

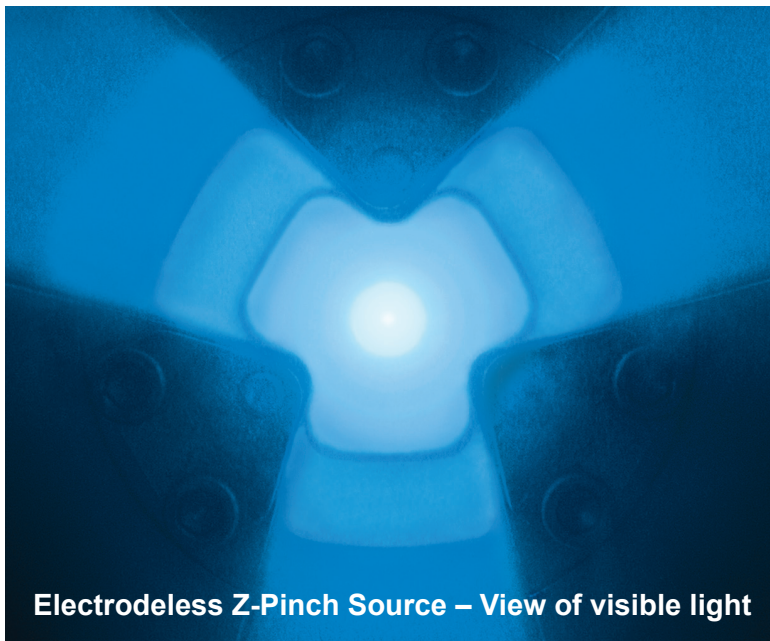
EQ-10HR



High Repetition Rate Electrodeless Z-Pinch™ 10 kHz EUV Source

The EQ-10HR 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-10HR high repetition rate EUV source is uniquely suited for metrology and research applications where simulation of high volume manufacturing (HVM) is required.

The Energetiq EQ-10HR EUV source is a stand-alone system ready to be integrated into a process tool. It includes the Electrodeless Z-pinch™ source assembly, maglev vacuum pumping subsystem, gas delivery subsystem, power delivery subsystem, and control electronics.



Electrodeless Z-Pinch Source – View of visible light

Features and Benefits

- Performance
 - 10 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 S2-0715 compliant

Applications

- Accelerated EUV Optics Testing
- EUV Metrology
- EUV Resist Development
- Defect Inspection
- EUV Microscopy



About Energetiq

Energetiq Technology, Inc. is a wholly-owned subsidiary of Hamamatsu Photonics. Energetiq combines its deep understanding of the plasma physics needed for high-brightness light generation with its long experience in building rugged industrial & scientific products. The result is that users can expect the highest levels of performance combined with the highest reliability.

Electrodeless Z-Pinch™ Technology

Z-pinch plasmas have been shown 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, however 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		
• Pulse Repetition Rate	10 kHz	
• Source Operating Pressure	150 mTorr typical	
• Xenon Flow Rate	100 sccm typical	
Physical Specifications EQ-10HR		
	System Dimensions (H x W x D)	Weight
• Source Rack	2002 x 611 x 915 mm (78.8 x 24.1 x 36.0 in)	440 kg (968 lbs)
• 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	810 x 697 x 769 mm (31.9 x 27.5 x 30.3 in)	98.4 kg (217 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	208V, 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	80–100 PSIG (0.55–0.69 MPa)	
• Xenon	15–40 PSIG (0.10–0.28 MPa), 100 sccm max. (40 sccm typ.)	
Compliance		
• EQ-10 Series	CE Mark, SEMI S2-0715	

Patent Numbers: US: 7307375; 7199384; 7183717; 7948185; 8143790 -- EP 2187711 -- *Other Patents Pending*



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