



Functional Devices EMPS32W Micro Inverters Instruction Manual

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RIB Lighting Controls Devices EMPS32W Micro-Inverters Instruction Manual



B3174

Installation And Operation Instructions

For Micro Inverter Series

Lead Calcium Battery Models: EMPS32W and EMPS55W

Nickel Cadmium Battery Models: EMPS20W and EMPS35W

Surface (S), Recessed (R) and Ceiling T-Grid (T) Mounted Versions

B3174 04.20.22



READ AND FOLLOW ALL SAFETY INSTRUCTIONS

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IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed, including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS:

- Do not use outdoors.
- Do not let power supply cords touch hot surfaces.
- Do not mount near gas or electric heaters.
- Use caution when servicing batteries. Battery acid can cause burns to the skin and eyes. If acid is spilled on the skin or in the eyes, flush acid with fresh water and contact a physician immediately
- Equipment should be mounted securely in locations and at heights where it will not be readily subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the MANUFACTURER may cause an unsafe condition.
- The AC voltage rating of this equipment is specified on the product label. Do not connect equipment to any other voltage.
- Do not use this equipment for other than its intended purpose.
- Servicing of this equipment should be performed by qualified service personnel.

SAVE THESE IMPORTANT SAFETY INSTRUCTIONS

The installation and use of this product must comply with all national, federal, state, municipal, or local codes that apply. Please read this manual thoroughly before operating the Micro Inverter System.

Section 100 System Installation Instructions

101. Specifications

Input

- Input voltage: Universal 120 or 277Vac.
- Input frequency: 60HZ $\pm 2\%$
- Input surge protection: Meets UL 924

Output

- Output voltage: Universal 120 or 277Vac, 60HZ. Other voltages available upon request
- Output regulation: (static) $\pm 5\%$ based on a 0% – 100% resistive load
- Minimum loading: none required
- Output distortion: Less than 3% THD linear load
- Load power factor: .44 lead to .44 lag
- Output frequency: ± 0.3 Hz during emergency
- Time to transfer to inverter after a utility power failure: <1 second

Battery

- Battery type: Maintenance-free sealed Lead Calcium or Nickel Cadmium
- Battery charger: Fully automatic dual-mode with temperature compensation
- Recharge time: Meets UL requirements (96 Hours)
- Battery protection: Automatic low-battery voltage disconnect and reverse polarity protection.

- Standard batteries: Sealed Lead-Calcium: 7-year life, Sealed Nickel Cadmium: 15-year life
- Battery voltage: 12Vdc (all models)
- Runtimes: 90 minutes standard.
- Operating temperature: Lead Calcium models: 20°C to 30°C (68°F to 86°F)
Nickel Cadmium models: 0°C to 50°C (32°F to 122°F)
- Relative humidity: 95% non-condensing

Note: Lead Calcium battery performance rated at 25°C (77°F) for load, Nickel Cadmium battery performance rated at 0°C to 50°C (32°F to 122°F) for load

Table 1 (Physical Specifications)

System Model Number	Housing Mounting Style	Housing Size	Number Of Installed Batteries	Housing Dimensions			System Weight*	
				Length	Height	Depth	(Lbs.)	(Kg.)
EMPS32 WS	Surface	Small	1	143/4" (37.5 cm)	73/8" (18.7cm)	31/8" (7.9cm)	14	6.
EMPS55 WS	Surface	Large	1	143/4" (37.5 cm)	73/8" (18.7cm)	43/8" (11.1cm)	18	8.
EMPS20 WS	Surface	Small	1	143/4" (37.5 cm)	73/8" (18.7cm)	31/8" (7.9cm)	11	5.0
EMPS35 WS	Surface	Large	1	143/4" (37.5 cm)	73/8" (18.7cm)	43/8" (11.1cm)	12	5.
EMPS32 WR	Recessed	Small	1	161/4" (41.3 cm)	87/8" (22.5cm)	31/8" (7.9cm)	15	7.
EMPS55 WR	Recessed	Large	1	161/4" (41.3 cm)	87/8" (22.5cm)	43/8" (11.1cm)	19	9.
EMPS20 WR	Recessed	Small	1	161/4" (41.3 cm)	87/8" (22.5cm)	31/8" (7.9cm)	12	5.
EMPS35 WR	Recessed	Large	1	161/4" (41.3 cm)	87/8" (22.5cm)	43/8" (11.1cm)	13	6.
EMPS32 WT	Ceiling Recessed		1	237/8" (60.6 cm)	61/4" (15.8cm)	4.0" (10.2cm)	15	7.
EMPS55 WT	Ceiling Recessed		1	237/8" (60.6 cm)	61/4" (15.8cm)	4.0" (10.2cm)	19	9.
EMPS20 WT	Ceiling Recessed		1	237/8" (60.6 cm)	61/4" (15.8cm)	4.0" (10.2cm)	12	5.
EMPS35 WT	Ceiling Recessed		1	237/8" (60.6 cm)	61/4" (15.8cm)	4.0" (10.2cm)	13	6.

