

Design 2000_{plus}

Compressed Air - Air Compressors & Dryers

2009 Project Information Form for Rhode Island

This Project Information Form provides a template to collect project systems and equipment information and specifications. In addition, this form serves as a guide to Compressed Air Systems terms and identifies energy efficiency improvement products and incentives. Contact your **Energy Solutions representative** to complete an application and to determine the incentive for this Compressed Air project.

Customer Facility Information

Customer Facility Name: _____ Date of Application: _____
 _____ Sq. Ft. Covered by Application: _____
 Contact Person: _____ Design 2000_{plus} Project Type:* (see below for details)
 Street Address: _____ Federal ID Number: _____
 City: _____ State: _____ Zip: _____ Company Type:
 E-mail Address: _____ Incorporated Exempt Not Incorporated
 Facility Description: _____ Phone Number: _____
 _____ Fax Number: _____

Customer of Record Information: Billing Account Number: _____ Internal Use only

***Design 2000_{plus} Project Type (select one)**

- Change in the use or Function of the Building Space
- New Building
- New Equipment for New Process or Expanded Operation
- Renovation of Existing Equipment
- Expansion of an Existing Building
- New Controls for Improved Operations
- Planned Replacement of Equipment
- Replacement of Failed Equipment

Installation Contractor Information

Installation Performed By:** Customer Installation Contractor Project Expediter Other (Vendor)

Complete this section if installation is not by the customer

Installation Company: _____ Street Address: _____
 Contact Person: _____ City: _____
 E-mail Address: _____ State: _____ Zip: _____
 Phone Number: _____

** If contractor has not been selected, select **Customer**

Application Information

Application Funding Type AAP Other Internal Use only
 Expected Completion Date _____
 Proposed Incentive Recipient Customer (Account Credit or Check) Installation Contractor*** Other (Vendor)***

***** Complete this section if Installation Contractor or Other has been selected**

Federal ID Number: _____ Company Type: Incorporated Exempt Not Incorporated

This Form Was Completed By:

Name: _____
 Phone Number: _____ E-mail Address: _____

For More information

Phone: 1-800-787-1706 Internet: www.nationalgridus.com

Project Information Form Index:

- Page 1: Customer information datasheet
- Page 2: Proposed Equipment Specification Table and reference guide to terms
- Page 3-4: Compressed Air Eligibility Requirements and Incentive Details
- Page 5: Compressed Air Survey document

Instructions:

- 1) Fill in the Customer information datasheet on page 1
- 2) Fill in the Proposed Equipment Specification Table on page 2
- 3) Fill in the Compressed Air Survey on page 5
- 4) Contact your Energy Solutions representative to complete an application and to determine the incentive for this Compressed Air project.

Proposed Equipment Specification (Facility Detail)

A. Building and Room Identification (Installation Site): _____

Measure Type: Compressed Air

Control Type: L/NL - Load/ No Load VFD – Variable Frequency Drives VarD - Variable Displacement

Size: _____ Horsepower (Hp) (see page three, item #2 for conversion from kW to HP)

Storage: Yes (New Storage Proposed) No (No additional storage proposed)

Existing Storage Remaining in Service: _____ Gallons (excludes storage from tank mounted compressors)

New Storage* Size: _____ Gallons

Eligible Storage (from CAIR spreadsheet): _____ Gallons
Internal Use Only

*New storage is the total storage being purchased through this proposal

Annual Hours of Compressor Operation: _____ (must run a minimum 2000 hours per year)*

Does this compressed air system have a Variable Frequency Drive (VFD)? Yes No (if yes – provide information below)

Harmonics Test Eligibility Information:

- Total VFD Load Supplied by Transformer (Hp)* _____
- KVA Rating of Building Transformer _____

* The value for the "Total VFD Load Supplied by Transformer" is the sum of the rated horse power for all motors, existing as well as all proposed at this time, in the facility that are under control of Variable Frequency Drives.

B. Building and Room Identification (Installation Site): _____

Measure Category: Dryer

Control Type: CYC - Cycling VFD - Variable Frequency Drives

Size: _____ CFM

Annual Hours of Dryer Operation: _____ (must run a minimum 2000 hours per year)*

Guide to Terms

Compressed Air Unit of Measure: Hp (Horsepower)

Dryer Unit of Measure: CFM (Cubic Feet Per Minute)

Compressor Storage: Air receiver tanks (see page three and four, item #7 and #8 for details)

Annual Hours of Operation: *see page four, item #9 for details

KVA Rating of Building Transformer: For Utility Owned Transformers, contact your Energy Solutions representative

I. Compressed Air Eligibility Requirements and Incentive Details

Prescriptive *versus* Custom Approach:

Under the prescriptive program, incentives are available for air compressors and dryers in accordance with the rules that follow in this section.

