



**DRAPER**<sup>®</sup>

# 12V INTELLIGENT BATTERY CHARGER

53489, 53490, 53491.



These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

# 1. TITLE PAGE

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## 1.1 INTRODUCTION:

**USER MANUAL FOR: 12V INTELLIGENT BATTERY CHARGER**

Stock No: 53489, 53490, 53491.

Part No: BC14, BC16, BC110.

## 1.2 REVISIONS:

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As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://drapertools.com/manuals>

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## 1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

**Warning!** – Information that draws attention to the risk of injury or death.

**Important** – Information that draws attention to the risk of damage to the product or surroundings.

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## 3. WARRANTY

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### 3.1 WARRANTY

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact:

**Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.**

**Telephone Sales Desk: +44 (0) 8049 4333 or Product Help Line +44 (0) 23 8049 4344.**

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This warranty period covering labour is 12 months from the date of purchase except where tools are hired out when the warranty period is 90 days from the date of purchase. The warranty is extended to 24 months for parts only. This warranty does not apply to any consumable parts, any type of battery or normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

**Note:** If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This warranty applies in lieu of any other warranty expressed or implied and variations of its terms are not authorised.

Your Draper warranty is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the warranty period.

Please note that this warranty is an additional benefit and does not affect your statutory rights.

**Draper Tools Limited.**

# 4. INTRODUCTION

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## 4.1 SCOPE

The charger is a microprocessor controlled automatic charger, i.e. it is suitable in particular for charging maintenance-free batteries and for the long-term charging and maintenance-charging of batteries which are not in constant use. This manual is intended to give the user an overview of the function and controls of this product to aid its safe and effective use. Any application other than that it was intended for, is considered misuse.

## 4.2 SPECIFICATION

Stock No's. ....	53489 .....	53490.....	53491
Part No's. ....	BCI4 .....	BCI6 .....	BCI10
Rated Voltage .....	230V~50Hz.....	230V~50Hz .....	230V~50Hz
Rated output current			
12V STD,12V AGM/c,12V GEL.....	4A .....	6A .....	10A
6V STD, 12V LFP .....	2A .....	2A .....	2A
Rated battery capacities			
12V STD,12V AGM/c,12V GEL....	10-120Ah .....	20-150Ah.....	30-200Ah
6V STD, 12V LFP .....	4-60Ah .....	4-60Ah.....	4-60Ah
Protection class.....	II .....	II.....	II
Protection type .....	IP65.....	IP65 .....	IP65
Temperature.....	- 20°C to 40°C .....	- 20°C to 40°C.....	- 20°C to 40°C
Suitable battery types (for all 3 chargers) .....	WET, MF, Ca/Ca, EFB, AGM, GEL, LFP		
Weight (machine only).....	0.5kg.....	0.7kg .....	0.8kg

LFP = 12v Lithium-ion (LiFePO4 technology) type batteries.

 **Warning!** Check with battery manufacturer prior to charging other types of lithium battery.

## 4.3 HANDLING AND STORAGE

- Care must be taken when handling this product.
  - Dropping this power tool could have an effect on its accuracy and could also result in personal injury. This product is not a toy and must be respected.
- Environmental conditions can have a detrimental effect on this product if neglected.
  - Exposure to damp air can gradually corrode components. If the product is unprotected from dust and debris, components will become clogged.
  - If not cleaned and maintained correctly or regularly, the machine will not perform at its best.

# 5. HEALTH AND SAFETY INFORMATION

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## 5.1 GENERAL SAFETY INSTRUCTIONS FOR POWER TOOL USE

 **Warning!** Read all safety warnings, instructions, illustrations and specifications provided with this power tool. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term “power tools” in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

### 1) Work area safety

- a) **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
- b) **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
- c) **Keep children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

### 2) Electrical safety

- a) **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
- b) **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
- c) **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- d) **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
- e) **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
- f) **If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.** Use of an RCD reduces the risk of electric shock.

### 3) Personal safety

- a) **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
- b) **Use personal protective equipment Always wear eye protection.** Protective equipment such as a dust mask, non-skid safety shoes, hard hat or hearing protection use for appropriate conditions will reduce personal injuries.
- c) **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.
- d) **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- e) **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
- f) **Dress properly. Do not wear loose clothing or jewellery. Keep your hair and clothing away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving

## 5. HEALTH AND SAFETY INFORMATION

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parts.

- g) 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.
- h) Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles. A careless action can cause severe injury within a fraction of a second.

### 4) Power tool use and care

- a) Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.
- b) Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- c) Disconnect the plug from the power source and/or remove the battery pack, if detachable, from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- d) Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.
- e) Maintain power tools and accessories. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.
- f) Keep cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- g) Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.
- h) Keep handles and grasping surfaces dry, clean and free from oil and grease. Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

### 5) Service

- a) Have your power tool serviced by a qualified repair person using only identical replacements parts. This will ensure that the safety of the power tool is maintained.

