



Legal Department

September 24, 2018

Chairman Asim Z. Haque
Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793

Re: In the Matter of the Application of)
The Ohio State University)
and Ohio Power Company) Case No. 18-0806-EL-EEC
for Approval of a Special Arrangement)
Agreement with a Mercantile Customer)

Tanner S. Wolfram
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Dear Chairman Haque,

Attached please find the Joint Application of Ohio Power Company (AEP Ohio) and the above-referenced mercantile customer for approval of a Special Arrangement of the commitment of energy efficiency/peak demand reduction (EE/PDR) resources toward compliance with the statutory benchmarks for 2018 (hereinafter "Joint Application").

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

The Commission's Order in Case No. 10-834-EL-EEC established a streamlined process to expedite review of these special arrangements by developing a sample application process for parties to follow for consideration of such programs implemented during the prior three calendar years. The attached Joint Application and affidavit conforms with AEP Ohio's version of the streamlined sample application. As requested by Commission Staff, any confidential information referenced in the Joint Application has been provided confidentially to Commission Staff for filing in Commission Docket 10-1599-EL-EEC and subject to the confidentiality protections of R.C. 4901.16 and OAC 4901-1-24(E). AEP Ohio respectfully requests that the Commission treat the two cases as associated dockets and that any confidential information provided to Staff for filing in connection with the Joint Application be subject to the protective order requested in Docket 10-1599-EL-EEC.

Cordially,

/s/ Tanner Wolfram
Tanner Wolfram

Attachments



Public Utilities Commission

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

Case No.: 18-0806-EL-EEC

Mercantile Customer: THE OHIO STATE UNIVERSITY

Electric Utility: Ohio Power

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

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

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

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

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

Section 1: Company Information

Name: THE OHIO STATE UNIVERSITY

Principal address: 2003 Millikin Rd, Columbus, Oh 43210

Address of facility for which this energy efficiency program applies: 1735 Cannon Dr, Columbus, Oh 43210

Name and telephone number for responses to questions:

John Rappleye, The Ohio State University, (614) 292-6240

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

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

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

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

Section 2: Application Information

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

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

B) Our electric utility is: Ohio Power Company

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

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

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

Section 3: Energy Efficiency Programs

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

- ☐ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).
- ☐ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s):
- ☒ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s): 8/1/2016
- ☐ Behavioral or operational improvement.

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

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

Annual savings: kWh

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

Annual savings: kWh

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

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

Unit Quantity (watts) = Existing (watts x units) – Installed (watts x units)
kWh Reduction (Annual Savings) = Unit Quantity x (Deemed kWh/Unit)

Annual savings: 167,375 kWh

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

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

The less efficient new equipment is the minimum required by Ohio State code or Federal Standard whichever is more stringent. For those measures where no code applies the baseline equipment is assumed to be the least efficient equipment available in the marketplace or standard practice, whichever results in the most conservative annual savings. Any information available describing the less efficient new equipment option is provided in 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures.

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

Section 4: Demand Reduction/Demand Response Programs

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

☒ Coincident peak-demand savings from the customer's energy efficiency program.

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

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

➤ Choose one or more of the following that applies:

☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.

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

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

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

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

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

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

37.6 kW

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

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

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

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

A) The customer is applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

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

OR

☐ Commitment payment

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

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

☒ A cash rebate of \$ 11,124.79. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

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

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

OR

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

Section 6: Cost Effectiveness

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

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: _____
(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT) . The calculated UCT value is: 4.74 (Skip to Subsection 2.)

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

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

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The utility's incremental measure costs were _____.

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

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

Our avoided supply costs were \$ 57,532.35

The utility's program costs were \$ 1,004.25

The utility's incentive costs/rebate costs were \$ 11,124.79.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

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

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

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

- 1) any confidentiality requirements associated with the agreement;

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

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

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

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

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

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

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

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

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

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

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



**Public Utilities
Commission**

Project # 18-22675
Docket # 18-0806

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

Case No.: 18-0806-EL-EEC

State of Ohio :

Nigma Mustafa, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

DNV GL Energy Services USA Inc. agent of Ohio Power

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

Nigma Mustafa Energy Engineer
Signature of Affiant & Title

Sworn and subscribed before me this 9th day of August, 2018 Month/Year

Linda M. Schmidt
Signature of official administering oath

LINDA M. SCHMIDT
Print Name and Title
Admin. Assistant

My commission expires on 7/31/2022



LINDA M. SCHMIDT
Notary Public, State of Ohio
My Commission Expires 7-31-2022



A unit of American Electric Power

Attachment 1
Self Direct Project Overview & Commitment
Page 1 of 1

Self Direct Project Overview & Commitment

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

| | | |
|---|--|---|
| Customer Name | THE OHIO STATE UNIVERSITY | |
| Project Number | AEP-18-22675 | |
| Customer Premise Address | 1735 CANNON DR, COLUMBUS, OH 43210 | |
| Customer Mailing Address | 2003 Millikin Rd, Columbus, OH 43210 | |
| Date Received | 2/15/2018 | |
| Project Installation Date | 8/1/2016 | |
| Annual kWh Reduction | 167,375 | |
| Total Project Cost | \$48,937.05 | |
| Unadjusted Energy Efficiency Credit (EEC) Calculation | \$14,833.05 | |
| Simple Payback (yrs) | 5.9 | |
| Utility Cost Test (UCT) for EEC | 4.74 | |
| Utility Cost Test (UCT) for Exemption | N/A | |
| <i>Please Choose One Option Below and Initial</i> | | |
| Self Direct EEC: 75% | \$11,124.79 | <input checked="" type="checkbox"/> Initial: <u>WHP</u> |
| EE/PDR Rider Exemption | 12 Months (with possible extension up to N/A months after PUCO Approval) | <input type="checkbox"/> Initial: N/A |

Note: This is a one time selection. By selecting EEC, the customer will receive payment in the amount stated above. Selection of 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 EE/PDR rider exemption is subject to ongoing review for compliance and could be changed by the PUCO.

If EEC has been selected, will the Energy Efficiency Funds selected help you move forward with other energy efficiency projects?

☐ YES ☒ NO

Note: Exemptions for periods beyond 24 months are subject to look-back or true-up adjustments every year to ensure that the exemption accurately reflects the EEDR savings. Applicants must file for renewal for any exemption beyond 12 months.

Project Overview:

The Self Direct (Prescriptive and Custom) project that the above has completed and applied is as follows.
Installed lighting in a 98,887 square foot new dormitory. The new lighting draws 41,314 Watts of power, which is 58% lower than the ASHRAE 90.1-2007 maximum allowed lighting connected load.

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

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

Ohio Power Company

By: [Signature]
Title: Manager
Date: 05/31/2018

THE OHIO STATE UNIVERSITY

By: [Signature]
Title: ENERGY PROGRAMS MANAGER
Date: MAY 31, 2018



Application Guidelines

Final Applications must be submitted before November 16, 2018 in order to qualify for incentives identified in this application.

Step 1. Verify Eligibility

- Customer must have a valid AEP Ohio account.
- Equipment/measure must be installed at facilities served by the AEP Ohio account.
- Project must produce permanent reduction in electrical energy use (kWh).
- All installed equipment must meet or exceed the specifications in the application.
- Please see [Efficient Products for Business, Process Efficiency and New Construction Terms and Conditions](#) or [Self-Direct Terms and Conditions](#) for program rules and regulations.

Step 2. Complete Applicant Information

- All fields in customer and project information sections must be completed.
- Contractor information must be completed if project is not self-performed.

Step 3. Complete the Incentive Worksheet(s)

- Find and read specifications related to the project.
- Choose the incentive category on the worksheet based on installed equipment and specifications.
- Complete all fields (fixture description, operating hours, etc.) on the related worksheet.

Step 4. Sign Customer Agreement

- Read the [Terms and Conditions](#) before signing and submitting the application.
- Sign Pre-Approval Agreement and submit the application to reserve funds.
- Sign Final Application Agreement and submit the application after the project is completed to receive funds.
- Complete Third Party Payment Release Authorization ONLY if incentive payment is to be paid to an entity other than AEP Ohio customer listed on the Applicant Information page.

Step 5. Submit Pre-Approval Application¹

(For Self-Direct applications, skip to Step 6)

- Submitting a Pre-Approval Application to determine qualification and reserve program funds for a project is strongly recommended.
- All process efficiency projects require pre-approval.
- Complete all fields in Pre-Approval Agreement.
- Pre-Approval Application must be submitted with:
 - Proposed scope of work (type and quantity of old and new equipment must be listed)
 - Specification sheets for all proposed equipment
 - W-9 form
- Submit application via email, fax or mail.
- An inspection may be required during application review; applicants requiring inspection will be contacted for scheduling.

Step 6. Submit Final Application

- Complete all fields for Final Application Agreement.
- Update the application if measures/equipment differs from pre-application.
- Final Application must be submitted with:
 - Dated and itemized material invoice
 - External labor invoice (if applicable)
 - If Pre-Approval Application was not submitted, include the documents listed on Step 5
- Submit application via email, fax or mail.
- An inspection may be required during application review; applicants requiring inspection will be contacted for scheduling.
- Self-Direct applications require additional steps. Please see the [Self-Direct Terms and Conditions](#) for details.

AEP Ohio Business Incentives Program

445 Hutchinson Avenue, Suite 300

Columbus, Ohio 43235

877-541-3048 | aepohiosolutions@clearesult.com

Visit our website at AEPohio.com/solutions

¹A Pre-Approval Application is not a guarantee of an incentive; the actual incentive will be based on the energy savings and equipment installed as determined in the Final Application. Funds are reserved for 90 days, unless an applicant is granted an extension. The program team reserves the right to contact the customer before the reservation expiration date to ensure that the project is moving forward. If the project is not underway, the reservation may be cancelled. Reserved funds are not transferable to other projects, facilities and/or customers. A waiting list will be established when funds become fully subscribed.



Application Checklist

Pre-Approval

- ☐ Completed Applicant Information
- ☐ Estimated Total Project Cost
- ☐ Estimated Completion Date
- ☐ Completed Incentives Requested Section of Application
- ☐ Applicable Incentive Worksheets Completed
- ☐ Completed and Signed Customer Agreement
- ☐ Equipment Specifications
- ☐ Proposed Scope of Work
- ☐ W-9 Form (Business Name Must Match Line 1 or 2 on the Form)

Final Application Only (Without Pre-Approval)

- ☐ Completed Applicant Information
- ☐ Completed Incentives Requested Section of Application
- ☐ Applicable Incentive Worksheets Completed
- ☐ Total Project Cost
- ☐ Completion date
- ☐ Completed and Signed Customer Agreement
- ☐ Completed Third-Party Payment Release Authorization (optional)
- ☐ Itemized Invoices
- ☐ Equipment Specifications
- ☐ Scope of Work
- ☐ W-9 Form (Business Name Must Match Line 1 or 2 on the Form)

Final Application (With Pre-Approval)

- ☐ Completed Applicant Information
- ☐ Assigned Project Number on Signature Page
- ☐ Total Project Cost
- ☐ Project Completion Date
- ☐ Completed and Signed Final Payment Agreement
- ☐ Completed Third-Party Payment Release Authorization (optional)
- ☐ Installed Equipment Specifications (if there were changes from pre)
- ☐ Itemized Invoices
- ☐ Updated Scope of Work (if there were changes from pre)
- ☐ Applicable Incentive Worksheets (if there were changes from pre)



Applicant Information

AEP Application Number AEP - _ _ - _ _ _ _ _

Application Type (Select One)

CUSTOMER INFORMATION

Business Name _____

Name as It Appears on Utility Bill _____

How many AEP Ohio Accounts are at the Project Site? _____

AEP Ohio Account Numbers for this Project¹ _____

Taxpayer ID _____ - _____ W-9 Tax Status (Select One) _____

MAILING ADDRESS - WHERE CHECK WILL BE SENT

Contact Name _____ Contact Title _____

Mailing Address _____ City _____ State OH _____ Zip _____

Phone _____ Ext. _____ Contact Email _____

How Did You Hear About the Program? (Select One) _____ AEP OH Energy Advisor _____

PROJECT INFORMATION

Project Name (if applicable) _____

☐ Check if mailing address and project site address are the same.

Project Site Address _____ City _____ State OH _____ Zip _____

Building Type (Select One) _____ Shift (Select One) _____

Annual Operating Hours _____ Building Area (sq. ft.) _____

Construction Type (Select One) _____ Does the facility have a data center? (Select One) _____

¹Please only enter the first eleven digits of the account number.



Applicant Information

CONTRACTOR INFORMATION

Company Name _____

Contact Name _____ Title of Contact _____

Mailing Address _____ City _____ State OH Zip _____

Phone _____ Ext. _____ Contact Email _____

PRIMARY CUSTOMER CONTACT INFORMATION

Contact Name _____ Title of Contact _____

Phone _____ Ext. _____ Contact Email _____

Who should we contact with questions about the application? ☐ Customer ☐ Contractor

Incentive Summary Table

| INCENTIVE CATEGORY | TOTAL INCENTIVES |
|--------------------------------|------------------|
| LIGHTING | |
| HVAC | |
| MOTORS & DRIVES | |
| COMPRESSED AIR | |
| REFRIGERATION/FOOD SERVICE | |
| AGRICULTURE | |
| MISCELLANEOUS | |
| PROCESS EFFICIENCY | |
| NC LIGHTING (SELF-DIRECT ONLY) | |
| TOTAL INCENTIVES | |

AEP Application Number AEP - _ - _



Customer Agreement

APPLICATION AGREEMENT

By signing this document, I agree to program requirements outlined in the measure specifications, Terms and Conditions for the applicable program and Final Application Agreement. As an eligible customer, I verify the information is correct and request consideration for participation under this program. Furthermore, I concur that I meet all eligibility criteria in order to receive payment under this program.

[Link to Efficient Products for Business/Process Efficiency Terms and Conditions, and Final Application Agreement](#)

[Link to Self-Direct Terms and Conditions, and Final Application Agreement](#)

☐ Pre-Application ☐ Final-Application

Project Completion Year (Select One) _____

Self-Direct _____

Project Completion Date _____

Total Project Cost _____

Total Requested Incentive¹ _____

Total Self-Direct Requested Incentive² _____

Print Name _____

Date _____

AEP Ohio Customer Signature _____

PRINT APPLICATION

¹Incentives have a threshold of 50% of the project cost and total incentives paid to a threshold of \$25,000 and Bid4Efficiency above that.

²Self-Direct incentives are 75% of Total Requested Incentive, after 50% of the project cost threshold and tiering is applied.



Third Party Payment Release

THIRD PARTY PAYMENT RELEASE AUTHORIZATION (NOT APPLICABLE TO SELF-DIRECT)

Complete this section **ONLY** if incentive payment is to be paid to an entity other than the AEP Ohio customer.

Make checks payable to: Company/Individual _____

Mailing Address _____ City _____ State ^{OH} Zip _____

Phone _____ Ext. _____

Taxpayer ID of 3rd Party _____ W-9 Tax Status _____

By signing this document, I authorize the payment of the incentive to the third party named above and understand that I will not receive the incentive payment from AEP Ohio. I also understand that my release of the payment to a third party does not exempt me from the program requirements outlined in the measure specifications, Terms and Conditions, and Final Application Agreement.

| Print Name | Date | AEP Ohio Customer Signature |
|------------|-------|-----------------------------|
| _____ | _____ | _____ |

Contractor: Vaughn Industries

PANEL LUMINAIRE

LM22 - 2 X 2 LIGHT PANEL SERIES

FEATURES

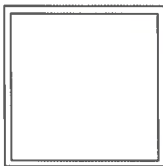
CONSTRUCTION

- Side lit design for an ultra thin profile
- IC rated, IP44-suitable for damp or dry locations
- Wide beam angle (120°) for better spacing
- CE and cULus rated
- RoHS compliant
- 5 year warranty (standard)

ELECTRICAL

- Dimmable (via driver or using PWM) ⁽¹⁾
- Constant voltage design allows for multiple lights per driver
- LM-80 and LM-79 available
- Panels should be placed within 50 feet of driver
- Rated at 60W max AC power (51W DC) ⁽²⁾

2X2



| | |
|--------------|------------|
| Project Name | OSU - NRDT |
| Date | |
| Type | A1 |

T/LT

| | |
|------------------|--------------|
| TILT Part Number | L GM 22 35 W |
| TILT Driver | LD60 |

CM22 DCOS

| LUMEN PACKAGES (2X2) ⁽³⁾ | | | | | |
|-------------------------------------|--------------------------|------|------|------|------|
| CCT | 50,000 hours (L70) | | | | |
| | STANDARD 90+ CRI, R9 >50 | | | | |
| | | | | | |
| 5000k | Lumens | 4700 | 4157 | 3736 | 2775 |
| | LPW | 74.1 | 79.2 | 82 | 87.5 |
| 4000k | Lumens | 4550 | 4298 | 3837 | 2847 |
| | LPW | 77.3 | 78.4 | 80.4 | 87.7 |
| 3500k | Lumens | 4225 | 3829 | 3426 | 2542 |
| | LPW | 72.5 | 75.2 | 77.4 | 84.8 |
| 3000k | Lumens | 3900 | 3360 | 3016 | 2237 |
| | LPW | 67.6 | 71.5 | 73.9 | 81.4 |

ORDERING INFORMATION

| L | GM | 22 | 50 | W |
|--------------|-----------------|--------------|--|---|
| Fixture Type | Mounting Type | Size | CCT | Frame Color ⁽⁴⁾ |
| L - Light | GM - Grid Mount | 22 - 2' x 2' | 50 - 5,000K 40 - 4,000K 35 - 3,500K 30 - 3,000K | W - White B - Black S - Silver + - special order |

USE WITH

| Driver | |
|--------|----------|
| LD60 | LD60PE7 |
| LD60P | LD90PE7 |
| LD90 | LD100PE7 |
| LD100P | |

DRIVER SPECIFICATION

NOTE on DRIVERS: UL 8750, short circuit, over current, over voltage, and over temperature protection
UL recognized and CE rated, RoHS compliant
Class II, SELV, IP67

| Model ⁽⁵⁾ | Size in Inches (LxWxH) | AC Input | DC Output | Dimming ⁽⁹⁾ | Temp | Max Fixtures ⁽⁸⁾ |
|----------------------|------------------------|-----------|-----------|------------------------|------------|-----------------------------|
| LD60 | 6.50 x 1.63 x 1.26 | 90 - 305V | 60W | I-10V | -40C - 60C | 1 |
| LD60P | 12.50 x 2.38 x 1.50 | 90 - 305V | 60W | I-10V | -40C - 70C | 1 |
| LD90 | 6.34 x 2.40 x 1.26 | 90 - 305V | 90W | I-10V | -40C - 60C | 1 |
| LD100P | 14.50 x 2.63 x 1.58 | 90 - 305V | 100W | I-10V | -40C - 60C | 2 |

| Emergency ⁽⁷⁾ | Size in Inches (LxWxH) | AC Input | Output ⁽⁶⁾ | Lumens | Temp | Max Fixtures ⁽⁸⁾ |
|--------------------------|------------------------|-----------|-----------------------|-----------|----------|-----------------------------|
| LD60PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 1 |
| LD90PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 1 |
| LD100PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 2 |

NOTES (NUMBERS)

(1) See driver or dimming product sheet for specific details

(2) AC W used for circuit power, DC W used for driver circuit

(3) Lumen packages provided using Dim Chip with driver

(4) Colors other than white are custom

(9) TILT drivers use a I-10V control but are compatible with most

0-10V control systems. For details specific to your system, contact us at 855.440.8458

(5) "P" designation after watt rating denotes Plenum Rated

(6) Based on watt load of fixtures and driver output

(7) See Product Sheet for Emergency Drivers

(8) Safe amount of fixtures per driver

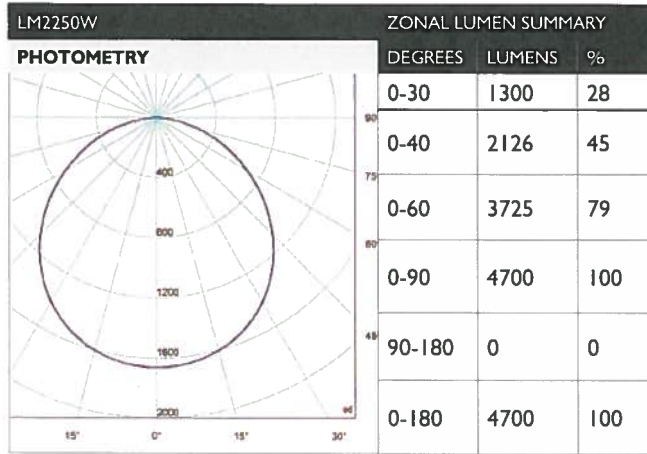


Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

TILT PANEL LUMINAIRE LM22

PHOTOMETRIC CHARTS WITH TESTING DATA. CALL FOR SPECIFIC INFORMATION NOT LISTED HERE: 855.440.8458



LUMINANCE SUMMARY CD./SQ.M.

| ANGLE | MEAN CD./SQ.M |
|-------|---------------|
| 45 | 4997 |
| 55 | 4708 |
| 65 | 4309 |
| 75 | 3742 |
| 85 | 2819 |

| | COEFFICIENT OF UTILIZATION | | | | | | | | |
|----|----------------------------|------|------|------|------|------|------|------|------|
| | 80% | | | 70% | | | 50% | | |
| | 70 | 50 | 30 | 70 | 50 | 30 | 70 | 50 | 30 |
| 0 | 1.19 | 1.19 | 1.19 | 1.16 | 1.16 | 1.16 | 1.11 | 1.11 | 1.11 |
| 1 | 1.09 | 1.05 | 1.01 | 1.07 | 1.03 | 0.99 | 0.98 | 0.95 | 0.92 |
| 2 | 1.00 | 0.92 | 0.86 | 0.98 | 0.90 | 0.85 | 0.87 | 0.82 | 0.78 |
| 3 | 0.91 | 0.81 | 0.74 | 0.89 | 0.80 | 0.73 | 0.77 | 0.71 | 0.66 |
| 4 | 0.84 | 0.73 | 0.65 | 0.82 | 0.72 | 0.64 | 0.69 | 0.62 | 0.57 |
| 5 | 0.78 | 0.65 | 0.56 | 0.75 | 0.64 | 0.56 | 0.62 | 0.55 | 0.49 |
| 6 | 0.71 | 0.58 | 0.50 | 0.69 | 0.57 | 0.49 | 0.56 | 0.48 | 0.43 |
| 7 | 0.66 | 0.52 | 0.44 | 0.64 | 0.51 | 0.43 | 0.50 | 0.42 | 0.37 |
| 8 | 0.61 | 0.47 | 0.39 | 0.59 | 0.47 | 0.39 | 0.45 | 0.38 | 0.33 |
| 9 | 0.56 | 0.43 | 0.35 | 0.55 | 0.42 | 0.35 | 0.41 | 0.34 | 0.29 |
| 10 | 0.52 | 0.39 | 0.31 | 0.51 | 0.39 | 0.31 | 0.38 | 0.31 | 0.26 |

NOTES

- Lifespan: 50,000 hrs (L70)
- LM79 and LM80 available upon request. Call 855.440.8458
- IES files available online at: laurenillumination.com/resources



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laurenillumination.com | laureninternational.com

SURFACE MOUNT KIT

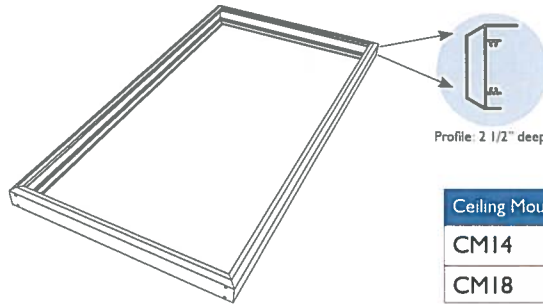
FEATURES

- Designed for use with TILT panels and drivers
- Multi-purpose hanging configurations for:
 - Mounting light to ceiling
 - As a down-lighted hanging fixture
 - As a two-way, up and down-lighted fixture
- Frame profile: 2-1/2" deep
- Screw location guide included in flange for mounting
- Heavy-duty frame construction
- Easily adapted for conduit feed

| | |
|--------------|-------------------|
| Project Name | OSU - NRDT |
| Date | |
| Type | A1 |

T/LT

| | |
|------------------|-------------|
| TILT Part Number | CM22 |
|------------------|-------------|



| Ceiling Mount and Hanging Kit Models: | | |
|---------------------------------------|---------------------|------|
| CM14 | CM22 | CM24 |
| CM18 | Custom ¹ | HK02 |

Part Number
Example: CM14

| CM | I4 | | |
|---------------------------|---------------------|------------------------------------|--|
| Name | Model | Description | Use |
| CM - Surface Mount | CM14 | Accessories, 1' x 4' Surface Mount | Use to surface mount or for hanging* panel lights. |
| | CM18 | Accessories, 1' x 8' Surface Mount | |
| HK - Hanging Kit | CM22 | Accessories, 2' x 2' Surface Mount | Call for details |
| | CM24 | Accessories, 2' x 4' Surface Mount | |
| | Custom ¹ | Made to order sizes | |
| | HK02 | 2 pcs. Hanging Mount Kit* | |

| SURFACE MOUNT | MODEL | DESCRIPTION | WIDTH | LENGTH | USE |
|-----------------------------|---------------------|----------------------------------|--|---------------------|--|
| <p>Profile: 2 1/2" deep</p> | CM14 | Accessories, 1'X4' Surface Mount | 13.075" | 49.075" | Use to surface mount or hang panel lights. NOTE: Hanging mount requires use of HK02. |
| | CM22 | Accessories, 2'X2' Surface Mount | 25.075" | 25.075" | |
| | CM24 | Accessories, 2'X4' Surface Mount | 25.075" | 49.075" | |
| | CM18 | Accessories, 1'X8' Surface Mount | 13.075" | 96.825" | |
| | CUSTOM ¹ | Made to order | Custom ¹ | Custom ¹ | Call for details |
| | HK02 | 2 pcs Hanging Mount Kit | Specify 5-foot or 10-foot lengths for cables | | Use to hang* Surface mount kit from Surface or substrate |

NOTES

* When hanging light panels, Surface Mount Kit requires the use of HK02

¹ Custom sizes available - call when ordering 855.440.8458



Contractor: Vaughn Industries

DIM CHIP

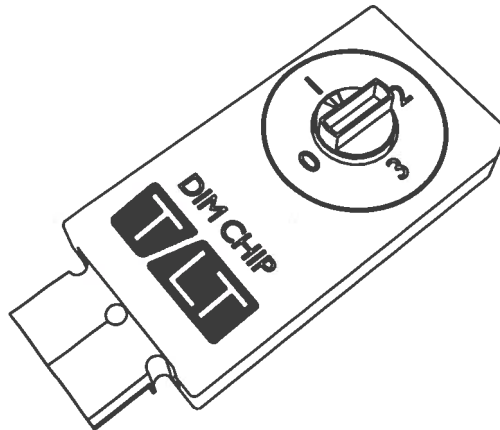
FEATURES

- Dim Chips are designed to be used with TILT drivers
- Limits driver wattage through control circuit
- Four level options available per chip
- Custom settings available with driver wattage levels set to customer request
- Limits both light output and corresponding wattage with no efficiency loss
- 5 year warranty

| | |
|--------------|-------------------|
| Project Name | OSU - NRDT |
| Date | |
| Type | A1 |



| | |
|------------------|------------|
| TILT Part Number | DCO |
|------------------|------------|



Dim Chip Models:

| |
|----------|
| DC01 |
| DC02 |
| DC03 |
| CUSTOM + |

SPECIFICATIONS

| PERCENT OF DRIVER WATTAGE | | | | |
|---------------------------|------|------|------|---|
| ALL DIM CHIP MODELS | DC01 | DC02 | DC03 | CUSTOM+ |
| Dim Chip Setting 0 | 100% | 100% | 100% | Contact Lauren at 855.440.8458 for a custom Dim Chip, to set wattage or lumen levels for your application |
| Dim Chip Setting 1 | 85% | 75% | 50% | |
| Dim Chip Setting 2 | 75% | 50% | 30% | |
| Dim Chip Setting 3 | 50% | 25% | 10% | |

FOR USE WITH

| DOWNLIGHTS | PANELS |
|------------------|---------------------------------------|
| LCLCV6 LCLCV8 | LGM14, LFM14 LGM22, LFM22 LGM24 |

DIMMER COMPATIBILITY CHART*

| DRIVER | DIMMING |
|--|---------|
| NOTE: Driver selection may be specific to your installation configuration. For complete listing of driver and its particular dimming compatibility, see individual TILT driver sheet. | |

NOTES

*TILT drivers use a 1-10V control but are compatible with most 0-10V control systems. For details specific to your system, contact us at 855.440.8458

+For custom Dim Chip settings, call Customer Service at 855.550.8458



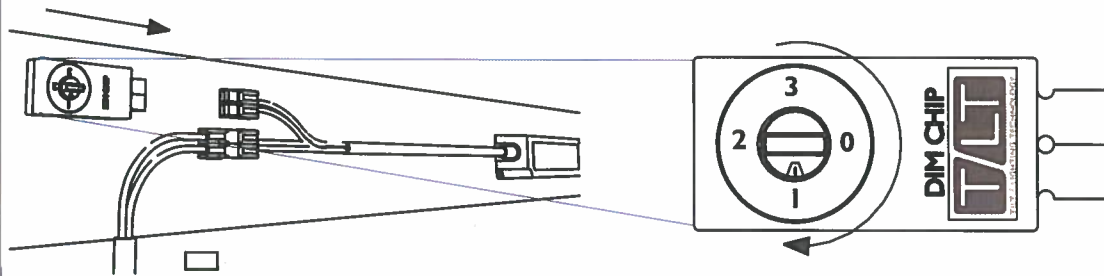
Contractor: Vaughn Industries

Job Name: OSU NRD Building F

DIM CHIP DC01, DC02, DC03

WIRING DETAIL & SETTING CONTROL

SEE INSTALLATION MANUAL FOR APPROVED INSTALLATION METHODS AND OTHER DETAILS FOR ALL DRIVERS



SETTING DIAGRAM

| DC01 | | DC02 | | DC03 | | CUSTOM ⁺ | |
|---------|---------------------|---------|---------------------|---------|---------------------|--|---------------------|
| Setting | % of driver Wattage | Setting | % of driver Wattage | Setting | % of Driver Wattage | Setting | % of Driver Wattage |
| 0 | 100 | 0 | 100 | 0 | 100 | Contact Lauren at 855.440.8458 for a custom Dim Chip, to set wattage or lumen levels for your application. | |
| 1 | 85 | 1 | 75 | 1 | 50 | | |
| 2 | 75 | 2 | 50 | 2 | 30 | | |
| 3 | 50 | 3 | 25 | 3 | 10 | | |

NOTES

- For details specific to your system, call us at 855.550.8458
- + For custom Dim Chip settings, call Customer Service at 855.550.8458
- * TILT drivers use a 1-10V control but are compatible with most 0-10V control systems. For details specific to your system, contact us at 855.440.8458



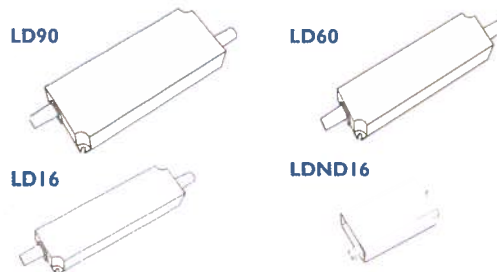
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 laurenillumination.com | laureninternational.com

Contractor: Vaughn Industries
CONSTANT VOLTAGE DRIVERS

PRODUCT DATA SHEETS

FEATURES

- 24V constant voltage power supply
- Protections include:
 - Short circuit / over current / over voltage / over temperature
- Class II power unit SELV rated
- Built in active PFC function
- Dimmable (see chart below)
- UL recognized
- RoHS compliant
- CE rated
- 5-year warranty



| | |
|------------------|------------------|
| Project Name | OSU - NRD |
| Date | |
| Type | A1 |
| T/LT | |
| TILT Part Number | LD60 |

| Constant Voltage Driver Models: |
|---------------------------------|
| LD90 |
| LD60 |
| LD16 |
| LDND16 (Non Dim) |

SPECIFICATIONS

| ALL PLENUM MODELS | LD60 | LD90 | LD16 | LDND16 (Non Dim) |
|---------------------------------------|--|-----------------|----------------|------------------|
| Length x Width (in) | 6.500" x 1.750" | 6.500" x 2.375" | 6.00" x 1.625" | 3.00" x 1.50" |
| Height (in) | 1.250" | 1.500" | 1.250" | 1.125" |
| IP Rating | IP67 | IP67 | IP30 | IP30 |
| DC output supply (V) | 60 | 90 | 16 | 16 |
| AC input voltage range | 90 - 305VAC | 90-305VAC | 90-305VAC | 90 - 264VAC |
| AC inrush current (max) Cold start | 75A @ 230VAC | 70A @ 230VAC | 50A @ 230VAC | 70A @ 230VAC |
| Safety standards | UL 8750 | UL 8750 | UL 8750 | UL 8750 |
| Protections | Short circuit/over current/over voltage/over temperature | | | |
| Thermal Operation | -40°C - 50°C | -40°C - 50°C | -40°C - 50°C | -40°C - 50°C |
| Thermal Shutdown | 75°C | 70°C | 70°C | 70°C |

FOR USE WITH

| LUMINAIRE | CV DRIVER | MAX # UNITS | CV DRIVER | MAX # UNITS | CV DRIVER | MAX # UNITS |
|-----------|--------------|-------------|-----------|-------------|-----------|-------------|
| LCLCV6 | LD16, LDND16 | 1 | LD60 | 5 | LD90 | 8 |
| LCLCV8 | LD16, LDND16 | 1 | LD60 | 4 | LD90 | 6 |
| LGM22 | LD16, LDND16 | 0 | LD60 | 1 | LD90 | 1 |
| LGM24 | LD16, LDND16 | 0 | LD60 | 0 | LD90 | 1 |
| LGM14 | LD16, LDND16 | 0 | LD60 | 1 | LD90 | 1 |

DIMMER COMPATIBILITY CHART

| BRAND | MODEL |
|-----------------|-----------------------------|
| TILT | WLVD |
| TILT | DIM CHIP (DC01, DC02, DC03) |
| LEVITON (0-10V) | IP-710* |
| LUTRON (0-10V) | DVSTV* |

*TILT drivers use a 1-10V control but are compatible with most 0-10V control systems.
For details specific to your system, contact us at 855.440.8458

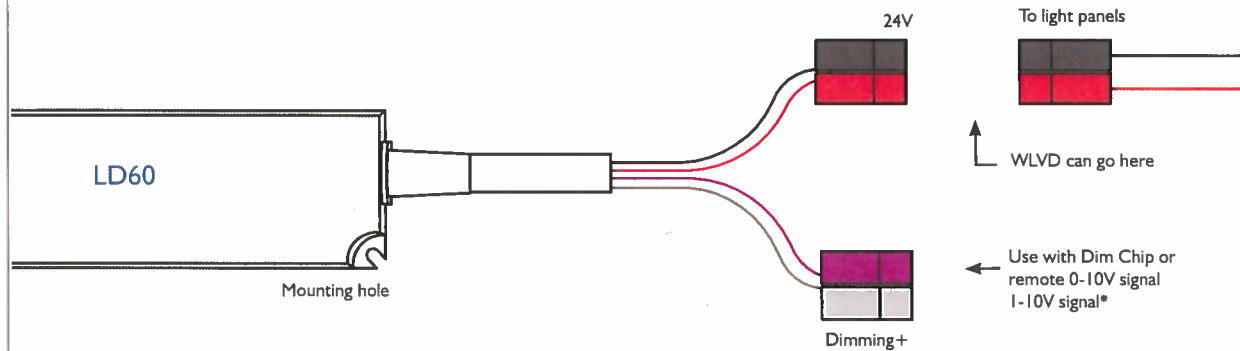
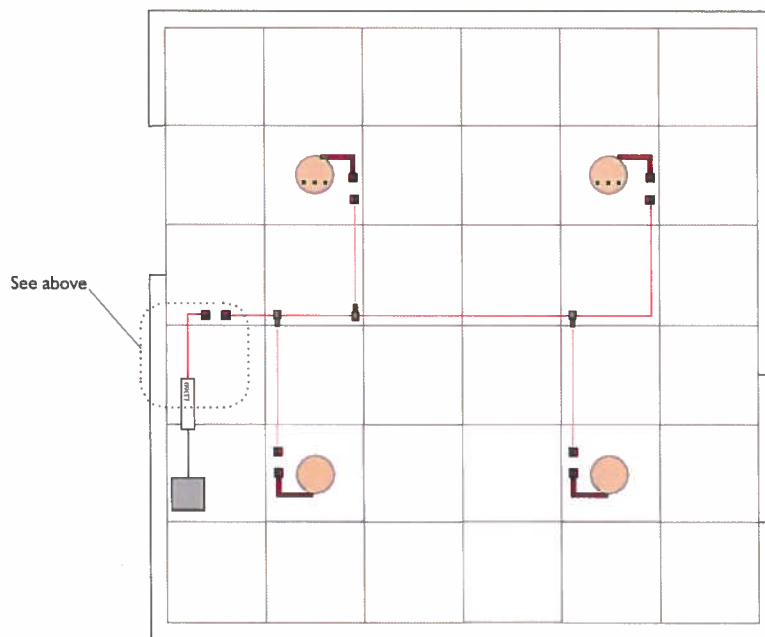


Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

CONSTANT VOLTAGE DRIVERS LD90, LD60, LD16, LDND16**CONNECTING CONSTANT VOLTAGE DRIVERS - DC WIRING****CLOSE-UP DC WIRING DETAIL**

SEE INSTALLATION MANUAL FOR APPROVED INSTALLATION METHODS AND OTHER DETAILS FOR ALL DRIVERS

**SAMPLE ROOM LAYOUT WITH DRIVERS INSTALLED****NOTES**

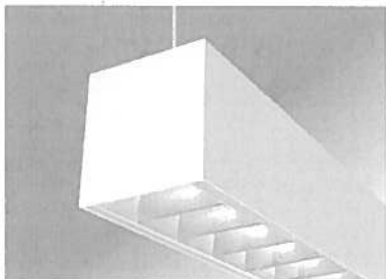
- Lights should be placed within 50 feet of driver
- Wattage load (lights) should not exceed wattage of driver
- + TILT drivers use 1-10V. They will accept 0-10V signals. Operation from 0-1V will depend on the system being used.
For details specific to your system, call us at 855.440.8458



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P: 855.440.8458 | F: 330.339.1515
laurenillumination.com | laureninternational.com



CONSTRUCTION 6063-T5 extruded aluminum housing. Highly reflective die-formed white painted aluminum reflector. Die-formed anodized snap-in aluminum semi-specular parabolic louver, removable for lamp replacement.

ELECTRICAL Standard T5 and T5HO: Program start 120/277 volt integral electronic ballast with less than 10% THD. Standard T8: Instant start 120/277 volt electronic ballast with less than 10% THD. Through wiring with quick connects standard. Standard single circuit. Each ballast provided with disconnects to meet luminaire disconnect code requirement.

MOUNTING Aircraft cable and wall mount available. Adjustable aircraft cable mounts on 4'-0" and 8'-0" centers (See back page for MR16 mounting detail). Aircraft Cable supplied with 5" power and 2" non-power canopies. Refer to installation instructions for appropriate ceiling detail. Canopies are painted white unless otherwise specified.

FINISH Standard powder-coat white painted finish. Consult factory for custom colors.

LABELS UL and cUL Listed, approved for dry/damp location unless otherwise noted.

LUMINAIRE SPECIFICATION

Sample Catalog #: EX4-A-N-1T5-24-AC48G1-120-1C-W

EX4- _ - _ - N- _ T _ _ -

EX4-
Edge EX 4,
Straight Lamp

N- None,
Closed

1T5- (1) T5
2T5- (2) T5¹ #
1T5HO- (1) T5HO
2T5HO- (2) T5HO¹ #
1T8- (1) T8⁸
2T8- (2) T8^{1,8}

LO- Lens Overlay
M _ - MR16 Lamp⁷
CN- Non-
Illuminated
Connector

P- Parabolic Louver
L- White Louver
WP- Asymmetric with
Acrylic Lens⁹
WL- Asymmetric with
Acrylic Lens⁹

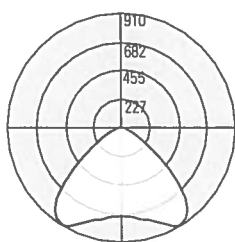
Individual Units

4- 4'
8- 8'

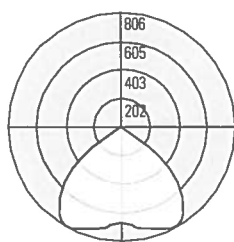
Continuous Runs

xx'- Specify nominal
overall row length
in 4' increments

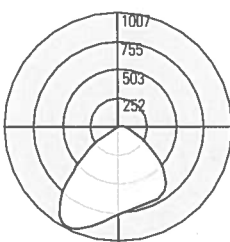
¹Not available with Asymmetric Lamp option (WP and WL). ²Consult factory for additional lengths. ³Consult factory for tegular edged tiles. ⁴Replaces standard 2" canopy ⁵347 volt and UNV not available with MR16 and battery packs. ⁶Some Edge EX configurations will not accommodate all electrical options. Consult factory. ⁷See Back Page for Layout and Ordering Information ⁸WP, WL, 2T5/2T5HO, and T8 lamps are not available with staggered lamp option (EX4S).



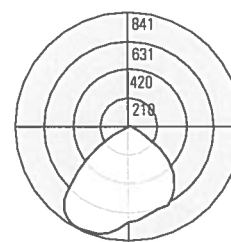
Test # 202436
Part # EX4-P-N-1T5
Total Luminaire Efficiency: 74.5%



Test # 202438
Part # EX4-P-N-1T8
Total Luminaire Efficiency: 61.6%

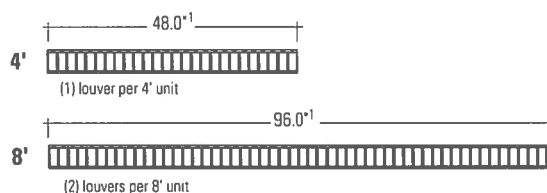


Test # 202442
Part # EX4-WP-N-1T5
Total Luminaire Efficiency: 72.9%



Test # 202444
Part # EX4-WP-N-1T8
Total Luminaire Efficiency: 59.5%

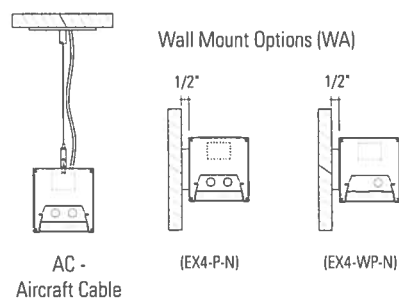
• INDIVIDUAL MODULES¹



See Straight or Staggered Lamp Guide for row configuration, wattage and number of lamps per run.

¹Add 1/16" for each end plate or 1/8" to the overall length of the row.

• MOUNTING OPTIONS

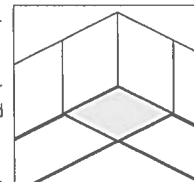


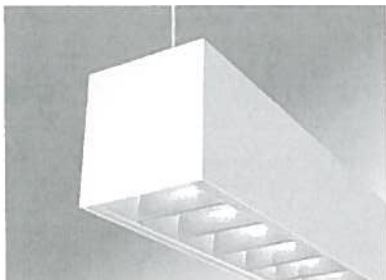
• NON-ILLUMINATED CONNECTOR

APPLICATION: Utilize non-illuminated connectors to create unique configurations.

INSTALLATION: Non-illuminated connector easily joins to linear fixtures using standard Pinnacle Lighting joiner kits.

ORDERING INFORMATION: Specify Non-Illuminated Connector (CN) in the options section of the part number. Sample Catalog #: EX4-P-N-1T5-24-AC48G1-120-1C-W-CN.





CONSTRUCTION 6063-T5 extruded aluminum housing. Highly reflective die-formed white painted aluminum reflector. Die-formed anodized snap-in aluminum semi-specular parabolic louver, removable for lamp replacement.

ELECTRICAL Standard T5 and T5HO: Program start 120/277 volt integral electronic ballast with less than 10% THD. Standard T8: Instant start 120/277 volt electronic ballast with less than 10% THD. Through wiring with quick connects standard. Standard single circuit. Each ballast provided with disconnects to meet luminaire disconnect code requirement.

MOUNTING Aircraft cable and wall mount available. Adjustable aircraft cable mounts on 4'-0" and 8'-0" centers (See back page for MR16 mounting detail). Aircraft Cable supplied with 5" power and 2" non-power canopies. Refer to installation instructions for appropriate ceiling detail. Canopies are painted white unless otherwise specified.

FINISH Standard powder-coat white painted finish. Consult factory for custom colors.

LABELS UL and cUL Listed, approved for dry/damp location unless otherwise noted.

LUMINAIRE SPECIFICATION

Sample Catalog #: EX4-A-N-1T5-24-AC48G1-120-1C-W

EX4_ _ _ N- _ T_ _ _

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Edge EX 4,
Straight Lamp

N- None,
Closed

1T5- (1) T5
2T5- (2) T5¹
1T5HO- (1) T5HO
2T5HO- (2) T5HO¹
1T8- (1) T8²
2T8- (2) T8¹

LO- Lens Overlay
M_ MR16 Lamp³
CN- Non-
Illuminated
Connector

P- Parabolic Louver
L- White Louver
WP- Asymmetric with
Acrylic Lens⁴
WL- Asymmetric with
Acrylic Lens⁴

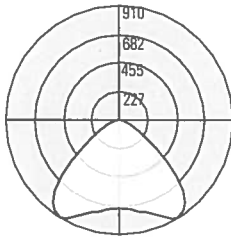
Individual Units

4- 4'
8- 8'

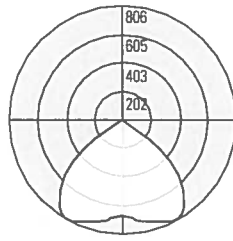
Continuous Runs

xx'- Specify nominal
overall row length
in 4' increments

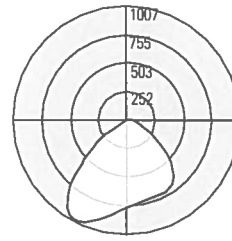
¹Not available with Asymmetric Lamp option (WP and WL). ²Consult factory for additional lengths. ³Consult factory for regular edged tiles. ⁴Replaces standard 2" canopy. ⁵347 volt and UNV not available with MR16 and battery packs. ⁶Some Edge EX configurations will not accommodate all electrical options. Consult factory. ⁷See Back Page for Layout and Ordering Information. ⁸WP, WL, 2T5/2T5HO, and T8 lamps are not available with staggered lamp option (EX4S).



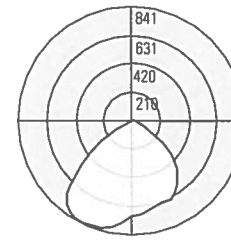
Test # 202436
Part # EX4-P-N-1T5
Total Luminaire Efficiency: 74.5%



Test # 202438
Part # EX4-P-N-1T8
Total Luminaire Efficiency: 61.6%

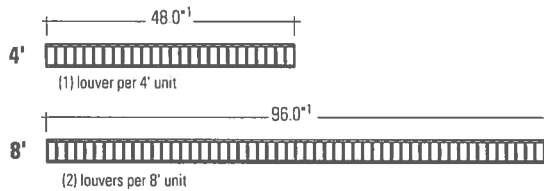


Test # 202442
Part # EX4-WP-N-1T5
Total Luminaire Efficiency: 72.9%



Test # 202444
Part # EX4-WP-N-1T8
Total Luminaire Efficiency: 59.5%

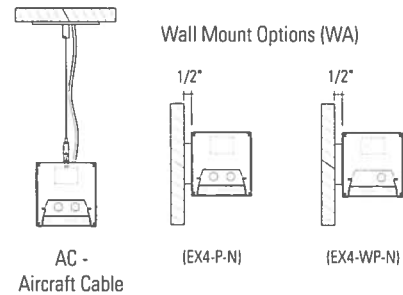
• INDIVIDUAL MODULES¹



See Straight or Staggered Lamp Guide for row configuration, wattage and number of lamps per run.

¹Add 1/16" for each end plate or 1/8" to the overall length of the row.

• MOUNTING OPTIONS

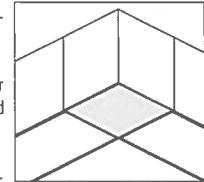


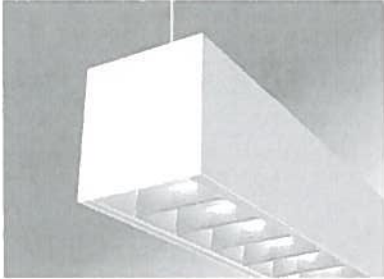
• NON-ILLUMINATED CONNECTOR

APPLICATION: Utilize non-illuminated connectors to create unique configurations.

INSTALLATION: Non-illuminated connector easily joins to linear fixtures using standard Pinnacle Lighting joiner kits.

ORDERING INFORMATION: Specify Non-Illuminated Connector (CN) in the options section of the part number. Sample Catalog #: EX4-P-N-1T5-24-AC48G1-120-1C-W-CN.





CONSTRUCTION 6063-T5 extruded aluminum housing. Highly reflective die-formed white painted aluminum reflector. Die-formed anodized snap-in aluminum semi-specular parabolic louver, removable for lamp replacement.

ELECTRICAL Standard T5 and T5HO: Program start 120/277 volt integral electronic ballast with less than 10% THD. Standard T8: Instant start 120/277 volt electronic ballast with less than 10% THD. Through wiring with quick connects standard. Standard single circuit. Each ballast provided with disconnects to meet luminaire disconnect code requirement.

MOUNTING Aircraft cable and wall mount available. Adjustable aircraft cable mounts on 4'-0" and 8'-0" centers (See back page for MR16 mounting detail). Aircraft Cable supplied with 5" power and 2" non-power canopies. Refer to installation instructions for appropriate ceiling detail. Canopies are painted white unless otherwise specified.

FINISH Standard powder-coat white painted finish. Consult factory for custom colors.

LABELS UL and cUL Listed, approved for dry/damp location unless otherwise noted.

LUMINAIRE SPECIFICATION

Sample Catalog #: EX4-A-N-1T5-24-AC48G1-120-1C-W

EX4_ _ _ _ N- _ T _ _ _

EX4-
Edge EX 4,
Straight Lamp

N- None,
Closed

1T5- (1) T5
2T5- (2) T5¹
1T5HO- (1) T5HO
2T5HO- (2) T5HO¹
1T8- (1) T8²
2T8- (2) T8²

LO- Lens Overlay
M _ _ MR16 Lamp³
CN- Non-
Illuminated
Connector

P- Parabolic Louver
L- White Louver
WP- Asymmetric with
Acrylic Lens⁴
WL- Asymmetric with
Acrylic Lens⁴

Individual Units

4- 4'
8- 8'

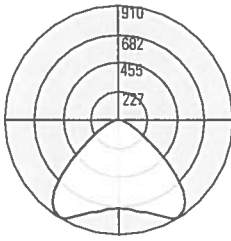
Continuous Runs

xx' - Specify nominal
overall row length
in 4' increments

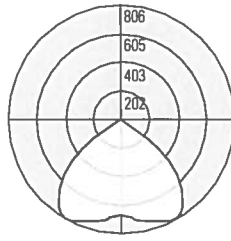
¹Not available with Asymmetric Lamp option (WP and WL). ²Consult factory for additional lengths. ³Consult factory for tegular edged tiles. ⁴Replaces standard 2" canopy. ⁵347 volt and UNV not available with MR16 and battery packs. ⁶Some Edge EX configurations will not accommodate all electrical options. Consult factory. ⁷See Back Page for Layout and Ordering Information. ⁸WP, WL, 2T5/2T5HO, and T8 lamps are not available with staggered lamp option (EX4S).

PHOTOMETRICS

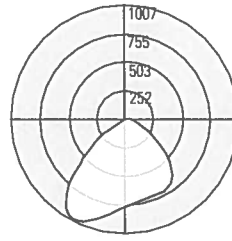
EDGE EX4_P



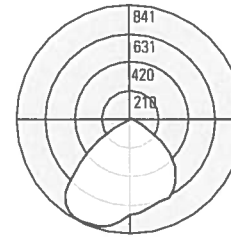
Test # 202436
Part # EX4-P-N-1T5
Total Luminaire Efficiency: 74.5%



Test # 202438
Part # EX4-P-N-1T8
Total Luminaire Efficiency: 61.6%

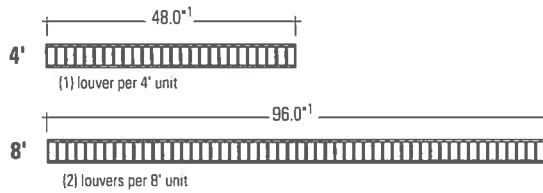


Test # 202442
Part # EX4-WP-N-1T5
Total Luminaire Efficiency: 72.9%



Test # 202444
Part # EX4-WP-N-1T8
Total Luminaire Efficiency: 59.5%

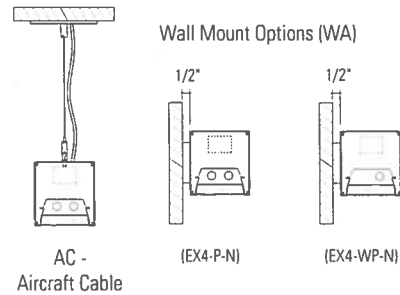
• INDIVIDUAL MODULES¹



See Straight or Staggered Lamp Guide for row configuration, wattage and number of lamps per run.

¹Add 1/16" for each end plate or 1/8" to the overall length of the row.

• MOUNTING OPTIONS

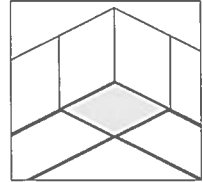


• NON-ILLUMINATED CONNECTOR

APPLICATION: Utilize non-illuminated connectors to create unique configurations.

INSTALLATION: Non-illuminated connector easily joins to linear fixtures using standard Pinnacle Lighting joiner kits.

ORDERING INFORMATION: Specify Non-Illuminated Connector (CN) in the options section of the part number. Sample Catalog #: EX4-P-N-1T5-24-AC48G1-120-1C-W**CN**.



Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

OSU NRDT

EDGE EX4B

LUMINOUS GEOMETRY™

T5, T5HO, T8 Direct and Indirect Linear with
Straight & Staggered Lamps / Parabolic Louver



Project Name
EX4B P O T8 2 1 12 AC48G9 120 2C W DG

Catalog Number

Date

A10

Type

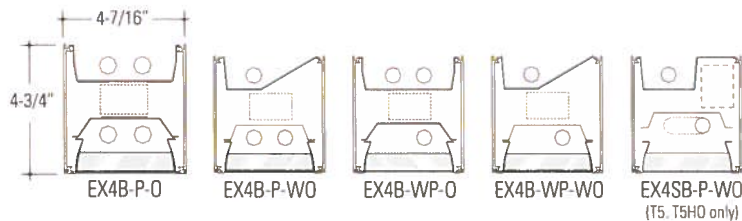
CONSTRUCTION 6063-T5 extruded aluminum housing. Highly reflective die-formed white painted aluminum reflector. Die-formed anodized snap-in aluminum semi-specular parabolic louver, removable for lamp replacement.

ELECTRICAL Standard T5 and T5HO: Program start 120/277 volt integral electronic ballast with less than 10% THD. Standard T8: Instant start 120/277 volt electronic ballast with less than 10% THD. Through wiring with quick connects standard. Standard single circuit. Each ballast provided with disconnects to meet luminaire disconnect code requirement.

MOUNTING Aircraft cable and wall mount available. Adjustable aircraft cable mounts on 4'-0" and 8'-0" centers (See back page for MR16 mounting detail). Aircraft Cable supplied with 5" power and 2" non-power canopies. Refer to installation instructions for appropriate ceiling detail. Canopies, and power cords are painted white unless otherwise specified.

FINISH Standard powder-coat textured white, metallic silver, textured black or bronze painted finish, consult factory for chip of standard paint finishes. Pendants and canopies painted white unless specified differently in the options section of the part number. Contact factory for additional custom color and finish options.

LABELS UL and cUL Listed, approved for dry/damp location unless otherwise noted.



LUMINAIRE SPECIFICATION

Sample Catalog #: EX4B-P-O-T5-1-1-24-AC48G1-120-1C-W-DG

EX4_B - P - O - T_8 - 2 - 1 12 - AC48G9 120 - 2C - W - DG

| HOUSING | DIRECT | INDIRECT | LAMP TYPE | LAMPS DOWN | LAMP UP | LENGTH | MOUNTING | VOLTAGE | CIRCUITING | FINISH | OPTIONS |
|--|--|---|--|---|--|--|---|---|---|--------|---------|
| EX4B- Edge EX 4 Bi-Directional, Straight Lamp EX4SB- Edge EX 4 Bi-Directional, Staggered Lamp ¹⁰ | P- Parabolic Louver L- White Louver WP- Asymmetric with Parabolic Louver ¹⁰ WL- Asymmetric with White Louver ¹⁰ | O- Open WO- Asymmetric Open ¹⁰ | T5- T5 Lamp ¹⁰ T5HO- T5HO Lamp ¹⁰ T8- T8 Lamp ¹⁰ | 1- 1 Lamp 2- 2 Lamp ¹ | Individual Units 4- 4' 8- 8' Continuous Runs xx'- Specify nominal overall row length in 4' increments 12' | Aircraft Cable³ AC48G1- 1" T-Bar ⁴ AC48G9- 9/16" T-Bar ⁴ AC48GS- Slotted T-Bar ⁴ AC48JB- Junction Box AC48ST- Structure AC5_G- 5" Non-Power Canopy ⁵ AC5_JB- 5" Non-Power Canopy ⁵ SQ48G- 5" Square Canopy ⁵ SQ48JB- 5" Square Canopy ⁵ Wall WA- Wall Mount | 120- 120 V 277- 277 V 347- 347 V ⁶ UNV- UNV ⁶ (120/277) | W- Matte White S- Metallic Silver ¹¹ BL- Textured Black ¹¹ BR- Bronze ¹¹ CC- Custom Color ¹¹ | DG- Dust Guard LO- Lens Overlay SR- Specular Reflector MR16- MR16 Lamp ⁹ CN- Non- Illuminated Connector CC-C- Custom Color Canopy ¹¹ | | |

¹Not available with Asymmetric Lamp option (WP). ²Not available in EX4SB or with WO option. ³Consult factory for additional lengths. ⁴Consult factory for regular edged tiles. ⁵Replaces standard 2" canopy. ⁶347 volt and UNV not available with MR16 and battery packs. ⁷Some Edge EX configurations will not accommodate all electrical options. Consult factory. ⁸Dual circuit = top and bottom lamps are on separate circuits. ⁹See Back Page for Layout and Ordering Information. ¹⁰WP, WL, WO, T5/T5HO and T8 lamps not available with staggered lamp. ¹¹If canopy is to match fixture housing, must specify with CC-C. If not specified canopy will be standard matte white.



Pinnacle Architectural Lighting 12655 East 42nd Avenue, Suite 50 Denver, CO 80239
Phone 303.322.5570 Fax 303.322.5568 www.pinnacle-ltg.com

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June 2014

Specifications and dimensions subject to change without notice. Specification sheets that appear on pinnacle-ltg.com are the most recent version and supersede all other previously printed or electronic versions.

Date Submitted: Sept. 2, 2015

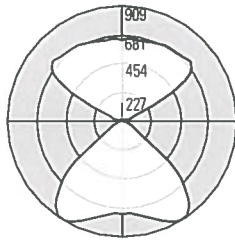
Distributor: C.E.D. Columbus, OH 43207

Contractor: Vaughn Industries

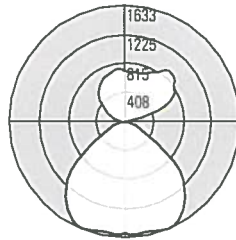
PHOTOMETRICS

TYPE A10

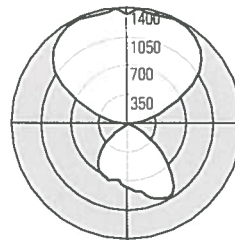
EDGE EX4B_P



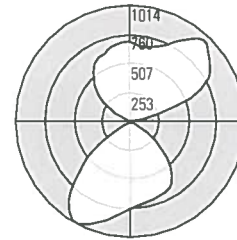
Test # 202480
Part # EX4B-P-O-T5-1-1-SR
Total Luminaire Efficiency: 84.3%



Test # 202495
Part # EX4B-P-WO-T5-2-1-SR
Total Luminaire Efficiency: 78.6%

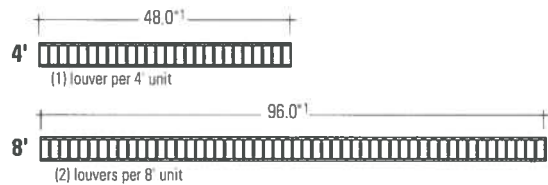


Test # 202501
Part # EX4B-WP-O-T5-1-2-SR
Total Luminaire Efficiency: 85.1%



Test # 202504
Part # EX4B-WP-WO-T5-1-1-SR
Total Luminaire Efficiency: 83.5%

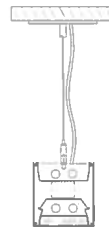
• INDIVIDUAL MODULES¹



See Straight and Staggered Lamp Guide for row configuration, wattage and number of lamps per run.

