



INSTRUCTION MANUAL



Model: SPI 16 PRO

The new SPI Pro series of electronic battery chargers has been designed to charge all kinds of lead-acid, traditional or latest generation batteries and LiFePO4 lithium batteries. These chargers are particularly suitable for daily use and for long-lasting maintenance charges.

All charging parameters are set using the charging function keys on the control panel. Depending on the model, you can set:

- battery type (std: wet or gel, AGM: efb, start & stop or spiral, lithium: LiFePO4)
- charging current according to battery capacity
- the charging voltage according to the battery voltage
- the duty cycle to be carried out: slow, medium and fast charge; deep recovery charge, show room function and power supply as a replacement to the battery.

Battery state diagnosis stage A1	The charger state of charge of the battery to be charged.
Charging phase: "Recovery from deep discharge"	The charger starts using a pulse current until the battery has reached optimal voltage and current levels to start the second charging phase.
Charging phase: " soft I"	Reduced constant current charge
Charging phase : " I"	Charge at constant current until the maximum battery voltage is reached.
Charging phase : " U0"	Charge at stabilized voltage until the current reaches minimum values.
Charging phase : " Recovery" *	Only with charger set on RECON: constant current deep charge phase and increasing voltage to increase battery charging capacity.
Diagnosis of battery status: "A2"	The charger analyzes the state of efficiency of the charged battery.
Charging phase: " U"	The battery charge status is maintained at a reduced constant voltage.
Charging phase: " Up"	The battery charge is maintained with pulses of current (provided constantly).

- * RECOVERY function (RECON): this charging mode allows you to recover wet 12volt batteries that have been inactive for a long time and have acid stratification. This function acts physically on the electrolytic solution of the battery so that it mixes again counteracting the stratification.
- SHOW ROOM function: the chargers are equipped with the show room function. This function allows for operation of all the vehicel utilities during demonstrations in the dealership. (Only in 12V mode)
- SUPPLY function: the chargers are equipped with the supply function (power supply). This function allows you to keep the memory of a vehicle active during battery changes or in all cases where the battery is disconnected from the vehicle circuit. (Only in 12V mode)
- For battery analysis and error reporting the chargers have been designed to analyze the battery status before and during charging and report any anomalies in connection between the charger and the battery to be charged. Through the digital display an error code is displayed, so as to quickly and easily verify the anomaly that has occurred.

WARNING

- The charger is intended for charging lead acid and lithium (LiFePO4) batteries. Do not use for other purposes. Do not charge non-rechargeable batteries. Do not charge frozen batteries.
- This appliance should not be used by persons (including children - under 8 years of age) with reduced physical, sensory or mental capabilities, or without sufficient knowledge and experience, unless they are supervised and have received adequate instructions.
- Keep away from children. This appliance should not be used as a toy.
- Always wear protective goggles and protect your face from the battery during connection and disconnection.
- Explosive gases may be emitted when charging the battery, so avoid sparks or flames and do not smoke.
- Charge in properly ventilated and dry environments: do not expose to rain or snow.
- Make sure that the charger is disconnected from the mains before connecting, or disconnecting, the charging cables to the battery.
- When charging never place the charger over the battery.
- The liquid inside the batteries is corrosive, if there is accidental contact of the acid with the skin or eyes rinse immediately with water and seek medical advice.
- The improper use of the charger, or the tampering of the electronic circuit inside the device, will void the warranty.
- In case of damage, the power cord of the appliance must be replaced by authorized technicians, since intervention requires the use of special tools.
- Repair or maintenance of the appliance must be carried out only by qualified personnel.
- Use the charger only after carefully reading the instruction manual.

CHARGING

Charging batteries connected to the vehicle

1. Before starting ensure that the power cord is disconnected from the mains socket.
2. Locate the vehicles main earth point; generally connected to the negative terminal of the battery.
3. Connect the output lead with red clamp to the positive (+) pole of the battery.
4. Connect the output lead with black clamp to the ground of the vehicle, away from the battery and any fuel lines.
5. Use of eyelet terminals.
 - Connect the black eyelet output lead to the negative (-) terminal of the battery.
 - Connect the red eyelet output wire to the positive (+) terminal of the battery.
 - Ensure that the two eyelets are properly secured to the battery terminals by ensuring optimal electrical contact.
 - Secure the connector end and cable run with cable ties at a point in the vehicle away from the fuel line (do not use metal clamps or other material that could damage the output cable).

Charging batteries not connected to a vehicle











1. Before starting ensure that the power cord is disconnected from the mains socket.

2. Connect the output conductor with red clamps to the positive (+) pole of the battery.
3. Connect the output conductor with black clamps to the negative (-) pole of the battery.
4. **Caution:** ensure that both clamps have adequate contact with the battery terminals.

