



Legal Department

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

July 15, 2014

Chairman Thomas W. Johnson
Ohio Power Siting Board
Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793

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

Re: **In the Matter of the Application of**)
Momentive Perf Materials Quartz Inc.)
and Ohio Power Company) **Case No. 14-1236-EL-EEC**
for Approval of a Special Arrangement)
Agreement with a Mercantile Customer)

Dear Chairman Johnson,

Attached please find the Joint Application of Ohio Power Company (OPCo) and mercantile customer Momentive Perf Materials Quartz Inc. for approval of a Special Arrangement of the commitment of energy efficiency/peak demand reduction (EE/PDR) resources toward compliance with the statutory benchmarks for 2014.

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

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

Cordially,

/s/ Yazen Alami
Yazen Alami

Attachments



Case No.: 14-1236-EL-EEC

Mercantile Customer: MOMENTIVE PERF MATERIALS QUARTZ INC

Electric Utility: Ohio Power

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

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

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

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

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

Section 1: Company Information

Name: MOMENTIVE PERF MATERIALS QUARTZ INC

Principal address: 611 O'Neill Drive, Hebron, Oh 43025

Address of facility for which this energy efficiency program applies: 611 O'Neill Dr, Hebron, Oh 43025-9680

Name and telephone number for responses to questions:

Melissa Trout, Momentive Perf Materials Quartz Inc

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

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

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

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

Section 2: Application Information

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

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

B) Our electric utility is: Ohio Power Company

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

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

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

Section 3: Energy Efficiency Programs

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

- ☐ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).
- ☒ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s): 9/19/2012
- ☐ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):
- ☐ Behavioral or operational improvement.

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

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

Annual savings: kWh

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

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

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

Annual savings: 174,326 kWh

See Confidential and Proprietary Attachment 5 - Self Direct Program Project Calculation for annual energy savings calculations and 10-1599-EL-

EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

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

See 10-1599-EL-EEC for the work papers that provide all methodologies, protocols, and practices used in this application for prescriptive measures, as needed.

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

Annual savings: kWh

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

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

Section 4: Demand Reduction/Demand Response Programs

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

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

➤ Choose one or more of the following that applies:

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

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

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

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

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

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

22.5 kW

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

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

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

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

A) The customer is applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

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

OR

☐ Commitment payment

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

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

☒ A cash rebate of \$ 7,918.95. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

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

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

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

OR

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

OR

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

Section 6: Cost Effectiveness

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

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: _____
(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT) . The calculated UCT value is: 5.86 (Skip to Subsection 2.)

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

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

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The utility's incremental measure costs were _____.

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

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

Our avoided supply costs were \$ 52,497.16

The utility's program costs were \$ 1,045.96

The utility's incentive costs/rebate costs were \$ 7,918.95.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

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

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

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

- 1) any confidentiality requirements associated with the agreement;

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

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

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

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

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

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

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

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

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

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

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



Public Utilities Commission

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

Case No.: 14-1236-EL-EEC

State of Ohio :

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

1. I am the duly authorized representative of:

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

Brian Larey Energy Efficiency Engineer
Signature of Affiant & Title

Sworn and subscribed before me this 14th day of July, 2014 Month/Year

Brenda Walke
Signature of official administering oath

Brenda Walke, Notary
Print Name and Title

My commission expires on 01-16-2018



Brenda Walke
Notary Public, State of Ohio
My Commission Expires 01-16-2018



A unit of American Electric Power

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

Self Direct Project Overview & Commitment

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

Customer Name	MOMENTIVE PERF MATERIALS QUARTZ INC	
Project Number	AEP-14-12484	
Customer Premise Address	611 O NEILL DR, HEBRON, OH 43025-9680	
Customer Mailing Address	611 O'Neill Drive, Hebron, OH 43025	
Date Received	2/11/2014	
Project Installation Date	9/19/2012	
Annual kWh Reduction	174,326	
Total Project Cost	\$24,433.75	
Unadjusted Energy Efficiency Credit (EEC) Calculation	\$10,558.60	
Simple Payback (yrs)	2.1	
Utility Cost Test (UCT) for EEC	5.86	
Utility Cost Test (UCT) for Exemption	0.05	
<i>Please Choose One Option Below and Initial</i>		
Self Direct EEC: 75%	\$7,918.95	☒ Initial: MLT
EE/PDR Rider Exemption	4 Months (After PUCO Approval)	☐ Initial:

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

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

___ YES ☒ NO

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

Project Overview:

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

Replaced (39) 400W MH with (39) 6L 4' T8 High Bay
Replaced (26) 400W MH with (26) 6L 4' T5HO High Bay

Installed new cooling tower with VFDs on (2) 50 HP motors

Added new manufacturing area with lighting power 2,290 watts below ASHRAE 90.1-2007 baseline

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

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

Ohio Power Company

By: *John J. Williams*

Title: Manager

Date: 6/27/2014

MOMENTIVE PERF MATERIALS QUARTZ INC

By: *Melissa Trout*

Title: Director of Operations - Newark

Date: 6/25/14

Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



STEPS FOR SUBMITTING YOUR APPLICATION

Step 1: Verify Project, Equipment and Customer Eligibility

- ✓ Project must be a facility improvement that produces a permanent reduction in electrical energy usage (kWh).
- ✓ Facilities must be AEP electric customers that are considered "mercantile" under the definition of the Public Utilities Commission of Ohio (PUCO).
- ✓ Projects must operate at least 2,245 hours per year to qualify for cash rebates. Projects with annual energy (kWh) savings greater than the facility's annual energy (kWh) consumption are not eligible.
- ✓ All installed equipment must meet or exceed the specifications outlined in the application.
- ✓ Equipment must be installed in facilities served by AEP Ohio.
- ✓ Customer must have a valid AEP Ohio account number on an eligible AEP Ohio non-residential account.
- ✓ The Self-Direct program applies to customer facilities served by AEP Ohio's retail electric distribution rates that are defined as "mercantile" and meet the minimum energy usage requirements of 700,000 kWh per year, or that are part of a national account involving multiple facilities in one or more states.

Step 2: Submit Application

- ✓ Complete the Checklist page.
- ✓ Agree to the Terms and Conditions and Final Payment Agreement.
- ✓ Attach the documentation listed:
 - Completed Applicant Information form
 - Completed and signed Customer Agreement form
 - Measure worksheet(s)
 - Scope of work (type, quantity, and specifications of old and new equipment)
 - Dated and itemized invoices for the purchase and installation of all equipment installed
 - Specifications for all installed equipment installed showing that it meets program specifications
- ✓ Submit the signed Final Application via email, fax or mail prior to November 14, 2014, for any projects completed on or after January 1, 2011. Any applications received after the deadline may not be submitted to the Public Utilities Commission of Ohio (PUCO) by December 31, 2014, which may jeopardize approval.

Step 3: Project Review

- ✓ The program team will review your application. The review of some projects will require an inspection; the team will contact applicants requiring an inspection for scheduling.
- ✓ After approval by AEP Ohio, the customer will receive an

Overview and Commitment form to sign and return. The project will then be submitted to the PUCO for consideration. The PUCO will assign a case number and review the project details prepared by AEP Ohio. The PUCO may request additional information, or approve or reject the energy efficiency cash rebates.

Step 4: Receive Energy Efficiency Cash Rebates

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

AEP Ohio Business Incentives Program

2740 Airport Drive, Suite 160
Columbus, OH 43219

Phone: (877) 607-0739

Fax: (877) 607-0740

aepohioincentives@dnvkema.com

Visit our website at aepohio.com/solutions.

Self-Direct Program Application

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CHECKLIST

FINAL APPLICATION

Required Attachments

- ☐ Completed and signed Applicant Information form
- ☐ Completed Final Payment Agreement form including Energy Efficiency Cash Rebates Requested section
- ☐ Itemized invoices
- ☐ Equipment specifications
- ☐ Scope of work
- ☐ W-9 (required for LLC, individual, partnership, property management companies)

Cash Rebate Worksheets¹

- ☐ Lighting
- ☐ HVAC
- ☐ Motors & Drives
- ☐ Compressed Air
- ☐ Refrigeration/Food Service
- ☐ Agriculture & Miscellaneous
- ☐ Transformers
- ☐ UPS
- ☐ Custom
- ☐ New Construction Lighting

Application date _____

Estimated incremental project cost _____

Expected completion date _____

¹Incomplete applications will delay processing and receipt of energy efficiency cash rebates.

Revised Submittal

Please complete below if this is a revised submittal.

