ANSI C136 Standards Update

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American National Standards for Street and Area Lighting Equipment

- C136.15 Field Identification
- C136.25 Ingress Protection
- C136.35 Ancillary Devices (LEAD)
- C136.37 LED Luminaires
- C136.38 Induction Lighting
- C136.40 Solar Lighting Systems
- C136.41 Controls (Dimming, Receptacle)
- C136.42 LED Retro-fit

ANSI C136.15-2011 Field Identification

Scope

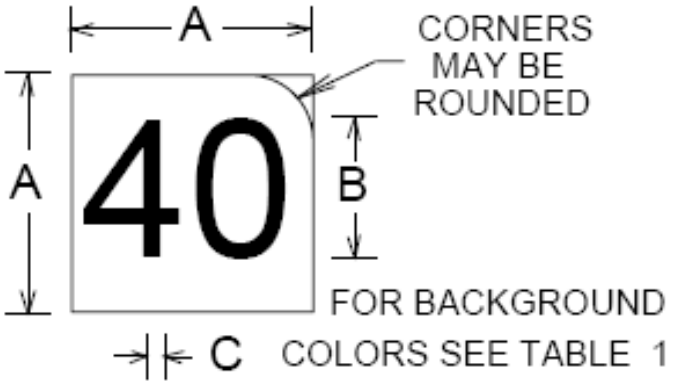
The intent of this standard is to provide a simple, uniform method for identifying the type and wattage rating of a luminaire used for roadway and area lighting.

Table 1
Lamp Marker Background Color for Identifying Lamp Type

Lamp type	Identifying color
High-pressure sodium	Gold or yellow
High-pressure sodium/penning	Green
Low-pressure sodium	Tan
Mercury vapor	Blue
Metal halide	Red
*Pulse start metal halide	Red and White

*Refer to Figures 2 and 3 for marking a vertical and horizontal burn pulse start metal halide

ANSI C136.15-2011 Field Identification



Marker dimensions		
Dimension	Marker type	
	Small	Large
A	25.4 ± 1.6 mm (1 ± 1/16 in)	76.2 ± 1.6 mm (3 ± 1/16 in)
B	19.05 mm Min (3/4 in Min)	50.8 mm Min (2 in Min)
C	3.175 mm Min (1/8 in Min)	6.35 mm Min (1/4 in Min)

Figure 1
MARKER DIMENSION

ANSI C136.15-2011 Field Identification

Figure 2
Horizontal Burn Pulse Start Metal Halide Background

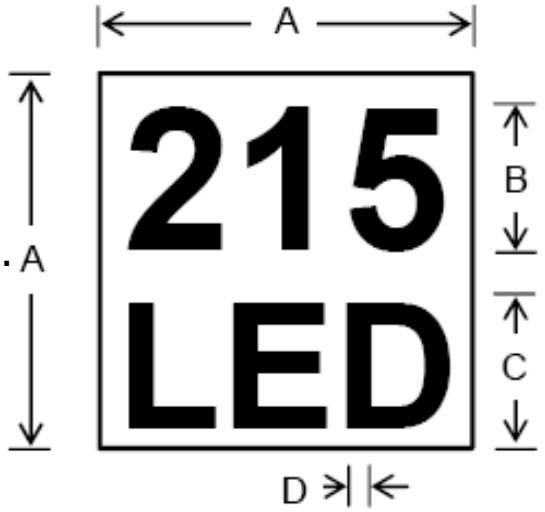
Figure 3
Vertical Burn Pulse Start Metal Halide Background

Table 2
Lamp Marker Numerals for Identifying HID Lamp Wattage

Lamp wattage	Remarks	Identifying numeral
18		1
35		3
50		5
55		5
70		7
90		9
100		10
135		13
150		15
150	100 Volts	15H
175		17
175	position oriented	17B
180		18
200		20
215		21
220		22
250		25
250	position oriented	25B
310		31
320		32
350		35
360		36
400		40
400	position oriented	40B
450		45
600		60
660		66
700		70
750		75
875		87
1000		X1

ANSI C136.15-2011 Field Identification

Black print on white background.