HOW TO USE THE BATTERY CHARGER





1. Once the output clamps have been connected to the battery, connect the power cord to the mains socket, making sure that the voltage corresponds to the rated voltage of the charger.
2. With the charger in “stand-by” mode, set the appropriate charge parameters using the mode button to select the correct voltage.

For **12V batteries** the following charging parameters can be selected via the “Function” button:

4A		For charging 12V 5Ah to 80Ah batteries Maintenance for 12V 5Ah to 120Ah batteries Suitable for charging WET and Gel batteries
8A		For charging 12V 50Ah to 160Ah batteries Maintenance for 12V 50Ah to 250Ah batteries Suitable for charging WET and Gel batteries
16A		For charging 12V 90Ah to 360Ah batteries Maintenance for 12V 90Ah to 550Ah batteries Suitable for charging WET and Gel batteries
4A		For charging 12V 5Ah to 80Ah batteries Maintenance for 12V 5Ah to 120Ah batteries Suitable for charging AGM-START&STOP and AGM-SPIRAL and EFB or WET batteries with temperatures below 5C°
8A		For charging 12V 50Ah to 160Ah batteries Maintenance for 12V 50Ah to 250Ah batteries Suitable for charging AGM-START&STOP and AGM-SPIRAL and EFB or WET batteries with temperatures below 5C°
16A		For charging 12V 90Ah to 360Ah batteries Maintenance for 12V 90Ah to 550Ah batteries Suitable for charging AGM-START&STOP and AGM-SPIRAL and EFB or WET batteries with temperatures below 5C°
4A		For charging 12V 5Ah to 80Ah batteries Maintenance for 12V 5Ah to 120Ah batteries Suitable for charging lithium batteries: <u>LiFePO4 (do not charge other types of lithium batteries)</u>
8A		For charging 12V 50Ah to 160Ah batteries Maintenance for 12V 50Ah to 250Ah batteries Suitable for charging lithium batteries: <u>LiFePO4 (do not charge other types of lithium batteries)</u>
16A		For charging 12V 90Ah to 360Ah batteries Maintenance for 12V 90Ah to 550Ah batteries Suitable for charging lithium batteries: <u>LiFePO4 (do not charge other types of lithium batteries)</u>
		Lithium batteries are equipped with a BMS that in some cases can prevent the start of the charging cycle; in this scenario to activate the charge process Press and hold the “Function” button for 5 seconds, after setting the charger in lithium mode.
RECON 4A-8A-16A AGM		The RECONDITION mode is for WET and AGM batteries that have long been inactive and have an acid stratification. Caution: due to the high voltage that is reached during this charging cycle, recovery must be carried out with battery removed from the vehicle. A battery recovery connected to the vehicle could cause damage to the on-board electronics. (Only in 12V mode)


After selecting the appropriate 12volt function the charging process starts automatically after 5 seconds.

For **24V batteries** the following charging parameters can be selected via the "Function" button:



4A		For charging 24V 5Ah to 80Ah batteries Maintenance for 24V 5Ah to 120Ah batteries Suitable for charging WET and Gel batteries
8A		For charging 24V 50Ah to 160Ah batteries Maintenance for 24V 50Ah to 250Ah batteries Suitable for charging WET and Gel batteries
4A		For charging 24V 5Ah to 80Ah batteries Maintenance for 24V 5Ah to 120Ah batteries Suitable for charging AGM-START&STOP and AGM-SPIRAL and EFB batteries
8A		For charging 24V 50Ah to 160Ah batteries Maintenance for 24V 50Ah to 250Ah batteries Suitable for charging AGM-START&STOP and AGM-SPIRAL and EFB batteries

After selecting the appropriate 24volt function the charging process starts automatically after 5 seconds.

Additional battery charger functionality can be selected using the mode button as follows.

SHOW ROOM	SHOW ROOM function: 13.8 V. This function keeps vehicle accessories in operation during demonstrations in the dealership by supporting the connected vehicle battery. (Only in 12V mode)
SUPPLY 	POWER SUPPLY function: 14.0 V. Press and hold the "Mode " key for 5 sec to activate this function. This function allows you to keep the memory of a vehicle active during battery changes or in all cases where the battery is disconnected from the vehicle circuit. (Only in Mode 12V) Warning: in this function the charger is not protected against reverse polarization. RISK OF DAMAGE!

Charging reports:

	Battery charging. Green LED flashing.
	The battery is 100% charged, from this moment the charger enters the maintenance phase and will constantly monitor the state of charge of the battery, ensuring that it always remains at an optimal level. Fixed green Led.

INTERRUPTION OF THE CHARGE CYCLE DUE TO LOSS OF AC SUPPLY.

