5475

LASER®

Intelligent Battery Charger
4 in 1

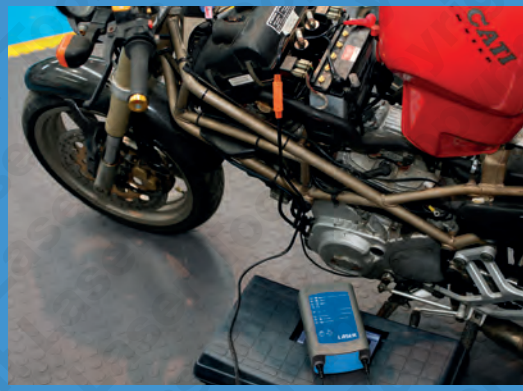
Instructions

For all 12 volt automotive battery types: lead-acid, AGM (absorbed glass mat) Gel and deep cycle.

This charger initiates an 8-stage charging cycle which charges and maintains the battery. Additionally there is a boost mode for battery rescue, and a steady 12v supply mode. The charger can also be used to test the battery without connecting to a 240v AC supply. It features overload, short circuit and polarity reversal protection.

Includes a ‘snow’ mode for charging in temperatures below 0ºC
Note: this is for AGM absorbed glass mat batteries only - never attempt to charge a battery with frozen electrolyte.

The charger is supplied with three methods of connection:
Insulated battery clamps.
Eyelet connectors for motorcycles.
Onboard 12v connector.



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The Complete Connection

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Guarantee

If this product fails through faulty materials or workmanship, contact our service department direct on: **+44 (0) 1926 818186**. Normal wear and tear are excluded as are consumable items and abuse.

The 8-stage Charging Works as Follows

1. **Soft Start:** Tests if the battery can accept charge; charging will commence if battery is okay.
2. **Desulphation:** Pulsing current removes sulphates from the battery plates and restores battery efficiency and capacity.
3. **Bulk Charge:** Charges with maximum set current until approximately 80% of capacity.
4. **Absorption:** Charging current drops off and brings battery to 100% charge.
5. **After-Charge:** For a limited period the voltage increases as the current drops down; the higher voltage starts gassing and thus mixing of the electrolyte which is beneficial for battery capacity and expected life.
6. **Analysis:** Tests if battery can maintain charge (self-discharge): if battery voltage drops below 11.6v within 10 minutes, battery is faulty.
7. **Maintenance:** Keeps battery at 100% capacity without overcharging.
8. **Cycle Recharge:** A continuation of the Maintenance mode that monitors battery voltage and will gently pulse current and increase voltage.

Boost Mode (Battery Rescue):

For deeply discharged batteries, in 'boost' mode, the charger follows the same 8-stage charging sequence but stage 1 (Soft Start) is replaced by a 'rescue' stage that pulses both voltage and current to mix the electrolyte which assists the subsequent Desulphation stage.

This rescue stage can last for up to two hours - if the battery can be returned to service the charger will enter charge mode; if not, the error Indicator (fault light) will illuminate.

Battery Tester Mode

The charger can be used as a battery tester, there is no need to connect to an 240v AC power supply. Connect the charger to the battery terminals, noting positive and negative identification. The LED's will display the state of charge of the battery: Full (Green LED), Medium (Yellow LED), Low (Yellow LED), Discharged/Empty (Red LED).

Note: if the LED's flash, then the battery is deeply discharged. Charging can be attempted using the Boost Mode (battery rescue).

Connection

Note: The charger should be connected to the battery before connecting to the mains supply. When finished, switch off at the mains supply before disconnecting the charger from the battery.

You MUST wear eye protection when connecting the clamps.

Safety First. Be Protected.

LED status	Charging Mode	Normal Mode: Normal LED on. (Yellow LED)
		Snow Mode: Cold LED on. (Yellow LED)
		Supply Mode: Supply LED on. (Yellow LED)
		Boost (Rescue) Mode: Both Normal and Snow LED on.
	Error Indicator Status	Error LED On: error status, Error LED Flash: warning status. (Red LED
	Error Indicator	Normal Mode: "RED LED" (Reverse or Charger fault)
		Supply Mode: (Red LED) Over load
		Supply Mode: (Red LED) Over load or output under 12.6v
	Battery Test Mode Indicator	Discharged LED: The battery must be charged. (Red LED)
		Low LED: The battery must be charged. (Yellow LED)
		Medium LED: The battery must be charged. (Yellow LED)
		Full LED: The battery is full. (Green LED)
Safety and EMC	Safety Standards	EN 60335 and UL1310
	Withstand Voltage	Meet I/P - O/P: 3 Kv AC I/P - FG: 1.5Kv AC O/P - FG: 0.5Kv AC
	Isolation Resistance	Meet 100M ohms | 500VDC at 25°C
	EMI Conduction and Radiation	CISPR22 class B
	Harmonic Current	EN61000-3-2,-3
	Certificate	CE | cUL | FCC | CB | RoHs
	EMS Immunity	EN55014-4-2
Others	MTBF	150k hours min. MIL - HDBK - 217F (25°C)
	Type of Batteries	Lead Acid
	Dimension (L x W x H)	191mm x 116mm x 63mm
	Weight	0.82kg

Specifications

Charger Mode button:
Press this button to cycle between ‘Normal’, ‘Snow’ and ‘DC Supply’ modes. (LED will illuminate indicating mode selected.)

