

Operating Instructions

MOTION+ Ultimate Charger



	Date	Name		No. V1.1 EN
Issued:	10.07.2026	AV		
Revision:	01.00.2026	MG		
Checked:				

1 Introduction

In response to growing global environmental concerns and our commitment to sustainability, we are taking targeted measures to integrate environmentally friendly practices into all areas of our business. We are constantly striving to reduce our paper consumption, which is why we have provided this printed manual in English only. However, online versions are available in other languages. To access these, simply scan the QR code.



Multilingual manual

2 Safety

Only an adult trained person should operate this equipment. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction - children being supervised not to play with the appliance.

The input and output voltages used with this equipment may be high enough to endanger life, so insulated, shrouded connectors must be fitted. This device is only suitable for industrial use.

Please read this manual completely and convey instructions to all personnel concerned. Keep the manual in a safe and convenient place.

It is advisable to thoroughly read the information on battery safety supplied with the battery, prior to charging.

Towards the end of charge, lead acid batteries give off hydrogen gas, which is explosive if in sufficient concentration, therefore avoid flames and sparks. Appropriate measures must be taken to ensure adequate ventilation.

Incorrect use of a charger or maladjustment of its controls can damage a battery. The equipment has been factory set and does not require user adjustment.

This product has been designed, manufactured and certified to be in conformance with European Union (CE), United Kingdom (UKCA) and Australian (RCM) Safety and EMC Directives. Testing has ensured that the battery and charger combination conform as a system for use in Light and Heavy Industrial environments for each respective product variant. The following notes are for the guidance of the person installing and using the product.

The charger must be isolated from the input supply and the battery, before any panels are removed.

3 Model ranges

Depending on the model type, this battery charger can be used to charge the following types of batteries:

- Lead-Acid of types PzS and GiS (e.g. Exide Material Handling Essential and Premium) with voltage and capacities of:
 - 24 V, 36V: 95 – 6776 Ah
 - 48 V: 95 – 5886 Ah
 - 72 V, 80 V: 441 – 4554 Ah

- VRLA type batteries of PzV, GiV or AGM-type (e.g. Exide Sonnenschein Light traction and Exide Sonnenschein Material Handling),
 - 24 V, 36V: 130 – 5000 Ah
 - 48 V: 130 – 4334 Ah
 - 72 V, 80 V: 130 – 3334 Ah
- Lithium-Ion batteries of LFP and NMC type (Exide (Solition, MHB) Material Handling, Exide Solition Light traction LTB2), LTB, Exide Sonnenschein Lithium.
 - 24 V, 36V: 25 – 3000 Ah
 - 48 V: 25 – 2600 Ah
 - 72 V, 80 V: 25 – 2000 Ah

Do not attempt to recharge non-rechargeable batteries!

Recharging a non-rechargeable battery is dangerous. Non-rechargeable batteries, such as alkaline or zinc-carbon batteries, are designed for single-use only. Attempting to recharge them could result in leakage, rupture, or even fire hazards.

Charging can be carried out only when the ambient temperature is between 0°C and 35°C.

4 Installation

Installation must only be carried out by suitably qualified personnel and in accordance with current local and national wiring regulations.

Battery leads should not be altered without prior consultation with service personnel.

The charger should be sited in a cool, dry, well-ventilated location away from corrosive fumes and humid atmospheres.

The charger must have a minimum clearance overhead of 200mm, ensuring ventilation is not obstructed at the rear intake and the front exhaust vents.

The device should be moved into position using lifting devices that are slid under the base.

Wall Mounting:

1. Ensure that the following parts are available (not included):
 - 4× suitable screws (e.g. countersunk screws)
 - Optional: 4× washers
 - Tools as required (screwdriver, spirit level, pencil, tape measure)
2. Select a stable, level surface (e.g. wall or mounting plate). Ensure that there is sufficient space for the dimensions: width: 487 mm, height: 745 mm.
3. Mark the positions of the screws. The component has four keyhole slots, one at each corner. The following dimensions are relevant for the screw positions: Horizontal:
 - a. Total width of the unit: 413 mm (H1), 487 mm (H2)
 - b. Distance between the inner screw points: 375 mm (H1), 350 mm (H2)Vertical:

