



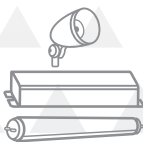
CATALOG



ENERGY RETROFIT



DESIGN



BULBS + PARTS + FIXTURES



CONTROLS



NEW BUILD



RECYCLING



OUR STORY

Lighting Unlimited was founded in 1989 by Scott Schneider, company owner, with one simple goal: to take care of customers through exceptional service and expertise. The company has grown to meet the challenges and opportunities that have arisen with an ever-evolving lighting industry. We have been awarded INC 5000's Fastest Growing Companies four years running, remaining true to the principles that have sustained us over the last 30 years.

OUR VISION & MISSION

We believe in enhancing people's lives through the power of lighting! We provide customized lighting solutions through our passionate and expertly trained lighting nerd team members who are responsive, creative and engaging. We strive for excellence in customer service by meeting all your lighting needs.

OUR OFFERING



NEW BUILD



ENERGY RETROFIT



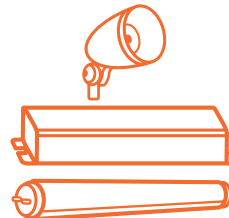
DESIGN



CONTROLS



RECYCLING



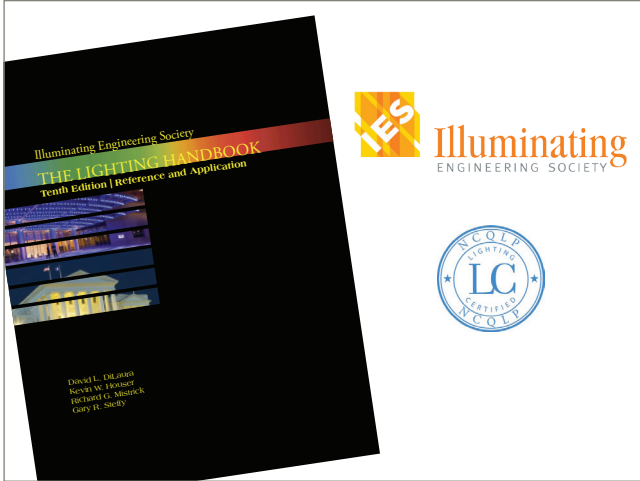
BULBS+PARTS+FIXTURES

CONTRACTOR SERVICES

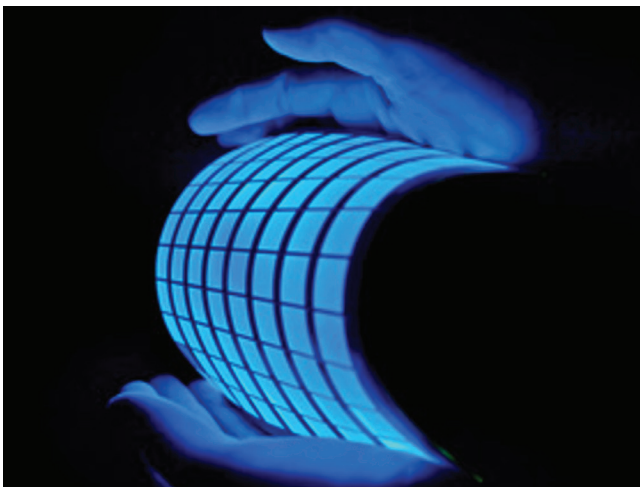
- ▶ On-site Training
- ▶ Technical Lighting Advice
- ▶ Finance Options
- ▶ Rebate Guidance

- Lighting Design + Specs ◀
- Design Build Assistance ◀
- Photometric Calculations ◀
- Landscape Layout + Design ◀

LC-CERTIFIED STAFF

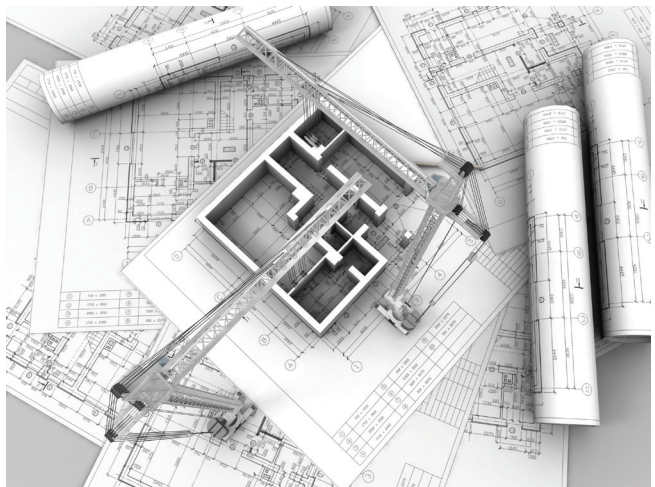


DESIGN



EFFICIENCY

- ▶ Free Energy Audits
- ▶ Technical Lighting Advice
- ▶ Cost Savings Engineering
- ▶ Recycling



JOB MANAGEMENT

- Lighting Plan Take-Offs ◀
- Product Staging ◀
- Controls Commissioning ◀
- Turnkey Management ◀

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OUR PARTNERS

In addition to our extensive line card of lighting manufacturers, Lighting Unlimited is also proud to support the following organizations:



OUR MANUFACTURERS

BALLASTS/TRANSFORMERS

Advance
Halco
Hatch
Keystone
Sola
Universal
Workhorse/Fulham

CONTROLS

Daintree
Eaton
ETC
Intermatic
Lutron
nLight
Sensor Switch
WattStopper

EMERGENCY/BATTERIES

Exitronics
Fulham
Interstate
Light Alarm
Power Sentry

FIXTURES

Acuity Brands
CREE
Dialight
Eaton/Cooper
Gardco
GE Lighting Systems
Holophane
Hubbell Brands
Lithonia
LG
LSI
Philips Lighting Brands
Progress Lighting
RAB
Visionaire

LED SPECIALTY

Color Kinetics
Diode LED
Lumenpulse

LANDSCAPE

BK Lighting
Bliss Lights
Dabmar
Focus
Hadco
Hydrel
Kim
Sollos

LIGHT BULBS

Brilliance LED
Bulbrite
CREE
EiKO
General Electric/Current
Green Creative
Halco
Lightronics
Maxlite
Osram/Sylvania/Ledvance
Philips/Signify
Satco
Soraa
TCP
Ushio
Venture
Voltarc
Westinghouse

PLASTIC LENSES/LOUVERS

American Louver
Bergen
Plastifab
SLP

RECESSED CAN & TRIMS

Elite
Halo
Intense
Juno
Lightolier
Lithonia
Liton
Nicor
Nora

ROPE/STRING/TAPE LIGHTS

American Lighting
Diode LED
GM Lighting
National Specialty Lighting
Wide Loyal

TRACK/MONORAIL/CABLE

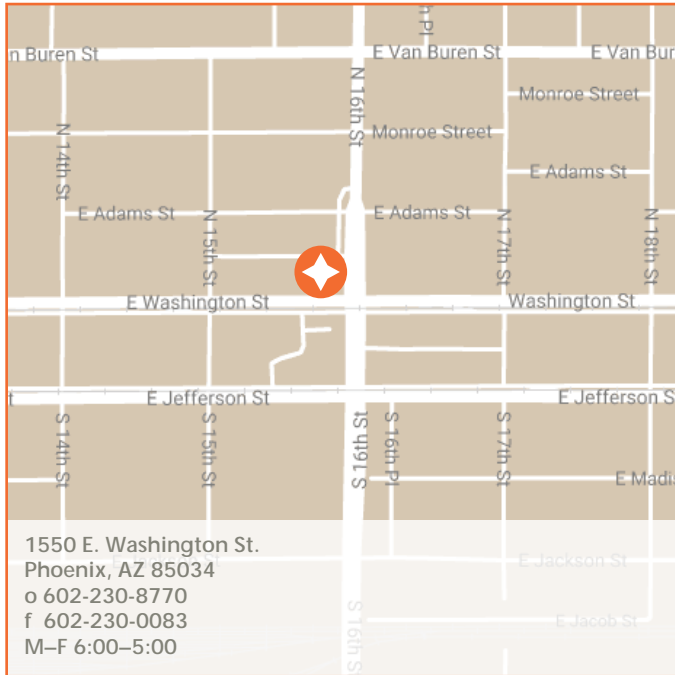
Bruck
Liton
Nicor
Progress Lighting
Tech Lighting
WAC

MISC.

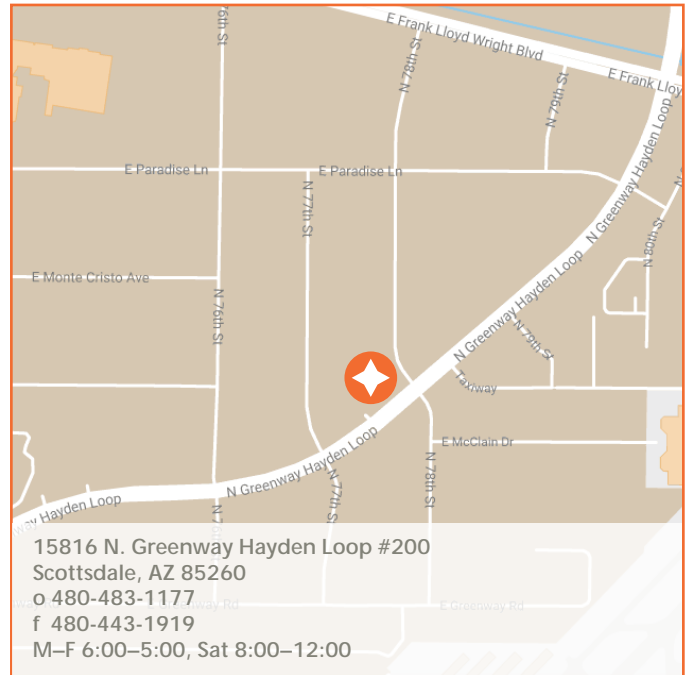
American de la Rosa
Bulb EZ
BRK
Cem-Tec
Fanimation
Gripple
Ideal
J + J Electronics (Pool Lights)
King Innovations
Lighting Resources
NEBO
Pass & Seymour
Selecta Switch
Shurtape
Techni-Lux
WAGO

4 CONVENIENT LOCATIONS

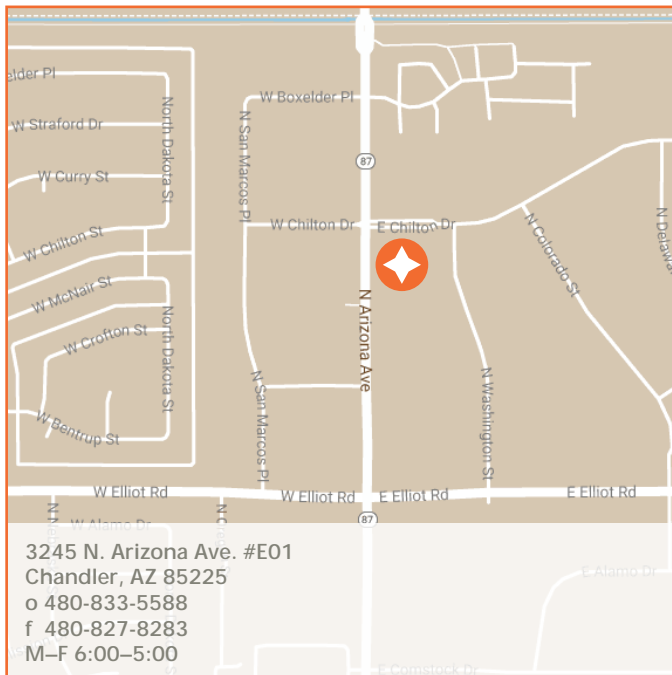
PHOENIX – CORPORATE OFFICE



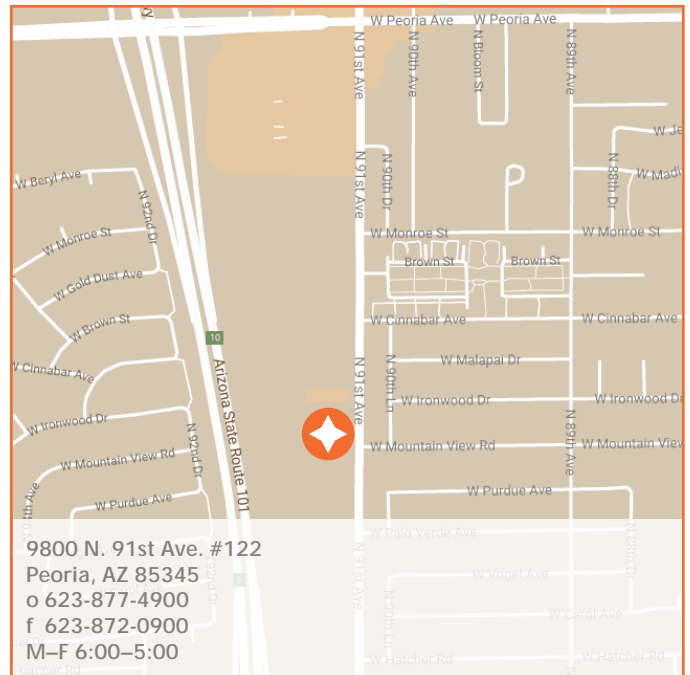
SCOTTSDALE



CHANDLER



PEORIA



LEARN WITH US

Lighting is a rapidly evolving industry, with technologies, standards, regulations, and market conditions changing regularly. All of our staff undergo rigorous training and education to ensure we protect our clients' interests and make reliable, sustainable recommendations to meet customer needs. Lighting Unlimited is constantly looking for ways to continue our education as well as extend instructional seminars and material to our valued clients. Some of these efforts include:

- **Spring and Fall Counter Days:** This is a unique opportunity to mingle directly with the forefront manufacturers in our industry over lunch. Customers can interact with the latest in LED and controls, learn about ways to save money through energy efficiency, and network with industry experts in a casual environment.
- **Manufacturer Training:** Ever wondered how your product is made? Join us as we visit the factories of our key partners to see their production, discover what fixtures are in development and on the horizon, and train on how to look for opportunities to upgrade new and existing buildings.
- **IES Training Sessions:** Learn about the very latest in building codes, lighting technologies, and industry best practices. Courses count for continuing education credits for NCQLP Lighting Certification, CEM, and many other accreditations.
- **Lunch and Learns:** Request a tailored presentation for your staff to learn about relevant topics unique to your business. Lighting Unlimited can host, at our facility or yours, and will provide lunch, training materials, and customize the information to suit your company's needs.
- **Continuing Education Credits (AIA):** Lighting Unlimited offers lighting and controls presentations in conjunction with AIA to help architects, engineers, and designers with continuing education credits. These classes are tailored to help you and your staff understand the shifting complexities of the lighting market, and can be scheduled to accommodate your timeline.

To learn more about how to get involved with any of our training programs, call us at **602-230-8770** or email us at orders@lu-az.com.

