Application, Installation, & Service Manual

AHW / AH4P-Series Hydronic Air Handlers

Model Size 65

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GENERAL SAFETY PRECAUTIONS

To avoid electric shock, which can cause serious injury or death, ensure all access panels are in place and properly secured before applying power to the unit. Before performing service or maintenance on the heat pump system, ensure all power sources are DISCONNECTED.

Safety glasses and work gloves should be worn at all times whenever a heat pump is serviced. A fire extinguisher and proper ventilation should be present whenever brazing is performed.

This appliance is not intended for intervention by persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless suitably supervised. Children should be prevented from playing with appliance.

Model Nomenclature

AHW—65—VSP—1—SDETV—xx

Series:
AHW = 2-pipe hydronic air handler
AH4P = 4-pipe hydronic air handler

Nominal Size:
65 = 5 Ton

Control Method:
(identifier not present) = 24VAC signals
VSP = 0-10VDC from external controller

Voltage Code:
0 = 115-1-60
1 = 208/230-1-60

Air Coil:
S = standard (non-coated)
K = e-coated

Revision:
01, 02 etc.

Cabinet Orientation
V = Vertical
H = Horizontal

Air Outlet Orientation
T = Top
S = Side

Blower Motor:
E = ECM (constant airflow)

Blower Type:
D = Direct Drive

APPLICATION/AVAILABILITY TABLE								
MODEL	CONTROL METHOD	VOLTAGE	AIR COIL / BLOWER	ORIENTATION	REVISIONS			
AHW-65	-	0 1	S D E	T V S H	02			
AHW-65	VSP	0 1	S D E	T V S H	02			
AH4P-65	-	0 1	S D E	T V S H	02			
AH4P-65	VSP	0 1	S D E	T V S H	02			
This manual applies only to the models and revisions listed in this table.								

go to TABLE OF CONTENTS

Table of Contents

Tables & Documents

Tables

Documents

go to TABLE OF CONTENTS

AHW/AH4P-Series Description

General Overview

The Nordic **AHW**-series and **AH4P**-series are ducted hydronic air handlers (fan coils) that can transfer the heating or cooling effect from heated or chilled water into air in a forced air duct system. The duct system of the air handler can be zoned, or more commonly comprises one zone of a larger zoned heating/cooling/dehumidification system.

Being an air handler without its own heated or chilled source, the 2-pipe **AHW**-series does require one indoor water loop. This loop can be seasonally switched between heated and chilled to perform heating or cooling duty.

Similarly, the **AH4P**-series is a 4-pipe version that requires both heated and chilled indoor hydronic loops, for installations where both are always available. In this way, both heating and cooling are always instantly available, and also **dehumidification** can be performed.

Both the AHW and AH4P are available in one model size (65), which can be modulated over a very large capacity range by varying the airflow and water flow. Both **vertical** and **horizontal** versions are available, in **115-1-60** or **208/230-1-60** electrical service.

The AHW-series has provision for an internal electric **plenum heater**, which can be ordered as an accessory. If a plenum heater is required with the AH4P-series, it is placed outside the unit in the discharge ductwork.

The room thermostat or zone controller calls for either one selectable airflow, or one of five airflows, from 900-2300 cfm. If the –VSP option is ordered, it is also possible for the thermostat or controller to use a 0-10VDC signal to request any airflow from 0-2500 cfm (see next section).

The blower motor is a premium constant-airflow ECM, which delivers the selected air flow regardless of back pressure from the duct system or air filter. The cabinet is constructed from powder coated galvanized sheet metal and is fully insulated with fiberglass insulation.

Factory Options

The handler can be ordered in a **vertical** or **horizontal** configuration from the factory.

The 2-pipe **AHW** or 4-pipe **AH4P** should also be correctly specified at time of order.

Each model can be ordered with **24VAC** control, in which case 5 discreet airflows are available for activation by the thermostat or control system; or continuously variable airflow *(**AHW-65-VSP**)* in which the external thermostat or controller sends a **0-10VDC** signal to select any airflow from 0 to 2500 cfm.

See **Model Nomenclature** and **Application Table** on page 2 for complete model numbers.

* *See **Piping** chapter for annotated copies of these diagrams*

go to TABLE OF CONTENTS

Installation Basics

Sample Bill of Materials

FROM MARITIME GEOTHERMAL
- AHW/AH4P SERIES AIR HANDLER
- PLENUM HEATER __kW
- P/T PORTS AND HOSE ADAPTERS (2)

DUCTWORK
- OUTLET PLENUM ADAPTER W/ FLEXIBLE COLLAR
- RETURN AIR ADAPTER W/ FLEXIBLE COLLAR
- TRUNK DUCT W/ JOINERS
- 6” ROUND DUCT W/ADAPTERS
- ALUMINUM TAPE
- SHEET METAL SCREWS

PIPING
- PIPE (HYDRONIC LOOP & CONDENSATE DRAIN)
- PIPE FITTINGS
- ZONE VALVE or ZONE PUMP
- ANTIFREEZE (IF USED)

ELECTRICAL
- THERMOSTAT OR CONTROLLER
- SERVICE WIRE: 14-2 OR 12-2
- PLENUM HEATER SERVICE WIRE
- BREAKER
- PLENUM HEATER BREAKER
- THERMOSTAT WIRE 18-4 (OR 18-8 FOR MULTISPEED)
- THERMOSTAT WIRE 18-2 (PLENUM HEATER)
- FORK TERMINALS FOR TSTAT WIRE (10)
- CONDENSATE PUMP & HOSE (IF REQUIRED)

Unpacking the Unit

When the air handler reaches the site it should be unpacked to determine if any damage has occurred during shipment. Any visible damage should be noted on the carrier's freight bill and a suitable claim filed at once.

The unit is well constructed and every effort has been made to ensure that it arrives intact; but it is in the customer's best interest to check the unit thoroughly when it arrives.

Unit Placement

Ducted air units should be centrally located in the building with respect to the conditioned space. A heating, cooling, or dehumidification system cannot be expected to produce have an even effect throughout the building when it is located at one end of the structure and the air is transmitted a long distance with uninsulated metal ductwork.

The front (piping side) access panel should remain clear of obstruction for a distance of **2 ft (0.7 m)** to facilitate servicing and maintenance. Ensure the unit is level to eliminate any possible condensate draining issues.

Horizontal models come equipped with an air filter rack on which all four sides are removable for changing air filter, while vertical models come with an air filter rack which can be installed with the removable end on either side. Be careful not to run piping in front of the filter rack access cover.

Note that since AHW units require an **external condensate trap** (see **Piping** chapter), they can not easily be floor mounted. They will instead need to be hung or placed on a low stand at least **5.5” (14 cm)** higher than the floor.

Horizontal units may be hung using threaded rod and angle or channel iron bars underneath. Be sure the hanging system is suitable for **2X** the weight of the unit.

AHW: Air Return & Outlet Orientation

On all **2-pipe** air handler models, the air return and outlet are in a fixed orientation in relation to to ‘front’ of the unit (the side where water pipes are located).

For **horizontal 2-pipe** models, the air returns to the back side and is discharged to the right.

For **vertical 2-pipe** models, the air returns to the back side and is discharged upwards.

See **Dimensions** section at the end of this manual.

AH4P: Air Return & Outlet Orientation

On all **4-pipe** air handler models, the air return and outlet are in a fixed orientation in relation to to ‘front’ of the unit (the side where water pipes are located).

For **horizontal 4-pipe** models, the air returns on the *left.* The blower position is field convertible in order to discharge air to either the *right side* (default position) or *back*.

For **vertical 4-pipe** models, the air returns on the *left* side and is discharged upwards.

See **Dimensions** section at the end of this manual.

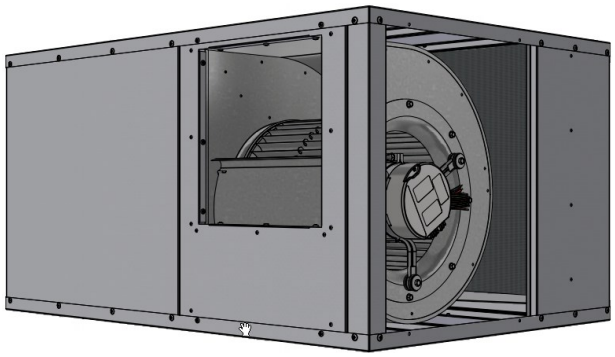
go to TABLE OF CONTENTS

AH4P Horizontal - Switching the Air Outlet Orientation

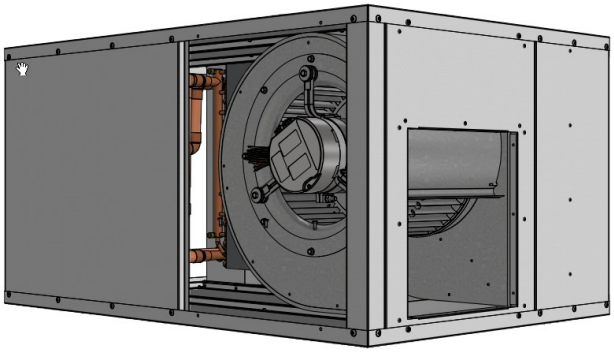
The **AH4P horizontal model only** has a field configurable blower position, resulting in **straight through (side)** or **back** air discharge. Its default location from the factory is in the straight through (side) position. It can easily be placed in the end of the unit to provide a 90° turn in the air flow.

To switch the location of the fan outlet:

1. Be sure power supply to unit is turned off.
2. Remove the screws that hold the access panel adjacent to the blower in place and remove it by pulling up on the handle and then outward from the bottom.
3. Disconnect the two wiring harnesses and ground wire from the fan motor.
4. Remove the screws that hold the cabinet roof in place, so that the roof can be lifted slightly at the blower location during the following step.
5. Remove the screws that hold the blower panel in place and remove the blower in its panel by pulling up and then outward from the bottom, lifting the roof slightly as required.
6. Install the blower in the new location. Be sure to **flip the blower over** so that the motor faces out the adjacent access panel, so that wiring harness may be reconnected and that service access to the motor is maintained even with ductwork connected. Secure blower panel and cabinet roof with screws.
7. Reconnect both motor harnesses and ground wire.
8. Install the remaining access panel and secure with remaining screws.



BLOWER IN SIDE DISCHARGE POSITION (DEFAULT)

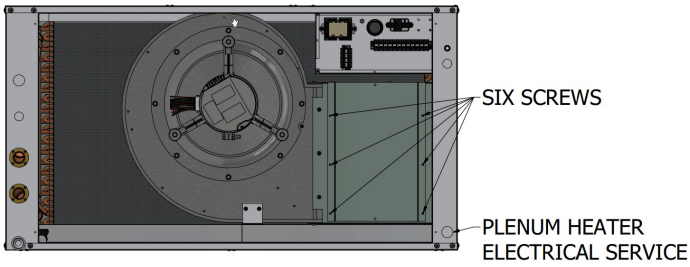


BLOWER IN BACK DISCHARGE POSITION

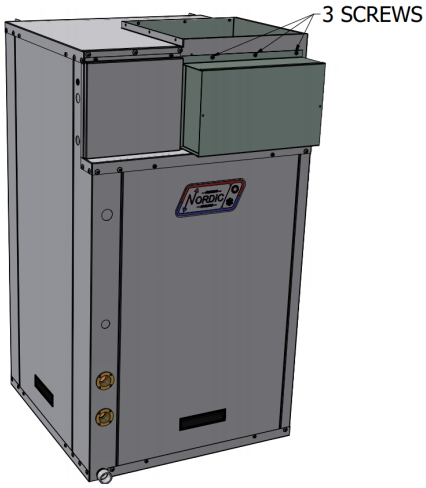
Plenum Heater Installation

When ordering the plenum heater (which is ordered as an accessory), be sure to specify the type of installation anticipated, since the plenum heater models are different for internal or external (duct) installation.

1. **AHW-series (horizontal):**
Plenum heater is mounted internally in air handler cabinet. Remove the cabinet door; then remove screws from the plenum heater cover plate, remove the cover plate, and place the plenum heater in the cutout. Secure both flanges of the plenum heater to the blower with six screws through pre-punched holes. Use the knockouts on the cabinet for electrical connections.



2. **AHW-series (vertical):**
Plenum heater is mounted internally at top of air handler cabinet, from the outside. Remove the top right cover by removing 3 screws, and place the plenum heater in the cutout. Slide it in and then down so that the bottom flange is held in the cabinet groove. Secure the top flange of the plenum heater using the 3 screws removed earlier, through pre-punched holes. Use the knockout on the plenum heater itself for electrical connections, since the plenum heater's electrical box remains exposed.



3. **AH4P-series:**
Plenum heater should be installed externally in the air discharge duct outside the air handler cabinet in a manner that allows all of the airflow to pass through it, to prevent any hot spots in the heater elements. Ensure that the plenum heater is mounted in an approved position as per its instructions.

go to TABLE OF CONTENTS

Wiring

Power Supply Connections

The air handler has a 0.875” knockout for main power supply connection from the breaker panel to the electrical box. There are also 0.875” knockouts and plastic grommet(s) for connections to plenum heater power supply, thermostat, and water valve.

NOTE: Two separate power supplies are required, one for the air handler and a second one for the plenum heater. Each must have its own supply wires and breaker.

A schematic (wiring) diagram can be found on the electrical box cover of the unit as well as in the **Model Specific Information** section of this manual. The *Electrical Specifications* table in the **Model Specific Information** section contains information about the wire and breaker size.