- c. Total height of the device: 515 mm (H1), 745 mm (H2)
 - d. Distance between the inner screw points: 350 mm (H1) 350mm (H2)
 - e.  Recommendation: Use a spirit level to mark the upper line parallel to the floor, then transfer the height measurements downwards.
4. As these are keyhole slots: Do not screw the screws in completely; leave them protruding by approx. 2–3 mm. The screw heads must fit into the wider part of the keyholes. Check that the screws are tight enough to support the weight.
 5. Guide the component with the keyholes over the screw heads. Slide it down until the screws are seated in the narrow part of the keyholes. Check that the component is hanging securely and without play.
 6. Optionally, you can then tighten the screws slightly to ensure a particularly stable attachment. Be careful not to deform the housing.

The charger is intended for indoor use only. Before installation, check that:

- The charger has not sustained any transit damage.
- The rating is suitable for the intended input supply and battery (lead-acid (vented, gel, AGM) or lithium-ion) to be charged.
- The connector polarity is correct and matches the polarity of the battery connector.

Input supply

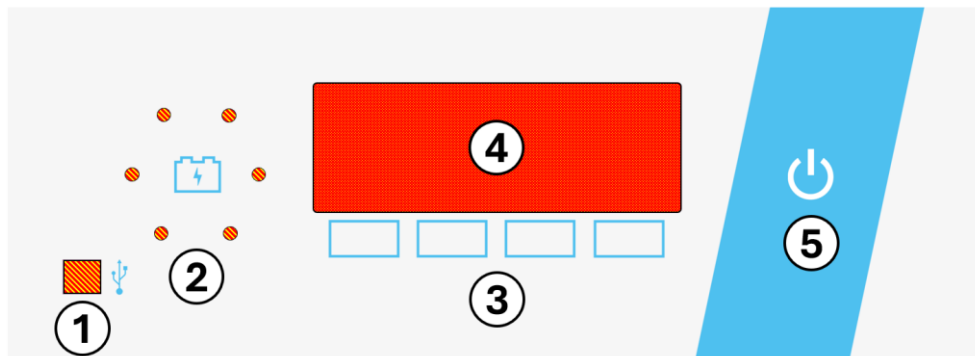
A hand operated lockable isolator should be used in the installation, to enable the charger to be disconnected from the supply, for maintenance or repair work. The charger does not exhibit high in-rush current, therefore type B or C circuit breakers can be used.

The circuit breakers rating should be based on the chargers maximum input current, as stated on the rating plate.

Careful consideration must be taken when connecting this charger to a generator. The generator must be capable of at least four times the input power requirements of the charger, failure to do so can result in damage to the charger. The generator should have load step immunity to prevent undershoot and overshoot with typical loads. Typically, the generator control bandwidth should be less than 7Hz with good gain and phase margins.

5 Display and Control

5.1 Overview



1. Communications Port
2. High Visibility - Charge Status Indicator
3. Softkeys (The function of the button will be displayed on the LCD display)
4. LCD Display
5. Pause Button

5.2 Charge Status Indicator Summary

Mode	Indication
Bulk Charge / battery recovery mode	Cycling red
Second Stage / watering	Cycling yellow
Charge Complete	Constant green
Green with cycling red	Auto-balance pulse / refresh pulse / equalising / cool down
Critical fault	All flashing red
Standby / pause / inhibit	All off
Power save mode	Left hand indicator red
Watering alert	All flashing green
Watering alert & auto-balance pulse	Flashing green with cycling red

LCD Symbols

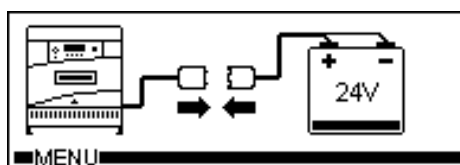
-  Watering system (Shown when enabled, flashing during operation)
-  Communications port (Shown when active)
-  Equalise (Shown when enabled, flashing during operation)
-  Automatic Equalise (Shown when enabled, flashing during operation)
-  Warning (Shown when a warning is active)
-  Battery Recovery Mode (Shown when enabled, flashing during operation)
-  *Air system enabled (Shown when enabled, flashing during operation)

6 Operation

Before connecting the battery, check that the battery voltage corresponds to the voltage indicated inside the battery symbol on the LCD display. The charger should be permanently connected to the mains supply.

