGEMENT. INSTALLATIONS IN MANUFACTURED HOUSING CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

EXCEPTION: MANUFACTURED HOUSING INSTALLATIONS ARE APPROVED ONLY WITH DOCUMENTATION BY A RECOGNIZED INSPECTION AUTHORITY THAT THE INSTALLATION HAS BEEN MADE IN COMPLIANCE WITH THE INSTRUCTIONS AND ALL WARNINGS HAVE BEEN OBSERVED.

Continued on next page ›

⚠ WARNING

PROPOSITION 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the State of California to cause cancer.

All manufacturer products meet current Federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.

California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.

All "new equipment" shipped for sale in California will have labels stating that the product contains and/or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.

You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air-conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.

- **Glass Wool (Fiberglass) Insulation**
- **Carbon Monoxide (CO).**
- **Formaldehyde**
- **Benzene**

More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.

⚠ WARNING

IF UNIT IS TO BE INSTALLED WITHOUT AN INDOOR COIL, RETURN DUCT OR PLENUM, IT MUST NOT BE INSTALLED DIRECTLY OVER COMBUSTIBLE MATERIAL. IF INSTALLED WITHOUT AN INDOOR COIL WITH A RETURN DUCT OR PLENUM, THE AIR PLENUM OR DUCT MUST HAVE A SOLID SHEET METAL BOTTOM WITH NO RETURN AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS LOCATED DIRECTLY UNDER THE UNIT. EXPOSING COMBUSTIBLE MATERIAL TO THE RETURN OPENING OF AN UPFLOW UNIT WITHOUT AN INDOOR COIL CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠ WARNING

THE SUPPLY AIR PLENUM OR DUCT MUST HAVE A SOLID SHEET METAL BOTTOM WITH NO SUPPLY AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS LOCATED IN IT FOR THE FIRST 36 INCHES OF HORIZONTAL SURFACE ON UNITS WITH ELECTRIC HEATERS. FAILURE TO OBSERVE SUPPLY PLENUM, DUCT WARNINGS CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠ WARNING (SEE SPECIFIC AIR-FLOW POSITION FOR ADDITIONAL WARNINGS)

UNITS ARE FOR DUCTED APPLICATIONS ONLY. A MINIMUM OF 36 INCHES OF SUPPLY AIR PLENUM AND DUCTWORK IS REQUIRED. NO SUPPLY AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS MAY BE LOCATED WITHIN THE FIRST 36 INCHES OF SUPPLY PLENUM AND DUCTWORK ON UNITS WITH ELECTRIC HEATERS. FAILURE TO OBSERVE SUPPLY PLENUM/DUCT WARNINGS CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

⚠ CAUTION

When used on cooling applications, excessive sweating may occur when unit is installed in an unconditioned space. This can result in property damage.

- **Some building codes require extra cabinet insulation and gasketing when unit is installed in attic applications.**
- **If installed in an unconditioned space, apply caulking around the power wires, control wires, refrigerant tubing and condensate line where they enter the cabinet. Seal the power wires on the inside where they exit conduit opening. Caulking is required to prevent air leakage into and condensate from forming inside the unit, control box, and on electrical controls.**
- **Install the unit in such a way as to allow free access to the coil/filter compartment and blower/control compartment.**
- **Install the unit in a level position to ensure proper condensate drainage. Make sure unit is level in both directions within 1/8".**
- **Install the unit in accordance with any local code which may apply and the national codes. Latest editions are available from: "National Fire Protection Association, Inc., Batterysmarch Park, Quincy, MA 02269." These publications are:**
  - **ANSI/NFPA No. 70-(Latest Edition) National Electrical Code.**
  - **NFPA 90A Installation of Air Conditioning and Ventilating Systems.**
  - **NFPA 90B Installation of Warm Air Heating and Air-Conditioning Systems.**
- **The equipment has been evaluated in accordance with the Code of Federal Regulations, Ttle 24, Chapter XX, Part 3280.**

⚠ CAUTION (SEE SECTION 3.2.3: HORIZONTAL APPLICATIONS)

HORIZONTAL UNITS MUST BE CONFIGURED FOR RIGHT HAND AIR SUPPLY OR LEFT HAND AIR SUPPLY. HORIZONTAL DRAIN PAN MUST BE LOCATED UNDER INDOOR COIL. FAILURE TO USE THE DRAIN PAN CAN RESULT IN PROPERTY DAMAGE.

⚠ WARNING (SEE SECTION 7.0: MAINTENANCE)

Units with circuit breaker(s) meet requirements as a service disconnect switch, however, if access is required to the line side (covered) of the circuit breaker, this side of the breaker(s) will be energized with the breaker(s) de-energized. Contact with the line side can cause electrical shock resulting in personal injury or death.

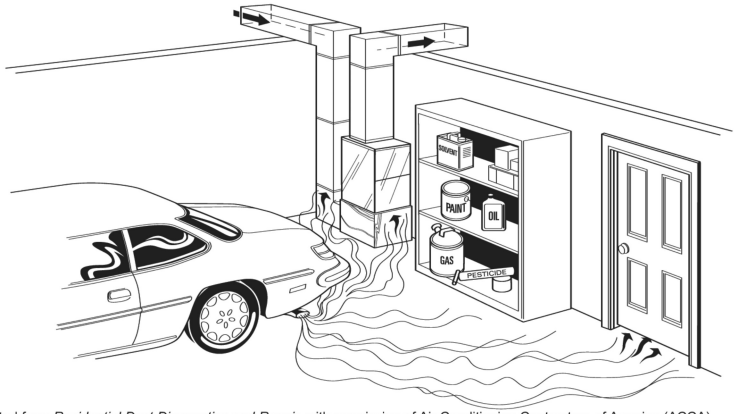
⚠ NOTICE

Use of this air-handler during construction is not recommended. If operation during construction is absolutely required, the following temporary installation requirements must be followed:

Installation must comply with all Installation Instructions in this manual including the following items:

- **Properly sized power supply and circuit breaker/fuse**
- **Air-handler operating under thermostatic control;**
- **Return air duct sealed to the air-handler;**
- **Air filters must be in place;**
- **Correct air-flow setting for application**
- **Removing the coil and storing it in a clean safe place is highly recommended until construction is completed and the outdoor unit is installed.**
- **Clean air-handler, duct work, and components including coil upon completion of the construction process and verify proper air-handler operating conditions according as stated in this instruction manual.**
- **NOTE: Electric strip heater elements tend to emit a burning odor for a few days if dust has accumulated during construction. Heater elements are easily damaged. Take great care when cleaning them. Low pressure compressed air is recommended for cleaning elements.**

FIGURE 1
MIGRATION OF DANGEROUS SUBSTANCES, FUMES, AND ODORS INTO LIVING SPACES



Adapted from *Residential Duct Diagnostics and Repair,* with permission of Air Conditioning Contractors of America (ACCA).

⚠WARNING

Carbon Monoxide (CO) Poisoning Can Cause Severe Injury or Death.

Carbon Monoxide from the exhaust of motor vehicles and other fuel burning devices can be drawn into the living space by the operation of the central heating and air conditioning system.

Exhaust from motor vehicles, generators, garden tractors, mowers, portable heaters, charcoal and gas grills, gasoline powered tools, and outdoor camping equipment contains carbon monoxide, a poisonous gas that can kill you. You cannot see it, smell it, or taste it.

- **Do NOT operate an automobile or any engine in a garage for more than the few seconds it takes to enter or exit the garage.**
- **Do NOT operate any fuel-burning device in an enclosed or partly enclosed space, or near building windows, doors or air intakes.**

The U.S. Consumer Product Safety Commission (CPSC) and Health Canada recommend the installation of UL or CSA certified Carbon Monoxide Alarm(s) in every home.

⚠ WARNING

Duct leaks can create an unbalanced system and draw pollutants such as dirt, dust, fumes and odors into the home causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the living space through leaking ducts and unbalanced duct systems causing personal injury or death (see Figure 1).

- **If air-moving equipment or ductwork is located in garages or off-garage storage areas - all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.**
- **If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers - all joints, seams, and openings in the equipment and duct must also be sealed to prevent depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the living space.**

⚠ NOTICE

Improper installation, or installation not made in accordance with the Underwriters Laboratory (UL) certification or these instructions, can result in unsatisfactory operation and/or dangerous conditions and are not covered by the unit warranty.

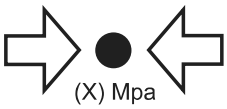
⚠ NOTICE

Intended for indoor use only (excluding laundry rooms).

⚠ CAUTION

This unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard, UL 60335-2-40/CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.

Markings Reference

	[Symbol ISO 7000-1659 (2004-01]	Service indicator: read technical manual
	A2L Symbol	Warning: low burning velocity material
	[Symbol ISO 7000-1701 (2004-01]	Pressure
	[Symbol IEC 60417-6040 (2010-08]	Ultraviolet radiation, instructional safeguard
	[Symbol ISO 7000-1641 (2004-01]	Operator's manual: operating instructions
	[UN GHS (Globally Harmonized System of Classification and Labeling of Chemicals)]	Refrigerant Safety Group AXX, warning; flammable materials

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2.0 GENERAL INFORMATION

2.1 IMPORTANT INFORMATION ABOUT EFFICIENCY & INDOOR AIR QUALITY

Central cooling and heating equipment is only as efficient as the duct system that car-ries the cooled or heated air. To maintain efficiency, comfort and good indoor air quality, it is important to have the proper balance between the air being supplied to each room and the air returning to the cooling and heating equipment.

Proper balance and sealing of the duct system improves the efficiency of the heating and air conditioning system and improves the indoor air quality of the home by reducing the amount of airborne pollutants that enter homes from spaces where the ductwork and/or equipment is located. The manufacturer and the U.S. Environmental Protection Agency's Energy Star Program recommend that central duct systems be checked by a qualified contractor for proper balance and sealing.

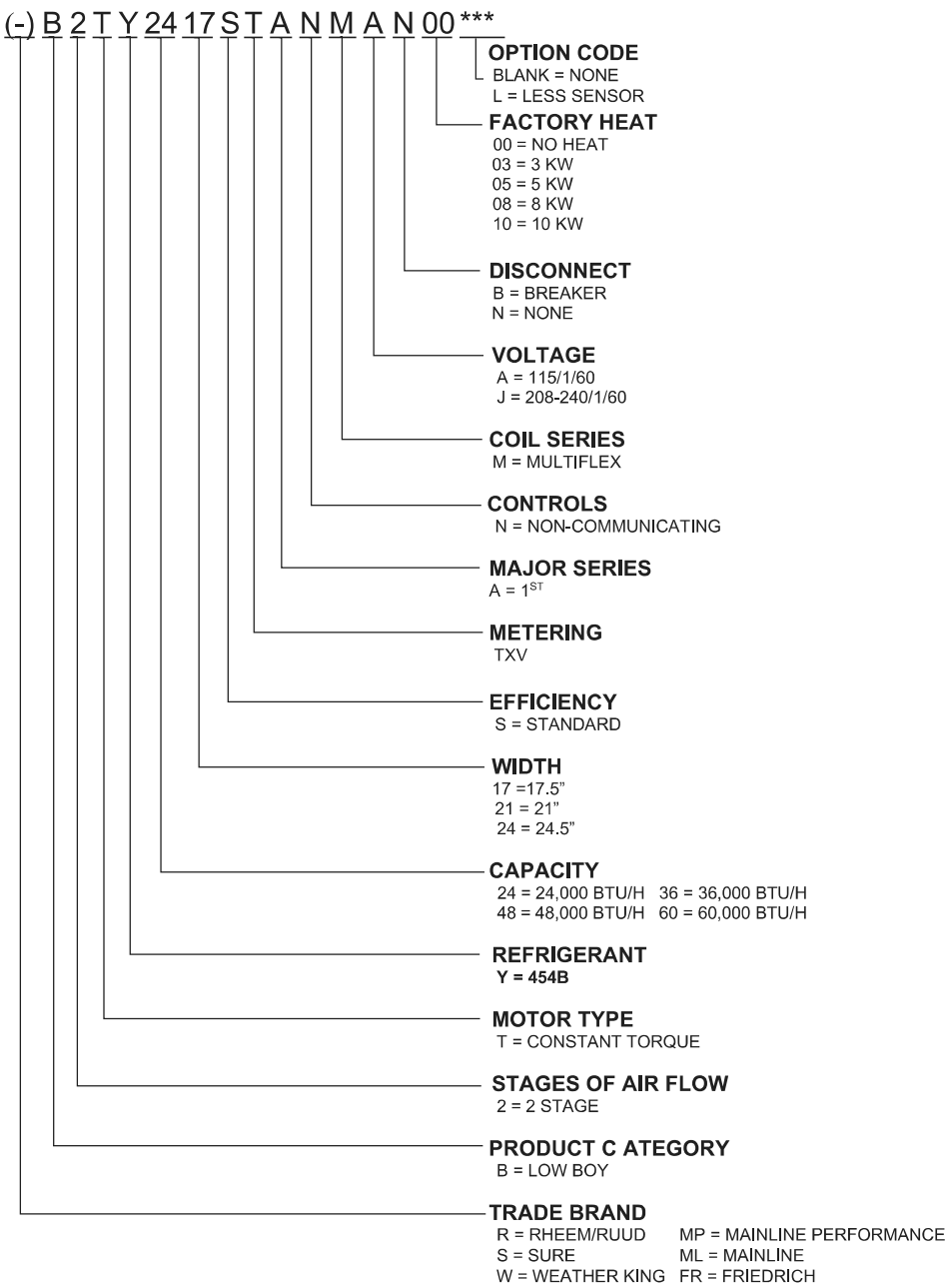
2.2 CHECKING PRODUCT RECEIVED

Immediately upon receipt, all cartons and contents should be inspected for transit damage. Units with damaged cartons should be opened immediately. If damage is found, it should be noted on the delivery documents and a damage claim filed with the delivering carrier.

After unit has been delivered to the job site, remove the unit from the carton taking care not to damage the unit. Check the unit rating plate for unit model number, unit size, coil model, voltage, phase, etc. to assure the unit matches the job specifications.

2.3 MODEL NUMBER NOMENCLATURE & AVAILABLE MODELS

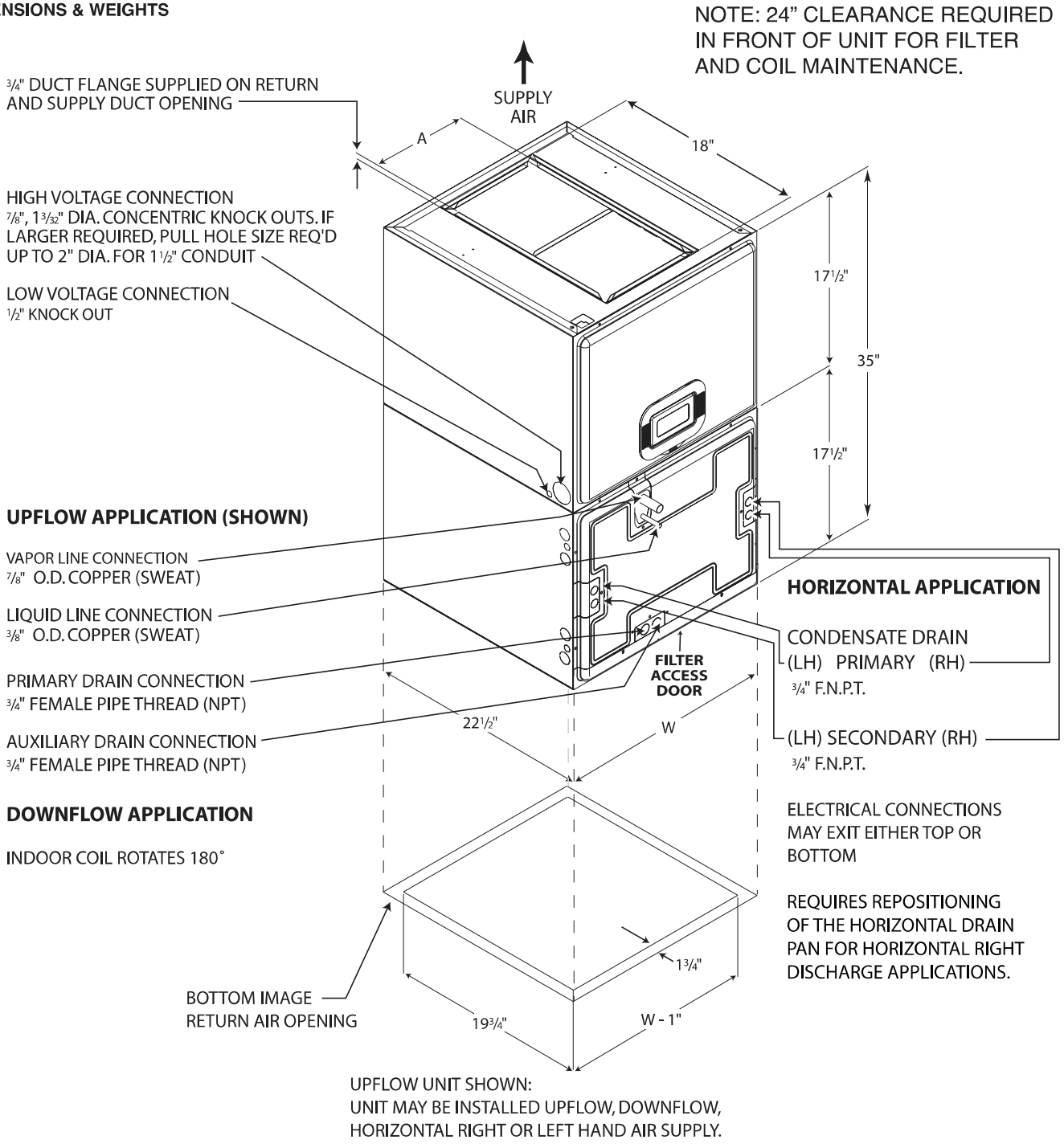
FIGURE 2
MODEL NUMBER NOMENCLATURE



Available Models
(-)B2TY2417STANMJB05
(-)B2TY2417STANMJB07
(-)B2TY2417STANMAN00
(-)B2TY3621STANMJB05
(-)B2TY3621STANMJB07
(-)B2TY3621STANMJB10
(-)B2TY3621STANMAN00
(-)B2TY4824STANMJB05
(-)B2TY4824STANMJB07
(-)B2TY4824STANMJB10
(-)B2TY4824STANMAN00
(-)B2TY6024STANMJB10
(-)B2TY6024STANMAN00

2.4 DIMENSIONS & WEIGHTS

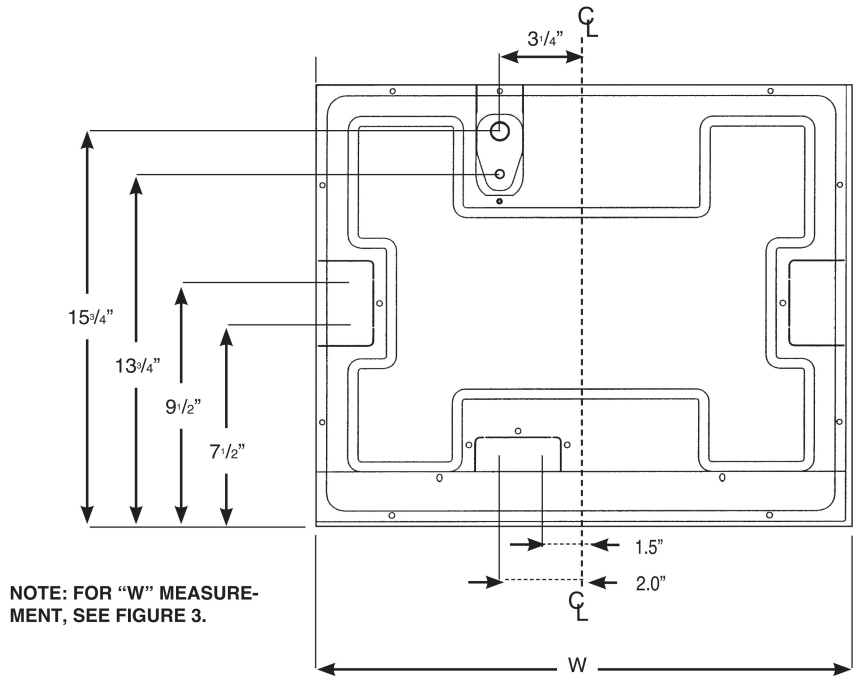
FIGURE 3
DIMENSIONS & WEIGHTS



DIMENSIONAL DATA

Model Cabinet Size	Unit Width "W" In. [mm]	Supply Duct "A" In. [mm]	Unit Weight/Shipping Weight (Lbs.) [kg]
17	17 1/2 [445]	7 9/16 [192]	92/99 [42/45]
21	21 [533]	9 7/16 [240]	109/117 [49/53]
24	24 1/2 [622]	11 3/4 [298]	125/134 [57/61]
25	24 1/2 [622]	11 3/4 [298]	125/134 [57/61]

FIGURE 4
DIMENSIONS FOR FRONT CONNECT COIL



NOTE: FOR "W" MEASUREMENT, SEE FIGURE 3.

