

# RETROFIT.LIN-96



## Performance Ratings and Certifications

UL 1598C  
 UL 8750  
 CSA C22.2#250.0  
 CSA C22.2#250.13

## Performance Summary

Lumens:14,816-22,224 lm  
 Lumens Per Watt:140 LPW  
 Power Consumption:105.60-158.40 W  
 Light Engine:L70 Rated Lifetime of 100,000+ hours.  
 CRI:Minimum 70 CRI. Custom CRI available upon request.  
 CCT (Typical):3000K, 4000K, 5700K, optional tight bins  
 Light Dist. Pattern:Multiple Distributions Available  
 Energy Savings:50-90%  
 Manufactured in the U.S. with parts from U.S. and imported

## Electrical System Characteristics / Data

AC Input:120/277 VAC (standard), 480 VAC (upgrade)  
 FCC:Title 47, Part 2, Part 15, Class A  
 EM:Compliance to EN55015, EN55022(CISPR22) Class B, EN61000-3-2 Class C(60% load); EN61000-3-3  
 EM Immunity:Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547,EN55024, light industry level (surge 4KV),  
 criteria A  
 Withstand Voltage:I/P-O/P:3.75KVAC I/P-FG:2KVAC O/PFG:1.5KVAC  
 Isolation Resistance:I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC / 25 / 70% RH  
 Power Factor:PF > 0.98/115VAC, PF > 0.92/277VAC  
 Total Harmonic Distortion:THD < 20%  
 Standard Surge Protection:All-Around Protection: OVP, SCP, OLP.  
 Enhanced Surge Protection:Protects against surges according to IEEE62.41.2 C and ANSI C136.2  
 Emergency Batt. Backup:Optional upgrades available.

## Warranty

Standard limited 5-year warranty. Optional 10-year warranty available. See details at [www.Noribachi.com](http://www.Noribachi.com).

# Performance Specifications

<b>Electrical Load</b>				
Light Engine	Drive Current (Amps@120VAC)	Drive Current (Amps@277VAC)	Drive Current (Amps@480VAC)	System Power (Watts)*
LIN-96-A-CW-MT	0.88	0.38	0.22	105.60
LIN-96-B-CW-MT	1.32	0.57	0.33	158.40

\* ideal wattage

<b>Operating Characteristics (Typical @5700K CCT)</b>				
Light Engine	Lumens (Medium Dist)	Input Power (Watts)	Lumens per Watt	Replaces
LIN-96-A-CW-MT	14,816	105.60	140.30	360 - 600W
LIN-96-B-CW-MT	22,224	158.40	140.30	360 - 600W

ELECTRICAL CHARACTERISTICS AND PERFORMANCE DATA VERIFIED BY NATIONALLY RECOGNIZED TESTING LABS (NRTL). FOR FULL REPORTS AND RESULTS, VIS IT [WWW.NORIBACHI.COM/REPORTS](http://WWW.NORIBACHI.COM/REPORTS). ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. ALL VALUES TYPICAL UNLESS OTHERWISE NOTED. LUMEN VALUES MAY VARY BY +/-10%. COLOR TEMPERATURE MAY VARY ACCORDING TO ANSI C78.377.



# Electrical System Specifications

## Electrical System

Standard AC input of 120 - 277VAC. Optional upgrade to 480VAC. Driver meets maximum harmonic distortion (THD) of 20% and is ROHS compliant. Power Factor = > 0.9. Standard Surge protection according to IEC/EN 61000-4-5 EMC test standard and can protect against up to 4KV transient surge. Optional, enhanced Surge Protection protects Line-Ground, Line-Neutral, and Neutral-Ground. Protects against surges according to IEEE C62.41.2 C(10kA and 10kV) and ANSI C136.2.

## Controls

Optional controls include: 0-10V (010V), Step, line voltage and Bi-Level Dimming functionality (not guaranteed to work with all dimming systems). Occupancy and Daylight Harvest Sensors available. Optional Emergency Battery Backup: Nickel- Cadmium Batteries, 5W, 600 Lumens for 90 minutes. Optional Cold Emergency Battery Backup: 23W, 2000 Lumens for 90 minutes. The battery has a 7-10 year lifespan.

## Driver

All LED drivers provide constant current to give flicker free lighting. Two different drive currents are provided; A (350 mA) and B (525 mA). Highly reliable. Suitable for dry, damp and wet locations. Compliant to worldwide safety regulations for lighting.

