

GECI™ ORANGE DIAMOND CHARGER PORTABLE PLUG-IN CHARGER SYSTEM USER'S MANUAL

SAFETY INSTRUCTIONS AND WARNING:

Before to start using your battery charger, please take the time to read these instructions carefully. The owner's manual is an important part of the charger. It's recommended to keep it in good condition for the lifetime of the charger. It should be kept in a dry and clean place, always available to the users. To indicate important instructions, the following blocks are used throughout this manual.

>>>CAUTION!<<<

This operation can be dangerous for the user.

>>>ATTENTION!<<<

This operation is important for the functionality and reliability of the charger.

GENERAL:

Battery charging products can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices must be learned through study and training before using this equipment.

Only qualified personnel should install, use, or service this equipment.



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SHOCK PREVENTION:

Bare conductors, or terminals in the output circuit, or ungrounded, electrically-live equipments can fatally shock a person. To protect against shock, have competent electrician verify that the equipment is adequately grounded and learn what terminals and parts are electrically HOT.

The body's electrical resistance is decreased when wet, permitting dangerous current to flow through the body. Do not work in damp area without being extremely careful. Stand on dry rubber mat or dry wood and use insulating gloves when dampness or sweat cannot be avoided. Keep clothing dry.

INSTALLATION AND GROUNDING - A power disconnect switch must be located at the equipment. Check the data label for voltage and phase requirements. If only 3-phase power is available, connect single-phase equipment to **ONLY TWO WIRES** of the 3-phase line.

DO NOT CONNECT the equipment grounding conductor to the third live wire of the 3-phase line as this makes the equipment frame electrically HOT, which can cause a fatal shock. If a grounding conductor is part of the power supply cable, be sure to connect it to a properly grounded switch box or building ground. If not part of the supply cable, use a separate grounding conductor. Don't remove a ground prong from any plug. Use correct mating receptacles. Check ground for electrical continuity before using equipment. The grounding conductor must be of a size equal to or larger than the size of the line conductors.

CHARGING LEADS - Inspect leads often for damage to the insulation. Replace or repair cracked or worn leads immediately. Use leads having sufficient capacity to carry the operating current without overheating.

BATTERY TERMINALS - Do not touch battery terminals while equipment is operating.

SERVICE AND MAINTENANCE - Shut OFF all power at the disconnect switch or line breaker **BEFORE** inspecting, adjusting, or servicing the equipment. Lock switch OPEN (or remove line fuses) so that the power cannot be turned ON accidentally.

Disconnect power to equipment if it is to be left unattended or out of service. Disconnect battery from charger. Keep inside parts clean and dry. Dirt and/or moisture can cause insulation failure. This failure can result in high voltage at the charger output.

BURN AND BODILY INJURY PREVENTION:

The battery produces very high currents when short circuited, and will burn the skin severely if in contact with any metal conductor that is carrying this current. Do not permit rings on fingers to come in contact with battery terminals or the cell connectors on top of the battery. Battery acid is very corrosive. Always wear correct eye and body protection when near batteries.

FIRE AND EXPLOSION PREVENTION:

When batteries are being recharged, they generate hydrogen gas that is explosive in certain concentrations in air (the flammability or explosive limits are 4.1% to 72% hydrogen in air). The spark-retarding vents help slow the rate of release of hydrogen, but the escaping hydrogen may form an explosive atmosphere around the battery if ventilation is poor. The ventilation system should be designed to provide an adequate amount of fresh air for the number of batteries being charged. This is essential to prevent an explosion. Always keep sparks, flames, burning cigarettes, and other sources of ignition away from the battery recharging area. Do not break "live" circuits at the terminals of batteries. Do not lay tools or anything that is metallic on top of any battery.

ARCING AND BURNING OF CONNECTOR:

To prevent arcing and burning of the connector contacts, be sure the charger is OFF before connecting or disconnecting the battery. The ammeter should NOT indicate current flow.

