



The CAST Lighting Technical Guide

Maintenance & Troubleshooting

Version 1.4t

About this Technical Guide

The following guide is meant to serve two main functions:

- 1. Education.** In-depth descriptions of technical topics are presented with the intention to share state-of-the-art knowledge.
- 2. Empowerment.** Detailed instructions in troubleshooting and repair of CAST landscape lighting systems so the contractor can service systems in the field.

By addressing both these critical functions, CAST is supporting the growth and success of contractors who use CAST Lighting products.

Please Note: The information in this guide is primarily intended for individuals who have attended a CAST Lighting Hands-on Training. This training provides a basic understanding of the CAST method of installation that is the foundation upon which this technical guide builds.

IMPORTANT - PLEASE READ

CAST Lighting recognizes the authority of federal, state and local statutes, regulations and codes that govern the installation, service and repair of electrical equipment. The information, advice, suggestions and instructions in this technical guide are meant to be followed only with strict adherence to any statutes, regulations or codes that may govern such work.

If any of the material in this guide conflicts with any relevant statutes, regulations or codes then the statute, regulation or code takes precedence.

It is the responsibility of individuals who read this manual to learn of, and to adhere to, any relevant statutes, regulations and codes. Individuals should not proceed with any kind of

electrical work unless they completely understand any limitations or restrictions that may legally apply.

While system maintenance, troubleshooting and repair on the transformer secondary is all low voltage work (12v to 22v), replacement of breakers, receptacles and relays involve work on the 120v side. Individuals should take this information into account when deciding whether or not an electrical contractor is required for the repair.

CAST Lighting accepts no responsibility for any harm or damage that may result from an individual's use of the information contained herein if the individual acted in violation of any applicable statute, regulation or code.

Under no conditions should homeowners attempt to service the electrical components of a landscape lighting system.

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System Maintenance

The CAST landscape lighting system is composed of the highest quality components designed to function optimally for an unlimited length of time. To ensure this longevity of operation and to maintain the system integrity, we recommend a schedule of ongoing maintenance.

This maintenance is required to keep components clean; to relamp fixtures and adjust their placement; to check the operation of transformers, timers and photocells and to check on the integrity of wiring and electrical connections.

Ideally, the installer will include a maintenance agreement with the initial contract. The terms of the agreement may vary according to the size and complexity of the system and other factors relating to the relationship with the homeowner.

What Determines the Maintenance Schedule?

Typical maintenance intervals range from once every 6 months to once every 18 months. The optimal service interval depends on climate, complexity and vulnerability of the system, plant material, budget and relationship with the homeowner.

1. Climate

Extremes of temperature can shorten life expectancy of system components. High heat and humidity may accelerate socket and wire corrosion and shorten lamp life through an increase of operating temperatures and deterioration of lamp pins and contacts. CAST lighting components are designed to minimize such corrosive damage but it is likely that some electrical components may need replacement after an undeterminable number of years.

Extreme cold temperatures may also affect system performance. A drop of 40° F can result in a decreased wire resistance leading to a voltage increase of as much as 0.5 volts at the fixture. This may be enough to significantly decrease lamp life. The cold temperature also increases the thermal shock

Maintenance Check List

1. Ensure that all lamps are working. Optional: Replace all system lamps every 18-24 months.
2. Clean all fixture lenses (a CLR solution works well) and remove dirt and debris from inside and outside all fixtures. RainX™ or similar hydrophobic treatment may be applied to lenses.
3. Trim or prune plant material as needed.
4. Check that all fixtures are positioned and aimed optimally.
5. Remove debris from around Spider Splice junctions to ensure ongoing access.
6. Check that no buried wires are exposed or damaged.
7. Confirm that timers and photocells are operating properly. Clean these units and trim plant material (if needed) to ensure photocell exposure.
8. Replace timer battery (Model CTDTTC only) once a year.
9. Tighten all screws in transformer terminals.
10. With system powered on, confirm that primary amperage matches the amperage recorded at installation. If it does not match, troubleshoot system to determine cause.

imposed on lamp filaments during start-up, contributing toward early lamp failure.

Some Northern regions are also prone to frost heaves caused by the expansion, contraction and displacement of soil. Frost heaves can move fixtures and break wire.

