



Legal Department

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

June 28, 2013

Chairman Todd Snitchler
Ohio Power Siting Board
Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793

Re: **In the Matter of Limited Logistic Services**)
and Ohio Power Company for) **Case No. 13-1399-EL-EEC**
Approval of a Special Arrangement)
Agreement with a Mercantile Customer)

Yazen Alami
Regulatory Services
(614) 716-2920 (P)
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yalami@aep.com

Dear Chairman Snitchler,

Attached please find the Joint Application of Ohio Power Company (OPCo) and mercantile customer Limited Logistic Services for approval of a Special Arrangement of the commitment of energy efficiency/peak demand reduction (EE/PDR) resources toward compliance with the statutory benchmarks for 2013.

Amended Substitute Senate Bill 221 sets forth in R.C. 4928.66 EE/PDR benchmarks that electric distribution utilities shall be required to meet or exceed. The statute allows utilities to include EE/PDR resources committed by mercantile customers for integration into the utilities programs to be counted toward compliance with a utility's EE/PDR benchmarks. The statute also enables the Commission to approve special arrangements for mercantile customers that commit EE/PDR resources to be counted toward compliance with EE/PDR benchmarks.

The Commission's Order in Case No. 10-834-EL-EEC, established a streamlined process to expedite review of these special arrangements by developing a sample application process for parties to follow for consideration of such programs implemented during the prior three calendar years. Attached is OPCo's version of that application and accompanying affidavit. Any confidential information referenced in the Joint Application has been provided to the Commission Staff for filing in Commission Docket 10-1799-EL-EEC, under a request for protective treatment. OPCo respectfully requests that the Commission treat the two cases as associated dockets.

Cordially,

/s/ Yazen Alami
Yazen Alami

Attachments



Case No.: 13-1399-EL-EEC

Mercantile Customer: LIMITED LOGISTIC SERVICES

Electric Utility: Ohio Power

Program Title or Description: AEP Ohio Business Incentives for Energy Efficiency: Self Direct Program

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. [10-834-EL-POR](#)

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at ee-pdr@puc.state.oh.us.

Section 1: Company Information

Name: LIMITED LOGISTIC SERVICES

Principal address: Po Box 182199, Columbus, Oh 43218

Address of facility for which this energy efficiency program applies: 8455 E Broad St, Reynoldsburg, Oh 43068-9715

Name and telephone number for responses to questions:

James O'Neill, Limited Logistic Services, (614) 415-7983

Electricity use by the customer (check the box(es) that apply):

- ☒ The customer uses more than seven hundred thousand kilowatt hours per year at our facility. (Please attach documentation.)

See Confidential and Proprietary Attachment 4 – Calculation of Rider Exemption and UCT which provides the facility consumption for the last three years, benchmark kWh, and the last 12 months usage.

- ☐ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.) When checked, see Attachment 6 – Supporting Documentation for a listing of the customer's name and service addresses of other accounts in the AEP Ohio service territory.

Section 2: Application Information

A) The customer is filing this application (choose which applies):

- ☐ Individually, on our own.
- ☒ Jointly with our electric utility.

B) Our electric utility is: Ohio Power Company

The application to participate in the electric utility energy efficiency program is "Confidential and Proprietary Attachment 3 – Self Direct Program Project Completed Application."

C) The customer is offering to commit (choose which applies):

- ☐ Energy savings from our energy efficiency program. (Complete Sections 3, 5, 6, and 7.)
- ☐ Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)
- ☒ Both the energy savings and the demand reduction from the customer's energy efficiency program. (Complete all sections of the Application.)

Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (choose whichever applies):

- ☒ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, 4/8/2013 and the date on which the customer would have replaced your equipment if you had not replaced it early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).

The remaining life of the equipment varies and is not known with certainty. The future replacement date is unknown and has historically been at the end of equipment life. Replacement was completed early to achieve energy savings and to reduce future maintenance costs.

- ☐ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s):
- ☐ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):
- ☐ Behavioral or operational improvement.

B) Energy savings achieved/to be achieved by your energy efficiency program:

- 1) If you checked the box indicating that your project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) - (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Unit Quantity (watts) = Existing (watts x units) - Installed (watts x units)

kWh Reduction (Annual Savings) = Unit Quantity x (Deemed kWh/Unit)

Annual savings: 1,069,717 kWh

See Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation for annual energy savings calculations and 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

- 2) If you checked the box indicating that you installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by the higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: kWh

Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.

- 3) If you checked the box indicating that your project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: kWh

Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.

- 4) If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.

Section 4: Demand Reduction/Demand Response Programs

A) The customer's program involves (check the one that applies):

- ☒ Coincident peak-demand savings from the customer's energy efficiency program.
- ☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
- ☐ Potential peak-demand reduction check the one that applies):

➤ Choose one or more of the following that applies:

- ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
- ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

B) On what date did the customer initiate its demand reduction program?

The coincident peak-demand savings are permanent installations that reduce demand through energy efficiency and were installed on the date specified in Section 3 A above.

C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

$$\text{Unit Quantity (watts)} = \text{Existing (watts x units)} - \text{Installed (watts x units)}$$

$$\text{KW Demand Reduction} = \frac{\text{Unit Quantity (watts)}}{\text{(watts)}} \times \text{(Deemed KW/Unit)}$$

210.7 kW

See Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation for peak demand reduction calculation, and 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) The customer is applying for:

☐ Option 1: A cash rebate reasonable arrangement.

OR

☒ Option 2: An exemption from the cost recovery mechanism implemented by the electric utility.

OR

☐ Commitment payment

B) The value of the option that the customer is are seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

☐ A cash rebate of \$_____. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

OR

☐ A cash rebate valued at no more than 50% of the total project cost, which is equal to \$ 36,900.90. (Attach documentation and calculations showing how this payment amount was determined.)

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for incentive calculations for this mercantile program.

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

☒ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for 11 months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

☐ A commitment payment valued at no more than \$_____. (Attach documentation and calculations showing how this payment amount was determined.)

OR

☐ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of an ongoing efficiency program that is practiced by our organization. (Attach documentation that establishes your organization's ongoing efficiency program. In order to continue the exemption beyond the initial 24 month period your organization will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: _____
(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT) . The calculated UCT value is: 9.2 (Skip to Subsection 2.)

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The utility's incremental measure costs were _____.

Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were \$ 399,261.49

The utility's program costs were \$ 6,418.30

The utility's incentive costs/rebate costs were \$ 36,900.90.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

- Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment.

See Attachment 1 - Self Direct Project Overview and Commitment for a description of the project. See Attachment 6 - Supporting Documentation, for the specifications of the replacement equipment 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed. Due to the length of time since the equipment replacement, the make, model and year of the replaced equipment is not available.

- A copy of the formal declaration or agreement that commits your program to the electric utility, including:

- 1) any confidentiality requirements associated with the agreement;

See Attachment 2 - Self Direct Program Project Blank Application including Rules and Requirements. All confidentiality requirements are pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.)

- 2) a description of any consequences of noncompliance with the terms of the commitment;

See Attachment 2 - Self Direct Program Project Blank Application including Rules and Requirements. All consequences of noncompliance are pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.

- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;

None required because the resources committed are permanent installations that reduce demand through increased efficiency during the Company's peak summer demand period generally defined as May through September and do not require specific coordination and communication to provide demand reduction capabilities to the Company.

- 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,

See Attachment 2 - Self Direct Program Blank Application including Rules and Requirements granting such permission pursuant to the Retrospective Projects/Rules and Requirements that are part of the signed application which is provided as Confidential and Proprietary Attachment 3 - Self Direct Program Project Completed Application.

- 5) a commitment by you to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

See Attachment 1 - Self Direct Project Overview and Commitment for the commitment to comply with any information and compliance reporting requirements imposed by rule or as part of the approval of this arrangement by the Public Utilities Commission of Ohio.

- A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

The Company applies the same methodologies, protocols, and practices to Self Direct Program retrospective projects that are screened and submitted for approval as it does to prospective projects submitted through its Prescriptive and Custom Programs. The Commission has not published a technical reference manual for use by the Company so deviations can not be identified. The project submitted is a prescriptive project and energy savings are determined as described in Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation, and 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.



Public Utilities
Commission

Application to Commit
Energy Efficiency/Peak Demand
Reduction Programs
(Mercantile Customers Only)

Case No.: 13-1399-EL-EEC

State of Ohio :

Brian Lacey Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

KEMA Services, Inc agent of Ohio Power

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.

Brian Lacey
Signature of Affiant & Title

Energy Efficiency Engineer

Sworn and subscribed before me this 16th day of June, 2013 Month/Year

Angie Doan
Signature of official administering oath

Angie Doan, Notary
Print Name and Title

My commission expires on 1-13-2016



Angie Doan
Notary Public, State of Ohio
My Commission Expires 01-13-2016



Self Direct Project Overview & Commitment

The Public Utility Commission of Ohio (PUCO) will soon review your application for participation in AEP Ohio's Energy Efficiency/Peak Demand Response program. Based on your submitted project, please select by initialing one of the two options below, sign and fax to 877-607-0740.

Customer Name	LIMITED LOGISTIC SERVICES		
Project Number	AEP-12-08565		
Customer Premise Address	8455 E BROAD ST, REYNOLDSBURG, OH 43068-9715		
Customer Mailing Address	PO Box 182199, Columbus, OH 43218		
Date Received	4/12/2013		
Project Installation Date	4/8/2013		
Annual kWh Reduction	1,069,717		
Total Project Cost	\$229,904.00		
Unadjusted Energy Efficiency Credit (EEC) Calculation	\$49,201.20		
Simple Payback (yrs)	2.7		
Utility Cost Test (UCT)	9.2		
<i>Please Choose One Option Below and Initial</i>			
Option 1 - Self Direct EEC: 75%	\$36,900.90	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
Option 2 - EE/PDR Rider Exemption	10 Months (After PUCO Approval)	<input checked="" type="checkbox"/>	Initial:

Note: This is a one time selection. By selecting Option 1, the customer will receive payment in the amount stated above. Selection of Option 2: EE/PDR rider exemption, will result in the customer not being eligible to participate in any other energy efficiency programs offered by AEP Ohio during the period of exemption. In addition, the term of Option 2: EE/PDR rider exemption is subject to ongoing review for compliance and could be changed by the PUCO.

If Option 1 has been selected, will the Energy Efficiency Funds selected help you move forward with other energy efficiency projects? ☐ YES ☒ NO

Project Overview:

The Self Direct (Prescriptive) project that the above has completed and applied is as follows.

Retrofitted (5) 3FB34T12-U into (5) 2F17T8	Replaced (173) 8' 8F96T12 with (173) 16' 8F28T8
(10) 4ft permanent lamp removal	Replaced (23) Inc Exit with (23) LED Exit
Retrofitted (81) 2F34T12 into (81) 1F28T8	Replaced (435) 50w Halogen with (435) 15w R30 CFL
(81) 1F28T8 4ft permanent lamp removal	Replaced (1441) 60w Inc with (1441) 13w CFL
Retrofitted (10) 1F96T12 into (10) 2F28T8	Replaced (1603) 65w Inc with (1603) 16w R30 CFL
Replaced (21) 2F34T12 with (21) 2F28T8	
Replaced (5) 12F96T12 with (5) 24' 12F28T8	
Replaced (292) 2F96T12 HO 95w with (292) Tandem 2F28T8	
Replaced (24) 2F96T12 with (24) Tandem 2F28T8	
Replaced (2) 4F96T12 with (2) Tandem 4F28T8	

The documentation that was included with the application proved that the energy measures applied for were purchased and installed.

By signing this document, the Mercantile customer affirms its intention to commit and integrate the above listed energy efficiency resources into the utility's peak demand reduction, demand response, and energy efficiency programs. By signing, the Mercantile customer also agrees to serve as a joint applicant in any filings necessary to secure approval of this arrangement by the Public Utilities Commission of Ohio, and comply with any information and compliance reporting requirements imposed by rule or as part of that approval.

