

HEAT CONTROLLER, INC.

# **Installation, Operation and Maintenance Manual**

## **HAGXX-00-1A Series Electric Heat Air Handling Units**

HEAT CONTROLLER, INC.

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THE QUALITY LEADER IN CONDITIONING AIR

## **A. Introduction**

Heat Controller, Inc., Air Handlers come in a variety of models and sizes for upflow or horizontal use and when combined with cooling coils, are ready for air conditioning and heat pump applications. These instructions are primarily to assist qualified individuals trained and experienced in the proper installation of this type of equipment.

## **B. Rules for Safe Installation and Operation**

1. Read these rules and the instructions carefully. Failure to follow the rules and the instructions could cause a malfunction of the unit, and a possible safety hazard. Keep these instructions nearby the unit for future reference.
2. This unit has been designed and manufactured to comply with National Codes; however, it is the installer's responsibility to install this unit to comply with prevailing codes and regulations. Heat Controller, Inc., assumes no responsibility for units installed in violation of any code or regulation.
3. Before servicing, **ALWAYS SHUT OFF ELECTRICITY TO THE UNIT.** This will prevent any electrical shocks.
4. Ground the unit to prevent electric shock. All electrical wiring should be in accordance with the National Electrical Code.
5. Duct work must be installed in accordance with the standards of the National Fire Protection Association (NFPA) for the installation of Air Conditioning, Warm Air Heating and Ventilating Systems (NFPA 90A and 90B). The air distribution duct system should be sized for 0.2 inches of static pressure. See National Environmental Systems Contractors Association Manual K for duct sizing recommendations. Ductwork in non-conditioned spaces must be insulated to prevent formation of condensate and for maximum operating efficiency.
6. The safety testing agency label appearing on the unit covers the unit and factory installed coil(s) only. It does not cover any other equipment.
7. Exterior surface of cabinet may sweat when unit is installed in non-conditioned space such as attic or garage. Installer must provide protection such as full size auxiliary drain pan on all units installed in non-conditioned space such as attic or garage type installations to prevent damage from condensation. It is recommended that units installed in non-conditioned space be insulated on the outside with 1" thick fiberglass with the vapor barrier on the outside.
8. While designed to operate quietly when properly installed, several steps should be taken to insure this. Use of isolation pads when mounting unit, flexible duct collars for discharge, and use of acoustical duct liners are all good installation practices that promote quiet operation.
9. Cabinet insulation is rated for R=4.2 (standard). Some jurisdictions require R=6.0 on installations in non-conditioned space. Add insulation 1" thick to exterior of air handler to comply in these jurisdictions, putting the vapor barrier on the outside.

## **C. Unpacking the Unit**

The unit should be unpacked on receipt and if damage is found, a claim should be made immediately to the shipping carrier. This is the responsibility of the entity receiving the equipment. The air handler is completely assembled, as received. Electric power, thermostat wiring, refrigerant piping and duct connections are needed to complete an installation. Additionally, a drain connection will be needed.

Check the rating plate for unit size, voltage, phase etc. to make sure unit meets your requirements.

## **D. Physical Installation**

### **MINIMUM CLEARANCES**

These units have a 0" minimum clearance to combustible materials rating from all cabinet surfaces. The unit should be installed with serviceability clearance of 30" from the front of the unit. The unit can be serviced entirely from the front, including replacing the filter. Be sure and route primary and secondary drain connections so as not to obstruct filter replacement.

### **ARRANGEMENT**

Unit is shipped from the factory arranged to be installed in a vertical upflow or horizontal right to left airflow position (standard) or field convertible to a horizontal left to right airflow position.

### **Upflow Application**

In an upflow installation the discharge outlet is at the top. Care should be taken to ensure unit is level to permit proper condensate drainage. Normal upflow installation will be in a basement or closet. If installed in a closet, the closet should have a platform framed in, with an opening on top of the platform centered in the closet. Connect the supply air outlet to a discharge air plenum. Install return air grilles from outside the closet to space below the platform. Platform must be at least 10" above the floor. Run all supply and return ductwork in accordance with local codes.

### **Horizontal application**

Horizontal application will normally be used in an attic or crawl space. This type installation requires a return air duct be attached to the air handler inlet. The opposite end of the return air duct is attached to a return air filter grille through the ceiling or wall. Remove filter from unit if filter grill is used. The unit is shipped in right to left configuration.

