



ME-MR

Remote Control



Owner's Manual
(for Revision 1.0 or higher)

Disclaimer of Liability

The use of this manual and the conditions or methods of installation, operation, use, and maintenance of the ME-MR remote are beyond the control of Magnum Energy, Inc. Therefore, this company does not assume responsibility and expressly disclaims liability for loss, damage or expense, whether direct, indirect, consequential or incidental, arising out of or in any way connected with such installation, operation, use, or maintenance.

Due to continuous improvements and product updates, the images shown in this manual may not exactly match the unit purchased.

Restrictions on Use

The ME-MR remote may only be used in life-support devices or systems with the express written approval of Magnum Energy. Failure of the ME-MR can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. If the ME-MR fails, it is reasonable to assume that the health of the user or other persons may be endangered.

Important Product Safety Instructions

This manual contains important safety instructions that must be followed during the installation and operation of this product. Read all instructions and safety information contained in this manual before proceeding.

- All electrical work must be performed in accordance with local, state, and federal electrical codes.
- This product is designed for indoor/compartment installation. It must not be exposed to rain, snow, moisture, or liquids of any type.
- Use insulated tools to reduce the chance of electrical shock or accidental short circuits.
- Remove all jewelry such as rings, watches, bracelets, etc., when installing or performing maintenance on the inverter.
- Always disconnect the batteries or energy source prior to installing or performing maintenance on the inverter. Live power may be present at more than one point since an inverter utilizes both batteries and AC. Turning off the inverter may not reduce this risk.

Safety Symbols

To reduce the risk of electrical shock, fire, or other safety hazard, the following safety symbols have been placed throughout this manual to indicate dangerous and important safety instructions.



WARNING: This symbol indicates that failure to take a specified action could result in physical harm to the user.



CAUTION: This symbol indicates that failure to take a specified action could result in damage to the equipment.



Info: This symbol indicates information that emphasizes or supplements important points of the main text.



Remedy: This symbol provides possible solutions for related issues.

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1.0 Introduction

The ME-MR remote control allows you to monitor and customize the basic operating parameters of your Magnum inverter/charger. The ME-MR remote can be used on all Magnum inverter/charger models.



Info: The ME-MR remote control has minimal settings available from its menu. Careful consideration should be given to choosing this remote over the full featured ME-RC when customizing the inverter/charger for your particular system.

The ME-MR25 comes standard with a 25 foot, 4-conductor telephone cable and includes non-volatile memory (preserves adjustable settings, even if power to the remote or inverter is removed).

This manual is for the ME-MR remote with revision 1.0 or higher. See Section 3.1.11 (TECH Menu) on page 15 for information on how to determine your revision level.

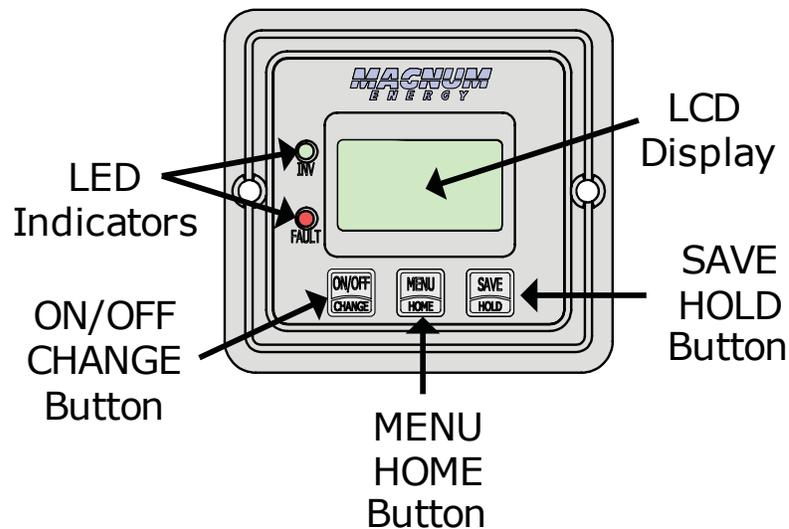


Figure 1-1, Front Panel Features

The ME-MR is equipped with the following features:

- **LED Indicators** - At-a-glance LEDs provide a quick indication of the inverter's status, or notifies you if a fault is present.
- **LCD Display** - An 8 x 2 line (16 characters total) alphanumeric display used for setting up the inverter/charger operation, as well as viewing current status or fault messages.
- **ON/OFF or CHANGE Pushbutton** - Allows the inverter to be turned on and off. This button also serves as a "change" button to navigate through the available settings for each menu.
- **MENU or HOME Pushbutton** - Accesses the remote's menus. You can also return directly to the scrolling Home screens by pressing and holding this button for 2 secs. See also Figure 3-1.
- **SAVE or HOLD Pushbutton** - Serves as a "save" button to retain your settings. This button also is used as a "hold" button to stop the Home screens from scrolling (press and hold the button for 2 secs.).

2.0 Installation

2.0 Installation

Before proceeding, read the Installation section to determine how you are going to install your ME-MR remote.



Info: Installations should be performed by qualified personnel, such as a licensed or certified electrician. It is the installer's responsibility to determine which safety codes apply, and to ensure that all applicable installation requirements are followed. Applicable installation codes vary depending on the specific location and application.



Info: Review the Important Product Safety Information on page *i* before any installation.

- Before connecting any wires, determine the remote cable's route throughout the home or vehicle/boat both to and from the inverter.
- Always check for existing electrical, plumbing, or other areas of potential damage before drilling or cutting into walls to mount the remote.
- Make sure all wires have a smooth bend radius and do not become kinked.
- If installing this remote in an boat, RV or truck, ensure the conductors passing through walls, bulkheads, or other structural members are protected to minimize insulation damage such as chafing, which can be caused by vibration or constant rubbing.

Tools Required

Installing the ME-MR remote control is a fairly simple process and requires the following tools:

- Phillips screwdriver
- Level
- Drill motor
- Cut-out tool (knife/saw)
- Pencil
- Drill bit (7/64")

2.1 Installation Procedure

Select an appropriate location to install the ME-MR remote control. Allow ample room to access the remote's buttons and to view the LEDs. Ensure the viewing angle of the display is appropriate. You can either flush mount (concealing the connection) or surface mount the remote.

2.1.1 Flush Mounting the Remote

After selecting the desired location for flush mounting the remote, cut out a mounting hole measuring $2\frac{3}{8}$ " x $2\frac{3}{8}$ " (see Figure 2-1). Place the remote into the cutout, and then use the remote to mark and pre-drill two holes for the #6 x $\frac{1}{2}$ " Phillips flat head mounting screws.

2.1.2 Surface Mounting the Remote using the Bezel

After selecting the desired location for surface mounting the remote, use the bezel as a template to mark the mounting holes. Mark and pre-drill four $\frac{1}{8}$ " holes (see Figure 2-2). Mount the bezel using the four #6 x $\frac{3}{4}$ " screws.

2.0 Installation

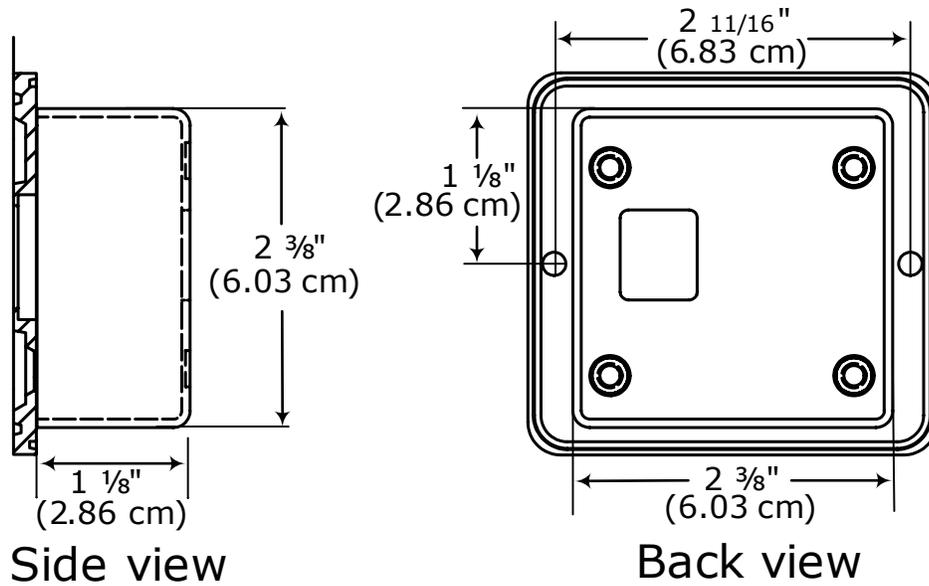


Figure 2-1, Cut-Out Dimensions for a Flush Mounted Remote

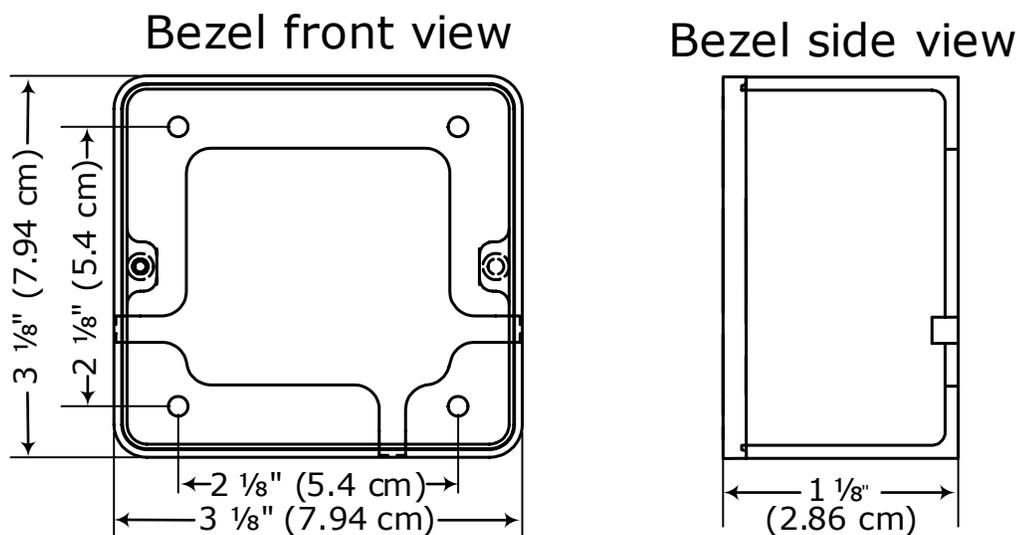


Figure 2-2, Bezel Dimensions for a Surface Mounted Remote

2.0 Installation

2.1.3 Connecting the Remote



CAUTION: When battery power needs to be connected to the inverter, all battery negative connections must always be connected before the battery positive connection. When battery power needs to be removed from the inverter, the battery positive should be removed before any battery negative connections are disconnected. This prevents any communication chips/lines becoming the DC return path to the battery – causing permanent damage to all connected accessories on the network.

Summation: Ensure all Battery Negative circuits are always connected before connecting or disconnecting Battery Positive.

1. Run the remote cable between the remote and the inverter/charger. This cable is a 4-wire telephony standard with RJ11 connectors on each end. A standard telephone cable (with 4 conductors) may be substituted if the provided remote cable cannot be used.
2. Connect the remote cable to the inverter/charger's Remote port (blue label). Refer to Figure 2-3.
3. Connect the inverter to the batteries, but ensure the inverter is off and that no AC power is connected to the inverter.
4. While monitoring the front of the remote, connect the other end of the remote cable into the RJ11 jack on the back side of the remote (Figure 2-3).
5. Immediately upon connecting the remote cable the LEDs will illuminate as the unit goes through a self-test. After the initial self-test, text should appear with a system status message indicating the current state of the inverter/charger. If not, please refer to the Troubleshooting section.
6. Next, mount the remote to the desired surface or to the bezel (using the two #6 x 1/2" Phillips flat head screws). The remote is ready for setup.