Ohio Power Company

By:
Title: Manager
Date: 6/19/2013

LIMITED LOGISTIC SERVICES

By:
Title: MANAGER HVAC - BAS
Date: 6/18/13



Self-Direct Program Project Application

RETROFIT AND NEW CONSTRUCTION

Step 1: Check Project, Equipment, and Customer Eligibility

- ✓ Project must be a facility improvement that results in a permanent reduction in electrical energy usage (kWh).
- ✓ Measures applying for credits must have a minimum operating hours of 2,245 hours per year. Projects with annual energy (kWh) savings greater than the facility's annual energy (kWh) consumption will not be eligible.
- ✓ All installed equipment must meet or exceed the specifications given in the application and be installed in facilities served by AEP Ohio: Customer must have a valid AEP Ohio account number on an eligible AEP Ohio non-residential rate (see terms and conditions for list of eligible rates eligibility requirements).

Step 2: Submit Application

- ✓ Fill out the Customer Information form and the Worksheet for the measures that you installed. You may submit the application via mail, fax, or e-mail.

Submit your application to:
Email: gridsmartohio@kema.com

AEP Ohio Business Incentives for Energy Efficiency
2740 Airport Drive Suite 160
Columbus, OH 43219
Call: (877) 607-0739
Fax: (877) 607-0740

Visit our web site at aridsmartohio.com

- ✓ Submit a completed application prior to November 16, 2012 for any projects completed on or after January 1, 2009. Any applications received after the deadline may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any credit. Complete the checklist page and attach the documentation listed: customer information page, a signed Final Payment Agreement page, measure worksheet, scope of work (type, quantity, and wattage of old and new equipment), dated and itemized invoices for the purchase and installation of all equipment installed and specification sheets for all equipment installed showing that it meets the program specifications.

Step 3: Project Review

- ✓ The program team will review your Application. For some projects, an inspection will be part of the review, and you will be contacted to schedule it.
- ✓ After approval by AEP Ohio, the customer will be sent an Overview and Commitment form to sign for all self-direct projects. After the Overview and Commitment form is returned the project will be submitted to the Public Utilities Commission of Ohio (PUCO) for consideration. The PUCO will assign case number and review the project details that were prepared by AEP Ohio. The PUCO may request additional information, approve or reject the energy efficiency credits.

Step 4: Receive Energy Efficiency Credits

- ✓ The program team will issue the energy efficiency credits, within four to six weeks after PUCO project approval.
- ✓ In lieu of a one-time energy efficiency credit, you may elect to seek an exemption from the Energy Efficiency/Peak Demand Reduction (EE/PDR) Rider for the associated electric account(s) for a defined period of time as stated on this Application. For this exemption the Energy Efficiency Credit amount (Option 1) is compared to the estimated value of the estimated EE/PDR obligation (Option 2), as calculated by AEP Ohio. The value of Option 2 will be approximately equal to the value of Option 1. If exemption is elected, the affected account is not eligible for other programs offered by AEP Ohio during the exemption period. Unless additional resources are committed, you will, after the specified number of months exempted, be again subject to the EE/PDR Rider. New Construction projects are not eligible to elect Option 2. Major Renovation projects that do not have a representative billing history for three years prior to the project installation are also not eligible to elect Option 2.
- ✓ If the energy efficiency credit is elected, you remain in the EE/PDR rider for the period of time that an exemption would have been in effect and may also participate in the AEP Ohio programs. However, during that period of time, you will not be allowed to elect the Option 2 exemption for any additional self-direct projects for the same account number.
- ✓ You are allowed and encouraged to consider using all or a portion of the energy credits, as received from AEP Ohio under this program, to help fund other energy efficiency and demand reduction projects you choose to initiate in the future. Future projects can also qualify for credits under the Prescriptive or Custom programs.

If you are viewing this document in Microsoft Excel, please note that each section of the application is accessible through the tabs at the bottom of the Excel window. Highlighted cells are for inputting information.



Self-Direct Program Project Application

APPLICATION CHECKLIST

APPLICATION	
Required Attachments	
<input type="checkbox"/>	Customer/Contractor Information (Completed and Signed)
<input type="checkbox"/>	Completed Forms for Energy Efficiency Credits Requested AND Signed Final Payment Agreement Page
<input type="checkbox"/>	Itemized Invoices
<input type="checkbox"/>	Equipment Specifications
<input type="checkbox"/>	Scope of Work
<input type="checkbox"/>	W-9 (LLC, Individual, Partnership, Property Management Companies)
Worksheets	
<input type="checkbox"/>	Lighting
<input type="checkbox"/>	HVAC
<input type="checkbox"/>	Refrigeration
<input type="checkbox"/>	Motors and VFD
<input type="checkbox"/>	Custom
Application Date: _____	
Completion Date: _____	
Project Cost: _____	
<i>*Incomplete applications will delay processing and energy efficiency credits. Please complete and submit forms for above checked boxes.</i>	

Please fill out if this is a revised submittal

ORIGINAL SUBMITTAL DATE: _____
APPLICATION NUMBER (IF KNOWN): _____

AEP Ohio Business Incentives Program for Energy Efficiency
2740 Airport Drive Suite 160
Columbus, OH 43219

Phone: (877) 607-0739
Fax: (877) 607-0740
gridsmartohio@kema.com
www.gridsmartohio.com



Self-Direct Program Project Application

TERMS AND CONDITIONS

AEP Ohio is offering prescriptive and custom incentives under the AEP Ohio Business Incentives for Energy Efficiency program to offer the implementation of past cost-effective energy efficiency improvements for non-residential (commercial and industrial) customers. AEP Ohio provides energy efficiency credits (EEC) for the purchase and installation of qualifying cost effective equipment in the customer's facility under the Terms and Conditions provided in this application and subject to regulatory approvals. Energy Efficiency credits will only be provided in the form of a check or an Energy Efficiency/Peak Demand Reduction (EE/PDR) Rider exemption under this program.

Please note that funds are limited and subject to availability.

All applications are subject to review and approval by AEP Ohio, its contractor(s)/agent(s), and the Public Utility Commission of Ohio (PUCO) prior to any EEC payments or exemptions from the EE/PDR rider in this program. Funds are limited and subject to availability.

Program Effective Dates

AEP Ohio Business Incentives for Energy Efficiency program EEC are offered until approved funds are exhausted or November 16th of each program year, whichever comes first. The effective dates of the current program year and application submittal requirements are as follows:

- Self-direct projects are projects completed since 1/1/2009. Self direct projects are eligible to apply for EEC with this application. Future projects that are not yet completed should apply on the Prescriptive/Custom application.
- All 2012 AEP Ohio Business Incentives for Energy Efficiency program Applications should be received no later than November 16, 2012. Any applications received after the deadlines may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any incentive. AEP Ohio reserves the right to extend or shorten this timeline.
- Subsequent program year budgets and plans will be made available towards the end of the existing program year. AEP Ohio currently has filed with the PUCO to offer this program through the 2014 program year.

Program and Project Eligibility

The Self-Direct Program applies to customer facilities served by AEP Ohio's retail electric rates who meet the minimum energy usage requirements of 700,000 kWh per year or who are part of a national account involving multiple facilities in one or more states.

The AEP Ohio Business Incentives for Energy Efficiency program offers both prescriptive credits for some of the more common energy efficiency measures and custom credits for those eligible improvements not included on the list of prescriptive measures. Program credits are available under the AEP Ohio Business Incentives for Energy Efficiency program to include non-residential accounts served on AEP Ohio's regulated retail rates. Qualifying projects must be installed in a facility in AEP Ohio's electric service territory in Ohio. These credits are available to all non-residential customers who pay into the Energy Efficiency and Peak Demand Response (EE/PDR) rider and receive their electricity over AEP Ohio wires, regardless which retail electric supplier the customer has chosen to purchase power. A customer may neither apply for nor receive incentives for the same product, equipment or service from more than one utility.

Custom projects must involve measures, which result in a reduction in electric energy usage due to an improvement in system efficiency. Projects that result in reduced energy consumption without an improvement in system efficiency are not eligible for a custom credit. The project simple payback prior to the incentive payment generally should fall between 1 to 7 years, or pass cost effectiveness test(s) determined by AEP Ohio to qualify for an incentive. Incentives are calculated based on first-year energy savings and peak demand reduction. Peak demand reduction is defined as the reduction in average load over the Performance Hours by the replacement of existing electrical equipment with more efficient electrical equipment. Peak Performance Hours is defined as the time between June 1st and August 31st on weekday, non-holidays, between the hours 3:00 PM and 6:00 PM Eastern Time.

Projects involving measures covered by the prescriptive credit portion of the program are not eligible for a custom credit. However, the applicant has the option to apply for a custom incentive for whole building integrated projects or systems, even if they include prescriptive measures. The prescriptive elements may be capped at the deemed savings and/or incentive level.



Self-Direct Program Project Application

TERMS AND CONDITIONS

Project requirements under the AEP Ohio Business Incentives for Energy Efficiency program include the following:

- Projects must involve a new facility improvement that results in a permanent reduction in electrical energy usage (kWh).
- Projects that are NOT eligible for a credit include the following:
 - Fuel switching (e.g. electric to gas or gas to electric)
 - Changes in operational and/or maintenance practices or simple control modifications not involving capital costs
 - Removal or termination of existing processes, facilities, and/or operations.
 - On-site electricity generation
 - Projects involving gas-driven equipment in place of or to replace electric equipment (such as a chiller)
 - Projects focused primarily on power factor improvement
 - Projects that involve peak-shifting (and not kWh savings)
 - Renewables (Please visit www.gridsmartohio.com for Renewables Program)
 - Are required by state or federal law, building or other codes, or are standard industry practice
 - Are easily reverted/removed or are installed entirely for reasons other than improving energy efficiency
 - Include other conditions to be determined by AEP Ohio
 - Renewables (Please visit www.gridsmartohio.com for Renewables Program)
- Any measures installed at a facility must produce verifiable and persistent energy reduction and must be sustainable and provide 100% of the energy benefits as stated in the Application for a period of at least five (5) years or for the life of the product, whichever is less. If the Customer ceases to be a delivery service customer of AEP Ohio or removes the equipment or systems at any time during the 5-year period or the life of the product, the Customer may be required to return a prorated amount of incentive funds to AEP Ohio.
- Customer cannot apply for incentives for future projects and elect after the fact to apply for credits under this program.
- Confidential information contained in any documents associated with this application will be protected from public filings. However, this information may be disclosed to the Public Utilities Commission of Ohio for further review and approval.
- Used or rebuilt equipment is generally NOT eligible for an incentive.
- All installed equipment must meet state, federal, and local codes and requirements.
- Costs associated with internal labor are not eligible.
- Projects must be installed on the AEP Ohio electric account in Ohio served by an eligible electric rate type listed on the application.
- Equipment must be purchased, installed, and operating (or capable of operating in the case of seasonal uses) prior to submitting a final application for an incentive.
- AEP Ohio will issue incentive payments in the form of checks, not utility bill credits.
- The incentive is paid as a one-time, one-program offer and cannot be combined with incentive payments from other AEP Ohio programs. The customer may be eligible to participate in other programs offered by AEP Ohio, as long as no project receives more than one incentive.

PROGRAM ENERGY EFFICIENCY CREDITS	
Energy efficiency credit levels for one-year energy savings	See tables for prescriptive credits. Custom credits \$0.08/kWh X 75%
Minimum/Maximum simple payback before energy efficiency credit applied	Must pass cost effectiveness test(s) (determined by AEP Ohio). Generally between 1-7 years.
Maximum payout	75% of 50% of the total cost (additional measure caps may apply)
Energy efficiency credit levels for projects completed since 1/1/2009	calculated amount on the Prescriptive or Custom worksheets attached and subject to funding limits
Credit Limit	See Incentive Limits and Tiering section
Credit Calculation Order	Measure credit caps are applied first. Project cost credit limits are applied second. Credit tiering is applied third. And 75% factor applied to credit last.



