

Review this manual before any installation. See page 3

Important: You must register for warranty replacement parts

RMS/HRC 
by Radiant Made Simple™



RMS™ Owner and Installation Manual

75 W Veum Ave.

(320) 297-9100

Appleton, MN 65208

www.radiantmadesimple.com

Unit ID

Record here for future reference

Model No.: _____

S/N: _____

Install Date: _____

Don't forget to register your unit. See details in the warranty section.

Important

These instructions should be used as a general guide only. Electric Code and local utility requirements must be followed and take precedence over these instructions.

- This product requires an appropriate 220/240 and recommends a separate 110/120 VAC single phase circuits.
- Circuit Panel breaker size varies according to boiler output.
- Do not use 1 leg of the 240 volt circuit for the 120 volt application.
- The RMS panel assemblies are manufactured with quality components for maximum life, durability, and minimum service. **To ensure a satisfactory installation it is important that you read these instructions carefully before installing and operating the system. Failure to do so may result in breach of warranty.**

Unpacking

- **Inspect the unit and check whether there are missing parts. Report any damage or claims to the carrier immediately. For all returns to be accepted they must be authorized by the manufacturer.**

RMS package contents

<ul style="list-style-type: none">• RMS Panelized System• Outdoor Temperature Sensor• Thermostat• RMS Manual 11/03/23	<ul style="list-style-type: none">• Boiler Installation Instructions• Pump Instructions Manual• 4 Mounting Screws
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Additional Items Required,

Accessory Kit: RMS 3 Loop Accessory Kit, No Tubing

- (3) Fittings, hose Barb X MPT, 1/2" X 1/2" w/nut
- (3) Valve, 1/2" QKPT w/washer
- (1) Crimp Tool Close Quarter 1/2" or 3/4"
- (1) Pump, Drill Powered
- (6) Crimp Ring, 1/2" Black Copper

Accessory Kit: RMS 5 Loop Accessory Kit, No Tubing

- (5) Fittings, hose Barb X MPT, 1/2" X 1/2" w/nut
- (5) Valve, 1/2" QKPT w/washer
- (1) Crimp Tool Close Quarter 1/2" or 3/4"
- (1) Pump, Drill Powered
- (10) Crimp Ring, 1/2" Black Copper

Installation guidelines for RMS panelized system

Introduction

The RMS panel system is designed specifically for installation in poured concrete basement, shop or garage, and concrete slabs that are well-insulated below and around the outside edge of the slab. The system sizing assumes that there is a maximum area heat loss of 19 BTU/h/sq. ft., which exceeds the requirements for well-insulated basements heated to 70° F and garages or shops heated to 55° F in the coldest parts of the continental U.S. Use of this system in applications may exceed the heating capacity of the system and is at the discretion of the purchaser. Due to the potential variations in building envelope construction, we are not responsible for the application or misapplication of this product.

The RMS panel systems are available as follows:

Model Part No.	Description
RMS-03kW-AA	Hydronic space heater capacity is 3 kW, 10,236 BTU/h
RMS-06kW-AA	Hydronic space heater capacity is 6 kW, 20,472 BTU/h
RMS-09kW-AA	Hydronic space heater capacity is 9 kW, 30,708 BTU/h
RMS-11kW-AA	Hydronic space heater capacity is 11 kW, 37,532 BTU/h

These systems will automatically modulate to use only the amount of electricity needed to satisfy the thermostat. If the floor is cold the boiler will run at 100% capacity until the floor is warmed to the temperature needed to heat the space.

Applications and sizing for each system are as follows:

W1Z-008A	RMS-3 kW-AA 10,236 BTU/h		RMS-6 kW-AA 20,472 BTU/h		RMS-9 kW-AA 30,708 BTU/h		RMS-11 kW-AA 37,532 BTU/h	
	Basement	Garage	Basement	Garage	Basement	Garage	Basement	Garage
No. Loops								
1	300 ft ²	300 ft ²	n/a	n/a	n/a	n/a	n/a	n/a
2	^a 600 ft ²	^a 600 ft ²	600 ft ²	600 ft ²	n/a	n/a	n/a	n/a
3	n/a	n/a	900 ft ²	900 ft ²	n/a	n/a	n/a	n/a
4	n/a	n/a	^a 1200 ft ²	^a 1200 ft ²	1200 ft ²	1200 ft ²	1200 ft ²	1200 ft ²
5	n/a	n/a	n/a	n/a	1500 ft ²	1500 ft ²	1500 ft ²	1500 ft ²

^a The amount of loop pipe will yield 19 BTU/h/ft². In well insulated applications the heat loss may be less than 17BTU/h/ft². If used in application where the BTU/h heat loss is greater than 19BTU/h/ft² the chosen system may not be able to heat the space to the desired temperature.

