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Title

BIRNS Quantum High-Bay LED Light
Model 4301 Instruction Sheet

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SAFETY INSTRUCTIONS

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

- a) **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
- b) Do not use outdoors.
- c) Do not let power supply cords touch hot surfaces.
- d) Do not mount near gas or electric heaters.
- e) Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- f) The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- g) Do not use this equipment for other than intended use.
- h) Read and understand this manual before installing, operating or maintaining the equipment.
- i) Do not use in areas where explosive or flammable vapors may be present.
- j) Ensure that AC power supply is de-energized (“OFF”) prior to installation.
- k) Mount and use this unit in strict accordance with National Electrical Code, Uniform Building Code, Life Safety Code, and/or any other local code requirements. Use only approved wiring methods.
- l) Always de-energize and ground the equipment before maintenance.
- m) Installation and servicing of this unit should be performed by qualified service personnel.

SAVE THESE INSTRUCTIONS

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Safety Notice Symbols

Danger, Warning, Caution and Notice statements are used throughout this manual to emphasize important and critical information, and to indicate the degree of hazard that may be encountered by the user. These words and symbols are defined as follows:



Danger: death or serious injury will result if proper precautions are not taken.



Warning: death or serious injury could result if proper precautions are not taken.



Caution: that minor or moderate injury could result if proper precautions are not taken.



Notice: addresses practices not related to personal injury.

Qualified Person

For the purposes of this manual and product labels, a qualified person is one who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved. In addition, this person has the following qualifications:

1. Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
2. Is familiar with the installation and maintenance of electrical equipment.
3. Is trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.

Scope

This Manual provides basic information and requirements for installation and maintenance of the BIRNS Quantum High-Bay LED Light Model 4301.

Product Description and Purpose

The Model 4301 BIRNS Quantum High-Bay LED floodlight delivers powerful illumination for demanding high-ceiling applications throughout nuclear facilities and particularly inside Containment. Emitting over 21,000 lumens of near daylight “white light”, it provides safer, more comfortable and efficient working conditions. It has a low 210W power draw and a 109,000 hour lamp life—along with high optical efficiency of 102 lumens per Watt—delivering huge energy savings over metal halide and tungsten halogen lamp options.

