



MIP-100

MINI INVERTER PACK

INSTALLATION AND OPERATING INSTRUCTIONS

IMPORTANT SAFEGUARDS

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

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. To prevent electric shock, switch off the mains power supply until installation is complete and AC input power is supplied to this product.
2. This product requires an unswitched AC power supply of 120-277V, 50/60Hz.
3. Make sure all connections are in accordance with the National or Canadian Electrical code and any local regulations.
4. To reduce the risk of electrical shock, disconnect both normal power, emergency power supplies and unit connector of this product before servicing.
5. For emergency operation of LED, incandescent, fluorescent fixtures and screw-base lamps.
6. The product is UL Listed for field installation, and use with grounded, Listed, damp location rated fixtures.
7. Use this product in 0°C minimum, 50°C maximum ambient temperatures (Ta). It can provide minimum 90 minutes illumination under the emergency mode.
8. This product is suitable for use in dry or damp locations. Do not use outdoors. Do not mount it near gas, heaters, air outlets or other hazardous locations.
9. Do not attempt to service the batteries. A sealed, non-maintenance battery is used that is not field replaceable. Contact the manufacturer for information or service.
10. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition and void warranty.
11. Do not use this product for other than intended use.
12. Installation and service should be performed by qualified service personnel.
13. This product should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.



Li-ion

**THIS PRODUCT CONTAINS A RECHARGEABLE LI-ION BATTERY.
THE BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY.**

SAVE THESE INSTRUCTIONS

2575 Metropolitan Drive • Trevose, PA • 19053 U.S.A
Telephone: 1- (800) 967-5540 • Fax: (215) 244-4208



INSTALLATION INSTRUCTIONS



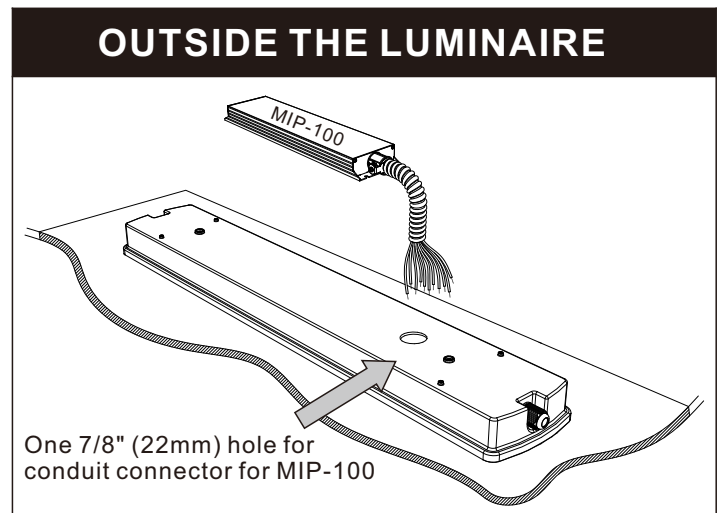
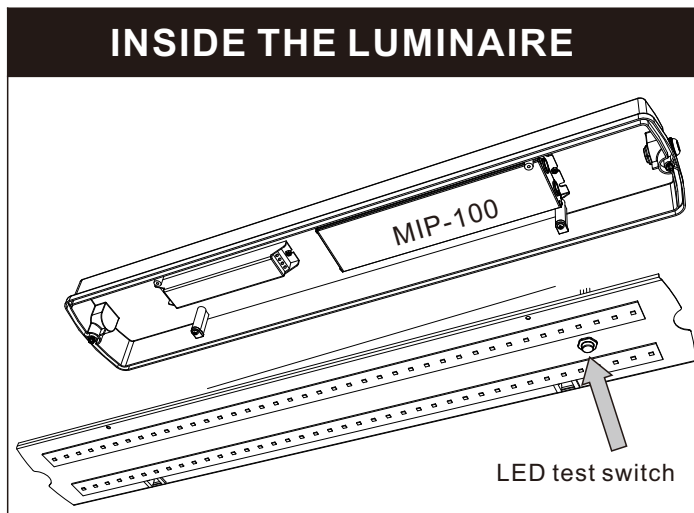
CAUTION: MAKE CERTAIN THE AC POWER IS OFF AND THE MIP-100 BROWN WIRE UNIT CONNECTOR IS DISCONNECTED UNTIL THE INSTALLATION IS COMPLETE.

