



# 22mm Low-Cost Panel Mount LED Indicators

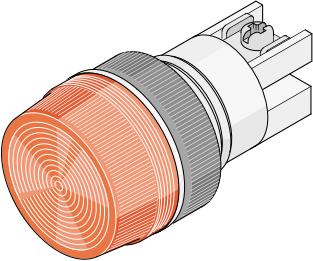
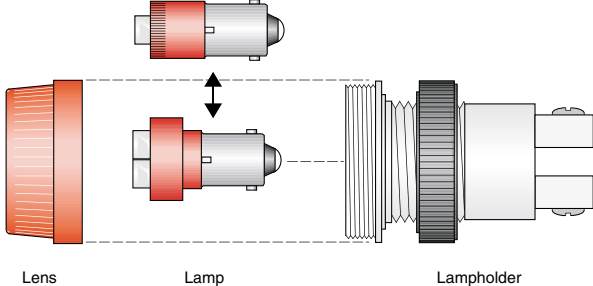
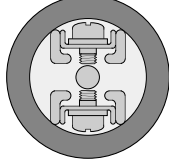
## Features

- Panel Mounting Diameter 22mm (7/8 in.)
- Low-Cost Replacement to Industry Standard 22mm Pilot Lights
- Long Life 100,000+ hrs (10 years)
- Solid-State, High Shock/Vibration Resistant
- Maintenance Free, Easy Installation
- Combination Terminals
- Low Power Consumption, High Intensity
- Major Power Savings
- Major Reduction in Heat Generation
- Built-in Current Limiting Resistor

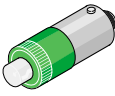
## Options

- Special Voltages/Cluster
- Sunlight-Visible Super Bright or High-Efficiency LEDs
- Bi-Colors, Tri-Colors, RGB, IR
- Splash Proof - Moisture Proof
- Non-Relampable Models Available
- Flashing / Blinking
- Diffuser (For Use with Legend Inserts)

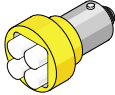
## Complete Lamp Assembly

<p><b>Part Number Includes: Lens, Lamp &amp; Holder</b></p> <p>BS851CXF-XXV-XX (BF321 LED Lamp) BS854CXF-XXV-XX (BF304 LED Lamp)</p> 	<p><b>Assembly Diagram</b></p>  <p>Lens      Lamp      Lampholder</p>	<p><b>Combination Terminals</b> Can Accept:</p> <ul style="list-style-type: none"> <li>• 0.25" female quick connect</li> <li>• Wire clamp for bare wire (up to 12 AWG)</li> <li>• Fork lug quick connect</li> </ul>  <p>End View</p>
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## 1 LED / Lamp Assembly (Recommended for Low, Ambient Light Conditions)

<p><b>Part Number Example</b></p> <p>BS851 CRF</p> <p><b>Series / No. of LEDs</b> BS851 = 1 LED (BF321 LED Lamp)</p>  <p>Flat Top LED for Wide Angle</p>	<p><b>Physical Characteristics</b></p> <p><b>Lens Color</b></p> <ul style="list-style-type: none"> <li>CRF = Clear Red</li> <li>CAF = Clear Amber</li> <li>CYF = Clear Yellow</li> <li>CGF = Clear Green</li> <li>CBF = Clear Blue</li> <li>CWF = Water Clear</li> </ul>	<p><b>Electrical Characteristics</b></p> <p><b>28V</b></p> <p><b>Std. Operating Voltage</b></p> <table border="1"> <thead> <tr> <th>DC</th> <th>AC</th> </tr> </thead> <tbody> <tr> <td>5/6V</td> <td>120V</td> </tr> <tr> <td>12/14V</td> <td>240V</td> </tr> <tr> <td>24/28V</td> <td></td> </tr> <tr> <td>48V</td> <td></td> </tr> <tr> <td>130V</td> <td></td> </tr> </tbody> </table>	DC	AC	5/6V	120V	12/14V	240V	24/28V		48V		130V		<p><b>Polarity</b></p> <p><b>BP</b></p> <p><b>Options</b></p> <p>BP = Bipolar (For DC Use Only)</p> <p>P = Center Contact Positive</p> <p>N = Center Contact Negative</p> <p>AC = AC Only</p>
DC	AC														
5/6V	120V														
12/14V	240V														
24/28V															
48V															
130V															