* System weights shown include installed batteries

Table 2 (Electrical Specifications)

System Model Number	Input/Output: Voltage (60Hz.)	Capacity (90 Min) Watson	Battery Type	Power Consumption. (Max.)	Battery Voltage (Vdc)	DC Input Current (Adc)	Input Current		Thermal Output in BTUs		Temp. Range (°C)
							120Vac (Max.)	277Vac (Max.)	Standby	Emergency	
EMPS 32W	120/277	32/32	Lead-Calcium	9W	12	3.	0.34A	0.15A	7	32	20 to 30
EMPS 55W	120/277	55/55	Lead-Calcium	9W	12	6.	0.54A	0.23A	7	47	20 to 30
EMPS 20W	120/277	20/20	Nickel Cadmium	9W	12	2.	0.25A	0.11A	31	22	0 to 50
EMPS 35W	120/277	35/35	Nickel Cadmium	9W	12	4.	0.37A	0.16A	31	35	0 to 50

Receiving, Moving, and Storing Systems and Batteries

102.1 Shipping Damage

Micro inverter system batteries are shipped along with the unit within a single shipping carton. Batteries for most units are not shipped within the housing with the exception of Plenum Rated Ceiling Mount (T-Grid) models. Carefully inspect all cartons upon receipt for evidence of shipping damage. Notify the carrier immediately of leaking or damaged cartons for possible concealed damage.

102.2 Temporary Storage of Units and Batteries

For temporary storage of Micro inverter systems and batteries prior to installation, select a clean, cool, dry location with normal ventilation for human habitation and level floors. Storage Temperature: Store all batteries at 0° to +40° C (32° to +104° F). Batteries will have a longer shelf life if stored at 15° C (60° F). The Micro-Inverter electronics and battery cabinets may be stored at -20° to +60° C (-4° to +140° F).

IMPORTANT:

Lengthy storage of batteries will cause irreversible damage to the cells. Failure to connect Micro inverter system batteries to an energized charging circuit within 90 days from the date of shipment will void the battery warranty.

DANGER: Explosive – Can Cause Blindness Or Other Severe Injuries

Every type of battery can produce hydrogen gas, even sealed, maintenance-free batteries. The gas is vented through the vent caps and into the air. Do not allow smoking, sparks, or flames in the battery storage location because hydrogen is concentrated under the vent cap of each cell of the battery. Hydrogen is highly explosive and is hard to detect because it is colorless, odorless, and lighter than air.

Installation Requirements

103.1 Operating Environment

Install the Micro inverter system in a clean, cool, dry place with normal ventilation for human habitation and in such a location to hamper vandalism but allow easy access for testing and maintenance.

Operating Temperature:

Micro inverter Systems with Lead Calcium batteries are UL Listed for 20° to 30° C (+ 68° to +86° F) operation. Micro inverter Systems with Nickel Cadmium batteries are UL Listed for 0° to 50° C (+ 32° to +122° F) operation. Battery performance and the service life is maximized if the operating temperature is maintained at 25° C (77° F).

