

1.01 COLOR MIXING LED WASH FIXTURE

A. General

1. The fixture shall be Red, Green, Blue, and White LED luminaire with motorized zoom and DMX control. The fixture shall be the AP-150 RGBW by Altman Stage Lighting, Inc. or approved equal.
2. The fixture shall incorporate a state of the art microprocessor-controlled solid state LED light engine, and on-board power supply.
3. The fixture shall utilize active cooling and feature advanced cooling mitigation and control from either the DMX controller or via an active cooling system on board settings.
4. The fixture shall utilize a high efficiency optics and zoom mechanism to achieve greater than 1,900 lumens of output with a 12°- 65° beam angle motorized zoom.
5. IES photometric files, at multiple beam angles shall be available upon request from the manufacturer to model light output using the industry standard design software.
6. The fixture shall comply with USITT DMX-512 A, ANSI E1.20-2006, and ANSI E1.37-2 (2015) Remote Device Management over USITT DMX 512A Standard (RDM) for DMX controlled models. Luminaires not utilizing E1.37.2 (2015) RDM standard shall not be acceptable.
7. The fixture shall be ETL Listed to UL1573, and UL8750 LED for stage and studio use as well as Portable Electric Luminaires (UL Standard 153) and CE marked.
8. Fixtures which do not comply with this specification shall not be accepted.

B. Physical

1. The fixture shall be constructed in majority of an aluminum die cast shell. Construction shall employ all corrosion-resistant materials and hardware and shall be free of pits and burrs.
2. Standard finish shall be epoxy black, electrostatic application. The fixture shall be available with a black color finish.
3. Power supply, cooling and electronics shall be integral to each unit.

4. Fixture dimensions shall be 10.2" (259mm) L x 13.62" (346mm) H x 9.06" (230mm) Dia. and weigh 11lbs (5.08 kg) without accessories.
5. The fixture shall include a blending optic to reduce the projection of multiple shadows from the different color sources in the fixture.
6. Fixture shall be equipped with a dual slot accessory holder with tool-free quick release accessory holder clips with self-locking accessory retaining latch.
7. An integrated rigid flat steel kick stand yoke with locking tilt handle shall be available for stand-alone floor and overhead pipe mounting.
 - a. Pipe mounted fixtures shall be supplied as an additional accessory, a cast iron C-clamp Altman #510 suitable for use on up to 2" nominal (50.8 mm) O.D. pipe. Clamp must incorporate a 360-degree rotational "safety stud" with locking bolt. Any clamp not offering this safety feature will not be acceptable.
 - b. Fixtures shall be supplied, as an additional accessory, with safety cable for use when securing the fixture to a pipe.

C. Thermal

1. The fixture shall be cooled via an active cooling system and shall be capable of Progressive Output Management (POM): where the fixtures' logic follows a set of rules based upon the operators operational preferences. This logics shall include:
 - a. Direct DMX control: the fixture's DMX channel will control the fan's output, in conjunction with the Progressive Output Management when the luminaire is on. This control will enable the end user to silence the fan when low intensity is required.
 - b. Static (fixed) fan settings: When the unit is set to a defined "fixed" fan speed - if the LED reaches a maximum threshold temperature, the output of the luminaire will be reduced until thermal equilibrium is reached.
 - c. Automatic fan settings: when the unit is set to automatic fan control, fan cooling will slowly increase and decrease based upon the operating temperature.
2. Under normal operating conditions, the LED engine shall be capable of 50,000 hours rated lifespan to LM-70 / 70% maximum calibrated intensity with Progressive Output Management cooling, units not utilizing this style of cooling management shall not be accepted.

3. Ambient operating temperature shall be 32°F to 104°F (0 – 40 °C) non-condensing and IP-20 rated for indoor dry location use.

D. Electrical

1. The fixture shall be equipped with 100V to 240V 50/60 Hz auto-ranging internal power supply and requires power from a constant “non-dim” power source for.
2. The fixture shall receive power via a PowerCon™ blue power inlet and thru power via a PowerCon™ grey power outlet.

