THE ILLUMINATOR

ILLUMINATOR SERIES E
The Illuminator Series E is an uninterrupted lighting inverter. It transfers to inverter mode (battery power) when utility power is interrupted for more than one line cycle. This series is capable of supporting full normally off load. The Series E is designed for fluorescent, quartz, LED, and incandescent normally on and/or normally off lighting loads and applications that require large normally off (emergency only) lighting loads.

ILLUMINATOR SERIES IE
The Illuminator Series IE is an uninterrupted lighting inverter. It transfers to inverter mode (battery power) when utility power is interrupted for less than 1ms. The line interactive design eliminates excessive transfers to battery power. The Series IE is designed for HID lighting loads, mixed HID/Incandescent/Quartz/LED/Fluorescent normally on loads and applications that do not require large normally off (emergency only) loads.

APPLICATIONS
- 911 Facilities
- Airports
- Apartment/Condominium Complexes
- Assisted Living Centers, Nursing Homes
- Banks, Financial Institutions
- Casinos
- City, County, State, Federal Buildings
- Grocery Stores/Home Center Stores
- Hospitals
- Hotels, Motels
- Industrial
- Medical Offices
- Military Complexes
- Movie/Performing Art Theaters
- Office Buildings
- Parking Garages
- Prisons
- Race Tracks
- Railroad, Subway, Bus Stations
- Religious Facilities
- Restaurants
- Retail Department Stores
- Schools, Colleges, Day Care Centers
- Shopping Malls
- Sport Facilities
- Toll Booths
- Tunnels and Bridges
- Designed to work with all electronic power factor corrected ballasts.
- Central inverters can eliminate unit equipment in architecturally sensitive applications.
- Eliminate maintenance costs of individual testing of unit equipment and battery powered ballasts. All tests and diagnostics are performed and recorded automatically.

SYSTEM SPECIFICATIONS

<table>
<thead>
<tr>
<th>INPUT</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120 or 277VAC 1-phase 2-wire +/-10% 15% on Series E, and +10% -15% on Series IE. Contact factory for all other voltages. Walk-in Limiting inrush current to less than 125% of full rated load. 60Hz, +/- 3%. 1Hz per second nominal.</td>
</tr>
<tr>
<td>Input Power</td>
<td></td>
</tr>
<tr>
<td>Input Frequency</td>
<td></td>
</tr>
<tr>
<td>Synchronizing Slew Rate</td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td></td>
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<td>AIC Rating</td>
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<td>Power Factor</td>
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<thead>
<tr>
<th>OUTPUT</th>
<th>Voltage</th>
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<tr>
<td></td>
<td>120 or 277VAC 1-phase 2-wire. Contact factory for all other voltages. Load current change +/-2%, battery discharge +/-12.5% +/-2% for +/-20 load step change, +/-3% for a 50% load step change, recovery within 3 cycles. &lt; 3% THD for linear load. Fuse protected. 60Hz +/- 0.05Hz during emergency mode. 0.5 lag/lead.</td>
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<tr>
<td>Static Voltage</td>
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<tr>
<td>Dynamic Voltage</td>
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<tr>
<td>Harmonic Distortion</td>
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<td>Overload</td>
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<td>Output Frequency</td>
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<td>Load Power Factor</td>
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<td>Inverter Overload Protection</td>
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<thead>
<tr>
<th>BATTERY</th>
<th>Type</th>
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<tr>
<td></td>
<td>Valve-regulated sealed lead-calcium; Consult factory for additional battery types. Microprocessor controlled for various battery types and temperature compensating (recharge per UL924 spec). Automatic low-battery disconnect; automatic restart upon utility return. Fuse</td>
</tr>
<tr>
<td></td>
<td>Charger</td>
</tr>
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<td></td>
<td>Protection</td>
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<tr>
<td></td>
<td>Disconnect</td>
</tr>
<tr>
<td></td>
<td>Optional Runtimes</td>
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<td></td>
<td>Extended runtimes available. Consult factory for additional information.</td>
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<th>ENVIRONMENTAL</th>
<th>Operating Temperature</th>
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<tr>
<td>Storage Temperature</td>
<td>20° to 70°C (68° to 86°F) per UL 924.</td>
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<td>Relative Humidity</td>
<td>&lt; 95% (non-condensing)</td>
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<table>
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<tr>
<th>RELATED</th>
<th>Efficiency</th>
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<tr>
<td>Design</td>
<td>98% while on utility. PWM inverter type utilizing IGBT technology with 2Ms transfer time on Series E and 50Ms on Series IE.</td>
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<tr>
<td>Output Circuits</td>
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</tr>
<tr>
<td>Generator Input</td>
<td></td>
</tr>
<tr>
<td>Control Panel</td>
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</tr>
<tr>
<td>Metering</td>
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</tr>
<tr>
<td>Alarms</td>
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<tr>
<td>Communications</td>
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<td>Manual Maintenance Bypass</td>
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<tr>
<td>Alarm Contacts</td>
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<td>Warranty</td>
<td></td>
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<tr>
<td>Factory Start-up</td>
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<td>5-Year Maintenance Plan</td>
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<th>Cabinet</th>
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<td>Cooling</td>
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<tr>
<td>Cable Entry</td>
<td></td>
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<tr>
<td>Access</td>
<td></td>
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|          | Freestanding NEMA Type 1. Forced Air, during emergency mode. Top or sides on 1.5 - 3kVA; Sides only on 6 - 16.7kVA. Front. |

