



Legal Department

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Columbus, OH 43215-2373  
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September 5, 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  
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Re: **In the Matter of the Application of** )  
**American Fine Sinter Co., LTD.** )  
**and Ohio Power Company** ) **Case No. 14-1492-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 American Fine Sinter Co., LTD. 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.:** 14-1492-EL-EEC

Mercantile Customer: AMERICAN FINE SINTER COMPANY

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](mailto:ee-pdr@puc.state.oh.us).

## Section 1: Company Information

Name: AMERICAN FINE SINTER COMPANY

Principal address: 957 N County Rd 11, Tiffin, Oh 44883

Address of facility for which this energy efficiency program applies: 957 Maule Rd, Tiffin, Oh 44883

Name and telephone number for responses to questions:

Jeff Woolley, American Fine Sinter Company, (419) 443-8880

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

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

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

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

## Section 2: Application Information

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

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

B) Our electric utility is: Ohio Power Company

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

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

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

### Section 3: Energy Efficiency Programs

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

- ☐ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).
- ☐ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s):
- ☒ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s): 6/1/2013
- ☐ Behavioral or operational improvement.

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

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

Annual savings: kWh

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

Annual savings: kWh

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

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

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

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

Annual savings: 49,988 kWh

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

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

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

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

## Section 4: Demand Reduction/Demand Response Programs

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

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

➤ Choose one or more of the following that applies:

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

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

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

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

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

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

9.2 kW

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

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

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

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

A) The customer is applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

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

OR

☐ Commitment payment

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

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

☒ A cash rebate of \$ 2,940.60. (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: 5.02 (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 \$ 16,266.25

The utility's program costs were \$ 299.93

The utility's incentive costs/rebate costs were \$ 2,940.60.

## 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.: 14-1492-EL-EEC

State of Ohio :

Rizwan Syed, 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.

Rizwan Syed Energy Efficiency Engineer  
Signature of Affiant & Title

Sworn and subscribed before me this 26<sup>th</sup> day of August, 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



### 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	AMERICAN FINE SINTER COMPANY	
Project Number	AEP-14-13409	
Customer Premise Address	957 MAULE RD, TIFFIN, OH 44883	
Customer Mailing Address	957 N County Rd 11, Tiffin, OH 44883	
Date Received	6/3/2014	
Project Installation Date	6/1/2013	
Annual kWh Reduction	49,988	
Total Project Cost	\$8,256.70	
Unadjusted Energy Efficiency Credit (EEC) Calculation	\$3,920.80	
Simple Payback (yrs)	4.7	
Utility Cost Test (UCT) for EEC	5.02	
Utility Cost Test (UCT) for Exemption	0.09	
<i>Please Choose One Option Below and Initial</i>		
Self Direct EEC: 75%	\$2,940.60	<input checked="" type="checkbox"/> Initial: <i>[Signature]</i>
EE/PDR Rider Exemption	12 Months (with possible extension up to N/A months after PUCO Approval)	<input type="checkbox"/> Initial: N/A

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

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

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

#### Project Overview:

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

New construction- installed interior lighting saves 5,302 total watts compared to ASHRAE 90.1-2007 standards  
Installed a new 30-hp VFD on new well water pump not required by ASHRAE 90.1-2007

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

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

Ohio Power Company

By: *[Signature]*

Title: Manager

Date: 8-14-2014

AMERICAN FINE SINTER COMPANY

By: *JEFF WOOLLEY*

Title: EHS Engineer

Date: 8/14/14

## 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](mailto:aepohioincentives@dnvkema.com)

Visit our website at [aepohio.com/solutions](http://aepohio.com/solutions).

## Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



## 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 Worksheets<sup>1</sup>

- ☐ 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 \_\_\_\_\_

<sup>1</sup>Incomplete 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](mailto:aepohioincentives@dnvkema.com)

Visit our website at [aepohio.com/solutions](http://aepohio.com/solutions).



## Self-Direct Program Application

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



## 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

ENERGY IS PRECIOUS. LET'S NOT WASTE IT.



## 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](http://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](http://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 Information<sup>1</sup>

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

<sup>1</sup>Solution 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](http://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 HBE series is an outstanding value for high mounting height industrial or retail applications. The HBE optic has been optimized to provide maximum performance from T5 lamps. Optional uplight component is provided to enable excellent ceiling uniformity. HBE'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 "big box" retail, shopping malls, light industrial, etc.

## SPECIFICATION FEATURES

### Construction

Full body construction is achieved with channel and end plates, along w/stiffening brackets and side rails to help create a strong, clean finished frame for this luminaire. Side rails are standard on all HBE products.

