

CE

KRONOS

H I G H F R E Q U E N C Y



Instructions Manual

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CAREFULLY READ THE FOLLOWING INSTRUCTIONS BEFORE CONNECTING THE DEVICE TO THE MAINS VOLTAGE AND/OR TO THE BATTERY.
ALSO MAKE SURE THAT THE SIZE OF THE DEVICE IS ADEQUATE TO THE BATTERY CONNECTED TO IT.

INTRODUCTION

The battery chargers produced by TCE Group Srl offer many unique features comprehensively described in this manual.

Carefully read these instructions to use the device at its best and avoid potential problems in future.

TCE Group Srl strongly advises to carefully follow all information and advice mentioned to guarantee safe use of the device

The correct utilization of the device will increase its working life and maximize efficiency.

In case of suggestions, advices or error noticed in this manual, your notifications will be very much appreciated to improve the quality of our service.

Thank you for your trust in choosing our product

For further information, technical details, brochures or illustrative material visit our website www.tcechargers.com

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1. SAFETY & RISKS

1.1. Proper use of the product and general suggestions

The product is built by following high qualitative standards to guarantee its reliability and safety.

Every inadequate use of the device can cause:



- Wounds or death to the user and/or to third party
- Damage to the device and/or to other materials or real or personal goods
- Damage to the environment near the device
- Inadequate and inefficient operations compared to the standard working state of the device

The personnel involved with the use of the device must:



- Have a qualification degree in the use of electrical / electronic devices
- Carefully read the manual to understand the proper and correct functioning of the device
- Respect the rules mentioned in this manual
- Use only the correct tools when doing standard maintenance or when repairing a fault on the device

In case of other signs or indication attached to the device for safety reasons, they must:

- Be in a legible and comprehensible state for everyone
- Not to be damaged
- Not to be removed
- Not cover existing signs and/or indication
- Not to be covered with other signs/stickers or painted with paint or color of any kind

The use of the device implies:

- A carefully reading of the manual and follow the instructions
- Perform periodical maintenance to maintain the device in an optimal state
- **ALWAYS** follow the instructions written on the battery from its producer



This device must be used **EXCLUSIVELY** to fulfill its purpose. Every other non-compliant use of the device will be reputed inadequate and will lead to the void of the warranty.

Every damage caused to the device, persons, real and personal property by an inadequate use of the device cannot be accused to the producer.

The device **MUST** be used only in networks with ground connection and with fuse or magnetic protection in the plug..

TCE Group Srl declares that the device has a protection degree **IP21**.

Before the utilization of the device, perform a quick visual inspection to make sure that there is no visual damage that could compromise the correct functioning of its operations.

In case of ascertain damages on the charger or on the safety devices that could compromise its functioning, they must be repaired immediately before starting the charging cycle.

Do not remove, cut off or modify in any way any of the many safety devices installed inside and/or outside the charger.

Before starting a normal charging cycle, also check the battery conditions:



- Make sure that there is no dirt or foreign objects on top of the battery
- Make sure the battery is in good condition
- Make sure that there are no short circuits or faulty cells
- Check the water level of the battery before any charge
- Check the condition of the connectors (make sure that the contacts inside the plug are in optimal condition)

In case of suspected or ascertained damage to the battery or charger, do not start the charging cycle and contact a technician.

1.2. Risks caused by the network and charging current



The wrong utilization of the device can leave the operator open to many risks: for example risks of electrocution or risks of electromagnetic fields that could cause cardiac problems to pacemaker users.

An electric shock can be fatal, to avoid electric shocks during the usage of the device:

- Do not touch any live wire inside the device or directly connected to it
- **NEVER** touch the battery poles connected to the device
- Do not short circuit the cables of the device or the charging plug

All the cables must be checked to make sure that there is no damage, they are insulated and well sized for the device.

Loose cable connection, burn marks, damage of different kind or wrong size must be **IMMEDIATELY** addressed.

1.3. Risks caused by Acid, Gas and toxic vapors



The batteries charged by our device contain acid which can be dangerous for health and can cause serious problems to the eyes and/or the skin in case of direct contact.

