

 Discover®

ADVANCED ENERGY

Lithium Ion Battery

APPLICATION NOTE:

OPEN LOOP INTEGRATION WITH MAGNUM ENERGY

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OVERVIEW

There are some notable differences when configuring your Discover AES installation versus conventional lead acid batteries.

This Application Note provides information about the integration of Discover AES Lithium batteries with Magnum Energy systems and related components using the ME-ARC (Advanced Remote Control), ME-RTR (Router), and ME-ARTR (Advanced Router).

Magnum Energy reference documents:

- ME-RTR / ME-ARTR Owner's Manual
- ME-ARC Owner's Manual
- ME-AGS-N Owner's Manual

Discover reference documents:

- Discover Energy 808-0004 42-48-6650 Data Sheet
- Discover Energy 808-0005 44-24-2800 Data Sheet
- Discover Energy 805-0015 AES LiFePO Battery 44-24-2800 42-48-6650 Manual

Visit discoverbattery.com for the most recent version of published documents.

Certain configuration, installations, service, and operating tasks should only be performed by qualified personnel in consultation with local utilities and/or authorized dealers. Qualified personnel should have training, knowledge, and experience in:

- Installing electrical equipment
- Applying applicable installation codes
- Analyzing and reducing hazards involved in performing electrical work
- Installing and configuring batteries

No responsibility is assumed by Discover Battery for any consequences arising out of the use of this material.

Read AES Battery Manual and Safety instructions before installing the battery.

Read Magnum Energy manuals for guidance on product features, functions, parameters and how to use the product safely.

1. BATTERY OPERATING LIMITS

1.1 Maximum Battery Operating Limits

The battery should not be operated outside these operating limits. The BMS will open its internal relay and disconnect the battery if any of these limits are exceeded.

Maximum Operating Limits	44-24-2800	42-48-6650
Continuous Charge Current*	110 Adc	130 Adc
Continuous Discharge Current*	110 Adc	130 Adc
Charge Voltage	27.2 V	54.4 V
Operating Voltage (Min / Max)	22.4 V / 29.2 V	44.8 V / 58.4 V
Charge Temperature (Min / Max)	0°C / 45°C (32°F / 113°F)	
Discharge Temperature (Min / Max)	-20°C / 50°C (-4°F / 122°F)	
Storage Temperature (Min / Max)	-20°C / 45°C (-4°F / 113°F)	

* Effects of AC Ripple must be taken into consideration when sizing and configuring your system.

▲ NOTE!

Intentional bypassing of BMS to operate battery outside maximum and minimum limits voids warranty.

1.2 Recommended Battery Operating Settings

Although the battery is capable of performing at higher operating limits, the following settings are recommended to maximize battery health and account for unforeseen external conditions.

Recommended Operating Settings	44-24-2800	42-48-6650
Max Continuous Charge Current	< 78 A	< 92 A
Max Continuous Discharge Current	< 78 A	< 92 A
Charge Voltage (Bulk/Absorb)	27.2 V	54.4 V
Charge Voltage (Float)	26.8 V	53.6 V
Low Voltage Disconnect	24 V	48 V
Operating Temperature	20°C (68°F)	

2.0 AES Open Loop Integration with Magnum Energy Equipment

2.1 Device Settings

AES batteries must be set up to work with Power Conversion and Monitoring devices in either an Open Loop or Closed Loop configuration. The charge and discharge settings in a Open Loop configuration are set up manually through the controller for the Power Conversion device at the time of installation. In a Closed Loop configuration, charge and discharge settings are dynamically controlled by the BMS of the AES Battery over a connection with the Power Conversion device network.

Note: Closed Loop communication with a Power Conversion device network requires the use of a LYNK Gateway Communication device (p/n 950-0015) available from Discover Battery. For details please refer to the appropriate Application Note for your Power Conversion device available from the Discoverbattery.com website, or contact your Discover Battery provider for assistance.

The settings in this document are for an Open Loop configuration with Magnum Energy equipment.

3. Configuration Settings

The general settings for AES batteries in an Open Loop configuration with Magnum devices such as inverter chargers and Auto Generator Starting products are as follows below. Refer to Magnum product manuals for the safe and correct operation of products.

3.1 ME-RTR / ME-ARTR Programming Settings

Inverter	Menu Location	44-24-2800	42-48-6650
02B Low Battery Cut Out (LBCO) Volts ⁽¹⁾	SETUP: 02 Inverter Setup	24.4 V	48.8 V
03C Battery Type	SETUP: 03 Inverter Setup	CC/CV	CC/CV
Max Charge Amps ⁽²⁾	CC/CV Charge Settings	110 A x number of batteries	130 A x number of batteries
CV Chg Volts	CC/CV Charge Settings	27.2 V	54.4 V
CV Charge Done Time	CC/CV Charge Settings	0.5 - 3.0 Hrs	0.5 - 3.0 Hrs
Set Max CC/CV Charge Time	CC/CV Charge Settings	12.0 Hrs	12.0 Hrs
Set DC Volts to Recharge	CC/CV Charge Settings	25.2 V	50.4 V

(1) Absolute lowest cut off voltage, set voltage as required (see inverter manual).

(2) May be set to lower value if necessitated by charger size.

3.2 ME-AGS-N Programming Settings

Inverter	Menu Location	44-24-2800	42-48-6650
04A Gen Run DC Volts - Start Volts ⁽³⁾	SETUP: 04 AGS Setup	25.2 V	50.4 V
04A Gen Run DC Volts - Stop Volts ⁽⁴⁾	SETUP: 04 AGS Setup	27.0 V	54.0 V
04A Gen Run DC Volts - Start/Stop Delay	SETUP: 04 AGS Setup	0.1 Hrs	0.1 Hrs

(3) Approximately <10% remaining capacity, increase voltage as required

(4) Approximately 90%-95% SOC. This value ensures the generator will turn off and not operate in Absorption charge for an extended period of time

▲ NOTE!

When the batteries are operating in Open Loop mode, State of Charge (SOC) triggers should not be used for Gen Run start or stop.

3.3 PT-100 Programming Settings

Charge Controller	Menu Location	44-24-2800	42-48-6650
01E Link PT CHG Settings ⁽⁵⁾	SETUP: 01 System Setup	YES	YES
06A Battery Type	SETUP: 06 PT Setup	Linked	Linked
06B Absorb Done	SETUP: 06 PT Setup	Linked	Linked
06C Max Charge Rate ⁽⁶⁾	SETUP: 06 PT Setup	100%	100%
06D Max Charge Time	SETUP: 06 PT Setup	12.0 Hrs	12.0 Hrs

(5) When linked, the inverter's charger settings are used to determine how the inverter/charger and the PT controller will charge the battery. By linking, you can avoid setting charge parameters that conflict and cause the separate chargers to work against each other.

(6) May be set to lower value if necessary. If multiple controllers are used on a single battery bank, ensure that the total charge rate from all controllers is limited to the maximum charge rate needed for your battery bank.