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<th></th>
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<tr>
<td>SERIES E</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>20% Maximum of System Capacity</td>
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<tr>
<td>SERIES IE</td>
<td>No</td>
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System Specifications

**Width Height Depth Weight**

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<th>in/cm</th>
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<td>1135</td>
<td>76</td>
<td>885/398</td>
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</tbody>
</table>

**Electronics Module**

- Power Rating (kVA) & (kW)
- Efficiency (@ full load)
- Audible Noise (dBA @ 1m)
- Heat Loss (BTU/HR)
- Cabinet Dimensions
  - Width in/cm
  - Height in/cm
  - Depth in/cm
  - Weight lbs/kg

**Batteries**

- (90 Minutes @ Full Load)
- Number of Batteries
- Voltage (VDC)
- Current (Amperes)
- Total System Weight lbs/kg

**System Design Features**

- **Electronics Module**
- **Inverters**
  - Fourth generation IGBT-based inverter with dynamic pulse-by-pulse current limiting and inrush protection. Short circuit and overloads protected by microprocessor and PWM integration for maximum reliability.
- **Waveform**
  - Pure PWM sine wave, less than 3% THD with 0.5 leading and 0.5 lagging loads. Microprocessor and crystal controlled.
- **Thermal Performance**
  - Bonded fin heat sink technology for maximum thermal performance. Fan energized only on inverter mode which increases reliability and reduces preventative maintenance.
- **Battery Charger**
  - Integrated 3 step with equalize, temperature controlled, 24-hour recharge for 90 minute system is standard.
- **Modular**
  - Innovative modular sub-assembly design leads the industry with less than 15 minute MTTR.
- **Construction**
  - Enclosure is cold-rolled steel with powder-coated surface. Hinged doors with security 3-point Corbin 60 locking system for easy access and maintenance.
- **Batteries**
  - Front access, maintenance-free, sealed lead calcium VRLA batteries are standard. Significantly reduces installation and maintenance time and increases safety.
- **Small Footprint**
  - 25” (depth) x 30” (wide) 1.5 - 5kVA, or 25” (depth) x 48” (wide) 6 - 16.7kVA.
- **Control Panel**
  - Self-testing and self-diagnostics per NFPA and UL standards. Memory logs of over 1525 parameters contained in Test, Event and Fault Logs. Easy to read alpha-numeric display with user-friendly keypad integrates Systems’ Meter, Alarm, Control and Program functions.
The electronics warranty is a 5-year extended warranty included with the electronics. The electronics warranty covers any defects in materials or workmanship under normal use and service, and will be honored for a period of 5 years from the date of purchase. The electronics warranty does not cover damage caused by misuse, abuse, or neglect.

**Batteries**

- **Battery Options:**
  - G - Battery (VRLA)
  - S - Battery (VRLA) (Standard)

**Maintenance**

- **Routine Maintenance:**
  - Inspect the system regularly for any issues or problems.
  - Replace any filters or components as needed.