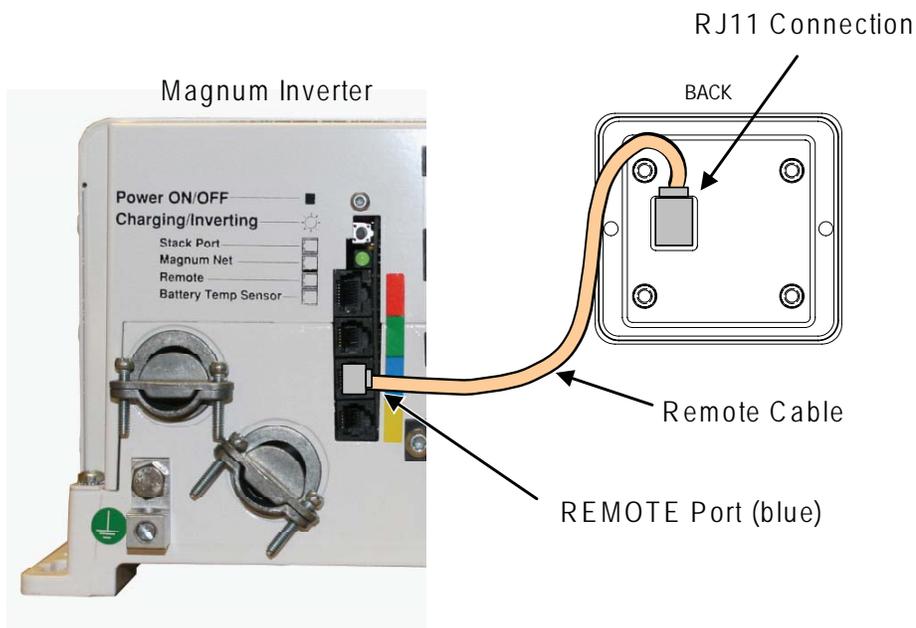


Figure 2-3, Remote Control Connections

3.0 Setup

When the ME-MR remote is connected to a Magnum inverter/charger, the remote's settings determine the inverter/charger's operating parameters. The default settings in the remote (see Table 3-4) are adequate for most installations. However, you can change some of the operating parameters if required. This section shows you how to navigate the remote, gives you an understanding of the function of each adjustable setting, and helps you decide what setting should be used.

3.1 Navigating the Remote

The ME-MR has an internal structure of menu items and adjustable settings.



Info: See Figure 4-1 for a complete map of the remote's menu items and adjustable settings.

The items on the remote's front panel are used to find, adjust, and save the desired setting. They are:

- **LCD Display** - The LCD display shows menu items, adjustable settings, and the meter's display information.

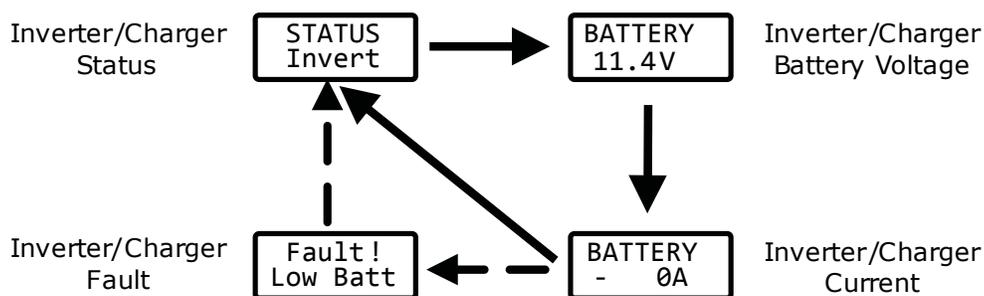


Info: The LCD display returns to the scrolling Home screens to show inverter status, DC voltage, current, and any fault present (if applicable) after 30 seconds – if no buttons have been pressed.



Info: When the "←" (left facing arrow) symbol is shown on the display, it indicates that the displayed setting has been selected and will be used.

- **ON/OFF/CHANGE Pushbutton** - Allows you to quickly scroll through and select various menu items and settings after pressing the MENU pushbutton.
- **MENU/HOME Pushbutton** - Allows easy access to the menu items that can help with configuring, monitoring, and troubleshooting your inverter/charger. Press and hold this button (2 secs.) to return to the scrolling Home screens (Figure 3-1).
- **SAVE/HOLD Pushbutton** - Saves the menu item displayed on the screen. A saved setting is denoted by the arrow symbol. Press and hold this button (2 secs.) to stop the Home screens from scrolling ("HOLD" displays). Press once to view the next Home screen. Press and hold again (2 secs.) to resume scrolling of the Home screens ("SCROLL" displays).



Note: Fault screen only appears if a fault has been detected

Figure 3-1, Scrolling Home Screens

3.0 Setup

3.2 Remote Menu Items

This section covers the function of each menu item and explains what configurable settings are available from each menu.

3.2.1 AC IN Menu

Use this menu as a quick means of changing your *AC IN* setting to coordinate with the circuit breaker rating from the incoming AC source.

- **AC IN:** This selection ensures the inverter's AC loads receive the maximum current available from the utility or generator power. Whenever the utility or generator is connected to the inverter, the current used to power the AC loads and to charge the batteries is monitored. When the total current used to power the AC loads and charge the batteries begins to approach the *AC IN* setting, the current that was used for charging the batteries will automatically be reduced. This ensures the AC loads have all the available current when needed. The feature is not available on the MM and MMS Series inverter/chargers.

Default setting - *AC IN* = 30 Amps

Where to set: Adjust the *AC IN* setting to match the current rating of the utility power or the generator's circuit breaker. If using multiple AC sources (utility and generator) through an AC transfer switch, adjust this setting to the smaller AC breaker size. This setting is dependent on the stability of the AC source. If using a generator, factors such as altitude and output voltage regulation may require a lower setting than the generator's breaker size. If the breaker on the AC source is tripping (because it is a weak breaker) try reducing this setting to the next lower level.



CAUTION: The *AC IN* setting does not limit the current to the inverter loads. If the current to the loads on the output of the inverter are greater than the circuit breaker rating on the incoming AC source, you may experience nuisance tripping of this breaker.

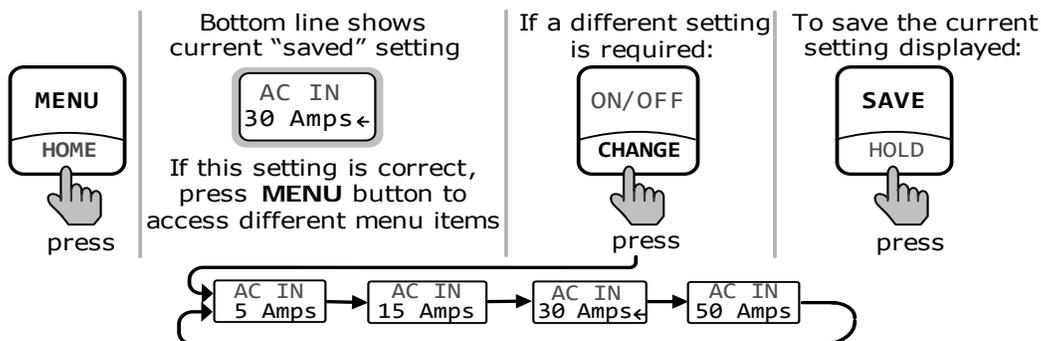


Figure 3-2, *AC IN* Selections

3.2.2 Search Watts Menu

- SEARCH:** This selection allows you to turn off the Search Watts feature, or to adjust the power level to determine when the feature becomes active. The power level range selection is *0 Watts (off)* to *20 Watts*. If this feature is not needed, select *SEARCH=Off*. When 'Search' is turned off, the inverter continuously provides full AC voltage to the loads.

Default setting - *SEARCH = 5 Watts*



Info: When the Search Watts feature is active "*SEARCH*" appears on the top line of the LCD display, and the green INV LED will slowly flash.

What is the Search Watts feature? This feature is used to help save battery power by reducing the inverter's output to search pulses when there is no detectable load. If someone turns on a load greater than the wattage level setting while the inverter is searching, the inverter will start inverting to provide full voltage on its output.

Should I use the Search Watts feature? If the inverter can spend a great deal of time searching (to reduce the power drain on your batteries) and you can tolerate small loads (less than 5 watts) from being on, then the Search Watts feature should be used. However, if you require some small load (e.g., digital clocks, satellite receivers, answering machines, etc.,) to always be on, then this feature should be turned off (*SEARCH = Off*).

Where to set: The *SEARCH* setting should be adjusted to the same power level (or the next lower setting) of the smallest load that you want to run. If you don't know the wattage of the smallest load you want to run, turn the switch for the load on and then decrease the *SEARCH* setting until the load comes on and stays on.

Example: You have reviewed all the loads you want to run and determined that the smallest load is a 20 watt light. Set *SEARCH = 20 Watt*. Whenever you turn on any load (because all the loads are greater than 20 watts), the inverter will stop searching and start inverting to deliver power to the load.



Info: Even though the Search feature is on, some connected equipment may draw enough current even while off to keep the inverter in Invert mode.

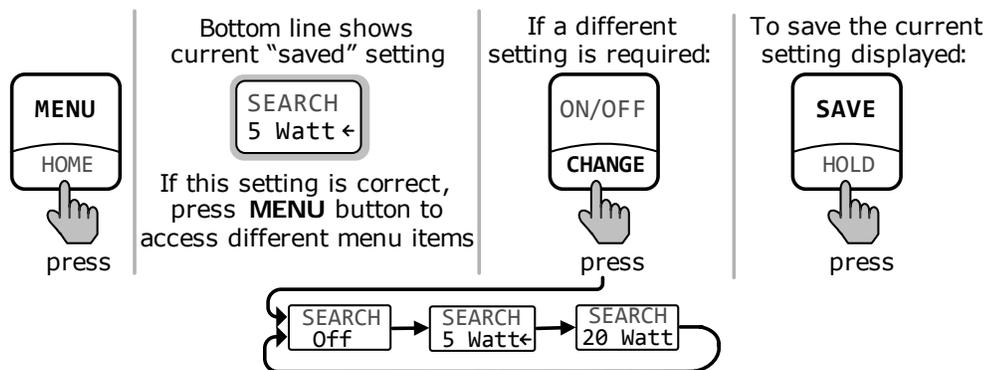


Figure 3-3, Search Watts Selections

3.0 Setup

3.2.3 Battery Amp-Hours Menu

- **BAT AHRS:** This selection is used to select the approximate capacity of the battery bank that is connected to the inverter (in battery amp-hours). This setting determines the time the battery charger is in the Absorb Charging stage (i.e., absorption time). See Table 3-1 to correlate the battery capacity to the absorption time.

Default setting - *BAT AHRS = 400 AH*

Table 3-1, Battery Amp-Hrs to Absorb Charging Time

Battery Amp-Hrs Selected	Absorb Charging Time
Batt AmpHrs = 200	60 minutes
Batt AmpHrs = 400	90 minutes
Batt AmpHrs = 800	120 minutes

Where to set: Select the setting based on the 20 hour Amp-Hour (AH) capacity of your battery bank.

How do I determine my battery amp-hour capacity? The inverter requires deep cycle batteries, which are specifically made for continuous use. Deep cycle batteries are rated either by a) amp-hours, or b) reserve capacity in minutes.

- Amp-hour (AH) capacity is a measurement of how many amps a battery can deliver for a specified length of time (usually 20 hrs) until the voltage achieves 1.75 VDC/cell at 80° F.
- Reserve Capacity (RC) is a measure of how many minutes a battery can deliver a certain amount of current (usually 25A) while maintaining a voltage above 1.75 VDC/cell at 80° F.



Info: If using the Reserve Capacity (25A), the 20 hour AH capacity can be estimated by multiplying 'reserve capacity' by 50%.