Submittal date _____ AEP Project Number (if known) AEP - 1 ____ - ____ - ____ - ____

AEP Ohio Business Incentives Program

2740 Airport Drive, Suite 160

Columbus, OH 43219

Phone: (877) 607-0739

Fax: (877) 607-0740

aepohioincentives@dnvkema.com

Visit our website at aepohio.com/solutions.

Self-Direct Program Application

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TERMS AND CONDITIONS

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

Please note that funds are limited and subject to availability.

Program Effective Dates

AEP Ohio Business Incentives Program offers cash rebates until approved funds are exhausted or November 14, 2014, whichever comes first. The effective dates of the current AEP Ohio Business Incentives Program and application submittal requirements are as follows:

- Self-direct projects are projects completed since January 1, 2011. Self-direct projects are eligible to apply for EEC with this application. Current or future projects should apply using a prescriptive or custom application.
- All 2014 AEP Ohio Business Incentives Program applications should be received no later than November 14, 2014. Any applications received after the deadline may not be submitted to the Public Utility Commission of Ohio (PUCO) by December 31, 2014, which may jeopardize approval. AEP Ohio reserves the right to extend or shorten this timeline.

Program and Project Eligibility

The AEP Ohio Business Incentives Program offers both prescriptive cash rebates for some of the more-common energy efficiency measures and custom cash rebates for other eligible improvements not included on the list of prescriptive measures. Cash rebates available under the AEP Ohio Business Incentives Program include non-residential accounts served on AEP Ohio's regulated retail rates.

Qualifying projects must be installed in a facility in AEP Ohio's electric service territory in Ohio. Cash rebates are available to all non-residential accounts that pay into the EE/PDR rider and receive their electricity over AEP Ohio wires, regardless from which retail electric supplier the customer has chosen to purchase power. A customer may neither apply for nor receive cash rebates for the same measure, equipment or service from more than one electric distribution utility.

The Self-Direct program applies only to customer facilities served by AEP Ohio's retail electric distribution rates, which are defined as "mercantile" and meet the minimum energy usage requirements of 700,000 kWh per year, or that are part of a national account involving multiple facilities in one or more states.

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

Projects must involve measures that result in a reduction in electric energy usage due to an improvement in system efficiency. Projects that result in reduced energy consumption without an improvement in system efficiency are not eligible for a custom cash rebate. The project simple payback for custom projects prior to the cash rebate payment generally should fall between 1 to 7 years, or pass cost-effectiveness test(s) determined by AEP Ohio to qualify for a cash rebate. Incentives are based on energy savings during the first 12 months following installation.

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

Project requirements under the AEP Ohio Business Incentives Program include the following:

- Projects must involve a new facility improvement with capital improvements that results in a permanent reduction in electrical energy usage (kWh). Existing/old lighting equipment must be functional and in operation at the time of replacement.
- Any measures installed at a facility must produce verifiable and persistent energy reduction and must be sustainable and provide 100% of the energy benefits as stated in the application for a period of at least five (5) years or for the life of the measure, whichever is less. If the customer ceases to be a delivery service customer of AEP Ohio or removes the equipment or systems at any time during the 5-year period or the life of the measure, the customer may be required to return a prorated amount of cash rebate funds to AEP Ohio.
- All equipment must be new. In rare circumstances, AEP Ohio reserves the right to allow used or rebuilt equipment if the customer can prove the existing equipment cannot be replaced with new equipment.
- All installed equipment must exceed state, federal and local codes and requirements.
- Equipment must be purchased, installed and operating (or capable of operating in the case of seasonal uses) prior to

Self-Direct Program Application

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TERMS AND CONDITIONS

- submitting an application for a cash rebate.
- AEP Ohio will issue cash rebate payments in the form of checks or an energy efficiency Peak Demand Reduction Rider Exemption.
- The cash rebate is paid as a one-time, one-program offer and cannot be combined with incentive payments from other AEP Ohio programs. The customer may be eligible to participate in other programs offered by AEP Ohio, as long as no single project receives more than one cash rebate or incentive.

Confidential information contained in any documents associated with this application will be protected from public filings. However, this information will be disclosed to the PUCO and AEP's independent evaluators for further review and approval. Customers who require a non-disclosure agreement ("NDA") will be required to permit disclosure of certain information to support the submission of their application to the PUCO to be eligible to participate.

Projects that are NOT eligible for a cash rebate include the following:

- Fuel switching (e.g., electric to gas or gas to electric)
- Changes in operational and/or maintenance practices or simple control modifications not involving capital costs (Please visit aepohio.com/solutions for Retro-Commissioning Program or Continuous Improvement Program)
- Removal or termination of existing processes, facilities and/or operations
- On-site electricity generation
- Projects involving gas-driven equipment in place of or to replace electric equipment (such as a chiller)
- Projects focused primarily on power factor improvement
- Projects that involve only peak-shifting without kWh savings
- Renewables (Please visit aepohio.com/save for Renewables Program)
- Projects required by state or federal law, building or other codes, or projects that are standard industry practice
- Projects easily reverted/removed
- Projects installed entirely for reasons other than improving energy efficiency
- Other conditions as may be determined by AEP Ohio

Energy Efficiency Cash Rebate Limits

For both prescriptive and custom measures in this application, the **total EEC shall be 75% of the lesser of:** 1) The calculated cash rebate as approved by AEP Ohio or 2) 50% of incremental project cost (not including internal labor). In calculating the savings and EEC for custom measures, please contact the AEP Ohio Business Incentives Program office to determine an appropriate baseline for savings. In addition to the above incremental project cost limit, cash rebate payment rates vary when a customer's calculated cash rebate exceeds the tiers listed in the chart.

PROGRAM ENERGY EFFICIENCY CASH REBATES	
Energy efficiency cash rebate levels for one-year energy savings	See tables for prescriptive cash rebates. Custom cash rebates: \$0.08/kWh x 75%.
Minimum/maximum simple payback before energy efficiency cash rebate applied	Must pass cost effectiveness test(s) determined by AEP Ohio; generally between one and seven years
Maximum payout	75% of 50% of the incremental project cost, excluding internal labor (additional caps and tiering may also apply)
Energy efficiency cash rebate levels for projects completed since 1/1/2011	Calculated amount on the prescriptive or custom worksheets attached and subject to funding limits
Cash rebate limit	See Cash Rebate Limits and Tiering section
Cash rebate calculation order	Measure cash rebate caps are applied first. Project-cost cash rebate limits are applied second. Cash rebate tiering is applied third. Lastly, 75% factor is applied to cash rebate.

Energy Efficiency Cash Rebate Tiering

The total cash rebate paid for any self-direct application cannot exceed 50% of the incremental project cost (not including internal labor). In addition to the above incremental project cost limit, cash rebate payment rates vary when a customer's calculated cash rebate exceeds the tiers listed below:

- Tier 1 \$0 - \$100,000 = 100% of eligible calculated cash rebate value
- Tier 2 \$100,001 - \$300,000 = 50% of eligible calculated cash rebate value
- Tier 3 \$300,001 - \$500,000 = 25% of eligible calculated cash rebate value
- Tier 4 \$500,001 - beyond = 10% of eligible calculated cash rebate value

Application Review Process

Applications are not a guarantee of program acceptance and energy efficiency cash rebates. AEP Ohio will review applications for eligibility and completeness. Completed applications will be reviewed in the order received. Funds are reserved for the project when AEP Ohio receives a completed application and determines that the project meets the program eligibility requirements. Upon review of the application, the program will notify applicants who submit incomplete applications of deficiencies; applicants may lose their place in the review process until receipt of all requested information. Applications must be completed and all information received by the deadlines defined above to begin processing. Applicants are encouraged to call the program hotline with any questions about documentation requirements.

TERMS AND CONDITIONS

Application

Projects completed on or after January 1, 2011, must submit an application and all required supporting documentation by November 14, 2014, to be applicable for the 2014 program year. Any applications received after the deadline may not be submitted to the PUCO by December 31, 2014, and could jeopardize approval.

A signed application with supporting project documentation verifying project installation and capital improvements must be submitted to AEP Ohio prior to application approval. Project documentation, such as (but not limited to) copies of dated invoices for the purchase and installation of the measures, equipment specification sheets, energy-savings analysis, complete application and W-9 forms (LLC, individual, partnership, property management companies), is required. The invoice should be itemized sufficiently to separate the project cost from the costs of other services not related to the energy efficiency project and other repairs. The location or business name on the invoice must be consistent with the application information. Requested information such as proof of project completion could include equipment purchase dates, installation dates, proof that the equipment was operational, manufacturer specifications, warranty information, invoices and proof of owner co-payment.

