



Public Utilities Commission

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

Case No.: 13-0456-EL-EEC

Mercantile Customer: Great Lakes Cheese, Co.

Electric Utility: The Cleveland Electric Illuminating Company

Program Title or
Description: Lighting Retrofit

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: Great Lakes Cheese, Co.

Principal address: 17825 Great Lakes Parkway, Hiram Ohio, 44234

Address of facility for which this energy efficiency program applies: 17825 Great Lakes Parkway, Hiram Ohio, 44234

Name and telephone number for responses to questions: Arthur Butt, 440.834.2500

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. (Please attach 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: The Cleveland Electric Illuminating Company

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)). **If Checked, Please see Exhibit 1 and Exhibit 2**
- ☐ 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: 897,292 kWh

- 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. **Please see Exhibit 1 if applicable**

- 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. **Please see Exhibit 1 if applicable**

- 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?

12/29/2010

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

90 kW

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 \$32,449. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

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: **See Exhibit 3** (Skip to Subsection 2.)

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

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

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The 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 **See Exhibit 3**

The utility's program costs were **See Exhibit 3**

The utility's incentive costs/rebate costs were **See Exhibit 3**

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.
- 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.



Public Utilities Commission

Application to Commit
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Reduction Programs
(Mercantile Customers Only)

Case No.: 13-0456-EL-EEC

State of Ohio :

Arthur Butt, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Great Lakes Cheese, Co.

[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.

Arthur Butt - Maintenance Supervisor
Signature of Affiant & Title

Sworn and subscribed before me this 25 day of February, 2013 Month/Year

[Signature]
Signature of official administering oath

LORENE A. KOSAKOWSKI
Print Name and Title NOTARY

My commission expires on DEC. 10, 2017



Customer Legal Entity Name: Great Lakes Cheese Co.
Site Address: Hiram
Principal Address: 17825 Great Lakes Parkway

Project No.	Project Name	Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment:	Description of methodologies, protocols and practices used in measuring and verifying project results	What date would you have replaced your equipment if you had not replaced it early? Also, please explain briefly how you determined this future replacement date.	Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.
1	Lighting Retrofit	The retrofit of the plant lighting included repalcing 421- 400 watt metal halide fixtures with new fixtures. The new fixtures included 3, 4, and 6 lamp T5HO fixtures with electronic ballasts. Also- 60 dock bay fixtures were intalled with Leviton high bay passive infra red occupancy sensors.	Lighting inventory was performed with pre & post ECM fixture consumption and demand utilized in school. Specified retrofits and replacements of the existing fixtures. Electrical Usage (kWh) = (Number of fixtures x watts per fixture x Operating hours). Electrical Demand (kWd) = (Number of fixtures x watts per fixture) ; Electrical Energy Cost = (kWh x \$/kwh) ; Existing KWh - Retrofit KWh = Savings. See Great Lakes Cheese_Hiram_Lighting Rebate Calculator for details. Measurement and Verification is based on IPMVP Option A. Calculations based on physical assessment of operational factors and commonly accepted usage assumptions.	N/A	N/A

Exhibit 2

Customer Legal Entity Name: Great Lakes Cheese Co.

Site Address: Hiram

Principal Address: 17825 Great Lakes Parkway

	Unadjusted Usage, kwh (A)	Weather Adjusted Usage, kwh (B)	Weather Adjusted Usage with Energy Efficiency Addbacks, kwh (c) <i>Note 1</i>
2011	12,893,192	12,893,192	13,790,484
2010	11,341,616	11,341,616	11,348,991
2009	10,364,220	10,364,220	10,364,220
Average	11,533,009	11,533,009	11,834,565

Project Number	Project Name	In-Service Date	Project Cost \$	50% of Project Cost \$	KWh Saved/Year (D) counting towards utility compliance	KWh Saved/Year (E) eligible for incentive	Utility Peak Demand Reduction Contribution, KW (F)	Prescriptive Rebate Amount (G) \$	Eligible Rebate Amount (H) \$ <i>Note 2</i>	Commitment Payment \$
1	Lighting Retrofit	12/29/2010	\$214,033	\$107,017	897,292	897,292	90	\$43,265	\$32,449	
					-	-	-			
					-	-	-			
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					-	-	-			
					-	-	-			
	Total		\$214,033		897,292	897,292	90	\$43,265	\$32,449	\$0

Docket No. 13-0456

Site: 17825 Great Lakes Parkway

Notes

(1) Customer's usage is adjusted to account for the effects of the energy efficiency programs included in this application. When applicable, such adjustments are prorated to the in-service date to account for partial year savings.

(2) The eligible rebate amount is based upon 75% of the rebates offered by the FirstEnergy Commercial and Industrial Energy Efficiency programs or 75% of \$0.08/kWh for custom programs for all energy savings eligible for a cash rebate as defined in the PUCO order in Case NO.10-834-EL-EEC dated 9/15/2010, not to exceed the lesser of 50% of the project cost or \$250,000 per project. The rebate also cannot exceed \$500,000 per customer per year, per utility service territory.

Exhibit 3 Utility Cost Test

UCT = Utility Avoided Costs / Utility Costs

Project	Total Annual Savings, MWh (A)	Utility Avoided Cost \$/MWh (B)	Utility Avoided Cost \$ (C)	Utility Cost \$ (D)	Cash Rebate \$ (E)	Administrator Variable Fee \$ (F)	Total Utility Cost \$ (G)	UCT (H)
1	897	\$ 308	\$ 276,617	\$ 4,050	\$32,449	\$8,973	\$ 45,472	6.1
Total	897	\$ 308	276,617	4,050	\$32,449	\$8,973	45,472	6.1

Notes

- (A) From Exhibit 2, = kWh saved / 1000
- (B) This value represents avoided energy costs (wholesale energy prices) from the Department of Energy, Energy Information Administration's 2009 Annual Energy Outlook (AEO) low oil prices case. The AEO represents a national average energy price, so for a better representation of the energy price that Ohio customers would see, a Cinergy Hub equivalent price was derived by applying a ratio based on three years of historic national average and Cinergy Hub prices. This value is consistent with avoided cost assumptions used in EE&PDR Program Portfolio and Initial Benchmark Report, filed Dec 15, 2009 (See Section 8.1, paragraph a).
- (C) = (A) * (B)
- (D) Represents the utility's costs incurred for self-directed mercantile applications for applications filed and applications in progress. Includes incremental costs of legal fees, fixed administrative expenses, etc.
- (E) This is the amount of the cash rebate paid to the customer for this project.
- (F) Based on approximate Administrator's variable compensation for purposes of calculating the UCT, actual compensation may be less.
- (G) = (D) + (E) + (F)
- (H) = (C) / (G)

Great Lakes Cheese Co. ~ Hiram
Docket No. 13-0456

Site: 17825 Great Lakes Parkway

Lighting Inventory Form

Applicant Name: _____

Facility Name: _____

Date: _____

Instructions: Please use one line for each fixture type in a room or area.

For existing or proposed control, choose OCC for Occupancy Sensor, DAYLTO for photosensor, or NONE for none. Controls must save energy to qualify.

The total of Column S, the quantities of CFLs and exit signs in Column M, and the quantities of sensors in Column R, will be used to calculate your incentive on the NonStandard Lighting form.

[illegible]

PROJECT BASIC INFORMATION				PRE-INSTALLATION				POST-INSTALLATION				ENERGY CALCULATIONS																									
Line Item	Building Address	Floor	Area Description	Interior or Exterior Fixture	Predecessor Space Type	Area Coding	Pre Fixture Qty	Pre Fixture Code	Pre Watts Fixture (W)	Pre Vol / Space (V)	Existing Control and dim	Existing Sensor Quantity (see notes)	Pre Fixture Qty	Post Fixture Code	Post Watts Fixture (W)	Post Vol / Space (V)	Predefined Control and dim	Proposed Sensor Quantity (see notes)	Fixture Change (in Controlled Load (W) including CFLs or LED Signs)	Fixture Change in Controlled Load (W) including CFLs or LED Signs	Change in Controlled Load (W) CFL or LED and signs	Applicable Efficiency Factor (EF) Estimate	Correction Factor	Interruption Factor (demand)	Dimmable Factor (energy)	Pre Controls Factor	Post Controls Factor	Fixture Demand Savings (W) including CFLs or LED Signs	Fixture Demand Savings (W) including CFLs or LED Signs	Applicable Fixture Load Factor (FLF) Estimate	Predefined Fixture Load Factor	Annual Interior Fixture Load Savings (including CFLs or LED Signs)	Annual Exterior Fixture Load Savings (including CFLs or LED Signs)	Annual Signage Fixture Load Savings (CFLs or LED only)	Annual EER Based Fixture Load Savings (EER only)	Post Fixture Load Number	
133											NONE						NONE																				
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Project Estimated Annual Savings Summary

Estimated Annual kWh Savings	897,292
Total Change in Connected Load	89.66

Annual Estimated Cost Savings	\$89,729.20
Annual Operating Hours	8,548

Interior Lighting Incentive @ \$0.05/kWh (excluding retrofit CFLs, sensors, or LED exit signs)	\$41,765.25
Exterior Lighting Incentive @ \$0.05/kWh (excluding retrofit CFLs, sensors, or LED exit signs)	\$0.00
Total retrofit CFL Incentive @ \$1/screw-in CFL lamp; \$15/hard-wired CFL lamp (includes all retrofit CFLs, both interior and exterior)	\$0.00
Total retrofit LED Exit Incentive @ \$10/exit sign	\$0.00
Total Lighting Controls Incentive @ \$25/sensor (includes all Lighting Controls, both interior and exterior)	\$1,500.00

Total Calculated Incentive	\$43,265.25
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Total Fixture Quantity excluding retrofit CFLs and LED Exit Sign	421
Total Lamp Quantity for retrofit Screw-In CFLs	0
Total Lamp Quantity for retrofit Hard-Wired CFLs	0
Total Fixture Quantity for retrofit LED Exit Signs	0
Total Quantity for Occupancy Sensors	60
Total Quantity for Daylight Sensors	0

Please briefly describe how you estimated your coincidence factor (CF) and applicant equivalent full-load hours (EFLH) for facility type "Other" indicated on the Lighting Form tab

Demand Savings (For Internal Use Only)

115.97



20949

Product Information Bulletin

PENTRON® ECO® & PENTRON® HO ECO®

T5 Linear Fluorescent Lamps



- High Performance T5 lamps
 - 104 LPW max. for PENTRON ECO
 - 94 LPW max. for PENTRON HO ECO
 - Designed for high frequency electronic ballasts
- Designed to pass Federal TCLP test*
- Nominal 2', 3', 4', and 5'
 - Approx. 2" shorter than T8 lengths
- Miniature Bi-Pin base
- 3000K, 3500K, 4100K, 5000K, 6500K, 85 CRI
- 93% lumen maintenance
- FP54 average rated life increased:
 - 35,000 hrs. @12 hours/start
 - 25,000 hrs. @3 hours/start
 - all others rated for 20,000 hrs. @3 hours/start
- Greater luminaire design flexibility
- Peak lumen output at 35°C (95°F)

SYLVANIA PENTRON ECO and PENTRON HO ECO —
A new product line of slender, 5/8" diameter, T5 linear
fluorescent lamps with improved system performance
characteristics compared to T8 & T12 technology.

Engineered with thermal characteristics which provide improved lumen output in luminaires. PENTRON ECO brings increased design opportunities for unique, highly efficient, low profile lighting.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.