MEDICAL AND FIRST AID TREATMENT:

First aid facilities and a qualified first aid person should be available for each shift for immediate treatment of electrical shock victims.

EMERGENCY FIRST AID: Call physician and ambulance immediately and use First Aid techniques recommended by the American Red Cross.

>>>DANGER: ELECTRICAL SHOCK CAN BE FATAL.<<<

DANGER: ELECTRICAL SHOCK CAN BE FATAL.

If person is unconscious and electric shock is suspected, do not touch person if he or she is in contact with charging equipment, battery, charging leads, or other live electrical parts.

Disconnect power at wall switch and then use First Aid.

Dry wood, wooden broom, and other insulating material can be used to move cables, if necessary, away from person.

IF BREATHING IS DIFFICULT, give oxygen.

IF NOT BREATHING, BEGIN ARTIFICIAL BREATHING, such as mouth-to-mouth.

IF PULSE IS ABSENT, BEGIN ARTIFICIAL CIRCULATION, such as external heart massage.

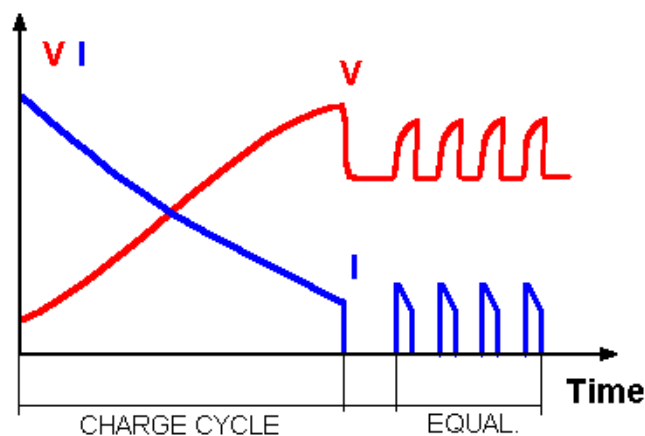
In case of acid in the eyes, flush very well with clean water and obtain professional medical attention immediately.

GECI™ ORANGE DIAMOND CHARGER DESCRIPTION

IBCI OD1200-OD2400 battery chargers have been designed to charge Lead-Acid batteries.

These units convert the AC input to a DC output at the correct voltage. The charge curve is Wa, with programmable finishing charge time and automatic equalization.

The operation of the chargers is managed by the new MRG Charge Controller, which is a microprocessor based electronic board of the last generation.



The Charge Controller monitors the entire charging curve, and it incorporates several safety features.

The front panel of the MRG charge controller is composed by 4 status LEDs

(CHARGING - 80% CHARGED - COMPLETE - FAULT! / ALARM !) and 3 ammeter LEDs.

GECI™ ORANGE DIAMOND CHARGER INSTALLATION

CONDITIONS OF USE:

- Temperature (operation): from 5°C to 45°C
- Temperature (storage): from -20°C to 60°C.
- Relative Humidity: less than 75 %.

>>>CAUTION!<<<

Risk of electrical shock!

The charger can be installed by qualified personnel only.

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Don't use the unit in presence of flammable gas, because it can generate sparks.

>>>ATTENTION!<<<

Make sure that the unit's maximum input power (reported on the data label) is available from your power supply, and verify that the unit's operating voltage is correct.

Allow adequate air circulation to prevent internal heat buildup.

Don't place the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

AC INPUT CONNECTION AND VOLTAGE SETTINGS:

>>>ATTENTION!<<<

The proper setting of the power transformer taps is fundamental for the correct operation of the chargers. If the real AC input voltage is different than the AC nominal voltage to which the charger is set, the charging current of the charger may be significantly different than the nominal.

The charger must be connected to the AC input using an adequate cable and plug, with disconnect switch and fuses.

Find the POWER TRANSFORMER TAPS and the label with the list of the NOMINAL voltages available, that are located on the left side of the internal panel.

