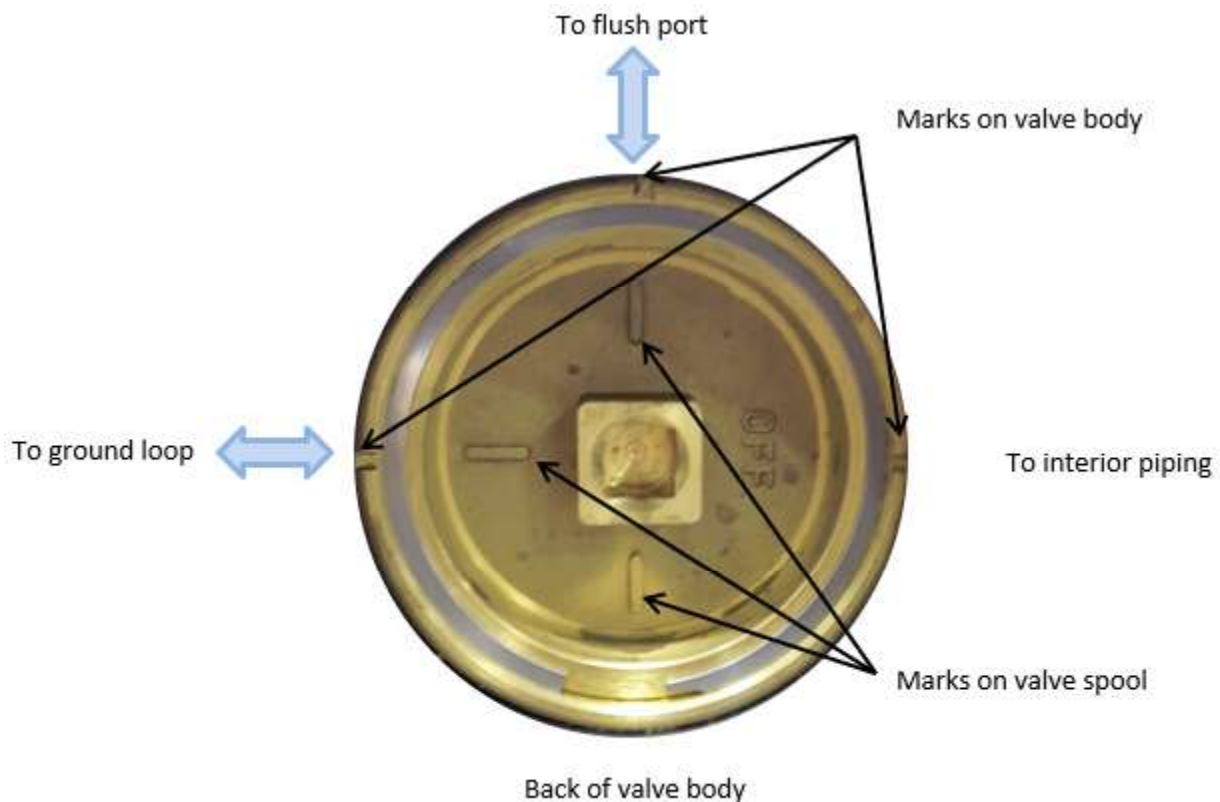


### 3-Way, 4-Position Valve Operation

Some GTK come with a 3-way, 4-position flushing, purging, and isolation valve. These valves provide the installer or service technician a means to 1) flush the ground loop side of the system, 2) flush the heat pump/interior piping side of the system, 3) flush both sides simultaneously, and 4) isolate the ground loop system from the interior piping and heat pumps for service

