

MEDI+PRODUCTS



PRODUCTS BY MEDICANIX INC.

Emergency Power System: MD – T Series



Owner's Manual

MEDICANIX INC.

Reassurance MD - T Series Owner Manual

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Product Information

(Required information when calling for service)

Date of Purchase:

Serial Number:

Facility Information:

(In the rear of the system)

Name Plate:

Model & Serial Number



Safety Warnings and Disclaimer

Location Warnings:

- Insure that you store the system in a structurally sound area as these UPS systems are extremely heavy. Also take special care when moving or lifting the system. Remove the batteries before attempting a stairway.
- Leave adequate space around the system for proper ventilation and do not store or lean items against the system which will prevent the ventilation needed for the system to function.
- Do not locate in high traffic areas where the possibility of impact can be foreseen.

Intended Use and Equipment & Wiring Connections:

- This system is not intended to support life or run life supporting equipment but rather to power surgical appliances needed in superficial surgical procedures. When used within a surgery environment do not use in the presence of flammable anesthetic mixtures with air oxygen or nitrous oxide. Applicable codes may specify keeping the system at a distance from the patient.
- This UPS system stores energy. Output battery terminals and possibly output breakers or outlets may possibly be live when the system is turned off or after the input power has been disconnected.
- Please be sure to electrically isolate the UPS entirely before opening access panels on the unit.
- Please be sure that the power supplied to this unit is the proper phase, voltage, and amperage specified.

MEDICAL USAGE

SAFETY NOTICE & DISCLAIMER

1. All hardwired units should be installed by licensed, professional personnel in accordance with local and national codes. Most Reassurance units are however 'plug & play' and not hardwired.
2. The unit should be installed in an area kept at controlled room temperature or somewhat cooler (60 - 70°F).
3. Although the system is supplied with sealed VRLA batteries they are not *leak proof*. We recommend the unit should not be located near explosive medical gas storage or open flame heaters or electric spark-inducing equipment.

STATEMENT OF LIABILITY IN MEDICAL ENVIRONMENTS

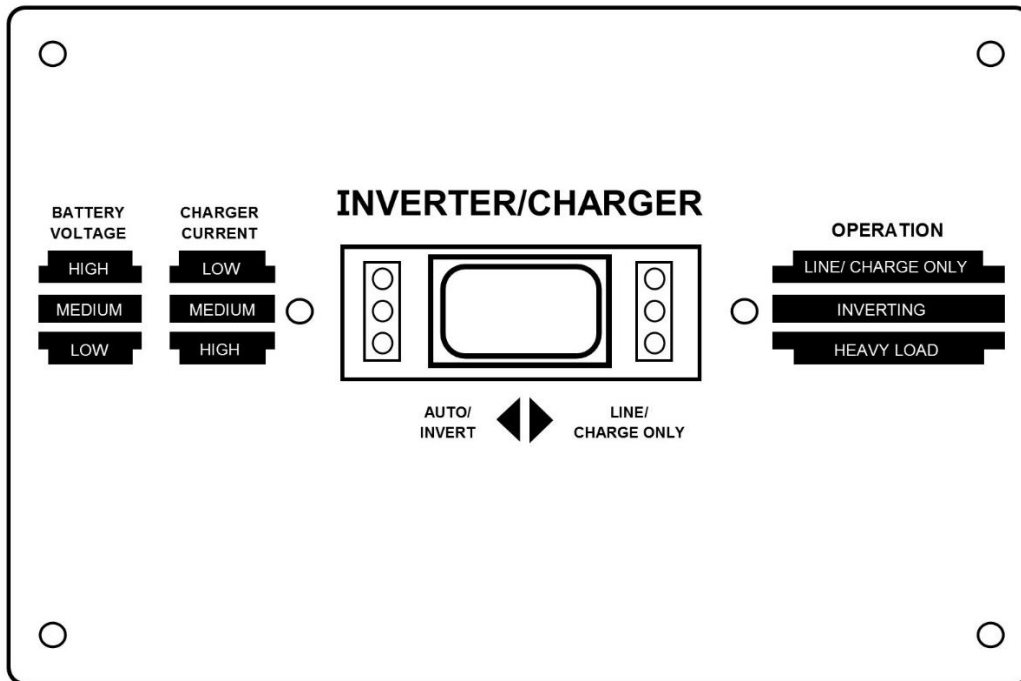
- The **REASSURANCE** is not to be relied upon as a primary emergency power source for life-support equipment. Its use is intended for the supply of emergency power to appliances which may be employed in non life-threatening medical procedures. It is imperative that it is understood that at no time should a patient remain unattended. At this writing the FDA has no classification for a general-purpose medical emergency power supply. This system is not a medical device.
- All life-support type equipment, life-signs monitors, gas monitors etc. are expected to have their own built-in F.D.A. approved appliance-specific energy sources and be maintained correctly. General room lighting and exit signs are also expected to have multiple independent energy sources.
- If life-supporting equipment is to be powered by any sort of electrical source or device it is MEDIPRODUCT'S expectation that several alternative independent power supply sources and devices be available.

