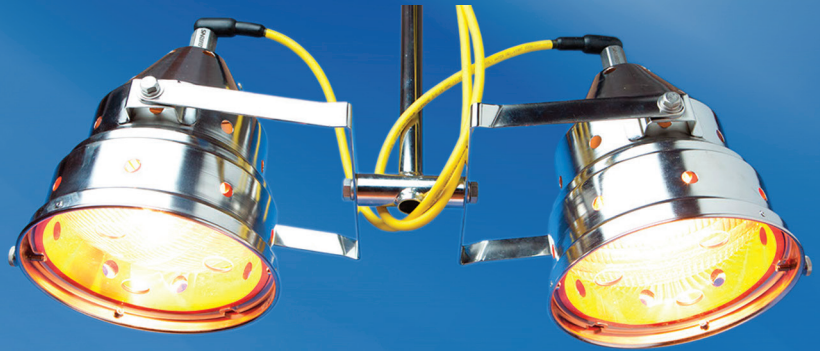




# DUAL KELVIN™

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 2950K '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



BIRNS Screened Kelvin shown here

yoke support brackets are each secured with six welds. Plus, the BIRNS Screened Dual Kelvin (Model 2513) includes rugged stainless steel mesh coverings.

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 includes special pan/tilt yokes allowing the lights to be independently aimed.

## 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 9001:2015 Certified;  
NRC 10CFR50, App. B Compliant



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## High Performance . . . Under Pressure®

## SPECIFICATIONS

### ORDERING INFORMATION: Model 2501 and 2513

The Model 2501 BIRNS Dual Kelvin includes two Model 5801 BIRNS Kelvin luminaires with 120V/1000W lamps, one 1.5m (5 ft.) 44L-001-05 SS mounting pole, and one 17F-049 Power Cable Assembly.

The Model 2513 BIRNS Screened Dual Kelvin includes two Model 5813 BIRNS Kelvin luminaires with 120V/1000W lamps, one 1.5m (5 ft.) 44L-001-05 SS mounting pole, and one 17F-049 Power Cable Assembly.

**Step 1:** Select "Standard" or "Screened" Kelvins.

**Step 2:** Select a beam angle.

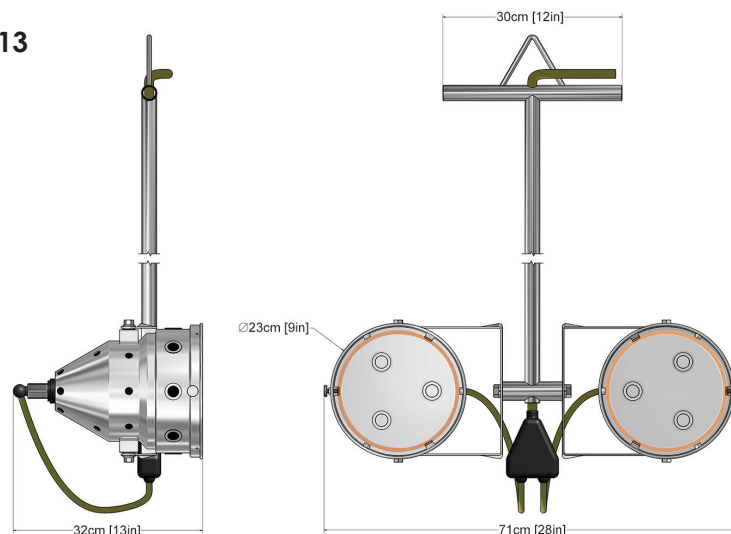
**Step 3:** Select cable length and type  
(Aquaprene or Super Vu-tron®).

**Step 4:** Complete the model number per the schemata below.

	<b>2501</b>	<b>-</b>	<b>MB</b>	<b>-</b>	<b>130</b>	<b>-</b>	<b>SV</b>
<b>Kelvin Type</b>							
2501: Kelvin							
2513: Screened Kelvin							
<b>Beam Angle*</b>							
NS: Narrow Spot (20°x24°)							
MB: Medium Beam (21°x44°)							
WF: Wide Flood (45°x71°)							
<b>Cable Length</b>							
25 ft. (7.6m)							
50 ft. (15m)							
100 ft. (30m)							
130 ft. (40m)							
<b>Cable Type</b>							
SV: Super-Vutron							
Blank: Aquaprene							

**Step 5:** Select optional Items.

Item	Description
62A-004	Spare Lexan Protector
25A-002	Spare Silicone Backing Ring
32D-028	Spare lamp Narrow Spot
32D-029	Spare lamp Medium Beam
32D-030	Spare lamp Wide Flood
44H007	Wall Bracket



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: <sup>1</sup>	4,000 hours <sup>2</sup>
Dimming Range:	0-100%
Rated Light Output:	16,000 Initial Lumens x2
Correlated Color Temp.:	2950K

#### 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 <sup>5</sup> Gy (4 x 10 <sup>7</sup> R)

#### ELECTRICAL

Input Voltage: <sup>3</sup>	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 <sup>5</sup> Gy
Lamp Cushion/Backing Ring:	Silicone	10 <sup>6</sup> Gy
Connector:	Glass-reinforced epoxy (GRE)	10 <sup>6</sup> Gy
Connector Pins:	Copper alloy, gold-plated per MIL-G-45204	
Aquaprene Cable (standard):	CR (Neoprene) jacket, STR insulation	10 <sup>6</sup> Gy
Super-Vutron Cable (optional):	CSPE jacket, EPDM insulation	10 <sup>6</sup> Gy

<sup>1</sup>The time after which 50% of test lamps were no longer operating.

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

<sup>3</sup>Substantive 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.

\*This is the beam angle of each (singular) lamp, defined as the angle at which the intensity is 50% of maximum.