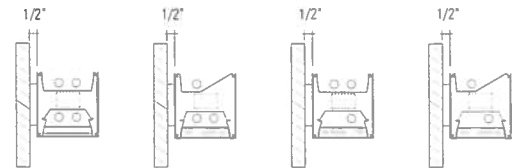
¹Add 1/16" for each end plate or 1/8" to the overall length of the row

• MOUNTING OPTIONS



AC -
Aircraft Cable

Wall Mount Options (WA)



(EX4B-P-O) (EX4B-P-WO) (EX4B-WP-O) (EX4B-WP-WO)

• MR16 HALOGEN LAMP

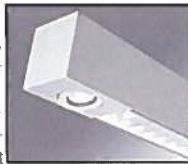
APPLICATION: MR16's are ideal for conference rooms, corridors, wall washing, retail spaces and training facilities where accent lighting is required.

TECHNICAL: MR16 fully enclosed compartment eliminates light from entering into other fixture areas. Available in 20, 35 and 50 watt halogen lamps (lamps not included). Consult factory for other lamp types. Lamp tilts to 35 degrees left or right with 179 degree rotation.

ELECTRICAL: Standard 50 watt max halogen lamp transformer. MR16 installed as independent circuit. MR16 voltage to match fluorescent voltage. Universal voltage and 347 volt not available.

LABELS: UL and cUL Listed, approved for dry/damp location unless otherwise noted.

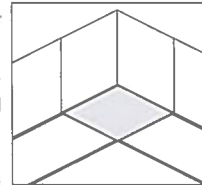
ORDERING INFORMATION: Specify MR16 layout and lens in the options section of the part number. Sample Catalog #: EX4B-P-O-T5-1-1-24-AC48G1-120-1C-S-M2/LP. See MR16 Resource Guide for Layout and Lens Options.



• NON-ILLUMINATED CONNECTOR

APPLICATION: Utilize non-illuminated connectors to create unique configurations.

INSTALLATION: Non-illuminated connector easily joins to linear fixtures using standard Pinnacle Lighting joiner kits.



ORDERING INFORMATION: Specify Non-Illuminated Connector (CN) in the options section of the part number. Sample Catalog #: EX4B-P-O-T5-1-1-24-AC48G1-120-1C-W-CN

• DUST GUARD

APPLICATION: Dust Guard prevents particle ingress.

CONSTRUCTION: Clear acrylic lens lays on top of fixture and is easily removed for lamp replacement.

ORDERING INFORMATION: Specify Dust Guard (DG) in the options section of the part number. Sample Catalog #: EX4B-P-O-T5-1-1-24-AC48G1-120-1C-W-DG.

• LENS OVERLAY

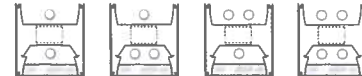
APPLICATION: Lens overlay provides additional lamp shielding in conjunction with parabolic louver.

CONSTRUCTION: Extruded frosted acrylic lens easily installs on top of semi-specular parabolic louver.

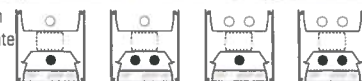
ORDERING INFORMATION: Specify Lens Overlay (LO) in the options section of the part number. Sample Catalog #: EX4B-P-O-T5-2-2-24-AC48G1-120-1C-W-LO

• CIRCUITING

1C = All lamps on 1 circuit.*



2C = Top and bottom lamps are on separate circuits.**



*1D= All lamps on 1 dimmed circuit

**2D = Top and bottom lamps are on separate dimmed circuits

Consult factory for emergency circuit (E) and battery pack (B) applications as detailed shop drawings are required.



Pinnacle Architectural Lighting 12655 East 42nd Avenue, Suite 50 Denver, CO 80239
Phone 303.322.5570 Fax 303.322.5568 www.pinnacle-ltg.com

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June 2014

Specifications and dimensions subject to change without notice. Specification sheets that appear on pinnacle-ltg.com are the most recent version and supersede all other previously printed or electronic versions.
Date Submitted: Sept. 2, 2015 Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E

Job Name:
OSU - NRD BUILDINGCatalog Number:
FAVCS-PL-1T5-1C-120-S-CXX-TS-8
(DUST COVER NOT AVAIL)
Notes:

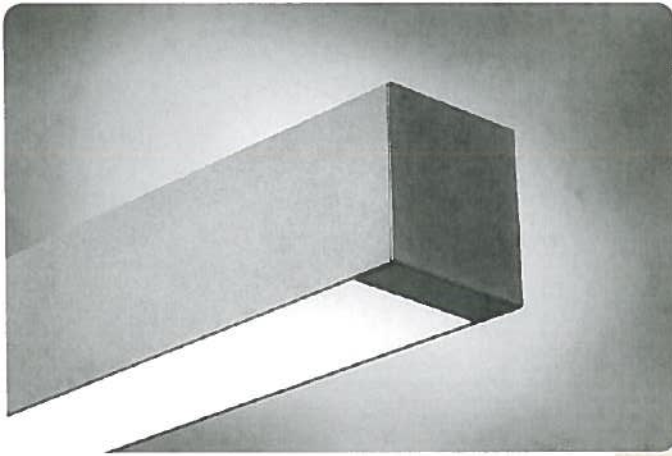
Type:

A16

SPEC14-5147

new in '05

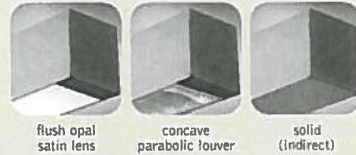
avenue® c



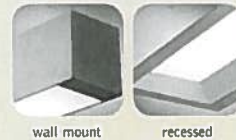
FEATURES

Extruded aluminum, suspended linear
T5/T5HO fluorescent luminaire.3.5" miniature square profile creates sleek
aesthetic.Luminaire may be specified in a direct or
indirect configuration.Avenue® C makes an exceptional aesthetic
statement in conference rooms, private
offices, reception areas or other high-end
applications.

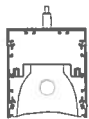
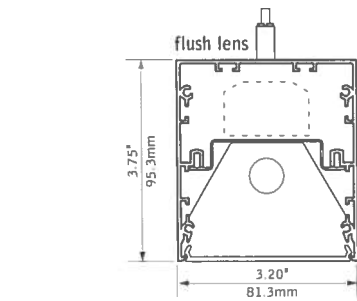
shielding options



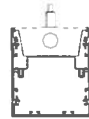
companion luminaire



DIMENSIONAL DATA

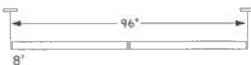
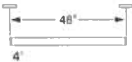


louver

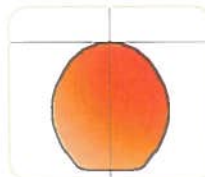


solid (indirect)

suspended



PERFORMANCE

Flush Lens
1-Lamp T5
59% Efficiency
620 cd @ 10°See Photometric section for
additional performance data.

august 2005

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Spectrum Lighting, Inc.


Job Name:
 OSU - NRD BUILDING

Catalog Number:
 FAVCS-PL-1T5-1C-120-S-CXX-TS-8
 (DUST COVER NOT AVAIL)

Notes:

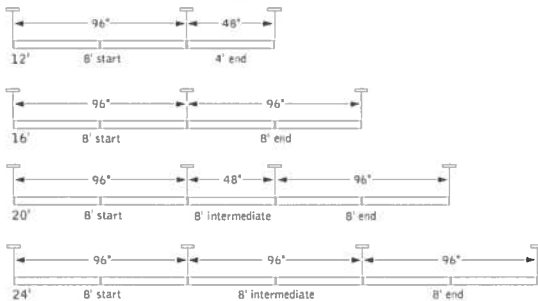
Type:

A16

SPEC14-5147

fixture type:

project name:

MOUNTING INFORMATION

Consult factory for additional row length information.

ORDERING

luminaire series

Avenue C FAVCS

FAVCS

shielding

Flush Satin Lens FL

Concave Parabolic Louver PL

Indirect with Solid Housing SD

PL

lamping

One Lamp T5 1T5

One Lamp T5HO 1T5HO

1T5

circuits

Single Circuit 1C

1C

voltage

120 Volt 120

277 Volt 277

347 Volt 347

(Consult factory for availability)

120

ballast

Electronic Program Start S

(<10% THD)

Electronic Dimming Ballast D

(Consult factory for dimming availability)

S

suspension

24" Cable Suspension C24

48" Cable Suspension C48

96" Cable Suspension C96

(Specify "J" in place of "C" for 5" dia.

canopies at power feed and 2" dia.

canopies at non-feed locations)

(Consult factory for sloped ceiling applications)

Surface Mount SM

CXX**CXX = MUST SPECIFY SUSPENSION LENGTH**

factory options

Clear Acrylic Dust Cover DC

Emergency Circuit EC

Emergency Battery Pack EM

HLR/GLR Fuse FU

Include 3000K Lamp L830

Include 3500K Lamp L835

Include 4100K Lamp L841

TS

finish

Matte White Housing WH

Titanium Silver TS

8'

luminaire length

4' Nominal Housing 4'

8' Nominal Housing 8'

12' (8'+4') 12'

16' (8'+8') 16'

20' (8'+4'+8') 20'

24' (8'+8'+8') 24'

(Consult factory for custom lengths and corner availability)

SPECIFICATIONS**construction**

One-piece, .050" thick housing of 6063-T5 extruded aluminum.

20 Ga. ballast channel.

16 Ga. internal bulkhead.

14 Ga. steel end caps.

All luminaires are provided with single point aircraft cable suspension mounted on 48" and 96" centers.

4' unit weight: 15 lbs

8' unit weight: 28 lbs

optic

22 Ga. reflector finished in high reflectance white.

Concave parabolic louver: 1"H x 1" frequency fabricated of low iridescent, semi-specular premium grade aluminum.

Flush lens: extruded DR™ acrylic lens .156" thick with opal satin finish.

electrical

Luminaires are pre-wired with factory installed branch circuit wiring and over-molded quick connects.

Electronic ballasts are thermally protected and have a Class "P" rating.

Optional DALI and other dimming ballasts available.

Consult factory for dimming specifications and availability.

UL and cUL listed.

emergency

Emergency battery packs provide 90 minutes of illumination.

Initial lumen output for lamp types are as follows:

T5 Lamp: Up to 550 lumens

T5HO Lamps: Up to 825 lumens

Battery pack requires unswitched hot from same branch circuit as AC ballast.

finish

Polyester powder coat applied over a 5-stage pre-treatment.

Standard luminaire housing finished in Matte Satin White or Titanium Silver.

Focal Point L.L.C. 4201 South Pulaski Rd, Chicago, Illinois 60632 | T: 773.247.9494 | F: 773.247.8494 | info@focalpointlights.com | www.focalpointlights.com

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FAVCS-PL-1T5-1C-120-S-CXX-TS-8
(DUST COVER NOT AVAIL)
Notes:

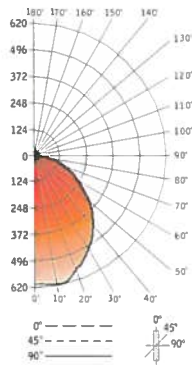
Type:**A16**

SPEC14-5147

flush lens
avenue® c



Filename: FAVCSFLT5 IES
Catalog #: FAVCS-FL-1T5-1C-120-S-C24-WH-4
Efficiency: 59%
Test #: 12397.1

CANDLEPOWER DISTRIBUTION

Spacing 1.3
Criterion 1.3

| Vertical Angle | 0° | 22.5° | 45° | 67.5° | 90° | Zonal Lumens |
|----------------|-----|-------|-----|-------|-----|--------------|
| 0° | 610 | 610 | 610 | 610 | 610 | |
| 5° | 613 | 613 | 613 | 613 | 611 | 59 |
| 15° | 616 | 616 | 616 | 615 | 615 | 175 |
| 25° | 559 | 558 | 556 | 553 | 553 | 257 |
| 35° | 490 | 489 | 487 | 484 | 483 | 306 |
| 45° | 405 | 403 | 402 | 399 | 399 | 311 |
| 55° | 304 | 302 | 299 | 299 | 298 | 269 |
| 65° | 206 | 204 | 201 | 200 | 198 | 200 |
| 75° | 110 | 108 | 108 | 107 | 108 | 114 |
| 85° | 29 | 29 | 25 | 22 | 21 | 28 |
| 90° | 0 | 0 | 0 | 0 | 0 | 0 |
| 95° | 0 | 0 | 0 | 0 | 0 | 0 |
| 105° | 0 | 0 | 0 | 0 | 0 | 0 |
| 115° | 0 | 0 | 0 | 0 | 0 | 0 |
| 125° | 0 | 0 | 0 | 0 | 0 | 0 |
| 135° | 0 | 0 | 0 | 0 | 0 | 0 |
| 145° | 0 | 0 | 0 | 0 | 0 | 0 |
| 155° | 0 | 0 | 0 | 0 | 0 | 0 |
| 165° | 0 | 0 | 0 | 0 | 0 | 0 |
| 175° | 0 | 0 | 0 | 0 | 0 | 0 |
| 180° | 0 | 0 | 0 | 0 | 0 | 0 |

LUMEN SUMMARY

| | Zone | Lumens | % Lamp | % Fixt |
|-----------------|---------|--------|--------|--------|
| | 0°-30° | 490 | 16.9 | 28.5 |
| | 0°-40° | 796 | 27.4 | 46.3 |
| | 0°-60° | 1376 | 47.5 | 80.1 |
| | 0°-90° | 1718 | 59.3 | 100.0 |
| Total Luminaire | 0°-180° | 1718 | 59.3 | 100.0 |

LUMINANCE DATA (CD/M²)

| Vertical Angle | 0° | 45° | 90° |
|----------------|------|------|------|
| 45° | 7474 | 7418 | 7363 |
| 55° | 6916 | 6802 | 6779 |
| 65° | 6360 | 6206 | 6113 |
| 75° | 5546 | 5445 | 5445 |
| 85° | 4342 | 3743 | 3144 |

CO-EFFICIENTS OF UTILIZATION

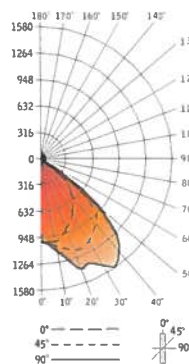
| Floor | 0 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---------|----|----|----|----|----|----|----|----|----|
| Ceiling | 70 | 50 | 30 | 10 | 0 | 0 | 0 | 0 | 0 |
| Wall | 70 | 50 | 30 | 10 | 0 | 0 | 0 | 0 | 0 |
| RCR0 | 71 | 71 | 71 | 71 | 69 | 69 | 69 | 66 | 66 |
| 1 | 65 | 62 | 60 | 58 | 63 | 61 | 57 | 59 | 55 |
| 2 | 60 | 55 | 51 | 48 | 58 | 54 | 48 | 52 | 46 |
| 3 | 55 | 49 | 44 | 41 | 53 | 48 | 40 | 46 | 40 |
| 4 | 50 | 44 | 39 | 35 | 49 | 43 | 35 | 41 | 34 |
| 5 | 46 | 39 | 33 | 30 | 45 | 38 | 29 | 37 | 29 |
| 6 | 42 | 35 | 29 | 26 | 41 | 34 | 26 | 33 | 25 |
| 7 | 39 | 31 | 26 | 22 | 38 | 31 | 22 | 30 | 22 |
| 8 | 36 | 28 | 23 | 19 | 35 | 27 | 19 | 27 | 19 |
| 9 | 33 | 25 | 20 | 17 | 32 | 25 | 17 | 24 | 17 |
| 10 | 31 | 23 | 18 | 15 | 30 | 22 | 15 | 22 | 15 |

Go to www.focalpointlights.com for additional photometric data.

louver
avenue® c



Filename: FAVCSPL1T5H IES
Catalog #: FAVCS-PL-T5HD-1C-120-S-C24-WH-4
Efficiency: 54%
Test #: 12387.1

CANDLEPOWER DISTRIBUTION

Spacing 1.1
Criterion 1.9

| Vertical Angle | 0° | 22.5° | 45° | 67.5° | 90° | Zonal Lumens |
|----------------|------|-------|------|-------|------|--------------|
| 0° | 1012 | 1012 | 1012 | 1012 | 1012 | |
| 5° | 1017 | 1024 | 1030 | 1037 | 1041 | 98 |
| 15° | 984 | 1026 | 1127 | 1235 | 1279 | 320 |
| 25° | 849 | 940 | 1188 | 1330 | 1386 | 530 |
| 35° | 681 | 861 | 1107 | 1404 | 1583 | 707 |
| 45° | 473 | 646 | 957 | 1165 | 1326 | 710 |
| 55° | 115 | 202 | 381 | 446 | 392 | 288 |
| 65° | 18 | 24 | 35 | 55 | 44 | 36 |
| 75° | 7 | 8 | 9 | 9 | 11 | 9 |
| 85° | 1 | 1 | 1 | 2 | 2 | 2 |
| 90° | 0 | 0 | 0 | 0 | 0 | 0 |
| 95° | 0 | 0 | 0 | 0 | 0 | 0 |
| 105° | 0 | 0 | 0 | 0 | 0 | 0 |
| 115° | 0 | 0 | 0 | 0 | 0 | 0 |
| 125° | 0 | 0 | 0 | 0 | 0 | 0 |
| 135° | 0 | 0 | 0 | 0 | 0 | 0 |
| 145° | 0 | 0 | 0 | 0 | 0 | 0 |
| 155° | 0 | 0 | 0 | 0 | 0 | 0 |
| 165° | 0 | 0 | 0 | 0 | 0 | 0 |
| 175° | 0 | 0 | 0 | 0 | 0 | 0 |
| 180° | 0 | 0 | 0 | 0 | 0 | 0 |

LUMEN SUMMARY

| | Zone | Lumens | % Lamp | % Fiet |
|--------------------|---------|--------|--------|--------|
| Total Luminaire | 0°-30° | 948 | 19.0 | 35.1 |
| | 0°-40° | 1655 | 33.1 | 61.3 |
| | 0°-60° | 2653 | 53.1 | 98.3 |
| | 0°-90° | 2700 | 54.0 | 100.0 |
| | 0°-180° | 2700 | 54.0 | 100.0 |

LUMINANCE DATA (CD/M²)

| Vertical Angle | 0° | 45° | 90° |
|----------------|------|-------|------|
| 45° | 8729 | 17660 | 2447 |
| 55° | 2616 | 8668 | 8918 |
| 65° | 556 | 1081 | 1359 |
| 75° | 353 | 454 | 555 |
| 85° | 150 | 150 | 299 |

CO-EFFICIENTS OF UTILIZATION

| Floor | 0 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---------|----|----|----|----|----|----|----|----|----|
| Ceiling | 70 | 50 | 30 | 10 | 0 | 0 | 0 | 0 | 0 |
| Wall | 70 | 50 | 30 | 10 | 0 | 0 | 0 | 0 | 0 |
| RCR0 | 64 | 64 | 64 | 64 | 63 | 63 | 63 | 60 | 60 |
| 1 | 61 | 59 | 57 | 56 | 59 | 58 | 55 | 55 | 53 |
| 2 | 57 | 54 | 51 | 49 | 56 | 53 | 48 | 51 | 47 |
| 3 | 53 | 49 | 46 | 43 | 52 | 48 | 43 | 47 | 42 |
| 4 | 49 | 44 | 41 | 38 | 48 | 44 | 38 | 42 | 37 |
| 5 | 46 | 40 | 36 | 33 | 45 | 40 | 33 | 38 | 33 |
| 6 | 42 | 36 | 32 | 29 | 41 | 36 | 29 | 35 | 29 |
| 7 | 39 | 33 | 29 | 26 | 38 | 32 | 26 | 32 | 25 |
| 8 | 36 | 29 | 25 | 22 | 35 | 29 | 22 | 28 | 22 |
| 9 | 33 | 26 | 22 | 19 | 32 | 26 | 19 | 25 | 19 |
| 10 | 30 | 24 | 20 | 17 | 30 | 23 | 17 | 23 | 17 |

Go to www.focalpointlights.com for additional photometric data.

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

Submitted by Spectrum Lighting, Inc.


Job Name:
 OSU - NRD BUILDINGS

Catalog Number:
 FAVCS-PL-1T5-1C-120-S-CXX-TS-8
 (DUST COVER NOT AVAIL)

Notes:

Type:**A16**

SPEC14-5147

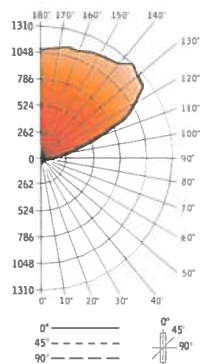
 solid
 avenue® c


Filename: FAVCSSD1T5H IES

Catalog #: FAVCS-SD-1T5H0-1C-120-S-C24-WH-4"

Efficiency: 88%

Test #: 12596.1

CANDLEPOWER DISTRIBUTION

| Vertical Angle | 0° | 22.5° | 45° | 67.5° | 90° | Zonal Lumens |
|----------------|------|-------|------|-------|------|--------------|
| 0° | 0 | 0 | 0 | 0 | 0 | 0 |
| 5° | 0 | 0 | 0 | 0 | 0 | 0 |
| 15° | 0 | 0 | 0 | 0 | 0 | 0 |
| 25° | 0 | 0 | 0 | 0 | 0 | 0 |
| 35° | 0 | 0 | 0 | 0 | 0 | 0 |
| 45° | 0 | 0 | 0 | 0 | 0 | 0 |
| 55° | 0 | 0 | 0 | 0 | 0 | 0 |
| 65° | 0 | 0 | 0 | 0 | 0 | 0 |
| 75° | 0 | 0 | 0 | 0 | 0 | 0 |
| 85° | 0 | 0 | 0 | 0 | 0 | 0 |
| 90° | 0 | 1 | 2 | 2 | 2 | |
| 95° | 18 | 63 | 32 | 25 | 23 | 67 |
| 105° | 162 | 399 | 446 | 389 | 361 | 398 |
| 115° | 366 | 606 | 861 | 925 | 929 | 735 |
| 125° | 557 | 731 | 1012 | 1197 | 1245 | 843 |
| 135° | 731 | 836 | 1061 | 1245 | 1309 | 790 |
| 145° | 861 | 914 | 1044 | 1164 | 1203 | 650 |
| 155° | 985 | 1009 | 1075 | 1142 | 1168 | 495 |
| 165° | 1082 | 1090 | 1111 | 1135 | 1142 | 312 |
| 175° | 1092 | 1089 | 1089 | 1092 | 1090 | 104 |
| 180° | 1080 | 1080 | 1080 | 1080 | 1080 | |

LUMEN SUMMARY

| | Zone | Lumens | % Lamp | % Fix |
|--------------------|----------|--------|--------|-------|
| Total Luminaire | 0°-30° | 0 | 0 | 0 |
| | 0°-90° | 0 | 0 | 0 |
| | 90°-130° | 2042 | 40.9 | 46.5 |
| | 90°-180° | 4393 | 87.9 | 100 |
| | 0°-180° | 4393 | 87.9 | 100 |

LUMINANCE DATA (CD/M²)

| Vertical Angle | 0° | 45° | 90° |
|----------------|----|-----|-----|
| 45° | 0 | 0 | 0 |
| 55° | 0 | 0 | 0 |
| 65° | 0 | 0 | 0 |
| 75° | 0 | 0 | 0 |
| 85° | 0 | 0 | 0 |

CO-EFFICIENTS OF UTILIZATION

| Floor | 80 | 70 | 20 |
|---------|----|----|----|
| Ceiling | 70 | 50 | 10 |
| Wall | 70 | 50 | 10 |
| RCR | 84 | 84 | 84 |
| 1 | 76 | 73 | 69 |
| 2 | 69 | 63 | 58 |
| 3 | 63 | 55 | 50 |
| 4 | 57 | 49 | 43 |
| 5 | 53 | 43 | 37 |
| 6 | 48 | 39 | 32 |
| 7 | 44 | 34 | 28 |
| 8 | 41 | 31 | 25 |
| 9 | 38 | 28 | 22 |
| 10 | 35 | 25 | 20 |

Go to www.focalpointlights.com for additional photometric data

Contractor: Vaughn Industries

Job Name: OSU NBDT Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
O34SUSSW

Notes:

Type:

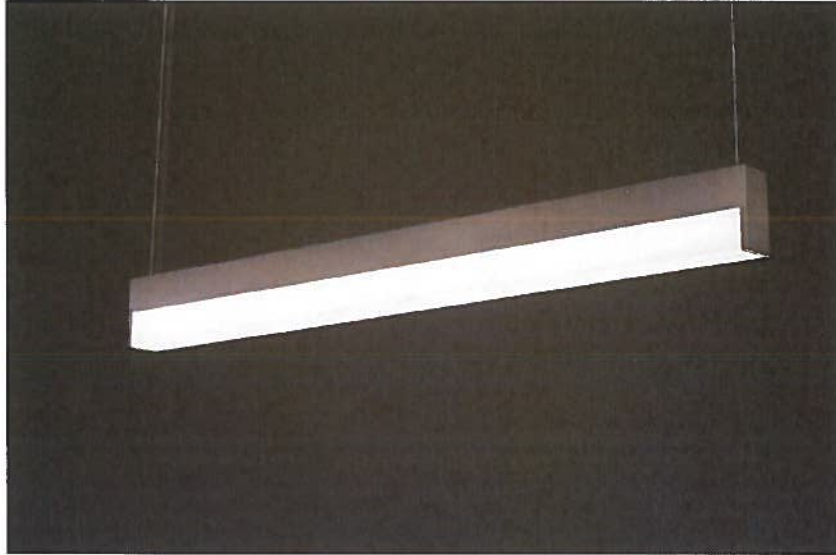
A17

LSC14-37947

O3 | allège³



omni-direct



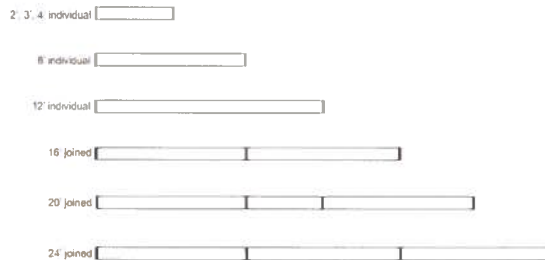
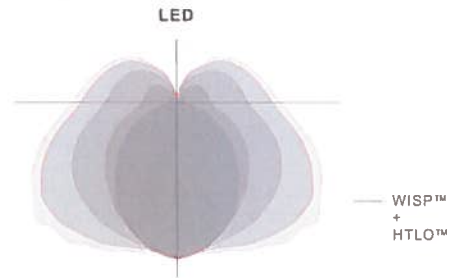
suspended



ceiling



wall



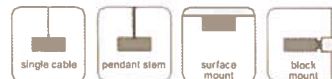
| LED | 1 board in cross |
|----------|--------------------|
| per foot | watts/ft lumens/ft |
| LS | 5 600 |
| LH | 10 1200 |

Lumens at board at 4000k
Consult IES files online for delivered lumens
Specifications subject to change

Available Light Platforms:



Available Mounting:



Contractor: **Vaughan Industries**Job Name: **OSU NBDT Building F**

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

O34SUSSW

Notes:

Type:**A17**

LSC14-37947

O3 | allège³

project

type

quantity

interior**Mounting:**

Single Cable: (1) 4', 1mm stainless steel aircraft cable w/ fully adjustable grippers and locking device. 5' plastic-coated, silver-braided, flexible cord. Satin white, square canopy is standard.

Pendant/Stem: 3/8" stem and round canopy, painted white. Indicate pendant length. If specified for earthquake zone, a light will provide swivel canopies.

Wall Blocks: Precisely milled aluminum block mounts provide minimalist appearance. 3/8", 1/2", 1" or 2" deep. ADA compliant with 3/8", 1/2" or 1" blocks. (2) blocks provided per fixture, lengths 8ft or less; (3) blocks per 12ft. Direct-to-wall mounting is not available due to lens proximity to wall.

Ceiling/Surface Mount: Fixture mounts directly to ceiling, power connects inside fixture using BX or MX style wiring.

Lengths:

All length dimensions are nominal, used for general length identification purposes. Actual lengths may vary by several inches. Lengths to 12' are individual fixtures and do not connect. Lengths beginning with "R" designate standard, nominal rows comprised of 4' and/or 8' sections. 3/8" mid plate joiners are visible between sections.

Specify all modifications with the "integrations" specification sheet: nominal lengths other than the standards available here, rows longer than 24', exact lengths, span mount, mullion mount, etc.

LED:

5yr warranty >60,000hr LED life. Tested to LM-79 and LM-80. See wattage/lumen table for specifications per foot. All specifications are subject to change.

T5/T5HO:

Single lamp in cross section. Program start is factory standard.

T8:

Single lamp in cross section. Instant start is factory standard; choose low <0.8BF, standard 0.8-1.0BF; high >1.0BF. Specify if program start or custom ballast factor is required.

Construction:

60% recycled aluminum extruded housing. Precision milled endcaps. 180° omni-directional 3D lens.

Finish:

Electrostatically applied powder coat finish.

Listing:

UL/CUL, Damp Location.

Companion Luminaires:

O2 scone

Legend:

1. Emergency ballast not applicable on lengths 3ft or less
2. Standard multi-circuiting - see fixture chart below

Series: **O3****Dimension:**

**advise
length ?**

| | | |
|-----------------|-----|----|
| nominal 2' | 2 | 4' |
| nominal 3' | 3 | |
| nominal 4' | 4 | |
| nominal 8' | 8 | |
| nominal 12' | 12 | |
| nominal 16' row | R16 | |
| nominal 20' row | R20 | |
| nominal 24' row | R24 | |

Lamping:

| | |
|------------------------|-----|
| LED standard output | LS |
| LED high output | LH |
| T5 (1) | S |
| T5HO (1) | H |
| T8 (1) low output | T8L |
| T8 (1) standard output | T8S |
| T8 (1) high output | T8H |

LED Temp (if applicable):

| | |
|-------|----|
| 3000k | 30 |
| 3500k | 35 |
| 4000k | 40 |

Voltage:

| | |
|-----------------------|---|
| universal 120V - 277V | U |
| 120V | 1 |
| 277V | 2 |
| 347V | 3 |

Optics:

| | |
|--------------------|----|
| WISP™ lens | S |
| WISP™ + HTLO™ lens | SH |

Mounting:

| | |
|---|----|
| single aircraft cable | S |
| pendant / rigid stem - indicate stem length | P |
| pendant / rigid stem for earthquake zone - indicate stem length | PV |
| wall mount blocks 1" | M1 |
| wall mount blocks 2" | M2 |
| wall mount blocks 3/8" | M3 |
| wall mount blocks 1/2" | M5 |
| ceiling/surface mount | F |

Finish:


| | |
|-------------------------|---|
| alightanium™ | T |
| satin white | W |
| satin black | B |
| textured eggshell white | E |
| other - specify RAL# | O |

Options:

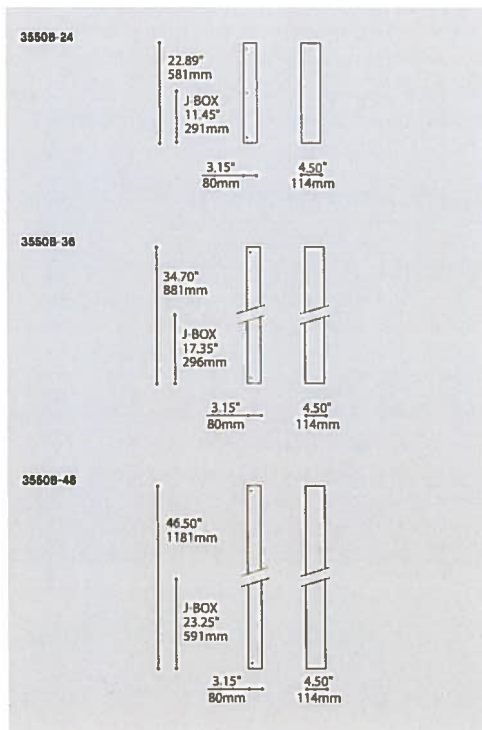
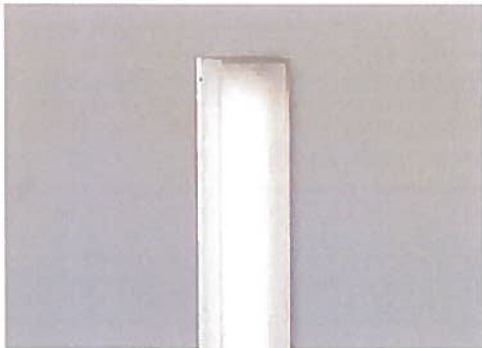
| | |
|---|---|
| dimming - specify manufacturer, model/series and voltage | D |
| emergency (fluorescent only) - specify model/series or lumens | E |
| external fusing | F |
| multi-circuit | M |
| new york city code | N |

Multi-circuit standards

| | |
|----------|--|
| 2, 3, 4' | |
| 8' | |

| | | | |
|--|--|--|--------------|
|  LIGHTING UNLIMITED | Project 14-16183-14 Date 10/29/2014 OSU HNDT BUILDING Submitted By LIGHTING UNLIMITED INC | Catalog Number 3550B-48 2XF T5 28 120V-FRO Job Name OSU HNDT BUILDING | Type |
| | | Notes | A18 |

DOUBLE FLARE 3550B



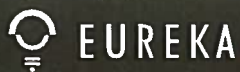
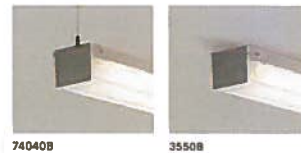
| ORDERING SPECIFICATION | SPÉCIFICATION DE COMMANDE | CODE |
|--|--|------------------|
| MODEL MODÈLE | | 3550B |
| 3550B | DOUBLE FLARE | |
| LUMINAIRE LENGTH LONGUEUR DU LUMINAIRE | | 48 |
| 24 | 24" | |
| 36 | 36" | |
| 48 | 48" | |
| LIGHT SOURCE SOURCE LUMINEUSE | | 2XF T5 28 |
| (WATTAGE, LAMP TYPE, LAMP FORM, BASE TYPE, OTHER INFO) | | |
| 3550B-24 | | |
| 2XF T5 14 | 14W X 2, T5 | |
| 2XF T5 24 | 24W X 2, T5 HO | |
| 3550B-36 | | |
| 2XF T5 21 | 21W X 2, T5 | |
| 2XF T5 39 | 39W X 2, T5 HO | |
| 3550B-48 | | |
| 2XF T5 28 | 28W X 2, T5 | |
| 2XF T5 54 | 54W X 2, T5 HO | |
| VOLTAGE VOLTAGE | | 120V |
| 120V | 120 VOLT | |
| 277V | 277 VOLT | |
| 347V* | 347 VOLT | |
| *ONLY AVAILABLE WITH 2XF T5 54 (NDH DIMMING BALLAST) | | |
| DIMMING OPTION / OPTION DE GRADATION | | |
| AVAILABLE WITH 2XF T5 24 AND 2XF T5 54 | | |
| DM1 | ADVANCE MARK 10 ELECTRONIC DIMMING BALLAST | |
| AVAILABLE WITH 2XF T5 14, 2XF T5 21, 2XF T5 28 AND 2XF T5 54 | | |
| DM7 | ADVANCE MARK 7 ELECTRONIC DIMMING BALLAST | |
| AVAILABLE WITH ALL LIGHT SOURCES | | |
| D3D | LUTRON HI-LUME 3D ELECTRONIC DIMMING BALLAST (ECOSYSTEM DIGITAL LINK WIRING) | |
| D33 | LUTRON HI-LUME 3D ELECTRONIC DIMMING BALLAST (3-WIRE WIRING) | |
| EMERGENCY BATTERY BATTERIE D'URGENCE | | |
| AVAILABLE WITH ALL LIGHT SOURCES, 120V OR 277V ONLY | | |
| NOT AVAILABLE WITH A DIMMING BALLAST | | |
| EM | EMERGENCY BATTERY | |
| STRUCTURE FINISH FINI STRUCTURE | | FRO |
| FRO | FROSTED | |

PRODUCT CHARACTERISTICS CARACTÉRISTIQUES DU PRODUIT




| | |
|--------------------------|--|
| DESIGN: | Modern rectangular profile available in three lengths and updated performance. ADA compliant. |
| LIGHT SOURCE: | Highly efficient fluorescent T5 and T5 HO light sources. Dimming and emergency available. |
| STRUCTURE: | Structure in extruded aluminum & die-stamped steel. Injection moulded plastic end caps. |
| DIFFUSER: | Machined & frosted acrylic housing with snap-fit, extruded micro-prism acrylic lens. |
| CERTIFIED: | e-UL-us |
| CONCEPTION: | Profil rectangulaire et contemporain plus performant offert en trois longueurs. Conforme à la norme ADA. |
| SOURCE LUMINEUSE: | T5 et T5 HO à haute performance; ballasts à gradation et d'urgence disponibles. |
| STRUCTURE: | Structure en acier extrudé et en acier embouti. Embouts injectés en plastique. |
| DIFFUSEUR: | Boîtier d'acrylique usiné et givré avec fixé par enclenchement. Lentille extrudée en acrylique avec micro-prismes. |
| CERTIFIÉ: | e-UL-us |

FAMILY FAMILLE



SPECIFICATION

| | | | |
|--|--|--|------|
|  LIGHTING UNLIMITED | Project 14-16183-14 Date 10/29/2014 OSU NRDY BUILDING | Job Name OSU NRDY Building F Catalog Number P-PAU-8-1TT-0000-LED SN | Type |
| | Submitted By LIGHTING UNLIMITED INC | Notes | A24 |



BESA LIGHTING

pahu 8, 12, 16

SPECIFICATIONS:

DESCRIPTION

Cable-hung or stem-mount pendant with handcrafted glass diffuser.
Three sizes are available.

LAMPING

Standard: 120V incandescent, suitable for dimming,
not included.

CFL: 4-Pin CFL with non-dimming electronic ballast. 120V,
lamp not included.

GU24 CFL: Self-ballasted GU24 lampholders, 120V,
lamp not included.

LED: 10W GU24 LED Lamp 120V, dimmable, *included.*

DIFFUSER

Inner shade shall be handcrafted Opal glass.

Outer shade shall be handcrafted glass in various decors

Opening sizes: 3x7mm holes.

SUSPENSION

Cable-hung: 3x 10' aircraft-quality stainless steel cable support
with 10' AWM-type cord. Jacket tint coordinates with metal finish.
5" Dia. canopy is plated stamped steel. Bronze or Satin Nickel.

Stem-mount: 4 connectable stem sections (3", 6", 12" and 18" lengths)
plus telescoping piece for up to 3" adjustment, 10' max. 5" Dia. canopy
(with swivel) and stem sections are plated steel. Bronze or Satin Nickel

MOUNTING

Installs directly to a 4" octagonal ceiling box. Suitable for sloped ceilings.

LABELS

UL or ETL Listed. Suitable for Damp Locations (interior use only).
Consult factory concerning lower wattage labeling for energy
requirements.



Clear
*Shown with No Inner
Glass option (NI)

Trans. Armagnac/Opal
*Shown with 1TT
stem fixture

Trans.Amethyst/Opal




Trans.Olive/Opal



All dimensions provided are nominal.
Allowance must be made for dimensional tolerance in handcrafted glasses.

REV 1/14

| | | | |
|---|--|---|---|
|  | Project 14-16183-14 Date 10/29/2014 Contractor: Vaughn Industries Submitted By LIGHTING UNLIMITED INC | Catalog Number P18-0806 LED SN Job Name: P18-0806 Building F Notes | Type <div style="font-size: 2em; font-weight: bold; text-align: center;">A24</div> |
|---|--|---|---|



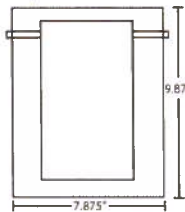
BESA LIGHTING

pahu 8, 12, 16

ORDERING:

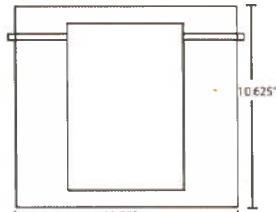
Pahu 8:

Lamp: 100W A19



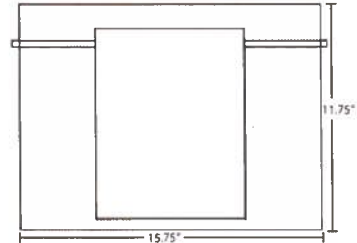
Pahu 12:

Lamp: 100W A19



Pahu 16:

Lamp: 150W A21



Pahu 8:

| Connection* | Pahu 8 Decor | Lamp Options | Metal Finish | Options |
|------------------|----------------------------|------------------------|-----------------|-------------|
| 3x Cable Fixture | A00607 Trans.Amethyst/Opal | (blank) 100W A19 Incan | BR Bronze | L 15' cord |
| 1KG 1 Lt. Flat | C00607 Clear/Opal | F1 18W TBX 120V | SN Satin Nickel | NI No inner |
| Stem Fixture | G00607 Trans.Armagnac/Opal | 01 18W TBX 277V | | |
| 1TT 1 Lt. Flat | L00607 Trans.Olive/Opal | GU24 18W GU24 120V | | |
| | | LED 10W LED 120V | | |

Pahu 12:

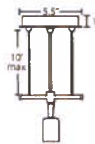
| Connection* | Pahu 12 Decor | Lamp Options | Metal Finish | Options |
|------------------|----------------------------|------------------------|-----------------|-------------|
| 3x Cable Fixture | A18407 Trans.Amethyst/Opal | (blank) 100W A19 Incan | BR Bronze | L 15' cord |
| 1KG 1 Lt. Flat | C18407 Clear/Opal | I1 26W TBX 120V | SN Satin Nickel | NI No inner |
| Stem Fixture | G18407 Trans.Armagnac/Opal | R1 26W TBX 277V | | |
| 1TT 1 Lt. Flat | L18407 Trans.Olive/Opal | GU24 26W GU24 120V | | |
| | | LED 10W LED 120V | | |

Pahu 16:

| Connection* | Pahu 16 Decor | Lamp Options | Metal Finish | Options |
|------------------|----------------------------|------------------------|-----------------|-------------|
| 3x Cable Fixture | A00707 Trans.Amethyst/Opal | (blank) 150W A21 Incan | BR Bronze | L 15' cord |
| 1KG 1 Lt. Flat | C00707 Clear/Opal | I1 26W TBX 120V | SN Satin Nickel | NI No inner |
| Stem Fixture | G00707 Trans.Armagnac/Opal | R1 26W TBX 277V | | |
| 1TT 1 Lt. Flat | L00707 Trans.Olive/Opal | GU24 26W GU24 120V | | |
| | | LED 10W LED 120V | | |

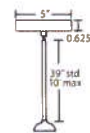
PENDANT OPTIONS:

CABLE HUNG PENDANT



- 3x 10' aircraft-quality stainless steel cable
- 1KG Series, 1x lampholder
- Cord: 10' AWM-type provided
- Bronze or Satin Nickel

STEM PENDANT



- Swivel at canopy, suitable for sloped ceilings
- Includes telescoping section plus 4 connectable stem sections, (1x 3", 1x 6", 1x 12", 1x 18"), 10' max
- Bronze or Satin Nickel

LED 120V PENDANTS:

- Internal driver integrated in the lamp, GU24 base
- Total power of only 6 watts
- Non-dimmable
- Rated life: 30,000 hours
- Frosted acrylic diffuser

ACCESSORIES:

ADDITIONAL STEM SECTIONS:

Additional connecting stems are available to increase overall length, up to 10' max. Telescoping adjustable section allows up to 3" movement.

| | |
|--------------------|--------------|
| T20A-SN or T20A-BR | Adj. Section |
| T203-SN or T203-BR | 3" Section |
| T206-SN or T206-BR | 6" Section |
| T212-SN or T212-BR | 12" Section |
| T218-SN or T218-BR | 18" Section |

Project Information:

Contractor: Vaughn Industries

Job Name: OSU NBDT Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

P2851-09

Notes:

Type:**A40**

LSC14-37947



Incandescent

Alexa

Close-To-Ceiling

Type _____

-09

P2851

**Finish**Catalog
No.Brushed
Nickel

Lamping

Dimensions (Inches)

A

B

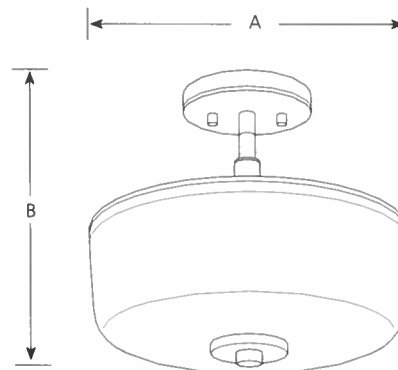
P2851

-09

2 (m) 100w

12-1/4

11

200 W**Specifications:**General

- White linen glass bowl: 12-1/4" dia., 4-1/2" ht.
- A crisp, clear edge accent strip complements the etched and clear glass
- Plated Brushed Nickel (-09) finish
- Steel construction
- Companion Bath and Vanity, Chandelier, Close-to-ceiling, Hall and Foyer, Pendant, Wall bracket, fixtures are available

Mounting

- Ceiling mount
- Canopy covers a standard 4" hexagonal recessed outlet box
- Mounting strap for outlet box included

Electrical

- Medium base ceramic sockets
- Pre-wired

Labeling

- UL-CUL Dry location listed

Progress Lighting
701 Millennium Blvd.
Greenville, South Carolina
29607

www.progresslighting.com

Rev. 08/13

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
44 0902

Notes:

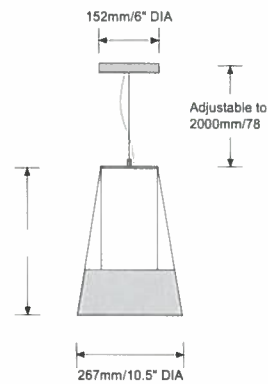
Type:**A45**

LSC14-37947

32 W**KIORA****A SPECIFY LAMP/LUMINAIRE TYPE**

| Code: | Lamp: | Weight: | Photometry: |
|---------|--------------------|-------------|--------------|
| 44 0902 | 1 x 26/32/42W PL-T | 2.0Kg/4.4lb | File# 440902 |
| 44 0903 | 1 x 57W PL-T | 2.0Kg/4.4lb | File# 440903 |

Example Specification Code: 44 0902



INTERIOR PENDANTS



WWW.BETACALCO.COM | © 2011 BETA-CALCO INC.

75

Contractor: Vaughn Industries

Job Name: OSU NEDT Building F

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**


44 0902 LP32T35KSYL FSDFI

Notes:

Type:**A45**

LSC14-37947

**GENERAL SPECIFICATION****Outer diffuser:** Injection moulded clear acrylic with an etched lower band.**Internal diffuser:** Injection moulded opal acrylic.**Suspension:** Single stainless steel cable.**Power cable:** Silver braided.**Canopy finish:** White powder coated paint.**Reflector:** Aluminum, frosted finish with vertical facets.**Ballasts:** HPF, high frequency electronic ballasts for multiple types and voltages 120-277V.**Mechanical:** Mounts directly to a junction box (by others) hardware (by others).**Approvals:** ETL.MULTI-ARM
Page 206

| | | | |
|--|--|--|--|
|  | Project 14-16183-14 Date 10/29/2014 Contractor: Vaughn Industries Submitted By LIGHTING UNLIMITED INC | Catalog Number DP7AL-CP13-BD-36/CP13/BA/MWI/AL7BA Job Name OSU NBDT Building F Notes | Type <div style="border: 2px solid red; padding: 10px; display: inline-block; font-size: 2em; font-weight: bold;">A47</div> |
|--|--|--|--|

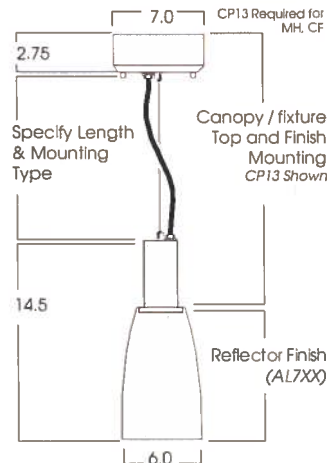


SPECLUME
7" PENDANT SERIES
SPUN ALUMINUM
CF / INC / MH

SL
SERIES

PRODUCT INFORMATION:

- Decorative spun aluminum pendant is sleek and simple.
- Fixture specification options offer a creative mix of reflector and mounting finishes.
- Choose from compact fluorescent, incandescent, or metal halide lamping options.
- See mounting options section for maximum CF / MH lengths.
- Suitable for use in damp location
- Consult the factory for dimming and EM options
- Manufactured and tested to UL standard No. 1598.



26 W

| MODEL | LAMPS | WATTS | BALLAST | MOUNTING | MOUNTING FINISH | REFLECTOR |
|--|-------|-----------------|-------------------------|--|---|--|
| DP7AL- SpecLume Pendant Series, 6"x10" Spun Aluminum | CF ** | 18, 26, 32, 42* | E1 -Electronic, 120v | CD* -Cord and Cable Mount | PT -Platinum Silver (Gray Cord / Stem) | AL7PT -Platinum Silver |
| | INC | 100w | E2 -Electronic, 277v | CDCC -Cord/Cable and Cable Mount | MB -Matte Black (Black Cord / Stem) | AL7MB -Matte Black |
| | MH ** | 20, 39 (PAR 20) | **SPECIFY VOLTAGE | HM* -Hang Straight Pendant | MW -Matte White (White Cord / Stem) | AL7MW -Matte White |
| | | | | HMAT* -Adjustable Length Hang Straight Pendant | BA/MWI -Brushed Aluminum/ Matte White Interior (Gray Cord / Stem) | AL7BA -Brushed Aluminum |
| | | | | PM* -Pendant/ Straight Mount | CC -Custom Color (see color chart) | AL7CC -Custom Color (see color chart) |
| | | | | CP13-Ballast Housing | | |
| | | | | * Specify Length in inches **12" or 36" lengths only See SpecLume Mounting Page | | |
| DP7AL | CF | 26 | EX | CD13 | BA / MWI | AL7BA |

Dimensions shown are nominal. SpecLume Lighting is continually improving products and reserves the right to make changes that will not alter performance or appearance with or without written notice.



SPECTRUM
LIGHTING INC.

WWW.SPECLIGHT.COM • 994 JEFFERSON STREET, FALL RIVER, MA 02721 • 508.678.2303 FAX 508.678.2260



Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-E-1-42TT-S-120-C144-NA

Notes:

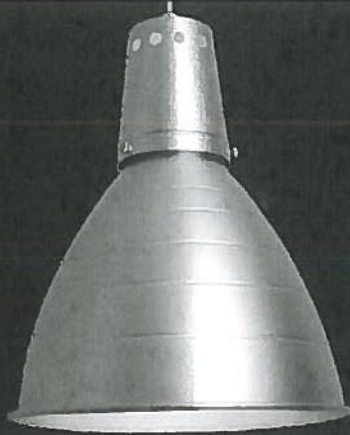
Type:

A73

SPEC14-5147

Groove™ E

FLUORESCENT



decorative grooves



stepped canopy
& single point
suspension



frosted green
diffusion disk

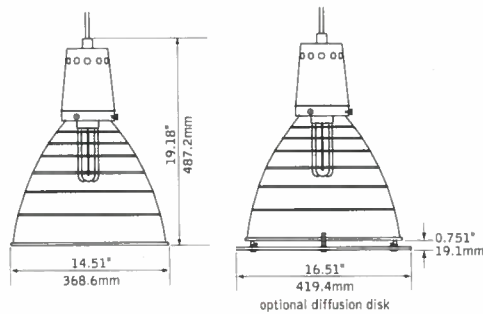


frosted white
diffusion disk

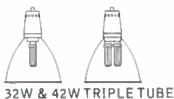


sconce conversion

DIMENSIONAL DATA



lamping options



32W & 42W TRIPLE TUBE



A, BR, G, R & PS LAMPS

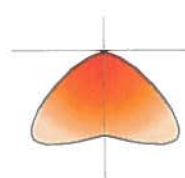
FEATURES

Pendant mount decorative luminaire available with compact fluorescent or incandescent lamps

Housing, reflector and canopy are spun with high quality aluminum.

Ideally suited for retail, hospitality, lobbies, corridors, open ceiling areas and other specialty applications.

PERFORMANCE



1-Lamp 42W Triple Tube
63 % Efficient
706 cd @ 35°

PRODUCT OVERVIEW

Lumen Output: 1546-4035lm
Wattage: 32-300W
Lamping: TT, A, G, BR, R, PS

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-E-1-42TT-S-120-C144-NA

Notes:

Type:

A73

SPEC14-5147

Features

Product

SPECIFICATIONS**Construction**

Housing, reflector and canopy are each one-piece precision-spun 14Ga. aluminum. Housing: 7.62"H x 5.25" Dia. Reflector: 12.35"H x 14.51" Dia. aperture with grooved cylindrical pattern. Canopy: 1.32"H x 4.52" Dia. stepped design with #8-32 recessed set screw. Weight: 10 lbs.

Optic

14Ga. anodized aluminum reflector with diffuse satin matte surface for lamp image reduction. Optional frosted green or white acrylic diffusion disk with polished edges are retained by aluminum fasteners and (3) #8-32 thumb screws.

Electrical

Luminaires are pre-wired for single circuit with thermally protected Class "P" electronic ballast. Factory installed decorative metal braided power cord is included. White SJT power cord supplied for 347V. 144" cord is provided on all luminaires and may be cut to length in field. Incandescent: Medium base porcelain socket. For lamp types A, BR, G, R, and PS types. Fluorescent Lamp: One or two lamp triple tube compact fluorescent, 4-pin, 32W (GX24q-4) or 42W (GX24q-4). Optional dimming ballasts available. Consult factory for specifications and availability.

Labels

UL listed

Finish

Luminaire housing, reflector and canopy are clear anodized with polished satin finish. Reflector interior has matte diffuse finish.

ORDERING**Luminaire Series**

Groove FGR

Profile E

Lamp Quantity

One Lamp 1

Two Lamp 2

(CFL only)

Lamp Type

32w. Triple Tube, GX24q-3 32TT

42w. Triple Tube, GX24q-4 42TT

120V Only, 60W Max., A15-Med A15

120V Only, 100W Max., A19-Med A19

120V Only, 100W Max., A21-Med A21

120V Only, 60W, G25-Med G25

120V Only, 60W, G30-Med G30

120V Only, 150W, G40-Med G40

120V Only, 65W, BR30-Med BR30

120V Only, 125W, BR40-Med BR40

120V Only, 50W, R20-Med R20

120V Only, 75W, R25-Med R25

120V Only, 110W, R30-Med R30

120V Only, 300W, R40-Med R40

120V Only, 300W, PS25-Med PS25

120V Only, 300W, PS30-Med PS30

(Consult factory for wattages not listed)

Ballast

Electronic Program Start<10% THD S

Electronic Dimming Ballast* D

(Fluorescent lamps only)

Voltage

120 Volt 120

277 Volt 277

347 Volt 347

Suspension

Cable, Straight Feed C144

(144" cable, cut in field)

Factory Options

Frosted Green Diffusion Disk GD

Frosted White Diffusion Disk WD

Include 3000K Lamp* L830

Include 3500K Lamp* L835

Include 4100K Lamp* L841

(Fluorescent lamps only)

Finish

Natural Anodized NA

(Contact factory for paint color options)

FGR

E

1

42TT

42 W

S

120

C144

NA

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-E-1-42TT-S-120-C144-NA

Notes:

Type:

A73

SPEC14-5147

Groove™ E

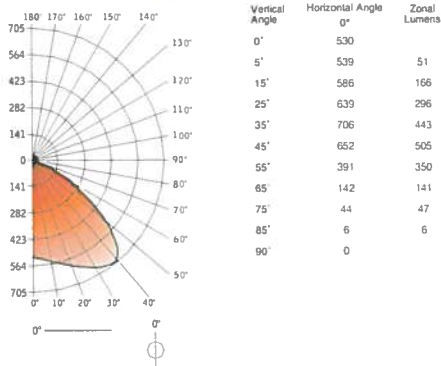
FLUORESCENT

FGR-E-1-42TT-S-120-CXX-NA

Filename FGR E142TT IE5
Test # 12421.0

Lumens 2006lm
Efficiency 63%

CANDELPWER DISTRIBUTION



LUMEN SUMMARY

| | Zone | Lumens | % Lamp | % Fixture |
|--------------------|--------|--------|--------|-----------|
| Total Luminaire | 0-30° | 513 | 16.0 | 25.6 |
| | 0-40° | 956 | 29.9 | 47.7 |
| | 0-60° | 1812 | 56.6 | 90.3 |
| | 0-90° | 2006 | 62.7 | 100.0 |
| | 0-180° | 2006 | 62.7 | 100.0 |

LUMINANCE DATA (CD/M²)

| Vertical Angle | 0° |
|----------------|------|
| 45° | 8744 |
| 55° | 6452 |
| 65° | 3182 |
| 75° | 1611 |
| 85° | 625 |

CO-EFFICIENTS OF UTILIZATION

| | Floor | Ceiling | Wall | RCR | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--|-------|---------|------|-----|----|----|----|----|----|----|----|----|---|---|----|
| | 70 | 50 | 30 | 10 | 75 | 50 | 30 | 10 | 60 | 40 | 20 | 10 | 5 | 2 | 1 |
| | 70 | 50 | 30 | 10 | 73 | 50 | 30 | 10 | 60 | 40 | 20 | 10 | 5 | 2 | 1 |
| | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 60 | 40 | 20 | 10 | 5 | 2 | 1 |
| | 70 | 50 | 30 | 10 | 67 | 47 | 27 | 13 | 55 | 35 | 18 | 9 | 4 | 2 | 1 |
| | 70 | 50 | 30 | 10 | 64 | 44 | 24 | 11 | 52 | 32 | 16 | 8 | 3 | 1 | 0 |
| | 70 | 50 | 30 | 10 | 61 | 41 | 21 | 9 | 49 | 29 | 14 | 7 | 2 | 1 | 0 |
| | 70 | 50 | 30 | 10 | 58 | 38 | 18 | 7 | 46 | 26 | 12 | 6 | 1 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 55 | 35 | 15 | 5 | 43 | 23 | 10 | 5 | 1 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 52 | 32 | 12 | 4 | 40 | 20 | 9 | 4 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 49 | 29 | 9 | 3 | 37 | 17 | 8 | 3 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 46 | 26 | 6 | 2 | 34 | 14 | 6 | 2 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 43 | 23 | 3 | 1 | 31 | 11 | 4 | 1 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 40 | 20 | 1 | 0 | 28 | 8 | 2 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 37 | 17 | 0 | 0 | 25 | 5 | 1 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 34 | 14 | 0 | 0 | 22 | 3 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 31 | 11 | 0 | 0 | 19 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 28 | 8 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 25 | 5 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 22 | 3 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 19 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 16 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 13 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 70 | 50 | 30 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Numbers indicate percentage value of reflectivity

Go to www.localpointlights.com for additional photometric data

note: Photometric testing performed in an independent lab with standard lamps and ballasts. Lamp and ballast type and configuration will affect photometric performance.

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-G-W-1-42TT-S-120-C144-NA

Notes:

Type:

A74

SPEC14-5147

Groove™ G
FLUORESCENT



white prismatic

clear prismatic with
metalized interior

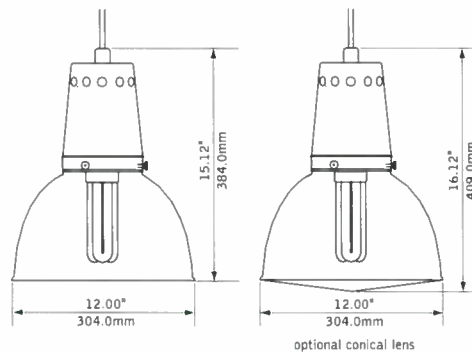
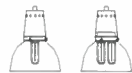
clear prismatic

frosted green
diffusion diskfrosted white
diffusion disk

conical lens



score companion

DIMENSIONAL DATA**lampping options**

32W & 42W TRIPLE TUBE



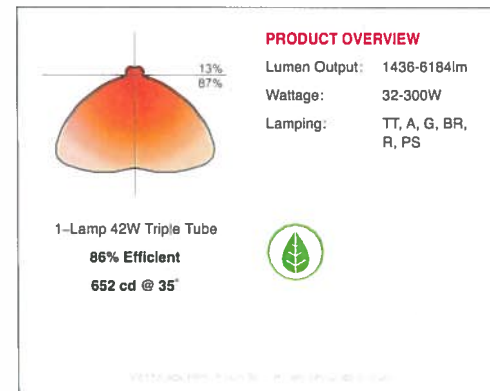
A, BR, G, R & PS LAMPS

FEATURES

Pendant mount decorative luminaire available with compact fluorescent or incandescent lamps

Housing and canopy are high quality spun aluminum with acrylic refractor.

