

# Instructions for battery charger

## CCC<sub>1220xxx</sub>



**Splash proof, dustproof and water proof**

**⚠ IPX4/IPX5**



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 **Medico**  
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**BATTERY CHARGERS**

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# Instructions for chargers CCC<sub>1220xxx</sub> and Power Supply CVS<sub>1420BS</sub>



**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: If the ERROR lamp light up (red) and remain on,  
The battery is not connected to the charger <sup>1,2</sup>
- 3: Connect the charger to the battery (if not constantly connected)  
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. <sup>2,3</sup>
- 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 battery again.  
The charger cannot overcharge the battery.
- 5: Before resuming operation, turn off the AC supply to the charger or  
Turn the charger off by removing the charger's power plug from the outlet.

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<sup>1</sup> The charger tests itself when on and signals its configuration using flash codes via the lights on the front of the charger (see table 1 for an explanation of the flash codes).  
Steady light in ERROR signals: "Charger OK, but no battery connected" - If the ERROR light fails to show a steady light, contact your charger supplier.

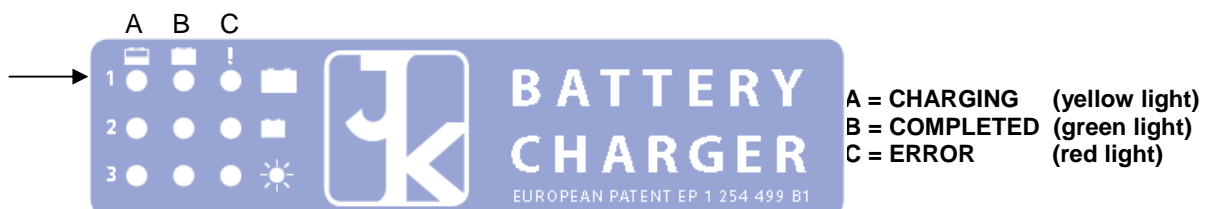
<sup>2</sup> Any fault in the battery when connecting or later during charging is signaled using a flash code on the lights via the front of the charger (see table 2).

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

<sup>4</sup> 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).

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Figure 1: The names of the lights for the main charger output 1:




## 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 as described in this manual.

**In addition, pay attention to the following:**

**Important:** During charging, lead batteries may give off small quantities of explosive gases. Batteries 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 a battery.

**Important:** The charger is turned off by disconnecting the charger's power plug from the outlet or switch off the power on the outlet.

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.

**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 sides (heat sink) will become warm during parts of the charging process.

- Avoid constantly touching the charger's base and side when the charger is on and for 10 minutes after it has been switched off.
- 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:** 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.

## 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 loads off when not in use.
  - o If a load 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 (or as often as 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 (row 1, main output 1)


Stage on start-up	Table 1: Signaling of the charger's configuration when the charger is turned on.					
1	All lights lit for around 1 second during start-up test					
2	From 1 to 15 short flashes on CHARGING depending on the programmed charging characteristics					
3	4 flashes that signal the charger's properties (set before delivery):  1st flash: TCSpost charging (patented). 2nd flash: Temperature-compensated standby charging. 3rd flash: Charging of batteries with off-load voltage below 8,4V possible. 4th flash: Ampere-hour meter active  <b>Red flash (ERROR light):</b> Property <b>passive</b> <b>Green flash (COMPLETED light):</b> Property <b>active</b>					
Faults	Table 2: Signaling of faults during operation or at turn on				Fault type	Designation
	Light status 6)			ERROR		
	CHARGING	COMPLETED				
<b>Charger fault:</b> ERROR flashes continuously	OFF	OFF	Prolonged flash		Mains voltage too low	Contact electrician 1)
	ON	OFF	Prolonged flash		Fault in charger	Contact charger supplier
<b>Battery fault:</b> 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)
<b>External error source:</b> 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)

Table 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**

## Meaning of the flash codes and status lamps

	A	B	C	A	B	C
<b>OUTPUT 1</b>	YELLOW CHARGING	GREEN COMPLETE	RED ERROR/STD.BY			
<b>OUTPUT 2</b>	YELLOW CHARGING	GREEN COMPLETE	YELLOW ERROR/STD.BY			
<b>INPUT 3</b>	YELLOW CHARGING	GREEN COMPLETE	YELLOW ERROR/STD.BY			