Temperature Effect On Lead Calcium Battery Performance:

Lead Calcium batteries will be less efficient at temperatures below 20° C (68° F), and high temperatures will reduce battery life. Typically, at 35° C (95° F), battery life will be half of what it would be at a normal temperature of 25° C (77° F). At 45° C (113° F), battery life will be one-fourth of normal.

Temperature Effect On Nickel Cadmium Battery Performance :

Nickel Cadmium batteries will provide their full rated capacity throughout their useful life when operated within a range of 0°C to 50°C (32°F to 122°F)

Ventilation:

The air around the unit must be clean, dust-free, and free of corrosive chemicals or other contaminants. Do not

place the Micro inverter system or batteries in a sealed room or container. **CAUTION:** Never Install Batteries in A Sealed Room Or Enclosure

103.2 High Altitude Operation:

The maximum operating temperature drops 1° Celsius per 300 meters (2° F per 1000 feet) above sea level. The maximum elevation is 3000 meters (10,000 feet).

Cabinet Mounting

104.1 Tools Required

The following tools are required to install the system: Socket Set, Phillips Screwdriver, Diagonal Wire Cutters, Long Nose Pliers, Electrical Tape, Digital Volt-Ohm Meter, Safety Glasses with Side Shields, Small Punch (knockout removal), Hammer, Electric Drill, Wood or Masonry Bits, Level.

104.2 Mounting Hardware

Mounting hardware is not provided. Care should be taken when selecting mounting hardware to assure that it is the proper type for the application and sized to safely support the system's full weight when installed assuring safe and secure attachment of the system to the wall surfaces or building structures. For ease of installation, the factory recommends that the head size of mounting screws or bolts be small enough to pass through the keyhole knockouts provided for mounting. This will allow the unit to be hung on partially installed mounting hardware and facilitate easy cabinet removal if ever necessary.

104.3 Knockout Locations

All models provide knockouts on the top and right-hand sides of the unit. Additional entry points, if required can be added using a metal punch. Do not drill into the cabinet as metal filings can cause short circuits and damage the equipment.

NOTE: Consider unit knockout locations prior to mounting the unit. Allow room for easy routing of conduit to the entry point.

104.4 Surface Mount (S) Models:



1. Remove cover and any packing material inside unit housing that may have been used for shipping purposes.
2. Remove the appropriate knockouts, 7/8" diameter, on the top and/or right-hand side of the unit housing to facilitate conduit attachment. Also, remove keyhole knockouts in the upper corners on the back of the housing.
3. Secure housing to the mounting surface through both keyhole knockouts provided using mounting hardware (not supplied) sized appropriately to support the unit weight.

104.5 Recessed Mount (R) Models:



1. Remove cover and any packing material inside unit housing that may have been used for shipping purposes.
2. Remove the appropriate knockouts, 7/8" diameter, on the top and/or right-hand side of the unit housing to facilitate conduit attachment. Also remove the appropriate round knockouts, 5/16" diameter, which is located on all sides of the unit housing. Specific knockout requirements are dictated by mounting orientation of unit (vertical or horizontal) and location of wall studs and /or other support members.
3. Secure housing to support members through round knockouts using mounting hardware (not supplied) sized appropriately to support the unit weight.
IMPORTANT: The unit should be so positioned that the cabinet extends between 3/8" and 3/4" beyond the finished wall surface after installation.
4. Prior to the final attachment of the unit cover, the LED indicator panel assembly position must be adjusted to sit flush against the inside surface of the cover after attachment. This is accomplished using the (2) 8-32 hex nuts on the indicator assembly.

104.6 Ceiling T-Grid Mount (T) Models:



1. Remove cover and any packing material inside unit housing that may have been used for shipping purposes.
2. Remove the appropriate knockout(s), 7/8" diameter, located on either side of the unit housing to facilitate conduit attachment.

IMPORTANT: Take care to remove only the knockouts required for utility connection. Removal of knockouts if unused and left open will void the plenum rating of the unit.

3. Mount the unit securely in place between T-Grid members.

NOTICE: A safety chain or cable, rated 50-pound minimum working load, and 250-pound minimum breaking strength is required to hang the unit in a T-Grid system. Failure to correctly install the unit will cause an unsafe condition!