2.5 IMPORTANCE OF PROPER INDOOR/OUTDOOR MATCH-UPS

To assure many years of reliable operation and optimum customer comfort and to assure the outdoor unit warranty remains valid, an air-handler model should be selected that is properly matched to the outdoor unit. This is especially critical for heat pump systems to assure proper refrigerant charge balance between the cooling and heating modes. The recommended approach is to select an air-handler model that has an AHRI match with the outdoor unit. Refer to the AHRI directory at **www.ahridirectory.org** to confirm the air-handler and outdoor unit are a certified combination in the AHRI Directory.

2.6 IMPORTANCE OF QUALITY INSTALLATION

A quality installation is critical to assure safety, reliability, comfort, and customer satisfaction. Strict adherence to applicable codes, the information in this installation manual, the outdoor unit installation manual, and the thermostat installation manual are key to a quality installation. Read the entire instruction manuals before starting the installation.

IMPORTANT: This product has been designed and manufactured to meet certified AHRI capacity and efficiency ratings with the appropriate outdoor units. However, proper refrigerant charge, proper air-flow, and refrigerant line sizing are critical to achieve optimum capacity and efficiency and to assure reliable operation. Installation of this product should follow the manufacturer's refrigerant charging and air-flow instructions located in the outdoor unit installation instructions and the charging chart label affixed to the outdoor unit. Failure to confirm proper charge and air-flow may reduce energy efficiency and shorten equipment life.

The equipment has been evaluated in accordance with the Code of Federal Regulations, Title 24, Chapter XX, Part 3280.

Install the unit in accordance with applicable national, state, and local codes. Latest editions are available from: "National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02269." These publications are:

- ANSI/NFPA No. 70-(Latest Edition) National Electrical Code.
- NFPA 90A Installation of Air Conditioning and Ventilating Systems.
- NFPA 90B Installation of Warm Air Heating and Air-Conditioning Systems.

Install the unit in such a way as to allow necessary access to the coil/filter rack and blower/control compartment.

3.0 INSTALLATION

3.1 TOOLS & REFRIGERANT

3.1.1 TOOLS REQUIRED FOR INSTALLING AND SERVICING R-454B MODELS

Manifold Sets:

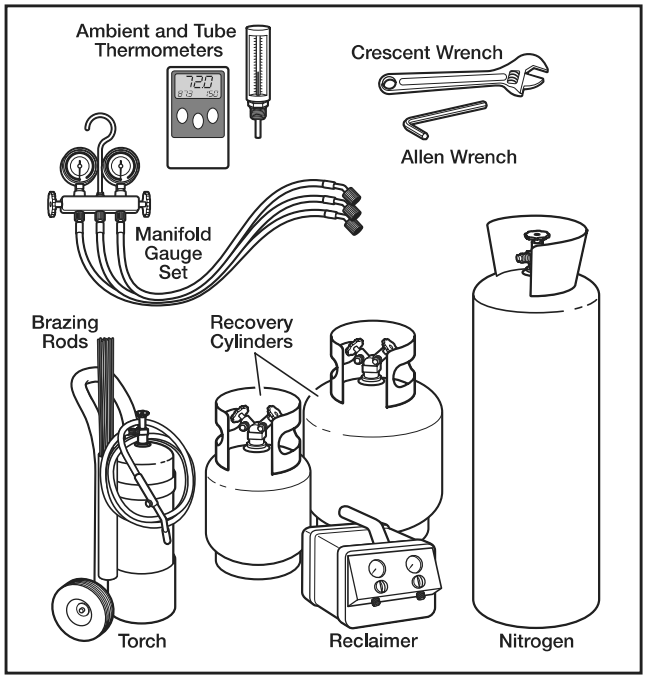
- Up to 800 PSIG High-Side
- Up to 250 PSIG Low-Side
- 550 PSIG Low-Side Retard

Manifold Hoses:

- Service Pressure Rating of 800 PSIG

Recovery Cylinders:

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



⚠ NOTICE

R–454B is classified as safety group A2L per ASHRAE Standard 34. Verify that service equipment and instruments are certified for use with group A2L refrigerants, and in particular with R–454B.

3.1.2 SPECIFICATIONS OF R-454B

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

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 77 °F [25 °C] is 213 psig [1469 kPa] and dew point saturation pressure at 77 °F [25 °C] is 205 psig [1415 kPa].

Composition: R–454B is classified as safety group A2L per ASHRAE Standard 34. Verify that service equipment and instruments are certified for use with group A2L refrigerants, and in particular with R–454B is a non-azeotropic mixture of 68.9% by weight difluoromethane (HFC-32) and 31.1% by weight 2,3,3,3-tetrafluoro-1-propene (HFO-1234yf).

Pressure: The pressure of R–454B is classified as safety group A2L per ASHRAE Standard 34. Verify that service equipment and instruments are certified for use with group A2L refrigerants, and in particular with R–454B is similar to that of R-410A. Recovery and recycle equipment, pumps, hoses, and the like must have design pressure ratings appropriate for R-454B. Manifold sets need to range up to 800 psig high-side and 250 psig low-side with a 550 psig low-side retard. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating, DOT 4BA400 or DOT 4BW400.

Flammability: R–454B is classified as safety group A2L, where the 2L flammability class indicates lower flammability. **R-454B and air should never be mixed in tanks or supply lines or be allowed to accumulate in storage tanks. Leak checking should never be done with a mixture of R-454B and air.**

3.1.3 QUICK-REFERENCE GUIDE FOR R-454B

- Refrigerant R–454B 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 cylinders are light green gray in color with a red band on the shoulder or top of the cylinder to indicate flammability.
- R-454B is only compatible with POE oils.
- Vacuum pumps will not remove moisture from POE oil used in R-454B systems.
- R-454B systems should be charged with liquid refrigerantin liquid phase. R-454B cylinders should be inverted to ensure liquid charging of the equipment.
- Do not install a suction line filter drier in the liquid line.

- A factory-approved outdoor liquid line filter drier is shipped with every unit and must be installed in the liquid line at the time of installation. If only the air-handler is being replaced on an existing system, the existing filter drier must be replaced at the time of installation with a field supplied filter drier. **IMPORTANT:** A bi-flow filter drier must be used for heat pump applications. Filter driers must be rated for minimum working pressure of 600 psig. The filter drier will only have adequate moisture-holding capacity if the system is properly evacuated.
- Desiccant (drying agent) must be compatible for POE oils and R-454B refrigerant.
- R-454B cylinders containing less than 50 lbs of refrigerant require a CGA 164 fitting. R-454B cylinders containing more than 50 lbs of refrigerant require a CGA 670 fitting.

3.2 APPLICATIONS AND ORIENTATION

⚠ WARNING

IF UNIT IS TO BE INSTALLED WITHOUT AN INDOOR COIL, RETURN DUCT OR PLENUM, IT MUST NOT BE INSTALLED DIRECTLY OVER COMBUSTIBLE MATERIAL. IF INSTALLED WITHOUT AN INDOOR COIL WITH A RETURN DUCT OR PLENUM, THE AIR PLENUM OR DUCT MUST HAVE A SOLID SHEET METAL BOTTOM WITH NO RETURN AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS LOCATED DIRECTLY UNDER THE UNIT. EXPOSING COMBUSTIBLE MATERIAL TO THE RETURN OPENING OF AN UPFLOW UNIT WITHOUT AN INDOOR COIL CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

3.2.1 VERTICAL UPFLOW APPLICATIONS

- Electrical connections can be made from either the left or right side of the unit. Refrigerant and condensate drain connections are made on the front of the unit (see Figures 3 & 4).
- If return air is to be ducted, install duct flush with floor. Use fireproof resilient gasket 1/8 to 1/4 in. thick between duct, unit and floor. Set unit on floor over opening.

3.2.2 VERTICAL DOWNFLOW APPLICATIONS

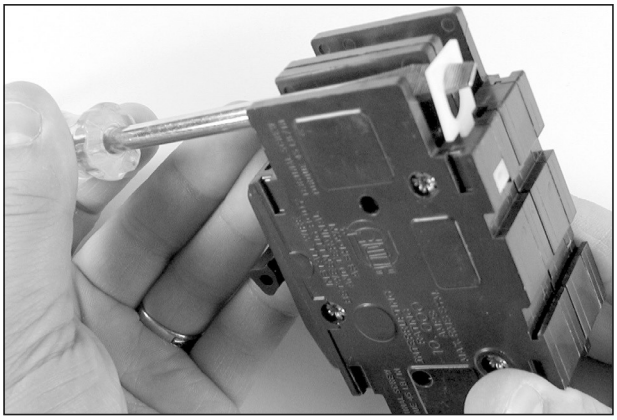
Conversion to Vertical Downflow: A vertical upflow unit may be converted to vertical downflow. (See Figure 3)

1. Remove the indoor coil.
2. Install coil rails in the top of the coil box (supplied).
3. Rotate unit into the downflow position, with the coil compartment on top and the blower compartment on bottom.
4. Reinstall the indoor coil in its new position.
5. Rotate the circuit breaker(s) 180° (see instructions for rotating breaker(s) that follow).

IMPORTANT NOTE: In a downflow configuration the internal air filter must not be used.

6. A remote air filter should be installed in the return air system.
7. The remote air filter should be sized for a maximum of 300 feet per minute of air velocity for the CFM required.

FIGURE 5
ROTATING CIRCUIT BREAKER



IMPORTANT: To comply with certification agencies and the National Electric Code, units with circuit breaker(s) on vertical units must have circuit breakers installed so that the breaker switch "on" position and marking is up and, "off" position and marking is down.

A. To turn breaker(s): Rotate one breaker pair (circuit) at a time starting with the one on the right. Loosen both lugs on the load side of the breaker. Wires are bundles with wire ties, one bundle going to the right lug and one bundle going to the left lug.

B. Using a screwdriver or pencil, lift white plastic tab with hole away from breaker until breaker releases from mounting opening (see Figure 5).

C. With breaker held in hand, rotate breaker so that “on” position is up, “off” position is down with unit in planned vertical mounting position. Insert right wire bundle into top right breaker lug, ensuring all strands of all wires are inserted fully into lug, and no wire insulation is in lug.

D. Tighten lug as tight as possible while holding circuit breaker. Check wires and make sure each wire is secure and none are loose. Repeat for left wire bundle in left top circuit breaker lug.

E. Replace breaker by inserting breaker mounting tab opposite white pull tab in opening, hook mounting tab over edge in opening.

F. With screwdriver or pencil, pull white tab with hole away from breaker while setting that side of breaker into opening. When breaker is in place, release tab, locking circuit breaker into location in opening.

G. Repeat above operation for remaining breaker(s) (if more than one is provided).

H. Replace single point wiring jumper bar, if it is used, on line side of breaker and tighten securely.

I. Double check wires and lugs to make sure all are secure and tight. Check to make sure unit wiring to circuit breaker load lugs match that shown on the unit wiring diagram.

8. Electrical connections can be made from either the left or right side of the unit. Refrigerant and condensate drain connections are made on the front of the unit (see Figure 4).

3.2.3 HORIZONTAL APPLICATIONS

All models are shipped from the factory with a horizontal drain pan positioned for horizontal left supply air discharge and require no modification for this orientation.

To convert a unit from horizontal left supply air discharge to horizontal right supply air discharge, remove the coil access panel and slide the coil out of the cabinet. Remove the horizontal drain pan and install it on the other side of the coil so it will be under the coil in the horizontal right supply air discharge orientation as shown in Figure 7 and described in the procedure below.

⚠ CAUTION

HORIZONTAL UNITS MUST BE CONFIGURED CORRECTLY FOR RIGHT HAND AIR SUPPLY OR LEFT HAND AIR SUPPLY. HORIZONTAL DRAIN PAN MUST BE LOCATED UNDER INDOOR COIL. FAILURE TO USE THE DRAIN PAN CAN RESULT IN PROPERTY DAMAGE.

1. Install horizontal drain pan as shown for right supply air-discharge. Drain pan connections must be toward front of coil (header connection end). Install coil assembly into horizontal pan as shown with coil end plates fitting into “V” shaped supports in the front and back of the horizontal pan. Mounting tabs on vertical drain pan fit over the air inlet side of the horizontal pan with vertical pan inside horizontal drain pan. Horizontal pan must be under indoor coil when in the installed position.
2. Note primary and auxiliary drain pan positions for horizontal right vs. horizontal left. Drain connection with 3/4” hole must be connected to primary drain. Connection with 3/8” knockout is the secondary drain connection.
3. Electrical connections may be made from the top or bottom of the unit. Refrigerant and condensate drain connections must be made on the front of the unit. (See unit dimensions and horizontal right hand supply and horizontal left hand supply, Figures 3, 6 & 7.)

IMPORTANT: Units cannot be installed horizontally laying on or suspended from the back of the unit. Horizontal units must be supported or suspended from one side or the other when in the horizontal position.

4. Support along the length of the unit, all units installed horizontally. Do not support or suspend unit from both ends without support in the center of the cabinet. If unit is to be supported or suspended from corners, run two reinforcing rails length of unit and support or suspend from reinforcing rails.

NOTE: When converting from horizontal left to horizontal right, the foam tape must be moved to the side of the vertical drain pan opposite to horizontal drain pan.

FIGURE 6
INDOOR COIL AND DRAIN PAN SET-UP
HORIZONTAL LEFT-HAND AIR SUPPLY (FACTORY SHIPPED)

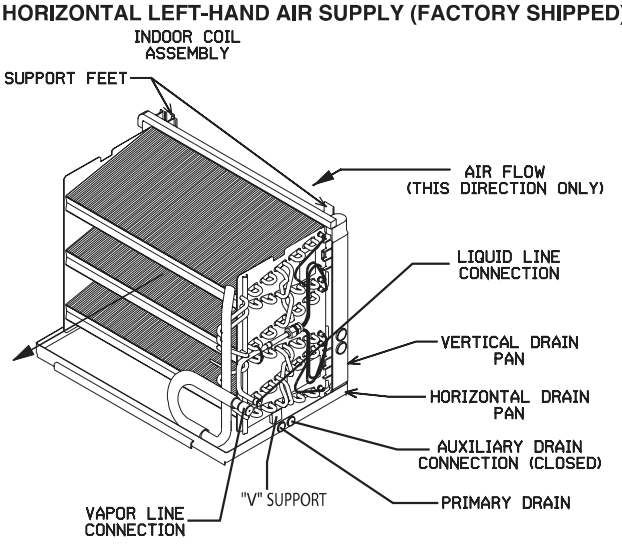
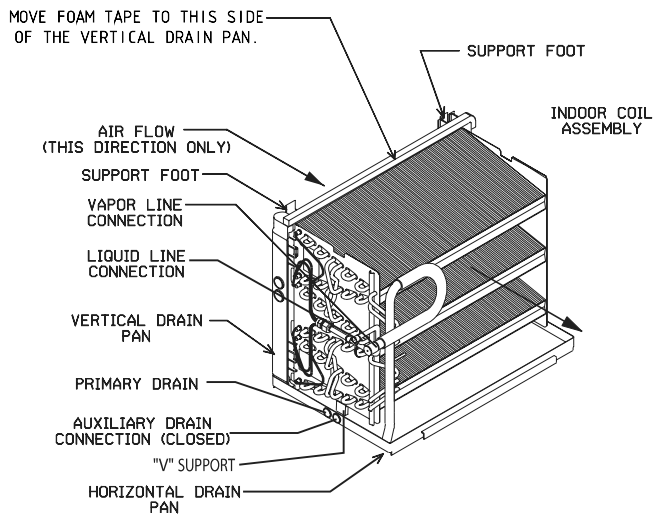


FIGURE 7
INDOOR COIL AND DRAIN PAN SET-UP
HORIZONTAL RIGHT-HAND AIR SUPPLY



⚠ WARNING

THE SUPPLY AIR PLENUM OR DUCT MUST HAVE A SOLID SHEET METAL BOTTOM WITH NO SUPPLY AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS LOCATED IN IT FOR THE FIRST 36 INCHES OF HORIZONTAL SURFACE ON UNITS WITH ELECTRIC HEATERS. FAILURE TO OBSERVE SUPPLY PLENUM, DUCT WARNINGS CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

3.2.4 INSTALLATION IN AN UNCONDITIONED SPACE

The exterior cabinet of an air handler has a greater risk of sweating when installed in an unconditioned space than when it is installed in the conditioned space. This is primarily due to the temperature of the conditioned air moving through the air handler and the air circulating around the unit where it is installed. For this reason, the following is recommended for all air handler applications, but special attention should be paid to those installed in unconditioned spaces:

1. Duct sizing and air-flow are critical and must be based on the equipment selected.
2. Supply and return duct attachment: If other than the factory flanges are used, the attachment of ducting must be insulated and tight to prevent sweating.
3. No perimeter supply flanges are provided. If a full perimeter supply duct is used, it is the responsibility of the installer to provide duct flanges as needed, to secure and seal the supply duct to prevent air leakage and the sweating that will result.
4. Apply caulking around all cabinet penetrations such as power wires, control wires, refrigerant tubing and condensate line where they enter the cabinet. Seal the power wires on the inside where they exit conduit opening. Sealing is required to prevent air leakage into the unit which can result in condensate forming inside the unit, control box, and on electrical controls. Take care not to damage, remove or compress insulation when applying the caulk.
5. In some cases, the entire air handler can be wrapped with insulation. This can be done as long as the unit is completely enclosed in insulation, sealed and service access is provided to prevent accumulation of moisture inside the insulation wrap.
6. An auxiliary overflow pan is recommended to protect the structure from excessive cabinet sweating or a restricted coil drain line. (See Section 3.3)
7. If an electric heater kit is installed, be sure the breaker or disconnect cover is sealed tightly to the door panel.

