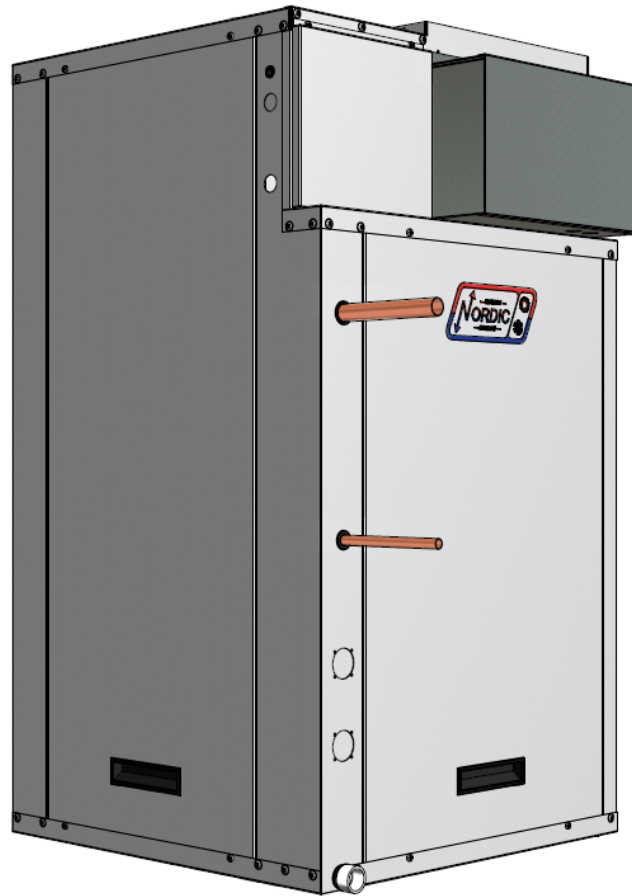




Engineering Specification

AH-**-P-*-SDETV Vertical Refrigerant Air Handler for Split Systems

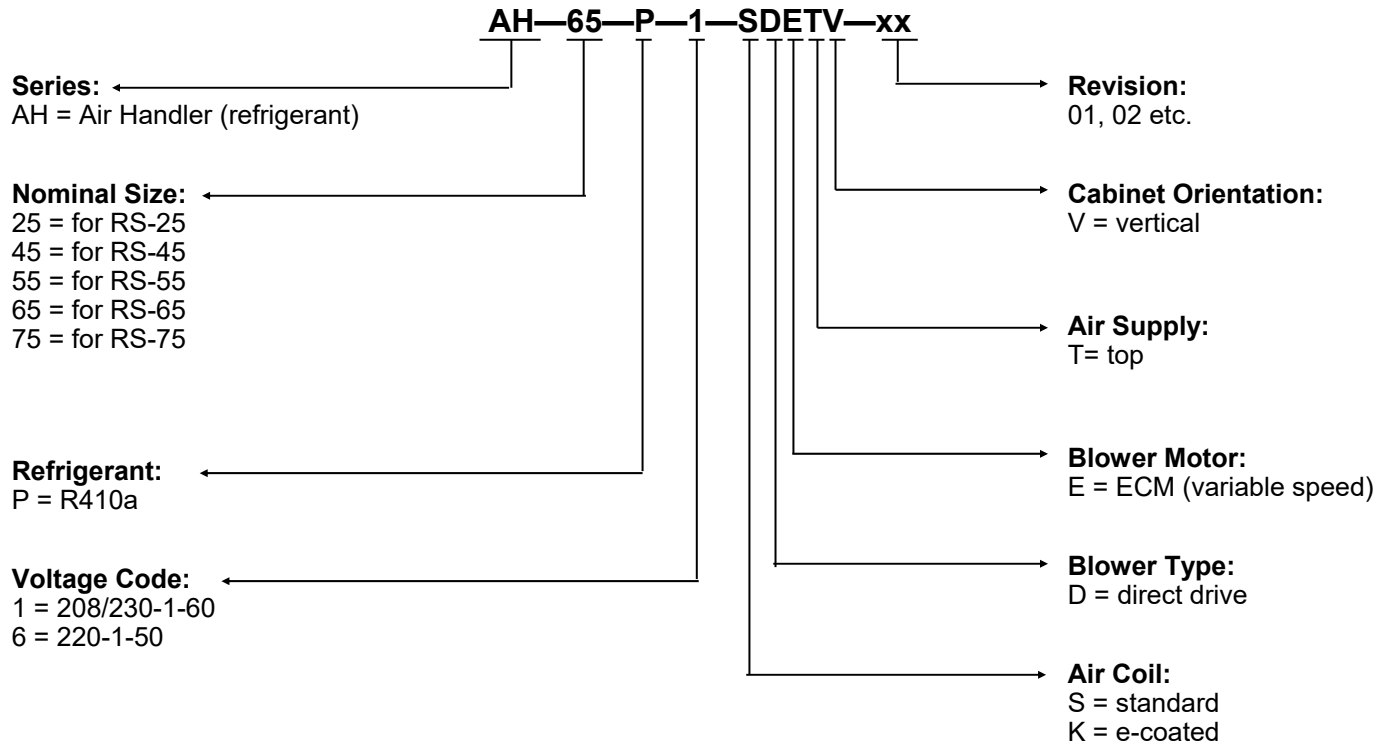


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001750SPC-01

Model Nomenclature



APPLICATION TABLE									
SERIES	SIZE	REFRIGERANT	VOLTAGE	FAN/CASE	REVISIONS				
AH	45 55 65 75	P	1 6	SDETV	02				
This manual applies only to the models and revisions listed in this table.									

