EarthLinked®

STORAGE WATER TANK
MODELS 30-GST, 50-GST, 80-GST & 119-GST

Installation, Operation & Maintenance Manual

Disclaimer

The EarthLinked® Storage Water Tank is sold as a component part of an EarthLinked® Space Heating and Cooling System or an EarthLinked® Commercial Water Heating System. It must be properly sized, matched and installed with other system components to provide the intended performance and safe operation of the system. This component must be installed by an authorized, trained technician who has successfully completed the ETI training class and passed the final examination.

Installation must be made in accordance with this manual and the installation manual for the appropriate system noted above. Failure to provide installation by an authorized, trained installer in a manner consistent with the appropriate manuals will nullify the limited warranty coverage for the system.

Earthlinked Technologies shall not be liable for any defect, unsatisfactory performance, damage or loss, whether direct or consequential, relative to the design, manufacture, construction, application or installation of field specified components.

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1. General Description of Applications

The GST-30, GST-50, GST-80 and GST-119 Storage Water Tanks and may be applied to the following EarthLinked® systems. Installation instructions for each of these applications follow.

- **Earthlinked® Commercial Water Heating Applications**. The GST storage water tank provides storage for hot water generated by the EarthLinked® compressor unit. The storage water tank is piped in tandem with a reserve heater that provides hot water if the compressor unit is off line. The reserve heater also generally functions to raise the water temperature from 110°F to a higher required temperature.
- **EarthLinked® Domestic Water Heating Applications utilizing the Domestic Water Module (DWM).** The GST storage water tank provides storage for hot water generated by the compressor unit and domestic water module. The storage water heater is piped in tandem with a reserve heater that provides hot water if the compressor unit or domestic water module are taken off line. The reserve heater also generally functions to raise the water temperature from 110°F to a higher required temperature.

IMPORTANT!

Read the manufacturer's instructions (on the storage water tank) concerning proper installation of the GST storage water tank, referenced in Section 7, before installing the EarthLinked® systems described above. Installation must be consistent with all applicable codes and regulations.

The EarthLinked® GST storage water tank description appears in Figure 1. In addition, the Model HHK-1872 temperature control is required for commercial and residential water heating.

DESCRIPTION

EarthLinked® 30, 50, 80 and 119 gallon storage water tanks are designed for commercial and residential applications where water storage is required. These are approved for use with EarthLinked® systems.

The insulated, glass-lined tanks have large 2" NPT geoexchange to provide maximum heat exchange efficiency.

The potable water heating temperature control kit, Model HHK-1872, is an immersion control ordered separately and required for potable water heating applications. The kit is complete and includes the temperature control, immersion well and conductive heat compound.

MODEL	STORAGE, US GAL.	GEO CONN., NPT	HOT CONN., NPT	RELIEF VALVE CONN., NPT	DIMENSIONS, INCHES				SHIPPING WT., LBS.
					A	B	C	D	
30GST	30	2"	2"	3/4"	39-1/2	20	11-1/4	4-3/8	145
50GST	50	2"	2"	3/4"	48-1/2	22	11	4-1/4	195
80GST	80	2"	2"	3/4"	60-1/2	24	22	7	240
119GST	119	2"	2"	1"	65-1/2	28	22	7	350