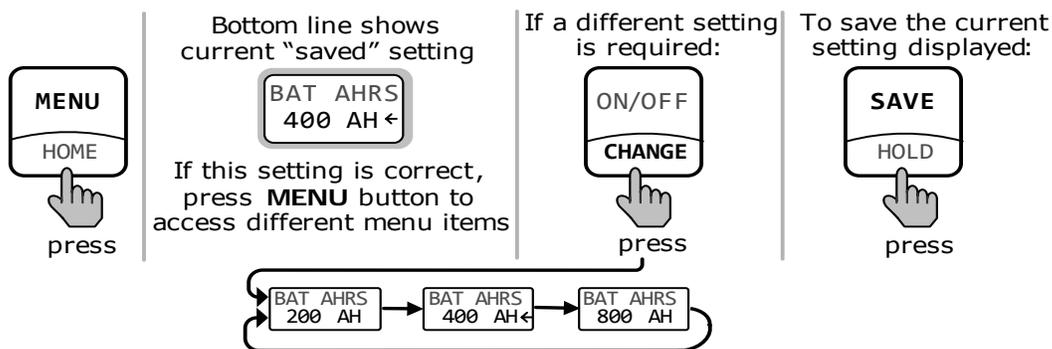


Figure 3-4, Battery Amp-Hours Selections

Table 3-2 below provides an estimated 20 hour AH capacity based on the group/code size, physical size, and the voltage of the battery. If you are not sure of your battery's 20 hour AH rating, consult your battery manufacturer/dealer or use the table below to obtain an estimate.

Table 3-2, Battery Size to Battery Amp-Hours (estimated)

Group/ Code Size	Physical Size (L" x W" X H")	Battery Voltage	Battery AHrs (20 hour rate)
GC-2 (Golf Cart)	10 3/8 x 7 13/16 x 10 5/8	6V	220 AHrs
L16	11 11/16 x 7 x 16 11/16	6V	375 AHrs
Group 22	9 1/2 x 6 7/8 x 8 5/16	12V	55 AHrs
Group 24	10 1/4 x 6 13/16 x 8 7/8	12V	70 AHrs
Group 27	12 1/16 x 6 13/16 x 8 7/8	12V	95 AHrs
Group 31	13 x 6 13/16 x 9 7/16	12V	110 AHrs
4D	20 3/4 x 8 3/4 x 9 7/8	12V	200 AHrs
8D	20 3/4 x 11 1/8 x 9 7/8	12V	225 AHrs

Once you've determined the AH capacity of each battery, review how your batteries are connected (parallel or series) to determine the total amp-hour capacity of the battery bank.

Parallel connection - When batteries are connected in parallel (positive to positive, negative to negative) they increase the amp-hour capacity of the battery bank, but the voltage remains the same.

Example: You have a 12-volt battery bank with three 12-volt batteries that are rated at 125 amp-hours (AH) each. Each of the positive terminals are connected together and each of the negative terminals are connected together, which means they are connected in parallel. The amp-hours of each battery connected in parallel are added together (125 AH + 125 AH + 125 AH = 375 AH), but the voltage of the battery bank stays the same (12 VDC).

Series connection - When batteries are connected in series (positive to negative) they increase the voltage of the battery bank, but the amp-hour rate remains the same.

Example: You have a 12-volt battery bank with two 6-volt batteries that are rated at 220 amp-hours (AH) each. The positive terminal of the first battery is connected to the negative terminal of the second battery, which means these batteries are connected in series. Since the two 6-volt batteries are connected in series, the voltage of the batteries are added together to produce 12-volts (6 VDC + 6 VDC = 12 VDC), but the amp-hour capacity of the battery bank does not change (220 AH).

In battery banks where you have batteries connected in series and in parallel - the rules are the same. The batteries connected in series are referred to as a "series string" and the amp-hour capacity doesn't change. Each series string is connected together in parallel to increase the amp-hour capacity. Add the amp-hour capacity of each series string connected in parallel to determine the total amp-hour capacity of the battery bank.

3.0 Setup

3.2.4 Battery Type Menu

- BAT TYPE:** This menu is used to select the battery type, which determines the battery charge profile and ensures the batteries are receiving the proper charge voltage. The fixed voltage selections are *GEL* (for Gel batteries), *Flooded* (for liquid lead acid batteries), *AGM 1* (for Lifeline AGM batteries), and *AGM 2* (for East Penn/Deka/Discover/Trojan AGM batteries). Refer to Table 3-3 to determine the specific charge voltage based on the battery type selected.

Default setting - *BAT TYPE = Flooded*



Info: The voltage settings shown in Table 3-3 are based on the Battery Temperature Sensor (BTS) being disconnected or at a temperature of 77° F (25° C). If the BTS is connected, the actual charge voltage increases if the temperature around the BTS is colder than 77° F (25° C), and decreases if hotter than 77° F (25° C). This ensures the batteries receive the correct charge voltage even if they become cold or hot.

Table 3-3, Battery Type to Charge Voltages

Battery Type	Inverter Voltage	Absorption Voltage	Float Voltage	Equalization Voltage
GEL	12 VDC	14.1 VDC	13.6 VDC	14.1 VDC ¹
	24 VDC	28.2 VDC	27.2 VDC	28.2 VDC ¹
	48 VDC	56.4 VDC	54.4 VDC	56.4 VDC ¹
Flooded	12 VDC	14.6 VDC	13.4 VDC	15.5 VDC
	24 VDC	29.2 VDC	26.8 VDC	31.0 VDC
	48 VDC	58.4 VDC	53.6 VDC	62.0 VDC
AGM 1 ²	12 VDC	14.3 VDC	13.1 VDC	15.5 VDC
	24 VDC	28.6 VDC	26.2 VDC	31.0 VDC
	48 VDC	57.2 VDC	52.4 VDC	62.0 VDC
AGM 2 ³	12 VDC	14.5 VDC	13.5 VDC	14.5 VDC ¹
	24 VDC	29.0 VDC	27.0 VDC	29.0 VDC ¹
	48 VDC	58.0 VDC	54.0 VDC	58.0 VDC ¹

Note 1: Voltage same as absorption voltage – to prevent equalization.

Note 2: Specifications for Concord (Lifeline Series) AGM batteries.

Note 3: Specifications for East Penn, Deka, Discover and Trojan AGM batteries.

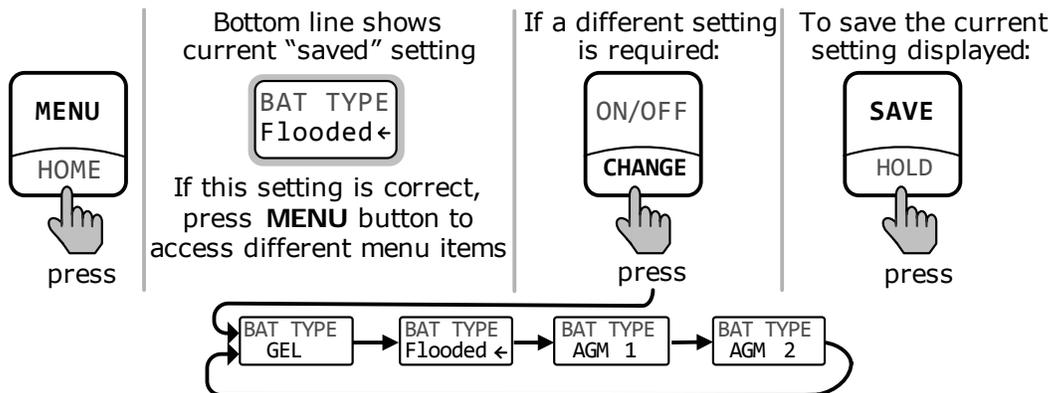


Figure 3-5, Battery Type Selections

3.2.5 Charge Rate Menu

- CHG RATE:** This selection is used to set the maximum charge rate allowed to charge the batteries during Bulk, Absorption, Float, and Equalize charging. Selections are 10%, 50%, and 100%. The *CHG RATE = 10%* setting is available to help minimize charging, while continuing to allow pass-through power.

Default setting - *CHG RATE = 100%*

The charge rate selections are provided as a percentage of the inverter/charger's maximum charging capability. Refer to the label on the side of the inverter or the owner's manual for the inverter/charger to determine its maximum charge rate. Once you find this maximum charge rate, determine the percentage needed to limit the charge rate to your battery bank.

Example: If the maximum charge rate of your inverter/charger is 100 amps and you need to limit the charge rate to 50 amps, choose the *CHG RATE = 50%* selection (50 amps = 50% of 100 amps).



Info: The topology of the Magnum inverter when connected to an AC source overrides the setting, and starts charging if the battery voltage is <12 VDC (12-volt models), <24 VDC (24-volt models) or <48 VDC (48-volt models).

Where to set: The maximum charge rate is generally set to a C/5* rate (C = the total amp-hour capacity of the battery bank – using the 20 hour AH rate). The C/5 rate is usually used when the objective is to charge the batteries as quickly as possible (i.e., 400 AH ÷ 5 = 80 amp maximum charge rate). A lower rate such as C/20* is used when the batteries need to be charged as slow as possible. The ME-MR provides three settings for charge rate adjustment and they are 10, 50, and 100%. Multiply this percentage and the max charge rate of the inverter to find the closest setting to the desired charger output.



CAUTION: The C/5 or C/20 charge rate settings are guidelines; they are not requirements on how you should set your battery charge rate. For specific charge rate requirements, refer to your battery manufacturer.



Info: If multiple inverter/chargers are used on a single battery bank, you must ensure that the total charge rate from all inverter/chargers is limited to the max charge rate needed for your battery bank. This setting only limits the charging on each inverter/charger individually, not on all inverter/chargers.

* C/5 or C/20 rate - Charge rates are commonly expressed as a ratio of the total amp-hour (AH) capacity of the battery bank. For example, with a 400 AH battery bank (C = 400), the C/5 charge rate is 80 A (400/5 = 80 A).

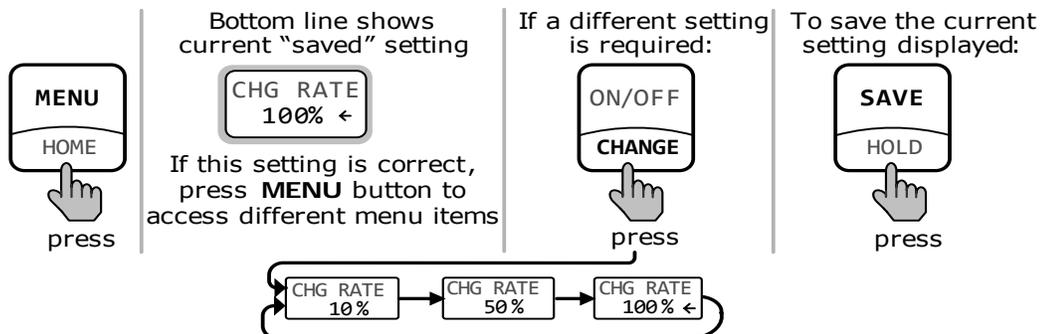


Figure 3-6, Charge Rate Selections

3.0 Setup

3.2.6 Low Battery Cut-Out (LBCO) Menu

- **LBCO:** This menu is used to set the DC voltage level that turns off the inverter to help protect the batteries from over-discharge damage. Selections are from 9 VDC to 11 VDC (12-volt inverter models), 18 VDC to 22 VDC (24-volt inverter models), or 36 VDC to 44 VDC (48-volt inverter models). If the battery voltage drops below the LBCO selected setpoint continuously for more than one minute, the FAULT LED will come on, the inverter will turn off, and the display shows "FAULT! Low Bat" (low battery status). If the battery voltage falls below 8.5 volts (12-volt models), 17.0 volts (24-volt models) or 34.0 (48-volt models), the FAULT LED and Low Bat status will be immediate.