Operation & Maintenance

System Operation:

On the center of the black panel in the front of the power system is a control switch.

This will toggle the system between Auto Invert, and Line Charge Only.



Line Charge Only:

Move the switch to this position whenever there **is not** equipment operating off of the system. This selection put the system in a “charge only” state. The Input utility power will still feed thru the system powering the unit’s output receptacles or breakers however if the input power were to be unplugged or cut off the system will completely shut down.

The “Line/Charge Only” LED will flash to remind you that the battery power in standby.

We recommend keeping this function selected for any of the following scenarios:

- 1) At an outpatient surgery while there are no surgical procedures taking place.
- 2) If the unit is not being used or in storage.

Having it in this position will ensure that the batteries will not be discharged if the power were to go off in the middle of the night or during the weekend.

Auto Invert:

Move the switch to this position whenever there is equipment being backed up by the system. This selection puts the system in a “standby” state. The Input utility power will be feed thru the system powering the unit’s output receptacles or breakers, but as soon as a power outage occurs the system will automatically transfer over the battery.

We recommend keeping this function selected for any of the following scenarios:

1) While surgical procedures taking place. (remember to switch it back to line charge only as soon as the procedure is over)

2) If the unit is being used for standby power to support an appliance such as a refrigerator or freezer.

Having it in this position will keep the supported equipment running if the power were to go off in the middle of the night or during the weekend.

Operating Mode LED Light Indicators:

LINE LED:

This is a green light that is continuously on whenever the supported equipment is receiving utility power and the switch is on Auto Invert. This means that the system will automatically switch over to battery power if input power is lost.

If the Systems is switched to Charge Only, the light will flash intermittently. In this state the supported equipment will still receive utility power but the system will not continue to supply power if the utility power were to be disconnected.

Inverting LED:

This is a yellow light, which will turn on continuously, if the supported equipment is receiving power from the battery. This light will flash if the system does not detect the minimum load necessary to supply power indicating the system is in “search mode”.

Heavy Load LED:

This is a red light will turn on when your Inverter/Charger is receiving utility power but the load is somewhere between 80% and 110% of the system’s capacity. This is to alert you that the inverter will not be able to support the load if the utility input power were to fail.

This light will flash if the system shut itself down due to a severe overload.

Battery Level LED Indicators:

There are three LED lights on the left side of the panel which show the approximate charge/and discharge level of the systems batteries.

The following chart indicates these levels:

LED Indicator	Approximate Level
Green	96% - Full
Green & Yellow	81% - 95%
Yellow	61% - 80%
Yellow & Red	41% - 60%
Red	21% - 40%
All Off	1% - 20%
Red Flash	0% (System shutdown)
Three - Slow Flash	Batteries Discharged Excessively
Three – Fast Flash	Batteries are Overcharged

Maintenance Procedures

Maintenance – User/Owner

The MEDI+Products Silent Sentry contains virtually no moving or lubricated components and therefore requires almost no user maintenance except testing and recordkeeping.

The user should be aware that by their nature, battery life is negatively affected by some usage patterns. Of course, batteries are intended to be used, but minimizing deep discharges, and frequent charge / discharge cycles will extend overall life. Their life expectancy will be generally in the range of four to five years. Please refer to the section on Battery Testing for more on this subject. If the appliance(s) supported are intermittently used – as in the case of surgery, for example – it is recommended that the inverter's 'Auto-On' feature be inhibited (turned off). In the case of refrigeration support, the 'Auto-On' should be enabled and its functionality be confirmed by test.

Records should be kept of battery tests as well as incidents causing battery discharges, including date, rate of discharge, length of discharge, name of person doing the test, &c.