### Electrical

The HBE comes with a standard Class "P" electronic ballast and twist-lock lampholders. UL/cUL listed for high ambient environments up to 55°C (131°F) for all lamp and ballast combinations when used in open upright configurations. Suitable for damp locations.

### Finish

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

### 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.

### Shielding

Door frame and lens assembly is optional for more demanding environments.

### Options

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

Catalog #	Type
Project	
Comments	Date
Prepared by	

### Mounting

The HBE series is ideally suited for suspension mounting with optional wire hook and chain set, or cable mounting. Single monopoint mounting is also 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 ambient ballast in open, upright configurations (T5HO lamping only).

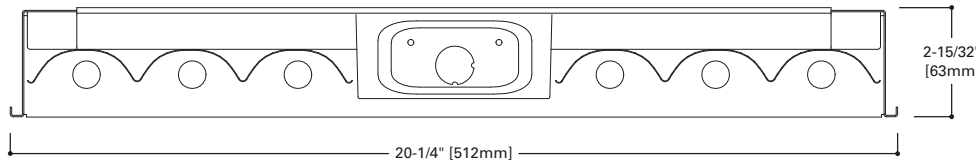


## HBE SERIES

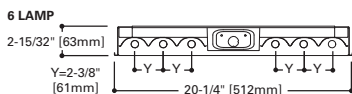
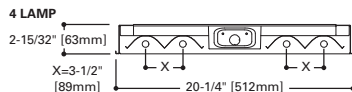
20" X 48"  
HIGH-BAY  
4 OR 6  
T5HO LAMPS

High-Bay Efficiency  
Fluorescent Luminaire

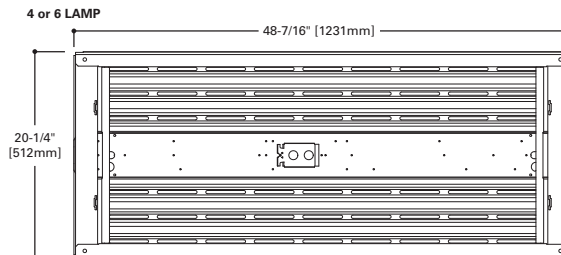
**APPROVED**



## LAMP CONFIGURATIONS



## DIMENSION TOP VIEW



## ENERGY DATA

Input Watts:  
**ER Ballast**  
454 (226), 654 (351)

Luminaire Efficacy Rating  
**LER = 74** (Narrow Beam)  
**Catalog Number:** HBE-654T5-UPL

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

\*\*Consult Pre Sales Technical Support.

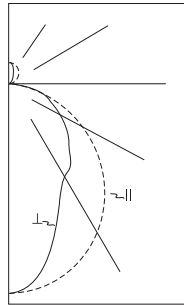
LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

## LINEAR DISCONNECT

Safe and convenient means of disconnecting power.



## PHOTOMETRICS



### HBE-654-UPL Electronic Ballasts (6) 54W T5 Lamps 4400 lumens

Spacing criterion:  
(II) 1.2 x mounting  
height, (L) 0.8 x  
mounting height  
Efficiency 94.5%  
Test Report:  
HBE654-UPL.IES  
LER = FL70

Yearly Cost of 1000  
lumens, 3000 hrs at  
.08 KWH = \$3.43

### Candela

Angle	Along II	45°	Across L
0	11367	11367	11367
5	11286	11162	11065
10	11121	10662	10221
15	10844	9831	8961
20	10473	8753	7677
25	9990	7633	6567
30	9422	6562	5918
35	8767	5678	5655
40	8038	5092	5129
45	7230	4728	4566
50	6367	4105	4116
55	5452	3518	3592
60	4503	3001	3093
65	3540	2471	2561
70	2544	1931	2204
75	1612	1537	1725
80	793	1021	925
85	205	293	182
90	3	17	19

### Coefficients of Utilization

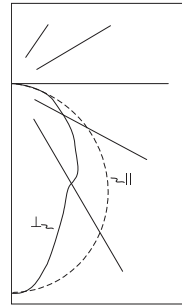
Effective floor cavity reflectance																			20%		
rc	80%				70%				50%				30%				10%				0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0			
RCR																					
0	111	111	111	111	108	108	108	108	102	102	102	96	96	96	91	91	91	89			
1	102	98	94	90	99	95	91	88	90	87	84	85	83	81	81	79	77	75			
2	93	86	79	74	90	83	78	73	80	74	70	75	71	68	71	68	65	63			
3	85	76	68	62	82	74	67	61	70	64	60	67	62	58	64	60	56	54			
4	78	67	59	53	76	66	58	53	63	56	51	60	54	50	57	53	49	47			
5	72	60	52	46	70	59	51	46	56	50	45	54	48	44	52	47	43	41			
6	67	55	47	41	65	54	46	40	51	45	40	49	43	39	47	42	38	36			
7	62	50	42	36	60	49	41	36	47	40	35	45	39	35	43	38	34	32			
8	58	46	38	33	56	45	38	32	43	37	32	42	36	31	40	35	31	29			
9	54	42	35	30	53	41	34	29	40	33	30	38	33	29	37	32	28	26			
10	51	39	32	27	50	38	31	27	37	31	26	36	30	27	35	29	26	24			

### Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	7486	28.4	30.0
0-40	11514	43.6	46.2
0-60	18847	71.4	75.6
0-90	23419	88.7	93.9
0-180	24939	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	17447	11409	11017
55	16218	10464	10685
65	14290	9975	10341
75	10629	10136	11370
85	4011	5737	3564



### HBE-654 Electronic Ballasts (6) 54W T5 Lamps 4400 lumens

Spacing criterion:  
(II) 1.2 x mounting  
height, (L) 0.8 x  
mounting height  
Efficiency 93.5%  
Test Report:  
HBE654.IES  
LER = FL70

Yearly Cost of 1000  
lumens, 3000 hrs at  
.08 KWH = \$3.43

### Candela

Angle	Along II	45°	Across L
0	11640	11640	11640
5	11533	11495	11417
10	11369	10923	10400
15	11097	9989	9133
20	10714	8912	8029
25	10232	7898	7049
30	9661	6970	6467
35	9002	6109	6247
40	8261	5587	5619
45	7456	5199	4935
50	6593	4510	4402
55	5676	3796	3748
60	4724	3206	3158
65	3729	2543	2656
70	2718	1989	2292
75	1736	1594	1740
80	878	1054	1036
85	225	366	274
90	2	12	3

### Coefficients of Utilization

		Effective floor cavity reflectance												20%								
rc		80%				70%				50%				30%				10%				0%
rw		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0			
RCR																						
0		113	113	113	113	109	109	109	109	104	104	104	100	100	100	95	95	95	94			
1		102	98	94	90	100	96	92	89	92	89	86	88	86	83	85	83	81	79			
2		93	86	79	74	91	84	78	73	81	76	72	77	73	70	75	71	68	66			
3		85	76	68	62	83	74	67	62	71	65	61	69	64	60	66	62	59	57			
4		78	67	59	53	76	66	59	53	64	57	52	62	56	51	60	55	51	49			
5		72	61	52	46	70	59	52	46	58	51	46	56	50	45	54	49	45	43			
6		67	55	47	41	64	54	46	41	52	45	40	51	45	40	49	44	40	38			
7		62	50	42	36	61	49	42	36	48	41	36	46	40	36	45	40	35	34			
8		58	46	38	33	57	45	38	33	44	37	32	43	37	32	42	36	32	30			
9		54	42	35	30	53	42	34	30	41	34	29	40	34	29	39	33	29	27			
10		51	39	32	27	50	39	32	27	38	31	27	37	31	27	36	31	27	25			

### Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	772	29.3	31.3
0-40	11999	45.4	48.6
0-60	19848	75.2	80.4
0-90	24683	93.5	100.0
0-180	24683	93.5	100.0

### Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	17991	12544	11909
55	16884	11292	11149
65	15053	10266	10723
75	11446	10506	11473
85	4396	7165	5355

## 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: HBE-654T5-N-A-UNV-L5850-EBT2-U Includes V Hangers for rapid installation<sup>(4)</sup>

<b>Series</b> HBE=High Bay Efficiency	<b>Voltage<sup>(1)</sup></b> UNV=Universal 120/277 Voltage UNC=Universal 347/480 Voltage 120V=120 Volt 277V=277 Volt 347V=347 Volt	<b>Ballast Type</b> EBT=T5HO Linear Electronic Program Start. Total Harmonic Distortion < 10% No. of Ballast 1, 2 or 3 EHT=T5HO Linear Electronic Program Start High Ambient. Total Harmonic Distortion < 10% No. of Ballast 1, 2 or 3	<b>Options</b> Blank=Side Rails (Standard) MP=Modular Power Receptacle (Used for all Cord or Cord and Plug options) <sup>(6), (7)</sup> UPL=Uplight Apertures on Reflector MWS=Modular Wiring System <sup>(6)</sup> MS=360° or 180° motion sensor installed, 120V through 347V, or 480V <sup>(2)</sup>	<b>Packaging</b> U=Unit Pack PALC=Job Pack In Carton PAL=Job Pack Out of Carton
<b>No. of Lamps</b> 4=4 Lamps 6=6 Lamps	<b>Lamp Type</b> 49T5=49WT5HO Lamps (48") 51T5=51WT5HO Lamps (48") 54T5=54WT5HO Lamps (48")	<b>Options</b> Lamps Installed L5830=T5 Lamp, 80CRI 3000K L5835=T5 Lamp, 80CRI 3500K L5841=T5 Lamp, 80CRI 4100K L5850=T5 Lamp, 80CRI 5000K GL=Single Element Fuse GM=Double Element Fuse EL=Emergency Installed <sup>(1)</sup>		
<b>Distribution</b> N=Narrow Beam (Standard) M=Medium Beam W=Wide Beam				
<b>Shielding</b> Blank=None A=Prismatic Acrylic Lens & Doorframe WG=Wireguard & Doorframe CL=Clear Acrylic Lens & Doorframe A/WG=Acrylic Lens, Wireguard & Doorframe CL/WG=Clear Lens, Wireguard & Doorframe				

