D94 / D98 Intelligent Automatic Battery Charger

User Manual

[Revision 2.0 October 2018]

READ THIS MANUAL CAREFULLY BEFORE USE – FAILURE TO DO SO MAY RESULT IN INJURY, PROPERTY DAMAGE AND MAY VOID WARRANTY. • KEEP THIS MANUAL FOR FUTURE REFERENCE. • Products covered by this manual may vary in appearance, assembly, inclusions, specifications, description and packaging.

E&OE

Safety

Safety messages are designed to alert you to possible dangers or hazards that could cause death, injury or equipment or property damage if not understood or followed. Safety messages have the following symbols:

 You WILL be KILLED or SERIOUSLY INJURED if you do not follow instructions.	 You CAN be KILLED or SERIOUSLY INJURED if you do not follow instructions.	 You CAN be INJURED if you do not follow instructions or equipment damage may occur.

It is important that you read and understand the instruction manual before use and keep the manual in a safe place for future reference. Safety information presented here is generic in nature – some advice may not be applicable to every piece of equipment.

All safety precautions must be observed to reduce the risk of personal injury when operating the equipment.

The term “equipment" refers to your product, be it electrical mains, battery or petrol engine powered.

IMPORTANT – Handle the equipment safely and carefully.

BEFORE USE - If you are not familiar with the safe operation/handling of this equipment, or are in any way unsure of any aspect of suitability or correct use it for your application, you should complete training conducted by a person or organization qualified in safe use and operation of this equipment, including fuel/electrical handling and safety.

WARNINGS

- Read all safety warnings and all instructions. Failure to follow warnings and instructions may result in electric shock, fire and/or serious injury.
- Do not operate the equipment in flammable or explosive environments, such as in the presence of flammable liquids, gases or dust. Engine and equipment may create sparks or heat that may ignite vapours, dust etc
- Keep clear of moving parts.
- This equipment may be a potential source of electric shock if misused.
- Do not operate the equipment if it is damaged, malfunctioning or is in an excessively worn state.
- Do not allow others to use the equipment unless they have read this manual and are adequately trained.
- When using the equipment, basic safety precautions detailed here must always be followed to reduce the risk of fire, electric shock, personal injury and material damage.
- When wiring electrically powered equipment, follow all electrical and safety codes.
- Ensure the electrical supply conforms to the equipment requirements.
- To reduce risk of electric shock, disconnect the equipment from the electrical supply before connecting batteries, cleaning etc.

General Work Area Safety

Work areas should be clean and well it.

Do not operate the equipment if bystanders, animals etc are within operating range of the equipment or the general work area.

Personal Safety

Keep packaging away from children - risk of suffocation! Operators must use the equipment correctly. When using the equipment, consider conditions and pay due care to persons and property.

Prevent unintentional starting of the equipment - ensure equipment and power source switches are in the OFF position before connecting or moving the equipment. Do not carry equipment with hands/fingers touching any controls. Remove any tools or other items that are not a part of the equipment from it before starting or switching on.

Stay alert and use common sense when operating equipment. Do not overreach. Keep proper footing and balance at all times. Do not use equipment when tired or under the influence of drugs, alcohol or medication. This equipment is not intended for use by persons with reduced physical, sensory or mental capabilities.

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. Always wear eye protection. Protective equipment such as respirators, non-skid safety shoes, hard hat, hearing protection etc should be used for appropriate conditions. Other people nearby should also wear appropriate personal protective equipment. Do not wear loose clothing or jewellery, which can be caught in moving parts. Keep hair and clothing away from the equipment.

If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of dust collection can reduce dust-related hazards.

General Equipment Use and Care

Do not force the equipment. Use the correct equipment for your application. The correct equipment will perform better and be safer within its design parameters. Do not use the equipment if the ON/OFF switch malfunctions – any equipment that cannot be controlled with the ON/OFF switch is dangerous and must be repaired.

Use the equipment and accessories etc. in accordance with these instructions, taking into account working conditions and the work to be performed. Using the equipment for operations different from those intended could result in hazardous situations.

Before use, inspect the equipment for misalignment or binding of moving parts, loose components, damage or any other condition that may affect its operation. If damaged, have the equipment repaired by an authorized service centre or technician before use.

Always keep the equipment and accessories (cutting tools, nozzles, bits etc) properly maintained. Keep the equipment, controls and handles dry and free from dirt, oil and grease.

Store the equipment out of reach of children or untrained persons. To avoid burns or fire hazards, let the equipment cool completely before transporting or storing. Never place the equipment in places where there are flammable materials, combustible gases or combustible liquids etc.

