

INSTALLATION INSTRUCTIONS

AIR HANDLERS

FEATURING INDUSTRY STANDARD R-454B REFRIGERANT:

(-)H1P Standard Efficiency with Aluminum Coil

(-)H2T High Efficiency with Aluminum Coil (2-Stage Non-Communicating)



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.



ISO 9001:2015

DO NOT DESTROY THIS MANUAL

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

TABLE OF CONTENTS

1.0 SAFETY INFORMATION.....	4
2.0 GENERAL INFORMATION.....	7
2.1 IMPORTANT INFORMATION ABOUT EFFICIENCY & INDOOR AIR QUALITY.....	7
2.2 CHECKING PRODUCT RECEIVED.....	7
2.3 MODEL NUMBER NOMENCLATURE.....	8
2.4 AVAILABLE MODELS.....	8
2.5 DIMENSIONS & WEIGHT.....	10
2.5.1 DIMENSIONS & WEIGHTS: (H)HP MODELS.....	10
2.5.2 DIMENSIONS & WEIGHTS: (H)HT MODELS.....	11
2.6 IMPORTANCE OF PROPER INDOOR/OUTDOOR MATCHUPS.....	12
2.7 IMPORTANCE OF QUALITY INSTALLATION.....	12
3.0 INSTALLATION.....	12
3.1 TOOLS & REFRIGERANT.....	12
3.1.1 TOOLS REQUIRED FOR INSTALLING AND SERVING R-454B.....	13
3.1.2 SPECIFICATIONS OF R-454B.....	14
3.1.3 QUICK REFERENCE GUIDE FOR R-454B.....	15
3.2 APPLICATIONS AND ORIENTATION.....	16
3.2.1 VERTICAL UPFLOW & HORIZONTAL LEFT DISCHARGE.....	16
3.2.2 VERTICAL DOWNFLOW & HORIZONTAL RIGHT DISCHARGE.....	16
3.2.3 INSTALLATION IN AN UNCONDITIONED SPACE.....	17
3.2.4 INSTALLATION IN AN UNVENTILATED AREA.....	17
3.2.5 INSTALLATION IN MOBILE MANUFACTURED HOMES.....	17
3.2.6 INSTALLATION IN CORROSIVE ENVIRONMENTS.....	18
3.2.7 SUPPORTING AIR HANDLER IN HORIZONTAL APPLICATIONS.....	18
3.3 AUXILIARY OVERFLOW PAN.....	18
3.4 CLEARANCES.....	19
3.5 DUCT FLANGES.....	19
3.6 DUCTWORK.....	20
3.7 RETURN AIR FILTER.....	20
3.8 REFRIGERANT LINE CONNECTIONS & CHARGING.....	21
3.8.1 PREPARATION.....	21
3.8.2 LIQUID LINE FILTER DRIER.....	21
3.8.3 BRAZING.....	21
3.8.4 LEAK TESTING.....	21
3.8.5 EVACUATION.....	21
3.8.6 REFRIGERANT CHARGING.....	21
3.8.7 REFRIGERANT DETECTION SYSTEM (RDS).....	22
3.8.8 REFRIGERANT DETECTION SYSTEM (RDS) INSTALLATION INSTRUCTIONS.....	22
3.9 TAV SENSING BULB ATTACHMENT.....	26
3.10 CONDENSATE DRAIN.....	27
3.11 THERMOSTAT.....	27
3.12 ELECTRICAL WIRING.....	27
3.12.1 CONFIGURING UNIT FOR 208 VOLT POWER.....	27
3.12.2 GROUNDING.....	28
3.12.3 POWER WIRING.....	29
3.12.4 COPPER WIRE SIZE - ALLOW 3% VOLTAGE DROP.....	29
3.12.5.1 ELECTRICAL DATA - BLOWER MOTOR ONLY - WITHOUT ELECTRIC HEAT: (H)HP.....	29
3.12.5.2 ELECTRICAL DATA - BLOWER MOTOR ONLY - WITHOUT ELECTRIC HEAT: (H)HT.....	30
3.12.6.1 ELECTRICAL DATA - WITH ELECTRIC HEAT: (H)HP.....	30
3.12.6.2 ELECTRICAL DATA - WITH ELECTRIC HEAT: (H)HT.....	30
3.12.7 ELECTRIC HEATER KIT SUPPLEMENTAL INFORMATION.....	36
3.12.8 CONTROL WIRING.....	37
3.12.9 THERMOSTAT & CONTROL WIRING CONNECTIONS.....	37
3.13 AIR-FLOW.....	38
3.13.1 GENERAL AIR-FLOW OPERATING LIMITS.....	38
3.13.2 SELECTING INDOOR BLOWER MOTOR SPEED.....	39
3.13.2.1 (H)HP MODELS (PSC MOTOR).....	39
3.13.2.2 (H)HT MODELS (CONSTANT TORQUE ECM MOTOR) - 3 STAGE AIR-FLOW.....	39
3.13.2.3 (H)HT MODELS (CONSTANT TORQUE ECM MOTOR) - SINGLE STAGE AIR-FLOW.....	39
3.13.2.4 200V AIR-FLOW PERFORMANCE DATA: (H)HP (PSC MOTOR).....	40
3.13.2.5 115/208/240V AIR-FLOW PERFORMANCE DATA: (H)HP (PSC MOTOR).....	42
3.13.2.6 115/208/240V AIR-FLOW PERFORMANCE DATA: (CONSTANT TORQUE MOTOR).....	44

TABLE OF CONTENTS (continued)

4.0 START-UP	48	9.10 WIRING DIAGRAM (JH1P – 115V)	69
4.1 PRE-START CHECKLIST	48	9.11 WIRING DIAGRAM (JH1P – 208/240V)	70
4.2 SYSTEM START-UP AND OPERATIONAL CHECK-OUT	48	9.12 WIRING DIAGRAM (JH1P – 208/240V)	71
4.3 SEQUENCE OF OPERATION	48	9.13 WIRING DIAGRAM (JH1P – 208/240V)	72
4.3.1 COOLING MODE	48	9.14 WIRING DIAGRAM (JH1P – 480V)	73
4.3.2 ELECTRIC HEAT MODE	49	9.15 WIRING DIAGRAM (JH1P – 480V)	74
4.3.3 HEAT PUMP HEATING MODE	48	9.16 WIRING DIAGRAM (JH2T – 480V)	75
4.3.4 SUPPLEMENTAL ELECTRIC HEAT DURING DEFOST	49	9.17 WIRING DIAGRAM (JH2T – 480V)	76
4.3.5 EMERGENCY HEAT (HEAT PUMP)	48		
4.3.6 THERMOSTAT FAN SETTING	49		
4.4 CORRECTING ELECTRIC HEAT kW FOR VOLTAGE	49		
4.5 CALCULATING ELECTRIC HEAT CAPACITY IN BTU/H	49		
4.6 CHECKING INDOOR AIR FLOW	50		
4.6.1 ESTIMATING CFM USING EXTERNAL STATIC PRESSURE	50		
4.6.2 ESTIMATING CFM USING ELECTRIC HEAT TEMPERATURE RISE	50		
4.7 CHECKING REFRIGERANT CHARGE	50		
5.0 COMPONENTS & CONTROLS	51		
5.1 BLOWER MOTOR	51		
5.2 MOTOR RUN CAPACITOR	51		
5.3 BLOWER CONTROL	51		
5.4 BLOWER	52		
5.5 TRANSFORMER	52		
5.6 INDOOR COIL ASSEMBLY	52		
6.0 ACCESSORIES & KITS	53		
6.1 ELECTRIC RESISTANCE HEATER KITS	53		
6.2 JUMPER BAR KITS	53		
6.3 AUXILIARY HORIZONTAL OVERFLOW PANS	53		
6.4 EXTERNAL FILTER BASES	53		
6.5 COMBUSTIBLE FLOOR BASES	54		
6.6 HORIZONTAL ADAPTER KITS	54		
7.0 INDOOR SERVICE/MAINTENANCE	54		
7.1 GENERAL GUIDELINES	54		
7.2 CHECKS TO THE REFRIGERANT EQUIPMENT	55		
7.3 CHECKS TO ELECTRICAL DEVICES	55		
7.4 REPAIRS TO SEALED COMPONENTS	55		
7.5 REPAIR TO INTRINSICALLY SAFE COMPONENTS	55		
7.6 CABLING	55		
7.7 DETECTION OF FLAMMABLE REFRIGERANTS	55		
7.8 REMOVAL AND EVACUATION	55		
7.9 CHARGING PROCEDURES	56		
7.10 RECOVERY	56		
7.11 DECOMMISSIONING AND LABELING	56		
7.12 AIR FILTER	56		
7.13 INDOOR COIL, DRAIN PAN, DRAIN LINE	56		
7.14 BLOWER MOTOR AND WHEEL	57		
7.15 MOTOR LUBRICATION	57		
7.16 BLOWER ASSEMBLY REMOVAL & REPLACEMENT	57		
7.17 MOTOR REPLACEMENT	57		
7.18 BLOWER WHEEL REPLACEMENT	58		
7.19 REPLACEMENT PARTS	58		
8.0 DIAGNOSTICS	59		
9.0 WIRING DIAGRAMS	60		
9.1 WIRING DIAGRAM (JH1P – 115V)	60		
9.2 WIRING DIAGRAM (JH1P – 208/240V)	61		
9.3 WIRING DIAGRAM (JH2T – 115V)	62		
9.4 WIRING DIAGRAM (JH2T – 230V)	63		
9.5 WIRING DIAGRAM (JH2T – 230V)	64		
9.6 WIRING DIAGRAM (JH2T – 115V)	65		
9.7 WIRING DIAGRAM (JH2T – 230V)	66		
9.8 WIRING DIAGRAM (JH2T – 208/240V)	67		
9.9 WIRING DIAGRAM (JH2T – 208/240V)	68		

WARNING (SEE SECTION 3.12: 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 3.1: 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 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

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.

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 3.2.2: VERTICAL DOWNFLOW)

The RXHB-17, RXHB-21 or RXHB-24 combustible floor base is required when some units with electric heat are applied downflow on combustible flooring. Failure to use the base can cause a fire resulting in property damage, personal injury or death. See **CLEARANCES** for units requiring a combustible floor base. See the accessory section in this manual for combustible floor base RXHB.

WARNING (SEE SECTION 3.13.2: GROUNDING)

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

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.

WARNING (SEE SECTION 3.6: 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.

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.

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.

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 3.7: 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 8 inches from the solid bottom. Metal plenums 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 3.2: VERTICAL DOWNFLOW & HORIZONTAL RIGHT DISCHARGE)

Unit must be reconfigured for vertical down or horizontal right supply air discharge applications. The coil must be repositioned so the vertical drainpan is on the bottom for vertical down discharge applications or the horizontal drip pan is below coil for horizontal right discharge applications. Failure to reconfigure the unit for these applications can result in property damage and poor system performance.

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 6.3 of this manual for auxiliary horizontal overflow pan accessory information (model RXBN).

NOTICE

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

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.

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.

⚠ 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, gasco tractors, snows, portable heaters, charcoal and gas grills, gasoline powered tools, and outdoor cooking 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 Alarms in every room.

⚠ NOTICE

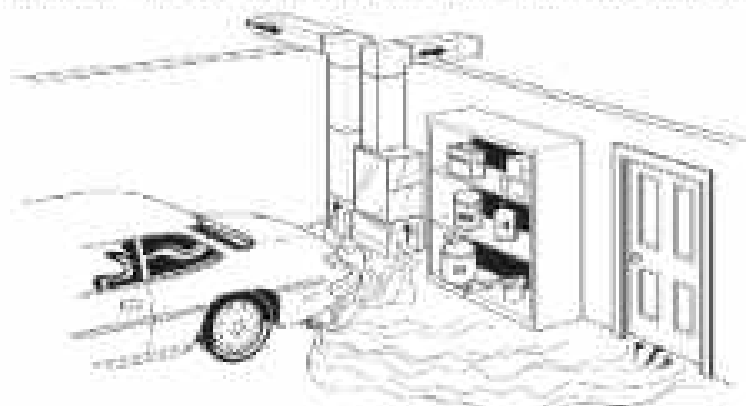
Use of this air-handler during construction is not recommended. If operation during construction is absolutely required, the following temporary installation requirements must be followed:

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 PROCEEDINGS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, 1978, VOL. 10, P. 10.1

⚠ 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).

MARKINGS REFERENCE

	[Symbol ISO 7200-1009 (2004-01)]	Service indicator; read technical manual
	A2L Symbol	Warning: low burning velocity material
	[Symbol ISO 7380-1701 (2004-07)]	Pressure
	[Symbol IEC 60417-6040 (2010-08)]	Ultraviolet radiation, instructional safeguard
	[Symbol ISO 7200-1041 (2004-01)]	Operator's manual; operating instructions
	[UN GHS (Globally Harmonized System of Classification and Labeling of Chemicals)]	Refrigerant Safety Group A2L, warning: flammable materials

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 carries 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.

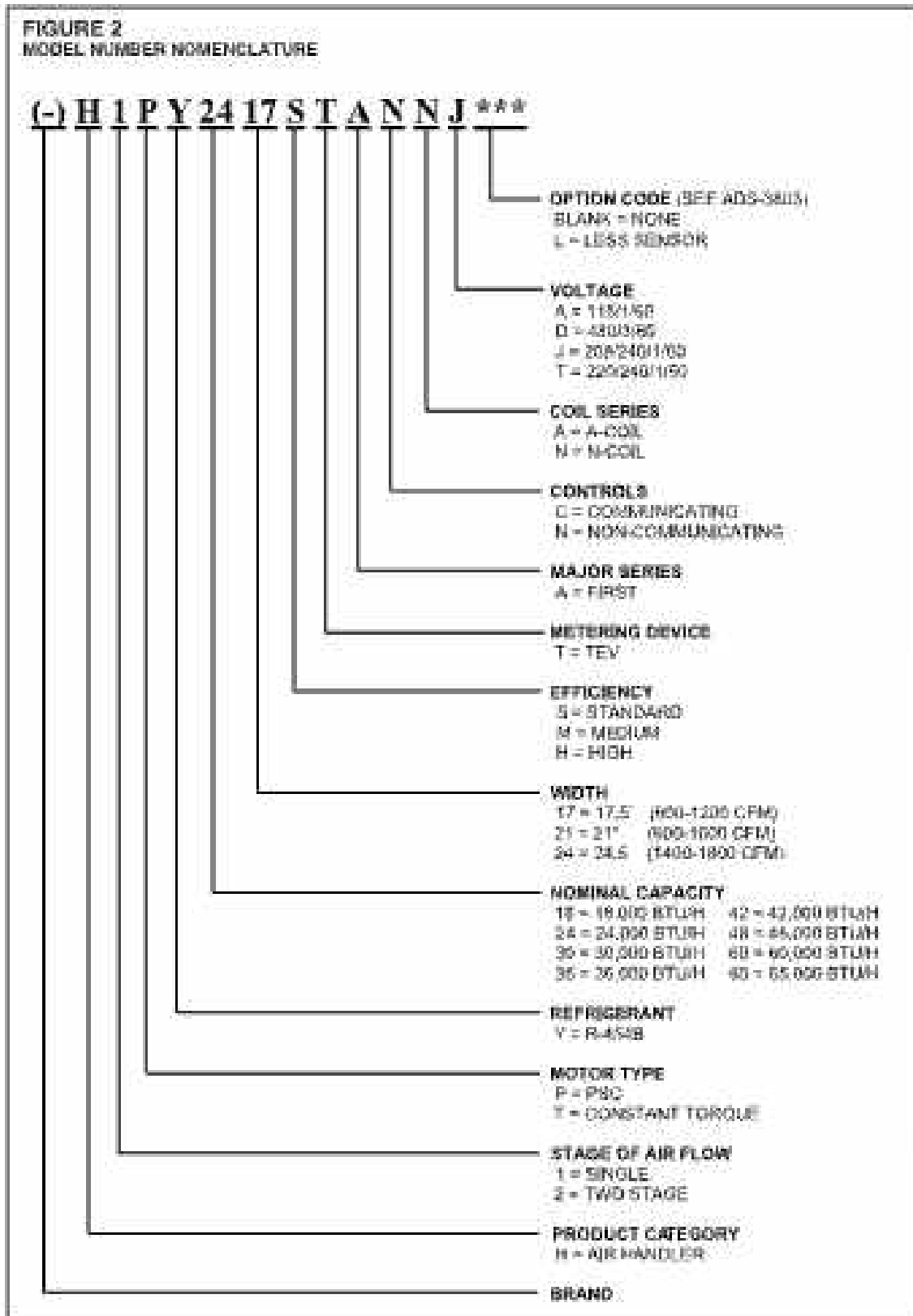
Proper balance and sealing of the duct system improves the efficiency of the heating and air conditioning system and improves the indoor air quality of the home by reducing the amount of airborne pollutants that enter homes from spaces where the ductwork and/or equipment is located. The manufacturer 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



2.4 AVAILABLE MODELS

AVAILABLE 115V MODELS

(-)H1PY1817STANNA	(-)H2TY4821STANNA
(-)H2TY2417STANNA	(-)H1PY4821STANNA
(-)H1PY2417STANNA	(-)H2TY4824STANNA
(-)H1PY3017STANNA	(-)H2TY6021STANNA
(-)H2TY3617STANNA	(-)H2TY3621MTANAA
(-)H1PY3617STANNA	(-)H2TY3621MTANNA
(-)H2TY3621STANNA	(-)H2TY4821STANAA
(-)H1PY3621STANNA	(-)H2TY6021STANAA
(-)H1PY4221STANNA	

AVAILABLE 480V MODELS

(-)H2TY3617STANND	(-)H2TYR024STANND
(-)H1PY3617STANND	(-)H2TY3621MTANAD
(-)H2TY3621STANND	(-)H2TY3621MTANND
(-)H1PY3621STANND	(-)H2TY4821STANAD
(-)H1PY4221STANND	(-)H2TY6021STANAD
(-)H2TY4821STANND	
(-)H1PY4821STANND	
(-)H2TY4824STANND	

AVAILABLE 208/240V MODELS

(-)H1PY1817STANNU	(-)H1PY4824STANNU
(-)H2TY2417STANNU	(-)H2TY6024STANNU
(-)H1PY2417STANNU	(-)H1PY6024STANNU
(-)H1PY3017STANNU	(-)H2TY3621MTANAU
(-)H2TY3617STANNU	(-)H2TY3621MTANNU
(-)H1PY3617STANNU	(-)H2TY4821STANAU
(-)H2TY3621STANNU	(-)H2TY6021STANAU
(-)H1PY3621STANNU	
(-)H1PY4221STANNU	
(-)H2TY4821STANNU	
(-)H1PY4821STANNU	
(-)H2TY4824STANNU	

Notes:

- J Voltage (208/240V) single phase air handler is designed to be used with single or three phase 208/240V power. When connecting 3-phase power to the air handler terminal block, bring only two leads to the terminal block. Cap, insulate and fully secure the third lead.
- The air handlers are shipped from the factory with the proper indoor coil installed, and cannot be ordered without a coil.
- These air handlers do not have an internal filter rack. An external filter rack or other means of filtration of return air is required.
- Electric resistance heaters are field installed items. (See Section 5.1)

2.5 Dimensions & Weight

2.5.1 DIMENSIONS & WEIGHTS: (-)H1P MODELS

FIGURE 3A
DIMENSIONS AND WEIGHTS

ELECTRICAL CONNECTIONS MAY EXIT TOP OR EITHER SIDE

SUPPLY AIR ↑

NOTE: 3" CLEARANCE REQUIRED
IN FRONT OF UNIT FOR FILTER
AND COIL MAINTENANCE.

HIGH VOLTAGE CONNECTION (4" /
1.016" / 1.315" DIA. KNOCK OUTS)

LOW VOLTAGE CONNECTION
(5/8" AND 7/8" KNOCK OUT
OUTSIDE OF CABINET)

FLANGES ARE PROVIDED FOR
FIELD INSTALLATION
(SEE DUCT FLANGES
SECTION 3.5 FOR
INSTRUCTIONS)

Return Air Opening Dimensions

Model Cabinet Size	Return Air Opening Width (Inches)	Return Air Opening Depth/Length (Inches)
17	15 1/2	19 1/2
21	19 1/2	19 1/2
24	22 1/2	19 1/2

AUXILIARY DRAIN CONNECTION
3/4" FEMALE PIPE THREAD (NPT)
HORIZONTAL APPLICATION ONLY

PRIMARY DRAIN CONNECTION
3/4" FEMALE PIPE THREAD (NPT)

AUXILIARY DRAIN CONNECTION
3/4" FEMALE PIPE THREAD (NPT)
UPFLOW/DOWNFLOW APPLICATION
ONLY

LIQUID LINE CONNECTION
COPPER (SWEAT)

VAPOR LINE CONNECTION
COPPER (SWEAT)

UPFLOW UNIT SHOWN.
UNIT MAY BE INSTALLED UPFLOW, DOWNFLOW,
HORIZONTAL RIGHT, OR LEFT AIR SUPPLY.

DIMENSIONAL DATA

MODEL SIZE (-H1P)	REFRIGERANT CONNECTIONS		UNIT HEIGHT IN. [mm]	UNIT WIDTH "W" IN. [mm]	SUPPLY DUCT "A" IN. [mm]	UNIT WEIGHT / SHIPPING WEIGHT (LBS.) [kg]
	SWEAT (IN.) [MM] ID					UNIT WITH COIL (MAX. kW.)
	LIQUID	VAPOR				
1417S/2417S	3/8" [9.53]	1/2" [12.06]	42 1/2" [1080]	17 1/2" [444.5]	18" [458.4]	81/83 [37/43]
2017S/2617S	3/8" [9.53]	1/2" [12.06]	42 1/2" [1080]	17 1/2" [444.5]	18" [458.4]	90/104 [41/47]
2621S	3/8" [9.53]	1/2" [12.06]	42 1/2" [1080]	21" [533.4]	18 1/2" [465.3]	106/124 [48/56]
4221S/4821S	3/4" [19.05]	1/2" [12.06]	50 1/2" [1283]	21" [533.4]	18 1/2" [465.3]	136/145 [62/66]
4824S	3/4" [19.05]	1/2" [12.06]	50 1/2" [1283]	24 1/2" [621.3]	20" [508.2]	143/161 [65/73]
6024S	3/4" [19.05]	1/2" [12.06]	55 1/2" [1410]	24 1/2" [621.3]	22" [561.2]	164/181 [75/82]

2.5.2 DIMENSIONS & WEIGHTS: (-)H2T MODELS

FIGURE 3B
DIMENSIONS AND WEIGHTS

HIGH-VOLTAGE CONNECTION (3/4" (30.2), 1/2" (12.7) DIA. KNOCK OUTS)

ELECTRICAL CONNECTIONS MAY EXIT TOP OR EITHER SIDE

LOW-VOLTAGE CONNECTION (3/8" AND 1/2" KNOCK OUT OUTSIDE OF CABINET)

SUPPLY AIR ↑

NOTE: 34" CLEARANCE REQUIRED IN FRONT OF UNIT FOR FILTER AND COIL MAINTENANCE.

FLANGES ARE PROVIDED FOR FIELD INSTALLATION

(SEE DUCT FLANGES SECTION 3.3 FOR INSTRUCTIONS)

Return Air Opening Dimensions

Model Cabinet Size	Return Air Opening Width (Inches)	Return Air Opening Depth/Length (Inches)
17	15 1/4	19 1/4
23	18 1/4	19 1/4
34	22 1/4	19 1/4

AUXILIARY DRAIN CONNECTION (3/4" FEMALE PIPE THREAD (NPT) HORIZONTAL APPLICATION ONLY)

PRIMARY DRAIN CONNECTION (1/4" FEMALE PIPE THREAD (NPT)

AUXILIARY DRAIN CONNECTION (3/4" FEMALE PIPE THREAD (NPT) UPFLOW/DOWNFLOW APPLICATION ONLY

LIQUID LINE CONNECTION (COPPER (SWEAT))

VAPOR LINE CONNECTION (COPPER (SWEAT))

UPFLOW UNIT SHOWN;

UNIT MAY BE INSTALLED (UPFLOW, DOWNFLOW, HORIZONTAL RIGHT, OR LEFT AIR SUPPLY).

DIMENSIONAL DATA

MODEL SIZE	REFRIGERANT CONNECTIONS		UNIT HEIGHT "H" (mm)	UNIT WIDTH "W" (mm)	SUPPLY DUCT "A" (mm)	UNIT WEIGHT / SHIPPING WEIGHT (LBS.) (kg)
	SWEAT (IN.) (mm) ID					UNIT WITH COIL (MAX. kW)
HH2TV	LIQUID	VAPOR				
20175	3/4" (19.0)	1/2" (12.7)	42 1/2" (1080)	17 1/2" (443)	16" (406)	62/106 (28/48)
20190	3/4" (19.0)	1/2" (12.7)	42 1/2" (1080)	17 1/2" (443)	16" (406)	66/115 (30/50)
30016	3/4" (19.0)	1/2" (12.7)	50 1/4" (1280)	21" (533)	19 1/2" (493)	126/140 (57/64)
30018	3/4" (19.0)	1/2" (12.7)	51" (1295)	21" (533)	19 1/2" (493)	132/140 (60/64)
40015	1" (25.4)	3/4" (19.0)	50 1/2" (1282)	21" (533)	19 1/2" (493)	138/146 (62/66)
40016	1" (25.4)	3/4" (19.0)	51" (1295)	21" (533)	19 1/2" (493)	142/151 (65/68)
40018	1" (25.4)	3/4" (19.0)	51" (1295)	21" (533)	19 1/2" (493)	146/151 (66/68)
50015	1" (25.4)	3/4" (19.0)	54 1/2" (1393)	24 1/2" (620)	22" (559)	159/176 (72/80)
40140	3/4" (19.0)	1/2" (12.7)	45 1/2" (1155)	24 1/2" (620)	22" (559)	170/180 (77/82)

2.6 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.

