

KESSIL PROFESSIONAL SPECIFICATION SHEET

W360X

Full-spectrum LED (Light Emitting Diode) Product

1.01 GENERAL

- A. The product shall be a Kessil W360X manufactured by DiCon Fiberoptics Inc.
 - 1. Kessil, a DiCon FiberOptics Inc. brand, shall provide all LED products to ensure color consistency.
 - 2. The product shall be a high-intensity LED illuminator utilizing a Dense Matrix 3D LED Array System comprised of at least 6 different LED chip colors
- B. Each LED fixture shall be tested and optimized for photometric performance.

1.02 PHYSICAL

- A. The dimensions of the fixture shall be Ø 4.3" W x 3.9" H (10.8 x 10.0 cm) and weigh approximately 0.8 lbs (0.3 kg). The following shall be provided:
 - a. Kessil W360X fixture, consisting of
 - 1. W360X Head Unit
 - 2. 80W, 24V, Track Mount PSU
- B. The housing shall have a black or white finish.
- C. The housing material shall be PC (polycarbonate) + ABS (acrylonitrile-butadiene-styrene).
- D. Mounting Type shall have Track, Clamp, or Monopoint Adapter selection.
- E. Cooling and electronic control systems shall be fully integrated within the fixture housing.

1.03 TRACK SEGMENTS

- A. The product shall be installed on a surface-mounted track - One Track
 - 1. Track input voltage shall be 120V.
 - 2. 2 circuits shall have 20 Amps max per circuit, 40 Amps max per track.
 - 3. The track shall have standard length options of 4' and 8', and can be cut and connected by track accessories.
 - 4. The track shall have mounting points size 0.47" x 0.16" (12mm x 4mm), Slot Per 1.64' (500mm).
- B. With Data (-TOX): 7 conductors (2 Data, 2 Live, 2 Neutral, 1 Ground)
 - 1. 4' Track with data - Black (9000-UL4/B-ST2-120) / White (9000-UL4/W-ST2-120)

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2. 8' Track with data - Black (9000-UL8/B-ST2-120) / White (9000-UL8/W-ST2-120)

- C. The track shall have a black or white finish
- D. The material shall be Aluminum / PVC (polyvinyl chloride) / PC (polycarbonate) / Copper conductors.
- E. The track max load is 50kg/110 lbs (per 1.5' of track).

1.04 ENVIRONMENTAL AND AGENCY COMPLIANCE

- A. The product shall comply with UL 1574 (Track Lighting Systems) and CSA C22.2 standards.
- B. Compliance shall be verified through ETL testing and certification.
- C. The product shall bear both ETLus and cETL markings.
- D. The product shall also comply with FCC 47 CFR Part 15 Subpart B requirements, tested by ANSI C63.4.
- E. The fixture shall comply with RoHS (Restriction of Hazardous Substances) and TAA (Trade Agreements Act) regulations.
- F. The product shall be rated for IP-25 and able to sustain operation at full intensity while actively being sprayed by water from all directions.

1.05 THERMAL

- A. Product heat management shall be achieved through forced cooling.
- B. The cooling fans shall be rated for a minimum operational lifespan of 50,000 hours.
- C. The product shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 50,000 hours of use.
- D. The product shall operate in an ambient temperature range of 32°F (0° C) minimum to 104°F (40° C) maximum.

1.06 ELECTRICAL

- A. The product shall have an auto-ranging 100 V to 240 V 50/60 Hz power supply unit.
- B. The product shall have a maximum draw of 80W.
- C. DC input Voltage shall be 14- 30V.
- D. The product requires power from a non-dimming source.
- E. Products shall have dynamic thermal monitoring at multiple locations in the LED array, control board, and other electronics to prevent thermal shift of color or intensity.
- F. Product power input shall have current-limiting fuse protection.
- G. The power supply shall have power factor correction.

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1.07 **OPTICAL DATA**

- A. The product shall contain a patented Dense Matrix LED Light Source manufactured by DiCon FiberOptics, Inc.
 - 1. The fixture shall have a 130-degree native beam angle
- B. All LEDs used in the product shall be manufactured by DiCon FiberOptics, ensuring high brightness and proven quality.
- C. DiCon FiberOptics, Inc. shall utilize an advanced production LED binning process to maintain color consistency.
- D. All LED products (100% of each lot) shall undergo a minimum three-hour burn-in test during manufacturing.
- E. The LED system shall comply with all relevant patents.