Self-Direct Program Project Application

TERMS AND CONDITIONS

Energy Efficiency Credit Limits

For both the Prescriptive and Custom measures in this application, the total energy efficiency credits shall be 75% the lesser of: 1) The calculated credit as approved by AEP Ohio, or 2) 50% of Total Project Cost (not including internal labor cost). In calculating the savings and energy efficiency credits for Custom measures, please contact AEP Ohio Business Incentives for Energy Efficiency Program office to determine appropriate baseline for savings.

Incentive Limits and Tiering

- The limit for each self-direct project is \$225,000.
- The limit for each business entity (corporation, LLC, partnership, etc) is based on their tariff, indicated below.

TARIFF	LIMIT PER BUSINESS ENTITY
General Service Tariffs 1, 2, 3 & 4	\$900,000 per year

- A business entity with facilities in both categories can qualify for both limits. All facilities served in one category for a business entity are combined to determine the limit.
- The total credit paid for any self direct application cannot exceed 50% of the total project cost (not including internal labor). In addition to the above project cost limit, credit payment rates vary when a customer's calculated credit exceeds the tiers listed below:
 - **Tier 1** \$0 - \$100,000 = 100% of eligible calculated credit value
 - **Tier 2** \$100,001 - \$300,000 = 50% of eligible calculated credit value
 - **Tier 3** \$300,001 - \$500,000 = 25% of eligible calculated credit value
 - **Tier 4** \$500,001 - Beyond = 10% of eligible calculated credit value

Application

Application should be submitted by November 16, 2012 for any projects completed or or after Jan 1, 2009 or later. Any applications received after the deadlines may not be submitted to the PUCO by November 16, 2012 and could jeopardize approval of any incentive. Project documentation, such as copies of dated invoices for the purchase and installation of the measure and/or product specification sheets, is required. AEP Ohio reserves the right to request additional backup information, supporting detail, calculations, manufacturer specification sheets or any other information to any credit payment.

The location or business name on the invoice must be consistent with the application information. Applications shall all required documentation should be received by November 16, 2012 to be applicable for the 2012 program year.

A signed application with documentation verifying installation of the project including, but not limited to, equipment, invoices, approvals, and other related information must be submitted to AEP Ohio prior to application approval.

The project invoice should provide sufficient detail to separate the project cost from the cost of other services such as repairs and building code compliance. AEP Ohio reserves the right to request additional supporting documentation as deemed necessary to ensure measure eligibility and verify that the expected energy savings will occur. Confidential information contained in any documents associated with this application will be protected from public filings. However, this information could include: equipment purchase dates, installation dates, proof that the equipment is operational, manufacturer specifications, warranty information, and proof of customer co-payment.

The customer understands and agrees that all other terms and conditions, as specified in the application, including all attachments and exhibits attached to this application, serves as a contract for the customer's commitment of energy resources to AEP Ohio, shall apply.



Self-Direct Program Project Application

TERMS AND CONDITIONS

Application Review Process

AEP Ohio will review Applications for eligibility and completeness. Completed applications will be reviewed in the order received. Funds are reserved for the project when AEP Ohio receives a complete application and determines that the project meets the program eligibility requirements. Applicants who submit incomplete applications will be notified of deficiencies upon review of the application, and may lose their place in line in the review process until all requested information is received. Applications must be completed and all information received by the deadlines defined above to begin processing. Applicants are encouraged to call the program hotline if they have any questions about documentation requirements.

Inspections

AEP Ohio reserves the right to inspect all projects to verify compliance with the program rules and verify the accuracy of project documentation. This may include installation inspections, verification of detailed lighting layout descriptions, metering, data collection, interviews, and utility bill or monitoring data analyses. The customers are required to allow access to project documents and the facility where the measures were installed for a period of five years after receipt of incentive payment by AEP Ohio. Customer understands and agrees that Program installations may also be subject to inspections by the PUCO or their designee, and photographs of installation may be required.

Tax Liability

Credits are taxable and, if more than \$600, will be reported to the IRS unless the customer is exempt. AEP Ohio is not responsible for any taxes that may be imposed on your business as a result of your receipt of payment. W-9 (for LLC, Individual, Partnership, Property Management Companies) must be provided along with all applications.

Requirements for Custom Project Electricity Savings Calculation

The annual electricity savings must be calculated for custom projects using industry-accepted engineering algorithms or simulation models. The applicant may estimate the annual electricity usage of both the existing and proposed equipment based on the current operation of the facility. A listing of the pre-existing information requirements is provided at the end of the custom application section. If the previous equipment was at the end of its useful life, the applicant must use, as the baseline, the equipment that would meet the applicable federal and local energy codes unless an "as found" baseline is being used by the applicant. If the applicant is using an "as found" baseline, additional specific information on the pre-existing information must be provided.

The applicant must be able to clearly describe the method used to calculate the savings. The applicant must provide all assumptions used in the calculations and document the sources for these assumptions. If no savings analysis is provided by the customer/contractors, AEP Ohio reserves the right to utilize their approved methodology and analysis to determine energy savings.

The method and assumptions used by the applicant to calculate the annual savings will be reviewed by AEP Ohio. AEP Ohio is solely responsible for the final determination of the annual energy savings and peak demand reduction to be used in calculating the credit amount. AEP Ohio also reserves the right to require specific measurement and verification activities including monitoring the retrofit to determining the credit. Verification of the preexisting consumption may also be required.

AEP Ohio may need to conduct inspections of projects to verify equipment and operating conditions. For custom and "as found" projects, the applicant is required to provide information in order to allow AEP Ohio to verify the baseline usage of the pre-existing equipment. Customers are encouraged to submit projects that warrant special treatment (i.e., non-typical projects) to be considered on a case-by-case basis by AEP Ohio.

Disclaimer

AEP Ohio does not guarantee the energy savings and does not make any warranties associated with the measures eligible for credits under this program. AEP Ohio has no obligations regarding and does not endorse or guarantee any claims, promises, work, or equipment made, performed, or furnished by any contractors or equipment vendors that sell or install any energy efficiency measures. AEP Ohio is not responsible for the proper disposal/recycling of any waste generated as a result of this project. AEP Ohio is not liable for any damage caused by the operation or malfunction of the installed equipment.



Self-Direct Program Project Application

Important: Please read the terms and conditions before signing and submitting this application.
You must complete all information and provide required additional documentation to avoid processing delays.

CUSTOMER INFORMATION

Business Type (*select one*)

- ☐ LARGE OFFICE
☐ SMALL OFFICE
☐ SCHOOL
☐ SMALL RETAIL/SERVICE
☐ LARGE RETAIL/SERVICE
☐ HOTEL/MOTEL
☐ MEDICAL - Hospital
☐ MEDICAL - Nursing Home
☐ ASSEMBLY/MEETING PLACE
☐ RESTAURANT
☐ GROCERY
☐ CONDITIONED WAREHOUSE
☐ UNCONDITIONED WAREHOUSE
☐ INDUSTRIAL/MANUFACTURING
☐ COLLEGE/UNIVERSITY
☐ GOVERNMENT/MUNICIPAL
☐ OTHER/MISCELLANEOUS

Tax Status (*from W9*)

- ☐ CORPORATION (Inc., PC, Etc.)
☐ Government Agency
☐ Individual
☐ Partnership
☐ Exempt
☐ OTHER (may receive 1099) _____

How Did You Hear?

- ☐ AEP Account Representative
☐ Contractor
☐ Distributor
☐ Website
☐ Other

Operating Days

- ☐ Seven days/week
☐ Five days/week

Operating Hours

- ☐ Low Hours (<8h /day)
☐ One shift (8h /day)
☐ Two shifts (16h/day)
☐ Three shifts (24h/day)
☐ Building Operating Hours _____
☐ Equipment Operating Hours _____

Square Footage

Affected Area S.F. _____

NAME OF APPLICANT'S BUSINESS		PROJECT NAME (IF APPLICABLE)	
NAME AS IT APPEARS ON UTILITY BILL	AEP OHIO ACCT #*	APPLICANT TAXPAYER ID # (SSN/FEDERAL ID)	
MAILING ADDRESS		CITY	STATE ZIP
INSTALLATION ADDRESS		CITY	STATE ZIP

CUSTOMER CONTACT

Please provide all contacts we may need to process for this project. The business contact should be the project decision maker, the technical contact, etc

NAME OF CONTACT PERSON - Preferred Contact for Documentation		TITLE OF CONTACT	
CONTACT PHONE #	EXT.	CONTACT FAX #	CONTACT EMAIL ADDRESS

SOLUTION PROVIDER/CONTRACTOR INFORMATION **

NAME OF CONTRACTING COMPANY			
NAME OF CONTACT PERSON		TITLE OF CONTACT PERSON	
CONTACT PHONE #	EXT.	CONTACT FAX #	CONTACT EMAIL ADDRESS
MAILING ADDRESS		CITY	STATE ZIP

If there are questions about the application who should we contact?

Customer

☐

Contractor

☐

As an eligible customer, I verify the information is correct and request consideration for participation under this program.

CUSTOMER SIGNATURE (AEP OHIO CUSTOMER)	PRINT NAME
TOTAL INCENTIVE REQUESTED***	DATE
ESTIMATED COMPLETION DATE	ESTIMATED PROJECT COST

* AEP Ohio Account Number where measure is installed

** Solution Provider/Contractor - Party involved in the application submittal (i.e. specs, scope of work, etc.)

*** Credit cannot exceed 50 percent of the total project cost or other caps described in the Terms and Conditions.



Self-Direct Program Project Application

SELF-DIRECT APPLICATION AGREEMENT

I understand that the location or business name on the invoice must be consistent with the application information. Final Applications and all required supporting documentation should be received by **November 16, 2012 for projects completed on or after January 1, 2009. Any applications received after the deadlines may not be submitted to the PUCO by December 31st, 2012 and could jeopardize approval of any incentive by the PUCO.**

I agree to verification by the utility or their representatives of both sales transactions and equipment installation.

I understand that these credits are available to all non-residential customers who pay into the Energy Efficiency and Demand Response (EE/PDR) rider and receive their electricity over AEP Ohio wires regardless from which retail electric supplier the customer has chosen to purchase power.

I certify that the information on this application is true and correct, and that the Taxpayer ID Number, tax status, and W-9 are the applicant's.

I agree that if: I remove the related product(s) identified in my application before a period of 5 years or the end of the product life, whichever is less, I shall refund a prorated amount of energy efficiency credits to AEP Ohio based on the actual period of time in which the related product(s) were installed and operating. This is necessary to assure that the project's related energy benefits will be achieved.

I understand that the program may be modified or terminated without prior notice.

AEP Ohio reserves the right to refuse payment and participation if the customer or contractor violates Program rules and requirements. AEP Ohio is not liable for energy efficiency credits promised to customers as a result of misrepresentation of the Program.

Customer and customer's contractor shall be responsible to comply with any applicable codes or ordinances.

All submissions become the property of AEP Ohio. It is recommended for you to keep to a copy for your records.

I understand that this project must involve a facility improvement that results in improved energy efficiency. I also understand that all materials removed, including lamps and PCB ballasts, must be permanently taken out of service and disposed of in accordance with local codes and ordinances. I understand it is my responsibility to be aware of any applicable codes or ordinances. Information about hazardous waste disposal can be found at:
<http://www.epa.gov/epawaste/hazard/index.htm>

I understand that the Application and all required documentation should be received by the AEP Ohio Business Incentives for Energy Efficiency program by November 16, 2012 for any projects completed on or after January 1, 2009. Any applications received after the deadlines may not be submitted to the PUCO by December 31, 2012 and could jeopardize approval of any credit by the PUCO. All equipment must be fully operational.