Ideally suited for retail, hospitality, lobbies, corridors, open ceiling areas and other specialty applications.

PERFORMANCE

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-G-W-1-42TT-S-120-C144-NA

Notes:

Type:

A74

SPEC14-5147

SPECIFICATIONS

Construction

Housing and canopy are each one-piece precision-spun 14Ga. aluminum. Housing: 7.62"H x 12" Dia. Canopy: 1.32"H x 4.52" Dia. stepped design with #8-32 recessed set screw. Weight: 10 lbs.

Optic

Molded acrylic prismatic refractor: 7.47"H x 12.00"Dia. aperture with fluted pattern. Optional frosted green or white acrylic diffusion disk with polished edges is retained by aluminum fasteners and (3) #8-32 thumb screws. Optional conical lens with stainless steel clamp band.

Electrical

Luminaires are pre-wired for single circuit with thermally protected Class "P" electronic ballast. Factory installed decorative metal braided power cord is included. White SJT power cord supplied for 347V. 144" cord is provided on all luminaires and may be cut to length in field. Incandescent: Medium base porcelain socket. For lamp types A, BR, G, R, and PS types. Fluorescent Lamp: One or two lamp triple tube compact fluorescent, 4-pin, 32W (GX24q-3) or 42W (GX24q-4). Optional dimming ballasts available. Consult factory for specifications and availability.

Labels

UL listed.

Finish

Luminaire housing and canopy are clear anodized with polished satin finish.

ORDERING

Luminaire Series

Groove FGR

Profile G

Shielding

Clear Prismatic Refractor C

Clear Prismatic Refractor with Metallized Interior M

White Prismatic Refractor W

(Contact factory for additional reflector colors)

Lamp Quantity

One Lamp 1

Two Lamp 2

(CFL only)

Lamp Type

32w Triple Tube, GX24q-3 32TT

42w Triple Tube, GX24q-4 42TT

120V Only, 60W Max., A15-Med A15

120V Only, 100W Max., A19-Med A19

120V Only, 100W Max., A21-Med A21

120V Only, 200W, A23-Med A23

120V Only, 60W, G25-Med G25

120V Only, 60W, G30-Med G30

120V Only, 150W, G40-Med G40

120V Only, 65W, BR30-Med BR30

120V Only, 125W, BR40-Med BR40

120V Only, 50W, R20-Med R20

120V Only, 75W, R25-Med R25

120V Only, 110W, R30-Med R30

120V Only, 300W, R40-Med R40

120V Only, 300W, PS25-Med PS25

120V Only, 300W, PS30-Med PS30

(Consult factory for wattages not listed)

Ballast

Electronic Program Start<10% THD S

Electronic Dimming Ballast* D

(Fluorescent lamps only)

Voltage

120 Volt 120

277 Volt 277

347 Volt 347

Suspension

Cable, Straight Feed C144

(144" cable, cut in field)

Factory Options

Frosted Green Diffusion Disk GD

Frosted White Diffusion Disk WD

Conical Lens CL

(Conical lens not available with 2-lamp dimming)

(Fluorescent lamps only)

Include 3000K Lamp* L830

Include 3500K Lamp* L835

Include 4100K Lamp* L841

(fluorescent lamps only)

Finish

Natural Anodized NA

(contact factory for paint color options)

42 W

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
FGR-G-W-1-42TT-S-120-C144-NA

Notes:

Type:

A74

SPEC14-5147

Groove™ G

FLUORESCENT

FGR-G-W-1-42TT-S-120-C144-NA

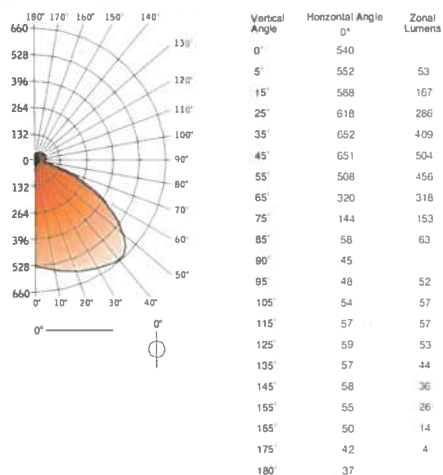
Filename FGRGW142 IES

Lumens 2751lm

Test # 12129 0

Efficiency 86%

CANDELPWER DISTRIBUTION



LUMEN SUMMARY

| Zone | Lumens | % Lamp | % Fixture |
|-----------------|--------|--------|-----------|
| 0-30° | 505 | 15.8 | 16.4 |
| 0-40° | 2408 | 75.2 | 87.5 |
| 90-130° | 219 | 6.6 | 7.9 |
| 90-180° | 343 | 10.7 | 12.5 |
| Total Luminaire | 2751 | 86.0 | 100.0 |

LUMINANCE DATA (CD/M²)

| Vertical Angle | 0° |
|----------------|------|
| 45° | 6742 |
| 55° | 5484 |
| 65° | 3729 |
| 75° | 1885 |
| 85° | 886 |


CO-EFFICIENTS OF UTILIZATION

| Floor | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 00 |
|---------|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| Ceiling | 100 | 100 | 100 | 100 | 96 | 96 | 96 | 90 | 90 | 83 | 83 | 78 | 75 |
| Wall | 91 | 87 | 84 | 80 | 88 | 84 | 78 | 79 | 74 | 74 | 70 | 69 | 63 |
| RCR | 0 | 83 | 76 | 71 | 66 | 80 | 74 | 64 | 69 | 61 | 55 | 55 | 53 |
| | 3 | 76 | 67 | 60 | 55 | 73 | 65 | 54 | 61 | 51 | 57 | 49 | 45 |
| | 4 | 69 | 59 | 52 | 46 | 66 | 57 | 45 | 54 | 43 | 51 | 42 | 38 |
| | 5 | 63 | 52 | 44 | 38 | 60 | 50 | 38 | 47 | 36 | 44 | 35 | 31 |
| | 6 | 57 | 46 | 38 | 33 | 55 | 44 | 32 | 42 | 31 | 39 | 30 | 27 |
| | 7 | 52 | 41 | 33 | 28 | 50 | 39 | 27 | 37 | 26 | 35 | 25 | 23 |
| | 8 | 48 | 36 | 29 | 24 | 46 | 35 | 23 | 33 | 22 | 31 | 21 | 19 |
| | 9 | 44 | 32 | 25 | 20 | 42 | 31 | 20 | 29 | 19 | 28 | 18 | 16 |
| | 10 | 41 | 29 | 22 | 17 | 39 | 28 | 17 | 26 | 16 | 25 | 16 | 14 |

Numbers indicate percentage values of reflectivity

Go to www.focalpointlights.com for additional photometric data

note: Photometric testing performed in an independent lab with standard lamps and ballasts. Lamp and ballast type and configuration will affect photometric performance.

| | | | |
|--|--|--|---|
|  | Project 14-16183-14 Date 10/29/2014 Contractor: Vaughn Industries OSO NRD Building Submitted By LIGHTING UNLIMITED INC | Catalog Number L5257 Job Name: OSO NRD Building F Notes | Type <div style="border: 2px solid red; padding: 10px; font-size: 2em; font-weight: bold;">A75</div> |
| | | | |

LIMBURG Collection

Pendant luminaires for fluorescent lamps

Material: Housing and canopy constructed of aluminum with a painted silver RAL 9006 finish and black cable.

Glass: Crystal glass with light-diffusing texture, satin matte finish, and screw neck.

Reflector: Anodized specular reflector of pure aluminum.

Electrical: One (1) 26W triple 4-pin GX24q-3 base compact fluorescent lamp (by others). GX24q-3 4-pin socket and electronic ballast, 120V or 277V – specify.

Installation: Mounts directly to standard 4" octagonal wiring box.

U.L. listed, suitable for damp locations.

Please note: Rod suspension ϕ .31".



| lamp | lumen | A | B | L |
|---------------------------|-------|----|-----|----|
| L5257 1 26 W CF triple-4p | 1800 | 7¼ | 12½ | 79 |

BEGA/US

1000 BEGA Way, Carpinteria, CA 93013 (805)684-0533 FAX (805)566-9474

© copyright BEGA/US 2006
Revised 4/06

Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

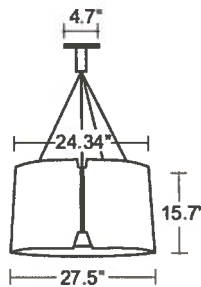
TANGO

○ lighting

MANHATTAN PENDANT BIG

OSU NRDT

Type: A76



Manhattan
Big
(Pendant)

PAGE 21

92 W

4 x 23W Max
E26
medium base
low energy

Blue/White,
Beige/White, or
White/White

2901 SW 3RD AVE. UNIT 4, FT LAUDERDALE, FL 33315 P. (954)767-0100 F.(954)767-0103
Email: info@tangolighting.com

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
112252MC9MWHMP

Notes:

Type:

A77

LSC14-37947



Job Name:

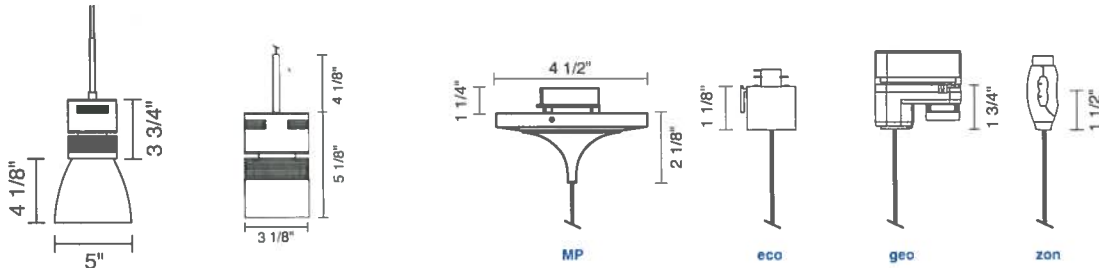
Contact:

Ordering Code:

Fixture Type:

Z15 LED Pendant Cylinder

BRUCK
LEDRA brands



Applications

The Z15 Pendant Cylinder with Chroma technology provides energy efficient light using a cold remote phosphor module by XICATO® with an industry best SDCM of 1 x 2 Macadam ellipses. The housing is machined aluminum and seconds as its heat sink and driver housing. It is offered in matte chrome, white and black with either snoot aperture or white or blue frosted glass shade optic. The Z15 Pendant Cylinder is fully dimmable and offered in 4 color temperatures. The 3" Z15 Pendant Cylinder carries a 5 year NO COLOR SHIFT AND FIXTURE WARRANTY.

LED Performance

LED: Patented Cold Remote Phosphor, XICATO®
SDCM: 1 x 2 MacAdam Ellipse, +/- 50 Kelvin
CCT: 2700k, 3000k, 3500k, or 4000k
CRI: >80 - typically 82, >95 - typically 97
LIFE: 85% at 50k hrs based on LM-80 testing
5 year "no color shift" warranty

| | lumens | +82 CRI | +97 CRI |
|---------|--------|---------|---------|
| 700lm | | | 15W |
| 1000 lm | | 15W | |

Housing

Machined aluminum housing with white, matte chrome, or black finish. Optional cast glass shade.

Mounting

Pendant provided with a cable length of 60". Canopy over a 3" - 4" recessed round junction box. Optional Track mounting: Global Trac Systems, GEO track and ECO track, Halo® Power Trac track, and Zonyx track.

Reflector

Reflectors are provided with computer designed, lamp specific, post Alzak anodized reflectors of pure aluminum (99.98%). Available in Specular aluminum (SA) to provide glare and iridescence free performance.

LiteOptics / Accessories

Optical attachments allow for tool-less access to LED components and reflector. Ease of maintenance with field interchangeable optics when performance variations and lighting requirements of the space change. Optional dust protective lens provided on snoot aperture.

Electrical / LED Driver

120Vac input, 50/60Hz, 15W, 16VA. Electronic 120V driver. Trailing Edge (ELV) dimming. *Consult factory for other voltage options.

Listings

ETLus Listed to UL1598 (suitable for dry and damp locations),
UL1574 (track suitable for dry locations only)
cETL Listed to CSA C22.2 #250.0 and #9.0
Made in the USA - meets the requirements of the Buy American provision within the ARRA.

Ordering Codes

Follow the steps to specify your luminaire.

example: 112 - 250 - mc - 2a - m - zonmc

| 1 Light Source | 2 Shade | 3 Finish | 4 Color Temperature | 5 Reflector / Glass* | 6 Mounting Option |
|----------------|-----------------------|---|---|--|--|
| 112 LED | 250 252 with glass | bk black mc matte chrome wh white | 2 >80 CRI, 2700k, 1000lm 2a >95 CRI, 2700k, 700lm 3 >80 CRI, 3000k, 1000lm 3a >95 CRI, 3000k, 700lm 3V >80 CRI, 3000k Vibrant, 1000lm 9 >80 CRI, 3500k, 1000lm 9a >95 CRI, 3500k, 700lm 4 >80 CRI, 4000k, 1000lm 4a >95 CRI, 4000k, 700lm | fl flood, 60° m medium, 40° s spot, 20° bl blue wh white | MP 4" Kiss Canopy ecobk ECO/Halo black ecosv ECO/Halo matte silver ecowh ECO/Halo white geobk GEO black geosv GEO matte silver geowh GEO white zonmc Zonyx matte chrome |

NOTES:

*specify reflector degree for 250 only

*specify glass color for 252 glass only

Contractor: Vaughn Industries

Job Name: OSU NBDT Building F

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
112252MC9MWHMP

Notes:

Type:

A77

LSC14-37947



Job Name:

Contact:

Ordering Code:

Fixture Type:



250 no shade, standard



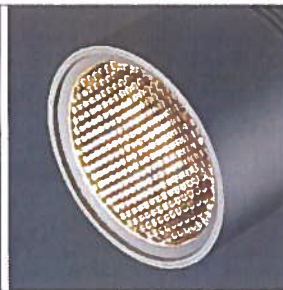
252-bl blue glass shade



252-wh white glass shade



Snoot



Louver



Barn Doors



Lens Options

| Accessory Code | |
|-----------------|--------------|
| 900300bk | black |
| 900300mc | matte chrome |
| 900300wh | white |

| Accessory Code* | |
|-----------------|-------|
| 900310 | black |

| Accessory Code** | |
|------------------|-------|
| 900305bk | black |

| Accessory Code* | |
|-----------------|---------------|
| 900321 | diffuser lens |
| 900322 | frosted lens |
| 900320 | linear lens |

NOTES:

*Accessories available for **250** Snoot aperture only.

Requires **900300 Snoot Accessory.

Contractor: Vaughn Industries

Job Name: OSU NRDOT Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

112252MC9MWHMP

Notes:

Type:**A77**

LSC14-37947

LED DriverLP1020-xx Series
Switch-Mode LED Driver

| | |
|-------------------|---------------|
| Total Power | 20 Watts |
| Input Voltages | 100 ~ 277 VAC |
| Number of Outputs | One |

Product Specifications

ANZ#: Z095k, September 7, 2011

SPECIAL FEATURES

- UL1310, Class 2 and UL879 recognized
- Single output, constant current or constant voltage design
- IP66 compliant
- Suitable for dry and damp locations
- Designed for outdoor or indoor applications
- Suitable in standard electrical junction boxes
- ELV (trailing-edge) dimmable - Optional
- Active PFC reduces power consumption

ENVIRONMENTAL

Operating temperature: -30 to 50 °C
(De-rating : 2% per °C from 50~70°C)

Storage temperature: -40 to +85° C

Humidity (Non-Condensing): 5% to 95%

Cooling: Convection

Vibration Frequency: 5 to 50 Hz

MTBF: >100,000 Hours at full load and 25°C ambient conditions (MIL-217F)

EMC: Compliant to 47CFR, Part 2, Part 15 and Cisp PUB, 22 Class B

Acoustic Noise: Less than 24db (20~20K Hz)

ELECTRICAL SPECIFICATIONS

Input range 100 ~ 304 VAC

Frequency 47 to 63 Hz

PF and THD > 0.92 at full load, 115VAC; <20% full load, 230VAC

Crest Factor 1.5 max.

Inrush current 10.0 Amps maximum at 230VAC, cold start, 25° C

Input current 0.3 Amps maximum at 115VAC

Efficiency 85% typical at maximum load

EMI filtering 47CFR, Part 2, Part 15 and Cisp PUB, 22 Class B

Maximum power 20W

Current Accuracy ±1% (when applicable)

Load regulation ±3%

Leakage Current 300uA typ.

Hold up time Half cycle minimum at 120 VAC and 80% of rated load

Protection Over-voltage, Over current and Short circuit protection: Auto-recovery

SAFETY

UL UL1310, Class 2 and UL879 recognized

cUL UL1310, Class 2 and UL879 recognized

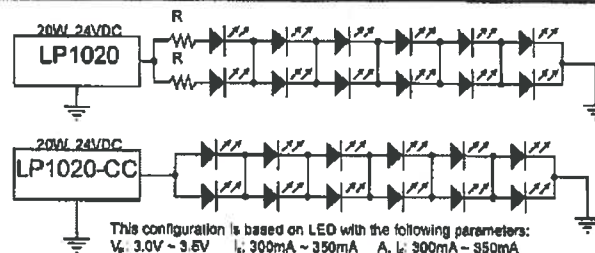
CE

Note: 52VDC output is not cUL recognized

| Model Number | Constant Voltage Mode | | | Model Number | Constant Current Mode | | |
|--------------|-----------------------|---------------|-------|-----------------|-----------------------|-----------|-------|
| | V (DC) | Output A (mA) | Watts | | V (DC) | mA(Max.) | Watts |
| LP1020-36 | 36, ±5% | 550 | 20 | LP1020-36-CCxxx | 18~36 | 550, ±5% | 20 |
| LP1020-22 | 22, ±5% | 910 | 20 | LP1020-22-CCxxx | 12~22 | 910, ±5% | 20 |
| LP1020-17 | 17, ±5% | 1250 | 21 | LP1020-17-CCxxx | 9~17 | 1250, ±5% | 20 |
| LP1020-13 | 13, ±5% | 1540 | 20 | LP1020-13-CCxxx | 7~13 | 1540, ±5% | 20 |
| LP1020-10 | 10, ±5% | 2000 | 20 | LP1020-10-CCxxx | 7~10 | 2000, ±5% | 20 |

Note: The Constant Voltage models are not compatible with ELV dimmer

Note: The output current of Constant Current models are adjustable at factory from 50% ~ 100%.

RECOMMEND APPLICATION SCHEMATICS

MAGTECH INDUSTRIES CORP. 5625-A S. Arville, Las Vegas, NV 89118 Tel: 702-364-9998 Fax: 702-364-1562 www.magtechind.com Anz095k

Contractor: Vaughn Industries

Job Name: OSU NBDT Building F

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

112252MC9MWHMP

Notes:

Type:**A77**

LSC14-37947

MECHANICAL DRAWING**Model Information – Single DC output****LP1020-XX – Constant Voltage Model**

XX – Available Output Voltage, refer to chart above

LP1020-XXC (YYY) – Constant Current Model

C – Stands for Constant Current Model

XX – Available Output Voltage

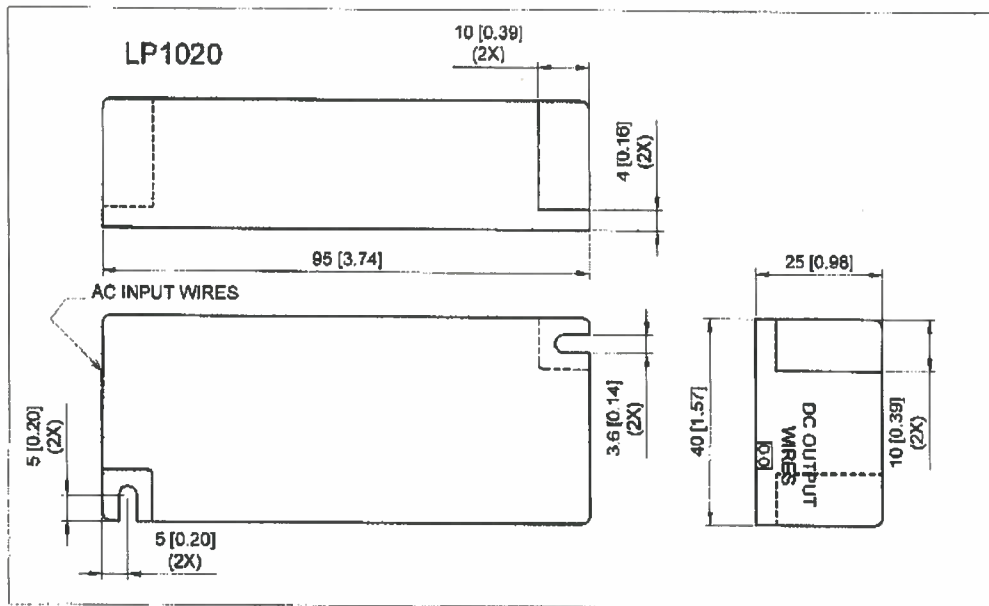
YYY – Available Constant Current Settings, 350mA or 700mA or 1050mA

AC input cable


AWG #20, two conductors UL PLTC type or equiv.

DC output cable

AWG #20, two conductors UL PLTC type or equiv.



MAGTECH INDUSTRIES CORP. 5625-A S. Arville, Las Vegas, NV 89118 Tel: 702-364-9998 Fax: 702-364-1562 www.magtechind.com Arz095k

| | | | |
|--|---|--|--------------------------|
|  | Project 14-16183-14 Date 10/29/2014 Contractor: Vaughn Industries OSO NRDT BUILDING | Job Name: OSO NRDT Building F Catalog Number: 10966 | Type <h1>A78</h1> |
| | Submitted By LIGHTING UNLIMITED INC | Notes | |

Hampstead Lighting

Product Specifications

Lamp:
2x26W 120V Fluorescent

Dimensions:
D:16" H:8" Max H:47"

Diffuser:
Blown Glass

Finish:
Grey

Color:
White

Labels:
cUL

Warranty:
Hampstead Lighting extends a warranty on the metal portion of all lighting fixtures it sells, including the plating, for a period of one calendar year from the original date of sale. This also applies to the transformer or ballast, if any, provided that was installed by a licensed electrician.

Please contact Hampstead Lighting for additional warranty information. Custom options are available for this fixture.
For more information email
inforequest@hampsteadlighting.com.

Aliki Large White Suspension
Stock Number: 10966



Additional Comments/Custom Options:

**HAMPSTEAD
LIGHTING**

2500 Royal Place * Tucker * GA 30312 * Phone: 770.447.1700 * Fax: 770.447.1702 * www.hampsteadlighting.com

www.hampsteadlighting.com

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Hampstead Lighting attempts to display the colors of the products shown on this Website as accurately as possible. However, we cannot guarantee that the color you see matches the product color, as the display of color depends, in part, upon the type of computer monitor used by you.
Hampstead Lighting is a Trade Only Company

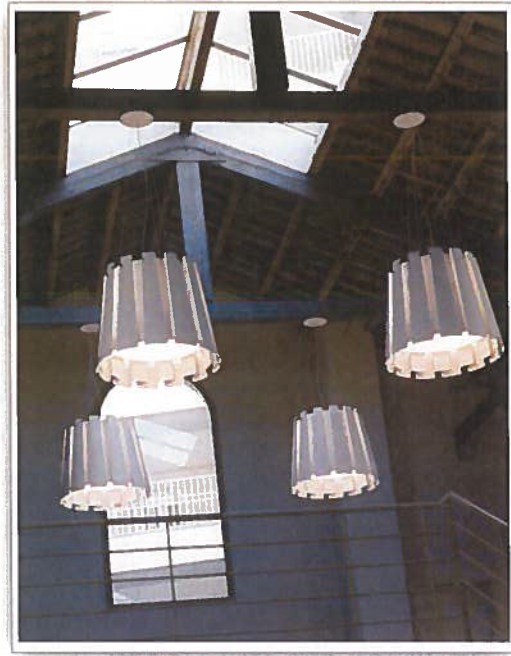
Contractor: Vaughn Industries

TANGO

lighting

TWIST PENDANT

OSU NRD T
Type: A79

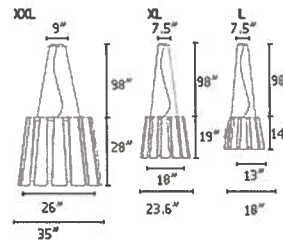


Specifications

Finish

Shiny laquer: white,
black, grey or gold

Dimensions



Lamps

XXL - 4x 200W max, A23 Medium
Base incandescent

XL - 3x 200W max A23 Medium
Base incandescent

L - 2x 150W max E26 Medium Base
incandescent

600 W

2901 SW 3RD AVE. UNIT 4, FT LAUDERDALE, FL 33315 P. (954)767-0100 F. (954)767-0103
Email: info@tangolighting.com

Contractor: Vaughn Industries

PANEL LUMINAIRE

LM22 - 2 X 2 LIGHT PANEL SERIES

FEATURES

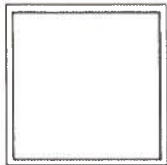
CONSTRUCTION

- Side lit design for an ultra thin profile
- IC rated, IP44-suitable for damp or dry locations
- Wide beam angle (120°) for better spacing
- CE and cULus rated
- RoHS compliant
- 5 year warranty (standard)

ELECTRICAL

- Dimmable (via driver or using PWM)⁽⁵⁾
- Constant voltage design allows for multiple lights per driver
- LM-80 and LM-79 available
- Panels should be placed within 50 feet of driver
- Rated at 60W max AC power (51W DC)⁽⁶⁾

2X2



| | |
|------------------|--------------|
| Project Name | OSU - NRDT |
| Date | |
| Type | B1 |
| T/LT | |
| TILT Part Number | L GM 22 35 W |
| TILT Driver | LD60 |

| LUMEN PACKAGES (2X2) ⁽¹⁾ | | | | | |
|-------------------------------------|--------------------------|------|------|------|------|
| CCT | 50,000 hours (L70) | | | | |
| | STANDARD 90+ CRI, R9 >50 | | | | |
| | | | | | |
| 5000k | Lumens | 4700 | 4157 | 3736 | 2775 |
| | LPW | 74.1 | 79.2 | 82 | 87.5 |
| 4000k | Lumens | 4550 | 4298 | 3837 | 2847 |
| | LPW | 77.3 | 78.4 | 80.4 | 87.7 |
| 3500k | Lumens | 4225 | 3829 | 3426 | 2542 |
| | LPW | 72.5 | 75.2 | 77.4 | 84.8 |
| 3000k | Lumens | 3900 | 3360 | 3016 | 2237 |
| | LPW | 67.6 | 71.5 | 73.9 | 81.4 |

ORDERING INFORMATION

| L | GM | 22 | 50 | W |
|--------------|-----------------|--------------|--|---|
| Fixture Type | Mounting Type | Size | CCT | Frame Color ⁽⁴⁾ |
| L - Light | GM - Grid Mount | 22 - 2' x 2' | 50 - 5,000K 40 - 4,000K 35 - 3,500K 30 - 3,000K | W - White B - Black S - Silver + - special order |

USE WITH

| Driver | |
|--------|----------|
| LD60 | LD60PE7 |
| LD60P | LD90PE7 |
| LD90 | LD100PE7 |
| LD100P | |

DRIVER SPECIFICATION

NOTE on DRIVERS: UL 8750, short circuit, over current, over voltage, and over temperature protection
UL recognized and CE rated, RoHS compliant
Class II, SELV, IP67

| Model ⁽⁵⁾ | Size in Inches (LxWxH) | AC Input | DC Output | Dimming ⁽⁹⁾ | Temp | Max Fixtures ⁽⁸⁾ |
|----------------------|------------------------|-----------|-----------|------------------------|------------|-----------------------------|
| LD60 | 6.50 x 1.63 x 1.26 | 90 - 305V | 60W | I-10V | -40C - 60C | 1 |
| LD60P | 12.50 x 2.38 x 1.50 | 90 - 305V | 60W | I-10V | -40C - 70C | 1 |
| LD90 | 6.34 x 2.40 x 1.26 | 90 - 305V | 90W | I-10V | -40C - 60C | 1 |
| LD100P | 14.50 x 2.63 x 1.58 | 90 - 305V | 100W | I-10V | -40C - 60C | 2 |

| Emergency ⁽⁷⁾ | Size in Inches (LxWxH) | AC Input | Output ⁽⁶⁾ | Lumens | Temp | Max Fixtures ⁽⁸⁾ |
|--------------------------|------------------------|-----------|-----------------------|-----------|----------|-----------------------------|
| LD60PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 1 |
| LD90PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 1 |
| LD100PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 2 |

NOTES (NUMBERS)

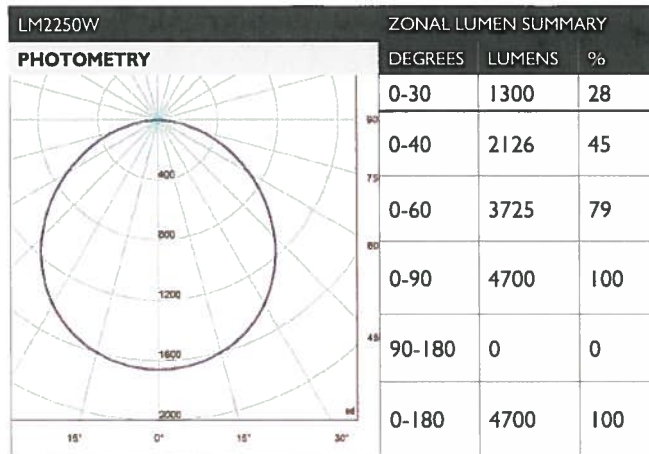
- (1) See driver or dimming product sheet for specific details
- (2) AC W used for circuit power, DC W used for driver circuit
- (3) Lumen packages provided using Dim Chip with driver
- (4) Colors other than white are custom
- (5) "P" designation after watt rating denotes Plenum Rated
- (6) Based on watt load of fixtures and driver output
- (7) See Product Sheet for Emergency Drivers
- (8) Safe amount of fixtures per driver
- (9) TILT drivers use a I-10V control but are compatible with most 0-10V control systems. For details specific to your system, contact us at 855.440.8458



Contractor: Vaughn Industries

TILT PANEL LUMINAIRE LM22

PHOTOMETRIC CHARTS WITH TESTING DATA. CALL FOR SPECIFIC INFORMATION NOT LISTED HERE: 855.440.8458



LUMINANCE SUMMARY CD./SQ.M.

| ANGLE | MEAN CD./SQ.M. |
|-------|----------------|
| 45 | 4997 |
| 55 | 4708 |
| 65 | 4309 |
| 75 | 3742 |
| 85 | 2819 |

| | COEFFICIENT OF UTILIZATION | | | | | | | | |
|----|----------------------------|------|------|------|------|------|------|------|------|
| | 80% | | | 70% | | | 50% | | |
| | 70 | 50 | 30 | 70 | 50 | 30 | 70 | 50 | 30 |
| 0 | 1.19 | 1.19 | 1.19 | 1.16 | 1.16 | 1.16 | 1.11 | 1.11 | 1.11 |
| 1 | 1.09 | 1.05 | 1.01 | 1.07 | 1.03 | 0.99 | 0.98 | 0.95 | 0.92 |
| 2 | 1.00 | 0.92 | 0.86 | 0.98 | 0.90 | 0.85 | 0.87 | 0.82 | 0.78 |
| 3 | 0.91 | 0.81 | 0.74 | 0.89 | 0.80 | 0.73 | 0.77 | 0.71 | 0.66 |
| 4 | 0.84 | 0.73 | 0.65 | 0.82 | 0.72 | 0.64 | 0.69 | 0.62 | 0.57 |
| 5 | 0.78 | 0.65 | 0.56 | 0.75 | 0.64 | 0.56 | 0.62 | 0.55 | 0.49 |
| 6 | 0.71 | 0.58 | 0.50 | 0.69 | 0.57 | 0.49 | 0.56 | 0.48 | 0.43 |
| 7 | 0.66 | 0.52 | 0.44 | 0.64 | 0.51 | 0.43 | 0.50 | 0.42 | 0.37 |
| 8 | 0.61 | 0.47 | 0.39 | 0.59 | 0.47 | 0.39 | 0.45 | 0.38 | 0.33 |
| 9 | 0.56 | 0.43 | 0.35 | 0.55 | 0.42 | 0.35 | 0.41 | 0.34 | 0.29 |
| 10 | 0.52 | 0.39 | 0.31 | 0.51 | 0.39 | 0.31 | 0.38 | 0.31 | 0.26 |

NOTES

- Lifespan: 50,000 hrs (L70)
- LM79 and LM80 available upon request. Call 855.440.8458
- IES files available online at: laurenillumination.com/resources



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2162 Reiser Avenue SE | New Philadelphia, OH 44663 P: 855.440.8458 | F: 330.339.1515
laurenillumination.com | laureninternational.com

TDS - LM22

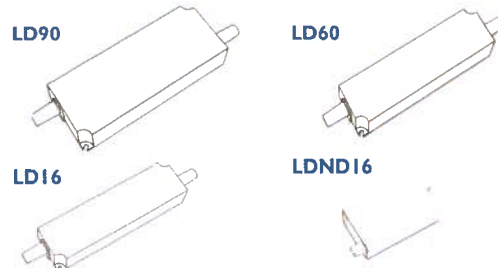
Date Submitted: Sept, 2, 2015

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Distributor: C.E.D. Columbus, Oh 43207

CONSTANT VOLTAGE DRIVERS

FEATURES

- 24V constant voltage power supply
- Protections include
 - Short circuit / over current / over voltage / over temperature
- Class II power unit - SELV rated
- Built in active PFC function
- Dimmable (see chart below)
- UL recognized
- RoHS compliant
- CE rated
- 5-year warranty



| | |
|--------------|-------------------|
| Project Name | OSU - NRDT |
| Date | |
| Type | B1 |



| | |
|------------------|-------------|
| TILT Part Number | LD60 |
|------------------|-------------|

Constant Voltage Driver Models:

| |
|------------------|
| LD90 |
| LD60 |
| LD16 |
| LDND16 (Non Dim) |

SPECIFICATIONS

| ALL PLENUM MODELS | LD60 | LD90 | LD16 | LDND16 (Non Dim) |
|---------------------------------------|--|-----------------|----------------|------------------|
| Length x Width (in) | 6.500" x 1.750" | 6.500" x 2.375" | 6.00" x 1.625" | 3.00" x 1.50" |
| Height (in) | 1.250" | 1.500" | 1.250" | 1.125" |
| IP Rating | IP67 | IP67 | IP30 | IP30 |
| DC output supply (W) | 60 | 90 | 16 | 16 |
| AC input voltage range | 90 - 305VAC | 90-305VAC | 90-305VAC | 90 - 264VAC |
| AC inrush current (max) Cold start | 75A @ 230VAC | 70A @ 230VAC | 50A @ 230VAC | 70A @ 230VAC |
| Safety standards | UL 8750 | UL 8750 | UL 8750 | UL 8750 |
| Protections | Short circuit/over current/over voltage/over temperature | | | |
| Thermal Operation | -40°C - 50°C | -40°C - 50°C | -40°C - 50°C | -40°C - 50°C |
| Thermal Shutdown | 75°C | 70°C | 70°C | 70°C |

FOR USE WITH

| LUMINAIRE | CV DRIVER | MAX # UNITS | CV DRIVER | MAX # UNITS | CV DRIVER | MAX # UNITS |
|-----------|--------------|-------------|-----------|-------------|-----------|-------------|
| LCLCV6 | LD16, LDND16 | 1 | LD60 | 5 | LD90 | 8 |
| LCLCV8 | LD16, LDND16 | 1 | LD60 | 4 | LD90 | 6 |
| LGM22 | LD16, LDND16 | 0 | LD60 | 1 | LD90 | 1 |
| LGM24 | LD16, LDND16 | 0 | LD60 | 0 | LD90 | 1 |
| LGM14 | LD16, LDND16 | 0 | LD60 | 1 | LD90 | 1 |

DIMMER COMPATIBILITY CHART

| BRAND | MODEL |
|-----------------|-----------------------------|
| TILT | WLVD |
| TILT | DIM CHIP (DC01, DC02, DC03) |
| LEVITON (0-10V) | IP-710* |
| LUTRON (0-10V) | DVSTV* |

*TILT drivers use a 1-10V control but are compatible with most 0-10V control systems.
For details specific to your system, contact us at 855.440.8458



Contractor: Vaughn Industries

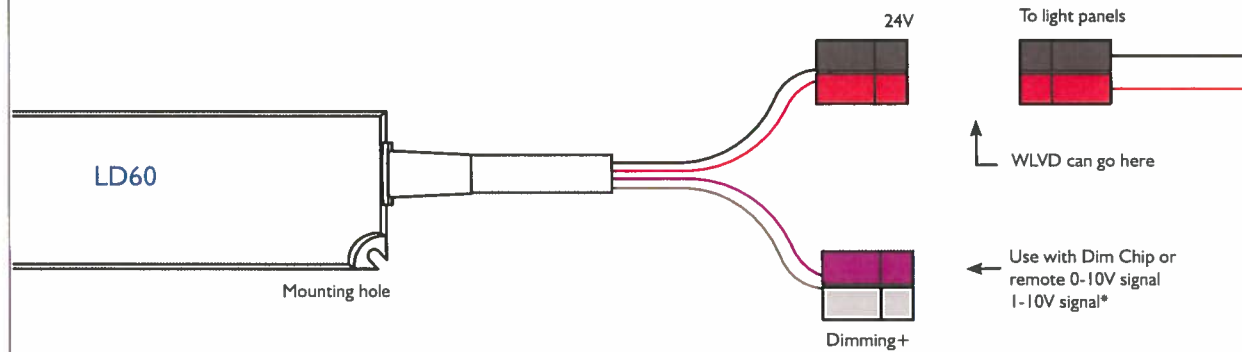
Job Name: OSU NRD T Building F

CONSTANT VOLTAGE DRIVERS LD90, LD60, LD16, LDND16

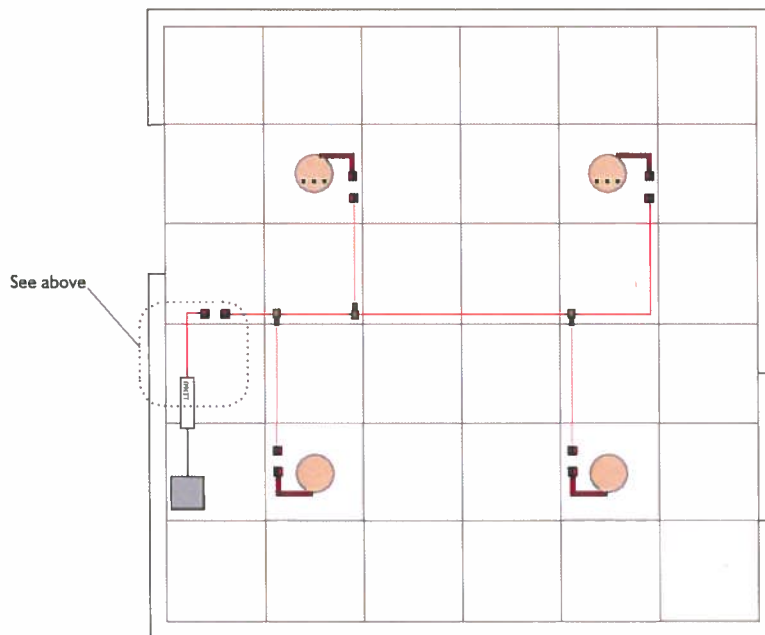
CONNECTING CONSTANT VOLTAGE DRIVERS - DC WIRING

CLOSE-UP DC WIRING DETAIL

SEE INSTALLATION MANUAL FOR APPROVED INSTALLATION METHODS AND OTHER DETAILS FOR ALL DRIVERS



SAMPLE ROOM LAYOUT WITH DRIVERS INSTALLED



NOTES

- Lights should be placed within 50 feet of driver
- Wattage load (lights) should not exceed wattage of driver
- + TILT drivers use 1-10V. They will accept 0-10V signals. Operation from 0-1V will depend on the system being used. For details specific to your system, call us at 855.440.8458



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of Lauren Illumination



Lauren Illumination is a Lauren International Company
2162 Reiser Avenue SE | New Philadelphia, OH 44663
P: 855.440.8458 | F: 330.339.1515
laurenillumination.com | laureninternational.com

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**STE14-232G-MPO-EPUQHESPN-
FO835SYL

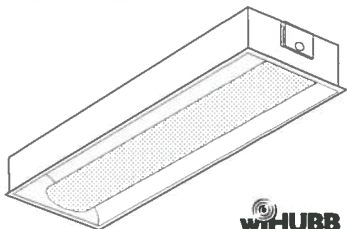
Notes:

Type:**B2**

LSC14-37947

Columbia
LIGHTING**STE14**

1' x 4' Stratus® Recessed Indirect / 1, 2, or 3-Lamp T5, T5HO, T8

**PROJECT INFORMATION**

Project Name _____

Type _____

Catalog No. _____

Date _____

CONSTRUCTION

Luminaire housing and end caps are die formed code gauge cold rolled steel. The sturdy reflector is stiffened with linear forms, profiled to a precision curve. Perforated basket with high transmission overlay for improved optical efficiency plus lamp obscuration. Basket and all reflective surfaces are finished after fabrication with unique formula high reflectivity matte white paint for soft, uniform indirect illumination.

Thermoplastic light traps snap into the housing at both ends of the basket to prevent light leaks. Basket hinges down for easy access to center wireway.

INSTALLATION

An access plate is furnished with each luminaire for fast wiring access from the plenum. No need to open fixture.

BALLASTS

Energy efficient, thermally protected, automatic resetting, Class P, high power factor, sound rated A, magnetic or electronic ballasts. CEE NEMA Premium compliant.

ELECTRICAL

Standard class "P", thermally protected, autoresetting HPF ballast, sound rated A, CEE NEMA Premium compliant. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

CEILING COMPATIBILITY

NEC-compliant T-Bar clips supplied with all grid trim fixtures. See ceiling details on reverse. For type SG ceilings order G trim. Fixture will be regressed 3/8" from the face of the ceiling tee. For hard ceilings order G trim and FK flange accessory. Assemble then support FK accessory at the ceiling plane using tie wires (by others). Contact your Columbia representative for compatibility information for specific ceiling types or for continuous row applications in hard ceilings.

CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

- Precision optical design produces high efficiency in a high visual comfort architecturally styled direct/indirect distribution
- Custom perforated metal basket with high transmission lamp-obscuring overlay
- Optimized coating process and unique paint formulation provide exceptional reflectivity in a matte finish for a soft visual image and balanced basket and reflector illumination
- Completely recessed, provides a clean ceiling with uniform illumination at mounting heights as low as 8 feet
- Available for use with T8, T5 or T5HO linear fluorescent lamps
- Optional acrylic dust guard pivots to seal lamp compartment against contaminants especially for schools, medical facilities and public spaces
- Companion Louvered (STEL), side basket (STS) and pendant (STP) models available
- Available with exclusive wiHUBB technology preinstalled
 - Peer to peer, self-healing wireless mesh network
 - Integrated control system for 0-10VDC or step dimming, or On/Off

ORDERING INFORMATION**EXAMPLE STE14-232G-MPO-EU**

| STE | 14 | | | MPO | | |
|---|--|--|--------------------------|-------------------------|---|--|
| MODEL | NO. OF LAMPS IN CROSS SECTION | CEILING TYPE | CEILING DIM. | VOLTAGE | OPTIONS | |
| STE Stratus® E-Series Recessed Indirect | 1 One 2 Two 3 Three | G Grid Lay-in SM Surface Mount | MPO Metal Perf w/Overlay | U 120V-277V 347 347V | GLR Fast Blow Fuse GMF Slow Blow Fuse EL Emergency Battery Pack ELS Emergency Battery Pack, T5 DG Dust Guard Clear Acrylic NYC NYC Compliant NYCU NYC Compliant, Union Label WIH wiHUBB Enabled ¹ | |
| SIZE | LAMP TYPE | BALLAST | | | | |
| 14 1' x 4' | 28 4' T5 28 Watt 32 4' T8 32, 30, 28 or 25 Watt 34 4' T5HO 34 or 31 Watt | E Electronic T8, Instant Start ED Electronic Dimming, T8 and T5 EP Electronic T5, T5HO or T8, Programmed Start | | | | |

EPUQHESPN - Sylvania Programmed Start Ballast

FO835SYL- Sylvania Lamps Installed

**ACCESSORIES
(ORDER SEPARATELY)**

FK14 1' x 4' Single Flange Kit

¹ Not available with Surface Mount Ceiling Types

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RECESSED ARCHITECTURAL / STE14

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Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**STE14-232G-MPO-EPUQHEPSN-
FO835SYL

Notes: 2-F32T8/835 LAMPS INCLUDED

Type:**B2**

LSC14-37947

Columbia
LIGHTING**STE14**

1' x 4' Stratus® Recessed Indirect / 1, 2, or 3-Lamp T5, T5HO, T8

PHOTOMETRIC DATA

Test 3849 Test Date 2/4/11

LUMINAIRE DATA

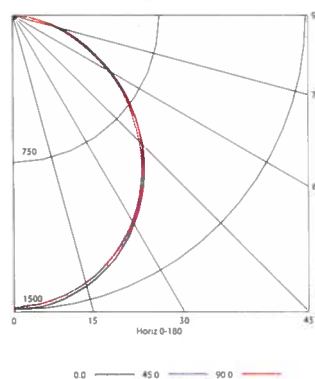
| | |
|--------------------------|--|
| Luminaire | STE14-232G-MPO-EU |
| | STE Stratus® E-Series, Recessed Architectural |
| | 1 x 4 2-lamp with perforated metal basket and opal overlay |
| Ballast | B232IUNVHP-B |
| Ballast Factor | 0.88 |
| Lamp | F28T8 |
| Lumens per Lamp | 2725 |
| Watts | 47 |
| Shielding Angle | 0° = 90 90° = 90 |
| Spacing Criterion | 0° = 1.23 90° = 1.21 |
| Luminous Opening in Feet | Length: 4.00 |
| | Width: 0.92 |
| | Height: 0.00 |

ZONAL LUMEN SUMMARY

| Zone | Lumens | % Lamp | % Fixt. |
|-------|--------|--------|---------|
| 0-30 | 1137 | 20.9 | 29.1 |
| 0-40 | 1842 | 33.8 | 47.2 |
| 0-60 | 3164 | 58.1 | 81.1 |
| 0-90 | 3903 | 71.6 | 100.0 |
| 0-180 | 3903 | 71.6 | 100.0 |

ENERGY DATA

| | |
|---|--|
| Total Luminaire Efficiency | 71.6% |
| Luminaire Efficacy Rating (LER) | 73 |
| IESNA RP-1-1993 Compliance | Noncompliant |
| Comparative Yearly Lighting Energy Cost per 1000 Lumens | \$3.29 based on 3000 hrs. and \$0.08 per KWH |

INDOOR CANDELA PLOT**AVG. LUMINANCE (Candela/Sq. M.)**

| Average Luminance Angle | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 |
|-------------------------|------|------|------|------|------|
| 0 | 4361 | 4361 | 4361 | 4361 | 4361 |
| 30 | 4151 | 4114 | 4087 | 4104 | 4107 |
| 40 | 3979 | 3914 | 3902 | 3898 | 3914 |
| 45 | 3872 | 3789 | 3773 | 3814 | 3843 |
| 50 | 3731 | 3640 | 3613 | 3704 | 3709 |
| 55 | 3585 | 3473 | 3488 | 3514 | 3493 |
| 60 | 3387 | 3264 | 3305 | 3270 | 3253 |
| 65 | 3177 | 2997 | 3066 | 3018 | 2983 |
| 70 | 2968 | 2771 | 2797 | 2720 | 2685 |
| 75 | 2712 | 2486 | 2475 | 2418 | 2396 |
| 80 | 2274 | 2173 | 2173 | 2139 | 2139 |
| 85 | 1510 | 1913 | 2114 | 2114 | 2114 |

COEFFICIENTS OF UTILIZATION (%)

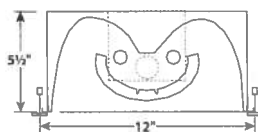
| RC | 70 | 80 | 90 | 100 | 70 | 80 | 90 | 100 | 50 | 30 | 10 | 0 |
|----|----|----|----|-----|----|----|----|-----|----|----|----|----|
| 1 | 78 | 75 | 72 | 69 | 76 | 73 | 70 | 68 | 70 | 68 | 66 | 60 |
| 2 | 71 | 65 | 61 | 57 | 69 | 64 | 60 | 56 | 62 | 58 | 55 | 51 |
| 3 | 65 | 58 | 52 | 47 | 63 | 57 | 51 | 47 | 54 | 50 | 46 | 43 |
| 4 | 60 | 51 | 45 | 40 | 58 | 50 | 45 | 40 | 48 | 43 | 40 | 37 |
| 5 | 55 | 46 | 40 | 35 | 53 | 45 | 39 | 35 | 44 | 38 | 34 | 32 |
| 6 | 51 | 41 | 35 | 31 | 49 | 41 | 35 | 30 | 39 | 34 | 30 | 28 |
| 7 | 47 | 38 | 31 | 27 | 46 | 37 | 31 | 27 | 36 | 31 | 27 | 25 |
| 8 | 44 | 34 | 28 | 24 | 43 | 34 | 28 | 24 | 33 | 28 | 24 | 22 |
| 9 | 41 | 32 | 26 | 22 | 40 | 31 | 26 | 22 | 30 | 25 | 22 | 20 |
| 10 | 39 | 29 | 24 | 20 | 38 | 29 | 23 | 20 | 28 | 23 | 20 | 18 |

RCR = Room Cavity Ratio

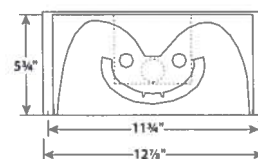
RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

DIMENSIONAL DATA

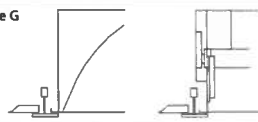
1' x 4'; 2-Lamp, Lay-In Recessed



Surface

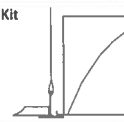
**CEILING COMPATIBILITY**

Type G



For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum heights of 1 1/2" allowed.

FK14 Flange Kit



For hard ceiling applications, fixtures must be ordered with a flange kit that wires directly into the concealed ceiling opening for a clean finished appearance. For row configurations contact your local Columbia Representative.

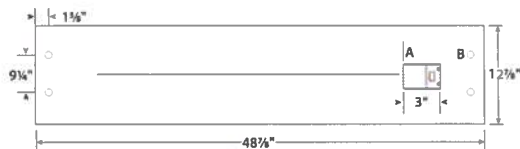
Type SG



For 3/8" slot grid type ceilings. Luminaire will be regressed 3/8" horizontal surface of the tee.

Flange kit cut out dimension for single FK14 only: 12 1/4" x 48 1/4"

Top View

Surface Mount K.O. Dimensions
A: 2" x 3" Access with (2) 3/8" Mount Supply Knockouts
B: 1/4" Mounting holes (4) for surface or cable mounting

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

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RECESSED ARCHITECTURAL / STE14

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Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**STE24-332G-MPO-3EPUQHEPSN-
FO835SYL

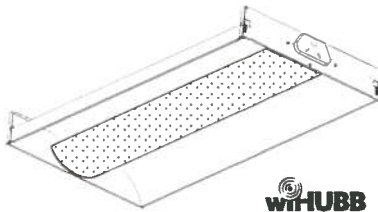
Notes: 3-F32T8/835 LAMPS INCLUDED

Type:**B17**

LSC14-37947

Columbia
LIGHTING**STE24-3**

2' x 4' Stratus® Recessed Indirect / 3-Lamp T5, T5HO, T8

**wiHUBB****FEATURES**

- Precision optical design produces high efficiency in a high visual comfort architecturally styled direct/indirect distribution
- Custom perforated metal basket is backed by a high transmission lamp obscuring overlay
- Optimized coating process and unique paint formulation provide exceptional reflectivity in a matte finish for a soft visual image and balanced basket and reflector illumination
- Completely recessed, provides a clean ceiling with uniform illumination at mounting heights as low as 8 feet
- Available for use with T8, T5 or T5HO linear fluorescent lamps
- Optional acrylic dust guard pivots to seal lamp compartment against contaminants especially for schools, medical facilities and public spaces
- Companion Louvered (STEL), side basket (STS) and pendant (STP) models available
- Available with exclusive wiHUBB technology preinstalled
 - Peer to peer, self-healing wireless mesh network
 - Integrated control system for 0-10VDC or step dimming, or On/Off

PROJECT INFORMATION

Project Name _____

Type _____

Catalog No. _____

Date _____

CONSTRUCTION

Luminaire housing and end caps are die formed code gauge cold rolled steel. The sturdy reflector is stiffened with linear forms, profiled to a precision curve. Perforated basket with high transmission overlay for improved optical efficiency plus lamp obscuration. Basket and all reflective surfaces are finished after fabrication with unique formula high reflectivity matte white paint for soft, uniform indirect illumination.

Thermoplastic light traps snap into the housing at both ends of the basket to prevent light leaks. Basket hinges down for easy access to center wireway.

INSTALLATION

An access plate is furnished with each luminaire for fast wiring access from the plenum. No need to open fixture.

BALLASTS

Energy efficient, thermally protected, automatic resetting, Class P, high power factor, sound rated A, magnetic or electronic ballasts. CEE NEMA Premium compliant.

ELECTRICAL

Standard class "P", thermally protected, autoresetting HPF ballast, sound rated A, CEE NEMA Premium compliant. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

CEILING COMPATIBILITY

NEC-compliant T-Bar clips supplied with all grid trim fixtures. See ceiling details on reverse. For type SG ceilings order G trim. Fixture will be regressed 3/8" from the face of the ceiling tee. For hard ceilings order G trim and FK flange accessory. Assemble then support FK accessory at the ceiling plane using tie wires (by others). Contact your Columbia representative for compatibility information for specific ceiling types or for continuous row applications in hard ceilings.

CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

ORDERING INFORMATION**EXAMPLE STE24-332G-MPO-E**

| STE | 24 | - | 3 | - | MPO | - | | | | |
|---|--------------|---------------|--------------------------|-------------------------|---|------------|--|---|--|--|
| MODEL | NO. OF LAMPS | CEILING TYPE | SHIELDING | VOLTAGE | OPTIONS | SIZE | LAMP TYPE | BALLAST | | |
| STE Stratus® E-Series Recessed Indirect | 3 Three | G Grid Lay-in | MPO Metal Perf w/Overlay | U 120V-277V 347 347V | GLR Fast Blow Fuse GMF Slow Blow Fuse EL Emergency Battery Pack EL5 Emergency Battery Pack, T5 DG Dust Guard Clear Acrylic NYC NYC Compliant NYCU NYC Compliant, Union Label WIH wiHUBB Enabled ¹ | 24 2' x 4' | 28 4', T5: 28 Watt 32 4', T8: 32, 30, 28 or 25 Watt 34 4', T5HO: 54 or 51 Watt | E Electronic T8, Instant Start ED Electronic Dimming T8 and T5 (specify series) EP Electronic T5, T5HO, or T8, Programmed Start 3E 3-Lamp Electronic T8, Instant Start 3EP 3-Lamp Electronic T5, T5HO, Instant or T8 Programmed Start | | |

96 W = 32 W x 3

3PEUQHEPSN - One 3 Lamp Sylvania Programmed Start Ballast

FO835SYL - Sylvania Lamps Installed

**ACCESSORIES
(ORDER SEPARATELY)**FK24 2' x 4' Single Flange Kit
(Shipped separately)¹Not available with Surface Mount Ceiling Types

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RECESSED ARCHITECTURAL / STE24-3

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Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
STE24-332G-MPO-3EPUQHEPSN-
F0835SYL
Notes: 3-F32T8/835 LAMPS INCLUDED

Type:**B17**

LSC14-37947

Columbia LIGHTING

STE24-3

2' x 4' Stratus® Recessed Indirect / 3-Lamp T5, T5HO, T8

PHOTOMETRIC DATA

Test ITL65805 Test Date 8/30/10

LUMINAIRE DATA

| | |
|-----------------------------|--|
| Luminaire | STE24-332G-MPO-3EU Stratus, Recessed/Architectural 2 x 4 3-lamp with perforated metal basket and opal overlay |
| Ballast | ICN-3P32-5C |
| Ballast Factor | 0.88 |
| Lamp | F28T8 |
| Lumens per Lamp | 2750 |
| Watts | 71 |
| Shielding Angle | 0° = 0.90° = 0 |
| Spacing Criterion | 0° = 1.22 90° = 1.30 |
| Luminous Opening in Feet | Length: 3.93 Width: 1.88 Height: 0.00 |

ZONAL LUMEN SUMMARY

| Zone | Lumens | % Lamp | % Fixt. |
|-------|--------|--------|---------|
| 0-30 | 1750 | 21.2 | 26.9 |
| 0-40 | 2875 | 34.8 | 44.2 |
| 0-60 | 5130 | 62.2 | 78.8 |
| 0-90 | 6507 | 78.9 | 100.0 |
| 0-180 | 6507 | 78.9 | 100.0 |

ENERGY DATA

| | |
|--|--|
| Total Luminaire Efficiency | 78.9% |
| Luminaire Efficacy Rating (LER) | 81 |
| IESNA RP-1-1993 Compliance | Noncompliant |
| Comparative Yearly Lighting Energy Cost per 1000 Lumens | \$2.96 based on 3000 hrs. and \$0.08 per KWH |

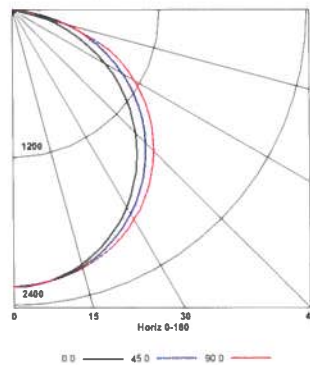
COEFFICIENTS OF UTILIZATION (%)

| | RC | 80 | | | | 70 | | | | 50 | | | | 0 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| | RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 0 | |
| RCR | 1 | 86 | 82 | 79 | 76 | 84 | 80 | 77 | 74 | 77 | 74 | 72 | 66 | |
| | 2 | 78 | 71 | 66 | 61 | 76 | 70 | 65 | 61 | 67 | 63 | 59 | 55 | |
| | 3 | 71 | 63 | 56 | 51 | 69 | 61 | 55 | 50 | 59 | 54 | 50 | 46 | |
| | 4 | 65 | 55 | 48 | 43 | 63 | 54 | 48 | 43 | 52 | 47 | 42 | 39 | |
| | 5 | 60 | 49 | 42 | 37 | 58 | 48 | 42 | 37 | 47 | 41 | 36 | 34 | |
| | 6 | 55 | 44 | 37 | 32 | 53 | 44 | 37 | 32 | 42 | 36 | 32 | 30 | |
| | 7 | 51 | 40 | 33 | 28 | 50 | 40 | 33 | 28 | 38 | 32 | 28 | 26 | |
| | 8 | 47 | 37 | 30 | 25 | 46 | 36 | 30 | 25 | 35 | 29 | 25 | 23 | |
| | 9 | 44 | 34 | 27 | 23 | 43 | 33 | 27 | 23 | 32 | 27 | 23 | 21 | |
| | 10 | 42 | 31 | 25 | 21 | 41 | 31 | 25 | 21 | 30 | 24 | 20 | 19 | |

RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

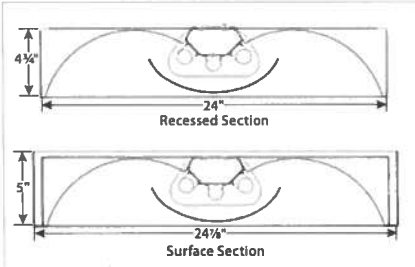
INDOOR CANDELA PLOT



AVG. LUMINANCE (Candela/Sq. Ft.)

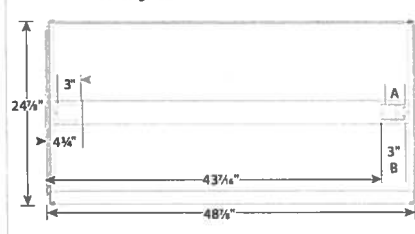
| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 |
|----|------|------|------|------|------|
| 0 | 3275 | 3275 | 3275 | 3275 | 3275 |
| 30 | 3110 | 3142 | 3220 | 3285 | 3307 |
| 40 | 2986 | 3058 | 3174 | 3307 | 3330 |
| 45 | 2917 | 3000 | 3158 | 3309 | 3350 |
| 50 | 2824 | 2926 | 3125 | 3300 | 3359 |
| 55 | 2700 | 2832 | 3078 | 3289 | 3358 |
| 60 | 2538 | 2719 | 3010 | 3255 | 3339 |
| 65 | 2330 | 2603 | 2923 | 3254 | 3289 |
| 70 | 2011 | 2415 | 2794 | 3088 | 3016 |
| 75 | 1790 | 2184 | 2550 | 2561 | 2561 |
| 80 | 1460 | 1913 | 1905 | 2156 | 2114 |
| 85 | 919 | 1170 | 1438 | 1504 | 1504 |

DIMENSIONAL DATA



Top View

Surface Mount K.O. Dimensions
A: 1/2" K.O.
B: 2" x 3" Access (Cover Removed)
C: 2" x 3" Rectangular Knockout



NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

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RECESSED ARCHITECTURAL / STE24-3

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CEILING COMPATIBILITY

Type G Side



For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum heights of 1 1/2" allowed.