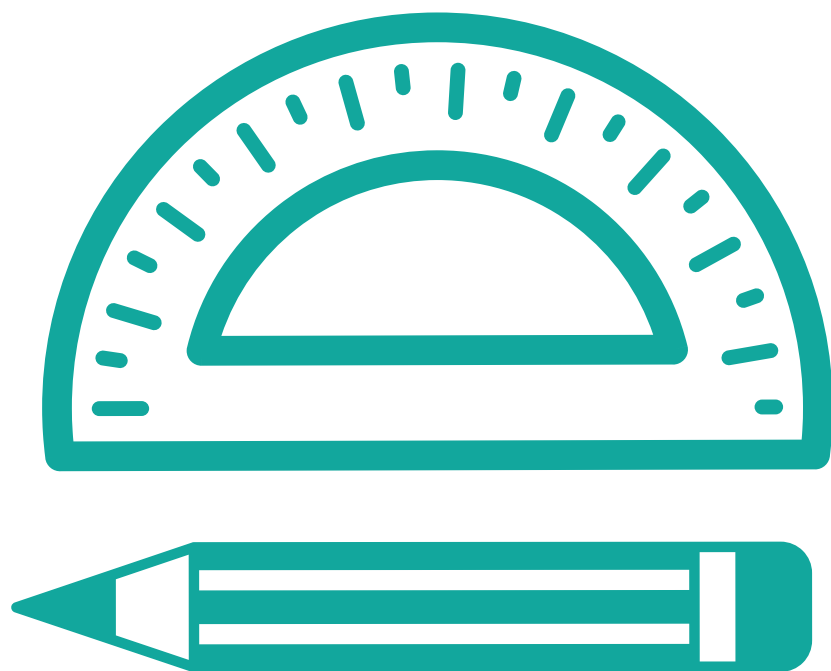


GOVERNMENT / NATIONAL SOLUTIONS

Lighting Unlimited is based out of Arizona, but services many national accounts. With distribution and sales staff available around the country, we offer a wide range of services including:

- **Cost Saving Solutions:** Consistent pricing, reliable delivery, warranties, and freight management
- **TI/Project Support:** Take offs, bill of material creation, order processing, tracking, and expediting
- **Lighting Design:** Layouts, specification, plan review, and product recommendations
- **Warehousing:** Dedicated inventory and 24-hour shipping
- **Energy Saving Solutions:** Retrofit identification and analysis, lighting control management, utility rebates, and designs to meet code
- **Turnkey Solutions:** National electrical contractor partners to service and provide labor along with material
- **State Purchasing:** Providing a reliable source for lighting supplies at the lowest price to maximize government compliance





NEW BUILD

NEW CONSTRUCTION & TI SERVICES

New construction and tenant improvements are among the best times to consider new LED luminaires and controls. This is a good opportunity to upgrade the facility while there are no occupants and there is easy access to electrical equipment. Thinking ahead can result in more efficient labor and reduced future cost. The right lighting specification can keep you code compliant, help facilities achieve independent accreditations, and create a comfortable, architecturally-pleasing work environment. Our staff specializes in finding the right balance of performance and economy when designing a lighting package, and are skilled at aligning your individualized needs with the proper lighting and controls specification. We work hard to meet timelines by providing accurate, updated lead times, and utilizing our knowledge of quick ship materials from manufacturers to deliver in tight windows. By building strong partnerships with our manufactures and contractors, we can select the right solution for your application regardless of brand.

As lighting fixtures age, their output becomes diminished, lenses become yellowed, and certain styles can begin to date facilities. These concerns not only detract from the appearance of a facility, but they can present safety concerns and make it difficult to attract customers and tenants. With advancements in lighting, new technologies, such as LED, can offer significant improvements when compared to existing lighting systems. These benefits include:

- Slimmer, modern form factors
- Better light quality and controllability
- Color temperature specificity
- Reduced glare and ambient noise
- No mercury
- Vandal-proof options
- Dark sky compliance
- Decreased heat, increased human comfort

Additionally, upgrading to new products can help buildings to achieve Energy Star Certification, LEED, stay Title 24 compliant, and meet other internal initiative standards. Manufacturers offer 3–10 year warranties on their products, in addition to Lighting Unlimited's product guarantee. Some of the many, highly reputable companies we work with include:

- | | | | |
|---------------------|------------------|-----------|------------|
| • Lithonia Lighting | • GE Lighting | • RAB | • Keystone |
| • LSI | • Green Creative | • CREE | • Cooper |
| • Philips | • LG | • Hubbell | |

Though Lighting Unlimited is not a contractor, we work with our many partners to offer turn-key solutions for your project. To request a quote or consultation, please call us at **602-230-8770** or email us at spec@lu-az.com.



LOYALTY REWARDS PROGRAM

NEW FOR OUR MOST VALUED CUSTOMERS!

This 18-month promotion is all about rewarding customers for their continued loyalty and support during the promotional period of **July 1, 2018** through **December 31, 2019**.

This is our way of saying 'Thank You' for doing business with us as we serve ALL your buying needs from all of our locations.

The program is really simple. To start, you will earn 1 Lighting Unlimited Loyalty Reward Point for every \$5 in purchases that you make during the 18-month promotional period. Here is the best part: as you continue to make purchases and hit various purchase thresholds, you will receive BONUS points payouts. The more you spend with Lighting Unlimited, the more points you earn in your account. In addition to earning 1 point for every \$5 you spend, when you spend \$25,000 or more with us before December 31, 2019, we will add bonus points to your account! See the chart for details:

SPEND	BONUS POINTS
\$25,000	5,000
\$50,000	25,000
\$75,000	45,000
\$100,000	65,000

These points allow you to choose from thousands of choices from our online catalog at **Lu-AzRewards.com**. We have something for everyone to choose from whether it be merchandise or vacations.

A SAMPLING OF THE 1000'S OF AWARDS YOU CAN CHOOSE!



TERMS & CONDITIONS

1. Each contractor must supply their license # to be eligible to participate.
2. The rewards program runs from 7/1/18 – 12/31/19. Participating customers will be credited points for all LU purchases made back to 7/1/18, even if customer enrolls in the program at a later date. All points must be redeemed for prizes by 3/31/20.
3. All accounts must remain current and in good standing in accordance with LU terms.
4. This program may be cancelled at any time.
5. Large, negotiated projects may be excluded from this program, or awarded at a different points-to-dollars spend ratio, at LU's discretion.
6. Qualifying orders must be ordered, shipped and invoiced during the program period.
7. This offer excludes Government agencies, institutional and investor owned entities.
8. Points may only be earned as outlined. This program has no value other than shown and may not be redeemed other than as outlined herein.
9. For the travel packages on the rewards site - certain other restrictions apply and are listed on the travel voucher that you will receive upon ordering with your points. For drive-away vacations 35 days advance notice is required before departure date: sports trips 60 days advance notice before date, and cruise trips 90 days advance notice before departure date. Customers may work with Capitol Marketing to "upgrade" trip, add days, rental cars, upgrade destination, cabins are inside staterooms (cruises), etc. All additional costs will be the responsibility of the customer. Upgrades depend on availability of request. All requests for travel depend on availability. Capitol Marketing Concepts is the sole determining body of availability.
10. Void where prohibited by law or local ordinance.

CONTRACTOR SERVICES

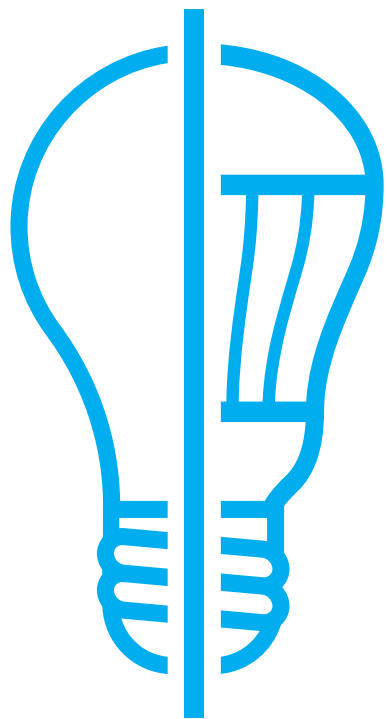
Contractors are the heartbeat of the lighting industry. From TIs to ground-ups, projects to maintenance services, there are very few stages of the lighting process that they don't touch. Our goal at Lighting Unlimited is to provide unparalleled service to our contractors to ensure that we maximize their time spent in the field. Our extensive inventory and four valley locations offer you flexibility when you need additional materials on a jobsite. For projects, TIs, and new build our logistics team offers up-to-date ETAs, BOM staging until your crew is ready to install, and warehouse-to-jobsite delivery. Our full list of services for our valued contractors includes:

- Photometry, Lighting Design, and Product Specification
- **Free** Lighting Surveys, Energy Audits, and Financial Analysis
- **Free** Rebate Paperwork and Tracking
- Job Accounts and NET30 Terms
- Extensive Inventory and Warehousing
- Project and Material Staging
- Jobsite Delivery within 24 hours
- Expert Lighting Training
- Contractor Rewards Programs
- 179D Tax Deduction Preparation

Lighting Unlimited is strictly a lighting distributor and does not provide labor to our customers. In addition to all of the services above, we also have a referral and partnership program for when our sales team needs your labor expertise! By becoming a preferred contractor partner, Lighting Unlimited will provide additional training and support, opportunities to bid projects, referral work for maintenance contracts, and much more!

To find out more about our contractor services, request a bid for a job, enroll in our rewards program, or request more information about our preferred contractor program, contact us at **602-230-8770** or email us at orders@lu-az.com.





ENERGY RETROFIT + RECYCLING

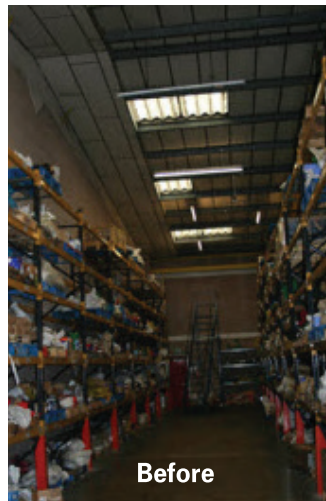
LIGHTING RETROFIT SOLUTIONS

The demand for renovation solutions is larger than ever, representing more than 40% of the US lighting market. Lighting Unlimited's expert staff can help you identify retrofit opportunities and recommend energy-efficient lighting and control solutions. A successful lighting renovation reduces energy and maintenance costs, increases net operating income, and delivers a more sustainable solution. The best renovations also enhance the visual environment, improve human comfort, and increase productivity and morale. Whether a retrofit or redesign, Lighting Unlimited offers the right products to meet your needs and achieve desired results, including:

- **Energy Savings** – By reducing your monthly electric bill, a lighting retrofit delivers financial returns that are an unparalleled investment for your business
- **Maintenance Savings** – Save the inconvenience and wasted time spent changing bulbs by installing a long-lasting luminaire
- **Utility Incentives** – Rebates can reduce the cost of a project, improving ROI and payback periods
- **Improved Safety** – Updating lighting and controls can improve the security of a space by allowing greater visibility
- **Environmental Benefits** – LED lighting eliminates harmful mercury, and dark sky compliant fixtures allow us to view the night sky as it is intended
- **Controllability** – LED affords us the opportunity to easily implement controls strategies, saving you additional money and keeping you code compliant
- **Tax Benefits** – Certain upgrades may qualify you for a federal tax incentive, making projects even more lucrative
- **Design Versatility** – LED solutions are slimmer and allow for more creativity, flexibility, and specificity when designing a space to suit your taste



At Lighting Unlimited, we are committed to tailoring our recommendations to give you the perfect balance of economy and performance. With our vast portfolio of manufacturers and proven expertise in indoor and outdoor luminaires, controls, LED technology, and daylighting strategies, we deliver integrated, intelligent solutions.



FINANCIAL CONSIDERATIONS

30% of the average utility bill can be attributed to lighting and heat offset. Additionally, LED solutions consume an average of 50–70% less than traditional light sources. Evaluating the potential utility savings using traditional financial metrics, such as payback period and return on investment (ROI), shows that upgrading to LED is one of the smartest and most lucrative ways to invest in your company. By lowering your monthly expense, you can increase net operating income and the real cash value of your portfolio.

In addition to these benefits, investing in a lighting upgrade can also yield substantial maintenance and air conditioning savings, as well as avoid recycle fees and monthly maintenance contracts. If this wasn't enough to help you seriously evaluate the economic advantage of energy efficient lighting, many utilities also offer rebates which help pay for a considerable amount of the project cost. Payments from the utility can also be deferred to Lighting Unlimited so that you only have to pay the difference out of pocket. You may also qualify for an additional federal tax incentive.

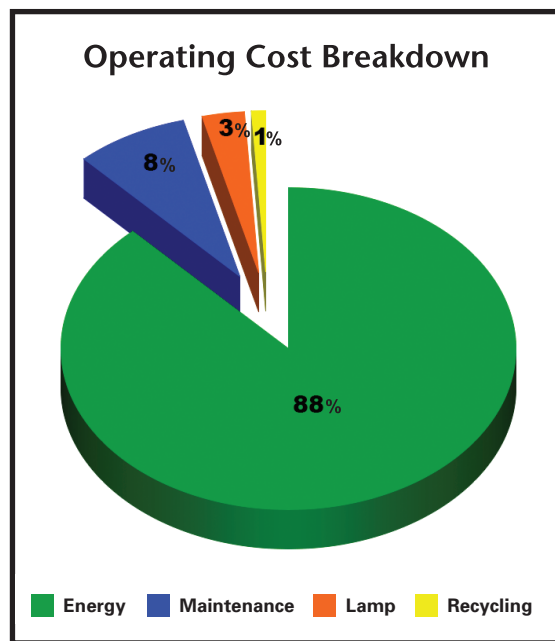
Still not convinced? Allow one of our lighting experts to run a **free analysis** of your building to identify areas of potential savings, run an in-depth financial analysis of your project, and even install demo products so that you can "try before you buy." Remember: there is a cost to waiting. Every day that you keep inefficient fixtures running puts more money in the utility's pocket, and takes it out of yours. To request a consultation, please call us at **602-230-8770**, email us at orders@lu-az.com, or visit us online at www.lu-az.com.

THE TRUE COST OF LIGHTING

1. The cost of lamps (bulbs) you use – 3%
2. The cost of electricity it takes to light those lamps – 88%
3. The costs of maintenance and labor – 8%
4. The cost to recycle used lamps – 1%

Initial cost is the biggest barrier to most lighting retrofits.

However, once you account for the real cost of ownership, the only significant barrier is where to procure the funds, not whether to invest.



FINANCING

Converting a facility to energy-efficient lighting or commissioning other major lighting upgrades such as tenant improvements or new construction can represent a very positive impact on a business, as well as your bottom line. Technologies such as LED lighting shifted from a commodity re-order product to a very real financial decision. We understand that not all businesses have capital expenditure funds or other means readily available for sizable investments, even if the upgrade will net savings down the line. To help alleviate this burden, Lighting Unlimited has partnered with several equipment leasing companies who have the stability and foresight to make projects happen that otherwise wouldn't.

Lighting Unlimited is not a financial institution or broker, and we collect no commissions on the financing portion of projects. Our goal is to aid your business by connecting you to trusted partners who can provide information about rates, payments, and leasing terms. Benefits of equipment leasing include:

- **No money out of pocket to begin a lighting upgrade**
- **Other facility upgrades can be rolled into the lease, including plumbing, building envelope, HVAC, etc.**
- **Many times the energy savings accrued as a result of a lighting upgrade can offset or even net positive cash flow when compared to a structured monthly payment**
- **Most leases allow for an early buyout**
- **In some cases, zero interest financing may be available**

Utility rebates (if applicable) can either reduce the total lease payment, or can serve as a positive cash flow to help aid other areas of your business.

If you would like to learn more about financing and available partners please contact us at **602-230-8770**, visit us online at www.lu-az.com, or schedule a consultation with our expert outside staff at lead@lu-az.com.



RECYCLING



WHY RECYCLE?

We hear about mercury in our environment more and more these days. Everywhere we look – even in ostensibly “pristine” waterways – scientists are finding mercury in fish. The track of contaminants into our diets is a complicated one and has multiple sources, one of which is certainly the mercury found in certain types of lighting which are often not properly recycled.