1.08 **SPECTRUM**

- A. Photosynthetically Active Radiation (PAR)
 - a. The fixture shall deliver full-spectrum light with spectral peaks aligned with chlorophyll A and B absorption maxima (425 nm, 455 nm, 640 nm, and 660 nm), critical for efficient photosynthesis.
 - b. The fixture will output a spectrum low in green light (no more than 32% of the total PPFD output shall fall in the 500-600nm range when set at 4000K, and no more than 36% at 6500K), as plants do not use green light.
- B. AMZ (Amazon Sun)
 - a. Fixture shall have a tunable CCT between 4000K–6500K
 - b. Adjusting the CCT shall maintain the spectral peaks for chlorophyll A and B
- C. TB (Tuna Blue)
 - a. Fixture shall have a tunable CCT between 10000K and 20000K
 - b. Adjusting the CCT shall maintain the spectral peaks for chlorophyll A and C
 - c. Fixture shall have spectral peaks at 425 nm and 455 nm to support zooxanthellae photosynthesis and coral fluorescence
 - d. Fixture shall have an additional 390–400 nm UVA range enhances coral and invertebrate pigmentation and overall health
 - e. Fixture shall have a broadband blue spectrum with no spectral gaps between 390nm and 500nm

1.09 **INTENSITY MEASUREMENTS**

- A. The fixture shall emit a luminous flux of approximately 4,340 lumens in Amazon Sun and 1,447 lumens in Tuna Blue.
- B. High PPFD Output:

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- a. At 4000K distance 3' (0.9m):
 - i. Measured illuminance: 156 footcandles (fc) = 1679 lux
 - ii. Average PPFD: $156 \text{ fc} \times 0.26 = 41 \mu\text{mol}/\text{m}^2/\text{s}$
 - b. At 6500K distance 3' (0.9m):
 - i. Measured illuminance: 158 footcandles (fc) = 1700 lux
 - ii. Average PPFD: $158 \text{ fc} \times 0.23 = 36 \mu\text{mol}/\text{m}^2/\text{s}$
 - c. At 10,000K distance 3' (0.9m):
 - i. Measured illuminance: 96 footcandles (fc) = 1028 lux
 - ii. Average PPFD: $96 \text{ fc} \times 0.007375 = 0.708 \mu\text{mol}/\text{m}^2/\text{s}$
 - d. At 20,000K distance 3' (0.9m):
 - i. Measured illuminance: 47 footcandles (fc) = 498 lux
 - ii. Average PPFD: $47 \text{ fc} \times 0.002126 = 0.100 \mu\text{mol}/\text{m}^2/\text{s}$
- C. The fixture must produce a uniform light distribution without intense brightness in the center. When measuring light output, the center intensity should be no more than 2x that measured at 30 degrees from the center.
- D. Amazon Sun
- a. Color output @4000k distance 3' (0.9m) at 156fc/1679lux, distance 5' (1.5m) at 82fc/880lux, distance 10' (3.0m) at 20fc/214lux.
 - b. Color output @6500k distance 3' (0.9m) at 158fc/1700lux, distance 5' (1.5m) at 83fc/891lux, distance 10' (3.0m) at 21fc/217lux.
 - c. At 3 feet (0.9 meters), the beam spreads to 5.2 feet (1.6 meters) in diameter.
 - d. At 5 feet (1.5 meters), the beam spreads to 8.8 feet (2.7 meters) in diameter.
 - e. At 10 feet (3.0 meters), the beam spreads to 17.5 feet (5.3 meters) in diameter.
- E. Tuna Blue
- a. Color output @10,000k distance 3' (0.9m) at 96fc/1028lux, distance 5' (1.5m) at 35fc/370lux, distance 10' (3.0m) at 11fc/110lux.
 - b. Color output @20,000k distance 3' (0.9m) at 47fc/498lux, distance 5' (1.5m) at 17fc/179lux, distance 10' (3.0m) at 6fc/57lux.

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- c. At 3 feet (0.9 meters), the beam spreads to 5.2 feet (1.6 meters) in diameter.
- d. At 5 feet (1.5 meters), the beam spreads to 8.8 feet (2.7 meters) in diameter.
- e. At 10 feet (3.0 meters), the beam spreads to 17.5 feet (5.3 meters) in diameter.

1.10 DIMMING AND CONTROL

- A. The product shall provide LED dimming from 0% to 100% using a 0–255 scale, where values between 0 and 255 control the light's brightness.
- B. The product shall use analog dimming and be flicker-free at all refresh rates/measurements when run above 6% intensity.
- C. The product shall be equipped with a 2-knob user interface and can be DMX controlled when used with a DMX-compatible driver labeled “PSX” in the ordering guides and part numbers.
- D. DMX Footprint
 - a. Amazon Sun
 - i. Channel 1: Intensity (0–255)
 - ii. Channel 2: CCT (2,000K–10,000K mapped across 0–255)
 - b. Tuna Blue
 - i. Channel 1: Intensity (0–255)
 - ii. Channel 2: CCT (10,000K–20,000K mapped across 0–255)
 - iii. Channel 3: Violet Control
 - iv. Channel 4: Red Control
 - v. Channel 5: Green Control

1.11 REQUIRED FEATURE SET

- A. The product shall offer user-selectable Color Temperature settings.
- B. The product shall offer user-selectable dimming settings.
- C. The product shall contain a direct power connection.
- D. The product shall contain two manual knobs on the back of the fixture to control all fixture parameters.
- E. All provided products will contain the above feature set.

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