

Operation

Three Stage Charge Regimen

The charger utilizes the three stage charge regimen which is widely recommended by battery manufacturers for allowing the fastest possible recharge time without loss of batteries' electrolyte (gel or liquid) which may be caused by sustained charging at higher voltages. This three stage regimen is initiated each time a.c. is applied:

1) Bulk Phase: :KHQ EDWWHULHV DUH VLJQL¿FDQWO\ GLVFKDUJHG WKH charger responds initially by delivering a high amount of d.c. current, at or near the charger's maximum rated output. It is during this stage that charging current is maintained at a high level as battery voltage increases. Bulk charging continues until battery voltage reaches the "charge" voltage level (where batteries are at about 75-80% of capacity). A current limit circuit prevents charger overload during this maximum output stage

2) Absorption Phase: During this second stage of the charge cycle, battery voltage is maintained at the "charge" voltage level. Output current begins to taper off as the battery plates become saturated. Charge voltage is maintained until the current sensing circuit detects that output current has tapered to about 5-15 % of charger rating. At this point the batteries are at about 95 % of full charge and the 3KDVH 7KUHH FKDUJHU VZLWFKHV WR WKH WKLUG DQG ¿QDO VWDJH RI WKH charge cycle.

3) Float Phase: For extended battery life the charger then auto-PDWLFDOO\ VZLWFKHV WR D ORZHU ÅRDW YROWDJH OHYHO. 7KLV ÅRDW FKDUJH keeps batteries at peak condition without overcharging. The charger may be left in this stage for lengthy periods of time without atten-WLRQ WKRXJK SHULRGLF FKHFNV RI HOHFWURO\WH OHYHO LQ ÅRRGHG EDWWHULHV is recommended). It is not necessary or recommended to shut the charger off when this stage is reached.

Typical Charge Output Graph



* Approximately 10 hours maximum at factory settings

Input Current Ratings (@ Full Load) PT-40U: 6.8 amps @ 115V, 3.4 amps @ 230V PT-24-20U: 6.8 amps @ 115V, 3.4 amps @ 230V

Output Current Ratings

PT-40U: 40 amps continuous **PT-24-20U:** 20 amps continuous

Temperature Rating (all models)

-20°C to + 60°C; Derate linearly from 100% @ 50°C to 60% @ 60°C

Application Notes

Start Up

1) Before powering up your charger, check for tight electrical connections to each battery. Switch off any d.c. loads on the batteries. Apply a.c. power - light above meter will illuminate. Observe the d.c. ammeter on the front panel. This meter displays the total d.c. output of the charger. through all banks. If the meter is reading mid-scale or higher, it is an indication that the batteries are in a relatively low state of charge. If the meter needle is at or near the bottom of the scale the batteries are at or nearing full charge

2) Apply a load to the charger by switching on some lights, a pump or some other d.c. appliance. Observe the charger meter. It should read approximately the same as the expected current draw of the appliance. As current is demanded from the battery system, the charger will automatically increase its output in response to the increased load demand. When load current exceeds 10-20 % of the charger's rated capacity, the charger will go into the absorption mode and remain there until current drops below 5-15 % of capacity or until the time-out circuit cycle is complete.

Constant Versus Occasional Use

In general, it is recommended that the charger be left connected continuously to the a.c. distribution system so that it will be in operation whenever a.c. is available. Repeatedly allowing batteries to become completely discharged before recharging will greatly shorten their life. Leaving the charger on continuously will prevent this.

While the output regulation of the charger will minimize battery gassing and water loss, monthly checks of the electrolyte level (for wet lead acid batteries) are still strongly recommended.

Proper Load Sizing

The charger is rated for continuous duty. While the charger cannot be damaged by overloads that exceed this continuous rating, excessive load demands may draw battery voltage down faster than the charger can resupply it. If battery voltage continues to drop and the output current is at maximum while the charger is in service, check to see that your average d.c. loads are not exceeding the charger's rated output.

Operation With Engine

It is perfectly acceptable to allow the charger to remain on when the engine is started and while it is running. The current limit feature of the Phase Three Charger will protect against any damage due to the high current demands of engine cranking. Output diodes prevent back-feed of current into the charger from the alternator while the engine runs.

2SHUDWLRQ DV D G.F. 3RZHU 6XSSO\ RU 5DGDU 5HFWL; HU

7KH FKDUJHU SURGXFHV DQ H[WUHPHO\ ZHOO-¿OWHUHG G.F. RXWSXW. 7KHUHIRUH it is able to power virtually any d.c. powered device (within the unit's rating) without the battery attached in-line (if, for instance, the battery must be removed for any purpose and a.c. is still available). All but the most sensitive d.c. powered electronic devices will function as normally as if powered by a battery. In addition, the current limiting circuitry enables the charger to handle the high start-up surges associated with inductive loads, such as d.c. motors in radar sets.

IMPORTANT SAFETY INSTRUCTIONS

1. SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for the Phase Three Battery Charger. 2. Before using this battery charger, read all instructions and cautionary markings on (1) the battery charger (2) the battery, and (3) any product powered by the battery.

