



Case No.: 13-1340 -EL-EEC

Mercantile Customer: Miller Coors LLC

Electric Utility: Duke Energy

**Program Title or
Description: Ammonia Purger**

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

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

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

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

Section 1: Mercantile Customer Information

Name: **Miller Coors LLC**

Principal address: **2525 Wayne Madison Road Trenton, Ohio 45067**

Address of facility for which this energy efficiency program applies:

2525 Wayne Madison Road Trenton, Ohio 45067

Name and telephone number for responses to questions:

Megan Fox 513-287-3367

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

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

Section 2: Application Information

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

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

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

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

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

Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (check those that apply):

- ✓ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).

The existing ammonia air purger can only be used when manually supervised. The current purge piping is connected to multiple points which are purged simultaneously which is an ineffective practice. A new automatic purger was installed and eliminated the need for operators to manually turn the system on. The new system improved system efficiency, eliminated unwanted air in the system and automatically cycled through 24 points of the system to ensure each point is effectively purged. The system was fully installed by February 2013.

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

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

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

Annual savings: 1,043,482 kWh
Refer to Appendix B for calculations and supporting document

- 2) If you checked the box indicating that the customer installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) - (kWh

used by the higher efficiency new equipment) = (kWh per year saved)].
Please attach your calculations and record the results below:

Annual savings: _____kWh

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

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

Annual savings: _____kWh

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

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

Section 4: Demand Reduction/Demand Response Programs

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

- ✓ **Coincident peak-demand savings from the customer's energy efficiency program.**
- ☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
- ☐ Potential peak-demand reduction (check the one that applies):
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

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

The new equipment was installed in February 2013

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

119.1 kW

Refer to Appendix B for calculations and supporting documentation.

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

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

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

A) The customer is applying for:

☒ **Option 1: A cash rebate reasonable arrangement.**

OR

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

OR

☐ Commitment payment

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

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

☒ A cash rebate of **\$41,250. Refer to Appendix C for documentation.** (Rebate shall not exceed 50% project cost.

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

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

OR

☐ A commitment payment valued at no more than \$_____. (Attach documentation and

calculations showing how this payment amount was determined.)

OR

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

Section 6: Cost Effectiveness

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

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: _____
(Continue to Subsection 1, then skip Subsection 2)
- ✓ Utility Cost Test (UCT) . **The calculated UCT value is 6.78 (Skip to Subsection 2.) Refer to Appendix D for calculations and supporting documents.**

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

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

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The incremental measure costs were _____.

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

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

Our avoided supply costs were **\$461,516**.

The utility's program costs were **\$26,861**.

The utility's incentive costs/rebate costs were **\$41,250**.

Refer to Appendix D for calculations and supporting documents.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

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

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

- 1) any confidentiality requirements associated with the agreement;
- 2) a description of any consequences of noncompliance with the terms of the commitment;
- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
- 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
- 5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

Refer to Offer Letter following this application

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



DUKE ENERGY
Mercantile Self Direct Program
139 East Fourth Street
Cincinnati, OH 45202
513 629 5572 fax

April 30, 2013

Mr. Mark Koch
Miller Coors LLC
2525 Wayne Madison Road
Trenton Ohio 45067

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

Dear Mr. Koch:

Thank you for your Duke Energy Mercantile Self Direct rebate application. As noted in the Energy Conservation Measure (ECM) chart on page two, a total rebate of \$41,250.00 has been proposed for your Ammonia Purger completed in the 2013 calendar years. **All Self Direct Rebates are contingent upon approval by the Public Utilities Commission of Ohio (PUCO).**

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

- providing your signature on page two
- completing the PUCO-required affidavit on page three.

Please return the documents to my attention via fax at 513-629-5572 or e-mail to SelfDirect@Duke-Energy.com. Upon receipt, Duke Energy will submit the necessary documentation to PUCO. Following PUCO's approval, Duke Energy will remit payment.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Grady Reid, Jr.", written in a cursive style.

Grady Reid, Jr
Product Manager
Mercantile Self Direct Rebates

cc: Bob Bandenberg, Duke Energy
Rob Jung, Ecova
Doug Niehaus, Century Mechanical

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

☒ Rebate is accepted.

☐ Rebate is declined.

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

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


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

If rebate is accepted, will you use the monies to fund future energy efficiency and/or demand reduction projects?

☒ YES

☐ NO

If rebate is declined, please indicate reason (optional):



Customer Signature

Denise A. Quinn

Printed Name

5/28/13

Date

Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	Newly Installed Automatic Ammonia Purger	\$41,250.00
Total		\$41,250.00



Public Utilities Commission

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

Case No.: ____ - ____ -EL-EEC

State of Ohio :

Denise A. Quinn, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

MillerCoors LLC

[insert customer or EDU company name and any applicable name(s) doing business as]

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.
3. I am aware of fines and penalties which may be imposed under Ohio Revised Code Sections 2921.11, 2921.31, 4903.02, 4903.03, and 4903.99 for submitting false information.

Denise A. Quinn V.P. / Brewery Plant Manager
Signature of Affiant & Title

Sworn and subscribed before me this 28th day of May,
2013 Month/Year

Wanda D. Gibson
Signature of official administering oath

Wanda D. Gibson
Print Name and Title

WANDA D. GIBSON
Notary Public, State of Ohio
My Commission Expires 08-03-2015

My commission expires on _____

24400870 01		
MILLER BREWING CO		
2525 WAYNE MADISON RD		
TRENTON, OH 45067		
Date	Days	Actual KWH
3/5/2013	29	7,783,972
2/4/2013	31	7,914,194
1/4/2013	32	7,995,876
12/3/2012	33	8,808,918
10/31/2012	29	8,125,096
10/2/2012	32	8,350,116
8/31/2012	29	5,592,868
8/2/2012	30	6,660,680
7/3/2012	29	5,239,043
6/4/2012	32	5,847,160
5/3/2012	30	4,896,092
4/3/2012	29	4,812,526
Total		82,026,541

Appendix B - MillerCoors LLC Purger Energy Savings Achieved

[illegible]

DETAILED CALCULATIONS

Mar 2013 V1

Salesforce Opportunity Name

0

Project Name

MillerCoors - MSD Custom - Trenton-Ammonia Purger Project

Application #

CMO13-1390210

Rev.

0

State

OH

Measure Description

The measure involved replacing the existing ammonia purgers with energy efficient auto-purgers. The retrofit was completed for three compressor systems. The baseline purgers operate manually with purge piping connected to multiple points. This was an ineffective method of purging the system of non-condensing gases, which increases the energy use of the refrigeration system. The installed automatic purge system is much more effective because the system uses solenoid valves located throughout the system to systematically purge the refrigeration system, ensuring the condensing pressure can be maintained at the lowest possible level.

Baseline

The standard baseline for MSD projects is the pre-retrofit equipment. The baseline equipment includes manually controlled Armstrong ammonia air purgers.

Savings Calculation Methodology

The calculations were performed using an energy savings calculation methodology provided by the manufacturer of the purger equipment. The calculation and inputs were deemed reasonable.

Incremental Measure Cost (IMC)

The cost of \$177,528.76 was verified by a submitted invoice. The incremental cost is equivalent cost because the alternative would be to take no action.

IMC Calculation

IMC (\$)	Baseline Cost (\$)	Measure Cost (\$)
\$177,528.76	\$0.00	\$177,528.76

References to source documents/back up files as appropriate

MILLERCOORS LLC_REVISD PURGER APP PART1AND2_04032013_E.pdf

Attached Files

- ☒ Equipment Specs
- ☒ Calculations
- ☒ Cost Documentation



Savings Calculations

(insert all appropriate calculations or simulation results below)

$$\text{Savings} = \frac{P_a}{P_d} \times C \times H \times T \times M$$

P_a = Excess Pressure Due to Air

P_d = Pure Refrigerant Condensing Pressure
(In Absolute Pressure)

C = System Capacity (Tons or kW)

H = Energy Consumption Factor
(From the Chart Below)

T = Hours of Run-Time Per Year

M = Electric Rate Per Kilowatt-Hour

Energy Consumption Factor

US Customary		
Refrigerant	Suction Temp	Factor
Ammonia	-20°F	1.03
	0°F	.80
	20°F	.52
	35°F	.40
R22	-20°F	1.11
	0°F	.80
	20°F	.59
	35°F	.42
R134a	-20°F	1.13
	0°F	.83
	20°F	.58
	35°F	.41

Calculating savings

To calculate the approximate annual savings that can be realized by installing an AUTO-PURGER, use the formula at the left. Simply enter the values and complete the computation. To determine the condensing pressure of pure refrigerant, refer to a pressure-temperature chart for the refrigerant used. An ammonia pressure-temperature chart is on page 7. To determine the excess pressure due to air, refer to the explanation and examples on page 7.