* Regulations may vary. Check your local and state regulations.

Product Availability

Wattage		Lamp Length	
PENTRON	PENTRON HO	Nominal	MOL
14W	24W	~2ft	563.2 mm (22.17")
21W	39W	~3ft	863.2 mm (33.89")
28W	54W	~4ft	1163.2 mm (48.50")
35W	80W	~5ft	1463.2 mm (57.61")

Application Information

Applications

Indirect
Shallow recessed
Cove and valance
Low profile surface mount
Sign lighting
Showcase lighting
Any place controlled, high-efficiency light is desired

Application Notes

1. PENTRON ECO and PENTRON ECO HO lamps are about 2" shorter than T8 & T12 bi-pin lamps.
2. Miniature Bi-Pin bases will not install into T8 & T12 sockets.
3. Miniature Bi-Pin bases require UL Listed 600 Volt rated sockets.
4. Requires high frequency programmed rapid start electronic ballasts for T5s equipped with end-of-life sensing circuit.
5. PENTRON ECO (not PENTRON HO ECO) operates at same current for uniform color and brightness between nominal 2', 3', 4', and 5' lengths.
6. Apply thermal factor in calculations for use in exterior or unheated applications.

Sample Specification

Lamps shall be PENTRON® ECO® T5 lamps having miniature bi-pin bases and minimum of 93% lumen maintenance. Lamps shall have a correlated color temperature of (3000K, 3500K, 4100K, 5000K & 6500K) and a Color Rendering Index of 85. The PENTRON ECO T5 lamps shall be operated on dedicated QUICK-TRONIC® PS ballasts having a primary voltage of (120V, 277V) with complete system warranty from the manufacturer covering lamps and ballasts.

Lamps shall be PENTRON T5 HO ECO lamps having miniature bi-pin bases and a minimum of 93% lumen maintenance. Lamps shall have a correlated color temperature of (3000K, 3500K, 4100K, 6500K) and a CRI of 85. The PENTRON T5 HO ECO lamps shall be operated on dedicated QUICKTRONIC PHO ballasts having a primary voltage of (120V, 277V) with complete system warranty from the manufacturer covering lamps and ballasts.

System Comparison 20949

T12/SS vs. OCTRON T8 vs. PENTRON ECO T5

Lamp	Lamp Type	# Lamps	Ballast	BF	System Watts	Initial System Lumens	Lumen Maint.	Mean System Lumens	Relative Light Output	Mean System LPW
F40T12CW/SS	T12	2	Magnetic	0.88	72	4660	0.85	3960	100%	55
F032/841	T8	2	System 32	0.90	59	5310	0.92	4890	123%	83
FP28/841	T5	2	System PS	1.0	62	5200	0.93	4836	122%	78
FP54/841/HO/ECO	T5	1	System PHO	1.0	61	4450	0.93	4140	105%	68

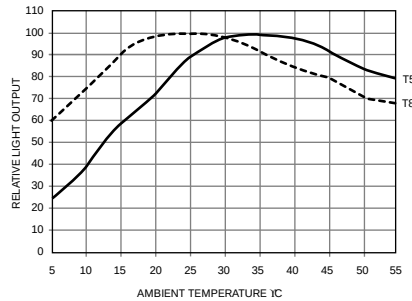
T12HO/SS vs. OCTRON T8 vs. PENTRON T5 HO ECO

Lamp	Lamp Type	# Lamps	Ballast	BF	System Watts	Initial System Lumens	Lumen Maint.	Mean System Lumens	Relative Light Output	Mean System LPW
F96T12/CW/HO/SS	T12	1	Magnetic	0.94	122	7520	0.82	6170	100%	51
F096/841	T8	1	System 59	1.13	70	6670	0.92	6140	100%	88
FP80/841/HO/ECO	T5	1	System PHO	1.0	89	6150	0.93	5720	93%	64

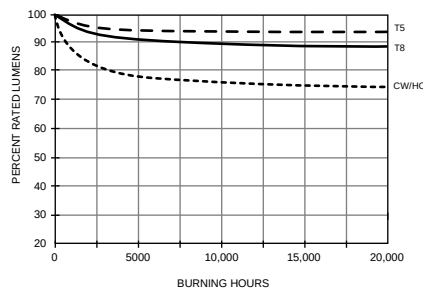
* Comparison at 25°C

Technical Information

Lumen Output vs. Temperature T8/T5

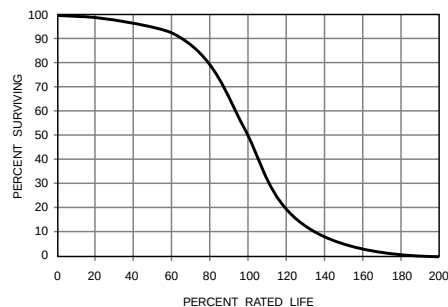


Fluorescent Lamp Lumen Maintenance

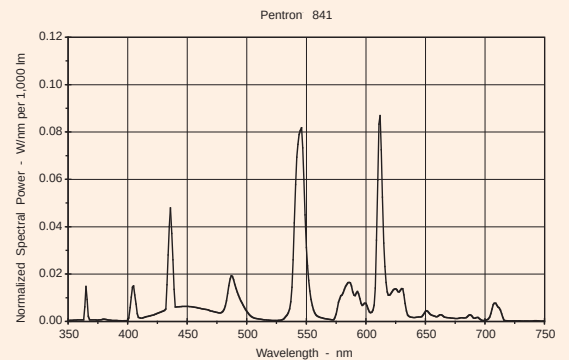
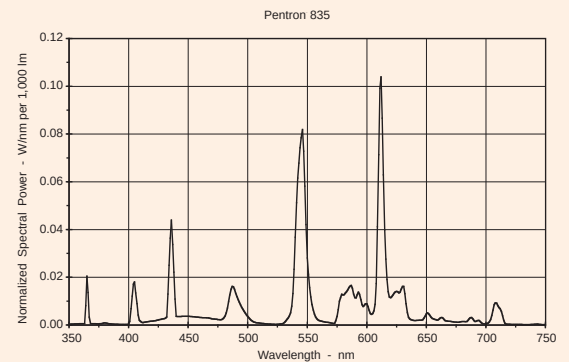
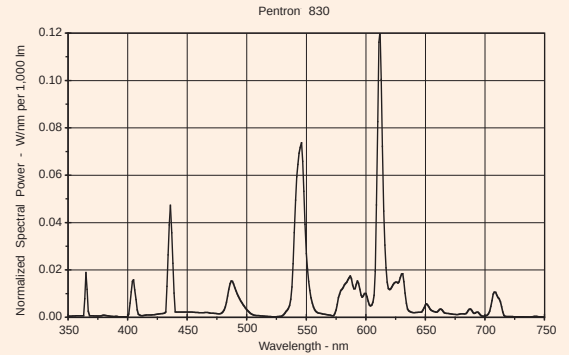


* Lumen output continues to decrease throughout the life of a fluorescent lamp.

Typical Fluorescent Lamp Mortality



Spectral Power Distributions



Specify Performance

OSRAM SYLVANIA offers an Exclusive System Warranty: QUICK 60+® LIMITED WARRANTY

One of the key benefits of the OSRAM SYLVANIA PENTRON ECO & PENTRON HO ECO lamps is the operation of the lamps on an electronic ballast. QUICKTRONIC PS & QUICKTRONIC PHO ballasts operate the lamps at full light output with optimal system performance. But more importantly, you receive the benefits of the most comprehensive system warranty in the business.

What is covered:

FP54/800HO/ECO lamps for up to 36 months

All other PENTRON ECO and PENTRON HO ECO lamps for up to 24 months

QUICKTRONIC PS & QUICKTRONIC PHO ballasts for up to 60 months

If lamps are group re-lamped the lamp warranty can be renewed for an additional period.

See the QUICK 60+ Warranty Guide for additional information.

Key Ballast Features

100% ballast factor

- QUICKSENSE® technology, (end-of-lamp-life sensing)
- PROStart™, optimal starting conditions that provides up to 100,000 switching cycles for use on occupancy sensors and building control systems
- High Power Factor, (>98%)
- Low Harmonic Distortion, (<10%, with inrush limiting circuitry)
- Starting Temperature: 0°F
- Remote Mounting Distance up to 19 feet, depending on model
- Dimming ballast available: System 54PHO-DIM

See OSRAM SYLVANIA's "BALLAST TECHNOLOGY & SPECIFICATION GUIDE" for further details.

System Performance Guide*

QUICKTRONIC PS ELECTRONIC PENTRON FLUORESCENT SYSTEMS

Item Number	Description	Voltage VAC	Lamp** Type	Rated Lumens* (LM)	No. of Lamps	Ballast Factor (BF)	System Lumens*	Input Wattage (W)	System Efficacy* (lm/W)
49681	QTP1X28/120PSN-E	120	FP28T5/800/ECO	2600	1	1.00	2600	32	81
49682	QTP1X28/277PSN-E	277	FP28T5/800/ECO	2600	1	1.00	2600	32	81
49683	QTP2X28/120PSN-E	120	FP28T5/800/ECO	2600	2	1.00	5200	62	84
49684	QTP2X28/277PSN-E	277	FP28T5/800/ECO	2600	2	1.00	5200	62	84
50890	QTP1X28/120PSN-F	120	FP28T5/800/ECO	2600	1	1.00	2600	32	81
50900	QTP1X28/277PSN-F	277	FP28T5/800/ECO	2600	1	1.00	2600	31	84
50910	QTP2X28/120PSN-F	120	FP28T5/800/ECO	2600	2	1.00	5200	66	79
50920	QTP2X28/277PSN-F	277	FP28T5/800/ECO	2600	2	1.00	5200	65	80

QUICKTRONIC PHO ELECTRONIC PENTRON HO FLUORESCENT SYSTEMS

Item Number	Description	Voltage VAC	Lamp** Type	Rated Lumens* (LM)	No. of Lamps	Ballast Factor (BF)	System Lumens*	Input Wattage (W)	System Efficacy* (lm/W)
49631	QTP1X39-24/120PSN-E	120	FP24T5/HO/800/ECO	1750	1	1.00	1750	28	63
49632	QTP1X39-24/277PSN-E	277	FP24T5/HO/800/ECO	1750	1	1.00	1750	27	65
49633	QTP2X39-24/120PSN-E	120	FP24T5/HO/800/ECO	1750	2	1.00	3500	54	65
49634	QTP2X39-24/277PSN-E	277	FP24T5/HO/800/ECO	1750	2	1.00	3500	53	66
49631	QTP1X39-24/120PSN-E	120	FP39T5/HO/800/ECO	3100	1	1.00	3100	42	74
49632	QTP1X39-24/277PSN-E	277	FP39T5/HO/800/ECO	3100	1	1.00	3100	42	74
49633	QTP2X39-24/120PSN-E	120	FP39T5/HO/800/ECO	3100	2	1.00	6200	87	71
49634	QTP2X39-24/277PSN-E	277	FP39T5/HO/800/ECO	3100	2	1.00	6200	85	73
49651	QTP1X54/120PSN-E	120	FP54T5/HO/800/ECO	4450	1	1.00	4450	62	72
49652	QTP1X54/277PSN-E	277	FP54T5/HO/800/ECO	4450	1	1.00	4450	61	73
49653	QTP2X54/120PSN-E	120	FP54T5/HO/800/ECO	4450	2	1.00	8900	120	74
49654	QTP2X54/277PSN-E	277	FP54T5/HO/800/ECO	4450	2	1.00	8900	117	76
49660	QTP1X80/120PSN-E	120	FP80T5/HO/800/ECO	6150	1	1.00	6150	91	68
49670	QTP1X80/277PSN-E	277	FP80T5/HO/800/ECO	6150	1	1.00	6150	90	68

* Comparison at 25°C for 830, 835 & 841 lamps. Lumens slightly lower for 850 and 865 lamps.