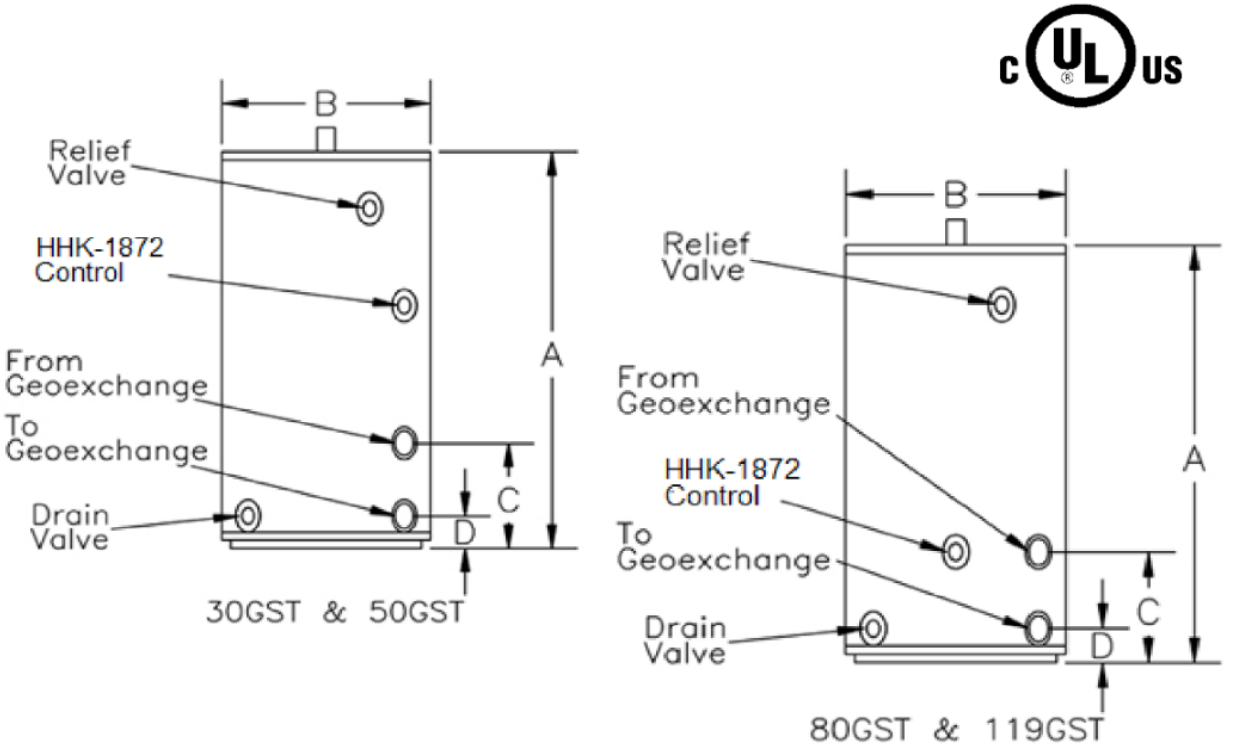

Figure 1. GST Storage Water Tank

2. EarthLinked® Commercial Water Heating Applications

Figure 2a illustrates the installation of a GST storage water tank in tandem with a reserve water heater for a commercial water heating application. Location of the storage water tank from the compressor unit is to be no more than 10 ft apart. Water piping and connections between the compressor unit and tank are all 1-1/2" Type L copper. Hot water supply to the system is out the top of the reserve heater as show. Final hot water temperature to the system is determined by the thermostat setting on the reserve water heater. The electrical field wiring for the HHK-1872 control on the water storage tank and the heater element in the reserve water heater is illustrated in Figure 2b.

