Ohio | Public Utilities Commission

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

Case No.: 10-1819-**EL-EEC**

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 implemented during the prior three calendar years.

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the 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 electric utilities' energy efficiency rider option (Option 2) will not qualify for the 60-day automatic approval.

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.

If you consider some of the items requested in the application to be confidential or trade secret information, please file a copy of the application under seal, along with a motion for protective order pertaining to the material you believe to be confidential. Please also file a copy of the application in the public docket, with the information you believe to be confidential redacted.

Section 1: Company Information

Name: KOHLS DEPT STORE

Principal address: P.O. Box 15787 (Dept.28268), Philadelphia, Pa 19103

Address of facility for which this energy efficiency program applies: 120 Meadow Park Ave, Lewis Center, Oh 43035

Name and telephone number for responses to questions:

Lucas Pfaff, Kohls Dept Store, (215) 732-4480 Ext. 289_

Electricity use by our company (at least one must apply to your company—check the box or boxes that apply):

☒ We use 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.

☐ We are 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) We are filing this application (choose which applies):

☐ Individually, on our own.

☒ Jointly with our electric utility.

B) Our electric utility is: Columbus Southern 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) We are offering to commit (choose which applies):

☐ Energy savings from our energy efficiency program. (Complete Sections 3, 5, 6, and 7.)

☐ Demand reduction from our demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)

☒ Both the energy savings and the demand reduction from our energy efficiency program. (Complete all sections of the Application.)

Section 3: Energy Efficiency Programs

A) Our energy efficiency program involves (choose whichever applies):

☒ Early replacement of fully functioning equipment with new equipment. (Provide the date on which you replaced your fully functioning equipment, 7/1/2007 and the date on which you would have replaced your equipment if you had not replaced it early. Please include a brief explanation for how you 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. We installed our new equipment on the following date(s):

☐ Installation of new equipment for new construction or facility expansion. We installed our new equipment on the following date(s):

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

a) 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: 122,162 kWh

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for annual energy savings calculations Attachment 6 – Supporting Documentation for custom measures, and Attachment 8 – Prescriptive Protocols for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

b) 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.

c) 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.

Section 4: Demand Reduction/Demand Response Programs

A) Our program involves (choose which applies):

☒ Coincident peak-demand savings from our energy efficiency program.

☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)

☐ Potential peak-demand reduction (choose which applies):

- Choose one or more of the following that applies:

  ☐ Our 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.

  ☐ Our 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) What is the date your peak demand reduction program was initiated?

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):

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

KW Demand Reduction = Unit Quantity (watts) x (Deemed KW/Unit (watts))

26.6 kW

See Confidential and Proprietary Attachment 5 – Self Direct Program Project Calculation for peak demand reduction calculation, and Attachment 6 – Supporting Documentation for custom measures, and Attachment 8 – Prescriptive Protocols 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) We are applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

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

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

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

☐ A cash rebate, based on avoided generation cost, of $_____. (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 $ 6,953.74. (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 ____ months (not to exceed 24 months). (Attach

calculations showing how this time period 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: 7.3 (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 (capacity and energy) by the sum of our program costs and our electric utility's administrative costs to implement the program.

Our avoided supply costs were _____.

Our program costs were _____.

The utility's administrative 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 $ 55,975.00

The utility's administrative costs were $ 732.97

The utility's incentive costs/rebate costs were $ 6,953.74.

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 Attachment 8 – Prescriptive Protocols 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 confidentially 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 you 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 you 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 combination custom and prescriptive project and energy savings are determined as described in Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation, Attachment 6 – Supporting Documentation for custom measures, and Attachment 8 – Prescriptive Protocols for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

Ohio | Public Utilities Commission

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

Case No.: 10-1819-EL-EEC

State of OHIO :

RYAN J CALKINS, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

   KEMA Services, Inc agent of Columbus Southern 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.

3. I am aware of fines and penalties which may be imposed under Ohio Revised Code Sections 2921.11, 2921.31, 4903.02, 4903.03, and 4903.99 for submitting false information.

Ryan Calkins Energy Efficiency Engineer
Signature of Affiant & Title

Sworn and subscribed before me this 30TH day of November, 2010 Month/Year

Angie Doan
Signature of official administering oath

Angie Doan, Outreach Manager
Print Name and Title

My commission expires on 01-03-11

NOTARIAL SEAL STATE OF OHIO

ANGIE DOAN
Notary Public, State of Ohio
My Commission Expires 01-03-11

AEP OHIO
A unit of American Electric Power

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 330-308-6000.

Customer Name	**KOHLS DEPT STORE**
Project Number	**AEP-09-00660**
Customer Premise Address	**120 MEADOW PARK AVE, LEWIS CENTER, OH 43035**
Customer Mailing Address	**P.O. Box 15787 (Dept.28268), Philadelphia, PA 19103**
Date Received	**11/16/2009**
Project Installation Date	**7/1/2007**
Annual kWh Reduction	**122,162**
Total Project Cost	**$95,510.91**
Unadjusted Energy Efficiency Credit (EEC) Calculation	**$9,271.65**
Simple Payback (yrs)	**9.5**
Utility Cost Test (UCT)	**7.3**

		Please Choose One Option Below and Initial
Option 1 - Self Direct EEC: 75%	**$6,953.74**	☐ **Initial: _____**
Option 2 - EE/PDR Rider Exemption	**25 Months (After PUCO Approval)**	☐ **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 and Custom) project that the above has completed and applied is as follows. This project consisted of replacing (310) T12 fixtures with (310) T8 and T5 fixtures, replacing (22) Incandescent lights with (22) CFLs, replacing (310) 100W CMH with 39W CMH and (42) 150W CMH with 100W CMH. After reviewing the invoicing and project scope this application has been verified.

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.

Columbus Southern Power Company

By:_____

Title: _____

Date: _____

KOHLS DEPT STORE

By: _____

Title: _____

Date: _____

AEP OHIO
A unit of American Electric Power

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 330-308-6000.

Customer Name	KOHLS DEPT STORE	
Project Number	AEP-09-00660	
Customer Premise Address	120 MEADOW PARK AVE, LEWIS CENTER, OH 43035	
Customer Mailing Address	P.O. Box 15787 (Dept 28368), Philadelphia, PA 19103	
Date Received	11/16/2009	
Project Installation Date	7/1/2007	
Annual kWh Reduction	122,162	
Total Project Cost	$85,510.91	
Unadjusted Energy Efficiency Credit (EEC) Calculation	$9,271.65	
Simple Payback (yrs)	9.5	
Utility Cost Test (UCT)	7.3	
		Please Choose One Option Below and Initial
Option 1 - Self Direct EEC: 75%	$6,953.74	☑ Initial: LP
Option 2 - EE/PDR Rider Exemption	25 Months (After PUCO Approval)	☐ 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?

X YES ___ NO

Project Overview:

The Self Direct (Prescriptive and Custom) project that the above has completed and applied is as follows. This project consisted of replacing (310) T12 fixtures with (310) T8 and T5 fixtures, replacing (22) Incandescent lights with (22) CFLs, replacing (310) 100W CMH with 39W CMH and (42) 150W CMH with 100W CMH. After reviewing the invoicing and project scope this application has been verified.

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.

Columbus Southern Power Company

By: _____

Title: Manager

Date: 9/13/10

KOHLS DEPT STORE

By: _____ LUCAS PFAFF

Title: PROJECT MANAGER

Date: 9/8/10

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Self-Direct Program Project Application

Application Instructions

- Complete the application form for each installation account number.
- Complete the Self-Direct Program spreadsheet, which is in Excel format, fully describing each measure replaced and installed along with project costs, existing and new equipment inventories/operation descriptions, baseline and new usage measurements or detailed calculations, total energy and demand savings, and other specified information. It shall be the customer's responsibility to provide all necessary documentation, calculations, and energy impact and summer peak demand saving verification in order to justify the project for incentives.
- Complete the Self-Direct Program project description and include all required documentation including detailed customer-approved invoices, proof of purchase, receipts, technical specifications, studies/proposals, etc.
- NOTE: Sending inadequate invoice documentation, incomplete/incorrect forms, or backup information, including detailed energy and summer peak demand calculations, will delay review of the application. Contact AEP Ohio if you require additional assistance in completing the application.
- Submit all information to AEP Ohio. All completed submissions become the property of AEP Ohio. Make a copy of all documents for your records.

FORM SUBMITTAL: Please note all Rules and Requirements.
Return the signed, completed form and all required detailed documentation to:

Mail: AEP Ohio
6031 East Main Street, Suite 190
Columbus, OH 43213
Fax: 877-607-0740
Email: gridsmartohio@kema.com
Questions: Call 877-607-0739

Visit **gridsmartohio.com** for more information on the Self-Direct Program and other energy efficiency incentive programs offered by AEP Ohio.

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Self-Direct Program Project Application

THIS INCENTIVE APPLICATION FORM IS VALID THROUGH DECEMBER 31, 2009.

Project ID provided by AEP Ohio
PROJECT ID: _____

☐ Pre-approval Application ☐ Final Application

SECTION 1: SELF-DIRECT CUSTOMER INFORMATION

Company Name		Contract Date of Acceptance
Mailing Address		
City	State	Zip Code
Contact Name (print)	Phone	Fax
Contact E-mail*		

Building Type: ☐ Office ☐ School/College ☐ Retail/Service ☐ Restaurant ☐ Hotel/Motel ☐ Medical ☐ Grocery
☐ Warehouse ☐Light industry ☐ Heavy Industry ☐ Government/Municipal ☐ Other_____

By signing here, I acknowledge the information on this application is accurate and complete. I confirm I have read, agree with and understand the Rules and Requirements of this application and I have the authority to execute on behalf of my company / corporation.

Customer Signature _____ **Date** _____

* By providing your e-mail address, you are granting AEP Ohio permission to send further e-mails regarding our programs and services

SECTION 2: COMPLETION AND PAYMENT INFORMATION

Attention to	Total Incentive Amount Requested $	
Taxpayer ID # of Recipient (if not a Corporation or Tax Exempt)	Total Project Cost $	Total Incremental Cost $
☐ Corporation (Inc, LLC, PC, etc.) ☐ Tax Exempt ☐ Other (Individual, Partnership – may receive 1099)	Total Annual kWh Claimed	kW Demand Reduction Claimed

SECTION 3: JOB SITE INFORMATION (where equipment was installed)

Job Site Name			Project Contact Name
Job Site Address (physical location)			Project Contact Telephone
City	State	Zip Code	Project Contact Email
Job Site AEP Ohio Account Number (primary account)		Job Site Premise Number	

SECTION 4: CONTRACTOR INFORMATION (equipment or service provider/ installer)

Contractor Name

Contractor Street Address	City	State	Zip Code
Contractor Contact Name	Contact Telephone	Contact Email	

SECTION 5: CUSTOMER ELECTION (CHOOSE ONE OPTION AND COMPLETE ASSOCIATED INFORMATION)

Option #1	☐ Incentive Payment	Incentive Calculation: $ _____
Option #2	☐ Exemption From EE/PDR Rider	# of Months Exempted: ____ months (calculation provided by AEP Ohio)

Self-Direct Program

Retrospective Projects / Rules and Requirements

Columbus Southern Power Company and Ohio Power Company are collectively known as AEP Ohio ("AEP Ohio"). AEP Ohio provides energy-efficiency incentives for the purchase and installation of qualifying cost-effective equipment in the customer's facility (the customer's "Commitment of Resources") under the Rules and Requirements provided in this incentive application and subject to regulatory approvals.

Customer Qualifications

The Self-Direct Program (the "Program") applies to customers served at 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. This application defines the Date of Acceptance.

Terms and Conditions

- THIS INCENTIVE APPLICATION FORM IS VALID FOR SUBMITTAL BY SELF-DIRECT CUSTOMERS UNTIL DECEMBER 31, 2009. AEP Ohio incentive programs may be changed or cancelled at any time without notice. The Customer and its contractor are solely responsible for contacting AEP Ohio to ask whether or not the program is still in effect and to verify program parameters.
- Customer agrees to commit all energy and demand resources identified in this application to AEP Ohio's energy and demand target / benchmarks as identified in Senate Bill 221.
- Incentive payments are available while program funding lasts.
- To ensure maximum program participation, AEP Ohio reserves the right to limit funding on a per project basis.
- Pre-approval by AEP Ohio is required.
- Incentive items must be installed on the AEP Ohio electric account listed on the application.
- The incentive payment shall be:
  - 75% of the calculated incentive under the Business Lighting or Custom Program, whichever is applicable to this project.
- In lieu of a one-time incentive payment, the customer 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, and as defined in the table below, the incentive payment amount is compared to the estimated net present value (NPV) of the customer's estimated EE/PDR rider obligation, as calculated by AEP Ohio. If exemption is elected, the customer is not eligible for other programs offered by AEP Ohio during the period of exemption. Unless additional resources are committed, the customer will, after the specified number of months on this Application, be subject to the EE/PDR Rider.
- If an incentive is elected, the customer remains in the EE/PDR rider for the period of time that an exemption would have been in effect and may also participate in other AEP Ohio programs.
- All equipment must be new; used or rebuilt equipment is **not** eligible for an incentive.
- Eligible measures must produce **verifiable** and **persistent** energy and/or demand reduction, for a period of no less than five (5) years from the date of installation, through an increase in efficiency or through the use of load-shifting technologies. Measurement and verification may be required.
- Ineligible measures:
  1. Rely solely on changes in customer behavior and require no capital investment, or merely terminate existing processes, facilities and/or operations.
  2. Are required by state or federal law, building or other codes, or are standard industry practices.
  3. Involve fuel switching, plug loads, or generate electricity.
  4. Are easily reverted / removed or are installed entirely for reasons other than improving energy efficiency.
  5. Include other conditions to be determined by AEP Ohio.
- Projects submitted for retrospective claims must be installed and operating between January 1, 2006 and the Date of Acceptance into the Self-Direct Program. Incentive levels, as shown in the table below, are based on the calendar year of installation / operation. Customer shall provide proof of equipment installation / operation start-up.
- All applications are subject to AEP Ohio, its contractor(s) / agent(s), and the Public Utility Commission of Ohio (PUCO) review and approval prior to any incentives paid or exemption from the EE/PDR Rider under this program.
- Customer is allowed and encouraged to consider using all or a portion of the incentive payment, as received from AEP Ohio under this program, to help fund other customer-initiated energy efficiency and demand reduction projects in the future. Future projects can also qualify for incentives under the Business Lighting or Custom program.
- A signed final 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 summer peak period is defined as weekday peak-demand hours (7:00 AM to 9:00 PM, May through September).
- 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.
- AEP Ohio reserves the right to randomly inspect customer facility(ies) for installation of materials listed on this incentive application and will need access to survey the installed project. 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. All documentation and verification is subject to strict confidentiality.
- If the inspection finds that customer did not comply with program rules and requirements, any incentive received under this Program must be returned to AEP Ohio including interest. Exemption from the rider will be voided as well. In addition, AEP Ohio reserves the right to withhold payment or exemption for projects that do not meet reasonable industry standards as determined by AEP Ohio.
- AEP Ohio reserves the right to refuse payment and participation if the customer or contractor violates program rules and procedures. AEP Ohio is not liable for incentives promised to customers as a result of program misrepresentation.
- 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, which will serve as a contract for the customer's commitment of energy and demand resources to AEP Ohio, shall apply.
- AEP Ohio reserves the right to request additional backup information, supporting detail, calculations, manufacturer specification sheets or any other information prior to any incentive payment.
- Equipment could have been installed in retrofit, replacement, or new construction applications and must meet reasonable industry standards. All equipment / measures must meet minimum cost effectiveness requirements as defined or determined by AEP Ohio. Customer must also provide evidence of measure life.
- AEP Ohio will issue any approved incentives in the form of checks.
- Customer can not apply for incentives for future projects and elect after the fact to apply for exemption under this program.
- All documentation and verification is subject to strict confidentiality.
- All completed submissions become the property of AEP Ohio.

Disclaimers

AEP Ohio:

- Does not endorse any particular manufacturer, product or system design by offering these incentives.
- Will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives. AEP Ohio will report incentives greater than $as income on IRS form 1099. Such incentives shall be taxable unless Customer 600 meets acceptable tax exemption criteria. Customers are encouraged to consult with their tax advisors about the taxability of any incentive payments.
- Does not expressly or implicitly warrant the performance of installed equipment (contact your contractor for detailed equipment warranties).
- Is not responsible for the proper disposal/recycling of any waste generated as a result of this project.
- Is not liable for any damage caused by the operation or malfunction of the installed equipment.
- Does not guarantee that a specific level of energy or cost savings will result from the implementation of energy conservation measures or the use of products funded under this program.

OPTION #1 - ONE-TIME INCENTIVE PAYMENT	
Incentive Levels (for retrospective projects completed since January 1, 2006)	75% of the calculated incentive payment under the current Business Lighting or Custom Programs, whichever is applicable.
Min / Max payback w/o incentive applied	1 year Min / 7 Year Max

OPTION #2 - EXEMPTION FROM EE / PDR RIDER
Exemption from the EE/PDR rider is determined by comparing the value of the one-time incentive payment with the estimated net present value (NPV) of the EE/PDR rider payments, as calculated by AEP Ohio, for the customer's associated electric account. This NPV is defined as the customer's financial contribution to AEP Ohio's efforts to reach EE/PDR targets. Exemption term will be rounded to the nearest month.

Self-Direct Program

Retrospective Project Description: Project _____ of _____

Project Descriptive Name	Project In-service Date
Affected Electric Account Number(s)	

Claimed Project Baseline (AEP Ohio will make the final determination of applicable baseline):

____ Retrofit (the project was an elective retrofit and the equipment was still operable)

____ Replacement (the project was a replacement of equipment at or near the end of its useful life)

____ New (the project was an addition of new equipment in an existing facility or new construction)

Describe the project including detail of energy savings equipment. Attach additional sheets if needed.

Describe the removed equipment and operating strategy. Attach additional sheets if needed.

Describe the installed equipment and operating strategy. Attach additional sheets if needed.

Describe your calculation method for energy savings. Attach additional sheets if needed.

In addition to electrical energy and/or demand reduction, other benefits of proposed project include:

___Conserves other utilities (gas, water, etc.)
___Improves process flow
___Improves product quality
___Increases production capacity
___Other _____
___Meets environmental regulations
___Reduces labor
___Saves energy
___Uses fewer raw materials

Project Technical Specifications

(This sheet provides an example of required data collection. The Self-Direct spreadsheet provides additional guidance and streamlines the process for collecting, documenting and reporting this information to AEP Ohio, and it follows the format of this sheet. Please provide as much detail as possible on the Self-Direct spreadsheet to expedite review and processing of the requested incentive).

Please complete the Self-Direct spreadsheet for each measure installed and provide supporting documentation including engineering or equipment supplier studies, customer-approved invoices, purchase orders, detailed calculations of baseline and energy and peak summer demand savings. A detailed proposal and complete package will expedite review of application. This information is required by AEP Ohio and/or its consultants for project analysis.

	EQUIPMENT REMOVED OR LOWER EFFICIENCY OPTION	INSTALLED EQUIPMENT OR HIGHER EFFICIENCY OPTION
Equipment type		
Manufacturer of equipment		
Model number(s)		
Date of Removal / In-Service Date		
Age of equipment at removal		
Estimated remaining useful life at time of removal or installation		
Efficiency rating		
Nameplate data: kW, tons, HP, watts, etc.		
Quantity		
Annual operating hours		
Annual energy savings (kWh)		
Summer peak reduction (kW)*		
Annual electric bill savings ($)		
COST BREAKOUT		
Equipment		
Engineering		
Installation		
Other (explain)		
TOTAL PROJECT COST		
Incremental Cost = Installed Option Total Cost – Removed Equipment or Lower Efficiency Option Total Cost		

* **Determination of peak demand reduction (kW) from non-HVAC equipment:** For non-HVAC measures, calculate the average kW reduction over the period from 7 a.m. to 9 p.m., weekdays, from May 1 through September 30. The preferred calculation method will estimate hourly kW demands over the peak demand period, and average the results. However, if measures do not vary significantly during those hours, a less rigorous estimation process may be applied if approved in advance by the program.

* **Determination of peak demand reduction (kW) within HVAC systems:** Calculate the maximum HVAC peak demand reduction that occurs between 7 a.m. to 9 p.m. on a weekday from May 1 through September 30.

COOPER LIGHTING - METALUX®

DESCRIPTION

The Paralux III Series features recessed aesthetics and the latest in energy efficient technology. The luminaire incorporates a nominal 3" deep precision cell louver into a 4-3/4" deep para-contoured fixture housing. This combination creates a total high performance parabolic optical assembly for optimum performance. The series is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility. The high performance luminaire is designed to offer maximum efficiency and performance for today's unique interior specifications. The Paralux III series is an excellent choice for commercial office spaces, schools, hospitals or retail merchandising areas.

Catalog #	2EP3GX-332S36I-UNV	Type
Project	KOHLS	A
Comments		Date
Prepared by		

SPECIFICATION FEATURES

A···Construction

4-3/4" deep, para-contoured housing, die formed of code gauge, prime cold rolled steel. Die embossed housing has full length die formed stiffeners for added strength. Contoured ballast/wireway cover is easily removed without tools. Die formed captive lampholder bracket fully encloses lampholder wiring permitting easy lampholder replacement. Heavy end plates are securely attached with interlocking tabs and screws. Four auxiliary fixture end suspension points provided. KOs for continuous row wiring. End plates have labor saving integral Grid-Lock feature for safety and convenience.

B···Electrical**

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Pressure lock lampholders. UL/CUL listed. Suitable for damp locations.

C···Finish

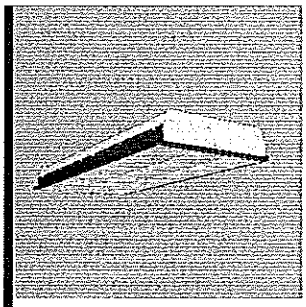
Lighting grade, baked white enamel finish. Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition.

D···Hinging/Latching

Positive spring loaded, self locking, steel latches. Safety lock T-hinges allow hinging and latching from either side.

E···Louver

Die formed of low iridescent, vertical grain anodized aluminum. Finish is Anodic oxide coating. Accurate precision parabolic cells are held in place with interlocking feature. True-cut mitered corners. Black reveal with integral mechanical light seal around entire perimeter of louver. Louver protected from construction contaminants by polyethylene cover.

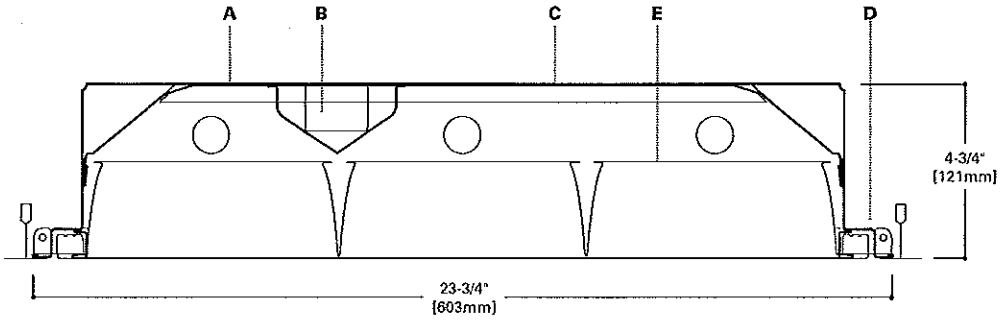


2EP3GAX
328T8
332

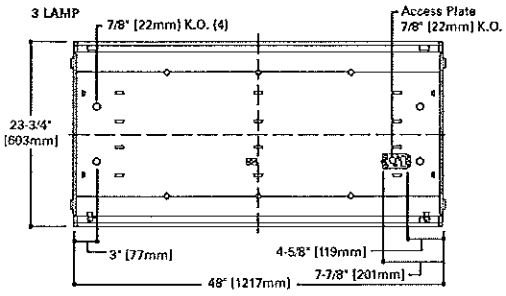
18, 24 Cell

**2' X 4' PARABOLIC
3 T8 LAMPS
SEMI-SPECULAR,
SPECULAR OR WHITE
PAINTED LOUVER**

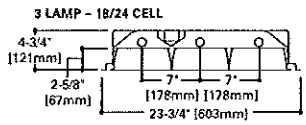
Paralux III
Recessed Static or
Air Supply Troffer



MOUNTING DATA



LAMP CONFIGURATIONS



ENERGY DATA

Input Watts:
EB Ballast & STD Lamps
328T8 (67)
332 (81)

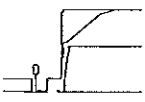
Luminaire Efficacy Rating
LER = FP-77
Catalog Number: 2EP3GAX-332S36I

Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.11

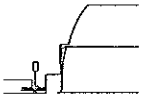
**Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

CEILING COMPATIBILITY

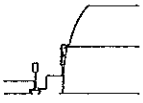
G
Grid/Lay-in
Standard



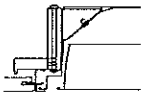
T
Concealed T



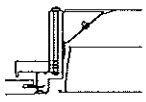
T
Slot Grid



F
Aluminum Flange Trim
With Supporting
Swing Gates



MZ
Modular Trim
With Supporting
Swing Gates



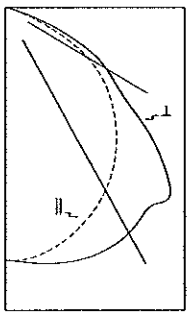
Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G or T
Slot Grid	G or T
Flange	F
Concealed "T" or "Z" Metal Pan	MZ
	MZ

(Verify compatibility/ consult Pre Sales Technical Support.)

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT
Safe and convenient means of disconnecting power.

PHOTOMETRICS



2EP3GX-332S38I
Electronic Ballast

F32T8/35K Lamps
3100 Lumens

Spacing criterion: (II) 1.2 x mounting height, (⊥) 1.5 x mounting height

Efficiency 66.3%

Test Report: 220P212

LER = FP-74

Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.24

Candlepower

Angle	Along II	45°	Across ⊥
0	2238	2238	2238
5	2239	2252	2270
10	2198	2250	2306
15	2135	2227	2333
20	2051	2185	2343
25	1955	2123	2329
30	1845	2041	2287
35	1719	1941	2211
40	1574	1817	2246
45	1414	1689	2060
50	1248	1536	1678
55	1084	1220	1268
60	846	818	1043
65	546	506	756
70	250	255	421
75	101	106	143
80	47	48	54
85	16	16	16
90	0	0	0

Coefficients of Utilization

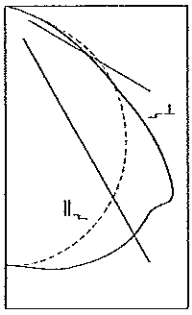
	Effective floor cavity reflectance				20%													
rc	80%				70%				50%			30%			10%			0%
rw	70	60	30	10	70	60	30	10	50	30	10	50	30	10	60	30	10	0
RCR																		
0	79	79	79	79	77	77	77	77	74	74	74	71	71	71	68	68	68	66
1	73	70	68	66	71	69	67	65	66	64	63	64	62	61	61	60	59	58
2	67	62	58	55	66	61	57	54	59	56	53	57	54	52	55	53	51	49
3	62	55	50	46	60	54	50	46	52	48	45	50	47	44	49	46	44	42
4	57	49	44	39	55	48	43	39	47	42	39	45	41	38	44	40	38	36
5	52	44	38	34	51	43	38	34	42	37	34	41	36	33	39	36	33	32
6	48	40	34	30	47	39	34	30	38	33	29	37	32	29	36	32	29	28
7	45	36	30	26	43	35	30	26	34	30	26	33	29	26	33	29	26	24
8	41	33	27	23	40	32	27	23	31	27	23	31	26	23	30	26	23	22
9	38	30	25	21	38	30	25	21	29	24	21	28	24	21	27	24	21	20
10	36	28	22	19	35	27	22	19	27	22	19	26	22	19	25	22	19	18

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1830	19.7	29.7
0-40	3053	32.8	49.5
0-60	5433	58.4	88.1
0-90	6167	66.3	100.0
0-180	6167	66.3	100.0

Typical VCP Percentages

	Height Along		Height Across	
Room Size (Ft.)	8.5'	10.0'	8.5'	10.0'
20 x 20	69	68	65	64
30 x 30	74	71	70	67
30 x 60	76	73	73	71
60 x 30	79	76	76	72
60 x 60	80	76	77	74



2EP3GX-332S36I-EB82
Electronic Ballast

F32T8/35K Lamps
3100 Lumens

Spacing criterion: (II) 1.3 x mounting height, (⊥) 1.5 x mounting height

Efficiency 69.1%

Test Report: 220P211

LER = FP-77

Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.11

Candlepower

Angle	Along II	45°	Across ⊥
0	2243	2243	2243
5	2246	2258	2275
10	2213	2263	2311
15	2160	2248	2340
20	2084	2215	2354
25	1992	2163	2342
30	1884	2089	2303
35	1762	1998	2231
40	1619	1880	2268
45	1463	1759	2080
50	1288	1619	1670
55	1120	1310	1244
60	921	891	1052
65	673	583	771
70	373	339	432
75	128	132	148
80	54	54	55
85	19	18	15
90	0	0	0

Coefficients of Utilization

	Effective floor cavity reflectance				20%													
rc	80%				70%				50%			30%			10%			0%
rw	70	60	30	10	70	60	30	10	60	30	10	50	30	10	50	30	10	0
RCR																		
0	82	82	82	82	80	80	80	80	77	77	77	74	74	74	71	71	71	69
1	76	73	71	68	74	72	69	67	69	67	65	66	65	63	64	62	61	60
2	70	65	60	57	68	63	59	56	61	58	55	59	56	53	57	54	52	51
3	64	57	52	48	62	56	51	47	54	50	46	52	49	46	50	47	45	43
4	59	51	45	41	57	50	44	40	48	43	40	46	42	39	45	42	39	37
5	54	45	39	35	52	45	39	35	43	38	34	42	37	34	41	37	34	32
6	50	41	35	31	48	40	34	30	39	34	30	38	33	30	37	33	30	28
7	46	37	31	27	45	36	31	27	35	30	27	34	30	26	33	29	26	25
8	43	34	28	24	42	33	28	24	32	27	24	31	27	24	31	27	23	22
9	40	31	25	21	39	30	25	21	30	25	21	29	24	21	28	24	21	20
10	37	28	23	19	37	28	23	19	27	23	19	27	22	19	26	22	19	18

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1850	19.9	28.8
0-40	3102	33.4	48.3
0-60	5569	59.9	86.6
0-90	6428	69.1	100.0
0-180	6428	69.1	100.0

Typical VCP Percentages

	Height Along		Height Across	
Room Size (Ft.)	8.5'	10.0'	8.5'	10.0'
20 x 20	69	68	65	64
30 x 30	74	71	70	67
30 x 60	76	73	73	71
60 x 30	79	76	76	72
60 x 60	80	76	77	74

ORDERING INFORMATION

SAMPLE NUMBER: 2EP3GAX-332S36I-UNV-EB81-U

Rating
Blank= Standard
NY=New York City Rated
ATW-SW4= Chicago Rated

HR=Heat Removal[1]

Width
2=2' Width

EP=Paralux Louver

3=3" Louver Depth

Trim Type
G=Grid/Lay-in (Standard)
G or T=Concealed T[3]
G or T=Slot Grid[2][3]
F=Aluminum Flange Trim[10]
MZ=Modular Trim

AX=Air Supply Floating Louver
X=Blank Side/Floating Louver - Non-Air Supply (Omit A)
AVX=Air Supply Floating Louver with Directional Air Vane (Add V)

Number of Lamps[4]
3 lamps

Wattage (Length)
28T8=28W T8 (48")[7]
32=32W T8 (48")

Louver Color
S=Silver
W=White

Cell Configuration
36=3 Rows of 6, 18 Cell
38=3 Rows of 8, 24 Cell

Louver Finish
I=Semi-Specular/Haze (Low Iridescent) Standard (Silver Only)
MI=Specular/Mirrored (Low Iridescent) (Silver Only)
P=Painted (White only)

Option – Aluminum Flange Trim[10]
Blank=SW (Single White)

Type	Color
'S' Single	'N' Natural
'R' In Row	'W' White
'E' End of Row	

Voltage[5]
120V=120 Volt
277V=277 Volt
347V=347 Volt
UNV=Universal Voltage 120-277[9]

Options
GL=Single Element Fuse
GM=Double Element Fuse
WTR=White Reveal
Flex=Flex Installed (Reference Flex ordering information)
EL=Emergency Installed[9]

Lamps Installed
Blank=No Lamps Installed
L8830=T8 Lamp, 28W and 32W, 3000K[7]
L8835=T8 Lamp, 28W and 32W, 3500K[7]
L8841=T8 Lamp, 28W and 32W, 4100K[7]
L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens
L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens

Ballast Type[6]
EB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10%
No. of Ballast 1 or 2
EB8_/PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 10%
No. of Ballast 1 or 2
ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%
No. of Ballast 1 or 2

HPT8 Ballast
HB8_L=T8 Electronic Instant Start. Low Ballast Factor .77
HB8_=T8 Electronic Instant Start. Ballast Factor .88
HB8_N=T8 Electronic Instant Start. Normal Ballast Factor 1.0
HB8_H=T8 Electronic Instant Start. High Ballast Factor 1.15-1.2
HR8_DIM=T8 Electronic Program Start Step Dimming. Ballast Factor .88
HR8_L=T8 Electronic Program Start. Low Ballast Factor .77
HR8_=T8 Electronic Program Start. Ballast Factor .88
HR8_H=T8 Electronic Program Start. High Ballast Factor 1.15-1.2

Options
PAF=Painted After Fabrication
RIF1=Radio Interference Suppressor
20GA/REP=20 Gauge Riveted Endplates. For use in New York City.
RLS=Rotor-Lock Socket (T8 Lamps Only)
(Additional options available. See Accessory Section)

Packaging
U=Unit Pack
PAL=Job Pack, out of carton
PALC=Job Pack, in carton

ACCESSORIES

EQ-CLIP-U=T-BAR Safety Earthquake Clips[2]

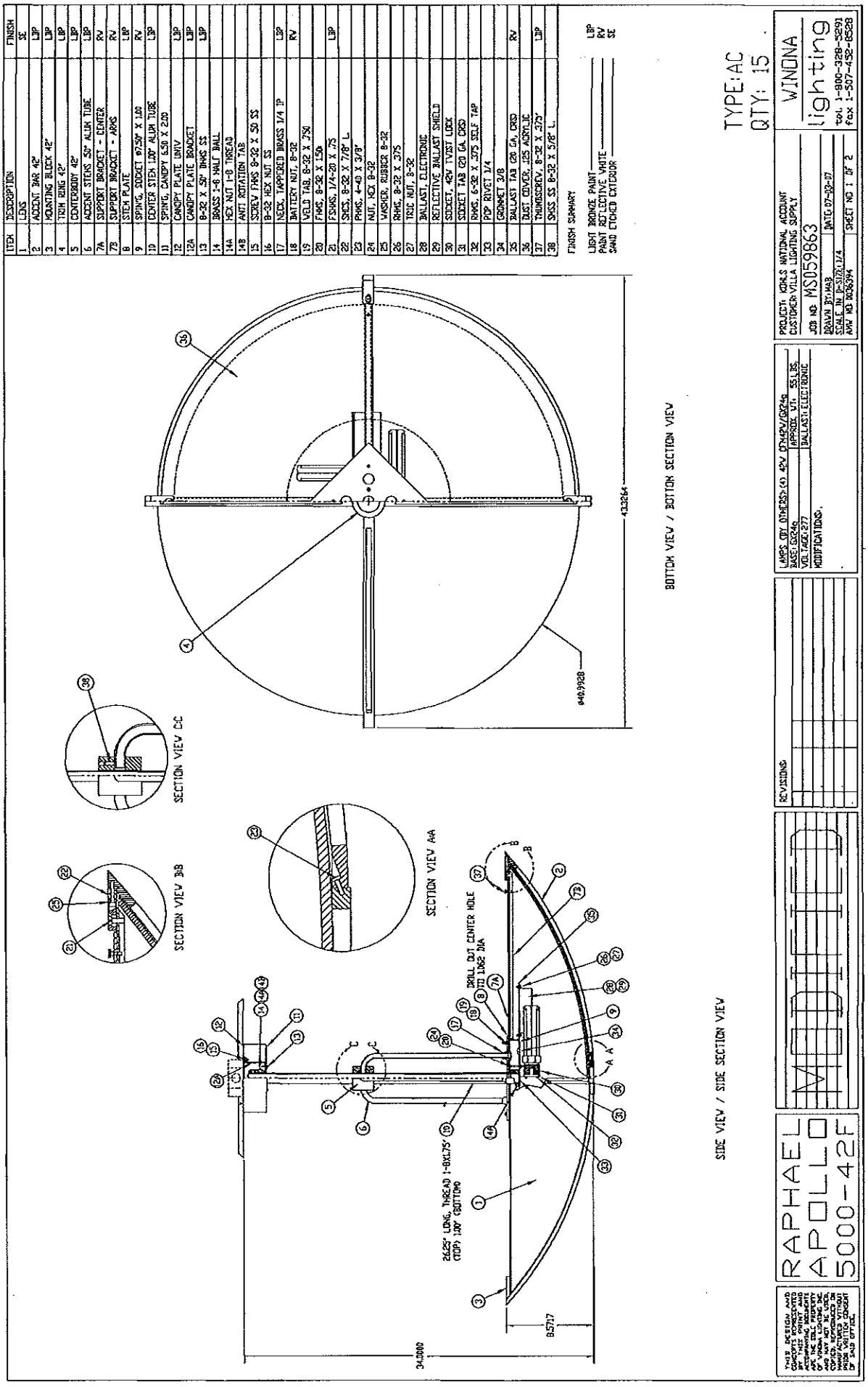
SHIPPING INFORMATION

Catalog No.	Wt.
2EP3GAX-332S36I	42 lbs.
2EP3GAX-328T8S36I	42 lbs.
2EP3GAX-332S38I	42 lbs.
2EP3GAX-328T8S38I	42 lbs.