NOTE: A properly qualified electrician should be retained for all connections to the unit and associated controls. The connections to the unit MUST CONFORM TO LOCAL CODES.

TABLE 1 - Power Supply Connections (AHW/AH4P)		
Line	**Description**	**Voltages**
L1/N	**Line 1**	**L1** for 230-1-60, **N** for 115-1-60
L2	**Line 2**	**All**
GND	**Ground**	**All**

TABLE 2 - Power Supply Connections (Plenum Heater)		
Line	**Description**	**Voltages**
L1	**Line 1**	**All**
L2	**Line 2**	**All**
GND	**Ground**	**All (connect to ground lug)**

Control Transformer

The low voltage controls are powered by a class II transformer with impedance protection. If the transformer is accidentally shorted out by directly connecting the **R** and **C** terminals, it will need to be replaced.

IMPORTANT NOTE: For 208/230VAC-1-60 units, if connecting to 208VAC power supply move the red wire connected to the 240 terminal of the transformer to the 208 terminal of the transformer.

Thermostat Requirements (non-VSP models)

In the most usual and simplest installation, the required room thermostat is one which makes a dry contact between the air handler’s **R** and **G** terminals in heating or cooling mode when it wants the air handler blower to run. This is the only requirement for the thermostat.

In this case, the provided grey wire jumper from **G** should be connected to the terminal corresponding to the desired airflow (900, 1200, 1500, 1900, or 2300 cfm).

Auxiliary heat may be called for by making a dry contact from **R** to **W2**, which will activate the plenum heater relay and turn on the plenum heater through terminals **CP** and **1**. Note that a simultaneous **G** call is required, and that especially for externally installed plenum heaters (as for AH4P-series), an airflow setting resulting in an air velocity of at least 400 ft/min at the elements is needed to prevent plenum heater high temperature safety trips.

Also, a 24VAC water valve maybe connected between **V** and **C**.

TABLE 3 - Control Signal Description (Single Airflow)	
Signal	**Description**
C	**24VAC Common (Ground)**
R	**24VAC Hot**
W2	**Auxiliary heat**
G	**Blower ON**
V	**24VAC water valve (connect between V & C)**
CP	**Plenum Heater dry contact (Connect to C or I in plenum heater)**
1	**Plenum Heater dry contact. (Connect to 1 and 2 in plenum heater)**

For installations that require the controller to call for multiple airflows, the grey wire jumper from **G** to an airflow terminal should be disconnected (and well insulated to prevent accidental shorting). The controller may then make a dry contact between **R** and one of the five airflow terminals to activate those airflows. A call for higher airflow will override a call for a lower airflow value; for example, if **R** is connected to both the **1200cfm** and **1500cfm** terminals, the airflow will be 1500 cfm.

Note that if a 24VAC water valve connected between **V** and **C** is to be opened, a **G** call must be made at the same time.

Auxiliary heat may be called for by making a dry contact from **R** to **W2**, which will activate the plenum heater relay and turn on the plenum heater through terminals **CP** and **1**. Note that a simultaneous airflow call is required, and that especially for externally installed plenum heaters (as for AH4P-series), an airflow setting resulting in an air velocity of at least 400 ft/min at the elements is needed to prevent plenum heater high temperature safety trips.

TABLE 4 - Control Signal Description (Multiple Airflows)	
Signal	**Description**
C	**24VAC Common (Ground)**
R	**24VAC Hot**
W2	**Auxiliary heat**
G	**Water valve open**
900cfm	**Activate airflow at this airflow value** (disconnect grey wire jumper to G and insulate its fork terminal)
1200cfm	
1500cfm	
1900cfm	
2300cfm	
V	**24VAC water valve (connect between V & C)**
CP	**Plenum Heater dry contact (Connect to C or I in plenum heater)**
1	**Plenum Heater dry contact. (Connect to 1 and 2 in plenum heater)**

go to TABLE OF CONTENTS

Thermostat Requirements (-VSP models)

For –VSP models (e.g. AHW-65-VSP-...), the thermostat or controller does not call for one discreet airflow value, but instead uses a 0-10VDC signal to call for any airflow between **0** and **2500** cfm.

The airflow will be proportional to the DC input signal. For example, a **5VDC** input will result in an airflow of **1250 cfm** regardless of backpressure from the ductwork and air filter; and a **10VDC** input signal will result in an airflow of 2500 cfm. (In practice, airflows above 2300 cfm will likely be limited by the maximum torque output of the blower motor, so will be less than their nominal value.) Refer to airflow tables in the **Model Specific Information** chapter for airflows with the various input signals.

Note that if a 24VAC water valve connected between **V** and **V1** is to be opened, a dry contact between **R** and **G** must be made at the same time as the DC airflow signal. This **G** call is *not* required for airflow.

Auxiliary heat may be called for by making a dry contact from **R** to **W2**, which will activate the plenum heater relay and turn on the plenum heater through terminals **CP** and **1**. Note that for internally installed plenum heaters, at least **500 cfm** airflow must be called for at the same time by the 0-10VDC signal to run the blower and prevent plenum heater high temperature safety trips. More airflow will be required for externally installed heaters (as installed for AH4P-series) since the duct area will be larger and airflow distribution over the duct cross section will be more uneven; an airflow resulting in an air velocity of at least 400 ft/min at the elements is required.

A motor speed output on the terminal **RPMOUT** is available. This is a pulse output with 36 pulses per revolution. For example, there will be:

- 120 pulses per second at a motor speed of 200 rpm
- 240 pulses per second at a motor speed of 400 rpm
- 360 pulses per second at a motor speed of 600 rpm
- 480 pulses per second at a motor speed of 800 rpm

Note that because of the constant airflow functionality, motor speed will vary with duct and air filter backpressure at any given airflow.

TABLE 5 - Control Signal Description (-VSP Models, 0-10VDC Operation)

Signal	Description
C	24VAC Common (Ground)
R	24VAC Hot
W2	Auxiliary heat
G	Water valve open
0-10VDC+	Airflow demand signal 0-10VDC
GND	Ground for airflow demand signal
RPMOUT	Motor speed output (36 pulses/revolution)
V	24VAC water valve
V1	
CP	Plenum Heater dry contact (Connect to C or I in plenum heater)
1	Plenum Heater dry contact. (Connect to 1 and 2 in plenum heater)

Water Valve Control with AH4P-Series

It should be noted that if an AH4P-series air handler is to be used for heating or cooling duty (rather than dehumidification), the two water valves will have to be controlled by the thermostat or controller directly. This is because there is only one water valve connection point in the air handler.

For dehumidification duty, both water valves may be connected to the same terminals in the air handler to provide simultaneous operation.

go to TABLE OF CONTENTS

Piping

Condensate Drain

The unit comes equipped with one 3/4" female PVC socket drain connection. This drain allows the condensate which forms during the air conditioning cycle to be removed from the unit. The drain should be connected and vented as per local codes; an example is shown on the following page. During high humidity conditions, there could be as much as 25 gallons of water formed per day.

The condensate drain is **not** internally trapped, and an external trap and vent must be installed. To have room for a trap, the unit should be mounted at least **5.5" (14 cm)** above floor level, on a stand or using a hanger.

An external condensate pump may be installed if there is not sufficient slope to drain condensate under gravity to a drain. The unit should be mounted at a sufficient height to have room for the condensate drain pump's tank under the unit.

To avoid overflow of the condensate pan, the drain line and trap should be inspected periodically to ensure they are not plugged with accumulated debris.

See following page for a diagram showing the condensate drain connection.

Hydronic Loop(s)

AHW-Series: The connections for the single hydronic loop are **1"** brass female NPT. They are labelled **ZONE IN** and **ZONE OUT**.

AH4P-Series: The connections for the heated and chilled loops are **3/4"** brass female NPT. They are labelled **HOT ZONE IN, HOT ZONE OUT, COLD ZONE IN,** and **COLD ZONE OUT**.

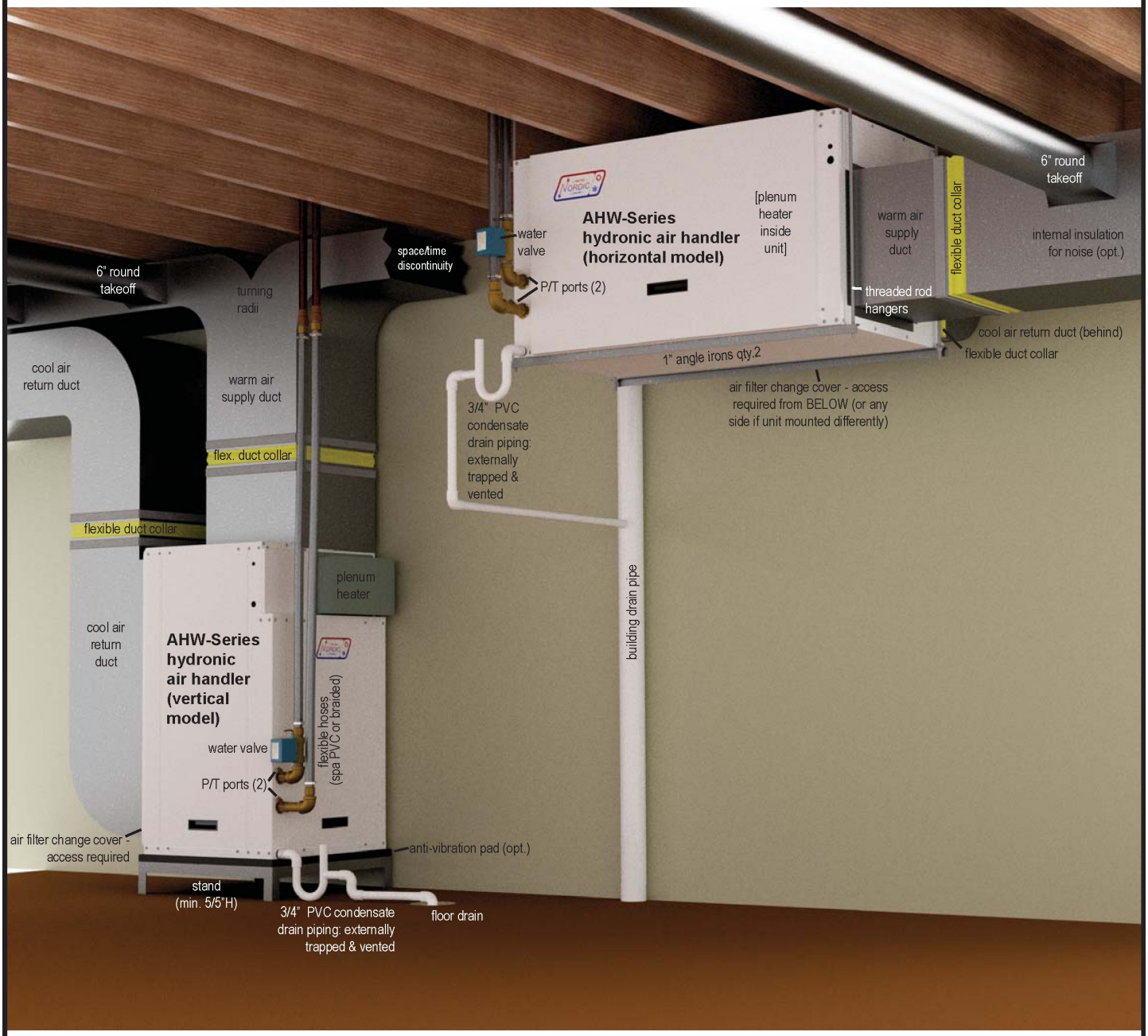
Flexible piping may be used to avoid transmitting fan vibrations through the piping system. Be sure to use piping that has a temperature rating suitable for the maximum water temperature produced by the connected heating device.

All chilled water piping should be insulated with closed cell pipe insulation to prevent condensation and dripping on walls and floors. Similarly, all heated water piping should be insulated to prevent heat loss.

A water valve may be connected on the OUT connection port as shown on the following page, and controlled from the air handler's terminal strip.

go to TABLE OF CONTENTS

Typical Duct & Piping Connections - AHW



See other diagrams and instructions in the manual for design, selection, and installation details. Many of the items illustrated in this diagram are available as accessories from Maritime Geothermal Ltd.. Other items are commonly available from plumbing or HVAC wholesalers.

This diagram illustrates the use of a water valve located at the AHW unit for water flow control. Piping will differ for:

- All water valves centrally located near the heat pump or other heating/chilling device.
- Individual zone pumps instead of water valves.

REV	ECO#	IMPL BY	APVD BY	DATE
01	Initial Rel.	Dan Rheault	Dan Rheault	30-Jun-2022

Drawn By: Dan Rheault	Date: 30-Jun-2022	MARITIME GEOTHERMAL LTD. P.O. Box 2555, 170 Plantation Rd., Petitcodiac, NB CANADA E4Z 6H4
Checked By: Dan Rheault	Date: 30-Jun-2022	Drawing Name
Eng. Approved By	Date	
Mfg. Approved By	Date	
Approved By	Date	Size: LET; Drawing Number: 002601PDG; Revision: 01; Sheet: 1 / 1

go to TABLE OF CONTENTS

Ductwork

Zoning

The air handler is most commonly configured as one of several zones on the hydronic system.

Zoning of the air handler's air duct system can also be performed; that is, it can have several zones of its own. Unlike with a heat pump, there is no consideration of having too small a zone, since there is no compressor. However, the control system should be set up so that airflow from the AHW / AH4P matches the open air ducting. This is done with using 5 discreet air flow levels called for by 24VAC signals, or for –VSP models using a 0-10VDC signal to call for any airflow from 0 to 2500 cfm.