AEP Ohio will pay 75% of the lesser of: 1) The calculated credit as approved by AEP Ohio subject to funding limits or 2) 50% of the project cost (subject to application caps). I understand that AEP Ohio or their representatives have the right to ask for additional information at any time AEP Ohio's Business Incentives Program for Energy Efficiency will make the final determination of energy efficiency credit levels for this project.

The program has a limited budget. Applications will be processed within the budget limits. Applications and all supporting documentation required should be received by November 16, 2012 to be eligible for funding under the current program period.



Self-Direct Program Project Application

SELF-DIRECT APPLICATION AGREEMENT

Customer understands and agrees that all other terms and conditions, as specified in the application, including all attachments and exhibits attached to this application which will serve as a contract for the Customer's Commitment of energy and demand resources to AEP Ohio shall apply.

I understand that AEP Ohio does not guarantee the energy savings and does not make any warranties associated with the measure eligible for energy efficiency credits under this program, and, further, that AEP Ohio has no obligations regarding any claims, promises, work, or equipment made, performed, or furnished by any contractors or equipment vendors that sell or install any energy efficiency measures and does not endorse or guarantee same.

Energy efficiency credits will be based upon the final application and program terms and conditions, as well as the availability of funds.

Any and all energy savings generated by the project described in this application are hereby committed to AEP Ohio in order to count against its respective companies' benchmark requirements in S.B.221.

ENERGY EFFICIENCY CREDITS REQUESTED

I have read and understand the program requirements and measure specifications, and Terms and Conditions set forth in this application and agree to abide by those requirements. Furthermore, I concur that I must meet all eligibility criteria in order to be paid under this program.

ALL EQUIPMENT MUST BE INSTALLED AND OPERATIONAL. A CUSTOMER SIGNATURE IS REQUIRED FOR PAYMENT. SIGNED APPLICATIONS RECEIVED BY FAX OR EMAIL WILL BE TREATED THE SAME AS ORIGINAL APPLICATIONS RECEIVED BY MAIL. All submissions become the property of AEP Ohio. Keep a copy for your records.

TOTAL PROJECT COST		TOTAL ENERGY EFFICIENCY CREDITS REQUESTED*
CUSTOMER SIGNATURE (AEP OHIO CUSTOMER)		
PRINT NAME	DATE	ACTUAL COMPLETION DATE

**AEP Ohio will pay the lesser of 1) The calculated credit as approved by AEP Ohio 2) 50% of the total project cost of the project.*



Flat Par Specifications

SpringLamp® Compact Fluorescent Flat Pars

NPF – 8,000 Hours

Applications:

A great energy saving solution for hard to reach light fixtures

- + Track Lights
- + Recessed Cans
- + Outdoor Fixtures



Kelvin Color Temperature Options (Ordering Suffix):

- Available in: 2700°K, 3000°K (30K), 3500°K (35K), 4100°K (41K), 5000°K (50K) and 6500°K (65K)

*Order items in 30K to replace PAR Halogen lamps

Features and Benefits

- Long life CFL, 8,000 hours average rated life
- Amalgam technology- provides cooler operating temperatures for consistent performance in any position
- Lower maintenance costs for lamp replacements
- No lead glass- Better lumen maintenance over life of bulb
- Medium base
- Replace less often, ideal for hard to reach places
- U.L. Listed for wet locations - use indoors or outdoors
- 12 Month Warranty

Catalog Number

Notes

Type



Specifications

End of Life Protection	Yes
Ballast Type	Electronic
Starting Method	Modified Rapid Start
Input Line Voltage	120VAC
Input Line Frequency	50/60HZ
Lamp Life (rated)	8,000 Hours
Color Rendering Index	82
Minimum Starting Temperature	-20 ° F
Maximum Operating Temperature	160 ° F
U.L. / C.U.L. Listed	Yes
FCC Compliance	Part 18, Subpart C
Lamp Operating Frequency	45 KHZ
Lamp Current Crest Factor	< 1.60
Maximum Open Circuit Voltage	600V
Power Factor	> .50
Total Harmonic Distortion	< 150%

Light Output

PF2014			PF3016			PF3823		
HT	FC	DIA	HT	FC	DIA	HT	FC	DIA
4	8.5	11.0	4	13.9	11.0	4	19.6	13.4
6	3.8	16.5	6	6.2	16.5	6	8.7	20.0
8	2.1	22.0	8	3.5	22.0	8	4.9	26.6
10	1.4	27.5	10	2.2	27.5	10	3.1	33.3
12	1.5	33.0	12	1.5	33.0	12	2.2	39.9

HT = Height in Feet

FC = Foot Candle Value at Center of Beam

DIA = Diameter in Feet

Special Application Notes

- UL approved for wet location in Base Up position only. Base Up position is defined as screw base in a 12:00 position. Any other base position must be in a UL approved weatherproof fixture.

Warranties and Certifications:	Item #	Wattage	Halogen Wattage Comparison	Initial Lumens	Input Line Current	M.O.L. (inches)	Diameter (inches)	Life vs. Incandescent	Base Type
12 MONTH WARRANTY TCP reserves the right to void the warranty for any mis-application of these products.	PF2014	14	30	350	.233A	4.5	2.5	3x	Medium
	PF3016	16	75	700	.267A	5.0	3.7	3x	Medium
	PF3823	23	90	1000	.383A	5.4	4.8	3x	Medium

TCP, Inc.
325 Campus Dr. | Aurora, Ohio 44202 | P: 1-800-324-1496 | tcp.com
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TCP is proud to have been awarded
ENERGY STAR® Partner of the Year 2010.



PARTNER OF THE YEAR



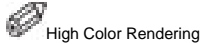


GE
Lighting

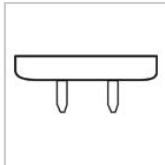
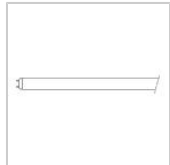
45749 - F17T8/SPX41/ECO

GE Ecolux® Starcoat® T8

- Passes TCLP, which can lower disposal costs.



High Color Rendering



CAUTIONS & WARNINGS

Caution

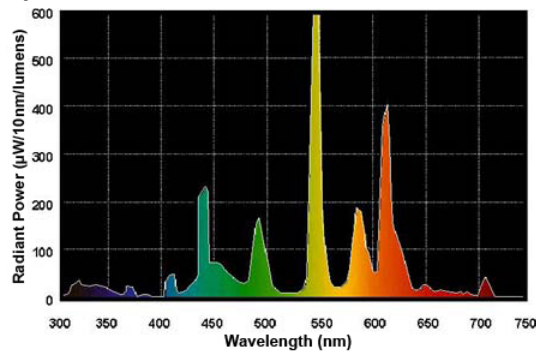
- Lamp may shatter and cause injury if broken
 - Wear safety glasses and gloves when handling lamp.
 - Do not use excessive force when installing lamp.

Warning

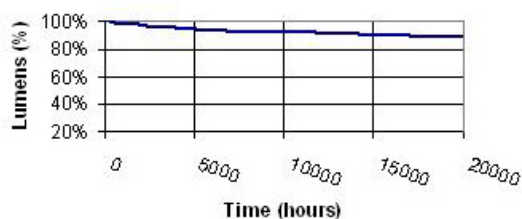
- Risk of Electric Shock
 - Turn power off before inspection, installation or removal.

GRAPHS & CHARTS

Spectral Power Distribution



Lumen Maintenance



Lamp Mortality

For additional information, visit www.gelighting.com

GENERAL CHARACTERISTICS

Lamp Type	Linear Fluorescent - Straight Linear
Bulb	T8
Base	Medium Bi-Pin (G13)
Wattage	17
Voltage	70
Rated Life	20000 hrs
Rated Life (instant start) @ Time	15000 h @ 3 h
Rated Life (rapid start) @ Time	20000 h @ 12 h
Rated Life (rapid start) @ Time	20000.0 @ 3.0/24000.0 @ 12.0 h
Bulb Material	Soda lime
Starting Temperature	10 K (50 °F)
LEED-EB MR Credit	154 picograms Hg per mean lumen hour
Additional Info	TCLP compliant

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	1350
Mean Lumens	1280
Nominal Initial Lumens per Watt	79
Color Temperature	4100 K
Color Rendering Index (CRI)	86
S/P Ratio (Scotopic/Photopic Ratio)	1.8

ELECTRICAL CHARACTERISTICS

Open Circuit Voltage (rapid start)	285 V
Open Circuit Voltage (rapid start) Min @ Temperature	210 V @ 10 °C
Cathode Resistance Ratio - Rh/Rc (MIN)	4.25
Cathode Resistance Ratio - Rh/Rc (MAX)	6.5
Current Crest Factor	1.7

DIMENSIONS

Maximum Overall Length (MOL)	23.78 cm
Minimum Overall Length	23.67 cm
Nominal Length	24 cm
Bulb Diameter (DIA)	1 cm
Bulb Diameter (DIA) (MIN)	0.94 cm
Bulb Diameter (DIA) (MAX)	1 cm
Max Base Face to Base Face (A)	23.22 cm
Face to End of Opposing Pin (B) (MIN)	23.4 cm
Face to End of Opposing Pin (B) (MAX)	23.5 cm
End of Base Pin to End of Opposite Pin End (C)	23.67 cm

PRODUCT INFORMATION

Product Code	45749
Description	F17T8/SPX41/ECO
ANSI Code	1001-1
Standard Package	Case
Standard Package GTIN	10043168457498
Standard Package Quantity	24
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	24
UPC	043168457491

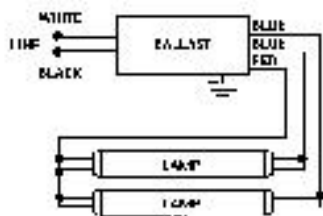


GE
Lighting

72262 - GE232MAX-L/ULTRA

GE LFL UltraMax™ Electronic High Efficiency Multivolt Instant Start Ballast

- Energy saving high efficiency instant start electronic ballast (> 90%)
- Multi-Voltage Technology handles voltage from 120 to 277V
- UL Type CC Rating provides protection against arcing in electrical devices.
- Active Current Regulation regulates the output to each lamp with individual lamp inverter modules.
- Anti-Striation Control for better light quality, with no striations.
- Cold temperature -20F Minimum Starting Temperature



GENERAL CHARACTERISTICS

Application	2 or 1- F32T8 120 to 277 "L".77 BF
Category	Linear Fluorescent
Ballast Type	Electronic - High Efficiency Multivolt Instant Start
Starting Method	Instant start
Lamp Wiring	Parallel
Line Voltage Regulation (+/-)	10 %
Case Temperature	70 °C(158 °F)
Ballast Factor	Low (.77)
Power Factor Correction	Active
Sound Rating	A (20-24 decibels)
Additional Info	Anti-striation control/Auto-restart/Thermally protected

PRODUCT INFORMATION

Product Code	72262
Description	GE232MAX-L/ULTRA
Standard Package	Case
Standard Package GTIN	10043168722626
Standard Package Quantity	10
Sales Unit	Standard Pack
No Of Items Per Sales Unit	1
No Of Items Per Standard	10
Package	
UPC	043168722629

DIMENSIONS

Case dimensions			
Length (L)		9.5 in(241.30 mm)	
Width (W)		1.3 in(33.02 mm)	
Height (H)		1.2 in(30.48 mm)	
Mounting dimensions			
Mount Length (M)		9.0 in(228.60 mm)	
Mount Width (X or F)		0.9 in(22.10 mm)	
Mount Slots (MS)		0.3 in(8.20 mm)	
Weight		1.4 lb	
Exit Type		Side	
Remote Mounting Distance to Lamp		18 ft	
Remote Mounting Wire Gauge		18 AWG	
Lead lengths	Qty	Exit	Length (± 1 in.)
Black	1	Left	25 (635mm)
Blue	2	Right	31 (787mm)
Red	1	Right	45 (1143mm)
White	1	Left	25 (635mm)