In case of direct contact with the acid, use water to wash it away and seek medical advice.

TCE Group Srl advises to always wear personal protection equipment when carrying out maintenance operations to both the battery and chargers.

During the standard operations of the device, gases and vapors are released from the battery which can cause health problems. These gases and vapors are also highly explosive.



The correct use of the device requires the use of a well-ventilated environment to prevent the accumulation of such gases and avoid risks of explosions.

Charging rooms with less than 4% of Hydrogen in the air are reputed safe against explosions caused by gases. Good ventilation provides a safe and reliable working environment for charging operations.



During the charge, TCE Group Srl advises to keep **AT LEAST** a 80cm distance between the charger and the battery and to keep well away from any object that could cause or could be the origin of sparks and/or flames.

To avoid problems or damage caused by gas, vapor or acid, TCE Group Srl suggests:

- Do not remove the charging plug during the charging cycle
- Do not inhale the gas or vapor released by the battery during the charge
- Make sure that the battery being charged is in a well-ventilated area
- Avoid and prevent short circuit in the battery cells
- Do not leave any foreign objects on top of the battery during the charge

1.4. Protecting third parties



While the device is in function, it is advised to keep all non-authorized personnel away from the charger.

In case of any personnel whom have necessity to go near the device during the charging cycle, TCE Group Srl suggests:

- To warn them about the dangers caused by the device while in function (gas, dangers of electrocution and charging currents, electromagnetic fields, etc. etc.)
- Provide the necessary PPE (gloves, helmets, etc. etc.)
- Try to avoid direct contact between the device and non-authorized personnel

1.5. Safety devices

The charger is equipped with many different safety devices to guarantee a reliable and safe use.

The inbuilt safety features ensure good condition of the battery, the charger and of the near environment.

The control card offers safety on the charging cycle, it monitors the different charging phases making sure that the value recorded and read are always inside the range of optimal values for the connected battery.

The fuse installed inside the device offers protection against short circuit and reverse polarity.

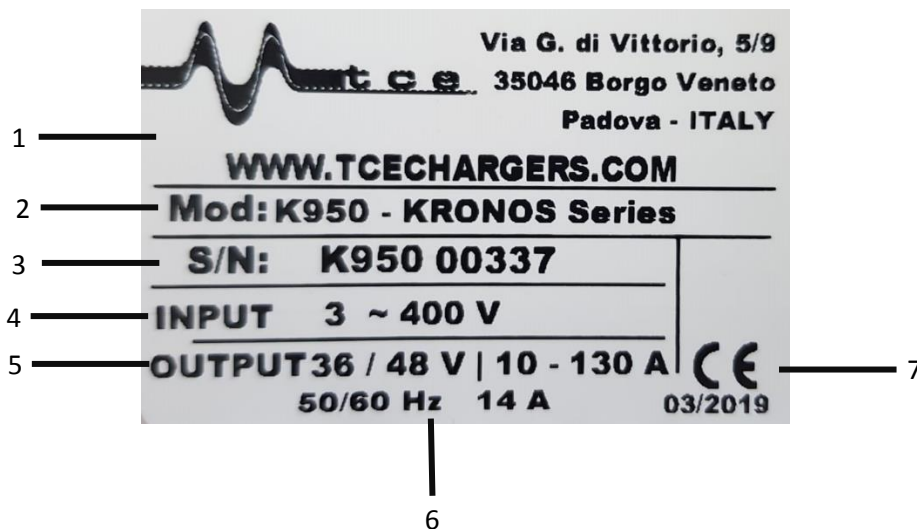
All TCE Group Srl devices have many safety timers to offer reliability during night charges or during the weekends when the battery is left attached to the charger for the equalization cycle.

1.6. Device serial code label

Attached on the side of every device produced by TCE Group Srl there is a label with a unique serial code number belonging to the device and some useful information.

The label is anti-tampering and has the purpose to give information regarding the period of time when the device was produced.

If the label is damaged or tampered with, the warranty will be considered void.