MATCHING EQUIPMENT	
AIR HANDLER	MATCHING GEOTHERMAL SPLIT HEAT PUMP
AH-45	RS-45
AH-55	RS-55
AH-65	RS-65
AH-75	RS-75

Maritime Geothermal Ltd. has a continuous improvement policy and reserves the right to modify specification data at any time without prior notice .

Design Features

- Energy Star rated
- AHRI certified for performance
- CSA certified for safety (CSA 22.2 No 236-05)
- Satin galvanized steel cabinet
- Powder coat finish
- Acoustically insulated cabinet (1/2")
- All connections located on same side
- Constant airflow ECM blower motor with single side service access
- Four airflow stages: recirculation mode, stage 1, stage 2 and stage 3 (auxiliary/emergency).
- Airflows may be adjusted to -6%, +6% or +12% via tap board located in electrical box
- Dry contact terminals for 15% airflow reduction to facilitate zoning applications
- Optional plenum heater can be internally mounted
- Reversible air filter rack
- Stainless steel condensate drip tray
- Clear condensate drain with 3/4" PVC socket connection, not internally trapped
- Multi-circuit high efficiency air coil
- Balanced port thermostatic expansion valve (TXV) with internal bleed

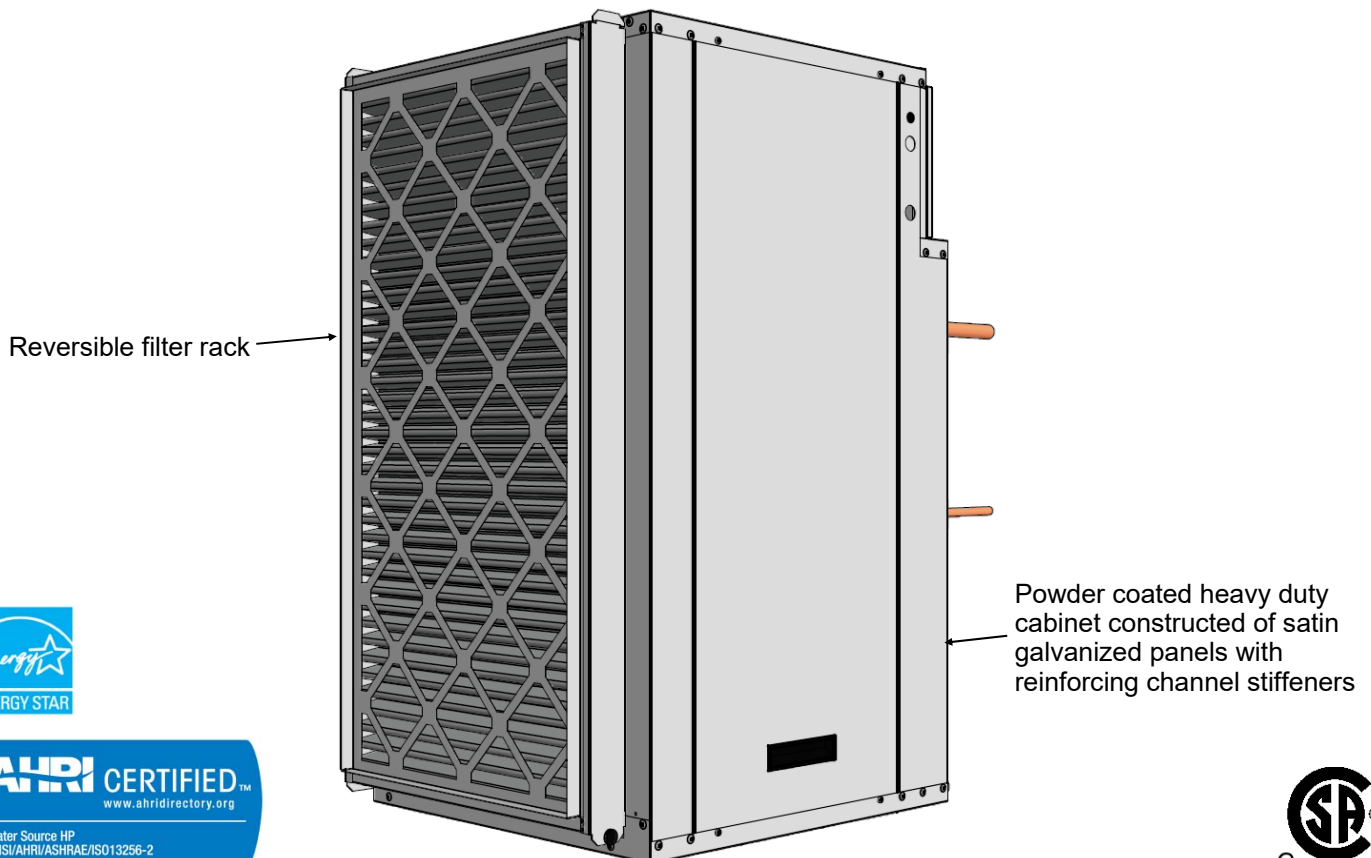
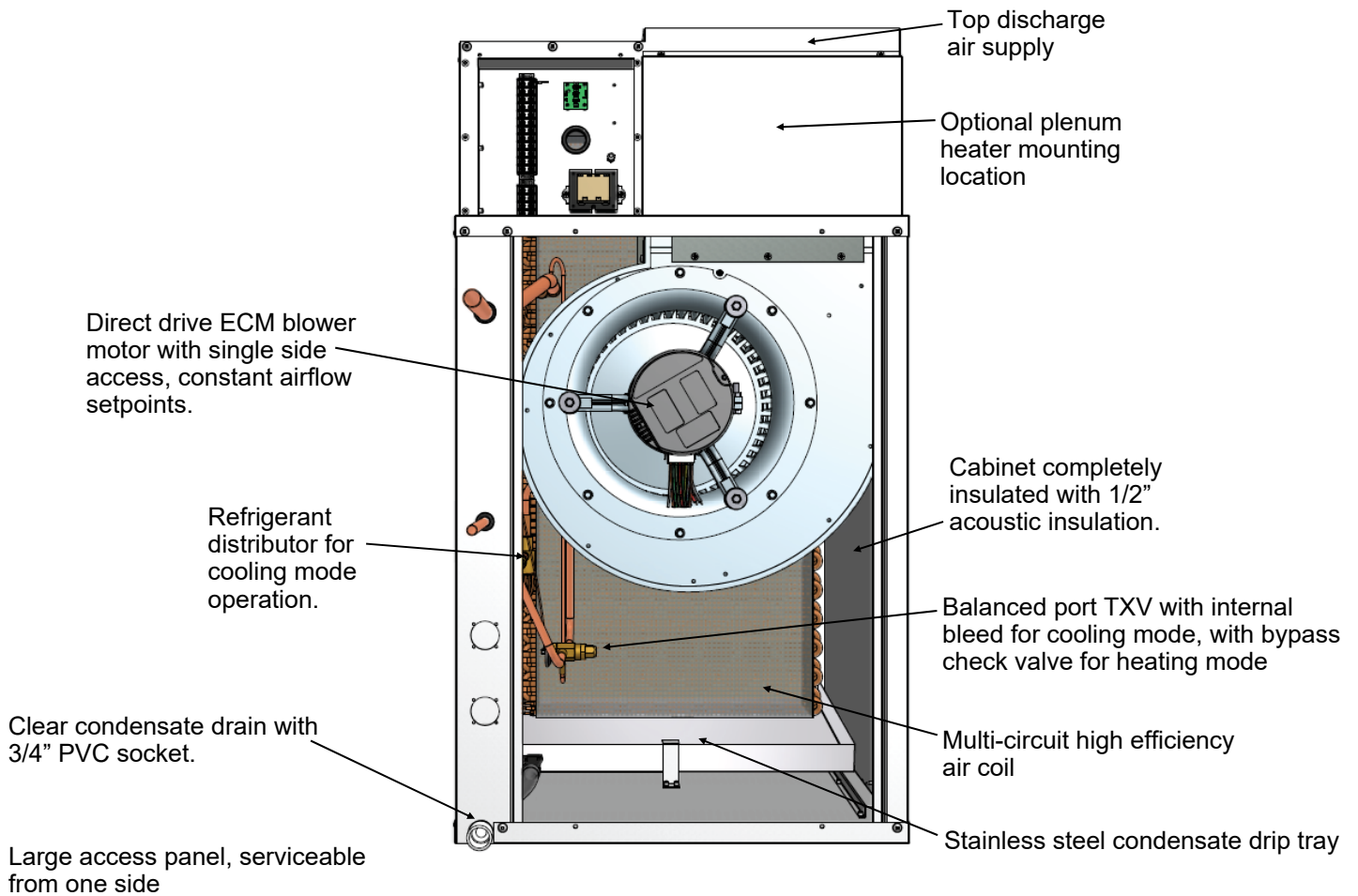
Mandatory Additional Equipment

