



Case No.: 17-0171-EL-EEC

Mercantile Customer: Miami University

Electric Utility: Duke Energy

Program Title or Description: Martin Dining Hall Building Upgrade

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: Mercantile Customer Information

Name: **Miami University**

Principal address: **4955 Oxford Trenton Rd.
Oxford, OH 45056**

Address of facility for which this energy efficiency program applies:

**4955 Oxford Trenton Rd.
Oxford, OH 45056**

Name and telephone number for responses to questions:

Andrew Taylor, (317) 838-2096

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

- ☒ The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (**Refer to Appendix A for documentation.**)
- ☐ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section 2: Application Information

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

- ☐ Individually, without electric utility participation.
- ☒ **Jointly with the electric utility.**

B) The electric utility is: **Duke Energy**

C) The customer is offering to commit (check any that apply):

- ☐ Energy savings from the customer's 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 capacity savings 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 (check those that apply):

- ✓ 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)).

Martin Dining Hall was renovated in August 2016. Project scope included upgrades of numerous envelope system (wall insulation and window U-values) as well as building systems (lighting and HVAC).

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

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

- 1) If you checked the box indicating that the 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: 44,751 kWh
Refer to Appendix B for calculations and supporting document

- 2) If you checked the box indicating that the customer 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 any less efficient new equipment that was rejected in favor

of the more efficient new equipment.

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

Annual savings: _____kWh

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

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

Annual savings: _____kWh

Section 4: Demand Reduction/Demand Response Programs

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

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

Martin Dining Hall was upgraded in August 2016.

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

9.5 kW

Refer to Appendix B for calculations and supporting documentation.

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 energy efficiency 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 **\$2,242. Refer to Appendix C for documentation.** (Rebate shall not exceed 50% project cost.

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 the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer 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 **13.76** (Skip to Subsection 2.) **Refer to Appendix D for calculations and supporting documents.**

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 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 **\$39,030**.

The utility's program costs were **\$594**.

The utility's incentive costs/rebate costs were **\$2,242**.

Refer to Appendix D for calculations and supporting documents.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

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

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

- 1) any confidentiality requirements associated with the agreement;
- 2) a description of any consequences of noncompliance with the terms of the commitment;
- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
- 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,
- 5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

Refer to Offer Letter following this application

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.

19500677 01		
MIAMI UNIVERSITY		
4955 OXFORD TRENTON RD		
OXFORD, OH 45056		
Date	Days	Actual KWH
7/29/2016	29	7,105,788
6/30/2016	30	7,389,036
5/31/2016	32	6,726,816
4/29/2016	29	6,904,512
3/31/2016	31	6,879,096
2/29/2016	31	7,505,820
1/29/2016	29	6,214,032
12/31/2015	31	6,307,524
11/30/2015	31	6,942,348
10/30/2015	30	7,230,744
9/30/2015	30	8,264,736
8/31/2015	31	7,996,896
Total		85,467,348

Appendix B - Miami University Energy Savings Achieved

	Baseline Used			Post Project Actual			Hours of Operation	Savings	
	Description	Annual kWh	Summer Coincident kW	Description	Annual kWh	Summer Coincident kW		Annual kWh	Summer Coincident kW
ECM - 1	Original Martin Hall	384,179	83.966	Martin Hall Building Upgrade	339,428	74.456	5,460	44,751	9.5
Notes:	Energy consumption baseline, demand baseline and post project energy consumption basis are outlined in the following pages.								
After consideration of line losses, total energy savings are 47,973 kWh and 10.2 summer coincident kW . These values may also reflect minor DSMore modeling software rounding error.									

Appendix C -Cash Rebate Calculation

Miami University Martin Hall

Measure	Quantity	Cash Rebate Rate	Cash Rebate
Martin Hall Upgrade	1	50% of incentive that would be offered by the Smart \$aver Custom program	\$2,242
			\$2,242

Appendix D -UCT Value

Miami University Martin Hall Renovation

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
Martin Hall Building Upgrade	\$39,030	\$594	\$2,242	1	13.76
Totals	\$39,030	\$594	\$2,242	1	

Total Avoided Supply Costs \$39,030

Total Program Costs \$594

Total Incentive \$2,242

Aggregate Application UCT

13.76

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

Questions? Call 1-866-380-9580 or visit www.duke-energy.com.

Email this form along with completed Mercantile Self Direct Prescriptive or Custom applications, proof of payment, energy savings calculations and spec sheets to SelfDirect@Duke-Energy.com. You may also fax to 1-513-629-5572.

Mercantile customers, defined as using at least 700,000 kWh annually or having an account in multiple locations are eligible for the Mercantile Self Direct program. Indicate which applies:

- ☒ a single Duke Energy Ohio account with 700,000 kWh annual usage
☐ an account with multiple locations

Please list Duke Energy account numbers below (attach listing of multiple accounts and/or billing history for other utilities as required):

Account Number	Annual Usage	Account Number	Annual Usage
1950-0677-01-8	85,000,000		

Self Direct rebates are available for completed Custom projects that have not previously received a Duke Energy Smart Saver® Custom Incentive. Self Direct rebates are applicable to Prescriptive measures that were installed more than 90 days prior to submission to Duke Energy and have not previously received a Duke Energy Prescriptive rebate.

Self Direct Program rules allow for, though do not require, certain projects that are Prescriptive in nature under the Smart Saver program to be evaluated using the Custom process in the Self Direct program. Use the list on page two as a guide to determine which Self Direct program best fits your project(s). Apply for Self Direct projects using the appropriate application forms in conjunction with this cover sheet.

Self Direct Program rules also allow for behaviorally based and/or no cost and low cost projects to receive rebates.

Please check each box to indicate completion/inclusion of the following program requirements:

<input type="checkbox"/> All sections of appropriate application(s) are completed	<input type="checkbox"/> Proof of payment.*	<input type="checkbox"/> Manufacturer's Spec sheets	<input type="checkbox"/> Energy model/calculations and detailed inputs for Custom applications
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*If a single payment record is intended to demonstrate the costs of both Prescriptive & Custom projects, please include an additional document with an estimated breakout of costs for each Prescriptive and Custom energy conservation measure.

**Behavioral energy efficiency and demand reduction projects must be both measurable and verifiable. Provide justification with your application. Rebates for such projects may be small in magnitude.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Application Type	Prescriptive Measures with Optional Custom Processing	
Heating & Cooling and Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	<input type="checkbox"/> Energy Star Window/Sleeve/Room AC	<input type="checkbox"/> Air Source Heat Pump Water Heater
	<input type="checkbox"/> Central Air Unit	
	<input type="checkbox"/> Setback/Programmable Thermostat	<input type="checkbox"/> Window Film
	<input type="checkbox"/> Guestroom Energy Management Control	
Chillers	<input type="checkbox"/> Air Cooled Chiller	<input type="checkbox"/> Water Cooled Chiller
Motors, Pumps and Variable Frequency Drives (VFDs)	<input type="checkbox"/> VFD – Applied to Process Pump	<input type="checkbox"/> VFD – applied to HVAC Fan
	<input type="checkbox"/> VFD – Applied to HVAC Pump	
Food Service	<input type="checkbox"/> ENERGY STAR Hot Food Holding Cabinet	<input type="checkbox"/> Anti-Sweat Heater Control
	<input type="checkbox"/> Night Covers for Display	<input type="checkbox"/> Cooking Equipment
	<input type="checkbox"/> ECM Cooler, Freezer, and Display Case Motors	<input type="checkbox"/> ENERGY STAR ICE MACHINE
	<input type="checkbox"/> ENERGY STAR Solid or Glass Door Reach-in Freezer or Refrigerator	
Process Equipment	<input type="checkbox"/> Engineered Nozzle – COMPRESSED AIR	<input type="checkbox"/> Pellet Dryer Duct Insulation
	<input type="checkbox"/> Air compressor equipped with VFD	
Chiller Tune-ups	<input type="checkbox"/> Air cooled chiller tune-up	<input type="checkbox"/> Water cooled chiller tune-up

Please indicate above any Prescriptive energy conservation measures to be evaluated through the Custom process. Only Prescriptive measures listed above are eligible for this option. To receive a Self Direct Custom rebate, a detailed analysis of pre-project and post-project energy usage and project costs must be included in the application.

Although some Self Direct Prescriptive measures are eligible for evaluation through Custom processes, such an approach may not be most effective for certain measures.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Proposed energy efficiency measures may be eligible for Self-Direct Custom rebates if they clearly reduce electrical consumption and/or demand as compared to the appropriate baseline.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee a rebate will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications cannot be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, beginning on page 6.

Notes on the Application Process

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact your Duke Energy Ohio, Inc account manager or the Duke Energy Self Direct team at 1-866-380-9580.

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. These calculations are performed and submitted by the Duke Energy Ohio customer, or your designated equipment vendor / engineer. Application Part 2 worksheets and page 6 of this application contain additional guidance on acceptable calculations. *Complex or unique projects may require the use, at the applicant's expense, of modeling software.* Please contact the Duke Energy Self Direct team with questions about these requirements.

If you do not receive an acknowledgement email within 1 day of submitting an application via online, email, or fax, please call 1-866-380-9580. The acknowledgement email will provide with an estimated response time based on an initial assessment of your application. The application review may include some communication to resolve any questions about the project or to request additional information. Applications that are received complete without missing information have a faster review time.

There are two ways to submit your completed application form and excel worksheets.

Email: Complete, sign, scan and send this application form and attachments to:
SelfDirect@duke-energy.com (Note attachment size limit is applicable)

Fax: 513-629-5572

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



1. Contact Information (Required)

Duke Energy Customer Contact Information					
Company Name	Miami University - Accounts Payable				
Address	Roudebush RM 107				
City	Oxford	State	OH	Zip Code	43056
Project Contact					
Title	Mr. Doug Hammerle				
Office Phone	513-529-1696	Mobile Phone		Fax	513-529-2482
E-mail Address	hammerd@miamioh.edu				

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	Prater Engineering Associates, Inc.				
Address	6130 Wilcox Rd				
City	Dublin	State	OH	Zip Code	43016
Project Contact	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Chris Whicker			
Title	Mechanical Engineer				
Office Phone	614-766-4896	Mobile Phone		Fax	614-766-2354
E-mail Address	cwhicker@praterengr.com				

Who is the primary point of contact for technical questions? ¹	Chris Whicker
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Payment Information	
If an incentive is awarded, who should receive payment? ²	
<input checked="" type="checkbox"/> Customer <input type="checkbox"/> Vendor (customer or customer's agent ³ must sign below)	
I hereby authorize payment of incentive directly to the vendor:	
Customer Signature _____	Date ____ / ____ / ____ (mm/dd/yyyy)
Tax ID Number for Payee (provide W-9)	31-6402089
Mailing Address for Payee (if different from above)	
Street	
City	State Zip Code

¹ Note that if the vendor is the primary point of contact, the customer will still be copied on all application correspondence. If the customer does not wish to be copied, the customer must provide a signed waiver indicating an entity acting as agent for the customer. Duke Energy does not act as agent.

² If payment is to be made to an entity other than the Duke Energy account holder or the vendor, a payment waiver is required and will be provided for customer signature.

³ If an outside agent is acting on behalf of the Duke Energy customer of record, a letter of authorization on customer letterhead and signed by an authorized employee of the customer must be provided.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



2. Project Information (Required)

- A. Please indicate project type:
- ☐ New Construction
 - ☐ Expansion at an existing facility (existing Duke Energy account number)
 - ☐ Replacing equipment due to equipment failure
 - ☐ Replacing equipment that is estimated to have remaining useful life of 2 years or less
 - ☒ Replacing equipment that is estimated to have remaining useful life of more than 2 years
 - ☐ Behavioral, operational and/or procedural programs/projects
- B. Please describe your project, or attach a detailed project description that describes the project.
See attached for project description
- C. When did you start and complete implementation?
Start date 03/2015 (mm/yyyy) End date 08/2016 (mm/yyyy)
- D. Are you also applying for Self-Direct Prescriptive rebates and, if so, which one(s)⁴?
Not at this time
- E. Please indicate which worksheet(s) you are submitting for this application (check all that apply):
- ☐ Lighting
 - ☐ Variable Frequency Drive (VFD)
 - ☐ Compressed Air
 - ☐ Energy Management System (EMS)
 - ☒ General (for projects not easily submitted using one of the above worksheets)
- F. List all assumptions about the baseline and proposed equipment energy use and operation schedule, or attach a document listing that information. Attach specification sheets for all proposed new equipment. See attached for utilization schedule and cut sheets.
- G. Attach a supplier or contractor estimate, engineer's cost estimate, and/or other equivalent information documenting the Implementation Cost for each project listed in your application. Does the Implementation Cost include any internal labor⁵? No.
If yes, please specify which costs are internal labor. N/A

⁴ If your project involves some equipment that is eligible for prescriptive rebates and some equipment that is likely eligible for custom rebates, and if it is feasible to separate the equipment for the energy analysis, then the equipment will be evaluated separately. If it is not feasible to separate the equipment for analysis, then the equipment will be evaluated together in the custom application.