- 1) TCE Group SRL contacts
- 2) Charger model
- 3) Serial number
- 4) Power supply information
- 5) Output voltage/current information
- 6) Input absorption in ampere
- 7) CE mark and production date

1.7. Certifications

We declare under our exclusive responsibility that the product is compliant to the European standards 2006/95/EU, 2004/108/EU, 2011/65/EU D. Lgls n°27/2014 (RoHS), 2002/96/EU e 2003/108/EU (RAEE) and to theirs relative documentation.



2. INSTALLATION

IMPORTANT:
Dedicated section for the technician and qualified personnel

- 2.1. Connection of the device to the network

To connect the charger to the mains voltage network, use the outgoing cable from the device to install a suitable plug with ground pin (in some models the power cord is supplied with the power plug already installed)

AVOID THE USE OF POWER CORD EXTENSIONS.



The mains voltage plug where the charger will be connected to the network must be proportionally sized for the power consumption of the device and must have fuses and/or other safety devices compliant to the country standards.

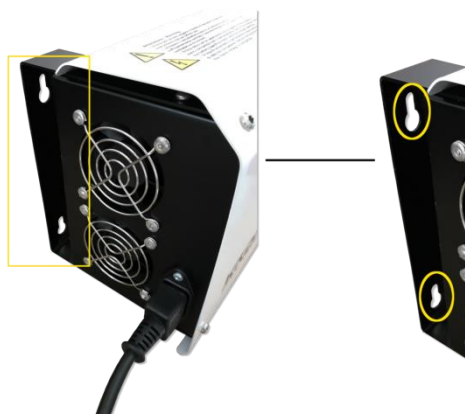


Before connecting the charger to the network, check the information mentioned on the serial number label to make sure that the device is suitable for the network voltage.

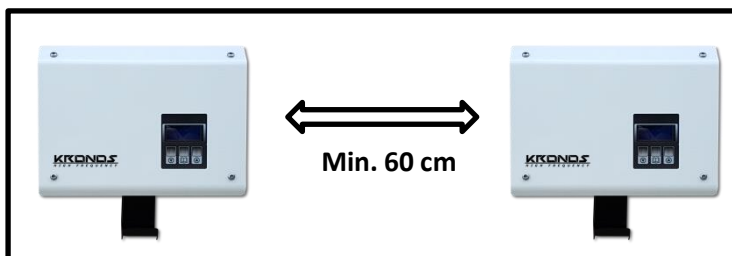
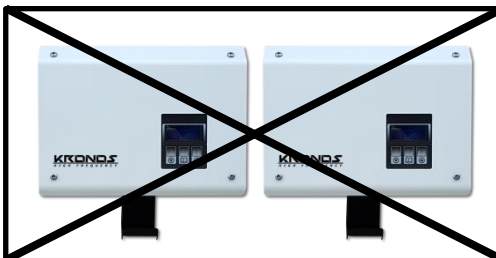
Make also sure of the correct grounding of the mains plug.

The replacement of the power cord is possible only and exclusively if made by competent and authorized personnel. The new power cord must be compatible with the same size of the cable supplied by the factory.

To guarantee optimal operations of the KRONOS Series, it is suggested to attach the device to the wall by using the integrated support on the back of the device.



IMPORTANT: avoid to attach the devices in series because they might create a hot air channel that will lead to a non-suitable ventilation of the devices themselves.



3. OPERATION AND CHARGING VISUALS

Before connecting the charger to the battery, make sure that:

- **The device is correctly set for the battery connected****
- The charging cables (red and black) are properly connected and tightened in the charging plug
- The charging plug is in an optimal state

3.1. Operation



** In case the device is not set properly, it could cause serious damage to the battery. In particular, it is suggested to make sure that the charger output voltage matches the nominal voltage of the battery and that the nominal charging current of the charger is ideal for the capacity of the battery connected to it.

Once the charger is connected to the battery, the charging cycle will automatically begin.

In case for any given reason there is the need to force an interruption of the charging cycle, it is possible to interrupt the connection between the charger and the battery. The charging cycle will stop immediately.