3. CAUTION — To reduce the risk of injury, charge only 6 cell (PT-40U) or FHOO 37- - 8 OHDG-DFLG UHFKDUJHDEOH EDWWHULHV ÀRRGHG, \$*0, JHO or sealed). Other types of batteries may burst, causing personal injury and damage.

4. Do not expose charger to rain or spray.

5. Use of an attachment not recommended or sold by NEWMAR may result LQ D ULVN RI ¿UH, HOHFWULF VKRFN RU LQMXU\ WR SHUVRQV.

6. To reduce the risk of damage to the electric plug and cord (if plugged into an a.c. outlet), pull by plug rather than cord when disconnecting the charger. 7. Make sure the cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.

8. An extension cord should not be used. Use of an improper cord could UHVXOW LQ D ULVN RI ¿UH DQG HOHFWULF VKRFN.

9. Do not operate the charger with a damaged cord or plug; replace them immediately

10. Do not operate the charger if it has received a sharp blow, been GURSSHG. RU RWKHUZLVH GDPDJHG: WDNH LW WR D TXDOL; HG VHUYLFHPDQ.

service or repair is necessary. Incorrect reassembly may result in a risk of HOHFWULF VKRFN DQG ¿UH.

12. To reduce the risk of electric shock, disconnect the charger from a.c. source before attempting any maintenance or cleaning. WARNING-RISK OF EXPLOSIVE GASES

1. WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGER-

OUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPOR-TANCE THAT BEFORE INSTALLING AND USING YOUR CHARGER. YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY. 2. To reduce the risk of battery explosion, follow these instructions and

those published by the battery manufacturer and by the manufacturer of any equipment you intend to use in the vicinity of the battery. Review all cautionary markings on these products.

PERSONAL PRECAUTIONS

1. Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.

2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.

3. Wear complete eye protection and clothing protection. Avoid touching your eyes while working near a battery.

4. If battery acid contacts skin or clothing, wash immediately flood the eye with running cold water for at least 10 minutes and get medical attention immediately

5. NEVER smoke or allow a spark or flame in the vicinity of the battery or

6. Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical part and cause an explosion.

7. Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

8. 8VH WKH EDWWHU\ FKDUJHU IRU FKDUJLQJ JHO-FHOO, \$*0 RU ÀRRGHG OHDG-DFLG batteries only. Do not use the charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property. 9. NEVER charge a frozen battery.

PREPARING TO CHARGE

1. Be sure the area around the battery is well ventilated.

2. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.

3. \$GG GLVWLOOHG ZDWHU LQ HDFK FHOO XQWLO EDWWHU\ DFLG UHDFKHV OHYHO VSHFLį.HG by battery manufacturer. This helps purge excessive gas from cells. Do QRW RYHU; OO.)RU D EDWWHU\ ZLWKRXW FHOO FDSV, FDUHIXOO\ IROORZ PDQXIDFWXUHU¶V recharging instructions.

4. 6WXG\ DOO EDWWHU\ PDQXIDFWXUHU¶V VSHFL¿F SUHFDXWLRQV VXFK DV UHPRYing or not removing cell caps while charging and recommended rates of charge

5. To change the battery chemistry, move selector switch and unplug the unit, leaving it unpowered for 1 minute for changes to take effect.

GROUNDING AND a.c. POWER CORD CONNECTION

The charger should be grounded to reduce the risk of electric shock.

11. 'R QRW GLVDVVHPEOH WKH FKDUJHU; WDNH LW WR D TXDOL; HG VHUYLFHPDQ ZKHQ (For marine applications only) EXTERNAL CONNECTIONS TO THE CHARGER SHALL COMPLY WITH UL RECOMMENDATIONS AND/ OR UNITED STATES COAST GUARD ELECTRICAL REGULATIONS (33CFR183, SUB-PART I)

(For marine applications only) THE INSTALLATION AND PROTEC-TION OF VESSEL WIRING ASSOCIATED WITH BATTERY CHARGERS

SHALL COMPLY WITH ABYC STANDARDS; E-11) AC & DC ELEC-TRICAL SYSTEMS ON BOATS, AND A-31) BATTERY CHARGING & INVERTERS

Limited Warranty ship for two years from the date of purchase.

In the event of a product failure caused by defect of material or workmanship you return the entire product with original packing if possible, freight pre-paid, to the place of purchase or to NEWMAR, 15272 Newsboy Circle, Huntington Beach, California 92649. If this product is determined to be defective by NEWMAR, we will repair the product and ship it back to you without charge. If non-repairable within 30 days, we will ship an equivalent or better replacement product or provide you with a refund of your purchase price. If you have any questions concerning this Limited Warranty, contact us at the below address or call Customer Service at 1-714-751-0488.

Expanded Version of this Manual Available On-Line

This manual is intended to provide for a quick and easy installation reference and operation guide. A more fully detailed manual with expanded HISODQDWLRQV DQG VSHFL; FDWLRQV LV DOVR DYDLODEOH RQ OLQH 6LPSO\ JR WR WKH NEWMAR web site (address below) and click on PDF Library to view or

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