## 5.2 ADDITIONAL SAFETY INSTRUCTIONS FOR MAINS POWERED CHARGERS & BATTERY PACKS


### Chargers

- The charger is for indoor use only.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- Prior to plugging the charger in to the supply, check that the plug, cable and charger casing are in good condition. If any are damaged, have the defective part(s) replaced immediately by a suitably qualified person.
- Only use a correctly rated mains outlet to provide power, do not plug into site generators,

## 5. HEALTH AND SAFETY INFORMATION

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attach to engine generators or D.C. sources. Do not use a mains socket outlet that is not switched.

-  **Warning!** Explosive gases. Prevent flames and sparks. During charging, provide adequate ventilation during charging. The battery must be placed in a well ventilated area (for chargers for lead-acid batteries).
- Do not attempt to charge battery packs that are too hot (over 30°C) or too cold (under 5°C), if these conditions apply set the battery pack aside to “normalise” before proceeding with the charging operation.
- Set up the charger and cable in a safe place where it won’t be knocked, tripped over, stepped on, etc. and where it is well ventilated. Make sure the ventilation slots in the charger case are not obstructed.
- Inspect the battery pack for damage, if it is undamaged, plug it into the charger, ensuring the correct orientation.
- Switch the charger on and check that the correct indicators illuminate, allow the battery pack to charge (see the specific instructions for your charger). Once charging is complete, switch the charger off, disconnect from power supply, remove the battery pack and store.
- The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains;
- After charging, disconnect the battery charger from the supply mains. Then remove the chassis connection and then the battery connection.

### Battery packs



- Before charging, read the instructions.
- Do not expose to rain.
- The charger must be disconnected from the power supply before removing the battery.
- The battery must be removed from the appliance before it is recycled.
- The battery is to be disposed of in-line with local authority procedures.
- Do not crush, open or burn the battery. Exposure to potentially harmful materials may occur.
- In case of fire use CO<sub>2</sub> or dry chemical extinguisher.
- Do not expose to high temperatures >50°C. The battery may degrade at high temperatures.
- Charge battery in conditions between 5°C to 30°C with the designated charger for the battery.
- Do not use battery if it has been stored at 5°C or less. Allow it to “normalise” at room temperature before usage/charging.

### **Warning!** – Leaking battery packs

- The electrolyte in battery packs is corrosive. Avoid contact with the skin.
- If contact is made, flush the area with clean water, pat dry and seek medical attention at the earliest opportunity.
- Inform medical personnel that the contaminant is a “high alkaline, corrosive liquid”.
- If electrolyte comes into contact with the eyes, flush with copious amounts of water only. Seek immediate medical attention, relaying the information above.

## 5.3 CONNECTION TO THE POWER SUPPLY (CHARGER)

**Caution:** Risk of electric shock. Do not open.

This appliance is supplied with an approved plug and cable for your safety. The value of the fuse fitted is marked on the pin face of the plug. Should the fuse need replacing, ensure the substitute is of the correct rating, approved to BS1362 and ASTA  or BSI Kite  marked. Ensure the fuse cover is replaced before attempting to connect the plug to an electrical outlet.



## 5. HEALTH AND SAFETY INFORMATION

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If the cover is missing, a replacement must be obtained or the plug replaced with a suitable type. If a replacement plug is to be fitted this must be carried out by a qualified electrician.

Never use a damaged or incomplete plug.

This appliance is Class II<sup>†</sup> and is designed for connection to a power supply matching that detailed on the rating label and compatible with the plug fitted.

Carefully select an extension lead. Some machines are not suitable for use with extension leads. If the tool is designed for use outdoors, only use an extension lead suitable for that environment in conjunction with an RCD adaptor. When using an extension lead, select one capable of handling the current (amps) drawn by the machine in use. Ensure the cable is fully unwound regardless of the distance between the power supply and the tool. Excess current (amps) and a coiled extension lead will cause the cable to heat up and can result in fire.

Keep extension leads away from moving hazardous parts to avoid damages to the cable which can lead to contact with live parts. Position cable safely to avoid tripping over.

<sup>†</sup>Double insulated : This product requires no earth connection as supplementary insulation is applied to the basic insulation to protect against electric shock in the event of failure of the basic insulation.

