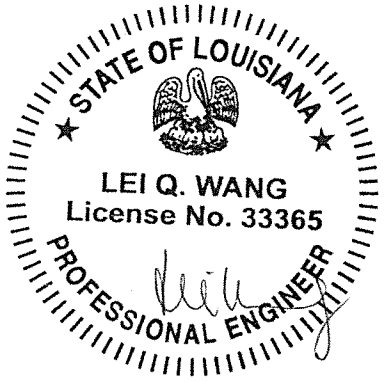
Louisiana

Department of Transportation And Development

Traffic Control Standard

Number 42

12 INCH (300mm) LED Traffic Signal Lamp Unit



11/9/2012

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1. SCOPE

Red Modules (SAP# 10914, Stock# 14-03-4000):
12-in Red L.E.D. Signals
Yellow Modules (SAP# 10915, Stock# 14-03-4005):
12-in Yellow L.E.D. Signals
Green Modules (SAP# 10916, Stock# 14-03-4010):
12-in Green L.E.D. Signals
Red Arrow Modules (SAP# 50570, Stock# 14-03-4015):
12-in Red Arrow L.E.D. Signals
Yellow Arrow Modules (SAP# 10917, Stock# 14-03-4020):
12-in Yellow Arrow L.E.D. Signals
Green Arrow Modules (SAP# 10918, Stock# 14-03-4025):
12-in Green Arrow L.E.D. Signals

1.1. This specification describes the minimum acceptable design and performance requirements for 12 inch (300 mm) light emitting diode (LED) circular and arrow traffic signal lamp units for span wire and mast arm applications.
1.2. Modules must be preapproved on the Traffic Operations Approved Product List

2. 12 INCH (300 mm) LED TRAFFIC SIGNAL LAMP UNIT

2.1. General

2.1.1. All LED traffic signal lamp units shall conform to the latest versions of the Institute of Transportation Engineers (I.T.E.) Vehicle Traffic Control Signal Heads (VTCSHs) LED Vehicle Arrow Traffic Signal Supplement standard, the I.T.E. VTCSHs LED Circular Signal Supplement standard, and this specification. In the case of conflicts between standards and specifications, the latest Louisiana Department of Transportation and Development (LADOTD) specifications shall govern.

2.1.2. The LED traffic signal lamp unit shall be designed as a retrofit replacement for existing signal lamps which will fit into existing traffic signal housings without modification and not require any special tools for installation.

2.1.3. Installation of a retrofit replacement LED traffic signal lamp unit into existing signal housing shall only require removal of the existing lens, reflector, and incandescent lamp, fitting of the new unit securely in the housing door, and connecting to existing electrical wiring or terminal block by means of simple connectors.

2.1.4. If proper orientation of the LED traffic signal lamp unit is required for optimum performance, prominent and permanent directional marking(s), such as an "UP arrow" or equivalent, for correct indexing and orientation shall exist on the unit.

2.1.5. The manufacturer's name, model number, serial number, and manufacture date (minimum month and year) batch number and that the module has been tested by the manufacturer shall be permanently marked on the backside of the LED traffic signal lamp unit. A label shall be placed on the unit certifying compliance to the latest I.T.E. VTCSHs LED Vehicle Arrow Traffic Signal Supplement or latest I.T.E. VTCSHs LED Circular Signal Supplemental standards, including standard title and date.

2.2. Physical and Mechanical Requirements

2.2.1. The LED traffic signal lamp unit shall be a single, self-contained device, not requiring on-site assembly for installation into existing traffic signal housing.

2.2.2. The assembly and manufacturing process for the LED traffic signal lamp unit shall be such as to ensure all internal LEDs and electronic components are supported to withstand mechanical shock and vibration from high winds and other sources.

2.2.3. Each LED traffic signal lamp unit shall be comprised of a UV stabilized polymeric outer shell, multiple LED light sources, and a regulated power supply. LEDs are to be mounted on a polycarbonate positioning plate or PC board.

2.2.4. Each LED traffic signal lamp unit shall have a clear lens with the incandescent look (individual LEDs should not be directly visible). Tinted lenses are not acceptable.

2.3. Optical and Light Output Requirements

2.3.1. The LEDs shall be manufactured using Aluminum-Indium-Gallium-Phosphide (AlInGaP) technology or other LEDs with lower susceptibility to temperature degradation than Aluminum-Gallium-Arsenic (AlGaS). AlGaS LEDs will not be allowed.

2.3.2. Designs which require LEDs to be operated at currents greater than the LED manufacturer's recommended drive current will not be allowed.

2.3.3. The color of the LED traffic signal lamp units shall be specified in the solicitation.

2.3.4. Each LED traffic signal lamp unit shall meet minimum laboratory light intensity values and light output distribution as described in I.T.E. VTCSHs LED Supplements for a minimum period of sixty (60) months, based on normal use in traffic signal operation over an operating temperature range of -40° C to +74° C.

2.3.5. Measured chromaticity coordinates of LED traffic signal lamp units shall conform to the chromaticity requirements detailed in the latest edition of the I.T.E. VTCSHs LED Circular Signal Supplement or the latest edition of the I.T.E. VTCSHs LED

Vehicle Arrow Traffic Signal Supplement for circular or arrow indications respectively for a minimum period of sixty (60) months.

2.4. Electrical

2.4.1. Each LED traffic signal lamp unit shall incorporate a regulated power supply engineered to electrically protect the LEDs and maintain a safe and reliable operation. The power supply shall provide capacitor filtered DC regulated current to the LEDs per the LED manufacturer specification. Design of the power supply shall be such that the failure of an individual component, or any combination of components, cannot cause the signal to be illuminated after AC power is removed.

2.4.2. LED traffic signal lamp units shall be operationally compatible with TS1, TS2, and 2070 controllers, conflict monitors with plus features, and malfunction management units currently used by the LADOTD.

2.4.3. Circular and arrow LED traffic signal lamp units shall be designed to sense a loss of light output due to catastrophic LED failure and react in compliance with the failed state impedance provision of the I.T.E. VTCSHs Circular Signal Supplement (latest edition).

2.4.4. Two, captive, color coded, 600V 18 AWG minimum jacketed wires, 3 feet (1 m) long, conforming to the National Electric Code, rated for service at 105° C, are to be provided for an electrical connection.

2.4.5. The LED traffic signal lamp units shall have on-board circuitry, including voltage surge protection, to withstand high-repetition noise transients and low-repetition high-energy transients as stated in Section 2.1.8, NEMA Standard TS 2-2003, except voltage shall be 2000V instead of 1000V. The circuitry shall also be able to withstand high-repetition low-energy transients as stated in Section 2.1.6, NEMA Standard TS 2-2003.

2.5. Environmental Requirements

2.5.1. Environmental requirements shall meet or exceed I.T.E. VTCSHs LED Standard Supplements (latest edition).

2.6. Production Testing Requirements

2.6.1. A quality assurance (QA) program must be in place at the manufacturer's facility to ensure product reliability in accordance with I.T.E. VTCSHs LED Standard Supplements (latest edition).

2.6.2. The manufacturer shall energize each new LED traffic signal lamp unit for a minimum of 24 hours at nominal operating voltage (120V AC RMS) at room temperature to check for any electronic infant mortality to occur, and to ensure

electronic component reliability prior to shipment. Test results of a module may be required from the manufacturer at any time.