NOTES: <sup>(1)</sup>Voltage must be specified when ordered with plugs, motion sensor or emergency ballasts. <sup>(2)</sup>When ordering MS option, specify as UNV (for 120 or 277V), 347 or 480V. <sup>(3)</sup>Requires use of MC, or MPC, cord accessories, specify voltage for plugs. <sup>(4)</sup>T8 ballast systems suitable for operation in ambient environments up to 131°F (55°C) in open upright configuration. <sup>(5)</sup>Can be used in high abuse applications such as gymnasiums. <sup>(6)</sup>Cannot be combined with Modular Power Receptacle (MP). <sup>(7)</sup>For MWS with MP, choose MP in fixture logic and then choose MWS accessory such as MDS6.

**Accessories** (order separately)  
HBL-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 (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)<sup>(2)</sup>  
MDS6=6' Modular Power Cord with MWS 27DS18/2G06MP Connector<sup>(7)</sup>  
WG/HBL6-4FT-B=4/6 Lamp Wireguard w/Clips

## SHIPPING DATA

Catalog No.	Wt.
HBE-654T5	18 lbs.



## Quick Ship Ordering Information Sample Number: HBE654T5-UPL-L5

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.

Includes V Hangers for rapid installation<sup>(4)</sup>

<b>Family</b> HBE	<b>Lamp Type</b> 51=51W T5HO Lamps (48") 54=54W T5HO Lamps (48")	<b>Ballast Type</b> T5HO Systems HT5=(1) or (2) 120/277V T5HO High Ambient Electronic Program Rapid Start	<b>Power Receptacle</b> Blank=Standard Wiring to Access Plate MP=Modular Power Receptacle <sup>(6)</sup>	<b>Lamping</b> Blank=No Lamps L4=Lamps Installed 80+CRI 4100K <sup>(7)</sup> L5=Lamps Installed 80+CRI 5000K <sup>(7)</sup> L5ES=Energy Savings Lamps Installed 80+CRI 5000K
<b>Lamp Qty</b> 4=4 Lamps 6=6 Lamps	<b>Distribution</b> Blank=Narrow Beam W=Wide Beam	<b>Uplight</b> Blank=No Uplight UPL=Uplight		

NOTES: <sup>(6)</sup>Requires use of Modular cord and plug accessories. <sup>(7)</sup>For Quick Ship, lamping option only available w/54W lamp type.



## Pump Specs

**Customer :** FINDLAY PLUMBING and HEATING  
16400 State Rt. 12 East  
Findlay, OH  
45840

PEERLESS OF OHIO, INC.

PO Box 592, Bowling Green, OH. 43402  
E-MAIL: peerless@bizwoh.rr.com  
Phone 1-419-353-6676  
Fax 1-419-353-7879 Fax

*Furnaf*

**Project :** Cold Well 400@180  
**Quote No. :** US-2306-648

**Page No :** 4

**Contact :** James W. McCarty  
**Phone :** 1-419-423-9300 **Fax :** 1-419-423-6610  
**Date :** Thursday, December 27, 2012