US Customary

The conditions for this example are:

Refrigerant: ammonia

Suction temperature: 0°F

Condensing temperature: 86°F

Excess pressure due to air (P_a): 17 psi

Pure refrigerant condensing pressure (P_d): 169.2 psia

System capacity (C): 1500 tons

Energy consumption factor (H): .80

Hours of run-time per year (T): 6500 hours

Electric rate per kilowatt-hour (M): .06 dollars

$$\frac{17 \text{ psi}}{169.2 \text{ psia}} \times 1500 \text{ tons} \times .80 \times 6500 \text{ hours} \times \$0.06/\text{kWhr}$$

$$= \$47,020/\text{year}$$

$$\text{Savings} = \frac{P_a}{P_d} \times C \times H \times T \times M$$

P_a = Excess Pressure Due to Air
 P_d = Pure Refrigerant Condensing Pressure
 (In Absolute Pressure)
 C = System Capacity (Tons or kW)
 H = Energy Consumption Factor
 (From the Chart Below)
 T = Hours of Run-Time Per Year
 M = Electric Rate Per Kilowatt-Hour

Energy Consumption Factor

RSE Chart Entry		
Refrigerant	Evaporator Temp	Factor
Ammonia	-20°F	1.00
	0°F	.80
	20°F	.60
	40°F	.40

30°F example

FV3 Compressor 1 = 1 Model 1163 Total Run Time (in 2011) = 25,827
 FV3 Compressor and Model 1163 Run Time = 17.4

Run Time 31,133,040 (2011)

Frick Model 1160 tons

P_a = 10 psia
 P_d = 169.2 psia
 C = 965.5 tons
 H = 0.66
 T = 20827 hours
 M = 1 kwh

Savings= 784373 KWH

Frick Model 775 tons

P_a = 10 psi
 P_d = 169.2 psia
 C = 756.3 tons
 H = 0.66
 T = 120 hours
 M = 1 kwh

Savings= 3540 KWH

Vilter Flash Compressors

Flash Gas, but they are running on the lower side which puts them around 150 tons each

Design: 25 psi suction, 144 bar

Actual: 24 - 25 psi suction, 150 - 160 bar (actual pressure)

P_a = 10 psi
 P_d = 169.2 psia
 C = 150 tons
 H = 0.66
 T = 31331 hours
 M = 1 kwh

Savings= 183320 KWH

Total Savings= 971233 KWH

Savings 971233 kWh
 111 kW

Appendix C -Cash Rebate Calculation

MillerCoors LLC Purger

Measure	Quantity	Cash Rebate Rate	Cash Rebate
Automatic Energy Efficiency Purgers	1	50% of incentive that would be offered by the Smart \$aver Custom program	\$41,250
			\$41,250

Appendix D -UCT Value

MillerCoors LLC Purger

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
Automatic Energy Efficiency Purgers	\$461,516	\$26,861	\$41,250	1	6.78
Totals	\$461,516	\$26,861	\$41,250	1	

Total Avoided Supply Costs \$461,516

Total Program Costs \$26,861

Total Incentive \$41,250

Aggregate Application UCT

6.78

3. Ammonia Purger Project

Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

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

Email this form along with completed Mercantile Self Direct Prescriptive or Custom applications, proof of payment, energy savings calculations and spec sheets to SelfDirect@Duke-Energy.com. You may also fax to 1-513-419-5572.

Mercantile customers, defined as using at least 700,000 kWh annually are eligible for the Mercantile Self Direct program. Please indicate mercantile qualification:

- ☒ a single Duke Energy Ohio account
☐ multiple accounts in Ohio (energy usage with other utilities may be counted toward the total)

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

Account Number	Annual Usage	Account Number	Annual Usage
2470-0870-01-9	50000,000 Kwh		

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

Self Direct Program requirements dictate that certain projects that may be Prescriptive in nature under the Smart Saver program must be evaluated using the Custom process. Use the table on page two as a guide to determine which Self Direct program fits your project(s). Apply for Self Direct projects using the appropriate application forms in conjunction with this cover sheet. Where Mercantile Self Direct Prescriptive applications are listed, please refer to the measure list on that application. If your measure is not listed, you may be eligible for a Self Direct Custom rebate. Self Direct Custom applications, like Smart Saver Custom applications, should include detailed analysis of pre-project and post-project energy usage and project costs. Please indicate which type of rebate applications are included in the table provided on page two.

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

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

Application Type	Replaced equipment at end of lifetime or because equipment failed**	Replaced fully operational equipment to improve efficiency***	New Construction
Lighting	MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>	MSD Prescriptive Lighting <input checked="" type="checkbox"/>	MSD Prescriptive Lighting <input type="checkbox"/>
		MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> Custom Lighting Worksheet <input type="checkbox"/>
Heating & Cooling	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Heating & Cooling <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s) <input type="checkbox"/>	MSD Prescriptive Heating & Cooling <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General and/or EMS Worksheet(s) <input type="checkbox"/>
Chillers & Thermal Storage	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Chillers & Thermal Storage <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Motors & Pumps	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Motors, Pumps & Drives <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
VFDs	Not Applicable	MSD Prescriptive Motors, Pumps & Drives <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom VFD Worksheet <input type="checkbox"/>
		MSD Custom Part 1 <input type="checkbox"/> MSD Custom VFD Worksheet <input checked="" type="checkbox"/>	
Food Service	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Food Service <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
Air Compressors	MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet <input type="checkbox"/>	MSD Prescriptive Process <input type="checkbox"/>
			MSD Custom Part 1 <input type="checkbox"/> MSD Custom Compressed Air Worksheet <input type="checkbox"/>
Process <i>Purger</i>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>	MSD Prescriptive Process <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>
		MSD Custom Part 1 <input checked="" type="checkbox"/> MSD Custom General Worksheet <input checked="" type="checkbox"/>	
Energy Management Systems	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>	MSD Custom Part 1 <input type="checkbox"/> MSD Custom EMS Worksheet <input type="checkbox"/>
Chiller Tune-ups	MSD Prescriptive Chiller Tune-ups <input type="checkbox"/>		
Behavioral*** & No/Low Cost	MSD Custom Part 1 <input type="checkbox"/> MSD Custom General Worksheet <input type="checkbox"/>		

** Under the Self Direct program, failed equipment and equipment at the end of its useful life are evaluated differently than early replacement of fully functioning equipment. **All equipment replacements due to failure or old age will be evaluated via the Custom program.**

*** Please ensure that you include the age of the replaced equipment for measures classified as "Early Replacement" in your application as well as the estimated date that you would have otherwise replaced the existing equipment if you had not chosen a more energy efficient option.

**** Behavioral energy efficiency and demand reduction projects must be both measurable and verifiable. Provide justification with your application.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



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

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

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

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

Notes on the Application Process

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

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. Monthly calculations are best. You, the Duke Energy Ohio customer, or your equipment vendor / engineer should perform these calculations and submit them to Duke Energy for review. *We strongly encourage the use of modeling software (such as eQuest or comparable) for complex projects.*

Upon receipt of your application, an acknowledgement email will be sent to you with an estimated response time based on an initial assessment of your application. The application review may include some communication to resolve any questions about the project or to request additional information. Applications that are received complete without missing information have a faster review time.

There are two ways to submit your completed application.