AC Connections

CAUTION:

- A) All Micro inverter system units contain hazardous AC and DC voltages. Because of these voltages, a qualified electrician must install the Micro inverter system, AC line service, and batteries. The electrician must install the AC line service according to local, state, and NEC codes and must be familiar with batteries and battery installation.
- B) Before installing, maintaining, or servicing the unit, always remove or shut off all sources of AC power to the Microinverter system. Disconnect the unit battery leads to make sure the unit will not supply output voltage. Turn the AC line input circuit breaker OFF at the service panel.
- C) Whenever AC and/or DC voltage is applied, there will be AC voltage inside the Micro inverter system unit; the unit can supply power from the AC line or from its batteries. To avoid equipment damage or personal injury, always assume that there may be voltage inside the Microinverter system.
- D) Remove rings, watches, and other jewelry before installing the AC wiring. Always wear protective clothing and eye protection and use insulated tools when working near batteries. Whenever servicing an energized unit with the inside panel open, electric shock is possible; follow all local safety codes. **TEST BEFORE TOUCHING!**
- E) To reduce the risk of fire or electric shock, install the Micro inverter system and the batteries in a temperature-controlled and humidity-controlled indoor area free of conductive contaminants. See Section 103 for operating environment specifications.

105.1 AC Wiring Preparations

1. Remove the system's front cover.
2. Make sure the Micro inverter system input and output voltages are correct for the particular application.

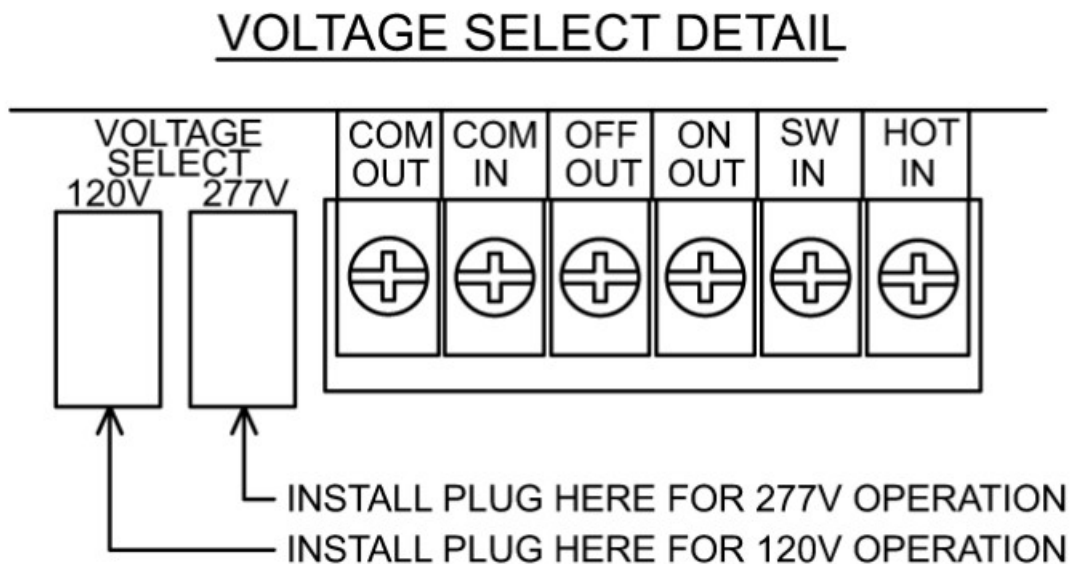
Remember that the Microsystem provides single-phase power only.

3. The input circuit breaker in the input service panel provides the means for disconnecting AC to the Microinverter system. Only authorized persons shall be able to disconnect AC to the unit. (See NEC 700-20 and 700-21.) **CAUTION:** To prevent electrical shock or equipment damage, for all units, make sure the Micro Inverter Battery is disconnected and the AC input circuit breaker at the service panel is OFF before making AC connections to the Microinverter system.
4. If not previously done, remove cabinet knockouts for AC Input and AC Output as described in Sections 104-4, 104.5 or 104.6 depending on the mounting method **CAUTION: Do not drill the cabinet; drill filings may damage the unit and prevent it from operating. If larger knockouts are needed, use a chassis punch to enlarge the appropriate knockout. Do not add additional or unnecessary knockouts.**
5. Install the input and output conduits.
6. Run the AC Input service conductors and AC Output conductors through separate conduits. Micro inverter system emergency output circuits shall be installed in dedicated conduit systems and not shared with other electrical circuits as described in NEC 700-9(b).