Refer to airflow tables in the **Model Specific Information** chapter for airflows with the various input signals.

Commercial/Industrial Installations

If a large area, for example a warehouse or greenhouse, is to be dehumidified or heated/cooled, the units may be ceiling-hung and it is possible that minimal or no ductwork is specified. Check the jobsite plans.

Duct Systems - General

Ductwork layout for a hydronic air handler will differ from traditional hot air furnace design in the number of leads and size of main trunks required. Air temperature leaving the air handler varies widely with water temperature, water flow, and air flow according to the performance tables later in this manual. But it may be **95°-105°F (35-40°C)**, much cooler than that of a conventional fossil fuel furnace. To compensate for this, larger volumes of lower temperature air must be moved and consequently duct sizing must be able to accommodate the greater airflow without creating a high static pressure or high velocity at the outlet diffusers.

A duct system capable of supplying the required airflow is of utmost importance. Maritime Geothermal Ltd. recommends that the external static pressure from the duct system be kept below 0.2 inches of water total. In some instances the number of diffusers will actually double when compared to the number that would be used for a hot air furnace.

1. Generally allow **100 cfm** for each floor grill.
2. All leads to the grills should be 6" in diameter (28 sq.in. ea).
3. The main hot air trunks should be at least 75% of the cross sectional area of leads being fed at any given point.
4. Return air grills should have a minimum of the same total cross sectional area as the total of the supply grills.
5. The the cross sectional area of the return trunks should equal the cross sectional area of the grills being handled at any given point along the trunk.

It is ***VERY IMPORTANT*** that all turns in both the supply trunks and the return trunks be made with ***TURNING RADII***. Air act like a fluid and, just like water, pressure drop is increased when air is forced to change direction rapidly around a sharp or irregular corner.

It is recommended that flexible collars be used to connect the main trunks to the air handler. This helps prevent any vibrations from travelling down the ductwork.

Duct Systems - Grill Layout

Most forced air heating systems in homes have the floor grills placed around the perimeter of the room. Heating supply grills should be placed under a window when possible to help prevent condensation on the window. As mentioned in the previous sub-section, supply grill leads should be 6" in diameter (28 square inches each) to allow **100 cfm** of airflow.

In a typical new construction, there should be one supply grill for every 100 square feet of area in the room. When rooms require more than one grill, they should be placed in a manner that promotes even distribution, such as one at each end of the room. It is always a good idea to place a damper in each grill supply or place adjustable grills so that any imbalances in the heat distribution can be corrected.

The total number of supply grills available is based on the design airflow. The table shows the number of grills recommended vs. airflow.

TABLE 6 - Airflow vs. Hot Air Grills

Airflow	# of Grills (@100 cfm)
900 cfm	9
1200 cfm	12
1500 cfm	15
1900 cfm	19
2300 cfm	23

Return grills should be mounted on the floor. At minimum they should be the same size as the supply grill, **it is highly recommended that they be 25% to 50% larger than the total supply.** They should be placed opposite the supply grills when possible to ensure distribution across the room. For rooms requiring more than one supply grill, it may be possible to use one larger return grill if it can be centrally positioned opposite of the supply grills, however it is preferred to have one return for each supply to optimize heat distribution across the room.

Thermostat Location

Most air handlers are installed as a single ducted air zone with one thermostat. The thermostat should be centrally located within the conditioned space. It should be placed away from any supply grills, and should not be positioned directly above a return grill. Most installations have the thermostat located in a hallway, or on the inner wall of the living room. It should be noted that most buildings do not have any supply ducts in the hallway. This can lead to a temperature lag at the thermostat if there is very little air movement in the hallway, causing the space to be warmer than indicated by the thermostat.

Plenum Heater

The plenum heater will be usually installed inside the air handler, as described in the **Installation Basics** section. If a plenum heater is installed in the discharge ductwork outside the air handler, it should be at least 12" away from any flexible duct collars.

go to TABLE OF CONTENTS

TABLE 7 - Duct Sizing Guide (external static of 0.20" H_2O)

Airflow (CFM)	Minimum Duct Area (sq.in)	Diameter (in)	Rectangular Equivalents (in)						Return Air Diameter (in)	Airflow (L/s)
37	20	5	2.25 x 10	3 x 8	3.5 x 6	4 x 5.5	5 x 5		5	17
63	20	5	2.25 x 10	3 x 8	3.5 x 6	4 x 5.5	5 x 5		6	30
100	28	6	3.25 x 10	4 x 8	5 x 6	5.5 x 5.5	6 x 6		7	47
152	38	7	3.25 x 14	4 x 11	5 x 8.5	6 x 7	6.5 x 6.5		8	72
212	50	8	4 x 15	5 x 12	6 x 10	7 x 8	8 x 8		9	100
226	50	8	4 x 15	5 x 12	6 x 10	7 x 8	8 x 8		10	107
277	64	9	5 x 15	6 x 12	7 x 10	8 x 9	8.5 x 8.5		10	131
304	64	9	5 x 15	6 x 12	7 x 10	8 x 9	8.5 x 8.5		12	143
393	79	10	6 x 15	7 x 13	8 x 11	9 x 10	9.5 x 9.5		12	185
411	113	12	7 x 18	8 x 16	9 x 14	10 x 12	11 x 11		12	194
655	113	12	7 x 18	8 x 16	9 x 14	10 x 12	11 x 11		14	309
680	154	14	8 x 22	9 x 19	10 x 17	11 x 15	12 x 14	13 x 13	14	321
995	154	14	8 x 22	9 x 19	10 x 17	11 x 15	12 x 14	13 x 13	16	470
1325	201	16	8 x 30	10 x 22	12 x 18	14 x 16	15 x 15		18	625
1450	201	16	8 x 30	10 x 22	12 x 18	14 x 16	15 x 15		20	684
1750	254	18	8 x 40	10 x 30	12 x 24	14 x 20	16 x 17	16.5 x 16.5	20	826
2000	254	18	8 x 40	10 x 30	12 x 24	14 x 20	16 x 17	16.5 x 16.5	22	944
2250	314	20	10 x 38	12 x 30	14 x 26	16 x 22	18 x 19	18.5 x 18.5	22	1062
2600	314	20	10 x 38	12 x 30	14 x 26	16 x 22	18 x 19	18.5 x 18.5	24	1227
2900	380	22	12 x 36	14 x 30	16 x 26	18 x 23	20 x 20		24	1369
3400	380	22	12 x 36	14 x 30	16 x 26	18 x 23	20 x 20		26	1605
3600	452	24	14 x 38	16 x 32	18 x 28	20 x 25	22 x 22		26	1699
4300	452	24	14 x 38	16 x 32	18 x 28	20 x 25	22 x 22		28	2029
5250	531	26	16 x 38	18 x 32	20 x 30	22 x 24	24 x 24		30	2478
6125	616	28	18 x 38	20 x 34	22 x 30	24 x 28	26 x 26		32	2891
6500	616	28	18 x 38	20 x 34	22 x 30	24 x 28	26 x 26		34	3068
7250	707	30	20 x 40	22 x 38	24 x 32	26 x 30	28 x 28		34	3422
7800	707	30	20 x 40	22 x 38	24 x 32	26 x 30	28 x 28		36	3681
8500	804	32	22 x 40	24 x 38	26 x 34	28 x 32	30 x 30		36	4012
9200	804	32	22 x 40	24 x 38	26 x 34	28 x 32	30 x 30		38	4342
9800	908	34	24 x 42	25 x 40	26 x 38	28 x 34	30 x 32	31 x 31	38	4625
10900	908	34	24 x 42	25 x 40	26 x 38	28 x 34	30 x 32	31 x 31	40	5144
			28 x 40	30 x 36	32 x 34	33 x 33				
			30 x 42	32 x 38	34 x 36	35 x 35				
			30 x 45	34 x 40	36 x 38	37 x 37				

go to TABLE OF CONTENTS

Startup Procedure

The AHW/AH4P-Series Startup Record located in this manual is used in conjunction with this startup procedure to provide a detailed record of the installation. A completed copy should be left on site, a copy kept on file by the installer and a copy should be sent to Maritime Geothermal Ltd.

Check the boxes or fill in the data as each step is completed. For data boxes, circle the appropriate units.

Pre-Start Inspection

Ductwork:

1. Verify that all ductwork has been completed and is firmly attached to the unit. Verify that any dampers or diverters are properly set for operation of the air handler.
2. Verify that all registers are open and clear of any objects that would restrict the airflow.
3. Verify that a new air filter is installed and the cover is secured.
4. Verify the condensate drain is connected, properly vented, and free of debris.
5. If a plenum heater has been installed, verify that it is securely fastened.

Hydronic Loop:

1. Verify that all shutoff valves are fully open and there are no restrictions in the piping from the zone headers to the unit, and that full flow is available to the unit.
2. Verify that the entire system has been flooded and all the air has been purged as much as possible. Further purging may be required after the system has been operating for a while.
3. Verify that the loop contains the proper mix of antifreeze for the intended application if applicable. Record the type of antifreeze and the mixture value on the startup sheet; circle % Vol. or % Weight.
4. Record the static loop pressure on the startup sheet.

Electrical:

1. **Ensure the power to the unit is off. Ensure the power to the plenum heater is off if equipped.**
2. Verify all high voltage connections. Ensure that there are no stray wire strands, all connections are tight, and the ground wire is connected tightly to the ground connector for the air handler and plenum heater.
3. Record the fuse / circuit breaker size and wire gauge for the air handler. Record the fuse / circuit breaker size, wire gauge and size of the plenum heater if installed.
4. Verify that the control connections to the thermostat and plenum heater (if installed) are properly connected and all control signals are off, so that the unit will not start up when the power is turned on.
5. Ensure all access panels except the lower one that provides access to the electrical box are in place.

go to TABLE OF CONTENTS

Unit Startup

The unit is now ready to be started. The steps below outline the procedure for starting the unit and verifying proper operation of the unit. **It is recommended that safety glasses be worn during the following procedures.**

Preparation:

1. Turn the power on to the hydronic air handler and set the thermostat to OFF. Set up the thermostat as per its instructions so that it will function properly with the air handler.
2. Measure the following voltages on the terminal block and record them on the startup sheet: L1-L2.

Heating Mode:

1. **Ensure the heating source is operational and the zone supply water has reached the desired temperature.**
2. Set the thermostat to heating mode and adjust the setpoint to activate heating. The fan should slowly ramp up to speed after the time delay of the thermostat expires (if applicable) and the zone valve (if installed) will open to allow water flow to the unit (allow up to 30 seconds for the valve to open).
3. Record the following after 10 minutes of runtime:
    1. Duct Return temperature (poke a small hole in the flex collar and insert probe in airstream)
    2. Duct Supply temperature (poke a small hole in the flex collar and insert probe in airstream)
    3. Duct Delta T
    4. Hydronic Loop In temperature
    5. Hydronic Loop Out temperature
    6. Hydronic Delta T
4. Adjust the thermostat setpoint to the desired room temperature and let the unit run through a cycle. Ensure the unit shuts off at the end of the cycle (fan and zone valve if installed).
6. **If a plenum heater is installed,** remove the electrical cover from the plenum heater. Place a current clamp meter around one of the supply wires. Turn on the power to the plenum heater. Adjust the thermostat setpoint to at least **85°F (29°C)** and observe the current increase to operating level.

Cooling Mode:

1. **Ensure the cooling source is operational and the zone supply water has reached the desired temperature.**
2. Set the thermostat to cooling mode and adjust the setpoint to activate cooling.
3. Record the following after 10 minutes of runtime:
    3. Duct Return temperature
    4. Duct Supply temperature
    5. Duct Delta T
    6. Hydronic Loop In temperature
    7. Hydronic Loop Out temperature
    8. Hydronic Delta T

4. Adjust the thermostat setpoint to the desired room temperature if possible, otherwise set it just low enough to allow the unit to run (ie 1°F (0.5°C) less than room temperature) and let the unit run through a cycle. Ensure the unit shuts off at the end of the cycle (fan and zone valve if installed).

Final Inspection:

1. Turn the power off to the unit (and plenum heater if installed) and remove all test equipment.
2. Install the electrical box cover and the access panel on the unit.
3. Do a final check for leaks in the hydronic system and ensure the area is clean.
4. Turn the power on to the unit and the plenum heater if installed. Set the thermostat to the final settings.

Startup Record:

1. The installer should sign and date the Startup Record and have the client sign as well. The installer shall leave the Startup Record with the client, retain a copy for filing and send a copy to Maritime Geothermal Ltd. for warranty registration.

go to TABLE OF CONTENTS

Startup Record: AHW/AH4P-Series

Installation Site		**Startup Date**	**Installer**	
City			**Company**	
Province			**Model**	
Country			**Serial #**	
Client Name		**Client Phone #**		

Check boxes unless asked to record data. Circle data units.