Email your scanned form to: SelfDirect@duke-energy.com

Or, fax your form to 513-419-5572

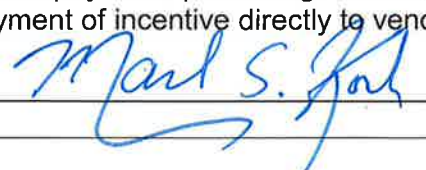
**Mercantile Self Direct
Nonresidential Custom Rebate Application
PART 1**



1. Contact Information (Required)

Duke Energy Customer Contact Information					
Company Name	MillerCoors LLC				
Address	2525 Wayne Madison Rd				
Project Contact	Mark Koch, PE				
City	Trenton	State	OH	Zip Code	45067
Title	Sustainability and Environmental Engineer				
Office Phone	513-844-4238	Mobile Phone	513-464-4618	Fax	None
E-mail Address	mark.koch@millercoors.com				

Equipment Vendor / Contractor / Architect / Engineer Contact Information					
Company Name	Century Mechanical				
Address					
City		State		Zip Code	
Project Contact	Doug Niehaus				
Title	Project Manager				
Office Phone	513-681-5700	Mobile Phone	—	Fax	None
E-mail Address	DNiehaus@centurymechanicalsolutions.com				
Describe Role	equipment supplier				

Payment Information					
Payee Legal Company Name (as shown on Federal income tax return):	MillerCoors LLC				
Mailing Address	2525 Wayne Madison Rd				
City	Trenton	State	OH	Zip Code	45067
Type of organization (check one) <input type="checkbox"/> Individual/Sole Proprietor <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Unit of Government <input type="checkbox"/> Non-Profit (non-corporation)					
Payee Federal Tax ID # of Legal Company Name Above:	26-8387410				
Who should receive incentive payment? (select one) <input checked="" type="checkbox"/> Customer <input type="checkbox"/> Vendor (Customer must sign below)					
If the vendor is to receive payment, please sign below: I hereby authorize payment of incentive directly to vendor:					
Customer Signature					
Date	3 / 8 / 2013 (mm/dd/yyyy)				

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



2. Project Information (Required)

A. Please indicate project type:

- ☐ New Construction
- ☐ Expansion at an existing facility
- ☐ Replacing equipment due to equipment failure
- ☐ Replacing equipment that is estimated to have remaining useful life of 2 years or less
- ☒ Replacing equipment that is estimated to have remaining useful life of more than 2 years
- ☐ Behavioral, operational and/or procedural programs/projects

B. Please describe your project, or attach a detailed project description that describes the project.

See attached capital appropriation Request

C. When did you start and complete implementation?

Start date / (mm/yyyy) End date / (mm/yyyy)

01/2012 02/2013

D. Are you also applying for Self-Direct Prescriptive incentives and, if so, which one(s)¹?

*Lighting ~~residential~~
purger is Mercantile merc. self direct.*

E. Please indicate which worksheet(s) you are submitting for this application (check all that apply):

- ☐ Lighting
- ☐ Variable Frequency Drive (VFD)
- ☐ Compressed Air
- ☐ Energy Management System (EMS)
- ☒ General (for projects not easily submitted using one of the above worksheets)

F. Please tell us if there is anything about your electrical energy projections (either for the baseline or the proposed project) that you are either unsure about or for which you have made significant assumptions. Attach additional sheets as needed.

Required: Attach a supplier or contractor invoice or other equivalent information documenting the Implementation Cost for each project listed in your application. (Note: self-install costs cannot be included in the Implementation Cost) ✓

¹ If your project involves some equipment that is eligible for prescriptive incentives and some equipment that is likely eligible for custom incentives, and if it is feasible to separate the equipment for the energy analysis, then the equipment will be evaluated separately. If it is not feasible to separate the equipment for analysis, then the equipment will be evaluated together in the custom application.

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



3. Signature (Required – must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

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

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

Application Signature

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

Mark S. Koch
Duke Energy Ohio, Inc Customer Signature

Print Name Mark S. Koch

Date 3-8-2013

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



Checklist for completing the Application

INCOMPLETE APPLICATIONS WILL RESULT IN DELAYS IN DUKE ENERGY PROCESSING YOUR APPLICATION AND NOTIFYING YOU CONCERNING ANY REBATES. Before submitting the application and the required supplementary information, use the following checklist to ensure that your application is complete and the information in the application is accurate. (Note: this checklist is for your use only – do not submit this checklist with your application)

Section No. & Title	Have You:
1. Contact Information	<input checked="" type="checkbox"/> Completed the contact information for the Duke Energy customer? <input checked="" type="checkbox"/> Completed the contact information for the equipment vendor / project engineer that can answer questions about the technical aspects of the project, if that is a different person than above?
2. Project Information	<input checked="" type="checkbox"/> Answered the questions A-E, including providing a description of your project. <input checked="" type="checkbox"/> Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	<input checked="" type="checkbox"/> Signed your name? <input checked="" type="checkbox"/> Printed your name? <input checked="" type="checkbox"/> Entered the date?
Supplementary information (Required)	<input type="checkbox"/> Attached a supplier or contractor's invoice or other equivalent information documenting the Implementation Cost for projects listed in your application? (Note: self-install costs cannot be included in the Implementation Cost) <input type="checkbox"/> (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for each project listed in your application?

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact:

- your Duke Energy account manager
or,
- the Duke Energy Smart \$aver® team at 1-866-380-9580.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Instructions/Terms/Conditions

Note: Please keep for your records- do not submit with the application

1. Energy service companies or contractors may assist in preparing the application, but an authorized representative of the customer must sign this application to be eligible to participate in the Mercantile Self Direct Program. Completion of this application does not guarantee the approval of a Self Direct Custom Rebate.
2. Once all documentation requested in this application is received by *Duke Energy Ohio, Inc*, and any follow-up information requested by *Duke Energy* is received, the rebate amount for each Energy Conservation Measure (ECM) will be communicated to the customer. The rebate amount will be based on ECM energy savings and ECM incremental installation cost.
3. All rebates require approval by the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc* will submit an application for rebate on the customer's behalf upon customer attestation to program terms, conditions and requirements as outlined in the rebate offer letter and upon customer completion of attestation documents required by the Public Utilities Commission of Ohio.
4. *Duke Energy Ohio, Inc* will issue a Self Direct Custom Rebate check, based on the approved rebate amount for each ECM, upon receiving approval from the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc* does not guarantee PUCO approval.
5. With the application, the customer must provide a list of all sites where the ECMs were installed. *Duke Energy Ohio, Inc* requests that sites of similar size, hours of operation and energy consuming characteristics be grouped together in one application for the determination of the rebate amount. The application should identify the site where each unique ECM was installed.
6. Based on the information submitted with the application and the information gathered both before and after the initial installation of the ECM, *Duke Energy Ohio, Inc* will calculate the rebate amount for each ECM.
7. *Duke Energy Ohio, Inc* may conduct random site inspections of a sample of the locations where the ECMs are installed to verify installation and operability of the ECMs and to obtain information needed to calculate the Approved Incentive Amount.
8. Customers are encouraged to retain copies of all forms, invoices and supporting documentation for their records.
9. Approved rebates are valid for 6 months from the date communicated to the customer by *Duke Energy Ohio, Inc*, subject to the expiration of measure eligibility based on project completion dates and application submission deadlines as defined by PUCO. Customers are encouraged to execute their rebate offer contracts and PUCO-required affidavits promptly to ensure eligibility is not forfeited.

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



10. *Duke Energy Ohio, Inc* reserves the right to recover all unrecoverable costs associated with the project approval if the customer decides not to execute the rebate contract, after the project is approved by *Duke Energy Ohio, Inc*.
11. Projects financially supported by other funding sources will be evaluated on a case-by-case basis for potential partial funding from *Duke Energy Ohio, Inc*.
12. Participants must be *Duke Energy Ohio, Inc* nonresidential, mercantile customers with the project sites in the *Duke Energy Ohio, Inc* service territory.
13. Customers or trade allies may not use any *Duke Energy* logo without prior written permission.
14. Only trade allies registered with *Duke Energy* are eligible to participate.
15. All equipment must be new. Used or rebuilt equipment is not eligible for incentives. All old existing equipment must be removed on retrofit projects.
16. Disclaimers: *Duke Energy Ohio, Inc*
 - a. does not endorse any particular manufacturer, product or system design within the program;
 - b. will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives;
 - c. does not expressly or implicitly warrant the performance of installed equipment. (Contact your contractor for details regarding equipment warranties.);
 - d. is not responsible for the proper disposal/recycling of any waste generated or obsolete or old equipment as a result of this project;
 - e. is not liable for any damage caused by the installation of the equipment nor for any damage caused by the malfunction of the installed equipment; and
 - f. reserves the right to change or discontinue this program at any time. The acceptance of program applications is determined solely by *Duke Energy Ohio, Inc*.



