

Maxtek PLO-10i

Phase Lock Oscillator



LOW COST, EASY TO USE OVER A WIDE FREQUENCY RANGE

The PLO-10i Phase Lock Oscillator is a major advancement in QCM instrumentation. Specially designed for demanding research applications, the PLO provides very accurate measurements of crystal frequency and crystal resistance in a low cost and easy to use package.

The PLO-10i achieves a high level of performance through the use of phase lock technology developed specifically for QCM measurements of lossy films in both gas and liquid phase. The PLO's accuracy is the result of effective shunt capacitance cancellation and minimal phase error as compared to traditional oscillator circuits. The unit's net shunt capacitance can be adjusted below 0.3 picofarad, which is especially important when the QCM losses are large and changing.

The PLO's absolute phase error is +/- 2 degrees and phase stability is maintained within +/- 0.5 degrees over a temperature range of 50° to 100°F. All of this translates into very accurate frequency and resistance measurements even with heavily loaded crystals. In fact, the unit's absolute frequency error is less than 250 Hz with a 5,000 ohm crystal (Q=240), less than 10 Hz for 1,000 ohms crystal and less than 0.1 Hz for a 100 ohm crystal.

In addition to being very accurate, the PLO operates over a wide frequency range. Two standard frequency ranges are available, 3.8 to 6 MHz and 5.1 to 10 MHz. Alternate frequency ranges are available upon request. The wide frequency range allows the PLO to measure crystals over most, if not all of their entire useful frequency range.

FEATURES AT A GLANCE

- High measurement accuracy
- Wide frequency range
- Supports heavily loaded crystals
- Crystal resistance output
- User adjustable capacitance cancellation

The PLO-10i can be used with our crystal holders and 1" diameter crystals. You can even attach an optional FC-550 flow cell to the crystal holder to create an easy to use low volume flow cell. All the user has to provide is a frequency counter and a volt meter to complete the QCM system. Of course, with the PLO's user adjustable capacitance cancellation, the PLO can be used with a wide variety of user supplied crystal and crystal holder configurations for special applications.

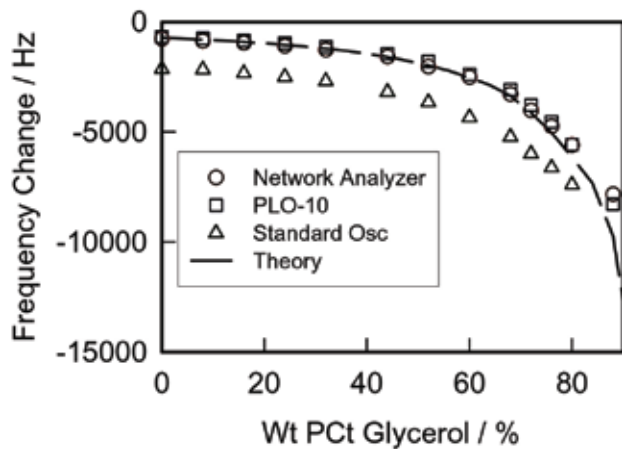


Figure 1 - Frequency change versus Glycerol weight percentage as predicted by theory and as measured by a Network Analyzer, the PLO-10i and a traditional oscillator.

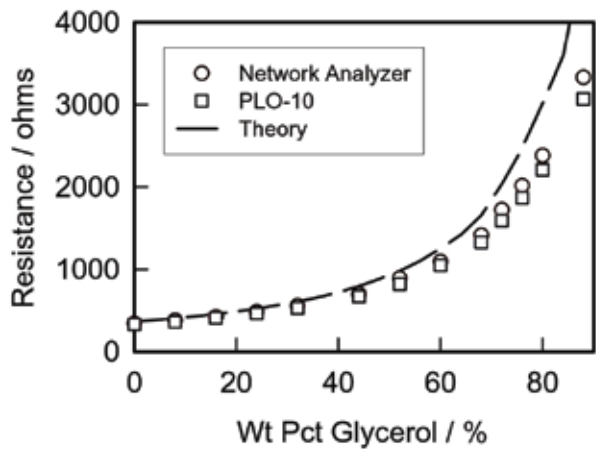


Figure 2 - Crystal resistance versus Glycerol weight percentage as predicted by theory and as measured by a Network Analyzer and the PLO-10i.

SPECIFICATIONS

Frequency Range	3.8 to 6.06 MHz, 5.1 to 10 MHz	Indicators	Green "Lock" LED Red "Unlock" LED Yellow "Sweep Rate" LED
Compensation	± 0.3 pfd	Crystal Drive Voltage	125 mV rms
Crystal Conductance Range	0.2 down to 0.0002 siemen	Crystal Drive Source Impedance	20 ohm ± 1%
Phase Angle Accuracy	± 2 degrees	Crystal Power	200 µW max.
Phase Angle Stability	± 0.5 degrees	Crystal Face Isolation	Transformer, ± 200 VDC maximum
Frequency Error Vs. Phase Error and Crystal Q	Q = 100,000 - 0.087 ppm per degree Q = 10,000 - 0.87 ppm per degree Q = 1,000 - 8.7 ppm per degree	Frequency Output Level	4 Vp-p
Conductance Output Range	0 to 40 millisiemen	Frequency Output Source Impedance	50 ohms
Conductance Output Scaling	100 volt/siemen	Conductance Output Level	0 to 4 VDC
Conductance Output Accuracy	± 10% + 50 microsiemen	Conductance Output Source Impedance	1,000 ohms
Operating Temperature Range	0 to 55°C	Power	12 to 15 VDC @ 150 mA
Operating Temperature Range for Stated Stability	20 ± 10°C	Size	1.6"W x 3.2"H x 4.8"D
Controls	Reset Switch, Coarse and Fine Capacitance Trimmers	Weight (Shipping)	3 lbs.

ORDERING INFORMATION

Part #	Description
605206	PLO-10i Phase Lock Oscillator (3.8 to 6 MHz Frequency Range). (Note: crystal sensor and holder, not included, are also required.)
605206-2	PLO-10i Phase Lock Oscillator (5.1 to 10 MHz Frequency Range). (Note: crystal sensor and holder, not included, are also required.)

Accessories

172205	CHT-100 Teflon® Crystal Holder. (1" diameter crystal- with SMB termination.)
173205	CHC-100 CPVC® Crystal Holder. (1" diameter crystal- with BNC termination.)
184204	CHK-100 Kynar® Crystal Holder. (1" diameter crystal- with SMB termination.)
603216-2	Cable, SMB Plug - SMB Plug, 2' length
888023	Adapter, BNC Male to SMB Jack
184208	FC-550 Flow Cell Easily attaches to any CHT-100 Crystal Holder. Kynar body with Viton o-ring.

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