Installation

Read these instructions completely before starting.

Tools and supplies required

- Screwdriver (used to install panel to mounting surface)
- Sharp knife (used to cut PEX tubing)
- 2 Hoses with double female ends (washing machine connector hose)
- Channel lock pliers (used to tighten hose connections)
- Fluid Transfer Pump (Example: Drill Pump)
- Garden hose (used to flow fluid from the system into the 5 gallon pail)
- Five Gallon pail (used as reservoir for filling system with fluid)

You will need the following supplies

- Propylene glycol antifreeze (see chart in “Filling with anti-freeze” section)
- 2(2) -5’ lengths of re-rod 3/8” or 1/2”(use to fasten tube bends for PEX tubing)

Caution

Your contractor must be informed that there is PEX tubing in the concrete floor and that he is not to nail into the concrete and damage the PEX tubing.

- The system pump is capable of pumping a maximum of 5 loops of 1/2” X 300’ PEX tubing.
- Never connect more than 5 loops of 1/2” X 300’ PEX loops to an RMS manifold.
- Ideal spacing for a slab on grade application is 1 linear foot of tubing for each 1 square foot of space.

Additional Kits Needed

See Page 4

Identification of parts

Upper Mounting Channel

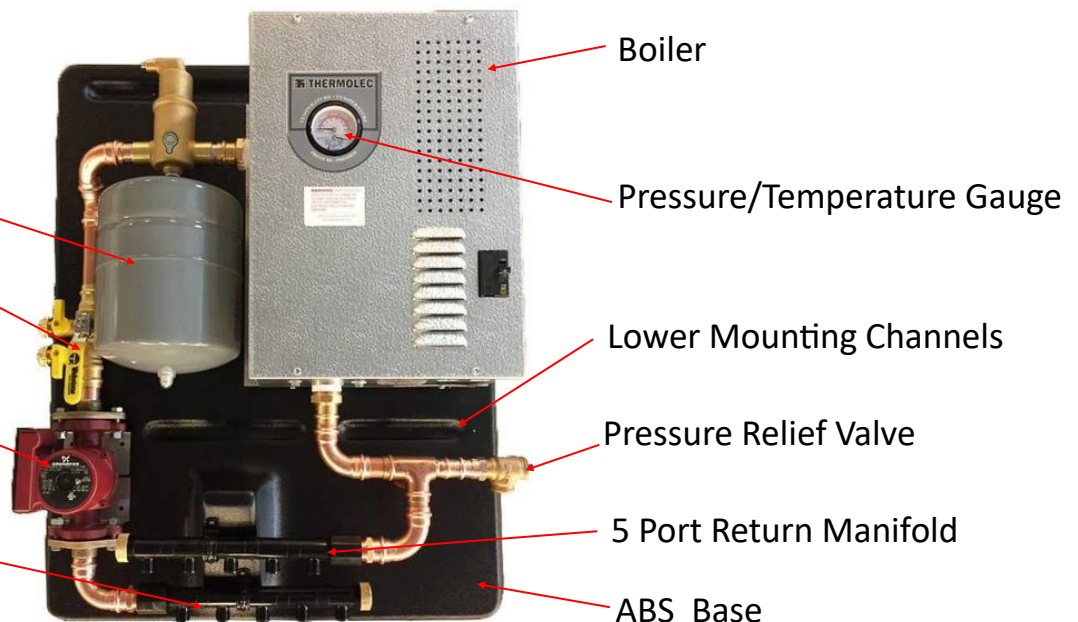
Air Eliminator

Expansion Tank

Fill and Purge Valve

Circulating Pump

5 Port Supply



Insulation

Prior to installing the radiant floor tubing in any application, the area beneath and around the outside edge of the concrete slab must be properly drained, compacted, and insulated. (See Figure 1) If this is not done, the heat that you intend to go into the room will have the option of going into the surrounding soil instead. This will cause high energy consumption (\$\$) and the hydronic space heater size will possibly be too small for the additional heat loss. We recommend a minimum of 1 1/2" or 2" high-density foundation-grade foam board insulation beneath the slab and a minimum of 1" high-density foundation-grade foam board insulation at the edge of the concrete slab. These products are available at your local building center.