2.7 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/condensate compartment.

3.0 INSTALLATION

3.1 TOOLS & REFRIGERANT

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

Manifold Sets:

- Up to 600 PSIG High-Side
- Up to 260 PSIG Low-Side
- 550 PSIG Low-Side Return

Manifold Hoses:

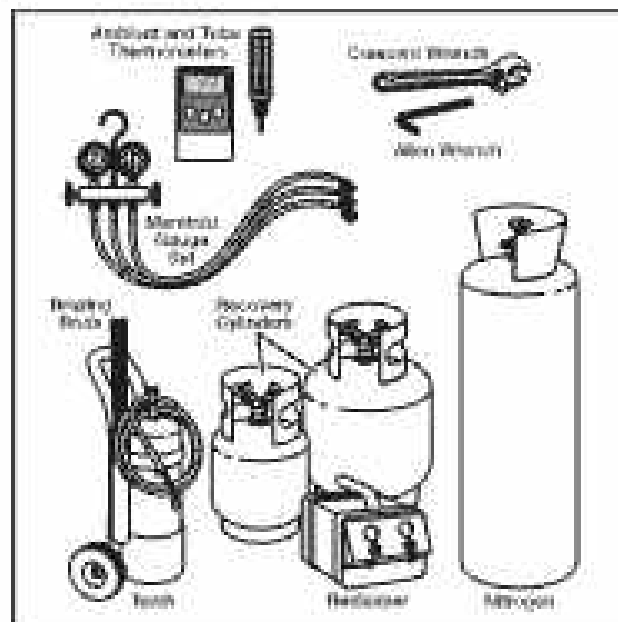
- Service Pressure Rating of 900 PSIG

Recovery Cylinders:

- 100 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 retrofit into R-410A systems.

Physical Properties: R-454B has an atmospheric bubble point of -59.6 °F [-50.8 °C] and an atmospheric dew point of -55.0 °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 relief. Hoses need to have a service pressure rating of 800 psig. Recovery cylinders need to have a 400 psig service pressure rating, DOT 48A400 or DOT 48W400.

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 refrigerant in 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 b-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 364 fitting. R-454B cylinders containing more than 50 lbs of refrigerant require a CGA 670 fitting.

3.2 APPLICATIONS AND ORIENTATION

3.2.1 VERTICAL UPFLOW & HORIZONTAL LEFT DISCHARGE

- Vertical Upflow & Horizontal Left Discharge is the factory configuration for all models (see Figure 4).
- The return air plenum must be large enough to supply unit and strong enough to support unit weight.
- If return air is to be ducted through the floor, 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.

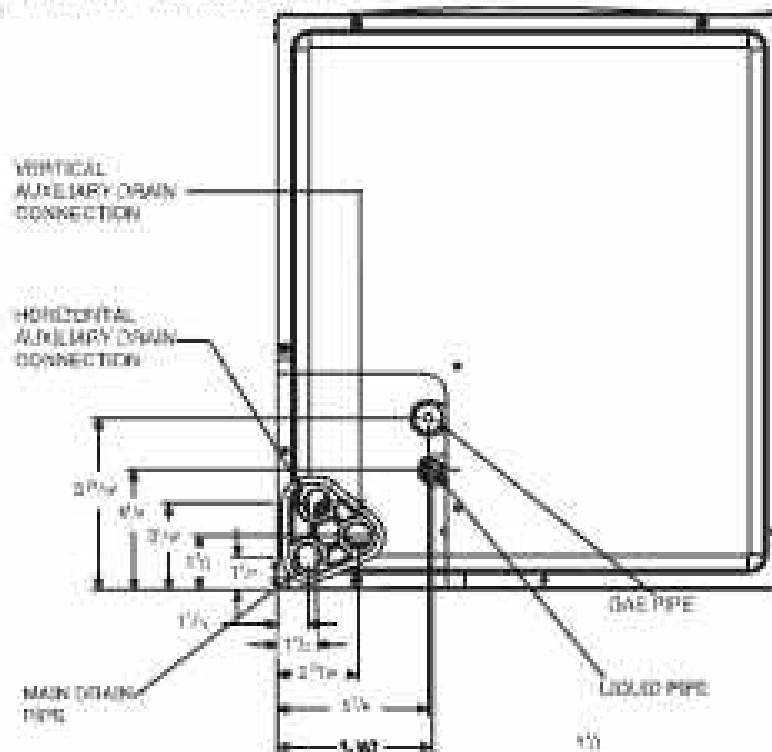
IMPORTANT: Do not cut the side out of air-handler cabinet for a side return duct as this will result in the return air bypassing the coil. Instead, install air-handler on top of a field-supplied sheet metal or wooden box and run the side return duct into the side of the box.

3.2.2 VERTICAL DOWNFLOW & HORIZONTAL RIGHT DISCHARGE

The unit as shipped from the factory is not configured for vertical down or horizontal right discharge applications and must be converted in the field to work in those applications. To make this conversion, remove the coil door and slide the indoor coil out of the cabinet.

When converting the air-handler for vertical down and horizontal right discharge applications, an additional set of 2 coil support rails must be installed before the coil can be reinstalled. These additional rails are supplied with the air-handler and are packaged with the duct flanges. Six screws are also provided for mounting the rails and can be found in the installation hardware bag. Clearance holes must be drilled in the sides of the cabinet for the mounting screws using the provided dimples as guides. Note that the shorter coil support rail with no notch must be mounted on the left-hand side to provide clearance for the drainpan condensate connection boss.

FIGURE 4
DIMENSIONS FOR REFRIGERANT-TUBING & DRAIN CONNECTIONS



The vertical down/horizontal right coil support rails were not installed at the factory so the insulation under them would not be compressed which could result in exterior cabinet sweating in humid environments due to that location being in the cold downstream side of the indoor coil in vertical up and horizontal left discharge applications. The coil support rails installed at the factory should be left in place to help retain the cabinet insulation. They will be located on the warmer return side of the air-handler for down and horizontal right discharge applications and will therefore not pose a risk for cabinet sweating.

Once the additional coils support rails are installed, slide the coil back into the cabinet 180° from its original position, ensuring the retaining channel is fully engaged with the coil rail. (See Figure 6, Detail A.) Leave the coil door off until after the refrigerant tubing is brazed to the refrigerant stubs to allow TXV to be wrapped with a wet rag or heat sink compound during the brazing process. If the air-handler is not already in position, it can now be positioned so the blower discharge is either down or to the right depending on the application.

DRIP LOOP NOTE: When installing the unit in down or horizontal right discharge applications, make sure the wires going to the blower motor form a proper drip loop to force any condensate that might form on the wires to drip off the lowest point of the wiring instead of entering the motor or motor control. This may require cutting the wire-tie and installing a new wire-tie to form a new drip loop.

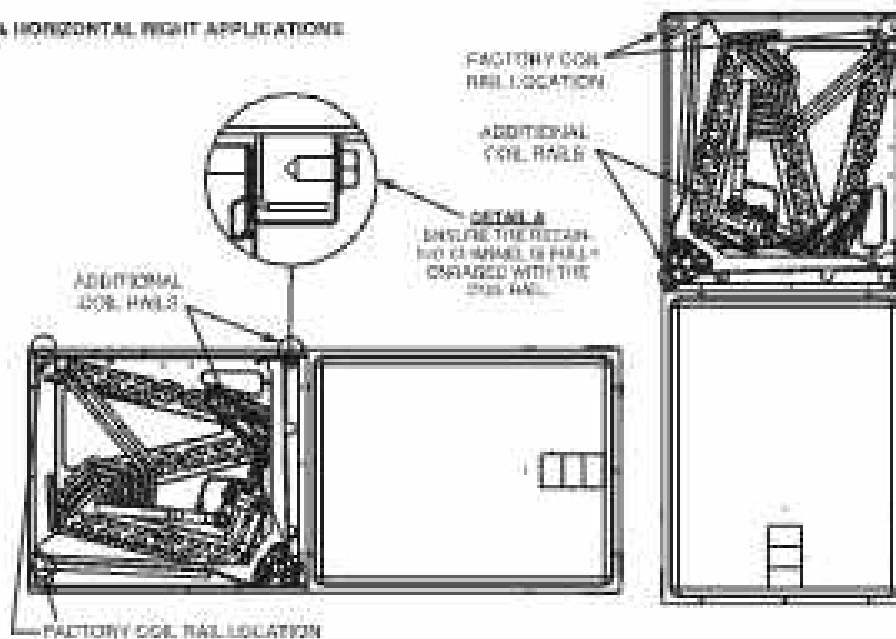
IMPORTANT: To comply with certification agencies and the National Electric Code for down discharge applications, the circuit breaker(s) on field-installed electric heater kits must be re-installed per procedure below so that the breaker switch "on" position and marking is up and the "off" position and marking is down.

1. To turn breaker(s): Rotate one breaker pair (circuit) at a time starting with the one on the right. Loosen both lugs on the least side of the breaker. Wrap wire bundles with wire ties, one bundle going to the right lug and one bundle going to the left lug.
2. Using a screwdriver or pencil, lift white plastic tab with hole away from breaker until breaker releases from mounting opening (see Figure 5).

FIGURE 5
ROTATING CIRCUIT BREAKER



FIGURE 6
VERTICAL DOWNFLOW & HORIZONTAL RIGHT APPLICATIONS



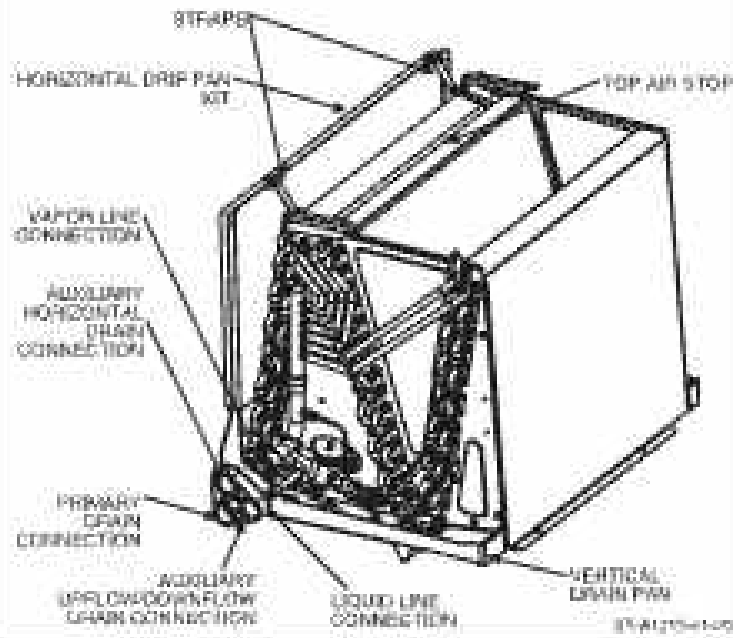
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3. With breaker held in hand, rotate breaker so that "on" position is up and the "off" position is down with unit in the vertical mounting position. Insert right wire bundle into top right breaker lug, ensuring all strands of all wires are inserted fully into lug, and no wire insulation is caught in lug.
4. 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.

IMPORTANT: Failure to securely hold the breaker will result in the plastic mounting base on the breaker to be broken off when the lug is tightened.

1. Replace breaker by inserting breaker mounting tab opposite white pull tab in opening, hook mounting tab over edge in opening.
2. 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.
3. Repeat above operation for remaining breaker(s) (if more than one is provided).

FIGURE 7
INDOOR COIL AND DRAIN PAN DETAILS



▲ CAUTION

Auxiliary horizontal overflow pan kits RXBM- (or equivalent) are required when the unit is configured for the horizontal position over a finished ceiling and/or living space. (See Sections 3.3 and 5.3.) Failure to install overflow pan can result in property damage.

4. If one is used, replace the single point wiring jumper bar on line side of breaker and tighten securely.
5. 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.

IMPORTANT: Units cannot be installed horizontally laying on or suspended from the back of the unit.

▲ WARNING

The RXHB-17, RXHB-21 or RXHB-24 combustible floor base is required when some units with electric heat are applied downflow on combustible flooring. Failure to use the base can cause a fire resulting in property damage, personal injury or death. See **CLEARANCES** (Section 3.4) for units requiring a combustible floor base. See the accessory section in this manual for combustible floor base RXHB.

3.2.3 INSTALLATION IN AN UNCONDITIONED SPACE

The outdoor 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:

- Duct sizing and air-flow are critical and must be based on the equipment selected.
- 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.
- 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.
- 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.
- 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.
- An auxiliary overflow pan is recommended to protect the structure from excessive cabinet sweating or a restricted coil drain line. (See Section 3.2)
- If an electric heater kit is installed, be sure the breaker or disconnect cover is sealed tightly to the door panel.

3.2.4 INSTALLATION IN AN UNVENTILATED AREAS

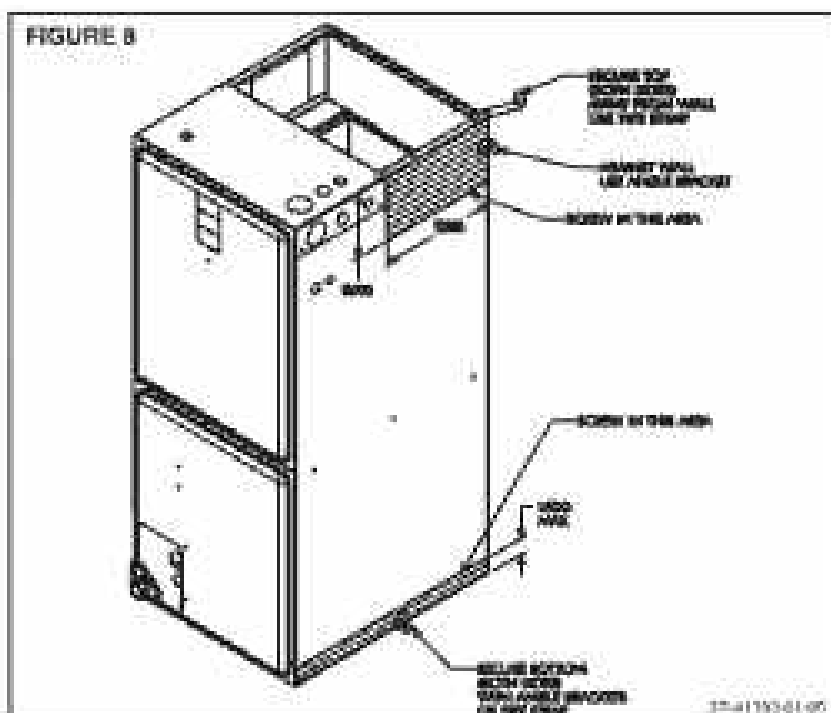
If the installation room areas are not compliant with the outdoor room area values, Appliances shall not be installed in an area where there are potential ignition sources or a continuous open flame unless there is a flame arrest installed on flame-producing appliance. Auxiliary devices which may be 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 3.2.8 Refrigerant Detection System (RDS) Installation Instructions.

3.2.5 INSTALLATION IN MOBILE/MANUFACTURED HOMES

1. Air handler must be secured to the structure using "L" brackets or pipe strap.
2. Allow a minimum of 24 inches (610 mm) front clearance required to access doors.
3. Recommended method for securing air handler:
 - A. If air handler is against the wall, secure top of air handler to wall stud using two 16ga thick angle brackets one on each side. Attach brackets with No. 10 self-tapping 1" long screws to air handler and use 3/4" lag screws 1 1/2" long to wall stud. Secure bottom of unit with two 16ga "L" brackets with No. 10 self-tapping 3/2" long screws to air handler and use 3/4" lag screws 1 1/2" long to floor.
 - B. If air handler is away from wall attach pipe strap to top of air handler using No. 10 1/2" long self-tapping screws on both sides. Angle strap down and away from back of air handler, remove all slack, and fasten to wall stud of structure using 3/4" lag screws 1 1/2" long. Secure bottom of unit with two 16ga "L" brackets with No. 10 self-tapping screws to air handler and use 3/4" lag screws 1 1/2" long to floor.



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 SUPPORTING AIR-HANDLER IN HORIZONTAL APPLICATIONS

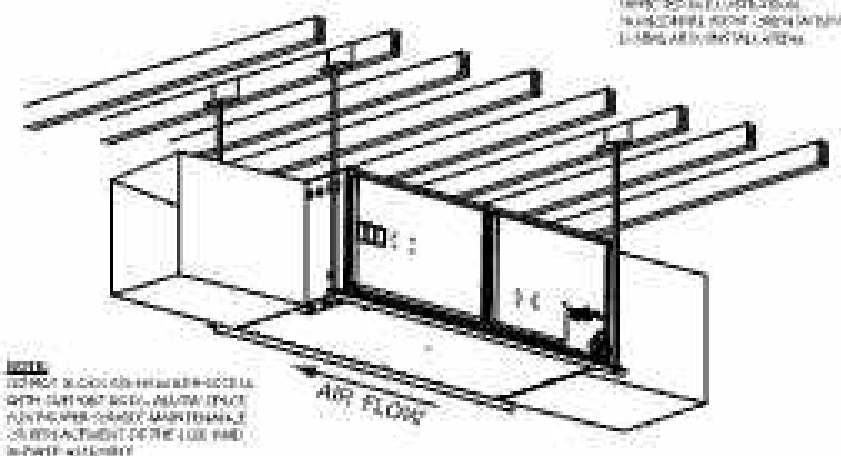
The air-handler must be adequately supported underneath if it is installed in the horizontal position to prevent it from sagging in the middle which can cause issues removing and re-installing the access panels. Position the unit on adequate supports or on support angles or channels (See Figure 9) before connecting ductwork to the unit. If an auxiliary overflow pan is required (See Section 3.3), the overflow pan will need to be adequately supported with the air-handler being supported underneath within the auxiliary overflow pan by angles and/or channels.

3.3 AUXILIARY OVERFLOW PAN

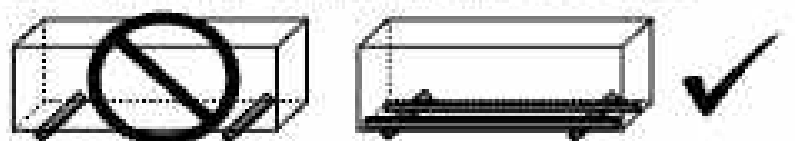
In compliance with recognized codes, an auxiliary overflow pan must installed under all equipment containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping. See Section 6.2 of this manual for information regarding the recommended auxiliary horizontal overflow pan (model RXBM) for this air-handler.

FIGURE 9

SUSPENDED HORIZONTAL AIR-HANDLER.

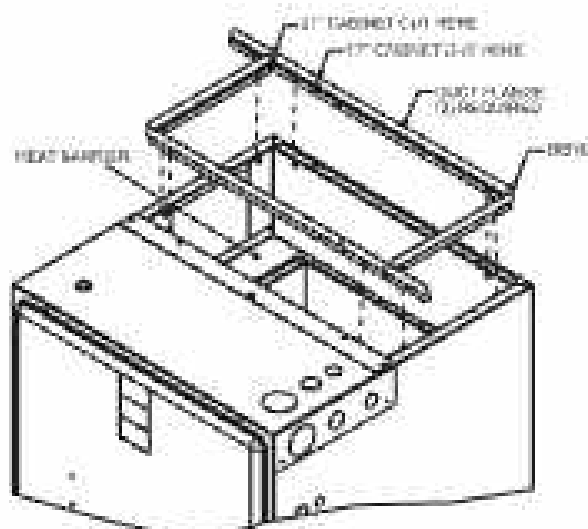


SUPPORTING HORIZONTAL AIR-HANDLERS IN AUXILIARY OVERFLOW PANS OR AIR-HANDLERS THAT ARE NOT SUSPENDED.



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FIGURE 10
DUCT FLANGE INSTALLATION



3.4 CLEARANCES

- All units are designed for "0" inches clearance to combustible material on all cabinet surfaces except for downflow application with higher kW electric heat as noted below.
- Some units require a combustible floor base depending on the heating kW if installed in the downflow configuration on a combustible surface. The following table should be used to determine these requirements.

Model Cabinet Size	17	21	24
Maximum Model Designation kW	15	18	30

- Units with electric heating kW equal to or less than the values listed in the table do not require a combustible floor base. See Section 6.5 for Combustible Floor Base RXMB-XX.
- 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 DUCT FLANGES

Duct flanges (4 pieces) are shipped with the unit and are to be field installed on the top of the air-handler using the following procedure and referring to Figure 10.

- Loosen the screws attaching the heat burner to the cabinet.
- Form a 90° bend with the short leg length at approximately 6.3" from the end where the slot is cut in the flange to facilitate bending. The duct flanges are shipped sized for the 24.5" wide cabinet. For the 17.5" and 21" wide cabinets, cut the long leg as shown in Figure 10 to match the cabinet width.
- Slide the duct flanges onto the screws loosened in step one above. Tighten the screws to secure the flanges.

3.6 DUCTWORK

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

WARNING

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

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, filters, accessories, etc. are accounted for in total resistance. Refer to the air-flow performance tables in this manual to determine the available external static pressure for the particular air-handler model being installed.
- 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 18th 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 duct flanges supplied with the unit. See Section 3.5.
- **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.
- **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.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape or caulk the duct-to-unit joint as required to prevent air leaks.

3.7 RETURN AIR FILTER

An internal filter rack is not provided with this air-handler. Therefore, an external means of filtering the return air is required. 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 plenum 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 system 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 typically 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.

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.

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.

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

3.8 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 6 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.

3.8.1 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 that does not block service access to the front of the air-handler.

3.8.2 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 screens.

3.8.3 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.

After the refrigerant brazed connections are made at the air-handler and the tubing has cooled down sufficiently, replace the coil section access panel if it has been removed and seal the air gap around the connection stubs with the foam rubber gasket included in the air-handler parts bag. Peel the self-adhesive backing off of the foam gasket and position it around the stubs with the adhesive side toward the cabinet, then press it firmly against the cabinet. The gasket is split to allow it to go over the stubs after the refrigerant tubes are brazed to the stubs. (See Figure 12 in Section 3.10)

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 12" from the end can be used to hold it in place so it doesn't move away from the cabinet. For air-handlers with TXV's, a section of the insulation will need to be cut out to make room for the externally mounted TXV bulb. (See Section 3.10) Once the bulb is mounted, insulate the bulb with the foam insulation included in the air-handler parts bag, making sure none of the vapor line is uninsulated.

3.8.4 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 60 minutes (longer if possible) to assure the pressure does not drop.

3.8.5 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.

3.8.6 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.

3.8.7 REFRIGERANT DETECTION SYSTEM (RDS)

The RDS is used to mitigate any leaked refrigerant that may occur in the indoor portion of the system.

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.

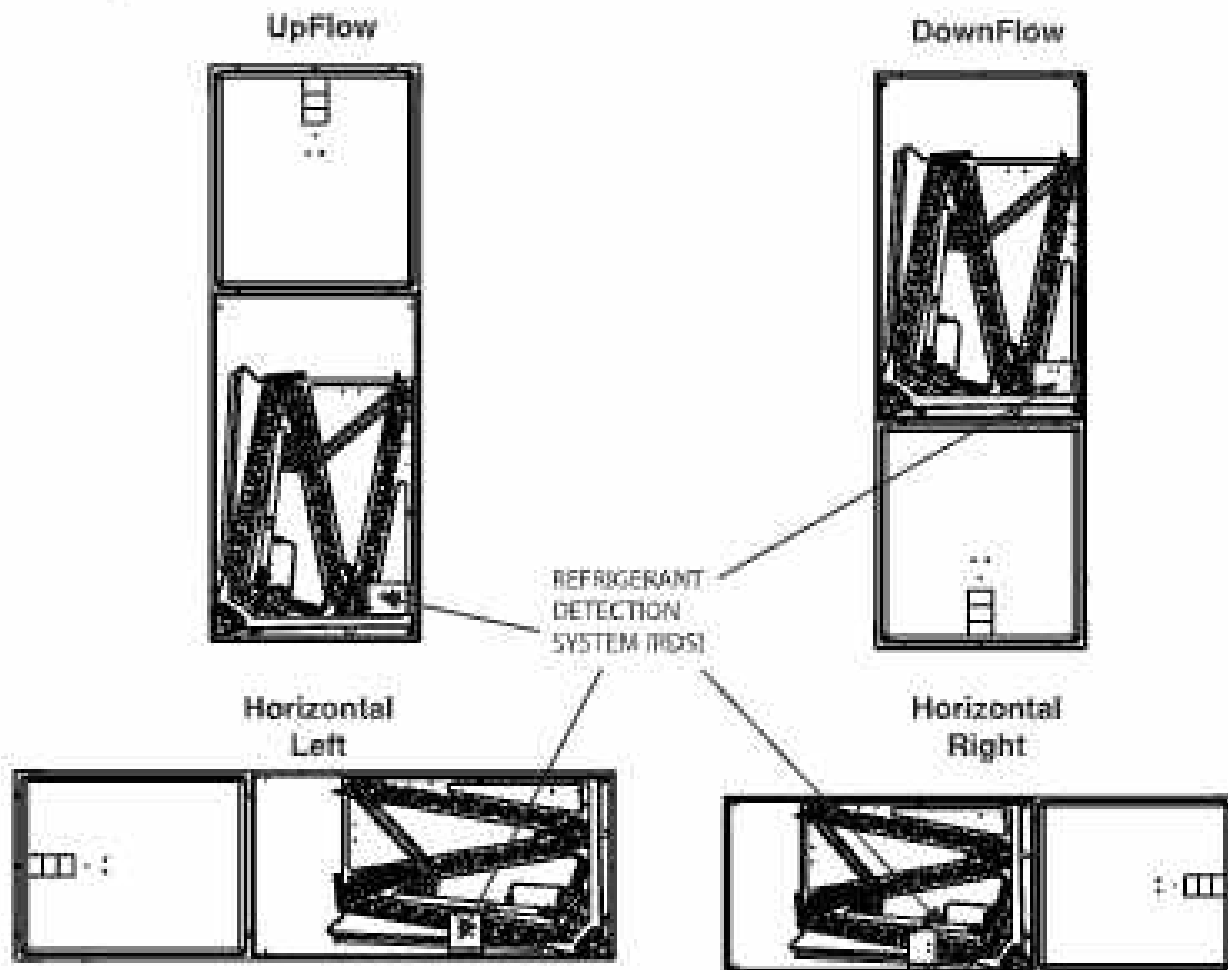
Life expectancy of the RDS is 15 years and should be replaced at the end of life.