Quick guide	SHORE POWER ON						SHORE POWER OFF					
	1	2	3	4	5	6	7	8	9	10		
	Batt.1 full Batt.2 full Sun.3 OK	Batt.1 Not connected	Batt.1 chg Batt. 2 chg Sun.3 wait	Batt.1 full Batt. 2 chg. Sun.3 wait	Batt.1 chg. Batt. 2 full Sun.3 ON	Batt.1 ON Batt. 2 OFF	Batt.1 ON Batt. 2 OFF Sun.3 ON	Batt.1 full Batt. 2 chg. Sun.3 wait	Batt.1 chg. Batt. 2 full Sun. 3 chg.	Batt.1 full Batt.2 full Sun.3 OK		
<b>LED</b>	A B C	A B C	A B C	A B C	A B C	A B C	A B C	A B C	A B C	A B C		
<b>1</b>	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0		
<b>2</b>	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0		
<b>3</b>	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0	0   0		
<b>LED FUNCTION</b>	I=ON / 0=OFF / #=FLASHING / I <sup>D</sup> => I <sup>C</sup> = DEPENDENCY											

The light combinations shown are the most common. Other combinations exist but are relatively rare and will typically show up in abnormal situations such as disconnecting of the main battery during charging. If a non shown combination shows up, then check connections and fuses between the connected batteries and the charger.

## Ampere-hour meter

(Measurement of charged capacity of output 1)

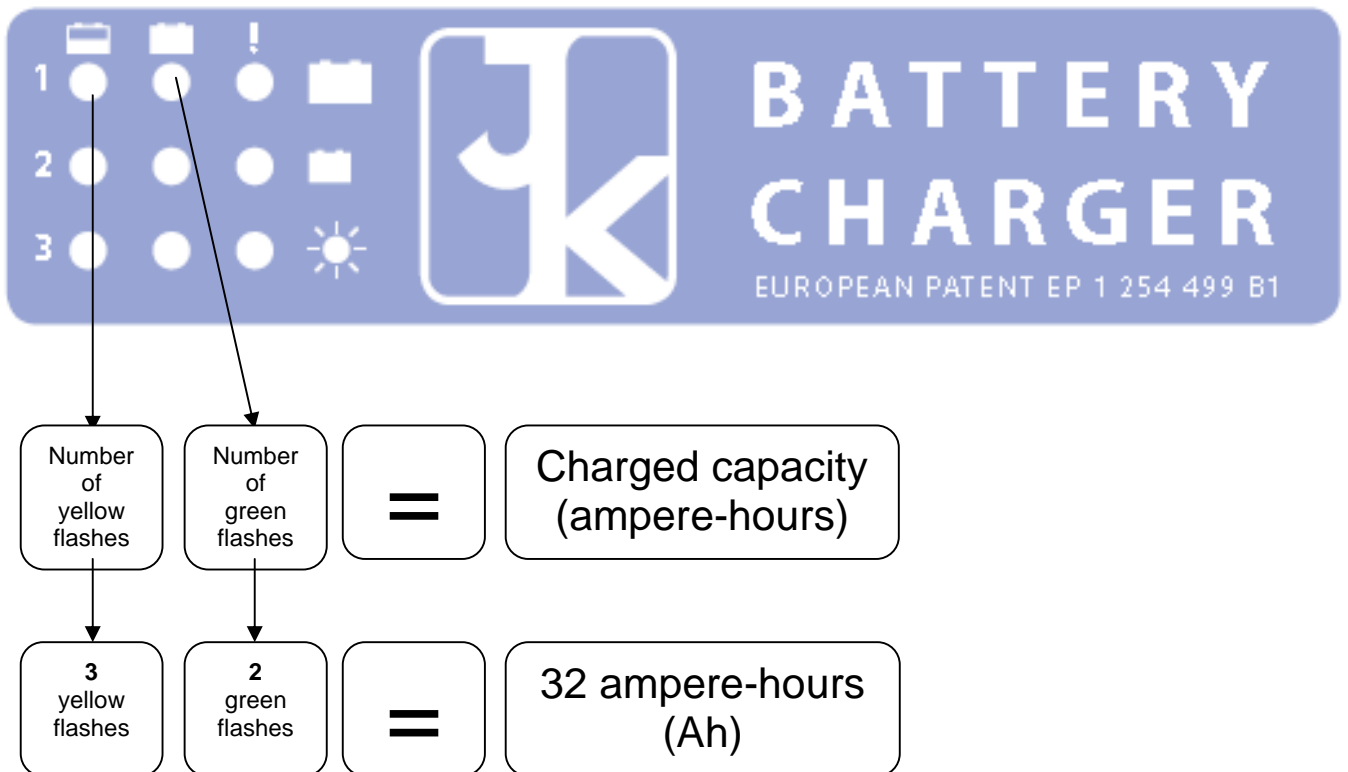


Figure 3: Display showing charged capacity when the charger is disconnected from the battery once charging has ended.