Product Layout

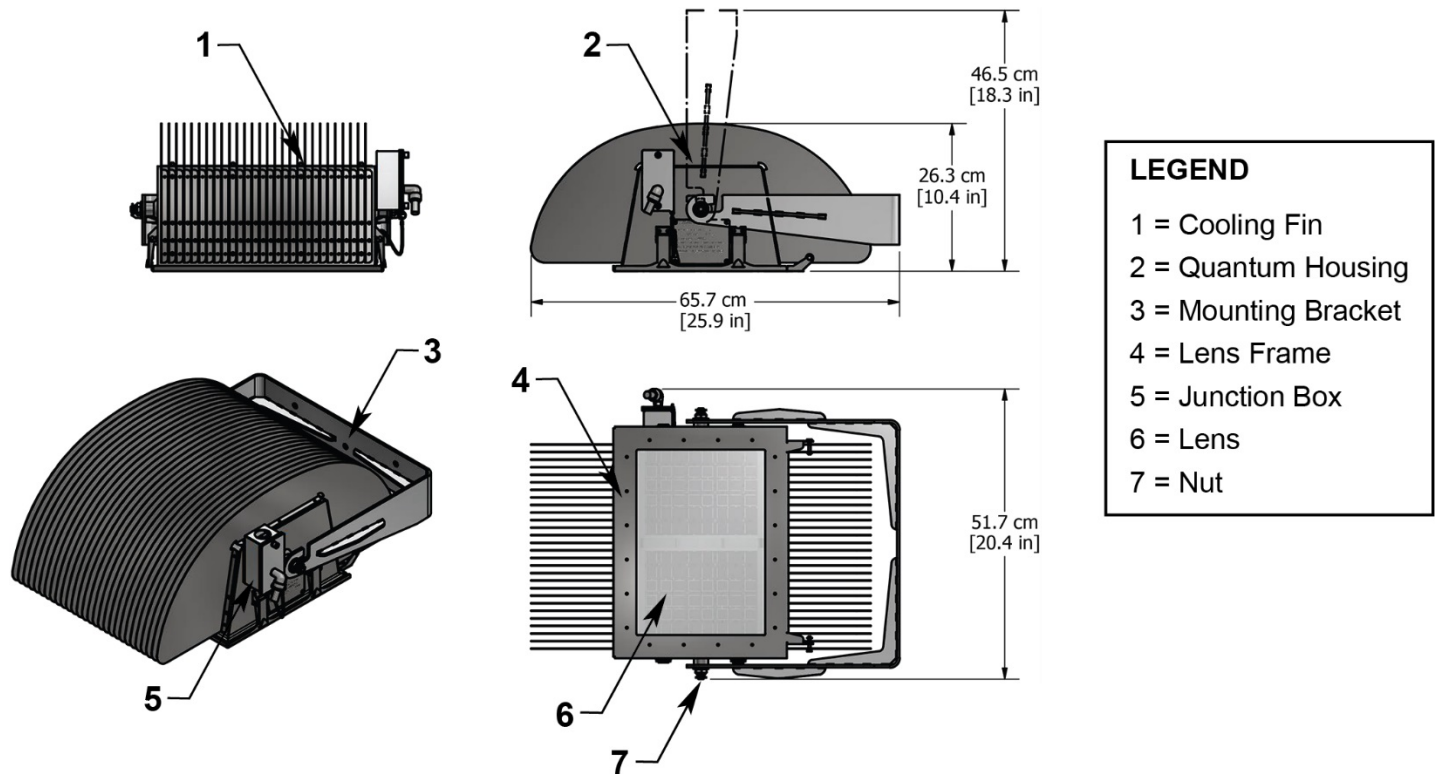


Figure 1 – BIRNS Quantum Exterior



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Installation Instructions

Unpacking



THE PACKED UNIT WEIGHS 70 POUNDS (32 KILOGRAMS). DO NOT DROP IT. TAKE ALL NECESSARY SAFETY PRECAUTIONS WHEN LIFTING HEAVY WEIGHTS.



To protect the unit during transportation to the installation site, it is recommended unpacking be performed in the same area as final installation.

1. Set the packaged unit on a flat horizontal surface (table, floor, etc.). Lay the carton flat.
2. Cut open the packing tape on the “top” of the carton and open the carton flaps.
3. Remove the foam rubber packing protecting the Quantum fins.



When removing the mounting bracket, do not over-loosen or completely remove the nut handle, as this can damage or dislodge the retaining washer.

4. Remove the mounting bracket from the housing assembly by loosening the locking nut handles (turn counter-clockwise) until the bracket can be slid off the mounting bracket buttons.
5. Remove the mounting bracket from the box.

Installation



THE QUANTUM IS HEAVY AND THE BRACKET MUST BE SECURED AS DEFINED BELOW TO AVOID POSSIBLE HAZARDS FROM FALLING OR LOOSE ASSEMBLIES.

Bracket Installation

As a minimum, the Quantum mounting bracket must be secured to the facility (wall, ceiling, post, etc.) using the two outer mounting holes. For added security, it is recommended the middle mounting hole also be secured. The bracket must be secured using **5/16-inch (8-mm)** (minimum diameter) fasteners. For horizontal (i.e. wall) installation, install the mounting bracket with the retaining slot openings on top.

Affix the bracket to the substrate as follows:

1. If mounting bolts have not been previously configured and installed:
 - a. Using the bracket as a template with the bracket retaining slot openings facing up, mark the location of the desired mounting holes onto the mounting surface. Ensure the bracket is level and centered when marking the mounting points.
 - b. Using the appropriately sized drill, drill holes through the marked points.
2. Using the appropriate number of mounting bolts (two minimum) secure the bracket to the mounting surface with the bracket retaining slot openings facing up.



THE QUANTUM HOUSING IS HEAVY. TO AVOID INJURY OR DAMAGE, LIFTING THE HOUSING AND INSTALLING ONTO THE MOUNTING BRACKET SHOULD BE PERFORMED BY TWO PEOPLE.



Mounting on to Bracket

Install the Quantum housing onto the mounting bracket as follows.

1. Remove the housing from the packing box by grasping the mounting bracket buttons and lifting the housing up and out of the box.
2. Position the housing over the mounting.
3. Carefully slide the mounting bracket button threads in to the bracket retaining slot openings.
4. Ensure the bracket button threads are fully forward in the bracket retaining slot.

5. Aim the Quantum as desired. When it is in the desired position, adjust the J-box vent to point within 45 degrees of straight toward the floor.
6. Ensure the button threads and the lock nut threads are coated with a nuclear-grade anti-seize compound.
7. Tighten the locking nuts by turning clockwise. Tighten the lock nut just until the slack is removed from the nut, Belleville washer, and bracket. Then tighten the nut 60 degrees more.