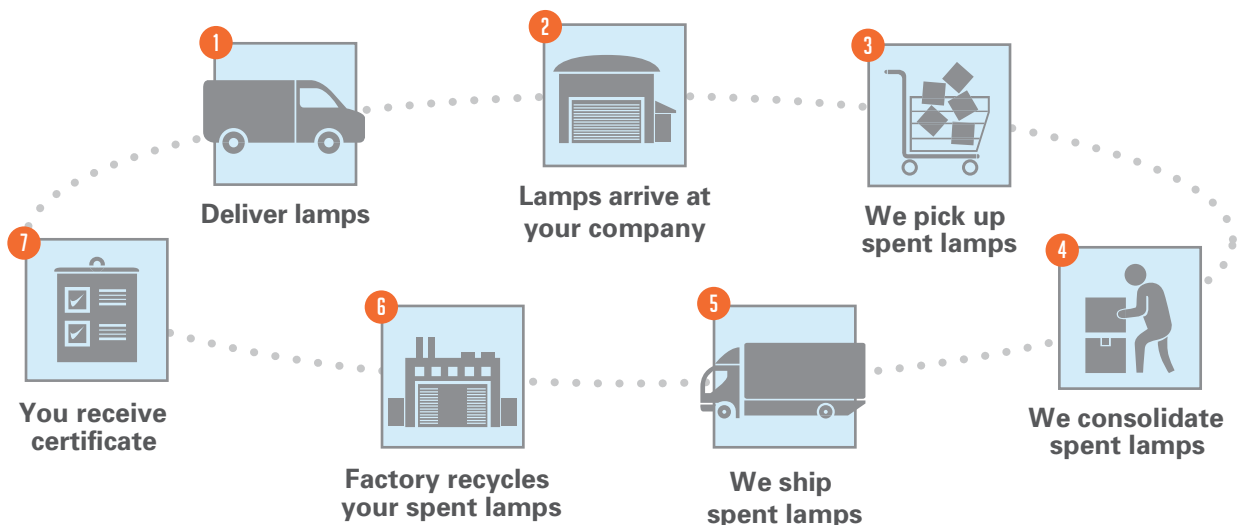
Today's lighting systems are more energy-efficient and environmentally friendly than ever before. Nevertheless, hazardous materials, such as mercury, are contained in lighting waste. Environmental regulations require this waste to be managed properly. Failure to follow regulations could result in costly environmental liability and adverse publicity.

Recycling reduces the potential for future liability as most lighting waste is regulated by the Federal Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), the Superfund liability laws and the Universal Waste Rule.

Regulations require that hazardous waste must be properly identified, stored, transported, treated, and disposed of and that generators are financially responsible for cleaning up the effects of improper disposal.

The Universal Waste Rule is designed to promote and simplify the proper management and recycling of certain lighting wastes.

HOW RECYCLING WORKS



REPLACEMENT LAMP ENERGY SAVING CALCULATOR

Use this calculator to determine the estimated annual energy cost savings resulting from an upgrade of one lamp or system. For fluorescent systems, include the ballast wattage in the original and replacement totals.

Calculate the total kilowatts saved by replacing the inefficient lamps with more efficient lamps.

Original Lamp Wattage	
Replacement Lamp Wattage	-
Watts Saved Per Lamp	=
Number of Lamps to Replace	x
Total Watts Saved	=
	÷ 1,000
Total Kilowatts Saved =	

Calculate the total kWh saved per year.

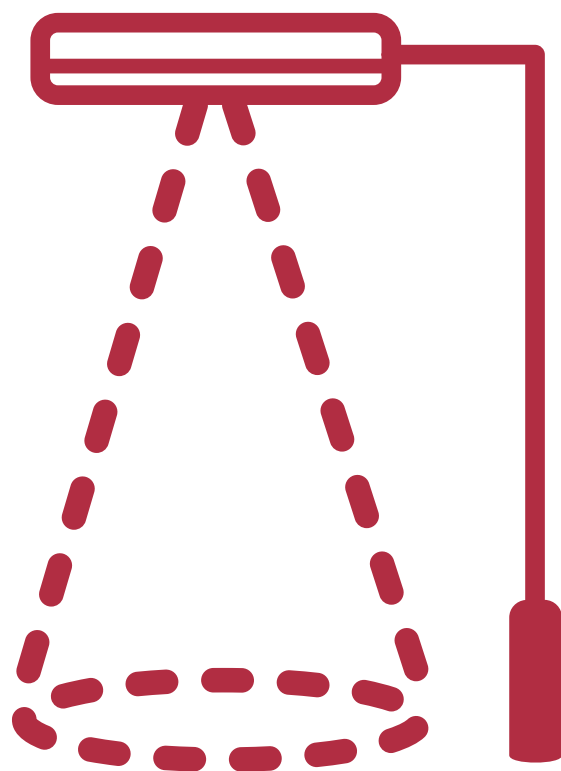
Total Kilowatts Saved	
Hours Used Per Day	x
Days Used Per Week	x
Weeks Used Per Year	x
Total kWh Saved Per Year =	

Calculate the total energy cost saved per year.

Total kWh Saved Per Year	
Energy Cost Per kWh	x (\$0.10 in AZ)
Total Energy Cost Savings Per Year =	

Calculate the payback on investment.

Initial Cost of Lighting Upgrade	\$	
Total Energy Cost Savings Per Year	÷	
Number of Months for Payback on Investment =		
Savings over Life of Lamp =		



DESIGN

DESIGN SERVICES

Lighting Unlimited is proud to offer design services to our valued customers. It can be difficult to navigate the rapidly evolving world of lighting and select the right luminaire from countless options and brands. Lighting significantly impacts the appearance, energy consumption, color, and safety of an environment. It can also affect our mood and well-being, and create an immediate impression of the space. Rather than design to meet minimum lighting standards, our team works diligently to understand your design objectives, creatively think through accents, appearance, luminaires, and budget, and coordinate with the design team to enhance the overall look of the building. Whether you are looking to achieve an industry standard, create an integrated or unique aesthetic, or lower energy consumption and maintenance, let our certified staff help you pick the right strategy and options to meet your needs. Moreover, we are well versed in daylight and control systems, and can help assist you in deciding on the right balance of integration, energy savings, economy, and controllability.

Lighting Unlimited will also provide you with the appropriate documentation for your project as well as a layout to demonstrate the expected light levels, keep you in code compliance, and model rendering to help you visualize the lighting impact in the space. We utilize both Dialux and Visual software, in addition to other design tools.

In addition to our commercial design services, we also offer:

- **Residential Lighting Layouts**
- **Landscape Design and Evening Consultations**
- **Hourly Design Services for Contractors**
- **Hydroponic Solutions and Consultations**

To request a consultation please call us at **602-230-8770**, email us at spec@lu-az.com, or visit us online at www.lu-az.com.

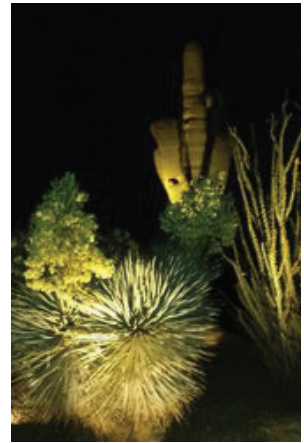


RESIDENTIAL DESIGN SOLUTIONS

Lighting is essential to the function of every household. Every room has at least one light source, and many have several. When it comes to remodels and home design, we often think of kitchen upgrades, color schemes, furniture and arrangement, etc. but limit lighting to a handful of recessed cans and fans. But what if that same essential lighting could also be used to enhance your home? What if lighting could *define* your home?

Color and light have an inseparable relationship, and are the two most important factors when creating a space. Even if you have the most inspirational flooring, countertops, or wall color, the wrong light can ruin the intended “wow” factor. In other words, lighting doesn’t have to be boring. Chandeliers, themed pendants, custom track, and landscape lighting can transform even the plainest spaces into striking points of interest.

When it comes to creating a decorative lighting plan, experts agree that there should be four layers of light, or “TADA!”: Task, Ambient, Decorative, and Accent. Task lighting illuminates usable surfaces within a room. Undercabinet lighting, countertop pendants, desk and reading fixtures, and backlight for shelving are all great examples of task lighting. Ambient light provides the general illumination for a space. This could be a pendant, lampstand, recessed cans, or some kind of combination. Decorative lights are beautiful in their own regard and become a centerpiece in a room, such as modern fixtures, chandeliers, and custom luminaires. Lastly, accent lighting needs to be at least three times brighter than the rest of the space and its purpose is to highlight points of interest in a room (i.e. photos, artwork, etc.). Most accent lighting is track; however, there are several recessed and wall mount options as well. By combining multiple layers of light, areas instantly feel more attractive, inviting, and impactful.



With advanced lighting controls and LED, you have more design options than ever and can significantly decrease your monthly electric bill. Considering a remodel, renovation or looking to upgrade your home? Plan a cost-free consultation with our expert staff to discuss your specific needs, browse the catalogs of state-of-the-art lighting designers, and create the beautiful lighting plan your home deserves. Contact us at **602-230-8770** or send your request to sales@lu-az.com to plan your visit.

RECOMMENDED FOOT-CANDLE LEVELS

INDOOR		
Indoor Application		Recommended Foot-Candle Level
Aircraft Hangar		75–100
Assembly/Packing	<i>Medium</i>	50–70
	<i>Fine</i>	75–100
Auto Service Garage		60–80
Auto Showroom		50–80
Body Shop		80–120
Church		20–25
Construction/Temporary		5
Cooler		20–30
Engineering/Drafting		50–125
Food Processing		50–100
Foundry		40–60
Gymnasium	<i>Recreational</i>	30
	<i>Elementary/Club</i>	50
	<i>High School</i>	80
Hockey	<i>Recreational</i>	50
	<i>Club</i>	100
Horse Riding Arena		30–50
Loading Dock		30–50
Machine Shop	<i>Rough</i>	50–75
	<i>Medium</i>	75–100
	<i>Fine</i>	100–200
Manufacturing	<i>Crude</i>	50–75
	<i>Average</i>	75–100
	<i>Detail</i>	100–150
Multipurpose Room		30–75
Office	<i>Ambient</i>	30–50
	<i>Task</i>	60–75
Parking Garage		2–10
Retail	<i>Average</i>	50–80
	<i>Superstores</i>	80–120
Swimming Pools (on pool deck)	<i>Recreational</i>	30
	<i>Professional</i>	75
Tennis Courts	<i>Recreational</i>	50
	<i>Club</i>	60–75
	<i>Professional</i>	125
Warehouse	<i>Active</i>	20–30
	<i>Inactive</i>	15–20
Woodworking Shops		60–80

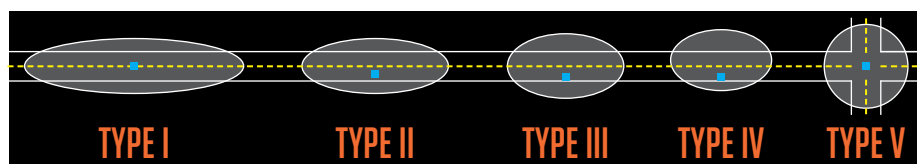
*All recommended footcandle levels are based on the IESNA Lighting Handbook ninth edition. For all applications, the visual environment must also be considered. All values shown are average maintained footcandles at 2.5' Above Finished Floor (AFF).

OUTDOOR		
Outdoor Application		Recommended Foot-Candle Level
Auto Sales Lot		100–200
Basketball		<i>Recreational</i> 20
Building Floodlighting		5–50
Golf	<i>Miniature</i>	10
	<i>Driving Range</i>	20 at the tee
		10 vertical 600' down range
Hockey	<i>Recreational</i>	20
	<i>Club</i>	30
	<i>College</i>	50
Horseshoes		5
Parking Areas		1–7
Riding Arena	<i>Recreational</i>	30
	<i>Professional</i>	50
Security Lighting		0.5–5
Service Stations		20–80
Sign Lighting		5–100
Street Lighting		1–3
Swimming Pool (on pool deck)	<i>Recreational</i>	30
	<i>College</i>	50
Tennis Courts	<i>Recreational</i>	30
	<i>Club</i>	50–75
	<i>Tournament</i>	125
Volleyball	<i>Recreational</i>	20
	<i>Club</i>	30

*All values shown are average maintained footcandles.

REFLECTANCES OF COLOR AND MATERIALS			
Color/Material	Reflectance	Color/Material	Reflectance
Black Paint	0%	Glass	0%
Clean White Paint	70%	Pastels	30–50%
Dirty White Paint	50%	Unpainted Concrete	30%
Dark Paints	10%	Unpainted Metal	30%
Foil Back Insulation	30%	Wood	30%

NOTE: Floors are typically considered 20%.

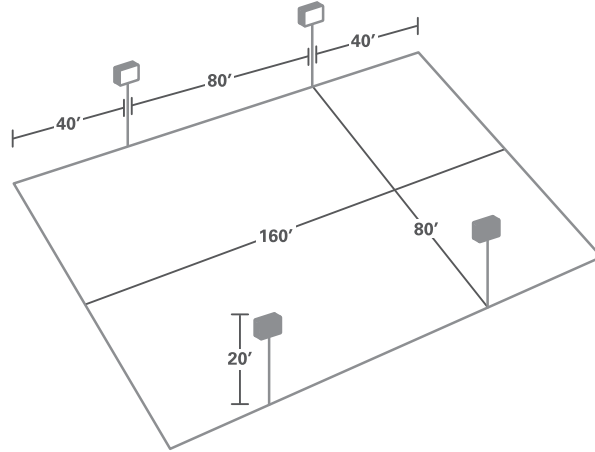


The basic patterns of the five main type classifications in the IESNA streetlight illumination distribution definitions. The blue squares indicate the placement of the overhead fixtures: over roadway center, lane center, or near curbside.

