



HB-88W-50K-WB, 2 Bar HighBay, 16,720 lumens

## Cardinal® High Bay Fixtures

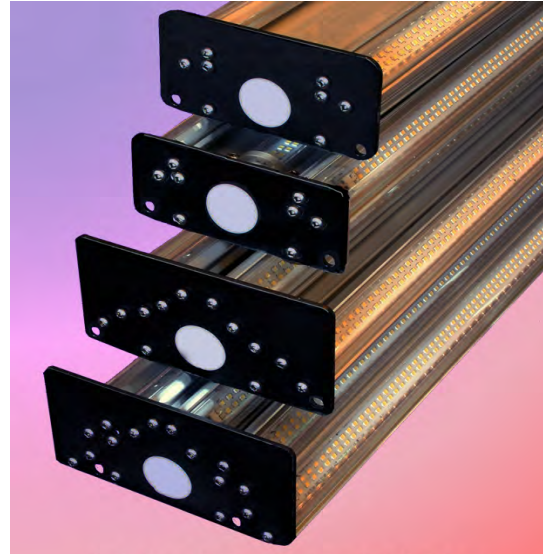
RedBird LED Cardinal® High Bay fixtures employ the same high efficacy LEDs and Drivers developed for our STRIPIT KIT® series of DLC listed products. **Custom Aluminum Extrusions** are used throughout the product forming an incredibly tough, yet lightweight chassis while also providing unmatched thermal management of the LEDs and Drivers, ensuring a 100,000 hour service life with virtually no lumen depreciation or chromatic shift. All other hardware is Stainless Steel.

Each 45" light bar is a complete Light Engine comprised of the extrusion with the LED PCB permanently embedded in it, a 44 watt Constant Current driver with 0-10V Dimming compatibility and custom MIRO-SILVER reflectors for the Narrow Beam models.

The RedBird High Bays are available in 4100K and 5000K CCTs. Standard models are offered as a 2-Bar, 3-Bar, 4-Bar and 6-Bar configurations delivering from 16,720 to 50,160 lumens. RedBird LED High Bays are offered in two basic Beam Distribution options:

**Wide Beam Fixtures** – provide a 120° x 160° Beam Angle, providing broad uniform coverage in open areas. An angular adjustment feature allows each light bar to be aimed prior to installation. As shown in photograph of the 2-Bar Wide Beam unit above, with the outer bars angled out at 45 degrees the beam pattern delivered is a 120° x 160° output as shown in the polar plot on the following page.

**Focused / Narrow Beam Fixtures** – provide a 120° x 45° Beam Angle. The beam forming is accomplished with computer designed linear reflectors built with mirror finished Anolux-MIRO<sup>®</sup>-SILVER<sup>®</sup> providing 98.5% reflective properties across the entire visible spectrum to deliver the desired high efficiency beam forming with complete preservation of the chromatic quality of the LEDs – a perfect solution for 30-40 foot high pallet racks with 10-14 foot aisles.



2 to 6 Bar HighBays, 16,720 to 50,160 lumens

At **190 lm/watt efficacy**, the RedBird LED High Bays can deliver more than 50,000 lumens, while consuming less than 264W. **Today's production units deliver 196 lms/watt.** See attached LED Spec Sheet for Edison Opto new 2835 LEDs being installed. Operating at only 25% of rated forward current levels.

Options for the Cardinal High Bay fixtures include occupancy and/or ambient light sensors. These interface to the standard 0-10V dimmable drivers enable complete control of the output levels and daylight harvesting capabilities.

The RedBird Drivers are Multi-volt (110-277 VAC and 347-480 VAC) compatible. The standard RedBird push for excellence is also embedded in the Driver design yielding PF=0.99, THD < 6% and a total conversion efficiency of 94%. The MTBF rating on the Drivers is > 140,000 hours. In case of a power loss, we also offer a Battery Backed Emergency Driver option.