MillerCoors™

**CAPITAL APPROPRIATION REQUEST SUMMARY
AMMONIA PURGER UPGRADE
TRENTON BREWERY
IO# 118423**

PROJECT JUSTIFICATION & DESCRIPTION

The existing Armstrong ammonia air purger is not capable of automatic operation and can only be used when manually supervised.

The automatic purger from Hansen will eliminate the need for the operators to manually turn on the system. The ammonia system efficiency will improve by eliminating unwanted air in the system. This upgrade will improve the ammonia cooling saving \$23,500 annually in electricity, and save 2,000,000 gallons (\$1,500) of water annually.

PROJECT BACKGROUND

For best efficiency, it is important to remove all the non-condensable gases from a refrigeration system so the condensing pressure can be maintained at the lowest possible level. The current purge piping is connected to multiple points. All points are purged simultaneously which is an ineffective practice. An automatic air purger (such as the models made by Hansen Technologies) can be connected to up to (24) points in the system, and will automatically cycle through these points to insure that each point is effectively purged. Each individual purge point is equipped with a solenoid valve controlled by the automatic air purger, and only one solenoid is opened at any time to insure effective purging of that part of the system.

Best practice is to purge each evaporative condenser liquid outlet individually, as well as purge each high-pressure receiver individually.

FINANCIALS – Project Cost

<u>Capital</u>	Corporate	\$ 0	<u>Expense</u>	Corporate	\$ 0
	Plant Managed	\$ 140,000		Plant Managed	\$ 40,000
	Capital			Capital	
	Total	\$ 140,000		Total	\$ 40,000

Other Costs: None

This project will dispose of recorded capital assets and the Net Book Value (NBV) is:

- Major Asset X04000742 w/ NBV = \$2785

This project was not included in the CY2012 Original Budget request.

This project was not endorsed by COT and approved by the ISC for incorporation into the CY2012 Budget request.

This project will not require graphics development and/or a material runout requirement.

PROJECT BENEFITS

1. Saves \$23,500 annually in electrical costs.
2. Decreases operator time required by automating the system.
3. Save 2,000,000 gallons of water annually.

SAVINGS SUMMARY:

Annual Savings	\$ 25,000	One Time Avoided Costs	\$0
Diversions	\$ 0		\$
Total Savings	\$ 25,000	Total	\$
IRR:	%	Payback: _____ years	

ENERGY and WATER IMPACT

- Saves 2,000,000 gallons of water annually.
- Saves \$23,500 energy cost.

ALTERNATIVES STUDIED

- Alternatives have not been studied. We propose to design/build with our preferred refrigerant vendor (Century Mechanical Solutions).

IMPLEMENTATION STRATEGY

Implementation Plan –Design / Build

Minority/Women Business Enterprises – All work performed by Century Mechanical Solutions (Not a minority vendor)

Design – Century Mechanical Solutions will design/build. This is a replacement project so new system will fit into existing mechanical, electrical and structural design.

Manufacturing Systems – The plant will manage/perform all manufacturing system needs.

Equipment Purchases – The project is design/build. The contractor will manufacture or purchase all required equipment.

Subcontracts – Contracts will be lump sum.

Construction Management – Construction management will be handled by the plant.

Startup / Ramp-up Plan – Start up performed by design/build company.

Permit, Factory Mutual, Process Safety Management – Permit requirements will be evaluated and managed by the Plant Environmental Engineer, Mark Koch.

Others –RAMs and Training will be managed by the plant.

PROJECT SCHEDULE – all date's contingent on CAR approval date

CAR Approval: 10/1/12	Start-up Window: Immediate
Design Complete: 11/1/12	Downtime Requirement: Will be worked around plant needs
Delivery Complete: 12/15/12	100% Scheduled Production or Beneficial Completion: 12/31/12
Construction Window: 12/20/12 – 12/31/12	Close to Commitments: 12/31/12

Startup Window Details:
100% Prod: Start Date 12/31/12 End Date 12/31/12

Project completion milestones		
SG5 Audit	Completion Date 1/21/13	M. Woodyard
WCM	Completion Date 12/31/12	M. Sears
RAMS	Completion Date 12/1/12	J. Schoultheis

Training Plan	Completion Date 12/1/12	P. Bozik
Spare Parts	Completion Date 1/15/13	M. Waymeyer
EH&S Checklist Close	Completion Date 1/15/13	M. Woodyard

Schedule Comments:
Scheduled dependent on CAR approval.

Research & Experimentation Tax Credit

This project does not qualify to be included in the Research and Experimentation Tax Credit Program.
 (If it does, the Project Manager will need to complete the R&E Tax Credit Activity Profile Write Up prior to the end of the 4th Qtr.)

Project Scorecard

- Complete **Project Scorecard** with team at the SG2 Meeting and attach to CAR.

Risk Management

Identify Potential Risks - determine course of action
 Risks can be Accepted, Mitigated, Avoided, or Transferred (Ac, M, Av, T)

Risk	Ac, M, Av, T	Plan
Equipment lead time increases	Ac	Push install to 2013

Change Management

- How will work processes change?
 - Work process will be automated
- How will our internal or external customers/clients experience change?
 - Automated system.
- How will technology or processes change?
 - Updated technology that includes automation.
- How will the culture and values of the organization change? (Hint: DO NOT overlook.)
 - None
- Do we initiate the MillerCoors Change Management process with the respective brewery Quad-Team?
 - No

Team Resources and Roles

Name	Contact Telephone	Role
Mark Woodyard	(513) 844 - 4120	Project Manager
Todd Washing	(513) 844 - 4603	Project Sponsor
Todd Washing	(513) 844 - 4603	Project Owner
Todd Washing	(513) 844 - 4603	Technical Services Manager
Mark Woodyard	(513) 844 - 4120	Engineering Services Manager
Mark Woodard	(513) 844 - 4120	Plant Project Coordinator (PPC)
Steve Bryant	(513) 844 - 4158	Maintenance Supervisor
Mike Waymeyer	(513) 844 - 4053	Maintenance Planner Controller
Paul Bozik	(513) 844 - 4993	Training Manager
John Wells	(513) 844 - 4679	Unit Manager
Leah Spears	(513) 844 - 4198	Brewery Safety Manager

Mark Koch	(513) 844 - 4238	Brewery Environmental Coordinator
John Van Nelson	() -	Corporate Design Lead
	() -	Corporate Design MS lead
Darren Weber	() -	Manager Project Implementation

Communication Plan

Team Meetings

- Have agenda and list of follow-up items that include person responsible and date due.
- Identify frequency of Team Meetings (*daily, weekly, biweekly, etc*)
- During design weekly team meeting will be held between the Corporate PM, Plant PPC, Design Lead, Designer, and operations
- During construction, daily team meetings, lead by the Project Manager or designated representative, will be held on site during the construction and startup phases at a specified time and location. All plant team members listed on the team listing shall be invited to participate.
- During testing and startup, daily team meetings, lead by the startup manager, will be held on site during the construction and startup phases at a specified time and location. All plant team members listed on the team listing shall be invited to participate.

- Communications
 - How will we communicate? Phone and email.
 - All project phase Communications
 - PM is responsible to issue the team meeting minutes to all members within two days after a meeting.
 - PPC will update PM with the Plant Managed Capital Cash Flow changes by the first week of each month.
 - PM will update Version 500 by the 10th of each month

- Construction Phase Communications
 - Daily to team members in attendance at the team meetings.
 - Others will be contacted as appropriate.

- Startup Phase Communications
 - Daily to team members in attendance at the team meetings.
 - Performance (actual vs. plan)
 - Reported daily until the project meets performance
 - Distributed to all team members listed on the team listing and to Plant and Corporate Leadership.