Default settings: LBCO = 10 VDC (12-volt models), 20 VDC (24-volt models) or 40 VDC (48-volt models).



Info: The inverter will automatically begin to start inverting when the DC voltage increases to ≥ 12.5 VDC (12-volt models), ≥ 25.0 VDC (24-volt models) or ≥ 50.0 VDC (48-volt models). If AC power is available and connected to the inverter's input the inverter will automatically clear the Low Battery fault, pass the input AC power to the output, and begin charging the batteries.

Where to set: If you want to cycle the batteries slightly but don't want to discharge them more than 20%*, then the LBCO setting should be set to 11 VDC (12-volt models), 22 VDC (24-volt models) or to 44 VDC (48-volt models). In some applications, such as installations in an off-grid home or when doing a lot of dry-camping in your RV, you may want to cycle down to 25%* by setting the LBCO to 10 VDC (12-volt models), 20 VDC (24-volt models) or to 40 VDC (48-volt models). In extreme circumstances, you have the ability to discharge the batteries to 80%* by setting the LBCO to 9 VDC (12-volt models), 18 VDC (24-volt models), or to 36 VDC (48-volt models) before recharging.

* These discharge percentages are rough estimates; for accurate battery monitoring, a battery monitor such as Magnum's ME-BMK and the ME-RC remote is required.



Info: The inverter will automatically begin to start inverting when the DC voltage increases to ≥ 12.5 VDC (12-volt models), ≥ 25.0 VDC (24-volt models) or to ≥ 50.0 VDC (48-volt models). If AC power is available and connected to the inverter's input, the inverter will automatically clear the Low Battery fault, pass the input AC power to the output, and begin charging the batteries.

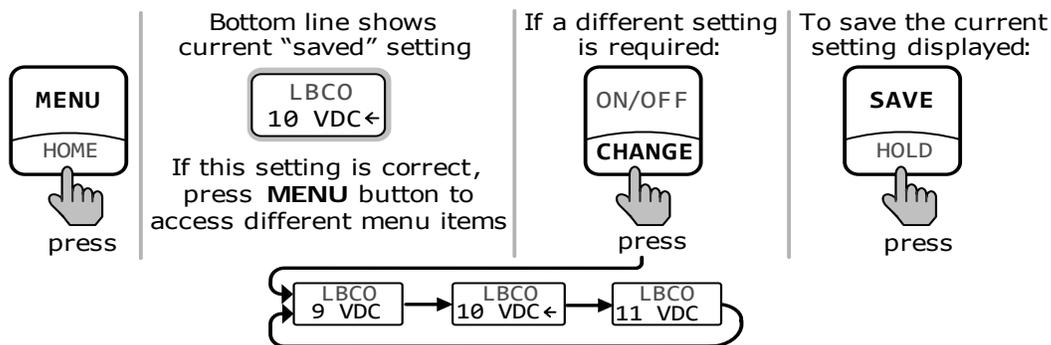


Figure 3-7, LBCO: Low Battery Cut-Out Selections

3.2.7 Low VAC Dropout Menu

- VAC DROP:** This selection is used to set the minimum AC voltage that must be present on the input before the inverter/charger switches from Invert to Charge mode. For example, if this setting is set to *VAC DROP = 60 VAC*, then the AC input voltage must be above 60 volts before the inverter will switch from Invert mode to Charge mode. This setting also determines the minimum AC voltage threshold where the inverter/charger transfers from the AC input (utility/shore or generator) and begins inverting. This protects AC loads from utility outages.

Dropout selections include: *VAC DROP = 60 VAC*, *80 VAC*, and *100 VAC* for 120v units (North American units), and *110 VAC* to *190 VAC* for 230v (export units).

Default setting - *VAC DROP = 80 VAC* for North American units, *150 VAC* for export models.

Where to set: It depends on the application and what you are using as the AC source. The settings not only look at the incoming voltage to determine when to transfer, but they also determine the response sensitivity to incoming voltage fluctuations. Use the 100 VAC dropout setting when the AC source is well regulated and you are operating devices that are sensitive to voltage fluctuations. Use the 80 VAC or lower setting (≤ 80 VAC) when the AC source may have significant fluctuations in RMS voltage. These settings are highly recommended if using a generator for charging.

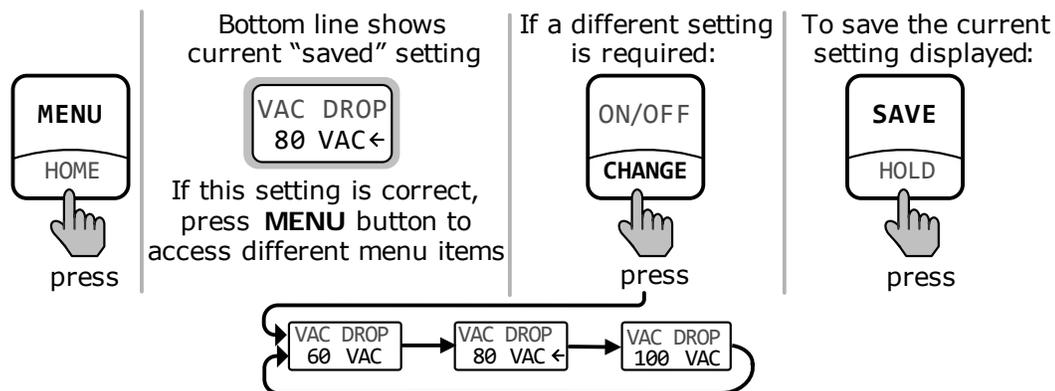


Figure 3-8, VAC Dropout Selections

3.2.8 Power Save Menu

- PWR SAVE:** This setting allows you to turn the Power Save feature on or off.

Default setting - *PWR SAVE = On*

What is the Power Saver feature? The Power Saver feature causes the LCD backlight and LEDs on the remote display to turn off to conserve energy. The remote goes into Power Saver mode if there has not been a pushbutton press or fault message for 15 minutes. Whenever the remote goes into the Power Saver mode, the LCD backlight and LEDs can be reactivated by pressing any remote pushbutton.

3.0 Setup

If you have a fault during the Power Saver mode, the LCD backlight, and the FAULT LED will come on and stay on as long as the fault is detected. If you want the LCD backlight and LEDs to always be on, select *PWR SAVE = Off*.

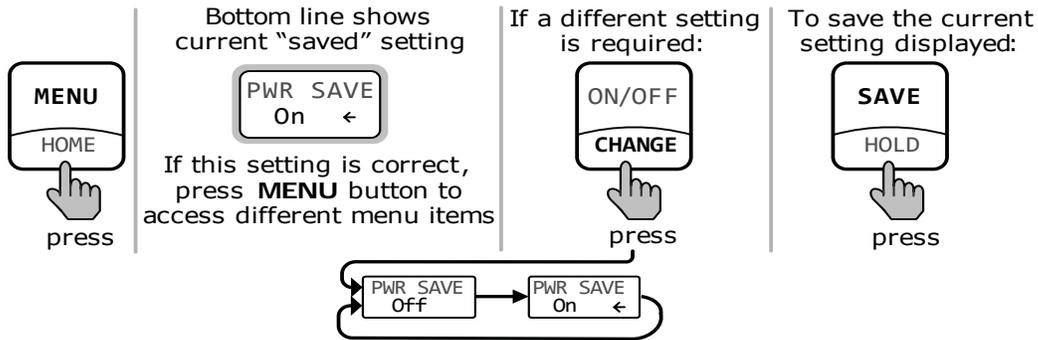


Figure 3-9, Power Saver Selections

3.2.9 Equalize Menu

- **EQUALIZE:** This menu allows you to equalize the batteries after a Float Charge is achieved. Equalizing should only be attempted by experienced users.

Default setting - *EQUALIZE = Disabled*

What is equalizing? Equalizing is a controlled overcharge of the batteries. During this process, there will be excessive gassing of the batteries. This condition is not only corrosive, but can also be dangerous as hydrogen gasses are emitted during the charging process.



WARNING: Only equalize in well ventilated areas. Consult your battery's manufacturer for recommendations on equalizing.



Info: Equalization can only be accomplished when the charger status is "FLOAT" or "BattSave".



Info: Equalization charging is not available if either *GEL* or *AGM 2* is selected from the *Battery Type* menu.

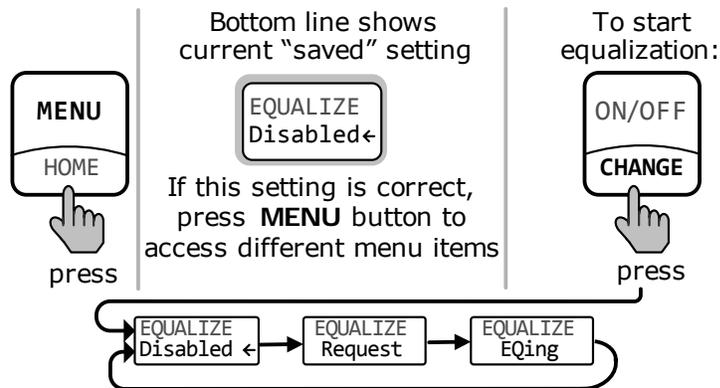


Figure 3-10, Equalize Selections

3.2.10 Charger Standby Menu

- **CHARGER:** Select whether to activate Charger Standby mode after AC power is connected (charger ready and waiting for AC input).

Default setting - *CHARGER = No AC In*

What is Charger Standby? When the charger is in Charger Standby, the incoming AC is still available on the inverter's output, but the charger is not allowed to charge.



Info: To resume charging, access the Charger Standby menu and press the CHANGE button.



Info: If upon accessing this menu "No AC In" displays, you will not be able to change the Charger's status.

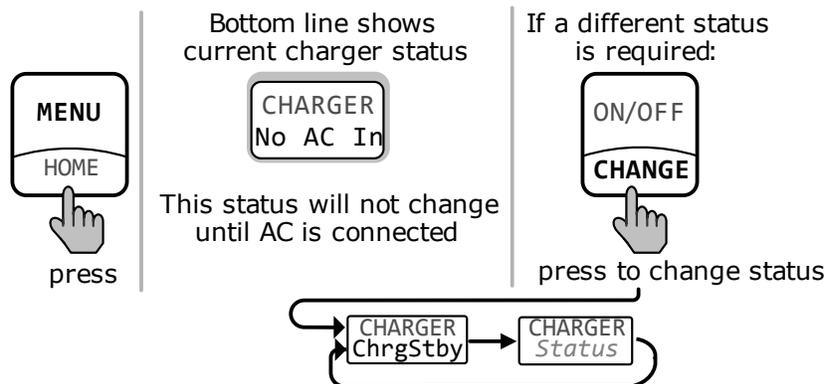


Figure 3-11, Charger Standby Selections

3.2.11 TECH Menu

- **TECH:** This menu provides access to selections that are used to assist service technicians in troubleshooting. It provides access to read only system information along with a selection that allows all system settings to be returned to the original factory default values.

Scroll to the end of the remote's menus until "*TECH, Press ON*" appears. Press the ON/OFF CHANGE button to access these selections. Continue to press the ON/OFF CHANGE button to view each TECH menu item.

- **Bat Temp** - Displays the temperature readings of the battery temperature sensor (if connected).
- **Xfm Temp** - Displays the temperature readings of the inverter's transformer.
- **FET Temp** - Displays the temperature readings of the FETs (Field Effect Transistors).
- **Inverter Rev.** - Displays the firmware revision level of the inverter.
- **Remote Rev.** - Displays the firmware revision level of the remote.
- **Inv Model** - Displays the model number of the connected inverter.



Info: When "*Model Unknown*" displays, the remote is unable to determine the inverter model. This may be due to an older inverter model or an inverter revision newer than the remote. All remote menu selections and features that are available in the inverter will function normally.