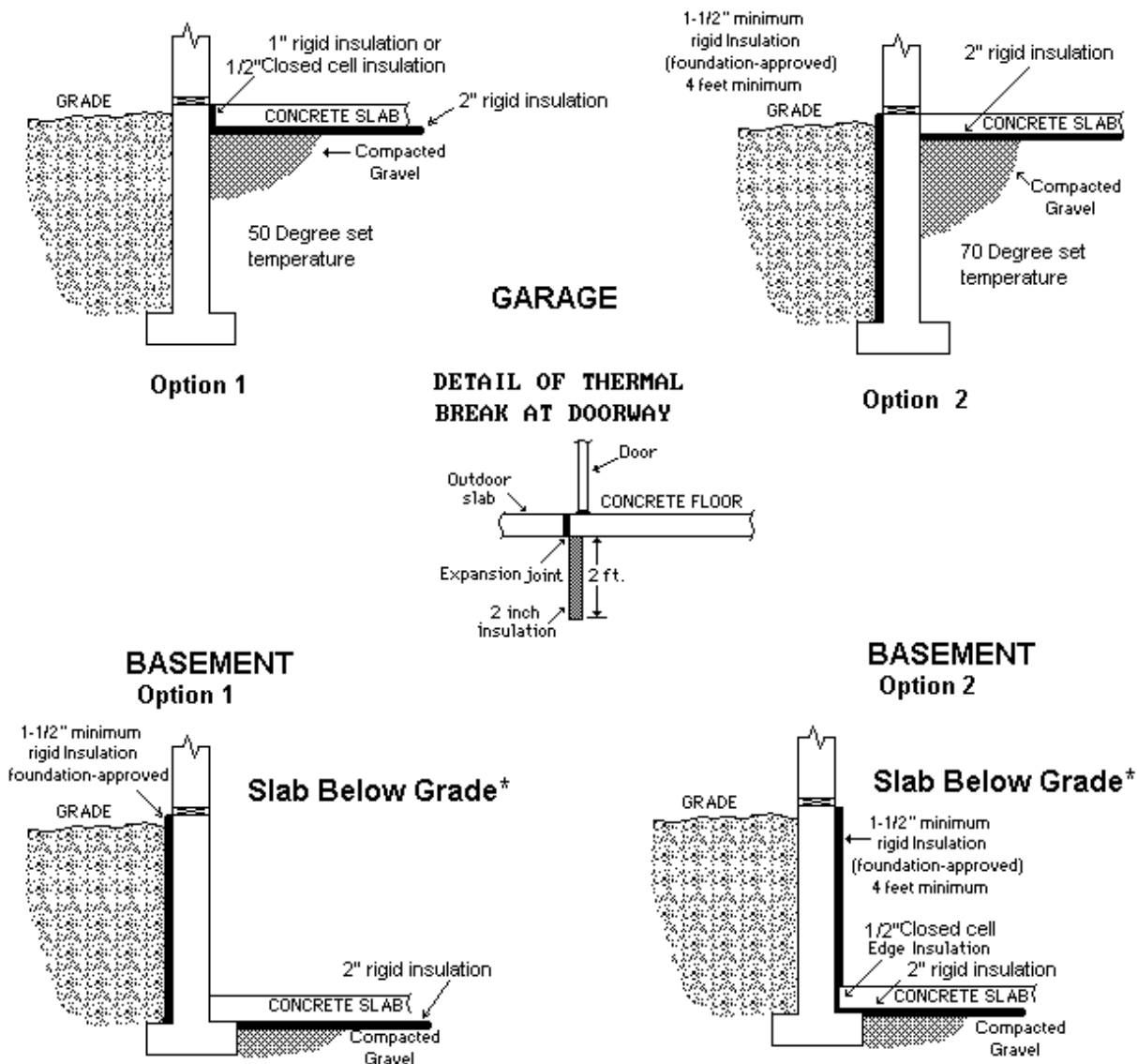


FIGURE 1 INSULATION OPTIONS

MOUNTING THE RMS PANEL

Determine where the RMS panel will be located since all of the tubes will terminate there. The panel should be located in a place with enough room for all the PEX tubes to leave and return to the area without congestion. Attach the panel to the wall with the bottom of the panel 36" from the floor. Be sure to allow a minimum of 15" clearance above the unit to service the elements if needed. See Figure 2.

Install a plastic pipe (not supplied) from the pressure relief valve to within 6" of the floor.