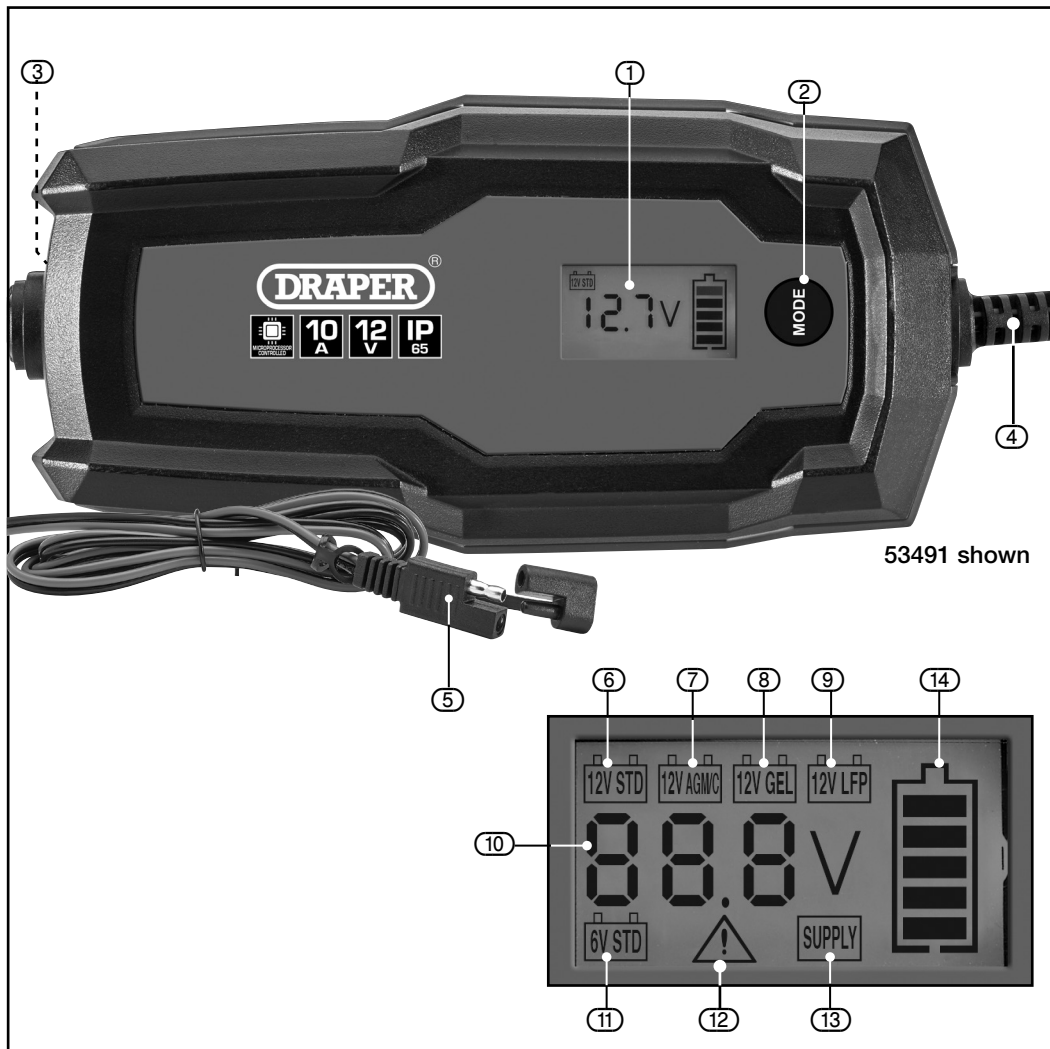
**Important!** If using an extension lead, follow the instructions that came with your lead regarding maximum load while cable is wound. If in doubt, ensure that the entire cable is unwound. Using a coiled extension lead will generate heat which could melt the lead and cause a fire.

### 5.4 RESIDUAL RISK

**Important:** Although the safety instructions and operating manuals for our tools contain extensive instructions of safe working with power tools, every power tool involves a certain residual risk which can not be completely excluded by safety mechanisms. Power tools must therefore always be operated with caution!

# 6. TECHNICAL DESCRIPTION

## 6.1 IDENTIFICATION



- ① LCD display.
- ② Mode button.
- ③ Hang hole.
- ④ Mains power.
- ⑤ Charge lead to connector.
- ⑥ 12V battery (lead acid battery).
- ⑦ 12V AGM battery. & Winter mode.
- ⑧ 12V GEL battery.
- ⑨ 12V LFP battery.
- ⑩ Charging voltage.
- ⑪ 6V battery.
- ⑫ Reverse polarity.
- ⑬ Operating 12V DC consumers.
- ⑭ Charge status of the battery.

# 7. UNPACKING AND CHECKING

## 7.1 PACKAGING

Carefully remove the product from the packaging and examine it for any sign of damage that may have happened during shipping. Lay the contents out and check them against the parts shown below. If any part is damaged or missing, please contact the Draper Help Line (the telephone number appears on the Title page) and do not attempt to use the product.

