Data Sheet

SemiQCM® SR Sensor

Description

INFICON® SemiQCM SR sensors, installed on a chamber wall or foreline of a semiconductor tool, offer a proven solution for material deposition monitoring, clean endpoint detection, precursor ampoule depletion, and precursor delivery fault detection. The sensor is installed via an ISO KF-25, KF-40, or CF-40 port, with both straight and right-angle BNC connector options. The sensor is capable of monitoring a sub-monolayer level of mass change, ideal for most advanced CVD and ALD processes. By connecting to FabGuard® software via an IMM-200 deposition monitor, the SemiQCM SR sensor becomes an integrated part of the tool and serves as an in situ process monitoring system to improve the yield and minimize the potential wafer scrap.

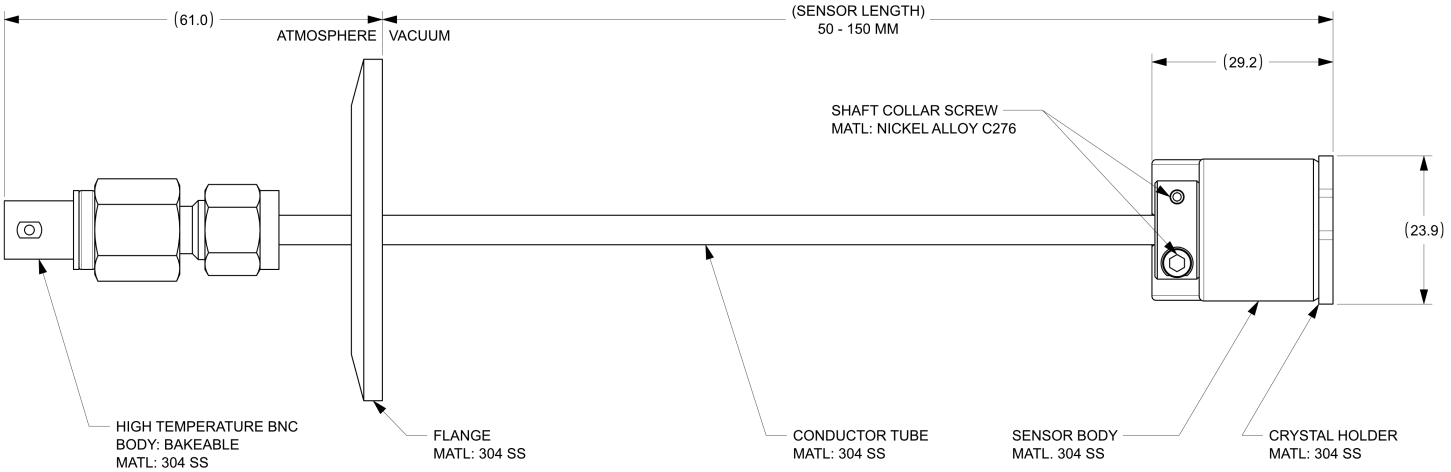
Specifications

Maximum temperature	200°C
Sensor head size (maximum envelope)	23.9 mm O.D. x 29.2 mm (0.94 in. O.D. x 1.15 in.)
Sensor length (in vacuum)	50–150 mm (1.97–5.91 in.)
Mounting feedthrough	ISO KF/CF flange

Materials

Body and holder	304 stainless steel
Springs	Au-plated BeCu
Coax line	4.8 mm (0.188 in.) O.D. stainless steel
Other mechanical parts	18-8 or 304 stainless steel, nickel C276
Insulators	>96% Al_2O_3 in vacuum: Teflon® used elsewhere
Wire	Ni in vacuum, Ni-plated Cu elsewhere
Braze	Vacuum-process high-temperature NiCr alloy
Crystal	14.0 mm (0.551 in.) diameter

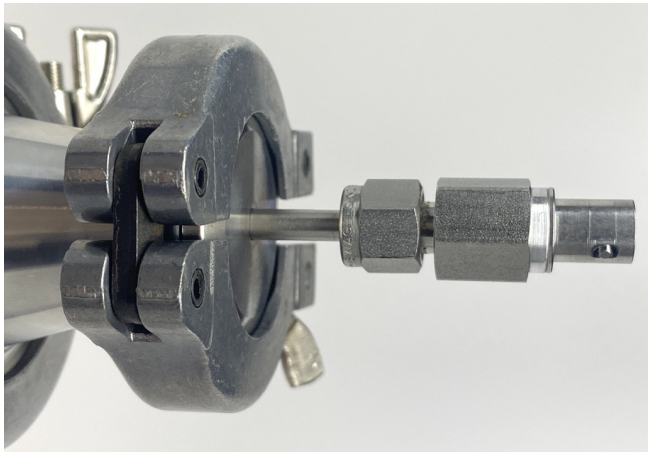
Dimensions



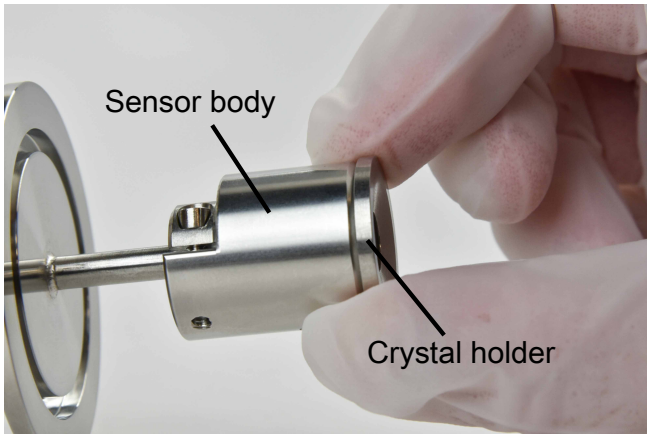
Crystal Holder Assembly Replacement

Replacing the entire crystal holder assembly is recommended over only replacing the crystal, as it takes less time and no additional tools are required.