ELECTRICAL CHARACTERISTICS

Supply Current Frequency	50 Hz/60 Hz
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SAFETY & PERFORMANCE

- cUL Listed
- FCC - CLASS A Non-Consumer
- NRCan
- UL Class P
- UL Listed
- UL Type 1 Outdoor
- UL Type CC
- UL Type HL
- RoHs Compliant
- NEMA Premium®

SPECIFICATIONS BY LAMP & WATTAGE

Lamp	# of Lamps	Line Volts	System Watts	Nom. Line Current	System Ballast Factor	Ballast Efficacy Factor	Power Factor% (>=)(<=)	Crest Factor	THD% (<=)	Min. Starting Temp (°F/°C)
FE15T8	1	120	14	0.12 A	0.78	5.57	99	1 1/2	12	0.0 / -18
FE15T8	1	277	15	0.07 A	0.78	5.20	73	1 1/2	40	0.0 / -18
FE15T8	2	120	21	0.18 A	0.78	3.71	99	1 1/2	9	0.0 / -18
FE15T8	2	277	22	0.09 A	0.78	3.55	93	1 1/2	13	0.0 / -18
F32T8/WM	1	120	27	0.23 A	0.78	2.89	99	1 1/2	8	60.0 / 16
F32T8/WM	1	277	27	0.1 A	0.78	2.89	95	1 1/2	12	60.0 / 16
F32T8/WM	2	120	47	0.39 A	0.78	1.66	99	1 1/2	5	60.0 / 16
F32T8/WM	2	277	46	0.17 A	0.78	1.70	98	1 1/2	9	60.0 / 16
F32T8/25W	1	120	22	0.0 A	0.77	NaN	99	1 1/2	10	60.0 / 16
F32T8/25W	1	277	22	0.0 A	0.77	NaN	97	1 1/2	10	60.0 / 16
F32T8/25W	2	120	38	0.0 A	0.77	2.03	99	1 1/2	10	60.0 / 16
F32T8/25W	2	277	38	0.0 A	0.77	2.03	98	1 1/2	10	60.0 / 16

F32T8	1	120	28	0.23 A	0.77	NaN	99	1 1/2	8	-22.0 / -30
F32T8	1	277	28	0.11 A	0.77	NaN	95	1 1/2	12	-22.0 / -30
F32T8	2	120	49	0.42 A	0.77	1.57	99	1 1/2	5	-22.0 / -30
F32T8	2	277	48	0.18 A	0.77	1.60	98	1 1/2	8	-22.0 / -30
F28T8	1	120	25	0.21 A	0.77	3.08	99	1 1/2	8	60.0 / 16
F28T8	1	277	25	0.1 A	0.77	3.08	94	1 1/2	13	60.0 / 16
F28T8	2	120	43	0.36 A	0.77	1.79	99	1 1/2	6	60.0 / 16
F28T8	2	277	43	0.16 A	0.77	1.79	98	1 1/2	9	60.0 / 16
F25T8	1	120	23	0.19 A	0.80	3.48	99	1 1/2	9	-22.0 / -30
F25T8	1	277	23	0.09 A	0.80	3.48	93	1 1/2	13	-22.0 / -30
F25T8	2	120	39	0.33 A	0.80	2.05	99	1 1/2	6	-22.0 / -30
F25T8	2	277	39	0.14 A	0.80	2.05	97	1 1/2	10	-22.0 / -30
F25T12	1	120	24	0.2 A	0.80	3.33	99	1 1/2	9	0.0 / -18
F25T12	1	277	24	0.09 A	0.80	3.33	94	1 1/2	13	0.0 / -18
F25T12	2	120	41	0.35 A	0.80	1.95	99	1 1/2	6	0.0 / -18
F25T12	2	277	41	0.15 A	0.80	1.95	98	1 1/2	9	0.0 / -18
F17T8	1	120	17	0.14 A	0.79	4.65	99	1 1/2	11	-22.0 / -30
F17T8	1	277	17	0.08 A	0.79	4.65	8	1 1/2	36	-22.0 / -30
F17T8	2	120	27	0.23 A	0.79	2.93	99	1 1/2	8	-22.0 / -30
F17T8	2	277	27	0.1 A	0.79	2.93	95	1 1/2	12	-22.0 / -30

CAUTIONS & WARNINGS

Warning

- Risk of Electric Shock
 - Properly ground ballast and fixture.
 - Turn power off before servicing--see instructions.

WARRANTY INFORMATION

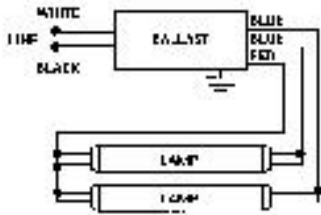
GE Lighting warrants to the purchaser that each ballast will be free from defects in material or workmanship for period as defined in the attached documents from the date of manufacture when properly installed and under normal conditions of use.



72266 - GE232MAX-N/ULTRA

GE LFL UltraMax™ Electronic High Efficiency Multivolt Instant Start Ballast

- Energy saving high efficiency instant start electronic ballast (> 90%)
- Multi-Voltage Technology handles voltage from 120 to 277V
- UL Type CC Rating provides protection against arcing in electrical devices.
- Active Current Regulation regulates the output to each lamp with individual lamp inverter modules.
- Anti-Striation Control for better light quality, with no striations.
- Cold temperature -20F Minimum Starting Temperature



GENERAL CHARACTERISTICS

Application	2 or 1- F32T8 120 to 277 "N".87 BF
Category	Linear Fluorescent
Ballast Type	Electronic - High Efficiency Multivolt Instant Start
Starting Method	Instant start
Lamp Wiring	Parallel
Line Voltage Regulation (+/-)	10 %
Case Temperature	70 °C(158 °F)
Ballast Factor	Normal
Power Factor Correction	Active
Sound Rating	A (20-24 decibels)
Additional Info	Anti-striation control/Auto-restart/Thermally protected

PRODUCT INFORMATION

Product Code	72266
Description	GE232MAX-N/ULTRA
Standard Package	Case
Standard Package GTIN	10043168722664
Standard Package Quantity	10
Sales Unit	Standard Pack
No Of Items Per Sales Unit	1
No Of Items Per Standard	10
Package	
UPC	043168722667

DIMENSIONS

Case dimensions			
Length (L)		9.5 in(241.30 mm)	
Width (W)		1.3 in(33.02 mm)	
Height (H)		1.2 in(29.97 mm)	
Mounting dimensions			
Mount Length (M)		8.9 in(226.06 mm)	
Mount Width (X or F)		1.1 in(27.94 mm)	
Mount Slots (MS)		0.3 in(7.62 mm)	
Weight		1.4 lb	
Exit Type		Side	
Remote Mounting Distance to Lamp		18 ft	
Remote Mounting Wire Gauge		18 AWG	
Lead lengths	Qty	Exit	Length (± 1 in.)
Black	1	Left	25 (635mm)
Blue	2	Right	31 (787mm)
Red	1	Right	45 (1143mm)
White	1	Left	25 (635mm)

ELECTRICAL CHARACTERISTICS

Supply Current Frequency	50 Hz/60 Hz
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SAFETY & PERFORMANCE

- cUL Listed
- FCC - CLASS A Non-Consumer
- NRCan
- UL Class P
- UL Listed
- UL Type 1 Outdoor
- UL Type CC
- UL Type HL
- RoHs Compliant
- NEMA Premium®

SPECIFICATIONS BY LAMP & WATTAGE

Lamp	# of Lamps	Line Volts	System Watts	Nom. Line Current	System Ballast Factor	Ballast Efficacy Factor	Power Factor% (>=)(<=)	Crest Factor THD% (<=)	Min. Starting Temp (°F/°C)
FE15T8	1	120	15	0.13 A	0.91	6.07	99	1 1/2 11	-22.0 / -30
FE15T8	1	277	16	0.08 A	0.91	NaN	78	1 1/2 40	-22.0 / -30
FE15T8	2	120	25	0.21 A	0.91	3.64	99	1 1/2 8	-22.0 / -30
FE15T8	2	277	25	0.97 A	0.91	3.64	95	1 1/2 16	-22.0 / -30
F32T8/WM	1	120	29	0.24 A	0.88	3.03	99	1 1/2 7	60.0 / 16
F32T8/WM	1	277	30	0.11 A	0.88	2.93	96	1 1/2 12	60.0 / 16
F32T8/WM	2	120	53	0.45 A	0.88	1.66	99	1 1/2 5	60.0 / 16
F32T8/WM	2	277	52	0.19 A	0.88	1.69	99	1 1/2 8	60.0 / 16
F32T8/25W	1	120	25	0.0 A	0.87	3.48	99	1 1/2 10	60.0 / 16
F32T8/25W	1	277	25	0.0 A	0.87	3.48	97	1 1/2 10	60.0 / 16
F32T8/25W	2	120	44	0.0 A	0.87	1.98	99	1 1/2 10	60.0 / 16
F32T8/25W	2	277	43	0.0 A	0.87	2.02	98	1 1/2 10	60.0 / 16

F32T8	1	120	31	0.26 A	0.87	2.81	99	1 1/2	7	-22.0 / -30
F32T8	1	277	31	0.12 A	0.87	2.81	96	1 1/2	12	-22.0 / -30
F32T8	2	120	54	0.47 A	0.87	1.61	99	1 1/2	5	-22.0 / -30
F32T8	2	277	53	0.2 A	0.87	1.64	99	1 1/2	8	-22.0 / -30
F28T8	1	120	28	0.23 A	0.87	3.11	99	1 1/2	7	60.0 / 16
F28T8	1	277	28	0.11 A	0.87	3.11	95	1 1/2	13	60.0 / 16
F28T8	2	120	49	0.41 A	0.87	1.78	99	1 1/2	4	60.0 / 16
F28T8	2	277	48	0.18 A	0.87	NaN	98	1 1/2	8	60.0 / 16
F25T8	1	120	25	0.21 A	0.93	3.72	99	1 1/2	8	-22.0 / -30
F25T8	1	277	26	0.98 A	0.93	3.58	94	1 1/2	13	-22.0 / -30
F25T8	2	120	45	0.38 A	0.93	2.07	99	1 1/2	6	-22.0 / -30
F25T8	2	277	45	0.16 A	0.93	2.07	98	1 1/2	10	-22.0 / -30
F25T12	1	120	26	0.22 A	0.93	3.58	99	1 1/2	7	0.0 / -18
F25T12	1	277	27	0.1 A	0.93	3.44	95	1 1/2	13	0.0 / -18
F25T12	2	120	48	0.4 A	0.93	NaN	99	1 1/2	5	0.0 / -18
F25T12	2	277	47	0.17 A	0.93	1.98	98	1 1/2	9	0.0 / -18
F17T8	1	120	19	0.16 A	0.92	4.84	99	1 1/2	9	-22.0 / -30
F17T8	1	277	19	0.08 A	0.92	4.84	87	1 1/2	16	-22.0 / -30
F17T8	2	120	32	0.27 A	0.92	NaN	99	1 1/2	7	-22.0 / -30
F17T8	2	277	32	0.12 A	0.92	NaN	96	1 1/2	13	-22.0 / -30

CAUTIONS & WARNINGS

Warning

- Risk of Electric Shock
 - Properly ground ballast and fixture.
 - Turn power off before servicing--see instructions.

WARRANTY INFORMATION

GE Lighting warrants to the purchaser that each ballast will be free from defects in material or workmanship for period as defined in the attached documents from the date of manufacture when properly installed and under normal conditions of use.

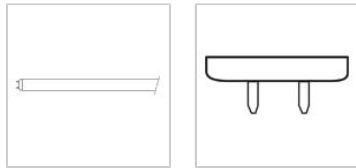
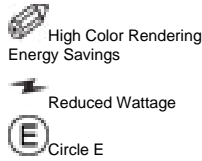


GE
Lighting

72864 - F28T8/XLSPX35ECO

GE Ecolux® UltraMax™ Starcoat® T8

• Passes TCLP, which can lower disposal costs.