## Technical specifications for CCC<sub>1220xxx</sub>

Charge current output 1:	20 A (type S03:+3A from sunpanel)
Compatible batteries:	12 V, 40 Ah .. 300 Ah – Type Gel, AGM
Charge current output 2:	3 A
Input3:	8-30V / 5A (Input for solar panel) With MPPT (maximum PowerPoint Tracking)

## Technical specifications for CVS<sub>1420BS</sub>

<b>When shore power is on:</b>	
Output current output 1:	0 -20 A supplied by CVS1420BS.
Output voltage output 1:	14 Volt supplied by CVS1420BS.
<b>When shore power is off:</b>	
Output current output 1:	0 -25 A supplied from the battery on input 2, via the internal switch.
Output voltage output 1:	10 -14.7 Volt supplied from the battery on input 2, via the internal switch.
Input current input 2:	0 - 25 A from battery
Input voltage input 2:	10 -14.7 Volt from battery

## General Technical specifications

Dimensions, (W x H x D):	320 mm x 75 mm x 200 mm
Weight:	2,6 kg
Efficiency:	not less than 90%
Short-circuit and faulty polarization safe	
Mains power:	230V 50Hz (180-264Vac)
CE - labeled in accordance with:	The low voltage Directive and the EMC directive
Enclosure rating:	Splash proof, dustproof and water proof  IP54/IP65
Insulation class:	II (double-insulated) 
	This means that the charger and Power Supply can be connected to an ordinary power socket without earth connection.

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

**Warning:** The charger may only be used for charging rechargeable 12V lead batteries  
**Warning:** You must not recharge batteries that are not rechargeable!

<b>Type overview:</b>	
Model: CCC1220:	Charge current: 20A (single output)
Model: CCC1220s03:	Charge current: 20A + 3A (single output and input from sun panel)
Model: CCC12201203:	Charge current: 20A + 3A (dual output)
Model: CCC12201203s03:	Charge current: 20A + 3A + 3A (dual output and input from sun panel)
Model: CVS1420BS:	14V /20A Power supply with electronic load switch
CVS1420BS will simultaneously with the shore power connection, automatically switch all consumption from the utility battery, to be supplied from the CVS1420BS power supply. The CVS1420BS are used in connection with one of the CCC1220xxx models (or with other chargers)	

## Characteristics of the FIX series

Energy transfer from the mains to the battery or load uses a patented switch mode power circuit. The charging process is controlled by a built-in microcomputer, externally programmable by jumpers

- for different battery types, charging curves and installation cable length and gauge as well as other options, such as the JK Medico Patented TCS™ post charging, where the current state of the battery is adapted automatically, optimizing the lifetime of the battery and fully charging the battery in shortest possible time.  
Once the battery is fully charged, the status changes to trickle charging.  
Overcharging is not possible.

The "CHARGING", "COMPLETED" and "ERROR" lights signal the charging status. Any faults in the battery or charger are signaled using error codes (see table 2).

The chargers should be individually programmed with Charging characteristics for different battery types, charging curves, installation cable length/gauge and program options by jumpers as defined in the programming instruction below.

## Program options:

1. TCS post charging (patented): To be used in connection with CVS1420BS or in systems with no load on the batteries during charging.
2. Temperature-compensated standby charging the charger has built-in temperature-compensated standby charging, it must be placed in the same temperature environment, while charging, as the batteries it is charging
3. Controlled charging of significantly depleted batteries
4. Display of charged capacity (Ampere-hour meter)

**Important:** The charger's properties (program options and programming) must fit the battery type, installation type, cable length and gauge for best and safe operation.

**Important:** All input/outputs should be protected with fuses, use a 30A blade fuse (green) for the main output and a 10A blade fuse (red) for output 2 (the voltage drop across the fuses are calculated into the defined installation in table 3)