1x110

① 135 VAC

② 120 VAC

③ 110 VAC

1x240

240 VAC

220 VAC

208 VAC

Using an adequate AC-voltmeter, measure the value of the REAL AC input voltage available at the mounting location of the charger.

Identify which of the 5 NOMINAL voltage values is closest to the REAL measured value.

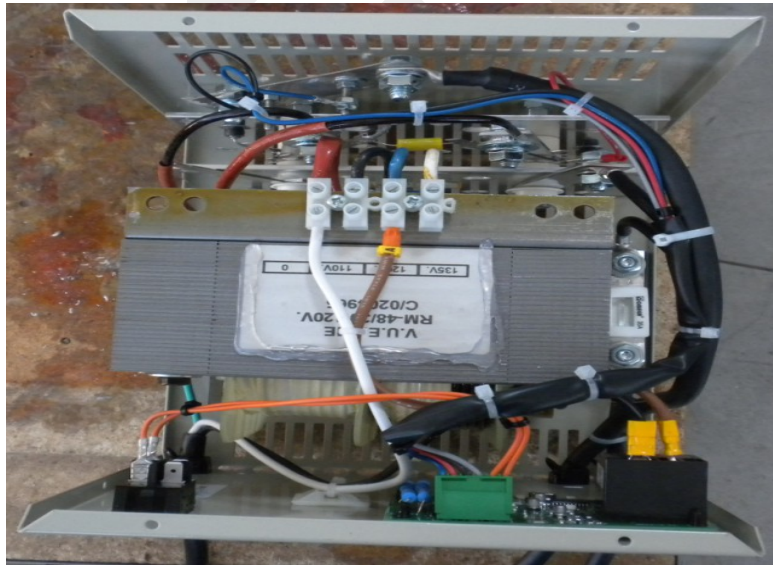
Example 1: for a charger 1x110 , if the measured voltage is 118 VAC, the transformer should be connected to the tap number 2, that corresponds to 120 VAC.

Example 2: for a charger 1x240, if the measured voltage is 210 VAC, the transformer should be connected to the tap number 3, that corresponds to 208 VAC.

In the smaller units (with a single primary winding), it's sufficient to move the transformer wire marked with the letter "A" to the correspondent terminal block.

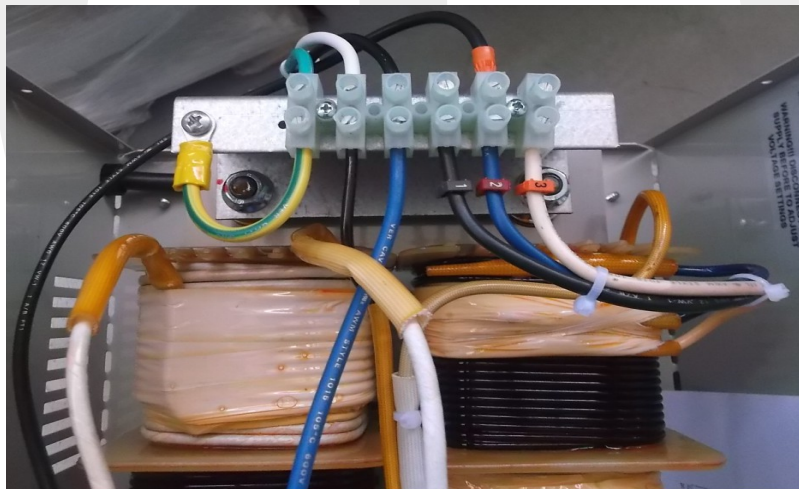
In the bigger units (with two primary windings), the wires to be moved may be one or two, both marked with the letter "A".

Tighten the terminal block screw with the right torque, and pull the wire in order to make sure that it's properly mounted.