Inspections

The AEP Ohio Business Incentives Program reserves the right to inspect all projects to verify compliance with the program rules and verify the accuracy of project documentation. This may include installation inspections, verification of detailed lighting layout descriptions, metering, data collection, interviews and utility bill or monitoring data analysis. Customers are required to allow access to project documents and the facility where the measures were installed for a period of five years after receipt of cash rebate payment by AEP Ohio. In the event a building(s) is turned over to a new account holder/owner before AEP Ohio officially measures and verifies incentivized equipment, AEP Ohio reserves the right to do so under new ownership. Customer understands and agrees that program installations may also be subject to inspections by the PUCO, its designee or AEP's independent evaluators, and photographs of installation may be required.

Requirements for Custom Project Electricity Savings Calculation

The annual electricity savings must be calculated for custom projects using industry-accepted engineering algorithms or simulation models. The applicant may estimate the annual electricity usage of both the existing and proposed equipment based on the current operation of the facility. A listing of the pre-existing information requirements is provided at the end of the custom application section. If equipment is replaced prior to the end of its rated service life in order to achieve energy savings,

the existing equipment performance may be used as the baseline in the energy-savings calculations. Documentation of early replacement decision and/or actual equipment energy usage will be required. If equipment is replaced due to failure or for other reasons (such as obsolescence or a need for more capacity), the baseline performance used in the savings calculation must be either the minimum performance that would be required by code in effect for that equipment type at the time of installation and application (where a code applies) or industry standard when a code does not apply.

If the previous equipment was at the end of its useful life, the applicant must use, as the baseline, the equipment that would meet the applicable federal and local energy codes in effect at the time of installation or industry standard, if no code exists.

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

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

For custom projects, the applicant is required to provide information in order to allow AEP Ohio to verify the baseline usage of the pre-existing equipment in order to use the existing equipment as the baseline. AEP Ohio may need to conduct inspections of projects to verify equipment and operating conditions.

Customers are encouraged to contact the hotline to speak with program staff prior to submitting projects that warrant special treatment. These non-typical projects will be considered on a case-by-case basis by AEP Ohio.

Tax Liability

Cash rebates are taxable and, if more than \$600, will be reported to the IRS unless the customer is exempt. AEP Ohio is not responsible for any taxes that may be imposed on your business as a result of your receipt of cash rebate. A W-9 for LLC, individual, partnership and property management companies must be provided with all applications.

TERMS AND CONDITIONS

Disclaimer

Any and all energy savings and coincident demand generated by the project described in this application are hereby committed to AEP Ohio. That retained demand can be used to count against AEP Ohio's benchmark requirements in S.B. 221, regardless; any retained demand provided to PJM generation auctions must be done so by AEP Ohio only.

Peak-demand reduction is defined as the reduction in average load over the performance hours as a result of replacing existing electrical equipment with more-efficient electrical equipment. Peak performance hours are defined as the time between June 1 and August 31 on weekdays and non-holidays, between the hours 3:00 p.m. and 6:00 p.m. Eastern Standard Time. PJM Peak Hours are defined as the time between June 1 and August 31 on weekdays and non-holidays, between the hours 2:00 p.m. and 6:00 p.m. Eastern Standard Time.

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

Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



APPLICANT INFORMATION

Important: Please read the Terms and Conditions before signing and submitting this application. Complete all information and provide required documentation to avoid processing delays.

Project Information

Building Type (click here for
Building Type definitions)

W-9 Tax Status

How Did You Hear About the
Program?

Shift

Affected Area Square Footage

Dodge Report Number (if applicable)

Building Operating Hours

Equipment Operating Hours

Does the Facility Have a Data Center?

Name of Applicant's Business _____

Project Name (if applicable) _____ Name as It Appears on Utility Bill _____

AEP Ohio Account Number Where Measure Installed _____ Taxpayer ID (SSN/FEIN) _____

Mailing Address _____ City _____ State _____ Zip _____

☐ Check if mailing address and installation address are the same.

Installation Address _____ City _____ State _____ Zip _____

Customer Contact

Please provide all contacts we may need to process this project. List the project decision-maker, the technical contact, etc. as the contractor contact.

Name of Contact(s) (preferred contact for documentation) _____

Title of Contact _____ Phone # _____ Ext. _____

Contact Fax # _____ Contact Email _____

Solution Provider/Contractor Information¹

Name of Contracting Company _____

Name of Contact Person _____ Title of Contact _____

Mailing Address _____ City _____ State _____ Zip _____

Phone # _____ Ext. _____ Contact Fax # _____ Contact Email _____

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

¹Solution provider/contractor is the party involved in the application submittal (i.e., specs, scope of work, etc.).

Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



FINAL PAYMENT AGREEMENT

Final Payment Agreement

I understand that the application and all required documentation should be received by the AEP Ohio Business Incentives Program by November 14, 2014, for any projects completed on or after January 1, 2011. Any applications received after the deadline may not be submitted to the PUCO by December 31, 2014, and could jeopardize approval of any cash rebate by the PUCO. All equipment must be purchased, installed and fully operational prior to submitting the application.

I understand that AEP Ohio or its representatives have the right to ask for additional information at any time. AEP Ohio Business Incentives Program will make the final determination of cash rebate levels for this project.

I understand that this project must involve a facility improvement that results in improved energy efficiency.

As an eligible AEP Ohio account holder, I certify that decisions to acquire and install the indicated energy efficiency measures, which will be demonstrated with supporting documentation required by AEP Ohio, were made after January 1, 2011, and that work was completed on this project on or after January 1, 2011. The energy efficiency measures are for use in my business facility and not for resale.

I understand that the location and business name on the project documentation must be consistent with the application information. Project documentation, measure specification sheets and details of measure installation are included. Documentation indicating contract dates prior to January 1, 2011, may render this application ineligible. I understand that all submissions become the property of AEP Ohio. It is recommended to keep a copy of the application for your records.

I agree that if: (1) I did not install the related measure(s) identified in my application or (2) I remove the related measure(s) identified in my application before a period of five (5) years or the end of the measure life, whichever is less, I shall refund a prorated amount of energy efficiency cash rebates to AEP Ohio based on the actual period of time the related measure(s) were installed and operating. This is necessary to assure that the project's related energy benefits will be achieved. (3) AEP Ohio will pay 75% of the lesser of: 1) The calculated cash rebate as approved by AEP Ohio, subject to funding limits or 2) 50% of the incremental project cost (subject to application caps). I understand that AEP Ohio or its representatives have the right to ask for additional information at any time. AEP Ohio Business Incentives Program will make the final determination of energy efficiency cash rebate levels for this project.

I agree to be responsible to comply with any applicable codes or ordinances. I also understand that all materials removed, including lamps and PCB ballasts, must be permanently taken out of service and disposed of in accordance with local codes and ordinances. I understand it is my responsibility to be aware of any applicable codes or ordinances. Information about hazardous waste disposal can be found at epa.gov/epawaste/hazard/index.htm.

I agree to verification by the utility or its representatives of both sales transactions and equipment installation. I understand that these cash rebates are available to all non-residential accounts that pay into the Energy Efficiency and Demand Response (EE/PDR) rider and receive their electricity over AEP Ohio wires, regardless from which retail electric distribution supplier the customer has chosen to purchase power.

I understand that AEP Ohio reserves the right to refuse payment and participation if the customer or contractor violates program rules and requirements. AEP Ohio is not liable for energy efficiency cash rebates promised to customers as a result of misrepresentation of the program.

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

Energy efficiency cash rebates will be based upon the Final Application and program terms and conditions, as well as the availability of funds.

I understand that the program has a limited budget. Applications will be processed until allocated funds are reserved or spent. Final Applications should be received by November 14, 2014, to be eligible for funding under the current program period.

I certify that the information on this application is true and correct, and that the taxpayer ID number, tax status and W-9 are the applicant's. I understand that cash rebates exceeding \$600 will be reported to the IRS, unless the payee is exempt. I understand that cash rebates assume related energy benefits over a period of five (5) years or for the life of the measure, whichever is less.

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

FINAL PAYMENT AGREEMENT

I understand and agree that all other terms and conditions as specified in the application, including all attachments and exhibits attached to this application, will serve as a contract for the customer's commitment of energy and demand resources to AEP Ohio and shall apply.

I understand that any and all energy savings and coincident demand generated by the project described in this application are hereby committed to AEP Ohio. That retained demand can be used to count against AEP Ohio's benchmark requirements in S.B. 221, regardless; any retained demand provided to PJM generation auctions must be done so by AEP Ohio only.

Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



CUSTOMER AGREEMENT

- ☐ I have read and understand the program requirements, measure specifications, and [Terms and Conditions and Final Application Agreement](#) and agree to abide by those requirements. Furthermore, I concur that I meet all eligibility criteria in order to receive payment under this program. For final applications, sign and submit only after all equipment is installed and operational. A customer signature is required for payment. Signed applications received by email or fax will be treated the same as original applications received by mail.
- ☐ As an eligible customer, I verify the information is correct and request consideration for participation under this program.

Digital Signature Instructions

1. Click in the signature box.
2. Follow the digital signature directions displayed in the "Add Digital ID" pop-up box.
3. Establish a digital ID and password.
4. In the "Sign Document" pop-up box, you can select to change the signature appearance from typed font to an imported graphic.
5. Follow directions to save signed application; signature and verification information will appear in the signature box.

Total Incremental Project Cost

Customer Signature (AEP Ohio Customer)

Date

Total Cash Rebates Requested

Print Name

Project Completion Date

SUBMIT VIA EMAIL

PRINT APPLICATION

COOPER LIGHTING - METALUX®

DESCRIPTION

The HBI series is an outstanding solution for high mounting height industrial or retail applications. The HBI optic has been optimized to provide maximum performance from T8 lamps. Optional uplight component is provided to enable excellent ceiling uniformity. HBI's high lumen package allows the benefits of fluorescent to be applied at high mounting heights that were traditionally exclusive to H.I.D. The primary benefits include exceptional color rendering, high system efficacy, 95% lumen maintenance, long lamp life, instant on/instant re-strike, economical dimming, and uniform brightness control. Primary applications include retail, shopping malls, light industrial, gymnasiums and recreational environments.

SPECIFICATION FEATURES

Construction

Full bodied steel housing with integral ballast channel adds strength, rigidity and structural protection for optical assembly.

Electrical

The HBI comes with a standard Class P electronic ballast and twistlock lampholders. UL/cUL listed for high ambient environments up to 55°C (131°F) for all lamps and ballast combinations when used in open uplight configurations. Suitable for damp locations. Optional modular power receptacle meets UL2459 and NEC 410.73 and is UL/cUL rated for make and break under load from outside the luminaire to speed maintenance.

Finish

White enamel finish preceded by a multistage cleaning cycle, iron phosphate coating with rust inhibitor to protect against contaminants and oxidation.

Downlight/Uplight Optics

Die formed, segmented optical design optimizes performance across three distributions. Optical choices include a narrow distribution for aisles, medium distribution for assembly and loading areas, or wide distribution for general, open area lighting. An uplight option is offered to permit ceiling uniformity and allow for ample lamp and luminaire heat dissipation. Gasketed door frame & lens assembly is optional for more demanding environments.

Options

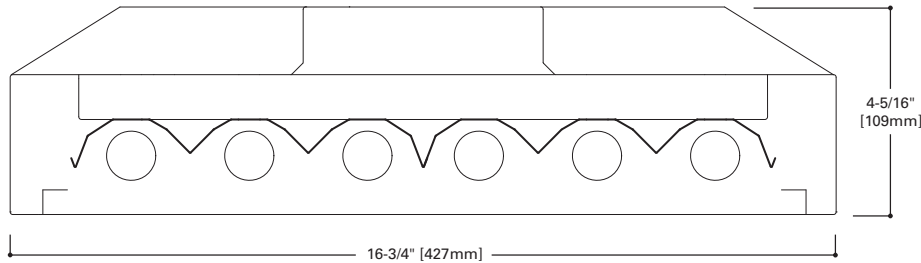
Integral Occupancy Sensor available and provides from 600 sq. ft. (MS) up to 1250 sq. ft. (MSO) of coverage in a maximum mounting height of 40' using interchangeable lens caps provided.

Mounting

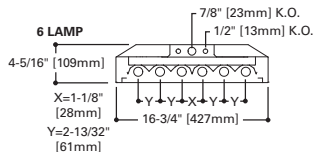
The HBI series is suited for suspension mounting with optional wire hook and chain set or cable mounting. Single monopoint mounting is available with SPM Tong Hanger.

Warranty

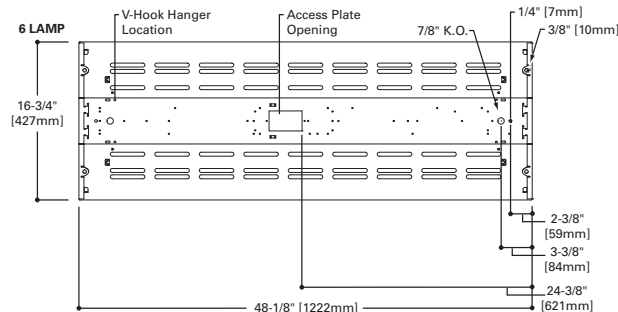
When operated in high ambient conditions, the HBI is supported by a 5 yr/55°C and 3 yr/65°C ballast warranty when used with a high power factor ballast in open, uplight configurations. To maximize your warranty, the HBI should be ordered with a high power factor ballast in ambient environments that typically exceed 40°C (102°F).



LAMP CONFIGURATIONS



DIMENSION TOP VIEW



HBI SERIES

6 T8 LAMPS

High-Bay Industrial
Fluorescent Luminaire



ENERGY DATA

Input Watts:

EB Ballast
632=169W

EB/Plus Ballast
632=218W

ER Ballast
632=169W

ER/Plus Ballast
632=218W

Luminaire Efficacy Rating

LER = FL-84 (Narrow Beam)

Catalog Number: HBI-632-N-UPL

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$2.85

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

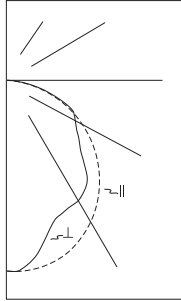
**Consult Pre Sales Technical Support.

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

LINEAR DISCONNECT

Safe and convenient means of
disconnecting power.

PHOTOMETRICS



HBI-632-N-UNV-EB82
Electronic Ballasts
(6) 32W T8 Lamps
2850 lumens
Spacing criterion:
(H) 1.3 x mounting
height, (L) 1.1 x
mounting height
Efficiency 91.3%
Test Report:
HBI632.IES
LER = FL81
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$2.95

Candela

Angle	Along H	45°	Across L
0	5981	5981	5981
5	6000	5958	5900
10	5959	5716	5516
15	5861	5330	4953
20	5702	4832	4572
25	5468	4418	4452
30	5189	4191	4398
35	4862	3996	4222
40	4491	3834	3894
45	4085	3563	3314
50	3649	3169	2953
55	3186	2598	2657
60	2699	2220	2469
65	2193	1914	2291
70	1668	1693	1766
75	1144	1291	1226
80	635	760	703
85	194	274	227
90	10	14	14

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%											
	80%			70%			50%			30%		
rw	70	50	30	70	50	30	50	30	10	50	30	10
RCR	70	50	30	70	50	30	50	30	10	50	30	10
0	109	109	109	109	106	106	106	106	101	101	101	97
1	99	94	90	87	96	92	89	85	89	85	83	85
2	90	82	76	70	87	80	74	69	77	72	68	74
3	82	72	64	58	79	70	63	58	68	62	57	65
4	75	64	55	49	73	62	55	49	60	53	48	58
5	69	57	49	42	67	56	48	42	54	47	42	52
6	64	51	43	37	62	50	43	37	49	42	36	47
7	59	46	38	33	57	46	38	33	44	37	32	43
8	55	42	35	29	53	42	34	29	41	34	29	39
9	51	39	31	26	50	38	31	26	37	31	26	36
10	48	36	29	24	47	36	29	24	35	28	24	34

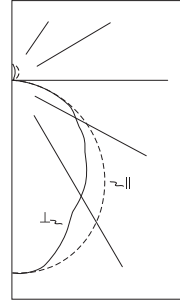
Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	4244	24.8	27.2
0-40	6874	40.2	44.0
0-60	12002	70.2	76.9
0-90	15606	91.3	100.0
0-180	15606	91.3	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	12912	11262	10475
55	12415	10124	10353
65	11598	10122	12116
75	9879	11148	10587
85	4975	7027	5821

PHOTOMETRICS



HBI-632-N-UNV-EBT2-UPL
Electronic Ballasts
(6) 32W T8 Lamps
2850 lumens
Spacing criterion:
(H) 1.0 x mounting
height, (L) 1.1 x
mounting height
Efficiency 94.5%
Test Report:
HBI632-UPL.IES
LER = FL84
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$2.85

Candela

Angle	Along H	45°	Across L
0	6096	6096	6096
5	6103	6109	6097
10	6057	6018	5933
15	5952	5772	5528
20	5776	5383	5054
25	5542	4954	4556
30	5252	4442	4306
35	4916	4027	4025
40	4529	3719	3653
45	4117	3379	3251
50	3665	2969	2984
55	3186	2542	2597
60	2686	2231	2288
65	2169	1823	2045
70	1634	1539	1588
75	1105	1147	1089
80	602	660	616
85	174	218	158
90	5	6	7