⁵ Internal labor costs cannot be counted in the Incremental Project Cost for purposes of analysis.

**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



3. Signature

(Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Doug Hammerle, do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Rebates Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

A handwritten signature in cursive script that reads 'Doug Hammerle'.

Duke Energy Ohio, Inc Customer Signature

Print Name Doug Hammerle

Date 8/22/16



12/6/2016

Doug Hammerle
MIAMI UNIVERSITY - 1950067701
4955 OXFORD TRENTON RD
OXFORD OH 45056

Subject: Your Application for a Duke Energy Mercantile Self-Direct Rebate CMO16-0000097771

Dear Doug Hammerle,

Thank you for your Duke Energy Mercantile Self Direct rebate application. As noted in the Energy Conservation Measure (ECM) chart on page 2, a total rebate of \$2,242.00 has been proposed for your project completed in the 2016 calendar years. **All Self Direct Rebates are contingent upon approval by the Public Utilities Commission of Ohio (PUCO).**

At your earliest convenience, please indicate if you accept this rebate by:

- providing your signature on Page 2
- completing the PUCO-required affidavit on Page 3

Please return the documents to my attention via fax at 513.629.5572 or email to customprocessing@duke-energy-energyefficiency.com. Upon receipt, Duke Energy will submit the necessary documentation to PUCO. Following PUCO's approval, Duke Energy will remit payment.

We value your business and look forward to working with you on this and future energy efficiency projects. We hope you will consider our Smart Saver® incentives, when applicable. Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Taylor", with a long horizontal flourish extending to the right.

Andrew Taylor
Program Manager
Custom Incentives

cc: Deanna Bowden
Chris Whicker



**Please indicate your response to this rebate offer
within 30 days of receipt.**

☐ Rebate is accepted.

☐ Rebate is declined.

By accepting this rebate, MIAMI UNIVERSITY - 1950067701 affirms its intention to commit and integrate the energy efficiency projects listed on the following pages into Duke Energy's peak demand reduction, demand response and/or energy efficiency programs.

Additionally, MIAMI UNIVERSITY - 1950067701 also agrees to serve as joint applicant in any future filings necessary to secure approval of this arrangement as required by PUCO and to comply with any information and reporting requirements imposed by rule or as part of that approval.

Finally, MIAMI UNIVERSITY - 1950067701 affirms that all application information submitted to Duke Energy pursuant to this rebate offer is true and accurate. Information in question would include, but not be limited to, project scope, equipment specifications, equipment operational details, project costs, project completion dates, and the quantity of energy conservation measures installed.

If rebate is accepted, will you use the monies to fund future energy efficiency and/or demand reduction projects? ☐ Yes ☐ No

Customer Signature

Printed Name

Date



Proposed Rebate Amounts

Measure ID	Energy Conservation Measure	Proposed Rebate Amount
ECM-1	Martin Hall Dorm Renovation	\$2,242.00 per project X 1
	Total	\$2,242.00



Application to Commit

Energy Efficiency/Peak Demand Reduction Programs

Case No.: ____ - ____ -EL-EEC

State of _____ :

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

1. I am the duly authorized representative of:

[INSERT CUSTOMER OR EDU COMPANY NAME AND ANY APPLICABLE NAME(S) DOING BUSINESS AS]

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

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

SIGNATURE OF AFFIANT & TITLE

Sworn and subscribed before me this ____ day of _____, _____
DAY MONTH YEAR

SIGNATURE OF OFFICIAL ADMINISTERING OATH

PRINT NAME AND TITLE

My commission expires on _____
DATE



Smart Saver® Incentive Program

phone: 866.380.9580

fax: 980.373.9755

customprocessing@duke-energy-energyefficiency.com

12/6/2016

Doug Hammerle
MIAMI UNIVERSITY - 1950067701
4955 OXFORD TRENTON RD
OXFORD OH 45056

Subject: Your Application for a Duke Energy Mercantile Self-Direct Rebate CMO16-0000097771

Dear Doug Hammerle,

Thank you for your Duke Energy Mercantile Self Direct rebate application. As noted in the Energy Conservation Measure (ECM) chart on page 2, a total rebate of \$2,242.00 has been proposed for your project completed in the 2016 calendar years. **All Self Direct Rebates are contingent upon approval by the Public Utilities Commission of Ohio (PUCO).**

At your earliest convenience, please indicate if you accept this rebate by:

- providing your signature on Page 2
- completing the PUCO-required affidavit on Page 3

Please return the documents to my attention via fax at 513.629.5572 or email to customprocessing@duke-energy-energyefficiency.com. Upon receipt, Duke Energy will submit the necessary documentation to PUCO. Following PUCO's approval, Duke Energy will remit payment.

We value your business and look forward to working with you on this and future energy efficiency projects. We hope you will consider our Smart Saver® incentives, when applicable. Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Andrew Taylor', with a stylized flourish at the end.

Andrew Taylor
Program Manager
Custom Incentives

cc: Deanna Bowden
Chris Whicker



**Please indicate your response to this rebate offer
within 30 days of receipt.**

☒ Rebate is accepted.

☐ Rebate is declined.

By accepting this rebate, MIAMI UNIVERSITY - 1950067701 affirms its intention to commit and integrate the energy efficiency projects listed on the following pages into Duke Energy's peak demand reduction, demand response and/or energy efficiency programs.

Additionally, MIAMI UNIVERSITY - 1950067701 also agrees to serve as joint applicant in any future filings necessary to secure approval of this arrangement as required by PUCO and to comply with any information and reporting requirements imposed by rule or as part of that approval.

Finally, MIAMI UNIVERSITY - 1950067701 affirms that all application information submitted to Duke Energy pursuant to this rebate offer is true and accurate. Information in question would include, but not be limited to, project scope, equipment specifications, equipment operational details, project costs, project completion dates, and the quantity of energy conservation measures installed.

If rebate is accepted, will you use the monies to fund future energy efficiency and/or demand reduction projects? ☒ Yes ☐ No



Customer Signature



Printed Name



Date



Proposed Rebate Amounts

Measure ID	Energy Conservation Measure	Proposed Rebate Amount
ECM-1	Martin Hall Dorm Renovation	\$2,242.00 per project X 1
	Total	\$2,242.00



Application to Commit

Energy Efficiency/Peak Demand Reduction Programs

Case No.: ____ - ____ -EL-EEC

State of OHIO :

17-0171-EL-EEC

Doug Hamwerle, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Miami University
[INSERT CUSTOMER OR EDU COMPANY NAME AND ANY APPLICABLE NAME(S) DOING BUSINESS AS]

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

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

Doug Hamwerle Dir. of Energy Systems
SIGNATURE OF AFFIANT & TITLE

Sworn and subscribed before me this 7th day of DECEMBER, 2016
DAY MONTH YEAR

Scott W. Lessing
SIGNATURE OF OFFICIAL ADMINISTERING OATH

My commission expires on _____
DATE



ENERGY CONSUMPTION SUMMARY

By PRATER ENGINEERING ASSOCIATES

	Elect Cons. (kWh)	Gas Cons. (kBtu)	PHotW Cons. (kBtu)	PCldW Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 1							
Primary heating							
Primary heating			593,520		14.1 %	593,520	791,360
Other Htg Accessories					0.0 %	0	0
Heating Subtotal			593,520		14.1 %	593,520	791,360
Primary cooling							
Cooling Compressor				1,806,187	43.0 %	1,806,187	1,389,375
Tower/Cond Fans					0.0 %	0	0
Condenser Pump					0.0 %	0	0
Other Clg Accessories					0.0 %	0	0
Cooling Subtotal....				1,806,187	43.0 %	1,806,187	1,389,375
Auxiliary							
Supply Fans	112,377				9.1 %	383,542	1,150,742
Pumps	5,088				0.4 %	17,364	52,098
Stand-alone Base Utilities	2,776	1,507	4,844		0.4 %	15,824	36,469
Aux Subtotal....	120,240	1,507	4,844		9.9 %	416,731	1,239,309
Lighting							
Lighting	91,724				7.5 %	313,052	939,251
Receptacle							
Receptacles	83,512	782,925			25.4 %	1,067,951	1,679,296
Cogeneration							
Cogeneration					0.0 %	0	0
Totals							
Totals**	295,476	784,431	598,364	1,806,187	100.0 %	4,197,441	6,038,590

* Note: Resource Utilization factors are included in the Total Source Energy value .

** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name: 14150 Martin
Dataset Name: MARTINS3-16.TRC

TRACE® 700 v6.3.2 calculated at 04:27 PM on 04/27/2016
Alternative - 1 Energy Consumption Summary report page 1

ENERGY CONSUMPTION SUMMARY

By PRATER ENGINEERING ASSOCIATES

	Elect Cons. (kWh)	Gas Cons. (kBtu)	PHotW Cons. (kBtu)	PCldW Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 2							
Primary heating							
Primary heating			1,503,652		25.3 %	1,503,652	2,004,869
Other Htg Accessories					0.0 %	0	0
Heating Subtotal			1,503,652		25.3 %	1,503,652	2,004,869
Primary cooling							
Cooling Compressor				2,421,500	40.8 %	2,421,500	1,862,692
Tower/Cond Fans					0.0 %	0	0
Condenser Pump					0.0 %	0	0
Other Clg Accessories					0.0 %	0	0
Cooling Subtotal....				2,421,500	40.8 %	2,421,500	1,862,692
Auxiliary							
Supply Fans	143,424				8.2 %	489,508	1,468,669
Pumps	22,806				1.3 %	77,838	233,537
Stand-alone Base Utilities	5,756	1,866	4,844		0.4 %	26,354	67,361
Aux Subtotal....	171,986	1,866	4,844		10.0 %	593,699	1,769,568
Lighting							
Lighting	102,770				5.9 %	350,755	1,052,369
Receptacle							
Receptacles	83,512	782,925			18.0 %	1,067,951	1,679,296
Cogeneration							
Cogeneration					0.0 %	0	0
Totals							
Totals**	358,269	784,791	1,508,496	2,421,500	100.0 %	5,937,557	8,368,794

* Note: Resource Utilization factors are included in the Total Source Energy value .

** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name: 14150 Martin
Dataset Name: MARTINS3-16.TRC

TRACE® 700 v6.3.2 calculated at 04:27 PM on 04/27/2016
Alternative - 2 Energy Consumption Summary report page 1

Item 2B – Project Description

This renovation project includes renovation of all dormitory living spaces, common areas, and recreation areas. The project includes elevator upgrades and a new sprinkler system will be installed throughout the building. An upgraded HVAC system will be installed throughout the building. The new HVAC system will use hydronic heating and cooling. Chilled water and heating hot water will be provided via the campus systems. Hydronic water (HWS/R & CHWS/R) will be distributed throughout the building via new end-suction pumps that will utilize variable frequency drives. A new air handler (AHU-1) will be located in the lower level. This air handler will serve VAV boxes, which will provide reheat capability. A DOAS unit(s) will be located in the attic to provide ventilation air to restroom groups, 2nd/3rd floor common areas, and corridors. Conditioning of restroom groups will be achieved by blower coil units (BCU's) located in the attic. BCU's contain hot water and chilled water coils. The DOAS unit will have heat recovery capability (sensible-only heat wheels). DOAS-1 will recover heat from the associated restroom groups.