1. SPECIFICATION OF MIP-100

Voltage		Output power
Input	Output	
120V/60Hz	120V/60Hz	100W
230V/50Hz	230V/50Hz	
277V/60Hz	277V/60Hz	

2. INSTALLING THE MIP-100

The MIP-100 can be mounted inside or outside (nearby or on top of *) the luminaire.

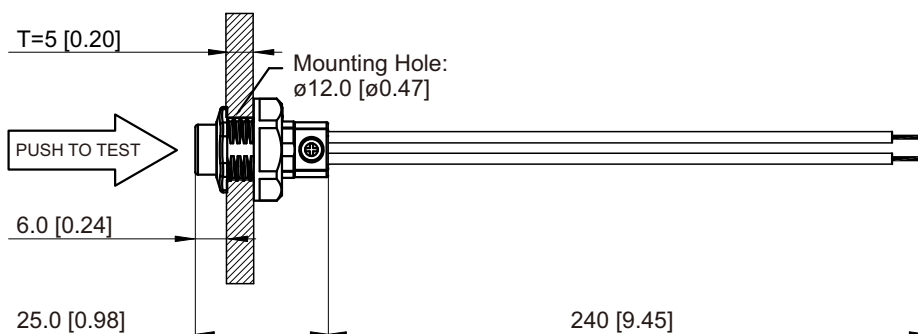


* NOTICE:

The MIP-100 Emergency Inverter Pack are rated for operation with an internal pack ambient between 0°C to 50°C. To meet this rating, warranty condition and ensure optimum component life, it is recommended that the pack be mounted remotely from the light fixture or high ambient temperatures. Where it is necessary to mount directly to the light fixture, the installer should verify that the stabilized fixture surface temperature rise does not contribute radiant heat directly to the pack surface; resulting in the pack internal ambient temperature exceeding the max. 50°C rating. Locate or space the pack as necessary.

3. INSTALLING THE LED TEST SWITCH (LTS)

Select a convenient location for the LTS so that it can be seen after installation. Drill a 1/2" (12 mm) hole for mounting the LTS. Connect the wires from LTS to the MIP-100 model according to the wiring diagram on page 3.



All dimensions are typical

Dimension unit: mm [inch]
Tolerance: ±1 [0.04]

WIRING DIAGRAMS



CAUTION: DO NOT MATE BROWN WIRE UNIT CONNECTOR UNTIL INSTALLATION IS COMPLETE AND AC POWER IS SUPPLIED.