Type SG Ceiling




For 5/8" slot grid type ceilings. Luminaire will be recessed 1/4" horizontal surface of the tee.

FK Flange Kit

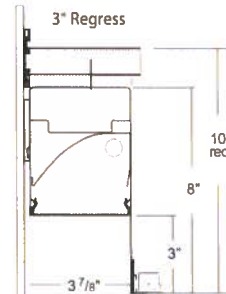
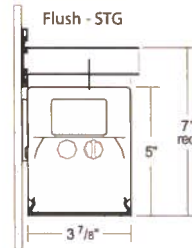
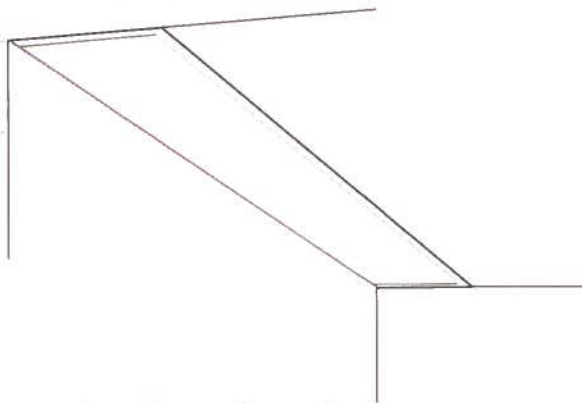


For hard ceiling applications, fixtures must be ordered with a flange kit that wires directly into the concealed ceiling opening for a clean finished appearance. For row configurations contact your local Columbia Representative.

Flange kit cut out dimension for single FK22 only: 24 1/4" x 48 3/4"

| | | | | |
|---|---|-----------------------------|--|------------|
|  LIGHTING UNLIMITED | Project 14-16183-14 Date 10/29/2014 OSU NRD BUILDING | Job Name OSU NRD Building 5 | Catalog Number P43 STD FLSH 2T8 04'-BLW-TMW-D1G-SC-WTW-120-X1 | Type |
| | Submitted By LIGHTING UNLIMITED INC | Notes | | B24 |

P43 Perimeter Cove & Perimeter



| series/ style | lens position | Lamp Rows | nominal length | shielding | trim color | distribution | circuit- ing | mount- ing | voltage | ceiling system | options |
|--|-------------------------------|-------------------------|---|--|------------------------------------|--|-----------------------------------|------------------------|-----------------------|---|---|
| P43-PSTD | FLSH | 1T8 | 04' | BLW | TMW | D1G | SC | WTW | 120 | X1 | |
| PSTD standard | FLSH flush lens | 1T8 | 02' | AWW acrylic wall wash lens (use D1G or D1R dist) | TMW' textured matte white | D1 direct | SC single circuit | WTW wall to wall | 120 | X1 exposed T-Bar | EML' emergency battery (600-700 lumens) |
| PSTG staggered (N/A D1R) (1 lamp only) | REG3 3" regress lens | 2T8 (N/A PSTG) | 03' | | | D1G' asymmetric 5" wall grazer | DC dual circuit (2 lamp) | LP light pocket | 277 | X3B hard ceiling (overlapping flange) | EMH' emergency battery (1100-1400 lumens) |
| | | 1T5/HO | 06' | AWG acrylic wall graze lens (use D1S, STG only) | YGW gloss white | D1S asymmetric with grazer (STG only) | Distribution (optics) | | | X6 slot grid | DM dimming, specify manufacturer, voltage, and other requirements |
| | | 2T5/HO (N/A PSTG) | 08' | SAL satin acrylic lens | Y_ premium Color | D1R' asymmetric to room (15') (N/A REG3) (N/A STG) | | | 347 UNV 120-277 | X7 hard ceiling (concealed flange) | RSE rapid-start electronic |
| | | | R row length | OPL opal frost acrylic lens | CC custom color | *1 lamp only, must use AWW lens | | | | | 10THD ballast w/ < 10% total harmonic distortion |
| | | | LED or staggered recomm- ended beyond 8' to avoid socket shadow | PRA prismatic acrylic lens | *standard | | | | | | B_ specify ballast, manu- facturer & catalog # |
| | | | | SPL silver parabolic louver | | | | | | | FH fixture fusing (slow blow) |
| | | | | BLA bladed louver- anodized | | | | | | | C2 90° 2-way corner w/ acrylic lens, lit corners on STG & DIG/D1R only |
| | | | | BLW bladed louver - white | | | | | | | QC quick-connect circuit assemblies |
| | | | | | | | | | | | *consult factory |

Features A narrow 4" wide recessed perimeter lighting system in either a standard or a staggered lamp configuration for single T8 or T5/HO lamp rows to provide continuous lighting without socket shadows along the entire row length. Standard lamping for T25 or T5HO lamp rows have offset lamps within modular rows to mitigate socket shadows. T8 lamps in standard configuration are end to end in modular rows and are not offset.


Construction The housing, available in 2-, 3-, 4-, 6- or 8-foot standard lengths, is made of die-formed 20-gauge steel. Louver material is semispecular, low iridescent aluminum. Snap-in prismatic lens is clear extruded acrylic. Snap-in satin acrylic lens is clear frost extruded acrylic with a matte finish for soft, even light transmission. AWW lens is designed with micro prisms for optical performance and MUST be used for D1G wall graze.

NOTE: All D1G/D1R & PSTG include gear trays.

Finish The standard housing and trim color is textured matte white (TMW) using polyester powder paint.

Electrical T8 fixtures have instant-start electronic ballasts with less than 20% THD. T5 and T5HO fixtures have programmed start electronic ballast with less than 10% THD. Fixtures are U.L. Damp labeled (non-emergency) and I.B.E.W. manufactured. Maximum ballast size available on non-staggered models: 2 3/8" width x 1 1/4" height. Maximum ballast size available on staggered models: 1 3/4" width x 1 1/4" height.

Mounting Fixture is to be recessed-mounted into exposed T-bar or hard ceiling applications.

| | | | |
|--|--|-------------------------|---|
|  | Project 14-16183-14 Date 10/29/2014 Client: Vaughn Industries Job Name: P43 STD FLOOR 215-04-BLW-TMW-D1G-SC-WTW-120-X1 Submitted By LIGHTING UNLIMITED INC | Catalog Number Notes | Type <div style="font-size: 2em; font-weight: bold; text-align: center;">B24</div> |
|--|--|-------------------------|---|

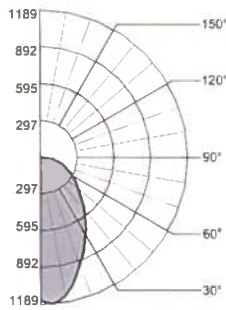
Cove & Perimeter **P43 Perimeter**

photometric data

P43-PSTD-REG3-1T5HO-AWW-D1G

Report #L88404201 D=97.30% I=2.70%
Spacing Criteria Along 100; Across 100

Delivered Lumens: 2011
Input Watts: 32.55
Efficiency: 77.30%



Zonal Lumen Summary

| Zone% | % Lamp | % Luminaire |
|--------|--------|-------------|
| 0-90 | 76.00 | 98.20 |
| 90-180 | 1.40 | 1.80 |

Candlepower Summary

| Vertical Angle | Horizontal Angle | 0° | 22.5° | 45° | 67.5° | 90° |
|----------------|------------------|------|-------|------|-------|------|
| 0 | 1159 | 1159 | 1159 | 1159 | 1159 | 1159 |
| 5 | 1189 | 1184 | 1181 | 1173 | 1150 | |
| 10 | 1136 | 1139 | 1155 | 1159 | 1127 | |
| 15 | 1038 | 1050 | 1089 | 1122 | 1090 | |
| 20 | 928 | 942 | 995 | 1060 | 1037 | |
| 25 | 826 | 839 | 890 | 978 | 970 | |
| 30 | 729 | 740 | 784 | 879 | 888 | |
| 35 | 635 | 646 | 682 | 770 | 793 | |
| 40 | 546 | 557 | 587 | 659 | 687 | |
| 45 | 466 | 474 | 499 | 552 | 576 | |
| 50 | 395 | 401 | 418 | 454 | 466 | |
| 55 | 341 | 345 | 354 | 377 | 376 | |
| 60 | 287 | 289 | 290 | 300 | 288 | |
| 65 | 240 | 240 | 234 | 230 | 201 | |
| 70 | 197 | 195 | 186 | 170 | 147 | |
| 75 | 154 | 152 | 141 | 120 | 95 | |
| 80 | 113 | 110 | 99 | 79 | 54 | |
| 85 | 73 | 69 | 59 | 46 | 24 | |
| 90 | 35 | 33 | 28 | 15 | 9 | |

Coefficients of Utilization (%)

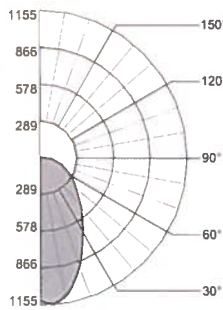
| Floor | effective floor cavity reflectance = 20 | | | | | | | | | | | |
|---------|---|----|----|----|----|----|----|----|----|----|----|--|
| Ceiling | 80 | | | | 70 | | | | 50 | | | |
| Wall | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | |
| 0 | 92 | 92 | 92 | 89 | 89 | 89 | 89 | 85 | 85 | 85 | 85 | |
| 1 | 85 | 81 | 78 | 76 | 82 | 79 | 77 | 74 | 76 | 74 | 72 | |
| 2 | 78 | 72 | 67 | 63 | 76 | 71 | 66 | 62 | 68 | 64 | 61 | |
| 3 | 72 | 64 | 59 | 54 | 70 | 63 | 58 | 53 | 61 | 56 | 52 | |
| 4 | 66 | 58 | 52 | 47 | 64 | 57 | 51 | 47 | 55 | 50 | 46 | |
| 5 | 61 | 52 | 46 | 41 | 60 | 51 | 45 | 41 | 50 | 44 | 40 | |
| 6 | 57 | 48 | 41 | 37 | 56 | 47 | 41 | 37 | 45 | 40 | 36 | |
| 7 | 53 | 44 | 37 | 33 | 52 | 43 | 37 | 33 | 42 | 36 | 33 | |
| 8 | 50 | 40 | 34 | 30 | 49 | 40 | 34 | 30 | 39 | 33 | 30 | |
| 9 | 47 | 37 | 31 | 27 | 46 | 37 | 31 | 27 | 36 | 31 | 27 | |
| 10 | 44 | 35 | 29 | 25 | 43 | 34 | 29 | 25 | 33 | 28 | 25 | |

photometric data

P43-PSTG-REG3-1T5-04-AWG-D1S

Report #L88404201 D=97.30% I=2.70%
Spacing Criteria Along 100; Across 90

Delivered Lumens: 1745
Input Watts: 34.42
Efficiency: 51%



Zonal Lumen Summary

| Zone% | Lumens | % Luminaire |
|--------|---------|-------------|
| 0-90 | 1697.28 | 97.30 |
| 90-180 | 47.89 | 2.70 |

Candlepower Summary

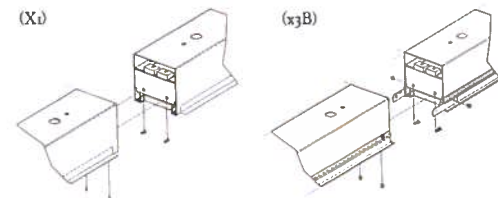
| Vertical Angle | Horizontal Angle | 0° | 25° | 45° | 65° | 90° |
|----------------|------------------|------|------|------|------|------|
| 0 | 1131 | 1131 | 1131 | 1131 | 1131 | 1131 |
| 5 | 1144 | 1144 | 1146 | 1148 | 1120 | |
| 10 | 1042 | 1066 | 1107 | 1132 | 1102 | |
| 15 | 887 | 930 | 1008 | 1091 | 1080 | |
| 20 | 726 | 770 | 870 | 1010 | 1035 | |
| 25 | 640 | 656 | 731 | 908 | 984 | |
| 30 | 590 | 593 | 627 | 794 | 912 | |
| 35 | 535 | 543 | 555 | 669 | 821 | |
| 40 | 481 | 486 | 492 | 562 | 705 | |
| 45 | 424 | 428 | 431 | 472 | 578 | |
| 50 | 376 | 376 | 375 | 398 | 452 | |
| 55 | 333 | 331 | 322 | 328 | 341 | |
| 60 | 302 | 295 | 282 | 273 | 257 | |
| 65 | 271 | 260 | 239 | 216 | 178 | |
| 70 | 238 | 229 | 202 | 171 | 116 | |
| 75 | 210 | 197 | 168 | 131 | 71 | |
| 80 | 178 | 166 | 136 | 96 | 37 | |
| 85 | 142 | 132 | 105 | 67 | 13 | |
| 90 | 98 | 90 | 71 | 42 | 0 | |

Coefficients of Utilization (%)

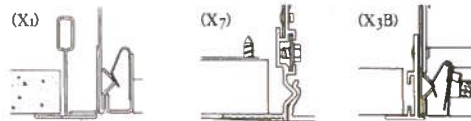
| Floor | effective floor cavity reflectance = 20 | | | | | | | |
|---------|---|-----|------|-----|------|-----|-----|-----|
| Ceiling | 80 | | 70 | | 50 | | | |
| Wall | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 |
| 0 | 1181 | 181 | 1181 | 151 | 1151 | 151 | 101 | 101 |
| 1 | 1091 | 104 | 1009 | 97 | 106 | 102 | 98 | 84 |
| 2 | 100 | 93 | 86 | 81 | 97 | 90 | 85 | 82 |
| 3 | 92 | 83 | 75 | 69 | 80 | 74 | 69 | 78 |
| 4 | 85 | 75 | 67 | 60 | 83 | 73 | 66 | 60 |
| 5 | 79 | 68 | 59 | 53 | 77 | 66 | 59 | 53 |
| 6 | 74 | 62 | 54 | 48 | 72 | 61 | 53 | 47 |
| 7 | 69 | 57 | 49 | 43 | 67 | 56 | 48 | 42 |
| 8 | 65 | 52 | 45 | 39 | 63 | 52 | 44 | 39 |
| 9 | 61 | 49 | 41 | 36 | 60 | 48 | 41 | 35 |
| 10 | 58 | 45 | 38 | 33 | 56 | 45 | 38 | 33 |

installation

Adjoining Detail

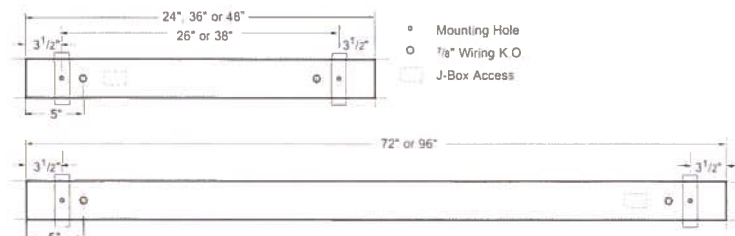



Ceiling Systems



Framing Dimensions X3B & X7
Add 1/2" in fixture width. Add 5/8" in fixture length.

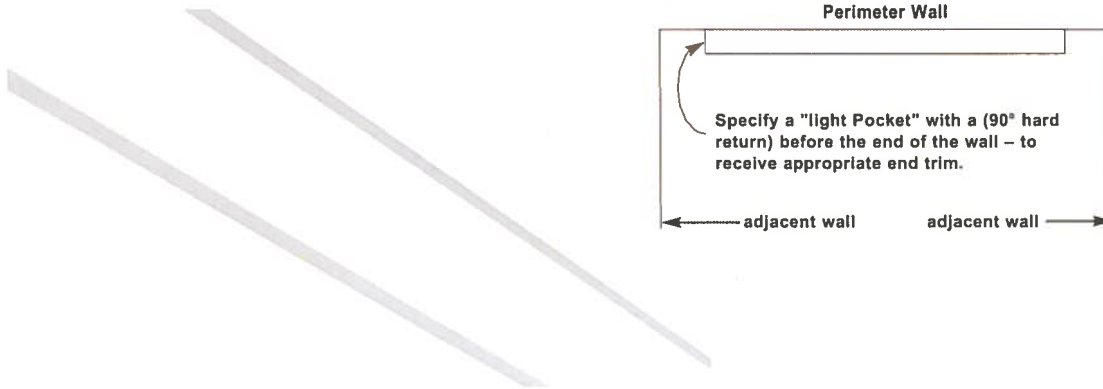
Mounting Locations



| | | | |
|--|---|--|-------------|
|  | Project 14-16183-14 Date 10/29/2014 Submitted By LIGHTING UNLIMITED INC | Catalog Number P43-P54-FLOR-218-04-BLW-TMW-D1G-SC-WTW-120-X1 Notes | Type B24 |
|--|---|--|-------------|

P43 Perimeter Cove & Perimeter

Frosted



1 lamp Staggered System (STG)

Typical Row Examples - Lamp quantities and wattages are dependant on row size.

T5/T5HO - (3) 3' 21w or 39w lamps - Gear Trays: (1) 3' and 1 (6') Telescoping



T5/T5HO - (2) 3' 21w or 39w lamps and (2) 4' 28w or 54w lamps - Gear Trays: (1) 6' and 1 (8') Telescoping



T5/T5HO - (1) 3' 21w or 39w lamps and (5) 4' 28w or 54w lamps - Gear Trays: (1) 3', (1) 4', (1) 8' & (1) 8' Telescoping



T8 - (3) 3' 25w lamp - Gear Tray: (1) 8' individual



T8 - (3) 3' 25w and (1) 32w lamps - Gear Trays (1) 3', (1) 4' and (1) 6', Telescoping



T8 - (2) 3' 25w lamps and (4) 32w lamps - Gear Trays (2) 8' and (1) 6' Telescoping



Gear Trays are field installed
4 1/4" lamp overlap, from certain
viewing angles brightness
variations may be visible
at overlap.

Standard System

Typical Row Examples

2T8 lamp rows



2T5 or 2T5HO lamp rows



2T5 or 2T5HO lamp rows



Factory supplied submittal drawing will be provided. Lamps are not supplied.

Prudential reserves the right to change design specifications or materials without notice.

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**TMC-320-FL-1-T5 28W-SQHFR
SURFACE MOUNT -4' BL-120

Notes:

Type:**B25**

LSC14-37947

**Project****Notes**

Configure product using standard options.
For other custom options contact Voigt.
Example: SQOP, 1-T5-17, 0W/1, 4', WH, 120, PHC



Surface Mount Shown



Surface Mount Shown



Aircraft Cable Mount Shown



Stem Mount Shown

COMMERCIAL

Model

Timo Mini

- Lo-Profile Linear Fluorescent
- T5/T8 Lamping
- Shure Seal Powder Coat Finish - For long lasting finish
- Optional Integral battery back up
- Wet Location Rated
- Optional Vandal Proof

Applications:

- Offices • Corridors • Stairwells • Retail • Garage

Shure Seal Finish

| fixture Series | lamp | lens | suspension | length | finish | voltage | options |
|--|--|-----------------------------------|---|---|---|------------|---|
| TMC-320-FL-1T5-28W-4'-SQHFR (Surface Mount) - 4' 1 BL -120 | | | | | | | PHC |
| TMC-320-FL | 1-T5-17w 1-T5-28w 1-T828w 1-T832w 1-T5-28w 1-54T5HO Note: Fixture is single lamp cross section | SQHFR-High performance frost lens | surface mount Fixed-wall mount with arm-std extension 1". SRM-Semi Recess Mount SC-Swivel Canopy, Wireless (Specify Length) RC-Right Canopy Wireless (Specify Length) AC-Air-Craft Cable (Specify Length) For other contact Voigt | 4' Specify length of fixture: 4' 8' Other | WH-White BL-Black DB-Dark Bronze SIL-silver Custom available check with factory | 120 277 | PHC-Photo Sensor OCG-Occupancy Sensor F-Fuse VP-Vandal Proof |

Contractor: Vaughn Industries

Job Name: OSU NBDT Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**TMC-320-FL-1-T5 28W-SQHFR
SURFACE MOUNT -4' BL-120

Notes:

Type:**B25**

LSC14-37947

TIMO MINI

Timo Mini

- Lo-Profile Linear Fluorescent
- T5/T8 Lamping Exclusive
- Shure Seal Powder Coat Finish - For long lasting finish
- Optional Integral battery back up
- Wet Location Rated

Applications:

- Offices • Corridors • Stairwells • Retail • Garage
- Shure Seal Finish**



Surface Mount Shown



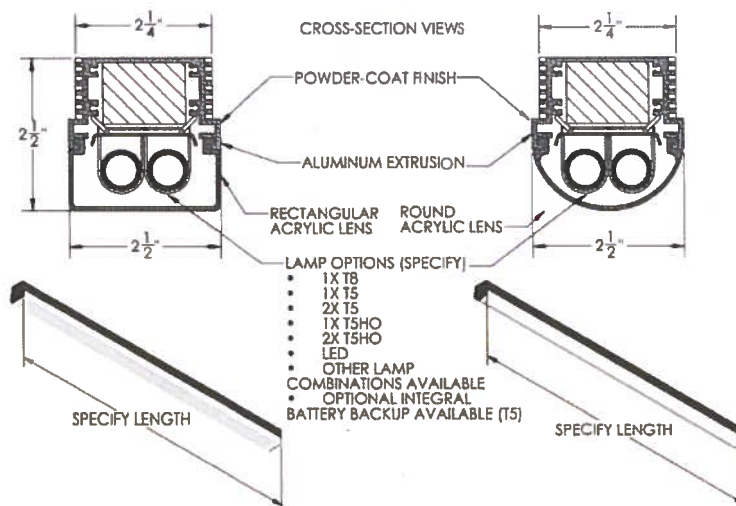
Surface Mount Shown




Aircraft Cable Mount Shown



Stem Mount Shown



| | | | | |
|---|---|---------------------------|--|------|
|  | Project 14-16183-14 Date 10/29/2014 C.D. Vaughn Industries OSU NRD BUILDING | Job Name OSU NRD Building | Catalog Number DMW 2 32 MVOLT GEB10PS | Type |
| | Submitted By LIGHTING UNLIMITED INC | Notes | | C2 |



FEATURES & SPECIFICATIONS

INTENDED USE — Intended for low to medium mounting heights where dust, dirt, humidity or moisture are present. Ideal for canopies, dock areas, wastewater treatment, refrigerated areas, food processing and other non-hazardous environments. Certain airborne contaminants can diminish integrity of acrylic. [Click here for Acrylic Environmental Compatibility table for suitable uses.](#)

CONSTRUCTION — Housing formed from impact resistant, UV stabilized, fiberglass reinforced polyester with cold-rolled steel enclosed wireway. Poured in place gasketing provides a seal between housing and diffuser. Captive, corrosion-resistant cam-action latches secure the diffuser, six on 4' units, and ten on 8' units. Stainless steel latches available.

Finish: Painted parts pretreated with a five-stage iron-phosphate process to ensure superior paint adhesion and corrosion resistance, then finished with a high-gloss, baked white enamel.

OPTICS — High-impact acrylic diffuser with a stippled interior surface to spread lamp image.

PLEASE NOTE: The standard 4' diffuser is 2-1/4" deep, and the standard 8' or 48T8HO diffuser is 3" deep. To order the 4' diffuser so that it matches the depth of the 8' diffuser, order the ARDP option. The 8' diffuser is not available in the 2-1/4" depth.

ELECTRICAL — Thermally protected, resetting, Class P, HPF, non-PCB, UL Listed and CSA Certified ballast is standard.

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

INSTALLATION — For unit or row installations, surface (ceiling or wall) or suspended mounting. Wall mounting; horizontal orientation only for use in damp locations. Stainless steel surface spring-mounting brackets standard (2 included).

LISTINGS — 120V, 277V and MVOLT are UL Listed and CSA Certified (standard). 347V is CSA Certified (see Options). NOM Certified (see Options). Listed for 25°C ambient and wet locations for covered-ceiling applications. IP65 rated. Optional IP67 rating available (supplied with 8 latches on 4' units and 14 latches for 8' units; covered ceiling not required). Compliance to FDA/USDA requirements and/or NSF splash-zone certification.

WARRANTY — 1-year limited warranty. Complete warranty terms located at www.aquitybrands.com/CustomerResources/Terms_and_conditions.aspx

Actual performance may differ as a result of end-user environment and application.
Note: Specifications subject to change without notice.

Enclosed and Gasketed Industrial

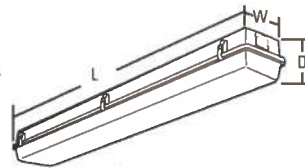


DMW
INSTANT, PROGRAMMED OR RAPID START

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

| Specifications | |
|----------------|--|
| Length: | 50 (127.0) 98 (248.9) |
| Width: | 8-1/8 (20.6) |
| Fixture depth: | 5-5/8 (14.3) (deep lens) 4-3/4 (12.1) (standard lens) |

All dimensions are shown in inches (centimeters) unless otherwise noted.



ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: DMW 2 32 MVOLT GEB10IS

| DMW | 2 | 32 | | MVOLT | GEB10PS | |
|---|-----------------|---|--|------------------|-----------|---|
| Series | Number of lamps | Lamp type | Diffuser | Voltage | Ballast | Options |
| DMW | 1 | 28T5 28W T5 (48") ¹ | (blank) 2-1/4" Deep high-impact acrylic (50% DR) | 120 | GEB10IS | ELDW Emergency battery pack (nominal 300 lumens) ⁷ |
| Wet location | 2 | 32 32W T8 (48") | ARDP 3" Deep high-impact acrylic (50% DR) ⁵ | 277 | | ELSDW Emergency battery pack (nominal 500 lumens) ⁷ |
| For tandem double-length unit, add prefix T. Example: TDMW ¹ | 3' | 48T8HO 44W T8HO (48") 54T5HO 54W T5HO (48") 96T8 59W T8 slimline (96") 96T8HO 86W T8 380mA (96") | | 347 | GEB10RS | EL6DW Emergency battery pack (nominal 600 lumens) ⁷ |
| | | | | MVOLT | | EL14DW Emergency battery pack (nominal 1400 lumens) ⁷ |
| | | | | others available | | GLR Internal fast-blow fusing ⁴ |
| | | | | | GEB10PS | GMF Internal slow-blow fusing ⁸ |
| | | | | | | RIF1 Radio interference filter, one per fixture |
| | | | | | | STSL Stainless steel latches |
| | | | | | | WLF Wet location fittings (one pair, installed, top, for use with 1/2" rigid conduit) |
| | | | | | GEB10PS90 | IP67 IP67 rated, requires 8 latches for 4' fixtures and 14 latches for 8' fixtures |
| | | | | | | CSA CSA certified (only required for 347V) |
| | | | | | | NOM NOM certified |
| | | | | | | CS89 6' white cord, 16/3, no plug, wet location |
| | | | | | | CS88 6' Brad Harrison 16/3 cord and straight blade plug set wet location ⁴ |
| | | | | | | MSI_ Wet location occupancy sensor pre-wired ¹¹ |
| | | | | | | DL Damp location ⁹ |

Accessories: Order as separate catalog number.

| | |
|------------|--|
| BCD | Bracket for hanger chain mounting. Two per package ¹¹ |
| HC36 | Chain hangers (1 pair, 36" long); Requires BCD |
| WLF | Wet location fittings (1 pair, not installed, for use with 1/2" rigid conduit) |
| DMW/VRISMB | Surface mounting brackets (pair) ¹² |


Notes

- 1 Not available with 96T8 or 96T8HO.
- 2 32W T8 and 28 T5 lamps only.
- 3 Must specify GEB10PS ballast.
- 4 Must specify GEB10PS90 ballast.
- 5 ARDP standard on 48T8HO and 8' fixtures.
- 6 Available 347V T8 only.
- 7 Must specify voltage: 120 or 277V only.
- 8 Must specify voltage. Not available with MVOLT.
- 9 For mounting up to 8' specify MS18, for mounting up to 20' specify MS120.
- 10 DL option required for battery packs, sensors, and cord sets that are not wet location listed.
- 11 For stainless steel, specify STS (ex: BCD STS).
- 12 Brackets ship standard with fixture. For replacement purposes only.

INDUSTRIAL

Date Submitted: Sept. 2, 2015

DMW-FL
Distributor: C.E.D. Columbus, Oh 43207

| | | | |
|---|--|---|--------------------------------|
|  | <p>Project 14-16183-14 Date 10/29/2014 Submitted By LIGHTING UNLIMITED INC</p> | <p>Catalog Number DMW 262-MVOLT-CEB10PS Notes</p> | <p>Type C2</p> |
|---|--|---|--------------------------------|

DMW Instant, Programmed or Rapid Start

MOUNTING DATA

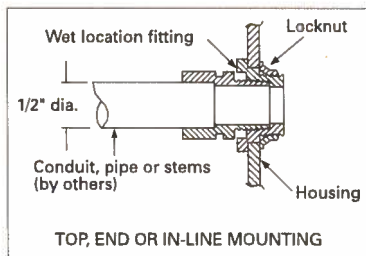
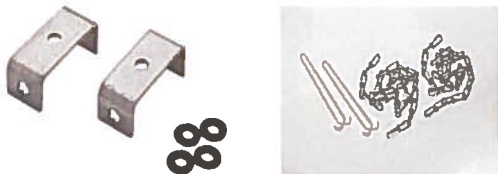
For unit or row installation, surface (ceiling or wall) or suspended mounting

DMW — Drill holes through housing and channel at appropriate locations. Includes gasketed wet location fittings on ends for power feeding/mounting. Fitting is threaded for 1/2" rigid conduit (optional WLF for top mounting). Attach to surface using fasteners and sealing washers (by others) appropriate for ceiling materials

Unit installation — Minimum of two hangers required.

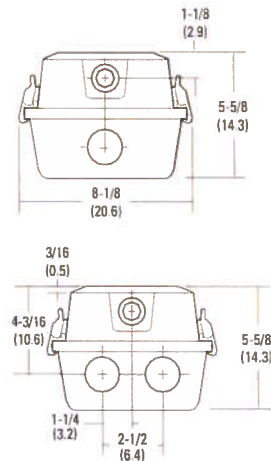
Row installation — Minimum of two hangers required. Recommended 1/2" nipple with union (by others) for DMW.

MOUNTING ACCESSORIES



DIMENSIONS

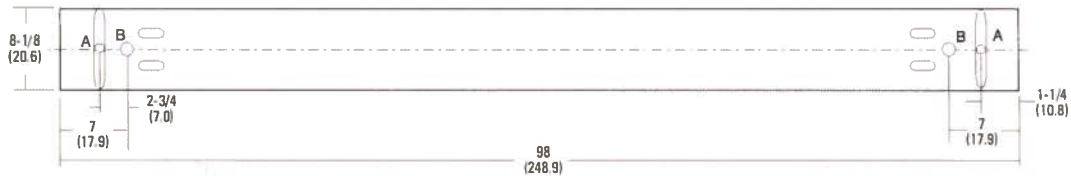
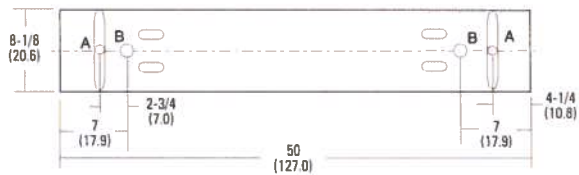
Inches (centimeters). Subject to change without notice



A = 11/16 (17) Dia.

B = 1-1/8 (29) Dia.

Recommended mounting locations
(field drilling required)



PHOTOMETRICS

See www.lithonia.com



DMW-FL

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus



Lighting Systems
of Columbus, Inc.

Job Name:

OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:

KL4-232-U-EPUQHEPSN-KHC

Notes:

Type:

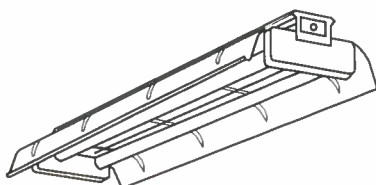
C8

LSC14-37947

Columbia
LIGHTING

KL BI-PIN

Premium Industrial / 2, 3, or 4-Lamp T5, T5HO, T8



FEATURES

- Available in 4' and 8' lengths
- Reflectors have 15% uplight
- Spring loaded turret lampholders
- 6" lamp spacing
- For individual or continuous row mounting
- Channel ends double as joiners
- Full depth end closures available
- T5/T5HO versions feature rotating locking sockets without turrets

PROJECT INFORMATION

Project Name

Type

Catalog No.

Date

CONSTRUCTION

Heavy steel housing with longitudinal reinforcing ribs for extra strength. Reflector die-embossed with transverse ribs for maximum rigidity. Solid top or 15% uplight versions with extruded openings available.

CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

FINISH

White painted parts are treated with a five stage phosphate bonding process and finished with a high reflectance baked enamel.

ELECTRICAL

Standard class "P", thermally protected, auto-resetting HPF ballast, sound rated A. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

ORDERING INFORMATION

EXAMPLE KL4-232-U-EU-GLR-PAF

| KL | | | | | | |
|-----------------------|--------------|-------------------------------|--|--|---|---|
| MODEL | LENGTH | NO. OF LAMPS IN CROSS SECTION | LAMP TYPE | REFLECTOR TYPE | VOLTAGE | OPTIONS |
| KL Premium Industrial | 4 4' 8 8' | 2 Two 3 Three 4 Four | 28 4' T5 28 Watt 32 4' T8 32, 30, 28 or 25 Watt 54 4' T5HO 54 or 51 Watt | U Apertured Reflector for Uplight (Standard) ST Solid Top (No Uplight) SLR Specular Reflector with Uplight SLRST Specular Reflector Solid Top | U 120V-277V 347 347V | GLR Fast Blow Fuse GMF Slow Blow Fuse EL Emergency Battery Pack BC Branch Circuit Plug-on Wiring System (See options section for details) PAF Paint After Fabrication NYC NYC Compliant NYCU NYC Compliant, Union Label |
| | | | | | BALLAST | ACCESSORIES (ORDER SEPARATELY) |
| | | | | | E Electronic T8, Instant Start 4E 4-Lamp Electronic T8, Instant Start EP Electronic T8, Program Start 4EP 4-Lamp Electronic T8, Program Start For others available, see Ballast Options | KZT Zip Tee Hanger - 1/2" spacer on T-bar ceiling KTH Slide Clamp Tong Hanger S18 18" Stem, canopy and 8" aligner SS18 18", 45" Swivel Stem & Canopy KHC 24" Chain Hanging Assembly KLEC Full Depth End Closure KLWG4 Wire Guard 4" lg. - 2 required per 8" fixture KLEGG White Straight Blade Egg Crate Louver 4" - 2 required per 8" fixture |

EPUQHEPSN- Sylvania Programmed Start Ballast

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

KL4-232-U-EPUQHEPSN-GLR KHC

Notes:

Type:**C8**

LSC14-37947

Columbia LIGHTING

KL BI-PIN

Premium Industrial / 2, 3, or 4-Lamp T5, T5HO, T8

PHOTOMETRIC DATA**LUMINAIRE DATA**

| | |
|-------------------|--------------------------------|
| Luminaire | KL4-232-OCT-PAF |
| | KL Industrial |
| | 1' x 4' 2-Lamp Industrial with |
| | Apertured White Reflector |
| Ballast | R2P32 |
| Ballast Factor | 0.95 |
| Lamp | FO32/41K |
| Lumens per Lamp | 2900 |
| Watts | 74 |
| Shielding Angle | N/A |
| Spacing Criterion | 0° = 1.27 90° = 1.30 |
| Luminous Opening | Length: 4.00 |
| in Feet | Width: 1.02 |
| | Height: 0.00 |

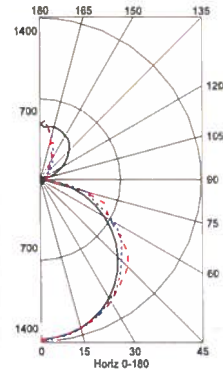
ZONAL LUMEN SUMMARY

| Zone | Lumens | % Lamp | % Fixt. |
|--------|--------|--------|---------|
| 0-30 | 1090 | 18.8 | 20.9 |
| 0-40 | 1807 | 31.1 | 34.7 |
| 0-60 | 3314 | 57.1 | 63.6 |
| 0-90 | 4396 | 75.8 | 84.3 |
| 90-120 | 179 | 3.1 | 3.4 |
| 90-130 | 263 | 4.5 | 5.0 |
| 90-150 | 518 | 8.9 | 9.9 |
| 90-180 | 817 | 14.1 | 15.7 |
| 0-180 | 5212 | 89.9 | 100.0 |

Test 10183 Test Date 1/8/03

ENERGY DATA

| | |
|---------------------------------|-----------------|
| Total Luminaire Efficiency | 89.9% |
| Luminaire Efficacy Rating (LER) | 67 |
| IESNA RP 1-1993 Compliance | Non-Compliant |
| Comparative Yearly Lighting | \$3.58 based on |
| Energy Cost per 1000 Lumens | 3000 hrs. and |
| | \$0.08 per KWH |

INDOOR CANDELA PLOT**AVG. LUMINANCE (Candela/Sq. M.)**

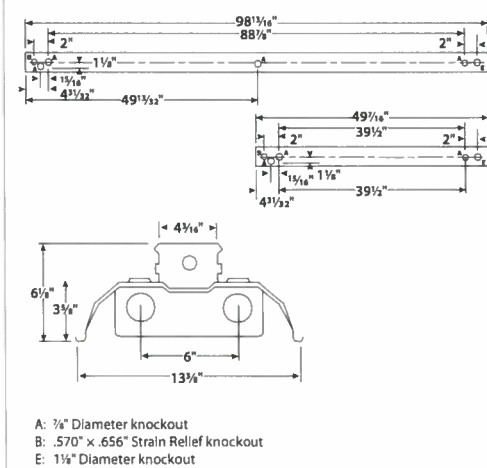
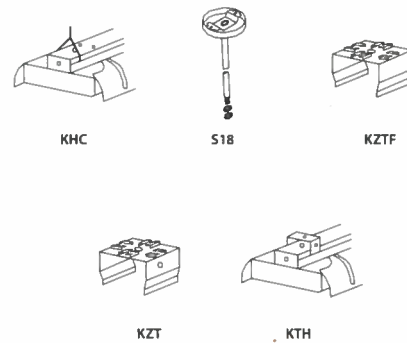
| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 |
|----|------|------|------|------|------|
| 0 | 3654 | 3654 | 3654 | 3654 | 3654 |
| 30 | 3616 | 3622 | 3671 | 3726 | 3717 |
| 40 | 3578 | 3595 | 3706 | 3788 | 3833 |
| 45 | 3544 | 3582 | 3712 | 3921 | 4000 |
| 50 | 3509 | 3579 | 3776 | 4104 | 4059 |
| 55 | 3459 | 3569 | 3923 | 3905 | 3827 |
| 60 | 3387 | 3493 | 3894 | 3704 | 3667 |
| 65 | 3296 | 3477 | 3652 | 3839 | 3964 |
| 70 | 3155 | 3595 | 3718 | 4327 | 4536 |
| 75 | 2956 | 3374 | 4210 | 4353 | 3955 |
| 80 | 2674 | 3464 | 3342 | 2370 | 2355 |
| 85 | 2149 | 2967 | 2876 | 2785 | 2815 |

COEFFICIENTS OF UTILIZATION (%)

| RC | RW | 70 | | | | 50 | | | | 30 | | | | 10 | | | | 0 | | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 |
| RC1 | 1 | 94 | 90 | 86 | 82 | 90 | 86 | 83 | 79 | 80 | 77 | 74 | 62 | 68 | 64 | 61 | 51 | | | | |
| | 2 | 85 | 78 | 71 | 66 | 81 | 75 | 69 | 64 | 69 | 64 | 61 | 51 | | | | | | | | |
| | 3 | 77 | 68 | 60 | 54 | 74 | 65 | 58 | 53 | 60 | 55 | 50 | 42 | 42 | | | | | | | |
| | 4 | 71 | 60 | 52 | 46 | 67 | 58 | 50 | 45 | 53 | 47 | 42 | 36 | | | | | | | | |
| | 5 | 65 | 53 | 45 | 39 | 62 | 51 | 44 | 38 | 48 | 41 | 36 | 31 | | | | | | | | |
| | 6 | 60 | 48 | 39 | 34 | 57 | 46 | 38 | 33 | 43 | 36 | 32 | 27 | | | | | | | | |
| | 7 | 55 | 43 | 35 | 30 | 53 | 42 | 34 | 29 | 39 | 32 | 28 | 24 | | | | | | | | |
| | 8 | 51 | 39 | 31 | 26 | 49 | 38 | 31 | 26 | 35 | 29 | 25 | 21 | | | | | | | | |
| | 9 | 48 | 36 | 28 | 23 | 46 | 35 | 28 | 23 | 33 | 26 | 22 | 19 | | | | | | | | |
| | 10 | 45 | 33 | 26 | 21 | 43 | 32 | 25 | 21 | 30 | 24 | 20 | 17 | | | | | | | | |

RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

DIMENSIONAL DATA**MOUNTING ACCESSORIES**

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

Contractor: Vaughn Industries

Job Name: OSU NROD Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**KL4-332-U-EPUQHEPSN- KHC
KLWG4

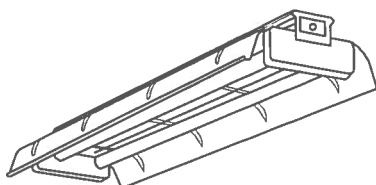
Notes:

Type:**C9**

LSC14-37947

Columbia
LIGHTING**KL BI-PIN**

Premium Industrial / 2, 3, or 4-Lamp T5, T5HO, T8

**FEATURES**

- Available in 4' and 8' lengths
- Reflectors have 15% uplight
- Spring loaded turret lampholders
- 6" lamp spacing
- For individual or continuous row mounting
- Channel ends double as joiners
- Full depth end closures available
- T5/T5HO versions feature rotating locking sockets without turrets

PROJECT INFORMATION

Project Name _____

Type _____

Catalog No. _____

Date _____

CONSTRUCTION

Heavy steel housing with longitudinal reinforcing ribs for extra strength. Reflector die-embossed with transverse ribs for maximum rigidity. Solid top or 15% uplight versions with extruded openings available.

CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

FINISH

White painted parts are treated with a five stage phosphate bonding process and finished with a high reflectance baked enamel.

ELECTRICAL

Standard class "P", thermally protected, auto-resetting HPF ballast, sound rated A. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

ORDERING INFORMATION

EXAMPLE KL4-232-U-EU-GLR-PAF

| KL | MONFI | CITE | NO. OF LAMPS IN CROSS SECTION | LAMP TYPE | REFLECTOR TYPE | VOLTAGE | OPTIONS |
|-----------------------|-------|-------|-------------------------------|--|--|--|---|
| KL Premium Industrial | 4' 4' | 8' 8' | 2 Two 3 Three 4 Four | 28 4' T5 28 Watt 32 4' T8 32, 30, 28 or 25 Watt 54 4' T5HO 54 or 51 Watt | U Apertured Reflector for Uplight (Standard) ST Solid Top (No Uplight) SLR Specular Reflector with Uplight SLRST Specular Reflector Solid Top | U 120V-277V 347 347V | GLR Fast Blow Fuse GMF Slow Blow Fuse EL Emergency Battery Pack BC Branch Circuit Plug-on Wiring System (See options section for details) PAF Paint After Fabrication NYC NYC Compliant NYCU NYC Compliant, Union Label |
| | | | | | | BALLAST | ACCESSORIES (ORDER SEPARATELY) |
| | | | | | | E Electronic T8, Instant Start 4E 4-Lamp Electronic T8, Instant Start EP Electronic T8, Program Start 4EP 4-Lamp Electronic T8, Program Start <small>For others available, see Ballast Options</small> | KZT Zip Tie Hanger - 1/2" spacer on T-bar ceiling KTH Slide Clamp Tong Hanger S18 18" Stem, canopy and 8" aligner SS18 18", 45" Swivel Stem & Canopy KHC 24" Chain Hanging Assembly KLEC Full Depth End Closure KLWG4 Wire Guard 4' lg. - 2 required per 8' fixture KLEGG White Straight Blade Egg Crate Louver 4' - 2 required per 8' fixture |

EPUQHEPSN- Sylvania Programmed Start Ballast

KLWG4 - 4' Wireguard

Page 1/2 Rev. 05/13/10

INDUSTRIALS / KL BI-PIN

© 2010 Columbia Lighting, a division of Hubbell Lighting, Inc. Because of continuing product improvement programs, Columbia Lighting reserves the right to change specifications without notice. 701 Millennium Blvd. Greenville, SC 29607 / Tel: 864.678.1000 / Tech Support: 864.678.1668 / Website: www.columbialighting.com



Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRDOT Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**KL4-332-U-EPUQHEPSN- KHC
KLWG4

Notes:

Type:**C9**

LSC14-37947

Columbia

LIGHTING

KL BI-PIN

Premium Industrial / 2, 3, or 4-Lamp T5, T5HO, T8

PHOTOMETRIC DATA**LUMINAIRE DATA**

Luminaire: KL4-232-OCT-PAF
KL Industrial
1' x 4' 2-Lamp Industrial with
Apertured White Reflector

Ballast: R2P32
Ballast Factor: 0.95
Lamp: FO32/41K
Lumens per Lamp: 2900
Watts: 74
Shielding Angle: N/A
Spacing Criterion: 0° = 1.27 90° = 1.30
Luminous Opening in Feet: Length: 4.00
Width: 1.02
Height: 0.00

ZONAL LUMEN SUMMARY

| Zone | Lumens | % Lamp | % Fixt. |
|--------|--------|--------|---------|
| 0-30 | 1090 | 18.8 | 20.9 |
| 0-40 | 1807 | 31.1 | 34.7 |
| 0-60 | 3314 | 57.1 | 63.6 |
| 0-90 | 4396 | 75.8 | 84.3 |
| 90-120 | 179 | 3.1 | 3.4 |
| 90-130 | 263 | 4.5 | 5.0 |
| 90-150 | 518 | 8.9 | 9.9 |
| 90-180 | 817 | 14.1 | 15.7 |
| 0-180 | 5212 | 89.9 | 100.0 |

Test 10183 Test Date 1/8/03

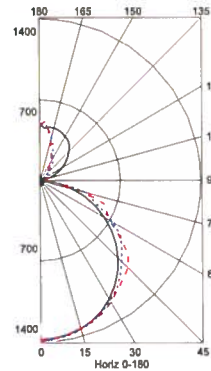
ENERGY DATA

Total Luminaire Efficiency: 89.9%

Luminaire Efficacy Rating (LER): 67

IESNA RP-1-1993 Compliance: Non-Compliant

Comparative Yearly Lighting Energy Cost per 1000 Lumens: \$3.58 based on 3000 hrs. and \$0.08 per KWH

INDOOR CANDELA PLOT**AVG. LUMINANCE (Candela/Sq. M.)**

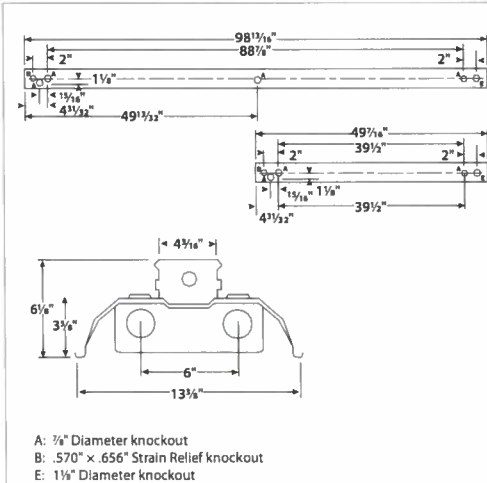
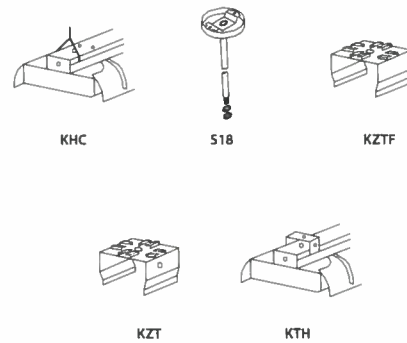
| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 |
|----|------|------|------|------|------|
| 0 | 3654 | 3654 | 3654 | 3654 | 3654 |
| 30 | 3616 | 3622 | 3671 | 3726 | 3717 |
| 40 | 3578 | 3595 | 3706 | 3788 | 3833 |
| 45 | 3544 | 3582 | 3712 | 3921 | 4000 |
| 50 | 3509 | 3579 | 3776 | 4104 | 4059 |
| 55 | 3459 | 3569 | 3923 | 3905 | 3827 |
| 60 | 3387 | 3493 | 3894 | 3704 | 3667 |
| 65 | 3296 | 3477 | 3652 | 3839 | 3964 |
| 70 | 3155 | 3595 | 3718 | 4327 | 4536 |
| 75 | 2956 | 3374 | 4210 | 4353 | 3955 |
| 80 | 2674 | 3464 | 3342 | 2370 | 2355 |
| 85 | 2149 | 2967 | 2876 | 2785 | 2815 |

COEFFICIENTS OF UTILIZATION (%)

| RC | 70 | 80 | 90 | 100 | 70 | 80 | 90 | 100 | 50 | 30 | 10 | 0 |
|----|----|----|----|-----|----|----|----|-----|----|----|----|----|
| 1 | 94 | 90 | 86 | 82 | 90 | 86 | 83 | 79 | 80 | 77 | 74 | 62 |
| 2 | 85 | 78 | 71 | 66 | 81 | 75 | 69 | 64 | 69 | 64 | 61 | 51 |
| 3 | 77 | 68 | 60 | 54 | 74 | 65 | 58 | 53 | 60 | 55 | 50 | 42 |
| 4 | 71 | 60 | 52 | 46 | 67 | 58 | 50 | 45 | 53 | 47 | 42 | 36 |
| 5 | 65 | 53 | 45 | 39 | 62 | 51 | 44 | 38 | 48 | 41 | 36 | 31 |
| 6 | 60 | 48 | 39 | 34 | 57 | 46 | 38 | 33 | 43 | 36 | 32 | 27 |
| 7 | 55 | 43 | 35 | 30 | 53 | 42 | 34 | 29 | 39 | 32 | 28 | 24 |
| 8 | 51 | 39 | 31 | 26 | 49 | 38 | 31 | 26 | 35 | 29 | 25 | 21 |
| 9 | 48 | 36 | 28 | 23 | 46 | 35 | 28 | 23 | 33 | 26 | 22 | 19 |
| 10 | 45 | 33 | 25 | 21 | 43 | 32 | 25 | 21 | 30 | 24 | 20 | 17 |

RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

DIMENSIONAL DATA**MOUNTING ACCESSORIES**

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

Contractor: Vaughn Industries

Job Name: OSU NBDT Building F

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

CAD136-T825NUNV-B01K2 X7

Notes:

Type:**D1**

LSC14-37947

**CAD
Cadillac**

Premium-Grade Surface-Mounted Cube Light With Opal Lens Retained By Spring Loaded Ends

| |
|---------|
| Project |
| Type |
| Date |
| Cat # |

Application Features

Premium-grade, surface-mounted ceiling/wall luminaire. For use with indoor applications where low-glare illumination is required. End caps are spring loaded for a clean look and allow for easy access to fixture for servicing or relamping.

**Specifications****Optical System**

Standard diffuser is soft matt white opal acrylic designed for even and low-glare illumination.

Mounting

Mounting holes are provided. Mounts over electrical junction box.

Construction

Die and brake-formed, heavy-gauge steel housing assembly. Spot-welded for rigidity and clean appearance. End-caps are spring loaded.

Finish

White, polyester powder painted housing. High-reflective coated surface for improved efficiency.

Electrical

Rotary lampholders ensure positive lamp retention. Sufficient knockouts are provided for connections and through wiring.

Approvals

Approved to CSA and UL standards.

Features

- Heavy-duty construction
- Available with 1 or 2 lamps (T5 and T8 configurations)
- Easy re-lamping and re-ballasting
- Row-mountable (requires a joiner bracket)
- Soft matt white opal acrylic wrap-around diffuser

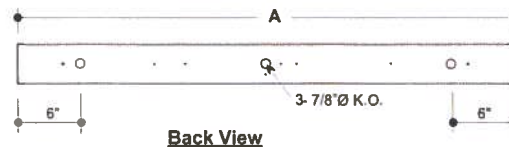
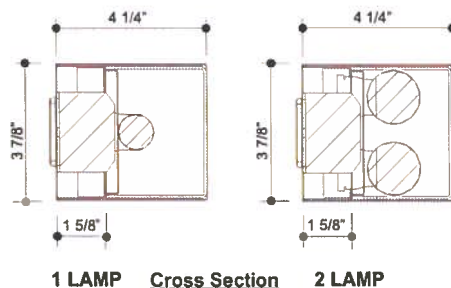
Options & Adders

- Multi-level switching
- Dimmable and Emergency ballast
- Radio interference filter (120V - 277V)
- Prismatic acrylic overlay
- Convenience outlet
- Pull chain switch

Applications

- Corridors
- Utility Areas
- Vanities

ARCHITECTURAL LIGHTING

Dimensions**Back View**

| MODEL | | NOMINAL LENGTH | Length A (In.) |
|--------|--------|----------------|----------------|
| 1 LAMP | 2 LAMP | | |
| 115 | 215 | 15" | 15 1/16" |
| 118 | 218 | 18" | 18 1/16" |
| 124 | 224 | 24" | 24 1/16" |
| 136 | 236 | 36" | 36 1/16" |
| 148 | 248 | 48" | 48 1/16" |

Contractor: Vaughn Industries

Job Name: OSU NBDT Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

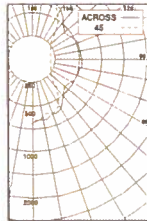
CAD136-T825NUNV-B01K2 X7

Notes:

Type:**D1**

LSC14-37947

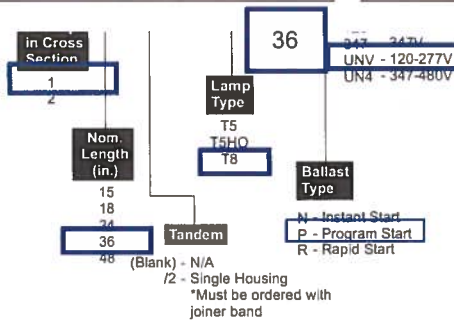
| |
|---------|
| Project |
| Type |
| Date |
| Cat # |

**CAD
Cadillac**Premium-Grade Surface-Mounted Cube Light With Opal Lens
Retained By Spring Loaded Ends**Photometrics** - CAD248T832N120 - Efficiency 75.3%**Candle Distribution****Luminance Summary-CD. / SQ. M.**

| ANGLE | ALONG | 45 | ACROSS |
|-------|-------|-------|--------|
| 45 | 4861 | 5676 | 7099 |
| 55 | 3145 | 5033 | 8420 |
| 65 | 2225 | 5906 | 12423 |
| 75 | 2074 | 9783 | 21195 |
| 85 | 1715 | 28657 | 64856 |

Candle Power Summary

| ZONE | LUMENS | % LAMP | % LUMINAIRE |
|----------|---------|--------|-------------|
| 0 - 30 | 506.80 | 8.60 | 11.40 |
| 0 - 40 | 827.80 | 14.00 | 18.60 |
| 0 - 60 | 1388.80 | 23.50 | 31.30 |
| 0 - 90 | 2210.50 | 37.50 | 49.80 |
| 40 - 90 | - | - | - |
| 60 - 90 | 821.7 | 13.90 | 18.50 |
| 90 - 180 | 2232.60 | 37.80 | 50.30 |
| 0 - 180 | 4443.10 | 75.30 | 100.00 |

Ordering**Example:**

CAD248-T832PUNV-P12

Lamp Watts

| Length | Nominal Lamp Watts | | |
|--------|--------------------|------|----|
| | T5 | T5HO | T8 |
| 15 | - | - | 14 |
| 18 | - | - | 15 |
| 24 | 14 | 24 | 17 |
| 36 | 21 | 39 | 25 |
| 48 | 28 | 54 | 32 |

Other options may be available consult factory.
Specifications and data subject to change without notice.
☐ B01 Ballast Disconnect - In-line Power Disconnect
(CCA UL Req'd For Voltages above 450V)

☐ B02 Dimming Addressable Digital (dali)

☐ B03 Dimming Low Voltage (0-10V)

☐ B04 Dimming Line Voltage

☐ B08 Ballast - High Ballast Factor

☐ B09 Ballast - Low Ballast Factor

☐ B30 Emergency Lighting Battery Pack Specification Grade

☐ B33 Emergency Lighting Battery Pack 1-lamp

☐ B34 Emergency Lighting Battery Pack 2-lamp
Finish Options (white is standard)
☐ F01 Black
Packaging Options (select one only)
☐ K0 Pack Bulk/ Pallet Packed and/or Wrapped
Mounting Options
☐ M15 Mounting Joiner Band
Lens and Shielding Options

(opal white acrylic is standard)

☐ P12 Lens Prismatic Acrylic - P12
Switch Options (select one only)
☐ S1 Switch Pull-chain

☐ S2 Switch Pull-chain three-way

☐ S5 Switch Toggle

☐ S6 Switch Turn
Wiring Options
☐ V02 Convenience Outlet

☐ V25 Radio Frequency Filter
Approval and Rating Options
☐ X7 Dual CSA and USA Markets

Sylvania QHEBallast

K2- 2 fixtures packaged together.

Contractor: Vaughn Industries

Job Name: OSU NBDT Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
CAD124-T817NUNV-B01X7
Notes:

Type:
D2

LSC14-37947



**CAD
Cadillac**

Premium-Grade Surface-Mounted Cube Light With Opal Lens Retained By Spring Loaded Ends

| |
|---------|
| Project |
| Type |
| Date |
| Cat # |

Application Features

Premium-grade, surface-mounted ceiling/wall luminaire. For use with indoor applications where low-glare illumination is required. End caps are spring loaded for a clean look and allow for easy access to fixture for servicing or relamping.



Specifications

Optical System

Standard diffuser is soft matt white opal acrylic designed for even and low-glare illumination.

Mounting

Mounting holes are provided. Mounts over electrical junction box.

Construction

Die and brake-formed, heavy-gauge steel housing assembly. Spot-welded for rigidity and clean appearance. End-caps are spring loaded.

Finish

White, polyester powder painted housing. High-reflective coated surface for improved efficiency.

Electrical

Rotary lampholders ensure positive lamp retention. Sufficient knockouts are provided for connections and through wiring.

Approvals

Approved to CSA and UL standards.