2. Complexity and Vulnerability Influence on Maintenance

Obviously, the bigger a system is, the more likely that maintenance issues will surface. For this reason alone, more frequent maintenance visits are advised. There are also many factors that make the system more vulnerable. In such cases the

maintenance schedule should have shorter intervals.

Factors that increase vulnerability of a system:

- **Use of higher voltage taps.** While it is sometimes necessary to use higher voltage taps, this increases the vulnerability of lamps to successive burnout (one lamp burnout leads to premature burnout of other lamps on the run).
- **Fewer numbers of fixtures on a single wire run.** Risk of successive burnout is also increased by fewer numbers of fixtures on a run.
- **Landscaping work.** Despite the installers best efforts to bury and protect wire runs, landscape workers may damage wires.

3. Plant Material

As plant material grows, fixtures may need to be repositioned and re-aimed. Lamp types may also need to be changed.

4. Budget and Relationship

It is often a hard sell to add a maintenance program on top of an expensive lighting system (especially when it's sprung on the homeowner at proposal time). A common approach that works well is to give one-year free maintenance, after which a billed maintenance schedule begins.

Some installers decline to take on a lighting project if the homeowner refuses the maintenance program. The wisdom in this is evident when you consider that a great initial installation (without ongoing maintenance) can turn into an eyesore and damage the reputation of the installer.

Successful contractors sell the project up-front as an ongoing relationship rather than a one-time design and installation.

The Importance of Documentation

System maintenance is greatly facilitated when the installer records system data in the following places:

- **Fixture Record Tags** – For fixture/Lamp-specific data
- **Transformer System Record Forms** (located inside the

transformer lids) – For Transformer-specific data

- **Spider Splice Caps** – For wire-run identification

Maintenance Procedures

1. Cleaning fixtures

Bronze and copper fixtures that still have their natural uncoated finish should be wiped with a cloth to remove dirt and other detritus. If persistent stains are present due to bird droppings or other causes, then a wire brush or coarse steel wool can be used to remove the stain. Complete the cleaning process with a damp cloth being careful to remove any steel particles. Note that excessive use of the wire brush or steel wool will remove the surface patina.

If needed, a mild soapy solution can be used on the fixtures, but any kind of detergent or cleaning solution may cause changes to the colors of the surface patina.

Each fixture should be opened and inspected. Dirt, insects and other foreign material should be removed. If insects have invaded the fixture, then an appropriate insecticide can be applied inside the fixture to prevent future infestation.

2. Cleaning lenses

Convex lenses in CAST fixtures reduce precipitation of solids on lens surfaces, but some precipitation still occurs. The most effective cleaner for lenses is CLR[®] solution. This solution is applied to the lens and wiped dry with a cloth. Persistent stains may be removed with a scrubbing pad. Rain-X or similar hydrophobic solution may be applied to help prevent future precipitation on the lens.

3. Inspection of Spider Splices and wire runs

Locate each Spider Splice junction and remove any material that may have obscured it. Open the junction, pull out the splice bundle, and clean the enclosure if needed.

Visually inspect all areas where wire has been run. If wire has been exposed, re-bury wire.

Troubleshooting

The following chart serves as a reference to aide the installer in troubleshooting various problems that may arise in a CAST Landscape Lighting System. Since CAST Lighting products are so robust, the majority of problems arise from either installation issues or damage to system components post installation.

While this troubleshooting chart may be helpful in identifying problems with systems from other manufactures, the causes and remedies may not apply.

For each cause, an indication of 'Likelihood of Cause' (LC) is given. This information helps the installer by identifying which causes are most likely to be the reason for the problem. The 'Very Likely' causes (***) should be checked first; only when they are discounted should the 'Less Likely' (**) then the 'Rarely' (*) causes be investigated.