## 4 LEDs / Lamp Assembly (Recommended for Sunlight-Visible Light Conditions)

<p><b>Part Number Example</b></p> <p>BS854 CRF</p> <p><b>Series / No. of LEDs</b> BS854 = 4 LEDs (BF304 LED Lamp)</p>  <p>Flat Top LED for Wide Angle</p>	<p><b>Physical Characteristics</b></p> <p><b>Lens Color</b></p> <ul style="list-style-type: none"> <li>CRF = Clear Red</li> <li>CAF = Clear Amber</li> <li>CYF = Clear Yellow</li> <li>CGF = Clear Green</li> <li>CBF = Clear Blue</li> <li>CWF = Water Clear</li> </ul>	<p><b>Electrical Characteristics</b></p> <p><b>28V</b></p> <p><b>Std. Operating Voltage</b></p> <table border="1"> <thead> <tr> <th>DC</th> <th>AC</th> </tr> </thead> <tbody> <tr> <td>5/6V</td> <td>120V</td> </tr> <tr> <td>12/14V</td> <td>240V</td> </tr> <tr> <td>24/28V</td> <td></td> </tr> <tr> <td>48V</td> <td></td> </tr> <tr> <td>130V</td> <td></td> </tr> </tbody> </table>	DC	AC	5/6V	120V	12/14V	240V	24/28V		48V		130V		<p><b>Polarity</b></p> <p><b>BP</b></p> <p><b>Options</b></p> <p>BP = Bipolar (For DC Use Only)</p> <p>P = Center Contact Positive</p> <p>N = Center Contact Negative</p> <p>AC = AC Only</p>
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5/6V	120V														
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- Notes:**
1. Contact local representative to determine best style for each application
  2. Not all possible combinations of color, voltage and polarity are available

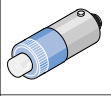
Log # 091A Rev 12-99




# 22mm Low-Cost Panel Mount LED Indicators

## LED Lamp Replacement

Physical Characteristics		Electrical Characteristics	Polarity	Options
Part Number Example	<b>BF321 C R3K</b>	<b>28V</b>	<b>BP</b>	
Series / No. of LEDs	BF321 = 1 LED BF304 = 4 LED Cluster	LED/Chip Brightness Code	Std. Operating Voltage	BP = Bipolar (For DC Use Only) P = Center Contact Positive N = Center Contact Negative AC = AC Only
LED Lens Type	Clear	* (See Note No. 2)	DC AC	
		R3K = UL Red (660nm)	5/6V 120V	
		E3K = HE Red (626nm)	12/14V 240V	
		O3K = SP Orange (610nm)	24/28V	
		Y3K = SP Yel (595nm)	48V	
		AG6K = SP Green (525nm)	130V	
		B1K = SP Blue (470nm)		
		CW4K = Cool White		
		IW2K = Incand White		



BF321

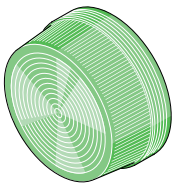
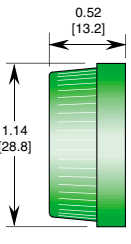


BF304

Flat Top LED for Wide Angle

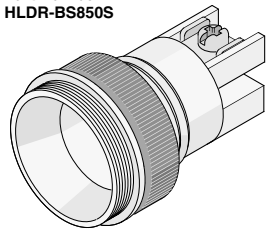
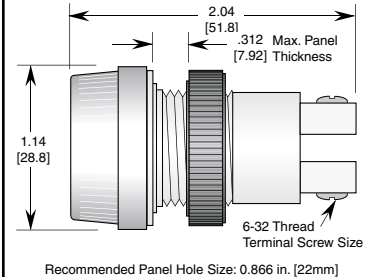
- Notes:**
1. Contact local representative to determine best style for each application
  2. LED brightness code determined by factory based on application\*
  3. Not all possible combinations of color, voltage and polarity are available
  4. For best results, match LED lamp color with lens cap color
  5. Water clear lens (-CWF) will work with any color LED

## Lens Cap Replacement

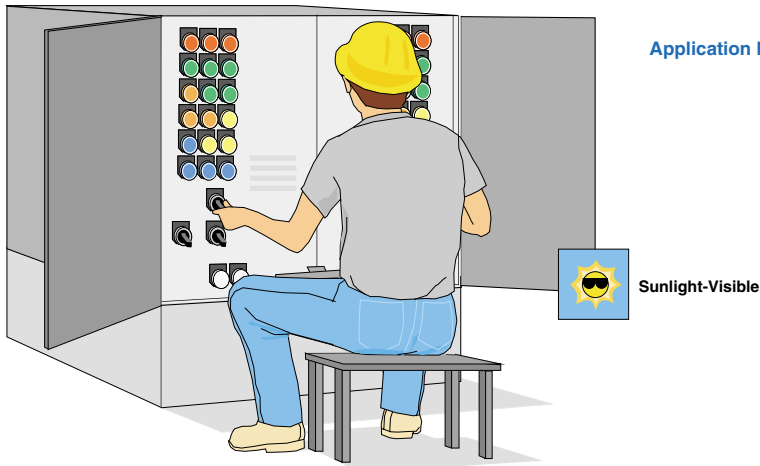
Part Number LENS-LCF850-CXF (X = choose color)	Dimensions	Lens Cap Part Number	Lens Type/Color
		LENS-LCF850-CRF	Clear Red ●
		LENS-LCF850-CAF	Clear Amber ●
		LENS-LCF850-CYF	Clear Yellow ●
		LENS-LCF850-CGF	Clear Green ●
		LENS-LCF850-CBF	Clear Blue ●
		LENS-LCF850-CWF	Water Clear ○