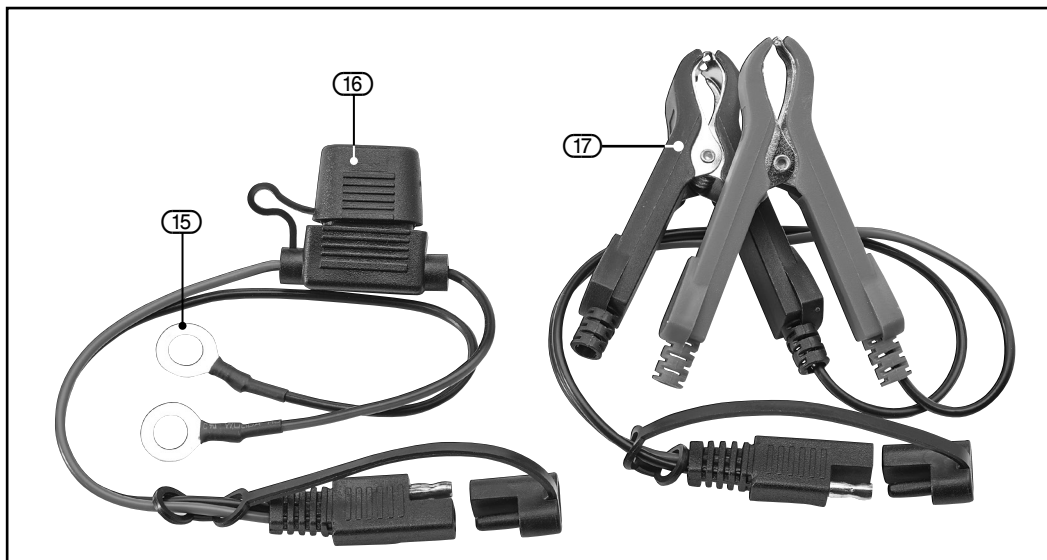
The packaging material should be retained at least during the warranty period, in case the machine needs to be returned for repair.

### Warning!

- Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.
- If any of the packaging is to be thrown away, make sure they are disposed of correctly, according to local regulations.

## 7.2 WHAT'S IN THE BOX

As well as the main product, there are several parts not fitted or attached to it.



(15) O-ring lead with connector (for permanently installation).

(16) Fuse unit 15A.

(17) Crocodile clamp lead with connector.

**Note:** For details of our full range of accessories and consumables, please visit [drapertools.com](http://drapertools.com)

## 8. PREPARING THE BATTERY CHARGER

### 8.1 BEFORE CHARGING YOUR BATTERY – FIGS. 1 – 2

We recommend that the battery is disconnected from the vehicle, this will avoid any possible damage to the alternator.

Loss of codes for audio and security etc, can be prevented by connecting a Draper Memory Saver – Stock No. 22277 12V socket type (Fig.1), or Stock No. 22231 EOBD 16pin diagnostic socket type (Fig.2) before disconnecting the battery. Check that the voltage of the battery matches that of the charger.



FIG.1



FIG.2

# 9. OPERATION

## 9.1 APPLICATION

The charger is designed for charging non maintenance-free or maintenance-free 12V lead acid batteries (wet / Ca/Ca / EFB batteries) and for lead gel and AGM batteries which are used in motor vehicles.

## 9.2 CONNECTION

Before you connect the equipment to the power supply make sure that the data on the specifications label are identical to the supply voltage.

**⚠ Warning!** Do not charge any frozen batteries.

Please also refer to the instructions in the owner's manuals for the car, radio, navigation system, etc.

### Notes on automatic charging (programs 12V STD, 12V AGM/C, 12V GEL, 12V LFP)

The charger is a microprocessor controlled automatic charger, i.e. it is suitable in particular for charging maintenance-free batteries and for the long-term charging and maintenance-charging of batteries which are not in constant use, e.g. for classic cars, recreational vehicles, lawn tractors and the like. The integrated microprocessor enables charging in several steps. The final charging step, maintenance charging, maintains the battery capacity at 95–100% and therefore keeps the battery fully charged at all times. The charging operation does not need to be monitored. However, do not leave the battery unattended if you charge it over an extended period of time, so that you can disconnect it from the mains power supply in the event of a fault in the charger.

## 9.3 PERMANENT INSTALLATION OF "O" RINGS TO BATTERY – FIG. 3

The permanently installed "O" rings M8 allow the battery to be connected to charger via connector without obtaining access to battery. (chiefly for motorbikes, classic cars, jetski's etc where access to battery is difficult).

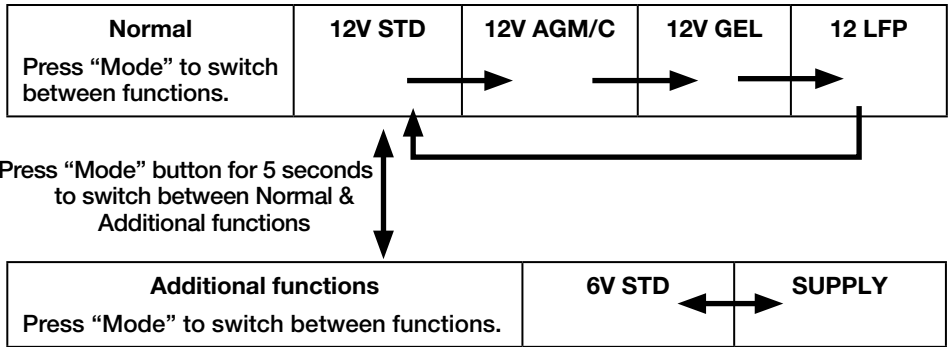


FIG.3

## 9.4 SETTING THE CHARGING PROGRAMS

- If the voltage of the battery is less than 3.5V or more than 15V, the battery is either not suitable for charging or it is faulty. The message "BAt" will appear in the LCD display. The ⚠ symbol will flash. It is also possible that other battery errors or faults can mean that the battery cannot be charged.
- If there is a short-circuit between the charging terminals while the SUPPLY function is on, the message "Lo V" will appear in the LCD display. The ⚠ symbol will flash.
- When the charger is disconnected from the socket outlet, the last charging program to have been set will be saved (apart from 6V STD and SUPPLY) and will be the default program the next time the charger is used.

