



Kinetek Controls

A Kinetek Company®

Mark I Series

Standalone Battery Charger

User's Manual

Contents

- 1.0 Precautions**
- 2.0 Charger Description and Features**
- 3.0 Connectors and Indicators**
- 4.0 Charger Operating Instructions**
- 5.0 Storage Instructions**
- 6.0 Maintenance and Cleaning**
- 7.0 Specifications**

1.0 Precautions / Précautions

- 1.1 Save these instructions. This manual contains important safety and operating instructions.

Conserver ces instructions. Ce manuel contient des instructions importantes concernant la sécurité et le fonctionnement.

- 1.2 Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason it is of the utmost importance that each time before using your charger, you read and follow the instructions provided exactly.

Il est dangereux de travailler à proximité d'une batterie au plomb. Les batteries produisent des gaz explosifs en service normal. Il est aussi important de toujours relire les instructions avant d'utiliser le chargeur et de les suivre à la lettre.

- 1.3 To reduce risk of battery explosion, follow these instructions and those marked on battery.

Pour réduire le risque d'explosion, lire ces instructions et celles qui figurent sur la batterie.

- 1.4 Never smoke or allow an open spark or flame in the vicinity of the battery or engine.

Ne jamais fumer près de la batterie ou du moteur et éviter toute étincelle ou flamme nue à proximité de ces derniers.

- 1.5 Use charger for charging a lead-acid battery only. It is not intended to supply power to an extra-low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property.

Utiliser le chargeur pour charger une batterie au plomb uniquement. Ce chargeur n'est pas conçu pour alimenter un réseau électrique très basse tension ni pour charger des piles sèches. Le fait d'utiliser le chargeur pour charger des piles sèches pourrait entraîner l'éclatement des piles et causer des blessures ou des dommages.

- 1.6 Never charge a frozen battery.

Ne jamais charger une batterie gelée.

- 1.7 If it is necessary to remove battery from vehicle to charge it, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.

S'il est nécessaire de retirer la batterie du véhicule pour la charger, toujours débrancher la borne de mise à la masse en premier. S'assurer que le courant aux accessoires du véhicule est coupé afin d'éviter la formation d'un arc.

- 1.8 Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

Prendre connaissance des mesures de précaution spécifiées par le fabricant de la batterie, et les taux de chargement recommandés.

- 1.9 Never place the charger directly above or below the battery being charged; gases or fluids from the battery will corrode and damage the charger. Locate the charger as far away from the battery as DC cables permit.

Ne jamais placer le chargeur directement au-dessus de ou au dessous de la pile est chargée; les gaz ou les liquides de la pile corroderont et endommageront le chargeur. Localiser le chargeur comme au loin de la pile comme DC câble le permis.

- 1.10 Prior to charging batteries, ensure that each battery has the proper amount of electrolyte. Please refer to battery manufacturer's recommendations regarding proper battery maintenance.

Avant charger de piles, s'assurer que chaque pile a la quantité correcte d'électrolyte. S'il vous plaît se référer aux recommandations de manufacturer de pile en ce qui concerne l'entretien de pile correct.

- 1.11 Charger must be properly grounded and connected to power to reduce to risk of electrical shock.

Le chargeur doit être convenablement fondé et doit être connecté pour alimenter pour réduire le risque de décharge électrique.

- 1.12 **DANGER** - Never alter AC power cord or plug provided.

LE DANGER - Ne change jamais la corde d'alimentation ou le bouchon a fourni.

- 1.13 Always charge batteries in a well ventilated area.

Toujours les piles de charge dans un puits ont ventilé le secteur.

