

## Variable Frequency Drive (VFD)

### Technical Sheet

#### Energy Solutions for Business

Baltimore Gas and Electric Company (BGE) offers incentives through its Smart Energy Savers Program® to help commercial, industrial, government, institutional and non-profit electric service customers offset the upfront costs for energy-efficient improvements. The VFD Technical Sheet covers Variable Frequency Drives (VFDs) for retrofitting and improving the performance of existing inefficient equipment.

#### Application and Instructions

##### Eligible Participants

Incentives are available to non-residential, commercial, industrial, government, institutional, and non-profit electric service customers within the BGE service territory that fall under rate schedules G, GS, GL, P, or T.

##### Eligible Participants

All equipment must be new and meet all designated requirements. Used equipment or equipment not meeting program and/or technical requirements is not eligible for incentives. Existing equipment must be removed and may not be reinstalled within the BGE service territory.

##### Submitting and Application

All VFD applications, regardless of the total requested incentive amount, require a program pre-approval letter. No amount of existing equipment being replaced may be removed or altered, and no amount of proposed equipment applied for may be purchased and/or installed prior to the issuance of a program pre-approval letter. To receive a [program pre-approval letter](#), an application must first be submitted for review through [BGE's Application Center](#) and

include the manufacturer data (cut) sheets for all proposed equipment, and customer-signed [Terms and Conditions](#).

##### Approval Requirements

Once an application has been submitted, the project will be assigned a project ID. A [program pre-approval letter](#) will be issued once the application has been pre-approved. Only at this time may any existing equipment being replaced be removed or altered and may the proposed equipment being applied for be purchased and/or installed. Once the installation of all proposed equipment is complete and the BGE customer is satisfied with the equipment and installation, the BGE customer must sign the program pre-approval letter. The BGE customer-signed preapproval letter must be uploaded to the [BGE Application Center](#) along with the final detailed invoice(s). Pre-approval commitments are valid for up to 6 months for prescriptive retrofit projects and up to 12 months for new construction and custom projects from the date of the pre-approval letter that is issued to the customer of record.

##### Program Details

Details of the program, including incentive levels and technical requirements, are subject to change without prior notice. You may go to [BGESmartEnergy.com](#) to get the most current program information, or you may call 410.290.1202.

Total incentives are limited to \$1,000,000 per Federal Tax ID per calendar year. Incentives above this level may be granted on a case-by-case basis subject to program budget limitations. BGE reserves the right to deny any application that may result in BGE exceeding its program budget.

##### Participation Instructions

###### Step 1

Verify that your project meets the eligibility requirements specified on the VFD Technical Sheet. Visit the program website at [BGESmartEnergy.com/business/energy-solutions-business](#) or contact us at 410.290.1202 with any questions about eligibility.

## Step 2

Whether the application is submitted by the BGE end-use customer or the Service Provider, the Service Provider and/or installation contractor must submit an [Energy Solutions for Business Service Provider application](#) prior to the submission of incentive applications. The party listed as completing and submitting the application must be the party who completes and submits the application. Service Providers and installation contractors must be properly licensed and insured and could face participation restrictions based on their cumulative score through the Application Evaluation System. For a list of Service Providers who have participated in the program and currently have no participation restrictions, please visit the Energy Solutions for Business [Service Provider Directory](#).

## Step 3

Visit [the Application Center](#) to submit an online application. Refer to the Application Checklist to verify that all required information and documentation are included for submission to BGE.

All elements of a completed application must be uploaded to the Application Center. All applications will be reviewed for eligibility and completeness. Completed applications will be reviewed in the order received. Applicants who submit incomplete applications will be notified of deficiencies. BGE may require a pre-installation inspection and will notify customers if an inspection of the facility is necessary.

## Step 4

The application will be processed, and BGE will notify the applicant in writing when the review is complete and if funds have been reserved. Upon receipt of the program pre-approval letter, participants may begin removing/altering existing equipment and purchase and install the program-approved energy-efficient equipment. Notify BGE immediately if there are any changes to the scope of work, as this may require additional pre-approval.

## Step 5

Upon project completion, please review your approved application and note any changes to the project that

occurred during installation. The BGE end-use customer must sign and return [the program pre-approval letter](#) and provide invoices for all energy efficiency measures. BGE may require a post-installation inspection to verify compliance with program rules and verify the accuracy of project documentation and equipment operation.