Submitted by:

Mark Woodyard
513-844-4120

HANSEN

PRODUCT DATA SHEET:

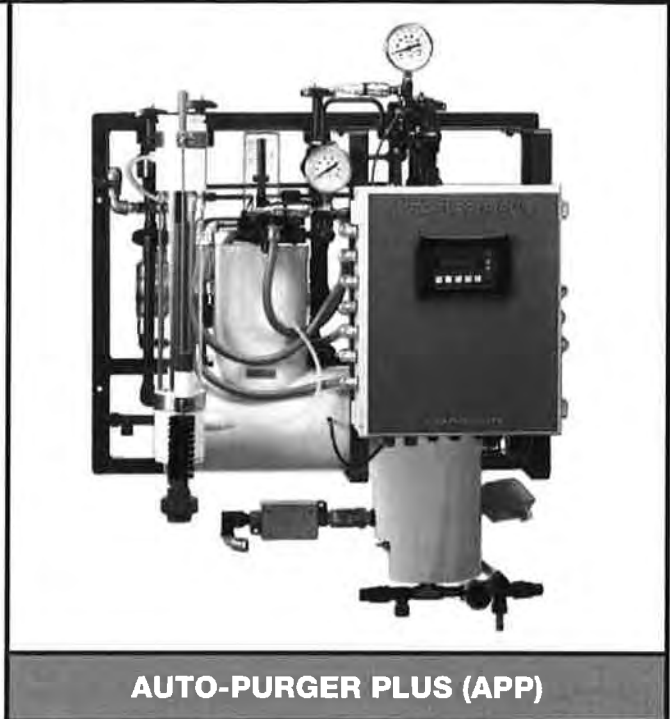
AUTO-PURGER PLUS (APP) Automatic Air & Water Purger

INTRODUCTION

The AUTO-PURGER PLUS (APP) is a totally automatic, electronically controlled non-condensable gas (air) and water purger for reducing the energy costs of operating an ammonia refrigeration system. The AUTO-PURGER PLUS is shipped preassembled, prewired, insulated, and includes an automatic water bubbler, a relief valve, and an isolation service valve package. All AUTO-PURGER's are factory tested.

Air and water are detrimental to the operation of ammonia refrigeration systems. Air in the system collects in the condenser and obstructs heat transfer resulting in higher than necessary condensing pressures. Water in ammonia raises the boiling point of the refrigerant requiring lower suction pressures than otherwise necessary to maintain the correct refrigerant liquid temperature. Both of these conditions require excess energy to maintain correct refrigeration capacity and temperature. *See Graphs 1 and 2 on page 2.*

The Hansen AUTO-PURGER PLUS efficiently and automatically helps maintain condensing and suction temperatures at nearly optimum operating conditions. Because both air and water removal functions are incorporated into one compact unit, floor space, maintenance, and energy are minimized. Additionally, the operation of the AUTO-PURGER PLUS is very similar to the Hansen standard AUTO-PURGER so those familiar with the AUTO-PURGER will find it very easy to use and maintain.



AUTO-PURGER PLUS (APP)

FEATURES

- Compact wall mounting saves floor space
- High capacity water separation – up to 7 gallons per day
- High capacity air separation – up to 20 times the capacity of competitor units
- Requires less energy to operate– single phase, 115V, 20A circuit
- LCD console displays purger data
- On-board diagnostics

INSTALLATION

Installation requires piping the foul gas line, pumped liquid line, liquid return line, suction line, water bubbler fill and drain lines, relief valve vent line, and water purge line to a customer supplied container. Installation also requires wiring the power connection, and wiring the remote purge point solenoid valves, which must be purchased separately.

HANSEN TECHNOLOGIES CORPORATION

TEL 630.325.1565 FAX 630.325.1572 EMAIL INFO@HANTECH.COM WWW.HANTECH.COM

OPERATION

The AUTO-PURGER PLUS collects non-condensable gases (air) from the refrigeration system and releases the air to a water bubbler; the APP also collects and releases water from the refrigeration system. The water is first concentrated in the evaporator section of the AUTO-PURGER PLUS using the foul gas from the condenser purge points as part of the normal operation of a non-condensable gas purger. The evaporator is supplied by pumped, water-contaminated, refrigerant liquid from the lowest temperature recirculator vessel. As the refrigerant boils off in the AUTO-PURGER evaporator, the water is left behind. At about 20% water concentration the purger then isolates the mixture of water and ammonia and further concentrates the water with hot gas and electric heat. At approximately 90% water concentration the liquid is drained to a customer supplied container. The AUTO-PURGER PLUS then repeats the cycle of separating air and concentrating water.

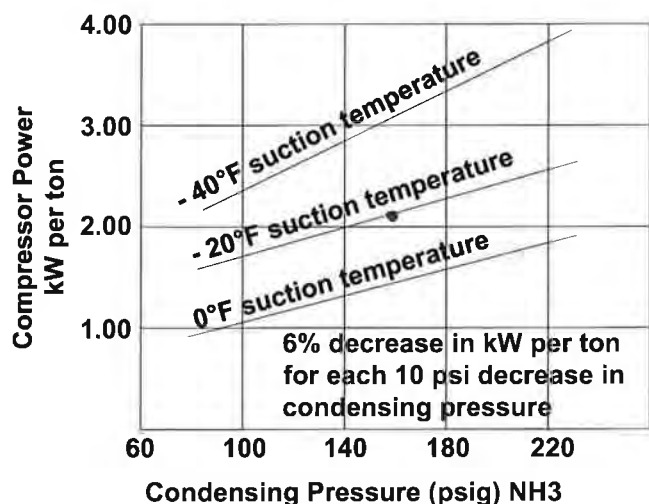
SELECTION

Model	Description
APP08	8 purge points
APP16	16 purge points
APP24	24 purge points
APPC	for computerized plants

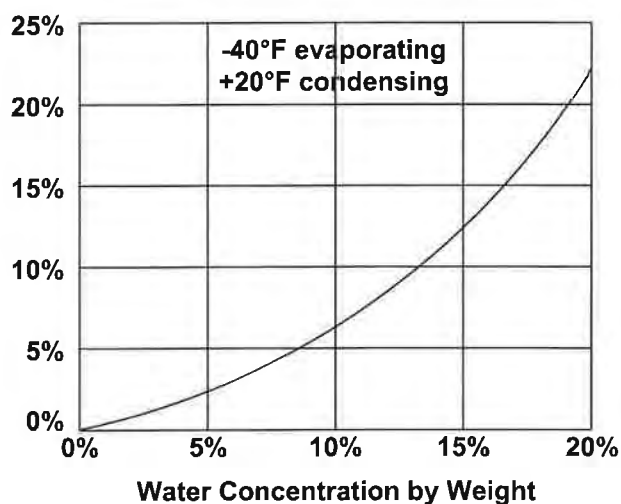
All models are suitable for ammonia only. Standard electrical supply is single phase, 20A, 115V, 50/60 Hz. Optional single phase, 15A, 230V, 50/60 Hz is also available.

To order, specify model and voltage.

GRAPH 1: ENERGY SAVINGS, AIR REMOVAL



GRAPH 2: ENERGY SAVINGS, WATER REMOVAL



For more information, visit:

WWW.HANTECH.COM

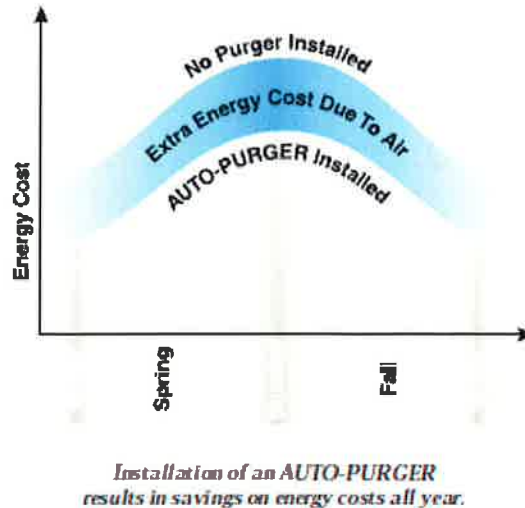
HANSEN TECHNOLOGIES CORPORATION

TEL 630.325.1565 FAX 630.325.1572 EMAIL INFO@HANTECH.COM WWW.HANTECH.COM

AMMONIA PURGE SYSTEM

Installing an AUTO-PURGER Saves Money

An AUTO-PURGER noncondensable gas (air) purger quickly and efficiently removes air from a refrigeration system. Noncondensable gases, primarily air, present in a refrigeration system increase condensing pressures. Air also reduces the overall capacity of the refrigeration system by acting as an insulator, which increases the amount of time compressors must run. The increased run-time of compressors, in turn, increase the energy required to operate the system throughout the year. This is true not only during the hot ambient temperatures of summer days, but also during the cool ambient temperatures of night and the winter season. Eliminating air in the refrigeration system reduces the energy required to operate the system, resulting in lower electricity bills.