1x110

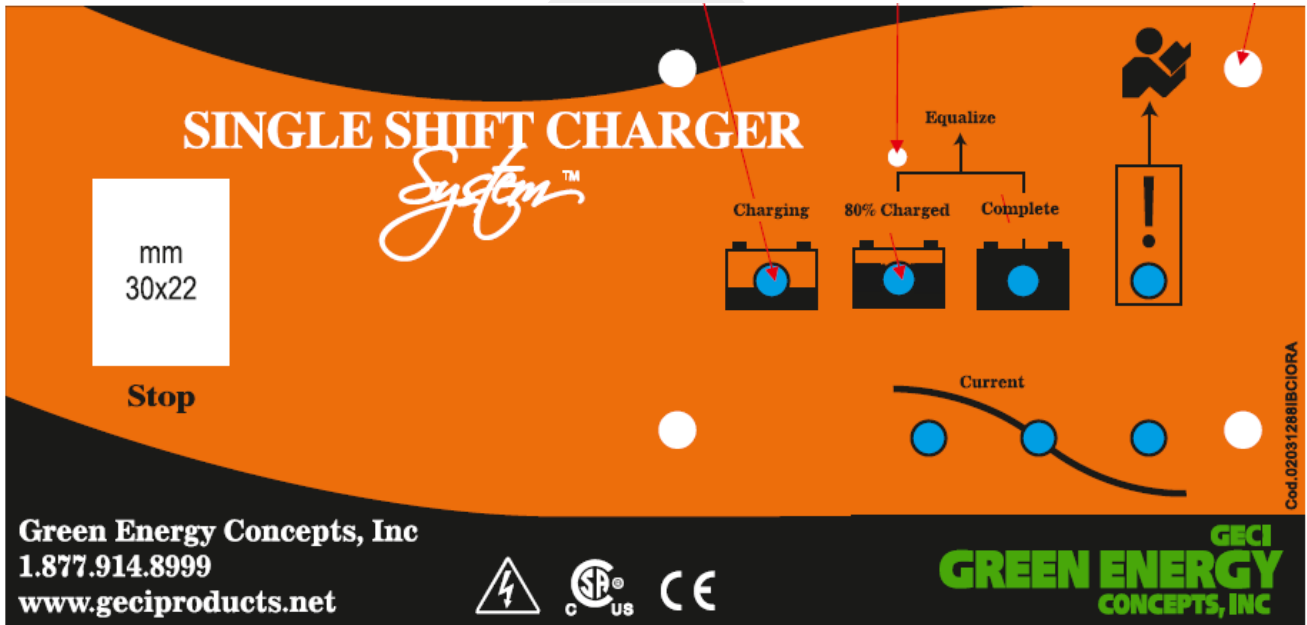
Move the wire to the terminal block correspondent to the measured AC INPUT voltage.



1x240

Move the wire to the terminal block correspondent to the measured AC INPUT voltage.

GECI™ ORANGE DIAMOND CHARGER PROGRAMMING

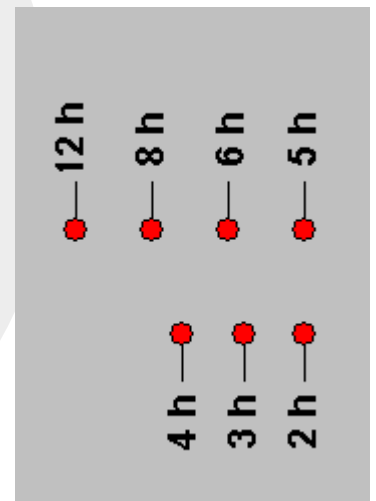


PROGRAMMATION OF THE FINISHING CHARGE TIME:

The programmable finishing charge times are 2 to 12 hours in the MRG Charge Controller. The default value (factory programmed) is 3 hours.

Behind the small hole located near the LED "80% CHARGED", there is a button that is used to program the finishing charge time. This button can be reached using a small object, like a needle, a small screwdriver or a toothpick.

