

AlcaPower®

SX-2 702911

SMART BATTERY CHARGER FOR 12V, 24V LEAD BATTERIES AND 12.8V LiFePO4 BATTERIES

ENGLISH



User Manual



www.alcapower.com



INTRODUCTION

Thank you for choosing an AlcaPower product. You can be sure that the product you have purchased is one of the best that is currently available on the market. Before using the product, please read this manual very carefully and keep it for further reference.

AlcaPower SX-2 is an intelligent, multi-step battery charger equipped with a microcontroller that allows you to manage the charging and maintenance of lead-acid batteries (WET, AGM, and GEL) with nominal voltage of 12V or 24V. Furthermore, thanks to the dedicated mode, it can charge 12.8V LiFePO4 batteries up to a maximum of 80Ah.

SAFETY WARNINGS

 **CAUTION** This battery charger was designed for rechargeable lead-acid batteries of 12 and 24 volt rated voltage and 12.8V LiFePO4 rechargeable batteries. Do not use it to power electrical/electronic systems and devices except those specifically designed to be powered by a battery charger. **If not used for other purposes, it could cause explosions or damages of various kinds and severity.**

 **CAUTION DO NOT ATTEMPT TO CHARGE NON-RECHARGEABLE BATTERIES.**

- **Do not operate** this charger if one or more parts are damaged. Failure to follow this warning could result in serious injury or death, or damage to the battery charger and other property.
- Do not use the charger to recharge non-rechargeable batteries. They could explode and cause serious damage to people, property and the surrounding environment.
- Do not recharge a frozen battery.
- Do not recharge a damaged battery.
- Do not use the charger if it appears to be damaged or faulty. Take it to the seller's technical assistance service for inspection and/or repair.
- Do not disassemble the charger, this could cause electric shock or fire. Position the charger as far away from the battery as the length of the cables allows.
- Never place the battery charger on top of the battery being charged, the gases from the battery could corrode its parts, cause damage of various types and severity or fire.
- During charging operations, always use protective glasses, gloves, protective clothing and keep your face away from the battery.
- Remove all metal objects such as rings, bracelets, necklaces, watches, etc. when working with a lead acid or LiFePO4 battery. A lead-acid or LiFePO4 battery can produce a short-circuit current high enough to melt these metal objects, causing serious burns or other damage of varying nature and severity.
- **Risk of explosion!** A charging battery can emit explosive gases. Avoid smoking, creating sparks or flames near the battery. Explosive and flammable substances, such as petrol or thinners, should not be kept near the charger or battery.
- Disconnect the charger from the mains before making or disconnecting connections to the battery.
- Connect the charger to the battery appropriately. First connect the pole connected to the car chassis, then connect the other pole of the battery and keep the cables away from the fuel pipes.
- Pay attention to the polarity of the connections between the battery and the charger. The connector to be fixed to the positive pole is the red one and cannot be connected to the negative pole. The negative pole must be connected to the black connector of the battery charger.
- Do not cover the charger while charging.
- After charging, disconnect the charger from the power supply.
- Charging should be stopped immediately if the battery feels too hot, leaks or gives off a bad smell.
- In the event of malfunction or damage, immediately unplug the charger from the power outlet.
- Do not use the vehicle while charging the battery installed on board the vehicle, the engine must be kept off.

- While charging, the battery should be placed in a well-ventilated area.
- **Chemical burn hazard!** Battery acid is highly corrosive. If your skin or eyes come into contact with the acid, immediately rinse the affected areas with cold running water and consult a doctor promptly.
- This charger is not intended for use by people (including children) with reduced physical, sensory or cognitive capabilities.
- Keep out of reach of children.
- Make sure the charger enters maintenance charging mode before leaving it connected for a long time.
- Periodically monitor the charger when it is operating and connected to a battery.



DISPOSAL. The crossed dustbin symbol reported on the product indicates that, at the end of its useful life, the product must be collected separately from other waste. Therefore, the end-user must deliver the product to the collection centers for electric and electronic waste (WEEE). Alternatively, the product can be returned to the retailer shop when buying a new product of the same type, in a ratio of one to one, or one to zero for products having external dimension no more than 25cm. A separate collection guarantees the recovery and reuse of the materials used in manufacturing the product, contributes to the respect of the environment and the protection of health by preventing pollution and reducing the need for raw materials.