NOTES: [1]Integral end plate grid lock feature not available in heat removal. [2]An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture. [3]Convertibility applies to housing only, appropriate shielding media assemblies must be utilized. [4]Standard off-center ballast on 3-lamp fixtures. [5]Products also available in non-US voltages and frequencies for international markets. [6]Not available when specifying emergencies, voltage must be specific. [7]When utilizing 28WT8 lamps, HPT8 Ballast must be specified. [8]Fixtures equipped with "EL" option have 5-1/2" housing depth. [9]G: Louver is recessed by 5/16" in ConcealedT or Slot Grid. T: Louver height= 3", Housing depth= 5-1/2" [10]Specify row configuration, type in catalog number when ordering complete fixture.

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

AC



ITEM	DESCRIPTION	FINISH
1	LENS	SE
2	ACCENT BAR 42"	LBP
3	MOUNTING BLOCK 42"	LBP
4	TRIM RING 42"	LBP
5	CONTERBODY 42"	LBP
6	ACCENT STEMS .50" ALUM TUBE	LBP
7A	SUPPORT BRACKET - CENTER	RV
7B	SUPPORT BRACKET - ARMS	RV
8	STEM PLATE	LBP
9	SPING, SOCKET Ø7.50" X 1.00	RV
10	CENTER STEM 1.00" ALUM TUBE	LBP
11	SPRING, CANOPY 6.50 X 2.00	
12	CANOPY PLATE UNIV	LBP
12A	CANOPY PLATE BRACKET	LBP
13	8-32 X .50" DHMS SS	LBP
14	BRASS 1-8 HALF BALL	
14A	HEX NUT 1-8 THREAD	
14B	ANTI ROTATION TAB	
15	SCREW FHMS 8-32 X .50 SS	
16	8-32 HEX NUT SS	
17	NECK, TAPERED BRASS 1/4 IP	LBP
18	BATTERY NUT, 8-32	RV
19	WELD TAB, 8-32 X .750	
20	FHMS, 8-32 X 1.50	
21	FSMS, 1/4-20 X .75	LBP
22	SMS, 8-32 X 7/8" L	
23	PHMS, 4-40 X 3/8"	
24	NUT, HEX 8-32	
25	WASHER, RUBBER 8-32	
26	RHMS, 8-32 X .375	
27	TRIC NUT, 8-32	
28	BALLAST, ELECTRONIC	
29	REFLECTIVE BALLAST SHIELD	
30	SOCKET, 42W TVIST LOCK	
31	SOCKET TAB 020 GA. CRS	
32	RHMS, 6-32 X .375 SELF TAP	
33	POP RIVET 1/4	
34	GROMMET 3/8	
35	BALLAST TAB 020 GA, CRS	RV
36	DUST COVER, .125 ACRYLIC	
37	THUMBSCREW, 8-32 X .375"	LBP
38	SHSS SS 8-32 X 5/8" L	

Type AF

Sonneman 3139 Art Deco / Retro Pendant from the Lightweights Collection

Manufacturer SKU: 3139
This item is part of the (Lightweights) Series

Finish Selected:
Satin Aluminum w/ Black Shade (Please Select a Finish)

View Media Gallery

Image displayed may differ from actual product appearance, especially in finish.

Product Availability
Send to a Friend
Live Help
Print This Page

Product Details - Specifications

Be the first to write a review.

Enjoy No Interest for 6 Months
On purchases of $500 or more with your ImprovementDirect Preferred Account Subject to credit approval. Details

No Payment For 90 Days
On purchases over $250 with Bill Me Later®! Click here for restrictions and details.

Product Details for Sonneman 3139

- Lightweights Small Cylinder Ceiling Pendant
- H 25"
- Canopy: 5" Diameter
- 10' adjustable wire
- Shade: Spandex H 17" x 10" Diameter
- Bulb: (1) 60 watt medium base

Specifications

Architectural Style:	Task Focused
Bulb Base:	Medium
Bulb Type:	Incandescent
Collection:	Lightweights
Energy Star:	No
Height:	25
Number of Bulbs:	1
Theme:	Art Deco / Retro
Watts:	15
Width:	10

Product Reviews

Review This Product

Reasons To Shop at LightingDirect.com

Our Accomplishments
400,000+ products shipped - Over 50 warehouses, 30 vendors, 20+ direct-manufacturer relationships - Top 30 Fastest Growing Retailer

Safest Place to Shop Online
Read how we do more to protect your information and transactions.

110% Low Price Guarantee
We will beat any competitors' price by 10% of the difference. Learn More...

Free Shipping
Orders over $ 50 automatically receive Free Shipping!*

Improvement Direct Preferred Account
Improvement Direct Preferred Account makes it quick, easy and secure to shop for thousands of home improvement products and earn great benefits.

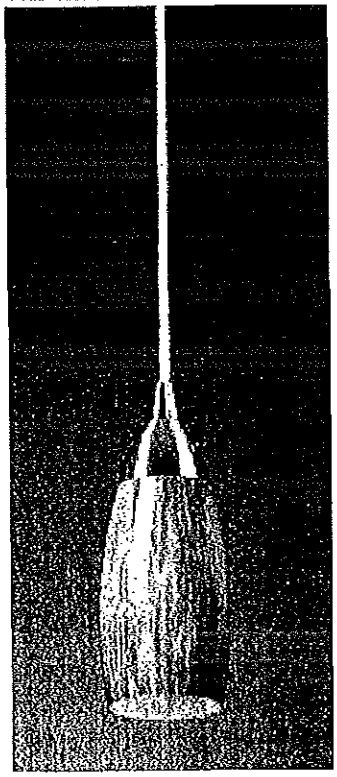
Improvement Direct Network of Stores
LightingDirect.com is a Network Store of Improvement Direct. When shopping with LightingDirect.com, you have access to ALL of our stores. One account – everything home improvement and décor!

Lighting Fixtures by: Title Brand Price
Indoor and Outdoor lighting by: Title Price
Popular Lighting by: Popularity Our Choice All-Round Favorites Title

TYPE AN

Item 110-1FR Detail

Item Number: 110-1FR
Description: 1 Light Pendant In Satin Nickel Or Dark Rust And Frosted Martini Glass
Item Height: 7
Item Width: 3
Item Depth: 0
Shipping Weight: 0
Catalog: 2700
Page: 274
Number of Bulbs: 1
Bulb Type: 60W CAND
Collection: Milan
Category: Pendant
Finish: Satin Nickel Or Dark Rust



COOPER LIGHTING - METALUX®

DESCRIPTION

The Paralux III Series features recessed aesthetics and the latest in energy efficient technology. The luminaire incorporates a nominal 3" deep precision cell louver into a 4-3/4" deep para-contoured fixture housing. This combination creates a total high performance parabolic optical assembly for optimum performance. The series is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility. The high performance luminaire is designed to offer maximum efficiency and performance for today's unique interior specifications. The Paralux III series is an excellent choice for commercial office spaces, schools, hospitals or retail merchandising areas.

Catalog #	2EP3GX-2U6T8	Type
Project	KOHLS	B
Comments		Date
Prepared by		

SPECIFICATION FEATURES

A···Construction

4-3/4" deep, para-contoured housing, die formed of code gauge, prime cold rolled steel. Die embossed housing has full length die formed stiffeners for added strength. Contoured ballast/wireway cover is easily removed. Die formed captive lampholder bracket fully encloses lampholder wiring permitting easy lampholder replacement. Heavy gauge end plates are securely attached with interlocking tabs and screws. Four auxiliary fixture end suspension points provided. KOs for continuous row wiring. End plates have integral Grid-Lock feature for safety and convenience.

B···Electrical**

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Pressure lock lampholders. UL/CUL listed. Suitable for damp locations.

C···Finish

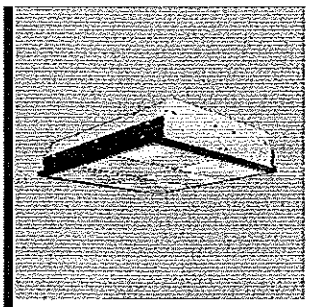
Lighting grade, baked white enamel finish. Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition.

D···Hinging/Latching

Positive spring loaded, self locking, steel latches. Safety lock T-hinges allow hinging and latching from either side.

E···Louver

Die formed of low iridescent, vertical grain anodized aluminum. Finish is Anodic oxide coating. Accurate precision parabolic cells are held in place with interlocking feature. True-cut mitered corners. Black reveal with integral mechanical light seal around entire perimeter of louver. Louver protected from construction contaminants by polyethylene cover.

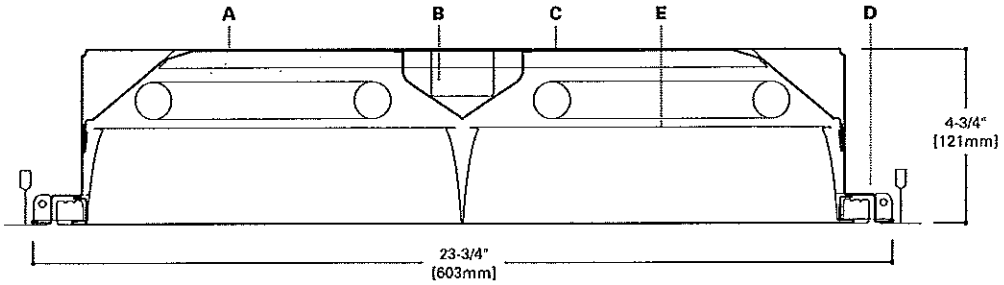


2EP3GAX
2U6T8

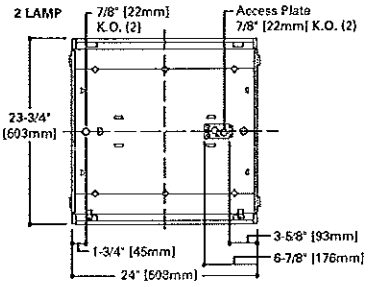
6, 9, 16 Cell

**2' X 2' PARABOLIC
2 U-LAMP
SEMI-SPECULAR,
SPECULAR OR WHITE
PAINTED LOUVER**

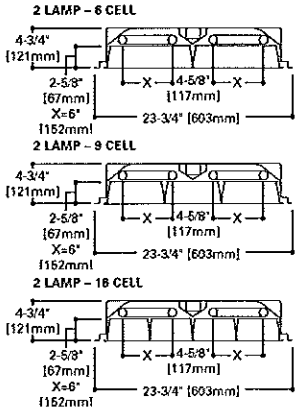
Paralux III
Recessed Static or
Air Supply Troffer



MOUNTING DATA

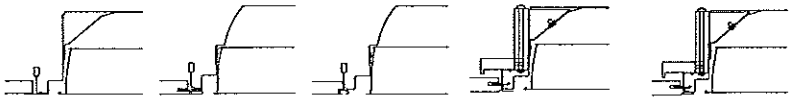


LAMP CONFIGURATIONS



CEILING COMPATIBILITY

G	T	T	F	MZ
Grid/Lay-in Standard	Concealed T	Slot Grid	Aluminum Flange Trim With Supporting Swing Gates	Modular Trim With Supporting Swing Gates



Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G or T
Slot Grid	G or T
Flange	F
Concealed "T" or "Z"	MZ
Metal Pan	MZ

(Verify compatibility/ consult Pre Sales Technical Support.)

ENERGY DATA

Input Watts:
EB Ballast & STD Lamps
2U6T8 (61)

Luminaire Efficacy Rating
LER = FP-52
Catalog Number: 2EP3GAX-2U6T8

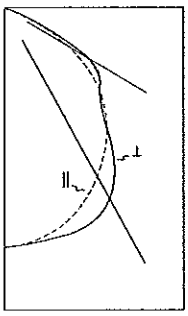
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $4.62

**Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT
Safe and convenient means of disconnecting power.

PHOTOMETRICS



2EP3GAX-2U6T8S23I
Electronic Ballast

FB31T8/35K/6 Lamps
2600 Lumens

Spacing criterion: (II) 1.2 x mounting height, (⊥) 1.3 x mounting height

Efficiency 63.8%

Test Report: 2EP3GAX2U6T8S23I.IES

LER = FP-52

Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $4.62

Coefficients of Utilization

Effective floor cavity reflectance					20%													
rc	80%				70%				50%			30%			10%			0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	76	76	76	76	74	74	74	74	71	71	71	68	68	68	65	65	65	64
1	71	68	66	64	69	67	65	63	64	62	61	62	60	59	59	58	57	56
2	65	60	57	53	63	59	56	53	57	54	52	55	53	51	53	51	49	48
3	60	54	49	45	58	53	48	45	51	47	44	49	46	43	48	45	43	41
4	55	48	43	39	53	47	42	39	45	41	38	44	40	38	43	40	37	36
5	51	43	38	34	49	42	37	33	41	36	33	40	36	33	39	35	32	31
6	47	39	33	29	46	38	33	29	37	32	29	36	32	29	35	31	29	27
7	43	35	30	26	42	35	30	26	34	29	26	33	29	26	32	28	25	24
8	40	32	27	23	39	32	27	23	31	26	23	30	26	23	29	26	23	22
9	38	29	24	21	37	29	24	21	28	24	21	28	24	21	27	23	21	20
10	35	27	22	19	35	27	22	19	26	22	19	26	22	19	25	21	19	18

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1067	20.5	32.2
0-40	1717	33.0	51.8
0-60	2984	57.4	90.0
0-90	3317	63.8	100.0
0-180	3317	63.8	100.0

Typical VCP Percentages

	Height Along		Height Across	
Room Size (Ft.)	8.5'	10.0'	8.5'	10.0'
20 x 20	72	67	65	60
30 x 30	79	73	75	69
30 x 60	83	78	79	74
60 x 30	82	78	78	73
60 x 60	85	82	82	78

Candela

Angle	Along II	45°	Across ⊥
0	1314	1314	1314
5	1303	1311	1319
10	1274	1304	1338
15	1234	1300	1371
20	1188	1293	1383
25	1129	1266	1330
30	1066	1210	1174
35	990	1089	998
40	909	920	902
45	812	773	880
50	708	698	924
55	586	647	950
60	422	547	754
65	204	327	327
70	65	102	100
75	21	25	26
80	7	9	10
85	4	4	4
90	0	0	0

ORDERING INFORMATION

SAMPLE NUMBER: 2EP3GAX-2U6T8S23I-UNV-EB81-U

Rating
Blank= Standard
NY=New York City Rated
ATW-SW4= Chicago Rated

HR=Heat Removal[1]

Width
2=2' Width

EP=Paralux Louver

3=3" Louver Depth

Trim Type
G=Grid/Lay-in (Standard)
G or T=Concealed T[4]
G or T=Slot Grid[2][3]
F=Aluminum Flange Trim[7]
MZ=Modular Trim

AX=Air Supply Floating Louver
X=Blank Side/Floating Louver - Non-Air Supply (Omit A)
AVX=Air Supply Floating Louver with Directional Air Vane (Add V)

Number of Lamps
2 lamps

Wattage (Length)
U6T8=32W T8 (24")

Louver Color
S=Silver
W=White

Cell Configuration
23=2 Rows of 3, 6 Cell
33=3 Rows of 3, 9 Cell
44=4 Rows of 4, 16 Cell

Louver Finish
I=Semi-Specular/Haze (Low Iridescent) Standard (Silver Only)
MI=Specular/Mirrored (Low Iridescent) (Silver Only)
P=Painted (White only)

Option - Aluminum Flange Trim[7]
Blank=SW (Single White)

Type	Color
'S' Single	'N' Natural
'R' In Row	'W' White
'E' End of Row	

Voltage [3]
120V=120 Volt
277V=277 Volt
347V=347 Volt
UNV=Universal Voltage 120-277[4]

Options
GL=Single Element Fuse
GM=Double Element Fuse
WTR=White Reveal Lamps=Lamps Installed (refer to lamp ordering options)
Flex=Flex Installed (Reference Flex ordering information)
EL=Emergency Installed[5]

Ballast Type [3]
EB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10%
No. of Ballast: 1, 2 or 3

EB8_/PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 10%
No. of Ballast: 1, 2 or 3

ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%
No. of Ballast: 1, 2 or 3

Options
PAF=Painted After Fabrication
RIF1=Radio Interference Suppressor
20GA/REP=20 Gauge Riveted Endplates. For use in New York City.
RLS=Rotor-Lock Socket (T8 Lamps Only)
(Additional options available. See Accessory Section)

Packaging
U=Unit Pack
PAL=Job Pack, out of carton
PALC=Job Pack, in carton

ACCESSORIES

EQ-CLIP-U=T-BAR Safety Earthquake Clips[2]

NOTES: [1]Integral end plate grid lock feature not available in heat removal. [2]An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture. [3]Products also available in non-US voltages and frequencies for international markets. [4]Not available when specifying emergencies, voltage must be specific. [5]Fixtures equipped with "EL" option may require a 5-1/2" housing depth. If installing in field, must use low profile battery pack. [6]G: Louver is recessed by 5/16" in Concealed T or Slot Grid. T: Louver height= 3", Housing depth= 5-1/2". [7]Specify row configuration, type in catalog number when ordering complete fixture.

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

SHIPPING INFORMATION

Catalog No.	Wt.
2EP3GAX-2U6T8S23I	28 lbs.
2EP3GAX-2U6T8S33I	28 lbs.
2EP3GAX-2U6T8S44I	28 lbs.

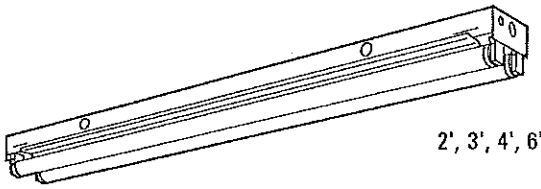
LITHONIA LIGHTING®

Catalog Number	
C-2-25-277-TUBI-XL	
Notes	Type C3

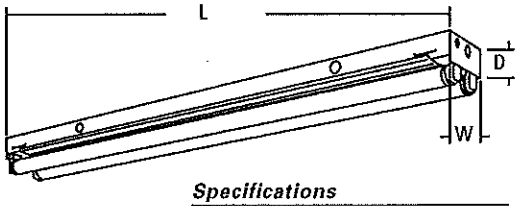
FEATURES & SPECIFICATIONS

General-Purpose Strip

C



2', 3', 4', 6' or 8' length
1 or 2 lamps



All dimensions are inches (millimeters).

INTENDED USE

Ideal where high brightness and good illumination levels are required such as retail, light industrial and warehouses.

ATTRIBUTES

Fixture can be assembled with snap together components and requires no tools. Available in one lamp or two lamp configuration.

CONSTRUCTION

Heavy-duty channel, die-formed from code-gauge steel.

Sturdy channel cover secured by captive quarter-turn latch for easy access to wireway.

Combination endplate/channel connector furnished with each fixture.

FINISH

Five-stage iron phosphate pretreatment ensures superior paint adhesion and rust resistance. Painted parts finished with high-gloss, baked white enamel.

ELECTRICAL SYSTEM

Thermally protected, resetting, Class P, UL Listed and CSA Certified ballast is standard. Sound rating depends on lamp/ballast combination.

AWM, TFN, THHN wire throughout, rated for required temperatures.

INSTALLATION

For unit or row installations, surface or suspended mounting.

LISTING

UL listed to US and Canadian safety standards. Optional: Mexico NOM.

WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

Specifications subject to change without notice.

Specifications

Length:	24" (610)
	36" (914)
	48" (1219)
	72" (1829)
	96" (2438)
Width:	4-3/8" (111)
Fixture Depth:	2-1/16" (52)

ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**

Example: C 2 32 MVOLT GEB10IS

C	2	25	277	TUBI-XL
Series	Number of lamps	Lamp type	Voltage	Options

C General-purpose strip
For tandem double-length unit, add prefix T. Example: TC

1
2
Not included.

T8
17 17W T8 (24")
25 25W T8 (36")
32 32W T8 (48")
96T8 59W T8 slimline (96")
T12 Slimline
36 30W slimline (36")
48 38W slimline (48")
72 55W slimline (72")
96 75W slimline (96")

MVOLT[1,2]
120
277
347
Others available.

GEB Electronic ballasts, ≤20% THD[3]
GEB10IS Electronic ballasts, ≤10% THD instant start[2]
BILP IS, high efficiency, .78bf (low)
1/4 One four-lamp ballast[4]
EL Emergency battery pack (nominal 300 lumens)
GLR Internal fast-blow fuse (add X for external)
GMF Internal slow-blow fuse (add X for external)
PLF_ Plug-in wiring; specify 1, 2 or 3 branch circuits and hot wires (A = Black, B = Red, C = Blue, AB or AC)
TILW Tandem in-line wiring
CW Cold-weather ballast; 0°F starting temp
CSA CSA Certified (only required for 347V)
NOM NOM Certified

Accessories

Order as separate catalog numbers.

SQ_	Swivel-stem hanger (specify length in 2" increments).
1B	Ceiling spacer (adjusts from 1-1/2" to 2-1/2" from ceiling).
CONLGC	12" screw-on channel connector.
WGCUN	Wireguard, 4' white.[5]
HC36	Chain hangers (1 pair, 36" long).
HRC	Hooker® T-bar hanger (flush to ceiling).
HRC1	Hooker® T-bar hanger (1-1/2" from ceiling).
WGCSMR	Wireguard, 4' white for symmetric reflector.[5]
WGCASR	Wireguard, 4' white for asymmetric reflector.[5]
CSMR48WH	Symmetric reflector, 4' white, 7" aperture.[5]
CASR48WH	Asymmetric reflector, 4' white, 5-3/4" wide.[5]

NOTES:
1 MVOLT standard for 120-277V applications, 50-60 mhz operation. Some options require voltage specified.
2 T8 lamps only.
3 Slimline lamps only.
4 Not available in slimline.
5 Order two for 8' fixtures.

C General-Purpose Strip

MOUNTING DATA

For unit or row installation, surface or suspended mounting.

Unit installation — Minimum of two hangers required.

Row installation — Two hangers per channel required. One per fixture plus one per row if CONLGC installed.

Hooker® (HRC) and HC Hangers — Minimum two per channel (unit and row)

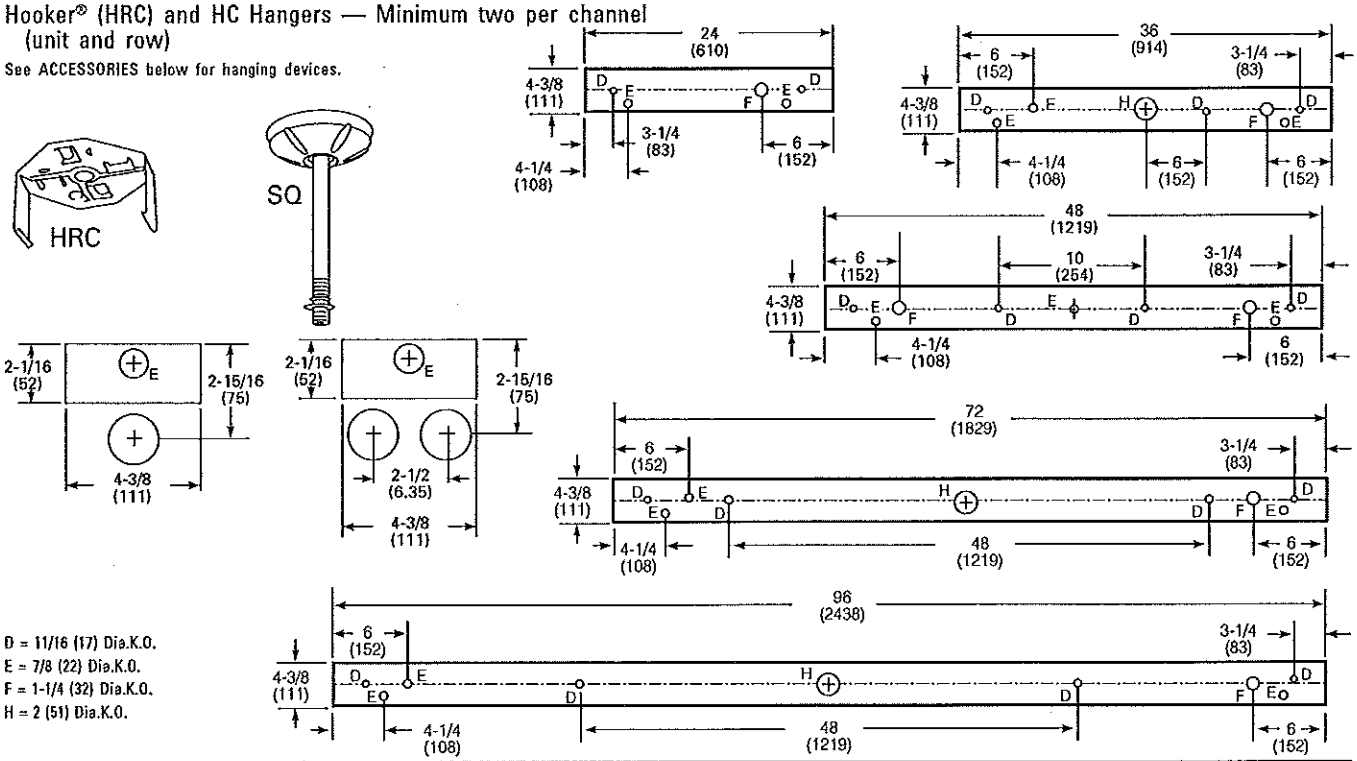
See ACCESSORIES below for hanging devices.

DIMENSIONS

Inches (millimeters). Subject to change without notice.

48", 72" and 96" have only two 7/8" K.O.'s 6" from each end

24" and 36" have only two 7/8" K.O.'s 3-1/4" from each end



PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedure. Floor reflectances are 20%. Lamp configurations shown are typical. All data based on 25°C. Full photometric data on these and other configurations available upon request.

C 2 95
TEST NO: LTL 18310
LUMENS PER LAMP: 6300

Coefficients of Utilization

	pf	20%							
	pc	80%			70%			50%	
	pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
RCR	0	103	103	103	98	98	98	90	90	90
	1	86	82	78	82	78	74	75	72	69
	2	74	67	61	70	64	59	64	59	55
	3	64	56	49	61	54	48	56	49	44
	4	56	47	41	53	46	40	49	42	37
	5	49	41	35	47	39	34	43	37	31
	6	44	36	30	42	34	29	39	32	27
	7	40	32	26	38	30	25	35	28	24
	8	36	28	23	35	27	22	32	25	21
	9	33	25	20	32	25	20	29	23	19
	10	30	23	18	29	22	18	27	21	17

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1785.8	14.2	15.7
0° - 40°	3042.4	24.1	26.8
0° - 60°	5944.0	47.2	52.3
0° - 90°	9027.5	71.6	79.4
90° - 180°	2341.8	18.6	20.6
0° - 180°	11369.4	90.2	100.0

C 2 32
TEST NO: LTL 5181
LUMENS PER LAMP: 2900

Coefficients of Utilization

	pf	20%							
	pc	80%			70%			50%	
	pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
RCR	0	106	106	106	102	102	102	93	93	93
	1	89	84	79	85	80	76	78	74	71
	2	76	68	62	72	66	60	66	61	56
	3	65	57	50	62	55	49	57	51	45
	4	57	48	42	55	47	40	50	43	38
	5	51	42	35	48	40	34	44	37	32
	6	45	36	30	43	35	29	40	33	28
	7	41	32	26	39	31	25	36	29	24
	8	37	29	23	35	28	22	33	26	21
	9	34	26	20	32	25	20	30	23	19
	10	31	23	18	30	23	18	28	21	17

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	842.1	14.5	15.6
0° - 40°	1435.8	24.8	26.7
0° - 60°	2810.1	48.4	52.2
0° - 90°	4362.5	75.2	81.0
90° - 180°	1021.0	17.6	19.0
0° - 180°	5383.6	92.8	100.0

Energy (Calculated in accordance with NEMA standard LE-5)

LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	WATTS
86.2	$2.79	(2)T8 F32	2900	.88	55

* Comparative yearly lighting energy cost per 1000 lumens

Energy (Calculated in accordance with NEMA standard LE-5)

ORDERING INFORMATION	LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	WATTS
C 2 32 MVOLT GEB101S	77.6	$3.09	F32T8/735	2800	.88	59
C 2 32 MVOLT BILP	93.6	$2.56	F32T8/835/HT8	3100	.78	48

* Comparative yearly lighting energy cost per 1000 lumens

LITHONIA LIGHTING®
An AcuityBrands Company

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 770-922-9000, 800-315-4963, Fax: 770-602-1531
www.lithonia.com

LITHONIA LIGHTING®

Catalog Number	
C-2-32-277-TUBI-XL	
Notes	Type
	C4

FEATURES & SPECIFICATIONS

INTENDED USE

Ideal where high brightness and good illumination levels are required such as retail, light industrial and warehouses.

ATTRIBUTES

Fixture can be assembled with snap together components and requires no tools. Available in one lamp or two lamp configuration.

CONSTRUCTION

Heavy-duty channel, die-formed from code-gauge steel.

Sturdy channel cover secured by captive quarter-turn latch for easy access to wireway.

Combination endplate/channel connector furnished with each fixture.

FINISH

Five-stage iron phosphate pretreatment ensures superior paint adhesion and rust resistance. Painted parts finished with high-gloss, baked white enamel.

ELECTRICAL SYSTEM

Thermally protected, resetting, Class P, UL Listed and CSA Certified ballast is standard. Sound rating depends on lamp/ballast combination.

AWM, TFN, THHN wire throughout, rated for required temperatures.

INSTALLATION

For unit or row installations, surface or suspended mounting.

LISTING

UL listed to US and Canadian safety standards. Optional: Mexico NOM.

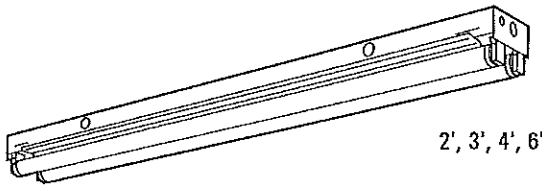
WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

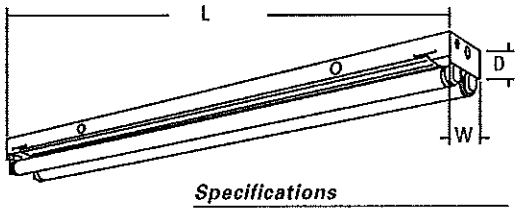
Specifications subject to change without notice.

General-Purpose Strip

C



2', 3', 4', 6' or 8' length
1 or 2 lamps



All dimensions are inches (millimeters).

Specifications

Length: 24" (610)
36" (914)
48" (1219)
72" (1829)
96" (2438)
Width: 4-3/8" (111)
Fixture Depth: 2-1/16" (52)

ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**

Example: C 2 32 MVOLT GEB10IS

C	2	32	277	TUBI-XL
Series	Number of lamps	Lamp type	Voltage	Options

C General-purpose strip
For tandem double-length unit, add prefix T. Example: TC

1
2
Not included.

T8
17 17W T8 (24")
25 25W T8 (36")
32 32W T8 (48")
96T8 59W T8 slimline (96")
T12 Slimline
36 30W slimline (36")
48 38W slimline (48")
72 55W slimline (72")
96 75W slimline (96")

MVOLT[1,2]
120
277
347
Others available.

GEB Electronic ballasts, ≤20% THD[3]
GEB10IS Electronic ballasts, ≤10% THD instant start[2]
BILP IS, high efficiency, .78bf (low)
1/4 One four-lamp ballast[4]
EL Emergency battery pack (nominal 300 lumens)
GLR Internal fast-blow fuse (add X for external)
GMF Internal slow-blow fuse (add X for external)
PLF_ Plug-in wiring; specify 1, 2 or 3 branch circuits and hot wires (A = Black, B = Red, C = Blue, AB or AC)
TILW Tandem in-line wiring
CW Cold-weather ballast; 0°F starting temp
CSA CSA Certified (only required for 347V)
NOM NOM Certified

Accessories

Order as seperate catalog numbers.

SQ_ Swivel-stem hanger (specify length in 2" increments).
1B Ceiling spacer (adjusts from 1-1/2" to 2-1/2" from ceiling).
CONLGC 12" screw-on channel connector.
WGCUN Wireguard, 4' white.[5]
HC36 Chain hangers (1 pair, 36" long).
HRC Hooker® T-bar hanger (flush to ceiling).
HRC1 Hooker® T-bar hanger (1-1/2" from ceiling).
WGCSMR Wireguard, 4' white for symmetric reflector.[5]
WGCASR Wireguard, 4' white for asymmetric reflector.[5]
CSMR48WH Symmetric reflector, 4' white, 7" aperture.[5]
CASR48WH Asymmetric reflector, 4' white, 5-3/4" wide.[5]

NOTES:
1 MVOLT standard for 120-277V applications, 50-60 mhz operation. Some options require voltage specified.
2 T8 lamps only.
3 Slimline lamps only.
4 Not available in slimline.
5 Order two for 8' fixtures.

C General-Purpose Strip

MOUNTING DATA

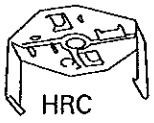
For unit or row installation, surface or suspended mounting.

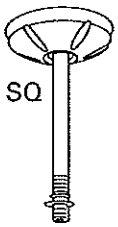
Unit installation — Minimum of two hangers required.

Row installation — Two hangers per channel required. One per fixture plus one per row if CONLGC installed.

Hooker® (HRC) and HC Hangers — Minimum two per channel (unit and row)

See ACCESSORIES below for hanging devices.



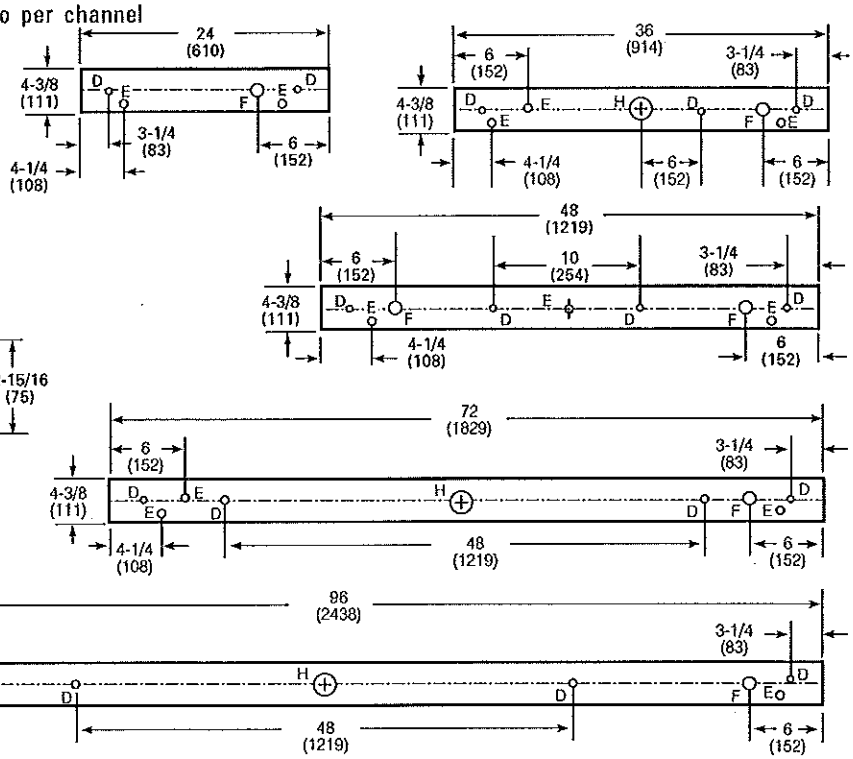


DIMENSIONS

Inches (millimeters). Subject to change without notice.

48", 72" and 96" have only two 7/8" K.O.'s 6" from each end

24" and 36" have only two 7/8" K.O.'s 3-1/4" from each end



PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedure. Floor reflectances are 20%. Lamp configurations shown are typical. All data based on 25°C. Full photometric data on these and other configurations available upon request.

