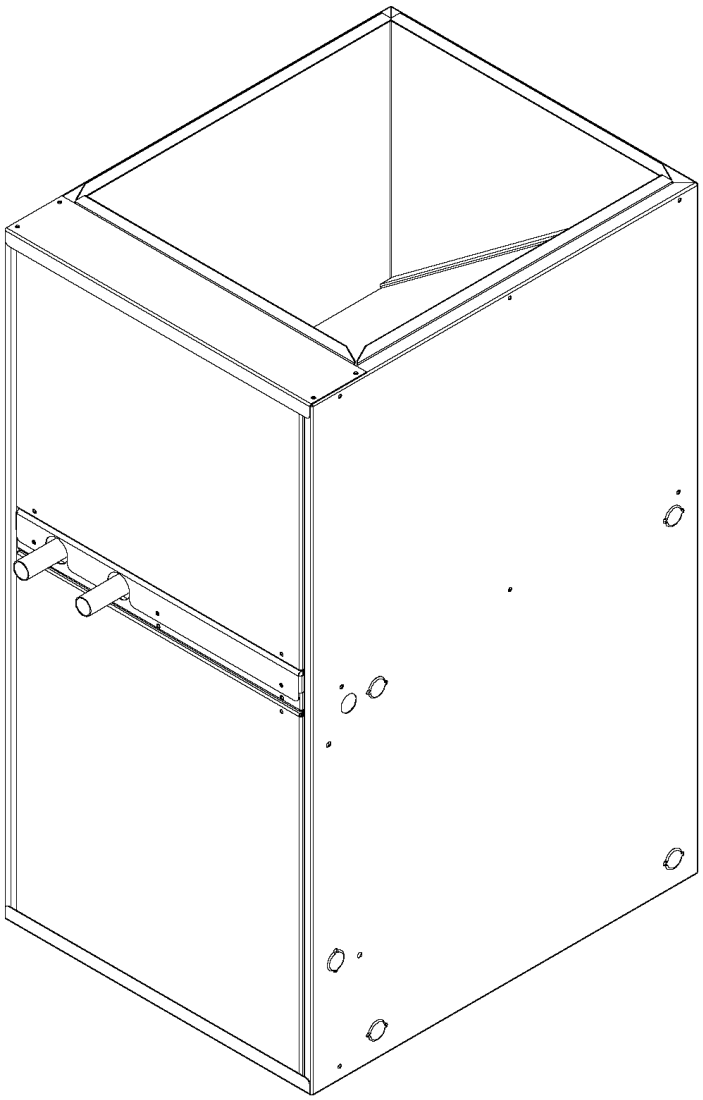
Rinnai®

37AHB SERIES HYDRONIC AIR-HANDLER SIZES 045 THRU 090

Installation, Operation, and Maintenance Manual



To register your hydronic air-handler or tankless water heater, please visit www.rinnairegistration.com.

Quality Assurance

This product is manufactured in a facility registered by UL to ISO 9001.

2100-536 Rev A

ELECTRICAL CONNECTIONS

Line-Voltage Connections:

U.S. INSTALLATIONS: Make all electrical connections in accordance with National Electrical Code (NEC) ANSI/NFPA 70 and all local codes or ordinances having jurisdiction.

CANADIAN INSTALLATIONS: Make all electrical connections in accordance with Canadian Electrical Code CSA C22.1 and all authorities having jurisdiction.

Check all factory wiring per unit wiring diagram and inspect factory wiring connections to be sure none were loosened in transit.

⚠ WARNING

Before installing or servicing system, always turn off all power to system. There may be more than 1 disconnect switch. Electrical shock can cause personal injury or death.

⚠ CAUTION

If a disconnect switch is to be mounted on the unit, select a location where a drill or fastener will not be in contact with electrical or hydronic components. Electrical shock can cause personal injury or death.

NOTE: Prior to making any electrical connections, ensure that supply voltage, frequency, and phase are as specified on unit rating plate.

Check to ensure that the existing electrical service is adequate to handle the additional load imposed by the Hydronic Air-Handler. Refer to unit wiring diagram for proper electrical connections.

All electrical connections MUST comply with NEC and any other local codes or ordinances having jurisdiction. USE COPPER WIRE ONLY. Provide separate branch electric circuit with field supplied disconnect switch.

Location of disconnect switch to be in clear site, accessible and in close proximity to the unit.

Correct polarity MUST be maintained for 115 V wiring. If polarity is incorrect unit will NOT operate.

Control Box Relocation:

The Control Box is factory installed in the blower compartment upper left corner (see Figure 12); if factory location of Control Box is suitable, proceed to next section. To relocate the Control Box to an alternate location (blower compartment upper right side) follow steps 1 thru 7 below:

1. Remove and keep one screw and cover from the Control Box.
2. Remove and keep two screws holding Control Box to casing of 37AHB unit (See Fig. 12.).
3. Remove wire tie from looped wires attached to Control Box.
4. Before Control Box is reinstalled, remove the scored piece of insulation from the desired side. Remove two knockouts in the casing where the Control Box is to be installed.

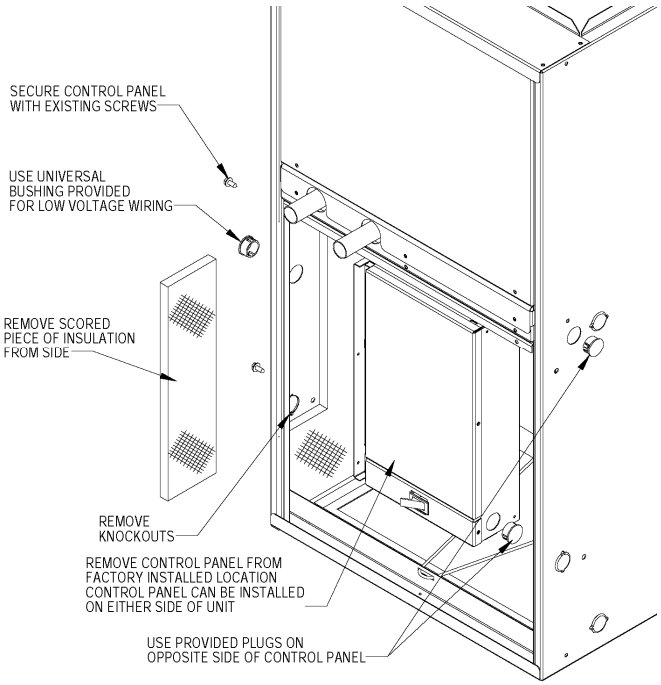


Figure 12: Control Box Relocation

⚠ WARNING

Do NOT remove ground screw inside control box.

5. Secure Control Box to casing with the two screws removed and kept from Step 2.
6. Reinstall two plastic plugs (from spare parts bag) where indicated in openings on adjacent side of Control Box.
7. Route Control Box wiring within unit away from hot surfaces, sharp edges and rotating parts.

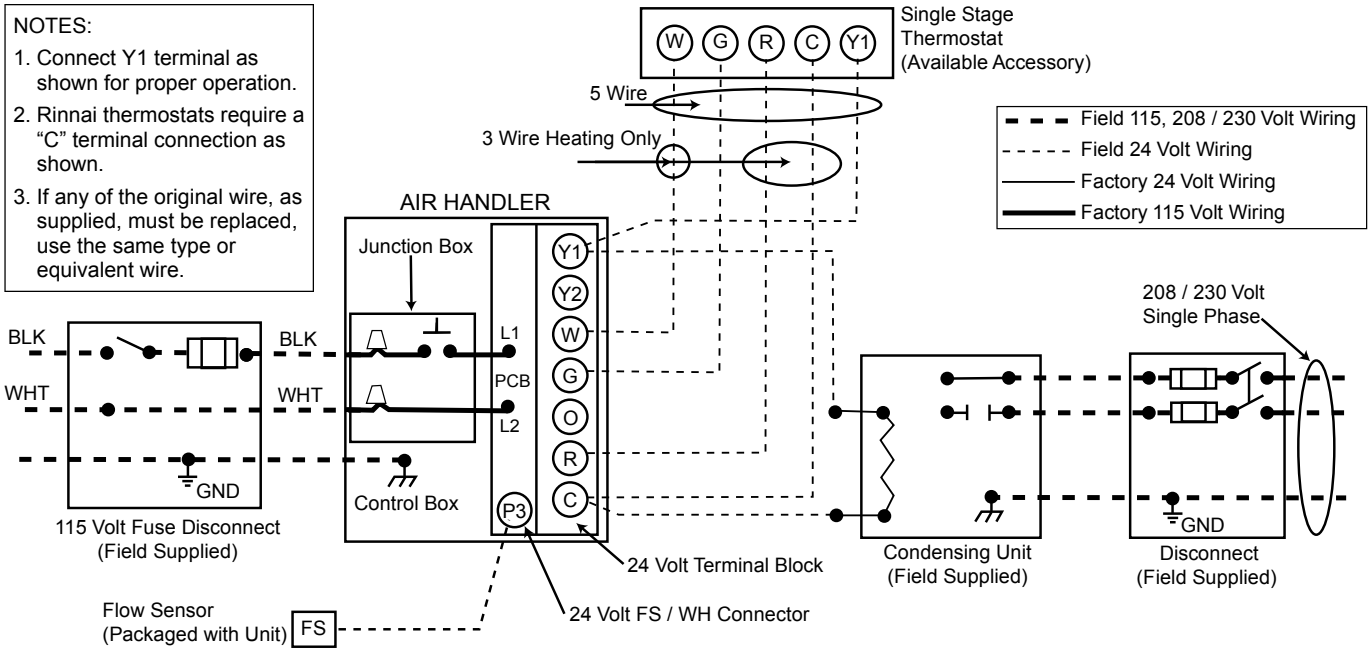


Figure 13: Field Wiring Diagram

Electrical Connection to Control Box

1. Route the air-handler power wires through aligned holes in casing and Control Box and make field wire connections in Control Box. Use best practices for wire bushings, strain relief, etc. Field wiring to the unit must be grounded and conform to the National Electrical Code C22.1 Part 1 - latest edition. Use only UL listed conduit and conduit connectors to connect supply wires to the unit and provide appropriate grounding. Grounding may also be accomplished by grounding the control box per appropriate local codes. Electric wires that are field installed shall conform to the temperature limitation for 63° F (35° C) rise when installed in accordance with instructions. Refer to Table 4 for specific air-handler electrical data.
2. Route and secure field ground wire to ground screw on Control Box.
3. Connect line voltage leads as shown in Figure 13.
4. Reinstall cover to Control Box. Ensure that wires are not pinched between cover and edge of Control Box.

⚠ WARNING

Failure to follow this warning could result in a fire. Do not use aluminum wire between the Hydronic Air-Handler and the disconnect switch. USE COPPER WIRE ONLY.

24V Control System Connections to Unit's Printed-Circuit Board (PCB):

Refer to Figures 25 through 27 for factory wiring details. For low voltage connections between the unit and the thermostat, use No. 18 AWG color-coded, insulated (63° F / 35°C minimum) wires. (Refer to Figures 16 through 19.)

Low Voltage Connections:

These units use a grounded 24 volt AC low voltage circuit and require at least a Single stage heating and a Single stage cooling thermostat.

The "R" terminal is the hot terminal and the "C" terminal is grounded.

"G" terminal is the fan input.
"Y1" terminal is the compressor Stage 1 input.
"Y2" terminal is the compressor Stage 2 input.
"O" terminal is the reversing valve input. The reversing valve must be de-energized for heating mode.
"R" terminal is 24 VAC hot.
"C" terminal is 24 VAC grounded.
"W" terminal is the heat input. This terminal also energizes the emergency heat if configured for heat pump.

Consumer Safety Information

SAFETY DEFINITIONS

Indicates safety alerts. When this symbol is seen on the Hydronic Air-Handler and in all instructions and/or manuals, be alert to the potential for personal injury. Recognize signal words DANGER, WARNING, and CAUTION. These words are used with the safety alert symbol.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE This is used to highlight important information which will aid in installation, improve reliability or enhance operation.

SAFETY CONSIDERATIONS

Before any work is undertaken, it is imperative to observe all precautions as stated in this manual, on tags, and/or labels, together with any other safety measures that may apply.

- Wear safety glasses and work gloves.
- When practical, objects to be brazed shall be moved to a designated safe location or, if the objects to be brazed cannot be readily moved, all movable fire hazards in the vicinity shall be taken to a safe place, or otherwise protected.
- Use quenching cloth for all brazing and un-brazing operations.
- Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

Read these installation instructions carefully and adhere to all WARNINGS and CAUTIONS. Consult local building codes, Occupational Safety & Health Administration (OSHA) and National Electrical Code (NEC) for special requirements.

Improper installation, modification, service, maintenance, or use of Hydronic systems can cause electrical shock, burns or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor for information or support. The qualified installer or agent must use factory authorized kits and/or accessories when installing this product. Refer to the appropriate Rinnai® literature for listing.

⚠ WARNING

Before installing or servicing the Hydronic Air-Handler, always turn off all power to unit. There may be more than 1 disconnect switch. Electrical shock can cause personal injury or death.

⚠ CAUTION

Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing.

NOTICE

Application of this Hydronic Air-Handler should be indoors. Special attention should be given to unit sizing and piping, filling, and purging.

Read the entire instruction manual before starting the installation.

Overview of the Rinnai Hydronic Air-Handler

INTRODUCTION:

The optimum in hydronic technology: the updated Rinnai® multi-position Hydronic Air-Handlers offer a unique solution for a wide variety of small and medium sized residential and light commercial applications. They are compact and ready to fit in tight spaces which may include, but not limited to, attics, basements, closets, crawlspaces, and utility rooms.

The 37AHB units are equipped with an intelligent microprocessor control that allows for domestic hot water priority and adapts to available hot water flow for space heating by automatically regulating the pump and blower sequence to maximize comfort.

These unique Hydronic Air-Handlers are designed to work in combination with our line of Rinnai® tankless products to deliver a wide variety of heating capacities that cover the entire residential and light commercial heating spectrum.

Because our units are designed specifically to the Rinnai® tankless products, our stated capacities are fine tuned and are based on the "Hydronic Air-Handler / Tankless Water Heater" match set and **NOT** a given water flow rate.

CODES AND STANDARDS:

It is the responsibility of the installer to follow all national codes, standards and local ordinances, in addition to instructions laid out in this manual. The installation must comply with regulations of the local building, heating, plumbing, and other codes. Where local codes are not applicable, the installation must comply with the national codes and any and all authorities having jurisdiction.

The following is a suggested list of codes and standards for the United States and Canada:

General Installation

Installation of Air Conditioning and Ventilating Systems NFPA 91 (latest edition)

Duct Systems

Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

2001 Fundamentals Handbook Chapter 34 or 2000 HVAC Systems and Equipment Handbook Chapters 9 and 16

US and CANADA: Air Conditioning Contractors Association (ACCA) Manual D

Acoustical Lining and Fibrous Glass Duct

US and CANADA: current edition of SMACNA; NFPA 90B as tested by UL Standard 181 for Class I Rigid Air Ducts

Electrical Connections

US: National Electrical Code (NEC) ANSI/NFPA 70 (latest edition)

CANADA: Canadian Electrical Code CSA C22.1 (latest edition)

Plumbing Systems:

US and CANADA: ICC International Plumbing Code (IPC); Uniform Mechanical Code (UMC); Uniform Plumbing Code (UPC)

Model Number Nomenclature

37AH B 045 08 K A 5

Model

37AH - Multi-Speed Hydronic Air-Handler

Series

A - Unit with PSC Motor
B - Unit with ECM Technology

Nominal Heating Capacity (BTU/h)

045 = 45,000
060 = 60,000
075 = 75,000

Cooling / Heating Air Flow Range (CFM)

08 = 800 (650-800)
12 = 1200 (650-1200)
14 = 1400 (1000-1600)
16 = 1600 (1200-1750)

Voltage Code (V-Ph-HZ)

K = 115 - 1 - 60
L = 240 - 1 - 50 (export models)

Engineering Digit

Denotes minor change (not present in sales or service literature)

Multi-position

5 = Yes
2 = No

Table 1 - Physical Data

DIMENSIONS										
UNIT SIZE	A		B		C		D		E	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
37AHB04508KA5	14	355.6	18	457.2	12	304.8	10 - 1/2	266.7	19	482.6
37AHB06012KA5	17 -1/2	444.5	18	457.2	16	406.4	16 - 11/16	423.9	19 - 1/4	489.0
37AHB07514KA5	21	533.4	18	457.2	20	508	18 - 11/16	474.7	19 - 1/2	495.3
37AHB09016KA5	24 - 1/2	622.3	18	457.2	24	609.6	21 - 1/8	536.6	19	482.6

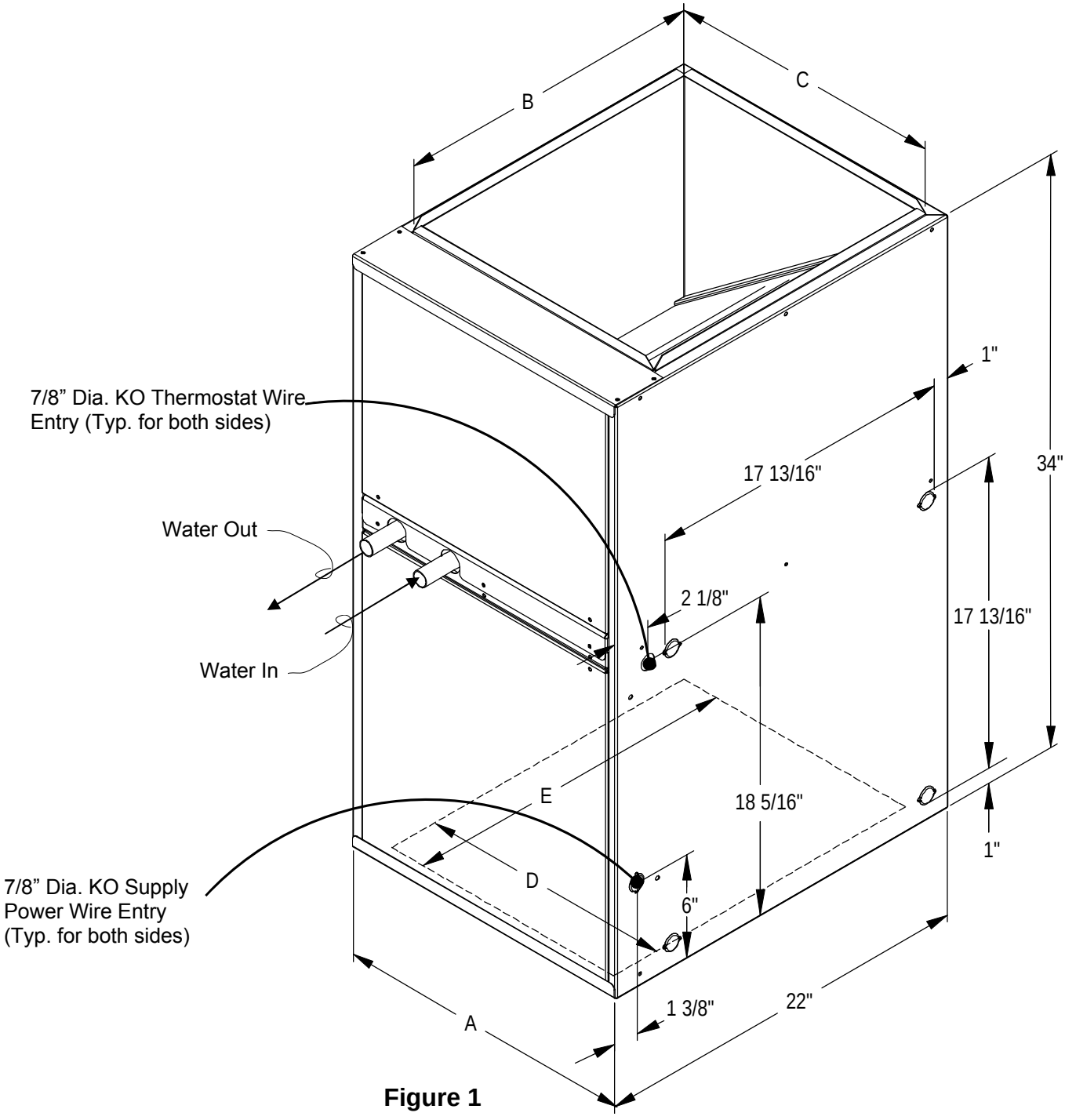


Figure 1

Receiving and Checking Equipment

IDENTIFY UNIT

The unit model number and serial number are stamped on the unit identification / name plate (located on the top right side of unit). Check this information against shipping papers and job requirements.

INSPECT SHIPMENT

Upon receipt of a 37 Series Hydronic Air-Handler the packaging should be checked for peripheral signs of transportation damage while unit is still in the shipping package. If unit appears to be damaged or is torn loose from its anchorage, the unit shall be immediately examined by the receiving party before removal. If damage is found, the receiving party must sign the driver's delivery receipt noting all damage (i.e. carton damage and/or product damage) as well as contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent. All claim papers MUST be forwarded to Rinnai® America Corporation for processing. In general, upon receipt of product, be sure to check all items against shipping list; if items are found to be missing, it should be noted as such on the driver's delivery receipt; and the receiving party shall also immediately notify the area distributor. To prevent loss or damage, leave all parts in original packages until installation.

Installation

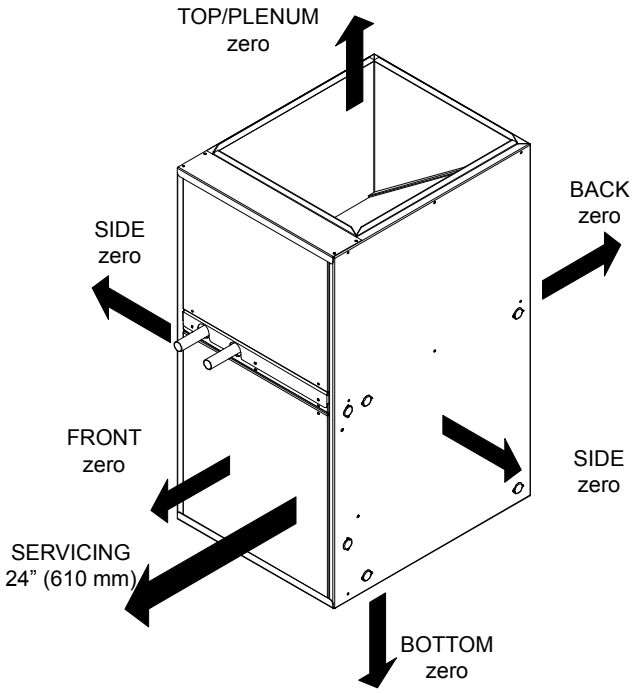


Figure 2: Minimum Clearance to Combustible Construction

⚠ WARNING

Do not install this unit if the unit is damaged.

Do not install this unit if any part or all of unit has been under water. Refer to the Receiving and Checking Equipment section.

The 37AHB Series Hydronic Air-Handler needs to be installed and commissioned by a knowledgeable qualified professional.

NOTES:

1. This Air-Handler is approved for up-flow, down-flow, and horizontal configurations.
2. Clearance arrows do not change with Hydronic Air -Handler orientation.
3. **This Hydronic Air-Handler is for indoor installation only.**
4. Unit(s) shall be installed in such a way as to ensure that the electrical components are protected from any contact with water.
5. Unit(s) shall not be installed directly on any combustible material other than wood flooring.
6. This unit is designed to be used with an air distribution system (ductwork). Refer to section the Air Distribution.
7. The installer shall provide ample space for servicing and cleaning. Always comply with minimum clearances as shown in Figure 2.
8. The 37AHB units are designed to be installed vertically or horizontally on the floor; units may also be hung from the ceiling or wall. Be sure to allow appropriate clearances for wiring, piping, and servicing.

LOCATING AND MOUNTING THE HYDRONIC AIR-HANDLER

General

The multi-position 37AHB Series Hydronic Air-Handlers are shipped in packaged configuration. This means that the units may be installed without assembly and/or modifications when configured for bottom return air inlet application; however, some modifications and assembly are necessary if units are to be installed in an application that requires side return air inlet arrangement. For instructions on required modifications and assembly refer to Figures 3 and 4.

NOTE: For side return application, obtain Side Filter Rack" and "Bottom Fill Plate from your area authorized Rinnai® distributor.