3.2.5 INSTALLATION IN UNVENTILATED AREAS

If the installation room areas are not compliant with the outdoor room area values. Appliance shall not be installed in an area where there are potential ignition sources or a continuous open flame unless there is a flame arrest installed on flame-producing appliance.

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C (1292°F) and electric switching devices.

Only auxiliary devices that are approved by the manufacturer or declared suitable with the refrigerant can be installed in the connecting ductwork.

For appliances using A2L refrigerants, connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct.

Note: “Unventilated” is defined by applications without an air circulation fan, or applications that do not employ a refrigerant detection system (RDS). For ventilation and room area table refer to RDS determination table in section 3.8.8 Refrigeration Detection System (RDS) Installation Instructions.

3.2.6 INSTALLATION IN CORROSIVE ENVIRONMENTS

The metal parts of this unit may be subject to rust or deterioration if exposed to a corrosive environment which can shorten its life. In addition to exposure to the exterior of the cabinet, chemical contaminants inside the building that can be drawn into the unit from the return air grille and attack structural metal parts, electrical components and the indoor coil, causing premature failure of the unit. If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to isolate the unit and return grille from contaminants.

3.2.7 MODULAR UNIT CONFIGURATION

All units are modular construction allowing installer to disassemble unit into two 17-1/2" high components, coil casing and blower unit, for ease of installation, then reassemble in location.

TO DISASSEMBLE:

Remove both access panels and remove six screws holding coil casing to blower unit, lift blower unit from coil casing.

TO REASSEMBLE:

To attach coil casing to blower unit, make sure 3/4" flanges on back and sides of return air opening of blower casing are bent along perforated edge to inside of casing. Clearance holes in flange should match up with drive holes on inside of blower casing. Make sure 3/4" flanges on coil casing are bent up (back and 2 sides only) on supply air side of coil casing along perforated edge. Do not bend flange on front of coil casing. Set supply air side of coil casing (3/4" flanges) into return air opening of blower casing. Replace 6 - #8 screws through flange in coil casing, flange in blower casing and into drive holes on inside of blower casing, two screws in back and two screws in each side. Do not overtighten sheet metal screws, they will strip easily if overtightened.

IMPORTANT: Configure the unit with the indoor coil casing installed on air inlet (return) side of the blower section. Do not try to configure unit with indoor coil on discharge (supply) side of blower section.

3.3 AUXILIARY OVERFLOW PAN

In compliance with recognized codes, an auxiliary overflow pan must installed under all equipment containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping. See Section 6.5 of this manual for information regarding the recommended auxiliary horizontal overflow pan (model RXBM) for this air-handler.

3.4 CLEARANCES

- All units are designed for "0" inches clearance to combustible material on all cabinet surfaces.
- Units with electric heat require a one inch clearance to combustible material for the first three feet of supply plenum and ductwork.
- Vertical downflow applications require clearance on at least one side of the unit for electrical connections. Refrigerant and condensate drain connections are made on the front of the unit.
- All units require 24 inches minimum access to the front of the unit for service.
- These units may be installed in either ventilated or nonventilated spaces.

3.5 DUCTWORK

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.

⚠ WARNING (SEE SPECIFIC AIR-FLOW POSITION FOR ADDITIONAL WARNINGS)

UNITS ARE FOR DUCTED APPLICATIONS ONLY. A MINIMUM OF 36 INCHES OF SUPPLY AIR PLENUM AND DUCTWORK IS REQUIRED. NO SUPPLY AIR OPENINGS, REGISTERS OR FLEXIBLE AIR DUCTS MAY BE LOCATED WITHIN THE FIRST 36 INCHES OF SUPPLY PLENUM AND DUCTWORK ON UNITS WITH ELECTRIC HEATERS. FAILURE TO OBSERVE SUPPLY PLENUM/DUCT WARNINGS CAN CAUSE A FIRE RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system air-flow be adequate. Make sure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See air-flow performance tables in this manual.
- Design the duct system in accordance with "ACCA" Manual "D" Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: "ACCA" Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates **flexible air duct,** be sure **pressure drop** information (straight length plus all turns) shown in "ACCA" Manual "D" is accounted for in system.
- Supply plenum is attached to the 3/4" duct flanges supplied on the unit around the blower outlet. Flanges are flat for shipping purposes and must be bent up along perforated edge around blower opening. Be sure to bend flanges completely up so they do not interfere with air being discharged from blower.

IMPORTANT: Flanges around blower opening for attaching supply duct must be bent up out of blower discharge even if not used so they do not restrict air-flow from blower.

- Supply plenum should be the same size as the flanges provided around the blower outlet. Ideally, it should extend 3 feet from the unit before turning or branching off plenum into duct runs. The plenum forms an extension of the blower housing and minimizes air expansion losses from the blower. Changing the size, shape or length will degrade blower performance. If supply discharges directly into a larger duct or plenum as much as .1" W.C., static pressure will be lost. If 3 feet is not possible, even 6, 12 or 18 inches will help.

IMPORTANT: If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

- Some units with electric heaters require 1 in. clearance to supply plenum and branch ducts to combustible material for the first 3 feet from the unit. See CLEARANCES.
- A 3/4" return duct flange is supplied on all sides of the air inlet opening of the unit coil casing. If the unit is to be installed without a coil casing (no indoor coil), a 3/4" flange is supplied on the back and sides of the air inlet opening of the blower casing. No flange is provided on the front of the opening to the blower casing. If return duct is attached to the inlet of the blower casing, the front flange of the duct should be run up into the opening or 90° brake made on the front flange to tape to the front of the blower casing.

IMPORTANT: The front flange on the return duct if connected to the blower casing must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.

- Return duct flanges on blower or coil casing are flat for shipping purposes and must be bent out along perforated edge around opening.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

3.6 RETURN AIR FILTER

The unit internal air filter should only be used if the unit is readily accessible for filter cleaning or replacing, and unit is installed in the upflow or horizontal position.

- See unit position figures for location of filter in unit cabinet and service panel giving access to unit filter.

IMPORTANT NOTE: The internal filter must not be used in the downflow configuration.

- If unit is not readily accessible for filter maintenance or is being installed in a downflow applications, an external filter should be installed in the return air system.
- External filters should be sized for a maximum of 300 feet/min air velocity or the maximum velocity recommended by the type of filter installed. One or more return air filter grilles, a filter rack attached to unit return air intake, or a filter rack installed between a sealed return air platform and the return duct are all acceptable means of filtration. All return ducts must be filtered, either at each return grille or at a common filter near the unit.

Important: Do not install a return air filter grille **and** a filter rack at the unit and do not install a filter in the supply duct system.

- Filter type, sizing, and placement are critical to heating and cooling system performance. Reduced air-flow can shorten the life of system components such as the compressor, indoor coil, heater elements, over temperature limits, and relays. As filters near the end of their useful life, the pressure drop through them increases. Therefore, it is important to factor the "end of life" (dirty) pressure drop of filters into the external static pressure of the duct system when selecting blower speeds and designing ductwork to assure the sytem is operating at the design CFM and system reliability is not compromised. Always verify that the system's air-flow is within specifications by performing a temperature rise (heating mode) and/or temperature drop (cooling mode) with all filters in place.

Important: High efficiency pleated filters and electronic air cleaners typicaly have significantly higher pressure drop than standard efficiency fiberglass filters, especially when they get dirty. Do not use high efficiency filters or electronic air cleaners unless adequate filter area is provided to lower the filter pressure drop to an acceptable level.

⚠ WARNING

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the heating elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house. Operating the system without a filter will also allow lint and dirt particles to accumulate on the indoor coil fin and restrict air-flow through the coil. Soot damage may occur even with filters in place when certain types of candles, oil lamps or standing pilots are burned.

⚠ CAUTION

R–454B is classified as safety group A2L per ASHRAE Standard 34. Verify that service equipment and instruments are approved for use with group A2L refrigerants, and in particular with R–454B. Failure to exercise care may result in equipment damage or personal injury.

3.7 REFRIGERANT LINE CONNECTIONS & CHARGING

Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:

• The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

• Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure.

• No leak shall be detected; where addition of charge is required to complete installation, refer to the Outdoor I&O System start-up and refrigerant charging details for instructions on how to determine the additional REFRIGERANT CHARGE and how to complete the REFRIGERANT CHARGE on the label provided by the manufacturer. Interconnecting refrigerant piping length and diameter shall be taken into consideration as listed in the Line Set Selection.

3.7.1 PREPARATION

The coil is shipped with a low pressure (5-10 psig) charge of dry nitrogen which will be released when the rubber plugs are removed. Leave the rubber plugs in the refrigerant connection stubs on the air-handler until the refrigerant lines are ready to be brazed to the refrigerant connection stubs to prevent contaminants from entering the coil. Clean the ends of the tubing and coil connection stubs (inside and outside) with an alcohol wipe before inserting the line set tubes into the coil connection stubs to assure a quality leak-free braze joint.

Refer to the outdoor unit installation instructions for details on refrigerant line sizing and installation. Be sure to follow long line length guidelines if they apply.

Route the refrigerant tubing in a manner than does not block service access to the front of the air-handler. 24 inch clearance is required for filter, coil, or blower removal and service access.

3.7.2 LIQUID LINE FILTER DRIER

A new liquid filter drier must be installed every time any part of the system has been open to the atmosphere, even if it's for a short period of time. The filter drier should be installed close to the air-handler for a system started up in the cooling mode and near the outdoor unit for a heat pump system started up in the heating mode. This allows the filter drier to catch any contaminants in the liquid line before they can enter the indoor or outdoor TXV inlet screen.

3.7.3 BRAZING

Air inside the tubing and coil should be displaced with dry nitrogen prior to the brazing process to prevent the formation of harmful copper oxide inside the tubing. It is very important not to pressurize the system with nitrogen while brazing or pin-hole leaks will form in the braze joint. This is accomplished by removing the gauge port valve core on one of the outdoor unit service valves to allow the pressure to be relieved as the heated nitrogen expands. Fill the system with dry nitrogen through the other service valve gauge port and then turn the nitrogen flow off just before brazing is begun.

Protect the TXV, copper to aluminum suction header joint, and outdoor unit service valves from overheating using a wet rag or heat sink compound. Leave the wet rag or heat sink material in place until the joint and surrounding tubing cools down to a safe temperature. Double tip torches can help minimize brazing time and heat conduction to the heat sensitive components if the flame is turned down and held on the joint just long enough to make the braze joint. With both single and double tip torches, turning the flame up too much and keeping the flame on the joint too long will damage the heat sensitive components even when a wet rag or heat sink compound is used.

Use a sheet metal shield to protect the cabinet's paint from the torch flames during the brazing process. The vapor line insulation should be pushed back on the line about 12 inches from the joint and retained to prevent it from igniting or melting during the brazing process.

1. To install the refrigerant connections, first install the refrigerant block-off plate (located in the Parts Bag, see Figure 8) around the refrigerant connections. Braze all fittings. When refrigerant lines have cooled, insert the foam gasket (located in the parts bag, see Figure 8) around the refrigerant lines, between the coil and the refrigerant block-off plate (see figure 9).
2. After the foam gasket has been installed, the vapor line insulation should be pulled back in place so it contacts the air-handler cabinet to prevent condensate from forming on the cold tube and dripping off. A loosely fitting zip-tie placed around the insulation ½" from the end can be used to hold it in place so it doesn't move away from the cabinet.

FIGURE 8
REFRIGERANT BLOCK-OFF PLATE AND FOAM GASKET

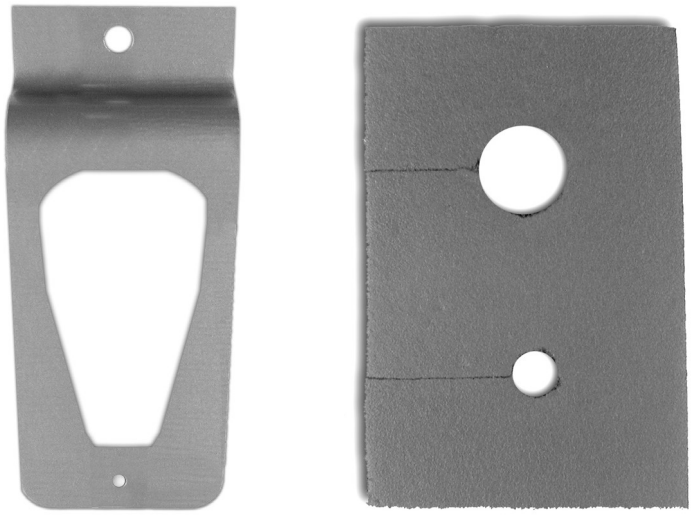
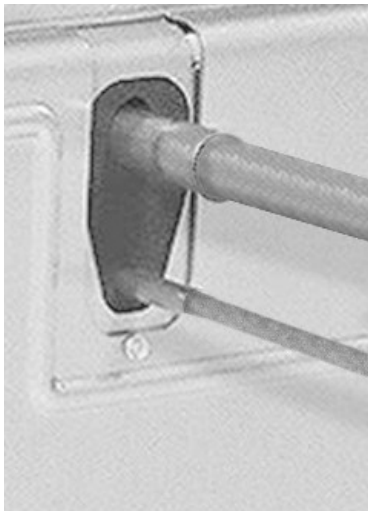


FIGURE 9
COMPLETED REFRIGERANT CONNECTION ASSEMBLY



3.7.4 LEAK TESTING

After all braze joints are completed, replace the valve core removed when purging with nitrogen and then leak test the system by pressurizing to 150 psig with dry nitrogen and allow the system to sit for at least 15 minutes (longer if possible) to assure the pressure does not drop.

3.7.5 EVACUATION

If no leaks are detected, evacuate the system down to 500 microns or below before charging the system or opening the service valves on the outdoor unit which will release the charge stored in the outdoor unit into the line set and air-handler coil. Failure to reach 500 microns of vacuum is a sign of a leak or excessive moisture inside the system.

3.7.6 REFRIGERANT CHARGING

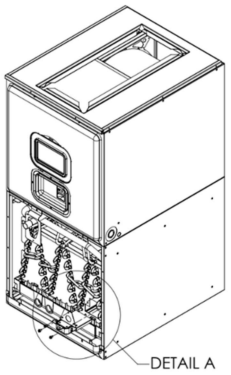
Once the evacuation process is completed, break the vacuum with the refrigerant from a refrigerant cylinder or with refrigerant stored in the outdoor unit by opening the outdoor unit service valves. The charging process cannot be completed until the remaining steps in the installation process are completed and the indoor air-flow is adjusted to the proper level. See Section 4.7 for further details.

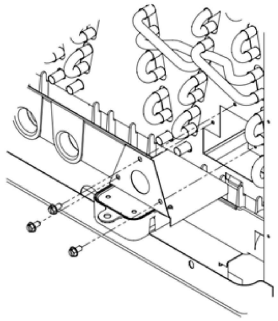
3.7.7 REFRIGERANT DETECTION SYSTEM (RDS)

The RDS is used to mitigate any leaked refrigerant that may occur in the indoor portion of the system.
Life expectancy of the RDS is 15 years and should be replaced at the end of life.
Contact Rheem Parts Department for RDS replacement.
Tripped RDS Sequence of Operations:
Step 1: RDS detects a leak at or over the sensor setpoint.
Step 2: Relay in RDS shuts ODU down and energizes the indoor blower.
Step 3: Leaked refrigerant gets dispersed during the blower on cycle.
Step 4: Once the concentration of the leaked refrigerant is below the RDS setpoint, the blower continues to run for 5 minutes.
Step 5: If the concentration stays below the RDS setpoint for 5 minutes, the system returns to normal operation.
Note: There is no lockout timer, and the system can continue to go through these steps.

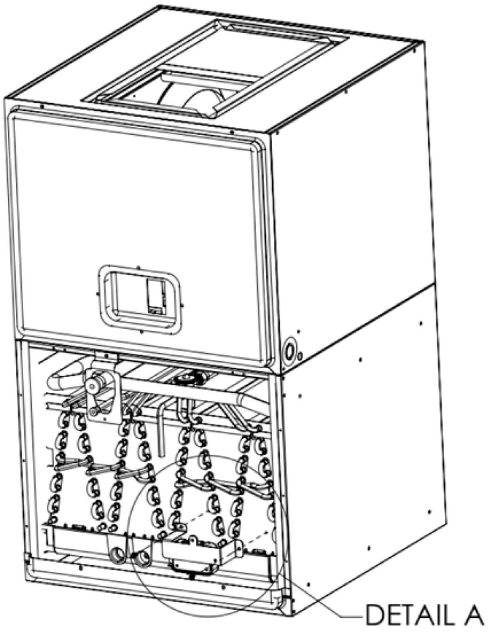
3.7.8 REFRIGERANT DETECTION SYSTEM (RDS) INSTALLATION INSTRUCTIONS

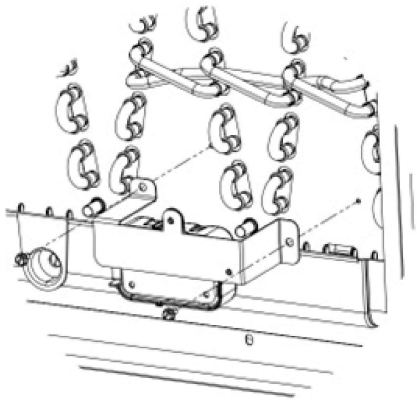
17-inch Cabinet Size
For 17in cabinet size, to access the sensor housing remove three screws seen in DETAIL A of the following illustrations. Once screws are removed slide out bracket to access bracket and its proceeding wiring.