CAUTIONS & WARNINGS

Caution

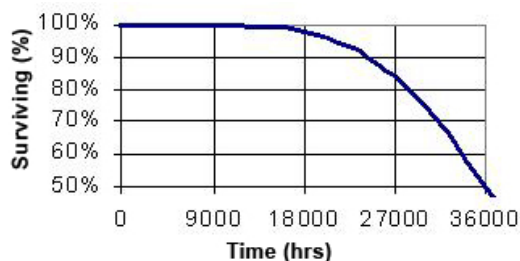
- Lamp may shatter and cause injury if broken
 - Wear safety glasses and gloves when handling lamp.
 - Do not use excessive force when installing lamp.
- Lamp may shatter and cause injury if broken
 - Wear safety glasses and gloves when handling lamp.
 - Do not use excessive force when installing lamp.

Warning

- Risk of Electric Shock
 - Turn power off before inspection, installation or removal.
- Risk of Electric Shock
 - Turn power off before inspection, installation or removal.

GRAPHS & CHARTS

Lamp Mortality



Lumen Maintenance

GENERAL CHARACTERISTICS

Lamp Type	Linear Fluorescent - Straight Linear
Bulb Base	T8
Wattage	Medium Bi-Pin (G13)
Voltage	28
Rated Life	115
Rated Life (instant start) @ Time	36000 hrs
Rated Life (rapid start) @ Time	24000 h @ 3 h
	30000 h @ 12 h
	36000.0 @ 3.0/42000.0 @ 12.0 h
Bulb Material	Soda lime
Starting Temperature	15 K (59 °F)
LEED-EB MR Credit	43 picograms Hg per mean lumen hour
Additional Info	TCLP compliant

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	2725
Mean Lumens	2562
Nominal Initial Lumens per Watt	97
Color Temperature	3500 K
Color Rendering Index (CRI)	85
S/P Ratio (Scotopic/Photopic Ratio)	1.5

ELECTRICAL CHARACTERISTICS

Open Circuit Voltage (instant start) Min @ Temperature	550 V @ 15 °C
Cathode Resistance Ratio - Rh/Rc (MIN)	4.25
Cathode Resistance Ratio - Rh/Rc (MAX)	6.5
Lamp Current	0.275 A
Current Crest Factor	1.7

DIMENSIONS

Maximum Overall Length (MOL)	47.78 cm
Minimum Overall Length	47.78 cm
Nominal Length	48 cm
Bulb Diameter (DIA)	1 cm
Bulb Diameter (DIA) (MIN)	0.94 cm
Bulb Diameter (DIA) (MAX)	1 cm
Max Base Face to Base Face (A)	47.22 cm
Face to End of Opposing Pin (B) (MIN)	47.4 cm
Face to End of Opposing Pin (B) (MAX)	47.5 cm
End of Base Pin to End of Opposite Pin End (C)	47.67 cm

PRODUCT INFORMATION

Product Code	72864
Description	F28T8/XLSPX35ECO
Standard Package	Case
Standard Package GTIN	10043168728642
Standard Package Quantity	36
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	36
UPC	043168728645



GE
Lighting

72866 - F28T8/XLSPX41ECO

GE Ecolux® UltraMax™ Starcoat® T8

• Passes TCLP, which can lower disposal costs.

Photo
Not Available

Rendering

High Color

Photo
Not Available

Savings

Energy

Photo
Not Available

Wattage

Reduced

GENERAL CHARACTERISTICS

Lamp Type	Linear Fluorescent - Straight Linear
Bulb Base	T8 Medium Bi-Pin (G13)
Rated Life	45000.0 hrs
Rated Life (instant start) @ Time	24000 h @ 3 h
Rated Life (rapid start) @ Time	30000 h @ 12 h
	45000.0 @ 3.0/50000.0 @ 12.0 h
Bulb Material	Soda lime
Starting Temperature (MIN)	15.0 K
LEED-EB MR Credit	26 picograms Hg per mean lumen hour
Additional Info	TCLP compliant

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	2675.0
Mean Lumens	2515.0
Nominal Initial Lumens per Watt	95
Color Temperature	4100.0 K
Color Rendering Index (CRI)	82.0
S/P Ratio (Scotopic/Photopic Ratio)	1.8

ELECTRICAL CHARACTERISTICS

Wattage	28.0
Voltage	115.0
Open Circuit Voltage (instant start) Min @ Temperature	550 V @ 15 nV
Cathode Resistance Ratio - Rh/Rc (MIN)	4.25
Cathode Resistance Ratio - Rh/Rc (MAX)	6.5
Lamp Current	0.275 A
Current Crest Factor (MAX)	1.7

DIMENSIONS

Maximum Overall Length (MOL)	47.7800 in(1213.6 mm)
Minimum Overall Length	47.7800 in(1213.6 mm)
Nominal Length	48.000 in(1219.2 mm)
Bulb Diameter (DIA) (MIN)	0.940 in(23.9 mm)
Bulb Diameter (DIA) (MAX)	1.100 in(27.9 mm)
Bulb Diameter (DIA)	1.000 in(25.4 mm)
Max Base Face to Base Face (A)	47.220 in(1199.4 mm)
Face to End of Opposing Pin (B) (MIN)	47.400 in(1204.0 mm)
Face to End of Opposing Pin (B) (MAX)	47.500 in(1206.5 mm)
End of Base Pin to End of Opposite Pin End (C)	47.670 in(1210.8 mm)

PRODUCT INFORMATION

Product Code	72866
Description	F28T8/XLSPX41ECO
Standard Package	Case
Standard Package GTIN	10043168728666
Standard Package Quantity	36
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	36
UPC	043168728669

DIN – Strip Based Indirect Wrap

Energy Efficient, Economical, StripBased Indirect Wrap

- Provides energy efficiency with a contemporary look and feel, at a cost point that drives compelling ROI scenarios.
- Excellent one for one fixture replacement where covering existing paint footprints is not a concern.
- Can be surface mounted or suspended, individually, or in rows.
- Low Glare Indirect Lighting.

Why P2? It's Simple, Our Experience.

- Many energy efficient strips and wraps provide basic energy efficient lighting at a low cost point, but lack aesthetic appeal.
- We realize that you need an eye-catching low glare fixture at a price that contributes to lowering your project's payback.
- The DIN was developed to fill that niche and drive your paybacks down.

DIN – Indirect Wrap



Application

- Education and retail.
- Configured to order with the latest energy efficient lamps and ballasts.
- Available in 1, 2, or 3 Lamp cross sections.
- Available in 4' or 8' lengths.

DIN – 1x4 – 2L – T8 – UL1 – PMB – LP – IS – UE

DIN	1x4	2L	T8	UL1	PMB	LP	IS	UE	
Model	Fixt Size	Lamp Quantity	Lamp Type	Voltage	Basket Type	Ballast Factor	Ballast Starting	T8 Ballast Grade	Other

Fixture Series

DIN = Indirect Wrap Narrow Base

Fixture Size

1x4 = 1x4 Nominal
1x8 = 1x8 Nominal

Lamp Qty

xL = x indicates number of lamps

Lamp Type

T8 = Linear T8 Lamps

Voltage (1)

UL1 = Universal 120-277
UL2 = Universal 120-277
UH1 = Universal 347-480
UH2 = Universal 347-480

Basket Type

PMB = Perforated Metal Basket
SMB = Slotted Metal Basket

Ballast Factor (2)

XL = Ultra Low Power (.62 - .66)
LP = Low Power (.75 - .78)
MP = Mid Power (.85 - .88)
MN = Neutral Power (.97 - 1.04)
HP = High Power (1.15 - 1.20)

Ballast Starting Method

PS = Programmed Start
IS = Instant Start
PSD = Program Start Step Dimming
ISD = Instant Start Step Dimming
PVD = Program Start 0-10v Variable Dim
IVD = Instant Start 0-10v Variable Dim

T8 Ballast Grade

ST = Standard Grade
UE = Ultra Efficient T8

Other Options

SB = Specific Ballast Type or Manufacturer (3)
EB = Emergency Battery Backup (3)

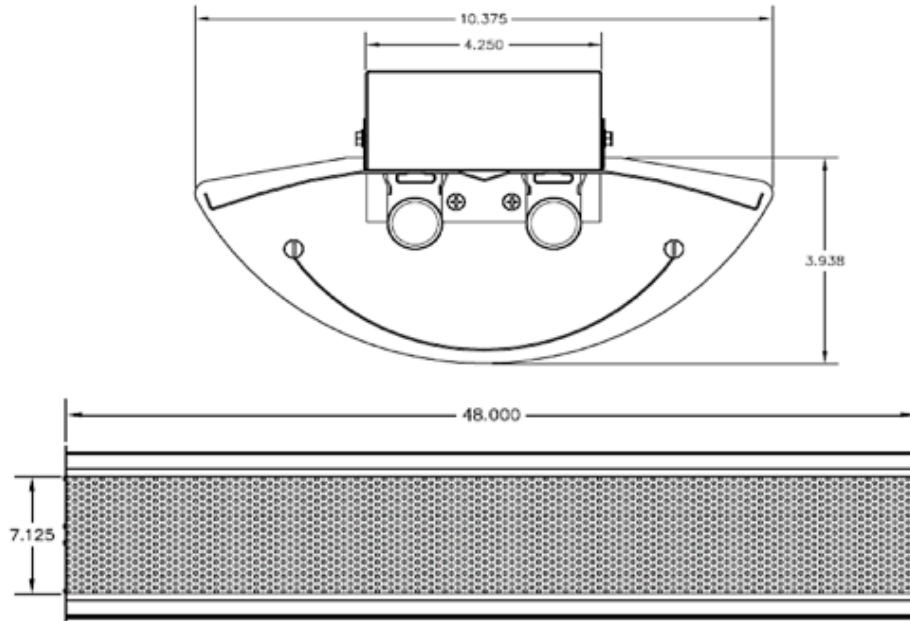
Numeric Footnotes

(1) Numeral indicates number of ballasts per fixture.

(2) Ballast factors outside ranges shown to be called out numerically.

(3) If SB or EB is requested, purchaser must identify the ballast manufacturer and the catalog number.

DIN – Strip Based Indirect Wrap



Existing Systems

Existing Lamp / Ballast System	Lamp Quantity & Type	Mean Lumens Per Lamp	Mean Lumens Per Fixture	Ballast Factor	Net Lumens Per Fixture	Input Watts	Net Lumens Per Watt
2L40-T12 Mag	2 F40/T12/WM	2,280	4,560	0.88	4,013	72	56
3L40-T12 Mag	3 F40/T12/WM	2,280	6,840	0.88	6,019	115	52
4L40-T12 Mag	4 F40/T12/WM	2,280	9,120	0.88	8,026	144	56
1L96-T12 Mag	1 F96/T12/ES	4,750	4,750	0.88	4,180	76	55
2L96-T12 Mag	2 F96/T12/ES	4,750	9,500	0.88	8,360	126	66
1L96-T12HO Mag	1 F96/T12HO/ES	6,950	6,950	0.95	6,603	125	53
2L96-T12HO Mag	2 F96/T12HO/ES	6,950	13,900	0.93	12,927	210	62

Re-Lighting Options

Proposed Lamp / Ballast System	Lamp Quantity & Type	Mean Lumens Per Lamp	Mean Lumens Per Fixture	Ballast Factor	Net Lumens Per Fixture	Input Watts	Net Lumens Per Watt
2L32-T8-LP Elec	2 F32T8/841	2,800	5,600	0.77	4,312	48	90
2L32-T8-MP Elec	2 F32T8/841	2,800	5,600	0.87	4,872	53	92
3L32-T8-LP Elec	3 F32T8/841	2,800	8,400	0.77	6,468	72	90
3L32-T8-MP Elec	3 F32T8/841	2,800	8,400	0.87	7,308	80	91
4L32-T8-LP Elec	4 F32T8/741	2,660	10,640	0.77	8,193	96	85
4L32-T8-MP Elec	4 F32T8/741	2,660	10,640	0.87	9,257	107	87
6L32T8-LP Elec	6 F32T8/841	2,800	16,800	0.77	12,936	144	90
6L32T8-MP Elec	6 F32T8/841	2,800	16,800	0.87	14,616	160	91

General Notes

- Lamp/ballast system values shown are a general reference intended to supply a quick comparison of several common lamp/ballast systems, the associated energy consumption, and net lumen output.
- Values shown are based on normal operating temperatures and at 277 volts.
- Fixture efficiency percentages are generally representative of each system type, actual values will vary.
- There are many operating variables that affect system output, in addition to rating variances from brand to brand.
- All T8 electronic ballast values shown are based on Ultra Efficient (aka 3rd Generation) T8 ballasts.
- All T5 and T8 lamp values shown are for basic grade lamps. Extended life and higher lumen lamps types are available.
- In addition to those shown there are a wide variety of systems to choose from, each with distinct features and cost points.
- Please consult the lamp/ballast manufacturer's catalogs for the detailed information required to model your system.