IMPORTANT

In case of both forced interruption or after the completion of a regular charging cycle, the device requires a variable period of time to cool off the internal components.

During this period, the aeration fans will remain on and will automatically turn off when reached the required internal temperature.

Once the cooling phase is over, the fans will turn off and will be possible to unplug the charger from the mains voltage network plug.

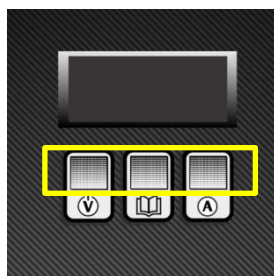
It is advised to always leave the device connected to the mains voltage network to allow its cooling once the charging cycle is completed. The lack of this cooling phase leads to a shorter lifespan of the device.

3.2. Visualizations



The entire KRONOS Series, from the smallest to the biggest model, is supplied with a touch display with 3 buttons, a display that supplies useful information regarding the charging cycle.

The touch buttons are located under the small squares. If you press on the symbol of the button, there won't be the desired effect.



The charging visualizations are 4:

- 1) Charging current (Ampere - A)
- 2) Battery voltage of the battery connected (Volt - V)
- 3) Ampere delivered to the battery (Ah)
- 4) Percentage of charge of the battery (%)



4. CHARGING PARAMETERS SETTING



All the chargers of the Kronos Series allow the choice between different voltage, current and preset charging curve options for different types of batteries for a use on a wider range of products.

Besides, among the charging curves, there are two special functions:

- Desulphator function
- Power supply function

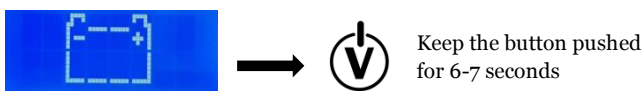
To activate the desulphation function, power supply function and/or change the charging parameters is simple and intuitive through the touch buttons and the visualizations on the display.

4.1. How to access to the charging parameters

IMPORTANT:
Before attempting any kind of change of the default parameters, it is suggested to consult a specialized technician and to carefully read the section of the manual 7.2. Charging curves description to make sure that the selected charging curve is compatible with the battery that will be charged

To access to the charging parameters, follow this procedure:

- When the charger shows on the display a symbol of a flashing battery, keep the “V” button pushed for about 6-7 seconds to access to the special visualization for the parameters selection.

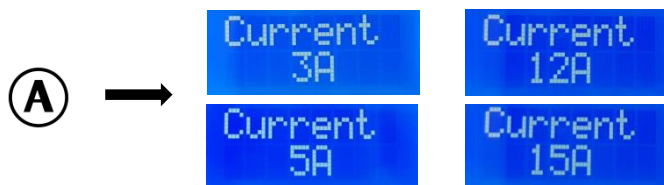


Release the “V” button when the charger emits a buzzing noise.

To select the new charging voltage, push the “V” button



- Use the “A” button to select the new charging current



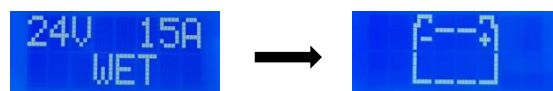
- Use the central button to select the charging curve (check section 7.1. Charging curves description for further information)



To confirm the new parameters, simply wait for 3 seconds and the charger will memorize the newly selected parameters.

When the selection is complete, on the main display will appear a symbol of a battery to indicate that the charger is ready to be used.

Confirmation visual, after 3 seconds the charger will automatically memorize the new parameters



4.2. Special functions

The special functions integrated inside the control cards of the Kronos Series make the charger a proper desulphator or power supply.

Once selected the wanted function (check section 5.1. How to access to the charging parameters), the charger will offer new options to customize the charging cycle according to your needs.