Hansen AUTO-PURGERs are the Best Noncondensable Gas (Air) Purgers

The thousands of satisfied AUTO-PURGER customers are a testament to the quality and reliability of Hansen AUTO-PURGERs. The money saved in reduced energy costs alone will pay for the purchase and installation of an AUTO-PURGER.

Hansen AUTO-PURGERs are the leader in multipoint purging. Multipoint purging is the only effective method for removing all air from a refrigeration system. In addition, the large air-removal capacity of Hansen AUTO-PURGERs allows a very large amount of air to be removed quickly. This helps ensure that the refrigeration system runs at its design capacity, especially in hot weather months.

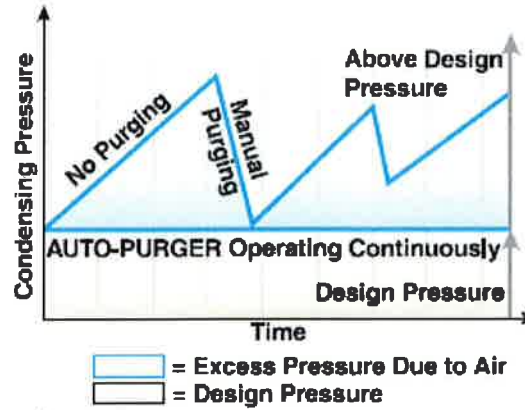
There are AUTO-PURGER models to match a variety of system requirements. From large ammonia or halocarbon systems, to single condenser operation, to hazardous locations, there is an AUTO-PURGER to meet your needs.

- Large air removal capacity over a short time span
- Multipoint purging
- Payback typically within one year
- Flexible installation location
- Models to match a variety of system sizes and requirements
- Completely automatic startup
- Factory assembled and tested
- CSA and CE certification available

Purger Operation

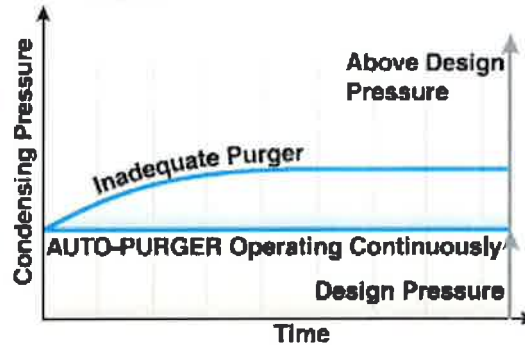
Condensing pressure and purger operation

AUTO-PURGERS remove more air and over a shorter period of time than other purging methods or units to maintain the minimum possible condensing pressure. A refrigeration system without a purger or with an inadequate purger may allow fluctuations in condensing pressure or may not be able to maintain the minimum possible condensing pressure. The charts to the right illustrate this effect.



How does air get into a system?

Air can enter a system in a number of ways. For systems operating in a vacuum, leaky gaskets and shaft seals allow air into the system. Other common ways for air to enter are during repairs and service, when adding refrigerant to the system, and through the chemical breakdown of refrigerant. Also, lubricating oils can breakdown under heat and high pressure to create noncondensable gases.



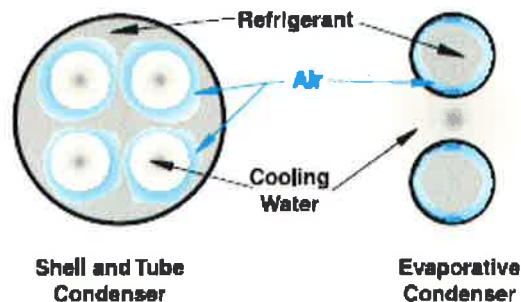
Pressure profiles for a system with an AUTO-PURGER versus manual purging and the same system with an AUTO-PURGER versus an inadequate purger.

Where does air collect?

Air collects at various locations on the high-pressure side of the system. These locations are typically the lowest gas velocity and coolest temperature areas. High-pressure condensers, receivers, and heat reclaim heat exchangers are all likely locations where air will collect.

Air as an insulator

Air tends to act as insulation in refrigeration systems. A layer of air forms a blanket on the walls of the condensing surface, preventing refrigerant from making contact with the lower-temperature heat exchanger surface. This results in greatly reduced system efficiency.

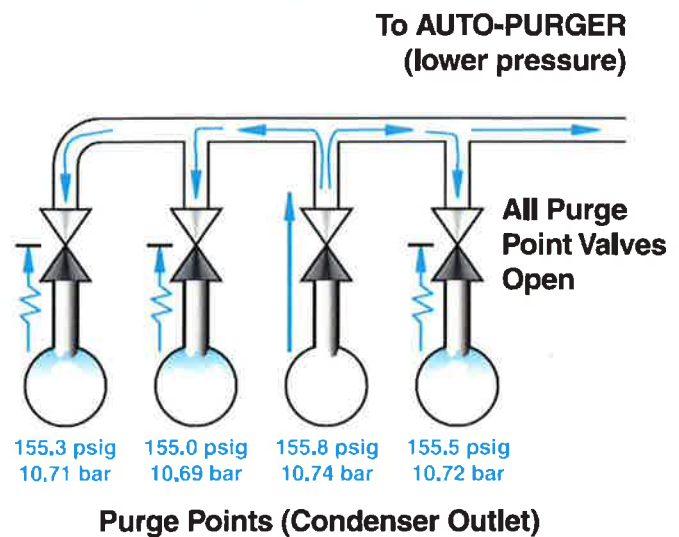


Air acts as an insulator between the refrigerant and the cooling surface, greatly reducing condensing efficiency.

Purge one point at a time

Why not just open all purge points at the same time? If this is done, air is removed from only one of the points. Even though the pressure difference across the purge points may be as small as .25 psi (.02 bar), air will only be removed from the point that has the highest pressure. As a result, air will continue to collect in the other locations.

In addition, if the pressure difference is great enough, it is possible that air from the point with the highest pressure can be forced into the other condensers. By purging from each point one at a time, which is standard on AUTO-PURGERs, air is effectively removed from throughout the entire refrigeration system.



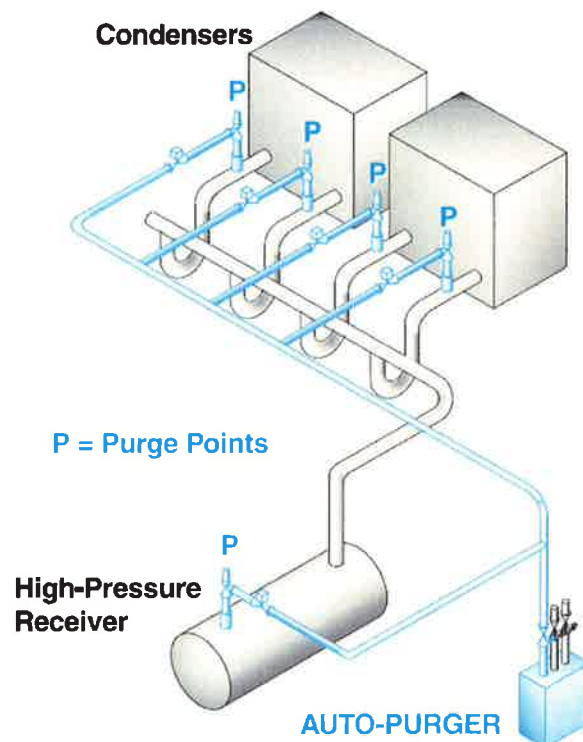
When multiple purge points are open simultaneously, air is purged from only the point with the highest pressure.

Multipoint purging

It is difficult to determine where air will collect in a system. There are typically several likely collection points. Multiple factors influence where air will collect. The number of condensers and receivers, condenser piping design, and component arrangement and operation all affect the location of air.