**To avoid unprotected wires connected to the battery terminals, place the fuses as close as possible to the battery.**

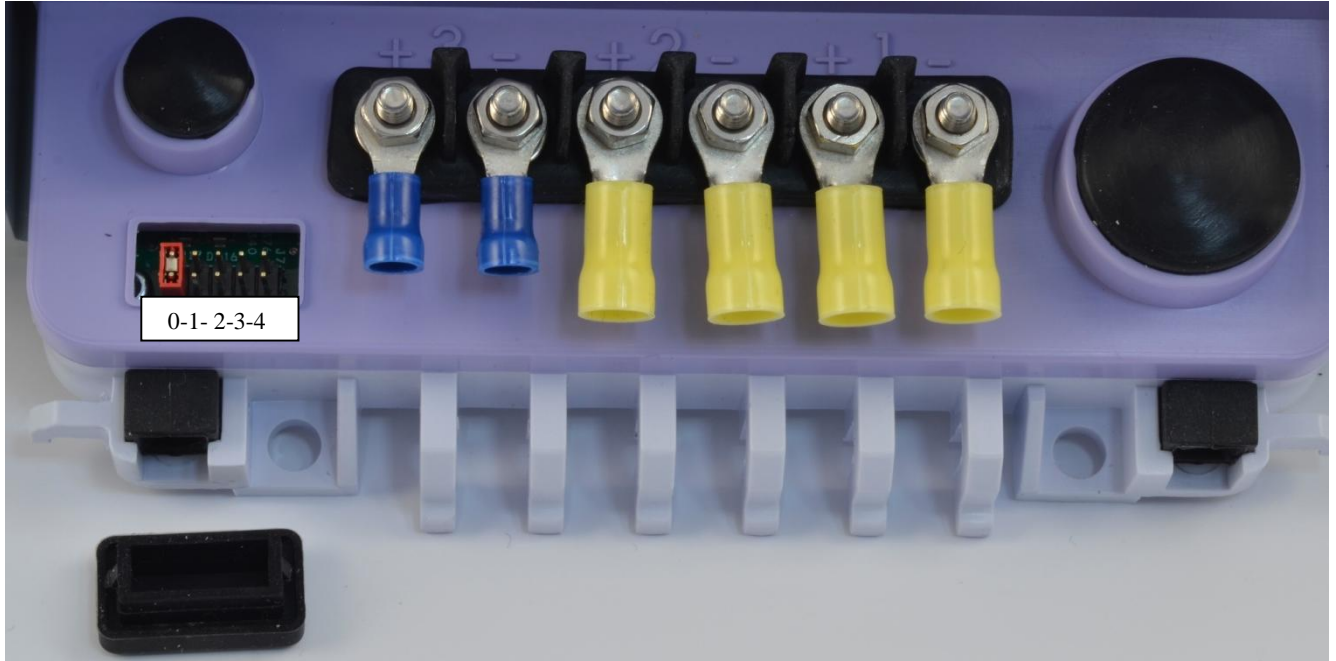


**Info:** All input and outputs are shortcircuit protected electronically and by melting fuses.

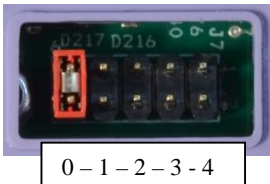
**Programming of the charger:**

The charger are default software programmed for AGM batteries (CC NO. 6) as the example below.

If you need other programming please remove the rubber plug and place the jumpers according to the programming table below



Jumper "0" are always present when standard temperature compensation are used and should not be present if external temperature sensing are used (OP01)



JUMPER = |  
NO JUMPER = x

PROGRAMMING JUMPERS					CC NO	Battery type	Prgrm option	L=Cable length [m] and G=gauge[mm <sup>2</sup> ] Positive and negative cable length are equal (Positive + negative cable = 2 x L)									
0	1	2	3	4				20A main output				3A output					
								L	G	L	G	L	G	L	G		
					1	AGM	1,2,3,4	2	2,5	3	4	5	6	2	1,5	>2	2,5
	x				2	GEL	1,2,3,4	2	2,5	3	4	5	6	2	1,5	>2	2,5
		x			3	AGM	2,3,4	1	2,5	2	4	3	6	2	1,5	>2	2,5
	x	x			4	AGM	2,3,4	1	4	2	6	-	-	2	1,5	>2	2,5
			x		5	AGM	2,3,4	4	4	6	6	-	-	2	1,5	>2	2,5
	x		x		<b>6</b>	<b>AGM</b>	<b>2,3,4</b>	<b>2</b>	<b>2,5</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>1,5</b>	<b>&gt;2</b>	<b>2,5</b>
		x	x		7	NU	NU	-	-	-	-	-	-	-	-	-	-
	x	x	x		8	GEL	2,3,4	1	2,5	2	4	3	6	2	1,5	>2	2,5
				x	9	GEL	2,3,4	1	4	2	6	-	-	2	1,5	>2	2,5
	x			x	10	GEL	2,3,4	4	4	6	6	-	-	2	1,5	>2	2,5
		x		x	11	GEL	2,3,4	2	2,5	3	4	5	6	2	1,5	>2	2,5

Table 3.