E. Control and User Interface

1. A local control keypad with a graphical user LCD display shall be provided for configuration, control, and review of:
 - a. DMX-512A Device Address
 - b. Status
 - c. Manual settings
 - d. Zoom Control
 - e. Fan Control
 - f. General Settings
2. It shall be possible to lock out the control keypad at the fixture to prevent accidental change in fixture configuration during operation. Locking and unlocking the control keypad shall be via predefined keypad lock.
3. Each fixture shall be compatible with the USITT DMX512-A control protocol, ANSI E1.20-2006 and ANSI E1.37-2 (2015) Remote Device Management over DMX512-A (RDM) standards.
4. The DMX-512A device address for each fixture shall be user selectable.
5. It shall be possible to set the DMX-512A device address for the fixture both locally and while the fixture is installed and connected to the system via the RDM (ANSI E1.20-2006 protocol) and an appropriate device such as a PC, lighting console, or a handheld programmer.
6. Fixtures which do not allow for setting of the DMX address via both local controls at the fixture and remotely while installed via RDM shall not be accepted.

7. The fixture shall have an available “Master Channel” function to provide control of intensity without changing the color of the output of the fixture. The master shall operate in either 8-bit or 16-bit resolution as defined by the configuration of the fixture.
 8. The fixture shall have user selected personalities to correctly match response to the application and control system utilized. Personalities shall provide the following options which may be combined as desired:
 - a. RGB, HSIC, 8 or 16 Bit DMX operation
 - b. On board preset color operation
 - c. Strobe (up to 30 hz)
 - d. Stand-alone effects
 - e. Stand-alone fixed output
 9. The fixture shall be capable of standalone operation, activated and configured at the control keypad. Standalone modes shall include the following:
 - a. Fixed color temperature defined with local control presets or DMX control.
 - b. Strobe with user selectable color and speed – up to 30 HZ.
- F. Optical
1. A 4:1 matrix of LEDs shall provide color or tunable white light or fixed white light, via an RGBW emitter. Fixtures not utilizing built in white points or color presets shall not be accepted.
 2. All lenses to feature cosine beam and field distribution and feature a 4:1 beam to field distribution ratio.
 3. The fixture shall feature a motorized zoom from spot (12°) to flood (65°) via DMX or manual settings with five (5) different nominal beam angle stop points of:
 - a. VNSP (Very Narrow Spot)
 - b. NSP (Narrow Spot)
 - c. MFL (Medium Flood)
 - d. WFL (Wide Flood)
 - e. XWFL (Extra Wide Flood)Fixtures not utilizing a motorized zoom with both manual and Dmx control shall not be accepted.

4. The fixture's optics shall be designed so as not to produce color shadows when used with beam shaping accessories such as barn doors or top-hats.
5. The fixture shall have an available dimming curve settings mode which makes PWM control of LED levels imperceptible to video cameras and related broadcast equipment.
6. A custom color control algorithm shall control the calibration of the colors from luminaire to luminaire. Color calibration shall be able to be turned on or off via the menu system or RDM. Fixtures not employing advanced color control calibration shall not be accepted.

G. Light Emitting Diodes

1. The fixture shall use a specific 4:1 LEDs for a wide range of color mixing or tuning for color models the standard configuration shall be Red, Green, Blue, and White LEDs with a white point of 6,500° Kelvin.
2. The fixtures led's shall be discretely binned in concert with the color calibration system to ensure color consistency from fixture to fixture.

H. Dimming Engine

1. The fixture shall provide full range dimming performance based upon its DMX input control signal and configuration and shall be equipped with an LED system compatible with standard 8-bit and 16-bit input, with high resolution dimming.
2. Dimming curves shall be optimized for smooth dimming at low intensities and over longer timed fades. Dimming curve settings to include:
 - a. Standard
 - b. Incandescent
 - c. Linear
3. LEDs shall be driven by Pulse Width Modulation. (PWM)
4. Additional smoothing algorithms shall be available to augment the high resolution dimming engine.

END SPECIFICATION

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