**KNIGHT™ BOLLARD**

**PRODUCT DATA**

**Knight Bollards** combine rustproof construction, a unique geometric design, and the striking aesthetic of the rest of the Knight family. Fixtures consist of a robust square column with the light source positioned above a beautifully detailed quadrant casting. Bollards can be specified for lighting only or with an optional internal security core designed to protect buildings and public spaces against vehicle infringement. Available with CFL, HID or LED lamping, standard Knight Bollards have a symmetrical lighting pattern.

### MATERIAL & CONSTRUCTION DETAILS

**COLUMN**
- Column is 8" x 8" square (203 mm x 203 mm square) extruded aluminum with rounded corners.
- Standard height is 43.1" (1095 mm); shorter heights down to a minimum of 33" (838 mm) are available on a custom basis.

**HEAD**
- Aluminum quadrant casting with aluminum lamp housing and four borosilicate glass lenses. Lenses can be replaced with opaque shields for asymmetrical distribution, if required.
- 45 lbs (20.4 kg)

**WEIGHT**
- 45 lbs (20.4 kg)

**FLUORESCENT LAMPS & BALLASTS**
- Standard lamp options are compact fluorescent (CFL) or high intensity discharge (HID). See lamp information on pages 3 and 4.
- Metal halide lamps are color-improved.
- Compact fluorescent: electronic, thermally protected, 120/277V combination for 26W or 42W compact fluorescent lamp, less than 10% THD, 0 °F starting temperature.
- High intensity discharge: F-can ballast, thermally protected, 120/277V, -20°F starting temperature, class B sound rating.

**LED LAMP & DRIVER**
- Custom LED light engine, featuring advanced LED technology with 16W, 3000K warm white and 4000K natural white LEDs.
- LED driver has two options: 0-10V dimming (120-277V input power) or phase dimming (120V input power); -40°C to 90°C operating temperature.
- LED driver certifications include: IP66 (waterproof) enclosure, and Class 2 rated output (UL8750).

### INSTALLATION & MAINTENANCE

**INSTALLATION**
- Standard mounting is surface mount with 1/2"-13x18" galvanized steel J-bolt anchors. Security bollards use an embedded security core, available for an upcharge.
- Installation of a surge protector as part of each units wiring is recommended.
- Necessary hardware is included. Templates available upon request.

**MAINTENANCE**
- Metal surfaces can be cleaned as needed, using a soft cloth or brush with warm water and a mild detergent. Avoid abrasive cleaners.

### OPTIONAL SECURITY CORE

Site security is a major concern in today’s unpredictable world. Public and private buildings, government facilities, campuses and public parks are all susceptible to accidental, as well as deliberate, vehicle infringement. Design professionals, city planners, facilities managers and engineers must now be increasingly sensitive to the safety and security requirements of public and private spaces. Security bollards placed at ingress points are an excellent way to guard against vehicle infringement while still allowing pedestrian access.

Until now, most security bollards have taken the form of generic pipes and cylinders that offered little in the way of design or lighting functionality. An integral security solution is now available as an optional enhancement to Forms+Surfaces’ Knight lighting bollards. By adding a pre-engineered and fully-tested security core to the existing Knight design, we can offer a beautiful and efficient lighting bollard that also meets the stringent hi-impact crash requirements normally attained only with unattractive pipe barriers.

Forms+Surfaces’ security bollards have been tested using a Finite Element Analysis (FEA) by a professional engineering consultant. FEA is a software-based tool commonly used in the automotive industry and used extensively for crash test simulations. All of our bollards with the security solution option were tested and passed a very demanding set of impact criteria. Tests were performed using our bollards set in permanent concrete footings spaced 42" apart (to assure a minimum of two bollards being hit) and struck by a vehicle at a 90-degree impact. The impact simulation found the bollards to be successful in stopping a 5,500 lb. vehicle traveling at a minimum test velocity of 40 mph.

In addition to our permanently embedded security bollards, Forms+Surfaces can also provide non-illuminated options. Please contact us to discuss design and installation considerations for Knight bollards with security cores.

**Crash scenario with 5,500 lb. pickup truck approaching embedded bollard system at 40 mph**

**Full-scale crash 330ms after impact**

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**KNIGHT™ BOLLARD**

**NOMINAL DIMENSIONS (SURFACE MOUNT)**

- 8” (203 mm) lamp housing with reflector
- 8” x 8” (203 mm x 203 mm) aluminum column
- Base plate with anchor bolts
- Conduit with 42” wire whip (by others)
- Cast-in-place J-bolt anchors
- Poured concrete footer

**BASE PLATE MOUNTING DETAIL**

- 0.63” (16 mm) dia. thru holes for 1/2-13 anchor bolts (4x)
- 2.50” (63 mm) dia. conduit opening

**NOMINAL DIMENSIONS (SECURITY CORE)**

- 8” (203 mm) lamp housing with reflector
- 8” x 8” (203 mm x 203 mm) aluminum column
- Base plate with anchor bolts
- Schedule 160 pipe 5/8” (16 mm) wall thickness
- Poured concrete security footer 18” x 18” x 30” (457 mm x 457 mm x 762 mm) minimum