Example: AGM battery + program options:2,3,4 + main output cable length:2m + 3A output cable length: 2m = CC NO: 6

## 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.

**Important:** connect the charger to a mains outlet with easy accessible on/off switch

**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 a battery.

The charger is dustproof, splash proof and waterproof (IP54 and IP65).

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

**Warning:** The charger must not be submerged in water.

## Location of charger

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

**Important:** For optimum convection cooling Place / fix the charger on a fixed vertical surface with the longest side vertical and ensure there is at least 5 cm free space on all sides.

Position the charger so that the control lights are visible.

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

**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 high temperature vaporized water (vapor cleaning)

## Disposal



The charger is labeled: 

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

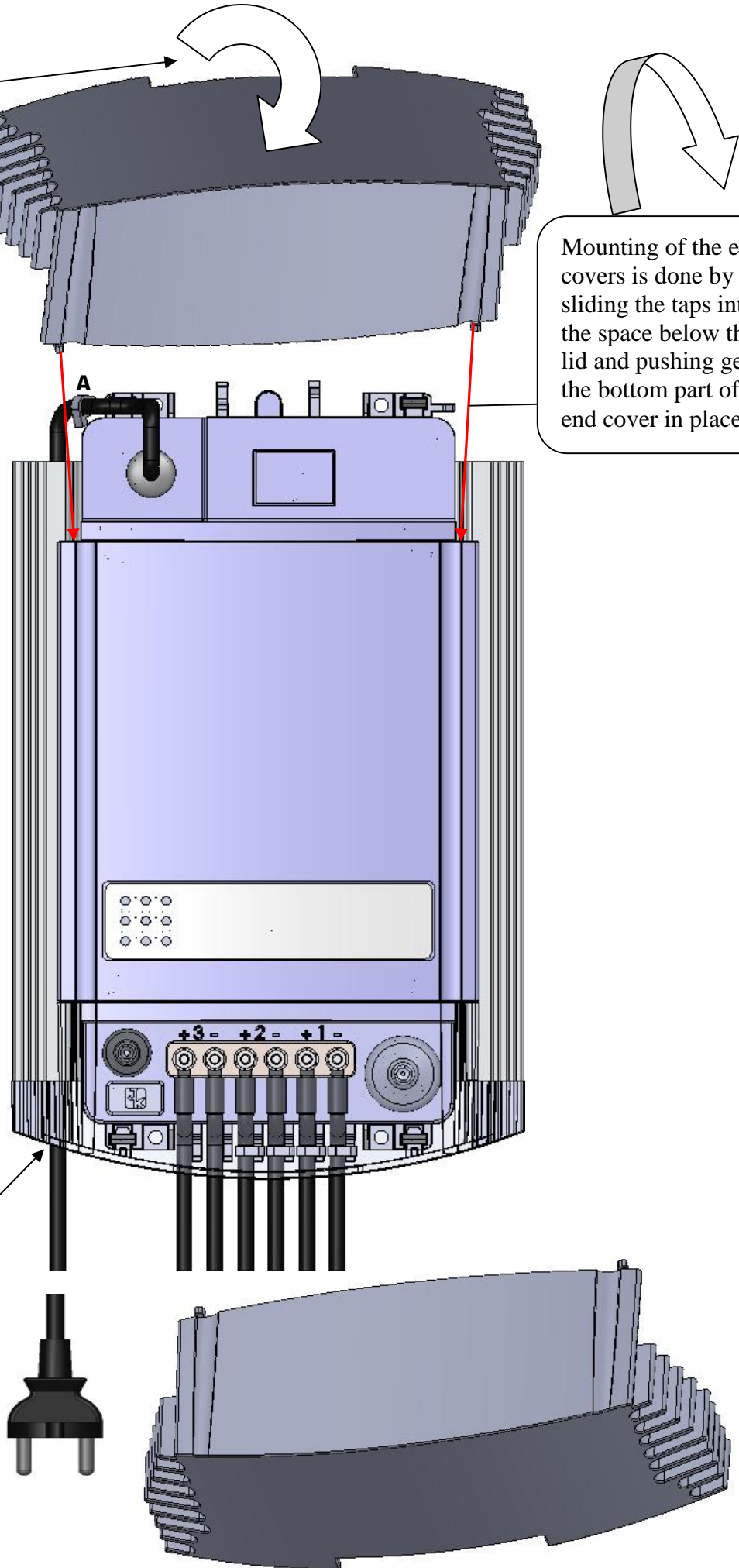
The charger **must** be taken to a controlled collection point for electronics waste when it is exhausted and needs to be disposed of.