6.1 Standby

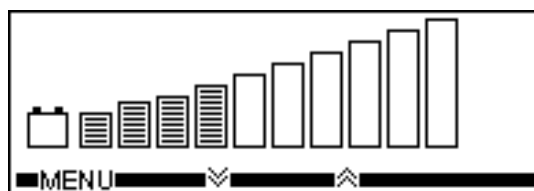
With the input supply connected and no battery, the charger will enter the standby mode. During this mode the charge status indicator will show indication 6 and the LCD display will show the following:



As a power saving feature the LCD backlight will be switched off after 1 minute of inactivity, the backlight can be turned back on by briefly pressing any of the buttons. During this time the charge status indicator will show indication 7.

6.2 Charging

When a battery is connected to the charger, charge will start automatically. The charge status indicator will show indication 1 or indication 2 (The speed of the rotation indicates the state of charge of the battery, with fast cycling indicating a low charge state) and the LCD display will show the following.



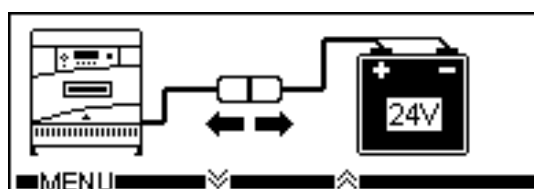
The bar graph display gives the user an indication of the battery's present state of charge.

During charge, the user can scroll through the following charge information, by pressing the or keys.

- VPC Voltage per cell
- Ah Total Ampere hours delivered to the battery
- Amps The present output current
- Stage The present charge stage
- Charge Time The total charge time
- Rest Time Time elapsed since charge completed
- ^*Battery Temp The present battery temperature
- Warnings Displays any warnings - *Only shown when applicable*

6.3 Charge Complete

When charge is complete the charge status indicator will show indication 3 and the LCD display will show the following:

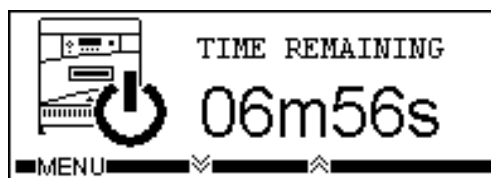


The battery should be left connected to the charger until required; under these conditions the battery will receive periods of refreshing charge to maintain it in the fully charged condition. During these periods, the charge status indicator will show indication 4.

6.4 Removing the battery

The battery can only be disconnected when charging current has stopped flowing. Therefore, the pause button must be pressed before disconnection. A second press of the pause key will clear the pause condition and continue charge (Disabled during the first 10 seconds of pause).

When the charger is paused the charge status indicator will show indication 6 and the LCD display will show the following:



If the pause mode is entered but the battery is not removed within 10 minutes the charge will automatically continue.

6.5 Cool Doen Mode (Profile Dependant)

Cool down mode is activated after the charge has completed and allows the battery time to 'cool down' before its next use. During this time the battery should remain connected to the charger but can be removed if required.

During cool down, the charge status indicator will show indication 4 with the LCD displaying the remaining time.

7 User menu

A user menu can be accessed by pressing the **MENU** key, the following options can then be scrolled through by pressing the ∇ or $\blacktriangle$ keys and then activated by pressing the **SELECT** key:

^Charger History



Cycle Data
Cycle Graphs
Total Initiations
Total Terminations

Total Charge Ah
Total Charge Time

Charger Information



Charger Type
Module Part Number
Module Temperature
Serial Number
Auto Equalisation

Software Version
Network ID
Network Speed
Date Code
Watering System

^*Battery History



Install Date
Inits
Terms
TOT EQU
TOT WTR

<20% DOD
<50% DOD
<80% DOD
>80% DOD

Language



English
Francais
Nederlands
Deutsch

Dansk
Svenska
Espanol

Charger options



Opportunity Charge
Auto Balance
Onboard
Stored Equalise
AGV

Safety Disconnect
^*BattID
^Fast Status
^*Battery Temp

Settings



Set LCD Contrast
Reset Charger
Override / Enable Inhibit
Set Delayed Start

The menu can be exited by pressing **BACK** key.