DESULPHATOR Function

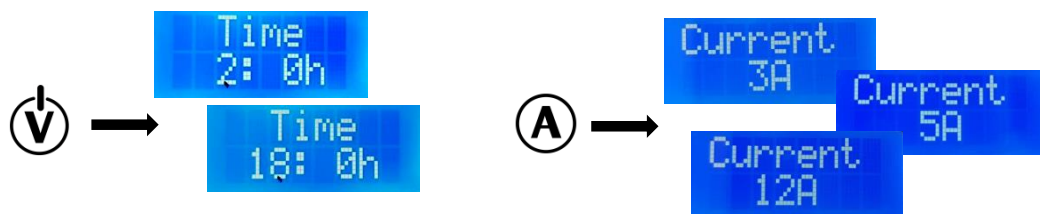


In case the “DeSulfat” function is selected, the purpose of the “V” button will be modified.

The new purpose of the “V” button will be to select the duration of the desulphator cycle.

The desulphator cycle can last from a minimum of 2 hours to a maximum of 18 hours (it is possible to repeat the charging cycle if necessary).

The function of the “A” button remains the same and it will always be possible to choose the constant charging current between the parameters offered by the unit.



Once selected the wanted parameters, simply leave the charger in standby for a few seconds and it will automatically memorize the new configuration.

To begin the cycle, simply connect the battery (or the single cell) to the device and the cycle will begin automatically.

To interrupt the desulphation cycle, keep the “V” button pushed for 3 seconds.

In case there is the need to change the charging curve or charger functions, it will be necessary to disconnect the battery to the charger and wait for the flashing battery visualization to appear on the display.

IMPORTANT: the desulphator function has 2 limits:

- The battery connected (or single cell) must be of at least 1 volt
- The charging voltage cannot exceed the maximum voltage allowed from the the condensers inside the device (Ex. Battery charger of 80V, the maximum voltage that the device can reach in desulphator mode is 126V)

ATTENTION: when the device is turned on and in Power Supply mode, pay the utmost attention to the positive and negative poles.

REMEMBER TO ALWAYS INTERRUPT THE FUNCTION BEFORE DISCONNECTING THE ELECTRICAL DEVICE FROM THE CHARGER.

THE FUNCTION WORKS EVEN IF THERE ISN'T A RESISTANCE CONNECTED TO THE CHARGER.

POWER SUPPLY Function

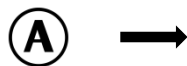


In case the “Power Supply” function is selected, it will be possible to choose between the voltage range available to power any electrical device.

Once selected the voltage, leave the battery charger in standby for a few seconds and it will automatically memorize the selected parameters.

To start to power an electric device, connect it to the cables and keep the “A” button pushed for 3 seconds.

Keep pushed for 3 seconds



To interrupt the function, keep the “A” button pushed for 3 seconds.

In case there is the need to change the device function, simply keep the “V” button pushed for about 6-7 seconds (check section 5.1. How to access to the charging parameters).



5. MAINTENANCE

IMPORTANT:
Section dedicated to
authorized and competent
personnel

5.1. Periodic maintenance



To guarantee an optimal and lasting operation of the device, TCE Group Srl suggests to perform a quick periodical maintenance.

Based on the working environment where the charger is located, the period will be variable (Ex. in dusty environments it is requested to perform a more frequent maintenance of the device).

Perform the maintenance only if the device is not connected to the mains voltage network and to the battery.

This period maintenance must be performed by competent and authorized personnel.

The steps to perform this maintenance are:

- Perform a visual check of the inside and outside condition of the device
- Blow away the dust that obstruct the airflow inside the charger with compressed air through the slits found on both sides of the device, also try to remove the dust found inside the inside heat sinks
- Make sure that the cables connection and cables don't have any sign of burns due to bad contact
- Make sure that the fuse is in good condition
- Make sure that the charging plugs are in good condition
- Check the condition of both the outgoing and ingoing cables and their plugs
- Make sure to clean the air filter (if installed in the given model) every 6 months and to perform a visual check of the filter before every charge

In case there are problems found during the periodical maintenance, it is suggested to contact TCE Group Srl or a specialized technician and to momentarily interrupt the use of the device.

6. TECHNICAL INFORMATION

6.1. Charging curves description



The chargers of the KRONOS Series offer the possibility to choose among different charging curves based on the battery that they will have to charge.