Micro-Inverter models can be configured for either 120Vac or 277Vac input connections as well as various modes of output operation as described in this section. Refer to the appropriate wiring diagrams to properly connect the utility AC power, fixtures, and external switching device (where applicable). Perform all wiring procedures in accordance with applicable codes.

105.2 AC Input Voltage Selector Plug Installation

MthiecroactiunavleArtCerinspsuttelmines may be voltage-operated from and install either 120Vac or provided Voltage 277Vac power sources. Determine Selector Plug in the position next to the system terminal block that matches the line voltage potential as shown in the illustration below.



CAUTION: Failure to install the Voltage Selector Plug will prevent system operation. Installing the Voltage Selector Plug in a position that does not match the actual AC input line voltage will damage the unit, void the warranty, and may cause a dangerous or unsafe condition.

105.3 AC Input/Output Wiring Connections to Terminal Block

Depending on how the fixture load is to be operated, wire the system as described below.

Normally-On Operation – Connected fixture(s) remain illuminated in AC and emergency modes. See Wiring Diagram 1.

Normally-Off Operation – Connected fixture(s) illuminate only upon loss of utility AC power. See Wiring Diagram 2.

Normally-On and Normally-Off Operation – A combination of the operating modes described above. See Wiring Diagram 3.

Switched Load Operation – Single Circuit – Connected fixture(s) can be externally switched and will illuminate upon loss of utility AC power regardless of the external switch position. See Wiring Diagram 4.

Diagram 1. NORMALLY ON LOADS

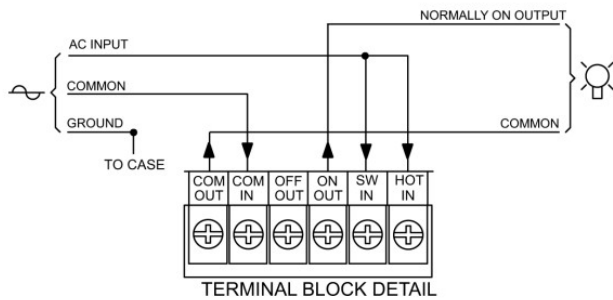


Diagram 2. NORMALLY OFF LOADS

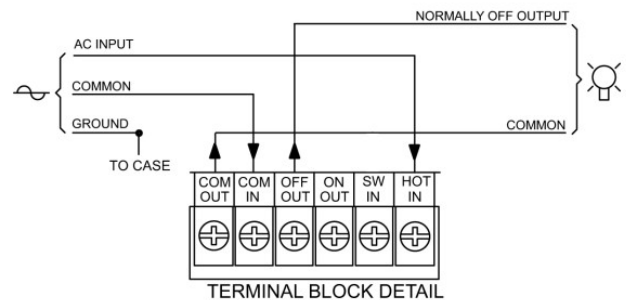


Diagram 3. NORMALLY ON & OFF LOADS

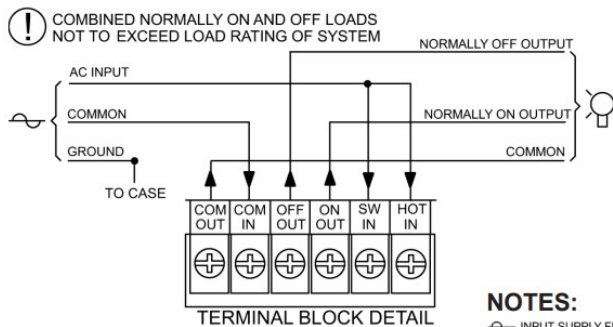
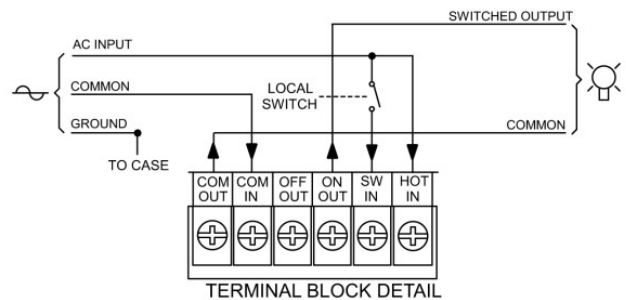