C 2 96
TEST NO: LTL 18310
LUMENS PER LAMP: 6300

Coefficients of Utilization

	pf	20%							
	pc	80%			70%			50%	
	pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
RCR	0	103	103	103	98	98	98	90	90	90
	1	86	82	78	82	78	74	75	72	69
	2	74	67	61	70	64	59	64	59	55
	3	64	56	49	61	54	48	56	49	44
	4	56	47	41	53	46	40	49	42	37
	5	49	41	35	47	39	34	43	37	31
	6	44	36	30	42	34	29	39	32	27
	7	40	32	26	38	30	25	35	28	24
	8	36	28	23	35	27	22	32	25	21
	9	33	25	20	32	25	20	29	23	19
	10	30	23	18	29	22	18	27	21	17

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1785.8	14.2	15.7
0° - 40°	3042.4	24.1	26.8
0° - 60°	5944.0	47.2	52.3
0° - 90°	9027.5	71.6	79.4
90° - 180°	2341.8	18.6	20.6
0° - 180°	11369.4	90.2	100.0

C 2 32
TEST NO: LTL 5181
LUMENS PER LAMP: 2900

Coefficients of Utilization

	pf	20%							
	pc	80%			70%			50%	
	pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
RCR	0	106	106	106	102	102	102	93	93	93
	1	89	84	79	85	80	76	78	74	71
	2	76	68	62	72	66	60	66	61	56
	3	65	57	50	62	55	49	57	51	45
	4	57	48	42	55	47	40	50	43	38
	5	51	42	35	48	40	34	44	37	32
	6	45	36	30	43	35	29	40	33	28
	7	41	32	26	39	31	25	36	29	24
	8	37	29	23	35	28	22	33	26	21
	9	34	26	20	32	25	20	30	23	19
	10	31	23	18	30	23	18	28	21	17

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	842.1	14.5	15.6
0° - 40°	1435.8	24.8	26.7
0° - 60°	2810.1	48.4	52.2
0° - 90°	4362.5	75.2	81.0
90° - 180°	1021.0	17.6	19.0
0° - 180°	5383.6	92.8	100.0

Energy (Calculated in accordance with NEMA standard LE-5)

LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	WATTS
86.2	$2.79	(2)T8 F32	2900	.88	55

* Comparative yearly lighting energy cost per 1000 lumens

Energy (Calculated in accordance with NEMA standard LE-5)

ORDERING INFORMATION	LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	WATTS
C 2 32 MVOLT GEB10IS	77.6	$3.09	F32T8/735	2800	.88	59
C 2 32 MVOLT BILP	93.6	$2.56	F32T8/835/HT8	3100	.78	48

* Comparative yearly lighting energy cost per 1000 lumens

LITHONIA LIGHTING®
An AcuityBrands Company

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 770-922-9000, 800-315-4963, Fax: 770-602-1531
www.lithonia.com

MINI THEATRICAL BELL

T6 METAL HALIDE

MTB
T6 MH

APPLICATION:
Retail and commercial accent and display lighting

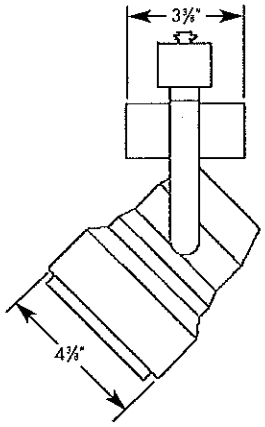
CONSTRUCTION:
Aluminum head and ballast housing
Snap-on lens holder, holds up to 2 accessories
Steel yoke
Powder coat paint

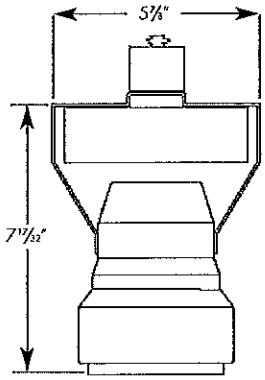
OPTICS:
High performance specular peened aluminum reflector
Specially designed for T6 MH lamps
90° tilt, 350° rotation
Locking vertical adjustment

MOUNTING:
Available for track, canopy and busway mounting

LABELING:
UL and CUL listed

PROJECT:
KOHLS
TYPE:
FL





ELECTRICAL

Lamping

Ballast		39w Input watts	39w Amps*	70w Input watts	70w Amps*
Electronic	120v	44	.37	79	.67
	277v	46	.17	79	.29

*Data is for open circuit current
T6 G12 base metal halide, 39w and 70w

Amerlux reserves the right to change details that do not affect overall function and performance.

AMERLUX®
LIGHTING SOLUTIONS
ADAPT. ABILITY.™

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Finish	Mounting	Voltage	Beam Spreads	Options/ Accessories
MTB	39 70	T6	E - electronic	WT - white textured BT - black textured ST - silver textured ___ - ___ (other RAL)	TS1 - T931 1cir 120v TS21 - Power Source 2cir/2neut 120v TS31 - Power Source 3cir 120v TS22 - Amerlux 2cir/2neut 277v TN1 - Global 1cir 120v TEK - Global 2cir/2neut 120v TN3 - Global 3cir 120v TN2 - Global 2cir/2neut 277v C - canopy B - busway CCL - C-clamp ___ - ___ (other)	120 277	CL - spot NF - narrow flood FL - flood WF - wide flood SL - linear spread lens	SUN - sunrise optic reflector GOLD - ferric gold optic reflector HEX - hexcell louver (⅛" x ⅛") CB - cross blade, ¾" depth (specify finish)

Example: MTB-39-T6-E-WT-TN1-120-CL

Cat #: **MTB-39-T6-E-WT-FL**

MINI THEATRICAL BELL

T6 METAL HALIDE

M.T.B.
T6 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

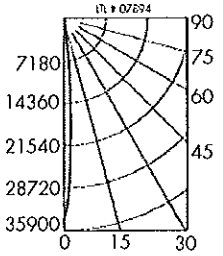
TYPE: **KOHLS TYPE FL**

FIXTURE DATA:

Complete photometric data (.ies format) available upon request.

39W T6 MH

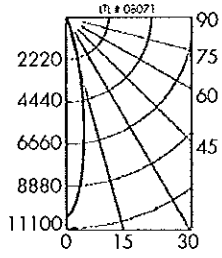
Spot Distribution
LTL # 07694



Candelas at Nadir

Deg	Candela
0	33724
5	11905
15	714
25	332
35	141
45	0

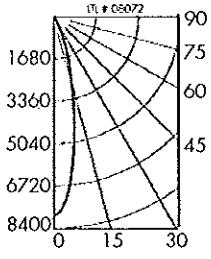
Narrow Flood Distribution
LTL # 08071



Candelas at Nadir

Deg	Candela
0	10455
5	8638
15	2484
25	371
35	75
45	23

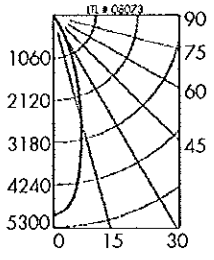
Flood Distribution
LTL # 08072



Candelas at Nadir

Deg	Candela
0	7883
5	6829
15	2723
25	739
35	136
45	23

Wide Flood Distribution
LTL # 08073

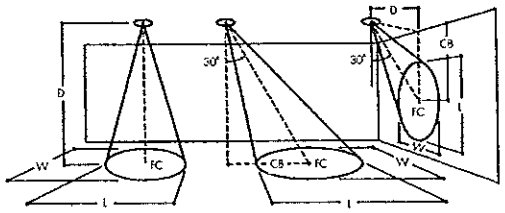


Candelas at Nadir

Deg	Candela
0	4985
5	4738
15	2698
25	1057
35	207
45	23

APPLICATION DATA:

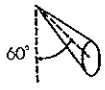
Notes and Definitions:
Beam spread is to 50% center beam candlepower (CBCP).
D=Distance to floor or wall.
FC=Footcandles on floor or wall at center beam aiming location.
L=Effective Visual Beam length in feet (50% of maximum footcandle level).
W=Effective Visual Beam width in feet (50% of maximum footcandle level).
CB=Distance across or down to center beam location.



0° Aiming Angle Horizontal Footcandles

30° Aiming Angle Horizontal Footcandles

30° Aiming Angle Vertical Footcandles



60° Aiming Angle Vertical Footcandles

	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
SPOT	5.0'	1348	1.0	1.0	5.0'	804	1.1	1.0	3.0	3.0'	451	1.7	0.8	5.3	3.0'	2379	0.6	0.5	1.8
	7.5'	599	1.2	1.2	7.5'	337	1.7	1.2	4.0	4.0'	269	2.1	1.1	6.8	4.0'	1344	0.7	0.6	2.3
	10.0'	337	1.4	1.4	10.0'	201	2.1	1.6	6.0	5.0'	171	2.7	1.4	8.2	5.0'	833	1.0	0.8	2.8
	12.5'	215	1.7	1.7	12.5'	137	2.4	2.0	7.0	6.0'	118	3.2	1.7	10.2	6.0'	553	1.2	1.0	3.3
NARROW FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	418	1.7	1.7	5.0'	258	2.4	2.1	3.0	3.0'	181	3.1	1.9	4.2	3.0'	744	1.4	1.3	1.8
	7.5'	185	2.7	2.7	7.5'	122	3.4	3.1	4.0	4.0'	101	4.2	2.5	5.7	4.0'	426	1.8	1.6	2.3
	10.0'	104	3.5	3.5	10.0'	67	4.6	4.0	5.0	5.0'	65	5.3	3.2	7.2	5.0'	274	2.3	2.0	2.7
	12.5'	67	4.3	4.3	12.5'	44	5.6	5.0	7.0	6.0'	45	6.3	3.8	8.2	6.0'	190	2.7	2.4	3.3
FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	315	2.0	2.0	5.0'	196	2.7	2.4	3.0	3.0'	143	3.6	2.1	4.2	3.0'	562	1.6	1.4	1.8
	7.5'	140	3.1	3.1	7.5'	94	3.8	3.4	4.0	4.0'	81	4.8	2.8	5.2	4.0'	323	2.1	1.8	2.2
	10.0'	79	3.9	3.9	10.0'	52	5.1	4.5	5.0	5.0'	52	5.9	3.5	6.7	5.0'	208	2.6	2.3	2.7
	12.5'	51	5.0	5.0	12.5'	33	6.4	5.6	7.0	6.0'	36	7.2	4.2	8.3	6.0'	145	3.1	2.7	3.2
WIDE FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	199	2.8	2.8	5.0'	135	3.4	3.0	2.0	3.0'	111	3.7	2.6	3.7	3.0'	383	2.0	1.7	1.2
	7.5'	89	3.9	3.9	7.5'	60	5.0	4.5	4.0	4.0'	64	4.9	3.4	4.8	4.0'	218	2.6	2.3	1.7
	10.0'	50	5.3	5.3	10.0'	35	6.6	5.9	5.0	5.0'	41	6.1	4.2	5.8	5.0'	140	3.3	2.9	2.3
	12.5'	32	6.6	6.6	12.5'	22	8.2	7.3	6.0	6.0'	28	7.3	5.0	7.2	6.0'	98	3.9	3.5	2.7

LITHONIA LIGHTING®

Catalog Number	
S-1-25-277-TUBI	
Notes	Type L3-AD3

FEATURES & SPECIFICATIONS

INTENDED USE

Intended for unit or row installations, surface or suspended mounting.

ATTRIBUTES

Designed exclusively for use with T8 lamps, electronic ballasts and sockets.

CONSTRUCTION

Standard channel, die formed from Code-guage steel.

Sturdy Channel cover secured by captive quarter turnlatch for easy access to wireway.

End plate and channel connector furnished with each fixture.

Housing formed from Cold rolled steel.

FINISH

Five Stage iron-phosphate pretreatment ensures superior paint adhesion and rust resistance.

Painted parts finished with high-gloss, baked white polyester.

ELECTRICAL SYSTEM

Thermally-protected, resetting, Class P, UL Listed, CSA Certified ballast is standard.

Available in Tandem wired lengths.

Luminaire is suitable for damp locations. AWM, TFN or THHN wire used throughout, rated for required temperatures.

LISTING

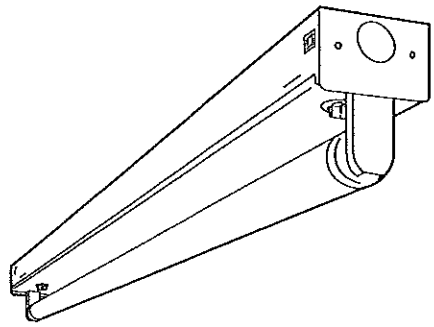
UL Listed to US and Canadian safety standards. Optional: Mexico NOM.

WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

Standard Strip

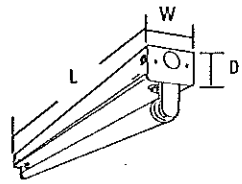
S



Linear Lamp and Compact Fluorescent
1 Lamp

Specifications

Length: 18 (457), 24 (610)
36 (914), 48 (1219)
72 (1829) or 96 (2438)
Width: 2-3/4 (70)
Depth: 1-3/4 (45)
All dimensions are inches (millimeters).



ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**
Example: S 1 32 MVOLT GEB10IS

S	1	25	277	TUBI
Series	Number of lamps	Lamp type	Voltage	Options

Series	Number of lamps	Lamp type	Voltage	Options
S Standard strip[1]	**1**	25 25W T8 (36")	120	**GEB10IS T8 electronic ballast, ≤ 10% THD, instant start (T8 only)**
For tandem double-length unit, add prefix T. Example: TS	Not included	CF27 27W TT5 (15")	277	GEB10RS T8 electronic ballast, ≤ 10% THD, rapid start
		17 17W T8 (24")	347	BILP IS High-efficiency .78 bf (low)
		32 32W T8 (48")	**MVOLT**	GEB Electronic ballasts, ≤20% THD.
		CF39 39W TT5 (18")	Others available	GLR Internal fast-blow fuse (add X for external)
		CF40 40W TT5 (24")		GMF Internal slow-blow fuse (add X for external)
		50T8 40W T8 (60")		CS3 6' cordset, NEMA L5-15P SJT, twist-lock plug, 120V
				PLF__ Plug in wiring, specify number of branch circuits and hot wires (A-black, B-Red, C-Blue, AB or AC)
				NOM NOM Certified

Accessories

Order as separate catalog numbers.

SQ_	Swivel-stem hanger (specify length in 2" increments).
1B	Ceiling spacer (adjusts from 1-1/2" to 2-1/2" from ceiling).
WGS	Wireguard, 4' white, for unshielded S strip.[1]
WGSSMR	Wireguard, 4' white, for S strip with SSMR reflector.[1]
WGSASR	Wireguard, 4' white, for S strip with SASR reflector.[1]
SSMR 48WH	Symmetric reflector, 4' white. [1]
SASR 48WH	Asymmetric reflector, 4' white.[1]
S48WG	Wireguard, 4' white, Canada only
SSMRCF 24WH	Symmetric reflector, 2' white.*
SASRCF 24WH	Asymmetric reflector, 2' white.*
TSASRCF 24WH	Asymmetric reflector, 2' white, for TS 1 CF18.*

*Other lengths available. Replace 24 in catalog number with length in inches. Other finishes available. Replace WH in catalog number with SSR or other finish.

NOTES:
1 Order two for 8' fixtures.

S Strip, Rapid Start

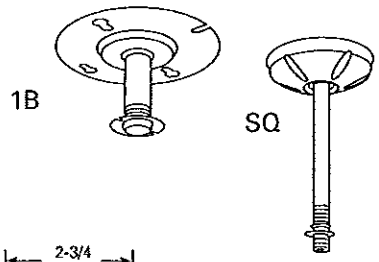
MOUNTING DATA

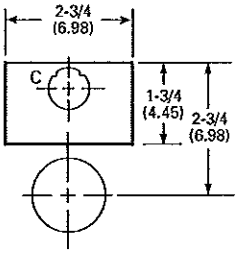
For unit or row installation, surface or stem mounting.

Unit installation — Minimum of two hangers required.

Row installation — One hanger per channel plus one per row required.

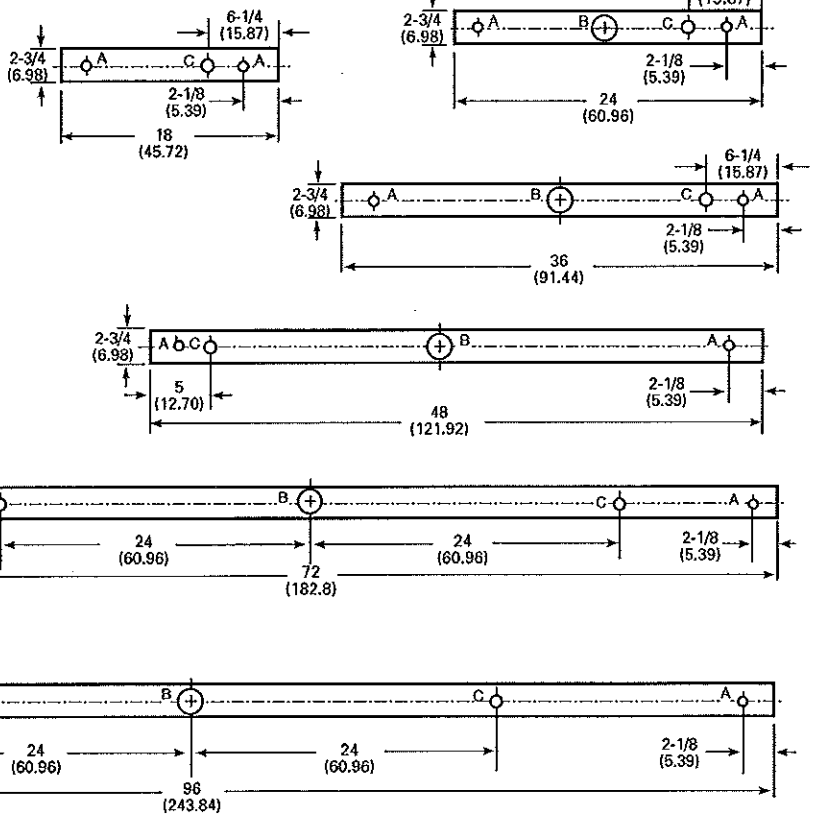
See ACCESSORIES below for hanging devices.





A = 11/16 (1.74) Dia. K.O.
B = 2 (5.08) Dia. K.O.
C = 7/8 (2.22) Dia. K.O.

DIMENSIONS



PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedure. Floor reflectances are 20%. Lamp configurations shown are typical. Full photometric data on these and other configurations available upon request.

S 1 32
Report LTL 5725
S/MH (along) 1.2 (across) 1.6

Coefficient of Utilization

Ceiling	80%			70%			50%		
Wall	70%	50%	30%	70%	50%	30%	50%	30%	10%
1	97	91	86	92	87	82	79	75	72
2	87	77	70	82	74	67	67	61	56
3	78	67	58	74	64	56	58	52	46
4	71	59	50	67	56	48	51	44	38
5	65	51	42	61	49	41	45	37	32
10	43	30	22	41	28	21	26	20	15

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixture
0-30	388	13.4	13.9
0-40	660	22.8	23.7
0-60	1307	45.1	46.9
0-90	2176	75.0	78.1
90-180	609	21.0	21.9
0-180	2786	96.1	100.0

Energy (Calculated in accordance with NEMA standard LE-5)

LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	INPUT WATTS
94.7	$2.53	(1) F3278/735	2800	.88	25

* Comparative yearly lighting energy cost per 1000 lumens

LITHONIA LIGHTING®
An AcuityBrands Company

Sheet #: S-TT5-T8

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 800-858-7763
www.lithonia.com

LITHONIA LIGHTING®

Catalog Number	
S-1-32-277-TUBI	
Notes	Type L4AD4

FEATURES & SPECIFICATIONS

INTENDED USE

Intended for unit or row installations, surface or suspended mounting.

ATTRIBUTES

Designed exclusively for use with T8 lamps, electronic ballasts and sockets.

CONSTRUCTION

Standard channel, die formed from Code-guage steel.

Sturdy Channel cover secured by captive quarter turnlatch for easy access to wireway.

End plate and channel connector furnished with each fixture.

Housing formed from Cold rolled steel.

FINISH

Five Stage iron-phosphate pretreatment ensures superior paint adhesion and rust resistance.

Painted parts finished with high-gloss, baked white polyester.

ELECTRICAL SYSTEM

Thermally-protected, resetting, Class P, UL Listed, CSA Certified ballast is standard.

Available in Tandem wired lengths.

Luminaire is suitable for damp locations. AWM, TFN or THHN wire used throughout, rated for required temperatures.

LISTING

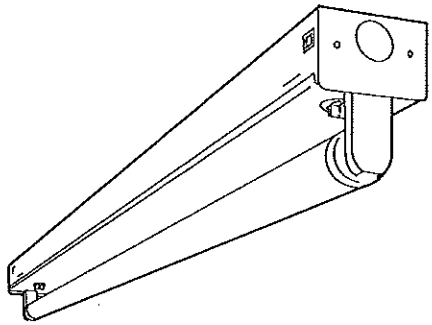
UL Listed to US and Canadian safety standards. Optional: Mexico NOM.

WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

Standard Strip

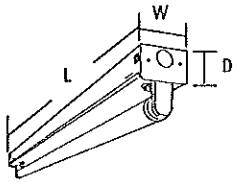
S



Linear Lamp and Compact Fluorescent
1 Lamp

Specifications

Length: 18 (457), 24 (610)
36 (914), 48 (1219)
72 (1829) or 96 (2438)
Width: 2-3/4 (70)
Depth: 1-3/4 (45)
All dimensions are inches (millimeters).



ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**
Example: S 1 32 MVOLT GEB10IS

S	1	25	277	TUBI
Series	Number of lamps	Lamp type	Voltage	Options

S Standard strip[1]
For tandem double-length unit, add prefix T. Example: TS

1
Not included

25 25W T8 (36")
CF27 27W TT5 (15")
17 17W T8 (24")
32 32W T8 (48")
CF39 39W TT5 (18")
CF40 40W TT5 (24")
50T8 40W T8 (60")

120
277
347
MVOLT
Others available

GEB10IS T8 electronic ballast, ≤ 10% THD, instant start (T8 only)
GEB10RS T8 electronic ballast, ≤ 10% THD, rapid start
BILP IS High-efficiency .78 bf (low)
GEB Electronic ballasts, ≤20% THD.
GLR Internal fast-blow fuse (add X for external)
GMF Internal slow-blow fuse (add X for external)
CS3 6' cordset, NEMA L5-15P SJT, twist-lock plug, 120V
PLF__ Plug in wiring, specify number of branch circuits and hot wires (A-black, B-Red, C-Blue, AB or AC)
NOM NOM Certified

Accessories

Order as separate catalog numbers.

SQ_ Swivel-stem hanger (specify length in 2" increments).
1B Ceiling spacer (adjusts from 1-1/2" to 2-1/2" from ceiling).
WGS Wireguard, 4' white, for unshielded S strip.[1]
WGSSMR Wireguard, 4' white, for S strip with SSMR reflector.[1]
WGSASR Wireguard, 4' white, for S strip with SASR reflector.[1]
SSMR 48WH Symmetric reflector, 4' white. [1]
SASR 48WH Asymmetric reflector, 4' white.[1]
S48WG Wireguard, 4' white, Canada only
SSMRCF 24WH Symmetric reflector, 2' white.*
SASRCF 24WH Asymmetric reflector, 2' white.*
TSASRCF 24WH Asymmetric reflector, 2' white, for TS 1 CF18.*
*Other lengths available. Replace 24 in catalog number with length in inches. Other finishes available. Replace WH in catalog number with SSR or other finish.

NOTES:
1 Order two for 8' fixtures.

S Strip, Rapid Start

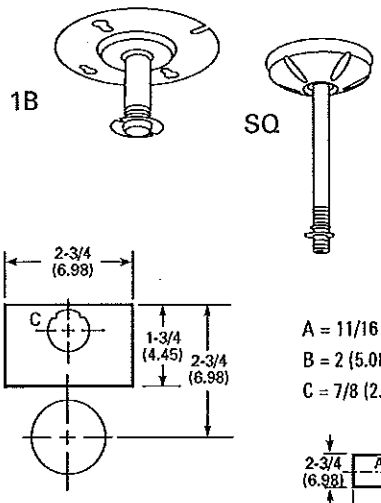
MOUNTING DATA

For unit or row installation, surface or stem mounting.

Unit installation — Minimum of two hangers required.

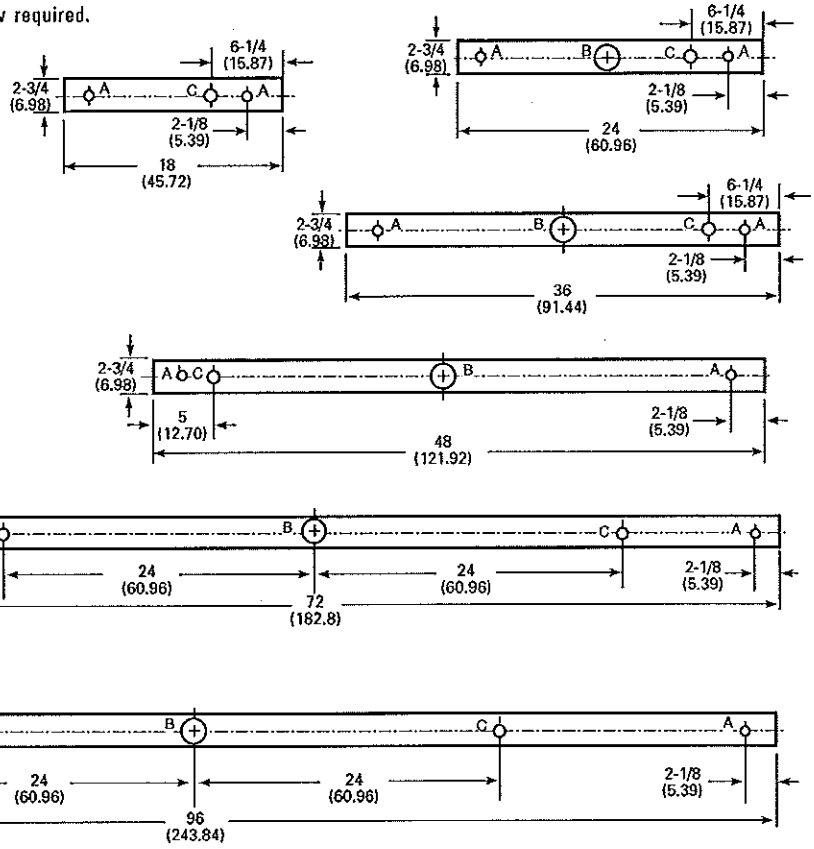
Row installation — One hanger per channel plus one per row required.

See ACCESSORIES below for hanging devices.



A = 11/16 (1.74) Dia. K.O.
B = 2 (5.08) Dia. K.O.
C = 7/8 (2.22) Dia. K.O.

DIMENSIONS



PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedure. Floor reflectances are 20%. Lamp configurations shown are typical. Full photometric data on these and other configurations available upon request.

S 1 32
Report LTL 5725
S/MH (along) 1.2 (across) 1.6
Coefficient of Utilization

Ceiling	80%			70%			50%		
Wall	70%	50%	30%	70%	50%	30%	50%	30%	10%
1	97	91	86	92	87	82	79	75	72
2	87	77	70	82	74	67	67	61	56
3	78	67	58	74	64	56	58	52	46
4	71	59	50	67	56	48	51	44	38
5	65	51	42	61	49	41	45	37	32
10	43	30	22	41	28	21	26	20	15

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixture
0-30	388	13.4	13.9
0-40	660	22.8	23.7
0-60	1307	45.1	46.9
0-90	2176	75.0	78.1
90-180	609	21.0	21.9
0-180	2786	96.1	100.0

Energy (Calculated in accordance with NEMA standard LE-5)

LER.FL	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	INPUT WATTS
94.7	$2.53	(1) F3278/735	2800	.88	25

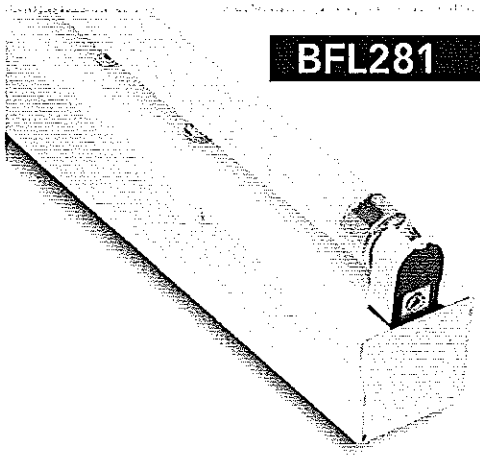
* Comparative yearly lighting energy cost per 1000 lumens

LITHONIA LIGHTING®
An AcuityBrands Company

Sheet #: S-TT5-T8

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 800-858-7763
www.lithonia.com

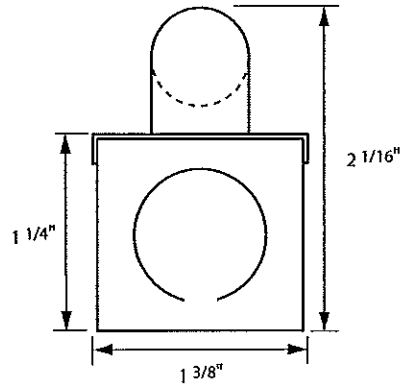
type : LC2



BFL281

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent architectural fixture with integral ballast



SPECIFICATIONS

- Fully assembled housing is formed and welded, 20 ga. steel, chemically treated to resist corrosion and enhance paint adhesion
- Standard finish is high reflectance white powder coat, applied post production
- Knock-outs accept standard electrical fittings (by others)
- Rotational locking lamp holders
- Available for T5 8W, 13W, 14W, 21W, 28W, 35W and high output 24W, 39W, 54W, 80W linear fluorescent lamps
- Standard 120V or 277V electronic high power factor ballast is pre-wired to the lamp holders (consult factory for other voltage options)
- Dimming ballast options available **(consult factory for availability and system compatibility)**
- UL and C-UL listed for dry and damp locations
- IBEW

SPECIFICATION/ORDER FORMAT

catalog no.	voltage	options
BFL281-8	/120	Dimming -
BFL281-13	/277	*(consult factory or power*
BFL281-14	*(consult factory for*	*supply section for cata-*
BFL281-21	*other voltages)*	*log number)*
BFL281-28		/DL - damp location
BFL281-35		/CU - custom finish
BFL281-24		*(consult factory)*
BFL281-39		
BFL281-54		
BFL281-80		

DIMENSION INFORMATION

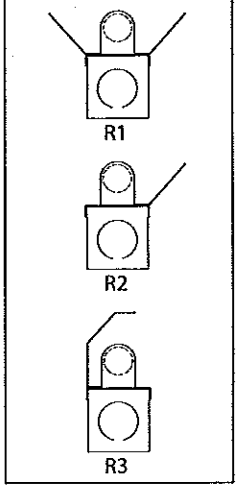
lamp	O.A. length
8w T5	12 3/16"
13w T5	21 1/4"
14w T5	22 1/2"
21w T5	34 1/4"
28w T5	46 1/16"
35w T5	57 15/16"
24w T5 HO	22 1/2"
39w T5 HO	34 1/4"
54w T5 HO	46 1/16"
80w T5 HO	57 15/16"

bartco LIGHTING
leading the way and lighting it
tel 714.230.3200 fax 714.230.3222
bartcoLIGHTING.com

type :

BFL281 ACCESSORIES

REFLECTORS



Standard finish on all reflectors is high reflectance white powder coat

- 281-R1-6 Symmetrical Reflector For BFL281-6
- 281-R1-8 Symmetrical Reflector For BFL281-8
- 281-R1-13 Symmetrical Reflector For BFL281-13
- 281-R1-14 Symmetrical Reflector For BFL281-14
- 281-R1-21 Symmetrical Reflector For BFL281-21
- 281-R1-28 Symmetrical Reflector For BFL281-28
- 281-R1-35 Symmetrical Reflector For BFL281-35
- 281-R1-24 Symmetrical Reflector For BFL281-24
- 281-R1-39 Symmetrical Reflector For BFL281-39
- 281-R1-54 Symmetrical Reflector For BFL281-54
- 281-R1-80 Symmetrical Reflector For BFL281-80
- 281-R2-6 Asymmetrical Reflector For BFL281-6
- 281-R2-8 Asymmetrical Reflector For BFL281-8
- 281-R2-13 Asymmetrical Reflector For BFL281-13
- 281-R2-14 Asymmetrical Reflector For BFL281-14
- 281-R2-21 Asymmetrical Reflector For BFL281-21
- 281-R2-28 Asymmetrical Reflector For BFL281-28
- 281-R2-35 Asymmetrical Reflector For BFL281-35
- 281-R2-24 Asymmetrical Reflector For BFL281-24
- 281-R2-39 Asymmetrical Reflector For BFL281-39
- 281-R2-54 Asymmetrical Reflector For BFL281-54
- 281-R2-80 Asymmetrical Reflector For BFL281-80
- 281-R3-6 Inside Asymmetrical Reflector For BFL281-6
- 281-R3-8 Inside Asymmetrical Reflector For BFL281-8
- 281-R3-13 Inside Asymmetrical Reflector For BFL281-13
- 281-R3-14 Inside Asymmetrical Reflector For BFL281-14
- 281-R3-21 Inside Asymmetrical Reflector For BFL281-21
- 281-R3-28 Inside Asymmetrical Reflector For BFL281-28
- 281-R3-35 Inside Asymmetrical Reflector For BFL281-35
- 281-R3-24 Inside Asymmetrical Reflector For BFL281-24
- 281-R3-39 Inside Asymmetrical Reflector For BFL281-39
- 281-R3-54 Inside Asymmetrical Reflector For BFL281-54
- 281-R3-80 Inside Asymmetrical Reflector For BFL281-80

MOUNTING CLIPS

- MC281 Pair mounting clips *(for glass to glass case mounting)*

LENSES

One piece polycarbonate striated snap-on cover with end caps

- LNC Clear Lens *(sold by the foot)* ___ft
- LNO Opal Lens *(sold by the foot)* ___ft

LENSES

Two piece system comprised of a polycarbonate channel and striated snap-on cover

- U5LNC Universal Clear Lens *(sold by the foot)* ___ft
- U5LNO Universal Opal Lens *(sold by the foot)* ___ft

TUBE GUARD

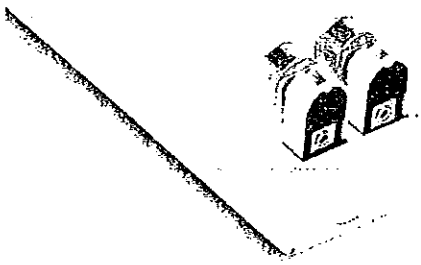
- TG Tube Guard *(sold by the foot)* ___ft

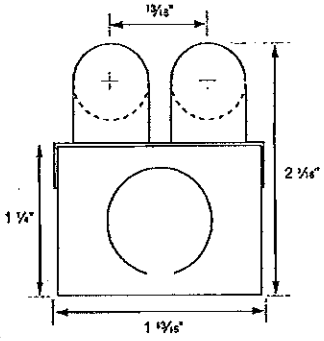
type :

BFL282

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent two lamp top mount architectural fixture with integral ballast





SPECIFICATIONS

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- Standard finish is high reflectance white powder coat, applied post production
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- Rotational locking lamp holders
- Available for two T5 8W, 13W, 14W, 21W, 28W, 35W and high output 24W, 39W, 54W, 80W linear fluorescent lamps
- Standard 120V or 277V electronic high power factor ballast is pre-wired to the lamp holders (consult factory for other voltage options)
- Dimming ballast and emergency battery back up options available (consult factory for availability and system compatibility)
- UL and C-UL listed for dry and damp locations
- IBEW

SPECIFICATION/ORDER FORMAT

catalog no.	voltage	options
BFL282-8	/120	Dimming –
BFL282-13	/277	*(consult factory or power*
BFL282-14	(consult factory for	*supply section for*
BFL282-21	other voltages)	*catalog number)*
BFL282-28		Emergency Ballast –
BFL282-35		*(consult factory or power*
BFL282-24		*supply section for*
BFL282-39		*catalog number)*
BFL282-54		/DL - damp location
BFL282-80		/CU - custom finish
		(consult factory)

DIMENSION INFORMATION

lamp	O.A. length
2 x 8w T5	12 13/16"
2 x 13w T5	21 1/4"
2 x 14w T5	22 1/2"
2 x 21w T5	34 1/4"
2 x 28w T5	46 1/16"
2 x 35w T5	57 15/16"
2 x 24w T5 HO	22 1/2"
2 x 39w T5 HO	34 1/4"
2 x 54w T5 HO	46 1/16"
2 x 80w T5 HO	57 15/16"

LIGHTING

tel 714.230.3200 fax 714.230.3222

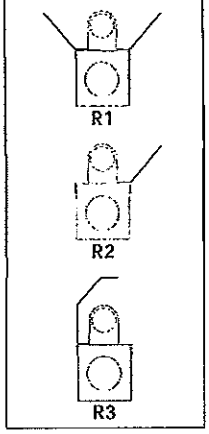
bartcoLIGHTING.com

type :

BFL282

ACCESSORIES

REFLECTORS



Standard finish on all reflectors is high reflectance white powder coat

282-R1-6	Symmetrical Reflector For BFL282-6
282-R1-8	Symmetrical Reflector For BFL282-8
282-R1-13	Symmetrical Reflector For BFL282-13
282-R1-14	Symmetrical Reflector For BFL282-14
282-R1-21	Symmetrical Reflector For BFL282-21
282-R1-28	Symmetrical Reflector For BFL282-28
282-R1-35	Symmetrical Reflector For BFL282-35
282-R1-24	Symmetrical Reflector For BFL282-24
282-R1-39	Symmetrical Reflector For BFL282-39
282-R1-54	Symmetrical Reflector For BFL282-54
282-R1-80	Symmetrical Reflector For BFL282-80
282-R2-6	Asymmetrical Reflector For BFL282-6
282-R2-8	Asymmetrical Reflector For BFL282-8
282-R2-13	Asymmetrical Reflector For BFL282-13
282-R2-14	Asymmetrical Reflector For BFL282-14
282-R2-21	Asymmetrical Reflector For BFL282-21
282-R2-28	Asymmetrical Reflector For BFL282-28
282-R2-35	Asymmetrical Reflector For BFL282-35
282-R2-24	Asymmetrical Reflector For BFL282-24
282-R2-39	Asymmetrical Reflector For BFL282-39
282-R2-54	Asymmetrical Reflector For BFL282-54
282-R2-80	Asymmetrical Reflector For BFL282-80
282-R3-6	Inside Asymmetrical Reflector For BFL282-6
282-R3-8	Inside Asymmetrical Reflector For BFL282-8
282-R3-13	Inside Asymmetrical Reflector For BFL282-13
282-R3-14	Inside Asymmetrical Reflector For BFL282-14
282-R3-21	Inside Asymmetrical Reflector For BFL282-21
282-R3-28	Inside Asymmetrical Reflector For BFL282-28
282-R3-35	Inside Asymmetrical Reflector For BFL282-35
282-R3-24	Inside Asymmetrical Reflector For BFL282-24
282-R3-39	Inside Asymmetrical Reflector For BFL282-39
282-R3-54	Inside Asymmetrical Reflector For BFL282-54
282-R3-80	Inside Asymmetrical Reflector For BFL282-80

TUBE GUARD

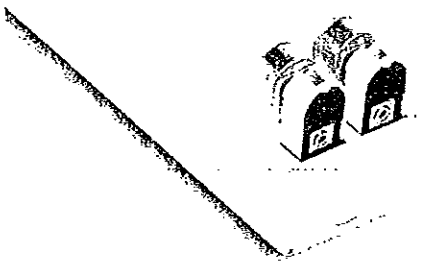
TG	Tube Guard *(sold by the foot)*	___ft

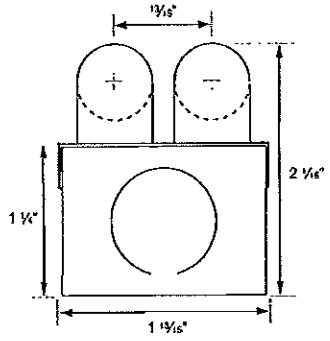
type :

