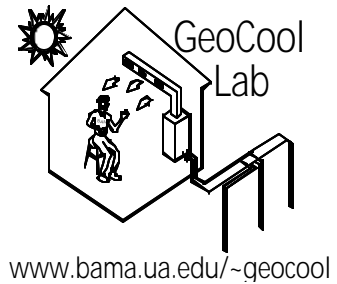


MEMORANDUM
THE UNIVERSITY OF ALABAMA
MECHANICAL ENGINEERING

Box 870276 – Tuscaloosa, AL 35487- 0276

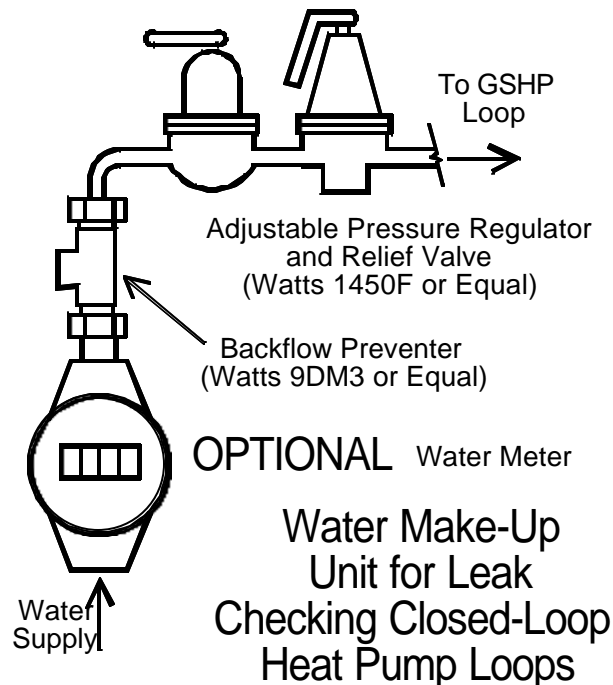
skavanaugh@coe.eng.ua.edu – 205-348-1649 (-6419 fax)

www.bama.ua.edu/~geocool



Date: January 2001
To: Whom It May Concern
From: Steve Kavanaugh
Re: Pressurization and Make-up of GHP Systems

This is a suggested low cost option for maintaining pressure on closed loop systems to prevent pump cavitation. The water meter is optional if a leak is suspected. One of these could serve individual heat pump loops, several loops located in an area, a sub-central loop or a central loop.



Polyethylene pipe is different than metal pipe. Unlike steel or copper, when HDPE gets warm it expands more rapidly than water. Thus, the pressure will actually decrease with rising temperature. The pressure on the loop is temperature dependent. If you want to pressure-test a system, the temperature must be stable. Thus, you must not operate the loop for a several hours.

This characteristic also means that minimum pressure will occur during the warmest loop temperature condition. Fortunately, most pumps do not require a lot of pressure on the pump suction to prevent cavitation. Grundfos requires only 1.3 psig @ 140°F for their circulators. Requirements at lower temperature will be even less. The problem with going below 0 psig is that if you have a leak, air can enter rather than water leaking out.