Features

- Heavy-duty construction
- Available with 1 or 2 lamps (T5 and T8 configurations)
- Easy re-lamping and re-ballasting
- Row-mountable (requires a joiner bracket)
- Soft matt white opal acrylic wrap-around diffuser

Options & Adders

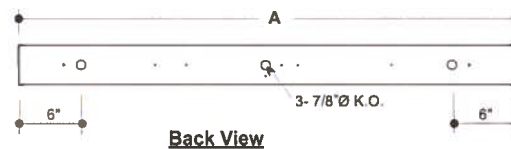
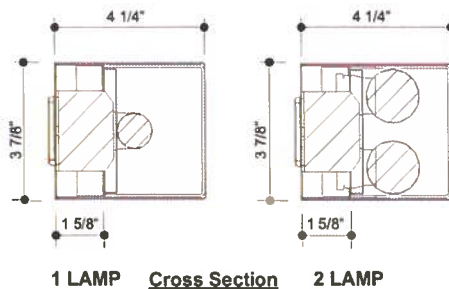
- Multi-level switching
- Dimmable and Emergency ballast
- Radio interference filter (120V - 277V)
- Prismatic acrylic overlay
- Convenience outlet
- Pull chain switch

Applications

- Corridors
- Utility Areas
- Vanities

ARCHITECTURAL LIGHTING

Dimensions



Back View

| MODEL | | NOMINAL LENGTH | Length A (in.) |
|--------|--------|----------------|----------------|
| 1 LAMP | 2 LAMP | | |
| 115 | 215 | 15" | 15 1/16" |
| 118 | 218 | 18" | 18 1/16" |
| 124 | 224 | 24" | 24 1/16" |
| 136 | 236 | 36" | 36 1/16" |
| 148 | 248 | 48" | 48 1/16" |

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

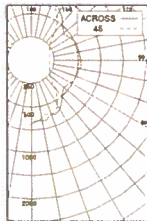
CAD124-T817NUNV-B01X7

Notes:

Type:**D2**

LSC14-37947

| |
|---------|
| Project |
| Type |
| Date |
| Cat # |

**CAD
Cadillac**Premium-Grade Surface-Mounted Cube Light With Opal Lens
Retained By Spring Loaded Ends**Photometrics** - CAD248T832N120 - Efficiency 75.3%**Candle Distribution****Luminance Summary-CD. / SQ. M.**

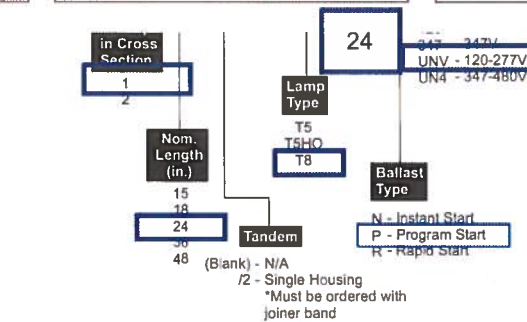
| ANGLE | ALONG | 45 | ACROSS |
|-------|-------|-------|--------|
| 45 | 4861 | 5676 | 7099 |
| 55 | 3145 | 5033 | 8420 |
| 65 | 2225 | 5906 | 12423 |
| 75 | 2074 | 9783 | 21195 |
| 85 | 1715 | 28657 | 64856 |

Candle Power Summary

| ZONE | LUMENS | % LAMP | % LUMINAIRE |
|----------|---------|--------|-------------|
| 0 - 30 | 506.80 | 8.60 | 11.40 |
| 0 - 40 | 827.80 | 14.00 | 18.60 |
| 0 - 60 | 1388.80 | 23.50 | 31.30 |
| 0 - 90 | 2210.50 | 37.50 | 49.80 |
| 40 - 90 | - | - | - |
| 60 - 90 | 821.7 | 13.90 | 18.50 |
| 90 - 180 | 2232.60 | 37.80 | 50.30 |
| 0 - 180 | 4443.10 | 75.30 | 100.00 |

Ordering

ARCHITECTURAL LIGHTING

**Example:**

CAD248-T832PUNV-P12

Lamp Watts

| Length | Nominal Lamp Watts | | |
|--------|--------------------|------|----|
| | T5 | T5HO | T8 |
| 15 | - | - | 14 |
| 18 | - | - | 16 |
| 24 | 14 | 24 | 17 |
| 30 | 21 | 39 | 25 |
| 48 | 28 | 54 | 32 |

Other options may be available consult factory.
Specifications and data subject to change without notice.
☐ B01 Ballast Disconnect - In-line Power Disconnect
(CSA UL Required For Voltages above 480V)

☐ B02 Dimming Addressable Digital (dali)

☐ B03 Dimming Low Voltage (0-10V)

☐ B04 Dimming Line Voltage

☐ B08 Ballast - High Ballast Factor

☐ B09 Ballast - Low Ballast Factor

☐ B30 Emergency Lighting Battery Pack Specification Grade

☐ B33 Emergency Lighting Battery Pack 1-lamp

☐ B34 Emergency Lighting Battery Pack 2-lamp
Finish Options (white is standard)
☐ F01 Black
Packaging Options (select one only)
☐ K0 Pack Bulk/ Pallet Packed and/or Wrapped
Mounting Options
☐ M15 Mounting Joiner Band
Lens and Shielding Options

(opal white acrylic is standard)

☐ P12 Lens Prismatic Acrylic - P12
Switch Options (select one only)
☐ S1 Switch Pull-chain

☐ S2 Switch Pull-chain three-way

☐ S5 Switch Toggle

☐ S6 Switch Turn
Wiring Options
☐ V02 Convenience Outlet

☐ V25 Radio Frequency Filter
Approval and Rating Options
☐ X7 Dual CSA and USA Markets

Sylvania QHE Ballast

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
5010-48-WEC-232L-UNV-ELBPR

Notes:

Type:**D5**

SPEC14-5147

5010

Economical bath and vanity luminaire is available in a variety of lamp and ballast combinations to ensure just the right light for the task.

STANDARD SPECIFICATIONS

HOUSING: Steel, white painted finish with chrome plated or white painted endcaps

DIFFUSER: White acrylic

BALLAST: 120-277V HPF Electronic

LAMP: Linear fluorescent (T8)

**ORDERING INFORMATION**

5010-48-WEC-232L-UNV-ELBPR

2. SIZE

24 L: 24"
36 L: 36"
48 L: 48"

3. WATTAGE**24 SIZE**

17L 1-17W T8, elec. HPF
217L 2-17W T8, elec. HPF

36 SIZE

25L 1-25W T8, elec. HPF
225L 2-25W T8, elec. HPF

48 SIZE

32L 1-32W T8, elec. HPF
232L 2-32W T8, elec. HPF

4. ENDCAPS

CEC Chrome
WEC White

5. AVAILABLE OPTIONS

BAC Buy American Compliant
BBI Integral Battery Backup
BBIC Integral Battery Backup, Cold Weather (36 or 48 size only)
CO Convenience Outlet (120v)
ES4 ENERGY STAR® (elec., HPF) (120v only)
PC Pull Chain (120 volt)

**ELBPR = ELECTRONIC
BALLAST PROGRAM RAPID
START TO BE INSTALLED**



www.brownlee.com

Specifications and dimensions subject to change without notice.
Consult your Brownlee Lighting representative for availability and ordering information

REVISED
2012.1.31

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

HALO®**Description**

The Halo RL560 is a complete LED Baffle-Trim Module for 5" and 6" aperture recessed downlights; suitable for new construction, remodel and retrofit installation. The RL560 is cULus Listed for use with Halo and All-Pro, and is UL Classified for use with other compatible 5" and 6" housings. The RL560 with integral LED driver offers 120 volt dimming capability. The RL560 lens provides uniform illumination and wet location listing. Precision construction makes any housing AIR-TITE for added HVAC savings and code compliance.

| | | |
|-------------|----------------------------|---------------------|
| Catalog # | H750ICAT RL560WH683 | Type |
| Project | RL56TRIMSN | F1, F2 + F11 |
| Comments | OSU - NRD | Date |
| Prepared by | | |

Specification Features**MECHANICAL
Module - Trim**

- Module construction includes LED, heat sink, reflector, lens, baffle and trim ring
- Regressed baffle
- Heat sink designed to conduct heat away from the LED keeping the junction temperatures below specified maximums, even when installed in insulated ceiling environments
- Designer trim finish options (sold separately)
 - White (Paintable) Trim Ring
 - Satin Nickel Trim Ring
 - Tuscan Bronze Trim Ring

Lens

- Regressed lens
- Impact-resistant polycarbonate
- Convex form for lamp-like appearance
- High lumen transmission
- Diffusing for even illumination

Mounting

- Push-N-Twist universal installation clips
- Pre-installed clips designed to fit industry standard 5" and 6" recessed housings

Housing Compatibility

See Housing Compatibility

LED

- Color Temperature (CCT)*
Options: 2700K, 3000K, 3500K, and 4000K
- CRI options: 80 and 90*
 - 90 CRI can be used for California Title 24 compliance/certified to Title 20
 - 80 CRI can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as an LED luminaire

LED Chromaticity

- A tight chromaticity specification ensures LED color uniformity,

sustainable Color Rendering Index (CRI) and Correlated Color Temperature (CCT) over the useful life of the LED

- LED chromaticity of 3 SDCM exceeds ENERGY STAR® color standards per ANSI C78.377- 2008
- 90 CRI model features high color performance with R9 greater than 50
- Every Halo LED is quality tested, measured, and serialized in a permanent record to register lumens, wattage, CRI and CCT
- Halo LED serialized testing and measurement ensures color and lumen consistency on a per-unit basis, and validates long-term product consistency over time

ELECTRICAL**Power Connections**

- LED connector is a non-screw base luminaire disconnect offering easy installation with the matching Halo 5" and 6" LED housings
- LED Connector meets California Title-24 high efficacy luminaire requirement for a non-screw base socket, and where required to qualify as a high efficacy luminaire
- The included E26 medium screw-base Edison adapter provides easy retrofit of incandescent housings (see Housing Compatibility)

Ground Connection

Separate grounding cable included on the module for attachment to the housing during installation.

LED Driver

- Integral to the housing, 120V 50/60 Hz constant current dimmable driver provides high-efficiency operation
- Driver meets FCC 47CFR Part 15 EMI/RFI consumer limits for use in residential and commercial installations
- Driver features high power factor and low THD and has integral thermal protection in the event of over

temperature or internal failure

- If dimming is not required the fixture can be operated from a standard wall switch

Dimming

- Designed for continuous dimming capability to nominally 5% with many 120V Leading Edge (LE) and Trailing Edge (TE) Phase Control dimmers. (Dimmers with low end trim adjustment offer greater assurance of achieving 5% level.)
- Consult dimmer manufacturer for compatibility and conditions of use

Note: some dimmers require a neutral in the wallbox.

Warranty

Cooper Lighting provides a five year limited warranty on RL56 LED.

**Compliance
Labels**

- UL/cUL Listed 1598 Luminaire (with listed housings)
- UL Classified (with other housings - see Housing Compatibility)
- UL/cUL Listed for Damp Location
- UL/cUL Listed for Wet Location - Shower Applications
- IP56 Ingress Protection rated
- May be installed in housings in direct contact with insulation** and combustible material

Compliance

- Airtight certified per ASTM E283 (not exceeding 2.0 CFM under 57 Pascals pressure difference)
- 90 CRI: Can be used to comply with California Title 24 High Efficacy requirements. Certified to California Title 20 Appliance Efficiency Database.*
- 80 CRI: Can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as an LED luminaire
- Can be used for International Energy Conservation Code (IECC) high efficiency luminaire compliance.



RL560WH61
White

600 Series 5/6-Inch LED Recessed Retrofit Module-Trim

80CRI
2700K, 3000K,
3500K, 4000K

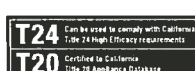
90CRI
2700K, 3000K,
3500K, 4000K

**FOR USE IN
INSULATED CEILING
AND NON- INSULATED
CEILING RATED
HOUSINGS**

**HIGH-EFFICACY LED
WITH INTEGRAL
DRIVER - DIMMABLE**



Refer to ENERGY STAR® Certified Products List.
Can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as a LED Luminaire.



Refer to ENERGY STAR® Certified Products List.
Can be used to comply with California Title 24 High Efficacy requirements.
Certified to California Title 20 Appliance Efficiency Database.

- * Refer to ENERGY STAR® Certified Products List and CEC (T20) Appliance Database for listings.

- ** Not for use with housings in direct contact with spray foam insulation.

- † See ordering information table for available models.

Cooper Lighting
by **EATN**

Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

TD518004EN
March 25, 2015

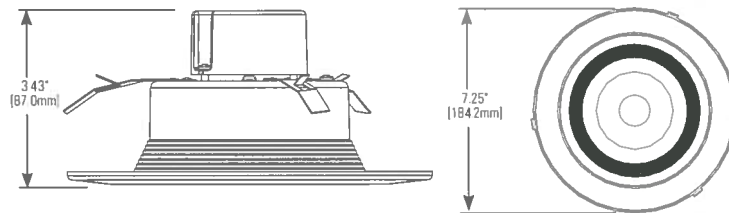
Contractor: Vaughn Industries
RL56 LED System
600 Series

Specification Features Continued

- Can be used for Washington State Energy Code compliance
- ENERGY STAR® Certified luminaire - consult ENERGY STAR® Certified Product List*
- EMI/RFI per FCC 47CFR Part 15 Class B Consumer limits, suitable for use in residential and commercial installations
- Contains no mercury or lead and RoHS compliant.
- Photometric testing in accordance with IES LM-79
- Lumen maintenance projections in accordance with IES LM-80 and TM-21

TYPES F1, F2 + F11

RL56 Dimensions



Energy Data

RL56 Series (Values at non-dimming line voltage)

Minimum Starting Temp: -30°C (-22°F)

EMI/RFI: FCC Title 47 CFR, Part 15, Class B (Consumer)

Sound Rating: Class A

Input Voltage: 120V

Power Factor: >0.90

Input Frequency: 60Hz

THD: <20%

Input Power: 10.5W - RL560WH6827, RL560WH6927, RL560WH6930, RL560WH6935

10W - RL560WH6940, RL560WH6940R, RL560WH6940C

9.4W - RL560WH6830, RL560WH6835

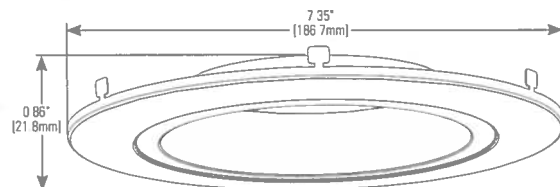
9W - RL560WH6840, RL560WH6840R, RL560WH6840C

Input Current: 0.15A

Maximum IC (Insulated Ceiling) Ambient Continuous Operating Temperature: 25°C (77°F)

Maximum Non-IC Ambient Continuous Operating Temperature 40°C (104°F)

Designer Trim Dimensions



Ordering Information

Sample Number: RL560WH6827-RL56TRMWH

Complete unit includes a RL56 Baffle-Trim LED Module and a 5" or 6" compatible housing, ordered separately. Optional accessory designer trim ring ordered separately.

RL56 600 Series

80 CRI

RL560WH6827= 5 1/2" Retrofit Baffle - Trim LED Module, 80CRI, 2700K, Matte White

RL560WH6830= 5 1/2" Retrofit Baffle - Trim LED Module, 80CRI, 3000K, Matte White

RL560WH6835= 5 1/2" Retrofit Baffle - Trim LED Module, 80CRI, 3500K, Matte White

RL560WH6840= 5 1/2" Retrofit Baffle - Trim LED Module, 80CRI, 4000K, Matte White

90 CRI

RL560WH6927= 5 1/2" Retrofit Baffle - Trim LED Module, 90CRI, 2700K, Matte White

RL560WH6930= 5 1/2" Retrofit Baffle - Trim LED Module, 90CRI, 3000K, Matte White

RL560WH6935= 5 1/2" Retrofit Baffle - Trim LED Module, 90CRI, 3500K, Matte White

RL560WH6940= 5 1/2" Retrofit Baffle - Trim LED Module, 90CRI, 4000K, Matte White

Accessory (Order Separately)

RL56TRMSN=5/6" Satin Nickel Trim Ring

RL56TRMTBZ=5/6" Tuscan Bronze Trim Ring

RL56TRMWH=5/6" White Paintable Trim Ring

RL56CLIP=Replacement kit of 5" and 6" Friction Clips for retrofitting into an existing housing without torsion spring receiving brackets. (One set of clips included with the unit.)

OT400P=Oversize Flat White Metal Trim Ring 6" I.D. x 9-1/4" O.D. (ring slips behind RL56 ring, in stepped configuration)

OT403P=Oversize White Plastic Trim Ring 6" I.D. x 8" O.D. (ring slips behind RL56 ring, in stepped configuration)

TRM690WH=Oversize Matte White Metal Trim Ring. Designed for RL560 ring to inset into oversize ring for an even (non-stepped) trim surface

HE26LED=Replacement screw base adapter (one included with unit)

Housing Compatibility

RL56 Series LED Retrofit is UL Classified for retrofit in the follow 5/6" recessed housings:

The RL Series LED light module - trim combination is cULus Listed or UL Classified for use with any 5 1/2" diameter recessed housing constructed of steel or aluminum with an internal volume that exceeds 107.9 in³ in addition to those noted above.

Cooper Lighting

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

RL56 LED System
600 Series**TYPES F1, F2 + F11****HOUSINGS - Halo and All-Pro UL Listed Compatibility****Compatible Halo LED Housings with LED luminaire connector (high efficacy compliant - Title 24, IECC, WSEC)**

| Recessed Can Size | Catalog Number | Description |
|-------------------|----------------|--|
| 5" | H550ICAT | 5" LED, Insulated Ceiling, AIR-TITE, New Construction Housing |
| | H550RICAT | 5" LED, Insulated Ceiling, AIR-TITE, Remodel Housing |
| | H750ICAT | 6" LED, Insulated Ceiling, AIR-TITE, New Construction Housing |
| 6" | H750RICAT | 6" LED, Insulated Ceiling, AIR-TITE, Remodel Housing |
| | H750T | 6" LED, Non-IC, AIR-TITE, New Construction Housing |
| | H750RINTD010 | 6" LED, Non-IC, AIR-TITE, Remodel International Housing |
| | H750TCP | 6" LED, Non-IC, New Construction/Remodel Chicago Plenum Housing |
| | H2750ICAT | 6" LED, Shallow, Insulated Ceiling, AIR-TITE, New Construction Housing |

Compatible Halo Incandescent E26 Screwbase Housings

| | | |
|-----------|-----------|--|
| 5" | H5ICAT | 5" Insulated Ceiling, AIR-TITE New Construction Housing |
| | H5RICAT | 5" Insulated Ceiling, AIR-TITE Remodel Housing |
| | H5T | 5" Non-IC, New Construction Housing |
| | H5RT | 5" Non-IC, Remodel Housing |
| | H5TM | 5" Non-IC, New Construction Housing (metric version - Canada) |
| | H25ICAT | 5" Shallow, Insulated Ceiling, AIR-TITE New Construction |
| 6" | H7ICAT | 6" Insulated Ceiling, AIR-TITE New Construction Housing |
| | H7RICAT | 6" Insulated Ceiling, AIR-TITE Remodel Housing |
| | H7ICT | 6" Insulated Ceiling, New Construction Housing |
| | H7RICT | 6" Insulated Ceiling, Remodel Housing |
| | H7ICATNB | 6" Insulated Ceiling, AIR-TITE New Construction Housing, No Socket Bracket |
| | H7ICTNB | 6" Insulated Ceiling, New Construction Housing, No Socket Bracket |
| | H7T | 6" Non-IC, New Construction Housing |
| | H7RT | 6" Non-IC, Remodel Housing |
| | H7TNB | 6" Non-IC, New Construction Housing, No Socket Bracket |
| | H7TCP | 6" Non-IC, Chicago Plenum, New Construction/Remodel Housing |
| | H7UICAT | 6" Insulated Ceiling, Universal New Construction Housing |
| | H7UICAT | 6" Insulated Ceiling, Universal, AIR-TITE, New Construction Housing |
| | H27ICAT | 6" Shallow, Insulated Ceiling, AIR-TITE New Construction Housing |
| | H27RICAT | 6" Shallow, Insulated Ceiling, AIR-TITE Remodel Housing |
| | H27ICT | 6" Shallow, Insulated Ceiling, New Construction Housing |
| | H27RICT | 6" Shallow, Insulated Ceiling, Remodel Housing |
| | H27T | 6" Shallow, Non-IC, New Construction Housing |
| | H27RT | 6" Shallow, Non-IC, Remodel Housing |
| | ML7BXRFK | 6" Retrofit Enclosure, Non-IC, BX Whip |
| | ML7E26RFK | 6" Retrofit Enclosure, Non-IC, E26 Screw base Interface |

All-Pro Compatible Incandescent E26 Screwbase Housings

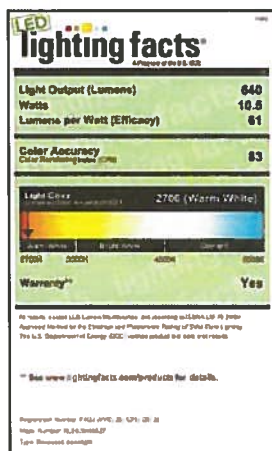
| | | |
|-----------|-----------|--|
| 5" | E1500AT | 5" Insulated Ceiling, AIR-TITE New Construction Housing |
| | E1500RAT | 5" Insulated Ceiling, AIR-TITE Remodel Housing |
| | ET500 | 5" Non-IC, New Construction Housing |
| | ET500R | 5" Non-IC, Remodel Housing |
| | E1700AT | 6" Insulated Ceiling, AIR-TITE New Construction Housing |
| 6" | E1700RAT | 6" Insulated Ceiling, AIR-TITE Remodel Housing |
| | E1700 | 6" Insulated Ceiling, New Construction Housing |
| | E1700R | 6" Insulated Ceiling, Remodel Housing |
| | E1700ATNB | 6" Insulated Ceiling, AIR-TITE New Construction Housing, No Socket Bracket |
| | E1700NB | 6" Insulated Ceiling, New Construction Housing, No Socket Bracket |
| | E1700U | 6" Insulated Ceiling, Universal New Construction Housing |
| | E1700UAT | 6" Insulated Ceiling, Universal, AIR-TITE, New Construction Housing |
| | ET700 | 6" Non-IC, New Construction Housing |
| | ET700R | 6" Non-IC, Remodel Housing |
| | E12700AT | 6" Shallow, Insulated Ceiling, AIR-TITE New Construction Housing |
| | E12700 | 6" Shallow, Insulated Ceiling, New Construction Housing |
| | E12700R | 6" Shallow, Insulated Ceiling, AIR-TITE Remodel Housing |
| | ET2700 | 6" Shallow, Non-IC, New Construction Housing |
| | ET2700R | 6" Shallow, Non-IC, Remodel Housing |

RL56 LED System 600 Series

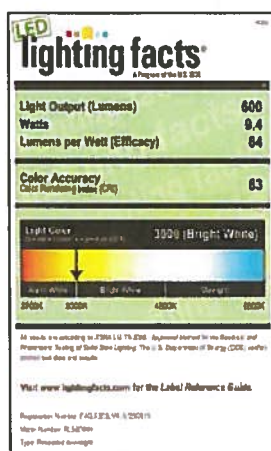
Contractor: Vaughn Industries

Lighting Facts

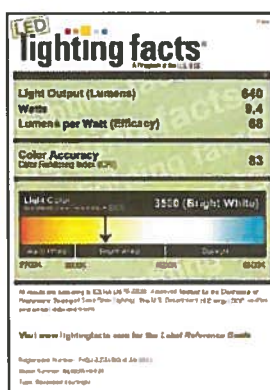
RL560WH6827
2700K Source



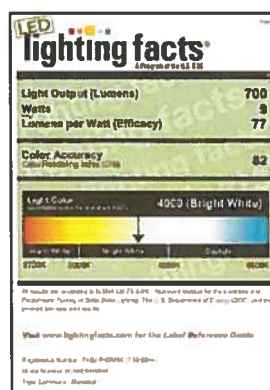
RL560WH6830
3000K Source



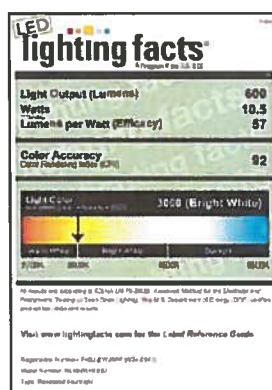
RL560WH6835
3500K Source



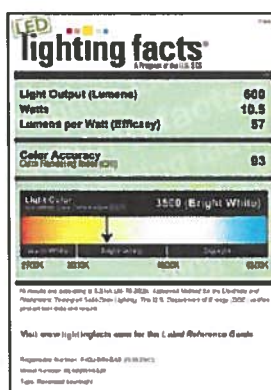
RL560WH6840
4000K Source



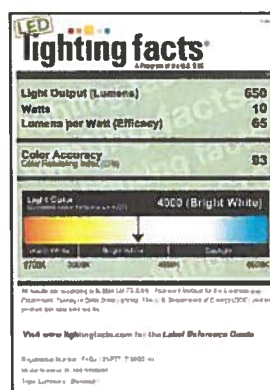
RL560WH6930
3000K Source



RL560WH6935
3500K Source



RL560WH6940
4000K Source



Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
RA4LRM-2-35K12D1-CST4322-LW-CLR
Notes:

Type:
F10

SPEC14-5147

CONTECH
LIGHTING

RA4LRM 4" LED Recessed Downlight: Remodel Housing

Catalog No. _____

Type _____

Project _____

Specifications/Features

Housing/Mounting

Specification grade 4" remodel housing, 5-1/4" O.D. plaster ring flange.
4-7/8" Ceiling opening. Works in ceiling thicknesses from 1/2" - 2".
16 Gauge galvanized steel housing with die-cast aluminum heat sink.
Requires minimum 3" clearance around fixture from insulation material.
Thermal protection provided in case of improper insulation use.
Heavy duty steel plaster ring is secured to ceiling by three (3) spring clamps.
LED drivers are fully accessible from below the ceiling, and with the spring-latch housing attachment, can be easily removed.
Quick-connect LED light engine enables easy installation and removal.

Electrical

UL8750 and Class 2 Compliant; RoHS Compliant, US only.
Output over voltage, over-current and short circuit protection.
Approved for through-circuit wiring. Max.: (4) 12 AWG (2in/2out).
Pre-wired junction box with convenient screwdriver pry-outs. (4) 1/2" concentric knockouts.

Lamp

Light engine consists of a high output multi-chip LED array arranged into a single LED package, enabling precise optical control without requiring lensing to diffuse multiple LED sources.
Excellent fixture-to-fixture color consistency within a 3-step MacAdam Ellipse tolerance.

Dimming

All RA4LRM downlights are available for non-dimming and dimming applications.
For non-dimming applications, use driver option D2.

Trims

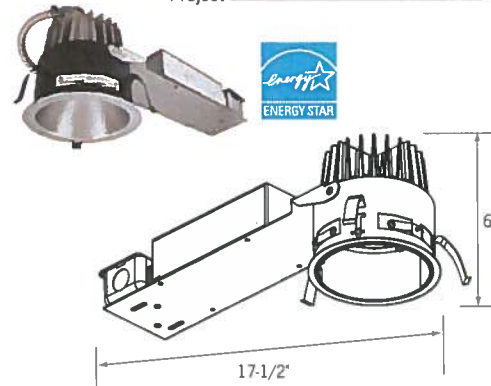
Specification Grade trims are available in several different styles and finishes for your space. Featuring a high quality Alzak™ finish; optically designed for reduced glare while maintaining maximum lumen output. See "4" LED Recessed Trims" spec sheet for information and details.

Warranty

This complete fixture is covered by Con-Tech's full five (5) year replacement guarantee after date of purchase.

Labels/Usage

CSAus Certified to UL Standards. Suitable for damp locations.
CSA Certified to UL Standards. Refer to trim spec sheet for Canada compliant trims.
Energy Star approved when used with CST4322L-CLR (all beam distributions) and CST4322L-PL trims. Not approved for high CRI options.
Assembled in the USA.



Ceiling Opening: 4-7/8"
Ceiling Thickness: 1/2" - 5/8"

| | 1000 Series | 2000 Series |
|-------------------------------|---------------------|---------------------|
| Input Voltage | | |
| Non-dimming | 90-305V AC, 47-63Hz | 90-305V AC, 47-63Hz |
| 0-10V dimming | 90-305V AC, 47-63Hz | 90-305V AC, 47-63Hz |
| Triac dimming | 90-135V AC, 47-63Hz | Not Available |
| Lutron HiLume® Dimming | 120V AC, 50/60Hz | 120V AC, 50/60Hz |
| Input Wattage | 16 | 29 |
| Output Current (mA) | 350 | 700 |
| Color Temp | 2700K/3000K/3500K | 2700K/3000K/3500K |
| CRI: Standard / High | 83 (80min) / 93+ | 83 (80min) / 93+ |
| Driver | | |
| Power Factor | > 0.90 | > 0.90 |
| THD | < 20% | < 20% |
| Dimming | | |
| 0-10V | 15-100% | 15-100% |
| Triac | 10-100% | Not Available |
| Lutron HiLume® | 1-100% | 1-100% |
| Emergency Batt. Backup | Not Available | Not Available |

Ordering Information

Example Order: RA4LRM — I30K12D2 CST4322LN-CLR

| Housing | LED Module/Color Temp | Electrical/Dimming | Trim Type |
|--|---------------------------|---------------------------------------|---|
| RA4LRM-2-35K12D1-CST4322-LW-CLR | | | |
| RA4LRM | 1000 Series | 12D1 - 120V Triac Dimming | <ul style="list-style-type: none"> All Others Leave Blank W - Wall Wash |
| | 127K - 16W/2700K | 12D2 - 120V Non-Dimming/0-10V Dimming | |
| | 130K - 16W/3000K | 12D3 - 120V Lutron HiLume® Dimming | |
| | 135K - 16W/3500K | 27D2 - 277V Non-Dimming/0-10V Dimming | |
| | 127KC - 16W/2700K/93+ CRI | | |
| | 130KC - 16W/3000K/93+ CRI | | |
| | 135KC - 16W/3500K/93+ CRI | | |
| | 2000 Series | | |
| | 227K - 29W/2700K | | |
| | 230K - 29W/3000K | | |
| | 235K - 29W/3500K | | |
| | 227KC - 29W/2700K/93+ CRI | | |
| | 230KC - 29W/3000K/93+ CRI | | |
| | 235KC - 29W/3500K/93+ CRI | | |

* Trims

See "4" LED Recessed Trims" sheet for trim information and details.

1-847-559-5500

www.contechlighting.com

Please Recycle

All specifications subject to change without notice.

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
RA4LRM-2-35K12D1-CST4322-LW-CLR
Notes:

Type:**F10**

SPEC14-5147

CONTECH
LIGHTING

RA4L
4" LED Recessed Downlight

Catalog No. _____

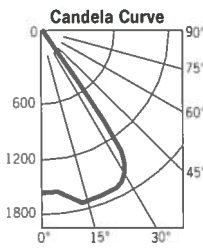
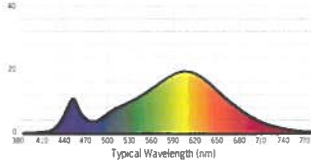
Type _____

Project _____

Photometrics**RA4LNC-230K12D2/CST4322LW-CLR**

Designed for 50,000 Hour Lamp Life*; LM-79 Test No. 70358

Light Output (Fixture Delivered Lumens): 2056
Total Watts@120V: 28.6
Lumens Per Watt: 72
Color Rendering Index (CRI): 83
Color Temperature (CCT): 3079K Warm White
Spectral Power Distribution Chart³



| FROM 0 | CANDELA | LUMENS |
|--------|---------|--------|
| 0 | 1553 | |
| 5 | 1519 | 150 |
| 15 | 1731 | 489 |
| 25 | 1714 | 783 |
| 35 | 924 | 542 |
| 45 | 78 | 64 |
| 55 | 24 | 21 |
| 65 | 6 | 6 |
| 75 | 2 | 1 |
| 85 | 0 | 0 |
| 95 | 0 | |

Intensity Distribution

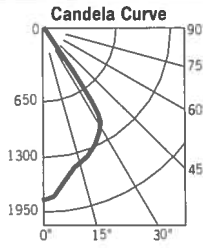
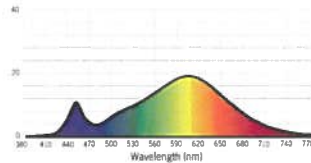
| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 | 43.1 | 7.7 |
| 8 | 24.3 | 10.3 |
| 10 | 15.5 | 12.9 |
| 12 | 10.8 | 15.5 |
| 14 | 7.9 | 18.0 |
| 16 | 6.1 | 20.6 |

Beam Distribution: 72°
Spacing Criteria: 1.29

RA4LNC-230K12D2/CST4322L-PL

Designed for 50,000 Hour Lamp Life*; LM-79 Test No. 70359

Light Output (Fixture Delivered Lumens): 1806
Total Watts@120V: 29.5
Lumens Per Watt: 61
Color Rendering Index (CRI): 82
Color Temperature (CCT): 3080K Warm White
Spectral Power Distribution Chart³



| FROM 0 | CANDELA | LUMENS |
|--------|---------|--------|
| 0 | 1855 | |
| 5 | 1725 | 161 |
| 15 | 1502 | 428 |
| 25 | 1347 | 616 |
| 35 | 721 | 436 |
| 45 | 139 | 112 |
| 55 | 40 | 39 |
| 65 | 10 | 11 |
| 75 | 2 | 2 |
| 85 | 0 | 0 |
| 95 | 0 | |

Intensity Distribution

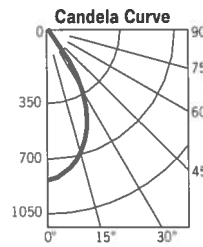
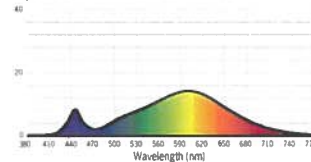
| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 | 51.5 | 6.0 |
| 8 | 29.0 | 8.0 |
| 10 | 18.5 | 10.0 |
| 12 | 12.9 | 12.1 |
| 14 | 9.5 | 14.1 |
| 16 | 7.2 | 16.1 |

Beam Distribution: 68°
Spacing Criteria: 1.0

RA4LNC-230K12D2/CTR4323L-CLR

Designed for 50,000 Hour Lamp Life*; LM-79 Test No. 72139

Light Output (Fixture Delivered Lumens): 876
Total Watts@120V: 28.7
Lumens Per Watt: 31
Color Rendering Index (CRI): 81
Color Temperature (CCT): 3168K Warm White
Spectral Power Distribution Chart³



| FROM 0 | CANDELA | LUMENS |
|--------|---------|--------|
| 0 | 812 | |
| 5 | 907 | 76 |
| 15 | 931 | 196 |
| 25 | 778 | 239 |
| 35 | 479 | 180 |
| 45 | 236 | 99 |
| 55 | 131 | 52 |
| 65 | 61 | 24 |
| 75 | 16 | 8 |
| 85 | 3 | 3 |
| 95 | 0 | |

Footcandles on Wall

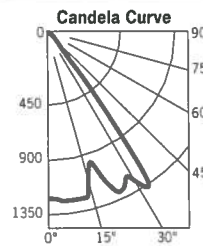
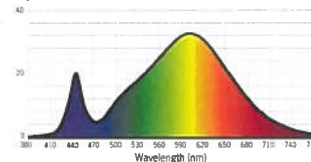
| Distance from Ceiling | 0 | 1 | 2 | 3 | 4 | 5 |
|-----------------------|----|---|---|---|---|---|
| 1 | 3 | 2 | 1 | 0 | 0 | 0 |
| 2 | 8 | 6 | 3 | 1 | 0 | 0 |
| 3 | 9 | 8 | 4 | 2 | 1 | 0 |
| 4 | 10 | 8 | 5 | 3 | 1 | 1 |
| 5 | 9 | 8 | 5 | 3 | 1 | 1 |
| 6 | 7 | 7 | 5 | 3 | 2 | 1 |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 8 | 4 | 4 | 3 | 3 | 2 | 1 |
| 9 | 3 | 3 | 3 | 2 | 2 | 1 |

beam center

RA4LNC-230K12D2/CTR4326L-CLR-P

Designed for 50,000 Hour Lamp Life*; LM-63 Test No. 71563

Light Output (Fixture Delivered Lumens): 1730
Total Watts@120V: 29
Lumens Per Watt: 60
Color Rendering Index (CRI): 82
Color Temperature (CCT): 3138K Warm White
Spectral Power Distribution Chart³



| FROM 0 | CANDELA | LUMENS |
|--------|---------|--------|
| 0 | 1258 | |
| 5 | 1280 | 122 |
| 15 | 1107 | 326 |
| 25 | 1256 | 587 |
| 35 | 628 | 461 |
| 45 | 105 | 84 |
| 55 | 53 | 49 |
| 65 | 29 | 29 |
| 75 | 14 | 16 |
| 85 | 5 | 6 |
| 95 | 5 | |

Intensity Distribution

| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 | 34.9 | 8.0 |
| 8 | 19.7 | 10.6 |
| 10 | 12.6 | 13.3 |
| 12 | 8.7 | 15.9 |
| 14 | 6.4 | 18.6 |
| 16 | 4.9 | 21.2 |

Beam Distribution: 70°
Spacing Criteria: 1.30

1. Accuracy of rendering colors
2. Color appearance of light source
3. Colors present within the light source

*Dependent on surrounding temperatures

For the 1000 Series/16W data, multiply results by .50

1-847-559-5500

www.contechlighting.com

Please Recycle

All specifications subject to change without notice.

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

DOWNLIGHTS

LCLCV6 - 6" DOWNLIGHT SERIES

FEATURES

CONSTRUCTION

- Side lit design for an ultra thin profile
- IC rated, IP44-suitable for damp or dry locations
- Wide beam angle (120°) for better spacing
- CE and cULus rated
- RoHS compliant
- 5 year warranty (standard)

ELECTRICAL

- Dimmable (via driver or using PWM)⁽¹⁾
- Constant voltage design allows for multiple lights per driver
- LM-80 and LM-79 available
- Downlights should be placed within 50 feet of driver
- Rated at 12W max AC power (10W DC)⁽²⁾

| | |
|--------------|-----------------|
| Project Name | OSU NRDT |
| Date | |
| Type | F12 |



| | |
|------------------|---------------------|
| TILT Part Number | LCL CV 6 35W |
| TILT Driver | LDND16 |

| LUMEN PACKAGES (6" DOWNLIGHT) ⁽¹⁾ | | | | |
|--|---------------------------|------|------|------|
| CCT | 50,000 hours (L70) | | | |
| | STANDARD 90+ CRI, R9 > 50 | | | |
| 5000k | Lumens | 750 | 696 | 439 |
| | LPW | 62.3 | 63.6 | 65.6 |
| 4000k | Lumens | 700 | 550 | 352 |
| | LPW | 56.1 | 59.5 | 61.3 |
| 3500k | Lumens | 675 | 514 | 329 |
| | LPW | 53.3 | 57.2 | 58.9 |
| 3000k | Lumens | 650 | 478 | 306 |
| | LPW | 50.6 | 54.8 | 56.4 |

ORDERING INFORMATION

| LCL | CV | 6 | 50 | W |
|--------------------|------------------------------|---------------|--|--|
| Fixture Type | Distribution Type | Size | CCT | Frame Color ⁽⁴⁾ |
| LCL - Light | CV - Constant Voltage | 6 - 6" | 50 - 5,000K 40 - 4,000K 35 - 3,500K 30 - 3,000K | W - White B - Black S - Silver + - special order |

USE
WITH

| Driver | |
|--------|----------|
| LDND16 | LD16PE7 |
| LD16 | LD60PE7 |
| LD60 | LD90PE7 |
| LD60P | LD100PE7 |
| LD90 | |
| LD100P | |

DRIVER SPECIFICATION

NOTE on DRIVERS: UL 8750, short circuit, over current, over voltage, and over temperature protection
UL registered and CE rated, RoHS compliant
Class II, SELV, IP67

| Model ⁽⁵⁾ | Size in Inches (LxWxH) | AC Input | DC Output | Dimming ⁽⁹⁾ | Temp | Max Fixtures ⁽⁸⁾ |
|----------------------|------------------------|-------------|-----------|------------------------|------------|-----------------------------|
| LDND16 | 3.00" x 1.50" | 90 - 264VAC | 16W | 1-10V | -40C - 60C | 1 |
| LD16 | 6.00" x 1.625" | 90 - 305VAC | 16W | 1-10V | -40C - 60C | 1 |
| LD60 | 6.50 x 1.63 x 1.26 | 90 - 305V | 60W | 1-10V | -40C - 60C | 5 |
| LD60P | 12.50 x 2.38 x 1.50 | 90 - 305V | 60W | 1-10V | -40C - 70C | 5 |
| LD90 | 6.34 x 2.40 x 1.26 | 90 - 305V | 90W | 1-10V | -40C - 60C | 8 |
| LD100P | 14.50 x 2.63 x 1.58 | 90 - 305V | 100W | 1-10V | -40C - 60C | 8 |

| Emergency ⁽⁷⁾ | Size in Inches (LxWxH) | AC Input | Output ⁽⁶⁾ | Lumens | Temp | Max Fixtures ⁽⁸⁾ |
|--------------------------|------------------------|-----------|-----------------------|-----------|----------|-----------------------------|
| LD16PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 1 |
| LD60PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 4 |
| LD90PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 8 |
| LD100PE7 | 13.00 x 5.50 x 1.75 | 90 - 305V | 7W for 90 mins | 400 - 600 | 0C - 50C | 8 |

NOTES (NUMBERS)

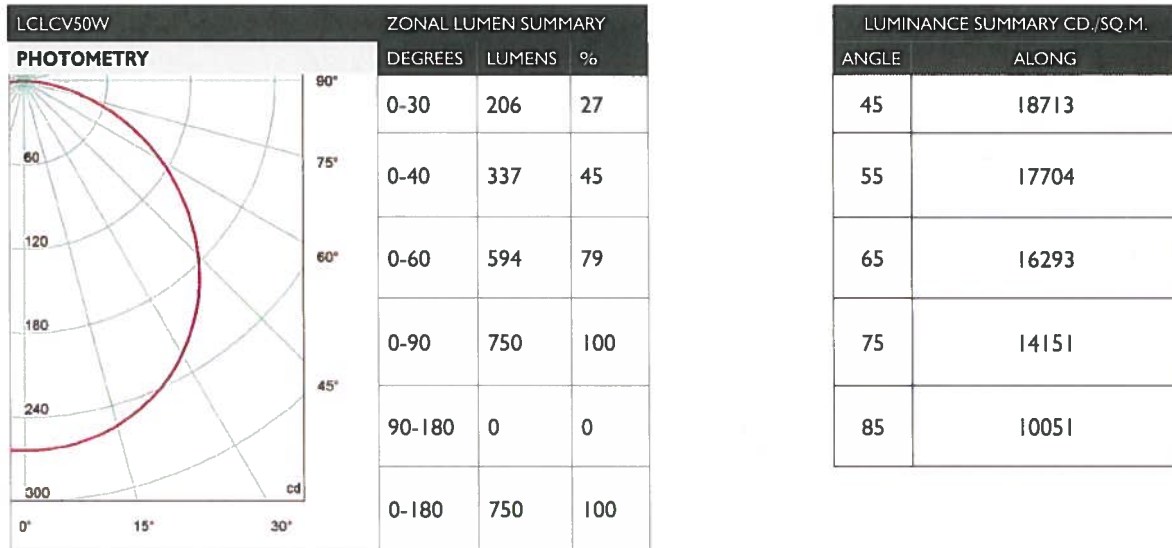
- (1) See driver or dimming product sheet for specific details
- (2) AC W used for circuit power, DC W used for driver circuit
- (3) Lumen packages provided using Dim Chip with driver
- (4) Colors other than white are custom
- (5) "P" designation after watt rating denotes Plenum Rated
- (6) Based on watt load of fixtures and driver output
- (7) See Product Sheet for Emergency Drivers
- (8) Safe amount of fixtures per driver
- (9) TILT drivers use a 1-10V control but are compatible with most 0-10V control systems. For details specific to your system, contact us at 855.440.8458



Contractor: Vaughn Industries

TILT DOWNLIGHT SERIES LCLCV6

PHOTOMETRIC CHARTS WITH TESTING DATA. CALL FOR SPECIFIC INFORMATION NOT LISTED HERE: 855.440.8458



| | COEFFICIENT OF UTILIZATION | | | | | | | | |
|----|----------------------------|------|------|------|------|------|------|------|------|
| | 80% | | | 70% | | | 50% | | |
| | 70 | 50 | 30 | 70 | 50 | 30 | 50 | 30 | 10 |
| 0 | 1.19 | 1.19 | 1.19 | 1.16 | 1.16 | 1.16 | 1.11 | 1.11 | 1.11 |
| 1 | 1.10 | 1.05 | 1.01 | 1.07 | 1.03 | 0.99 | 0.99 | 0.96 | 0.93 |
| 2 | 1.00 | 0.93 | 0.87 | 0.98 | 0.91 | 0.85 | 0.87 | 0.83 | 0.78 |
| 3 | 0.92 | 0.82 | 0.74 | 0.90 | 0.80 | 0.73 | 0.78 | 0.72 | 0.66 |
| 4 | 0.85 | 0.73 | 0.65 | 0.83 | 0.72 | 0.65 | 0.70 | 0.63 | 0.58 |
| 5 | 0.78 | 0.66 | 0.57 | 0.76 | 0.64 | 0.56 | 0.62 | 0.55 | 0.50 |
| 6 | 0.72 | 0.59 | 0.50 | 0.70 | 0.58 | 0.50 | 0.56 | 0.49 | 0.43 |
| 7 | 0.66 | 0.53 | 0.44 | 0.64 | 0.52 | 0.44 | 0.50 | 0.43 | 0.38 |
| 8 | 0.61 | 0.48 | 0.39 | 0.60 | 0.47 | 0.39 | 0.46 | 0.38 | 0.33 |
| 9 | 0.57 | 0.43 | 0.35 | 0.55 | 0.43 | 0.35 | 0.41 | 0.34 | 0.29 |
| 10 | 0.53 | 0.40 | 0.31 | 0.51 | 0.39 | 0.31 | 0.38 | 0.31 | 0.26 |

NOTES

- Lifespan: 50,000 hrs (L70)
- LM79 and LM80 available upon request. Call 855.440.8458
- IES files available online at: laurenillumination.com/resources



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2162 Reiser Avenue SE | New Philadelphia, OH 44663 P: 855.440.8458 | F: 330.339.1515
laurenillumination.com | laureninternational.com

~~Contractor: Vaughn Industries~~~~Job Name: OSU NBDT Building E~~

Submitted by Lighting Systems of Columbus


Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
WMR-42F1-PC

Notes: LAMP INCLUDED

Type:**K1**

LSC14-37947

WM SERIESCOMPACT
WALL SCONCE

| | | |
|--------|------|-----------|
| Cat. # | | Approvals |
| Job | Type | |

**APPLICATIONS**

- Accent wall sconces for mounting heights on 8-12 ft.

SPECIFICATIONS

- Shipped as full cutoff downlight
 - Units have an internal shield that when removed allows up/down distribution
- UV stabilized polycarbonate front is decorative yet rugged.
- Die cast housing provides rigid mounting and dissipates ballast/lamp heat.
- Silicone gasket seals out moisture and insects.
- Fluorescent units feature 120V photocontrol for dusk to dawn energy saving control.
- 70 watt pulse start units have Tri-Tap® ballast (120, 277, 347V) and are shipped less photocontrol. PBT-1 or PBT-234 may be field installed if photocontrol is desired.
- All units include lamp(s).

LISTINGS

- All units are UL 1598 listed for USA and Canada.



| | A | B | C | D | E |
|------------|----------------------------------|---------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| WMR | 14 ⁵ / ₈ " | 5 ¹ / ₂ " | 7 ⁵ / ₁₆ " | 4 ¹³ / ₁₆ " | 6 ¹¹ / ₁₆ " |
| | 370 mm | 140 mm | 185 mm | 121 mm | 170 mm |
| WMS | 14 ⁵ / ₈ " | 5 ¹ / ₂ " | 6 ⁵ / ₁₆ " | 4 ¹³ / ₁₆ " | 6 ¹¹ / ₁₆ " |
| | 370 mm | 140 mm | 160 mm | 121 mm | 170 mm |

ORDERING INFORMATION

| Catalog Number ¹ | Shape | Wattage | Voltage | Photocontrol | Weight | |
|-----------------------------|--------|-------------------|---------------|--------------|--------|-------|
| | | Radius Style | | | lbs | (kg) |
| WMR-213F1-PC | Radius | 2X13 FLU | 120 | Yes | 6.5 | (2.9) |
| WMR-42F1-PC | Radius | 42 FLU | 120 | Yes | 6.0 | (2.7) |
| WMR-70P6 | Radius | 70 PS | 120, 277, 347 | No | 11.0 | (5.0) |
| | | Soft Square Style | | | | |
| WMS-213F1-PC | Square | 2X13 FLU | 120 | Yes | 6.5 | (2.9) |
| WMS-42F1-PC | Square | 42 FLU | 120 | Yes | 6.0 | (2.7) |
| WMS-70P6 | Square | 70 PS | 120, 277, 347 | No | 11.0 | (5.0) |

¹ All units have molded-in dark bronze finish and include lamps.

Due to our continued efforts to improve our products, product specifications are subject to change without notice.



Hubbell Outdoor Lighting • 701 Millennium Boulevard • Greenville, SC 29607 • PHONE: 864-678-1000
For more information visit our web site: www.hubbell-llg.com

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

WMR-42F1-PC

Notes: LAMP INCLUDED

Type:**K1**

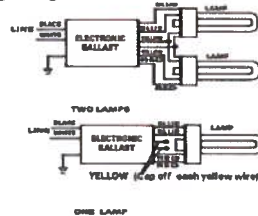
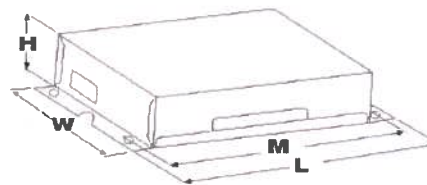
LSC14-37947

**ANTRON ELECTRONICS CO. LTD.**CSS-UV42PS@277V

| | |
|-----------------|-------------|
| Ballast Type | Electronic |
| Starting Method | Rapid Start |
| Lamp Connection | Series |
| Input Voltage | 120-277 |
| Input Frequency | 60HZ |
| Status | Active |
| Safety Approval | UL/CUL |

ELECTRICAL SPECIFICATIONS

| Lamp Type | NO. of Lamps | Rated Lamp Watts | Min Start Temp (°F/°C) | Input Current (Amps) | Input Power (ANSI Watts) | Ballast Factor | MAX THD % | Power Factor | MAX Lamp Current Crest Factor | BEF |
|-----------|--------------------|------------------------|------------------------------|----------------------------|--------------------------------|-------------------|-----------------|-----------------|-------------------------------------|------|
| PLT26W | 2 | 26 | -22/-30 | 0.18 | 53 | 0.86 | 15 | 0.99 | 1.7 | 1.62 |
| PLT42W | 1 | 42 | -22/-30 | 0.14 | 39 | 0.8 | 15 | 0.98 | 1.7 | 2.05 |
| PLT32W | 1 | 32 | -22/-30 | 0.11 | 30 | 0.8 | 15 | 0.98 | 1.7 | 2.67 |
| PLT26W | 1 | 26 | -22/-30 | 0.1 | 27 | 0.88 | 15 | 0.98 | 1.7 | 3.26 |
| PLL40W | 1 | 40 | -22/-30 | 0.13 | 37 | 0.78 | 15 | 0.98 | 1.7 | 2.11 |
| PLL39W | 1 | 39 | -22/-30 | 0.11 | 29 | 0.49 | 15 | 0.98 | 1.7 | 1.69 |
| PLL36W | 1 | 36 | -22/-30 | 0.1 | 28 | 0.73 | 15 | 0.98 | 1.7 | 2.61 |
| PLL24W | 1 | 24 | -22/-30 | 0.08 | 22 | 0.8 | 30 | 0.95 | 1.7 | 3.64 |
| 2D28W | 1 | 28 | -22/-30 | 0.1 | 28 | 0.67 | 15 | 0.98 | 1.7 | 2.39 |

Wiring Diagram**Enclosure****Standard Lead Length(inch/cm)**

| | in. | cm. | | in. | cm. |
|--------|-----|-----|--------------|-----|-----|
| Black | | | Yellow/Blue | | |
| White | | | Blue/White | | |
| Blue | | | Brown | | |
| Red | | | Orange | | |
| Yellow | | | Orange/Black | | |
| Gray | | | Black/White | | |

| Over All(L) | Width(W) | Height(H) | Mounting(M) |
|-------------|----------|-----------|-------------|
| 13.3cm | 6.3cm | 3cm | 12.3cm |
| 5.36" | 2.48 | 1.18 | 4.84 |

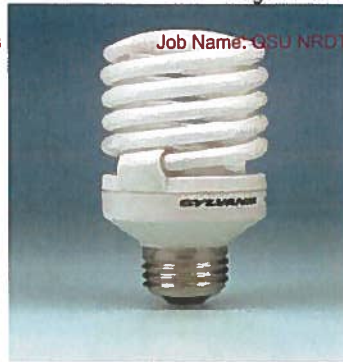


Revised 03/22/2004

Data is based upon tests performed by Antron Electronics in a controlled environment and representative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Contractor: Vaughn Industries

Job Name: OSU NRD Building F



Product Number: 20720
Order Abbreviation: CF23EL/MICRO/835/RP3
General Description: 23W Compact Fluorescent Micro Mini with integral 120V ballast medium screw base color temperature 3500K 82 CRI 10,000 hour life
Price: 7.94 USD
Quantity: 1
EA

Job: OSU - NRD
Lamp for Types:
A40 + A76

| Product Information | |
|------------------------------|-------------------------------|
| Abbrev. With Packaging Info. | CF23ELMICRO835RP3 18/CS 3/SKU |
| Average Rated Life (hr) | 10000 |
| Base | Medium |
| Bulb | MICROMINI |

Product Details

Page 2 of 2



Footnotes

- Approximate initial lumens after 100 hours operation.
- Minimum starting temperature for DULUX EL lamps is 0° F, unless otherwise specified in product literature.
- DULUX ELs meet CSA, FCC and UL requirements.
- Caution: DULUX EL units cannot be used on dimming circuits (unless the lamp is labeled dimmable), emergency exit fixtures or lights, electronic timers, photocells, lighted switches or any other switches that do not meet UL20 Sec. 7.6.15. In outdoor applications, use only in enclosed fixtures to avoid exposure to weather. Use only on 120V, 60 Hz circuits. Never disassemble or modify lamp. Install or remove unit from fixture by grasping plastic base. Best performance achieved when operated at 77degrees F (25 degrees C). 40 Watt lamp is designed for base down orientation only
- 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 for DULUX EL lamps is 0 degrees F
- 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.



2101 S High St. Columbus, Ohio 43207
Phone: 614/445-8871 Fax: 614/445-8871

Contractor: Vaughn Industries

www.sylvania.com

DULUX® T/E/IN ECOLOGIC® 4-Pin Amalgam Compact Fluorescent Lamps

Job: OSU - NRDT Lamps for Types:

CF26DTEIN835ECO - TYPES A47, A75, A78

CF32DTEIN835ECO - TYPES A45

CF42DTEIN835ECO - A73, A74 + K1

Key Features & Benefits

- Improved lumen output vs. non-amalgam triple tube lamps
 - Maintains 90% lumens from 40° to 140°F ambient
- Long 12,000 to 16,000 hour average rated life
- Fast run-up to full brightness
- ECOLOGIC passes Federal TCLP Test*
- RoHS compliant
- Operates electronic ballasts systems
 - Flicker-free starting and dimmable
 - Compatible with QUICKTRONIC® PROStart CF
- High luminous efficacy
- Rare earth tri-phosphor with 82 CRI
- Less power consumption than incandescent of comparable light output

SYLVANIA DULUX T/E/IN compact fluorescent lamps are ideal for use in a wide range of commercial and residential applications. They are designed to be operated on energy efficient electronic and dimming ballasts.

SYLVANIA DULUX T/E/IN lamps are long-life, energy-saving alternatives for incandescent lamps. Amalgam technology provides higher lumens over a much wider temperature range than non-amalgam lamps. The triple tube configuration of these lamps allows for single-lamp luminaire designs with improved efficacy and photometric performance.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.



* Regulations may vary. Check your local and state regulations.

Product Offering

| Lamp | Wattage | CCT |
|-------------|---------|----------------------------|
| CF18DT/E/IN | 18 | 2700K, 3000K, 3500K, 4100K |
| CF26DT/E/IN | 26 | 2700K, 3000K, 3500K, 4100K |
| CF32DT/E/IN | 32 | 2700K, 3000K, 3500K, 4100K |
| CF42DT/E/IN | 42 | 2700K, 3000K, 3500K, 4100K |
| CF57DT/E/IN | 57 | 3000K, 3500K, 4100K |

Application Information

Applications

- Recessed downlights
- Surface mounted luminaires
- Wall sconces

Application Notes

1. 4-pin lamps are designed for use with programmed rapid start ballasts. Not recommended for use with IS ballasts.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC PROStart CF electronic ballasts are UCSA Certified and FCC 47CFR Part 18 Consumer Rated.
6. For horizontal operation, install lamp with etch facing down.
7. QUICKTRONIC ballasts feature QUICKSENSE® circuitry for end-of-life protection required by NEMA.

Contractor: Vaughn Industries

Job: OSU - NRDT
Lamp for Fixtures Types:
A45, A47, A73, A74, A75, A78, K1

Ordering Information

| Item Number | Ordering Abbreviation | NEMA Generic Designation | Base | Watts | Volts ¹ | Amps ¹ | Initial Lumens | Mean Lumens ² | CCT | CRI | Avg. Rated Life (hrs.) ³ |
|-------------|-----------------------|--------------------------|---------|-------|--------------------|-------------------|----------------|--------------------------|-------|-----|-------------------------------------|
| 20875 | CF18DT/E/IN/827/ECO | CFTR18W/GX24q/27 | GX24q-2 | 18 | 80 | .210 | 1,200 | 1,032 | 2700K | 82 | 12,000 |
| 20876 | CF18DT/E/IN/830/ECO | CFTR18W/GX24q/30 | GX24q-2 | 18 | 80 | .210 | 1,200 | 1,032 | 3000K | 82 | 12,000 |
| 20877 | CF18DT/E/IN/835/ECO | CFTR18W/GX24q/35 | GX24q-2 | 18 | 80 | .210 | 1,200 | 1,032 | 3500K | 82 | 12,000 |
| 20878 | CF18DT/E/IN/841/ECO | CFTR18W/GX24q/41 | GX24q-2 | 18 | 80 | .210 | 1,200 | 1,032 | 4100K | 82 | 12,000 |
| 20879 | CF26DT/E/IN/827/ECO | CFTR26W/GX24q/27 | GX24q-3 | 26 | 80 | .300 | 1,800 | 1,548 | 2700K | 82 | 16,000 |
| 20880 | CF26DT/E/IN/830/ECO | CFTR26W/GX24q/30 | GX24q-3 | 26 | 80 | .300 | 1,800 | 1,548 | 3000K | 82 | 16,000 |
| 20881 | CF26DT/E/IN/835/ECO | CFTR26W/GX24q/35 | GX24q-3 | 26 | 80 | .300 | 1,800 | 1,548 | 3500K | 82 | 16,000 |
| 20882 | CF26DT/E/IN/841/ECO | CFTR26W/GX24q/41 | GX24q-3 | 26 | 80 | .300 | 1,800 | 1,548 | 4100K | 82 | 16,000 |
| 20883 | CF32DT/E/IN/827/ECO | CFTR32W/GX24q/27 | GX24q-3 | 32 | 100 | .320 | 2,400 | 2,064 | 2700K | 82 | 16,000 |
| 20884 | CF32DT/E/IN/830/ECO | CFTR32W/GX24q/30 | GX24q-3 | 32 | 100 | .320 | 2,400 | 2,064 | 3000K | 82 | 16,000 |
| 20885 | CF32DT/E/IN/835/ECO | CFTR32W/GX24q/35 | GX24q-3 | 32 | 100 | .320 | 2,400 | 2,064 | 3500K | 82 | 16,000 |
| 20886 | CF32DT/E/IN/841/ECO | CFTR32W/GX24q/41 | GX24q-3 | 32 | 100 | .320 | 2,400 | 2,064 | 4100K | 82 | 16,000 |
| 20887 | CF42DT/E/IN/827/ECO | CFTR42W/GX24q/27 | GX24q-4 | 42 | 135 | .320 | 3,200 | 2,752 | 2700K | 82 | 16,000 |
| 20888 | CF42DT/E/IN/830/ECO | CFTR42W/GX24q/30 | GX24q-4 | 42 | 135 | .320 | 3,200 | 2,752 | 3000K | 82 | 16,000 |
| 20871 | CF42DT/E/IN/835/ECO | CFTR42W/GX24q/35 | GX24q-4 | 42 | 135 | .320 | 3,200 | 2,752 | 3500K | 82 | 16,000 |
| 20890 | CF42DT/E/IN/841/ECO | CFTR42W/GX24q/41 | GX24q-4 | 42 | 135 | .320 | 3,200 | 2,752 | 4100K | 82 | 16,000 |
| 20896 | CF57DT/E/IN/830/ECO | CFTR57W/GX24q/30 | GX24q-5 | 57 | 182 | .320 | 4,300 | 3,698 | 3000K | 82 | 12,000 |
| 20897 | CF57DT/E/IN/835/ECO | CFTR57W/GX24q/35 | GX24q-5 | 57 | 182 | .320 | 4,300 | 3,698 | 3500K | 82 | 12,000 |
| 20899 | CF57DT/E/IN/841/ECO | CFTR57W/GX24q/41 | GX24q-5 | 57 | 182 | .320 | 4,300 | 3,698 | 4100K | 82 | 12,000 |

Notes:

1. Measured on high-frequency ballast
2. Measured at 40% of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still functional.