** Also compatible with other manufacturers' equivalent lamp types that meet ANSI standards.

20949

Ordering and Specification Information

PENTRON

Item Number	Ordering Abbreviation	Base	Watts	Initial Lumens @25°C	Initial Lumens @35°C	Bulb	MOL (mm)	Average Rated Life (hours)*	Color Temp	CRI
20907	FP14/830/ECO	Miniature Bi-Pin	14	1200	1350	T-5	563.2	20,000	3000K	85
20908	FP14/835/ECO	Miniature Bi-Pin	14	1200	1350	T-5	563.2	20,000	3500K	85
20914	FP14/841/ECO	Miniature Bi-Pin	14	1200	1350	T-5	563.2	20,000	4100K	85
20988	FP14/865/ECO	Miniature Bi-Pin	14	1100	1300	T-5	563.2	20,000	6500K	85
20919	FP21/830/ECO	Miniature Bi-Pin	21	1900	2100	T-5	863.2	20,000	3000K	85
20921	FP21/835/ECO	Miniature Bi-Pin	21	1900	2100	T-5	863.2	20,000	3500K	85
20924	FP21/841/ECO	Miniature Bi-Pin	21	1900	2100	T-5	863.2	20,000	4100K	85
20989	FP21/865/ECO	Miniature Bi-Pin	21	1750	2000	T-5	863.2	20,000	6500K	85
20868	FP28/830/ECO	Miniature Bi-Pin	28	2600	2900	T-5	1163.2	20,000	3000K	85
20901	FP28/835/ECO	Miniature Bi-Pin	28	2600	2900	T-5	1163.2	20,000	3500K	85
20902	FP28/841/ECO	Miniature Bi-Pin	28	2600	2900	T-5	1163.2	20,000	4100K	85
22203	FP28/850/ECO	Miniature Bi-Pin	28	2545	2840	T-5	1163.2	20,000	5000K	85
20990	FP28/865/ECO	Miniature Bi-Pin	28	2400	2750	T-5	1163.2	20,000	6500K	85
20925	FP35/830/ECO	Miniature Bi-Pin	35	3300	3650	T-5	1463.2	20,000	3000K	85
20926	FP35/835/ECO	Miniature Bi-Pin	35	3300	3650	T-5	1463.2	20,000	3500K	85
20927	FP35/841/ECO	Miniature Bi-Pin	35	3300	3650	T-5	1463.2	20,000	4100K	85

*Based on 3 hrs. per start on electronic programmed start

PENTRON HO

Item Number	Ordering Abbreviation	Base	Watts	Initial Lumens @25°C	Initial Lumens @35°C	Bulb	MOL (mm)	Average Rated Life (hours)*	Color Temp	CRI
20928	FP24/830/HO/ECO	Miniature Bi-Pin	24	1750	2000	T-5	563.2	20,000	3000K	85
20929	FP24/835/HO/ECO	Miniature Bi-Pin	24	1750	2000	T-5	563.2	20,000	3500K	85
20931	FP24/841/HO/ECO	Miniature Bi-Pin	24	1750	2000	T-5	563.2	20,000	4100K	85
20932	FP39/830/HO/ECO	Miniature Bi-Pin	39	3100	3500	T-5	863.2	20,000	3000K	85
20933	FP39/835/HO/ECO	Miniature Bi-Pin	39	3100	3500	T-5	863.2	20,000	3500K	85
20934	FP39/841/HO/ECO	Miniature Bi-Pin	39	3100	3500	T-5	863.2	20,000	4100K	85
20903	FP54/830/HO/ECO	Miniature Bi-Pin	54	4450	5000	T-5	1163.2	25,000 ¹	3000K	85
20904	FP54/835/HO/ECO	Miniature Bi-Pin	54	4450	5000	T-5	1163.2	25,000 ¹	3500K	85
20906	FP54/841/HO/ECO	Miniature Bi-Pin	54	4450	5000	T-5	1163.2	25,000 ¹	4100K	85
20949	FP54/850/HO/ECO	Miniature Bi-Pin	54	4360	4900	T-5	1163.2	25,000 ¹	5000K	85
20862	FP54/865/HO/ECO	Miniature Bi-Pin	54	4050	4750	T-5	1163.2	25,000 ¹	6500K	85
20935	FP80/830/HO/ECO	Miniature Bi-Pin	80	6150	7000	T-5	1463.2	20,000	3000K	85
20936	FP80/835/HO/ECO	Miniature Bi-Pin	80	6150	7000	T-5	1463.2	20,000	3500K	85
20937	FP80/841/HO/ECO	Miniature Bi-Pin	80	6150	7000	T-5	1463.2	20,000	4100K	85

*Based on 3 hrs. per start on electronic programmed rapid start

1. Average life for FP54 lamps at 12 hrs. per start on electronic programmed rapid start ballasts is 35,000 hrs.

Ordering Guide

PENTRON FP28/830

FP	28	/	8	30	/	ECO
Fluorescent	Wattage:		8 = 85 CRI	30 = 3000K		ECOLOGIC®
PENTRON T5	14, 21, 28			35 = 3500K, 41 = 4100K		
	or 35 watts			50 = 5000K, 65 = 6500K		

PENTRON HO FP54/830/HO

FP	80	/	8	30	/	HO	/	ECO
Fluorescent	Wattage:		8 = 85 CRI	30 = 3000K		High Output		ECOLOGIC®
PENTRON T5 HO	24, 39, 54			35 = 3500K, 41 = 4100K				
	or 80 watts			50 = 5000K, 65 = 6500K				

Dimensions



Ordering Abbreviation	(A) Max. Overall Length mm (in)	(B) Base Face to Opposite Pin mm (in)	(C) Base Face to Base Face mm (in)	(D) Max. Outside Diameter mm (in)
FP14 & FP24/HO	563.2 (22.17)	553.7 - 556.1 (21.80 - 21.89)	547.1 - 549.0 (21.54 - 21.61)	17.0 (0.67)
FP21 & FP39/HO	863.2 (33.89)	853.7 - 856.1 (33.61 - 33.70)	847.1 - 849.0 (33.35 - 33.43)	17.0 (0.67)
FP28 & FP54/HO	1163.2 (45.80)	1153.7 - 1156.1 (45.42 - 45.52)	1147.1 - 1149.0 (45.16 - 45.24)	17.0 (0.67)
FP35 & FP80/HO	1463.2 (57.61)	1453.7 - 1456.1 (57.23 - 57.33)	1447.1 - 1449.0 (56.97 - 57.05)	17.0 (0.67)

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The right fit for your high-output applications

Philips Advance programmed-start Centium® ballasts for T5HO lamps are available for a wide variety of applications

No matter what the conditions require, operating at a variety of line voltages between 120V to 480V, whether located in high ambient temperature environments (requiring a 90°C rating) or not, if you desire hi-low switching options for improved energy efficiency (4-lamp models only), our family of Philips Advance Centium ballasts for T5HO lamps are ideal for a wide variety of applications.

All of these ballasts utilize programmed-start circuitry which provides extended lamp life in frequent switching applications like those associated with the use of occupancy sensors or motion detectors. These ballasts additionally feature IntelliVolt® multiple voltage technology, auto-restrike capability, and lamp End-Of-Life (EOL) protection circuitry which safely removes power from the lamp upon failure.

Our ballasts for T5HO lamps are the optimal choice for a broad range of retail, commercial and institutional and industrial applications including; warehouses, manufacturing, schools, offices, and speciality and department stores. For additional energy saving opportunities Philips Advance T5HO ballasts are

compatible with energy saving lamps. For specific lead lengths visit our e-catalog at www.philips.com/advance.

Programmed Start

- Potentially extends lamp life in frequent switching applications such as occupancy sensors or daylight harvesting.

-20°F Starting Capability (-29°C)

- Suitable for cold temperature applications (54W models only).

High-Low Switching on 4-Lamp Models

- Allows for easy switching from 4-lamps to 2-lamps with just one ballast.

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No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F /°C)	Dim.	Wiring Diag.
F24T5/HO (24W)											
1	120-277	PS	Centium	ICN-2S24+	27	1.02	10	0.23 - 0.10	0/-18	D	73
				ICN-2S39	29	1.12	15	0.25 - 0.12			
2	120-277	PS	Centium	ICN-2S24+	52	1.00	10	0.44 - 0.19	0/-18	D	74
				ICN-2S39	55	1.10	10	0.47 - 0.21			
F39T5/HO (39W)											
1	120-277	PS	Centium	ICN-2S24+	40	0.90	10	0.34 - 0.15	0/-18	D	73
				ICN-2S39	43	1.02	10	0.36 - 0.16			
2	120-277	PS	Centium	ICN-2S39	87-85	1.00	10	0.73 - 0.31	0/-18	D	74
F54T5/HO (49W)											
1	120-277	PS	Centium	ICN-2S54+	58	1.02	10	0.49-0.21	-20/-29	D	73
				ICN-2S54-90C+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	58	1.02	10	0.18-0.13		L	73
2	120-277	PS	Centium	ICN-2S54+	112-109	1.00	10	0.93-0.40	-20/-29	D	74
				ICN-2S54-90C+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	112-109	1.00	10	0.35-0.25		L	74
3	120-277	PS	Centium	ICN-4S54-90C-2LS	168-165	1.00	10	1.52-0.66	-20/-29	G	75
				ICN-4S54-90C-2LS-G							
	347-480			HCN-4S54-90C-2LS-G	175-172	1.00	10	0.54-0.39			
4	120-277	PS	Centium	ICN-4S54-90C-2LS	222-216	1.00	10	2.00-0.86	-20/-29	G	75A
				ICN-4S54-90C-2LS-G							
	347-480			HCN-4S54-90C-2LS-G	223-218	1.00	10	0.69-0.50			
F54T5/HO (54W)											
1	120-277	PS	Centium	ICN-2S54+	62	1.02	10	0.52-0.23	-20/-29	D	73
				ICN-2S54-90C+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	62	1.02	10	0.18-0.13		L	
2	120-277	PS	Centium	ICN-2S54+	120-117	1.00	10	1.00-0.43	-20/-29	D	74
				ICN-2S54-90C+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	120-119	1.00	10	0.35-0.25		L	74
3	120-277	PS	Centium	ICN-4S54-90C-2LS	182-179	1.00	10	1.52-0.66	-20/-29	G	75A
				ICN-4S54-90C-2LS-G							75
	347-480			HCN-4S54-90C-2LS-G	188-186	1.04	10	0.54-0.39			
4	120-277	PS	Centium	ICN-4S54-90C-2LS	240-234	1.00	10	2.00-0.86	-20/-29	G	75
				ICN-4S54-90C-2LS-G							
347-480	HCN-4S54-90C-2LS-G	239-237	1.00	10	0.69-0.50						
F80T5/HO (80W)											
1	120-277	PS	Centium	ICN-1S80	91-89	1.00	10	0.76-0.33	0/-18	D	73
FT24W/2GII - 24/27W (PL-L24W, F27BX/RS, FT24DL)											
1	120-277	PS	Centium	ICN-2S24+	27	1.02	10	0.23-0.10	0/-18	D	73
				ICN-2S39	29	1.12	15	0.24-0.12			
2	120-277	PS	Centium	ICN-2S24+	52	1.00	10	0.44-0.19		D	74A
				ICN-2S39	54	1.10	10	0.46-0.20			