DESIGN SERVICE LAYOUTS

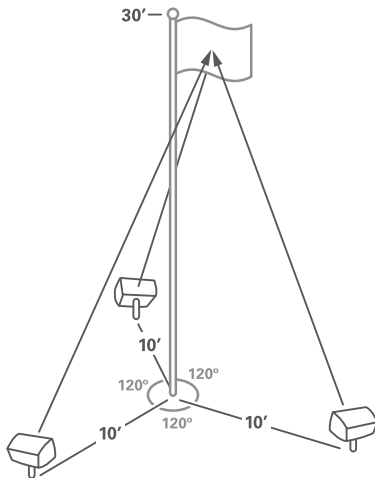
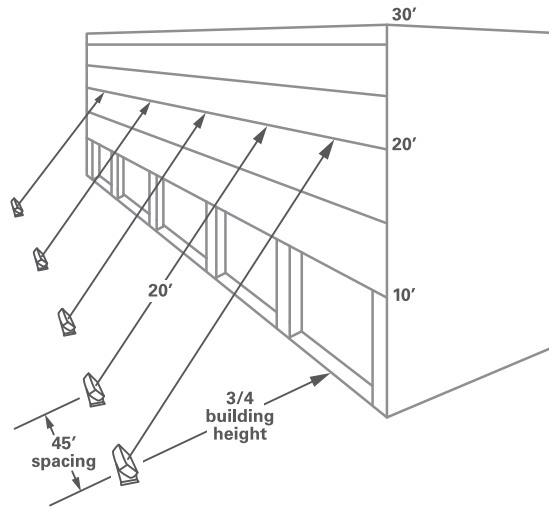
FLOOD LIGHT MOUNTING/SPACING

1. Mounting Height = $\frac{1}{2}$ Distance to be Lit
 $\frac{1}{2}$ (40 ft) = 20 ft high
2. Spacing = When more than one pole is used, use the 4 Times rule for spacing
 4 (20 ft pole) = 80 ft between



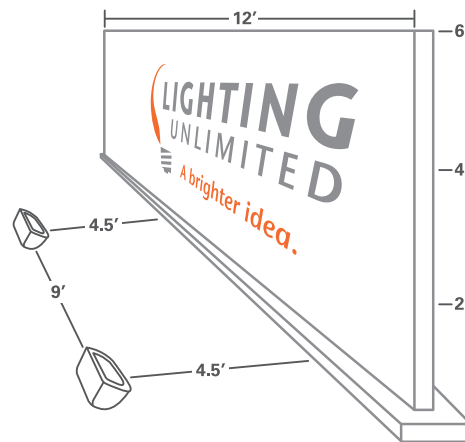
FACADE LIGHTS

1. Setback is $\frac{3}{4}$ Times the Height
 $\frac{3}{4}$ (30 ft) = 22.5 ft back
2. Spacing is 2 Times Setback Distance
 2 (22.5 ft) = 45 ft apart



FLAG

1. Setback is $\frac{1}{3}$ the Pole Height
 $\frac{1}{3}$ (30 ft) = 10 ft setback



SIGN LIGHTS

1. Setback is $\frac{3}{4}$ the Sign Height
 $\frac{3}{4}$ (6 ft) = 4.5 ft setback
2. Spacing is 2 Times the Setback
 2 (4.5 ft) = 9 ft apart



CONTROLS

CONTROLS SYSTEMS & SOLUTIONS

Creating an intelligent, responsive lighting environment is not only essential to effective facility management, it is also easier to implement, maintain, and sustain than ever before. Additionally, as legislation continues to address requirements, lighting and control systems will be needed to maintain compliance. Lighting Unlimited offers a wide range of controls solutions to maximize natural daylight as well as electric light when necessary. Additionally, our staff can help you make sense of which system is right for you based on budget and degree of control needed, as well as help you troubleshoot existing systems. Below is a brief description of common applications and considerations when thinking about a lighting upgrade, performing a TI, or looking to improve your existing facility:

WIRELESS CONTROLS

Wireless controls represent a significant advancement in building automation. This control strategy offers integration with HVAC systems, high visibility and reporting, daylighting and occupancy zones, and individual fixture control. Depending on your needs, wireless controls can be scaled and designed to meet your functional needs and expectations. In retrofit scenarios where labor and ceiling access are a concern, many LED manufacturers are beginning to incorporate intelligent control systems into retrofit and new luminaires. These systems operate the system at a driver-level, meaning that no wire needs to be pulled between fixtures, saving money and time spent on labor. Commissioning is performed through a smart device, and is often included in the cost of a project by the manufacturer. Many of these products have a unique, secure way of grouping fixtures (such as Wi-Fi), can eliminate wall plates and bulkier sensor technologies, and be integrated into other existing equipment controls. These systems allow for zoning to accommodate the functionality of a business, and include sensor, daylight harvesting, and dimming functions. These systems are not only easy to install and commission, they save 30–80% in energy which prolongs the life of the luminaire. Adding controls keeps you code compliant, and new, smart wireless systems are very cost effective.



TUNABLE WHITE

Nature has a very basic, inherent functionality that corresponds to the way the environment interacts with the world around us. These circadian rhythms are directly correlated to light, productivity, and our sleeping cycles. Warmer color temperature light, such as sunrises and sunsets, increase the production of melatonin in humans regulating our

sleeping habits. Cooler temperatures, such as midday sun, inhibit melatonin and increase serotonin in humans, giving us a sense of energy and focus. Because the majority of indoor light is artificial, wouldn't it make sense to have lighting that reflects what is naturally occurring just outside our walls? Tunable white is a cutting-edge LED and controls technology that enables a luminaire to subtly shift its color temperature throughout the day to mimic the changing temperatures of our sun. This technology eliminates the dreary feeling of static fluorescent light, and allows humans to maximize comfort and productivity as a result of the lighting environment around them.

INDOOR POSITIONING SYSTEMS & LI-FI

Many manufacturers such as Acuity, Philips, and GE are investing heavily into new controls technologies that allow retailers to enhance customer experience through indoor positioning systems. This new technology helps direct a customer through the store and offers helpful tips on where to find products, coupons, recipe ideas, fashion tips, and other associated merchandise considerations. Many of these systems use Wi-Fi, GPS, and other common location technologies to implement their strategy, but some are even beginning to incorporate Li-Fi. Like something straight out of science fiction, lighting companies are now using light itself to transmit high-definition data to televisions, smart phones, and more. While still an emerging market, indoor positioning is an exciting opportunity for businesses to put their fixtures to use, aiding customer experience and driving sales.

DAYLIGHT/PHOTOCELLS

For interior applications, one of the best ways to maximize energy savings is to use natural light. Smart systems can detect the amount of daylight in the room and reduce the output of fixtures near the areas to maintain even, efficient illumination. For exterior applications, we also offer a wide variety of photocells and timers to ensure that when the sun is up, your lights are off.

DYNAMIC RGB & DMX CONTROLS

Looking for a way to make your property stand out from the rest? Color changing options with LED can be programmed to reinforce your brand, draw pedestrian attention, or change with the seasons. Whether it is tape lighting, new fixtures, or flex options, we work exclusively with cutting-edge industry leaders that can help identify how to take your application from average to awe-inspiring.



VACANCY/OCCUPANCY SENSORS

One of the easiest, most cost-effective solutions is to implement vacancy/occupancy sensors. These sensors can be equipped to simply shut off lights after leaving a room, or turn lights on and off with occupancy. Passive Infrared (PIR) sensors sense heat changes, while lower-cost Ultrasonic technology uses sonar-like waves to detect motion. Depending on your application, one or both of these options can be used, and we can help get the right design using wall, corner, and ceiling options. These can be adjusted so that you can avoid frustrating performance and maximize your savings.

DIMMING

As with LED solutions, every facility is unique, and may have several options to address dimming in the facility including:

- **2 Wire Dimming:** Have an existing panel that needs to be updated? Unsure if your building's original system will operate with new LED technologies? Our staff are experts at specifying and troubleshooting forward phase/triac dimming systems, as well as reverse phase/MLV systems. Additionally, we are able to integrate high-performing LEDs within the system, and stock a variety of compatible dimming switches and parts.
- **3 Wire Dimming:** Though less common, if you have a fluorescent dimming system or are interested in a Digitally Addressable Lighting Interface (DALI) system, let our staff conduct a free analysis to determine the best solution for your facility. We also stock a variety of compatible ballasts/drivers, and can help to maximize your system efficiency.
- **0-10V Dimming:** This 4 wire dimming system is the preferred choice of many LED applications. Be it integrated solutions, simple wiring from the fixtures, or wireless control options, we can help tailor the right solution to your application.



Below are some of our controls lighting partners:

- Lutron
- Enerlites
- Color Kinetics
- Philips
- WattStopper
- ETC
- Traxon
- LG
- Intermatic
- Sensor Switch
- Lumenpulse
- Cree

TODAY'S PRIMARY WIRELESS CONNECTIVITY TECHNOLOGIES

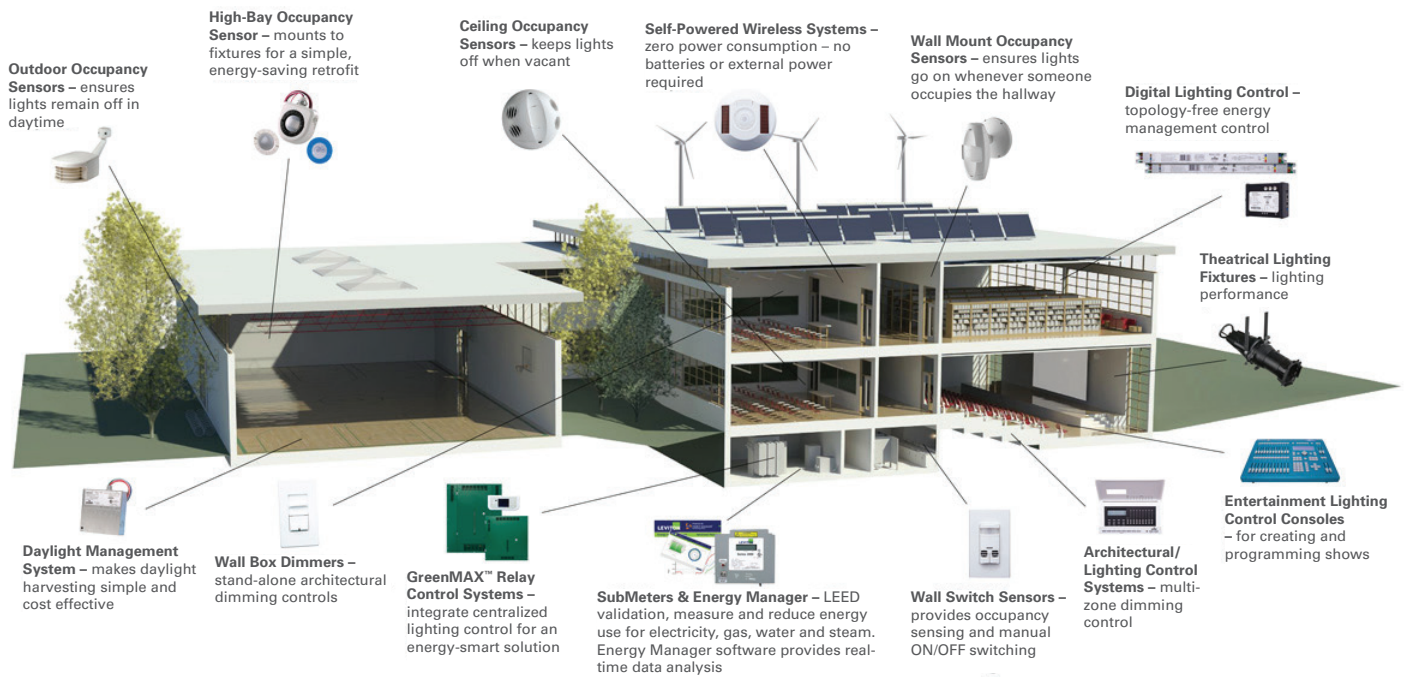
Proprietary	Bluetooth	Bluetooth Smart	WiFi	ZigBee Thread
Closed systems	I/O & Audio	Smart phone	Device-to-app	Ecosystems
Device-to-device	Device-to-PC	Device-to-phone	Infrastructure	Device-to-device
Long range	Streaming	Beaconing	High bandwidth	Reliable mesh
Large network	Point-to-point	Point-to-point	Medium network	Large Network

ADVANCED LIGHTING CONTROLS – BASIC COMPONENTS

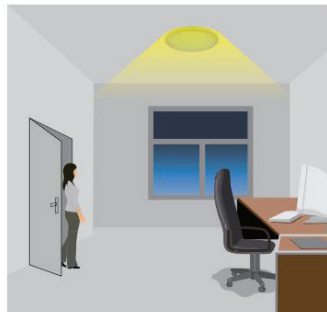
Type	Description	Benefits	Limitations	Tech Notes
Controllable Luminaire or Ballast / Driver	Luminaire or other load needs to be able to receive a signal from the control system.	Can have lower power consumption as conditions change.	Adds cost and complexity to lighting system.	Solid-state Lighting (SSL) has a great potential to be controlled in many ways.
Sensors and Input Devices	Multiple sensor types send signals to a central network.	Allows a unified control strategy.	All control devices must be compatible.	A networked system allows for easier monitoring and reporting.
Occupancy / Vacancy	Sensors that gather data in infrared, ultrasonic, micro-phonic, and / or video modes.	Cost-effective energy savings.	Knowing which sensor type to deploy can be challenging.	Combined sensors are called dual-technology.
Daylighting	Open loop or closed loop photosensors, weather data, and astronomical time clocks can be used.	In a well daylit space, electric lighting can be OFF or dimmed during most of the day.	Many buildings do not have adequate daylighting. Commissioning of daylighting controls can be complex.	The zone closest to windows and skylights yield most of the savings.
Time Clock (Astronomical)	Electronic time clock that self-adjusts for daily changes in sunrise and sunset times.	Self-adjusting timers, particularly for perimeter spaces, can increase energy savings.	Requires unit to be set to the proper geographical location.	When combined with photocells this can be a powerful tool to maximize savings in daylit areas.
Manual Control	User ability to override (lower) the lighting control	Studies show that occupants often set the lighting levels lower than the automatic settings	Requires a user interface that is intuitive and rugged for long-term use.	Giving occupant control of the lighting can aid in productivity.
Communication Mode	Control signals are carried through open or closed systems. The communications protocol can be open source or manufacturer specific.	There are a variety of ways that the control signals can reach the lights.	System compatibility and interoperability are concerns. All components need to be able to interface correctly.	Cloud-based systems can allow control from a wide variety of locations. Closed-network systems may be more secure.
Wireless	Portions of the system can communicate without wires. This can be done with radio, Bluetooth, WiFi, or light signals.	Using wireless controls can lower installation costs.	Not all spaces are suitable for wireless signals.	Systems can be a “mesh network,” allowing for increased robustness of control signals.
Wired	There is a wire linkage from the controller all the way to the luminaire. This can be dedicated control wires, line carrier, or Ethernet.	Wired systems are less prone to interface problems than wireless.	Wired systems take more planning and higher first costs, especially in existing buildings. It may not be practical to install control wires.	Some installations use power and control over Ethernet (PoE). This is only possible with modern low-power SSL lighting.
Intermediate “Black Boxes”	Translate and deliver commands from sensors or user interface to the lighting.	System persistence by updating protocols if enabled.	As more components are included, there are more failure points.	A distributed power system requires less heavy wire.
Networked User Interface	Allows programming, commissioning and real-time adjustment of the lighting system.	A networked system allows changes to be made from a central location. Reports can be generated.	Requires integration with IT systems.	A GUI can ensure that the system is easy to use and program.

BUILDING ENERGY MANAGEMENT SYSTEMS

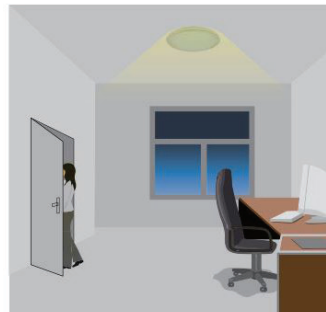
A Building Energy Management System (BEMS) is an integrated system of software, hardware, and services that controls energy use through information and communication technology. Used in commercial buildings, BEMS technology works by monitoring, automating, and controlling building systems such as heating, ventilation, air conditioning, thermostats, and lighting to increase building energy efficiency and improve comfort. Integrating lighting into your building's automation is easier and more effective than ever.



With sufficient natural light, the light does not switch on when presence detected.



With insufficient natural light, the sensor switches on the light automatically when the person enters the room.



People left, light dims to 10%/20%/30%/50% (optional) stand-by level after the hold-time.



Light switches off automatically after the stand-by period elapsed.

Below are some of our BEMS partners:

- Lutron
- Intermatic
- ETC
- Daintree
- WattStopper
- Enerlites
- Sensor Switch
- Encilium

RESIDENTIAL CONTROL SYSTEMS

Did you know that lighting is literally and figuratively responsible for all color, vibrancy, space, and dimension we experience in a given setting? With proper lighting design (see residential design section) controls are even more important and easier to integrate/maximize. Add scene control to set particular moods, and maximize the various effects lighting can have on our well-being. Controls can also add to security and safety and be tied into your thermostat and security system. Looking to add an additional “wow” factor? Consider pairing controls with a color-changing LED solution, or implementing a shade system that can be controlled with the press of a button. Eliminate unnecessary light switches and confusion, create the perfect environment to match your occasion, and shave money off your monthly electric bill.