- 1.14 Charger is rated for sheltered use only. Charger is drip resistant, but not water proof.
Le chargeur est évalué pour l'usage abrité seulement. Le chargeur est la goutte résistant, mais pas preuve d'eau.
- 1.15 Charger is programmed to charge lead acid batteries at rated voltage only.
Le chargeur est programmé pour charger de premières piles acides à la tension évaluée seulement.
- 1.16 Charger is programmed to charge batteries, which have a 20 Hr AH capacity within the range listed on the front panel.
Le chargeur est programmé pour charger des piles, qui ont un 20 Hr AH la capacité dans la gamme énumérée sur le panneau de devant.
- 1.17 Prior to charging batteries, ensure that each battery has the proper amount of electrolyte. Please refer to battery manufacturer's recommendations regarding proper battery maintenance.
Avant charger de piles, s'assurer que chaque pile a la quantité correcte d'électrolyte. S'il vous plaît se référer aux recommandations de manufacturier de pile en ce qui concerne l'entretien de pile correct.
- 1.18 Charger must be properly grounded and connected to power to reduce to risk of electrical shock.
Le chargeur doit être convenablement fondé et doit être connecté pour alimenter pour réduire le risque de décharge électrique.
- 1.19 **DANGER** - Never alter AC power cord or plug provided.
LE DANGER - Ne change jamais la corde d'alimentation ou le bouchon a fourni.
- 1.20 Always charge batteries in a well ventilated area.
Toujours les piles de charge dans un puits ont ventilé le secteur.
- 1.21 Charger is rated for sheltered use only. Charger is drip resistant, but not water proof.
Le chargeur est évalué pour l'usage abrité seulement. Le chargeur est la goutte résistant, mais pas preuve d'eau.

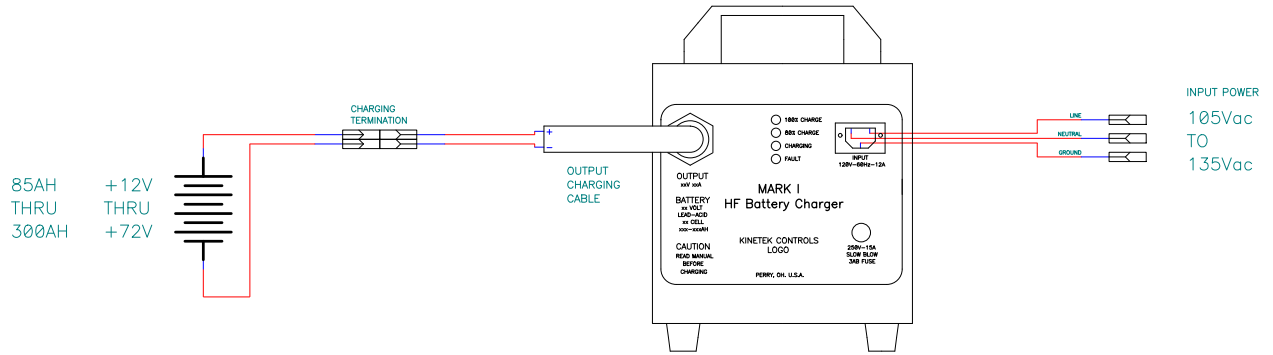
1.22 Charger is programmed to charge lead acid batteries at rated voltage only.

Le chargeur est programmé pour charger de premières piles acides à la tension évaluée seulement.

1.23 Charger is programmed to charge batteries, which have a 20 Hr AH capacity within the range listed on the front panel.

Le chargeur est programmé pour charger des piles, qui ont un 20 Hr AH la capacité dans la gamme énumérée sur le panneau de devant.

Mark I Battery Charger Block Diagram



Charger Specifications

2.1 Description -

The Mark I Standalone Battery Charger is a microcontroller operated charger. The charger is fully automatic and has a 3 stage charging sequence –

- | | |
|----------------|---|
| Stage 1 | Main Charge Mode.
The charger outputs maximum current to the battery until reaching a preset voltage level. |
| Stage 2 | Finish Charge Mode.
The charger outputs a regulated voltage level to the battery until reaching a preset current level. |
| Stage 3 | Equalization Charge Mode.
The charger outputs a regulated finish current level until reaching the preset equalizing voltage level. Upon reaching equalization voltage, the charger will enter into <i>Adaptive Equalization Mode</i> and regulate the output at the equalization voltage level for a period of time directly proportional to the depth of discharge. Charge cycle terminates when the Adaptive Equalization Mode timer expires. <i>Note: AGM & Gel battery configurations do not use Stage 3.</i> |

NOTE –

Each charging stage has a timer subroutine which will monitor the charger output versus elapsed time.