PROBLEM	LC*	CAUSE	REMEDY
LAMP ISSUES			
Premature lamp burnout	***	Overly high voltage during or after installation caused by: <ul style="list-style-type: none"> • Failure to adjust voltage to optimum range of 10.8 to 11.5v (at the lamp) during installation. • Variations in 120v line voltage. • Other lamps on the same run burned out, causing voltage rise at remaining lamps. 	<ul style="list-style-type: none"> • Adjust lamp voltage to within limits. • Be sure to measure voltage with all system lights on. • Instruct homeowner to replace lamps soon after they fail or schedule total lamp replacement every 12-18 months. • Monitor 120v line voltage to assess variation then reduce lamp voltages down to compensate for highest expected line voltage
	***	Water from irrigation system contacts lamp.	<ul style="list-style-type: none"> • Adjust timing of irrigation system so it does not turn on while lamps are on, or • Install Sprinkler Shield (CSPRS), or • Reposition fixtures and/or nozzles.
	***	Oil from fingers on lamp envelope causing hot spots and breakage. (Note: this only occurs with tungsten halogen lamps.)	Avoid touching lamp surface with bare fingers.
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

CAUTION: Repairs that require work with 120-volt currents should only be undertaken by licensed electricians.

PROBLEM	LC*	CAUSE	REMEDY
Lamp lights only when tapped	***	Lamp is improperly inserted into socket	Re-insert lamp securely into socket.
	***	Lamp filament has broken and carries current only intermittently.	Replace lamp.
	*	Socket contacts or connections have been damaged	Replace socket.
More Information, read: "Reducing Lamp Burnout"			
WIRING ISSUES			
No power to a single fixture (Other fixtures on same run are powered)	***	Bad Splice (See 'CAST Soldering Method' p. 34)	Redo splice.
	**	Cut Wire between Spider Splice and fixture	Repair or replace cut wire.
	*	Bad socket.	Replace socket.
	*	Transformer Issue – this can only be a cause if all lamps on a single run are burned out.	See 'Transformer Issues'
No power to all fixtures on a single wire run (Fixtures on other runs are powered)	***	Bad Splice.	Redo splice.
	***	Cut Wire between transformer and fixture	Repair or replace cut wire.
	***	Overloaded home run wire – more than 25 amps /300 watts (secondary breaker trips).	Reduce load on wire run by reducing lamp wattage(s), reducing number of fixtures on that run or using a heavier gauge wire.
	**	Shorted home run wire due to damaged wire (secondary breaker trips).	Locate damaged wire and repair or replace.
	**	Loose connection at the transformer common or voltage taps. Check that wires are stripped properly to prevent short circuits between terminals and to ensure wire insulation is not interfering with connections.	Ensure that home run wires are adequately inserted into taps and that tap screws (front and back) are tightened securely. Note: these screws should be tightened annually. Re-strip wire if needed.
	*	Multiple Deck or Niche Light fixtures are mounted on metal that connects the grounds of these fixtures (secondary breaker trips).	Check that each of these fixtures are spliced with the same polarity – the lettered strands of fixture leads should all be spliced together.
No power to all fixtures on all runs	***	Transformer issue.	See 'Transformer Issues' (p. 7).
	**	Breaker Box issue.	See 'Line Voltage Issues' (p. 9).
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

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PROBLEM	LC*	CAUSE	REMEDY
Voltage loss on a wire run is greater than expected	***	Wires may have been poorly stripped resulting in cut strands. Or, splices may be done poorly.	Use caution and best practices when stripping wires and making splices.
TRANSFORMER ISSUES			
Secondary breaker trips (Immediately)	***	Overloaded wire run. Check for this by removing one or more lamps to reduce load.	Reduce load on wire run by reducing lamp wattage(s), reducing number of fixtures on that run or using a heavier gauge wire.
	**	Shorted home run wire due to: <ul style="list-style-type: none"> • Damaged wire in field • Shorted wire in fixture • Shorted wire in splice • Shorted wire at terminals 	Locate damaged or shorted wire and repair or replace. Note: check that wire insulation is not interfering with terminal connection and that stripped wires are not contacting adjacent terminals (or wires connected to those terminals).
	*	Defective secondary breaker.	Replace secondary breaker.
	*	Multiple Deck or Niche Light fixtures (SCB lamps) are mounted on a common metal surface. This can result in a short since one fixture wire in these fixtures is connected to the fixture body.	Check that each of these fixtures are spliced with the same polarity – the lettered strands of fixture leads should all be spliced together. Note: A known issue has been that the lettered strand is not always connected to the same fixture point - in this case, connect one fixture at a time to determine if the fixture wires need to be reversed at the splice.
Secondary breaker trips (intermittently)	***	Common tap load is near maximum (25 amps/300 watts) and overloads due to: <ul style="list-style-type: none"> • Variations in 120v line voltage, or • Damage to wire run, or • Deterioration of wire splice 	<ul style="list-style-type: none"> • Redistribute wire runs among commons • Reduce load on wire runs by reducing lamp wattage(s), reducing number of fixtures on runs or using heavier gauge wire. • Check for damage to wire runs and for integrity of splices.
No power to voltage tap (single tap only)	***	Terminal screw in the rear of the tap has come loose.	Ensure that terminal screws are tightened securely. Note: these screws should be tightened annually.
	*	Terminal tap has been heat damaged due to a loose connection.	Replace terminal tap.
	*	Internal wire from core has been heat damaged due to loose connection.	Call CAST.

***Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'**

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PROBLEM	LC*	CAUSE	REMEDY
No power to all voltage taps (Primary Breaker has not tripped)	***	No line voltage to transformer. (Check voltage at GFCI outlet to confirm this.)	Refer to "Line Voltage Issues"
	**	Timer Failure. Remove timer and insert bypass plug to check for this.	Refer to "Timer Issues"
	**	Photocell failure. Remove photocell and insert bypass loop to check for this.	Refer to "Photocell Issues".
	*	Transformer relay has failed. (Only for transformer models of 900 watts and greater.) When the relay has failed there will be no power to the timer outlet.	Check to ensure that wire connections to relay are secure. If needed, replace relay. For additional protection, install No-Surge Soft-Start unit.
	*	GFCI voltage is OK but timer outlet has no power or displays less than GFCI voltage. This may indicate a break in neutral or hot wire in transformer power cord.	Check continuity of transformer power cable to ensure that transformer plug ends have continuity to timer receptacle. If not, replace power cord.
No power to all voltage taps (Primary Breaker and/or service panel breaker trips intermittently - nuisance tripping)	***	Transformer load is near maximum and overloads due to variations in 120v line voltage.	Reduce load on transformer.
	**	Inrush current from transformer is tripping the panel breaker. (This only occurs when transformer is located within about 15 ft. from the panel.)	Install No-Surge Soft-Start unit.
	*	Inrush current is not adequately absorbed by transformer's thermistor. (This only occurs when transformer is located within about 15 ft. from the panel.) Note: Transformers manufactured prior to Dec. 2003 did not come equipped with a thermistor and are prone to this problem. Transformers manufactured after Jan. 2008 employ No-Surge technology and may not have a thermistor installed.	Install No-Surge Soft-Start unit.
No power to all voltage taps (Primary Breaker trips immediately)	***	Transformer is overloaded.	Reduce load on transformer.
	*	Short circuit inside transformer. Check internal transformer wiring for damaged or disconnected wire. (Most common at terminal taps.)	Repair, replace or reconnect damaged or disconnected wires.
	*	Relay has failed.	Replace relay. Install No-Surge Soft-Start unit.

***Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'**

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PROBLEM	LC*	CAUSE	REMEDY
Voltage at one or more voltage taps is lower than expected	***	The wire entering from the top of the terminal block (from inside the transformer) may be loose.	Tighten set screw at the top of the terminal block. If problem is not corrected, pop out the terminal block and inspect the connection to ensure that wire(s) is (are) making good contact with the set screw contact plate inside the block.
Buzzing or Noisy Transformer	***	Low Line Voltage	Troubleshoot line voltage issue.
	*	Loose relay connection(s).	Secure connections to relay.
	*	Relay damaged due to dust or moisture inside relay. Note: transformers manufactured after July 2006 have sealed relays that prevent this problem.	Replace relay. Install No-Surge Soft-Start unit.
Voltage taps are powered even when the timer and/or photocell is unplugged	***	Power Bypass Relay has malfunctioned (internal switch remains closed).	Replace Power Bypass Relay. Install No-Surge Soft-Start unit.
LINE VOLTAGE ISSUES (Note: Licensed electrician required for 120v work)			
Breaker at panel trips (Immediately)	***	Circuit overloaded. Check that breaker is able to accommodate transformer load. As a general guide: <ul style="list-style-type: none"> • Min. 20 amp breaker for 1500w & 1200w • Min. 15 amp breaker for 300w, 600w & 900w 	Ideally you will have a breaker dedicated to the landscape lighting system. Consult electrician.
Breaker at panel trips (Intermittently)	*	Inrush current from transformer is tripping the Non-'High Magnetic' type panel breaker. This only occurs when transformer is located within about 15 ft. from the panel.	Install No-Surge Soft-Start unit.
GFCI Outlet trips	***	Fault to ground.	Consult electrician.
	*	Defective GFCI Outlet or outlet is incorrectly wired.	Consult electrician.
LAMP SOCKET ISSUES			
Socket Contacts fail to make good connection with lamp pins or contacts	***	Corroded socket. Can result from incomplete insertion of lamp into socket or from prolonged exposure to heat and humidity.	Replace socket.
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