- If a proposed compressor project falls short of the minimum hours established in this program but in all other ways complies with the requirements of the Prescriptive Approach, the proposed project is not eligible for an incentive under either the Prescriptive or the Custom Approach.
- Accessory devices that will be installed along with compressors will be handled as separate stand alone Custom Approach while the compressor, receiver and dryer for the same project continue on the standard prescriptive incentive track. Examples of such accessories include; low pressure drop filters and zero loss drains.
- Proposed compressor installations that satisfy all the requirements of the Prescriptive Approach, that also include significant energy conservation measures involving modifying the distribution system or reducing air consumption at the end uses, may apply for incentives under the Custom Approach.
- If harmonics remediation devices must be installed in order for a proposed Variable Frequency Drive compressor project to comply with National Grid’s harmonic standards, the project may be run as a Custom Approach project and the proposed project cost may include the harmonics remediation work.

Table 1.1: Prescriptive High Efficiency Air Compressor Incentives

Horsepower	Incentive per Hp Load/No Load	Incentive per Hp Variable Speed	Incentive per Hp Variable Displacement
≥15 to <25	\$50	\$90	N/A
≥25 to <50	\$40	\$110	N/A
≥50 to <75	\$40	\$100	\$90

Prescriptive High Efficiency Air Compressor Incentives

1. Only rotary screw compressors are eligible for prescriptive incentives. For scroll and reciprocating compressors follow the Custom Approach.
2. Only compressors with nameplate horsepower equal to or greater than 15 Hp and less than or equal to 75 Hp are eligible for Prescriptive incentives. For compressors with capacity rated in kW, rating shall be converted to Hp for compliance check [= (kW) /(.746kW/Hp)].
3. Prescriptive incentives are only applicable to oil flooded Rotary Screw Compressors. Oil free units must use the Custom Approach.
4. Proposed compressor must have; Load/No Load, Variable Speed Drive or Variable Displacement capacity control.
5. Prescriptive incentives are only applicable to single compressor systems. (Back-up compressors that operate only while primary machine is serviced will be allowed.) Multiple compressor systems of any size that serve a common distribution system must use the Custom Approach.
6. Prescriptive incentives are only applicable to compressors operating at a pressure of 145 psi or below. Compressors operating at higher pressures must use the Custom Approach.
7. Primary storage is required on all projects
 - b. For load/no load machines the minimum requirement is 4 gallons per acfm of compressor capacity.
 - c. For VSD or Variable Displacement machines, the minimum requirement is 2 gallons per acfm of compressor capacity
 - d. Where the limitations on the size range of available storage vessels (400 or 600 gallons etc) requires the purchase of more than the minimum required storage volume, an incentive will be provided for up to 1 gallon/acfm compressor capacity beyond the required minimum. (Example: if calculated minimum is 460 gallons, standard storage available is 600 gallons, 75 acfm compressor rating, the incentive paid is for 535 gallons. (460 + 75 = 535) Assumes there is not existing storage.)
 - e. Incentives are paid only for new storage capacity installed coincident with a new eligible compressor.
 - f. Storage from any existing tank mounted compressors remaining on site may not be counted toward minimum requirements.
 - g. Contact your Energy Solutions representative for assistance with storage rules.

Table 1.2: Storage Incentive

Storage Incentive per Gallon	\$2.75
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(continued on page 4)

8. Where there is existing storage that will be reused with the new compressor, the existing capacity is deducted from the quantity of storage eligible for an incentive on the project. (Total Primary Storage Required - Existing Storage = Storage Eligible for an Incentive.) If existing storage to be reused satisfies the minimum requirements for Primary storage, no incentive is available for storage.
9. Design 2000plus compressors and dryers must run a minimum of 2,000 hours a year. Note when determining compliance for compressors; count only the hours that the end uses supplied by the compressor are operational, not the operating hours of the facility.
10. Harmonic test for eligibility is required on equipment using Variable Frequency Drive air compressors and refrigerated dryers. Obtain a Standards of Harmonics Form from your Energy Solutions representative.
11. Compressors and dryers with VFD's must have as a minimum a 3% impedance series reactor in its AC power input connection.
12. The Compressed Air System Assessment questionnaire (page five) must be completed in its entirety and submitted at time of application.
13. Replacement of compressors over 20 years old shall be done under the Design 2000plus Program.
14. Supply cut-sheet on compressor that states capacity (CFM) at the operating pressure specific to this project.