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%											
	80%			70%			50%			30%		
rw	70	50	30	70	50	30	50	30	10	50	30	10
RCR	70	50	30	70	50	30	50	30	10	50	30	10
0	112	112	112	112	109	109	109	109	103	103	103	98
1	102	98	94	90	99	95	91	88	90	87	85	86
2	93	85	79	73	90	83	77	72	79	74	70	75
3	85	75	67	61	82	73	66	60	70	64	59	67
4	78	66	58	52	75	65	57	51	62	55	50	59
5	71	59	51	45	69	58	50	44	56	49	44	54
6	66	54	45	39	64	52	45	39	50	43	38	49
7	61	49	40	35	59	48	40	34	46	39	34	43
8	57	44	37	31	55	44	36	31	42	35	30	41
9	53	41	33	28	52	40	33	28	39	32	27	38
10	50	38	30	25	49	37	30	25	36	30	25	35

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	4812	26.4	27.9
0-40	7183	42.0	44.5
0-60	12252	71.7	75.8
0-90	15556	91.0	96.3
0-180	16155	94.5	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	13013	10680	10276
55	12415	9905	10120
65	11471	9641	10815
75	9542	9905	9404
85	4462	5590	4052

Modular F-Bay Power Supply Option

Cooper Lighting's F-Bay Modular Power Supply option is available for use with all F-Bay products. The modular power supply allows external fixture access for safe and easy servicing. There is no need to remove lamps or reflectors to disconnect fixture power with F-Bay Modular Power Supply. Access to the individual fixture's power supply allows servicing without turning off all the fixtures, disrupting occupants. F-Bay Modular Power Supply is a time-saver in installation – **simply plug & power.**



1. Modular Power Supply Receptacle supplied mounted into fixture Access Plate
2. Modular Power Cord & Plugs in 120, 277, 347, & 480V configurations for easy plug & power into existing supply

No internal fixture access required for installation or disconnecting power

Modular Motion Sensor Option supplied with Mounting Box and Modular Power Supply Receptacle

Code Compliance

- UL/cUL Certified for Make/Break under load (UL2549)
- Meets NEC requirements for ballast disconnect (NEC 410.73G)
- Allows for addition of Occupancy Sensor without hard connections
- Receptacles complete with insulating/dust cap

ORDERING INFORMATION

SAMPLE NUMBER: HBI-632-N-UNV-EB82/PLUS-MP-UPL-U

Includes V Hangers for rapid installation⁽⁶⁾

Series HBI=High Bay Industrial	Voltage ⁽²⁾ UNV=Universal 120/277 Voltage UNC=Universal 347/480 Voltage ⁽⁵⁾ 120V=120 Volt 277V=277 Volt 347V=347 Volt 480V=480 Volt	Ballast Type ⁽³⁾ EB8 =T8 Electronic Instant Start. Total Harmonic Distortion < 10% No. of Ballast 2 or 3 EB8 /PLUS= T8 Electronic Instant Start. High Ballast Factor >1.15. Total Harmonic Distortion < 10% No. of Ballast 1, 2 or 3 ER8 =T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% No. of Ballast 2 or 3 ER8 /PLUS= T8 Electronic Program Start. High Ballast Factor >1.15. Total Harmonic Distortion < 10% No. of Ballast 2 or 3 DIM=Consult Factory ⁽⁷⁾	Options MP=Modular Power Receptacle (Used for all Cord or Cord and Plug options) ^{(1), (10)} NUA=No upright apertures in housing. (Cannot be combined w/UPL) UPL=Uplight Apertures MWS=Modular Wiring System ⁽⁹⁾ MS=360° or 180° Motion Sensor, 120 through 347, or 480V ⁽⁴⁾ G2=Gasketed Door (Requires Selection of Lensed Doorframe) SDF=Slotted Doorframe (Requires Selection of Lensed Doorframe)	Packaging U=Unit Pack PALC=Palletized In Carton PAL=Job Pack Out of Carton
No. of Lamps 6=6 Lamps	Options Lamps Installed L8830=T8 Lamp, 85CRI 3000K L8835=T8 Lamp, 85CRI 3500K L8841=T8 Lamp, 85CRI 4100K L8850=T8 Lamp, 85CRI 5000K HL=Add HL at end of lamp for high lumen lamps, T8 only GL=Single Element Fuse GM=Double Element Fuse EL=Emergency Installed ⁽²⁾		Accessories (order separately) HB-SPM=Single Monopoint Hanger w/Hub RH-1=Retrofit Hanger FH-1=Fixture Hook FL-1=Fixture Loop Y-TOGGLE-=Y Mounting Toggle, #2 Cable ⁽⁸⁾ (Specify 10' or 30', requires 2 per fixture) HBAYC-CHAIN/SET/U=(2) V-Hook Hangers, 36" Chain Sets w/S-Hooks MC3=3' Modular Power Cord MPC3=3' Modular Power Cord & Plug (Specify Voltage) MC6=6' Modular Power Cord MPC6=6' Modular Power Cord & Plug (Specify Voltage) MMS=360° or 180° Aisle Motion Sensor with Modular Power Receptacle (120-277V) ⁽¹¹⁾ MDS6=6' Modular Power Cord with MWS 27DS18/2G06MP Connector ⁽¹⁰⁾ SWG=Heavy Duty Wireguard for Field Installation	
Lamp Type 32=32W T8 Lamps (48")				
Distribution N=Narrow Beam (Standard) M=Medium Beam W=Wide Beam				
Shielding Blank=None A=Prismatic Acrylic Lens & Doorframe WG=Wireguard & Doorframe A/WG=Acrylic Lens, Wireguard & Doorframe CL=Clear Acrylic Lens & Doorframe CL/WG=Clear Lens, Wireguard & Doorframe				

NOTES: ⁽¹⁾Requires use of MC_ or MPC_cord accessories, specify voltage for plugs. ⁽²⁾Voltage must be specified when ordered with plugs or emergency ballasts. ⁽³⁾ER8 and EB8 ballast systems suitable for operation in ambient environments up to 122°F (50°C) in open upright configuration. ⁽⁴⁾When ordering MS option, specify UNV (for 120 or 277V), 347 or 480V. ⁽⁵⁾2/3 lamp ballast configurations in EB8/PLUS only for T8 UNC versions. ⁽⁶⁾Can be used in high abuse applications such as gymnasiums. ⁽⁷⁾Dimming ballast must be specified at time of order. ⁽⁸⁾Two required. ⁽⁹⁾Cannot be combined with Modular Power Receptacle (MP). ⁽¹⁰⁾For MWS with MP, choose MP in fixture logic and then choose MWS accessory such as MDS6.

SHIPPING DATA

Catalog No.	Wt.
HBI-632-UPL	16 lbs.



Quick Ship Ordering Information Sample Number: HBI632-MP-UPL-L5

Quick Ship orders ship in 5 days in order quantities not to exceed 200 pieces.

Includes V Hangers for rapid installation⁽⁶⁾

NOTE: Orders received after noon are entered on the following day.

Family HBI	Distribution Blank=Narrow Beam W=Wide Beam	Ballast Type Blank=(2) 120/277V 4L and 2L High Ballast Factor > 1.15 T8 Instant Start Electronic PS=(2) 120/277V 4L and 2L High Ballast Factor > 1.15 T8 Electronic Program Rapid Start ⁽⁹⁾	Power Receptacle Blank=Standard Wiring to Access Plate MP=Modular Power Receptacle ⁽¹⁰⁾	Uplight Blank=No Uplight UPL=Uplight
Lamp Qty 6=6 Lamps				Lamping Blank=No Lamps L4=Lamps Installed 85+CRI 4100K ⁽¹¹⁾ L5=Lamps Installed 85+CRI 5000K L5HL=Lamps Installed 85+CRI 5000K, High Lumen
Lamp Type 32=32W T8 Lamps (48")				

NOTES: ⁽⁹⁾Recommended when utilizing Motion Sensor option. ⁽¹⁰⁾Requires use of Modular cord and plug accessories. ⁽¹¹⁾High lumen (3100 initial) lamps supplied for 4100K.

COOPER LIGHTING - METALUX®

DESCRIPTION

The HBI series is an outstanding solution for high mounting height industrial or retail applications. The HBI optic has been optimized to provide maximum performance from T5 lamps. Optional uplight component is provided to enable excellent ceiling uniformity. HBI's high lumen package allows the benefits of fluorescent to be applied at high mounting heights that were traditionally exclusive to HID. The primary benefits include exceptional color rendering, high system efficacy, 95% lumen maintenance, long lamp life, instant on/instant re-strike, economical dimming, and uniform brightness control. Primary applications include retail, shopping malls, light industrial, gymnasiums and recreational environments.