Charger Current button:
Once the mode has been selected (see ‘Charger Mode button’ above) then press this button to select the level of current (charging) that is required. (LED will illuminate indicating charging rate selected.)

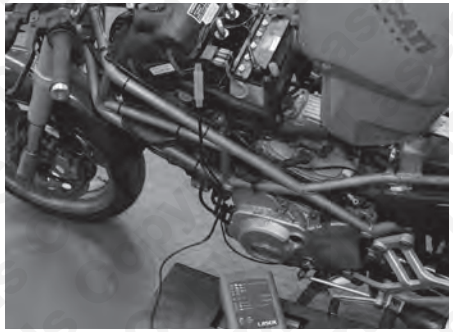
Charging Mode	Charge Voltage	Normal mode: 14.9v DC ±2% Snow mode: 15.5v DC ±2% Boost (Rescue): 18v DC ±2%
	Charge Current Range	10A
	Rated Maximum Power	150W
	Efficiency	> 85% @ Full Load
	Normal Charging Mode	8-stage charging
	Snow Charging Mode	Charging when temp is under 0°C (AGM batteries only)
	Boost (Rescue) Mode	18v - max output current
Supply Mode	Output Voltage	13.5v DC ±5%
	Output Current	2A | 5A | 10A
	Output Mode	Constant voltage and maximum current output
Input	Input Voltage Range	100 ~ 264v AC
	Input Frequency Range	47 ~ 63Hz
	Input Current Rating	3A

Protections	Reverse Polarity	YES, except for Supply mode. No Charge and error LED on until fault has been removed.
	Disconnect	YES, except for Supply mode.
	Over Temperature	Output power drops until temperature is within limits.
	Short Circuit	YES. Does not charge until fault has been removed.
	Wrong Battery Type	YES (No Charge When Vbat <2v or Vbat >16.5v)
Environment	Operating Temperature	-20° ~ 40°C
	Operating Humidity	10 - 95% RH
	Vibration	10~500HZ, 2G | P-P, 3 axes,15min sweep without malfunction.
	Shock	20G | Package

Cars and Light Commercials

1. Identify the polarity of the battery terminals (if not clearly indicated, the positive terminal or post is normally larger than the negative).
2. Connect the positive (red) clamp to the positive battery terminal first. Some modern cars have a remote positive terminal located away from the battery. Use this remote terminal for the charging connector.
3. Then connect the negative (black) clamp to the car chassis or engine block as far from the battery as the leads will allow. Note: DO NOT connect the clamp to fuel lines or sheet metal body parts; connect to a heavy gauge metal part of the chassis or engine block.
4. Then connect battery clamp lead connector to the corresponding connector on the charger lead.

Cars and Light Commercials



1. Identify the polarity of the battery terminals.
2. Choose the ‘motorcycle eyelet’ set of connector leads; extract the eyelets from the insulated covers and fit to the motorcycle battery, remembering to fit the positive connector first.
3. Then connect battery eyelet lead connector to the corresponding connector on the charger lead.
4. The ‘motorcycle eyelet’ set of connector leads is designed for permanent connection to the motorcycle; the leads are disconnected from the charger when the motorcycle is to be used. The lead set is supplied with a splash-proof cover which is placed snugly over the charger-end connector when not in use.
5. Care must be taken with the routing of the connector leads when replacing the seat | battery cover so that the leads are not pinched or squeezed. Leads must not be able to interfere with the chain, wheels, etc. Make sure the eyelet insulating covers are completely covering the eyelets.

Controls

Charger Mode button:
Press this button to cycle between ‘Normal’, ‘Snow’ and ‘DC Supply’ modes. (LED will illuminate indicating mode selected.)

Charger Current button:
Once the mode has been selected (see ‘Charger Mode button’ above) then press this button to select the level of current (charging) that is required. (LED will illuminate indicating charging rate selected.)

Operation

Connect charger to battery as described in this instruction manual.

Normal Charger Mode:
- Select this mode with the 'Charger Mode' button. Normal Mode LED will illuminate.
- Select desired charging current (rate) with the 'Charger Current' button. LED will illuminate indicating 2A, 5A or 10A.
- Charging will start automatically.