PRE-START INSPECTION

Ductwork	Ductwork is completed, dampers/ diverters are adjusted							
	Registers are open and clear of objects							
	Air filter and end cap are installed							
	Condensate Drain is connected, properly vented and free of debris							
	Plenum heater is securely fastened (if applicable)							
Hydronic Loop	All shut-off valve are open (full flow available)							
	Loop is full and purged of air							
	Antifreeze type (if applicable)							
	Antifreeze concentration		% Volume		% Weight			
	Loop static pressure		psi	kPa				
Electrical	High voltage connections are correct and securely fastened							
	Circuit breaker (or fuse) size and wire gauge for air handler		A		Ga.			
	Circuit breaker (or fuse) size, wire gauge, and Plenum Heater size		A		Ga.		kW	
	Low voltage connections are correct and securely fastened							

STARTUP DATA

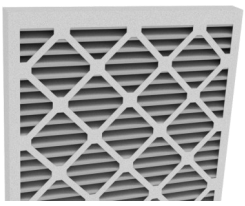
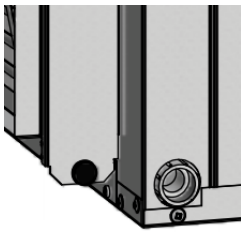
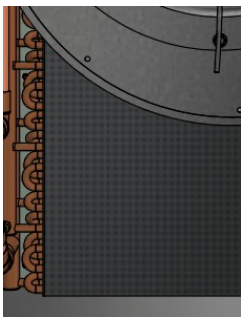
Preparation	Voltage across L1 and L2			VAC				
Heating Mode (10 minutes)	Duct Return, Duct Supply, and Delta T		In		Out		°F	°C
	Water In, Water Out, and Delta T		In		Out		°F	°C
	Fan (black wire) current		A					
	Fan shuts off and zone valve closes (if applicable)		Fan Off			Valve Closed		
Cooling Mode (10 minutes)	Duct Return, Duct Supply, and Delta T		In		Out		°F	°C
	Water In, Water Out, and Delta T		In		Out		°F	°C
	Fan shuts off and zone valve closes (if applicable)		Fan Off			Valve Closed		

Date:		**Installer Signature:**		**Client Signature:**	

A total of three copies are required, one for the homeowner, one for the installer and on to be sent to Maritime Geothermal Ltd.

go to TABLE OF CONTENTS

Routine Maintenance

MAINTENANCE SCHEDULE			
Item		**Interval**	**Procedure**
Air Filter		6 months	Inspect for dirt. Replace if necessary.
Condensate Drain		1 year	Inspect for clogs. Clean if necessary.
Water to Air Heat Exchanger		When experiencing performance degradation that is not explained by low airflow	*Fin contamination:* Inspect outside surface of fins for dirt that has gotten by air filter, perhaps due to not changing filter at recommended interval. Clean using cleaning solution or high pressure water or air. *Hydronic circuit fouling:* Disconnect the hydronic loop and flush heat exchanger with a calcium removing solution. Generally not required for closed loop or cold water open loop systems; whenever system performance is reduced for warm water open loop systems (unusual).

go to TABLE OF CONTENTS

Troubleshooting Guide

STEP 1: If there is a thermostat powered from the air handler's **R** and **C** terminals, verify that the display is present. If it is not, proceed to POWER SUPPLY TROUBLESHOOTING; otherwise proceed to STEP 2.

STEP 2: If a 24VAC signal does not appear across **G** and **C** of the air handler's terminal strip (or a DC signal across **0-10VDC+** and **GND** for –VSP models) within 6 minutes, proceed to the THERMOSTAT TROUBLESHOOTING section; otherwise, proceed to the FAN/BLOWER TROUBLESHOOTING section.

POWER SUPPLY TROUBLESHOOTING			
Fault	**Possible Cause**	**Verification**	**Recommended Action**
No power to the air handler	Disconnect switch open (if installed)	Verify disconnect switch is in the ON position.	Determine why the disconnect switch was opened, if all is OK close the switch.
	Fuse blown / breaker tripped	Breaker is tripped at panel; or at air handler disconnect box, voltmeter shows 230VAC on the line side but not on the load side.	Reset breaker or replace fuse with proper size and type. (Time-delay type "D")
No display on thermostat.	Transformer impedance protection has been activated due to a short circuit, or faulty transformer	230VAC is present across L1 and L2 of the air handler power strip but 24VAC is not present across R and C of the terminal strip.	Replace transformer.
	Faulty wiring between air handler and thermostat	24VAC is not present across R and C of the thermostat.	Correct the wiring.
	Faulty Thermostat	24VAC is present across R and C of the thermostat but thermostat has no display.	Replace thermostat.

THERMOSTAT TROUBLESHOOTING			
Fault	**Possible Cause**	**Verification**	**Recommended Action**
No G signal to air handler (or 0-10VDC signal for –VSP models)	Incorrect thermostat or controller setup	Thermostat or controller does not indicate a call for heating or cooling. No output signal from thermostat or controller.	Correct the setup.
	Faulty thermostat or controller to air handler wiring	Signal present at output of the thermostat or controller but not present across G and C (or 0-10VDC+ and GND) of the air handler's terminal strip.	Correct or replace wiring.
	Faulty thermostat or controller	No output signal from thermostat or controller when a demand is indicated.	Replace thermostat or controller.

go to TABLE OF CONTENTS

FAN/BLOWER TROUBLESHOOTING			
Fault	**Possible Cause**	**Verification**	**Recommended Action**
Low Airflow	Dirty air filter	Inspect.	Replace.
	Dirty air coil	Inspect.	Clean.
	Poor ductwork	Measure delta T between supply and return ducts at the unit, and compare to the performance tables later in this manual. If delta T is very high, it is an indicator of low airflow.	The constant airflow ECM blower will provide the demand airflow up to 0.5 inH_2O duct backpressure. The ductwork is poorly designed or greatly undersized if the fan motor cannot provide the required airflow.
	Airflow called for by thermostat or controller is too low	Check control routine.	Select a higher setting.
Fan operating with wrong airflow (may be hard to detect)	Fan motor's signal harness is loose	Verify that the 16-pin connector is properly inserted into the motor. Gently tug on each wire to verify it is properly inserted into the connector.	Repair any loose connections.
	Faulty signal harness or faulty motor head **Ensure airflow demand signal is present on terminal strip**	For non-VSP models, measure 24VAC between white/black (pin 3) and the following at the blower motor signal harness (insert probes in connector where wire is inserted, do not unplug connector): 900 cfm = grey (pin 15) 1200 cfm = yellow (pin 6) 1500 cfm = yellow/black (pin14) 1900 cfm = violet (pin 2) 2300 cfm = green (pin 13) For –VSP models, pull out the signal plug and check for a 0-10VDC signal between pins 3 and 10 (see wiring diagram later in this manual).	If proper signal isn't present, replace signal harness. If proper signal is present, replace fan motor head.
Fan not operating or operating intermittently	Fan motor's signal harness or power harness is loose	Verify that each connector is properly inserted into the fan motor. Gently tug on each wire to verify it is properly inserted into the connector.	Repair any loose connections.
	Faulty signal harness or faulty motor head **Ensure airflow demand signal is present on terminal strip**	See above.	See above.
	Faulty power harness or faulty motor	Insert the tips of the voltmeter probes into the back of the connector at the fan to measure the voltage across the red and black wires. Value should be 230VAC.	Replace power harness if 230VAC is not present, replace motor if 230VAC is present.

go to TABLE OF CONTENTS

PLENUM HEATER TROUBLE SHOOTING			
Fault	**Possible Cause**	**Verification**	**Recommended Action**
No 230VAC across plenum heater L1 and L2	Disconnect switch open (if installed)	Verify disconnect switch is in the ON position.	Determine why the disconnect switch was opened, if all is OK close the switch.
	Fuse blown / breaker tripped	At plenum heater disconnect box (if installed), voltmeter shows voltage on the line side but not on the load side. Check if breaker is tripped.	Reset breaker or replace fuse at plenum heater disconnect box. Replace fuse with proper size and type. (Time-delay type "D")
	Same "line" to L1 and L2	Measuring L1 to ground and L2 to ground both yield 115VAC, but L1 to L2 yields 0VAC.	Correct wiring.
No W2 signal at air handler terminal strip	No call for auxiliary or emergency heat from thermostat	Verify that the thermostat is indicating that auxiliary or emergency heat should be on.	Set thermostat to engage auxiliary or emergency heat. (Note that some thermostats require a jumper between auxiliary and emergency. Check the thermostat manual.)
	Faulty thermostat	Thermostat doesn't indicate a call for auxiliary or emergency when it should. Or indicates auxiliary or emergency but no 24VAC signal present across C and the auxiliary and/ or emergency pin at the thermostat.	Replace thermostat.
	Faulty thermostat wiring	24VAC signal is present across C and the auxiliary and/or emergency pin at the thermostat but no 24VAC signal is present across W2 and C at the air handler's terminal strip.	Correct wiring.
No 24VAC signal from C to ground at the plenum heater control board	Plenum heater transformer is burned out	Voltmeter does not show 24VAC across transformer secondary.	Replace transformer.
	Plenum heater control board is faulty	Transformer tested OK in previous step.	Replace control board.
No 24VAC signal from 1 to ground at the plenum heater control board (when a plenum heater demand is present)	Faulty wiring	24VAC present across C and ground at the plenum heater, but not across ground of the plenum heater and C_P of the air handler's terminal strip	Correct the wire which should run from air handler C_P to plenum heater C.
		If above tested OK, 24VAC is present across ground of plenum heater and 1 of the air handler's terminal strip, but not across ground of plenum heater and 1 of the plenum heater.	Correct the wire which should run from air handler terminal "1" to plenum heater terminal "1".
	Faulty plenum heater relay in air handler	24VAC is present across pin 1 and pin 3 of the relay, 24VAC is present from air handler C_P to plenum heater ground, but not from air handler terminal "1" to plenum heater ground.	Replace relay.
Plenum heater thermal overload is tripped.	Fan not operating	See Fan/Blower Troubleshooting section	Correct problem.
	Fan operating at an airflow setting that is insufficient for plenum heater	Increasing airflow demand from control system rectifies problem	Revisit controller programming.
	Faulty overload	Reset thermal overload	Replace if faulty.

go to TABLE OF CONTENTS

Model Specific Information

Table 8 - Shipping Information				
MODEL	WEIGHT lb. (kg)	DIMENSIONS in (cm)		
		L	W	H
AHW-65 (horizontal)	197 (89)	50 (127)	36 (91)	30 (76)
AHW-65 (vertical)	197 (89)	38 (97)	32 (81)	50 (127)
AH4P-65 (horizontal)	255 (116)	50 (127)	36 (91)	30 (76)
AH4P-65 (vertical)	255 (116)	38 (97)	32 (81)	50 (127)

Electrical Specifications

TABLE 9	Elec. Code	Power Supply			Fan	Circulator	FLA	MCA	Max. Fuse/ Breaker	Min. Wire Size
		V-ø-Hz	MIN	MAX	RLA	Max A	Amps	Amps	Amps	ga
AHW-65	0	115-1-60	102	138	12.8	-	13.0	16.2	20	#12-2
	1	208/230-1-60	204	276	7.0	-	7.2	9.0	15	#14-2
AH4P-65	0	115-1-60	102	138	12.8	-	13.0	16.2	20	#12-2
	1	208/230-1-60	204	276	7.0	-	7.2	9.0	15	#14-2

TABLE 10 - Plenum Heater Electrical Specifications				
Size (kW)	(230-1-60)			
	FLA (A)	MCA (A)	Breaker (A)	Wire Size
5	20.8	26.0	30	#10
7	29.2	36.5	40	#8
10	41.7	52.1	60	#6
15	62.5	78.1	80	#4
20	83.3	104.2	100	#3

go to TABLE OF CONTENTS

Airflow

Table 11: Airflow (24VAC Control)			
Dry contact from R to this terminal:	AIRFLOW		Comment
	cfm	*L/s*	
900cfm	**900**	***425***	
1200cfm	**1200**	***570***	
1500cfm	**1500**	***710***	
1900cfm	**1900**	***900***	
2300cfm	**2300**	***1090***	May be limited by 80oz.ft torque limit at high static pressures.

Table 12: Airflow (-VSP Models, 0-10VDC Control)			
DC voltage applied from 0-10VDC+ to GND:	AIRFLOW		Comment
	cfm	*L/s*	
0	**0**	***0***	
1.0	**250**	***120***	
1.5	**375**	***180***	
2.0	**500**	***240***	
2.5	**625**	***300***	
3.0	**750**	***350***	
3.5	**875**	***410***	
4.0	**1000**	***470***	
4.5	**1125**	***530***	
5.0	**1250**	***590***	
5.5	**1375**	***650***	
6.0	**1500**	***710***	
6.5	**1625**	***770***	
7.0	**1750**	***830***	
7.5	**1875**	***880***	
8.0	**2000**	***940***	
8.5	**2125**	***1000***	
9.0	**2250**	***1060***	
9.5	**2375**	***1120***	May be limited to a lower airflow due to 80 oz.ft torque limit.
10.0	**2500**	***1180***	Likely to be limited to a lower airflow due to 80 oz.ft torque limit.