22-inch and 24-inch Cabinet Size
For 22-inch and 24-inch cabinet sizes, to access the sensor housing remove the two screws seen in DETAIL A of the following illustrations. Once screws are removed, pull bracket away from coil to access bracket and its proceeding wiring.





DETAIL A

RDS DETERMINATION TABLE

Total System Charge (oz)	Minimum Indoor Airflow (CFM)	Without Refrigerant Leak Detection Sensor Room Area of Smallest Conditioned Space Including Space Where Indoor Unit is Installed (sqft)			With Refrigerant Leak Detection Sensor Minimum Required Total Conditioned Room Area (sqft)
		Distance From Floor to Bottom Edge of Lowest Inlet or Outlet Vent Opening			
		2 FT	*6 FT*	*9 FT*	Any configuration
50	85	195	56	38	47
100	169	781	113	75	94
150	254	1758	195	113	141
200	338	3126	347	154	187
250	423	4884	543	241	234
300	507	7032	781	347	281
350	592	9572	1064	473	328
400	676	12502	1389	617	375
450	761	15823	1758	781	422
500	846	19534	2170	965	469
550	930	not permitted - sensor required			515
600	1015				562

Note: If the total charge quantity falls between two rows, use the minimum room area and airflow in the row corresponding to the higher total system charge.

3.8 CONDENSATE DRAIN

Consult local codes or ordinances for specific requirements that may apply.

- The coil door is shipped from the factory with the condensate drain knockout attached. Knockout must be removed and the appropriate condensate block-off plate (included in parts bag) must be installed to allow removal of the coil door without disturbing the drain pipes. (See Figure 10-14).
- The condensate block-off plate for vertical applications is different from the one used for horizontal applications. See figure 12 and 13 to distinguish between the two block-off plates.
- Vertical units (vertical drain pan) are supplied with a 3/4” female pipe thread primary drain connection and a 3/4” female pipe thread auxiliary drain connection. (See unit dimensions figures for drain locations.)

IMPORTANT: Side drain connections on vertical drain pans have a plastic web covering opening. Connection(s) used must be broken out before connection(s) are made. Break out only connection(s) to be used. Front drain connections have removable threaded plastic plugs factory installed. Plugs must be removed before connections are made; do not remove plugs if these connections are not used.

- Horizontal units (horizontal drain pan) are supplied with a 3/4” female pipe thread primary drain connection and a 3/4” female pipe thread auxiliary drain connection. (See unit dimensions and position figures for drain locations).

IMPORTANT: All horizontal pans have plastic web over the secondary drain connection. Plastic web covering secondary connection must be broken out if used. Secondary connection is lowered by 3/8”. Do not get primary and secondary connections interchanged.

FIGURE 10
COIL DOOR

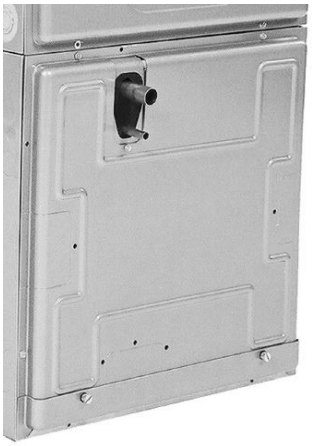


FIGURE 12
CONDENSATE BLOCK-OFF PLATE - VERTICAL APPLICATION

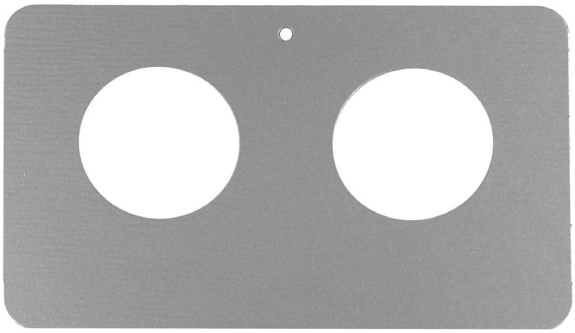


FIGURE 11
REMOVING CONDENSATE KNOCKOUT

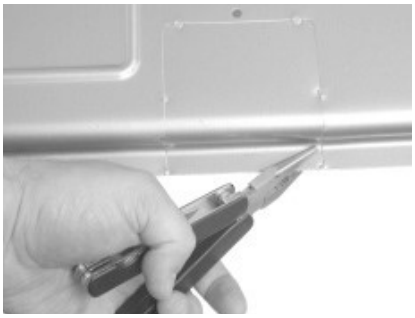


FIGURE 13
CONDENSATE BLOCK-OFF PLATE-HORIZONTAL APPLICATIONS

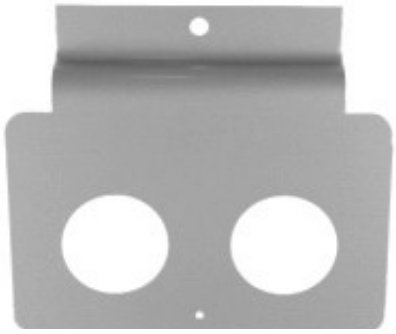
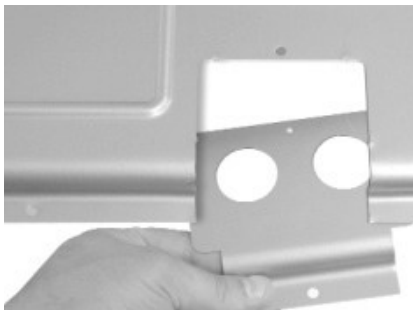


FIGURE 14
INSTALLING CONDENSATE BLOCK-OFF PLATE



- Removal of door knockouts required for drain connections can be made much easier with the door removed from the cabinet.
- Install drain lines so they do not block service access to front of unit. 24 in. clearance is required for filter, coil or blower removal and service access.
- Make sure unit is level or pitched slightly toward primary drain connection so that drain pan will drain completely without water standing in pan.

IMPORTANT: 2-6" PVC lengths are provided for making drain connection. When making drain fitting connections to drain pan, use a thin layer of Teflon paste, silicone or Teflon tape and install hand tight.

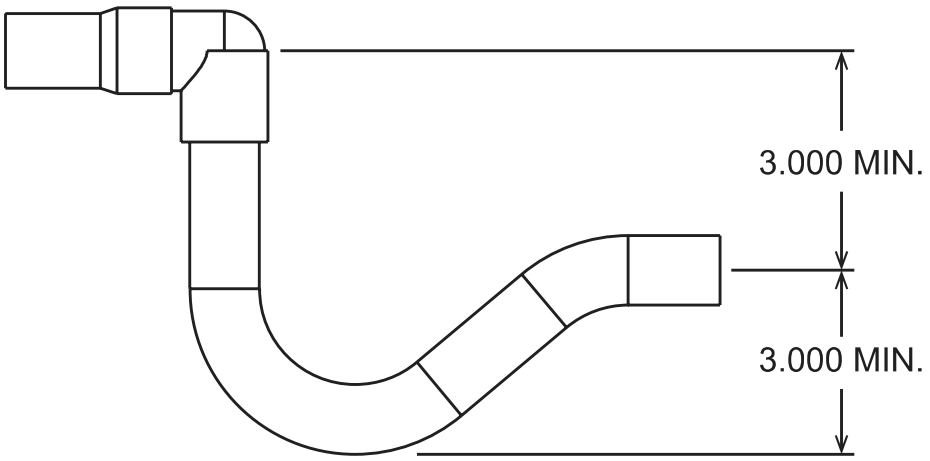
IMPORTANT: When making drain fitting connections to drain pan, do not over torque. Over torquing fittings can split pipe connections on drain pan.

- Do not reduce drain line size less than connection size provided on condensate drain pan.
- All drain lines must be pitched downward away from the unit a minimum of 1/8 in. per foot of line to ensure proper drainage.
- Do not connect condensate drain line to a closed or open sewer pipe. Run condensate to an open drain or outdoors.
- The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
- Make provisions for disconnecting and cleaning of the primary drain line should it become necessary.
- Install a 2 in. trap in the primary drain line as close to the unit as possible. Make sure that the top of the trap is below connection to the drain pan to allow complete drainage of pan.

IMPORTANT: Do not operate unit without a drain trap (see Figure 15). The condensate drain is on the negative side of the blower, therefore, air being pulled in through the condensate line will prevent positive drainage without a proper trap.

- Auxiliary drain if used should be run to a place where it will be noticeable if it become operational. Occupant should be warned that a problem exists if water should begin running from the auxiliary drain line.
- Test condensate drain pan and drain line after installation is complete. Pour several quarts of water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain line fittings, and water is draining from the termination of the primary drain line.

FIGURE 15
CONDENSATE DRAIN TRAP



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3.9 THERMOSTAT

See instructions for the condensing unit or heat pump for recommended room thermostats.

- On units with one electric heat sequencer (HR_1) (see wiring diagram for electric heater), heat anticipator setting should be .16.
- On units with two electric heat sequencers (HR_1 & HR_2) (see wiring diagram for electric heater), heat anticipator setting should be .32 if both are connected to same stage on thermostat. Setting should be .16 if (HR_1 & HR_2) are connected to separate stages.

NOTE: Some thermostats contain a fixed, non-adjustable heat anticipator. Adjustment is not permitted.

- The thermostat should be mounted 4 to 5 feet above the floor on an inside wall of the living room or a hallway that has good air circulation from the other rooms being controlled by the thermostat. It is essential that there be free air circulation at the location of the same average temperature as other rooms being controlled. Movement of air should not be obstructed by furniture, doors, draperies, etc. The thermostat should not be mounted where it will be affected by drafts, hot or cold water pipes or air ducts in walls, radiant heat from fireplace, lamps, the sun, T.V. or an outside wall. See instruction sheet packaged with thermostat for mounting and installation instructions.

3.10 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance.

3.10.1 CONFIGURING UNIT FOR 208 VOLT POWER

The control transformer in 208/240V air-handlers must be configured in the field to operate on a 208 volt electrical supply to assure adequate control voltage (24+ volts) with the reduced supply voltage. The units are shipped from the factory for 220-240 volt applications. For 208 volt applications, disconnect electrical power to the unit and remove the blower access panel and then the control box cover located on the blower housing. Then remove the insulated cap from the 208 volt transformer terminal and move the BLACK wires that are connected to the 240 volt transformer terminal to the 208 volt transformer terminal. Plug the insulated cap onto the transformer 240V terminal.

3.10.2 GROUNDING

- This product must be sufficiently grounded in accordance with National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.

⚠ WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Ground lug(s) are located close to wire entrance on left side of unit (upflow). Lug(s) may be moved to marked locations near wire entrance on right side of unit (upflow), if alternate location is more convenient.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

3.10.3 POWER WIRING

It is important that proper electrical power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- Units with factory installed circuit breaker(s) meet UL and CSA requirements as a service disconnect and should make above requirement for a field installed branch circuit disconnect unnecessary.

IMPORTANT: Units may be equipped with a 60 amp. circuit breaker. This breaker protects the internal wiring in the event of a short circuit and serve as a disconnect. The circuit breaker installed within the unit does not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.

- Supply circuit power wiring must be 75°C minimum copper conductors only. See electrical data for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or "HACR" type circuit breakers.
- Power wiring may be connected to either the right or left side (vertical) top or bottom (horizontal). A 7/8", 1-3/32" dia. concentric knockout is provided for connection of power wiring to unit. If a larger opening is required, dependent upon kW electric heat supplied, pull appropriate size hole required for conduit size being used. Using a conduit hole punch (Greenlee type), center punch using outside cabinet around 7/8" knockout as a template to center punch location and punch desired hole size. Holes may be punched for any size conduit up to a 2" hole for 1-1/2" conduit.
- Power wiring is connected to either the power terminal block or circuit breaker(s) in unit control compartment.

3.10.4 COPPER WIRE SIZE - AWG. (3% VOLTAGE DROP)

SUPPLY WIRE LENGTH FEET																		
200 [61]	12	10	8	8	8	6	6	6	4	4	3	3	2	2	1	0	00
150 [46]	12	10	10	10	8	8	6	6	6	4	4	3	3	2	1	0	00
100 [30]	14	12	10	10	8	8	8	6	6	4	4	3	3	2	1	0	00
50 [15]	14	12	10	10	8	8	8	6	6	4	4	3	3	2	1	0	00
	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150	175
SUPPLY CIRCUIT AMPACITY																	

NOTE: WIRE BASED ON COPPER CONDUCTORS 75°C MINIMUM RATING.
FOR MORE THAN 3 CONDUCTORS IN A RACEWAY OR CABLE, SEE N.E.C. FOR DERATING THE AMPACITY OF EACH CONDUCTOR.

3.10.5 ELECTRICAL DATA: BLOWER MOTOR ONLY WITHOUT ELECTRIC HEAT

MODEL SIZE/ELEC. DESIGNATION	VOLTAGE	PHASE	HERTZ	HP [W]	RPM	SPEEDS	CIRCUIT AMPS.	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTOR
(-)B2TY2417STANMAN00	115	1	60	1/3 [249]	300-1100	5	3.2	5.0	15
(-)B2TY3621STANMAN00	115	1	60	1/2 [373]	300-1100	5	4.2	6.0	15
(-)B2TY4824STANMAN00	115	1	60	3/4 [559]	300-1100	5	6.4	8.0	15
(-)B2TY6024STANMAN00	115	1	60	3/4 [559]	300-1100	5	8.5	11.0	15
(-)B2TY2417STANMJ* **	208-240	1	60	1/3 [249]	300-1100	5	1.8	2.3	15
(-)B2TY3621STANMJ* **	208-240	1	60	1/2 [373]	300-1100	5	2.4	3.0	15
(-)B2TY4824STANMJ* **	208-240	1	60	3/4 [559]	300-1100	5	3.8	4.8	15
(-)B2TY6024STANMJ* **	208-240	1	60	3/4 [559]	300-1100	5	5.0	6.3	15

3.10.6 ELECTRICAL DATA: WITH ELECTRIC HEAT

Model Size/ Elec./KW Designation	Heater KW Volts 208/240	PH/HZ	Heater No/KW @ 240V	Type Supply Circuit Single Circuit Multiple Circuit	Motor Amps	Heater AMPs	Minimum Circuit Ampacity	Maximum Circuit Protector
RB2TY2417STANMJB05	3.7/4.9	1/60	2/2.5	Single Circuit	1.8	19.6/22.2	25/28	25/30
RB2TY2417STANMJB07	5.3/7.0	1/60	2/3.5	Single Circuit	1.8	27.3/30.8	35/39	35/40
RB2TY3621STANMJB05	3.7/4.9	1/60	2/2.5	Single Circuit	2.4	20.2/22.8	26/29	30/30
RB2TY3621STANMJB07	5.3/7.0	1/60	2/3.5	Single Circuit	2.4	27.9/31.6	35/40	35/40
RB2TY3621STANMJB10	7.5/10.0	1/60	3/3.3	Single Circuit	2.4	38.5/44.1	49/56	50/60
RB2TY4824STANMJB05	3.7/4.9	1/60	2/2.5	Single Circuit	3.8	21.5/24.2	27/31	30/35
RB2TY4824STANMJB07	5.3/7.0	1/60	2/3.5	Single Circuit	3.8	29.3/33.0	37/42	40/45
RB2TY4824STANMJB10	7.5/10.0	1/60	3/3.3	Single Circuit	3.8	39.9/45.5	50/57	50/60
RB2TY6024STANMJB10	7.5/10.0	1/60	3/3.3	Single Circuit	5	41.1/46.7	52/59	60/60

Supply circuit protective devices may be fuses or "HACR" type circuit breakers. Largest motor load is included in single circuit and circuit 1 multiple circuit.
If non-standard fuse size is specified, use next size larger standard fuse size.

3.10.7 CONTROL WIRING

IMPORTANT: Class 2 low voltage control wire should not be run in conduit with power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 AWG color-coded (105°C minimum). For lengths longer than 100 ft., 16 AWG wire should be used.
- Control wiring should be routed through 1/2" dia. knockout near power wiring entrance on either left or right side of unit. After opening selected knockout, install bushing (supplied in parts bag) in the open hole.
- If control wiring is routed through right side (upflow), it must be routed through extruded holes in lower front of blower housing behind power raceway to the left side of blower housing before connecting them to the air-handler field control wiring connections. If routed through left side (upflow), it should be routed through extruded hole in lower front left blower side before connecting them to the air-handler field control wiring connections.
- Field control connections are made to wires from the Blower Control on the left side of control compartment (upflow position) using the wire nuts provided on those wires.
- See wiring diagrams attached to indoor and outdoor sections to be connected, outdoor unit installation manual, or Figures 16 and 17 in this manual.
- Do not leave excess field control wiring inside unit, pull excess control wire to outside of unit and provide strain relief for field control wiring on inside of cabinet at point wiring penetrates cabinet.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

3.10.8 THERMOSTAT & CONTROL WIRING CONNECTIONS

NOTE: These low voltage application diagrams are generic. Your indoor/outdoor units may not have all the characteristics shown or may not wire exactly as shown. Refer to the diagrams and information sent with your indoor/outdoor sections.

