

NEWMAR[®]

A MISSION CRITICAL ELECTRONICS BRAND

Owners Manual

RMI-48V1600W-2U

RMI-48V2400W-2U

RMI-125V1600W-2U

Rack Mount Inverter

MCE NETWORK & INDUSTRIAL POWER



DuraComm

NEWMAR



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M-RMI-NEWMAR-2U REV A

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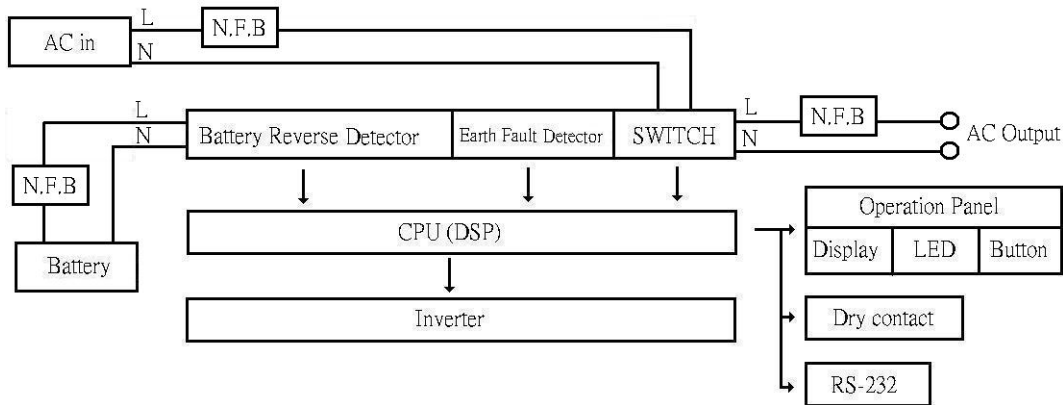
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- True-sine wave output
- Wide operating temp range
- Features 4 NEMA 5-20R AC receptacles
- Standard 19" 1U rackmount
- Built-in protection
 - Input: reverse polarity/over voltage
 - Output: short circuit/overload/over temperature
- Forced air cooling
- Form "C" alarm contacts



Description

These 2U, 1600 & 2400 W true-sine wave inverters provide seamless, regulated and filtered 120 VAC 50/60 Hz back-up power for AC powered communications equipment from the site's 48 or 125 VDC power system. Ensure equipment operation remains uninterrupted in the event of a power grid failure or if the site utility power is disconnected for maintenance or upgrade purposes. These inverters have high nonlinear current capability (i.e. Crest Ratio 3:1) and is suitable for powering inductive, capacitive, and resistive loads.



Specifications

	1600W	2400W
Electrical		
Rating	2000kVA	3000kVA
DC Input		
Nominal Voltage/Max. Current	48VDC/50A / 125V20A	
Voltage Range	48VDC (42-64 VDC) / 125VDC (105-160 VDC)	
Efficiency	>85% (full load) at 48 or 125 VDC	
AC Input (Bypass)		
Nominal Voltage	110VAC ±25%	
Frequency	50 or 60 HZ ±3Hz	
Protection	AC Circuit Breaker	
Inverter Output		
Output Power	1600W	2400W
Max. Surge Power	2400W	3600W
Voltage	110VAC ±1%	
Voltage Regulation	<2% at linear load	
Frequency	50 or 60 Hz ±0.1%	
THD Distortion	<3% at linear load	
Waveform	Pure Sine Wave	
Crest Power	3:1	
Protection		
Short Circuit	Inverter Shut-off	
Overload	105-125% for 60s; 126-150% for 30s; 151% for 1s; transfer to bypass	
DC Polarity Reverse	Yes	
Communication	RS-232 or dry contact	
Mechanical		
Dimensions (LxWxH)	488 x 430 x 89 mm (19" x 16.9" x 3.5") 2U	
Weight	12.0kg (26.5 lbs.)	
Environmental		
Temperature	0-40°C(32-104°F)	
Relative Humidity	0-90% non-condensing	

INSTALLATION WARNING



Failure to observe this instruction can cause material damage and impair the function of the device.