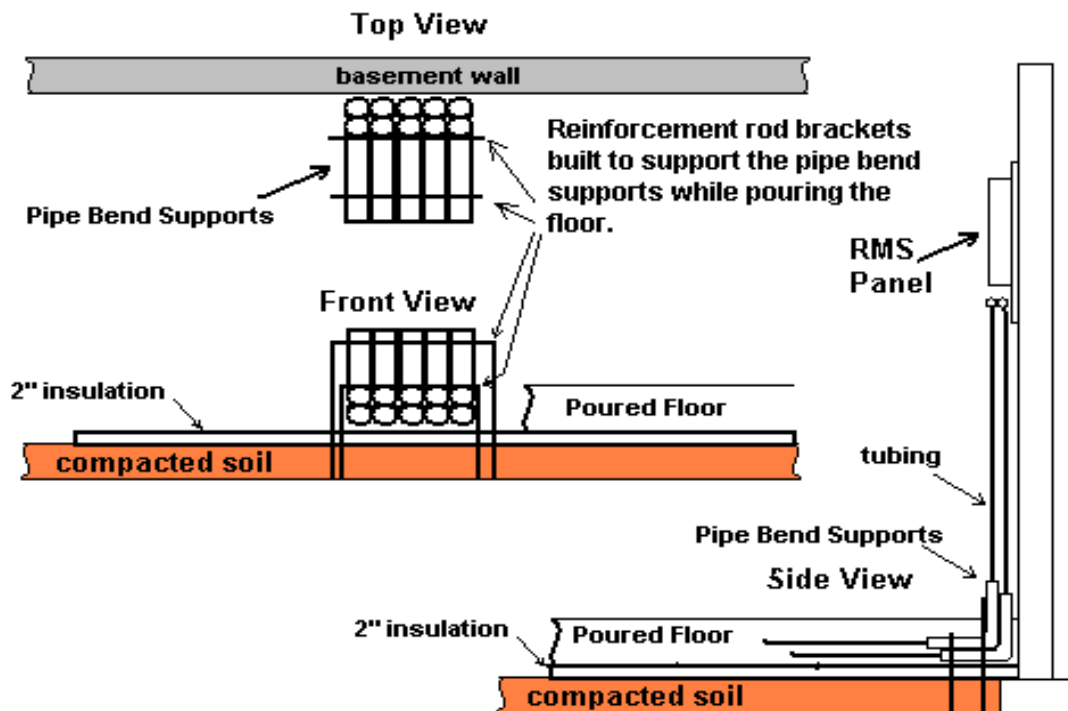


FIGURE 2

ATTACHING THE TUBING

Attach one end of a loop to the rear manifold using the crimp rings and tool included. We recommend that you attach one end of the tubing to the return side manifold (rear), lay the tubing in the floor and come back to the manifold and connect the other end to the supply (front). (Tip: Install the rear ports and connect the tubing before the front ports to allow easy access to the back row of fittings.) This eliminates the need to cut the tubing. If you do cut the tubing, mark the cut carefully and use a sharp knife (or tubing cutter) taking care to make a square cut.

TUBING LAYOUT

PEX tubing, staples, and tube bends sold separately see part number W1Z-008A

The tubing is to be laid out with approximately equal spacing with all the tubes of equal length $\pm 5\%$. If one tube is substantially shorter than another, that tube will have a greater water flow and the full-length tubes will have less water flow causing uneven heat. As a general rule, place PEX tubing at approximately 3" from what will be concrete slab edge and 12" apart.

PEX Installation TIP: *Divide the total area by the number of loops to be used. Space the tubing as required filling that area with the loop serving it.*

Keep in mind that concrete tends to average the temperature of the slab so that precise separation of area temperatures is not possible. All tubes should be protected, at the point they enter and exit the concrete, with the pipe bend supports included. The tubes should exit the concrete directly below the RMS panel so that the tubes do not strain the manifold connections when attached. One method of insuring this is to make two brackets out of re-rod and drive them into the soil to hold the pipe bend supports during installation. (See figure 2.) Attached is a plan for tubing layout (See figure 3.) It is not always possible to make a complete loop and still have enough tube to get back to the manifold. In those cases, go as far as you can with the run and still allow enough length to get back to the manifold. Fill in the area with the next loop as shown. The tubing can be installed in applications with or without re-rod. If re-rod is not used, the tubing can be attached to the insulation with the plastic anchors that are included with the tubing. With the tubing held in place, tap the anchors down with a mallet. If re-rod is to be used, the tubing can be installed as described using the plastic anchors and the re-rod put in place afterward or the re-rod can be put in place first. If you put the re-rod down first, we recommend tying the tubing to the re-rod with steel or plastic wire ties instead of attaching the tubing to the insulation with plastic anchors.