SPECIFICATION FEATURES

Construction

Full bodied steel housing with integral ballast channel adds strength, rigidity and structural protection for optical assembly.

Electrical

The HBI comes standard with a high ambient Class P electronic ballast and twistlock lampholders. UL/cUL listed for high ambient environments up to 65°C (149°F) for all lamps and ballast combinations when used in open upright configurations. Suitable for damp locations. Optional modular power receptacle meets UL2459 and NEC 410.73 and is UL/cUL rated for make and break under load from outside the luminaire to speed maintenance.

Finish

White enamel finish preceded by a multistage cleaning cycle, iron phosphate coating with rust inhibitor to protect against contaminants and oxidation.

Downlight/Uplight Optics

Die-formed, segmented optical design optimizes performance across three distributions. Optical choices include a narrow distribution for aisles, medium distribution for assembly and loading areas, or wide distribution for general, open area lighting. An uplight option is offered to permit ceiling uniformity and allow for ample lamp and luminaire heat dissipation. Gasketed door frame & lens assembly is optional for more demanding environments.

Options

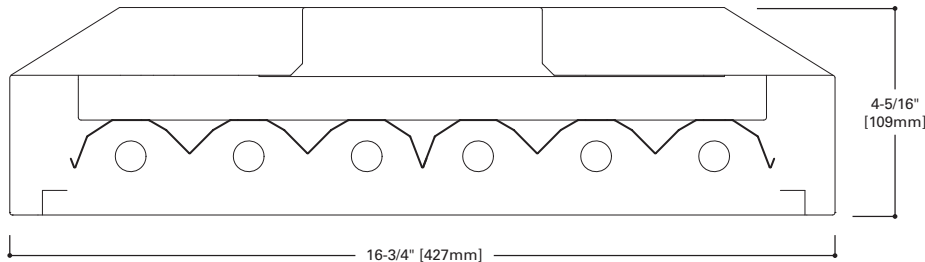
Integral Occupancy Sensor available and provides from 600 sq. ft. (MS) up to 1250 sq. ft. (MSO) of coverage at a maximum mounting height of 40' using interchangeable lens caps provided.

Mounting

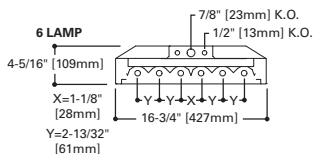
The HBI series is suited for suspension mounting with optional wire hook and chain set or cable mounting. Single monopoint mounting is available with SPM Tong Hanger. Includes V Hangers for rapid installation.

Warranty

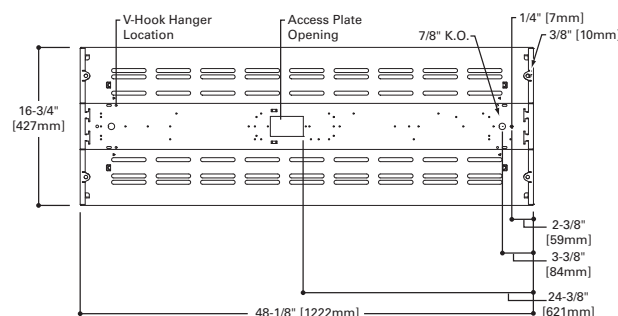
When operated in high ambient conditions, the HBI is supported by a 5 yr/55°C and 3 yr/65°C ballast warranty when used with a high ambient ballast in open, upright configurations (T5HO lamping only).



LAMP CONFIGURATIONS



DIMENSION TOP VIEW



HBI SERIES

6 T5HO LAMPS

High-Bay Industrial
Fluorescent Luminaire



ENERGY DATA

Input Watts:

ER Ballast

628 = 189W

654 = 351W

Luminaire Efficacy Rating

LER = FL-78 (Narrow Beam)

Catalog Number: HBI-654T5-N-UPL

Yearly Cost of 1000 lumens,

3000 hrs. at .08 KWH = \$3.07

* Reference the lamp/ballast data in the

Technical Section for specific

lamp/ballast

requirements

** Consult Pre Sales Technical

Support.

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

**Consult Pre Sales Technical Support.

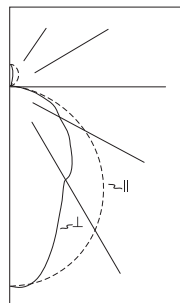
LAMPS CONTAIN MERCURY. DISPOSE ACCORDING
TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT

Safe and convenient means of
disconnecting power.



PHOTOMETRICS



HBI-654T5-N-UNV-EHT2-UPL

(2) Electronic Ballasts
(6) F54T5 54W Lamps
3500 lumens
Spacing criterion:
(H) 1.2 x mounting
height, (L) 0.9 x
mounting height
Efficiency 93.3%
Test Report:
HBI654T5-UPL-IES
LER =FL-78
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH =\$3.07

Candela

Angle	Along H	45°	Across L
0	10966	10966	10966
5	10911	10991	10971
10	10772	10668	10272
15	10522	9899	9049
20	10184	8864	7762
25	9744	7757	6758
30	9218	6744	5989
35	8601	5860	5790
40	7923	5216	5278
45	7185	4862	4668
50	6381	4278	4184
55	5515	3633	3497
60	4592	3093	3034
65	3633	2415	2693
70	2665	1995	2053
75	1730	1480	1418
80	878	828	725
85	223	274	105
90	10	15	12

Coefficients of Utilization

		Effective floor cavity reflectance								20%												
rc	RCR	80%				70%				50%				30%				10%				0%
		70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0		
0		110	110	110	110	107	107	107	107	101	101	101	96	96	96	91	91	91	89			
1		101	97	93	90	98	94	91	88	90	87	84	85	83	81	81	80	78	76			
2		92	85	79	74	90	83	77	73	79	74	70	75	72	68	72	69	66	64			
3		85	75	68	62	82	73	67	61	70	64	60	67	62	58	64	60	57	54			
4		78	67	59	53	75	65	58	53	63	56	51	60	55	50	58	53	49	47			
5		72	60	52	46	69	59	51	46	56	50	45	54	49	44	52	47	43	41			
6		66	54	46	41	64	53	46	40	51	45	40	49	43	39	48	42	38	36			
7		62	50	42	36	60	49	41	36	47	40	35	45	39	35	44	38	34	32			
8		58	45	38	33	56	45	37	32	43	37	32	42	36	31	40	35	31	29			
9		54	42	34	29	52	41	34	29	40	33	29	39	33	29	37	32	28	27			
10		51	39	32	27	49	38	31	27	37	31	26	36	30	26	35	30	26	24			

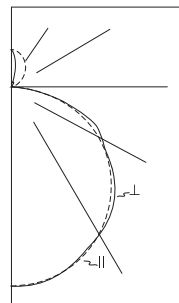
Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	7518	28.5	30.5
0-40	11618	44.0	47.1
0-60	19142	72.5	77.7
0-90	23554	89.2	95.6
0-180	24650	93.3	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	23633	15992	15354
55	22363	14732	14180
65	19994	13291	14821
75	15546	13300	12743
85	5951	7312	2802

PHOTOMETRICS



HBI-654T5-W-UNV-EHT2-UPL

(2) Electronic Ballasts
(6) F54T5 54W Lamps
4400 lumens
Spacing criterion:
(H) 1.3 x mounting
height, (L) 1.3 x
mounting height
Efficiency 92.6%
Test Report:
HBI654-W-UPL-IES
LER =FL-78
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH =\$3.09

Candela

Angle	Along H	45°	Across L
0	7332	7332	7332
5	7301	7321	7337
10	7231	7258	7265
15	7096	7125	7111
20	6913	6918	6872
25	6671	6634	6601
30	6377	6302	6377
35	6033	5963	6148
40	5651	5632	5832
45	5230	5278	5420
50	4776	4845	4929
55	4282	4331	4338
60	3747	3754	3898
65	3159	3113	3517
70	2512	2647	2750
75	1820	2005	1927
80	1079	1174	1029
85	346	400	183
90	14	40	36