**Alarm Panels**

- **Alarm Panel Options:**
  - Remote Meter Panel
  - Remote Summary Alarm Panel

**System Display Functions**

- **System Display Functions:**
  - Temperature
  - Alarms Present
  - Date
  - Time
  - Alarm Type

**Ordering Guide**

- **Ordering Guide:**
  - Example Model Number: 1-E-4-S-BA2007-F-T-S-M-N-2YW

**System Diagram**

- **System Diagram:**
  - Shows the various components and connections of the system.

**Accessories**

- **Accessories:**
  - 5-Year Extended Warranty
  - 1-E-4-S-BA2007-F-T-S-M-N-2YW

**Temperature and Alarms Present**

- Temperature and Alarms Present:
  - Note: All displayed meter functions match the inverter.

**Control Functions**

- **Control Functions:**
  - Set Yearly Test Date/Time
  - Set High AC Voltage Alarm
  - Set Month Test Date/Time
  - Set Low AC Voltage Alarm
  - Set Date
  - Set Low Battery Alarm
  - Set Time
  - Set Near Low Battery Alarm
  - AC Current Output
  - Inverter Watts
  - AC Voltage Input
  - Battery Current

**Example:**

- 1-E-4-S-BA2007-F-T-S-M-N-2YW

**System Options**

- **System Options:**
  - Illuminator Series "IE"
  - Illuminator Series "E"

**System Monitor**

- **System Monitor:**
  - Monitors the system for any issues or problems.

**System Controls**

- **System Controls:**
  - Controls the power flow and distribution of the system.

**System Maintenance**

- **System Maintenance:**
  - Performs routine maintenance on the system.

**System Display**

- **System Display:**
  - Displays the status of the system.

**System Model**

- **System Model:**
  - Example Model Number: 1-E-4-S-BA2007-F-T-S-M-N-2YW

**System Accessories**

- **System Accessories:**
  - 5-Year Extended Warranty
  - Example Model Number: 1-E-4-S-BA2007-F-T-S-M-N-2YW

**System Options**

- **System Options:**
  - Illuminator Series "IE"
  - Illuminator Series "E"
**SYSTEM OPTIONS**

E-MAIL/MODEM

User can enable/disable and program alarms that will trigger messages to e-mail destinations. User can set specific alarm events that will alert service or maintenance personnel. The system will transmit monthly and yearly tests per NFPA requirements. Bi-directional communication eases system diagnostics and data retrieval through the RS-232 serial communication port.

TIME DELAY

Delays retransfer of inverter to continue supplying emergency power to the normally off output for 15 minutes after the return of utility power.

OUTPUT CIRCUIT BREAKER

Maximum output breakers available: 12 unsupervised (1-pole), 8 supervised (1-pole) for 1.5 - 5 kVA, and 24 unsupervised (1-pole), 15 supervised (1-pole) for 6 - 16.7 kVA. Additional output breakers available on 1.5 - 5kVA systems (additional 30 pole positions, 42 positions total: enclosure height increases to 62”).

OUTPUT TRIP ALARM

An audible and visual alarm activates when an output distribution circuit breaker is open or has tripped.

MAINTENANCE BYPASS

This device is internally mounted in the system and permits maintenance personnel to easily bypass the inverter and connect directly to the AC utility power. The "make before break" switch isolates the electronics or inverter system to allow performance of routine maintenance or servicing.

REMOTE METER PANEL

Allows a second fully functional front meter panel to be mounted external to the inverter up to 150 feet away. (100’ cable standard)

**BATTERY OPTIONS**

S - BATTERY (Sealed Lead-Calcium) (Standard)

A maintenance free, valve regulated lead calcium battery. Constructed with a polypropylene jar installed in a steel container. Does not require any special room ventilation. 10-year prorated warranty.

G - BATTERY (Sealed Lead-Calcium)

A maintenance free, long life, valve regulated lead calcium battery. Constructed with a polypropylene jar installed in a steel container. Does not require any special room ventilation. 20-year prorated warranty.