Ordering Guide

| | | | | | | | | | | |
|-------------|--------------------|--------|---|------------|---|---------|---|--------------|---|-----------|
| CF | 26 | DT | / | E | / | IN | / | 835 | / | ECO |
| Compact | Wattage | DULUX® | | Electronic | | Amalgam | | 8 = 82 CRI | | ECOLOGIC® |
| Fluorescent | 18, 26, 32, 42, 57 | Triple | | Ballast | | | | 27=2700K CCT | | |
| | | | | | | | | 30=3000K CCT | | |
| | | | | | | | | 35=3500K CCT | | |
| | | | | | | | | 41=4100K CCT | | |

System Comparison

Compact Fluorescent vs. Incandescent

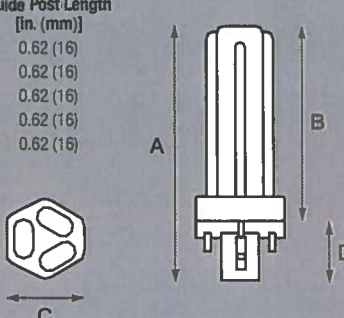
| Lamp Type | Rated Lamp Life (hrs.) | System Lumens | System Wattage | System LPW | Energy Savings* |
|------------------------------------|------------------------|---------------|----------------|------------|-----------------|
| 100W Incandescent | 750 | 1,710 | 100 | 17 | — |
| DULUX T/E/IN 26W w/QUICKTRONIC® CF | 18,000 | 1,800 | 28 | 64 | \$115 |
| 150W Incandescent | 750 | 2,740 | 150 | 18.5 | — |
| DULUX T/E/IN 42W w/QUICKTRONIC CF | 16,000 | 3,200 | 46 | 70 | \$66 |

* Based on an energy cost of \$0.10/kWh over the life of the lamp.

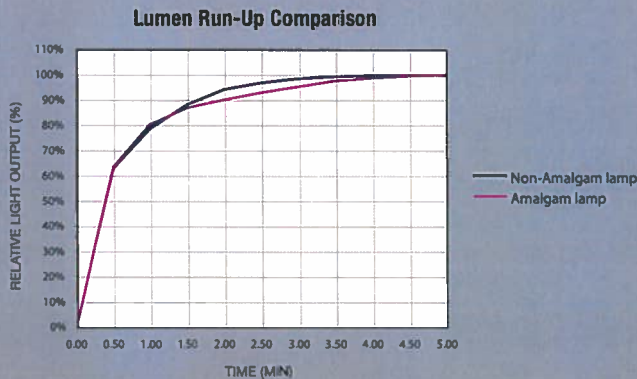
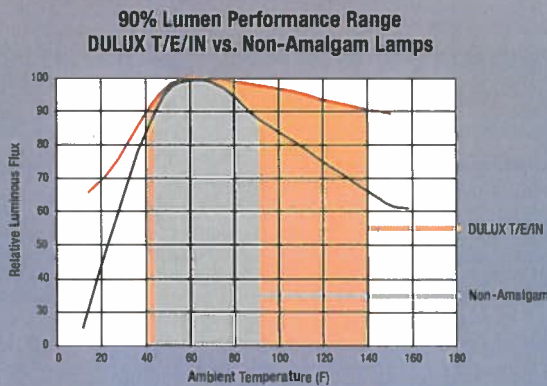
Contractor: Vaughn Industries

Lamp Dimensions

| | (A) MOL [in. (mm)] | (B) Max. Base Face to Top of Lamp [in. (mm)] | (C) Max. Base Width [in. (mm)] | (D) Guide Post Length [in. (mm)] |
|-------------|--------------------------|--|--------------------------------------|--|
| CF18DT/E/IN | 4.37 (111) | 3.74 (95) | 1.90 (48) | 0.62 (16) |
| CF26DT/E/IN | 4.96 (126) | 4.33 (110) | 1.90 (48) | 0.62 (16) |
| CF32DT/E/IN | 5.59 (142) | 4.96 (126) | 1.90 (48) | 0.62 (16) |
| CF42DT/E/IN | 6.42 (163) | 5.78 (147) | 1.90 (48) | 0.62 (16) |
| CF57DT/E/IN | 7.76 (197) | 7.13 (181) | 1.90 (48) | 0.62 (16) |



Technical Information



Related Literature

For maximum energy savings consider pairing with the following electronic ballast:

Ballast Technology Applications & Specification Guide (Literature Code: ECS-Electronic2009)

QUICK 60+® System Warranty (Literature Code: ECS140)

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QUICKTRONIC and DULUX are registered trademarks of OSRAM GmbH.
Specifications subject to change without notice.

CF055R3

Date Submitted: Sept. 2, 2015

Sample Specification

Lamp(s) shall be (a) DULUX® (CF18DT/E/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN or CF57DT/E/IN) ECOLOGIC® lamps and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 to 16,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, -3, -4 or -5) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC® ballasts. Both lamps and ballasts are covered by the QUICK 60+® system warranty.

United States

OSRAM SYLVANIA

100 Endicott Street
Danvers, MA 01923
1-800-LIGHTBULB

Trade

Phone: 800-255-5042
Fax: 800-255-5043

National Accounts

Phone: 800-562-4671
Fax: 800-562-4674

OEM/Special Markets

Phone: 800-762-7191
Fax: 800-762-7192

Retail

Phone: 800-842-7010
Fax: 800-842-7011

SYLVANIA Lighting Services

Phone: 800-323-0572
Fax: 800-537-0784

Display/Optic

Phone: 888-677-2627
Fax: 855-543-1043

Canada

OSRAM SYLVANIA LTD.

2001 Drew Road
Mississauga, ON L5S 1S4
1-800-LIGHTBULB

Trade

Phone: 800-263-2852
Fax: 800-667-6772

OEM/Special Markets/Display/Optic

Phone: 800-265-2852
Fax: 800-667-6772

Retail

Phone: 800-720-2852
Fax: 800-667-6772

SYLVANIA Lighting Services

Phone: 800-663-4268
Fax: 866-239-1278

Mexico

OSRAM MEXICO

Tultitlan/Edo de Mexico
Phone: 011-52-55-58-99-18-50

ENCELIUM Technologies

United States

Phone: 201-928-2400
Fax: 201-928-4028

Canada

Phone: 905-731-7678
Fax: 905-731-1401

www.sylvania.com



Contractor: Vaughn Industries

Job Name: OSU NRD T Building F

www.sylvania.com

OCTRON® 800 ECOLOGIC® Fluorescent Lamps

Job: OSU NRD T

Lamp for Types:

FO17/835/ECO - TYPE D2

FO25/835/ECO - TYPE D1

FO32/835/ECO - TYPES A5, A6, A7, A10,
B2, B17, B24, C2, C8, C9, D5

Key Features & Benefits

- Passes Federal TCLP test*
- Energy efficient T8 lamp
- Made in the USA
- Lead free
- RoHS compliant
- Compatible with QUICKTRONIC® electronic ballasts
- QUICK 60+® System Warranty

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

* Regulations may vary. Check your local and state regulations.



OCTRON 800 ECOLOGIC T8 lamps offer a high quality solution for general purpose fluorescent lighting applications where color is important. These lamps are available in a wide range of color temperatures: 3000K, 3500K, 4100K and 5000K that feature improved color rendering and lumen maintenance when compared to 700 series lamps. When paired with QUICKTRONIC electronic ballasts, these systems are a good alternative to T12 fluorescent systems and are covered by the comprehensive QUICK 60+ system warranty.

Product Offering

| Ordering Abbreviation | Wattage | Lumens | CRI |
|-----------------------|---------|--------|-----|
| FO17/800/ECO | 17 | 1350 | 82 |
| FO25/800/ECO | 25 | 2150 | 82 |
| FO32/800/ECO | 32 | 2950 | 85 |
| FO40/800/ECO | 40 | 3650 | 82 |
| FO96/800/ECO | 96 | 5900 | 82 |

Application Information

Applications

- Cove
- Recessed troffer
- Strip light fixture
- Valance

Application Notes

1. Lamps starting down to -20°F (dependent on ballast)
2. Operation below 50°F may affect lumen output or lamp operation.
3. For cold temperature applications, use in enclosed fixture or use tube to maximize lamp performance.
4. For rapid start operation, check with ballast manufacturer for ground plane requirement.
5. For maximum energy savings, operate on electronic instant start ballast.



2101 S High St. Columbus, Ohio 43207
Phone: 614/445-8871 Fax: 614/445-8871

SEE THE WORLD IN A NEW LIGHT



FL085R1 11/10

Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Ordering Information

| Item Number | Ordering Abbreviation | Nominal Length | Initial Lumens | Mean Lumens ¹ | Rated Life | | | | CCT | CRI |
|-------------|-----------------------|----------------|----------------|--------------------------|---------------|------------------|--------------|---------------|-------|-----|
| | | | | | Instant Start | Programmed Start | Rapid Start | | | |
| | | | | | 3 hrs/ start | 12 hrs/ start | 3 hrs/ start | 12 hrs/ start | | |
| 22135 | F017/830/ECO | 24 | 1,350 | 1,269 | 24,000 | 28,000 | 30,000 | 36,000 | 3000K | 82 |
| 22136 | F017/835/ECO | 24 | 1,350 | 1,269 | 24,000 | 28,000 | 30,000 | 36,000 | 3500K | 82 |
| 22137 | F017/841/ECO | 24 | 1,350 | 1,269 | 24,000 | 28,000 | 30,000 | 36,000 | 4100K | 82 |
| 22138 | F025/830/ECO | 36 | 2,150 | 2,021 | 24,000 | 28,000 | 30,000 | 36,000 | 3000K | 82 |
| 22139 | F025/835/ECO | 36 | 2,150 | 2,021 | 24,000 | 28,000 | 30,000 | 36,000 | 3500K | 82 |
| 22140 | F025/841/ECO | 36 | 2,150 | 2,021 | 24,000 | 28,000 | 30,000 | 36,000 | 4100K | 82 |
| 21777 | F032/830/ECO | 48 | 2,950 | 2,773 | 24,000 | 28,000 | 30,000 | 36,000 | 3000K | 85 |
| 21779 | F032/835/ECO | 48 | 2,950 | 2,773 | 24,000 | 28,000 | 30,000 | 36,000 | 3500K | 85 |
| 21781 | F032/841/ECO | 48 | 2,950 | 2,773 | 24,000 | 28,000 | 30,000 | 36,000 | 4100K | 85 |
| 22143 | F032/850/ECO | 48 | 2,950 | 2,773 | 24,000 | 28,000 | 30,000 | 36,000 | 5000K | 80 |
| 22144 | F040/830/ECO | 60 | 3,650 | 3,431 | 24,000 | 28,000 | 30,000 | 36,000 | 3000K | 82 |
| 22145 | F040/835/ECO | 60 | 3,650 | 3,431 | 24,000 | 28,000 | 30,000 | 36,000 | 3500K | 82 |
| 22146 | F040/841/ECO | 60 | 3,650 | 3,431 | 24,000 | 28,000 | 30,000 | 36,000 | 4100K | 82 |
| 22147 | F096/830/ECO | 96 | 5,900 | 5,428 | 18,000 | 24,000 | | | 3000K | 82 |
| 22148 | F096/835/ECO | 96 | 5,900 | 5,428 | 18,000 | 24,000 | | | 3500K | 82 |
| 22149 | F096/841/ECO | 96 | 5,900 | 5,428 | 18,000 | 24,000 | | | 4100K | 82 |
| 22173 | F096/850/ECO | 96 | 5,900 | 5,428 | 18,000 | 24,000 | | | 5000K | 82 |

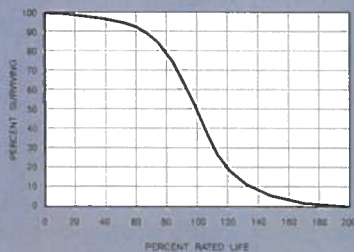
1. Mean lumens measured at 40% of rated life.

Ordering Guide

| FO | 32 | / | 8 | 35 | / | ECO |
|-------------|----------------------------|---|---------------|----------------|---|----------|
| Fluorescent | Wattage: | | 8 = 80-85 CRI | 30 = 3000K CCT | | ECOLOGIC |
| OCTRON | 17, 25, 32, 40 or 96 watts | | | 35 = 3500K CCT | | |
| | | | | 41 = 4100K CCT | | |
| | | | | 50 = 5000K CCT | | |

Technical Information

Typical Fluorescent Lamp Mortality



Related Literature

For maximum energy savings consider pairing with the following electronic ballast:

Ballast Technology Applications & Specification Guide (Literature Code: ECS-Electronic2009)

QUICK 60+® System Warranty (Literature Code: ECS140)



2101 S High St. Columbus, Ohio 43207
Phone: 614/445-8871 Fax: 614/445-8871

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OCTRON, ECOLOGIC and QUICK 60+ are registered trademarks of OSRAM SYLVANIA Inc.
QUICKTRONIC is a registered trademark of OSRAM GmbH.

FL085R1 11/10

Date Submitted: Sept. 2, 2015

Job: OSU NRDT
Lamp for Types:
A5, A6, A7, A10
B2, B17, B24
C2, C8, C9
D1, D2,

Sample Specification

Lamp(s) shall be an OCTRON® ECOLOGIC® lamp(s) (F017/ECO, F025/ECO, F032/ECO, F040/ECO and F096/ECO) having medium bi-pin bases. Lamp(s) shall be designed to pass the Federal TCLP test in force at the time of manufacture. Lamp(s) shall have a correlated color temperature of (3000K, 3500K, 4100K or 5000K) and a CRI of (80, 82 or 85). The OCTRON lamp(s) shall be operated on dedicated QUICKTRONIC® ballast(s) with complete system warranty from one manufacturer covering lamp(s) and ballast(s).

United States
OSRAM SYLVANIA
100 Endicott Street
Danvers, MA 01923

Trade
Phone: 1-800-255-5042
Fax: 1-800-255-5043

National Accounts
Phone: 1-800-562-4671
Fax: 1-800-562-4674

OEM/Special Markets
Phone: 1-800-762-7191
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Display/Optic
Phone: 1-888-677-2627
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Canada
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Phone: 1-800-263-2852
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Phone: 1-800-265-2852
Fax: 1-800-667-6772

www.sylvania.com

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

www.sylvania.com

PENTRON® ECOLOGIC® T5 Linear Fluorescent Lamps

Job: OSU NRDT
Lamp for Types: A16, A17, A18, B25
FP28/835/ECO

Key Features & Benefits

- High Performance T5 lamps
 - Up to 104 LPW
 - 95% lumen maintenance
 - Peak lumen output at 35°C (95°F)
 - Dimmable
 - Ideal for occupancy sensor applications
- Up to 36,000 hours lamp life
- TCLP and RoHS compliant
- Made in the USA
- Lead free glass
- Greater luminaire design flexibility
- Nominal 2', 3', 4', and 5'
- QUICK 60+ system warranty offered when paired with QUICKTRONIC T5 electronic ballast

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

* Regulations may vary. Check your local and state regulations.



PENTRON ECOLOGIC T5 lamps offer a high quality lighting solution for linear fluorescent applications where luminaire design flexibility is important. These lamps are available in 2, 3, 4 and 5-foot lengths and offer a wide range of color temperatures: 2700K, 3000K, 3500K, 4100K, 5000K and 6500K. When paired with a QUICKTRONIC® T5 ballast, these systems are covered by the comprehensive QUICK 60+® system warranty.



This light source meets restrictions on hazardous substances.



Product Offering

| Ordering Abbreviation | Watts | CCT |
|-----------------------|-------|--|
| FP14/800/ECO | 14 | 3000K, 3500K, 4100K, 6500K |
| FP21/800/ECO | 21 | 3000K, 3500K, 4100K, 6500K |
| FP28/800/ECO | 28 | 2700K, 3000K, 3500K, 4100K, 5000K, 6500K |
| FP35/800/ECO | 35 | 3000K, 3500K, 4100K |

Application Information

Applications

- Cove and valance
- Direct / indirect luminaires
- Facade luminaires
- Low profile surface mount
- Shallow recessed fixtures
- Showcase
- Signage



2101 S High St. Columbus, Ohio 43207
Phone: 614/445-8871 Fax: 614/445-8871

Application Notes

1. PENTRON ECO lamps are about 2" shorter than T8 & T12 Bi-Pin lamps.
2. Miniature Bi-Pin bases will not install into T8 & T12 sockets.
3. Miniature Bi-Pin bases require UL Listed 600 Volt rated sockets.
4. Requires high frequency programmed rapid start electronic ballasts for T5s equipped with end-of-life sensing circuit.
5. PENTRON ECO operates at same current for uniform color and brightness between nominal 2', 3', 4', and 5' lengths.
6. Apply thermal factor in calculations for use in exterior or unheated applications.

Electronic instant start ballast.

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

Job: OSU NRDT
Lamp for Types:

A16, A17, A18, B25



Ordering Information

| Item Number | Ordering Abbreviation | Base | Watt | Nominal Length (In) | Initial Lumens @ 25°C | Mean Lumens @ 25°C | Initial Lumens @ 35°C | Mean Lumens @ 35°C | Programmed 3 hrs/start | Rapid Start 12 hrs/start | CCT | CRI |
|-------------|-----------------------|------------------|------|---------------------|-----------------------|--------------------|-----------------------|--------------------|------------------------|--------------------------|-------|-----|
| 20907 | FP14/830/ECO | Miniature Bi-Pin | 14 | 24 | 1,200 | 1,140 | 1,350 | 1,285 | 25,000 | 28,000 | 3000K | 85 |
| 20908 | FP14/835/ECO | Miniature Bi-Pin | 14 | 24 | 1,200 | 1,140 | 1,350 | 1,285 | 25,000 | 28,000 | 3500K | 85 |
| 20914 | FP14/841/ECO | Miniature Bi-Pin | 14 | 24 | 1,200 | 1,140 | 1,350 | 1,285 | 25,000 | 28,000 | 4100K | 85 |
| 20988 | FP14/865/ECO | Miniature Bi-Pin | 14 | 24 | 1,100 | 1,045 | 1,300 | 1,235 | 25,000 | 28,000 | 6500K | 85 |
| 20919 | FP21/830/ECO | Miniature Bi-Pin | 21 | 36 | 1,900 | 1,805 | 2,100 | 1,995 | 25,000 | 28,000 | 3000K | 85 |
| 20921 | FP21/835/ECO | Miniature Bi-Pin | 21 | 36 | 1,900 | 1,805 | 2,100 | 1,995 | 25,000 | 28,000 | 3500K | 85 |
| 20924 | FP21/841/ECO | Miniature Bi-Pin | 21 | 36 | 1,900 | 1,805 | 2,100 | 1,995 | 25,000 | 28,000 | 4100K | 85 |
| 20989 | FP21/865/ECO | Miniature Bi-Pin | 21 | 36 | 1,750 | 1,665 | 2,000 | 1,900 | 25,000 | 28,000 | 6500K | 85 |
| 20975 | FP28/827/ECO | Miniature Bi-Pin | 28 | 48 | 2,600 | 2,470 | 2,900 | 2,755 | 30,000 | 36,000 | 2700K | 85 |
| 20868 | FP28/830/ECO | Miniature Bi-Pin | 28 | 48 | 2,600 | 2,470 | 2,900 | 2,755 | 30,000 | 36,000 | 3000K | 85 |
| 20901 | FP28/835/ECO | Miniature Bi-Pin | 28 | 48 | 2,600 | 2,470 | 2,900 | 2,755 | 30,000 | 36,000 | 3500K | 85 |
| 20902 | FP28/841/ECO | Miniature Bi-Pin | 28 | 48 | 2,600 | 2,470 | 2,900 | 2,755 | 30,000 | 36,000 | 4100K | 85 |
| 22203 | FP28/850/ECO | Miniature Bi-Pin | 28 | 48 | 2,545 | 2,420 | 2,840 | 2,700 | 30,000 | 36,000 | 5000K | 85 |
| 20990 | FP28/865/ECO | Miniature Bi-Pin | 28 | 48 | 2,400 | 2,280 | 2,750 | 2,615 | 30,000 | 36,000 | 6500K | 85 |
| 20925 | FP35/830/ECO | Miniature Bi-Pin | 35 | 60 | 3,300 | 3,135 | 3,650 | 3,470 | 25,000 | 28,000 | 3000K | 85 |
| 20926 | FP35/835/ECO | Miniature Bi-Pin | 35 | 60 | 3,300 | 3,135 | 3,650 | 3,470 | 25,000 | 28,000 | 3500K | 85 |
| 20927 | FP35/841/ECO | Miniature Bi-Pin | 35 | 60 | 3,300 | 3,135 | 3,650 | 3,470 | 25,000 | 28,000 | 4100K | 85 |

Ordering Guide

| FP | 14 | / | 8 | 30 | / | ECO® |
|----------------------------|---------------------------------------|---|------------|--|---|-----------|
| Fluorescent PENTRON® T5 | Wattage: 14, 21, 28 or 35 watts | | 8 = 85 CRI | 27 = 2700K CCT, 30 = 3000K CCT 35 = 3500K CCT, 41 = 4100K CCT 50 = 5000K CCT, 65 = 6500K CCT | | ECOLOGIC® |



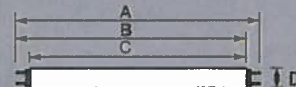
2101 S High St. Columbus, Ohio 43207
Phone: 614/445-8871 Fax: 614/445-8871

Contractor: Vaughn Industries

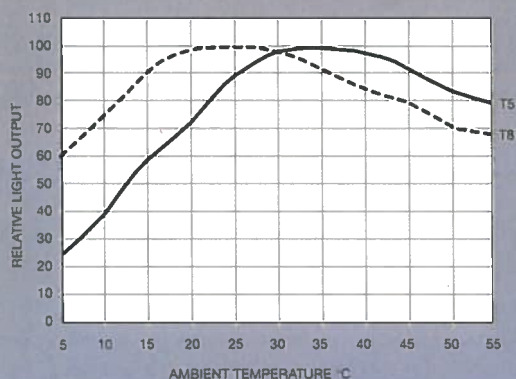
Technical Information

Dimensions

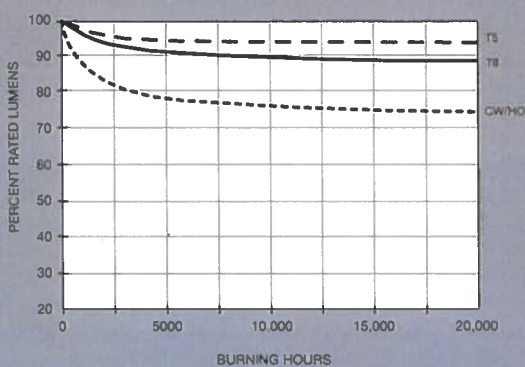
| Ordering Abbreviation | (A) Max. Overall Length mm (in.) | (B) Base Face to Opposite Pin mm (in.) | (C) Base Face to Base Face mm (in.) | (D) Max. Outside Diameter mm (in.) |
|-----------------------|-------------------------------------|---|--|---------------------------------------|
| FP14 | 563.2 (22.17) | 553.7 - 556.1 (21.80 - 21.89) | 547.1 - 549.0 (21.54 - 21.61) | 17.0 (0.67) |
| FP21 | 863.2 (33.89) | 853.7 - 856.1 (33.61 - 33.70) | 847.1 - 849.0 (33.35 - 33.43) | 17.0 (0.67) |
| FP28 | 1163.2 (45.80) | 1153.7 - 1156.1 (45.42 - 45.52) | 1147.1 - 1149.0 (45.16 - 45.24) | 17.0 (0.67) |
| FP35 | 1463.2 (57.61) | 1453.7 - 1456.1 (57.23 - 57.33) | 1447.1 - 1449.0 (56.97 - 57.05) | 17.0 (0.67) |



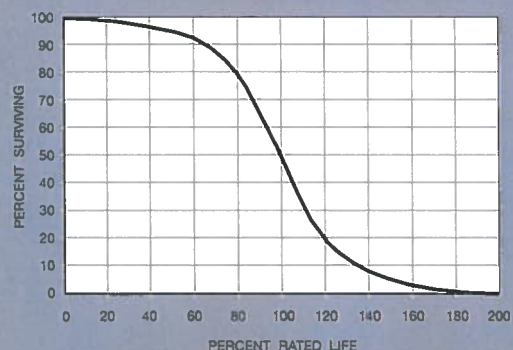
Lumen Output vs. Temperature T8/T5



Fluorescent Lamp Lumen Maintenance



Typical Fluorescent Lamp Mortality



Related Literature

For optimum system performance and warranty pair with QUICKTRONIC® electronic ballast systems:

Ballast Technology Applications & Specification Guide (Literature Code: ECS-Electronic2009)

QUICK 60+® System Warranty (Literature Code: ECS140)

ULTRA LED A-line Lamps

Omnidirectional

OSU NRDT
Type: A79



Key Features & Benefits

- Dimmable down to 10%*
- Long life: up to 25,000 hours (L70)
- UV and IR free
- Mercury and lead free
- RoHS compliant
- Available in 2700K and 5000K color temperatures
- Suitable for indoor/outdoor environments
- Reduces energy consumption up to 83%
- Last up to 33 times longer than incandescent lamps
- No warm-up time, instant-on with full light output and stable color

* Performance may vary depending on dimmer used in application. Please refer to Dimmer Compatibility List (RETRO-DIM) for a list of compatible dimmers or visit www.SYLVANIA.com/LEDretrofit



Rated up to 25,000 hours at 70% lumen maintenance, SYLVANIA ULTRA LED A-line omnidirectional lamps offer years of service and reduce energy and maintenance costs. SYLVANIA ULTRA LED lamps are environmentally preferred products. They are RoHS compliant and contain no mercury, lead or other hazardous materials. They emit no UV or IR radiation. A CRI of 80+ ensures good color definition and with warm white 2700K and cool 5000K color temperature, these lamps can be used in many applications in both homes and businesses.

Product Offering

| Ordering Abbreviation | Wattage | Color Temperature | Typical Lumens |
|-----------------------|---------|-------------------|----------------|
| LED7W A19 | 7 | 2700K & 5000K | 450 |
| LED11W A19 | 11 | 2700K | 800 |
| LED12W A19 | 12 | 5000K | 900 |
| LED13W A19 | 13 | 2700K & 5000K | 1100 & 1250 |
| LED17W A21 | 17 | 2700K & 5000K | 1600 & 1750 |

Application Information

Applications

- Downlights
- Pendant fixtures
- Table lamps
- Wall sconces

Market Segments

- Healthcare
- Hospitality
- Residential
- Retail

Application Notes

1. Operating temperature range between -20°C and +45°C (-4°F and + 113°F)
2. Not for use with emergency light fixtures or exit lights
3. Use in open fixture
4. Suitable for damp locations

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For FCC Part 15 user information, please see www.sylvania.com/fcc15b

RETR0053R15 3-15

C.E.D. 2101 S. High St. Columbus, Oh 43207

Phone: 614/445-8871 / Fax: 614/445-7705

Date Submitted: Sept, 2, 2015



Distributor: C.E.D. Columbus, Oh 43207

Specification Data

Catalog #
Project **OSU NRDT**
Comments
Prepared by

Type
A79

Ordering Information

| Item Number | Ordering Abbreviation | Wattage (W) | Base Type | Replaces | Input Voltage (V) | Average Rated Life (hrs.) ¹ | CCT ³ | Typical Lumens (lm) ² | CRI ⁴ | Power Factor | Bulb Finish | ENERGY STAR [®] |
|-------------|--------------------------|-------------|-----------|----------|-------------------|--|------------------|----------------------------------|------------------|--------------|-------------|--------------------------|
| 79099 | LED7A19/DIM/O/827/G3 | 7 | Medium | 40W A19 | 120 | 25,000 | 2700K | 450 | 83 | .92 | Frosted | Yes |
| 79102 | LED7A19/DIM/O/850/G3/RP | 7 | Medium | 40WA19 | 120 | 25,000 | 5000K | 450 | 85 | .91 | Frosted | Yes |
| 79103 | LED11A19/DIM/O/827/G3 | 11 | Medium | 60W A19 | 120 | 25,000 | 2700K | 800 | 82 | .89 | Frosted | Yes |
| 72557 | LED12A19/DIM/O/850/RP | 12 | Medium | 60WA19 | 120 | 25,000 | 5000K | 900 | 84 | .98 | Frosted | Yes |
| 79082 | LED13A19/DIM/O/827/G3 | 13 | Medium | 75W A19 | 120 | 25,000 | 2700K | 1100 | 82 | .87 | Frosted | Yes |
| 79125 | LED13A19/DIM/O/850/G3/RP | 13 | Medium | 75WA19 | 120 | 25,000 | 5000K | 1250 | 80 | .86 | Frosted | Yes |
| 79105 | LED17A21/DIM/O/827/G3 | 17 | Medium | 100W A19 | 120 | 25,000 | 2700K | 1600 | 80 | .87 | Frosted | Yes |
| 79186 | LED17A21/DIM/O/850/RP/G3 | 17 | Medium | 100WA19 | 120 | 25,000 | 5000K | 1750 | 82 | .87 | Frosted | Yes |

OSRAM SYLVANIA submits most lamps for ENERGY STAR testing. Early qualification for ENERGY STAR lamps begin at 25,000 hours (L₇₀) regardless that the design of the lamp is manufactured for a greater life expectancy. As the lamps pass ENERGY STAR qualifications, manufacturers are able to increase rated life as dictated by ENERGY STAR guidelines becoming either provisionally qualified or fully qualified. Please visit EnergyStar.gov for more information about testing requirements for ENERGY STAR qualified products.

1. Hours lifetime with 70% (L70) lumen maintenance 2. Thermally stable typical lumens (±10%) 3. Thermally stable typical CCT (±10%) 4. CRI - Color Rendering Index

Ordering Guide

| | | | | | | | | | |
|------------|-----------|------------|----------|------------|----------|-----------------|----------|----------|--------------|
| LED | 11 | A19 | / | DIM | / | 0 | / | 8 | 27 |
| LED | Wattage | Lamp Type | | Dimmable | | Omnidirectional | | CRI | CCT |
| Lamps | | A19/A21 | | | | | | 80+ | 2700K, 5000K |

Energy Savings

| Basic Product Description | LED Life (hrs.) | LED Lumens | Similar Incandescent | Incandescent Life (hrs.) | Incandescent Lumens | Watts Saved | Energy Savings* | LED Life vs. Incandescent |
|---------------------------|-----------------|------------|----------------------|--------------------------|---------------------|-------------|-----------------|---------------------------|
| LED7A19 | 25,000 | 450 | 40W A19 | 1500 | 465 | 33 | \$90.75 | >16x |
| LED11A19 | 25,000 | 800 | 60W A19 | 1000 | 850 | 49 | \$134.75 | 25x |
| LED12A19 | 25,000 | 900 | 60W A19 | 1000 | 850 | 48 | \$132.00 | 25x |
| LED13A19 | 25,000 | 1100 | 75W A19 | 750 | 1170 | 62 | \$170.50 | >33x |
| LED17A21 | 25,000 | 1600 | 100W A19 | 750 | 1600 | 83 | \$228.25 | >33x |

*Energy savings over life of lamp calculated at \$0.11/kWh

Lamp Dimensions

| | (A) MOL (inches) | (B) Diameter (inches) | 7W A19 | 11W A19 | 12W A19 | 13W A19 and 17W A21 |
|----------|------------------|-----------------------|--------|---------|---------|---------------------|
| LED7A19 | 4.33 | 2.36 | | | | |
| LED11A19 | 4.56 | 2.36 | | | | |
| LED12A19 | 4.42 | 2.44 | | | | |
| LED13A19 | 4.41 | 2.36 | | | | |
| LED17A21 | 5.43 | 2.91 | | | | |

Certain Photography © 2012/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221/1222/1223/1224/1225/1226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Contractor: Vaughn Industries

www.sylvania.com

QUICKTRONIC® PROStart® T5 Universal Voltage Systems

Job: OSU - NRDT
Ballast for Types
A16, A17, A18, B25

Type CC

Programmed Rapid Start
Normal Ballast Factor



High Efficiency Series

QHE T5 PSN

Lamp / Ballast Guide

28W T5 – PENTRON® lamps
1 or 2 lamp QHE2x28T5/UNV PSN

Primary Lamp Type:
FP28

Also operates:
FP14, FP21, FP35

Two lamp fixed output model can be
wired for one lamp operation.

Key System Features

- High Efficiency Systems over 90% efficient
- Universal voltage (120-277V)
- Low-profile (0.87" High)
- 1.0 Ballast factor (see table)
- QUICKSENSE® ballast technology (end-of-lamp-life sensing)
- PROStart programmed rapid start
- Min. starting temperature
 - -20°F (-29°C)
- Operates at >42 kHz to reduce potential interference with infrared control systems
- Meet the most demanding utility rebate standards
- UL Type CC rated
- RoHS compliant
- Lead-free solder, printed circuit board and manufacturing process



Application Information

SYLVANIA QUICKTRONIC PS ballasts are ideally suited for:

- Commercial
- Retail
- Hospitality
- Institutional
- New construction
- Direct lighting
- Indirect lighting
- Surface mount
- Cove lighting

SYLVANIA QUICKTRONIC High Efficiency (QHE) PROStart T5 Universal Voltage electronic ballasts operate PENTRON T5 lamps saving >2 watts as compared to standard T5 ballasts.

QUICKTRONIC PROStart T5 ballasts feature programmed rapid start lamp starting and operation which provides optimum conditions to deliver up to 100,000 switching cycles for use on occupancy sensors and building control systems.

QUICKTRONIC PROStart T5 ballasts are RoHS compliant and feature lead-free solder, printed circuit boards and manufacturing process.

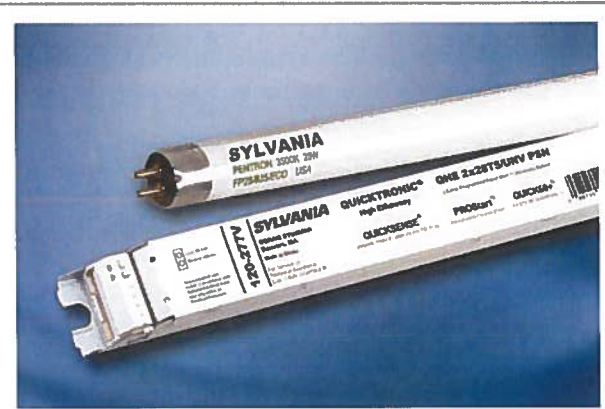
Setting the standard for quality, QUICKTRONIC PROStart T5 systems are covered by the QUICK 60+® warranty, the first and most comprehensive system warranty in the industry.

System Information

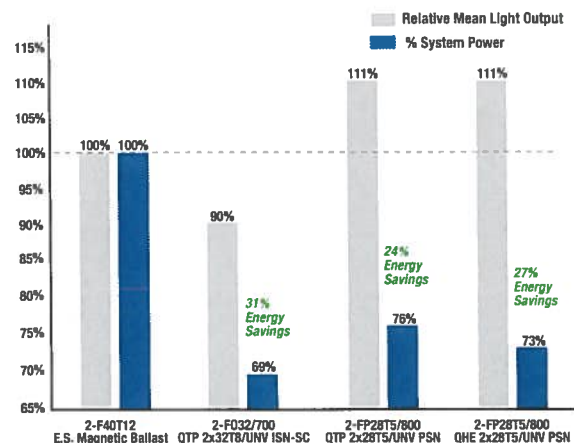
SYLVANIA QUICKTRONIC PS T5 High Efficiency (QHE) System advantages:

- Operate from 120V through 277V
 - Eliminates "wrong voltage" errors
 - Reduces inventory by 50%
- Utilizes Programmed Rapid Start operation for:
 - Highest System Efficacy
 - Longer Life
 - Over 100,000 switching cycles for occupancy sensor and building control systems applications

QUICKSENSE ballast technology helps to protect against overheated bases and sockets, as well as cracking of the glass wall, and uses dynamic end-of-lamp-life sensing to avoid false shutdowns caused by some static sensing methods. QUICKSENSE ballast technology will auto reset when the end-of-life lamps are replaced with new ones.



| System Type (2-lamp) | Input Power (W) | Initial System Lumens | Initial System Efficacy (LPW) | Mean System Lumens | Relative Mean Light Output | Energy Savings (%) |
|---------------------------------|-----------------|-----------------------|-------------------------------|--------------------|----------------------------|--------------------|
| 2-F40T12 ES Mag. Ballast | 86 | 5795 | 67 | 4925 | 100% | Baseline |
| 2-F032/700 QTP2x32T8/UNV ISN-SC | 59 | 4930 | 84 | 4435 | 90% | 31% |
| 2-FP28T5/800 QTP2x28T5/UNV PSN | 65 | 5800 | 89 | 5395 | 111% | 24% |
| 2-FP28T5/800 QHE2x28T5/UNV PSN | 63 | 5800 | 92 | 5395 | 111% | 27% |



ECS421 - 6-13

Date Submitted: Sept, 2, 2015

SEE THE WORLD IN A NEW LIGHT



Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRD T Building F

Job: OSU - NRD T
Ballast for Types: A16, A17, A18, B2

High Efficiency Type CC & Universal Voltage (120-277V)



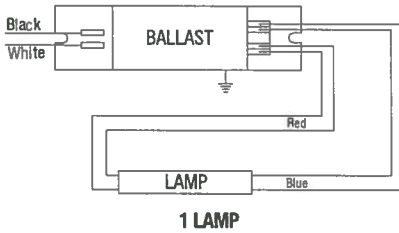
| Item Number | OSRAM SYLVANIA Description | Input Current (AMPS) | Lamp Type | Rated Lumens (lm) | No. of Lamps | Ballast Factor (BF) | System Lumens | Mean Lumens | Input Power (W) 120V 277V | System Efficacy (lm/W) | BEF ² |
|---|----------------------------|----------------------|-----------|-------------------|--------------|---------------------|---------------|-------------|---------------------------|------------------------|------------------|
| 51473 ○ 20-pack (without leads) (51472) ○ 10-pack (with leads) | QHE2x28T5/UNV PSN | 0.55/0.23 | FP28T5 | 2900 | 2 | 1.00 | 5800 | 5395 | 63 62 | 94 | 1.61 |
| | | 0.68/0.29 | FP35T5 | 3650 | 2 | 0.99 | 7225 | 6720 | 80 78 | 93 | 1.27 |
| | | 0.39/0.18 | FP21T5 | 2100 | 2 | 1.01 | 4240 | 3945 | 47 46 | 92 | 2.20 |
| | | 0.27/0.13 | FP14T5 | 1350 | 2 | 1.03 | 2780 | 2585 | 32 32 | 87 | 3.22 |
| | | 0.27/0.12 | FP28T5 | 2900 | 1 | 1.00 | 2900 | 2695 | 33 32 | 91 | 3.13 |
| | | 0.34/0.15 | FP35T5 | 3650 | 1 | 1.02 | 3725 | 3460 | 41 40 | 93 | 2.55 |
| | | 0.21/0.10 | FP21T5 | 2100 | 1 | 1.04 | 2185 | 2030 | 25 24 | 91 | 4.33 |
| | | 0.15/0.07 | FP14T5 | 1350 | 1 | 1.03 | 1390 | 1295 | 17 17 | 82 | 6.06 |

1 At 35°C lamp ambient temperature

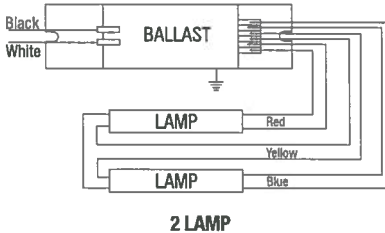
2 Ballast Efficiency Factor (BEF) shown = (Ballast Factor x 100) divided by Input Power (Note: calculation based on lowest wattage value).

3 System Efficacy calculation based on lowest input power value.

○ Preliminary specifications. Please contact OSRAM SYLVANIA for additional information.



1 LAMP



2 LAMP

Dimensions:

Model QHE2x28T5/UNV PSN enclosure size:

Overall: 14.17" L x 1.18"W x 0.87"H (360mm L x 30mm W x 22mm H)

Mounting: 13.74" (349mm)

Wiring:

51473: Push-in connectors

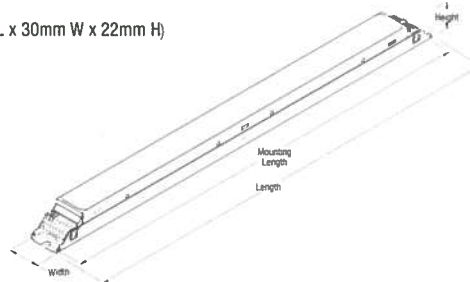
51472: Push-in connectors with leads

Use 18AWG solid copper wire only

Product Weight:

51473: 0.68 lb (0.30kg) each (approx.)

51472: 0.88 lb (0.40kg) each (approx.)



Item Number: 51473 QHE 2 x 28T5 / UNV PSN
QUICKTRONIC High Efficiency
Number of Lamps (2)
Starting/Ballast Factor
Line Voltage (120-277V)
Primary Lamp Wattage

Normal Ballast Factor

T5 PROstart®

High Efficiency

Performance Guide

Data based upon SYLVANIA PENTRON® lamps shown. QUICKTRONIC® ballasts are also compatible with other lamp manufacturers equivalent lamp types that meet ANSI specifications.

Specifications⁴

Starting Method: Programmed Rapid Start

Ballast Factor: 1.00 (see table)

Circuit Type: Series

Lamp Frequency: >42 kHz

Lamp CCF: Less than 1.6

Starting Temp: -20°F (-29°C)⁵

Input Frequency: 50/60 Hz

Low THD: <10%

Power Factor: >98%

Voltage Range: ±10% of 120-277V rated line (108-305V)

UL Type CC rated

UL Listed Class P, Type 1, Outdoor

CSA Certified

70°C Max Case Temperature

FCC 47CFR Part 18 Non-Consumer

Class A Sound Rating

ANSI C62.41 Cat. A Transient Protection

QUICKSENSE Dynamic End-of-

Lamp-Life Sensing

Remote Mounting (Max. wire length

from ballast case to lampholder):

up to 18 feet. Remote red leads up

to 18 feet. Keep blue leads <10 feet.

RoHS Compliant⁶

4 Data based on PENTRON 28W lamp types for primary ballast application.

5 Operation below 50°F (10°C) may affect light output or lamp operation – see "Low Temp. Starting" definition.

6 Complies with European Union Restriction of Hazardous Substances Directive.

System Life / Warranty

QUICKTRONIC products are covered by the QUICK 60+® warranty, a comprehensive lamp and ballast system warranty. For additional details, refer to the QUICK 60+ warranty bulletin.

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the system solution®

Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

QHE T5 PSN

©2013 OSRAM SYLVANIA

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

Job: OSU NRDT

www.sylvania.com

QUICKTRONIC® PROStart® T8 Parallel Operation Systems

Ballast for Types:

A5, A6, A7, A10, B2, B17, B24, C2,
C8, C9, D1, D2, D5

Type CC, Lamp Striation Control

Parallel Operation

Normal Ballast Factor

NEMA
Premium

High Efficiency Series

QHE T8 PSN

Lamp / Ballast Guide

Primary Systems

32W T8 - OCTRON® lamps

1-lamp QHE 1x32T8/UNV PSN-MC

2-lamp QHE 2x32T8/UNV PSN-MC

3-lamp QHE 3x32T8/UNV PSN-SC

4-lamp QHE 4x32T8/UNV PSN-SC

Also operates:

F030/SS, F028/SS, F025/SS, FBO32,
FBO31, FBO30/SS, FBO29/SS, F025,
F017, FBO24 & FBO16

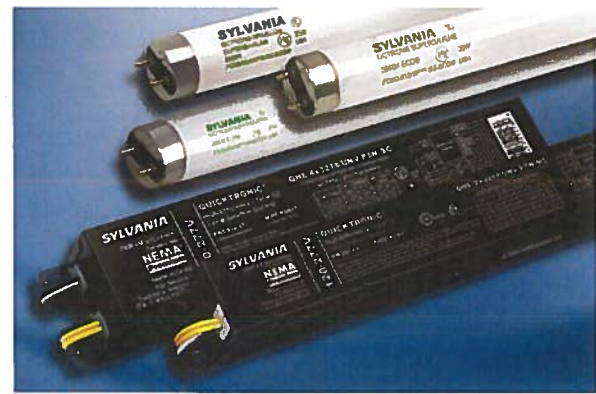
F40T8 operation:

1 lamp on 2L ballast; 2 lamps on 3L
ballast; 3 lamps on 4L ballast

SYLVANIA QUICKTRONIC High Efficiency PROStart programmed rapid start electronic T8 ballast family offers several major advantages:

- **High Efficiency:** Operate 32W linear and U-bend equivalent T8 lamps, saving >2 watts as compared to standard T8 programmed rapid start ballasts.
- **Parallel Circuitry:** keeps remaining lamps lit if one or more go out.
- **Lamp Striation Control (LSC):** T8 energy saving lamps should be operated above 60°F, but under certain conditions, the lamps may striate. LSC circuitry will minimize or eliminate this condition in most applications. (Please consult lamp manufacturers for additional details.)

- **Micro-Can Enclosure:** the 1 & 2-lamp models are in the micro-can enclosure. This allows the ballast to fit in very small profile fixtures where standard can T8 ballasts are too large.
- **NEMA Premium Electronic Ballast Program and RoHS compliant:** These ballasts feature lead-free solder, printed circuit boards and manufacturing. The NEMA Premium Electronic Ballast Program promotes the use of



Key System Features

- **High Efficiency Systems** over 90% efficient
- NEMA Premium Electronic Ballast Program compliant
- PROStart programmed rapid start
- Extends lamp life
- **Parallel operation** (one lamp out, remaining lamps stay lit)
- Normal ballast factor: 0.88
- UL Type CC
- LSC (Lamp Striation Control)
- Universal input voltage (120-277V)
- Minimum starting temperature:
 - -20°F (-29°C) for T8 lamps
 - 60°F (16°C) for energy saving T8 lamps
- RoHS compliant
- Lead-free solder, printed circuit board and manufacturing process



Application Information

SYLVANIA QUICKTRONIC PROStart T8 ballasts

are ideally suited for:

- Any application where extended lamp life is required to reduce maintenance costs
- Occupancy sensors
- Energy retrofits
- Building control systems

System Information

SYLVANIA QUICKTRONIC High Efficiency (QHE) System advantages:

- Operate from 120V through 277V
 - Eliminates "wrong voltage" errors
 - Reduces inventory by 50%
- Utilize Programmed Rapid Start operation for
 - Longer lamp life
 - Over 100,000 switching cycles for occupancy sensor and building control systems
- Operate at >42 kHz to reduce potential interference with infrared control systems

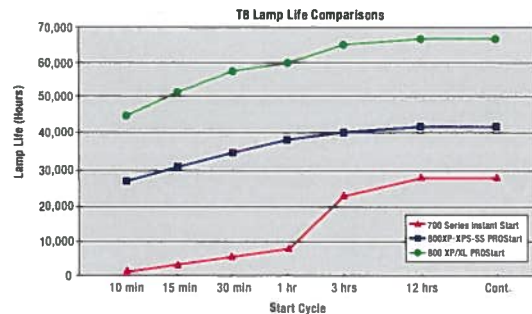
high efficiency T8 electronic ballasts by meeting or exceeding the Ballast Efficiency Factors, (BEF) established by the CEE, (Consortium for Energy Efficiency). For additional details on this program go to: www.cee1.org or www.nema.org

- **Longer lamp life:** PROStart technology extends lamp life compared to instant start models for long or short switching cycles, which is ideal for reducing maintenance costs or for saving energy

when using occupancy sensors.

- **UL Type CC compliant:** ballasts utilize a micro-controller based circuit to reduce arcing caused by loose connections or improper lamp pin-to-socket connections.
- **QUICK 60+® System Warranty:** Setting the standard for quality the system is covered by the first and most comprehensive warranty in the industry.

| Lamp & Ballast Type | Input Power (W) | Initial Lumens | Initial LPW | Mean System Lumens | Relative Mean Light Output | % Energy Savings |
|-------------------------------------|-----------------|----------------|-------------|--------------------|----------------------------|------------------|
| 3-F032/700 QTP3x32T8/UNV ISN-SC | 86 | 6865 | 80 | 6310 | 100% | 0% |
| 3-F032/800/XP® QHE3x32T8/UNV PSN-SC | 82 | 7920 | 97 | 7445 | 118% | 5% |
| 3-F028/SS QHE3x32T8/UNV PSN-SC | 72 | 7195 | 100 | 6760 | 107% | 16% |
| 3-F025/SS QHE3x32T8/UNV PSN-SC | 66 | 6535 | 99 | 6140 | 97% | 23% |



ECS413 - 6-13

Date Submitted: Sept. 2, 2015

SEE THE WORLD IN A NEW LIGHT



Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

Job: OSU NRDT Ballast for Types:

High Efficiency Parallel Wired, Type CC, Lamp Striation Control (120-277V)



| Item Number | OSRAM SYLVANIA Description | Input Current (AMPS) | Lamp Type | Rated Lumens (lm) | No. of Lamps | Ballast Factor (BF) | Initial System Lumens | Mean System Lumens | Input Power (W) 120V 277V | System Efficacy ¹ (lm/W) | BEF ² |
|--------------------|---|----------------------|------------|-------------------|--------------|---------------------|-----------------------|--------------------|---------------------------|-------------------------------------|------------------|
| 51397 ○ 51398 ○ | QHE1x32T8/UNV PSN-MC Banded 10-Pack Pallet Pack | 0.26/0.11 | F032/700 | 2600 | 1 | 0.88 | 2290 | 2105 | 30 29 | 79 | 3.03 |
| | | 0.26/0.11 | F032XPS* | 3100 | 1 | 0.88 | 2730 | 2565 | 30 29 | 94 | 3.03 |
| | | 0.26/0.11 | F032XP*/XL | 2950 | 1 | 0.88 | 2595 | 2440 | 30 29 | 90 | 3.03 |
| | | 0.24/0.10 | F030/SS | 2850 | 1 | 0.88 | 2510 | 2360 | 28 26 | 97 | 3.38 |
| | | 0.22/0.10 | F028/SS | 2725 | 1 | 0.88 | 2400 | 2255 | 26 25 | 96 | 3.52 |
| 51408 ○ 51409 ○ | QHE2x32T8/UNV PSN-MC Banded 10-Pack Pallet Pack | 0.20/0.09 | F025/SS | 2475 | 1 | 0.88 | 2180 | 2045 | 23 23 | 95 | 3.83 |
| | | 0.48/0.21 | F032/700 | 2600 | 2 | 0.88 | 4575 | 4205 | 57 55 | 83 | 1.60 |
| | | 0.48/0.21 | F032XPS | 3100 | 2 | 0.88 | 5455 | 5130 | 57 55 | 99 | 1.60 |
| | | 0.48/0.21 | F032XP*/XL | 2950 | 2 | 0.88 | 5190 | 4980 | 57 55 | 94 | 3.03 |
| | | 0.46/0.20 | F030/SS | 2850 | 2 | 0.88 | 5015 | 4715 | 55 53 | 95 | 1.66 |
| 51413 ○ 51414 ○ | QHE3x32T8/UNV PSN-SC Banded 10-Pack Pallet Pack | 0.43/0.18 | F028/SS | 2725 | 2 | 0.88 | 4795 | 4510 | 51 50 | 96 | 1.76 |
| | | 0.38/0.16 | F025/SS | 2475 | 2 | 0.88 | 4355 | 4095 | 45 44 | 99 | 2.00 |
| | | 0.69/0.29 | F032/700 | 2600 | 3 | 0.88 | 6865 | 6310 | 83 82 | 84 | 1.07 |
| | | 0.69/0.29 | F032XPS | 3100 | 3 | 0.88 | 8185 | 7695 | 83 82 | 100 | 1.07 |
| | | 0.69/0.29 | F032XP*/XL | 2950 | 3 | 0.88 | 7790 | 7320 | 83 82 | 95 | 3.03 |
| 51418 ○ 51419 ○ | QHE4x32T8/UNV PSN-SC Banded 10-Pack Pallet Pack | 0.68/0.28 | F030/SS | 2850 | 3 | 0.88 | 7525 | 7075 | 80 78 | 96 | 1.13 |
| | | 0.62/0.27 | F028/SS | 2725 | 3 | 0.88 | 7195 | 6760 | 73 72 | 100 | 1.22 |
| | | 0.56/0.24 | F025/SS | 2475 | 3 | 0.88 | 6535 | 6140 | 67 66 | 99 | 1.33 |
| | | 0.93/0.39 | F032/700 | 2600 | 4 | 0.88 | 9150 | 8415 | 111 108 | 85 | 0.81 |
| | | 0.93/0.39 | F032XPS | 3100 | 4 | 0.88 | 10,910 | 10,255 | 111 108 | 101 | 0.81 |
| | | 0.93/0.39 | F032XP*/XL | 2950 | 4 | 0.88 | 10,385 | 9760 | 111 108 | 94 | 3.03 |
| | | 0.89/0.38 | F030/SS | 2850 | 4 | 0.88 | 10,030 | 9430 | 105 103 | 97 | 0.85 |
| | | 0.83/0.35 | F028/SS | 2725 | 4 | 0.88 | 9590 | 9015 | 98 95 | 101 | 0.93 |
| | | 0.77/0.33 | F025/SS | 2475 | 4 | 0.88 | 8710 | 8190 | 91 89 | 98 | 0.99 |

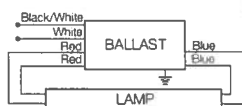
Banded Pack contains 10 pieces each, (add "-B" to description). Pallet Pack contains 840 pieces, (add "-PAL" to description).

¹ System Efficacy is based on the lowest input Power

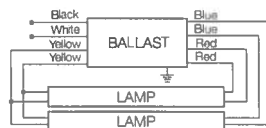
² BEF (Ballast Efficiency Factor) shown = (Ballast Factor x 100) divided by Input Power (Note: calculation based on lowest input power)

○ Preliminary specifications. Please contact OSRAM SYLVANIA for additional information.

1 lamp

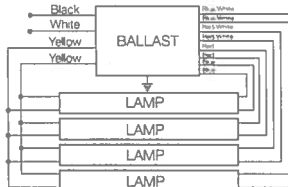


2 lamp



Note: For 1L application, individually cap both RED leads. Insulate to 600 volts.

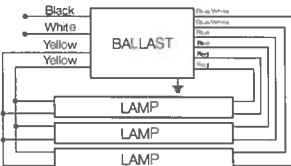
4 lamp



Note: For 3L application, individually cap both RED leads. For 2L application, individually cap both RED and BLUE leads. For 1L application, individually cap both RED, BLUE and Red/White leads. For lamps approved for 1L operation, see QUICKSYSTEMS. Insulate to 600 volts.

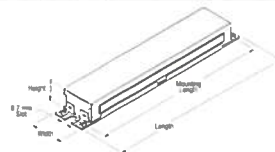
Installation Notes Lamp wiring for 3 & 4 lamp QHE PSX "parallel" models vary from QTP series models. Be sure to wire ballasts per label/schematics shown on this bulletin.

3 lamp



Note: For 2L application, individually cap both RED leads. For 1L operation, individually cap both RED and BLUE leads. Insulate to 600 volts.

"SC" Overall: 9.5" L x 1.68" W x 1.18" H
"MC" Overall: 9.5" L x 1.30" W x 1.00" H
Mounting: 8.90"



Product Weight:

QHE1xPSN & QHE2xPSN: 0.66 lbs. each
QHE3xPSN & QHE4xPSN: 1.27 lbs. each

Wiring:

Leads only (no connectors provided)

| | | | |
|-----------------------------|-------|-----------------------------|-------------------------|
| Item Number | 51408 | QHE 2 x 32T8 / UNV PSN - MC | Case Size |
| QUICKTRONIC High Efficiency | | | Starting/Ballast Factor |
| Number of Lamps | | | Line Voltage (120-277V) |
| | | | Primary Lamp Wattage |

Normal Ballast Factor

T8 PROStart®

High Efficiency

Performance Guide

Data based upon SYLVANIA OCTRON® lamps shown. QUICKTRONIC® QHE PROStart ballasts are also compatible with other lamp manufacturers equivalent lamp types that meet ANSI specifications.

QHE PROStart ballasts will operate F32 (and the SUPERSAVER® & U-Bend equivalent) T8 lamps. Complete performance data is available in the QUICKSYSTEMS section of the SYLVANIA Ballast Technology & Specification Guide.

Specifications

Data based on F32T8

Starting Method: Programmed Rapid Start
Ballast Factor: 0.88
Circuit Type: Parallel
Lamp Frequency: >42 kHz
Lamp CCF: Less than 1.7
Starting Temp:³
-20°F (-29°C) for OCTRON T8 lamps;
60°F (16°C) for SUPERSAVER® T8 lamps
Input Frequency: 50/60 Hz
Low THD: <10%
Power Factor: >98%
Voltage Range: ±10% of 120-277V rated line (108-305V)

UL Listed Class P, Type 1 Outdoor
UL Type CC Rated
Lamp Striation Control (LSC)
CSA Certified (where applicable)
70°C Max. Case Temperature
FCC 47 CFR Part 18 Non-Consumer
Class A Sound Rating
NEMA Premium Electronic Ballast
Program compliant
RoHS compliant⁴
ANSI C62.41 Cat. A Transient Protection
GFCI & emergency ballast compatible
Remote Mounting (Max wire length from ballast case to lampholder):
• 20 ft: full wattage T8s
• 10 ft: energy saving T8s
• 4 ft: 25W energy saving T8s

³ Operation below 50°F (10°C) may affect light output or lamp operation – see "Low Temp Starting" definition

⁴ Complies with European Union Restriction of Hazardous Substances Directive.

System Life / Warranty

QUICKTRONIC products are covered by the QUICK 60+® warranty, a comprehensive lamp and ballast system warranty. For additional details, refer to the QUICK 60+ warranty bulletin.

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the system solution®

Date Submitted: Sept, 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

QHE T8 PSN

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Contractor: Vaughn Industries

Job Name: OSU NRD T Building F

Job: OSU - NRD T

Ballast for Types:

A45, A47, A73, A74, A75, A78, K1

www.sylvania.com

QUICKTRONIC® PROStart® CF Universal Dual Entry Systems



<10% THD Electronic T4 Compact Fluorescent
Programmed Rapid Start Systems
Normal Ballast Factor

Professional Series

CF DUAL ENTRY

Lamp / Ballast Guide

Primary Systems

- 13W T4 – DULUX D/E, T/E lamps
1-lamp or 2-lamp QTP1/2x13CF/UNV
- 18W T4 – DULUX D/E, T/E lamps
1-lamp or 2-lamp QTP1/2x18CF/UNV
- 26W T4 – DULUX D/E, T/E lamps
1-lamp QTP2x26CF/UNV
2-lamp QTP2x26CF/UNV
- 32 or 42W T4 – DULUX T/E lamps
1-lamp QTP2x26CF/UNV
2-lamp QTP2x26/32/42CF/UNV
- 57W or 70W T4 – DULUX T/E lamp
1-lamp QTP2x26/32/42CF/UNV

For other lamp types, refer to the Performance Guide section on the next page.

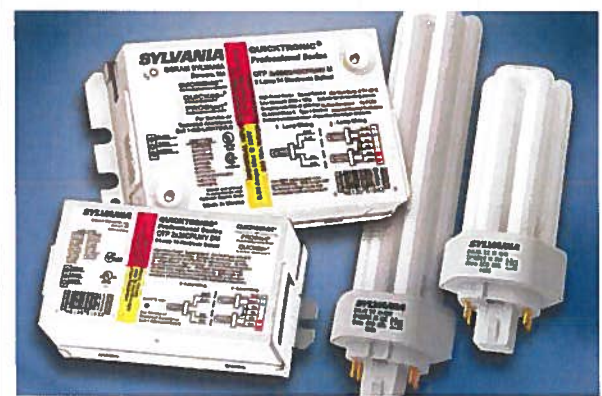
SYLVANIA QUICKTRONIC PROStart CF ballasts operate DULUX® D/E and T/E lamps with full lumen output and optimal system performance.

QUICKTRONIC CF ballasts feature one mounting style of low profile, lightweight enclosures to provide simple assembly for any fixture application.

Universal input voltage (120–277V) and multi-lamp multi-watt capability allow for fewer SKUs to support a wide range of applications.

Dual entry, color coded connectors located on the side and bottom allow for increased mounting flexibility with one ballast and also increased ease of installation.

These ballasts are RoHS compliant and feature lead-free solder, printed circuit boards and manufacturing process.



Setting the standard for quality, QUICKTRONIC PROStart CF Systems are covered by our QUICK 60+® warranty, the first and most comprehensive system warranty in the industry.



Key System Features

- Universal Input Voltage (120–277V)
- Dual entry, color coded connectors
- PROStart Ballasts program rapid start
- QUICKSENSE ballast technology
- High Power Factor
- Low Harmonic Distortion
- Small size and lightweight
- Metal enclosure
- UL, CSA, FCC
- QUICK 60+ warranty
- RoHS compliant
- Lead-free solder, printed circuit board and manufacturing process



System Information

PROStart programmed rapid start is the optimum starting method, providing up to 100,000 switching cycles for use on occupancy sensors and building control systems.

QUICKSENSE® end-of-lamp-life sensing technology helps to protect against overheated bases and sockets, as well as cracking of the glass wall. QUICKSENSE ballast technology uses dynamic end-of-lamp-life sensing to avoid false shutdowns caused by some static sensing methods and will auto-reset when the end-of-life lamps are replaced with new ones.

QUICKTRONIC CF ballasts come with wire-trap connectors for quick and easy installation.



