

**Ametek Aerospace
Thermal Vacuum Test Station**

This customer wanted a device that would check the accuracy and calibrate pressure transducers while experiencing the conditions of space – a vacuum with extremes of hot (in the sun's view) and cold (out of the sun's view). This piece of equipment did not exist as a standard production item so the Innoventor engineering team was chartered to design a custom system from scratch, using off-the-shelf materials when possible.

The challenge was to adjust or modify the components in such a way that they would work together in the required fashion. An additional tough challenge was the presence of a hard vacuum. This limits the type of material that are present in the vacuum chamber due to an effect called outgassing. Outgassing reduces the pump efficiency and consequently minimizes what level of vacuum is achievable. Hard vacuum also limits heat transfer and makes precise temperature control more demanding.

The special features include:

- Manual mode which allows the user to pick the thermal set point...hot,cold or ambient.. and the duration of the thermal soak.
- In auto mode, the station will execute a preprogrammed sequence of thermal cycles and notify the user of successful completion
- The Station controls the temperature by using a resistive heater and liquid nitrogen.
- Built in safety features including pressure relief valves are vented to an external exhaust line to avoid the danger of suffocation.

The customer has positively endorsed the quality of this system.



Thermal vacuum test system is designed for extreme temperatures and conditions