The equipment is not weatherproof, and should not be stored in direct sunlight, at high ambient temperatures or locations that are damp or very humid.

Battery Charger Use and Care

WARNINGS – EXPLOSION HAZARD

- Use for charging lead-acid batteries only. Do not use for other battery types , which may burst and cause injury to persons and damage to property.
- Substances used in batteries and gases or vapours produced when charging may be extremely flammable / explosive – keep clear of naked flames or other ignition sources.
- Correct battery polarity MUST be followed. Incorrect polarity may present an explosion hazard.
- Always charge batteries in well-ventilated areas. NEVER charge in closed-in or restricted areas.
- Use only accessories supplied with the product. Use of non-supplied or recommended accessories may result in fire, electric shock, or injury and will void warranty.
- When disconnecting the battery charger, pull by the plug and not by the cord. Pulling on the cord may damage it.
- Do not operate equipment with a damaged cord or plug. Have the cord or plug replaced immediately.
- Do not disassemble charger. Take it to a qualified professional when service or

- Do not use an extension cord unless absolutely necessary. Use of an improper extension cord could result in fire or electric shock. If an extension cord must be used, make sure that:
  - The extension cord socket is compatible with the charger plug.
  - The extension cord is properly wired and in good condition.
  - The extension cord wire gauge is suitable for the charger current rating.

Personal Precautions and Safety

- Wear fully enclosing eye protection and protective clothing when working with lead-acid batteries.
- Make sure someone is within range of your voice or close enough to come to your aid when you work with or near a lead-acid battery.
- If battery acid contacts skin or eyes, remove affected clothing and any excess acid. Seek medical attention immediately and rinse with water for at least 15 minutes then apply a cold compress.
- To reduce the possibility of short-circuiting the battery and possible severe injury, remove all personal metal items such as rings, bracelets, watches etc.
- Take great care when handling metal items (tools etc) around or near batteries to reduce the possibility of short-circuiting the battery and possible severe injury.

repair is required.

- Locate the charger as far away from the battery as the charger cables allow.
- Do NOT charge a frozen battery. If battery fluid (electrolyte) is frozen, place the battery in a warm area to thaw before charging.
- Do NOT allow battery acid to come into contact with the charger or any of its components..
- Do NOT place a battery on top of the charger.
- Do NOT place the charger directly above a battery being charged. Gases from the battery may corrode and damage the charger.
- Do NOT allow the battery terminal clamps to touch at any time when the charger is energized.
- Do NOT start a vehicle engine with the charger connected to the vehicle battery.
- Boat batteries should be removed from the boat and charged on land.
- Always select the correct voltage of the battery being charged. Do NOT charger a battery using a different voltage to the battery rating.
- Always follow battery manufacturer instructions for battery charging.

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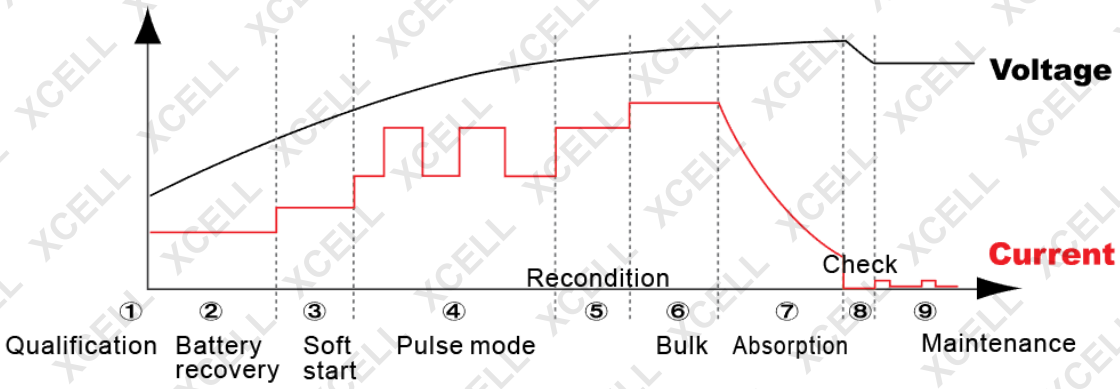
Introduction

The battery charger is a high-frequency switch mode type that is suitable for charging a range of lead-acid batteries. The charger features a logic controlled 9-stage charging program that monitors battery charge and switches modes automatically to ensure the battery charge is a s close to 100% of the original capacity as possible.

The charger is capable of restoring almost completely discharged batteries (must have a minimum 2V) and also batteries that are slightly sulphated. It is possible to leave the charger connected to a battery indefinitely, in which case it will maintain battery charge as required. It can also be used in temperatures below 5°C.