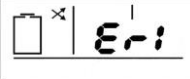
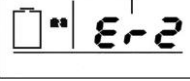
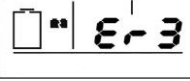
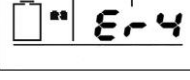
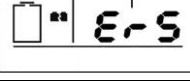
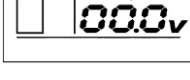
In case of interruptions on the 230V mains line the charger stores the working cycle it was running so that it can automatically resume when the power is returned to the 230 Volt MAINS line. This function is essential in cases where the charger performs charge cycles in the absence of an operator; for example during very long working cycles (maintenance charges) or night cycles (charges for means that need daily charge cycles).

END OF CHARGE

1. Disconnect the power cord of the appliance from the mains socket
2. Disconnect the output conductor with black clamp from the ground of the vehicle or the negative terminal (-) of the battery.
3. Disconnect the output conductor with red clamp from the positive terminal (+) of the battery.

BATTERY ANALYSIS AND ERROR REPORTING

In case of anomaly the charger can report the following indications:

DISPLAY SIGNALING	CAUSE	REMEDY
	The output clamps are improperly connected to the battery. Reverse polarity.	Position the clamps correctly and start the charging process again. (See HOW TO USE THE BATTERY CHARGER)
	Battery with too low voltage. (You are trying to charge a 12Volt battery with charger set to 24V). Battery with too high voltage. (You are trying to charge a 24Volt battery with charger set to 12V).	Check the battery voltage. The battery may be defective. Consult the nearest Battery Service Center.
	Charger in error.	Have the charger checked by the nearest Service Center.
	After a certain period of time the battery is unable to absorb current.	The battery may be defective. Consult the nearest Battery Service Center.
	Battery recovery failed after a full cycle of desulfation.	The battery may be defective. Consult the nearest Battery Service Center.
	Disconnected cables, short circuit cables.	Position the pliers correctly and resume the battery charge; (see paragraph "how to use the charger").
	Battery completely short circuit.	The battery may be defective. Consult the nearest Battery Service Center.

PROTECTION

The chargers are equipped with following safety functions to ensure maximum safety during the use and operation of the device.

- Full protection against sparks
- Short circuit protection
- Voltage compensation
- Overheat protection
- Reverse polarity protection

MAINTENANCE

When not in use the charger should be kept in a dry area. For cleaning the external body of the charger, disconnect the appliance and use a soft cloth.

SPECIFICATIONS

- Input: 230V AC-50Hz
- Output: 12V – 16 Amps / 24V – 8 Amps

WARRANTY TERMS AND CONDITIONS

Schumacher Electric Corporation (the “Manufacturer”) or the resellers authorized by the Manufacturer (the “Reseller”) warrant this Charger (the “Product”) for two (2) years, according to the following stipulations. Any and all warranties, other than the warranty included herein, are hereby expressly disclaimed and excluded to the fullest extent permissible under applicable law. Legislation may imply warranties or conditions or impose obligations on Manufacturer which cannot be excluded, restricted or modified in relation to consumer goods.

Consumer End-User Warranty

Any claims under this warranty must be communicated to Reseller within 2 months after discovery of the non-conformity.

Resellers/Professional End-User Warranty

The Manufacturer provides a limited warranty for hidden defects or non-conformities. This warranty is subject to the following conditions:

- a) The Manufacturer only warrants hidden defects in material or workmanship present in their root cause at the moment of the first sale by the Manufacturer;
- b) Manufacturer’s obligation under this warranty is limited to repairing or replacing the Product with a new or reconditioned unit at the sole option of the Manufacturer;
- c) Manufacturer does not have any warranty obligations if the alleged defects were caused by abnormal usage, fair wear and tear, unauthorized use of the Product or use of the Product differing from the description in the applicable manual or other specifications given by the Manufacturer, insufficient care, repairs carried out by persons or entities or with parts not approved by Manufacturer, poor care, accidents, unauthorized changes or modifications, incorrect transport, storage or treatment of the Product;
- d) In order to exercise this right, the Product must be returned complete and in its original state and packaging, with mail costs prepaid, along with proof of purchase to the Manufacturer or its authorized representatives in order for repair or replacement to occur.

Common Warranty Provisions

The warranty mentioned above only applies to the first professional or consumer user having legally acquired the Product from the Manufacturer or a Reseller. No warranty is extended towards clients, agents or representatives of those buyers.

The Product is sold under the specifications, for the use and purpose in accordance with the provisions of this manual, with express exclusion and disclaimer of warranty of any other specifications, uses and purposes.

Authorized Resellers are prohibited from making any statements or providing any warranty in excess of the above warranties. Non-authorized resellers may only sell the product under the condition that they assume all warranty obligations with the total exclusion of any warranty provided by the Manufacturer.

Manufacturer does not provide any warranty for any accessories used with the Product that are not manufactured by Schumacher Electric Corporation.

This warranty does not exclude or diminish any claims the Manufacturer may have against the distributors of The Product.

THE MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME OR MAKE ANY OTHER OBLIGATION TOWARDS THE PRODUCT OTHER THAN THIS WARRANTY.

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