Boost Mode (Battery Rescue):
- Press and hold the 'Charger Mode' button for 3 - 5 seconds.
- Both Snow Mode and Normal Mode LEDs will illuminate - release 'Charger Mode' button.
- This rescue stage can last for up to two hours - if the battery can be returned to service the charger will enter Normal charge mode; if not, the error Indicator (fault light) will illuminate.

12v DC Supply Mode:
- Can be used with the cigar lighter connector. This mode can be useful to supply a steady current, for example when vehicle ignition is turned on for extended periods when conducting diagnostic tests, etc.
- Select this mode with the 'Charger Mode' button. DC Supply Mode LED will illuminate.
- Select desired charging current (rate) with the 'Charger Current' button. LED will illuminate indicating 2A, 5A or 10A.
- Care must be taken in this DC Supply mode not to leave charger connected for extended periods as there is the danger of over charging the battery.

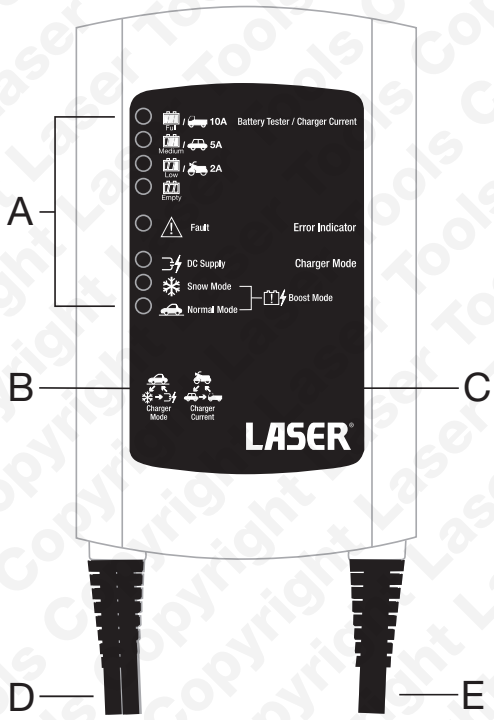
Error Indicator:
The 'Fault' LED will illuminate when:
- The connectors have been accidentally reversed (wrong polarity).
- The battery is damaged | cannot accept charge.
- Operation or setting fault.
- In 'Supply Mode' the circuit is overloaded.

When 'Fault' LED has illuminated, disconnect the connectors, including the 240v AC supply Identify reason for fault and leave for a couple of minutes before reconnecting.

Notes:
- If disconnecting main battery terminals (to remove battery from vehicle for example) check you have codes for audio, security systems, etc.
- If removing battery from vehicle to charge it, make sure to remove the earth (ground) terminal first. Vehicle ignition and all accessories must be turned off to avoid sparks when removing terminals.

Warning:
- Working near a lead-acid battery is dangerous - a battery generates explosive gases during normal operation. These gases increase when the battery is being charged.
- Ensure the work area is well ventilated.
- Make sure that there is no possibility of these gases being ignited. There must be no naked flames, cigarettes, flame heaters, blowtorches, etc, near the battery or work area.
- The gases can be ignited by a stray spark - disconnect the charger from the mains before disconnecting the leads from the battery.
- You must wear approved safety eye protection when connecting or disconnecting battery | battery charger leads.
- Avoid touching your eyes while working with batteries.

A LED's
B Charger Mode Button
C Charger Current Button
D To Battery
E To 240v AC Supply



Safety Notes:
- Place charger as far away from the battery being charged as the charger cables will permit.
- When working with or near a lead-acid battery make sure there is another person close enough to come to your aid if necessary.
- If battery acid contacts skin or clothing, wash immediately with soap and plenty of water.
- If acid enters an eye, immediately flush eye with cool, clean water for at least 15 minutes and seek medical attention.
- When working with or near a lead-acid battery make sure to remove personal metal items such as watch straps, rings, bracelets, necklaces, etc. A short across the battery terminal from one of the above could cause severe burns.
- Never allow the charger clamps to touch each other or to contact a piece of metal that could bridge them.

It is the operator's responsibility to comply with the following:
- Inspect all power supply leads, plugs and all electrical connections for wear and/or damage.
- Before use, inspect the insulation on the charger cable and check the charger and plug before connecting to the mains supply.
- Also regularly inspect power supply sockets, extension leads and connectors.
- Ensure that the mains voltage marked on the charger is the same as the electrical power supply to be used.
- Do not carry the charger by its power lead.
- Do not pull the power plug from the socket by the power lead.
- Extension lead reels: when a cable extension lead reel is used it should be fully unwound before connection. We recommend the cable reel has an RCD fitted. Be sure that the capacity of the cable reel is suitable for the product.

If in any doubt about electrical safety, consult a qualified electrician.