702911 SX-2

AlcaPower declares under its own responsibility that this product meets the essential requirements of the European Directive 2014/53/EU (RED - Radio Equipment Directive). To receive a copy of the declaration of conformity, contact the manufacturer at: www.alcapower.com.

Milan, January 27, 2025

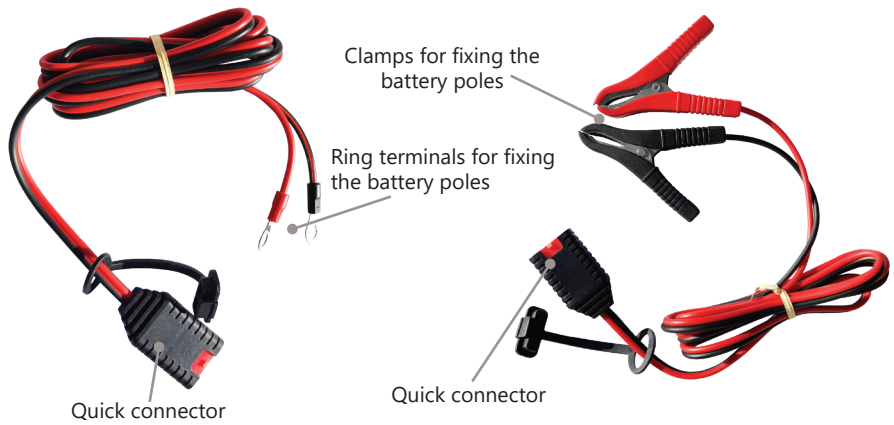
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INCLUDED ACCESSORIES

CONNECTION CABLE WITH RING TERMINALS CONNECTION CABLE WITH ALLIGATOR CLAMPS



OPTIONAL ACCESSORY

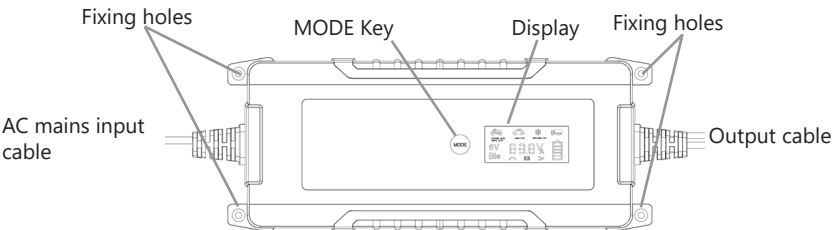
3 outputs switching HUB to connect up to 3 batteries.

Product code: 702909

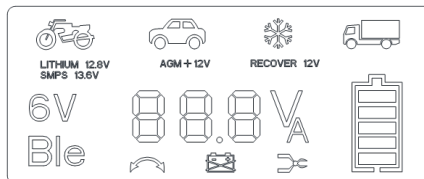
Product name: SX-HUB

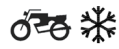


INDICATIONS AND CONTROLS LAYOUT



- **MODE Key:** allows to select the different operating modes.
NOTE: if the battery voltage is lower than 3.7V, the key does not allow any selection.
- **DISPLAY indications:**



Item	Indication
	Flashing: battery not connected.
	Error: indicates that an anomaly has occurred, therefore any charging process is suspended. It may be caused by the following reasons: 1. Timer > 10 ore at step 2-3 (Recovery+soft start) 2. In Recover 12V: if battery voltage <12V after 4 hours 3. Timer>15hours at Lithium Bulk charge. 4. Total Timer>50hours at Pb battery modes. 5. Battery voltage lower than 1~2V or higher than 28V. Note: old and sulfated batteries, in which the phenomenon of stratification of the electrolyte has occurred, or batteries unused for a long time, can generate error messages for no apparent reason.
	Flashing: battery connected in reverse polarity.
	State of charge of the battery: Flashing with different no. of bars, 5 steady bars means fully charged.
	Mode selected: 12V Lead acid battery (regular capacity)
	Mode selected: Cold/AGM 12V Lead acid battery (regular capacity)
	Mode selected: 12V Small
	Mode selected: 12V Small Cold/AGM
	Mode selected: 24V Lead acid battery
	Mode selected: Cold/AGM 24V Lead acid battery
LITHIUM 12.8V	Mode selected: Lithium iron phosphate (LiFePO4) 12.8V battery
AGM + 12V	Mode selected: AGM+ battery
RECOVER 12V	Mode selected: Recover 12V Lead acid battery
SMPS 13.6V	Mode selected: Power supply 13.6V 5A

PRELIMINARY OPERATIONS

- Choose a properly ventilated place, in which there are no easily flammable substances or objects.
- Clean the poles of the battery you intend to charge, taking care not to short-circuit them.
- If the battery is installed inside a vehicle, observe the instructions given by the vehicle manufacturer.
- Connect the SX-2 battery charger to the AC mains socket. All the display icons will flash twice, then only the battery voltage number remain lit, to indicate that the battery charger is in Standby.