All dimensions in inches [millimeters]

## Lamp Holder Replacement

Part Number HLDR-BS850S	Dimensions
	
	<p>Recommended Panel Hole Size: 0.866 in. [22mm]</p>

## Application



- Application Notes:**
- 1 LED lamp assembly recommended for low, ambient light conditions.
  - 4 LED lamp assembly recommended for sunlight-visible light conditions.

Log # 091B Rev 12-99



# LED Color Chart

LEDtronics Code	LED Chip Code	Wavelength nm	Color Name	Fwd Voltage $V_f$ @ 20mA	Intensity 5mm LEDs	Viewing Angle	LED Dye Material
941	IR941	940	Infrared	1.5	16mW @ 50mA	15°	GaAlAs/GaAs - Gallium Aluminum Arsenide/ Gallium Arsenide
881	IR881	880	Infrared	1.7	18mW @ 50mA	15°	GaAlAs/GaAs - Gallium Aluminum Arsenide/ Gallium Arsenide
851	IR851	850	Infrared	1.7	26mW @ 50mA	15°	GaAlAs/GaAlAs - Gallium Aluminum Arsenide/ Gallium Aluminum Arsenide
0UR	R3KF	660	Ultra Red	1.8	2000mcd @ 20mA	15°	GaAlAs/GaAlAs - Gallium Aluminum Arsenide/ Gallium Aluminum Arsenide
00R	R3/R4/R5	635	High Eff. Red	2.0	200mcd @ 20mA	15°	GaAsP/GaP - Gallium Arsenic Phosphide /Gallium Phosphide
0ER	E3K	633	Super Red	2.2	3500mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
0UO	O3K/O6K	620	Super Orange	2.2	4500mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
0UO	O3KF	612	Super Orange	2.2	6500mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
00O	O4/O5	605	Orange	2.1	160mcd @ 20mA	15°	GaAsP/GaP - Gallium Arsenic Phosphide /Gallium Phosphide
0UY	Y3KF	595	Super Yellow	2.2	5500mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
0PY	Y3KH	592	Super Pure Yellow	2.1	7000mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
00Y	Y3/Y4/Y5	585	Yellow	2.1	100mcd @ 20mA	15°	GaAsP/GaP - Gallium Arsenic Phosphide /Gallium Phosphide
0IW	IW2K	4500K	Incand White	3.6	2000mcd @ 20mA	20°	SiC/GaN - Silicon Carbide/Gallium Nitride
0PW	PW4K	6500K	Pale White	3.6	4000mcd @ 20mA	20°	SiC/GaN - Silicon Carbide/Gallium Nitride
0CW	CW6K	8000K	Cool White	3.6	6000mcd @ 20mA	20°	SiC/GaN - Silicon Carbide/Gallium Nitride
0LY	LY1K	574	Super Lime Yellow	2.4	1000mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
0UG	G1K	570	Super Lime Green	2.0	1000mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
00G	G3/G4/G5	565	High Eff. Green	2.1	200mcd @ 20mA	15°	GaP/GaP - Gallium Phosphide/Gallium Phosphide
UPG	PG350	560	Super Pure Green	2.1	350mcd @ 20mA	15°	InGaAlP - Indium Gallium Aluminum Phosphide
0PG	PG5	555	Pure Green	2.1	80mcd @ 20mA	15°	GaP/GaP - Gallium Phosphide/Gallium Phosphide
0AG	AG10K	525	Aqua Green	3.5	10,000mcd @ 20mA	15°	SiC/GaN - Silicon Carbide/Gallium Nitride
0BG	BG2K	505	Blue Green	3.5	2000mcd @ 20mA	45°	SiC/GaN - Silicon Carbide/Gallium Nitride
0PB	PB3K	470	Super Blue	3.6	3000mcd @ 20mA	15°	SiC/GaN - Silicon Carbide/Gallium Nitride
00B	UB500	430	Ultra Blue	3.8	100mcd @ 20mA	15°	SiC/GaN - Silicon Carbide/Gallium Nitride