

Instructions for battery chargers

CCC₄₀₅ and CCC₄₁₀

24V/5A

24V/10A

used for recharging batteries in wheelchairs and scooters



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Instructions for chargers CCC₄₀₅ / CCC₄₁₀



Important: Read the instructions before charging

NOTE: With regard to the name of the lights: see figure 1

- 1: Turn on the charger by connecting the charger's power plug to the outlet.
- 2: Wait for ERROR to light up (red) and remain on. ^{1,2}
- 3: Connect the charging plug to the wheelchair's ⁵ charging socket.
The ERROR light goes out and both the CHARGING and COMPLETED lights will be lit for around 1 second while the charger inspects the battery. If charging is required, the COMPLETED light goes out and the CHARGING light will remain lit until the battery is fully charged. ^{2,3}
- 4: Wait for the COMPLETED light to come on as a sign that the battery is fully charged.
The charger automatically switches to trickle charging (very low electrical consumption). Therefore allow the charger to remain connected before using the wheelchair again. The charger cannot overcharge the batteries.
- 5: Before resuming operation, remove the charging plug from the wheelchair's charging socket. The COMPLETED light will go out and the ERROR light will come on. ⁴
Turn the charger off by removing the charger's power plug from the outlet.
- 6: If it becomes necessary to interrupt charging before the COMPLETED light comes on, turn the charger off by removing its power plug from the outlet before removing the charging plug from the wheelchair's charging socket.
This will prevent sparks and unnecessary wear to the charging plug.

¹ The charger tests itself when on and signals its configuration using flash codes via the lights on the front of the charger (see diagram 1 for an explanation of the flash codes).

Steady light in ERROR signals: "Charging OK, but no battery connected" - If the ERROR light fails to show a steady light, contact your charger supplier.

² Any fault in the battery when connecting or later during charging is signaled using a flash code on the lights via the front of the charger (see diagram 2).

³ If a significantly depleted battery is charged, the CHARGING light will flash once charging begins.

⁴ If the charger is supplied with an ampere-hour meter, the charged capacity will immediately be signaled once the ERROR light comes on (see figure 2).

⁵ The word "wheelchair" in these instructions refers to any battery-operated mobility aid.

Figure 1: The names of the lights:

1. CHARGING (yellow light)
2. COMPLETED (green light)
3. ERROR (red light)



Safety information regarding daily use

Important: Safe use means observing the instructions regarding measures prior to use, as well as the charger's location, dismantling, repairs, maintenance and cleaning on page 7.

In addition, pay attention to the following:

Important: During charging, lead batteries may give off small quantities of explosive gases. Wheelchairs should, therefore, be charged in well-ventilated rooms.

Warning:  : **Avoid flames and sparks** (so that any explosive gases are not ignited).

Warning: Chargers that have suffered damage to their casing, cables or plugs are at risk of short-circuiting and/or are a potential shock hazard and must, therefore, **not** be connected to mains power or the wheelchair's charging socket.

If you discover that the charger has been damaged, contact your supplier for repair.

Important: Plugs and/or cables that are significantly worn must be replaced. Cables or outlets must be replaced by authorized personnel only. - Contact your charger supplier for repairs.

Important: In order to avoid condensation forming, the charger should not be exposed to rapid temperature changes.

Warning: Condensation on the surface of the charger may affect electrical safety! If you discover condensation on the charger, store it at a temperature within the specified or operating temperature range until any trace of condensation disappears - although at least 4 hours - before connecting the charger to the mains power or the wheelchair.

Warning: For safety reasons, batteries must not be repeatedly recharged if the charger has reported that the battery is faulty (see diagram 2) - Contact your battery supplier.

Warning: For safety reasons, repeated charging should not be undertaken using a charger that has reported "Fault in charger" (see diagram 2) - Contact your charger supplier for repairs.

Warning: The charger's base and rear plate (cooling plate) will become warm during parts of the charging process.