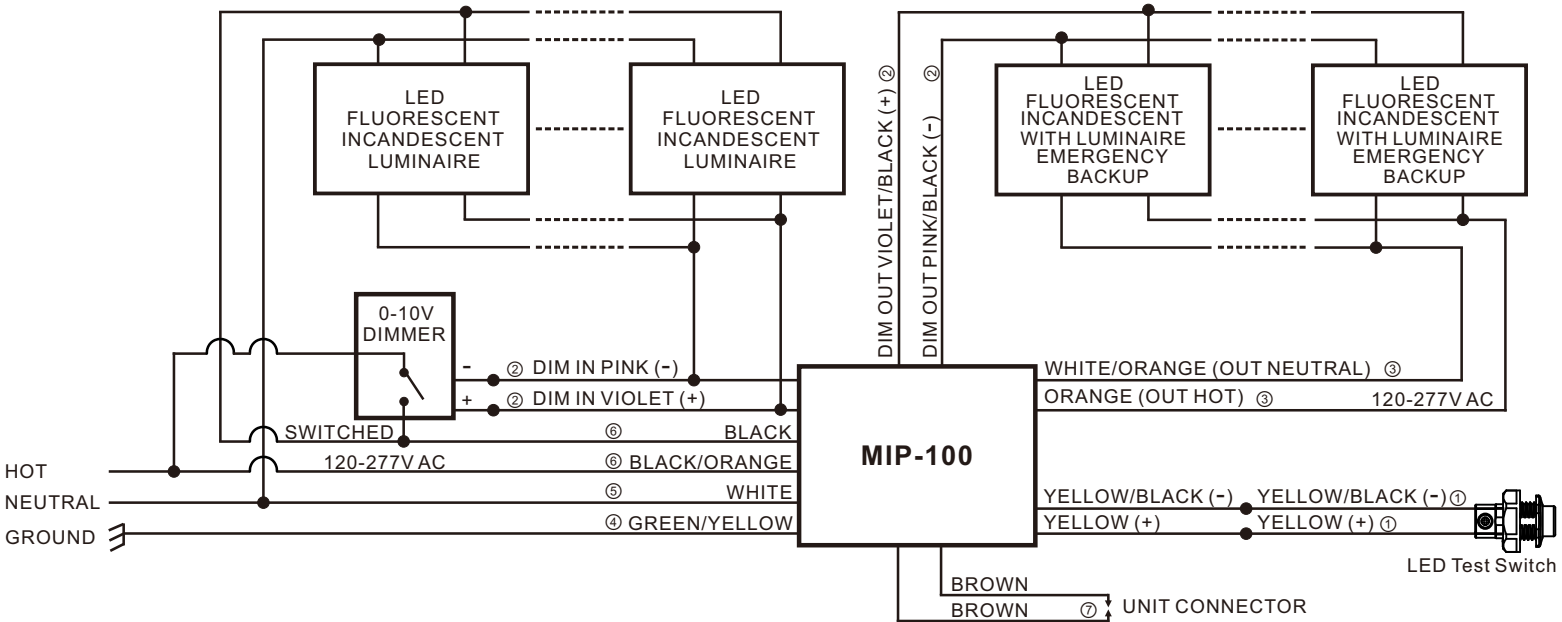
1. The MIP-100 requires an unswitched AC power supply of 120-277 volt, 50/60Hz.
2. Refer to the wiring diagrams below. Make connections in the following order ①②③④⑤⑥⑦
3. Consult the factory for other wiring diagrams.

WIRING DIAGRAM FOR 0-10V DIMMABLE EMERGENCY LIGHTING SYSTEM

MAX. DIMMABLE LOAD = 900W (PF of load >=0.9)

LUMINAIRES WITH DIMMED EMERGENCY BACKUP

NON-EMERGENCY LUMINAIRES



NOTE: THE MAX. LINKABLE LUMINAIRE QUANTITY IN EMERGENCY MODE MAY VARY DUE TO LUMINAIRE ELECTRICAL CHARACTERISTICS. ACTUAL LOAD MUST BE VERIFIED BY END USER.

