

Installation, Operating, and Maintenance Manual



Part # 3619
Rev. 27APR2017

Geo-Booster™

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3619-04-27-17

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NOTES:

This guide provides the installer with instructions specific to the Geo-Booster. Please refer to your heat pump manufacturer’s instructions or IGSHPA guidelines for additional detailed flushing, purging, and installation information. Please review the entire I.O.M. document before proceeding with the installation.

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GENERAL DESCRIPTION

The Geo-Booster is an active loop pressurization system that eliminates issues with low loop pressures in closed-loop geothermal ground loop or hydronic systems. The Geo-Booster will maintain a minimum loop pressure of 25 psig, +/- 3 psig, on the loop system. The Geo-Booster includes a pump with a built-in pressure switch* factory set at 25 psig (see Appendix A for adjustment), and a check valve to prevent back-flow into the one-gallon tank. The sealing cap ensures a closed system, prevents loop fluid evaporation, and provides vacuum relief allowing the fluid to be pumped from the tank.

*Factory setting: ON at 25 psig, OFF at 35 psig. If setting is changed, the ON/OFF differential will remain at 10 psig.

PARTS LIST

- (1) Geo-Booster system with tank, cap, pump, and power supply (assembled)
- (9') Flexible braided hose
- (1) 3/8" Check valve with 5" flexible braided hose (assembled)
- (2) ¼" x 2-½" Lag screws
- (3) Hose clamps
- (2) ¼" Brass Nipples
- (1) ¼" Brass Tee
- (1) ¼" Brass Ball Valve



INSTALLATION

The Geo-Booster can be mounted in any available indoor location in or around the mechanical room. The Geo-Booster includes over nine feet of hose which allows flexibility in mounting the system. If the unit needs to be located further than nine feet from the plumbing access point additional hose can be added or alternative pumping methods can be employed provided that the materials are compatible with the antifreeze used in the loop. The Geo-Booster can be plumbed into any point of the loop but is preferably located at the lowest pressure point in the system which is normally the return pipe from the ground loop just before the circulator pump(s).

Procedure-New Ground Loop

This procedure assumes the Geo-Booster is being installed in a new ground loop installation that will be flushed and purged after the Geo-Booster installation.

1. Mount the Geo-Booster to a well supported structure such as a framed or concrete/masonry wall using appropriate mounting hardware (Figure 1).

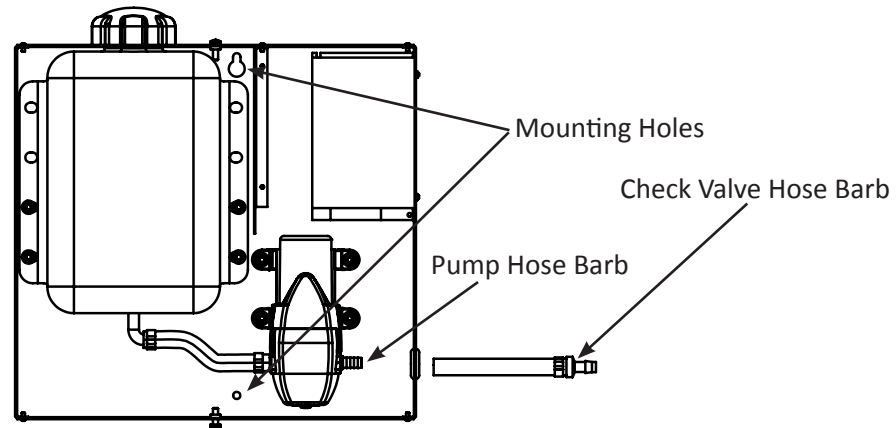


Figure 1: Geo-Booster with cover removed

2. Install the check valve by inserting the end of the flexible braided hose with the check valve attached through the rubber grommet in the right side of the cabinet (Figure 1) and securing to the pump hose barb with a hose clamp. Attach the long hose to the check valve hose barb fitting using a hose clamp. Ensure the hose will reach the intended plumbing point in the loop system.
3. Plumb the other end of the hose into the ground loop piping system on the return pipe before the flow center or circulator. The included ball valve should be installed at the desired plumbing point to allow isolation of the Geo-Booster. See Figure 2 for one plumbing method.

