**LED PAPI 230VAC / Voltage Powered Systems**

**(model: S4GA LED PAPI 230VAC)**

**Purchase Specification**

Note: while designing your system select preferred options according to your specific design requirements.

LED PAPI

Purchase specification shall include supply and installation of the LED Precision Approach Path Indicator (PAPI) system as per following requirements (specification).

Complete PAPI system shall also consist of all necessary items to complete the installation process including but not limited to all cables and connectors, the preparation and installation of all required conduits and fittings and all required mounting structures. This item shall also include the commissioning and testing of the installation and all elements necessary to put the LED PAPI system in operation to the satisfaction of the Project Engineer.

This item shall conform to the requirements of ICAO, Annex 14th, Volume I, 8th Edition dated July 2018, Figure A2-23, EASA CS ADR-DSN, Figure U-26, TP312, 5th Edition dated 2015, clause 5.2.16.12, Figure B-19 and FAA AC 150/5345-28H, Figure 3-1. The LED PAPI shall be a certified by the third party accredited laboratory for ICAO, EASA, FAA and TP312 photometric and chromaticity. The LED PAPI shall be as manufactured by S4GA (www.solutions4ga.com) or approved equal.

Equipment

The LED PAPI system shall consist of the following classifications:

1. Type.

{L-880 - System consisting of 4 Light Units

or

L-881 - System consisting of 2 Light Units}

1. Style.

{Style A - Voltage powered

1. Class.

Class I - Operation down to -31F (-35C)

The system shall also include an Installation Kit and one Installation and Maintenance Manual (per system) and the ability to download a digital version of from their web site.

**LED PAPI Light Head Assembly (LHA)**

The PAPI LHA shall use a Light Emitting Diode (LED) optics to reduce energy consumption and maintenance. To maximize optical efficiency, the optical system shall consist of a sealed and ventilated optical chamber. The LED module and front glass shall be easily replaceable without requiring PAPI unit re-calibration. Each LHA power requirement shall not exceed 120 W including the lens heater (aka arctic kit).

The LHA shall be compact and easy to handle not exceeding the following dimensions per unit: H 225 mm) x W 305 mm) X L 669 mm) and weight no more than 47kg

The outer optical lens shall be protected from sandblasting by a separate, hardened front glass which is temperature controlled and is designed to ensure that the outer glass is clear of frost/dew.

The average intensity in red light will be at least 19,000 Cd for a horizontal beam spread of -6° to +6° and a vertical angle of 3.5° below transition. The transition sector will not exceed 3 minutes of arc over the full beam width.

The average intensity in the white light will be at least 47,000 Cd for a horizontal beam spread of -6° to +6° and a vertical angle of 3.5° above transition. The transition sector will not exceed 3 minutes of arc over the full beam width.

Additionally for ICAO, the intensity value in the white sector of the beam shall not be less than 2 and shall not exceed 6.5 times the corresponding intensity in the red sector.

Each PAPI single projector shall be of multi-lamp design for increased redundancy.

Each PAPI LHA shall be possible to configure between 1x up to 2x single projectors on one frame for increased redundancy / increased brilliancy.

Each PAPI LHA shall have a tilt sensor. The unit design shall ensure all lamps in the system are de-energized when one light unit in vertical axis is lowered more than ¼ degree or raised greater than ½ degree, additionally when light unit in horizontal axis tilt over 1,75 degree in either direction. The light unit tilt sensing shall be fail-safe so any malfunction, including loss of input power, de-energizes the PAPI light unit.

Each PAPI LHA shall be constructed as follows :

The PAPI LHA shall be made from sheet of stainless steel marine grade fully protected against corrosion. The PAPI LHA shall be fully weatherproof. For ease of alignment, the PAPI LHA shall be mounted on a frame using 2x hand operated latches for easy maintenance and field replacement capabilities, frame shall rest on three mounting legs. Precision elevation adjustment shall be possible in less than 5 minutes per unit, making use of the supplied external inclinometer (one per system)

Style A System Requirements

Each LHA shall be equipped with separate Power Control Unit (PCU). Optionally Each Light Unit will be equipped with dual power units (so LHA can be connected to two independent power circuits for higher safety operations) Input power to the PCU shall be 94-265 VAC, 50/60Hz. For any system configuration, the input power required by the PAPI shall be 350 VA maximum.

PAPI Projector shall be optionally equipped with IR LEDs for operations using NVG googles.

IR LED signal will be steady / flashing (2 Hz). Projector will be optionally equipped with selector switch to manually activate IR LEDs / set manually intensity up to 6x levels.

Each projector unit will be equipped with internal fault detection logic. In case of LED failure resulting with significant loss of illumination PAPI projector will de-energize automatically.

Optionally each projector shall be equipped with Emergency Selector Switch allowing for 100% Manual Setting in Visible Light Spectrum / Infrared Light Spectrum

Optionally PAPI LED Projector unit will be equipped with Bluetooth allowing for local wireless communication via dedicated Mobile App for airport maintenance Team.

Optionally PAPI LED Projector unit will be equipped with S4GA radio communication unit allowing for remote control and monitoring of individual unit using : UR-101or UR-201 or ALCMS Control & Monitoring Software.

The intensity of the PAPI system shall be automatically selected (to high intensity during the day and low intensity at night) using a photocell connected to the PCU.

Remote Control Options:

* The FAA L-880/881 versions shall use a photocell for Day night determination and remote control for Night intensities only 5% or 20% intensities.
* ICAO or non-FAA installations shall allow for control up to 6 intensities manually (up to 8 x intensities via Airfield Lighting Control and Monitoring System)
* Separate de-activation switch will be installed in projector to by-pass a faulty indication from photo-sensor / tilt switch
* Powered from a continuous 50/60 Hz AC voltage source. A hard wired connection to the PCU shall provide for On/Off control and intensity selection via remote control per FAA or ICAO.
* Powered from a continuous 50/60 Hz AC voltage source. Provides On/Off control through current sensing of the runway series circuit during nighttime operations. During daytime, light units are activated at the 100% step via control from the photocell (current sensing input is not used). Nighttime intensity is automatically set to 5% or 20% (field selectable).

Construction Methods

Installing the PAPI LHAs and PCU

The contractor shall furnish and install the LED PAPI system as specified in the proposal and shown in the plans. The LED PAPI shall be mounted {on a concrete base} at the location shown on the plans. The LED PAPI shall be vertically aligned according to the requirements in the plans using the aiming procedures detailed by the manufacturer. The tilt sensor shall be set on all LED PAPI LHAs according to the manufacturer’s instructions.

Tests

The completed system shall be fully tested by continuous operation for not less than 24 hours prior to acceptance. The test shall include the functioning of each intensity control in both Remote and Local not less than 10 times at the beginning and end of the 24-hour test. The test shall insure the tilt switch is operational and all units turn off when the signal is opened.

Method of Measurement

The quantity of lights to be paid for under this item shall be for one LED PAPI system, one Installation Kit and one Installation and Installation and Maintenance Manual installed and accepted as a system ready for operation.