- Connect the SX-2 charger to the battery:

Using the alligator clips cable:

1. Insert the cable quick connector on the corresponding connector on the output cable of the SX-2 battery charger.
2. Connect the black clamp to the negative terminal - of the battery.
3. Connect the red clamp to the positive + terminal of the battery.

Using the ring terminals cable:

1. Insert the cable quick connector on the corresponding connector on the output cable of the SX-2 battery charger.
2. Connect the black ring terminal to the negative terminal - of the battery.
3. Connect the red ring terminal to the positive + terminal of the battery.

- Press the MODE button to select the charging mode, then the battery charger starts a test phase during which it identifies the battery voltage and checks whether the battery can be recharged safely.
- If the battery can be charged, the SX-2 starts charging the battery. The charging bars on the display turn on in sequence. The charger continues the charging process according to the previously selected mode until the battery is fully charged.
- Once the battery has reached its full charge, all the bars on the display are steady. This means that the battery is ready for use and the charger has started the maintenance phase.

 CAUTION

Note: before leaving the SX-2 battery charger unattended for a long time, make sure that at the end of the test phase it has detected the exact voltage of the battery you intend to recharge and has started the charge maintenance phase, in case the battery is already fully charged.

Note: SX-2 is equipped with memory function. If the AC mains goes out, when it returns, the SX-2 will start charging the battery again from the last mode selected. The memory function is not available for Special modes.

Caution: before starting to charge a battery, make sure that the charging mode set on the battery charger is suitable for the battery connected to it! If this warning is not observed, there is a risk of damage to property and people!

BATTERY CHARGING MODES

To select the charging mode, press the MODE button until the corresponding icon lights up on the display.

12V Mode

This mode allows charging of 12V nominal voltage lead-acid batteries. Once the battery is connected to the charger, the latter automatically detects the voltage. If the voltage is between 3.7V~14V, the charger starts the 12V mode and charges the battery.

There are four different charging modes for 12V lead acid batteries:

- **STANDARD:** this mode is recommended for 12V lead-acid batteries, with capacity range between 18Ah and 240Ah. The maximum charging current is 10A.
- **STANDARD COLD/AGM:** this mode is recommended for 12V AGM batteries and for cold environment (below 10°C). For battery with capacity between 18Ah and 240Ah. The maximum charging current is 10A.
- **SMALL:** this mode is recommended for 12V lead-acid batteries, with capacity range between 4Ah and 18Ah. The maximum charging current is 1.5A.
- **SMALL COLD/AGM:** this mode is recommended for 12V AGM batteries and for cold environment (below 10°C). For battery with capacity range between 4Ah and 18Ah. The maximum charging current is 1.5A.

24V Mode

This mode allows charging of 24V nominal voltage lead-acid batteries. Once the battery is connected to the charger, the latter automatically detects the voltage. If the voltage is between 14V~28V, the charger starts the 24V mode and charges the battery.

There are two different charging modes for 24V lead acid batteries:

- **NORMAL:** this mode is recommended for 24V lead-acid batteries, with capacity range between 10Ah and 120Ah. The maximum charging current is 5A.
- **COLD/AGM:** this mode is recommended for 24V AGM batteries and for cold environment (below 10°C). For battery with capacity between 10Ah and 120Ah. The maximum charging current is 5A.

Special Modes – For Expert users –

To select a special mode, hold down the MODE key for 3 seconds, then press it briefly several times until the desired mode is selected on the display.