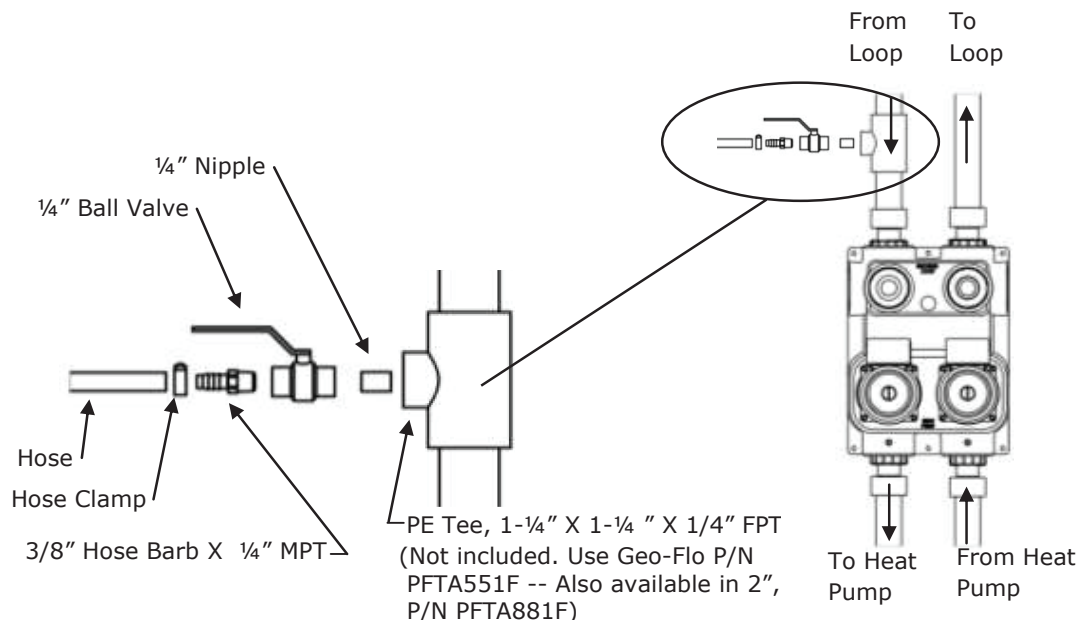


Figure 2: Geo-Booster installation with plumbing point above flow center



WARNING: OPEN THE MAIN POWER SUPPLY DISCONNECT SWITCH AND SECURE IT IN AN OPEN POSITION PRIOR TO PERFORMING ELECTRICAL WORK. VERIFY THAT POWER HAS BEEN DISCONNECTED PRIOR TO WIRING THE GEO-BOOSTER. FAILING TO SECURE THE ELECTRICAL SUPPLY COULD RESULT IN SERIOUS INJURY OR DEATH.

4. Wire the power supply using 120VAC or 230VAC single phase power following all applicable local codes (see Figure 3). The power supply can be wired in series with a power disconnect switch located adjacent to the unit if desired. Another option is to wire the power supply using the same contacts in the heat pump used for the circulator pumps. This method ensures that the Geo-Booster will only operate when the heat pump runs. The installer must verify that the heat pump's circuit breaker can handle the load.

Connect L to the black wire, connect N to the white wire, and the ground symbol to the green (or bare) wire. The power supply will accept 120VAC or 230VAC.

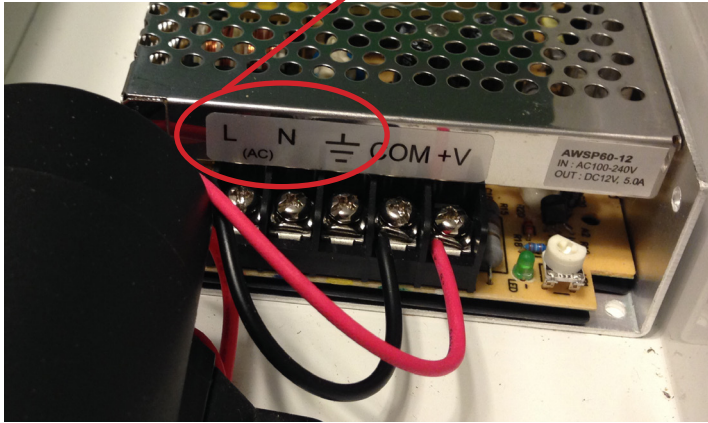


Figure 3: Geo-Booster power wiring

5. Fill the tank with loop fluid.



WARNING: ONLY USE PREMIXED ANTIFREEZE IN A NON-FLAMMABLE STATE. FAILURE TO OBSERVE SAFETY PRECAUTIONS MAY RESULT IN FIRE, INJURY, OR DEATH.