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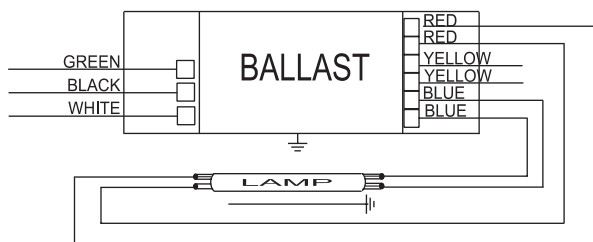
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No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F /°C)	Dim.	Wiring Diag.	
FT36W/2GII - 36/39W (PL-L36W, F39BX/RS, FT36DL)												
1	120-277	PS	Centium	ICN-2S24+	34	0.90	10	0.29-0.13	0/-18	D	73	
				ICN-2S39	36	0.96	15	0.30-0.13				
				ICN-2S54+	46	1.22	20	0.39-0.18	-20/-29			B
				ICN-2S54-90C+								
				ICN-2S54-90C-SC								
	347-480			HCN-2S54-90C-WL	46	1.22	15	0.13-0.10	L	73		
2	120-277	PS	Centium	ICN-2S39	69	0.94	10	0.59-0.25	0/-18	D	74A	
				ICN-2S54+	89-86	1.20	10	0.75-0.32				-20/-29
				ICN-2S54-90C+								
				ICN-2S54-90C-SC								
				347-480	HCN-2S54-90C-WL	89	1.20	10	0.26-0.19	L		
	3			120-277	PS	Centium	ICN-4S54-90C-2LS	133-132	1.20	10	1.11-0.49	-20/-29
ICN-4S54-90C-2LS-G												
347-480		HCN-4S54-90C-2LS-G	137-135	1.20			10	0.40-0.29				
4		120-277	PS	Centium			ICN-4S54-90C-2LS	176-173	1.20	10	1.47-0.64	
	ICN-4S54-90C-2LS-G											
	347-480	HCN-4S54-90C-2LS-G			182-180	1.20	10	0.53-0.38				
	FT50W/2GII/RS - 50W (PL-L50W, F50BX/RS)											
1	120-277	PS	Centium	ICN-2S54+	61	1.12	15	0.51-0.23	-20/-29	D	73	
	ICN-2S54-90C+											
	ICN-2S54-90C-SC											
	347-480			HCN-2S54-90C-WL	61	1.12	10	0.18-0.13		L		
2	120-277	PS	Centium	ICN-2S54+	118-115	1.10	10	0.99-0.43	-20/-29	D	74A	
	ICN-2S54-90C+											
	ICN-2S54-90C-SC											
	347-480			HCN-2S54-90C-WL	118	1.10	10	0.34-0.25		L		
3	120-277	PS	Centium	ICN-4S54-90C-2LS	178-175	1.10	10	1.49-0.65	-20/-29	E	75A	
	ICN-4S54-90C-2LS-G											
	347-480			HCN-4S54-90C-2LS-G	185-183	1.10	10	0.54-0.39				
4	120-277	PS	Centium	ICN-4S54-90C-2LS	235-230	1.10	10	1.96-0.84	-20/-29	E	75	
	ICN-4S54-90C-2LS-G											
	347-480			HCN-4S54-90C-2LS-G	236-234	1.10	10	0.68-0.49				
FT55W/2GII - 55W (PL-L55W, F55BX, FT55DL)												
1	120-277	PS	Centium	ICN-2S54+	58	0.92	15	0.49-0.22	-20/-29	D	73	
	ICN-2S54-90C+											
	ICN-2S54-90C-SC											
	347-480			HCN-2S54-90C-WL	58	0.92	10	0.17-0.13		L		73
2	120-277	PS	Centium	ICN-2S54+	112-109	0.90	10	0.94-0.41	-20/-29	D	74A	
	ICN-2S54-90C+											
	ICN-2S54-90C-SC											
	347-480			HCN-2S54-90C-WL	112	0.90	10	0.33-0.24		L		74A
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	169-166	0.90	10	1.41-0.61	-20/-29	G	75A	
	347-480			HCN-4S54-90C-2LS-G	178-176	0.90	10	0.52-0.37				
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	222-217	0.90	10	1.86-0.80	-20/-29	G	75	
	347-480			HCN-4S54-90C-2LS-G	228-226	0.90	10	0.66-0.47				

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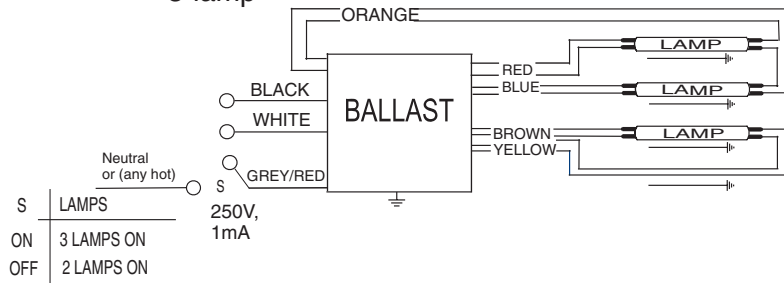
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F /°C)	Dim.	Wiring Diag.
FT80W/2G II - 80W (PL-L80W, FT80DL)											
1	120-277	PS	Centium	ICN-1S80	91-89	1.00	10	0.76-0.33	0/-18	D	73
FC9T5 (22W Circline)											
1	120-277	PS	Centium	ICN-2S24+	27	1.02	10	0.23-0.10	0/-18	D	73
				ICN-2S39	29	1.12	15	0.24-0.12			
2	120-277	PS	Centium	ICN-2S24+	52	1.00	10	0.44-0.19	0/-18	D	74
				ICN-2S39	54	1.10	10	0.46-0.20			
FC12T5 (40W Circline)											
1	120-277	PS	Centium	ICN-2S24+	40	0.84	10	0.34-0.15	0/-18	D	73
				ICN-2S39	42	0.92	10	0.35-0.16			
2	120-277	PS	Centium	ICN-2S39	80	0.90	10	0.68-0.29	0/-18	D	74
(1) FC9T5 & (1) FC12T5 {(1) 22W & (1) 40W Circline}											
1&1	120-277	PS	Centium	ICN-2S39	68	1.00	10	0.58-0.25	0/-18	D	74
FC12T5/HO (55W Circline)											
1	120-277	PS	Centium	ICN-2S54*+	55	0.87	15	0.46-0.21	0/-18	D	73
				ICN-2S54-90C*+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	55	0.87	10	0.16-0.12			
2	120-277	PS	Centium	ICN-2S54*+	106-103	0.85	10	0.89-0.38	0/-18	D	74
				ICN-2S54-90C*+						B	
				ICN-2S54-90C-SC						L	
	347-480			HCN-2S54-90C-WL	106	0.85	10	0.31-0.22			



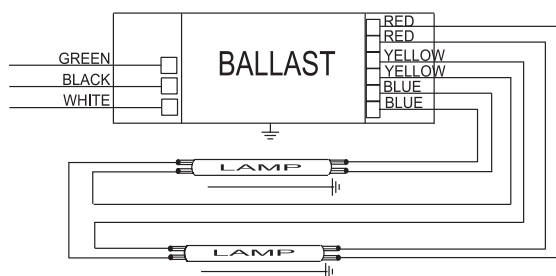
For one lamp operation, do not use yellow leads

Diag. 73*

3-lamp

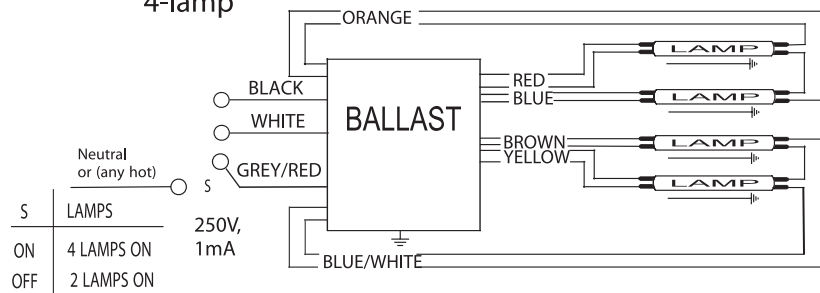


Diag. 75*†



Diag. 74*

4-lamp



Diag. 75A*†

* For all HCN ballasts hot leads are black with orange with black and white

† Grey/red wire must be connected to the neutrals or any hot

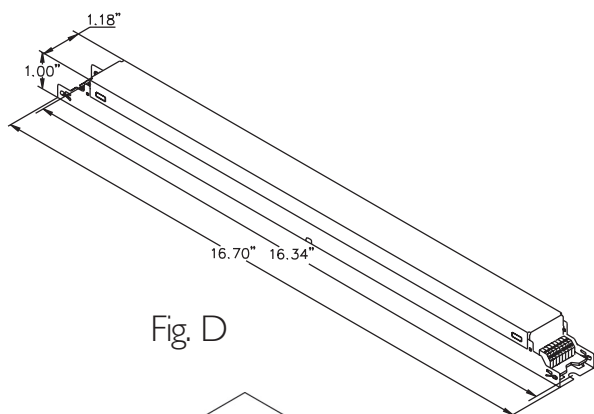


Fig. D

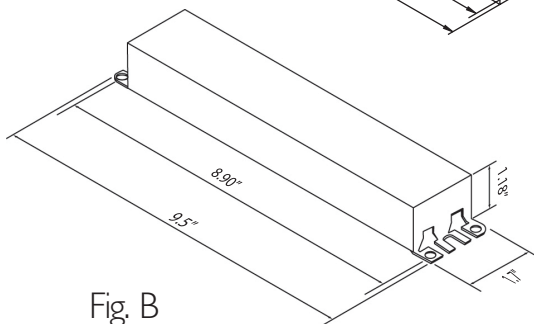


Fig. B

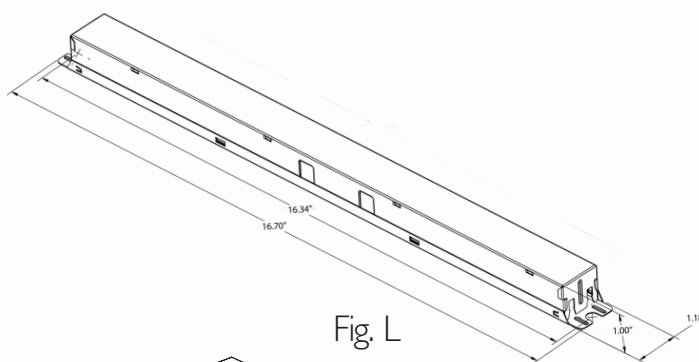


Fig. L

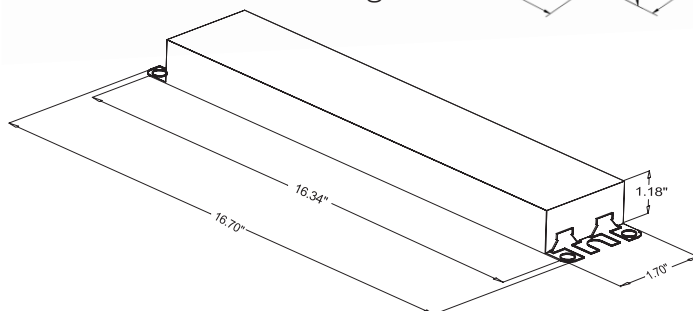


Fig. G

F44GHL

Ballast Specification

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V or 347V through 480V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.0 for primary lamps.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at normal line voltage with full load primary lamps.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18°C (0°F) or -29°C (-20°F) for primary lamp.
- 2.11 Ballast shall provide Lamp EOL Protection.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

F48GHL

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type I Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).
- 3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a _____ limited warranty from date of manufacture against defects in material or workmanship. (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).
- 4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.