The existing primary electrical service will be upgraded from 4.16 kV to 12.47 kV. A new unit substation will be provided, which will be served from a 15kV pad mounted switch. Existing 15 kV conductors currently connected to the 5 kV equipment will be relocated and extended to a new 500 kVA transformer in the unit substation with a 12,470V primary and a 208/120V, 3 phase, 4 wire secondary. Power will be distributed from the unit substation switchboard to a distribution switchboard, lighting and power panelboards, and HVAC equipment. Additional panelboards and HVAC equipment will be fed from the second switchboard.

LED lighting will be used in majority of spaces. Fluorescent fixtures to be used in equipment room, utility and attic space. Lighting system is served at 120 volts. Vacancy sensors and manual switches will be provided in standalone spaces throughout the building to automatically shut off lighting when the area is unoccupied. Vacancy sensors require lighting to be manually turned on when an occupant enters the space. Lighting in corridors and common areas will be controlled by the building automation system to automatically lower lighting levels at designated times. Select lighting fixtures in corridors, restrooms, service spaces and other areas dictated by the design will operate as nightlights and emergency lighting fixtures, and will not be switched.

**Job Name:**

Miami U - Martin Hall - LEE15-23341

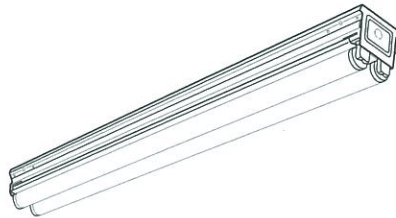
Catalog Number:

K4-232-EPU-ADVIOP-CSWG4-MW-KHC

Notes:

Type:**C1**

LEE15-23868

Columbia
LIGHTING
APPROVED
K4, K8 BI-PIN
Heavy Duty Channel / 1 or 2-Lamp T8
**FEATURES**

- Heavy duty channel with longitudinal reinforcing ribs for added rigidity and easy slide clamp hanging
- Rotary lock lampholders for positive lamp contact
- Channel ends double as joiners
- Individual or row mounting. Surface or suspended
- ¼ turn fasteners retain the ballast cover for quick and easy installation

PROJECT INFORMATION

Project Name

Type

Catalog No.

Date

CONSTRUCTION

Heavy steel housing with longitudinal reinforcing ribs for extra strength.

FINISH

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

BALLASTS

Energy efficient, thermally protected, automatic resetting, Class P, high power factor, sound rated A, unless otherwise specified. CEE NEMA Premium compliant.

ELECTRICAL

Standard class "P", thermally protected, auto-resetting 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.

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 K4-232-EU**

K	-	32	-	-	-	-
MODEL	SIZE	NO. OF LAMPS IN CROSS SECTION	LAMP TYPE	BALLAST	VOLTAGE	OPTIONS
K Heavy Duty Channel	4 4' 8 8'	1 One 2 Two	32 4', T8: 32, 30, 28 or 25 Watt	E Electronic T8, Instant Start 3E 3-Lamp Electronic T8, Instant Start 4E 4-Lamp Electronic T8, Instant Start For a specific ballast vendor show as option. EPUADVIOP - Programmed Rapid Start Advance Optanium Ballast	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.) UN Full Height Channel Ends PAF Paint After Fabrication NYC NYC Compliant NYCU NYC Compliant, Union Label
ACCESSORIES (ORDER SEPARATELY)						
ITB4 Hanger for close mounting on a T-Bar Ceiling						
KZT Zip Tee Hanger - 1½" spacer on tee bar ceiling						
KTH Slide Clamp Tong Hanger						
CSWG4 4" Wire Guard, 2 required for 8" fixture						
CSRA4 4" Asymmetric Reflector						
CSR4 4" Symmetric Reflector						
MW - Matte White						

KHC - Chain hanging assembly includes two 24" lengths of chain and two hanger hooks



Job Name:
Miami U - Martin Hall - LEE15-23341

Catalog Number: K4-232-EPU-ADVIOP-CSWG4-MW-KHC Notes:
--

Type:

C1

LEE15-23868

Columbia
LIGHTING

K4, K8 BI-PIN

PHOTOMETRIC DATA

LUMINAIRE DATA

Luminaire	K4-240-LE K Striplight 4' Pendant Mount Premium Striplight w/White Reflector
Ballast	R-2540
Ballast Factor	0.95
Lamp	F40T12
Lumens per Lamp	3150
Watts	85
Shielding Angle	N/A
Spacing Criterion	0° = 1.25 90° = 1.58
Luminous Opening in Feet	Length: 4.00 Width: 0.35 Height: 0.00

COEFFICIENTS OF UTILIZATION (%)

	RC	80				70				50				0
	RW	70	50	30	10	70	50	30	10	50	30	10	0	
RCR	1	94	88	83	79	89	84	80	76	77	73	70	56	
	2	84	75	68	62	80	72	65	60	65	60	55	44	
	3	76	65	57	50	72	62	54	48	57	50	45	36	
	4	69	57	48	41	65	54	46	40	45	43	38	30	
	5	63	50	42	35	60	48	40	34	44	37	32	25	
	6	58	45	36	30	55	43	35	29	40	33	27	22	
	7	53	40	32	26	51	39	31	25	36	29	24	19	
	8	50	37	29	23	47	35	28	22	32	26	21	17	
	9	46	33	26	20	44	32	25	20	30	23	19	15	
	10	43	31	23	18	41	30	23	18	27	21	17	13	

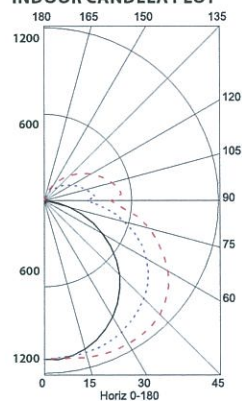
RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance **RW** = Wall Reflectance

ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt.
0-30	908	14.4	15.6
0-40	1547	24.6	26.6
0-60	3024	48.0	52.0
0-90	4650	73.8	80.0
90-120	831	13.2	14.3
90-130	990	15.7	17.0
90-150	1142	18.1	19.6
90-180	1164	18.5	20.0
0-180	5813	92.3	100.0

INDOOR CANDELA PLOT



0.0 ——— 45.0 90.0 - - - -

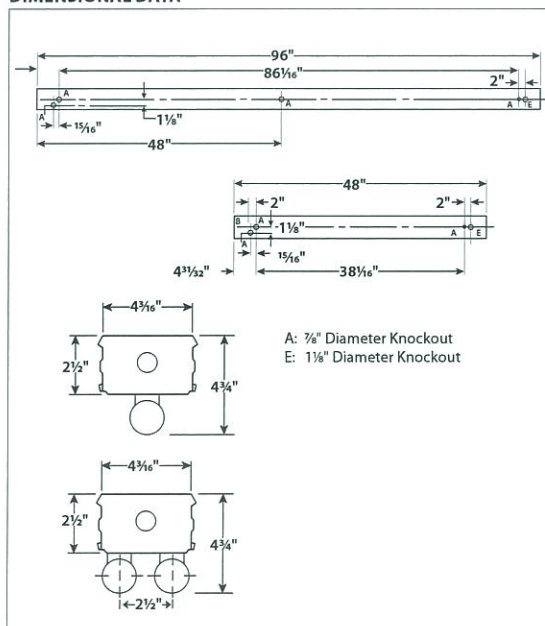
ENERGY DATA

Total Luminaire Efficiency	92.3%
Luminaire Efficacy Rating (LER)	65
IESNA RP-1-1993 Compliance	Non-Compliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.69 based on 3000 hrs. and \$0.08 per KWH

AVG. LUMINANCE (Candela/Sq. M.)

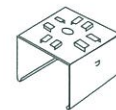
	0.0	22.5	45.0	67.5	90.0
0	8457	8457	8457	8457	8457
30	8283	8638	9348	9943	10174
40	8029	8742	9997	11050	11414
45	7916	8818	10471	11732	12156
50	7691	8971	11004	12464	12942
55	7440	9115	11635	13364	13927
60	7104	9395	12394	14378	15039
65	6695	9806	13463	15700	16446
70	6115	10386	14769	17534	18546
75	5347	11318	16933	20795	22191
80	4428	13150	21474	27098	28957
85	3088	18879	33347	43749	47109

DIMENSIONAL DATA

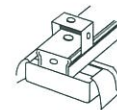


NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

MOUNTING ACCESSORIES

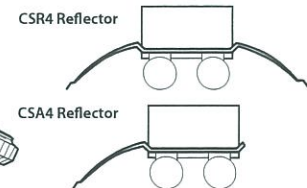


KZT
1½" Spacer



KTH
Slide Clamp Tong Hanger

ACCESSORIES

CSWG4 Wire
Guards

CSR4 Reflector

CSA4 Reflector

Presented By: FD LAWRENCE ELECTRIC

Contact Phone:

Customer Name: ESI ELECTRIC

Project Name: MIAMI U MARTIN HALL

Contact E-mail:

Fixture Type: C1-LAMPS



GE
Lighting

72866 - GE Ecolux® UltraMax™ Starcoat® T8

F28T8/XLSPX41ECO

☞ Passes TCLP, which can lower disposal costs.

Product Photo



GENERAL CHARACTERISTICS

Base Description	Medium Bi-Pin
Base Type	Pin/Plug-In
Mercury Content	2.95 mg
Mercury-Picogram per mean lm hr	25.6
Rated Life Instant Start-Hrs	24000 h @ 3 h 34000 h @ 12 h
Rated Life Rapid Start - Hrs	45000 h @ 3 h 50000 h @ 12 h
Starting Temp (MIN) C-degrees	15 °C
Bulb Material	Soda lime
Rated Life Hours-nominal	45000 h
Primary Application	Energy Saving
Product Technology	Linear Fluorescent
Base	G13
Bulb Shape	T8

PHOTOMETRIC CHARACTERISTICS

Mean Lumens nominal	2515 lm
Nominal Initial Lumen per Watt	96
Initial Lumens-nominal	2675 lm
Color Rendering Index-CRI	82
Color Temperature	4100 K

PRODUCT INFORMATION

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

DIMENSIONS

Bulb Diameter (DIA) <Max>	1.1 in
Bulb Diameter (DIA) <Min>	0.94 in
Diameter	1 in
End of Base Pin to Pin	47.67 in
Face to End of Opposing Pin (B) <Max>	47.5 in
Face to End of Opposing Pin (B) <Min>	47.4 in
Nominal Length	48 in

ELECTRICAL CHARACTERISTICS

Scotopic/Photopic Ratio	1.8
Current Crest Factor (MAX)	1.7
Open Circuit Voltage (instant start) Min @ Temperature	550.00 V @ 15 °C
Cathode Resistance Ratio - Rh/Rc (MIN)	4.250
Cathode Resistance Ratio - Rh/Rc (MAX)	6.500
Rated power (Watts)	28 W

CAUTIONS & WARNINGS

Caution

Lamp may shatter and cause injury if broken

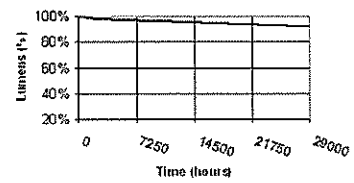
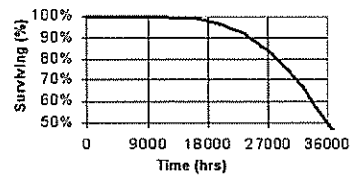
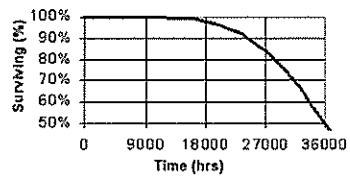
Wear safety glasses and gloves when handling lamp.

Do not use excessive force when installing lamp.

Warning

Risk of Electric Shock

Turn power off before inspection
installation or removal.