Suitable Battery Types

The charger can be used for of the following types:

- Lead-Acid (unsealed liquid electrolyte, may also be known as "WET").
- AGM (absorbent glass mat).
- GEL (sealed "gelified" electrolyte).

See Specifications for detailed information on applicable battery voltage and capacity.

Parts Identification

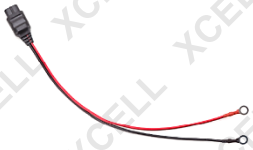
No.	Name	No.	Name
1	Battery Charger (includes 240VAC mains input cable and low voltage DC output cable)	3	Permanent Battery Connect Cable
2	Terminal Clamp Battery Connect Cable (shown connected to charger output cable)		

Operation

Substances used in batteries and gases or vapours produced when charging may be extremely flammable – keep clear of naked flames or other ignition sources. • Correct battery polarity MUST be followed. Incorrect polarity may present an explosion or fire hazard. • Do NOT attempt to charge a frozen battery. • Do NOT connect to or charge the battery of a running engine. • Do NOT connect the battery connect clamps to any part of the fuel system or sensitive electrical components. • Position all charger cables so they cannot come into contact with conductive parts of the vehicle (except the battery terminals), be pinched or caught etc. • Always select the correct voltage of the battery being charged. Do NOT charger a battery using a different voltage to the battery rating. • Always follow battery manufacturer instructions for battery charging. • If applicable, before charging, remove any battery cell ventilation caps and check that the cell electrolyte level is adequate. After charging, check electrolyte level and re-install battery cell ventilation caps.

Using Charging Cables

The charging (output) cables are colour-coded for polarity – **RED** = *POSITIVE* and **BLACK** = *NEGATIVE*. There are two types of cable supplied:



- **Permanent Battery Connect Cable** – For convenient, regular charging. To use, attach the connectors on the ends of the cable directly to the battery terminals. To use, connect the free end of the cable to the battery charger output cable.

- **Terminal Clamp Battery Connect Cable** – For connecting directly to the corresponding battery terminals. To use, squeeze the clamp to open the jaw, then place the jaw over the battery terminal and release the clamp. Ensure that the clamp is firmly attached to the battery terminal.

To connect either battery connect cable to the charger, firmly push the ends of the battery connect cable and charger output cables together (they can fit one way only).

Charging a Battery

1. If using the terminal clamp battery connect cable, connect the **POSITIVE** clamp to the battery **POSITIVE** terminal, the connect the **NEGATIVE** clamp to the battery **NEGATIVE** terminal.
2. Connect the battery charger output cable to the battery connect cable.
3. Connect the charger to a 240VAC electrical supply and switch the supply ON. The display illuminates.
4. Use **MODE** to select the required charging program. Once a mode has been selected, the charger begins charging the battery.

To stop charging:

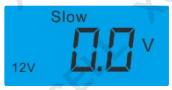
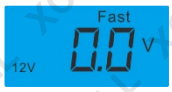
1. Switch the electrical supply to the charger OFF, then disconnect the charger power cable.
2. Disconnect the battery connect cable from the battery charger output cable.
3. If using the terminal clamp battery connect cable, remove the clamp from the **NEGATIVE** terminal, then remove the clamp from the **POSITIVE** terminal.

Charging Modes and Display Functions

A battery must be connected to the charger in order for the charger to function correctly. If no battery is detected, the display flashes and/or "F1" is shown – see Troubleshooting.

The battery charger features logic controlled "intelligence" to accurately monitor the battery and automatically adjust charging functions to optimise charging. Battery charge status and current functions are shown on the charger LCD.

To switch between functions and display modes, press **MODE** repeatedly until the required function/mode is reached. When next used or after a disruption to the power supply, the charger defaults to the last used mode. See Specifications for detailed information on charging mode voltages and current.

	**Voltage** - Shows the voltage being supplied to the battery.
	**Recon** – Shows to indicate battery "recondition" / "repair" mode in operation.
	**Slow** – Shows to indicate 12V "Slow" charge mode.
	**Fast** – Shows to indicate 12V "Fast" charge mode.
	***** - Shows to indicate 12V "Winter" charge mode. Use at ambient temperatures below 5°C. Also suitable for many AGM batteries.
	**6V** – Shows to indicate 6V charge mode. ***D94 model only***.
	**Charging** - Shows current battery charge status. As the battery charge increases, the number of blocks displayed increases. When the battery is fully charged, "FUL" is also shown. If the charger remains connected after the battery is fully charged, it will maintain the battery at full charge for as long as it remains connected and switched on.