BFL282

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent two lamp top mount architectural fixture with integral ballast





SPECIFICATIONS

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- Standard finish is high reflectance white powder coat, applied post production
- Knock-outs accept standard electrical fittings (by others)
- Rotational locking lamp holders
- Available for two T5 8W, 13W, 14W, 21W, 28W, 35W and high output 24W, 39W, 54W, 80W linear fluorescent lamps
- Standard 120V or 277V electronic high power factor ballast is pre-wired to the lamp holders (consult factory for other voltage options)
- Dimming ballast and emergency battery back up options available (consult factory for availability and system compatibility)
- UL and C-UL listed for dry and damp locations
- IBEW

SPECIFICATION/ORDER FORMAT

catalog no.	voltage	options
BFL282-8	/120	Dimming –
BFL282-13	/277	*(consult factory or power*
BFL282-14	(consult factory for	*supply section for*
BFL282-21	other voltages)	*catalog number)*
BFL282-28		Emergency Ballast –
BFL282-35		*(consult factory or power*
BFL282-24		*supply section for*
BFL282-39		*catalog number)*
BFL282-54		/DL - damp location
BFL282-80		/CU - custom finish
		(consult factory)

DIMENSION INFORMATION

lamp	O.A. length
2 x 8w T5	12 13/16"
2 x 13w T5	21 1/4"
2 x 14w T5	22 1/2"
2 x 21w T5	34 1/4"
2 x 28w T5	46 1/16"
2 x 35w T5	57 15/16"
2 x 24w T5 HO	22 1/2"
2 x 39w T5 HO	34 1/4"
2 x 54w T5 HO	46 1/16"
2 x 80w T5 HO	57 15/16"

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leading the way and lighting it

tel 714.230.3200 fax 714.230.3222

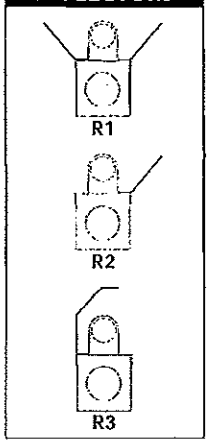
bartcoLIGHTING.com

type :

BFL282

ACCESSORIES

REFLECTORS



Standard finish on all reflectors is high reflectance white powder coat

◗ 282-R1-6	Symmetrical Reflector For BFL282-6
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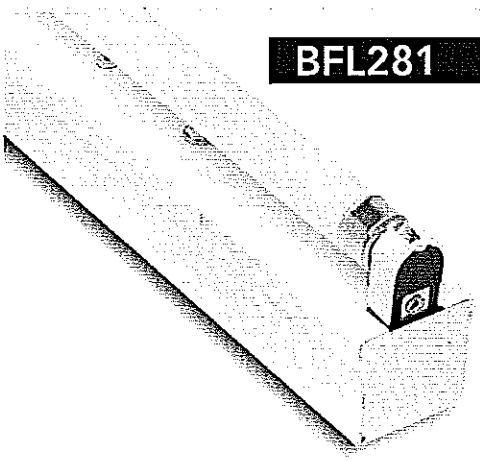
◗ 282-R1-13	Symmetrical Reflector For BFL282-13
◗ 282-R1-14	Symmetrical Reflector For BFL282-14
◗ 282-R1-21	Symmetrical Reflector For BFL282-21
◗ 282-R1-28	Symmetrical Reflector For BFL282-28
◗ 282-R1-35	Symmetrical Reflector For BFL282-35
◗ 282-R1-24	Symmetrical Reflector For BFL282-24
◗ 282-R1-39	Symmetrical Reflector For BFL282-39
◗ 282-R1-54	Symmetrical Reflector For BFL282-54
◗ 282-R1-80	Symmetrical Reflector For BFL282-80
◗ 282-R2-6	Asymmetrical Reflector For BFL282-6
◗ 282-R2-8	Asymmetrical Reflector For BFL282-8
◗ 282-R2-13	Asymmetrical Reflector For BFL282-13
◗ 282-R2-14	Asymmetrical Reflector For BFL282-14
◗ 282-R2-21	Asymmetrical Reflector For BFL282-21
◗ 282-R2-28	Asymmetrical Reflector For BFL282-28
◗ 282-R2-35	Asymmetrical Reflector For BFL282-35
◗ 282-R2-24	Asymmetrical Reflector For BFL282-24
◗ 282-R2-39	Asymmetrical Reflector For BFL282-39
◗ 282-R2-54	Asymmetrical Reflector For BFL282-54
◗ 282-R2-80	Asymmetrical Reflector For BFL282-80
◗ 282-R3-6	Inside Asymmetrical Reflector For BFL282-6
◗ 282-R3-8	Inside Asymmetrical Reflector For BFL282-8
◗ 282-R3-13	Inside Asymmetrical Reflector For BFL282-13
◗ 282-R3-14	Inside Asymmetrical Reflector For BFL282-14
◗ 282-R3-21	Inside Asymmetrical Reflector For BFL282-21
◗ 282-R3-28	Inside Asymmetrical Reflector For BFL282-28
◗ 282-R3-35	Inside Asymmetrical Reflector For BFL282-35
◗ 282-R3-24	Inside Asymmetrical Reflector For BFL282-24
◗ 282-R3-39	Inside Asymmetrical Reflector For BFL282-39
◗ 282-R3-54	Inside Asymmetrical Reflector For BFL282-54
◗ 282-R3-80	Inside Asymmetrical Reflector For BFL282-80

TUBE GUARD

◗ TG	Tube Guard *(sold by the foot)*	___ft

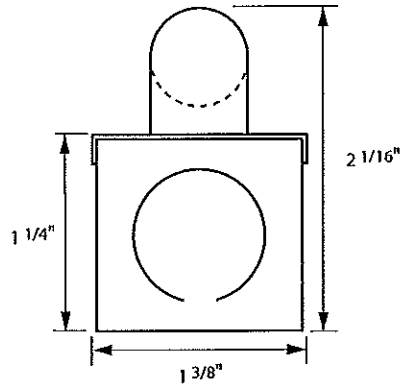
type : LJ2



BFL281

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent architectural fixture
with integral ballast



SPECIFICATIONS

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- Available for T5 8W, 13W, 14W, 21W, 28W, 35W and high output 24W, 39W, 54W, 80W linear fluorescent lamps
- Standard 120V or 277V electronic high power factor ballast is pre-wired to the lamp holders (consult factory for other voltage options)
- Dimming ballast options available **(consult factory for availability and system compatibility)**
- UL and C-UL listed for dry and damp locations
- IBEW

SPECIFICATION/ORDER FORMAT

catalog no.	voltage	options
BFL281-8	/120	Dimming -
BFL281-13	/277	*(consult factory or power*
BFL281-14	*(consult factory for*	*supply section for cata-*
BFL281-21	*other voltages)*	*log number)*
BFL281-28		/DL - damp location
BFL281-35		/CU - custom finish
BFL281-24		*(consult factory)*
BFL281-39		
BFL281-54		
BFL281-80		

DIMENSION INFORMATION

lamp	O.A. length
8w T5	12 3/16"
13w T5	21 1/4"
14w T5	22 1/2"
21w T5	34 1/4"
28w T5	46 1/16"
35w T5	57 15/16"
24w T5 HO	22 1/2"
39w T5 HO	34 1/4"
54w T5 HO	46 1/16"
80w T5 HO	57 15/16"

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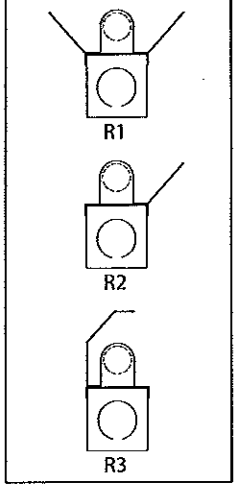
type :

BFL281

ACCESSORIES

REFLECTORS



Standard finish on all reflectors is high reflectance white powder coat

◗ 281-R1-6	Symmetrical Reflector For BFL281-6
◗ 281-R1-8	Symmetrical Reflector For BFL281-8
◗ 281-R1-13	Symmetrical Reflector For BFL281-13
◗ 281-R1-14	Symmetrical Reflector For BFL281-14
◗ 281-R1-21	Symmetrical Reflector For BFL281-21
◗ 281-R1-28	Symmetrical Reflector For BFL281-28
◗ 281-R1-35	Symmetrical Reflector For BFL281-35
◗ 281-R1-24	Symmetrical Reflector For BFL281-24
◗ 281-R1-39	Symmetrical Reflector For BFL281-39
◗ 281-R1-54	Symmetrical Reflector For BFL281-54
◗ 281-R1-80	Symmetrical Reflector For BFL281-80
◗ 281-R2-6	Asymmetrical Reflector For BFL281-6
◗ 281-R2-8	Asymmetrical Reflector For BFL281-8
◗ 281-R2-13	Asymmetrical Reflector For BFL281-13
◗ 281-R2-14	Asymmetrical Reflector For BFL281-14
◗ 281-R2-21	Asymmetrical Reflector For BFL281-21
◗ 281-R2-28	Asymmetrical Reflector For BFL281-28
◗ 281-R2-35	Asymmetrical Reflector For BFL281-35
◗ 281-R2-24	Asymmetrical Reflector For BFL281-24
◗ 281-R2-39	Asymmetrical Reflector For BFL281-39
◗ 281-R2-54	Asymmetrical Reflector For BFL281-54
◗ 281-R2-80	Asymmetrical Reflector For BFL281-80
◗ 281-R3-6	Inside Asymmetrical Reflector For BFL281-6
◗ 281-R3-8	Inside Asymmetrical Reflector For BFL281-8
◗ 281-R3-13	Inside Asymmetrical Reflector For BFL281-13
◗ 281-R3-14	Inside Asymmetrical Reflector For BFL281-14
◗ 281-R3-21	Inside Asymmetrical Reflector For BFL281-21
◗ 281-R3-28	Inside Asymmetrical Reflector For BFL281-28
◗ 281-R3-35	Inside Asymmetrical Reflector For BFL281-35
◗ 281-R3-24	Inside Asymmetrical Reflector For BFL281-24
◗ 281-R3-39	Inside Asymmetrical Reflector For BFL281-39
◗ 281-R3-54	Inside Asymmetrical Reflector For BFL281-54
◗ 281-R3-80	Inside Asymmetrical Reflector For BFL281-80

MOUNTING CLIPS

◗ MC281 — Pair mounting clips *(for glass to glass case mounting)*

LENSES

One piece polycarbonate striated snap-on cover with end caps

◗ LNC	Clear Lens *(sold by the foot)*	___ft
◗ LNO	Opal Lens *(sold by the foot)*	___ft

LENSES

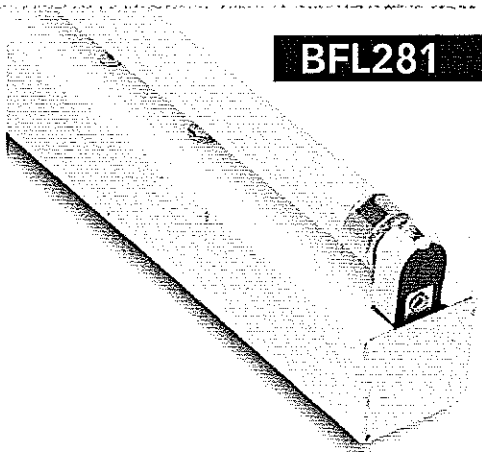
Two piece system comprised of a polycarbonate channel and striated snap-on cover

◗ U5LNC	Universal Clear Lens *(sold by the foot)*	___ft
◗ U5LNO	Universal Opal Lens *(sold by the foot)*	___ft

TUBE GUARD

◗ TG — Tube Guard *(sold by the foot)* ___ft

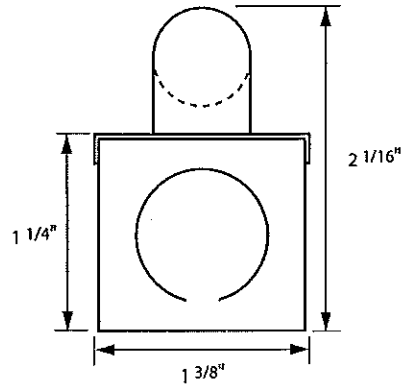
type : LC3



BFL281

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent architectural fixture with integral ballast



SPECIFICATIONS

- Fully assembled housing is formed and welded, 20 ga. steel, chemically treated to resist corrosion and enhance paint adhesion
- Standard finish is high reflectance white powder coat, applied post production
- Knock-outs accept standard electrical fittings (by others)
- Rotational locking lamp holders
- Available for T5 8W, 13W, 14W, 21W, 28W, 35W and high output 24W, 39W, 54W, 80W linear fluorescent lamps
- Standard 120V or 277V electronic high power factor ballast is pre-wired to the lamp holders (consult factory for other voltage options)
- Dimming ballast options available **(consult factory for availability and system compatibility)**
- UL and C-UL listed for dry and damp locations
- IBEW

SPECIFICATION/ORDER FORMAT

catalog no.	voltage	options
BFL281-8	/120	Dimming -
BFL281-13	/277	*(consult factory or power*
BFL281-14	*(consult factory for*	*supply section for cata-*
BFL281-21	*other voltages)*	*log number)*
BFL281-28		/DL - damp location
BFL281-35		/CU - custom finish
BFL281-24		*(consult factory)*
BFL281-39		
BFL281-54		
BFL281-80		

DIMENSION INFORMATION

lamp	O.A. length
8w T5	12 3/16"
13w T5	21 1/4"
14w T5	22 1/2"
21w T5	34 1/4"
28w T5	46 1/16"
35w T5	57 15/16"
24w T5 HO	22 1/2"
39w T5 HO	34 1/4"
54w T5 HO	46 1/16"
80w T5 HO	57 15/16"

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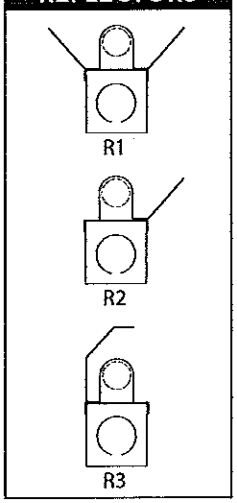
type :

BFL281

ACCESSORIES

REFLECTORS



Standard finish on all reflectors is high reflectance white powder coat

◗ 281-R1-6	Symmetrical Reflector For BFL281-6
◗ 281-R1-8	Symmetrical Reflector For BFL281-8
◗ 281-R1-13	Symmetrical Reflector For BFL281-13
◗ 281-R1-14	Symmetrical Reflector For BFL281-14
◗ 281-R1-21	Symmetrical Reflector For BFL281-21
◗ 281-R1-28	Symmetrical Reflector For BFL281-28
◗ 281-R1-35	Symmetrical Reflector For BFL281-35
◗ 281-R1-24	Symmetrical Reflector For BFL281-24
◗ 281-R1-39	Symmetrical Reflector For BFL281-39
◗ 281-R1-54	Symmetrical Reflector For BFL281-54
◗ 281-R1-80	Symmetrical Reflector For BFL281-80
◗ 281-R2-6	Asymmetrical Reflector For BFL281-6
◗ 281-R2-8	Asymmetrical Reflector For BFL281-8
◗ 281-R2-13	Asymmetrical Reflector For BFL281-13
◗ 281-R2-14	Asymmetrical Reflector For BFL281-14
◗ 281-R2-21	Asymmetrical Reflector For BFL281-21
◗ 281-R2-28	Asymmetrical Reflector For BFL281-28
◗ 281-R2-35	Asymmetrical Reflector For BFL281-35
◗ 281-R2-24	Asymmetrical Reflector For BFL281-24
◗ 281-R2-39	Asymmetrical Reflector For BFL281-39
◗ 281-R2-54	Asymmetrical Reflector For BFL281-54
◗ 281-R2-80	Asymmetrical Reflector For BFL281-80
◗ 281-R3-6	Inside Asymmetrical Reflector For BFL281-6
◗ 281-R3-8	Inside Asymmetrical Reflector For BFL281-8
◗ 281-R3-13	Inside Asymmetrical Reflector For BFL281-13
◗ 281-R3-14	Inside Asymmetrical Reflector For BFL281-14
◗ 281-R3-21	Inside Asymmetrical Reflector For BFL281-21
◗ 281-R3-28	Inside Asymmetrical Reflector For BFL281-28
◗ 281-R3-35	Inside Asymmetrical Reflector For BFL281-35
◗ 281-R3-24	Inside Asymmetrical Reflector For BFL281-24
◗ 281-R3-39	Inside Asymmetrical Reflector For BFL281-39
◗ 281-R3-54	Inside Asymmetrical Reflector For BFL281-54
◗ 281-R3-80	Inside Asymmetrical Reflector For BFL281-80

MOUNTING CLIPS

◗ MC281 — Pair mounting clips *(for glass to glass case mounting)*

LENSES

One piece polycarbonate striated snap-on cover with end caps

◗ LNC	Clear Lens *(sold by the foot)*	___ft
◗ LNO	Opal Lens *(sold by the foot)*	___ft

LENSES

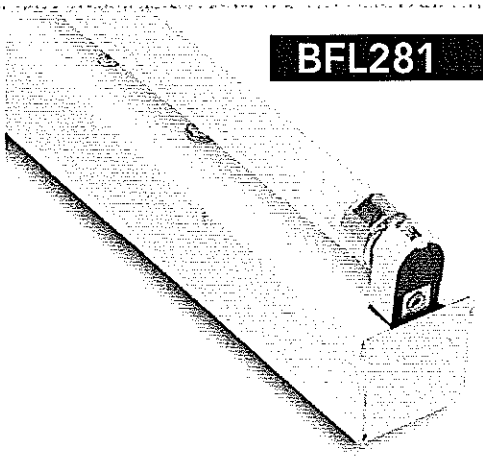
Two piece system comprised of a polycarbonate channel and striated snap-on cover

◗ U5LNC	Universal Clear Lens *(sold by the foot)*	___ft
◗ U5LNO	Universal Opal Lens *(sold by the foot)*	___ft

TUBE GUARD

◗ TG — Tube Guard *(sold by the foot)* ___ft

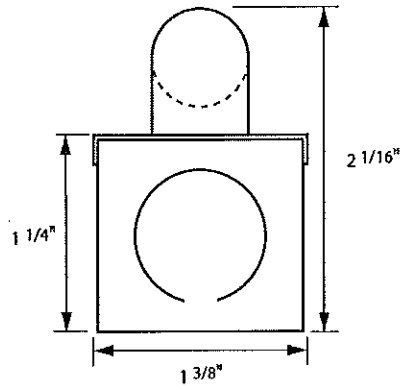
type : LJ4



BFL281

LINEAR T5 FLUORESCENT

low profile linear T5 fluorescent architectural fixture with integral ballast



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BFL281-35		/CU - custom finish
BFL281-24		*(consult factory)*
BFL281-39		
BFL281-54		
BFL281-80		

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39w T5 HO	34 1/4"
54w T5 HO	46 1/16"
80w T5 HO	57 15/16"

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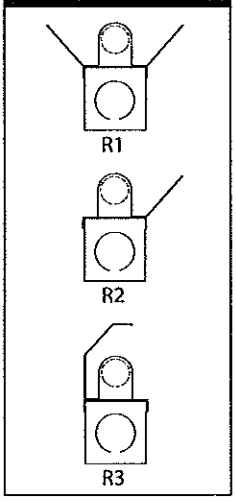
type :

BFL281

ACCESSORIES

REFLECTORS



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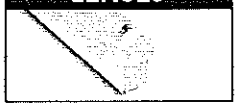
◗ 281-R1-14	Symmetrical Reflector For BFL281-14
◗ 281-R1-21	Symmetrical Reflector For BFL281-21
◗ 281-R1-28	Symmetrical Reflector For BFL281-28
◗ 281-R1-35	Symmetrical Reflector For BFL281-35
◗ 281-R1-24	Symmetrical Reflector For BFL281-24
◗ 281-R1-39	Symmetrical Reflector For BFL281-39
◗ 281-R1-54	Symmetrical Reflector For BFL281-54
◗ 281-R1-80	Symmetrical Reflector For BFL281-80
◗ 281-R2-6	Asymmetrical Reflector For BFL281-6
◗ 281-R2-8	Asymmetrical Reflector For BFL281-8
◗ 281-R2-13	Asymmetrical Reflector For BFL281-13
◗ 281-R2-14	Asymmetrical Reflector For BFL281-14
◗ 281-R2-21	Asymmetrical Reflector For BFL281-21
◗ 281-R2-28	Asymmetrical Reflector For BFL281-28
◗ 281-R2-35	Asymmetrical Reflector For BFL281-35
◗ 281-R2-24	Asymmetrical Reflector For BFL281-24
◗ 281-R2-39	Asymmetrical Reflector For BFL281-39
◗ 281-R2-54	Asymmetrical Reflector For BFL281-54
◗ 281-R2-80	Asymmetrical Reflector For BFL281-80
◗ 281-R3-6	Inside Asymmetrical Reflector For BFL281-6
◗ 281-R3-8	Inside Asymmetrical Reflector For BFL281-8
◗ 281-R3-13	Inside Asymmetrical Reflector For BFL281-13
◗ 281-R3-14	Inside Asymmetrical Reflector For BFL281-14
◗ 281-R3-21	Inside Asymmetrical Reflector For BFL281-21
◗ 281-R3-28	Inside Asymmetrical Reflector For BFL281-28
◗ 281-R3-35	Inside Asymmetrical Reflector For BFL281-35
◗ 281-R3-24	Inside Asymmetrical Reflector For BFL281-24
◗ 281-R3-39	Inside Asymmetrical Reflector For BFL281-39
◗ 281-R3-54	Inside Asymmetrical Reflector For BFL281-54
◗ 281-R3-80	Inside Asymmetrical Reflector For BFL281-80

MOUNTING CLIPS

◗ MC281 — Pair mounting clips *(for glass to glass case mounting)*

LENSES



One piece polycarbonate striated snap-on cover with end caps

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LENSES

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◗ U5LNC	Universal Clear Lens *(sold by the foot)*	___ft
◗ U5LNO	Universal Opal Lens *(sold by the foot)*	___ft

TUBE GUARD

◗ TG — Tube Guard *(sold by the foot)* ___ft

MINI THEATRICAL BELL
T6 METAL HALIDE

MTB
T6 MH

APPLICATION:
Retail and commercial accent and display lighting

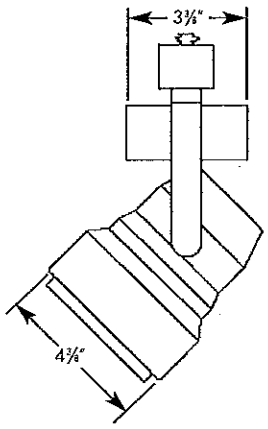
CONSTRUCTION:
Aluminum head and ballast housing
Snap-on lens holder, holds up to 2 accessories
Steel yoke
Powder coat paint

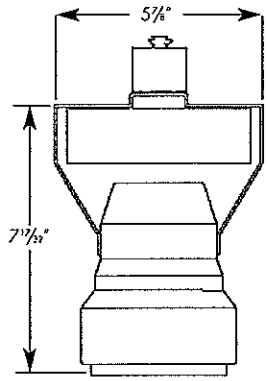
OPTICS:
High performance specular peened aluminum reflector
Specially designed for T6 MH lamps
90° tilt, 350° rotation
Locking vertical adjustment

MOUNTING:
Available for track, canopy and busway mounting

LABELING:
UL and CUL listed

PROJECT:
KOHLS
TYPE:
NF





ELECTRICAL

Lamping

Ballast		39w Input watts	39w Amps*	70w Input watts	70w Amps*
Electronic	120v	44	.37	79	.67
	277v	46	.17	79	.29

*Data is for open circuit current
T6 G12 base metal halide, 39w and 70w

Amerlux reserves the right to change details that do not affect overall function and performance.

AMERLUX®
LIGHTING SOLUTIONS
ADAPT. ABILITY.™

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Finish	Mounting	Voltage	Beam Spreads	Options/ Accessories
MTB	39 70	T6	E - electronic	WT - white textured BT - black textured ST - silver textured __ - __ (other RAL)	TS1 - T931 1cir 120v TS21 - Power Source 2cir/2neut 120v TS31 - Power Source 3cir 120v TS22 - Amerlux 2cir/2neut 277v TN1 - Global 1cir 120v TEK - Global 2cir/2neut 120v TN3 - Global 3cir 120v TN2 - Global 2cir/2neut 277v C - canopy B - busway CCL - C-clamp __ - __ (other)	120 277	CL - spot NF - narrow flood FL - flood WF - wide flood SL - linear spread lens	SUN - sunrise optic reflector GOLD - ferric gold optic reflector HEX - hexcell louver (⅛" x ⅛") CB - cross blade, ¾" depth (specify finish)

Example: MTB-39-T6-E-WT-TN1-120-CL

Cat #: **MTB-39-T6-E-WT-NF**

MINI THEATRICAL BELL

T6 METAL HALIDE

MTB
T6 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

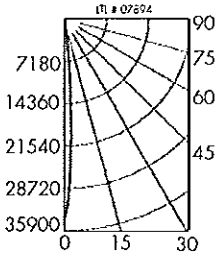
TYPE :**KOHLS TYPE NF**

FIXTURE DATA:

Complete photometric data (.ies format) available upon request.

39W T6 MH

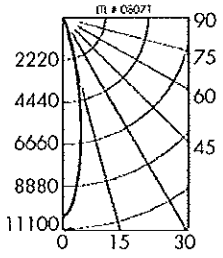
Spot Distribution
LTL # 07694



Candelas at Nadir

Deg	Candela
0	33724
5	11905
15	714
25	332
35	141
45	0

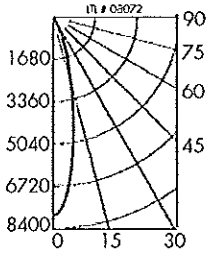
Narrow Flood Distribution
LTL # 08071



Candelas at Nadir

Deg	Candela
0	10455
5	8638
15	2484
25	371
35	75
45	23

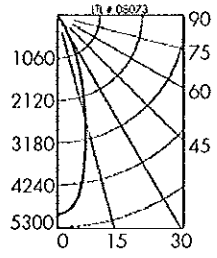
Flood Distribution
LTL # 08072



Candelas at Nadir

Deg	Candela
0	7883
5	6829
15	2723
25	739
35	136
45	23

Wide Flood Distribution
LTL # 08073

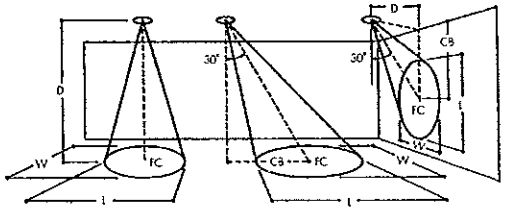


Candelas at Nadir

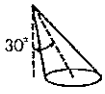
Deg	Candela
0	4985
5	4738
15	2698
25	1057
35	207
45	23

APPLICATION DATA:

Notes and Definitions:
Beam spread is to 50% center beam candlepower (CBCP).
D=Distance to floor or wall.
FC=Footcandles on floor or wall at center beam aiming location.
L=Effective Visual Beam length in feet (50% of maximum footcandle level).
W=Effective Visual Beam width in feet (50% of maximum footcandle level).
CB=Distance across or down to center beam location.

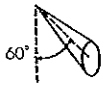


0° Aiming Angle Horizontal Footcandles



30° Aiming Angle Horizontal Footcandles

30° Aiming Angle Vertical Footcandles

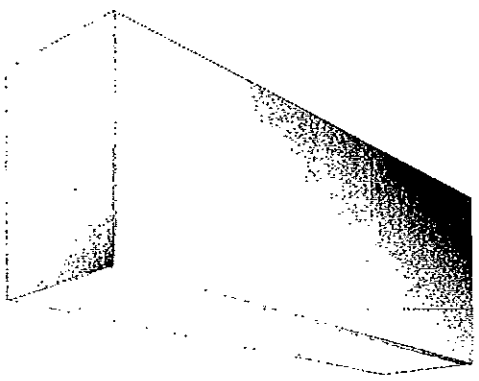


60° Aiming Angle Vertical Footcandles

	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
SPOT	5.0'	1348	1.0	1.0	5.0'	804	1.1	1.0	3.0	3.0'	451	1.7	0.8	5.3	3.0'	2379	0.6	0.5	1.8
	7.5'	599	1.2	1.2	7.5'	337	1.7	1.2	4.0	4.0'	269	2.1	1.1	6.8	4.0'	1344	0.7	0.6	2.3
	10.0'	337	1.4	1.4	10.0'	201	2.1	1.6	6.0	5.0'	171	2.7	1.4	8.2	5.0'	833	1.0	0.8	2.8
	12.5'	215	1.7	1.7	12.5'	137	2.4	2.0	7.0	6.0'	118	3.2	1.7	10.2	6.0'	553	1.2	1.0	3.3
NARROW FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	418	1.7	1.7	5.0'	258	2.4	2.1	3.0	3.0'	181	3.1	1.9	4.2	3.0'	744	1.4	1.3	1.8
	7.5'	185	2.7	2.7	7.5'	122	3.4	3.1	4.0	4.0'	101	4.2	2.5	5.7	4.0'	426	1.8	1.6	2.3
	10.0'	104	3.5	3.5	10.0'	67	4.6	4.0	5.0	5.0'	65	5.3	3.2	7.2	5.0'	274	2.3	2.0	2.7
	12.5'	67	4.3	4.3	12.5'	44	5.6	5.0	7.0	6.0'	45	6.3	3.8	8.2	6.0'	190	2.7	2.4	3.3
FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	315	2.0	2.0	5.0'	196	2.7	2.4	3.0	3.0'	143	3.6	2.1	4.2	3.0'	562	1.6	1.4	1.8
	7.5'	140	3.1	3.1	7.5'	94	3.8	3.4	4.0	4.0'	81	4.8	2.8	5.2	4.0'	323	2.1	1.8	2.2
	10.0'	79	3.9	3.9	10.0'	52	5.1	4.5	5.0	5.0'	52	5.9	3.5	6.7	5.0'	208	2.6	2.3	2.7
	12.5'	51	5.0	5.0	12.5'	33	6.4	5.6	7.0	6.0'	36	7.2	4.2	8.3	6.0'	145	3.1	2.7	3.2
WIDE FLOOD	D	FC	L	W	D	FC	L	W	CB	D	FC	L	W	CB	D	FC	L	W	CB
	5.0'	199	2.8	2.8	5.0'	135	3.4	3.0	2.0	3.0'	111	3.7	2.6	3.7	3.0'	383	2.0	1.7	1.2
	7.5'	89	3.9	3.9	7.5'	60	5.0	4.5	4.0	4.0'	64	4.9	3.4	4.8	4.0'	218	2.6	2.3	1.7
	10.0'	50	5.3	5.3	10.0'	35	6.6	5.9	5.0	5.0'	41	6.1	4.2	5.8	5.0'	140	3.3	2.9	2.3
	12.5'	32	6.6	6.6	12.5'	22	8.2	7.3	6.0	6.0'	28	7.3	5.0	7.2	6.0'	98	3.9	3.5	2.7

KOHL'S LIGHTING DIRECTIVE INNOVATION 2008

Type - TS2

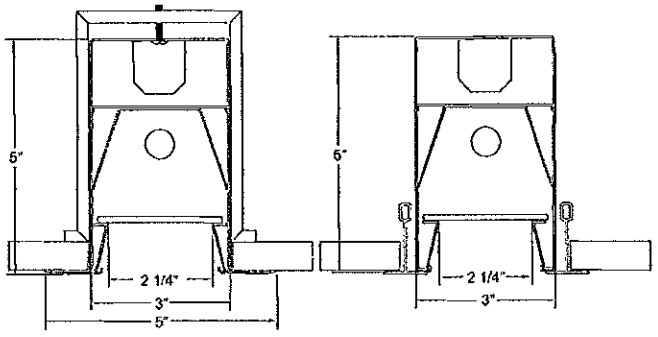


STEEL SQUARES
DIRECT RECESSED

SERIES S35-RG

REGRESSED TRIM

Options:
Mounting Options:
FL - Flanged for Plaster or Dry Wall Ceilings. (Mounting Yokes Supplied)
T - Standard T-Bar Ceiling
Lamp Options:
BX - Biax
OCT - T8 Octron
T5 - 5/8" Diameter
T5HO - 5/8" Diameter (High Output)
Diffuser Options:
P12- Prismatic Lens
WOA-White Opal Acrylic Lens.
Color Options:
WHT - White Trim (Standard)
CA - Custom Colors for Ceiling Trim
Eletrical Options:
UNV - Universal Voltage
120 - 277 Volt Operation
277 - 277 Volt Operation
DIM - Dimming Ballast
EM - Emergency Ballast
GLR - In Line Fusing
2CIR - 2 Circuit Wiring



FL
FLANGE

T
T-GRID

The PMC S35-RG Series is one of the fixture designs that seem to be timeless. Compact enough to fit in limited spaces, it can also be a dominant force in interior design. S35-RG fixtures have powder coated housings, with precision-formed, high reflectance, enamel reflectors for optimal efficiency.

Fixtures are UL listed, and have ***standard electronic ballasts.*** Each fixture is lamp-tested at the factory before shipment.

ORDERING INFORMATION

S35-RG- D- FL- 1/T5HO- 2 - WOA- WHT- 120

SERIES NUMBER	D	FL	1	BX OCT T5 T5HO	2 3 4 6 8	P12 WOA	UNV 120 277 EM DIM GLR 2CIR
LIGHT OUTPUT							
MOUNTING							
NUMBER OF LAMPS							
LAMP TYPE							
LENGTH							
DIFFUSER							
COLOR						WHT Standard CA Custom Color	
OPTIONS							

PMC LIGHTING

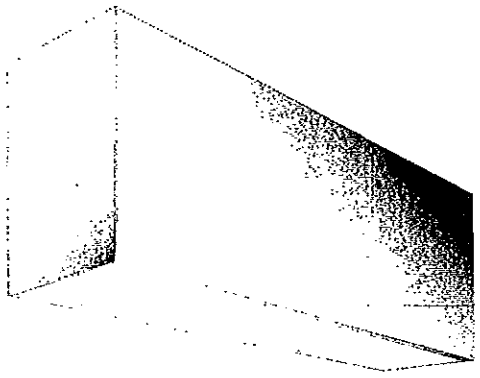
KOHL'S LIGHTING DIRECTIVE INNOVATION 2008

Type - TS4

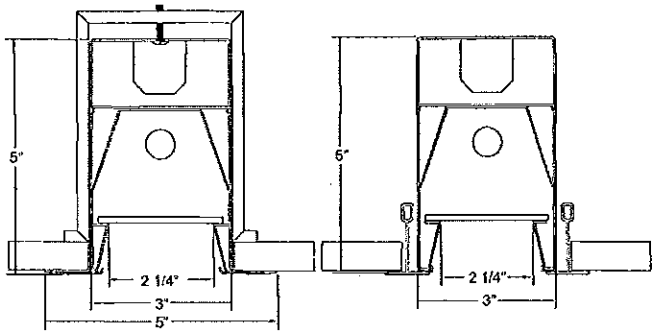
STEEL SQUARES
DIRECT RECESSED

SERIES S35-RG

REGRESSED TRIM



Options:
Mounting Options:
FL - Flanged for Plaster or Dry Wall Ceilings. (Mounting Yokes Supplied)
T - Standard T-Bar Ceiling
Lamp Options:
BX - Biax
OCT - T8 Octron
T5 - 5/8" Diameter
T5HO - 5/8" Diameter (High Output)
Diffuser Options:
P12- Prismatic Lens
WOA-White Opal Acrylic Lens.
Color Options:
WHT - White Trim (Standard)
CA - Custom Colors for Ceiling Trim
Eletrical Options:
UNV - Universal Voltage
120 - 277 Volt Operation
277 - 277 Volt Operation
DIM - Dimming Ballast
EM - Emergency Ballast
GLR - In Line Fusing
2CIR - 2 Circuit Wiring



FL
FLANGE

T
T-GRID

The PMC S35-RG Series is one of the fixture designs that seem to be timeless. Compact enough to fit in limited spaces, it can also be a dominant force in interior design. S35-RG fixtures have powder coated housings, with precision-formed, high reflectance, enamel reflectors for optimal efficiency.

Fixtures are UL listed, and have ***standard electronic ballasts.*** Each fixture is lamp-tested at the factory before shipment.

ORDERING INFORMATION

S35-RG- D- FL- 1/T5HO- 4 -WOA- WHT- 120

SERIES NUMBER								
LIGHT OUTPUT	D							
MOUNTING		FL T						
NUMBER OF LAMPS			1					
LAMP TYPE				BX OCT T5 T5HO				
LENGTH					2 3 4 6 8			
DIFFUSER						P12 WOA		
COLOR							WHT Standard CA Custom Color	
OPTIONS								UNV 120 277 EM DIM GLR 2CIR

PMC LIGHTING

LITHONIA LIGHTING®

Catalog Number	
LQJ-13DTT-277-J01A	
Notes	Type: W

FEATURES & SPECIFICATIONS

INTENDED USE

Recessed frame-in rated Non-IC.

Approved for all ceiling and wiring types.

Remodel applications.

CONSTRUCTION

Steel frame. Cutout section on frame for remodel applications.

Galvanized bar hangers span up to 24" o.c. and feature built in nailer and T-bar clips.

Galvanized steel junction box with four built in romex clamps; six ¾" knockouts with slots for pryout.

Rated for through branch wiring.

Maximum 8 (4in 4out) No 12 AWG conductors. Rated for 90° C.

Ground wire provided.

Removable J-box doors for easy access.

ELECTRICAL SYSTEM

Durable two-pin positive latch thermoplastic socket mounted in socket cup.

Socket assembly attaches to reflector to ensure proper and consistent lamp position.

Thermal protection provided against improper insulation use.

Encased-and-potted, normal power factor (NPF) electromagnetic ballast is standard.[1]

INSTALLATION

2 x 8 wood joist or T-bar installation.