PHILIPS ADVANCE

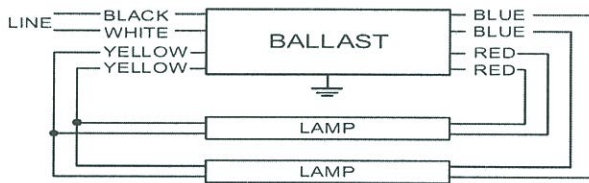
TYPE C1

Electrical Specifications

IOP2PSP32N@120V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. 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	B.E.F.
F17T8	1	17	0/-18	0.16	19	1.00	10	0.95	1.6	5.26
F17T8	2	17	0/-18	0.25	30	0.88	10	0.97	1.6	2.93
F25T8	1	25	0/-18	0.21	25	0.97	10	0.96	1.6	3.88
F25T8	2	25	0/-18	0.36	43	0.88	10	0.98	1.6	2.05
F32T8	1	32	0/-18	0.27	32	0.94	10	0.98	1.6	2.94
* F32T8	2	32	0/-18	0.47	56	0.88	10	0.99	1.6	1.57
F32T8/ES (25W)	1	25	60/16	0.23	27	0.94	10	0.98	1.6	3.48
F32T8/ES (25W)	2	25	60/16	0.38	45	0.88	10	0.99	1.6	1.96
F32T8/ES (28W)	1	28	60/16	0.23	30	0.94	10	0.98	1.6	3.13
F32T8/ES (28W)	2	28	60/16	0.41	49	0.86	10	0.99	1.6	1.76
F32T8/ES (30W)	1	30	60/16	0.25	30	0.94	10	0.98	1.6	3.13
F32T8/ES (30W)	2	30	60/16	0.46	55	0.88	10	0.99	1.6	1.60

Wiring Diagram



Diag. 21

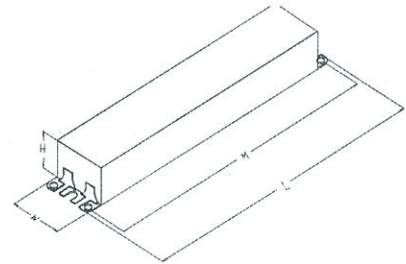
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	25	63.5
White	25	63.5
Blue	33	83.8
Red	33	83.8
Yellow	48	121.9
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 03/25/14

Data is based upon tests performed by Philips Lighting N.A in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

TYPE C1

PHILIPS ADVANCE

IOP2PSP32N@120V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

- 2.1 Ballast shall be _____ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start or Programmed Start Parallel ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V) with sustained variations of +/- 10% (voltage and frequency).
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -29C (-20F) on Instant Start ballasts or -18C (0F) on Programmed Start ballasts for standard T8 lamps and 16C (60F) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.
- 2.13 Ballast shall have lamp striation-reduction circuitry.
- 2.14 Maximum distance for Energy Saving Lamps in Remote/Tandem wiring applications shall be 6 feet for Instant Start and Programmed Start models.

Section III - Regulatory

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.
- 3.6 Ballast shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.
- 3.7 IOP or GOP ballast shall comply with UL Type CC rating.
- 3.8 Ballast shall comply with NEMA 410 for in-rush current limits.
- 3.9 Ballast shall meet RoHS Compliance Standards

Section IV - Other

- 4.1 Ballast shall be manufactured in an ISO 9001 Qualified factory.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at maximum case temperature of 90C.
- 4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.
- 4.4 Energy-saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

Revised 03/25/14

Data is based upon tests performed by Philips Lighting Electronic N.A. in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A.

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

PHILIPS ADVANCE

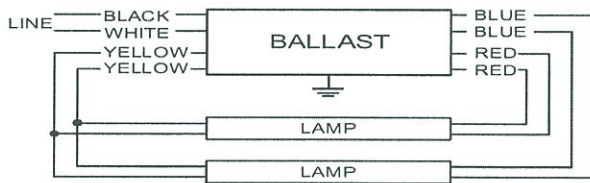
TYPE C1

Electrical Specifications

IOP2PSP32N@277V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. 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	B.E.F.
F17T8	1	17	0/-18	0.07	19	1.00	10	0.98	1.6	5.26
F17T8	2	17	0/-18	0.11	30	0.88	10	0.98	1.6	2.93
F25T8	1	25	0/-18	0.10	25	0.97	10	0.95	1.6	3.88
F25T8	2	25	0/-18	0.16	43	0.88	10	0.98	1.6	2.05
F32T8	1	32	0/-18	0.12	32	0.94	10	0.98	1.6	2.94
* F32T8	2	32	0/-18	0.20	55	0.88	10	0.98	1.6	1.60
F32T8/ES (25W)	1	25	60/16	0.10	27	0.94	10	0.97	1.6	3.48
F32T8/ES (25W)	2	25	60/16	0.16	44	0.88	10	0.99	1.6	2.00
F32T8/ES (28W)	1	28	60/16	0.10	28	0.94	10	0.97	1.6	3.36
F32T8/ES (28W)	2	28	60/16	0.18	48	0.86	10	0.98	1.6	1.79
F32T8/ES (30W)	1	30	60/16	0.11	30	0.94	10	0.98	1.6	3.13
F32T8/ES (30W)	2	30	60/16	0.20	54	0.88	10	0.98	1.6	1.63

Wiring Diagram



Diag. 21

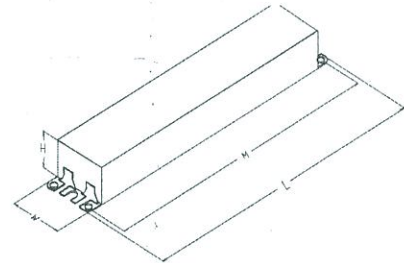
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	25	63.5
White	25	63.5
Blue	33	83.8
Red	33	83.8
Yellow	48	121.9
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 03/25/14

Data is based upon tests performed by Philips Lighting N.A in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

TYPE C1

PHILIPS ADVANCE

IOP2PSP32N@277V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

- 2.1 Ballast shall be _____ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start or Programmed Start Parallel ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V) with sustained variations of +/- 10% (voltage and frequency).
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -29C (-20F) on Instant Start ballasts or -18C (0F) on Programmed Start ballasts for standard T8 lamps and 16C (60F) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.
- 2.13 Ballast shall have lamp striation-reduction circuitry.
- 2.14 Maximum distance for Energy Saving Lamps in Remote/Tandem wiring applications shall be 6 feet for Instant Start and Programmed Start models.

Section III - Regulatory

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.
- 3.6 Ballast shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.
- 3.7 IOP or GOP ballast shall comply with UL Type CC rating.
- 3.8 Ballast shall comply with NEMA 410 for in-rush current limits.
- 3.9 Ballast shall meet RoHS Compliance Standards

Section IV - Other

- 4.1 Ballast shall be manufactured in an ISO 9001 Qualified factory.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at maximum case temperature of 90C.
- 4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.
- 4.4 Energy-saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

Revised 03/25/14

Data is based upon tests performed by Philips Lighting Electronic N.A. in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A.

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886



Job Name:
Miami U - Martin Hall - LEE15-23341

Catalog Number:
XEM4-232-RA-EPUADVIOP

Notes:

Type:
C2

LEE15-23868

APPROVED

Columbia
LIGHTING

XEM

Enclosed and Gasketed Fiberglass / 1, 2, or 3-Lamp T5 or T8



FEATURES

- Enclosed and Gasketed Industrial
- Available in 2', 4', or 8' lengths
- T8 or T5 fluorescent
- IP65 all sizes, IP67 4' and 8'
- Fiberglass housing with F1 weatherability rating, standard
- Smooth housing for ease of cleaning
- Gasket is non-porous to ensure seal
- Impact modified acrylic lens
- Lens selections include ribbed clear or frost, optically clear deep profile, or deep profile frost
- Lens firmly secured with tamper resistance ready polycarbonate latches
- Stainless steel latching optional
- Removable gear tray electrical access
- Includes surface mounting brackets
- Specular reflector available
- CSA c/US labeled, built to UL 1598, UL924 as appropriate
- Available with exclusive wiHUBB technology preinstalled

PROJECT INFORMATION

Project Name

Type

Catalog No.

Date

CONSTRUCTION

Housing is formed from UL 5VA fiberglass. F1 weatherability rating, suitable for indoor or outdoor use with respect to exposure to UV light. Pour-in-place non-porous gasketing assures seal. Fluorescent lamp sockets and ballast affixed to removable gear tray. 14 Latches per 8', 8 per 4', 6 per 2'. Latches are provided tamper resistance ready, tamper resistant screws optional. Latches are standard polycarbonate, optional in stainless steel. Knockouts are provided for electrical access and mounting.

SHIELDING

Lineal ribbed clear acrylic lens impact modified; modification adds flexibility to reduce impact breakage compared to standard acrylic formulations. Polycarbonate ribbed diffuser optional. Frosted acrylic or polycarbonate lens available for additional lamp diffusion. Deep acrylic lens in clear or frost optional (without lineal ribs).

FINISH

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

ELECTRICAL

Standard class "P", thermally protected, auto-resetting 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.

CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate CSA c/US labels. Ingress protection IP65 and IP67 standard. UL Sanitation certified. Wet location labeling is standard. Emergency-equipped fixtures built to UL 924.

ORDERING INFORMATION (See page 2 for Product Availability Data and Sensor Kits)

EXAMPLE XEM4-232-RA-EU

XEM		NO. OF LAMPS IN CROSS SECTION		BALLAST		OPTIONS	
MODEL	SIZE	LAMP TYPE	LENS TYPE		VOLTAGE		
XEM Enclosed and Gasketed Fiberglass Industrial	2' 2"	14 2', T5 Standard: 14 Watt	RA Ribbed Acrylic, Impact Resistant (standard)	E Electronic, T8, Instant Start (Standard)	U 120V-277V	EL Emergency Battery Pack, 350-450 Lumens, T8 only ¹	
	4' 4"	17 2', T8: 17 Watt	RFA Ribbed Frosted Acrylic, Impact Resistant	3E 3-Lamp Electronic, Instant Start (T8)	120 120V	EL141 900-1400 Lumen T8 Battery Pack ⁴	
	8' 8"	28 4', T5 Standard: 28 Watt	RP Ribbed Polycarbonate ²	4E 4-Lamp Electronic, Instant Start (T8)	277 277V	EL5 390-700 Lumen T5 Battery Pack ⁴	
		32 4', T8: 32, 30, 28, or 25 Watt	RFP Ribbed Frosted Polycarbonate ²	24E (1) 2-Lamp and (1) 4-Lamp Electronic, Instant Start (T8)	347 347V	EL5H 600-1325 Lumen T5 Battery Pack ⁴	
		96T8 8', T8: 59 Watt ³	DCA Deep Clear Acrylic ³	EP Electronic, Programmed Start		GLR Fast Blow Fuse	
			DFA Deep Frosted Acrylic ³	3EP 3-Lamp Electronic, Programmed Start		GMF Slow Blow Fuse	
				4EP 4-Lamp Electronic, Programmed Start		TP Tamper Proof Screws	
				24EP (1) 2-Lamp and (1) 4-Lamp Electronic, Programmed Start (T8)		SSL Stainless Steel Latches	
				ESD Electronic Step Dimming for 2-Lamp 4' only ⁴		F0835 T8 Lamp Installed, 82 CRI, 3500K	
				ED Electronic Dimming ⁵		F0841 T8 Lamp Installed, 82 CRI, 4100K	
				3ED (1) 3-Lamp Electronic Dimming ⁵		F0850 T8 Lamp Installed, 82 CRI, 5000K	
				4ED (1) 4-Lamp Electronic Dimming ⁵		F5841 T5 Lamp Installed, 82 CRI, 4100K	
				24ED (1) 2-Lamp and (1) 4-Lamp Electronic T8 ⁵		F5850 T5 Lamp Installed, 82 CRI, 5000K	
				11E (2) 1-Lamp Electronic Instant Start		F3C8W 3 Wire 8' Wet Cord	
				11EP (2) 1-Lamp Electronic Programmed Start		F3C15W 3 Wire 15' Wet Cord	
				11ED (2) 1-Lamp Electronic Dimming ⁵		SWH Single Wet Hub 1/2" NPT Hub	
						DWH Dual Wet Hub 1/2" NPT Hub	
						WIH wiHUBB Enabled ⁶	
						M4R Specular Alum Reflector, 95% Reflectivity	
						PAF Paint After Fabrication Reflector	
						HT Elevated Ambient Rating 40°C ⁷	
						XEDPM Dual Pendant Brackets (pendant by others) ⁸	
						XEHC Chain Hanger	
						XE45MB 45° Mounting Bracket	
						XE45MBSS 45° Stainless Steel Mounting Bracket	
						EXTREME ENVIRONMENT / XEM	



Job Name:
Miami U - Martin Hall - LEE15-23341

Catalog Number:
XEM4-232-RA-EPUADVIOP

Notes:

Type:

C2

LEE15-23868

Columbia
LIGHTING

XEM
Enclosed and Gasketed Fiberglass / 1, 2, or 3-Lamp T5 or T8

PRODUCT AVAILABILITY DATA

PRODUCT AVAILABILITY							
Size	# of Lamps in Cross Section	# of Lamps in Fixture	Lamp Type	Width	Length	Height RA, RFA	Height DCA, DFA
2'	1	2	14,17	6 7/8"	27 1/2"	4 3/8"	N/A
	2	2	14,17	6 7/8"	27 1/2"	4 3/8"	N/A
4'	1	1	28,32	6 7/8"	51 3/4"	4 3/8"	5 5/8"
	2	2	28,32	6 7/8"	51 3/4"	4 3/8"	5 5/8"
	3	3	28,32	6 7/8"	51 3/4"	4 3/8"	5 5/8"
8'	1	2	28,32	6 7/8"	100"	4 3/8"	5 5/8"
	1	1	96T8	6 7/8"	100"	4 3/8"	5 5/8"
	2	4	28,32	6 7/8"	100"	4 3/8"	5 5/8"
	2	2	96T8	6 7/8"	100"	4 3/8"	5 5/8"
	3	6	28,32	6 7/8"	100"	4 3/8"	5 5/8"

SENSOR KITS (Order Separately)

All sensor kits include Occupancy & Daylight.