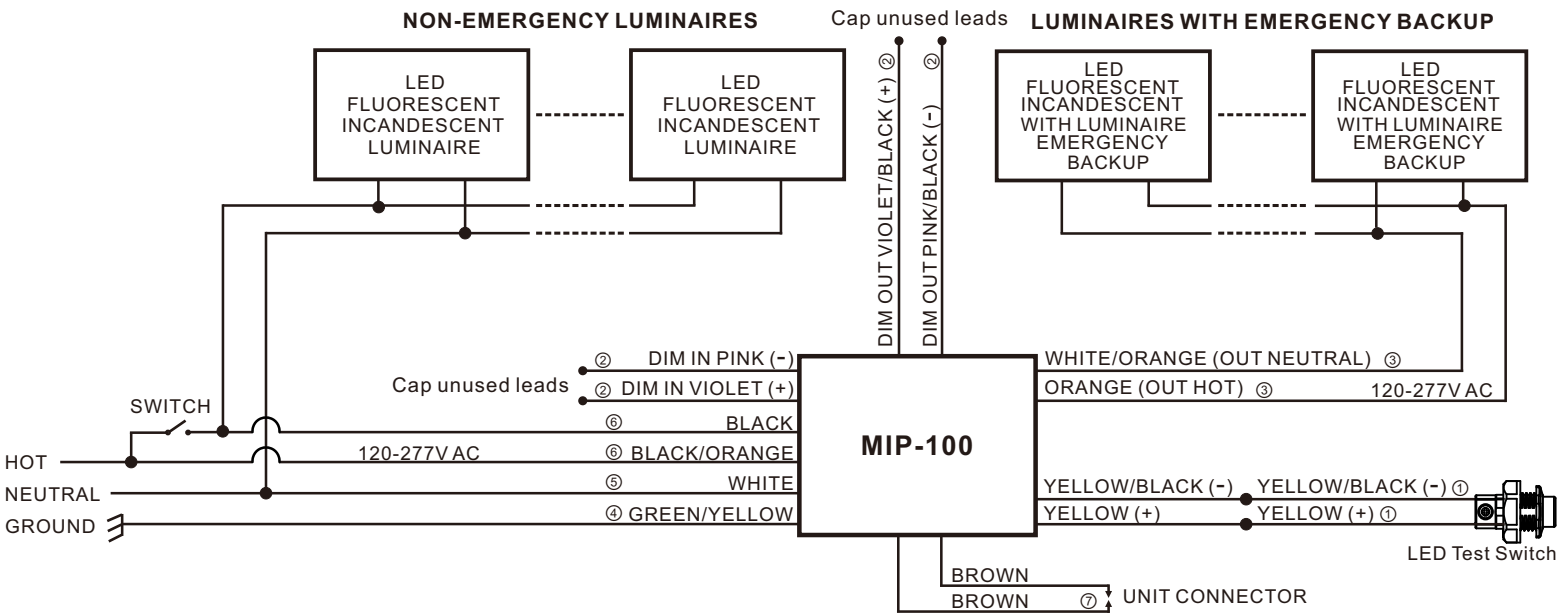
CAUTION: BROWN WIRE UNIT CONNECTOR ENERGIZES INVERTER-CONNECT LAST AND ALWAYS DISCONNECT BEFORE SERVICING

WIRING DIAGRAM FOR NON-DIMMABLE EMERGENCY LIGHTING SYSTEM

MAX. LOAD = 100W

LUMINAIRES WITH EMERGENCY BACKUP

NON-EMERGENCY LUMINAIRES



CAUTION: BROWN WIRE UNIT CONNECTOR ENERGIZES INVERTER-CONNECT LAST AND ALWAYS DISCONNECT BEFORE SERVICING

OPERATION / INSTALLATION NOTES

OPERATION

When AC power is applied, the LED test switch is illuminated, indicating that the batteries are being charged. When AC power fails, the MIP-100 automatically switches to emergency power, operating the lighting load at rated emergency power. During power failure, the LED test switch will be off. When the AC power is restored, the MIP-100 switches the system back to normal mode of operation and resumes battery charging. The minimum emergency operation time is 90 minutes. A short term discharge test may be conducted after the unit has been charging for 1 hour. The charging time for the full discharged battery of MIP-100 is 24 hours.

ADAPTIVE AUTOMATIC DIMMING WIRING FOR LOADS LARGER THAN MIP'S OUTPUT RATING

The MIP inverter series features patented Adaptive Automatic dimming that allows for dimming of loads greater than the MIP's rated output, (100W) up to 900W (MIP-100). All fixtures that exceed the MIP's output rating (100W) must have 0-10VDC dimming capable drivers. Connection of the MIP's output dimming wires (Violet/Black, Pink/Black wires) to the fixture is mandatory in all cases whether local dimming is required or not. Failure to connect the MIP's output dimming wires (Violet/Black, Pink/Black) will result in a fault during emergency mode and the fixtures will not illuminate. For loads equal to or less than the output rating of the MIP (100W) 0-10VDC dimming is not required for proper function.