Expandable bar hangers allow for off center mounting in wood joist or T-bar ceilings.

Length of 25-1/4" maximum 13-1/4" minimum or cut to fit 10-1/2" on center joist construction.

Retaining clips hold finishing trim secure and snug to ceiling.

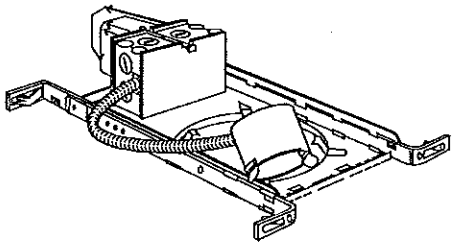
Maximum ceiling thickness determined by finishing trim. See specific trim page.

Ceiling cutout 5-3/4".

LISTING

UL Listed (standard). CSA Certified (see Options).

Damp location listing (See trim selection for wet location listing).



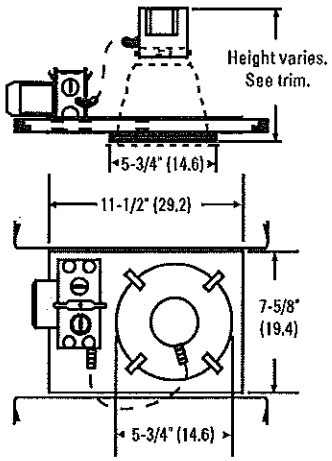
5" Frame-in

LQJ

FLUORESCENT
Non-IC
New Construction

Specifications

Height: 3-1/2 (8.9)
Trim height varies
Length: 13 (33.0)
Width: 11-5/8 (29.5)



All dimensions are inches (centimeters).

ORDERING INFORMATION

Example: **LQJ 13DTT 120 J01**

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

LQJ	13DTT	277		J01A
Series	Lamp	Volt	Options	Reflector[2]
LQJ	13DTT	120 277 347	**HPF** High Power factor (90% power factor for 120 , 277 and 347 volt). **GEBIO** Generic electronic ballast, THD (total harmonic distortion) <10%. Requires four-pin lamp (13DTT only). **GMF** Single slow-blow fuse. **LRC** Provides compatibility with Lithonia Reloc System. Lithonia Reloc System can be installed less this option with connectors provided by others.	Open Narrow Flange **J01** White Open **J01A** Clear Specular Open **J01G** Gold Specular Open **JB1** Black Metal Baffle **JB1W** White Metal Baffle **JB4** Black Baffle **JB4W** White Baffle **JC1BL** Black Specular Cone

Accessories:

Order as separate catalog number.

LBH 22" extended bar hangers, set of two
LSMC T-bar mounting clips, set of four

NOTES:

1 Not recommended for use with occupancy sensors, device may reduced lamp life or premature failure. Consult lamp manufacturer.
2 Trim ring white as standard.

See trim summary on reverse side for maximum wattages.

J Series 5" Fluorescent LQJ Full Reflector Trims

Description / Catalog number — Maximum wattage / Sheet number

General/Task

Open Narrow Flange
J01 White
J01AZ Clear Specular
J01GZ Gold Specular

13 DTT

Non-IC COPN-170

Cone Narrow Flange
JC1AZ Clear Specular
JC1BLZ Black Spedular
JC1GZ Gold Specular

13 DTT

Non-IC COPN-180

Metal Baffle Narrow Flange
JB1 Black
JB1W White

13 DTT

Non-IC CBAF-180

Baffle Narrow Flange
JB4 Black
JB4W White

13 DTT

Non-IC CBAF-190

NOTES:
1 Maximum wattage listed. Lower wattage lamps may be used.

Lithonia Lighting
Recessed Downlighting
One Lithonia Way, Conyers, GA 30012
Phone: 800-315-4935 Fax: 770-918-1209
www.lithonia.com

4 1/2" X 6" RECTANGLE WALL WASH

T6 METAL HALIDE

HW46
T6 MH

APPLICATION:
Retail and commercial accent and display lighting

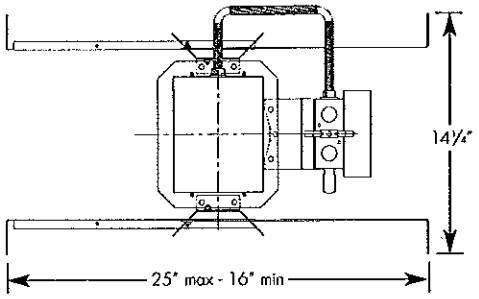
CONSTRUCTION:
Steel housing painted matte black
Stamped steel mounting plate and mounting bars

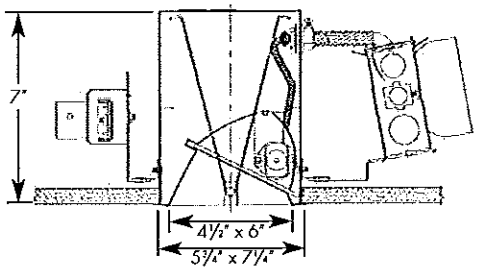
OPTICS:
Formed specular aluminum textured reflector, specially designed for T6 metal halide lamps
Formed semi-diffuse clear aluminum aperture cone with white flange (standard)
Glass lens

MOUNTING:
For use in T-grid or sheet rock ceilings

LABELING:
UL and CUL listed
Damp location

PROJECT:
KOHLS
TYPE:
WL





Ceiling cut out dimension: 5⅜" x 6 13/16"

ELECTRICAL

Ballast		Lamping 39w Input watts	39w Amps*	70w Input watts	70w Amps*
Electronic	120v	44	.37	79	.67
	277v	46	.17	79	.29

*Data is for open circuit current
T6 G12 base metal halide, 39w and 70w

Amerlux reserves the right to change details that do not affect overall function and performance.

AMERLUX
LIGHTING SOLUTIONS
ADAPT. ABILITY.™

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Aperture Cone Finish	Trim Finish	Voltage	Beam Spreads	Options/ Accessories
HW46	39 70	T6	E - electronic	SD - semi-diffuse	W - white C - clear (same as aperture)	120/277U	WW - wall wash	SUN - sunrise optic reflector GOLD - ferric gold optic reflector

Example: HW46-39-T6-E-SD-W-120/277U-WW

Cat #:

4 1/2" X 6" RECTANGLE WALL WASH

T6 METAL HALIDE

HW46
T6 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

TYPE: **KOHLS TYPE WL**

FIXTURE DATA: For 70w data, multiply by 1.9

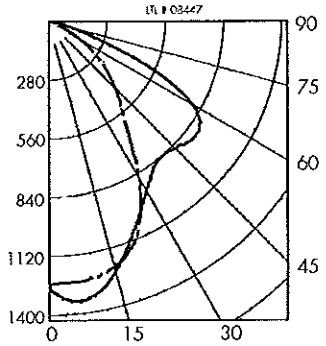
Complete photometric data (.ies format) available upon request.

4½" x 6" RECTANGLE WALL WASH 39W t6 Lamp: Philips
CDM/35/T6/830 Lamp Lumens: 3400
Recessed

ZONAL LUMEN SUMMARY

Zone	lumens	%Lamp	%Fixt
0-30	847	24.9	39.7
0-40	1235	36.3	57.8
0-60	1886	55.5	88.3
0-90	2136	62.8	100.0
90-180	0	0.0	0.0
0-180	2136	62.8	100.0

Total Luminaire Efficiency = 62.8%

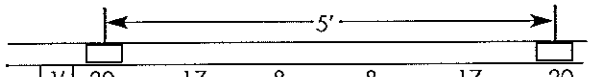


APPLICATION DATA:

Footcandles on Wall

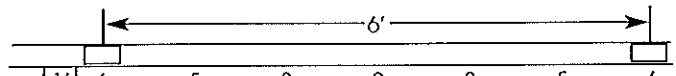
Footcandles are average and rounded off. Data for multiple units are based on a minimum of five units.

3 Feet From Wall



Distance From Ceiling							
1'	20	17	8	8	17	20	
2'	59	51	38	38	51	59	
3'	41	38	34	34	38	41	
4'	29	28	26	26	28	29	
5'	22	22	21	21	22	22	
6'	17	17	18	18	17	17	
7'	14	14	15	15	14	14	
8'	11	12	12	12	12	11	
9'	10	10	10	10	10	10	

4 Feet From Wall



Distance From Ceiling							
1'	6	5	3	2	3	5	6
2'	30	28	21	16	21	28	30
3'	32	30	27	26	27	30	32
4'	25	24	22	22	22	24	25
5'	19	19	18	17	18	19	19
6'	15	15	15	15	15	15	15
7'	13	13	13	13	13	13	12
8'	10	11	11	11	11	10	10
9'	9	9	9	9	9	9	9

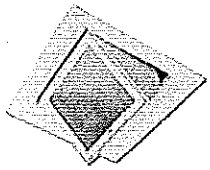
KOHL'S INNOVATIONS STORE

TYPE "WR"

MINI CAVALETTO

T6 RECESSED ADJUSTABLE WALL WASH

MCAV
T6 MH



APPLICATION:
Retail and commercial wall wash applications

CONSTRUCTION:
Die-cast aluminum lamp housing and base
Captive lamp housing door with locking knob permits handsfree relamping
Powder coat paint

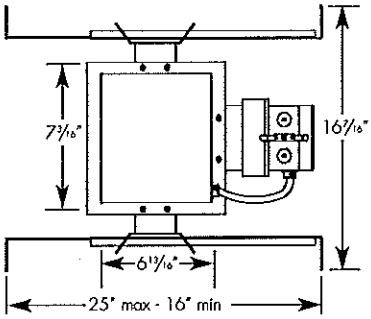
OPTICS:
High performance specular aluminum reflector, specially designed for T6 metal halide lamps
45° tilt
Vertical aiming angle indicator
Locking vertical adjustment

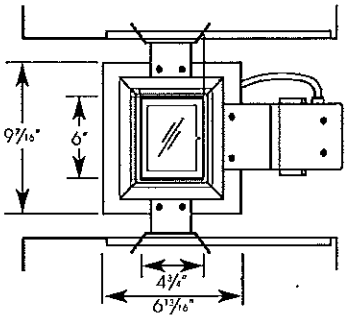
MOUNTING:
For use in T-grid or sheet rock ceilings

LABELING:
UL and CUL listed
Damp location

PROJECT:

TYPE:
WR



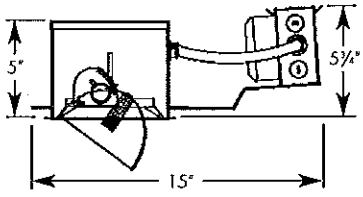


ELECTRICAL

Ballast		Lamping 39w Input watts	39w Amps*	70w Input watts	70w Amps*
Electronic	120v	44	.37	79	.67
	277v	46	.17	79	.29

*Data is for open circuit current
T6 G12 base metal halide, 39w and 70w

Amerlux reserves the right to change details that do not affect overall function and performance.



Ceiling cut out dimension: 6 13/16" x 8"

AMERLUX
LIGHTING SOLUTIONS
ADAPT. ABILITY.

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Finish	Voltage	Beam Spreads	Options/Accessories
MCAV	39 70	T6	E electronic	W white	120/277U	WW wall wash	SUN - sunrise optic reflector GOLD - ferric gold optic reflector VISOR - angled visor provides additional shielding and beam cut off, specify finish CB - cross blade, 1" deep

Example: MCAV-39-T6-E-W-120/277U-WW

Cat #:

KOHL'S INNOVATIONS STORE

TYPE "WR"

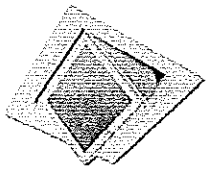
MINI CAVALETTO

T6 RECESSED ADJUSTABLE WALL WASH

MCAV
T6 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

TYPE:



FIXTURE DATA: For 70w data, multiply by 1.9

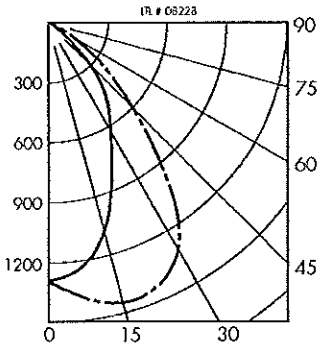
Complete photometric data (.ies format) available upon request.

IMPERIA T6 WALL WASH 39W
Lamp: Philips CDM/35/T6/830 Lamp Lumens: 3400
Track Mounting

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	929	27.3	49.0
0-40	1375	40.4	72.5
0-60	1829	53.8	96.4
0-90	1896	55.8	100.0
90-180	0	0.0	0.0
0-180	1896	55.8	100.0

Total Luminaire Efficiency = 55.8%

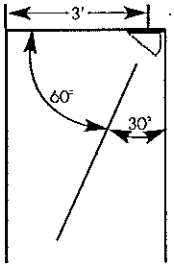


APPLICATION DATA:

Footcandles on Wall

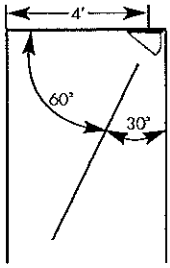
Footcandles are average and rounded off. Data for multiple units are based on a minimum of five units.

3 Feet From Wall



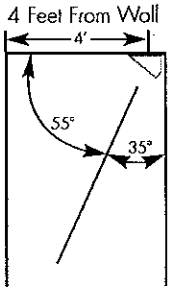
Distance From Ceiling	5'					
1'	69	62	51	53	64	69
2'	76	72	64	65	73	76
3'	62	61	59	59	61	62
4'	44	44	44	44	44	44
5'	30	30	30	30	30	30
6'	21	21	21	21	21	21
7'	15	15	15	15	15	15
8'	12	12	12	12	12	12
9'	9	9	9	9	9	9

4 Feet From Wall



Distance From Ceiling	6'						
1'	61	59	51	48	53	60	61
2'	62	60	55	52	56	61	62
3'	49	49	47	46	47	49	49
4'	35	35	35	34	34	34	34
5'	24	24	24	24	23	23	23
6'	16	16	16	16	16	16	16
7'	12	12	12	12	12	12	12
8'	9	9	9	9	9	9	9
9'	7	7	7	7	7	7	7

4 Feet From Wall

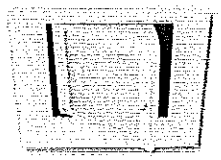


Distance From Ceiling	6'						
1'	54	52	46	42	47	52	54
2'	58	57	53	50	53	57	58
3'	50	49	49	47	48	49	50
4'	37	37	37	37	37	37	37
5'	26	26	26	26	26	26	26
6'	19	19	19	19	19	19	19
7'	14	14	14	14	14	14	14
8'	10	10	10	10	10	10	10
9'	8	8	8	8	8	8	8

CAVALETTO II

ED17 RECESSED ADJUSTABLE WALL WASH

CAV II
ED17 MH



APPLICATION:
Retail and commercial wall wash applications

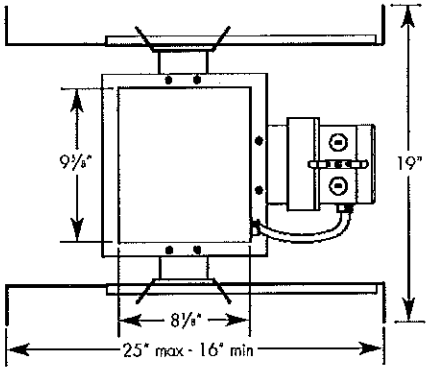
CONSTRUCTION:
Die-cast aluminum lamp housing and base
Captive lamp housing door with locking knob permits handsfree relamping
Powder coat paint

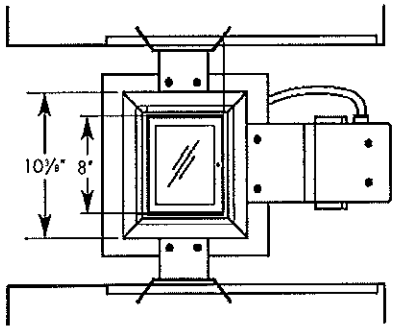
OPTICS:
High performance specular aluminum reflector, specially designed for ED17 metal halide lamps
45° tilt
Vertical aiming angle indicator
Locking vertical adjustment

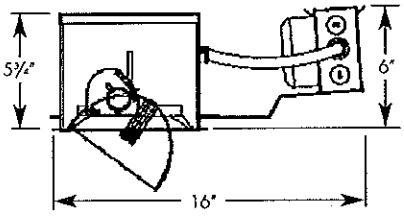
MOUNTING:
For use in T-grid or sheet rock ceilings

LABELING:
UL and CUL listed
Damp location

PROJECT:
KOHLS
TYPE:
WS







Ceiling cut out dimension: 8⅛" x 9⅛"

ELECTRICAL

Ballast		Lamping 70w Input watts	70w Amps*	100w Input watts	100w Amps*	150w Input watts	150w Amps*
Electronic	120v	79	.67	110	.90	167	1.4
	277v	79	.29	110	.41	167	.61

*Data is for open circuit current
ED-17 medium base metal halide 70w, 100w & 150w

Amerlux reserves the right to change details that do not affect overall function and performance.

AMERLUX®
LIGHTING SOLUTIONS
ADAPT. ABILITY.™

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Finish	Voltage	Beam Spreads	Options/Accessories
CAV II	70 100 150	17 - ED17	E - electronic	W - white	120/277U (39w, 70w) 120 (150w) 277 (150w)	WW - wall wash	SUN - sunrise optic reflector GOLD - ferric gold optic reflector

Example: CAV II-70-17-E-W-120/277U-WW

Cat #: **CAVII-100-17-E-W-120/277-WW**

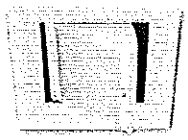
CAVALETTO II

ED17 RECESSED ADJUSTABLE WALL WASH

CAV II
ED17 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

TYPE: **KOHLS TYPE WS**



FIXTURE DATA: For 100w data, multiply by 1.5; For 150w data, multiply by 2.0

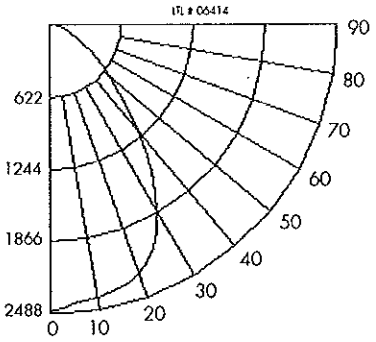
Complete photometric data (.ies format) available upon request.

CAVALETTO II 70W ED17 MH
Lamp: Philips MHC70/U/M/3K Lamp Lumens: 6200
Recessed

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1851	30.0	38.0
0-40	2916	47.0	60.0
0-60	4381	71.0	90.0
0-90	4843	78.0	100.0
90-180	0	0.0	0.0
0-180	4843	78.0	100.0

Total Luminaire Efficiency = 78.0%

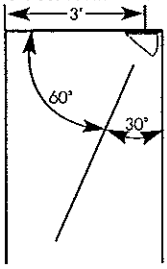


APPLICATION DATA:

Footcandles on Wall

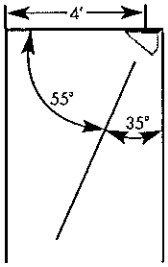
Footcandles are average and rounded off. Data for multiple units are based on a minimum of five units.

3 Feet From Wall



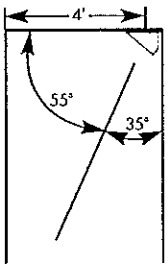
Distance From Ceiling	6'						
1'	115	98	56	40	56	98	115
2'	142	122	80	62	80	122	142
3'	104	96	76	66	76	96	104
4'	72	70	61	58	62	70	72
5'	52	51	49	48	49	51	52
6'	40	40	39	38	39	40	40
7'	32	32	32	31	32	32	32
8'	27	27	27	27	27	27	27
9'	24	24	24	24	24	24	24

4 Feet From Wall



Distance From Ceiling	6'						
1'	76	73	56	48	56	73	76
2'	101	96	78	68	78	96	101
3'	90	87	78	73	78	87	90
4'	71	71	67	66	67	71	71
5'	56	56	55	54	55	56	56
6'	46	46	45	45	45	46	46
7'	37	37	37	37	37	37	37
8'	32	32	32	32	32	32	32
9'	27	27	27	27	27	27	27

4 Feet From Wall



Distance From Ceiling	8'								
1'	71	67	47	31	25	31	47	67	71
2'	94	87	64	43	36	43	64	87	94
3'	81	76	62	47	42	47	62	76	81
4'	60	58	51	44	41	44	51	58	60
5'	45	45	41	38	37	38	41	45	45
6'	35	35	33	32	32	32	33	35	35
7'	28	28	28	27	27	27	28	28	28
8'	23	23	23	23	23	23	23	23	23
9'	20	20	20	20	20	20	20	20	20

SVA II SHALLOW VERTICALLY ADJUSTABLE

SVA II
T6 MH

APPLICATION:
Retail and commercial ambient, accent and display lighting

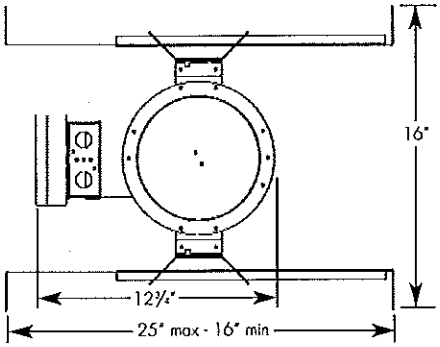
CONSTRUCTION:
Rolled steel housing painted matte black
Stamped steel mounting plate and mounting bars

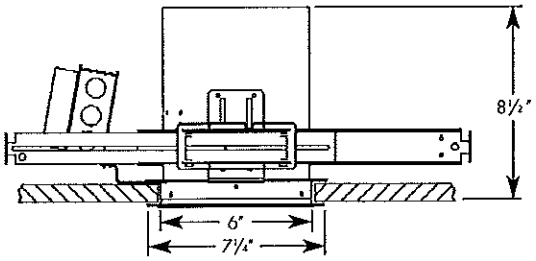
OPTICS:
Unique spun specular aluminum hammertone reflector,
Spun semi-diffuse clear aluminum aperture cone with white flange (standard)
Clear glass lens
Two socket positions allows for flood or wide flood distribution

MOUNTING:
For use in T-grid or sheet rock ceilings

LABELING:
UL and CUL listed
Damp location

PROJECT:
KOHLS
TYPE:
Y





Ceiling cut out dimension: 6¾"

ELECTRICAL

Ballast		Lamping 39w Input watts	39w Amps*	70w Input watts	70w Amps*	150w Input watts	150w Amps*
Electronic	120v	44	.37	79	.67	167	1.4
	277v	46	.17	79	.29	167	.61

*Data is for open circuit current
T6 G12 base metal halide 39w, 70w and 150w

Amerlux reserves the right to change details that do not affect overall function and performance.

AMERLUX®
LIGHTING SOLUTIONS
ADAPT. ABILITY.™

ORDERING INFORMATION:

Model	Wattage	Lamp Type	Ballast	Aperture Cone Finish	Trim Finish	Voltage	Beam Spreads	Options/ Accessories
SVA II	39 70 150	T6	E - electronic	SD - semi-diffuse	W - white C - clear (same as aperture)	120/277U (39w, 70w) 120 (150w) 277 (150w)	FL - flood WF - wide flood	SUN - sunrise optic reflector GOLD - ferric gold optic reflector

Example: SVA II-39-T6-E-SD-W-120/277U-FL

Cat #: **SVA II-39-T6-E-SD-W-120/277U-FL**

SVA II SHALLOW VERTICALLY ADJUSTABLE

SVA II
T6 MH

AMERLUX LIGHTING SOLUTIONS
ADAPT. ABILITY.

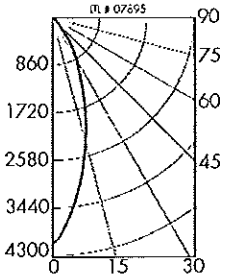
TYPE :**KOHLS TYPE Y**

FIXTURE DATA: For 70w data, multiply by 1.9; For 150w data, multiply by 4

Complete photometric data (.ies format) available upon request.

39W T6 MH

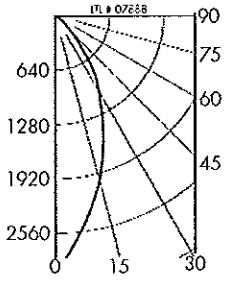
Flood Distribution
ITL # 07695



Candelas at Nadir

Deg	Candela
0	4062
5	3602
15	2324
25	1209
35	619
45	160

Wide Flood Distribution
ITL # 07688

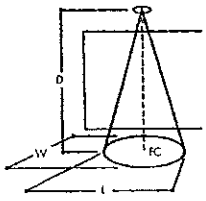


Candelas at Nadir

Deg	Candela
0	2967
5	2673
15	2003
25	1299
35	771
45	260

APPLICATION DATA:

Notes and Definitions:
Beam spread is to 50% center beam candlepower (CBCP).
D=Distance to floor or wall.
FC=Footcandles on floor or wall at center beam aiming location.
L=Effective Visual Beam length in feet (50% of maximum footcandle level).
W=Effective Visual Beam width in feet (50% of maximum footcandle level).
CB=Distance across or down to center beam location.



0° Aiming Angle Horizontal Footcandles

	D	FC	L	W
FLOOD	5.0'	162	2.8	2.8
	7.5'	72	4.2	4.2
	10.0'	41	5.5	5.5
	12.5'	26	6.9	6.9

	D	FC	L	W
WIDE FLOOD	5.0'	118	3.4	3.4
	7.5'	53	5.0	5.0
	10.0'	30	6.7	6.7
	12.5'	19	8.4	8.4

Ballast for Type A

Universal Lighting Technologies

TRIAD®

ULTim A Triad® Brand

B332IUNVHE-A

APPLICATION and PERFORMANCE SPECIFICATION

Description: High frequency electronic ballast for (3/2) F32T8, (3/2) F32T8ES, (3/2) F28T8, (2) F40T8, (3/2) F25T8ES-25W, (3) F25T8, and (3) F17T8. Also equivalent U-shaped lamps.

- Line Voltage: 108vac - 305vac, 50/60Hz
- Parallel Lamp Operation
- Instant Start
- Active Power Factor Correction

*60 Hz data

Lamp Type	Lamp #	Volts	Input Watts	Nominal Line Amps	Power Factor	Ballast Factor	Ballast Efficacy Factor	Harmonic Total	Crest Factor
F32T8	**3**	**120**	**83**	**0.70**	**> .99**	**.87**	**1.05**	**< 10%**	**< 1.7**
F32T8	**3**	**277**	**81**	**0.30**	**> .98**	**.87**	**1.07**	**< 10%**	**< 1.7**
F32T8	2	120	64	0.53	> .99	.99	1.55	< 10%	< 1.7
F32T8	2	277	63	0.23	> .98	.99	1.57	< 10%	< 1.7
F32T8ES	3	120	79	0.65	> .99	.87	1.10	< 10%	< 1.7
F32T8ES	3	277	77	0.28	> .98	.87	1.13	< 10%	< 1.7
F32T8ES	2	120	59	0.49	> .99	.99	1.68	< 10%	< 1.7
F32T8ES	2	277	57	0.21	> .97	.99	1.74	< 10%	< 1.7
F32T8ES (25W)	3	120	66	0.56	> .98	.87	1.32	< 10%	< 1.7
F32T8ES (25W)	3	277	65	0.24	> .95	.87	1.34	< 10%	< 1.7
F32T8ES (25W)	2	120	51	0.43	> .98	.99	1.94	< 10%	< 1.7
F32T8ES (25W)	2	277	50	0.19	> .95	.99	1.98	< 10%	< 1.7
F28T8	3	120	75	0.60	> .99	.87	1.16	< 10%	< 1.7
F28T8	3	277	73	0.26	> .98	.87	1.19	< 10%	< 1.7
F28T8	2	120	54	0.45	> .99	.99	1.83	< 10%	< 1.7
F28T8	2	277	53	0.19	> .97	.99	1.87	< 10%	< 1.7
F40T8	2	120	77	0.64	> .99	.99	1.29	< 10%	< 1.7
F40T8	2	277	75	0.27	> .98	.99	1.32	< 10%	< 1.7
F25T8	3	120	67	0.56	> .99	.90	1.34	< 10%	< 1.7
F25T8	3	277	66	0.24	> .98	.90	1.36	< 10%	< 1.7
F17T8	3	120	46	0.39	> .99	.92	2.00	< 10%	< 1.7
F17T8	3	277	46	0.17	> .97	.92	2.00	< 10%	< 1.7

Application and Performance Specification Information Subject to Change without Notification.

Performance:
- Meets ANSI Standard C82.11-1993
- Meets ANSI Standard C62.41-1991
- Meets FCC Part 18 (Class A) for EMI and RFI Non-Consumer Limits
- Anti-striation circuitry

Safety:
- No PCB's
- cULus

(Class P, Type 1 Outdoor, Type HL)

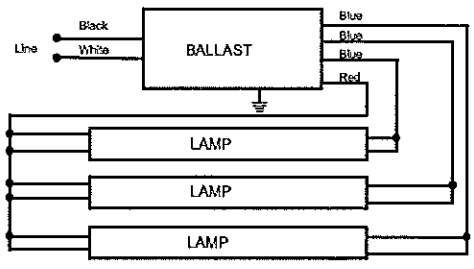
Application:
- Minimum Starting Temperature: 0° F, -18° C
  For ES & 28W Lamps: 60° F, 16° C
- Maximum Ambient Temperature: 105° F, 40° C
- Sound Rated: A
- Remote Mounting: 20 ft. max. lead length, 18 AWG
- No remote/tandem wiring for ES lamps

Physical Parameters

Length:	9.50"	
Width:	1.70"	
Height:	1.18"	
Weight:	1.7 lbs.	
Lead Length:	White, Black	25" (± 1")
	Red	48" (± 1")
	Blue	31" (± 1")

Warranty:
Universal Lighting Technologies warrants to the purchaser that each electronic ballast will be free from defects in material or workmanship for a period of 5 years from date of manufacture when properly installed and under normal conditions of use. Call **1-800-BALLASTx800** for technical assistance

Manufactured in North America



Note: For two lamp application, cap one blue lead, insulate to 600 volts

Ballast Must be Grounded

NEMA Premium

Ballast for Types: B, C3, C4

Universal Lighting Technologies

TRIAD®

B232IUNVHE-A

ULTim A Triad® Brand

APPLICATION and PERFORMANCE SPECIFICATION

Description: High frequency electronic ballast for (1/2) F32T8, (1/2) F32T8ES, (1/2) F32T8ES-25W, (1/2) F28T8, (2) F25T8, (2) F17T8 and (1) F40T8 lamps. Also equivalent U-shaped lamps.

- Line Voltage: 108vac - 305vac, 50/60Hz
- Parallel Lamp Operation
- Instant Start
- Active Power Factor Correction

*60 Hz data

Lamp Type	Lamp #	Volts	Input Watts	Nominal Line Amps	Power Factor	Ballast Factor	Ballast Efficacy Factor	Harmonic Total	Crest Factor
F32T8	**2**	**120**	**55**	**0.45**	**>.95**	**.87**	**1.58**	**< 10%**	**< 1.7**
F32T8	**2**	**277**	**54**	**0.20**	**>.95**	**.87**	**1.61**	**< 10%**	**< 1.7**
F32T8	1	120	33	0.28	>.95	1.05	3.18	< 10%	< 1.7
F32T8	1	277	33	0.13	>.95	1.05	3.18	< 10%	< 1.7
F32T8ES	2	120	52	0.42	>.95	.87	1.67	< 10%	< 1.7
F32T8ES	2	277	51	0.19	>.95	.87	1.71	< 10%	< 1.7
F32T8ES	1	120	32	0.25	>.95	1.05	3.28	< 10%	< 1.7
F32T8ES	1	277	32	0.12	>.95	1.05	3.28	< 10%	< 1.7
F32T8ES (25W)	2	120	44	0.37	>.98	.87	1.98	< 10%	< 1.7
F32T8ES (25W)	2	277	43	0.16	>.98	.87	2.02	< 10%	< 1.7
F32T8ES (25W)	1	120	27	0.23	>.98	1.05	3.89	< 10%	< 1.7
F32T8ES (25W)	1	277	27	0.10	>.95	1.05	3.89	< 10%	< 1.7
F28T8	2	120	49	0.40	>.95	.87	1.78	<10%	<1.7
F28T8	2	277	48	0.18	>.95	.87	1.81	<10%	<1.7
F28T8	1	120	29	0.24	>.95	1.10	3.79	<10%	<1.7
F28T8	1	277	29	0.11	>.95	1.10	3.79	<10%	<1.7
F25T8	2	120	44	0.36	>.95	.88	2.00	< 10%	< 1.7
F25T8	2	277	44	0.16	>.95	.88	2.00	< 10%	< 1.7
F17T8	2	120	30	0.24	>.95	.90	3.00	< 10%	< 1.7
F17T8	2	277	30	0.12	>.95	.90	3.00	< 10%	< 1.7

Application and Performance Specification Information Subject to Change without Notification.

Performance:
- Meets ANSI Standard C82.11-1993
- Meets ANSI Standard C62.41-1991
- Meets FCC Part 18 (Class A) for EMI and RFI Non-Consumer Limits
- Meets CSA Standard 654 for Ballast Efficiency
- Anti-striation circuitry

Safety:
- No PCB's
- cULus

(Class P, Type 1 Outdoor, Type HL)

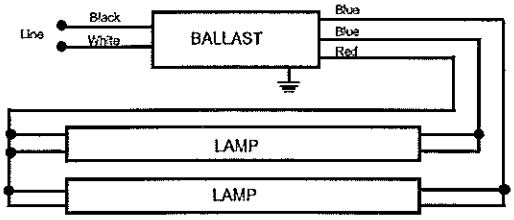
Application:
- Minimum Starting Temperature: 0° F, -18° C
  For ES & 28W Lamps: 60° F, 16° C
- Maximum Ambient Temperature: 105° F, 40° C
- Sound Rated: A
- Remote Mounting: 20 ft. max. lead length, 18 AWG
- No remote/tandem wiring for ES lamps

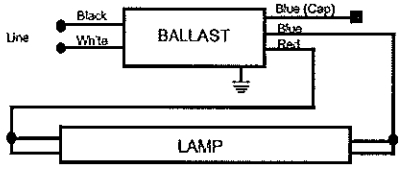
Physical Parameters

Length:	9.50"	
Width:	1.70"	
Height:	1.18"	
Weight:	1.70 lbs	
Lead Length:	Black, White	25" (+/-1")
	Red	48" (+/-1")
	Blue	31" (+/-1")

Warranty:
Universal Lighting Technologies warrants to the purchaser that each electronic ballast will be free from defects in material or workmanship for a period of 5 years from date of manufacture when properly installed and under normal conditions of use. Call **1-800-BALLASTx800** for technical assistance

Manufactured in North America





For one lamp application, individually cap blue leads, insulate to 600 volts

Ballast Must be Grounded

NEMA Premium

Ballast for Types: L3, L4

Universal Lighting Technologies

TRIAD®

B132IUNVHE-A

ULTim A Triad® Brand

APPLICATION and PERFORMANCE SPECIFICATION

Description: High frequency electronic ballast for (1) F32T8 and others as indicated below. Also equivalent U-shaped lamps.

- Line Voltage: 108vac - 305vac, 50/60Hz
- Parallel Lamp Operation
- Instant Start
- Active Power Factor Correction

*60 Hz data

Lamp Type	Lamp #	Volts	Input Watts	Nominal Line Amps	Power Factor	Ballast Factor	Ballast Efficacy Factor	Harmonic Total	Crest Factor
F32T8	**1**	**120**	**28**	**0.24**	**>.98**	**.87**	**3.11**	**< 10%**	**< 1.7**
F32T8	**1**	**277**	**28**	**0.12**	**>.95**	**.87**	**3.11**	**< 10%**	**< 1.7**
F32T8ES	1	120	26	0.22	>.98	.87	3.35	< 10%	< 1.7
F32T8ES	1	277	26	0.11	>.95	.87	3.35	< 10%	< 1.7
F32T8ES (25W)	1	120	23	0.19	>.98	.87	3.78	< 10%	< 1.7
F32T8ES (25W)	1	277	23	0.09	>.95	.87	3.78	< 10%	< 1.7
F28T8	1	120	24	0.20	>.98	.87	3.63	< 10%	< 1.7
F28T8	1	277	24	0.10	>.95	.87	3.63	< 10%	< 1.7
F25T8	1	120	22	0.18	>.98	.89	4.05	< 10%	< 1.7
F25T8	1	277	22	0.10	>.95	.89	4.05	< 10%	< 1.7
F17T8	1	120	16	0.13	>.98	.90	5.63	< 10%	< 1.7
F17T8	1	277	16	0.07	>.90	.90	5.63	< 10%	< 1.7
F40T8	1	120	35	0.30	>.98	.86	2.46	< 10%	< 1.7
F40T8	1	277	35	0.14	>.95	.86	2.46	< 10%	< 1.7

Application and Performance Specification Information Subject to Change without Notification.

Performance:
- Meets ANSI Standard C82.11-1993
- Meets ANSI Standard C62.41-1991
- Meets FCC Part 18 (Class A) for EMI and RFI Non-Consumer Limits
- Anti-striation circuitry

Safety:
- No PCB's
- cULus

(Class P, Type 1 Outdoor, Type HL)

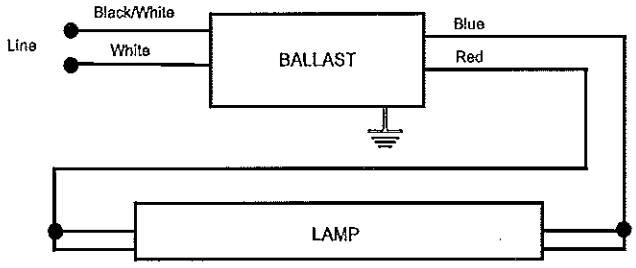
Application:
- Minimum Starting Temperature: 0° F, -18° C
  For ES & 28W Lamps: 60° F, 16° C
- Maximum Ambient Temperature: 105° F, 40° C
- Sound Rated: A
- Remote Mounting: 20 ft. max. lead length, 18 AWG
- No remote/tandem wiring for ES lamps

Physical Parameters

Length:	9.50"	
Width:	1.70"	
Height:	1.18"	
Weight:	1.70 lbs	
Lead Length:	Black, White	25" (+/-1")
	Red	48" (+/-1")
	Blue	31" (+/-1")

Warranty:
Universal Lighting Technologies warrants to the purchaser that each electronic ballast will be free from defects in material or workmanship for a period of 5 years from date of manufacture when properly installed and under normal conditions of use. Call**1-800-BALLASTx800** for technical assistance.