Contact Rheem Parts Department for RDS replacement.

3.8.8 REFRIGERANT DETECTION SYSTEM (RDS) INSTALLATION INSTRUCTIONS

Important Note: The installation process for the RDS varies depending on the flow configuration of the unit. It is crucial to adhere to the following instructions. The RDS is initially configured for upflow installation during manufacturing and can be adjusted for downflow, horizontal right flow, and horizontal left flow configurations.

The RDS must be installed at the location respective to the flow configuration that the unit is installed. Installation locations are defined for each flow configuration in the below illustration.



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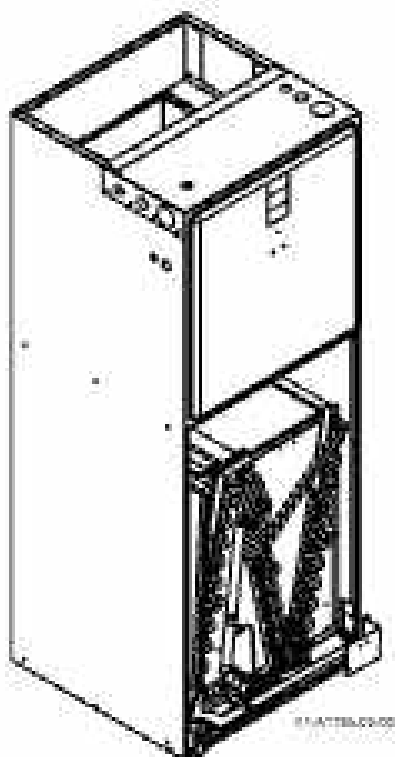
PART LIST:

Item Description	Part Number	Quantity
Primary Bracket	AE-108587-01	1
Flange	AE-108586-01	2
Screw	63-22153-05	5
Cup Point Screw	63-24368-01	5
Standoff (14" and 17" upflow only)	AE-110038-01	1

See outdoor installation manual Section 5 for conditioned room area calculations and indoor airflow verifications for units without refrigerant leak detection sensors.

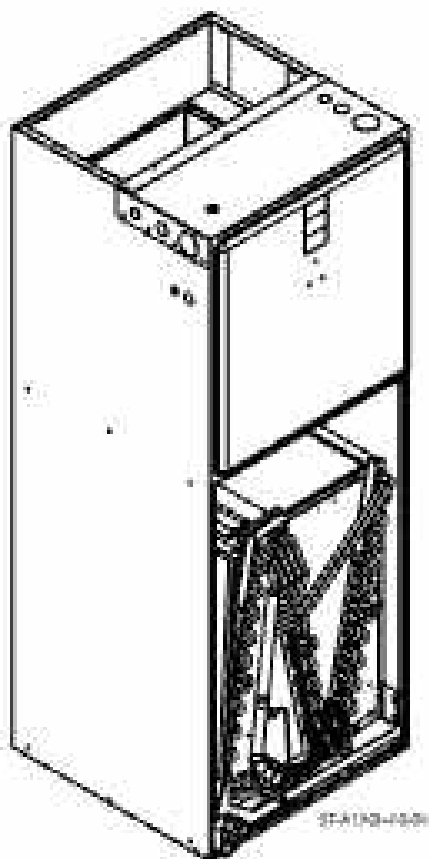
Step 1: Primary Bracket Removal

Unscrew and remove the primary bracket from the flange. This screw (Part Number: 63-22153-05) will be used in Step 3. Ensure the RDS wiring harness is not under tension throughout this process.

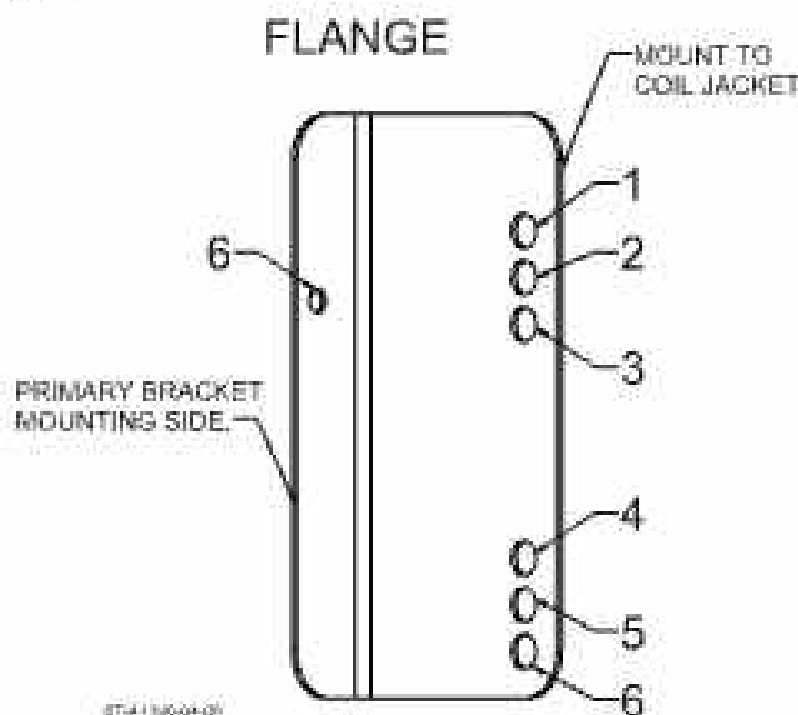


Step 2: Flange Removal and Relocation

A. Remove the two screws holding the flange in place to the cabinet.



B. Position the flange according to the unit's flow configuration. Fasten the flange to the cabinet using the two screws removed in the previous step. Refer to the below illustrations for the correct hole placement. Note: An additional flange is installed in manufacturing for the horizontal left flow configuration.

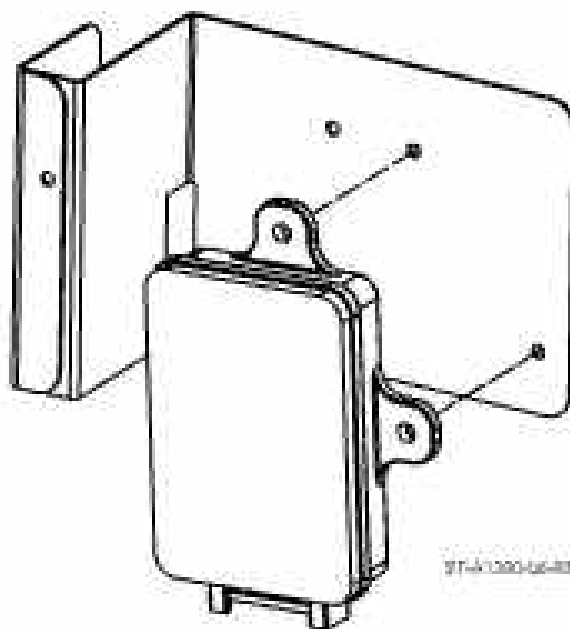


- For vertical flow configurations, secure the flange using holes 1 and 6 for all unit models.
- For horizontal flow configurations, always use hole 1 and either hole 4 or 5, depending on the air-handler cabinet.

Step 3: RDS Orientation and Relocation

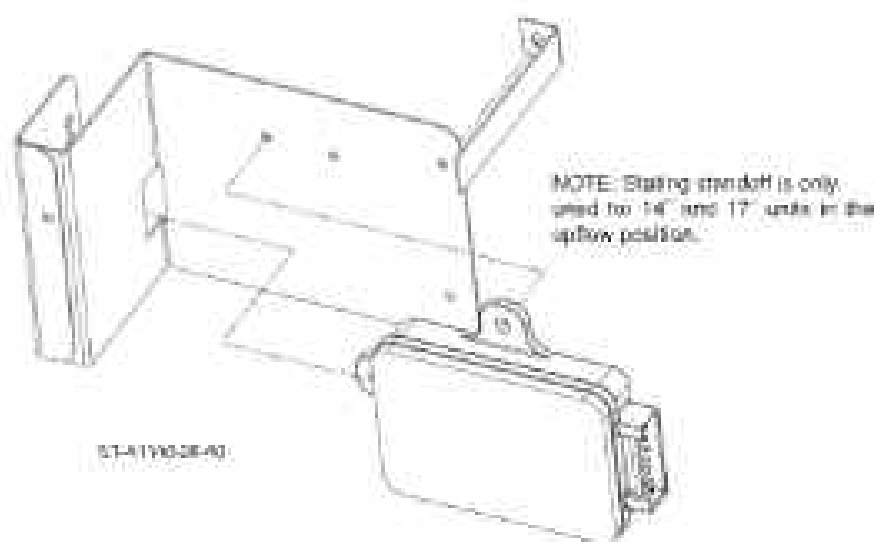
A. Horizontal Flow Configurations

- Remove the RDS from the upflow or downflow mounting orientation on the primary bracket by removing the single snub-nosed screw and sliding the RDS out of the slot.
- Secure the RDS to the primary bracket using the snub-nose screw provided in the parts bag and the screw removed in the previous step, following the hole positions shown in the illustration.
- Fasten the primary bracket to the flange using the screw removed in Step 1, as shown in the below illustration. Ensure the wiring harness has a drip loop toward the horizontal flow drain pan.



B. Vertical Flow Configurations

- L Mount the RDS to the primary bracket with one tab fixed in the slot and the other at the hole as shown in the below illustration. Use the provided nub-nose screw.



- ii. Fasten the primary bracket to the flange as described in Step 3, A.ii. Ensure the wiring harness has a drip loop toward the vertical flow drain pan.

RDS DETERMINATION TABLE

Total System Charge (oz)	Minimum Indoor Airflow (CFM)	Without Refrigerant Leak Detection Sensor Area of Smallest Conditioned Room Or Space Where Indoor Unit is Installed (sqft)			With Refrigerant Leak Detection Sensor Minimum Required Total Conditioned Room Area = Sum of all conditioned spaces/rooms (sqft)
		Discharge From Ceiling or Return Edge of Ceiling with Air to Outside from Ceiling and Return Edge or Return Unit			
		32 FT	4 FT	14 FT	
50	166	336	112	75	94
100	332	781	255	150	147
150	498	1264	398	225	221
200	664	1726	531	300	275
250	831	2154	664	375	403
300	998	2602	797	450	502
350	1164	3074	934	525	598
400	1331	3542	1070	600	700
450	1497	4035	1207	675	743
500	1664	4554	1370	750	807
550	1829	Not specified - system required			1031
600	1997				1129

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.

3.9 TXV SENSING BULB ATTACHMENT

IMPORTANT: DO NOT perform any brazing with the TXV bulb attached to the vapor line. After brazing operations have been completed and the tubing has cooled to the touch, clamp the TXV bulb securely on the vapor line at the 10 to 2 o'clock position (see Figures 11 and 12) with the strap provided in the parts bag. Insulate the TXV sensing bulb and suction line with the provided pressure sensitive insulation (size 6" x 7") and secure with provided wire ties.

FIGURE 11
BULB LOCATION

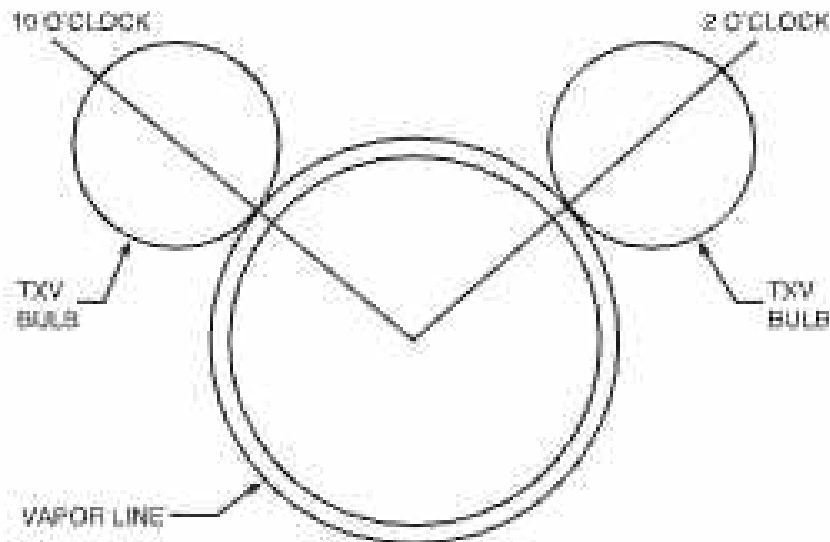
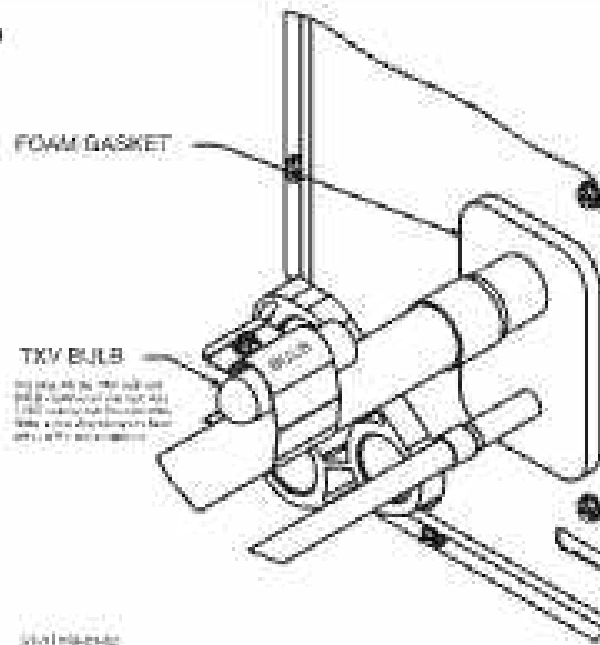


FIGURE 12
TXV BULB & FOAM GASKET LOCATION



IMPORTANT: TXV sensing bulb should be located on a horizontal section of suction line, just outside of coil box. The copper sensing bulb must never be placed on any aluminum tube as this will result in galvanic corrosion and eventual failure of the aluminum tube.

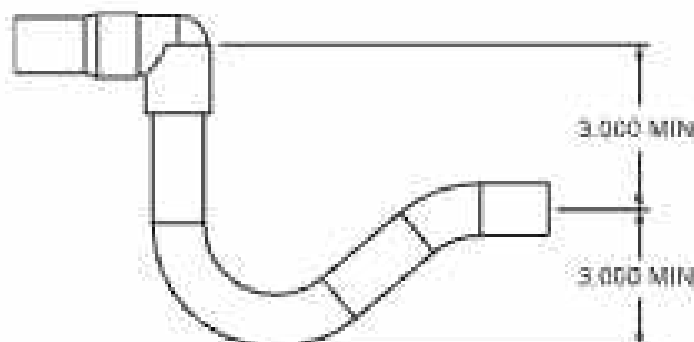
3.10 CONDENSATE DRAIN

Consult local codes or ordinances for specific requirements.

IMPORTANT: When making drain fitting connections to the 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 overtighten. Overtightening fittings can split pipe connections on the drain pan.

FIGURE 13
CONDENSATE DRAIN TRAP



51-A1244-01-00

- Install drain lines so they do not block service access to front of the unit. Minimum clearance of 24 inches is required for filter, coil or blower removal and service access.
- Although the condensate drain pan is designed to be self draining, it is recommended that the air-handler cabinet be pitched slightly downward toward the primary drain connection to assure the condensate drains completely from the drain pan. The downward pitch should be approximately 1/8" per foot and in both axes.
- 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" 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 3 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 (See Figure 13).
- The auxiliary drain line should be run to a place where it will be noticeable if it becomes operational. The building occupants should be warned that a problem exists if water should begin running from the auxiliary drain line. An auxiliary drain shut-off switch can be installed in lieu of an auxiliary drain line. The shut-off switch should be wired into the control circuit so the outdoor unit shuts down should the switch detect water.
- Plug the unused drain connection with the plugs provided in the parts bag, using a thin layer of teflon paste, silicone or teflon tape to form a water tight seal.
- Test the condensate drain pan and drain line after installation is complete. Pour 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 open end of the primary drain line.

3.11 THERMOSTAT

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

- On units with one electric heat sequencer (TD) (see wiring diagram for electric heater), heat anticipator setting should be .16.
- On units with two electric heat sequencers (TD+ & TD-) (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 (TD+ & TD-) 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.

3.12 ELECTRICAL WIRING

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

3.12.1 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.

The indoor blower motor in 208/240V versions of the (-)H1P air-handlers must also be configured for 208 volt applications to assure full air-flow delivery at the reduced voltage. This step is not required on (-)H2T or (-)H2T air-handlers since they have constant torque ECM motors. To configure the PSC motor in (-)H1P air-handlers for 208 volt applications, unplug the PURPLE motor lead connected to the insulated terminal on the end of the ORANGE wire coming from the transformer. Pull the cap out of the insulated terminal on end of the YELLOW motor lead and plug the cap into the terminal on the end of the PURPLE motor lead to eliminate the possibility of an electrical short. Plug the YELLOW motor lead into the terminal on the end of the ORANGE wire from the transformer. Secure the indoor blower motor wiring with zip ties to assure they can't come in contact with the blower wheel. Replace the control box cover and blower access panel.

3.12.2 GROUNDING

- This product must be sufficiently grounded in accordance with National Electrical Code (N.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.

3.12.3 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 disconnected or adequate size, location within sight of, and readily accessible to the unit.

IMPORTANT: Units with electric heater kits installed may be equipped with one, two, or three 30000 amp circuit breakers. These breakers protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do 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 in Sections 3.12.5 and 3.12.6 for ampacity, wire size and circuit protection requirements. Supply circuit protective devices may be either fuses or "MCCB" type circuit breakers.
- Field power wiring may be connected to either the right, left side or top. Three 1/4", 1/2", 1/2" dia. concentric knockouts are provided for connection of power wiring to unit.
- Field power wiring is to be connected to the power terminal block in unit control compartment.
- For units equipped with an electric heater kit, field power wiring is to be connected to the heater kit breaker, terminal block, or pullout disconnected terminals and the power wiring pigtail from the heater kit is to be connected to the unit power terminal block in the unit control compartment. Refer to installation instructions provided with the heater kit for additional details.

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

Circuit Breaker Rating	Circuit Breaker Type	Circuit Breaker Size (Amps)	Supply Circuit Ampacity																
			12	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150
200 (80)			12	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150
150 (60)			12	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150
100 (30)			12	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150
75 (15)			12	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150

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

3.12.5.1 ELECTRICAL DATA – BLOWER MOTOR ONLY – WITHOUT ELECTRIC HEAT: (-)H1PY

MODEL H1PY	VOLTAGE	PHASE*	HERTZ	HP	RPM	SPEED	CIRCUIT AMP.	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTOR
18175	115	1	60	1/8	1725	2	2.2	5.0	15
24175				1/8	1725	2	3.9	5.0	15
36175				1/4	1725	4	4.7	6.0	15
48175				1/2	1725	2	6.7	6.0	15
60175				1/2	1725	2	7.9	6.0	15
72175	208/240	1 P 3	60	3/4	1725	2	4.3	11.0	15
18175				1/8	1725	2	1.2	3.0	15
24175				1/8	1725	2	1.7	3.0	15
36175				1/4	1725	4	2.3	1.2	15
48175/48175-51				1/2	1725	2	3.2	4.0	15
60175	208/240	1 P 3	60	1/2	1725	2	3.2	4.0	15
72175				1/2	1725	2	3.2	4.0	15
84175				3/4	1725	2	3.2	4.0	15
96175				1	1725	2	3.2	4.0	15
108175				1 1/4	1725	2	3.2	4.0	15

*Blower motors are all single phase motors.

3.12.5.2 ELECTRICAL DATA – BLOWER MOTOR ONLY – WITHOUT ELECTRIC HEAT: (-)H2T

MODEL (-)H2T	VOLTAGE	PHASE*	HERTZ	HP (B)	RPM	SPEED	MOTOR AMP.	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION
24175	115	1	60	1/8 (40)	1725-1700	4	2.2	5	15
36175/36175-51				1/8 (17.5)	1725-1700	4	3.9	5	15
48175/48175-51				1/4 (33.8)	1725-1700	4	4.3	6	15
60175/60175-51				1/2 (33.8)	1725-1700	4	4.3	7	15
72175				1/2 (34.2)	1725-1700	4	4.3	7	15
84175/84175-51	208/240	1 P 3	60	1/2 (37.5)	1725-1700	4	3.9	4	15
96175				3/4 (33.8)	1725-1700	4	3.2	4	15
108175				1 (33.8)	1725-1700	4	3.9	7	15
120175				1 1/4 (33.8)	1725-1700	4	4.7	6	15
144175/144175-51				1 1/2 (37.5)	1725-1700	4	3.2	7	15
168175	208	1	60	1 1/2 (40)	1725-1700	4	3.2	7	15
192175				1 3/4 (33.8)	1725-1700	4	3.9	7	15
216175				2 (33.8)	1725-1700	4	3.9	7	15
240175				2 1/4 (33.8)	1725-1700	4	3.2	7	15
264175				2 1/2 (33.8)	1725-1700	4	3.9	7	15

3.12.6.1 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H1PY

Installation of the UL Listed original equipment manufacturer provided heater kits listed in the following table is recommended for all auxiliary heating requirements.