## Installation general

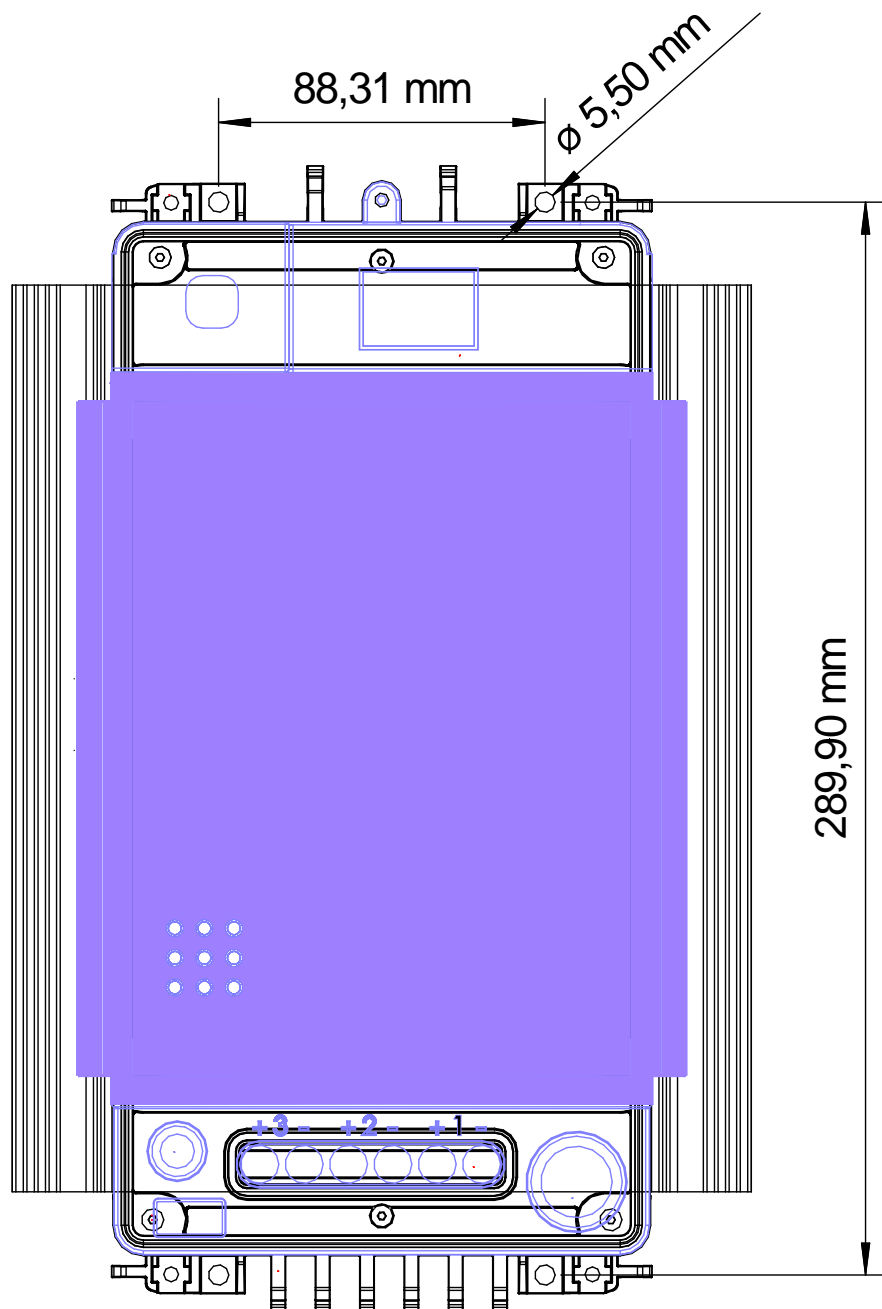
Dismantling of the end covers is done by pulling gently in the bottom of the end cover

Mounting of the end covers is done by sliding the taps into the space below the lid and pushing gently the bottom part of the end cover in place

The mains cable can be placed in a groove in the back plate (in both sides) if suitable for mounting. Strap the cable at "A" as shown



## Installation, screw mounting



The charger should be fixed with four  $\text{Ø}4\text{-}5\text{mm}$  screws.