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Form No. EL-2070-D 05/10

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Customer Support/Technical Service: 800-372-3331
OEM Support: 866-915-5886
www.philips.com/advance

QUICKTRONIC® T8 Instant Start UNIVERSAL VOLTAGE

High Efficiency Series

High Ballast Factor

Lamp/Ballast Guide

32W T8 - OCTRON®

- 1-lamp QHE1x32T8/UNV ISH-SC
- 2-lamp QHE2x32T8/UNV ISH-SC
- 3-lamp QHE3x32T8/UNV ISH-SC
- 4-lamp QHE4x32T8/UNV ISH

Also operates:

- FBO32, FBO31, FO30/SS (30W),
- FBO30/SS (30W), FBO29/SS (29W),
- FO28/SS (28W) & FO25/SS (25W)

Key System Features

- High Efficiency Systems over 90% efficient
- Over 100 LPW (lumens/watt) with OCTRON SUPERSAVER® lamps
- Lowest power T8 PLUS Systems
- Universal voltage (120-277)
- 1.15-1.20 ballast factor
- 30-50% Energy savings
- 20°F (-29°C) min. starting temp. for OCTRON lamps
- 60°F (16°C) min. starting temperature with OCTRON SUPERSAVER lamps
- <10% THD
- Virtually eliminates lamp flicker

Application Information

SYLVANIA QUICKTRONIC High Efficiency

is ideally suited for:

- Any applications where the highest light output for the lowest amount of power T8 systems are needed for maximum energy savings
- High bay lighting
- Energy Retrofits
- Commercial & Retail
- Hospitality & Institutional
- New Construction

SYLVANIA QUICKTRONIC

High Efficiency (QHE) energy-saving electronic T8 ISH (PLUS) ballasts save up to 6% (up to 4 watts) over standard T8 ISH ballasts without compromising light output or lamp life. The added energy savings also provides for a quicker payback. QHE ballasts also meet the most demanding utility rebate standards.

High light output and multi-lamp capability for up to four lamps allows fewer ballasts to be used in a fixture and provides tandem wiring options. Also, parallel circuitry is utilized to keep the remaining lamps lit if one or more should go out.

SYLVANIA QUICKTRONIC High

Efficiency (QHE) operates OCTRON T8 lamps with maximum efficacy and high lumen output, and provides **30-50% energy savings** when compared to F40T12 magnetic systems.

System Information

SYLVANIA QUICKTRONIC

High Efficiency (QHE) operates from 120V through 277V, eliminating "wrong voltage" wiring errors and reducing the number of models in inventory by half.

SYLVANIA QUICKTRONIC

High Efficiency (QHE) uses instant start operation to provide the highest system efficacy and to assure low temperature starting capability. Instant start also provides for maximum remote wiring distances.

SYLVANIA QUICKTRONIC High Efficiency (QHE)

electronic ballasts have very low harmonic distortion (<10% THD) for high system performance.

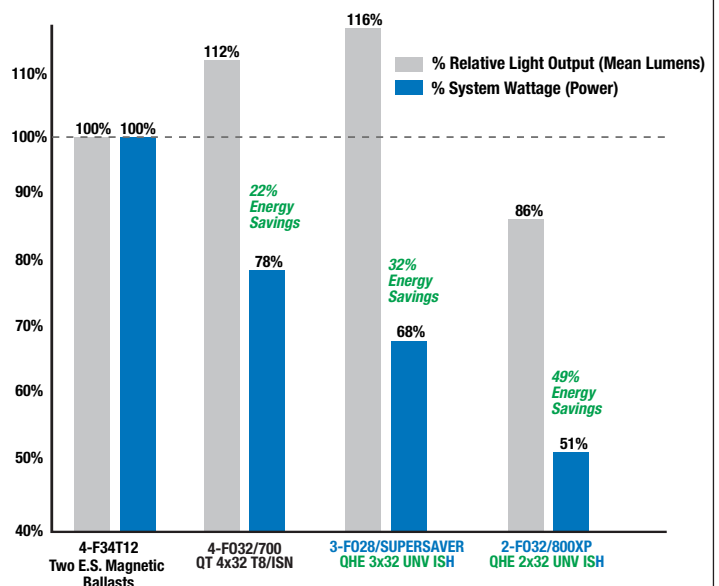
Ballast operates at >42kHz to reduce potential interference with infrared control systems.



SYLVANIA QUICKTRONIC High Efficiency (QHE) is also covered by our QUICK 60+® warranty, the first and most comprehensive lamp & ballast system warranty in the industry.

This product is also offered in new banded packaging and pallet packs.

System Type	Input Wattage	Initial Lumens	System LPW	Mean Lumens	Energy Savings
4:F34T12 - Two E.S. Magnetic Ballasts	144	9330	65	7930	Baseline
4:F032T8/700 - QTP4x32T8/UNV-ISH-SC	112	9860	89	8870	22%
3:F032/XP - QHE3x32T8/UNV-ISH-SC	111/109	10620	96/97	10000	23%
3:F028/SS - QHE3x32T8/UNV-ISH-SC	98/96	9650	98/101	9170	32%
2:F032/XP - QHE2x32T8/UNV-ISH-SC	74/73	7200	97/99	6800	49%
2:F028/SS - QHE2x32T8/UNV-ISH-SC	65/64	6540	101/102	6200	55%



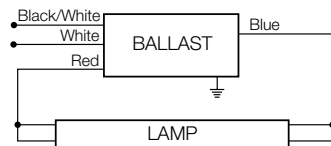
<10% THD High Efficiency Electronic T8 Fluorescent PLUS Systems

Item Number	OSRAM SYLVANIA Description	Input Voltage (VAC)	Input Current (AMPS)	Lamp Type	Rated Lumens (lm)	No. of Lamps	Ballast Factor (BF)	System Lumens	Input Wattage (W)	System Efficacy (lm/W)
49871	QHE 1X32T8/UNV ISH-SC	120-277	0.32/0.14	F032/XP	3000	1	1.20	3600	38	95
			0.30/0.13	F030SS	2850	1	1.20	3420	36	95
			0.27/0.12	F028SS	2725	1	1.20	3270	33	99
			0.26/0.12	F025/SS	2475	1	1.20	2970	30	99
49873	QHE 2X32T8/UNV ISH-SC	120-277	0.65/0.28	F032/XP	3000	2	1.20	7200	74/73	97/99
			0.59/0.25	F030SS	2850	2	1.20	6840	70/69	98/99
			0.55/0.23	F028SS	2725	2	1.20	6540	65/64	101/102
			0.50/0.22	F025/SS	2475	2	1.20	5940	58/57	102/104
49875	QHE 3X32T8/UNV ISH-SC	120-277	0.93/0.40	F032/XP	3000	3	1.18	10620	111/109	96/97
			0.87/0.38	F030SS	2850	3	1.18	10090	104/103	97/98
			0.82/0.35	F028SS	2725	3	1.18	9650	98/96	98/101
			0.72/0.31	F025/SS	2475	3	1.18	8760	87/86	101/102
49877	QHE 4X32T8/UNV ISH	120-277	1.21/0.52	F032/XP	3000	4	1.15	13800	144/141	96/98
			1.13/0.49	F030SS	2850	4	1.15	13110	135/133	97/99
			1.06/0.46	F028SS	2725	4	1.15	12535	127/124	99/101
			0.94/0.41	F025/SS	2475	4	1.15	11385	112/111	102/103

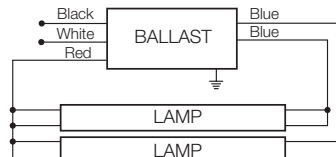
☞ New Product, contact OSRAM SYLVANIA for product availability.

Products listed above are 10 packs.

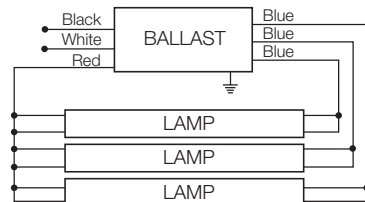
Pallet Packs	Qty	Qty	10 PC Banded Packs	Qty
49872 QHE1x32T8/UNV-ISH-SC-PAL	840	49874 QHE2x32T8/UNV-ISH-SC-PAL	840	☞ 49919 QHE1x32T8/UNV-ISH-SC-B
49876 QHE3x32T8/UNV-ISH-SC-PAL	840	49878 QHE4x32T8/UNV-ISH-PAL	500	☞ 49920 QHE2x32T8/UNV-ISH-SC-B
				☞ 49922 QHE4x32T8/UNV-ISH-B



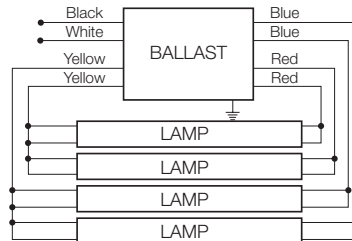
QUICKTRONIC 1x32



QUICKTRONIC 2x32



QUICKTRONIC 3x32



QUICKTRONIC 4x32

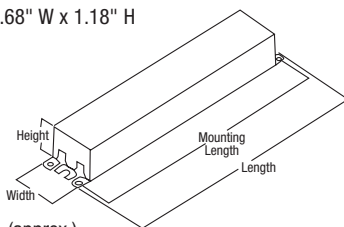
Dimensions "-SC" Small Enclosure:

Overall: 9.5" L x 1.68" W x 1.18" H
Mounting: 8.90"

Wiring:
Leads only

Packaging:
10 pieces

Weight: 1.6 lbs ea. (approx.)



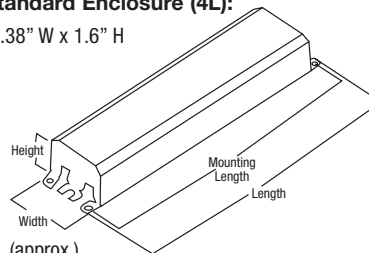
Dimensions Standard Enclosure (4L):

Overall: 9.5" L x 2.38" W x 1.6" H
Mounting: 8.90"

Wiring:
Leads only

Packaging:
10 pieces

Weight: 2.8 lbs ea. (approx.)

Specifications¹

Starting Method: Instant Start

Ballast Factor: 1.15/1.20

Circuit Type: Parallel

Lamp Frequency: > 40KHz

Lamp CCF: Less than 1.7

Starting Temp:¹

-20°F for OCTRON T8 lamps;

60°F for SUPERSAVER® T8 lamps

Input Frequency: 50/60 Hz

Low THD: < 10%

Power Factor: > 98%

Voltage Range: +/- 10% of
120-277 rated line (108-305V)

UL Listed Class P, Type 1 Outdoor

CSA Certified (where applicable)

70°C Max Case Temperature

FCC 47CFR Part 18 Non-Consumer

Class A Sound Rating

ANSI C62.41 Cat. A Transient Protection

Remote Mounting up to 20 feet¹

¹ Operation below 50°F may affect light output or lamp operation – see "Low Temp. Starting" definition.

