

Detecting Water in The System

There are laboratory procedures that can measure water in thermal fluids. However, they are really only useful for fluid that hasn't been charged into the system. Once water is in the system, it is relatively easy to detect.

Small water infiltrations (less than 300-400 ppm) show up as pump pressure fluctuations (you may even hear cavitation). Sometimes the fluctuations are misinterpreted or ignored because the system's heater outlet temperature is well above water's atmospheric boiling point. However, the fluid temperature is lowest at the pump suction and that temperature determines whether the water is liquid or gas at that point in the system. So if the fluctuations start suddenly while the system is heating up, there are low levels of water in the fluid.

High levels of water (like the free water visible at the bottom of a decanted sample of fluid) are pretty difficult to misinterpret. Once water residing at a system low-point reaches its boiling point, its volume increases suddenly – by up to 1600 times, depending on the fluid temperature and pressure at that point – as it flashes to steam. The displaced fluid is quickly forced up into the expansion tank and out the vent. Hot fluid and steam spurting out of a vent is hard to ignore. Serious injury – and possibly fire – can occur if an open drum is used as the catch tank.

Be on the lookout for any sudden change in your system, be it pump cavitation, increased expansion tank volume, unusual sounds or increased pressures – especially during start-up. It can often mean you've got water in the system.