WIRE COLOR CODE:

BK - BLACK	G - GREEN	P - PINK	W - WHITE
BR - BROWN	GY - GRAY	PR - PURPLE	Y - YELLOW
GL - BLUE	O - ORANGE	R - RED	

FIGURE 16
TYPICAL THERMOSTAT: STRAIGHT COOLING W / ELECTRIC HEAT

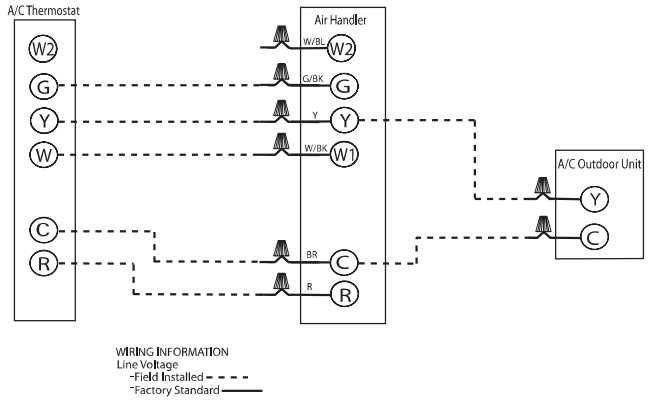


FIGURE 17
TYPICAL THERMOSTAT: HEAT PUMP W / ELECTRIC HEAT

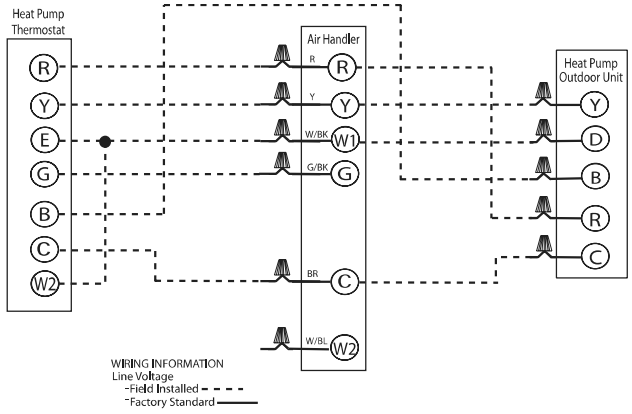


FIGURE 18: (-)B2TY
TYPICAL 2-STAGE THERMOSTAT: 2-STAGE COOLING WITH ELECTRIC HEAT

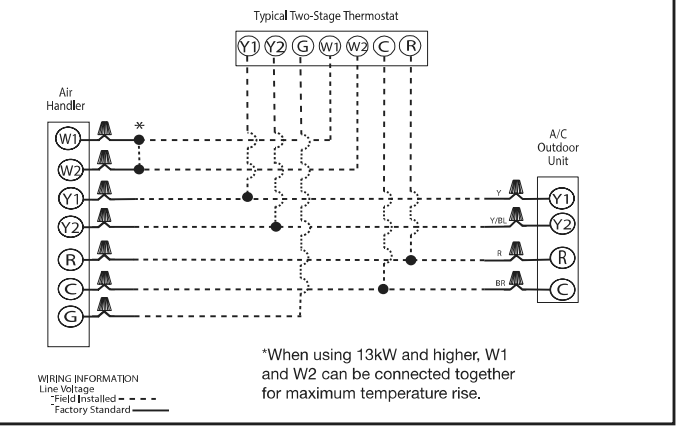
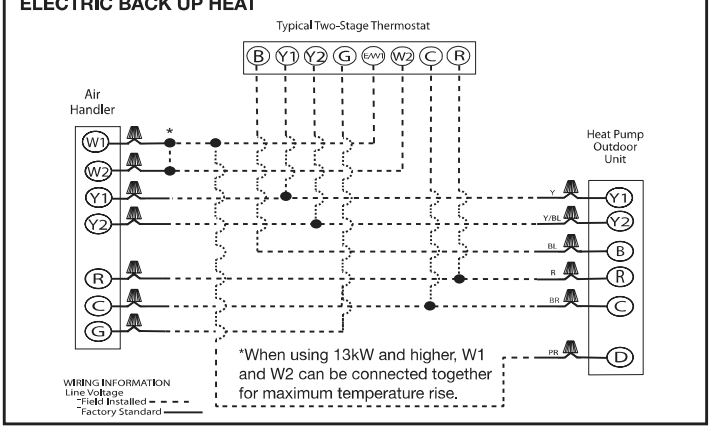


FIGURE 19: (-)B2TY
TYPICAL 2-STAGE HEAT PUMP WITH ELECTRIC BACK UP HEAT



3.10.8 THERMOSTAT & CONTROL WIRING CONNECTIONS (continued)

FIGURE 20: (-)B2TY

TYPICAL SINGLE-STAGE THERMOSTAT: SINGLE-STAGE COOLING WITH ELECTRIC HEAT.

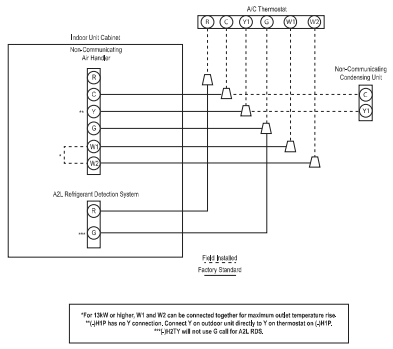


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FIGURE 21: (-)B2TY

TYPICAL SINGLE-STAGE THERMOSTAT: SINGLE-STAGE HEAT PUMP WITH ELECTRIC HEAT.

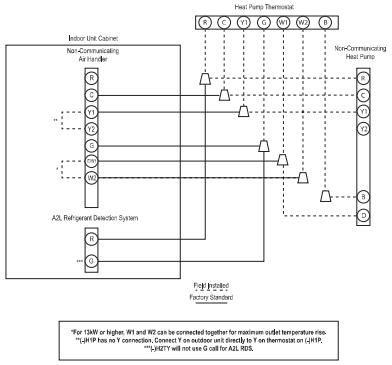

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FIGURE 22: (-)B2TY

TYPICAL TWO-STAGE THERMOSTAT: TWO-STAGE COOLING WITH ELECTRIC HEAT.

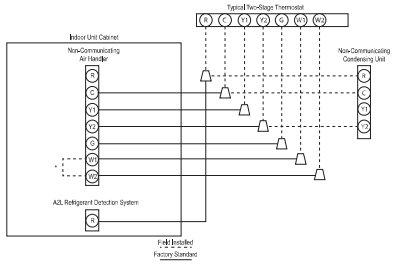

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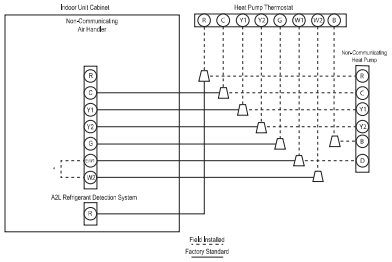
FIGURE 23: (-)B2TY

TYPICAL TWO-STAGE THERMOSTAT: TWO-STAGE HEAT PUMP WITH ELECTRIC HEAT.



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3.11 AIR-FLOW

Air-flow performance data is based on a dry indoor coil and return air filter in place. Select performance table for appropriate unit size, voltage and number of electric heaters to be used. Make sure external static applied to unit allows operation within the minimum and maximum limits shown in Section 3.11.1 below for both cooling and electric heat operation. For optimum blower performance, operate the unit in the .5 to .7 in W.C. external static range. Units should be applied with a minimum of .1 in W.C. external static pressure.

NOTE: The air-flow performance data tables (see Section 3.11.3) list air-flow information for air-handlers without heater and with maximum heater kW allowed for each model. The following formula can be used to calculate the adjusted CFM for smaller kW heaters.

$$\text{Adjusted CFM} = \text{No Heat CFM} - [(\text{No Heat CFM} - \text{Max kW CFM}) \times \frac{\text{Actual kW}}{\text{Max kW}}]$$

3.11.1 GENERAL AIR-FLOW OPERATING LIMITS

ModeVCabinet Size	17		21		24		25	
Cooling BTU/H Cooling Tons Nominal	18000 1.5	24000 2	30000 2.5	36000 3	42000 3.5	48000 4	60000 5	60000 5
Heat Pump or Air Conditioning Maximum Heat/Cool CFM (37.5 CFM/1,000 BTUH) (450 CFM/'Ton Nominal)	675	900	1125	1350	1575	1800	2025	2250
Heat Pump or Air Conditioning Nominal Heat/Cool CFM (33.3 CFM/1,000 BTUH) (400 CFM/Ton Nominal)	600	800	1000	1200	1400	1600	1800	2000
Heat Pump or Air Conditioning Minimum Heat/Cool CFM (30.0 CFM/1,000 BTUH) (360 CFM/Ton Nominal)	540	720	900	1080	1260	1440	1620	1800
Maximum kW Electric Heating & Minimum Electric Heat CFM	11 560	11 560	11 900	**11** 1220	18 1220	18 1220	18 1460	18 1460
Maximum Electric Heat Rise °F	85	85	35	35	65	65	43	43

3.11.2 (-)B2TY MODELS (CONSTANT TORQUE ECM MOTOR) - 2 STAGE AIR-FLOW

(·)B2TY models are specifically designed to be matched with 2-stage outdoor units, but can also be matched with single-stage outdoor units if properly configured for the correct indoor air-flow as•covered in Section 3.11.3 below, They have constant torque ECM motors with 5 blower motor speed taps, labeled Tl through T5. Speed selections are made on the low voltage terminal block located on the motor housing. Speed tap T1 is always dedicated to continuous fan operation and delivers approximately 50% of the speed tap T4 air-flow. From factory, yellow (Y1) and Blue (Y2) leads are connected to the motor low voltage terminal block taps T4 & T5. Yellow and Blue leads on 1/2 tonnages (1.5T, 2.5T, 3.5T) units use taps T2 & T3. Reference table 3.13.3.3. Yellow and Blue leads on Full Tonnages (2, 3, 4, 5) units use taps T4 and T5. Reference table 3.13.3.3. The Yellow (Y1) and Blue (Y2) leads connected to the motor low voltage terminal block should be connected to terminals T2 and T3 on the motor low voltage terminal block and terminals T4 and T5. The air-handler Is configured from the factory for high external static pressure applications with the Yellow and Blue leads connected to terminals T4 and T5 on the motor low voltage terminal block.

3.11.3 (-)B2TY MODELS (CONSTANT TORQUE ECM MOTOR) - SINGLE STAGE AIR-FLOW

(-)B2TY air-handlers may be matched to single stage outdoor units if properly configured. When using a single speed outdoor unit, Y1 and Y2 thermostat wires must connect to the Y2 (Yellow/Blue) wire on the air handler. For 1/2 tonnage outdoor units (1.5T, 2.5T and 3.5T) the blue wire from the control board should be connected to either T2 or T3 on the motor low voltage terminal block. For full tonnage outdoor units (2.0T, 3.0T, 4.0T and 5.0T) the blue wire from the control board should be connected to either T4 or T5 on the motor low voltage terminal block. Select the speed tap based on the general air-flow operating limits table 3.13.1 and static of the application.

3.11.4 AIR-FLOW PERFORMANCE DATA

Model			Blower	Motor	External Static Pressure-Inches W.C. [kPa] with filter & indoor coil										
Cabinet Size	Tonnage	Heaters	ElectricNominal Speed Tap	Voltage		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 [.23]	1.0 [.25]
-17	1.5 Ton	none	2	208/240	CFM	-	519	476	433	391	348	301	257	181	120
					WATTS	-	52.8	57.1	61.5	66.3	71.7	76.7	80.1	84.0	86.4
		none	3	208/240	CFM	-	720	689	656	623	591	559	526	495	463
					WATTS	-	99.3	104.5	109.8	115.4	120.8	126.2	132.1	138.5	145.1
		3 (max)	2	208/240	CFM	-	509	466	423	381	338	291	247	171	110
					WATTS	-	47.8	52.1	56.5	61.3	66.7	71.7	75.1	79.0	81.4
		3 (max)	3	208/240	CFM	-	710	679	646	613	581	549	516	485	453
					WATTS	-	94.3	99.5	104.8	110.4	115.8	121.2	127.1	133.5	140.1
		none	2	115	CFM	-	550	509	468	429	390	347	255	303	183
					WATTS	-	49.1	54.2	59.1	63.8	68.8	74.5	84.4	80.4	88.3
		none	3	115	CFM	745	712	678	645	613	581	548	517	488	451
					WATTS	92.9	98.8	105.6	111.6	117.6	123.3	129.1	135.5	141.3	149.3
	2.0 Ton	none	4	208/240	CFM	-	602	563	525	490	452	414	374	334	292
					WATTS	-	68.6	73.3	78.0	82.4	87.4	93.3	99.4	105.1	108.6
		none	5	208/240	CFM	-	-	845	818	792	764	735	707	680	654
					WATTS	-	-	158.4	164.5	170.7	176.9	183.9	190.7	197.0	203.6
		3 (max)	4	208/240	CFM	-	592	553	515	480	442	404	364	324	282
					WATTS	-	63.6	68.3	73.0	77.4	82.4	88.3	94.4	100.1	103.6
		3 (max)	5	208/240	CFM	-	-	835	808	782	754	725	697	670	644
					WATTS	-	-	153.4	159.5	165.7	171.9	178.9	185.7	192.0	198.6
		none	4	115	CFM	641	605	567	530	496	460	427	387	349	305
					WATTS	67.1	72.7	78.5	83.8	88.8	94.6	99.8	106.6	113.2	118.1
		none	5	115	CFM	896	870	840	810	782	754	727	699	674	648
					WATTS	147.5	154.0	161.9	169.5	176.9	183.9	191.1	197.9	205.2	212.4
-21	2.5 Ton	none	2	208/240	CFM	789	743	699	605	557	497	451	391	322	254
					WATTS	57.9	63.2	68.4	79.0	85.3	91.8	96.8	105.1	110.0	113.2
		none	3	208/240	CFM	1060	1027	994	963	927	894	859	826	793	760
					WATTS	145.7	152.4	160.0	167.5	175.3	182.0	189.5	197.0	204.7	212.4
		3 (max)	2	208/240	CFM	819	773	729	635	587	527	481	421	352	284
					WATTS	67.9	73.2	78.4	89.0	95.3	101.8	106.8	115.1	120.0	123.2
		3 (max)	3	208/240	CFM	1090	1057	1024	993	957	924	889	856	823	790
					WATTS	155.7	162.4	170.0	177.5	185.3	192.0	199.5	207.0	214.7	222.4
		none	2	115	CFM	737	693	650	602	554	492	450	391	325	239
					WATTS	67.4	73.5	79.4	85.5	91.9	99.4	105.2	113.6	120.0	123.7
		none	3	115	CFM	1076	1042	1010	977	944	911	877	841	805	768
					WATTS	158.3	166.3	174.2	182.3	190.2	198.5	206.5	215.0	223.4	232.3
	3.0 Ton	none	4	208/240	CFM	790	749	706	661	617	572	511	474	417	357
					WATTS	72.3	77.9	83.5	88.9	94.7	101.1	108.3	113.0	122.0	127.4
		none	5	208/240	CFM	1197	1171	1143	1114	1086	1057	1025	994	964	934
					WATTS	202.2	209.9	218.3	227.1	235.3	243.8	252.1	260.1	269.1	278.4
		3 (max)	4	208/240	CFM	820	779	736	691	647	602	541	504	447	387
					WATTS	85.3	90.9	96.5	101.9	107.7	114.1	121.3	126.0	135.0	140.4
		3 (max)	5	208/240	CFM	1227	1201	1173	1144	1116	1087	1055	1024	994	964
					WATTS	215.2	222.9	231.3	240.1	248.3	256.8	265.1	273.1	282.1	291.4
		none	4	115	CFM	808	767	738	726	684	640	594	532	493	453
					WATTS	81.6	88.0	92.4	94.3	100.7	107.3	114.1	122.5	128.6	135.9
		none	5	115	CFM	1201	1172	1141	1113	1083	1060	1055	1026	995	963
					WATTS	216.4	224.5	233.9	242.5	251.7	258.9	260.5	269.3	278.6	288.4

3.11.4 AIR-FLOW PERFORMANCE DATA – continued

Model			Blower	Motor	External Static Pressure-Inches W.C. [kPa] with filter & indoor coil										
Cabinet Size	Tonnage	Heaters	ElectricNominal Speed Tap	Voltage		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 [.23]	1.0 [.25]
-24	3.5 Ton	none	2	208/240	CFM	901	835	782	731	681	620	565	515	472	420
					WATTS	72.1	80.6	87.7	94.3	100.7	108.1	115.2	121.2	127.0	133.4
		none	3	208/240	CFM	1531	1494	1444	1404	1370	1338	1306	1275	1245	1217
					WATTS	255.3	267.6	284.5	298.6	310.5	322.3	333.7	344.7	354.9	365.2
		3 (max)	2	208/240	CFM	926	860	807	756	706	645	590	540	497	445
					WATTS	92.1	100.6	107.7	114.3	120.7	128.1	135.2	141.2	147.0	153.4
		3 (max)	3	208/240	CFM	1556	1519	1469	1429	1395	1363	1331	1300	1270	1242
					WATTS	275.3	287.6	304.5	318.6	330.5	342.3	353.7	364.7	374.9	385.2
		none	2	115	CFM	896	835	783	733	678	632	579	519	481	438
					WATTS	76.3	85.7	93.6	100.9	108.7	115.6	124.1	132.7	138.9	145.7
		none	3	115	CFM	1504	1473	1433	1383	1350	1317	1286	1256	1227	1195
					WATTS	260.9	271.6	286.6	305.5	317.2	329.3	341.9	352.7	363.4	373.6
	4.0 Ton	none	4	208/240	CFM	1105	1043	998	957	915	875	824	780	737	693
					WATTS	113.0	124.8	133.0	141.1	148.6	155.8	165.4	173.9	181.8	189.6
		none	5	208/240	CFM	1656	1629	1589	1544	1508	1482	1454	1424	1394	1365
					WATTS	322.7	334.3	350.6	369.5	384.9	397.1	409.1	421.8	435.2	447.7
		3 (max)	4	208/240	CFM	1135	1073	1028	987	945	905	854	810	767	723
					WATTS	133.0	144.8	153.0	161.1	168.6	175.8	185.4	193.9	201.8	209.6
		3 (max)	5	208/240	CFM	1686	1659	1619	1574	1538	1512	1484	1454	1424	1395
					WATTS	342.7	354.3	370.6	389.5	404.9	417.1	429.1	441.8	455.2	467.7
		none	4	115	CFM	1119	1061	1016	974	934	884	842	798	756	711
					WATTS	121.8	134.1	143.6	152.5	161.0	169.9	178.3	187.7	198.0	207.0
		none	5	115	CFM	1655	1625	1593	1544	1512	1479	1451	1423	1396	1369
					WATTS	342.7	355.7	370.3	392.6	407.4	423.0	436.1	449.5	462.4	475.5
-24	5 Ton	none	2	208/240	CFM	1121	1062	1007	950	877	799	693	637	580	514
					WATTS	100.7	110.1	118.7	127.9	138.8	149.5	161.4	168.3	174.8	182.2
		none	3	208/240	CFM	1657	1618	1582	1548	1516	1481	1437	1398	1343	1294
					WATTS	274.5	287.4	300.0	311.9	324.4	336.7	350.7	364.8	382.7	398.4
		3 (max)	2	208/240	CFM	1079	1020	965	908	835	757	651	595	538	472
					WATTS	121	130	139	148	159	169	181	188	195	202
		3 (max)	3	208/240	CFM	1615	1576	1540	1506	1474	1439	1395	1356	1301	1252
					WATTS	295	307	320	332	344	357	371	385	403	418
		none	2	115	CFM	1111	1058	1004	938	874	791	692	626	573	501
					WATTS	104.3	113.1	122.5	134.1	144.3	157.1	168.0	176.0	183.6	191.3
		none	3	115	CFM	1658	1620	1580	1546	1514	1478	1435	1393	1347	1299
					WATTS	283.2	296.8	311.0	323.3	336.4	350.0	365.0	379.8	396.0	412.9
		none	4	208/240	CFM	1226	1179	1131	1080	1022	957	884	778	728	674
					WATTS	125.6	134.5	144.2	153.9	164.7	176.4	188.1	201.9	208.9	217.7
		none	5	208/240	CFM	2010	1977	1944	1917	1887	1860	1838	1809	1787	1760
					WATTS	470.4	485.6	504.6	520.4	537.8	554.0	569.8	587.5	603.5	621.0
		3 (max)	4	208/240	CFM	1184	1137	1089	1038	980	915	842	736	686	632
					WATTS	145.6	154.5	164.2	173.9	184.7	196.4	208.1	221.9	228.9	237.7
		3 (max)	5	208/240	CFM	1968	1935	1902	1875	1845	1818	1796	1767	1745	1718
					WATTS	490.4	505.6	524.6	540.4	557.8	574.0	589.8	607.5	623.5	641.0
		none	4	115	CFM	1213	1161	1110	1060	998	938	848	757	697	653
					WATTS	126.0	136.1	146.3	156.3	168.3	179.3	194.2	206.3	215.6	222.8
		none	5	115	CFM	2014	1985	1953	1920	1887	1856	1829	1801	1774	1739
					WATTS	489.5	505.8	524.3	542.5	560.6	578.9	594.6	611.9	629.1	649.3

4.0 START-UP

4.1 PRE-START CHECKLIST

PRE-START CHECKLIST	
❑ YES ❑ NO	Is unit properly located, level, secure and serviceable?
❑ YES ❑ NO	Has auxiliary pan been provided under the unit with separate drain? (Units installed above a finished ceiling).
❑ YES ❑ NO	Is condensate line properly sized, run, trapped, pitched and tested?
❑ YES ❑ NO	Is ductwork correctly sized, run, taped and insulated?
❑ YES ❑ NO	Have all cabinet openings and wiring been sealed with caulking?
❑ YES ❑ NO	Is the filter clean, in place and of adequate size?
❑ YES ❑ NO	Is the wiring tight, correct and to the wiring diagram?
❑ YES ❑ NO	Is the unit properly grounded and protected (fused)?
❑ YES ❑ NO	Is the thermostat heat anticipator been set properly?
❑ YES ❑ NO	Is the unit circuit breaker(s) rotated properly “on” up - “of” down?
❑ YES ❑ NO	Are the unit circuit breaker(s) line lug cover(s) in place?
❑ YES ❑ NO	Are all access panels in place and secure?
Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.	