**SYSTEM DISPLAY FUNCTIONS**

- **METER FUNCTIONS**
  - AC Voltage Input
  - AC Voltage Output
  - AC Current Output
  - Battery Voltage
  - System Data
  - Program Functions
  - Set Date
  - Set Time
  - Set Month Test Date/Time
  - Set Yearly Test Date/Time
  - Set Load Fault Reduction Setting

- **CONTROL FUNCTIONS**
  - Test Log & Event Log (75 Logs Stored): Date, Time, Duration, Output Voltage, Output Current, Ambient Temperature and Alarms Present
  - Alarm Log (75 Logs Stored): Date, Time, Alarm Type
  - Test
  - Buzzer On/Off

- **SUMMARY FORM C CONTACTS**
  Form “C” contacts rated at 5 amps maximum at 250VAC/30VDC. Dry contacts will change state when any system alarm activates. Contacts change state with the following alarms: High/low battery charger fault, low near battery, low battery, load reduction fault, output overload, high/low AC input volts, high ambient temperature, inverter fault, test failure, and optional circuit breaker trip alarm.

- **FAST CHARGE**
  This is a battery charger upgrade which decreases the time to recharge a fully discharged battery bank to a full charge. The recharge time is decreased from the standard 24-hour period to a 12-hour period.

- **NORMALLY OFF OUTPUT** (Standard on Series IE)
  This output circuit is dedicated for emergency-only equipment. Emergency-only equipment operates during power outages and when the system is on battery back up. This option leaves the selective load circuits off during normal utility power conditions.

- **REMOTE SUMMARY ALARM PANEL**
  A wall mountable box containing an audible alarm and light that will activate upon any system alarm with silence switch.

- **INVERTER ON FORM C CONTACT**
  Form “C” dry contacts that will change state when the inverter transfers to battery operation.

- **STATUS MONITORING CONTACTS**
  Form “C” dry contacts capable of monitoring system and option statuses (Inverter On, Inverter Off, AC Present, High Temperature, Summary Alarm, System Bypasses*, and Ota**) *Requires purchase of Maintenance Bypass and/or Output Trip Alarm options.

**WARRANTY**

- 5-Year Extended Warranty
- 2-Year Factory Start-Up Extended 2-Year Warranty
- 5-Year Preventative Maintenance Plan
- Start-Up Included
- 5-Year Extended Electronic Warranty
- Service Monitoring Plan

**ORDERING GUIDE**

**Example Model Number:**

1-E-4-S-BA2007-F-T-S-M-N-2YW

**ACCESSORIES**

- MOD: Modern
- EMB**: External Maintenance Bypass Switch
  - A: Cannot purchase External Maintenance Bypass Switch with Branch Circuit Breaker options.
## SYSTEM SPECIFICATIONS

<table>
<thead>
<tr>
<th>Width in/cm</th>
<th>Height in/cm</th>
<th>Depth in/cm</th>
<th>Weight lbs/kg</th>
<th>Power Rating (kVA)</th>
<th>Power Rating (kW)</th>
<th>Efficiency (@ full load)</th>
<th>Audible Noise (dBA @ 1m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.5</td>
<td>98</td>
<td>45</td>
<td>102</td>
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<td>885/398</td>
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</table>

### INVERTER
Fourth generation IGBT-based inverter with dynamic pulse-by-pulse current limiting and inrush protection. Short circuit and overload protected by microprocessor and PWM integration for maximum reliability.

### WAVEFORM
Pure PWM sine wave, less than 3% THD with 0.5 leading and 0.5 lagging loads. Microprocessor and crystal controlled.

### THERMAL PERFORMANCE
Bonded fin heat sink technology for maximum thermal performance. Fan energized only on inverter mode which increases reliability and reduces preventative maintenance.

### BATTERY CHARGER
Integrated 3 step with equalize, temperature controlled, 24-hour recharge for 90 minute system is standard.

### MODULAR
Innovative modular sub-assembly design leads the industry with less than 15 minute MTTR.

## SYSTEM DESIGN FEATURES

### ELECTRONICS MODULE

<table>
<thead>
<tr>
<th>Power Rating (kVA)</th>
<th>Power Rating (kW)</th>
<th>Efficiency (@ full load)</th>
<th>Audible Noise (dBA @ 1m)</th>
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### BATTERIES (90 Minutes @ Full Load)