Important Information on Variable Frequency Drives

VFDs can be sensitive to overvoltages that occur when power factor correcting capacitor banks on the utility power system are switched on. To qualify for an incentive payment, each VFD must include a series reactor (*inductor, choke*) in its AC input connections. Your VFD supplier should assist in the sizing of the reactor. Minimum requirement is a 3% impedance reactor, based on the horsepower of the VFD to be installed.

As a general rule, a 3% reactor is sufficient to avoid misoperation of VFDs during utility capacitor switching and will also help reduce the magnitude of harmonic currents generated by the drive. In some instances your supplier may find it necessary to install 5% reactors and, rarely, additional filtering devices to meet acceptable current and voltage harmonic distortion requirements.

If your power factor is less than 0.8 (80%), we recommend that you consider power factor correction concurrent with the installation of drives, because the presence of power factor correction equipment can influence proper reactor sizing, and because the presence of VFDs can influence the design of power factor correction equipment. In situations where the load due to VFDs is a substantial part of the facility load, we recommend that filters, rather than capacitors, be used for power factor correction.

The use of VFDs which incorporate pulse width modulation (PWM) may produce overvoltages which may cause premature failure of AC induction motors not rated for use with an inverter. We recommend that when installing PWM drives, you consider utilizing inverter rated motors or suitable overvoltages mitigation devices that may include additional line reactors between the drive and the motor. Consider shaft grounding, insulated bearings, load filters or conductive lubricants to prevent possible bearing frosting or fluting. This is particularly important for installations where the motor will operate in a narrow speed band for long periods of time.

II. Refrigerated Dryers for Air Compressors

Table 2.1: High Efficiency Dryer Incentives

CFM Range	Incentive per CFM Cycling & VSD Dryers
Less than 100 CFM	\$7.00
100 to 199 CFM	\$6.75
200 to 299 CFM	\$5.75
300 to 399 CFM	\$5.25
400 and greater CFM	\$5.00

- Dryers must serve a single air compressor with an input power rating of 75 Hp or less.
- Dryer sizing shall be in line with the design capacity (acfm) of the single compressor it serves.
- Dryers shall be refrigerated, "thermal mass", cycling design. VSD refrigerated dryers also qualify.
- Dryer incentives are only available for projects qualifying as; end of life replacement, new construction, new process, or increased system capacity, consistent with Design 2000plus program guidelines.

Compressed Air Survey Document:

The following information is to be completed by the equipment vendor in coordination with the customer. Please describe the major components of your existing facility compressor and compressed air system.

Existing Compressor Description (Manufacturer & Model)	Rated Hp & CFM	Operating PSI	Control Type	Existing Primary Storage	Hours/Wk and Loading	Compressor Loading (% Rated CFM)
Ex: Gardner Denver Modulating 50 Hp Model: #ABCDEF	50 Hp 220 cfm	110 psi	Modulating	100 gal	90 hrs/wk	10hr@90% 30hr@30% 50hr@60%
1.						
2.						
3.						
Proposed Equipment:						

Compressed Air System Operational Issues

How many shifts _____ and how does production vary? _____

What is the current system pressure at the furthest point from the compressor? _____psi

What is the minimum pressure required for proper equipment operation? _____psi

Any significant operational problems

- Inadequate pressure Yes No
- Moisture or air quality Yes No
- Production problems due to pressure fluctuations Yes No
- Other _____

Compressor Age _____

Compressor Cooling Medium (air, chilled water) _____

Number of Condensate Drains _____ Type _____ Timer Style Drain Settings _____

Dryer Type:

- Desiccant _____
- Refrigerant _____
- None _____

Dryer Capacity (CFM) _____

How many gallons of storage listed above are from tank mounted compressors? _____

Leak Identification and Remediation

Date of Last Leak Survey if Any _____

Survey Provider and Survey Type (eg ultrasonic) _____

Estimate Leak Level from Survey _____

Follow-up Leak Remediation Efforts _____

Has the customer attended the Compressed Air Challenge Fundamentals Training? Yes No

Would you like additional compressed air efficiency services?

- Compressed Air Challenge technical training Yes No
- Technical assistance with a more complex compressed air project Yes No
- Leak assessment assistance Yes No

For Compressed Air Challenge technical and training information please visit: www.compressedairchallenge.org