AIR HANDLER MODEL (-)H1PY	HEATER MODEL NO.	HEATER KW (240/240V)	FH HZ	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT - SINGLE CIRCUIT - MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT CAPACITY	Maximum Overcurrent Protection
18175 24175 (208/240V)	RXBH-1724103AB	2.25/3.0	199	1-3.0	SINGLE	10.8/12.5	1.7	5818	20/25
	RXBH-1724103AB	2.25/3.0	199	1-3.0	SINGLE	10.8/12.5	1.7	5818	20/25
	RXBH-1724105AB	3.0/4.5	199	1-4.5	SINGLE	17.3/26.0	1.7	3428	25/30
	RXBH-1724107AB	5.4/7.2	199	2-5.6	SINGLE	26.0/30.0	1.7	3590	35/40
	RXBH-1724110AB	7.2/9.0	199	2-4.5	SINGLE	34.6/40.0	1.7	4899	50/55
	RXBH-1724A13AB	9.0/12.0	199	3-4.17	SINGLE	45.1/55.1	1.7	5949	60/70
	RXBH-1724A13AB	5.1/4.3	199	1-4.17	MULTIPLE CRT 1	15.0/17.4	1.7	2104	25/25
		6.1/5.3	199	2-4.17	MULTIPLE CRT 2	30.1/34.7	0	3544	40/45
	RXBH-1724A57C-B	5.4/7.2	249	2-5.4	SINGLE	15.0/17.3	1.7	2104	25/25
	RXBH-1724A16C-B	7.2/9.0	249	3-5.2	SINGLE	29.0/21.1	1.7	2831	30/35
	RXBH-1724A13C-B	9.0/12.0	249	3-4.17	SINGLE	38.1/36.1	1.7	3540	35/45
20175/20175 (208/240V)	RXBH-17103AB	2.25/3.0	199	1-3.0	SINGLE	10.8/12.5	2.5	5718	20/25
20075 20175/20215 (208/240V)	RXBH-1724103AB	2.25/3.0	199	1-3.0	SINGLE	10.8/12.5	2.5	5718	20/25
	RXBH-1724105AB	3.0/4.5	199	1-4.5	SINGLE	17.3/26.0	2.5	2909	25/30
	RXBH-1724107AB	5.4/7.2	199	2-5.6	SINGLE	26.0/30.0	2.5	3491	40/45
	RXBH-1724110AB	7.2/9.0	199	2-4.5	SINGLE	34.6/40.0	2.5	4704	50/55
	RXBH-1724A13AB	9.0/12.0	199	3-4.17	SINGLE	45.1/55.1	2.5	6109	60/70
	RXBH-1724A13AB	5.1/4.3	199	1-4.17	MULTIPLE CRT 1	15.0/17.4	2.5	2205	25/25
		6.1/5.3	199	2-4.17	MULTIPLE CRT 2	30.1/34.7	0	3544	40/45
	RXBH-1724A16AB	11.0/14.0	199	2-4.0	SINGLE	51.0/55.0	2.5	6876	70/90
	RXBH-1724A19AB	3.0/4.5	199	1-4.5	MULTIPLE CRT 1	17.3/26.0	2.5	2529	25/30
		7.2/9.0	199	2-4.5	MULTIPLE CRT 2	34.6/40.0	0	4490	45/55
	RXBH-1724A18AB	12.0/17.0	199	2-5.55	SINGLE	60.6/75.4	2.5	8165	90/100
	RXBH-1724A18AB	4.3/5.7	199	1-5.55	MULTIPLE CRT 1	20.5/23.4	2.5	2905	20/25
		6.0/7.0	199	2-5.55	MULTIPLE CRT 2	41.1/47.2	0	6085	60/90
	RXBH-1724A57C-B	5.4/7.2	249	2-5.4	SINGLE	15.0/17.3	2.5	2305	25/25
	RXBH-1724A16C-B	7.2/9.0	249	3-5.2	SINGLE	29.0/21.1	2.5	2902	30/35
	RXBH-1724A17C-B	9.0/12.0	249	3-4.17	SINGLE	29.1/36.1	2.5	3541	40/45
	RXBH-1724A19C-B	10.0/14.0	249	3-4.8	SINGLE	39.0/34.8	2.5	4147	45/55
	RXBH-1724A16C-B	12.0/17.0	249	3-5.55	SINGLE	35.8/41.0	2.5	4495	50/55

† Heater Kit Connection Type: A=Breaker B=Terminal Block C=Field Disconnect

3.12.6.1 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H1PY - continued

AIR HANDLER MODEL (-H1PY)	HEATER MODEL NO.	HEATER KW (240/240V)	PHASE	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT SINGLE CIRCUIT MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT CAPACITY	MAXIMUM OVERCURRENT PROTECTION
41118 44218 44249 (208/240V)	R08H-17A701J-B	5.5/6.2	1-Ø	1-4.8	SINGLE	17.3/20.0	5.2	2500	3000
	R08H-17A701J-B	5.4/6.2	1-Ø	3-7.8	SINGLE	24.6/20.0	5.2	1544	4045
	R08H-17A710J-B	7.2/8.8	1-Ø	3-4.8	SINGLE	24.6/20.0	5.2	1607	4000
	R08H-1724A15J-B	12.0/14.4	1-Ø	1-4.8	SINGLE	31.5/20.0	5.2	1200	3000
	R08H-1724A15J-B	3.8/5.8	1-Ø	1-4.8	MULTIPLE Ckt 1	17.3/20.0	5.2	2500	3000
		7.2/8.8	1-Ø	3-4.8	MULTIPLE Ckt 2	24.6/20.0	5.0	1400	4000
	R08H-1724A18J-B	13.0/17	1-Ø	3-5.84	SINGLE	41.8/20.0	5.2	1400	5000
	R08H-1724A18J-B	6.0/8.7	1-Ø	1-5.88	MULTIPLE Ckt 1	20.0/20.0	5.2	1200	3540
		8.2/11.3	1-Ø	1-5.84	MULTIPLE Ckt 2	41.8/20.0	5.0	1000	5400
	R08H-24A20J-B	14.4/18.2	1-Ø	4-4.8	SINGLE	33.2/20.0	5.2	2000	1000
	R08H-24A20J-B	7.2/8.8	1-Ø	3-4.8	MULTIPLE Ckt 1	24.6/20.0	5.2	1607	5000
		7.2/8.8	1-Ø	3-4.8	MULTIPLE Ckt 2	24.6/20.0	5.0	1400	4000
	R08H-24A25J-B	18.0/25.0	1-Ø	6-4.0	SINGLE	56.4/24.8	6.2	1900	12000
	R08H-24A25J-B (4-120 only)	8.0/9.8	1-Ø	3-4.0	MULTIPLE Ckt 1	28.8/23.3	5.2	4000	4000
		9.0/9.8	1-Ø	4-4.0	MULTIPLE Ckt 2	36.0/23.3	5.0	3600	4000
		9.0/9.8	1-Ø	3-4.0	MULTIPLE Ckt 3	28.8/23.3	5.0	3600	4000
	R08H-1724A30J-B	5.4/7.2	3-Ø	3-2.4	SINGLE	16.0/17.3	5.2	2400	3400
	R08H-1724A100-B	7.2/8.8	3-Ø	3-3.2	SINGLE	20.0/23.1	5.2	3000	3040
	R08H-1724A150-B	10.4/14.4	3-Ø	3-4.8	SINGLE	30.0/34.5	5.2	4400	4600
	R08H-1724A180-B	12.0/11.0	3-Ø	3-5.88	SINGLE	36.0/41.0	5.2	3000	5000
	R08H-24A200-B	14.4/18.2	3-Ø	4-3.2	SINGLE	40.0/40.2	5.2	5000	5000
	R08H-24A200-B	7.2/9.8	3-Ø	4-3.2	MULTIPLE Ckt 1	20.0/23.1	5.2	1200	3540
		7.2/9.8	3-Ø	3-3.2	MULTIPLE Ckt 2	20.0/23.1	5.0	2500	2500
	R08H-24A250-B	18.0/26.0	3-Ø	6-4.0	SINGLE	50.0/47.8	6.2	1800	7000
	R08H-24A250-B (4-120 only)	9.0/12.0	3-Ø	3-4.0	MULTIPLE Ckt 1	36.0/36.0	5.2	3600	4000
		9.0/12.0	3-Ø	3-4.0	MULTIPLE Ckt 2	36.0/34.4	5.0	3200	4000

† Heater/Kilowatt Connection Type: A = Breaker B = Terminal Block C = Pullout Disconnect

3.12.6.1 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H1PY - continued

AIR HANDLER MODEL (-)H1PY	HEATER MODEL NO.	HEATER R/W (208/240V)	PH/Hz	NO. ELEMENTS (-)KW PER	TYPE SUPPLY CIRCUIT SINGLE CIRCUIT MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION
800S (208/240V)	R08H172AT1PUB	3.250	1/60	1-4/8	SINGLE	17.6200	5.2	25.00	75-95
	R08H172BT1PUB	5.475	1/60	2-4/8	SINGLE	25.3700	5.2	35.00	95-115
	R08H172AT1PUB	7.290	1/60	3-4/8	SINGLE	34.4300	5.2	50.00	135-155
	R08H172BT1PUB	10.915	1/60	5-4/8	SINGLE	51.9400	5.2	75.00	185-205
	R08H172AT1PUB	5.475	1/60	1-4/8	MULTIPLE CRT 1	17.2900	5.2	25.00	75-95
		7.290	1/60	2-4/8	MULTIPLE CRT 2	24.4400	5	35.00	115-135
	R08H172BT1PUB	12.875	1/60	4-4/8	SINGLE	51.4700	5.2	65.00	185-205
	R08H172AT1PUB	4.327	1/60	1-4/8	MULTIPLE CRT 1	24.1200	5.2	35.00	115-135
		6.0113	1/60	2-4/8	MULTIPLE CRT 2	41.147.2	5	50.00	135-155
	R08H202CTUB	15.5700	1/60	4-1/2	SINGLE	68.3500	3.2	85.00V	195-215
	R08H202CTUB	7.008	1/60	2-4/8	MULTIPLE CRT 1	44.8700	5.2	75.00	175-195
		7.008	1/60	2-4/8	MULTIPLE CRT 2	44.8700	5	45.00	45-65
	R08H202CTUB	19.074.0	1/60	6-4.0	SINGLE	86.4700	5.2	115.00	225-250
	R08H202CTUB	6.000	1/60	2-4/8	MULTIPLE CRT 1	44.8700	5.2	45.00	45-65
		6.000	1/60	2-4/8	MULTIPLE CRT 2	24.4300	5	35.00	115-135
		6.000	1/60	2-4/8	MULTIPLE CRT 3	17.2900	5	25.00	75-95
	R08H202CTUB	21.475.0	1/60	6-4/8	SINGLE	100.4700	4.2	125.00V	195-215
	R08H202CTUB	7.008	1/60	2-4/8	MULTIPLE CRT 1	44.8700	5.2	75.00	175-195
		7.008	1/60	2-4/8	MULTIPLE CRT 2	44.8700	5	45.00	45-65
		7.008	1/60	2-4/8	MULTIPLE CRT 3	24.4300	5	35.00	115-135
1000S (208/240V)	R08H175AT1PUB	7.2	1/60	1-4/8	SINGLE	4.2	1.2	15	15
	R08H175BT1PUB	14.4	1/60	2-4/8	SINGLE	8.2	1.2	30	30
	R08H175BT1PUB	14.4	1/60	3-4/8	SINGLE	17.2	1.2	35	35
	R08H175BT1PUB	17	1/60	4-4/8	SINGLE	20.4	1.2	40	40
1250S (208/240V)	R08H204CTUB	7.7	1/60	1-2.4	SINGLE	6.2	1.8	18	18
	R08H204CTUB	9.3	1/60	2-2.2	SINGLE	7.8	1.8	17	20
	R08H204CTUB	14.4	1/60	3-4/8	SINGLE	17.2	1.8	24	25
	R08H204CTUB	17	1/60	4-4/8	SINGLE	20.4	1.8	25	30
	R08H204CTUB	18.2	1/60	4-0.2	SINGLE	22.2	1.8	30	35
1600S (208/240V)	R08H204CTUB	7.7	1/60	1-2.4	SINGLE	6.2	2.2	18	18
	R08H204CTUB	9.3	1/60	2-2.2	SINGLE	7.8	2.2	18	20
	R08H204CTUB	14.4	1/60	3-4/8	SINGLE	17.2	2.2	25	25
	R08H204CTUB	17	1/60	4-2.4	SINGLE	20.4	2.2	25	30
	R08H204CTUB	18.2	1/60	4-0.2	SINGLE	22.2	2.2	30	35
	R08H204CTUB	24	1/60	6-4.0	SINGLE	29.3	2.2	30	40

† Heater Kit Connection Type: A=Breaker B=Terminal Block C=Pullout Disconnect

n/D Voltage = 150 Volts

*Values only. No single point kit available.

NOTES:

- Electric heater BTU/H = (heater watts + motor watts) x 3.412 (see airflow table for motor watts.)
- Supply circuit protective devices may be fuses or HACR type circuit breakers.
- Motor load is included in single circuit or circuit 1 of multiple circuits.
- Heater loads are balanced on 3 phase motors with 3 or 6 heating elements only.
- Electric heater kits are not permitted for use with 115 volt air-handlers (A voltage).
- 3 Voltage (208/240V) single phase air-handlers are designed to be used with single or three phase 208/240V electric heaters. To connect 3 phase power to the air handler terminal block, bring only two leads to terminal block, cap, insulate, and fully secure the third lead.
- Do not install 480V electric heaters in 208/240V air-handlers.
- Do not install 208/240V electric heaters in 480V air-handlers.
- If the heater kit is listed under both single and multiple circuits, the heater kit is shipped from factory as multiple circuits. For single phase applications, Jumper bar kit R08H-A21 and R08H-A31 can be used to convert multiple circuits to a single supply circuit. See Section 5.2 for details.

3.12.6.2 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H2T

Installation of the UL Listed original equipment manufacturer provided heater kits listed in the following table is recommended for all auxiliary heating requirements.

AIR HANDLER MODEL FH2TY	HEATER MODEL NUMBER	HEATER KW (200/240V)	PH/Hz	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT SINGLE CIRCUIT MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION
2417STANUJ	R2BH-172417J4-B	2,251.0	180	1-3.3	SINGLE	18.812.5	1.8	1618	30/25
	R2BH-172419J4-B	2,253.0	180	1-3.3	SINGLE	18.812.5	1.8	1618	30/25
	R2BH-172419J4-B	3,644.8	180	1-4.8	SINGLE	17,320.8	1.8	2408	30/35
	R2BH-172419J4-B	5,477.2	180	2-3.3	SINGLE	25,030.8	1.8	3840	40/45
	R2BH-172419J4-B	7,299.8	180	2-4.8	SINGLE	34,840.8	1.8	4873	30/50
	R2BH-172419J4-B	9,412.8	180	2-4.17	SINGLE	48,152.1	1.8	5868	60/75
	R2BH-172419J4-B	3,144.2	180	1-4.17	MULTIPLE Ckt 1	15,017.4	1.8	2104	30/35
	R2BH-172419J4-B	6,388.3	180	2-4.17	MULTIPLE Ckt 2	30,034.7	0.8	3844	40/50
2417STANUJ	R2BH-1724A07C-B	5,477.2	380	1-2.4	SINGLE	15,017.3	1.8	2104	30/35
	R2BH-1724A09C-B	7,299.8	380	1-3.3	SINGLE	28,023.1	1.8	2800	30/40
3617STANUJ	R2BH-173617J4-B	2,251.0	180	1-3.3	SINGLE	18.812.5	2.3	1718	30/35
	R2BH-173619J4-B	2,253.0	180	1-3.3	SINGLE	18.812.5	2.4	1719	30/35
	R2BH-173619J4-B	3,644.8	180	1-4.8	SINGLE	17,320.8	2.4	2508	30/38
	R2BH-173619J4-B	5,477.2	180	2-3.3	SINGLE	25,030.8	2.4	3841	40/45
	R2BH-173619J4-B	7,299.8	180	2-4.8	SINGLE	34,840.8	2.4	4753	50/45
	R2BH-1736A13J-B	8,412.5	180	2-4.17	SINGLE	48,152.1	2.4	5868	60/75
	R2BH-1736A13J-B	3,144.2	180	1-4.17	MULTIPLE Ckt 1	15,017.4	2.4	2105	30/35
	R2BH-1736A13J-B	6,388.3	180	2-4.17	MULTIPLE Ckt 2	30,034.7	0.8	3848	40/50
	R2BH-1736A15J-B	10,614.4	180	2-4.18	SINGLE	51,890.8	2.4	6878	70/80
	R2BH-1736A15J-B	3,644.8	180	1-4.18	MULTIPLE Ckt 1	17,320.8	2.4	2508	30/38
	R2BH-1736A15J-B	7,289.8	180	2-4.18	MULTIPLE Ckt 2	34,640.8	0.8	4450	50/50
	R2BH-1736A18J-B	12,817.8	180	4-4.26	SINGLE	61,670.8	2.4	8892	60/100
	R2BH-1736A18J-B	4,357.7	180	1-5.88	MULTIPLE Ckt 1	28,523.8	2.4	2933	30/40
	R2BH-1736A18J-B	8,511.3	180	2-5.88	MULTIPLE Ckt 2	41,147.2	0.8	5238	60/60
	R2BH-1736A07C-B	5,477.2	380	1-2.4	SINGLE	15,017.3	2.4	2200	30/38
	R2BH-1736A09C-B	7,299.8	380	1-3.3	SINGLE	28,023.1	2.4	2802	30/40
36218TANUJ	R2BH-173617J4-B	2,251.0	180	1-3.3	SINGLE	18.812.5	2.3	1718	30/35
	R2BH-173619J4-B	2,253.0	180	1-3.3	SINGLE	18.812.5	2.3	1718	30/35
	R2BH-173619J4-B	3,644.8	180	1-4.8	SINGLE	17,320.8	2.3	2508	30/38
	R2BH-173619J4-B	5,477.2	180	2-3.3	SINGLE	25,030.8	2.3	3841	40/38
	R2BH-173619J4-B	7,289.8	180	2-4.8	SINGLE	34,640.8	2.3	4753	50/40
	R2BH-1736A13J-B	8,412.8	180	2-4.17	SINGLE	48,152.1	2.3	5868	60/75
	R2BH-1736A13J-B	3,144.2	180	1-4.17	MULTIPLE Ckt 1	15,017.4	2.3	2090	30/38
	R2BH-1736A13J-B	6,388.3	180	2-4.17	MULTIPLE Ckt 2	30,034.7	0.8	3844	40/45
	R2BH-1736A15J-B	10,614.4	180	2-4.18	SINGLE	51,890.8	2.3	6873	70/80
	R2BH-1736A15J-B	3,644.8	180	1-4.18	MULTIPLE Ckt 1	17,320.8	2.3	2508	30/38
	R2BH-1736A15J-B	7,289.8	180	2-4.18	MULTIPLE Ckt 2	34,640.8	0.8	4450	50/50
	R2BH-1736A18J-B	12,817.8	180	4-4.26	SINGLE	61,670.8	2.3	8892	60/100
	R2BH-1736A18J-B	4,357.7	180	1-5.88	MULTIPLE Ckt 1	28,523.8	2.3	2933	30/40
	R2BH-1736A18J-B	8,511.3	180	2-5.88	MULTIPLE Ckt 2	41,147.2	0.8	5239	60/60
	R2BH-1736A07C-B	5,477.2	380	1-2.4	SINGLE	15,017.3	2.3	2200	30/40
	R2BH-1736A09C-B	7,299.8	380	1-3.3	SINGLE	28,023.1	2.3	2802	30/40
3621MTANUJ 3621MTANUJ	R2BH-173619J4-B	2,253.0	180	1-3.3	SINGLE	18.812.5	2.4	1719	30/35
	R2BH-173619J4-B	2,253.0	180	1-3.3	SINGLE	18.812.5	2.4	1719	30/35
	R2BH-173619J4-B	3,644.8	180	1-4.8	SINGLE	17,320.8	2.4	2508	30/38
	R2BH-173619J4-B	5,477.2	180	2-3.3	SINGLE	25,030.8	2.4	3841	40/38
	R2BH-173619J4-B	7,289.8	180	2-4.8	SINGLE	34,640.8	2.4	4753	50/40
	R2BH-1736A13J-B	8,412.5	180	2-4.17	SINGLE	48,152.1	2.3	5868	60/75
	R2BH-1736A13J-B	3,144.2	180	1-4.17	MULTIPLE Ckt 1	15,017.4	2.4	2090	30/38
	R2BH-1736A13J-B	6,388.3	180	2-4.17	MULTIPLE Ckt 2	30,034.7	0.8	3844	40/45
	R2BH-1736A15J-B	10,614.4	180	2-4.18	SINGLE	51,890.8	2.4	6878	70/80
	R2BH-1736A15J-B	3,644.8	180	1-4.18	MULTIPLE Ckt 1	17,320.8	2.4	2508	30/38
	R2BH-1736A15J-B	7,289.8	180	2-4.18	MULTIPLE Ckt 2	34,640.8	0.8	4450	50/50
	R2BH-1736A18J-B	12,817.8	180	4-4.26	SINGLE	61,670.8	2.4	8892	60/100
	R2BH-1736A18J-B	4,357.7	180	1-5.88	MULTIPLE Ckt 1	28,523.8	2.4	2933	30/40
	R2BH-1736A18J-B	8,511.3	180	2-5.88	MULTIPLE Ckt 2	41,147.2	0.8	5238	60/60
	R2BH-1736A07C-B	5,477.2	380	1-2.4	SINGLE	15,017.3	2.4	2200	30/38
	R2BH-1736A09C-B	7,299.8	380	1-3.3	SINGLE	28,023.1	2.4	2802	30/40

• F Heater Kit Connection Type: A=Breaker B=Terminal Block C=Pushout Disconnect

3.12.6.2 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H2T - continued

AIR HANDLER MODEL (-)H2T	HEATER MODEL NUMBER	HEATER KW (240/240V)	PH/Hz	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT SINGLE CIRCUIT MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT AMPLACITY	MAXIMUM OVERCURRENT PROTECTION
4021STANUJ	R08H172A000-E	3.643	100	14.3	SINGLE	17.2200	3.7	7000	3000
	R08H172A007-E	5.467	100	23.3	SINGLE	26.3300	3.7	10400	4000
	R08H172A010-E	7.290	100	29.3	SINGLE	34.4400	3.7	13900	5000
	R08H172A014-E	10.814	100	44.3	SINGLE	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 1	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 2	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	SINGLE	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
4021STANAJ	R08H172A000-E	3.643	100	14.3	SINGLE	17.2200	3.8	7000	3000
	R08H172A007-E	5.467	100	23.3	SINGLE	26.3300	3.8	10400	4000
	R08H172A010-E	7.290	100	29.3	SINGLE	34.4400	3.8	13900	5000
	R08H172A014-E	10.814	100	44.3	SINGLE	51.3600	3.8	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 1	71.4000	3.8	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 2	94.4400	3.8	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 1	117.4000	3.8	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.8	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.8	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.8	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.8	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.8	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.8	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.8	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.8	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.8	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.8	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.8	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.8	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.8	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.8	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.8	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.8	53000	16000
4041STANUJ	R08H172A000-E	3.643	100	14.3	SINGLE	17.2200	3.7	7000	3000
	R08H172A007-E	5.467	100	23.3	SINGLE	26.3300	3.7	10400	4000
	R08H172A010-E	7.290	100	29.3	SINGLE	34.4400	3.7	13900	5000
	R08H172A014-E	10.814	100	44.3	SINGLE	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 1	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 2	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 1	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000
	R08H172A014-E	10.814	100	44.3	MULTIPLE Ckt 1	51.3600	3.7	19900	7000
	R08H172A015-E	14.313	100	59.3	MULTIPLE Ckt 2	71.4000	3.7	26900	9000
	R08H172A018-E	18.817	100	74.3	MULTIPLE Ckt 1	94.4400	3.7	40000	12000
	R08H172A019-E	23.321	100	89.3	MULTIPLE Ckt 2	117.4000	3.7	53000	16000

- ? Heater Kit Connection Type: A=Breaker B=Terminal Block Q=Pullout Disconnect

3.12.6.2 ELECTRICAL DATA – WITH ELECTRIC HEAT: (-)H2T - continued

AIR HANDLER MODEL (-)H2T	HEATER MODEL NUMBER	HEATER KW (208/240V)	PHHZ	NO. ELEMENTS - KW PER	TYPE SUPPLY CIRCUIT SINGLE CIRCUIT MULTIPLE CIRCUIT	HEATER AMPS	MOTOR AMPS	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION
6021STANA/J	6021H2TAN000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN002	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN003	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN004	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN005	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN006	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN007	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN008	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN009	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN010	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN011	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN012	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN013	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN014	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN015	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN016	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN017	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN018	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN019	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021H2TAN020	1.0	300	1.0	SINGLE	4.7	0.7	15	25
6024STANA/J	6024H2TAN000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN002	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN003	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN004	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN005	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN006	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN007	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN008	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN009	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN010	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN011	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN012	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN013	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN014	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN015	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN016	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN017	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN018	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN019	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024H2TAN020	1.0	300	1.0	SINGLE	4.7	0.7	15	25
511TSANND	511TSANND000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	511TSANND001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
3621MTANAD/ 3621MTANND/ 3621STANND	3621MTANAD000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	3621MTANAD001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
4821STANAD/ 4821STANND	4821STANAD000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	4821STANAD001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
4824STANND	4824STANND000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	4824STANND001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
6021STANAD	6021STANAD000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6021STANAD001	1.0	300	1.0	SINGLE	4.7	0.7	15	25
6024STANND	6024STANND000	1.0	300	1.0	SINGLE	4.7	0.7	15	25
	6024STANND001	1.0	300	1.0	SINGLE	4.7	0.7	15	25

• To learn more about our types, go to [Air Handler](#), [To Tank and Back](#), [Controls Document](#)

*Values only, MC single point not available.

NOTES:

- Electric heater RTHH - Jacketed walls - metal walls with 1/2" over all insulation for heater safety.
- Heaters can be purchased without any fan speed or "MAX" speed fan elements.
- If fan element is not used, fan speed will be standard, you can use larger standard fan speed.
- Labeled in the unit to indicate fan speed or about 1 or multiple circuits.
- Heater loads are indicated on the nameplate with 3 or 4 fan speed.
- For electrical heating elements, fan speed will be standard with a voltage (120V) as standard.
- A voltage (120V) or fan speed or fan speed is indicated on the nameplate with a voltage (120V) as standard.
- On the unit, fan speed or fan speed is indicated on the nameplate with a voltage (120V) as standard.
- If the unit is used in a single or multiple circuits, the MC is shipped with fan speed or fan speed. For single phase applications, it is shipped with 120V, 240V and 480V and 120V and 240V are used to connect multiple fan speed to a single fan speed. Make to fan speed fan speed is possible.

3.12.7 ELECTRIC HEATER KIT SUPPLEMENTAL INFORMATION

If a heater kit is listed both Single and Multi-circuit, the kit is shipped as a Multi-circuit and will require a single point kit.

Contractor should "mark or check" the left column for the kit installed.

Only listed kits can be applied

These are the required maximum and minimum circuit breaker sizes for overcurrent protection and should not be confused with the size of the breakers installed in the heater kit.

Heater Kit Supplemental Information: What allows the manufacturer to use standard Circuit Breakers up to 60 amps inside the air handler, when using an approved Heater Kit?

National Electric Code (Section 424-22b) and UL standards allow subdividing heating element circuits, of less than 48 amps, using breakers of not more than 60 amps. Additionally per NEC 424-3b, a rating not less than 125 percent of the load and NEC 424-22c, which describes the supplementary overcurrent protection required to be factory-installed within, or on the heater. The breakers in the heater kit are not, and have never been intended to protect power wiring leading to the air handler unit. The breakers in the heating kit are for short circuit protection and to provide a disconnect. All internal unit wiring, where the breakers apply, has been UL approved for short circuit protection.

Ampacity, (not breaker size), determines supply circuit wire size. The ampacity listed on the unit rating plate and the Maximum and Minimum circuit breaker size (noted above) or in the units specification sheet or installation instructions provides the information to properly select wire and circuit breaker/protector size. The National Electric Code (NEC) specifies that the supply or branch circuit must be protected at the source.

3.12.8 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. For lengths longer than 150 ft., 16-AWG wire should be used.
- Low voltage control connections are made to low voltage pigtail(s) extending from top of air handler (upflow position - see Figure 3). Connections for control wiring are made with wire nuts. Control wiring knockouts (9/8 and 7/8) are also provided on the right and left side of the unit for side connection.
- See Section 3.12.8 below for control wiring connections.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.
- See Section 3.12.1 for how to reconfigure transformer for 208 volt applications.

