

1.01 LED FOLLOW SPOT

A. General - Luminaire

1. The luminaire shall be a 7600K fixed white LED 780 watt Follow spot luminaire capable of producing over 14,000 lumens. The luminaire shall be the AFS-700 LED Follow Spot from Altman Lighting Inc. or approved equal.
2. The luminaire shall incorporate a microprocessor-controlled solid-state LED light engine, and on-board power supply.
3. The luminaire shall incorporate quiet active cooling no greater than 30 dBA at .5m to maintain luminous intensity.
4. The luminaire shall utilize high efficiency and patented optics to render a homogenized shade of white at the focal plane.
5. Photometric files shall be available upon request from the manufacturer.
6. The luminaire shall comply with USITT DMX-512 A.
7. Luminaire shall be rated ETL or equally accredited 3rd party compliance certification and be CE listed.
8. The luminaire shall be UL1573 and UL8750 LED listed for stage and studio use.
9. The luminaire shall ship with:
 - a. AFS-700 Control Module
 - b. Adjustable and collapsible black Tripod
 - c. 5' Neutrik PowerCon™ to Edison power cable as standard.
 - d. AFS-700 Manual
 - e. AFS-700 LED Follow spot containing:
 - 1) Internal Seven (7) facet automated Dichroic color wheel
 - 2) Internal three (3) facet automated Dichroic CTO Wheel
 - 3) Internal eighteen (18) Leaf automated iris
 - 4) Internal 7°-13° Automated Zoom Lens
 - 5) Internal Automated Focus Lens

Luminaires that do not provide the above feature sets as a standard option shall not be considered.

10. Available connector options shall include but not be limited to:

- a. Raw cable-end, 20A Stage-Pin, 20A Twist-lock, or 16A CEE type equipped power leads.
11. Luminaire shall be rated IP20
 12. Warranty to include a minimum of 3 years on all components of the luminaire.
- B. General – Control Panel
1. The luminaire control panel shall have the ability to be located anywhere on the luminaires control accessory mounting rail allowing for left and righthanded operation. The control panel can be removed – unplugged from the luminaire when under DMX control. Luminaires not employing a moveable control panel shall not be accepted.
 2. Each luminaire control panel shall have the ability to control one or more AFS-700 follow spots through a DMX daisy chain between luminaires.
 3. The control panel will employ back lit indicator lights for each color and led on/off status.
 4. The controller shall have control of:
 - 1) LED on/off
 - 2) Dimmer – Slider for controlling output intensity
 - 3) Strobe – Slider for controlling strobe rate.
 - 4) CTO - Slider for controlling Color Temperature.
 - 5) Iris – Slider for opening and closing luminaires iris.
 - 6) Focus – Slider for controlling beam sharpness.
 - 7) Zoom – slider for controlling beam size.
 - 8) Color (8) Eight Back lit buttons
- C. Physical
1. The luminaire shall be constructed of extruded aluminum, refined and without burrs, pits, or rough edges. Plastic and steel components shall be used within the luminaire.
 2. Luminaire shall weigh no more than 40 pounds (18.14kg).
 3. Luminaire shall feature an external rail system capable of supporting balancing weights, additional handles, AFS-700 Control module.
 4. The luminaire shall contain a specialized LED array light engine, optimized specifically for this luminaire's optical system.

5. Overall dimensions of the luminaire shall not be larger than the following dimensions:
 - a. 13.38" (339.9mm) tall – including yoke
 - b. 11" (279 mm) wide
 - c. 40" (1016 mm) long
 6. All major parts and components shall be black. Luminaire body shall be anodized, not painted.
 7. An additional accessory holder for standard 7.5" x 7.5" shall be completely boxed in on three (3) sides, guarding filter frames from damage. Filter frame shall be capable of supporting industry standard 7.5" x 7.5" accessories.
 8. All system components (including electronics, power supply, and cooling shall be integral to each unit. Units utilizing external power supplies, ballasts, or transformers shall not be accepted.
- D. Electrical
1. The luminaire shall be equipped with 100V to 240V 50/60 Hz universal power supply.
 2. Luminaire shall feature up to a 780 watt long-life LED emitter matrix. Luminaire shall not consume more than 800W in normal operation.
 3. Power input shall be via Neutrik Powercon.
 4. Automatic power correction power supply shall be standard.
 5. Quiescent power load shall be no more than 60 watts.
 6. PWM frequency shall be variable, based upon dimming timing - with an upper limit of 15 kHz.
- E. Thermal
1. Under normal operating conditions, the LED engine shall be capable of 50,000 hours rated lifespan to LM-70 / 70% maximum calibrated intensity with active cooling.
 2. Ambient operating temperature 32°F to 104°F (0 – 40 °C).
 3. Active cooler shall consist of a pulse width modulation-controlled fan.