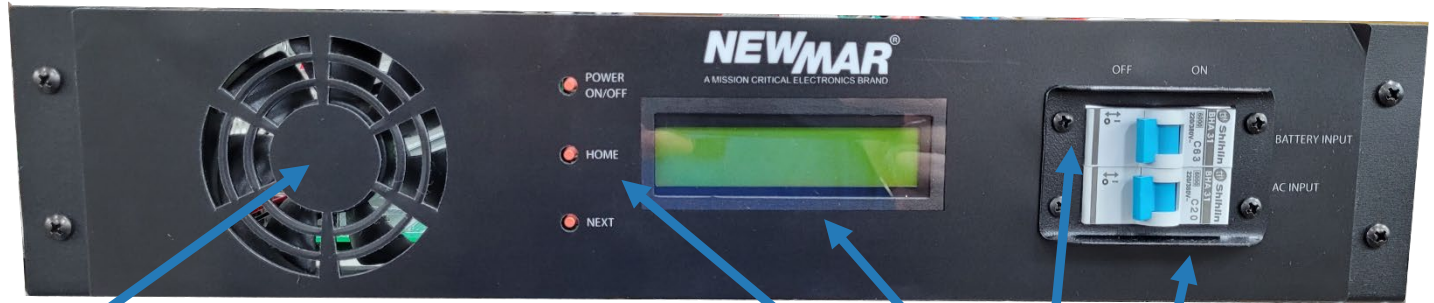
Relating to a danger from electrical current or voltage. Failure to observe this instruction can cause material damage and personal injury and impair the function of the device.

Installation and wiring must comply with the local and national electrical codes and must be done by a certified electrician.

- Always connect the grounding connection on the RACK MOUNT INVERTER to the appropriate grounding system.
- Disconnect all AC and DC side connections before working on any circuits associated with the RACK MOUNT INVERTER. Pressing the ON / OFF button on the Rack Mount Inverter to OFF position may not entirely remove dangerous voltages.
- Be careful when touching bare terminals of capacitors. The capacitors may retain high lethal voltages even after the power has been removed. Discharge the capacitors before working on the circuits.
- The RACK MOUNT INVERTER should be installed indoor only in a well ventilated, cool, dry environment.
- Do not expose to moisture, rain, snow or liquids of any type.
- To reduce the risk of overheating and fire, do not obstruct the suction and discharge openings of the cooling fan.
- To ensure proper ventilation, do not install in a low clearance compartment.
- Working with the RACK MOUNT INVERTER may produce arcs or sparks. Thus, the RACK MOUNT INVERTER should not be used in areas where there are inflammable materials or gases requiring ignition protected equipment. These areas may include spaces containing gasoline powered machinery fuel tanks, battery compartments.
- Batteries contain very corrosive diluted sulphuric acid as electrolyte. Precautions should be taken to prevent contact with skin, eyes or clothing.
- Batteries generate hydrogen and oxygen during charging resulting in evolution of explosive gas mixture. Care should be taken to ventilate the battery are and follow the battery manufacturer recommendation.
- Never smoke or allow a spark or flame near the batteries.
- Use caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
- Remove metal items like rings, bracelets and watches when working with batteries. The batteries can produce a short circuit current high enough to weld a ring or the like to metal and thus cause a severe burn.
- If you need to remove a battery, always remove the ground terminal from the battery first. Make sure that all the accessories are off so that you do not cause a spark.
- The AC output of this RACK MOUNT INVERTER cannot be synchronized with another AC source and hence, it is not suitable for paralleling.

- The AC output of the RACK MOUNT INVERTER should never be connected directly to an electrical breaker panel / load center which is also fed from the utility power / generator. Such a connection may result in parallel operation of the different power sources and AC power from the utility / generator will be fed back into the RACK MOUNT INVERTER which will instantly damage the output section of the RACK MOUNT INVERTER and may also pose a fire and safety hazard. If an electrical breaker panel / load center is fed from an INVERTER and this panel is also required to be powered from additional alternate AC sources, the AC power from all the AC sources like the utility / generator / RACK MOUNT INVERTER should first be fed to a manual selector switch and the output of the selector switch should be connected to the electrical breaker panel / load center.
- To prevent possibility of paralleling and severe damage to the RACK MOUNT INVERTER, never use a simple jumper cable with a male plug on both ends to connect the AC output of the RACK MOUNT INVERTER to a handy wall receptacle in the home / RV.
- Do not directly connect to the hot side of the RACK MOUNT INVERTER to the two hot legs of the 115 / 230V AC electrical breaker panel / load centre where multi-wire (common neutral) branch circuit wiring method is used for distributing of AC Power. This may lead to overloading / overheating of the neutral conductor and is a risk of fire.
- A split phase transformer (Isolated or Auto transformer) of suitable wattage rating (25% more than the wattage rating of the RACK MOUNT INVERTER) with primary of 115V AC and secondary of 115 / 230V AC (two 115V AC split phases 180 degrees apart) should be used. The hot and neutral of the 115V AC output of the RACK MOUNT INVERTER should be fed to the primary of this transformer and the 2 hot outputs (115V AC split phases) and neutral from the secondary of this transformer should be connected to the electrical breaker panel / load center.
- It is to be ensured that the input voltage of the RACK MOUNT INVERTER does not exceed 64V DC for 48V DC system; 160V DC for 125V DC System to prevent permanent damage to the RACK MOUNT INVERTER.
- Do not connect the RACK MOUNT INVERTER to a battery system with a voltage higher than the rated battery input voltage.
- It is to be ensured that the input voltage of the RACK MOUNT INVERTER does not lower than 42V DC for 48V DC system; 105V DC for 125V DC System to prevent permanent damage to the RACK MOUNT INVERTER.
- Do not connect the RACK MOUNT INVERTER to a battery system with a voltage higher than the rated battery input voltage.
- When making battery connection on the input side, make sure that the polarity of battery connection is correct (Connect the positive (+) of the battery to the positive (+) terminal of the RACK MOUNT INVERTER and the negative (-) of the battery to the negative (-) terminal of the RACK MOUNT INVERTER). If the input is connected in reverse polarity, the buzzer will alarm and auto shutdown.