FEATURES & SPECIFICATIONS

INTENDED USE

White thermoplastic exit sign for general-purpose applications.

CONSTRUCTION

Injection-molded, flame-retardant, high-impact, thermoplastic housing with snap-fit design components for easy installation. Universal J-box pattern and universal mounting capabilities: top, back or end mounting (canopy included). Universal chevrons are easily removed for directional indication. Fully assembled single face with extra faceplate for easy field-conversion to double face.

OPTICS

Expected LED life of up to 10 years.

ELECTRICAL

Dual-voltage input 120V or 277V AC. Emergency exits provided with test switch, status indicator and rechargeable battery. Maintenance-free ni-cad battery provides 90 minutes of emergency power.

LISTING

UL Listed. Meets UL 924, NFPA 101, NFPA 70-NEC and OSHA illumination standards. Indoor damp location (10°C to 40°C) listed standard.

WARRANTY

Fixtures are covered by Lithonia Lighting 24-month warranty against mechanical defects in manufacture.

All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.

Catalog Number
Notes
Type

Contractor Select

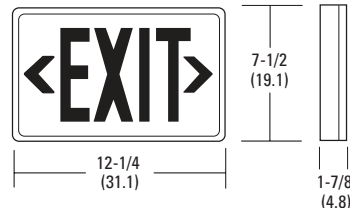
Exits



EXG



EXR



All dimensions are inches (centimeters).

ORDERING INFORMATION

Catalog Number	UPC	Description	Voltage	Wattage	Amps	Pallet Qty.	Standard Carton Qty.
EXR M6	745973431658	Red	120/277	3.8	.03/.02	270	6
EXG M6	745973431665	Green	120/277	3.8	.03/.02	270	6
EXR EL M6	745973431771	Red with backup battery	120/277	3.8	.03/.02	270	6
EXG EL M6	745973431788	Green with backup battery	120/277	3.8	.03/.02	270	6

Notes

- See spec sheet [ELA-WG](#).

Accessories¹: Order as separate catalog number.

ELA WG1 Wireguard (back mount only)

Prismatic Troffer Retrofit Kit

Retrofit Series

Features

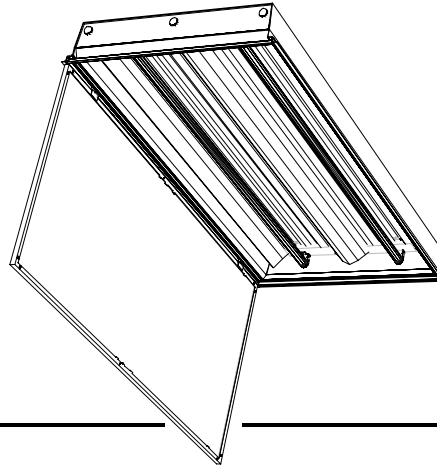
Computer designed for optimal performance

Provides uniform light distribution

Minimizes lens streaking

Tool-free reflector installation and removal

Fits most prismatic troffers



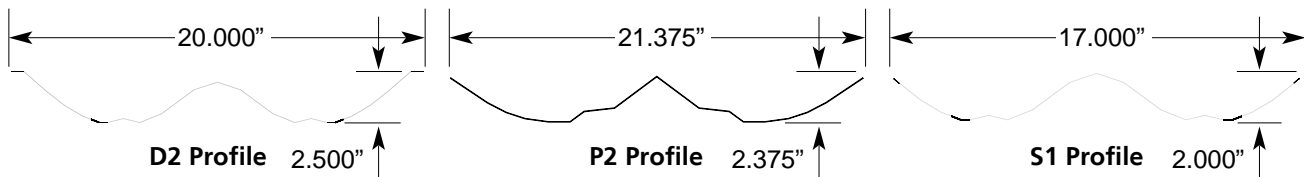
Technical Data

Socket Bars: 0.036" pre-painted cold-rolled steel. Prepunched for lampholders and wire pas-sageway. Tabs on socket bars securely mount the reflector in the correct position relative to the lamps. Note: ESI's optional uni-bracket is pictured in the diagrams.

Reflector: The reflector can be ordered with an 85% reflective anodized finish, a 95% reflective enhanced or film finish, or a 92% reflective white enamel. The substrate is 0.020" high quality aluminum. The reflector profile is optimized using computer analysis and manufactured using state of the art CNC equipment. A protective premask is applied to all reflective surfaces prior to manufacture.

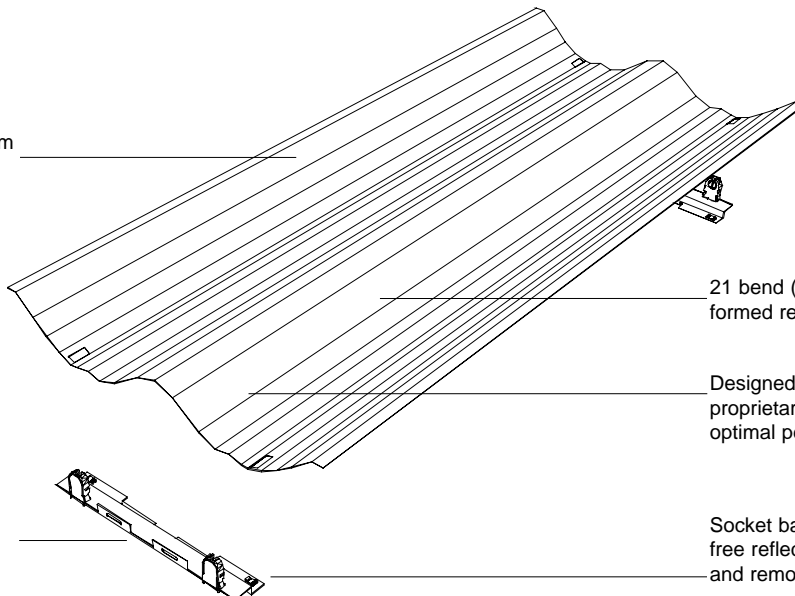
Installation: For retrofit, the existing ballast and socket bars are removed. With the new ballast installed, the ESI socket bars are centered at the ends of the fixture and fastened with two self-tapping screws. The reflector is positioned between the socket bars. By applying slight compression to the reflector peak, the tabs on the socket bar are aligned with the punchouts in the reflector. When the compression is released, the tabs securely hold the reflector in place.

Installation



Highlights

Available in reflectances from 85% to 95%, meeting every performance and budget requirement.



21 bend (D2), press-brake formed reflector profile

Designed and analyzed on proprietary software for optimal performance

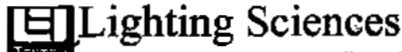
Solid, 0.032" gloss white steel socket bars

Socket bar tabs allow tool-free reflector installation and removal

Prismatic Troffer Retrofit Kit

Retrofit Series

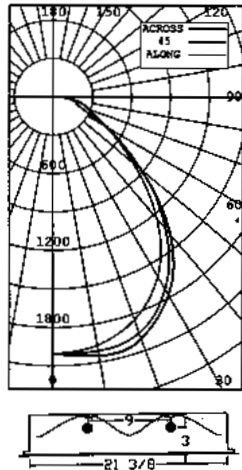
Photometrics (Shown for D2 Profile)*



Lighting Sciences Inc.
7830 E. Evans Road
Scottsdale, Arizona 85250 USA
Tel: 480-991-5260 • Fax: 480-991-5375

CERTIFIED TEST REPORT NO. LSI 14143

ENERGY SOLUTIONS 2' X 4' TROFFER LUMINAIRE, CAT# 24EAD2
WITH 95 SPECULAR D2 REFLECTOR AND PRISMATIC ACRYLIC LENS
TWO PHILIPS 32W FLUORESCENT LAMPS, CAT# F32T8/TL841. LUMEN RATING = 3000 LMS.
ONE MOTOROLA MZ-IN-T8-G-PD-120 BALLAST OPERATING AT 120 VAC AND 60 WATTS



ANGLE	ALONG	45	67.5	ACROSS
0	2008	2008	2008	2008
5	1999	1999	2012	2026
10	1967	1960	2013	2039
15	1916	1944	2000	2041
20	1845	1884	1955	1993
25	1742	1795	1853	1892
30	1612	1666	1726	1767
35	1444	1495	1556	1604
40	1240	1282	1345	1401
45	1021	1049	1123	1149
50	803	825	886	890
55	611	622	655	653
60	458	448	445	462
65	347	325	285	330
70	282	257	200	254
75	235	203	176	204
80	166	147	140	148
85	83	84	78	83
90	0	0	0	0

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	% LUMINAIRE
0-30	1601	26.69	34.72
0-40	2560	42.68	55.52
0-60	3981	66.36	86.32
0-90	4612	76.87	100.00
40-90	2051	34.19	44.48
60-90	630	10.51	13.68
90-180	0	.00	.00
0-180	4612	76.87	100.00

** EFFICIENCY = 76.9% **

LUMINANCE SUMMARY - CD./SQ.M.

ANGLE	ALONG	45	ACROSS
45	2283	2519	2575
55	1683	1812	1815
65	1299	1068	1331
75	1435	1073	1463
85	1504	1410	1699

S/MH = 1.3
SC(ALONG) = 1.2, SC(ACROSS) = 1.3

CERTIFIED BY:
DATE: JUN 21, 1999
PREPARED FOR: ENERGY MASTERS
ST. PAUL, MN

TESTED IN ACCORDANCE TO IES PROCEDURES.

