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Application Bulletin - AB170512

Two pump variable speed applications with Geo-Prime tank

Summary:

When using a two pump pressurized variable speed flow center with a Geo-Prime tank, there are instances where the variable speed pump could experience negative suction pressure when the constant speed pump is not running. Geo-Flo does not recommend using the Geo-Prime tank with two pump pressurized variable speed flow centers at this time.

Background

Figures 1 and 2 show typical applications with a two pump pressurized variable speed flow center and a Geo-Prime tank. If both pumps are running, pump suction pressures are positive (Figure 1), and there is no issue. However, as shown in Figure 2, if the constant speed pump is not running, and the tank is at atmospheric pressure (the Geo-Prime tank can operate between atmospheric pressure and 13 psig), the suction pressure to the variable speed pump could be negative. Pressure drop across the heat exchanger will not be usable, and the negative suction pressure could cause the variable speed pump to cavitate.

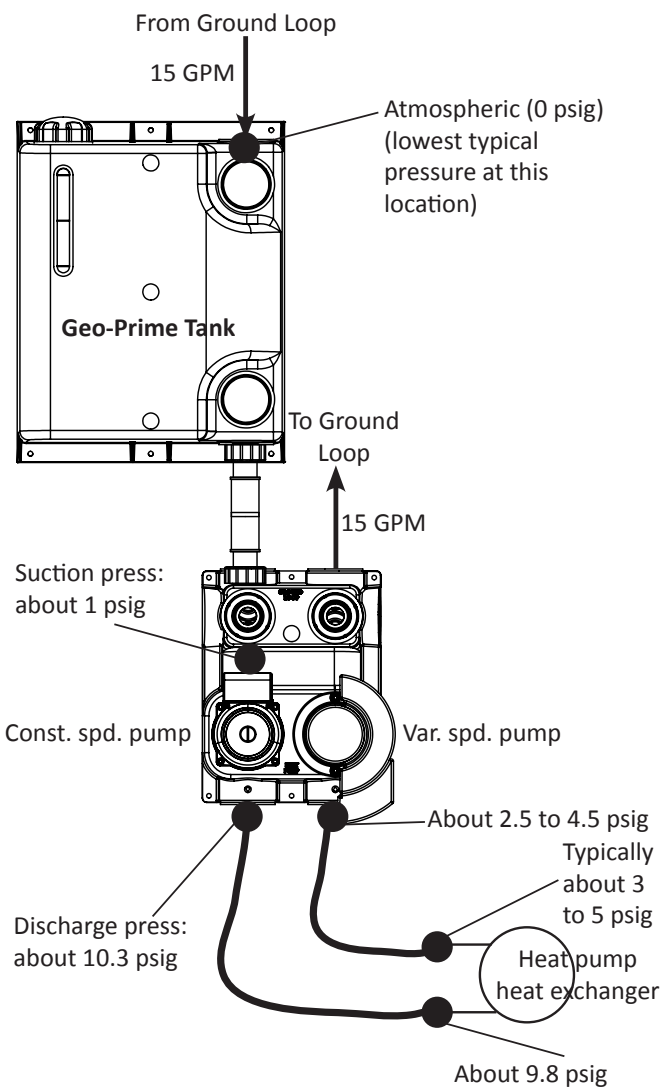


Figure 1: Both pumps running

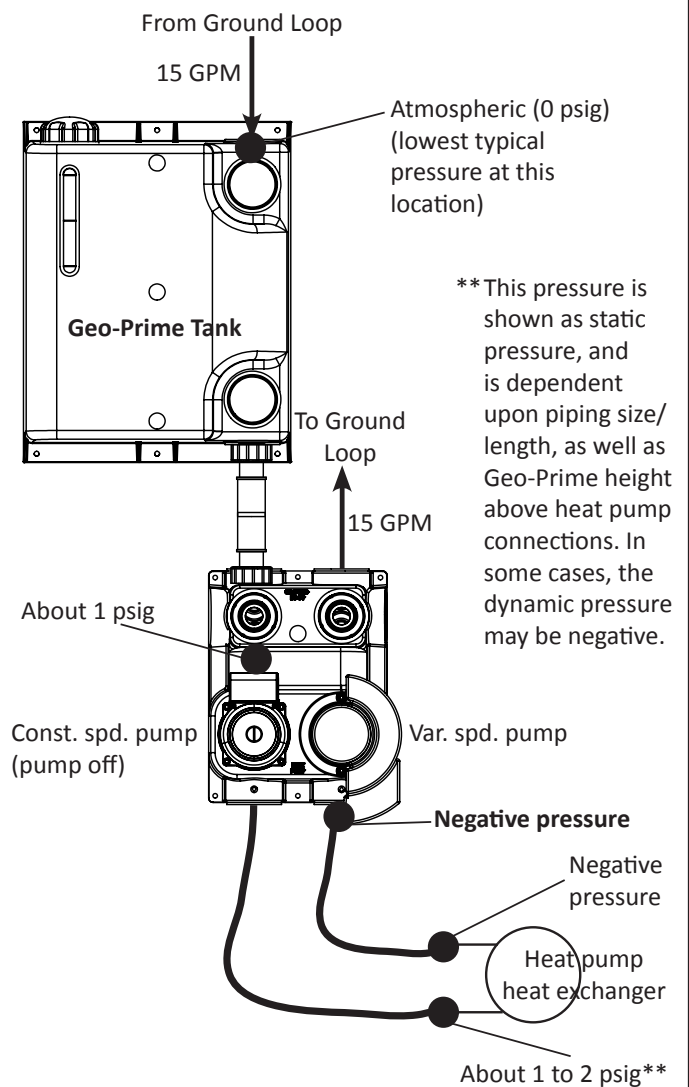


Figure 2: Only variable speed pump running

Corrective Action