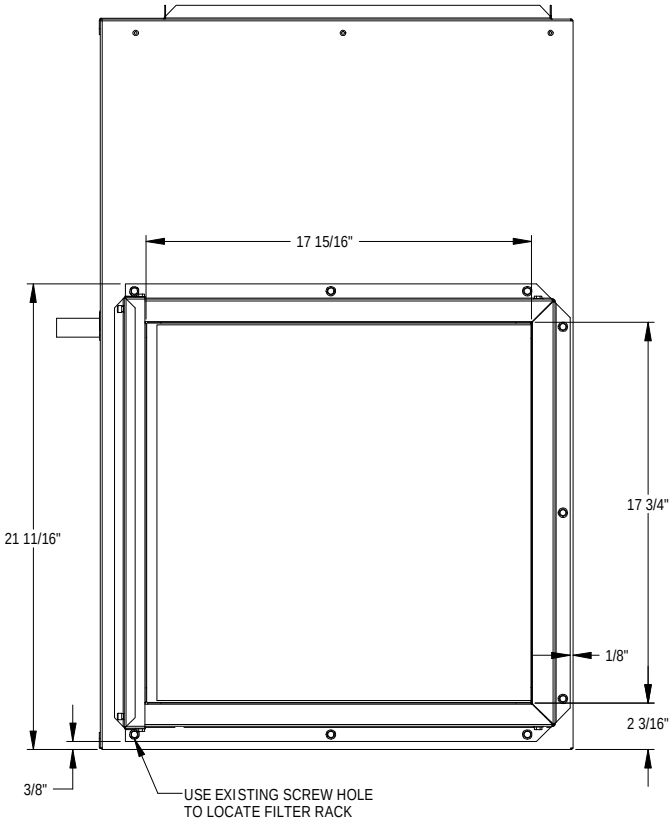


Figure 4: Side Filter Rack Installation

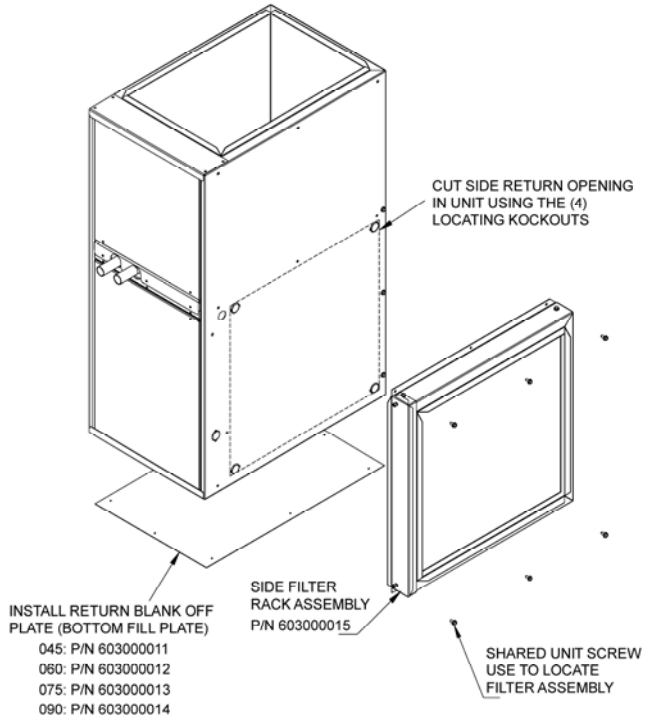


Figure 3: Modification of Unit to Accommodate Side Filter Rack Installation

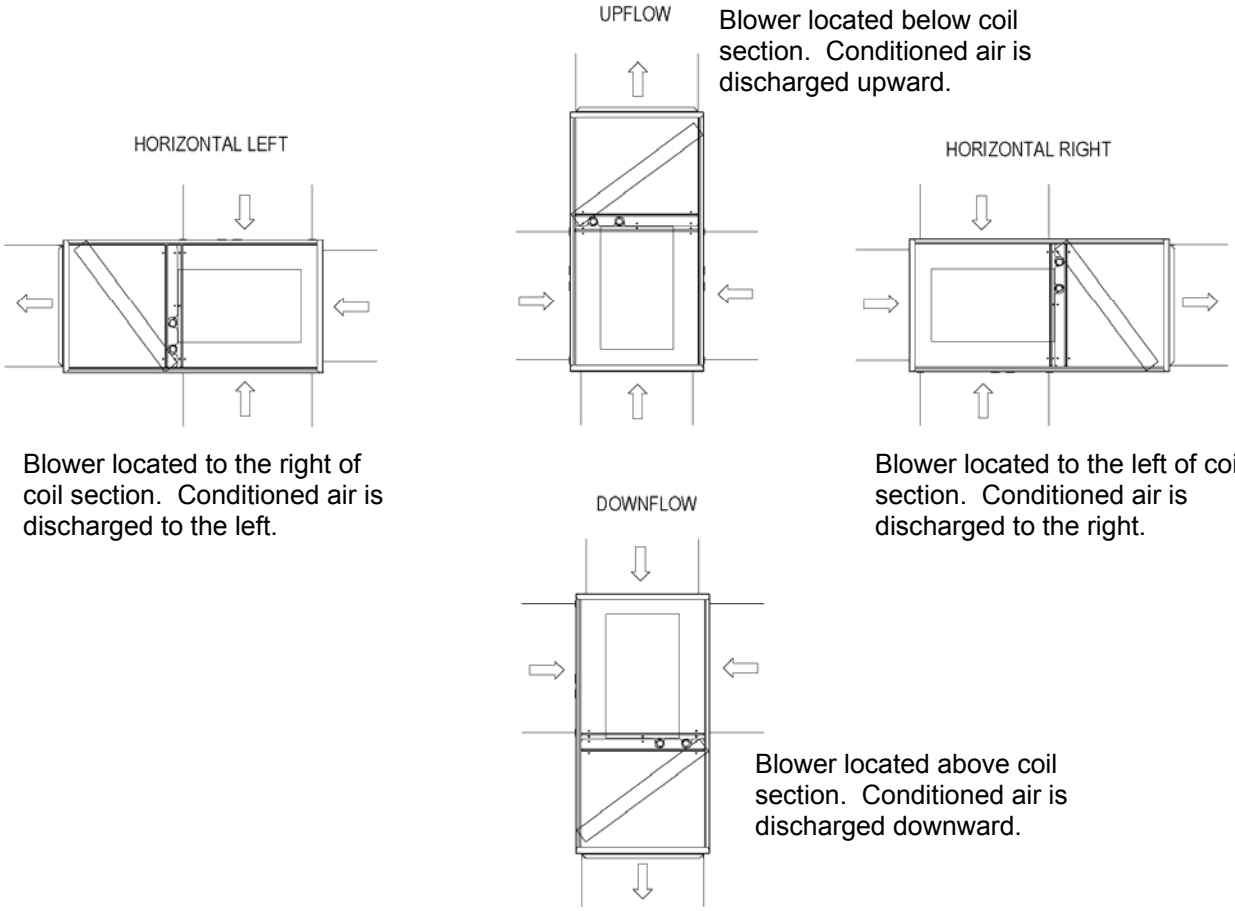


Figure 5: Multi-Position Orientation

Upflow Installations

The 37AHB Hydronic Air-Handler is ready to install in the up-flow position without modifications.

The unit MUST be supported on the bottom ONLY and set on a field supplied supporting frame or plenum. Supporting frame or plenum must be anchored to the unit and to the floor or wall.

The 37AHB Air-Handlers are shipped without a bottom fill plate. If side return installation is desired, the return opening (Bottom) must be blanked off. If a bottom fill plate is required, install only a factory authorized bottom fill plate. Refer to the Rinnai Accessory list for details. For side filter rack installation instructions refer to Figures 3 and 4.

Downflow Installation

The 37AHB Hydronic Air-Handler is ready to install in the down-flow position without assembly or modifications when configured for bottom return air inlet installation. If side return air inlet installation is desired refer to Figures 3 and 4.

Horizontal Left and Right Installations

Without Cased Coil:

If a cased coil is NOT being installed, the cabinet can be placed on either side for horizontal airflow as shipped, when configured for bottom return air inlet installation. If side return air inlet installation is desired refer to Figures 3 and 4.

With Cased Coil (Field Supplied):

Refer to the manufacturer's Cased Coil installation instructions for details.

CLOSET INSTALLATION (RETURN AIR THRU OPENING OR GRILL)

The 37AHB Hydronic Air-Handler can be installed in a closet on a supporting stand or be mounted from the closet wall using the closet as the return air plenum. Unit should be high enough from the floor to provide unimpeded return air flow into the bottom of the cabinet.

Closet return air opening can be on the front (in closet door), side (thru the wall) or a combination of both, providing there is clearance on the sides between unit's cabinet and closet. Refer to ACCA Manual D or SMACNA for sizing and free area recommendations.

NOTE: Local codes may limit application of systems without a ducted return to single story dwellings.

SUSPENDED CABINET INSTALLATION

If the cabinet cannot be supported on a frame or supported from the wall, it may be suspended.

Use metal strapping or threaded rod with angle iron under cabinet for support. These supports MUST run parallel with the length of the cabinet (see Figures 6 and 7).

Ensure that there is adequate room to remove service and access panels after installing supporting brackets.

If an auxiliary drain pan is required, the support is to be placed under the drain pan. In such installations the unit will need to be supported on vibration isolators (rubber or Styrofoam blocks).

IMPORTANT: When a 37AHB unit is matched with an evaporative type (cased coil/condensing unit) split system for cooling application and the system is installed above a finished ceiling and/or an occupied space, building codes may call for a secondary insulated condensate pan (by others) to be installed under the entire unit. In other instances, some local codes may allow the running of a separate, secondary condensate line in lieu of the required drain pan. It is the responsibility of the installer to consult local codes for compliance.

⚠ WARNING

It is the installer's responsibility to use an appropriate hanging method capable of supporting the unit's weight. Refer to the specification section of this document for the respective unit's installed weights.

NOTICE

For seismic hanging requirements, refer to local codes.

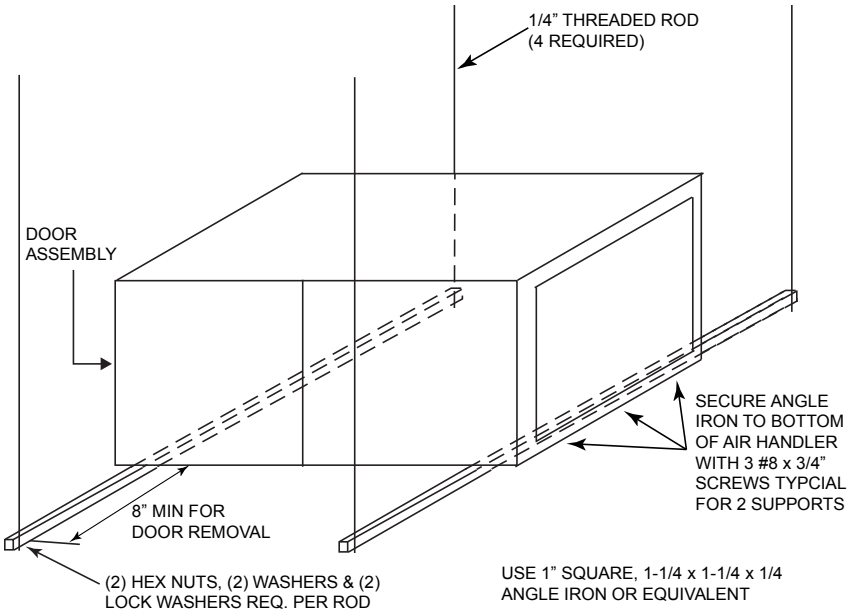


Figure 6: Horizontal Unit Suspension

Attachment Methods Using Straps

Method 1

Use (4) #8 x 3/4 sheet metal screws for each strap. Straps to be vertical against the unit's sides and not allowed to be pulled away from the sides.

Method 2

Fold all straps under the air-handler and secure with (4) #8 x 3/4 sheet metal screws (2 screws at the side and 2 screws at the bottom. (Care must be taken not to drive the screw through the coil.)

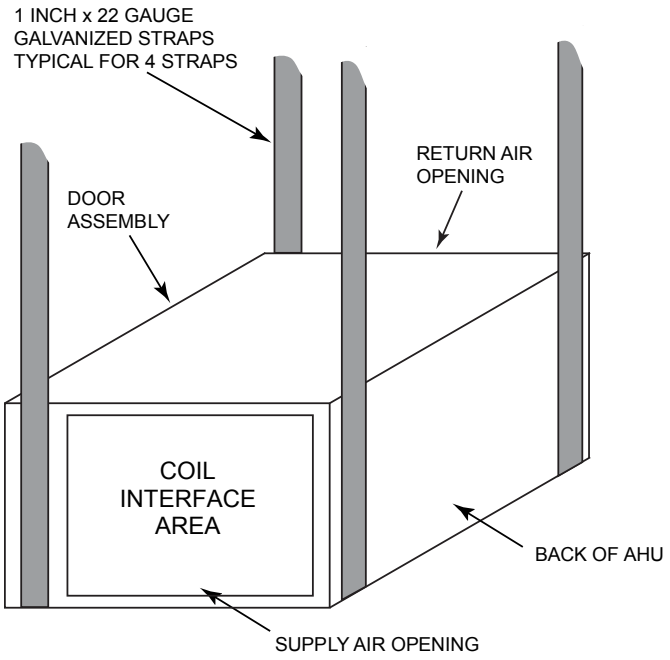


Figure 7: Horizontal Unit Suspension with Straps

DUCT CONNECTIONS

Supply Duct

The supply ductwork must be attached to the outside of the flange on the air discharge end of unit. Flexible connectors may be used if desired.

Return Duct

The return ductwork should be attached to the air return side (bottom or side) of unit using sheet metal screws or other fasteners.

For side return air inlet installation see the Figures 3 and 4.

FILTER INSTALLATION

Internal filter rack and a 1 inch disposable filter are standard on all models. Refer to the Specifications section for dimensions.

AIR SYSTEM

Existing Ductwork

It is the responsibility of the installer to inspect all previously installed air distribution systems to determine its suitability for the new heating and/or cooling system. Existing ductwork may have to be modified and/or insulated to provide satisfactory air distribution.

Ductwork Installation

Connect the supply-air duct over the outside of 3/4-in. flange on the unit's discharge side. Secure the duct to the flange with proper fasteners for the type of duct used. Support the duct independently.

Use flexible connectors (if desired between the ductwork and the unit to prevent transmission of vibration.

Use insulation with vapor barrier for ductwork passing

PROHIBITED INSTALLATIONS

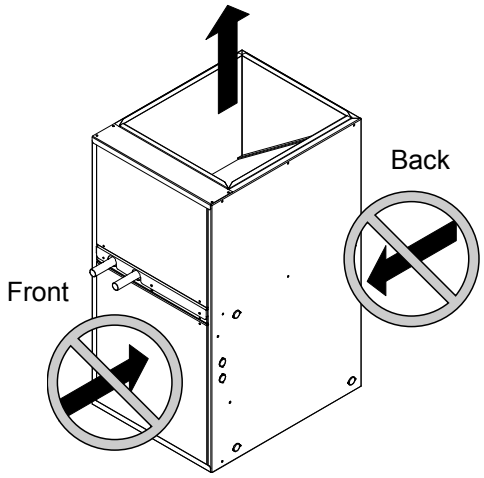


Figure 8: The air inlet is not allowed to be at the front or back of the air-handler

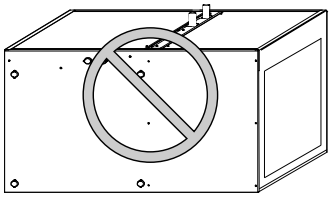


Figure 9: Do not position the air-handler on its back or with it face down.

NOTE:
Multiple Air-Handler configured for installation with a single Rinnai Tankless Water Heater is prohibited.

PLUMBING

Codes:

Observe all local sanitary codes when installing water lines. The water supply mating connection to the 37AHB Hydronic Air-Handling Units are made via the two (3/4 in. Dia. X 2-1/2 in. Long) copper stubs to the front-left of the unit labeled “WATER IN” and “WATER OUT” (see Figure 1). Mating connectors to be two field supplied 3/4 in. FNPT-sweat ends or two field-supplied 3/4 in. SharkBite type FNPT-push fitting ends or equivalent.

All associated hydronic piping MUST comply with ICC, UPC and any other local codes or ordinances having jurisdiction. USE POTABLE GRADE COPPER OR OTHER PIPING MATERIALS. MATERIALS TO BE LEAD FREE APPURTENANCES ONLY.

NOTE: Recommended piping, fittings, valves and other appurtenances (exclusive of those indicted as accessories that are available through Rinnai distribution) called for in piping schematics to be field-supplied.

Flow Sensor Installation:
(Required for Open Loop Systems)

Care must be taken to ensure that the flow sensor is not damaged due to excessive tightening. The torque must not exceed the maximum limit stated below. The installation should be checked to ensure that no leaking is evident.

Mating connectors to be (2) 3/4” FNPT fittings (field supplied).

Pipe-work/connector alignment is imperative (avoid bending stress).

Polytetrafluoroethylene (PTFE) thread seal tape (teflon tape), or equivalent, is recommended.

Tighten fittings to maximum torque of 15lb/ft (20Nm).

Soldering Copper Tubing:

The common method of joining copper tubing in hydronic heating systems is soft soldering. Plumbing codes do not allow solders containing lead to be used for domestic water service. USE ONLY 95/5 tin/ antimony solder for all piping systems that incorporate a domestic water supply.

Note: Precautions must be taken during soldering to avoid debris or solder from lodging in piping system.

Mechanical Joining of Tubing:

Where used, refer to the respective mechanical system manufacturer’s installation instructions.

Tubing Insulation:

Any tube conveying fluid at a temperature greater than that of the surrounding air releases heat.

Insulate all accessible hot water lines and associated valves with material, such as expanded neoprene or polyurethane 3/8-in. to 1⁄2-in. thick.

Match the pipe sleeve's inside diameter to the pipe’s outside diameter for a snug fit. Place the pipe sleeve so the seam will be face down on the pipe. Tape, wire, or clamp insulation every foot or two to secure it to the pipe. If taping is desired, use acrylic tape instead of duct tape.

Copper Tubing Support:

Copper tubing must be properly supported to prevent sagging or buckling. On horizontal runs with hard temper tubing, the following maximum support spacing is suggested:

- 1/2 in. to 3/4 in. tube: 5 feet maximum spacing
- 1 in. to 1-1/4 in. tube: 6 feet maximum spacing
- 1-1/2 in. to 2 in. tube: 8 feet maximum spacing

The above suggested spacing does not account for extra weight of piping components such as an expansion tank, etc. When such components are present the piping should be supported immediately adjacent to the component.

On vertical runs, copper tubing should be supported at each floor level or at a maximum of every 10 feet.

Thermal Expansion of Piping:

In all hydronic systems, piping undergoes temperature swings as the system operates. This causes changes in the length of the piping due to thermal expansion.

If the piping is rigidly mounted, this expansion can cause annoying popping or squeaking sounds and in extreme cases, the piping can even buckle.

To counter expansion movement, design piping circuits with sufficient elbows, tees or expansion loops (only used in large systems) or piping supports that allow the tubing to expand and contract freely.

Another alternative is to install an expansion compensator fitting capable of absorbing the movement.

Hydraulic Resistance of Fittings, Valves, and Other Devices:

Before the total hydraulic resistance of a piping circuit can be found, the individual hydraulic resistances of all fittings, valves, or other such components must be determined. One approach is to consider each fitting, valve, or other device as an equivalent length of copper tube of the same pipe size (see Table 2).

By using the equivalent length of piping for all components in the circuit, the circuit can be treated as if it were a single piece of pipe having a length equal to the sum of the actual pipe length, the total equivalent lengths of all fittings, valves, or other devices. Refer to Figure 10 and the associated computation of equivalent lengths.

Pipe Sizing Considerations:

When selecting a pipe size for a given flow rate, the resulting average flow velocity should be between 2 and 4 feet per second.

At water flow velocities of approximately 2 feet per second, flowing water will carry air bubbles along a vertical pipe. Average flow velocities of 2 feet per second or higher can draw along air bubbles in a downward flow. At the above stated velocities air bubbles shall be routed to an air separator where they can be collected and discharged from the system. Use Taco 4900 series air separator, Model 49-075, or equivalent (field supplied).

Average flow velocities higher than 4 feet per second could cause flow noise and should be avoided.

Expansion Tanks:

All liquids used in hydronic heating systems expand when heated. For all practical purposes, liquids are incompressible. Any container completely filled with a liquid and sealed from the atmosphere will experience a rapid increase in pressure as the liquid is heated.

To prevent this from occurring, all modern hydronic systems MUST be equipped with an expansion tank. Refer to expansion tank manufacture's instructions for proper sizing and installation.

PROCEDURE FOR CALCULATING THE TOTAL EQUIVALENT LENGTH OF PIPE

Given piping assembly as shown in Figure 10 below, what is the total equivalent length of the system?

First determine the total straight pipe lengths; next refer to table 2 to determine the equivalent straight pipe length for each fitting shown. Add together the equivalent lengths of piping and fittings.

¾" Tubing (total straight pipe length)....68 ft.

(6) ¾" 90 deg. Elbows……..6(2) = 12 ft.

(2) ¾" Side port tee……..2(3) = 6.0 ft.

(1) ¾" Taco air separator….1(0.3) = 0.3 ft.

(1) ¾" Rinnai flow sensor.....1(3.2) = 3.2 ft.

(2) ¾" Ball valves……..2(2.2) = 4.4 ft.

Total Equivalent length……93.9 ft.

NOTICE

Where possible the length of pipe should not exceed 150 feet total equivalent length.

Any piping running through unconditioned space MUST be insulated to prevent heat loss, and possible freezing of the line.

Stickers indicating direction of flow, (WATER IN, and WATER OUT) are labeled on the outside of the cabinet. DO NOT reverse these lines, as this will cause the unit to malfunction.

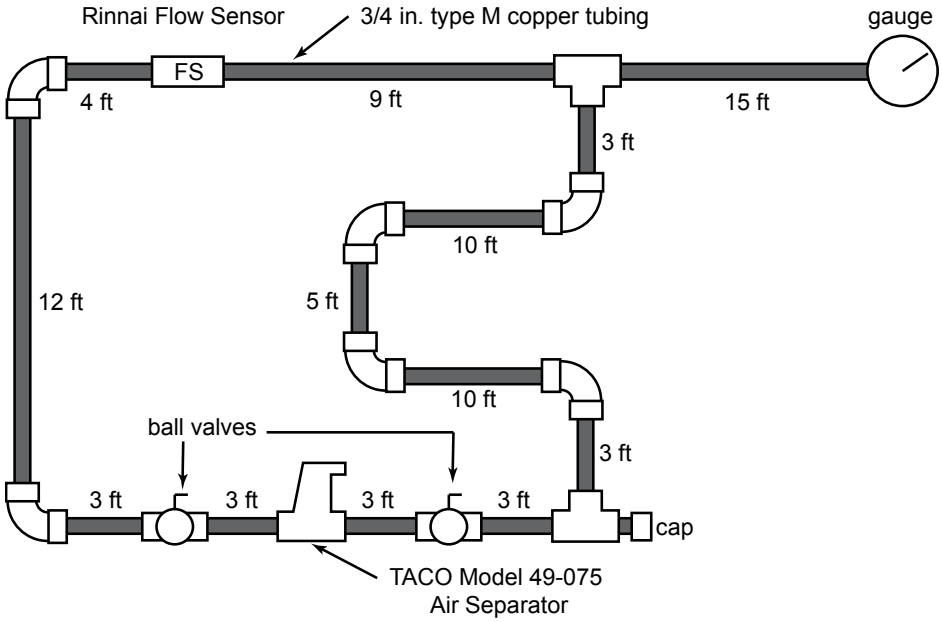


Figure 10 Equivalent Length Calculation

Table 2: Equivalent Length of Straight Pipe for Valves and Fittings (ft)

Fitting or Valve	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
90 deg. Elbow	0.5	1	2	2.5	3	4	5.5	7	9
45 deg. elbow	0.35	0.5	0.75	1	1.2	1.5	2	2.5	3.5
Straight thru tee	0.2	0.3	0.4	0.45	0.6	0.8	1	0.5	1
Side port tee	2.5	2	3	4.5	5.5	7	9	12	15
Reducer coupling	0.2	0.4	0.5	0.6	0.8	1	1.3	1	1.5
Gate valve	0.35	0.2	0.25	0.3	0.4	0.5	0.7	1	1.5
Globe valve	8.5	15	20	25	36	46	56	104	130
Angle valve	1.8	3.1	4.7	5.3	7.8	9.4	12.5	23	29
Ball valve	1.8	1.9	2.2	4.3	7	6.6	14	0.5	1
Swing check valve	0.95	2	3	4.5	5.5	6.5	9	11	13
Flow check valve	NA	NA	83	54	74	57	177	85	98
Butterfly valve	NA	1.1	2	2.7	2	2.7	4.5	10	15.5
Rinnai Flow Sensor	NA	NA	3.2	NA	NA	NA	NA	NA	NA
Taco 49-075 Air	NA	NA	0.3	NA	NA	NA	NA	NA	NA

Piping Configuration

When employing a Tankless Water Heater in a combination hydronic hot water heating system, the system is considered an Open Loop System; i.e. the system must be configured to simultaneously deliver both domestic hot water and space heating. By definition, if the circuit is sealed off from the atmosphere at all locations (as is true for most modern hydronic systems) it is called a **closed loop system.** Conversely If the circuit is open to the atmosphere at *any point*, it is called an **open loop system**. Current Rinnai tankless products are not certified for closed loop applications. Air-Handlers may be used in closed loop application only with the new Rinnai Condensing Boilers. Refer to Boiler Manuals for more details.

Open Loop System

If piping is done in accordance with the recommended schematic diagram shown in Figure 11, the following purge and priming procedure applies.

PURGING AND PRIMING THE SYSTEM:

The following procedure describes how the Rinnai® system may be piped to eliminate the need for a "purge cart" to fill the system and remove entrapped air bubbles.