- Avoid touching the charger's base and rear plate when the charger is on and for 10 minutes after it has been switched off.
- Users with a reduced sense of touch and/or extended reaction time must be particularly careful when touching the charger's base and rear plate.
- Special care must also be paid if the specified, maximum ambient temperature is exceeded or if the charger gets too warm for any external reason.

Important: Always use the handle when moving the charger.

Important: Avoid covering the charger in any way.

- If the charger is covered or gets too warm for any external reason, the charging time will be longer.

Important: Chargers **CCC₄₀₅** / **CCC₄₁₀** are certified in accordance with current EMC standards. Portable equipment with built-in radio transmitters – such as cell phones – may, however, affect the function of the charger under adverse conditions. Therefore avoid using cell phones or other radio communication equipment in the immediate vicinity of the charger.

Battery care

To get the most out of the batteries with regard to operating time per charge and total lifetime, observe the following:

- Always turn the wheelchair off when not in use.
 - o If the wheelchair is left on, this may cause significant depletion of the battery.
 - o Significant depletion will reduce the lifetime of the battery unless it is recharged immediately.
- Recharge daily (every night, if possible) - even if the full capacity of the battery has not been used.
 - o The charger cannot overcharge the battery.
- Always recharge the battery as soon as possible after it has gone flat.

Meaning of the flash codes

Stage on start-up	
1	All lights lit for around 1 second during start-up test
2	From 1 to 15 short flashes on CHARGING depending on charging characteristics (set before delivery)
3	<p>4 flashes that signal the charger's properties (set before delivery):</p> <p>1st flash: TCS additional charging (patented). 2nd flash: Temperature-compensated standby charging. 3rd flash: Charging of batteries with off-load voltage below 16.8V possible. 4th flash: Ampere-hour meter.</p> <p>Red flash (ERROR light): Property passive Green flash (COMPLETED light): Property active</p>

Figure 1: Signaling of the charger's configuration when the charger is on.

	Light status 6)			Fault type	Designation
	CHARGING	COMPLETED	ERROR		
Charger fault: ERROR flashes continuously	OFF	OFF	Prolonged flash	Mains voltage too low	Contact electrician 1)
	ON	OFF	Prolonged flash	Fault in charger	Contact charger supplier
Battery fault: Group flash with ERROR	OFF	OFF	2 flashes	Battery fault: Charging when significantly depleted not possible	Contact battery supplier 3)
	OFF	ON	3 flashes	Battery fault: Fault during charging with falling current - battery defect	Contact battery supplier 3)4)
	OFF	ON	4 flashes	Battery fault: Main charging time too long. Battery defect or charger too small in relation to battery capacity	Contact battery supplier 3)4)
	OFF	ON	5 flashes	Battery fault: Battery voltage too high	System fault 2)
External error source: Group flash with ERROR	OFF	OFF	6 flashes	Charger temperature too high	Check that the charger is positioned so that there is 5 cm of free space on all sides
	OFF	OFF	ON	No battery connected	Standby mode 5)

Figure 2: Signaling of faults

- 1) Always possible - charging will recommence once the mains voltage is OK.
- 2) During start-up.
- 3) During charging (- No standby charging in the event of a fault!)
- 4) Available capacity filled.
- 5) In the event of any interruption (fault!) to the charging process, the connection of an incorrectly polarized battery or an attempt to charge batteries using an off-load voltage below 3V, ERROR will remain lit (steady) when connecting a charging plug.