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PROBLEM	LC*	CAUSE	REMEDY
Socket or Socket Wires appear burned or cracked	***	Socket has overheated with prolonged use. Note: CAST MR-16 sockets manufactured after 2004 are equipped with a heat shield and extra-high-temperature-resistant wiring.	Replace socket. Add heat shield to MR-16 sockets if not already equipped. (Request Part #XCHMHS2 for CCTL1C, #XCHMHS1 for all other MR-16 fixtures.)
Path Lights with Bayonet-Mount Sockets fail	***	These sockets were replaced with more robust Wedge-Base Sockets in 2004.	Return fixture to CAST for socket retrofit.
Niche Lights with Wedge Base Sockets fail	***	A limited line of Niche lights with Wedge Base Sockets were manufactured in 2004. These sockets were replaced with SCB Sockets.	Return fixture to CAST for socket retrofit.
FIXTURE FINISH ISSUES			
Chalky coating appears on bronze surface	***	This is a natural occurrence with bronze after exposure to the environment. The coating is caused by zinc leaching to the surface. The leaching process may last one to several weeks depending upon the presence of rain, condensation and other factors.	The coating eventually disappears as the surface progresses to an old-penny brown. The coating may also be removed by applying CLR and wiping with a cloth. This application may need to be repeated until the leaching process has concluded. Spraying WD-40 followed by rubbing in with a cloth will result in an even brown color.
Bronze surface is unevenly colored or streaked	***	The bronze surface may change color unevenly depending upon environmental exposure. This is normal and the surface evens out as it ages.	To immediately bring bronze and copper to its final patination, see "Coloring of Bronze and Copper" (www.cast-lighting.com/art-tony-color.html)
Path Light hats and vases show a different color than the copper stem	***	The bronze and copper may undergo color changes at different rates. Over time, they will both transform into a similar patina blue-green.	
Client wants fixtures to be black or verdi upon installation	***	Refer to article in website - "Coloring and Patination Bronze"	
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

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PROBLEM	LC*	CAUSE	REMEDY
Rust spots appear on bronze surface	***	The presence of iron and other minerals in rain or irrigation water may cause accumulation of these minerals on the surface of the fixtures leading to rust spots or discoloration.	Clean fixture with CLR, using steel wool or a wire brush if necessary. (Wipe clean after scouring to ensure that iron or steel does not remain on the fixture.) If irrigation water is the problem, then try to re-aim nozzles or re-locate fixtures. Spraying WD-40 followed by rubbing in with a cloth will result in an even brown color.
	**	This is a known issue for certain production runs prior to 2006. It is caused by the presence of iron particles in the sand used in sand-casting. (Rust spots from this cause are small and localized.)	Rust spots are superficial and can be easily removed with steel wool or a wire brush. (Wipe clean after scouring to ensure that iron or steel does not remain on the fixture.)
FIXTURE LENS AND FILTERS ISSUES			
Lens become cloudy	***	Results from deposition of minerals from rain, sprinklers and condensation and from other environmental factors.	Washing and scouring the lens with CLR will remove most types of deposition.
Lens cracks or breaks	***	Physical abuse.	Replace lens.
	*	Thermal shock – cold water on hot lens. (Note: CAST lenses are highly resistant to this type of damage.)	Replace lens.
Filters will not fit inside vase of Bullet Area Light	***	There is a known issue with insufficient space for supplemental filters inside early models of the Bullet Area Light (CBAL1CB).	Remove the heat shield from the socket. Note: if heat shield is removed, do not exceed lamp wattage of 35W.
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