Maximum external static pressure (all model sizes): **0.50 inH_2O**

go to TABLE OF CONTENTS

Performance Tables - Horizontal Models

AHW/AH4P-65 Horizontal

	EAT (°F)	Airflow (cfm)	Water Flow (gpm)	EWT = **100**°F			EWT = **110**°F			EWT = **120**°F			EWT = **140**°F			EWT = **160**°F			Water Pressure Drop (psi)
				Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	
HEATING	68	900	2	**17,800**	86	82	**23,700**	92	86	**29,700**	98	90	**42,200**	110	97	**55,200**	123	104	0.2
			4	**24,600**	93	88	**32,600**	101	93	**40,500**	109	100	**56,400**	124	111	**72,400**	140	123	0.7
			6	**27,000**	95	91	**35,500**	104	98	**44,100**	112	105	**61,300**	129	119	**78,700**	147	133	1.6
			8	**28,100**	96	93	**36,900**	105	101	**45,800**	114	108	**63,700**	132	124	**81,600**	150	139	2.7
		1200	2	**19,500**	83	80	**26,000**	88	84	**32,700**	93	87	**46,500**	103	93	**60,800**	114	98	0.2
			4	**28,700**	90	86	**38,100**	97	91	**47,300**	104	96	**66,000**	118	107	**84,700**	132	117	0.7
			6	**32,500**	92	89	**42,800**	100	96	**53,100**	108	102	**74,000**	124	115	**94,900**	139	128	1.6
			8	**34,400**	94	91	**45,300**	102	99	**56,200**	110	106	**78,200**	127	120	**100,300**	143	134	2.7
		1500	2	**20,700**	80	79	**27,600**	85	82	**34,700**	89	85	**49,300**	98	90	**64,400**	107	94	0.2
			4	**31,700**	87	84	**42,200**	93	89	**52,400**	100	94	**73,100**	112	103	**93,900**	124	112	0.8
			6	**36,800**	90	88	**48,500**	97	94	**60,300**	104	100	**84,000**	118	112	**107,800**	133	123	1.6
			8	**39,500**	92	90	**52,100**	99	97	**64,700**	107	104	**90,100**	122	117	**115,600**	137	130	2.7
		1900	2	**21,800**	78	78	**29,100**	82	81	**36,500**	85	83	**51,900**	93	87	**67,800**	100	91	0.2
			4	**34,800**	85	83	**46,400**	90	87	**57,600**	95	91	**80,400**	106	99	**103,300**	117	107	0.8
			6	**41,400**	88	86	**54,600**	94	92	**67,900**	100	97	**94,700**	113	108	**121,600**	126	119	1.6
			8	**45,200**	89	89	**59,600**	96	95	**74,000**	103	101	**103,200**	117	114	**132,500**	131	126	2.7
		2300	2	**22,600**	77	77	**30,100**	80	80	**37,800**	83	82	**53,700**	89	85	**70,200**	96	88	0.2
			4	**37,100**	83	81	**49,600**	87	85	**61,700**	92	89	**86,000**	102	96	**110,500**	111	104	0.8
			6	**45,000**	86	85	**59,400**	91	90	**73,900**	97	95	**103,000**	108	105	**132,400**	120	115	1.6
			8	**49,800**	88	88	**65,600**	94	93	**81,600**	100	99	**113,800**	113	111	**146,200**	125	123	2.7

METRIC

	EAT (°C)	Airflow (L/s)	Water Flow (L/s)	EWT = **38**°C			EWT = **43**°C			EWT = **49**°C			EWT = **60**°F			EWT = **71**°F			Water Pressure Drop (kPa)
				Capacity (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	
HEATING	20	425	0.13	**5.21**	29.9	27.8	**6.94**	33.2	30.1	**8.72**	36.6	32.2	**12.38**	43.5	36.1	**16.17**	50.7	39.7	1.2
			0.25	**7.22**	33.7	30.9	**9.56**	38.1	33.9	**11.87**	42.5	37.5	**16.53**	51.3	44.1	**21.21**	60.2	50.6	5.2
			0.38	**7.91**	35	32.7	**10.41**	39.7	36.7	**12.93**	44.5	40.6	**17.98**	54.1	48.4	**23.05**	63.7	56.2	11.0
			0.50	**8.23**	35.6	33.8	**10.82**	40.5	38.2	**13.43**	45.4	42.4	**18.66**	55.4	51	**23.91**	65.3	59.6	18.8
		570	0.13	**5.72**	28.1	26.8	**7.63**	30.8	28.7	**9.58**	33.6	30.5	**13.62**	39.4	33.7	**17.81**	45.3	36.6	1.2
			0.25	**8.41**	31.9	29.7	**11.16**	35.9	32.7	**13.87**	39.7	35.6	**19.33**	47.5	41.4	**24.82**	55.3	47.1	5.2
			0.38	**9.51**	33.6	31.7	**12.54**	37.8	35.3	**15.57**	42.2	38.9	**21.68**	50.8	46.1	**27.83**	59.6	53.1	11.0
			0.50	**10.08**	34.3	32.9	**13.27**	38.9	37	**16.48**	43.4	41	**22.92**	52.6	48.9	**29.40**	61.8	56.9	18.8
		710	0.13	**6.06**	26.9	26.2	**8.09**	29.2	27.8	**10.16**	31.6	29.4	**14.45**	36.4	32.1	**18.89**	41.5	34.4	1.2
			0.25	**9.29**	30.6	28.9	**12.36**	34.1	31.5	**15.36**	37.5	34.2	**21.41**	44.4	39.3	**27.51**	51.3	44.4	5.2
			0.38	**10.78**	32.3	30.9	**14.21**	36.2	34.3	**17.66**	40.1	37.6	**24.61**	48	44.2	**31.60**	55.9	50.7	11.0
			0.50	**11.58**	33.2	32.2	**15.26**	37.4	36.1	**18.96**	41.6	39.8	**26.40**	50.1	47.3	**33.88**	58.6	54.7	18.8
		900	0.13	**6.39**	25.7	25.6	**8.52**	27.7	27	**10.70**	29.6	28.3	**15.22**	33.7	30.7	**19.88**	37.8	32.6	1.2
			0.25	**10.20**	29.2	28.1	**13.58**	32.2	30.3	**16.89**	35.2	32.7	**23.55**	41.2	37.3	**30.26**	47.2	41.8	5.2
			0.38	**12.13**	30.9	30.1	**16.00**	34.4	33.1	**19.89**	37.9	36.2	**27.74**	44.9	42.2	**35.64**	52	48.1	11.0
			0.50	**13.24**	31.9	31.4	**17.46**	35.7	35	**21.70**	39.5	38.5	**30.23**	47.2	45.4	**38.83**	54.9	52.3	18.8
		1100	0.13	**6.62**	24.9	25.1	**8.82**	26.6	26.4	**11.08**	28.2	27.6	**15.75**	31.7	29.6	**20.57**	35.3	31.2	1.2
			0.25	**10.89**	28.1	27.4	**14.52**	30.8	29.4	**18.07**	33.4	31.6	**25.20**	38.7	35.7	**32.38**	44.1	39.7	5.2
			0.38	**13.20**	29.8	29.4	**17.41**	32.9	32.2	**21.65**	36.1	35.1	**30.20**	42.4	40.6	**38.81**	48.8	46	11.0
			0.50	**14.59**	30.8	30.8	**19.24**	34.3	34.1	**23.91**	37.7	37.4	**33.35**	44.7	43.9	**42.84**	51.8	50.3	18.8

EWT = Entering Water Temperature
LWT = Leaving Water Temperature
EAT = Entering Air Temperature (dry bulb)
LAT = Leaving Air Temperature (dry bulb)

NOTE:
Not all heat pump series have high temperature capability; see heat pump's specification data.

W-Series: *maximum 120-130°F (49-54°C)*
ATW-Series: *maximum 105-120°F (41-49°C)*

go to TABLE OF CONTENTS

Performance Tables - Horizontal Models

AHW/AH4P-65 Horizontal

	EAT (°F)	Airflow (cfm)	Water Flow (gpm)	EWT = **40**°F				EWT = **45**°F				EWT = **50**°F				Water Pressure Drop (psi)
				Total Capacity (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Total Capacity** (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Total Capacity** (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	
COOLING	80.6 (46% RH)	900	2	**23,200**	20,000	60	63	**20,200**	18,400	62	65	**15,800**	15,800	65	66	0.2
			4	**32,500**	25,200	55	56	**27,900**	23,200	57	59	**23,400**	21,200	59	62	0.7
			6	**38,800**	28,000	52	53	**32,800**	25,500	55	56	**26,800**	23,000	57	59	1.7
			8	**43,100**	30,000	50	51	**36,200**	27,000	53	54	**29,300**	24,100	56	57	2.8
		1200	2	**25,200**	22,400	64	65	**20,100**	20,100	65	65	**17,300**	17,300	68	67	0.2
			4	**36,300**	29,900	58	58	**31,500**	27,700	60	61	**26,900**	25,300	62	63	0.7
			6	**44,000**	33,600	55	55	**37,600**	30,900	57	58	**31,200**	28,100	59	60	1.7
			8	**49,700**	36,200	53	52	**41,900**	32,900	56	55	**34,300**	29,700	58	59	2.8
		1500	2	**24,300**	24,300	66	64	**21,300**	21,300	68	62	**18,400**	18,400	70	68	0.2
			4	**39,200**	33,600	60	60	**34,300**	31,100	62	62	**27,700**	27,700	64	64	0.7
			6	**48,100**	38,400	57	56	**41,300**	35,500	59	59	**34,900**	32,400	61	62	1.7
			8	**54,700**	41,500	56	54	**46,500**	38,100	58	57	**38,400**	34,600	60	60	2.8
		1900	2	**25,600**	25,600	68	66	**22,500**	22,500	70	67	**19,400**	19,400	71	69	0.2
			4	**42,300**	37,600	63	61	**37,300**	34,700	64	64	**30,300**	30,300	66	65	0.7
			6	**52,400**	43,900	60	57	**45,500**	40,600	61	60	**39,000**	37,100	63	63	1.7
			8	**60,100**	47,800	58	55	**51,400**	44,100	60	58	**43,300**	40,300	61	61	2.8
		2300	2	**26,500**	26,500	70	66	**23,300**	23,300	71	68	**20,100**	20,100	73	70	0.2
			4	**44,900**	40,600	65	62	**37,100**	37,100	66	64	**32,300**	32,300	68	66	0.7
			6	**55,900**	48,400	62	59	**49,000**	44,800	63	61	**40,000**	40,000	65	63	1.7
			8	**64,400**	53,100	60	56	**55,600**	49,200	61	59	**47,300**	45,000	63	62	2.8

METRIC

	EAT (°C)	Airflow (L/s)	Water Flow (L/s)	EWT = **4**°C				EWT = **7**°C				EWT = **10**°C				Water Pressure Drop (kPa)
				Total Capacity (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	**Total Capacity** (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	**Total Capacity** (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	
COOLING	27 (46% RH)	425	0.13	**6.8**	5.9	15.8	17.3	**5.9**	5.4	16.7	18.4	**4.6**	4.6	18.1	18.8	1
			0.25	**9.5**	7.4	12.9	13.4	**8.2**	6.8	14.0	14.9	**6.8**	6.2	15.1	16.5	5
			0.38	**11.4**	8.2	11.3	11.6	**9.6**	7.5	12.7	13.3	**7.9**	6.7	14.1	14.9	11
			0.50	**12.6**	8.8	10.2	10.4	**10.6**	7.9	11.9	12.2	**8.6**	7.1	13.5	14.1	20
		570	0.13	**7.4**	6.6	17.6	18.4	**5.9**	5.9	18.6	18.4	**5.1**	5.1	19.7	19.6	1
			0.25	**10.7**	8.8	14.4	14.5	**9.2**	8.1	15.4	15.9	**7.9**	7.4	16.4	17.4	5
			0.38	**12.9**	9.9	12.9	12.6	**11.0**	9.1	14.0	14.2	**9.2**	8.2	15.2	15.8	11
			0.50	**14.6**	10.6	11.8	11.3	**12.3**	9.6	13.2	13.0	**10.1**	8.7	14.5	14.8	20
		710	0.13	**7.1**	7.1	18.8	17.9	**6.2**	6.2	19.8	16.6	**5.4**	5.4	20.8	20.2	1
			0.25	**11.5**	9.9	15.7	15.3	**10.1**	9.1	16.6	16.7	**8.1**	8.1	17.7	17.7	5
			0.38	**14.1**	11.3	14.1	13.3	**12.1**	10.4	15.1	14.8	**10.2**	9.5	16.1	16.4	11
			0.50	**16.0**	12.2	13.1	12.0	**13.6**	11.2	14.2	13.7	**11.3**	10.2	15.4	15.3	20
		900	0.13	**7.5**	7.5	20.2	18.6	**6.6**	6.6	21.1	19.7	**5.7**	5.7	21.9	20.8	1
			0.25	**12.4**	11.0	17.1	16.2	**10.9**	10.2	17.8	17.6	**8.9**	8.9	18.9	18.4	5
			0.38	**15.4**	12.9	15.3	14.1	**13.3**	11.9	16.2	15.6	**11.4**	10.9	17.2	17.2	11
			0.50	**17.6**	14.0	14.3	12.8	**15.1**	12.9	15.3	14.3	**12.7**	11.8	16.3	16	20
		1100	0.13	**7.8**	7.8	21.2	19.1	**6.8**	6.8	21.9	20.2	**5.9**	5.9	22.6	21.2	1
			0.25	**13.2**	11.9	18.1	16.9	**10.9**	10.9	18.9	17.5	**9.5**	9.5	19.9	18.9	5
			0.38	**16.4**	14.2	16.4	14.8	**14.3**	13.1	17.2	16.3	**11.7**	11.7	18.2	17.4	11
			0.50	**18.9**	15.6	15.3	13.3	**16.3**	14.4	16.2	14.9	**13.9**	13.2	17.1	16.6	19

EWT = Entering Water Temperature
LWT = Leaving Water Temperature
EAT = Entering Air Temperature (dry bulb)
LAT = Leaving Air Temperature (dry bulb)