4.2 SYSTEM START-UP AND OPERATIONAL CHECK-OUT

After the air-handler and other system components have been installed and the Pre-Start Checklist has been completed, the system should be started up and an operational check-out should be performed. The operational check-out includes checking sequence of operation of the controls, air-flow, and refrigerant charge. If the controls are not found to be functioning properly, or the air-flow or refrigerant charge are not within specifications, corrective action must be taken. The following sections are provided to assist the installer with the operational check-out.

4.3 SEQUENCE OF OPERATION

4.3.1 COOLING MODE

When the thermostat calls for cooling, the G terminal on the blower control board is energized which in turn energizes the indoor blower motor. This causes the indoor blower to circulate air through the air-handler and duct system during the cooling cycle. The Y terminal on the blower control board is also energized which tells the blower control board to energize the cooling speed on the motor instead of the reduced CFM continuous fan speed.

When the thermostat call is satisfied or the thermostat is turned to the off position. The G and Y terminals on the blower control board are de-energized. A time delay programmed into the motor keeps the blower motor energized for an additional 30 seconds to extract the residual cooling from the cold indoor coil.

4.3.2 ELECTRIC HEAT MODE

When the thermostat calls for heat, the W1 terminal on the blower control board is energized. This energizes the indoor blower motor and all of the electric heating elements.

When the thermostat call for heat is satisfied or the thermostat is turned to the off position, the W1 terminal on the blower control board is de-energized which will de-energize the heating elements. The blower motor will be de-energized 75 seconds after the call for heat ends.

4.3.3 HEAT PUMP HEATING MODE

When the heat pump thermostat is set to "heat" mode, the "B" terminal on the outdoor unit is energized which energizes the reversing valve and switches it to the heating position. When the thermostat calls for heat, the G terminal on the blower control board is energized which in turn energizes the indoor blower motor. This causes the indoor blower to circulate air through the air-handler and duct system during the heating cycle. The Y terminal on the blower control board is also energized which tells the blower control board to energize the heating speed on the motor instead of the reduced CFM continuous fan speed. The heating speed on the motor is the same as the cooling speed.

Should the room temperature continue to fall when the system is operating in the heat pump heating mode, the thermostat energizes the W2 terminal on the blower control board which energizes supplemental electric heat.

When the thermostat call for heat is satisfied, the G and Y terminals on the blower control board are de-energized. A time delay programmed into the motor keeps the blower motor energized for an additional 30 seconds to extract the residual heat from the warm indoor coil.

4.3.4 SUPPLEMENTAL ELECTRIC HEAT DURING DEFROST

Supplemental electric heat during the defrost cycle can be provided by running a wire from the purple pigtail wire (from D terminal on defrost control) on the outdoor heat pump unit to the W1 pigtail on the air-handler. This will energize the electric heat during the defrost cycle to prevent cold air from being discharged from the supply registers in the home.

For the most economical operation and if cold discharge air is not a concern, do not run the wire from the purple pigtail on the outdoor unit to the W1 pigtail on the air-handler. In this case, supplemental heat will only be energized if the thermostat energizes the 2nd stage of heat during the defrost cycle due to a significant drop in room temperature.

4.3.5 EMERGENCY HEAT (HEAT PUMP)

If heat pump thermostat is set to the "Emergency Heat" mode, the outdoor unit will be prevented from operating and heat will be provided solely by the electric heater. The electric heater elements and indoor blower motor will be energized any time there is a call for heat with no compressor and outdoor fan operation. A jumper should be installed between the W1 and E terminals on the thermostat subbase so a call for emergency heat will be transferred to the 1st stage of heat of the thermostat. The indoor blower will cycle on and off with the electric heater elements when the thermostat fan setting is set to the "auto" mode, although there will be a 75 second delay off period for the blower motor after the call for heat ends.

4.3.6 THERMOSTAT FAN SETTING

If the thermostat "FAN" setting is adjusted to the "AUTO" position, the indoor blower motor will only operate when there is a call for cooling or heating. If the setting is adjusted to the "ON" position, the indoor blower motor will operate continuously at a reduced speed when there is no call for cooling and heating to reduce power consumption and noise.

4.4 CORRECTING ELECTRIC HEAT kW FOR VOLTAGE

The actual electric heat kW varies with the supply voltage. Use the following formula to correct the heater rated kW at voltages other than rated voltage.

Actual kW = Rated kW × (Actual Voltage^2 / Rated Voltage^2).

4.5 CALCULATING ELECTRIC HEAT CAPACITY IN BTUH

Use the following formula to convert heater kW to heating capacity in BTUH.

BTUH Capacity = kW × 3412

(Where 3412 = BTUH per kW)

4.6 CHECKING INDOOR AIR-FLOW

4.6.1 ESTIMATING CFM USING EXTERNAL STATIC PRESSURE

A common method of checking indoor is to measure the external static pressure that the air-handler is working against and then referring to the air-flow data in Section 3.13.3. Measuring external static pressure to a high degree of precision in the field is challenging, so keep in mind that the CFM determined by this method is an estimate, but is accurate enough for all practical purposes.

To determine external static pressure, the static pressure should be measured in inches of water column across the air-handler using an incline manometer, digital static pressure meter, or a Magnahelic. The static pressure inside the return plenum should be measured as close to the air-handler as possible and must be measured between any external filter rack and the unit so the pressure drop across the filter is accounted for. The static pressure inside the supply plenum should be measured at a point about halfway between the air-handler and the first elbow or the end of the plenum. Total external static pressure is the sum of the return and supply plenum static pressures. Even though the return plenum static pressure is a negative pressure, it must be added to the supply plenum static pressure, ignoring the negative sign. The supply and return plenum static pressure tubing can also be connected to both pressure ports of the pressure measuring device which will automatically add the two pressures together.

4.6.2 ESTIMATING CFM USING ELECTRIC HEAT TEMPERATURE RISE

If the air-handler is equipped with an electric heater, the CFM can be estimated using the air temperature rise across the air-handler with the heater and blower both energized once the unit has run long enough for the temperatures to stabilize. As with determining CFM using external static pressure, the CFM determined by this method is an estimate, but is accurate enough for all practical purposes. Measure the return air temperature as close to the unit as possible and the supply air temperature about half way from the air-handler to the first elbow or end of the supply plenum. Use the following formula to calculate CFM once the temperature rise is determined.

CFM = Heating BTUH / (Elevation Factor × Temp Rise °F)

Note: Refer to Section 4.5 to determine Heating BTUH and the following chart for Elevation Factor.

Elevation (Feet)	Elevation Factor
Sea Level	1.08
500	0.98
1000	0.96
1500	0.95
2000	0.93
2500	0.91
3000	0.90
3500	0.88
4000	0.86
5000	0.83
6000	0.83
7000	0.77
8000	0.74
9000	0.72
10000	0.69

4.7 CHECKING REFRIGERANT CHARGE

System refrigerant charging should only be performed after the indoor air-flow is confirmed to be correct for the application. Once the air-flow is confirmed, refer to the manufacturer's outdoor unit charging chart and installation manual for the proper charging procedure for the system.

5.0 COMPONENTS & C0NTROLS

5.1 BLOWER MOTOR

All (-)B2TY models have 5-speed constant torque electronically commutated (ECM) style motors that are significantly more efficient than PSC motors.

- The motor has a control module mounted on the end of the motor opposite the shaft end which is replaceable should only the control module itself fail.
- Constant torque ECM motors do not require a run capacitor.
- A terminal block on the motor shell is provided for the 5 speed taps, labeled T1 – T5. The speed taps are 24VAC inputs. **Do not connect line voltage to these speed taps.** T1 provides the slowest speed and is dedicated to continuous fan operation. T2 – T5 are for cooling & heating operation and are selectable at the terminal block using a single wire with an insulated terminal that plugs onto the terminals in the terminal block. Speed change instructions are detailed in Section 3.11.2.
- The constant torque motor has a built in soft start that will ramp the motor up to speed gradually.
- An off-delay is built into the control of the motor that keeps the motor energized for 30 seconds after 24 volts is removed from all speed tap terminals.
- If two of the speed tap terminals (T1 – T5) are energized with 24 volts simultaneously, the motor will operate at the higher of the 2 speeds. An example of this is when the G and Y thermostat inputs are both energized in the cooling or heat pump heating mode. In this case, T1 (continuous fan) and a higher numbered speed tap will both be energized resulting in the motor operating at the higher speed to support the cooling or heat pump heating air-flow requirement.
- The air-flow delivery rate for a constant torque ECM motor will not decrease as much as it does with a PSC motor as external static pressure increases.

5.2 BLOWER CONTROL

An electronic blower control is provided to control blower motor & electric heat operation and is located inside the controls compartment.

- There are two 24V outputs on the blower control for controlling the motor, one for continuous fan and one for cooling & heating operation.
- Motor speed changes are made at the motor speed terminal block instead of on the blower control.
- The control has an on-board 3 amp automotive style fuse to protect the control circuit.
- There is a 6-pin connector for the thermostat pigtail harness to connect to. Wires from the thermostat do not connect directly to the blower control, but rather to the pigtails that are routed to the left side of the controls compartment.
- There is no on-delay for blower operation when there is a call for blower operation.
- There is no blower off-delay provided by the blower control when a call for cooling or heat pump heating ends since a 30 second off-delay is programmed into the constant torque ECM motor.
- There is a blower off-delay programmed into the blower control when a call for electric heating ends. The delay is 45 seconds for the White-Rodgers control and 30 seconds for the UTEC control. This off-delay is added to the 30 second off delay programmed into the motor for a total off-delay of 75 or 60 seconds.

5.3 BLOWER ASSEMBLY

The blower utilizes a forward curved centrifugal wheel. The blower housing is constructed from galvanized sheet metal. The motor is attached with a 4-arm wire basket belly band type mount that screws into the side of the blower housing. The blower slides into place on a track and is secured by 2 sheet metal screws. The controls and electric heater are integral with the blower housing.

5.4 ELECTRIC HEATER

- 208/240V (-)B2TY air-handlers are available with a factory installed electric resistance heater ranging from 6 kW – 11 kW. Refer to Section 2.3 for the available kW for each cabinet size.
- Field installed electric resistance heater kits are not available.
- All models with electric heat have a single stage heat.
- All models with electric heat are equipped with a circuit breaker style disconnect where the incoming line voltage power is connected.
- The sheath (cal-rod) style heating elements are mounted inside the blower housing wrap.
- The heating elements are controlled by either sequencers or relays depending on the total kW of the heater.
- Automatic reset bimetallic disc limits de-energize the heating elements should the air-flow become too restricted or should the blower motor fails.
- A manual reset limit control is provided on all models that is set to trip at a higher discharge air temperature than the automatic reset limits trip at and functions as a safety back-up.

IMPORTANT: If the manual reset limit control has tripped, check all of automatic reset limits for welded contacts and check for air-flow restrictions, failed blower motor, or failed blower control before resetting the manual reset limit control.

5.5 TRANSFORMER

A 40VA transformer is located inside the controls compartment and is attached to the blower housing which provides 24V control voltage for both the air-handler & the outdoor unit. The transformer in 208/240V models is wired from the factory for 240V applications, but has a separate 208V tap for 208V applications. The black wires connected to the 240V tap must be moved to the 208V tap when installing the air-handler in 208V applications to assure full 24V+ control voltage for reliable operation of the system controls.

5.6 INDOOR COIL ASSEMBLY

- The indoor coil slabs are a fin & tube design with enhanced aluminum fins and internally grooved copper tubing.
- Most models have 6-10 individual slabs depending on the cabinet size.
- All models have non-bleed thermal expansion valves (TXV) for refrigerant control.
- All models have a self-draining composite condensate drain pan to eliminate standing water and a composite horizontal drain pan to catch any water drips from the coil when the air-handler is oriented in the horizontal position.
- All models have built-in sheet metal channels in various locations designed to manage condensate when the air-handler is oriented in the horizontal position, thus preventing water “blow-off”.
- Copper stubs are provided for field tubing connections.
- The coil assembly slides into the air-handler on sheet metal rails.
- The horizontal drain pan is installed at the factory for horizontal left supply air discharge applications. It must be moved to the other side of the coil for horizontal right supply air discharge applications. (See Section 3.2.3)

6.0 ACCESSORIES & KITS

6.1 REPLACEMENT FILTERS

Model Cabinet Size	Filter Size	Part Number
-17	16.25 × 21	54-23217-02
-21	19.75 × 21	54-23217-03
-24	23.25 × 21	54-23217-04
-25	23.25 × 21	54-23217-04

6.2 AUXILIARY HORIZONTAL OVERFLOW PAN

- **External Auxiliary Horizontal Overflow Pan RXBM-AA06 -** Fits all models.

7.0 INDOOR SERVICE/MAINTENANCE

For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your local dealer as to the proper frequency of maintenance and the availability of a maintenance contract.

IMPORTANT: Before performing any service or maintenance procedures, see the "Safety Information" (Section 1.0) at the front of this manual. Servicing shall be performed only as recommended by the manufacturer and by qualified personnel who are trained by a training organization or manufacturer accredited to teach national competency standards that may be set in legislation for servicing equipment with flammable refrigerant. The achieved competence should be documented by a certificate.

⚠ WARNING

UNITS WITH CIRCUIT BREAKER(S) MEET REQUIREMENTS AS A SERVICE DISCONNECT SWITCH, HOWEVER, IF ACCESS IS REQUIRED TO THE LINE SIDE (COVERED) OF THE CIRCUIT BREAKER, THIS SIDE OF THE BREAKER(S) WILL BE ENERGIZED WITH THE BREAKER(S) DE-ENERGIZED. CONTACT WITH THE LINE SIDE CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

7.1 GENERAL GUIDELINES

Prior to beginning work on systems containing A2L REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the REFRIGERATING SYSTEM, the following procedures shall be completed prior to conducting work on the system:

• Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

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

• The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

• If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

• No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

• Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

7.2 CHECKS TO THE REFRIGERANT EQUIPMENT

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using A2L REFRIGERANTS:

• The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed.

• The ventilation machinery and outlets are operating adequately and are not obstructed.

• If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.

• Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.

• Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

7.3 CHECKS TO ELECTRICAL DEVICES

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

• That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.

• That no live electrical components and wiring are exposed while charging, recovering or purging the system.

• That there is continuity of earth bonding.

7.4 REPAIRS TO SEALED COMPONENTS

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation. Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

- Ensure that the apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications. Sealed electrical components shall be replaced.

7.5 REPAIR TO INTRINSICALLY SAFE COMPONENTS

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak. NOTE: The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components must be replaced and do not have to be isolated prior to working on them.

7.6 CABLING

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

7.7 DETECTION OF FLAMMABLE REFRIGERANTS

Under NO circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall NOT be used. The following leak detection methods are deemed acceptable for all refrigerant systems:

- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids (such as bubble method or fluorescent method agents) are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to the next section (7.8 Removal and Evacuation).

7.8 REMOVAL AND EVACUATION

When breaking into the refrigerant circuit to make repairs or for any other purpose, it is important that best practice is followed for A2L refrigerants. The following procedure shall be adhered to safely remove refrigerant following local and national regulations: Evacuate Purge the circuit with inert gas (optional for A2L) Evacuate (optional for A2L) Continuously flush or purge with inert gas when using flame to open circuit Open the circuit The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing A2L refrigerants, The system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall NOT be used for purging refrigerant systems. The outlet for the vacuum pump shall NOT be close to any potential ignition sources, and ventilation shall be available. For appliances containing flammable refrigerants, refrigerants purging shall be 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 atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall NOT be close to any potential ignition sources, and ventilation shall be available.

7.9 CHARGING PROCEDURES

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

- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.
For more in-depth charging procedures, refer to Refrigerant Charging section of the Outdoor Installation Instructions.

7.10 RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the A2L refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant shall 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 and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

7.11 DECOMMISSIONING AND LABELING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.
b) Isolate system electrically.
c) Before attempting the procedure, ensure that: Mechanical handling equipment is available, if required, for handling refrigerant cylinders; All personal protective equipment is available and being used correctly; The recovery process is supervised at all times by a competent person; Recovery equipment and cylinders conform to the appropriate standards.
d) Pump down refrigerant system, if possible.
e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g) Start the recovery machine and operate in accordance with instructions.
h) Do not overfill cylinders (no more than 80 % volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.
Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

7.12 AIR FILTER

Check the system filter every ninety days or as often as found to be necessary and if obstructed, clean or replace at once.

IMPORTANT: Do not operate the system without a filter in place.

- The filter in the unit is a cleanable type. Clean filter using cold water and allow filter to dry. No oiling or coating of the filter is required or recommended.
- New filters to replace those supplied in unit are available from your local distributor or home supply store.

TO ACCESS AIR FILTER:

1. Locate thumb screws on filter access door and remove.
2. Remove filter access door by tilting it down from the top.
3. Slide filter out.

- Internal filter is NOT used in downflow air configuration.

7.13 INDOOR COIL, DRAIN PAN, DRAIN LINE

Inspect the indoor coil once each year for cleanliness and clean as necessary. It is necessary to remove the filter and check the return air side of the coil for debris.