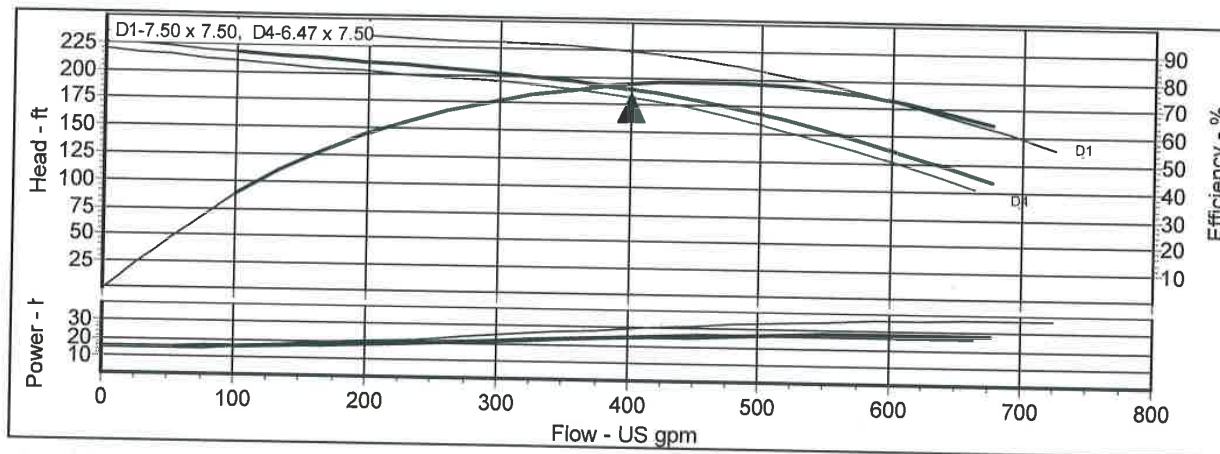
**Pump Model:** Peerless Vertical - M10LB 4 Stages  
**Nom. Speed:** 1770 RPM, 60 Hz Electric  
**Market :** Vertical Turbine Pump  
**Impeller No.:** 4605684 / HC  
**Material Spec. Group:** A - B: CIE; I: Brz = Standard  
**Item :** 400 GPM @ 180'  
**Your Ref. :**

**Fluid:** Water  
**Temperature:** 100 °F  
**Viscosity:** 0.689 cSt  
**Sp. Gravity:** 0.995 (base temp. 68 °F)

Stage No.	Trim Status	Imp. Dia. (inch) D2-in x D2-out
1 - 4	Trimmed P	6.68 x 7.50

**Flow rate Q:** 400 US gpm  
**Bowl Total Head:** 185 ft  
**Bowl Efficiency:** 77.6 %  
**Bowl Power Required:** 24.6 hp  
**NPSH Required:** 7 ft

Performance curve according to Hyd Inst-Peerless Std



### Comments

Refer to factory for all single point bowl performance guarantees. Pumps must be selected with Hydraulic Institute-Peerless Std. See Std Hydraulic Performance document in RAPID for testing tolerances & contractual guarantees.

Flow (US gpm)	Head (ft)	Efficiency (%)	Power Required (hp)	NPSH Required (ft)	Thrust (lb)
0.0	226.4	0.0	14.5		1316
84.5	219.7	30.4	15.3		1184
169.0	213.1	52.4	17.3		1086
253.5	206.7	66.2	19.9	4.3	960
337.9	198.4	74.3	22.7	5.7	823
422.4	185.7	78.2	25.2	7.7	700
506.9	166.6	78.2	27.1	10.7	590
591.4	140.6	73.8	28.3	15.5	468
675.9	108.6	64.4	28.6	21.9	333

Grundfos - RAPID v8.26.6 - 23rd March 2007.