Maintenance

Do not use the charger if any of the electrical cords or terminal clamps have been damaged in any way. If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or qualified person in order to avoid a hazard.

Follow these steps below to maintain the charger in optimum condition:

- After each use, clean the battery charger clamps - be sure to remove any battery fluid as this will cause corrosion of the copper material.
- Clean the outside case of the charger with a soft cloth and, if necessary, mild soap solution.
- Keep the charger cords loosely coiled during storage to prevent damage to them.

Troubleshooting

Note: Some maintenance activities described may be beyond the scope of some users. For procedures that you are not comfortable with or have the tools or experience for, or if problems persist after following all suggested actions, contact a service centre or qualified technician.

The following information may assist in identifying a problem and rectifying it.

Error Code: F1

Possible Fault	Action
Battery not detected	Ensure that the battery connect cable connections to the charger output cable and the battery are secure. Check that the battery terminals/clamps are clean and not corroded so as to provide a good electrical connection.
Short-circuit detected	Ensure that the battery connections and all cable connections are secure and polarity is correct. Check the condition of all cables and ensure that no damage has occurred. Ensure that there is no possibility of the battery terminal or terminal clamps being shorted.
Reverse polarity connection detected	Check and ensure that polarity of the battery connections is correct.

Error Code: F2

Possible Fault	Action
Poor electrical connection to battery	Ensure that the battery connect cable connections to the charger output cable and the battery are secure. Check that the battery terminals/clamps are clean and not corroded, so as to provide a good electrical connection.

Error Code: F3

Possible Fault	Action
Battery voltage too high	Have the battery checked by an authorised person. Replace battery if necessary.

Error Code: F4

Possible Fault	Action
Battery current leakage detected	Attempt to charge again. If fault persists, have the battery checked by an authorised person or replace the battery.

Specifications

D94

Electrical Requirements	220 to 240VAC / 50 to 60Hz 0.45A.
Charge Mode Output	**Slow**: 14.4VDC 1.0A. Suitable for 12V batteries up to 20Ah. **Fast**: 14.4VDC 4.0A. Suitable for 12V batteries up to 80Ah. **Winter**: 14.7VDC 4.0A. Also recommended for 12V AGM type batteries. **6V**: 7.5VDC 4.0A. Suitable for 6V batteries up to 80Ah.
Battery Compatibility	6V / 12V AGM / GEL / WET Lead-Acid types.

D98

Electrical Requirements	220 to 240VAC / 50 to 60Hz 0.6A.
Charge Mode Output	**Slow**: 14.4VDC 2.0A. Suitable for 12V batteries up to 40Ah. **Fast**: 14.4VDC 8.0A. Suitable for 12V batteries up to 160Ah. **Winter**: 4.7VDC 8.0A. Recommended for 12V AGM type batteries.
Battery Compatibility	12V AGM / GEL / WET Lead-Acid types.

Some experts believe that the incorrect or prolonged use of almost any product may cause serious injury or death. To help reduce your risk of serious injury or death, refer to the information below. For more information, see www.datastreamserver.com/safety

- Consult all documentation, packaging and product labelling before use. Note that some products feature documentation available online. It is recommended to print and retain the documentation.
- Before each use, check the product for loose/broken/damaged/missing parts, wear or leaks (if applicable). Never use a product with loose/broken/damaged/missing parts, wear or leaks.
- Products must be inspected and serviced (if applicable) by a qualified technician every 6 months. This is based on average residential use by persons of average size and strength, and on a property of average metropolitan size. Use beyond these recommendations may require more frequent inspections/servicing.
- Ensure that all users of the product have completed a suitable industry recognised training course before being allowed access to the product.
- The product has been supplied by a general merchandise retailer that may not be familiar with your specific application or description of application. Be sure to attain third-party approval from a qualified specialist for your application before use, regardless of any assurances from the retailer or its representatives.
- This product is not intended for use where fail-safe operation is required. As with any product (for example, automobile, computer, toaster), there is the possibility of technical issues that may require the repair or replacement of parts, or the product itself. If the possibility of such failure and the associated time it may take to rectify could in any way inconvenience the user, business or employee, or financially affect the user, business or employee, then the product is not suitable for your requirements. This product is not intended for use where incorrect operation or a failure of any kind, including but not limited to, a condition requiring product return, replacement, parts replacement or service by a technician may cause financial loss, loss of employee time or an inconvenience requiring compensation.
- If this product has been purchased in error when considering the information presented here, contact the retailer directly for details of their returns policy, if required.