- **LITHIUM:** this mode is specifically designed for charging LiFePO4 batteries with nominal voltage of 12.8V (4-cells), with capacities between 10Ah~80Ah. If the battery voltage is between 11.6V~13.8V, the charger starts charging the battery with a maximum current of 5A.
Safety warning: use SX-2 exclusively to charge LiFePO4 batteries equipped with BMS (Battery Management System) protection circuit.
- **AGM+ 12V:** This mode uses a specific charging process for AGM batteries with 15V end-of-charge voltage, such as lead-calcium AGM batteries. Please consult the technical datasheet of your battery before using this mode.
- **RECOVER 12V:** with this mode it is possible to attempt recovery of 12V lead batteries that are old, sulfated and in which the electrolyte stratification phenomenon has occurred, or batteries unused for long time. Battery voltage must be between 3.7V~14V to select this mode.
Note: this mode must not be used with LiFePO4 batteries. Use this charging mode only with 12V lead-acid batteries. It is not available for 24V batteries.
Note: the success of the battery recovery depends exclusively on the state of the battery: **it is not possible to recover every battery!**
- **SMPS 13.6V:** this mode turns the SX-2 into a 13.6V 5A power supply, so it can power small loads. For example, after activating this mode, you can connect the SX-2 output to the terminals of a car battery, to always keep powered on the car ECUs. To enter this mode, press the mode button for 3 seconds without any battery connected to the output of the SX-2. This mode also allows you to reactivate a LiFePO4 battery in deep discharge protection.
CAUTION: When POWER SUPPLY mode is active, output short circuit protection is not active!

CHARGER CONTROL USING THE APP

- The SX-2 battery charger can be managed via App on Apple iOS 8.0 or later systems and Android 4.4 or later systems.
- To install the App search for “AP charger 2.0” in the App Store or Google Play.



Use of the App

1. Open the App, tap on the icon + in the top right corner of the main screen to add the device (battery charger) to manage.
2. Tap the “My Device” icon in the center of the screen to enter the page where the list of added devices is located and select the one you want to manage.

Note: through the App “AP charger 2.0” it is also possible to manage the optional 3-output switching hub “SX-HUB”.

Steps data for 12V STANDARD modes

	Max time	STANDARD	STANDARD COLD / AGM
1. Diagnosis	3 seconds	Check battery: If Vbat is between 3.7~12.0V go to next step. If Vbat is between 12.0-14.0V jump to bulk step. If Vbat>14.0V, this mode is not available.	
2. Recovery	10 hours	If Vbat is between 3.7V~10.5V, starts a 5A current pulses charge. If in 10 hours the battery does not exceed 10.5V it goes in Error mode.	
3. Soft start		See "SPECIAL FUNCTIONS" section.	
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 10A until voltage reach 12.8V.	
5. Bulk 2		Charging current equal to 7.5A until voltage reach 13.8V.	
6. Bulk 3		Charging current equal to 5A until voltage reach 14.1V.	
7. Bulk 4		Charging current equal to 3.7A until voltage reach 14.4V. Break 5 sec. then go to next step.	Charging current equal to 3.7A until voltage reach 14.7V. Break 5 sec. then go to next step.
8. Absorption	10 hours	Charging current equal to 1.5A until voltage reach 14.4V. Go to next step after 10 hrs.	Charging current equal to 1.5A until voltage reach 14.7V. Go to next step after 10 hrs.
9. Trickle	Break time + 10hours. Break time: (25-charge hours) if charging hour < 10 hours; otherwise, 6 hours	After Break time, if Vbat drop to 13.1V then charging with 80mA max. until Vbat is 14.7V max. Timer=10 hrs stop Trickle after break.	
10. Maintenance	It depends on voltage	If Vbat drop to 12.8V charging with 1.5A until 13.6V then go to trickle charge. If Vbat <12.8V at maintenance, restart charge.	

Steps data for 12V SMALL modes

	Max time	SMALL	SMALL COLD / AGM
1. Diagnosis	3 seconds	Check battery: If Vbat is between 3.7-12.0V go to next step. If Vbat is between 12.0-14.0V jump to bulk step. If Vbat>14.0V, this mode is not available.	
2. Recovery	10 hours	If Vbat is between 3.7V~10.5V, starts a 1.5A current pulses charge. If in 10 hours the battery does not exceed 10.5V it goes in Error mode.	
3. Soft start		See "SPECIAL FUNCTIONS" section.	
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 1.5A until voltage reach 12.8V.	
5. Bulk 2		Charging current equal to 1.5A until voltage reach 13.8V.	
6. Bulk 3		Charging current equal to 1.5A until voltage reach 14.1V.	
7. Bulk 4		Charging current equal to 1.5A until voltage reach 14.4V. Break 5 sec. then go to next step.	Charging current equal to 1.5A until voltage reach 14.7V. Break 5 sec. then go to next step.
8. Absorption	10 hours	Charging current equal to 1.5A until voltage reach 14.4V. Go to next step after 10 hrs.	Charging current equal to 1.5A until voltage reach 14.7V. Go to next step after 10 hrs.
9. Trickle	Break time + 10hours. Break time: (25-charge hours) if charging hour < 10 hours; otherwise, 6 hours	After Break time, if Vbat drop to 13.1V then charging with 80mA max. until Vbat is 14.7V max. Timer=10 hrs stop Trickle after break.	
10. Maintenance	It depends on voltage	If Vbat drop to 12.8V charging with 1.5A until 13.6V then go to trickle charge. If Vbat <12.8V at maintenance, restart charge.	