Lines shaded GREY = ***No dehumidification****; operation not recommended*

go to TABLE OF CONTENTS

Performance Tables - Vertical Models

AHW/AH4P-65 Vertical

	EAT (°F)	Airflow (cfm)	Water Flow (gpm)	EWT = **100**°F			EWT = **110**°F			EWT = **120**°F			EWT = **140**°F			EWT = **160**°F			Water Pressure Drop (psi)
				Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	**Capacity** (Btu/hr)	LAT (°F)	LWT (°F)	
HEATING	68	900	2	18,700	87	81	24,700	93	85	30,800	99	89	43,200	111	96	55,900	124	103	0.2
			4	**25,000**	93	87	**32,900**	101	93	**40,900**	109	99	**57,000**	125	111	**73,100**	141	123	1.0
			6	**27,300**	95	91	**35,900**	104	98	**44,500**	113	105	**61,900**	130	119	**79,400**	147	133	2.0
			8	**28,300**	96	93	**37,200**	105	101	**46,200**	114	108	**64,200**	132	124	**82,200**	150	139	3.5
		1200	2	20,600	83	79	27,300	88	83	34,000	94	86	47,700	104	91	61,700	114	97	0.2
			4	**29,200**	90	85	**38,500**	97	91	**47,900**	104	96	**66,700**	118	106	**85,600**	132	116	1.0
			6	**32,900**	93	89	**43,300**	101	95	**53,800**	108	102	**74,800**	124	115	**96,000**	140	127	2.0
			8	**34,800**	94	91	**45,800**	102	98	**56,800**	111	106	**79,100**	127	120	**101,400**	144	134	3.5
		1500	2	21,900	81	78	29,000	85	81	36,200	90	83	50,700	99	88	65,600	107	93	0.2
			4	**32,300**	87	84	**42,700**	94	88	**53,100**	100	93	**74,000**	112	102	**95,000**	125	111	1.0
			6	**37,300**	90	88	**49,100**	98	94	**61,100**	105	99	**85,100**	119	111	**109,200**	134	123	2.0
			8	**40,100**	92	90	**52,800**	100	97	**65,500**	107	103	**91,200**	123	117	**117,000**	138	130	3.5
		1900	2	23,100	79	77	30,600	83	79	38,100	86	81	53,500	93	86	69,100	101	89	0.2
			4	**35,500**	85	82	**47,000**	90	86	**58,400**	96	90	**81,400**	107	99	**104,600**	118	107	1.0
			6	**42,000**	88	86	**55,400**	94	91	**68,800**	101	97	**95,900**	114	108	**123,200**	126	118	2.0
			8	**45,800**	90	88	**60,400**	97	95	**75,100**	104	101	**104,600**	118	113	**134,300**	132	126	3.5
		2300	2	24,000	77	76	31,700	80	78	39,500	84	80	55,400	90	84	71,600	96	87	0.2
			4	**37,900**	83	81	**50,300**	88	85	**62,500**	93	88	**87,100**	102	96	**111,900**	112	103	1.0
			6	**45,700**	86	85	**60,300**	92	75	**75,000**	97	95	**104,500**	109	105	**134,300**	121	114	2.0
			8	**50,600**	88	87	**66,700**	94	93	**82,800**	100	99	**115,500**	113	111	**148,300**	126	122	3.5

METRIC

	EAT (°C)	Airflow (L/s)	Water Flow (L/s)	EWT = **38**°C			EWT = **43**°C			EWT = **49**°C			EWT = **60**°F			EWT = **71**°F			Water Pressure Drop (kPa)
				Capacity (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	**Capacity** (kW)	LAT (°C)	LWT (°C)	
HEATING	20	425	0.13	5.5	30.4	27.3	7.2	33.7	29.5	9.0	37.1	31.6	12.7	44.0	35.6	16.4	51.1	39.3	2
			0.25	**7.3**	33.9	30.8	**9.7**	38.3	34.1	**12.0**	42.7	37.4	**16.7**	51.7	43.9	**21.4**	60.6	50.3	7
			0.38	**8.0**	35.2	32.7	**10.5**	39.9	36.6	**13.0**	44.7	40.6	**18.1**	54.4	48.3	**23.3**	64.1	56.1	14
			0.50	**8.3**	35.7	33.8	**10.9**	40.7	38.1	**13.5**	45.7	42.4	**18.8**	55.7	50.9	**24.1**	65.7	59.4	24
		570	0.13	6.0	28.6	26.2	8.0	31.3	28.1	10.0	34.2	29.8	14.0	39.9	33.0	18.1	45.7	36.0	2
			0.25	**8.5**	32.2	29.6	**11.3**	36.1	32.5	**14.0**	39.9	35.4	**19.6**	47.8	41.2	**25.1**	55.7	46.8	7
			0.38	**9.6**	33.7	31.7	**12.7**	38.1	35.2	**15.8**	42.4	38.8	**21.9**	51.2	45.9	**28.1**	60.0	52.9	14
			0.50	**10.2**	34.5	32.9	**13.4**	39.1	36.9	**16.7**	43.7	40.9	**23.2**	52.9	48.8	**29.7**	62.3	56.7	24
		710	0.13	6.4	27.3	25.5	8.5	29.7	27.1	10.6	32.1	28.6	14.9	36.9	31.3	19.2	41.9	33.8	2
			0.25	**9.5**	30.8	28.7	**12.5**	34.2	31.3	**15.6**	37.7	33.9	**21.7**	44.7	39.1	**27.8**	51.7	44.1	7
			0.38	**10.9**	32.4	30.8	**14.4**	36.4	34.2	**17.9**	40.4	37.4	**24.9**	48.4	44.0	**32.0**	56.4	50.4	14
			0.50	**11.7**	33.3	32.2	**15.5**	37.6	35.9	**19.2**	41.8	39.7	**26.7**	50.4	47.1	**34.3**	59.1	54.5	24
		900	0.13	6.8	26.1	24.8	9.0	28.1	26.2	11.2	30.1	27.4	15.7	34.1	29.7	20.3	38.2	31.8	2
			0.25	**10.4**	29.3	27.8	**13.8**	32.4	30.2	**17.1**	35.4	32.4	**23.9**	41.4	37.0	**30.6**	47.5	41.4	7
			0.38	**12.3**	31.1	29.9	**16.2**	34.6	33.0	**20.2**	38.1	36.0	**28.1**	45.3	41.9	**36.1**	52.4	47.8	14
			0.50	**13.4**	32.1	31.3	**17.7**	35.9	34.8	**22.0**	39.8	38.3	**30.7**	47.6	45.2	**39.4**	55.3	52.1	24
		1100	0.13	7.0	25.2	24.4	9.3	26.9	25.6	11.6	28.6	26.7	16.2	32.1	28.7	21.0	35.6	30.4	2
			0.25	**11.1**	28.2	27.2	**14.7**	30.9	29.2	**18.3**	33.6	31.3	**25.5**	38.9	35.4	**32.8**	44.3	39.3	7
			0.38	**13.4**	29.9	29.2	**17.7**	33.1	23.7	**22.0**	36.3	34.8	**30.6**	42.7	40.3	**39.4**	49.2	45.7	14
			0.50	**14.8**	31.0	30.7	**19.5**	34.5	34.0	**24.3**	38.0	37.2	**33.8**	45.1	43.7	**43.5**	52.3	50.1	24

EWT = Entering Water Temperature
LWT = Leaving Water Temperature
EAT = Entering Air Temperature (dry bulb)
LAT = Leaving Air Temperature (dry bulb)

NOTE:
Not all heat pump series have high temperature capability; see heat pump's specification data.

W-Series: *maximum 120-130°F (49-54°C)*
ATW-Series: *maximum 105-120°F (41-49°C)*

go to TABLE OF CONTENTS

Performance Tables - Vertical Models

AHW/AH4P-65 Vertical

	EAT (°F)	Airflow (cfm)	Water Flow (gpm)	EWT = **40**°F				EWT = **45**°F				EWT = **50**°F				Water Pressure Drop (psi)
				Total Capacity (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Total Capacity** (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	**Total Capacity** (Btu/hr)	Sensible Capacity (Btu/hr)	LAT (°F)	LWT (°F)	
COOLING	80.6 (46% RH)	900	2	**25,200**	21,100	59	65	**21,900**	19,400	61	67	**17,100**	17,100	63	67	0.2
			4	**34,900**	26,300	54	57	**29,600**	24,000	56	60	**24,600**	21,900	59	62	0.8
			6	**40,800**	29,000	51	54	**34,200**	26,200	54	56	**27,800**	23,500	57	59	2.1
			8	**44,700**	30,800	50	51	**37,400**	27,600	53	54	**30,000**	24,500	56	58	3.5
		1200	2	**27,500**	23,800	63	68	**24,100**	21,800	64	69	**18,800**	18,800	66	69	0.2
			4	**39,100**	31,200	57	60	**33,600**	28,800	59	62	**28,400**	26,200	61	64	0.9
			6	**46,500**	34,800	54	55	**39,400**	31,800	57	58	**32,400**	28,800	59	61	2.1
			8	**51,800**	37,200	52	53	**43,500**	33,700	55	56	**35,300**	30,300	58	59	3.5
		1500	2	**29,000**	25,500	65	69	**23,200**	23,200	67	62	**20,000**	20,000	69	70	0.2
			4	**42,200**	35,200	59	61	**36,700**	32,500	61	63	**31,300**	29,500	63	66	0.9
			6	**50,900**	39,800	57	57	**43,400**	36,600	59	59	**36,300**	33,300	61	62	2.1
			8	**57,100**	42,800	55	54	**48,300**	39,000	57	57	**39,600**	35,300	59	90	3.5
		1900	2	**27,900**	27,900	67	68	**24,600**	24,600	69	70	**21,200**	21,200	71	71	0.2
			4	**45,600**	39,400	62	63	**39,900**	36,300	63	65	**32,000**	32,000	65	66	0.9
			6	**55,500**	45,500	59	58	**47,800**	42,000	61	61	**40,500**	38,200	62	64	2.1
			8	**62,900**	49,300	57	56	**53,400**	45,200	59	58	**44,500**	41,100	61	61	3.5
		2300	2	**29,000**	29,000	69	62	**25,500**	25,500	71	71	**22,000**	22,000	72	72	0.2
			4	**48,400**	42,700	64	64	**42,500**	39,200	65	66	**34,200**	34,200	67	67	0.9
			6	**59,200**	50,300	61	60	**51,400**	46,400	62	62	**41,600**	41,600	64	64	2.1
			8	**67,300**	54,900	59	57	**57,700**	50,600	61	59	**48,800**	46,000	63	62	3.5

METRIC

	EAT (°C)	Airflow (L/s)	Water Flow (L/s)	EWT = **4**°C				EWT = **7**°C				EWT = **10**°C				Water Pressure Drop (kPa)
				Total Capacity (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	**Total Capacity** (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	**Total Capacity** (kW)	Sensible Capacity (kW)	LAT (°C)	LWT (°C)	
COOLING	27 (46% RH)	425	0.13	**7.4**	6.2	15.2	18.4	**6.4**	5.7	16.1	19.4	**5.0**	5.0	17.4	19.4	2
			0.25	**10.2**	7.7	12.3	14.1	**8.7**	7.0	13.6	15.4	**7.2**	6.4	14.8	16.8	6
			0.38	**11.9**	8.5	10.8	11.9	**10.0**	7.7	12.3	13.6	**8.2**	6.9	13.8	15.2	14
			0.50	**13.1**	9.0	9.8	10.6	**11.0**	8.1	11.6	12.4	**8.8**	7.2	13.3	14.2	24
		570	0.13	**8.1**	7.0	17.0	19.7	**7.1**	6.4	17.8	20.6	**5.5**	5.5	19.1	20.4	2
			0.25	**11.5**	9.2	13.9	15.3	**9.8**	8.4	14.9	16.6	**8.3**	7.7	16.0	17.9	6
			0.38	**13.6**	10.2	12.4	13.0	**11.5**	9.3	13.7	14.5	**9.5**	8.4	14.9	16.0	14
			0.50	**15.2**	10.9	11.3	11.6	**12.7**	9.9	12.8	13.2	**10.4**	8.9	14.3	14.9	24
		710	0.13	**8.5**	7.5	18.4	20.5	**6.8**	6.8	19.2	16.4	**5.9**	5.9	20.3	21.1	2
			0.25	**12.4**	10.3	15.2	16.2	**10.7**	9.5	16.1	17.4	**9.2**	8.7	17.1	18.7	6
			0.38	**14.9**	11.7	13.6	13.8	**12.7**	10.7	14.7	15.2	**10.6**	9.8	15.8	16.7	14
			0.50	**16.7**	12.5	12.6	12.3	**14.1**	11.4	13.9	13.9	**11.6**	10.4	15.1	32.2	24
		900	0.13	**8.2**	8.2	19.6	19.9	**7.2**	7.2	20.5	20.8	**6.2**	6.2	21.4	21.8	2
			0.25	**13.4**	11.6	16.6	17.1	**11.7**	10.6	17.4	18.3	**9.4**	9.4	18.5	18.9	6
			0.38	**16.3**	13.3	14.9	14.7	**14.0**	12.3	15.9	16.1	**11.9**	11.2	16.9	17.5	14
			0.50	**18.4**	14.4	13.9	13.2	**15.6**	13.3	15.0	14.6	**13.1**	12.1	16.1	16.2	24
		1100	0.13	**8.5**	8.5	20.7	16.9	**7.5**	7.5	21.4	21.4	**6.4**	6.4	22.2	22.2	2
			0.25	**14.2**	12.5	17.6	17.9	**12.5**	11.5	18.4	19.0	**10.0**	10.0	19.5	19.5	6
			0.38	**17.3**	14.7	16.0	15.4	**15.1**	13.6	16.8	16.7	**12.2**	12.2	17.9	17.7	14
			0.50	**19.7**	16.1	14.9	13.8	**16.9**	14.8	15.9	15.2	**14.3**	13.5	16.9	16.8	24

EWT = Entering Water Temperature
LWT = Leaving Water Temperature
EAT = Entering Air Temperature (dry bulb)
LAT = Leaving Air Temperature (dry bulb)

Lines shaded GREY = ***No dehumidification****; operation not recommended*

go to TABLE OF CONTENTS

Wiring Diagram (24VAC Airflow Control)

THERMOSTAT or CONTROLLER
C - ground for powering thermostat
R - 24VAC live
G - When thermostat makes a dry contact with **R**, airflow will start at value of the airflow jumper and zone valve will open.
W2 - When thermostat makes a dry contact with **R**, plenum heater will be activated. Thermostat must make a **G** call at the same time to activate airflow in order to avoid a plenum heater high temperature safety trip.