Seasonal weather can also affect where air collects. In hot summer weather, air may be driven to the lower-temperature, high-pressure receivers inside a building. In cold winter weather, the opposite may be true.

Therefore, it is important to purge from each possible air collection point one at a time. Multipoint purging is the only effective method to ensure complete air removal from the system.



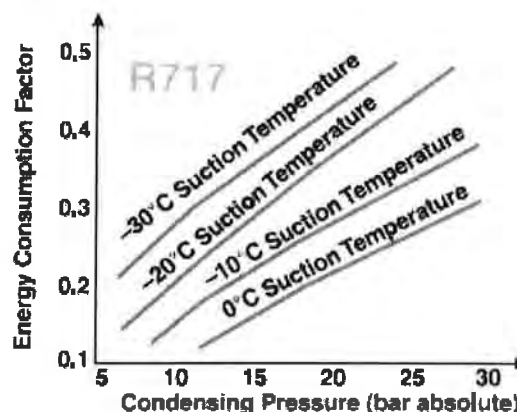
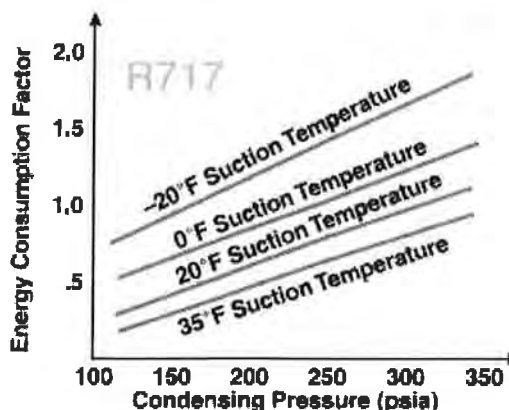
Cost Savings and Payback

Cost of air

The presence of air in a refrigeration system increases the condensing pressure. As a result, the power requirement of the compressor also increases. The chart to the right shows the relationship between condensing pressure and power consumption of the compressor for a typical ammonia system.

For every 10 psi (0.7 bar) increase in condensing pressure, there is approximately a 6% increase in power consumption by the compressors. This, in turn, means the amount of money required to operate the system also increases.

An AUTO-PURGER quickly and effectively removes all air from the system. Therefore, for every 10 psi (0.7 bar) decrease in condensing pressure resulting from the installation of an AUTO-PURGER there is approximately a 6% decrease in power consumption by the system.



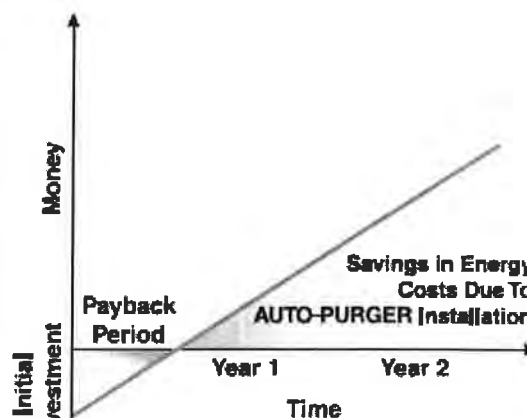
Energy consumption factor versus condensing pressure for an ammonia refrigeration system.

Return on investment

Since installing an AUTO-PURGER results in large savings in energy cost, the payback on the initial investment is very quick. For a typical installation, the payback is reached within one year.

Once the payback is reached, all of the money saved in energy cost represents a return on the initial investment. Since the payback is reached so quickly, the return is typically many times the cost associated with installing an AUTO-PURGER.

Year after year, the system condensing pressure is kept low by the AUTO-PURGER. In turn, energy costs are kept low resulting in more money added to profits.



Return on AUTO-PURGER investment.

$$\text{Savings} = \frac{P_a}{P_d} \times C \times H \times T \times M$$

P_a = Excess Pressure Due to Air
 P_d = Pure Refrigerant Condensing Pressure
 (In Absolute Pressure)
 C = System Capacity (Tons or kW)
 H = Energy Consumption Factor
 (From the Chart Below)
 T = Hours of Run-Time Per Year
 M = Electric Rate Per Kilowatt-Hour

Energy Consumption Factor

US Customary		
Refrigerant	Suction Temp	Factor
Ammonia	-20°F	1.03
	0°F	.80
	20°F	.62
	35°F	.40
R22	-20°F	1.11
	0°F	.80
	20°F	.59
	35°F	.42
R134a	-20°F	1.13
	0°F	.83
	20°F	.64
	35°F	.41

Calculating savings

To calculate the approximate annual savings that can be realized by installing an AUTO-PURGER, use the formula at the left. Simply enter the values and complete the computation. To determine the condensing pressure of pure refrigerant, refer to a pressure-temperature chart for the refrigerant used. An ammonia pressure-temperature chart is on page 7. To determine the excess pressure due to air, refer to the explanation and examples on page 7.

US Customary

The conditions for this example are:

Refrigerant: ammonia

Suction temperature: 0°F

Condensing temperature: 86°F

Excess pressure due to air (P_a): 17 psi

Pure refrigerant condensing pressure (P_d): 169.2 psia

System capacity (C): 1500 tons

Energy consumption factor (H): .80

Hours of run-time per year (T): 6500 hours

Electric rate per kilowatt-hour (M): .06 dollars

$$\frac{17 \text{ psi}}{169.2 \text{ psia}} \times 1500 \text{ tons} \times .80 \times 6500 \text{ hours} \times \$06/\text{kWhr}$$

$$= \$47,020/\text{year}$$

$$\text{Savings} = \frac{P_a}{P_d} \times C \times H \times T \times M$$

P_a = Excess Pressure Due to Air

P_d = Pure Refrigerant Condensing Pressure
(In Absolute Pressure)

C = System Capacity (Tons or kW)

H = Energy Consumption Factor
(From the Chart Below)

T = Hours of Run-Time Per Year

M = Electric Rate Per Kilowatt-Hour

Energy Consumption Factor

US Customary		
Refrigerant	Suction Temp	Factor
Ammonia	-20°F	1.03
	0°F	.80
	20°F	.52
	35°F	.40

10 F suction

FES Compressors 1 - 5 Model 1160 Total Run Hours for 2011 - 20,827

FES Compressor #6 Model 775 Run hours - 1224

Recip Comp: 31,331 tons 2011

Frick Model 1160 tons

P_a = 10 psi
 P_d = 169.2 psia
 C = 965.5 tons
 H = 0.66
 T = 20827 hours
 M = 1 kwh

Saving= 784373 KWH

Frick Model 775 tons

P_a = 10 psi
 P_d = 169.2 psia
 C = 756.3 tons
 H = 0.66
 T = 120 hours
 M = 1 kwh

Saving= 3540 KWH

Vilter Flash Compressors

Flash Gas, but they are running in the house mode which puts them around 150 tons each.

Design: 25 psi suction, 185 head

Actual: 24 - 25 psi suction, 150 - 160 head pressure

P_a = 10 psi
 P_d = 169.2 psia
 C = 150 tons
 H = 0.66
 T = 31331 hours
 M = 1 kwh

Saving= 183320 KWH

Total Saving= 971233 KWH



CENTURY MECHANICAL SOULTIONS
1554 CHASE AVE
CINCINNATI OH 45223

Your vendor number with us
134444

Please deliver to:
Miller Brewing Co.
Trenton Brewery
2525 Wayne Madison Road
Trenton OH 45067-9760

Del. terms: FOB Origin, Prepaid & Add
Payt. terms: Within 30 days Due net

Currency USD

Item	Material Order qty.	Description Unit	Price per unit	Taxable Net value
00001	147,528.76	Ammonia Purger System Upgrade \$\$	1.00 / 1 \$\$	Exempt 147,528.76
Technical/Information Contact Mark Woodyard --5138444120-				

Century mech will install a new Hansen Air Purging System as detailed below. It was noted at the time of thier site visit that the existing (2) Evapco condensers purge piping are not connected properly. Century will repipe these so these (2) condensers will purge air properly. It also was noted that the existing foul gas piping is installed incorrectly to all the condensers. The current piping arrangement traps liquid at each of the purge outlets on all of the Niagara condensers. When these units are purged liquid refrigerant as opposed to foul gas is delivered to the existing purger. With the new piping system that will be installed these problems will be eliminated. By having an automatic purging system there will be a system operational cost savings with continuous removal of air and non-condensables from the system. As the system head pressure is lowered less energy will be consumed.