- Matching split heat pump (see previous page)

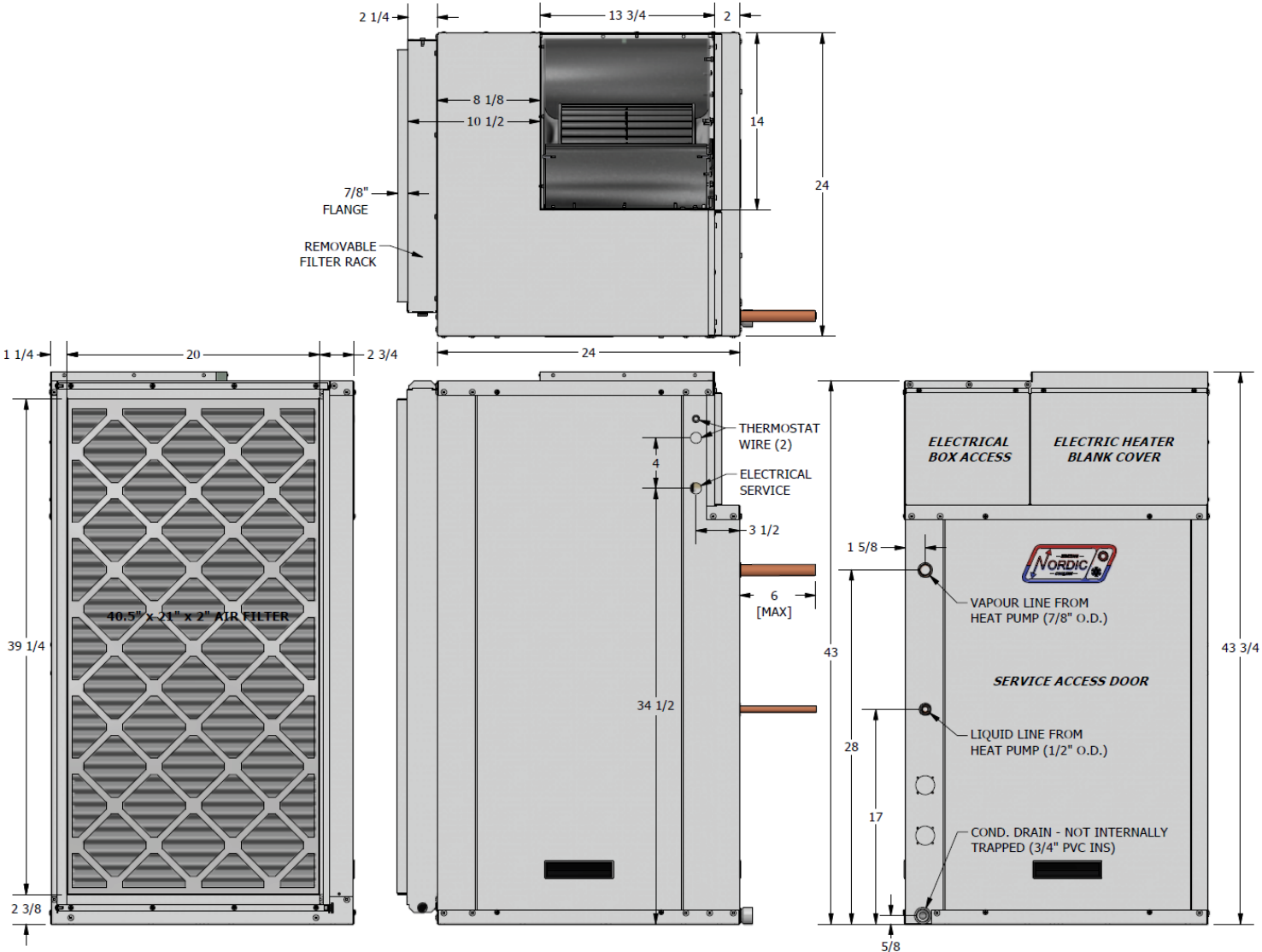
Available Accessories

- Anti-vibration pad for under unit
- Passive electrostatic cleanable permanent air filter
- Electric plenum heaters 5 / 7 / 10 / 15 / 20 kW, internally mountable

Design Features



Dimensions



Specifications

Electrical Data					
MODEL	Fan	FLA	MCA	Max Fuse/ Breaker	Wire Size
	RLA	Amps	Amps	Amps	ga
AH-45	3.5	4.3	5.2	15	#14-2
AH-55	4.0	4.8	5.8	15	#14-2
AH-65	5.5	6.3	7.7	15	#14-2
AH-75	6.5	7.3	8.9	15	#14-2

Power Supply Data			
Code	Power Supply		
	V-ø-Hz	MIN	MAX
1	208/230-1-60	187	253
6	220-1-50	198	242

Shipping Information				
MODEL	WEIGHT lb. (kg)	DIMENSIONS in (cm)		
		L	W	H
AH-45	200 (91)	40 (102)	30 (76)	48 (122)
AH-55	208 (94)	40 (102)	30 (76)	48 (122)
AH-65	216 (98)	40 (102)	30 (76)	48 (122)
AH-75	223 (101)	40 (102)	30 (76)	48 (122)

For other specifications, including standard capacity ratings and performance tables, see documentation for matching equipment.

Wiring Diagram

AH-Series Schematic Diagram 208/230-1-60 / 220-1-50 / ECM Fan

Use an 18-6 conductor cable to connect this unit to the heat pump or thermostat.

NOTE: MUST USE DRY CONTACTS

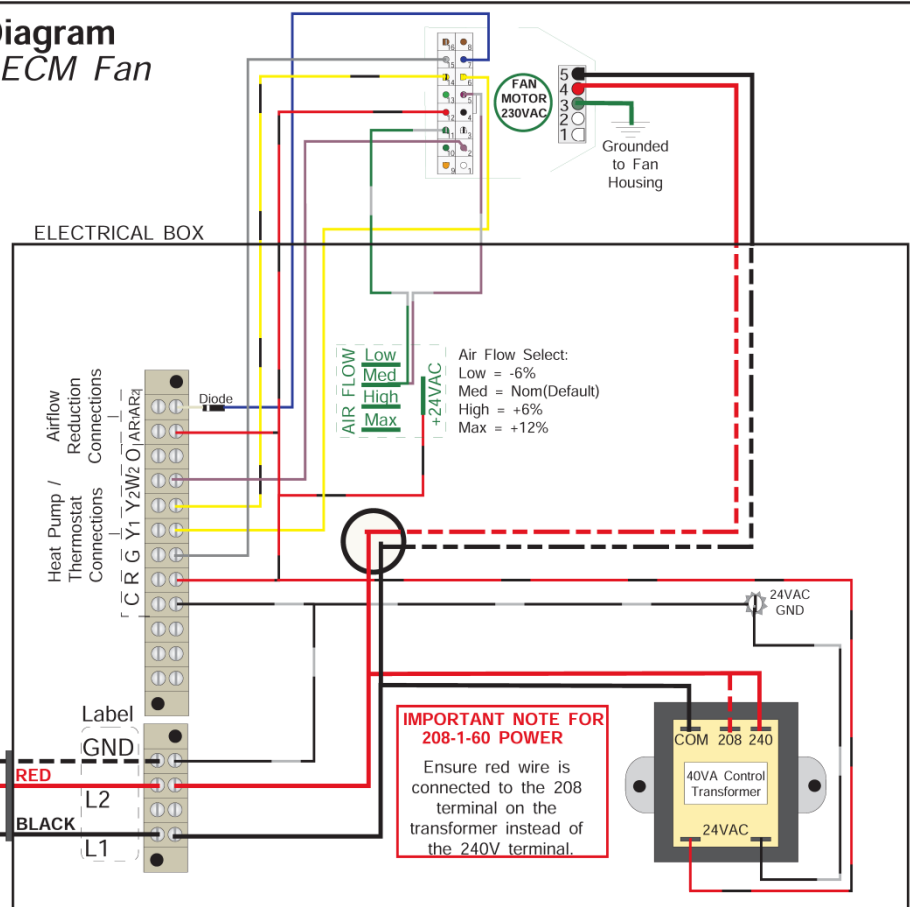
- C - 24VAC Common
- R - 24VAC Hot
- G - Fan Recirculation
- Y1 - Fan Stage 1
- Y2 - Fan Stage 2
- W2 - Fan Stage 3 (Aux /Emergency)
- O - No Connect

