**SECTION 26 51 13**

**INTERIOR LIGHTING**

**LED Dimming Drivers**

*Specifier: This is intended to be used as a guide specification for dimmable LED drivers. Please visit www.acuitybrands.com or contact* [*your local agent*](https://www.acuitybrands.com/support/how-to-buy) *for more information.*

**PART 1- GENERAL**

1.1 SUMMARY

A. Section Includes:

1. LED dimming driver.

B. Related Sections:

1. Edit the following subparagraphs to coordinate with other sections in the Project Manual.

2. Section [262726 - Wiring Devices] [\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_]

3. Section [265100 – Interior Lighting] [\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_]

4. Section [260923 – Lighting Control Devices:] [\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_:]

1.2 REFERENCES

A. Underwriters Laboratories, Inc. (UL)

1. 1310 and 8750 – Light Emitting Diode (LED) equipment for use in lighting products.

B. American National Standards Institute (ANSI)

1. ANSI C82.18 - 2022 - American National Standard for Light-Emitting Diode Drivers Performance Characteristics

2. ANSI/IES RP-16-10 – Nomenclature and definitions for illuminating engineering

3. ANSI E1.20 - Remote Device Management Over DMX512 Networks

4. ANSI E1.11-2008 (R2018)- ESTA DMX 512, USITT (Serial Digital Data Transmission Standard for Controlling Lighting Equipment)

5. ANSI C62.41 – Recommended practice in low power circuits

6. ANSI C137.1-2022 - Lighting Systems - 0-10V Dimming Interface for LED Drivers

C. International Electrotechnical Commission (IEC).

1. IEC 61347-1 – General and safety requirements for lamp control gear

2. IEC 61347-2-13 – Particular requirements for electronic control gear for LED modules

3. IEC 62384 - DC or AC supplied electronic control gear for LED modules – performance requirements

4. IEC 61000-3-2 - Harmonic current emissions

5. IEC 61547 - EMC immunity requirements

6. IEC 62386– Digital addressable lighting interface (DALI)

7. IEC 1789-2015 – Recommended Practices for modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers

D. European Mark for electrotechnical products (ENEC)

1. EN55015 – Radio disturbances <30 Mhz

2. EN55022 – Performance requirement for EMC, Information technology and Telecommunications equip.

3. EN60929/IEC60929 – Performance requirement for AC supplied electronic equipment

E. Federal Communications Commission (FCC) rules – Part 15: Radio Frequency Devices.

1. Commercial rated Class A

2. Residential rated Class B

F. Entertainment Services and Technology Association

1. ESTA E1.3 - Entertainment Technology - Lighting Control System - 0 to 10V Analog Control Protocol

G. National Electrical Manufacturers Association (NEMA)

 1. NEMA 77 - Standard for Temporal Light Artifacts

1.3 SUBMITTALS

A. See Section 013000 – Administrative Requirements for submittal procedures

B. Shop Drawings: Clearly indicate the name of the job, Architect/Engineer and list fixture type (s) for each specific driver. Contractor shall endeavor to submit all drivers as one package along with the luminaire package.

C. Product Data: Provide dimensions, ratings and specific catalog number and identification of items and accessories and performance data.

D. Wiring Diagrams – as needed for special operation or interaction with other system(s)

1.4 DESCRIPTION

A. LED dimming driver

1. 0-10V DC Voltage Controlled Dimming Drivers

2. Digital (DALI Low Voltage Controlled) Dimming Drivers

3. Digital Multiplex (DMX Low Voltage Controlled) Dimming Drivers

4. nLight® OR SensorSwitch™ controls supported, including embedded controls, dimming drivers

1.5 QUALITY ASSURANCE

A. Manufacturer: Minimum 5 years’ experience in manufacturing of dimmable electronic lighting drivers.

B. Recognized or listed by UL for use in the US and Canada. Provide evidence of compliance upon request.

C. Recognized or certified by ENEC, PSE, KC, BIS, TISI, UKCA for use in applicable global markets. Provide evidence of compliance upon request.