Daylight activation requires setting of dip-switches on site.

	Catalog #	# Relays	Lens Type	Voltage	Wet Label	Product
120V / 277V / 347V	OS1360WLK	1	360°	120/277/347	Yes	XEM
	OS2360WLK	2	360°	120/277/347	Yes	XEM
	OS1AWLK	1	Aisle	120/277/347	Yes	XEM
	OS2AWLK	2	Aisle	120/277/347	Yes	XEM
208V / 480V	OS1360480WLK	1	360°	480V	Yes	XEM
	OS1A480WLK	1	Aisle	480V	Yes	XEM
	OS1360208WLK	1	360°	208V	Yes	XEM
	OS1A208WLK	1	Aisle	208V	Yes	XEM

PHOTOMETRIC DATA

Test 7154 Test Date 09/16/13

LUMINAIRE DATA

Luminaire	XEM4-232-RA-EU
	XEM Enclosed and Gasketed, Industrial 6.75" x 51.5" 2-lamp with ribbed clear acrylic lens
Ballast	ICN-2P32-N
Ballast Factor	0.88
Lamp	F32T8
Lumens per Lamp	2850
Watts	56
Mounting	Surface
Shielding Angle	0° = 90° 90° = 90°
Spacing Criterion	0° = 1.26 90° = 1.67
Luminous Opening in Feet	Length: 4.27 Width: 0.52 Height: 0.27

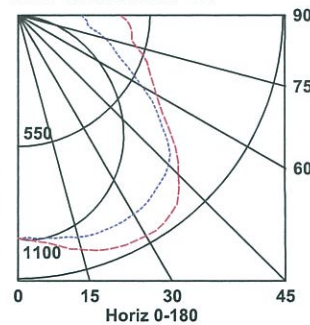
ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt.
0-30	803	14.1	19.0
0-40	1379	24.2	32.7
0-60	2614	45.9	62.0
0-90	3776	66.3	89.5
0-180	4218	74.0	100.0

ENERGY DATA

Total Luminaire Efficiency	74.0%
Luminaire Efficacy Rating (LER)	66
ANSI/IESNA RP-1-2004 Compliance	Noncompliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.64 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	4513	4513	4513	4513	4513
30	4293	4114	4337	4497	4578
40	4104	4003	4308	4461	4531
45	3966	3905	4293	4235	4246
50	3822	3879	4093	3972	3969
55	3628	3870	3752	3593	3601
60	3364	3710	3390	3303	3384
65	3040	3202	3033	3181	3311
70	2657	2700	2846	3156	3335
75	2182	2304	2791	3115	3252
80	1582	2056	2578	3126	3397
85	969	1793	2816	3448	3738

COEFFICIENTS OF UTILIZATION (%)

RCR	RC 80					RC 70					RC 50					RC 0				
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0	70	50	30	10
1	77	72	69	65	64	70	66	63	65	62	60	51								
2	69	62	56	52	66	60	55	50	56	52	48	41								
3	63	54	47	42	60	52	46	41	49	44	39	34								
4	57	47	40	35	55	46	39	34	43	37	33	29								
5	52	42	35	30	50	41	34	29	38	33	28	24								
6	48	38	31	26	46	37	30	25	34	29	24	21								
7	44	34	27	22	43	33	27	22	31	25	21	18								
8	41	31	24	20	40	30	24	20	28	23	19	16								
9	38	28	22	18	37	27	21	17	26	21	17	14								
10	36	26	20	16	35	25	20	16	24	19	15	13								

RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance



Job Name:
Miami U - Martin Hall - LEE15-23341

Catalog Number:
XEM4-232-RA-EPUADVIOP

Notes:

Type:

C2

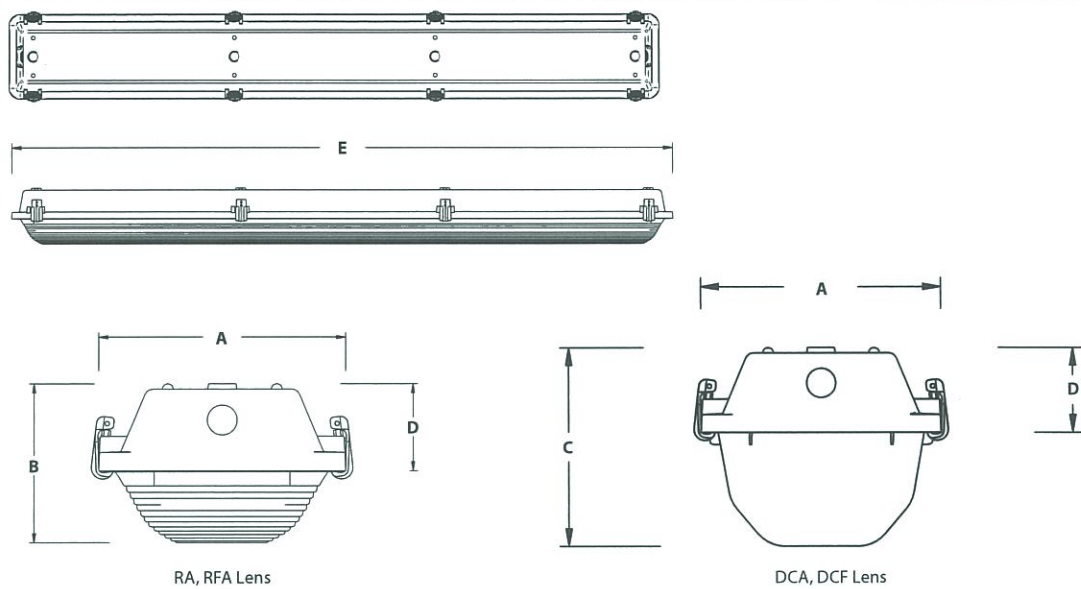
LEE15-23868

Columbia
LIGHTING

XEM

Enclosed and Gasketed Fiberglass / 1, 2, or 3-Lamp T5 or T8

DIMENSIONAL DATA



RA, RFA Lens

DCA, DCF Lens

		HEIGHT				
PRODUCT NUMBER	WIDTH	RF, RFA	DCA, DFA	LATCH	LENGTH	
XEM	Size	A	B	C	D	E
XEM2	2'	6 ⁷ / ₈ "	4 ³ / ₈ "	N/A	2 ³ / ₈ "	27 ⁷ / ₈ "
XEM4	4'	6 ⁷ / ₈ "	4 ³ / ₈ "	5 ⁵ / ₈ "	2 ³ / ₈ "	51 ⁷ / ₈ "
XEM8	8'	6 ⁷ / ₈ "	4 ³ / ₈ "	5 ⁵ / ₈ "	2 ³ / ₈ "	100"

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

Presented By: FD LAWRENCE ELECTRIC

Contact Phone:

Customer Name: ESI ELECTRIC

Project Name: MIAMI U MARTIN HALL

Contact E-mail:

Fixture Type: C2-LAMPS



GE
Lighting

72866 - GE Ecolux® UltraMax™ Starcoat® T8

F28T8/XLSPX41ECO

☞ Passes TCLP, which can lower disposal costs.

Product Photo



GENERAL CHARACTERISTICS

Base Description	Medium Bi-Pin
Base Type	Pin/Plug-In
Mercury Content	2.95 mg
Mercury-Picogram per mean lm hr	25.6
Rated Life Instant Start-Hrs	24000 h @ 3 h 34000 h @ 12 h
Rated Life Rapid Start - Hrs	45000 h @ 3 h 50000 h @ 12 h
Starting Temp (MIN) C-degrees	15 °C
Bulb Material	Soda lime
Rated Life Hours-nominal	45000 h
Primary Application	Energy Saving
Product Technology	Linear Fluorescent
Base	G13
Bulb Shape	T8

PHOTOMETRIC CHARACTERISTICS

Mean Lumens nominal	2515 lm
Nominal Initial Lumen per Watt	96
Initial Lumens-nominal	2675 lm
Color Rendering Index-CRI	82
Color Temperature	4100 K

PRODUCT INFORMATION

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

DIMENSIONS

Bulb Diameter (DIA) <Max>	1.1 in
Bulb Diameter (DIA) <Min>	0.94 in
Diameter	1 in
End of Base Pin to Pin	47.67 in
Face to End of Opposing Pin (B) <Max>	47.5 in
Face to End of Opposing Pin (B) <Min>	47.4 in
Nominal Length	48 in

ELECTRICAL CHARACTERISTICS

Scotopic/Photopic Ratio	1.8
Current Crest Factor (MAX)	1.7
Open Circuit Voltage (instant start) Min @ Temperature	550.00 V @ 15 °C
Cathode Resistance Ratio - Rh/Rc (MIN)	4.250
Cathode Resistance Ratio - Rh/Rc (MAX)	6.500
Rated power (Watts)	28 W

CAUTIONS & WARNINGS

Caution

Lamp may shatter and cause injury if broken

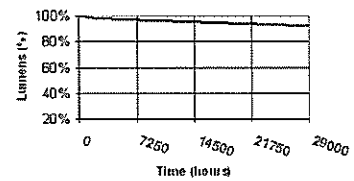
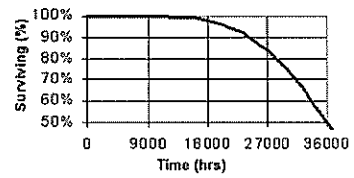
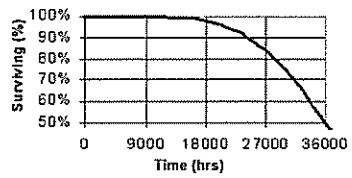
Wear safety glasses and gloves when handling lamp.

Do not use excessive force when installing lamp.

Warning

Risk of Electric Shock

Turn power off before inspection
installation or removal.