TUBING LAYOUT PLAN

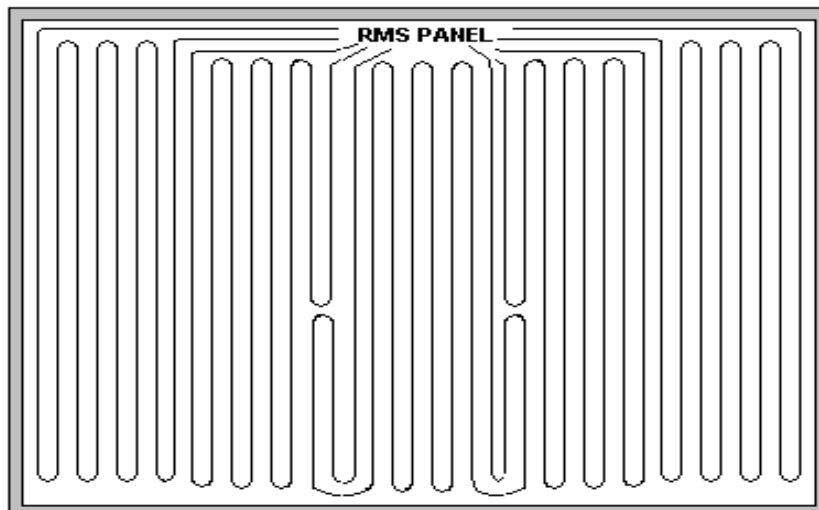


FIGURE 3

POURING THE CONCRETE

We strongly recommend hiring professionals for pouring and finishing the concrete slab. During pouring, reasonable care should be taken to prevent damage to the tubes. If the cement is to be wheeled, planks should be placed over the tubing to prevent damage. PEX tubing is very tough but common sense and care will prevent a serious problem at this point. Follow the recommendations of your concrete installer before walking on the floor. Some concrete contractors will want the tubing filled with antifreeze and pressurized to keep the pipe at the bottom of the slab and prevent damage. In that case, follow the filling and purging instructions below before pouring the concrete.

ANTIFREEZE IN HYDRONIC HEAT SYSTEMS

Antifreeze with inhibitors is required in hydronic systems to keep them from freezing, and to prevent corrosion from attacking the system components. Most Propylene glycol antifreeze products do not have enough inhibitors to be mixed at a ratio less than 30%. A mixture as strong as 30% reduces the fluids heat transfer capabilities and increases the pumping resistance. We have found a mixture of 23% to be a sweet spot between pumping resistance, protection level, and heat transfer capabilities. Our antifreeze, EnviroGuard Ultra HD, is a special blend with enough inhibitors for the 23% solution.

NOTE

As a substitute for Propylene glycol, RV anti-freeze containing Propylene glycol may be used. Installer assumes all responsibilities for material and the ratio used.

WARNING

Many RV Anti-freeze products use alcohol as the base and must not be used.

FILLING AND PURGING AIR WITH ANTIFREEZE

CAUTIONS: This system must be protected with Propylene glycol antifreeze solution before final operation. We recommend filling this system with 23% Propylene glycol antifreeze to protect the Boiler and the floor in the case of extended power failure or a problem with the system. The following table below shows the total system capacity of each RMS system and the amount of propylene glycol antifreeze solution to use.

RMS System and the amount of propylene glycol anti-freeze solution to use						
Model	RMS 3kW-AA	RMS 3kW-AA	RMS 6kW-AA	RMS 9kW-AA	RMS 11kW-AA	RMS 11kW-AA
Loops	1	2	3	4	5	
System Volume	4.7	7.4	10.1	12.8	15.5	
Propylene Glycol Anti-freeze ratio ^a	1.5	2.2	2.8	3.4	4	
Gallons of water	5.2	7.2	9.3	11.4	13.5	
Oz of household chlorine bleach	1.3	1.9	2.4	3	3.5	
^a The table above yields an approximate 22% concentration.						