- Generally, the coil can be easily cleaned when it is dry. If the coil is coated with dirt or lint, blow compressed air or nitrogen through the supply side of the coil fins blowing dirt or lint from the return air side of the coil onto the filter or cardboard placed between filter and coil. Be sure lint and dirt is removed from the filter and return air system.
- If the coil is coated with oil or grease, clean it with a mild detergent and water solution. Rinse the coil thoroughly with clear water. Be careful not to splash water excessively into unit and system.
- Inspect the drain pan and condensate drain at the same time the cooling coil is checked. Clean the drain pan and condensate drain by removing any foreign matter from the pan. Flush the pan and drain tube with clear water.
- If the drain tube is restricted, it can generally be cleaned with high pressure water. Remove the drain line from the unit away from the pan and coil to clear the drain line.

IMPORTANT: Do not use caustic household drain cleaners in the condensate pan or near the indoor coil. Drain cleaners will quickly damage the indoor coil.

7.14 BLOWER MOTOR & WHEEL

Inspect the blower motor and wheel for cleanliness. With the system air filter in place, it should be several years before it would become necessary to clean the blower motor and wheel.

- If it becomes necessary to remove the blower assembly from the unit, see instructions on removal and disassembly of motor, blower and heater parts.
- The blower motor and wheel may be cleaned by using a vacuum with a soft brush attachment. Remove grease with a mild solvent such as hot water and detergent. Be careful not to disturb the balance weights (clips) on the blower wheel blades. Do not drop or bend wheel as balance will be affected.

7.15 MOTOR LUBRICATION

The blower motor sleeve bearings are pre-lubricated by the motor manufacturer and do not have oiling ports. Motor should be run for an indefinite period of time without additional lubrication.

7.16 BLOWER ASSEMBLY REMOVAL & REPLACEMENT

⚠ WARNING

IF REMOVAL OF THE BLOWER ASSEMBLY IS REQUIRED, ALL DISCONNECT SWITCHES SUPPLYING POWER TO THE AIRHANDLER MUST BE DE-ENERGIZED AND LOCKED (IF NOT IN SIGHT OF UNIT) SO THE FIELD POWER WIRES CAN BE SAFELY REMOVED FROM THE BLOWER ASSEMBLY. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN PERSONAL INJURY OR DEATH.

Removing the blower assembly is not required for normal service and maintenance. Removal is necessary for replacement of components such as motor, blower wheel and electric heater(s). After extended use, removal of the blower assembly may become necessary for a thorough cleaning of the blower motor and wheel.

1. Mark field power supply wiring (for replacement) attached to terminal block or circuit breaker(s) on blower assembly. Remove wiring from terminal block or circuit breaker(s).
2. Mark low voltage control wiring (for replacement) where attached to unit control terminals on left side of blower housing.
3. Remove two screws holding blower assembly to front channel of cabinet and pull blower assembly from cabinet.
4. To replace blower assembly, slide blower assembly into blower deck. Make sure blower assembly engages lances in deck properly. If assembly hangs up, check to make sure top and bottom are lined up in proper locations.
5. Slide blower assembly to back of cabinet and make sure it is completely engaged.
6. Replace two screws holding blower assembly to front channel of cabinet. Take care not to strip screws, just snug into place.
7. Replace low voltage control wiring with wire nuts and make sure wiring is to wiring diagram and a good connection has been made.
8. Replace field power wiring to terminal block or circuit breaker(s) on control area of blower assembly. Make sure wires are replaced as they were, check wiring diagram if necessary. Tighten supply power wiring securely to terminals lugs.
9. Make sure wiring is within cabinet and will not interfere with access door. Make sure proper separation between low voltage control wiring and field power wiring has been maintained.
10. Replace blower assembly control access panel before energizing equipment.

7.17 MOTOR REPLACEMENT

With the blower assembly removed, the indoor blower motor can be removed and replaced using the following procedure:

1. Remove motor leads from the motor high and low voltage plugs. Note the lead locations for ease of re-assembly.
2. Loosen the set screw holding the blower wheel onto the motor shaft. The shaft extends through the blower hub so that a wrench can be used on the extended shaft to break the shaft loose if necessary. Be careful not to damage the shaft. Use a wheel puller on the groove in the hub if necessary.
3. Loosen the bolt holding the wire motor band around the motor shell and pull the motor from the motor mount. Note the motor position in the mount for re-assembly.
4. To re-assemble, insert the motor shaft through the hub in the blower wheel and orient the motor to original position.
5. For proper motor cooling, it is important that the motor be mounted the same as the original, as far into the blower as practical.
6. The dimension from the face of the motor end plate (shaft end) to the first wire on the motor mount band around the shell should be:

   1.25” for (-)B2TY-17
   1.25” for (-)B2TY-21
   1.25” for (-)B2TY-24
   1.5” for (-)B2TY-25

7. With motor held to above position and motor lead plugs oriented to the original position (the wire connectors on the motor must point straight to the supply air end of the unit and away from the return air [filter] end of the unit). Securely tighten the bolt on the mount band to the motor shell.
8. Turn the motor shaft so that the flat on the shaft is located under blower wheel setscrew, and the blower wheel is centered in the blower housing with the same distance on each side between the inlet venturi and the outside of the blower wheel.
9. Re-assemble the motor wiring (high and low voltage plugs) into the motor.

IMPORTANT: DO NOT FORCE POWER PLUG INTO THE MOTOR CONNECTOR BACKWARDS. The A.C. power plug to the motor has locking tabs. It has been proven that by applying excessive force to the A.C. cable half of the connector it is possible to force the connector in backwards. It will not seat and "click" properly but will make connection. If A.C. power is applied with the connector reversed the motor will be immediately destroyed.

7.18 BLOWER WHEEL REPLACEMENT

With the blower assembly removed and the motor assembly removed (see above instructions), remove the screws holding the blower wrap (cutoff) to the blower sides.

1. With wrap (cutoff) screws removed, cut off end of blower wrap will spring up. Lifting wrap blower wheel is removed through the discharge opening in the blower housing.
2. To replace, make sure wheel is oriented properly with hub to the opposite side from the motor. Lift blower wrap and insert blower wheel through discharge opening in the blower housing.
3. Hold blower wrap down into position and replace screws holding blower wrap to blower sides.
4. See motor replacement and blower assembly instructions for remaining assembly procedure.

7.19 ELECTRIC HEATER ELEMENT REPLACEMENT

With the blower assembly removed, electric heater(s) can be removed and replaced from the blower housing without disturbing the motor or blower wheel.

1. Remove both wires from the heater to be removed and remove three screws from outside of blower wrap holding heater brackets to blower wrap.
2. One screw is located under the control mounting plate and is a little difficult to get at. A 1/4" box end or open end wrench should be used to remove and replace this screw
3. With three screws removed, lift heater element and heater terminals through mounting holes in top of blower wrap.
4. Lift heater from blower wrap and with terminal end of heater headed for blower cut off and to the outside of the blower side, remove heater.
5. To replace the heater element, reverse the above process to replace heater.
6. Make sure bend on heater near terminals end is down in place flush or below outlet flanges on blower assembly. Replace screws in heater brackets and tighten.
7. Make sure terminals on heater are straight with at least 1/2" clearance to control mounting plate and 1/2" clearance to access panel. Use a straight edge across front flanges on blower assembly to check clearance (bend if necessary for proper clearance).
8. Replace wiring, make sure connections are tight and are made in accordance with the unit wiring diagram.

7.20 REPLACEMENT PARTS

Any replacement part used to replace parts originally supplied on equipment must be the same as or an approved alternate to the original part supplied. The manufacturer will not be responsible for replacement parts not designed to physically fit or operate within the design parameters the original parts were selected for.

These parts include but are not limited to: Circuit breakers, heater controls, heater limit controls, heater elements, motor, motor capacitor, blower relay, control transformer, blower wheel, filter, indoor coil and sheet metal parts.

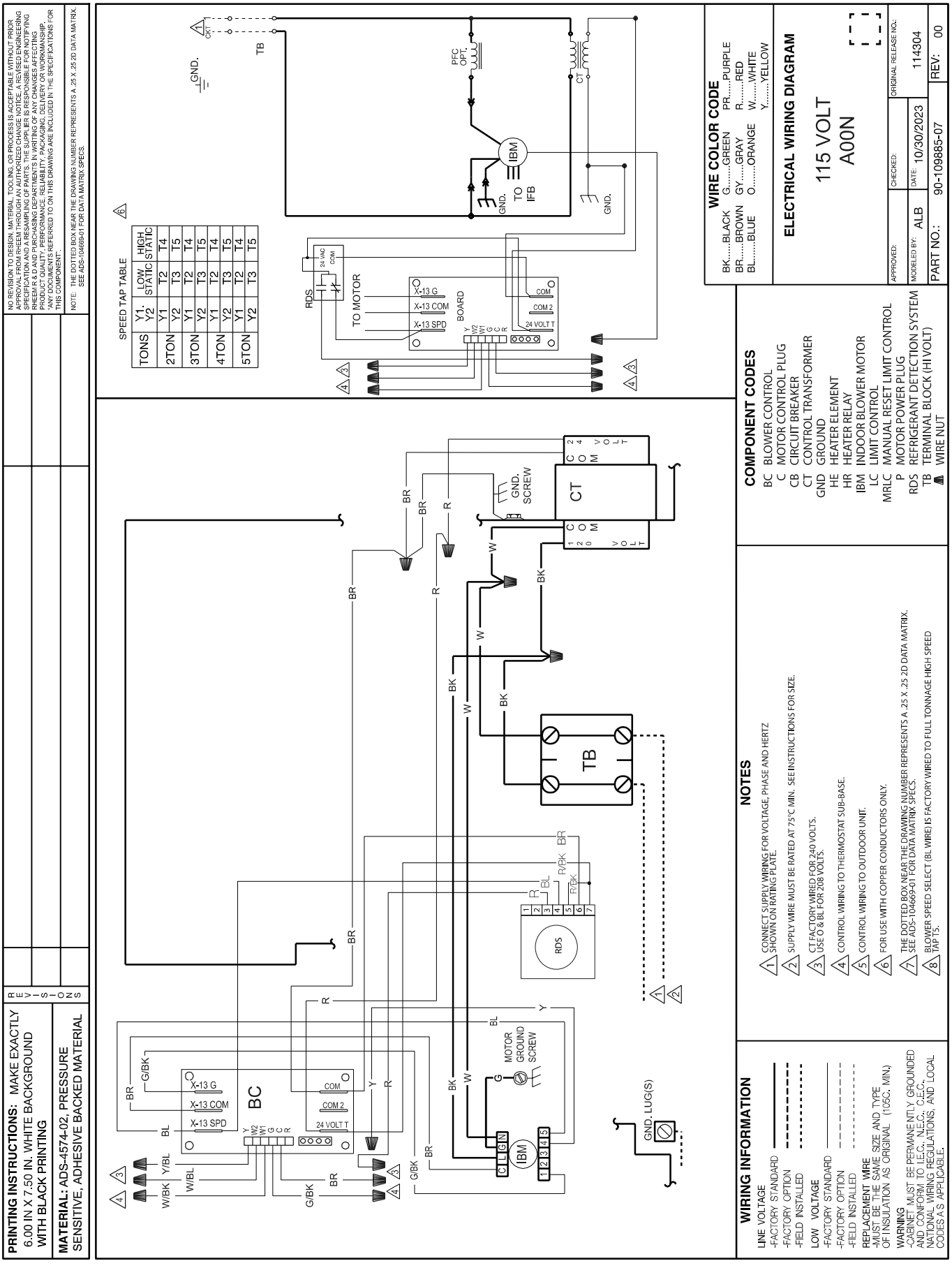
When ordering replacement parts, it is necessary to order by part number and include with the order the complete model number and serial number from the unit data plate. (See parts list for unit component part numbers).

8.0 DIAGNOSTICS

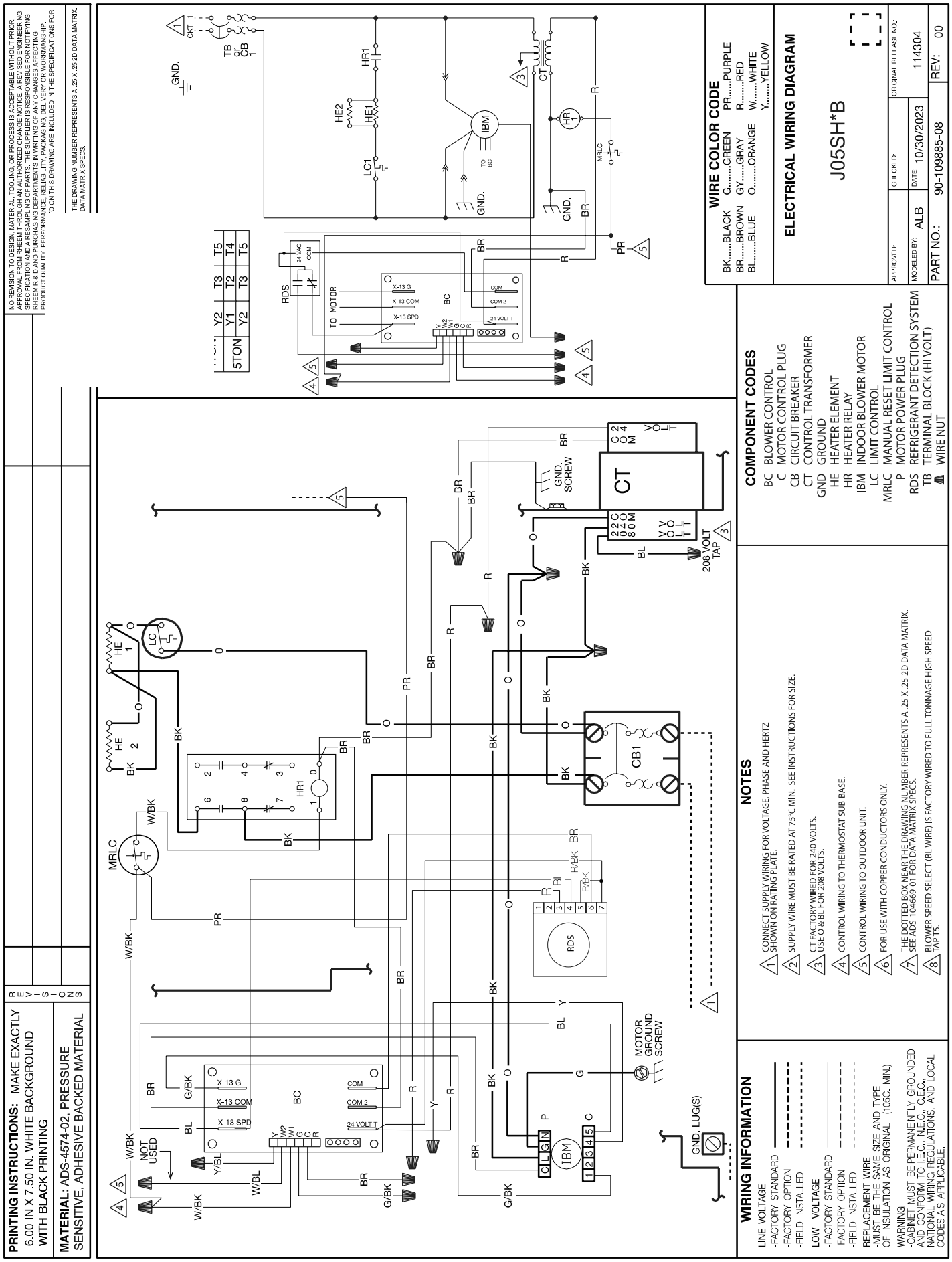
Problem	Possible Cause (Suggested Fix)
Blower Motor will not operate	• Failed motor (replace) • Failed motor control module (replace module) • Blown 3A fuse on blower control (check for control circuit short, replace fuse) • Loose wiring connection or broken wire (check connections & wiring) • Failed transformer (replace) • Failed blower control (replace) • Disconnect breaker is turned of or has tripped due to over-current or shorted circuit (check for shorts, reset breaker)
Excessive vibration	• Blower wheel out of balance (replace or clean blower wheel)
Water overfowing drain pan	• Plugged drain (clear drain) • Unit not level (level unit)
Electric heater not heating properly or not heating at all, but blower motor is operating	• Over temperature limit has tripped (check for low air-fow) • Over temperature limit has failed (replace) • Sequencer or contactor has failed (replace) • One or more heating elements have burned out (replace)
Coil is frozen up	• System low on refrigerant charge (check for leaks & adjust charge) • Dirty return air flter (replace flter) • Inadequate air-fow due to incorrect blower motor speed selected (select higher speed) or excessively restrictive duct system (correct duct system)
Excessive air-fow	• Incorrect blower motor speed selected (select lower speed)
Water blow-of from coil	• Excessive airfow (select lower blower motor speed) • Contaminants on coil fns (clean coil) • Damaged coil fns (comb out fns or replace coil)
TXV not controlling properly	• TXV bulb not positioned correctly or clamp not tight (Check position of TXV sensing bulb and tightness of clamp) • Failed TXV (replace) • Plugged TXV inlet screen (clean or replace screen or replace TXV)
Blower Constantly Running	• A2L Sensor Failure (Replace RDS if necessary)