### **CAUTION**

**A "P" trap must be installed in the coil drain line! Cap unused drain fittings.**

### **WARNING**

**To ensure unit will not interfere with drains and refrigerant lines, modification must be made prior to installing these lines..**

### **FOR LEFT TO RIGHT APPLICATIONS.**

1. Remove and set aside front panels.
2. Remove the coil support bracket (4-screws).

3. Remove horizontal drain pan retaining clip (1-screw).
4. Carefully remove coil assembly and bottom drain pan.
5. Move horizontal drain pan from left hand side of coil to right side.
6. Install modified coil assembly back into unit.
7. Reinstall coil support bracket and horizontal drain pan retaining clip.
8. Determine drain holes being used and reposition knockout caps.
9. Reinstall doors.

#### **CAUTION**

**IT IS MANDATORY TO USE AN  
EMERGENCY AUXILIARY DRAIN PAN  
WITH ANY COIL OR AIR HANDLER  
INSTALLED IN AN ATTIC OR ABOVE A  
FINISHED CEILING!**

### **E. Electric Furnace**

Optional electric heating packages are available, see the unit label for various sizes.

*\* See Electric Heater Kit Specifications Table*

### **F. Power Wiring**

Refer to the unit's nameplate for specific electrical data.

#### **CAUTION**

**DISCONNECT POWER AT MAIN FUSE OR CIRCUIT  
BREAKER DISTRIBUTION PANEL BEFORE WIRING  
UNIT TO PREVENT SHOCK OR FIRE HAZARD.**

#### **Use copper conductors only. Tighten all wire connectors.**

Refer to unit nameplate for minimum circuit ampacity. For correct wire size, refer to the National Electrical Code. Use 75°C minimum wire in unit wiring compartment.

**NOTE:** SEE UNIT FOR COMPLETE WIRING DIAGRAM LOCATED ON BLOWER HOUSING.

### **G. Control Wiring**

Field connections are made to the low voltage terminal strip. Consult installation instructions provided with accessory items for specific information on control wiring. Use 18 AWG minimum copper control conductors for control wiring up to 50 feet between units. 16 AWG control conductors are recommended for lengths up to 100 feet. Class 2 wiring is acceptable. Do not short control leads. Transformer burn-out will result. Set thermostat heat anticipator at 0.15 amps for air handler.

### **H. Blower Motor**

Units are equipped with a three-speed blower motor. Two factory-selected motor speed leads are connected to the fan relay (FR) to provide automatic speed change for heating and cooling airflow volumes. The pre-selected motor speeds would normally not have to be changed in the field. All HAH models contain a post purge timer (TDR) that delays the blower turning off at the end of the cooling cycle, this improves energy efficiency.

Terminal number 4 on the (FR) fan relay is the cooling blower speed and terminal number 6 on the (FR) is the heating blower speed.

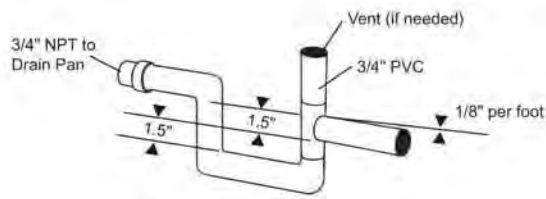
### **I. Refrigerant Piping**

All air handlers have DX refrigerant cooling coils installed, liquid and suction piping should be sized in accordance with condensing unit manufacturer's recommendations. An adapter (by others) may be required to make the transition between the line set and the coil connector. The evaporator coil has sweat copper connections. The suction line is a swaged solder cup connection. The liquid line connection is made to a tail piece portion of the TXV. Remove the nut on the inlet to the expansion valve and place it on the tail piece prior to brazing the liquid line. DO NOT connect the tail piece to the TXV until the liquid line has been brazed to the tail piece. Refrigerant lines should be soldered with silver solder or other high temperature brazing alloy. Dry nitrogen must flow through the refrigerant lines during the brazing operation to prevent oxidation.