Coefficients of Utilization

		Effective floor cavity reflectance								20%															
rc		80%				70%				50%				30%				10%				0%			
rw		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0			
RCR																									
0		109	109	109	109	106	106	106	106	100	100	100	95	95	95	90	90	90	87						
1		99	94	90	87	96	92	88	85	87	84	81	82	80	78	78	76	74	72						
2		90	82	75	70	87	80	74	68	75	70	66	72	67	64	68	65	62	59						
3		81	71	64	57	79	69	62	56	66	60	55	63	57	53	60	55	52	49						
4		74	63	54	48	72	61	53	47	58	52	46	55	50	45	53	48	44	42						
5		68	56	47	41	66	55	47	41	52	45	40	50	44	39	47	42	38	36						
6		63	50	42	36	61	49	41	35	47	40	35	45	39	34	43	37	33	31						
7		58	45	37	31	56	44	37	31	42	35	30	41	34	30	39	33	29	27						
8		54	41	33	28	52	40	33	28	39	32	27	37	31	27	36	30	26	24						
9		50	38	30	25	49	37	30	25	36	29	24	34	28	24	33	27	23	22						
10		47	35	27	22	46	34	27	22	33	26	22	32	26	22	31	25	21	20						

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	5773	21.9	23.6
0-40	9557	36.2	39.1
0-60	17462	66.1	71.4
0-90	23082	87.4	94.4
0-180	24447	92.6	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	14044	14173	14555
55	14176	14338	14361
65	14193	13987	15802
75	13352	14710	14137
85	7538	8715	3987

Modular F-Bay Power Supply Option

Cooper Lighting's F-Bay Modular Power Supply option is available for use with all F-Bay products. The modular power supply allows external fixture access for safe and easy servicing. There is no need to remove lamps or reflectors to disconnect fixture power with F-Bay Modular Power Supply. Access to the individual fixture's power supply allows servicing without turning off all the fixtures, disrupting occupants. F-Bay Modular Power Supply is a time-saver in installation – **simply plug & power.**



1. Modular Power Supply Receptacle supplied mounted into fixture Access Plate
2. Modular Power Cord & Plugs in 120, 277, 347, & 480V configurations for easy plug & power into existing supply

No internal fixture access required for installation or disconnecting power

Modular Motion Sensor Option supplied with Mounting Box and Modular Power Supply Receptacle

Code Compliance

- UL/cUL Certified for Make/Break under load (UL2549)
- Meets NEC requirements for ballast disconnect (NEC 410.73G)
- Allows for addition of Occupancy Sensor without hard connections
- Receptacles complete with insulating/dust cap

ORDERING INFORMATION

SAMPLE NUMBER: HBI-654T5-A-UNV-EHT2-MP-UPL-U

Includes V Hangers for rapid installation⁽⁶⁾

Series HBI=HB Industrial	Voltage ⁽²⁾ UNV=Universal 120/277 Voltage UNC=Universal 347/480 Voltage ⁽⁴⁾ 120V=120 Volt 277V=277 Volt 347V=347 Volt 480V=480 Volt	Ballast Type EHT=T5HO Linear Electronic Program Start High Ambient ^{(4) (5) (6)} Total Harmonic Distortion < 10% No. of Ballast 2 or 3 EBT=T5 Linear Electronic Program Start (28T5 only) Total Harmonic Distortion < 10% No. of Ballast 2 or 3 DIM=Consult Factory ⁽⁷⁾	Options MP=Modular Power Receptacle (Used for all Cord or Cord and Plug options) ^{(1) (11)} NUA=No upright apertures in housing. (Cannot be combined w/UPL) UPL=Uplight Apertures MWS=Modular Wiring System ⁽¹⁰⁾ MS=360° or 180° Motion Sensor, 120 through 347, or 480V ⁽³⁾ G2=Gasketed Door (Requires Selection of Lensed Doorframe) SDF=Slotted Doorframe (Requires Selection of Lensed Doorframe)	Packaging U=Unit Pack PALC=Palletize d In Carton PAL=Job Pack Out of Carton
No. of Lamps 6=6 Lamps	Options Lamps Installed L5830=T5 Lamp, 85CRI 3000K L5835=T5 Lamp, 85CRI 3500K L5841=T5 Lamp, 85CRI 4100K L5850=T5 Lamp, 85CRI 5000K GL=Single Element Fuse GM=Double Element Fuse EL=Emergency Installed ⁽²⁾			
Lamp Type 28T5=28W T5 Lamps (48") 49T5=49W T5HO Lamps (48") ⁽⁸⁾ 51T5=51W T5HO Lamps (48") ⁽⁸⁾ 54T5=54W T5HO Lamps (48") ⁽⁸⁾				
Distribution N=Narrow Beam (Standard) M=Medium Beam W=Wide Beam				
Shielding Blank=None A=Prismatic Acrylic Lens & Doorframe WG=Wireguard & Doorframe A/WG=Acrylic Lens, Wireguard & Doorframe CL=Clear Acrylic Lens & Doorframe CL/WG=Clear Lens, Wireguard & Doorframe				

NOTES: ⁽¹⁾Requires use of MC_ or MPC_cord accessories, specify voltage for plugs. ⁽²⁾Voltage must be specified when ordered with plugs or emergency ballasts. ⁽³⁾When ordering MS option, specify voltage as UNV (for 120 or 277V), 347 or 480V. ⁽⁴⁾2 lamp ballast configurations only for T5 UNC versions. ⁽⁵⁾EHT/HT5/HCT5 ballast systems suitable for ambient environments not to exceed 149°F (65°C) in open upright configurations and less lens option. ⁽⁶⁾Can be used in high abuse applications such as gymnasiums. ⁽⁷⁾Dimming ballast must be specified at time of order. ⁽⁸⁾EHT standard with T5HO lamps. ⁽⁹⁾Two required. ⁽¹⁰⁾Cannot be combined with Modular Power Receptacle (MP). ⁽¹¹⁾For MWS with MP, choose MP in fixture logic and then choose MWS accessory such as MDS6.

Accessories (order separately)
HB-SPM=Single Monopoint Hanger w/Hub
RH-1=Retrofit Hanger
FH-1=Fixture Hook
FL-1=Fixture Loop
Y-TOGGLE-=Y Mounting Toggle, #2 Cable⁽⁹⁾
(Specify 10' or 30', requires 2 per fixture)
HBAYC-CHAIN/SET/U=(2) V-Hook Hangers,
36" Chain Sets w/S-Hooks
MC3=3' Modular Power Cord
MPC3=3' Modular Power Cord & Plug
(Specify Voltage)
MC6=6' Modular Power Cord
MPC6=6' Modular Power Cord & Plug
(Specify Voltage)
MMS=360° or 180° Aisle Motion Sensor with
Modular Power Receptacle (120-277V)⁽¹⁾
MDS6=6' Modular Power Cord with MWS
27DS18/2G06MP Connector⁽¹¹⁾
SWG=Heavy Duty Wireguard for Field
Installation



Quick Ship Ordering Information

Sample Number: HBI654HCT5-MP-UPL-L5

Includes V Hangers for rapid installation⁽⁶⁾

Quick Ship orders ship in 5 days in order quantities not to exceed 200 pieces.

NOTE: Orders received after noon are entered on the following day.

Family HBI	Distribution Blank=Narrow Beam W=Wide Beam	Power Receptacle Blank=Standard Wiring to Access Plate MP=Modular Power Receptacle ⁽¹⁰⁾	Lamping Blank=No Lamps L4=Lamps Installed 85+CRI 4100K ⁽¹¹⁾ L5=Lamps Installed 85+CRI 5000K ⁽¹¹⁾ L5ES=Energy Saving Lamps Installed 85+CRI 5000K
No. of Lamps 6=6 Lamps	Ballast Type T5HO Systems HT5=(1) or (2) 120/277V T5 High Ambient Electronic Program Rapid Start ⁽⁶⁾	Uplight Blank=No Uplight UPL=Uplight	
Lamp Type 51=51WT5HO Lamps (48") 54=54WT5HO Lamps (48")			

NOTES: ⁽¹⁰⁾Requires use of Modular cord and plug accessories. ⁽¹¹⁾For Quick Ship, lamping option only available w/54W lamp type.

SHIPPING DATA

HBI-654T5-UPL 16 lbs.

Marley MHF Closed-Circuit Fluid Cooler Pressure Drop

[illegible]



Wall-mounted drive

ACS800-U1, 1 to 200 Hp

Compact and complete drive

The ACS800-U1 offers all that you need in a single, extremely small, wall-mounted package making it a compact and complete drive. The standard degree of protection is UL Type 1. Optional UL Type 12 allows full performance without derating. Power ratings start from 1 Hp heavy-duty rating and go up to 200 Hp continuous load rating. There are five different mechanical frame sizes covering the power range. Each frame size is optimized for performance, size and weight.