If the MIP is being used for multiple fixtures, all output wires including dimming of the MIP must be connected in series across all fixtures. In the event of an emergency the MIP will automatically bypass any local switching or dimming and illuminate the loads to the packs maximum rated output of either 100W.

INSTALLTION NOTES ADAPATIVE DIMMING - EMRGENCY LOAD CALCULATION CHECKLIST

1. MEASURE ACTUAL EMERGENCY-MODE WATTAGE

Include power factor, driver efficiency, and other system losses.

2. IDENTIFY LOWEST DIMMING LEVEL OF THE DRIVER

In 0-10V systems, "percent" is relative to the control voltage range.

Example: 1% on the dimmer scale may equal - 10% light output.

Example calculation: $30W \times 15\% (1.5V) = 4.5W$ Load.

Max luminaires = Pack rating / Emergency load per luminaires.

3. IF DRIVER EFFICIENCY AND MINIMUM OUTPUT LEVEL UNKNOWN > ADD 30% TO CALCULATED LOAD.

4. IF FADE DIMMING USED > ADD 50% TO CALCULATED LOAD

WIRING FOR LOADS EQUAL OR LESS THAN MIP'S OUTPUT RATING

All loads that are equal to or less than the MIP's rated output (100W) do not require connection of the dimming output wires (Violet/Black, Pink/Black) for proper function. Cap dimming wires if not used.

The MIP's dimming output wires (Violet/Black, Pink/Black) can be connected to the fixture if local dimming is required during utility mode.

In the event of an emergency the MIP will automatically bypass any local switching or dimming and illuminate the connected load to full illumination not exceeding 100W.

SWITCHED OPERATION WIRING

Connect all wires from the inverter to the fixture following the diagram printed on the label. In this mode the fixture can be controlled by local switching/dimming during utility mode (On/Off), in the event of an emergency the inverter will bypass local switching/dimming and the fixture will illuminate at the inverters rated capacity (100W).

NORMALLY-ON OPERATION

Connect the Black and Black/Orange wires of the pack to line Hot, all remaining wires from the inverter shall be connected to the fixture following the diagram printed on the inverter. In this mode the fixture will be in the "On" state during utility power, in the event of an emergency the fixture will continue to illuminate at the inverters rated capacity (100W).

NORMALLY-OFF OPERATION

Cap the Black wire of the pack, all remaining wires from the inverter shall be connected to the fixture following the diagram printed on the inverter. In this mode the fixture will be in the "Off" state during utility power, in the event of an emergency the fixture will illuminate at the inverters rated capacity (100W).

TESTING / MAINTENANCE / SELF-TEST CONDITIONS

TESTING AND MAINTENANCE

The following Periodic testing is recommended to ensure the system is working correctly.

1. Visually inspect the LED test switch (LTS) monthly. It should be illuminated when AC power is applied, check status conditions (see section titled "LED Test Switch Conditions" below).
2. Conduct a 60-second discharge test, which can be initiated via the LED Test Switch (see section titled "**Manual Test**" below) or by switching OFF the emergency breaker for 60-seconds. Check status conditions (see section titled "**LED TEST SWITCH CONDITIONS**" below).
3. Conduct a 90-minute discharge test annually, which can be initiated via the LED Test Switch (see section titled "Manual Test" Below) or by switching OFF the emergency breaker for 90 minutes. Check status conditions (see section titled "**LED TEST SWITCH CONDITIONS**" below).