Page No : 11

# ELECTRIC MOTOR DRIVER - Performance and Data Sheet



Manufacturer	USEM	Full Load speed	1755 rpm
Availability Type	Stock	Type of Motor Efficiency	standard
Motor Hp	30 hp	NEMA Motor Design / Class	B / F
Synchronous speed	1800 rpm	Insulation	
Weight	640 lbs	Model Number	HT30S2BLF
Motor Frame Number	286TP	Maximum Altitude	3300 ft
Voltages No 1 / No 2 / No 3 / No 4 (see below for Utilized Voltage)	460 / 230 / 0 / 0 V	Rotation (seen from above)	counter-clockwise
Full Load Amps at Voltage 1 / 2 / 3 / 4	37.2 / 90.8 / 0.0 / 0.0 A	Max Down Thrust 100% / 175% extra high thrust / 300% extra high thrust	3200 / 0 / 0 lbs
Motor built for Voltage	460 V	175% / 300% extra high thrust Selected (0=No, 1=Yes)	175%: 0 / 300%: 0
Motor Type (VHS = Vertical Hollow Shaft, VSS = Vertical Solid Shaft)	VHS	Reed Critical Frequency Line / BDStd / BD1 / BD2	70 / 87 / 87 / 87 Hz
Service Factor 1.15 utilized by Pump	Pump does NOT utilize Service Factor 1.15. Peak HP of pump is 0.954 x Name Plate HP of motor	Rotor Inertia	4.45 lb*ft^2
Type of Starting	Starting Method at Voltage 460V: Full Voltage (standard)	Ambient Temperature	40 °C
Efficiency at 100% / 75% / 50% Load	90.1% / 90.5% / 90.4%	Temperature Rise at Service Factor 1.00	80°C
Efficiency Reduction at 175% / 300% Thrust	0 / 0 %-point	Connection Type	Dual Voltage, PWS on Low Voltage
Power Factor 100% / 75% / 50% Load	84.9 / 82.2 / 74.9	Dimension Print Number	RTF
Base Diameters: Std BD / BD1 / BD2 (Utilized BD - see below)	16.5 / 12 / 10 inches	VHS Shaft: length CD / max diameter BX	CD=26.563 / BX= 1.251 inches
Line Shaft Diameter and utilized BD for connection with Discharge Head	Line Shaft Diameter= 1.00 inch, Motor Base Diameter BD=12 inch	VSS Shaft diameter U / alternative U	0 / 0 inches
Phase / Frequency	3 / 60Hz	VSS Shaft length AH	0 inches
Enclosure	TEFC	VSS dimensions	EU=0, EW=0, EX=0 inches
		VSS Shaft key dimensions	depth R=0, size S=0 inches
		Motor height AG	29.25 inches
		Center of Gravity at BD-Std / BD1 / BD2	11 / 11 / 11 inches
		Conduit box - dimensions	AC=7.5625, AF=4.4375, BV=14.4375 inches



# SIEMENS

VFD for pump motor

**Submittal Sheet**  
Document No. 154-042  
May 9, 2011

**APPROVED**



## SED2 Variable Frequency Drives

### Description

The SED2 variable frequency drives are designed specifically for HVAC applications. The SED2 supports a wide variety of digital and analog I/O for diverse control capability. Built-in PID features control pumps and fans, and an integral system protocol can interface P1/N2 networks. Using the SED2 multi-level parameter access, operators can quickly pinpoint relevant data.


### Features

- Built-in SBT P1 and JCI N2 (Metasys®) building automation system protocols for easy network integration
- LON Interface and Modbus Interface optional
- Low harmonics design reduces noises and interference eliminates need for filters/reactors in most installations
- Built-in PID for fast and accurate pressure control
- Pump staging for open loop, constant pressure, and constant flow-type applications
- Multi-level program access
- Belt failure detection with or without an external sensor
- Service mode for applications requiring continuous, uninterruptible operation
- Accepts a wide variety of digital and analog I/O types, including direct Ni 1000 RTD sensor level inputs
- One common interface throughout all power ranges
- Optional Advanced Operator Panel for uploading/downloading parameters
- Full form C relay contacts for digital outputs



### Frame Sizes

SED2 IP20 and NEMA Type 1 frame sizes and power ranges are as follows:

HP	1	1.5	2	3	4	5	7.5	10	15	20	25	30	40	50	60	75	100	125				
kW	.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90				
280V	A	B			C			D			E			F								
480V	A		B			C			D			E							F			
575V	C																					

SED2 IP54/NEMA Type 12 frame sizes and power ranges are as follows:

FED0244R1	HP	1.5	2	3	4	5	7.5	10	15	20	25	30	40	50	60	75	100	125
	kW	1.1	1.5	2.2	3	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90
	480V	B					C			D				E		F		
	575V	C								D				E		F		

## Product Numbers

<b>Your Product Number:</b>																	
<b>Example Product Number:</b>		S	E	D	2	-	0	.	7	5	/	2	2	X			
<b>Model</b>																	
SED2-		VFD only															
<b>kW rating</b>																	
0.75, 1.1, 1.5, 2.2,		(Uses 2 to 4 spaces plus a divider "/")															
3, 4, 5.5, 7.5, 11, 15,																	
18.5, 22, 30, 37, 45,																	
55, 75, 90 [See Note for these selections]																	
<b>Voltage</b>																	
2		200 to 240V															
3		380 to 480V															
4		500 to 600V															
<b>NEMA rating</b>																	
2		(IP 20)															
1		NEMA Type 1															
5		NEMA Type 12 (IP 54) [See Note]															
<b>Filter</b>																	
X		Factory Required Designator															
		*** leave blank ***															

### Note:

Available only with Voltage Codes 3 and 4.

### Example Shown:

SED2-0.75/22X

SED2 VFD only, 0.75 kW (1 hp), 200 to 240V, open type IP20.

## Typical Specifications

SED2 shall provide control of fan and pump HVAC applications. A wide range of I/O allows for simple control solutions, with integral P1 and N2 protocols embedded for full control capabilities.