### **J. Refrigerant Flow Control**

As shipped, the TXV installed on the A-coil is for the nominal capacity of a 13 SEER matched with Heat Controller, Inc., condensing units. The TXV is for use on an R-410A system. For other refrigerants, contact the factory. TXV has a built-in check valve for reverse flow and is suitable for heat pump operation. All are externally equalized with non-adjustable superheat and have 15% bleed. Hard start capability for outdoor units is not normally required when a 15% bleed valve is used. The external equalizer line attached to the TXV has a female flare nut and is attached to the suction line at the coil. Install the TXV bulb to the suction line using the bulb clamp furnished with the kit. The bulb should be installed on a horizontal run of the suction line if possible. On a line less than 7/8" OD, the bulb may be installed on top of the line. With 7/8" OD or over, the bulb should be installed in a position of about 4 or 8 o'clock. If the bulb installation is made on a vertical run, the bulb should be located at least 6 inches from any bend and on the tubing side opposite the plane of the bend. On vertical bulb installations, the bulbs should be positioned with the bulb capillary tube at the top. The bulb must be insulated using thermal insulation to protect it from the effects of the surrounding ambient temperature.

## K. CONDENSATE DRAIN



The air handler drain pan has 3/4" FPT primary and secondary connections whether used in an upflow or horizontal configuration. Piping from each stub is to have a 1 1/2" minimum trap and each run pitched so as to provide for adequate drainage and secondary fittings together into a common drain. When an air handler is installed above a finished ceiling, an auxiliary drain pan must be provided under the unit as required by most local building codes. The secondary drain must be piped to a location that would provide the occupant a warning if the primary drain is blocked.

## L. AIR FILTER

Air handlers are factory equipped with an air filter. If the return grille has its own filter, the filter installed in the air handler should be removed. Air filter should be inspected and cleaned or replaced as often as is necessary to prevent restriction of air flow (minimum every three months for normal installations). Always replace the filter with the same type originally furnished.

## M. CHECK TEST AND START UP

### TURN OFF POWER AT BREAKER PANEL

Electric heaters are high current devices. Verify that all electrical connectors, whether push-on or compression-type are tight. Loose connections will cause the wire and/or terminal to fail.

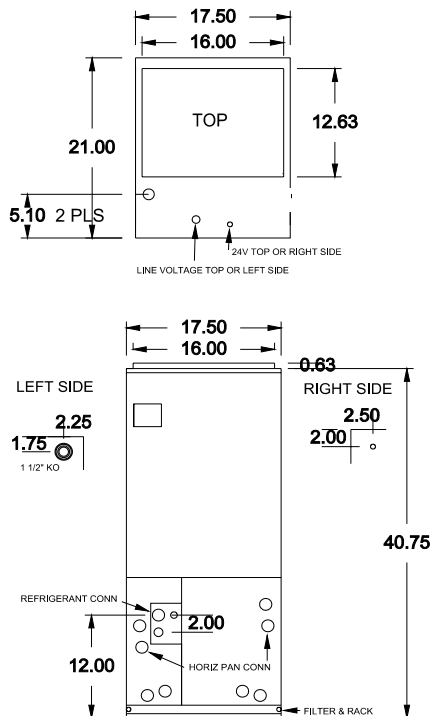
The unit should be tested after the system has been completely installed to determine proper operation. Energize the unit by switching on the line voltage source and the thermostat.

## N. PERIODIC MAINTENANCE

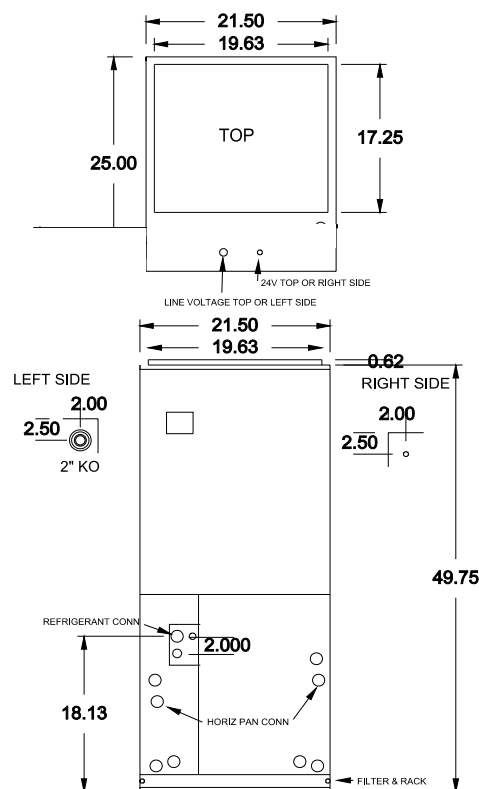
Inspect and clean or replace filters at least every three months to ensure good airflow and optimum system capacity, efficiency and life. This equipment should **NEVER BE OPERATED WITHOUT AN AIR FILTER** in place (see Section AIR FILTER). The blower motor is permanently lubricated. **ALWAYS** disconnect power before removing access doors!