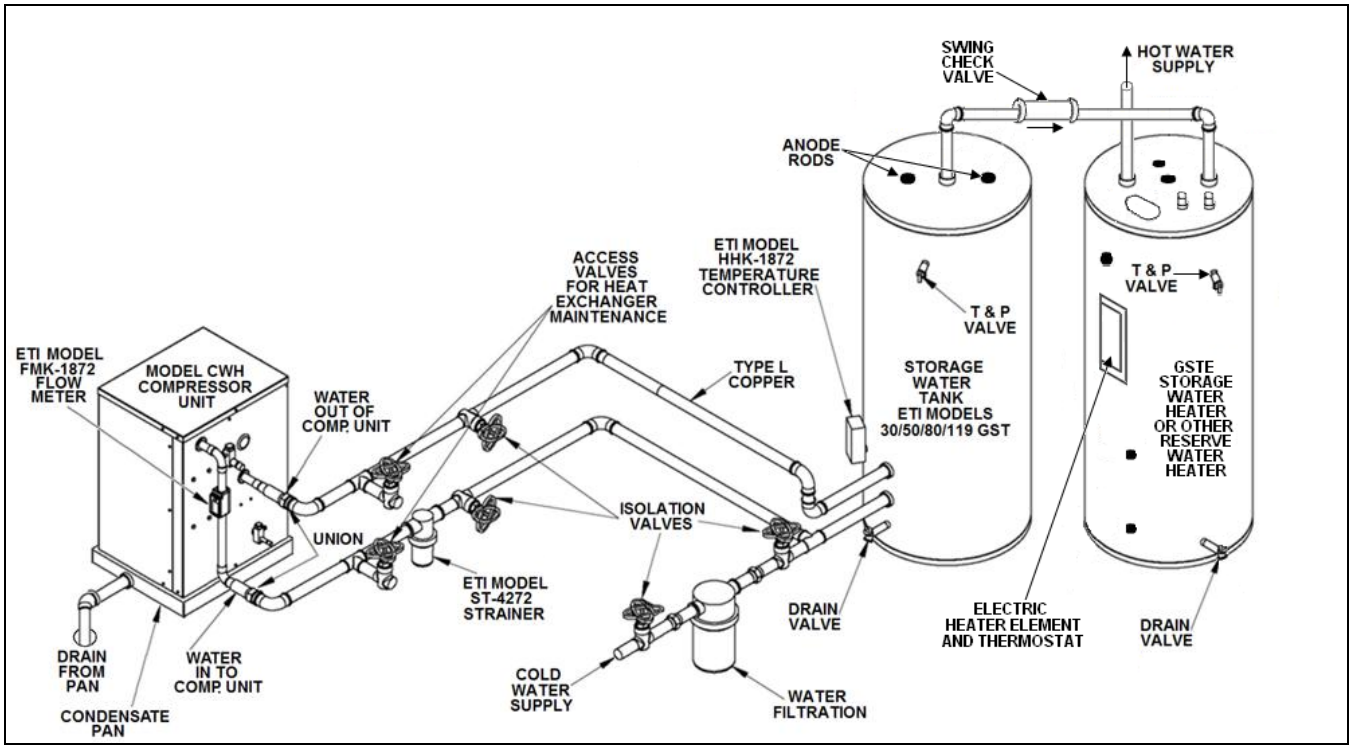

Figure 2a. Commercial Water Heating Application

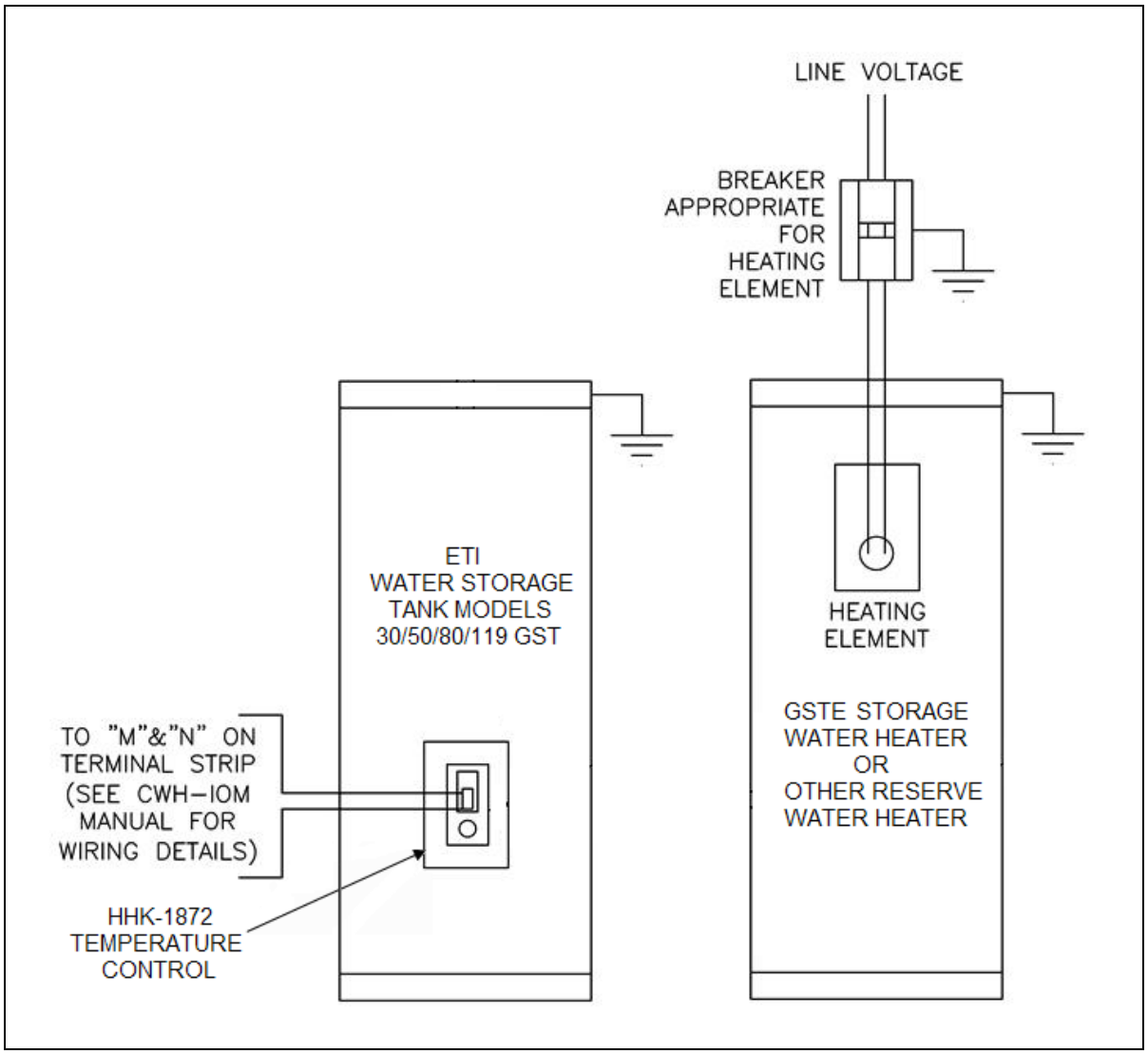

Figure 2b. Electrical Field Wiring - CWH

3. EarthLinked® Domestic Water Heating (DWM) Applications

Figure 3a illustrates the installation of a GST storage water tank in tandem with a reserve water heater for a residential water heating application. Location of the storage water tank from the DWM is to be no more than 10 ft. apart. Water piping connections between the compressor unit and the storage water tank are all 1-1/2" Type L copper for Models DWM-4248 and DWM-6072. Piping connections are 1" Type L copper for Model DWM-1836. Hot water supply to the residence is out the top of the reserve heater as shown. Final hot water temperature to the residence is determined by the thermostat setting on the reserve water heater. The electrical field wiring for the HHK-1872 temperature control on the water storage tank and the heater element in the reserve water heater is illustrated in Figure 3b.

