

FAQ 02-13: How do I install my QCM sensor and feedthrough ?

Location

Location of a QCM sensor has a significant effect on system performance. The crystal should be exposed to the same vapor flux as the substrate, but the sensor should not block or interfere with vapors getting to the substrate. The sensor should be shielded from heat sources - anything that might cause the sensor temperature to change during the process. And, of course, the sensor should be located where it can be easily reached for changing the crystal.

Mounting

Standard Sigma sensors are supplied with 30" (760mm) of 1/8" (3mm) stainless steel water cooling lines. Standard Sigma feedthroughs have about 6" (150mm) of 3/16" (4.76mm) tubing on the vacuum side. In a typical installation, the 1/8" sensor tubing is slipped inside the 3/16" feedthrough tubing, the tubing is bent as needed to position the sensor, and the tubing is brazed or soldered in place.

If that sounds a little too easy, you're right. Some things to consider:

1. Stainless steel tubing is not easy to bend. Use a mandrel to form the bend without kinks that limit flow. Or let us know how you want the tubing bent at the time of your order, and we'll do it for you.
2. Stainless steel is not easy to braze or solder. Find someone experienced in the craft, or plan to practice on something less expensive than a QCM sensor & feedthrough. You really don't want water leaking into your vacuum system.
3. Although the stainless steel tubing seems rigid and capable of supporting the sensor, they won't prevent vibrations from affecting the sensor. For installations requiring long cooling lines, use the tapped mounting holes in the base of the sensor to stabilize the sensor

As an option to welding the cooling lines, we provide feedthroughs with Ultra-Torr[®] compression fittings on the cooling lines. All you do is cut the sensor cooling lines to the right length, slip them into the Ultra-Torr[®] fitting, and hand tighten the fitting. Ultra-Torr[®] fitting do not deform the tubing, so some sensor adjustment is possible after installation.

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