Small Metal Case

Dual Entry Metal with and without PEM Studs
Side & Bottom Mount Capabilities

QTP2x26/32/42CF/UNV Metal Case Models



Dual Entry Metal with and without PEM Studs
Side & Bottom Mount Capabilities

Application Information

SYLVANIA QUICKTRONIC CF ballasts

are ideally suited for:

- Recessed downlights
- Wall sconces
- Ceiling fixtures
- Commercial
- Retail, hospitality, institutional

ECS433 - 6-13

Date Submitted: Sept, 2, 2015

SEE THE WORLD IN A NEW LIGHT



Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRD T Building F

Job: OSU - NRD T
Ballast for Types:

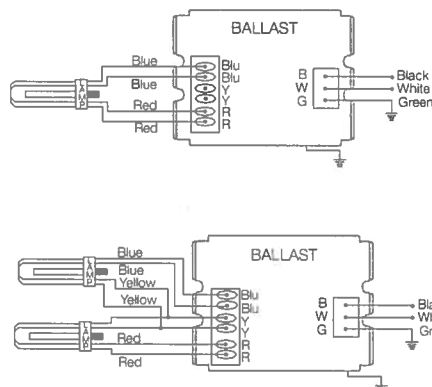
Universal Voltage (120-277V)



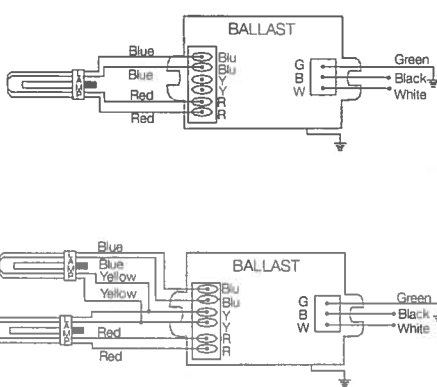
| Item Number | Description ¹ | Input Current (AMPS) | Lamp ¹ Type | Rated Lumens (lm) | No. of Lamps | Ballast Factor (BF) | System Lumens | Mean Lumens | Input Power (Watts) | System Efficacy (lm/W) | BEF ⁴ |
|-------------|----------------------------|----------------------|------------------------|-------------------|--------------|---------------------|---------------|-------------|---------------------|------------------------|------------------|
| 51818 | QTP1/2x13CF/UNV DM | 0.25/0.11 | 13W DD/E,T/E | 900 | 1 | 1.00 | 900 | 775 | 16 | 56 | 6.25 |
| | | | 13W DD/E,T/E | 900 | 2 | 1.00 | 1800 | 1550 | 29 | 62 | 3.45 |
| 51823 | QTP1/2x18CF/UNV DM | 0.32/0.14 | 18W DD/E,T/E | 1200 | 1 | 1.00 | 1200 | 1030 | 20 | 60 | 5.00 |
| | | | 18W DD/E,T/E | 1200 | 2 | 1.00 | 2400 | 2065 | 38 | 63 | 2.63 |
| 51833 | QTP2x26CF/UNV DM | 0.50/0.22 | 26W DD/E,T/E | 1800 | 1 | 1.00 | 1800 | 1550 | 28 | 64 | 3.57 |
| | | | 26W DD/E,T/E | 1800 | 2 | 1.00 | 3600 | 3095 | 54 | 67 | 1.85 |
| 51898 | | | 32W DT/E | 2400 | 1 | 0.98 | 2350 | 2025 | 35 | 67 | 2.80 |
| | | | 42W DT/E | 3200 | 1 | 0.96 | 3070 | 2640 | 45 | 68 | 2.13 |
| 51843 | QTP2x26/32/42CF/UNV DM | 0.90/0.40 | 26W DT/E | 1800 | 2 | 1.02 | 3670 | 3155 | 54 | 68 | 1.89 |
| | | | 32W DT/E | 2400 | 2 | 0.96 | 4610 | 3965 | 69 | 67 | 1.39 |
| 51863 | | | 42W DT/E | 3200 | 2 | 0.95 | 6080 | 5230 | 94 | 65 | 1.01 |
| | | | 57W DT/E | 4300 | 1 | 1.00 | 4300 | 3700 | 62 | 69 | 1.61 |
| | QTP2x26/32/42CF/UNV DM PEM | 0.57/0.25 | 70W DT/E | 5200 | 1 | 0.92 | 4780 | 4115 | 71 | 67 | 1.30 |

1 Also compatible with other manufacturers' equivalent 4 pin lamp types that meet ANSI specifications.
2 Rated lamp lumens and performance data based on DULUX T/E series 4 pin lamps.
3 Data is for all models within the brackets. The maximum input current is shown for maximum input power.
4 Ballast Efficiency Factor (BEF) shown = (Ballast Factor x 100) divided by Input Power (Note: calculation based on lowest wattage value).

Metal Case (51843 & 51863)



Small Metal Case (51818, 51823, 51833 & 51898)



Dimensions:

Metal case (51843 & 51863): 4.95" L x 2.93" W x 1.35" H
Small Metal case (51818, 51823, 51833 & 51898): 4.95" L x 2.37" W x 1.10" H
Mounting: Utilize flanges (4.57" L), or (2) #8-32 x 0.375" Long
PEM studs on 2" centers

Packaging:

Quantity: 20 pieces per case
16 pieces per case for Item Number 51898
18 pieces per case for Item Number 51863
Weight: 0.40 lbs ea. (Small Metal case)
0.90 lbs ea. (Metal case)

Wiring:

Push-in connectors (no leads provided)
Use 18AWG solid copper wire only

Item Number **51843** QTP 2 x 26/32/42 CF / UNV DM Case Type (Dual Mount)
QUICKTRONIC PROFESSIONAL Line Voltage (120-277V)
Number of Lamps (1, 2) Primary Lamp Wattage

Normal Ballast Factor

CF PROStart®

Professional Series

Performance Guide

QTP 2x26CF/UNV models also operates:
1-lamp: CF28/2D, CF38/2D, FPC40/T5, FT40DL

1- or 2-lamp: FPC22/T5, FT24DL, FT24DF
2-lamp: CF13DSE, FT18DL, FT18DF, CF21/2D

QTP 2x26/32/42CF/UNV models also operates:
2-lamp: FT36DL, FT40DL, FPC40/T5
1+1: FPC22/T5 / FPC40/T5

Specifications

Starting Method: Programmed Rapid Start
Circuit Type: Series
Lamp Frequency: >42 kHz
Lamp CCF: Less than 1.7
Starting Temp: -5°F/-20°C min.⁵
Input Frequency: 50/60 Hz
Low THD: <10%
Power Factor: >98%
Voltage Range: ±10% of 120-277V
rated line (108-305V)

UL Listed Class P, Type 1 Outdoor
CSA or C/UL Certified
75°C Max Case Temp. (5 yr. warranty)
80°C Max Case Temp. (3 yr. warranty)
FCC 47CFR Part 18 Non-Consumer
Sound Rated A
RoHS Compliant⁶
ANSI C62.41 Cat. A Transient Protection
Dynamic End-of-Lamp-Life Sensing
Remote Mounting (Max. wire length from ballast case to lampholder): up to 15 feet for one lamp and up to 6 feet for two lamp.
5 Operation below 50°F (10°C) may affect light output or lamp operation – see Low Temperature Starting definition.
6 Complies with European Union Restriction of Hazardous Substances Directive (Directive EC 2002/95)

System Life / Warranty

QUICKTRONIC products are covered by the QUICK 60+® warranty, a comprehensive lamp and ballast system warranty. For additional details, refer to the QUICK 60+ warranty bulletin.

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CF DUAL ENTRY


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the system solution®

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E

| | | | |
|---|---|--|---------------------------------|
|  | Job Name: OSU - NRD BUILDINGS | Catalog Number: MS-A102-IVORY Notes: | Type: SPEC14-5147 |
|---|---|--|---------------------------------|

Maestro®

Dual Technology Occupancy Sensor Switch

Sensor

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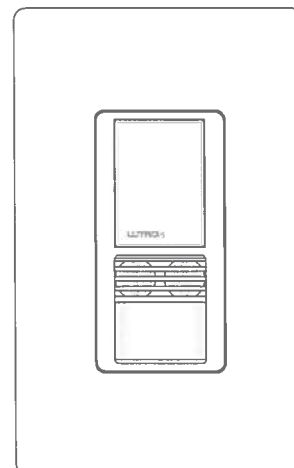
Maestro® Dual Technology Sensor Switch

The Maestro® Dual Technology (Dual Tech) Occupancy Sensor Switch applies our exclusive XCT™ Technology to the ultrasonic as well as the passive infrared technology in this sensor to create a product that can detect very fine motion, such as typing. This product also includes all of the great features found in the rest of the Maestro® sensor family, including: adaptive relay switching, smart ambient light detection, and simple button presses for changing settings. The Maestro® Dual Tech Occupancy Sensor Switch is available in single-circuit and dual-circuit versions.

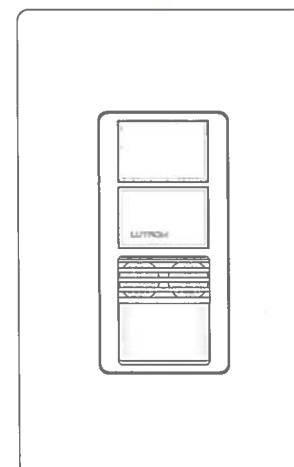
The single-circuit versions (MS-A102, MS-B102) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as "automatic shutoff". The dual-circuit versions (MS-A202, MS-B202) can be used to meet many of the Title 20/24, ASHRAE 90.1, and IECC code requirements such as "automatic shutoff" and "multi-level lighting control". To find some examples of code-specific applications, visit www.lutron.com/energycodes

Features

- XCT™ Technology for major, minor, fine, and very fine motion detection
- 180° sensor field-of-view
- Tamper-resistant PIR lens
- Up to 900 ft² (81 m²) major motion coverage and 400 ft² (36 m²) minor motion coverage
- Two Ambient Light Detect (ALD) options:
 - Learning ALD Mode:
Uses adaptive algorithm.
Sensor learns user's preferred light level over time.
 - Fixed ALD mode:
Four selectable light level thresholds: Hi, Med, Low, Min
- Occupancy models (MS-A102-XX, MS-B102-XX, MS-A202-XX, MS-B202-XX) can be set to Auto-ON/Auto-OFF or Manual-ON/Auto-OFF per circuit
- Dual-circuit models (MS-A202, MS-B202) meet Title 24 requirements for multi-level lighting control.
- Single-circuit "Vacancy" models (MS-A102-V-XX, MS-B102-V-XX) available to meet Title 24/Title 20 requirements for vacancy sensors.
- Adjustable timeout for each circuit (1, 5, 15, or 30 minutes)
- Sensitivity adjustment
 - PIR (Hi, Med, Low, Min)
 - Ultrasonic (Hi, Med, Low, Off)
- Switches all lighting loads: incandescent, halogen, ELV, MLV, CFL, LED, magnetic fluorescent, electronic fluorescent
- Switches fan loads at 120 V~
- MS-B102, MS-B102-V work with Maestro® accessory switches in multi-location applications
- MS-A models DO NOT require neutral wiring, while the MS-B models DO require neutral wiring.



MS-A102-XX (Occupancy model)
MS-A102-V-XX (Vacancy model)
MS-B102-XX (Occupancy model)
MS-B102-V-XX (Vacancy model)



MS-A202-XX (Occupancy model)
MS-B202-XX (Occupancy model)

Notes:

- "XX" in the model number represents color/finish code. See **Colors and Finishes** at end of document.
- Wallplate not included.

LUTRON® SPECIFICATION SUBMITTAL

Page

| | |
|--|-----------------------|
| Job Name: Job Number: | Model Numbers: |
|--|-----------------------|

Contractor: Vaughn Industries

Job Name: OSU NRDT Building E

Submitted by Spectrum Lighting, Inc.


Job Name:
OSU - NRDT BUILDINGS

Catalog Number:
MS-A102-

Notes:

Type:

SPEC14-5147

Maestro®**Dual Technology Occupancy Sensor Switch****Sensor**

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Specifications**Regulatory Approvals**

- UL Listed to U.S. and Canadian safety requirements (applies only to MS-B102, MS-B102-V, MS-B202)
- NOM certified
- Title 20/24 certified lighting control device
 - Complies with Title 20 and Title 24 section 110.9

Power/Load Control

- 120–277 V~ 50/60 Hz

Key Design Features

- Dual Sensing Technology
- Switches all lighting loads
- 6 A of lighting load per circuit at 120–277 V~
- 4.4 A (1/6 HP) of fan load per circuit at 120 V~
- Crush/tamper resistant lens
- Smart Ambient Light Detection (ALD)
- Fixed Ambient Light Detection
- Adaptive zero-cross switching algorithm for extended relay life (patent pending)
- XCT™ Technology for major, minor, fine, and very fine motion detection
- Programmable Circuit Swapping eliminates need for rewiring to reassign circuits after installation of a dual-circuit product. (patent pending)
- Product ground current does not exceed 0.5 mA

Environment

- Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0%–90% humidity, non-condensing. Indoor use only.

Warranty

- 5-Year Limited Warranty. For additional Warranty information, please visit www.lutron.com/TechnicalDocumentLibrary/Sensor_Warranty.pdf

Sensor Detection

Lutron Dual Tech sensors operate by triggering initial occupancy using PIR technology, and maintain occupancy using both ultrasonic and PIR technology.

Advanced Features**Switching**

- Adaptive zero-cross switching—maximizes relay life by switching at the point of minimum energy on the AC power curve (patent pending). Actively adapts to variations in relay timing.

Additional Information on Sensors

- For single-circuit PIR Maestro Occupancy Sensor Switch models, please see Lutron P/N 369666
- For Maestro Occupancy Sensor C•L Dimmer models, please see Lutron P/N 369748
- For dual-circuit PIR Maestro Occupancy Sensor Switch, please see Lutron P/N 369758
- For more information, please see www.lutron.com/occvacensors
- Lutron Technical Hotline: 1.800.523.9466.

LUTRON® SPECIFICATION SUBMITTAL

Page

Job Name:**Model Numbers:****Job Number:**

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Spectrum Lighting, Inc.


Job Name:
OSU - NRD BUILDINGS

Catalog Number:
MS-A102-

Notes:

Type:

SPEC14-5147

Maestro®

Dual Technology Occupancy Sensor Switch

Sensor

369773c 3 04 09 14

Custom Settings

Default settings shown in bold

Timeout

- 30 min
- **15 min**
- 5 min
- 1 min

Mode - Sensor Modes

Lights automatically turn off in all sensor modes

- **Occ - Occupancy mode (No ALD)**^{1,2,3}
- Lrn - Occupancy with learning ALD mode
- Fixd - Occupancy with fixed ALD mode
- **Vac - Vacancy mode (No ALD)**^{2,3}

¹ MS-A102-XX, MS-B102-XX default is Occ
² MS-A102-V-XX, MS-B102-V-XX is locked as Vac
³ MS-A202-XX, MS-B202-XX defaults are Circuit 1 - Occ, Circuit 2 - Vac

Ultrasonic Sensitivity

- High
- **Med**
- Low
- Off

PIR - Passive Infrared Sensitivity

- **High**
- Med
- Low
- Min

Additional Settings**Fixed ALD Light Level**

- Hi
- Med
- **Low***
- Min

* "Low" is the default setting for any sensor that is set by the user to Occupancy with fixed ALD mode

While-Occupied

- **Enabled**
- Disabled

Walk-Thru Mode

- Enabled
- **Disabled**

Custom Settings - Details**Ambient Light Detection (ALD) mode**

Lights turn on only when natural light in the room is below the set threshold.

- **Learning:** The ambient light threshold adjusts to the user's preference via manual interaction with the sensor switch.
- **Fixed:** Choose a fixed ALD light level from four pre-set options:
High, Medium, Low, and Minimum

Manual Off-While-Occupied Options

ENABLED (default setting)

- When the sensor switch is manually turned off, the sensor switch will not turn the lights back on automatically while the room is occupied.
- Once the room is vacated, the Auto-On feature returns to normal operation after the timeout period has expired.
- This may be the preference in conference rooms or classrooms while viewing presentations. This feature requires motions to keep the lights off.

DISABLED

- When the sensor switch is manually turned off, the Auto-On feature will return to normal operation after 25 seconds.
- This may be the preference in a restroom if the user always wants the lights to turn on upon entering and the lights to turn off when the room is vacant.

Walk-Thru ModeENABLED¹

- If motion is not detected within 3 minutes after initial occupancy, the lights will turn off after 3 minutes, instead of the current timeout.
- This setting may be the preference in commercial applications where personnel may briefly trigger sensors during non-working hours.

DISABLED (default setting)

- When motion is detected, the lights will ALWAYS remain on for the entire timeout duration, regardless of the duration of occupancy detection.

¹ 1 minute timeout would be overridden if walk-thru mode is also ENABLED

LUTRON® SPECIFICATION SUBMITTAL

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Job Name:
OSU - NRD BUILDINGS

Catalog Number:
MS-A102-

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Type:

SPEC14-5147

Maestro®

Dual Technology Occupancy Sensor Switch

Sensor

369773c 4 04.09.14

Load Type and Capacity

| Control | Neutral Connection Required | Vacancy Only | Number of Circuits | Voltage / Load Type / Maximum Load (Anywhere in Gang) ¹ | Minimum Load | 3-Way with Mechanical Switch | Multi-Location with Accessory Switch |
|---------|-----------------------------|--------------|--------------------|--|--------------|------------------------------|--------------------------------------|
| → | | | | | 0 A | | |
| | | | | | | | |
| | | | | | | | |
| | | | | Lighting 6 A ² | | | |
| | | | | 120 V~ Fan 4.4 A (1/6 HP) ³ | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

¹ Ratings shown are per circuit.² Sensor Switch Load Type: Designed for use with permanently installed incandescent, halogen, MLV, ELV, CFL, LED, magnetic fluorescent, and electronic fluorescent lighting loads.³ When controlling light and fan loads simultaneously on a single-circuit, maximum load capacity per circuit is 4.4 A at 120 V~.

Sensor Switch Placement

- The sensor switch performs better with an unobstructed view of room occupants.
- Hot objects and moving air currents can affect the performance of the sensor switch. The sensor switch performs best when located 6 ft (1.8 m) or more away from hot objects or moving air currents.
- The PIR performance depends on a temperature differential between the ambient room temperature and that of room occupants. Warmer rooms may reduce the ability of the sensor switch to detect occupants.
- The ultrasonic performance can be affected by air currents and moving objects. Consider the effects of fans, HVAC vents, open windows, or moving objects when installing the sensor switch.
- If the sensor sees a specific area that is not desired (e.g., hallway), Lutron offers a lens mask kit (Lutron P/N 50013614) that can be ordered through Tech Support (1.800.523.9466). Alternatively, selectively placing opaque tape (e.g., painter's tape, electrical tape, masking tape) over certain parts of the lens can limit its field of vision to block undesired detection areas. Masking the lens may effect ALD performance, but DOES NOT block ultrasonic frequencies.

Definitions

Major motion: movement of a person entering or passing through an area.**Minor motion:** movement of a person occupying an area and engaging in small activities (e.g., reaching for a telephone, turning the pages of a book, opening a file folder, picking up a coffee cup).**Fine Motion:** movement of a person occupying an area and engaging in very small activities (e.g., reading a magazine).**Very Fine Motion:** movement of a person occupying an area and engaging in very small activities (e.g., typing on a keyboard).

LUTRON® SPECIFICATION SUBMITTAL

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Job Name:

Model Numbers:

Job Number:

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building F

Catalog Number:
MS-A102-

Notes:

Type:

SPEC14-5147



Job Name:
OSU - NRD BUILDINGS

Maestro



Dual Technology Occupancy Sensor Switch

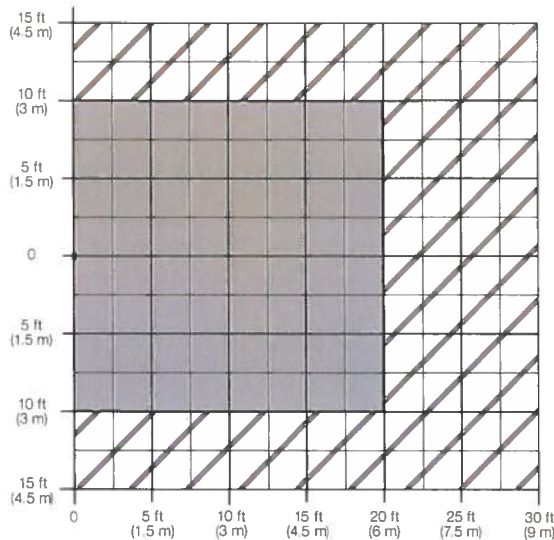
Sensor

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Sensor Switch Placement (continued)

NEMA WD7 Coverage

-  Major motion coverage: 900 ft² (81 m²)
-  Minor motion coverage: 400 ft² (36 m²)



Test Room Dimensions: 37 ft x 38 ft (11.28 m x 11.6 m)

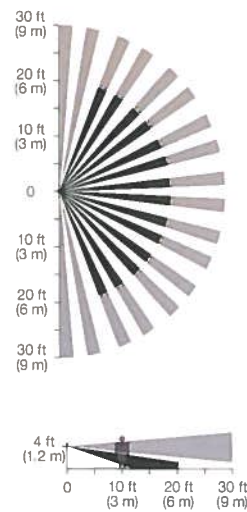
Test Floor Surface Material: Carpet

Sensor Coverage Angle: 180°

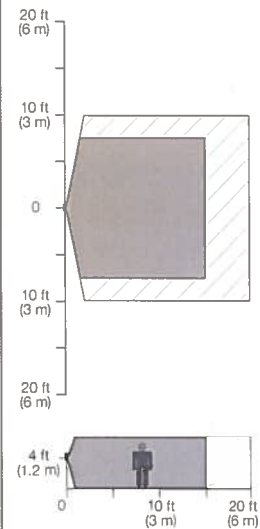
Major motion coverage: Initial trigger motion detection

Minor motion coverage: Maintained motion detection

Passive Infrared
Beam Diagram
(For Reference Only)



Ultrasonic Coverage
(For Reference Only)



Ultrasonic Frequency: 40 kHz

LUTRON SPECIFICATION SUBMITTAL

Page

Job Name:

Model Numbers:

Job Number:

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
MS-A102-

Notes:

Type:

SPEC14-5147

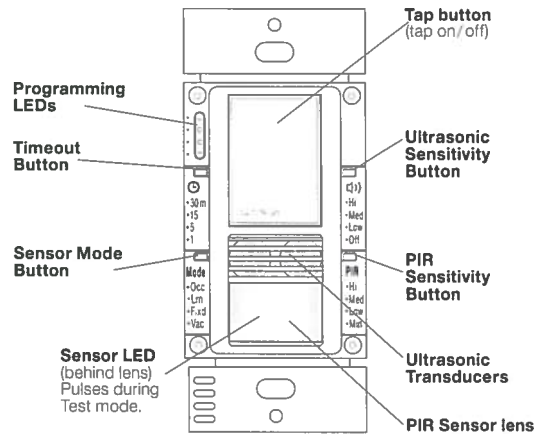
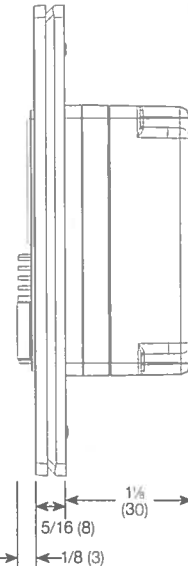
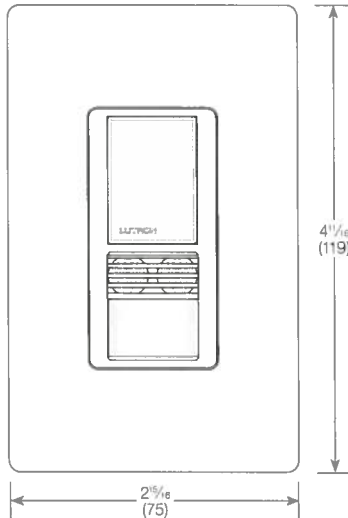
Maestro®**Dual Technology Occupancy Sensor Switch****Sensor**

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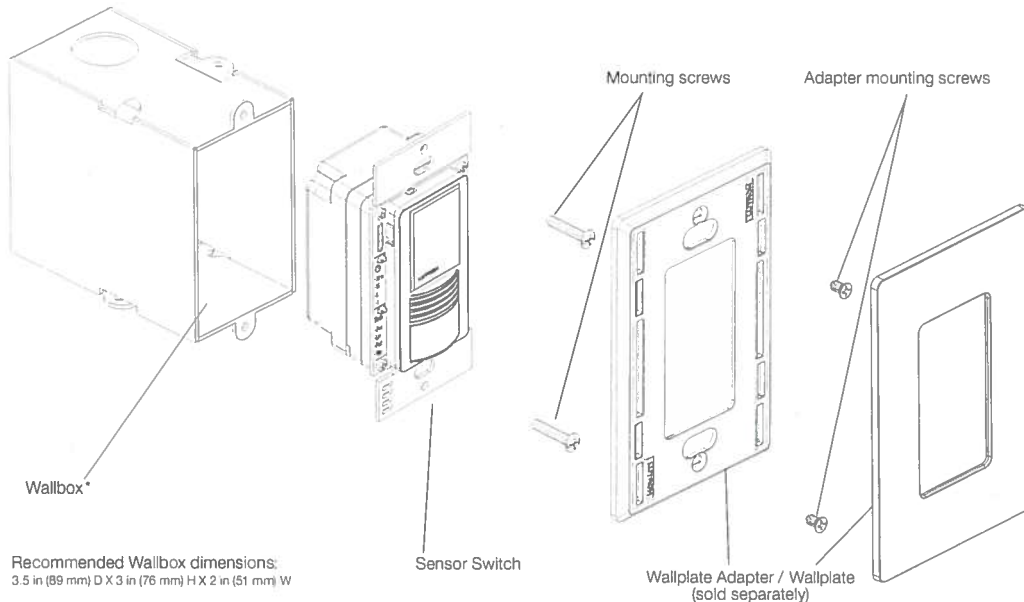
Dimensions - Single-Circuit MS-A102, MS-A102-V, MS-B102, MS-B102-V

Measurements shown as: in (mm).

Operation

Front View**Side View**

Mounting



* Recommended Wallbox dimensions:
3.5 in (89 mm) D X 3 in (76 mm) H X 2 in (51 mm) W

LUTRON® SPECIFICATION SUBMITTAL

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Job Name:**Model Numbers:****Job Number:**

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Submitted by Spectrum Lighting, Inc.


Job Name:
OSU - NRD BUILDINGS

Catalog Number:
MS-A102-

Notes:

Type:

SPEC14-5147

Maestro®

Dual Technology Occupancy Sensor Switch

Sensor

369773c 14 04.09.14

Colors and Finishes

Gloss Finishes

White
WHIvory
IVAlmond
ALLight Almond
LAGray
GRBrown
BRBlack
BL

Satin Finishes

Hot
HTMerlot
MRPlum
PLTurquoise
TQTaupe
TPEggshell
ESBiscuit
BISnow
SWPalladium
PDMidnight
MNSienna
SITerracotta
TCGreenbriar
GBBluestone
BGMocha Stone
MSGoldstone
GSDesert Stone
DSStone
STLimestone
LSSea Glass
SG

- Due to printing limitations, colors and finishes shown cannot be guaranteed to match actual product colors perfectly.
- Color chip keychains are available for more precise color matching:
Gloss Finishes: DG-CK-1
Satin Finishes: SC-CK-1

LUTRON® SPECIFICATION SUBMITTAL

Page

Job Name:

Model Numbers:

Job Number:

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
OAC-DT-1000-R

Notes:

Type:

SPEC14-5147



OAC-DT, MicroSet Dual Tech Ceiling Sensor Low Voltage

PIR
ActivatedUltrasonic
ActivatedMicroSet
Self-AdjustingCalifornia
Title 24
Compliant

- MicroSet self-adjusting Time Delay and sensitivity
- Optional built-in light level sensor
- Optional BAS/HVAC isolated relay
- NEMA WD7 Standard robotic method utilized to verify coverage patterns
- Selectable Walk Through Mode

Specifications:**Technology:** Passive Infrared (PIR) and Ultrasonic (US)**Power Requirements:****Input:**

- 10-30 VDC from Greengate Switchpack or Greengate system.
- Maximum current needed is 25mA per sensor.

Output:

- Open collector output to switch up to ten Greengate Switchpacks.
- BAS with Isolated Form C Relay in (-R) model.
- Isolated Form C Relay Ratings: 1A 30 VDC/VAC.

Time Delays: Self-adjustable, 15 seconds/test (10 min. Auto), or Selectable 5, 15, 30 minutes, or Zero Time Delay**Coverage:** 500, 1000, and 2000 sq. ft.**Light Level Sensing (-R models):** 0 to 300 foot-candles**Operating Environment:**

- Temperature: 32°F - 104°F (0°C - 40°C)
- Relative humidity: 20% to 90%, non-condensing
- For indoor use only

Housing: Durable, injection molded housing. Polycarbonate resin complies with UL 94V0.**Size:** 4.5"H x 1.42"W (114.3mm x 36.068mm)**LED lamp:** Green LED for Ultrasonic

Red LED for Passive Infrared

Warranty: Five year

FCC Compliant
cULus Listed
RoHS Compliant RoHS

www.coopercontrol.com

| Catalog # | Type |
|-------------|------|
| Project | |
| Comments | |
| Prepared by | Date |

**Overview**

The Dual Technology sensor's combination of Ultrasonic and Passive Infrared technologies offers the most complete sensing equipment available today. This pairing helps eliminate false activations or deactivations for additional energy savings. The OAC-DT sensors are also equipped with MicroSet self-adjusting technology which provides an adaptive and airflow tolerant technology, making them ideal for spaces which have increased airflow due to higher occupant levels. MicroSet self-adjusting Dual Technology sensors drastically simplify and reduce a contractor's installation and adjustment time period.

Technology

The MicroSet self-adjusting technology continuously monitors multiple sub-frequencies in the event that if a continuous Doppler shift occurs, such as those created by airflow from an air duct, the sensor will identify the noise as continuous and then block it out of view at a select sub-frequency. It will continue to monitor other sub-frequencies for human motion. This avoids false-activation, while still maintaining the high level of sensitivity that is necessary for sensing minor motion in a changing environment. Separate concurrent time delays for both Passive Infrared and Ultrasonic technologies avoid false activations or deactivations. In Automatic ON Mode, the lights turn ON when a person enters the room. In Manual On Mode (-R model only), the lights are turned ON by activating a momentary switch (model # GMDS-1) that is connected to the sensor. When enabled, the daylighting feature (-R models only) prevents lights from turning ON when the room is adequately illuminated by natural light.

Applications

| | | |
|------------------|----------------|----------------------------|
| classrooms | common areas | hallways |
| conference rooms | computer rooms | other indoor office spaces |
| office spaces | break rooms | |

Ordering

| Catalog # | Recommended Room Size | Field of View | Frequency | Features |
|---------------|-----------------------|----------------|-----------|-------------------------------|
| OAC-DT-2000-R | 2,000 sq. ft. | Two Way (360°) | 32 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-2000 | 2,000 sq. ft. | Two Way (360°) | 32 kHz | |
| OAC-DT-1000-R | 1,000 sq. ft. | Two Way (360°) | 32 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-1000 | 1,000 sq. ft. | Two Way (360°) | 32 kHz | |
| OAC-DT-0501-R | 500 sq. ft. | One Way (180°) | 40 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-0501 | 500 sq. ft. | One Way (180°) | 40 kHz | |

203 Cooper Circle
Peachtree City, GA 30269

P: 800-553-3879
F: 800-954-7015

COOPER Controls

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRDT BUILDINGS

Catalog Number:
OAC-DT-1000-R

Notes:

Type:

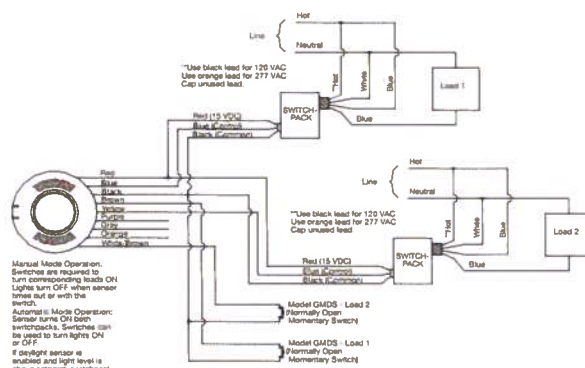
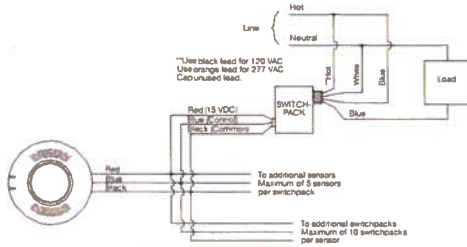
SPEC14-5147

Wiring Diagrams

OAC-DT, MicroSet Dual Tech Low Voltage

One Sensor, One Switchpack

Manual or Automatic-On Control of Two Standard Switchpacks



SENSOR WIRE LEAD LEGEND


| | |
|-------------|------------------------------------|
| Black | (Common) |
| Red | (10-30VDC) |
| Blue | (Control - Occupancy) |
| Yellow | (Control - Occupancy and Daylight) |
| Brown | (Switch-Blue Lead Control) |
| Brown/White | (Switch-Yellow Lead Control) |


Sensor's Isolated Relay

| | |
|--------|-------------------|
| Orange | (Normally Open) |
| Gray | (Common) |
| Purple | (Normally Closed) |

Recommended Wire: 18-3 AWG stranded non-shielded

Manual Mode Operation:
Switches are required to turn corresponding loads ON. Lights turn OFF when sensor times out or with the switch.

Automatic Mode Operation:
Sensor turns ON both switchpacks. Switches  are used to turn lights ON or OFF.

If daylight sensor is enabled and light level is above setpoint, switchpack connected to yellow lead  will not turn ON.

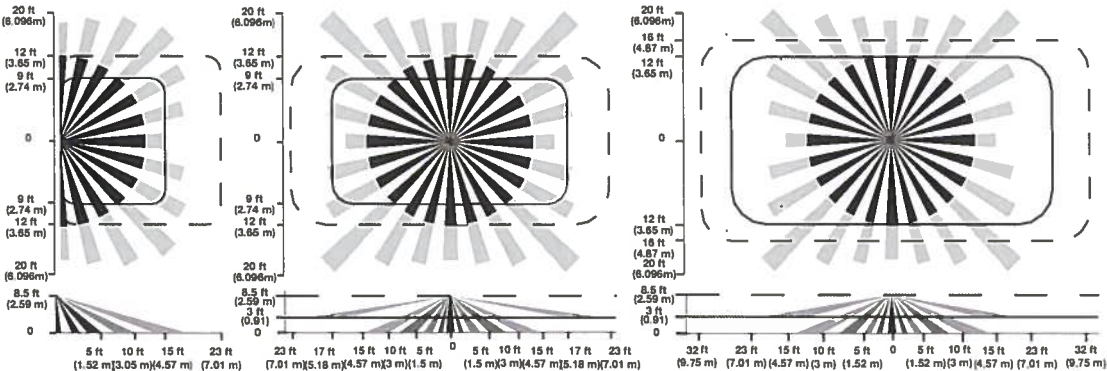
Recommended Wire
18-3 AWG Stranded Wire

Coverage

OAC-DT-0501-R
500 sq. ft.

OAC-DT-1000-R
1,000 sq. ft.

OAC-DT-2000-R
2,000 sq. ft.




Recommended Mounting Height: 8 to 12 ft

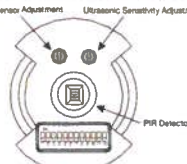
Maximum coverage area may vary somewhat according to room shape and the presence of obstacles

The NEMA WD 7 Standard and robotic method were utilized to verify coverage patterns.

Controls

| DIP Switch Legend | | | | | | | | | | | | | | |
|-------------------------------------|------------|---|------------------|--------------|------------------|--------------------|---|---------|-----------------------------------|----------|------------------|-----------------|------------------|-----------------|
| DIP Switch | Time Delay | | Activation | | PIR Sensitivity | Walls-Through Mode | | LEDs | | Override | Sweep | Full/Half Logic | HVAC/Tracking | Zero Time Delay |
| | 1 | 2 | Relay 1 3 | Relay 2 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| Auto | ▼ | ▼ | Auto | Auto | Full | Disable | Enable | Disable | ▼ | Disable | ▼ | Normal | Disable | Disable |
| 5 Minutes | ▼ | ▼ | Manual | Manual | 50% | Enable | Disable | Enable | ▼ | Enable | ▼ | Swamp | Enable | Enable |
| 10 Minutes | ▲ | ▲ | (← R model only) | | (← R model only) | | Daylight Sensor Adjustment | | Ultrasonic Sensitivity Adjustment | | (← R model only) | | (← R model only) | |
| 15 Minutes | ▲ | ▲ | | | | | | | | | | | | |
| "Self-Adjusts to 10 min. user mode" | | | | | | |  | | | | | | | |

Default =



www.coopercontrol.com
203 Cooper Circle, Peachtree City, GA 30269
P: 800-553-3879 F: 800-954-7016

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ACC120009

COOPER Controls

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Spectrum Lighting, Inc.


Job Name:
OSU - NRD BUILDINGS

Catalog Number:
OAC-DT-0501-R
Type:**Notes:**

SPEC14-5147



OAC-DT, MicroSet Dual Tech Ceiling Sensor Low Voltage

PIR
ActivatedUltrasonic
ActivatedMicroSet
Self-AdjustingCalifornia
Title 24
Compliant

- MicroSet self-adjusting Time Delay and sensitivity
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- Isolated Form C Relay Ratings: 1A 30 VDC/VAC.

Time Delays: Self-adjustable, 15 seconds/test (10 min. Auto), or Selectable 5, 15, 30 minutes, or Zero Time Delay**Coverage:** 500, 1000, and 2000 sq. ft.**Light Level Sensing (-R models):** 0 to 300 foot-candles**Operating Environment:**

- Temperature: 32°F - 104°F (0°C - 40°C)
- Relative humidity: 20% to 90%, non-condensing
- For indoor use only

Housing: Durable, injection molded housing. Polycarbonate resin complies with UL 94V0.**Size:** 4.5"H x 1.42"W (114.3mm x 36.068mm)**LED lamp:** Green LED for Ultrasonic

Red LED for Passive Infrared

Warranty: Five year

FCC Compliant

cULus Listed

RoHS Compliant



www.coopercontrol.com

| | |
|-------------|------|
| Catalog # | Type |
| Project | |
| Comments | |
| Prepared by | Date |

**Overview**

The Dual Technology sensor's combination of Ultrasonic and Passive Infrared technologies offers the most complete sensing equipment available today. This pairing helps eliminate false activations or deactivations for additional energy savings. The OAC-DT sensors are also equipped with MicroSet self-adjusting technology which provides an adaptive and airflow tolerant technology, making them ideal for spaces which have increased airflow due to higher occupant levels. MicroSet self-adjusting Dual Technology sensors drastically simplify and reduce a contractor's installation and adjustment time period.

Technology

The MicroSet self-adjusting technology continuously monitors multiple sub-frequencies in the event that if a continuous Doppler shift occurs, such as those created by airflow from an air duct, the sensor will identify the noise as continuous and then block it out of view at a select sub-frequency. It will continue to monitor other sub-frequencies for human motion. This avoids false-activation, while still maintaining the high level of sensitivity that is necessary for sensing minor motion in a changing environment. Separate concurrent time delays for both Passive Infrared and Ultrasonic technologies avoid false activations or deactivations. In Automatic ON Mode, the lights turn ON when a person enters the room. In Manual On Mode (-R model only), the lights are turned ON by activating a momentary switch (model # GMDS-*) that is connected to the sensor. When enabled, the daylighting feature (-R models only) prevents lights from turning ON when the room is adequately illuminated by natural light.

Applications

| | | |
|------------------|----------------|----------------------------|
| classrooms | common areas | hallways |
| conference rooms | computer rooms | other indoor office spaces |
| office spaces | break rooms | |

Ordering

| Catalog # | Recommended Room Size | Field of View | Frequency | Features |
|---------------|-----------------------|----------------|-----------|-------------------------------|
| OAC-DT-2000-R | 2,000 sq. ft. | Two Way (360°) | 32 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-2000 | 2,000 sq. ft. | Two Way (360°) | 32 kHz | |
| OAC-DT-1000-R | 1,000 sq. ft. | Two Way (360°) | 32 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-1000 | 1,000 sq. ft. | Two Way (360°) | 32 kHz | |
| OAC-DT-0501-R | 500 sq. ft. | One Way (180°) | 40 kHz | w/BAS Relay & Daylight Sensor |
| OAC-DT-0501 | 500 sq. ft. | One Way (180°) | 40 kHz | |

203 Cooper Circle
Peachtree City, GA 30269P: 800-553-3879
F: 800-954-7016

Occupancy Sensors - Ceiling Mount

Submitted by Spectrum Lighting, Inc.

Job Name:
OSU - NRDT BUILDINGS

Catalog Number:
OAC-DT-0501-R

Notes:

Type:

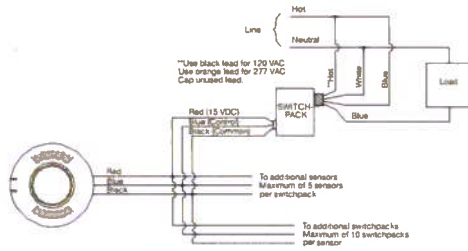
SPEC14-5147



OAC-DT, MicroSet Dual Tech Low Voltage

Wiring Diagrams

One Sensor, One Switchpack



SENSOR WIRE LEAD LEGEND

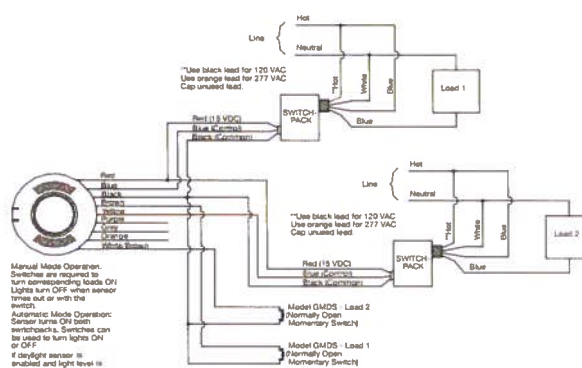
| | |
|-------------|-----------------------|
| Black | (Common) |
| Red | (10-30VDC) |
| Blue | (Control - Occupancy) |
| Yellow | (Control - Occupancy) |
| Brown | (Switch-Blue Lead) |
| Brown/White | (Switch-Yellow Lead) |

Sensor's Isolated Relay

| | |
|--------|-------------------|
| Orange | (Normally Open) |
| Gray | (Common) |
| Purple | (Normally Closed) |

Recommended Wire: 18-3 AWG stranded non-shielded

Manual or Automatic-On Control of Two Standard Switchpacks



Manual Mode Operation:
Switches are required to turn corresponding loads ON. Lights turn OFF when sensor times out or with the switch.

Automatic Mode Operation:
Sensor turns ON both switchpacks. Switches can be used to turn lights ON or OFF.

If daylight sensor is enabled and light level is above setpoint, switchpack connected to yellow lead will not turn ON.

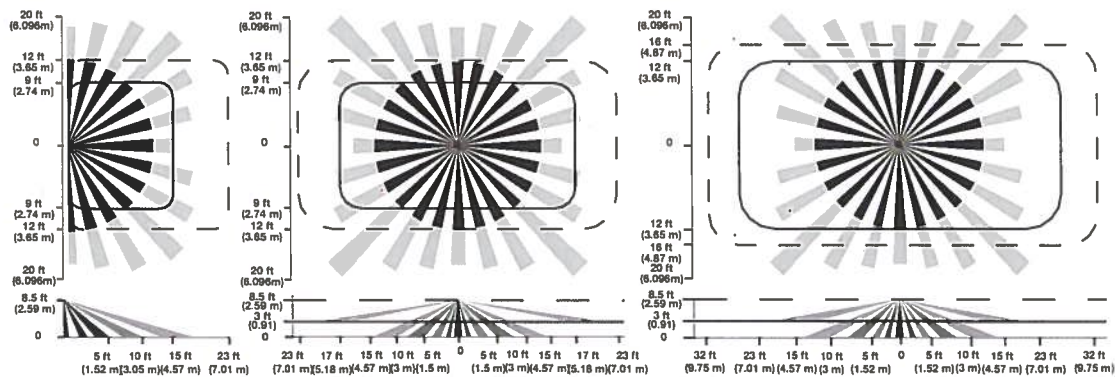
Recommended Wire
18-3 AWG Stranded Wire
mcm-bell.com

Coverage

OAC-DT-0501-R
500 sq. ft.

OAC-DT-1000-R
1,000 sq. ft.

OAC-DT-2000-R
2,000 sq. ft.



Recommended Mounting Height: 8 to 12 ft

Minor Motion, 27

Major Motion 57

Minor Motion, Ultrasonic

Major Motion Pictures

Maximum coverage area may vary somewhat according to room shape and the presence of obstacles

The NEMA WD 7 Standard and robotic method were utilized to verify coverage patterns.

Controls

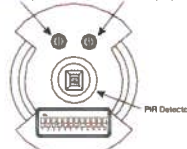
| DIP Switch Legend | | | | | | | | | | | | | | | | | | |
|-------------------|------------|---|-----------------|---|-----------------|-------------------|------------------------------|----------|---------|-----------------|---------------------------------------|-----------------|---------|---|-----------------|---|-----------------|----|
| DIP Switch | Time Delay | | Activation | | PIR Sensitivity | Walk-Through Mode | LEDS | Override | Sweep | Full/Half Logic | HVAC/Tracking | Zero Time Delay | | | | | | |
| | 1 | 2 | Relay 1 | | | | | | | | | | Relay 2 | | | | | |
| | | | 3 | 4 | | | | | | | | | 5 | 6 | 7 | 8 | 9 | 10 |
| Auto* | ▲ | ▼ | Auto | ▼ | Auto | ▼ | Full | ▼ | Disable | ▼ | Enable | ▼ | Disable | ▼ | Normal Swap | ▼ | Disable | ▼ |
| 5 Minutes | ▲ | ▼ | Manual | ▼ | Manual | ▼ | 50% | ▼ | Enable | ▼ | Disable | ▼ | Enable | ▼ | Swap | ▼ | Enable | ▼ |
| 15 Minutes | ▲ | ▼ | (-R model only) | | (-R model only) | | Flashed Sensor Active moment | | | | Inoperative - Escalator Active moment | | | | (-R model only) | | (-R model only) | |

***Self-Adjusts to 10 min. user mode**

Default =

Daylight Sensor Adjustment Ultrasonic Sensitivity Adjustment

(-R model only) (-R model only)



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ACC120009

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COOPER Controls

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries
Submitted by Spectrum Lighting, Inc.

Job Name: OSU NRD Building E



Job Name:
OSU - NRD BUILDINGS

Catalog Number:
SP20-MV

Type:**Notes:**

SPEC14-5147



SP15 & SP20, Heavy Duty Switchpacks



- Replaces separate transformers and relays
- Zero-crossing circuit provides increased durability, especially with today's high inrush loads
- Capable of switching up to 20 Amps
- Suitable for Plenum use
- Rated for Ballast, Tungsten and Motor Loads

Specifications:

Electrical Ratings:

Input: (120/277 VAC-SP20-MV) (347 VAC- SP15-347) (220-240 VAC- SP20-240), 50/60 Hz operation. Contacts are isolated and may be used to control low voltage circuits.

Output: 15 VDC 125 mA to operate up to five Greengate sensors.

Control: Connecting the 22 AWG red and blue control leads to each other will close the relay contacts.

Ballast Compatibility: Compatible with magnetic and electronic ballasts.

NOTE: The life of some compact fluorescent lamps (CFLs) is shortened by frequent automatic or manual switching. Check with the CFL and ballast manufacturer to determine effects of cycling.

Operating Environment:

- Temperature: 32°F to 104°F (0°C to 40°C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Housing: Medium impact injection molded housing. ABS resin complies with UL 94V0. Plenum rated for external junction box mounting, with Teflon coated leads.

Motor Load: 1 HP 120-240 VAC; 2 HP 250 VAC

Size: 2 15/16" x 2 7/16" x 1 11/16"

Warranty: Five year

UL, CSA listed

www.coopercontrol.com

| | |
|-------------|------|
| Catalog # | Type |
| Project | |
| Comments | |
| Prepared by | Date |

Can be easily mounted on or in a 4sq. junction box, via 1/2" in nipple

Reduces installation expense



Available for 120, 220, 240, 277 & 347 VAC operation

Overview

Switchpacks provide 15 VDC operating voltage to all low voltage, 15 VDC, occupancy sensors and daylighting controllers. A single switchpack can provide power for up to five sensors. Up to ten switchpacks can be connected to one sensor for control of multiple circuits. Isolated contacts may also be used to control HVAC, contactors, motors, etc.

Operation

The switchpack has two main components; a transformer and a high current relay. The transformer has a primary high voltage input and a low voltage output. The low voltage output, 15 VDC provides operating power to low voltage occupancy sensors manufactured by Cooper Controls. When an occupancy sensor detects motion, it electrically closes an internal circuit which pulls up the control signal between the sensor and the switchpack signaling the switchpack to close it's high current relay resulting in the lights being turned ON.

Application

The switchpack is designed to work with low voltage sensors which require switchpacks. It cannot be used with sensors designed for use with any other low voltage relay systems. Consult sensor spec sheets for other sensor/relay combinations.

Ordering

| Catalog # | Rated | Ballast | Tungsten | Motor (HP) | Output |
|-----------|-------------|---------|-----------|--------------------|---------------|
| SP20-MV | 120/277 VAC | 20A | 15A, 120V | 1HP-120V, 2HP-250V | 15 VDC, 125mA |
| SP15-347 | 347 VAC | 15A | NR | NR | 15 VDC, 125mA |
| SP20-240 | 220-240 VAC | 20A | NR | NR | 15 VDC, 125mA |

203 Cooper Circle
Peachtree City, GA 30269

P: 800-553-3879
F: 800-954-7016

COOPER Controls

Occupancy Sensors - Switchpacks

Submitted by Spectrum Lighting, Inc.



Job Name:
OSU - NRDT BUILDINGS

Catalog Number:
SP20-MV

Notes:

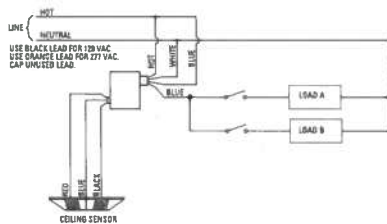
Type:

SPEC14-5147

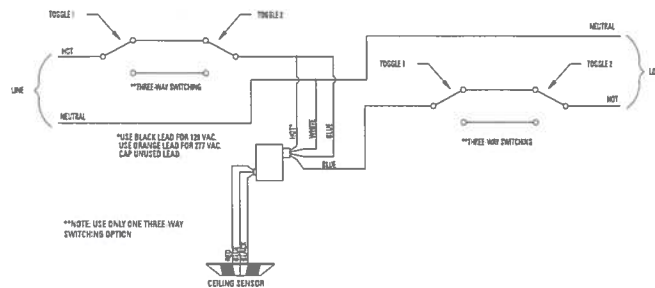
SP15 & SP20, Heavy Duty Switchpacks

Wiring Diagrams

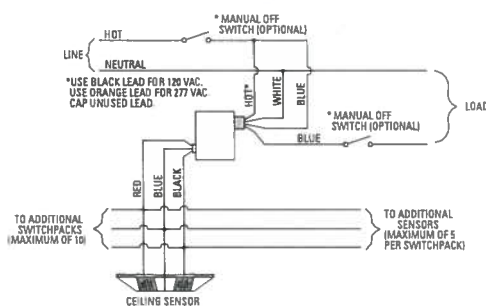
A/B Switching



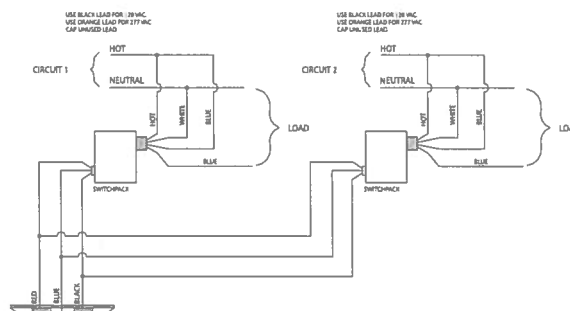
Three Way Switching



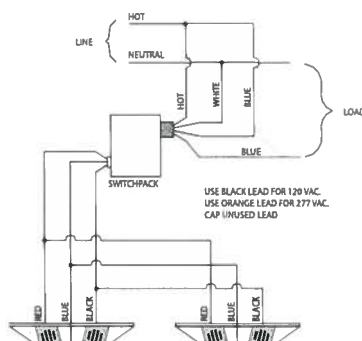
Standard Configuration



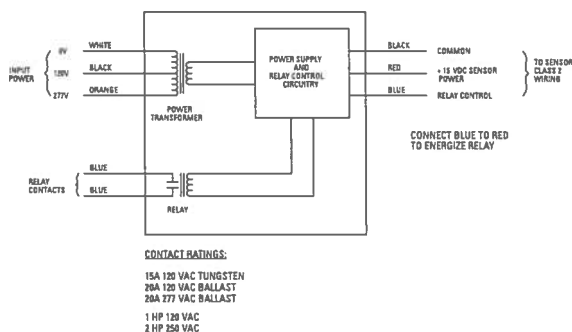
2 Circuits, 1 Sensor



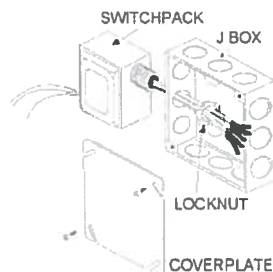
1 Circuit, 2 or more sensors



SP20-MV Schematic



Mounting



All connections are made via pigtails with twist-on wire connectors.

NOTE: Connect either the orange or black supply lead to the power source depending upon the power requirements. Cap the unused lead.

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P: 800-553-3879 F: 800-954-7016

ACC080177

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COOPER Controls

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

UL924 Enclosed 20 AMP Bypass Relay with Remote Emergency Control

EMERGENCY LIGHTING BYPASS CONTROLS



PROJECT INFORMATION

Project Name

OSU NRDT - Building I

Catalog No.

UL924

Date



UL924BRUNV

Hubbell Building Automation's enclosed 20 Amp electrically held UL 924 Bypass Relay is specifically designed for projects requiring bypass utilizing an unswitched emergency circuit that is not controlled by a relay in a panel or power pack. The control of the lighting on the emergency circuit is switched ON and OFF based on the normal circuit switching input to the unit. When the loss of commercial power occurs, the contact returns to its normally closed state and bypasses control to the emergency egress lighting.

The unit includes an automatic test function that simulates utility power failure and holds emergency lighting on for 2.5 seconds each time the switched input is turned OFF.

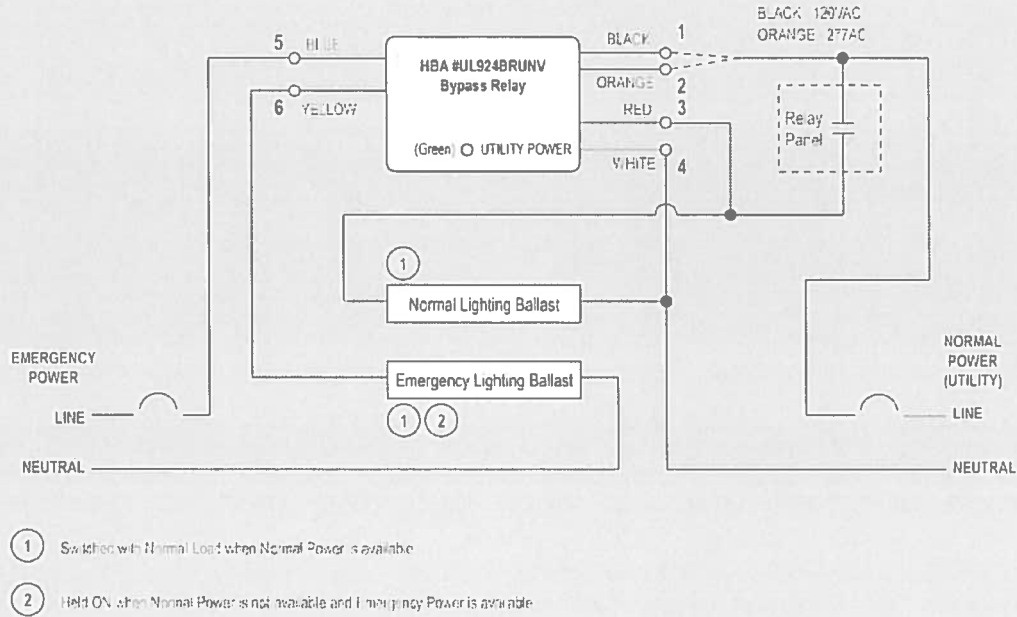
PRODUCT FEATURES

- 20 Amp 120/277VAC Relay
- Available with Dual Tap 120VAC or 277VAC Coil
- N/C isolated contacts
- UL listed
- No minimum load requirement
- Five-year warranty



HUBBELL
Building Automation

Contractor: Vaughn Industries



General Specifications

| | |
|-------------------------|--|
| # Relays & Contact Type | One (1) SPST Continuous Duty Electrically Held Coil |
| Contact Ratings | 1500 VA Tungsten @ 120VAC 20 Amp Ballast @ 120/277VAC 2 HP @ 277VAC 1 HP @ 120VAC |
| Coil Current | 0.06 A @ 120VAC 0.06 A @ 277VAC |
| Coil Voltage Input | UL9248RUNV. 120 or 277VAC; 60Hz |
| Operating environment | Indoor use only 32° to 140°F Relative humidity (non-condensing): 0% to 95% |
| Dimensions | 3.75" x 1.75" x 1.25" with mounting ears for 1-gang box |
| Housing Rating | Plenum, NEMA 1 |
| Flame Rating | UL94V-0 |
| Wires | 7", 105° C, 600V Rated |
| Certifications | UL Listed, UL924 |
| Warranty | Five years |

Ordering Information

| UL9248RUNV | |
|------------|--|
| MODEL | |
| UL9248RUNV | UL924 Emergency Control Relay (Shunt or Bypass) with auto test 120-277VAC Coil |



HUBBELL
Building Automation

9601 Dessau Road | Building One | Austin, Texas 78754 | 512-450-1100 | 512-450-1215 fax | www.hubbell-automation.com

6002A 12.26.2013

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

LIMBURG Collection

Type: **A75**
LIMBURG Product #: **L5287**
Project: **OSU NRDT**
Voltage: **120V**

Diffuse pendant luminaires for halogen lamps

Material: Housing, canopy, and rod suspension constructed of aluminum with a painted silver RAL 9006 (L5287) or polished stainless steel (L5483) finish.

Glass: Hand blown, three-ply opal glass with satin matte finish and screw neck. Glass is open on bottom. Minimum 75% transmission. Luminaire efficiency: 89.7%.

Electrical: One (1) 26 W, 32 W, or 42 W triple 4-pin GX24q-4 base compact fluorescent lamp (by others). GX24q-4 4-pin socket and electronic ballast, with universal voltage, 120 V through 277 V.

Installation: Mounts directly to standard 4" octagonal wiring box.

U.L. listed, suitable for damp locations.

Please note: Rod suspension ϕ .39".

Weight: 6.6 lbs.

L = overall length of luminaire

Mounting options:

588 45° swivel canopy

Shallow 45° swivel canopy is designed for stem mounted pendants and is ideal for use on sloped ceilings and in seismic areas.