Diagram 4. SWITCHED LOADS



NOTES:

- INPUT SUPPLY FROM UNSWITCHED UTILITY RATED 20 AMPS MAXIMUM.
- OUTPUT(S) TO LIGHTING LOADS

Battery Information

Important Safety Precautions

The installer must take these precautions:

1. Wear protective clothing, eye-wear, rubber gloves, and boots. Batteries contain corrosive acids or caustic alkalis and toxic materials and can rupture or leak if mistreated. Remove rings and metal wristwatches or other metal objects and jewelry. Don't carry metal objects in pockets where the objects can fall onto the batteries or into the Microinverter system.
2. Tools must have insulated handles so that they will not short battery terminals. Do not allow a tool to short a battery terminal to another battery terminal or to the cabinet at any time. Do not lay tools or metal parts on top of the batteries, and do not lay any objects where they could fall onto the batteries or into the cabinet.
3. Install the batteries as described in this manual. When connecting cables, never allow a cable to short across a battery's terminals or to the cabinet.
4. Keep the cable away from any sharp metal edges.
5. Install the battery leads so they cannot be pinched by the Micro inverter system cover/door.
6. Where conductors may be exposed to physical damage, protect conductors in accordance with NEC requirements.
7. Full voltage and current are always present at the battery terminals. The batteries used in this system can produce dangerous voltages, extremely high currents, and a possible risk of electric shock. Batteries may cause severe injury if the terminals are shorted together or to the ground (earth). Be extremely careful to avoid electric shock and burns caused by contacting battery terminals or shorting terminals during battery installation. Do not touch uninsulated battery terminals.
8. A qualified electrician who is familiar with battery systems and required precautions must install and service the batteries. Any battery used with this unit shall comply with the applicable requirements for batteries in the standard for emergency lighting and power equipment, UL 924. Cabinets are designed to be used with, and

batteries must be replaced by identical cells or a Manufacturer approved equivalent. If using substitute batteries not supplied by the manufacturer, the unit's UL listing will be void, and the equipment may fail to perform properly. The installation must conform to national and local codes as well. Keep unauthorized personnel away from batteries.

106.1 Tools

The following tools are required to install the system batteries: Long Nose Pliers, Digital Volt-Ohm Meter, and Safety Glasses

CAUTION: Always use insulated tools for battery installation.

106.2 Battery Installation and Connection

1. Lead-Calcium Battery Models: EMPS32W and EMPS55W are supplied with a single 12Vdc Lead Calcium battery. To install the unit battery, place the battery within the system housing and connect the black battery negative fly lead to the battery's black (B-) terminal. Connect the red battery positive fly lead to the battery's red (B+) terminal.
2. Nickel Cadmium Battery Models: EMPS20W and EMPS35W are supplied with a single 12Vdc Nickel Cadmium battery. To install the unit battery, place the battery within the system housing and connect the black battery negative fly lead to the battery's black (B-) lead wire. Connect the red battery positive fly lead to the battery's red (B+) lead wire.

106.3 Battery Voltage Check

Using a digital volt-ohm meter, check for correct nominal battery voltage between DC Input NEG and POS wires. Voltage reading should be $\pm 10\%$ of the system's nominal 12Vdc operating voltage.

107. Final Installation Checklist

IMPORTANT: Before proceeding to the System Start-Up Procedure (Section 108) complete the Final Installation Checklist below.