## Technical Data

**Table 1. Drive Specifications.**

Drive Specifications	Description
Input voltage and power ranges (3-phase)	208V and 230V to 240V, 3 ac $\pm$ 10%. 1 hp to 60 hp (3.9 amps to 154 amps)
	380V to 480V, 3 ac $\pm$ 10% 1 hp to 125 hp (2.1 amps to 178 amps)
	500V to 600V, 3 ac $\pm$ 10% 1 hp to 125 hp (2.1 amps to 125 amps)
Input frequency	47 Hz to 63 Hz
Output frequency	0 Hz to 150 Hz
Power factor	$\geq$ 0.9
VFD degree of efficiency	96% to 97%
Switch-on current	Less than nominal input current
Auxiliary supply 24V	Galvanically separated, unregulated auxiliary supply (18V to 32V) 100 mA
Overload capacity	110% for 60 seconds
Control method	Linear, parabolic and programmable V/f; and flux current control low-power mode
PWM frequency	2k Hz to 16k Hz (adjustable in 2k Hz increments)
Fixed frequencies	15 programmable
Skip frequency bands	4 programmable
Setpoint resolution	0.01 Hz digital
	0.01 Hz serial
	10 bit analog
Digital inputs (sink/source)	6: fully programmable and scalable isolated digital inputs, switchable
Analog inputs	2: 0 to 10 Vdc, 0/4 to 20 mA, can also be configured as digital inputs or Ni 1000 input
Relay outputs	2: configurable 30 Vdc/5A (resistive), 250 Vac/2A (inductive)
Analog outputs	2: programmable (0/4 mA to 20 mA, or 0 Vdc to 10 Vdc)
Serial interface	RS-485 transmission rate: Up to 38.4k Baud Protocols: USS, P1 and N2
Protection level	IP20
	NEMA Type 1 with protective shield and gland plate installed
	IP54/NEMA Type 12
Temperature ranges	Operating: 14°F to 104°F (–10°C to 40°C) Storage: –40°F to 158°F (–40°C to 70°C)
Humidity	95% rh, non-condensing
Operational altitudes	Up to 3280 ft (1000m) above sea level without derating
Protection features	Under-voltage, Over-voltage, Overload, Ground fault, Short circuit, Stall prevention, Locked motor, Motor overtemperature I <sup>2</sup> t PTC, Over-temperature, Parameter PIN protection.
Standards	UL, cUL, CE, C-tick
CE conformity	Conformity with EC Low Voltage Directive 73/23/EEC

**NOTE:** SED2 Compliance with EN61000-3-12:  
From September 1st, 2005 all electrical apparatus covered by the EMC directive will have to comply with EN61000-3-12 "Limits for harmonic currents produced by equipment connected to public low voltage systems with input currents > 16A and  $\leq$  75 A per phase".

Siemens variable speed drives of the product range SED2 (Micromaster 436) fulfill the requirements of the EN 61000-3-12 (without the need for external line reactors) regarding the THD values of Table 3 under the pre condition of Rsce > 190. The required PWhd values will not be achieved. Due to this fact it is recommended to apply for connection approval at the local electricity board.

The local electricity board will evaluate among many other data the content of the 5th harmonic current and the Line Power Factor "Lambda", which is the ratio of active power and apparent power.

Siemens frequency inverters are optimized in design and operation characteristics regarding energy efficiency and less interference with line supplies.



Table 2. Output Ratings.