## Dimensions

### HAG 1324, 1336

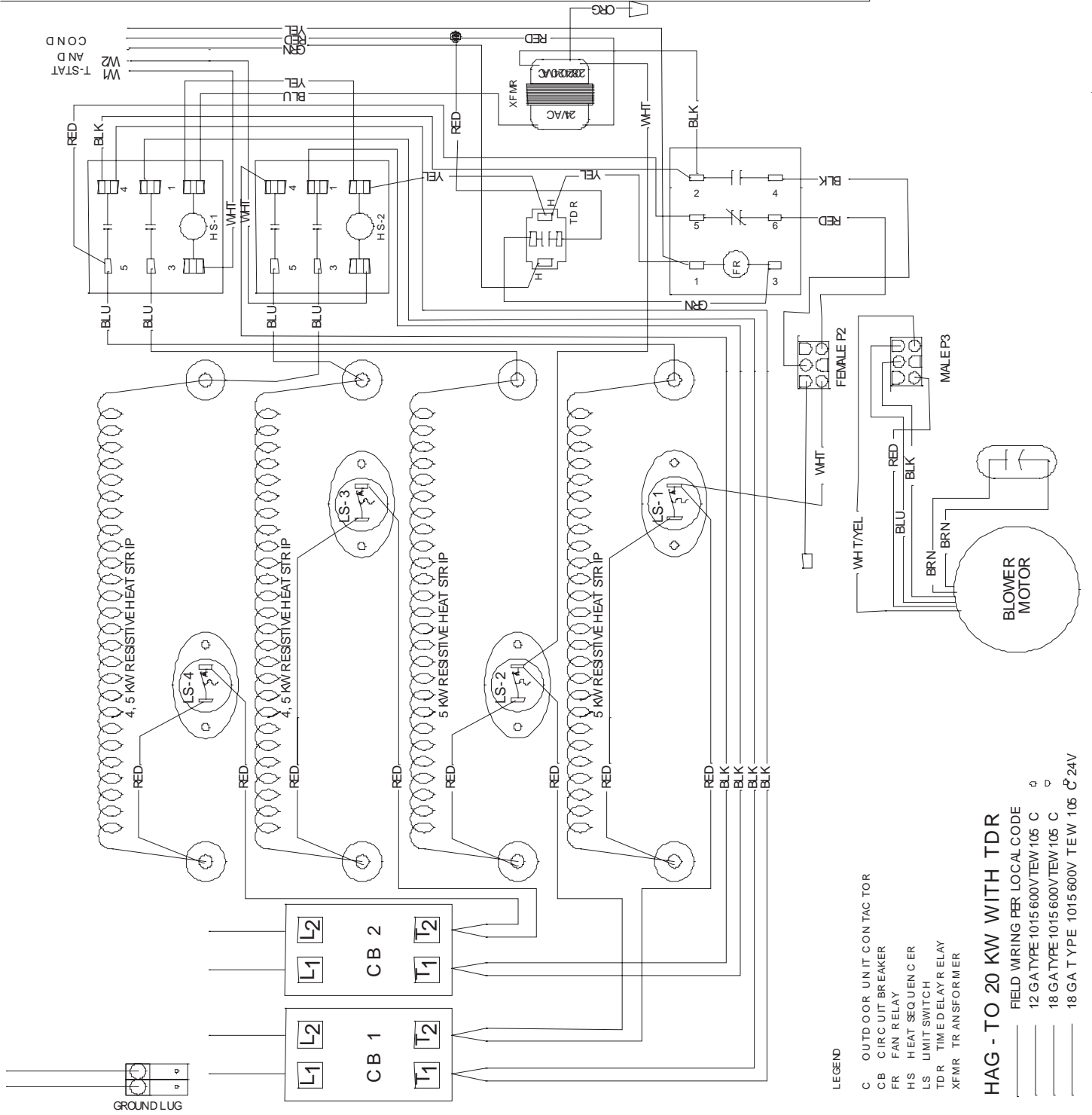


### HAG 1348, 1360



## ELECTRIC HEATER KIT SPECIFICATIONS

MODEL	USED WITH	kW@		MINIMUM CIRCUIT AMPACITY		MAX. FUSE OR BREAKER (HACR)	
		240V	208V	240V	208V	240V	208V
N/A	Without heat	0	0	2.1	1.9	15	15
7800-305B	HAG24-00-1A	5.0	3.8	29	25	30	25
7800-306B		8.0	6.0	44	39	45	40
7800-308B		10	7.5	55	48	60	50
N/A	Without heat	0	0	3.5	3.4	15	15
7800-305B	HAG36-00-1A	5.0	3.8	30	27	30	30
7800-306B		8.0	6.0	46	40	50	40
7800-308B		10	7.5	56	49	60	50
7800-312B		15	11.3	56/26	49/23	60/30	50/30
N/A	Without heat	0	0	4.0	3.9	15	15
7800-313B	HAG48-00-1A	5.0	3.8	30	27	30	25
7800-314B		8.0	6.0	46	41	50	45
7800-315B		10	7.5	57	50	60	50
7800-316B		15	11.3	53/30	46/27	60/30	50/30
7800-317B		20	15	57/63	50/46	60/60	50/50