AIRFLOW REDUCTION

Connect AR1 & AR2 together with dry contacts to reduce the airflow for zone applications.

Field Wiring
208-230/220VAC
(Voltage Codes 1, 6)

Air Handler Electrical Service Requirements			
208/230VAC Single Phase 60Hz (208/230-1-60)			
220VAC Single Phase 50Hz (220-1-50)			
Model Size	Min. Circuit Ampacity	Min. Wire Gauge	TD Fuse or Breaker
25	3.9	14-2	15
45	5.2	14-2	15
55	5.8	14-2	15
65	7.7	14-2	15
75	8.9	14-2	15



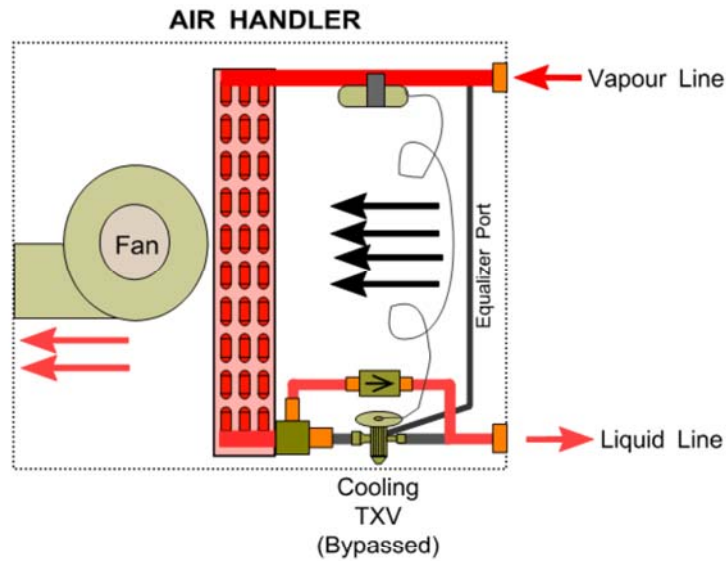
					Drawn By Chris Geddes	Date 11 FEB 2013	<div>MARITIME GEOTHERMAL LTD.</div>			170 Plantation Rd. Petitcodiac, NB E4Z 6H4	
					Checked By Chris Geddes	Date 11 FEB 2013					
					Approved By (ENG) Chris Geddes	Date 11 FEB 2013	Drawing Name AH-**-*-SDETV Schematic Diagram				
					Approved By (MFG)	Date					
01	IR 000211	C. GEDDES	C. GEDDES	11 FEB 2013	Approved By	Date	Size A	Drawing Number 001747SCH	Drawing Revision 01	SHEET 1 of 1	
REV	ECO #	IMPL BY	APVD BY	DATE							

AH-Series Refrigeration Circuit

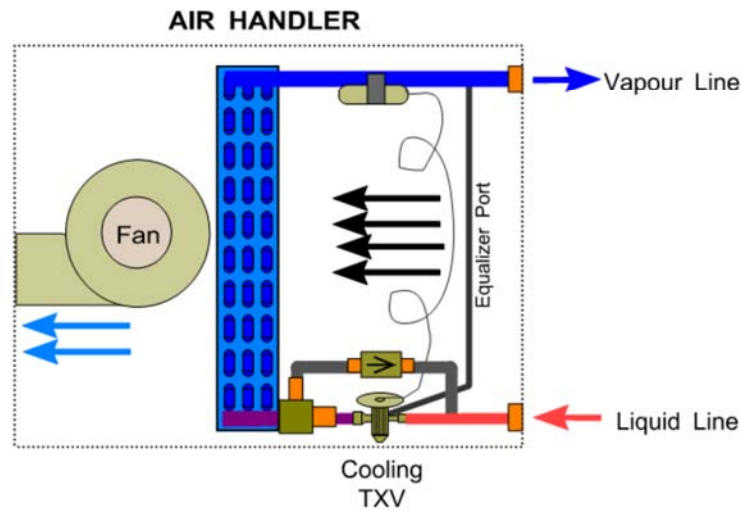
LINE SET SIZE CHART (OD)