Steps data for 24V modes

	Max time	24V	24V COLD / AGM
1. Diagnosis	3 seconds	Check battery: If Vbat is between 14.0-24.0V go to next step. If Vbat is between 24.0-28.0V jump to bulk step. If Vbat>28.0V, goes in Error.	
2. Recovery	10 hours	If Vbat is between 14.0V~21.0V, starts a 2A current pulses charge. If in 10 hours the battery does not exceed 21.0V it goes in Error.	
3. Soft start		See "SPECIAL FUNCTIONS" section.	
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 5A until voltage reach 25.6V.	
5. Bulk 2		Charging current equal to 3.7A until voltage reach 27.6V.	
6. Bulk 3		Charging current equal to 2.5A until voltage reach 28.2V.	
7. Bulk 4		Charging current equal to 1.5A until voltage reach 28.8V. Break 5 sec. then go to next step.	Charging current equal to 1.5A until voltage reach 29.4V. Break 5 sec. then go to next step.
8. Absorption	10 hours	Charging current equal to 0.9A until voltage reach 28.8V. Go to next step after 10 hrs.	Charging current equal to 0.9A until voltage reach 29.4V. Go to next step after 10 hrs.
9. Trickle	Break time + 10hours. Break time: (25-charge hours) if charging hour < 10 hours; otherwise, 6 hours	After Break time, if Vbat drop to 26.2V then charging with 80mA max. until Vbat is 29.4V max. Timer=10 hrs stop Trickle after break.	
10. Maintenance	It depends on voltage	If Vbat drop to 25.6V charging with 0.9A until 27.2V then go to trickle charge. If Vbat <25.6V at maintenance, restart charge.	

Steps data for AGM+ 12V

	Max time	AGM+ 12V
1. Diagnosis	3 seconds	Check battery: If Vbat is between 3.7-12.0V go to next step. If Vbat is between 12.0-14.0V jump to bulk step. If Vbat>14.0V, this mode is not available.
2. Recovery	10 hours	If Vbat is between 3.7V~10.5V, starts a 5A current pulses charge. If in 10 hours the battery does not exceed 10.5V it goes in Error mode.
3. Soft start		See " SPECIAL FUNCTIONS " section.
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 10A until voltage reach 12.8V.
5. Bulk 2		Charging current equal to 7.5A until voltage reach 13.8V.
6. Bulk 3		Charging current equal to 5A until voltage reach 14.1V.
7. Bulk 4		Charging current equal to 3.7A until voltage reach 14.7V. Break 5 sec. then go to next step.
8. Absorption	10 hours	Charging current equal to 1.5A until voltage reach 15.0V. Go to next step after 10 hrs.
9. Trickle	Break time + 10hours. Break time: (25-charge hours) if charging hour < 10 hours; otherwise, 6 hours	After Break time, if Vbat drop to 13.1V then 1.5A pulse charge until Vbat is 15.0V max. Timer=10 hrs stop charge after break.
10. Maintenance	It depends on voltage.	If Vbat drop to 12.8V charging with 1.5A until 13.6V then go to trickle charge. If Vbat <12.8V at maintenance, restart charge.