# 9. OPERATION



## 9.5 STANDARD CHARGING PROGRAMS

**12V STD** (6): Charging program for lead acid batteries (wet, Ca/Ca, EFB batteries) and gel batteries. When the charger is used for the first time, 12V STD will appear in the display.

**12V AGM/C** (7): Charging program for AGM batteries and cold weather conditions (ambient temperature of -20°C to +5°C) for normal lead acid batteries (wet / Ca/Ca batteries)

**12V GEL**: (8): Charging program for GEL batteries.

**12V LFP**: (9): Charging program for "Lithium iron phosphate" or LFP batteries.

## 9.6 SPECIAL CHARGING PROGRAMS

**6V STD**: (11): Charging program for 6V batteries

## 9.7 ADDITIONAL FUNCTION

**SUPPLY** (13): For supplying 12V D.C. voltage, e.g. when changing a battery or for operating 12V D.C. consumers.

**⚠ Warning!** Protection against swapped poles will not be available. If the poles are swapped there is a risk of damaging the charger and the battery/on-board vehicle power supply or a connected consumer. It is imperative that you make sure the polarity is correct when you connect up. Observe the maximum power consumption of the consumer.

### Note:

- The direct voltage which is provided (shown in the display) is load-dependent and without load it is approx. 14.5V.
- This function can be used for consumers which are operated from a vehicle's cigarette lighter.
- Refer to and observe the operating manual for your 12V consumer.

## 9.8 CHARGING THE BATTERY

- Release or remove the battery stoppers (if fitted) from the battery.
- Check the acid level in the battery. If necessary, top up the battery with distilled water (if possible).  
Important! Battery acid is aggressive. Rinse off any acid splashes thoroughly with lots of water and seek medical advice if necessary.
- Connect the battery clamps.

### With a battery removed from vehicle:

- a. Connect the RED positive charger lead to the positive (+) terminal on your battery.
- b. Connect the BLACK negative charger lead to the negative (-) terminal on your battery


## 9. OPERATION


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### With a battery connected to vehicle:

Note: All loads in the vehicle must be switched off during charging.


- Connect the RED positive charger lead to the positive (+) terminal on your battery.
- Connect the BLACK negative charger lead to your vehicles ground connection on either the engine or chassis, away from any fuel lines or the battery vents.

If the clamps are INCORRECTLY connected with regard to polarity, the LCD screen will display the following (the + and - inside the battery icon, the fault icon  and "Err"), and a warning will sound until the clamps are disconnected. Unplug the charger, then remove the clamps, reconnect the clamps properly.

 **Warning!** Under normal circumstances the negative battery pole is connected to the bodywork and you proceed as described above. In exceptional cases (refer to the manufacturers manual) it is possible that the positive battery pole is connected to the bodywork (*positive earthing*). In this case connect the black charger cable to the negative pole on the battery. Then connect the red charger cable to the bodywork at a point away from the battery and the petrol pipe.

- After the battery has been connected to the charger, you can connect the charger to a socket. You can now change the charging settings.
- Important!** Charging may create dangerous explosive gas and therefore you should avoid spark formation and naked flames whilst the battery is charging. There is a risk of explosion! It is essential that you ventilate the rooms well.
- When "FUL" appears in the LCD display, charging has been completed. The charger holds the battery at 95% – 100% available battery capacity using pulsed charging. If the charger shows this after just a few minutes, this indicates that the battery capacity is low. The battery needs replacing.

### 9.9 FAULT INDICATOR

The fault indicator will flash  (light up) in the following cases:

- If the voltage of the battery is less than 3.5 V or more than 15 V. The battery is either unsuitable for charging or is defective. It is also possible that other battery errors or faults can mean that the battery cannot be charged.
- If the terminal clamps are connected to the battery terminals with the wrong polarity. The protection against swapped poles ensures that the battery and charger do not get damaged. Remove the charger from the battery and start the charging process from the beginning again. Caution! Protection against swapped poles is not available when the SUPPLY program is used.
- If there is a short-circuit between the two terminal clamps (the metal parts of the clamps come into contact with each other). The protection against short-circuits ensures that the battery and charger do not get damaged.