AIRFLOW SELECTION
Connect the grey wire with the fork terminal to one of the 5 airflows. Airflow will be constant at that value regardless of backpresure.

A controller can be connected to call for multiple airflows by making dry contact from **R** directly to the airflow terminals (instead of to **G**). In this case, disconnect the grey wire with fork terminal; when the controller calls for any airflow, it will also have to call on **G** to open the zone valve.

Note that a call for a higher airflow will override a call for a lower airflow value. For example, if **R** is connected to both the **1200cfm** and **1500cfm** terminals, airflow will be 1500 cfm.

ZONE VALVE
A 24VAC zone valve may be connected between **V** and **C**. It will be opened along with a **G** call.

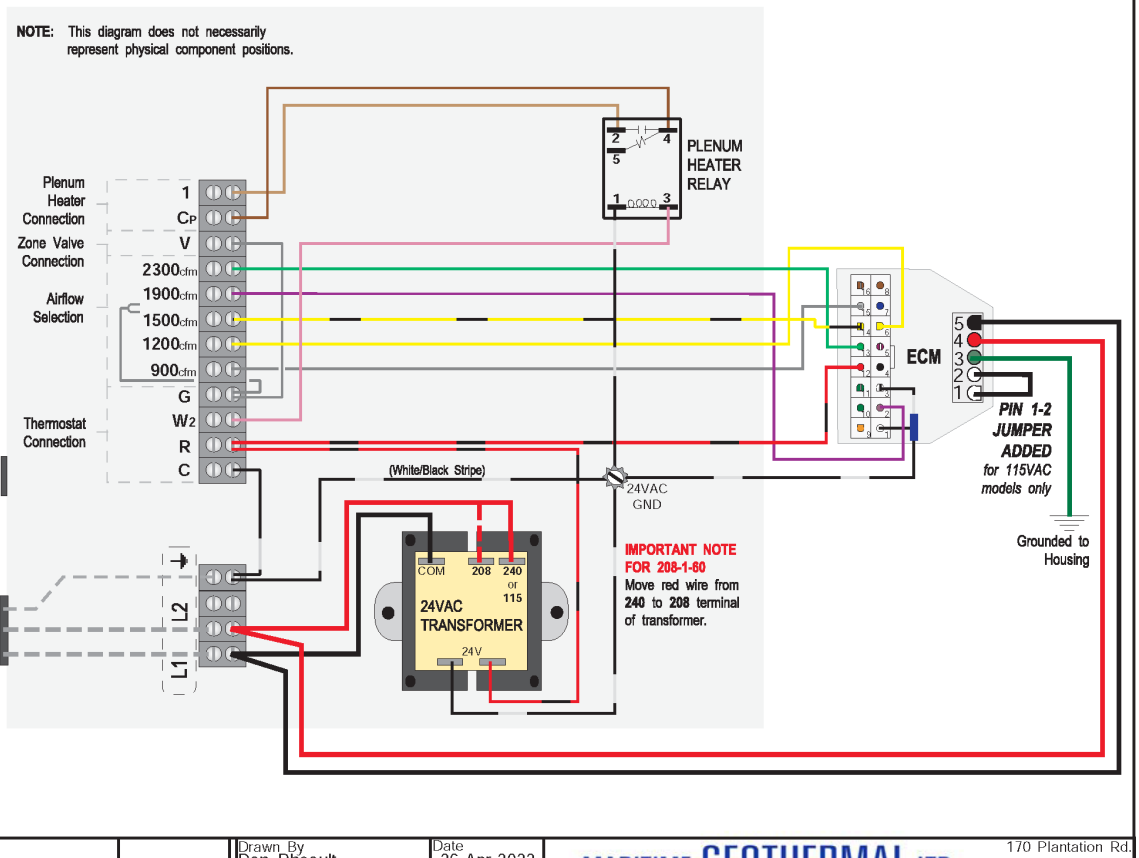
PLENUM HEATER
When the air thermostat makes a dry contact between **R** and **W2**, the plenum heater relay will activate and make a dry contact between **CP** and **1** in order to actuate the plenum heater. (Connect **CP** and **1** to **C** and **1~2** in the plenum heater.)

AHW / AH4P-65 Schematic Diagram

24VAC Airflow Control

115-1-60 or 208/230-1-60

ELECTRICAL BOX



REV	ECO #	IMPL BY	APVD BY	DATE
01	Initial Release	D. RHEAULT	D. RHEAULT	26-Apr-2022

Drawn By: Dan Rheault	Date: 26-Apr-2022	MARITIME GEOTHERMAL LTD. 170 Plantation Rd. Petitcodiac, NB E4Z 6H4
Checked By: Dan Rheault	Date: 26-Apr-2022	Drawing Name: AHW/AH4P-65 Schematic Diagram
Approved By (ENG)	Date	
Approved By (MFG)	Date	
Approved By	Date	

Size	Drawing Number	Drawing Rev	SHEET
A	002590SCH	01	1 of 1

go to TABLE OF CONTENTS

Wiring Diagram (-VSP models, 0-10VDC Airflow Control)

24VAC CONNECTIONS
C - ground for powering controller
R - 24VAC live
G - When controller makes a dry contact with **R**, zone valve will open. *Connection not required for airflow.*
W2 - When controller makes a dry contact with **R**, plenum heater will be activated. Thermostat must make a **0-10VDC** call at the same time to activate an appropriate airflow to avoid a plenum heater high temp. trip.

0-10VDC AIRFLOW CONTROL
To activate airflow, a 0-10 VDC signal must be applied to the **0-10VDC+** terminal, with the **GND** terminal as the DC ground. This will give a constant airflow proportional to the input signal up to 2500 rpm. For example, a 5VDC input will result in a constant airflow of 1250 cfm regardless of duct backpressure.

A motor speed output is available on terminal **RPMOUT**. This is a pulse output with 36 pulses per revolution. For example, there will be 60 pulses/second at a motor speed of 100 rpm. Note that because of the constant airflow functionality, motor speed will vary with air backpressure at any given airflow.

ZONE VALVE
A 24VAC zone valve may be connected between **V** and **V1**. It will be opened along with a **G** call.

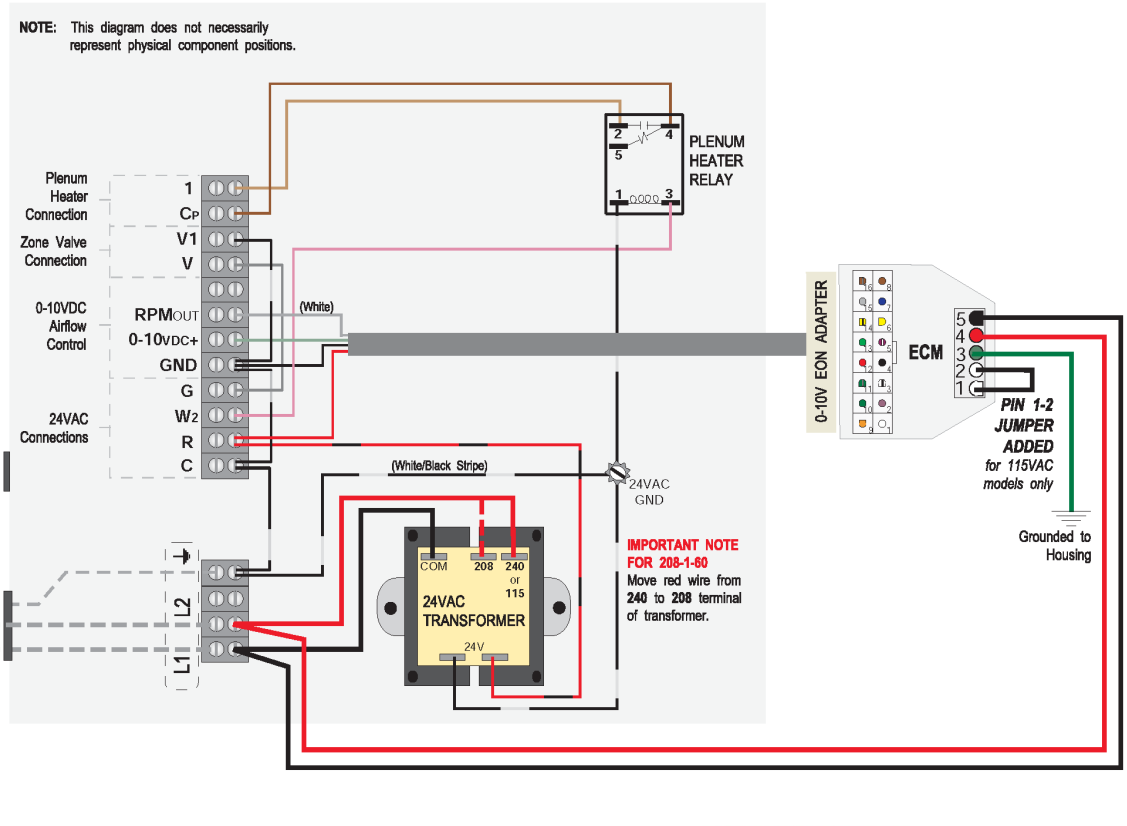
PLENUM HEATER
When the air thermostat makes a dry contact between **R** and **W2**, the plenum heater relay will activate and make a dry contact between **CP** and **1** in order to actuate the plenum heater. (Connect **CP** and **1** to **C** and **1~2** in the plenum heater.)

AHW / AH4P-65-VSP Schematic Diagram

0-10VDC Airflow Control

115-1-60 or 208/230-1-60

ELECTRICAL BOX



REV	ECO #	IMPL BY	APVD BY	DATE
01	Initial Release	D. RHEAULT	D. RHEAULT	26-Apr-2022

Drawn By	Dan Rheault	Date	26-Apr-2022
Checked By	Dan Rheault	Date	26-Apr-2022
Approved By	(ENG)	Date	
Approved By	(MFG)	Date	
Approved By		Date	

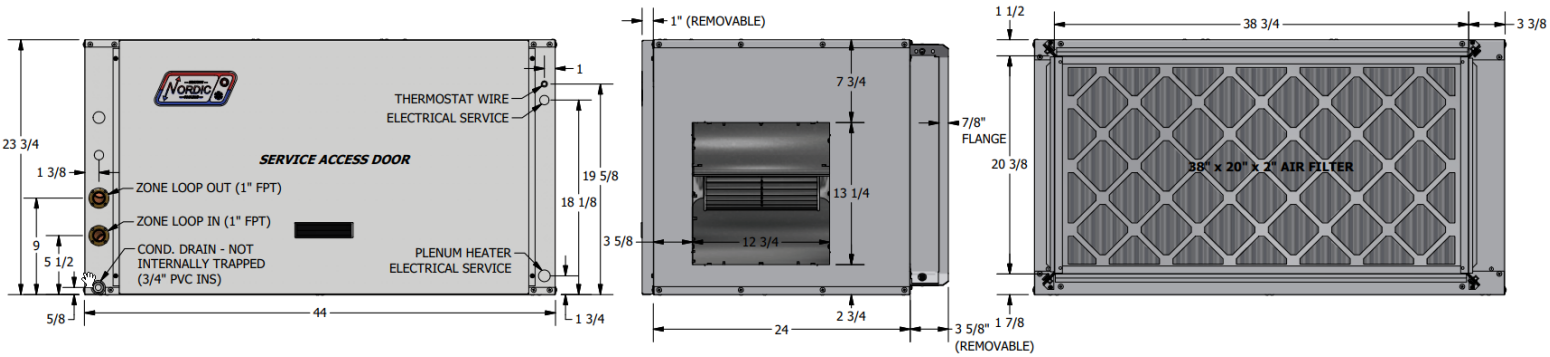
MARITIME GEOTHERMAL LTD.
170 Plantation Rd.
Petitcodiac, NB
E4Z 6H4