RACK MOUNT INVERTER GUIDE



#	Description
1	Ventilation Exit
2	Control Buttons
3	LCD Display
4	Battery Circuit Breaker
5	AC Input Circuit Breaker

Front View



#	Description
1	AC Terminals
2	Output Receptacles
3	Battery Terminal
4	Dry Contact
5	Ventilation Exit

Front View

INSTALLATION

1. Unpacking and Inspection

Unpack the packaging and check the package contents. The shipping package contains:

- A RACK MOUNT INVERTER
- A user manual

Inspect the appearance of the RACK MOUNT INVERTER to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts.

2. Installation Wiring and Compliance

- Installation and wiring must comply with the local and the national electrical codes and must be done by a certified electrician.
- The DC input positive and negative terminals are isolated from the chassis. Similarly, the neutral pole of the AC receptacles / the neutral wire is not bonded to the chassis. System grounding to suit the national / local electrical codes is to be undertaken by the installer.

3. Preventing Electrical Shock

Always connect the grounding connection on the RACK MOUNT INVERTER to the appropriate grounding system.

4. Installation Environment

- The RACK MOUNT INVERTER should be installed indoor only in a well ventilated, cool, dry environment.
- It is recommended to retain 4in/10cm from the wall.
- Do not expose to moisture, rain, snow or liquids of any type.
- To reduce the risk of overheating and fire, do not obstruct the suction and discharge openings of the cooling fans.
- To ensure proper ventilation, do not install in a low clearance compartment
- Working with the RACK MOUNT INVERTER may produce arcs or sparks. Thus, the RACK MOUNT INVERTER should not be used in areas where there are inflammable materials or gases requiring ignition protected equipment. These areas may include space containing gasoline powered machinery, fuel tanks, battery compartment.

5. Cooling by Forced Air Fan Ventilation

The RACK MOUNT INVERTER produces heat when operating. The amount of heat produced is proportional to the amount of power supplied by the RACK MOUNT INVERTER. A DC fan is used to provide forced air cooling of this RACK MOUNT INVERTER. The fan is thermostatically controlled and will be switched on only if the temperature of certain hot spots inside the RACK MOUNT INVERTER rises above a certain temperature. At lower loads and / or at lower ambient temperatures, the fan may not switch on at all. This is normal. The unit is protected against overtemperature due to failure of the fan / inadequate heat transfer. The AC output will be shut down if the hot spot inside the RACK MOUNT INVERTER reaches a certain higher temperature.

6. Precautions When Working with Batteries

- Batteries contain very corrosive diluted sulphuric acid as electrolyte. Precautions should be taken to prevent contact with skin, eyes or clothing.
- Batteries generate hydrogen and oxygen during charging resulting in evolution of explosive gas mixture. Care should be taken to ventilate the battery are and follow the battery manufacturer recommendation.
- Never smoke or allow a spark or flame near the batteries.
- Use caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
- Remove metal items like rings, bracelets and watches when working with batteries. The batteries can produce a short circuit current high enough to weld a ring or the like to metal and thus cause a severe burn.

- If you need to remove a battery, always remove the ground terminal from the battery first. Make sure that all the accessories are off so that you do not cause a spark.