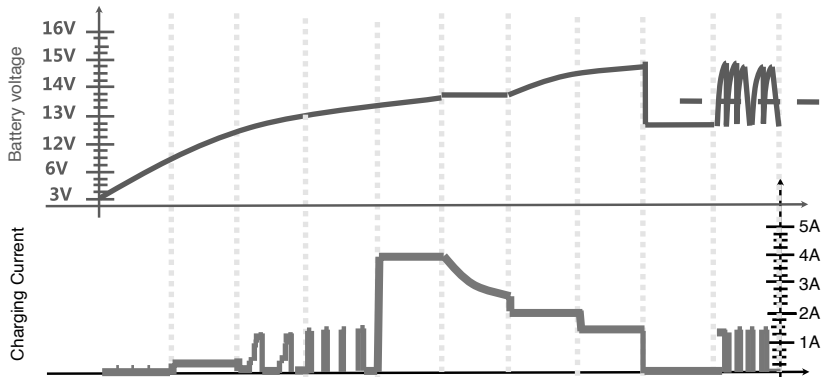
### 9.10 FINISHING CHARGING THE BATTERY

- Pull the plug out of the socket.
- Disconnect the black charging cable from the bodywork.
- Then release the red charging cable from the positive pole on the battery.
- Important!** In case of positive earthing, first disconnect the red charging cable from the bodywork and then the black charging cable from the battery.
- Screw or push the battery stoppers back into position (if there are any).

**Important!** If the mains plug is pulled out but the charger cables are still connected to the battery, the charger will draw off a small amount of electricity from the battery. We therefore recommend that you always completely remove the charger from the battery when not in use.

# 9. OPERATION

## 9.11 10 STEPS OF CHARGING 53489



STEPS	STEP 0 Battery Activated	STEP 1 Devulcanization	STEP 2 Repair	STEP 3 Pulse current charge	STEP 4 CC	STEP 5 CV	STEP 6 Floating Charge	STEP 7 Flat Charge	STEP 8 Analysis Battery	STEP 9 Compensation Charge	
MODE	12V STD	V <3V I Detection	5.2V 0.5A	7.5V 1.5A 1Hz	10.5V 1.5A 1Hz	12.6V 4A	13.6V 3.6A-2.6A	13.8V 2A	14.8V 1.5A	14.8V Detection	<13.2V 1.5A 1Hz
	12V AGMC	V <3V I Detection	5.2V 0.5A	7.5V 1.5A 1Hz	10.5V 1.5A 1Hz	12.6V 4A	13.6V 3.6A-2.6A	13.8V 2A	14.8V 1.5A	14.8V Detection	<13.2V 1.5A 1Hz
	12V GEL	V <3V I Detection	5.2V 0.5A	7.5V 1.5A 1Hz	10.5V 1.5A 1Hz	12.6V 4A	13.6V 3.6A-2.6A	13.8V 2A	14.3V 1.5A	14.3V Detection	<13.2V 1.5A 1Hz
	12V LFP	V <3V I Detection	5.2V 2A	7.5V 2A	10.5V 2A	12.6V 4A	13.6V 3A	13.8V 3A-1A	14.6V 3A-1A	14.6V Detection	<13.2V 2A 1Hz
	6V STD	V <3V I Detection	5.2V 0.5A	5.5V 1A 1Hz	5.8V 2A 1Hz	6.3V 2A	6.7V 2A	7V 2A	7.2V 2A	7.2V Detection	<6.6V 2A 1Hz
	SUPPLY	V 14V I 3A									

### STEP 0 Battery activated

After the selection of the charging mode, the charger checks the status of the battery. If the Voltage lower than 5V, will use trickle charging to activate the battery.

### STEP 1 Battery Devulcanization

After the selection of the charging mode, the charger checks the status of the battery. For batteries with vulcanization on the plate, repeated charging with small current pulses eliminates vulcanization, which increases the battery capacity.

### STEP 2 Battery Repair

After the selection of the charging mode, the charger checks the status of the battery. For old batteries or batteries that have not been used for a long time, it will charge with pulse current to expand the battery capacity again.

### STEP 3 Pulse current charge

Save the battery with impulse charging prepare for Bulk charging.

### STEP 4 Constant current charging

Charging with maximum current until approximately 80% battery capacity.

### STEP 5 Constant voltage charging

Charging with steady charging voltage to maximize up to 100% battery capacity.

### STEP 6 Floating Charge

Charge optimization / Charge with small Constant current charging

### STEP 7 Flat Charge

Charge optimization / Charge with smaller Constant current charging to maximize the battery charge, try to reach a fully charged state.

### STEP 8 Analysis Battery

Stop 1 minutes, Analysis the charging voltage, to determine whether is full.

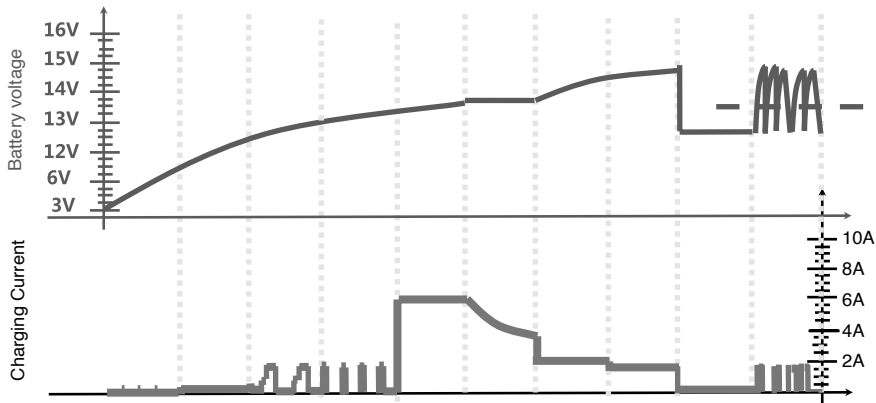
### STEP 9 Compensation Charge

Battery capacity will be kept at 95-100% and the battery voltage will be supervised. If necessary, the charger will give an impulse to the battery to keep it completely recharged.



