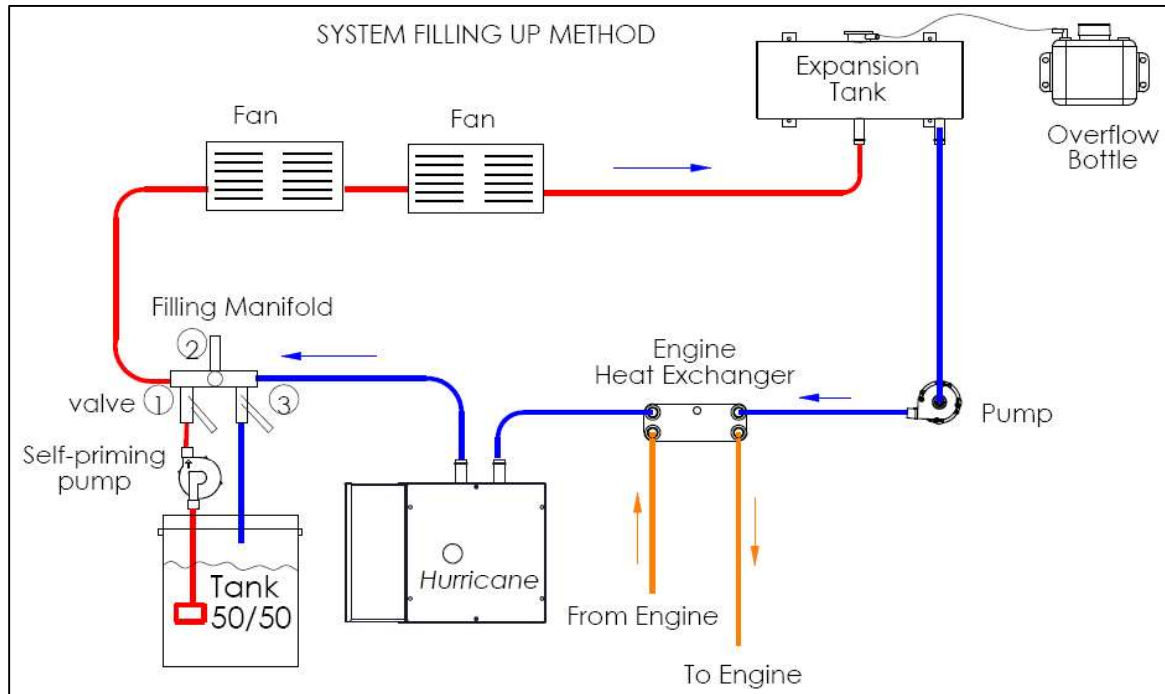


Use this method if you have installed PEX tubing for the heating system.

To fill, purge, and test the heater's circulation system using the manifold method, use this diagram and the following procedure:



**Figure 8-2: Filling System with Fluid Using “Manifold Method”**

- 1 Put the pressure pump's suction hose into a 5gal/23l tank of straight water or 50/50 mix (antifreeze and water), equipped with a mesh screen to capture any debris.
- 2 Attach the outlet of the self-priming pump to the manifold inlet and a spare hose from the tank to the manifold outlet. (See figure 8-2)
- 3 Close the middle valve (2) and open both in-outlet valves (1 & 3). This forces the fluid to circulate through the 50/50 tank
- 4 Check to ensure any air vents and drains are sealed.
- 5 Start the pressure pump.

## Section 8, Filling and Testing the Circulation System

- 6** As the fluid is pumped out of the 50/50 tank, make sure that the supply pump never sucks air.
- 7** Slowly add more fluid to the tank until all air has been expelled and the mixture starts coming out of the return hose in the 50/50 tank. (Keep the fluid level in the tank above the inlet of the suction hose.) This will flush the system of any debris and purge the lines of air.
- 8** Monitor the heating system during filling and purging to ensure:
  - all fittings remain secure
  - no leaks in any connections or hosing
  - good flow through the expansion tank
  - no pressure build up in excess of 7psi/0.5bar
- 9** If you discover any leaks, temporarily stop the filling procedure to repair the leak.
- 10** Continue running the pressure pump for about 10 minutes *after* it has purged all air from the system, and continue monitoring for leaks.
- 11** If you filled the system with straight water, drain it and refill it with a 50/50 mix of antifreeze and water.
- 12** Stop the pressure pump.
- 13** On the manifold, close valves 1 and 3 and open valve 2 to allow normal system operation.
- 14** Fill the overflow tank with fluid to the correct level.
- 15** Turn on the heater's circulating pump by putting the pump jumper in place.
- 16** Check that the circulating pump runs quietly and smoothly. If there is still bubbling or cavitation present, re-purge the system.
- 17** Verify the flow rate with an inline flow meter (see Figure 8-3 and Section 7-2).
- 18** Double check the entire plumbing system for leaks. Open and close any air vents to eliminate remaining air bubbles.

- 19 Recheck the fluid level and circulation in the expansion tank.
- 20 Remove the pump jumper on the control board. This returns the pump to normal operation.

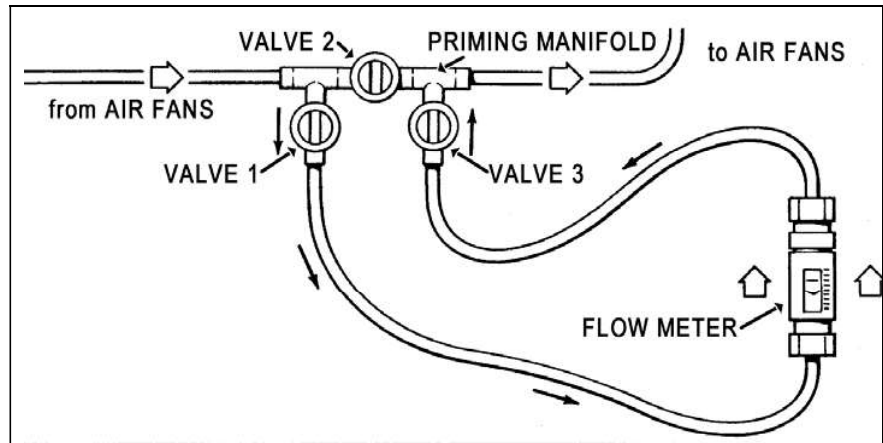


Figure 8-3: Flow Meter Inline with Circulation Loop

## 8.5 Verifying the Flow Rate

After filling, you must verify the flow rate using an inline flow meter. The purpose is to ensure the installation has been done correctly and the heater will operate effectively. If you do not have a flow meter, measure the temperature of the input and output hoses of the heater they should be under 20°F/11°C difference.

In a series-plumbed system, water flows through a single heating loop that consists of all the heater's elements—the pipe, fittings, burner, fans, etc. The entire system should have a flow of no less than 2gpm/9lpm. A flow slower than 2gpm/9lpm may be an indication of excessive resistance in the circulation system. Larger systems with more than five air fans should use a manifold to provide evenly distributed heat.