# EQ-10 EUV Light Source

Electrodeless Z-Pinch™ 10 Watt EUV Source

The EQ-10 is a compact, easy-to-use, reliable, and cost-effective EUV light source, based on Energetiq's proven Electrodeless Z-Pinch™ technology using Xenon gas. The EQ-10 EUV source is uniquely suited for metrology and research applications. The EQ-10 has become the workhorse EUV source for the EUV community, through its proven reliability, ease of use, and low operating cost.

The Energetiq EQ-10 EUV Source's modular design makes it ready to be integrated in a process tool. The system includes the electrodeless Z-pinch source assembly, vacuum and gas subsystems, power delivery subsystem, and control electronics. The EQ-10 is capable of delivering up to 10 Watts of in-band EUV into 2π steradians and will run continuously at pulse repetition rates of up to 2 kHz.
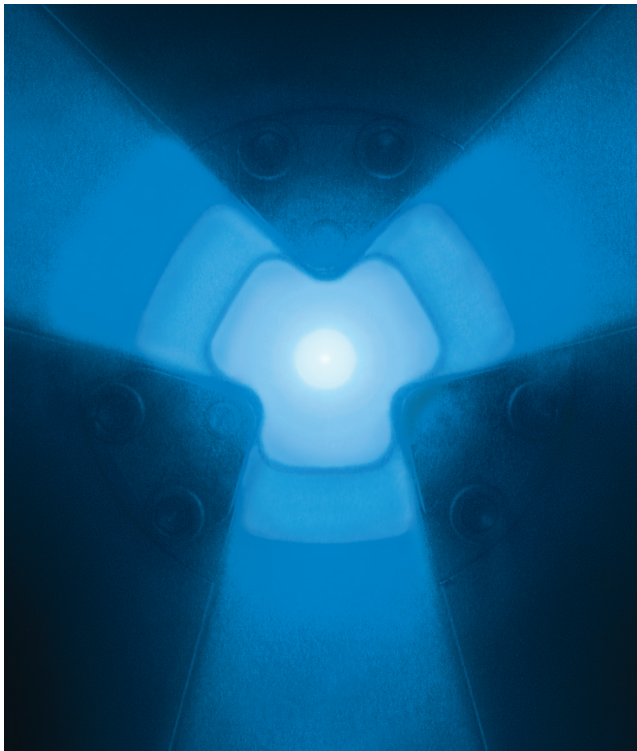
EQ-10

**Electrodeless Z-Pinch Source
– View of visible light**

Features & Benefits

Performance

- 10W into 2π using Xenon
- Up to 2 kHz pulse rate
- Small plasma size
- Low debris

Low Cost of Ownership

- Low Xenon flow rate
- Minimized consumable cost
- Small footprint

Proven Reliability

- Patented Electrodeless Z-Pinch technology
- CE-Mark and SEMI S2-0703 compliant

Applications

- EUV Metrology
- EUV Resist Development
- Defect Inspection
- EUV Microscopy

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Electrodeless Z-Pinch™ Technology

Z-pinch plasmas have been shown in the literature to be effective at producing EUV and SXR light. However, all the implementations to date have involved conducting high discharge currents into the plasma using electrodes. These electrodes, which are typically in contact with high temperature plasma, can melt and produce significant debris.

Energetiq's unique technology is also based on a Z-pinch plasma, but it avoids electrodes entirely by inductively coupling the current into the plasma. The plasma in the Energetiq source is magnetically confined away from the source walls, minimizing the heat load and reducing debris. Energetiq's Electrodeless Z-Pinch technology has excellent spatial stability, and stable repeatable power output.

Specifications

EUV Performance

• EUV Power Output	10 Watts into 2π steradians (13.5 nm, ±1% bandwidth)
• Pulse Repetition Rate	1200 to 2000 Hz
• Source Operating Pressure	70 to 100 mTorr typical
• Xenon Flow Rate	5 to 15 sccm typical

Physical Specifications EQ-10RH

	System Dimensions (H x W x D)	Weight
• Instrument Rack	1356 x 611 x 915 mm (53.4 x 24.1 x 36.0 in)	215.5 kg (475 lbs)
• Modulator	498 x 356 x 701 mm (19.6 x 14.0 x 27.6 in)	54.4 kg (120 lbs)
• Source	764 x 556 x 533 mm (30.1 x 21.9 x 21.0 in)	95.3 kg (210 lbs)
• Fore Pump Assembly	643 x 259 x 460 mm (30.1 x 21.9 x 21.0 in)	27.7 kg (61 lbs)

Utility Requirements

• Electrical	200–230V, 3Ø, 50/60 Hz, 30A
• Cooling Water	40-60 PSID (0.28–0.41 MPa), 1.5 GPM (5.7 lpm) min., 30°C max. inlet
• Clean Dry Air	75–90 PSIG (0.52–0.62 MPa)
• Xenon	15–40 PSIG (0.10–0.28 MPa), 20 sccm max. (10 sccm typ.)

Compliance

• EQ-10 Series	CE Mark, SEMI S2-0703

Patent Numbers:
US 7,307,375
US 7,199,384
US 7,183,717
US 7,948,185
US 8,143,790
EP 2187711
Other patents applied for.

About Energetiq...

Energetiq Technology, Inc. is a developer and manufacturer of advanced short wavelength light products that enable nano-scale structures and products. The Energetiq team combines its deep understanding of the high power plasma physics needed for short wavelength light generation with its long experience in building rugged, industrial and scientific products. The result is that users can expect the highest levels of performance combined with the highest reliability.

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Specifications are subject to change without notice.
EQ10 Series—6/11