1. Remove the QCM sensor from the installation location by releasing the ISO KF clamp or CF screws.



2. Twist the crystal holder counterclockwise to align the locking pin, then pull the crystal holder straight out of the QCM sensor body.



3. Install the new crystal holder assembly into the sensor body by pressing the crystal holder straight in, making certain that the crystal holder is completely seated in the sensor body. Some force is required, but ensure that the crystal is not used for leverage.
4. Twist the crystal holder clockwise to lock in place.
5. Install the QCM sensor back on the foreline with the ISO KF clamp or CF screws and the appropriate centering ring or metal gasket.

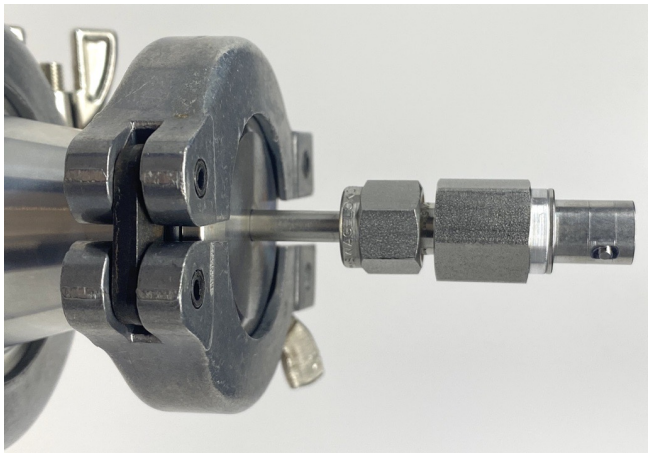
Crystal Replacement

Replacing only the crystal is an alternative option, but a crystal snatcher is required and the replacement process takes more time.

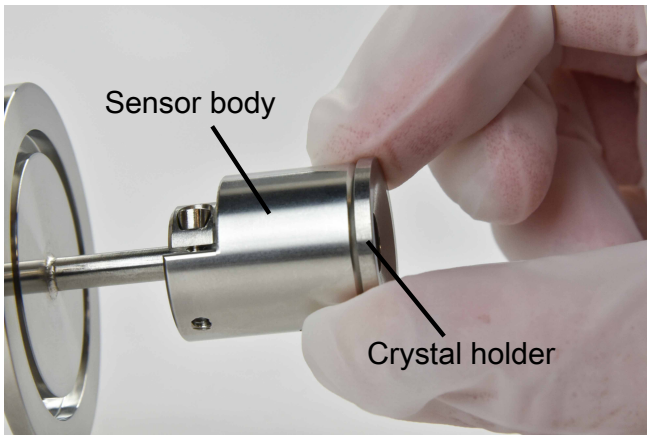
NOTICE

Avoid touching the crystal. Only handle the QCM crystal with Teflon tweezers and only handle the outer edges of the crystal.

1. Remove the QCM sensor from the installation location by releasing the ISO KF clamp or CF screws.



2. Twist the crystal holder counterclockwise to align the locking pin, then pull the crystal holder straight out of the QCM sensor body.



3. Insert the tapered end of a crystal snatcher (PN 008-007) into the ceramic retainer as shown below and apply a small amount of pressure. This locks the ceramic retainer to the snatcher and allows the ceramic retainer to be pulled straight out.

4 Invert the crystal holder to allow the crystal to drop out.

5 Using Teflon tweezers, grasp the edges of the new crystal. Orient the crystal so the patterned electrode is facing up. Gently insert the edge of the crystal beneath one of the wire segments inside the crystal holder. Release the crystal and ensure the crystal has dropped past both wire segments in the crystal holder. If necessary, use the tweezers to gently push the edge of the crystal to fully seat it in the crystal holder.

6 Replace the ceramic retainer by inserting it into the crystal holder at a slight angle and pressing down gently. Avoid using excessive force when handling the ceramic retainer to prevent breakage. Avoid rotating the ceramic retainer after installation to prevent scratching the crystal electrode.

7 Use a slight side-to-side rocking motion to release the ceramic retainer from the crystal snatcher. Pull the crystal snatcher up and out of the crystal holder. Turn the crystal snatcher around and use the back side to gently press the ceramic retainer to ensure it is completely seated in the crystal holder.

8 Reinstall the crystal holder into the sensor body by pressing the crystal holder straight in, making certain that the crystal holder is completely seated in the sensor body. Some force is required, but ensure that the crystal is not used for leverage.

9 Twist the crystal holder clockwise to lock in place.

10 Install the QCM sensor back on the installation location with the ISO KF clamp or CF screws and the appropriate centering ring or metal gasket.

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