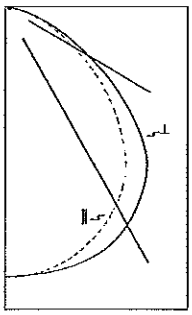
Manufactured in North America



Ballast Must be Grounded

NEMA Premium

PHOTOMETRICS



2GR8-332A
Electronic Ballast
F32T8/35K lamps
2800 lumens
Spacing criterion: (||) 1.2 x mounting height, (⊥) 1.4 x mounting height
Efficiency 76.0%
Test Report: 2GR8332A.IES
LER = FL-68
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.53

Coefficients of Utilization

Effective floor cavity reflectance					20%													
rc	80%				70%				60%			30%			10%			0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	91	91	91	91	88	88	88	88	84	84	84	81	81	81	78	78	78	76
1	84	81	78	75	82	79	76	74	76	74	72	73	71	69	70	69	67	66
2	77	72	67	63	75	70	66	63	68	64	61	65	62	60	63	61	59	57
3	71	64	59	54	70	63	58	54	61	57	53	59	55	52	57	54	51	50
4	66	58	52	47	64	57	51	47	55	50	46	53	49	45	51	48	45	43
5	60	51	45	40	59	51	45	40	49	44	40	48	43	39	46	42	39	37
6	56	46	40	35	54	46	40	35	44	39	35	43	38	35	42	38	34	33
7	51	42	35	31	50	41	35	31	40	34	31	39	34	30	38	33	30	29
8	47	37	31	27	46	37	31	27	36	30	27	35	30	26	34	30	26	25
9	44	34	27	23	43	33	27	23	32	27	23	31	26	23	31	26	23	21
10	41	30	24	20	40	30	24	20	29	24	20	29	24	20	28	23	20	19

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1965	23.4	30.8
0-40	3239	38.6	50.7
0-60	5421	64.5	84.9
0-90	6388	76.0	100.0
0-180	6386	76.0	100.0

Typical VCP Percentages

	Height Along		Height Across	
Room Size (Ft.)	8.5'	10.0'	8.5'	10.0'
20 x 20	67	71	64	68
30 x 30	60	64	57	61
30 x 60	52	55	47	50
60 x 30	62	66	60	64
60 x 60	52	55	48	51

Candela

Angle	Along ||	45°	Across ⊥
0	2460	2460	2460
5	2445	2456	2468
10	2416	2440	2464
15	2367	2409	2449
20	2295	2358	2413
25	2194	2281	2352
30	2063	2176	2266
35	1900	2045	2163
40	1705	1879	2015
45	1474	1650	1794
50	1200	1362	1474
55	932	1045	1122
60	710	745	811
65	533	497	566
70	389	326	416
75	275	243	327
80	201	204	251
85	110	122	143
90	0	0	0

ORDERING INFORMATION

SAMPLE NUMBER: 2GR8-332A-120V-EB81-U

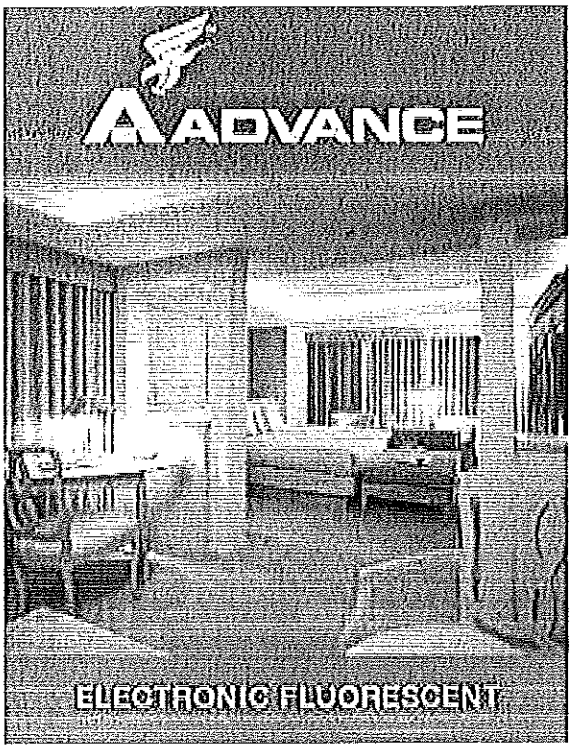
- 2=2' Width
- Series: GR8=General Purpose T8 Commercial Troffer[1]
- Number of Lamps[2]: 3=3 Lamps (Not included)
- Wattage (Length): 32=32W T8 (48")
- A=#12 Pattern Acrylic; A125=#12 Pattern Acrylic (.125" Thick); A19/156=#19 Pattern Acrylic (.156" Thick); IMA 48=Injection Moldeed Acrylic (.150" Thick); PB1S=Silver Parabolic Louver (1/2" x 1/2" x 1/2") (Additional shielding media available, see accessory section)
- Voltage[3]: 120V=120 Volt; 277V=277 Volt; 347V=347 Volt; UNV=Universal Voltage 120-277[4]
- Options: GL=Single Element Fuse; GM=Double Element Fuse; Lamps=Lamps Installed; Flex=Flex Installed; Emergency=EM Installed
- Ballast Type[3]: Blank=Standard Magnetic Ballast (Biax & 20W); LEOC8=T8 Magnetic Energy Saving; ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% (No. of Ballast 1, 2 or 3); EB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 20% (No. of Ballast 1, 2 or 3); EB8_/PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 20% (No. of Ballast 1, 2 or 3); TEB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10% (No. of Ballast 1, 2 or 3); DLS=Digital Lighting System Dimming
- Options: FCS-24W-U=Field Installed Flange Kit; FR=Suitable for Fire Rated Applications; EQ=T-BAR Safety Earthquake Clips[1] (See options & accessories)
- Packaging: U=Unit Pack

NOTES: [1]An EQ Grid Clip is recommended for all 9/16" ceiling systems. [2]Standard off-center ballast compartment on 3-lamp fixtures. [3]Products also available in non-US voltages and frequencies for international markets. [4]Not available when specifying emergencies, voltage must be specific.

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

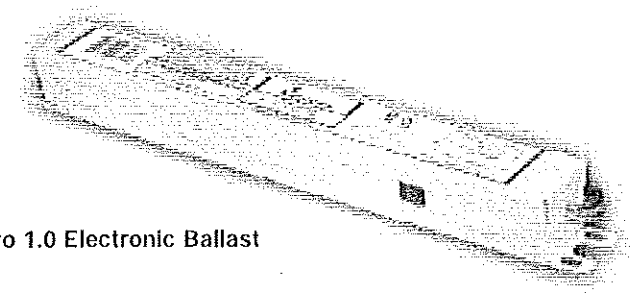
SHIPPING INFORMATION

Catalog No.	Wt.
2GR8-332A	31 lbs.



Centium®

Instant Start Ballast for Energy Efficiency T5 & T8 Lamps



Micro 1.0 Electronic Ballast

PRODUCT OVERVIEW:

Advance announces the enhancement of its popular line of Centium® Instant Start micro-can electronic ballasts. Advance's Centium (MC) ballasts with leads now feature Advance's exclusive IntelliVolt® multiple-voltage technology, enabling their operation at any input voltage from 120 to 277 volts, 50/60Hz. In addition, the ballasts, which previously operated one or two 32-watt T8, 25-watt T8, 28-watt T5 or 21-watt T5 fluorescent lamps, will now also run both 17-watt T8 lamps as well as 14-watt T5 lamps.

Lightweight and compact enough to fit into the sleekest new fixture designs, Advance's Centium (MC) ballasts are ideal in such applications as decorative/cove lighting, general and indirect lighting, and in any fixture where space restrictions require smaller ballasts. As with all Centium (MC) electronic ballasts, the ballasts operate at 0°F/-18°C and feature total harmonic distortion less than 10% and instant start technology, insuring energy-efficient lighting operation.

DESIGN HIGHLIGHTS:

- IntelliVolt® technology (120-277V, 50/60Hz)
  - o Ensures shipment of correct voltage ballast or fixture for each application
  - o Reduces SKU's required in inventory
- Low profile housing
  - o Only 1.00" high ballast provides flexibility in new generation fixture designs
- Operates above 40 kHz
  - o Eliminates interference with Infrared Control Systems
- 0°F starting capability
  - o Suitable for cold temperature applications
- <10% THD (>0.99 PF)
  - o Meets most demanding power quality requirements
  - o Perfect for applications where harmonics are a concern
- 20ft. remote mounting/tandem wiring capability
  - o Provides maximum application flexibility
- Auto-restrike capability
  - o Eliminates the need to reset power mains after failed lamps are replaced
- Instant Start lamp ignition
  - o Consumes less energy than Rapid Start ballasts
- Lamp EOL protection circuit
  - o Safely removes power from the lamp at end-of-life
  - o Prevents lamp overheating
- Microprocessor technology
  - o Provided optimal operation of lamps

APPLICATIONS:

- ■ Decorative Lighting
- ■ Cove Lighting
- ■ Indirect Lighting
- ■ General Lighting

Tel: 800-322-2086 • Fax: 888-423-1882 • Customer Support/Technical Service: 800-372-3331 •
www.advancetransformer.com

Centium

Lamp Data No.	Lamp Data Watts	Min. Start Temp. (F/C)	Input Volts	Catalog Number	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Power Factor %	Dim.	Wiring Diagram
F14T5												
1	14	32/-0	120	ICN-132-MC	UL CSA	0.15	19	1.05	10	0.98	A	1
			230			0.08			20			
			277			0.07						
2	14	32/-0	120	ICN-2M32-MC	UL CSA	0.30	36	1.05	10	0.98	A	2
			230			0.16			20			
			277			0.13						
F21T5												
1	21	32/-0	120	RCN-132-MC	UL CSA	0.22	27	1.10	10	0.99	A	1
			277	VCN-132-MC		0.10						
			120	ICN-132-MC		0.21	26	1.05	10	0.98		
			230			0.11			15			
			277			0.09						
2	21	32/-0	120	RCN-2M32-MC	UL CSA	0.42	50	1.10	10	0.99	A	2
			277	VCN-2M32-MC		0.18						
			120	ICN-2M32-MC		0.42	50	1.05	10	0.98		
			230			0.22			15			
			277			0.18						
F28T5												
1	28	32/-0	120	RCN-132-MC	UL CSA	0.25	30	0.98	10	0.98	A	1
			277	VCN-132-MC		0.11						
			120	ICN-132-MC		0.28	34	1.05	10	0.98		
			230			0.14			15			
			277			0.12						
2	28	32/-0	120	RCN-2M32-MC	UL CSA	0.50	60	0.98	10	0.99	A	2
			277	VCN-2M32-MC		0.22						
			120	ICN-2M32-MC		0.57	68	1.05	10	0.98		
			230			0.30			15			
			277			0.25						

Wiring Diagrams / Dimensions

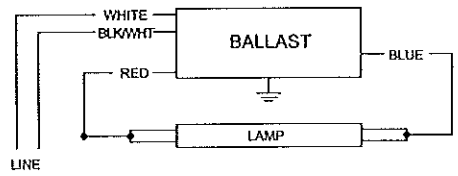


Diagram 1

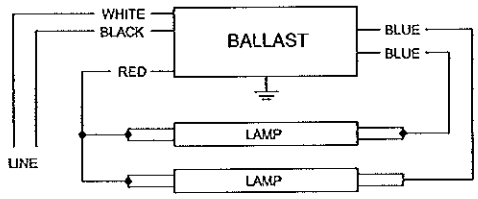
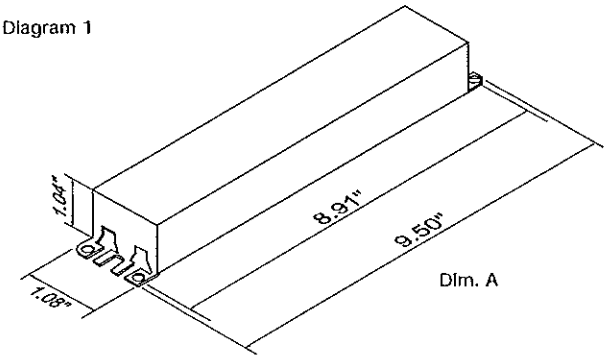


Diagram 2



Dim. A

Lamp Data		Min. Start Temp. (F/C)	Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Power Factor %	Dim.	Wiring Diagram
No.	Watts												
F17T8													
1	17	0/-18	120	ICN-132-MC	UL	CSA	0.14	17	0.88	10	0.98	A	1
			230				0.07						
			277				0.06			20			
2	17	0/-18	120	ICN-2M32-MC	UL	CSA	0.26	31	0.88	10	0.98	A	2
			230				0.13						
			277				0.11			20			
F25T8, FBO24T8													
1	25	0/-18	120	RCN-132-MC	UL	CSA	0.21	25	0.98	10	0.98	A	1
			277	VCN-132-MC			0.09						
			120	ICN-132-MC			0.19	23	0.88	10	0.98		
			230				0.11			15			
			277				0.09						
2	25	0/-18	120	RCN-2M32-MC	UL	CSA	0.41	48	0.88	10	0.99	A	2
			277	VCN-2M32-MC			0.18						
			120	ICN-2M32-MC			0.37	44	0.88	10	0.98		
			230				0.19			15			
			277				0.16						
F32T8/ES (30W)													
1	30	60/15	120	RCN-132-MC	UL	CSA	0.24	28	0.98	10	0.98	A	1
			277	VCN-132-MC			0.10						
			120	ICN-132-MC			0.23	27	0.88	10	0.98		
			230				0.12						
			277				0.10						
2	30	60/15	120	RCN-2M32-MC	UL	CSA	0.45	54	0.88	10	0.99	A	2
			277	VCN-2M32-MC			0.20						
			120	ICN-2M32-MC			0.45	54	0.88	15	0.98		
			230				0.24						
			277				0.20						
F32T8, FBO31T8, F32T8/U6													
1	32	0/-18	120	RCN-132-MC	UL	CSA	0.25	29	0.98	10	0.98	A	1
			277	VCN-132-MC			0.11						
			120	ICN-132-MC			0.25	30	0.88	10	0.98		
			230				0.13						
			277				0.11						
2	32	0/-18	120	RCN-2M32-MC	UL	CSA	0.49	58	0.88	10	0.99	A	2
			277	VCN-2M32-MC			0.21						
			120	ICN-2M32-MC			0.50	59	0.88	15	0.98		
			230				0.25						
			277				0.21						

Centium

BALLAST SPECIFICATIONS

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic and standard electronic ballasts.

1.2 The electronic ballast shall have a maximum height of 1.04 in. and maximum weight of 0.75 lbs.

1.3 The electronic ballast shall be furnished with integral leads, color-coded to ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Instant Start

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V or 277V with sustained variations of +/- 10% (voltage and frequency with no damage to the ballast. IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/-10% (voltage and frequency) with no damage to ballast.

2.4 The electronic ballast output frequency to the lamps shall be above 42 kHz to minimize interference with infrared control systems and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor for primary lamp applications as follows; 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18°C (0°F) for standard T8 lamps and 16°C (60°F) for energy-saving T8 lamps.

2.11 Ballast shall provide Lamp EOL Protection Circuit.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P, Type CC and Type 1 Outdoor; and Canadian Standards Association (CSA) certified.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply win ANSI C82.11, where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

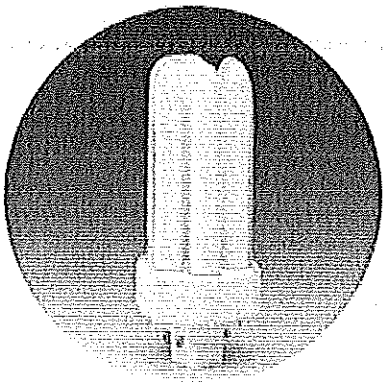
4.1 The electronic ballast shall be produced in a factory certified to ISO 9002 Quality System Standards.

4.2 The electronic ballast shall carry a five-year warranty from the date of manufacture. Warranty shall be valid for a maximum case temperature of 70°C.

4.3 The manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

[Return to search]

[Print Page]



Product Number 20871

Order Abbreviation: CF42DT/E/IN/835/ECO

General Description: DULUX 42W triple compact fluorescent amalgam lamp with 4-pin base, integral EOL, 3500K color temperature, 82 CRI, for use with electronic and dimming ballasts, ECOLOGIC

Product Information

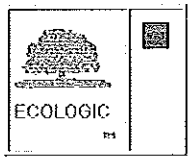
Abbrev. With Packaging Info.	CF42DTEIN835ECO 50/CS 1/SKU
Average Rated Life (hr)	12000
Base	GX24Q-4
Bulb	T4
Color Rendering Index (CRI)	82
Color Temperature/CCT (K)	3500
Diameter (in)	0.472
Diameter (mm)	12.00
Family Brand Name	Dulux® EL
Mean Lumens at 25C	2670
Maximum Overall Length - MOL (in)	6.5
Maximum Overall Length - MOL (mm)	163
Nominal Wattage (W)	42.00

Additional Product Information

Product Documents, Graphs, and Images

Compatible Ballast

Packaging Information



Footnotes

- Approximate initial lumens after 100 hours operation.
- Minimum starting temperature is a function of the ballast; consult the ballast manufacturer.
- There is a NEMA supported, industry issue where T2, T4, and T5 fluorescent and compact fluorescent lamps operated on high frequency ballasts may experience an abnormal end-of-life phenomenon. This end-of-life phenomenon can resultin one or both of the following: 1. Bulb wall cracking near the lamp base. 2. The lamp can overheat in the base area and possibly melt the base and socket. NEMA recommends that high frequency compact fluorescent ballasts have an end-of-life shutdown circuit which will safely and reliably shut down the system in the rare event of an abnormal end-of-life failure mode described above. The final requirements of this system are yet to be defined by ANSI. For additional information refer to NEMA papers on their WEBSITE at www.NEMA.org.
- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org
- This 4-pin DULUX lamp has an internal end-of-life mechanism (EOL) that shuts down the lamp preventing abnormal end-of life failure modes. This lamp was designed for use with high frequency ballasts that do not have their own end-of-life (lamp)sensing circuits, but it is also compatible with high frequency ballasts that have their own end-of-life (lamp) sensing circuits.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- Lumen output and life rated on high frequency operation.
- Rule of Thumb for Compact Fluorescent Lamps: Divide wattage of incandescent lamp by 4 to determine approximate wattage of compact fluorescent lamp that will provide similar light output.
- Optimum light output for DULUX T/E IN amalgam compact fluorescent lamps occurs at approximately 35 deg. C/ 95 deg. F ambient temperature when the lamp is operated in the base up position. The lumen value listed refers to the optimum light output. Non-amalgam compact fluorescent lamps provide atleast 90% light output from 60-100 degrees F in the base up position, the temperature range is narrower for horizontal or base down position.

[Print Page]

20153 – CMH39TUVCU830G12

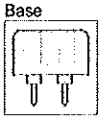
GE ConstantColor® PulseArc® CMH® Ceramic Metal Halide T4.5

a product of ecomagination

PRINT

Bulb

Base



View Larger

GENERAL CHARACTERISTICS

Lamp type	High Intensity Discharge - Ceramic Metal Halide
Bulb	T4.5
Base	Bi-Pin (G12)
Wattage	39
Rated Life	15000 hrs
Bulb Material	Quartz
Lamp Enclosure Type (LET)	Enclosed fixtures only
LEED-EB MR Credit	139 picograms Hg per mean lumen hour
Additional Info	UV control

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	3400
Mean Lumens	2300
Nominal Initial Lumens per Watt	87
Color Temperature	3000 K
Color Rendering Index (CRI)	84

ELECTRICAL CHARACTERISTICS

Burn Position	Universal burning position
Warm Up Time to 90%	2 min
Warm Up Time to 90% (MAX)	2 min/3 min
Hot Restart Time to 90% (MIN)	10 min
Hot Restart Time to 90% (MAX)	15 min

DIMENSIONS

Maximum Overall Length (MOL)	3.5600
Light Center Length (LCL)	2.180

PRODUCT INFORMATION

Product Code	20153
Description	CMH39TUVCU830G12
ANSI Code	C130/M130
Standard Package	Case
Standard Package GTIN	10043168201534
Standard Package Quantity	12
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	12
UPC	043168201537

COMPATIBLE GE BALLASTS

Product Code	Description	# of Bulbs	Power Factor	Ballast Factor
74116	GEMH39-MC-120	1	0.99	1.0
75378	GEMH39-MCM-120	1	0.99	1.0
87501	GEMH39-MSF-120	1	0.99	1.0

ADDITIONAL RESOURCES

Catalogs

Testimonials

Sell Sheets

- ConstantColor® CMH® Single-Ended G12 Lamps
- ConstantColor® CMH® Single-Ended G12 Lamps - OEM Data Sheet

MSDS (Material Safety Data Sheets)

Disposal Policies & Recycling Information

⚠ CAUTIONS & WARNINGS

R- WARNING: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured, and the arc tube continues to operate. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain types of lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available. Visit the FDA website for more information: http://www.fda.gov/cdrh/radhealth/products/urburns.html

See list of cautions & warnings.

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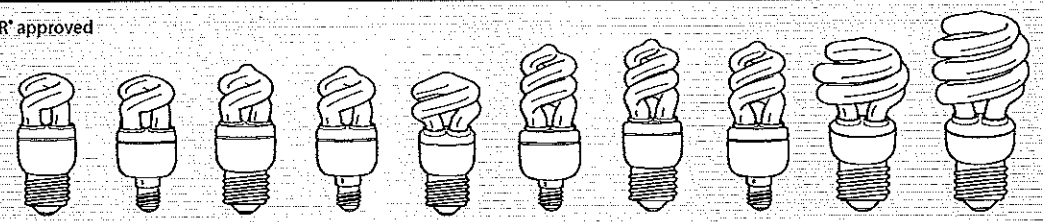
*Lamp for Fixture Types: AA, AN

289 Series (2W–13W) Specifications

SpringLamp® Compact Fluorescent, NPF

Item #	Wattage	Incandescent Wattage Comparison	Initial Lumens	Input Line Current	M.O.L. (inches)	Diameter (inches)	Lamp Life (hours)	Ideal for: Table/floor Lamps	Chandeliers	Recessed Cans	Bare bulb Fixtures	Wall Sconce	Ceiling Fixtures	Desk Lamp	Mirror Lights	Outdoor Lights
28902	2	15	150	.03A	3.0	1.3	8K		•		•	•		•	•	
28902C	2	15	150	.03A	3.0	1.3	8K		•			•		•	•	
28902T	2	15	150	.03A	3.2	1.2	8K		•			•		•	•	
28902TC	2	15	150	.03A	3.2	1.2	8K		•			•		•	•	
28904 ★	4	25	250	.07A	3.1	1.5	8K		•		•	•		•	•	
28904C	4	25	250	.07A	3.1	1.5	8K		•			•		•	•	
28904T ★	4	25	250	.07A	3.5	1.2	8K		•			•		•	•	
28904TC	4	25	250	.07A	3.5	1.2	8K		•			•		•	•	
28909 ★	9	40	550	.15A	3.6	1.9	12K	•	•	•	•	•	•	•		•
28913 ★	13	60	900	.22A	3.9	1.9	12K	•	•	•	•	•	•	•		•
28913Y	13	60	500	.22A	3.9	1.9	12K									•

★ = ENERGY STAR® approved



28902 28902C 28902T 28902TC 28904 28904C 28904T 28904TC 28909 28913

Features and Benefits:

- Small size
- Amalgam Technology – provides cooler operating temperatures for consistent performance in any position
- Long life, 8,000 hours to 12,000 hours average rated life
- No lead glass – Better lumen maintenance over life of bulb
- 2700 K color temperature closest to incandescent light
- Medium base or Candelabra base
- Replace less often, ideal for hard to reach places
- End of Life logic guards against violent failures
- UL Approved for totally enclosed fixtures

Specifications (at full brightness)

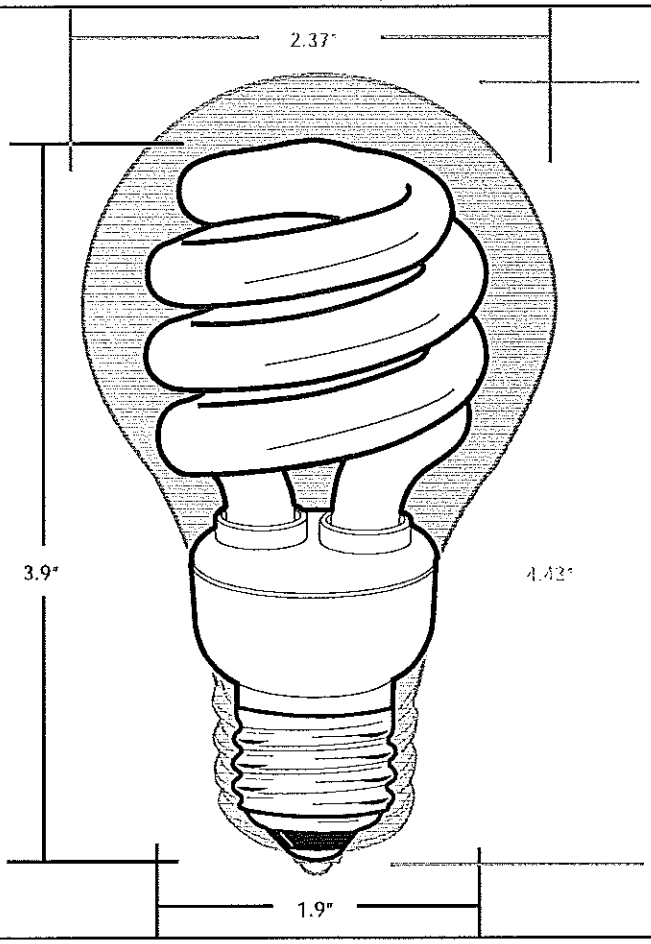
End of Life Protection	Yes
Ballast Type	Electronic
Starting Method	Modified Rapid Start
Input Line Voltage	120VAC
Input Line Frequency	50/60HZ
Lamp Life (rated)	8,000 or 12,000 Hours
Color Temperature	2700 K
Color Rendering Index	82
Min. Starting Temperature	-20 °F
Max. Operating Temperature	160 °F
U.L. / C.U.L. Listed	Yes
FCC Compliance	Part 18, Subpart C
Lamp Operating Frequency	45 KHZ
Lamp Current Crest Factor	< 1.60
Max. Open Circuit Voltage	600V
Power Factor	> .50
Total Harmonic Distortion	< 150%

Special Application Options: (Ordering Suffix)

- 3100°K(31K), 3500°K(35K), 4100°K(41K), 5100°K (51K), 6500°K(65K)
- Long Neck 1.65"(165), 1.75"(175), 2.25"(225) (9W & 13W only)
- Wet Location(WL) • Shatter Resistant(SS)
- Blue(BL), Green(GR), Red(RD), Pink(P), Soft Pink(SP), Yellow(Y)

c UL us 12 MONTH WARRANTY on 8,000 hour lamps 24 MONTH WARRANTY on 12,000 hour lamps

Actual Size Comparison: (28913 compared to 60 watt Incandescent)



TCP, Inc.
325 Campus Drive Aurora, Ohio 44202 P: 800-324-1496 F: 330-995-6188 tcpi.com

TCP is proud to have been awarded ENERGY STAR Partner of the Year 2009.

ENERGY STAR AWARD 2009 PARTNER OF THE YEAR

Type AF Lamp

GE Lighting

WORLDWIDE PARTNER

Commercial Products & Solutions

89632 – FLE15/2/A19XL

GE A19

PRINT

High Color Rendering
cUL Listed
Energy Savings

Base

View Larger

GENERAL CHARACTERISTICS

Lamp type	Compact Fluorescent - Self-Ballasted
Bulb	A19
Base	Medium Screw (E26)
ENERGY STAR® Qualified	Yes
Bulb Finish	Soft white
Wattage	15
Equivalent Wattage	60 W
Voltage	120
Rated Life	10000 hrs
Starting Temperature (MIN)	5 °F (-15 °C)
Total Harmonic Distortion (THD)	120 %
LEED-EB MR Credit	530 picograms Hg per mean lumen hour

ADDITIONAL RESOURCES

Catalogs
Testimonials
Disposal Policies & Recycling Information

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	825
Mean Lumens	660
Nominal Initial Lumens per Watt	55
Color Temperature	2700 K
Color Rendering Index (CRI)	82

ELECTRICAL CHARACTERISTICS

Input Voltage	120 V
Input Current	0.1700 A
Power Factor	0.6

DIMENSIONS

Nominal Length	4.600 in (116.8 mm)

PRODUCT INFORMATION

Product Code	89632
Description	FLE15/2/A19XL
Standard Package	Case
Standard Package GTIN	10043168896327

Standard Package Quantity	10
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	10
UPC	043168896320

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Type AP Lamp

WORLDWIDE PARTNER

GE Lighting

Commercial Products & Solutions

89636 – FLE26/2/T21XL

GE T21

PRINT

High Color Rendering
cUL Listed
Energy Savings
UL Listed

Base

View Larger

GENERAL CHARACTERISTICS

Lamp type	Compact Fluorescent - Self-Ballasted
Bulb	T21
Base	Medium Screw (E26)
ENERGY STAR® Qualified	Yes
Bulb Finish	Soft white
Wattage	26
Equivalent Wattage	100 W
Rated Life	10000 hrs
Starting Temperature (MIN)	5 °F (-15 °C)
LEED-EB MR Credit	324 picograms Hg per mean lumen hour

ADDITIONAL RESOURCES

Catalogs
Testimonials
Disposal Policies & Recycling Information

PHOTOMETRIC CHARACTERISTICS

Initial Lumens	1350
Mean Lumens	1080
Nominal Initial Lumens per Watt	51
Color Temperature	2700 K
Color Rendering Index (CRI)	82

ELECTRICAL CHARACTERISTICS

Input Voltage	120 V
Input Current	0.3700 A
Power Factor	0.6

DIMENSIONS

Nominal Length	6.000 in (152.4 mm)

PRODUCT INFORMATION

Product Code	89636
Description	FLE26/2/T21XL
Standard Package	Case
Standard Package GTIN	10043168896365
Standard Package Quantity	10

Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	10
UPC	043168896368

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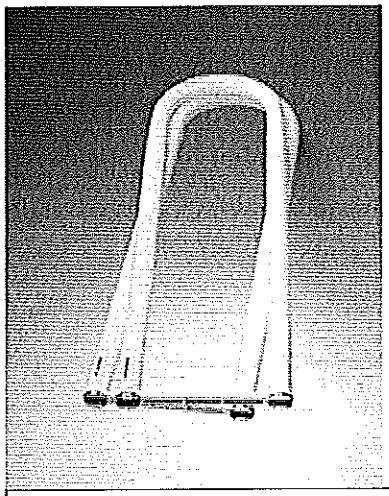


Product Numbers 22055

Order Abbreviation: FBO32/835XP/6/ECO *Lamp for Fixture Types: B, BE, G, GE

General Description: 32W, 22.5" MOL, T8 OCTRON XP Extended Performance Curvalume fluorescent lamp, 6" leg spacing, 3500K color temperature, rare earth phosphor, 85 CRI, suitable for IS or RS operation, ECOLOGIC

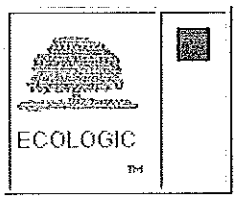
Product Information

Abbrev. With Packaging Info.	FBO32835XP6ECO 16/CS 1/SKU
Actual Length (in)	22.6
Actual Length (mm)	574.0
Average Rated Life (hr)	24000
Base	Medium Bipin
Bulb	T8
Color Rendering Index (CRI)	85
Color Temperature/CCT (K)	3500
Diameter (in)	1.10
Diameter (mm)	27.8
Family Brand Name	OCTRON® 800 XP®, ECOLOGIC®
Industry Standards	ANSI C78.81 - 2001
Initial Lumens at 25C	2900
Mean Lumens at 25C	2755
Nominal Length (in)	22.5
Nominal Wattage (W)	32.00

Additional Product Information

Product Documents, Graphs, and Images

Packaging Information



Footnotes

- Approximate initial lumens after 100 hours operation.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- Life rating of OCTRON XP lamps operated on instant start electronic ballasts is 18,000 hours based on the industry standard life test cycle of 3 hours per start.
- Minimum starting temperature is a function of the ballast; consult the ballast manufacturer.

- OCTRON lamps should be operated only with magnetic rapid start ballasts designed to operate 265 mA, T-8 lamps or high frequency (electronic) ballasts that are either instant start, or rapid start, or programmed rapid start specifically designed to operate T8 lamps. OCTRON lamps may be operated on instant start ballasts with ballast factors ranging from a minimum of 0.71 to a maximum of 1.20 at the nominal ballast input voltage. When OCTRON lamps are operated in the instant start mode, the two wires or two contacts of each socket should be connected to each other. They should then be connected to the appropriate ballast lead wire using National Electric Code techniques.
- Approximate length of OCTRON CURVALUME lamps is measured from base face to outside of glass bend.
- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org
- The lamp lumen maintenance factor used to determine the mean lumen value was 95%. This is the lamp lumen maintenance factor at 8,000 hours, 40% of 20,000 hours. It was used to allow comparison to standard OCTRON(R) lamps with an average rated life of 20,000 hours. The lamp lumen maintenance factor at 40% of the 24,000 hour average rated life of this lamp, 9600 hours, would be 94%.*

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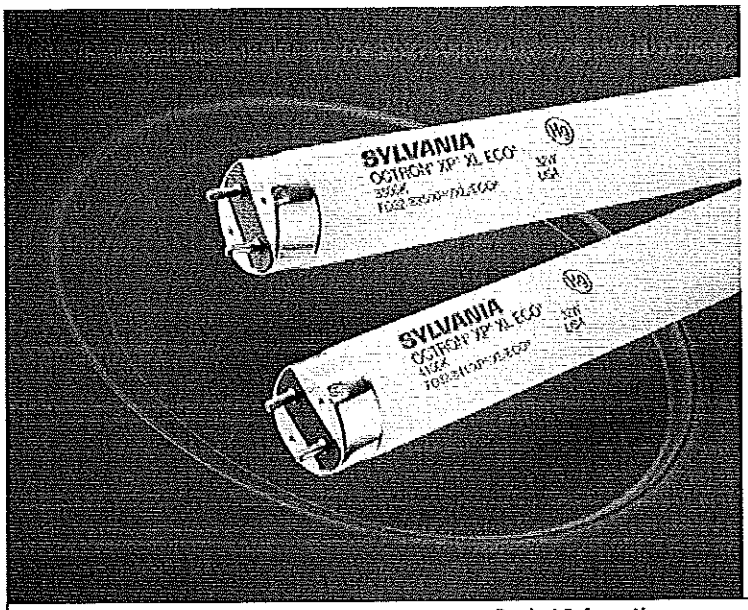


Product Number	21576
Order Abbreviation	FO32/835/XP/XL/ECO3
General Description	48" MOL; T8 OCTRON XP Extended Performance; Extended Long Life; 3500K color temperature; rare earth phosphor; 85 CRI; ECOLOGIC®3; suitable for operation on instant start or rapid start ballasts.