PHILIPS ADVANCE

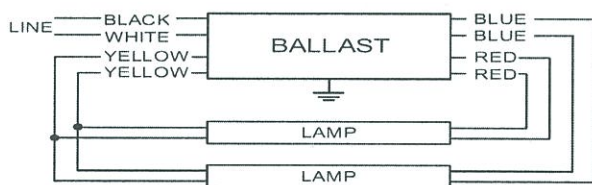
TYPE C2

Electrical Specifications

IOP2PSP32N@120V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. 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	B.E.F.
F17T8	1	17	0/-18	0.16	19	1.00	10	0.95	1.6	5.26
F17T8	2	17	0/-18	0.25	30	0.88	10	0.97	1.6	2.93
F25T8	1	25	0/-18	0.21	25	0.97	10	0.96	1.6	3.88
F25T8	2	25	0/-18	0.36	43	0.88	10	0.98	1.6	2.05
F32T8	1	32	0/-18	0.27	32	0.94	10	0.98	1.6	2.94
* F32T8	2	32	0/-18	0.47	56	0.88	10	0.99	1.6	1.57
F32T8/ES (25W)	1	25	60/16	0.23	27	0.94	10	0.98	1.6	3.48
F32T8/ES (25W)	2	25	60/16	0.38	45	0.88	10	0.99	1.6	1.96
F32T8/ES (28W)	1	28	60/16	0.23	30	0.94	10	0.98	1.6	3.13
F32T8/ES (28W)	2	28	60/16	0.41	49	0.86	10	0.99	1.6	1.76
F32T8/ES (30W)	1	30	60/16	0.25	30	0.94	10	0.98	1.6	3.13
F32T8/ES (30W)	2	30	60/16	0.46	55	0.88	10	0.99	1.6	1.60

Wiring Diagram



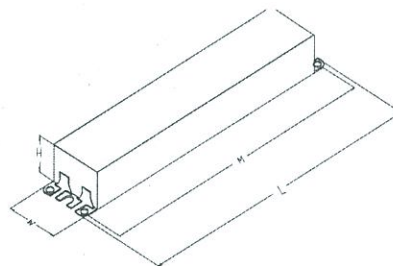
Diag. 21

The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	25	63.5	Yellow/Blue		0
White	25	63.5	Blue/White		0
Blue	33	83.8	Brown		0
Red	33	83.8	Orange		0
Yellow	48	121.9	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 03/25/14

Data is based upon tests performed by Philips Lighting N.A. in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

PHILIPS ADVANCE

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

- 2.1 Ballast shall be _____ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start or Programmed Start Parallel ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V) with sustained variations of +/- 10% (voltage and frequency).
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -29C (-20F) on Instant Start ballasts or -18C (0F) on Programmed Start ballasts for standard T8 lamps and 16C (60F) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.
- 2.13 Ballast shall have lamp striation-reduction circuitry.
- 2.14 Maximum distance for Energy Saving Lamps in Remote/Tandem wiring applications shall be 6 feet for Instant Start and Programmed Start models.

Section III - Regulatory

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.
- 3.6 Ballast shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.
- 3.7 IOP or GOP ballast shall comply with UL Type CC rating.
- 3.8 Ballast shall comply with NEMA 410 for in-rush current limits.
- 3.9 Ballast shall meet RoHS Compliance Standards

Section IV - Other

- 4.1 Ballast shall be manufactured in an ISO 9001 Qualified factory.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at maximum case temperature of 90C.
- 4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.
- 4.4 Energy-saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

IOP2PSP32N@120V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Revised 03/25/14

Data is based upon tests performed by Philips Lighting Electronic N.A. in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

Philips Lighting Electronic N.A.

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

PHILIPS ADVANCE

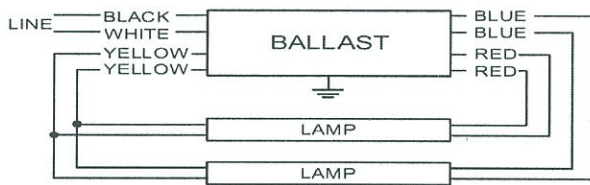
TYPE C2

Electrical Specifications

IOP2PSP32N@277V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. 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	B.E.F.
F17T8	1	17	0/-18	0.07	19	1.00	10	0.98	1.6	5.26
F17T8	2	17	0/-18	0.11	30	0.88	10	0.98	1.6	2.93
F25T8	1	25	0/-18	0.10	25	0.97	10	0.95	1.6	3.88
F25T8	2	25	0/-18	0.16	43	0.88	10	0.98	1.6	2.05
F32T8	1	32	0/-18	0.12	32	0.94	10	0.98	1.6	2.94
* F32T8	2	32	0/-18	0.20	55	0.88	10	0.98	1.6	1.60
F32T8/ES (25W)	1	25	60/16	0.10	27	0.94	10	0.97	1.6	3.48
F32T8/ES (25W)	2	25	60/16	0.16	44	0.88	10	0.99	1.6	2.00
F32T8/ES (28W)	1	28	60/16	0.10	28	0.94	10	0.97	1.6	3.36
F32T8/ES (28W)	2	28	60/16	0.18	48	0.86	10	0.98	1.6	1.79
F32T8/ES (30W)	1	30	60/16	0.11	30	0.94	10	0.98	1.6	3.13
F32T8/ES (30W)	2	30	60/16	0.20	54	0.88	10	0.98	1.6	1.63

Wiring Diagram



Diag. 21

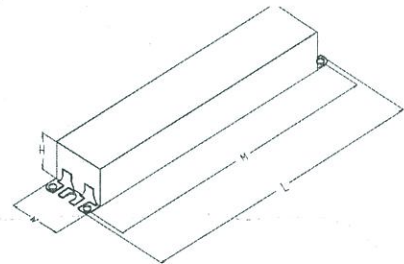
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	25	63.5
White	25	63.5
Blue	33	83.8
Red	33	83.8
Yellow	48	121.9
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 03/25/14

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Philips Lighting Electronic N.A

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

PHILIPS ADVANCE

IOP2PSP32N@277V	
Brand Name	OPTANIUM
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

- 2.1 Ballast shall be _____ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start or Programmed Start Parallel ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
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- 2.13 Ballast shall have lamp striation-reduction circuitry.
- 2.14 Maximum distance for Energy Saving Lamps in Remote/Tandem wiring applications shall be 6 feet for Instant Start and Programmed Start models.

Section III - Regulatory

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.
- 3.6 Ballast shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.
- 3.7 IOP or GOP ballast shall comply with UL Type CC rating.
- 3.8 Ballast shall comply with NEMA 410 for in-rush current limits.
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- 4.1 Ballast shall be manufactured in an ISO 9001 Qualified factory.
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- 4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.
- 4.4 Energy-saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

Revised 03/25/14

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Philips Lighting Electronic N.A.

10275 West Higgins Road Rosemont, IL 60018 Tel.: 800-322-2086 Fax: 888-432-1882
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886



Job Name:
Miami U - Martin Hall - LEE15-23341

Catalog Number:
LCL4-40ML-EU-CSHC

Notes:

Type:

C3

LEE15-23868

APPROVED

Columbia
LIGHTING

LCL

Lensed Striplight / LED

LED



FEATURES

- LED technology in a lensed striplight
- Long life 50,000 hour LEDs at L80 for reduced maintenance
- Up to 110 lumens per watt
- Choice of four LED color temperatures
- Superior color consistency within a 3-step MacAdam ellipse and greater than 80 CRI
- Choice of four lumen packages per size
- Available in 2', 4' or 8' lengths
- Optional integral emergency battery pack
- Heavy die-formed steel channel
- Fully assembled fixture for quick installation
- LED boards and driver accessible for future maintenance or upgrades
- Modular replaceable LED components
- Surface mount or suspended
- Five year warranty

PROJECT INFORMATION

Project Name

Type

Catalog No.

Date

CONSTRUCTION

Housing, wireway, and ends are formed from code-gauge steel. Housing components act as heat sink for LED heat dissipation. Knockouts are provided for electrical access and mounting. Shielded with 100% frosted prismatic acrylic lens.

FINISH

White painted parts are treated with a five-stage phosphate bonding process and finished with high reflectance baked enamel. For a post-painted housing finish select PAF option.

ELECTRICAL

Long-life LEDs are rated for 50,000 hours at L80 lumen maintenance. Driver options include fixed output for on/off function, step dimming (high/low/off) or continuous 0-10V dimming.

CERTIFICATION

All luminaires are built to UL 1598 and 2108 standards, and bear appropriate CSA c/US labels. Damp location labeling is standard. Emergency equipped fixtures labeled UL924. Adheres to LM70, LM80, and TM21 industry standards.

WARRANTY

Five year warranty (Terms and Conditions apply).

ORDERING INFORMATION

EXAMPLE LCL4-40HL-EU

LCL	SIZE	COLOR TEMP	LUMEN OUTPUT	DRIVER	VOLTAGE	OPTIONS
MODEL	SIZE	COLOR TEMP	LUMEN OUTPUT	DRIVER	VOLTAGE	OPTIONS
LCL LED Striplight	2' 2"	30 3000K	LW Low Watt	E Fixed Output	U 120V-277V	ELL14 Emergency Battery Pack, 1400 Lumens ^{1,2}
	4' 4"	35 3500K	ML Medium Lumen	ESD Step Dimming		GLR Fast Blow Fuse
	8' 8"	40 4000K	HL High Lumen	ED 0-10V Dimming		PAF Paint After Fabrication
		50 5000K	VL Very High Lumen			NYC NYC Compliant

See Product Availability Table below.

ACCESSORIES (ORDER SEPARATELY)
S18 18" Stem, Canopy
SS18 18" Swivel Stem—45° Swivel
CSHC Chain Hanger Assembly

PRODUCT AVAILABILITY				
SIZE	LUMEN PACKAGE	NOMINAL LUMENS (4000K)	NOMINAL WATTS	EFFICACY
2'	ML	2,500	26	100
4'	LW	2,500	25	100
	ML	5,000	48	104
	HL	6,100	55	110
	VL	10,100	96	105
8'	LW	5,000	48	104
	ML	10,100	96	105
	HL	12,200	111	110
	VL	20,100	193	104

¹ For compatibility with Dual-Lite LiteGear[®] inverters in lieu of installed battery pack, contact Hubbell Lighting representative.

² Not available in 2 ft size.

Lumens vary according to color temperature and other factors. See specific photometric test(s).



Job Name:
Miami U - Martin Hall - LEE15-23341

Notes:

Columbia
LIGHTING

LCL
Lensed Striplight / LED

PHOTOMETRIC DATA

LUMINAIRE DATA

Luminaire	LCL4-40HL-ED
	LCL Led Lensed Utility Channel, Industrial
	48" x 4½" x 3½" LED with acrylic formed lens
Ballast	D15CC55UNVTC
Ballast Factor	1.00
Lamp	LED
Fixture Lumens	6078
Watts	54.70
Shielding Angle	0° = 90 90° = 90
Spacing Criterion	0° = 1.24 90° = 1.28
Luminous Opening in Feet	Length: 4.00 Width: 0.40 Height: 0.00

ZONAL LUMEN SUMMARY

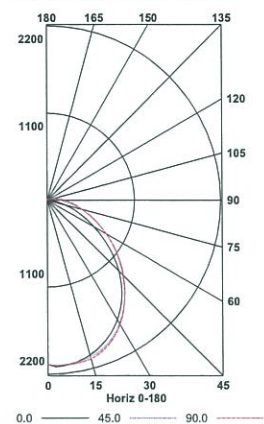
Zone	Lumens	Lamp	Fixt.
0-30	1649	27.1	27.1
0-40	2679	44.1	44.1
0-60	4574	75.2	75.2
0-90	5860	96.4	96.4
0-180	6078	100.0	100.0

ENERGY DATA

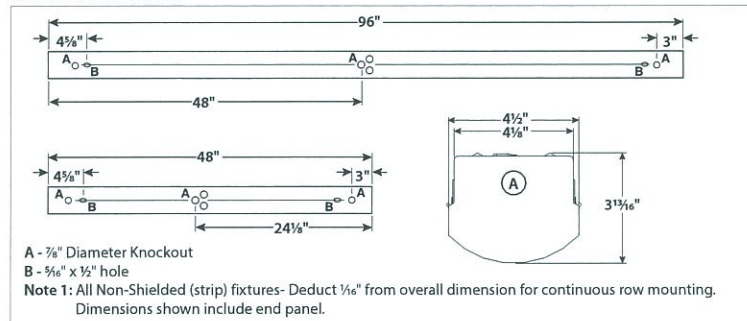
Total Luminaire Efficiency	100.0
Total Lumens per Watt	111
ANSI/IESNA RP-1-2004 Compliance	Noncompliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$2.16 based on 3000 hrs. and \$0.08 per KWH

Test ITL15383 Test Date 7/14/14

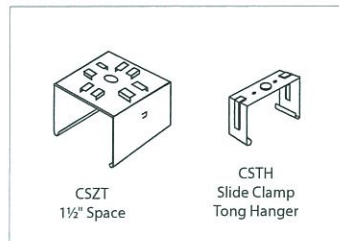
INDOOR CANDELA PLOT



DIMENSIONAL DATA



MOUNTING ACCESSORIES



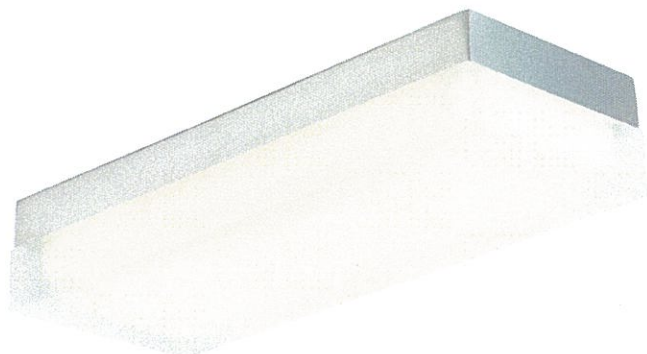
NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

DICE - model: FM-40

dwelLED™ Ceiling Flush Mounts

WAC LIGHTING

Responsible Lighting®



Fixture Type:

D2

Catalog Number:

FM-4009-30-BN

Project: MIAMI UNIVERSITY BRANDON HALL

Location:



PRODUCT DESCRIPTION

Add simple sophistication to any space. Smooth white opal glass featuring a unique interior ceramic glaze for glare free, balance diffused ambient illumination. Ideal as a centerpiece on the ceiling or as an accent on the wall.