Marker dimensions		
Dimension	Marker type	
	Small	Large
A	25.4 ± 1.6 mm (1 ± 1/16 in)	76.2 ± 1.6 mm (3 ± 1/16 in)
B	9.525 mm Min (3/8 in Min)	31.75 mm Min (1 1/4 in Min)
C	9.525 mm Min (3/8 in Min)	31.75 mm Min (1 1/4 in Min)
D	3.175 mm Min (1/8 in Min)	6.35 mm Min (1/4 in Min)

Figure 4
Marker Dimension—Solid State and Fluorescent Systems

ANSI C136.15-2011

Field Identification

Figure 5
Light-Emitting Diode Marker Design

Figure 6
Induction Marker Design

Figure 7
Compact Fluorescent Marker Design

Figure 8
Plasma Marker Design

ANSI C136.25-2009 Ingress Protection

- Resistance to dust, solid objects, and moisture for luminaire enclosures.
- Based on IEC 60529 (Electrical Enclosures) and IEC 60598-1 (Luminaires).
- Refers to IEC 60529 for testing procedures.

ANSI C136.25-2009 Ingress Protection

Code	**IP-XX**
First digit (dust and solid objects)	**0 to 6**
Second digit (moisture)	**0 to 8**

ANSI C136.25-2009 Ingress Protection

Table 1
DEGREES OF PROTECTION (OF PERSONS) AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL*

First characteristic numeral	Degree of protection of persons against hazardous parts	Test definition
0	Non-protected	None
1	Protected against access to hazardous parts with the back of a hand	50 mm Ø access probe sphere, shall have adequate clearance from hazardous parts
2	Protected against access to hazardous parts with a finger	12 mm Ø, 80 mm length, jointed test finger, shall have adequate clearance from hazardous parts
3	Protected against access to hazardous parts with a tool	2.5 mm Ø access probe shall not penetrate
4**	Protected against access to hazardous parts with a wire	1.0 mm Ø access probe shall not penetrate
5**	Protected against access to hazardous parts with a wire	1.0 mm Ø access probe shall not penetrate
6**	Protected against access to hazardous parts with a wire	1.0 mm Ø access probe shall not penetrate

* This table is based on Table 1 in IEC 60529.
** Although it appears the same, numbers 4, 5, and 6 are differentiated in Table 2.

ANSI C136.25-2009 Ingress Protection

Table 2
DEGREES OF PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL*

First characteristic numeral	Degree of protection against solid foreign objects	Test definition
0	Non-protected	None
1	Protected against solid foreign objects of 50 mm Ø and greater	50 mm Ø access probe sphere, shall not fully penetrate**
2	Protected against solid foreign objects of 12.5 mm Ø and greater	12.5 mm Ø access probe sphere, shall not fully penetrate**
3	Protected against solid foreign objects of 2.5 mm Ø and greater	2.5 mm Ø access probe shall not penetrate at all**
4	Protected against solid foreign objects of 1.0 mm Ø and greater	1.0 mm Ø access probe shall not penetrate at all**
5	Dust protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with operation of the equipment or impair safety
6	Dust tight	No ingress of dust

* This table is based on Table 2 in IEC 60529.
** The full diameter of the object probe shall not pass through an opening of the enclosure.

ANSI C136.25-2009 Ingress Protection

Table 3
DEGREES OF PROTECTION AGAINST WATER AS INDICATED BY THE SECOND CHARACTERISTIC NUMERAL*

Second characteristic numeral	Degrees of protection against ingress of water	Test definition
0	Non-protected	None
1	Protected against vertically falling drops of water	Vertically falling drops of water shall have no harmful effects
2	Protected against vertically falling drops of water when luminaire is tilted up 15 degrees	Vertically falling drops of water shall have no harmful effects when the enclosure is tilted at any angle up to 15 degrees on either side of the vertical
3	Protected against spraying water	Water sprayed at an angle up to 60 degrees on either side of the vertical shall have no harmful effects
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5	Protected against water jets	Water projected in jets against the enclosure from any direction shall have no harmful effects (3/8" Φ Nozzle, with 1 meter head)
6	Protected against powerful water jets	Water projected in powerful water jets against the enclosure from any direction shall have no harmful effects (same as 5, with 3 meter head)
7	Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of time and pressure
8	Protected against the effects of continuous immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions that shall be agreed upon by the manufacturer and user, but which are more severe than numeral 7

* This table is based on Table 3 in IEC 60529.

