

The BIRNS Dual Kelvin™ is a powerful 32,000+ lumen tungsten-halogen nuclear-grade underwater lighting system seismically qualified per IEEE-344. Durable, simple, light-weight and easy to use, this innovative unit has been proven in nuclear facilities around the world to enhance safety and accelerate refueling operations.



High Performance . . . Under Pressure®

The BIRNS Dual Kelvin is designed for underwater use in areas with high levels of radiation and nuclear contamination and is the world's simplest, most durable and dependable fuel pool lighting fixture. It includes a powerful underwater subsea-grade connector system designed for depths to 6km, and permits power cords to be quickly detached or replaced without tools. Its housings are free flooding for high-efficiency water cooling, yet compatible with Class A GFCIs (ground fault circuit interrupters). The BIRNS Dual Kelvin is supplied with durable 120V/1000W 3200K 'white light' lamps in a choice of wide, medium or narrow beam angles, and features instant on/off, hot-restrike, and 100% dimming capability without need for expensive and cumbersome ballasts.

BIRNS Dual Kelvin lamp protectors are made of Lexan polycarbonate—with over 30 times the impact resistance of safety glass, and over 300% the radiation tolerance of acrylic. The fixture's innovative design eliminates all uncaptivated parts; yoke nuts, for example, are mechanically captivated and welded into place, while the yoke support brackets are each secured with six welds. Relamping is easy, and can be performed by hand, without tools, in 60 seconds while wearing three pairs of gloves (no "screw-in" lamp sockets). The versatile system is easily decontaminated, and



BIRNS Screened Kelvin shown here

includes special pan/tilt yokes allowing the lights to be independently aimed. An optional Wall Bracket (item 44H-007) is also available for ease of mounting.

EXCLUSIVE FEATURES

- Brilliant 32,000+ lumen illumination, true-white color
- 60-second tool-free relamping
- Choice of three beam angles
- Instant on/off and ballast-free operation
- Complete dimming capability (0-100%)
- Seismically qualified per IEEE-344
- Rugged, all stainless steel inside-containment construction
- Integral underwater connectors, designed for easy operation

APPLICATIONS

Thousands of BIRNS Dual Kelvins are trusted in nuclear power plants worldwide, as they are ideal for long-term illumination of fuel pools and transfer canals, and extensively used in reactor cavity illumination during fuel movement or other large-scale activities.



BIRNS' Quality Management System is ISO 9001:2008 Certified; NRC 10CFR50, App. B Compliant

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SPECIFICATIONS

ORDERING INFORMATION

Model 2501 BIRNS Dual Kelvin includes:

- Two Model 5801 BIRNS Kelvin luminaires with 120V/1000W lamps (specify beam angle)
- One 44L-001-05 SS (Stainless Steel) mounting pole, 1.5m
- One 17F-049 Dual Kelvin Power Cable Assembly (7.5m standard; 15m or 30m optionally available). Can also be upgraded to Super-Vutron cable.

Model 2513 BIRNS Dual Kelvin includes:

- Two Model 5813 BIRNS Screened Kelvin luminaires with 120V/1000W lamps (specify beam angle). BIRNS Screened Kelvins feature rugged SS mesh coverings over all housing cooling holes, and specially designed Lexan plugs to cover the lamp protector finger holes, features which further enhance safety for high performance nuclear underwater illumination applications.
- One 44L-001-05 SS mounting pole, 1.5m
- One 17F-049 Dual Kelvin Power Cable Assembly (7.5m standard; 15m or 30m optionally available). Can also be upgraded to Super-Vutron cable.