STEP 1: CLOSE the air separator venting valve.

STEP 2: CLOSE ball valve 3 (BV_3);

STEP 3: OPEN drain valve 3 (DV_3) to which a hose MUST be connected and draining to a sink, drain or outdoors.

STEP 4: CLOSE drain valves 1 & 2 (DV_1 and DV_2) and OPEN ball valve 2 (BV_2).

STEP 5: OPEN cold water supply main valve (ball valve 1 - BV_1). The system will begin the prime/purge process using the street pressure. Entrapped air bubbles being pushed out of the system will be evident by a slight vibration of the discharge hose connected to drain valve 3 (DV_3). The hose will stop vibrating when laminar flow is achieved.

STEP 6: CLOSE drain valve 3 (DV_3);

STEP 7: OPEN ball valve 3 (BV_3). The system is now purged, primed and ready to go.

STEP 8: OPEN the air separator venting valve.

Note: For an open loop system, use expansion tank approved for potable water use only.

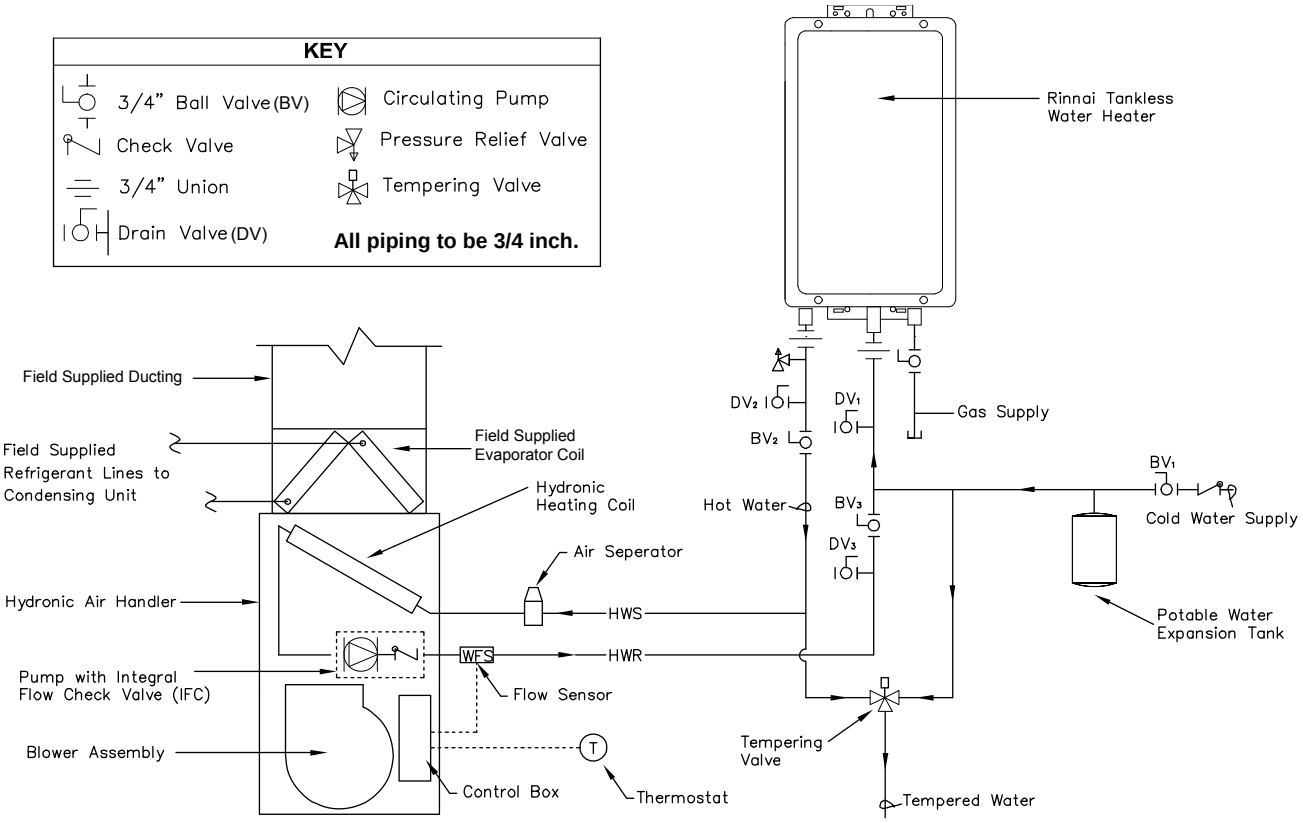


Figure 11 - Typical Piping Arrangement For Direct Space Heating and Domestic Water Supply with Tankless Water Heater. Open Loop

System Low Voltage Wiring Diagrams

NOTE: Local codes may require thermostat wiring to be routed through conduit or raceways. In such instances splices can be made inside the Hydronic Air-Handler. All wiring must be NEC Class I and must be separated from incoming power leads.

Provide field supplied disconnect. Refer to Table 4 (Specifications) for maximum fuse or circuit breaker sizes.

Transformer is factory wired for 115v operation. (See Figures 27 through 29.)

The secondary circuit of the transformer is protected by a 3-amp fuse mounted on the printed-circuit board.

IMPORTANT: Where possible, use a Rinnai factory authorized thermostat with the 37AHB series Hydronic Air-Handlers. If a thermostat other than specified is used, refer to the manufacturer's installation instructions for further details.

Wire Gauge	Maximum Distance (feet)
20 gauge	45
18 gauge	60
16 gauge	100
14 gauge	160
12 gauge	250

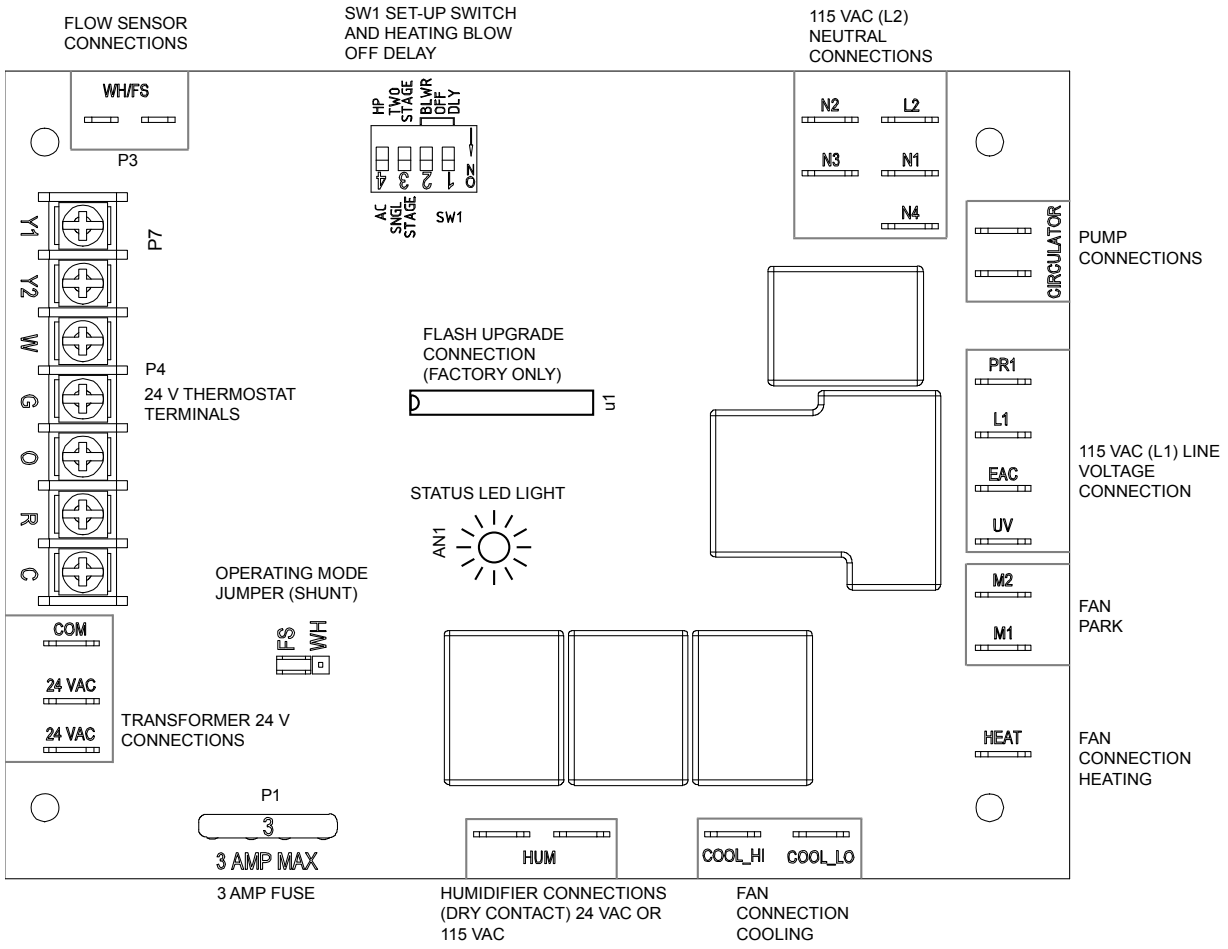


Figure 14: Hydronic Air-Handler Control Board

Notes:

1. For proper operation of an open loop system with the flow sensor refer to Figures 11 and 14; Note that the jumper (shunt) position on the PCB "point P7" MUST be in the FS position.
2. When changing the shunt position ensure that the unit's power is turned off.

Dip Switch Options (Smart Operating System):

The Rinnai® exclusive Smart Operating System is a feature of your 37AHB series Hydronic Air-Handler's control system that is designed to allow the installer (via DIP Switch – SW1) to configure the unit for single or two stage, A/C or Heat pump systems with selectable heat bower off delay.

Refer to Figures 14 and 15 for the proper dip switch setting to be used with the desired configuration.

When viewed with the Air-Handler in the upflow position, the dip switch will be as shown below (upside down.

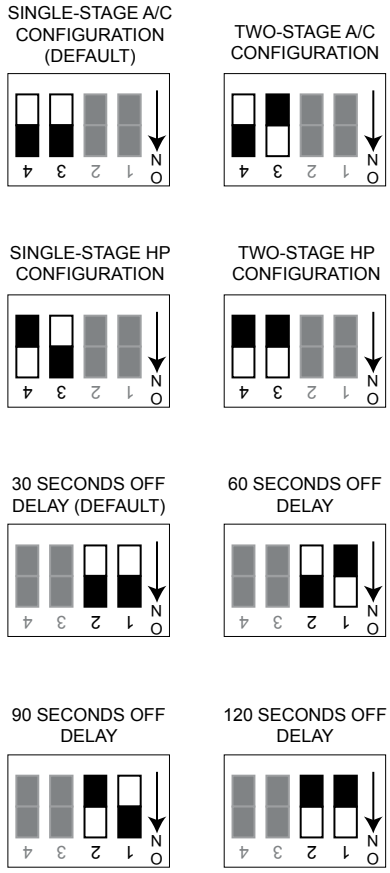
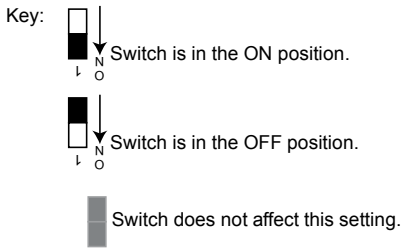


Figure 15: Dip Switch Positions



THERMOSTAT INSTALLATION:

Safety Considerations:

All wiring must conform to local and national electrical codes. Improper wiring or installation may damage thermostat.

⚠ WARNING

Before installing thermostat, turn off all power to unit. There may be more than one power disconnect. Electrical shock can cause personal injury or death.

INSTALLATION CONSIDERATIONS:

Air Conditioner Model:

The Standard Model A/C thermostat may be wired with or without connecting a common wire between the indoor equipment and the thermostat. However, it is recommended to use a common wire whenever possible. Without a common wire this thermostat becomes "power stealing." This means it will need to steal a small amount of power from the equipment to which it is connected. When "power stealing" connection is used, the supplied 270 ohm resistor must be connected at the indoor unit.

Heat Pump Model:

The Standard Model HP thermostat is not "power stealing" and MUST have both 'R' and 'C' wires connected to operate properly. This thermostat uses a green LED to indicate auxiliary/emergency heat operation.

Installation:

Thermostat should be mounted

- approximately 5 ft. (1.5 m) from floor
- close to or in a frequently used room, preferably on an inside partitioning wall
- on a section of wall without pipes or duct work.

Thermostat should NOT be mounted

- close to a window, on an outside wall, or next to a door leading to the outside.
- exposed to direct light and heat from a lamp, sun, fireplace, or other heat-radiating object which may cause a false reading.
- close to or in direct airflow from supply registers and return-air grilles
- In areas with poor air circulation, such as behind a door or in an alcove

Refer to Figures 16 through 19 for thermostat wiring diagram and thermostat installation instructions for further details.

THERMOSTAT WIRING DIAGRAMS

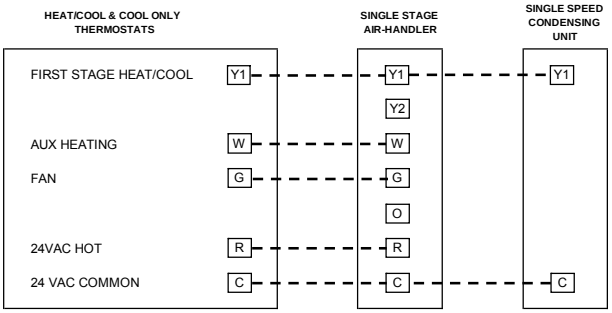


Figure 16 Single Stage Air Handler w/ Single Stage A/C

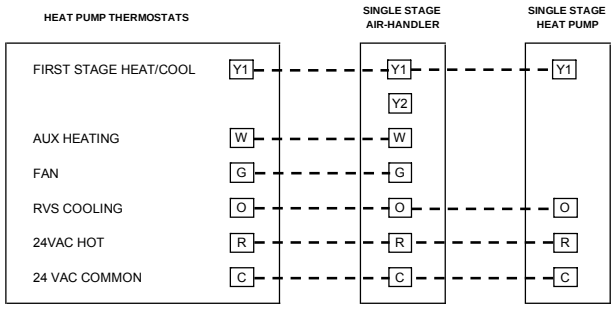


Figure 17 Single Stage Air Handler w/ Single Stage Heat Pump

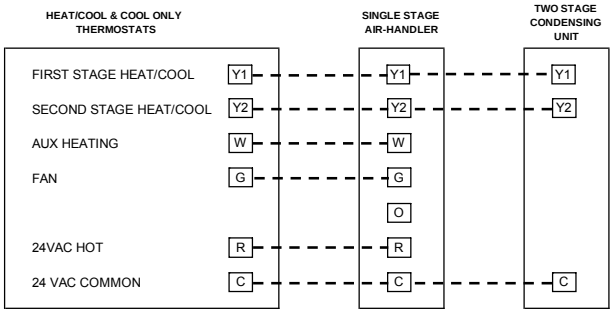


Figure 18 Single Stage Air Handler w/ Two Stage A/C

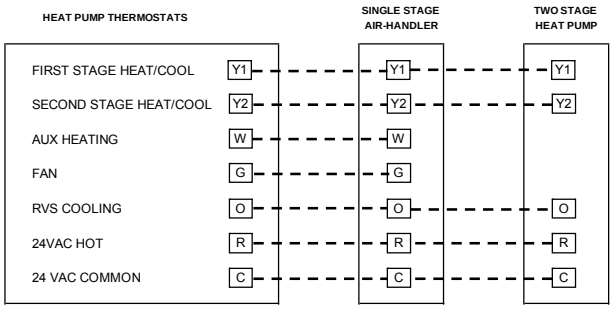


Figure 19 Single Stage Air Handler w/ Two Stage Heat Pump

Shunt Jumper Options:

An additional feature of the 37AHB series is its selectable operating sequence option; the 3-pin shunt header (P7) allows the control to operate the proper heating logic based on the following system requirements:

The 37AHB unit in Open Loop configuration:

"FS" Shunt selection: The "FS" logic sequence will configure the unit for operation with all Rinnai® Tankless Water Heaters; this logic monitors the ratio of available flow for space heating (via Flow Sensor); this status is then communicated to the PCB whose operating characteristics is primarily determined by the status of the Flow Sensor input (sequence allows domestic priority).

⚠ WARNING

Failure to follow this warning could result in an electrical shock, fire, or death.
To minimize personal injury if an electrical fault should occur, cabinet grounding MUST be an uninterrupted ground and MUST comply with NEC, ANSI/NFPA 70 and all local codes having jurisdiction. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.

START-UP PROCEDURE (HEATING ONLY):

The following conditions must be met prior to unit start -up.

Debris from soldering and/or other installation activities can cause equipment failure. Ensure that all associated lines and appurtenances are free of debris.

Check to ensure that unit is secure.

Check that blower wheel rotates freely within the scroll housing.

Check all wiring to ensure that connections are tight.

Check all ductwork and pipe connections to ensure proper seal.

Check to ensure that all packaging wraps are removed from equipment.

Ensure that front access doors are properly installed.

Check to ensure proper connections to the appropriate blower speed tap (Heat /Cool – High and Low). Refer to Air Delivery and Capacity Charts and/or the appropriate wiring diagram in this manual.

Perform all safety and start-up checks for Tankless Water Heater as per manufacturer's instructions.

Having verified all preceding checks, the Air-Handler's Start-Up Procedure is as follows:

STEP 1: Purge and fill system; follow appropriate purging procedure as laid out in this manual in section titled "Purging and Priming the System".

STEP 2: Turn on power supply to Air-Handler. Caution: blower and/or circulator may start to operate if thermostat is on and a call is present.

STEP 3: Turn thermostat on and switch system to the heating mode. The thermostat shall be set higher than the actual room temperature; this will cause the circulator to energize and initiate the heating cycle. (If the pump does not start, or the Air-Handler is not producing heat, refer to the Troubleshooting Section in this manual).

STEP 4: Program room thermostat as desired by homeowner.

START-UP PROCEDURE (COOLING SYSTEM)

Refer to field supplied evaporator coil and outdoor unit manufacturer's Installation Instructions for system hook-up, start-up instructions and refrigerant charging method details.

TROUBLESHOOTING BLOWER AND/OR PUMP MOTOR AND CONTROLS

If blower and/or pump motor does not run:

Turn off power and check the following:

1. Check that door switch is in the CLOSED position.
2. Check 3 amp fuse on Printed Circuit Board (PCB).

⚠ CAUTION

High voltage is at all times present at motor. Disconnect power to AHU before removing or replacing or servicing motor. Wait at least 5 min after disconnecting power before opening motor. Failure to follow this CAUTION could result in minor personal injury or product and property damage.

3. Check for 24 VAC between COM and 24 VAC on PCB. If no voltage is present, check transformer.
4. Check all connections for kinks which could cause loose connections. Ensure connections are secure.
5. Verify that approximately 120 VAC is present across L1 and L2 (refer to wiring diagrams).

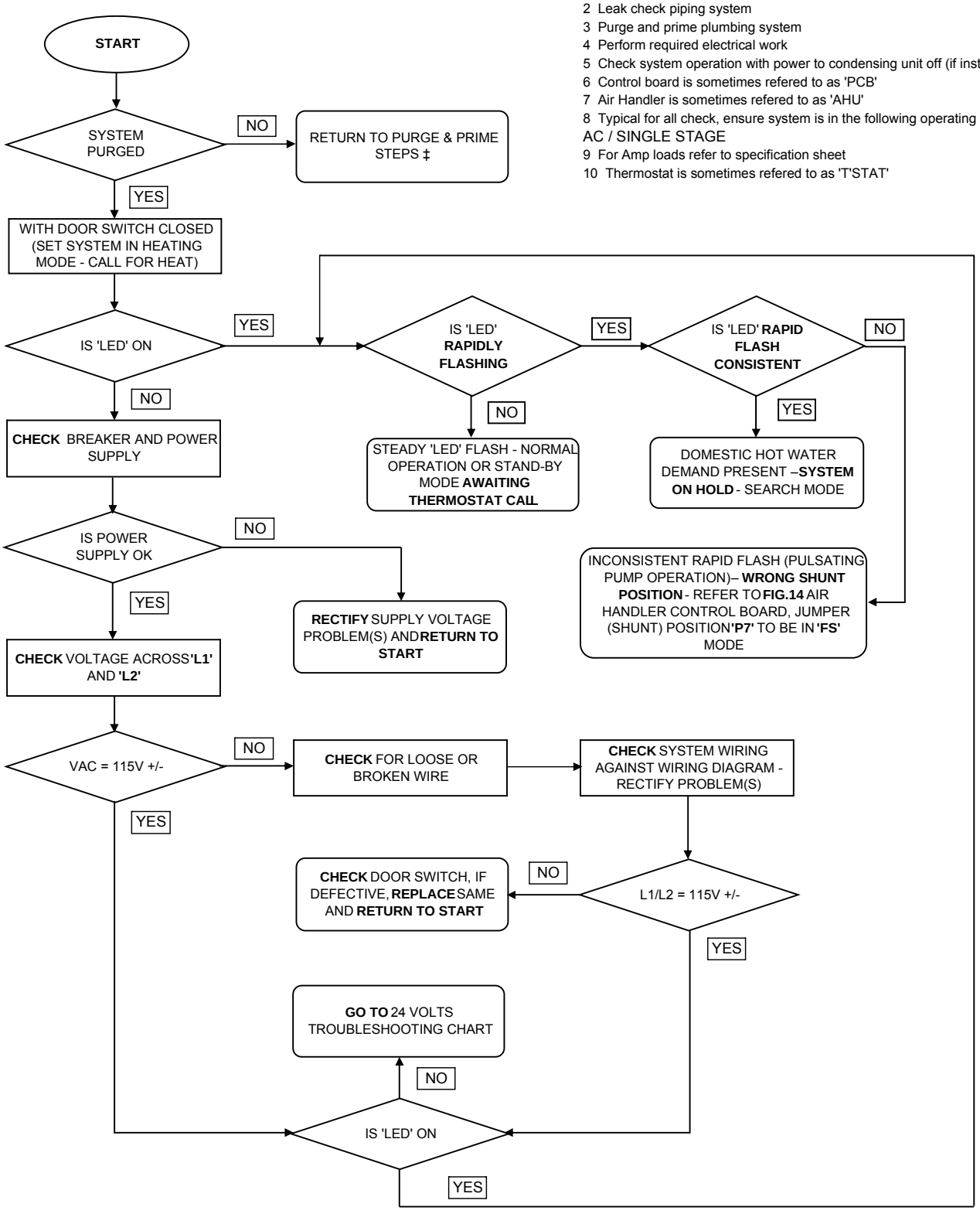
If system still fails to start, refer to Figures 20 through 23 for additional help.

TABLE 2.1: BLOWER MOTOR TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
Motor fails to start	Blown fuse	Turn off motor. Replace fuse
	Incorrect voltage	Verify motor voltage matches system voltage
	Improper connections	Turn off motor. Verify connections
	Blower wheel obstruction	Verify blower wheel is not in contact with the blower housing. Readjust blower wheel position on motor shaft.
Motor does not come up to full speed	Not applied properly	Check speed taps as per wiring diagram.
Motor stalls during operation	Overload motor	Check for duct blockage and/or verify that ducting system is not restrictive.
Motor vibrates or is excessively	Loosen or defective fan	Turn off motor. Tighten fan set screw or replace fan.