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PROBLEM	LC*	CAUSE	REMEDY
FIXTURE O-RINGS			
O-Rings crack or break	***	O-ring material has lost it's elasticity and resilience.	Replace O-Rings. Note: Apply non-silicone grease to rings once a year to prolong their life.
	**	O-rings can be damaged from using excessive force when sliding fixture shroud over O-ring.	Before sliding shroud over O-ring, use non-silicone lubricant on O-ring then use gentle twisting motion to affix shroud.
	**	Shrouds use a thumb screw for securing onto the fixture body. Before sliding the shroud over the O-ring, this thumb screw needs to be backed off so that it does not protrude beyond the inside shroud surface. A protruding screw can damage the O-ring.	Back off shroud thumb screw before attaching shroud.
PHOTOCELL AND TIMER OUTLETS, PHOTOCELL JUMPER WIRE			
Photocell or Timer Outlet or Photocell Jumper Wire is burned or cracked	***	Prior to 2004, the full current of the transformer passed through the timer and photocell outlets. Since 2004, all transformers (900w and above) incorporate a relay that sends a greatly reduced current through the outlets. Older Transformers (900w and above) may develop burning or cracking of the outlets and jumper wire.	Replace damaged outlets and jumper wires. For older transformers (900w and above – without a relay), contact CAST about retrofitting with a relay.
PHOTOCELL ISSUES			
Photocell fails to turn on transformer	***	Timer is not set or operating properly. To check for this, unplug timer, ensure that voltage is present, and insert timer bypass plug, re-test photocell. (Note: when you cover the photocell, it will take 2 to 3 minutes for the switch to engage.)	Address timer issue.
	*	Photocell outlet is damaged.	Replace photocell outlet.
	*	Photocell is damaged.	Replace photocell.
Photocell fails to turn off transformer (When timer is not present)	***	Photocell head is dirty.	Clean the photocell.
	***	Photocell is located in shady or dark area.	Relocate or re-aim photocell.
*Likelihood of Cause (LC): *** 'Very likely', ** 'Less likely', * 'Rarely'			

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CAST LIGHTING LIMITED WARRANTY

CAST Lighting warrants its products against defects in material and workmanship. Without charge, CAST Lighting will either repair or replace (CAST Lighting reserves the right to decide between repair or replacement) any properly installed CAST Lighting product which fails under normal operating conditions and has not undergone abuse beyond normal wear-and-tear within the specified warranty period.

Lighting Fixtures (does not include Demo Kit components)

- Bodies, Castings, Housings, Stakes, Stems and Lenses: Lifetime Warranty
- O-Rings and Socket Components: 3-Year Warranty

Transformers (does not include Electronic Mini-Transformers)

- Windings and Stainless Steel (SS Series) Enclosures: Lifetime Warranty
- Mild Steel (PS Series) Enclosures: 3-Year Warranty
- Electrical Components: 3-Year Warranty
- Photocells and Timers: 3-Year Warranty
- Note: Before CAST Lighting will accept suspect transformers, they must be bench-tested at the distributor to confirm malfunction. Warranty will not be honored for transformers with cut wires or other modifications.

Electronic Mini-Transformers: 3-Year Warranty

No-Ox[®] Wire: 25-Year Warranty

Tools and Meters: 1-Year Warranty

Demo Kit Components: 90-Day Warranty

Lamps: No Warranty

All products are warranted from the date of invoice, provided it is returned to the factory, transportation prepaid, and our factory inspection determines it to be defective under the terms of the warranty.

This warranty covers only equipment manufactured by CAST Lighting and does not extend to transportation, installation, labor compensation, or replacement charges, nor does it apply to any equipment of another manufacturer used in conjunction with CAST Lighting equipment.

NOTE - FIELD REPAIRS RECOMMENDED

All CAST Lighting products are designed to be field repairable by a qualified installer. All service parts are readily available and we encourage field repairs as a significant cost and labor saving can be realized by the installer. All warranted components, as stated in the above warranty, which are installed in the field, will be honored.