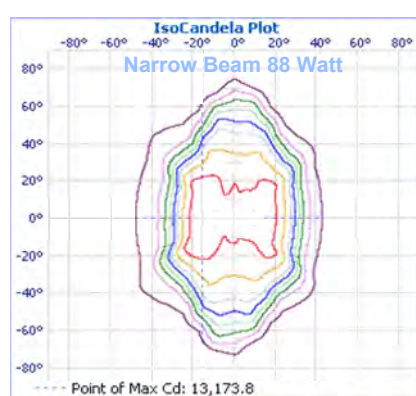
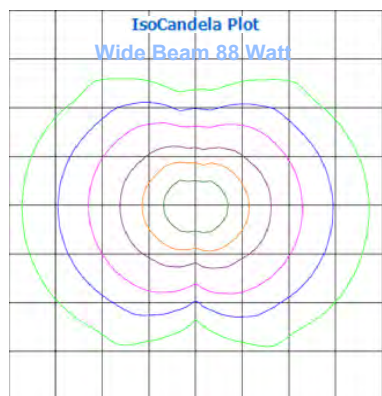
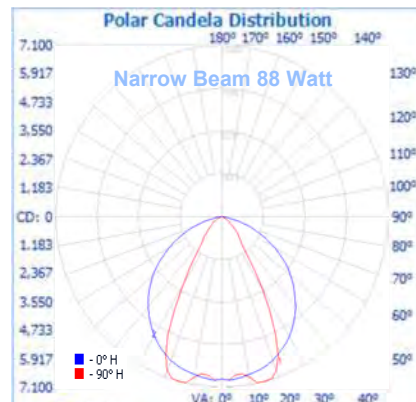
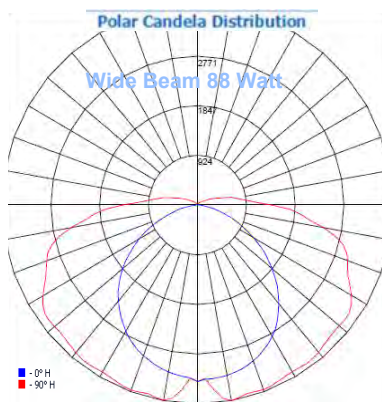
The HB series LEDs are under-driven by 50% with drive levels of only 44 watts for each 45" light bar. These low drive levels combined with the highly efficient thermal management provided by the custom AL extrusions result in ISTMT test results where the steady state operating temperature is a mere 37.7°C, only a 13°C rise above the ambient air temperature. As a result, RedBird High Bays are one of the very few LED high Bays that can be operated safely in ambient temperatures as high as 135°F without fear of premature failure, lumen degradation or color shift.

For a high bay product, which is by definition frequently mounted 30-40' high in a non-climate controlled warehouse where ambient temperatures can exceed 120°F, having this extra margin of temperature headroom is a major advantage of the RedBird LED High Bay solution.

Specifications and Features		Dimensions		2-Bar	3-Bar	4-Bar	6-Bar
		L	H	W	W	W	W
Narrow Beam Fixtures:		46.625"	3.63"	5"	5"	6"	6"
Wide Beam Fixtures:		46.625"	3"	5"	5"	5"	5"
Available CCT	4100K, 5000K	Lumens		16,720	25,080	33,440	50,160
Efficacy	195 lumens per watt						
Beam Patterns	120° x 160° Wide Beam / 120° x 45° Narrow Beam						
LED Drivers	CC type; 44 Watts per Light Bar, 1-10V Dimmable. Battery backup optional						
Power Connections	10 foot, 3 conductor sheathed power cord, 3-prong 120V plug standard						
PCB Construction	Aluminum core, molecularly bonded to High Bay Bar extrusions						
LED Elements	SMD LEDs driven at <25% rated forward current level						
Mounting Method	Cable Hung						
Sensors	Daylighting, Photocell and Occupancy Sensors available upon request						
CRI	>85						
R9	>5						
Duv	<0.0019						
Voltage	120-277VAC standard; 347/480VAC available						
Power Factor / THD	PF >0.99, THD < 6%						
Operating Temperature	-40°F to 135°F						
Certifications	UL, cUL, RU, 1993, 1598, 1598(B), 1598©, 8750, FCC, CE, RoHS						
DesignLights Consortium	Refer to DLC QPL for selected models						
Warranty	10 Year Full Replacement Warranty - no pro-rating.						
Rated Lifetime	> 100,000 Hrs						

### Ordering Information

HB SERIES	TOTAL WATTAGE	CCT	BEAM PATTERN
HB -	88W 88w dimmable	50K 5000°K	WB wide beam
HB -	176W 176w dimmable	41K 4100°K	NB narrow beam