	Final V/Cell	V/Cell during maintenance charge
WET	2,4	2,20
WET – DEEP	2,68	2,20
AGM1	2,38	2,22
AGM2	2,45	2,28
GEL	2,35	2,20

6.2. Model data sheet



Model data sheet

Model	Supply	Voltage Range	Current Range
K10	220-240 Vac	12 / 24 V	3 – 20 A
K20	220-240 Vac	12 / 24 V	3 – 35 A
K30	220-240 Vac	36 / 48 V	3 – 7 A
K40	220-240 Vac	36 / 48 V	3 – 15 A
K50	220-240 Vac	12 / 24 V	3 – 50 A
K60	220-240 Vac	12 / 24 V	3 – 100 A
K70	220-240 Vac	36 / 48 V	3 – 30 A
K75 (pfc)	220-240 Vac	36 / 48 V	3 – 35 A
K80	220-240 Vac	36 / 48 V	3 – 60 A
K85 (pfc)	220-240 Vac	36 / 48 V	3 – 60 A
K90	220-240 Vac	72 / 80 V	3 – 20 A
K95	220-240 Vac	72 / 80 V	3 – 35 A
K900	400 Vac	24 V	10 – 140 A
K950	400 Vac	36 / 48 V	10 – 130 A
K980	400 Vac	72 / 80 V	10 – 80 A
K1280	400 Vac	12 – 80 V	10 – 80 A
K1236	220-240 Vac	12 – 36 V	3 – 40 A

K1248	220-240 Vac	12 – 48 V	3 – 25 A
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6.3. Charging time data sheet



Current	8h charge	10h charge	12h charge
5A	40 Ah	50 Ah	60 Ah
10A	80 Ah	100 Ah	120 Ah
15A	120 Ah	150 Ah	180 Ah
20A	160 Ah	200 Ah	240 Ah
25A	200 Ah	250 Ah	300 Ah
30A	240 Ah	300 Ah	360 Ah
35A	280 Ah	350 Ah	420 Ah
40A	320 Ah	400 Ah	480 Ah
50A	400 Ah	500 Ah	600 Ah
60A	480 Ah	600 Ah	720 Ah
70A	560 Ah	700 Ah	840 Ah
80A	640 Ah	800 Ah	960 Ah
90A	720 Ah	900 Ah	1080 Ah
100A	800 Ah	1000 Ah	1200 Ah
110A	880 Ah	1100 Ah	1320 Ah
120A	960 Ah	1200 Ah	1440 Ah
130A	1040 Ah	1300 Ah	1560 Ah
140A	1120 Ah	1400 Ah	1680 Ah

WARRANTY

This device is built by following high qualitative standards to assure its high quality. Every single construction phase is overviewed by specialized personnel.

The warranty is granted ONLY AND IF TCE Group Srl agrees that the damage claimed is caused by faulty parts installed during the construction or assembly of the device.

In the event of a warranty claim, the customer will have to dispatch the unit in question to TCE Group Srl, if it is then deemed that the fault/damage was caused by faulty parts installed during the constructions or assembly, TCE Group Srl will provide a replacement of the faulty part/component to restore the optimal state of the device.

The duration of the warranty is **12 months** from the moment when the unit leaves TCE Group Srl warehouse (except if there are others agreement between TCE Group Srl and the customer/distributor).

The warranty IS NOT GRANTED if:

- The unit has been tampered with or **OPENED**
- The unit has been damaged by misuse and/or bad installation
- The unit has been damaged by a use that is not what it was built for
- The unit has been damaged by third party or environment causes (ex. Heavy rain, storms, etc etc)
- The unit has been damaged by the surrounding environment (ex. Alkaline environment)
- The unit has been damaged during transportation

This warranty does not cover in any case the replacement of the device or any compensation for costs, injuries, direct or indirect damages caused by unit fault (production stop included).

For any legal claims, the court of Padova (Italy) will be responsible and will handle the matter.

To request assistance or in case of problems, contact the nearest authorized dealer or directly contact TCE Group Srl.