Fixing dimensions: 88,3 x 289,9 mm

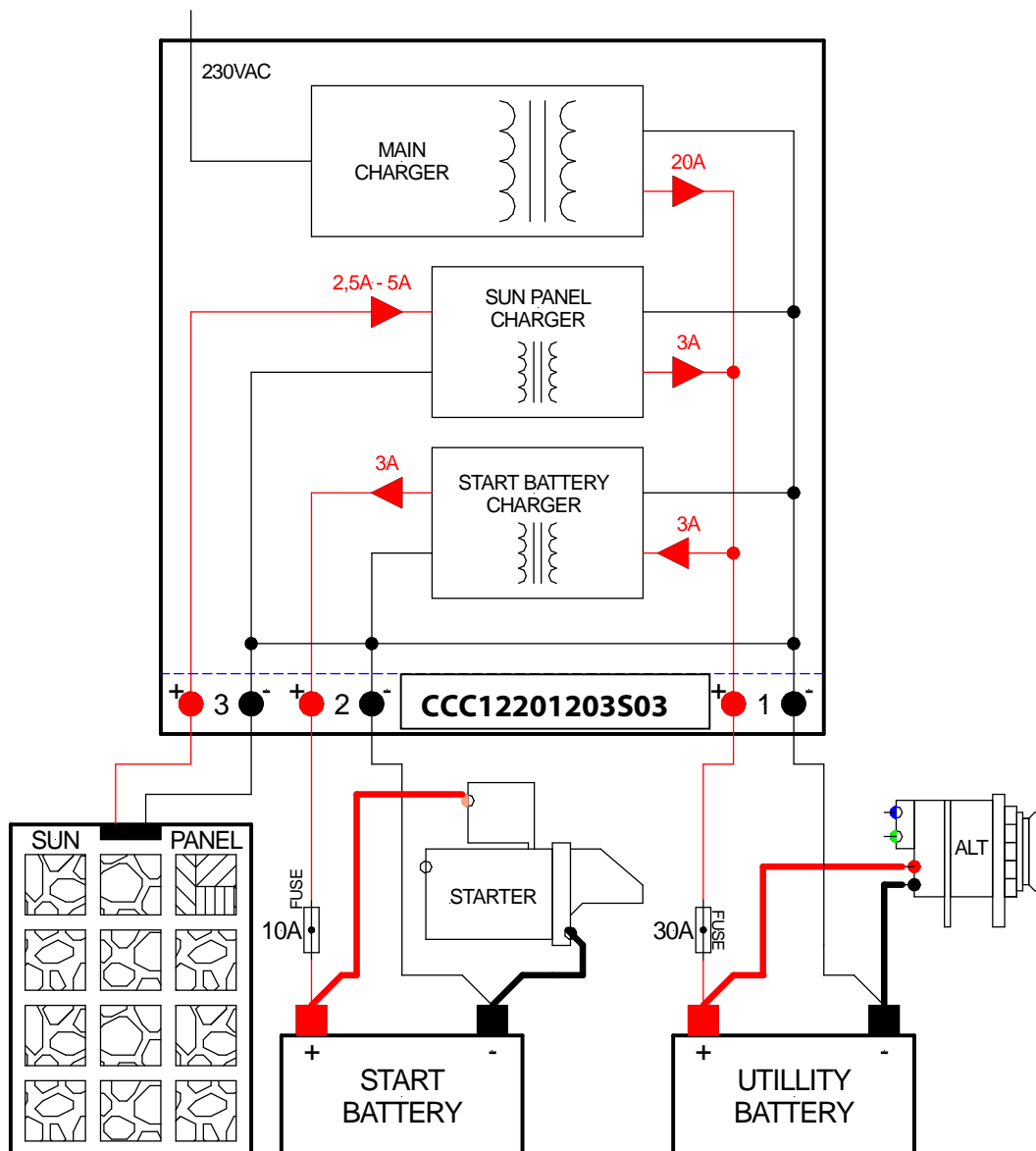
### **Warning:**

There is a little space below the screw fixing points, so do not use a lot of force when tightening the screws (The ABS plastic might be damaged).