1.6 WARRANTY

A. Provide manufacturer’s warranty covering 5 years on drivers from date of purchase OR on luminaire from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: eldoLED OR eldoLED an Acuity Brands company

B. [Basis of design product: eldoLED OR eldoLED an Acuity Brands company or subject to compliance and prior approval with specified requirements of this section, one of the following:]

1. eldoLED OR eldoLED an Acuity Brands company

2. <insert manufacturer’s name>

2.2 GENERAL

A. LED dimming shall be equal in range and quality to a commercial grade incandescent dimmer. Quality of dimming to be defined by dimming range, freedom from perceived flicker or invisible stroboscopic flicker, smooth and continuous change in level (no visible steps in transitions), selectable dimming curves including linear, logarithmic, soft linear and square, and stable when input voltage conditions fluctuate over what is typically experienced in a commercial environment. Demonstration of this compliance to dimming performance will be necessary for substitutions or prior approval.

B. Minimum of 50,000 hours of expected life while operating at maximum case temperature and 90 percent non-condensing relative humidity.

*Specifier: To reduce false circuit breaker tripping due to turn on inrush, the following statement ensures that electronic dimming driver will meet NEMA inrush recommendations.*

C. Driver must limit inrush current.

1. Meet or exceed NEMA 410 driver inrush standard

D. Driver must withstand voltage surges and transients without impairment to performance

1. Meet or exceed ANSI C62.41 Category A.

2. Meet or exceed ANSI C82.77-5-2017 Surge and Transient Standard.

E. No visible change in light output with a variation of plus/minus 10 percent line voltage input.

F. Total Harmonic Distortion (THD) less than 20% percent and meet ANSI C82.11 maximum allowable THD requirements at full output.

G. Driver shall be UL Listed Class P.

H. Driver shall have ability to provide dim to off, operating at industry standard standby power.

2.3 LIGHT QUALITY

A. Over the entire range of available drive currents, driver shall provide step-free, continuous dimming from 100 percent down to 0.1 percent of light output OR 1 per cent where indicated.

1. Driver must be capable of configuring minimum dimming levels and provide programmable output currents in 1mA increments

B. Driver must be capable of configuring a linear, logarithmic, soft linear and square dimming curve, allowing fine grained resolution at low light levels

*Specifier: To provide similar visual performance and illumination quality to incandescent dimming solution, system should minimize perceived and unperceived flicker:*

C. Driver and luminaire electronics shall deliver illumination that is free from objectionable flicker

1. Meet and comply with IEEE 1789 and NEMA 77 standards at all points within the dimming range.

D. Driver shall provide programmable color temperature range managed at local driver level.

E. Project Specific - Driver and luminaire electronics shall support Tunable White AND/OR Dim to Warm AND/OR Dynamic Dimming

2.4 CONTROL INPUT

A. 0-10V DC Voltage Controlled Dimming Drivers

1. Must meet IEC 60929 Annex E for General White Lighting LED drivers

B. Digital (DALI Low Voltage Controlled) Dimming Drivers

1. Must meet IEC 62386

C. Digital Multiplex (DMX Low Voltage Controlled) Dimming Drivers

1. Must meet DMX / RDM: USITT DMX512A and ANSI E1.20 (Explore & Address) and ANSI E1.11-2008 (R2018)- ESTA DMX 512, USITT (Serial Digital Data Transmission Standard for Controlling Lighting Equipment)

2. Capable of signal interpolation and smoothing of color and intensity transitions

D. nLight® OR SensorSwitch™ controls supported, including embedded controls, with Dimming Drivers

2.5 INSTALLATION

A. Driver may be remote mounted up to 300 ft. (100 m) depending on power level and wire gauge.

B. Driver 0-10V input shall be protected from line voltage mis-wire