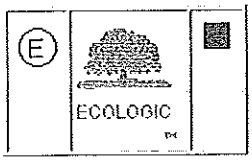
Product Information

Abbrev. With Packaging Info.	FO32835XPXLECO3 30/CS 1/SKU
Actual Length (in)	47.78
Actual Length (mm)	1213.6
Average Rated Life (hr)	40000
Base	Medium Bipin
Bulb	T8
Color Rendering Index (CRI)	85
Color Temperature/CCT (K)	3500
Diameter (in)	1.10
Diameter (mm)	27.9
Family Brand Name	OCTRON® XP® XL ECOLOGIC®3
Industry Standards	ANSI C78.81-2005
Initial Lumens at 25C	2950
Mean Lumens at 25C	2861
Nominal Length (in)	47.78
Nominal Length (mm)	1219.2
Nominal Wattage (W)	32.00

Additional Product Information

Product Documents, Graphs, and Images

Packaging Information



Footnotes

- This lamp may also be operated by the OSRAM SYLVANIA QUICKTRONIC(R) PSN ballast (.88 BF), or the QUICTRONIC PSX ballast (.71 BF).
- The lamp lumen maintenance factor used to determine the mean lumen value was 97%. This is the lamp lumen maintenance factor at 8000 hours, 40% of 20,000 hours. It was used for comparison to standard OCTRON® lamps with an average rated life of 20,000 hours. The lamp lumen maintenance factor at 40% of 40,000 hours, 16000 hours, would be 96%.
- The life of this lamp, operated on instant start electronic ballasts is 36,000 hours based on the industry standard life test standard of 3 hours per start.
- The 40,000 hour average rated life of the FO32/800XP®/XL/ECO®/, FO28/800XP/XL/SS/ECO, and FO32/25W/800XP/XL/SS/ECO OCTRON® lamps is based on operation at 3 hours per start on a QUICKTRONIC® programmed start ballast. If operated on other ballasts for T8 OCTRON lamps, lamp life will be 40,000 hours for programmed rapid start operation and 36, 000 hours for instant start operation at 3 hours per start.
- Approximate initial lumens after 100 hours operation.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org

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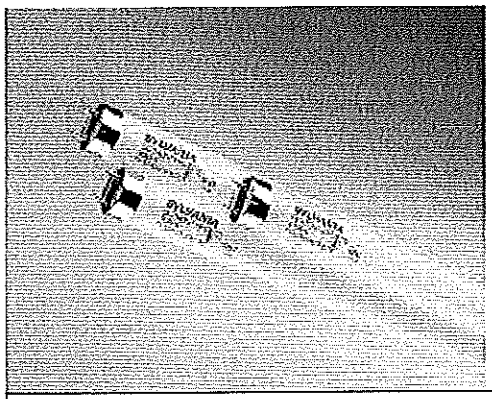
Return to: Octron 800 XPS | Print Page



Product Number:	22154
Order Abbreviation:	FO25/835/XPS/ECO3
General Description:	25W, 36" MOL, T8 OCTRON XPS Extended Performance Super fluorescent lamp, 3500K color temperature, rare earth phosphor, 85 CRI, suitable for RS or IS operation, ECOLOGIC®3

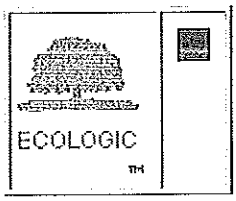
Product Information

Abbrev. With Packaging Info.	FO25835XPSECO3 30/CS 1/SKU
Actual Length (in)	35.78
Actual Length (mm)	1213.6
Average Rated Life (hr)	36000
Base	Medium Bipin
Bulb	T8
Color Rendering Index (CRI)	85
Color Temperature/CCT (K)	3500
Diameter (in)	1.10
Diameter (mm)	27.9
Family Brand Name	OCTRON® 800 XPS ECOLOGIC®3
Industry Standards	ANSI C78.81 - 2001
Initial Lumens at 25C	2200
Mean Lumens at 25C	2090
Mean Lumens at 35C	2090
Nominal Length (in)	36
Nominal Wattage (W)	25.00

Additional Product Information

Product Documents, Graphs, and Images

Packaging Information



Footnotes

- The 36,000 hour average rated life of the linear 2,3 and 4 foot OCTRON® XPS/ECO lamps is based on operation at 3 hours per start on a QUICKTRONIC® programmed start ballast. If operated on other ballasts for T8 OCTRON lamps, lamp life will be 36,000 hours for programmed rapid start operation and 24,000 hours for instant start operation at 3 hours per start.
- Approximate initial lumens after 100 hours operation.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- Minimum starting temperature is a function of the ballast; consult the ballast manufacturer.
- OCTRON lamps should be operated only with magnetic rapid start ballasts designed to operate

265 mA, T-8 lamps or high frequency (electronic) ballasts that are either instant start, or rapid start, or programmed rapid start specifically designed to operate T8 lamps. OCTRON lamps may be operated on instant start ballasts with ballast factors ranging from a minimum of 0.71 to a maximum of 1.20 at the nominal ballast input voltage. When OCTRON lamps are operated in the instant start mode, the two wires or two contacts of each socket should be connected to each other. They should then be connected to the appropriate ballast lead wire using National Electric Code techniques.

- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org
- The lamp lumen maintenance factor used to determine the mean lumen value was 95%. This is the lamp lumen maintenance factor at 8000 hours, 40% of 20,000 hours. It was used for comparison to standard OCTRON(R) lamps with an average rated life of 20,000 hours. The lamp lumen maintenance factor at 40% of 24,000 hours, 9600 hours, would be 94%. The lamp lumen maintenance factor at 40% of 30,000 hours, 12,000 hours, would be 93%. The lamp lumen maintenance factor at 40% of 36,000 hours, 14,400 hours would also be 93%.

Print Page

Return to: Pentron - T5 Fluorescent | Print Page

photo not available

Product Number: 21027

Order Abbreviation: FP21835ECOSL *Lamp for Fixture Type: LD3

General Description: 21W T5 PENTRON SAFELINE fluorescent lamp. 3500K CCT, 85CRI, ECOLOGIC

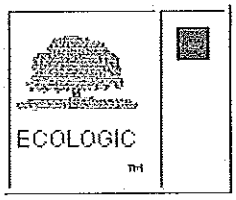
Product Information

Abbrev. With Packaging Info.	FP21835ECOSL 40/CS 1/SKU
Actual Length (in)	34
Actual Length (mm)	863.2
Average Rated Life (hr)	20000
Base	Miniature Bipin
Bulb	T5
Color Rendering Index (CRI)	85
Color Temperature/CCT (K)	3500
Diameter (in)	0.67
Diameter (mm)	17.0
Family Brand Name	PENTRON® SAFELINE®
Initial Lumens at 25C	1860
Initial Lumens at 35C	2037
Mean Lumens at 25C	1767
Mean Lumens at 35C	1894
Nominal Length (in)	36
Nominal Wattage (W)	21.00

Additional Product Information

Product Documents, Graphs, and Images

Packaging Information



Footnotes

- Approximate initial lumens after 100 hours operation.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- Minimum starting temperature is a function of the ballast; consult the ballast manufacturer.
- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP

test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org

- SAFELINE lamps satisfy the criteria of having a non-shattering covering for prevention of glass and other lamp components in your product by containment within the safety coating material. The covering must be intact or the lamp must be replaced to be in compliance. An onsite inspector will require correction if the lamps are installed improperly or not maintained properly.
- SAFELINE lamps are intended for indoor use only. Lamps must be used in ambient temperatures below 135 degrees F. For T8 and T12 lamps, the coating is designed to withstand constant operating temperatures up to 239 degrees F and has a melting point in excess of 500 degrees F. For T5 lamps, the coating is designed to withstand constant operating temperatures up to 500 degrees F and has a melting point in excess of 620 degrees F. Lamps must be used in open fixtures with sockets that provide adequate lamp pin to socket contact. Lamps must not be used with defective ballasts sockets, or fixtures with improper wiring.

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GE Lighting
WORLDWIDE PARTNER
Commercial Products & Solutions

46705 – F28W/T5/835/ECO *Lamp for Fixture Types: LD4, TS4, TS4E

GE Ecolux® Starcoat® T5

PRINT

• Passes TCLP, which can lower disposal costs.

a product of ecomagination

High Color Rendering

GENERAL CHARACTERISTICS

Lamp type	Linear Fluorescent - Straight Linear
Bulb	T5
Base	Miniature Bi-Pin (G5)
Wattage	28
Voltage	167
Rated Life	30000 hrs
Rated Life (rapid start) @ Time	30000 h @ 3 h 36000 h @ 12 h
Bulb Material	Soda lime
Starting Temperature (MIN)	-20 °C (-4 °F)
LEED-EB MR Credit	56 picograms Hg per mean lumen hour
Additional Info	TCLP compliant

PHOTOMETRIC CHARACTERISTICS

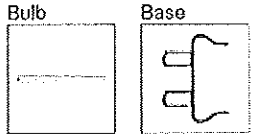
Initial Lumens	2900
Mean Lumens	2660
Nominal Initial Lumens per Watt	103
Color Temperature	3500 K
Color Rendering Index (CRI)	85
S/P Ratio (Scotopic/Photopic Ratio)	1.5

ELECTRICAL CHARACTERISTICS

Open Circuit Voltage (rapid start) Min @ Temperature	425 V @ 10 °C
Cathode Resistance Ratio - Rh/Rc (MIN)	4.25
Cathode Resistance Ratio - Rh/Rc (MAX)	6.5
Current Crest Factor (MAX)	1.7

DIMENSIONS

Maximum Overall Length (MOL)	45.8000 in (1163.3 mm)
Nominal Length	45.200 in (1148.0 mm)



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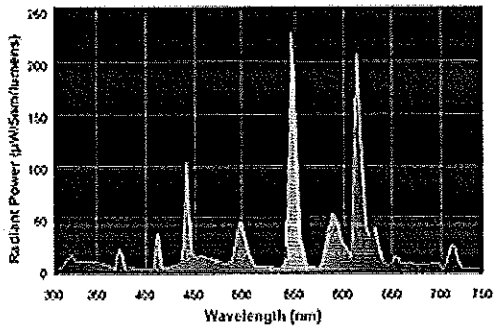
ADDITIONAL RESOURCES

Catalogs
Testimonials
Disposal Policies & Recycling Information

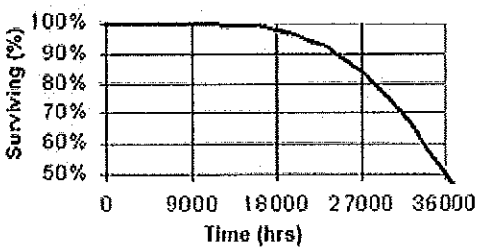
GRAPHS & CHARTS

Spectral Power Distribution



Lamp Mortality

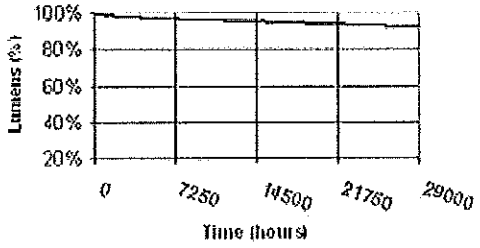
Bulb Diameter (DIA)	0.625 in (15.8 mm)
Bulb Diameter (DIA) (MAX)	0.670 in (17.0 mm)
Max Base Face to Base Face (A)	45.240 in (1149.0 mm)
Face to End of Opposing Pin (B) (MIN)	45.420 in (1153.6 mm)
Face to End of Opposing Pin (B) (MAX)	45.520 in (1156.2 mm)



PRODUCT INFORMATION

Product Code	46705
Description	F28W/T5/835/ECO
Standard Package	Case
Standard Package GTIN	10043168467053
Standard Package Quantity	40
Sales Unit	Unit
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	40
UPC	043168467056

Lumen Maintenance



COMPATIBLE GE BALLASTS

Product Code	Description	# of Bulbs	Power Factor	Ballast Factor
99655	GE228MVPS-A	1	99.0	1.09
99653	GE228MVPSH-A	1	99.0	1.21

YOU MIGHT ALSO BE INTERESTED IN...

For Energy

GE Ecolux® Starcoat® T5
Product code: 71653

- Passes TCLP, which can lower disposal costs.

COMPARE

*Click on product for more specification details

⚠ CAUTIONS & WARNINGS

See list of cautions & warnings.

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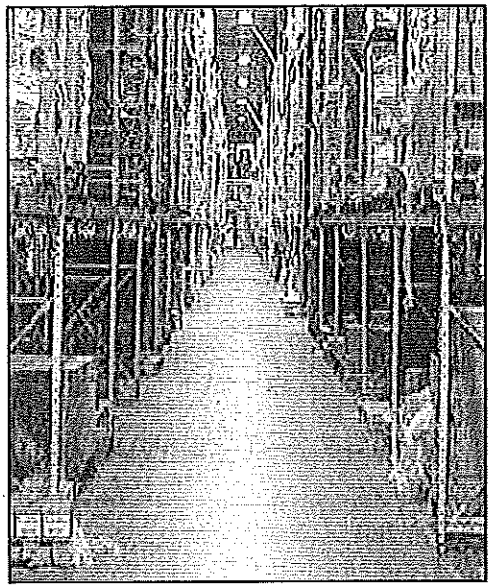
*Lamp for Fixture Type: TS2

GE Consumer & Industrial
Lighting

Starcoat®T5 Ecolux® High Efficiency and High Output



High Output:

Offers High Lumen Package

Ideally suited for indirect luminaires and uplighting or as replacement for HID fixtures in warehouse or "big box" applications.

High Efficiency:

Offers High Lumens per Watt

Ideally suited to commercial and retail application in both direct and combined direct/indirect luminaires.

Lamp Operation:

Starcoat® T5 Ecolux® lamps were designed to reach their maximum luminous flux at an ambient draft-free air temperature of 35°C. As the cold spot is situated near the metal cap, the temperature of the cap can tell how close the Hg vapor pressure is to the optimum: a cap temperature of approx. 43°-45°C corresponds to conditions resulting in maximum light output in a stabilized T5 lamp.

System Design Considerations:

If the design of the luminaire allows higher or lower ambient temperature than 35°C the luminous output will be different from the designed maximum light output. In cases where additional cathode heating is applied by an electronic ballast during lamp operation, power dissipation may substantially increase the temperature of the cold chamber located behind the electrode. This might result in a shift of the peak light output toward temperature ranges below 35°C. Air movement within the luminaires can also substantially affect the light output of the T5 lamps since it may also change the cold spot temperature. Consult OEM fixture Manufacturer Photometric tests for more detail on thermal and light output effects (photometrics).

Benefits of T5 in High Bay Applications:

Energy Savings

Great Lumen Maintenance

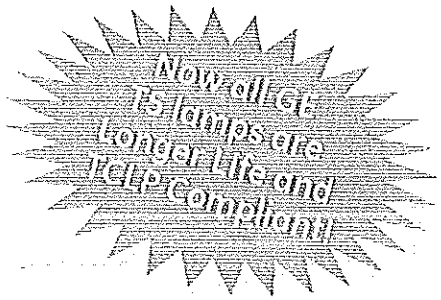
High Color Consistency and CRI (85)

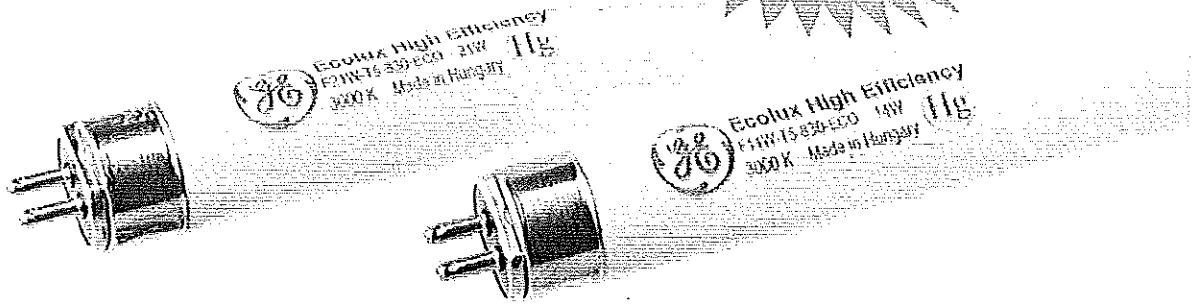
Limited Restrike or Warm-up Delays

Use with Energy-Saving Controls like occupancy sensors and dimmers

No End of Life Cycling

Full Range of Color Temperatures 3000K-6500K (including 5000K)



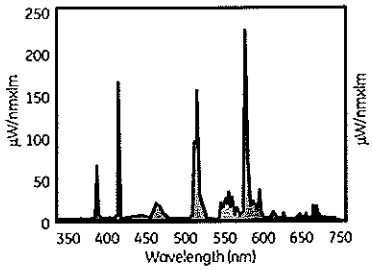


imagination at work

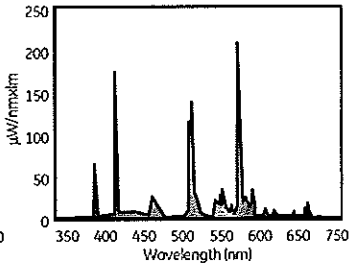
Starcoat ® T5 High Efficiency and High Output Lamp Specifications

At 35° C		HIGH EFFICIENCY				HIGH OUTPUT				
		14W	21W	28W	35W	24W	39W	54W	49W	80W
PRODUCT CODE BY COLOR TEMP.	3000K	31590	46677	46704	46724	46699	46744	46759	46751	46802
	3500K	46671	46684	46705	46727	46700	46745	46760	46752	46803
	4100K	46673	46687	46706	46735	46701	46746	46761	46753	46804
	5000K	46674	46686	46707	46742	46702	46747	46762	46757	46805
	6500K	46676	46689	46708	46743	46703	46748	46763	46758	46806
DESCRIPTION BY COLOR TEMP.		F14WT5/830/ECO	F21WT5/830/ECO	F28WT5/830/ECO	F35WT5/830/ECO	F24WT5/830/ECO	F39WT5/830/ECO	F54WT5/830/ECO	F49WT5/830/ECO	F80WT5/830/ECO
		F14WT5/835/ECO	F21WT5/835/ECO	F28WT5/835/ECO	F35WT5/835/ECO	F24WT5/835/ECO	F39WT5/835/ECO	F54WT5/835/ECO	F49WT5/835/ECO	F80WT5/835/ECO
		F14WT5/841/ECO	F21WT5/841/ECO	F28WT5/841/ECO	F35WT5/841/ECO	F24WT5/841/ECO	F39WT5/841/ECO	F54WT5/841/ECO	F49WT5/841/ECO	F80WT5/841/ECO
		F14WT5/850/ECO	F21WT5/850/ECO	F28WT5/850/ECO	F35WT5/850/ECO	F24WT5/850/ECO	F39WT5/850/ECO	F54WT5/850/ECO	F49WT5/850/ECO	F80WT5/850/ECO
		F14WT5/865/ECO	F21WT5/865/ECO	F28WT5/865/ECO	F35WT5/865/ECO	F24WT5/865/ECO	F39WT5/865/ECO	F54WT5/865/ECO	F49WT5/865/ECO	F80WT5/865/ECO
CASE QUANTITY		40	40	40	40	40	40	40	40	40
PHYSICAL CHARACTERISTICS										
Bulb Designation		T5	T5	T5	T5	T5	T5	T5	T5	T5
Max Bulb Diameter (D) (inches)		0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.669
Nominal Bulb Diameter (inches)		0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625
Base Type		G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin	G5 Min Bipin
Max Base Face to Base Face (A) (inches)		21.61	33.42	45.23	57.04	21.61	33.42	45.23	57.04	57.04
Max Face to End of Opposing Pin (B) (inches)		21.89	33.70	45.51	57.32	21.89	33.70	45.51	57.32	57.32
Min Face to End of Opposing Pin (B) (inches)		21.79	33.61	45.42	57.23	21.79	33.61	45.42	57.23	57.23
Max (Pin to Pin)		22.2	33.4	45.8	57.6	22.2	33.9	45.8	57.6	57.6
TCLP Compliant		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ELECTRICAL CHARACTERISTICS										
Nominal Lamp Watts		14	21	28	35	24	39	54	49	80
Nominal Lamp Volts		82	123	167	209	75	112	117	191	145
Nominal Lamp Operating Current (mA)		.170	.170	.170	.170	.300	.340	.460	.260	.555
Nominal Lamp Operating Frequency (kHz)		>20	>20	>20	>20	>20	>20	>20	>20	>20
Minimum Starting Temp (deg C)		-20	-20	-20	-20	-20	-20	-20	-20	-20
Dimmable (yes/no)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PHOTOMETRIC CHARACTERISTICS										
Reference - Initial Lumens		1350	2100	2900	3650	2000	3500	5000	4900	7000
- For 5000K		1300	2000	2750	3500	1900	3350	4800	4700	6700
- For 6500K		1250	1950	2700	3400	1900	3330	4750	4650	6650
Mean Lumens (40% Rated life)		1240	1930	2660	3350	1840	3220	4600	4500	6440
Nominal Efficacy (Lumens/Watt) - Initial		96	100	104	104	83	90	93	100	88
Avg. Rated Life (hrs) 3hr cycle - RS ballast		30000	30000	30000	30000	30000	30000	30000	30000	30000
12hr cycle - RS ballast		36000	36000	36000	36000	36000	36000	36000	36000	36000
Color Rendering Index (Ra) CRI		85	85	85	85	85	85	85	85	85

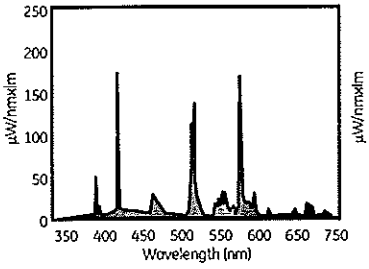
Spectral Power Distribution (3000K)



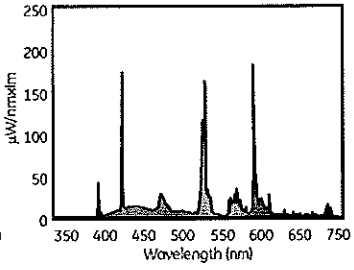
Spectral Power Distribution (3500K)



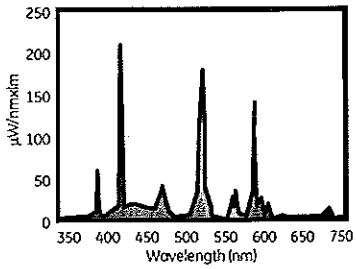
Spectral Power Distribution (4100K)



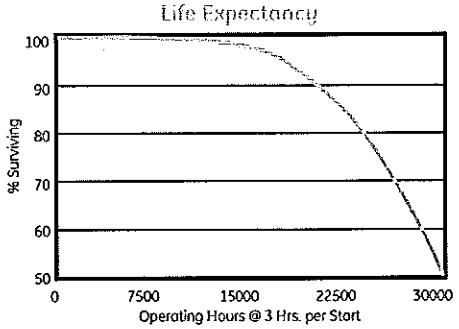
Spectral Power Distribution (5000K)



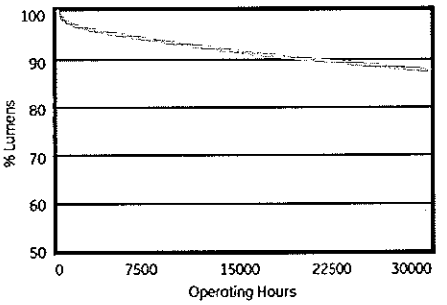
Spectral Power Distribution (6500K)



Life Expectancy



Lumen Maintenance



For additional product and application information, please consult GE's Website: www.gelighting.com

[Return to search] [Print Page]

Product Number:	20893
Order Abbreviation:	CF13DT/E/835/ECO
General Description:	DULUX 13W triple compact fluorescent lamp with 4-pin base, integral EOL, 3500K color temperature, 82 CRI, for use with electronic and dimming ballasts, ECOLOGIC

Product Information

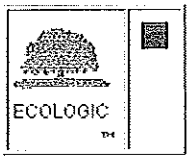
Abbrev. With Packaging Info.	CF13DTE835ECO 50/CS 1/SKU
Average Rated Life (hr)	12000
Base	GX24Q-1
Bulb	T4
Color Rendering Index (CRI)	82
Color Temperature/CCT (K)	3500
Diameter (in)	0.000
Diameter (mm)	0.00
Family Brand Name	Dulux® T/E
Industry Standards	IEC 60901- 3413
Mean Lumens at 25C	774
Maximum Overall Length - MOL (in)	4.2
Maximum Overall Length - MOL (mm)	106
NEMA Generic Designation (old)	CFM13W/GX24Q/835
Nominal Wattage (W)	13.00

Additional Product Information

Product Documents, Graphs, and Images

Compatible Ballast

Packaging Information



Footnotes

- Approximate initial lumens after 100 hours operation.
- Minimum starting temperature is a function of the ballast; consult the ballast manufacturer.
- There is a NEMA supported, industry issue where T2, T4, and T5 fluorescent and compact fluorescent lamps operated on high frequency ballasts may experience an abnormal end-of-life phenomenon. This end-of-life phenomenon can resultin one or both of the following: 1. Bulb wall cracking near the lamp base. 2. The lamp can overheat in the base area and possibly melt the base and socket. NEMA recommends that high frequency compact fluorescent ballasts have an end-of-life shutdown circuit which will safely and reliably shut down the system in the rare event of an abnormal end-of-life failure mode described above. The final requirements of this system are yet to be defined by ANSI. For additional information refer to NEMA papers on their WEBSITE at www.NEMA.org.
- SYLVANIA ECOLOGIC fluorescent lamps are designed to pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states. TCLP test results are available upon request. Lamp disposal regulations may vary, check your local & state regulations. For more information, please visit www.lamprecycle.org
- This 4-pin DULUX lamp has an internal end-of-life mechanism (EOL) that shuts down the lamp preventing abnormal end-of life failure modes. This lamp was designed for use with high frequency ballasts that do not have their own end-of-life (lamp)sensing circuits, but it is also compatible with high frequency ballasts that have their own end-of-life (lamp) sensing circuits.
- The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
- Rule of Thumb for Compact Fluorescent Lamps: Divide wattage of incandescent lamp by 4 to determine approximate wattage of compact fluorescent lamp that will provide similar light output.

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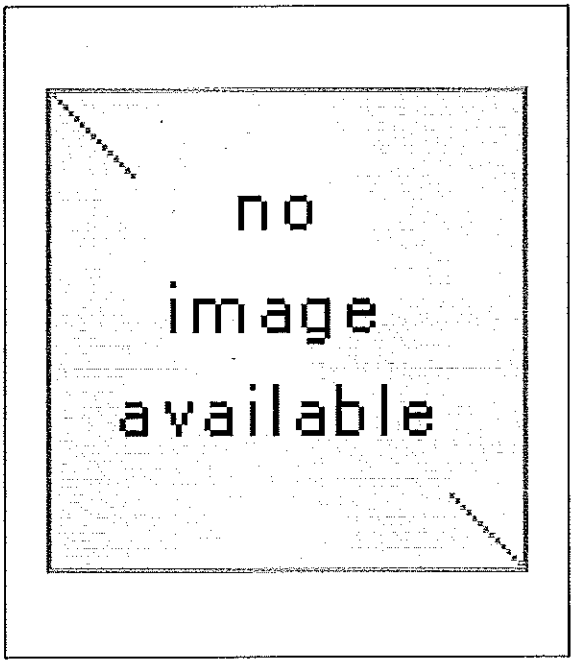
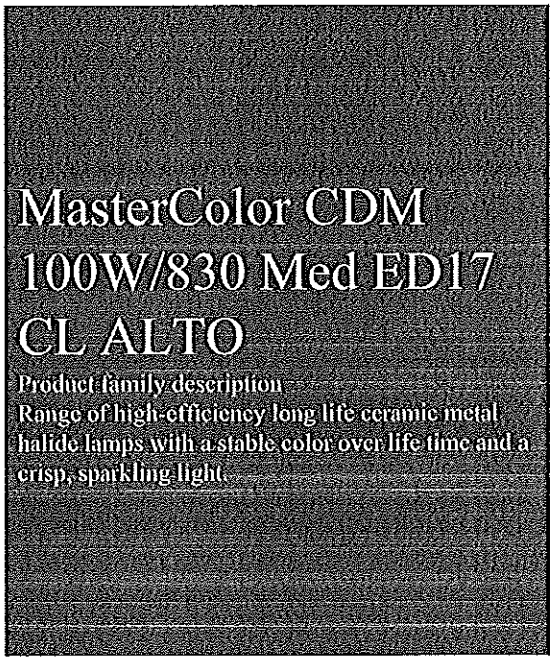
*Lamp for Fixture Types: WB, WS

13/5/2009





Features/Benefits

- Excellent color rendering.
- Superior color stability over life within +- 200K.
- Lamp to lamp color consistency over life.
- Higher lumen maintenance than standard metal halide.
- Warm (3K) or fresh white (4K) color impression.
- High lamp efficacy (up to 93 lumens per watt) for energy saving and low heat.
- Universal operating position.
- No shut off required in 24-hour-a-day/7-day-a-week operations (relamp fixtures at or before the end of rated life).
- Retrofit in existing ED-17 sockets.
- Long lamp life compared to quartz metal halide lamps.

Applications

- Ideal for general lighting, downlighting and flood lighting.

Notes

- Requires a ballast specified or approved for Philips Metal Halide lamp or one designed to the indicated ANSI Standard. A pulse ignitor is required. Sockets and wiring must withstand starting pulse. (391)
- Supply volts must be +/- 5% of rated ballast line volts for reactor type and +/- 10% for CWA or electronic ballasts. (392)
- This product utilizes ALTO® Lamp Technology. ALTO products pass the US EPA's Toxicity Characteristic Leaching Procedure (TCLP) for non-hazardous waste status. (399)
- MasterColor® Metal Halide Lamps are not recommended for use on dimmers and are not warranted if used on dimmer systems. (401)
- Rated average life is the life obtained, on the average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average. For lamps with a rated average life of 24,000 hours, life is based on survival of 67% of the lamps. (351)
- Approximate lumen values listed are for vertical operation of the lamp. (352)
- Means Lumens is the approximate lumen output at 40% of lamp rated average life. (353)
- Heat resisting glass bulb.

PHILIPS

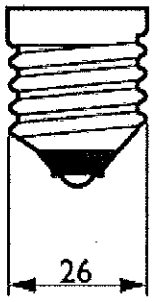
13/5/2009

Product data	
Product Number	208884
Full product name	MasterColor CDM 100W/830 Med ED17 CL ALTO
Ordering Code	MHC100/U/M/3K ALTO
Pack type	1 Sleeve Open End
Pieces per Sku	1
Skus/Case	12
Pack UPC	046677208882
EAN2US	
Case Bar Code	50046677208887
Successor Product number	
Base	Medium [Single Contact Medium Screw]
Base Information	Brass [Brass Base]
Bulb	ED17
Bulb Material	Hard Glass
Bulb Finish	Clear
Operating Position	Universal [Any or Universal (U)]
Packing Type	1SL [1 Sleeve Open End]
Packing Configuration	12
RatedAvgLife(See Family Notes)	16000 hr
Feature	ALTO®
Ordering Code	MHC100/U/M/3K ALTO
Pack UPC	046677208882
Case Bar Code	50046677208887
ANSI Code HID	M140/M90/E
Watts	100W
Lamp Voltage	101 V
Mercury (Hg) Content	6.4 mg
Color Code	830 [CCT of 3000K]
Color Rendering Index	85 Ra8
Color Designation	Warm White
Color Temperature	3000 K
Initial Lumens	9500 Lm
Design Mean Lumens	7125 Lm
Light Center Length L	3.438 in
Max Overall Length (MOL) - C	5.438 in
Diameter D	2.125 in
Product Number	208884

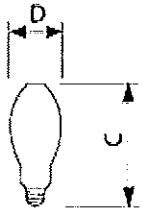
PHILIPS

13/5/2009

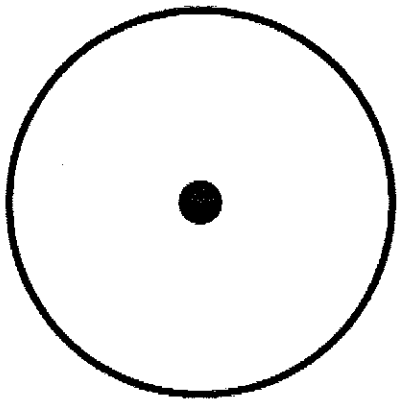
CDM ED17 CL



Base Medium



CDM ED17



Operating Position Universal

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AEP GridSMART

KEMA Operations Manual

Supplement – Summary of Deemed Savings for Incentives Year 2009

Summary of Common Deemed Savings Measures

The below table contains prescriptive measures in a convenient format for viewing the default deemed savings.

Measure	Unit	Incentive Per Unit	kW Per Unit	Total kWh Per Unit	Years Life
Screw in CFL 5-15 Watts	Lamp	$2.00	0.029	155	2
Screw in CFL 16-26 Watts	Lamp	$2.00	0.054	290	2
Screw in CFL 27 Watts or higher	Lamp	$3.00	0.069	368	2
Hardwired CFL 29W or Less	Fixture	$30.00	0.052	276	12
Hardwired 30W or Greater	Fixture	$60.00	0.103	544	12
T12 to T8 Conversion (with electronic ballast): 2-foot & 3-foot T12 to T8	Lamp	$6.00	0.012	60.5	11
T12 to T8 Conversion (with electronic ballast): 4-foot T12 U Tube to T8 U Tube	Lamp	$5.00	0.009	46.7	11
T12 to T8 Conversion (with electronic ballast): 4-foot T12 to HP or RW T8	Lamp	$7.00	0.012	62	11
T12 to T8 Conversion (with electronic ballast): 8-foot T12 to Reduced Wattage T8	Lamp	$7.00	0.016	78.7	11
Standard T8 to Reduced Wattage T8 (Lamp Only): 4-foot T8 to RW T8 (lamp only)	Lamp	$1.00	0.005	28.8	3
Standard T8 to Reduced Wattage T8 (Lamp Only): 8-foot T8 to RW T8 (lamp only)	Lamp	$1.00	0.005	24.6	3
Delamping (Combined with T8 ballast retrofit): 2-foot & 3 -foot delamping	Lamps Removed	$5.00	0.022	119.3	11
Delamping (Combined with T8 ballast retrofit): 4-foot delamping	Lamps Removed	$7.50	0.032	172.3	11
Delamping (Combined with T8 ballast retrofit): 8-foot delamping	Lamps Removed	$12.50	0.062	333.7	11
LED Exit Signs	Fixture	$25.00	0.042	343.4	16
Cold Cathode Lamps	Lamp	$5.00	0.020	108	5
Lighting Occupancy Sensors	Controlled kW	$90.00	0.300	1385	8
New T8/T5 Fixture	kW Reduction	$350.00	0.916	4914	11
Lighting Density	kW Reduction	$400.00	0.916	4914	11
LED Traffic Signals	Lamp	$15.00	0.085	275	6
LED Pedestrian Signals	Lamp	$15.00	0.044	150	8

AEP GridSMART

KEMA Operations Manual

Appendix A – AEP Ohio Prescriptive Lighting Protocols

Table of Contents

Lighting

Most lighting measures presented in these work papers use the same methodology. The following provides the assumptions and methods used for calculating energy savings.

Baseline and retrofit equipment assumptions, i.e. wattages, are specific to the measure. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed.

Savings are calculated by appyling operating hours and other parameters that define the energy savings. These workpapers base the energy savings methodology on the California 2005 DEER Study[1] assumptions. The DEER database is a tool that was jointly developed by the California Public Utilities Commission (CPUC) and the California Energy Commission with support and input from the Investor-Owned Utilities and other interested stakeholders. DEER provides operating hours, interative effects and coincidence factors by building type; however, savings for AEP Ohio Program will not be dependent on building type. Savings presented here are calculated using averages of DEER building type values.

Lighting factors used in savings calculations are listed in the table below. This document explains how these values and the resulting savings were derived.

Table 1: Average Lighting Factors

CFL Annual Operating Hours	Other Lighting Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,321	4,389	1.19	0.77	1.12

Annual energy savings and the peak coincident demand savings were calculated using the equations below:

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are based on the difference between baseline and efficient equipment connected wattage and annual operating hours, according to the following formula:

[1] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

kWh Reduction = (kW of existing equipment - kW of replacement equipment) * (Annual operating hours)*(Energy Interactive Effects)

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Interactive factors account for savings that the measures achieve through avoided air conditioning load because of reduced internal heat gains from energy-efficient lighting. The interactive effects do not apply to exterior lighting.

The annual operating hours, the coincidence factors, and the interactive effect factors are all derived from DEER figures.

The following table lists building types set by DEER. A straight average across DEER building types would heavily weight sectors that happen to have multiple DEER categories. For instance, DEER has four sectors in education and only two in medical. A straight average of operating hours would have weighted the education sector twice as heavily as the medical sector where in reality the two are similar in electric demand.[2] Instead, our average values are that of sector groupings as stated in the table below.

[2] AEP Ohio 2009 to 2028 Energy Efficiency, Peak Demand Reduction Potential Study, Volume 2. Page 48. Summit Blue Consulting, Inc. August 13, 2009.

Table 2: DEER Building Types

DEER	Average Grouping
Education – Primary School	K-12 School
Education – Secondary School	
Education – Community College	College/University
Education – University	
Grocery	Grocery
Health/Medical – Hospital	Medical
Health/Medical – Nursing Home	
Lodging – Hotel	Hotel/Motel
Lodging – Motel	
Lodging – Guest Room	
Manufacturing – Light Industrial	Light Industry
Office – Large	Office
Office – Small	
Restaurant – Sit-Down	Restaurant
Restaurant – Fast-Food	
Retail – 3-Story Large	Retail/Service
Retail – Single-Story Large	
Retail – Small	
Storage – Conditioned	Warehouse
Storage – Unconditioned	
Warehouse – Refrigerated	

The following tables list DEER values. Compact fluorescent lamps (CFLs), LED lighting (unless otherwise noted), and integrated ballast ceramic metal halides have CFL lighting operating hours. Other lighting categories have different operating hours as shown below.

Table 3: Interactive Effects by Building Type from DEER

DEER Market Sector	Demand Interactive Effects	Energy Interactive Effects
Education – Primary School	1.23	1.15
Education – Secondary School	1.23	1.15
Education – Community College	1.22	1.15
Education – University	1.22	1.15
Grocery	1.25	1.13
Medical – Hospital	1.26	1.18
Medical – Clinic	1.26	1.18
Lodging Hotel	1.14	1.14
Lodging Motel	1.14	1.14
Lodging – Guest Rooms	1.14	1.14
Manufacturing – Light Industrial	1.08	1.04
Office – Large	1.25	1.17
Office – Small	1.25	1.17
Restaurant – Sit-Down	1.26	1.15
Restaurant – Fast-Food	1.26	1.15
Retail – 3-Story Large	1.19	1.11
Retail – Single-Story Large	1.19	1.11
Retail – Small	1.19	1.11
Storage Conditioned	1.09	1.06
Storage Unconditioned	1.09	1.06
Warehouse	1.09	1.06

Table 4: Coincident Diversity Factors from DEER

DEER Market Sector	Coincident Diversity Factors
Education – Primary School	0.42
Education – Secondary School	0.42
Education – Community College	0.68
Education – University	0.68
Grocery	0.81
Medical – Hospital	0.74
Medical – Clinic	0.74
Lodging Hotel	0.67
Lodging Motel	0.67
Lodging – Guest Rooms	0.67
Manufacturing – Light Industrial	0.99
Office – Large	0.81
Office – Small	0.81
Restaurant – Sit-Down	0.68
Restaurant – Fast-Food	0.68
Retail – 3-Story Large	0.88
Retail – Single-Story Large	0.88
Retail – Small	0.88
Storage Conditioned	0.84
Storage Unconditioned	0.84
Warehouse	0.84

Table 5: Annual Operating Hours from DEER

DEER Market Sector	CFL Annual Operating Hours	Other Lighting Annual Operating Hours
Education – Primary School	1,440	1,440
Education – Secondary School	2,305	2,305
Education – Community College	3,792	3,792
Education – University	3,073	3,073
Grocery	5,824	5,824
Medical – Hospital	8,736	8,736
Medical – Clinic*	4,212	4,212
Lodging Hotel	8,736	8,736
Lodging Motel	8,736	8,736
Lodging – Guest Rooms	1,145	NA
Manufacturing – Light Industrial*	4,290	4,290
Office – Large	2,739	2,808
Office – Small	2,492	2,808
Restaurant – Sit-Down	3,444	4,368
Restaurant – Fast-Food	6,188	6,188
Retail – 3-Story Large	4,259	4,259
Retail – Single-Story Large	4,368	4,368
Retail – Small	3,724	4,004
Storage Conditioned*	2,860	4,859
Storage Unconditioned*	2,860	4,859
Warehouse*	2,600	4,859

* Not from DEER

Industrial-operating hours are assumed based on the following sources:

- DEER estimates hours to be 2,860.
- Efficiency Vermont Technical Reference User Manual's (No. 2004-29) estimates 5,913 hours.
- The 2004-2005 PG&E work papers assumed 6,650 hours for process industrial and 4,400 for assembly industrial.