# 9. OPERATION

## 9.12 10 STEPS OF CHARGING 53490



STEPS		STEP 0 Battery Activated	STEP 1 Devulcanization	STEP 2 Repair	STEP 3 Pulse current charge	STEP 4 CC	STEP 5 CV	STEP 6 Floating Charge	STEP 7 Flat Charge	STEP 8 Analysis Battery	STEP 9 Compensation Charge	
MODE	12V STD	V <3V	5.2V	7.5V	10.0V	12.6V	13.6V	13.8V	14.5V	14.5V	<13.2V	
		I Detection	0.5A	1.5A 1Hz	1.5A 1Hz	6A	5.4A-3.4A	2A	1.5A	Detection	1.5A 1Hz	
	12V AGMC	V <3V	5.2V	7.5V	10.0V	12.6V	13.6V	13.8V	14.5V	14.5V	<13.2V	
		I Detection	0.5A	1.5A 1Hz	1.5A 1Hz	6A	5.4A-3.4A	2A	1.5A	Detection	1.5A 1Hz	
	12V GEL	V <3V	5.2V	7.5V	10.0V	12.6V	13.6V	13.8V	14.3V	14.3V	<13.2V	
		I Detection	0.5A	1.5A 1Hz	1.5A 1Hz	6A	5.4A-3.4A	2A	1.5A	Detection	1.5A 1Hz	
	12V LFP	V <3V	5.2V	7.5V	10.0V	12.6V	13.6V	13.8V	14.6V	14.6V	<13.2V	
		I Detection	2A	2A	2A	6A	5A	5A	5A-1A	Detection	2A 1Hz	
	6V STD	V <3V	5.2V	5.0V	5.0V	6.0V	6.7V	7V	7.2V	7.2V	<6.6V	
		I Detection	0.5A	1A 1Hz	2A 1Hz	2A	2A	2A	2A	Detection	2A 1Hz	
	SUPPLY	V	14V									
		I	5A									

### STEP 0 Battery activated

After the selection of the charging mode, the charger checks the status of the battery. If the Voltage lower than 5V, will use trickle charging to activate the battery.

### STEP 1 Battery Devulcanization

After the selection of the charging mode, the charger checks the status of the battery. For batteries with vulcanization on the plate, repeated charging with small current pulses eliminates vulcanization, which increases the battery capacity.

### STEP 2 Battery Repair

After the selection of the charging mode, the charger checks the status of the battery. For old batteries or batteries that have not been used for a long time, it will charge with pulse current to expand the battery capacity again.

### STEP 3 Pulse current charge

Save the battery with impulse charging prepare for Bulk charging.

### STEP 4 Constant current charging

Charging with maximum current until approximately 80% battery capacity.

### STEP 5 Constant voltage charging

Charging with steady charging voltage to maximize up to 100% battery capacity.

### STEP 6 Floating Charge

Charge optimization / Charge with small Constant current charging

### STEP 7 Flat Charge

Charge optimization / Charge with smaller Constant current charging to maximize the battery charge, try to reach a fully charged state.

### STEP 8 Analysis Battery

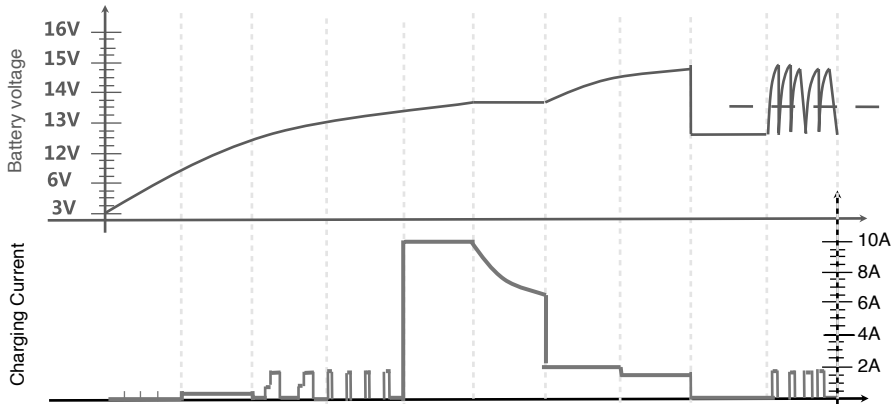
Stop 1 minutes, Analysis the charging voltage, to determine whether is full.

### STEP 9 Compensation Charge

Battery capacity will be kept at 95-100% and the battery voltage will be supervised. If necessary, the charger will give an impulse to the battery to keep it completely recharged.