The system has a battery voltage alarm which will sound below 11.5 and above 15 volts DC. Battery voltage indicators should be checked if the alarm sounds. Often a low battery alarm will result from a tripped supply breaker in the main building electric panel. If this is not the cause, please contact MEDI+Products promptly.

Maintenance and Troubleshooting – Qualified Technical Support

Adjustments can be made to the inverter module. Please refer to the supplementary inverter manual.

A large amount of energy is stored in the batteries which can cause injury to unqualified persons attempting to effect repairs. Also, no-one untrained with regard to electrical energy should attempt any service task or remove any of the front covers as live circuits will be exposed in all cases.

Eye protection should be worn by any person connecting or disconnecting batteries and battery cables.

Hand-washing is recommended for any person handling batteries.

Various battery connection patterns are used on several model variations. Battery replacements must follow the original factory configuration.

Troubleshooting charts for the inverter modules are within the supplementary inverter manual.

Battery 'float voltage' should be 13.5 – 13.8 VDC for nominal 12 volt systems. Higher voltages will be observed for 'bulk' and 'absorb' stages for preset time periods after a recharger restart, but should not exceed 15.5 except very briefly. Nominal 24 and 48 volts systems will be 27 - 27.6 and 54 – 55.2 respectively.

Testing Procedures

Standards of testing the power system must be implemented and carried along with regular testing.

Medi-Products sets out the following guidelines and instructions that must be understood and implemented for the use and dependence on our battery backup generators.

Weekly, Monthly and Annual load tests must be performed, recorded and documented. The following criteria must be followed in order to complete each test:

Weekly Testing:

The recommended weekly test is a quick and simple test which assures the functionality of the transfer switch, auto-invert and charge mode.

This test is performed by disconnecting the power that feeds the battery backup unit or if your system is a plug and play standalone system, unplug its power cord. Upon disconnecting the feed power, your system should switch over to invert mode and draw its power from the batteries. At this point you should be sure your refrigerator is still on and running.

After you have ensured that your system has switched over and inverting, you will need to restore the feed power (or re-plug the system in for mobile system. This test should not last more than 2 to 3 minutes.

Monthly Testing:

The monthly test is a load test that needs to be conducted no sooner than 20 days and no longer than 40 days from the prior (monthly) load test. This test is to ensure the generator can last 25% of its intended runtime. Your runtime is predetermined amount of time that your refrigerator will run on the battery backup. This would have been calculated at the time you have purchased the unit.

For the week you are performing the monthly test it is not necessary to also preform the weekly test.

Example: 12 hour run time = Monthly test 3 hours

Another important issue to take note of is that it is possible to over test your power system. Medi-Products battery backup systems use of AGM batteries, which they are discharged too frequently or discharged too deeply it can cause damage to the batteries, shorting their life expectancy and weakening them.

Record all the testing data on the test record sheet provided by Medi-Products.

Annual Load Testing:

This test is to ensure that your system can provide enough power for its intended use. It is important to understand that each system is generally sized to meet predetermined design criteria that pertains to the particular make and model of your refrigerator or freezer that is necessary to stay powered on in the event of a power outage. The primary objective of this test must be to ensure that the system is able to meet the needs of an anticipated emergency situation.

For the week and month you are performing the annual test it is not necessary to also preform the weekly or monthly test.

Disconnect the supply power to the system and run the appliance for the amount of backup time it is intended to power. Record the duration that the system was supplying power.

You may want to set a timer to remind you to restore the input power to the system and not over discharge the batteries. Reconnect the input power and recharge the battery bank. This may take several hours.

Record Keeping:

Recording these tests is important for the protection of your vaccines and costly inventory. You can use our test logs that are in our service manuals and on our download from our website.

Testing Procedures

Testing your emergency power system is a requirement in order to conform to Federal, State, NFPA and other accreditation and regulatory standards. Every Surgery Center both large and small must implement and carry out regular testing of their backup generator and emergency battery backup power system.

Medi-Products sets out the following guidelines and instructions that must be understood and implemented for the use and dependence on our battery backup generators.

Weekly, Monthly and 3 Year load tests must be performed, recorded and documented. The following criteria must be followed in order to complete each test:

Weekly Testing:

The recommended weekly test is a quick and simple test which assures the functionality of the transfer switch, auto-invert and charge mode.

This test is performed by disconnecting the power that feeds the battery backup unit or if your system is a mobile system, unplug its power cord. Upon disconnecting the feed power, your system should switch over to invert mode and draw its power from the batteries.