NOTICE

The Quantum is designed to be connected to facility AC power via a user-supplied conduit. The Quantum must be connected to facility input AC and the conduit secured in accordance with appropriate local and industry regulations. Three lever-type connectors are supplied for use at the user's discretion.

Post-Installation

1. Remove any protective film from housing and lens.
2. Dispose of all shipping material.

Electrical Connections

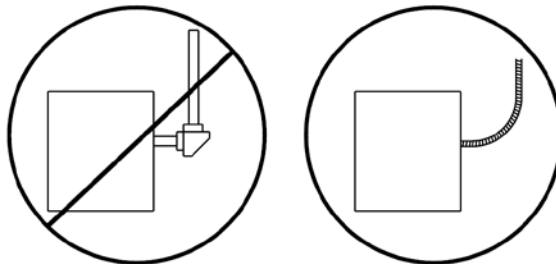
⚠ DANGER

ENSURE AC POWER IS "OFF" (DE-ENERGIZED) PRIOR TO INSTALLATION!

1. Remove the junction box cover by unscrewing the two Phillips head screws just until the lid can be removed. The screws are captive and should not be completely removed from the lid.
2. Route input power conductors, through a suitable flexible conduit, into the junction box.

NOTICE

We recommend that a UL-listed stainless-steel liquid-tight flexible conduit be used (although suitable flexible power cord is an alternative). Either way, rigid conduit should NOT be used.





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3. Route the facility AC power supply into the junction box.
4. Connect the facility ground line to the Quantum ground wire (green)
5. For 100 or 120 VAC installations, perform the following:
 - a. Connect the facility live line to the Quantum positive (brown) wire.
 - b. Connect the facility neutral line to the Quantum neutral (blue) wire.
6. For 220, 240 or 277 VAC installations, perform the following
 - a. Connect one facility line to the Quantum positive (brown) wire.
 - b. Connect the second facility line to the Quantum neutral (blue) wire.
7. Ensure the junction box lid threads are coated with a nuclear-grade anti-seize compound.
8. Replace the junction box cover and secure with two Phillips head screws.
9. Tighten the fluid-tight cable fitting until the cable is secured.

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Operation Instructions

The BIRNS Quantum is extremely simple to operate. Simply energize the circuit to operate the fixture. Turn “OFF” the power to turn off the fixture.

Preventative Maintenance

The Quantum High-Bay light is designed to be maintenance free. However, keeping the unit clean and the cooling fins free of dirt and debris will help ensure a long service life.

Troubleshooting Guide

The following is a list of possible problems with their causes and required corrective actions.

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
AC supply breaker trips	1. Short circuit in AC supply line 2. Overload on circuit 3. Incorrect power connections 4. Short circuit in junction box wiring	1. Remove short-circuit 2. Correct for proper load 3. Check input power connections and correct. 4. De-energize power and inspect wiring for loose or dislodged connections, then correct wiring.



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Technical Specifications

Physical

Length:	25.9 in (65.7 cm)
Height (max):	18.3 in (46.5 cm)
Height (min):	10.4 in (26.3 cm)
Width:	20.4 in (51.7 cm)
Weight:	70 lb. (32 kg)

Materials

Housing:	430 stainless steel
Mounting Hardware:	300 series stainless steel
Gaskets:	Silicone rubber
Window:	Tempered glass
Window frame:	300-series stainless steel
Window shield:	Polycarbonate

Lighting/Photometric

Lamp type:	High-power LED
Luminous Flux:	21,383 lm
Correlated Color Temperature:	4872 K
Average rated lamp life:	109,000 hours
Operating Position:	Universal (any position)
Fixture Type:	Flood

Electrical

Mains Input (VAC):	100, 120, 220, 240, 277
Frequency:	50 Hz or 60 Hz
Current:	1.8A @ 120 VAC
Power:	210 W

Environmental & Qualifications

Protection Level:	IP56
Radiation Tolerance:	2.5×10^5 Gy (2.5×10^7 R)
Seismic Qualifications:	Per IEEE 344-1987, IEEE-323-1974, IEEE 696-2005 High Required Response Spectrum, ICC-ES AC156, IEEE-382-1996, and NRC Guides 1.89 and 1.100
Certifications:	UL 1598, UL 8750
Operating Position:	Universal (any position)
Fixture Type:	Flood