## Ambient Temperature

We provide fixtures that can sustain ambient temperature ranging from -40F to 140F (-40C to 60C).

## Wireless Control Options

Optional wireless networking using the Noribachi Pulse Wireless controller. Pulse is an Arduino- based hardware platform that provides communication between fixtures and a base station using Digi's XBEE based mesh network. Pulse controls up to 16 independent LED lighting fixtures using an FCC approved 900 MHz frequency with up to 200 Kbps data transmission speed. Transmit power output 50 mW. Data transmission rate is 156.25 kbps. 128 bit AES Encryption.

## Occupancy Sensor and Daylight Harvesting

Sensor provides 60' diameter coverage from a 40' height. Time can be set from 30 seconds to 30 minutes.

## RGBW Controls

Optional RGBW controls with communication to fixture via DMX512 or DMX256 and four channel controls. Four channel control uses red, green, blue and white (to control intensity). DMX controller optional, either software DMX master (via CD and USB adapter) or a physical DMXmaster. 2.4 GHz wireless DMX networking optional. Other frequencies available upon request.

## Testing Compliance

Noribachi complies with and exceeds standards set forth by UL and CSA. All luminaires comply with UL 1598 (CSA C22.2#250.13), and UL 8750 (CSA C22.2#250.0) standards for safety. Performance testing is done in accordance with LM-79 color measurements and LM-79 distribution measurements, and LM-80 lumen maintenance testing.

## Manufacturing

Manufactured in beautiful Harbor City, CA. ARRA Compliant. NAFTA Compliant. Test and burn-in of 100% of all luminaires before shipment. No less than 8-years experience in manufacturing LED-based products.

## Warranty

Standard limited 5-year warranty, first year includes labor. Optional 10-year warranty available. See details at [www.Noribachi.com](http://www.Noribachi.com).

## Note

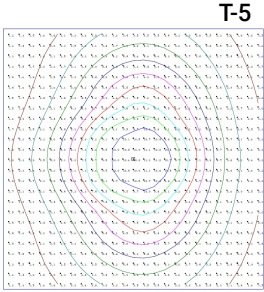
All safety tests and performance data is done in ambient (STP) conditions. Specifications subject to change without notice. Actual performance may differ as a result of enduser environment application. Actual wattage may differ by +/- 8%. Lumen values may vary within compliance with ANSI C78-377 (unless specifying tight color bins).

# Distribution Types

Distribution							
Light Engine	Drive	CCT	T1	T2	T3	T4	T5
LIN-96	A	5700	n/a	n/a	n/a	n/a	14,816
LIN-96	B	5700	n/a	n/a	n/a	n/a	22,224

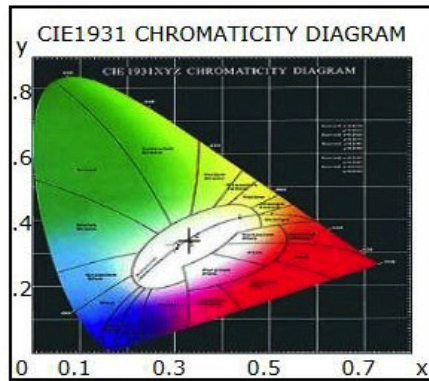
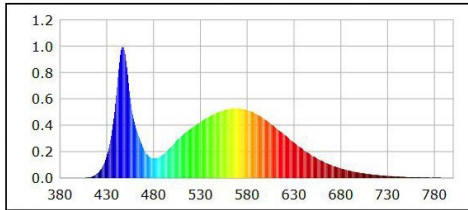
Distribution types may not be applicable to all fixture configurations

## Type Distribution



IES Type Distributions are generated in an open space.  
Light Distribution images are mounted at 10 feet.

# Optics Specifications



## White LED Optics

High brightness, high efficiency LEDs. Standard color temperature is Cool White (5700K typical). Neutral White (4000K typical) and Warm White (3000K typical) also available. All with minimum 70 CRI. Tight bins (< +/-50 degK variability) also available - recommended for WW installations as the eye is sensitive to variations in this color range. 40deg and 80deg beam angle optional (n/a for RGBW).

## RGBW Light Engine Optics

RGBW light engine also available, compatible with DMX controller. RGBW colors, to allow changing from pure white light to any hue available. Multiple channels of LEDs produce a full spectrum of light anywhere from deepest red to farthest violet. CRI greater than 75 in the 2700K - 4000K range.

Single color light engines also available. Red=630 nanometers, Green=525 nanometers. Blue=475 nanometers.