ANSI C136.25-2009 Ingress Protection

Table 4
SUGGESTED IP RATINGS FOR ANSI C136 EQUIPMENT

ANSI C136 luminaire	Complete luminaire	Optical system only
C136.6, NEMA head	IP 1 3	IP 0 3
C136.10, PC mounted	IP 5 3	---
C136.14, Cobra head	IP 3 3	IP 5 4
C136.16, Post top	IP 4 3	IP 4 4
C136.18, High mast	IP 3 3	IP 5 4
C136.23, Architectural	IP 3 3	IP 5 4
C136.24, Button (window)	IP 6 6	---
C136.24, Button (back)	IP 4 X	---
C136.27, Tunnel	IP 6 6	IP 6 6
C136.32, Set back	IP 5 4	IP 5 4

ANSI C136.35-2009 Ancillary Devices

Luminaire Electrical Ancillary Devices (LEAD)

This standard covers the electrical and mechanical interchangeability of electrical devices mounted on or in luminaires, brackets, or remotely mounted on the support structure of the luminaire and that may draw power from the luminaire. These devices are used in conjunction with roadway and area lighting luminaires and may be mounted or plugged into the photocontrol receptacle. This standard does not cover such things as flag banners, flower containers, or decorative holiday/seasonal lights.

ANSI C136.35-2009 Ancillary Devices

References to ANSI C136.2 Voltage Classification

- Dielectric Withstand, 600 volt class

References to ANSI C136.31 Vibration

- Shall not compromise the original integrity of the luminaire.

ANSI C136.35-2009 Ancillary Devices

References to ANSI C136.10 Locking-type Photocontrols

- Receptacle mounted devices must meet plug (contacts)physical requirements.
- Receptacle mounted devices must be rated accordingly.
- Environmental ratings in accordance with tests identified within.
- Humidity Test
- Rain Test
- Surge Test

ANSI C136.35-2009 Ancillary Devices

References to UL 773 Plug-In Locking Type Photocontrols

- Ultraviolet and water exposure test (enclosure)
- Low temperature test (enclosure)
- Outdoor exposure (external electrical leads)

References to FCC, C.F.R. Title 47 Requirements

- Radiated emissions

Misc. Requirements

- Electrical leads insulation rated for 150ºC min.

ANSI C136.37-2011 LED Luminaires

This standard defines interchangeability of and some requirements for solid state light (SSL) source fixtures (also referred to as luminaires and/or LED (light-emitting diode) fixtures).

Most requirements consistent with those for other C136 equipment.

ANSI C136.37-2011 LED Luminaires

Operating Temperature

A luminaire built to this standard shall be able to operate without reduced life or output from its L_{70} rating (between -20ºC and +25ºC ambient temperature), or as specified by the user.

The luminaire shall be capable of operating in a 40°C ambient with no permanent damage.

Manufacturers may provide lifetime ratings in hours at other ambient operating temperatures for reference.

ANSI C136.37-2011 LED Luminaires

Surge Protection

5.3 The luminaire shall be protected from damage or consequential damage for surge-test waveforms. This is defined in ANSI/IEEE C62.41.2-2002 (Tables 1 and 4) for Location Category C in both high and low exposures. High Exposure is defined as a surge with an open circuit voltage of 10KV at 1.2/50 microseconds and a short circuit current of 10KA. Low Exposure is defined as 6KV at 8/20 microseconds and a short circuit current of 3KA.