FEATURES


- Etched 3/4" thick pressed glass diffuser with interior ceramic glaze
- Mount as a ceiling fixture or wall sconce
- ADA compliant when mounted on wall
- ETL & cETL damp location listed
- Smooth and continuous ELV dimming
- Also rated for installation in closets
- Transformer located in J box
- 90 CRI
- 277V available (special order)
- 50,000 hour rated life
- 5 year warranty

SPECIFICATIONS

Construction: Durable die-cast aluminum canopy, with thick opal glass.

Light Source: LED

Standards: ETL & cETL damp location listed, ADA compliant

			Color Temp	Watt	LED Lumens	Delivered Lumens	Finish
		FM-4014-27	2700K	31W	1323	610	BN <i>Brushed Nickel</i> 
		FM-4014-30	3000K	31W	1356	640	
		FM-4006-27	2700K	17.5W	779	355	BN <i>Brushed Nickel</i> 
		FM-4006-30	3000K	17.5W	800	365	
		FM-4009-27	2700K	27W	1341	885	BZ <i>Bronze</i>  CH <i>Chrome</i> 
		FM-4009-30	3000K	27W	1376	910	

FM-40



APPROVED

Example: **FM-4014-27-BN**

For 277V, add an "F" before the color temperature: **FM-4014F-27-BN**

wacighting.com
Phone (800) 526.2588
Fax (800) 526.2585

Headquarters/Eastern Distribution Center
44 Harbor Park Drive
Port Washington, NY 11050

Central Distribution Center
1600 Distribution Ct
Lithia Springs, GA 30122

Western Distribution Center
1750 Archibald Avenue
Ontario, CA 91760



Date: _____ Type: _____

Firm Name: _____

Project: _____

eW Cove QLX Powercore

Performance interior linear LED cove and accent fixture with solid white light

Ordering Information

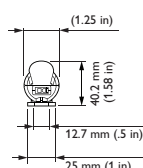
eW Cove QLX Powercore is a dimmable, linear LED fixture that provides an affordable, energy-efficient alternative to traditional cove lighting in applications requiring white light. With its low profile, rotating housing and flexible end-to-end locking power connectors, eW Cove QLX Powercore is the perfect choice for a wide range of interior retail, exhibit, hospitality, and architectural settings.

- Industry-best white-light quality and color consistency — Advances in Optibin, Philips proprietary binning optimization process, now provides color-consistency within a 2-step MacAdam ellipse across eW Cove product fixtures and manufacturing runs.
- Uncompromised Performance — Efficacies of near 100 lm/w provide optimum output without restrictions on lumen maintenance, operating temperature or warranty.

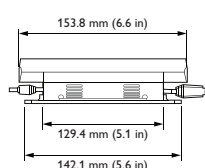
- Multiple options for design flexibility — Available in four color temperatures ranging from a warm 2700 K to a cool 4000 K. Lengths of 152 mm (6 in), 305 mm (12 in), and 1220 mm (48 in), wide and medium beam angles, and two power levels offer further design flexibility.
- Support for multiple voltages — Accepts power input of 120, 220 – 240, or 277 VAC for consistent installation and operation from line voltage in many locations.

Smooth dimming capability — Patented DIMand technology offers smooth dimming capability with selected reverse-phase ELV-type dimmers.

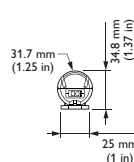
For detailed product information, please refer to the eW Cove QLX Powercore Product Guide at www.philipscolorkinetics.com/ls/essentialwhite/ewcoveqlxpc/



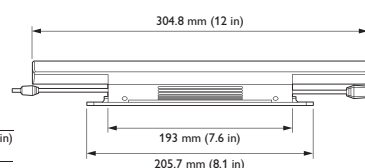
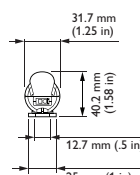
Medium Beam
60° x 90°



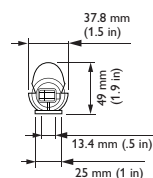
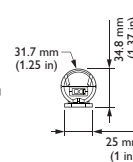
Wide Beam
110° x 110°



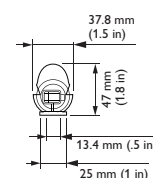
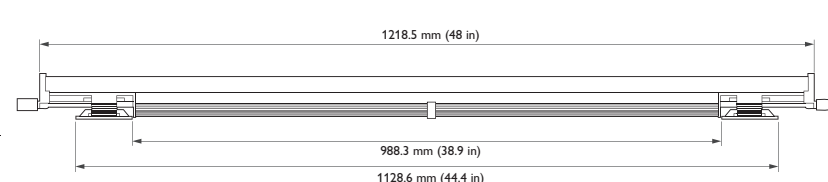
Medium Beam
60° x 90°



Wide Beam
110° x 110°



Medium Beam
60° x 90°



Wide Beam
110° x 110°

PHILIPS

Submitted by Bright Focus Sales, Inc.		Catalog Number: 523-000092-51	Type: CV1
BRIGHTFOCUS	Job Name: MARTIN HALL		
		Notes:	CLE15-11619

Ordering Information - 3500 K*, Wide Beam (110° x 110°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-50	910503705117	523-000091-50	910503705197	523-000092-50	910503705278
	Low	523-000090-18	910503705084	523-000091-18	910503705165	523-000092-18	910503705246
eW Cove QLX Powercore 220-240 VAC	High	523-000090-58	910503705125	523-000091-58	910503705206	523-000092-58	910503705286
	Low	523-000090-26	910503705092	523-000091-26	910503705173	523-000092-26	910503705254
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-66	910503705133	523-000091-66	910503705214	523-000092-66	910503705294
	Low	523-000090-34	910503705101	523-000091-34	910503705181	523-000092-34	910503705262
eW Cove QLX Powercore 277 VAC	High	523-000090-74	910503705141	523-000091-74	910503705222	523-000092-74	910503705303
	Low	523-000090-42	910503705109	523-000091-42	910503705189	523-000092-42	910503705270

Use Item Number when ordering in North America.

Ordering Information - 3500 K*, Medium Beam (60° x 90°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-54	910503705121	523-000091-54	910503705202	523-000092-54	910503705282
	Low	523-000090-22	910503705088	523-000091-22	910503705169	523-000092-22	910503705250
eW Cove QLX Powercore 220-240 VAC	High	523-000090-62	910503705129	523-000091-62	910503705210	523-000092-62	910503705290
	Low	523-000090-30	910503705096	523-000091-30	910503705177	523-000092-30	910503705258
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-70	910503705137	523-000091-70	910503705218	523-000092-70	910503705298
	Low	523-000090-38	910503705105	523-000091-38	910503705185	523-000092-38	910503705266
eW Cove QLX Powercore 277 VAC	High	523-000090-78	910503705145	523-000091-78	910503705226	523-000092-78	910503705305
	Low	523-000090-46	910503705113	523-000091-46	910503705193	523-000092-46	910503705272

Use Item Number when ordering in North America.

Ordering Information - 4000 K*, Wide Beam (110° x 110°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-51	910503705118	523-000091-51	910503705198	523-000092-51	910503705279
	Low	523-000090-19	910503705085	523-000091-19	910503705166	523-000092-19	910503705247
eW Cove QLX Powercore 220-240 VAC	High	523-000090-59	910503705126	523-000091-59	910503705207	523-000092-59	910503705287
	Low	523-000090-27	910503705093	523-000091-27	910503705174	523-000092-27	910503705255
eW Cove QLX Powercore 220-240 VAC Fixture and 10 ft (3 m) Leader Cable with terminator	High	523-000090-67	910503705134	523-000091-67	910503705215	523-000092-67	910503705295
	Low	523-000090-35	910503705102	523-000091-35	910503705182	523-000092-35	910503705263
eW Cove QLX Powercore 277 VAC	High	523-000090-75	910503705142	523-000091-75	910503705223	523-000092-75	910503705304
	Low	523-000090-43	910503705110	523-000091-43	910503705190	523-000092-43	910503705271

Use Item Number when ordering in North America.

Ordering Information - 4000 K*, Medium Beam (60° x 90°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-55	910503705122	523-000091-55	910503705203	523-000092-55	910503705283
	Low	523-000090-23	910503705089	523-000091-23	910503705170	523-000092-23	910503705251
eW Cove QLX Powercore 220-240 VAC	High	523-000090-63	910503705130	523-000091-63	910503705211	523-000092-63	910503705291
	Low	523-000090-31	910503705097	523-000091-31	910503705178	523-000092-31	910503705259
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-71	910503705138	523-000091-71	910503705219	523-000092-71	910503705299
	Low	523-000090-39	910503705106	523-000091-39	910503705186	523-000092-39	910503705267
eW Cove QLX Powercore 277 VAC	High	523-000090-79	910503705146	523-000091-79	910503705227	523-000092-79	910503705308
	Low	523-000090-47	910503705114	523-000091-47	910503705194	523-000092-47	910503705275

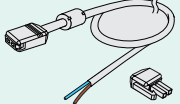
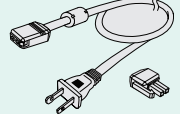

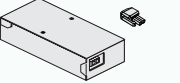
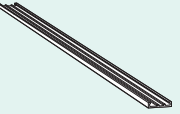
* Color temperatures conform to nominal CCTs as defined in ANSI Chromaticity Standard C78.377A.

Use Item Number when ordering in North America.



Submitted by Bright Focus Sales, Inc.		Catalog Number: 523-000092-51	Type: CV1
BRIGHTFOCUS	Job Name: MARTIN HALL		
		Notes:	CLE15-11619

Accessories


Item	Housing Color	Dimensions	Item Number	Philips 12NC		
Leader Cable (includes terminator), UL / cUL	Black	3 m (10 ft)	108-000032-10	912400130570		For connection to standard junction box
Leader Cable (includes terminator), CE / CCC	Black	3 m (10 ft)	108-000032-11	912400130571		
Leader Cable (includes terminator), UL / cUL	White	3 m (10 ft)	108-000032-12	912400130572		
Leader Cable (includes terminator), CE / CCC	White	3 m (10 ft)	108-000032-13	912400130573		
Leader Cable (includes terminator), UL, US Plug	Black	2.4 m (8 ft)	108-000032-14	912400130574		For portable installations
Jumper Cable, UL / cUL	White	305 mm (1 ft)	108-000033-06	910503700895		Depending on the installation's design, you may need jumper cables to add space between fixtures
		1.5 m (5 ft)	108-000033-07	910503700896		
Jumper Cable, CE / CCC	White	305 mm (1 ft)	108-000033-08	910503700897		
		1.5 m (5 ft)	108-000033-09	910503700898		
Wiring Compartment (includes terminator)	White	2.9 x 6.8 x 16 cm (1.17 x 2.7 x 6.32 in) (H x W x L)	120-000076-01	912400130576		Can be used for direct connection to conduit
Mounting Track	White	1219 mm (4 ft)	120-000125-00	910503701788		Optional mounting track ensures straight runs of fixtures

Use Item Number when ordering in North America.