Century to provide:

Authorized by:

Purchase order

PO number/date
100978509 / 10/04/2012

Revised PO Date
10/08/2012

Buyer/Telephone
Greg Huffner/513-844-4028

Our fax number
513-844-4195

Your person responsible
KEN WELLER

Mail Invoice To:
MillerCoors LLC
MillerCoors Accounts Payable
PO Box 3103
Milwaukee WI 53201-3103

PDF or electronic invoices must be sent to:
invoicereceipt@millercoors.com

Direct payment inquiries to Accounts Payable at
414-931-3513.

Delivery date: Day 12/28/2012

CENTURY MECHANICAL SOLUTIONS
1554 CHASE AVE
CINCINNATI OH 45223

PO number/date
100978509 / 10/04/2012

Page
2

Item	Material Order qty.	Description Unit	Price per unit	Taxable Net value
------	------------------------	---------------------	----------------	----------------------

Provide and install the following:

(3) Hansen Model AP24 Gas & Air Purgers
(66) Hansen Purge solenoid valves with coils
(3) Hansen safety relief valves
(86) Hansen 1# socket weld hand isolation valves
Suction, liquid, water, and drain piping and fittings
Insulation and jacketing on low temp piping
Foul gas piping from the existing evaporative condensers to the new purgers
Hangers and supports
ADDER: Provide touchscreen displays and power supplies

INCLUDED:

Demo of existing plant purger & piping
Labor
Crane
Rigging
Freight
Man lifts
Tools
Miscellaneous
Startup & checkout

Contact:

Doug Niehaus
Project Manager
Century Mechanical Solutions, Inc.
513-681-5700 office
513-681-5784 fax
513-265-8542 cell

00002		Purger Removal and Piping Relocate		Exempt
	30,000.00	\$\$	1.00 / 1 \$\$	30,000.00
Technical/Information Contact Mark Woodyard --5138444120-				

Removal and relocation of piping work related to Item #1.

Total net value excl. tax USD	177,528.76
Total tax	0.00

MillerCoors Standard Terms and Conditions are incorporated by this reference. MillerCoors expressly limits acceptance to the terms of this offer.

Payment Record

Standard PO 100978509 Created by Gregory Huffner

Document overview on Print preview Messages Personal settings

Standard PO 100978509 Vendor 134444 CENTURY MECHANICAL Doc. date 10/04/2012

Header															
Item	S.	Item	A	Material	Short text	PO quantity	O...	C Delv. date	Net price	Curr...	Per	O...	Matl Group	Pint	SLoc
1	2				Ammonia Purger System	147,528.76	12/28/2012		1.00 USD	1	44	MEEQ PR	08		
2	2				Purger Removal and Pip.	30,000.00	12/28/2012		1.00 USD	1	44	MTPD LP	08		

Item [1] Ammonia Purger System Upgrade

Material data Quantities/weights Delivery schedule Delivery Invoice Conditions Account assignment Purchase order history Texts Delivery ad...

T...	M/T	Material Do...	Item	Posting Date	Quantity	Delivery cost quantity	OUN	Ant. in loc. cur.	L. cur	Qty. in order pr. un.	DelCostQty (OPUn)	Or...
IR-L		6006236017	1	12/14/2012	42,528.76	0.00	\$\$	42,528.76	USD	42,528.76	0.00	4
IR-L		6006211060	1	12/10/2012	105,000.00	0.00	\$\$	105,000.00	USD	105,000.00	0.00	10
Tr./ev. Invoice receipt					147,528.76		\$\$	147,528.76	USD	147,528.76	0.00	14



The General Worksheet is part 2 of the application. Do not submit this file without submitting a completed Part1 Custom Application document file, which can be found at www.duke-energy.com. This worksheet is for all projects that are not easily submitted through one of the other worksheets

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

- Submitting this application does not guarantee an rebate will be approved.
- Rebates already decided to proceed.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications will not be reviewed; all fields are required.

Refer to the complete list of instructions and Disclaimers, found in the Mercantile Self Direct Custom Application Part 1 document.

Please enter your information and data into the cells that are shaded.
Cells in white are locked and cannot be written over.

Duke Energy Customer Contact Information (Match the information in Application Part 1):

Name	Mark S. Koch
Company	MillerCoor sLLC

Equipment Vendor / Project Engineer Contact Information

Name	Mark S. Koch , PE
Company	MillerCoors LLC

Before proceeding with the custom application, please verify that your project is not on the Self-Direct Prescriptive application.

The prescriptive rebate applications can be found at:

<http://www.duke-energy.com/ohio-large-business/smart-saver/mercantile-self-direct.asp>

Prescriptive rebate amounts are pre-approved.

List of Sites (Required)

App No.	
Rev.	

Provide a list of sites addressed by this custom rebate application

[illegible]

1 Site ID

Can be a store number, building name or other way to identify the location. If there is only one site involved in this application, then a Site ID is not necessary.

2 Account Numbers

Must match the facility of the proposed project(s). If there are multiple meters at a site, only include the meters that pertain to the project(s).



For each project, answer the following questions (use one worksheet per project)

Project Name: **Ammonia Purger**

How would you classify this project? (Place an x in all boxes that apply.)

Lighting	Heating/Cooling	Air Compressor	Energy Management System
VFD	Motors/Pumps	Process Equipment	Other, describe below:

Brief Project Description

Describe the Baseline (see note 3)	Equipment/System	Describe the Proposed High Efficiency Project
Original equipment installed in 1981 for ammonia refrigeration.		New Hanson Auto, detailed information attached.

If Existing Equipment is the Baseline, how many years of useful life remain or how many years until scheduled replacement? **10**

Detailed Project Description Attached? ☐ Yes (Required)

Operating Hours (see note 4)

24 x 7	Weekday		Saturday		Sunday		Weeks of Use in Year (see note 5)	Total Annual Hours of Use
	Start Hour	End Hour	Start Hour	End Hour	Start Hour	End Hour		
Yes								

Energy Savings

	Baseline (see Note 3)	Proposed	Savings	Describe how energy numbers were calculated
Annual Electric Energy	0 kWh	-971,233 kWh	971,233 kWh	
Electric Demand	0 kW	0 kW	0 kW	
Calculations attached	Yes	Yes	(Required)	Information attached

Simple Payback

Average electric rate (\$/kWh) on the applicable accounts (see note 6)	\$0.56
Estimated annual electric savings	\$543,890
Other annual savings in addition to electric savings, such as operations, maintenance, other fuels	
Incremental cost to implement the project (equipment & installation) (see note 7)	\$140,000.00
Copy of vendor proposal is attached (see note 8)	Yes
Simple Electric Payback in years (see note 9)	0.257404763
Total Payback in years	0.257404763

3 Baseline

Retrofit projects: the existing equipment is the baseline.
New construction projects: the baseline is the standard option in today's market, taking into account any applicable organizational, local, state or federal codes or standards currently in effect.

4 Operating Hours

Describe when the equipment is typically used. If the project is proposed for more than one site, provide any variations in operating hours between the sites on a separate sheet.

5 Weeks of Use in Year

If the equipment is not in use 52 weeks during the year (for example, during holiday or summer break), provide an explanation of when usage is not expected and why: **Facility operates 24/7 365**

6 Average electric rate (\$/kWh)

If you do not know your average electric rate, use \$0.10/kWh.

7 Incremental cost to implement the project

Costs exclude self installation costs. Retrofit projects, incremental cost is the total cost of the proposed project. New construction or where the existing equipment must be replaced anyway, then incremental cost is the premium of the proposed high efficiency project over baseline.

8 Copy of vendor invoice is attached

Vendor invoices detailing costs of the project are always required.
New construction projects or where the existing equipment must be replaced anyway, vendor proposal of baseline must also be attached.

9 Simple Electric Payback

If the simple electric payback is less than 1 year, the rebate structure is affected. Double check average electric rate for correct payback.