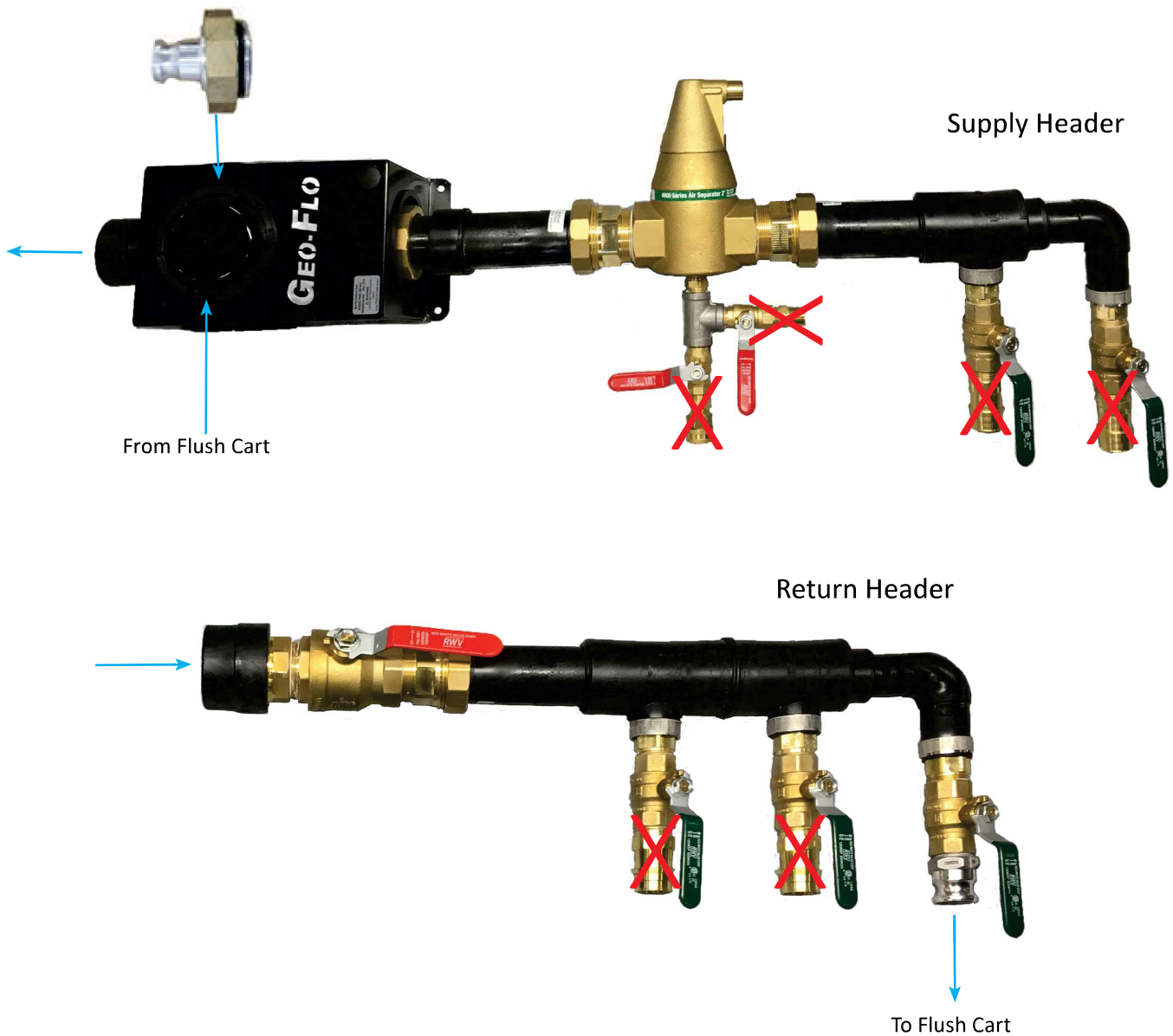
The valve body has three ports for fluid flow, and the valve spool can be rotated to four separate positions depending on how one chooses to direct fluid flow. The three flow directions are valve input, valve discharge, and valve side port (sometimes called flush port). “Tick” marks on the valve body indicate allowable flow directions, while dashes on the valve spool face indicate the fluid direction. Note that the valve spool has a “T” flow configuration. The word “OFF” shows which port is blocked.

In the example below, flow is directed between the flush port and the ground loop, as indicated by the double-headed arrows. The interior piping is shut off. If the valve is rotated 180 degrees (OFF to the left in example), the fluid flow will be directed between the flush port and the interior piping. When the system is operating, OFF is rotated toward the flush port allowing fluid flow between the ground loop and interior piping.



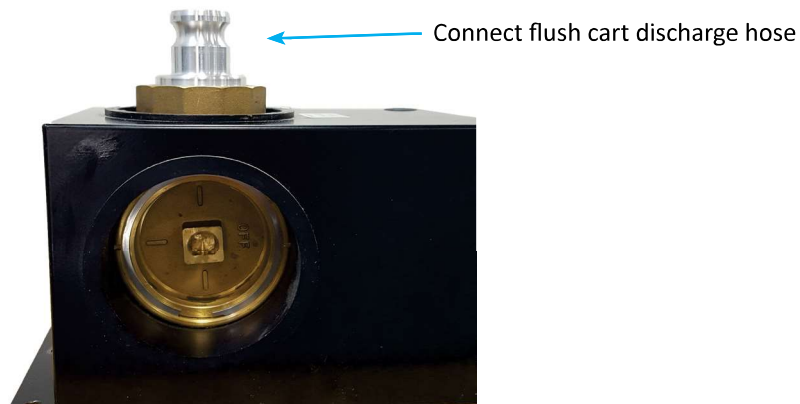
## Flushing and Purging

Flushing and purging using an appropriately designed and sized flush cart is the only industry accepted method of flushing debris and purging the air from the ground loop system. This document provides general considerations on flushing when the system utilizes a GTK Geothermal Trim Kit. Please refer to the detailed flushing instructions provided with your flush cart for more information on flushing and purging a ground loop system.