3.0 Setup

- Defaults** - This menu restores all settings on the inverter/charger to the original factory default settings. To restore, press and hold the SAVE/HOLD pushbutton for 5 seconds (see Figure 4-1). After the default settings have been restored, the display will show "Defaults Loaded". The inverter/charger factory defaults are listed in Table 3-4.

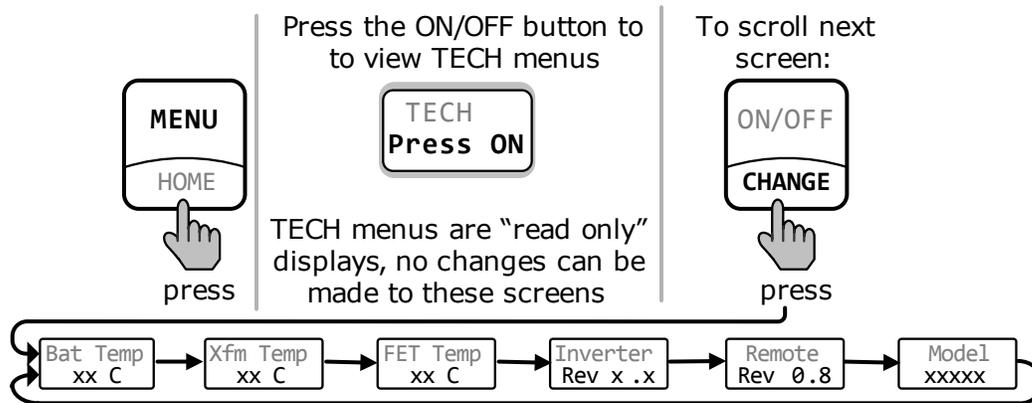


Figure 3-12, TECH Selections

Table 3-4, Inverter/Charger Default Settings

Menu	Default Setting
AC IN	AC IN = 30 Amps
Search Watts	SEARCH = 5 Watts
Battery Amp-Hours	BAT AHRS = 400 AH (Absorb Time = 90 min.)
Battery Type	BAT TYPE = Flooded
Charge Rate	CHG RATE = 100%
Low Battery Cut Out	LBCO = 10.0 VDC (12-volt models), 20.0 VDC (24-volt models), 40.0 VDC (48-volt models)
Low VAC Dropout	VAC DROP = 80 VAC (150 VAC for export)
Power Save	PWR SAVE = On (15 min.)
Equalize	EQUALIZE = Disabled
Charger Standby	CHARGER = No AC In (Charger Standby is off, will automatically charge when AC is connected)

4.0 Menu Map: ME-MR Remote Control

The following menu map is a complete overview of the inverter/charger settings and the info displays available from the ME-MR remote.

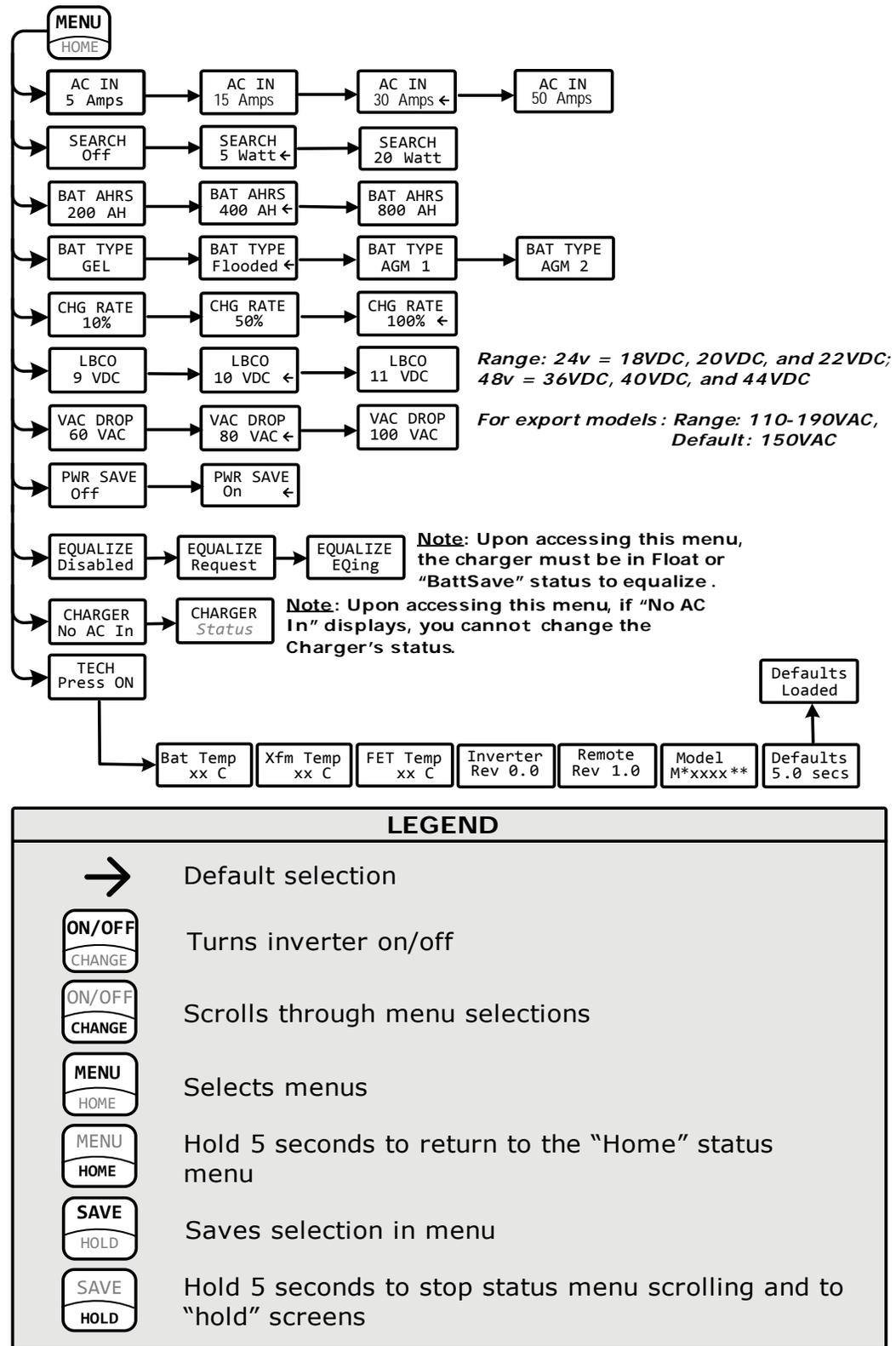


Figure 4-1, ME-MR Remote Menu Map

5.0 Operation

5.0 Operation

This section gives a brief overview of the ME-MR remote's LED indicators, LCD display, and available pushbuttons. It also covers how to operate an inverter/charger using the remote, and the various status and fault messages that may display during operation.

5.1 Front Panel

The ME-MR front panel contains LEDs and a LCD display for viewing system status, and pushbuttons to control system operation.

5.1.1 LED Indicators

There are two LED indicators on the front panel that illuminate solid or blink to indicate the inverter/charger's status. When the remote is first powered up, both LEDs come on as it goes through a self-test. Once the self-test is complete, the LEDs and the LCD display provide the operating status of the inverter/charger. See Section 5.3.4 for the LED Indicator Guide.

5.1.2 LCD Display

The LCD display is used for setting up the system operation as well as viewing the current operating status or any fault condition that may occur. This display has two lines of alphanumeric characters and features a backlight that can be set to turn off to conserve power. The top and bottom lines provide the inverter/charger's status, setup menus, and TECH read only information. When the remote is powered up, the display automatically scrolls through the Home screens showing the inverter/charger status and the battery voltage and current.

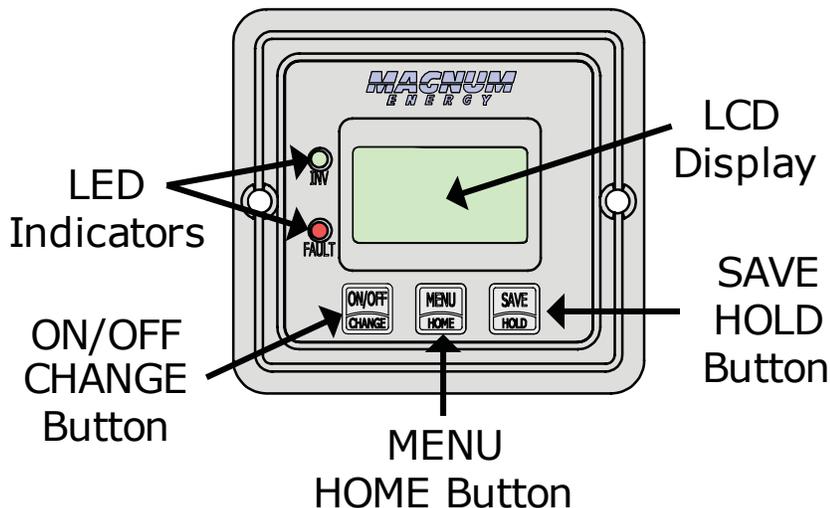


Figure 5-1, ME-MR Front Panel Controls and Indicators

5.1.3 ME-MR Remote Pushbuttons

ON/OFF Pushbutton

This pushbutton toggles the inverter function on and off. The green INV LED turns on and off with the pushbutton.

MENU Pushbutton

This pushbutton provides quick access to menu items that can help with configuring, monitoring, and troubleshooting your inverter/charger.

SAVE Pushbutton

This pushbutton saves the changes to settings selected in the remote's menus.

CHANGE Pushbutton

This pushbutton scrolls through the selections available under each menu heading. This menu restarts if you missed the desired selections, so if a selection is bypassed simply continue to press the MENU pushbutton until the desired selection reappears.

HOME Pushbutton

Hold down the HOME button for two seconds to return to Home screens.



Info: The MENU/HOME button can be used to reset the remote by pressing and holding it down for 10 seconds. This is useful if the display shows unrecognizable letters or symbols.

HOLD Button

Hold down this button for two seconds to stop the status screen from scrolling. Hold down again to restart the scrolling of the status screen.



Info: All adjustable inverter/charger settings in the ME-MR are saved in non-volatile memory and are preserved until changed – even if an inverter reset is performed, or if all power to the remote or inverter is removed.



Info: The ME-MR remote control is an inverter-only controller. In order to display a Magnum Energy accessory, you need to use the ME-RC50 or ME-ARC50 remote control. Please refer to the particular remote control owner's manual on the Magnum Energy website at www.magnumenergy.com for further information on displaying accessories.

5.2 Operating the Inverter/Charger using the ME-MR

Turning the inverter on - Press the ON/OFF pushbutton to activate the inverter. The inverter will either be searching for a load by using very little power from the batteries - if in Search mode (see Figure 5-3), or will be actively inverting by using power from the batteries to power the AC loads (see Figure 5-4). The green INV LED will be on when the inverter is actively inverting, and the green INV LED will flash while searching.

Turning the inverter off - While the inverter is actively inverting or searching, the ON/OFF pushbutton can be pressed to switch the inverter function off, and this will turn the green INV LED off (see Figure 5-2).

Inverter Standby - The inverter is in standby when it is active (green INV LED is on), and the remote shows a charge status because an external AC power (utility/shore or generator) is passing through the inverter to power the AC loads. During normal operation the AC loads will be powered by the external AC power. However, if a blackout or brownout condition occurs the inverter senses these conditions, transfers to Inverter mode, and then powers the AC loads connected to the inverter.



CAUTION: If you have critical loads and are in Inverter Standby, do not press the ON/OFF button to turn the inverter off. If the green INV LED is off, inverter power will NOT be available to run your critical loads should the external AC power be interrupted.

Equalize charging - Equalizing is a controlled overcharge performed after your flooded (or AGM1 type) batteries have been fully charged. It mixes the battery electrolyte (to reverse stratification) and removes sulfation that may have built up on the plates. These conditions, if left unchecked, reduce the overall capacity of the battery.