6. Power on the pump. Allow the pump to run until all air has been purged from the hose. Close the ball valve. The pump will automatically shut off when the maximum pressure setting is reached.
7. Flush the ground loop system using a quality flush cart and acceptable procedures.
8. Open the ball valve on the Geo-Booster.
9. Top-off the tank with loop fluid and replace the cap.

Optional: Remove the handle on the ball valve to prevent tampering.

Procedure-Retrofit Installation

This procedure assumes the Geo-Booster is being installed in an existing geothermal heat pump system between the flow center and the heat pump in a situation where the installer does not wish to flush the entire ground loop with a flush cart after the Geo-Booster installation. This procedure will require flushing the heat pump unit side of the system which is typically accomplished without a flush cart by using a garden hose, adapter fittings, and the domestic water source.

1. Mount the Geo-Booster to a well supported structure such as a framed or concrete/masonry wall using appropriate mounting hardware (Figure 1).
2. Install the check valve by inserting the end of the flexible braded hose with the check valve attached through the rubber grommet in the right side of the cabinet (Figure 1) and securing to the pump hose barb with a hose clamp. Attach the long hose to the check valve hose barb fitting using a hose clamp. Ensure the hose will reach the PT plug in the elbow on the heat pump.
3. Remove PT plug from elbow on the lowest pressure side of the heat pump. This is generally the “water out” side. Finalize plumbing connections using the supplied fittings (Figure 4).

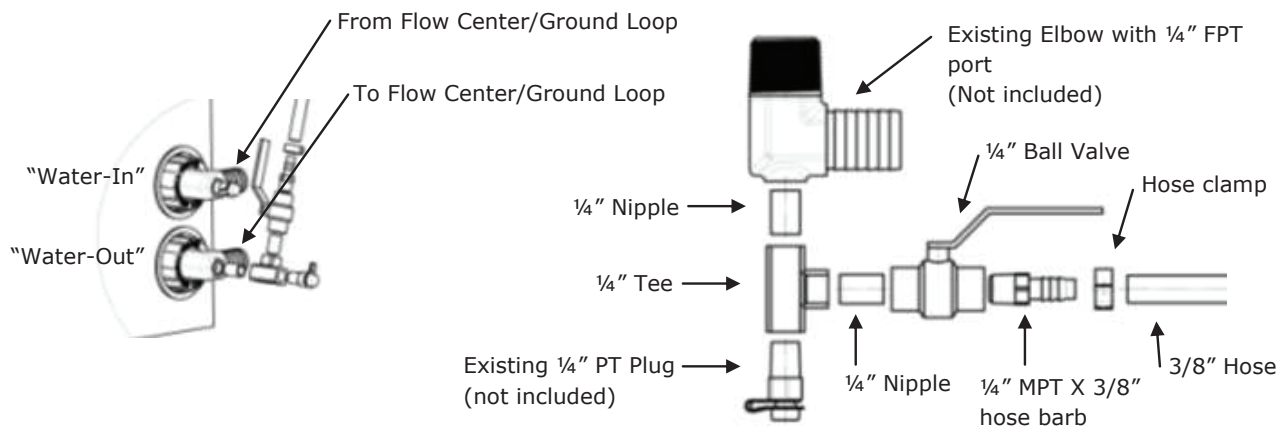


Figure 4: Geo-Booster installation between flow center and geothermal heat pump



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4. Wire the power supply using 120VAC or 230VAC single phase power following all applicable local codes (see Figure 3). The power supply can be wired in series with a power disconnect switch located adjacent to the unit if desired. Another option is to wire the power supply using the same contacts in the heat pump used for the circulator pumps. This method ensures that the

Geo-Booster will only operate when the heat pump runs. The installer must verify that the heat pump's circuit breaker can handle the load.

5. Fill the tank with loop fluid.



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6. Power on the Booster's pump. Allow the pump to run until all air has been purged from the hose and then close the ball valve. The pump will continue to run until it reaches the maximum pressure setting.
7. Flush the heat pump side of the system. This is accomplished with a garden hose, adapter fittings, and the domestic water source. When flushing is complete return the flow center's valve to the operating position.
8. Open the Geo-Booster's ball valve. The Booster's pump will run until the system pressure reaches the maximum pressure setting.
9. Top-off the tank with loop fluid and replace the cap.

Optional: Remove the handle on the ball valve to prevent tampering.