Everything inside

From the smallest to the largest ACS800-U1 there is an extensive range of built in features and options. Standard features include an AC Line Choke for harmonic filtering and drive protection, extensive and flexible I/O, user-friendly control panel with Start-up Assistant feature and a silent, long lifetime cooling fan. Brake chopper is included as standard in the two smallest frame sizes R2 and R3 as well as in the 690V R4 frame. In other frames the chopper is a built in option. Other built in options include EMC filters and extension modules for additional I/O, fieldbus and pulse encoder interface modules.

Main standard hardware features

- Wall mounting
- UL Type 1 protection class
- Compact design
- Harmonic filtering AC choke inside
- Input rectifier protection
- Brake chopper (in frame sizes R2-R3; R4 only 690 V)
- Long lifetime cooling fan and capacitors
- Extensive, programmable I/O with galvanically isolated inputs
- Three I/O and fieldbus extension slots inside
- Alphanumeric, multilingual control panel with start-up assistant feature
- Large power terminals allowing use of a wide range of cable sizes

Options for ACS800-U1

Built in options:

- UL Type 12 protection class
- Brake chopper (in frame sizes R4-R6)
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Analog and digital I/O extension modules
- Fieldbus modules (Communication)
- Pulse encoder interface module
- Resolver interface (Limited SW Support)

External options:

- Brake resistor
- Output du/dt filters



NEMA 12 Enclosure

Ratings and dimensions

ACS800-U1

ACS800 - U1 - XXXX -

2
5
7

 + XXXX

Type code	Frame size	Input	I _{max}	Normal Duty		Heavy-duty use		Noise Level	Air flow	Heat dissipation
				I _{2N}	P _N	I _{2HD}	P _{HD}			
		A	A	A	Hp	A	Hp	dBA	ft³/min	BTU/hr
3-phase supply voltage 208, 220, 230, 240. The power ratings are valid at nominal voltage, 240Vac (50 & 60Hz)										
ACS800-U1-0002-2	R2	5.2	8.2	6.6	1.5	4.6	1	62	21	350
ACS800-U1-0003-2	R2	6.5	10.8	8.1	2	6.6	1.5	62	21	350
ACS800-U1-0004-2	R2	9.2	13.8	11	3	7.5	2	62	21	410
ACS800-U1-0006-2	R3	18	24	21	5	13	3	62	41	550
ACS800-U1-0009-2	R3	24	32	27	7.5	17	5	62	41	680
ACS800-U1-0011-2	R3	31	46	34	10	25	7.5	62	41	850
ACS800-U1-0016-2	R4	38	62	42	15	31	10	62	61	1150
ACS800-U1-0020-2	R4	49	72	54	20 ⁽¹⁾	42	15 ⁽²⁾	62	61	1490
ACS800-U1-0025-2	R5	64	86	69	25	54	20 ⁽²⁾	65	99	1790
ACS800-U1-0030-2	R5	75	112	80	30	68	25 ⁽²⁾	65	99	2090
ACS800-U1-0040-2	R5	102	138	104	40 ⁽¹⁾	80	30 ⁽²⁾	65	99	2770
ACS800-U1-0050-2	R6	126	164	132	50	104	40	65	238	3370
ACS800-U1-0060-2	R6	153	202	157	60	130	50 ⁽²⁾	65	238	4050
ACS800-U1-0070-2	R6	190	282	192	75	154	60 ⁽²⁾	65	238	4910
3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz										
ACS800-U1-0004-5	R2	4.1	6.5	4.9	3	3.4	2	62	21	410
ACS800-U1-0005-5	R2	5.4	8.2	6.2	3	4.2	2	62	21	480
ACS800-U1-0006-5	R2	6.9	10.8	8.1	5	5.6	3	62	21	550
ACS800-U1-0009-5	R2	9.8	13.8	11	7.5	8.1	5	62	21	690
ACS800-U1-0011-5	R2	13	17.6	14	10	11	7.5	62	21	860
ACS800-U1-0016-5	R3	18	24	21	15	15	10	62	41	1150
ACS800-U1-0020-5	R3	24	32	27	20	21	15	62	41	1490
ACS800-U1-0025-5	R3	31	46	34	25	27	20	62	41	1790
ACS800-U1-0030-5	R4	40	62	42	30	34	25	62	61	2090
ACS800-U1-0040-5	R4	52	72	52	40	37	30 ⁽³⁾	62	61	2770
ACS800-U1-0050-5	R5	63	86	65	50	52	40	65	99	3370
ACS800-U1-0060-5	R5	77	112	79	60	65	50	65	99	4050
ACS800-U1-0070-5	R5	94	138	96	75	77	60	65	99	4910
ACS800-U1-0100-5	R6	121	164	124	100	96	75	65	238	6610
ACS800-U1-0120-5	R6	155	202	157	125	124	100	65	238	7890
ACS800-U1-0140-5	R6	179	282	180	150	156	125	65	238	9600
ACS800-U1-0205-5	R6	252	326	254	200	215	150	65	238	13670
3-phase supply voltage 525, 550, 575, 600, 690. The power ratings are valid at nominal voltage, 575Vac 60Hz										
ACS800-U1-0011-7	R4	10	14	11.5	10	8.5	5	62	61	1050
ACS800-U1-0016-7	R4	13	19	15	10	11	10	62	61	1200
ACS800-U1-0020-7	R4	19	28	20	15	15	10	62	61	1550
ACS800-U1-0025-7	R4	21	38	23	20	19	15	62	61	1850
ACS800-U1-0030-7	R4	29	44	30	25	22	20	62	61	2100
ACS800-U1-0040-7	R4	32	54	34	30	27	25	62	61	2400
ACS800-U1-0050-7	R5	45	68	46	40	34	30	65	99	2900
ACS800-U1-0060-7	R5	51	84	52	50	42	40	65	99	3450
ACS800-U1-0070-7	R6	70	104	73	60	54	50	65	238	4200
ACS800-U1-0100-7	R6	82	124	86	75	62	60	65	238	5650
ACS800-U1-0120-7	R6	103	172	108	100	86	75	65	238	6700
ACS800-U1-0145-7	R6	121	245	125	125	99	100	65	238	9084
ACS800-U1-0175-7	R6	150	245	155	150	131	125	65	238	11851
ACS800-U1-0205-7	R6	192	245	192	200	147	150	65	238	14275

NOTES:

- ⁽¹⁾ Overload may be limited to 5% at higher motor speeds (speed >90% motor base speed) by the internal power limit of the drive
⁽²⁾ Overload may be limited to 40% at higher motor speeds (speed >90% motor base speed) by the internal power limit of the drive
⁽³⁾ Rating not applicable for all motors. Available for some 4-pole 460V high efficiency NEMA motors.

I_{max} current available for 10 seconds at start.
I_{2N} continuous base current at 40°C (104°F). Overload cycle 110%
I_{2N} for 1 minute / 5 minutes allowed.
I_{2HD} continuous base current at 40°C (104°F). Overload cycle 150%
I_{2HD} for 1 minute / 5 minutes allowed.

- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
- All ACS800-U1 models come with a US conduit box (conduit plate in NEMA 12) as standard.

Enclosure

Degree of Protection:
UL Type 1 (Standard)
UL Type 12 (Optional)
Paint color:
NCS 1502-Y (RAL 90021/PMS 420C)

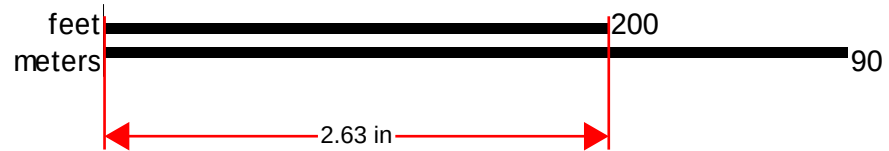
Frame size	UL Type 1					UL Type 12				
	H1 (in)	H2 (in)	W1 (in)	Depth (in)	Weight (lbs)	H1 (in)	W1 (in)	Depth (in)	Weight (lbs)	
R2	15.9	14.6	6.5	8.9	20	20.8	10.4	9.5	34	
R3	18.5	16.5	6.8	10.4	31	20.8	10.4	10.7	41	
R4	23.9	19.3	9.4	10.8	57	30.5	14.8	10.9	73	
R5	29.1	23.7	10.4	11.3	75	30.5	14.8	12.1	112	
R6	34.6	27.6	11.8	15.7	148	36.3	16.5	16.5	170	

H1 = Height with cable connection box
W1 = Width of the standard unit

H2=Height without cable connection box



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Case No(s). 14-1236-EL-EEC

Summary: Application - Momentive Perf Mat Quartz and Ohio Power Company for approval of a special arrangement agreement with a mercantile customer electronically filed by Mr. Yazen Alami on behalf of Ohio Power Company