2.2 Features -

- Automatic Three Stage Charging Sequence
- Automatic Current and Voltage Limits
- Automatic Battery Disconnect and Short Circuit Detection
- Temperature Compensation
- Low Ripple Voltage (.1V RMS at Full Load)
- Durable for Continual Use at Maximum Output
- Programmed Charge Soft Start
- Automatic Restart if Battery is “Swapped”
- Terminates Charge if Charging Rate of Change Falls below Preset Value
- Reverse Polarity Protection
- Uses Standard or Customer Supplied Charging Terminations
- Four, Single Color LED Display

2.0 Indicators

3.1 Power on Aspects

INDICATOR ASPECT	DESCRIPTION
RED / ORANGE / YELLOW / GREEN	SINGLE PROFILE SELFTEST
ORANGE / YELLOW	CHARGING – FINISH CHARGE MODE
ORANGE / GREEN	CHARGING – EQUALIZING CHARGE MODE
ORANGE / GREEN BLINKING	CHARGING – ADAPTIVE EQUALIZATION MODE
GREEN	CHARGE CYCLE COMPLETED
RED / GREEN ALTERNATING	<p>TIMEOUT FAULT</p> <p>CHARGE CYCLE TERMINATED AS A RESULT OF A CHARGING MODE TIMEOUT CONDITION, INDICATING THAT BATTERY IS NOT ACCEPTING CHARGE OR BATTERY IS TOO LARGE TO FULLY CHARGE IN ONE CHARGE CYCLE. CHARGER FUNCTIONS DISABLED.</p>
RED	<p>GENERAL FAULT</p> <p>CONTROLLER DEFECT – A DEFECT IN THE CHARGER CONTROLLER SYSTEM HAS BEEN DETECTED. CHARGER FUNCTIONS DISABLED.</p> <p>LOW OUTPUT CURRENT FAULT – CHARGING CURRENT HAS FALLEN BELOW AN OUTPUT CURRENT TRIGGER VALUE. THIS FAULT IS SELF CLEARING UPON DISCONNECT AND RECONNECT TO THE BATTERY.</p> <p>TEMPERATURE FAULT – INTERNAL TEMPERATURE DETECTED OUT OF RANGE. THIS FAULT IS SELF CLEARING.</p> <p>REVERSE POLARITY DETECTED – THE BATTERY HAS BEEN DETECTED TO BE CONNECTED IN REVERSE. CHARGER FUNCTIONS DISABLED.</p>
RED BLINKING	<p>LOW BATTERY VOLTAGE DETECTED</p> <p>BATTERY VOLTAGE IS TOO LOW TO START CHARGE CYCLE. THIS FAULT IS SELF CLEARING UPON DISCONNECT AND RECONNECT TO THE BATTERY.</p>
RED / YELLOW	<p>GEL CELL OVERLOAD FAULT</p> <p>VOLTAGE BUILDUP DETECTED DURING GEL CELL FINISH CHARGE MODE. CHARGER FUNCTIONS DISABLED.</p>
RED / ORANGE BLINKING	<p>OVERCURRENT FAULT CONDITION</p> <p>OUTPUT CURRENT EXCEEDED MAXIMUM TRIGGER VALUE. CHARGER FUNCTIONS DISABLED.</p>

3.2 Runtime Aspects -

INDICATOR ASPECT	DESCRIPTION
ORANGE	CHARGING – MAIN CHARGE MODE
ORANGE / YELLOW	CHARGING – FINISH CHARGE MODE
ORANGE / GREEN	CHARGING – EQUALIZING CHARGE MODE
ORANGE / GREEN BLINKING	CHARGING – ADAPTIVE EQUALIZATION MODE
GREEN	CHARGE CYCLE COMPLETED
RED / GREEN ALTERNATING	<p style="text-align: center;">TIMEOUT FAULT</p> <p>CHARGE CYCLE TERMINATED AS A RESULT OF A CHARGING MODE TIMEOUT CONDITION, INDICATING THAT BATTERY IS NOT ACCEPTING CHARGE OR BATTERY IS TOO LARGE TO FULLY CHARGE IN ONE CHARGE CYCLE. CHARGER FUNCTIONS DISABLED.</p>
RED	<p style="text-align: center;">GENERAL FAULT</p> <p>CONTROLLER DEFECT – A DEFECT IN THE CHARGER CONTROLLER SYSTEM HAS BEEN DETECTED. CHARGER FUNCTIONS DISABLED.</p> <p>LOW OUTPUT CURRENT FAULT – CHARGING CURRENT HAS FALLEN BELOW AN OUTPUT CURRENT TRIGGER VALUE. THIS FAULT IS SELF CLEARING UPON DISCONNECT AND RECONNECT TO THE BATTERY.</p> <p>TEMPERATURE FAULT – INTERNAL TEMPERATURE DETECTED OUT OF RANGE. THIS FAULT IS SELF CLEARING.</p> <p>REVERSE POLARITY DETECTED – THE BATTERY HAS BEEN DETECTED TO BE CONNECTED IN REVERSE. CHARGER FUNCTIONS DISABLED.</p>
RED BLINKING	<p style="text-align: center;">LOW BATTERY VOLTAGE DETECTED</p> <p>BATTERY VOLTAGE IS TOO LOW TO START CHARGE CYCLE. THIS FAULT IS SELF CLEARING UPON DISCONNECT AND RECONNECT TO THE BATTERY.</p>
RED / YELLOW	<p style="text-align: center;">GEL CELL OVERLOAD FAULT</p> <p>VOLTAGE BUILDUP DETECTED DURING GEL CELL FINISH CHARGE MODE. CHARGER FUNCTIONS DISABLED.</p>
RED / ORANGE BLINKING	<p style="text-align: center;">OVERCURRENT FAULT CONDITION</p> <p>OUTPUT CURRENT EXCEEDED MAXIMUM TRIGGER VALUE. CHARGER FUNCTIONS DISABLED.</p>