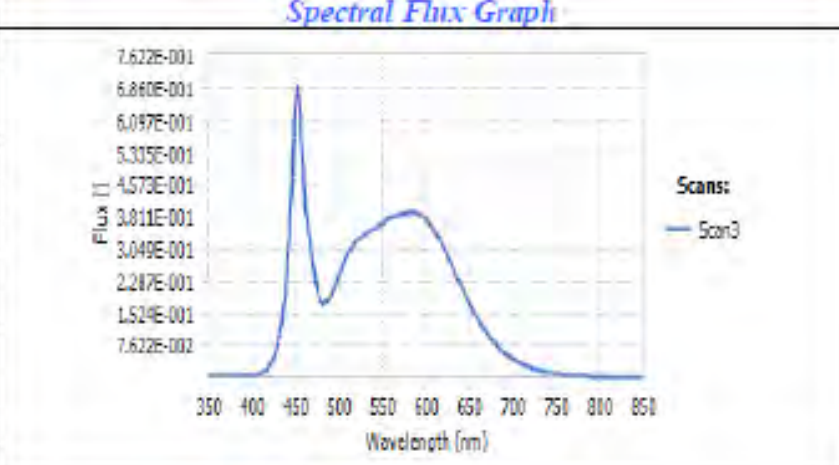
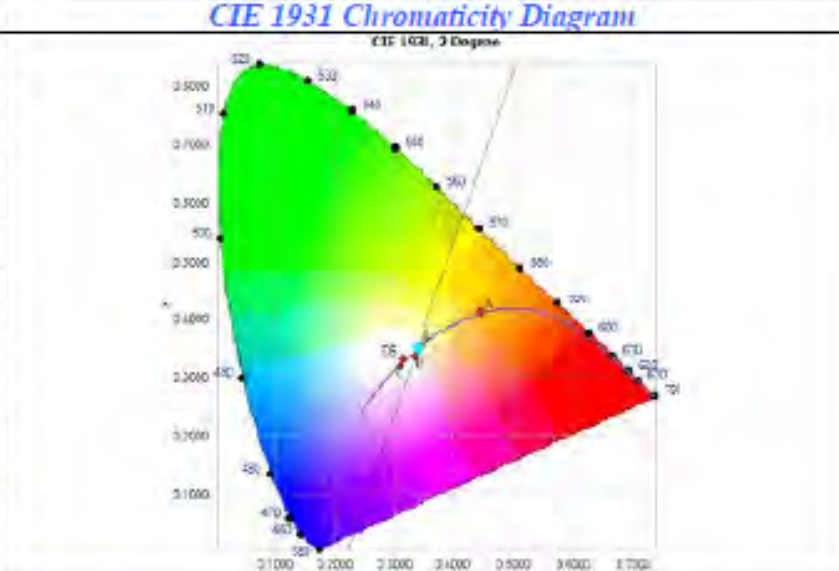
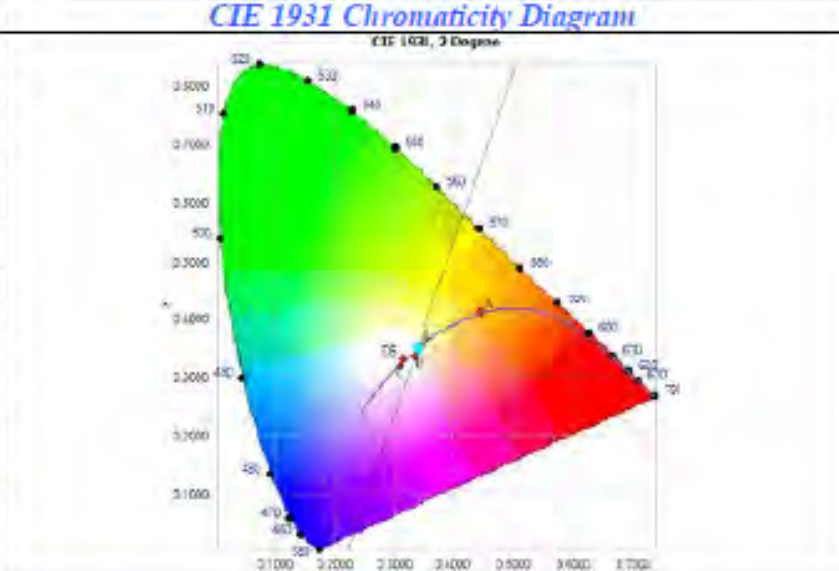
Close up of Narrow Beam Reflective optics installed on LED Strip in Extrusion



Selected Models Listed on DesignLights Consortium Qualified Product list. Check <http://designlights.org/qpl> to confirm



## Representative LM-79 data for HB-176W-50K-WB, 4-Bar HighBay Fixture

<i>Description of Evaluated Product</i>		<i>Photograph</i>		
Product Tested:	HB-176W-50K-WB			
Manufacturer:	RedBird LED, Inc.			
Notes:	None			
<i>Key Results</i>				
Luminous Flux:	34690 Lumens			
Input Power:	176.83 Watts			
Luminous Efficacy:	196.18 Lumens/Watt			
ISTMT Temp	37.7° C			
<i>Full Photometric Results</i>				
Total Luminous Flux:	34690 Lumens			
Luminous Efficacy	196.18 Lumens/Watt			
CCT	5222 K			
CRI	87.84			
R9	14.1			
Radiant Flux	110.19 Watts			
Chroma (x and y)	0.3392			0.3498
Chroma (u and v)	0.2081	0.3219		
Chroma (u' and v')	0.2081	0.4829		
Duv	0.0010			
<i>Electrical Results</i>		<i>CIE 1931 Chromaticity Diagram</i>		
Input Power	176.83 Watts			
Input Voltage (AC)	120.03 Volts			
Input Current	1.4855 Amps			
Power Factor	0.9917			
THD (V and A)	0.09			9.50
<i>Test Conditions</i>				
Date of Test	April 13, 2016			
Ambient Temp	24.8°C			
Humidity	52%			
Stabilization Time	60 Minutes			
Total Operating Time	64 Minutes			
Orientation of Sample	Downward Facing			
<i>Equipment List</i>				
Equipment Used	ID Number	Calibration Due Date		
Integrating Sphere D	SPH 400	N/A		
Spectrometer	CDS 1100	N/A		
Power Analyzer	PA108	5/2016		