3.12.9 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:

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

FIGURE 14: (-)H1P(-)H2T

TYPICAL THERMOSTAT: SINGLE STAGE COOLING W/ ELECTRIC HEAT

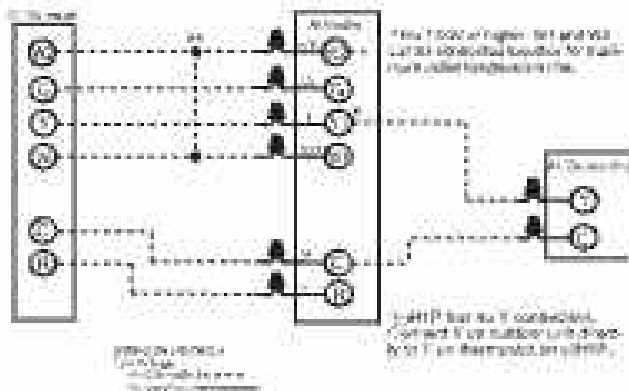


FIGURE 15: (-)H1P(-)H2T

TYPICAL THERMOSTAT: SINGLE STAGE HEAT PUMP W/ ELECTRIC HEAT

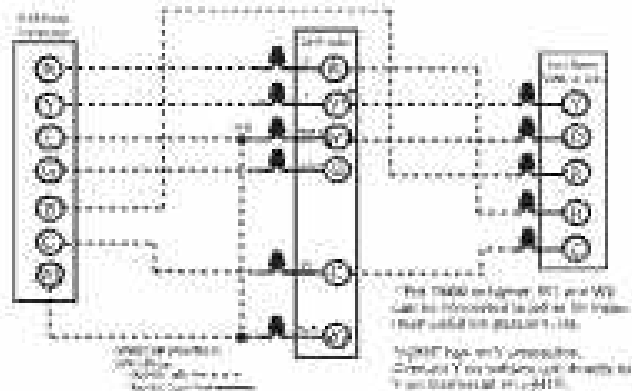


FIGURE 16: (-)H2T

TYPICAL 3-STAGE THERMOSTAT: 3-STAGE COOLING WITH ELECTRIC HEAT

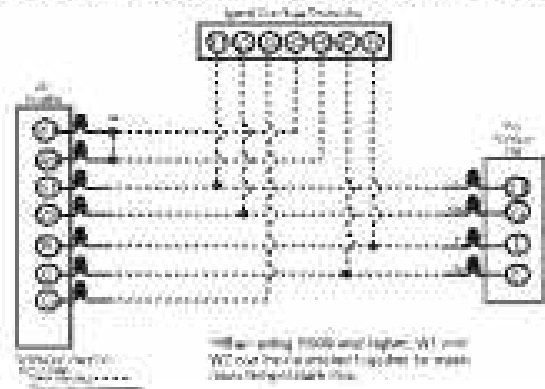
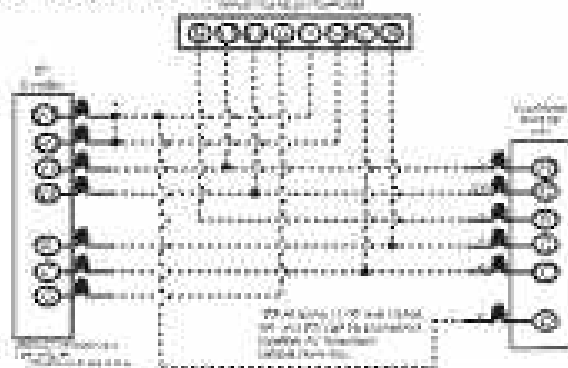


FIGURE 17: (-)H2T

TYPICAL 3-STAGE THERMOSTAT: 3-STAGE HEAT PUMP WITH ELECTRIC BACK-UP HEAT



3.13.2 SELECTING INDOOR BLOWER MOTOR SPEED

The (-)H1P and (-)H2T air-handlers must be configured in the field to assure proper air-flow is delivered for the particular application it is being used in. Refer to the AIR-FLOW PERFORMANCE DATA in Section 3.13.3 to determine which speed tap is appropriate for the application.

Important: The pressure drop through the required external filter is not included in the external static pressure shown in the Air-Flow Performance Tables in Section 3.13.3. The filter pressure drop must be added to the duct system pressure drop to determine total external static pressure. Filter pressure drop increases as the filter becomes dirty and must be considered when calculating worst case external static pressure.

3.13.2.1 (-)H1P MODELS (PSC MOTOR)

(-)H1P models are designed to be matched to a specific capacity outdoor unit, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, or 5.0 tons. They have PSC motors with 2 blower motor speed taps, low speed for applications with an external static pressure of up to 0.5" W.C. and high speed for applications with an external static pressure above 0.5" W.C. All models are shipped from the factory wired for high speed operation. **Note:** The external filter pressure drop must be included in the external static pressure when selecting a blower motor speed.

115V & 208/240V Models: The speed selection is made on the Blower Control Board. To change from high speed to low speed, remove the BLACK motor lead from the COM terminal, remove insulated cap from the end of the RED motor lead located in the control box and plug it into the terminal on the end of the BLACK motor lead to prevent it from shorting to ground. Attach RED wire to the COM terminal on the Blower Control Board.

480V Models: The speed selection is made on the Blower Relay. To change from high speed to low speed, remove the BLACK motor lead from terminal 3 on the Blower Relay and remove the cap from the terminal on the end of the RED motor lead. Connect the RED motor lead to terminal 3 on the Blower Relay. **For 3-4 ton models only,** connect the BLACK and YELLOW motor leads together.

3.13.2.2 (-)H2T MODELS (CONSTANT TORQUE ECM MOTOR) - 2 STAGE AIR-FLOW

(-)H2T 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 3.13.2.3. They have constant torque ECM motors with 5 blower motor speed taps, labeled T1 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 80% 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.

3.13.2.3 (-)H2T MODELS (CONSTANT TORQUE ECM MOTOR) – SINGLE STAGE AIR-FLOW

(-)H2T 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 in the Y3 (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 (2.5T, 3.5T, 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.

3.13.3.1 240V AIR-FLOW PERFORMANCE DATA: (-)H1P (PSC MOTOR)

Model Number (-)H1P1	Motor Speed (RPM)	Manufacturer Recommended Airflow Range (Min / Max) CFM	Blower Wheel Model HP (BHP) & # of Speeds	Motor Speed	PSC CFM (in) Air Delivery (PSC Motor Dry Cell - No Filter)										
					External Static Pressure-Inch W.C.										
						0.1 (20)	0.2 (20)	0.3 (20)	0.4 (20)	0.5 (20)	0.6 (20)	0.7 (20)	0.8 (20)	0.9 (20)	1.0 (20)
18178 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	753	693	625	562	500	442	403	345	288	—
					RPM	1803	1703	1581	1453	1329	1205	1083	960	793	—
					Watts	102	110	119	127	137	147	155	163	129	—
				High	CFM	649	602	547	491	432	379	328	280	233	201
					RPM	1644	1544	1426	1307	1182	1061	943	822	693	1567
					Watts	213	240	248	258	281	290	302	308	167	163
18179 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	800	737	665	592	519	442	369	313	188	—
					RPM	1811	1703	1571	1443	1319	1195	1073	950	793	—
					Watts	103	112	121	130	139	150	158	166	129	—
				High	CFM	696	642	587	531	472	419	368	319	267	211
					RPM	1644	1544	1426	1307	1182	1061	943	822	675	1567
					Watts	244	267	275	285	308	316	328	329	178	181
18178 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	870	803	725	646	565	480	401	339	288	253
					RPM	1843	1733	1599	1469	1343	1219	1095	970	853	1563
					Watts	109	118	128	138	149	161	172	182	187	219
				High	CFM	1008	943	871	800	725	651	581	510	430	363
					RPM	1942	1833	1699	1569	1443	1319	1195	1073	950	1567
					Watts	416	442	460	479	500	520	539	558	380	383
18179 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	860	793	715	636	555	470	389	326	195	221
					RPM	1839	1733	1599	1469	1343	1219	1095	970	853	1574
					Watts	111	120	130	140	151	162	173	184	189	223
				High	CFM	1018	953	881	810	735	661	591	520	440	373
					RPM	1877	1767	1633	1503	1377	1253	1129	1005	883	1567
					Watts	417	443	461	480	501	521	540	559	381	384
18178 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	1108	1033	955	876	795	710	629	548	465	399
					RPM	1942	1833	1699	1569	1443	1319	1195	1073	950	1567
					Watts	116	125	135	145	156	167	178	189	200	213
				High	CFM	1300	1225	1147	1068	985	900	815	732	649	563
					RPM	1877	1767	1633	1503	1377	1253	1129	1005	883	1567
					Watts	211	237	245	255	276	285	296	307	317	318
18179 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	1248	1163	1075	996	915	830	745	662	579	493
					RPM	1942	1833	1699	1569	1443	1319	1195	1073	950	1567
					Watts	121	130	140	150	161	172	183	194	205	218
				High	CFM	1400	1325	1247	1168	1085	1000	915	832	749	663
					RPM	1877	1767	1633	1503	1377	1253	1129	1005	883	1567
					Watts	247	273	281	291	312	321	332	343	353	354
18178 18 in blower	High	10000 CFM (44520 L/s)	10-14 (2.3-3.1) HP 2 Speed	Low	CFM	1388	1293	1205	1126	1045	960	875	792	709	623
					RPM	1942	1833	1699	1569	1443	1319	1195	1073	950	1567
					Watts	126	135	145	155	166	177	188	199	210	223
				High	CFM	1570	1485	1404	1325	1245	1165	1085	1005	924	843
					RPM	1877	1767	1633	1503	1377	1253	1129	1005	883	1567
					Watts	281	307	315	325	346	355	366	377	387	388

NOTE: “-/-” indicates air-flow values outside unit static range. Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.1 240V AIR-FLOW PERFORMANCE DATA: (-)H1P (PSC MOTOR) - continued

[illegible]

NOTE: "T-J" indicates air-flow values outside unit static range. Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.2 115/208/480V AIR-FLOW PERFORMANCE DATA: (-)H1P (PSC MOTOR)

Model Number (H1P)	Motor Speed (RPM)	Manufacturer Recommended Air-flow Range (Min-Max) CFM	Blower Size (HP) (30) 4-oz Spindle	Motor Speed	PSC CFM (14) 4-oz Full-Load (H1P) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)										
					Fan Static Pressure (inches W.C.)										
						0.1 (20)	0.2 (20)	0.3 (20)	0.4 (20)	0.5 (20)	0.6 (20)	0.7 (20)	0.8 (20)	0.9 (20)	1.0 (20)
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	71.2	34.1	18.5	9.2	4.7	2.4	1.2	0.6	0.3	—
					RPM	345	165	85	42	21	10	5	2	1	—
					Watts	162	77	40	20	10	5	2	1	0	—
				High	CFM	141.5	270	142	70	35	18	9	4	2	20
					RPM	694	714	356	207	103	51	26	13	6	160
					Watts	495	542	264	154	77	39	20	10	5	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51
1415 No. 1415	High	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	1415 (14) (14) (14) (14) (14) (14) (14) (14) (14) (14) (14)	Low	CFM	60.9	28.1	14.8	7.3	3.7	1.9	0.9	0.4	0.2	—
					RPM	315	152	77	38	19	9	4	2	1	—
					Watts	111	53	28	14	7	3	1	0	0	—
				High	CFM	121.8	235	121	61	31	15	7	3	1	20
					RPM	593	704	356	207	103	51	26	13	6	160
					Watts	361	427	213	107	53	26	13	6	3	51

NOTE: "-" indicates air-flow values outside unit static range. Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.2 115/208/480V AIR-FLOW PERFORMANCE DATA: (-)H1P (PSC MOTOR) - continued

Model Number (H1P)	Motor Speed From Factory	Manufacturer Recommended Air-Flow Range (Min./Max./CFM)	Blower Size Motor HP (W) 1/4 of Speed	Motor Speed	PSC CFM (sq) Air Delivery (HMMADA Dry Cell - No Filter)										
					External Static Pressure (inches W.G.)										
						0.1 (2.0)	0.2 (0.5)	0.3 (0.7)	0.4 (1.0)	0.5 (1.2)	0.6 (1.5)	0.7 (1.7)	0.8 (2.1)	0.9 (2.3)	1 (2.5)
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	1281	1245	1208	1158	1105	1070	1034	995	957	919
					EPM	846	846	847	847	847	847	847	847	847	847
					Static	1.50	1.07	0.70	0.42	0.24	0.14	0.08	0.04	0.02	0.01
				High	CFM	1145	1100	1054	1001	948	895	842	789	736	683
					EPM	1114	1071	1027	983	939	895	851	807	763	719
					Static	1.14	0.84	0.54	0.30	0.16	0.09	0.05	0.02	0.01	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	1145	1100	1054	1001	948	895	842	789	736	683
					EPM	846	846	847	847	847	847	847	847	847	847
					Static	1.14	0.84	0.54	0.30	0.16	0.09	0.05	0.02	0.01	0.00
				High	CFM	1007	962	916	863	810	757	704	651	598	545
					EPM	773	730	686	643	599	556	513	470	427	384
					Static	0.71	0.50	0.30	0.17	0.09	0.05	0.02	0.01	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	867	831	794	744	691	638	585	532	479	426
					EPM	571	571	571	571	571	571	571	571	571	571
					Static	0.31	0.20	0.13	0.07	0.04	0.02	0.01	0.00	0.00	0.00
				High	CFM	729	684	638	585	532	479	426	373	320	267
					EPM	545	513	481	449	417	385	353	321	289	257
					Static	0.20	0.13	0.08	0.04	0.02	0.01	0.00	0.00	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	691	655	618	568	515	462	409	356	303	250
					EPM	457	457	457	457	457	457	457	457	457	457
					Static	0.20	0.13	0.08	0.04	0.02	0.01	0.00	0.00	0.00	0.00
				High	CFM	553	508	462	409	356	303	250	197	144	91
					EPM	409	385	361	337	313	289	265	241	217	193
					Static	0.13	0.08	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	515	479	442	392	339	286	233	180	127	74
					EPM	356	356	356	356	356	356	356	356	356	356
					Static	0.13	0.08	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.00
				High	CFM	417	373	327	274	221	168	115	62	9	-44
					EPM	303	289	275	251	227	203	179	155	131	107
					Static	0.08	0.05	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	373	337	300	250	197	144	91	38	-15	-68
					EPM	250	250	250	250	250	250	250	250	250	250
					Static	0.08	0.05	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
				High	CFM	274	230	184	131	78	25	-28	-81	-134	-187
					EPM	180	166	152	138	124	110	96	82	68	54
					Static	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	337	301	264	214	161	108	55	2	-51	-104
					EPM	217	217	217	217	217	217	217	217	217	217
					Static	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
				High	CFM	230	186	140	87	34	-19	-72	-125	-178	-231
					EPM	144	130	116	102	88	74	60	46	32	18
					Static	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140CFM208 with 1/2hp motor	High	1044/1144CFM (30/30/17.1)	1/2HP (373) 2500rpm	Low	CFM	299	263	226	176	123	69	16	-37	-90	-143
					EPM	180	180	180	180	180	180	180	180	180	180
					Static	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				High	CFM	184	140	94	41	-12	-65	-118	-171	-224	-277
					EPM	108	94	80	66	52	38	24	10	-4	-18
					Static	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTE: "T-" indicates air-flow values outside unit static range. Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.3 115/208/240/480V AIR-FLOW PERFORMANCE DATA: (CONSTANT TORQUE MOTOR)

Model No. (kW/HP)	Fanstage Application	Blade Spaced From Factory	Blower Static Motor HP (kW) at 1 Speed	Blower Speed		CFM/M³/MIN/77°F - Dry, Clean Air Filter											
						External Static Pressure (inches wPG)											
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
30/35T 10/45kW	1A/7in	30	1/2 HP (373W) 1 Speed	1	CFM	638	554	481	421	367	318	275	237	203	173	147	
					HPM	725	630	547	480	425	375	330	290	255	225	198	
					WGL	40	35	30	26	23	20	17	15	13	11	9	
				2	CFM	253	219	188	165	145	128	113	99	87	76	66	
					HPM	292	252	218	192	170	151	134	119	106	93	82	
					WGL	34	30	26	23	20	17	15	13	12	10	8	
30/35T 10/45kW	1A/7in	40	1/2 HP (373W) 2 Speed	1	CFM	615	531	458	397	343	294	251	213	180	150	125	
					HPM	700	605	522	461	407	358	314	275	240	209	183	
					WGL	37	32	28	24	21	18	16	14	12	10	8	
				2	CFM	247	213	182	159	139	122	107	93	81	70	60	
					HPM	286	246	212	186	164	145	128	113	100	88	77	
					WGL	33	29	25	22	19	17	15	13	12	10	8	
30/35T 10/45kW	1B/9in	40	1/2 HP (373W) 2 Speed	4	CFM	622	538	465	404	350	301	258	220	187	157	132	
					HPM	712	617	544	483	429	379	336	297	262	230	201	
					WGL	37	32	28	24	21	18	16	14	12	10	8	
				5	CFM	575	491	418	357	303	254	211	173	140	110	85	
					HPM	660	565	492	431	377	328	285	246	211	180	153	
					WGL	32	28	24	21	18	16	14	12	10	8	6	
30/35T 10/45kW	1B/9in	40	1/2 HP (373W) 2 Speed	4	CFM	600	516	443	382	328	279	236	200	167	137	112	
					HPM	690	595	522	461	407	358	314	275	240	209	183	
					WGL	36	31	27	23	20	17	15	13	11	9	7	
				5	CFM	545	461	388	327	273	224	181	143	110	80	55	
					HPM	630	535	462	401	347	298	254	215	180	149	122	
					WGL	31	27	23	20	17	15	13	11	9	7	5	
30/35T 10/45kW	1C/11in	40	1/2 HP (373W) 2 Speed	4	CFM	600	516	443	382	328	279	236	200	167	137	112	
					HPM	690	595	522	461	407	358	314	275	240	209	183	
					WGL	36	31	27	23	20	17	15	13	11	9	7	
				5	CFM	545	461	388	327	273	224	181	143	110	80	55	
					HPM	630	535	462	401	347	298	254	215	180	149	122	
					WGL	31	27	23	20	17	15	13	11	9	7	5	
30/35T 10/45kW	1C/11in	40	1/2 HP (373W) 2 Speed	4	CFM	600	516	443	382	328	279	236	200	167	137	112	
					HPM	690	595	522	461	407	358	314	275	240	209	183	
					WGL	36	31	27	23	20	17	15	13	11	9	7	
				5	CFM	545	461	388	327	273	224	181	143	110	80	55	
					HPM	630	535	462	401	347	298	254	215	180	149	122	
					WGL	31	27	23	20	17	15	13	11	9	7	5	
30/35T 10/45kW	1D/13in	40	1/2 HP (373W) 2 Speed	4	CFM	600	516	443	382	328	279	236	200	167	137	112	
					HPM	690	595	522	461	407	358	314	275	240	209	183	
					WGL	36	31	27	23	20	17	15	13	11	9	7	
				5	CFM	545	461	388	327	273	224	181	143	110	80	55	
					HPM	630	535	462	401	347	298	254	215	180	149	122	
					WGL	31	27	23	20	17	15	13	11	9	7	5	

NOTE: Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.3 115/208/240/480V AIR-FLOW PERFORMANCE DATA: (CONSTANT TORQUE MOTOR) - continued

Model No. (HEIT)	Storage Application	Blow Speed (FPM)	Blower Size (Motor HP) (F of Blow)	Motor Speed		CFM@24"WTG-8oz Gel-Mo Filter										
						External Motor Pressure (inches of WG)										
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
J40125 with Motor	1.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	+	CPM	448	718	871	430	574	520	436	363	342	336	
					MPM	418	647	809	737	343	457	399	329	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1489	1421	1384	1417	1461	1494	1487	1487	1489	1489	1489
					MPM	112	81	529	118	142	273	1181	1186	1227	1217	
					Wdth	118	224	24	229	274	329	314	318	418	418	418
J40125 no Motor	2.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	X	CPM	447	718	871	430	574	468	437	371	331	336	
					MPM	417	648	809	737	343	457	399	329	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1148	1181	1184	1187	1181	1181	1181	1181	1181	1181	1181
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118
J40125 with Motor	2.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	X	CPM	447	718	871	430	574	468	437	371	331	336	
					MPM	417	648	809	737	343	457	399	329	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1148	1181	1184	1187	1181	1181	1181	1181	1181	1181	1181
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118
J40125 no Motor	1.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	+	CPM	443	648	731	346	457	386	328	311	311	311	
					MPM	413	648	809	341	457	399	329	324	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1429	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118
J40125 with Motor	1.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	+	CPM	443	648	731	346	457	386	328	311	311	311	
					MPM	413	648	809	341	457	399	329	324	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1429	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118
48H517H no Motor	2.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	X	CPM	443	648	731	346	457	386	328	311	311	311	
					MPM	413	648	809	341	457	399	329	324	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1429	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118
48H517H with Motor	2.3m	45	60Hz 1.0 (1.1/1.25) 0.5 (0.6)	X	CPM	443	648	731	346	457	386	328	311	311	311	
					MPM	413	648	809	341	457	399	329	324	324	324	317
					Wdth	111	36	50	59	103	118	118	121	125	124	
				S	CPM	1429	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
					MPM	118	118	118	118	118	118	118	118	118	118	118
					Wdth	118	118	118	118	118	118	118	118	118	118	118

NOTE: Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.3 115/208/240/480V AIR-FLOW PERFORMANCE DATA: (CONSTANT TORQUE MOTOR) - continued

Model No. (2021)	Fanage Application	Motor Speed From Factory	Blower Seal Motor HP (KW) at Speed	Blower Speed		CFM/PMMA700 - Dry Carbon Filter										
						Standard Static Pressure (inches of WG)										
						1.1	1.3	1.5	1.8	2.0	2.3	2.7	3.0	3.3	3.6	3.9
4000ST 1/2 HP	F 30	40	0.002 34.49-012 1/2 Square	4	CFM	100	100	100	99	99	712	614	528	466	401	353
					CFM	607	707	778	811	850	877	847	818	787	753	723
					W-B	119	134	142	144	140	135	130	124	118	114	109
				5	CFM	1133	1334	1456	1523	1600	1676	1646	1588	1528	1458	1382
					CFM	3171	3717	4071	4267	4529	4744	4548	4371	4171	3953	3710
					W-B	155	175	184	184	180	175	170	164	158	154	149
4000ST 1/2 HP	F 30	50	0.002 34.49-012 1/2 Square	4	CFM	100	100	100	99	99	712	614	528	466	401	353
					CFM	607	707	778	811	850	877	847	818	787	753	723
					W-B	119	134	142	144	140	135	130	124	118	114	109
				5	CFM	1171	1374	1497	1564	1640	1716	1686	1628	1568	1498	1422
					CFM	3291	3837	4191	4387	4649	4864	4668	4491	4291	4073	3830
					W-B	160	180	189	189	185	180	175	169	163	159	154
4000ST 1/2 HP	3.0/30	50	0.002 34.49-012 1/2 Square	4	CFM	866	866	866	871	871	566	466	398	336	273	241
					CFM	1441	1691	186	191	201	206	196	186	176	166	156
					W-B	81	91	91	91	86	81	76	71	66	61	56
				5	CFM	1566	1761	1891	1961	2061	2161	2161	2061	1961	1861	1761
					CFM	4111	4661	5061	5261	5561	5761	5561	5361	5161	4961	4761
					W-B	242	286	316	326	346	366	366	356	346	336	326
4000ST 1/2 HP	3.0/30	50	0.002 34.49-012 1/2 Square	4	CFM	1361	1361	1361	1361	1361	866	716	616	516	416	366
					CFM	2261	2661	2961	3061	3261	3361	3261	3161	3061	2961	2861
					W-B	141	161	171	171	181	181	176	171	166	161	156
				5	CFM	2461	2861	3161	3261	3461	3561	3461	3361	3261	3161	3061
					CFM	6261	7161	7861	8161	8661	8961	8661	8461	8261	8061	7861
					W-B	311	361	396	406	436	456	456	446	436	426	416
4000ST 1/2 HP	F 30	50	0.002 34.49-012 1/2 Square	4	CFM	100	100	100	99	99	712	614	528	466	401	353
					CFM	607	707	778	811	850	877	847	818	787	753	723
					W-B	119	134	142	144	140	135	130	124	118	114	109
				5	CFM	1133	1334	1456	1523	1600	1676	1646	1588	1528	1458	1382
					CFM	3171	3717	4071	4267	4529	4744	4548	4371	4171	3953	3710
					W-B	155	175	184	184	180	175	170	164	158	154	149
4000ST 1/2 HP	F 30	50	0.002 34.49-012 1/2 Square	4	CFM	100	100	100	99	99	712	614	528	466	401	353
					CFM	607	707	778	811	850	877	847	818	787	753	723
					W-B	119	134	142	144	140	135	130	124	118	114	109
				5	CFM	1133	1334	1456	1523	1600	1676	1646	1588	1528	1458	1382
					CFM	3171	3717	4071	4267	4529	4744	4548	4371	4171	3953	3710
					W-B	155	175	184	184	180	175	170	164	158	154	149
4000ST 1/2 HP	3.0/30	50	0.002 34.49-012 1/2 Square	4	CFM	100	100	100	99	99	712	614	528	466	401	353
					CFM	607	707	778	811	850	877	847	818	787	753	723
					W-B	119	134	142	144	140	135	130	124	118	114	109
				5	CFM	1133	1334	1456	1523	1600	1676	1646	1588	1528	1458	1382
					CFM	3171	3717	4071	4267	4529	4744	4548	4371	4171	3953	3710
					W-B	155	175	184	184	180	175	170	164	158	154	149

NOTE: Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

3.13.3.3 115/208/240/480V AIR-FLOW PERFORMANCE DATA: (CONSTANT TORQUE MOTOR) - continued

Model No. (240V)	Typical Application	Motor Speed (RPM)	Blower Size Motor HP (kW) at 1/2 Speed	Blower Speed		CFM@AWG18 - Dry Gas @ 15 in. H ₂ O										
						General Duty Pressure Rating at 15 in. H ₂ O										
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
1054-01 with blower	0.75 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	120	130	140	150	160	170	180	190	200	210	220
					HP	100	105	110	115	120	125	130	135	140	145	150
					Watts	715	750	785	820	855	890	925	960	995	1030	1065
				II	CFM	170	175	180	185	190	195	200	205	210	215	220
					HP	125	128	131	134	137	140	143	146	149	152	155
					Watts	890	920	950	980	1010	1040	1070	1100	1130	1160	1190
1054-01 1/2 hp blower	0.5 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	120	130	140	150	160	170	180	190	200	210	220
					HP	100	105	110	115	120	125	130	135	140	145	150
					Watts	715	750	785	820	855	890	925	960	995	1030	1065
				II	CFM	200	205	210	215	220	225	230	235	240	245	250
					HP	160	165	168	171	174	177	180	183	186	189	192
					Watts	1170	1210	1250	1290	1330	1370	1410	1450	1490	1530	1570
1054-01 with blower	0.5 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	120	130	140	150	160	170	180	190	200	210	220
					HP	100	105	110	115	120	125	130	135	140	145	150
					Watts	715	750	785	820	855	890	925	960	995	1030	1065
				II	CFM	210	215	220	225	230	235	240	245	250	255	260
					HP	165	170	173	176	179	182	185	188	191	194	197
					Watts	1190	1230	1260	1290	1320	1350	1380	1410	1440	1470	1500
1054-01 1/2 hp blower	0.75 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	110	120	130	140	150	160	170	180	190	200	210
					HP	90	95	100	105	110	115	120	125	130	135	140
					Watts	640	675	710	745	780	815	850	885	920	955	990
				II	CFM	160	165	170	175	180	185	190	195	200	205	210
					HP	130	133	136	139	142	145	148	151	154	157	160
					Watts	950	980	1010	1040	1070	1100	1130	1160	1190	1220	1250
1054-01 with blower	0.75 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	100	110	120	130	140	150	160	170	180	190	200
					HP	80	85	90	95	100	105	110	115	120	125	130
					Watts	570	605	640	675	710	745	780	815	850	885	920
				II	CFM	150	155	160	165	170	175	180	185	190	195	200
					HP	120	123	126	129	132	135	138	141	144	147	150
					Watts	840	870	900	930	960	990	1020	1050	1080	1110	1140
1054-01 1/2 hp blower	0.5 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	100	110	120	130	140	150	160	170	180	190	200
					HP	80	85	90	95	100	105	110	115	120	125	130
					Watts	570	605	640	675	710	745	780	815	850	885	920
				II	CFM	150	155	160	165	170	175	180	185	190	195	200
					HP	120	123	126	129	132	135	138	141	144	147	150
					Watts	840	870	900	930	960	990	1020	1050	1080	1110	1140
1054-01 with blower	0.5 hp	1800	11.0 HP (8.1 kW) 1/2 Speed	I	CFM	110	120	130	140	150	160	170	180	190	200	210
					HP	90	95	100	105	110	115	120	125	130	135	140
					Watts	640	675	710	745	780	815	850	885	920	955	990
				II	CFM	160	165	170	175	180	185	190	195	200	205	210
					HP	130	133	136	139	142	145	148	151	154	157	160
					Watts	950	980	1010	1040	1070	1100	1130	1160	1190	1220	1250

NOTE: Some CFM values on the table are outside of the general air-flow operating limits and are for reference only.