ANSI C136.37-2011 LED Luminaires

Correlated Color Temperature

Table 1. Allowable Nominal CCT (adapted from NEMA C78.377)

Outdoor White Color Range	Manufacturer-Rated Nominal CCT (K)	Allowed CCT from LM-79 Report	
		Measured CCT (K)	Measured Duv
Warm	2700	2580 to 2870	-0.006 to 0.006
	3000	2870 to 3220	-0.006 to 0.006
	3500	3220 to 3710	-0.006 to 0.006
Neutral	4000	3710 to 4260	-0.005 to 0.007
	4500	4260 to 4745	-0.005 to 0.007
Cool	5000	4745 to 5310	-0.004 to 0.008
	5700	5310 to 6020	-0.004 to 0.008
	6500	6020 to 7040	-0.003 to 0.009

ANSI C136.37-2011 LED Luminaires

Ratings (provided with luminaire)

a) Initial lumen output of the fixture at 25ºC ambient temperature
b) LED life at L_{70} lumen rating (as calculated per IES Guidelines), shall be a minimum of 50,000 hours or as specified by the user
c) Light distribution as defined by IES RP-8
d) Fixture labeling shall be to ANSI C136.22
e) BUG ratings as defined in IES TM-15 Addendum
f) Maximum wattage input at 25ºC
g) Correlated Color Temperature of light output
h) Operating ambient temperature range
i) Input voltage and frequency ranges
j) If section 5.3 test for high surge is met by fixture, "High Surge Rated" awarded
k) Weight
l) EPA

ANSI C136.37-2011 LED Luminaires

Ingress Protection

The LED Array shall be protected to a minimum rating of IP65 per ANSI C136.25. The electrical assembly or electrical compartment shall be rated a minimum of IP54--unless the individual internal electronic components are sealed to at least IP54 (or damp location).

ANSI C136.38-2009 Induction Lighting

- **Basic requirements**
- **Specify maximum allowable operating temperatures:**
  - **HF Generator case, test point**
  - **Power coupler, test point**
- **Comply with FCC Title 47, Part 18, Subpart C.**

ANSI C136.40-2011 Solar Lighting Systems

Scope

This standard defines the electrical and mechanical requirements of dc only solar-type light systems for use in roadway and area lighting equipment.

ANSI C136.40-2011 Solar Lighting Systems

IEC 61215
PV Panels

NEMA 250-2008
Enclosures

IEC 61427
Battery

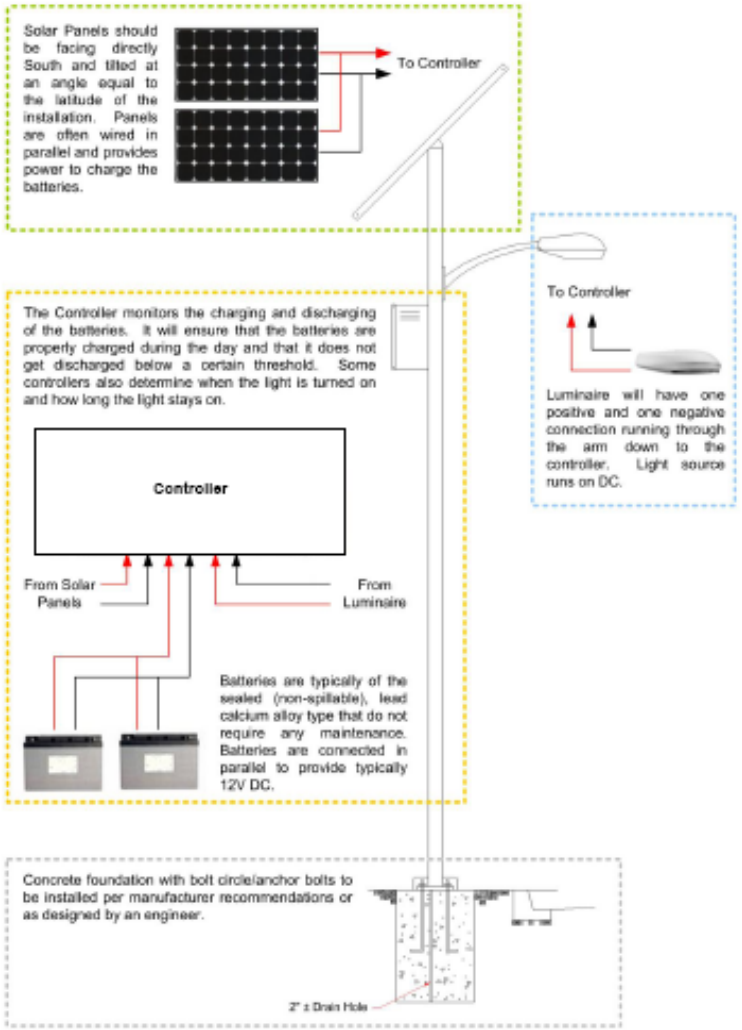


Figure 1
Typical Solar Lighting System Components

ANSI C136.40-2011 Solar Lighting Systems

- **Light Source Requirements**
- **Batteries**
- **Solar Panels**
- **Power Controls**
- **Inverters/Converters**
  - **NEMA Type 3R Enclosure**
  - **Operating Temperature Range: -40ºF to +140ºF (recommended for system, battery required)**

ANSI C136.40-2011 Solar Lighting Systems

Internal Labeling