8 Charger Features

8.1 Equalise System (Profile Dependant)

Periodically, low maintenance batteries require additional charging to equalise all of the cells to the same charge state, this should also be performed after the battery is watered. The charger provides one manual and two automatic equalise modes:

- Manual – The user can manually enable an equalise by pressing the = key during the charge cycle, a second press will clear this function.
- ^*BattID Automatic Equalise – The charger reads the BattID tag on battery connection and determines how many charge cycles have been completed since the last equalise was performed. If this has reached a set value, the charger will automatically enable the equalise function.

Ideal for larger fleets, where multiple batteries are used with multiple chargers. The battery will always receive an equalise at the correct time, regardless of which charger the battery is connected to.

- ^*Charger Automatic Equalise – The charger counts the number of charge cycles since the last equalise charge was performed. If this has reached a set value, the charger will automatically enable the equalise function.

Ideal for small sites where the charger is only used with one battery.

The automatic equalise modes can only be configured and enabled by service personnel, but the mode and cycle information can be viewed in the Charger Information screen in the User Menu.

Once enabled, the charger will perform the equalise function after the standard charge has been completed. The equalise function cannot be cleared once it has started and only one equalise is allowed per cycle.

During equalise, the charge status indicator will show indication 4 with the LCD displaying the remaining time.

8.2 Watering System (Profile Dependant)

Periodically, wet lead acid batteries require watering to replace the water that has evaporated during use. This should be performed when the battery is fully charged.

The charger provides four automatic watering modes:

- **^*BattID Automatic Watering** - The charger reads the BattID tag on battery connection and determines how many charge cycles have been completed since the battery was previously watered. If this has reached a set value, the charger will provide a signal that can be used to drive an automatic watering system. During this period the charge status indicator will show indication 2 and the LCD display will show the time remaining.

Ideal for larger fleets, where multiple batteries are used with multiple chargers and watering is performed by an automated system. This will provide a fully automated watering system that will not require any operator input.

- **^*BattID Watering Alert** – The charger reads the BattID tag on battery connection and determines how many charge cycles have been completed since the battery was previously watered. If this has reached a set value, the charger displays an alert screen (See below) indicating that the battery requires watering; this will be accompanied by the charge status indicator showing indication 8 or indication 9 during an auto-balance pulse.



If this is ignored and more cycles are performed this alert will turn into a warning code (F14) which is logged in the charger history and finally into a fault code that stops charge from being performed until the battery has been watered.

The user must manually reset the alert, once the battery has been watered, by pressing the >> key.

Ideal for larger fleets, where multiple batteries are used with multiple chargers and watering is a manual operation. An alert will always be issued at the correct time, regardless of which charger the battery is connected to.

- **^Charger Automatic Watering** – The charger counts the number of charge cycles since the battery was last watered. If this has reached a set value, the charger will provide a signal that can be used to drive an automatic watering system, during this period the charge status indicator will show indication 2 and the LCD display will show the time remaining.

Ideal for small sites where the charger is only used with one battery, but the battery is watered using an automated system.

- **Charger Watering Alert** - The charger counts the number of charge cycles since the battery was last watered. If this has reached a set value, the charger displays an alert screen indicating that the battery requires watering; this will be accompanied by the charge status indicator showing indication 8 or indication 9 during an auto-balance pulse.

If this is ignored and more cycles are performed this alert will turn into a warning code (F14) which is logged in the charger history and finally into a fault code that stops charge from being performed until the battery has been watered.

The user must manually reset the alert, once the battery has been watered, by pressing the >> key.

Ideal for small sites where the charger is only used with one battery and the battery is manually watered.

The watering modes can only be configured and enabled by service personnel, but the mode and cycle information can be viewed in the Charger Information screen in the User Menu.

8.3 Battery Recover Mode

If a battery is connected to the charger that is below the normal operating voltage an incorrect battery fault (F07) will be displayed. However, if the battery voltage is between 1 and 1.5VPC, battery recover mode is available. This mode employs a special charging technique to recover batteries that have been stood for a long time or have been over discharged.