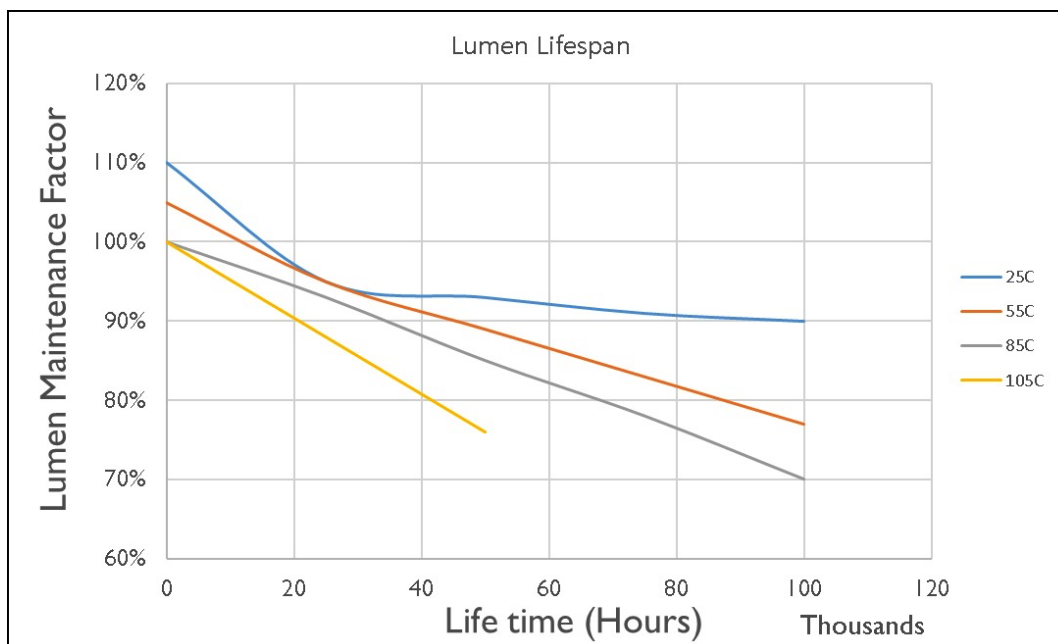
## Photometric Data for White LED Light Engine

Chromaticity coordinates:  $x=0.3305$   $y=0.3424$   $u(u')=0.2050$   $v=0.3186$   $v'=0.4779$   
 CCT:  $T_c=5700K$  ( $duv=0.00156$ )  
 Color Ratio:  $R=0.133$   $G=0.827$   $B=0.040$   
 Peak Wavelength: 447.2nm  
 Half Bandwidth: 19.1nm  
 Dominant Wavelength: 535.2nm  
 Color Purity: 0.020  
 Color Render Index:  $R_a=75.0$ ,  $avgR(1\sim14)=65.6$ ,  $avgR(1\sim15)=65.9$   $R1=74$ ,  $R2=76$ ,  $R3=76$ ,  $R4=81$ ,  $R5=75$ ,  $R6=66$ ,  $R7=84$ ,  $R8=67$ ,  $R9=0$ ,  $R10=41$ ,  $R11=78$ ,  $R12=40$ ,  $R13=73$ ,  $R14=86$ ,  $R15=71$

## Photometric Data for RGBW LED Light Engine

Chromaticity coordinates:  
 White  $x = 0.3405$ ,  $y = 0.3459$   
 Green  $x = 0.1687$ ,  $y = 0.7296$   
 Red  $x = 0.6968$ ,  $y = 0.3024$   
 Blue  $x = 0.1316$ ,  $y = 0.0636$

# Lumen Performance



### Lumen Maintenance Factors (B Drive)

TJ (Junction Temp)	INITIAL LMF	25K HR PROJECTED LMF	50K HR PROJECTED LMF	75K HR PROJECTED LMF	100K HR PROJECTED LMF
25°C	1.10	0.95	0.93	0.91	0.90
55°C	1.05	0.95	0.89	0.83	0.77
85°C	1.00	0.93	0.85	0.78	0.70
105°C	1.00	0.88	0.76	N/A	N/A

### Lumen Multiplier

AMBIENT TEMPERATURE	LUMEN MULTIPLIER
10°C	1.032
15°C	1.021
25°C	1.000
40°C	0.968
50°C	0.946

Each temperature has an independent initial value. In accordance with IESNA TM021011, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip). In accordance with IESNA TM-21- 11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip)