



LUMAWISE Endurance N+ Control Base, Dome and Shorting Cap

1. SCOPE

1.1. Content

This specification defines performance, tests, and quality requirements for the LUMAWISE Endurance N+ Control Base Assembly and Shorting caps used in dimmable roadway and area lighting applications utilizing ANSI C136.10 or ANSI C136.41 locking type receptacle interfaces. For test purposes, the TE Connectivity LUMAWISE Endurance N+ product will be mated to ANSI C136.41 compliant TE Connectivity Dimming Receptacle.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line has been completed. The Qualification Test Report number for this testing is 501-134115.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-32363: (Application Specification) LUMAWISE Endurance N+ Base, Dome and Short Cap
- [108-32059](#): (Product Specification) ANSI C136.41-2013 Dimming Receptacles
- [114-32115](#): (Application Specification) ANSI C136.41-2013 Dimming Receptacles
- [114-32148](#): (Application Specification) ANSI C136.41-2013 Rotatable Dimming Receptacles
- [501-134036](#): (Qualification Test Report) ANSI C136.41-2013 Dimming Receptacles
- [501-134115](#): (Qualification Test Report) LUMAWISE Endurance N+ Base, Dome and Short Cap

2.2. Industry Documents

- ANSI C136.10-2010: American National Standard for Roadway and Area Lighting Equipment - Locking-Type Photo Control Devices and Mating Receptacles – Physical and Electrical Interchangeability and Testing
- ANSI C136.41-2013: American National Standard for Roadway and Area Lighting Equipment – Dimming Control between an External Locking Type Photo Control and Ballast
- UL 773: Plug-In Locking Type Photo Controls for Use with Area Lighting
- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC-60529: Degrees of Protection Provided by Enclosures (IP Code)
- IEC-62262: Degrees of Protection Provided by Enclosures against External Mechanical Impacts
- IEC-60512-11-6: Connectors for Electronic Equipment – Corrosion, salt mist

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

3.2. Ratings

- Power Contact Voltage: 600 volts AC/DC
- Power Contact Current: 15 amperes maximum per circuit at 25°C ambient temperature
- Signal Dimming Contact Voltage: 30 volts DC
- Signal Dimming Contact Current: 1.5 amperes maximum per circuit at 25°C ambient temperature.
- Operating Temperature: -40 to +85°C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing and Application Specification	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	ΔR of 30 milliohms maximum	EIA-364-23. Subject mated specimen to 20 millivolts open circuit at 100 milliamperes maximum. See Figure 4 and 5.
Insulation resistance.	500 megaohms minimum.	EIA-364-21. Test unmated specimen only. Test at 500VDC level. Test between adjacent power contacts; between power and signal contacts.
Dielectric Withstanding Voltage	One-minute hold with no breakdown or flashover.	UL 773, Section 32 2500 volts AC (rms) at sea level. Test unmated specimen only. Test between power contacts; between signal contacts; between power and signal contacts.
Current Cycling (Heating Test), Power Contacts Only	30°C T-rise maximum during the "ON" period of the cycle.	ANSI C136.10-2010, Section 11.1. Apply 15 amperes to line and load contacts of Light Controller Base and test receptacle for 15 cycles, each consisting of 20 hours "ON" and 4 hours "OFF". Precondition specimen by mating and unmating to a receptacle 5 times.

Test Description	Requirement	Procedure
Temperature Rise vs Current	30°C maximum temperature rise at 15.0 amperes for power contacts and 1.5 amperes for signal dimming contacts.	EIA-364-70, Method 1 Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C. Power line & load (but not neutral) circuits and all dimming signal contact shall be energized and monitored during testing.
MECHANICAL		
Power Blade Contact Retention in Housing Base	60.0N minimum	EIA-364-29 Apply force by pushing in the direction of the mating face at a rate of 25.4mm/min. on power contact solder tails.
Vibration	No discontinuities of 1 microsecond or longer duration. See Note (a).	Mated specimens shall be subjected to a simple harmonic motion having an amplitude of either 0.250 in double amplitude (maximum total excursion) or 3.5 g peak, whichever is less. The vibration frequency shall be varied logarithmically between the approximate limits of 5 Hz and 55 Hz. The entire frequency range of 5 Hz to 55 Hz and return to 5 Hz shall be traversed at a rate of one octave/minute. This cycle shall be repeated for one hour in each of three mutually perpendicular directions, so that the motion shall be applied for a total period of 3 hours. Lead wires shall be secured to vibration table 76.2mm from rear of connector. See Figure 6.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note (a).	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 6.
Durability.	See Note (a).	EIA-364-9. Subject specimen and receptacle to 25 mating and un-mating cycles at the rate of 120 cycles per hour.
Impact	See Note (a).	IEC 62262. Subject mated specimens to (5) IK08(5J) impacts randomly on the top surface.
ENVIRONMENTAL		
Salt Spray	See Note (a).	IEC 60512-11-6 Exposure time is 240 hours. Test specimen mated to a Dimming Receptacle.

Test Description	Requirement	Procedure
Thermal shock.	See Note (a).	EIA-364-32, Test Condition I. Subject unmated specimens to 250 cycles between -40 and 65°C with 30-minute dwell at temperature extremes and 1-minute transition between temperatures.
Humidity	Must be subjected to DWV within 10 minutes from removal of humidity test chamber.	UL 773, Section 23. Subject mated specimens and receptacle to 96% non-condensing humidity for 168 hours at a temperature of 50°C.
Temperature Life	See Note (a).	EIA-364-17, Method A. Subject mated specimens to 100°C for 500 hours.
Temperature Life - IP	See Note (a).	EIA-364-17, Method A: Subject mated specimens 65°C for 240 hours.
Ingress Protection 6X (dust)	Must meet IP6X. No dust shall be present within the cover of the light control assembly or shorting cap assembly.	IEC 60529. Subject mated specimens to the IP6X (dust) requirements. Samples shall be mated to a receptacle.
Ingress Protection X6 (jet spray)	Must meet IPX6. No water shall be present within the cover of the light control assembly.	IEC 60529. Subject mated specimens to the IPX6 (jet spray) requirements. Samples shall be mated to a receptacle.
Humidity Freeze	See Note (a).	IEC 61215-2, Subject mated specimens to 10 cycles between -40 and 90°C 85% RH.


NOTE:

(a) Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 end

3.4. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)										
	A	B	C	D	E	F	G1	G2	H	J1	J2
	Test Sequence (b)										
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1
LLCR	2,6	2,5,7,9		2,4							
Insulation resistance			2,7								
Dielectric withstanding voltage			3,6								
Current Cycling (Heating Test)					2(c)						
Temperature Rise vs. Current		3,10									
Power Contact retention in housing base						2					
Vibration	4	8(d)									
Mechanical shock	5										
Durability	3										
Impact									2		
Salt Spray				3							
Thermal shock			4								
Humidity		4(c)	5								
Temperature Life		6									
Temperature Life - IP							2	2			
Ingress Protection 6X(dust)								3			3
Ingress Protection X6(jet spray)							3		3	3	
Humidity Freeze										2	2
Final examination of product	7	11	8	5	3	3	4	4	4	4	4


NOTE:

- (a) See paragraph 4.1.A
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition with 5 durability cycles.
- (d) During vibration, the mated receptacle and test specimen shall be energized at an 18°C temperature rise level and 100% connector current loading.

Figure 2 end

4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Minimum specimen quantities are shown in Figure 3.

		Test Group											Total Qty
		A	B	C	D	E	F	G1	G2	H	J1	J2	
Specimen P/N	Description	Quantity (minimum)											
2359482-X	Base Assembly, LUMAWISE Endurance N+	6	6	6	6	5	3	3	3	6	3	3	50
2361116-X	Assembly, Shorting Cap LUMAWISE Endurance N+			3	3	5		5	5	3		3	27
2359615-X	Cover Photocell, LUMAWISE Endurance N+	6	6	3	3			3	3	6	3	3	36
2213362-X	Receptacle Assembly, Dimmable Photocontrol							5(f)	5(f)	3(f)	3(f)	3(f)	19
2376865-X	Receptacle Assembly, LUMAWISE Endurance N With Integrated Gasket	6	6	6	6(f)	5		3(f)	3(f)	6(f)	3(f)	3(f)	47



NOTE:

- (f) Receptacle to be mounted to suitable sealed enclosure for test group as indicated
- (g) Gasket to be used in conjunction with receptacle to complete system sealing to enclosure

Figure 3

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be implemented, and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

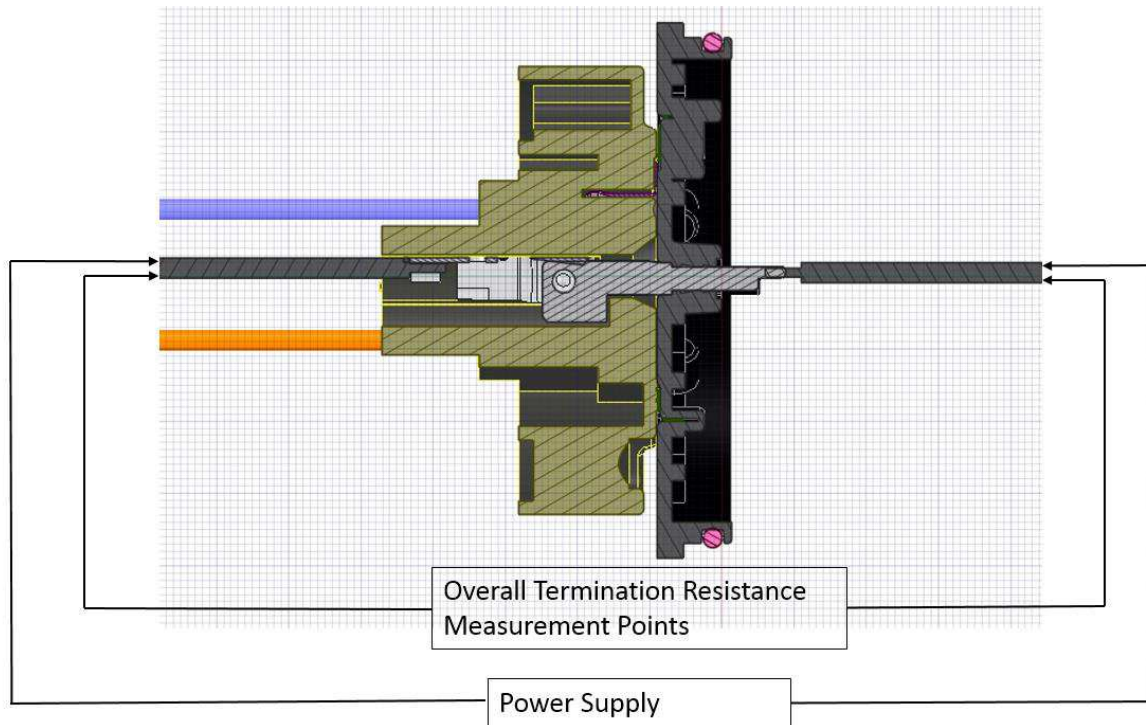


Figure 4
(LLCR Measurement Points – Power Contacts)

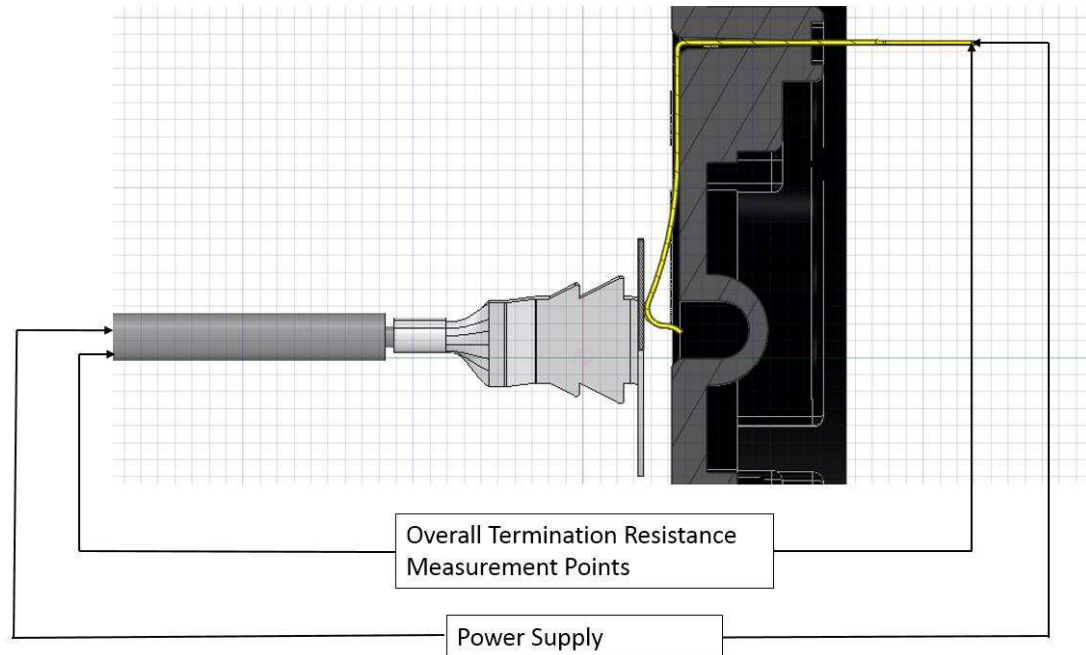


Figure 5
(LLCR Measurement Points – Signal Dimming Contacts)
(Receptacle housing removed for clarity.)

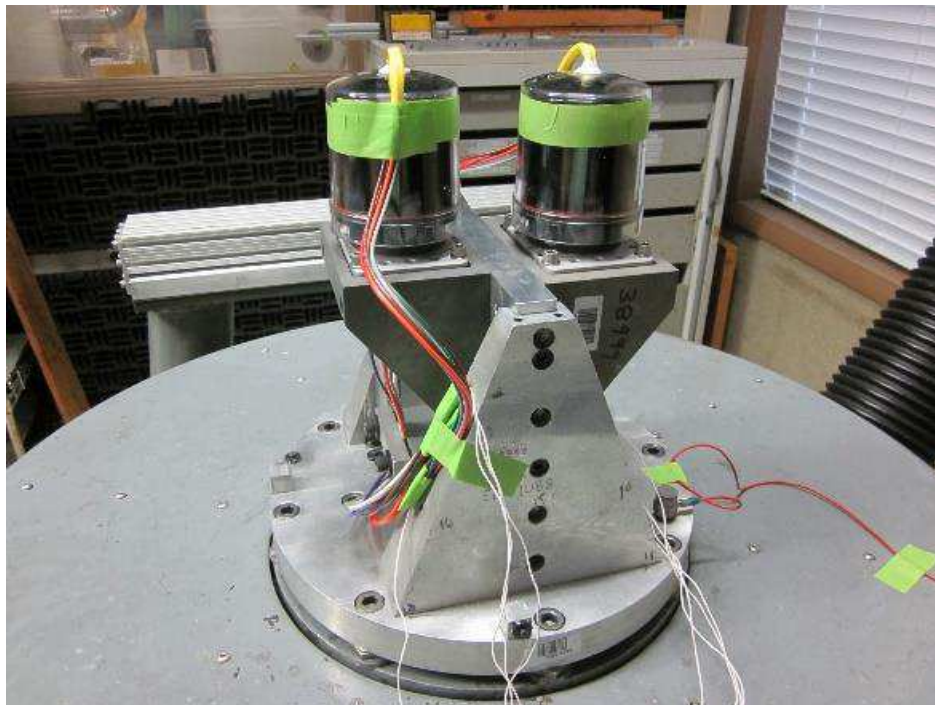


Figure 6
(Vibration and Mechanical Shock Mounting Fixture)