4. Fan shall automatically adjust for lowest possible noise output for a given luminance output
5. Luminaire shall employ temperature sensors on all temperature sensitive equipment to ensure to ensure stated LM rating.

F. Control and User Interface

1. The luminaire shall provide full range (0-100%) dimming without exhibiting flicker or stepping to both the eye and HD camera. Dimming curves shall be optimized for smooth dimming at low intensities and over longer timed fades.
2. A local control keypad with LCD display shall be provided for configuration and control of:
 - a. DMX-512A Device Address
 - b. Luminaire Personality
 - c. Stand Alone Operation
 - d. Individual attribute lock out
3. It shall be possible to lock out the control keypad at the luminaire to prevent accidental change in luminaire configuration during operation. Locking and unlocking the control keypad shall be via predefined key sequence.
4. Each luminaire shall be compatible with the USITT DMX512-A control protocols.
5. DMX or Local Control shall be connected via integral flush mount 5-Pin XLR input and output connectors.
6. Luminaire shall include integral flush mount 5-pin XLR output connector for DMX pass through or "Daisy Chain". Luminaires not including an output receptacle for DMX pass through shall not be acceptable.
7. DMX pass through shall also be utilized in stand alone or Lead follow spot mode where a single follow spot controller will control multiple attributes of additional follow spots connected to the same DMX Lan.
8. The DMX-512A device address for each luminaire shall be user selectable.
9. The luminaire shall be capable of standalone operation, activated and configured at the control keypad. Standalone functions shall include the following:
 - a. Fixed Color defined with local controls

- b. Zoom
 - c. Focus
 - d. Strobe
 - e. CTO
 - f. Iris
 - g. Dimmer
 - h. Led on/off
 - i. Primary / Replica
10. Control keypad shall be remote from the luminaire and able to be mounted anywhere on the control rail. Luminaires which cannot be fully controlled from either side of the luminaire will not be accepted.

G. Optical

1. Luminaire shall feature a custom matrix of LEDs to provide fixed color temperature white light. Variations of LED matrices to produce a 7600K native white beam with color and CCT variations via integrated color and CTO wheels.
2. Luminaire shall feature a fully homogenized output at the focal plane to enable color temperature changes without visible colors at the lens.
3. Lenses to feature cosine beam and field distribution and feature a 2:1 beam to field distribution ratio.
4. Zoom range shall automated and controlled from either DMX or via the onboard AFS-700 controller and shall provide a range no less than 7 – 13 degrees in beam angle.
5. Focus Lens system shall be automated and controlled from either DMX or via the onboard AFS-700 controller and shall provide a crisp concise beam with a sharp edge and allow for a soft edged beam with out affecting the previously set zoom.
6. An Automated 18 facet iris shall be capable of shaping the beam edge to reduce the over all beam diameter allowing for a 2.5 degree beam when fully closed.
7. An Automated CTO wheel capable of thee (3) different CTO settings shall be integral to the AFS-700 and shall be able to achieve 5600K, 4500K, and 3200K color temperatures. Luminaires with out CTO capability shall not be accepted.

8. A seven (7) position color wheel capable of adding color to the beam in conjunction with the CTO wheel shall be capable of full or split colors.
 9. A LED ON/OFF button (DMX Channel) shall allow for instant ON/OFF of the LED array following the luminaire's initial calibration start up.
 10. A variable strobe function up to 20hz (20 times a second) shall be available standard on the luminaire. Any luminaire not offering strobe functionality shall not be accepted.
 11. A range of accessories shall be available from the manufacturer including but not limited to:
 - a. Cylindrical Hood (top hat)
 - b. Front Accessory Holder 7.5" x 7.5"
 - c. Color frame
 - d. Accessory Color Boomerang (6 Color)
 - e. Weighted handle
 - f. Follow spot Handle
 - g. Balancing counterweight
- H. Light Emitting Diodes
1. The luminaire shall utilize a proprietary mix of white LEDs to produce the output as specified.
 2. LEDs shall be from reputable manufacturers with a proven track record for quality.
 3. All LEDs shall be subject to rigorous single binning and mixing procedures.
 4. LEDs shall be calibrated to an absolute nm wavelength CIE1931 X & Y coordinates.
 5. Burn-in procedure to be no less than 8 hours.
- I. Dimming Engine
1. LEDs shall be driven by Pulse Width Modulation. (PWM)
 2. PWM rates shall be variable and above 9800hz, ensuring no camera phasing, image flip or roll.

3. Dimming curves shall be smooth with no perceptible steps over long fades. Follow spots utilizing flag or chop mechanical dimmers shall not be accepted.
4. Luminous Output: Shall meet or exceed 14000 lumens output at narrow beam and produce no less than 130fc (1400 LUX) at 100'-0" (30.48M)

END SPECIFICATION

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