The system shall be provided with one or more permanently affixed, readily visible, durable nameplate or label that includes, as a minimum, the following information:

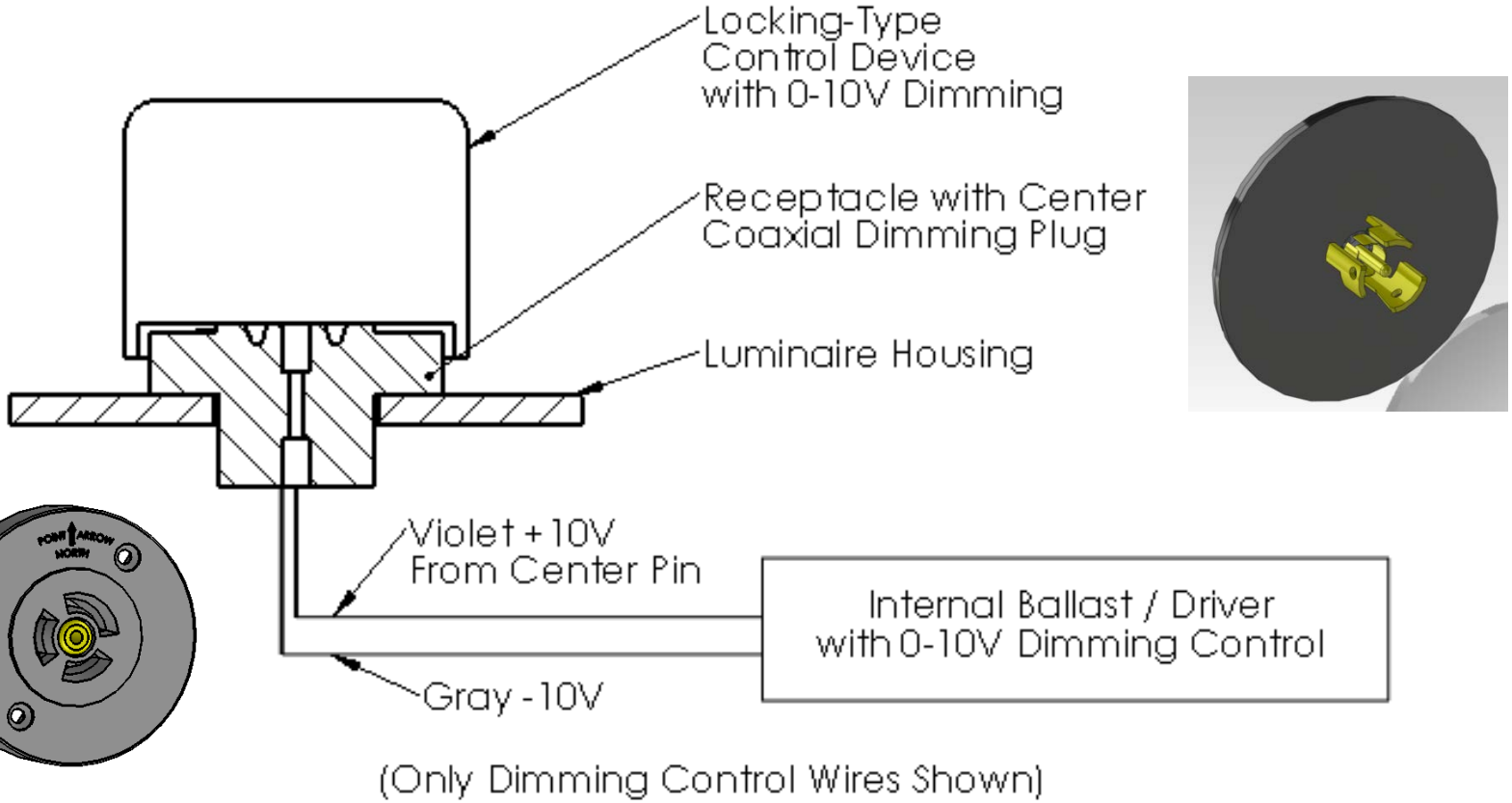
a) Manufacturer's name and catalog and model numbers
b) Date of manufacture
c) Input voltage
d) Operating voltage
e) Operating or starting current, whichever is greater
f) Descriptive wiring diagram and basic operating guidance
g) Lamp type, wattage, and voltage, if applicable
h) Ballast type, if applicable
i) Amp-hour capacity of battery system
j) Maximum weight of battery enclosure if post-mounted
k) Applicable agency approvals (UL, CSA, CE, ANSI, etc.)

ANSI C136.41-20XX Dimming Control

Scope

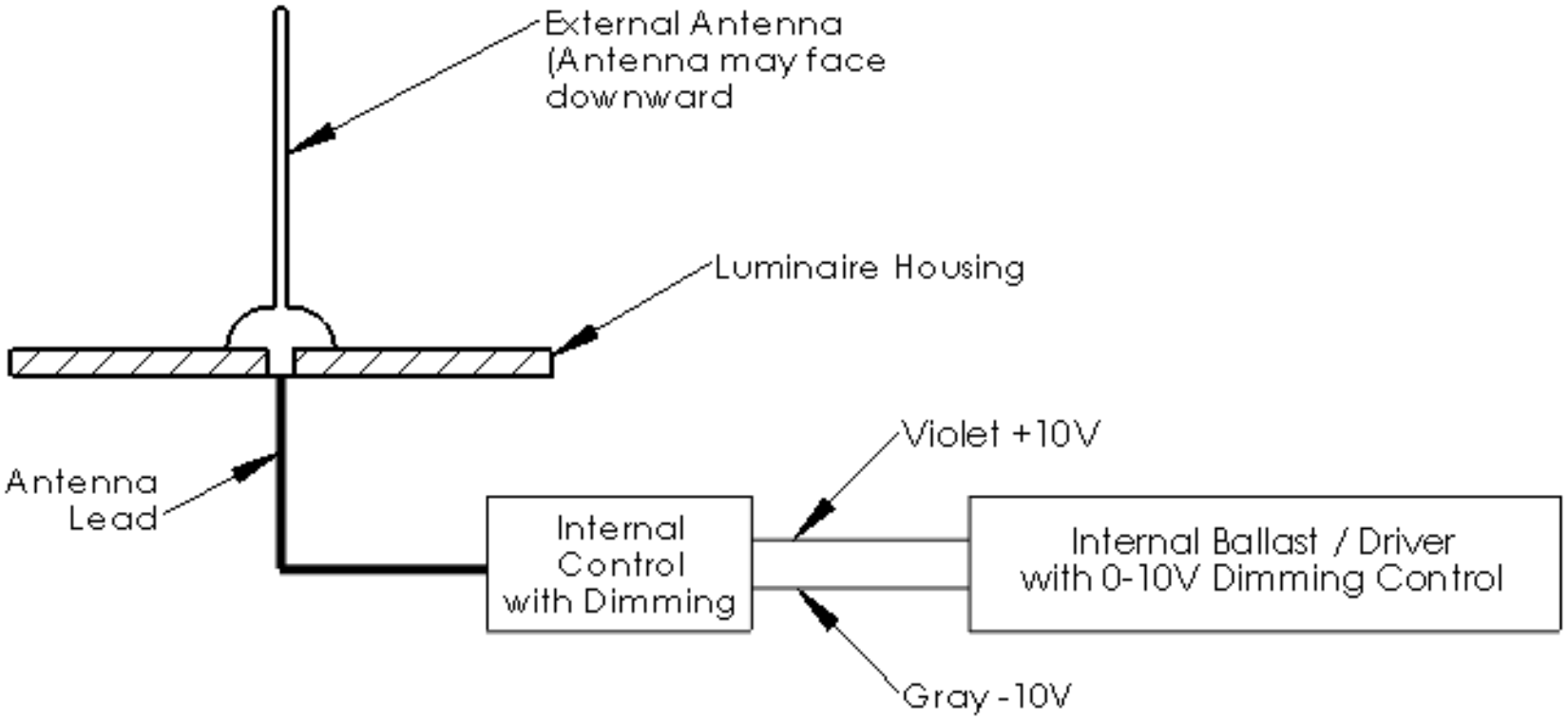
This standard describes methods of light level control between an external locking type photocontrol (or similar device) and a ballast or driver.