6) **ON: Light lit** **OFF: light not lit**

Ampere-hour meter (measurement of charged capacity)

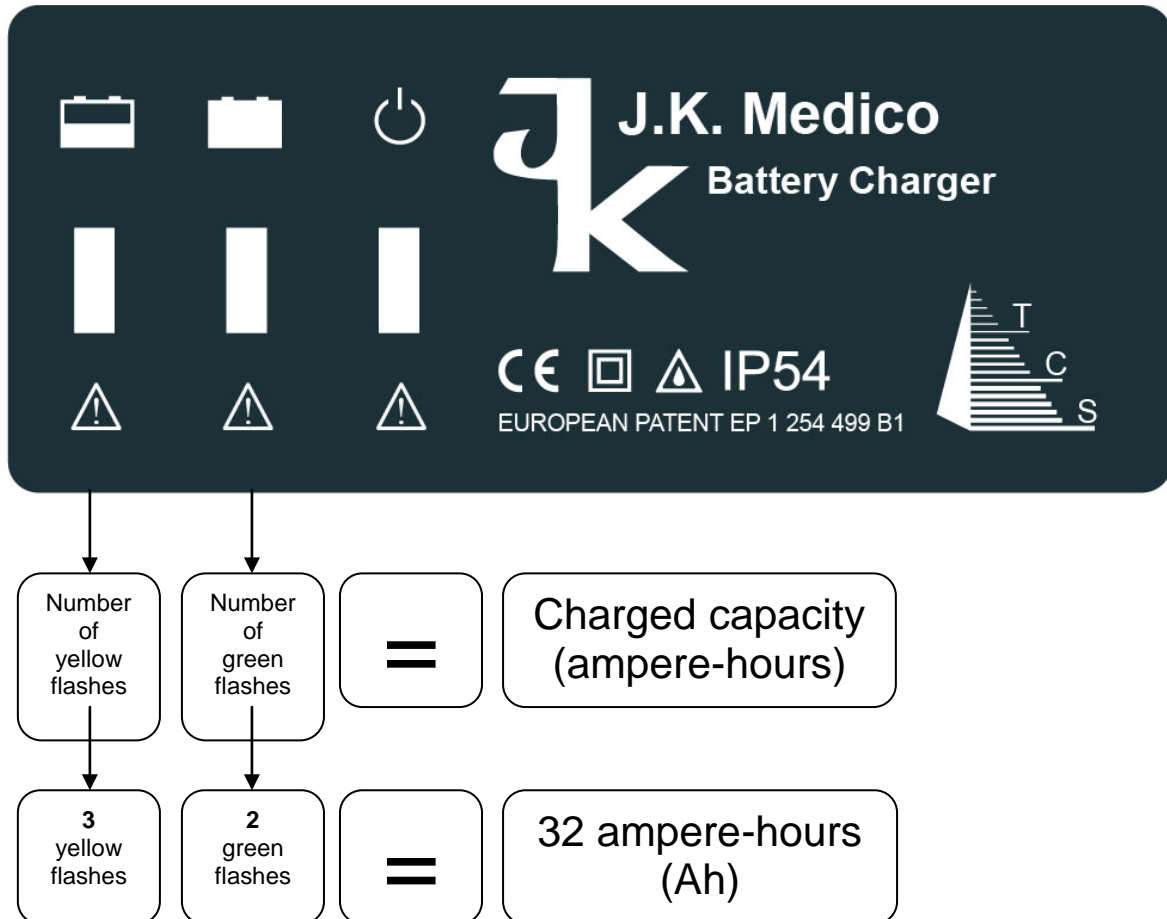


Figure 2: Display showing charged capacity when the charging plug is removed from the wheelchair's charging socket once charging has ended.

Technical specifications for CCC₄₀₅ and CCC₄₁₀

CCC₄₀₅:

Charging current (ripple-free):	5A
Compatible batteries:	24V, 20 Ah .. 50 Ah – Type Gel, AGM
Dimensions, B x H x D (incl. handle):	220 mm x 75 mm x 205 mm
Weight:	2.5 kg

CCC₄₁₀:


Charging current (ripple-free):	10 A
Compatible batteries:	24 V, 40 Ah .. 100 Ah – Type Gel, AGM
Dimensions, B x H x D (incl. handle):	220 mm x 75 mm x 205 mm
Weight:	2.6 kg

Efficiency: not less than 90%


Short-circuit and faulty polarization safe

Mains power: 230V 50Hz

CE - labeled in accordance with: the EU Directive 93/42/EEC on medical devices

Approvals:  EN60601-1, in accordance with the requirements for type B applied part



 EN60335-2-29

Enclosure rating: Splashproof and dustproof  IP54

Insulation class: II (double-insulated) 

This means that the charger can be connected to an ordinary (not ground) socket.