Drawing Name: AHW/AH4P-65-VSP Schematic Diagram

Size	Drawing Number	Drawing Rev	SHEET
A	002591SCH	01	1 of 1

go to TABLE OF CONTENTS

Dimensions: AHW-65 Horizontal



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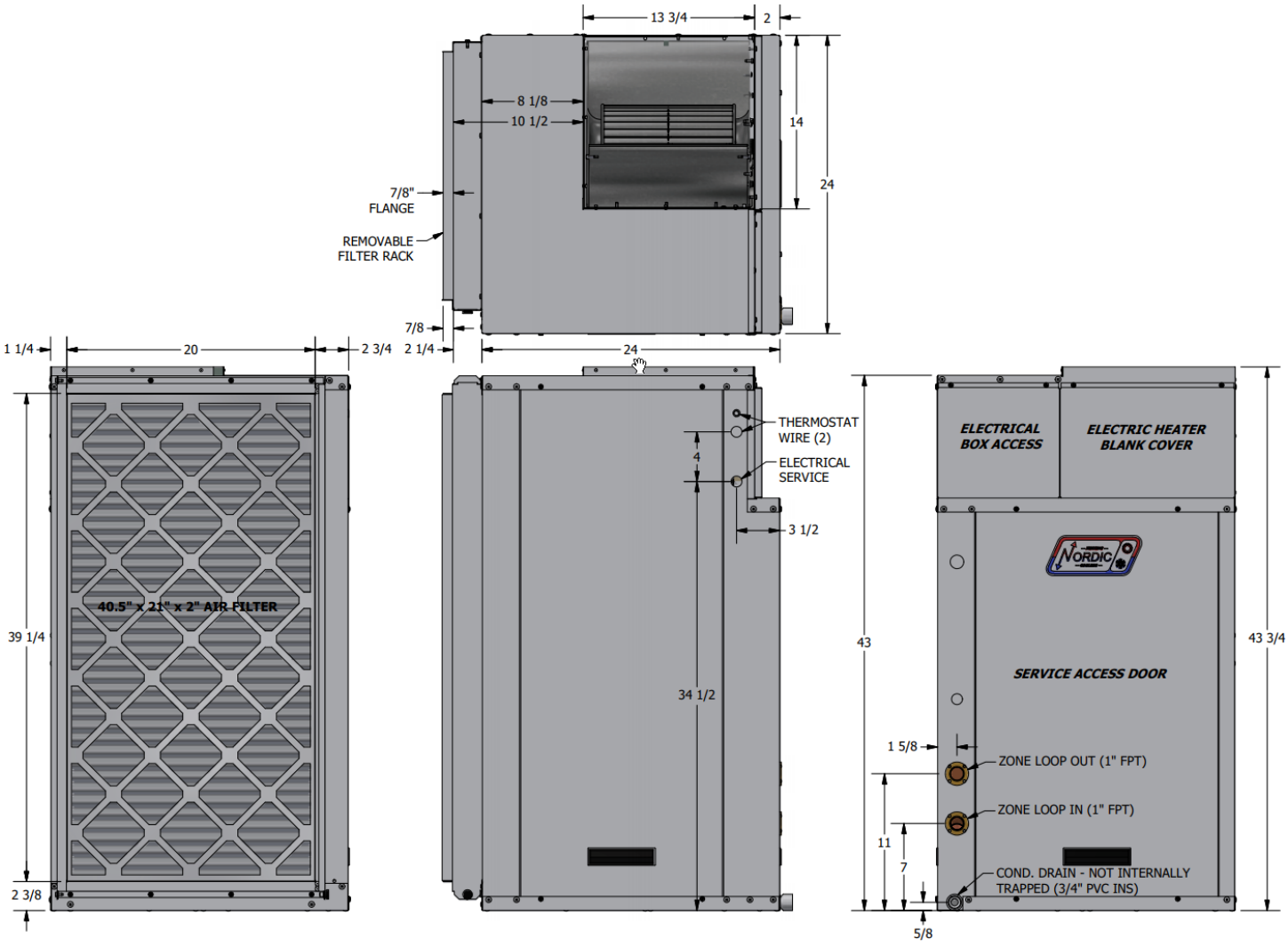
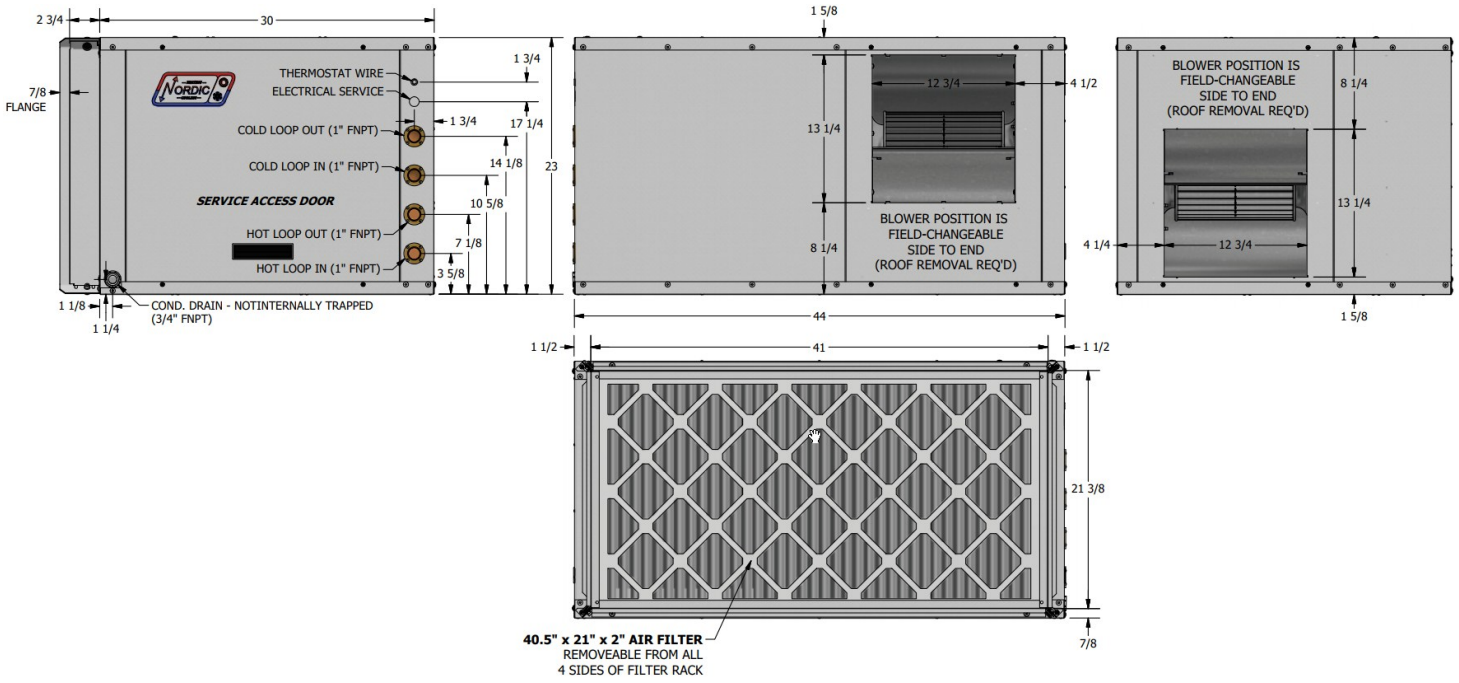
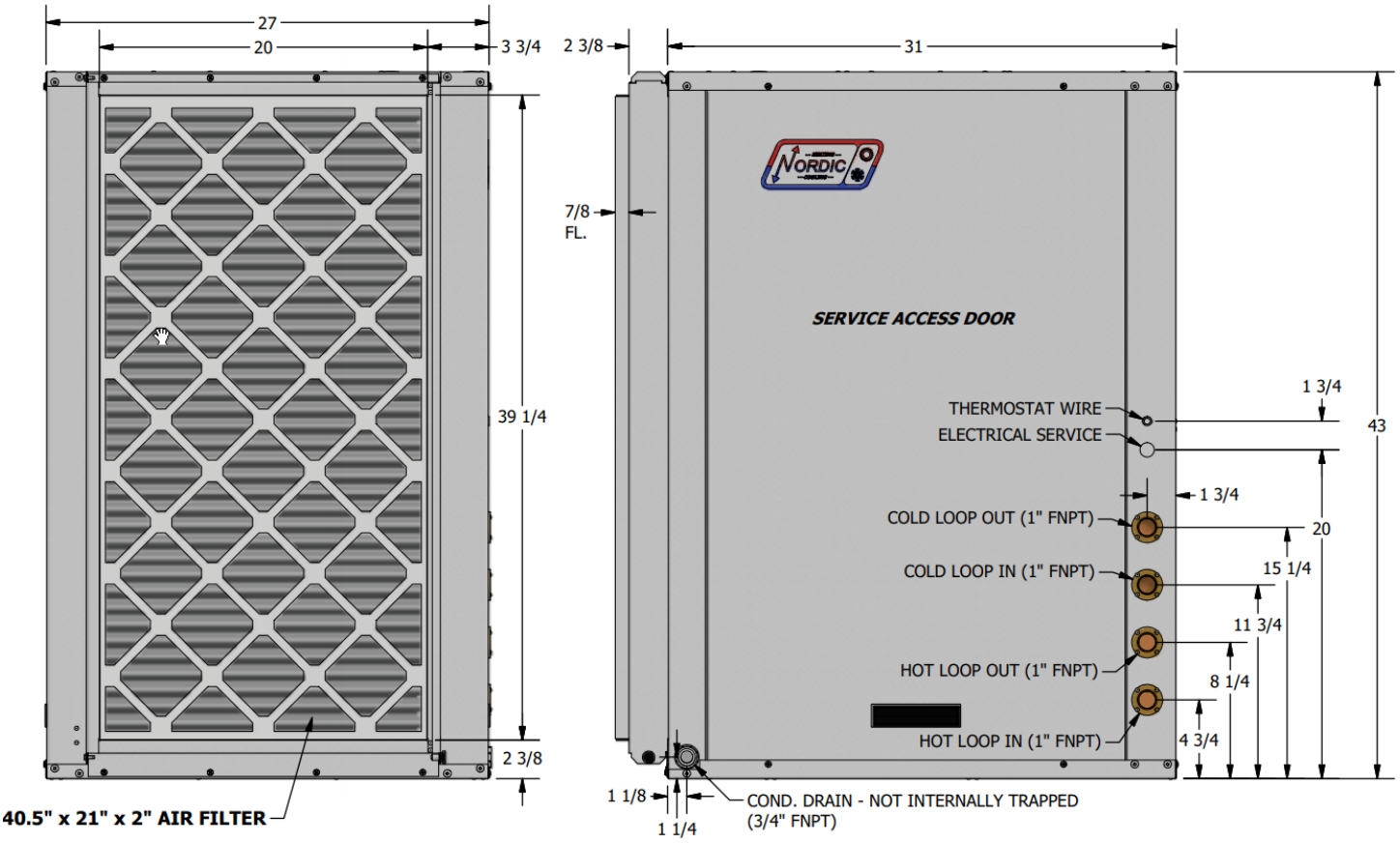


go to TABLE OF CONTENTS

Dimensions: AH4P-65 Horizontal



Dimensions: AH4P-65 Vertical



go to TABLE OF CONTENTS

LIMITED WARRANTY

MARITIME GEOTHERMAL LTD. warrants that its hydronic air handlers shall be free from defects in materials and workmanship for a period of ONE (1) YEAR after the date of installation or for a period of ONE (1) YEAR AND SIXTY (60) DAYS after the date of shipment, whichever occurs first. This warranty covers all internal components of the unit.

MARITIME GEOTHERMAL LTD. shall, at its option, repair or replace any part covered by this warranty. Defective parts shall be returned to MARITIME GEOTHERMAL LTD., transportation charges prepaid. Replacement or repaired parts and components are warranted only for the remaining portion of the original warranty period.

This warranty is subject to the following conditions:

1. The hydronic air handler must be properly installed and maintained in accordance with MARITIME GEOTHERMAL LTD. guidelines.

2. The installer must complete the **Startup Record** and return it to MARITIME GEOTHERMAL LTD. within 21 days of unit installation.

3. For new construction, it is the responsibility of the building or general contractor to supply temporary heat to the structure prior to occupancy. Generally, HVAC devices are designed to provide heat only to the completely finished and insulated structure. Startup of the unit shall not be scheduled prior to completion of construction and final duct installation for validation of this warranty.

If a hydronic air handler manufactured by MARITIME GEOTHERMAL LTD. fails to conform to this warranty, MARITIME GEOTHERMAL LTD.'s sole and exclusive liability shall be, at its option, to repair or replace any part or component which is returned by the customer during the applicable warranty period set forth above, provided that (1) MARITIME GEOTHERMAL LTD. is promptly notified in writing upon discovery by the customer that such part or component fails to conform to this warranty; (2) the customer returns such part or component to MARITIME GEOTHERMAL LTD., transportation charges prepaid, within (30) thirty days of failure, and (3) MARITIME GEOTHERMAL LTD.'s examination of such component discloses to its satisfaction that such part or component fails to conform to this warranty and the alleged defects were not caused by accident, misuse, neglect, alteration, improper installation, repair or improper testing. MARITIME GEOTHERMAL LTD. will not be responsible for any consequential damages or labour costs incurred. In additional, MARITIME GEOTHERMAL LTD. will not be responsible for the cost of replacement parts purchased from a third party.

go to TABLE OF CONTENTS

Maritime Geothermal Ltd.
PO Box 2555
170 Plantation Road
Petitcodiac, NB, E4Z 6H4

RESIDENTIAL WARRANTY REGISTRATION

(A PRINTED COPY OF THIS FORM IS SHIPPED WITH THE UNIT.)

Complete all fields to have your warranty effective as of the install date. Should this form not be completed or if it does not include sufficient detail, warranty will be effective as of the date your unit was shipped from Maritime Geothermal Ltd..

Model: _____

Serial Number: _____

Install Date: _____

Installed By: _____
(company name)

Loop Type: ☐ horizontal ☐ vertical ☐ open ☐ pond
(geothermal only)

Installation Type: ☐ new construction ☐ replacement/retrofit

Address of installation: _____

City: _____

Province / State: _____

Postal Code / Zip: _____

Where do I find my model and serial number?

There is a label on the outside of your unit like this one.