ANSI C136.41-20XX Dimming Control



Locking-Type Controller with Modified 5 Conductor Receptacle

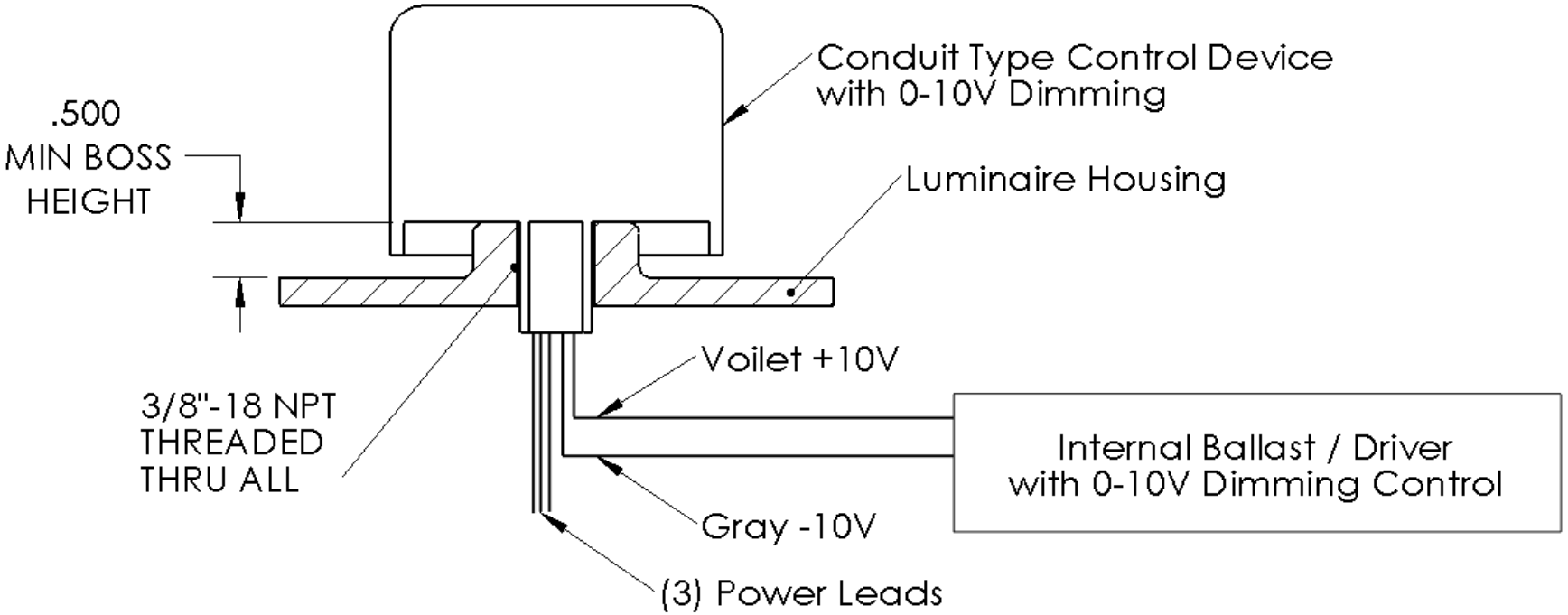
ANSI C136.41-20XX Dimming Control



(Only Dimming Control Wires Shown)

Internal Controller with External Antenna

ANSI C136.41-20XX Dimming Control



External Conduit Style Control

ANSI C136.42-20XX LED Retro-fit

SSL Cobra Head Retrofit Mechanical and Electrical Interchangeability

Ref. ANSI C136.17-1985 (R1995, R2005, R2010)

ANSI C136.42-20XX LED Retro-fit

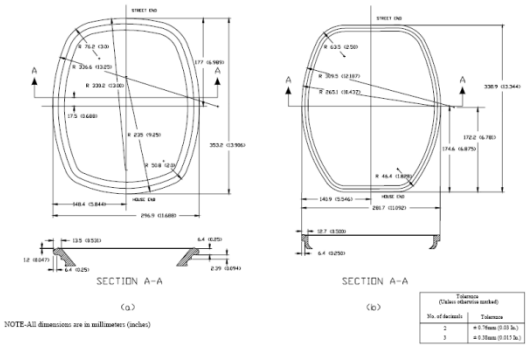


Figure 1 – Flange dimensions for refractors for small horizontal-burning HID luminaires

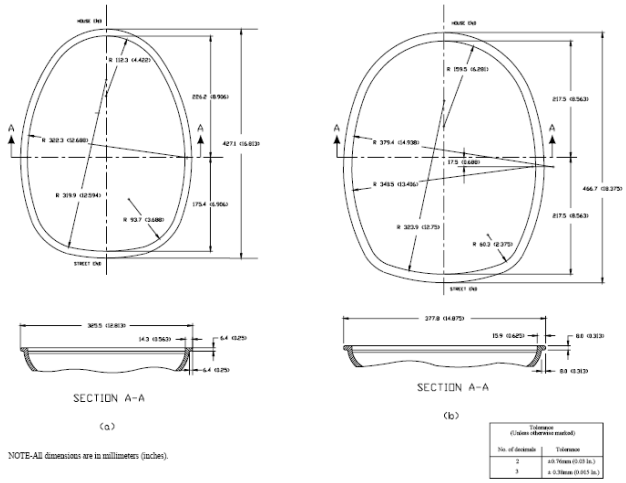


Figure 2A – Flange dimensions for refractors for medium horizontal-burning HID luminaires

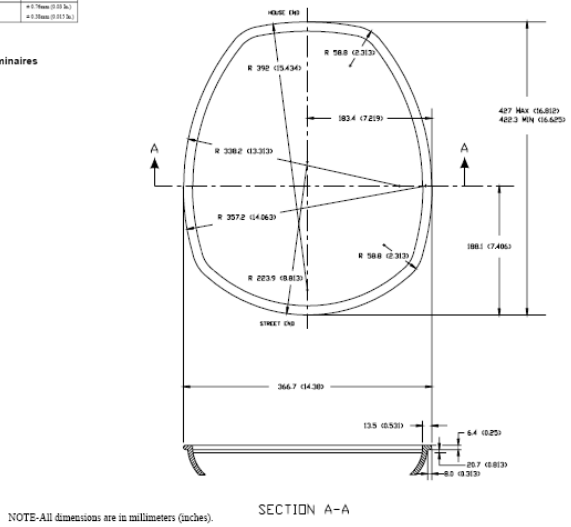


Figure 2B – Flange dimensions for refractors for medium horizontal-burning HID luminaires (continued)

ANSI Update

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