System Life / Warranty

QUICKTRONIC products are covered by our QUICK 60+® warranty, a comprehensive lamp and ballast system warranty. For additional details, refer to our QUICK 60+ warranty bulletin.

Ordering Guide

Specifications subject to change without notice.



OCTRON® 800 XP® ECOLOGIC®3

EXtended Performance Fluorescent Lamps



The SYLVANIA OCTRON 800 XP ECOLOGIC fluorescent lamps provide 20% longer life or more, higher initial and maintained lumens, improved color rendition and longer re-lamp periods compared to conventional T8 lamps. Because of their longer life, OSRAM SYLVANIA offers an improved system warranty with the use of OCTRON 800 XP ECOLOGIC lamps on our QUICKTRONIC® electronic ballasts. (See QUICK 60+® warranty on page 4.)

OCTRON 800 XP ECOLOGIC lamps operate on the same ballasts as OCTRON T8 lamps. OCTRON lamps are designed to operate on instant start and programmed rapid start ballasts. These ballasts include standard, high and low power models thus offering the choice to maximize light output or energy savings.

Application Information

Applications	Application Notes
Office	1. Lamps starting down to 0°F (dependent on ballast)
Schools	2. Operation below 50°F may affect lumen output or lamp operation.
Retail	3. For cold temperature applications, use in enclosed fixture or use tube guard to maximize lamp performance.
General Lighting	4. For rapid start operation, check with ballast manufacturer for ground plane requirement.
	5. For maximum energy savings, operate on high efficiency electronic instant start ballast.
	6. These lamps may help facilitate compliance with national energy codes such as ASHRAE/IES 90.1 or IECC and state energy codes such as California Title 24. For more information contact your local building inspection office.

Key Features & Benefits

- All OCTRON 800 XP lamps are members of the SYLVANIA ECOLOGIC3 family of lamps
- Average rated life of 36,000 hours
 - Maintains 95% lumens at 8000 hrs.
 - 94% at 9600 hrs., 93% at 12,000 hrs.
 - Improved CRI – 85
 - Available in 2700K, 3000K, 3500K, 4100K & 5000K
 - 17W, 25W, 32W & 40W
- Compatible with QUICKTRONIC electronic, high frequency ballasts
- Extend re-lamp cycles
- Options
 - Higher light levels
 - Use fewer fixtures
 - Use low-power ballast
 - Use fewer lamps with high power ballast

SYLVANIA OCTRON 800 XP ECOLOGIC3 fluorescent lamps are designed to satisfy the Federal Toxicity Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states.*

ECOLOGIC3 represents a more comprehensive approach to sustainability encompassing high efficiency, long life and RoHS/TCLP compliance.

*Regulations may vary. Check your local and state regulations.



Product Offering

Lamp Type	Initial Lumens	Average Rated Life (hrs)*
F017/827XP/EC03	1375	36,000
F017/830XP/EC03	1375	36,000
F017/835XP/EC03	1375	36,000
F017/841XP/EC03	1375	36,000
F017/850XP/EC03	1375	36,000
F025/827XP/EC03	2175	36,000
F025/830XP/EC03	2175	36,000
F025/835XP/EC03	2175	36,000
F025/841XP/EC03	2175	36,000
F025/850XP/EC03	2175	36,000
F032/827XP/EC03	3000	36,000
F032/830XP/EC03	3000	36,000
F032/835XP/EC03	3000	36,000
F032/841XP/EC03	3000	36,000
F032/850XP/EC03	2850	36,000
F040/830XP/EC03	3750	36,000
F040/835XP/EC03	3750	36,000
F040/841XP/EC03	3750	36,000

* Based on 3hrs/start on programmed rapid start ballast



Specification Data

Catalog #	Type
Project	
Comments	
Prepared by	Date

Ordering Information

OCTRON 800 XP ECOLOGIC3 SERIES LINEAR T8 FLUORESCENT LAMPS, (85 CRI, MEDIUM BI-PIN BASE)

Item Number	Ordering Abbreviation	Nominal Length (in)	Average Rated Life (Hours)*	Initial Lumens	Mean Lumens @8000 hrs.	Mean Lumens @14,400 hrs.	Color Temp.	CRI
21587	F017/827XP/EC03	24	36,000	1375	1305	1295	2700K	85
21785	F017/830XP/EC03	24	36,000	1375	1305	1295	3000K	85
21778	F017/835XP/EC03	24	36,000	1375	1305	1295	3500K	85
21907	F017/841XP/EC03	24	36,000	1375	1305	1295	4100K	85
22193	F017/850XP/EC03	24	36,000	1375	1305	1295	5000K	85
21586	F025/827XP/EC03	36	36,000	2175	2065	2045	2700K	85
21910	F025/830XP/EC03	36	36,000	2175	2065	2045	3000K	85
21776	F025/835XP/EC03	36	36,000	2175	2065	2045	3500K	85
21774	F025/841XP/EC03	36	36,000	2175	2065	2045	4100K	85
22194	F025/850XP/EC03	36	36,000	2175	2065	2045	5000K	85
22039	F032/827XP/EC03	48	36,000	3000	2850	2820	2700K	85
21759	F032/830XP/EC03	48	36,000	3000	2850	2820	3000K	85
21763	F032/835XP/EC03	48	36,000	3000	2850	2820	3500K	85
21767	F032/841XP/EC03	48	36,000	3000	2850	2820	4100K	85
22026	F032/850XP/EC03	48	36,000	2850	2710	2680	5000K	85
21912	F040/830XP/EC03	60	36,000	3750	3560	3525	3000K	85
21911	F040/835XP/EC03	60	36,000	3750	3560	3525	3500K	85
21916	F040/841XP/EC03	60	36,000	3750	3560	3525	4100K	85

* Based on 3 hours per start on rapid or programmed rapid start ballasts. At 12 hours per start, life is expected to be 42,000 hours. Average rated life on instant start ballasts is 24,000 hours at 3 hours per start and 36,000 hours at 12 hours per start.

Ordering Guide

FO	32	/	835	XP	/	EC03
Fluorescent OCTRON	Wattage: 17, 25, 32 or 40 watts		8=85 CRI 27=2700K, 30=3000K 35=3500K, 41=4100K 50=5000K	EXtended Performance		ECOLOGIC3

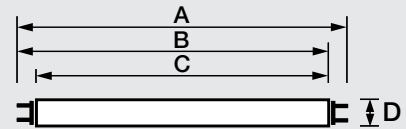
System Comparison

Lamp Type	Lamp Lumens	# Lamps	Ballast	System Watts @ 277V	System Lumens	System Lumens @8000 hrs	Relative Lumens	% Energy Savings
F032/700/ECO	2800	3	QHE3x32ISN	82	7560	6800	100%	—
F032/800/ECO	2950	3	QHE3x32ISN	82	7965	7330	108%	0%
F032/800XP/EC03	3000	3	QHE3x32ISN	82	8100	7695	113%	0%
F032/800XP/EC03	3000	3	QHE3x32ISL	71	7020	6585	97%	13%
F032/800XP/EC03	3000	3	QHE3x32ISH	109	10,620	10,090	148%	-33%
F032/800XP/EC03	3000	2	QHE2x32ISH	73	7200	6840	101%	11%

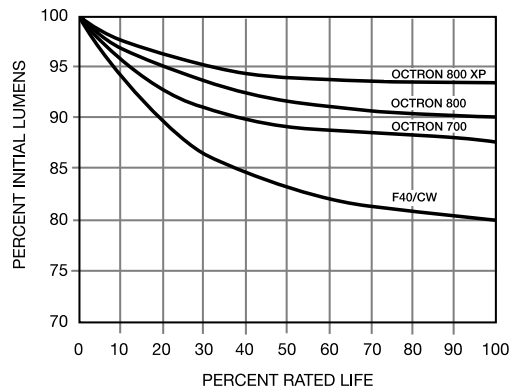
Technical Information

Dimensions

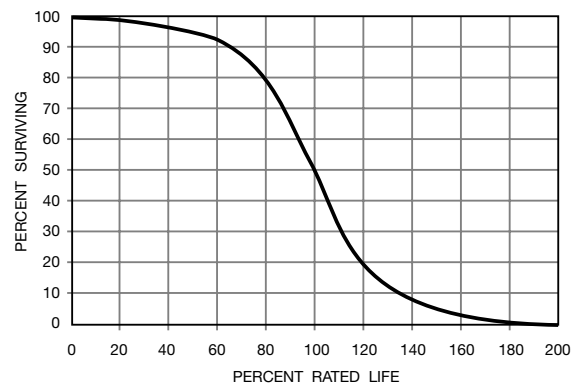
Lamp Type	(A) Max. Overall Length (in.)	(B) Base Face to Opposite Pin (in.)		(C) Max. Base Face to Base Face (in.)	(D) Max. Outside Diameter (in.)
		Min.	Max.		
F017	23.78	23.41	23.50	23.22	1.1
F025	35.78	35.40	35.50	35.22	1.1
F032	47.78	47.41	47.50	47.22	1.1
F040	59.61	59.24	59.33	59.05	1.1



Lumen Maintenance
OCTRON XP, OCTRON & F40/CW



Typical Fluorescent Lamp Mortality



Sample Specification

Lamp(s) shall be OCTRON 800XP ECOLOGIC3 lamp(s) (FO32/800XP/ECO3, FO17/800XP/ECO3, FO25/800XP/ECO3 or FO40/800XP/ECO3) having medium bi-pin bases. Lamp(s) shall be designed to pass the existing Federal TCLP test in force at time of manufacture. Lamp(s) shall have an average rated life of 36,000 hours, (3000, 1375, 2175, 3750) initial lumens, (2850, 1305, 2065, 3560) mean lumens at 8000 hours, a correlated color temperature of (2700K, 3000K, 3500K, 4100K or 5000K) and a CRI of 85. The OCTRON lamp(s) shall be operated on dedicated QUICKTRONIC ballasts with complete system warranty from the manufacturer covering lamp(s) and ballast(s).

Warranty

QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination

Limited 36 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

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Service and Sales Center
 18725 N. Union Street
 Westfield, IN 46074 USA

Industrial Commercial
 Phone: 1-800-255-5042
 Fax: 1-800-255-5043

National Accounts
 Phone: 1-800-562-4671
 Fax: 1-800-562-4674

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 Phone: 1-800-762-7191
 Fax: 1-800-762-7192

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 Fax: 1-800-667-6772

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OSFHU Passive Infrared Fixture Mount High Bay Occupancy Sensor



BASIC OPERATION

Passive Infrared Technology (PIR) is used to sense occupancy by comparing the infrared energy from an object in motion and the background space. PIR sensors minimize false ON from background environmental conditions such as air movement to provide reliable detection of line-of-sight motion.

The OSFHU high-bay occupancy sensor is specifically designed for high mounted areas such as warehouses, manufacturing and other high ceiling applications. The OSFHU installs directly to an industrial fluorescent luminaire or an electrical junction box. It is a self-contained sensor and relay that turns individual light fixtures ON or OFF based on occupancy in the detection zone. It comes with three interchangeable lenses for use in either a 360° high-bay or 360° low-bay general area or an aisle way. The OSFHU provides reliable coverage up to 40 ft. mounting heights. The OSFHU is also available in a model for cold storage applications with temperatures as low as -40° F.

