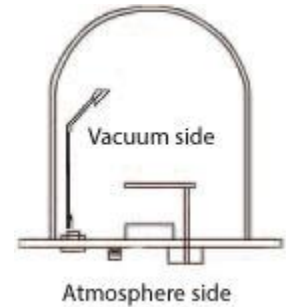


Connecting your Sensor Head Water Cooling Tubes to your Feedthrough Water Cooling Tubes.

Sensor head cooling tubes are typically 1/8" diameter and feedthrough cooling tubes typically 3/16" diameter. Connecting them requires a tube fitting called a reducing union that will reduce the size from 1/8" to 3/16". Fil-Tech offers three methods to make your connection that can be on the vacuum or atmosphere side of your chamber.



Vacuum Side/Bell Jar Side:

The Option Below Affixes The Sensor Head In Vacuum (\$50/set of 2)

- 1) **QISLockAdaptor:** This semi-permanent method uses a metal sleeve called a ferrule that forms a leak-resistant seal in vacuum. We ship the ferrule to you and you crimp the ferrule into place after you have determined the length of your waterlines. Fittings are made of forged or bar stock Type 316 stainless steel and include a nut. The nut is loosened, the tube is slid into place and tightened down, and the ferrule is tightened around the tube.



Atmosphere Side/Air Side:

The Options Below Allow The Sensor Head To Be Repositioned In Vacuum (\$75/set of 2)

- 2) **QISLockAdjustable:** This method involves factory brazing the fittings to the feedthrough cooling tubes and an O-ring connection that is affixed to the sensor head cooling tubes.

After the fittings are brazed to the feedthrough cooling tubes, the sensor head cooling tubes are inserted completely through the feedthrough with the sensor head cooling tubes exit to the atmosphere side. The O-ring fittings are then connected to the 1/8" sensor head cooling tubes. The sensor head can now be positioned as required.



- 3) **QISLockAdjustableFerrule:** This method uses a ferrule on the feedthrough cooling tubes and an O-ring seal on the sensor head cooling tubes allowing repeated disconnecting of the tubes. This option has been helium leak tested to a maximum leak rate of 4×10^{-9} std cm³/s at room temperature. However, the leak rate may increase as temperature increases due to permeation through the O-ring.

Installation is the same as above with the sensor head cooling tubes inserted completely through the feedthrough and the cooling tubes exiting to the atmosphere side. The ferrule tube fitting is connected to the feedthrough cooling tubes and tightened into place and the O-ring fittings are connected to the sensor head cooling tubes.