

## 1.01 COLOR MIXING OR WHITE LED ZOOM SPOTLIGHT

### A. General

1. The fixture shall be an Altman PHX 150 Zoom as manufactured by Altman Stage Lighting., or approved equal. Fixtures that do not meet the following performance criteria in this specification will not be acceptable.
2. The fixture shall be an LED based focusable, zoom luminaire with a range of beam angles provided via 2 adjustable lens tubes with differing zoom ranges.
3. The fixture shall provide silent convection cooled operation. No fan cooling shall be incorporated into the design of the fixture. Fixtures requiring fans for cooling will not be acceptable.
4. The fixture shall utilize a 150-watt maximum multi-LED array for light generation.
5. Unit shall be IP20 rated for indoor use.
6. A push button control interface shall be located on the rear of the fixture for ease of control.
7. The fixture shall be ETL, cETL and CE LISTED, and shall be so labeled when delivered to site. The fixture shall be ETL LISTED under Portable Luminaires (UL Standard 1573) and Surface Mount Luminaires (UL Standard 1598).
8. Ambient operating temperature shall be between -14°F to 104°F (-10°C to 40°C).
9. Power supply, cooling and electronics shall be included inside each unit.
10. Normal operation of optical and control functions of the fixture shall not require tools.

### B. Physical

1. The fixture shall have a die cast aluminum housing and major components, free of defects such as burrs, pits and malformations.
2. Finish shall be Epoxy Sandtex black, electrostatic application. Custom colors based on the RAL color system shall be available.
3. Fixture shall not weigh more than 27.15 lbs. (12.32kgs.).
4. Fixture shall have double clutch positive locking yoke locks on both sides of the housing.
5. The unit shall have 4 qty. tool free, stainless steel shutters equipped with insulated handles. The fixture shall include a lever located on each side to facilitate locking the shutters into position.
6. Shutters to be made of high quality steel. Shutter warping and burnout in normal use shall be unacceptable.
7. The focus barrel portion of the body shall be able to rotate 360° without the use of tools.

8. Fixture shall feature a standard size accessory slot with a sliding cover to eliminate uncontrolled light spill. Accessory slot shall accept the following accessories:
  - a. A and B size steel gobo pattern holders.
  - b. A and B size glass gobo pattern holders.
  - c. Iris.
  - d. Rotating gobo holder.
9. Fixture shall be supplied with:
  - a. Steel yoke constructed from rigid flat steel and with two mounting positions and indexed tilt angle markings.
  - b. Cast iron C-clamp (Altman #510) suitable for use on up to 2" O.D. pipe. Clamp shall incorporate a 360-degree rotational "Safety Stud" with locking bolt.
  - c. 18 inch safety cable.
  - d. Color frame.
  - e. Soft focus pattern holder.
  - f. Lens tube and locking hardware.
  - g. 5 foot power cable with powerCON™ socket outlets and the following options for plug type:
    - 1) Parallel Blade NEMA 5-15 "Edison" Male.
    - 2) 2 pin + ground Stage Pin Male.
    - 3) NEMA L5-20P Twist Lock Male.
    - 4) Bare end cable.

#### C. Electrical

1. The fixture shall be equipped with 100V to 240V 50/60 Hz auto-ranging internal power supply.
2. Power input and through shall be via lockable and separately keyed powerCON™ type connections.
3. Power supply shall have power factor correction.
4. Power supply outputs shall have resetting current-limiting protection.

#### D. Thermal

1. The fixture shall utilize thermal management to maintain LED life to an average of 70% intensity after 50,000 hours of use.
  - a. Thermal management shall include multiple temperature sensors within the housing to include:
    - 1) LED Temperature sensor.
    - 2) Power supply Temperature sensor.
    - 3) Display Board Temperature sensor.
    - 4) Heat Sink interface Temperature sensor.

#### E. Control

1. The unit shall be controlled using ANSI 1.11 USITT DMX512-A / ANSI E1.20 RDM (Remote Device Management). The DMX-512A device address for each fixture shall be user selectable.
2. Up to 16-bit virtual dimming control of the fixture shall provide full range (0-100%) dimming without exhibiting flicker or stepping. Dimming curves shall be optimized for smooth dimming at low intensities and over longer timed fades.
3. Control input and through function shall be via 5-pin XLR unified d-shell connections.
4. Console free playback options with Master and Slave modes shall be programmed into the onboard memory on RGB A/W versions. Functions shall include adjustable color fades and strobes.

#### F. Optical

1. LED arrays shall be available in the following combinations:
  - a. Color Mixing RGBA.
  - b. Color Mixing RGBW.
  - c. Fixed white color temperature 3000K.
  - d. Fixed white color temperature 5600K.
  - e. Variable white 3000K-5600K.
2. LED emitters should be rated for nominal 50,000 hour LED life to L70.
3. Fixture shall be calibrated at factory to achieve consistent color and intensity output between fixtures built at different times and/or from different LED lots or bins.
4. Fixtures shall have adjustable PWM frequency up to 8Khz with variable low end PWM variation to 10 Khz to avoid flicker on camera. PWM settings for video mode shall be adjustable by the user at the fixture if necessary to avoid any visible interference to video cameras and related equipment.
5. Color mixing fixtures shall be optimized for low saturate colors (pastels) as well as high saturate colors used in theatrical applications. Fixtures utilizing 3-color (Red, Green, and Blue) mixing systems cannot produce sufficient skin tones or saturate ambers, lavenders, or oranges and shall not be accepted.
6. Manufacturer of LED systems shall utilize an advanced production LED binning process to maintain color consistency.
7. Lenses
  - a. Lens tubes shall be available in two sizes:
    - 1) 15-30 degree field angle (total instrument length without yoke no more than 32" (813mm).
    - 2) 30-50 degree field angle (total instrument length without yoke no more than 27" (686mm).
  - b. Lens tube assemblies shall contain two adjustable and locking heat resistant lenses with anti-reflective coatings.
  - c. The 15° - 30° Zoom shall have two bi-convex aspheric lenses with an anti-reflective coating to increase lens transmission.

- d. The 30° - 50° Zoom shall have two plano-convex aspheric lenses with an anti-reflective coating to increase lens transmission.
- e. Fixture lens tube shall have scale markings on near to the adjustment knobs.
- f. Shutter assembly shall use 3 planes to ensure sharp focusing ability without halation.

END SPECIFICATION

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