LIGHTING UNLIMITED IS A 4X LUTRON 5-STAR SHOWROOM!

.....



SONOS
amazon alexa



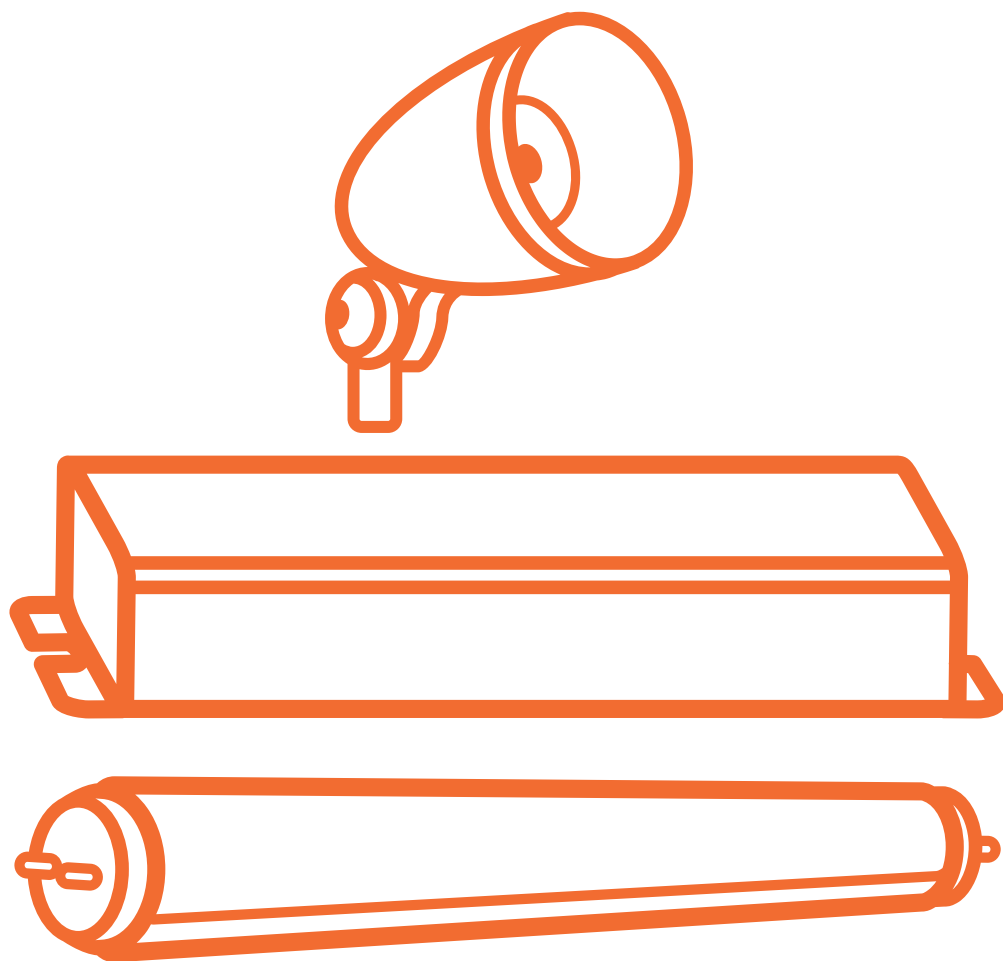
HomeKit

nest



Google Home
Hands-free smart speaker





BULBS + PARTS + FIXTURES

INVENTORY SOLUTIONS

Most people consider good lighting as lighting that goes unnoticed. A burnt-out bulb, ballast, or dated fixture not only detracts from the look of a facility, it can also be a serious security and safety concern. Having the proper inventory available to address maintenance concerns is vital to the function and form of property management. Lighting Unlimited invests in an expansive inventory, and builds strong partnerships with our vendors to ensure high order fulfillment, accurate lead times, and up-to-date tracking information. Below are some of the many, highly reputable manufacturers we stock:

Inventory and Logistics

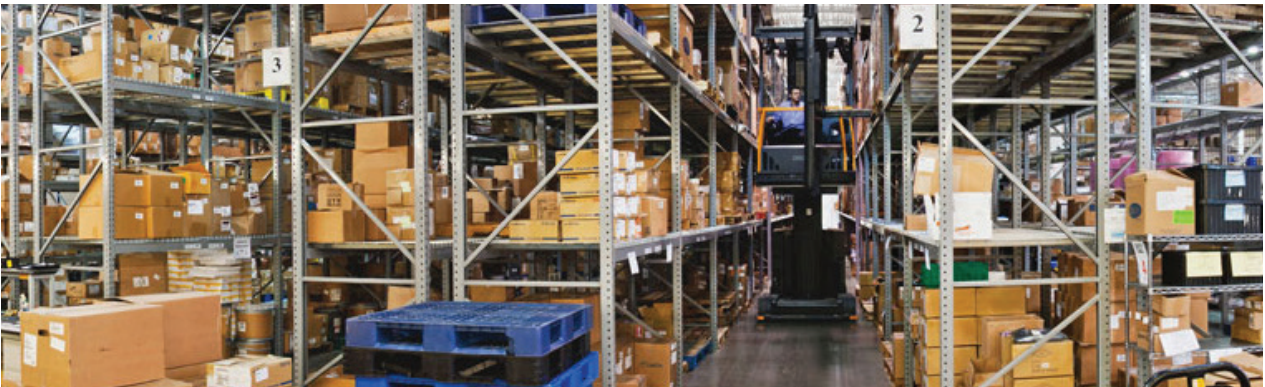


- Halco Lighting
- Green Creative
- Philips Lighting
- Advance
- GE Lighting
- Keystone
- Lithonia
- Liton
- Fulham
- Soraa
- Lutron

We are proud to ship nationally, and offer next-day delivery for Arizona businesses on in-stock items. Have a part that never seems to be in stock when you need it? Lighting Unlimited is also happy to offer our shelf space to keep routine products in inventory so you don't have to.

Additionally, as buildings age, a property can collect a variety of different parts, and revolving staff can contribute to inconsistent lighting maintenance. Lighting Unlimited representatives are available to make routine visits to your facility to check stock levels, make recommendations, bin and label products, and provide customized order guides to ensure consistent, dependable ordering.

To request a sales rep, order product, or request a quote, please call us at **602-230-8770**, email us at orders@lu-az.com, or visit us online at www.lu-az.com.



ONLINE ORDERING

Visit our website at www.lu-az.com to browse our extensive online inventory. Create an account, apply for credit, view pricing, and see highlights for product specials and new technologies. Online ordering is fast, simple, and product is shipped nationally to your doorstep. Have questions or don't see something you are looking for? We make it easy to reach our staff to help assist you and help find exactly what you are looking for.

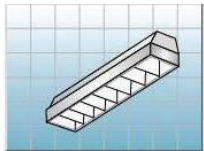
SAVE | ORDER TIME | ONLINE



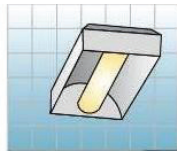
INTERIOR FIXTURE GUIDE

We offer a large variety of architectural and commercial products to fit every application. The trusted brands below give you flexibility and dependable performance for lighting needs such as troffers, strip fixtures, pendants, track lighting, sconces, cans, soffit/cove, hi-bay/low-bay, emergency, and controls:

- Acuity/Lithonia
- Hubbell Brands
- LSI
- Juno
- Liton
- Philips Brands
- CREE
- Cooper/Halo
- TechLighting
- WAC



Parabolic Louver Fluorescent Troffer for Critical VDT Applications



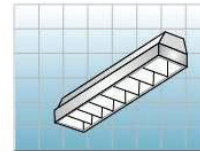
Recessed "Indirect" Luminaire



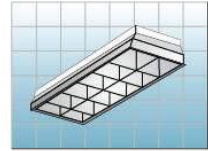
Open HID High-bay (Metal Reflector) Luminaire



Linear Fluorescent Troffer



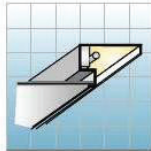
Parabolic Louver Fluorescent Troffer, 1x4 Baffle



Parabolic Louver Fluorescent Troffer, 2x4 Louver



Recessed Round Wall-washers



Recessed Wall Slots



Decorative Wall Sconce



Recessed Round Downlight



Recessed Square Downlight



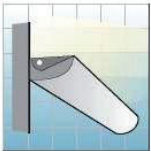
Recessed Linear Wall-washer



Chalkboard or Whiteboard Luminaire



Track Lighting (Metal Halide)



Wall-mounted Uplighting



Decorative Direct-Indirect Pendant



Recessed Accent Light (MR-16)



Recessed Accent Light (MH PAR)



Track Lighting (Incandescent)



Track Lighting (Fluorescent)



Decorative Indirect Pendants



Decorative Luminaire, Pendant



Decorative Luminaire, Sconce



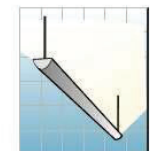
Task Lighting, Fixed and Furniture Integrated



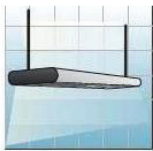
Portable Task Lighting



Decorative Pendant Downward Light



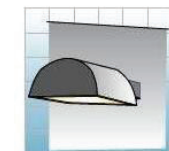
Suspended Linear Fluorescent Luminaire



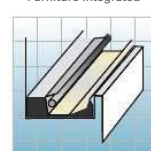
Suspended Direct-Indirect Fluorescent Luminaire (mostly down)



Lensed CF "Low-bay" Luminaire



Functional Wall Sconce



Cove-mounted Uplighting



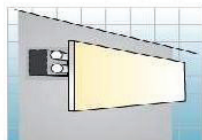
Portable Torchier Uplight



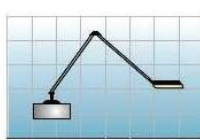
Open HID High-bay Luminaire Glass or Plastic Reflector



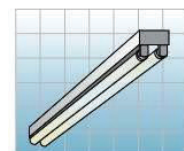
Suspended Direct-Indirect Fluorescent Luminaire (mostly up)



Wall-mounted Valance



Typical Compact Fluorescent Task Light



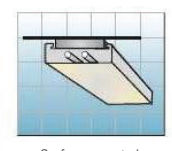
Open Fluorescent Luminaire, Striplight



Open Fluorescent Refl. Industrial



Lensed HID "Low-bay" Luminaire



Surface-mounted Fluorescent "Wraparound"

EXTERIOR FIXTURE GUIDE

Exterior lighting is essential for the safety and security of commercial properties. Properly maintained light levels reduce liability, and can enhance the look of a facility. LUI carries a complete line of roadway, parking lots, flood, wallpacks, canopy and underwater fixtures with shatterproof lenses to protect the fixture from vandals and bad weather. The brands below are proven industry leaders that build products to protect you and your visitor's best interests:

- LSI

- Acuity/Lithonia

- Hubbell Brands

- CREE

- RAB

- Bega

- Philips Brands

- Gardco

- Holophane

- Cemtech

- GE

- Color Kinetics



CAN / TRACK / LIGHTING SYSTEMS

LUI's trained staff can help you put together your lighting system to enhance any space. We offer track, monorail, cable and much more. LUI carries many accessories and parts to customize your lighting system.

- Bruck
- Liton
- Nicor
- Nora
- Progress
- Stone
- Tech Lighting
- WAC



RECESSED CAN SELECTION

Light up your commercial space or home with LUI's vast selection of recessed lighting. With a versatile and discrete design, recessed lights are the perfect lighting solution for many different styles of interiors. Using recessed lights to soften a room or focusing a spotlight on artwork can add to a well-designed space.

- Elite
- Halo
- Juno
- Lithonia
- Nicor
- Gotham
- Intense
- Lightolier
- Liton
- WAC



LANDSCAPE SOLUTIONS

There is a significant amount of money spent to design and maintain the look of a building. From paint to foliage, facades to water features, the aesthetics of a building can be a major attraction for tenants and visitors. Without proper lighting this investment can only be viewed during daylight hours. By adding lighting, a building can reach its full potential while increasing security, safety, and curbside appeal. Below are some of our trusted landscape lighting partners:

- Focus

- Halco

- Kim

- Brilliance

- Hydrel

- Hadco



CUSTOM LASER-CUT LIGHTS



WRAPPING TREES WITH LIGHTS



In order to calculate this, you'll need to gather the following information for each tree:
(All measurements should be made in inches)

- Height of trunk you want to light (**H**)
- Spacing between light strings on the trunk (**S**)
- Circumference (distance around) tree trunk (**C**)
- Average length of branch you want to light (**L**)
- Average circumference of branches (**A**)
- Number of branches you want to light (**N**)

The formulas below will work for any bulb spacing. The most widely used is 6" spacing.

Total feet needed for the first tree's trunk =
 $H \div S \times C$ (then divide by 12 to get feet)

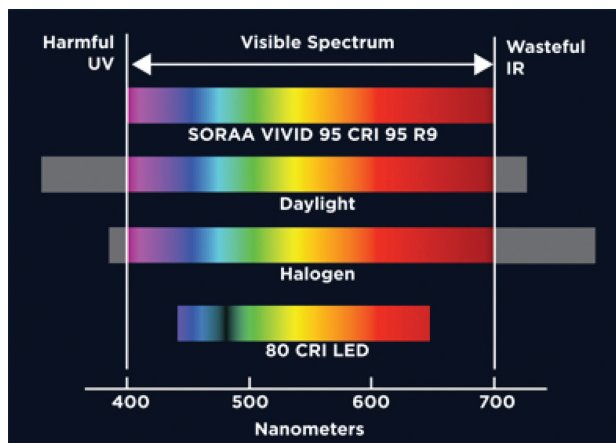
Total inches needed for the first tree's branches =
 $L \div S \times A \times N$

Add these to get the total for the first tree, and then proceed to calculate the other trees.

FULL SPECTRUM LAMPS

FULL SPECTRUM LIGHTING

LED lighting has become one of the fastest growing technologies and industries in the world today. As regulations and our understanding of this truly remarkable breakthrough has progressed, the need for education and reform has as well. Although energy savings is a primary motivator in retrofitting outdated technology to LED, this shouldn't come at the expense of high-quality visual acuity. Understanding where CRI (see reference + appendix) misses the mark can be a very revealing exercise. LED's spectrum can be very uneven, causing some colors to diminish or not show up at all underneath a luminaire. By investing in high-quality full spectrum LED lamps can not only save energy, but also bring vibrancy, detail, and positive contrast to a space. When considering a major renovation or upgrade, lighting is likely one of the smallest investments. Though a full spectrum lamp costs marginally more than a standard LED, the benefits you reap over the lifecycle of the lamp (as much as ten years!) will make you glad you chose to cut expense elsewhere.



BENEFITS

- Shows your home or business in its natural colors
- Promotes a sense of health and wellbeing
- Reduces glare and eyestrain
- Provides pleasing, bright light for easy reading
- Improves productivity

BRAND NAMES

• Verilux

• Reveal

• Solux

• SORAA



BALLASTS / DRIVERS

LUI stocks a wide selection of fluorescent and HID ballasts. We offer fluorescent ballasts to power almost any combination of lamps and voltages. Our selection of specialty ballasts includes refrigeration, sign, emergency, dimming and LED drivers.

- Advance
- Hatch
- Robertson
- Universal
- Halco
- Keystone
- SOLA
- Workhorse



Standard Fluorescent



CFL



Sign Ballasts



HID



Multiple Fluorescent



LED Drivers

STRIP / RGB LIGHTING

From accent to task lighting, LUI carries a complete, cost-effective solution. LUI stocks both rope and tape lights in colors, white, high output, waterproof or RGB. Choose from many accessories and voltages to accommodate all installations.