NOTES:

1 Pipe system between Tankless Water Heater and Air Handler ‡
2 Leak check piping system
3 Purge and prime plumbing system
4 Perform required electrical work
5 Check system operation with power to condensing unit off (if installed)
6 Control board is sometimes refered to as 'PCB'
7 Air Handler is sometimes refered to as 'AHU'
8 Typical for all check, ensure system is in the following operating mode: AC / SINGLE STAGE
9 For Amp loads refer to specification sheet
10 Thermostat is sometimes refered to as 'T'STAT'



‡ Refer to plumbing section in this manual

Figure 20: Hydronic Air-Handler Start-Up and 'LED' Troubleshooting - Flow Sensor (FS Configuration)

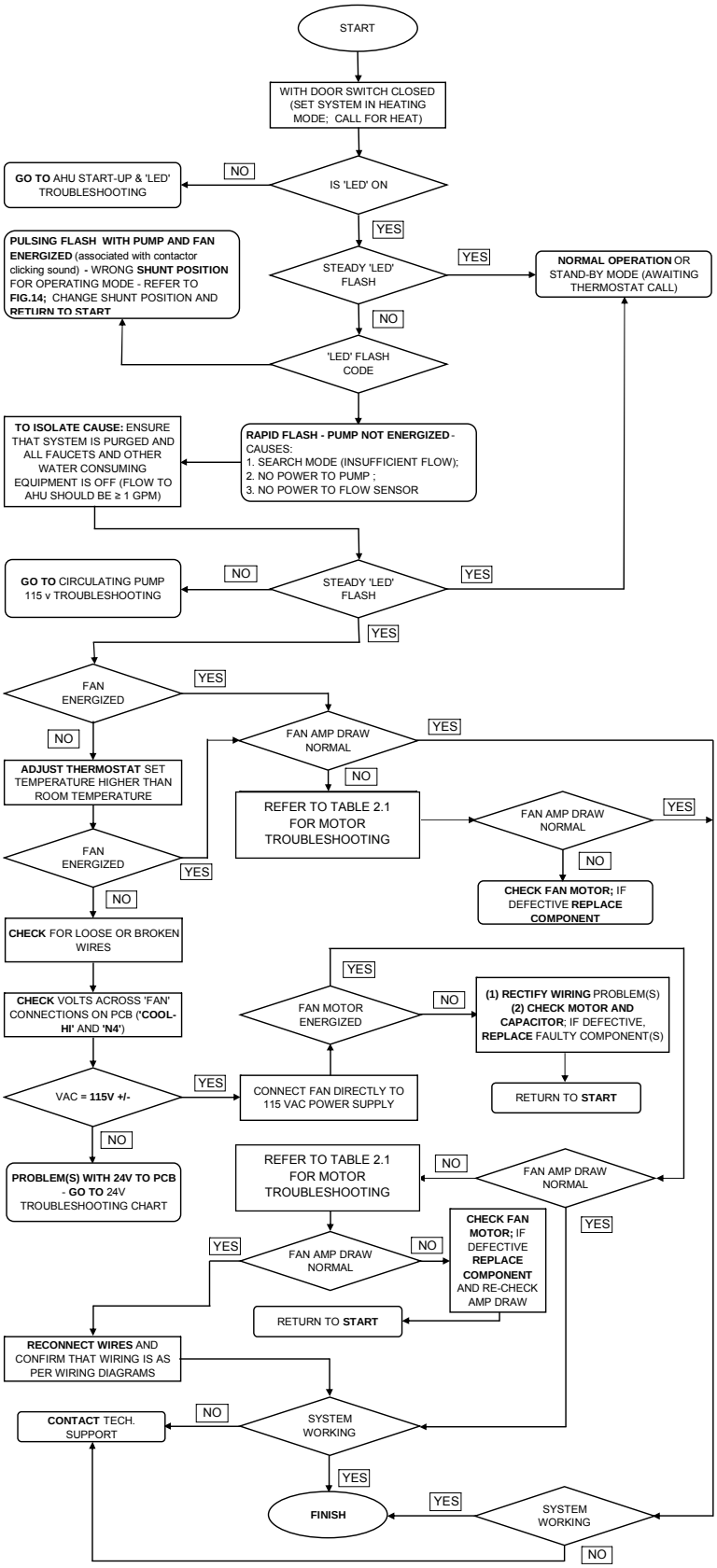


Figure 21: Blower System 115V Troubleshooting - Flow Sensor (FS) Configuration

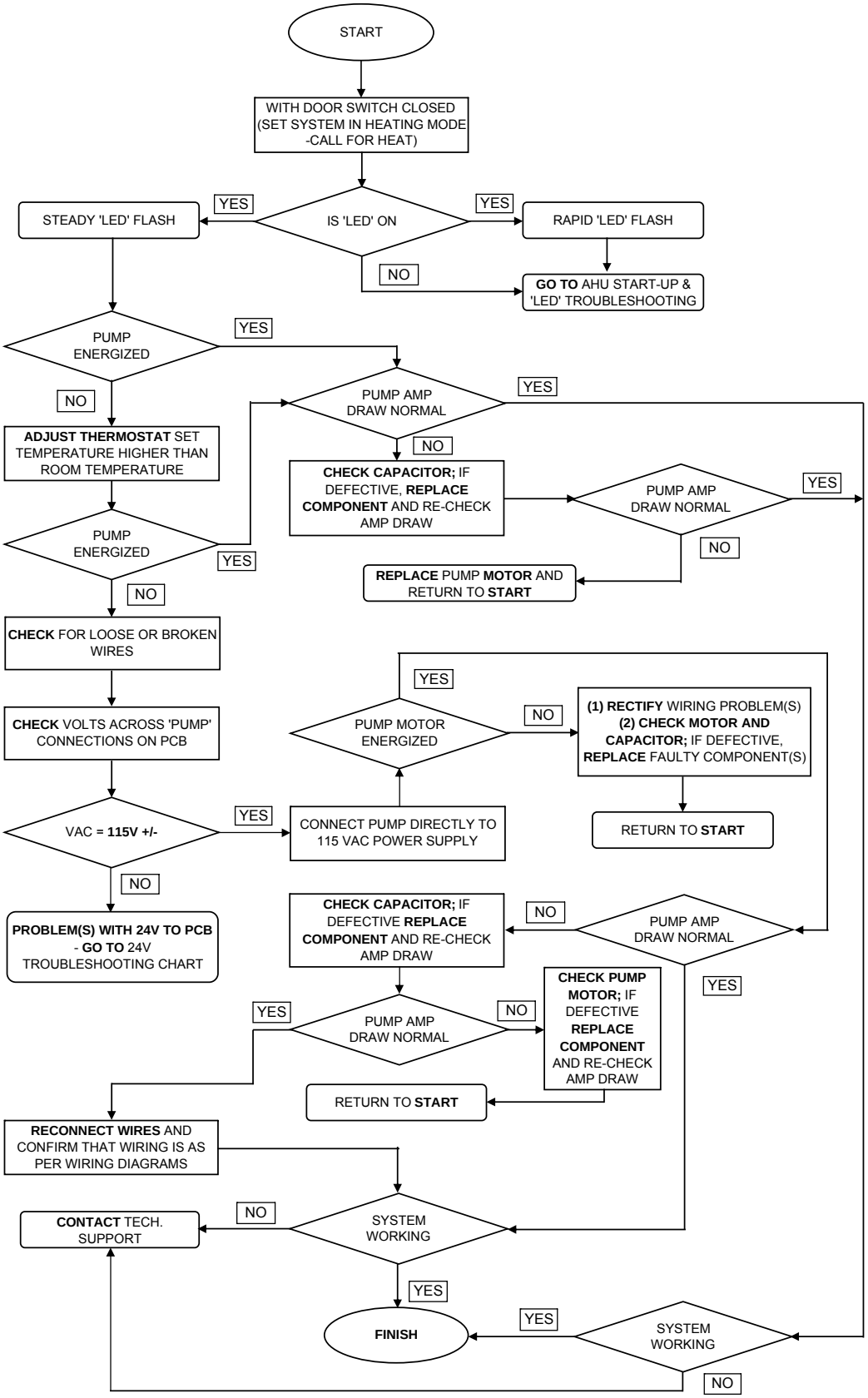
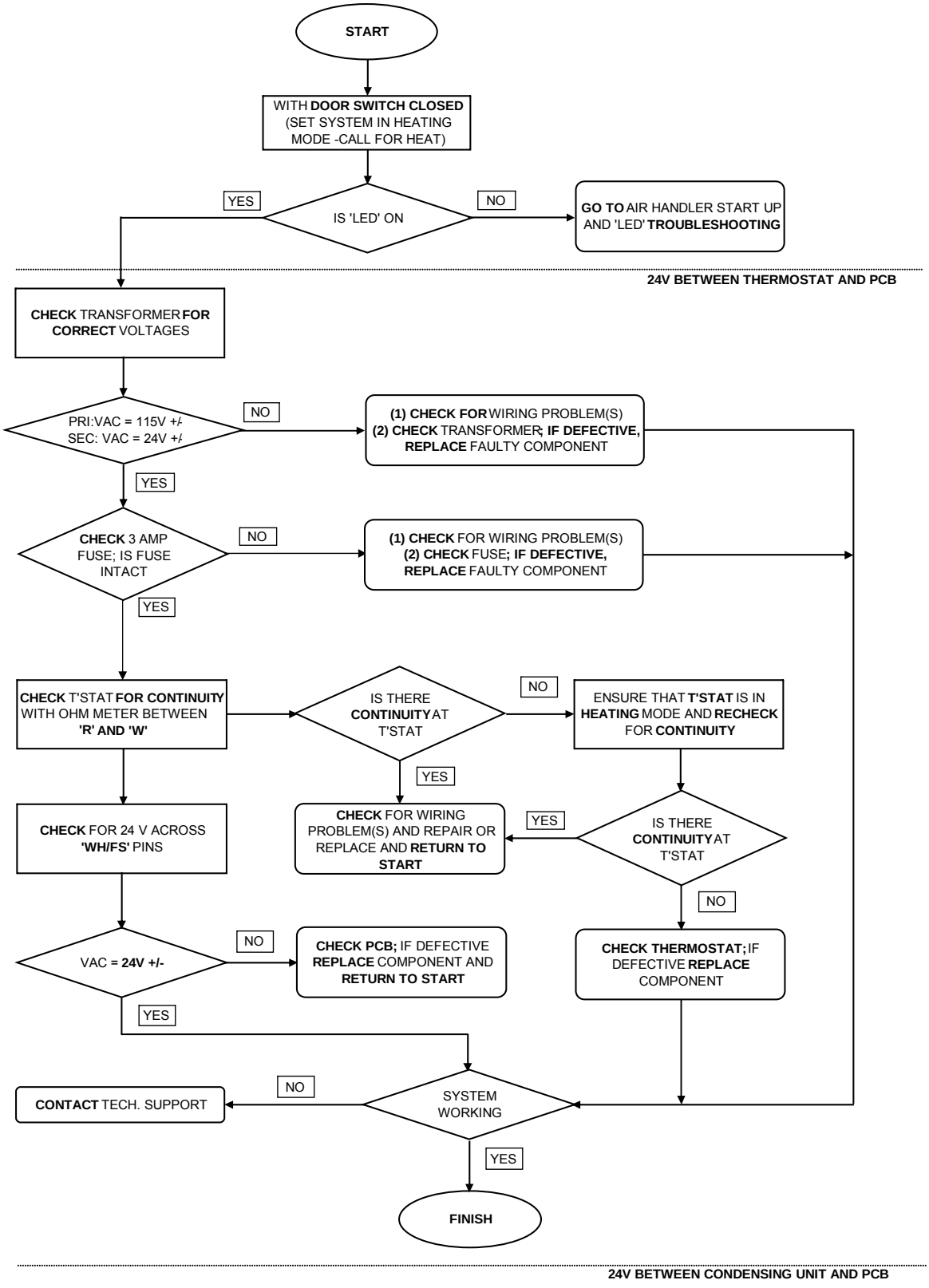


Figure 22: Circulating Pump 115V Troubleshooting - Flow Sensor (FS) Configuration



If a condensing unit and cased coil set is used in conjunction with the Rinnai Air Handler for cooling, refer to air conditioning manufacturer's instructions for hook-up and troubleshooting details.

Figure 23: 24V Troubleshooting - Flow Sensor (FS) Configuration

Sequence of Operation

SEQUENCE OF OPERATION:

NOTE: Air-Handler control must be grounded for proper operation; control is grounded through green wire routed to control box screw.

STANDBY MODE:

All control outputs are off and the control is waiting for a thermostat demand. The control initiates action when a thermostat call is received.

COOLING MODE:

Single-Stage Air-Conditioning (A/C) Cooling Demand:

When the thermostat calls for cooling (Y), the control energizes the COOL_HI blower tap after a 1 second on delay period.

When the thermostat removes the call for cooling (Y), the control de-energizes the COOL_HI blower tap after a cooling off delay period of 30 seconds.

A call for cooling has priority over a thermostat blower demand.

If a call for heat (W) exists with a call for cooling, the call for heat shall proceed as normal except the blower remains energized on the COOL_HI speed tap. If the call for cool goes away while a call for heat exists, the cooling off delay is canceled and the blower operation reverts to the heat cycle.

Two-Stage A/C Cooling Demand:

When the thermostat calls for cooling (Y), the control waits for a 1 second cooling on delay period and energizes the COOL_LO blower tap. If a 2nd stage cooling (Y2) call is sensed, the control de-energizes the COOL_LO blower tap and energizes the COOL_HI blower tap after a 1 second delay.

When the thermostat removes the call for 2nd stage cooling (Y2), the control de-energizes the COOL_HI blower tap and energizes the COOL_LO blower tap. When the thermostat removes the call for cooling (Y), the control de-energizes the COOL_LO blower tap after a cooling off delay period of 30 seconds.

If a call for heat (W) exists with a call for 2nd stage cooling, the call for heat shall proceed as normal except the blower remains energized on the COOL_HI speed. If the call for cool goes away while a call for heat exists, the cooling off delay is canceled and the blower operation reverts to the heat cycle.

Single-Stage Heat-Pump (HP) Cooling Demand:

When the thermostat calls for cooling (Y and O), the control waits for the 1 second cooling on delay period and energizes the COOL_HI blower tap.

When the thermostat removes the call for cooling (Y and O), the control de-energizes the COOL_HI blower tap after a cooling off delay period of 30 seconds.

A call for cooling has priority over a thermostat blower demand.

If a call for emergency heat (W) exists with a call for cooling, the call for heat shall proceed as normal except the blower remains energized on the COOL_HI speed tap. If the call for cool goes away while a call for emergency heat exists, the cooling off delay is canceled and the blower operation reverts to the heat cycle.

Two-Stage HP Cooling Demand:

When the thermostat calls for cooling (Y and O), the control waits for the 1 second cooling on delay period and energizes the COOL_LO blower tap. If a second stage cooling (Y2) call is sensed, the control de-energizes the COOL_LO blower tap and energizes the COOL_HI blower tap after the 1 second delay.

When the thermostat removes the call for 2nd stage cooling (Y2), the control de-energizes the COOL_HI blower tap and energizes the COOL_LO blower tap. When the thermostat removes the call for cooling (Y), the control de-energizes the COOL_LO blower tap after a cooling off delay period of 30 seconds.

If a call for emergency heat (W) exists with a call for 2nd stage cooling, the call for heat shall proceed as normal except the blower remains energized on the COOL_HI speed. If the call for cool goes away while a call for emergency heat exists, the 2nd stage cooling off delay is canceled and the blower operation reverts to the heat cycle.

HEATING MODE:

Heating Operation: Air-Conditioning (A/C) Mode - Configured for Flow Sensor (FS) Input:

Circulating Pump Operation:

On a call for heating, terminal “W” of the thermostat is energized. The control monitors the FS input and energizes the circulating pump if the FS signal is present.

If the FS signal is NOT present, the control will energize the circulating pump for 60 seconds in an attempt to activate the Flow Sensor (FS). If the FS signal does not become active during the time, the control will de-energize the circulating pump for 60 seconds and then start another 60 seconds with the circulating pump energized to try to activate the Flow Sensor. Sequential attempts to activate the Flow Sensor will use 60 second, 120 second and 180 second de-energized periods for the circulating pump. The de-energized period will circle back to the original 60 second off period following sequential unsuccessful energized attempt to activate the Flow Sensor. During this time the Status LED will rapidly flash, indicating that a heat demand is present, but not being satisfied because of the state of the FS input signal.

Heat Blower ON Delay:

The control waits for 25 seconds after the circulator pump is energized (and FS signal is present) and then energizes the indoor blower heat speed and the humidifier output.

If the thermostat demand for heat is removed, the control de-energizes the circulating pump, and runs the heat speed blower and humidifier through the selected blower off delay as defined by the dip switch settings in Figure 15.

Steady Heat:

Control inputs are continuously monitored to ensure the call for heat remains.

If the thermostat demand for heat is removed, control operation proceeds to the operation described in *"Heat Blower ON delay"* section above.

If the FS input becomes absent during steady state heating, the sequence in *"Circulating Pump Operation"* section above will become active and the blower off delay will run.

If the FS input signal returns within the same heating demand period (W), the control will begin jogging the circulator pump as described in *"Circulating pump Operation"* section, normal heating operation will resume.

Heat Blower OFF Delay:

When the heating thermostat demand (W) is removed, the control de-energizes the circulating pump and then de-energizes the indoor blower motor and humidifier after a delay time as defined by the dip switch settings in Figure 15.

Blower timing begins when the thermostat is satisfied. The control returns to standby when the blower off time is complete.

If the thermostat call for heat returns before the blower off delay is complete, the control re-energizes the circulating pump and resumes a normal heating sequence.

Heating Operation: Heat-Pump (HP) Mode - Configured for Flow Sensor (FS) Input:

Single-Stage HP Demand - Call for Heat:

The thermostat calls for heat by connecting (Y and R). The control will proceed to the Heat Blower ON Delay when a single stage heat demand exists.

The Heat Pump is the primary source of heating in this mode.

Blower ON Delays:

The control waits for 1 second and then energizes the COOL_HI tap if and the humidifier output. If the thermostat demand for heat is removed, the control runs the COOL_HI tap and humidifier through a fixed 30 second blower off delay.

Steady Heat:

Control inputs are continuously monitored to ensure the call for heat remains.

If the thermostat demand for heat is removed, control operation proceeds to the operation described in the *"Blower On and Off Delays"* section.

The Heat Pump is the primary source of heating in this mode.

Second Stage HP Demand – Call for Heat:

After the control enters into a Steady Heat mode, the second stage heating demand (Y2) input is monitored. If a (Y2) demand is sensed, the COOL_HI blower speed will be energized. If the (Y2) demand becomes absent, the COOL_HI blower speed will immediately be de-energized and the COOL_LO blower speed will again be energized.

Heat-Pump Emergency Heat Demand:

The Emergency Heat (W) input is continually monitored, and is a higher priority than single or 2-stage heating demands. If the Flow Sensor (FS) input signal is present with a call for emergency heat (W), the circulator pump will immediately be energized.

Sequence of Operation

If the FS input signal remains (indicating that there is adequate hot water flow) the circulator pump will remain energized, the HEAT blower speed and HUM outputs will then be energized. If the emergency heat demand (W) is removed, the HEAT blower speed will immediately be de-energized and the blower will return to the appropriate speed based on any remaining thermostat demand.

If the FS signal is NOT present, the control will energize the circulating pump for 60 seconds in an attempt to activate the Flow Sensor (FS). If the FS signal does not become active during the time, the control will de-energize the circulating pump for 60 seconds and then start another 60 seconds with the circulating pump energized to try to activate the Flow Sensor. Sequential attempts to activate the Flow Sensor will use 60 second, 120 second and 180 second de-energized periods for the circulating pump. The de-energized period will circle back to the original 60 second off period following sequential unsuccessful energized attempt to activate the Flow Sensor. During this time the Status LED will rapidly flash, indicating that a heat demand is present, but not being satisfied because of the state of the FS input signal.

If the FS input signal again becomes present within the same emergency heating demand (W), the pump will begin jogging (as described in the above paragraph), normal emergency heating operation will resume.

Heat Blower OFF Delay:

When the heating thermostat demand is removed, the control immediately de-energizes the circulating pump and then de-energizes the indoor blower motor and humidifier after a fixed 30 second blower off delay. Blower timing begins when the thermostat is satisfied. The control returns to standby when the blower off time is complete.

If the thermostat call for emergency heat returns before the blower off delay is complete, the control resumes an emergency heating sequence as defined.

Off Season Circulation Timer

All Rinnai® AHU models are equipped with a circulation timer. It is normal operation for these models to automatically run the circulation pump for a period of two minutes intermittently every six hours if there has not been a call for heat within the said six hours.

The unit also incorporates the unique feature of learning the household schedule to determine the best six hour intervals (periods of least flow interruption) to run the circulator timer.

Maintenance

Repairs should be performed by a qualified service technician. The appliance should be inspected annually by a qualified service technician. Verify proper operation after servicing.

CLEANING

It is important that compartments, filter, and circulating air passage ways of the appliance be kept clean. Clean as follows:

1. Turn off and disconnect electrical power. Allow to cool.
2. Replace the air filter. (Should be done at least quarterly. Refer to the Specifications section for sizes.)
3. Use pressurized air to remove dust from the components.
4. Use soft dry cloth to wipe cabinet.

SUPPLY AND RETURN AIR DUCT SYSTEMS

The supply and return air ducts should be inspected at least annually for blockages or damage.

MOTORS

Both the fan and pump motors are permanently lubricated and do not need periodic lubrication. Keep free of dust and dirt by cleaning annually.

INTEGRAL CIRCULATOR PUMP

Replacing Pump Motor Assembly:

1. Disconnect the electrical supply.
2. Reduce system pressure to 0 psi and allow system to return to room temperature. Isolate the circulator by closing the service valves or draining the system.
3. Remove the body bolts and swing motor assembly away from the volute.

Maintenance

4. Install new motor, and reassemble circulator using the new gasket and bolts supplied.
5. Follow the “installation” procedure to start up the circulator.

Replacing Pump Cartridge Assembly:

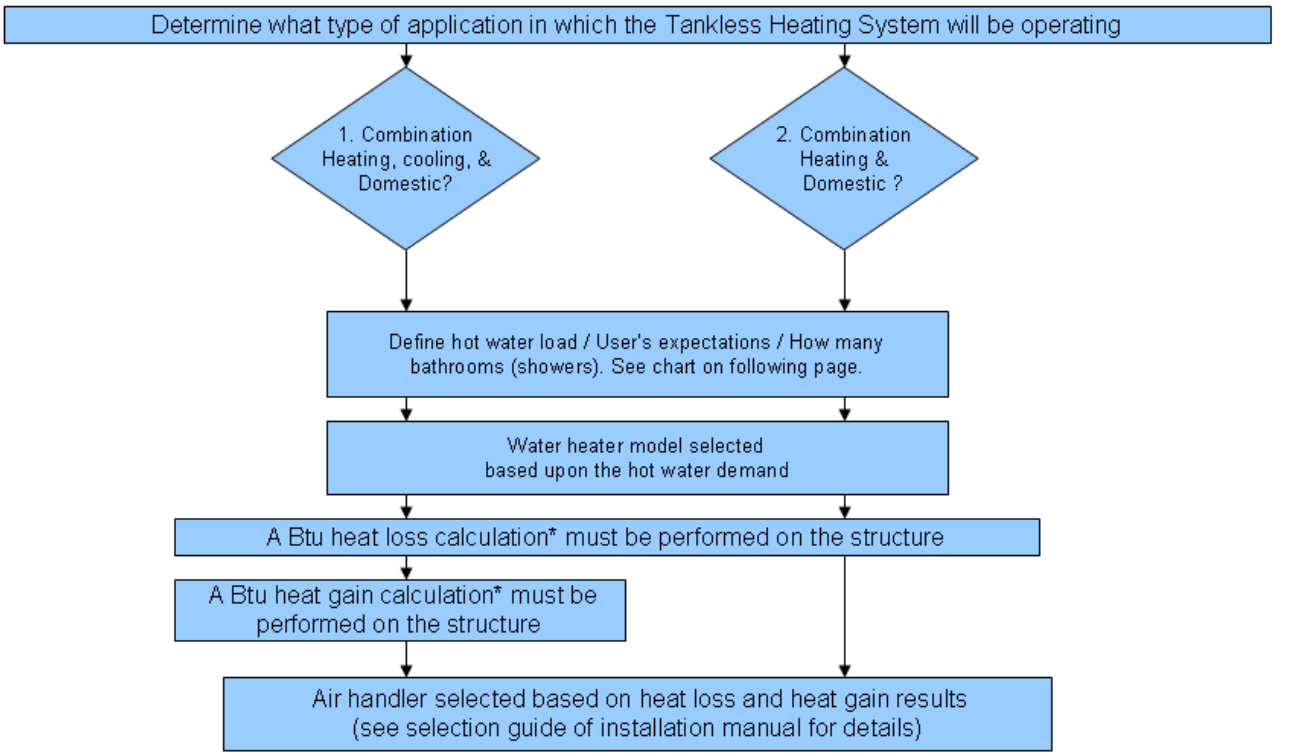
1. Disconnect the electrical supply.
2. Reduce system pressure to 0 psi and allow system to return to room temperature. Isolate the circulator by closing the service valves or draining the system.
3. Remove the body bolts and swing motor assembly away from the volute.
4. Pull cartridge out of the motor housing.
5. Install replacement cartridge, making sure that the cover plate is between the cartridge flange and motor.
6. Make sure the replacement cartridge corresponds to the full circulator product number. A complete parts list is available from your local distributor.
7. Reassemble the circulator using the new gasket and bolts supplied.
8. Follow the “Installation” procedure to start up the circulator.

Replacing Pump Capacitor:

1. Replacement capacitor must have same rating as originally furnished.

Selection Guide

Hydronic Air Handler and Tankless Water Heater Sizing Guidelines



Btu heat loss and heat gain calculations are comprehensive evaluations on a structure's ability to retain heat.
Please visit www.acca.org/tech/manualj for more information.

Figure 24: Hydronic Air-Handler and Tankless Water heater Sizing Guidelines

Selection Guide

GENERAL UNIT SELECTION PROCEDURE (WITH EXAMPLE)

I. Define hot water load for the total required domestic hot water usage:

To help with the sizing and selection of your new Rinnai Tankless Water Heater (TWH), refer to our Website at: http://www.rinnai.us or contact Rinnai's Application Engineering Department at: 800-621-9419

As an example let us assume that the selected Rinnai Tankless Water Heater for your whole house solution is the REU-KA2530FFUD-US (RC80HPi) and your calculated heat gain and heat loss values are as stated in section II.

II. Determining cooling and heating requirements for the given structure:

The ACCA's Manual J Residential Load Calculation method is the established trade standard, approved by ANSI, for the correct sizing and selection of Heating, Ventilation, Air-Conditioning and Refrigeration (HVACR) equipment in residential homes. Refer to Manual J latest edition; the text in question offers an all-inclusive new approach to ensure that Indoor Air Quality (IAQ) systems are as efficient, safe, and healthy as possible. Visit the Air Conditioning Contractors of America website at: http://www.acca.org or contact a qualified HVACR contractor for further assistance.