BGE will authorize payment upon the application's review and approval. The incentive check should be received within 6-8 weeks after the project's completion and final project approval.

## Questions

If you have questions about the program, call 410.290.1202, email [Business@BGESmartEnergy.com](mailto:Business@BGESmartEnergy.com) or visit [BGESmartEnergy.com](http://BGESmartEnergy.com).

## I. APPLICATION CHECKLIST

Please include the following items when you apply through [the Application Center](#):

- BGE electric account number
- [Terms and Conditions](#) signed by the BGE end-use customer
- Supporting documentation to include manufacturer’s specification (cut) sheets or AHRI certificate (when appropriate)

BGE will process applications for payment in the order received and issue incentive payment within 6–8 weeks after project completion and approval. Applicants will be notified if post-installation inspections are required prior to final payment. **Please note that failure to provide any of the above items may delay the processing of your application and result in a reduction in a Service Provider’s Evaluation Score.**

## II. IMPORTANT VFD INFORMATION

It is good engineering practice to ensure that the application of VFDs within a facility does not cause excessive facility harmonic distortion. See IEEE 519 and BGE Retail Electric Service Tariff Sections 3.2 and 9.15 for further information.

If the cable length between a VFD and controlled motor is greater than 50 feet, additional motor winding insulation on the first few winding or the installation of an LC filter on the output of the inverter may be required.

**The VFD should be grounded in accordance with manufacturer’s grounding requirements for noise as long as their requirement complies with applicable electric codes.**

The facility owner may want to consider: VFD startup by manufacturer representative, overcurrent trip protection, critical frequency lockout.

## III. VFD ELIGIBILITY REQUIREMENTS

Prescriptive incentives will be provided for the installation of variable frequency drives from 2–200 hp for ONLY the HVAC applications listed in Table IV below. For chilled water and heating pump installations, at least 75% of pump capacity must be controlled by 2-way valves. **Note:** The following HVAC VFD applications are not eligible to use for this Prescriptive application: replacement of a failed VFD; VFD used solely for balancing a constant flow; control of existing 2- speed cooling tower fan; 2-speed control of a fan or pump; mitigation of oversized motor installation. All VFD applications that are not eligible under this Prescriptive application may apply using BGE’s Custom Program application.

**VFDs must be controlled by an automatic signal in response to varying air or water flow. Controlled motors must operate a minimum of 2,000 hours per year.**

Published manufacturer’s information must be submitted with this application to demonstrate compliance for each of the following criteria:

- 15 Millisecond Minimum Ride through on the VFD Control at Full Load and No Inertia
- Auto Restart
- Flying Restart (Start into Rotating Motor, Speed Search)
- Under Voltage Trip 85% or Less
- Minimum 3% In Line Reactor or Equivalent (Choke, Isolation Transformer) Based on Drive Horsepower
- 95% Minimum Drive Efficiency at Full Load and Full Speed
- 0.95 Minimum Displacement Power Factor
- Warranty of at Least One Year for Parts

## IV. VFD INCENTIVES

Application Center Equipment Guide

Product Type	Category Name	Product
Motors and VSDs	Variable Speed Drives	VFD – Building Exhaust Fan / Make-up Air Fan
Motors and VSDs	Variable Speed Drives	VFD – Return Air Fan / Cooling Tower Fan / Supply Air Fan
Motors and VSDs	Variable Speed Drives	VFD – Pump Available Options: CWP = Chilled or Condenser Water Pump HWP = Heat Water Pump WHP = Water Source Heat Pump Circulating Loop

VFD Size and Incentive levels							
Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive	Horsepower	Incentive
2	\$500	7.5	\$900	25	\$1,600	60	\$3,000
3	\$600	10	\$1,100	30	\$1,800	75	\$3,750
4	\$700	15	\$1,350	40	\$2,000	100	\$5,000
5	\$800	20	\$1,500	50	\$2,500	>100 to ≤200	\$50 per Hp
Controlling Parameters							
DP = Differential Pressure				DT = Differential Temperature			

EmPOWER Maryland programs are funded by a charge on your energy bill. EmPOWER programs can help you reduce your energy consumption and save you money. To learn more about EmPOWER and how you can participate, go to [BGESmartEnergy.com](http://BGESmartEnergy.com).