

Redefining the Conventional

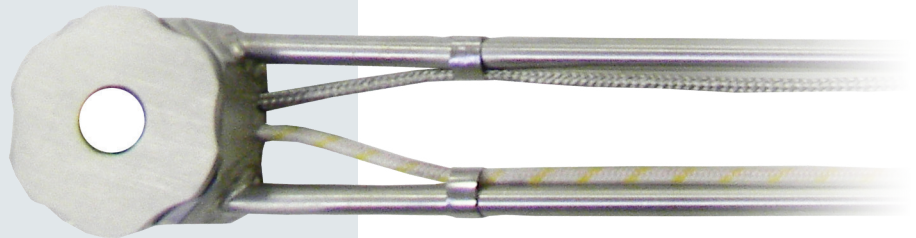
Temperature-fluctuation can be considered the most significant contributor to frequency drift in quartz crystals. Traditional sensor heads address this problem with water cooling. While many manufacturers advise that crystal temperature be kept at “around 20°C”, their products are incapable of actually measuring temperature.

Real-world application has shown that a standard water-cooled sensor can experience a 20° C flux within as few as 10 minutes during high-rate deposition. In an industry of nanometer measurements, this level of variance can easily result in considerable inaccuracy.

Dissatisfied with the level of precision available on the market, Colnatec undertook to design a sensor head that adds a new level of control to the thin film deposition process. As a result, the Phoenix™ sensor head is capable of not only measuring temperature but of withstanding temperatures higher than any other sensor head. This allows for monitoring processes up to 500°C (e.g., ALD, CVD, etc.).

When the Phoenix™ is combined with Colnatec’s Eon-LT™ monitor (or controller), temperature and frequency are automatically graphed alongside the corresponding rate and thickness values on a personal computer, allowing for real-time correction and accuracy up to .001 Hz.

The Phoenix™ is optimized for Colnatec’s RC™ crystals that are uniquely immune to radiation spikes and film stress caused by shutter openings, film condensation, and source radiation. The system is ideal for ALD systems when used with HT crystals, reducing ex-situ metrology sampling and scrapped runs due to real-time control of process and/or reactor conditions. In addition, the Phoenix™ achieves greater accuracy in film deposition per wafer, leading to increased process yield and improved film quality.



PHOENIX™ SINGLE FILM THICKNESS SENSOR

CONVENTIONAL SENSOR WITH EMBEDDED THERMOCOUPLE

Features

- Temperature measuring quartz crystal sensor head, single versions
- Embedded type K thermocouple
- Designed for 14 mm diameter crystals, up to 10 MHz operation
- Available with 2.75 Conflat™ or 1” bolt feed through as stock configuration. Length 30” (75 mm). Custom sizes, flanges, and bends available. Also available with compression fittings to allow infinite length adjustability.
- Standard SMA air side connection for crystal measurement. Compatible with the Eon-ID, Eon-LT™, or other film thickness monitors and controllers

Applications

- Atomic Layer Deposition (ALD)
- Chemical Vapor Deposition (CVD)
- Molecular Beam Epitaxy (MBE)
- CIGS (thin film solar)
- OLED (display & lighting)
- Multi-Layer Optical Thin Film Deposition

Specifications

Dimensions	
Length	4" to 30" depending on customer requirements
Cross Section	Able to be passed through a 2.75" ConFlat™ port
Ordering Information	
Phoenix™	Standard sensor with embedded thermocouple