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 - 'off' down?
☐ YES ☐ NO	Are the unit circuit breaker(s) low leg power(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.

For (-)H2T air-handlers, when the Y1 (1st stage) thermostat signal is energized by the thermostat, the indoor blower motor operates at the 1st stage cooling air-flow level. When the Y2 (2nd stage) thermostat signal is energized by a 2-stage thermostat, the air-flow increases to the 2nd stage of cooling air-flow. As the 2-stage thermostat alternates between the 1st and 2nd cooling stages, the indoor air-flow alternates between the 1st and 2nd stages of air-flow.

When the thermostat call is satisfied or turned to the off position, the G and Y inputs from the thermostat are de-energized. A time delay programmed into the (-)H1P blower control board or (-)H2T motor keeps the blower motor energized for an additional 30 seconds to extract the residual cooling from the cold indoor coil before it shuts down. If the thermostat is set for continuous fan operation, the motor continues to operate when the call for cooling ends. The air-flow on an (-)H2T air-handler will be reduced to the continuous fan speed while the air-flow on a (-)H1P air-handler will remain constant.

4.3.2 ELECTRIC HEAT MODE

When the thermostat calls for the 1st stage of heat, the W1 terminal on the blower control board is energized. This energizes the indoor blower motor and all of the electric heater elements for heater kits with 10kW of heat or less and the 1st stage elements for 15kW heater kits and higher. If W1 and W2 thermostat pigtail at the air-handler are wired together on 10kW heater kits and higher, all of the elements to be energized. For 10kW heater kits and higher, a 2-stage heat thermostat can be used to energize the W2 terminal on the blower control board upon a call for a 2nd stage of heat which will in turn will energize the 2nd stage heater elements. The heater kit will cycle between the 1st and 2nd stages of heat at the direction of the thermostat.

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 in a few seconds as the bimetallic disc in the sequencer cools. 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.

For (J)H2T air-handlers, when the Y1 (1st stage) thermostat pigtail is energized by the thermostat, the indoor blower motor operates at the 1st stage heating air-flow level. When the Y2 (2nd stage) thermostat pigtail is energized by a 2-stage thermostat, the air-flow increases to the 2nd stage of heating air-flow. The air-flow levels for both stages the heat pump heating are the same for the cooling mode. As the 2-stage thermostat alternates between the 1st and 2nd heat pump heating stages, the indoor air-flow alternates between the 1st and 2nd stages of air-flow.

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 the supplemental electric heat. For 10kW heater kits and larger, the W1 and W2 pigtail can be connected together for maximum supplemental heat for 2nd stage or wired to the W1 and W2 terminals on the thermostat separately to provide a 3rd stage of heat as needed.

When the thermostat call is satisfied, the G and Y terminals inputs from the thermostat are de-energized. A time delay programmed into the (J)H2P blower control board or (J)H2T motor keeps the blower motor energized for an additional 30 seconds to extract the residual heat from the warm indoor coil. If the thermostat is set for continuous fan operation, the motor continues to operate when the call for heating ends. The air-flow on an (J)H2T air-handler will be reduced to the continuous fan speed while the air-flow on a (J)H2P air-handler will remain constant.

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 O 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 sub-base 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. On (J)H2T models, the indoor blower motor will operate 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.

$$\text{Actual kW} = \text{Rated kW} \times (\text{Actual Voltage}^2 / \text{Rated Voltage}^2).$$

4.5 CALCULATING ELECTRIC HEAT CAPACITY IN BTUH

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

$$\text{BTUH Capacity} = \text{kW} \times 3412$$

$$(\text{Where } 3412 = \text{BTUH per kW})$$

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 3.13.5. 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 inline manometer, digital static pressure meter, or a Magnehelic. 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.

IMPORTANT:

When checking external static pressure in the cooling or heat-pump heating mode on (-)H2T models that are matched to a 2-Stage outdoor unit, the thermostat set point must be adjusted so the system is operating in the 2nd stage mode to assure the air-handler is delivering 2nd stage air-flow.

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:

$CFM = \text{Heating BTUH} / (\text{Elevation Factor} \times \text{Temp Rise } ^\circ F)$

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

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.

Note: The charging method for systems with a fixed orifice (piston) will likely be different than systems with TXV's.

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

5.0 COMPONENTS & CONTROLS

5.1 BLOWER MOTOR

All (-)H1P models have 2-speed single-phase permanent split capacitor (PSC) style motors.

- The 208/240 volt models also have voltage taps that allow the motor to be configured to restore full air-flow performance in 208 volt applications.
- The low speed tap is for applications with duct system external static pressures up to 0.5" W.C. and the high speed tap is for applications with external static pressures from 0.5 – 0.7" W.C.
- A run capacitor is required for the PSC motors which is mounted on the blower housing. Speed and voltage change instructions are detailed in Sections 3.13.1 & 3.13.2 of this manual.

All (-)H2T models have 5-speed constant torque electronically commutated (ECM) style motors that are significantly more efficient than PSC motors.

- The 208/240 volt models **do not** require the motor to be reconfigured for 208 volt applications, although the control transformer must still be reconfigured for 208 volt applications.
- 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 3.13.2.
- 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.
- For (-)H2T models matched to a 2-Stage thermostat and 2-Stage outdoor unit, a 2nd stage call for cooling or heat pump heating operation will result in both Y1+Y2 thermostat inputs being energized. The indoor blower motor will operate in the 2nd stage mode based on which terminal the blue (Y2) lead is connected to on the motor low voltage terminal block as long as it is connected to a terminal with a higher number than the yellow (Y1) lead.
- 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 MOTOR RUN CAPACITOR

Only the (-)H1P models have a run capacitor due to the fact they have PSC motors. The capacitor is mounted on the blower housing using a sheet metal strap. The microfarad (mfd) & voltage ratings vary depending on the blower motor and must be replaced with one with the same rating, except 370V rated capacitors can always be replaced with a 440V rated capacitor.

5.3 BLOWER CONTROL

An electronic blower control is provided to control blower motor & electric heat operation and is located inside the control box attached to the blower housing. The blower control in the (-)H1P and (-)H2T operate differently as described below.

(-)H1P Blower Control

- The contacts in the on-board relay (BR) are used to connect line voltage to the motor speed tap when there is a call for motor operation. Motor speed changes are made by switching motor speed taps at this relay.
- The control has an on-board 3 amp automotive style fuse to protect the control circuit.
- A plug on the electric heater kit wiring harness plugs into a 4 pin plug receptacle on the blower control to allow control of the electric heater by the blower control based on thermostat input.
- There is a 5-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 exterior of the air-handler cabinet.
- There is a 2 second on-delay for blower operation when there is a call for blower operation.
- There is a 30 second blower off-delay when a call for cooling or heat pump heating ends.
- There is a 75 second blower off-delay when a call for electric heating ends. This allows time for the contacts in the bi-metallic disc type heating sequencer to open which de-energizes the heater elements.

(-)H2T Blower Control

- 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.
- A plug on the electric heater kit wiring harness plugs into a 4 pin plug receptacle on the blower control to allow control of the electric

heater by the blower control based on thermostat input.

- 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 exterior of the air-handler cabinet.
- 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. This allows time for the contacts in the bi-metallic disc type heating sequencer to open which de-energizes the heater elements.

5.4 BLOWER

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 belly band type mount that screws into the side of the blower housing. The control box attaches to the front of the blower housing for access through the blower access door. The blower slides into place on a track and is secured by 4 sheet metal screws.

5.5 TRANSFORMER

A 40VA transformer is located inside the control box 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 & internally grooved aluminum tubing.
- Most models have 3 coil slabs in an "N" configuration, but some models have 2 coil slabs in an "A" configuration.
- All (-)H1P, (-)H2T air-handlers have non-bleed thermal expansion valves (TXV) for refrigerant control.
- All models have a self-draining polypropylene condensate drain pan to eliminate standing water & a painted & insulated sheet metal drip 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 coil is installed in the factory for upflow & horizontal left orientations. The coil must be removed and re-installed into the air-handler cabinet 180° from its factory orientation. An additional set of coil support rails must be installed before the coil can be re-installed. The additional set of rails are included with the air-handler for field installation. (See Section 3.2.2)
- The TXV sensing bulb is shipped unattached & must be securely attached to the vapor line with the supplied clamp and insulated with the supplied foam insulation. (See Section 3.10)

6.0 ACCESSORIES & KITS

6.1 ELECTRIC RESISTANCE HEATER KITS

- All (-H1P, -H1T) models are shipped without electric resistance heat.
- Electric heat kits ranging from 3kW to 30kW are available for field installation.
- Refer to Sections 3.13.5, 3.13.6, & 3.13.7 for electric heat kit model numbers available for specific air-handler models along with electrical ratings & additional information regarding the heater kits.
- Heater kit installation instructions are provided with the heater kit.
- All heater kits utilize open wire nickel-chromium heating elements.
- An automatic reset over-temperature limit is provided to shut off the heater elements should airflow become too restricted or if the blower motor fails.
- 10kW kits and larger are designed to operate in 2-stage heat mode if so desired or can be operated as single stage if the W1 & W2 thermostat pigtail are wired together.
- 208/240V single-phase ("J" Voltage), 208/240V 3-phase ("C" Voltage) & 480V 3-phase ("D" Voltage) heater kits are available.
- 115V ("A" Voltage) heater kits are not available.
- 208/240V 3-phase ("C" Voltage) heater kits must be installed in "J" Voltage air-handlers since there are no "C" Voltage air-handlers available. "C" voltage heater kits are for 3-phase applications and allow for smaller wire & fuse/breaker size compared to single-phase "J" Voltage heater kits.
- The heater kit is controlled by the blower control based on thermostat inputs.
- All heater kits are available with a circuit breaker style disconnect.
- 10kW heater kits and smaller are also available with either a pull-out style disconnect or with no disconnect.
- Incoming electric power is connected directly to the heater kit power terminals.
- The heater kit is provided with 2 power wires that connect to the air-handler power terminal block, providing power to operate the blower motor and controls.
- The heater kit is also provided with a 4-pin connector that plugs into a mating plug on the blower control to allow the control of the heater based on thermostat inputs.

6.2 JUMPER BAR KITS

- **Jumper Bar Kit 3 Ckt. to 1 Ckt. RXBJ-A31** is used to convert single phase multiple three circuit units to a single supply circuit. Kit includes cover and screw for line side terminals.
- **Jumper Bar Kit 2 Ckt. to 1 Ckt. RXBJ-A21** is used to convert single phase multiple two circuit units to a single supply circuit. Kit includes cover and screw for line side terminals.

NOTE: No jumper bar kit is available to convert three phase multiple two circuit units to a single supply circuit.

6.3 AUXILIARY HORIZONTAL OVERFLOW PANS

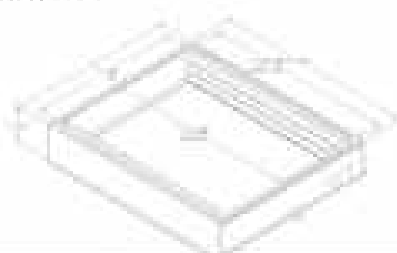
Cabinet Size	Auxiliary Horizontal Overflow Pan Accessory Model Number
17.5" wide & 3621S	RQBM-AC4H
21" & 24.5" wide except 3621S	RQBM-AC51

6.4 EXTERNAL FILTER BASES

(See Figure 18)

Model Cabinet Size	Filter Size	Part Number		A	B
17	16 x 20 (406 x 508)	RQHF-17	4" x 8" Filter	15.70	17.50
21	20 x 20 (508 x 508)	RQHF-21		19.20	21.00
24	26 x 20 (635 x 508)	RQHF-24		22.70	25.00

FIGURE 18
EXTERNAL FILTER BASE: RQHF



6.5 COMBUSTIBLE FLOOR BASES

For high heat downflow applications. (See Section 3.2.2.)

Model Cabinet Size	Combustible Floor Base Model Number
17	R018-17
21	R018-21
24	R018-24

6.6 HORIZONTAL ADAPTER KITS

This horizontal adapter kit is used to convert RCH replacement coils for horizontal applications if water management parts from original coil are not usable or are unavailable. See the following table to order proper horizontal adapter kit.

RCH Coil Model	Horizontal Adapter Kit Model Number (Single Qty.)	Horizontal Adapter Kit Model Number (10-pak Qty.)
2617	RXHH-A02	RXHH-A02x10
3017/3621S	RXHH-A03	RXHH-A03x10
3621M/4821S/4824S	RXHH-A04	RXHH-A04x10
5024S	RXHH-A05	RXHH-A05x10
3621M/4821S/5021S*	RXHH-A06	RXHH-A06x10

*1/2" Coil

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 maybe be set in legislation for servicing equipment with flammable refrigerant. The achieved competence should be documents 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 REFRIGERANT'S, 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 being placed, 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 bracing, 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, refrigerant 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.

A qualified installer, service agency or HVAC professional should instruct the homeowner on how to access filters for regular maintenance.

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

- New filters are available from a local distributor or home supply retailer.

7.13 INDOOR COIL, DRAIN PAN, DRAIN LINE

Inspect the indoor coil, drain pan, and drain line once each year for cleanliness and clean as necessary. Be sure to check the finned surface on the return side of the coil. It may be necessary to remove the air filter and use a mirror and flashlight to view the return side of the coil.

NOTE: A proper filter is the best defense against a dirty coil. Regardless of the filter choice, proper air-flow and velocity also play a crucial role in how effective a filter will be. Most filters will lose their effectiveness when face velocities exceed 300 - 400 feet per minute. Excessive air velocity can allow particles to pass right through the media. Additionally, loaded or restrictive filters may lose their

shape in higher air velocity applications and allow unfiltered air to bypass the filter altogether around the sides.

IMPORTANT: Coil and Drainpan Cleaning Method

Clean the finned surface of the indoor coil by rinsing the coil from both sides with clean warm water and/or with a vacuum with a soft brush attachment to remove accumulated contaminants and lint. It is important not to allow the tool to damage or bend the fins. Many chemical cleaners will attack the aluminum tubes which can cause refrigerant leaks. Therefore, use only clean warm water for cleaning aluminum tube evaporator coils. Do not use caustic household drain cleaners or bleach in the condensate pan or near the indoor coil as they will damage the aluminum fins and tubes.

7.14 BLOWER MOTOR AND WHEEL

Inspect the blower motor and wheel for cleanliness. 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 replacement of motor, blower, and blower wheel in Sections 7.5-7.7 below.
- 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 operate for an indefinite period of time without additional lubrication.

WARNING

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.

7.16 BLOWER ASSEMBLY REMOVAL & REPLACEMENT

Removing the blower assembly is not normally required for normal service and maintenance. Removal is necessary for replacement of defective parts such as motor, blower wheel. After extended use, removal of the blower assembly may become necessary for a thorough cleaning of the blower motor and wheel.

- 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).
- Mark low voltage control wiring (for replacement) where attached to unit control pigtail on right side of blower housing. Remove wire nuts attaching field control wiring to unit control pigtail.
- Remove 4 screws holding blower assembly to front channel of cabinet and pull blower assembly from cabinet.
- 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.
- Slide blower assembly to back of cabinet and make sure it is completely engaged.
- Replace 4 screws holding blower assembly to front channel of cabinet. Take care not to strip screws.
- Replace low voltage control wiring with wire nuts and make sure wiring is per the wiring diagram and all connections are tight and secure.
- Replace field power wiring to terminal block or circuit breaker(s) on control area of blower assembly. Make sure wires are connected per the wiring diagram. Tighten supply power wiring securely to terminal lugs.
- Make sure wiring is within cabinet and will not interfere with access door. Make sure there is proper separation between low voltage control wiring and field power wiring.
- 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:

- Remove motor leads from the motor capacitor and blower control box (-)H1P or motor terminals for (-)H2T. Note lead locations for ease of reassembly. Pull leads from plastic bushing in blower side.
- Loosen the set screw holding blower wheel onto the motor shaft. The shaft extends through 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 shaft. A wheel puller can be used on the groove in the blower hub if necessary.
- Remove 4 screws holding the motor mounts to the blower side and remove motor mount assembly from blower assembly.
- Remove the screw on the belly band strap around the motor shell and remove the 4 mounts from motor.
- Install (four) motor mounts and the belly band strap on the new motor using the screws removed in the previous step.
- Insert the motor shaft through the hub in blower wheel and orient motor to original position with motor leads and motor label facing

the front of blower (control area).

- Reassemble 4 screws through motor mounts into blower side. Do not overtorque screws.
- Turn motor shaft so that flat on shaft is located under blower wheel setscrew, and blower wheel is centered in blower housing with the same distance on each side between the inlet on/in and outside of blower wheel. Tighten setscrew on motor shaft. Turn wheel by hand to make sure it runs true without hitting blower sides.
- Reassemble motor wiring to capacitor and blower control for (-)H1P or motor terminals for (-)H2T making sure that wires match wiring diagram and are tight and secure.

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.

- 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.
- 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.
- Hold blower wrap down into position and replace screws holding blower wrap to blower sides.
- See motor replacement and blower assembly instructions for remaining assembly procedures.

7.19 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.

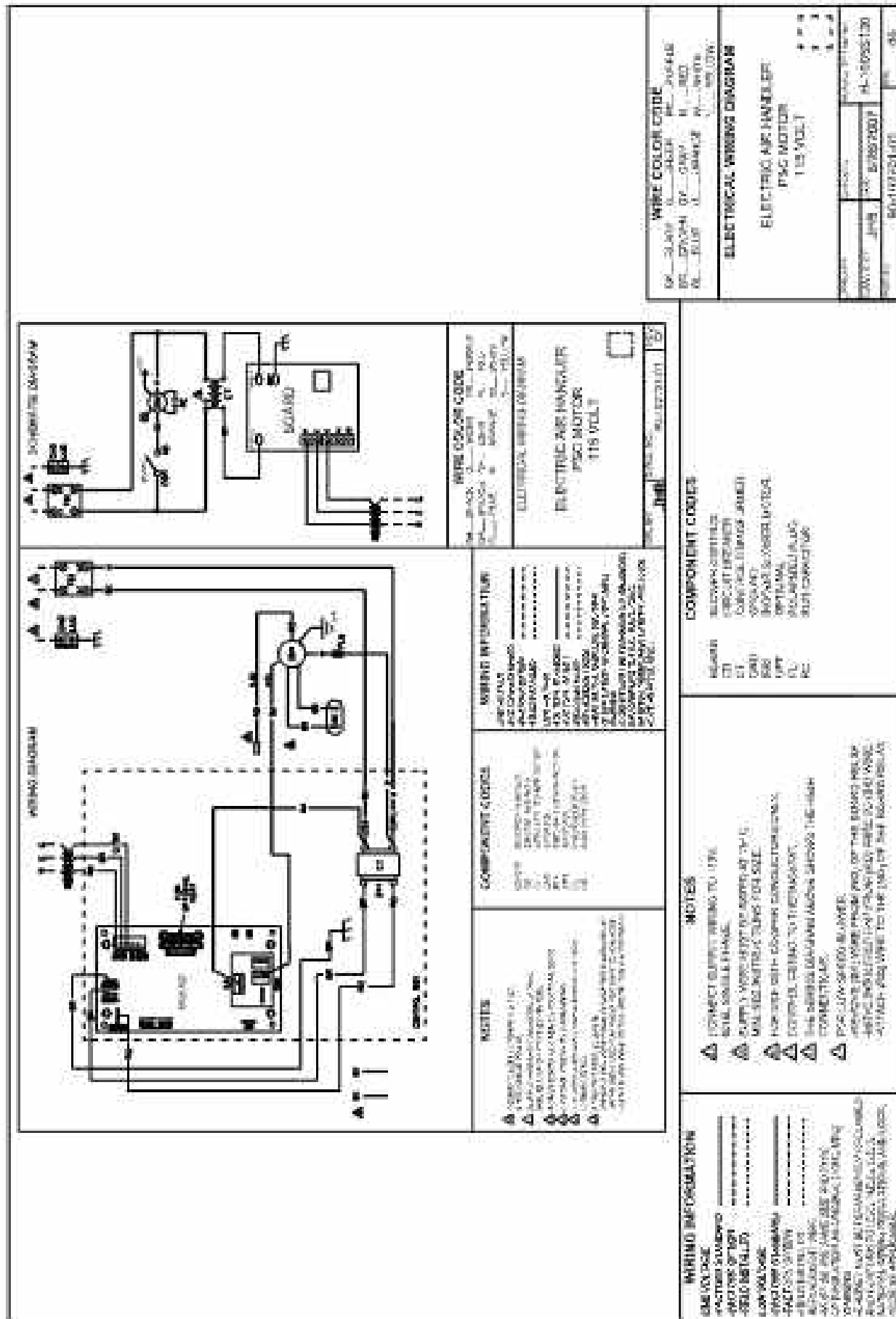
These parts include but are not limited to: Circuit breakers, heater controls, heater limit controls, heater elements, motor, motor capacitor, blower control, control transformer, blower wheel, indoor coil and sheet metal parts.

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).