Steps data for RECOVER 12V

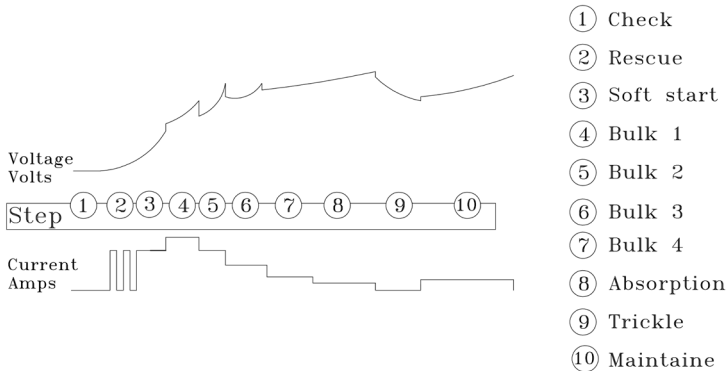
	Max time	RECOVER 12V
1. Diagnosis	3 seconds	1. If Vbat is between 3.7V~14.0V, pulse charge 16V 2A for 1 hour without detection then go to next step: 2. If Vbat is not >15V, keep charging as step above for another 3 hours; If Vbat>15V, stop charging; if Vbat is between 12.0~15.0V go to step 4; if Vbat <12V, stop charging and goes in Error.
2. Recovery	10 hours	
3. Soft start		
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 5A until voltage reach 12.8V.
5. Bulk 2		Charging current equal to 3.7A until voltage reach 13.8V.
6. Bulk 3		Charging current equal to 2.5A until voltage reach 14.1V.
7. Bulk 4		Charging current equal to 1.5A until voltage reach 14.7V. Break 5 sec. then go to next step.
8. Absorption	10 hours	Charging current equal to 0.9A until voltage reach 14.7V. Go to next step after 10 hrs.
9. Trickle	Break time + 10hours. Break time: (25-charge hours) if charging hour < 10 hours; otherwise, 6 hours	After Break time, if Vbat drop to 13.1V then charging with 80mA max. until Vbat is 14.7V max. Timer=10 hrs stop Trickle after break.
10. Maintenance	It depends on voltage	If Vbat drop to 12.8V charging with 1.5A until 13.6V then go to trickle charge. If Vbat <12.8V at maintenance, restart charge.

Steps data for LITHIUM 12.8V

	Max time	LITHIUM 12.8V
1. Diagnosis	3 seconds	0V charge enable(*), after that, if Vbat is out of 11.6-13.8V, this mode is not available
2. Recovery	N/A	N/A
3. Soft start		
4. Bulk 1	40 hours, after which it goes in Error mode	Charging current equal to 5A until voltage reach 13.8V.
5. Bulk 2		Charging current equal to 3.7A until voltage reach 14.1V.
6. Bulk 3		N/A
7. Bulk 4		
8. Absorption	10 hours	Charging current equal to 1.5A until voltage reach 14.5V. Full charged after 10 hrs.
9. Trickle	N/A	N/A
10. Maintenance		

(*) See Table **TECHNICAL SPECIFICATIONS**.

CHARGING STEPS GRAPH



The diagram above represents in a generic way the various steps of charging a battery. Thanks to its microcontroller, SX-2 self-regulates these steps based on the characteristics of the battery.

SPECIAL FUNCTIONS

Memory Function.

SX-2 battery charger remembers the last charge mode if power off. In the event that the AC mains goes out, when it returns, the SX-2 will return to charging the battery according to the previously set mode (provided that the detected battery voltage is consistent with the last mode set, otherwise it returns to Stand-by). The memory function is not available for Special Modes.

Caution: before starting to charge a battery, make sure that the selected charging mode is suitable for the battery connected to battery charger! If this warning is not observed, there is a risk of damage to things or people!

Soft Start.

To start the charging process, the SX-2 will supply an increasing voltage and current to the battery.

Break time / Verification and Maintenance.

This function allows to ensure that the battery can hold all the stored energy (capacity check). Following this, before starting the maintenance phase, the battery charger starts a verification phase (Trickle) whose duration is influenced by the total charge time of the battery, but never less than 6 hours.