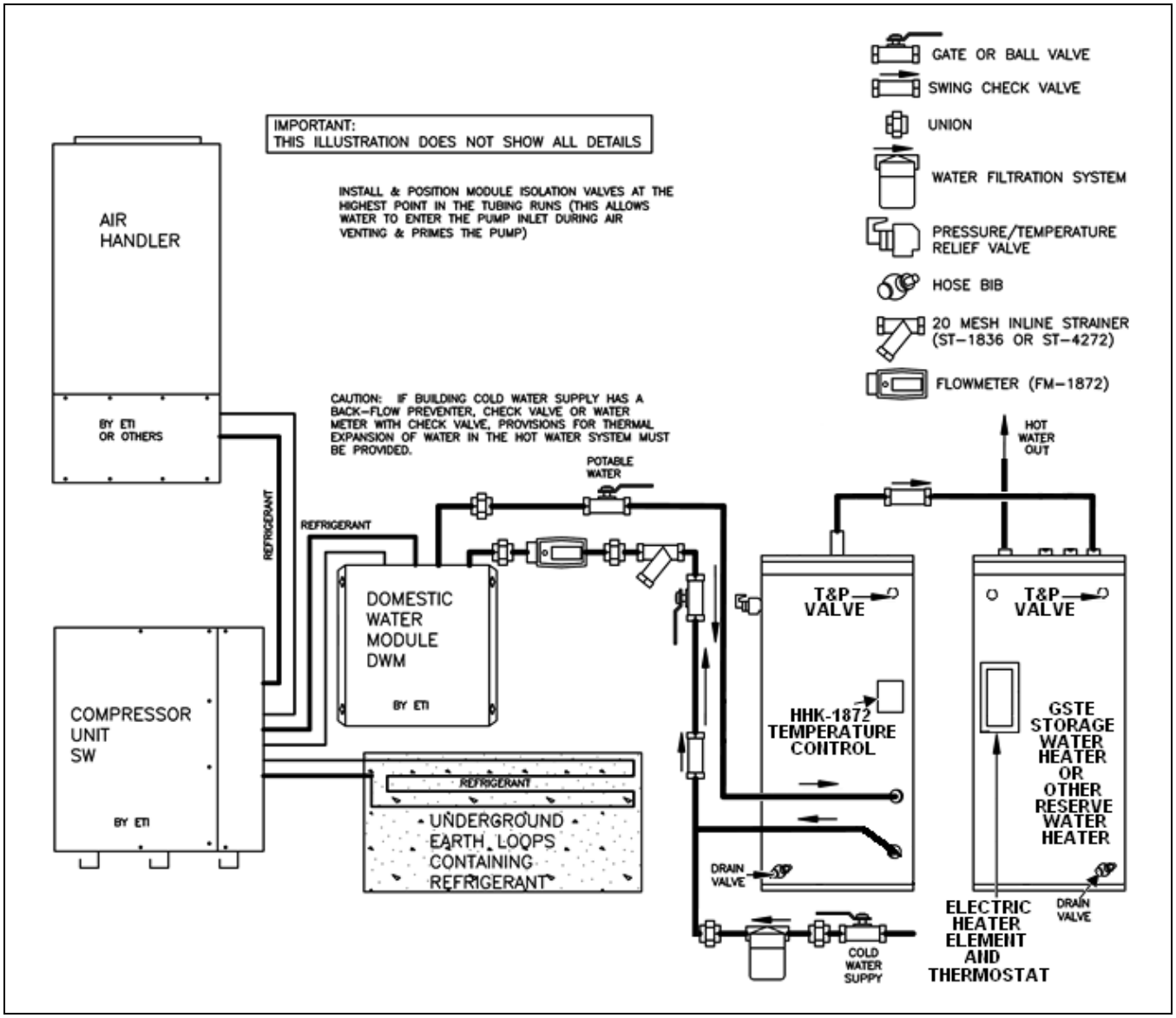

Figure 3a. Domestic (DWM) Water Heating Application

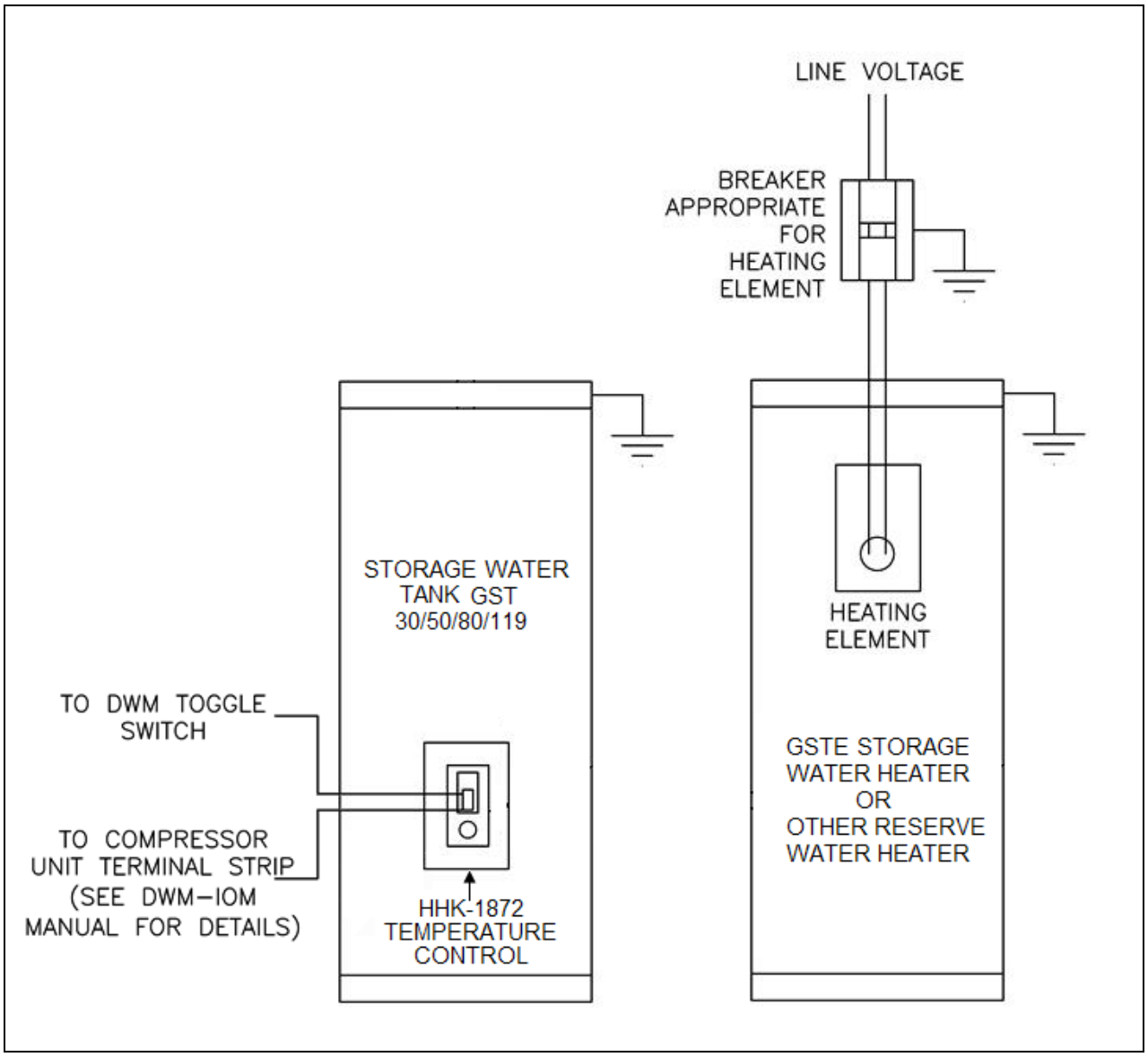

Figure 3b. Electrical Field Wiring – DWM

4. Operation

The GST storage water tank operates in conjunction with the other components of the EarthLinked® system. Entire system operational functions are detailed in EarthLinked® system manuals. The following operational functions pertain only to the storage water tank.