- Disconnect the charger from the AC input.
- Connect a battery. The four status LEDs will blink alternately.
- Push the button for the programming of the finishing charge time to enter the programming mode. Only one LED will blink. This LED corresponds to the finishing charge time that was previously programmed, with reference to the picture on the right.
- Push the button again to move the blinking LED to the desired position.
- Wait for 5 seconds. The charger will return to normal mode, and the four status LEDs will blink alternately.
- Disconnect the battery.

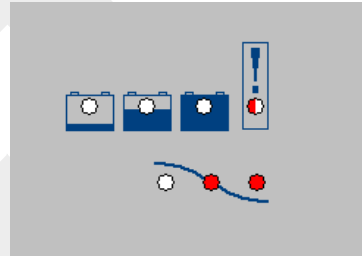


BATTERY CONNECTION – AUTOMATIC VOLTAGE CHECK AND AUTOSTART:

>>>ATTENTION!<<<

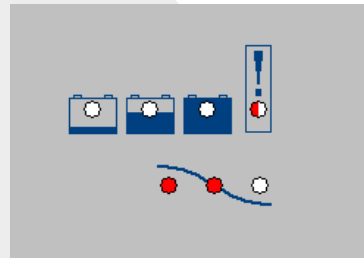
Chargers are programmed to do a complete cycle of charge automatically, however it's recommended to survey the operation of the charger when the battery remains connected to the charger for more than 12 hours.

Connect the battery to the charger, using an adequate plug. When the battery is correctly connected, all the LEDs of the control panel will light on in sequence for a quick check. If the voltage of the battery is below 1,60 V/cell, the charger will not start, and the MRG front panel will show the error message "Wrong Battery - Voltage Low".



- ON
- ◐ BLINKING
- OFF

If the voltage of the battery is higher than 2,50 V/cell, the charger will not start, and the MRG front panel will show the error message "Wrong Battery - Voltage High".



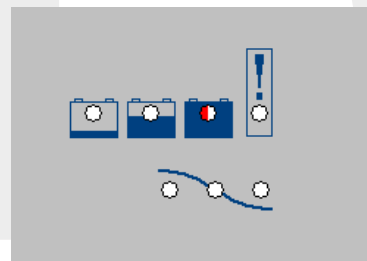
- ON
- ◐ BLINKING
- OFF

If the voltage of the battery is in the correct range [1,60 to 2,50 V/cell], the charge will start automatically.

CHARGE OPERATION:

While the charge is in progress, the 3 LED ammeter will indicate the output current level, while the status LED "Charging" blink continuously.

When the battery will reach the gassing voltage (2,40 V/cell) the status LED "80% Charged" will start blinking, together with the LED "Charging". The charge will continue for the programmed finishing time (2 to 12 hours), following the Wa charge curve.

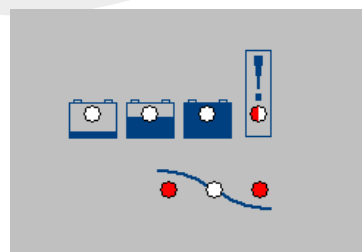


- ON
- ◐ BLINKING
- OFF

When the charge is complete, the charger switches off automatically, and the MRG front panel will give the message "COMPLETE":

OVERVOLTAGE PROTECTION:

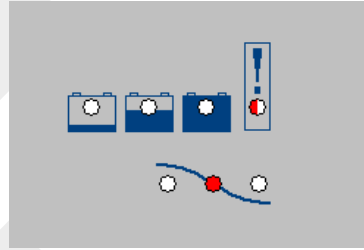
If, during the charge, the voltage of the battery will increase above 2,80 V/cell, the charger will shut down automatically, and the MRG front panel will show the message "Voltage High":



- ON
- ◐ BLINKING
- OFF

SAFETY TIMER – EMERGENCY STOP:

The MRG controller includes a safety timer that shuts the charger down if the battery doesn't reach the gassing voltage within a defined time limit. This time limit is not fixed, but it depends on the finishing time selected by the user. If this condition occurs, the MRG front panel shows the message "Time Error":