Compatible Dimmers†

Supplier	Part Number	Description	Voltage
Philips	913701252701	Captivation Phase Dimmer DC-DPD-I-1S-101	120 VAC
Philips	913703021009	DTE310	230 VAC
Philips	912400133633	Data Adapter, DALI to ELV, DigiDim 452	230 VAC
Philips	913701252701	Captivation Phase Dimmer DC-DPD-I-1S-101	277 VAC
Philips Strand	A21 with IGBT module	A21 Dimmer Cabinet with IGBT Dimmer Module	120 VAC
Philips Strand	A21 with IGBT module	A21 Dimmer Cabinet with IGBT Dimmer Module	277 VAC
Lutron	NTELV-600	Nova T Electronic Low Voltage Dimmer	120 VAC
Lutron	PHPM-PA-DV-WH	Phase-Adaptive Power Module	120 VAC
Lutron	PHPM-PA-DV-WH	Phase-Adaptive Power Module	277 VAC

† These dimmers have been tested in our lab and found to be compatible with this product. All installations are different. We highly recommend performing a full mockup of every lighting circuit, including all luminaires and controls, to test for the desired dimming range. Visit <http://1.usa.gov/1g3cGfs> for more information.

Submitted by Bright Focus Sales, Inc.		Catalog Number: 523-000092-51	Type: CV1
BRIGHTFOCUS	Job Name: MARTIN HALL	Notes:	CLE15-11619
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Date: _____ Type: _____

Firm Name: _____

Project: _____

eW Cove QLX Powercore

Performance interior linear LED cove and accent fixture with solid white light

Ordering Information

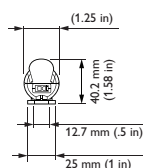
eW Cove QLX Powercore is a dimmable, linear LED fixture that provides an affordable, energy-efficient alternative to traditional cove lighting in applications requiring white light. With its low profile, rotating housing and flexible end-to-end locking power connectors, eW Cove QLX Powercore is the perfect choice for a wide range of interior retail, exhibit, hospitality, and architectural settings.

- Industry-best white-light quality and color consistency — Advances in Optibin, Philips proprietary binning optimization process, now provides color-consistency within a 2-step MacAdam ellipse across eW Cove product fixtures and manufacturing runs.
- Uncompromised Performance — Efficacies of near 100 lm/w provide optimum output without restrictions on lumen maintenance, operating temperature or warranty.

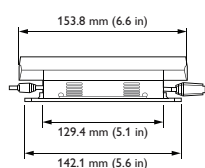
- Multiple options for design flexibility — Available in four color temperatures ranging from a warm 2700 K to a cool 4000 K. Lengths of 152 mm (6 in), 305 mm (12 in), and 1220 mm (48 in), wide and medium beam angles, and two power levels offer further design flexibility.
- Support for multiple voltages — Accepts power input of 120, 220 – 240, or 277 VAC for consistent installation and operation from line voltage in many locations.

Smooth dimming capability — Patented DIMand technology offers smooth dimming capability with selected reverse-phase ELV-type dimmers.

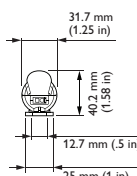
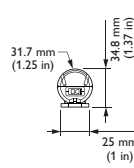
For detailed product information, please refer to the eW Cove QLX Powercore Product Guide at www.philipscolorkinetics.com/ls/essentialwhite/ewcoveqlxpc/



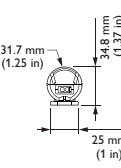
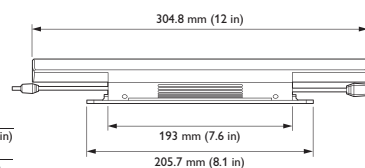
Medium Beam
60° x 90°



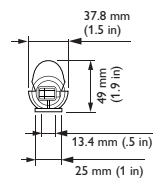
Wide Beam
110° x 110°



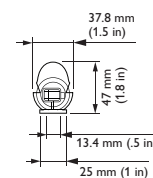
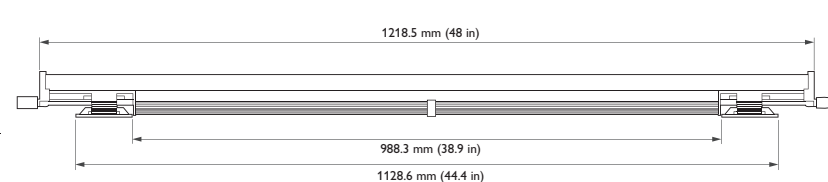
Medium Beam
60° x 90°



Wide Beam
110° x 110°



Medium Beam
60° x 90°



Wide Beam
110° x 110°

PHILIPS

Submitted by Bright Focus Sales, Inc.		Catalog Number: 523-000091-51 / 108-000033-06 / 120 000076-01 / 120-000125-00 Notes:		Type: CV1 CLE15-11619
BRIGHTFOCUS	Job Name: MARTIN HALL			

Ordering Information - 3500 K*, Wide Beam (110° x 110°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-50	910503705117	523-000091-50	910503705197	523-000092-50	910503705278
	Low	523-000090-18	910503705084	523-000091-18	910503705165	523-000092-18	910503705246
eW Cove QLX Powercore 220-240 VAC	High	523-000090-58	910503705125	523-000091-58	910503705206	523-000092-58	910503705286
	Low	523-000090-26	910503705092	523-000091-26	910503705173	523-000092-26	910503705254
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-66	910503705133	523-000091-66	910503705214	523-000092-66	910503705294
	Low	523-000090-34	910503705101	523-000091-34	910503705181	523-000092-34	910503705262
eW Cove QLX Powercore 277 VAC	High	523-000090-74	910503705141	523-000091-74	910503705222	523-000092-74	910503705303
	Low	523-000090-42	910503705109	523-000091-42	910503705189	523-000092-42	910503705270

Use Item Number when ordering in North America.

Ordering Information - 3500 K*, Medium Beam (60° x 90°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-54	910503705121	523-000091-54	910503705202	523-000092-54	910503705282
	Low	523-000090-22	910503705088	523-000091-22	910503705169	523-000092-22	910503705250
eW Cove QLX Powercore 220-240 VAC	High	523-000090-62	910503705129	523-000091-62	910503705210	523-000092-62	910503705290
	Low	523-000090-30	910503705096	523-000091-30	910503705177	523-000092-30	910503705258
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-70	910503705137	523-000091-70	910503705218	523-000092-70	910503705298
	Low	523-000090-38	910503705105	523-000091-38	910503705185	523-000092-38	910503705266
eW Cove QLX Powercore 277 VAC	High	523-000090-78	910503705145	523-000091-78	910503705226	523-000092-78	910503705305
	Low	523-000090-46	910503705113	523-000091-46	910503705193	523-000092-46	910503705272

Use Item Number when ordering in North America.

Ordering Information - 4000 K*, Wide Beam (110° x 110°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-51	910503705118	523-000091-51	910503705198	523-000092-51	910503705279
	Low	523-000090-19	910503705085	523-000091-19	910503705166	523-000092-19	910503705247
eW Cove QLX Powercore 220-240 VAC	High	523-000090-59	910503705126	523-000091-59	910503705207	523-000092-59	910503705287
	Low	523-000090-27	910503705093	523-000091-27	910503705174	523-000092-27	910503705255
eW Cove QLX Powercore 220-240 VAC Fixture and 10 ft (3 m) Leader Cable with terminator	High	523-000090-67	910503705134	523-000091-67	910503705215	523-000092-67	910503705295
	Low	523-000090-35	910503705102	523-000091-35	910503705182	523-000092-35	910503705263
eW Cove QLX Powercore 277 VAC	High	523-000090-75	910503705142	523-000091-75	910503705223	523-000092-75	910503705304
	Low	523-000090-43	910503705110	523-000091-43	910503705190	523-000092-43	910503705271

Use Item Number when ordering in North America.

Ordering Information - 4000 K*, Medium Beam (60° x 90°)

	Power Level	152 mm (6 in)		305 mm (12 in)		1220 mm (48 in)	
		Item Number	Philips 12NC	Item Number	Philips 12NC	Item Number	Philips 12NC
eW Cove QLX Powercore 120 VAC	High	523-000090-55	910503705122	523-000091-55	910503705203	523-000092-55	910503705283
	Low	523-000090-23	910503705089	523-000091-23	910503705170	523-000092-23	910503705251
eW Cove QLX Powercore 220-240 VAC	High	523-000090-63	910503705130	523-000091-63	910503705211	523-000092-63	910503705291
	Low	523-000090-31	910503705097	523-000091-31	910503705178	523-000092-31	910503705259
eW Cove QLX Powercore 220-240 VAC Fixture and 3 m (10 ft) Leader Cable with terminator	High	523-000090-71	910503705138	523-000091-71	910503705219	523-000092-71	910503705299
	Low	523-000090-39	910503705106	523-000091-39	910503705186	523-000092-39	910503705267
eW Cove QLX Powercore 277 VAC	High	523-000090-79	910503705146	523-000091-79	910503705227	523-000092-79	910503705308
	Low	523-000090-47	910503705114	523-000091-47	910503705194	523-000092-47	910503705275

* Color temperatures conform to nominal CCTs as defined in ANSI Chromaticity Standard C78.377A.

Use Item Number when ordering in North America.



Submitted by Bright Focus Sales, Inc.		Catalog Number: 523-000091-51 / 108-000033-06 / 120 000076-01 / 120-000125-00 Notes:		Type: CV1 CLE15-11619
BRIGHTFOCUS	Job Name: MARTIN HALL			

Accessories

Item	Housing Color	Dimensions	Item Number	Philips 12NC		
Leader Cable (includes terminator), UL / cUL	Black	3 m (10 ft)	108-000032-10	912400130570		For connection to standard junction box
Leader Cable (includes terminator), CE / CCC	Black	3 m (10 ft)	108-000032-11	912400130571		
Leader Cable (includes terminator), UL / cUL	White	3 m (10 ft)	108-000032-12	912400130572		
Leader Cable (includes terminator), CE / CCC	White	3 m (10 ft)	108-000032-13	912400130573		
Leader Cable (includes terminator), UL, US Plug	Black	2.4 m (8 ft)	108-000032-14	912400130574		For portable installations
Jumper Cable, UL / cUL	White	305 mm (1 ft)	108-000033-06	910503700895		Depending on the installation's design, you may need jumper cables to add space between fixtures
		1.5 m (5 ft)	108-000033-07	910503700896		
Jumper Cable, CE / CCC	White	305 mm (1 ft)	108-000033-08	910503700897		
		1.5 m (5 ft)	108-000033-09	910503700898		
Wiring Compartment (includes terminator)	White	2.9 x 6.8 x 16 cm (1.17 x 2.7 x 6.32 in) (H x W x L)	120-000076-01	912400130576		Can be used for direct connection to conduit
Mounting Track	White	1219 mm (4 ft)	120-000125-00	910503701788		Optional mounting track ensures straight runs of fixtures

Use Item Number when ordering in North America.

Compatible Dimmers†

Supplier	Part Number	Description	Voltage
Philips	913701252701	Captivation Phase Dimmer DC-DPD-I-1S-101	120 VAC
Philips	913703021009	DTE310	230 VAC
Philips	912400133633	Data Adapter, DALI to ELV, DigiDim 452	230 VAC
Philips	913701252701	Captivation Phase Dimmer DC-DPD-I-1S-101	277 VAC
Philips Strand	A21 with IGBT module	A21 Dimmer Cabinet with IGBT Dimmer Module	120 VAC
Philips Strand	A21 with IGBT module	A21 Dimmer Cabinet with IGBT Dimmer Module	277 VAC
Lutron	NTELV-600	Nova T Electronic Low Voltage Dimmer	120 VAC
Lutron	PHPM-PA-DV-WH	Phase-Adaptive Power Module	120 VAC
Lutron	PHPM-PA-DV-WH	Phase-Adaptive Power Module	277 VAC

† These dimmers have been tested in our lab and found to be compatible with this product. All installations are different. We highly recommend performing a full mockup of every lighting circuit, including all luminaires and controls, to test for the desired dimming range. Visit <http://1.usa.gov/1g3cGfs> for more information.

BRIGHTFOCUS

CV1

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