Assumptions:

Required Cooling Capacity ……..34,500 Btuh (Total Capacity)
Required Heating Capacity……..…..58,000 Btuh
Evaporator Air Quantity……..…1200 CFM
Calculated Ductwork ESP……..……0.2 in. WC
Electrical Characteristics……15-1-60

III. Determine total external static pressure (ESP) at design conditions:

Before using the Air Delivery and Capacity Charts (Table 5.0 thru 5.17), determine the total static pressure required. From the given example, note the Wet Coil Pressure Drop (from the field supplied Evaporative Cased Coil Installation Instructions), and the Filter Pressure Drop. Determine both static pressures at 1200 CFM:

Wet Coil Pressure Drop……0.21 in. WC (From Coil Manufacturer's Installation Instructions).

External Static Pressure…...0.2 in. WC (Ductwork etc.)

Filter Pressure Drop……..0.0 in. WC
(0.0 inches if the included Rinnai filter is used; 0.08 if another filter is used. Refer to the filter's manufacturer's instructions).

Total Static Pressure..…..... 0.49 in. WC

IV. Select unit based on required cooling capacity airflow:

For an initial selection, choose a unit size that will provide the required airflow. Refer to Tables 5.3 - Air Delivery and Capacity Chart. Note that at 0.5 ESP the 37AHB06012KA5 unit will deliver 1225 cfm when configured for HIGH Speed (Tap 1).

V. Select heating capacity of unit to provide the requisite design condition:

From the nominal capacity section of said table; the 37AHB060 units (Table 5.3), note that the unit 37AHB06012KA5 (as selected above) when matched with the REU-KA2530FFUD (RC80HPi) TWH will provide 58.1 MBH (58,100 Btuh) at an entering water temperature (to Air Handler) of 150 OF.

VI. Select unit that corresponds to power source available:

Refer to Model Number Nomenclature; note that the eleventh digit denotes the voltage code; therefore the "K" model (37AHB06012KA5) unit is the unit that should be selected for the above stated hypothetical conditions. This unit is designed to operate at 115/120v -1ph - 60hz.

Air Distribution Guide

HIGH VELOCITY DUCT SYSTEMS:

A high velocity air delivery system employs higher air velocities and static than that requisite for a conventional ducting system. Specifically, the design of such system requires a compromise between smaller duct sizes and increased fan pressure.

The updated Rinnai Hydronic Air-Handler (with ECM technology) will sustain total external static pressures (ESP) of up to 1.0 in. w. g., still, it is incumbent upon the designer to devise a system that will work within the parameters hereafter set forth in this manual. To satisfy the above, and to take maximum advantage of the increased available pressure of said Rinnai

Air Distribution Guide

Hydronic Air-Handler, He/ She should adhere to the following basic rules whenever possible.

1. Duct joints shall be, as a rule, sealed to prevent leakage of air which may cause objectionable sound.

2. Round ducts are favored to rectangular (on the supply side) as they offer greater rigidity and higher efficiency.

3. Fitting selection and placement should also be carefully studied as the correct fitting and its location will avoid excessive pressure drops and likely noise problems.

4. Figures 25 and 26 illustrate the critical distance as regards high velocity ducting system design.

Additionally, when laying out the header section for a typical high velocity system, the following factor must be considered:

> Unless space conditions dictate otherwise, the take-off from the header should be made using a 90 ^{o} tee or 90 ^{o} conical tee rather than a 45 ^{o} tee. By using 90^{o} fittings, the pressure drop to the branch throughout the system is more uniform. In addition, two fittings are normally required when a 45 ^{o} tee is used and only one when a 90 ^{o} fitting is used, resulting in lower first cost.

Practically speaking, the design of a high velocity system is basically the same as a low velocity duct system. If concerns about noise were not a factor, duct runs could be sized according to the smallest permissible duct diameter which would be govern only by the available external static pressure. In opposition, since noise reduction is paramount in residential designs, the designer must take special care to ensure that all duct sizes are compatible with velocity limits that are associated with both the discharge and return sides of the planned system.

To all intents and purposes, duct sizing calculations are based on fan performance and air side accessory pressure drop data that are provided by original equipment manufacturers. The importance of ensuring that the total pressure drop of the longest circulation path does not exceed the available static pressure and that velocities does not exceed the recommended limits cannot be overstated as these will ensure a quieter system that will deliver the required capacity to a given space.
It is absolutely overriding for the designer to verify available static pressure for both supply and return ducts. The following tables (tables 3 and 4) provide information about duct sizing (specific to hi-velocity system) and the redesigned 37AHB series air-handlers respectively.

To employ table 3 the designer must have generated at least the following information: total system required airflow (in CFM), and maximum number of 3 inch diameter supply legs based on 50 CFM per leg.

Table 4 “Specification Sheet” summarizes the performance and other technical characteristics of the 37AHB series air-handlers and their subsystems.

Some specification numbers are generated by numerical methods and are therefore statistical means based on the testing of three or more samples.
Use both tables in conjunction with good engineering practice together with all codes and ordinances having jurisdiction.

Figure 25:

Recommended Critical Distance between Elbows and 90^{O} Tees for a Typical High Velocity System.

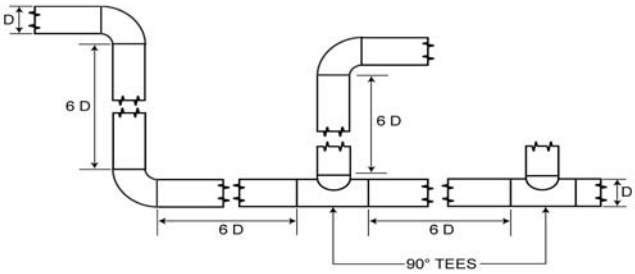
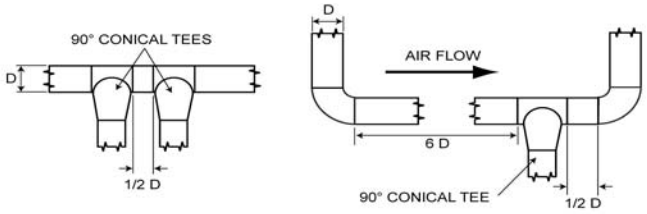


Figure 26:

Recommended Critical Distance between Elbows and 90^{O} Conical Tees for a Typical High Velocity System.



Rigid Trunk Duct Diameter (inches)		Table 3: Quick Reference Hi-Velocity Duct Sizing Chart Maximum Airflow (CFM) with Maximum Number of 3" flex legs																								Maximum Equivalent Duct Length (Feet)
4	MAF	**140**	**100**	**75**	**50**																					60
	NOL	3	2	2	1																					
5	MAF	**210**	**200**	**150**	**100**	**50**																				90
	NOL	4	4	3	2	1																				
6	MAF	**320**	**300**	**250**	**200**	**150**	**100**	**50**																		100
	NOL	6	6	5	4	3	2	1																		
7	MAF	**420**	**400**	**350**	**300**	**250**	**200**	**150**	**100**																	120
	NOL	8	8	7	6	5	4	3	2																	
8	MAF	**560**	**500**	**450**	**400**	**350**	**300**	**250**	**200**	**150**	**100**															140
	NOL	11	10	9	8	7	6	5	4	3	2															
10	MAF	**900**	**850**	**800**	**750**	**700**	**650**	**600**	**550**	**500**	**450**	**400**	**350**	**300**	**250**	**200**	**150**									175
	NOL	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3									
12	MAF	**1300**	**1200**	**1150**	**1100**	**1050**	**1000**	**950**	**900**	**850**	**800**	**750**	**700**	**650**	**600**	**550**	**500**	**450**	**400**	**350**	**300**	**250**				200
	NOL	26	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5				
14	MAF	**1700**	**1600**	**1500**	**1400**	**1300**	**1200**	**1100**	**1050**	**1000**	**950**	**900**	**850**	**800**	**750**	**700**	**650**	**600**	**550**	**500**	**450**	**400**	**350**	**300**		250
	NOL	34	32	30	28	26	24	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6		
16	MAF	**2300**	**2200**	**2100**	**2000**	**1900**	**1800**	**1700**	**1600**	**1500**	**1400**	**1300**	**1200**	**1100**	**1000**	**900**	**850**	**800**	**750**	**700**	**650**	**600**	**550**	**500**	**450**	320
	NOL	46	44	42	40	38	36	34	32	30	28	26	24	22	20	18	17	16	15	14	13	12	11	10	9	

NOTES:

1. Calculations are based on airflow of 50 CFM for each 3 inch diameter flexible leg.
2. Calculations assume system is equipped with a standard add-on evaporative coil and allows for approximately 120 equivalent length of return ducting.
3. MAF – Maximum airflow (CFM).
4. NOL – Number of 3” diameter flexible legs.
5. If a more detailed duct sizing method is required, refer to one or more of the referenced documents or any other industry recognized standard.

LIST OF REFERENCES:

ACCA - Manual D (Residential Duct Systems)
ACCA - Flexible Duct Performance & Installation Standards
ASHRAE Handbook-Fundamentals
HRAI - Residential Air System Design Manual
SMACNA - HVAC System Duct Design Manual

Table 4: Hydronic Air-Handler's Specifications

UNIT MODELS		37AHB04508KA5	37AHB06012KA5	37AHB07514KA5	37AHB09016KA5
Trade Name		AHB45	AHB60	AHB75	AHB90
RATING AND PERFORMANCE	**Descriptor (Typ.)**				
Nominal Output Capacity (BTU/h) †		45,000	60,000	75,000	90,000
Air Side Temperature Rise Rate in °F (68ºF Entering Air @ 150ºF Entering Water)	Heat Speed	50	50	50	50
External Static Pressure	(in. W.C.)	0 to 1.0	0 to 1.0	0 to 1.0	0 to 1.0
Nominal Airflow (CFM)	Heating	800 ‡	1200 ‡	1400 ‡	1600 ‡
	Cooling Range	650 - 800	650 - 1200	1000 - 1600	1200 - 1750
ELECTRICAL					
Power Supply	V - HZ - PH	115-60-1			
Minimum Circuit Ampacity	MCA	9.6	9.6	12.43	16.2
Max. Rating of Overcurrent Protective Device	MOP (Calculated)	13.6	13.6	18	23.7
Maximum Fuse or CKT BKR Size	Amps	15	15	20	25
Transformer (24V)		40 VA (Primary: 120 VAC / Secondary: 24 VAC)			
Printed Circuit Board	PCB	INTEGRAL (with connections for A/C system, UV lamp, Humidifier, and electronic air cleaner)			
CONTROLS					
Available Unit Configurations	A/C or HP	Dip Switch Selectable (SW1)			
	Single or Two Stage	Dip Switch Selectable (SW1)			
	FS or WH	Shunt Selectable (P-7)			
Safety Door Switch	Rated Voltage	125 VAC			
	Resistive Load	21 Amp			
Blower Off Delay	HTG/CLG	Dip-switch Selectable/Fixed 30 Sec			
Cool / Heat Blower On Delay	Varies	Cool: 1 second / Heat: 25 seconds (see Sequence of Operations)			
INDOOR BLOWER MOTOR					
Type		DIRECT DRIVE MOTOR (ECM)			
Motor HP		1/2	1/2	3/4	1
Motor (Full Load Amps)	FLA	6.2	6.2	8.5	11.5
Run Capacitor	mfd/volts	N/A			N/A
Volts-PH-HZ		115-1-60			
CIRCULATING PUMP					
Type		Wet Rotor			
Volts-PH-HZ		115-1-60			
Motor (Full Load Amps/Locked Rotor Amps)	FLA/LRA	1.8 / 2.6			
Pump Motor HP		1/8			
Run Capacitor	mfd/volts	14/250			
Maximum Working Pressure	PSI	125			
Min/Max Fluid Temperature	ºF (ºC)	120 (49) / 160 (71)			
HYDRONIC HEATING COIL					
Coil Construction		3/8" OD copper tubes, aluminum fins, galvanized steel frame			
Rows...Fins/In		2…16	2…16	3…14	3…15
Total Face Area	Sq. Ft.	2.3	2.6	2.8	3.3
Approximate Internal Volume	Gallons	0.47	0.53	0.86	1.02
PIPING CONNECTIONS - (QTY)					
Type		Copper Stubs			
Supply Diameter	Inches	(1) 3/4			
Return Diameter	Inches	(1) 3/4			
RETURN-AIR FILTERS					
Filter Type (Throwaway)	Inches ††	12 X 20 X 1	16 X 20 X 1	20 X 20 X 1	(2) 12 X 20 X 1
UNIT WEIGHT					
Shipping	lbs	92	109	118	136
Installed (with water)	lbs	107	127	138	159

Rinnai is continually updating and improving products. Therefore, specifications are subject to change without prior notice.

† Tested in accordance with ANSI/ASHRAE Standard 37-1988

‡ Airflow shown is for bottom only return-air (blower speed factory set). For air delivery other than stated, refer to Dry Coil Air Delivery table.

†† Required filter sizes shown are based on the larger of the ARI (Air Conditioning & Refrigeration Institute) rated cooling airflow or the heating airflow velocity of 300 ft/min for throwaway type or 450 ft/min for high-capacity type.

Side intake filter to be (1) 20"x20"x1" typical for all models.

Air filter pressure drop for non-standard filters must not exceed 0.08 in. wg.

TABLE 5.0: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB04508KA5 + REU-KA3237FFUD (WD)-US	AHB45 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					948	921	891	868	841	819	795	772	701	596	567			
	TAP 3 (H)	2.0	120	NET HEATING CAPACITY (MBH)	31.6	30.7	29.7	28.9	28.0	27.3	26.5	25.7	23.4	19.9	18.9	13	16	20
			130		36.7	35.7	34.5	33.6	32.6	31.7	30.8	29.9	27.2	23.1	22.0			
			140		44.1	42.8	41.4	40.4	39.1	38.1	37.0	35.9	32.6	27.7	26.4			
			150		50.9	49.4	47.8	46.6	45.2	44.0	42.7	41.4	37.6	32.0	30.4			
			160		58.9	57.2	55.4	53.9	52.3	50.9	49.4	48.0	43.6	37.0	35.2			
	AHB45 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					921	891	864	836	812	788	768	742	699	594	559			
	TAP 4 (M)	2.0	120	NET HEATING CAPACITY (MBH)	32.2	31.1	30.2	29.2	28.4	27.5	26.8	25.9	24.4	20.8	19.5	13	16	20
			130		37.6	36.4	35.3	34.1	33.1	32.2	31.3	30.3	28.5	24.2	22.8			
			140		44.4	43.0	41.7	40.3	39.2	38.0	37.0	35.8	33.7	28.6	27.0			
			150		50.2	48.6	47.1	45.6	44.3	42.9	41.9	40.4	38.1	32.4	30.5			
			160		58.4	56.5	54.8	53.0	51.5	50.0	48.7	47.1	44.3	37.7	35.5			
	AHB45 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					803	768	740	712	682	652	628	596	569	541	510			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	30.1	28.7	27.7	26.7	25.5	24.4	23.5	22.3	21.3	20.3	19.1	13	16	20
			130		35.8	34.2	33.0	31.7	30.4	29.1	28.0	26.6	25.4	24.1	22.7			
			140		42.1	40.3	38.8	37.4	35.8	34.2	33.0	31.3	29.9	28.4	26.8			
			150		49.7	47.5	45.8	44.1	42.2	40.4	38.9	36.9	35.2	33.5	31.6			
			160		56.7	54.2	52.2	50.2	48.1	46.0	44.3	42.1	40.1	38.2	36.0			

NOTES:
1. EWT - Entering Water Temperature (F).
2. CFM - Airflow in (Cubic Feet per Minute).
3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H.
5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps

TABLE 5.1: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB04508KA5 + REU-KA2530FFUD(WD)-US	AHB45 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					948	921	891	868	841	819	795	772	701	596	567			
	TAP 3 (H)	2.0	120	NET HEATING CAPACITY (MBH)	31.4	30.5	29.5	28.7	27.8	27.1	26.3	25.6	23.2	19.7	18.8	13	16	20
			130		37.4	36.3	35.2	34.3	33.2	32.3	31.4	30.5	27.7	23.5	22.4			
			140		46.0	44.7	43.2	42.1	40.8	39.7	38.6	37.4	34.0	28.9	27.5			
			150		52.3	50.8	49.1	47.9	46.4	45.2	43.9	42.6	38.7	32.9	31.3			
			160		59.3	57.6	55.7	54.3	52.6	51.2	49.7	48.3	43.8	37.3	35.5			
	AHB45 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					921	891	864	836	812	788	768	742	699	594	559			
	TAP 4 (M)	2.0	120	NET HEATING CAPACITY (MBH)	31.8	30.8	29.9	28.9	28.1	27.2	26.5	25.6	24.2	20.5	19.3	13	16	20
			130		37.2	36.0	34.9	33.8	32.8	31.8	31.0	30.0	28.2	24.0	22.6			
			140		45.8	44.3	42.9	41.6	40.4	39.2	38.2	36.9	34.7	29.5	27.8			
			150		52.1	50.4	48.9	47.3	45.9	44.6	43.4	42.0	39.5	33.6	31.6			
			160		58.7	56.7	55.0	53.2	51.7	50.2	48.9	47.3	44.5	37.8	35.6			
	AHB45 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					803	768	740	712	682	652	628	596	569	541	510			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	31.2	29.8	28.7	27.7	26.5	25.3	24.4	23.2	22.1	21.0	19.8	13	16	20
			130		35.3	33.8	32.6	31.3	30.0	28.7	27.6	26.2	25.0	23.8	22.5			
			140		41.1	39.3	37.8	36.4	34.9	33.3	32.1	30.5	29.1	27.7	26.1			
			150		49.0	46.8	45.1	43.4	41.6	39.7	38.3	36.3	34.7	33.0	31.1			
			160		55.0	52.6	50.7	48.7	46.7	44.6	43.0	40.8	38.9	37.0	34.9			

NOTES:
1. EWT - Entering Water Temperature (F).
2. CFM - Airflow in (Cubic Feet per Minute).
3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H.
5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps

TABLE 5.2: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB06012KA5 + REU-KA3237FFUD(WD)-US	AHB60 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1343	1318	1296	1270	1248	1225	1197	1168	1109	1025	889			
	TAP 1 (H)	3.0	120	NET HEATING CAPACITY (MBH)	40.7	39.9	39.3	38.5	37.8	37.1	36.3	35.4	33.6	31.1	26.9	20	24	30
			130		47.7	46.8	46.0	45.1	44.3	43.5	42.5	41.5	39.4	36.4	31.6			
			140		55.2	54.2	53.3	52.2	51.3	50.4	49.2	48.0	45.6	42.2	36.6			
			150		64.1	62.9	61.8	60.6	59.5	58.4	57.1	55.7	52.9	48.9	42.4			
			160		72.2	70.8	69.6	68.2	67.0	65.8	64.3	62.8	59.6	55.1	47.8			
	AHB60 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1148	1128	1103	1072	1045	1012	984	955	937	908	690			
	TAP 2 (MH)	2.5	120	NET HEATING CAPACITY (MBH)	38.7	38.0	37.2	36.1	35.2	34.1	33.2	32.2	31.6	30.6	23.3	20	24	30
			130		44.5	43.8	42.8	41.6	40.5	39.3	38.2	37.0	36.3	35.2	26.8			
			140		52.1	51.2	50.1	48.7	47.5	46.0	44.7	43.4	42.6	41.2	31.3			
			150		61.3	60.3	58.9	57.3	55.8	54.1	52.6	51.0	50.1	48.5	36.9			
			160		68.8	67.6	66.1	64.2	62.6	60.7	59.0	57.2	56.2	54.4	41.4			
	AHB60 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					971	942	911	880	847	817	784	751	715	680	642			
	TAP 4 (ML)	2.0	120	NET HEATING CAPACITY (MBH)	36.2	35.1	34.0	32.8	31.6	30.5	29.2	28.0	26.6	25.3	23.9	20	24	30
			130		42.6	41.4	40.0	38.6	37.2	35.9	34.4	33.0	31.4	29.9	28.2			
			140		50.0	48.5	46.9	45.3	43.6	42.0	40.3	38.6	36.8	35.0	33.0			
			150		57.8	56.0	54.2	52.4	50.4	48.6	46.6	44.7	42.5	40.5	38.2			
			160		64.6	62.7	60.6	58.6	56.4	54.4	52.2	50.0	47.6	45.3	42.7			
	AHB60 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					844	810	777	734	698	665	626	581	533	504	466			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	34.3	32.9	31.6	29.8	28.4	27.0	25.5	23.6	21.7	20.5	18.9	20	24	30
			130		44.6	42.8	41.0	38.8	36.9	35.1	33.1	30.7	28.2	26.6	24.6			
			140		47.4	45.4	43.6	41.2	39.2	37.3	35.1	32.6	29.9	28.3	26.1			
			150		53.9	51.7	49.6	46.9	44.6	42.5	40.0	37.1	34.0	32.2	29.8			
			160		61.2	58.8	56.4	53.3	50.6	48.3	45.4	42.2	38.7	36.6	33.8			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.3: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB06012KA5 + REU-KA2530FFUD(WD)-US	AHB60 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1343	1318	1296	1270	1248	1225	1197	1168	1109	1025	889			
	TAP 1 (H)	3.0	120	NET HEATING CAPACITY (MBH)	41.0	40.3	39.6	38.8	38.1	37.4	36.6	35.7	33.9	31.3	27.2	20	24	30
			130		47.4	46.5	45.7	44.8	44.0	43.2	42.2	41.2	39.1	36.2	31.4			
			140		54.8	53.8	52.9	51.8	50.9	50.0	48.8	47.6	45.2	41.8	36.3			
			150		63.7	62.6	61.5	60.3	59.2	58.1	56.8	55.4	52.6	48.6	42.2			
			160		70.4	69.1	68.0	66.6	65.5	64.3	62.8	61.3	58.2	53.8	46.6			
	AHB60 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1148	1128	1103	1072	1045	1012	984	955	937	908	690			
	TAP 2 (MH)	2.5	120	NET HEATING CAPACITY (MBH)	37.9	37.3	36.4	35.4	34.5	33.4	32.5	31.5	31.0	30.0	22.8	20	24	30
			130		44.5	43.7	42.8	41.6	40.5	39.2	38.2	37.0	36.3	35.2	26.8			
			140		52.1	51.2	50.1	48.7	47.4	45.9	44.7	43.4	42.5	41.2	31.3			
			150		60.5	59.4	58.1	56.5	55.1	53.3	51.9	50.3	49.4	47.8	36.4			
			160		66.9	65.7	64.3	62.5	60.9	59.0	57.3	55.6	54.6	52.9	40.2			
	AHB60 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					971	942	911	880	847	817	784	751	715	680	642			
	TAP 4 (ML)	2.0	120	NET HEATING CAPACITY (MBH)	35.0	34.0	32.8	31.7	30.5	29.5	28.3	27.1	25.8	24.5	23.1	20	24	30
			130		41.9	40.6	39.3	37.9	36.5	35.2	33.8	32.4	30.8	29.3	27.7			
			140		49.6	48.1	46.5	44.9	43.2	41.7	40.0	38.3	36.5	34.7	32.8			
			150		58.6	56.9	55.0	53.1	51.1	49.3	47.3	45.3	43.2	41.1	38.8			
			160		63.8	61.9	59.8	57.8	55.6	53.6	51.5	49.3	47.0	44.7	42.2			
	AHB60 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					844	810	777	734	698	665	626	581	533	504	466			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	33.3	32.0	30.7	29.0	27.6	26.3	24.7	22.9	21.0	19.9	18.4	20	24	30
			130		39.7	38.1	36.5	34.5	32.8	31.2	29.4	27.3	25.0	23.7	21.9			
			140		46.8	44.9	43.1	40.7	38.7	36.9	34.7	32.2	29.6	28.0	25.8			
			150		55.1	52.9	50.7	47.9	45.6	43.4	40.9	37.9	34.8	32.9	30.4			
			160		59.6	57.2	54.9	51.8	49.3	47.0	44.2	41.0	37.6	35.6	32.9			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.4: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB07514KA5 + REU-KA3237FFUD(WD)-US	AHB75 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1700	1666	1635	1604	1576	1543	1518	1492	1465	1430	1402			
	TAP 1 (H)	4.0	120	NET HEATING CAPACITY (MBH)	50.3	49.3	48.4	47.4	46.6	45.6	44.9	44.1	43.3	42.3	41.5	23	28	35
			130		60.0	58.8	57.7	56.6	55.6	54.5	53.6	52.7	51.7	50.5	49.5			
			140		69.1	67.7	66.5	65.2	64.1	62.7	61.7	60.7	59.6	58.1	57.0			
			150		80.2	78.6	77.1	75.7	74.3	72.8	71.6	70.4	69.1	67.5	66.1			
			160		89.8	88.0	86.4	84.7	83.3	81.5	80.2	78.8	77.4	75.5	74.1			
	AHB75 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1561	1524	1490	1456	1428	1396	1364	1330	1230	1265	1224			
	TAP 2 (MH)	3.5	120	NET HEATING CAPACITY (MBH)	51.3	50.1	49.0	47.8	46.9	45.9	44.8	43.7	40.4	41.6	40.2	23	28	35
			130		59.6	58.2	56.9	55.6	54.5	53.3	52.1	50.8	46.9	48.3	46.7			
			140		70.2	68.5	67.0	65.4	64.2	62.7	61.3	59.8	55.3	56.9	55.0			
			150		80.0	78.1	76.3	74.6	73.2	71.5	69.9	68.2	63.0	64.8	62.7			
			160		89.5	87.4	85.5	83.5	81.9	80.1	78.2	76.3	70.6	72.6	70.2			
	AHB75 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1391	1350	1320	1281	1245	1209	1170	1131	1090	1064	1031			
	TAP 3 (ML)	3.0	120	NET HEATING CAPACITY (MBH)	51.6	50.1	49.0	47.6	46.2	44.9	43.4	42.0	40.5	39.5	38.3	23	28	35
			130		60.8	59.0	57.7	56.0	54.4	52.9	51.2	49.4	47.7	46.5	45.1			
			140		72.0	69.9	68.4	66.3	64.5	62.6	60.6	58.6	56.4	55.1	53.4			
			150		81.3	78.9	77.2	74.9	72.8	70.7	68.4	66.1	63.7	62.2	60.3			
			160		91.6	88.9	86.9	84.3	82.0	79.6	77.0	74.5	71.8	70.1	67.9			
	AHB75 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1222	1174	1140	1100	1063	1014	979	937	887	829	777			
	TAP 4 (L)	2.5	120	NET HEATING CAPACITY (MBH)	47.4	45.5	44.2	42.7	41.2	39.3	38.0	36.3	34.4	32.2	30.1	23	28	35
			130		53.3	51.2	49.7	48.0	46.4	44.2	42.7	40.9	38.7	36.2	33.9			
			140		64.5	62.0	60.2	58.1	56.1	53.5	51.7	49.5	46.8	43.8	41.0			
			150		73.7	70.8	68.7	66.3	64.1	61.1	59.0	56.5	53.5	50.0	46.9			
			160		82.1	78.9	76.6	73.9	71.4	68.1	65.8	63.0	59.6	55.7	52.2			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.5: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB07514KA5 + REU-KA2530FFUD(WD)-US	AHB75 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1700	1666	1635	1604	1576	1543	1518	1492	1465	1430	1402			
	TAP 1 (H)	4.0	120	NET HEATING CAPACITY (MBH)	51.3	50.3	49.3	48.4	47.6	46.6	45.8	45.0	44.2	43.2	42.3	23	28	35
			130		61.3	60.1	58.9	57.8	56.8	55.6	54.7	53.8	52.8	51.5	50.5			
			140		71.6	70.2	68.9	67.6	66.4	65.0	63.9	62.8	61.7	60.2	59.1			
			150		82.2	80.6	79.1	77.6	76.2	74.6	73.4	72.2	70.8	69.2	67.8			
			160		91.9	90.1	88.4	86.7	85.2	83.4	82.1	80.7	79.2	77.3	75.8			
	AHB75 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1561	1524	1490	1456	1428	1396	1364	1330	1230	1265	1224			
	TAP 2 (MH)	3.5	120	NET HEATING CAPACITY (MBH)	52.6	51.3	50.2	49.0	48.1	47.0	45.9	44.8	41.4	42.6	41.2	23	28	35
			130		60.8	59.3	58.0	56.7	55.6	54.3	53.1	51.8	47.9	49.2	47.6			
			140		70.4	68.8	67.2	65.7	64.4	63.0	61.5	60.0	55.5	57.1	55.2			
			150		80.5	78.6	76.8	75.1	73.6	72.0	70.3	68.6	63.4	65.2	63.1			
			160		89.9	87.8	85.8	83.9	82.3	80.4	78.6	76.6	70.9	72.9	70.5			
	AHB75 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1391	1350	1320	1281	1245	1209	1170	1131	1090	1064	1031			
	TAP 3 (ML)	3.0	120	NET HEATING CAPACITY (MBH)	49.6	48.2	47.1	45.7	44.4	43.1	41.7	40.4	38.9	38.0	36.8	23	28	35
			130		57.8	56.1	54.8	53.2	51.7	50.2	48.6	47.0	45.3	44.2	42.8			
			140		66.1	64.2	62.7	60.9	59.2	57.5	55.6	53.8	51.8	50.6	49.0			
			150		76.1	73.8	72.2	70.1	68.1	66.1	64.0	61.9	59.6	58.2	56.4			
			160		87.1	84.6	82.7	80.3	78.0	75.7	73.3	70.9	68.3	66.7	64.6			
	AHB75 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1222	1174	1140	1100	1063	1014	979	937	887	829	777			
	TAP 4 (L)	2.5	120	NET HEATING CAPACITY (MBH)	47.6	45.7	44.4	42.8	41.4	39.5	38.1	36.5	34.5	32.3	30.3	23	28	35
			130		54.7	52.5	51.0	49.2	47.5	45.4	43.8	41.9	39.7	37.1	34.8			
			140		64.1	61.5	59.8	57.7	55.7	53.2	51.3	49.1	46.5	43.5	40.7			
			150		73.2	70.3	68.3	65.9	63.7	60.7	58.6	56.1	53.1	49.6	46.5			
			160		84.2	80.9	78.6	75.8	73.3	69.9	67.5	64.6	61.1	57.1	53.6			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.6: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB09016KA5 + REU-KA3237FFUD(WD)-US	AHB90 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1934	1889	1857	1818	1784	1750	1715	1680	1568	1491	1377			
	TAP 1 (H)	5.0	120	NET HEATING CAPACITY (MBH)	63.5	62.0	61.0	59.7	58.6	57.4	56.3	55.1	51.5	48.9	45.2	27	32	40
			130		71.3	69.6	68.4	67.0	65.8	64.5	63.2	61.9	57.8	55.0	50.8			
			140		82.1	80.2	78.8	77.2	75.7	74.3	72.8	71.3	66.6	63.3	58.5			
			150		94.3	92.1	90.5	88.6	87.0	85.3	83.6	81.9	76.4	72.7	67.1			
			160		106.9	104.4	102.6	100.5	98.6	96.7	94.8	92.8	86.6	82.4	76.1			
	AHB90 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1777	1732	1694	1650	1630	1592	1553	1517	1464	1441	1361			
	TAP 2 (MH)	4.0	120	NET HEATING CAPACITY (MBH)	58.9	57.5	56.2	54.7	54.1	52.8	51.5	50.3	48.6	47.8	45.1	27	32	40
			130		70.9	69.1	67.6	65.8	65.0	63.5	61.9	60.5	58.4	57.5	54.3			
			140		79.3	77.3	75.6	73.6	72.8	71.1	69.3	67.7	65.3	64.3	60.7			
			150		91.0	88.7	86.7	84.5	83.4	81.5	79.5	77.7	75.0	73.8	69.7			
			160		101.7	99.1	96.9	94.4	93.3	91.1	88.8	86.8	83.8	82.4	77.9			
	AHB90 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1573	1530	1490	1448	1417	1372	1327	1293	1253	1221	1175			
	TAP 3 (ML)	3.5	120	NET HEATING CAPACITY (MBH)	55.0	53.5	52.1	50.7	49.6	48.0	46.4	45.2	43.8	42.7	41.1	27	32	40
			130		65.2	63.4	61.7	60.0	58.7	56.8	55.0	53.6	51.9	50.6	48.7			
			140		75.7	73.6	71.7	69.6	68.2	66.0	63.8	62.2	60.3	58.7	56.5			
			150		86.2	83.9	81.7	79.4	77.7	75.2	72.7	70.9	68.7	66.9	64.4			
			160		96.8	94.1	91.7	89.1	87.2	84.4	81.6	79.5	77.1	75.1	72.3			
	AHB90 + RC98HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1400	1351	1317	1275	1225	1183	1134	1095	1053	1011	951			
	TAP 4 (L)	3.0	120	NET HEATING CAPACITY (MBH)	53.0	51.2	49.9	48.3	46.4	44.8	42.9	41.5	39.9	38.3	36.0	27	32	40
			130		63.1	60.9	59.4	57.5	55.2	53.3	51.1	49.3	47.5	45.6	42.9			
			140		72.5	70.0	68.2	66.0	63.4	61.3	58.7	56.7	54.5	52.4	49.3			
			150		82.7	79.8	77.8	75.3	72.3	69.9	67.0	64.7	62.2	59.7	56.2			
			160		93.0	89.7	87.5	84.7	81.4	78.6	75.3	72.7	69.9	67.2	63.2			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.7: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB09016KA5 + REU-KA2530FFUD(WD)-US	AHB90 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1934	1889	1857	1818	1784	1750	1715	1680	1568	1491	1377			
	TAP 1 (H)	5.0	120	NET HEATING CAPACITY (MBH)	61.4	60.0	59.0	57.8	56.7	55.6	54.5	53.4	49.8	47.4	43.7	27	32	40
			130		71.4	69.7	68.6	67.1	65.9	64.6	63.3	62.0	57.9	55.0	50.8			
			140		80.9	79.0	77.7	76.0	74.6	73.2	71.7	70.3	65.6	62.4	57.6			
			150		92.7	90.5	89.0	87.1	85.5	83.9	82.2	80.5	75.1	71.4	66.0			
			160		104.4	102.0	100.2	98.1	96.3	94.5	92.6	90.7	84.6	80.5	74.3			
	AHB90 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1777	1732	1694	1650	1630	1592	1553	1517	1464	1441	1361			
	TAP 2 (MH)	4.0	120	NET HEATING CAPACITY (MBH)	59.5	58.0	56.7	55.2	54.6	53.3	52.0	50.8	49.0	48.3	45.6	27	32	40
			130		68.9	67.1	65.6	63.9	63.2	61.7	60.2	58.8	56.7	55.8	52.7			
			140		79.1	77.1	75.4	73.5	72.6	70.9	69.1	67.5	65.2	64.2	60.6			
			150		90.4	88.1	86.2	84.0	82.9	81.0	79.0	77.2	74.5	73.3	69.3			
			160		101.4	98.9	96.7	94.2	93.0	90.9	88.6	86.6	83.6	82.2	77.7			
	AHB90 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1573	1530	1490	1448	1417	1372	1327	1293	1253	1221	1175			
	TAP 3 (ML)	3.5	120	NET HEATING CAPACITY (MBH)	57.1	55.6	54.1	52.6	51.5	49.8	48.2	47.0	45.5	44.3	42.7	27	32	40
			130		66.0	64.2	62.5	60.8	59.5	57.6	55.7	54.3	52.6	51.3	49.3			
			140		76.3	74.3	72.3	70.3	68.8	66.6	64.4	62.8	60.8	59.3	57.0			
			150		87.6	85.2	83.0	80.7	78.9	76.4	73.9	72.0	69.8	68.0	65.4			
			160		97.9	95.2	92.7	90.1	88.2	85.4	82.6	80.5	78.0	76.0	73.1			
	AHB90 + RC80HPi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1400	1351	1317	1275	1225	1183	1134	1095	1053	1011	951			
	TAP 4 (L)	3.0	120	NET HEATING CAPACITY (MBH)	54.4	52.5	51.2	49.5	47.6	46.0	44.1	42.5	40.9	39.3	37.0	27	32	40
			130		63.2	61.0	59.5	57.6	55.3	53.4	51.2	49.5	47.6	45.7	42.9			
			140		73.1	70.5	68.7	66.5	63.9	61.7	59.2	57.2	55.0	52.8	49.6			
			150		85.0	82.0	80.0	77.4	74.4	71.8	68.8	66.5	63.9	61.4	57.7			
			160		93.7	90.4	88.2	85.3	82.0	79.2	75.9	73.3	70.5	67.7	63.7			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.8: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP) 0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
37AHB04508KA5 + REU-VB2020FFUD-US	AHB45 +V53i				AIRFLOW (CFM) 948	921	891	868	841	819	795	772	701	596	567	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 3 (H)	2.0	120	NET HEATING CAPACITY (MBH)	34.5	33.6	32.5	31.6	30.6	29.8	29.0	28.1	25.5	21.7	20.7	13	16	20
			130		41.0	39.8	38.5	37.5	36.3	35.4	34.4	33.4	30.3	25.8	24.5			
			140		47.9	46.6	45.1	43.9	42.5	41.4	40.2	39.0	35.5	30.1	28.7			
			150		54.9	53.4	51.6	50.3	48.7	47.4	46.1	44.7	40.6	34.5	32.8			
			160		61.1	59.4	57.4	55.9	54.2	52.8	51.2	49.8	45.2	38.4	36.5			
	AHB45 +V53i				AIRFLOW (CFM) 921	891	864	836	812	788	768	742	699	594	559	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 4 (M)	2.0	120	NET HEATING CAPACITY (MBH)	33.9	32.8	31.8	30.8	29.9	29.0	28.3	27.3	25.7	21.9	20.6	13	16	20
			130		40.5	39.2	38.0	36.7	35.7	34.6	33.7	32.6	30.7	26.1	24.6			
			140		47.0	45.5	44.1	42.7	41.4	40.2	39.2	37.9	35.7	30.3	28.5			
			150		54.6	52.8	51.2	49.6	48.1	46.7	45.5	44.0	41.4	35.2	33.1			
			160		60.6	58.7	56.9	55.0	53.5	51.9	50.6	48.8	46.0	39.1	36.8			
	AHB45 +V53i				AIRFLOW (CFM) 803	768	740	712	682	652	628	596	569	541	510	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	32.3	30.9	29.8	28.7	27.5	26.2	25.3	24.0	22.9	21.8	20.5	13	16	20
			130		38.4	36.7	35.4	34.1	32.6	31.2	30.0	28.5	27.2	25.9	24.4			
			140		45.2	43.3	41.7	40.1	38.4	36.7	35.4	33.6	32.0	30.5	28.7			
			150		51.7	49.5	47.6	45.8	43.9	42.0	40.4	38.4	36.6	34.8	32.8			
			160		57.7	55.2	53.2	51.2	49.0	46.9	45.2	42.8	40.9	38.9	36.7			

NOTES:
1. EWT - Entering Water Temperature (F).
2. CFM - Airflow in (Cubic Feet per Minute).
3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H.
5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps

TABLE 5.9: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB04508KA5 + REU-VB2528FFUD(WD)-US	AHB45 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					948	921	891	868	841	819	795	772	701	596	567			
	TAP 3 (H)	2.0	120	NET HEATING CAPACITY (MBH)	32.1	31.2	30.2	29.4	28.5	27.7	26.9	26.1	23.7	20.2	19.2	13	16	20
			130		38.5	37.4	36.2	35.2	34.1	33.3	32.3	31.3	28.5	24.2	23.0			
			140		46.4	45.1	43.6	42.5	41.2	40.1	38.9	37.8	34.3	29.2	27.8			
			150		52.9	51.4	49.7	48.4	46.9	45.7	44.4	43.1	39.1	33.3	31.6			
			160		59.3	57.6	55.7	54.3	52.6	51.2	49.7	48.3	43.8	37.3	35.5			
	AHB45 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					921	891	864	836	812	788	768	742	699	594	559			
	TAP 4 (M)	2.0	120	NET HEATING CAPACITY (MBH)	31.7	30.6	29.7	28.7	27.9	27.1	26.4	25.5	24.0	20.4	19.2	13	16	20
			130		38.3	37.1	35.9	34.8	33.8	32.8	31.9	30.9	29.1	24.7	23.3			
			140		45.8	44.3	43.0	41.6	40.4	39.2	38.2	36.9	34.8	29.6	27.8			
			150		52.3	50.6	49.1	47.5	46.1	44.7	43.6	42.1	39.7	33.7	31.7			
			160		57.8	55.9	54.2	52.4	50.9	49.4	48.2	46.5	43.8	37.2	35.1			
	AHB45 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					803	768	740	712	682	652	628	596	569	541	510			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	29.0	27.7	26.7	25.7	24.6	23.5	22.6	21.5	20.5	19.5	18.4	13	16	20
			130		36.1	34.5	33.3	32.0	30.7	29.3	28.2	26.8	25.6	24.3	22.9			
			140		41.7	39.9	38.4	37.0	35.4	33.9	32.6	31.0	29.6	28.1	26.5			
			150		48.7	46.6	44.9	43.2	41.4	39.6	38.1	36.2	34.5	32.8	30.9			
			160		54.7	52.3	50.4	48.5	46.4	44.4	42.7	40.6	38.7	36.8	34.7			

NOTES:
1. EWT - Entering Water Temperature (F).
2. CFM - Airflow in (Cubic Feet per Minute).
3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H.
5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps

TABLE 5.10: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (^{O}F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP) 0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
37AHB04508KA5 + REU-VB2735FFUD(WD)-US	AHB45 + R94-LSi(e)				AIRFLOW (CFM) 948	921	891	868	841	819	795	772	701	596	567	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 3 (H)	2.0	120	NET HEATING CAPACITY (MBH)	31.7	30.8	29.8	29.0	28.1	27.4	26.6	25.8	23.4	19.9	19.0	13	16	20
			130		38.4	37.3	36.1	35.1	34.0	33.2	32.2	31.3	28.4	24.1	23.0			
			140		45.2	43.9	42.5	41.4	40.1	39.0	37.9	36.8	33.4	28.4	27.0			
			150		51.4	49.9	48.3	47.1	45.6	44.4	43.1	41.9	38.0	32.3	30.7			
			160		58.0	56.4	54.5	53.1	51.5	50.1	48.6	47.2	42.9	36.5	34.7			
	AHB45 + R94-LSi(e)				AIRFLOW (CFM) 921	891	864	836	812	788	768	742	699	594	559	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 4 (M)	2.0	120	NET HEATING CAPACITY (MBH)	31.9	30.8	29.9	28.9	28.1	27.3	26.6	25.7	24.2	20.6	19.3	13	16	20
			130		38.2	37.0	35.9	34.7	33.7	32.7	31.9	30.8	29.0	24.7	23.2			
			140		43.8	42.3	41.0	39.7	38.6	37.4	36.5	35.2	33.2	28.2	26.6			
			150		50.8	49.2	47.7	46.1	44.8	43.5	42.4	40.9	38.6	32.8	30.8			
			160		57.0	55.2	53.5	51.8	50.3	48.8	47.6	45.9	43.3	36.8	34.6			
	AHB45 + R94-LSi(e)				AIRFLOW (CFM) 803	768	740	712	682	652	628	596	569	541	510	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	29.5	28.2	27.1	26.1	25.0	23.9	23.0	21.9	20.9	19.8	18.7	13	16	20
			130		36.2	34.6	33.3	32.1	30.7	29.4	28.3	26.8	25.6	24.4	23.0			
			140		42.0	40.1	38.7	37.2	35.6	34.1	32.8	31.1	29.7	28.3	26.6			
			150		47.5	45.4	43.7	42.1	40.3	38.5	37.1	35.2	33.6	32.0	30.1			
			160		53.6	51.3	49.4	47.5	45.5	43.5	41.9	39.8	38.0	36.1	34.0			

NOTES:
1. EWT - Entering Water Temperature (F).
2. CFM - Airflow in (Cubic Feet per Minute).
3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H.
5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps

TABLE 5.11: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB06012KA5 + REU-VB2020FFUD-US	AHB60 + V53i				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1343	1318	1296	1270	1248	1225	1197	1168	1109	1025	889			
	TAP 1 (H)	3.0	120	NET HEATING CAPACITY (MBH)	37.3	36.6	36.0	35.3	34.7	34.0	33.2	32.4	30.8	28.5	24.7	20	24	30
			130		44.9	44.1	43.4	42.5	41.7	41.0	40.0	39.1	37.1	34.3	29.7			
			140		52.8	51.9	51.0	50.0	49.1	48.2	47.1	46.0	43.6	40.3	35.0			
			150		60.9	59.8	58.8	57.6	56.6	55.6	54.3	53.0	50.3	46.5	40.3			
			160		67.4	66.2	65.1	63.8	62.7	61.5	60.1	58.6	55.7	51.5	44.6			
	AHB60 + V53i				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1148	1128	1103	1072	1045	1012	984	955	937	908	690			
	TAP 2 (MH)	2.5	120	NET HEATING CAPACITY (MBH)	35.5	34.9	34.1	33.2	32.3	31.3	30.4	29.5	29.0	28.1	21.4	20	24	30
			130		42.3	41.5	40.6	39.5	38.5	37.3	36.2	35.2	34.5	33.4	25.4			
			140		49.6	48.7	47.6	46.3	45.1	43.7	42.5	41.2	40.5	39.2	29.8			
			150		57.4	56.4	55.2	53.6	52.3	50.6	49.2	47.8	46.9	45.4	34.5			
			160		64.3	63.2	61.8	60.1	58.5	56.7	55.1	53.5	52.5	50.9	38.7			
	AHB60 + V53i				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					971	942	911	880	847	817	784	751	715	680	642			
	TAP 4 (ML)	2.0	120	NET HEATING CAPACITY (MBH)	34.9	33.9	32.8	31.6	30.5	29.4	28.2	27.0	25.7	24.5	23.1	20	24	30
			130		41.2	40.0	38.7	37.4	36.0	34.7	33.3	31.9	30.4	28.9	27.3			
			140		48.1	46.7	45.1	43.6	41.9	40.5	38.8	37.2	35.4	33.7	31.8			
			150		55.2	53.5	51.8	50.0	48.1	46.4	44.5	42.7	40.6	38.6	36.5			
			160		61.8	60.0	58.0	56.0	53.9	52.0	49.9	47.8	45.5	43.3	40.9			
	AHB60 + V53i				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					844	810	777	734	698	665	626	581	533	504	466			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	33.1	31.8	30.5	28.8	27.4	26.1	24.6	22.8	20.9	19.8	18.3	20	24	30
			130		39.0	37.5	35.9	33.9	32.3	30.8	29.0	26.9	24.7	23.3	21.6			
			140		45.4	43.5	41.8	39.4	37.5	35.7	33.6	31.2	28.6	27.1	25.0			
			150		50.9	48.9	46.9	44.3	42.1	40.1	37.8	35.0	32.2	30.4	28.1			
			160		56.5	54.2	52.0	49.1	46.7	44.5	41.9	38.9	35.7	33.7	31.2			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.12: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB06012KA5 + REU-VB2528FFUD(WD)-US	AHB60 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1343	1318	1296	1270	1248	1225	1197	1168	1109	1025	889			
	TAP 1 (H)	3.0	120	NET HEATING CAPACITY (MBH)	39.9	39.2	38.5	37.7	37.1	36.4	35.6	34.7	32.9	30.4	26.4	20	24	30
			130		49.5	48.6	47.8	46.8	46.0	45.1	44.1	43.0	40.9	37.8	32.8			
			140		55.7	54.6	53.7	52.6	51.7	50.8	49.6	48.4	46.0	42.5	36.8			
			150		65.5	64.3	63.2	61.9	60.8	59.7	58.4	56.9	54.1	50.0	43.3			
			160		74.7	73.3	72.1	70.6	69.4	68.1	66.6	65.0	61.7	57.0	49.4			
	AHB60 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1148	1128	1103	1072	1045	1012	984	955	937	908	690			
	TAP 2 (MH)	2.5	120	NET HEATING CAPACITY (MBH)	38.0	37.4	36.6	35.5	34.6	33.5	32.6	31.7	31.1	30.1	22.9	20	24	30
			130		44.8	44.0	43.0	41.8	40.8	39.5	38.4	37.3	36.6	35.4	26.9			
			140		53.0	52.1	50.9	49.5	48.2	46.7	45.4	44.1	43.2	41.9	31.8			
			150		60.5	59.4	58.1	56.5	55.1	53.3	51.9	50.3	49.4	47.9	36.4			
			160		68.9	67.7	66.2	64.3	62.7	60.7	59.1	57.3	56.2	54.5	41.4			
	AHB60 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					971	942	911	880	847	817	784	751	715	680	642			
	TAP 4 (ML)	2.0	120	NET HEATING CAPACITY (MBH)	35.5	34.5	33.3	32.2	31.0	29.9	28.7	27.5	26.2	24.9	23.5	20	24	30
			130		42.6	41.3	40.0	38.6	37.1	35.8	34.4	32.9	31.4	29.8	28.2			
			140		49.1	47.7	46.1	44.5	42.9	41.3	39.7	38.0	36.2	34.4	32.5			
			150		56.9	55.2	53.4	51.6	49.7	47.9	46.0	44.0	41.9	39.9	37.6			
			160		63.9	62.0	60.0	57.9	55.8	53.8	51.6	49.5	47.1	44.8	42.3			
	AHB60 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					844	810	777	734	698	665	626	581	533	504	466			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	33.0	31.7	30.4	28.7	27.3	26.0	24.5	22.7	20.9	19.7	18.2	20	24	30
			130		39.0	37.5	35.9	34.0	32.3	30.8	29.0	26.9	24.7	23.3	21.6			
			140		47.3	45.4	43.5	41.1	39.1	37.3	35.1	32.6	29.9	28.2	26.1			
			150		54.3	52.1	50.0	47.2	44.9	42.8	40.3	37.4	34.3	32.4	30.0			
			160		60.4	58.0	55.6	52.6	50.0	47.6	44.8	41.6	38.2	36.1	33.4			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.13: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB06012KA5 + REU-VB2735FFUD(WD)-US	AHB60 + R94-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1343	1318	1296	1270	1248	1225	1197	1168	1109	1025	889			
	TAP 1 (H)	3.0	120	NET HEATING CAPACITY (MBH)	39.7	38.9	38.3	37.5	36.9	36.2	35.4	34.5	32.8	30.3	26.3	20	24	30
			130		48.3	47.4	46.6	45.7	44.9	44.0	43.0	42.0	39.9	36.8	32.0			
			140		55.5	54.5	53.6	52.5	51.6	50.6	49.5	48.3	45.8	42.4	36.7			
			150		63.7	62.5	61.5	60.3	59.2	58.1	56.8	55.4	52.6	48.6	42.2			
			160		73.3	72.0	70.8	69.3	68.1	66.9	65.4	63.8	60.6	56.0	48.5			
	AHB60 + R94-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1148	1128	1103	1072	1045	1012	984	955	937	908	690			
	TAP 2 (MH)	2.5	120	NET HEATING CAPACITY (MBH)	38.6	38.0	37.1	36.1	35.2	34.1	33.1	32.1	31.5	30.6	23.2	20	24	30
			130		45.6	44.8	43.8	42.6	41.5	40.2	39.1	37.9	37.2	36.1	27.4			
			140		54.0	53.1	51.9	50.5	49.2	47.6	46.3	44.9	44.1	42.7	32.5			
			150		61.9	60.9	59.5	57.8	56.4	54.6	53.1	51.5	50.6	49.0	37.2			
			160		67.9	66.8	65.3	63.4	61.8	59.9	58.2	56.5	55.5	53.7	40.8			
	AHB60 + R94-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					971	942	911	880	847	817	784	751	715	680	642			
	TAP 4 (ML)	2.0	120	NET HEATING CAPACITY (MBH)	35.6	34.5	33.4	32.2	31.0	29.9	28.7	27.5	26.2	24.9	23.5	20	24	30
			130		42.3	41.0	39.7	38.3	36.9	35.6	34.1	32.7	31.1	29.6	28.0			
			140		48.9	47.4	45.8	44.3	42.6	41.1	39.4	37.8	36.0	34.2	32.3			
			150		56.6	54.9	53.1	51.3	49.4	47.6	45.7	43.8	41.7	39.7	37.4			
			160		63.4	61.5	59.5	57.5	55.3	53.4	51.2	49.0	46.7	44.4	41.9			
	AHB60 + R94-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					844	810	777	734	698	665	626	581	533	504	466			
	TAP 5 (L)	1.5	120	NET HEATING CAPACITY (MBH)	34.4	33.0	31.7	29.9	28.5	27.1	25.5	23.7	21.7	20.5	19.0	20	24	30
			130		39.9	38.2	36.7	34.7	33.0	31.4	29.6	27.4	25.2	23.8	22.0			
			140		46.2	44.4	42.6	40.2	38.2	36.4	34.3	31.8	29.2	27.6	25.5			
			150		54.2	52.0	49.9	47.2	44.8	42.7	40.2	37.3	34.2	32.4	29.9			
			160		59.7	57.3	55.0	51.9	49.4	47.0	44.3	41.1	37.7	35.7	33.0			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.14: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB07514KA5 + REU-VB2528FFUD(WD)-US	AHB75 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1700	1666	1635	1604	1576	1543	1518	1492	1465	1430	1402			
	TAP 1 (H)	4.0	120	NET HEATING CAPACITY (MBH)	50.3	49.3	48.4	47.5	46.6	45.7	44.9	44.1	43.3	42.3	41.5	23	28	35
			130		61.9	60.7	59.5	58.4	57.4	56.2	55.3	54.3	53.4	52.1	51.1			
			140		71.7	70.3	69.0	67.7	66.5	65.1	64.0	62.9	61.8	60.3	59.1			
			150		82.2	80.5	79.0	77.5	76.2	74.6	73.4	72.1	70.8	69.1	67.8			
			160		92.1	90.2	88.6	86.9	85.4	83.6	82.2	80.8	79.3	77.5	75.9			
	AHB75 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1561	1524	1490	1456	1428	1396	1364	1330	1230	1265	1224			
	TAP 2 (MH)	3.5	120	NET HEATING CAPACITY (MBH)	48.8	47.7	46.6	45.6	44.7	43.7	42.7	41.6	38.5	39.6	38.3	23	28	35
			130		59.1	57.7	56.4	55.2	54.1	52.9	51.7	50.4	46.6	47.9	46.4			
			140		68.8	67.2	65.7	64.2	63.0	61.6	60.2	58.7	54.2	55.8	54.0			
			150		78.7	76.8	75.1	73.4	72.0	70.4	68.8	67.0	62.0	63.8	61.7			
			160		88.3	86.2	84.2	82.3	80.7	78.9	77.1	75.2	69.5	71.5	69.2			
	AHB75 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1391	1350	1320	1281	1245	1209	1170	1131	1090	1064	1031			
	TAP 3 (ML)	3.0	120	NET HEATING CAPACITY (MBH)	47.9	46.5	45.5	44.1	42.9	41.6	40.3	39.0	37.5	36.6	35.5	23	28	35
			130		58.2	56.5	55.2	53.6	52.1	50.6	49.0	47.3	45.6	44.5	43.1			
			140		67.5	65.5	64.1	62.2	60.4	58.7	56.8	54.9	52.9	51.6	50.0			
			150		77.5	75.3	73.6	71.4	69.4	67.4	65.2	63.1	60.8	59.3	57.5			
			160		86.8	84.2	82.3	79.9	77.6	75.4	73.0	70.5	68.0	66.4	64.3			
	AHB75 + R75-LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1222	1174	1140	1100	1063	1014	979	937	887	829	777			
	TAP 4 (L)	2.5	120	NET HEATING CAPACITY (MBH)	45.9	44.1	42.8	41.3	39.9	38.1	36.8	35.2	33.3	31.1	29.2	23	28	35
			130		55.7	53.5	52.0	50.2	48.5	46.2	44.6	42.7	40.4	37.8	35.4			
			140		64.1	61.6	59.8	57.7	55.7	53.2	51.3	49.1	46.5	43.5	40.7			
			150		72.6	69.7	67.7	65.3	63.1	60.2	58.1	55.6	52.7	49.2	46.1			
			160		81.5	78.3	76.1	73.4	70.9	67.7	65.3	62.5	59.2	55.3	51.8			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.15: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB07514KA5 + REU-VB2735FFUD(WD)-US	AHB75 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1700	1666	1635	1604	1576	1543	1518	1492	1465	1430	1402			
	TAP 1 (H)	4.0	120	NET HEATING CAPACITY (MBH)	50.3	49.3	48.4	47.4	46.6	45.6	44.9	44.1	43.3	42.3	41.5	23	28	35
			130		60.1	58.9	57.8	56.7	55.7	54.5	53.6	52.7	51.8	50.5	49.5			
			140		69.1	67.7	66.4	65.2	64.0	62.7	61.7	60.6	59.5	58.1	56.9			
			150		80.2	78.6	77.2	75.7	74.4	72.8	71.6	70.4	69.1	67.5	66.2			
			160		89.8	88.0	86.4	84.7	83.3	81.5	80.2	78.8	77.4	75.5	74.1			
	AHB75 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1561	1524	1490	1456	1428	1396	1364	1330	1230	1265	1224			
	TAP 2 (MH)	3.5	120	NET HEATING CAPACITY (MBH)	49.1	48.0	46.9	45.8	45.0	44.0	42.9	41.9	38.7	39.8	38.5	23	28	35
			130		59.1	57.7	56.4	55.1	54.1	52.9	51.6	50.4	46.6	47.9	46.3			
			140		68.9	67.2	65.7	64.2	63.0	61.6	60.2	58.7	54.3	55.8	54.0			
			150		79.4	77.5	75.8	74.1	72.6	71.0	69.4	67.6	62.6	64.3	62.3			
			160		88.6	86.5	84.6	82.7	81.1	79.3	77.5	75.5	69.9	71.8	69.5			
	AHB75 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1391	1350	1320	1281	1245	1209	1170	1131	1090	1064	1031			
	TAP 3 (ML)	3.0	120	NET HEATING CAPACITY (MBH)	45.6	44.3	43.3	42.0	40.8	39.7	38.4	37.1	35.7	34.9	33.8	23	28	35
			130		54.9	53.3	52.1	50.6	49.2	47.8	46.2	44.7	43.1	42.0	40.7			
			140		66.0	64.1	62.7	60.8	59.1	57.4	55.5	53.7	51.7	50.5	48.9			
			150		75.2	73.0	71.4	69.3	67.3	65.4	63.3	61.1	58.9	57.5	55.7			
			160		85.1	82.6	80.8	78.4	76.2	74.0	71.6	69.2	66.7	65.1	63.1			
	AHB75 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1222	1174	1140	1100	1063	1014	979	937	887	829	777			
	TAP 4 (L)	2.5	120	NET HEATING CAPACITY (MBH)	45.0	43.2	42.0	40.5	39.1	37.3	36.0	34.5	32.6	30.5	28.6	23	28	35
			130		53.4	51.3	49.8	48.0	46.4	44.3	42.7	40.9	38.7	36.2	33.9			
			140		62.4	59.9	58.2	56.1	54.3	51.8	50.0	47.8	45.3	42.3	39.7			
			150		71.7	68.9	66.9	64.6	62.4	59.5	57.5	55.0	52.1	48.7	45.6			
			160		80.3	77.2	75.0	72.3	69.9	66.7	64.4	61.6	58.3	54.5	51.1			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.16: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP) 0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
37AHB09016KA5 + REU-VB2528FFUD(WD)-US	AHB90 + R75-LSi(e)				AIRFLOW (CFM) 1934	1889	1857	1818	1784	1750	1715	1680	1568	1491	1377	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 1 (H)	5.0	120	NET HEATING CAPACITY (MBH)	63.5	62.0	61.0	59.7	58.6	57.5	56.3	55.2	51.5	49.0	45.2	27	32	40
			130		74.4	72.6	71.4	69.9	68.6	67.3	65.9	64.6	60.3	57.3	52.9			
			140		87.5	85.5	84.0	82.3	80.7	79.2	77.6	76.0	70.9	67.5	62.3			
			150		99.5	97.1	95.5	93.5	91.7	90.0	88.2	86.4	80.6	76.7	70.8			
			160		110.4	107.9	106.0	103.8	101.9	99.9	97.9	95.9	89.5	85.1	78.6			
	AHB90 + R75-LSi(e)				AIRFLOW (CFM) 1777	1732	1694	1650	1630	1592	1553	1517	1464	1441	1361	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 2 (MH)	4.0	120	NET HEATING CAPACITY (MBH)	61.2	59.7	58.4	56.9	56.2	54.9	53.5	52.3	50.5	49.7	46.9	27	32	40
			130		71.3	69.5	68.0	66.2	65.4	63.9	62.3	60.9	58.7	57.8	54.6			
			140		85.1	82.9	81.1	79.0	78.1	76.2	74.4	72.6	70.1	69.0	65.2			
			150		96.6	94.2	92.1	89.7	88.6	86.6	84.5	82.5	79.6	78.4	74.0			
			160		107.5	104.8	102.5	99.8	98.6	96.3	94.0	91.8	88.6	87.2	82.4			
	AHB90 + R75-LSi(e)				AIRFLOW (CFM) 1573	1530	1490	1448	1417	1372	1327	1293	1253	1221	1175	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 3 (ML)	3.5	120	NET HEATING CAPACITY (MBH)	58.1	56.5	55.0	53.5	52.3	50.7	49.0	47.7	46.3	45.1	43.4	27	32	40
			130		69.0	67.1	65.4	63.5	62.2	60.2	58.2	56.7	55.0	53.6	51.6			
			140		79.9	77.7	75.7	73.5	72.0	69.7	67.4	65.7	63.6	62.0	59.7			
			150		92.2	89.7	87.3	84.8	83.0	80.4	77.8	75.8	73.4	71.5	68.9			
			160		102.7	99.8	97.2	94.5	92.5	89.5	86.6	84.4	81.8	79.7	76.7			
	AHB90 + R75-LSi(e)				AIRFLOW (CFM) 1400	1351	1317	1275	1225	1183	1134	1095	1053	1011	951	Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
	TAP 4 (L)	3.0	120	NET HEATING CAPACITY (MBH)	54.4	52.5	51.2	49.5	47.6	46.0	44.1	42.5	40.9	39.3	37.0	27	32	40
			130		66.2	63.8	62.2	60.2	57.9	55.9	53.6	51.7	49.8	47.8	44.9			
			140		75.8	73.2	71.3	69.1	66.4	64.1	61.4	59.3	57.0	54.8	51.5			
			150		88.0	85.0	82.8	80.2	77.0	74.4	71.3	68.9	66.2	63.6	59.8			
			160		97.3	93.9	91.5	88.6	85.1	82.2	78.8	76.1	73.2	70.2	66.1			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

TABLE 5.17: AIR DELIVERY AND PERFORMANCE DATA (BOTTOM OR SIDE RETURN w/ FACTORY SUPPLIED FILTER)

UNIT SIZE	ECM SPEED TAP	SUPPORTS COOLING CAP. RANGE (TONS)	EWT (°F)	NOMINAL HEATING CAPACITY	External Static Pressure (ESP)											Number of 3" Diameter Branch Legs applicable to High Velocity Systems Only. Used only if methods other than Table 3 is used to determine duct sizes.		
					0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
37AHB09016KA5 + REU-VB2735FFUD(WD)-US	AHB90 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1934	1889	1857	1818	1784	1750	1715	1680	1568	1491	1377			
	TAP 1 (H)	5.0	120	NET HEATING CAPACITY (MBH)	60.7	59.3	58.3	57.1	56.0	55.0	53.9	52.8	49.2	46.8	43.2	27	32	40
			130		72.1	70.4	69.2	67.8	66.5	65.3	64.0	62.6	58.5	55.6	51.3			
			140		83.7	81.8	80.4	78.7	77.3	75.8	74.3	72.7	67.9	64.6	59.6			
			150		95.2	93.0	91.4	89.5	87.8	86.2	84.4	82.7	77.2	73.4	67.8			
			160		106.9	104.4	102.6	100.5	98.6	96.7	94.8	92.8	86.7	82.4	76.1			
	AHB90 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1777	1732	1694	1650	1630	1592	1553	1517	1464	1441	1361			
	TAP 2 (MH)	4.0	120	NET HEATING CAPACITY (MBH)	59.1	57.6	56.4	54.9	54.2	53.0	51.7	50.5	48.7	47.9	45.3	27	32	40
			130		69.5	67.8	66.3	64.5	63.8	62.3	60.8	59.3	57.3	56.4	53.2			
			140		81.1	79.1	77.4	75.3	74.4	72.7	70.9	69.3	66.9	65.8	62.1			
			150		92.5	90.2	88.2	85.9	84.9	82.9	80.9	79.0	76.2	75.0	70.9			
			160		103.5	100.9	98.7	96.1	95.0	92.8	90.5	88.4	85.3	84.0	79.3			
	AHB90 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1573	1530	1490	1448	1417	1372	1327	1293	1253	1221	1175			
	TAP 3 (ML)	3.5	120	NET HEATING CAPACITY (MBH)	55.8	54.3	52.9	51.4	50.3	48.7	47.1	45.9	44.4	43.3	41.7	27	32	40
			130		67.4	65.5	63.8	62.0	60.7	58.8	56.8	55.4	53.7	52.3	50.3			
			140		77.5	75.4	73.4	71.3	69.8	67.6	65.4	63.7	61.7	60.1	57.9			
			150		87.7	85.3	83.1	80.7	79.0	76.5	74.0	72.1	69.9	68.1	65.5			
			160		99.1	96.3	93.8	91.2	89.2	86.4	83.6	81.4	78.9	76.9	74.0			
	AHB90 + R94LSi(e)				AIRFLOW (CFM)											Minimum Legs @ 60 CFM/Leg	Optimal Legs @ 50 CFM/Leg	Maximum legs @ 40 CFM/Leg
					1400	1351	1317	1275	1225	1183	1134	1095	1053	1011	951			
	TAP 4 (L)	3.0	120	NET HEATING CAPACITY (MBH)	54.5	52.6	51.3	49.7	47.7	46.1	44.2	42.6	41.0	39.4	37.0	27	32	40
			130		63.2	61.0	59.5	57.6	55.3	53.4	51.2	49.4	47.6	45.7	42.9			
			140		74.1	71.5	69.7	67.5	64.8	62.6	60.0	57.9	55.7	53.5	50.3			
			150		85.0	82.0	79.9	77.4	74.4	71.8	68.8	66.5	63.9	61.4	57.7			
			160		94.4	91.1	88.8	86.0	82.6	79.8	76.5	73.8	71.0	68.2	64.1			

NOTES:
1. EWT - Entering Water Temperature (F); 2. CFM - Airflow in (Cubic Feet per Minute); 3. Legs - 3 inch diameter flexible ducts to diffusers.
4. 1 MBH = 1000 BTU/H; 5. Shaded box represents rating point; refer to wiring diagram for factory set speed taps.

Table 6: Air Delivery & Performance Data with V-Series EHS

37AHB045 & 37AHB060 Nominal Heating Capacity (MBH)

UNIT MODEL	EHS PART NUMBER	TRADE NAME	BLOWER SPEED‡	ESP (in. W.C.)	AIR DELIVERY (CFM)‡	ENTERING WATER TEMPERATURE (°F)				
						120	130	140	150†	160
37AHB04508KA5 (AHB45)	REU-V1616WC	C42e	HIGH	0.5	800	34.2	38.0	45.8	51.1	57.0
	REU-V2020WC	C53e				35.3	38.2	46.4	50.7	57.5
	REU-V2532WC	C85e				31.0	37.0	45.3	50.0	52.6
	REU-V2532WCD	C85e PLUS				31.0	37.0	45.3	50.0	52.6
	REU-V2520FFUC	C53i				34.6	40.6	46.2	52.3	58.3
	REU-V2520FFUCD	C53i PLUS				34.6	40.6	46.2	52.3	58.3
	REU-V2532FFUC	C85i				34.9	40.2	45.1	51.1	56.8
	REU-V2532FFUCD	C85i PLUS				34.9	40.2	45.1	51.1	56.8
	REU-V3237WC	C98e				34.4	39.3	45.2	51.0	55.6
	REU-V3237FFUC	C98i				34.6	39.9	45.6	52.1	58.0
37AHB06012KA5 (AHB60)	REU-V1616WC	C42e	HIGH	0.5	1200	39.1	46.4	53.8	61.5	69.5
	REU-V2020WC	C53e				38.9	46.2	53.6	61.1	68.2
	REU-V2532WC	C85e				39.7	46.0	52.7	60.5	68.9
	REU-V2532WCD	C85e PLUS				39.7	46.0	52.7	60.5	68.9
	REU-V2520FFUC	C53i				37.5	45.0	52.5	60.0	68.0
	REU-V2520FFUCD	C53i PLUS				37.5	45.0	52.5	60.0	68.0
	REU-V2532FFUC	C85i				41.2	48.3	55.8	62.2	69.0
	REU-V2532FFUCD	C85i PLUS				41.2	48.3	55.8	62.2	69.0
	REU-V3237WC	C98e				37.6	45.4	54.4	61.5	70.5
	REU-V3237FFUC	C98i				38.7	46.6	54.4	61.9	69.8

Legend

CFM Cubic Feet Per Minute
ESP External Static Pressure
EHS External Heat Source (Rinnai® V-Series Water Heaters)
‡ Factory Setting
† Recommended Operating Point

Notes

(1) 1 MBH = 1000 Btuh
(2) Air entering at 68ºF
(3) Capacities are based on a piping arrangement with a total equivalent length of 100 ft.

Table 7: Air Delivery & Performance Data with V-Series EHS

Unit Sizes: 37AHB075 & 37AHB090 Nominal Heating Capacity (MBH)

UNIT MODEL	EHS PART NUMBER	TRADE NAME	BLOWER SPEED‡	ESP (in. W.C.)	AIR DELIVERY (CFM)‡	ENTERING WATER TEMPERATURE (°F)				
						120	130	140	150†	160
37AHB07514KA5 (37AHB75)	REU-V1616WC	C42e	MEDIUM-HIGH	0.5	1400	46.9	55.8	65.1	74.6	83.5
	REU-V2020WC	C53e				46.4	55.2	64.4	73.6	83.0
	REU-V2532WC	C85e				50.2	59.3	68.6	78.2	87.4
	REU-V2532WCD	C85e PLUS				50.2	59.3	68.6	78.2	87.4
	REU-V2520FFUC	C53i				49.6	59.3	68.5	78.3	88.4
	REU-V2520FFUCD	C53i PLUS				49.6	59.3	68.5	78.3	88.4
	REU-V2532FFUC	C85i				48.6	57.2	66.3	75.9	85.1
	REU-V2532FFUCD	C85i PLUS				48.6	57.2	66.3	75.9	85.1
	REU-V3237WC	C98e				47.4	56.6	66.0	74.9	83.9
	REU-V3237FFUC	C98i				48.2	57.4	67.2	75.6	85.4
37AHB09016KA5 (37AHB90)	REU-V1616WC	C42e	MEDIUM-HIGH	0.5	1600	53.8	63.9	74.0	84.3	86.9
	REU-V2020WC	C53e				53.4	62.6	72.4	81.7	94.5
	REU-V2532WC	C85e				55.0	64.0	74.4	85.2	95.7
	REU-V2532WCD	C85e PLUS				55.0	64.0	74.4	85.2	95.7
	REU-V2520FFUC	C53i				57.3	68.3	78.4	89.3	101.1
	REU-V2520FFUCD	C53i PLUS				57.3	68.3	78.4	89.3	101.1
	REU-V2532FFUC	C85i				55.0	64.0	74.4	85.2	95.7
	REU-V2532FFUCD	C85i PLUS				55.0	64.0	74.4	85.2	95.7
	REU-V3237WC	C98e				51.8	62.5	74.5	85.1	95.5
	REU-V3237FFUC	C98i				52.9	63.9	65.8	86.6	97.7

Legend

CFM Cubic Feet Per Minute
ESP External Static Pressure
EHS External Heat Source (Rinnai® V-Series Water Heaters)
‡ Factory Setting
† Recommended Operating Point

Notes

(1) 1 MBH = 1000 Btuh
(2) Air entering at 68ºF
(3) Capacities are based on a piping arrangement with a total equivalent length of 100 ft.

Accessories

FIELD SUPPLIED ACCESSORIES

1. **Humidifier (HUM)**

   Connect an auxiliary 2.5 FLA, 2.5 LRA @ 115 VAC max Humidifier (if required). Connections are made via the “HUM” quick connects. The humidifier output is on whenever a heating demand is being satisfied. The contacts of this output are isolated to allow field personnel to apply 24 VAC or 115 VAC to one terminal and the humidifier load to the other.

2. **Electronic Air Cleaner (EAC)**

   Connect an auxiliary Electronic Air Cleaner (if required); rating shall be max 1.0 Amp @ 115 VAC. This output is energized whenever any of the four blower speeds are energized. Connections are made via 0.250 x 0.032” male quick connect terminals labeled "EAC" and "N3".

3. **UV Lamp**

   Connect an auxiliary UV lamp (if required); rating shall be max 1.0 Amp @ 115 VAC. This output is energized whenever any of the four blower speeds are energized. Connections are made via 0.250 x 0.032” male quick connect terminals labeled "UV" and "N2"

4. **Filter Rack & Bottom Fill Plates**

   Refer to Figures 3 and 4 in this manual and the table below:

Part	Model	Part Number
Bottom Fill Plate	37AHB045	603000011
Bottom Fill Plate	37AHB060	603000012
Bottom Fill Plate	37AHB075	603000013
Bottom Fill Plate	37AHB090	603000014
Side Filter Rack	37AHB	603000015

5. **Thermostats**

   The Standard Model thermostat is an electronic 24 vac, programmable, manual changeover wall -mount thermostat. This thermostat uses two set points to maintain and control room temperature in both the heating and air conditioning modes. The thermostat is designed to maintain +/-2°F accuracy. No batteries are required; temperature, blower, mode, and installer configuration settings are preserved with power off.

Part	Part Number
AC Thermostat	603000018
Heat Pump Thermostat	603000021

6. **Flow Sensor**

   Refer to the plumbing section of this manual for installation instructions. The sensor is packaged with the hydronic air-handler in the literature bag affixed between the filter and filter retention wire.

Part	Part Number
Sensor, Flow Actuated	603000010

7. **Anti-scald Thermostatic Temperature Control Valve**

   Anti-scald thermostatic temperature control valves are an important part of domestic water plumbing because they eliminate the scalding and cold water shocks that can occur in a shower when a toilet is flushed or a faucet is turned on. In an Open Loop system (dual function – space heating and domestic water heating), an anti-scald valve should be installed when the Tankless Water heater set thermostat is above 120°F (49°C); refer to local codes and/or all authority having jurisdiction. For recommended piping configuration refer to Figure 11. Anti-Scald valve shall be thermostatically controlled and meet at least the following specifications:

   - Dual certification ASSE 1016-T and ASSE 1017
   - IAPMO Approved
   - CSA Approved

   Constant water temperature under different operating conditions.

   An approved anti-scald/anti-chill thermostatic temperature control valve is available through the Rinnai® Accessory Program.