New Installations: For new installations, the Geo-Prime tank should not be used with two-pump pressurized variable speed flow centers unless the constant speed pump is wired to run when the compressor contactor is energized (see “Existing Installations”, below), or if the second pump is installed below the flow center (see Figure 3). Alternatives include the Geo-Booster active pressurization system, or the use of an NP series non-pressurized two pump variable speed flow center. Single pump flow centers are not affected, and may continue to be used with the Geo-Prime tank.

Existing Installations: If a Geo-Prime tank is already installed on a two pump pressurized variable speed flow center, the best solution is to remove the constant speed power wiring from the UPC-GEO controller, and attach it to the “T” side of the compressor contactor (some heat pumps have pump power blocks as part of the control box, which are connected to the “T” side of the contactor). This approach will power the constant speed pump any time the compressor is energized, eliminating the possibility of negative suction pressure at the variable speed pump. When the constant speed pump is running, the controller will automatically adjust the variable speed pump RPM to maintain set point for flow rate or Delta-T. However, only the energy use for the variable speed pump will be displayed at the controller. The constant speed pump energy usage is typically about 180 Watts, which may be added to the display Watts for total energy use.

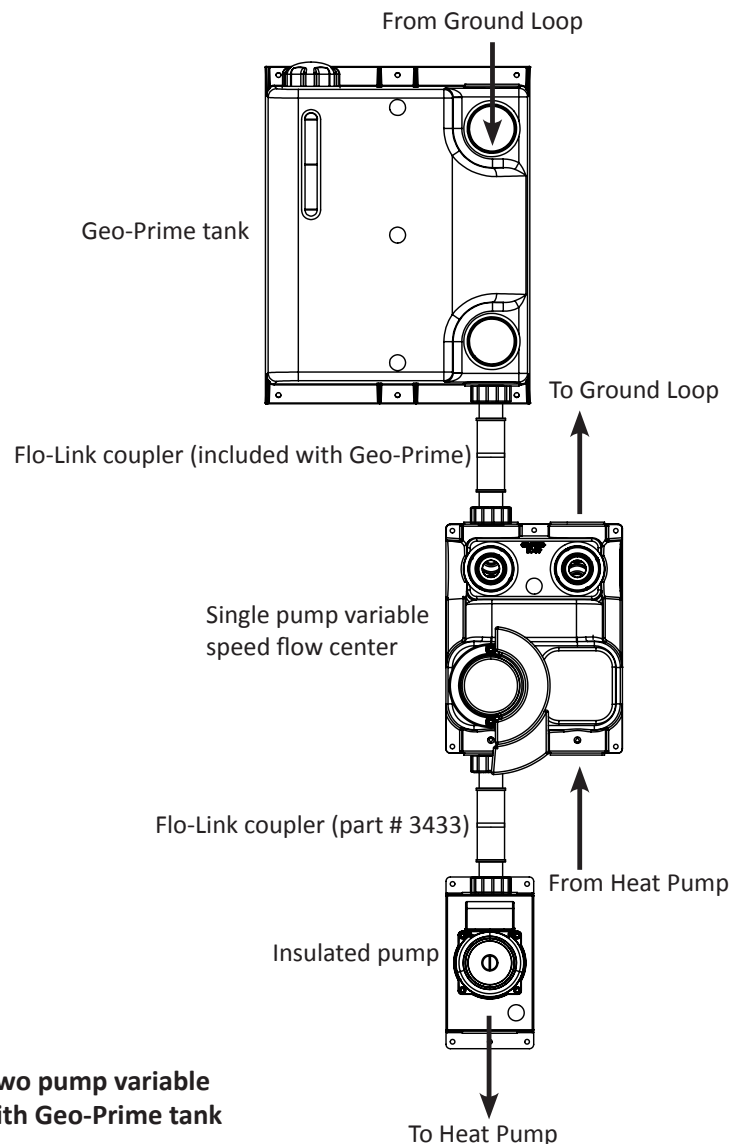


Figure 3: Alternate solution for two pump variable speed pressurized flow center with Geo-Prime tank