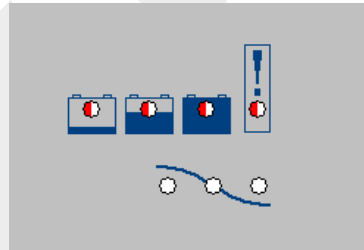


- ON
- BLINKING
- OFF

The cause of this problem may be a wrong setting of the input voltage: if the input is set to a certain value (for example: 610 V) but the real voltage is lower (for example: 575 V), the charging current will be significantly lower than the nominal value, therefore the battery will take too long to reach the gassing voltage.

AUTOMATIC DATA SAVING:

If, during the charge or equalization, one or more black-outs of the AC input occur, the microprocessor automatically saves all the relevant informations about the state of the charge. While the input power is absent and the battery is connected to the charger, the MRG Charge Controller will show the message "Black Out" (4 status LEDs blinking alternately).

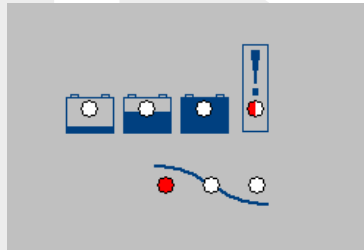


- ON
- BLINKING
- OFF

When the power supply will be available again, the charger will re-start automatically from the exact point of interruption, and the charge will be completed normally.

OVERCURRENT/SHORT CIRCUIT PROTECTION:

If the output current exceeds 140% of the rated value, the MRG Charge Controller will shut the charger down immediately, and it will show the message "OVERCURRENT" on the front panel.



- ON
- BLINKING
- OFF

SHUTDOWN ON BATTERY DISCONNECTION

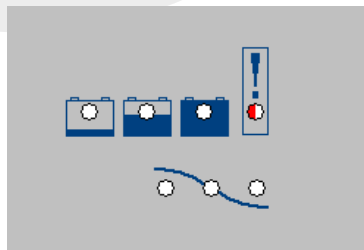
If the battery is disconnected while the charge is in progress, the charger will switch off automatically.

>>>CAUTION!<<<

NEVER disconnect the battery while it's being charged. Disconnecting the battery while it's being charged is hazardous for the user and voids the charger warranty.

MANUAL CHARGE TERMINATION:

While the charge is in progress, it's possible to turn off the charger by pressing the red button "STOP". The MRG front panel will show the message "MANUAL STOP".



- ON
- BLINKING
- OFF

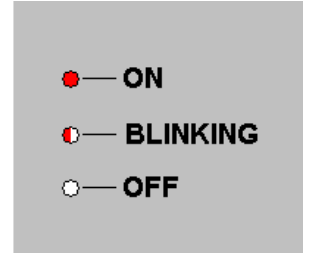
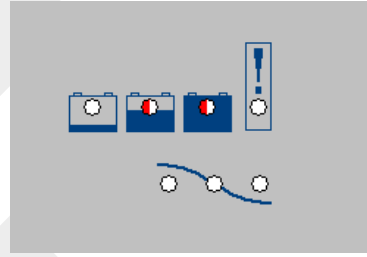
In this condition, it's safe to disconnect the battery.

EQUALIZATION:

The chargers Equalize the battery on a weekly basis. The operation is totally automatic.

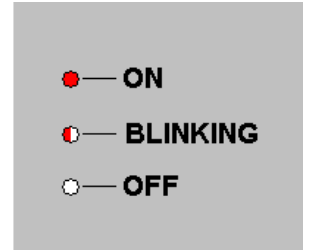
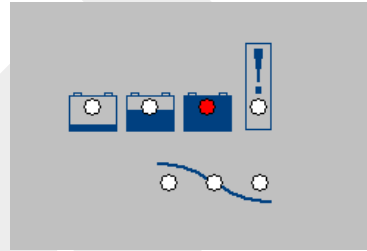
After the normal completion of the charge, the chargers wait for 15 hours, then it gives 4 equalization cycles of 30 minutes, with 15 hours of interval between each cycle.