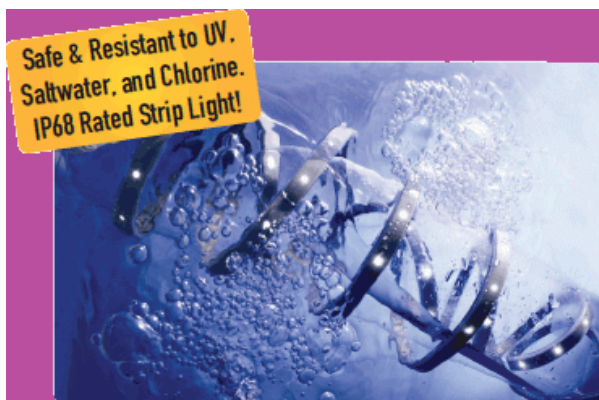
- Diode LED
- American Lighting
- Brilliance
- National Specialty
- Wide Loyal
- WAC



Tape



Rope



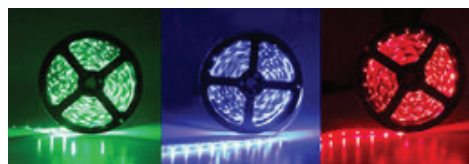
Waterproof



Wall Wash



Cuttable



Remote Control

SPECIALTY LAMPS

Looking to replace a hard-to-find specialty bulb? That is one of LUI's specialties. We offer a large selection of specialty bulbs.

• Bulbrite

• Eiko

• Lunera

• SATCO

• Ushio

• CREE

• Higuchi

• ProGrow Tech

• Shattershield

• Venture



Hydroponics



Antique



Heat



Colors



Shatterproof



Medical

SMOKE DETECTORS



Smoke alarms are required by law in most states. LUI carries direct wire or battery-operated units.

WIRING PRODUCTS



Productivity, reliability, and safety are the key components for Pass and Seymour switches, receptacles and GFCI outlets for residential and commercial customers.

TOOLS



Ideal manufactures premium quality wire connectors and tools that make the electricians job easier.

TUBE GUARDS

If you need a diffuser, LUI has the perfect one for your application. Whether you are looking for a T5, T8, or T12 fluorescent tube guard, LUI has the clear, colored, or UV-blocking product you seek.

• American Louver

• Bergan

• Malcolite

• SLP



EMERGENCY / EXIT LIGHTS

Exit signs and emergency lights are designed to provide adequate lighting in case of an emergency or power failure. LUI offers the highest quality compliant lights for any situation.

• Acuity

• Fulham

• Power Sentry

• Emergi-Lite

• Dual-Lite

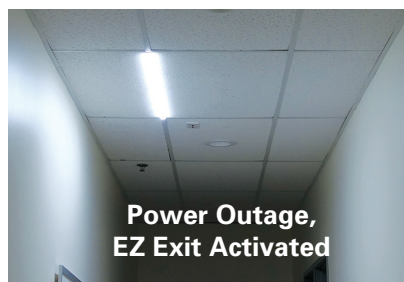
• Exitronics

• Lithonia

• Beghelli

• Chloride

• IOTA



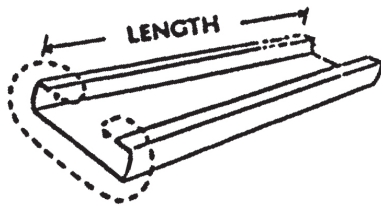
REPLACEMENT PLASTIC LENSES

1. Bring in your old, yellowed, broken or worn out wraparound lens or diffuser and we'll do the rest.

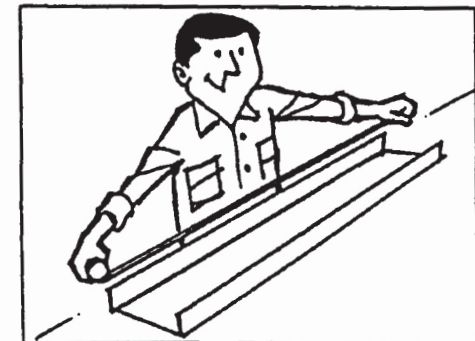
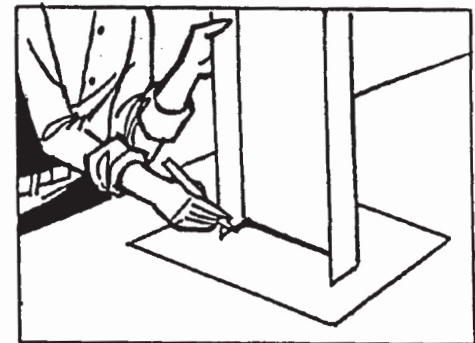
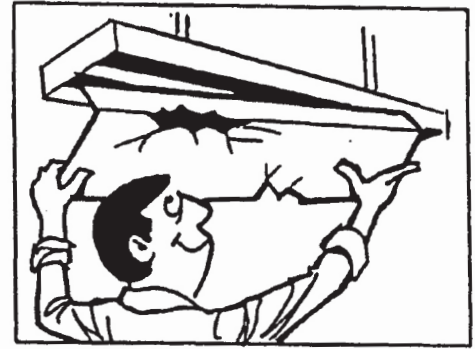
OR

1. Remove old wraparound lens or diffuser from the fixture.
2. On graph paper, place the old wraparound on its end.
3. Trace the end shape, being sure to draw both the inside and outside of the lens or diffuser.
4. Measure overall length of lens or diffuser *exactly*.
5. Send or give exact measurements and original drawing to Lighting Unlimited.

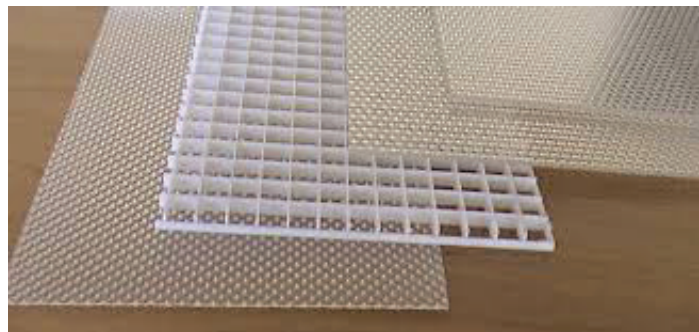
If end caps are needed, include accurate drawing.

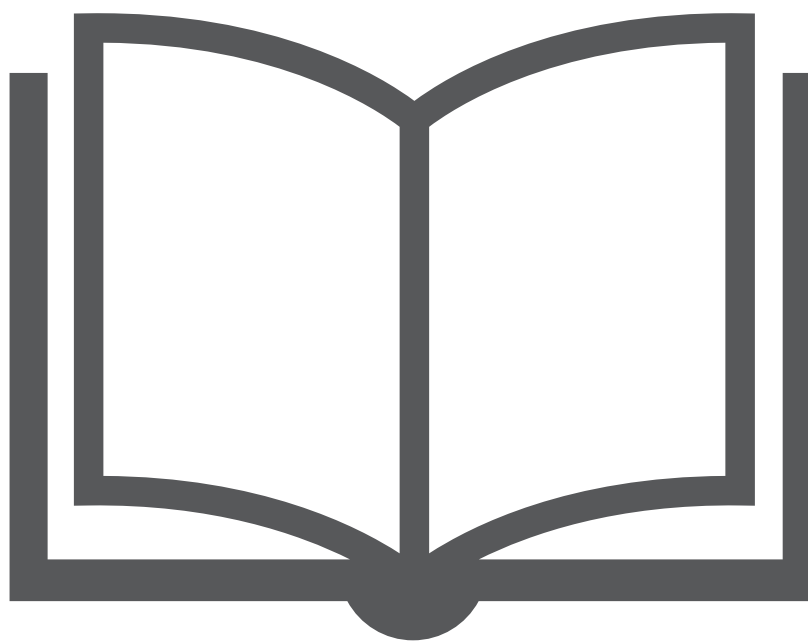


Lighting Unlimited guarantees that all wraparounds are quality acrylic and will not deteriorate or yellow for many years. All orders are carefully packaged and delivery is guaranteed.



• American Louver • Louvers International • Bergen • Malcolite • SLP • ALP





APPENDIX + REFERENCE MATERIAL

COLOR RENDERING INDEX

Color Rendering Index. Outdoor light has a CRI of 100. The closer to 100 the CRI is, the truer the color.



2700K
CRI 97



2700K
CRI 90



2700K
CRI 80



2700K
CRI 70

CRI Test Color Patches R_1-R_8



Supplemental Test Color Patches R_9-R_{14}



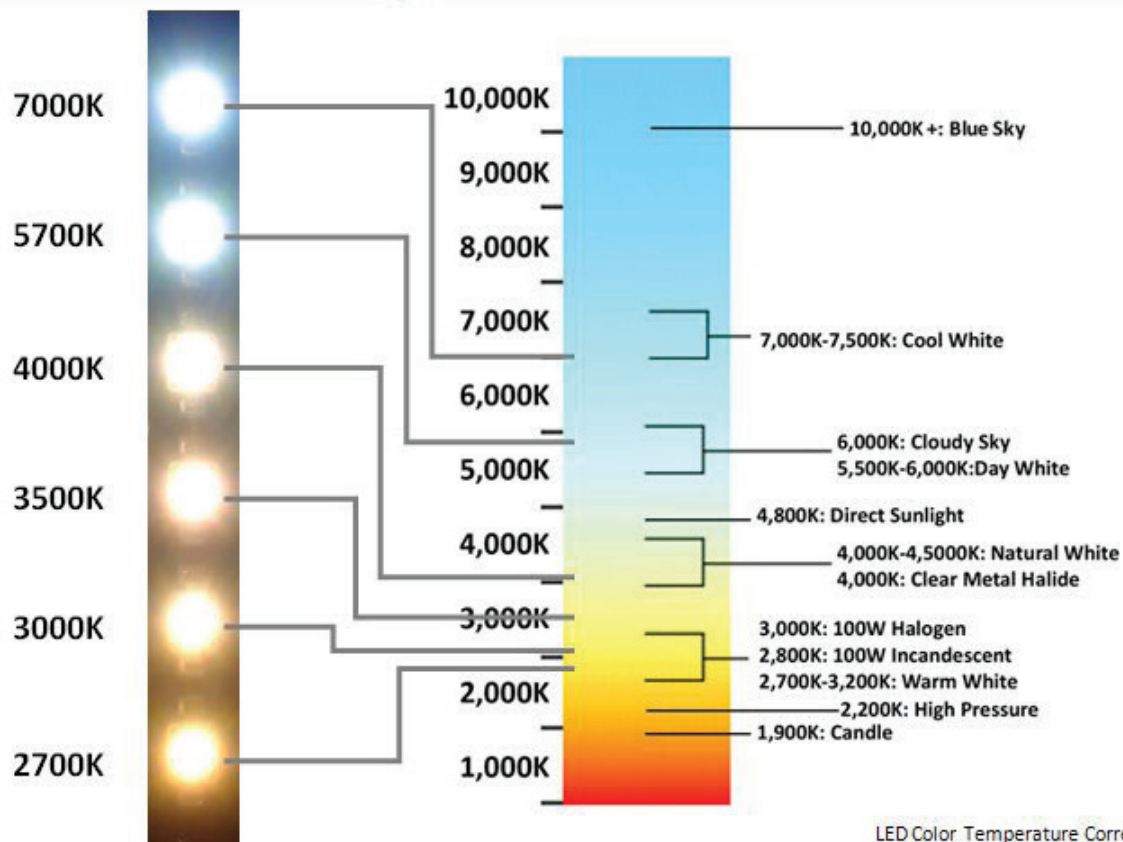
KELVIN AND CRI

FLUORESCENTS		
Color	Kelvin	CRI
Cool White	4100	62
Warm White	3000	52
Daylight	6500	84
Spx 30 (830)	3000	86
Spx 35 (835)	3500	86
Spx 41 (841)	4100	86
Verilux	6200	94
OTHER LIGHT SOURCES		
Mercury Vapor	2200	52
Metal Halide	4000	85
High Pressure Sodium	2500	80
Low Pressure Sodium	1000	18

COLOR TEMPERATURE SCALE

Basic LED Reference Example

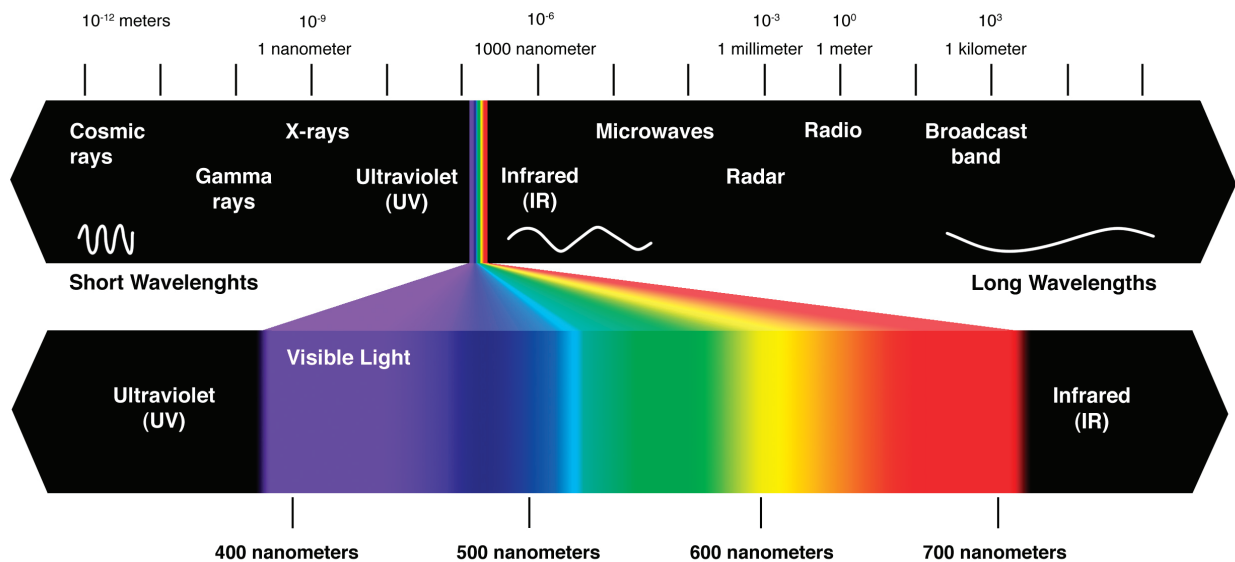
Kelvin Color Temperature Scale Chart



LED Color Temperature Correlation Example

Kelvin is the burning temperature or appearance of the light.

LIGHTING SPECTRUM



LED TESTING STANDARDS

When you order LEDs from LUI, you can be sure that they are safe, reliable, and will produce years of excellent light quality. We have put together a brief explanation of what these standards actually mean. It is important to note that these standards are not performance requirements, but standards applying to testing and reporting that allow comparisons of different products and manufacturers.

- **L70**

The point at which a light source has depreciated to 70% of the initial light output. This is commonly used as a lifetime reference for LEDs.

- **LM79**

A standardized method for photometric and electrical measurements of LED products. LM79 measures the total light output (lumens) of LEDs.

- **LM80**

A standard that specifies test conditions and methods of measurement for determining the useful life of an LED. The test requires a minimum of 6,000 hours of burning.

- **TM21**

A method for forecasting long-term lumen maintenance of LEDs beyond 6,000 hours of testing.

- **TM30**

A newly proposed method for measuring light quality. This includes more in-depth fidelity (accuracy) reference sources as well as a detailed look at the gamut (hue and saturation) of the tested product.

*LED lamps do not actually burn out the way other light sources do. Instead, they fade to a point below usable light level. Therefore, the concept of “lamp life” has been replaced by “lumen maintenance” for LEDs.