HHK-1872 Temperature Control Setting

The temperature control setting on the storage water tank, ETI Model HHK-1872, is set at the time of start-up. For optimum CWH system performance, the temperature control setting should be limited to a **maximum water temperature rise through the compressor unit of 60°F**. The following lists the maximum temperature control set points, based on the cold water supply temperature:

Cold Water Supply Temperature, °F	Max. Temperature Control Set Point, °F
55 and above	110
45	105
40	100

Freeze Protection

In the event that the compressor unit and GST storage water tank system is to be shut down for extended periods of time with surrounding air temperature below 32°F, the system is to be drained of water, to prevent freezing damage to the compressor unit, storage water heater and other interconnected piping components.

GSTE as Booster Heater

When the GSTE storage water heater is applied as a reserve/booster heater in tandem with a storage water tank (which stores water at 110F maximum) for the purpose of raising the water temperature, the thermostat controlling the electric heating element can be adjusted to the appropriate water temperature utilizing the following thermostat markings:

Thermostat Marking	Temperature, °F
Minimum	110
HOT	120
A	130
B	140
C	150
VERY HOT	160

5. Maintenance

The following schedule covers the items that require regular checking and maintenance on the GST storage water tank. The details for each item follow the maintenance schedule.

Maintenance Schedule

Every 6 Months (First Year Only)
Check Anode Rod(s)

Every 12 Months
Check Anode Rod(s)
Flush Tank
T&P Valve

Check Anode Rod(s) – First Year

The anode rods should be inspected twice the first year. The first time to check the anode rods is six months after the heater is installed.

The anode rod is a 3/4” diameter magnesium rod that “sacrifices itself” to control corrosion. If an anode rod has reduced in size to 1/4" diameter or shows signs of pitting it is time for replacement. To check the anode rod, follow these steps:

- Turn OFF the electric power.
- Shut OFF the water supply by means of the main cold water supply isolation valve.
- Open a drain valve in the piping illustration long enough to relieve the tank pressure and drain water, as appropriate, to lower water level below top of tank.
- Remove caps on top of the storage tank.
- Use a 1-1/16” six-sided socket wrench and breaker bar. Snap hard to break the anode rod seal.
- Remove rod(s), inspect and replace with new rod(s) as necessary. (An anti-sieze pipe sealant is recommended, Teflon tape is acceptable). Replacement anode rods are specified in the storage water tank and storage water heater literature that came with the tank or heater. The anode rods can be ordered through the local Bock dealer listed at www.bockwaterheaters.com
- Tighten the anode rod nut(s) and snap the caps into place.
- Be sure all drain valves are closed, turn on the main cold water supply isolation valve and purge the air from the tank and associated piping, as appropriate.
- Turn ON the electric power and initiate normal unit operation.

Check Anode Rod(s) – After First Year

- Repeat the inspection and maintenance as required on a once-a-year basis after the first year, unless necessary to inspect more often.

Flush Tank

- Turn OFF electric power.
- Close the isolation valves between the GST storage water tank and other EarthLinked® system components.
- Close the main cold water supply isolation valve to the storage water tank.
- Open a faucet downstream of the hot water outlet on the storage water heater.
- After connecting the storage water tank drain valve to a drain hose, open the drain valve and drain the entire tank of water to an open drain.
- Close tank drain valve.
- Open the main cold water inlet valve and fill the storage water tank with clean water until it is approximately 25% full.
- Turn off the main cold water supply isolation valve, open storage water tank drain valve, and observe the water coming out of the drain valve going into the drain.
- Continue to flush the tank as noted above until the water coming out of the drain valve is clear and free of sediment.
- Close the drain valve and the faucet.
- Open the main cold water supply valve and fill the storage water tank and piping system with water.
- Open the isolation valves between EarthLinked® system components and the storage water tank and purge air from system.
- Turn ON electric power and initiate normal system operation.