5.0 Operation



WARNING: Do not perform an equalization charge without reading and following all safety precautions pertaining to charging/equalization – as noted in this manual and in the inverter owner’s manual.

To enable the Equalization charge, see Figure 5-11 and follow all related information on page 23.

5.3 System Status Messages

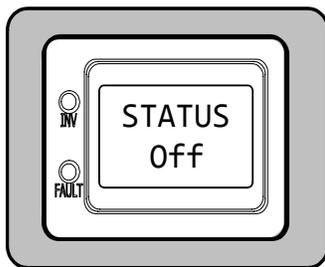
The remote control uses the top line of the LCD display to show the inverter/charger’s operation by displaying a status message. This section will review the inverter/charger’s operating modes and the available status messages under each mode. Use these messages along with the status LEDs to determine the inverter/charger’s current operating status, and to assist in troubleshooting the system if a fault occurs.

There are three operating modes of the inverter/charger:

- Inverter Mode
- Charger Mode
- Fault Mode

5.3.1 Inverter Mode Messages

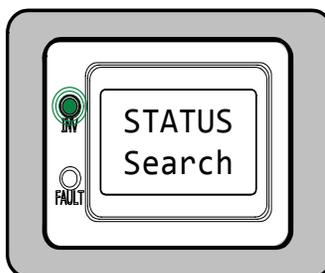
The inverter/charger is in Inverter mode when connected to a battery bank and AC power (shorepower/utility or generator) is not available or unacceptable to the inverter/charger’s input. The Inverter mode messages are Off, Searching, and Inverting.



Off appears on the LCD. All LEDs are off.

Figure 5-2, Off Mode

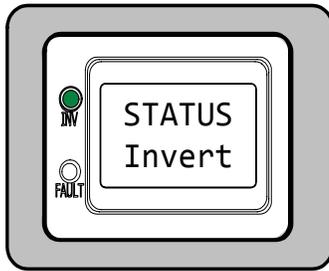
- **Off Mode** - This message tells you that there is no AC available on the inverter’s AC output. The inverter function is off.



Search appears on the LCD. The INV (green) LED slowly flashes. The FAULT LED (red) is off.

Figure 5-3, Search Mode

- **Search Mode** - When the inverter is in Search mode, the AC loads on the inverter output are less than the *SEARCH* setting. The Search mode function is used to reduce the inverter draw from the battery, and may be turned off whenever you want full inverter output voltage available at all times.



Invert appears on the LCD. The INV (green) LED is on solid. The FAULT (red) LED is off.

Figure 5-4, Inverting Mode

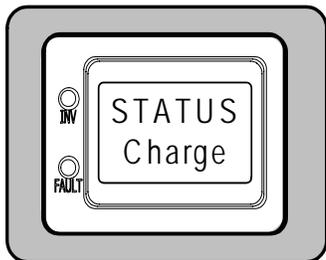
- **Inverting Mode** - The inverter is providing AC voltage on its output by inverting power from the batteries.

5.3.2 Charge Mode Messages

When AC power (utility or generator) is connected to the inverter/charger, it begins to monitor the AC input for acceptable voltage. Once the AC input is accepted, the AC transfer relay (inside the inverter) closes and Charge mode begins. There are several Charge mode messages; view the LCD display and the corresponding message in this section to identify and understand the particular Charge mode.



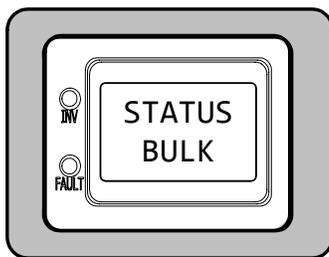
Info: The AC input becomes acceptable after a minimum 10 second delay, and when the voltage is greater than the *VAC DROP* setting.



Charge appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-5, Charge Mode

- **Charge Mode** - Once Charge mode has been enabled, the unit waits and displays "Charge" to determine the charge routine. If the DC voltage is low (≤ 12.8 VDC/12-volt models, ≤ 25.6 VDC/24-volt models, or ≤ 51.2 VDC/48-volt models), the charger initiates Bulk Charging. If the DC voltage is higher than this voltage, the charger skips the Bulk and Absorb Charging stages and goes directly to Float Charging.

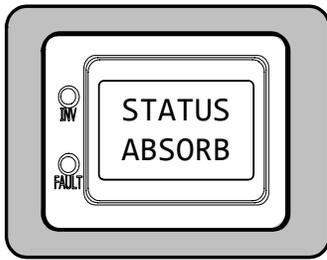


BULK appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-6, Bulk Charging Mode

- **Bulk Charging Mode** - The battery charger is delivering maximum current (determined by *CHG RATE* setting) to the batteries. The charger remains in Bulk Charge until the absorb voltage (determined by the *BAT TYPE* setting) is reached.

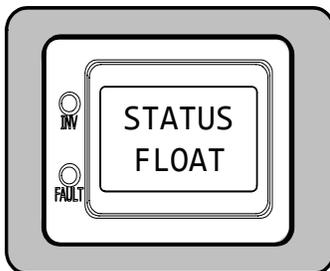
5.0 Operation



ABSORB appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-7, Absorb Charging Mode

- **Absorb Charging Mode** - The Absorb stage is the constant voltage stage and begins when the absorb voltage is reached (determined by the *BAT TYPE* setting) while Bulk Charging. During this stage, the DC charging current decreases as the battery becomes charged. This Charge stage continues until the absorb charging time (determined by the *BAT AHRS* setting) is finished.



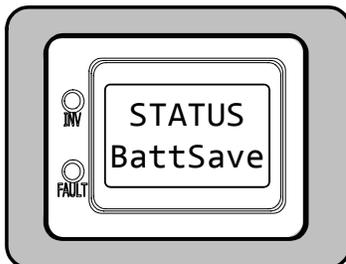
FLOAT appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-8, Float Charging Mode

- **Float Charging Mode** - At the end of the Absorb Charging stage, the charger reduces the charge voltage and tries to maintain the batteries at the Float Charge voltage setting; which is determined by the *BAT TYPE* setting. See Table 3-3.



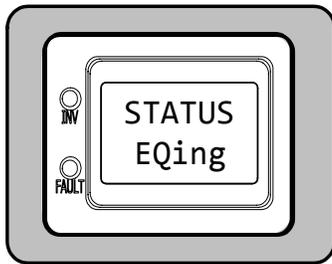
Info: If the battery voltage falls ≤ 12.1 VDC (12-volt models), ≤ 24.2 VDC (24-volt models) or ≤ 48.4 VDC (48-volt models), the unit will begin Bulk Charging.



BattSave appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-9, Battery Saver™ Mode

- **Battery Saver™ Mode** - This status indicates that you have entered the Battery Saver™ mode. This mode maintains the batteries without overcharging; thus preventing excessive loss of water in flooded batteries, or drying out of GEL/AGM batteries. After four hours Float Charging, the charger turns off and "BattSave" displays (charger is now in Battery Saver™ mode). If the battery voltage drops to ≤ 12.6 (12-volt models), ≤ 25.2 (24-volt models) or ≤ 50.4 (48-volt models), the charger automatically initiates another four hours of Float Charging. This cycle helps to ensure the batteries are monitored and maintained, and continues as long as AC power is continuously connected to the AC input.



EQing appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-10, Equalizing Mode

- **Equalizing Mode** - The battery charger is delivering the equalize voltage to the batteries. Refer to Table 3-3 to determine the equalize voltage.

Equalization charging can only be enabled while the charger is in Float Charge or in Battery Saver™ mode. To turn on Equalize Charging, ensure the LCD display reads "FLOAT" or "BattSave", press the MENU button until you see the "EQUALIZE Disabled" menu, and then press the CHANGE button. The display quickly reads "EQUALIZE Request", and then "EQUALIZE EQing."

The Equalize Charge continues for four hours, and then automatically stops and returns to Float Charging. The Equalize Charge can be manually stopped by pressing the MENU button until you see the "EQUALIZE EQing" menu, and then press the CHANGE button. The display should then read "EQUALIZE Disabled".

During equalization the batteries begin gassing and bubbling vigorously (which consumes water). Ensure that each cell has adequate distilled water levels prior to equalizing, and be sure to add water as needed after equalizing.

How often should I equalize? Some experts recommend heavily used batteries should be equalized anywhere from x1/mo. to 1-2x/year. Others only recommend it when the cells have a low specific gravity, or when the difference between any individual cell has a specific gravity reading greater than .015 after being fully charged.

How long should I equalize? While the batteries are gassing, monitor the specific gravity readings every hour. When the specific gravity readings no longer increase, the Equalization Charge is complete and should be stopped.



WARNING: Equalizing produces hydrogen and oxygen gas. Ensure the battery compartment has adequate ventilation in order to dissipate this gas to avoid explosions.



CAUTION: Ensure your batteries can be equalized. Performing an Equalize Charge on batteries other than liquid lead acid or certain AGM types could permanently damage them. Refer to your battery manufacturer/dealer for instructions on how to properly equalize your batteries.

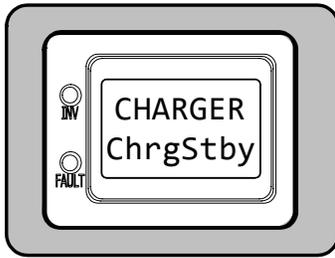


CAUTION: Ensure the DC loads will not be damaged by the higher voltage applied to the batteries during equalization. If in doubt, disconnect the DC loads to prevent damage.



Info: Equalization is not available if GEL or AGM 2 is selected from the BAT TYPE menu.

5.0 Operation



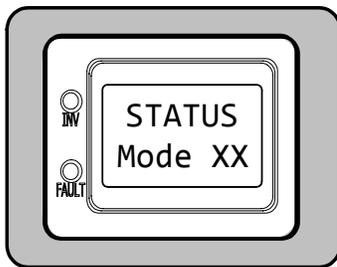
ChrgStby appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-11, Charger Standby Mode

- **Charger Standby** - The charger is disabled to prevent any charging, but the AC power to the AC input is still available on the AC output.



Info: Press the CHANGE button to turn the charger on. See Section 3.2.10 for more info on Charger Standby.



Mode XX appears on the LCD. The FAULT (red) LED is off, and the INV (green) LED could be on or off.

Figure 5-12, Unknown Mode

- **Unknown Mode XX** - The remote doesn't recognize the mode the inverter is reporting. Contact Magnum Technical Support for assistance.

5.3.3 Fault Mode Messages

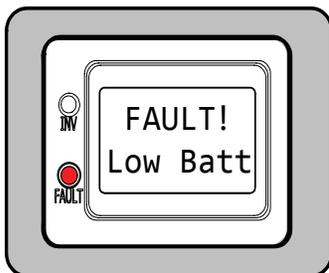
When an abnormal condition is detected, the FAULT LED comes on and a fault status is displayed. View the LCD display and use the information in this section to identify and correct the issue.



Info: Many faults automatically restart once cleared. Some require either a manual restart or an inverter reset. See Section 6.2.

5.3.3.1 System Fault Messages

These fault messages are usually caused by some external issue that directly affects the inverter/charger system.



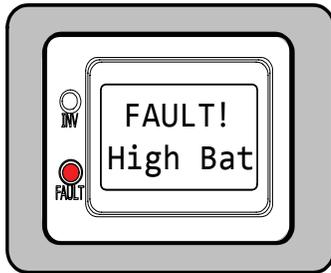
Low Batt appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-13, Low Battery Fault

- **Low Battery Fault** - The inverter turns off to prevent the batteries from being over-discharged. The FAULT LED illuminates when the battery voltage drops below the *LBCO* setting for >1 minute. The inverter automatically restarts and resumes operation when the battery voltage rises to ≥ 12.5 VDC (12v models), ≥ 25.0 VDC (24v models), or ≥ 50.0 VDC (48v models).



Remedy: This fault also automatically restarts if AC power (such as utility/shore power or a generator) is connected to the inverter/charger's input and battery charging begins.