FILLING AND PURGING AIR WITH ANTIFREEZE

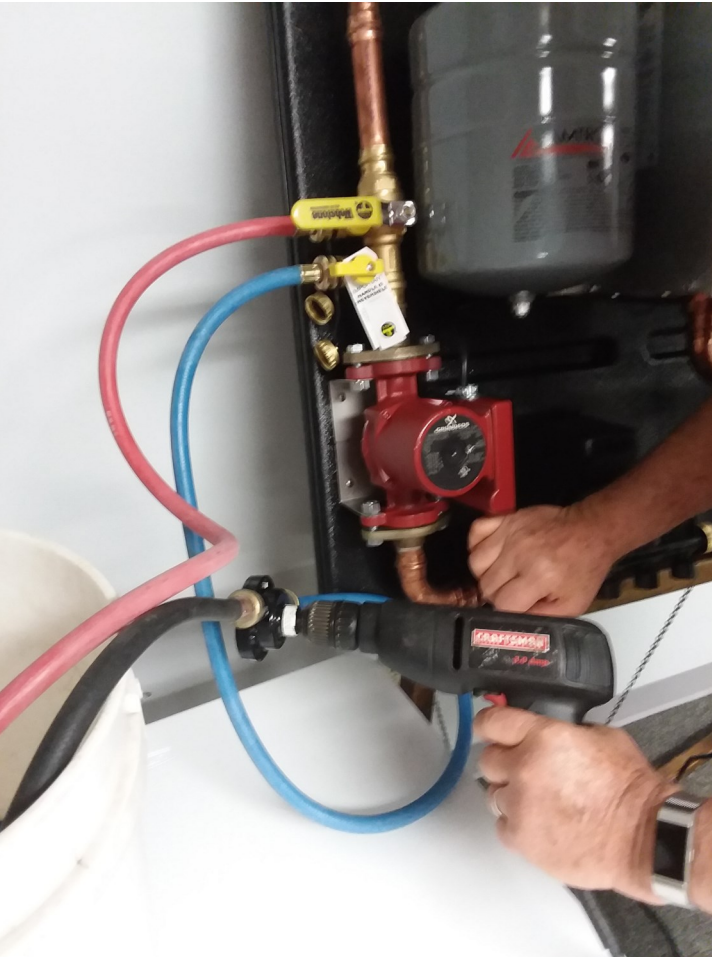
Important Information:

When choosing a drill to run the pump, a higher RPM drill is desired. For best results your drill should be capable of 1200 RPM min. 1600 RPM or greater is desirable. If your drill's RPM is low, it will take longer to fill and purge the system and the final pressure will be lower.

1. Position the FILL & PURGE VALVE main handle as shown in Figure 4
2. Connect a hose from a pail filled with our antifreeze solution to the drill pump inlet.
3. Connect a second hose from the pump outlet to the lower FILL & PURGE port. Open the lower PURGE port.
4. a. *(Borrow the hoses from your washing machine if necessary for these connections.)*
5. Connect a third hose to the upper FILL & PURGE and place the other end in the pail. Open the upper FILL & PURGE port valve.
6. Close all of the manifold supply valves except for one. (Figure 5)
7. Start the DRILL PUMP, refilling the pail with propylene glycol antifreeze, (Thermal Transfer fluid), as it is pumped into the system, keeping the fluid level above the hose inlet so the pump does not draw in air. When only thermal transfer fluid comes out of the upper FILL & PURGE port hose, with the pump running, close the open manifold valve and open the next valve. Repeat this procedure going through each loop making sure all air is out of the system.
8. Repeat steps 6 & 7 until all air is expelled from the system through a complete cycle of loops to ensure all air is out of the system.
9. Once all the transfer fluid has been installed and air removed, with the pump running, open all manifold ports, and close the upper FILL & PURGE port valve. Pump enough transfer fluid through the lower FILL & PURGE port valve to pressurize the system to 20-25 psi and then close the lower FILL & PURGE port valve. With the pump off, place the main FILL & PURGE valve in the “operate position” as shown on the HANDLE. *(The handle will be vertical.)*
10. If you are unable to pressurize the system to 20-25 psi with the pump, connect the pump hose to the domestic water supply and add enough water to raise the pressure to 20-25 psi.
11. The system is now filled with antifreeze, and purge of air.
12. Leave all hoses and the pump connected during the startup.
13. Inspect all fittings and joints for leaks.