SELF-TEST STATUS

On initial power on or after a battery reset, if the SELF-TEST is enabled, the LTS (LED test switch) will blink 3 times (on 0.3 seconds and off 0.3 seconds), and then stay off for 2 seconds. The LTS will return to normal mode (slow blinking during charging, continuously on once fully charged); If the SELF-TEST is disabled, the LTS will blink 6 times (on 0.3 seconds and off 0.3 seconds) and then stay off for 2 seconds. The LTS will return to normal mode (slow blinking during charging, continuously on once fully charged).

DISABLING/ENABLING SELF-TEST:

During normal operation, press the LTS 5 times within 3 seconds. If the SELF-TEST was previously enabled, the signal light will blink 6 times (on 0.3 seconds, off 0.3 seconds) and then stay off for 2 seconds. After 3 cycles of this display, the LTS will return to normal mode (slow blinking during charging, continuously on once fully charged), and the SELF-TEST will be disabled. If the SELF-TEST was previously disabled, the LTS will blink 3 times (on 0.3 seconds and off 0.3 seconds) and then stay off for 2 seconds. After 3 cycles of this display, the LTS will return to normal mode (slow blinking during charging, continuously on once fully charged) and the SELF-TEST will be enabled.

1. INITIAL SELF-TEST

When the system is connected properly and powered on (make sure the load is switched on), the MIP-36 will perform an Initial SELF-TEST. If any abnormal conditions exist, the LTS will blink quickly. Once the abnormal condition is corrected, the LTS will function correctly. The Initial Self Test will be restarted automatically when the connected dimmable loads' maximum power increases.

2. PREPROGRAMMED SCHEDULED SELF-TEST

- a) The unit will conduct the first Monthly SELF-TEST after 24 hours and up to 7 days after initial power on. Then monthly tests will be performed every 30 days.
- b) Annual SELF-TEST will occur every 52 weeks after initial power on.

- MONTHLY SELF-TEST

The Monthly SELF-TEST shall be executed every 30 days, and will test:

Normal to emergency transfer function, emergency, charging and discharging conditions are normal. Monthly test time is approximately 60 seconds.

- ANNUAL SELF-TEST

Annual SELF-TEST will occur every 52 weeks after the initial 24 hours full charge, and will test:

Proper initial battery voltage, 90-minute emergency operation and acceptable battery voltage at the end of the full 90-minute test.

If the SELF-TEST is interrupted by a power failure, a full 90-minute SELF-TEST will occur again 24 hours after the power is restored. If the power failure causes the battery to fully discharge, the product will restart the Initial SELF-TEST and Preprogrammed Scheduled SELF-TEST.

- MANUAL TEST

1. Press the LTS one time to simulate emergency mode for 10 seconds.
2. Press the LTS 2 times continuously within 3 seconds to force a 60-second monthly test. After the test is completed, the next (30-day) monthly test will count from this date.
3. Press the LTS 3 times continuously within 3 seconds to force a 90-minute annual test. After the test is completed, the next (52-week) annual test will count from this date. Note - the product must be 24-hour fully charged.
4. In normal mode, press and hold the LTS for greater than 3 seconds to restart Initial SELF-TEST.
5. During any manual test, press and hold the LTS for greater than 3 seconds to terminate a manual test. The Preprogrammed Scheduled SELF-TEST Test will not change.

TEST SWITCH CONDITIONS / LOAD CAPACITY RATING

LED TEST SWITCH CONDITIONS

LTS Slow Blinking: Normal Charging (1 second ON, 1 second OFF)

LTS On: Battery Fully Charged - Normal Condition

LTS Off: Power Failure

LTS Gradual Change: In Testing Mode

LTS Quickly Blinking: Abnormal Condition - Corrective Action Required (1/2 second ON, 1/2 second OFF)

LOAD/CAPACITY RATING IN WATTS

Model	90 Minute (1.5H)	120 Minute (2H)	150 Minute (2.5H)	180 Minute (3H)	240 Minute (4H)
MIP-36	36W	27W	21.6W	18W	13.5W
MIP-100	100W	75W	60W	50W	37.5W