LAMP SHAPES

A SERIES



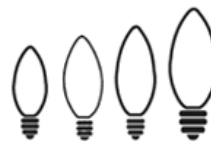
A15 A17 A19 A20 A21 A23

PS SERIES



PS25 PS35

B SERIES



B8 B10 B11 B13

C SERIES



C6 C7 C9 C11 C15

CA SERIES



CA5 CA7 CA8 CA10 CA11

RP & S SERIES



RP11 S6 S8 S11 S14 ST18

F SERIES



F10 F15 F20

PRISM



PRISM

R SERIES



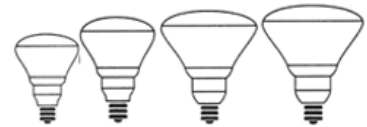
R12 R14 R16 R20 R25 R30 R40

MR SERIES



MR8 MR11 MR16 MR20

BR SERIES



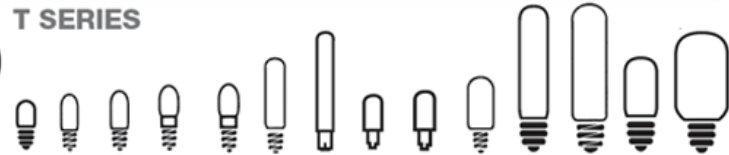
BR25 BR30 BR38 BR40

G SERIES



G9 G11 G12 G16 G16½ G19 G25 G30 G40

T SERIES



T3 T4 T4½ T5 T5½ T6 T6½ T7 T7½ T8 T9 T10 T14 T20

BT SERIES



BT15 BT28 BT37 BT56

E SERIES



E17 E18 E23½ E23 E37 E25 ED17

ED SERIES



ED18 ED23 ED23½ ED28 ED37

AR SERIES



AR70 AR111

PAR SERIES



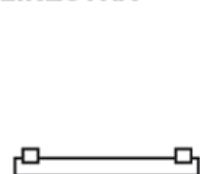
PAR14 PAR16 PAR20 PAR30 Short Neck PAR30 Long Neck PAR36 PAR38 PAR46 PAR56 PAR64

SPECIALTY



JC Bi-Pin Wedge Festoon Rigid Loop

LINESTRA



T10

LINEAR FLUORESCENTS



T2 T4 T5 T8 T12

COMPACT FLUORESCENT COILS



T2 Coil T3 Coil T4 Coil

COMPACT FLUORESCENT PLUG IN LAMPS



Twin Tube Triple Tube Quad Tube

LAMP BASES

SCREW BASES



WEDGE BASES



FLUORESCENT PIN BASES



TWIST & LOCK BASES



BAYONET BASES



BI PIN BASES



LAMP BASES

COMPACT FLUORESCENT PLUG IN BASES



SPECIALTY BASES



ADAPTERS



SOCKETS

LUI stocks lamp sockets, reducers, and extenders to customize most fixtures. With our extensive selection, you can find exactly what you need.

• SATCO

• H&M

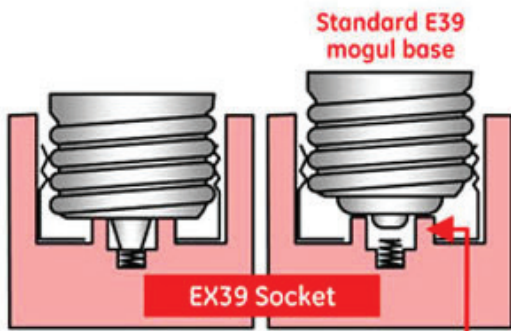
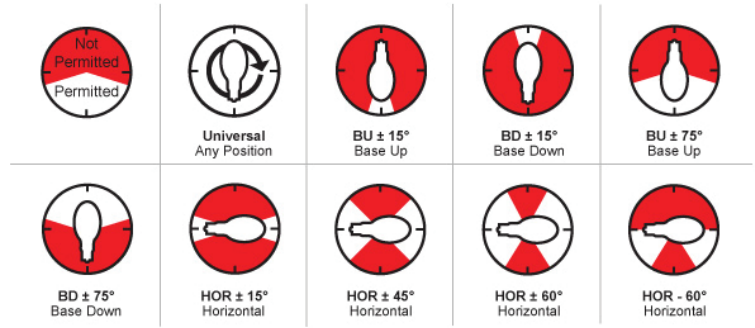
• American-De La Rosa

• Leviton

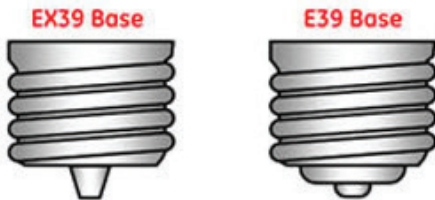


HID LAMP OPERATING POSITION CODES AND SYMBOLS

Lamps must be operated in their specified operating positions in order to maximize lamp performance and life. Incorrect positions may also create the possibility of a lamp rupture. Because of these factors, it is imperative that users adhere to the specified operating positions and fixture requirements. The following chart shows the correct lamp operating positions based on the Position Code Letters which are contained in the lamp descriptions.



Additional ceramic material around the center contact keeps standard E39 mogul base from seating and making contact

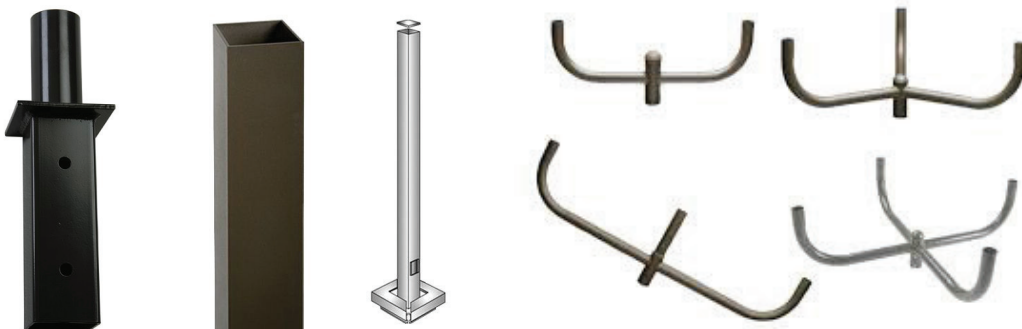


The EX39 base has an extended center terminal that can reach the center contact of an EX39 socket.

Bulb Designation	ANSI Designation	Lamp Type
MH39/35	M130	39/35W Metal Halide
MH50	M110	50W Metal Halide
MH70	M143/M139/M98	70W Metal Halide
MH100	M140/M90	100W Metal Halide
MH150	M142/M102	150W Metal Halide
MH175	M137/M57	175W Metal Halide
MH250	M138/M153/M58	250W Metal Halide
MH320	M132/M154	320W Metal Halide
MH400	M135/M155/M59	400W Metal Halide
MH1000	M47/M141	1000W Metal Halide
LU35 or C35	S76	35W High Pressure Sodium
LU50 or C50	S68	50W High Pressure Sodium
LU70 or C70	S62	70W High Pressure Sodium
LU100 or C100	S54	100W High Pressure Sodium
LU150 or C150/100	S55	150W High Pressure Sodium
LU250 or C250	S50	250W High Pressure Sodium
LU400 or C400	S51	400W High Pressure Sodium
LU1000 or C1000	S52	100W High Pressure Sodium

POLES/ARMS/BRACKETS

We offer steel, aluminum and fiberglass light poles in a variety of size to fit any exterior lighting plan. Choose from round, square or tapered poles. Pick our double, triple or quad bullhorn mounting brackets for versatility. We will help you select the correct mounting option to meet EPA weight, mounting and wind restrictions.

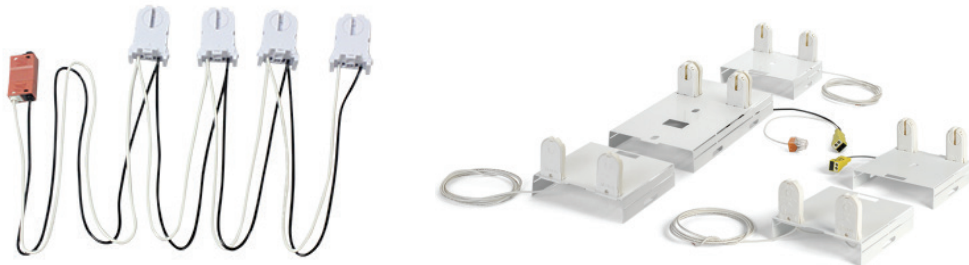


LED TUBES

WHICH LED TUBE IS RIGHT FOR YOU?					
TYPE	BALLAST	SOCKET	WIRING	DRIVER	DIMMING
A	uses existing	shunted or non-shunted	no rewiring	internal	limited
B – SE	requires removal	shunted	requires rewiring	internal	limited
B – DE	requires removal	shunted or non-shunted	direct power, cut out ballast + wire	internal	limited
C	requires replacement	shunted or non-shunted	requires rewiring	external LED	controllable
AB	uses existing or bypasses it	shunted or non-shunted	eventually must rewire	internal	limited

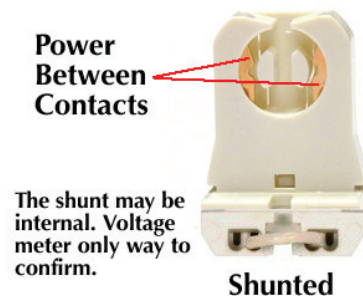
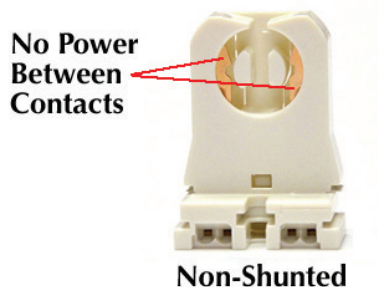
HARNESSES & BRACKETS

Wiring harnesses with power quick disconnects and T8 LED lamp fixture bracket kits.



SHUNTED OR NON-SHUNTED

Shunted sockets are designed to be used only with instant-start ballasts, while non-shunted are for programmed-start ballasts.



FOR LED	
T8-T5 Plug + Play	Shunted
T8 Direct Wire	Non-Shunted
T8 Remote Driver	Non-Shunted
FOR FLUORESCENT	
T8-T5 Rapid Start / Program / Dimming	Non-Shunted
T8-T5 Instant Start	Shunted
T-12	Non-Shunted

LAMP IDENTIFICATION AND MEASUREMENTS

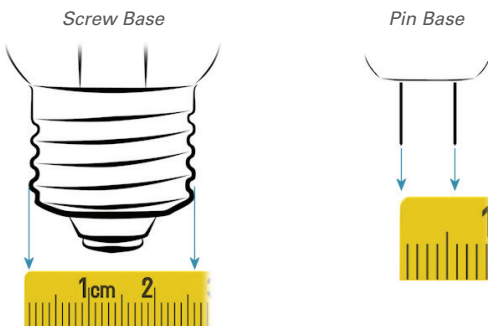
In order to identify your lamp if a part number is not known, please have as much of the following information as possible:

1. **Manufacturer**
2. **Voltage**
3. **Wattage or Amperage**
4. **Glass Shape** (see page 49)
5. **Bulb Diameter** (diameter of the bulb at its widest point)
6. **Base Type** (see pages 50 and 51)
7. **Maximum Overall Length** (measured from tip to tip) (see below)
8. **Lamp Application** (appliance, sports, sign, flashlight, etc.)
9. **Identifying Marks on the Glass or Base**

If we are not able to identify your lamp over the phone, send us a sample or take a picture and email it to us. We need an image with as much detail as close to scale as possible. Lamps are measured to eighths of an inch.

BASE WIDTH

Widest point of the base
Unit of Measurement: millimeters



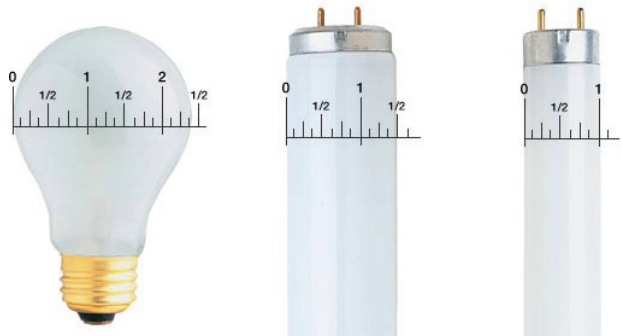
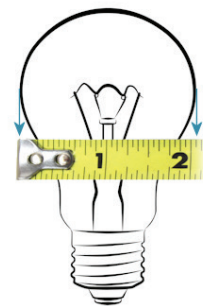
BULB LENGTH

Top of the glass to the
bottom of the base



BULB WIDTH

Widest point of the
bulb itself



MINIATURE LAMP ID

ANSI Code

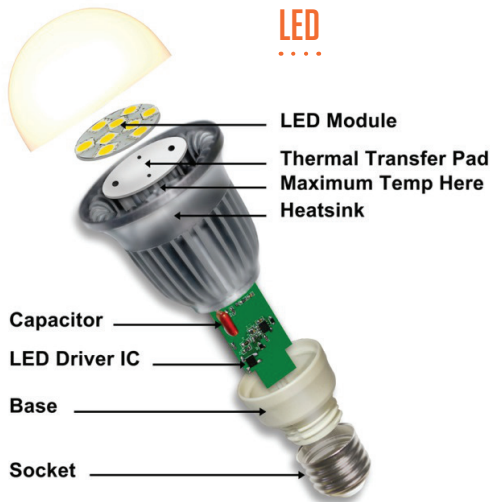
To ensure standardization and conformity in the manufacturing of specialty bulbs, the American National Standards Institute (ANSI) code system uniquely identifies certain lamps.

How to Identify

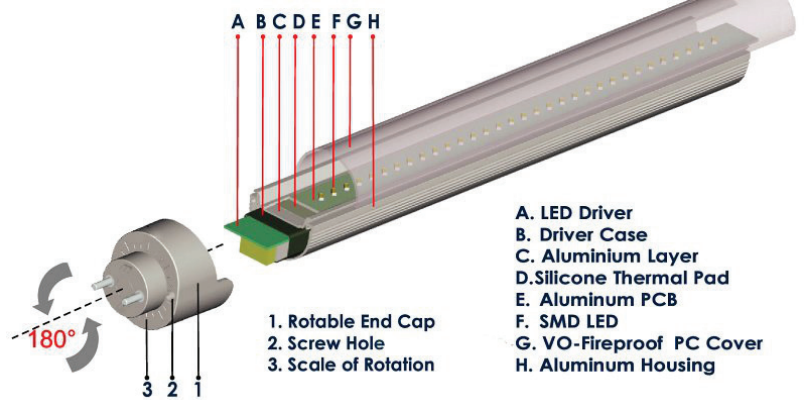
To accurately identify the replacement bulb you need, check the back of the lamp for a 3-letter ANSI code or manufacturer part number. If not available, the wattage, base shape, and voltage must be provided for ordering.