TECHNICAL SPECIFICATIONS

Input voltage	220-240 V AC - 50Hz - 1.5A	
Standby power	<2W	
Reverse current	<10mA	
Max. charge current	Lead acid 12V batteries	10A
	AGM+ 12V batteries	
	Lead acid 24V batteries	5A
	LiFePO4 12.8V batteries	
	Power supply mode	
	Lead acid SMALL mode	1.5A
End of charge voltage for NORMAL mode	Lead acid 12V batteries	14.4V
	Lead acid 24V batteries	28.8V
End of charge voltage for COLD/AGM mode	Lead acid 12V batteries	14.7V
	Lead acid 24V batteries	29.4V
End of charge voltage for LiFePO4 12.8V batteries		14.5V
Supported batteries	Wet, AGM, GEL and LiFePO4	
Charge Control Type	Constant current (CC)	
Battery sensing voltage	Lead acid 12V batteries	3.7V~14V
	Lead acid 24V batteries	14V~28V
	LiFePO4 12.8V batteries	11.6V~13.8V
Suggested capacity(*)	Lead acid 12V batteries	4Ah~240Ah
	Lead acid 24V batteries	10Ah~120Ah
	LiFePO4 12.8V batteries	10Ah~80Ah
Protections	Short-circuit, reverse polarity (> 1.5V), high battery voltage, high temperature, safety timer (max. 50 hours).	
0V battery enable	16.5V 120mA pulse at stand-by mode (Vbat< 2.0V).	
Operating temperature range	0°C ~ 40°C	
Storage temperature	-30°C ~ 60°C	
IP rating	IP65	
Safety class	Class II	
Cables length	AC input: 180 cm	Output: 150 cm
Accessory cables length	40 cm	
Dimensions	260.7x107.2x65.6mm	
Weight (accessories not included)	1075g	

(*) if you connect a battery with a higher capacity than the recommended, SX-2 will charge it anyway , but the charge time may take unpredictably long.

⚠ WARNINGS ⚠	
Electricity is a source of danger. Before using this product, make sure that the use of the same complies with current legal provisions to safeguard your own health and safety as well as that of others. Therefore, it is necessary to use the product in accordance with current regulations, standards and provisions to safeguard your own health and safety, by following the instructions, fully complying with the conditions prescribed in this manual.	Untrained, unaware individuals and minors It is strictly forbidden to allow children, individuals who have not been appropriately informed and non self-sufficient people to use the product without the supervision of an adult who is aware of how to properly use such equipment. It is forbidden to use the product for any other purpose other than that specified in the instructions, or that may go beyond its intended use that could prove to be a source of danger.
Foreseeable or unforeseeable misuse Any use of this product other than that specified in the instructions, or which goes beyond the designated use, is considered as non-compliant. Therefore, it is deemed as incompatible, improper, unforeseeable misuse and for such reasons, this conduct brings about a high level of danger. Consequently, with immediate effect, AlcaPower shall not be held responsible in any way whatsoever for damage caused by means of the abovementioned conduct.	Exemption from liability Under no circumstances whatsoever shall AlcaPower Distribuzione Srl be held responsible in the following cases: • If the product is not used properly. • If the safety standards and regulations are not complied with. • If improper and reasonably foreseen uses of the product is not considered. • If the assembly procedure and/or electrical connection are not carried out properly. • If the correct operation of the product is not regularly inspected. • If repairs and/or modifications are made to the product that alter its integrity.
Serious damage or injuries! In the event of incorrect or inappropriate electrical connections! Electrical connections must be carried out by paying particular attention, in accordance with standards and regulations to safeguard your own health and safety.	
Serious accidents in case of the selection of functions and operations! • Despite the safety protections present on the product, check that operations caused by the incorrect selection of functions are not carried out. • Select the functions so that the safety protections can act in accordance with safety standards. • Select the functions as described in the instructions. • Any connection to other equipment must be monitored to guarantee the utmost level of safety.	An error may cause high risk situations! Before, during and after use: cables, plugs and connectors must be carefully checked to avoid a short circuit and to make sure that they are intact and have no bare wires or parts that are even partially damaged.
	Pay attention to the environment in which you are working! Hazardous situations may be caused by the people, animals or materials present in the surrounding environment in which you are using the product. Humidity, gas, vapours, fumes, liquids, noise, vibrations, high temperatures, possible falling of materials, and explosive atmospheres.
Inadvertent product start-up and/or interruption! Hazardous situations may arise following inadvertent and sudden start-ups or interruptions of the operational functions of the product. Carry out inspections and check prior to starting up or interrupting the operational functions of the product.	Abnormal operational functions! In the event of abnormal operational functions of the product, it is necessary to promptly interrupt the operation of the product. See the instructions in the product-specific user manual.
Warranty: this product is covered by a warranty under the terms of the current applicable law. In case of need, contact the sales outlet where you bought the product.	MADE IN P.R.C. AlcaPower Distribuzione Srl, Corso di Porta Vittoria 18- 20122 Milano, IT. Tax Code and VAT 02237430034
Note: All pictures shown in this manual are for illustration purpose only, are not contractual and may differ from the actual product. Note: AlcaPower Distribuzione Srl reserves the right to make changes to this manual without prior notice and liability.	