Summaries

95% reflective, specular enhanced aluminum

Efficiency: 76.9%
Spacing height ratio (along) : 1.2
Spacing height ratio (across) : 1.3
Photometrics data file: 24EAD2.ies

85% reflective, specular anodized aluminum

Efficiency: 72.9%
Spacing height ratio (along) : 1.2
Spacing height ratio (across) : 1.2
Photometrics data file: 24AAD2.ies

92% reflective, diffuse white enamel

Efficiency: 76.4%
Spacing height ratio (along) : 1.2
Spacing height ratio (across) : 1.3
Photometrics data file: 24RWD2.ies

*shown for an enhanced aluminum reflector, full reports for all products available upon request

Ordering Information

Part Number = Fixture Size + Reflector Material + # Lamps + Lamp Wattage + Options

(Example K-24EAD2232 = 2'x4' Retrofit Kit with an Enhanced Aluminum Reflector for 2-32W lamps)

Size	Reflector	Design	# Lamps	Lamp Watts	Options
K-22 - 2' x 2'	EA - Enhanced Alum	D2 - Standard Troffer	2	17	BJB - Twist-lock
K-24 - 2' x 4'	AA - Anodized Alum	P2 - Parabolic Troffer		32	LEV - Std. Lampholders
	WR - White Enamel	S1 - Shallow Troffer			



GE
Lighting

81768 - Q35MR16CGFLCD-BA

GE Edison™ Halogen MR16 - Landscape Lighting

- GE Edison™ halogen bulbs provide a brighter, crisper light that makes your home look its best
- That's why professionals choose Edison for exceptional results and longer bulb life.
- Uses Halogen technology for a brighter, crisper light



GENERAL CHARACTERISTICS

Lamp Type	Halogen - MR
Bulb	MR16
Base	2-Pin (GX5.3)
Filament	C-6
Rated Life	2000.0 hrs
Primary Application	Indoor Floodlight;Landscape Lighting

ELECTRICAL CHARACTERISTICS

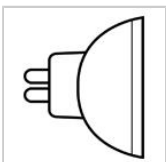
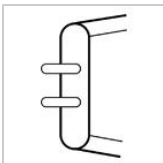
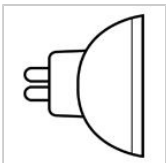
Wattage	35.0
Voltage	12.0

DIMENSIONS

Maximum Overall Length (MOL)	1.8750 in(47.6 mm)
Bulb Diameter (DIA)	2.000 in(50.8 mm)

PRODUCT INFORMATION

Product Code	81768
Description	Q35MR16CGFLCD-BA
Standard Package	Case
Standard Package GTIN	10043168817681
Standard Package Quantity	6
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	6
UPC	043168817684



Reflectorized Strip Fixture

Strip Series

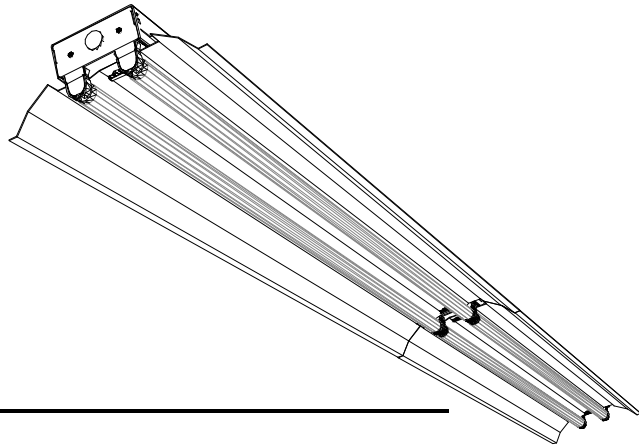
Features

Ideal for retail and warehouse space

Superior Light Quality

Snap-in end plates and socket bars

Computer designed specular reflectors



Technical Data

Housing: 20ga. (0.032") pre-painted die formed steel with sufficient knockouts for mounting and electrical supply.

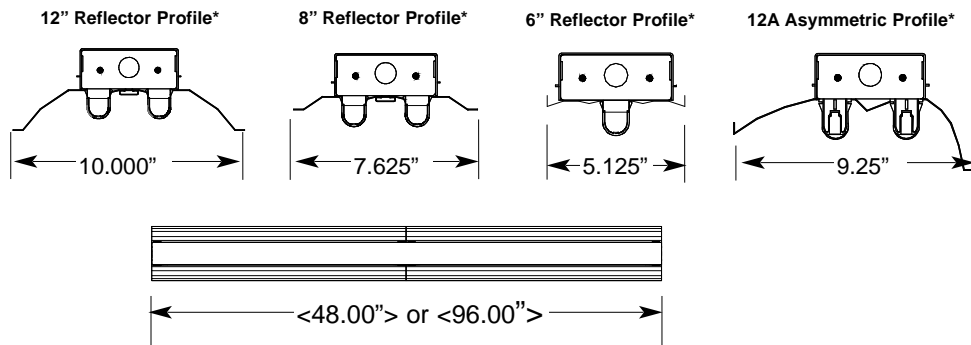
Finish: All cold rolled steel parts are painted with a smooth, glossy, highly reflective white paint.

Reflector: Can be ordered with a 95% specular, a 85% specular, or a 92% diffuse white enamel. Substrate is 0.020" high quality aluminum. The reflector profile is optimized using computer analysis and manufactured using state of the art CNC equipment. A protective premask is applied to all reflective surfaces prior to manufacture.

Construction: The solid 0.032" steel body provides added rigidity. The socket bars and end-plates securely snap into place. The reflectors are attached to the fixture body with quarter-turn fasteners.

Installation

*Also available in a 1Lamp and 3Lamp Cross-section



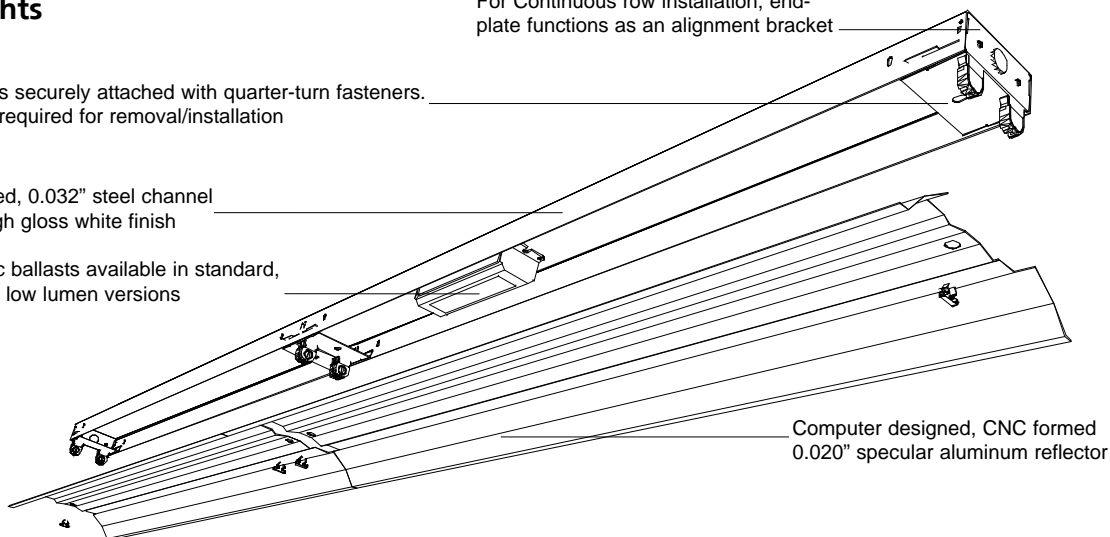
Highlights

Reflectors securely attached with quarter-turn fasteners.
No tools required for removal/installation

Die formed, 0.032" steel channel
with a high gloss white finish

Electronic ballasts available in standard,
high, and low lumen versions

For Continuous row installation, end-
plate functions as an alignment bracket



Reflectorized Strip Fixture

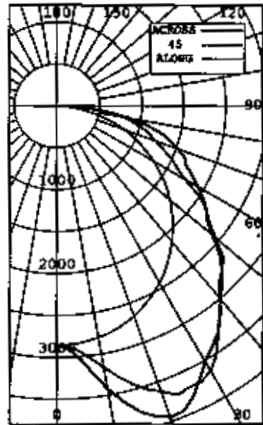
Strip Series

Photometrics (Shown for 1x8 4-32W with 12" Enhanced Alum Reflectors)



CERTIFIED TEST REPORT NO. LSI 14155

ENERGY SOLUTIONS 1' X 8' STRIP LUMINAIRE, CAT# 18EAR2
WITH 95 SPECULAR R2 REFLECTOR
FOUR PHILIPS 32W FLOUORESCENT LAMPS, CAT# F32T8/TL841. LUMEN RATING = 3000 LMS.
ONE ADVANCE REL-4P32-RH-TP BALLAST OPERATING AT 120 VAC AND 110 WATTS
CANDLEPOWER SUMMARY OUTPUT LUMENS



ANGLE	ALONG	45	ACROSS	OUTPUT LUMENS
0	2856	2856	2856	2856
5	2841	2870	2937	2999
10	2804	2920	3171	3372
15	2743	2995	3439	3778
20	2662	3077	3628	3950
25	2558	3130	3705	3859
30	2431	3138	3639	3518
35	2282	3082	3323	3302
40	2118	2965	3007	3046
45	1940	2778	2753	2671
50	1745	2447	2389	2497
55	1540	2048	2163	2092
60	1318	1731	1752	1886
65	1085	1385	1499	1641
70	849	1065	1250	1479
75	596	759	1055	1221
80	333	537	783	850
85	110	297	361	405
90	15	17	32	44

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	% LUMINAIRE
0-30	2831	23.50	24.61
0-40	4781	39.84	41.54
0-60	8638	71.99	75.06
0-90	11508	95.91	100.00
40-90	6727	56.06	58.46
60-90	2870	23.92	24.94
90-180	0	.00	.00
0-180	11508	95.91	100.00

** EFFICIENCY = 95.9% **

LUMINANCE SUMMARY - CD./SQ.M.

S/MR = 1.6

SC (ALONG) = 1.3, SC (ACROSS) = 1.6

ANGLE	ALONG	45	ACROSS
45	4662	6642	6671
55	4563	6433	6392
65	4362	6050	6025
75	3914	6333	6432
85	2149	7048	7783

CERTIFIED BY:
DATE: JUN 15, 1999
PREPARED FOR: ENERGY MASTERS
ST. PAUL, MN

TESTED IN ACCORDANCE TO IES PROCEDURES.

Case Study

100' x 100' x 9' Retail Space

Reflectances

Ceiling 75% Walls 50% Floor 20%

Fixture

ESI Strip 1' x 8'
Specular Silver Reflector
(4) 32W FO32 T8 Lamps
Standard Power Ballast (0.93)

Layout

96 Fixtures mounted on a
8' by 12' grid

Results

UPS: 1.06 watts/sq.foot
Illuminance: 105fc
(at 2.5' from floor)

Summary

Total Fixture Efficiency **95.9** Mounting Height Ratio **1.6**

Coefficients of Utilizations (%)

Ceiling Refl	80				70				50			
Wall Refl	70	50	30	10	70	50	30	50	30	10	70	50
RCR = 0	114	114	114	114	112	112	112	107	107	107	107	107
1	104	99	95	92	102	97	94	93	90	87	90	87
2	95	87	80	75	92	85	79	81	76	72	81	76
3	86	76	68	62	84	75	68	72	66	61	72	66
4	79	68	59	53	77	66	59	64	57	52	64	57
5	72	60	51	44	70	58	50	56	49	44	56	49
6	66	53	44	38	64	52	44	50	43	38	50	43
7	61	48	39	33	59	47	39	45	38	33	45	38
8	56	42	34	28	55	42	34	40	33	28	40	33
9	52	38	30	24	50	38	30	36	29	24	36	29
10	48	35	27	21	47	34	27	33	26	21	33	26

Photometric Data File 18EAR2

Ordering Information

Part Number = Fixture Size + Material + Design + # Lamps + Lamp Wattage + Voltage + Ballast Type + Options

(Example F-18STEA12S432277H = 1'x8' Strip with an enhanced alum. refl., 12S Design 4-32W lamps, 277 volts, and a high power ballast)

Size	Reflector	Design	# Lamps	Lamp Watts	Voltage	Ballast
F-14ST - 1' x 4'	EA - Enhanced Alum	6S - 6" Std. Distribution	1	32	120	N - Normal
F-18ST - 1' x 8'	AA - Anodized Alum	8S - 8" Std. Distribution	2	54	277	H - High Ballast Factor
	WR - White Enamel	12S - 12" Std. Distribution	3		UNV	L - Low Ballast Factor
		12A - 12" Asymmetric	4			
			6			

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

6/28/2013 12:30:39 PM

in

Case No(s). 13-1399-EL-EEC

Summary: Application In the Matter of Limited Logistic Services and Ohio Power Company for Approval of a Special Arrangement Agreement with a Mercantile Customer electronically filed by Mr. Yazen Alami on behalf of Ohio Power Company