PARTS OF A LIGHT BULB

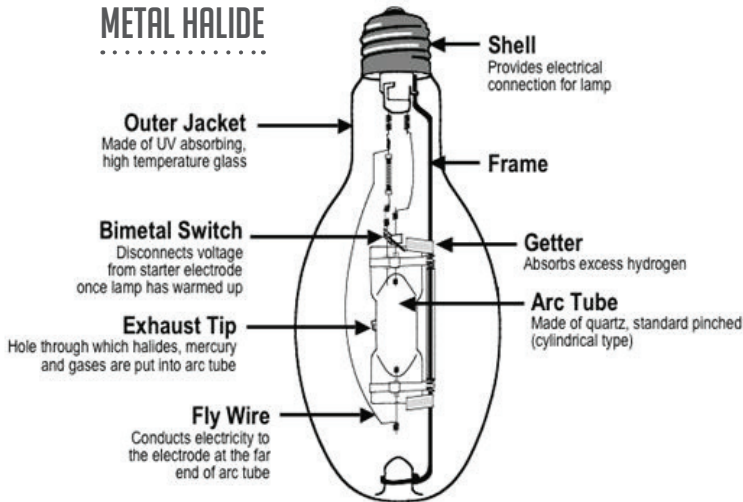
LED



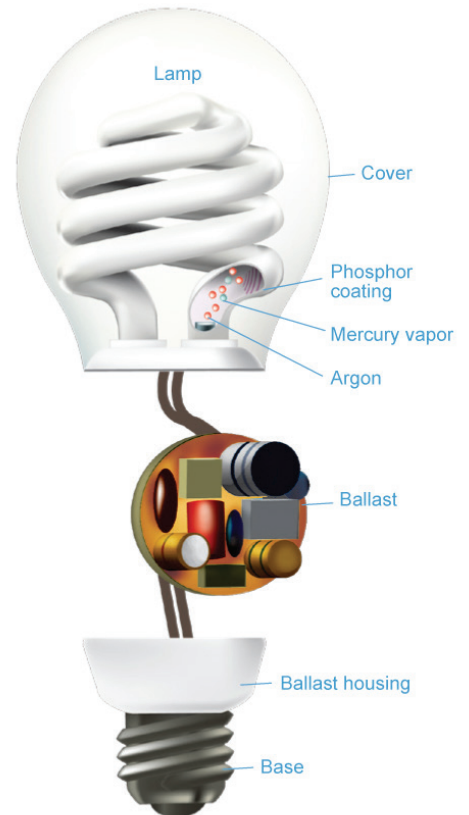
T8 LED



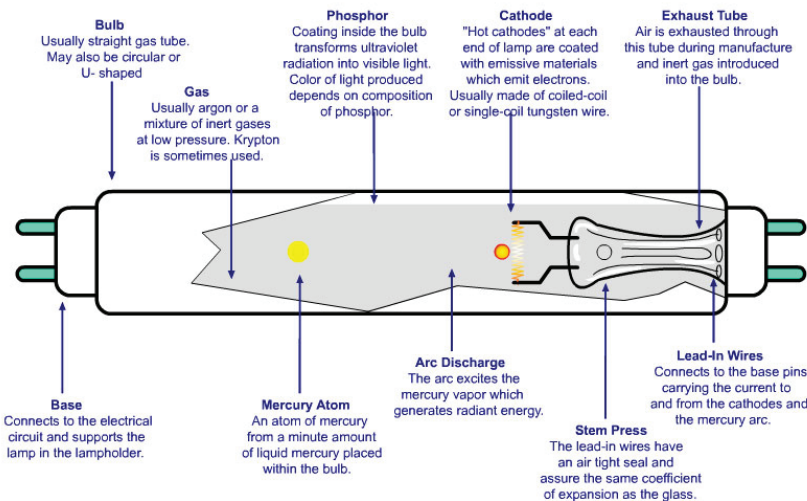
METAL HALIDE



CFL



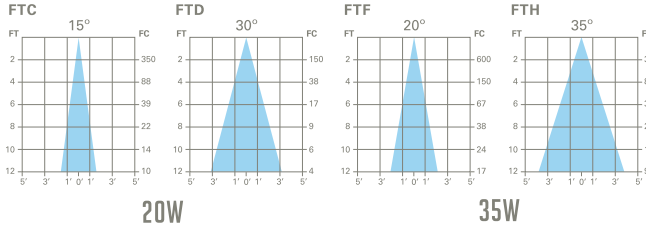
FLUORESCENT



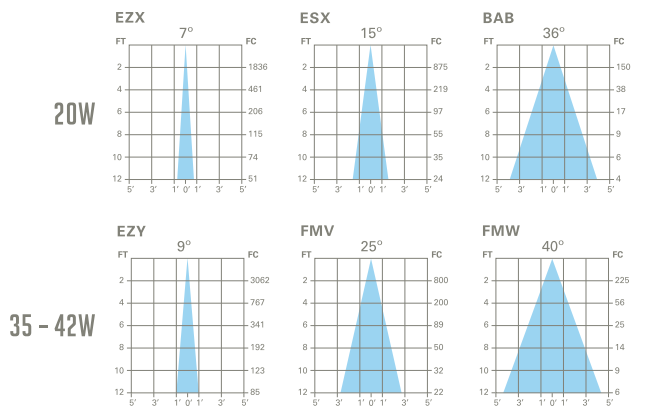
LAMP PHOTOMETRICS

HALOGEN

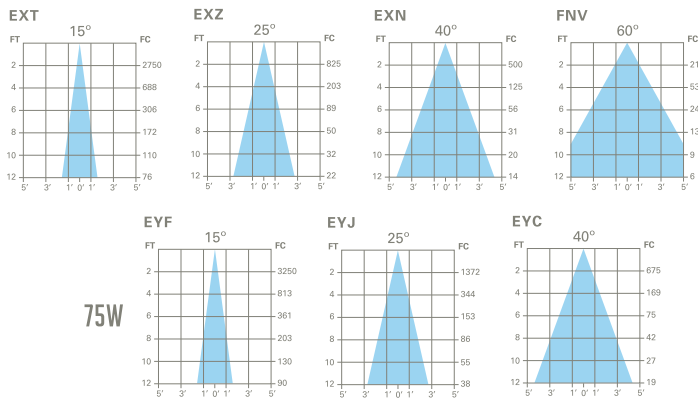
12V MR11



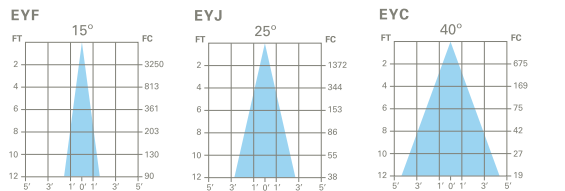
12V MR16



50W



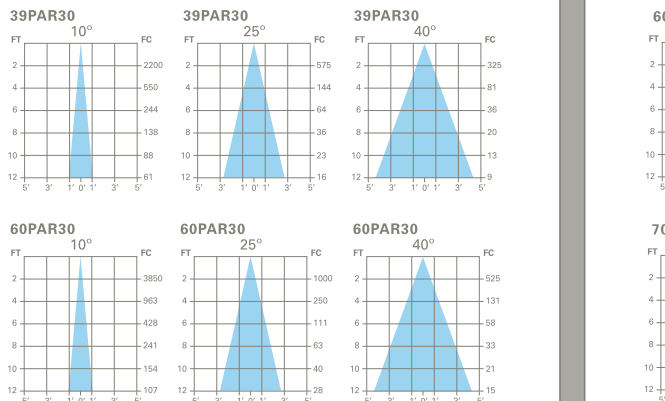
75W



PAR30



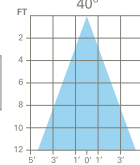
SHORT+LONG



LED

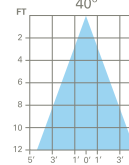
MR16 BAB 4.5W

40°



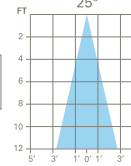
MR16 EXN 8W

40°



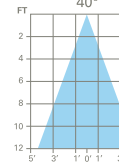
PAR20 NFL 8W

25°



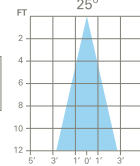
PAR20 FL 8W

40°



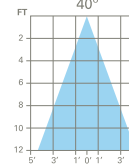
PAR30 NFL 14W

25°



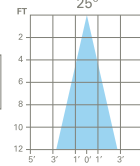
PAR30 FL 14W

40°



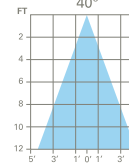
PAR38 NFL 16W

25°



PAR38 FL 16W

40°



PAR20



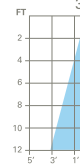
39PAR20

10°



39PAR20

30°



PAR38



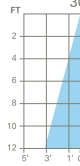
39PAR38

10°



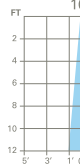
39PAR38

30°



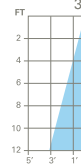
60PAR38

10°



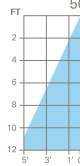
60PAR38

30°



60PAR38

50°



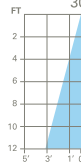
70PAR38

9°



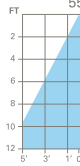
70PAR38

30°



70PAR38

55°

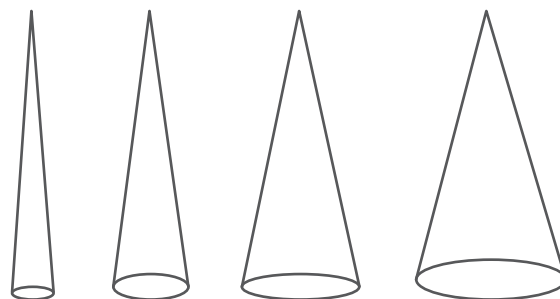


BEAM SPREADS

MR16				
Lamp Type	Degrees	Watts	GE Constant Color	Degrees
		20	EZX	7
ESX	12	20	ESX	15
BAB	38	20	BAB	40
FMT	12	35		
		35	FRA	20
FMV	24	35		
FMW	40	35	FMW	40
		42	EZY	9
EYR	12	42		
EYS	25	42		
EYP	40	42		
EXT	26	50	EXT	15
EXZ	26	50	EXZ	25
		50	EXK	30
EXN	40	50	EXN	40
FNV	60	50	FNV	55
FPA	12	65		
FPB	38	65		
		71	EYF	15
		71	EYJ	25
		71	EYC	40
EYF	12	75		
EYJ	26	75		
EYC	40	75		

MR11			
Lamp Type	Base	Degrees	Watts
FTB	GZ4	8	20
FTC	GZ4	20	20
FTD	GZ4	30	20
FTE	GZ4	10	35
FTF	GZ4	20	35
FTH	GZ4	29	35
FSS	DC	10	20
FST	DC	20	20
FSV	DC	28	20
GDY	DC	10	35
GDZ	DC	20	35
GBD	DC	6	20
GDE	DC	18	20
GDF	DC	32	20
GBJ	DC	10	50
GBK	DC	25	50

GENERAL BEAM SPREADS



Abbreviation	Description	Degree Spread
VNSP	Very Narrow Spot	less than 8°
NSP	Narrow Spot	8°–15°
SP	Spot	16°–23°
NFL	Narrow Flood	24°–30°
MFL	Medium Flood	31°–34°
FL	Flood	35°–44°
WFL	Wide Flood	45°–60°

CREDIT APPLICATION

LUI Sales Person:

Corporate Office

1550 E. Washington St.
Phoenix, AZ 85034
accounting@lu-az.com
P 602-230-8770
F 480-443-1919



**** Net 30 Accounts take 3-7 days to process. Please complete all fields.**

Business Information

Business or Corporate Name:			Date:	
Billing Address:		City:	State:	Zip:
Ship/Delivery to Address (if different)		City:	State:	Zip:
Accounting Contact Name:	Email:		Phone:	
Lighting Purchaser:	Email:		Phone:	
Year Business Established?	Number of employees:	Do you want invoices electronically? Yes / No		
Do you require a monthly statement? Yes / No		Does your company require Purchase orders? Yes / No		
Type of Business (circle one): Sole Proprietor Corporation Partnership		How did you find out about Lighting Unlimited?		
Estimated yearly lighting purchases?		Federal Tax ID #	Contractor's License #	
Are you tax exempt? Yes / No * if you are, please send back your signed Arizona tax resale 5000A form				

Ownership

Principal Name:		Email:		Phone:	
Address:		City:	State:	Zip:	
Principal Name:		Email:		Phone:	
Address:		City:	State:	Zip:	

Bank Reference

Bank Account Type (circle one) – Checking / Savings				
Bank Name:		Account number:		
Bank Phone:		Bank Email:		
Bank Address:		City:	State:	Zip:

CREDIT APPLICATION

Trade References (Major Suppliers)

1. Company Name:		Account Number:		
Address:		City:	State:	Zip:
Contact:	Phone:	Email:		
2. Company Name:		Account Number:		
Address:		City:	State:	Zip:
Contact:	Phone:	Email:		
3. Company Name:		Account Number:		
Address:		City:	State:	Zip:
Contact:	Phone:	Email:		

Credit Card Guarantee

MC/Visa/Amex # _____	Expiration date _____	CSV code _____
Card Holder Name _____	Address _____	Zip _____

Terms and Conditions for an Open Account

<ol style="list-style-type: none"> 1. By signing this application you authorize your bank and references to release financial information relating to credit worthiness. 2. By signing this application you attest to financial responsibility and willingness to pay all invoices in accordance with the terms of net 30 days. 3. If the account becomes delinquent and is turned over to a collection agency or attorney, the undersigned agrees to pay all fees incurred for the cost of collection. A service charge of 1.5% per month (18% annually) will be applied to all balances after 30 days. A service fee of \$30 will be charged for each returned check. 4. Applicant agrees to full payment according to the terms of each invoice. In the event of non-payment within said terms, applicant agrees to authorize Lighting Unlimited to charge above credit card for any outstanding balance, plus applicable interest and fees.
<p>Authorized Signature : _____ Title: _____ Date: _____</p> <p>Print Full Name _____</p> <p>Personal Guarantee of Principal: _____ Date: _____</p>



TERMS

Opening an account with us is easy. We offer net 30 day terms for qualified business customers on approved credit. We accept Mastercard, Visa and American Express. A finance charge of 1.5% per month may be assessed to past due accounts.

MINIMUM ORDER

Minimum order is \$25.00.

FREIGHT

Orders over \$500.00 net will be shipped free within the Phoenix metropolitan area. A delivery charge of \$9.95 will be assessed to orders under \$500.00.

DAMAGED SHIPMENTS

We must be notified in writing of any discrepancies or shipping damage within 5 days of shipment.

VOLUME DISCOUNTS

If you are buying in bulk, we may be able to offer special pricing. Call us!

RETURN POLICY

Regular stock items may be returned within 30 days with the original receipt, provided that the product is in the original packaging and in new condition. After 30 days, a 30% restocking fee will apply. Non-stocked items may be returned only if the manufacturer permits and a minimum of 30% restocking fee and all freight fees will be charged. No returns of cut rope or tape lights.

CUSTOMER SATISFACTION

Our goal is to provide you with a hassle-free experience. If you are not 100% satisfied, please let us, know.

SPECIAL ORDERS

All special orders require a 50% deposit. (non-stocked items)

EXCESS INVENTORY

LUI may be interested in purchasing your **new** excess inventory—send us a list.

WARRANTY

Our products are the highest quality and we want our customers to be satisfied with their purchase. Many of our products provide a manufacturer's warranty which LUI honors. Any product intentionally damaged or misused (or if payment in full is not made in accordance with the invoice terms) will not be warrantied.

PEORIA

9800 N. 91st Ave. #122
Peoria, AZ 85345
o 623.877.4900
M–F 6:00–5:00

PHOENIX

Corporate
1550 E. Washington St.
Phoenix, AZ 85034
o 602.230.8770
M–F 6:00–5:00

SCOTTSDALE

15816 N. Greenway Hayden Loop #200
Scottsdale, AZ 85260
o 480.483.1177
f 480.443.1919
M–F 6:00–5:00
Sat 8:00–12:00

CHANDLER

3245 N. Arizona Ave. #E01
Chandler, AZ 85225
o 480.833.5588
M–F 6:00–5:00

LIGHTING
UNLIMITED