After you have ensured that your system has switched over and inverting, you will need to restore the feed power (or re-plug the system in for mobile system). Be sure to insure that the system switches back to charge mode and be sure that auto invert is switched back off.

Monthly Testing:

The monthly test is a load test that needs to be conducted no sooner than 20 days and no longer than 40 days from the prior (monthly) load test. This test is to ensure the generator can put out 30% of its name plate capacity for 30 minutes. The following loads should be used for each of the following listed models:

System Size (watts)	Recommended Load Size	Recommended Load Amps @ 120 volt
2000	600	5
2500	750	6.25
2800	840	7
3000	900	7.5
3100	930	7.75
4000	1200	10
4400	1320	11
8800	2640	22

It is important that these monthly tests are performed for no longer than 30 minutes and the load is as close to the recommended size for your system as possible.

Another important issue to take note of is that it is possible to over test your power system. Medi-Products battery backup systems consist of AGM batteries, if they are discharged too frequently or discharged too deeply it can cause damage to batteries, shorting their life expectancy and weakening them.

Record all the testing data on the test record sheet provided by Medi-Products.

3 Year Load Testing:

This test is to ensure that your system can provide enough power for its intended use. It is important to understand that each system is generally sized to meet predetermined design criteria that pertains to a list of necessary equipment that requires power in the event of a power outage. The primary objective of this test must be to ensure that the system is able to meet the needs of an anticipated emergency situation.

Disconnect the supply power to the system and run the equipment that would be necessary in the event of a power failure, enacting a live power outage during a procedure. This test should last up to 2 hours or the duration of the longest procedure that is practiced at the location. Record the equipment that was powered and the duration that the system was supplying power to it.

When the procedure is over restore power to the system and recharge the battery bank.

Record Keeping:

Recording these tests is important for the protection of your practice, and also is credible in the eyes of the state and accreditation agencies. You can use our test logs that are in our service manuals and on our download from our website.

Facility Name: _____

Emergency Power System – Monthly Test Log

System Model: _____ Serial Number: _____ Battery Replacement Due: _____

Standby kW nameplate rating: _____ 30% of standby rating = _____ Batteries Last Replaced: _____

	Time Started	Time Finished	Battery Voltage	Load (watts/amps)	Tested By:	Comments	Status
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							

Installation & Startup

INSTALLATION NOTES

The REASSURANCE system is shipped fully assembled and ready to use. If shipped via LTL, use care removing from the shipping skid.

BATTERY INSTALLATION & REPLACEMENT

Batteries should be replaced every 4 or 5 years. Battery replacements should be of the same size and type as those originally provided and can be ordered from MEDI-PRODUCTS.

DO NOT USE LIQUID CELL OR AUTOMOTIVE BATTERIES. ALL BATTERIES MUST BE REPLACED TOGETHER AT THE SAME TIME AND CONNECTED AS SUPPLIED BY MEDI-PRODUCTS. Call 203-348-2886 with any questions.

Caution: Batteries cannot be 'turned off' – they are always 'on'. Use care to NEVER allow any conductive tool to touch + and – simultaneously. Some models also have the battery negative to be 'bonded to the cabinet. The use of insulating tape is recommended.

1. Turn all breakers/switches off, or unplug and remove battery covers.
2. If replacing existing batteries disconnect the gray connector that connects the batteries to the Inverter, if your model does not have a connector, simply start by removing the red inverter cable first.
3. Models 'MD' : To increase access space above the batteries, consider removing 6 nuts/bolts – three each side of the inverter/battery shelf. Using a 15" long prop, the upper section can be 'hinged' upward and supported with the prop.
4. After the inverter is disconnected remove from the batteries all battery cables. (Make sure you take special note of how the cables were routed) and remove all the batteries.
5. Un-package all the batteries and insert them into the battery compartments, making sure they are fully inserted.

WARNING:

CABLE REVERSAL WILL DESTROY THE INVERTER IMMEDIATELY AND WILL VOID THE WARRANTY.

PLEASE TAKE EXTRA CARE BEFORE POWERING SYSTEM WHEN REPLACING ORD INSTALLING BATTERIES

6. Please take note of the battery (DC) voltage that your model number requires. Check the required voltage for your model number listed on the next page. Once you have identified the voltage your system requires please refer to the cable configuration chart to find identify how the battery cables should be installed.