9.0 WIRING DIAGRAMS

9.1 WIRING DIAGRAM 115V – NO HEAT



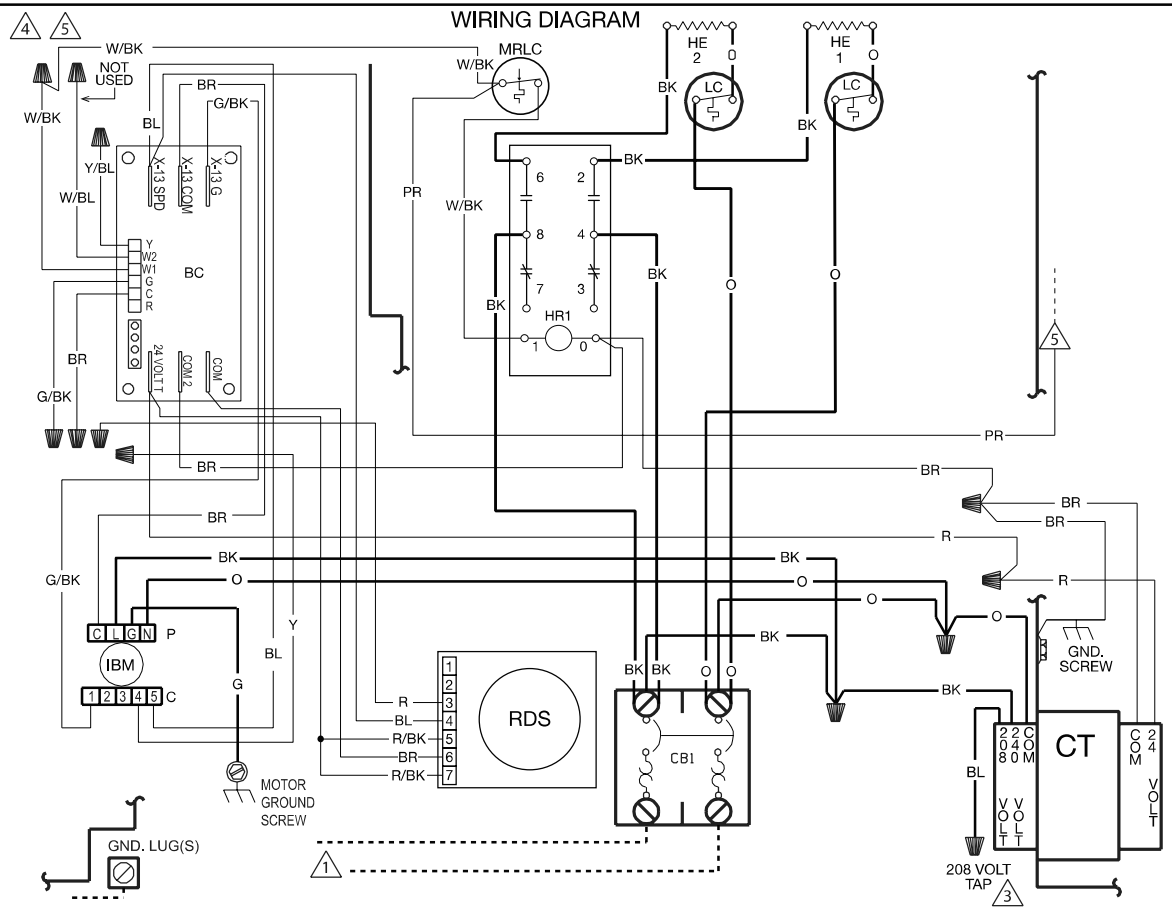
9.2 WIRING DIAGRAM 208/240V – 6kW



9.3 WIRING DIAGRAM 208/240V – 7kW

PRINTING INSTRUCTIONS: MAKE EXACTLY 6.00 IN X 7.50 IN. WHITE BACKGROUND WITH BLACK PRINTING	REVISIONS		NO REVISION TO DESIGN, MATERIAL, TOOLING, OR PROCESS IS ACCEPTABLE WITHOUT PRIOR APPROVAL FROM RHEEM THROUGH AN AUTHORIZED CHANGE NOTICE, A REVISED ENGINEERING SPECIFICATION AND A RESAMPLING OF PARTS. THE SUPPLIER IS RESPONSIBLE FOR NOTIFYING RHEEM R & D AND PURCHASING DEPARTMENTS IN WRITING OF ANY CHANGES AFFECTING PRODUCT QUALITY, PERFORMANCE, RELIABILITY, PACKAGING, DELIVERY OR WORKMANSHIP. *ANY DOCUMENTS REFERRED TO ON THIS DRAWING ARE INCLUDED IN THE SPECIFICATIONS FOR THIS COMPONENT*.
MATERIAL: ADS-4574-02, PRESSURE SENSITIVE, ADHESIVE BACKED MATERIAL			NOTE: THE DOTTED BOX NEAR THE DRAWING NUMBER REPRESENTS A .25 X .25 2D DATA MATRIX. SEE ADS-104669-01 FOR DATA MATRIX SPECS.

WIRING DIAGRAM

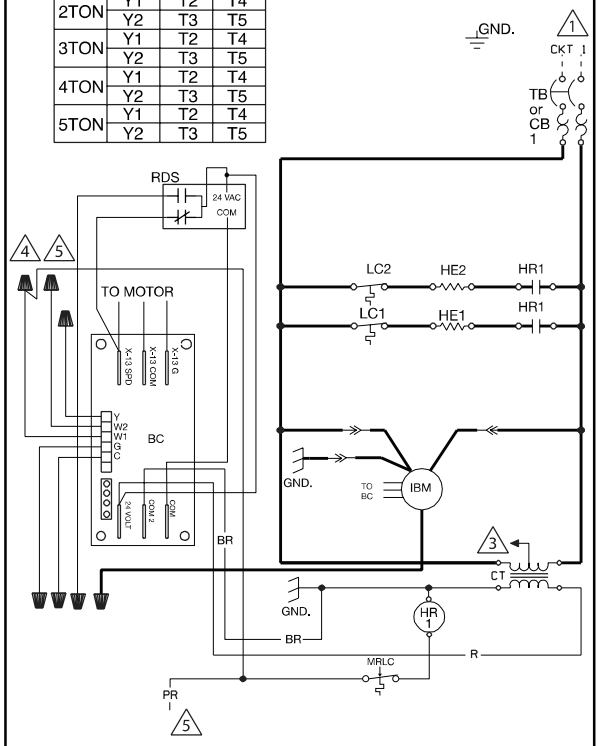


WIRING DIAGRAM REPRESENTS MAXIMUM COMPONENTS, FEWER COMPONENTS WILL RESULT IN LESS WIRING THAN SHOWN.

SCHEMATIC DIAGRAM

SPEED TAP TABLE

TONS	Y1. Y2	LOW STATIC	HIGH STATIC
2TON	Y1	T2	T4
	Y2	T3	T5
3TON	Y1	T2	T4
	Y2	T3	T5
4TON	Y1	T2	T4
	Y2	T3	T5
5TON	Y1	T2	T4
	Y2	T3	T5



WIRE COLOR CODE

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

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.

NOTES

1. CONNECT SUPPLY WIRING FOR VOLTAGE, PHASE AND HERTZ SHOWN ON RATING PLATE.
2. SUPPLY WIRE MUST BE RATED AT 75°C MIN. SEE INSTRUCTIONS FOR SIZE.
3. CT FACTORY WIRED FOR 240 VOLTS. USE O & BL FOR 208 VOLTS.
4. CONTROL WIRING TO THERMOSTAT SUB-BASE.
5. CONTROL WIRING TO OUTDOOR UNIT.
6. FOR USE WITH COPPER CONDUCTORS ONLY.
7. THE DOTTED BOX NEAR THE DRAWING NUMBER REPRESENTS A .25 X .25 2D DATA MATRIX. SEE ADS-104669-01 FOR DATA MATRIX SPECS.
8. BLOWER SPEED SELECT (BL WIRE) IS FACTORY WIRED TO FULL TONNAGE HIGH SPEED TAP T5.

COMPONENT CODES

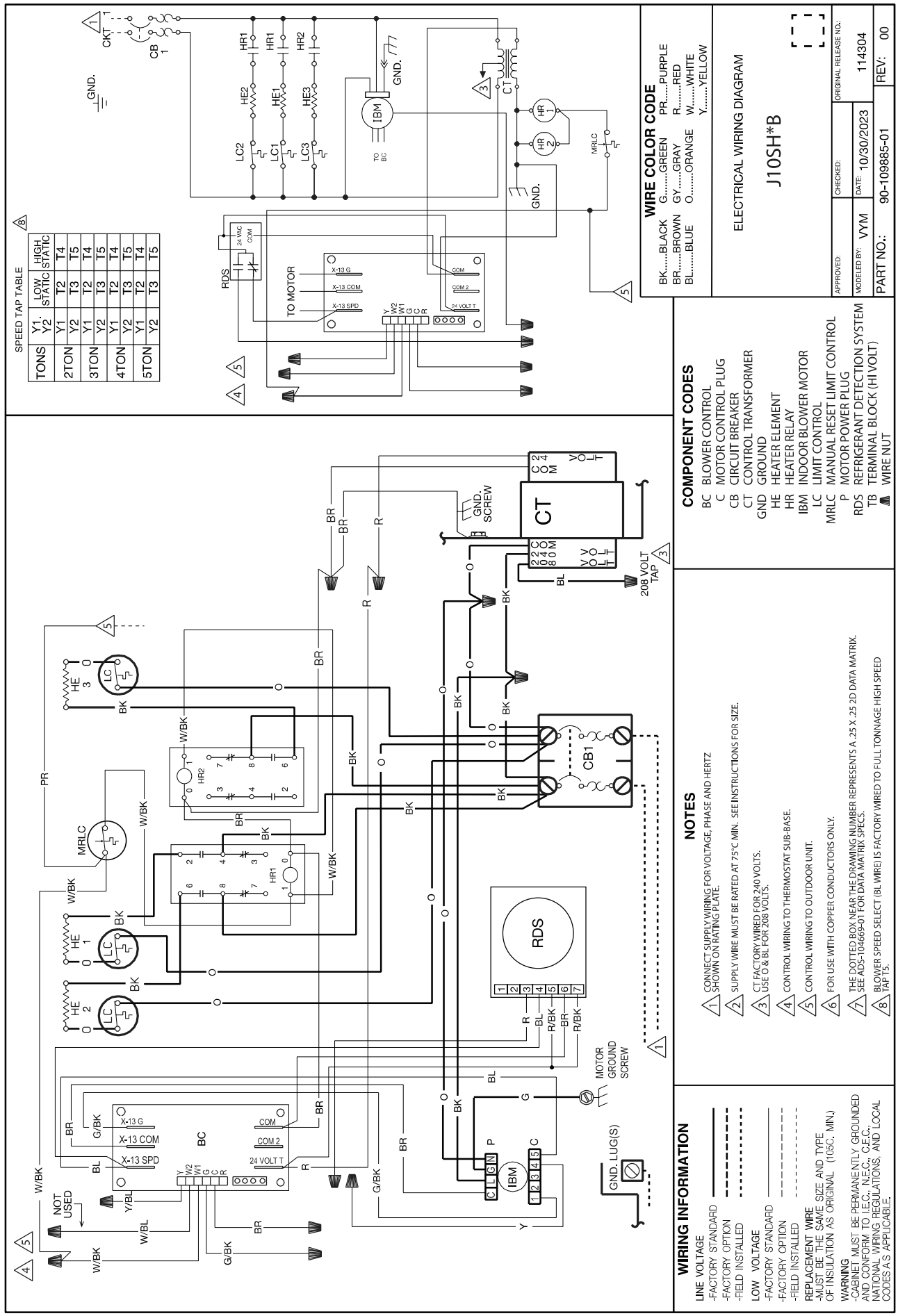
BC	BLOWER CONTROL
C	MOTOR CONTROL PLUG
CB	CIRCUIT BREAKER
CT	CONTROL TRANSFORMER
GND	GROUND
HE	HEATER ELEMENT
HR	HEATER RELAY
IBM	INDOOR BLOWER MOTOR
LC	LIMIT CONTROL
MRLC	MANUAL RESET LIMIT CONTROL
P	MOTOR POWER PLUG
RDS	REFRIGERANT DETECTION SYSTEM
TB	TERMINAL BLOCK (HI VOLT)
	WIRE NUT

ELECTRICAL WIRING DIAGRAM

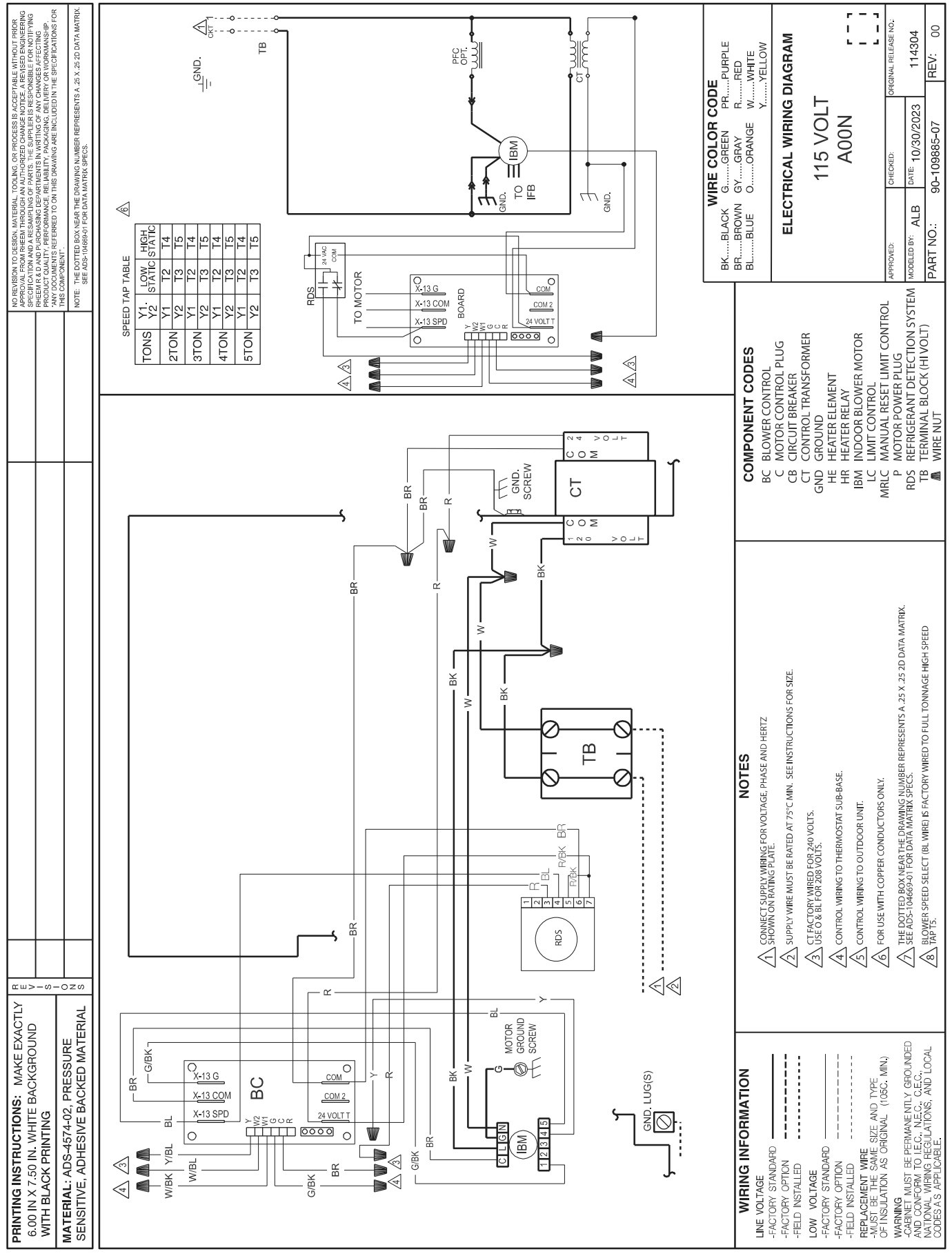
J07SH*B

APPROVED:	CHECKED:	ORIGINAL RELEASE NO.:
MODELED BY: VYM	DATE: 10/30/2023	114304
PART NO.: 90-109885-09		REV: 00

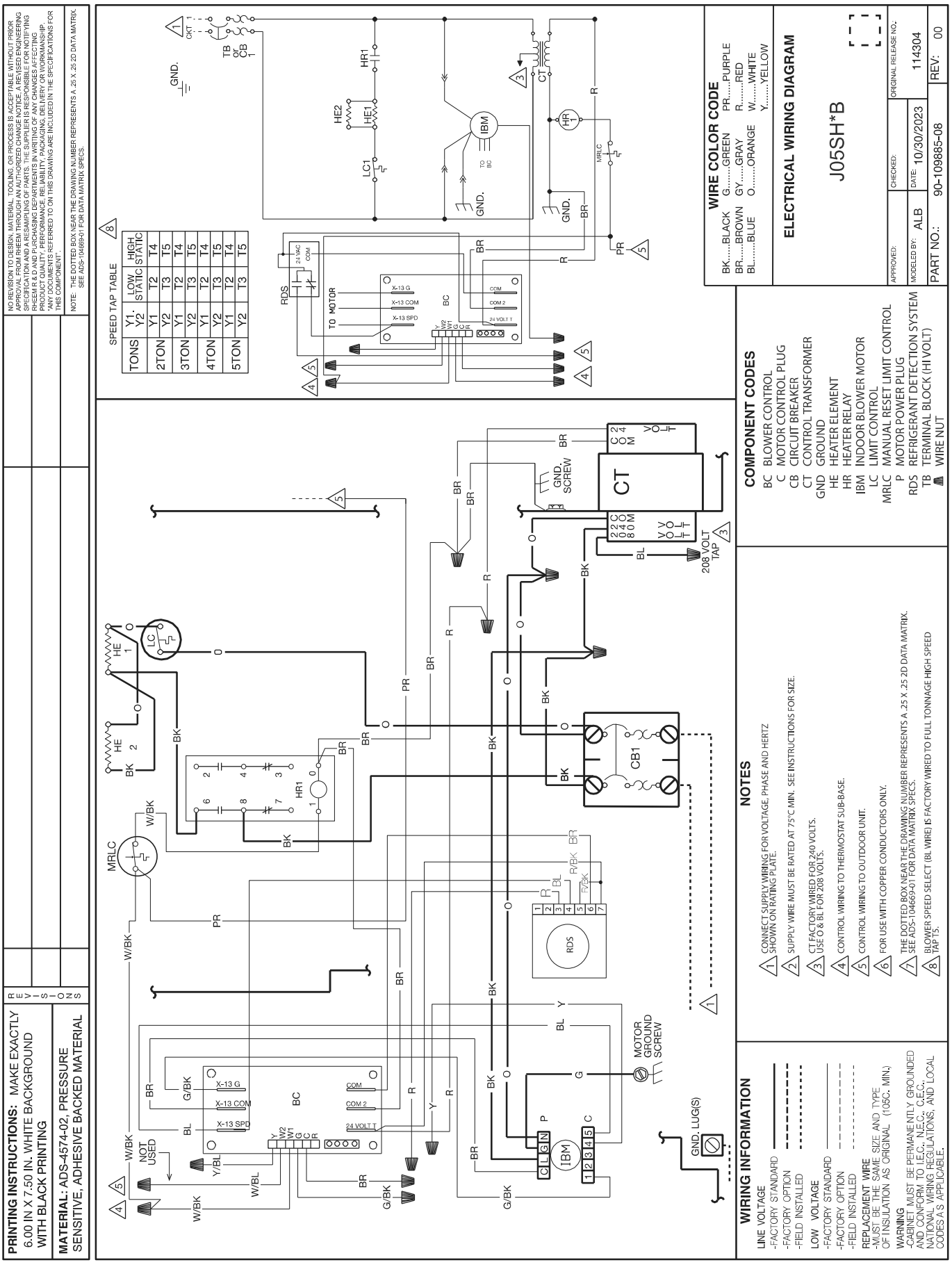
9.4 WIRING DIAGRAM 208/240V – 11kW HEATER



9.5 WIRING DIAGRAM 115V – A00N



9.6 WIRING DIAGRAM – J05SH*B



9.7 WIRING DIAGRAM – J07SH*B