High Bat appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-14, High Battery Fault

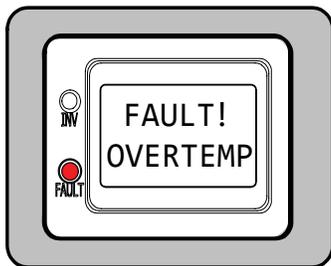
- **High Battery Fault** - The inverter turned off because the battery voltage is above the High Battery Cut-Out (HBCO) value. "High Bat" displays, and the FAULT (red) LED illuminates. The inverter automatically restarts and resumes operation when the battery voltage drops.



The HBCO value is dependent on your inverter revision and model. Normally, the HBCO value for ME/MM/RD Series inverters is 16 VDC (12-volt models) or 32 VDC (24-volt models); and the HBCO value for the MS/MMS Series inverters is 17 VDC (12-volt models), 34 VDC (24-volt models), or 68 VDC (48-volt models).



Remedy: This fault only occurs when an external DC charging source is charging the inverter's battery bank. Turn off any other additional charging source to allow the DC voltage level to drop.



OVERTEMP appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

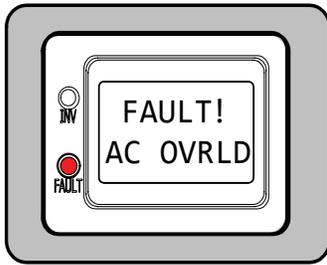
Figure 5-15, Overtemp Fault

- **Overtemp Fault** - The inverter/charger has shut down because the internal power components (FETs and/or transformer) have exceeded their safe temperature operating range. Once the unit cools down it automatically restarts and continues operation.



Remedy: If the fault occurs while inverting, reduce the load on the inverter. If it occurs while charging, turn down the charge rate. If this fault happens often, ensure the inverter is not in a hot area, has proper ventilation, and the cooling fans inside the inverter are working.

5.0 Operation



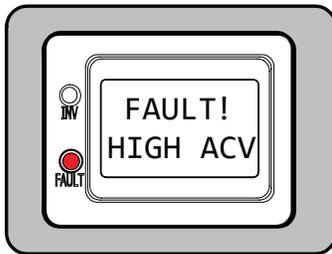
AC OVRLD appears on the LCD and the **FAULT** (red) LED is on. The **INV** (green) LED is off.

Figure 5-16, AC Overload Fault

- **AC Overload Fault** - The AC load on the inverter/charger's output exceeds the inverter's AC current protection limits. If the overload condition lasts for less than 10 seconds, the unit automatically restarts and resumes operation. However, if the overload occurs for longer than 10 seconds, the unit shuts down and requires a manual restart.



Remedy: This fault occurs because: the connected AC loads are larger than the inverter's output capacity, there is a wiring short on the output, or the output wires are incorrectly installed. Once the AC loads are reduced or the output wiring is corrected, the inverter can be restarted after a manual restart has been accomplished.



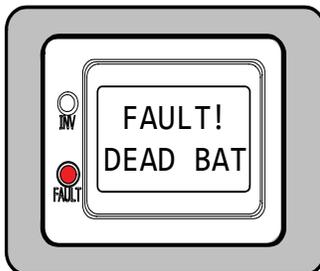
HIGH ACV appears on the LCD and the **FAULT** (red) LED is on. The **INV** (green) LED is off.

Figure 5-17, High AC Volts Fault

- **High AC Volts Fault** - The charger is disabled because a very high AC voltage (>145 VAC, >260 VAC for export models) has been detected on the AC input.



Remedy: Remove all AC power from the inverter's AC input for at least 15 minutes to automatically restart this fault. Ensure only 120VAC power is connected to each of the inverter's AC inputs. Check and correct the high voltage problem from the source.



DEAD BAT appears on the LCD and the **FAULT** (red) LED is on. The **INV** (green) LED is off.

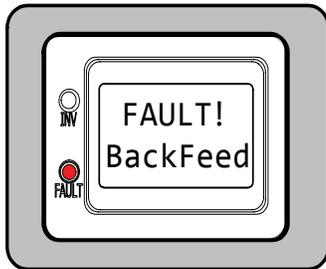
Figure 5-18, Dead Battery Charge Fault

- **Dead Battery Charge Fault** - This fault has detected a very discharged battery bank, or a battery bank not connected to the inverter. The unit is attempting to enter the Charge mode, but has detected less than 9 volts (12-volt models), 18 volts (for 24-volt models), or 36 volts (for 48-volt models) on the battery bank.



Remedy: Check the DC voltage on the inverter's DC terminals and compare it with the DC voltage on the battery bank. These two voltages should be very close (<0.5 VDC difference). If not, check to ensure all connections are tight and the fuse/circuit breaker between the inverter and battery bank is good.

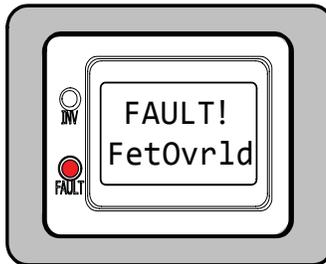
This fault automatically clears when the voltage is greater than 12.6 volts (12-volt models), 25.2 volts (24-volt models), or 50.4 volts (48-volt models) as detected by the inverter.



BackFeed appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-19, BackFeed Fault

- **BackFeed Fault** - The inverter shuts down because AC voltage from an external AC source has been detected on the inverter's AC output. When the unit shuts down because of this fault condition, an inverter reset is required in order to resume operation (see Section 6.2 to reset the inverter).



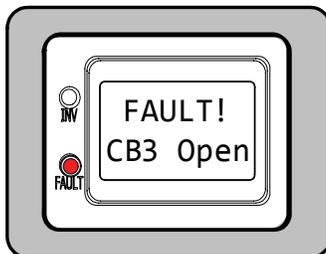
FetOvrld appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-20, FET Overload Fault

- **FET Overload Fault** - The inverter/charger has shut down because the internal FETs (Field Effect Transistors) have quickly exceeded a safe operating temperature. Once the FETs have cooled, perform a manual restart to resume operation.



Remedy: If the fault continues to occur, disconnect all the inverter's AC output wires and reset the inverter (see Section 6.2). If this fault does not clear after doing a reset, the inverter may require service.



CB3 Open appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-21, CB3 Open Fault

- **CB3 Open Fault** - The inverter has detected that the AC input circuit breaker (CB3) on the inverter/charger has opened due to excess current flow through the inverter to the AC loads.

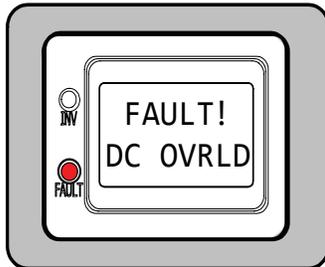
5.0 Operation



Remedy: After reducing the AC loads, push in the inverter's AC input circuit breaker to reset and resume operation.



Info: While in Charger mode, the inverter's AC input breaker could nuisance trip if the loads on the inverter's AC HOT OUT 1 exceed the current rating of this circuit breaker.



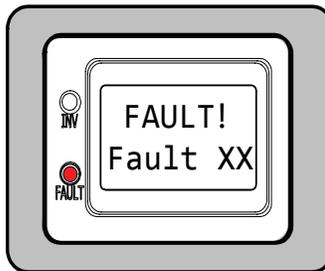
DC OVRLD appears on the LCD and the **FAULT** (red) LED is on. The **INV** (green) LED is off.

Figure 5-22, DC Overload Fault

- **DC Overload Fault** - The inverter shuts down to protect internal power components from an excessive AC load. If the overload condition lasts for less than 10 seconds, the unit automatically restarts and resumes operation. However, if the overcurrent condition occurs for more than 10 seconds, the unit shuts down and requires a manual restart.



Remedy: This fault occurs because: the connected AC loads exceed the inverter's output capacity, there is a wiring short on the AC output, or the wires are incorrectly installed. Once the AC loads are reduced or the output wiring is corrected, manually restart the inverter. If this fault continues after all these recommendations, perform an inverter reset (see Section 6.2).



Fault XX appears on the bottom line of the remote. The **FAULT** (red) LED is on and the **INV** LED (green) is off.

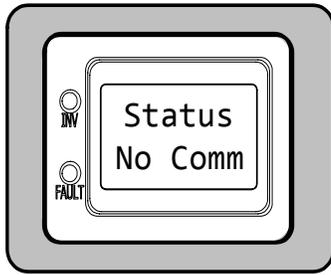
Figure 5-23, Unknown Fault

- **Unknown Fault** - When a number appears in the second line of the remote it means the remote doesn't know what fault the inverter is reporting.



Remedy: Contact Magnum Technical Support for assistance with this fault.

Note: The XXs in the display above are just placeholders.



No Comm appears on the LCD. FAULT (red) LED is off. INV (green) LED may be off or on. Ignore the INV LED.

Figure 5-24, No Comm

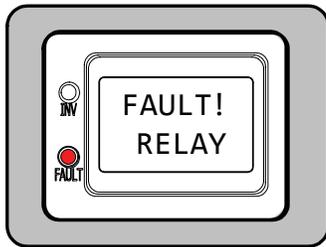
- **No Comm** - Remote is not receiving any information from the inverter.



Remedy: Reset the remote by disconnecting the remote communications cable from the inverter for 5 seconds, and then reconnect it (see Figure 2-3). If the fault continues, first check/replace the remote cable. This cable is 4-wire telephone cable.

What if the cable is not the issue?

- Try another remote display.
- Disconnect the remote from the Remote port and connect to the Network port.
- The inverter might need servicing.



RELAY appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-25, Internal Relay Fault

- **Internal Relay Fault** - The internal transfer relay is not closing even though the inverter is in Charge mode. Contact Magnum Technical Support.



Selco Op appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-26, Selco Op Fault

- **Selco Op Fault** - The Selco TCO (Temperature Cut-Out) opens and causes the inverter to shut down to protect the internal power transformer from damage. Once the Selco TCO cools down, the inverter automatically restarts and resumes operation.

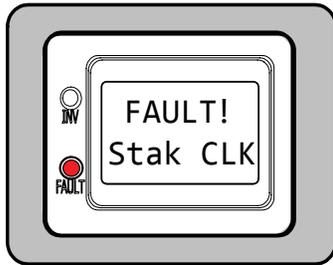


Remedy: If this fault occurs while inverting, reduce the load on the inverter. If it occurs while charging, turn down the charge rate. If it occurs often, ensure the inverter has adequate ventilation and the internal cooling fans are operational.

5.0 Operation

5.3.3.2 Stacking Fault Messages

A fault condition may occur when multiple inverters are connected together (i.e., stacked) — that is not possible on a single inverter installation.



Stak CLK appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-27, Stack Clock Fault

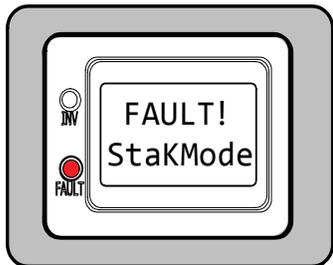
- **Stack Clock Fault** - There is a stacker cable problem or one inverter is losing synchronization with the other inverter.



Remedy: 1. Ensure you are using a Magnum Stacking Cable (this is not a telephone/data cable, this is a custom made cable). 2. Inspect the stacker cable and reconnect at both ends (ensure you hear an audible “click” from the connectors at both inverters).



Info: This fault has been known to occur when a Magnum Energy accessory is plugged into the Stack port, but the installation is not using multiple inverters in a stacked configuration. If this occurs, perform an [inverter reset](#) (see Section 6.2).



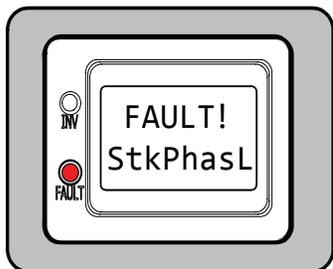
StaKMode appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-28, Stack Mode Fault

- **Stack Mode Fault** - A problem with the ‘other’ stacked inverter has been detected, check that unit for a fault condition.