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<th>Width in/cm</th>
<th>Height in/cm</th>
<th>Depth in/cm</th>
<th>Weight lbs/kg</th>
<th>Number of Batteries</th>
<th>Voltage (VDC)</th>
<th>Current (Amperes)</th>
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<td>8.0</td>
<td>98</td>
<td>45</td>
<td>544</td>
<td>1480/666</td>
<td>20</td>
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<tr>
<td>10.0</td>
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<td>98</td>
<td>45</td>
<td>680</td>
<td>1776/800</td>
<td>24</td>
</tr>
<tr>
<td>12.5</td>
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<td>98</td>
<td>45</td>
<td>850</td>
<td>2220/999</td>
<td>30</td>
</tr>
<tr>
<td>16.7</td>
<td>16.7</td>
<td>98</td>
<td>45</td>
<td>1135</td>
<td>2960/1355</td>
<td>40</td>
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</tbody>
</table>

### INVERTER
Fourth generation IGBT-based inverter with dynamic pulse-by-pulse current limiting and inrush protection. Short circuit and overload protected by microprocessor and PWM integration for maximum reliability.

### WAVEFORM
Pure PWM sine wave, less than 3% THD with 0.5 leading and 0.5 lagging loads. Microprocessor and crystal controlled.

### THERMAL PERFORMANCE
Bonded fin heat sink technology for maximum thermal performance. Fan energized only on inverter mode which increases reliability and reduces preventative maintenance.

### BATTERY CHARGER
Integrated 3 step with equalize, temperature controlled, 24-hour recharge for 90 minute system is standard.

### MODULAR
Innovative modular sub-assembly design leads the industry with less than 15 minute MTTR.

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**SYSTEM DESIGN FEATURES**

- **Industrial Grade Enclosure**
- **User Interface Display**
- **Input Breaker**
- **Power Distribution**
- **Installation Latch**
- **Battery Terminal Block**

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**Batteries**

- **90 Minutes @ Full Load**
  - Voltage: 90VDC
  - Current: 135A
  - Weight: 48lbs/kg
  - Number of Batteries: 5
  - Total System Weight: 230lbs/kg

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**CONSTRUCTION**

- Enclosure is cold-rolled steel with powder-coated surface.
- Hinged doors with security 3-point Corbin 60 locking system for easy access and maintenance.

**BATTERIES**

- Maintenance-free, sealed lead calcium VRLA batteries are standard.
- Significantly reduces installation and maintenance time and increases safety.

**SMALL FOOTPRINT**

- 25" (depth) x 30" (wide) for 1.5 - 5kVA, or 25" (depth) x 48" (wide) for 6 - 16.7kVA.

**CONTROL PANEL**

- Self-testing and self-diagnostics per NFPA and UL standards.
- Memory logs of over 1525 parameters contained in Test, Event and Fault Logs. Easy to read alpha-numeric display with user-friendly keypad integrates Systems' Meter, Alarm, Control and Program functions.
ILLUMINATOR SERIES IE
The Illuminator Series IE is an interruptible lighting inverter. It transfers to inverter mode (battery power) when utility power is interrupted for less than 1mS. The line interactive design eliminates excessive transfers to battery power. The Series E is designed for HID lighting loads, mixed HID/incandescent/quartz/LED/fluorescent normally on and/or normally off lighting loads and applications that do not require large normally off (emergency only) lighting loads.

The Illuminator Series E is an uninterruptible lighting inverter. It transfers to inverter mode (battery power) when utility power is interrupted for less than 1mS. The line interactive design eliminates excessive transfers to battery power. The Series E is designed for HID lighting loads, mixed HID/incandescent/quartz/LED/fluorescent normally on and/or normally off lighting loads and applications that do not require large normally off (emergency only) lighting loads.

APPLICATIONS

- 911 Facilities
- Airports
- Apartment/Condominium Complexes
- Assisted Living Centers, Nursing Homes
- Banks, Financial Institutions
- Casinos
- City, County, State, Federal Buildings
- Grocery Stores/Home Center Stores
- Hospitals
- Hotels, Motels
- Industrial
- Medical Offices
- Military Complexes
- Movie/Performing Art Theaters
- Office Buildings
- Parking Garages
- Prisons
- Race Tracks
- Railroad, Subway, Bus Stations
- Religious Facilities
- Restaurants
- Retail Department Stores
- Schools, Colleges, Day Care Centers
- Shopping Malls
- Sport Facilities
- Toll Booths
- Tunnels and Bridges
- Designed to work with all electronic power factor corrected ballasts.
- Central Inverters can eliminate unit equipment in architecturally sensitive applications.
- Eliminate maintenance costs of individual testing of unit equipment and battery powered ballasts. All tests and diagnostics are performed and recorded automatically.