Valve Position for FILLING and PURGING the system



Filling using Drill Pump



Filling the System using a Fluid Transfer Pump



Valve Position to Pressurize the System



Valve Position to Run the System

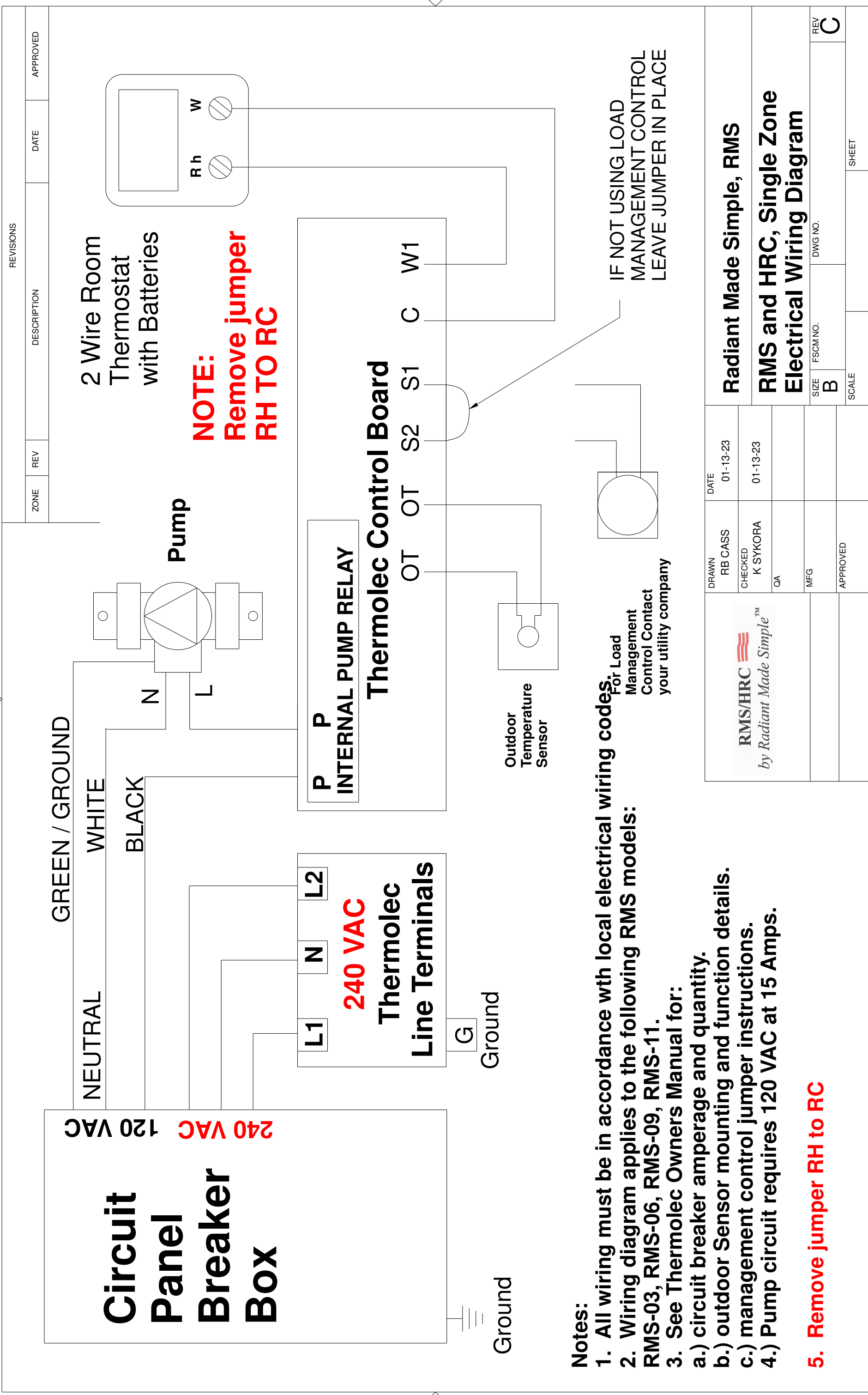
ELECTRICAL CONNECTIONS

The electric boiler must be wired according to the instructions included with the boiler and all local codes. This includes the 240 volt circuit for the heating elements, 120 volt circuit for the circulator pump, and the thermostat. Locate the thermostat on an inside wall away from direct sunlight or any areas that may be influenced by drafts. See the RMS Wiring Diagram, p. 16, and component specific wiring instructions for more detail.

STARTUP & OPERATION

The system is now ready to operate.

1. Turn on the circuit breakers to power the boiler and the circulating pump.
2. Set the thermostat to 5° above the room temperature. This will cause both the circulating pump and the boiler to start. Run the RMS heating system for ½ hour to ensure that any additional air is purged through the Air Bleed.
3. If the system pressure has dropped below 20 psi add enough antifreeze to return the pressure to 20-25 psi. *(See step 8 of Purging Air and Filling with Antifreeze Section.)*
4. As the system warms up and the thermostat starts to cycle, monitor the system pressure. If the pressure rises above 25 psi bleed off any excess pressure with the upper purge and fill port valve. *(Open it very slowly to release only the excess pressure.)* If the system pressure gets as high as 30 psi the pressure relief valve will release any additional pressure.
5. In normal operation, the thermostat calls for heat, starting the circulator pump and the boiler. When the thermostat set point is satisfied the circulator pump and boiler are turned off.