While the equalization charge is in progress, the MRG Front Panel shows the message "EQUALIZING":



With this timing system, the equalization is performed only in the weekend, when the battery remains connected to the charger for more than 15 hours after the completion of the charge.

At the end of the equalization, the charger will remain in stand-by mode, while the front panel gives the message "COMPLETE":





WARRANTY

GECI™ ORANGE DIAMOND CHARGER - OD1200-OD2400

Green Energy Concepts, Inc. (hereinafter called "GECI") warrants that each new and unused GECI battery charger, power supply or converter (hereinafter called "equipment") manufactured and supplied by it is of good workmanship and is free from any inherent mechanical defects, provided that (1) the product is installed and operated in accordance with generally accepted industrial standards and in accordance with the printed instructions of GECI, (2) the product is used under normal conditions for which designed, (3) the product is not subjected to misuse, negligence or accident, and (4) the product receives proper care, protection and maintenance under supervision of competent personnel. This warranty is subject to the following provisions:

1. PRODUCTS AND PARTS WARRANTED. Subject to the exceptions listed below each GECI equipment is warranted for a period of three (3) years from the date of its shipment, provided the charger is used in accordance with GECI's published performance rating or the unit involved. The Warranty covers parts, components and/or assemblies supplied completely free of charge but does not extend to labor, service, interventions and or any other costs whatsoever related to fixing defective chargers and/or parts. The conditions of this parts warranty are as follows:

- a. Primary switch contacts, fuses, bulbs and filters are not warranted unless found to be defective prior to use.
- b. Power transformers of 60Hz chargers are warranted for ten (10) years after GECI's shipment of the unit(s).
- c. The charger brand names that are warranted under this document are the Green, Red, Black and Orange Diamond.
- d. The Blue Diamond is handled separately and is not part of this warranty agreement.

2. COMMENCEMENT OF WARRANTY TIME PERIODS. The warranty periods shall commence on the date of shipment by GECI.

3. PERSONS COVERED BY WARRANTY. This warranty is extended by GECI only to the purchaser of new equipment from GECI or one of its authorized distributors. The products purchased under this agreement shall be used exclusively by the buyer and its employees and by no other persons, and therefore there shall be no third party beneficiary of this warranty.

4. LIMITATION OF REMEDY. The existence of claimed defects in any product covered by this warranty is subject to GECI's factory inspection and judgment. GECI liability is limited to repair of any defects found by GECI to exist or, at GECI's option, the replacement of the defective equipment, F.O.B. factory after the defective product has been returned by the purchaser at its expense to GECI's shipping place. Replacement and exchange parts will be warranted for the remainder of the original warranty or for a period of ninety (90) days, whichever is greater. GECI and its authorized distributors or dealers shall not be liable for direct or indirect, special or consequential damages in excess of such repair or replacement. In no event shall the purchaser be entitled to recover for contingent expenses resulting from, but not limited to, telephone calls, telegrams, travel expenses, lodging, duties and taxes, labor, rental or replacement equipment, loss of business or profits or other commercial losses.

5. USE OF DEFECTIVE PRODUCTS. Continued use of GECI equipment after discovery of a defect voids all warranties.

6. ALTERED EQUIPMENT. Except as authorized in writing, the warranty specified does not cover any equipment that has been altered by any party other than GECI.

EXCEPT AS STATED ABOVE, ALL OTHER WARRANTIES AND CONDITIONS, WHETHER EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED. BASSI NEITHER ASSUMES NOR AUTHORIZES ANY PERSONS TO ASSUME FOR BASSI ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OR USE OF THE GOODS SOLD, AND THERE ARE NO ORAL AGREEMENTS OR WARRANTIES COLLATERAL TO OR AFFECTING THIS WRITTEN WARRANTY.

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