To improve the field-of-view for deep body fixtures, a separate offset adapter accessory (OSFLO or OSFOA) can be used to position the sensor below the fixture body. The adapter simply snaps into a 1/2" knockout on the end of the industrial fixture to attach the sensor. The OSFHU and OSFLO/OSFOA provides the most labor savings available with quick snap, 42" wire leads, and no power required to configure.

INSTALLATION

The OSFHU mounts directly to an industrial fluorescent fixture or an electrical junction box through a standard 1/2" knockout using the provided lock-nut. Wiring is connected inside the fixture body. For deep body fixtures, the OSFLO or OSFOA accessory installs into the fixture 1/2" knockout using the provided lock-nut. The OSFHU sensor is installed in one of three, 1/2" punch-outs positioning the OSFHU at the correct field-of-view position flush or below the fixture reflector assembly. When applicable, wiring is routed through the OSFLO or OSFOA to the fixture body for wiring.

PRODUCT DATA

FEATURES

Quicksnap: built into the 1/2" nipple, this locking mechanism allows for the fastest and easiest mounting not requiring a threaded lock-nut

Reduce time and materials: easily reach the ballast at either end of the fixture without requiring more wire or connectors with the included 42" wire leads

Fast, easy time delay setting: can be set at any time without requiring power to the sensor; time delay is variable from 30s-20m

Instantly verify fixture operation and wiring connections: "instant ON" closing relay fires lamps in under 5 seconds

High Inrush Stability (H.I.S. Technology):

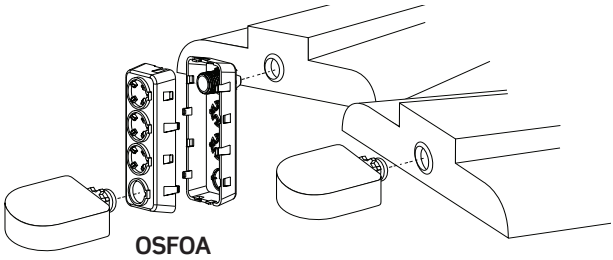
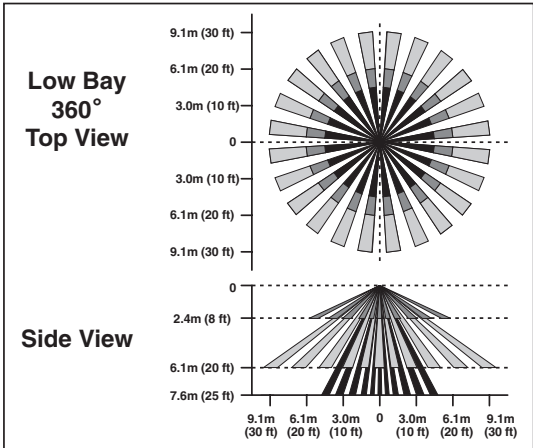
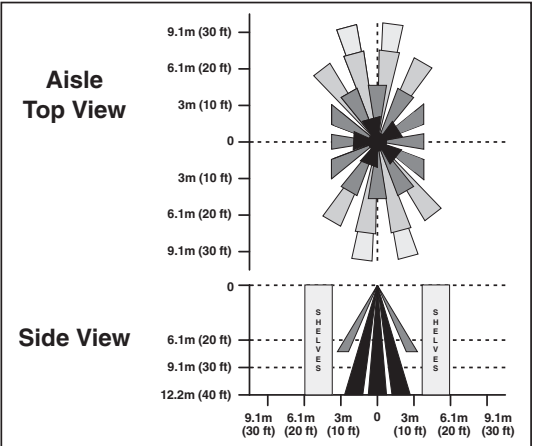
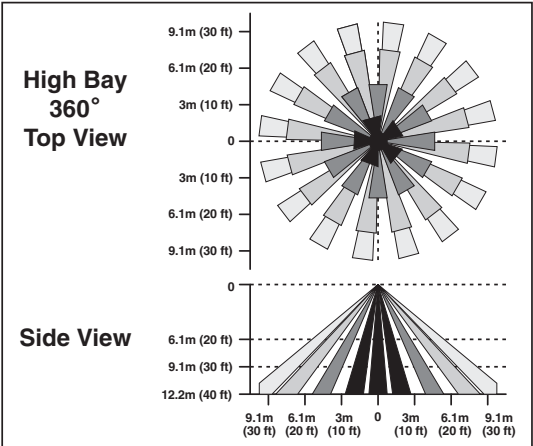
- Zero crossing circuitry optimizes relay operation for reliable, long-life operation
- Robust mechanical latching relay is durable for all load types

Auto temperature calibration: automatically adjusts the PIR sensitivity as ambient temperature rises to increase detection of heat movement through the field-of-view

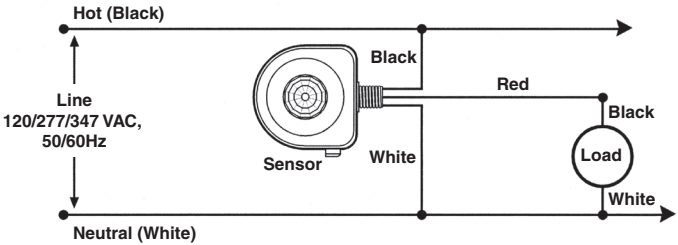
Return to last state: for safety and energy savings, the OSFHU contains a latching relay so that in the event power is lost to the device, the device will return to the last known state of the relay

False detection intelligence: for increased energy savings and to mitigate nuisance tripping, the super bright LED indicates advanced detection has been activated and the lights will only turn ON when true occupancy has been determined

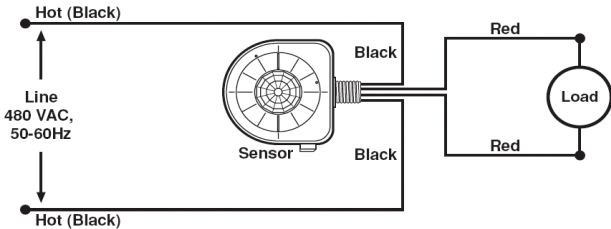
FIELD-OF-VIEW



OSFHU Wiring Diagram



OSFHU (480V) Wiring Diagram



OSFHU

SPECIFICATIONS

ELECTRICAL	
Input Voltage	120-230-277-347VAC; 240/480VAC (-I4W models)
Operational Frequencies	50/60Hz
Load Rating	800VA @ 120VAC Ballast 1200VA @ 277VAC Ballast 1500VA @ 347VAC Ballast 2000VA @ 480VAC Ballast Motor: 1/4 HP Load @ 120V
Standby Power Consumption	120V - 130mW - .13W 277V - 450mW - .45W 347V - 460mW - .46W
Time Delay	30 seconds-20 minutes (factory set to 30 sec - no power required to set)
Wire Designation	-ITW/-CTW models: Line-Black, Load-Red, Neutral-White -I4W/-C4W models: Line-Black, Load-Red, Load-Red
ENVIRONMENTAL	
Operating Temperature Range	14° F to 160° F (-10° C to 71° C)
Cold Storage Operating Temperature Range	-40° F to 160° F (-40° C to 71° C)
Storage Temperature Range	-14° F to 160° F (-25° C to 71° C)
Relative Humidity	20% to 90% non-condensing
PHYSICAL	
Dimensions	OSFHU: 3.50" H x 3.50" W x 1.25" D OSFOA: 5.50" H x 2.00" W x 2.00" D OSFLO: 4.325" H x 2.00" W x 2.00" D
Construction	High-impact, injection molded plastic housing
Color	White
OTHER	
Agency Listings	UL and CUL Listed (OSFHU models)
Warranty	Limited 5-Year

ORDERING INFORMATION

CAT. NO.	DESCRIPTION
OSFHU-ITW	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses, White
OSFHU-CTW	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses for Cold Storage, White
OSFHU-I4W	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses, 480V, No Neutral, White
OSFHU-C4W	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses for Cold Storage, 480V, No Neutral, White
OSFOA-00W	Offset Adapter Accessory for OSFHU, 3 Position, White
OSFLO-00W	Offset Adapter Accessory for OSFHU, 1 Position, White
OSFCG-00W	Protective Cage for Fixture Mounted Sensors

NAFTA and Made in USA models available.

Leviton Manufacturing Co., Inc. Lighting Management Systems

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Leviton Manufacturing of Canada, Ltd.

165 Hymus Boulevard, Pointe Claire, Quebec H9R 1E9 • Telephone: 1-800-469-7890 • FAX: 1-800-563-1853

Leviton S. de R.L. de C.V.

Lago Tana 43, Mexico DF, Mexico CP 11290 • Tel. (+52) 55-5082-1040 • FAX: (+52) 5386-1797 • www.leviton.com.mx

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G-7366F/J10-ak
REV OCT 2010

Mercantile Customer Project Commitment Agreement
Cash Rebate Option

THIS MERCANTILE CUSTOMER PROJECT COMMITMENT AGREEMENT ("Agreement") is made and entered into by and between The Cleveland Electric Illuminating Company, its successors and assigns (hereinafter called the "Company") and Great Lakes Cheese, Co., Taxpayer ID No. 34-4015620 its permitted successors and assigns (hereinafter called the "Customer") (collectively the "Parties" or individually the "Party") and is effective on the date last executed by the Parties as indicated below.

WITNESSETH

WHEREAS, the Company is an electric distribution utility and electric light company, as both of these terms are defined in R.C. § 4928.01(A); and

WHEREAS, Customer is a mercantile customer, as that term is defined in R.C. § 4928.01(A)(19), doing business within the Company's certified service territory; and

WHEREAS, R.C. § 4928.66 (the "Statute") requires the Company to meet certain energy efficiency and peak demand reduction ("EE&PDR") benchmarks; and

WHEREAS, when complying with certain EE&PDR benchmarks the Company may include the effects of mercantile customer-sited EE&PDR projects; and

WHEREAS, Customer has certain customer-sited demand reduction, demand response, or energy efficiency project(s) as set forth in attached Exhibit 1 (the "Customer Energy Project(s)") that it desires to commit to the Company for integration into the Company's Energy Efficiency & Peak Demand Reduction Program Portfolio Plan ("Company Plan") that the Company will implement in order to comply with the Statute; and

WHEREAS, the Customer, pursuant to the Public Utilities Commission of Ohio's ("Commission") September 15, 2010 Order in Case No. 10-834-EL-EEC, desires to pursue a cash rebate of some of the costs pertaining to its Customer Energy Project(s) ("Cash Rebate") and is committing the Customer Energy Project(s) as a result of such incentive.

WHEREAS, Customer's decision to commit its Customer Energy Project(s) to the Company for inclusion in the Company Plan has been reasonably encouraged by the possibility of a Cash Rebate.

WHEREAS, in consideration of, and upon receipt of, said cash rebate, Customer will commit the Customer Energy Project(s) to the Company and will comply with all other terms and conditions set forth herein.

NOW THEREFORE, in consideration of the mutual promises set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound, do hereby agree as follows:

1. **Customer Energy Projects.** Customer hereby commits to the Company and Company accepts for integration into the Company Plan the Customer Energy Project(s) set forth on attached Exhibit 1. Said commitment shall be for the life of the Customer Energy Project(s). Company will incorporate said project(s) into the Company Plan to the extent that such projects qualify. In so committing, and as evidenced by the affidavit attached hereto as Exhibit A, Customer acknowledges that the information provided to the Company about the Customer Energy Project(s) is true and accurate to the best of its knowledge.