Remedy: This fault automatically clears when the fault with the other inverter is corrected.



StkPhasL appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-29, Stack Phase Loss Fault

- **Stack Phase Loss Fault** - 1. The AC input wiring is incorrect; or 2. One phase was lost from the AC input source; or 3. One of the inverter’s internal transfer relay is bad; or 4. The inverter’s AC input circuit breaker may be open.



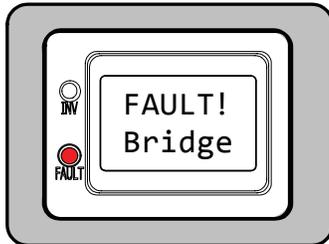
Remedy: If this fault doesn’t clear after checking the above recommendations, perform an inverter reset (see Section 6.2).

5.3.3.3 Internal Fault Messages

The inverter continually monitors several internal components. If a condition inside the inverter occurs that does not allow proper operation, the inverter shuts down to protect itself. To clear these internal type of faults, the inverter requires an inverter reset.



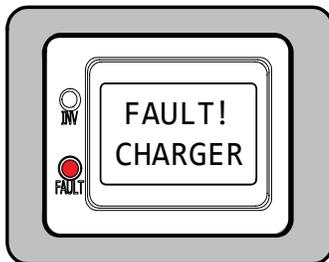
Remedy: Perform an inverter reset (see Section 6-2). After resetting the inverter, press the ON/OFF pushbutton to turn the inverter on and verify the fault has cleared. If the internal fault remains, the inverter may require repair at an authorized service facility.



Bridge appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-30, Internal Bridge Fault

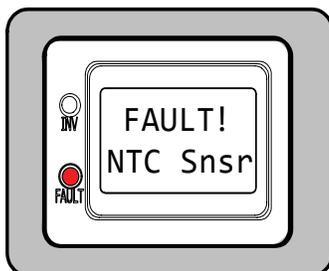
- **Internal Bridge Fault** - The inverter shuts down because the internal power-bridge protection circuit has been activated.



CHARGER appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-31, Internal Charger Fault

- **Internal Charger Fault** - The inverter shuts down because the internal charger protection circuit has been activated.



NTC Snsr appears on the LCD and the FAULT (red) LED is on. The INV (green) LED is off.

Figure 5-32, Internal NTC Fault

- **Internal NTC Fault** - The inverter shuts down because the internal NTC (temperature sensor) circuit has been activated.

5.0 Operation

5.3.4 LED Indicator Guide

The remote provides the following LEDs. Use them along with the LCD display to determine the operating status.

Table 5.1, LED Indicator Guide

LED	Status	Meaning
INV (green)	OFF	1. Inverter is disabled; or 2. Remote is in Power Saver mode - press any button to activate LEDs.
	ON	Inverter is enabled - 1. Supplying AC power on the output; or 2. In Standby (a charge status displays); the inverter will automatically supply AC power to the loads if shore or generator power is lost.
	BLINKING	Inverter is in Search mode (the AC load is below the Search Watts setting).
FAULT (red)	OFF	Normal operation.
	ON	A fault condition has been detected, check the LCD display to find and correct the cause.

6.0 Troubleshooting

If the remote is not functioning correctly, use the following table to help find a solution.

Table 6-1, Remote Troubleshooting

Symptom	Possible Cause	Solution
Display shows unrecognizable letters or symbols.	Static electricity may have been discharged into the LCD display.	Refresh Display: Press and hold the SELECT button for 10 seconds.
The LCD text display is locked-up, pressing any pushbutton has no response - may show "revision" or "connecting".	The RJ11 connections on the communication cable are not making a good connection.	Reset remote: 1) disconnect the remote cable from the inverter for 5 seconds and then reconnect; 2) check RJ11 cable connection on back of the remote (see Figure 2-2). Important: Ensure the RJ11 connector is pushed into the correct port. You should feel/hear "click" when the connection is made.
	The remote is not getting sufficient power from the inverter.	Ensure the inverter batteries are connected and the inverter is operating correctly. The inverter should be able to invert and power AC loads from the batteries (ensure no AC power is connected to the inverter's AC inputs).
The LEDs and the backlight are off.	The remote is in Power Saver mode.	Press any button to reactivate the remote (or turn the Power Saver mode to <i>Off</i>).
The remote is non-functional (no lights, no text on LCD display, and no response when pressing any pushbutton).	The communication cable is bad or not correctly connected to the Remote port on the inverter.	Check the communications cable from the inverter to remote; ensure: 1) it is connected to the REMOTE port, 2) the correct communications cable is used (a 4-conductor telephone cable may be substituted to determine if cable is good).
	Inverter is not connected to batteries.	Ensure inverter batteries are connected and inverter is operating correctly without any AC power connected (should be able to invert and power AC loads from batteries).

6.0 Troubleshooting

6.1 Troubleshooting Tips

6.1.1 Inverter Problems:

- **Inverter turned on, the INV LED on the inverter is blinking, no output:** Inverter is in Search mode. Either defeat Search mode — if not needed — or turn on loads greater than the Search Watts setting.

6.1.2 Charger Problems:

- **Unit won't transfer to Charge mode with AC applied:** Measure the input AC voltage, it should be 120VAC +/- 20 VAC, (export models: 230 VAC +/- 40 VAC). Also, check that the VAC dropout setting on the remote is 80 VAC (150 VAC for export models) or less.

- **Transfer relay closes, and then opens and continues to cycle:** AC voltage is too low, or has transients that drop the AC voltage momentarily. Change the VAC dropout setting to 60 VAC and check for improvements. If the cycling continues, back off the charge rate from 100% to 10%.

This cycling may also occur if the AC output of the inverter is connected to the inverter's AC input – check for proper input and output AC wiring. Check the remote for indication of a fault.

- **Charger not charging even though the remote says "CHARGE":** Full charge rates are not obtained in Charge status, only after this mode changes to "BULK", "ABSORB," or "FLOAT".

- **Charger not charging even though the remote says "BULK" (or "ABSORB"):** Check the DC amps meter and the DC voltmeter on the ME-MR display. It should be 80% or more of rated charge current if the battery voltage is under 14.0 VDC (28.0 VDC on 24-volt models or 48.0 VDC for 48-volt models). If not, check the charge rate setting and verify the setting is 80% or greater. Still low charge rate? Check the *AC IN* setting to verify the setting. If no AC loads are being passed through the inverter, the *AC IN* setting must be 15 amps (25 amps for 3kW unit) or greater, to receive a full charge rate.

- **Remote displays "FLOAT" not "BULK" when the AC is first plugged in:** Check DC volts on the ME-MR display, if the battery is over 13.0 VDC (26.0 VDC for 24-volt models or 52.0 VDC for 48-volt models) then the battery was already charged and the charger automatically goes to Float Charging to keep from overcharging the batteries.

- **Charge amps are lower than expected, or is 0 amps DC:** Measure input AC voltage and increase if the input voltage is under 90 VAC. The charge rate is reduced to try and keep the input voltage above 90 VAC; also check the *AC IN* and *CHG RATE* settings to determine if the current is being limited.

- **Charger output voltage is higher than expected:** Check the Battery Temperature Sensor (BTS) temperature. If the BTS is installed, the charge voltage settings will increase if the temperature around the BTS is below 77° F (25° C), and decrease if the temperature around the BTS is higher than 77° F (25° C).

6.2 Performing an Inverter Reset

Press and hold the inverter's Power ON/OFF pushbutton (see Figure 6-1) (for approximately 15 seconds) until the Charging/Inverting Status LED comes on and flashes rapidly. Once the rapid flashing has begun, release the Power ON/OFF pushbutton. The Status LED will go off after the pushbutton is released.

After the inverter reset is completed, press the ON/OFF pushbutton to turn on the inverter.

Some older inverter models do not allow an inverter reset. If the inverter reset fails, you will need to power-down the inverter using the procedure below. In either case, if an internal fault does not clear, the inverter will require repair at an authorized service facility.



Info: The Power ON/OFF pushbutton is a small momentary type switch which operates by lightly pressing and releasing.



Info: All adjustable inverter/charger settings in the ME-MR are saved in non-volatile memory and are preserved until changed – even if an inverter reset is performed or if all power to the remote or inverter is removed.



1. Press and hold the Power ON/OFF pushbutton for 15 seconds.

2. Watch the Charging/Inverting Status LED, after approximately 15 seconds it should come on and flash rapidly to indicate the inverter has reset. The Status LED will go off after the pushbutton is released.

Figure 6-1, Performing an Inverter Reset

6.3 Powering-down the Inverter

Perform the following steps to power-down the inverter:

1. Remove all AC power (utility or generator power) to the inverter.
2. Disconnect the positive battery cable to the inverter.
3. Ensure the inverter and remote control are disconnected from all AC and DC power (the remote display will be blank).

After the inverter has been disconnected from all power for 30 seconds, reconnect the positive battery cable and resume operation.



Info: There may be a momentary spark when the positive battery cable is connected to the inverter's terminal. This is normal and indicates that the inverter's internal capacitors are being charged.

7.0 Warranty and Service Info

7.0 Warranty and Service Information

7.1 Limited Warranty

Magnum Energy, Inc., warrants the ME-MR remote control to be free from defects in material and workmanship that result in product failure during normal usage, according to the following terms and conditions:

1. The limited warranty for this product extends for a maximum of 12 months from the product's original date of purchase.
2. The limited warranty extends to the original purchaser of the product and is not assignable or transferable to any subsequent purchaser.
3. During the limited warranty period, Magnum Energy will repair, or replace at Magnum Energy's option, any defective parts, or any parts that will not properly operate for their intended use with factory new or remanufactured replacement items if such repair or replacement is needed because of product malfunction or failure during normal usage. The limited warranty does not cover defects in appearance, cosmetic, decorative or structural parts or any non-operative parts. Magnum Energy's limit of liability under the limited warranty shall be the actual cash value of the product at the time the original purchaser returns the product for repair, determined by the price paid by the original purchaser. Magnum Energy shall not be liable for any other losses or damages.
4. Upon request from Magnum Energy, the original purchaser must prove the product's original date of purchase by a dated bill of sale, itemized receipt.
5. The original purchaser shall return the product prepaid to Magnum Energy in Everett, WA. After the completion of service under this limited warranty, Magnum Energy will return the product prepaid to the original purchaser via a Magnum-selected non-expedited surface freight within the contiguous United States and Canada; this excludes Alaska and Hawaii.
6. If Magnum repairs or replaces a product, its warranty continues for the remaining portion of the original warranty period or 90 days from the date of the return shipment to the original purchaser, whichever is greater. All replaced products and parts removed from repaired products become the property of Magnum Energy.
7. This limited warranty is voided if:
 - the product has been modified without authorization
 - the serial number has been altered or removed
 - the product has been damaged through abuse, neglect, accident, high voltage or corrosion
 - the product was not installed and operated according to the owner's manual

BEFORE RETURNING ANY UNIT, CONTACT MAGNUM ENERGY FOR A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER

7.0 Warranty and Service Info

7.1.1 How to Receive Repair Service

If your product requires warranty service or repair, contact either:

1. An authorized service center, as listed at:
<http://www.magnumenergy.com/ServiceCenters.htm>, or
2. Magnum Energy, Inc. at:
Telephone: 425-353-8833
Fax: 425-353-8390
Email: warranty@magnumenergy.com

If returning your product directly to Magnum Energy for repair, you must:

- return the unit in the original, or equivalent, shipping container
- receive a Return Materials Authorization (RMA) number from the factor
- prior to the return of the Product to Magnum Energy for repair, place RMA numbers clearly on the shipping container or on the packing slip

When sending your product for service, please ensure it is properly packaged. Damage due to inadequate packaging is not covered under warranty. We recommend sending the product by traceable or insured service.



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