1. Ensure the Micro Inverter cabinet(s) is securely fastened to a wall or other structure
2. Ensure that the input circuit breaker in the building service panel serving as the AC disconnect to the Micro Inverter system is in the OFF position.
3. Check for proper ground connections in the Micro Inverter unit cabinet.
4. Check for any loose wiring connections in the Micro Inverter unit cabinet.
5. Check that the correct nominal battery voltage (12 Vdc) is present in the Micro Inverter unit between the battery's NEG and POS terminals.
6. Verify AC Input Voltage Selector Plug is installed and in the proper position to accept the AC input line voltage. system voltage configuration.

CAUTION: Failure to install the Voltage Selector Plug will prevent system operation. Installing the Voltage Selector Plug in a position that does not match the AC input line voltage will damage the unit, void the warranty and may cause a dangerous or unsafe condition.

108. System Start-Up Procedure

IMPORTANT: The Microinverter system is a sophisticated electronic backup power supply, care must be taken to follow the steps below in their exact sequence. Failure to do so may result in possible equipment failure.

CAUTION: Familiarize yourself with the shutdown procedure in Section 200.1 before proceeding with the Micro Inverter system Start-Up.

1. Apply utility AC power to the system by turning the branch circuit breaker in the main power panel to the ON

position.

2. Observe the LED Status indicators and verify the following:
 - A) AC ON indicator (red LED) is illuminated (indicates AC utility power is available to the unit).
 - B) CHG ON indicator (green LED) is illuminated (indicates the battery is connected and charger is operational).
3. Verify that Normally-On fixtures or switched fixtures (where applicable) are illuminated (local fixture switch must be in ON position).

109. System Test

Momentarily push the TEST switch and verify the following:

- A) INV ON status indicator (yellow) illuminates (indicates inverter is operational).
- B) Normally-On, Normally-Off and Switched fixtures are illuminated (where applicable).

Maintenance

200.1 Safe Shut Down Procedure

CAUTION: To avoid possible equipment damage or personal injury, assume that there is AC voltage present inside the Micro inverter system unit any time AC input power or DC battery voltage is applied. The inverter is capable of providing output voltage from the batteries even when there is no AC input line voltage. When AC input voltage is present, the unit can provide output voltage even when the batteries are disconnected.

Do not touch components inside the unit. DC voltage is always present in the batteries and battery cables.

Final Shut Down Procedure

1. Open the unit's front access panel.
2. Disconnect the unit battery leads to make sure the unit will not supply output voltage.
3. Place the AC Input circuit breaker at the service panel in the OFF position.

CAUTION: HAZARDOUS ENERGY IS STORED IN CAPACITORS INSIDE THE Micro inverter UNIT. AFTER TURNING OFF SWITCHES, ALLOW 5 MINUTES FOR CAPACITORS TO DISCHARGE BEFORE ATTEMPTING ANY SERVICE PROCEDURES.

4. If the service technician does not need to access the inside of the unit, keep the unit's front cover/ door closed.
5. If the unit will be shut off for an extended period of time, recharge the battery every 60 to 90 days.

CAUTION: The battery will be damaged and the warranty voided if not routinely recharged.

NOTE: To turn the power back on, follow the "System Start-up Procedure" outlined in Section 108. Be sure to complete all of the steps to assure the unit will operate properly.

200.2 Routine System Maintenance

The Microinverter system unit is designed to provide years of trouble-free operation. The unit does require some routine attention to assure peak performance. The Manufacturer recommends a Preventative Maintenance check be performed by a qualified service technician at least every six months. The technician must observe important safety precautions while performing the following recommended tasks:

- Inspect and clean the unit interiors;
- Inspect all batteries for leaks, cause swelling or terminal corrosion;
- Perform an emergency operation test to check the operation of all critical connected loads

200.3 Manual Routine Inverter Tests

NFPA101 requires that Emergency Lighting Equipment be tested on a monthly basis for a period of at least 5 seconds, and a minimum of 90 minutes once a year. We strongly recommend these guidelines be followed to

ensure system readiness and to prolong battery life. The Micro-Inverter system was designed with a front panel test switch to facilitate monthly testing. Simply depress the button and hold to test the inverter at any time. Once released, the Micro Inverter will revert back to standby operation. For annual 90-minute discharge or other prolonged tests, simply turn off the AC Input breaker at the service panel.