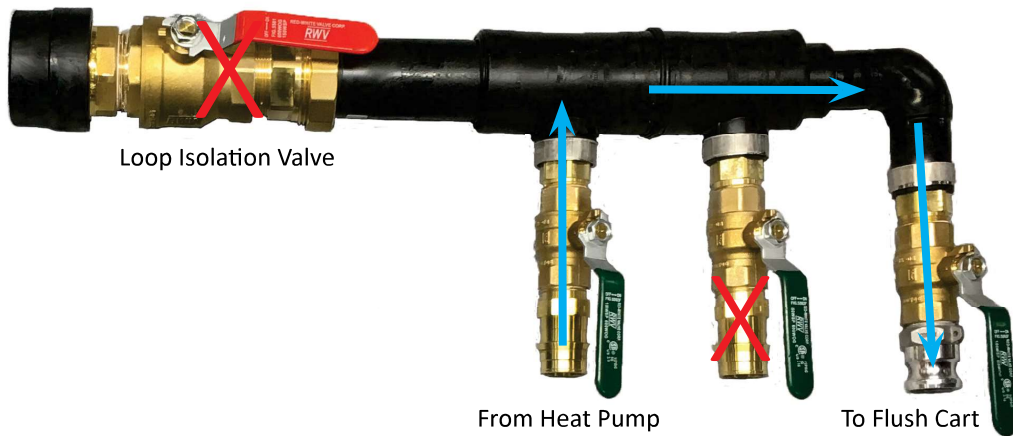
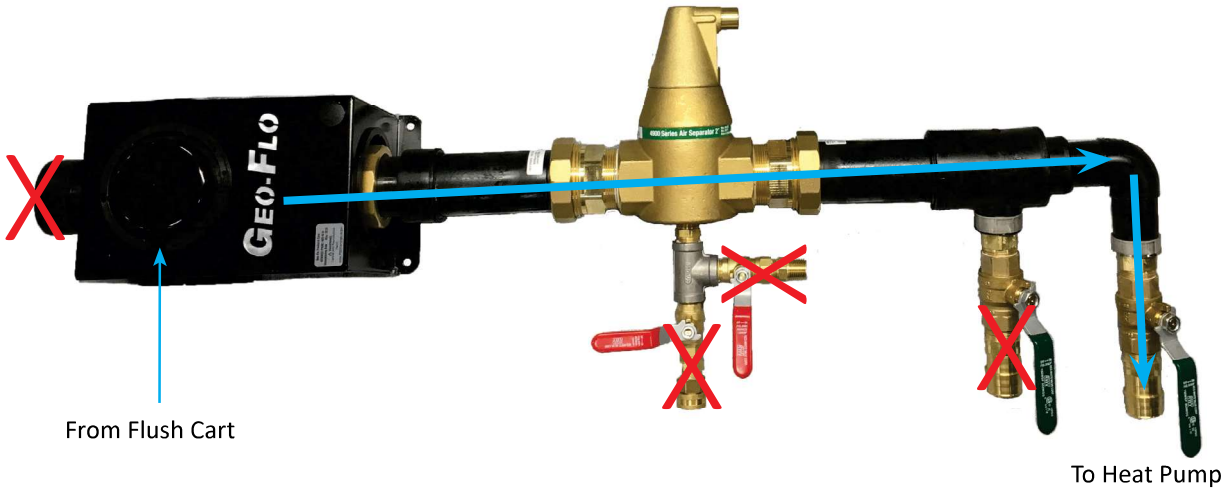
## Flushing and Purging cont.

1. Close all heat pump circuit valves.
2. Close blow-down valve and expansion tank valve on the air separator tee.
3. Attach flush cart return hose to the 1" cam adapter on the return header. Open this flush valve on the return header.
4. Remove cap and plug seal from the 2" valve and replace with 1" cam adapter. Attach flush cart discharge hose to the 1" cam adapter on the 3-way valve.



5. Using a ½" ratchet wrench, rotate the three way valve so "OFF" is toward the interior piping to direct the flush cart to push fluid through the ground loop and back through the return header.
6. Refer to the flush cart manufacturer's guidelines on flushing the loop, including dead-heading to check for air remaining in loop.

7. After the ground loop is sufficiently flushed, turn off the flush cart. Then, rotate the 3-way valve so that OFF is toward the ground loop. This directs the flush cart to circulate fluid into the interior piping.



NOTE: The expansion tank is factory pre-charged to 12 psig, which is sufficient for most applications. If the expansion tank is being installed in a location (such as a basement, or first floor) with significant connected piping above it, it may be necessary increase the pre-charge pressure to ensure the expansion tank is providing its full capacity.

14. Rotate the flush valve so that fluid is directed to both the ground loop and interior piping. To pressurize the system, turn on the flush cart and shut off the flush valve on the return header. Then, rotate the three-way valve so that OFF is towards the flush port. Finally, turn off the flush cart, and disconnect hoses.

## Maintenance

If the system is properly flushed of debris, and good water quality is utilized for the loop fluid (or appropriate treatment has been made) the GTK will not require ongoing maintenance. However, if debris remains in the loop after flushing, it will collect in the air separator and must be removed. This can be done by forcing fluid out through the blow-down valve. If this is unsuccessful, the air separator may need to be disassembled and cleaned. In this case, refer to the manufacturer's instructions for the air separator used in the system.