REVISIONS		DESCRIPTION	DATE	APPROVED
ZONE	REV			
		2 Wire Room Thermostat with Batteries		
		NOTE: Remove jumper RH TO RC		

- Notes:**
1. All wiring must be in accordance with local electrical wiring codes.
 2. Wiring diagram applies to the following RMS models: RMS-03, RMS-06, RMS-09, RMS-11.
 3. See Thermolec Owners Manual for:
 - a.) circuit breaker amperage and quantity.
 - b.) outdoor Sensor mounting and function details.
 - c.) management control jumper instructions.
 - 4.) Pump circuit requires 120 VAC at 15 Amps.
 5. **Remove jumper RH to RC**

IF NOT USING LOAD
MANAGEMENT CONTROL
LEAVE JUMPER IN PLACE

 <i>by Radiant Made Simple™</i>	DRAWN	DATE	Radiant Made Simple, RMS RMS and HRC, Single Zone Electrical Wiring Diagram
	RB CASS	01-13-23	
	CHECKED	01-13-23	
	K SYKORA		
	OA		
	MFG		
	APPROVED		
	SIZE	FSCM NO.	REV
	B		C
	SCALE	DWG NO.	
			SHEET

Maintenance

There is little regular maintenance required. During the summer months, be sure to set your thermostat to a low setting or turn off the circuit breaker to prevent the system from heating the floor at the same time you are trying to cool the house. It is a good idea to turn the system on a couple times during the summer for 5 minutes to exercise the circulating pump. The pressure gauge should be checked periodically to make sure the system maintains a minimum of 15 PSI. If not, 23% antifreeze mixture needs to be added to adjust the system pressure and the system checked for leaks. (See Filling and Purging Section.) We recommend retightening the manifold fittings by hand when the system is fully warmed up. You should not have to add to this system regularly. If you hear gurgling sounds from the pump or you can see air bubbles circulating through the translucent pipe, recheck system pressure and adjust to 20 psi (with the pump not running) if needed.

Returns & Refunds

The RMS/HRC panel may only be returned for a refund if it is unused and has not been installed. You have 14 business days to return the RMS/HRC panel to Radiant Made Simple. No returns will be excepted after 14 business days. You must contact us to fill out a return form and request a RMA. The RMA must be completed and returned with the complete unused RMS/HRC Panel. There is a 20% restocking fee on all RMS/HRC Panels returned and the shipping/freight charge is the customers responsibility. Once we receive the completed paperwork and the RMS/HRC Panel we will inspect the unit and will issue you an immediate refund if the RMS/HRC Panel passes the No Use/No Install Test/Inspection.

Warranty

The RMS/HRC panel is warranted against manufacturing defects for a period of 2 years from the date of purchase. All units must be registered within 14 days of purchase. If the you fail to register your product with in 14 business days of purchase the warranty will be void. In the event of a component failure Radiant Made Simple will, at our discretion, provide a replacement unit or repair components for installation. At our request, the defective part(s) must be returned to Radiant Made Simple in order to receive credit.

This warranty covers parts only. You must fill out a warranty claim and email it to our warranty department. Damage resulting from abuse, water damage, or faulty installation is specifically excluded. Radiant Made Simple's maximum liability shall be limited to the replacement cost of the unit.

Go here to register your unit: <https://www.radiantmadesimple.com/warranty-registration>

Go here to get a warranty claim form: <https://www.radiantmadesimple.com/claim-form>

Email the claim form to: support@radiantmadesimple.com

Technical Support

Technical Support is available at: support@radiantmadesimple.com

Or by calling (320)297-3555 or (320) 297-9100 M-F 8:00 am–5:00pm Central time.

WARRANTY CLAIM FORM

WHOLESALER/DEALER ORDER NO. _____

MODEL NO. (COMPLETE) _____ SERIAL NO. _____

DATE INSTALLED _____ (MM/DD/YY)

DATE FAILED _____ (MM/DD/YY)

CUSTOMER/HOMEOWNER NAME _____

CUSTOMER/HOMEOWNER ADDRESS _____

DATE OF ORIGINAL INSTALLATION _____ (MM/DD/YY)

PART THAT FAILED _____

REASON FAILED? _____

WHY WAS THE SERVICE CALL INITIATED? _____

SERVICE DEALER/CONTRACTOR SIGNATURE _____

SERVICE DEALER/CONTRACTOR COMPANY _____

Notes

RMS/HRC 
*by Radiant Made Simple*TM

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