Ambient environment	Temperature	Relative air humidity	Air pressure
Use 1)	-10°C .. +30°C	10% .. 90%	70 kPa .. 106 kPa
Transport and storage 2)	-40°C .. +70°C	10% .. 90%	70 kPa .. 106 kPa

1): Bearing in mind the safety information, page 2

2): In accordance with the packaging's label

Important: The charger may only be used with a **permanently fitted charging plug**.

The charging plug may be fitted and replaced by authorized personnel only.

Important: The charger may only be used for charging batteries that are built into wheelchairs.

Warning: The charger may only be used for wheelchairs if the mains supply is designed for a current that corresponds to at least the charger's specified charging current. There **must** be a fuse suitable for use during charging in the wheelchair's charging cord.

Warning: The charger may only be used for charging rechargeable **24V lead batteries** that are specifically designed for use in wheelchairs.

Warning: You must not recharge batteries that are not rechargeable!

Energy transfer from the mains to the battery uses a patented power circuit.

The charging process is controlled by a built-in microcomputer. The current state of the battery is adapted automatically. This will optimize the lifetime of the battery.

Once the battery is fully charged, the status changes to trickle charging. Overcharging is not possible.

The charging time is the shortest possible.

The "CHARGING", "COMPLETED" and "ERROR" lights on the front of the charger signal the charging status.

Any faults in the battery or charger are signaled using error codes (see diagram 2).

Option for (program options):



• TCS additional charging (patented):

• Temperature-compensated standby charging

If the charger has temperature-compensated standby charging, it must be placed in the same room (the same temperature) as the wheelchair if batteries need to be charged!

• Controlled charging of significantly depleted batteries

• Display of charged capacity (Ampere-hour meter)

• Adaption of charging characteristics to current requirements.

Important: The charger's properties (program options) may only be changed by authorized personnel!

Prior to use

Important: Check that there are no signs of damage to the casing, cables and plugs before starting to use the charger.

Contact your charger supplier in the event of mechanical damage.

Warning: Chargers with physical damage to their casing, cables or plugs are at risk of short-circuiting and/or are a potential shock hazard and must, therefore, **not** be connected to mains power or the wheelchair's charging socket.

The charger is dustproof and splashproof (IP54).

Important: Contact your charger supplier if you are unsure regarding the environment of use.

Warning: The charger must not be (either wholly or partially) submerged in water or covered with snow.

Location of charger

Warning: The charger must be kept out of reach of children

Place the charger on a fixed surface and ensure there is at least 5 cm free space on all sides.

Position the charger so that the control lights are visible.

Position the charger so that the distance to the wheelchair is at least 20 cm.

Do **not** place the charger in direct sunlight, by radiators or any other heat source.

Important: Avoid covering the charger in any way.

Dismantling and repairs

Important: The charger is supplied with a correctly polarized and mechanically coded charging plug. The charging plug must not be dismantled or modified.

Warning: For safety reasons, the charger must be dismantled and/or repaired by authorized personnel only. Contact your charger supplier if required for inspection and/or repairs.

Important: No modifications may be made to any part of the charger – including cables and plugs. Contact your charger supplier in the event of doubt.

Maintenance and cleaning

For normal use, the charger requires no maintenance over and above general cleaning, which requires a soft cloth, which may be damp if necessary

Warning: The charger must not be exposed to pressurized water.

Disposal

The charger is labeled:



This means that the charger must not be disposed of or removed as household garbage.

The charger **must** be taken to a controlled collection point for electronics waste when it is exhausted and needs to be disposed of.