7. DC Side Connections

- Follow this procedure to connect the battery cables to the DC Input terminals on the RACK MOUNT INVERTER. Your cables should be as short as possible (ideally, less than 10 feet /3 meters) and large enough to handle the required current in accordance with the electrical codes or regulations applicable to your installation
- Cables that are not an adequate gauge (too narrow) or are too long will cause decreased RACK MOUNT INVERTER performance such as poor surge capability and frequent low input voltage warnings and shutdowns.
- These low input voltage warnings are due to DC voltage drop across the cables from the RACK MOUNT INVERTER to the batteries.
- The longer and narrower these cables, the greater the voltage drop.



Failure to place a fuse on "+" cables running between the RACK MOUNT INVERTER and battery may cause damage to the RACK MOUNT INVERTER and void warranty.



The installation of a fuse must be on positive cable. Failure to place a fuse on cables running between the RACK MOUNT INVERTER and battery may cause damage to the RACK MOUNT INVERTER and will void warranty.

OPERATION

1. Start-up
 - Press ON/OFF button lasts for 2 seconds
 - To avoid touch error or push button fault, be sure to press ON / OFF button lasts for 2 seconds, till the LCD display "WELCOME TO RACK MOUNT INVERTER WORLD"
2. Shutdown
 - Press "ON/OFF" button lasts for 2 seconds
 - To avoid touch error or push button fault, be sure to press the button lasting for 2seconds.
3. System Test
 - LCD displays "RACK MOUNT INVERTER LOOP CHECK".
 - Test before the equipment operates. If DC voltage is too low, overheat or other abnormal status, the panel will have fault display, the unit will auto shutdown 5 seconds later.
4. Display Operation Status

Press ▲ "PgUp" key, to select Page 1 to 4 operation status

Page 1: Output Voltage & Frequency

<p>OUTPUT VOLT: 220V</p> <p>FREQ:50.0HZ</p>



The built-in Soft Start function will have output voltage start from low to high, till reach to nominal output voltage, then have it output.

Page 2: Output Current & System Temperature

OUTPUT LOAD: 0.0% 0.0A
TEMP: --°C

Page 3: DC Input Voltage & Discharger

INPUT DC:125V
DISCH: xxA

Page 4: Mains Input Voltage & Frequency

INPUT VOLT: 220VAC
FREQ: 50.0HZ

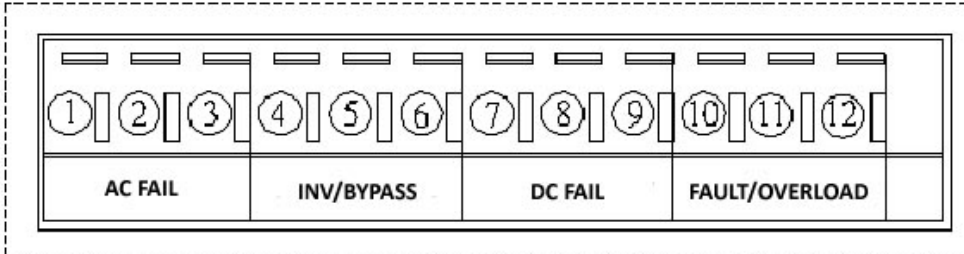
TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
When switching on, the AC INPUT Green LED does not light. Buzzer is off. There is no AC Voltage	There is no voltage at the DC input terminal	<ol style="list-style-type: none"> 1. Check the continuity of the battery input circuit. 2. Check that the battery fuse is intact. Replace if blown. 3. Check that all connections in the battery the input circuit are tight.
LCD displays "DC Volt too low, can't turn on", cannot power on.	DC input voltage is less than the lowest working voltage	<ol style="list-style-type: none"> 1. Use true RMS reading meter to measure if the DC Voltage reaches the lowest working voltage. (48VDC System: 42Vdc, 125VDC System: 105Vdc) 2. Verify if DC Cable is loose. 3. Verify if DC Voltage (48V / 125V DC) comply to the RACK MOUNT INVERTER spec.