Procedure-Temporary Installation

This procedure assumes the Geo-Booster is being installed in an existing geothermal heat pump system between the flow center and the heat pump in a situation where the installer does not wish to flush any portion of the system. This method requires the least installation time but due to the potential of a leak at the PT plug it should be considered temporary. The installation should be made permanent when other service work such as replacing a circulator is performed.

1. Mount the Geo-Booster to a well supported structure such as a framed or concrete/masonry wall using appropriate mounting hardware (Figure 1).
2. Install the check valve by inserting the end of the flexible braided hose with the check valve attached through the rubber grommet in the right side of the cabinet (Figure 1) and securing to the pump hose barb with a hose clamp. Attach the long hose to the check valve hose barb fitting using a hose clamp. Ensure the hose will reach the PT plug in the elbow on the heat pump.
3. Plumb the other end of the hose as shown in Figure 5.

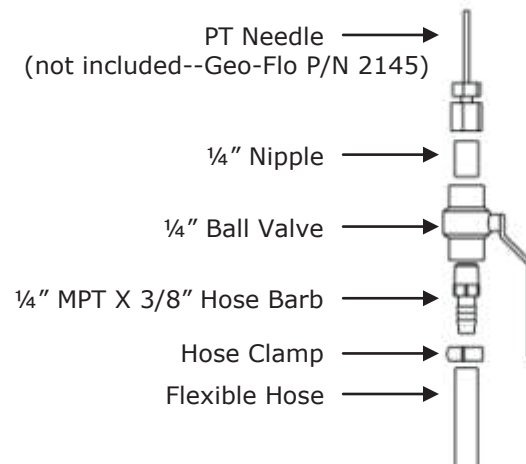


Figure 5: Assembly required for temporary installation of the Geo-Booster into an existing PT port



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4. Wire the power supply using 120VAC or 230VAC single phase power following all applicable local codes (see Figure 3). The power supply can be wired in series with a power disconnect switch located adjacent to the unit if desired. Another option is to wire the power supply using the same contacts in the heat pump used for the circulator pumps. This method ensures that the Geo-Booster will only operate when the heat pump runs. The installer must verify that the heat pump's circuit breaker can handle the load.
5. Fill the tank with loop fluid.



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6. Power on the Booster's pump while directing the hose into the top of the Geo-Booster's tank. Allow the pump to run until all air has been purged from the hose and then close the ball valve. The pump will continue to run until it reaches the maximum pressure setting.
7. Remove the cap from the PT Plug in the elbow on the lowest pressure side of the heat pump. This is generally the "water out" side.
8. Insert the PT needle into the plug and open the ball valve. The Booster's pump will run until the system pressure reaches the maximum pressure setting.
9. Top-off the tank with loop fluid and replace the cap.

Optional: Remove the handle on the ball valve to prevent tampering.

Note: Due to the potential of a leak at the PT plug this installation should be considered temporary. The installation should be made permanent when other service work such as replacing a circulator is performed.

TROUBLESHOOTING

The following table relates to issues with the Geo-Booster only. Please consult your manufacturer's flow center and heat pump installation manual for additional troubleshooting information.

Problem	Possible Cause	Solution
Pump runs continuously	Tank empty	Isolate Booster by closing ¼" valve; add fluid to tank; disconnect and purge air from hose; open valve.
	Stuck pressure switch	Tighten and loosen adjustment screw to attempt to reset switch. Otherwise, replace pump.
	Major leak in loop system	Locate leak, and repair loop.
Pump runs intermittently, but system pressure not maintained	Insufficient power to pump	Check input to power supply. Check voltage and amperage output from power supply. Power supply 12VDC should provide 1A minimum with max. press. setting about 25 psig. Low voltage (under 12VDC) or current (under 0.5A) indicate that power supply should be replaced.
	Pump pressure switch setting too low	Adjust pump pressure setting. See Appendix A.
Pump runs continuously, but system pressure is high	Pump pressure switch setting is too high	Adjust pump pressure setting. See Appendix A.
	Pump pressure switch is defective	Replace pump.
Pump does not run	No input power	Check input power (AC) and/or breaker/switch in series with Booster. Replace defective component.
	Blown fuse	Replace fuse.
	Isolation ball valve closed	Open valve.
	System pressure is between cut-in and cut-out pressures	No problem.
	Power supply defective	Check output (DC) of power supply. Replace power supply if necessary.
Pressure gauge reads less than max. pressure setting	Defective gauge	Replace gauge.
	Pump not running	See "Pump does not run".
	System pressure is between cut-in and cut-out pressures	No problem.
Tank requires filling very often	Leak in loop system	Locate leak, and repair loop.
Pump pulses when operating	Installation uses P/T port needle adapter for connection to piping system (Figure 5).	Not a problem. The pulsating is normal when the discharge is slightly restricted, but will not cause any issues.
	If pump is pulsating, and not maintaining pressure, pump may be defective.	Replace pump.