MODEL	VAPOUR	LIQUID
25	5/8"	3/8"
45	3/4"	3/8"
55	7/8"	1/2"
65	7/8"	1/2"
75	7/8"	1/2"

Heating Mode



Cooling Mode



					Drawn By Chris Geddes	Date 11 FEB 2013	MARITIME GEOTHERMAL LTD. 170 Plantation Rd. Petitcodiac, NB E4Z 6H4
					Checked By Chris Geddes	Date 11 FEB 2013	
					Approved By (ENG) Chris Geddes	Date 11 FEB 2013	
					Approved By (MFG)	Date	
01	Initial Release	C. GEDDES	C. GEDDES	11 FEB 2013	Approved By	Date	Drawing Name AH-Series Refrigeration Circuit Diagram
REV	ECO #	IMPL BY	APVD BY	DATE			
							Size A
							Drawing Number 001748RCD
							Drawing Revision 01
							SHEET 1 of 1

Airflow Data

MED Airflow (nominal)												
	STAGE 2				STAGE 1				FAN ONLY (Recirculation)			
Model	Full		AR1-AR2 reduction		Full		AR1-AR2 reduction		Full		AR1-AR2 reduction	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
25	800	378	680	321	680	321	578	273	448	211	381	180
45	1200	566	1020	481	1030	486	876	413	672	317	571	270
55	1500	708	1275	602	1240	585	1054	497	840	396	714	337
65	1900	897	1615	762	1540	727	1309	618	1064	502	904	427
75	2100	991	1785	842	1660	783	1411	666	1176	555	1000	472
80	2400	1133	2040	963	N/A	N/A	N/A	N/A	1344	634	1142	539

LOW Airflow (-6%)												
	STAGE 2				STAGE 1				FAN ONLY (Recirculation)			
Model	Full		AR1-AR2 reduction		Full		AR1-AR2 reduction		Full		AR1-AR2 reduction	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
25	752	355	639	302	639	302	543	256	421	199	358	169
45	1128	532	959	453	968	457	823	388	632	298	537	253
55	1410	665	1199	566	1166	550	991	468	790	373	671	317
65	1786	843	1518	716	1448	683	1230	581	1000	472	850	401
75	1974	932	1678	792	1560	736	1326	626	1105	522	940	443
80	2256	1065	1918	905	N/A	N/A	N/A	N/A	1263	596	1074	507

HIGH Airflow (+6%)												
	STAGE 2				STAGE 1				FAN ONLY (Recirculation)			
Model	Full		AR1-AR2 reduction		Full		AR1-AR2 reduction		Full		AR1-AR2 reduction	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
25	848	400	721	340	721	340	613	289	475	224	404	191
45	1272	600	1081	510	1092	515	928	438	712	336	605	286
55	1590	750	1352	638	1314	620	1117	527	890	420	757	357
65	2014	951	1712	808	1632	770	1388	655	1128	532	959	452
75	2226	1051	1892	893	1760	830	1496	706	1400	661	1190	562
80	2500	1180	2162	1021	N/A	N/A	N/A	N/A	1425	672	1211	572

MAX Airflow (+12%)												
	STAGE 2				STAGE 1				FAN ONLY (Recirculation)			
Model	Full		AR1-AR2 reduction		Full		AR1-AR2 reduction		Full		AR1-AR2 reduction	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
25	896	423	762	359	762	359	647	306	502	237	426	201
45	1344	634	1142	539	1154	544	981	463	753	355	640	302
55	1680	793	1428	674	1389	655	1180	557	941	444	800	377
65	2128	1004	1809	854	1725	814	1466	692	1192	562	1013	478
75	2352	1110	1999	944	1859	877	1580	746	1317	622	1120	528
80	2500	1180	2285	1078	N/A	N/A	N/A	N/A	1505	710	1279	604

Maximum external static pressure: Unit sizes 25-45: 0.50 inH₂O,
Unit sizes 55-80: 0.70in H₂O

INFORMATION TAKEN FROM DOCUMENT 000527INF-04

Engineering Guide Specifications

General

The air handler shall be part of a matched split heat pump system. The unit shall be listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory, Underwriters Laboratory (UL), or Canadian Standards Association (CSA). The unit shall be rated in accordance with applicable standards of the Air Conditioning, Heating, and Refrigeration Institute / International Standards Organization (AHRI/ISO) and/or Canadian Standards Association (CSA). The air handler unit, as manufactured by Maritime Geothermal, Petitcodiac, New Brunswick, shall be designed to operate correctly within the liquid and air temperature ranges specified on the "Minimum and Maximum Operating Temperatures" page of the engineering specification document of its matched compressor unit.

Factory Quality

Each unit shall be run tested at the factory with water circulating through the outdoor loop and air circulating through the indoor loop. Quality control system checks shall include: computerized nitrogen pressurized leak test, evacuation of refrigeration circuit to sustained vacuum, accurate system charge, detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail criteria. Units tested without water and air flow are not acceptable. The units shall be warranted by the manufacturer against defects in materials and workmanship in accordance with the warranty section at the end of this document. Optional extended factory warranty coverage may be available.