7. Install the battery cables carefully. As the final battery connection is made a significant spark may be noticed. This is normal. PLEASE USE EYE PROTECTION.

8. Reinstall all the cabinet covers and cabinet bolts and test the that the system is inverting by momentarily disconnecting the power supply to check the transfer switch action.

9. Once you have finished the installation and tested the systems momentarily, charge overnight before using.

START-UP NOTES

Before turning on main power, the batteries must be installed

Before plugging in, briefly activate the system by pressing the INVERTER touch-pad on the front panel or switch to 'Auto Invert' as applicable..

Verify that the system is producing power. A motorized tool is a good test device.

If all is well, AC power can now be connected. The normal response will be for the battery charger to become active. After a moment, this will be indicated by a hum and indicator lights illuminating. If this does not happen press the CHARGER touch pad if present on your system.

Automatic power transfer can now be tested by applying a load and briefly disconnecting the AC power, observing that the load is sustained.

It should not necessarily be expected that the output voltage will measure 120 VAC on most multimeters unless a pure-sinewave system is being installed; 90-100 VAC is more typical. The reason for this is that the inverted power is not a "pure" sine waveform which most meters are designed to measure. Please be assured that the Root-Mean-Squared voltage is equivalent to that of the utility and the RMS voltage is the basis for calculating power. Occasionally there may be a compatibility problem with a particular item, in which case the owner should contact MEDI+Products. Any device that does not immediately operate should not be repeatedly tried - to minimize the rare possibility of damage. At the same time it should also be understood that there is a load-hunting mode in the inverter system which may or may not be activated to minimize unnecessary discharge should the system be automatically activated by a power failure when there is no load. This load-hunting action may cause a slight delay in turning on the first load item. If the owner desires to turn this feature on or off, please contact MEDI+Products or the Inverter booklet.

Before departing, the installer should restore AC power and toggle the POWER button till the indicator light in the power button is off. Unless a Full-time Load is being supported. (When the INV light is off or flashing the system will not activate upon power failure.)

The owner should devise his own testing regimen based on his particular needs and familiarize himself with the equipment and the testing instructions included elsewhere in this manual.

WARRANTY ACTIVATION FORM

MEDI-PRODUCTS warrants that your **REASSURANCE** Emergency Power System is assembled using high quality components and workmanship and is free of defects in material and workmanship. This warranty shall remain in effect for one (1) year from the date of original consumer purchase of the inverter. Warranty on the batteries is pro-rated over 30 months.

THIS WARRANTY DOES NOT COVER:

- 1) Replacement parts or labor furnished by anyone other than MEDI-PRODUCTS approved service agent. (All approved agents should be licensed electricians or bio-medical technicians or as specifically approved.)
- 2) Defects or damage caused by labor furnished by someone other than MEDI-PRODUCTS or approved service agent.
- 3) Any malfunction or failure of this product while it is in the possession of the owner during the warranty period if the malfunction or failure is not caused by a defect in material and workmanship of MEDI-PRODUCTS or if the malfunction or failure is caused by unreasonable use, including the failure to verify the equipment's utility and usefulness prior to emergency conditions.
- 4) Normal battery depletion.

ALSO:

- 1) This warranty is non-transferable to other owners of the product during the warranty period without the express written consent of MEDI-PRODUCTS.
- 2) MEDI-PRODUCTS reserves the rights to repair, replace, or allow credit for any material returned under this warranty. Any damage caused by the customer will be charged or deducted from this allowance.
- 3) All warranty work will be performed at MEDI-PRODUCTS factory, or using a valid Warranty Authorization Number (WAN) prior to repair. Products shall be delivered to MEDI-PRODUCTS factory freight prepaid and fully insured.

The inverter manufacturer's owner's manual is provided. The owner should become conversant with it and also with this owner's manual. Before operating your SILENT SENTRY™ be sure to read these safety instructions.

TO INITIATE YOUR WARRANTY PLEASE COMPLETE THIS FORM AND RETURN WITHIN 30 DAYS

It is recommended that you keep a copy of this activation form for your own records.

Model Number:	_____	Serial Number:	_____
Date of installation:	_____	Facility Name:	_____
Contact Name:	_____	Phone Number:	_____
Fax Number:	_____	Email Address:	_____

Address where System is installed: _____

Complete and fax to 203-487-7423

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MEDI+PRODUCTS

BACK-UP POWER SYSTEMS