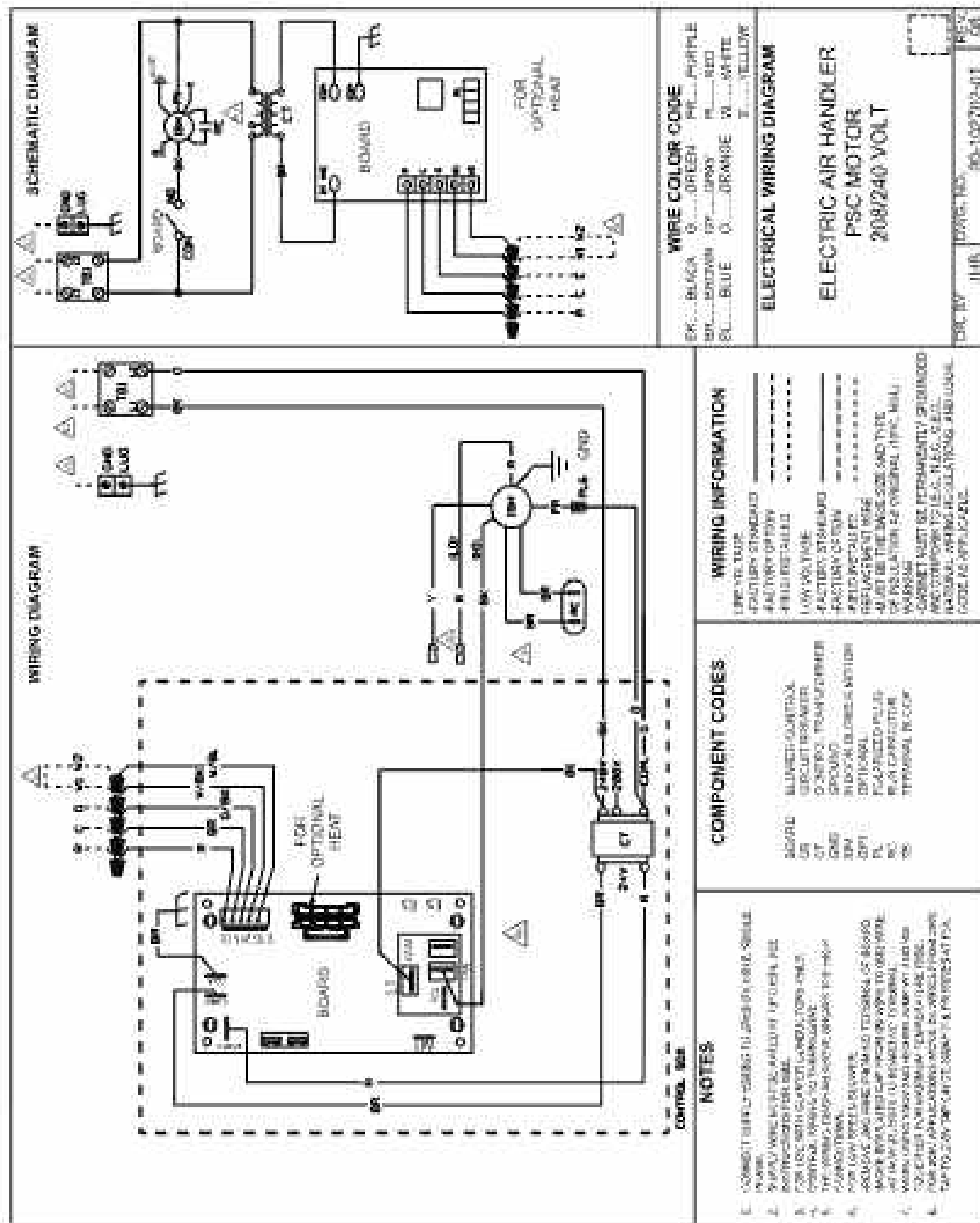
8.0 DIAGNOSTICS

Problem	Possible Cause (Suggested Fix)
Blower Motor will not operate	- Failed run capacitor on (-)H1P (replace) - Failed motor (replace) - Failed motor control module on (-)H2T (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 off 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 overflowing 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-flow) - 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 filter (replace filter) - Inadequate air-flow due to incorrect blower motor speed selected (select higher speed) or excessively restrictive duct system (correct duct system)
Excessive air-flow	Incorrect blower motor speed selected (select lower speed)
Water blow-off from coil	- Excessive air-flow (select lower blower motor speed) - Contaminants on coil fins (clean coil) - Damaged coil fins (comb out fins 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)

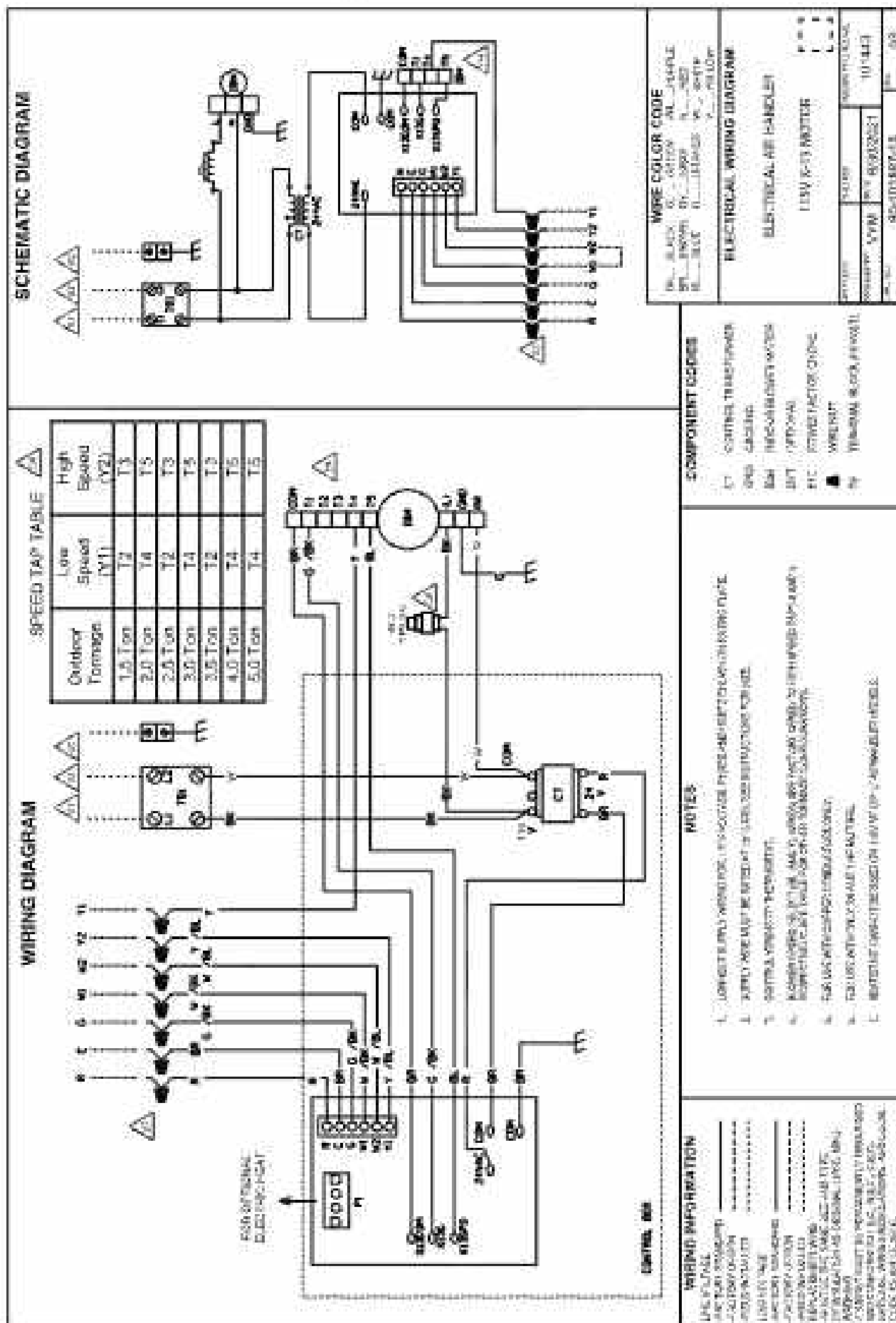
9.1 WIRING DIAGRAM (-)H1P – 115V

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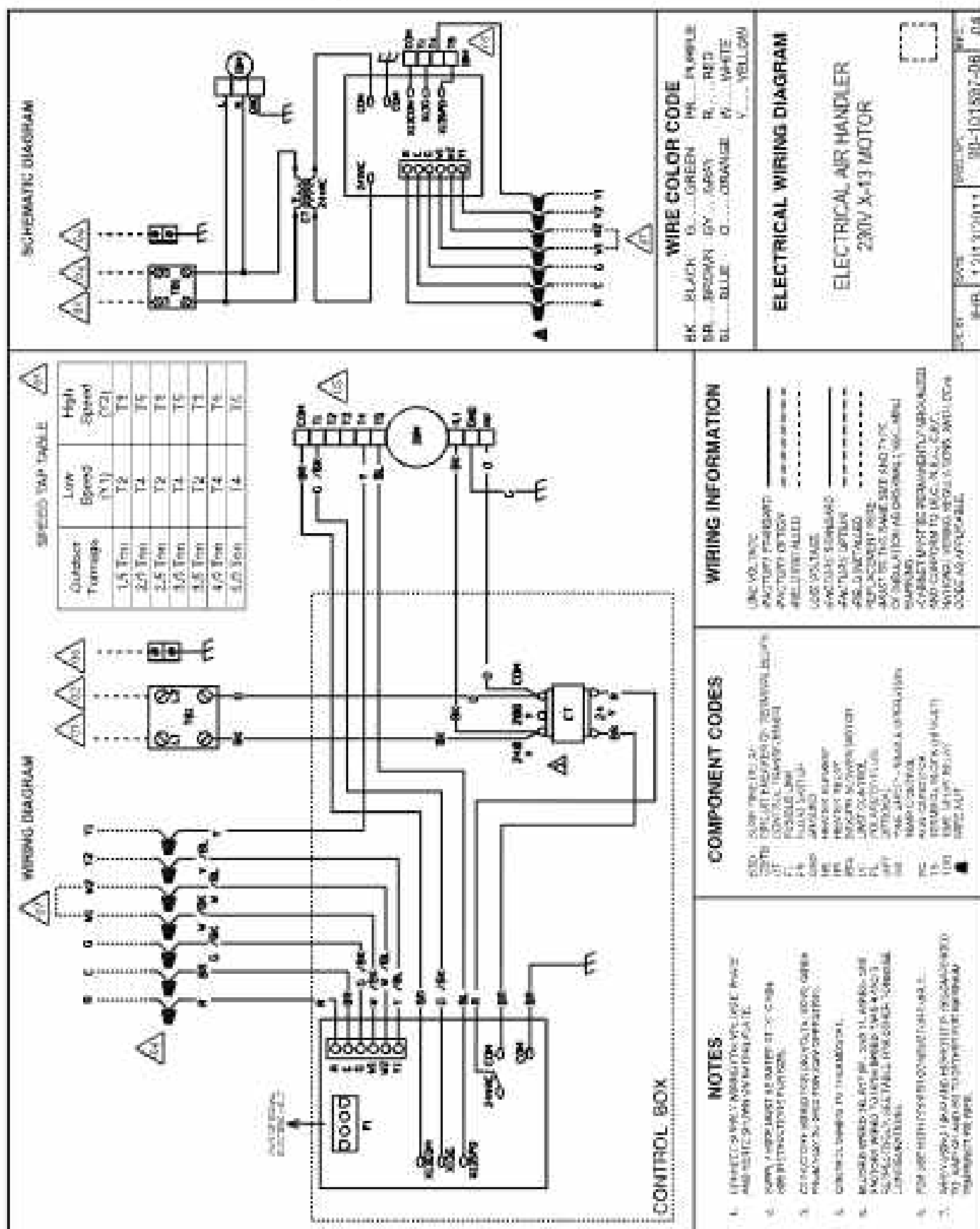
9.2 WIRING DIAGRAM (-)H1P – 208/240V