DEER's estimated hours are far lower than figures other sources have provided and so we have increased the DEER values by 50% or to 4,290 hours. This value is reasonable and on the conservative side of the averages. We will use this conservative value until more data is available for AEP Ohio or other MidWestern utility territory.

Similarly, we believe that the DEER storage and warehouse operating hours are low as well. Using data from other programs in the region, KEMA has seen average operating hours that are significantly higher and is using a higher value of 4,859 as a better estimate of deemed operating hours for this region.

DEER has set Medical-Hospital operating hours at 8,736. We have lowered this value for the purposes of calculating our average by using operating hours that are 50% above that of offices or 4,212 hours (Medical-Clinic operating hours). This reduction accounts for areas in medical facilities that behave more like offices and do not operate around the clock. The value used in our calculations is the average of the DEER Hospital and the revised clinic operating hours.

Hotel/Motel operating hours are the average of guest room hours and either hotel or motel operating hours since a facility can only be one or the other.

Incremental costs are taken from a number of sources. The AEP Ohio 2009-2028 Energy Efficiency/Peak Demand Reduction Potential Study conducted in August of 2009 provides costs for some measures. Since this study was prepared specifically for AEP, the utility's costs are used whenever applicable. Because some measures listed in the study do not match with that of the program, costs are derived from other sources as well including DEER, KEMA, and the Commonwealth Edison Company's 2008-10 Energy Efficiency and Demand Response Plan prepared by ICF International. The ICF document is referenced as the ICF Portfolio Plan.

Compact Fluorescent Lamps, Screw-In	
Measure Description	ENERGY STAR-rated CFLs with lamp/ballast efficacy of ≥ 40 lumens per Watt. Measure applies only if incandescent or HID lamps are being replaced.
Units	Per lamp
Base Case Description	Incandescent or HID lamps.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: AEP Ohio Potential Study
Effective Useful Life	Source: DEER 2.5 years

This incentive applies to screw-in lamps and applies only if an incandescent or high-intensity discharge (HID) lamp is being replaced. All screw-in CFLs must be ENERGY STAR® rated. The lamp/ballast combination must have an efficacy ≥40 lumens per Watt (LPW). For screw-in CFLs, electronic ballasts are required for lamps ≥18 Watts.

Measure Savings

Baseline and retrofit equipment assumptions are presented in the next table. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed. The table shows the wattages used for the savings calculations.

Table 6: Baseline and Retrofit Wattages

Measure	Base Wattage (Watts)	Retrofit Wattage (Watts)	kW Reductions (kW)
15 W or less	75	15	0.060
15 W or less	60	15	0.045
15 W or less	60	14	0.046
15 W or less	50	14	0.036
15 W or less	65	13	0.052
15 W or less	60	13	0.047
15 W or less	40	13	0.027
15 W or less	40	11	0.029
15 W or less	40	10	0.030
15 W or less	35	7	0.028
15 W or less	30	7	0.023
15 W or less	25	7	0.018
15 W or less	30	9	0.021
15 W or less	25	9	0.016
15 W or less	25	5	0.020
15 W or less	20	5	0.015
16W-25W	100	25	0.075
16W-25W	75	25	0.05
16W-25W	100	23	0.077
16W-25W	100	20	0.08
16W-25W	75	20	0.055
16W-25W	75	19	0.056
16W-25W	75	18	0.057
16W-25W	60	18	0.042
16W-25W	60	16	0.044
26W and Greater	150	40	0.11
26W and Greater	150	36	0.114
26W and Greater	100	30	0.07
26W and Greater	100	28	0.072
26W and Greater	100	26	0.074
26W and Greater	75	26	0.049

Table 7: Wattage Reduction

Wattage Category	Average Wattage Reduction
≤15	32
16 to 26	60
>26	76

The following tables provide the measure savings using the above wattage reduction assumptions.

Table 8: Measure Savings for 15 W or less

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.029	155

Table 9: Measure Savings for 16 – 26 W

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.054	290

Table 10: Measure Savings for > 26 W

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.069	368

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below.

Noncoincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are based on the difference between baseline and efficient equipment connected wattage and annual operating hours, according to the following formula:

kWh Reduction = (kW of existing equipment - kW of replacement equipment) * (Annual operating hours)*(Energy Interactive Effects)

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = noncoincident kW savings * Coincidence Factor * Demand interactive effect

Interactive factors account for savings that the measures achieve through avoided air conditioning load because of reduced internal heat gains from energy-efficient lighting.

The annual operating hours, the coincidence factors, and the interactive effect factors are all derived from DEER figures.[3]

Measure Life and Incremental Measure Cost

The following table provides the measure life and incremental measure cost (IMC) documented for this measure as well as the source of the data.

Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

Table 11: Measure Life and Incremental Measure Cost

Wattage Category		Value	Source
All	Measure Life	2.5	DEER 2005
≤15W	Incremental Measure Cost	$4.13	AEP Ohio Potential Study
16W-26W	Incremental Measure Cost	$4.13	AEP Ohio Potential Study
> 26W	Incremental Measure Cost	$4.13	AEP Ohio Potential Study

[3] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Compact Fluorescent Fixtures, Hardwired	
Measure Description	New fixtures or modular retrofits with hardwired electronic ballasts qualify. The CFL ballast must be programmed start or programmed rapid start with a PF ≥90 and THD ≤20%.
Units	Per fixture
Base Case Description	Incandescent or HID lamps.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: KEMA
Effective Useful Life	Source: DEER 12 years

Hardwired CFL incentives apply only to complete new fixtures or modular (pin-based) retrofits with hardwired electronic ballasts. The CFL ballast must be programmed 'start' or programmed 'rapid start' with a PF ≥90 and THD ≤20 percent.

Measure Savings

Baseline and retrofit equipment assumptions are presented in the table below. Most lighting retrofits assume early replacement of existing technologies where the baseline represents the equipment removed. The following table shows the wattages used for the savings calculations.

Table 12: Baseline and Retrofit Wattages

Measure	Base Wattage	Retrofit Wattage	kW Reduction
29W or Less	100	28	0.072
29W or Less	125	27	0.098
29W or Less	110	27	0.083
29W or Less	100	26	0.074
29W or Less	75	26	0.049
29W or Less	100	25	0.075
29W or Less	75	25	0.05
29W or Less	100	23	0.077
29W or Less	75	20	0.055
29W or Less	75	19	0.056
29W or Less	75	18	0.057
29W or Less	60	18	0.042
29W or Less	60	16	0.044
29W or Less	60	15	0.045
29W or Less	60	14	0.046
29W or Less	60	13	0.047
29W or Less	40	13	0.027
29W or Less	40	9	0.031
30W or Greater	120	30	0.09
30W or Greater	120	40	0.08
30W or Greater	200	55	0.145
30W or Greater	200	65	0.135

Table 13: Wattage Reduction

Wattage Category	Average Wattage Reduction
≤29	57
≥30W	113

The following tables provide the measure savings using the above wattage reduction assumptions.

Table 14: Measure Savings for 29W or less

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.052	276

Table 15: Measure Savings for ≥30W

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.103	544

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database.[4] DEER values by building type were averaged for the AEP Ohio Program.

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

[4] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Table 16: Measure Life and Incremental Measure Cost

Wattage Category		Value	Source
All	Measure Life	12	DEER
≤29	Incremental Measure Cost	$95	KEMA
≥30W	Incremental Measure Cost	$132	KEMA

Permanent Lamp Removal	
Measure Description	Incentives are paid for the permanent removal of existing 8', 4', 3' and 2' fluorescent lamps. Unused lamps, lamp holders, and ballasts must be permanently removed from the fixture. This measure is applicable when retrofitting from T12 lamps to T8 lamps or simply removing lamps from a T8 fixture. Removing lamps from a T12 fixture that is not being retrofitted with T8 lamps are not eligible for this incentive.
Units	Per lamp
Base Case Description	Various configurations of fluorescent fixtures before removal of lamps.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio Plan
Effective Useful Life	Source: DEER 11 years

Incentives are paid for the permanent removal of existing fluorescent lamps resulting in a net reduction of the number of foot-lamps. Customers are responsible for determining whether or not to use reflectors in combination with lamp removal in order to maintain adequate lighting levels. Unused lamps, lamp holders, and ballasts must be permanently removed from the fixture. This measure is applicable when retrofitting from T12 lamps to T8 lamps or simply removing lamps from a T8 fixture. Removing lamps from a T12 fixture that is not being retrofitted with T8 lamps is not eligible for this incentive. A Pre-approval Application is required for lamp removal projects in order for KEMA to have the option of conducting a pre-retrofit inspection.

Measure Savings
Non-coincident demand savings are summarized by the following table:

Table 17: Wattage Reduction

Wattage Category	Average Wattage Reduction
8 Foot Lamp Removal	68
4 Foot Lamp Removal	35
2 Foot or 3 Foot Lamp Removal	24

Table 18: Measure Savings for 8-Foot Lamp Removal

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	8-foot Lamp Peak Savings (kW)	8-foot Savings (kWh)
4,389	1.19	0.77	1.12	0.062	333.7

Table 19: Measure Savings for 4-Foot Lamp Removal

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	4-foot Lamp Peak Savings (kW)	4-foot Savings (kWh)
4,389	1.19	0.77	1.12	0.032	172.3

Table 20: Measure Savings for 2-Foot or 3-Foot Lamp Removal

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	2-foot or 3-foot Lamp Peak Savings (kW)	2-foot or 3-foot Savings (kWh)
4,389	1.19	0.77	1.12	0.022	119.3

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database.[5] However, DEER values by building type were averaged for the AEP Ohio Program.

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

[5] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline assumptions are presented in the next table. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed. The table shows the wattages used for the savings calculations. Weighted average savings values are used when determining deemed savings for each 8 foot or 4 foot lamp permanently removed.

Table 21: Wattages for Eight-foot Lamps

Baseline	Base Wattage	Lamp Removed Wattage	Weight Percentages
Two 8' T12 (60W/75W)	140	70	85%
Two 8' T8 (59W)	111	56	15%
Total Weighted Average		68	

Table 22: Wattages for Four-foot Lamps

Baseline	Base Wattage	Lamp Removed Wattage	Weight Percentages
Two 4' T8 (32W)	65	36	3%
Two 4' T12 (34W/40W)	72	36	8%
Three 4' T8 (32W)	92	31	7%
Three 4' T12 (34W/40W)	115	38	22%
Four 4' T8 (32W)	118	30	15%
Four 4' T12 (34W/40W)	144	36	45%
Total Weighted Average		**35**	

Table 23: Wattages for Two and Three-foot Lamps

Baseline	Base Wattage	Lamp Removed Wattage	Weight Percentages
Two 3' T12 (30W)	76	38	15%
Two 3' T8 (34W/40W)	48	24	15%
Two 2' T8 (17W)	31	15	30%
Two 2' T12 (20W)	56	28	30%
Three 2' T8 (17W)	46	16	2.5%
Three 2' T12 (20W)	62	21	2.5%
Four 2' T8 (17W)	60	15	2.5%
Four 2' T12 (20W)	112	28	2.5%
Total Weighted Average		24	

Measure Life and Incremental Measure Cost

The following table provides the measure life and incremental measure cost (IMC) documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

Table 24: Measure Life and Incremental Measure Cost

Measure Category		Value	Source
All	Measure Life	11	DEER
8-Foot Lamp Removal	Incremental Measure Cost	$25.91	ICF Portfolio Plan
4-Foot Lamp Removal	Incremental Measure Cost	$25.70	ICF Portfolio Plan
2-Foot or 3-Foot Removal	Incremental Measure Cost	$25.70	KEMA

High Performance and Reduced Wattage 4-foot T8 Lamps and Ballast	
Measure Description	This measure consists of replacing existing T12 4' lamps and magnetic ballasts with high performance 32W T8 lamps or reduced wattage 28W or 25W lamps and electronic ballasts. Both the lamp and ballast must meet the Consortium for Energy Efficiency (CEE) high performance or reduced wattage T8 specification (www.cee1.org) summarized below.
Units	Per lamp
Base Case Description	T12 lamp and magnetic ballasts
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: AEP Ohio Potential Study
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing existing T12 lamps and magnetic ballasts with high-performance T8 lamps or reduced wattage (28 or 25W) T8 lamps and electronic ballasts. This measure is based on the Consortium for Energy Efficiency (CEE) high-performance T8 or reduced wattage specification (www.cee1.org) and is summarized below. A list of qualified lamps and ballasts can be found at: http://www.cee1.org. Both the lamp and ballast must meet the specification to qualify for an incentive. The incentive is calculated based on the number of lamps installed. A manufacturer's specification sheet must accompany the application.

For reduced wattage 4-foot T8 lamps, the nominal wattage must be 28 W (≥2,585 Lumens) or 25 W (≥2,400 Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥80, and lumen maintenance at 94 percent. Other requirements can be found on the CEE website using the links above.

The table below provides the specification for high performance systems.

Table 25: High-Performance T8 Specifications

Performance Characteristics for Systems				
Mean system efficacy	≥ 90 Mean Lumens per Watt (MLPW) for Instant Start Ballasts			
	≥ 88 MLPW for Programmed Rapid Start Ballasts			
Performance Characteristics for Lamps				
Color Rendering Index (CRI)	≥ 80			
Minimum initial lamp lumens	≥ 3100 Lumens[6]			
Lamp life	≥ 24,000 hours			
Lumen maintenance or minimum mean lumens	≥ 90% or ≥ 2,900 Mean Lumens			
Performance Characteristics for Ballasts				
Ballast Efficacy Factor (BEF) BEF = (BF x 100) / Ballast Input Watts	**Instant-Start Ballast (BEF)**			
	Lamps	Low BF ≤ 0.85	Norm 0.85 < BF ≤ 1.0	High BF ≥ 1.01
	1	> 3.08	> 3.11	NA
	2	> 1.60	> 1.58	>1.55
	3	≥ 1.04	≥ 1.05	≥ 1.04
	4	≥ 0.79	≥ 0.80	≥ 0.77
	Programmed Rapid Start Ballast (BEF)			
	1	≥ 2.84	≥ 2.84	NA
	2	≥ 1.48	≥ 1.47	≥ 1.51
	3	≥ 0.97	≥ 1.00	≥ 1.00
	4	≥ 0.76	≥ 0.75	≥ 0.75
Ballast Frequency	20 to 33 kHz or ≥ 40 kHz			
Power Factor	≥ 0.90			
Total Harmonic Distortion	≤ 20%			

Measure Savings
Savings are summarized by the following table:

Table 26: Measure Savings for High-Performance or Reduced Wattage 4-foot Lamp and Ballast (per lamp)

Coincident Demand Savings (kW)	Energy Savings (kWh)
0.012	62.0

[6] For lamps with temperature ≥4500K, 2,950 minimum initial lamp lumens are specified.

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database and shown in the following table. However, DEER values by building type were averaged for the AEP Ohio Program.

Table 27: Factors used for Calculating Lighting Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are presented in the table below.

Table 28: Baseline and Retrofit Wattages for High-Performance or Reduced Wattage Fixture Retrofits

	T8, 4-foot Configuration	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
High	4-lamp	144	32	108	0.036	0.009	9%
	3-lamp	103	32	83	0.02	0.007	4%
	2-lamp	72	32	54	0.018	0.009	8%
	1-lamp	43	32	28	0.015	0.015	4%
Med	4-lamp	144	28	96	0.048	0.012	15%
	3-lamp	103	28	72	0.031	0.010	10%
	2-lamp	72	28	48	0.024	0.012	15%
	1-lamp	43	28	25	0.018	0.018	10%
Low	4-lamp	144	25	85	0.059	0.015	9%
	3-lamp	103	25	66	0.037	0.012	4%
	2-lamp	72	25	44	0.028	0.014	8%
	1-lamp	43	25	22	0.021	0.021	4%
	Weighted Average					0.0126	

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost since cost of the less efficient option is 0.

Table 29: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Incremental Measure Cost	4 Foot Lamp and Ballast	$13.14	AEP Ohio Potential Study

Reduced Wattage 4-foot Lamp Only	
Measure Description	This measure consists of replacing existing standard T8 4' lamps and electronic ballasts with reduced wattage T8 lamps. The lamp must meet the Consortium for Energy Efficiency (CEE) reduced wattage T8 specification (www.cee1.org). The nominal wattage for 4 foot lamps must be 28W (≥2585 Lumens) or 25W (≥2400 Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥ 80, and lumen maintenance at 94%. A manufacturer's specification sheet must accompany the application.
Units	Per lamp
Base Case Description	Standard T8 fixtures.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio Plan
Effective Useful Life	Source: KEMA 3 years

Incentives are available when replacing standard 32-Watt T8 lamps with reduced-wattage T8 lamps when an electronic ballast is already present. The lamps must be reduced wattage in accordance with the Consortium for Energy Efficiency (CEE) specification (www.cee1.org). Qualified products can be found at http://www.cee1.org. The nominal wattage must be 28 W (≥2,585 Lumens) or 25 W (≥2,400 Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥80, and lumen maintenance at 94 percent. A manufacturer's specification sheet must accompany the application.

Measure Savings
Savings are summarized by the following table:

Table 30: Measure Savings for Reduced-Wattage 4-foot Lamp Only

Coincident Demand Savings (kW)	Energy Savings (kWh)
0.005	28.8

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database and shown in the next table. However, DEER values by building type were averaged for the AEP Ohio Program.

Table 31: Factors used for Calculating Lighting Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are presented in the next table.

Table 32: Baseline and Retrofit Wattages for 4-foot T8 Lamp Only

T8 Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
4 ft, 4-lamp	32	112	28	96	0.016	0.004	18%
4 ft, 3-lamp	32	85	28	72	0.013	0.004	13%
4 ft, 2-lamp	32	58	28	48	0.01	0.005	15%
4 ft ,1-lamp	32	32	28	25	0.007	0.007	5%
4 ft, 4-lamp	32	112	25	85	0.027	0.007	18%
4 ft, 3-lamp	32	85	25	66	0.019	0.006	13%
4 ft, 2-lamp	32	58	25	44	0.014	0.007	15%
4 ft ,1-lamp	32	32	25	22	0.01	0.010	5%
Weighted Average						0.006	

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost for

lamp and ballast retrofit and incremental for lamp only. The lamp and ballast retrofit is a change in technology.

Table 33: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	4 Foot Lamp Only	$2.10	ICF Portfolio Plan

Reduced Wattage 8-foot	
Measure Description	This measure consists of replacing existing T12 8' lamps and magnetic ballasts with reduced wattage T8 lamps and electronic ballasts. Both the lamp and ballast must meet the Consortium for Energy Efficiency (CEE) high performance or reduced wattage T8 specification (www.cee1.org). Eight foot lamps must have a minimum MLPW of 90 and must have a nominal wattage of less than 57W. A manufacturer's specification sheet must accompany the application. High wattage T8 (59W) can be replaced with reduced wattage lamps without replacing the ballast. The lamps must also meet CEE standards for reduced wattage.
Units	Per lamp
Base Case Description	T12 lamp and magnetic ballasts or high watt T8 fixtures (for reduced wattage lamp only replacements).
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: DEER and ICF Portfolio Plan
Effective Useful Life	Source: KEMA and DEER

This measure consists of replacing existing T12 lamps and magnetic ballasts with reduced wattage lamp and electronic ballast systems. The lamps and ballasts must meet the Consortium for Energy Efficiency (CEE) specification (www.cee1.org). Qualified lamps and ballast products can be found at http://www.cee1.org. Incentives are also available when replacing 59-Watt T8 lamps with reduced-wattage T8 lamps when an electronic ballast is already present. Eight-foot lamps must have a minimum MLPW of 90 and must have a nominal wattage of less than 57 W. A manufacturer's specification sheet must accompany the application.

Measure Savings
Savings are summarized by the following table:

Table 34: Measure Savings for Reduced-Wattage 8-foot Lamp and Ballast

Coincident Demand Savings (kW)	Energy Savings (kWh)
0.016	78.7

Table 35: Measure Savings for Reduced-Wattage 8-foot Lamp Only

Coincident Demand Savings (kW)	Energy Savings (kWh)
0.005	24.6

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database and shown in the table below. DEER values by building type were averaged for the AEP Ohio Program.

Table 36: Factors used for Calculating Lighting Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are presented in the next table.

Table 37: Baseline and Retrofit Wattages for 8-foot

	Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
Lamp and Ballast	8ft, 2 lamp	60	132	57	102	0.030	0.015	50%
	8ft, 1-lamp	60	77	57	60	0.017	0.017	50%
	Weighted Average						0.016	
Lamp Only	8ft, 2 lamp	59	106	57	102	0.004	0.002	50%
	8ft, 1-lamp	59	68	57	60	0.008	0.008	50%
	Weighted Average						0.005	

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost for lamp and ballast retrofit and incremental for lamp only. The lamp and ballast retrofit is a change in technology.

Table 38: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	8 Foot Lamp and Ballast	$36.91	DEER
Incremental Measure Cost	8 Foot Lamp Only	$5.50	ICF Portfolio Plan

2-foot & 3-foot T8 Lamps and Ballast	
Measure Description	This measure consists of replacing existing T12 2-foot and 3-foot lamps and magnetic ballasts with 17W, 2-foot, and 25W, 3-foot, T8 lamps and electronic ballasts.
Units	Per lamp
Base Case Description	T12 lamps and magnetic ballast
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: PG&E 2006 Work papers
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing existing T12 lamps and magnetic ballasts with T8 lamps and electronic ballasts. The lamp must have a color rendering index (CRI) ≥ 80 and the ballast must have a total harmonic distortion (THD) ≤ 32% at full light output and power factor (PF) ≥ 0.90. Ballasts must also be warranted against defects for 5 years. The incentive is calculated based on the number of lamps installed. A manufacturer's specification sheet must accompany the application.

Measure Savings
The coincident kW and kWh savings are provided in the following table:

Table 39: Measure Savings for 2-foot and 3-foot Lamp and Ballast (per lamp)

2-foot Lamp fixtures		3-foot Lamp fixtures	
Coincident Demand Savings (kW)	**Energy Savings (kWh)**	**Coincident Demand Savings (kW)**	**Energy Savings (kWh)**
0.010	51.6	0.013	69.5

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database and shown in the following table.

Table 40: Factors used for Calculating Lighting Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are presented in the tables below. The fixture wattages were collected from PG&E's Non-residential Retrofit Program standard fixture wattage table.

Table 41: Baseline and Retrofit Wattages for 2-foot lamps

T8 Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
2 ft, 4-lamp	20	112	17	61	0.051	0.013	2.5%
2 ft, 3-lamp	20	84	17	47	0.037	0.012	2.5%
2 ft, 2-lamp	20	56	17	33	0.023	0.012	65%
2 ft ,1-lamp	20	28	17	20	0.008	0.008	30%
Weighted Average						0.011	

Table 42: Baseline and Retrofit Wattages for 3-foot lamps

T8 Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
3 ft, 4-lamp	30	152	25	87	0.065	0.0163	2.5%
3 ft, 3-lamp	30	114	25	67	0.047	0.0157	2.5%
3 ft, 2-lamp	30	76	25	46	0.030	0.0150	65%
3 ft ,1-lamp	30	38	25	26	0.012	0.0120	30%
Weighted Average						0.014	

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost since cost of the less efficient option is $0.

Table 43: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	2 Foot Lamp and Ballast	$10.50	PG&E 2006 Work Paper
Incremental Measure Cost	3 Foot Lamp and Ballast	$21	PG&E 2006 Work Paper

U-Tube T8 Lamps and Ballast	
Measure Description	This measure consists of replacing existing T12 U-tube lamps and magnetic ballasts with T8 U-tube lamps and electronic ballasts.
Units	Per lamp
Base Case Description	U-tube T12 lamps and magnetic ballast
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: AEP Ohio Potential Study
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing existing U-tube T12 lamps and magnetic ballasts with U-tube T8 lamps and electronic ballasts. The lamp must have a color rendering index (CRI) ≥ 80 and the ballast must have a total harmonic distortion (THD) ≤ 20% at full light output and power factor (PF) ≥ 90. Ballasts must also be warranted against defect for 5 years. The incentive is calculated based on the number of lamps installed. A manufacturer's specification sheet must accompany the application.

Measure Savings
The coincident kW and kWh savings are in the following table.

Table 44: Measure Savings for U-tube Lamp and Ballast (per lamp)

Coincident Demand Savings (kW)	Energy Savings (kWh)
0.009	46.7

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database and shown in the following table.[7]

[7] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Table 45: Factors used for Calculating Lighting Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are presented in the following table. The wattages were collected from PG&E's Non-residential retrofit standard wattages table.

Table 46: Baseline and Retrofit Wattages for U-tube lamps

T8 Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
U-tube, 2 lamp	35	72	32	59	0.013	0.007	50%
U-tube, 1 lamp	35	43	32	31	0.012	0.012	50%
Weighted Average						0.010	

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost since cost of the less efficient option is $0. For U-tubes, it is assumed that the cost is the same as a high performance 4-foot T8 lamp (DEER measure ID D03-852).

Table 47: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	U-Tube Lamp and Ballast	$13.14	AEP Potential Study

Cold Cathode	
Measure Description	All cold cathode fluorescent lamps (CCFLs) must replace incandescent lamps of at least 10 W and not greater than 40 W. Cold cathode lamps may be medium (Edison) or candelabra base. Product must be rated for at least 18,000 average life hours.
Units	Per lamp
Base Case Description	Incandescent
Measure Savings	Source: KEMA, SCE
Measure Incremental Cost	Source: PG&E
Effective Useful Life	Source: SCE 5 years

All cold cathode fluorescent lamps (CCFLs) must replace incandescent lamps of at least 10 W and not greater than 40 W. Cold cathode lamps may be medium (Edison) or candelabra base. The product must be rated for at least 18,000 average life hours.

Measure Savings
Baseline and retrofit equipment assumptions are presented in table below. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed. The table shows the wattages used for the savings calculations from SCE and KEMA research of cold cathode manufacturers.

Table 48: Baseline and Retrofit Wattages

Measures[8]	Base Wattage (Watts)	Retrofit Wattage (Watts)	Wattage Reduction (Watt)
Incandescent (15W) -> Cold Cathode FL (5W)	15	5	10
Incandescent (30W) -> Cold Cathode FL (5W)	30	5	25
Incandescent (40W) -> Cold Cathode FL (8W)	40	8	32
Average			22

The following table provides the measure savings using the above non-coincident savings.

[8] Southern California Edison Company, Cold Cathode Fluorescent Lamp Workpaper WPSCNRLG0063. 2007.

Table 49: Measure Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
4,321	1.19	0.77	1.12	0.020	108

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database.

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy-efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost since cost of the less efficient option is $0..

Table 50: Measure Life and Incremental Measure Cost[9]

	Value	Source
Measure Life	5	SCE WP
Incremental Measure Cost	$9.68	PG&E WP

[9] Southern California Edison Company, Cold Cathode Fluorescent Lamp Workpaper WPSCNRLG0063. 2007, Pacific Gas & Electric, Lighting WP.doc, 2006.

Exit Signs	
Measure Description	High-efficiency exit signs must replace or retrofit an existing incandescent exit sign. Electroluminescent, photoluminescent, T1 and light-emitting diode (LED) exit signs are eligible under this category. Non-electrified and remote exit signs are not eligible. All new exit signs or retrofit exit signs must be UL or ETL listed, have a minimum lifetime of 10 years, and have an input wattage ≤5 Watts or be ENERGY STAR qualified.
Units	Per Sign
Base Case Description	Incandescent Exit Signs
Measure Savings	Source: ENERGY STAR
Measure Incremental Cost	Source: AEP Ohio Potential Study
Effective Useful Life	Source: DEER 16 years

High-efficiency exit signs must replace or retrofit an existing incandescent exit sign. Electroluminescent, photoluminescent, T1 and light-emitting diode (LED) exit signs are eligible under this category. Non-electrified and remote exit signs are not eligible. All new exit signs or retrofit exit signs must be UL or ETL listed, have a minimum lifetime of 10 years, and have an input wattage ≤5 Watts or be ENERGY STAR qualified.

Measure Savings
Baseline and retrofit equipment assumptions are presented in the next table. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed. The table shows the wattages used for the savings calculations.

Table 51: Baseline and Retrofit Wattages

Measure	Base Wattage	Retrofit Wattage	Wattage Reduction
Two Incandescent Bulbs (20W each) -> LED EXIT Sign (5W)	40	5	35

The measure savings use the above non-coincident savings.

Table 52: Exit Sign Savings

Peak kW Savings	kWh Savings
0.042	343.4

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below. The coincident diversity factor is 1.0 since the sign is on all the time. The operating hours are 8,760 hours per year.[10]

Table 53: Factors used for Calculating Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
8,760	1.19	1.00	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = non-coincident kW savings * Annual operating hours * Energy interactive effect

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect.

Measure Life and Incremental Measure Cost
The following table provides the measure life and incremental measure cost (IMC) documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. In this case, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

[10] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Table 54: Measure Life and Incremental Measure Cost

	Value	Source
Measure Life	16	DEER
Incremental Measure Cost	$82.54	AEP Ohio Potential Study

Occupancy Sensors	
Measure Description	Passive infrared, ultrasonic detectors and fixture-integrated sensors or sensors with a combination thereof are eligible. All sensors must be hard-wired and control interior lighting fixtures. The incentive is per Watt controlled.
Units	Per Connected Watt
Base Case Description	No Sensor
Measure Savings	Source: DEER
Measure Incremental Cost	Source: DEER
Effective Useful Life	Source: DEER 8 years

Passive infrared, ultrasonic detectors and fixture-integrated sensors or sensors with a combination thereof are eligible. All sensors must be hard-wired and control interior lighting fixtures. The incentive is per Watt controlled.

Measure Savings
The annual operation hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database.

Table 55: Measure Savings for Occupancy Sensor per Connected Watt

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak Watt Savings	kWh Savings
4,389	1.19	0.77	1.12	0.0003	1.385

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below.

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = Connected wattage/1000 * Annual operating hours * Energy interactive effect*Occupancy Off Rate

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = Connected wattage/1000 * Occupancy Off Rate * Coincidence Factor * Demand interactive effect

The baseline for this measure is fixtures that do not include any automatic controls, i.e., manual switches. Since the unit is defined as per connected Watt, the baseline demand is one watt. Demand savings depend on whether areas are high or low occupancy. DEER states that occupancy time off rates are at 20 percent for high-occupancy building types and 50 percent for low-occupancy building types.[11]. The table below shows the assumed range of occupancy off rates. Calculations here are performed with the 28% average sensor off rate.

Table 56: Occupancy Off Rate

Average Grouping	Occupancy Sensor Off Rate
Office	20%
School (K-12)	20%
College/University	20%
Retail/Service	20%
Restaurant	20%
Hotel/Motel	20%
Medical	20%
Grocery	20%
Warehouse	50%
Light Industry	50%
Heavy Industry	50%
Average	28%

Measure Life and Incremental Measure Cost
The following table provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

[11] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Table 57: Measure Life and Incremental Measure Cost

	Value	Source
Measure Life	8	DEER
Incremental Measure Cost	$0.32	DEER

New T5/T8 Fluorescent Fixtures	
Measure Description	This measure consists of replacing one or more existing fixtures with new fixtures containing T8 or T5 lamps and electronic ballasts. The T8 or T5 lamps must have a color rendering index (CRI) ≥ 80. The electronic ballast must be high frequency (≥20 kHz), UL listed, and warranted against defects for 5 years. Ballasts must have a power factor (PF) ≥ 0.90. Ballasts for 4-foot lamps must have total harmonic distortion (THD) ≤20 percent at full light output. For 2- and 3-foot lamps, ballasts must have THD ≤32% at full light output.
Units	Per Watt reduced
Base Case Description	Typically high wattage HID fixtures
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: KEMA
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing one or more existing fixtures with new fixtures containing T8 or T5 lamps and electronic ballasts. The T8 or T5 lamps must have a color rendering index (CRI) ≥ 80. The electronic ballast must be high frequency (≥20 kHz), UL listed, and warranted against defects for 5 years. Ballasts must have a power factor (PF) ≥ 0.90. Ballasts for 4-foot lamps must have total harmonic distortion (THD) ≤20 percent at full light output. For 2- and 3-foot lamps, ballasts must have THD ≤32 percent at full light output.

Measure Savings

The annual operating hours, the coincidence factors, and the interactive effect factors were all derived from the DEER database.[12]

Table 58: Measure Savings for New T8/T5 Fluorescent Fixtures per Watt Reduced

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak Watt Savings	kWh Savings
4,389	1.19	0.77	1.12	0.0009	4.9141

[12] 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below.

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = no-coincident kW savings * Annual operating hours * Energy interactive effect
Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are variable. Because we define this measure with the number of watts reduced, the non-coincident demand savings will be one watt by definition.

Measure Life and Incremental Measure Cost
The following table provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

Table 59: Measure Life and Incremental Measure Cost

	Value	Source
Measure Life	11	DEER
Incremental Measure Cost[13]	$0.75	KEMA

LED Traffic Signals	
Measure Description	LED traffic signals meeting ENERGY STAR criteria, including arrow signals, that will replace existing incandescent traffic signals. Signals shall have a maximum wattage of 25. Signals must be installed and active. Lights must be hardwired, with the exception of pedestrian hand signals. Yellow lights are not eligible for rebates.
Units	Per Signal
Base Case Description	Incandescent fixtures
Measure Savings	Source: Michigan Statewide Energy Savings Database
Measure Incremental Cost	Source: Michigan Statewide Energy Savings Database
Effective Useful Life	Source: Michigan Statewide Energy Savings Database Traffic Signal: 6 Years Pedestrian Signal: 8 Years

LED traffic signals that meet ENERGY STAR criteria save 80-90 percent of the energy typically consumed by incandescent traffic signals and LED signals generally last 5-10 times longer. Since traffic signals operate 24 hours a day, 365 days a year, the opportunity for energy savings is significant, particularly in the peak demand. LED Traffic signals perform better than incandescent models and are a better value. They also have lower maintenance costs because they need to be replaced less frequently.

Measure Savings

The energy savings vary for red, green and yellow signals. Savings also vary for round lamps, arrows and pedestrian signals. Reviewing details on California, Wisconsin and Texan programs, the savings below are typical.

In general, savings are greater on car traffic signals and cost generally less than for pedestrian signals. These savings include diversity for each lamp type, and represent an average.

Table 60: Measure Savings Traffic and Pedestrian Signals

Signal Type	kW	kWh
Traffic	0.085	275
Pedestrian	0.044	150

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. For lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is $0.

Table 61: Measure Life and Incremental Measure Cost

	Signal Type	Value	Source
Measure Life	Traffic	6	KEMA
Incremental Measure Cost	Traffic	$90	KEMA
Measure Life	Pedestrian	8	KEMA
Incremental Measure Cost[14]	Pedestrian	$140	KEMA

Lighting Density	
Measure Description	Savings for new construction lighting projects will be calculated with lighting density.
Units	Per kW Reduced
Base Case Description	ASHRAE 90.1-2004 Lighting density.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: NA
Effective Useful Life	Source: DEER 11 Years

This measure applies only to new construction lighting projects and savings are calculated using the ASHRAE 90.1-2004 new construction lighting density as a baseline. The wattages are given on a per square foot basis and vary with business type.

The following table shows the ASHRAE criteria.

Table 62: ASHRAE Building Density Criteria

Building Type	Lighting Power Density (W/ft^2)	Building Type	Lighting Power Density (W/ft^2)
Automotive	0.9	Motion Picture Theatre	1.2
Convention Center	1.2	Multi-Family	0.7
Court House	1.2	Museum	1.1
Dining: Bar Lounge/Leisure	1.3	Office	1.0
Dining: Cafeteria/Fast Food	1.4	Parking Garage	0.3
Dining: Family	1.6	Penitentiary	1.0
Dormitory	1.0	Performing Arts Theatre	1.6
Exercise Center	1.0	Police/Fire Station	1.0
Gymnasium	1.1	Retail	1.5
Health Care	1.0	School/University	1.2
Hospital	1.2	Sports Arena	1.1

Hotel	1.0	Town Hall	1.1
Library	1.3	Transportation	1.0
Manufacturing Facility	1.3	Warehouse	0.8
Motel	1.0	Workshop.	1.4

Applications must calculate the kW reduction using the above numbers, taking into account the business type as well as the actual building square footage. On a per kW reduced basis, the following table shows the energy and coincident savings.

Table 63: Lighting Density Savings

Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak Watt Savings	kWh Savings
4,389	1.19	0.77	1.12	0.916	4,914

Measure Savings Analysis
Annual energy savings and the peak coincident demand savings were calculated using the equations below.

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

kWh Reduction = no-coincident kW savings * Annual operating hours * Energy interactive effect
Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

Coincident kW savings = non-coincident kW savings * Coincidence Factor * Demand interactive effect

Baseline and retrofit equipment assumptions are variable. Because we define this measure as in the number of watts reduced, the non-coincident demand savings will be one kW by definition.

Measure Life
The following table provides the measure life documented for this measure as well as the source of the data.

Table 64: Measure Life

	Value	Source
Measure Life	11	DEER