Cabinet

Each unit shall be enclosed in a sheet metal cabinet. Cabinet shall be constructed of powder coated galvanized sheet metal of minimum 20 gauge. Sheet metal gauge shall be higher where structurally required. Design and construction of cabinet shall be such that it is rigid and passes the CSA/UL Loading Test requirements (200 lb roof test and 25 lb guard test). All panels shall be lined with minimum 1/2 inch [12.7 mm] thick acoustic type glass fiber insulation. All insulation shall meet the fire retardant provisions of NFPA 90A. This material shall also provide acoustical benefit. The unit must have a minimum of three access panels for serviceability of the compressor compartment. Units having only one access panel to compressor/heat exchangers/expansion device/refrigerant piping shall not be acceptable. The electrical box shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic grommets.

Refrigerant Circuit

All units shall contain only one refrigerant circuit, containing a refrigerant to air exchanger, thermostatic expansion valve (TXV) for operation in cooling mode, and bypass check valve for operation in heating mode.

The refrigerant to air heat exchanger shall be a multi-circuit design with copper tubing and aluminum fins with refrigerant distributor for cooling mode. It shall be designed and certified for 650 psig [4482kPa] working pressure on the refrigerant side.

The thermostatic expansion valve shall be a balanced port bi-flow type with internal bleed and shall provide proper superheat control over the unit's operating range with minimal deviation from the superheat setpoint.

Fan/Blower

The blower shall be a squirrel cage type, constructed of corrosion resistant material, with unobstructed removable venturi to allow one-side servicing of fan motor.

The blower motor shall be a direct drive electrically commutated motor (ECM) with soft start, variable speed, and constant airflow functionality that maintains selected air flow up to the maximum external static as indicated in the Airflow Data section of this specification.

Auxiliary Heat (Plenum Heater)

The option to field-install an accessory plenum heater shall be available, inside the air compartment of the unit. Provisions for mounting and electrical connections shall be supplied.

Condensate Tray

The condensate tray shall be made of stainless steel and be large enough to catch any condensation that may drip from the refrigerant to air exchanger during cooling operation. The condensate drain shall be clear tubing with a 3/4" PVC female socket fitting for external drain connection.

Piping and Connections

The unit shall have a pair of copper tubes for connection to the line set between the air handler unit and the matched compressor unit. All internal refrigerant piping shall be insulated with minimum 3/8" thick closed cell insulation. Insulation consisting of 1/8" closed-cell insulating tape shall not be acceptable.

Electrical

Controls shall be factory wired and mounted within the unit. Controls shall include a 24 volt alternating current (24VAC) min. 40VA class II control transformer for providing power to all internal controls. Terminal strips with screw terminals shall be provided for field control wiring and power supply line connections. Units shall be name-plated for use with time delay fuses or circuit breakers.

Unit Control

The control system shall have the following features:

1. 24VAC inputs for operation of various stages the fan motor: recirculation mode, stage 1, stage 2 and stage 3 (auxiliary/emergency).
2. Tap board for airflow adjustment for the following settings: Nominal, -6%, +6% and +12%
3. Dry contact input for overall air flow reduction of 15% for zoning application.

Maritime Geothermal works continually to improve its products. As a result, the design and specifications of any product may be changed without notice. Please contact Maritime Geothermal at 1-506-756-8135 or visit www.nordicghp.com for latest design and specifications. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any commercial contract or other agreement between any parties, but are merely Maritime Geothermal's statement of opinion regarding its products.

LIMITED EXPRESS WARRANTY

It is expressly understood that unless a statement is specifically identified as a warranty, statements made by Maritime Geothermal Ltd., a corporation registered in New Brunswick, Canada, ("MG") or its representatives, relating to MG's products, whether oral, written or contained in any sales literature, catalogue or agreement, are not express warranties and do not form a part of the basis of the bargain, but are merely MG's opinion or commendation of MG's products.

EXCEPT AS SPECIFICALLY SET FORTH HEREIN, THERE IS NO EXPRESS WARRANTY AS TO ANY OF MG'S PRODUCTS. MG MAKES NO WARRANTY AGAINST LATENT DEFECTS. MG MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.

LIMITED EXPRESS RESIDENTIAL WARRANTY - PARTS

MG warrants its Residential Class products, purchased and retained in the United States of America and Canada, to be free from defects in material and workmanship under normal use and maintenance as follows:

- (1) Air conditioning, heating and/or heat pump units built or sold by MG ("MG Units") for five (5) years from the Warranty Inception Date (as defined below).
- (2) Thermostats, auxiliary electric heaters and geothermal pumping modules built or sold by MG, when installed with MG Units, for five (5) years from the Warranty Inception Date (as defined below).
- (3) Sealed refrigerant circuit components of MG Units (which components only include the compressor, refrigerant to air/water heat exchangers, reversing valve body and refrigerant metering device) for ten (10) years from the Warranty Inception Date (as defined below).
- (4) Other accessories and parts built or sold by MG, when installed and purchased with MG Units, for five (5) years from the date of shipment from MG.
- (5) Other accessories, when purchased separately, for (1) year from the date of shipment from MG.

The "Warranty Inception Date" shall be the date of original unit installation, as per the date on the installation Startup Record or six (6) months from date of unit shipment from MG, whichever comes first.

To make a claim under this warranty, parts must be returned to MG in Petitcodiac, New Brunswick, freight prepaid, no later than ninety (90) days after the date of the failure of the part. If MG determines the part to be defective and within MG's Limited Express Residential Warranty, MG shall, when such part has been either replaced or repaired, return such to a factory recognized distributor, dealer or service organization, freight prepaid. The warranty on any part repaired or replaced under warranty expires at the end of the original warranty period.