Voltage (±10%)	Product Number			Output Rating		Output Current Max (amps)	Frame Size
	IP20	NEMA Type 1	IP54/NEMA Type 12	HP	kW		
208V and 230V to 240V (3-Phase)	SED2-0.75/22X	SED2-0.75/21X	—	1.0	0.75	3.9	A
	SED2-1.1/22X	SED2-1.1/21X	—	1.5	1.1	5.5	B
	SED2-1.5/22X	SED2-1.5/21X	—	2.0	1.5	7.4	B
	SED2-2.2/22X	SED2-2.2/21X	—	3.0	2.2	10.4	B
	SED2-3/22X	SED2-3/21X	—	4.0	3.0	13.6	C
	SED2-4/22X	SED2-4/21X	—	5.0	4.0	17.5	C
	SED2-5.5/22X	SED2-5.5/21X	—	7.5	5.5	22.0	C
	SED2-7.5/22X	SED2-7.5/21X	—	10.0	7.5	28.0	C
	SED2-11/22X	SED2-11/21X	—	15.0	11.0	42.0	D
	SED2-15/22X	SED2-15/21X	—	20.0	15.0	54.0	D
	SED2-18.5/22X	SED2-18.5/21X	—	25.0	18.5	68.0	D
	SED2-22/22X	SED2-22/21X	—	30.0	22.0	80.0	E
	SED2-30/22X	SED2-30/21X	—	40.0	30.0	104.0	E
	SED2-37/22X	SED2-37/21X	—	50.0	37.0	130.0	F
	SED2-45/22X	SED2-45/21X	—	60.0	45.0	154.0	F
380V to 480V (3-Phase)	SED2-0.75/32X	SED2-0.75/31X	—	1.0	0.75	2.1	A
	SED2-1.1/32X	SED2-1.1/31X	SED2-1.1/35X	1.5	1.1	3.0	A *
	SED2-1.5/32X	SED2-1.5/31X	SED2-1.5/35X	2.0	1.5	4.0	A *
	SED2-2.2/32X	SED2-2.2/31X	SED2-2.2/35X	3.0	2.2	5.9	B
	SED2-3/32X	SED2-3/31X	SED2-3/35X	4.0	3.0	7.7	B
	SED2-4/32X	SED2-4/31X	SED2-4/35X	5.0	4.0	10.2	B
	SED2-5.5/32X	SED2-5.5/31X	SED2-5.5/35X	7.5	5.5	13.2	C
	SED2-7.5/32X	SED2-7.5/31X	SED2-7.5/35X	10.0	7.5	18.4	C
	SED2-11/32X	SED2-11/31X	SED2-11/35X	15.0	11.0	26.0	C
	SED2-15/32X	SED2-15/31X	SED2-15/35X	20.0	15.0	32.0	C
	SED2-18.5/32X	SED2-18.5/31X	SED2-18.5/35X	25.0	18.5	38.0	D
	SED2-22/32X	SED2-22/31X	SED2-22/35X	30.0	22.0	45.0	D
	SED2-30/32X	SED2-30/31X	SED2-30/35X	40.0	30.0	62.0	D
	SED2-37/32X	SED2-37/31X	SED2-37/35X	50.0	37.0	75.0	E
	SED2-45/32X	SED2-45/31X	SED2-45/35X	60.0	45.0	90.0	E
	SED2-55/32X	SED2-55/31X	SED2-55/35X	75.0	55.0	110.0	F
	SED2-75/32X	SED2-75/31X	SED2-75/35X	100.0	75.0	145.0	F
	SED2-90/32X	SED2-90/31X	SED2-90/35X	125.0	90.0	178.0	F
500V to 600V (3-Phase)	SED2-0.75/42X	SED2-0.75/41X	—	1.0	0.75	1.4	C
	SED2-1.1/42X	SED2-1.1/41X	SED2-1.1/45X	1.5	1.1	2.1	C
	SED2-1.5/42X	SED2-1.5/41X	SED2-1.5/45X	2.0	1.5	2.7	C
	SED2-2.2/42X	SED2-2.2/41X	SED2-2.2/45X	3.0	2.2	3.9	C
	SED2-3/42X	SED2-3/41X	SED2-3/45X	4.0	3.0	5.4	C
	SED2-4/42X	SED2-4/41X	SED2-4/45X	5.0	4.0	6.1	C
	SED2-5.5/42X	SED2-5.5/41X	SED2-5.5/45X	7.5	5.5	9.0	C
	SED2-7.5/42X	SED2-7.5/41X	SED2-7.5/45X	10.0	7.5	11.0	C
	SED2-11/42X	SED2-11/41X	SED2-11/45X	15.0	11.0	17.0	C
	SED2-15/42X	SED2-15/41X	SED2-15/45X	20.0	15.0	22.0	C
	SED2-18.5/42X	SED2-18.5/41X	SED2-18.5/45X	25.0	18.5	27.0	D
	SED2-22/42X	SED2-22/41X	SED2-22/45X	30.0	22.0	32.0	D
	SED2-30/42X	SED2-30/41X	SED2-30/45X	40.0	30.0	41.0	D
	SED2-37/42X	SED2-37/41X	SED2-37/45X	50.0	37.0	52.0	E
	SED2-45/42X	SED2-45/41X	SED2-45/45X	60.0	45.0	62.0	E
	SED2-55/42X	SED2-55/41X	SED2-55/45X	75.0	55.0	77.0	F
	SED2-75/42X	SED2-75/41X	SED2-75/45X	100.0	75.0	99.0	F
	SED2-90/42X	SED2-90/41X	SED2-90/45X	125.0	90.0	125.0	F

\* IP54/NEMA Type 12 drives start at Frame Size B.

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**9/5/2014 3:45:11 PM**

**in**

**Case No(s). 14-1492-EL-EEC**

Summary: Application American Fine Sinter Co., LTD 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