This mode can be enabled by pressing the BRM key when the fault is displayed. Battery recover mode will then start; once the battery voltage has been recovered to a normal level a standard charge will be performed.

8.4 Delayed Start

Note: This function is only available if the network function is OFF and can only be set without a battery connected.

The set delayed start function will delay the start of charge for a set time period (15mins to 48hrs) after the battery has been connected.

During this period the charge status indicator will show indication 6 and the LCD display will show the following:



Once the time has elapsed, charge will start as normal. This can be overridden by pressing the >> button, for this cycle only.

The time can be set via the Settings screen in the user menu.

9 Faults / Warnings

If a fault occurs during charge the charge status indicator will show indication 5 and the LCD display will show a fault code and description, for example.



Faults permanently stop charge until they are rectified.

If a warning occurs during charge the warning symbol ⚠ will be displayed on the LCD display and the warning code and description can be accessed by scrolling through the charge information.

Warnings do not affect the charge procedure.

Fault Codes

F06	No output current
F07	**Incorrect battery
F09	**Bulk charge timeout
F10	**Gassing charge timeout
F12	Configuration error
F13	Thermistor fault
F16	**Battery over temperature
F17	**Auto balance timeout
F18	Battery disconnected
F19	Battery disconnected during cooldown
F20	Battery thermistor error
F21	Over current
F27	Slave 1 incorrect current
F28	Slave 2 incorrect current
F29	Slave 3 incorrect current
F30	Slave 1 temperature fault
F31	Slave 2 temperature fault
F32	Slave 3 temperature fault

Warning Codes

F01	**Over discharged battery
F02	**Deeply discharged battery
F03	**Sulphated battery
F04	Charger overheating (Becomes a fault if overheating persists)
F05	Mains failed during charge
F14	**Watering overdue (Becomes a fault after 5 cycles)
F23	Batt ID PCB error
F24	Batt ID antenna error
F25	Batt ID tag read error
F26	Batt ID not programmed

10 Repair

Only suitably qualified personnel should perform repair work on this equipment.

Use of genuine factory sourced replacement parts is necessary to ensure CE marking is not invalidated.

Contact your local maintenance facility for assistance or spares, quoting the charger type and serial number which can be found on the identification label.

11 Maintenance

Before carrying out maintenance, isolate the mains supply and disconnect the battery.

Only suitably qualified personnel should perform maintenance work on this equipment.

The charger will require little maintenance, but the following schedule is recommended once a month:

- (a) Check the condition of all cables, paying particular attention to the points where cables may be severely flexed, i.e. at the entry to charger cabinet, charging plugs and sockets.
- (b) Check condition of charging plugs and sockets for wear and any evidence of overheating, which could ultimately lead to charger malfunction.
- (c) Check that ventilation is not obstructed.
- (d) Ensure that all safety covers and panels are correctly in place.

GNB I.P. recommends that a yearly periodic inspection / test is performed on this equipment, contact your local agent for details.

12 Guarantee

See local conditions of sale.

13 Specification

Input Voltage	1PH - 230VAC $\pm$ 10% 3PH - 400VAC $\pm$ 10%
Input Frequency	45 – 66Hz
Input Current	Model dependant - Specified on charger rating plate
Input Cable	2 meters of flexible PVC cable to BS6500 (Input plug fitted on request)
Input Protection	Replaceable fuse(s) fitted inside the cubicle
Charge Characteristic***	Microprocessor controlled – HP = S, D, L, F, H, G, C, R & Z LP = S, D, F & C
Output Voltage***	Model dependant – 24, 36, 48, 72 & 80V Only
Output Cable	2.9 meters of heat, oil resistant & flame-retardant cable to BS6195
Output Current***	Model dependant - 20 to 600A
Output Protection	Replaceable fuse inside the cubicle
IP Rating	IP21
Cooling	Thermostatically controlled fan
Ventilation	Chargers must be positioned with at least 200mm of clearance overhead, with the fan and front vents unobstructed
Ambient temperature	0 – 35°C
User Interface	High visibility tri-colour charge status indicator, 192 x 64 Graphic LCD & 5 push buttons

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August 2026