- a. By committing the Customer Energy Project(s) to the Company, Customer acknowledges and agrees that the Company shall control the use of the kWh and/or kW reductions resulting from said projects for purposes of complying with the Statute. By committing the Customer Energy Project(s), Customer further acknowledges and agrees that the Company shall take ownership of the energy efficiency capacity rights associated with said Project(s) and shall, at its sole discretion, aggregate said capacity into the PJM market through an auction. Any proceeds from any such bids accepted by PJM will be used to offset the costs charged to the Customer and other of the Company's customers for compliance with state mandated energy efficiency and/or peak demand requirements
 - b. The Company acknowledges that some of Customer's Energy Projects contemplated in this paragraph may have been performed under certain other federal and/or state programs in which certain parameters are required to be maintained in order to retain preferential financing or other government benefits (individually and collectively, as appropriate, "Benefits"). In the event that the use of any such project by the Company in any way affects such Benefits, and upon written request from the Customer, Company will release said Customer's Energy Project(s) to the extent necessary for Customer to meet the prerequisites for such Benefits. Customer acknowledges that such release (i) may affect Customer's cash rebate discussed in Article 3 below; and (ii) will not affect any of Customer's other requirements or obligations.
 - c. Any future Customer Energy Project(s) committed by Customer shall be subject to a separate application and, upon approval by the Commission, said projects shall become part of this Agreement.
 - d. Customer will provide Company or Company's agent(s) with reasonable assistance in the preparation of the Commission's standard joint application for approval of this Agreement ("Joint Application") that will be filed with the Commission, with such Joint Application being consistent with then current Commission requirements.
 - e. Upon written request and reasonable advance notice, Customer will grant employees or authorized agents of either the Company or the Commission reasonable, pre-arranged access to the Customer Energy Project(s) for purposes of measuring and verifying energy savings and/or peak demand reductions resulting from the Customer Energy Project(s). It is expressly agreed that consultants of either the Company or the Commission are their respective authorized agents.
2. **Joint Application to the Commission.** The Parties will submit the Joint Application using the Commission's standard "Application to Commit Energy Efficiency/Peak Demand Reduction Programs" ("Joint Application") in which they will seek the Commission's approval of (i) this Agreement; (ii) the commitment of the Customer Energy Project(s) for inclusion in the Company Plan; and (iii) the Customer's Cash Rebate.

The Joint Application shall include all information as set forth in the Commission's standard form which, includes without limitation:

- i. A narrative description of the Customer Energy Project(s), including but not limited to, make, model and year of any installed and/or replaced equipment;
- ii. A copy of this Agreement; and
- iii. A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results.

3. **Customer Cash Rebate.** Upon Commission approval of the Joint Application, Customer shall provide Company with a W-9 tax form, which shall at a minimum include Customer's tax identification number. Within the greater of 90 days of the Commission's approval of the Joint Application or the completion of the Customer Energy Project, the Company will issue to the Customer the Cash Rebate in the amount set forth in the Commission's Finding and Order approving the Joint Application.
 - a. Customer acknowledges: i) that the Company will cap the Cash Rebate at the lesser of 50% of Customer Energy Project(s) costs or \$250,000; ii) the maximum rebate that the Customer may receive per year is \$500,000 per Taxpayer Identification Number per utility service territory; and iii) if the Customer Energy Project qualifies for a rebate program approved by the Commission and offered by the Company, Customer may still elect to file such project under the Company's mercantile customer self direct program, however the Cash Rebate that will be paid shall be discounted by 25%; and
 - b. Customer acknowledges that breaches of this Agreement, include, but are not limited to:
 - i. Customer's failure to comply with the terms and conditions set forth in the Agreement, or its equivalent, within a reasonable period of time after receipt of written notice of such non-compliance;
 - ii. Customer knowingly falsifying any documents provided to the Company or the Commission in connection with this Agreement or the Joint Application.
 - c. In the event of a breach of this Agreement by the Customer, Customer agrees and acknowledges that it will repay to the Company, within 90 days of receipt of written notice of said breach, the full amount of the Cash Rebate paid under this Agreement. This remedy is in addition to any and all other remedies available to the Company by law or equity.
4. **Termination of Agreement.** This Agreement shall automatically terminate:
 - a. If the Commission fails to approve the Joint Agreement;
 - b. Upon order of the Commission; or
 - c. At the end of the life of the last Customer Energy Project subject to this Agreement.

Customer shall also have an option to terminate this Agreement should the Commission not approve the Customer's Cash Rebate, provided that Customer provides the Company with written notice of such termination within ten days of either the Commission issuing a final appealable order or the Ohio Supreme Court issuing its opinion should the matter be appealed.

5. **Confidentiality.** Each Party shall hold in confidence and not release or disclose to any person any document or information furnished by the other Party in connection with this Agreement that is designated as confidential and proprietary ("Confidential Information"), unless: (i) compelled to disclose such document or information by judicial, regulatory or administrative process or other provisions of law; (ii) such document or information is generally available to the public; or (iii) such document or information was available to the receiving Party on a non-confidential basis at the time of disclosure.
 - a. Notwithstanding the above, a Party may disclose to its employees, directors, attorneys, consultants and agents all documents and information furnished by the other Party in connection with this Agreement, provided that such employees, directors, attorneys,

consultants and agents have been advised of the confidential nature of this information and through such disclosure are deemed to be bound by the terms set forth herein.

- b. A Party receiving such Confidential Information shall protect it with the same standard of care as its own confidential or proprietary information.
 - c. A Party receiving notice or otherwise concluding that Confidential Information furnished by the other Party in connection with this Agreement is being sought under any provision of law, to the extent it is permitted to do so under any applicable law, shall endeavor to: (i) promptly notify the other Party; and (ii) use reasonable efforts in cooperation with the other Party to seek confidential treatment of such Confidential Information, including without limitation, the filing of such information under a valid protective order.
 - d. By executing this Agreement, Customer hereby acknowledges and agrees that Company may disclose to the Commission or its Staff any and all Customer information, including Confidential Information, related to a Customer Energy Project, provided that Company uses reasonable efforts to seek confidential treatment of the same.
6. **Taxes.** Customer shall be responsible for all tax consequences (if any) arising from the payment of the Cash Rebate.
7. **Notices.** Unless otherwise stated herein, all notices, demands or requests required or permitted under this Agreement must be in writing and must be delivered or sent by overnight express mail, courier service, electronic mail or facsimile transmission addressed as follows:

If to the Company:

FirstEnergy Service Company
76 South Main Street
Akron, OH 44308
Attn: Victoria Nofziger
Telephone: 330-384-4684
Fax: 330-761-4281
Email: ymnofziger@firstenergycorp.com

If to the Customer:

Great Lakes Cheese, Co.
17825 Great Lakes Parkway
Hiram, Ohio, 44234
Attn: Arthur Butt
Telephone: 440.834.2500
Fax:
Email: Butt@greatlakescheese.com

or to such other person at such other address as a Party may designate by like notice to the other Party. Notice received after the close of the business day will be deemed received on the next business day; provided that notice by facsimile transmission will be deemed to have been received by the recipient if the recipient confirms receipt telephonically or in writing.

8. **Authority to Act.** The Parties represent and warrant that they are represented by counsel in connection with this Agreement, have been fully advised in connection with the execution thereof, have taken all legal and corporate steps necessary to enter into this Agreement, and that the undersigned has the authority to enter into this Agreement, to bind the Parties to all provisions herein and to take the actions required to be performed in fulfillment of the undertakings contained herein.
9. **Non-Waiver.** The delay or failure of either party to assert or enforce in any instance strict performance of any of the terms of this Agreement or to exercise any rights hereunder conferred, shall not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights at any later time or on any future occasion.
10. **Entire Agreement.** This Agreement, along with related exhibits, and the Company's Rider DSE, or its equivalent, as amended from time to time by the Commission, contains the Parties' entire understanding with respect to the matters addressed herein and there are no verbal or collateral representations, undertakings, or agreements not expressly set forth herein. No change in, addition to, or waiver of the terms of this Agreement shall be binding upon any of the Parties unless the same is set forth in writing and signed by an authorized representative of each of the Parties. In the event of any conflict between Rider DSE or its equivalent and this document, the latter shall prevail.
11. **Assignment.** Customer may not assign any of its rights or obligations under this Agreement without obtaining the prior written consent of the Company, which consent will not be unreasonably withheld. No assignment of this Agreement will relieve the assigning Party of any of its obligations under this Agreement until such obligations have been assumed by the assignee and all necessary consents have been obtained.
12. **Severability.** If any portion of this Agreement is held invalid, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, and the Parties further agree to substitute for the invalid portion a valid provision that most closely approximates the economic effect and intent of the invalid provision.
13. **Governing Law.** This Agreement shall be governed by the laws and regulations of the State of Ohio, without regard to its conflict of law provisions.
14. **Execution and Counterparts.** This Agreement may be executed in multiple counterparts, which taken together shall constitute an original without the necessity of all parties signing the same page or the same documents, and may be executed by signatures to electronically or telephonically transmitted counterparts in lieu of original printed or photocopied documents. Signatures transmitted by facsimile shall be considered original signatures.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year set forth below.

The Cleveland Electric Illuminating Company_
(Company)

By: John C. Langin

Title: V.P. Of Energy Efficiency

Date: 3-18-13

Great Lakes Cheese, Co.
(Customer)

By: Paul R. Butt

Title: Maintenance Supervisor

Date: 3.25.13

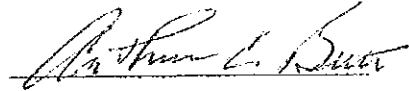
Affidavit of Great Lakes Cheese, Co. -- Exhibit A

STATE OF OHIO)
) SS:
COUNTY OF Portage)

I, Arthur Butt, being first duly sworn in accordance with law, deposes and states as follows:

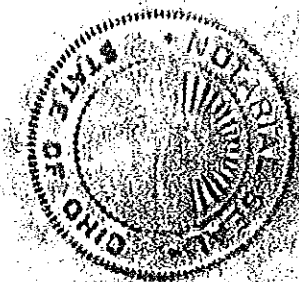
1. I am the Maintenance Supervisor of Great Lakes Cheese, Co. ("Customer") As part of my duties, I oversee energy related matters for the Customer.
2. The Customer has agreed to commit certain energy efficiency projects to The Cleveland Electric Illuminating Company ("Company"), which are the subject of the agreement to which this affidavit is attached ("Project(s)").
3. In exchange for making such a commitment, the Company has agreed to provide Customer with Cash ("Incentive"). This Incentive was a critical factor in the Customer's decision to go forward with the Project(s) and to commit the Project(s) to the Company.
4. All information related to said Project(s) that has been submitted to the Company is true and accurate to the best of my knowledge.

FURTHER AFFIANT SAYETH NAUGHT.



Sworn to before me and subscribed in my presence this 25 day of Feb, 2013


Notary



COMMISSION EXPIRES
DEC. 10, 2017

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

3/27/2013 4:34:52 PM

in

Case No(s). 13-0456-EL-EEC

Summary: Application to Commit Energy Efficiency/Peak Demand Reduction Programs of The Cleveland Electric Illuminating Company and Great Lakes Cheese, Co. electronically filed by Ms. Jennifer M. Sybyl on behalf of The Cleveland Electric Illuminating Company and Great Lakes Cheese, Co.