**NOMINAL DIMENSIONS (SURFACE MOUNT)**

- 43.1” (1095 mm)
- 8” (203 mm) lamp housing with reflector
- Lamp HID (shown) or CFL
- Borosilicate glass lens
- Socket (as required by lamp)
- Quadrant casting
- Ballast tray
- Ballast (HID ballast shown)
- 8” x 8” (203 mm x 203 mm) aluminum column
- Base plate with anchor bolts

**NOMINAL DIMENSIONS (SECURITY CORE)**

- 43.1” (1095 mm)
- 8” (203 mm) lamp housing with reflector
- Lamp HID (shown) or CFL
- Borosilicate glass lens
- Socket (as required by lamp)
- Quadrant casting
- Ballast tray
- Ballast (HID ballast shown)
- 8” x 8” (203 mm x 203 mm) aluminum column
- Base plate with anchor bolts

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NOMINAL DIMENSIONS (SURFACE MOUNT)

- 8" (203 mm) lamp LED chip & silicone diffuser
- 8" x 8" (203 mm x 203 mm) aluminum column
- Conduit with 42" wire whip (by others)
- Base plate with anchor bolts

- 43.1" (1099 mm)
- 7.50" (190 mm) base plate mounting detail
- 0.63" (16 mm) dia. thru holes for 1/2=13 anchor bolts (4x)
- 2.50" (63 mm) dia. conduit opening

NOMINAL DIMENSIONS (SECURITY CORE)

- 8" (203 mm) lamp housing with reflector
- 8" x 8" (203 mm x 203 mm) aluminum column
- Base plate with anchor bolts

- 43.1" (1099 mm)
- 7.50" (190 mm)
- 18" (457 mm) minimum for cast-in-place J-bolts
- 4.94" (124 mm) poured concrete footer
- Conduit with 42" wire whip (by others)
- Base plate with anchor bolts

- 24" (610 mm)
- 30" (762 mm)
- 18" x 18" x 30" (457 mm x 457 mm x 762 mm) poured concrete security footer

- 24" (610 mm) schedule 160 pipe
- 7/8" (16 mm) wall thickness
- Solid steel welded cross-support bars

- 43.1" (1099 mm)
- 7.50" (190 mm)
- 4.94" (124 mm) solid steel welded cross-support bars
- Poured concrete security footer 18" x 18" x 30" (457 mm x 457 mm x 762 mm) minimum

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LAMP DESCRIPTIONS

<table>
<thead>
<tr>
<th>LAMP</th>
<th>DESCRIPTION</th>
<th>BASE</th>
<th>COLOR TEMPERATURE</th>
<th>LUMINAIRE LUMENS*</th>
<th>B.U.G. RATING</th>
<th>ANSI CODE</th>
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</thead>
<tbody>
<tr>
<td>3000K LED</td>
<td>16W custom LED light engine</td>
<td>N/A</td>
<td>3,000K</td>
<td>362</td>
<td>B0-U2-G0</td>
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<td>4000K LED</td>
<td>16W custom LED light engine</td>
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<td>4,000K</td>
<td>362</td>
<td>B0-U2-G0</td>
<td>N/A</td>
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<td>CFM26</td>
<td>26W triple tube 4-pin compact fluorescent</td>
<td>GX24q-3</td>
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<td>B0-U1-G0</td>
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<td>CFM42</td>
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<td>GX24q-4</td>
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<td>70W metal halide, high intensity discharge</td>
<td>E26 medium</td>
<td>4,000K</td>
<td>962</td>
<td>B1-U1-G0</td>
<td>M143/M9B/E</td>
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*Luminaire lumens represents the absolute photometry for the luminaire, and indicates the lumens out of the entire fixture.

**NOTE:** Polar candela and isofootcandle plots can be found on the Knight Bollard product page on our website.

CERTIFICATION, CFL AND HID
- UL and C-UL listed for wet locations (compact fluorescent and metal halide).
- ETL and C-ETL (LED undergoing test)

ENVIRONMENTAL CONSIDERATIONS
- Please refer to the Knight Bollard Environmental Data Sheet for detailed environmental impact information.
- Knight Bollard has high recycled content and is highly recyclable.
- Standard powdercoat finishes are no-VOC; Non-standard powdercoat finishes are no- or low-VOC, depending on color.
- Low maintenance.

MODEL NUMBERS AND DESCRIPTIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBKNI-LED</td>
<td>Knight Bollard, custom LED light engine</td>
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<tr>
<td>LBKNI-CF</td>
<td>Knight Bollard, compact fluorescent</td>
</tr>
<tr>
<td>LBKNI-HID</td>
<td>Knight Bollard, high intensity discharge</td>
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</table>

PRODUCT OPTIONS
The following options are available for an upcharge

- Upgrade to embedded security core
- Premium Texture Colors from Forms+Surfaces Powdercoat Chart
- Custom RAL powdercoat color

LEAD TIME: 6 to 8 weeks. Shorter lead times may be available upon request. Please contact us to discuss your specific timing requirements.

PRICING: Please contact us at 800.451.0410 or sales@forms-surfaces.com. At Forms+Surfaces, we design, manufacture and sell our products directly to you. Our sales team is available to assist you with questions about our products, requests for quotes, and orders. Territory Managers are located worldwide to assist with the front-end specification and quoting process, and our in-house Project Sales Coordinators follow your project through from the time you place an order to shipment.

TO ORDER SPECIFY: Quantity, model, powdercoat color, lamp, voltage, surface mount or embedded security core. Quote/Order Forms are available on our website to lead you through the specification process in a simple checkbox format.