200.4 Routine Battery Inspection and Maintenance

Sealed Lead-Calcium Batteries

Maintenance-free cells are the most common type of battery used today in standby equipment. By design, it is as maintenance-free as a battery can be. It is recommended, however, that some simple steps be taken to increase system life and maximize reliability:

A) A quarterly visual check of the battery should be conducted to look for deformities in the battery case, electrolyte leakage, and/or terminal corrosion. Any batteries with these conditions are defective and should be replaced. Any corroded terminals found, regardless of how slight, are to be cleaned at once to prevent system failure.

B) Once a year, all battery connections should be checked for tightness and cleaned and retightened as necessary.

200.5 Battery Replacement Procedure

WARNING: Always use the same quantity and type of battery as replacements. Substituting batteries not supplied by the manufacturer will void the UL listing of the system and may cause equipment failure. To ensure the superior performance of your Micro inverter system and to maintain proper charger operation, replace spent batteries only with those having the same part number, voltage, and ampere-hour rating as the original batteries.

1. Follow the proper shutdown procedure as described in Section 200.1.
2. Disconnect the battery Positive red (B+) and Negative black (B-) connectors.
3. Remove the battery from the cabinet.
4. Install a new battery following the instructions outlined in Section 106.2.

200.6 Battery Disposal

WARNINGS:

- **Do not dispose of batteries in a fire, the batteries could explode.**
- **Do not open or mutilate batteries.**
- **Released electrolyte is highly toxic and harmful to the skin and eyes.**

CAUTION: Batteries contain lead or cadmium, depending on the model. Many state and local governments have regulations about used battery disposal. Please dispose of the batteries properly.

INSTRUCTIONS FOR SELF-DIAGNOSTIC TESTING (SDT)

Once the unit is properly installed in accordance with the installation instructions and AC power is supplied to the unit, the dual-color (SDT STATUS) LED indicator will illuminate, followed by the amber (INV ON) LED indicator. The dual-color LED indicates the unit's status. A steady GREEN LED indicates normal service; A blinking GREEN/RED LED indicates the battery is charging; A BLINKING RED LED (in different combinations) indicates a service alert. Refer to the SERVICE INDICATION chart below for details. During the loss of normal utility power, the dual-color LED will not be illuminated. The AMBER (INV ON) LED indicator will be illuminated only during inverter operation initiated by the loss of utility power or during any manual or automatic self-test.

SELF-DIAGNOSTIC SERVICE

The self-diagnostic function is factory preset and performs the following:

- a) Monitoring of battery, battery charger, and connected loads.
- b) Self-testing and a (30) second battery discharge once every (30) day, after normal utility power has been supplied for a minimum of (96) hours.

- c) Self-testing and a (30) minute battery discharge once every (180) day after normal utility power has been supplied for a minimum of (96) hours.
- d) Self-testing and a (90) minute battery discharge once every (365) day, after normal utility power has been supplied for a minimum of (96) hours.

SERVICE INDICATION

LED Indicator	Status
GREEN steady	Normal service
RED/GREEN blinking	High Charge enabled
GREEN blinking	Test Mode enabled
One blink RED/pause	Battery Charger fault
Two blinks RED/pause	Battery fault
Four blinks RED/pause	Lamp/Load fault


MANUAL TESTING

The unit also provides for manual testing by pushing the TEST button in a specific pattern:

Action	Reaction and LED Indication
Push test switch Once (within (2) seconds)	(30) second test: One blink GREEN/pause
Push test switch Twice (within (2) seconds)	(30) minute test: Two blinks GREEN/pause
Push test switch Three times (within (2) seconds)	(90) minute test: Three blinks GREEN/pause
Push test switch and hold for (3) seconds	Cancel test
Push test switch and hold for (6) seconds	System reset

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 PO Box 437, Sharpsville, Ind. 46068

Documents / Resources

	<p>Functional Devices EMPS32W Micro Inverters [pdf] Instruction Manual EMPS32W Micro Inverters, EMPS32W, Micro Inverters</p>
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