LIMITED EXPRESS RESIDENTIAL WARRANTY - LABOUR

This Limited Express Residential Labour Warranty shall cover the **labour** incurred by MG authorized service personnel in connection with the installation of a new or repaired warranty part that is covered by this Limited Express Residential Warranty only to the extent specifically set forth in the current **labour** allowance schedule "A" provided by MG's Warranty Department and only as follows:

- (1) MG Units for two (2) years from the Warranty Inception Date.
- (2) Thermostats, auxiliary electric heaters and geothermal pump modules built or sold by MG, when installed with MG Units, for two (2) years from the Warranty Inception Date.
- (3) Sealed refrigerant circuit components of MG Units (which components only include the compressor, refrigerant to air/water heat exchangers, reversing valve body and refrigerant metering device) for five (5) years from the Warranty Inception Date.

Labour costs are not covered by this Limited Express Residential Warranty to the extent they **exceed** the amount allowed under said allowance schedule, they are not specifically provided for in said allowance schedule, they are not the result of work performed by MG authorized service personnel, they are incurred in connection with a part not covered by this Limited Express Residential Warranty, or they are incurred more than the time periods set forth in this paragraph after the Warranty Inception Date.

This warranty does not cover and does not apply to:

- (1) Air filters, fuses, refrigerant, fluids, oil.
- (2) Products relocated after initial installation.
- (3) Any portion or component of any system that is not supplied by MG, regardless of the cause of the failure of such portion or component.
- (4) Products on which the unit identification tags or labels have been removed or defaced.
- (5) Products on which payment to MG, or to the owner's seller or installing contractor, is in default.
- (6) Products subjected to improper or inadequate installation, maintenance, repair, wiring or voltage conditions.
- (7) Products subjected to accident, misuse, negligence, abuse, fire, flood, lightning, unauthorized alteration, misapplication, contaminated or corrosive liquid or air supply, operation at abnormal air or liquid temperatures or flow rates, or opening of the refrigerant circuit by unqualified personnel.
- (8) Mold, fungus or bacteria damage
- (9) Corrosion or abrasion of the product.
- (10) Products supplied by others.
- (11) Products which have been operated in a manner contrary to MG's printed instructions.
- (12) Products which have insufficient performance as a result of improper system design or improper application, installation, or use of MG's products.
- (13) Electricity or fuel, or any increases or unrealized savings in same, for any reason whatsoever.

Except for the limited **labour** allowance coverage set forth above, MG is not responsible for:

- (1) The costs of fluids, refrigerant or system components **supplied by others**, or associated **labour** to repair or replace the same, which is incurred as a result of a defective part covered by MG's Limited Residential Warranty.
- (2) The costs of **labour**, refrigerant, materials or service incurred in diagnosis and removal of the defective part, or in obtaining and replacing the new or repaired part.
- (3) Transportation costs of the defective part from the installation site to MG, or of the return of that part if not covered by MG's Limited Express Residential Warranty.
- (4) The costs of normal maintenance.

This Limited Express Residential Warranty applies to MG Residential Class products manufactured on or after February 15, 2010. MG'S LIABILITY UNDER THE TERMS OF THIS LIMITED WARRANTY SHALL APPLY ONLY TO THE MG UNITS REGISTERED WITH MG THAT BEARS THE MODEL AND SERIAL NUMBERS STATED ON THE INSTALLATION START UP RECORD, AND MG SHALL NOT, IN ANY EVENT, BE LIABLE UNDER THE TERMS OF THIS LIMITED WARRANTY UNLESS THIS INSTALLATION START UP RECORD HAS BEEN ENDORSED BY OWNER & DEALER/INSTALLER AND RECEIVED BY MG LIMITED WITHIN 90 DAYS OF START UP.

Limitation: This Limited Express Residential Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such express warranty, including without limitation any express warranties or any implied warranties of fitness for particular purpose and merchantability, shall be limited to the duration of the Limited Express Residential Warranty.

LIMITATION OF REMEDIES In the event of a breach of the Limited Express Residential Warranty, MG will only be obligated at MG's option to repair the failed part or unit, or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If after written notice to MG's factory in Petitcodiac, New Brunswick of each defect, mal-function or other failure, and a reasonable number of attempts by MG to correct the defect, malfunction or other failure, and the remedy fails of its essential purpose, MG shall refund the purchase price paid to MG in exchange for the return of the sold good(s). Said refund shall be the maximum liability of MG. **THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER OR PURCHASER AGAINST MG FOR BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR MG'S NEGLIGENCE OR IN STRICT LIABILITY.**

LIMITATION OF LIABILITY MG shall have no liability for any damages if MG's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to: any war, civil unrest, government restrictions or restraints, strikes, or work stoppages, fire, flood, accident, shortages of transportation, fuel, material, or labour, acts of God or any other reason beyond the sole control of MG. **MG EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR MG'S NEGLIGENCE OR AS STRICT LIABILITY.**

OBTAINING WARRANTY PERFORMANCE Normally, the dealer or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any MG recognized distributor, dealer or service organization. If assistance is required in obtaining warranty performance, write or call: Maritime Geothermal Ltd • Customer Service • PO Box 2555 • Petitcodiac, New Brunswick E4Z 6H4 • (506) 756-8135 • or e-mail to info@nordicghp.com NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and from Canadian province to Canadian province. Please refer to the MG Installation, Installation and Service Manual for operating and maintenance instructions.

An extended warranty option is also available. Please contact Maritime Geothermal Ltd. via the contact information in the previous paragraph for more information.