SYSTEM SPECIFICATIONS

**INPUT**

| Voltage | 120 or 277VAC 1-phase 2-wire +10% -20% on Series E, and +10% -15% on Series IE. Contact factory for all other voltages. Walk-in Limiting inrush current to less than 125% of full rated load.
| Input Power | 60Hz, +/- 3%, 1Hz per second nominal.
| Input Frequency | Input Circuit Breaker.
| Synchronizing Slew Rate | 65k RMS symmetrical ampere short circuit rating.
| Protection | 0.5 lag/lead.
| AIC Rating | Power Factor | 115% for 10 minutes. 280% for 12 line cycles. Optional Distribution Circuit Breakers.

**OUTPUT**

| Voltage | 120 or 277VAC 1-phase 2-wire. Contact factory for all other voltages. Load current change +/–2%, battery discharge +/–12.5% +/–2% for +/–20 load step change, +/–3% for a 50% load step change, recovery within 3 cycles. < 3% THD for linear load. Fuse protected. 60Hz +/– 0.05Hz during emergency mode. 0.5 log to 0.5 lead.
| Static Voltage | 20° to 70°C (68° to 158°F) (electronics only). 95% (non-condensing)
| Dynamic Voltage | Operating Temperature | 20° to 30°C (68° to 86°F) per UL 924.
| Harmonic Distortion | Storage Temperature | +10% -20% on Series E, and +50% on Series IE.
| Overload | 0.5 lag/lead. | +10% -20% on SeriesIE.
| Inverter Overload Protection | Power Factor | +10% -20% on Series IE.
| Load Power Factor | Power Factor | +10% -20% on Series IE.

**BATTERY**

- Type: Valve-regulated sealed lead-calcium; Consult factory for additional battery types.
- Charger: Microprocessor controlled for various battery types and temperature compensating (recharge per UL924 spec).
- Protection: Automatic low-battery disconnect; automatic restart upon utility return. Fuse.
- Disconnect: Extended runtimes available. Consult factory for additional information.

**ENVIRONMENTAL**

- Operating Temperature: 20° to 70°C (68° to 158°F) (electronics only).
- Storage Temperature: +10% -20% on Series E, and +50% on Series IE.
- Relative Humidity: 20° to 70°C (68° to 86°F) per UL 924.
- +10% -20% on SeriesIE.
- +10% -20% on Series IE.

**GENERAL**

- Efficiency: 98% while on utility.
- Design: PWM inverter type utilizing IGBT technology with 2mS transfer time on Series E and 5mS on Series IE.
- Generator Control Panel: Microprocessor controlled 4 x 20-character vacuum fluorescent display with touchpad controls/functions scrolling system status.
- Alarms: High/Low Battery Charger Fault, Near Low Battery, Low Battery, Load Reduction Fault, Output Overload, High/Low AC Input Volt, High Ambient Temperature, Inverter Fault, Output Fault, Test Failure, and Optional Circuit Breaker Trip.
- Communications: RS-232 port (DB9 standard). E-mail/fax modem optional. Optional internal or external optional between internal distribution breakers. Optional Summary Alarm Form “C” Contacts.
- Manual Maintenance Bypass: 1 year standard warranty includes all parts, labor, & travel expenses within 48 contiguous states. 10 years prorated warranty on batteries. Extended warranties, preventative maintenance and customized service plans are available.
- Alarm Contacts: Purchase factory start-up & receive 1 additional year of electronics warranty.
- Warranty: Purchase 5-year preventative maintenance plan & receive free factory start-up.

**PHYSICAL**

- Cabinet: Freestanding NEMA Type 1.
- Cooling: Forced Air, during emergency mode.
- Cable Entry: Top or sides on 1.5 - 5kVA; Sides only on 6 - 16.7kVA. Front.
- Access:
ALSO AVAILABLE FROM MYERS POWER PRODUCTS:

ILLUMINATOR SERIES CIII
4.8 kVA to 50 kVA THREE PHASE

ILLUMINATOR CM
500 VA to 2000 VA SINGLE PHASE