## INSTALLATION OF CCC12201203S03

### *Dual output 12V/20A and 12V/3A and input from sun panel*

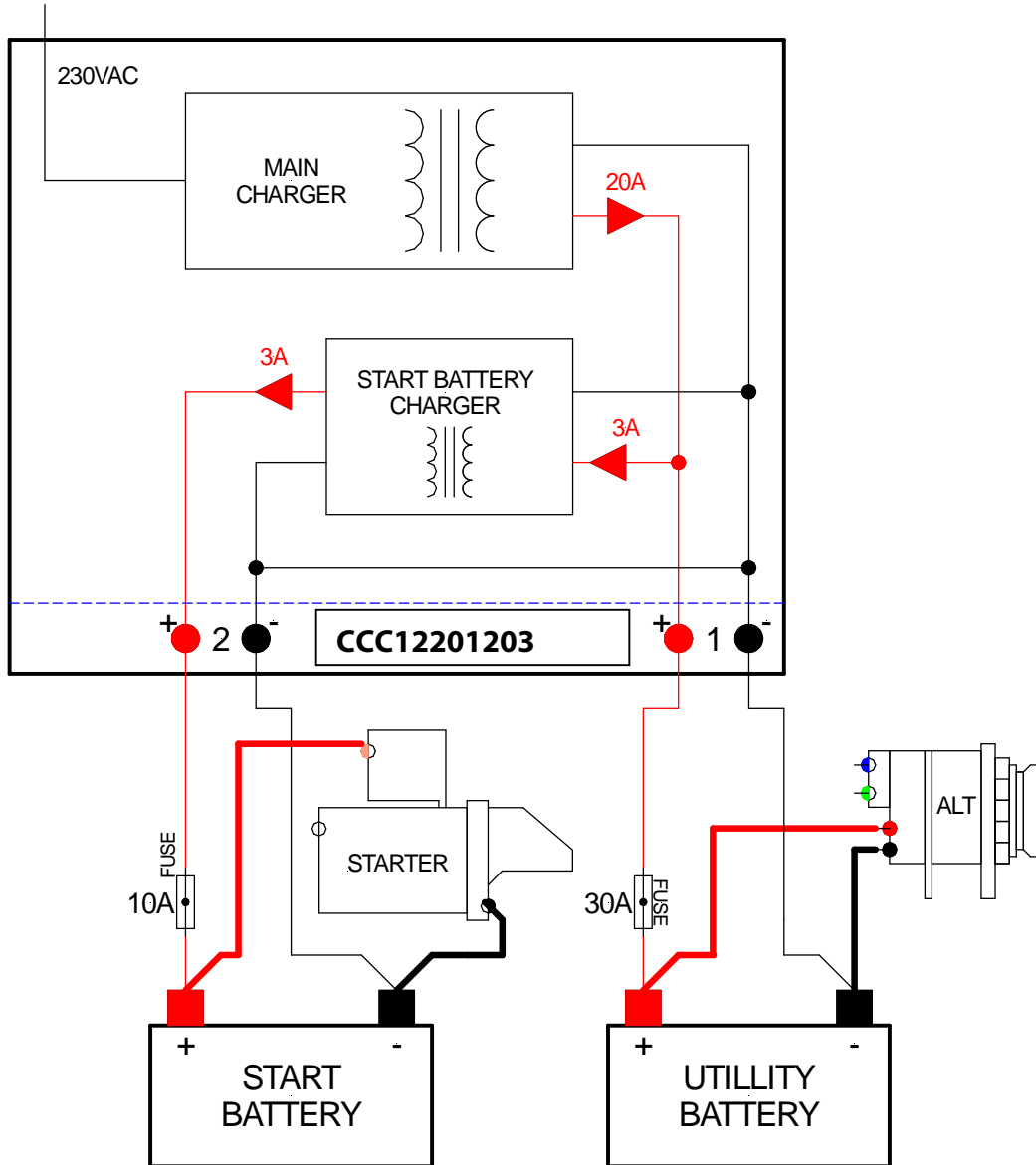
1. Output 1 connects directly to the Aux battery via a 30A fuse
2. Output 2 connects directly to the start battery via a 10A fuse
3. Input 3 connect directly to a sun panel
4. The Alternator are connected to the utility battery



## INSTALLATION OF CCC12201203

### **Dual output 12V/20A and 12V/3A**

1. Output 1 connects directly to the Aux Battery via a 30A fuse
2. Output 2 connects directly to the start battery via a 10A fuse
3. The Alternator are connected to the utility battery



## INSTALLATION OF CCC1220S03

### **Single output 12V/20A and input from sun panel**

1. Output 1 connects directly to the Aux Battery via a 30A fuse
2. Input 3 connects to a sun panel

## INSTALLATION OF CCC12201203S03

*Dual output 12V/20A, 12V/3A and input from sun panel together with CVS1420BS, Power Supply*

**Charger Output 1** connects to the utility battery via a 30A fuse and directly to the **CVS1420BS Power Supply input 2**

**Charger Output 2** connects directly to the start battery via a 10A fuse

**Charger Input 3** connect directly to a sun panel

**Power Supply Output 1** connects directly to the fuse box/ power distribution panel

The Alternator are connected to the utility battery