<p>“FAULT” LED lights on, buzzer alarms or LCD displays “OVERLOAD, can’t turn on”, cannot power on.</p>	<p>Permanent shut down of the AC output due to continuous overload beyond the continuous power rating of the RACK MOUNT INVERTER.</p>	<ol style="list-style-type: none"> 1. Reduce the load. The load is not suitable as it requires higher power to operate. Use a RACK MOUNT INVERTER with a higher power rating. 2. If the unit goes into permanent overload again after resetting and removing the load completely. Call for Technical Support.
<p>Buzzer alarm is sounded. LCD displays “Temp. too high, can’t turn on”, There is no AC output.</p>	<p>Shut down due to over temperature because of fan failure or inadequate cooling as a result of high ambient temperature or insufficient air exchange.</p>	<ol style="list-style-type: none"> 1. Check that the fan is working. If not, the fan / fan control circuit may be defective. Call Technical Support. 2. If the fan is working, check that the ventilation slots on the suction side and the openings on the discharge side of the fan are not obstructed. 3. If the fan is working and the openings are not obstructed, check that sufficient cool air is available. Also check that the ambient air temperature is less than 104°F/40°C. 4. Reduce the load to reduce the heating effect. After the cause of overheating is removed and the unit cools down, it will reset automatically.

COMMUNICATION PORT

1. Dry Contact



N.C. = NORMAL CLOSE; N.O. = NORMAL OPEN

TERMINAL	FUNCTION	COM	PORT	DRAWING
1	AC INPUT FAIL	COM-B	N.C.	
2	AC ALARM (AC voltage too high or too low)	COM-C		
3	AC INPUT O.K.	COM-A	N.O.	
4	BYPASS	COM-B	N.C.	
5	INV/BYPASS	COM-C		
6	INVERTER	COM-A	N.O.	
7	DC FAIL	COM-B	N.C.	
8	DC ALARM	COM-C		
9	DC CONNECT	COM-A	N.O.	
10	INVERTER TROUBLE	COM-B	N.C.	
11	INVERTER ALARM	COM-C		
12	NORMAL	COM-A	N.O.	

RECOMMENDED COPPER WIRE SIZE FOR CURRENT CAPACITY

(Insulated Wire, Single Conductor in free air)

Current Level in Amperes	Wire Size
<7 AMPERES	20 AWG Up to 5 feet 18 AWG Up to 10 feet
14 AMPERES	18 AWG Up to 5 feet 16 AWG Up to 10 feet
20 AMPERES	16 AWG Up to 5 feet 14 AWG Up to 10 feet
30 AMPERES	14 AWG Up to 5 feet 12 AWG Up to 10 feet

40 AMPERES	12 AWG Up to 5 feet 10 AWG Up to 10 feet
50 AMPERES	10 AWG Up to 5 feet 8 AWG Up to 10 feet
70 AMPERES	8 AWG Up to 5 feet 6 AWG Up to 10 feet
100 AMPERES	6 AWG Up to 5 feet 4 AWG Up to 10 feet

LIMITED WARRANTY

Newmar warrants to the initial end user, each power supply manufactured by Newmar to be free from defects in material and workmanship, when in normal use and service for a period of three years from the date of purchase, from an authorized Newmar dealer.

Should a product manufactured by Newmar fail or malfunction due to a manufacturing defect, or faulty component, Newmar, at its option, will repair or replace the defective product or parts thereof, which, after examination by Newmar, prove to be defective or not operational according to specifications in effect at the time of sale to the initial end user. The product that is replaced or repaired under the provisions of this warranty, will be warranted for the remainder of the original warranty period, only, and will not extend into a new three-year warranty period.

The limited warranty does not extend to any Newmar product subject to misuse, accidental damage, neglect, incorrect wiring not associated with manufacture, improper charging voltages, or any product with the serial number removed, altered, defaced, or changed in any way.

Newmar reserves the right to change, alter, or improve the specifications of its products at any time, and by so doing, incurs no obligation to install or retrofit any such changes or improvements in or on products manufactured before the inclusion of such changes.

Newmar requires any product needing in or out-of-warranty service to be returned to Newmar. All requests for warranty service must be accompanied by proof of purchase, such as a bill of sale with the purchase date identified. Newmar is not responsible for any expenses or payments incurred for the removal of the product from its place of use, transportation, or shipping expenses to the place of repair, or return expenses of a repaired or replacement product to its place of use.

The implied warranties which the law imposes on the sale of this product are expressly LIMITED, in duration, to the three (3) year period specified herein. Newmar will not be liable for damages, consequential or otherwise, resulting from the use and operation of this product, or the breach of this LIMITED WARRANTY.

Some states do not allow limitations on the duration of the implied warranty or exclusions or limitations of incidental or consequential damages, so said limitations or exclusions may not apply to you. This warranty gives you specific legal rights which vary from state to state.

This warranty is given in place of all other warranties, whether expressed, implied, or by law. All other warranties, including WITHOUT LIMITATION, warranties of merchantability and fitness or suitability for a particular purpose, are specifically excluded. Newmar reserves the right to change or modify its warranty and service programs without prior notice.

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