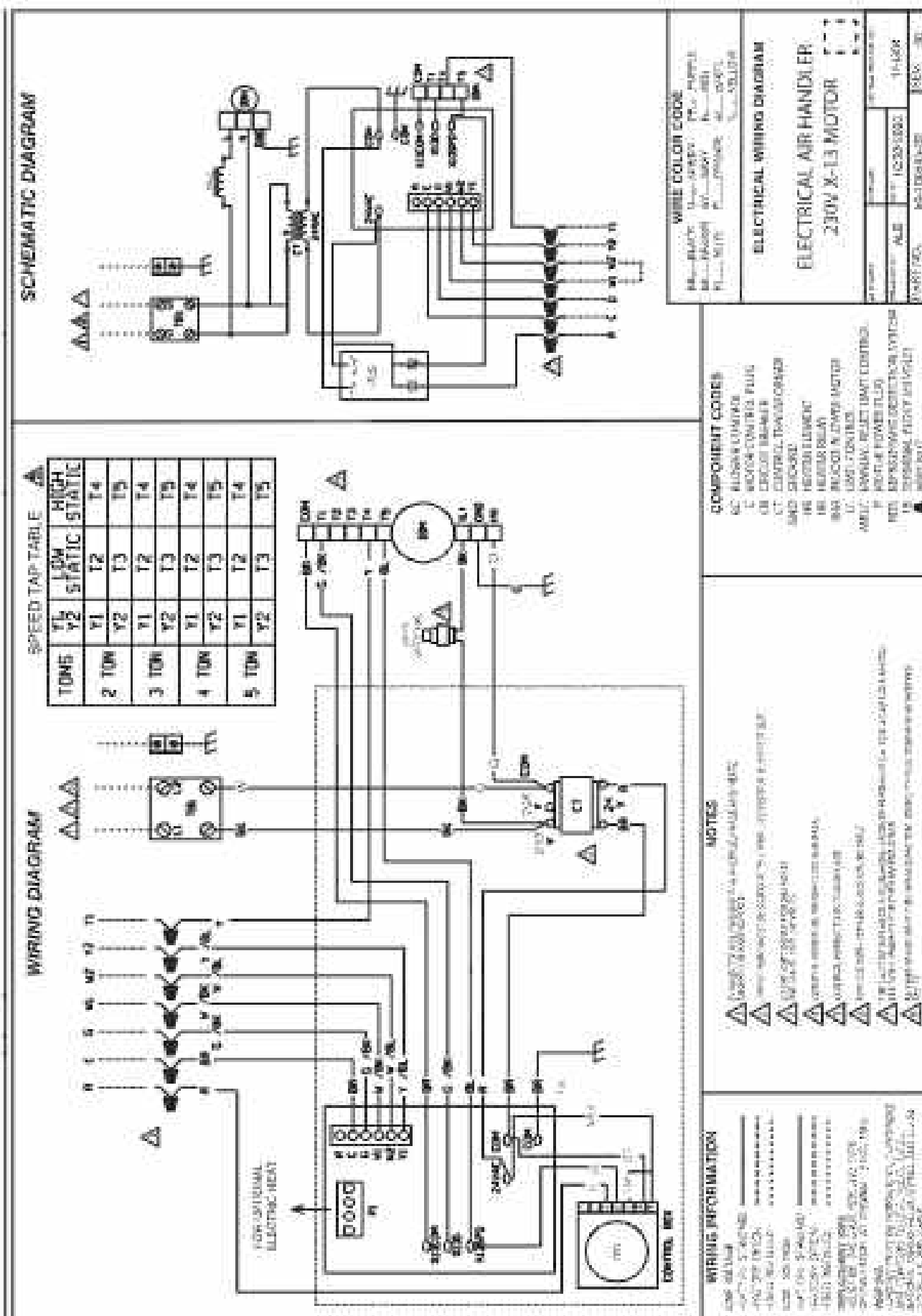
9.3 WIRING DIAGRAM (-)H2T - 115 V



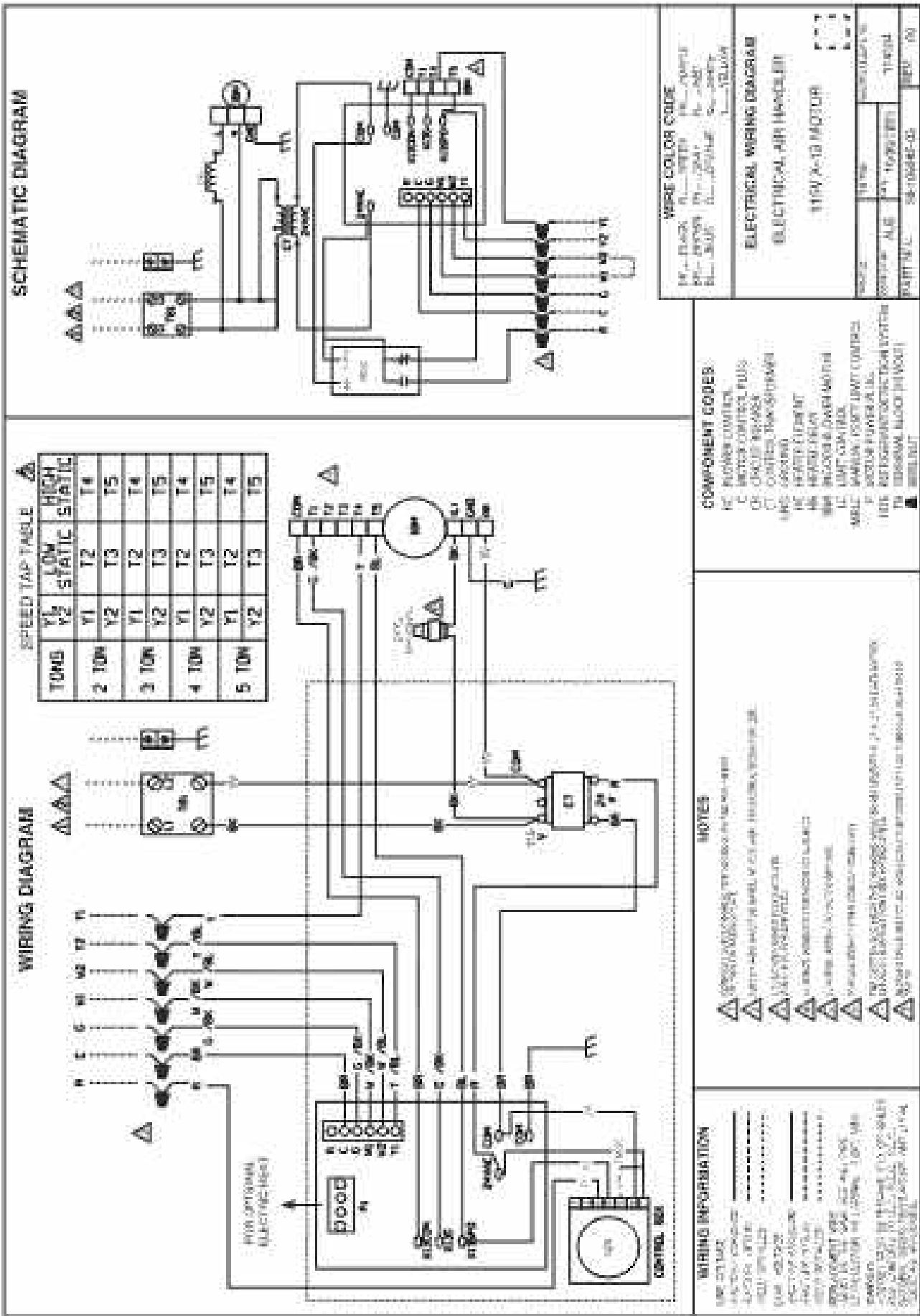
9.4 WIRING DIAGRAM (-)H2T – 230V



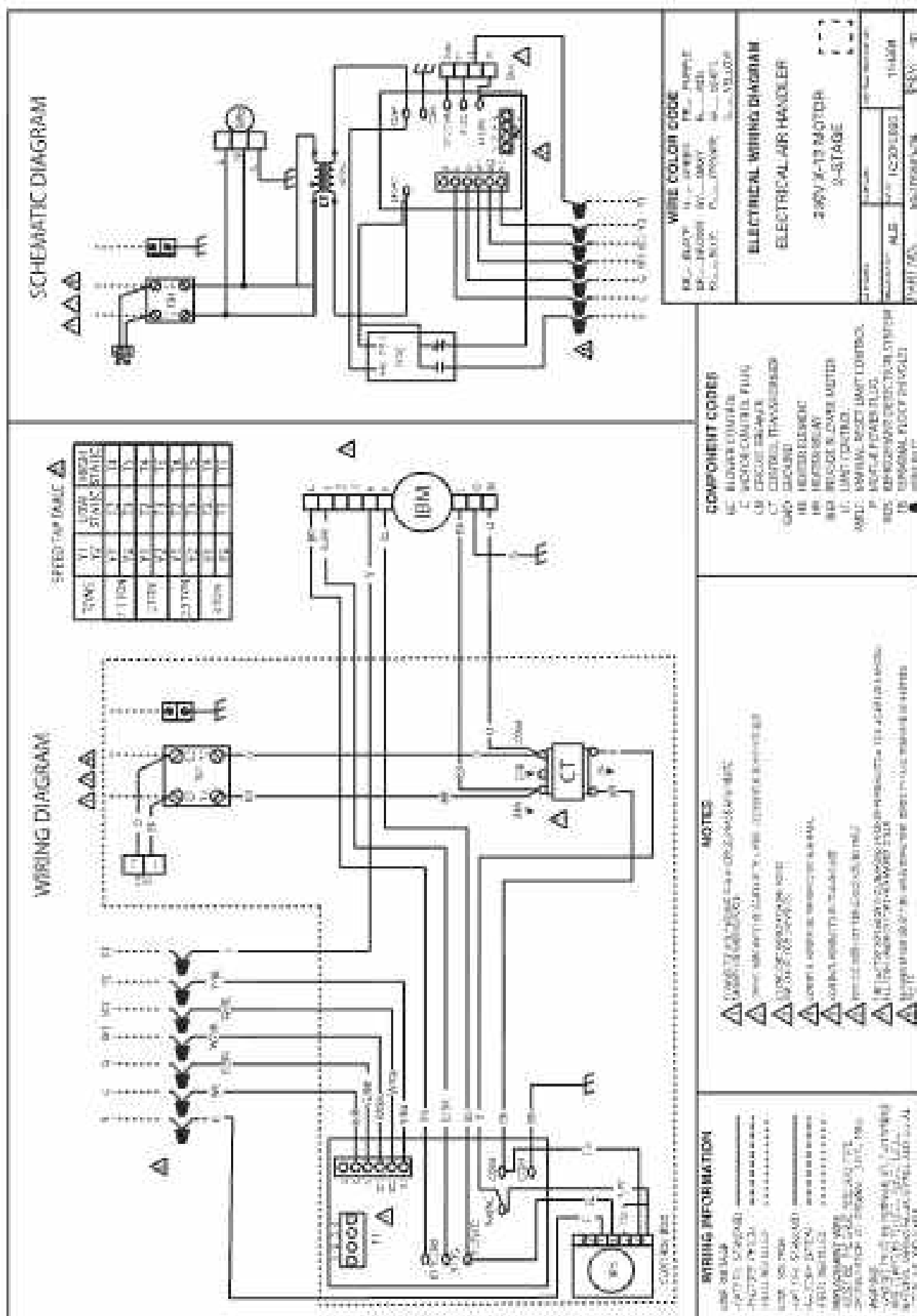
9.5 WIRING DIAGRAM (-)H2T – 230V



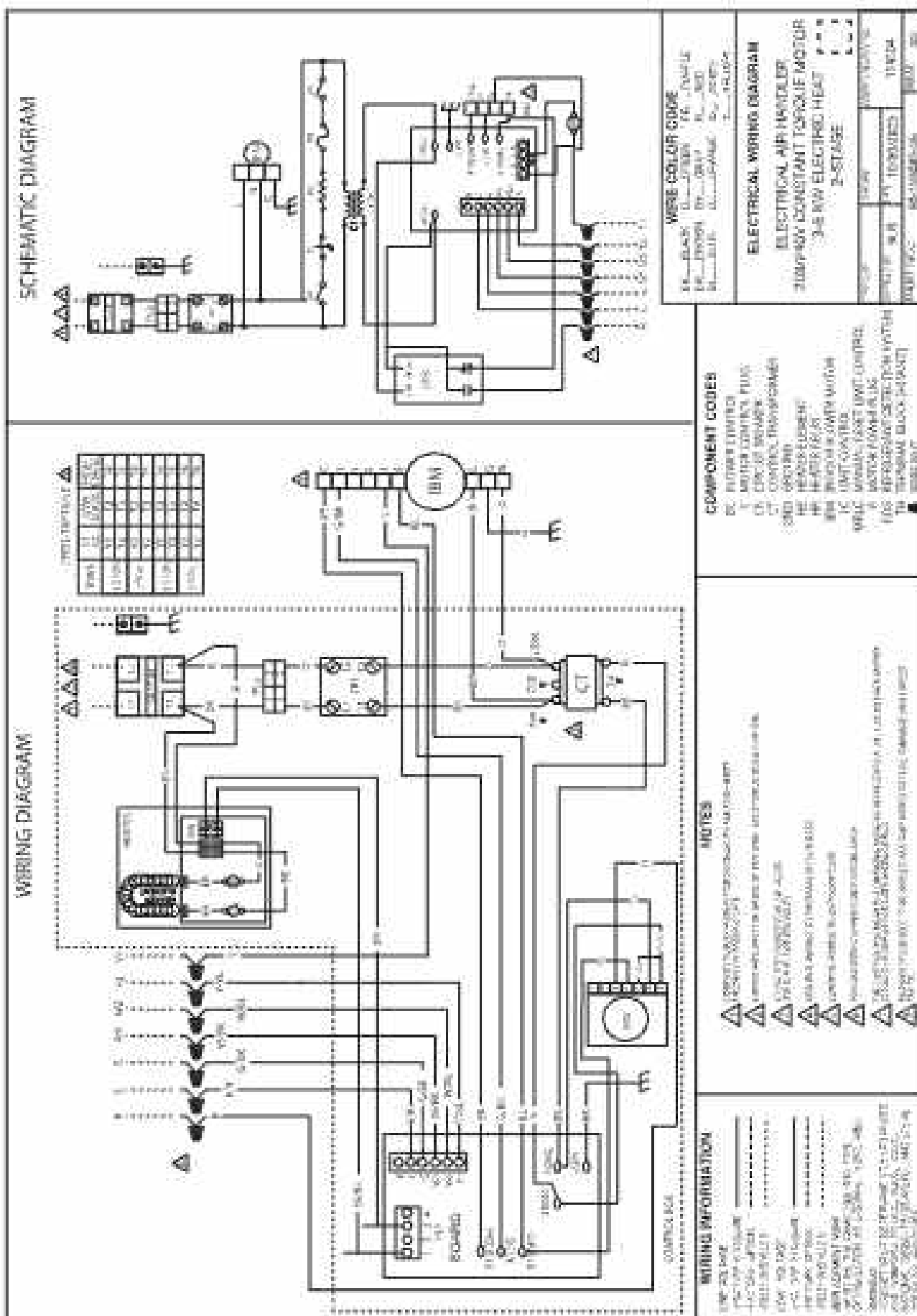
9.6 WIRING DIAGRAM (-)H2T – 115V



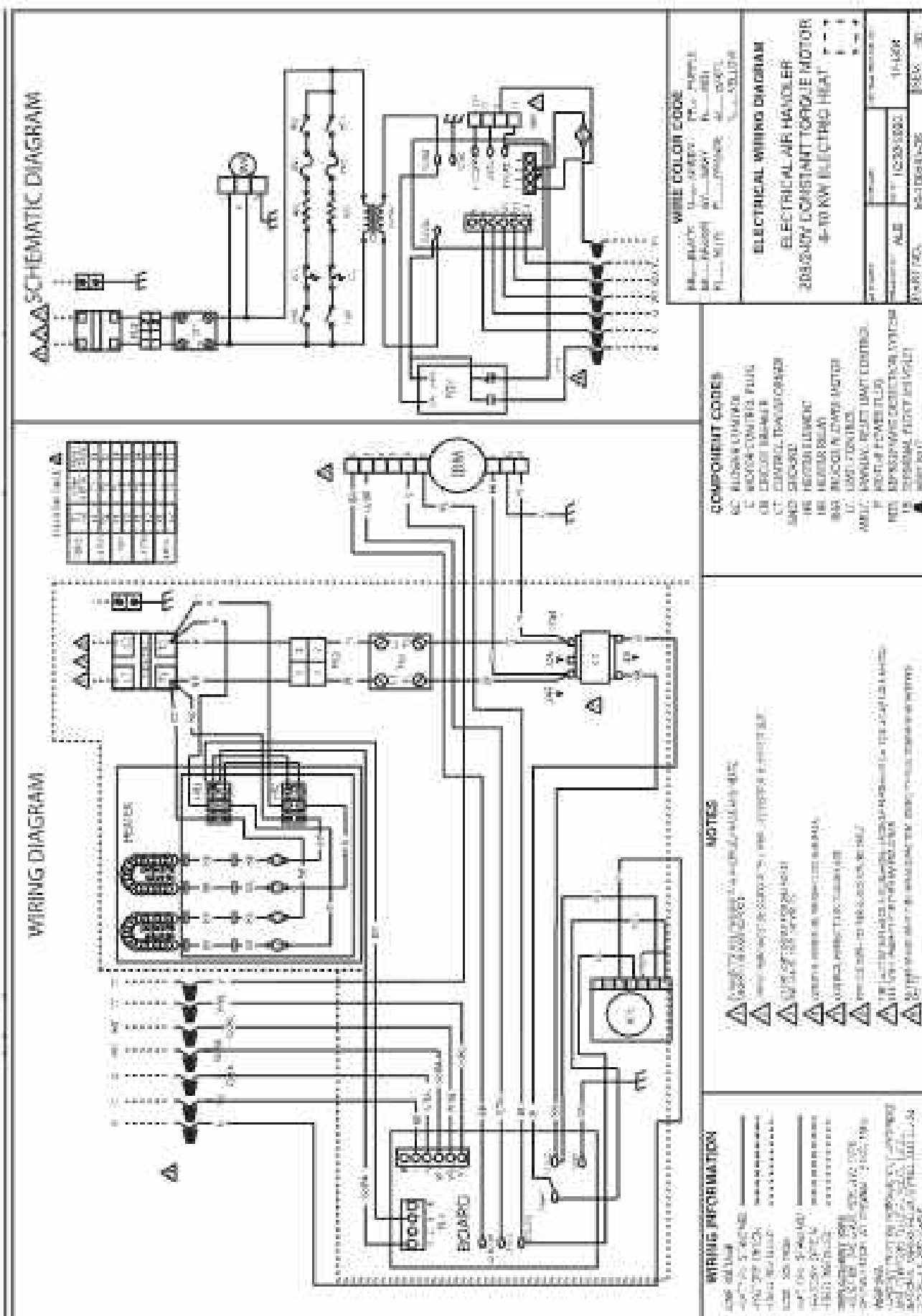
9.7 WIRING DIAGRAM (-)H2T – 230V



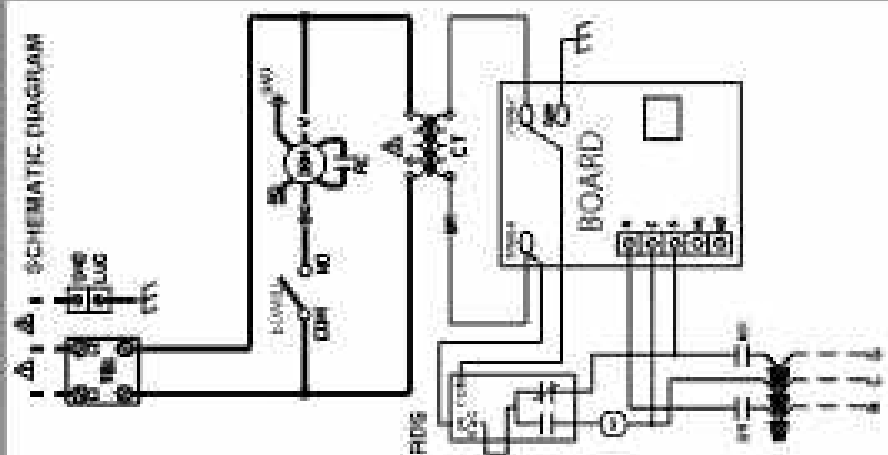
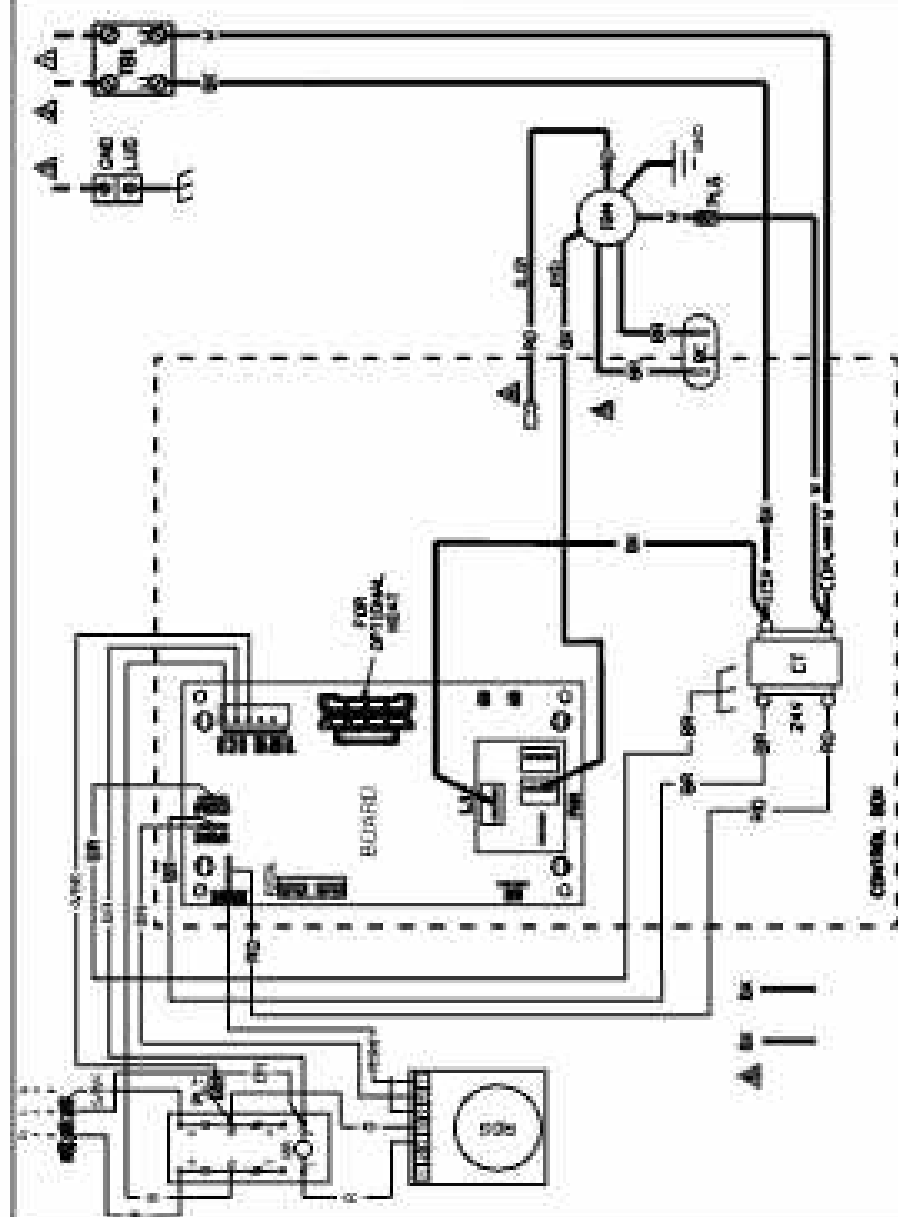
9.8 WIRING DIAGRAM (-)H2T – 208/240V



9.9 WIRING DIAGRAM (-)H2T – 208/240V



9.10 WIRING DIAGRAM (-)H1P – 115V



WIRE COLOR CODE

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

WIRING DIAGRAM - ELECTRICAL

ELECTRIC AIR HANDLER
(PSC MOTOR 115 VOLT)

DOC IV	DOC. NO.	REC.
1/1/1	50-108885-10	02

WITHIN INFORMATION

THE FOLLOWING INFORMATION IS FOR YOUR INFORMATION ONLY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. IT IS THE PROPERTY OF THE U.S. DEPARTMENT OF JUSTICE AND IS LOANED TO YOU. IT IS TO BE RETURNED TO THE U.S. DEPARTMENT OF JUSTICE WHEN YOU NO LONGER NEED IT. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE U.S. DEPARTMENT OF JUSTICE.

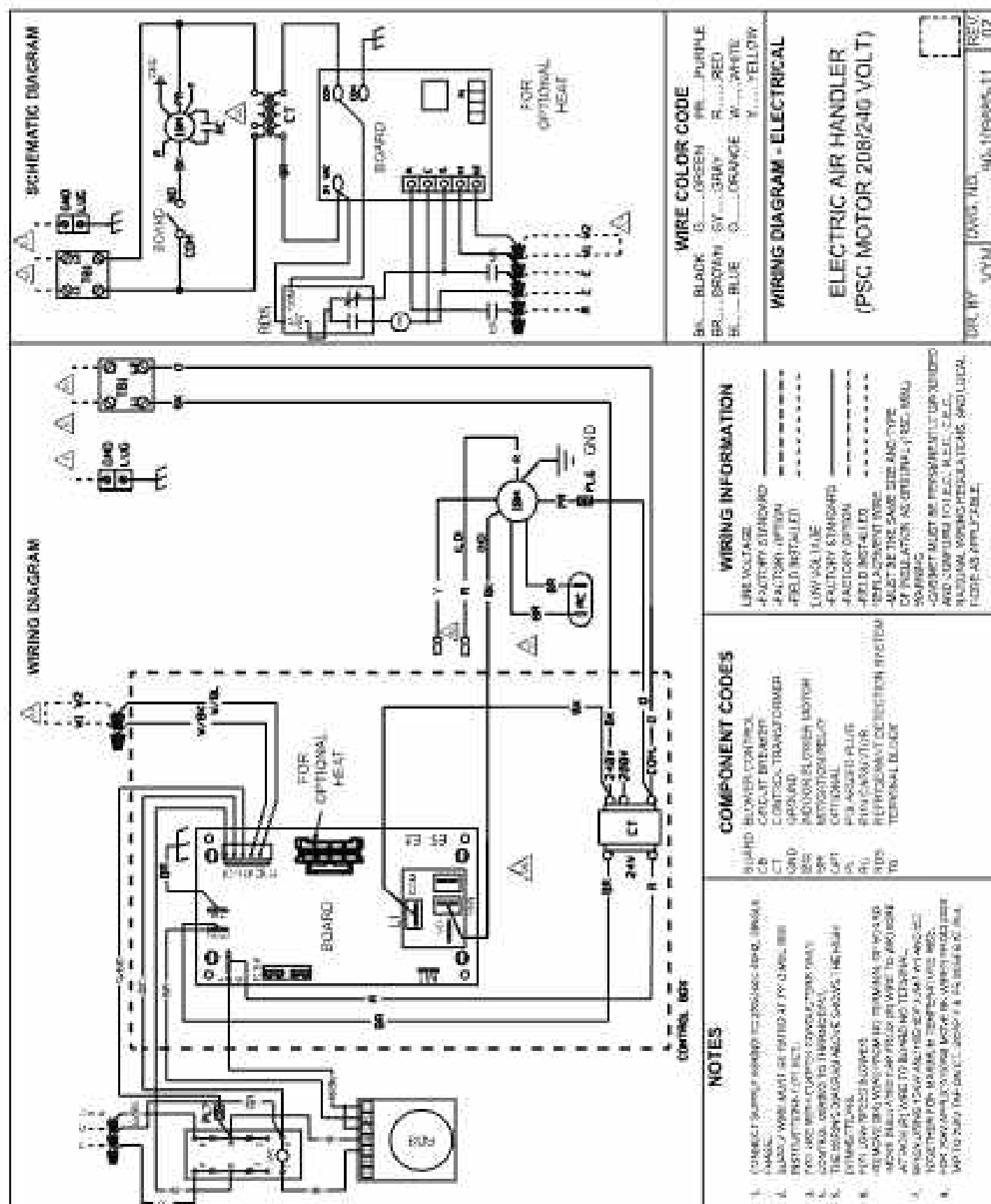
COMPONENT CODES

[illegible]

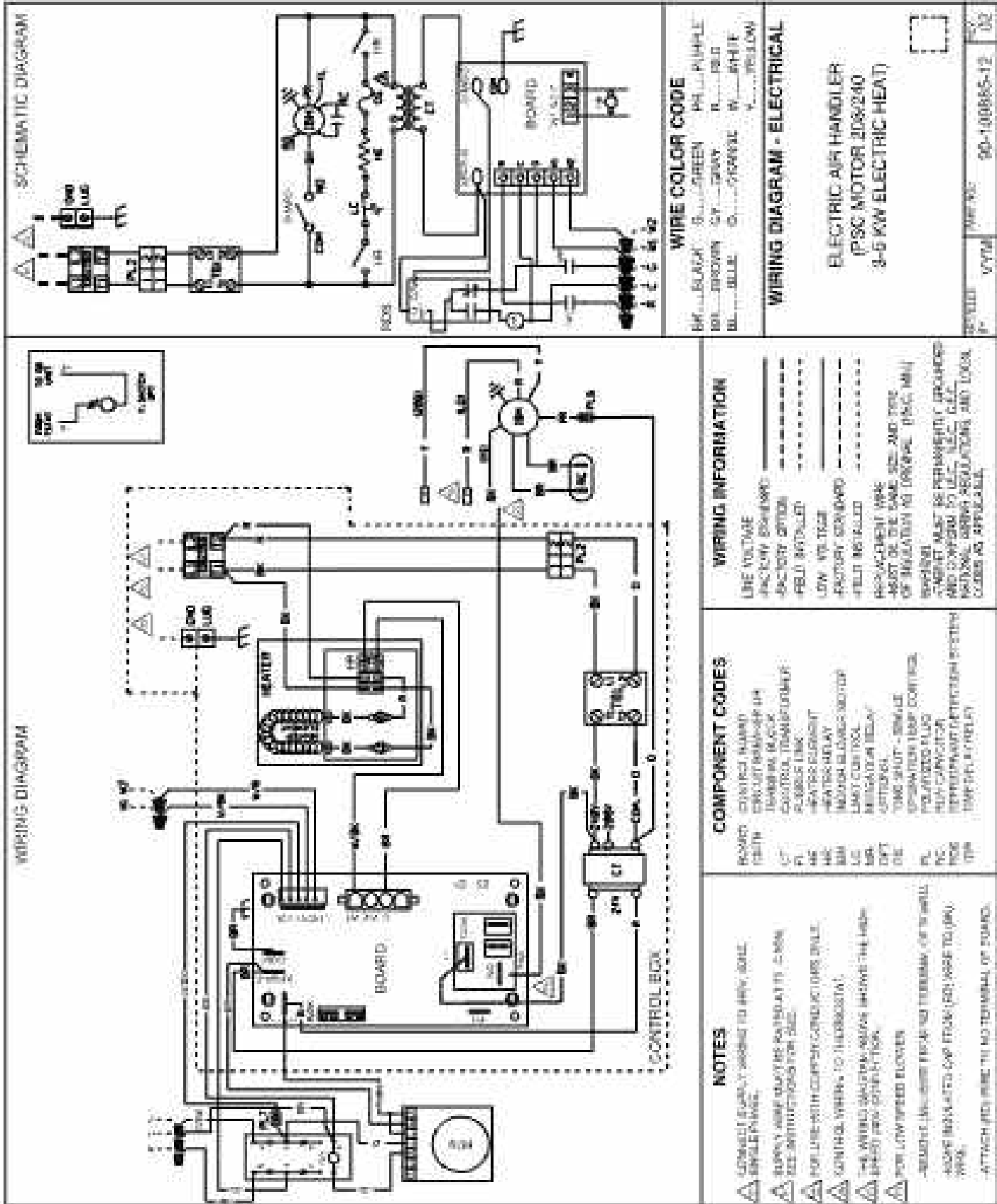
NOTES

- △ Connect to my wireless TV or audio device.
- △ Turn off all but required audio and video processing options.
- △ Set up my content source, tasks, and content.
- △ Control viewing in 3D mode.
- △ The content download service syncs the new content.
- △ For local content, sync.

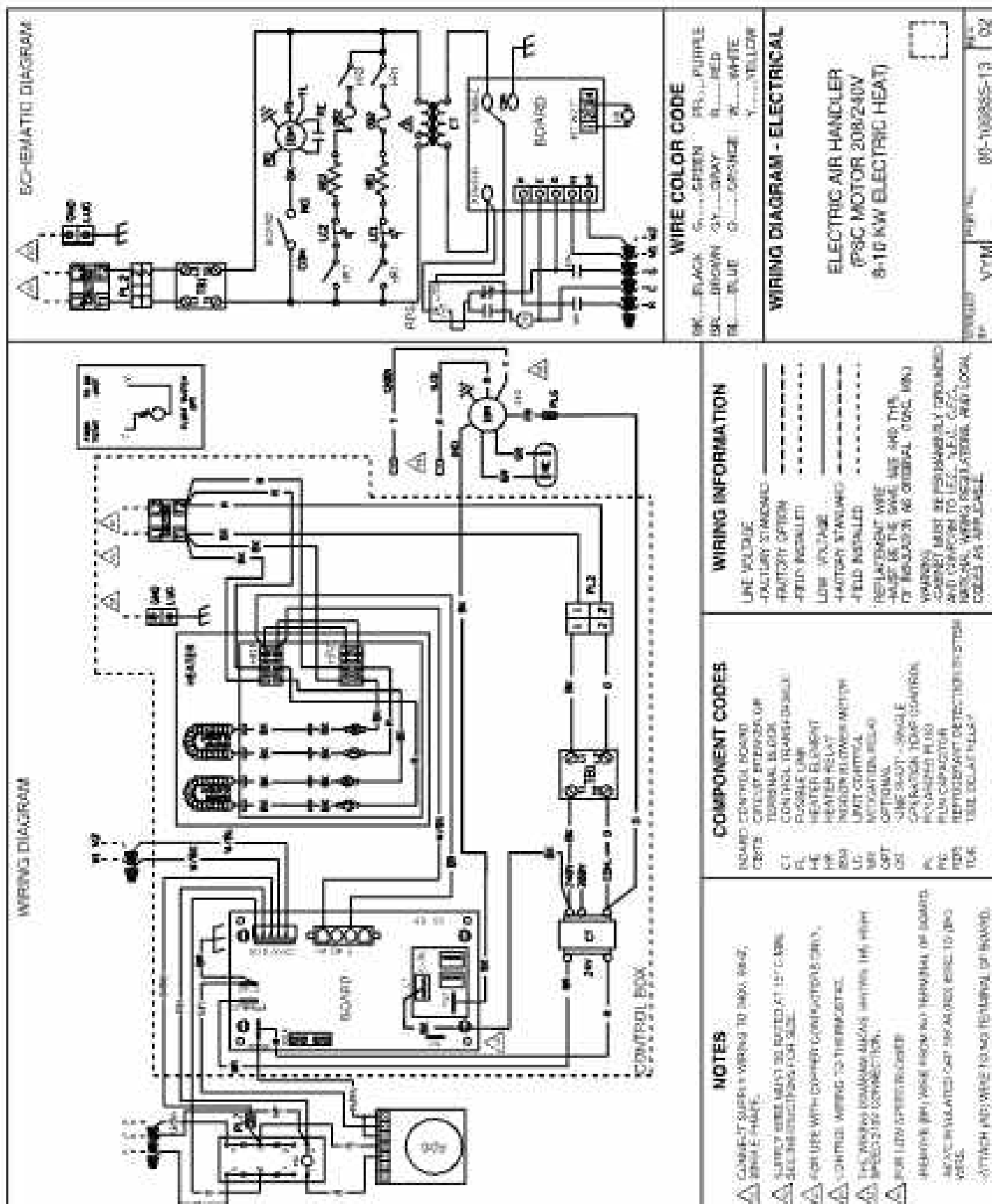
9.11 WIRING DIAGRAM (-)H1P – 208/240V



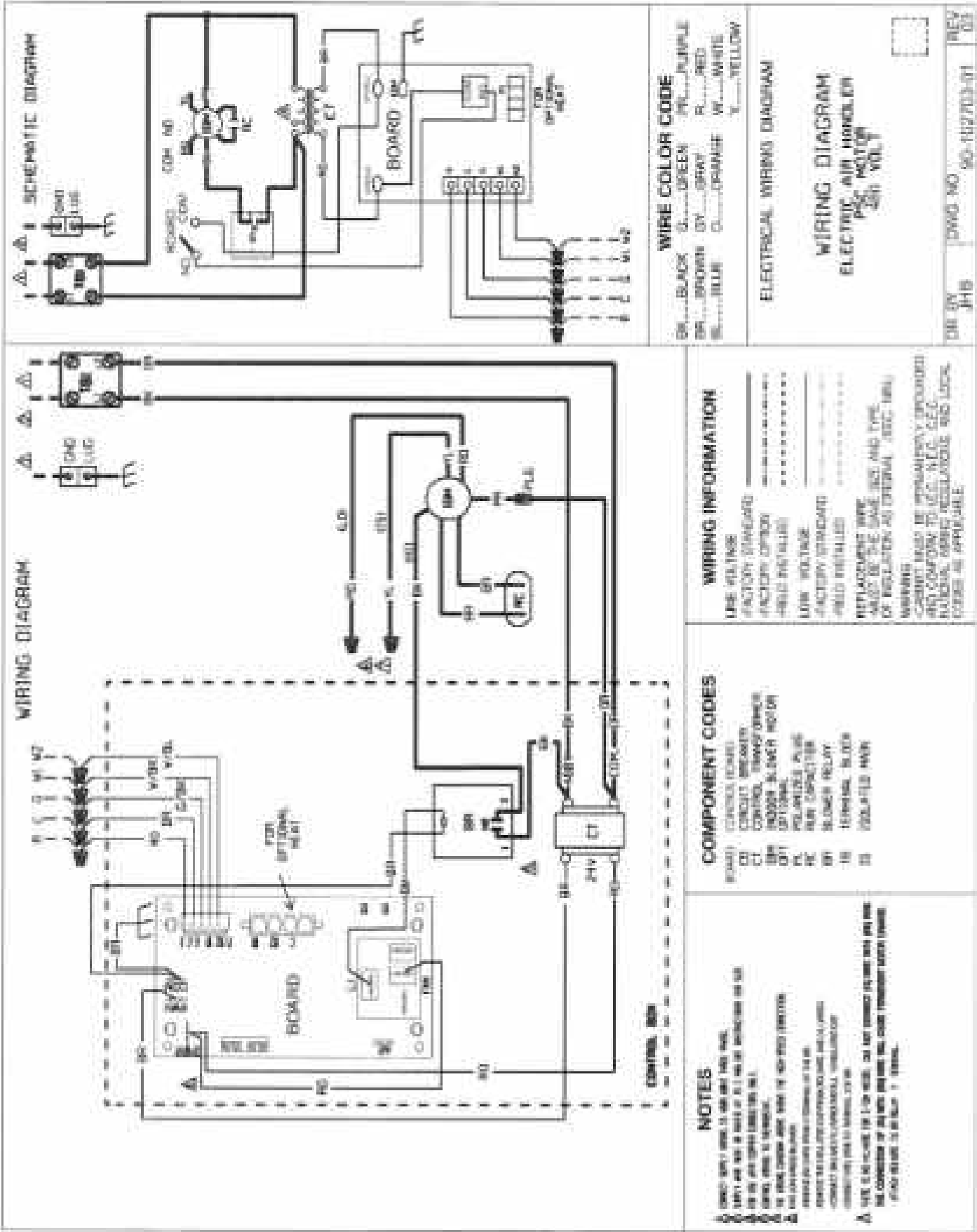
9.12 WIRING DIAGRAM (-)H1P – 208/240V



9.13 WIRING DIAGRAM (-)H1P – 208/240V



9.15 WIRING DIAGRAM (-)H1P - 480V



9.16 WIRING DIAGRAM (-)H2T - 480V