Part	Part Number
Thermostatic Mixing Valve	603000016

37AHB045 Wiring Diagram

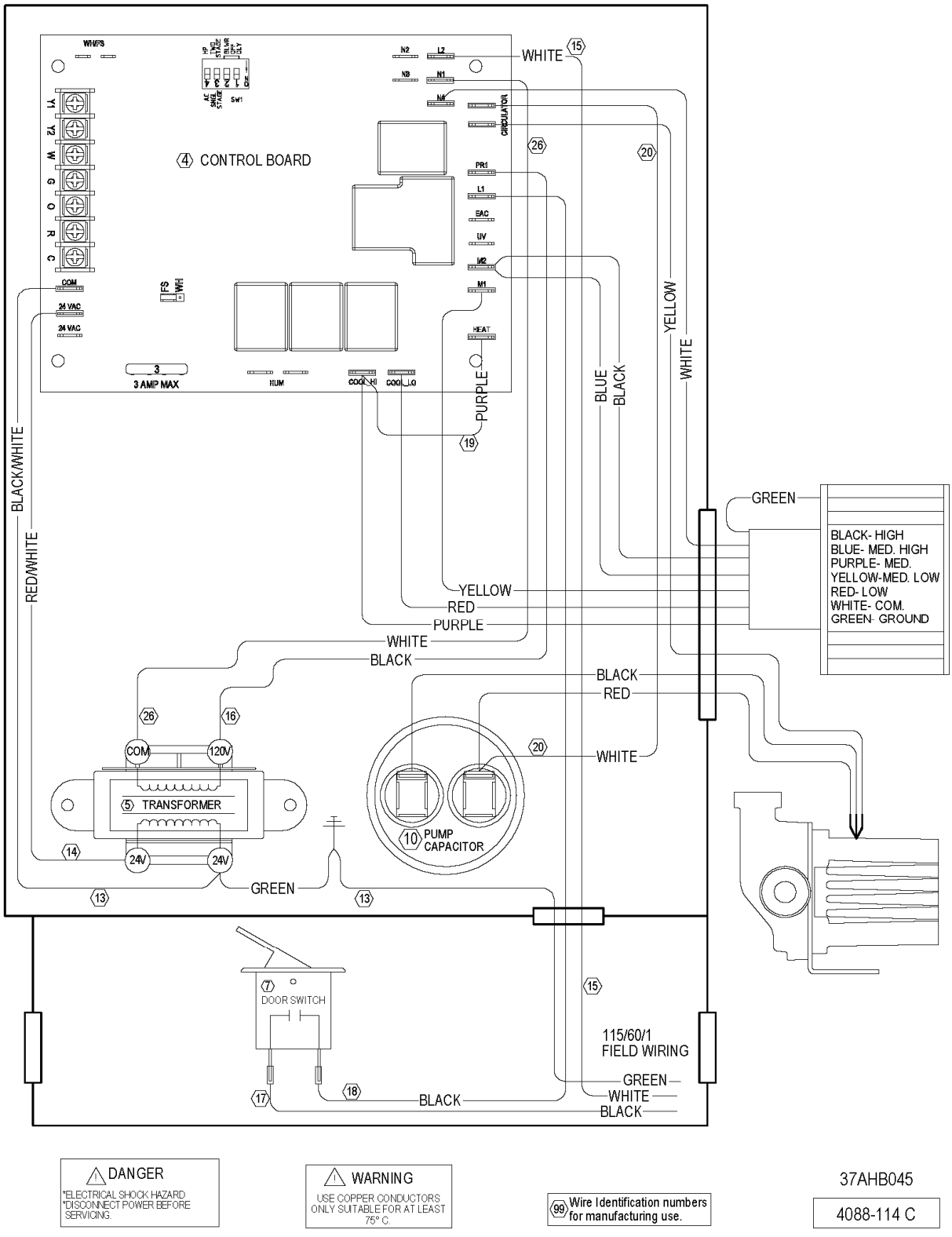


Figure 27

37AHB060 Wiring Diagram

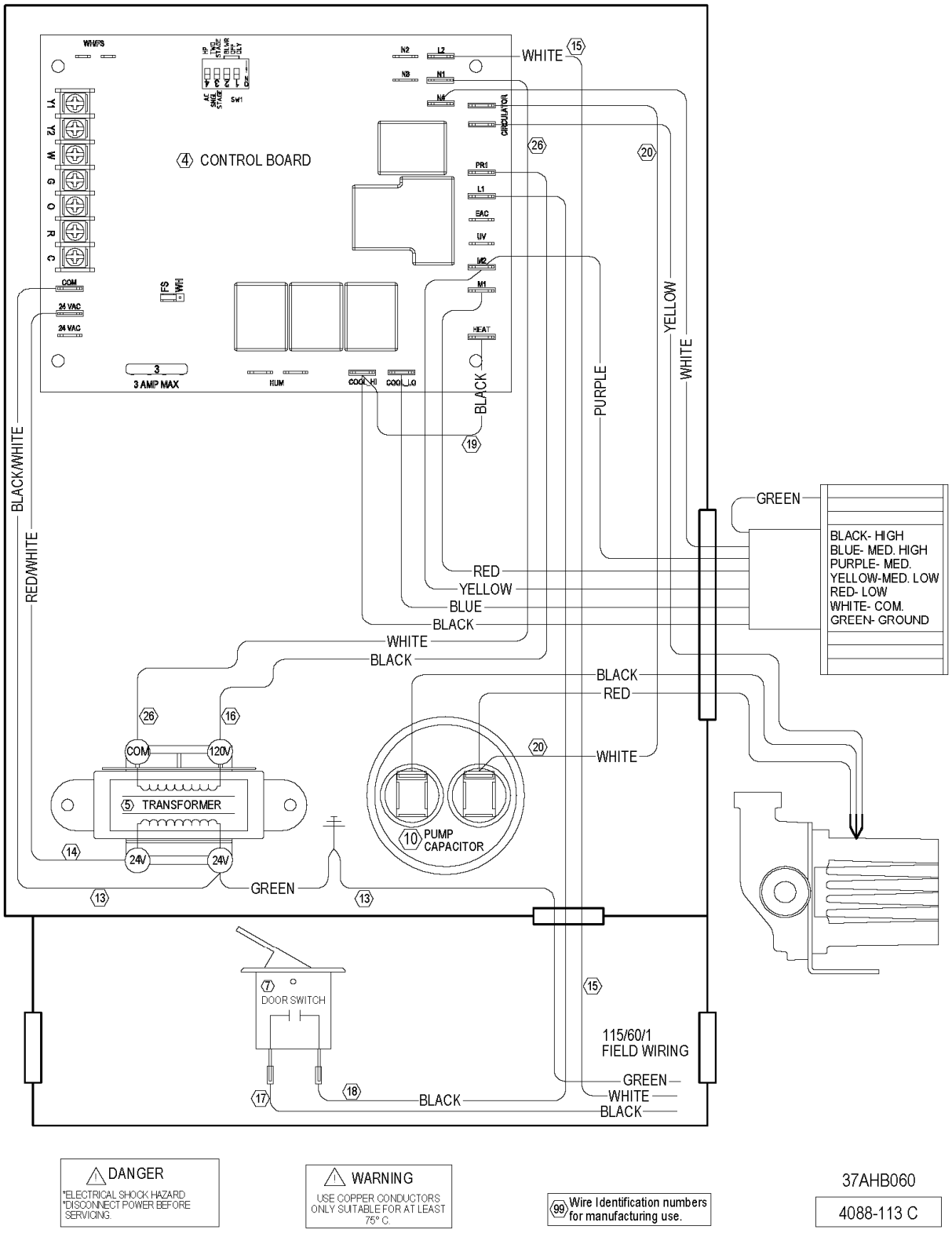


Figure 28

37AHB075 and 37AHB090 Wiring Diagram

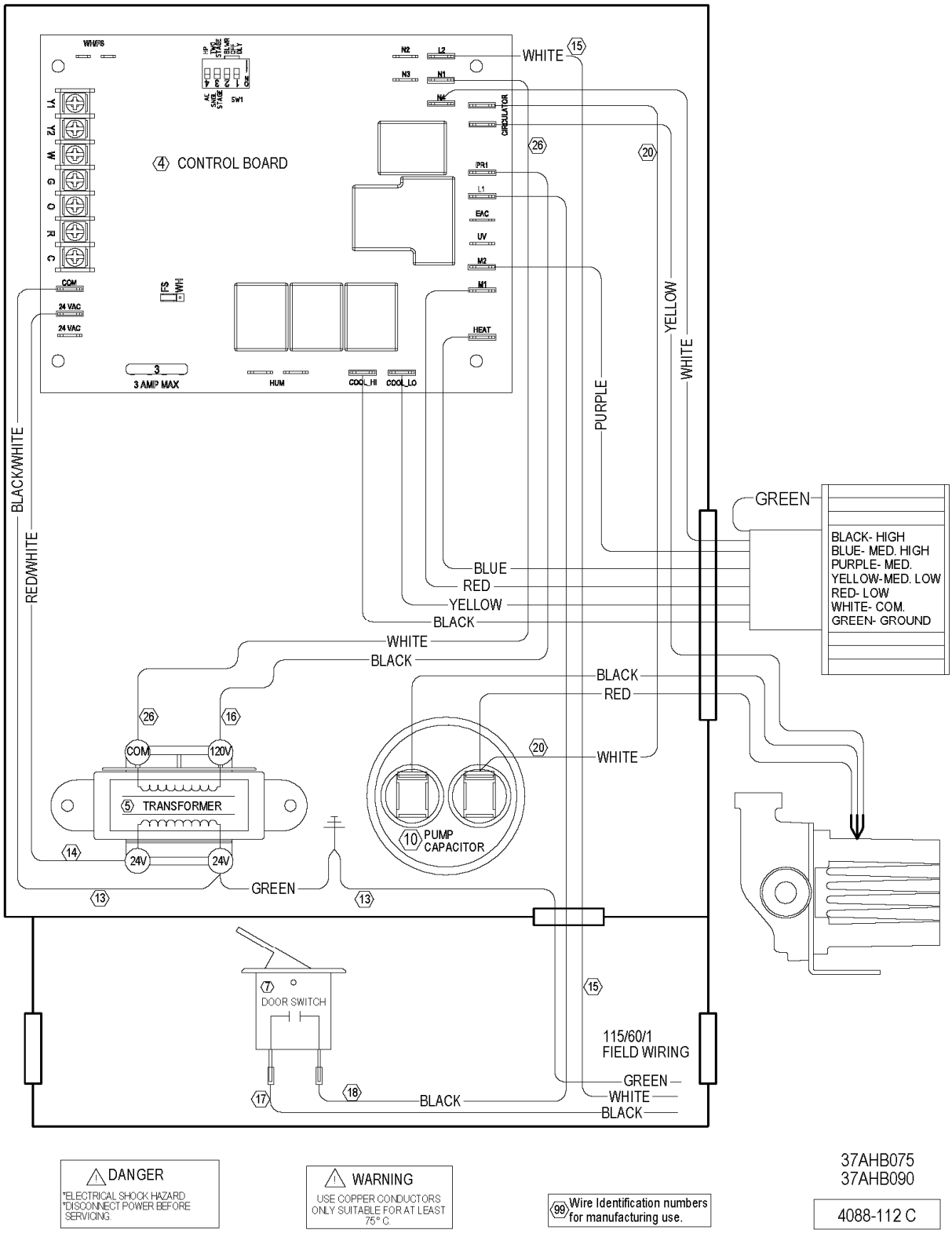


Figure 29

Parts List

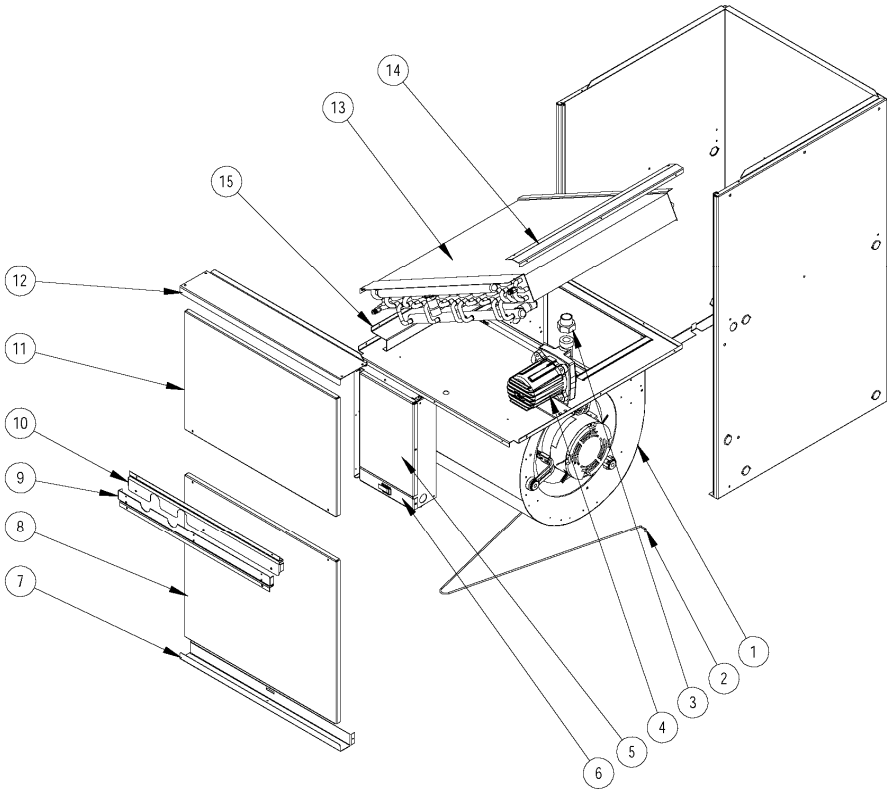
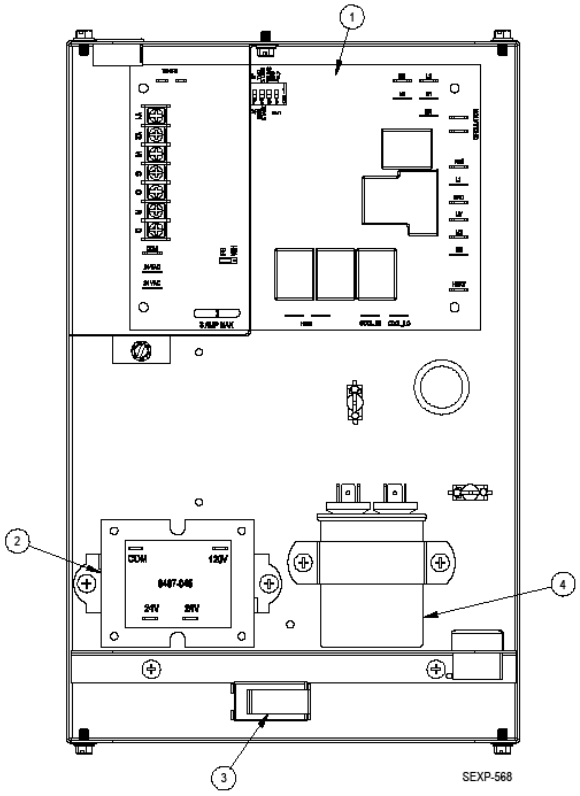


Figure 30: Unit Assembly

UNIT ASSEMBLY						
Balloon Number	Part Number	Description	MODEL			
			37AHB045	37AHB060	37AHB075	37AHB090
1	608000025	Complete Blower Assembly-See blower assembly section for individual parts	X			
	608000026			X		
	608000027				X	
	608000028					X
2	609000018	Filter Retention Wire	X	X	X	2
3	607000011	3/4" Pump Adaptor Set	2	2	2	2
4	607000010	Hydronic Pump	X	X	X	X
5	609000019	Control Panel Front Cover	X	X	X	X
6	609000052	High Voltage Compartment Cover	X	X	X	X
7	609000020	Lower Front Fill	X			
	609000021			X		
	609000022				X	
	609000023					X
8	609000024	Lower Front Service Door	X			
	609000025			X		
	609000026				X	
	609000027					X

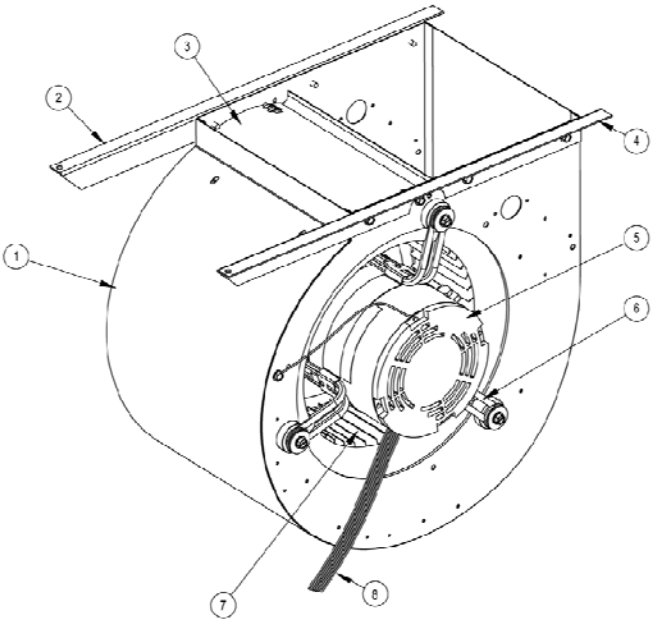
UNIT ASSEMBLY						
Balloon Number	Part Number	Description	MODEL			
			37AHB045	37AHB060	37AHB075	37AHB090
9	609000028	Lower Front Fill Panel	X			
	609000029			X		
	609000030				X	
	609000031					X
10	609000032	Upper Front Fill Panel	X			
	609000033			X		
	609000034				X	
	609000035					X
11	609000036	Upper Front Service Door	X			
	609000037			X		
	609000038				X	
	609000039					X
12	609000040	Top Fill	X			
	609000041			X		
	609000042				X	
	609000043					X
13	607000012	Water Coil	X			
	607000013			X		
	607000014				X	
	607000015					X
14	609000044	Coil Attachment Bracket	X			
	609000045			X		
	609000046				X	
	609000047					X
15	609000048	Coil Support			X	

Parts List



CONTROL PANEL					
Balloon Number	Part Number	Description	605000011 (sizes 045, 060)	605000012 (size 075)	605000013 (size 090)
1	605000010	Control Board	X	X	X
2	605000015	Transformer	X	X	X
3	605000014	Door Switch	X	X	X
4	605000018	Pump Capacitor	X	X	X

Figure 31: Control Panel



BLOWER ASSEMBLY						
			BLOWER			
Balloon Number	Part Number	Description	608000025 (size 045)	608000026 (size 060)	608000027 (size 075)	608000028 (size 090)
1	609000053	Blower Housing	X			
	609000054			X		
	609000055				X	
	609000056					X
2	609000057	Left Blower Angle	X	X	X	X
3	608000017	Diffuser	X			
	608000018			X		
	608000019				X	
	608000020					X
4	609000058	Right Blower Angle	X	X	X	X
5	605000025	1/2 HP Motor	X			
	605000026	1/2 HP Motor		X		
	605000027	3/4 HP Motor			X	
	605000028	1 HP Motor				X
6	609000059	Motor Mount Kit	X	X	X	X
7	608000021	Blower Wheel	X			
	608000022			X		
	608000023				X	
	608000024					X
8	605000030	Fan Motor Harness	X	X	X	X
	605000031					

Figure 32: Blower Assembly

Limited Warranty

Warranty Information

The installer is responsible for the correct installation of your Hydronic Air-Handler.

Please complete the information below to keep for your records:

Purchased from: _____

Address: _____ Phone: _____

_____

Date of Purchase: _____

Model No.: _____

Serial No.: _____

Installed by: _____ Installer's License No.: _____

Address: _____ Phone: _____

Date of Installation: _____

To register your hydronic air-handler or tankless water heater, please visit www.rinnairegistration.com.
For those without internet access, please call 1-866-RINNAI1 (745-6241).

Limited Warranty

What is covered?

This Warranty covers any defects in materials or workmanship when the product is installed and operated according to Rinnai written installation instructions, subject to the terms within this Limited Warranty document. Rinnai's hydronic air-handler should be installed by a state qualified or licensed contractor. Improper installation may void this Warranty. This Warranty extends to the original purchaser, but only while the product remains at the site of the original installation. This Warranty only extends through the first installation of the product and terminates if the product is moved or reinstalled at a new location.

How long does coverage last?

Item	Period of Coverage (from date of purchase)
Parts	5 Years *
Reasonable Labor	1 Year *

* In order to receive full warranty coverage on the air-handler when connected to any other type or brand of product other than a Rinnai tankless water heater, the flow rate through the air-handler must not exceed a maximum of 5 GPM.

Limited Warranty

What will Rinnai do?

Rinnai will repair or replace the covered product or any part or component that is defective in materials or workmanship as set forth. Labor will only be covered when the air-handler is connected to a Rinnai tankless water heater. Rinnai will pay reasonable labor charges associated with the repair or replacement of any such part or component. All repair parts must be genuine Rinnai parts. All repairs or replacements must be performed by an individual or servicing company that is properly trained, state qualified or licensed to do the type of repair.
Replacement of the product may be authorized by Rinnai only. Rinnai does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of the product. If Rinnai determines that repair of a product is not possible, Rinnai will replace the product with a comparable product at Rinnai's discretion. If a component or product returned to Rinnai is found to be free of defects in material or workmanship, or damaged by improper installation or damaged during return shipping, the warranty claim for product, parts and labor may be denied.

How do I get service?

You must contact a state qualified/licensed contractor or authorized service provider for the repair of a product under this Warranty. For the name of a qualified/authorized service provider please contact your place of purchase, visit the Rinnai website (www.rinnai.us), call Rinnai at 1-800-621-9419 or write to Rinnai at 103 International Drive, Peachtree City, Georgia 30269.

Proof of purchase is required to obtain warranty service. You may show proof of purchase with a dated sales receipt, or by registering within 30 days of purchasing the product. To register your hydronic air-handler or tankless water heater, please visit www.rinnairegistration.com. For those without internet access, please call 1-866-RINNAI1 (745-6241). Receipt of Registration by Rinnai will constitute proof-of-purchase for this product. However, Registration is not necessary in order to validate this Warranty.

What is not covered?

This Warranty does not cover any failures or operating difficulties due to the following:

- accident, abuse, or misuse
- alteration
- misapplication
- force majeure
- improper installation (such as but not limited to inadequate water quality, condensate damage, or absence of a drain pan under the appliance)
- improper maintenance (such as but not limited to scale build-up, or freeze damage)
- incorrect sizing
- any other causes other than defects in materials or workmanship

This Warranty does not apply to any product whose serial number or manufacture date has been defaced. This Warranty does not cover any product used in an application that uses chemically treated water.

Limitation on warranties

No one is authorized to make any other warranties on behalf of Rinnai America Corporation. Except as expressly provided herein, there are no other warranties, expressed or implied, including, but not limited to warranties of merchantability or fitness for a particular purpose, which extend beyond the description of the warranty herein and further Rinnai shall not be liable for indirect, incidental, special, consequential or other similar damages that may arise, including lost profits, damage to person or property, loss of use, inconvenience, or liability arising from improper installation, service or use. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

Any implied warranties of merchantability and fitness arising under state law are limited in duration to the period of coverage provided by this limited Warranty, unless the period provided by state law is less. Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Notes

Notes

Ask about Rinnai®

Rinnai's other fine products

EXPERIENCE OUR INNOVATION™

Tankless Water Heaters

- Residential and Commercial Applications
- Continuous Hot Water
- ENERGY STAR ® qualified models
- Up to 9.8 GPM
- Internal or External Installation
- Digital Temperature Control

Direct Vent Furnaces

- High Efficiency
- Cool-to-the-touch Cabinet
- Blower Included
- Vent Terminal A Included
- Gas Conversion Kit Included

Direct-Vent Fireplace, RHFE-750ETRA

- Up to 83% AFUE Energy Efficiency
- Zero-Clearance Installation
- Available in Four Options of Fronts
- Remotes and Fan Included
- Gas Conversion Kit Available

Hydronic Air Handler

- Designed for Use with Rinnai Systems
- Domestic Hot Water Priority
- Optional Programmable Thermostat
- Zero Clearance to Combustibles
- Accommodates Standard Cased-Coils

Boilers

- Residential and Commercial Applications
- ENERGY STAR ® qualified models
- Up to 96.5% AFUE efficiency
- Compact wall mounted design
- ASME accredited models

Condensing Tankless Water Heaters

- Residential and Commercial Applications
- ENERGY STAR ® qualified models
- Up to 95% thermal efficiency
- Internal or External Installation
- Pair up with the Rinnai Air Handler for efficient home heating

Rinnai Impression - Outdoor Fireplace

- Options include one-sided open, two-sided open, and freestanding.
- No electrical requirements
- Propane or convertible to natural gas with conversion kit provided
- Modular contruction offers design flexiblity

Register your product at www.rinnairegistration.com or call 1-866-RINNAI1 (746-6241)

For information on Rinnai's products contact
Rinnai America Corporation
103 International Drive
Peachtree City, GA 30269
TOLL FREE: 1-800-621-9419
FAX: 678-829-1666
www.rinnai.us