# 9. OPERATION

## 9.13 10 STEPS OF CHARGING 53491



STEPS		STEP 0 Battery Activated	STEP 1 Devulcanization	STEP 2 Repair	STEP 3 Pulse current charge	STEP 4 CC	STEP 5 CV	STEP 6 Floating Charge	STEP 7 Flat Charge	STEP 8 Analysis Battery	STEP 9 Compensation Charge	
MODE	12V STD	V	<3V	5.2V	7.5V	10.5V	12.6V	13.6V	13.8V	14.5V	<13.2V	
		I	Detection	0.5A	1.5A 1Hz	1.5A 1Hz	10A	9A-6.5A	2A	1.5A	Detection	1.5A 1Hz
	12V AGMC	V	<3V	5.2V	7.5V	10.5V	12.6V	13.6V	13.8V	14.8V	14.8V	<13.2V
		I	Detection	0.5A	1.5A 1Hz	1.5A 1Hz	10A	9A-6.5A	2A	1.5A	Detection	1.5A 1Hz
	12V GEL	V	<3V	5.2V	7.5V	10.5V	12.6V	13.6V	13.8V	14.3V	14.3V	<13.2V
		I	Detection	0.5A	1.5A 1Hz	1.5A 1Hz	10A	9A-6.5A	2A	1.5A	Detection	1.5A 1Hz
	12V LFP	V	<3V	5.2V	7.5V	10.5V	12.6V	13.6V	13.8V	14.6V	14.6V	<13.2V
		I	Detection	2A	2A	2A	10A	8A	8A	8A-1A	Detection	2A 1Hz
	6V STD	V	<3V	5.2V	5.5V	5.8V	6.3V	6.7V	7V	7.2V	7.2V	<6.6V
		I	Detection	0.5A	1A 1Hz	2A 1Hz	2A	2A	2A	2A	2A	Detection
	SUPPLY	V	14V									
		I	10A									

### STEP 0 Battery activated

After the selection of the charging mode, the charger checks the status of the battery. If the Voltage lower than 5V, will use trickle charging to activate the battery.

### STEP 1 Battery Devulcanization

After the selection of the charging mode, the charger checks the status of the battery. For batteries with vulcanization on the plate, repeated charging with small current pulses eliminates vulcanization, which increases the battery capacity.

### STEP 2 Battery Repair

After the selection of the charging mode, the charger checks the status of the battery. For old batteries or batteries that have not been used for a long time, it will charge with pulse current to expand the battery capacity again.

### STEP 3 Pulse current charge

Save the battery with impulse charging prepare for Bulk charging.

### STEP 4 Constant current charging

Charging with maximum current until approximately 80% battery capacity.

### STEP 5 Constant voltage charging

Charging with steady charging voltage to maximize up to 100% battery capacity.

### STEP 6 Floating Charge

Charge optimization / Charge with small Constant current charging

### STEP 7 Flat Charge

Charge optimization / Charge with smaller Constant current charging to maximize the battery charge, try to reach a fully charged state.

### STEP 8 Analysis Battery

Stop 1 minutes, Analysis the charging voltage, to determine whether is full.

### STEP 9 Compensation Charge

Battery capacity will be kept at 95-100% and the battery voltage will be supervised. If necessary, the charger will give an impulse to the battery to keep it completely recharged.

# 10. MAINTENANCE AND TROUBLESHOOTING

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## 10.1 MAINTENANCE

Regular inspection and cleaning reduces the necessity for maintenance operations and will keep your tool in good working condition.

The motor must be correctly ventilated during tool operation. Avoid blocking the air inlets and vacuum the ventilation slots regularly.

## 10.2 TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy
Equipment does not charge up	1. Charger clamps connected incorrectly.	1. Connect the red clamp to the positive pole and the back clamp to the bodywork.
	2. Contact between the charger clamps	2. Prevent contact.
	3. Battery defective	3. Have the battery checked by an expert and replace it if necessary.

**Note:** If the battery to be charged has fallen below 2 volts, the battery cannot be recharged with this charger.

# 11. EXPLANATION OF SYMBOLS

## 11.1 EXPLANATION OF SYMBOLS



Read the instruction manual.



Do not abandon into the environment.



Keep out of the reach of children.



Warning!



Do not incinerate or throw onto fire.



For indoor use only.  
Do not expose to rain.



Short-circuit-proof safety isolating transformer.



Fuse protective device.



Polarity indication.



Rated voltage.



Class II construction  
(Double insulated).



WEEE –  
Waste Electrical & Electronic Equipment.  
Do not dispose of Waste Electrical & Electronic  
Equipment in with domestic rubbish.

# 12. DISPOSAL

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## 12.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not dispose of WEEE\* as unsorted municipal waste.



\* *Waste Electrical & Electronic Equipment.*





# CONTACTS

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**Service/Warranty Repair Agent:**

**For after sales servicing or warranty repairs, please contact the  
Draper Tools Help Line for details of an agent in your local area.**

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