T&P Valve

Check the GST T&P Valve for proper operation by doing the following:

- Turn OFF electric power.
- Attach a drain hose to the valve, with water discharge directed to an open drain.
- Lift the lever at the end of the valve several times.
- The valve should operate freely and return to its original position properly.
- If water does not flow out of valve, close main cold water supply isolation valve to the system, and close isolation valves between EarthLinked® system components and the storage water tank, and lower the water level to below the T&P valve.
- Remove valve and inspect for corrosion or obstructions.
- Replace with new valve if necessary. DO NOT REPAIR AND INSTALL THE FAULTY VALVE.
- Open the isolation valves between the EarthLinked® system components and the storage water tank. Open the main cold water supply to fill the system. Purge air from system.
- Turn ON electric power and initiate normal system operation.

6. Manufacturer's Instructions

The storage water tank Models 30 GST, 50 GST, 80 GST and 119 GST are manufactured and warranted by Bock Water Heaters, Inc. of Madison, Wisconsin.

Prior to installing this storage water heater, read and follow the installation instructions attached to the storage water tank.

For recognition purposes, the first page of the Book installation Instructions for the "Geo-Stor™ Geothermal Storage Tank" is on the following page.

To the Installer:
Please attach these instructions next to the water heater.

To the Consumer:
Please read these and all component instructions and keep for future reference.

Geothermal Storage Tank
Instruction Manual

GEO-STOR™

Warranty, Registration Card and Parts List are included.
Homeowner: Please remember to return the Registration Card!

⚠ WARNING
Improper installation, adjustment, alteration, service or maintenance can cause serious injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer or service agency.

⚠ CAUTION
The recommended temperature for normal residential use is 120°F. The dial on the aquastat does not always reflect the out-coming water temperature and it could occasionally exceed 120°F. Variation in outcoming temperature could be based on factors including, but not limited to, usage patterns and type of installation. Test water at the tap nearest to the water heater and storage tank.

⚠ WARNING
Hotter water increases the risk of scald injury. Before adjusting the water temperature setting, read this instruction manual. Temperatures at which injury occurs vary with the person's age and the length of exposure. The slower reaction time of children, elderly, or physically or mentally challenged persons increases the scalding hazard to them. It is recommended that lower water temperatures be used where these exposure hazards exist. Households with small children or invalids may require a temperature setting less than 120°F to prevent accidental contact with hot water. To produce less than 120°F, use point-of-use temperature limiting devices.

If higher water temperature is needed in part of the water system, automatic temperature limiting devices must be used on all lines to water taps.

INSTALLER RESPONSIBILITIES
Please read all instructions before installing or placing this storage tank into service. This unit must be installed by licensed or authorized installers, or technical personnel that service water heating equipment. The Storage Tank must be installed in accordance with all local codes and ordinances.

HANDLING
Before uncrating, check for shipping damage. Report any damage to your carrier. Note damage on bill of lading or delivery receipt and file a claim.

LOCATION
This storage tank should be located in a central location to the piping system, as close as possible to the heat source and in an area not subject to freezing temperatures. Leave sufficient space for servicing and maintaining the tank.

THIS MANUAL HAS BEEN PREPARED TO ACQUAINT YOU WITH THE INSTALLATION, OPERATION, AND MAINTENANCE OF YOUR WATER HEATER AND TO PROVIDE IMPORTANT SAFETY INFORMATION.

Read all instructions thoroughly before attempting installation or operation of your water heater. Keep these instructions for future reference.

Local plumbing and electrical codes must be followed in the installation of this storage tank. In the absence of a local code use the UNIFORM PLUMBING CODE and the NFPA Code. Local codes may supersede instructions in this installation manual.

These instructions are a guide for the correct installation of the storage tank. The manufacturer will not be liable for damages caused by failure to comply with the installation and operating instructions outlined on the following pages.

If you lack the necessary skills required or have difficulty following the directions, seek help from a qualified person for that part of the installation you do not understand.

FAILURE TO FOLLOW THESE INSTRUCTIONS OR ALL APPLICABLE BUILDING CODES AND REGULATIONS VOIDS THE WARRANTY ON THIS WATER HEATER.

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