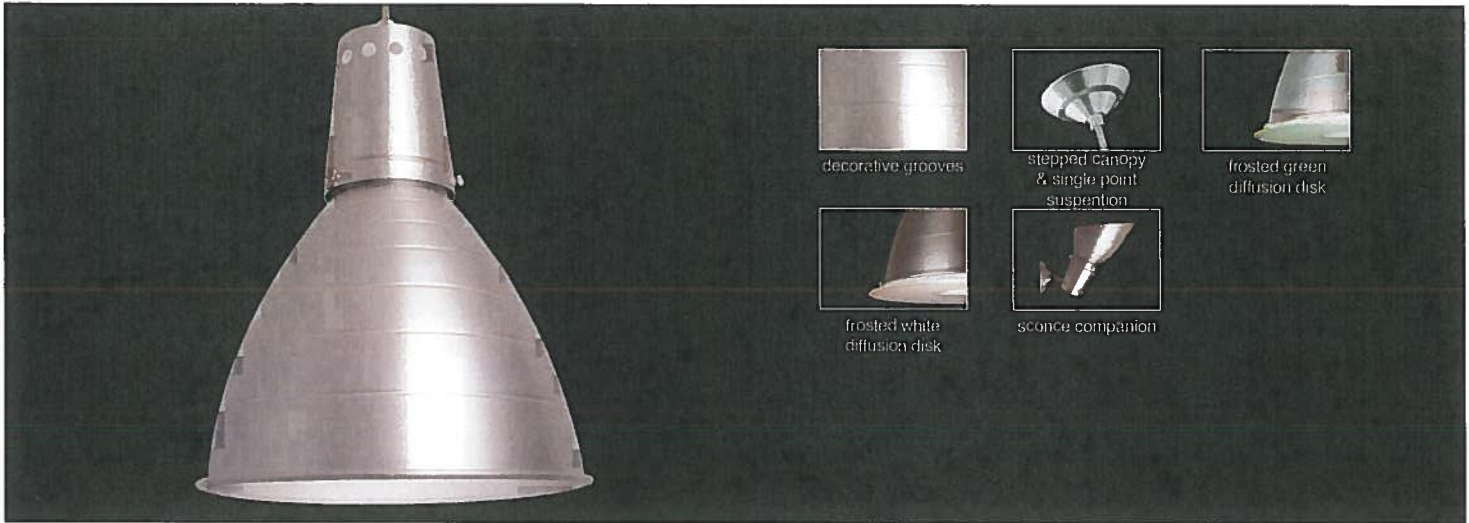


| Silver | Polished S/steel | Lamp | Lumen | A | B | L |
|--------------|------------------|--------------------|-------|-------|--------|----|
| L5287 | L5483 | 1 42W CF triple-4p | 3200 | 8 5/8 | 15 1/2 | 72 |

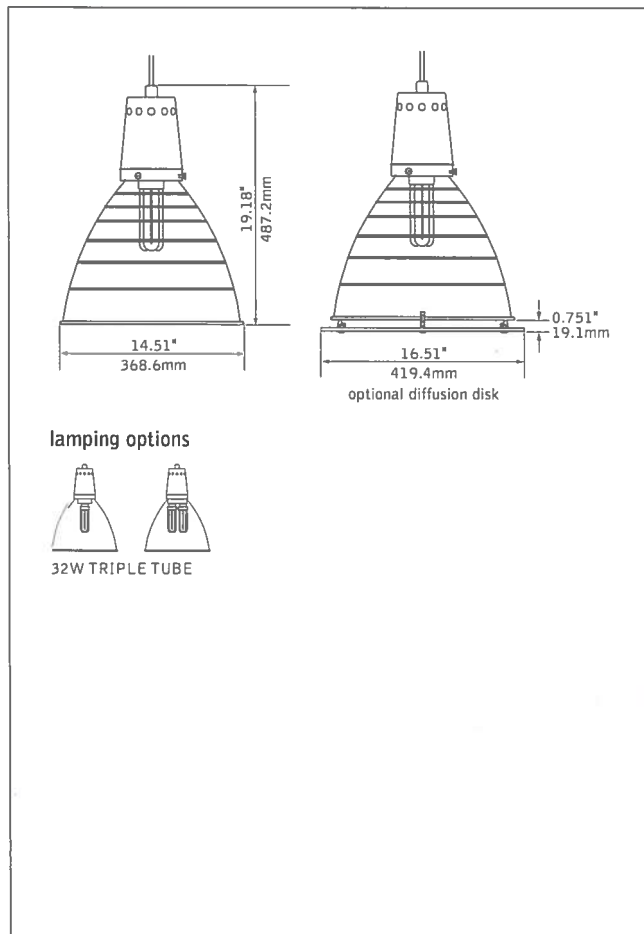
Contractor: Vaughn Industries

Groove™ E
FLUORESCENT

OSU NRDT DORM: F
TYPE: A73
FGR E 1 32TT S 120 C144 NA



DIMENSIONAL DATA



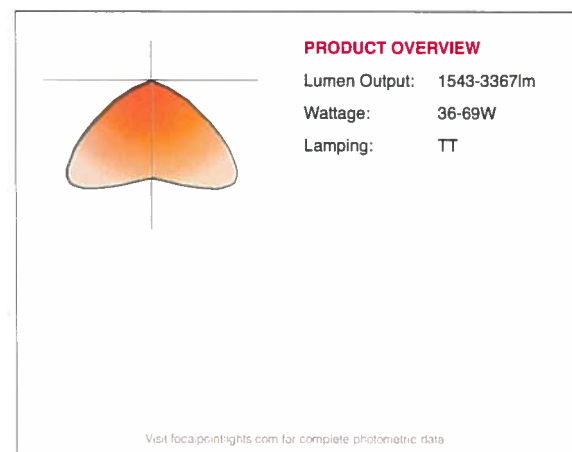
FEATURES

Pendant mount decorative compact fluorescent luminaire.

Housing, reflector and canopy are spun with high quality aluminum.

Ideally suited for retail, hospitality, lobbies, corridors, open ceiling areas and other specialty applications.

PERFORMANCE



fixture: Contractor: Vaughn Industries
project:

Job Name: OSU NRDT DORMS: F, I, L

OSU NRDT DORM: F
TYPE: A73

SPECIFICATIONS

Construction

Housing, reflector and canopy are each one-piece precision-spun 14Ga. aluminum. Housing: 7.62"H x 5.25" Dia. Reflector: 12.35"H x 14.51" Dia. aperture with grooved cylindrical pattern. Canopy: 1.32"H x 4.52" Dia. stepped design with #8-32 recessed set screw. Weight: 10 lbs.

Optic

14Ga. anodized aluminum reflector with diffuse satin matte surface for lamp image reduction. Optional frosted green or white acrylic diffusion disk with polished edges are retained by aluminum fasteners and (3) #8-32 thumb screws.

Electrical

Luminaires are pre-wired for single circuit with thermally protected Class "P" electronic ballast. Factory installed decorative metal braided power cord is included. White SJT power cord supplied for 347V. 144" cord is provided on all luminaires and may be cut to length in field. One or two lamp triple tube compact fluorescent, 4-pin, 32W (GX24q-4).

Labels

UL listed.

Finish

Luminaire housing, reflector and canopy are clear anodized with polished satin finish. Reflector interior has matte diffuse finish.

ORDERING

| | |
|------------------------------|-------------|
| Luminaire Series | FGR |
| Groove | FGR |
| Profile | E |
| Profile | E |
| Lamp Quantity | |
| One Lamp | 1 |
| Two Lamp | 2 |
| Lamp Type | 32TT |
| 32w. Triple Tube, GX24q-3 | 32TT |
| Ballast | S |
| Electronic <15% THD | S |
| Voltage | |
| 120 Volt | 120 |
| 277 Volt | 277 |
| 347 Volt | 347 |
| Suspension | C144 |
| Cable, Straight Feed | C144 |
| (144" cable cut in field) | |
| Factory Options | |
| Frosted Green Diffusion Disk | GD |
| Frosted White Diffusion Disk | WD |
| Include 3000K Lamp* | L830 |
| Include 3500K Lamp* | L835 |
| Include 4100K Lamp* | L841 |
| Finish | NA |
| Natural Anodized | NA |

(Contact factory for paint color options)

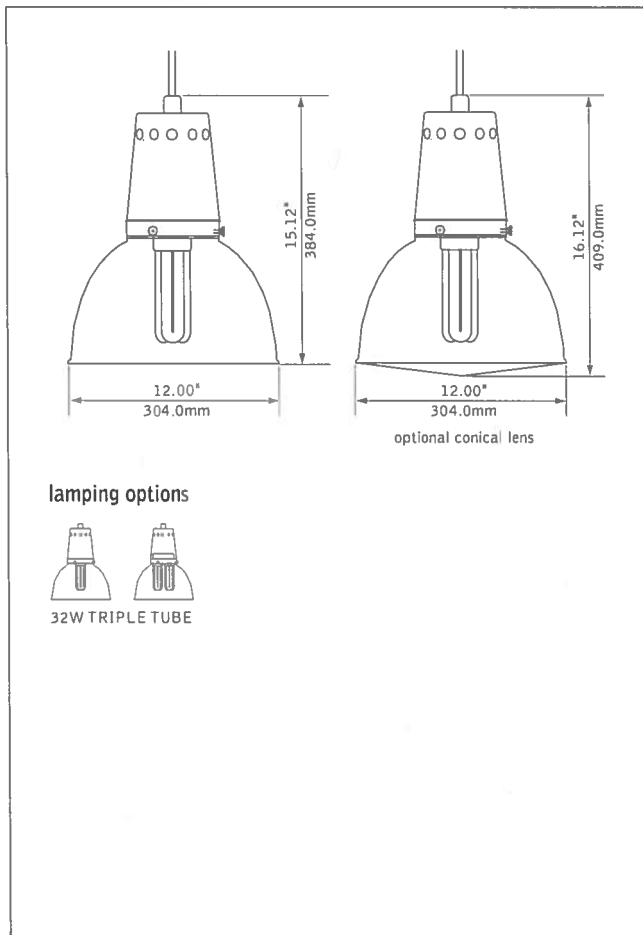
Contractor: Vaughn Industries

Groove™ G
FLUORESCENT

OSU - NRD T
DORMS: F, I, L
TYPE: A74
FGR G W 1 32TT S 120 C144 NA



DIMENSIONAL DATA



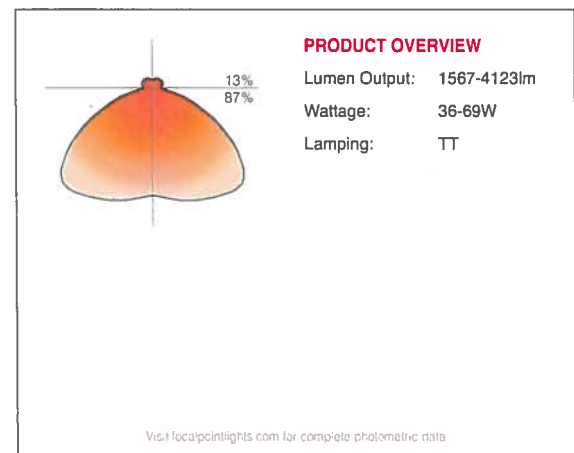
FEATURES

Pendant mount decorative compact fluorescent luminaire.

Housing and canopy are high quality spun aluminum with acrylic refractor.

Ideally suited for retail, hospitality, lobbies, corridors, open ceiling areas and other specialty applications.

PERFORMANCE



fixture: Contractor: Vaughn Industries
project:

Job Name: OSU NRDT Dorms: F, I, L

OSU NRDT - Dorms: F, I, L Fixture Type A74

SPECIFICATIONS

Construction

Housing and canopy are each one-piece precision-spun 14Ga. aluminum. Housing: 7.62"H x 12" Dia. Canopy: 1.32"H x 4.52" Dia. stepped design with #8-32 recessed set screw. Weight: 10 lbs.

Optic

Molded acrylic prismatic refractor. 7.47"H x 12.00"Dia. aperture with fluted pattern. Optional frosted green or white acrylic diffusion disk with polished edges is retained by aluminum fasteners and (3) #8-32 thumb screws. Optional conical lens with stainless steel clamp band.

Electrical

Luminaires are pre-wired for single circuit with thermally protected Class "P" electronic ballast. Factory installed decorative metal braided power cord is included. White SJT power cord supplied for 347V. 144" cord is provided on all luminaires and may be cut to length in field. One or two lamp triple tube compact fluorescent, 4-pin, 32W (GX24q-3).

Labels

UL listed.

Finish

Luminaire housing and canopy are clear anodized with polished satin finish.

ORDERING

Luminaire Series

Groove FGR

FGR

Profile

Profile G

G

Shielding

Clear Prismatic Refractor C

Clear Prismatic Refractor

with Metallized Interior M

White Prismatic Refractor W

(Contact factory for additional reflector colors)

Lamp Quantity

One Lamp 1

Two Lamp 2

Lamp Type

32w. Triple Tube, GX24q-3 32TT

32TT

Ballast

Electronic <15% THD S

S

Voltage

120 Volt 120

277 Volt 277

347 Volt 347

Suspension

Cable, Straight Feed C144

(144" cable cut in field)

C144

Factory Options

Frosted Green Diffusion Disk GD

Frosted White Diffusion Disk WD

Conical Lens CL

Include 3000K Lamp* L830

Include 3500K Lamp* L835

Include 4100K Lamp* L841

Finish

Natural Anodized NA

NA

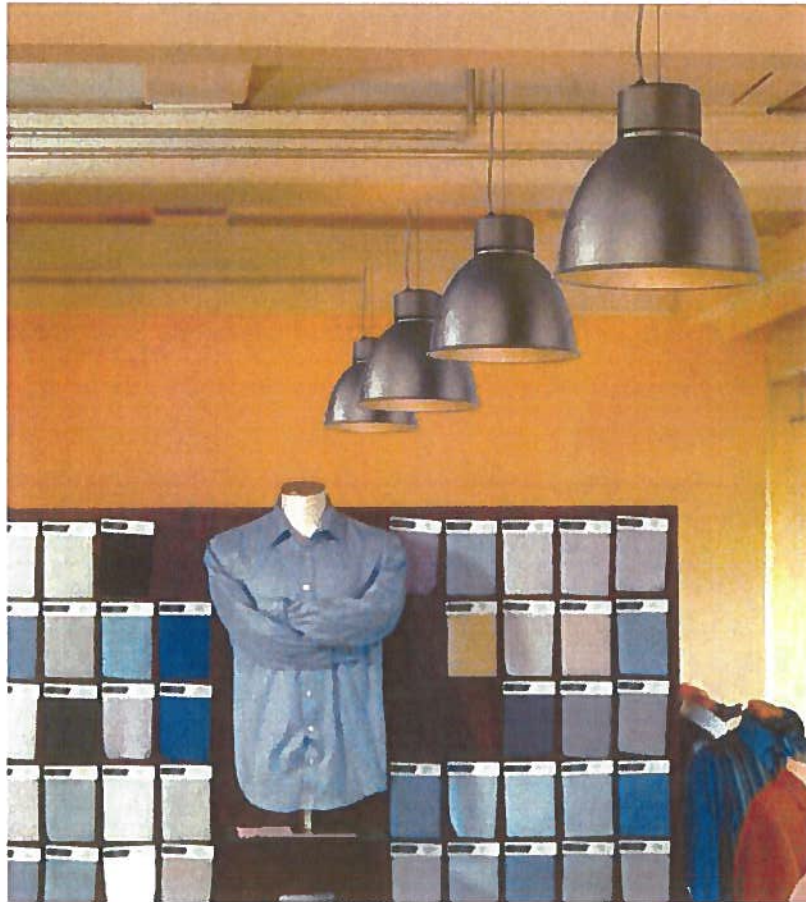
(Contact factory for paint color options)

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

| | | | |
|---|---|---|--------------------|
|  JACK DUFFY & ASSOC., INC. | Project 14-23811-0 OSU NRD Submitted By JACK H DUFFY | Catalog Number 7165204U/794023U Notes | Type A71 |
|---|---|---|--------------------|

SLV[®]
109



PARA LED



Sockets/Bulbs:
PH65-d/Forima LED Twistable
Module (incl.)
20W max.

Material:
Aluminum

Dimensions:
Ø/14 12.6/11.6 in
Canopy Ø/H 4.3/2 in

Accessory/Included parts:
Canopy (incl.)

Versions:
silver grey

Art. No.:
7165204U

Optional lamp/bulb:
Forima LED Twistable Module
1100 v. CBI R0
16W 3000K
Art. No.:
794023U



Note:
The 560202u
lamp was
discontinued.




SLV Lighting North America, Inc.

5731 Benjamin Center Drive • Tampa, FL 33634
Main Line: (813) 349-1900 • Fax Line: (813) 349-1907 • www.slvlighting.com

Contractor: Vaughn Industries

Job Name: OSU NRDT Building F

| | | | |
|---|--------------------------------|------------------------------------|---|
|  | Project 14-23811-0 OSU NRDT | Catalog Number 7165204U/794023U | <div style="font-size: 2em; font-weight: bold;">A71</div> |
| | Submitted By JACK H DUFFY | Notes | |

PHILIPS



Recommended dimmer list - Fortimo Twistable DLM Gen3 dim

794023U-SELECT DIMMER

| Brand | Type # | Type | Max load | Min # modules | Dimming performance |
|-----------------|------------|------|----------|---------------|---------------------|
| LE dimmers | | | * | per dimmer** | Lowest light level |
| Crabtree | DV21912 | RL | 400W | 2 | 1-10 % |
| Busch/A88 | 6523U | LED | 100W | 1 | 1-10 % |
| Busch | 2250U | R | 600W | 2 | 1-10 % |
| Schneider | CCT011269 | RL | 500W | 1 | 1-10 % |
| ELKO | RS16/400 | RL | 400W | 1 | 1-10 % |
| Varilight | P400 | RL | 400W | 2 | 1-10 % |
| legrand | 67084 | RLC | 400W | 1 | 1-10 % |
| Lauritz Knudsen | 506da109 | RL | 300W | 1 | 11-20% |
| Berker | 2866-10 | RL | 500W | 1 | 11-20% |
| GIRA | 030200/100 | RL | 600W | 1 | 11-20% |
| Berker | 283010 | R | 400W | 1 | 11-20% |
| JUNG | 225NV DE | RL | 500W | 1 | 11-20% |
| Vimar | 20160 | RL | 500W | 1 | 11-20% |
| BUSH | 2200U | RL | 400W | 1 | 11-20% |
| NIKO | 310-01901 | LED | 300W | 1 | 11-20% |
| Busch | 2247U | RL | 500W | 1 | 11-20% |
| PEHA | 435HAN | RL | 600W | 1 | >20% |
| ELKO | CCTEL11013 | RL | 400W | 1 | >20% |
| NIKO | 09-013 | RL | 300W | 1 | >20% |

* Dimmable, with x to y modules up to a max of 10% of the max dimmer load.

Note: LED dimmers can make use of max load


** When a minimum of 2 modules is recommended, flickering could happen when connecting only 1 module

TE dimmers

| | | | | | |
|---------|-----------|----|------|---|--------|
| SIEMENS | 5TC8 284 | RC | 600W | 1 | 1-10 % |
| JUNG | 225TDE | RC | 500W | 1 | 11-20% |
| Busch | 6513U-102 | RC | 400W | 1 | 11-20% |
| PEHA | 433HAB | RC | 300W | 1 | 11-20% |

Philips LED Systems OEM

13-03-2013 revision 1

| | | | | |
|---|---|-------------------------------|----------------------------|--------------------|
|  | Project 14-16183-14 Date 10/29/2014 Submitted By LIGHTING UNLIMITED INC | Job Name C.E.D. Building F | Catalog Number ELM61272 | Type EM1 |
| | | | Notes | |



FEATURES & SPECIFICATIONS

INTENDED USE — Provides a minimum of 90 minutes of illumination for the rated wattage upon loss of AC power. Ideal for applications requiring attractive unit equipment with quick installation.

CONSTRUCTION — White, compact, low-profile contemporary design. Engineering-grade thermoplastic housing is impact-resistant, scratch-resistant and corrosion-proof. UL94V-0 flame rating. UV-stable resin resists discoloration from natural and man-made light sources.

Two 9W wedge-based krypton lamps offer 80 percent more light output than standard 9W incandescent lamps. Patented, MR24, multi-faceted reflector significantly improves photometric performance — 48 percent more light delivered to path of egress.

Unique track-and-swivel arrangement permits full range of direction of lamp head adjustment. Ceiling mount standard. **US Patent No. D-532,918. Patent-pending Quick-Mount for simple installation.**

Tool-less access for maintenance. Rigid conduit entry on both top and side on large units (ELM654, ELM1254, and ELM1272), and top only for small units (ELM618 and ELM627).

Universal J-box mounting pattern.

Low-profile, integrated test switch/pilot light.

Battery: Sealed, maintenance-free lead-calcium battery standard. Automatic recharge after a 90-minute discharge. Single-circuit battery connection.

ELECTRICAL — Universal input voltage capability (120 through 277 volt, 50 or 60 Hz).

Current-limiting charger maximizes battery life and minimizes energy consumption. Provides low operating costs.

SHORT-CIRCUIT PROTECTION — CURRENT-LIMITING CHARGER CIRCUITRY

PROTECTS PRINTED CIRCUIT BOARD FROM SHORTS.

Thermal protection senses circuitry temperature and adjusts charge current to prevent overheating and charger failure.

Thermal compensation adjusts charger output to provide optimum charge voltage relative to ambient temperature.

Regulated charge voltage maintains constant-charge voltage over a wide range of line voltages. Prevents over/under charging that shortens battery life and reduces capacity.

Filtered charger input minimizes charge voltage ripple and extends battery life.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Self-Diagnostics: Single multi-color LED indicator to display two-state charging, test activation and three-state diagnostic status. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection. WRS Self-diagnostic testing for five minutes every 30 days and 90 minutes annually. Self diagnostic testing for five minutes every 30 days and 30 minutes biannually. Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition. Continuously monitors AC functionality. Load learning capability self-calibrates to DC load at first test, enabling it to detect a lamp failure on future tests. It may be recalibrated at any time by holding down the test switch for 15 seconds.



QUANTUM
Thermoplastic Emergency Light

ELM 6-12

High Capacity Units
Lead-Calcium Battery



Wireless Reporting System: Data from self-diagnostics will be communicated via wireless transceivers within their vicinity, creating a self-configuring, self-healing, and self-optimizing wireless network that exchanges the data between FIDO compatible emergency lighting fixtures on an event driven-basis. **Must be ordered with FIDO edge router.**

Wireless communications electronics to operate 2.4GHz mesh network are enclosed entirely within the fixture.

INSTALLATION — Radio range is 500' between fixtures in most buildings. Actual performance may vary depending on application environment and electromagnetic interference. Substantially longer distances have been recorded in uninterrupted open air. Consult factory for more details.

LISTINGS — UL listed. Damp Location listing available. Damp Location listed STD on WRS, Meets UL 924, NFPA 101, NFPA 70-NEC and OSHA illumination standards. WRS meets all applicable FCC requirements.

WARRANTY — 3-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Actual performance may differ as a result of end-user environment and application.

Note: Specifications subject to change without notice.

ORDERING INFORMATION

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

Example: ELM618

| ELM654 | H1206 | | | |
|-----------------------|---|--------------------------------------|--|---|
| Family | Lamp type | | Options ¹ | |
| ELM618 6V, 18W | 6-Volt MR 24 Composite | 12-Volt MR 24 Composite ⁴ | B Black housing ⁶ | RO Less heads ¹⁰ |
| ELM627 6V, 27W | (blank) 9W/6V krypton ¹ | (blank) 9W/12V krypton | N Maintenance-free ni-cad battery ² | DL Damp location, 50° - 104°F (10° - 40°C) ^{11,12} |
| ELM654 6V, 54W | H1206 12W/6V halogen¹ | H1212 12W/12V halogen | TD Time delay ⁸ | NOM NOM Certified ¹³ |
| ELM1254 12V, 54W | H2006 20W/6V halogen ¹ | H2012 20W/12V halogen | RT Remote test ⁹ | WRS Dual voltage 120/277, lead calcium battery back up and self-diagnostic with FIDO wireless reporting system capability ⁷ |
| ELM1272 12V, 72W | | | SD Self diagnostics ⁴ | |

| Options Availability Guide | | | | | | | | | | |
|----------------------------|------|-----------------|-----------------|-----------------|----------------|----------------|---------------------|------------------|-------------------|------------------|
| Product | Size | SD ⁸ | TD ⁸ | RT ⁹ | N ² | B ⁶ | DL ^{11,12} | RO ¹⁰ | NOM ¹³ | WRS ⁷ |
| ELM618 | S | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| ELM627 | S | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| ELM654 | L | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| ELM1254 | L | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| ELM1272 | L | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

| Accessories: Order as separate items. | | Notes |
|---------------------------------------|--|---|
| ELA LRT | Remote test (laser) for distances up to 15' | 1 Available on ELM618, ELM627, and ELM654 only |
| ELA VS2 | Polycarbonate vandal shield (1/8" thick) ⁴ | 2 Available on ELM627 and ELM654 only. Not available with any other options. |
| ELA WG2M | Wireguard (21-1/4" W x 15" H x 12"D) ¹¹ | 3 Available on ELM654 only |
| ELA MR24 | Compact MR24 remote lamp head | 4 Available on ELM1254 and ELM1272 only |
| | ELA MR24 K0606 (6W, 6V krypton) | 5 See Options Availability Guide. |
| | ELA MR24 K0906 (9W, 6V krypton) | 6 Available on ELM627 and ELM1272. |
| | ELA MR24 H1206 (12W, 6V halogen) | 7 Available on ELM618, ELM627, and ELM1254 only |
| | ELA MR24 K0912 (9W, 12V krypton) | 8 SD and TD for ELM618 and ELM1254 must be ordered with N option. TD not available with RT. |
| | ELA MR24 H1212 (12W, 12V halogen) | 9 RT not available with SD or TD. Order ELA LRT separately. |
| | ELA MR24 H2006 (20W, 6V halogen) | 10 Not available with any other options, except ELM1272 TD. |
| | ELA MR24 H2012 (20W, 12V halogen) | 11 Damp location listed from 50°F - 104°F (10°C to 40°C) except ELM618N, ELM627N and ELM1254N listed from 60°F - 90°F (16°C to 32°C). |
| FIDO | Emergency wireless reporting system edge router (see FIDO specification for details) | 12 Standard with WRS. |
| | | 13 NOM available with ELM618 and ELM1254 only (not available with any other options). See spec sheet ELA-WG . |
| | | 14 See spec sheet ELA-RTLP-MS-VS2 |
| | | 15 See spec sheet ELA-WG . |

EMERGENCY

Date Submitted: Sept. 2, 2015

Distributor: C.E.D. Columbus, Oh 43207

ELM6-12



Project 14-16183-14 Date 10/29/2014
Submitted By
LIGHTING UNLIMITED INC

Catalog Number
Job Name
Notes

EM1

ELM 6-12 QUANTUM® Thermoplastic Emergency Light

SPECIFICATIONS

ELECTRICAL

Primary Circuit

| Type | Volts | AC input Amps | Max watts | Output volts | 1-1/2 hrs. | 2 hrs. | 3 hrs. | 4 hrs. |
|---------|-------|------------------|-----------|-----------------|------------|--------|--------|--------|
| ELM618 | 120 | .167 | 5.2 | 6 | 18 | 13.5 | 9 | 3 |
| ELM627 | 277 | .072 | 5.6 | 6 | 27 | 20 | 13.5 | 10 |
| ELM654 | 120 | .250 | 7.4 | 6 | 54 | 40.5 | 27 | 20 |
| ELM1254 | 277 | .108 | 7.4 | 12 | 54 | 40.5 | 27 | 20 |
| ELM1272 | 120 | .250 | 11 | 12 | 72 | 54 | 36 | 27 |
| | 277 | .108 | 11.1 | | | | | |

BATTERY

Nickel-Cadmium

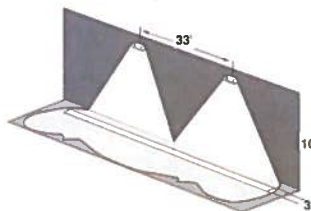
| Voltage | Shelf life ¹ | Typical life ¹ | Maintenance ¹ | Optimum temperature ¹ |
|---------|-------------------------|---------------------------|--------------------------|----------------------------------|
| 6/12 | 3 years | 5-7 years | none | 32°-100°F (0°-37.8°C) |

Sealed Lead calcium

| Voltage | Shelf life ¹ | Typical life ¹ | Maintenance ¹ | Optimum temperature ¹ |
|---------|-------------------------|---------------------------|--------------------------|----------------------------------|
| 6/12 | 12 months | 3-4 years | none | 60°-90°F (16°-32°C) |

- At 77°F (25°C)
- All life safety equipment, including emergency lighting for path of egress, must be maintained, serviced and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service or testing could jeopardize the safety of occupants and will void all warranties.
- Optimum ambient temperature range where unit will provide capacity to 90 minutes. Higher and lower temperatures affect life and capacity. Consult factory for detailed information.

PERFORMANCE DIAGRAMS

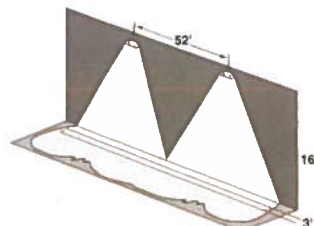


ELM12 Performance Advantage

- 12-volt, 9-watt krypton lamp
- Typical 10-foot mounting height delivers 33 feet center-to-center spacing
- 48% increase in center-to-center spacings over competitive 12-volt higher capacity emergency lighting units.

ELM6 Halogen Performance Advantage

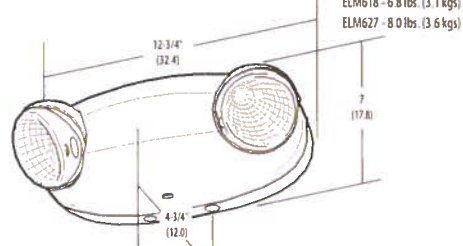
- 6-volt, 20-watt halogen lamp
- Higher mounting heights deliver 50+ feet center-to-center spacing
- 73% increase in center-to-center spacings over the highest wattage lamphead available from competitive emergency lighting units



MOUNTING

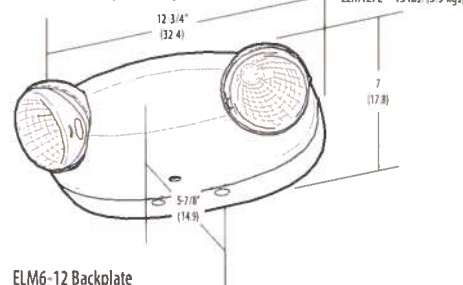
All dimensions are in inches (centimeters).

ELM618 and ELM627 Dimensions (small housing)



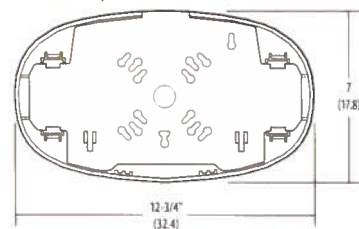
Shipping weight:
ELM618 - 6.8 lbs. (3.1 kgs)
ELM627 - 8.0 lbs. (3.6 kgs)

ELM654, ELM1254 and ELM1272 Dimensions (large housing)



Shipping weight:
ELM654 - 13 lbs. (5.9 kgs)
ELM1254 - 13 lbs. (5.9 kgs)
ELM1272 - 13 lbs. (5.9 kgs)

ELM6-12 Backplate



Recommended Center-to-Center Spacing

| Lamps | Mounting height | | | | |
|-------|-----------------|-----|-----|-----|-----|
| | 7.5' | 10' | 12' | 16' | 20' |
| K0606 | 25' | N/A | N/A | N/A | N/A |
| K0906 | 25' | 31' | 29' | 27' | 23' |
| K0912 | 25' | 33' | 30' | 29' | 26' |
| H1212 | N/A | 31' | 33' | 39' | 41' |
| H2006 | N/A | 35' | 37' | 52' | 49' |



ELM6-12

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LECSR**NA

Notes:

Type:**X1**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

FEATURES**Application**

The LE Series provides bright, even letter illumination in an energy-saving LED edge-lit exit sign configuration. AC or Emergency operation with optional Spectron® self-test/self-diagnostic circuitry. Special Wording ("SW") option allows customizing the stencil field to convey important information.

Construction

Water-clear injection-molded acrylic EXIT plaque is available with clear, white or mirror backgrounds. High strength extruded aluminum trim available in six finishes. Exit face design in single or double face with red or green letters. Custom printed directional chevron arrows. Standard EXIT stencil with 6" letters and 3/4" stroke; 8" letters for New York City requirements available as an option. Rough-in kit: galvanized steel, .036 (20 Ga.) housing, .060 (16 Ga.) mounting bars.

Installation

Universal rough-in box accommodates recessed installation of all models in wall, ceiling or end-mount applications. All mounting hardware is fully concealed.

Illumination

Exit face illumination is provided by energy saving, long life red or green LEDs. Exceeds UL 924 requirements for brightness and uniformity.

Compliances

UL 924 Listed

NFPA 70

NFPA 101

| | |
|----------------|------|
| Catalog Number | |
| Comments | Type |



Ceiling Mount



Wall Mount



End Mount



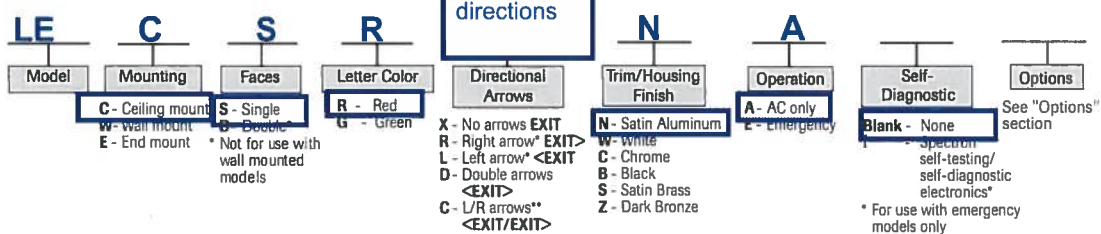
Special Wording Option

**NEMA
Premium****Warranty**

AC models: 5 years full.

Emergency models: 5 years on unit and electronics. Battery: 1 year full, 9 year pro-rata.

Spectron-equipped models: 5 years on unit and electronics, lifetime warranty on battery.

ORDERING GUIDE**OPTIONS**

- 2C** 2-circuit operation ^{2,5}
- FAP** Fire alarm panel interface ^{3,5,6}
- FM** Flasher module ^{1,6}
- AF** Audible flasher module ^{1,6}
- DC** Remote DC operation ^{2,4,5}
- 24K** 220-240VAC, 60Hz. operation ⁹
- XK** Recessed mount exit sign less rough-in kit ^{7,9}
- W** White plaque background
- M** Mirror-plaque background ⁸
- 8L** 8 inch letter plaque (red letters only) ^{10,11}
- SW** See available special wording choices on page 3 ^{12,13,14}

- ¹ For use with emergency models only.
- ² For use with AC models only.
- ³ Operates with 24-volt AC or DC fire alarm panels.
- ⁴ For emergency illumination of sign from remote 6-24VDC power sources.
- ⁵ -DC option may not be specified with -2C or -FAP options.
- ⁶ -AF, -FM and -FAP options may not be specified together.
- ⁷ Allows ordering of rough-in kit separately for recessed mount (LE) models. See "Accessories".
- ⁸ For use with single face models only. Standard on double face models.
- ⁹ Rough-in kit may not be ordered separately on models specified with -24K option.
- ¹⁰ LE exit models with 8" plaques registered under NY-BEC Calendar number 42135

ACCESSORIES (order separately)

- URK** Universal rough-in kit
- URK2C** Universal 2-circuit rough-in kit a,b,c
- ^a For use with AC models only.
- ^b Rough-in kit may not be ordered separately on models specified with -24K option.
- ^c Must be ordered in conjunction with -2C option on exit sign
- To Order Rough-In Kit Separately**
To order rough-in kit only for field installation, add "-XK" option suffix to exit model number and order "URK" or "URK2C" kit separately.

- ¹¹ Single face LE exit signs specified with the -8L option are supplied without backgrounds. Double face models specified with the -8L option are supplied with mirror backgrounds.
- ¹² Specify special wording code from page 3 when ordering. Example: SW#1
- ¹³ Special wording option not available with 8" letter plaque.
- ¹⁴ Some special wording signs not available with directional arrows.



Contractor: Vaughn Industries

Job Name: OSU NBDT Building F

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LECSR**NA

Notes:

Type:**X1**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

SPECIFICATIONS**Electronics**

Available with AC, emergency and Spectron® self-test/self-diagnostic electronics option. Emergency and self-diagnostic models equipped with isolation transformer and fully automatic constant current solid state charger with sealed maintenance-free nickel-cadmium battery. All emergency models with 90-minute run-time. All components mounted inside housing. Includes test switch and AC-on indicator. Transient/surge protection, low voltage disconnect and AC lock-out features included. Battery re-charge within UL time standards. Includes pre-stripped AC input pigtail leads.

Power Consumption (120/277VAC)

| | Single Face | Double Face |
|-------------------------|-------------|-------------|
| Red AC Only Models: | 2.2 watts | 3.4 watts |
| Green AC Only Models: | 2.5 watts | 4.0 watts |
| Red Emergency Models: | 3.3 watts | 4.5 watts |
| Green Emergency Models: | 3.6 watts | 5.0 watts |

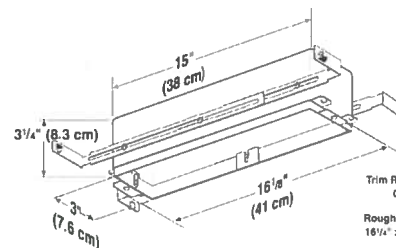
* Wattage figures include LED lamps, transformer and electronics power requirements.

Power Factor, Average: .8 (lagging)

Battery Type: Maintenance-free sealed nickel cadmium battery

AC Input: 120/277VAC, 60 Hz. (all models)

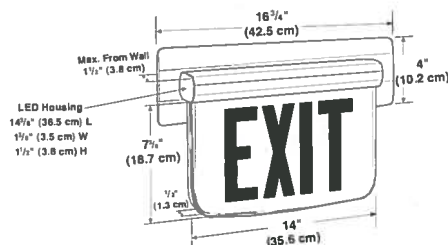
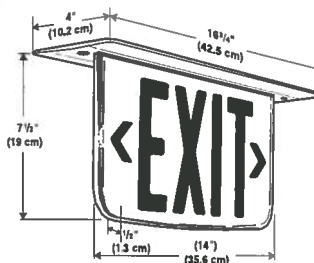
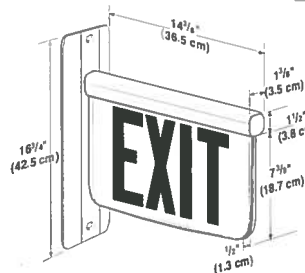
Operating Temperature Range: 20°C to 30°C (68°F to 86°F)

DIMENSIONS

Trim Ring Adjustment Range
0 - 1/4" (0 - 1.9 cm)

Rough-in Opening Dimensions
16 1/4" x 3 1/2" (41 cm x 8.6 cm)

| Mounting Bar Adjustment Range | |
|-------------------------------|------------------------|
| Side Mounted | End Mounted |
| Min: 16 1/4" (41 cm) | Min: 13" (33 cm) |
| Max: 25 1/4" (64 cm) | Max: 22 1/4" (57.8 cm) |



Hubbell Lighting, Inc.

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Lighting Systems of Columbus



Job Name:
OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

Catalog Number:
LECDR**NA

Notes:

Type:

X2

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

FEATURES

Application

The LE Series provides bright, even letter illumination in an energy-saving LED edge-lit exit sign configuration. AC or Emergency operation with optional Spectron® self-test/self-diagnostic circuitry. Special Wording ("SW") option allows customizing the stencil field to convey important information.

Construction

Water-clear injection-molded acrylic EXIT plaque is available with clear, white or mirror backgrounds. High strength extruded aluminum trim available in six finishes. Exit face design in single or double face with red or green letters. Custom printed directional chevron arrows. Standard EXIT stencil with 6" letters and 3/4" stroke; 8" letters for New York City requirements available as an option. Rough-in kit: galvanized steel, .036 (20 Ga.) housing, .060 (16 Ga.) mounting bars.

Installation

Universal rough-in box accommodates recessed installation of all models in wall, ceiling or end-mount applications. All mounting hardware is fully concealed.

Illumination

Exit face illumination is provided by energy saving, long life red or green LEDs. Exceeds UL 924 requirements for brightness and uniformity.

Compliances

UL 924 Listed
NFPA 70
NFPA 101

| | |
|----------------|------|
| Catalog Number | |
| Comments | Type |



Ceiling Mount



Wall Mount



End Mount



Special Wording Option

NEMA
Premium

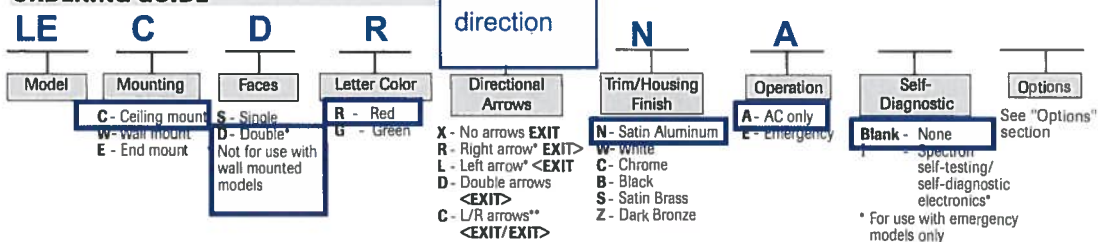
Warranty

AC models: 5 years full.

Emergency models: 5 years on unit and electronics. Battery: 1 year full, 9 year pro-rata.

Spectron-equipped models: 5 years on unit and electronics, lifetime warranty on battery.

ORDERING GUIDE



OPTIONS

- 2C** 2-circuit operation ^{2,5}
- FAP** Fire alarm panel interface ^{3,5,6}
- FM** Flasher module ^{1,6}
- AF** Audible flasher module ^{1,6}
- DC** Remote DC operation ^{2,4,5}
- 24K** 220-240VAC, 60Hz. operation ⁹
- XK** Recessed mount exit sign less rough-in kit ^{7,9}
- W** White plaque background
- M** Mirror-plaque background ⁸
- 8L** 8 inch letter plaque (red letters only) ^{10,11}
- SW** See available special wording choices on page 3 ^{12,13,14}

- ¹ For use with emergency models only.
- ² For use with AC models only.
- ³ Operates with 24-volt AC or DC fire alarm panels.
- ⁴ For emergency illumination of sign from remote 6-24VDC power sources.
- ⁵ -DC option may not be specified with -2C or -FAP options.
- ⁶ -AF, -FM and -FAP options may not be specified together.
- ⁷ Allows ordering of rough-in kit separately for recessed mount (LE) models. See "Accessories".
- ⁸ For use with single face models only. Standard on double face models.
- ⁹ Rough-in kit may not be ordered separately on models specified with -24K option.
- ¹⁰ LE exit models with 8" plaques registered under NY-BEC Calendar number 42135

ACCESSORIES (order separately)

- URK** Universal rough-in kit
- URK2C** Universal 2-circuit rough-in kit a,b,c
- ^a For use with AC models only.
- ^b Rough-in kit may not be ordered separately on models specified with -24K option.
- ^c Must be ordered in conjunction with -2C option on exit sign
- To Order Rough-In Kit Separately**
- To order rough-in kit only for field installation, add "-XK" option suffix to exit model number and order "URK" or "URK2C" kit separately.

for use in New York City.

- ¹¹ Single face LE exit signs specified with the -8L option are supplied without backgrounds. Double face models specified with the -8L option are supplied with mirror backgrounds.
- ¹² Specify special wording code from page 3 when ordering. Example: SW41
- ¹³ Special wording option not available with 8" letter plaque.
- ¹⁴ Some special wording signs not available with directional arrows.



Hubbell Lighting, Inc.

Contractor: Vaughn Industries

Job Name: OSU NRD Building F

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LECDR**NA

Notes:

Type:**X2**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

SPECIFICATIONS**Electronics**

Available with AC, emergency and Spectron® self-test/self-diagnostic electronics option. Emergency and self-diagnostic models equipped with isolation transformer and fully automatic constant current solid state charger with sealed maintenance-free nickel-cadmium battery. All emergency models with 90-minute run-time. All components mounted inside housing. Includes test switch and AC-on indicator. Transient/surge protection, low voltage disconnect and AC lock-out features included. Battery re-charge within UL time standards. Includes pre-stripped AC input pigtail leads.

Power Consumption (120/277VAC)

| | Single Face | Double Face |
|-------------------------|-------------|-------------|
| Red AC Only Models: | 2.2 watts | 3.4 watts |
| Green AC Only Models: | 2.5 watts | 4.0 watts |
| Red Emergency Models: | 3.3 watts | 4.5 watts |
| Green Emergency Models: | 3.6 watts | 5.0 watts |

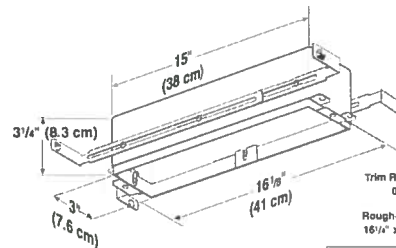
* Wattage figures include LED lamps, transformer and electronics power requirements.

Power Factor, Average: .8 (lagging)

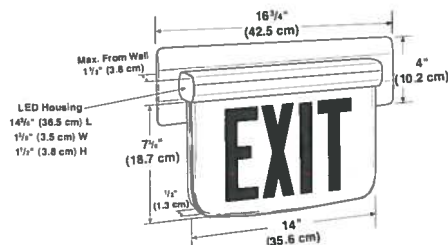
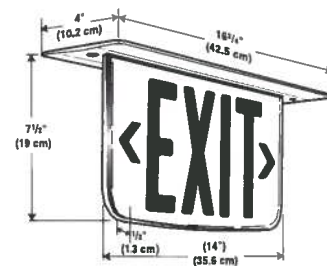
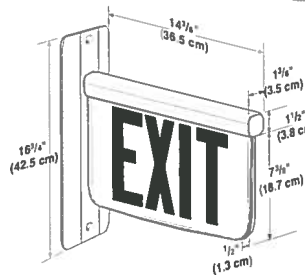
Battery Type: Maintenance-free sealed nickel cadmium battery

AC Input: 120/277VAC, 60 Hz. (all models)

Operating Temperature Range: 20°C to 30°C (68°F to 86°F)

DIMENSIONSTrim Ring Adjustment Range
0 - 1/4" (0 - 1.9 cm)Rough-In Opening Dimensions
16 1/2" x 3 1/2" (41 cm x 8.9 cm)

| Mounting Bar Adjustment Range | |
|-------------------------------|------------------------|
| Side Mounted | End Mounted |
| Min: 16 1/2" (41 cm) | Min: 13" (33 cm) |
| Max: 25 1/2" (64 cm) | Max: 22 1/2" (57.8 cm) |



Hubbell Lighting, Inc.

Contractor: Vaughn Industries

Job Name: OSU NRPDT Building F

Submitted by Lighting Systems of Columbus

Lighting Systems
of Columbus, Inc.**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LEWSR**NA

Notes:

Type:**X3**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

FEATURES**Application**

The LE Series provides bright, even letter illumination in an energy-saving LED edge-lit exit sign configuration. AC or Emergency operation with optional Spectron® self-test/self-diagnostic circuitry. Special Wording ("SW") option allows customizing the stencil field to convey important information.

Construction

Water-clear injection-molded acrylic EXIT plaque is available with clear, white or mirror backgrounds. High strength extruded aluminum trim available in six finishes. Exit face design in single or double face with red or green letters. Custom printed directional chevron arrows. Standard EXIT stencil with 6" letters and 3/4" stroke; 8" letters for New York City requirements available as an option. Rough-in kit: galvanized steel, .036 (20 Ga.) housing, .060 (16 Ga.) mounting bars.

Installation

Universal rough-in box accommodates recessed installation of all models in wall, ceiling or end-mount applications. All mounting hardware is fully concealed.

Illumination

Exit face illumination is provided by energy saving, long life red or green LEDs. Exceeds UL 924 requirements for brightness and uniformity.

Compliances

UL 924 Listed

NFPA 70

NFPA 101

| | |
|----------------|------|
| Catalog Number | |
| Comments | Type |



Ceiling Mount



Wall Mount



End Mount



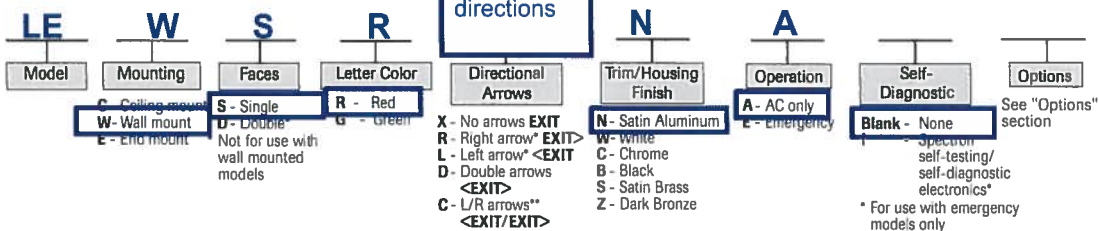
Special Wording Option

**Warranty**

AC models: 5 years full.

Emergency models: 5 years on unit and electronics. Battery: 1 year full, 9 year pro-rata.

Spectron-equipped models: 5 years on unit and electronics, lifetime warranty on battery.

ORDERING GUIDE**OPTIONS**

- 2C 2-circuit operation 2,5
- FAP Fire alarm panel interface 3,5,6
- FM Flasher module 1,6
- AF Audible flasher module 1,6
- DC Remote DC operation 2,4,5
- 24K 220-240VAC, 60Hz. operation 9
- XK Recessed mount exit sign less rough-in kit 7,9
- W White plaque background
- M Mirror-plaque background 8
- 8L 8 inch letter plaque (red letters only) 10,11
- SW See available special wording choices on page 3 12,13,14

- For use with emergency models only.
- For use with AC models only.
- Operates with 24-volt AC or DC fire alarm panels.
- For emergency illumination of sign from remote 6-24VDC power sources.
- DC option may not be specified with -2C or -FAP options.
- AF, -FM and -FAP options may not be specified together.
- Allows ordering of rough-in kit separately for recessed mount (LE) models. See "Accessories".
- For use with single face models only. Standard on double face models.
- Rough-in kit may not be ordered separately on models specified with -24K option.
- LE exit models with 8" plaques registered under NY-BEC Calendar number 42135

ACCESSORIES (order separately)

- URK Universal rough-in kit
 - URK2C Universal 2-circuit rough-in kit a,b,c
 - a For use with AC models only.
 - b Rough-in kit may not be ordered separately on models specified with -24K option.
 - c Must be ordered in conjunction with -2C option on exit sign
- To Order Rough-In Kit Separately**
- To order rough-in kit only for field installation, add "-XK" option suffix to exit model number and order "URK" or "URK2C" kit separately.

for use in New York City.

- Single face LE exit signs specified with the -8L option are supplied without backgrounds. Double face models specified with the -8L option are supplied with mirror backgrounds.
- Specify special wording code from page 3 when ordering. Example: SW41
- Special wording option not available with 8" letter plaque.
- Some special wording signs not available with directional arrows.



Contractor: Vaughn Industries

Job Name: OSU NBDT Building F

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LEWSR**NA

Notes:

Type:**X3**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

SPECIFICATIONS**Electronics**

Available with AC, emergency and Spectron® self-test/self-diagnostic electronics option. Emergency and self-diagnostic models equipped with isolation transformer and fully automatic constant current solid state charger with sealed maintenance-free nickel-cadmium battery. All emergency models with 90-minute run-time. All components mounted inside housing. Includes test switch and AC-on indicator. Transient/surge protection, low voltage disconnect and AC lock-out features included. Battery re-charge within UL time standards. Includes pre-stripped AC input pigtail leads.

Power Consumption (120/277VAC)

| | Single Face | Double Face |
|-------------------------|-------------|-------------|
| Red AC Only Models: | 2.2 watts | 3.4 watts |
| Green AC Only Models: | 2.5 watts | 4.0 watts |
| Red Emergency Models: | 3.3 watts | 4.5 watts |
| Green Emergency Models: | 3.6 watts | 5.0 watts |

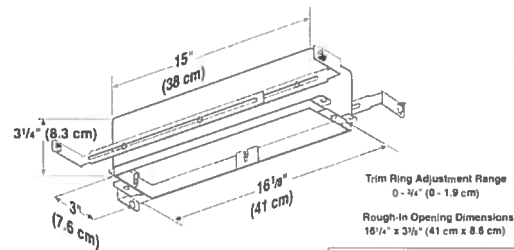
* Wattage figures include LED lamps, transformer and electronics power requirements

Power Factor, Average: .8 (lagging)

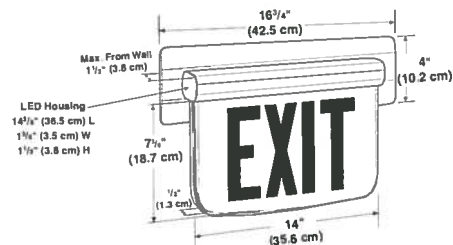
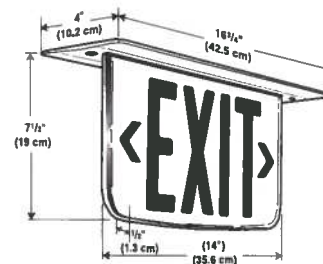
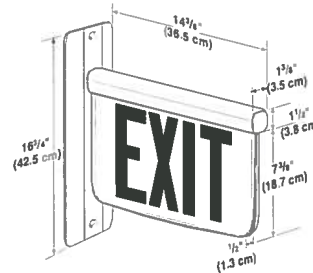
Battery Type: Maintenance-free sealed nickel cadmium battery

AC Input: 120/277VAC, 60 Hz. (all models)

Operating Temperature Range: 20°C to 30°C (68°F to 86°F)

DIMENSIONS

| Mounting Bar Adjustment Range | |
|-------------------------------|------------------------|
| Side Mounted | End Mounted |
| Min: 16 1/4" (41 cm) | Min: 13" (33 cm) |
| Max: 25 1/4" (64 cm) | Max: 22 1/4" (57.8 cm) |



Hubbell Lighting, Inc.

Contractor: Vaughn Industries

Job Name: OSU NRPDT Building E

Submitted by Lighting Systems of Columbus

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION**Catalog Number:**

LEEDR**NA

Notes:

Type:**X4**

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

FEATURES**Application**

The LE Series provides bright, even letter illumination in an energy-saving LED edge-lit exit sign configuration. AC or Emergency operation with optional Spectron® self-test/self-diagnostic circuitry. Special Wording ("SW") option allows customizing the stencil field to convey important information.

Construction

Water-clear injection-molded acrylic EXIT plaque is available with clear, white or mirror backgrounds. High strength extruded aluminum trim available in six finishes. Exit face design in single or double face with red or green letters. Custom printed directional chevron arrows. Standard EXIT stencil with 6" letters and 3/4" stroke; 8" letters for New York City requirements available as an option. Rough-in kit: galvanized steel, .036 (20 Ga.) housing, .060 (16 Ga.) mounting bars.

Installation

Universal rough-in box accommodates recessed installation of all models in wall, ceiling or end-mount applications. All mounting hardware is fully concealed.

Illumination

Exit face illumination is provided by energy saving, long life red or green LEDs. Exceeds UL 924 requirements for brightness and uniformity.

Compliances

UL 924 Listed
NFPA 70
NFPA 101

| | |
|----------------|------|
| Catalog Number | |
| Comments | Type |



Ceiling Mount



Wall Mount



End Mount



Special Wording Option

**NEMA
Premium****Warranty**

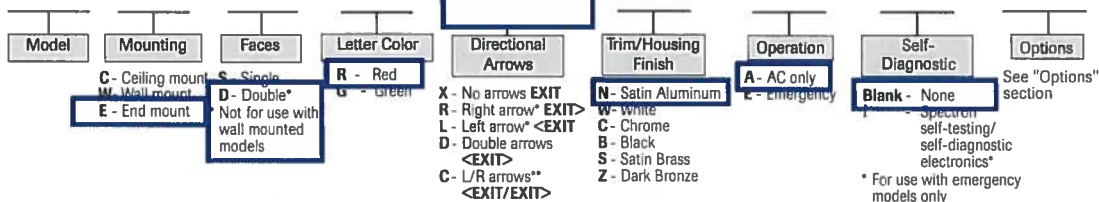
AC models: 5 years full.

Emergency models: 5 years on unit and electronics. Battery: 1 year full, 9 year pro-rata.

Spectron-equipped models: 5 years on unit and electronics, lifetime warranty on battery.

ORDERING GUIDE

Must specify
Arrows

**OPTIONS**

- 2C 2-circuit operation ^{2,5}
- FAP Fire alarm panel interface ^{3,5,6}
- FM Flasher module ^{1,6}
- AF Audible flasher module ^{1,6}
- DC Remote DC operation ^{2,4,5}
- 24K 220-240VAC, 60Hz. operation ⁹
- XK Recessed mount exit sign less rough-in kit ^{7,9}
- W White plaque background
- M Mirror-plaque background ⁸
- 8L 8 inch letter plaque (red letters only) ^{10,11}
- SW See available special wording choices on page 3 ^{12,13,14}

- ¹ For use with emergency models only.
- ² For use with AC models only.
- ³ Operates with 24-volt AC or DC fire alarm panels.
- ⁴ For emergency illumination of sign from remote 6-24VDC power sources.
- ⁵ -DC option may not be specified with -2C or -FAP options.
- ⁶ -AF, -FM and -FAP options may not be specified together.
- ⁷ Allows ordering of rough-in kit separately for recessed mount (LE) models. See "Accessories".
- ⁸ For use with single face models only. Standard on double face models.
- ⁹ Rough-in kit may not be ordered separately on models specified with -24K option.
- ¹⁰ LE exit models with 8" plaques registered under NY-BEC Calendar number 42135

ACCESSORIES (order separately)

- URK Universal rough-in kit
- URK2C Universal 2-circuit rough-in kit a,b,c
- ^a For use with AC models only.
- ^b Rough-in kit may not be ordered separately on models specified with -24K option.
- ^c Must be ordered in conjunction with -2C option on exit sign
- To Order Rough-In Kit Separately**
- To order rough-in kit only for field installation, add "-XK" option suffix to exit model number and order "URK" or "URK2C" kit separately.

for use in New York City.

- ¹¹ Single face LE exit signs specified with the -8L option are supplied without backgrounds. Double face models specified with the -8L option are supplied with mirror backgrounds.
- ¹² Specify special wording code from page 3 when ordering. Example: SW#1
- ¹³ Special wording option not available with 8" letter plaque.
- ¹⁴ Some special wording signs not available with directional arrows.



Hubbell Lighting, Inc.

Contractor: Vaughn Industries

Job Name: OSU NRD Building E

Submitted by Lighting Systems of Columbus

Catalog Number:

Type:

**Job Name:**OHIO STATE UNIVERSITY NORTH RESIDENTIAL
DISTRICT TRANSFORMATION

LEEDR**NA

Notes:

X4

LSC14-37947



LE Series

Architectural Recessed-Mounted LED Edge-Lit Exit Sign

SPECIFICATIONS**Electronics**

Available with AC, emergency and Spectron® self-test/self-diagnostic electronics option. Emergency and self-diagnostic models equipped with isolation transformer and fully automatic constant current solid state charger with sealed maintenance-free nickel-cadmium battery. All emergency models with 90-minute run-time. All components mounted inside housing. Includes test switch and AC-on indicator. Transient/surge protection, low voltage disconnect and AC lock-out features included. Battery re-charge within UL time standards. Includes pre-stripped AC input pigtail leads.

Power Consumption (120/277VAC)

| | Single Face | Double Face |
|-------------------------|-------------|-------------|
| Red AC Only Models: | 2.2 watts | 3.4 watts |
| Green AC Only Models: | 2.5 watts | 4.0 watts |
| Red Emergency Models: | 3.3 watts | 4.5 watts |
| Green Emergency Models: | 3.6 watts | 5.0 watts |

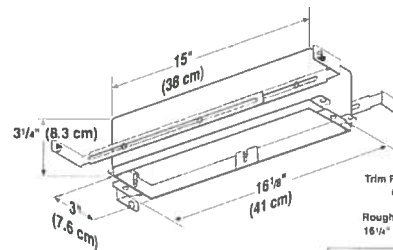
* Wattage figures include LED lamps, transformer and electronics power requirements.

Power Factor, Average: .8 (lagging)

Battery Type: Maintenance-free sealed nickel cadmium battery

AC Input: 120/277VAC, 60 Hz. (all models)

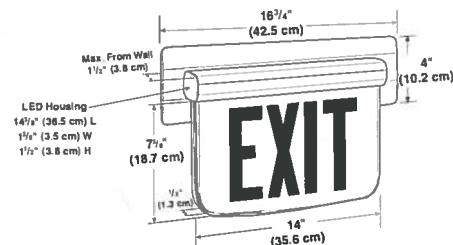
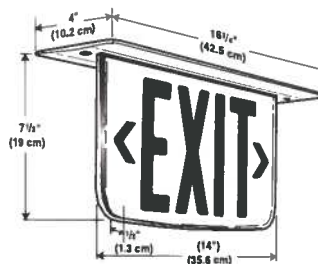
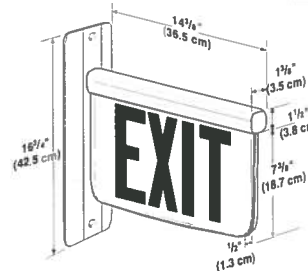
Operating Temperature Range: 20°C to 30°C (68°F to 86°F)

DIMENSIONS

Trim Ring Adjustment Range
0 - 1/4" (0 - 1.9 cm)

Rough-in Opening Dimensions
16 1/4" x 2 1/2" (41 cm x 8.8 cm)

| Mounting Bar Adjustment Range | |
|-------------------------------|------------------------|
| Side Mounted | End Mounted |
| Min: 16 1/4" (41 cm) | Min: 13" (33 cm) |
| Max: 25 1/4" (64 cm) | Max: 22 1/4" (57.8 cm) |



Hubbell Lighting, Inc.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

9/24/2018 1:32:51 PM

in

Case No(s). 18-0806-EL-EEC

Summary: Application -The Ohio State University and Ohio Power Company for approval of a special arrangement agreement with a mercantile customer electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company