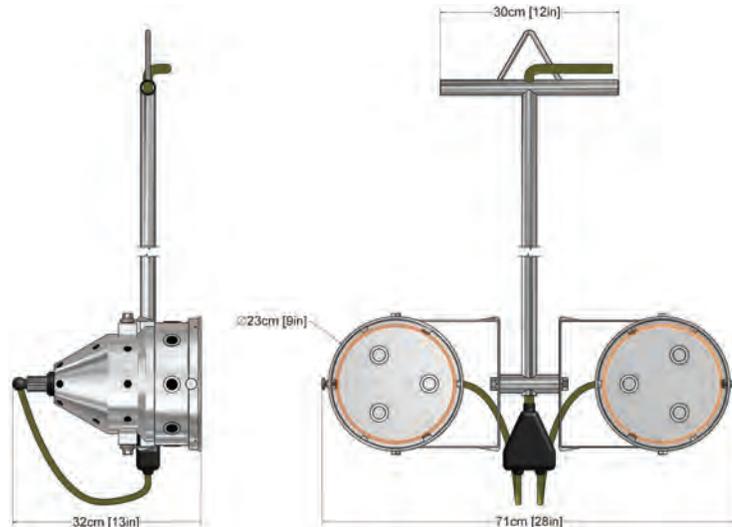
Replacement Lamps (all 120V/1000W)

- 32D-028 narrow beam (20° x 24°)
- 32D-029 medium beam (21° x 44°)
- 32D-030 wide beam (45° x 71°)

Optional wall bracket: 44H-007

Power Cable Assemblies

- Dual Kelvin (Aquaprene) Power Cable Assembly (standard)
 - 17F-049-25 : 7.5m (25 ft) (standard)
 - 17F-049-50 : 15m (50 ft)
 - 17F-049-100 : 30m (100 ft)
- Dual Kelvin Super-Vutron Power Cable Assembly
 - 17F-049-SV-25 : 7.5m (25 ft) (standard)
 - 17F-049-SV-50 : 15m (50 ft)
 - 17F-049-SV-100 : 30m (100 ft)



Cable can be routed through the mounting pole for protection or outside it for maximum convenience.

PHYSICAL

Length:	150cm (59 in.) from top of pole to middle of light
Width:	71cm (28 in.)
Depth (front to back):	32cm (13 in.)
Weight in Air:	14.1kg (31.0 lbs.) without cable

LIGHTING/PHOTOMETRIC

Lamp Type:	Incandescent Tungsten-Halogen PAR-64 (Parabolic Aluminized Reflector)
Time To Full Brightness:	<1 s after application of power
Operating Position:	Universal (i.e. any position)
Rated Average Lifetime: ¹	4,000 hours ²
Dimming Range:	0-100%
Rated Light Output:	16,000 Initial Lumens x2
Correlated Color Temp.:	3200K

ENVIRONMENTAL

Protection Level:	IP 68
Depth Rating:	30m (100 FSW) + 50% safety margin
Seismic Qualification:	Per IEEE-344, with 2% OBE and 3% SSE damping
Expected Radiation Tolerance:	4 x 10 ⁵ Gy (4 x 10 ⁷ R)

ELECTRICAL

Input Voltage: ³	115 +/- 15 VAC or VDC
Supply Frequency:	60 or 50Hz
Cable Size:	16 AWG type SO, 3 conductor (standard)
Cable Current Rating:	25 amperes maximum
Cable Voltage Rating:	600 volts maximum
Nominal Lamp Wattage:	1000 Watts x2

MATERIALS

All Housing Parts:	Stainless steel type 304	
Yoke Frame and Base:	Stainless steel type 304	
All Hardware, ground wire:	Stainless steel type 18-8	
Lamp Protector:	Polycarbonate (Lexan)	10 ⁵ Gy
Lamp Cushion/Backing Ring:	Silicone	10 ⁶ Gy
Connector:	Glass-reinforced epoxy (GRE)	10 ⁶ Gy
Connector Pins:	Copper alloy, gold-plated per MIL-G-45204	
Aquaprene Cable (standard):	CR (Neoprene) jacket, STR insulation	10 ⁶ Gy
Super-Vutron Cable (optional):	CSPE jacket, EPDM insulation	10 ⁶ Gy

¹The time after which 50% of test lamps were no longer operating.

²These ratings are determined by the lamp manufacturer based on laboratory tests under controlled conditions. Field results may vary.

³Substantive input voltage variation will affect lamp performance characteristics, including light output, lamp life, consumed power, color temperature, etc. Generally, higher voltage use will increase light output, power, and color temperature and will lessen lamp life, and lower voltages will have converse effects. However, the relationships are linear only near the rated input voltage value.