3.0 Charger Operating Instructions

- 4.1 Battery to be charged and charger should be in a well ventilated indoor or sheltered environment, prior to initiating battery charge cycle.
- 4.2 Connect charger output cable to battery to be charged.
- 4.3 Connect charger to 120Vac source.
- 4.4 Charger will show a momentary self test indication and then go into main charge mode.
- 4.5 Automatic Operation –
 - At 80% battery charge, the charger indicator aspect will be ORANGE / YELLOW.
 - During battery charge equalization (Battery charge level > 95%), the charger indicator aspect will be ORANGE / GREEN.
 - Adaptive Equalization Mode (Battery charge level near 100%) indicator aspect will be ORANGE / GREEN BLINKING.
 - At 100% battery charge, the charger indicator aspect will be GREEN.
- 4.6 Disconnect battery when charge cycle is completed.

NOTE -

The length of time needed for charging will depend on the size and depth of discharge of the battery. For best results, charger needs to be allowed to complete a full charge cycle, which may take up to 18 hours to complete.

IMPORTANT SAFETY NOTE -

When disconnecting the battery from the charger, disconnect charger from AC supply voltage first. The precaution will eliminate any risk of gas explosion due to arcing.

En débranchant la pile du chargeur, débrancher le chargeur de la tension de provision de courant alternatif premièrement. La précaution éliminera n'importe quel risque d'explosion de gaz en raison de l'arcage.

4.0 Charger Storage Instructions

- 5.1 When not in use, store charger indoors in a cool dry place. It would be preferable to store the charger in its original packing and carton.
- 5.2 Place this manual with the charger during storage.

6.0 Maintenance and Cleaning

- 6.1 Coil cord when not in use.
- 6.2 Clean case and cords with a slightly damp cloth. DO NOT use cleaners on charger.
- 6.3 Examine cords periodically for damage.

7.0 Specifications

MARK I, Standalone Charger Model Specifications	
KCCA0010	36V DC, 21A Maximum
KCCA0011	24V DC, 26A Maximum
KCCA0012	48V DC, 16.5A Maximum
KCCA0013	72V DC, 11A Maximum
KCCA0014	12V DC, 26A Maximum
MARK I, Standalone Charger General Specifications	
<i>Input</i>	
Voltage Range	105 to 135V AC 60Hz
Current	12A Maximum
<i>Output</i>	
Efficiency	90%
Ripple Voltage	.1V at Full Load
Voltage Accuracy	0.5%
Voltage Stability	± .2V
Current Accuracy	5%
<i>Environmental Conditions</i>	
Ambient Temperature	-20°C to 50°C
Storage Temperature	-40°C to 60°C
Relative Humidity	15% to 95%
Enclosure Type	Drip Tight
<i>Safety Features</i>	
Soft Start to Charging Cycle	Short Circuit Detection
Reverse Polarity Detection and Shutdown	Over Temperature Compensation
<i>Physical Specifications</i>	
Dimensions	7.4" W x 9.4" H x 8" D
Weight	12 lbs.
Housing	Steel
Ventilation	Rear Exposed Heatsink, Bottom Vents, Side Louvers
Output Cable	Standard IEC 320 – Front Panel
Power Cord Input	Reinforced, 2 Conductor #10 – Front Panel
LED Location	Front Panel
Line Fuse	3AG, Slow Blow, 15A Fuse – Front Panel