N/A	Without heat	0	0	6.0	5.9	15	15
7800-313B	HAG60-00-1A HAG61-00-1A	5.0	3.8	32	29	35	30
7800-314B		8.0	6.0	48	42	50	45
7800-315B		10	7.5	59	52	60	60
7800-316B		15	11.3	53/32	46/29	60/35	50/30
7800-317B		20	15	59/53	52/46	60/60	60/50
7800-400	4-Pole Jumper Bar Assembly 15 and 20kW only						

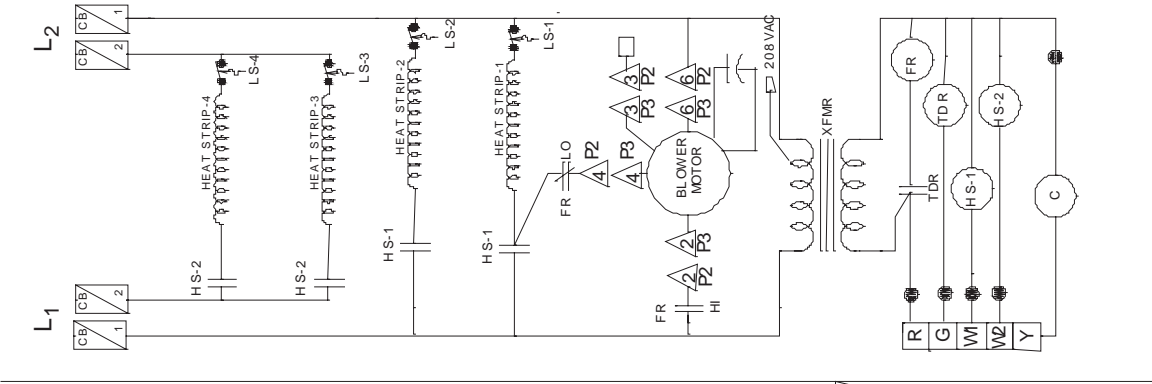


# LEGEND

- C OUTDOOR UNIT CONTACTOR
- CB CIRCUIT BREAKER
- FR FAN RELAY
- HS HEAT SEQUENCER
- LS LIMIT SWITCH
- TDR TIME DELAY RELAY
- XFMR TRANSFORMER

## HAG - TO 20 KW WITH TDR

FIELD WIRING PER LOCAL CODE
12 GA TYPE 1015 600V TEW 105 C
18 GA TYPE 1015 600V TEW 105 C
18 GA TYPE 1015 600V TEW 105 C 24V



Design, material, performance data and components  
subject to change without notice.

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