Appendix A - Adjusting Pressure Switch Setting

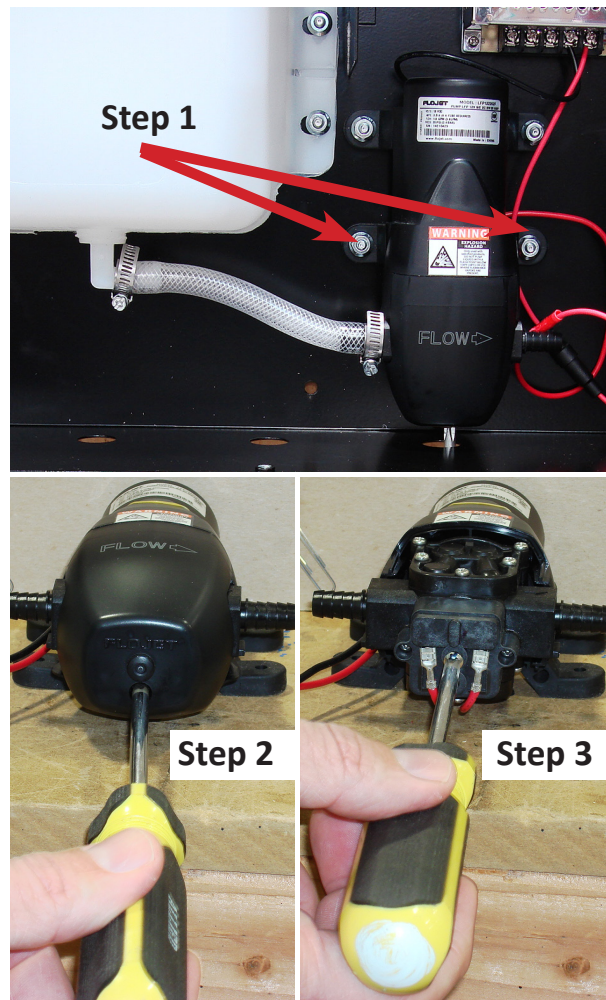
The factory selected pressure switch setting* of 25 psig +/- 3 psig should be appropriate for most geothermal and hydronic system applications regardless of how the system is plumbed and wired. However, the pressure switch setting may adjusted to fit the specific installation. Follow the steps below to change the maximum pressure switch setting.

NOTE: The system pressure switch setting should not be increased to exceed the 40 psig maximum rating of the pump.



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1. Remove the nuts that hold the pump to the cabinet (see picture to the right). Do not disconnect the hoses. Swing the pump body out just enough to remove the pump cover.
2. Remove screw that holds pump cover (see picture to the right).
3. Once the cover is removed, the adjustment screw will be accessible (see picture to the right). Tightening the adjustment screw (CW) increases the pressure switch setting, while loosening (CCW) the screw decreases the pressure switch setting.
4. Energize the Geo-Booster to check the system pressure. Note that if you have decreased the pressure switch setting, you may need to remove fluid from the system to decrease the system pressure enough to allow the pump to operate.
5. De-energize the Geo-Booster.
6. Reinstall the pump access cover, and reattach the pump to the cabinet.
7. Check the fluid level in the tank and add fluid as necessary. Replace the cabinet cover.
8. Energize the system.



*Factory setting: ON at 25 psig, OFF at 35 psig. If setting is changed, the ON/OFF differential will remain at 10 psig.

Manual Updates Table

Date	Description of Changes	Pages
27APR2017	Updated max. pressure setting and range (ON: 25 psig; OFF: 35 psig; +/- 3 psig)	Various
	Added additional troubleshooting tips	7
	Added Appendix A for adjusting pressure switch	8
23JUL2015	Updated picture to new black cabinet	Cover, page 1
	Updated parts listed (new check valve assembly)	1
	Updated Figure 1 to include to flex hose with check valve	2
	Updated Figure 2 to simplify piping	2
	Updated verbiage to reflect changes to check valve assembly	2, 4, 5
03JUL2014	Updated manual to new I.O.M. format	All
	Added Figure 3 (photo of wiring terminals)	3
09NOV2011	First published	All



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