

Faster Leak Checking

Many processes require a fast, accurate and reliable method for leak checking components. This can be accomplished by utilizing an Alicat Scientific M Series mass flow meter sized appropriately for the expected leak rate and an Alicat Scientific PC3 Series remote sensing pressure controller sized for the required pressure.

Alicat Scientific M Series mass flow meters are available with full scale ranges as small 0.5 SCCM with true 100:1 turndown ratio, meaning that flows as low as 5 microliters (0.005 SCCM) can be resolved.

If plumbed as shown in the diagram, the pressure is controlled at the entrance to the Device Under Test (DUT). A constant bleed through the needle valve allows the pressure controller to precisely hold the pressure at the DUT, ensuring that any flow through the meter after the bypass valve is closed is due either to leakage or to a cooling of the volume of the DUT.

Providing the temperature of the DUT is constant, the flow reported at the meter will be the leak rate of the DUT. Reducing dead volume between the flow meter and the DUT and the volume of the DUT itself will reduce the effects of temperature change and make the leak checking process faster.

Note: This process may not be suitable for leak tests on larger volumes where the allowable leakage is near zero because minute temperature differences on large volumes can produce actual flows that are greater than the allowed leakage rate. This same problem of physics would also affect leak checking by pressure decay.

